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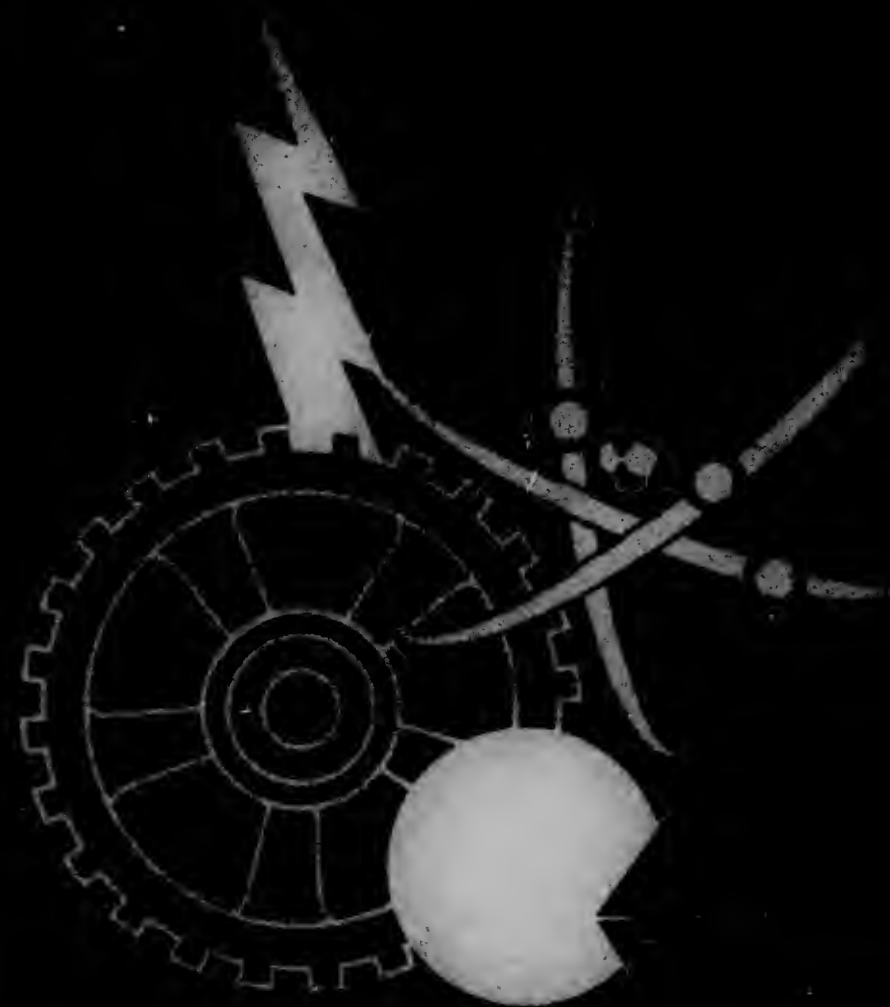
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OFFICIAL GAZETTE

of the
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PATENTS

February 4, 1992



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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O.G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

	Small Entity	Regular
U.S. National Stage fees		
USPTO was IPEA	310.00	620.00

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USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 31, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,800,592 through 4,802,241
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 29, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,495,657 through 4,497,068
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 29, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees	4,416,074	06/426,464	11/22/83
	4,416,076	06/335,032	11/22/83
	4,416,077	06/388,272	11/22/83
(c) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,416,085	06/373,859	11/22/83
	4,416,095	06/298,363	11/22/83
	4,416,099	06/264,416	11/22/83
	4,416,101	06/253,297	11/22/83
By a small entity (\$1.9f)	4,416,111	06/238,257	11/22/83
By other than a small entity	4,416,116	06/268,110	11/22/83
	4,416,120	06/405,931	11/22/83
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,416,122	06/373,893	11/22/83
	4,416,123	06/294,388	11/22/83
	4,416,125	06/364,898	11/22/83
	4,416,138	06/334,311	11/22/83
	4,416,142	06/297,813	11/22/83
By a small entity (\$1.9f)	4,416,146	06/355,032	11/22/83
By other than a small entity	4,416,147	06/283,484	11/22/83
	4,416,166	06/363,631	11/22/83
(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:	4,416,169	06/249,744	11/22/83
	4,416,171	06/332,868	11/22/83
	4,416,176	06/339,761	11/22/83
	4,416,177	06/239,849	11/22/83
	4,416,185	06/276,828	11/22/83
By a small entity(\$1.9(f))	4,416,188	06/265,224	11/22/83
By other than a small entity	4,416,195	06/458,483	11/22/83
	4,416,212	06/258,664	11/22/83
The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:	4,416,225	06/291,097	11/22/83
	4,416,226	06/383,835	11/22/83
	4,416,236	06/333,194	11/22/83
	4,416,237	06/352,457	11/22/83
	4,416,245	06/382,065	11/22/83
(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980	4,416,246	06/373,322	11/22/83
	4,416,255	06/385,083	11/22/83
	4,416,262	06/329,389	11/22/83
	4,416,263	06/340,065	11/22/83
	4,416,265	06/331,187	11/22/83
	4,416,266	06/264,381	11/22/83
By a small entity (\$1.9f)	4,416,271	06/312,164	11/22/83
By other than a small entity	4,416,289	06/371,078	11/22/83
	4,416,305	06/333,267	11/22/83
(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable	4,416,309	06/385,554	11/22/83
	4,416,313	06/316,884	11/22/83
	4,416,326	06/335,096	11/22/83
	4,416,332	06/269,993	11/22/83
	4,416,336	06/338,988	11/22/83
	4,416,339	06/341,472	11/22/83
	4,416,340	06/334,372	11/22/83
	4,416,353	06/266,101	11/22/83
	4,416,357	06/297,318	11/22/83
	4,416,358	06/265,834	11/22/83
	4,416,362	06/288,946	11/22/83
	4,416,369	06/338,681	11/22/83
	4,416,370	06/411,452	11/22/83
	4,416,373	06/345,684	11/22/83
	4,416,376	06/431,449	11/22/83
	4,416,377	06/356,928	11/22/83
According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.	4,416,381	06/325,295	11/22/83
	4,416,387	06/387,448	11/22/83
	4,416,391	06/408,046	11/22/83
	4,416,393	06/305,038	11/22/83
	4,416,411	06/387,018	11/22/83
	4,416,417	06/348,353	11/22/83
	4,416,418	06/354,151	11/22/83
	4,416,424	06/297,686	11/22/83
	4,416,428	06/337,126	11/22/83
	4,416,429	06/278,177	11/22/83
	4,416,430	06/344,622	11/22/83
	4,416,431	06/279,843	11/22/83
	4,416,433	06/282,809	11/22/83
	4,416,435	06/450,756	11/22/83
	4,416,436	06/314,254	11/22/83
	4,416,438	06/236,604	11/22/83
	4,416,443	06/398,361	11/22/83
	4,416,451	06/310,788	11/22/83
	4,416,454	06/279,776	11/22/83
	4,416,455	06/306,989	11/22/83
	4,416,463	06/318,919	11/22/83
	4,416,473	06/275,394	11/22/83
	4,416,481	06/250,085	11/22/83

PATENTS WHICH EXPIRED NOVEMBER 24, 1991
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 31,770	06/570,567	12/18/84
(4,417,029)	(06/289,556)	(11/22/83)
4,416,026	06/323,893	11/22/83
4,416,031	06/270,991	11/22/83
4,416,034	06/313,757	11/22/83
4,416,040	06/268,267	11/22/83
4,416,043	06/262,029	11/22/83
4,416,053	06/379,522	11/22/83
4,416,061	06/280,755	11/22/83
4,416,063	06/353,960	11/22/83
4,416,064	06/394,004	11/22/83
4,416,067	06/378,020	11/22/83
4,416,069	06/294,096	11/22/83
4,416,070	06/324,861	11/22/83
4,416,071	06/264,745	11/22/83

Patent Number	Serial Number	Issue Date	4,416,841	06/416,893	11/22/83
4,416,484	06/359,264	11/22/83	4,416,848	06/265,601	11/22/83
4,416,499	06/313,566	11/22/83	4,416,850	06/229,162	11/22/83
4,416,502	06/287,914	11/22/83	4,416,860	06/262,829	11/22/83
4,416,503	06/282,585	11/22/83	4,416,862	06/340,997	11/22/83
4,416,504	06/355,472	11/22/83	4,416,863	06/394,862	11/22/83
4,416,505	06/314,645	11/22/83	4,416,867	06/347,597	11/22/83
4,416,529	06/372,102	11/22/83	4,416,869	06/323,634	11/22/83
4,416,530	06/358,369	11/22/83	4,416,870	06/340,418	11/22/83
4,416,532	06/387,720	11/22/83	4,416,873	06/449,117	11/22/83
4,416,542	06/273,785	11/22/83	4,416,877	06/310,314	11/22/83
4,416,546	06/355,583	11/22/83	4,416,878	06/327,712	11/22/83
4,416,547	06/343,443	11/22/83	4,416,879	06/296,860	11/22/83
4,416,552	06/311,632	11/22/83	4,416,882	06/399,503	11/22/83
4,416,564	06/315,975	11/22/83	4,416,883	06/277,031	11/22/83
4,416,566	06/367,841	11/22/83	4,416,885	06/360,497	11/22/83
4,416,574	06/218,366	11/22/83	4,416,890	06/380,571	11/22/83
4,416,577	06/288,284	11/22/83	4,416,894	06/342,064	11/22/83
4,416,583	06/394,748	11/22/83	4,416,897	06/398,300	11/22/83
4,416,586	06/252,584	11/22/83	4,416,900	06/398,299	11/22/83
4,416,589	06/303,216	11/22/83	4,416,901	06/325,945	11/22/83
4,416,592	06/254,469	11/22/83	4,416,913	06/425,832	11/22/83
4,416,608	06/434,149	11/22/83	4,416,915	06/345,605	11/22/83
4,416,614	06/418,615	11/22/83	4,416,922	06/423,463	11/22/83
4,416,615	06/234,832	11/22/83	4,416,923	06/416,820	11/22/83
4,416,618	06/279,081	11/22/83	4,416,933	06/346,872	11/22/83
4,416,619	06/294,463	11/22/83	4,416,940	06/325,653	11/22/83
4,416,621	06/292,861	11/22/83	4,416,949	06/301,320	11/22/83
4,416,624	06/325,111	11/22/83	4,416,950	06/372,953	11/22/83
4,416,626	06/312,759	11/22/83	4,416,951	06/358,612	11/22/83
4,416,629	06/395,139	11/22/83	4,416,959	06/312,888	11/22/83
4,416,630	06/344,859	11/22/83	4,416,965	06/398,138	11/22/83
4,416,631	06/375,797	11/22/83	4,416,974	06/318,518	11/22/83
4,416,634	06/344,401	11/22/83	4,416,988	06/389,564	11/22/83
4,416,637	06/282,407	11/22/83	4,416,993	06/272,547	11/22/83
4,416,638	06/411,873	11/22/83	4,416,998	06/359,339	11/22/83
4,416,639	06/275,912	11/22/83	4,417,007	06/381,790	11/22/83
4,416,641	06/297,239	11/22/83	4,417,008	06/381,791	11/22/83
4,416,642	06/287,563	11/22/83	4,417,022	06/364,825	11/22/83
4,416,644	06/344,462	11/22/83	4,417,023	06/347,512	11/22/83
4,416,647	06/267,190	11/22/83	4,417,028	06/262,655	11/22/83
4,416,648	06/240,822	11/22/83	4,417,037	06/458,793	11/22/83
4,416,651	06/288,522	11/22/83	4,417,039	06/399,661	11/22/83
4,416,668	06/385,179	11/22/83	4,417,040	06/320,777	11/22/83
4,416,674	06/360,707	11/22/83	4,417,048	06/351,867	11/22/83
4,416,675	06/350,993	11/22/83	4,417,050	06/323,833	11/22/83
4,416,689	06/311,007	11/22/83	4,417,067	06/446,756	11/22/83
4,416,691	06/362,030	11/22/83	4,417,076	06/406,131	11/22/83
4,416,695	06/324,656	11/22/83	4,417,081	06/428,451	11/22/83
4,416,702	06/366,852	11/22/83	4,417,092	06/243,754	11/22/83
4,416,707	06/301,543	11/22/83	4,417,094	06/390,274	11/22/83
4,416,728	06/398,798	11/22/83	4,417,101	06/223,504	11/22/83
4,416,733	06/389,149	11/22/83	4,417,104	06/398,666	11/22/83
4,416,737	06/347,704	11/22/83	4,417,109	06/341,706	11/22/83
4,416,745	06/353,772	11/22/83	4,417,114	06/348,998	11/22/83
4,416,754	06/295,793	11/22/83	4,417,115	06/354,318	11/22/83
4,416,769	06/334,237	11/22/83	4,417,116	06/298,533	11/22/83
4,416,771	06/256,688	11/22/83	4,417,121	06/330,805	11/22/83
4,416,772	06/286,625	11/22/83	4,417,123	06/280,767	11/22/83
4,416,773	06/350,710	11/22/83	4,417,124	06/317,406	11/22/83
4,416,774	06/348,535	11/22/83	4,417,127	06/254,095	11/22/83
4,416,778	06/313,343	11/22/83	4,417,134	06/360,395	11/22/83
4,416,789	06/344,535	11/22/83	4,417,142	06/267,693	11/22/83
4,416,790	06/354,248	11/22/83	4,417,149	06/303,684	11/22/83
4,416,795	06/346,561	11/22/83	4,417,150	06/292,566	11/22/83
4,416,807	06/311,257	11/22/83	4,417,162	06/300,590	11/22/83
4,416,808	06/439,732	11/22/83	4,417,171	06/311,622	11/22/83
4,416,814	06/416,475	11/22/83	4,417,177	06/351,415	11/22/83
4,416,817	06/322,661	11/22/83	4,417,179	06/376,030	11/22/83
4,416,821	06/349,490	11/22/83	4,417,183	06/394,062	11/22/83
4,416,822	06/396,968	11/22/83	4,417,187	06/324,074	11/22/83
4,416,823	06/319,818	11/22/83	4,417,190	06/350,472	11/22/83
4,416,827	06/411,325	11/22/83	4,417,198	06/297,520	11/22/83
4,416,828	06/411,324	11/22/83	4,417,204	06/233,326	11/22/83
4,416,832	06/344,263	11/22/83	4,417,209	06/265,211	11/22/83
4,416,835	06/455,253	11/22/83	4,417,212	06/281,268	11/22/83
4,416,838	06/345,992	11/22/83	4,417,218	06/275,474	11/22/83
4,416,840	06/332,903	11/22/83	4,417,222	06/272,202	11/22/83
			4,417,235	06/247,003	11/22/83

Patent Number	Serial Number	Issue Date	4,708,118	06/881,724	11/24/87
			4,708,122	06/859,380	11/24/87
4,417,236	06/319,382	11/22/83	4,708,123	06/932,293	11/24/87
4,417,252	06/385,915	11/22/83	4,708,125	06/887,631	11/24/87
4,417,255	06/294,142	11/22/83	4,708,128	06/787,765	11/24/87
4,417,264	06/472,565	11/22/83	4,708,135	06/685,870	11/24/87
4,417,268	06/342,666	11/22/83	4,708,139	06/832,402	11/24/87
4,417,273	06/336,727	11/22/83	4,708,154	06/804,853	11/24/87
4,417,295	06/412,340	11/22/83	4,708,157	06/916,145	11/24/87
4,417,297	06/279,687	11/22/83	4,708,158	07/012,530	11/24/87
4,417,325	06/282,882	11/22/83	4,708,160	06/899,721	11/24/87
4,417,338	06/253,563	11/22/83	4,708,171	06/930,430	11/24/87
4,417,344	06/404,828	11/22/83	4,708,176	06/679,403	11/24/87
4,417,347	06/262,838	11/22/83	4,708,184	06/648,633	11/24/87
4,417,355	06/223,268	11/22/83	4,708,186	06/838,450	11/24/87
4,417,357	06/384,750	11/22/83	4,708,190	06/887,992	11/24/87
4,707,861	07/002,987	11/24/87	4,708,191	06/835,852	11/24/87
4,707,869	06/886,175	11/24/87	4,708,192	06/865,287	11/24/87
4,707,871	06/873,554	11/24/87	4,708,196	06/604,653	11/24/87
4,707,876	06/889,067	11/24/87	4,708,198	06/717,580	11/24/87
4,707,877	06/879,146	11/24/87	4,708,206	06/919,120	11/24/87
4,707,879	06/786,964	11/24/87	4,708,209	06/764,579	11/24/87
4,707,882	06/837,684	11/24/87	4,708,213	06/866,865	11/24/87
4,707,884	06/871,368	11/24/87	4,708,216	06/944,186	11/24/87
4,707,885	06/944,412	11/24/87	4,708,217	06/870,780	11/24/87
4,707,891	06/931,807	11/24/87	4,708,226	07/024,868	11/24/87
4,707,894	07/003,137	11/24/87	4,708,230	06/910,284	11/24/87
4,707,899	06/768,089	11/24/87	4,708,238	06/724,081	11/24/87
4,707,900	06/916,830	11/24/87	4,708,239	06/914,086	11/24/87
4,707,903	07/008,589	11/24/87	4,708,240	06/945,022	11/24/87
4,707,905	06/915,886	11/24/87	4,708,243	06/860,050	11/24/87
4,707,907	06/856,714	11/24/87	4,708,244	06/909,214	11/24/87
4,707,908	06/862,038	11/24/87	4,708,249	07/017,913	11/24/87
4,707,911	07/003,090	11/24/87	4,708,251	06/829,865	11/24/87
4,707,914	06/843,893	11/24/87	4,708,253	06/927,502	11/24/87
4,707,922	06/784,853	11/24/87	4,708,257	06/920,688	11/24/87
4,707,923	06/824,027	11/24/87	4,708,260	06/835,101	11/24/87
4,707,925	06/853,869	11/24/87	4,708,261	06/820,335	11/24/87
4,707,928	06/769,257	11/24/87	4,708,265	06/888,356	11/24/87
4,707,932	07/015,426	11/24/87	4,708,267	06/726,580	11/24/87
4,707,936	06/887,212	11/24/87	4,708,271	06/915,773	11/24/87
4,707,938	06/874,238	11/24/87	4,708,272	06/859,378	11/24/87
4,707,939	06/843,492	11/24/87	4,708,281	06/348,692	11/24/87
4,707,943	07/040,088	11/24/87	4,708,282	06/787,299	11/24/87
4,707,954	06/835,152	11/24/87	4,708,287	06/811,949	11/24/87
4,707,963	07/020,542	11/24/87	4,708,289	06/873,246	11/24/87
4,707,976	06/850,949	11/24/87	4,708,301	06/771,821	11/24/87
4,707,979	06/760,087	11/24/87	4,708,306	06/907,567	11/24/87
4,707,980	06/711,286	11/24/87	4,708,310	07/022,008	11/24/87
4,707,988	06/662,407	11/24/87	4,708,311	06/816,893	11/24/87
4,708,001	06/772,434	11/24/87	4,708,318	06/889,767	11/24/87
4,708,002	06/805,007	11/24/87	4,708,320	06/488,425	11/24/87
4,708,011	06/857,473	11/24/87	4,708,322	06/938,952	11/24/87
4,708,012	06/897,955	11/24/87	4,708,328	06/722,127	11/24/87
4,708,017	06/879,766	11/24/87	4,708,336	06/700,889	11/24/87
4,708,023	06/870,967	11/24/87	4,708,344	07/015,213	11/24/87
4,708,028	06/418,887	11/24/87	4,708,348	06/826,112	11/24/87
4,708,030	06/713,879	11/24/87	4,708,352	06/885,855	11/24/87
4,708,033	06/615,170	11/24/87	4,708,360	06/885,704	11/24/87
4,708,035	06/875,594	11/24/87	4,708,369	06/877,499	11/24/87
4,708,038	06/901,626	11/24/87	4,708,372	06/709,207	11/24/87
4,708,041	06/900,450	11/24/87	4,708,384	06/701,860	11/24/87
4,708,043	06/763,446	11/24/87	4,708,388	07/004,037	11/24/87
4,708,050	06/834,042	11/24/87	4,708,396	06/861,298	11/24/87
4,708,055	06/845,224	11/24/87	4,708,397	06/895,693	11/24/87
4,708,064	06/412,794	11/24/87	4,708,398	06/779,631	11/24/87
4,708,065	06/709,507	11/24/87	4,708,399	07/023,256	11/24/87
4,708,069	06/867,629	11/24/87	4,708,400	06/935,980	11/24/87
4,708,071	07/015,362	11/24/87	4,708,402	06/868,235	11/24/87
4,708,073	06/931,703	11/24/87	4,708,403	06/893,666	11/24/87
4,708,075	07/009,710	11/24/87	4,708,405	06/822,024	11/24/87
4,708,081	06/868,720	11/24/87	4,708,414	07/008,829	11/24/87
4,708,083	06/944,178	11/24/87	4,708,415	06/855,272	11/24/87
4,708,086	06/821,855	11/24/87	4,708,431	06/783,515	11/24/87
4,708,088	06/704,527	11/24/87	4,708,432	06/718,775	11/24/87
4,708,090	06/733,880	11/24/87	4,708,438	06/609,468	11/24/87
4,708,093	06/876,981	11/24/87	4,708,447	06/804,644	11/24/87
4,708,110	06/903,009	11/24/87	4,708,467	06/942,014	11/24/87
4,708,115	07/005,638	11/24/87	4,708,487	06/919,978	11/24/87

Patent Number	Serial Number	Issue Date	4,708,847	06/820,886	11/24/87
4,708,488	06/793,297	11/24/87	4,708,850	06/735,616	11/24/87
4,708,489	07/001,708	11/24/87	4,708,865	06/898,645	11/24/87
4,708,490	06/945,651	11/24/87	4,708,873	06/823,852	11/24/87
4,708,495	06/820,953	11/24/87	4,708,879	06/828,495	11/24/87
4,708,499	06/895,048	11/24/87	4,708,891	06/832,295	11/24/87
4,708,501	06/898,727	11/24/87	4,708,895	06/912,351	11/24/87
4,708,503	07/004,231	11/24/87	4,708,897	06/583,815	11/24/87
4,708,506	06/905,878	11/24/87	4,708,899	06/573,147	11/24/87
4,708,507	06/821,482	11/24/87	4,708,907	06/727,467	11/24/87
4,708,509	06/897,480	11/24/87	4,708,919	06/761,998	11/24/87
4,708,515	06/897,715	11/24/87	4,708,935	06/717,709	11/24/87
4,708,516	06/623,559	11/24/87	4,708,938	06/726,158	11/24/87
4,708,522	06/823,495	11/24/87	4,708,953	06/774,272	11/24/87
4,708,526	06/610,834	11/24/87	4,708,960	06/724,585	11/24/87
4,708,529	06/931,747	11/24/87	4,708,962	06/772,330	11/24/87
4,708,541	06/837,674	11/24/87	4,708,967	06/843,949	11/24/87
4,708,552	06/649,818	11/24/87	4,708,970	06/948,116	11/24/87
4,708,556	06/733,978	11/24/87	4,708,971	06/850,647	11/24/87
4,708,560	06/766,790	11/24/87	4,708,972	06/879,033	11/24/87
4,708,565	06/731,503	11/24/87	4,708,973	06/870,651	11/24/87
4,708,573	06/657,347	11/24/87	4,708,978	06/874,422	11/24/87
4,708,574	06/751,869	11/24/87	4,708,985	06/360,146	11/24/87
4,708,598	06/630,599	11/24/87	4,708,991	06/779,547	11/24/87
4,708,608	06/875,088	11/24/87	4,708,995	06/798,044	11/24/87
4,708,610	07/023,951	11/24/87	4,709,006	06/852,698	11/24/87
4,708,612	06/809,920	11/24/87	4,709,019	06/486,878	11/24/87
4,708,616	06/858,939	11/24/87	4,709,031	06/884,561	11/24/87
4,708,628	06/937,629	11/24/87	4,709,047	06/819,656	11/24/87
4,708,631	06/814,410	11/24/87	4,709,048	07/032,835	11/24/87
4,708,642	06/808,449	11/24/87	4,709,050	06/798,660	11/24/87
4,708,653	06/908,448	11/24/87	4,709,061	06/909,514	11/24/87
4,708,658	06/898,354	11/24/87	4,709,075	06/805,618	11/24/87
4,708,663	06/854,036	11/24/87	4,709,077	06/777,053	11/24/87
4,708,667	06/837,806	11/24/87	4,709,083	06/864,612	11/24/87
4,708,670	06/889,233	11/24/87	4,709,085	07/000,444	11/24/87
4,708,672	06/854,402	11/24/87	4,709,086	06/872,250	11/24/87
4,708,676	06/923,633	11/24/87	4,709,095	06/853,809	11/24/87
4,708,678	06/876,949	11/24/87	4,709,102	06/916,269	11/24/87
4,708,684	06/895,863	11/24/87	4,709,104	06/787,621	11/24/87
4,708,685	06/861,398	11/24/87	4,709,116	06/879,909	11/24/87
4,708,686	06/542,681	11/24/87	4,709,134	06/794,538	11/24/87
4,708,687	06/827,794	11/24/87	4,709,143	06/768,553	11/24/87
4,708,688	06/877,067	11/24/87	4,709,151	06/790,462	11/24/87
4,708,690	06/827,342	11/24/87	4,709,153	06/741,818	11/24/87
4,708,697	06/885,904	11/24/87	4,709,158	07/040,699	11/24/87
4,708,705	06/825,586	11/24/87	4,709,176	06/891,140	11/24/87
4,708,711	06/928,097	11/24/87	4,709,178	07/035,085	11/24/87
4,708,718	06/751,605	11/24/87	4,709,182	06/874,245	11/24/87
4,708,724	06/862,493	11/24/87	4,709,183	06/860,636	11/24/87
4,708,732	06/922,620	11/24/87	4,709,185	06/743,221	11/24/87
4,708,733	06/910,736	11/24/87	4,709,186	06/817,872	11/24/87
4,708,740	06/691,618	11/24/87	4,709,192	06/819,512	11/24/87
4,708,741	06/873,957	11/24/87	4,709,199	06/748,645	11/24/87
4,708,744	06/832,923	11/24/87	4,709,206	06/861,930	11/24/87
4,708,745	06/820,091	11/24/87	4,709,209	06/863,212	11/24/87
4,708,746	06/683,183	11/24/87	4,709,223	06/814,833	11/24/87
4,708,754	07/010,021	11/24/87	4,709,230	06/725,009	11/24/87
4,708,758	06/911,548	11/24/87	4,709,235	06/930,627	11/24/87
4,708,759	06/782,130	11/24/87	4,709,241	06/793,223	11/24/87
4,708,760	06/795,004	11/24/87	4,709,252	06/399,074	11/24/87
4,708,762	06/897,493	11/24/87	4,709,263	06/823,263	11/24/87
4,708,774	06/897,060	11/24/87	4,709,265	06/787,338	11/24/87
4,708,775	06/752,838	11/24/87	4,709,305	06/915,047	11/24/87
4,708,778	06/893,632	11/24/87	4,709,306	06/812,545	11/24/87
4,708,789	06/879,445	11/24/87	4,709,313	07/005,613	11/24/87
4,708,794	06/729,271	11/24/87	4,709,324	06/802,491	11/24/87
4,708,798	06/859,830	11/24/87	4,709,331	06/605,808	11/24/87
4,708,824	06/750,030	11/24/87	4,709,358	06/745,559	11/24/87
4,708,825	06/512,162	11/24/87	4,709,363	06/935,148	11/24/87
4,708,830	06/938,478	11/24/87	4,709,368	06/779,762	11/24/87
4,708,836	06/841,821	11/24/87	4,709,371	06/789,194	11/24/87
4,708,837	06/849,628	11/24/87	4,709,396	06/813,037	11/24/87
4,708,839	06/814,845	11/24/87	4,709,397	06/863,835	11/24/87
4,708,846	06/850,104	11/24/87	4,709,400	06/865,753	11/24/87
			4,709,409	09/899,830	11/24/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Application Patent Date	Delayed Payment Filing Date	Acceptance Date
4,626,236	06/788,706	12/02/86	10/21/85	6/03/91
4,661,056	06/839,668	4/28/87	3/14/86	10/21/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,844,339, Re. S.N. 07/809,125, Filed Dec. 18, 1991, Cl. 239/5, FUEL INJECTION APPARATUS, Christopher N. F. Sayer, et. al., Owner of Record: *Orbital Engine Co. Proprietary Ltd., Balclatta, Western Australia*, Attorney or Agent: Donald W. Hanson, Ex. Gp.: 314

4,885,623, Re. S.N. 07/802,743, Filed Dec. 5, 1991, Cl. 357/340, DISTRIBUTED CHANNEL-BIPOLAR DEVICE, James W. Holm-Kennedy, et. al., Owner of Record: *Inventor*, Attorney or Agent: James A. Sheridan, Ex. Gp.: 253

4,887,574, Re. S.N. 07/808,812, Filed Dec. 17, 1991, Cl. 123/425, CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE, Hiroshi Kuroiwa, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 342

4,890,106, Re. S.N. 07/810,688, Filed Dec. 19, 1991, Cl. 341/144, APPARATUS AND METHODS FOR DIGITAL-TO-ANALOG CONVERSION USING MODIFIED LSB SWITCHING, R. Allan Belcher, Owner of Record: *Burr-Brown Corp., Tucson, Ariz.*, Attorney or Agent: Charles R. Hoffman, Ex. Gp.: 214

4,890,883, Re. S.N. 07/805,092, Filed Dec. 9, 1991, Cl. 297/140.1, UPHOLSTERY SYSTEM, Thomas L. Boerema, et. al., Owner of Record: *Prince Corp., Holland, Mich.*, Attorney or Agent: Llyod A. Heneveld, Ex. Gp.: 357

4,923,116, Re. S.N. 07/791,360, Filed Nov. 14, 1991, Cl. 340/603, BATH WATER CONTROL SYSTEM, Gerald L. Homan, Owner of Record: *Integrated Technology System, Inc., Huntsville, Ala.*, Attorney or Agent: C. A. Phillips, Ex. Gp.: 268

4,969,572, Re. S.N. 07/809,271, Filed Dec. 16, 1991, Cl. 220/253, END CLOSURE HAVING A PUSH OPEN LID PORTION, John Vankerkhoven (deceased), et. al., Owner of Record: *The Specialty Packaging Group Inc., Wausau, Wis.*, Attorney or Agent: Peter W. Gowdey, Ex. Gp.: 241

4,990,221, Re. S.N. 07/805,587, Filed Dec. 10, 1991, Cl. 202/241, COKE OVEN DOOR JAMB CLEANER, William R. Baird, et. al., Owner of Record: *Saturn Machines Welding Co., Inc., Stugis, Ky.*, Attorney or Agent: John D. Poffenberger, Ex. Gp.: 133

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,282,605, Reexam. No. 90/002,546, Requested: Dec. 27, 1991, Cl. 359/157, SOUND REPRODUCING WITH REMOTE AMPLIFYING TRANSDUCER, Amar G. Bose, Owner of Record: *Bose Corp., Framingham, Mass.*, Attorney or Agent: Charles Hicken, Fish & Richardson, Waltham, Mass., Ex. Gp.: 260, Requester: Guy W. Shoup, Skjervsen, Morrill, MacPherson, Franklin & Friel, San Jose, Calif.

4,779,207, Reexam. No. 90/002,549, Requested: Jan. 2, 1992, Cl. 364/500, SO₃ FLUE GAS CONDITIONING SYSTEM, David A. Woracek, et. al., Owner of Record: *The Chemithon Corp., Seattle, Wash.*, Attorney or Agent: Seed & Berry, Seattle, Wash., Ex. Gp.: 234, Requester: Owner, c/o Marshall, O'Toole, Gerstein, Murray & Bicknell, Chicago, Ill.

4,964,860, Reexam. No. 90/002,547, Requested: Dec. 31, 1991, Cl. 604/391, DETACHABLE TWOPIECE ABSORBENT GARMENT, William P. Gibson, et. al., Owner of Record: *The Proctor & Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Larry L. Huston, Cincinnati, Ohio, Ex. Gp.: 338, Requester: Benoit Castel, Arlington, Va.

4,973,272, Reexam. No. 90/002,548, Requested: Dec. 30, 1991, Cl. 439/851, ELECTRICAL CONNECTOR WITH CONTACTORS, Douglas Chase, et. al., Owner of Record: *Wyle Laboratories, El Segundo, Calif.*, Attorney or Agent: Leon D. Rosen, Fredlich, Hornbaker & Rosen, Los Angeles, Calif., Ex. Gp.: 322, Requester: Owner

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before March 20, 1992.

Bashore, Alain L., 1600 S. Joyce St., #A-303, Arlington, Va. 22202
Stellar, George G., 1125 16th St., South, Arlington, Va. 22202
Robinson, Joseph C., 938 Beaumont Dr., North, Vancouver, B.C. Canada

Jan. 9, 1992 CAMERON WEIFFENBACH
Director, Office of
Enrollment and Discipline

Reexamination of Certain Patents

Before an application for patent may be issued as a patent, the application must be approved by a patent examiner authorized by the Commissioner to approve the issuance of a patent - i.e., a patent examiner having full signatory authority. It has been discovered that a number of patents were approved for issue by

an individual who, as an Assistant Examiner, did not have the requisite approval authority. These patents were not reviewed or signed by a patent examiner having the requisite approval authority, even though the files contain a signature which purports to be that of an examiner having approval authority.

A review has been made of all patents listing the individual in question as the Assistant Examiner. A total of 56 patents were found to have an unauthorized signature. The remainder of the patents listing the individual in question were determined to be properly signed by an examiner having approval authority.

To preserve the confidence of the public in the examining process and the presumption of validity that attaches to issued patents, each of the 56 patents will be the subject of a Commissioner-ordered reexamination under 35 U.S.C. 303(a). Reexamination was selected as the appropriate course of action because it provides for a consideration of the patentability of all claims in each patent, and permits the Patent and Trademark Office to initiate corrective action without fee expense to the patent owner. Reexamination will be initiated on each of the affected patents within two months of the date of this notice.

Each of the owners of the patents that will be subject to reexamination pursuant to this notice has been notified. The individual Assistant Examiner involved in the issuance of these patents is no longer employed by the Patent and Trademark Office. In addition, procedures have been implemented to prevent the recurrence of this problem.

Jan. 9, 1992

HARRY F. MANBECK Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks

**Applicability of the last paragraph of
U.S.C. §112 to patentability determinations
before the Patent and Trademark Office**

The following paragraph was first enacted in 1952 as the third paragraph of 35 U.S.C. §112:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

Act of July 19, 1952, ch. 950, 66 Stat. 798-99. The scope of a "means" in a claim undergoing a patentability determination over the prior art in the Patent and Trademark Office (PTO) is a function of (I) whether §112's last clause ("and such claim shall be construed to cover . . .") applies and (II) if so, how. It is the position of PTO that the clause does not apply.

I. Applicability of § 112's Last Clause

The applicability of the last clause to ex parte patentability determinations *vis-a-vis* the prior art is resolved by examining the statutory language, legislative history, CCPA decisions, long-standing PTO interpretation, legislative reenactment, and Federal Circuit cases.

**A. History of the Legislation, PTO Interpretation,
and CCPA Precedent**

The last clause of section 112's last paragraph states that means-plus-function claims "shall be construed to cover the corresponding structure material, or acts described in the specification and equivalents thereof." Act of July 19, 1952, ch. 950, 66 Stat. 798-99. Commentary concerning that clause as enacted in 1952 states that the clause:

relates primarily to the construction of such claims for the purpose of determining when the claim is infringed (note the use of the word "cover"), and would not appear to have much, if any, applicability in determining the patentability of such claims over the prior art, that is, the Patent Office is not authorized to allow a claim which "reads on" the prior art.

P. J. Federico, "Commentary on the New Patent Act," 35 U.S.C.A. 1, 25-26 (1954). Federico's passage notes that "cover" refers to

infringement, and contrasts claim "construction," done for infringement purposes, with PTO patentability determinations. *Id.* Federico assisted in drafting the Act and was regarded as an expert in the subject-matter of the Act. Report of the Committee on the Judiciary, H.R. 7794, reprinted at 34 J. Pat. Off. Soc'y 549, 552 (1952). Federico's contemporaneous commentary accompanying the new statute in U.S.C.A. deserves consideration as showing the last clause was intended to affect infringement cases and not to affect PTO ex parte patentability determinations *vis-a-vis* the prior art.

Similarly, Charles J. Zinn's contemporaneous commentary says:

The final paragraph of section 112 relating to functional claims is new. It recognizes the validity of combination claims wherein the novelty is expressed in functional terms. It offsets the theory of the Halliburton case but does not go so far as to permit the use of single means claims.

Commentary on New Title 35, U.S. Code "Patents," reprinted in 1952 U.S. Code Cong. and Ad. News 2509, 2514 (emphasis added). Zinn's passage notes the final paragraph's effect on claim validity (a post-issuance, court-determined matter) but not on patentability (a pre-issuance, PTO-determined matter). *Id.* It also notes that the final paragraph addressed *Halliburton Co. v. Walker*, 329 U.S. 1 (1946). *Halliburton* involved infringement/validity, not ex parte patentability. *Id.* Zinn, as the Judiciary Committee's law revision counsel, directed and supervised the actual work of preparing the preliminary drafts and the bill that became Title 35. Report of the Committee on the Judiciary accompanying H.R. 7794, reprinted at 34 J. Pat. Off. Soc'y 549, 552 (1952). Thus, Mr. Zinn's insight is consistent with the proposition that the third paragraph of §112 affects validity but not ex parte patentability determinations.

Less than six months after the effective date of the 1952 act, an eight-member panel of the Board of Appeals decided *Ex Parte Ball*, 99 U.S.P.Q. 146 (Bd. Pat. App. 1953). The eight-member panel in *Ex Parte Ball* included then Commissioner of Patents Watson, as well as Examiner-in-Chief Federico. Ball contended that:

each of the appealed claims distinguishes from the prior art in the recitation of a means or an elemental structure for performing a specified function that is not contemplated by the cited references . . .

Id. at 148. Before enactment of §112's last paragraph, the Board had sustained rejections of Ball's claims because, comparing the claim language to the prior art, "any differences which exist are only functionally expressed" in the claims. *Id.*

After enactment, the Board withdrew that position on reconsideration, apparently due to the first clause of §112's last paragraph: "an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure . . ." The Board reversed rejections of those claims that recited a novel function:

this function, as set forth, is distinctly unlike any function which is or could possibly be performed by the apparatus of [the prior art].

Id. at 148-49.

However, the Board sustained rejections of the claims (e.g., claim 39) whose recited function was performed by the prior art. *Id.* at 150. The Board reasoned that despite the last clause ("and such claims shall be construed to cover . . .") of §112's last paragraph, the claims in a pending application would be controlled by §112's second paragraph, requiring the language itself of a claim to particularly point out the novel subject matter. *Id.* The dominance of the second paragraph over the third was simultaneously stated in dictum in *In re Arbeit*, 206 F.2d 947, 958, 99 USPQ 123, 131 (CCPA 1953). Similar statements have appeared in all eighty-five subsequent editions of the Manual of Patent Examining Procedure (MPEP), from 1955 to present, specifically referring to *Ex Parte Ball*. MPEP §706.03(c).

In 1957, the CCPA squarely held that the last clause of §112's last paragraph ("and such claim shall be construed to cover . . .") does not apply to PTO's patentability determinations. *In re Lundberg*, 244 F.2d 543, 548, 113 USPQ 530, 534 (CCPA 1957). The CCPA stated:

notwithstanding the third [now sixth] paragraph of section 112, it is the language itself of the claims which must particularly point out and distinctly claim the subject matter which the applicant regards

as his invention, without limitations imported from the specification, whether such language is couched in terms of means plus function or consists of a detailed recitation of the inventive matter. Limitations in the specification not included in the claim may not be relied upon to impart patentability to an otherwise unpatentable claim.

Id. That holding was central to the CCPA's judgment affirming PTO's rejection of claim 54:

It is thus apparent that [prior art] either expressly discloses or reasonably would suggest to one skilled in the art, each element in the claimed combination, including the recited function of the detecting instrument. In view of our foregoing analysis of 35 U.S.C. §112, it is not seen that claim 54 patentably defines over the prior art. We accordingly sustain the board's rejection of this claim.

Id., 244 F.2d at 550, 113 USPQ at 536.

Following the CCPA's 1957 *Lundberg* decision, in 1965 Congress reenacted the "third" paragraph of §112 (1952) as the "sixth" paragraph of §112. Pub. L. 89-83, §9, 79 Stat. 261 (1965). In enacting Public Law 89-83, Congress saw no reason to disagree with the *Lundberg* and PTO interpretations; that the last clause does not apply in proceedings before PTO to determine whether claimed subject matter is patentable over the prior art under 35 U.S.C. §§102 or 103. See *Lorillard v. Pons*, 434 U.S. 575, 580 (1978) ("Congress is presumed to be aware of an administrative or judicial interpretation of a statute and to adopt that interpretation when it re-enacts a statute without change"); *Atkins v. United States*, 556 F.2d 1028, 1039 (Ct. Cl. 1977), cert. denied, 434 U.S. 1009 (1978) ("A cardinal principle of statutory interpretation is that, in the absence of a clearly expressed intent to the contrary, the revision or recodification of a statute indicates approval of court interpretations of the statute made prior to reenactment"). Upon reenactment, Congress did not in any way express disapproval of the PTO/CCPA means plus function interpretation as applied to ex parte examination.

In 1968, the CCPA in deciding *In re Sweet*, 393 F.2d 837, 841-42, 157 USPQ 495, 499 (CCPA 1968) noted, consistent with *Lundberg* and PTO's now well-established interpretation of the "third/sixth" paragraph of §112, that:

However, a recitation of "means" for performing a function is interpreted broadly to cover all means capable of performing the stated function and is not limited to the particular structure which the application may disclose.

The CCPA affirmed as to those claims where the claimed function was obvious from the prior art, but reversed where the function was not disclosed or otherwise made obvious (i.e., claim 17). *Id.*, 393 F.2d at 842-43, 157 USPQ at 500.

In 1975, Congress again reenacted the "sixth" paragraph of §112. Pub. L. 94-131, §7, 89 Stat. 690-91 (1975). Despite a second amendment of §112, Congress again declined to legislatively overrule the CCPA/PTO interpretation of the "third/sixth" paragraph of §112, as applied to patentability determinations of claims pending before PTO *vis-a-vis* the prior art. See *Ralden Partnership v. United States*, 891 F.2d 1575, 1579 (Fed. Cir. 1989) (an inference can be drawn that Congress acquiesced in agency interpretation of statute twice reenacted). Only Congress can "un-adopt" that interpretation.

The last clause of §112's last paragraph was consistently interpreted by the CCPA and PTO up to the time of the creation of the Federal Circuit. The PTO has now employed that interpretation without difficulty for thirty-eight years, a period in which PTO has issued over 2,436,000 patents.

There is no question that, both prior to and after creation of the Federal Circuit, courts of appeals applied the last clause of §112's last paragraph in infringement cases. It is also true that the last clause was not applied during PTO patentability determinations. But that is exactly what PTO believes Congress intended. In this respect, over 30 years of experience from 1952 to 1983 provides a certain "comfort level." Patent practitioners generally understand how the last paragraph of §112 was, and is, applied by PTO to determine whether means-plus-function limitations differ from the prior art.

Until creation of the Federal Circuit, the CCPA applied the *Lundberg* rationale to claims undergoing patent examination and courts of appeals applied the last clause of §112's last paragraph in infringement cases. Nothing in the Federal Courts

Improvement Act of 1982, Pub. L. 97-164, Title I (1982), was intended to change the manner in which the Federal Circuit was to deal with interpretation of claims during examination or construction of claims in infringement cases.

B. Federal Circuit Treatment

The "sixth" paragraph of §112 was consistently interpreted and applied by the CCPA and PTO up to the time of the creation of the Federal Circuit. However, it has been inconsistently interpreted by the Federal Circuit. Insofar as PTO is aware, *In re Mulder*, 716 F.2d 1542, 1549, 219 USPQ 189, 196 (Fed. Cir. 1983), represents the first arguable departure from *Lundberg*. The *Mulder* court aid:

With respect to claim 9, we note that it is drafted in "means plus function" format, so that it is "construed to cover the corresponding structure . . . described in the specification and equivalents thereof." 35 U.S.C. §112. As stated above, the board said that de Troye's arrangement constituted means to reduce input series resistance. Appellants have neither asserted nor shown that de Troye's structure is not the equivalent of the structure disclosed in their specification for reducing input series resistance.

The *Mulder* Board said what it said because it found de Troye to disclose the function. Hence, consistent with long-standing practice, it made no inquiry into the equivalency of the structures of the reference and *Mulder*. One might assume that appellants (*Mulder*) did not present a non-equivalence argument, because then well-established *Lundberg/Sweet* principles would have rendered such an argument futile.

In June of 1986, a journal article questioned whether PTO was properly applying the sixth paragraph of §112 in resolving § 102/103 issues. Moy, "The Interpretation of Means Expression During Examination," 68 J. Pat. Off. Soc'y 246 (1986). Moy acknowledges the existence of, and discusses, published (precedential) and unpublished (unprecedential) ex parte CCPA/Federal Circuit decisions which support PTO's view. *Id.* at 256-59. Moy thinks that it is wrong for PTO to confine its examination of means-plus-function clauses to simply whether the identical function is performed. However, Moy does not address whether Congress' two reenactments of the means-plus-function provisions of §112 constitute legislative adoption of PTO's interpretation of the sixth paragraph based on *Lundberg*. Nor does Moy point to anything in the Federal Courts Improvement Act which suggests that the newly created Federal Circuit was no longer to apply *Lundberg*.

Non-precedential Federal Circuit opinions have applied the *Lundberg* rule. See, e.g., *In re Boersma*, No. 84-627 (Fed. Cir. May 4, 1984) (unpublished), summarized at 28 Pat. Tm. & Copyrt. J. 83 (BNA May 24, 1984). *Lundberg* was addressed in concurring opinions of *In re Queener*, 796 F.2d 461, 230 USPQ 438 (Fed. Cir. 1986). Queener argued that PTO erroneously refused to apply the last clause of §112's last paragraph. The Court affirmed without reaching Queener's argument, explicitly indicating that it "need not, and does not" reach other matters, "including those pertaining to the 'means plus function' . . ." *Id.*, 796 F.2d at 464, 230 USPQ at 440. Senior Judge Miller, concurring, suggested that Queener's argument "is reasonable and should not be rejected out of hand or ignored by the majority and Judge Newman's concurring opinions." *Id.* Judge Newman separately concurred, citing *Lundberg* and noting:

[I]n view of Senior Judge Miller's interpretation of precedent to hold that the last paragraph of section 112 is reasonably applied, in prosecution before the PTO, so that the claims need not distinguish from the prior art, I write separately to express my concern lest we reopen that closed book. It is now beyond debate that limitations from the specification will not, during examination before the PTO, be imputed to the claims in order to avoid prior art; such limitations must be specifically stated in the claims. . . This law has been consistently applied.

Id., 796 F.2d at 464, 230 USPQ at 440.

In 1989, a Federal Circuit panel decided *In re Iwahashi*, 888 F.2d 1370, 1375 n.1, 12 USPQ2d 1908, 1912 n.1 (Fed. Cir. 1989). *In re Iwahashi* involved a §101 rejection, not a rejection based on the prior art. Under *In re Meyer*, 688 F.2d 789, 796 n. 6, 215

USPQ 193, 199 n.6 (CCPA 1982), equivalence under §112's last paragraph is applicable to §101 rejections, but not to rejections based on the prior art. The *Iwahashi* panel did not explicitly recognize the *Meyer* distinction.

Iwahashi note 1 refers to a statement of law in *In re Sweet*, *supra*, to the effect that "means" for performing a function is interpreted broadly to cover all means capable of performing the stated function and is not limited to the particular structure which the application may disclose. Note 1, however, disagrees with the "truth" (correctness) of *Sweet*'s statement of law. Note 1 says that the statement is partly true and partly untrue. The untrue part is said to be the first part, i.e., that means is interpreted to cover all means for performing the function. According to the note, the first part of the statement should have said that the means is interpreted as limited to the means disclosed in the specification and all equivalents thereof which perform the function.

"The immediately preceding two paragraphs" of the *Sweet* opinion, i.e., those appearing at 393 F.2d at 841, col. 2, 157 USPQ at 499, col. 1-2, are said to demonstrate that *Sweet* considered equivalence of structure under the last paragraph of §112. *In re Iwahashi*, *supra*. PTO does not believe that the "two paragraphs" demonstrate what the footnote says.

The *Iwahashi* footnote warns against removing the disputed statement of law from its context. The disputed statement of law in *In re Sweet* related to different claim language than did the two paragraphs. In volume 393 of the F.2d reporter, the two paragraphs related only to the function discussed on pages 840-41, whereas the disputed statement of law related only to the discussion of the whereby clause on page 842.

The two paragraphs dealt with whether the reference had a means to perform the claimed function "to simultaneously change the position of said cutting elements for cutting a different size diameter." *In re Sweet*, *supra*, 393 F.2d at 841, 157 USPQ at 499. The only precedent cited in the two paragraphs, *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959), also dealt only with whether a reference exhibited "actual performance of the stated functions," as those functions were interpreted.

The disputed statement of law, however, dealt with whether the whereby clause (whereby said cutting elements will "cut at substantially the same distance from the center of rotation on said different size diameter") required that the cutting elements be in alignment with radii of the workpiece. *In re Sweet*, *supra*, 393 F.2d at 842, 157 USPQ at 499-500. Since the language itself of the claim did not require such alignment, the CCPA refused to read it into the claim. *Id.* at note 6 and accompanying text. In 1990, a Federal Circuit panel decided *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Without citing *Lundberg*, that panel made a statement directly contrary to *Lundberg*, regarding a pending claim:

While a "means-plus-function" limitation may appear to include all means capable of achieving the desired function, the statute requires that it be "construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. §112 ¶ 6 (emphasis added);

In re Bond, 910 F.2d at 833, 15 USPQ2d at 1568. The panel remanded to the Board because the Board had not determined equivalence under §112 ¶ 6. The Board had not done so because it was (and is) the PTO's position that the last clause does not apply to pending applications.

C. Mandatory Authority

The following mandatory authority forecloses PTO interpretation of pending means claims as limited to structure, material, or acts described in the specification and equivalents thereof under 35 U.S.C. §112.

Supreme Court cases hold that an agency's consistent long-standing interpretation of a statute is entitled to deference. *Chevron U.S.A. Inc. v. Natural Resources Defense Council*, 467 U.S. 837, 843-45, *reh'g denied*, 468 U.S. 1227 (1984); *United States v. Clark*, 454 U.S. 555, 565 (1982); *FEC v. Democratic Senatorial Campaign Committee*, 454 U.S. 27, 32 (1981). In *FEC*, the Court of Appeals had struck down an agency interpretation of a statute. The Supreme Court reversed because the agency's interpretation was within its authority rather than frustrative of the policy Congress sought to implement or "inconsistent with the statutory mandate." *FEC*, *supra*.

As set forth above, the PTO has consistently and historically interpreted the last clause ("and shall be construed to cover...") as inapplicable to pending applications. *In re Queener*, 796 F.2d 461, 464, 230 USPQ 438, 440 (Fed. Cir. 1986) (Newman, J., concurring); Moy, "The Interpretation Of Means Expressions During Prosecution," 68 J. Pat. Tm. Off. Soc'y. 246, 251 (1986). Thus, PTO's interpretation of the last clause of §112's last paragraph is not easily overcome. In fact, application of the last clause to applications pending before the PTO is foreclosed by (1) the clause itself, (2) binding precedent, and (3) Congressional re-enactment.

1. The Clause Itself

As discussed below, the Supreme Court used the terms "construed" or "cover" around 1952 when referring to post-issuance matters in court (e.g., validity or infringement), and not to interpretation of claims by the PTO in a patentability determination. Therefore, it is reasonable to conclude that a 1952 statute that used either of those terms referred only to matters in court, not in the PTO. Since the last clause of §112's final paragraph used (a) "construed" and (b) "covered" in the same phrase "construed to cover" it must have referred only to infringement cases in court. Use of the term (c) "equivalents" further indicates that a court, not a PTO, determination is called for. The combined import of all three terms is clear.

(a) "construed"

The Supreme Court has used "construed" only to refer to post-issuance court matters and not to PTO patentability determinations. *See, e.g., Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 336 U.S. 271, 276-77 (1948), *aff'd on reh'g*, 339 U.S. 605 (1949), *reh'g denied*, 340 U.S. 845 (1950). The Supreme Court's usage just prior to the 1952 enactment is especially relevant to the meaning attributed to "construed" in the 1952 Act. The last paragraph of §112 was enacted in response to then-recent Supreme Court precedent. *Federico*, *supra*; Zinn, *supra*.

In *Graver Tank*, the Supreme Court reversed the Court of Appeals for erroneously importing limitations from the specification into the claims. *Graver Tank*, 336 U.S. at 276-77. The relevant passage dealt with a district court's holding invalid certain claims asserted in an infringement action:

The Court of Appeals [erroneously] considered that because there was nothing in the record to show that the applicants for the patent intended by these claims to assert a monopoly broader than nine metallic silicates named in the specifications, the [district] court should have construed the claims as thus narrowed and limited by the specifications.

Id. Because of the similar topic of that passage, and because *Graver Tank* was the seminal case on equivalents, Congress' usage of "construed" four years later in the last clause of §112's last paragraph was predictably consistent with that passage. Claims were "construed" by courts.

As another example, in *Great Atlantic & Pacific Tea Co. v. Suemark Equip. Corp.*, 340 U.S. 147, 149 (1950), *reh'g denied*, 340 U.S. 918 (1951), the Supreme Court applied §112's precursor in an infringement case. The Court found clearly erroneous district court's "construction" of an asserted claim because the limitation relied on was:

not mentioned in the claims, except, perhaps, by a construction too strained to be consistent with the clarity required of claims which define the boundaries of a patent monopoly.

Id. Claims were "construed" by courts.

The Federal Circuit's usage of "construe" is not especially probative of legislative intent because it is well after the 1952 enactment. However, when addressing why PTO's standards for patentability should be stricter than a district court's standards for validity, the Federal Circuit distinguishes between claims being "construed" by district courts, and "interpreted" or the like by the PTO. *See, e.g., In re Yamamoto*, 740 F.2d 1569, 1571, 222 USPQ 934, 936 (Fed. Cir. 1984); *see also In re Etter*, 756 F.2d 852, 858-59, 225 USPQ 1, 5-6 (Fed. Cir. 1985) (in banc) (rule of claim "construction" has no role in PTO reexamination), *cert. denied*, 474 U.S. 828 (1985). Similarly, in *Burlington Indus. v. Quigg*, 822 F.2d 1581, 1583, 3 USPQ2d 1436, 1438 (Fed. Cir. 1987), the court stated:

Issues of judicial claim construction such as arise after patent issuance, for example during infringe-

ment litigation, have no place in prosecution of pending claims before the PTO...

Thus, the last clause of §112's last paragraph has no place in prosecution of pending claims before the PTO under §102 or §103.

(b) "cover"

Federico's above-quoted statement reveals that the word "cover" in §112 is used to connote an infringement context. No known Supreme Court precedent uses the word "cover" in an ex parte patentability case.

(c) "equivalents"

Section 112's reference to "equivalents" indicates an infringement, not prosecution, setting. Compare *Graver Tank & Mfg. Co. supra*, 339 U.S. at 610 ("equivalence... is to be decided by the trial court."). "Equivalents" under §112 speaks solely to infringement; is judicially, not administratively, determined; and involves redefining issued claims:

exists solely for the equitable purpose of "preventing an infringer from stealing the benefit of an invention"... equivalence is judicially determined by reviewing the content of the patent, the prior art, and the accused device, and essentially redefining the scope of the claims.

Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 805 F.2d 1558, 1572, 231 USPQ 833, 842 (Fed. Cir. 1986), *reh'g denied*, 846 F.2d 1369, 6 USPQ2d 1886 (Fed. Cir.), *reh'g denied*, 7 USPQ2d 1414 (Fed. Cir. 1988) (in banc). The inclusion of "equivalents" in §112's last paragraph appears to address concerns of *Halliburton Co. v. Walker* that dealt only with potential infringers. *Halliburton, supra*, 329 U.S. at 12-13.

2. Binding Precedent

As a CCPA case, *Lundberg* is binding precedent. *South Corp. v. United States*, 690 F.2d 1368, 215 USPQ 657 (Fed. Cir. 1982) (in banc).

The *Lundberg* case cannot be distinguished on the grounds that no appealed claims were held patentable. The CCPA did not decide whether the disclosed means would have been obvious if incorporated into a claim. *Lundberg, supra*, 244 F.2d at 551, 230 USPQ at 537.

The *Lundberg* case cannot be distinguished as one in which the applicant urged limitation of a claim to the disclosed means only exclusive of equivalents. The CCPA held that a function clause cannot be used to incorporate any limitations whatsoever into an applicant's claims, *id.*, and that limitations not included in the language itself of the claims cannot impart patentability. *Id.*, 244 F.2d at 548, 113 USPQ at 534. It is irrelevant to those holdings whether attempted limitations would come from the disclosed means or from its equivalents. The CCPA noted that §112 required means-plus-function claims to be "construed to cover the corresponding structure, *** described in the specification and equivalents thereof." *Id.*, 244 F.2d at 546, 113 USPQ at 533 (emphasis added).

In his brief, *Lundberg* repeatedly argued for limitation to means "described in the specification, and equivalents thereof." *Lundberg's Brief For Appellants*, pages 9, 14, 35, and 38 (emphasis added). *Lundberg* implicitly argued that the prior art was not the same as, or equivalent to, the means described in his specification.

For example, *Lundberg* quoted his specification's detailed description of claim 54's detecting means. *Lundberg's Brief* at 33-34. *Lundberg* argued that the Board had erred in saying that the prior art means was the same. *Lundberg's Brief* at 34. *Lundberg* argued further that the prior art means was not equivalent to *Lundberg's* disclosed means in that he argued the prior art distinguished itself from the type of detector means (a detector of one or more components of magnetic field) disclosed in *Lundberg's* specification. *Lundberg's Brief* at 35. *Lundberg* cited record page 210 showing that the prior art distinguished itself from the type of detector means disclosed in *Lundberg's* specification. *Lundberg's Brief* at 35. *Lundberg* concluded that section of argument citing the 1952 Patent Act as requiring limitations "described in the specification and equivalents thereof [sic, thereof]" *Lundberg's Brief* at 35.

As another example, *Lundberg* argued that claim 54's airplane means for transporting referred to aircraft capable of the type of movement "repeatedly set forth in the present application" which he alleged was not even along the lines of the prior art's contemplation. *Lundberg's Brief* at 24-26.

3. Congress' Reenactments

Acts of Congress are mandatory authority. As discussed above, Congress' reenactments implicitly adopted and re-adopted the PTO/CCPA interpretation.

D. Effect of Federal Circuit Panel Decisions

Without addressing *In re Lundberg*, Federal Circuit panels have made statements contrary to the above statement of mandatory authority, *viz., In re Bond*, 910 F.2d 831, 833, 835, 15 USPQ2d 1566, 1568, 1569 (Fed. Cir. 1990), and arguably *In re Iwahashi*, 888 F.2d 1370, 1375 n.1, 12 USPQ2d 1908, 1912 n.1 (Fed. Cir. 1989) (not a prior art case) and *In re Mulder*, 716 F.2d 1542, 1549, 219 USPQ 189, 196 (Fed. Cir. 1983) (no definitive treatment).

Those panel decisions do not overcome the mandatory authority set forth *supra*. For example, they do not overcome *In re Lundberg*, which is binding precedent in the Federal Circuit. *See Capitol Elec. Inc. v. United States*, 729 F.2d 743, 746 (Fed. Cir. 1984); *South Corp. v. United States*, 690 F.2d 1368, 215 USPQ 657 (Fed. Cir. 1982) (in banc). Although Note 1 in *In re Iwahashi* disagreed with the "truth" of *Sweet's* statement of law, the *In re Iwahashi* panel had no authority to overrule any CCPA case. And, of course, no court can overcome the mandatory authority, discussed above, of §112's last clause itself and Congress' reenactments.

E. Other Considerations

Interpreting "means" in pending claims as including any capable means rather than the disclosed means and equivalents thereof, comports more with (1) the reverse doctrine of equivalents, (2) the statutory presumption of validity, and (3) policy considerations.

1. Reverse Doctrine of Equivalents

Section 112 ¶ 6 operates like the reverse doctrine of equivalents. *Intel Corp. v. United States Int'l Trade Comm'n*, Appeal No. 89-1459, 20 USPQ2d 1161, 1179 (Fed. Cir. September 17, 1991). One treatise states that:

Lundberg represents the better interpretation of Section 112 ¶ 6. This section is best understood as an expression of the reverse doctrine of equivalents. The reverse doctrine addresses how to treat later technical developments covered in words but not in substance by the claims in suit.

2 Patent Law Perspectives, ¶ 2.9[5], p. 2-1172.1 through p. 2-1172.7 (1991). Thus, consideration of equivalents at the time of prosecution is an unnecessary expenditure of resources and ineffectual because equivalence, and the reverse doctrine in particular, speaks to future advances. *See Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 568 (1898); *Graver Tank Mfg. v. Linde, supra*, 339 U.S. at 608. *Halliburton Co. v. Walker*, 329 U.S. 1, 12, 13 (1946), was addressed by §112's last paragraph and points out that a device may not be known as of the patent issue date as an equivalent of a claimed means.

Neither PTO nor an applicant can predict what means will be shown after issuance of a patent to be equivalent to the claimed means:

It is not required that those skilled in the art knew, at the time the patent application was filed of the asserted equivalent means of performing the claimed functions; that equivalence is determined as of the time infringement takes place.

Texas Instruments, Inc. v. United States I.T.C., 805 F.2d 1558, 1563, 231 USPQ 833, (Fed. Cir. 1986), *reh'g denied*, 846 F.2d 1369, 6 USPQ2d 1886 (Fed. Cir.) (note concurring opinion by Judge Davis), *reh'g denied*, 7 USPQ2d 1414 (Fed. Cir. 1988) (in banc). *See also D.M.I., Inc. v. Deere and Co.*, 755 F.2d 1570, 1574, 225 USPQ 236, 238 (Fed. Cir. 1985) ("there is and can be no requirement that applicants describe or predict every possible means of accomplishing that function"); *S.R.I. Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121, 227 USPQ 577, 586 (Fed. Cir. 1985) (in banc) (plurality) ("The law does not require the impossible. Hence, it does not require that an applicant describe in his specification every conceivable and possible future embodiment of his invention").

If pending means claims were interpreted as limited to disclosed means and equivalents thereof, patent applicants would have to prosecute based on what they predict to be or not to be equivalent in the future. That is impractical, if not nonsensical, because equivalence is determined "as of the time infringement takes place," *Texas Instruments, supra*. Statements during prosecution, however, may estop patentees from asserting a full range of equivalents against infringers in the future. See 2 Patent Law Perspectives, *supra* at 2-1172.5 (1991). Lacking such statements, courts would re-determine equivalence during infringement suits, duplicating and superseding PTO's determinations.

2. Presumption Of Validity

In courts, issued claims are presumed valid. 35 U.S.C. §282. Thus, courts determining validity in infringement cases give a narrower meaning to issued claims (to preserve their validity) than the "broadest reasonable interpretation" PTO gives to pending claims. *In re Etter*, 756 F.2d 852, 858-59, 225 USPQ 1, 5-6 (Fed. Cir. 1985) (in banc). The court stated:

In litigation, where a patentee cannot amend his claims, or add new claims, the presumption [of validity], and the rule of claim construction (claims shall be construed to save them if possible), have important roles to play. In reexamination, where claims can be amended and new claims added, and where no litigating adversary is present, those roles and their rationale simply vanish.

Id. See also *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (citing *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969) for the proposition that "before the application is granted, there is no reason to read into the claim the limitations of the specification"). Because § 282's presumption of validity and the narrowing rule of claim construction do not apply to pending claims, *In re Etter, supra*, the reasons for construing issued means claims as limited to disclosed means and equivalents thereof under §112 "simply vanish" in PTO examination.

A validity appeal from a district court is "quite another thing" (compared to an ex parte PTO appeal) because, inter alia, various additional segments (e.g. §282) of the patent statute are applicable to an issued patent. Compare *Polaroid Corp. v. Eastman Kodak Co.*, 789 F.2d 1556, 1559 n.8, 229 USPQ 561, 563 n.8 (Fed. Cir.), *cert. denied*, 479 U.S. 850 (1986).

3. Policy Considerations

Given PTO's long-standing interpretation of the sixth paragraph, judicially sanctioned in *Lundberg*, and twice implicitly adopted by Congress through reenactments of §112, any change in the practice is properly addressed by Congress — not the courts or PTO. A change in practice involves policy issues which would affect many involved in the patent system — PTO, patentees, and accused infringers. These and other policy issues are appropriately debated and resolved by Congress:

a. PTO Workload

PTO's workload will increase; without the benefit of live testimony and testing facilities, PTO will have to resolve structural equivalency.

b. Practical Application

Patent applicants may have concerns about pre-committing views on non-equivalency prior to the time a patent is asserted.

Under § 112, a court may determine the breadth of equivalents to be afforded means plus function clauses in issued patents with reference to, inter alia, expert testimony and the prosecution history. *Intel Corp. v. United States Int'l Trade Comm'n*, Appeal No. 89-1459, 20 USPQ2d 1161, 1179-80 (Fed. Cir. September 17, 1991). The PTO has no facility for calling its own expert to balance expert testimony that arguably could be made of record under 37 C.F.R. §1.132. Before prosecution is complete, there is no coherent prosecution history; it is a moving target.

Because equivalency is determined with reference to testimony of experts and others versed in the technology, it requires

a determination of credibility. *Graver Tank, supra*, 339 U.S. at 609. The Patent and Trademark Office is ill-equipped to assess credibility in ex parte patentability determinations.

Thus, it would be impractical for the PTO to attempt to apply the last clause of §112's final paragraph when comparing prior art to claims in ex parte examination.

c. Burden Shifting

If PTO accepted an applicant's non-equivalency argument, the burden of proof may shift in infringement cases; the accused infringer would have to prove non-equivalency, whereas today the patent owner must prove equivalency.

d. Claim Clarity

If pending means claims were interpreted as limited to the disclosed means and equivalents thereof without explicit claim language, it would be much more difficult to read and understand such claims. For example, identically worded claims in different applications could have different meanings, even to the point of mutual allowability and non-interference.

II. If §112 Applies. How?

PTO must apply the "broadest reasonable interpretation" to pending claims.

In *In re Yamamoto*, 740 F.2d 1569, 222 USPQ 934 (Fed. Cir. 1984), this court said that claims subject to reexamination will "be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not to be read into the claims." 740 F.2d at 1571, 222 USPQ at 936. That standard is applied in considering rejections entered in the course of prosecution of original applications for patent. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

In re Etter, 756 F.2d 852, 858, 225 USPQ 1, 5 (Fed. Cir. 1985) (in banc), *cert. denied*, 474 U.S. 828 (1985) (interpreting "means" clause).

That requirement would be applicable to PTO even if §112's last clause were also applicable. The only case directly requiring PTO to determine equivalents under § 6 required PTO at the same time to apply the "broadest reasonable interpretation" to the claim. *In re Bond*, 910 F.2d at 833, 15 USPQ2d at 1567. In PTO's view, the broadest reasonable interpretation of "means" for performing a function renders all capable means equivalent.

A court in a validity/infringement case must apply a narrow construction dictated by §282's presumption of validity, as discussed *supra*. In a validity/infringement case, "section 112 § 6 operates to cut back on the types of means which could literally satisfy the claim language." *Johnston v. Ivac Corp.*, 885 F.2d 1574, 1580, 12 USPQ2d 1382, 1386 (Fed. Cir. 1989) (emphasis in original). In such a case, claims are not given the broadest reasonable construction. Compare *In re Etter, supra*, 225 USPQ at 8, 756 F.2d at 862 (Nies, J., concurring) ("claims in litigation are to be 'so construed, if possible as to sustain their validity.' [citation omitted]. Claims in reexamination, on the other hand, 'will be given their broadest reasonable interpretation.'"). Since PTO must apply the broadest reasonable interpretation, the *Johnston v. Ivac Corp.* considerations do not dictate the same result in the PTO. Compare *In re Zletz, supra*, 893 F.2d at 321, 13 USPQ2d at 1322 (Board erred by applying the mode of claim construction used by courts in litigation).

Even if §112's last clause applied to PTO's ex parte patentability determinations *vis-a-vis* the prior art, and even if all capable means were not equivalent, the clause would not limit pending means claims to disclosed and equivalent means. As set forth *supra*, §112 § 6 operates like the reverse doctrine of equivalents and speaks only to post-issuance advances. Thus, pre-issuance, a claim encompasses disclosed and equivalent means as well as any other means for performing the function.

Dec. 13, 1991

HARRY F. MANBECK, Jr.
Commissioner of Patents
and Trademarks

Patent and Trademark Office
37 CFR Parts 1 and 10
[Docket No. 910764-1306]
RIN: 0651-AA27

Duty of Disclosure

Agency: Patent and Trademark Office, Commerce

Action: Notice of final rulemaking.

Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to (1) clarify the duty of disclosure for information required to be submitted to the Office; (2) provide flexible time limits for submitting information disclosure statements including the requirement for a fee in certain cases; (3) eliminate consideration of duty of disclosure issues by the Office except in disciplinary and interference proceedings, and under other limited circumstances; and (4) eliminate the striking of patent applications which are improperly executed. The Office further is amending the Patent and Trademark Office Code of Professional Responsibility to define as misconduct a failure to comply with the rules on duty of disclosure. The rules as adopted strike a balance between the need of the Office to obtain and consider all known relevant information pertaining to patentability before a patent is granted and the desire to avoid or minimize unnecessary complications in the enforcement of patents.

Effective Date: March 16, 1992. These rules will be applicable to all applications and reexamination proceedings pending or filed after the effective date.

For Further Information Contact: By telephone Charles E. Van Horn (703-305-9054) or J. Michael Thesz (703-305-9384) or by mail addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, and marked to the attention of Charles E. Van Horn (Crystal Park 2 - Room 919).

Supplementary Information: A notice of proposed rulemaking on duty of disclosure and practitioner misconduct published in the Federal Register at 54 FR 11334 (March 17, 1989), and in the Patent and Trademark Office Official Gazette at 1101 Off. Gaz. Pat. Off. 12 (April 4, 1989), was withdrawn. On August 6, 1991, the Office published in the Federal Register a notice of proposed rulemaking relating to duty of disclosure. 56 FR 37321. The notice was also published in the Official Gazette. 1129 Off. Gaz. Pat. Off. 52 (August 27, 1991). Sixty written comments were received in response to the notice of proposed rulemaking. A public hearing was held on October 8, 1991. Eleven individuals offered oral comments at the hearing. The sixty written comments and a copy of the transcript of the hearing are available for public inspection in the Office of the Assistant Commissioner for Patents, Room 919, Crystal Park II, 2121 Crystal Drive, Arlington, VA.

Familiarity with the notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in writing and at the public hearing in response to the notice of proposed rulemaking are discussed.

The rules as adopted shall take effect as to all applications and reexamination proceedings either pending or filed on or after the effective date of these rules. Thus, any information disclosure statement that is filed on or after that date must comply with the provisions of §§1.97 and 1.98 to be entitled to consideration.

Changes in Text: The final rules contain several changes to the text of the rules as proposed for comment. Those changes are discussed below.

Section 1.17(i)(1) has been changed from the proposed text to reflect the recent increase in the amount of the fee for filing a petition from \$120.00 to \$130.00.

Section 1.56(a) has been clarified to indicate that the duty of an individual to disclose information is based on the knowledge of that individual that the information is material to patentability. A sentence has been added to §1.56(a) to express the principle that the Office does not condone the granting of a patent on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. In addition, §1.56(a) as proposed has been changed to indicate that if all information material to patentability of any claim issued in a patent is cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98, the Office will consider as satisfied the

duty to disclose to the Office all information known to be material to patentability, as contrasted to the broader duty of candor and good faith. This rule does not attempt to define the spectrum of conduct that would lack the candor and good faith in dealing with the Office which is expected of individuals who are associated with the filing or prosecution of a patent application.

In §1.56(b), the phrase "or being made of record" has been inserted to make it clear that information is not material to patentability within the meaning of §1.56 if it is cumulative to either information already of record in the application or contemporaneously being made of record by applicant. For example, there would be no benefit to the Office for applicant to submit to the Office 10 different documents having the same teaching simply because the information was not cumulative to the information already of record.

The term "creates" has been replaced by the term "establishes" in §1.56(b)(1). In addition, the definition of a prima facie case of unpatentability, as set out in the preamble of the notice of proposed rulemaking, has been incorporated into the rule itself. A prima facie case of unpatentability of a claim is established when the information compels a conclusion that the claim is unpatentable

- (1) under the preponderance of evidence, burden-of-proof standard,
- (2) giving each term in the claim its broadest reasonable construction consistent with the specification, and
- (3) before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

This prima facie standard conforms to the standard used by an examiner to determine whether a claim is prima facie unpatentable.

Section 1.56(b)(2) has been modified from the text of the proposed rule. The focus of this paragraph has been changed so that it now relates to information which either refutes, or is inconsistent with, a position that applicant takes in either

- (1) opposing an argument of unpatentability relied on by the Office, or
- (2) asserting an argument of patentability.

The change from the proposed rule makes clear that information is material when it either refutes, or is inconsistent with, a position taken by applicant before the Office.

Section 1.97(e) has been changed from the proposed text to make it clear that a certification could contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a search report from a patent office outside the U.S. not more than three months prior to the filing date of the statement. Under this certification, it would not matter whether any individual with a duty actually knew about any of the information cited before receiving the search report. In the alternative, the certification could state that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual having a duty to disclose more than three months prior to the filing of the statement.

The changes to the text of §1.97(e) as proposed place the appropriate priority on getting relevant information to the Office promptly, with minimum burden to applicant. The text of the proposal has also been changed by adding the phrase "after making reasonable inquiry" to make it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. For example, if an inventor gave a publication to the practitioner prosecuting an application with the intent that it be cited to the Office, the practitioner should inquire as to when that inventor became aware of the publication before submitting a certification under §1.97(e)(ii) to the Office.

A new paragraph (h) has been added to the text of proposed §1.97. The purpose of new paragraph (h) is to ensure that no one could construe the mere filing of an information disclosure statement as an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in §1.56(b). It is in the best interest of the Office and the public to permit and encourage individuals to cite information to the Office without fear of making an admission against interest.

In §1.98(a)(2)(iii), the wording has been changed to make it clear that the requirement to submit a copy of each item of information listed in an information disclosure statement does not apply to the citation of a U.S. patent application.

The requirement in proposed §1.98(a)(3) for a concise explanation of the relevance of each item of information has been substantially changed by limiting the requirement in two significant ways. First, as adopted, the requirement is limited to information that is not in the English language. Second, the explanation required is limited to the relevance as understood by the individual designated in §1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office. Where the information listed is not in the English language, but was cited in a search report by a foreign patent office, the requirement for a concise explanation of relevance is satisfied by submitting an English language version of the search report.

In §1.98(d), the proposed text has been changed by adding the phrase "cited by or" to make it clear that legible copies of information listed in an information disclosure statement need not be submitted in a continuing application provided the information was either cited by or submitted to the Office in a prior application. A distinction between information cited by the Office or supplied by applicant to the Office serves no useful purpose in this situation.

The text of proposed §1.555 has been modified to limit the definition of information material to patentability in a reexamination proceeding to the types of information that an examiner could use in a reexamination proceeding to determine whether a claim was patentable, and to adopt other changes that parallel changes made in §1.56. Proposed §1.555(a) has been divided into two paragraphs. Paragraph (a), as adopted, substantially parallels the text of §1.56(a) as adopted. It indicates that the duty to disclose information to the Office in a reexamination proceeding is a part of the duty of candor and good faith that is owed to the Office by individuals transacting business with the Office. It further states one way that an individual may discharge the duty to disclose information material to patentability in a reexamination proceeding - i.e., by filing an information disclosure statement with the items listed in §1.98(a) as applied to individuals associated with the patent owner in a reexamination proceeding. Finally, the text of the rule has been changed to add a sentence that expresses the principle that a patent should not be granted on an application in connection with which fraud was practiced or attempted on the Office or there was any violation of the duty of disclosure through bad faith or intentional misconduct.

New paragraph (b) of §1.555 has been adopted to define information material to patentability in a reexamination proceeding. Much like the definition in §1.56(b), information is not material when it is cumulative to information of record or being made of record in the reexamination proceeding. Information is considered material when it satisfies either or both of the definitions in §1.555(b). Under §1.555(b)(1), information is material when it is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a prima facie case of unpatentability of a claim. This definition is limited to patents or printed publications because a reexamination proceeding must be based on patents or printed publications. 35 U.S.C. 302.

The definition of a prima facie case of unpatentability of a claim pending in a reexamination proceeding has been provided in the rule. A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the same principles that are applicable during ex parte examination of a patent application; namely:

- (1) under the preponderance of evidence, burden-of-proof standard,
- (2) giving each term in the claim its broadest reasonable construction consistent with the specification, and
- (3) before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

Finally, the definition of information material to patentability in §1.555(b)(2) has been added to parallel the provision in §1.56(b)(2).

After reviewing the Office policy on whether to consider duty of disclosure and other inequitable conduct issues in interference proceedings under 35 U.S.C. 135(a), including comments from the public directed to the statement in the notice of proposed

rulemaking that the Office will not consider, evaluate, or decide fraud or other inequitable conduct issues during an interference proceeding, a new Office policy has been adopted. Effective October 24, 1991, fraud and inequitable conduct issues will be considered when properly raised inter partes in patent interference cases. 1132 Off. Gaz. Pat. Off. 33 (November 19, 1991). In addition, the Chairman of the Board of Patent Appeals and Interferences has issued a notice that provides guidance on how an issue of fraud or other inequitable conduct can be raised in an interference proceeding. 1133 Off. Gaz. Pat. Off. 21 (December 10, 1991).

Response to and Analysis of Comments: Sixty (60) written comments were received in response to the notice of proposed rulemaking. These comments, along with those made at the public hearing, have been analyzed. Some suggestions made in the comments have been adopted and others have been rejected. Responses to the comments follow.

Comment 1. Nine comments indicated that the Office should not amend §1.56 since it is presently in conformance to the materiality standard being applied by the Court of Appeals for the Federal Circuit. One comment questioned what practical value of the proposed rule would justify the burden of the change.

Reply: The amendment to §1.56 was proposed to address criticism concerning a perceived lack of certainty in the materiality standard. The rule as promulgated will provide greater clarity and hopefully minimize the burden of litigation on the question of inequitable conduct before the Office, while providing the Office with the information necessary for effective and efficient examination of patent applications.

Comment 2. One comment stated that the present rules should be maintained and strengthened since the public interest is hurt more by an unjustly issued patent than by an unjustly denied patent. Another comment disagreed and argued that an unjustly denied patent can do great harm to society.

Reply: The Office strives to issue valid patents. The Office has both an obligation not to unjustly issue patents and an obligation not to unjustly deny patents. Innovation and technological advancement are best served when an inventor is issued a patent with the scope of protection that is deserved. The rules as adopted serve to remind individuals associated with the preparation and prosecution of patent applications of their duty of candor and good faith in their dealings with the Office, and will aid the Office in receiving, in a timely manner, the information it needs to carry out effective and efficient examination of patent applications.

Comment 3. Two comments stated that the rule should not permit applicants to draft claims and a specification to avoid a prima facie case of obviousness over a reference and then to be able to withhold the reference from the examiner.

Reply: The comments reflect a correct reading of the rule in that information is not material unless it comes within the definition of §1.56(b)(1) or (2). If information is not material, there is no duty to disclose the information to the Office. The Office believes that most applicants will wish to submit the information, however, even though they may not be required to do so, to strengthen the patent and avoid the risks of an incorrect judgment on their part on materiality or that it may be held that there was an intent to deceive the Office.

Comment 4. One comment stated that promulgation of the proposed rule would result in a significant decrease in the quantity of art cited to the Office because there will be no duty to cite art relevant to a pending claim.

Reply: The Office does not anticipate any significant change in the quantity of information cited to the Office after promulgation of amended §1.56. Presumably, applicants will continue to submit information for consideration by the Office in applications rather than making and relying on their own determinations of materiality. An incentive remains to submit the information to the Office because it will result in a strengthened patent and will avoid later questions of materiality and intent to deceive. In addition, the new rules will actually facilitate the filing of information since the burden of submitting information to the Office has been reduced by eliminating, in most cases, the requirement for a concise statement of the relevance of each item of information listed in an information disclosure statement.

Comment 5. Several comments stated that an objective "but for" standard would be preferable to the proposed rule. The objective "but for" standard would presumably consider information as a court does in an infringement proceeding with a clear and

convincing, burden-of-proof standard, giving the terms in each claim a narrow construction where necessary to uphold validity. **Reply:** The Office believes that amended §1.56 will provide a reasonable balance between the needs of applicants and of the Office. The suggested "but for" standard would not cause the Office to obtain the information it needs to evaluate patentability so that its decisions may be presumed correct by the courts. If the Office does not have needed information, meaningful examination of patent applications will take place for the first time in an infringement case before a district court. Courts will become increasingly less confident of the Office's product if they get the impression that practitioners and inventors can routinely withhold information from the Office, or that practitioners and inventors can make up their own minds about what is patentable. The Office should decide, in the first instance, what is patentable and any decision should be made with the best information available, including that known by the applicant. The Office notes that the House of Delegates of the American Bar Association twice, once in 1990 and again in 1991, refused to adopt a resolution favoring adoption of the "but for" standard.

Comment 6. One comment argued that proposed §1.56 does not relate to "the conduct of proceedings in the Patent and Trademark Office" (35 U.S.C. 6(a)) since the Office does not intend to reject applications as indicated by the cancellation of paragraphs (c) through (i) of current §1.56.

Reply: The amendment to §1.56 comes within the authority of the Commissioner for establishing regulations. *Norton v. Curtiss*, 433 F.2d 779, 167 USPQ 532 (CCPA 1970). The Office has reserved its inherent authority to reject an application under appropriate circumstances where fraud or other inequitable conduct has occurred. Also, the Office will consider fraud and inequitable conduct when properly raised in interference proceedings under 35 U.S.C. 135(a). The Office will also consider fraud and inequitable conduct in connection with attorney conduct under §10.23(c).

Comment 7. One comment stated that §1.56 should require only anticipatory art to be submitted during examination of an application, with a procedure such as reexamination being used after discovery in any litigation on the patent has revealed all available art.

Reply: An application is examined under all appropriate sections of Title 35, United States Code, and a presumption of validity attaches to a patent with regard to all aspects of patentability, including anticipation. 35 U.S.C. 282. Therefore, §1.56 should address more than just the submission of anticipatory information, including information relevant to patentability under 35 U.S.C. 103 and 35 U.S.C. 112.

Comment 8. One comment suggested that proposed §1.56 has some dangerous implications since courts are going to find violations of the duty of disclosure if §§1.97 and 1.98 are not complied with completely.

Reply: Section 1.56 provides that the duty of disclosure can be met by submitting information to the Office in the manner prescribed by §§1.97 and 1.98. Sections 1.97 and 1.98 are being amended so that information will be submitted to the Office in the manner and at the time which will facilitate consideration by the examiner. Applicants are provided certainty as to when information will be considered, and applicants will be informed when information is not considered. The Office does not believe that courts should, or will, find violations of the duty of disclosure because of unintentional non-compliance with §§1.97 and 1.98. If the non-compliance is intentional, however, the applicant will have assumed the risk that the failure to submit the information in a manner that will result in its being considered by the examiner may be held to be a violation.

Comment 9. Two comments stated that the Office should not delete the offense of attempted fraud from the §1.56. The comments stated that elimination of the reference to "gross negligence" in current §1.56 would be sufficient to protect the practitioner who delays submission of information with no intent to deceive the Office. One of the comments stated that the disciplinary rules alone are not sufficient to deter attempted fraud or inequitable conduct.

Reply: The language of §§1.56(a) and 1.555(a) has been modified to retain the provisions of prior §1.56(d) to indicate that the Office does not condone fraud, attempted fraud, or violation of the duty of disclosure through bad faith or intentional misconduct.

Comment 10. One comment stated that the appropriate standards for the duty of candor are analogous to fiduciary law which requires the fiduciary to disclose not only known facts, but also facts which it should have known, i.e., a negligence standard. The comment argued that it was undesirable to measure duty of candor or fraud by a reduced measure of "intent" instead of an objective negligence standard since the Office is not bound by the U.S. Court of Appeals for the Federal Circuit decision in *Kingsdown Medical Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 9 USPQ2d 1384 (Fed. Cir. 1988) (*en banc*), *cert. denied*, 490 U.S. 1067 (1989), and since the proposed standard is no more objective than alternative standards but is simply narrower and more certain. Another comment suggested that the Office should indicate that there is no intention to change the *Kingsdown* ruling.

Reply: Section 1.56 has been amended to present a clearer and more objective definition of what information the Office considers material to patentability. The rules do not define fraud or inequitable conduct which have elements both of materiality and of intent. The Office does not advocate any change to the *Kingsdown* ruling.

Comment 11. Two comments stated that the proposed modification of §1.56 would make submission of information to the Office an implied admission of the prima facie unpatentability of a claim. Several comments suggested that a sentence should be added to proposed §1.56 to specify that submission of information to the Office under this section shall not be deemed to be an admission or representation that the information is material to patentability.

Reply: The suggestions in the comments have been adopted by modifying §1.97 which deals with submission of information to the Office. Paragraph (h) of §1.97 now provides that the filing of an information disclosure statement shall not be considered to be an admission that the information cited in the statement is, or is to be considered to be, material to patentability as defined in §1.56.

Comment 12. One comment stated that the proposed §1.56 definition would be difficult to apply in litigation in which a different burden-of-proof standard is applied.

Reply: The definition of information material to patentability includes standards which are familiar to the Federal courts and which are capable of being handled like other issues.

Comment 13. One comment suggested that the last sentence of proposed §1.56(a), in which the Office encourages applicants to carefully examine prior art cited in foreign search reports and the closest known information, be removed from the rule and be placed in the preamble discussion so as to avoid the interpretation that the sentence creates a duty for applicants.

Reply: The suggestion is not adopted. The sentence does not create any new duty for applicants, but is placed in the text of the rule as helpful guidance to individuals who file and prosecute patent applications.

Comment 14. Three comments stated that the language of proposed §1.56(a) required revision to remove all statements or suggestions which might allow a court to consider a pending (i.e., unissued) claim for the purpose of determining whether the duty of disclosure requirement was met in view of the fact that the proposed rule was intended to indicate that there is no duty to disclose information which is material to a pending claim unless that claim ultimately issues in a patent. One comment argued that a court might interpret "the duty of candor and good faith" to be broader than the particular duty of disclosure specified in other portions of the proposed rule.

Reply: The language of §§1.56 and 1.555 has been modified to emphasize that there is a duty of candor and good faith which is broader than the duty to disclose material information. Section 1.56 further states that "no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct."

Comment 15. One comment suggested that proposed §1.56(a) be modified to clarify that both information and its materiality must be known before there is a duty to disclose the information.

Reply: The Office considers the language of §1.56(a) to be sufficiently clear in referring to a "duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section." If information is known to be material, it inherently must be known. Likewise, if information is not known to an individual, there is no duty to disclose the information whether it is material or not.

Comment 16. One comment stated that it should be made clear that "known" is limited to contemporaneous knowledge since a practitioner may have known something ten years ago but may not remember it presently.

Reply: Section 1.56 states that each individual associated with the filing and prosecution of a patent application has a duty to disclose all information known to that individual to be material to patentability as defined in the section. Thus, the duty applies to contemporaneously or presently known information. The fact that information was known years ago does not mean that it was recognized that the information is material to the present application.

Comment 17. One comment suggested that proposed §1.56(a) be modified to state that the duty of disclosure ends when an application becomes abandoned or allowed.

Reply: Paragraph (a) of §1.56 states that the duty to disclose information exists until the application becomes abandoned. The duty to disclose information, however, does not end when an application becomes allowed but extends until a patent is granted on that application. The rules provide for information being considered after a notice of allowance is mailed and before the issue fee is paid (§1.97(d)) and for an application to be withdrawn from issue after the issue fee has been paid. An application may be withdrawn from issue because one or more claims are unpatentable (§1.313(b)(3)) or an application may be withdrawn from issue and abandoned so that information may be considered in a continuing application before a patent issues (§1.313(b)(5)).

Comment 18. Three comments stated that the first two sentences of proposed §1.56(a) should be deleted since rules should simply instruct practitioners what to do without discussion of why they should do it or the philosophy involved.

Reply: The suggestion has not been adopted since the sentences aid in the understanding of the rule and will provide those involved in enforcing patents with an indication of the policy on which the rule is based.

Comment 19. One comment stated that §§1.56(a)(2) and (c) should be modified to refer to "individuals substantively associated with" the filing or prosecution of the patent application.

Reply: The suggestion is not adopted since the proposed rule language is clear and the suggested modification would create a redundancy with the language of §1.56(c)(3). The individuals designated in §§1.56(c)(1) and (2) as being associated with the filing or prosecution of a patent application within the meaning of the section are inherently substantively involved in the preparation or prosecution of the application.

Comment 20. One comment stated that proposed §1.56(b) should be modified to clarify that information is not material if it is cumulative to information already of record in an application or to information concurrently being made of record.

Reply: The suggestion has been adopted by adding a reference to information being made of record with regard to cumulative information in §§1.56(b) and 1.555(b).

Comment 21. One comment stated that the preamble discussion (of §1.56(b)) should indicate that test results in situations such as tests involving biological systems may properly be submitted as averages rather than as individual test runs.

Reply: Whether test results can be submitted as averages rather than as individual test runs depends on whether doing so would provide to the Office the information needed to make a proper determination on patentability. If the actual results are provided, the examiner can make an independent determination on whether some rejection is appropriate. In some cases providing averages might be misleading, but in other cases providing averages might be appropriate.

Comment 22. One comment stated that the definition of materiality in proposed §1.56(b) imposes substantial new burdens on applicants who would be required to disclose failed experiments, papers published less than one year prior to filing and experimental public uses even if they clearly are refutable and will not affect patentability. One comment stated that the proposed rule would require applicants to incur added expense for affidavits and comparison tests. Five comments stated that the Office should not require applicants to present results from clearly invalid tests since this would be contrary to usual scientific practice. One comment argued that information should not be required to be submitted if there was no doubt that it would not preclude patentability, e.g., where common ownership existed so that the exception of 35 U.S.C. 103, second paragraph, would apply.

Reply: The definition of materiality in §1.56 does not impose substantial new burdens on applicants, but is intended to provide the Office with the information it needs to make a proper and independent determination on patentability. It is the patent examiner who should make the determination after considering all the facts involved in the particular case. The comments reflect that the Office objective of clarifying what information the Office considers to be material has been accomplished by the amendment of the rules.

Comment 23. One comment suggested that §1.56 should confine the duty of disclosure to references known to applicant or the practitioner representing applicant and not found in prior art materials in the Office.

Reply: This suggestion is not adopted since information may be in the Office but not in the application file. It is not reasonable to assume that an examiner knows of a particular item of information or appreciates its relevance to a particular invention simply because it exists somewhere in the Office.

Comment 24. One comment stated that the language "or in combination with other information" should be removed from proposed §1.56(b)(1) because it was unworkable to require an applicant to combine references against its own claims, especially since, according to the commentator, examiners and the Board of Patent Appeals and Interferences frequently misapply the law. Another comment stated that the language creates an open field for litigators to claim that an inordinate number of references could be combined.

Reply: The rule does not require an applicant to combine references against its own claims. The applicant can submit information to the Office for the examiner's consideration whether the information is considered material or not. The fact that the teachings of a large number of references must be combined for a prima facie case of obviousness does not by itself weigh against a holding of obviousness. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Comment 25. Four comments stated that the definition of "prima facie case of unpatentability" §1.56(b)(1) should be included in the rule itself. One comment said that the definition should not be included in the rule.

Reply: The definition has been included in the rule for clarity.

Comment 26. One comment stated that the proposed §1.56(b)(1) placed a burden on the practitioner to analyze references that is inappropriate and contradictory to a practitioner's responsibility to his client.

Reply: The rule itself does not place a burden on the practitioner to analyze references. Information can be submitted to the Office in accordance with §§1.97 and 1.98, and the examiner will consider the references.

Comment 27. One comment questioned whether an applicant would be charged with withholding material information if the "other information" (§1.56(b)(1)) necessary to cause an undisclosed reference to become material is unknown to the applicant. Another comment suggested that the language should be changed to read "other known information" to show that the information must be known to applicant to give rise to a duty of disclosure.

Reply: Paragraph (b) of §1.56 defines information material to patentability. While information may be material under the definition, there is no duty on an individual to disclose the information if the information is unknown to the individual (§1.56(a)).

Comment 28. One comment suggested that defining materiality in §1.56(b) in terms of prima facie unpatentability would permit a conspiracy of silence in which (1) the applicant knows of information but is incapable of making the legal analysis to determine whether the information is material and (2) the patent practitioner, who is equipped to determine whether information is material, does not know of the information and does not ask. Thus, it is argued there would be no violation of the duty of disclosure which requires knowledge of both information and its materiality.

Reply: The Office has set forth what information should be submitted so that the Office can make a proper determination on patentability. The term "conspiracy" has the connotation of unlawfulness which would not be consistent with the duty of candor and good faith required in dealings with the Office.

Comment 29. One comment suggested that proposed §1.56(b)(1) should be revised to read "in combination with other information already of record in the application" to avoid the possibility that undisclosed material could be considered material in subsequent

litigation when combined with information not known at the time of the prosecution to any person substantively involved in the preparation or prosecution of the application.

Reply: Paragraph (a) of §1.56 makes it clear that the Office recognizes that the duty to disclose material information is limited to such information which is known by an individual substantively involved in the preparation or prosecution of the application. Thus, while information may be material under the definition of §1.56(b)(1), there can be no duty to disclose the information if it is material only in combination with unknown information.

Comment 30. One comment stated that proposed §1.56(b) should be modified so that paragraph (b)(1) refers to information that renders a claim unpatentable ("but for"), paragraph (b)(2) remains as proposed, and a paragraph (b)(3) is added to include the definition of materiality as "the closest information over which any pending claim patentably defines." This comment suggested that this modified definition would have the advantage of not requiring the applicant to submit references which applicant knows are immaterial and to then engage in "straw man" arguments based on such references.

Reply: The suggested modification to §1.56 has not been adopted. The suggested language would seemingly require information to be filed in each application, whether the information is relevant or not, since the "closest information" would be required. Section 1.56 does not require information which is not relevant to be submitted, but only information which meets the definition of material as set out in the rule.

Comment 31. One comment stated that if proposed §1.56(b)(1) is promulgated, there would be no need for proposed §1.56(b)(2) with regard to information which would make a prima facie case of unpatentability and other information required by paragraph (b)(2) might be obscure. Another comment argued that paragraph (b)(2) was unnecessary, confusing and ambiguous and suggested changes in the language to make the requirement clear and less ambiguous.

Reply: The suggestion as to the language change to §1.56(b)(2) has been adopted. The final rule language avoids the perceived problem of requiring an applicant to submit information supporting a position taken by the examiner. It is not appropriate, however, to eliminate paragraph (b)(2) because it is an essential part of the definition of information material to patentability and will help to ensure that all material facts are brought to the attention of the examiner during the examination process.

Comment 32. One comment questioned the language of proposed §1.56(b)(2) as to how an applicant could consider a prior art reference as supporting a position of unpatentability taken by the Office while at the same time disputing that interpretation.

Reply: The language of §1.56(b)(2) has been modified to clarify that information is material to patentability if it refutes, or is inconsistent with, a position the applicant takes in (1) opposing an argument of unpatentability relied on by the Office, or (2) asserting an argument of patentability.

Comment 33. One comment stated that §1.56(b)(2) was flawed in requiring a duty to conduct a file search to make sure that no information exists which even arguably contradicts a position taken or to be taken in response to the examiner, or which supports the examiner's position which may be improper.

Reply: Section 1.56(b)(2) does not require a search of files. Under §1.56(a), the duty of disclosure is confined to that information which is known to an individual to be material as defined in paragraph (b).

Comment 34. One comment stated that proposed §1.56(c) should be modified so that the duty of any individual designated as having a duty of disclosure would terminate when such individual ceases to be substantively involved in the preparation or prosecution of the application. The comment used, as an example, an inventor who would not be aware of art cited by the examiner which would cause information known to the inventor to fall within the definition of materiality for the first time.

Reply: The suggestion in the comment is not adopted. The duty to disclose information material to patentability rests on the individuals designated in §1.56(c) until the application issues as a patent or becomes abandoned. Paragraph (a) of §1.56 makes it clear, however, that each individual has a duty to disclose only information which is known to that individual to be material.

Comment 35. One comment stated that proposed §1.56(c)(3) should not include the assignee, or anyone to whom there is an obligation to assign the application, in the class of those who

have a duty to disclose material information since there might be a "witch hunt" during litigation to find one employee with knowledge of, or possession of, information that should have been disclosed.

Reply: No modification to §1.56(c)(3) is needed since §1.56 sets forth that only individuals who are associated with the filing and prosecution of a patent application have a duty of candor and good faith, including a duty to disclose to the Office all information known to be material to patentability.

Comment 36. One comment stated that proposed §1.56(d) should be revised to expressly allow an inventor to satisfy the duty by disclosing information to the practitioner who prepares or prosecutes the application so that redundant information disclosure statements will not be required from both the inventor and the attorney or agent.

Reply: The suggestion in the comment is not adopted since the duty as described in §1.56 will be met as long as the information in question was cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98 before issuance of the patent. Statements from both an inventor and the practitioner are not required to be submitted.

Comment 37. One comment stated that proposed §§1.52(c) and 1.67(c) should be modified to either (1) expressly permit alterations to be made in an application subsequent to the signing of the oath or declaration if a supplemental oath or declaration is later submitted, or (2) more properly, prohibit such alterations since if alterations are desirable, they can be made and the application can be filed with an unsigned oath or declaration. Another comment stated that willfully filling out false oaths should never be condoned.

Reply: The Office does not condone willfully filling out false oaths. Further, §10.23(c)(1) indicates that the Office considers it misconduct for a practitioner to knowingly file or cause to be filed an application containing a material alteration made after the signing of an accompanying oath or declaration without identifying the alteration. The Office will not consider striking an application in which an alteration was made, but a supplemental oath or declaration is required to be filed in an application containing alterations made after the signing of the oath or declaration.

Comment 38. One comment stated that the implementation of proposed §§1.63(b)(3) and 1.175(a)(7) allows for a two-month delay in the deadline for requiring declarations complying therewith.

Reply: The averments in oath or declaration forms presently in use that comply with the previous §1.63 or §1.175 will also comply with the requirements of the new rules. Therefore, the Office will continue to accept the old oath or declaration forms as complying with the new rules.

Comment 39. Five comments questioned the need for the proposed rules since statistics show that information disclosure statements are submitted early in prosecution and questioned what new service is being provided for the proposed fee in §1.97.

Reply: The Office desires to continue to encourage information to be submitted promptly so that it can be considered by the examiner when the first Office action is prepared. Some people have expressed a desire to have the option of waiting to submit information until after the first Office action, without concern that they will be subject to a charge of inequitable conduct. Section 1.97(c), as amended, will provide this option to applicants in that information will be considered later than three months after the filing date of the application (§1.97(a) prior to amendment) without a showing of promptness (prior §1.99). The fee will compensate the Office for the added expense caused by the late submission of the information and will serve as a disincentive to the intentional withholding of information even for a short period of time.

Comment 40. Two comments suggested that proposed §1.97(a) be modified so that the mechanism of proposed §1.98 would not be the only acceptable technique for submitting information.

Reply: The Office has set forth the minimum requirements for information to be considered in §§1.97 and 1.98. These rules will provide certainty for the public of exactly what the requirements are, when the Office will consider information and when the Office will not consider information. Thus, applicants are provided with means for complying with the duty of disclosure by following the rules. If information is submitted in a manner so that it is not considered by the Office, applicant will assume the

risk that a court might find a violation of the duty of candor and good faith which includes the duty to disclose material information.

Comment 41. Four comments suggested that information which is recognized by applicant as being material after the period set in proposed §1.97(b) as the result of prior art cited by the examiner should be permitted to be submitted to the Office without the fee set forth in 1.17(p), the certification or the petition fee required by §1.97.

Reply: The suggestion in the comments is not adopted since it would require a certification, e.g., why the information was just recognized as being material, and would unduly complicate the rules and the procedures for considering information submitted by applicant. Applicants can avoid or, at least, minimize the problem by submitting information which is known to be relevant to the application even though it is not yet recognized as being required to be submitted because it is material to patentability. The fees charged are to compensate the Office for the additional work that will be necessary when information is submitted during an advanced stage of the examination process.

Comment 42. Two comments suggested that the period for submitting information set in proposed §1.97(b) be changed to be two months from the issuance of the Official Filing Receipt to avoid information disclosure statements being misrouted in the Office.

Reply: The suggestion in the comment is not adopted. The date that the Filing Receipt is mailed is not maintained in the application file so there would be administrative difficulty in determining when a fee or certification is required to be filed under the new rule. An application can be filed with a self-addressed return postcard so that applicant can obtain the serial number assigned to the application very soon after filing. Further, information may be filed under §1.97(b) before the mailing of a first Office action on the merits even if this occurs later than three months after the application filing date.

Comment 43. One comment questions whether §1.97(b) or §1.97(d) applies in the event of issuance of a final rejection within three months of the filing of an application. The comment indicated that paragraph (b) should apply in this situation.

Reply: Paragraph (b) would apply in this situation since the paragraph specifies that information may be filed within three months of the filing date of the application or before the mailing date of a first Office action on the merits, whichever event occurs last. Thus, information would be considered pursuant to §1.97(b) if it was filed within three months of the filing date of the application even if a final rejection was mailed prior to three months from the filing date.

Comment 44. One comment stated that proposed §1.97(b)(1) should be clarified to indicate that "the filing of a national application" includes "a continuing application which replaces the original application."

Reply: The suggested modification has not been adopted since it is not necessary for clarity. The term "national application" includes continuing applications in this and the other patent rules. It is not desirable to add the suggested language to all occurrences of the term "application" in the rules or to raise the implication that continuing applications are not included in the term in other rules by adding the suggested language to this rule.

Comment 45. One comment stated that proposed §1.97 should be changed to state that if a responsible party becomes aware of material information less than three months before issuance of an Office action, that information will be considered timely filed if it is submitted together with the response to the action. The comment also stated that the Office could go farther and implement a rule which specifies that such information will be considered timely submitted if it reaches the examiner before the response to the Office action is taken up for consideration. Three other comments stated that the Office should accept information disclosure statements with responses to Office actions, with one comment arguing that there is no benefit in submitting two papers where one would suffice.

Reply: The suggestions in the comments are not adopted. The rule as proposed and promulgated has the advantage of being relatively easy to comply with and administer. Information should be submitted promptly so that the examiner will have the option of reviewing the information and withdrawing or revising the Office action. Requiring information to be submitted promptly contributes to the efficiency of the examination process.

Comment 46. One comment stated that there should be no fee in §1.97 associated with the filing of an information disclosure statement since this might impact negatively on the submission of material information; rather, it would be sufficient to permit material information submitted subsequent to a non-final action to support a final rejection in the next action, in the absence of the certification proposed in the rules. Another comment, however, stated that the proposed fee requirement would not be a disincentive to submission of prior art, but would force examiners to consider certain art which under current practice often is not made of record, but instead, requires the filing of a continuation application.

Reply: The fee required in the rule will serve both to cover additional expense caused the Office by the late submission of information and will also serve as a disincentive to failing to cooperate in submitting information early in the prosecution of an application rather than as a disincentive to submitting information at all.

Comment 47. One comment questioned whether information in an information disclosure statement submitted during the period set forth by proposed §1.97(c) could be used by an examiner to make the next action final if the statement was submitted with a certification under §1.97(e).

Reply: Information submitted with a certification during the period set forth in §1.97(c) will not be used to make the next Office action final on unamended claims since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office.

Comment 48. One comment stated that it was unfair for the Office to require a fee for considering information pursuant to proposed §1.97(c) and then also be able to use the information in making the Office action final.

Reply: The policy is not considered to be unfair. If information is submitted during the period set forth in §1.97(c) without the certification, the fee will compensate the Office for extra work that may be caused by the failure to submit information promptly. If the cost for this extra work were not placed upon the applicant in this situation, the cost would have to be borne by all applicants through payment of higher fees. The possibility that the next Office action may be made final will further encourage prompt disclosure of information to the Office.

Comment 49. One comment suggested that information should be considered (§1.97(c)) after final rejection, since this is different from after allowance when the Office would have to go back and reconsider its work. Two comments stated that proposed §1.97(c)(1) should not penalize applicants who receive a foreign search report after a final rejection is made in the application and that the certification under §1.97(e) should be available until an advisory action after final rejection or a notice of allowability occurs in the application. Another comment stated that final action may not even be on the merits but merely administrative.

Reply: The suggestions in the comments are not adopted. Both a notice of allowance and a final rejection represent a final Office decision on patentability. Information considered after either of these actions may require the Office to alter its position. After either of these actions, information will be considered only if it is submitted promptly in accordance with §1.97(d) or is submitted in a refiled application. It should be noted that information cited in a foreign search report, if cited to the Office within three months of the date on the search report, will be considered by the Office if filed before payment of the issue fee.

Comment 50. One comment stated that proposed §1.97(d) would result in unequal treatment of U.S. inventors who file first in the Office as compared to foreign inventors who file first in a foreign country since the latter will have the results of the search made by the foreign examining country earlier in the pendency of the U.S. application. Six comments suggested that a U.S. inventor should have the ability to make the certification of §1.97(e) and to have the Office consider the information, regardless of the stage of prosecution at which information from a foreign office is submitted.

Reply: It should be noted that the certification of §1.97(e) can be made and information considered by the Office until the issue fee is paid on the application. After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. The application may be with-

drawn from issue at this point, however, pursuant to §1.313(b)(5) so that the information can be considered in a continuing application, or pursuant to §1.313(b)(3) if applicant states that one or more claims are unpatentable over the information that is cited. It is further noted that it is applicants, not the Office, who make decisions on when and in which countries to file an application. U.S. inventors who may desire to seek patent protection in foreign countries have the ability to utilize the provisions of the Patent Cooperation Treaty and to delay the requirement to enter the national stage until after a search report on the invention is made.

Comment 51. One comment questioned whether a certification under §1.97(e) could properly be made in situations where information known by the applicant but not considered material is cited by a foreign patent office more than three months later than the first knowledge by applicant.

Reply: The language of §1.97(e) has been modified to permit a certification to be made in the situation described in the comment. If an item of information is submitted within three months of being cited in a communication from a foreign patent office in a counterpart foreign patent application, the certification can be properly made regardless of any individual's previous knowledge of the information.

Comment 52. One comment stated that the three-month time period for submitting information from foreign patent offices under proposed §1.97(e) might be too short because not all foreign offices provide copies of references and that the Office should provide for a petition in unusual circumstances. Five comments stated that a three-month time limit for filing foreign search reports is not reasonable but rather that six months would be more reasonable.

Reply: The Office has chosen the three month time period as appropriate in view of all the factors involved in obtaining information and in the examination process. It should be noted that Office actions typically set a three-month shortened statutory period for response. A response to an Office action generally requires more time for preparation than is involved in the submitting of a foreign search report and copies of the documents cited.

Comment 53. Five comments suggested that §1.97(e) should permit a certification to be made if an individual knew of information for more than three months before it was filed but did not recognize its materiality or relevance to the application.

Reply: The suggestion in the comments is not adopted. The Office desires to encourage prompt evaluation of information as to materiality by applicants and the Office so as to contribute to the efficiency and effectiveness of the examination process. It should be noted that an applicant is not required to delay the submission of information while evaluating materiality, but can submit the information pursuant to §§1.97 and 1.98.

Comment 54. One comment stated that proposed §1.97(e) should be clarified to specify that the certificates can be made regardless of the source of the information being submitted, so long as it is disclosed within three months of receipt. One comment stated that the three-month period of proposed §1.97(e) should be measured from the receipt date of a communication from a foreign patent office.

Reply: A certification under §1.97(e) can be made if each item of information was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to filing the statement. A certification can also be made if no item of information was cited in a communication from a foreign patent office in a counterpart foreign application or was known to any individual designated in §1.56(c) more than three months prior to filing the information disclosure statement. The Office wishes to encourage prompt evaluation of the relevance of information and to have a date certain for determining if a certification can properly be made. Although it is recognized that an individual actually becomes aware of the information in the communication from a foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to a first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee. The Office is willing to absorb any additional cost in considering such information relevant to patentability after the time set in proposed paragraph (b) only when it is clear that an applicant is diligent in providing the information to the Office.

Comment 55. One comment stated that the cost of making a certification under §1.97(e) would be more than the \$200.00 fee

proposed where no certification is made due to difficulties in obtaining information from foreign clients. The comment suggested that the rule provide for (1) the opportunity to provide documentation (as opposed to certification) illustrating when the information was received, and (2) the opportunity to submit information with increasing fees depending on when in the periods of §1.97(c) and (d) the information is submitted.

Reply: The suggestions in the comment are not adopted since they would add undue complexity to the rules and procedures. Further, the suggested provision of documentation, which presumably would be reviewed by someone in the Office, would probably add considerably to the overall expense of filing an information disclosure statement. No other comments indicated a desire for increasing fees depending on when the information is submitted.

Comment 56. Two comments stated that proposed §1.97(e) is ambiguous in using the language "to the knowledge of the person signing the certification" in that it could refer to "information and belief," "actual knowledge of the facts" or "no knowledge to the contrary." One comment stated that certifications should be able to be made on information and belief by a U.S. attorney or agent submitting a material reference received from a foreign patent attorney or agent, rather than requiring a certification from the foreign individual. Another comment suggested that the period should be calculated from when the applicant either knew or could have known of the reference because the U.S. attorney should not be penalized for delays from their foreign patent associates.

Reply: The certification under §1.97(e) should be made by a person who has knowledge of the facts being certified. The certification can be made by a practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry.

Comment 57. One comment stated that the language of proposed §1.97(e) would preclude the use of the certification in an application by corporations whose practitioners have over the years reviewed thousands of patents and technical publications, even though they are unaware of the relevance of any one thereof to the application.

Reply: The language of §1.97(e) is not intended to preclude use of the certification by representatives of corporations. The certification can be based on present, good faith knowledge about when information became known without a search of files being made. The Office, however, does desire to have information considered promptly by applicants as to materiality and to have information submitted to the Office early in the prosecution of an application.

Comment 58. One comment suggested that proposed §1.97(e) should permit certification only as to information submitted within four months of receipt from a foreign patent office, with all other late-submitted information requiring a fee so as to not open a legal quagmire implicit in the proposed certification requirement.

Reply: The suggestion in the comment is not adopted. The certification set forth in §1.97(e) is preferable since it provides the avoidance of the payment of a fee by a person who is submitting information promptly to the Office. An applicant has the option under the circumstances described in §1.97(e), however, to not make the certification and to pay the fee instead if so desired.

Comment 59. One comment suggested that proposed §1.97(f) be modified to specify that not less than one month will be given if a bona fide attempt is made to comply with §1.98 but part of the required content is omitted. Another comment suggested that §1.97(f) should state that the Office will give (rather than may give) additional time for compliance with §1.98.

Reply: The suggestions in the comments are not adopted. The language of §1.97(f) parallels present §1.135(c) since the practice and considerations are similar for both rules. The Office intends to provide one month to comply with §1.98 where a bona fide attempt has been made to do so.

Comment 60. One comment stated that proposed §1.97(f) should specify that the Office shall inform the applicant if a reference will not be considered due to noncompliance with §1.98 so as to

avoid any argument in litigation that a certain reference was not considered due to clerical noncompliance.

Reply: The Office plans to notify applicants in accordance with §§1.97(f) and (i) if submitted information will not be considered. The examiner will also indicate in the application record what information has been considered. Further details will appear in the Manual of Patent Examining Procedure in due course.

Comment 61. One comment suggested that proposed §1.97(g) should be modified to state that the filing of an information disclosure statement shall not be construed as a representation that no other material information exists such as is set forth in current §1.97(b).

Reply: The suggestion in the comment has not been adopted since referring to "no other material information" would imply that the information being submitted was admitted to be material. There is no requirement that information being submitted be material to the application.

Comment 62. One comment suggested that proposed §1.97(h) be modified to state that information not considered by the Office will be deemed in all respects to have not been submitted by the applicant since this would make a noncompliant submission clearly not a fulfillment of the duty of candor.

Reply: The suggestion in the comment is not adopted. The Office has no need or desire to rule on lack of fulfillment of the duty of candor in such a situation. The rules are drafted such that §1.56 sets forth what information is material to patentability and §§1.97 and 1.98 set forth procedures to assure consideration of information by the Office.

Comment 63. One comment stated the Office has a duty to consider information even if this involves withdrawing an application from issue or publishing a cancellation notice and that proposed §1.97(h) should be changed to so state. Another comment stated that it would be an abdication of the duty that the Office owes to the public for information in the file to be ignored since issuance of an invalid patent can be used to discourage others in the field. The comment suggested that the Office should leave in doubt whether the information will be considered or not.

Reply: It is necessary for the Office to balance its need and desire to consider all information relevant to an application with its need for an efficient operation and its capability to consider information at various stages in the prosecution of an application. The Office is setting forth when information will and will not be considered to provide certainty for the public.

Comment 64. One comment requested information on how a United States patent application or other information (§1.98(a)(1)(iii)) should be listed on a PTO 1449 form.

Reply: The PTO 1449 has been drafted so as to provide spaces for listing documents which are available to the public and which will be printed on the patent at issuance. Other information should be listed separately from the PTO 1449 form.

Comment 65. One comment stated that §1.98(a)(2)(i) should not require the submission by applicants of United States patents listed in an information disclosure statement since the Office is better equipped to provide examiners with copies of those documents than inventors and their attorneys. Alternatively, the comment suggested that the Office should establish a procedure whereby an order for the Office to provide the copies of the patents at the usual fee can accompany the information disclosure statement.

Reply: At the present time, when the Automated Patent System has not been fully implemented, the overall cost of the Office obtaining copies of patents and associating them with application files would be greater than for applicants to provide copies with information disclosure statements. Presumably, the applicant would be using a copy of the patent in preparing the statement and could easily make a copy for submission to the Office.

Comment 66. One comment suggested that §1.98(a)(2)(iii), as proposed, be clarified by substituting "except that no copy of a U.S. patent application need be included" for the proposed phrase "except a U.S. patent application."

Reply: The suggested clarification to the language of the rule has been adopted.

Comment 67. A number of comments objected to the requirement in §1.98(a)(3) for a concise explanation of the relevance of all items of information being submitted.

Reply: In response to the comments, §1.98(a)(3) has been modified to require a concise explanation only of patents, publications or other information listed in an information disclosure

statement that are not in the English language. Applicants may, if they wish, provide concise explanations of why English-language information is being submitted and how it is understood to be relevant. Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability.

Comment 68. Five comments stated that the proposed rules should be modified to state that if information is being submitted from a foreign search report, the requirement for a concise explanation in proposed §1.98(a)(3) may be satisfied by submitting an English-language version of the search report.

Reply: The language of §1.98(a)(3) has been modified so that no concise explanation is required for information submitted in the English language. The concise explanation requirement for non-English language information may be met by the submission of an English language version of the search report indicating the degree of relevance found by the foreign office. It is not necessary that this detail be included in the rule.

Comment 69. Five comments questioned whether the requirement in proposed §1.98(a)(3) would be satisfied by a statement that the references were cited in the prosecution of a parent application.

Reply: The requirement in §1.98(a)(3) for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a parent application. The concise explanation must explain the relevance as presently understood by the person designated in §1.56(c) most knowledgeable about the content of the information.

Comment 70. One comment suggested that proposed §1.98(a)(3) should be modified to require a concise explanation of "what is believed to be" the relevance of information listed to avoid the accusation of violation of duty of disclosure merely because more relevant portions of the information are later found. Another comment suggested that the concise explanation should state what is "reasonably understood by the person submitting the statement." Another comment stated that the applicant should be required to explain (1) only what is understood or believed about the item of information at the time the disclosure is made, or (2) why the item is listed.

Reply: The suggestions in the comments have been substantially adopted in modifying the language of §1.98(a)(3).

Comment 71. One comment stated that proposed §1.98(b) should not require the date (unless material) and place of publication of journal articles since such information is not given on search reports from foreign patent offices or on journals published by the American Chemical Society, which just give the year. Another comment indicated that sometimes it is not clear where the place of publication is.

Reply: The suggestions in the comments are not adopted. The date of publication is necessary for the Office to be able to determine if the information may be used in a rejection of the claims in an application. The place of publication refers to the name of the journal, magazine or other publication in which the article was published, which should be available in the vast majority of cases.

Comment 72. One comment suggested that §1.98(c) should not require a translation of a non-English language document to be filed if a translation is within the possession, custody or control of an individual designated in §1.56(c) because such person may not recall that there is a translation somewhere in the records of the individual, perhaps having been made for another application years earlier.

Reply: The requirement of the rule for a translation to be submitted under limited conditions is not a change in practice. See prior §§1.56(j) and 1.97(b). Since the requirement has caused little, if any, problem in the past, the suggestion of the comment is not adopted.

Comment 73. One comment suggested that §1.98(c) should be revised to make it clear that a reference that is essentially cumulative to another reference need not be listed in an information disclosure statement.

Reply: The concept that cumulative information is not material is set forth in §1.56(b). Section 1.98 does not deal with what information must be submitted, but provides an exception for cumulative information to the requirement for a copy to be submitted of each item of information listed in an information disclosure statement.

Comment 74. One comment stated that a sentence in the preamble discussion of proposed §1.98(c) was burdensome because it would require submission of incomplete or inexact translations which may have been made of an item of information. The sentence in question reads:

"But if the individual has the ability to translate the non-English language into English and has done so for the purposes of reviewing the information relative to the claimed invention, the translation would be considered 'readily available.'"

Another comment stated that proposed §1.98(c) should be modified to require a translation if the non-English language document is to be considered by the examiner since the attorney would want to prepare an accurate translation of particularly relevant references. One comment suggested that §1.98(c), or the preamble discussion, should make it clear that an English-language translation of a foreign language material reference need not be submitted where an individual merely reads in the reference in its original language and translates it mentally but does not prepare a written translation. Five other comments requested clarification on this point.

Reply: The Office does not intend to require translations unless they have been reduced to writing and are actually translations of what is contained in the non-English language information. Applicants should note, however, that most examiners do not have the ability to understand information which is not in English and that the Office will not routinely translate information submitted in a non-English language. The examiner will consider the information insofar as it is understood on its face, e.g., drawings, chemical formulas, English-language abstracts, but will not have the information translated unless it appears to be necessary to do so. Applicants are required to aid the examiner by complying with the requirements for a concise explanation in §1.98(a)(3) for information submitted in a non-English language.

Comment 75. One comment stated that §1.98(d) should be clarified to state that a copy of an item of information listed in an information disclosure statement need not be submitted if the reference was cited by the Office or previously submitted to the Office in connection with a prior application.

Reply: The suggestion in the comment is adopted. The language of §1.98(d) has been modified to state that a copy of an item of information is not required if it was previously cited by the Office or previously submitted to the Office in a prior application being relied on for an earlier filing date under 35 U.S.C. 120.

Comment 76. One comment suggested that proposed §1.98(d) should be revised to not require the submission of a copy of the information listed in an information disclosure statement if a copy of the information has previously been submitted to the Office in a prior application, whether or not the earlier application is being relied upon for an earlier filing date under 35 U.S.C. 120.

Reply: The suggestion in the comment is not adopted. The exception to the requirement for a copy of each item of information to be submitted has been made with regard to prior applications which will normally be available to, and considered by, the examiner. It would not be efficient for the examiner to be required to seek out unrelated application files to obtain a copy of an item of information when a copy could easily be submitted by applicant.

Comment 77. One comment questioned what would be considered "timely" under §1.291 so that information would be considered by the examiner without payment of a fee, in contrast to proposed §1.97 which may require a fee.

Reply: Section 1.291 has not been amended to redefine timeliness. The comment seems to imply that the fee requirements of §1.97 can be avoided through the use of a protest submitting information, but such a course of action might raise questions regarding compliance with the duty of candor and good faith required in dealings with the Office.

Comment 78. One comment stated that the Office should not drop the acknowledgment of a protest having been filed under §1.291 in a reissue application because the acknowledgment served as an indication that the protest had been received in the examining group from the mail room.

Reply: The suggestion in the comment is not adopted. Any perceived benefit from retaining the acknowledgment is outweighed by the administrative burden it causes. There is no good reason to treat the filing of protests in reissue applications

differently from the filing of protests in original applications or from the filing of other papers in the Office.

Comment 79. One comment questioned whether an application could be withdrawn from issue pursuant to proposed §1.313(b)(5) without admitting unpatentability.

Reply: There is no requirement that unpatentability must be admitted before an application can be withdrawn from issue pursuant to §1.313(b)(5). The rule provides for applications to be withdrawn from issue and abandoned for consideration of information in a continuing application. This differs from a petition under §1.313(b)(3) based on unpatentability of one or more claims.

Comment 80. One comment questioned whether, if an application is withdrawn from issue pursuant to proposed §1.313(b)(5), an information disclosure statement can be submitted in the continuing application under §1.97(b) without a certification.

Reply: A continuing application is treated like any other application with regard to the times set forth in §1.97(b). Thus, for example, an information disclosure statement could be filed without a fee or certification in a continuing application within three months of the filing date of the continuing application.

Comment 81. One comment questioned whether an application withdrawn from issue pursuant to §1.313(b)(5) could have new art and amendments considered in that application rather than in a continuing application. The comment also questioned the handling of applications withdrawn from issue pursuant to §1.313(b)(3).

Reply: The language of §1.313(b)(5) makes it clear that an application withdrawn from issue thereunder is to be abandoned without further prosecution. This differs from an application withdrawn from issue pursuant to §1.313(b)(3) because applicant had admitted the unpatentability of one or more claims.

Comment 82. One comment questioned whether the continuing application mentioned in proposed §1.313(b)(5) could be a file wrapper continuing application under §1.62 and how applicants can accomplish the withdrawal from issue under proposed §1.313(b) late in the prosecution of an application.

Reply: The continuing application mentioned in §1.313(b)(5) can be a file wrapper continuing application under §1.62. Even though §1.62 requires a file wrapper continuing application to be filed before the payment of the issue fee, the Office will consider the filing of a petition to withdraw from issue under §1.313(b)(5) as sufficient grounds to waive that requirement of §1.62. Late in the prosecution of an application, the Office has difficulty in matching papers with the application file. Papers requesting that an application be withdrawn from issue after the issue fee is paid should be directed, or preferably hand-carried, to the Office of Petitions in the Office of the Assistant Commissioner for Patents.

Comment 83. Seven comments suggested that §1.555(a) should not be amended to require the submission of "all information material to patentability" since a reexamination proceeding is limited to consideration of patents and printed publications.

Reply: The suggestion in the comments has been adopted. A paragraph (b), which defines what information is material to patentability in a reexamination proceeding, has been added to the rule.

Comment 84. One comment suggested that proposed §1.555(a) should be modified to make clear that there is no duty of disclosure on employees of a corporate patent owner if the employees are not substantively involved in the preparation of the reexamination request or the reexamination proceeding.

Reply: The suggestion in the comment to modify the language in §1.555(a) has not been adopted. The rule refers to individuals who are substantively involved on behalf of the patent owner in a reexamination proceeding.

Comment 85. Two comments stated that the Office should consider fraud or other inequitable conduct issues in interference proceedings.

Reply: The suggestion in the comments has been adopted. The Office will consider inequitable conduct issues in interference proceedings as announced on November 19, 1991, in the *Official Gazette* of the Patent and Trademark Office at 1132 Off. Gaz. Pat. Off. 33.

Comment 86. One comment requested more examples with regard to proposed §10.23(c)(10) of what alteration or combination of alterations in a declaration would be considered material.

Reply: It is not the function of the rules or the rulemaking process to provide a detailed listing of what alterations may be considered to be improper. This consideration will necessarily be made

in view of the totality of the circumstances involved. Practitioners would be well advised to avoid filing applications which contain alterations which have not been initialed and dated.

Comment 87. Two comments stated that §10.23(c)(10) should be amended to prohibit knowingly attempting to mislead the Office in the drafting or prosecution of a patent application. One comment stated that attempted fraud or inequitable conduct would not be prohibited by proposed §10.23(c)(10) because such conduct would not be a violation of proposed §§1.56 or 1.555.

Reply: No amendment is necessary to the language of §10.23(c)(10). It should be noted that the duty of candor and good faith in dealing with the Office is included in §§1.56 and 1.555. This duty includes a prohibition against knowingly attempting to mislead the Office.

Comment 88. Five comments stated that it would be unfair to impose the new disclosure requirements and fees on applications that are pending before the Office on the effective date of the new rule. Another comment stated that the rules should be immediately effective for all pending applications with some grace period for making the initial disclosure without penalty and without fee.

Reply: The Office will apply the new rules to all applications pending on, or filed on or after, the effective date of the rules. While this implementation may cause some burden on some applicants, other applicants will obtain benefits not otherwise available. This decision will also ease the administrative burden on the Office in implementing the new rules.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the rules as adopted do not require individuals to submit information that they are not already aware of and are not already under an obligation to provide to the Office. The rules further promote the efficiency of the examination process by encouraging a timely submission of an information disclosure statement and by substantially eliminating rejections based on inequitable conduct, thereby reducing the costs to all patent applicants.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity or innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This rule contains a collection of information requirement subject to the Paperwork Reduction Act, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Each information disclosure statement is estimated to take approximately 30 minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the collection of information. The time estimate has been reduced from that stated in the proposal since the requirement for a concise explanation of the relevance of each item of information cited in an information disclosure statement has been limited to information submitted in a language other than English. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (Attention Paper Reduction Project 0651-0011)

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended as follows:

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In §1.17, paragraph (i)(1) is revised and paragraph (p) is added to read as follows:

§1.17 Patent application processing fees.

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph \$130.00

§1.12—for access to an assignment record.

§1.14—for access to an application.

§1.53—to accord a filing date.

§1.55—for entry of late priority papers.

§1.60—to accord a filing date.

§1.62—to accord a filing date.

§1.97(d)—to consider an information disclosure statement.

§1.103—to suspend action in application.

§1.177—for divisional reissues to issue separately.

§1.312—for amendment after payment of issue fee.

§1.313—to withdraw an application from issue.

§1.314—to defer issuance of a patent.

§1.334—for patent to issue to assignee, assignment recorded late.

§1.666(b)—for access to interference settlement agreement.

(p) For submission of an information disclosure statement under §1.97(c) \$200.00

3. Section 1.28, paragraph (d)(2) is revised to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(d)(1) * * *

(2) Improperly and with intent to deceive

(i) establishing status as a small entity, or

(ii) paying fees as a small entity

shall be considered as a fraud practiced or attempted on the Office.

4. Section 1.51, paragraph (h) is revised to read as follows:

§1.51 General requisites of an application.

(b) Applicants are encouraged to file an information disclosure statement. See §§1.97 and 1.98.

5. Section 1.52, paragraph (c) is revised to read as follows:

§1.52 Language, paper, writing, margins.

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed should be made before the signing of any accompanying oath or declaration pursuant to §1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. Application papers containing alterations made after the signing of an oath or declaration referring to those application papers must be supported by a supplemental oath or declaration under §1.67(c). After the signing of the oath or declaration referring to the application papers, amendments may be made in the manner provided by §§1.121 and 1.123 through 1.125.

6. Section 1.56 is revised to read as follows:

§1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine: (1) prior art cited in search reports of a foreign patent office in a counterpart application, and (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) it refutes, or is inconsistent with, a position the applicant takes in:

(i) opposing an argument of unpatentability relied on by the Office, or

(ii) asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) each inventor named in the application;

(2) each attorney or agent who prepares or prosecutes the application; and

(3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

7. Section 1.63, paragraphs (b)(3) and (d) are revised to read as follows:

§1.63 Oath or declaration.

(b) * * *

(3) Acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in §1.56.

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in §1.56, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

8. Section 1.67 is amended by adding a new paragraph (c) to read as follows:

§1.67 Supplemental oath or declaration.

(c) A supplemental oath or declaration meeting the requirements of §1.63 must also be filed if the application was altered after the oath or declaration was signed or if the oath or declaration was signed:

(1) in blank;

(2) without review thereof by the person making the oath or declaration; or

(3) without review of the specification, including the claims, as required by §1.63(b)(1).

9. Section 1.97 is revised to read as follows:

§1.97 Filing of information disclosure statement.

(a) In order to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with §1.98 should be filed in accordance with this section.

(b) An information disclosure statement shall be considered by the Office if filed:

(1) within three months of the filing date of a national application;

(2) within three months of the date of entry of the national stage as set forth in §1.491 in an international application; or

(3) before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed after the period specified in paragraph (b) of this section, but before the mailing date of either

(1) a final action under §1.113 or

(2) a notice of allowance under §1.311,

whichever occurs first, provided the statement is accompanied by either a certification as specified in paragraph (e) of this section or the fee set forth in §1.17(p).

(d) An information disclosure statement shall be considered by the Office if filed after the mailing date of either

(1) a final action under §1.113 or

(2) a notice of allowance under §1.311,

whichever occurs first, but before payment of the issue fee, provided the statement is accompanied by:

(i) a certification as specified in paragraph (e) of this section,

(ii) a petition requesting consideration of the information disclosure statement, and

(iii) the petition fee set forth in §1.17(i)(1).

(e) A certification under this section must state either

(1) that each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement, or

(2) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart

foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in §1.56(c) more than three months prior to the filing of the statement.

(f) No extensions of time for filing an information disclosure statement are permitted under §1.136. If a bona fide attempt is made to comply with §1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

(g) An information disclosure statement filed in accordance with this section shall not be construed as a representation that a search has been made.

(h) The filing of an information disclosure statement shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in §1.56(b).

(i) Information disclosure statements, filed before the grant of a patent, which do not comply with this section and §1.98 will be placed in the file, but will not be considered by the Office.

10. Section 1.98 is revised to read as follows:
§1.98 Content of information disclosure statement.

(a) Any information disclosure statement filed under §1.97 shall include:

- (1) A list of all patents, publications, or other information submitted for consideration by the Office;
- (2) A legible copy of:
 - (i) Each U.S. and foreign patent;
 - (ii) Each publication or that portion which caused it to be listed; and
 - (iii) All other information or that portion which caused it to be listed, except that no copy of a U.S. patent application need be included; and
- (3) A concise explanation of the relevance, as it is presently understood by the individual designated in §1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from the specification or incorporated therein.

(b) Each U.S. patent listed in an information disclosure statement shall be identified by patentee, patent number and issue date. Each foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication shall be identified by author (if any), title, relevant pages of the publication, date and place of publication.

(c) When the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of one of the patents or publications may be submitted without copies of the other patents or publications provided that a statement is made that these other patents or publications are cumulative. If a written English-language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in §1.56(c), a copy of the translation shall accompany the statement.

(d) A copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120.

11. Section 1.99 is removed and reserved.

12. Section 1.175, paragraph (a)(7), is revised to read as follows:
§1.175 Reissue oath or declaration.

(a) * * *

(7) Acknowledging the duty to disclose to the Office all information known to applicants to be material to patentability as defined in §1.56.

* * * * *

13. Section 1.193(c) is removed and reserved.
§1.193 Examiner's Answer.

14. Section 1.291, paragraphs (a) and (c), are revised to read as follows:
§1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if:

- (1) the protest is timely submitted; and
- (2) the protest is either served upon the applicant in accordance with §1.248, or filed with the Office in duplicate in the event service is not possible.

Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office.

* * * * *

(c) A member of the public filing a protest in an application under paragraph (a) of this section will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard which the member of the public may include with the protest in order to receive an acknowledgment by the Office that the protest has been received. The Office may communicate with the applicant regarding any protest and may require the applicant to respond to specific questions raised by the protest. In the absence of a request by the Office, an applicant has no duty to, and need not, respond to a protest. The limited involvement of the member of the public filing a protest pursuant to paragraph (a) of this section ends with the filing of the protest, and no further submission on behalf of the protestor will be considered unless such submission raises new issues which could not have been earlier presented.

15. Section 1.313, paragraph (b), is revised to read as follows:
§1.313 Withdrawal from issue.

* * * * *

(b) When the issue fee has been paid, the application will not be withdrawn from issue for any reason except:

- (1) a mistake on the part of the Office;
- (2) a violation of §1.56 or illegality in the application;
- (3) unpatentability of one or more claims;
- (4) for interference; or
- (5) for abandonment to permit consideration of an information disclosure statement under §1.97 in a continuing application.

16. Section 1.555 is revised to read as follows:
§1.555 Information material to patentability in reexamination proceedings.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective reexamination occurs when, at the time a reexamination proceeding is being conducted, the Office is aware of and evaluates the teachings of all information material to patentability in a reexamination proceeding. Each individual associated with the patent owner in a reexamination proceeding has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability in a reexamination proceeding. The individuals who have a duty to disclose to the Office all information known to them to be material to patentability in a reexamination proceeding are the patent owner, each attorney or agent who represents the patent owner, and every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. The duty to disclose the information exists with respect to each claim pending in the reexamination proceeding until the claim is cancelled. Information material to the patentability of a cancelled claim need no be

submitted if the information is not material to patentability of any claim remaining under consideration in the reexamination proceeding. The duty to disclose all information known to be material to patentability in a reexamination proceeding is deemed to be satisfied if all information known to be material to patentability of any claim in the patent after issuance of the reexamination certificate was cited by the Office or submitted to the Office in an information disclosure statement. However, the duties of candor, good faith, and disclosure have not been complied with if any fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct by, or on behalf of, the patent owner in the reexamination proceeding. Any information disclosure statement must be filed with the items listed in §1.98(a) as applied to individuals associated with the patent owner in a reexamination proceeding, and should be filed within two months of the date of the order for reexamination, or as soon thereafter as possible.

(b) Under this section, information is material to patentability in a reexamination proceeding when it is not cumulative to information of record or being made of record in the reexamination proceeding, and

- (1) it is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a prima facie case of unpatentability of a claim; or
- (2) it refutes, or is inconsistent with, a position the patent owner takes in:
 - (i) opposing an argument of unpatentability relied on by the Office, or
 - (ii) asserting an argument of patentability.

A prima facie case of unpatentability of a claim pending in a reexamination proceeding is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is

given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) The responsibility for compliance with this section rests upon the individuals designated in paragraph (a) of this section and no evaluation will be made by the Office in the reexamination proceeding as to compliance with this section. If questions of compliance with this section are discovered during a reexamination proceeding, they will be noted as unresolved questions in accordance with §1.552(c).

Part 10 - Representation of Others Before the Patent and Trademark Office

17. The authority citation for Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

18. Section 10.23, paragraphs (c)(10) and (c)(11), are revised to read as follows:
§10.23 Misconduct.

* * * * *

(c) * * *

(10) Knowingly violating or causing to be violated the requirements of §1.56 or §1.555 of this subchapter.

(11) Knowingly filing or causing to be filed an application containing any material alteration made in the application papers after the signing of the accompanying oath or declaration without identifying the alteration at the time of filing the application papers.

Jan 9, 1992

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks

PATENT NOTICES

Certificates of Correction For Week of February 4, 1992

B1. 4,398,029	4,892,966	4,929,348	4,952,551
D. 276,725	4,894,182	4,929,784	4,952,663
D. 306,149	4,897,198	4,930,154	4,953,142
D. 308,919	4,897,223	4,930,581	4,953,150
4,648,807	4,898,005	4,931,221	4,953,234
4,714,918	4,902,142	4,931,474	4,953,429
4,741,401	4,903,403	4,932,012	4,953,718
4,742,347	4,903,594	4,933,044	4,953,781
4,745,057	4,906,441	4,935,081	4,954,782
4,764,966	4,909,914	4,935,966	4,954,875
4,787,162	4,912,064	4,936,000	4,954,881
4,790,917	4,912,805	4,937,189	4,955,588
4,795,677	4,913,192	4,939,726	4,955,603
4,803,075	4,913,919	4,939,816	4,955,891
4,807,640	4,914,030	4,940,133	4,956,100
4,822,035	4,914,233	4,940,220	4,956,390
4,822,384	4,914,811	4,940,432	4,956,455
4,822,404	4,915,078	4,941,554	4,957,479
4,835,627	4,915,129	4,942,732	4,957,795
4,847,025	4,915,624	4,943,459	4,957,826
4,852,273	4,915,827	4,944,025	4,957,837
4,859,627	4,916,810	4,944,818	4,959,403
4,864,165	4,917,280	4,945,173	4,959,855
4,864,630	4,917,482	4,945,466	4,960,132
4,868,910	4,918,225	4,946,314	4,960,334
4,870,030	4,919,085	4,946,658	4,960,777
4,871,844	4,919,337	4,946,686	4,960,863
4,875,112	4,919,403	4,946,715	4,962,071
4,875,710	4,920,236	4,947,184	4,962,239
4,876,213	4,920,519	4,947,346	4,962,870
4,876,228	4,921,509	4,947,808	4,963,603
4,876,612	4,921,936	4,948,119	4,964,085
4,878,125	4,922,093	4,948,248	4,964,107
4,879,295	4,922,283	4,948,442	4,964,651
4,882,318	4,922,847	4,948,735	4,964,690
4,882,761	4,923,244	4,949,298	4,965,575
4,883,779	4,923,720	4,949,912	4,982,845
4,884,264	4,924,401	4,949,984	5,008,809
4,886,723	4,927,805	4,950,853	5,054,797
4,890,116	4,928,164	4,951,587	
4,891,364	4,928,674	4,952,272	

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U. S. PATENT AND TRADEMARK OFFICE

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SPECIAL BOXES FOR MAIL

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Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
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Box M. Fee	
Box Non-Fee-Amendment	
Box OED	Mail for the Office of Enrollment and Discipline
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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for <i>original</i> request papers <i>only</i> .
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications <i>prior</i> to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
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Delaware	Newark: University of Delaware Library	(302) 451-2965
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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	Detroit Public Library	(313) 833-1450
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Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
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New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
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	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845

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PATENT EXAMINING CORPS

JAMES E. DENNY, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	10/27/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	4/26/90
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — BARRY S. RICHMAN, Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/6/90
BIOTECHNOLOGY, GROUP 180 — EDWARD E. KUBASIEWICZ, Director	308-0196	6/30/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	6/12/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	6/12/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	10/12/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS, GROUP 240 — CARLTON CROYLE, Director	308-0771	12/24/90
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	12/15/90
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	7/07/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	4/18/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	3/04/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	2/12/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	11/26/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	2/05/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	11/28/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during January 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.
Patents Numbers 3,858,241 to 3,863,270 inclusive
Plant Patents 3,674 to 3,677

1135 OG 30

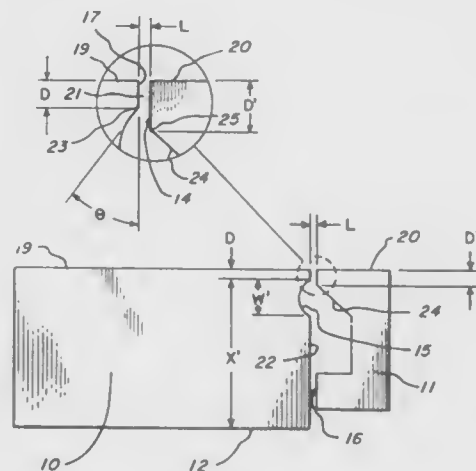
REEXAMINATIONS

FEBRUARY 4, 1992

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,982,318 (1636th)
MAGNETIC TRANSDUCER HEAD CORE MANUFACTURING METHOD
Douglas J. Hennenfent, Minneapolis, and Allan L. Holmstrand, Bloomington, both of Minn.
Reexamination Request No. 90/002,368, Jun. 17, 1991.
Reexamination Certificate for Patent No. 3,982,318, issued Sep. 28, 1976, Ser. No. 653,578, Jan. 29, 1976.
Int. Cl.³ G11B 5/42

U.S. Cl. 29—603



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

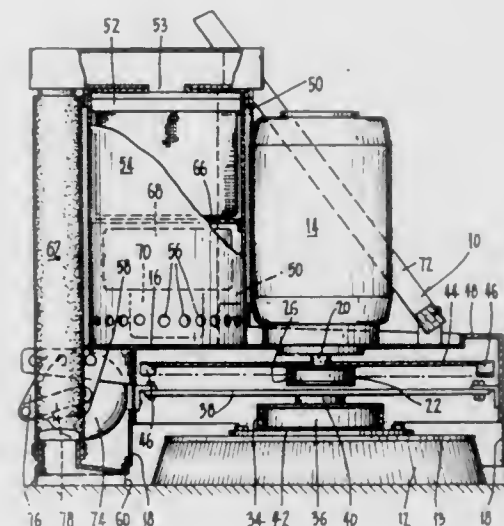
The patentability of claims 1-8 is confirmed.

1. In a method for manufacturing a magnetic transducing core comprising C and I elements bonded together and forming a common surface for transducing, and between facing C and I element surfaces intersecting the transducing surface, forming a flux gap in the flux path formed by the elements, an improvement for forming the shallower of the two faces forming the flux gap with a depth equal to a first precisely predetermined distance, and comprising the steps of:

- before bonding the elements together,
 - machining on the I element a reference surface spaced apart from the transducing surface portion thereof, and
 - machining along the width dimension of the I element flux gap face a notch whose length is at least the width of the C element's flux gap face and whose line of intersection with the I element flux gap face nearer the I element transducing surface portion is spaced therefrom at least the first predetermined distance and is a second precise predetermined distance from the reference surface;
- forming the C element with the depth of the flux gap face thereon greater than the first predetermined distance;
- bonding the C element to the I element to form the flux gap, with one edge of the C element flux gap face opposing and within the notch; and
- machining the transducing surface until the distance between the transducing surface and the reference surface equals the sum of the first and second predetermined distances.

B1 4,178,654 (1637th)
FLOOR POLISHING MACHINES
Alfred Mitchell, Montrose, Australia
Reexamination Request No. 90/002,155, Oct. 4, 1990.
Reexamination Certificate for Patent No. 4,178,654, issued Dec. 18, 1979, Ser. No. 845,677, Oct. 26, 1977.
Claims priority, application Australia, Nov. 29, 1976, PC8282
Int. Cl.³ A47L 11/202

U.S. Cl. 15—385



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-5 is confirmed.

1. A floor polishing machine comprising a housing having an upper substantially horizontal surface and a substantially vertical wall extending around the periphery of the upper surface, a ground engaging skirt depending from the vertical wall and being provided with air inlet means for admitting air to the interior of the housing, a rotary polishing means located within the housing, drive means arranged to rotate the polishing means in a horizontal plane, a fan located within the housing and arranged to be rotated in a horizontal plane when the polishing means is rotated, means forming a channel in a major portion of the periphery of the housing and open to the upper interior of the housing, the formed channel being of gradually increasing thickness to provide a gradually larger zone in cross-sectional area, and a particulate matter collection means in communication with the channel at its point of greatest cross-sectional area, whereby, when the polishing means is rotated the simultaneous rotation of the fan produces an up-draught around the entire periphery of the polishing means so as to direct particulate matter into the channel in the periphery of the housing for removal through the particulate matter collection means.

**B1 4,927,866 (1639th)
SHAPABLE MATERIAL AND SHAPED ARTICLES
OBTAINABLE THEREFROM**

Robert Purrmann, Starnberg; Rainer Guggenberger, Hechen-
dorf, and Gunter Pieper, Seefeld, all of Fed. Rep. of Germany,
assignors to ESPE Stiftung & Co. Produktions- und Vertriebs
KG

Reexamination Request No. 90/002,192, Oct. 31, 1990.
Reexamination Certificate for Patent No. 4,927,866, issued May
22, 1990, Ser. No. 316,946, Feb. 28, 1989.

Claims priority, application Fed. Rep. of Germany, Feb. 29,
1988, 3806448

Int. Cl.⁵ A61K 6/08

U.S. Cl. 523—115

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

The patentability of claims 21 and 22 is confirmed.

Claims 1-13, 15, 17 and 19 are cancelled.

Claim 14 is determined to be patentable as amended.

Claims 16, 18 and 20, dependent on an amended claim, are
determined to be patentable.

New claims 23 and 24 are added and determined to be pat-
entable.

14. [The] A method of [claim 13 wherein prior to step (II),
said composition is applied to the site of a bone defect] prepar-
ing a bone replacement part, which method comprises the steps of:
(I) mixing ingredients to form a pasty composition comprising:
(a) an aluminum fluorosilicate glass,
(b) at least one polycarboxylic acid having an average molec-
ular weight of greater than 500,
(c) a carbonate and/or hydrogen carbonate in an amount of
at least 0.1% by weight, based on (a),
(d) optionally a chelating agent, and
(e) optionally water;
(II) applying the composition to the site of a bone defect;
(III) shaping the composition as desired; and
(IV) allowing the composition to cure.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED FEBRUARY 4, 1992

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1019

METHOD FOR FORMING IMAGES ON PLAIN PAPER
Lyudmila Feldman, Centerville, and T. Kay Kiser, Kettering,
both of Ohio, assignors to The Mead Corporation, Dayton,
Ohio

Filed Jan. 10, 1990, Ser. No. 463,182

Int. Cl.⁵ G03C 1/72

U.S. Cl. 430—138

14 Claims



1. A process for forming images on a non-reactive substrate
comprising the steps of:

image-wise exposing an imaging sheet, said imaging sheet
comprising a support having a layer of photosensitive
microcapsules on the surface thereof, said microcapsules
containing a photohardenable or photosensitizable compo-
sition and a color precursor;

assembling said image-wise exposed imaging sheet with a
developer-donor sheet, said developer-donor sheet includ-
ing a web having a layer of a thermoplastic developer
resin on the surface thereof, said resin being capable of
reacting with a color precursor to form an image;

subjecting said assembly to said imaging sheet and said de-
veloper-donor sheet to a uniform rupturing force to cause
said photosensitive microcapsules to rupture and transfer
an image-wise pattern to said color precursor to said
developer layer thereby forming an image thereon;

Separating said imaging sheet from said developer-donor
sheet;

assembling said developer-donor sheet bearing said image
with a non-reactive substrate to form a second assembly;
and

subjecting said second assembly to heat and a uniform force
to transfer said developer to said non-reactive substrate.

H1020

**DEVELOPING SOLUTION FOR LIGHT-SENSITIVE
SILVER HALIDE PHOTOGRAPHIC MATERIAL AND
METHOD OF FORMING PHOTOGRAPHIC IMAGE
MAKING USE OF IT**

Syoji Nishio, Hino, and Kazuhiro Yoshida, Hachioji, both of
Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 586,284

Claims priority, application Japan, Sep. 25, 1989, 1-249577;
Sep. 25, 1989, 1-249578; Oct. 30, 1989, 1-282469; Nov. 1, 1989,
1-283095

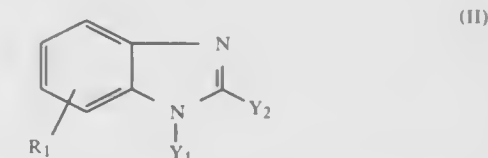
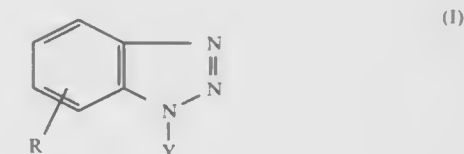
Int. Cl.⁵ G03C 5/24

U.S. Cl. 430—440

12 Claims

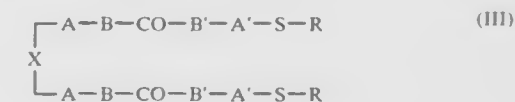
1. An image forming method comprising steps of
imagewise exposing a silver halide photographic light-sensi-
tive material comprising silver halide grains having a ratio
of (100) surface to (111) surface of not less than 5 to light,
and

developing said silver halide photographic light-sensitive
material with a developer comprising a compound repre-
sented by the following formula I or II:

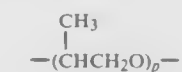


wherein Y, Y₁ and Y₂ are each a hydrogen atom or a
mercapto group, R and R₁ are each a hydrogen atom, a
halogen atom, a nitro group, an amino group, a cyano
group, a hydroxyl group, a mercapto group, a sulfo group,
a substituted or unsubstituted alkyl group, a substituted or
unsubstituted alkenyl group, a substituted or unsubstituted
alkinyl group, a substituted or unsubstituted aryl group, a
substituted or unsubstituted alkoxy group, a hydroxycar-
bonyl group, an alkylcarbonyl group or an alkoxy-car-
bonyl group, and

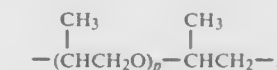
a compound represented by the following formula III:



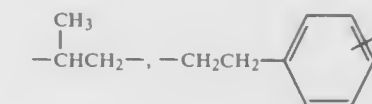
wherein A is an alkylene group having 1 to 3 carbon
atoms, or a polyalkylene ether group represented by
—(CH₂CH₂O)_p—, —(CH₂CH₂O)_p—CH₂—CH₂— or

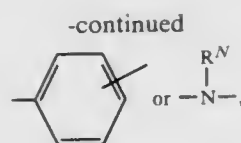


which is linked through the carbon atom thereof with B;
A' is an alkylene group having 1 to 3 carbon atoms, or a
polyalkylene ether group represented by —(CH₂CH₂O)-
p—CH₂—CH₂— or



provided that both of A and A' are not a polyalkylene
ether group at the same time and p is an integer of 2 to 30;
B and B' are independently —NH— or —O—, provided
that both of B and B' are not —O— at the same time; R is
an alkyl group having 1 to 3 carbon atoms, a phenyl
group, an aralkyl group or a —(CH₂)_q-COOR' group, in
which q is an integer of 1 to 3 and R' is an alkyl group
having 1 to 3 carbon atoms; X is —S—, —O—, —CH₂—,





in which ---R^{N} is an alkyl group having 1 to 3 carbon atoms.

H1021 REINFORCED POLYMER BLENDS

Joseph M. Machado, Richmond, and William P. Gergen, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1989, Ser. No. 429,447
Int. Cl.⁵ C08K 3/40

U.S. Cl. 524—494

23 Claims

1. A fiberglass-reinforced polymer blend comprising a major proportion of a polyamide polymer containing recurring amide linkages as integral parts of the polymer chain and a molecular weight of at least 5000, and a minor proportion of linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, optionally, an acidic polymer containing moieties of α -olefin, α,β -ethylenically unsaturated carboxylic acid and optionally a non-acidic, low molecular weight polymerizable third monomer of up to 8 carbon

atoms, which acidic polymer optionally has a portion of the carboxylic acid groups neutralized with non-alkali metal.

H1022 SOFT PAINTABLE POLYMER COMPOSITION

Geoffrey Holden, Houston; Donald D. Briggs, Katy, and Charles R. Donaho, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 9, 1991, Ser. No. 638,953
Int. Cl.⁵ C08K 5/01

U.S. Cl. 524—474

16 Claims

1. A soft paintable polymer composition consisting essentially of:

- from about 50 to about 90 parts by weight (pbw) of a hydrogenated block copolymer comprised of at least one vinyl aromatic hydrocarbon and at least one conjugated diene,
- from about 10 to about 50 pbw of a functionalized hydrogenated block copolymer comprised of at least one vinyl aromatic hydrocarbon and at least one conjugated diene, wherein (a) and (b) must add up to 100 pbw,
- from about 50 to about 300 pbw of a predominantly aliphatic hydrocarbon processing oil, and
- from about 5 to about 150 pbw of polypropylene.

REISSUES

FEBRUARY 4, 1992

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

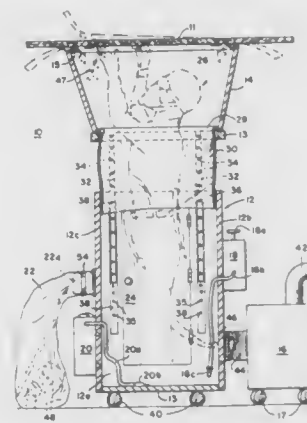
Re. 33,810 PORTABLE ISOLATION ENCLOSURE FOR USE IN CLEANING CONTAMINATED ENVIRONMENTS

Jerome F. Strieter, 12500 Peachstone Dr., Silver Spring, Md. 20904
Original No. 4,765,352, dated Aug. 23, 1988, Ser. No. 75,827, Jul. 17, 1987. Application for reissue Aug. 23, 1990, Ser. No. 571,141

U.S. Cl. 134—99

Int. Cl.⁵ B08B 7/04

34 Claims



21. A portable isolation enclosure, useful for cleaning contaminated environments, comprising:

- an open booth having a bottom wall and at least one vertically extending side wall to form a closed walled structure sufficiently large to comfortably enclose a worker;
- a height adjustable and open top ceiling-contacting plenum above and in open communication with said open top booth, said plenum being connected to said top booth for vertical movement with respect thereto;
- plenum position locking means, integral with said booth, for locking said plenum at various predetermined elevations relative to said booth;
- telescoping means for enclosing and sealing a space formed between said plenum and said booth regardless of the elevation of said plenum relative to said booth;
- a waste disposal means for discharging waste from said booth, said waste disposal means being in communication with said side wall; and
- a vacuum and filtering means for continuously evacuating the interior of said booth, for filtering waste particles from the atmosphere within said booth, and for discharging clean air to the exterior of said booth.

Re. 33,811 ACCUMULATING CONVEYOR

Jack E. Miller, St. Clair Shores, Mich., assignor to Harry Major Machine & Tool Co., Fraser, Mich.
Original No. 4,776,453, dated Oct. 11, 1988, Ser. No. 72,854, Jul. 14, 1987. Continuation-in-part of Ser. No. 850,260, Apr. 11, 1986, Pat. No. 4,681,212, which is a continuation-in-part of Ser. No. 761,584, Aug. 1, 1985, Pat. No. 4,598,818. Application for reissue Oct. 10, 1989, Ser. No. 419,520
Int. Cl.⁵ B65G 25/00

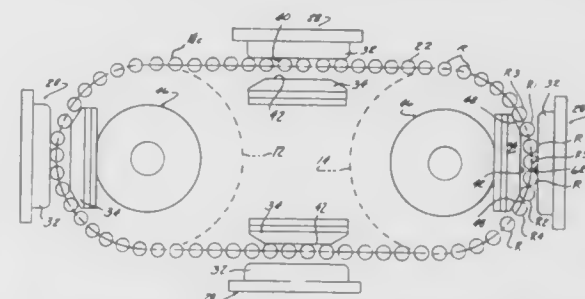
U.S. Cl. 198—803.2

13 Claims

1. For use in combination with an accumulating conveyor comprising a pair of like end sprocket means of like radius mounted for rotation about spaced, parallel, horizontal axes, an endless multiple-strand roller chain, at least one strand of said chain being operatively trained in tension about said end

sprocket means, means for supporting and guiding said one strand of said chain along horizontal upper and lower runs extending between said sprocket means, a second strand of said chain being supported by said one strand laterally clear of said sprocket means and said means for supporting and guiding, and drive means for driving said chain in continuous movement along an endless path;

an article carrier adapted to be mounted on said second strand of said chain, said carrier including mounting means mounted on the carrier and engaged with said second strand to support the carrier upon said second strand and operable to frictionally couple the carrier to said chain when the carrier is on the upper or lower run of the chain, said carrier having a frame and said mounting means comprising a rigid outer support plate and a rigid inner support plate fixedly mounted on said frame to be respectively located at the outer and inner side of the endless path of movement of said second strand, said support plates having opposed chain engaging edges; and



said [inner support plate] carrier having a wheel engaging surface in parallel and spaced apart relation to the chain engaging edge [thereof] of said inner support plate; a wheel means mounted for rotation about each of said axes; [a resilient] means [disposed] engaged between said [each of said axes] said wheel means and said wheel engaging surface [of] for urging said inner support plate against said chain;

said wheel means positioned for engagement with the wheel engaging surface of the [inner support plate] carrier during transit [thereof, the radius of said wheel and said resilient means exceeding the distance between the respective axis and the wheel engaging edge at its closest approach to said axis during travel of the carrier] of the carrier about the axis of the wheel means so as to [bias] hold the chain engaging edge of said inner support plate against the chain and prevent slippage therebetween during travel of the carrier from the upper to the lower run and from the lower to the upper run.

Re. 33,812 DIFFUSER FOR AERATION BASIN

Norbert Schneider, Holbeinstrasse 13, D-5657 Haan, Fed. Rep. of Germany
Original No. 4,764,314, dated Aug. 16, 1988, Ser. No. 13,158, Feb. 10, 1987. Continuation of Ser. No. 714,658, Mar. 21, 1985, abandoned. Application for reissue Aug. 7, 1990, Ser. No. 564,316
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410267

U.S. Cl. 261—62

Int. Cl.⁵ B01F 3/04

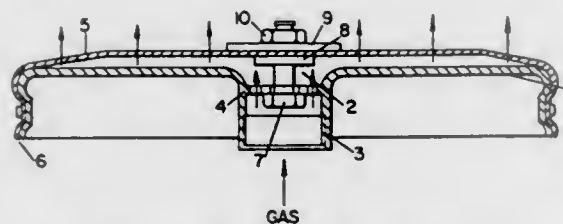
16 Claims

7. Diffuser means for use in an aeration basin for introducing

gas in the form of bubbles into liquid held in the basin, said diffuser means comprising:

a body member having a backing surface and passing in the body member extending from a gas inlet positioned to receive gas under pressure from a source thereof to an outlet at the backing surface for delivery of the gas under pressure thereto; a flexible, gas-permeable membrane covering the backing surface and secured generally along the periphery of the membrane to the body member in sealing relation, the membrane being positioned to distend and move away from the backing surface upon the delivery of gas under pressure to the diffuser, with the gas flowing through the distended portion of the membrane and into the liquid in the form of relatively small gas bubbles, and being positioned to collapse into engagement with the backing member when gas under pressure is not delivered to the diffuser;

and check valve means comprising movable valve member means movable with the membrane and a valve seat on the



body member at said outlet, the movable valve member means being moved away from the valve seat along with the membrane when gas under pressure is delivered to the diffuser to open the check valve for allowing the gas to enter the space between the member and the backing surface, and the movable valve member means being moved into sealing relationship with the valve seat to close the check valve when gas under pressure is no longer delivered, for blocking flow of liquid into the passaging in the diffuser means; and stop means comprising interengageable means on the body member and the member generally at central portions thereof for holding the central portion of the member generally adjacent to the central portion of the backing surface, whereby when gas under pressure is delivered to the diffuser means, the membrane distends, with portions of the membrane spaced outwardly of said central portion moving away from the backing surface but with the central portion of the membrane remaining held closely adjacent to the central portion of the backing surface by said stop means.

Re. 33,813

ELECTRIC MOTOR, PARTICULARLY A BRUSHLESS DIRECT CURRENT MOTOR

Johann von der Heide, Schramberg; Rolf Muller, Munich, and Ernst-Moritz Korner, St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Original No. 4,647,803, dated Mar. 3, 1987, Ser. No. 753,801, Jul. 8, 1985. Continuation of Ser. No. 570,187, Jan. 12, 1984, abandoned. Application for reissue Mar. 3, 1989, Ser. No. 319,276

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347360

Int. Cl.⁵ H02K 5/24

U.S. Cl. 310—51

33 Claims

1. An electric motor, particularly a brushless direct current motor, comprising:

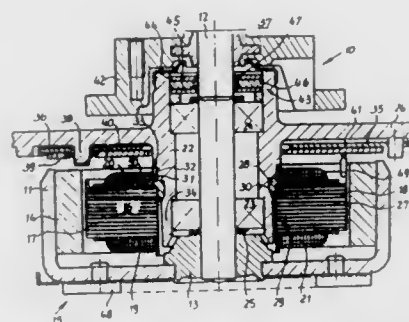
a stator and a rotor which define a substantially cylindrical air gap therebetween, said stator including stator iron means;

a rotor shaft supporting said rotor and mounted for common rotation therewith;

bearing means rotatably mounting said rotor shaft;

stationary, substantially tubular bearing support means dis-

posed in coaxial relationship to said rotor shaft and having an outer facing peripheral wall, said bearing means being mounted inside of said bearing support means and being supported thereby, said stator having an inner facing wall and being mounted on the outside of said bearing support means and being supported thereby, the inner facing wall of the stator facing the outer facing wall of the bearing support means;



said stator wall and said bearing support means wall being separated from one another over at least a substantial portion of their facing faces by a second air gap defined therebetween which extends also over a substantial portion of the axial length of said stator iron means; and elastic damping means connecting said stator to said bearing support means.

Re. 33,814

MANIFOLD INPUTS AND OUTPUTS FOR FURNACE REGENERATORS

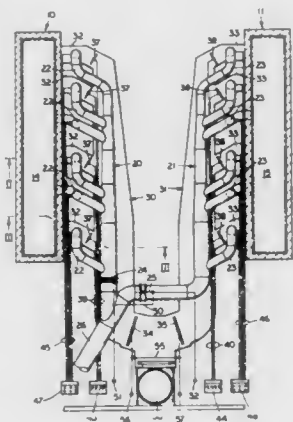
Robert O. Bradley, Toledo, Ohio; Heywood J. Knighton, deceased, late of Grosse Pointe Park, Mich. by William R. Steitz, legal representative, and Robert J. Naveaux, Perrysburg, Ohio, assignors to Toledo Engineering Co., Inc., Toledo, Ohio

Original No. 4,174,948, dated Nov. 20, 1979, Ser. No. 883,696, Mar. 6, 1978. Application for reissue Oct. 5, 1981, Ser. No. 309,196

Int. Cl.⁵ F27D 17/00; F28D 17/04

U.S. Cl. 432—181

17 Claims



1. A regenerator system for [a] an open hearth type furnace (F) having a pair of elongated unpartitioned regenerators (10, 11) through which intake air and exhaust gases alternately pass, and each said [generator] regenerator having in order from the bottom to the top, a tunnel (14, 15), brickwork (12, 13) and a longitudinal open duct (16, 17) along its top connected to a plurality of side ports (18, 19), said system further comprising:

(A) an input manifold (20, 21) for [said] each regenerator for feeding intake air [to each regenerator,] thereto, each said input manifold having branch ducts (22, 23) spaced along

and connected to its said [regenerators] regenerator tunnel (14, 15).

(B) an output manifold (30, 31) for each regenerator, separate from said input manifold, for removing exhaust gases [from each regenerator,] therefrom, each said output manifold having branch ducts (32, 33) spaced along and connected to its said regenerator tunnel (14, 15).

(C) a separately operative [gates] gate (27, 28, 37, 38) in each of said branch ducts, and

(D) separate reversing valve means (24, 25, 34, 35) between said input manifolds and between said output manifolds, whereby, said gates in said input and output manifold branch ducts may be separately adjusted and maintained without change when said reversing valve means are operated to effect different flows of air and exhaust gases in opposite directions through said regenerators to insure even distribution of heat and cooling of said brickwork throughout the unpartitioned regenerators and to compensate for asymmetry between said regenerators while insuring that the whole of their available regenerator brickwork is used, irrespective of whether one or

more of the ports from the regenerator into the furnace is blocked, thus avoiding dead spaces in the regenerator.

Re. 33,815

HEAT SENSITIVE RECORD SHEET

Masahiko Yamaguchi; Michihiro Gonda; Yutaka Satoh, and Mikiko Kanasugi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Original No. 4,510,513, dated Apr. 9, 1985, Ser. No. 513,344, Jul. 13, 1983. Application for reissue Jun. 27, 1988, Ser. No. 212,327

Claims priority, application Japan, Apr. 14, 1983, 58-64569

Int. Cl.⁵ B41M 5/30

U.S. Cl. 503—214

7 Claims

1. A heat sensitive record sheet which comprises a substrate having a coated layer comprising 2-anilino-3-methyl-6-dibutylamino-fluoran having v_{max} at about 450 nm and about 595 nm as measured in 95% acetic acid.

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PLANT PATENTS

GRANTED FEBRUARY 4, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,779
DAHLIA PLANT NAMED LINDA
His J. Wilms, Wognum, Netherlands, assignor to Royal Sluis, Enkhuizen, Netherlands
Filed Aug. 21, 1990, Ser. No. 570,318
Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68
1. A new and distinct cultivar of dahlia plant named Linda, as illustrated and described.

7,780
AFRICAN VIOLET PLANT NAMED EMILIE
Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany
Filed Aug. 10, 1990, Ser. No. 565,322
Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—69
1. A new and distinct cultivar of African violet named Emilie, as described and illustrated, and particularly characterized by its blue, star-shaped flowers; strong, upright flower stems that curve slightly toward the center to form a bouquet above the leaves; dark green, spear-shaped leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,781
CARNATION NAMED STACORPI
Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staav-eren B.V., Netherlands
Filed Sep. 7, 1990, Ser. No. 578,471
Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—71
1. The new and distinctive carnation cultivar, substantially as herein shown and described, particularly characterized by the dawn pink coloration of its continuously blooming flowers, which are borne singly on strong, upright stems of medium length.

7,782
PHILODENDRON PLANT NAMED SPLENDOR
Paul DeCoster, Brusselsesteenweg 94, 9230 Melle, Belgium
Filed Jul. 23, 1990, Ser. No. 556,538
Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—88
1. A new and distinct philodendron plant named Splendor, as described and illustrated.

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PATENTS

GRANTED FEB. 4, 1992

ERRATA

For CLASS	See PATENT NO.
4-237	5,084,917
7-132	5,084,935
14-071	5,084,936
60-039	5,085,037
60-039	5,085,038
60-039	5,085,040
60-244	5,085,041
454-158	5,085,132
454-063	5,085,133
454-067	5,085,134
600-008	5,085,209
602-026	5,085,210
600-008	5,085,211
244-007	5,085,315
229-207	5,085,323
296-141	5,085,473
385-060	5,085,492
385-096	5,085,493
385-098	5,085,494
359-455	5,085,495
359-569	5,085,496
359-070	5,085,497
359-246	5,085,503
359-843	5,085,504
353-098	5,085,505
353-122	5,085,506
366-219	5,085,512
366-155	5,085,513
359-002	5,085,514
356-398	5,085,515
356-394	5,085,516
356-394	5,085,517
374-124	5,085,525
374-101	5,085,526
374-014	5,085,527
439-479	5,085,583
296-222	5,085,622
148-319	5,085,733
205-188	5,085,742
205-105	5,085,743
205-148	5,085,744
523-414	5,086,094

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ERRATA—Continued

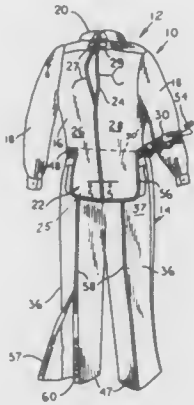
359-328	5,086,239
200-005	5,086,313
395-600	5,086,386
395-550	5,086,387
395-425	5,086,388
395-095	5,086,400
395-094	5,086,401
395-800	5,086,407
395-600	5,086,408

PATENTS
GRANTED FEBRUARY 4, 1992
GENERAL AND MECHANICAL

5,084,914
INVALID GARMENT
Mary Hesch, 137 E. 29th St., Erie, Pa. 16504
Filed Oct. 19, 1990, Ser. No. 604,132
Int. Cl.⁵ A41D 1/06, 13/12

U.S. Cl. 2—79

7 Claims



1. In combination, an invalid shirt and trousers, said trousers being adapted to extend around a person, said trousers having a waistband, and an open seat extending downward from said waistband, said invalid shirt having a front, a back, sleeves, a collar, a shirt tail, and a waistband region, said shirt tail extending from said waistband region to a bottom of said shirt, a slit in said back of said invalid shirt extending through said collar, through said shirt back and through said shirt tail thereby dividing said shirt back into a first panel and a second panel, first attaching means on said first panel adapted to be connected to second attaching means on said second panel for removably connecting said first panel to said second panel, a second slit in said invalid shirt extending from said waistband region through said shirt tail at a first side of said invalid shirt and a third slit in said invalid shirt extending from said waistband region through said shirt tail at a second side of said invalid shirt thereby dividing said shirt tail into a front shirt tail part adapted to be worn inside said waistband of said trousers and a rear shirt tail part adapted to overlie said open seat of said trousers, said trousers have a leg slit extending along the rear of each leg thereof from said open seat to a lower end of each said leg, first closing means and second closing means extending along edges of said slit adapted to close each said leg slit.

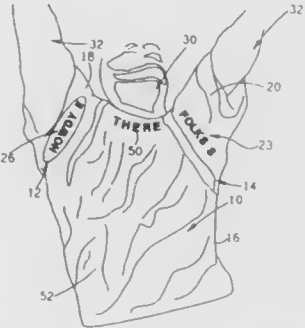
5,084,915
METHOD OF DISPLAYING INFORMATION
James M. Shotwell, 420 Porter St., and Fred W. Stellabotte, 3548 Rosa Way, both of, Fallbrook, Calif. 92028
Filed Jul. 19, 1990, Ser. No. 554,677
Int. Cl.⁵ A41B 1/00

U.S. Cl. 2—115

8 Claims

1. A item of clothing for displaying information, comprising: a body portion for covering the upper torso of a wearer, the body portion having an upper, neck opening and armhole openings at opposite, right and left sides; a pair of sleeves secured along seamlines to the respective right and left armhole openings of the body portion; regions of the sleeves and body portion adjacent the seamlines at the lower part of each armhole defining respective

right and left armpit regions corresponding to the position of an armpit of a wearer wearing the item of clothing and the item of clothing informational indicia applied to at least part of at least one armpit region of the item so as to

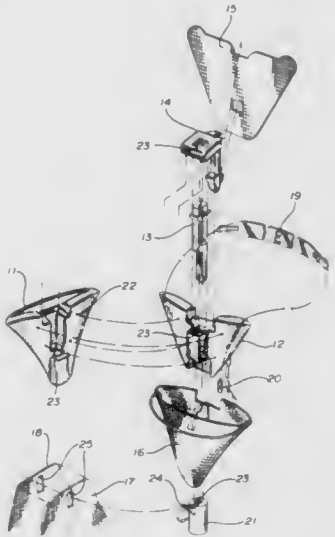


be substantially concealed when a wearer has their arms lowered, the indicia comprising means for conveying a message to an observer when the wearer raises at least one arm to reveal said one armpit region.

5,084,916
NECKTIE ASSEMBLY
Joseph R. Austin, 238 Isabella Ave., Irvington, N.J. 07111
Continuation-in-part of Ser. No. 348,290, May 5, 1989. This application Jul. 31, 1990, Ser. No. 560,734
Int. Cl.⁵ A41D 25/02

U.S. Cl. 2—149

5 Claims



1. A necktie comprising: a tie, interlocking front and rear tieknot shell halves having alternating rectangular central apertures, a slide bar securing the tie between the shell halves comprised of a cylinder with a hook on its upper end and a rectangular hole in its center, a slidable bar lock securing the tieknot shell halves together, and a neck strap.

5,084,917

LAVATORY SEAT DEVICE

Osamu Matsubara, Anjo; Kenichi Kaneko, Kariya, and Shinji Kawai, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

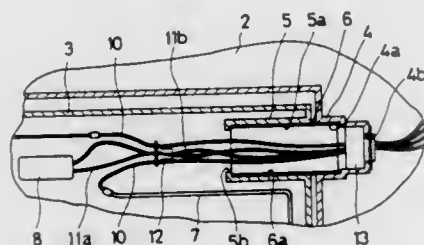
Filed Nov. 26, 1990, Ser. No. 617,794

Claims priority, application Japan, Nov. 28, 1989, 1-137401[U]; Nov. 30, 1989, 1-139198[U]; Nov. 30, 1989, 1-139199[U]

Int. Cl.⁵ A47K 13/00

U.S. Cl. 4—237

6 Claims



1. A lavatory seat device comprising:

a lavatory seat including an opening to communicate with a toilet bowl, said lavatory seat accommodating a heater and a thermo-sensor therein, said sensor for detecting a temperature of the heater;

first and second lead wire means;

control circuit means responsive to the signal from said thermo-sensor for controlling said heater in such a manner that the current supply to said heater is interrupted when said signal from said thermo-sensor reaches a set value or when cutting of said second lead wire means is detected;

a case having said control circuit means therein;

said first lead wire means for supplying an electric current from said control circuit to said heater;

said second lead wire means for conveying a signal from said thermo-sensor to said control circuit means;

a first pivot portion on said lavatory seat having a hole through which said first and second lead wire means extend;

a second pivot portion on said case fitting with said first pivot portion to allow pivoting of said lavatory seat relative to said case; and

holding means for holding said first and second lead wire means in such a manner that upon breakage of said first pivot portion or said second pivot portion, thus allowing, increased tensile force on said first and second lead wire means, said first lead wire means will not be cut by said increased tensile force prior to said second wire means being cut.

5,084,918

INTEGRAL SAFETY HELMET

Peter M. Breining, Paloalt, CA; Stephen H. Watson; Jermome M. Sivesind, both of Mountain View, Calif., and Gerrit Heyl, München, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Jun. 11, 1990, Ser. No. 535,502

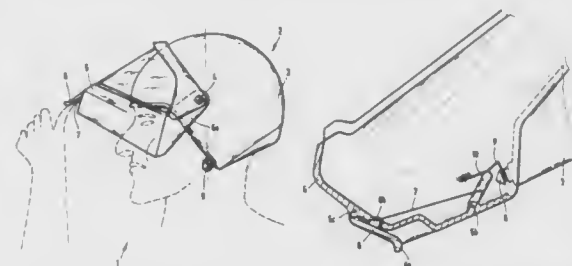
Int. Cl.⁵ A42B 1/08

U.S. Cl. 2—424

33 Claims

1. An integral safety helmet, particularly for motorcyclists, having a cap-shaped helmet bowl for surrounding a head of a wearer of the helmet and having a chin guard reaching over a lower-jaw part of the head, and connecting means for connecting this chin guard to the helmet bowl in an upwardly pivotable manner and for locking this chin guard with the helmet bowl in the folded-down state, wherein an opening bar is provided at the front side of the chin guard for releasing the chin guard, wherein the operating direction of the opening bar extends upwards in the swivelling direction of the chin guard, and

wherein a resilient locking device is provided to hold the chin guard in its locked position in such a manner that it is



automatically releasable in response to movement of the opening bar upwards.

5,084,919

SWIMMING POOL LADDER GUARD

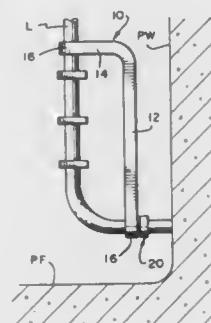
John A. Bittel, Sr., 85 Park Dr. N., Staten Island, N.Y. 10314

Filed Oct. 30, 1990, Ser. No. 605,374

Int. Cl.⁵ E04H 4/16

U.S. Cl. 4—496

3 Claims



3. The swimming pool ladder guard system for use in a pool having a wall-mounted ladder to provide a barrier between the ladder and a pool wall comprising:

a first guard member attached to said ladder for forming a barrier between the side of the ladder and the pool wall; said first guard member formed of an elongated, L-shaped, semi-rigid strip member having a first rectangular section with an upper surface in a first plane, and a second rectangular section connected with said first section and 90° degrees thereto, and having an upper surface in said first plane thereof;

each of said first and second sections having a distal end; a resilient hook member formed on each distal end of said first and second sections, each hook member curving upwardly from the distal end and back over the upper surface of said first and second section, respectively; said hook members being resilient and structured to grip said ladder for mounting said guard thereon;

a second guard member attachable to a bottom of the ladder to form a barrier between the bottom of the ladder and the pool wall; said second guard member formed of an elongated, rectangular, semi-rigid strip member having ends; a resilient hook member formed on each end of said second guard member, said hook members opening in the same direction relative to an upper surface of said second guard member; and

said hook members on said second guard member being resilient and removably attachable on said ladder for attachment thereto.

5,084,920

WATER RECYCLING SYSTEM

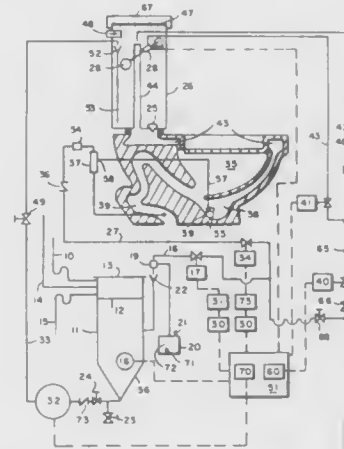
James L. Kimball, R.R. 1 Box 1570, North Waterford, Me. 04267

Filed Jan. 19, 1990, Ser. No. 467,785

Int. Cl.⁵ A47K 4/00

U.S. Cl. 4—665

21 Claims



1. A system of using gray water to dispose of wastes from a toilet fixture including a water closet, a toilet bowl having a cavity in a bottom portion thereof, and a conduit interconnecting the closet and the bowl, which system comprises

means for pooling gray water,

means for supplying the stored gray water to the closet,

means for permitting flow through the conduit of gray water from the closet to the bowl,

means for preventing flow through the conduit when the gray water in the closet is nearly depleted,

means actuated when the flow through the conduit is prevented for substantially depleting gray water remaining in the cavity of the bowl, and

means for supplying fresh water to the bowl wherein a substantial majority of the contents remaining in the bowl will be fresh water.

5,084,921

SUPINE PATIENT LIFT AND TRANSFER APPARATUS
George W. Hicks, Jr., 1401 NE. 70th, Oklahoma City, Okla. 73111

Filed Jan. 18, 1991, Ser. No. 642,949

Int. Cl.⁵ A61G 7/08

U.S. Cl. 5/—81.1; 5/86.1; 5/88.1

5 Claims

1. Apparatus for lifting and transporting supine bed patients from and to hospital-type beds or chairs, comprising:

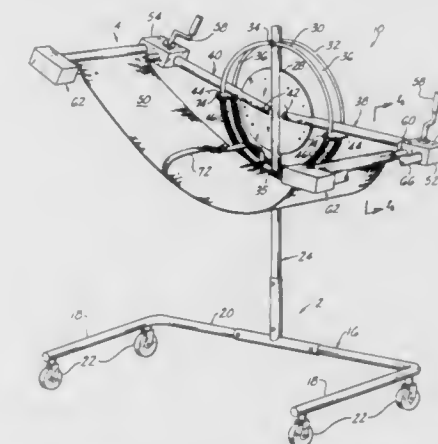
mobile frame means including an upright standard projecting above hospital bed height adjacent and at one side of a bed;

patient sling means including a substantially rectangular section of fabric having slotted end portions defining straps at its respective ends for underlying and projecting beyond the feet and head, respectively, of supine patients; and

patient sling lift means including a pair of opposed lift arm means pivotally supported by said standard for assisting a patient caretaker in moving said sling when supporting a patient in selected lifting and lowering actions, said sling lift means further including:

disk means diametrically intersecting the upper end portion of said standard for pivotally supporting the adjacent end of said pair of arms; and,

resilient means interposed between said standard and said pair of arms intermediate their respective ends for nor-



ally biasing the end portions of said pair of arms opposite their pivotal connection in an upward direction.

5,084,922

SELF-CONTAINED MODULE FOR INTENSIVE CARE AND RESUSCITATION

Claude Louit, Riscle, France, assignor to Societe Louit SA, Riscle, France

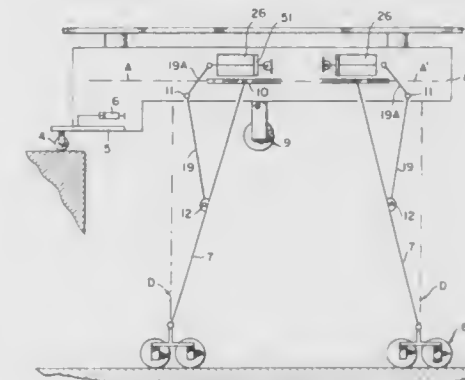
Filed May 19, 1989, Ser. No. 354,992

Claims priority, application France, May 19, 1988, 88 07046

Int. Cl.⁵ A61G 1/02, 7/00

U.S. Cl. 5—81.1

32 Claims



1. A self-contained module for intensive care and resuscitation comprising a detachable receiving table (2) for sick and injured persons;

medical and resuscitation assistance equipment; a footing (3) provided with ground-support members (8) including at least a first and a second support leg (7);

a girder (1) supporting the table (2) and the medical and resuscitation equipment and having attached the footing (3) for supporting and controlling the height level and inclination of the girder (1) above the ground;

actuating and guide means attached to the girder (1) and associated with the footing (3), wherein the actuating and guide means actuate the support legs (7) of the footing (3), thereby initiating a folding motion of an actuated, respective leg;

and wherein the actuated support legs perform the folding motion under the girder (1), and wherein the folding motion is performed by a rotary motion around a hinge point (10) and a translation motion along an upper rail (13) and a lower rail (14).

5,084,923

CRIB WITH STABILIZER BAR AND HIDDEN CONNECTOR FOR STABILIZER BAR

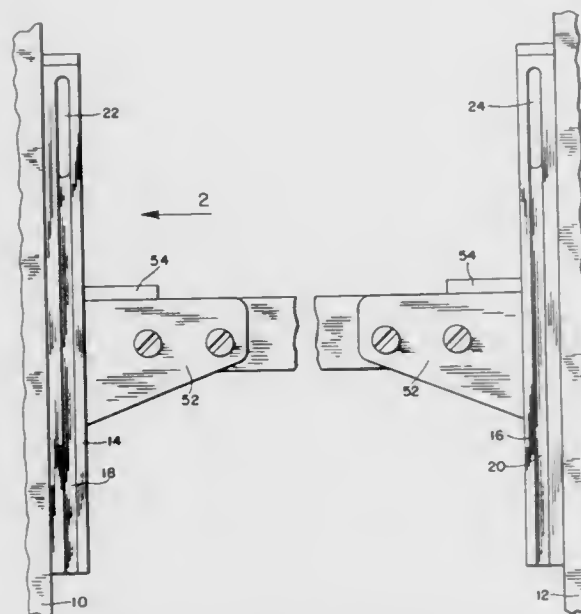
Edmund P. Guillot, Putnam, Conn., assignor to Gem Industries Inc., Gardner, Mass.

Filed Jun. 13, 1990, Ser. No. 537,897

Int. Cl.⁵ A47D 7/00

U.S. Cl. 5—93.1

3 Claims



1. A child's crib including end panels and interconnected sides, one side being a dropside, and a stabilizer bar having its ends connected to the panels at the side of the crib having the dropside,

a corner post at each edge of each panel, and means detachably connecting the stabilizer bar to a respective corner post at the dropside side of the crib,

said connecting means comprising a flat plate secured to a portion of the bar, a flange on the flat plate, and a pair of spaced downwardly extending tapering hooks on the flange at its edge portion remote from the flat plate,

a guide member on each respective corner post, said guide being parallel to the corner post and at a right angle to the flat plate, a keel plate parallel to the guide and fixed between the guide and the corner post, having a portion in a respective slot in the corner post and guide, a pair of generally parallel slots in the keel plate, said slots being adapted to receive the hooks simultaneously, an enlargement in one slot,

a depression in the guide in the area of the keel plate, said depression facing the respective corner post, the slots being accessible to the hooks because of the depression, the guide and corner post being flatwise positioned completely hiding the keel plate except for the area of the slots, the slots being enterable by the hooks and the bracket and hooks being locked in relation to the keel plate upon a downward thrust thereon once the hooks have entered the slots,

and a latch having two positions, a tongue on the latch to enter the enlargement in one position to lock the stabilizer bar in position, said latch being free of the keel plate in the other position of the latch, the stabilizer bar being capable of removal from the respective corner post only in the free position of the latch relative to the respective slot.

5,084,924

MOUNTING APPARATUS FOR WALL BEDS WITH SAFETY JAMMING FEATURE

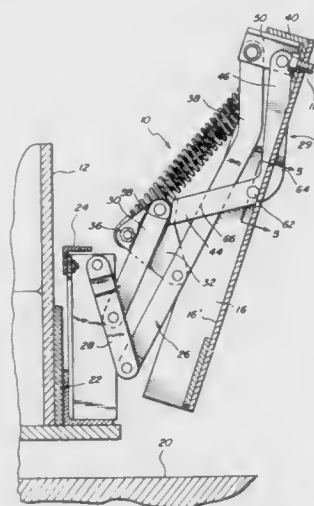
Melvin P. Spitz, 619 N. Elm Dr., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 455,162, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 143,374, Jan. 12, 1988, abandoned. This application Dec. 13, 1990, Ser. No. 626,907

Int. Cl.⁵ A47C 17/40

U.S. Cl. 5—136

1 Claim



1. In a counter-balancing assembly connected between a bed base of a wall bed and a mounting element normally anchored in position to a wall or floor, said counterbalancing assembly having means connected to a linkage assembly to provide a counter balancing force as the bed is being opened and closed, the improvement, comprising

a safety element moveable between a first position that allows the linkage assembly to clear the safety element when the bed is being opened and closed, and a second position wherein the safety element interacts with the linkage assembly to jam that assembly whenever the mounting element breaks free from its anchored position.

5,084,925

HOSPITAL BED GUARD EXTENDER

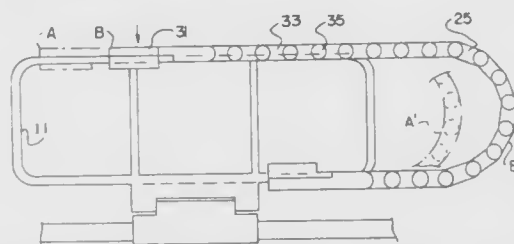
Stuart A. Cook, Duluth, Ga., assignor to Product Strategies, Inc., Duluth, Ga.

Filed Feb. 19, 1991, Ser. No. 656,984

Int. Cl.⁵ A47C 21/08

U.S. Cl. 5—425

3 Claims



1. In a hospital bed having a backboard, a footboard, longitudinal sides between said headboard and footboard and at least one collapsible guard rail on one side of said bed, at least one gap defined adjacent said guard rail, the improvement comprising:

a telescoping extender mounted upon said guard rail by a slidable member that mounts about said guard rail moveable between two positions, a first of said positions defining said gap and a second of said positions closing said gap.

5,084,926

CONTOUR PILLOW

James A. Wattie, and Joanne M. Wattie, both of Leicester, England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB89/01475, § 371 Date Jul. 23, 1990, § 102(e) Date Jul. 23, 1990, PCT Pub. No. WO90/06708, PCT Pub. Date Jun. 28, 1990

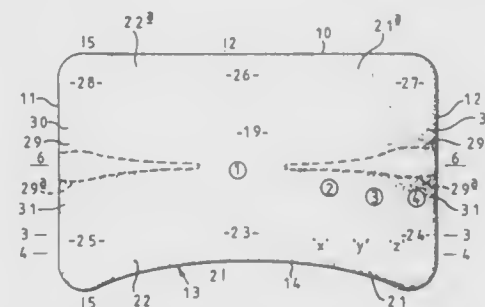
PCT Filed Dec. 11, 1989, Ser. No. 543,805

Claims priority, application United Kingdom, Dec. 15, 1988, 8829313

Int. Cl.⁵ A47G 9/00

U.S. Cl. 5—636

23 Claims



1. A pillow having an upper outer surface, a lower outer surface, said upper and lower surfaces are on opposite sides of a plane, and at least one peripheral outer surface therebetween, at least one of said upper outer surface and lower outer surface having a large central recessed area one of said upper outer surface and lower outer surface also including two first buttress portions at opposing sides with respect to said recessed area and extending to said at least one peripheral outer surface, a first pair of second buttress portions, each of said second buttress portions extending to said at least one peripheral outer surface and disposed adjacent to one of said first buttress portions and further recessed area means for spacing said one of said first buttress portions from said second buttress portions, said recessed area means extending from said central recessed area to said at least one peripheral outer surface, further including a second pair of second buttress portions, said further recessed area means including first and second pairs of further recessed areas, wherein said first pair of said second buttress portions is located adjacent to and on opposite sides of said one of said first buttress portions and spaced from said one of said first buttress portions by said first pair of said further recessed areas, and said second pair of said second buttress portions is located adjacent to and on opposite sides of the other of said first buttress portions and spaced from said other of said first buttress portions by said second pair of further recessed areas.

5,084,927

METHOD FOR PROTECTING A SURFACE FROM CONTAMINANTS

Gayle Parkevich, Cutler, Ind., assignor to Tan Sense Medical Corp., Cutler, Ind.

Filed Feb. 8, 1991, Ser. No. 653,664

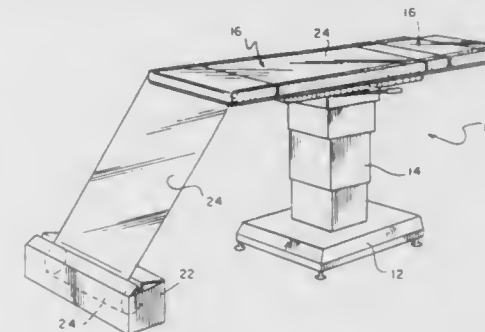
Int. Cl.⁵ A61G 1/01, 13/00; A47G 9/02

U.S. Cl. 5—484

3 Claims

1. A method for protecting a surface, adapted to support a patient, from contamination, the method comprising the steps of: providing a disposable, single, and generally planar film sheet having an upper side, a lower side and side edges, said film sheet having a maximum pore size of less than 0.1 micron, at least the lower side of the film sheet facing the surfaces having a cling property so that the film sheet clings to the surface, covering the surface with said film sheet, to thereby

reduce the likelihood of contaminating the surface with infectious agents, contaminants, bodily fluids or the like, and dis-



carding said film sheet prior to supporting a new patient on said surface.

5,084,928

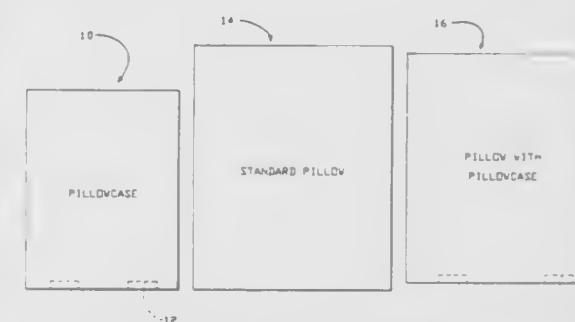
PILLOWCASE FORMED OF ELASTIC FABRIC
Adrienne M. Skillington, 150 Borica Way, San Francisco, Calif. 94127

Filed Nov. 7, 1990, Ser. No. 610,436

Int. Cl.⁵ A47G 9/02

U.S. Cl. 5—490

11 Claims



1. In a pillowcase formed for mounting over a resiliently compressible pillow of known shape and known length and width dimensions, said pillowcase being formed as a hollow fabric shell having two opposed sheet portions substantially conforming to said known shape of said pillow and having an opening therein for mounting of said pillowcase over said pillow, the improvement in said pillowcase comprising:

said fabric shell being formed with length and width dimensions which both are smaller than said known length and width dimensions of said pillow, and said fabric shell being formed of a material having sufficient elasticity to be stretched in both length and width dimensions over said pillow and resiliently distend into a substantially crease-free condition covering said pillow; and

closure means mounted to said pillowcase proximate said opening and formed to releasably secure said pillowcase in said crease-free condition over said pillow.

5,084,929

BED SHEET SLEEPING ENCLOSURE

Luana A. Staudinger, 504 San Nicholas Ct., Laguna Beach, Calif. 92651

Filed Aug. 7, 1991, Ser. No. 741,687

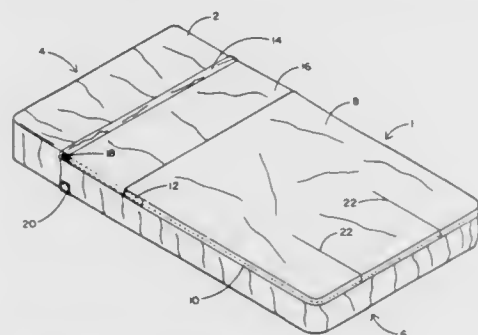
Int. Cl.⁵ A47G 9/04

U.S. Cl. 5—494

8 Claims

1. A bed sheet sleeping enclosure comprising:
a bottom form-fitted sheet;
a top flat sheet attached by stitching along the bottom edge thereof and partially along the side edges to said bottom form-fitted sheet;

means for transversely keeping the top flat sheet taut to slightly restrain a sleeping individual from sliding out while sleeping, said means for slightly restraining the sleeping individual including an elastic band extending transversely through the end of the top flat sheet nearest



the heat of the sleeping individual, said elastic band being limited to extend between the side edges of said top flat sheet; and
means for removably fastening the unattached portion of said side edges of said top flat sheet to said bottom form-fitted sheet.

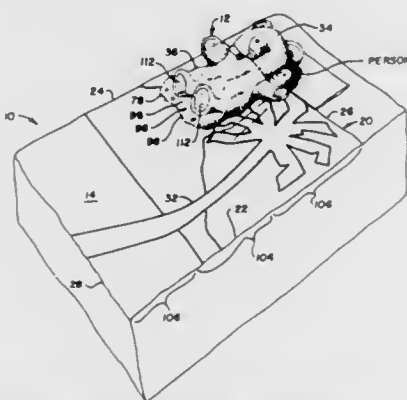
5,084,930

COMBINED SOFT SCULPTURE AND BLANKET

Cesare M. Danova, Los Angeles, Calif., assignor to BHT Holdings Limited, Hong Kong
Continuation-in-part of Ser. No. 935,339, Nov. 26, 1986, Pat. No. 4,734,948. This application Oct. 6, 1987, Ser. No. 104,927
Int. Cl.⁵ A47G 9/02

U.S. Cl. 5—502

42 Claims



1. A combined soft sculpture and blanket, comprising:
a blanket having a front surface, a back surface and an outer perimeter including an edge; and
a soft-sculptural object including a head portion connected with a torso portion at a neck having a perimeter;
said torso portion including a front panel made of flexible fabric and a back panel made of flexible fabric; each of said panels having a top edge, a left edge, a right edge and a bottom edge;
said top edges of said front and back panels being secured to said head along complementary portions of the perimeter of said neck;
one of said panels being substantially longer than the other so that each of said panels has a corresponding main portion, but the longer one of them in addition has a lower flap portion;
one of said panels being disposed facewise against one of said surfaces of said blanket with the top edge of such panel adjacent and extending along said edge of said blanket,

with said head portion protruding beyond said outer perimeter of said blanket at said edge;
means securing the main portion of the last-mentioned said panel, perimetricaly thereof to said blanket;
complementary securement means provided on said main portions of said panels along left edges of said panels;
complementary securement means provided on said main portions of said panels along right edges of said panels; and
complementary securement means provided on said lower flap portion of said longer one of said panels along the bottom edge thereof, and on the main portion of the other of said panels along the bottom edge thereof;
said combined soft sculpture and blanket having:
a first disposition in which said complementary securement means are unsecured and said blanket is spread-out, and
a second disposition in which said blanket is condensed by at least one of folding, rolling and wadding up, and said complementary securement means are secured with said condensed blanket being substantially completely enclosed within said soft-sculptural object.

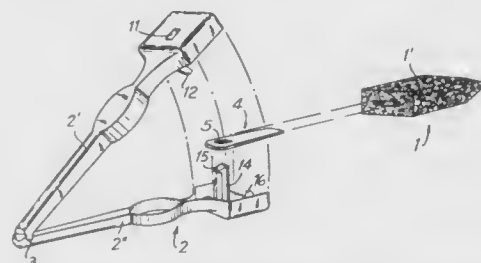
5,084,931

PAINT BRUSH WITH REPLACEABLE APPLICATOR

Reiner J. Kühlicke, Calle 65 No. 5920, 1653 V. Ballester, Argentina
Filed Apr. 14, 1989, Ser. No. 339,241
Claims priority, application Argentina, Apr. 25, 1988, 310,654
Int. Cl.⁵ A47L 13/46

U.S. Cl. 15—244.1

10 Claims



1. A paint brush comprising a handle with a male half and a female half, said halves being provided with housing receptacles and with a plurality of lateral walls and, on a front side of said handle, with corresponding partitions with serrated edges of smaller height than said lateral walls and with support and anchorage means, said housing receptacles being bounded by said partitions and said lateral walls for a secured end of said applicator part; a projecting member open towards said front side and protruding from a bottom of said housing receptacle of said female half, said bottom of said housing receptacle having an opening adjacent said projecting member; guide means provided on said lateral walls of said female half perpendicular to said bottom; and a stem with a hook-like nose on a free end thereof projecting substantially perpendicularly from said male half corresponding to said projecting member of said female half; and a replaceable applicator part with at least one retention ringlet engaged and held by said support and an anchorage means, said at least one retention ringlet being inserted in said handle and said male half and said female half being hinged at an end opposite said applicator part, said lateral walls of said male half having a plurality of guide lugs which cooperate with said guide means of said female half so that, when said handle is closed, said hook-like nose passes by and adjacent said projecting member and through said opening in said female half to hold said female half.

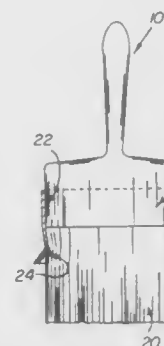
5,084,932

DRIP COLLAR FOR A PAINT BRUSH

Dale E. Zanchi, 1557 McCay Ave., Louisville, Ky. 40213
Filed Oct. 24, 1990, Ser. No. 602,810
Int. Cl.⁵ A46B 17/08

U.S. Cl. 15—248 R

3 Claims



1. A removable drip collar for a paint brush comprising:
a sleeve of an elastomeric material having an open top end and an open bottom end with a length between the open top end and open bottom end sufficient to receive the handle of the paint brush adjacent the ends of the brush bristles attached to the handle and extend over a length of the bristles, the open top end of the sleeve being circumferentially sized to radially tightly grip the perimeter of the handle creating a liquid-tight seal therebetween, and also being circumferentially sized at its open bottom end to compress the bristles tightly together near their proximal ends in a radial direction of the sleeve to create a liquid-tight seal between adjacent bristles to prevent paint from immigrating into the interstices of the bristles near their proximal ends and to create a liquid-tight seal between the bristles and the open bottom end of the sleeve to prevent paint from migrating into the interface between the bottom end of the sleeve and the brush bristles; and, a circumferential flange unitary with the sleeve at the open bottom end of the sleeve to extend over the brush bristles and projecting in a radial outward direction of the sleeve at an acute angle to the longitudinal axis of the sleeve and cooperating with the perimeter of the brush bristles to define a circumferential trough at the bottom end of the sleeve between the brush bristles and the flange when the drip collar is installed on a paint brush.

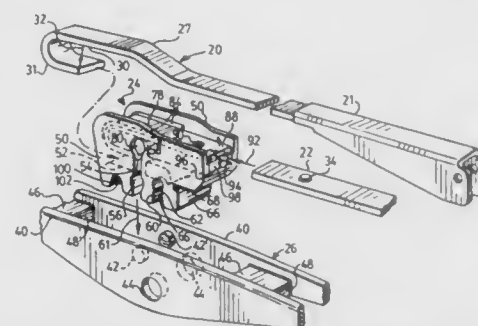
5,084,933

ADAPTOR FOR WINDSHIELD WIPER ARMS

Franz Buechele, 501 Lake Rd., Lawrenceburg, Tenn. 38464
Filed Oct. 19, 1990, Ser. No. 600,364
Int. Cl.⁵ B60S 1/40

U.S. Cl. 15—250.32

10 Claims



1. In an adaptor and windshield wiper assembly wherein a windshield wiper superstructure comprises a primary yoke having a pair of spaced substantially parallel walls on a portion of its length supporting therebetween transversely extending support means which slidably receive the adaptor, the im-

provement wherein the adaptor has first coupling means receiving and retaining a free end of a wiper arm and second coupling means securing the adaptor to the primary yoke, said second coupling means comprising a pair of transversely spaced walls connected by a web extending therebetween, the spacing between the walls of the adaptor being selected to allow the adaptor to be inserted between said parallel walls of the yoke, and the walls of the adaptor each having a first downwardly extending slot having a bottom end and a top end whereby the adaptor engages said support means upon downward relative movement of the adaptor into the yoke, the first slots each having first and second enlargements longitudinally spaced from each other between said ends, the first enlargement being spaced from the bottom end to retain the adaptor on said support means in a pre-assembled position with the adaptor partially inserted in the yoke such that the resulting yoke and adaptor assembly is disposed to receive a free end of a wiper arm, and the second enlargement being spaced from the top end to retain the adaptor on the support means in a fully assembled position with the adaptor fully inserted in the yoke such that the wiper arm is secured to the yoke.

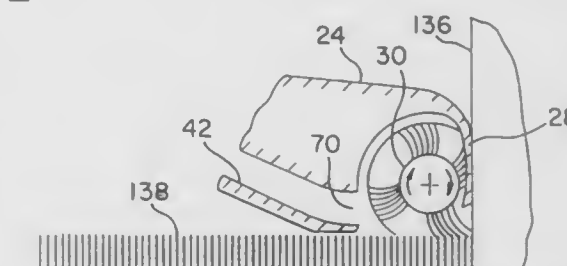
5,084,934

VACUUM CLEANERS

William R. Lessig, III, Hunt Valley, Md.; Rouse R. Bailey, Jr., New Park, Pa., and John R. Cochran, Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.
Division of Ser. No. 469,176, Jan. 24, 1990, Pat. No. 5,020,186.
This application Apr. 29, 1991, Ser. No. 692,647
Int. Cl.⁵ A47L 5/30

U.S. Cl. 15—325

20 Claims



1. An upright vacuum cleaner for cleaning carpet, comprising:
a handle connected to a base for manipulating the vacuum cleaner forwards and backwards over the carpet to be cleaned;
said base containing a floor brush rotatable about an axis parallel to the surface of the carpet, and a vacuum nozzle;
said nozzle having an inlet spaced from said brush and extending along the length of said brush;
said nozzle having an air passageway communicating with and extending from said inlet, after no more than an initial section adjacent said inlet said passageway having a constant cross-sectional area;
means for rotating said brush about said axis to sweep dirt from the carpet through said inlet;
means for sucking air through said inlet and said passageway;
said base having a front wall with said brush being disposed immediately adjacent but rearwardly of said front wall;
said front wall being resiliently yieldable rearwardly when said base is pressed forwardly against a room wall to enable said brush to contact and sweep the surface of the carpet at an edge location thereof abutting said room wall;
grooming brushes rotatably carried by said base and disposed rearwardly of said nozzle, said grooming brushes extending transversely to the forwards and backwards manipulation of the vacuum cleaner over the carpet; and
a plurality of wheels supporting said base on but above the carpet, said wheels being located between said floor brush

and said grooming brushes, and said wheels being located transversely inwards of the transversely outermost ends of said grooming brushes and transversely inwards of outer ends of said floor brush, the location of said wheels relative to said brushes enabling said brushes to brush out all wheel tracks on the carpet in both forward and backward manipulation of the vacuum cleaner on the carpet.

5,084,935

MULTIPLE-PURPOSE WIRE SHAPING AND CUTTING TOOL

Ferdinand Kalthoff, Laer, Fed. Rep. of Germany, assignor to Orbis-Werk Groten GmbH & Co. KG, Ahaus, Fed. Rep. of Germany

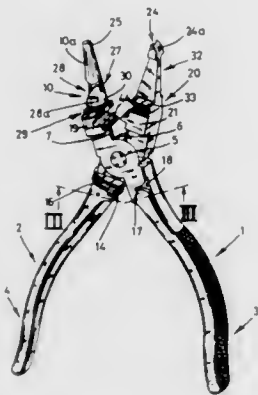
Filed Jan. 24, 1991, Ser. No. 645,594

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1990, 4006111

Int. Cl.⁵ B25B 7/22

U.S. Cl. 7—132

20 Claims



1. A plier-shaped multiple-purpose wire treating tool, particularly for use by dentists, comprising first and second elongated levers respectively having first and second handles and first and second jaws; and a pivot connecting said levers to each other intermediate said handles and the respective jaws for movement, about an axis which extends transversely of said levers, between first positions in which said jaws and said handles are respectively adjacent each other and second positions in which said jaws and said handles are respectively remote from one another, said jaws having cooperating cutting edges which sever a wire in response to movement of said levers toward said first positions thereof, the handle of one of said levers having a plurality of female corrugating elements and the handle of the other of said levers having a plurality of male corrugating elements each receivable with clearance in one of said female elements in response to movement of said levers to said first positions, said elements extending substantially radially of said axis.

5,084,936

APPARATUS FOR RAISING AND LOWERING A ROTATABLE PLATFORM

Joseph R. Thomas, Jr., Tampa, Fla., assignor to Airline Industrial Machinery, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 385,395, Jul. 27, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 553,216

Int. Cl.⁵ E01D 1/00

U.S. Cl. 14—71.5

21 Claims

1. A device for raising and lowering a rotatable vestibule, comprising:

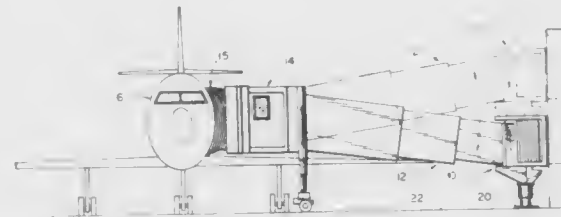
- a plurality of upstanding cylindrical column members disposed in telescoping relation to one another;
- said plurality of column members including an uppermost column, at least one intermediate column, and a lowermost column;
- a plurality of upstanding ram piston members disposed in telescoping relation to one another interiorly of said plu-

ality of column members and in concentric relation to said plurality of column members;

said plurality of piston members including an uppermost piston, at least one intermediate piston, and a lowermost piston;

a thrust plate member disposed in surmounting relation to said uppermost column of said plurality of column members;

said uppermost ram piston member being secured to said thrust plate member;



means for extending and retracting said plurality of ram piston members;

said plurality of column members passively extending and retracting in accordance with extension and retraction of said plurality of ram piston members;

motion limiting means for limiting the extension of said plurality of column members;

means for facilitating sliding extension and retraction of said plurality of column members;

said motion limiting means and said bushing means comprising a J-shaped member of a preselected material.

5,084,937

ERASER CRUMB CLEANER

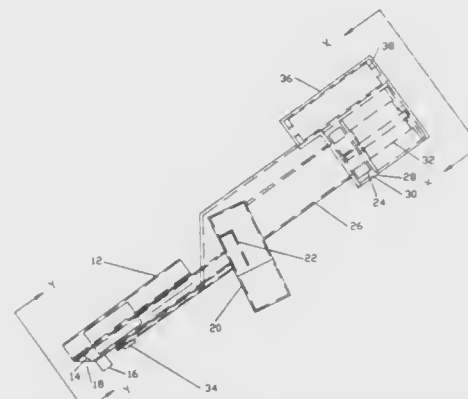
Ekramul Hague, 1300 Frontier La., Manhattan, Kans. 66502

Filed Feb. 8, 1991, Ser. No. 652,989

Int. Cl.⁵ A47L 5/24

U.S. Cl. 15—3.53

1 Claim



1. An eraser crumb cleaner held in the hand like a writing pen for collecting eraser crumbs and the like, simultaneously while erasing on paper comprising:

- an eraser holder of a hollow cylindrical shape;
- a suction pipe of a cylindrical shape and of a first inner diameter, said suction pipe being open at both ends and having an axis inclined to the plane of the paper, one end of said suction pipe serving as nozzle opening and a first receiving point of the eraser crumbs, said suction pipe and said eraser holder being fused together like two barrels of a double-barrel gun with said suction pipe positioned under said eraser holder;
- a cleaning brush;
- a container of a cylindrical shape and of a second inner diameter, said container having an axis substantially per-

pendicular to the plane of the paper and positioned within the space formed by the palm of the hand holding the eraser crumb cleaner, the other end of said suction pipe penetrating radially into said container;

a baffle fixed integrally into the inside of said container, said baffle being positioned facing said suction pipe;

an inlet pipe of a third inner diameter so as to conveniently support the apparatus of this invention on the hand holding the apparatus and rest comfortably on the metacarpal bone area of the index finger adjacent to the thumb, said inlet pipe being substantially equal in diameter to said container, said inlet pipe having substantially equal inclination to the plane of the paper as said suction pipe, the bottoms of said suction pipe and said inlet pipe forming one straight line, the lower end of said inlet pipe penetrating radially into said container;

a centrifugal fan having a fan rotor of a fourth diameter and of a backwardly curved-vane type positioned concentrically to said inlet pipe at the upper end of said inlet pipe;

an enclosure for said centrifugal fan to provide an appropriate air-outlet area, said enclosure having a cylindrical shape and surrounding said fan rotor, said enclosure being of a fifth inner diameter marginally larger than the fourth diameter and providing sufficient clearance between said enclosure and said fan rotor, said enclosure being positioned with its axis in line with the axis of said fan rotor, said enclosure having equidistant slot openings around its periphery for the passage of the air out of the apparatus of this invention, said slot openings being in line with the fan rotor;

an electric motor with its axis positioned colinear with the axis of said fan rotor;

a power means for supplying power to the electric motor and

a switching means for turning the electric motor on or off.

5,084,938

APPARATUS FOR CLEANING FLOOR COVERINGS

Leopold Knestele, Wengener Strasse 10, D 7954 Haidgau, Fed. Rep. of Germany

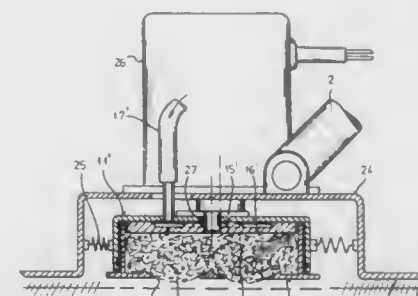
Filed Jun. 13, 1990, Ser. No. 537,075

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1989, 3919271

Int. Cl.⁵ A47L 11/284

U.S. Cl. 15—98

17 Claims



1. In an apparatus for cleaning rugs, wall-to-wall carpets, and similar floor coverings, and including, as a cleaning element, a sponge that is disposed in a downwardly open housing that is provided with a shaft-like handle, with said sponge being adapted to be supplied with cleaning liquid, the improvement wherein:

- said sponge is made of a fine-pore plastic; and
- a supporting frame in said housing is provided that has a U-shaped cross-sectional configuration and in which said sponge is held, with said supporting frame and said housing having an underside provided with supporting surfaces for placement adjacent said floor covering, at least one rectangularly shaped recess formed in said underside of said supporting frame and having an axis that extends perpendicular to or at an angle to a direction of movement

of said apparatus, said recess being open toward a floor covering inwardly of said support surfaces of said housing and supporting frame said sponge being disposed in the interior of said supporting frame and projecting partially out of said recess, in the form of bulging rolls, and beyond said support surfaces of said housing and supporting frame.

5,084,939

DOOR DAMPENING ASSEMBLY

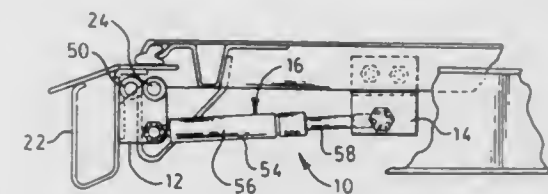
Ronald H. Garman, Pekin, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 14, 1990, Ser. No. 612,368

Int. Cl.⁵ E05F 3/02

U.S. Cl. 16—84

3 Claims



1. A door dampening assembly for dampening the motion of a vehicle door as the door moves in an arc about a fixed hinge portion, from a fully open position, to a partially open position, and to a fully closed position, said fixed hinge portion being secured to a vehicle frame portion, said door dampening assembly comprising:

- a gas spring cylinder having a cylindrical portion and a rod portion, said cylindrical portion and said rod portion having a combined length "L" in said partially open position and a combined length "L'" in said fully open position, said length "L'" being substantially equal to said length "L";
- a first connector having a threaded portion and a ball portion, said threaded portion being adapted to secure said first connector to one of said vehicle frame portion and said vehicle door, said ball portion being adapted to pivotally secure said first connector to said gas spring cylinder cylindrical portion;
- a second connector having a threaded portion and a ball portion, said threaded portion being adapted to secure said second connector to the other one of said vehicle frame portion and said vehicle door, said ball portion being adapted to pivotally secure said second connector to said gas spring cylinder rod portion; and
- a timing plate having first and second mounting portions and a stop portion, said first mounting portion being adapted to pivotally secure said timing plate to said vehicle frame portion and said second mounting portion being adapted to secure the threaded portion of one of said first and second connectors to said timing plate, said stop portion having a flat substantially planar surface, said surface being adapted to contact said vehicle frame portion.

5,084,940

ADJUSTABLE HANDLESET

James M. Loffler, El Toro, and Paul G. Solovieff, Tustin, both of Calif., assignors to Emhart Inc., Newark, Del.

Filed Jan. 18, 1990, Ser. No. 466,897

Int. Cl.⁵ E05B 1/00

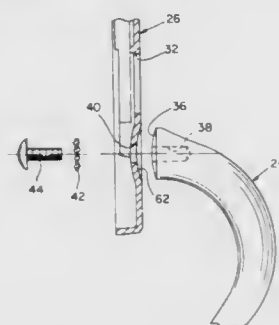
U.S. Cl. 16—110 R

12 Claims

1. An adjustable handleset, which comprises:

- a rose;
- a handle assembled with the rose at a juncture of assembly; means, interposed at the juncture of assembly, for permitting adjustment of the position of the handle relative to the

rose without complete separation and disassembly of the handle from the rose, and



means for firmly securing the handle with the rose at the juncture of assembly to preclude relative movement therebetween.

5,084,942
DEVICE AND METHOD FOR THE FINE CLEANING OF TEXTILE FIBERS HAVING POSITIONABLE BLADES AND GUIDES

Heinz Schelb, Wallisellen; Beat Bühler, and Ulf Schneider, both of Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Sep. 20, 1990, Ser. No. 585,707

Claims priority, application Switzerland, Sep. 20, 1989, 03419/89

Int. Cl.⁵ D01B 3/00

U.S. Cl. 19—200

32 Claims



5,084,941
SLIVER DIVIDER HAVING A POSITIONABLE BLADE AND GUIDE WALLS

Karl-Josef Brockmanns, Willich; Siegfried Bruns, and Theo Lembeck, both of Mönchengladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co, Mönchengladbach, Fed. Rep. of Germany

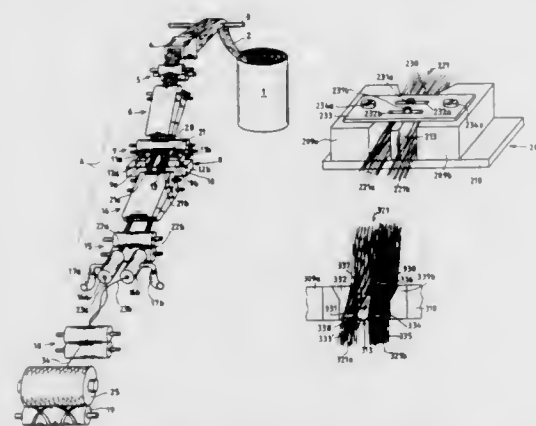
Filed Oct. 5, 1990, Ser. No. 593,085

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1989, 3933218

Int. Cl.⁵ D01G 15/40, 15/58

U.S. Cl. 19—151

20 Claims



1. A sliver dividing device in a drafting arrangement of a spinning machine, with a sliver travelling through a sliver guide in a given direction and defining a given plane, comprising a sliver divider for dividing the sliver into at least two strands to be delivered to a work station for further processing, said sliver divider being movable in a direction substantially perpendicular to the given direction and substantially parallel to the given plane.

1. A device for use in a cleaning process of textile fibers for use in conjunction with an opening roller, said device comprising:

- a plurality of separating blades spaced from said opening roller during said cleaning process;
- a plurality of guide elements spaced from said opening roller during said cleaning process; and
- means for adjustably positioning said separating blades and said guide elements relative to each other in order to selectively alter the distance between each neighboring separating blade and guide element during said cleaning process.

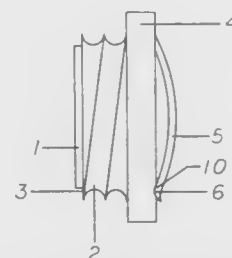
5,084,943
FLAT FILE HOODED GAS LIGHTER FASTENING DEVICE

Paul J. DeCanio, 49 Greis Ave., Lake Ronkonkoma, N.Y. 11779
Filed Oct. 4, 1990, Ser. No. 592,627

Int. Cl.⁵ A44B 21/00

U.S. Cl. 24—3 L

2 Claims



1. A device for removably fastening a double loop flat file hooded gas lighter to a desired location which comprises:

- (A) a body structure including on its external surface a continuous thread like groove extending from a first end surface of the body;

the first end surface includes a magnet permanently mounted thereon;

the second end surface is defined in part by a disc shaped stop flange which extends radially beyond said external surface continuous groove terminating at a location adjacent to an inside surface of the flange, said inside surface facing toward the first end surface of the body, the second end surface having attached thereon a fastening clip,

(B) said magnet comprises a disc like shaped element having a diameter which is smaller than that of said first end surface,

(C) said fastening clip comprises a rectangular convex shaped element having a closed first clip end fixed to the second end surface and an open second clip end including a nodule which is arranged to engage a fastening clip notch located in the second end surface, said fastening clip arranged for keeping continuous biased tension against the second end surface of the body,

(D) said stop flange has a diameter greater than that of the outer surface of a double loop portion of said lighter,

(E) whereby the device is attached to the flat file hooded gas lighter by engagement of said threads in a counter clockwise direction with the double loop of the lighter, which defines matching threads, and turned until the stop flange inside surface comes in to contact with the outer surface of the double loop, the body structure length is defined to allow the magnet to protrude past the double loop to allow the magnet to make contact with any ferrous support surface, the open second clip end being positioned to face in the direction of the hood of said gas lighter to allow the fastening clip, in a clipped mode, to hold the gas lighter in an inverted position.

5,084,944

UNIVERSAL MATERIAL CLIP

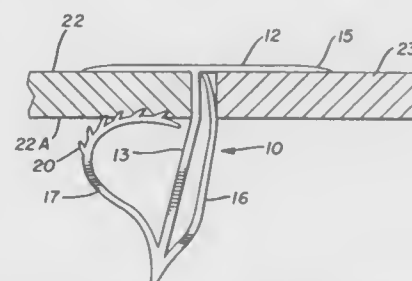
John Hileman, Youngstown, Ohio, assignor to Budd R. Brothers, Youngstown, Ohio

Filed Feb. 1, 1991, Ser. No. 649,548

Int. Cl.⁵ F16B 13/04

U.S. Cl. 24—453

4 Claims



1. A universal material clip for securing multiple panels to one another comprising a unitary body member having a flat engagement portion, a support leg extending angularly therefrom and having a free end, a pair of transversely flat engagement elements extending from the free end of said support leg, a plurality of independent multiple fingers on one of said engagement elements in spaced relation to one another, each of said engagement elements are of a cross-sectionally tapered configuration extending from said support leg and have a curved configuration throughout their longitudinal length to a free end.

5,084,945

LOCKBOX DETENT CLIP

C. L. Childers, 310 Spalding Lake Ct., Atlanta, Ga. 30360
Filed Jun. 29, 1990, Ser. No. 545,564

Int. Cl.⁵ A44B 21/00; E05B 65/52

U.S. Cl. 24—530

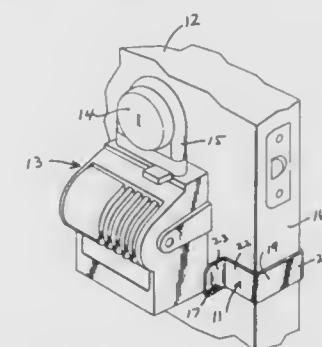
3 Claims

1. A detent clip adapted to fit around the edge of a door to

be in juxtaposition next to a lockbox to deter the lockbox from a swinging movement, said clip comprising:

a clip having an upstanding leg at the proximal end thereof and an upstanding leg at the distal end thereof,

the upstanding leg at the proximal end of the clip has a blocking lip projecting outwardly from the leg at a substantially right angle thereto, the blocking lip deterring the swinging movement of the lockbox,



said proximal and distal legs being joined by a connector member thereby forming a substantially U-shaped structure defining a cupped interior area, the cupped interior area of the clip being so formed to fit around the edge of said door,

resilient gripping means mounted on the interior surface of the upstanding leg at the proximal end of the clip to provide a resilient gripping surface to the door when said clip is in its operative position.

5,084,946

QUICK DISCONNECT CONNECTOR

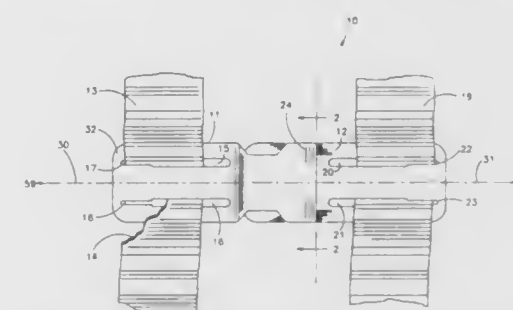
David J. Lee, Carmel, Ind., assignor to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Dec. 11, 1990, Ser. No. 625,371

Int. Cl.⁵ A44B 11/25

U.S. Cl. 24—625

12 Claims



1. A quick release connector comprising: a female member having a female end and an opposite first web connecting end, said female end including a plurality of side walls defining an outwardly opening cavity, said side walls including guide means thereon and a pair of oppositely positioned reliefs located within said cavity and defining a first pair of ramp means, said member further including a first longitudinal axis extending through said female end, said cavity, and said connecting end; and,

a male member having a male end and an opposite second web connecting end, said male member including a second longitudinal axis extending through said male end and said opposite second web connecting end, said male end including a pair of cantileveredly mounted flexible arms and a cantileveredly mounted post spaced apart from but between said arms with said post cooperatively engageable with said guide means to cause said male member to

move along said first longitudinal axis as said male member is inserted and withdrawn from said female member, said arms being flexible and movable from a normal spaced apart position whereat said arms lockingly engage said female end to an inwardly located release position whereat said arms converge, are unlocked and are movable outward apart from said female end, said post having a length in the direction of said second longitudinal axis less than said arms enabling said arms to contact together without contacting said post, said arms including a second pair of ramp means facing outwardly and engageable with said first pair of ramp means when said arms are in said cavity and are lockingly engaged with said female end, said first pair of ramp means and said second pair of ramp means being configured to hold said male member locked to said female member until external force above a predetermined amount is applied to said female member only along said first longitudinal axis and to said male member only along said second longitudinal axis.

5,084,947

SNAP RELEASE ATTACHMENT SYSTEM

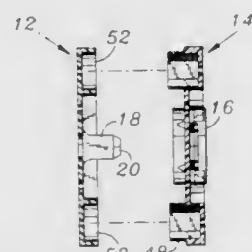
Jack Evans, and Christopher R. Morley, both of Mokena, Ill., assignors to Cellular IC, Mokena, Ill.

Filed Jun. 25, 1990, Ser. No. 542,692

Int. Cl.⁵ A44B 17/00

U.S. Cl. 24—658

9 Claims



I. A snap release system for attaching a first element to a second element, the system comprising:

a planar base member for connection to the first element; a planar top member for connection to the second element; one of said members having a projecting stud; the other of said members having a socket for receiving said stud when said members are brought together in a face to face orientation;

means for releasably holding said stud in said socket, said means for releasably holding being normally in a first position but being cammed to a second position as the members are brought into face to face engagement to automatically capture and hold said stud in said socket and said members together; and

a plurality of sockets on said one of said members and a plurality of bosses on said other of said members displaced from the centrally located stud so that bosses and sockets are co-linear in the plane of face to face engagement for aligning said members as they are brought into face to face engagement.

5,084,948

TEXTILE NAPPING MACHINE

Arne Nielsen, Oak Ridge, and Majid Moghaddassi, Greensboro, both of N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Jun. 18, 1990, Ser. No. 539,623

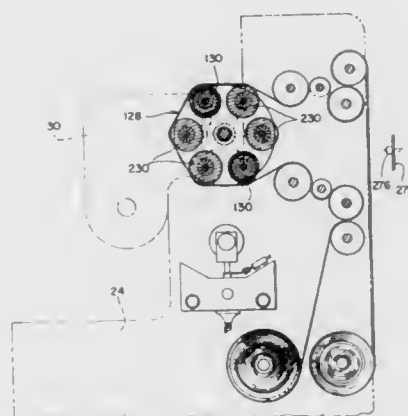
Int. Cl.⁵ D06C 11/00

U.S. Cl. 26—32

30 Claims

1. In a textile napping machine of the type having a napping cylinder having a fabric raising surface at its periphery for engagement with a traveling textile fabric and drive means for rotating said napping cylinder, the improvement comprising means for supporting said napping cylinder for selective move-

ment between an inoperative position wherein said napping cylinder is disengaged from driven relationship with said drive means for mounting and demounting said napping cylinder to



5,084,953

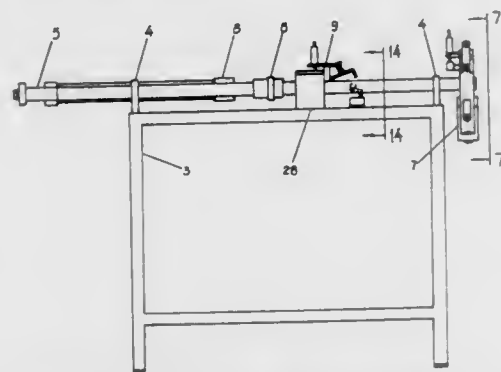
CONTAINER ASSEMBLY MACHINE

Norman H. Nye, 1348 Highbridge Rd., Cuyahoga Falls, Ohio 44223, and Arthur T. Medkeff, 260 Fawnwood Dr., Tallmadge, Ohio 44278

Continuation-in-part of Ser. No. 390,094, Aug. 7, 1989, abandoned. This application Dec. 5, 1990, Ser. No. 622,427
Int. Cl.³ B23P 19/02

U.S. Cl. 29—235

7 Claims



1. Apparatus for forming a container assembly comprising an expandable plastic inner liner having an open end inside a heavy walled elastic sleeve, said apparatus comprising:

- a plurality of grip members, each having a friction surface arranged to contact and grip the outer surface of said elastic sleeve;
- a plurality of radially movable support members for said grip members, said support members being radially moveable toward and away from a common center, each of said support members having an inner end in proximity with said common center and an outer end remote from said common center, said grip members being pivotally mounted on said support members at the inner ends thereof;
- an axially movable arbor on which said plastic inner liner can be placed;
- means for axially moving said arbor and a plastic inner liner placed thereon relative to said elastic sleeve and for inserting said inner liner into said sleeve while said sleeve is held by said grip members; and
- means for stripping the container assembly from said arbor, said means comprising a stripping sleeve slidable on said arbor and having an end portion adapted to engage the open end of said inner liner to restrain axial movement thereof, and means movable toward and away from said stripping sleeve for restraining axial movement of said stripping sleeve and said container assembly while said arbor is retracted.

5,084,954

QUICK CONNECTOR UNIVERSAL RELEASE TOOL

Gary Klinger, Allen Park, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 19, 1990, Ser. No. 629,933

Int. Cl.³ F16L 35/00

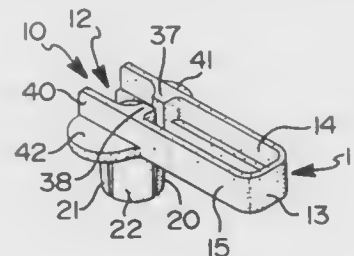
U.S. Cl. 29—237

22 Claims

1. A tool adapted for releasing male fittings from mating female connectors coupled together by a retaining element, said tool comprising:

- an elongated handle,
- a bifurcated body including first and second complementary body halves resiliently carried by said handle; and
- at least one finger member extending from each body half, said finger members radially converging along their axial

length coaxing to define a radially compliant passageway operable, in application, to substantially conform to a



surface of said male fitting and to displace said retaining element to release said fitting from said connector;

5,084,955

METHOD FOR MANUFACTURING A SUPERCONDUCTING MAGNET

Akinori Yamasaki, Akihiro Harada, and Teruo Miyamoto, all of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

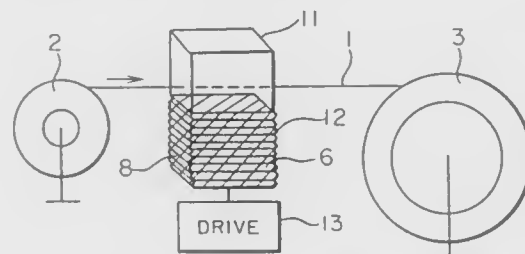
Filed Oct. 13, 1987, Ser. No. 107,049

Claims priority, application Japan, Oct. 16, 1986, 61-244198

Int. Cl.³ H01L 39/24

U.S. Cl. 29—599

6 Claims



1. A method for manufacturing a superconducting magnet comprising the steps of:
 - preparing a bath of a resin;
 - containing said bath of bonding agent resin within a vessel having a flexible bellows portion;
 - applying the resin directly on a length of a superconductor by passing the superconductor through the bath of said resin while said superconductor is simultaneously wound to form a winding;
 - raising and lowering the surface of the bath by expanding and contracting the bellows portion of the vessel to facilitate the passing of said superconductor through said bath and the application of said resin to said superconductor; and
 - hardening said resin on said superconductor to form a rigid winding wherein hardened resin is present between coils of said rigid winding.

5,084,956

METHOD OF MAKING AN OIL DASHPOT IN AN ELECTROMAGNETIC TRIPPING APPARATUS

Shigemasa Saito, and Hisashi Fujitaka, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Nov. 20, 1990, Ser. No. 615,967

Claims priority, application Japan, Nov. 20, 1989, 1-301547; Nov. 20, 1989, 1-301548

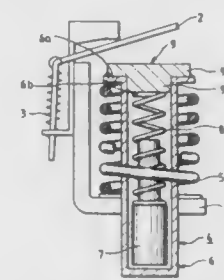
Int. Cl.³ H01F 7/16

U.S. Cl. 29—602.1

8 Claims

1. A method of producing an oil dashpot in an electromagnetic tripping apparatus comprising a cylinder having a body portion and a flange portion and a pole piece having a first diameter and a second diameter portion, comprising the steps:

fitting the pole piece onto the cylinder such that the first diameter portion is placed within an opening in the body portion of the cylinder and the second diameter portion abuts the flange portion of the cylinder to form a junction; pressing the pole piece against the cylinder such that a pre-



determined force is applied to the junction between the second diameter portion and the flange portion; heating the junction by a predetermined temperature such that interdiffusion occurs between the second diameter portion and the flange portion, whereby the cylinder is sealed.

5,084,957

METHOD FOR ALIGNING THIN FILM HEAD POLE TIPS

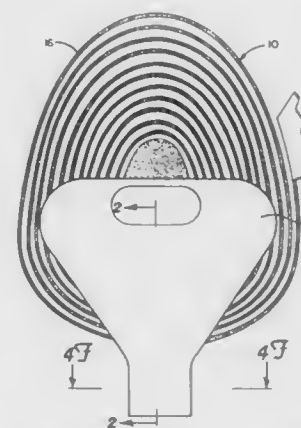
Nurul Amin, Burnsville; John Bortins, Bloomington; Beat G. Keel, Prior Lake, and Ying D. Yan, Burnsville, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 6, 1990, Ser. No. 609,921

Int. Cl.³ G11B 5/42

U.S. Cl. 29—603

20 Claims



1. A method of manufacturing a thin film magnetic head comprising:
 - depositing an elongated bottom pole layer having a gap face and side edges over a substrate, the gap face for magnetically coupling with a magnetic storage medium;
 - depositing a sacrificial layer having side edges over the bottom pole layer, wherein the side edges are in substantial alignment with the side edges of the bottom pole layer;
 - depositing an encapsulation layer over the sacrificial layer and the substrate;
 - removing the sacrificial layer and a portion of the encapsulation layer to form first and second dams from the encapsulation layer having edges, wherein the edges of the first and second dams are in substantial alignment with the side edges of the bottom pole layer; and
 - depositing an elongated upper pole layer having a gap face and side edges between the edges of the first and second dams and over the bottom pole layer, the gap face for magnetically coupling with a magnetic storage medium, wherein the side edges of the upper pole layer are in substantial alignment with the side edges of the bottom

pole layer and are defined by the edges of the first and second dams.

5,084,958

METHOD OF MAKING CONDUCTIVE FILM MAGNETIC COMPONENTS

Alexander J. Yerman, Scotia, N.Y., and Khai D. Ngo, Gainesville, Fla., assignors to General Electric Company, Schenectady, N.Y.

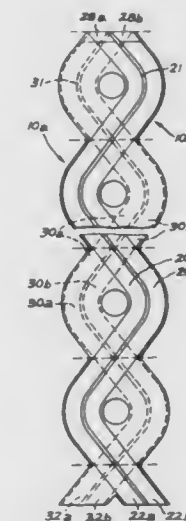
Division of Ser. No. 359,063, May 30, 1989, Pat. No. 5,017,902.

This application Jan. 25, 1991, Ser. No. 645,758

Int. Cl.³ H01F 41/02

U.S. Cl. 29—606

3 Claims



1. A method of making a conductive film magnetic component, comprising:
 - providing a primary conductive film having first and second major surfaces, said primary conductive film having a generally serpentine configuration when disposed in a plane;
 - folding said primary conductive film in an accordion manner to form a stack of layers having an axis extending at an angle thereto, said primary conductive film thereby comprising a primary winding encircling said axis in a manner to provide a plurality of winding turns with the winding turn connections being integral with said primary conductive film;
 - disposing a dielectric material between adjacent layers of said stack, said dielectric material comprising a dielectric membrane having first and second major surfaces, the first major surface of said primary conductive film being in contact with the first major surface of said dielectric membrane;
 - providing a plurality of separate secondary conductive films, each of said secondary conductive films being disposed on a secondary dielectric membrane;
 - interleaving said secondary conductive films with the layers of said stack so that said secondary conductive films are insulated from said primary winding; and
 - electrically connecting said secondary films together to form a secondary winding.

5,084,959

CHIP MOUNTING APPARATUS

Tateo Ando, Osaka, and Akira Kabeshita, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

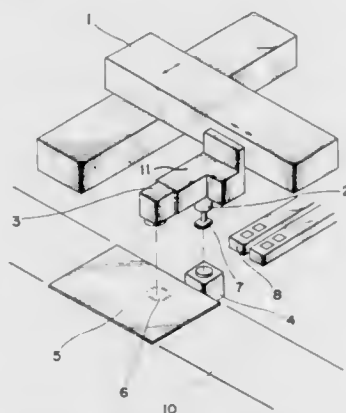
Filed Sep. 14, 1990, Ser. No. 582,613

Claims priority, application Japan, Sep. 19, 1989, 1-243717

Int. Cl.⁵ B23P 19/00

U.S. Cl. 29—740

2 Claims



1. A chip mounting apparatus comprising: an X-Y robot having an arm member which is movable in X and Y directions relative to a mounting position of the X-Y robot;
 - a chip mounting head and a substrate position recognizing camera respectively fixed to the arm member of the X-Y robot;
 - a substrate holding member for holding a chip mounting substrate, the substrate holding member being disposed such that a chip mounting position of the chip mounting substrate is spaced from and opposed to the substrate position recognizing camera; and
 - a chip position recognizing camera disposed spaced from and opposed to the chip mounting head,
- wherein a positional relationship between the chip mounting head and the substrate position recognizing camera is equivalent to a positional relationship between the chip mounting position of the chip mounting substrate and the chip position recognizing camera, wherein the chip mounting head is in a field of view of the chip position recognizing camera at the same time the chip mounting position of the chip mounting substrate is in a field of view of the substrate position recognizing camera.

5,084,960

APPARATUS FOR TERMINATING WIRES TO TERMINALS

Michael A. Yeomans, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 24, 1991, Ser. No. 647,115

Int. Cl.⁵ H01R 43/04

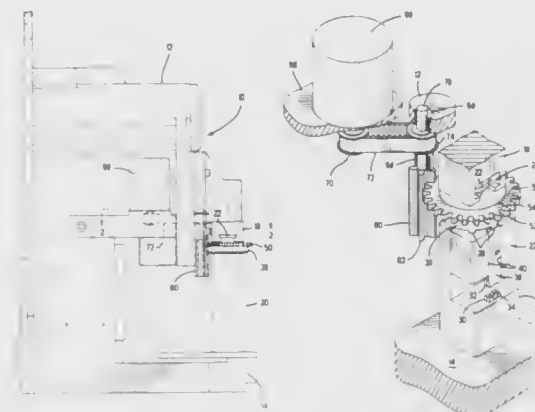
U.S. Cl. 29—753

5 Claims

1. In an automated machine for terminating a terminal to an insulated wire wherein said terminating includes crimping a portion of said terminal to the conductor of said wire and crimping another portion of said terminal to the insulation of said wire, said automated machine including a press having a base upon which an applicator is positioned, and a ram arranged for reciprocating motion toward and away from said base, said ram being operationally coupled to said applicator for effecting said crimping of both said portion and said another portion of said terminal, said applicator being arranged to crimp both said portions of said terminal, said applicator having an operable control for adjusting the insulation crimp height of said another portion of said terminal, said operable

control arranged to undergo reciprocating motion in concern with said ram,

means for automatically setting said operable control of said applicator to a desired insulation crimp height comprising: (a) an actuator;



- (b) coupling means for drivingly coupling said actuator to said operable control for effecting said adjusting;
- (c) controller means for determining the desired insulation crimp height and for causing said actuator to effect said automatic adjusting of said operable control to said desired insulation crimp height.

5,084,961

METHOD OF MOUNTING CIRCUIT ON SUBSTRATE AND CIRCUIT SUBSTRATE FOR USE IN THE METHOD

Minoru Yoshikawa, Tokyo, Japan, assignor to Micro Gijutsu Kenkyujo Co., Ltd., Tokyo, Japan

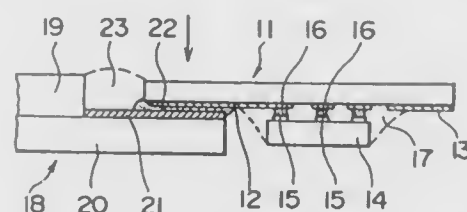
Filed Mar. 15, 1991, Ser. No. 669,910

Claims priority, application Japan, Apr. 9, 1990, 2-92186; Feb. 15, 1991, 3-42433

Int. Cl.⁵ H05K 3/34

U.S. Cl. 29—840

10 Claims



1. A method of mounting a circuit on the margin of a substrate with an electrode pattern having a pectinate marginal electrode, comprising the steps of: forming a circuit pattern, including a pectinate connecting electrode having the same pitch interval as that of said pectinate marginal electrode of said substrate, on a stick circuit substrate having the same coefficient of thermal expansion as that of said substrate and extending in the lateral or longitudinal direction of the margin of said substrate; directly mounting the necessary number of circuits on said circuit substrate; and electrically connecting said pectinate marginal electrode of said substrate and said pectinate electrode of said circuit substrate opposite thereto.

5,084,962

APPARATUS FOR AND METHOD OF AUTOMATICALLY MOUNTING ELECTRONIC COMPONENT ON PRINTED CIRCUIT BOARD

Kuniaki Takahashi; Koji Kudo; Shinichi Araya, and Hitoshi Nakayama, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

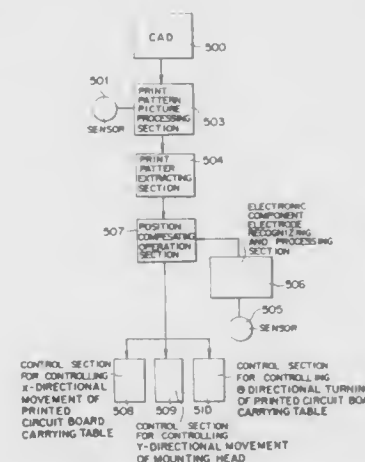
Filed Aug. 24, 1989, Ser. No. 398,514

Claims priority, application Japan, Aug. 24, 1988, 63-111023[U]; Oct. 7, 1988, 63-131517[U]; Oct. 8, 1988, 63-252926; Oct. 8, 1988, 63-252927; Oct. 8, 1988, 63-252928; Oct. 17, 1988, 63-135132[U]; Dec. 9, 1988, 63-160084[U]; Dec. 9, 1988, 63-160085[U]; Jan. 20, 1989, 64-5309[U]; Feb. 3, 1989, 1-24958

Int. Cl.⁵ H05K 3/30; B23P 19/00

U.S. Cl. 29—833

23 Claims



1. An automatic electronic component mounting apparatus comprising: at least one electronic component supply mechanism for supplying an electronic component to a predetermined position; at least one mounting head; first driving means for moving said at least one mounting head in a Y direction; a frame, and second driving means for moving said frame in an X direction, said frame being located in a Y directional position; a support base supported to said frame and projecting horizontally from said frame; table means for carrying a printed circuit board thereon and third driving means for turning said table means in a θ direction, said table means being rotatably supported to said support base of said frame, so that said table means is located in the Y directional position, and when said frame is moved in the X direction by said second driving means, said table means is also moved in the X direction; and controlling means for controlling an actuation of said first, second and third driving means as required, thereby controlling the Y directional position of said at least one mounting head, the X directional position of said table means supported to said support base of said frame, and a θ directional position of said table means; said controlling means being electrically connected to said first, second and third driving means; said at least one mounting head being adapted to hold an electronic component at said predetermined position to be moved in the Y direction by said first driving means to mount the electronic component on said printed circuit board.
15. A method of mounting electronic components on a printed circuit board, comprising the steps of: preparing an electronic component supply unit including a plurality of parts feeders; preparing a plurality of mounting heads for holding electronic components supplied from said supply unit to mount the electronic components in a plurality of elec-

tronic component mounting positions of a printed circuit board, said mounting heads being adapted to be moved in a Y direction separately;

preparing a printed circuit board supporting mechanism for supporting said printed circuit board, said printed circuit board supporting mechanism being adapted to be moved in an X direction perpendicular to the Y direction;

taking into consideration positions of components in the electronic component supply unit, the condition of actuation of each mounting head and electronic component mounting positions of a printed circuit board to firstly select one of electronic components which is regarded as that having the least idle waiting time with reference to the mounting heads, to mount the electronic component on the printed circuit board; and

next selecting one of the remaining electronic components in order which is regarded as that having the least idle waiting time with reference to the mounting heads, to mount the electronic component on the printed circuit board.

5,084,963

PRECONNECTION DEFORMING DIE AND METHOD OF CONNECTING A GROUNDING ROD WITH AN ELECTRICAL CABLE

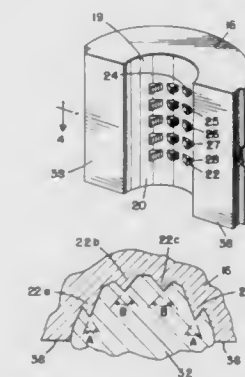
Thomas C. Murray, Aurora, and Kevin J. Flynn, Burlington, both of Canada, assignors to Burndy Corporation, Norwalk, Conn.

Filed Sep. 28, 1990, Ser. No. 589,872

Int. Cl.⁵ H01R 43/042; B21D 37/00; B23P 11/00

U.S. Cl. 29—863

15 Claims



1. A method of forming a mechanical and electrical connection between a grounding rod and an electrical cable, the method comprising: indenting an exterior surface of the rod by use of a hydraulic compression tool having U-shaped dies with tooth-like protuberances to form tooth-like indentations on the rod exterior surface, the tooth-like protuberances having at least two different types of protuberances of dissimilar shapes to form different types of tooth-like indentations; positioning a connector over the rod at the indentations; and compressing the connector onto the rod at the indentations, the connector deforming, at least partially, into the different types of tooth-like indentations to thereby provide an interlocking engagement between the connector and the rod.
6. A U-shaped indenting die for use with a cooperating die in a hydraulic compression tool for forming indentations in a grounding rod, the die comprising: an outer face suitably sized and shaped to be received in a jaw of the hydraulic compression tool; and an inner face forming a general recess and forming the U-shape configuration of the indenting die and having a plurality of series of individual tooth-like projections projecting into the recess, the projections including at least two different types of projections of dissimilar

shapes, such that the grounding rod can be indented by the die to form a plurality of series of individual tooth-like indentations of dissimilar shapes on an exterior surface of the rod and a connector can be compressed onto the rod with portions of the connector being deformed into the individual indentations in each series to fixedly connect the connector to the rod.

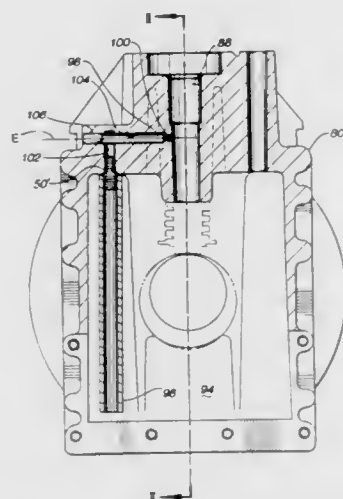
5,084,964

ALUMINUM DIE CASTING

Norman A. Cyphers, Rogers, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.
Division of Ser. No. 385,035, Jul. 28, 1989, abandoned, and a continuation-in-part of Ser. No. 566,326, Aug. 8, 1990, Pat. No. 5,059,099. This application Sep. 28, 1990, Ser. No. 589,818
Int. Cl.³ B23P 15/00

U.S. Cl. 29—888.02

26 Claims



19. A method of forming an integral hard working surface on an aluminum die casting comprising only the steps of: die casting an aluminum workpiece to near net shape, such that said aluminum workpiece is intrinsically thereby formed with a relatively thin surface region of increased hardness, wear resistance and non-porosity relative to a softer, less wear resistant and more porous bulk region interior to said workpiece; and finish machining said workpiece to a net shape of desired configuration and finish, such that at least a portion of said relatively thin surface region remains in the aluminum workpiece as said integral hard working surface.

5,084,965

PROCESS TO CUT HOUR GLASS SCREWS

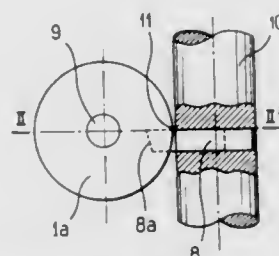
Bernard Zimmern, c/o SSCI 2 Reynolds St., East Norwalk, Conn. 06855

Filed Apr. 11, 1991, Ser. No. 683,874

Int. Cl.³ B23F 15/08

U.S. Cl. 29—889.23

4 Claims



1. Process to groove an hourglass screw consisting of the

steps of setting a screw blank on a first shaft, having a second shaft transverse to the first shaft, setting a tool inside the second shaft, setting expansion means inside said second shaft to locate the position of said tool, rotating the two shafts in a synchronized way, starting the grooving with the tool retracted in said second shaft, locking the tool to the second shaft at least while the tool is engaged inside the blank, actuating the expansion means to feed the tool out when the tool is out of engagement with the blank and unlocking at least partly the tool, at least when actuating the expansion means, and expanding the tool by a succession of sequences of locking, unlocking and expansion until full tool penetration in the screw is achieved.

5,084,966

METHOD OF MANUFACTURING HEAT PIPE SEMICONDUCTOR COOLING APPARATUS

Takashi Murase, Yokohama, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00145, § 371 Date Sep. 26, 1990, § 102(e) Date Sep. 26, 1990, PCT Pub. No. WO90/09036, PCT Pub. Date Aug. 9, 1990

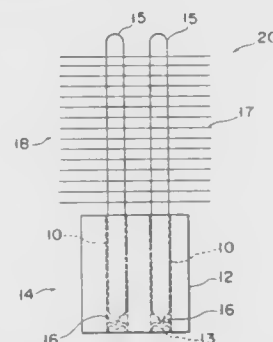
PCT Filed Feb. 6, 1990, Ser. No. 582,194

Claims priority, application Japan, Feb. 6, 1989, 1-27025

Int. Cl.³ F28F 3/04

U.S. Cl. 29—890.043

21 Claims



1. A method of manufacturing a heat pipe semiconductor cooling apparatus, comprising the steps of: forming at least one through hole in a metal elongated member, each said at least one through hole having first and second open ends; cutting said metal elongated member to have a predetermined length to obtain a metal block; providing at least one heat pipe, each said at least one heat pipe having a first and a second end portion; placing said metal block on a refractory flat plate to seal the first open end of said at least one through hole; inserting a low temperature solder and the first end portion of a respective at least one heat pipe in each of the at least one through holes; bonding said first end portion of the at least one heat pipe to the metal block by heating and melting the low temperature solder, thereby forming a heat-absorbing portion; and mounting fins on the second end portion of said at least one heat pipe to form a radiating portion.

5,084,967

DRY SHAVER WITH A TRIMMER

Hisao Nakagawa, Biwa; Shinsaku Yasunaka, and Masato Morita, both of Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

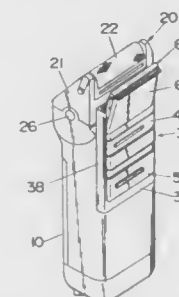
Filed Jul. 22, 1991, Ser. No. 733,993

Claims priority, application Japan, Jul. 31, 1990, 2-204319

Int. Cl.³ B26B 19/06

U.S. Cl. 30—34.1

5 Claims



1. In a dry shaver with a trimmer comprising: a housing mounting a main cutter at its upper end and having a vertically elongated front face; a slide handle slidably mounted on said front face of the housing; a trimmer plate carrying a trimmer cutter projecting forwardly from an upper end of said trimmer plate, said trimmer plate pivotally coupled at its lower end to said slide handle such that said trimmer plate is vertically movable together therewith on said front face between a lower inoperative position where it is kept in flat against said front face and an upper operative position where it is pivoted into an inclined condition with respect to said front face so as to project said trimmer cutter forwardly of said front face by a greater distance from said front face than at said lower inoperative position; said trimmer plate is characterized to be capable of moving toward said front face when it is in said upper operative position and is spring-biased toward into said inclined condition such that said trimmer plate is allowed to pivot toward said front face against the spring bias.

5,084,968

RAZOR BLADE ASSEMBLY

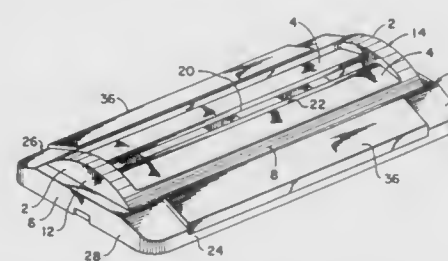
Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sep. 10, 1990, Ser. No. 579,838

Int. Cl.³ B26B 21/00, 21/14

U.S. Cl. 30—47

17 Claims



1. A razor blade assembly comprising a platform member including a first side wall, a second side wall, end walls interconnecting said first and second side walls, blade means mounted on said platform member, first connection means disposed on said platform member first and second side walls, and a frame member having first and second side walls interconnecting by end walls, said frame member being adapted to receive said platform member interiorly of the frame member, and second connection means disposed on said frame member first and second side walls and adapted to engage said platform member first connection means on said platform member first

and second side walls, respectively, to releasably connect said frame member first and second side walls to said platform member first and second side walls, respectively.

5,084,969

RAZOR HEAD OF A WET RAZOR

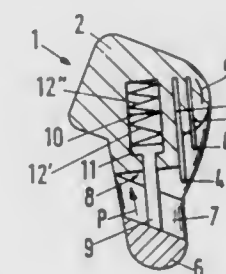
Wolfgang Althaus, Wuppertal, Fed. Rep. of Germany, assignor to Wilkinson Sword Gesellschaft mit Beschränkter Haftung, Solingen, Fed. Rep. of Germany

Filed Aug. 31, 1990, Ser. No. 577,255

Int. Cl.³ B26B 21/00

U.S. Cl. 30—79

15 Claims



1. In a razor head disposed at the front end of a handle of a wet razor, including a body in which is disposed a razor blade means in the form of a single or double razor blade having cutting edge means, with a guide strip that extends parallel to said cutting edge means being disposed in front of same, and with a protective cover being disposed behind said cutting edge means, the improvement wherein:

an adjustment mechanism is provided on which said guide strip, in a direction perpendicular to a lengthwise dimension of said guide strip, is disposed so as to be freely movable counter to a spring force that is effected by compound springs, each of which is a double spring that has a different spring constant and is operatively disposed between said body and said adjustment mechanism.

5,084,970

TUBE CUTTER

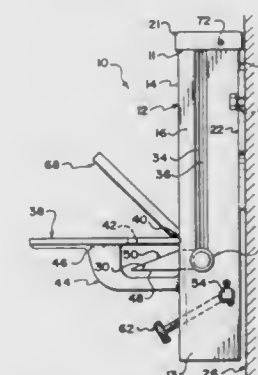
Manuel A. Garandel, 804 Jefferson Ave., Winnipeg, Manitoba, Canada R2V 0P9

Filed Nov. 2, 1990, Ser. No. 608,364

Int. Cl.³ B23D 21/06; B26B 27/00, 13/00, 11/00

U.S. Cl. 30—92

9 Claims



1. A method of cutting from a piece of tubing a portion of a predetermined length comprising mounting a support member on a fixed support so that the support member is held stationary, providing a first and a second abutment surface on the support member arranged such that in a cross section taken in a vertical plane the surfaces converge toward an apex and such that the piece can be moved to a location where the piece is contacted in said vertical plane at one point only by said first

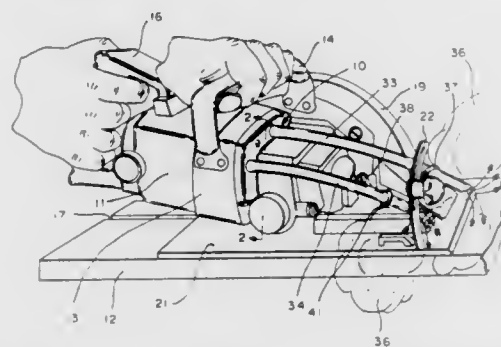
surface and at one point only by said second surface, providing a width of the first and second surfaces transversely of the vertical plane sufficient to hold a longitudinal axis of the tubing against twisting relative to the surfaces during cutting, providing a planar blade member projecting outwardly from said first surface in said vertical plane, said blade member having a pointed end thereof facing away from said first surface and a sharpened side edge thereof extending from the pointed end toward the first surface and facing away from the second surface, providing an end abutment member, moving the end abutment member to a position to locate one end face of the piece of tubing at a predetermined distance from the blade member, contacting the piece one the end abutment member, manually moving the piece in a direction transverse to the axis thereof toward the apex so that the pointed end punctures the tubing, and manually rotating the piece relative to the first and second surfaces about the axis of the piece while in contact with the first and second surfaces and the end abutment member to cause the sharpened side edge to cut the portion at said predetermined distance from the end face.

5,084,971

SAWDUST BLOWER ATTACHMENT FOR POWER SAWS
Mark A. Remington, 684 Frisco St., Half Moon Bay, Calif. 94019, and Ray K. Abrams, 524 Lakemead Way, Redwood City, Calif. 94062

Filed Sep. 12, 1990, Ser. No. 581,296
Int. Cl.⁵ B25F 3/00; B26B 25/00; B23B 51/06
U.S. Cl. 30—123

4 Claims



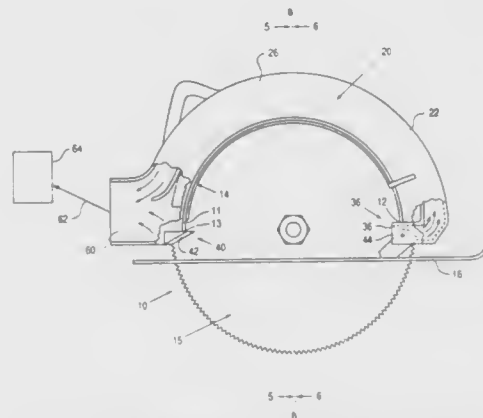
1. In a power saw having a housing encasing an electric motor with provisions for circulating air to cool the motor including an air exhaust from the housing, the motor driving a saw blade for cutting along a line, the improvement comprising a sawdust dispersion means mountable upon said housing, said dispersion means including an air plenum conformable to the housing along the margins surrounding such housing air exhaust and configured to receive substantially all of the air from the saw motor through such air exhaust, at least one conduit on said sawdust dispersion means connected to said plenum for receiving air therefrom, said conduit having smooth and continuous sidewalls extending from said plenum to an unobstructed distal end positioned adjacent to one side of the saw blade serving to provide an unobstructed flow of air from the plenum to proximate the cutting line when the saw blade engages the work, fastener means for mounting said plenum to said housing, and conduit positioning means equipped for mounting upon the saw housing, said conduit positioning means encircling said conduit and serving to locate the distal end of the conduit in a preselected position extending from the saw housing to discharge air adjacent to one side of the cutting line of the work being sawed.

5,084,972
DEVICE FOR COLLECTING DUST FROM A PORTABLE CIRCULAR SAW

Ricky L. Waugh, 292 Buddy La., Camby, Ind. 46113
Filed Jan. 25, 1991, Ser. No. 646,070
Int. Cl.⁵ B26D 7/18

U.S. Cl. 30—124

17 Claims



1. A device for attachment to an existing portable circular saw with a fixed upper blade guard having a front and rear terminus a top surface, an inside outer surface, and an outside outer surface extending between a front upper blade guard opening and a rear upper blade guard opening respectively defined by the front and rear terminus of the fixed upper blade guard, comprising:

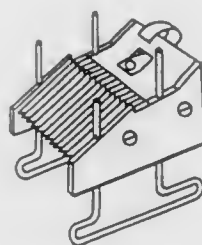
- a housing having a lower surface and a downwardly extending flange extending below said lower surface from a first side of said housing, said downwardly extending flange having an inside surface which with said lower surface defines a receiving channel designed and arranged to receive the fixed upper blade guard therein with said housing extending beyond the rear terminus of the fixed upper blade guard to define a rear end, and said lower surface defining a rear vacuum aperture located near the rear blade guard opening when the fixed upper blade guard is received within said receiving channel;
- a vacuum source connection means for connection to a vacuum source attached to said housing in fluid communication with said rear vacuum aperture;
- removable attachment means affixed to said housing for removably attaching said housing to the fixed upper blade guard.

5,084,973

ADJUSTABLE SPACER FOR HAIR CLIPPERS
Frederick J. Geer, 1045 Kentwood Cir., Charleston, S.C. 29412
Filed Feb. 14, 1990, Ser. No. 479,429
Int. Cl.⁵ B26B 19/20, 19/44

U.S. Cl. 30—133

9 Claims



1. An adjustable spacer for powered hair clippers adapted for the pneumatic removal of hair clippings comprising the degree of extension of each extension means from said brackets

being determined independently by a regulating means for maintaining a desired degree of extension and each extension means terminating in a foot for contacting the scalp, wherein said clippers are comprised of a cutting head and a housing, wherein each first and second extension means for adjustably spacing said clippers relative to a subjects scalp, said first extension means being attached to one side of said clippers by a first bracket, said second extension means being attached to another side of said clipper by a second bracket, bracket compresses a first channel and one of said extension means travels through said first channel, and wherein said regulating means comprises a series of notches along one side of each extension means against which may rest a locking pin held in place by pressure provided by a spring, which, in turn, is held in place by an adjustable screw for varying said pressure, said locking pin, spring, and screw lying within a second channel through said bracket wherein said second channel perpendicularly intersects said first channel and exits out a side edge of each bracket, permitting adjusting the degree of extension of each extension means beyond the cutting head of said clippers to predetermine the length of cut hair.

5,084,974

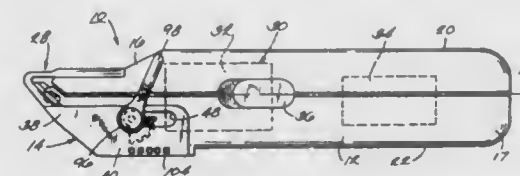
CLIPPER WITH LEVER ACTUATED ADJUSTABLE COMB

Daniel L. Sukow, Grafton; Daniel C. Quella, and Matthew L. Andis, both of Racine, all of Wis., assignors to Andis Company, Racine, Wis.

Filed Jan. 22, 1991, Ser. No. 643,340
Int. Cl.⁵ B26B 19/20

U.S. Cl. 30—201

19 Claims



6. A hair trimmer comprising a body having opposite ends and an axis extending between said ends, a pin extending outwardly from said body, and a comb engageable with said body and movable relative to said body along said axis and including means on said comb for engaging said pin to selectively permit and prevent removal of said comb from said body, said engaging means being movable relative to said comb along said axis, and means for selectively adjustably displacing said comb along said axis.

5,084,975

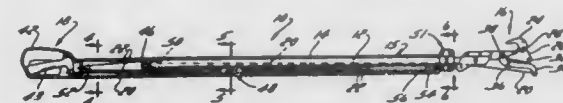
EXTENDABLE PRUNER

Craig H. Melter, Baraboo, Wis. assignor to Fiskars Oy Ab, Helsinki, Finland

Filed Jul. 5, 1991, Ser. No. 726,317
Int. Cl.⁵ B26B 13/00

U.S. Cl. 30—249

12 Claims



1. A portable extendable pruner for cutting limbs and branches, said pruner comprising:
a hollow elongate housing assembly including a pair of telescoping tubular sections;
a shears mounted on the outer end of one of said sections and an actuating means mounted on the outer end of the other of said sections;

a first cable mounted in said housing assembly for connecting said actuating means to said shears;
a second cable mounted in said housing assembly and having one end connected to said one of said sections and the other end connected to said other section; and a compensating pulley assembly connecting said second cable to said first cable for maintaining tension in said first cable when said sections are moved axially relative to each other to adjust the length of said housing assembly.

5,084,976

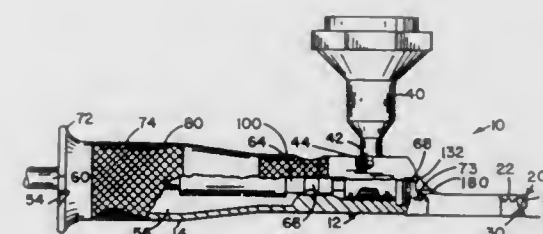
BONING KNIFE

Dale R. Ross, Rte. 4, Box 157AA, Council Bluffs, Iowa 51501
Continuation of Ser. No. 707,759, Mar. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 431,349, Mar. 23, 1983, abandoned. This application Jan. 18, 1989, Ser. No. 298,877

Int. Cl.⁵ B26B 7/00

U.S. Cl. 30—276

20 Claims



7. A boning knife comprising a hollow handle, a circular blade housing secured at one portion to and extending from the handle, and a circular blade carried by the housing for rotary movement relative to the housing, said handle having a rear gripping portion, the rearward terminal end of said handle having on its outer side an outwardly flared ridge which extends laterally of said handle from the exterior of said rear gripping portion from about 0.08 to about 0.375 inch.

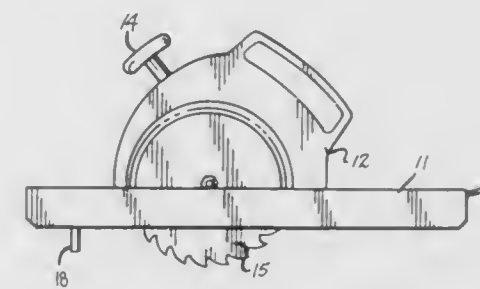
5,084,977

SAW GUIDE APPARATUS

Robert E. Perkins, 2 Kelly La., Pisgah Forest, N.C. 28768
Filed Mar. 22, 1991, Ser. No. 673,307
Int. Cl.⁵ B23D 51/02

U.S. Cl. 30—374

1 Claim



1. A saw guide apparatus comprising, in combination, a plate member, the plate member including a planar bottom surface, a forward edge and a rear edge, wherein the forward and rear edges are arranged in parallel relationship relative to one another, and a saw housing and drive mounted on the top surface of the plate member, with a rotary saw blade orthogonally projecting through the plate member extending downwardly from the top surface thereof in an orthogonal relationship relative to the forward edge and rear edge, and handle means mounted to the saw housing and drive for

directing the plate member and rotary saw across a workpiece, and
 guide means slidably mounted within the plate member spaced from the rotary saw blade, and
 wherein the guide means includes a dove tail groove coextensively directed through the plate member extending from the bottom surface of the plate member, with the dove tail groove arranged parallel to the rotary saw blade and spaced therefrom a predetermined spacing, and the guide means further including a guide member slidably received within the dove tail groove, wherein the guide member includes a "T" shaped projection slidably received within the dove tail groove, and the guide member including a guide plate orthogonally mounted to a forward terminal end of the guide member, with the guide plate extending downwardly to the bottom surface of the guide plate and spaced from the saw blade a further spacing less than the predetermined spacing, wherein the guide plate is arranged for abutment against a side edge of the workpiece to permit ripping of the workpiece, and wherein the guide member includes an arcuate handle extending rearwardly of the guide member spaced above a top surface of the plate member for enhanced ease of manual grasping and manipulation of the guide member, and
 wherein the dove tail groove includes a slot through the plate member oriented medially of the dove tail groove, and a support boss rotatably mounted within the guide member, with the boss including a threaded shaft extending through the slot, and a fastener member mounted to the threaded shaft overlying the top surface of the plate member to permit rotative adjustment of the support boss within the dove tail groove, and the support boss including an apertured projection extending downwardly from the support boss, and the guide plate including a top edge, and the top edge including a plurality of spaced ears receiving the projection therebetween, and an axle directed through the ears and the projection to pivotally mount the guide plate to the support boss, and spring means wound about the axle and positioned between a bottom surface of the support boss and the guide plate to bias the guide plate in an orthogonal relationship relative to the bottom surface of the plate member.

5,084,978

DENTAL SAW AND ABRASIVE TOOL

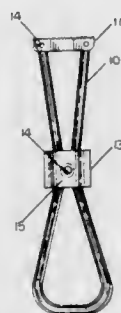
William D. McReynolds, 13661 A Ruelle Le Parc, Del Mar, Calif. 92014

Filed Sep. 19, 1990, Ser. No. 584,776

Int. Cl.⁵ B26B 1/00

U.S. Cl. 30—517

1 Claim



1. A dental saw and abrasive tool comprising a U shaped handle made of spring steel bent to form a pair of essentially parallel rods said rods having distal end portions bent forward to form a saw support;
 said distal end portion of said rods terminating in protruding circular pins of a reduced diameter to that of the rods; the parallel tool handle rods flared inwardly at approximately the vertical center of the handle;
 a thin, narrow, rectangular shaped saw blade with centered

mounting holes on each end affixed to the circular protruding pins with the saw teeth facing outwardly;
 the inherent spring forces of the rods providing a tension force to secure the saw blade to the tool handle; and
 the saw blade affixed to the ends of the tool handle rods by compressing the rod end inwardly to accommodate the mounting holes in the saw blade;
 the improvement comprises a finger receptacle formed of a U shaped cavity with vertical side walls and a horizontal top wall fixedly attached to the center of the parallel rods for accommodating the manipulation of the tool to achieve a better control of vertical and side pressure on the tool when it is held in an operator's hand.

5,084,979

FRONT AXLE TOE-IN PROCESS AND APPARATUS

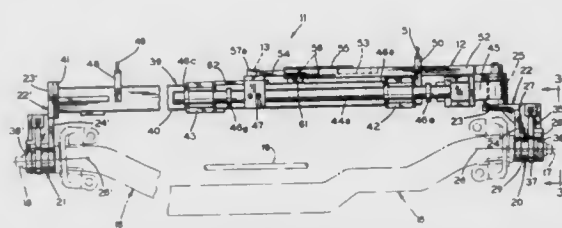
Paul L. Brosher, Hilliard; David R. LeBeau, Milford Center, both of Ohio, and Dallas Shuck, Fountain Hills, Ariz., assignors to Dana Corporation, Toledo, Ohio

Filed May 25, 1990, Ser. No. 529,135

Int. Cl.⁵ G01B 7/315

U.S. Cl. 33—193

17 Claims



1. An apparatus for indicating the toe-in setting of a pair of axle spindles on a vehicle front axle assembly comprising:
 a pair of clamps adapted to engage axle spindles, each of said clamps including a fixed jaw and a selectively moveable jaw for engaging and disengaging a spindle and an actuator connected to said moveable jaw for moving said moveable jaw toward and away from said fixed jaw;
 an elongated frame member having one of said clamps attached to an outer end thereof;
 a pivot bracket connected to said frame member and having the other one of said clamps pivotally attached thereto;
 an arc arm connected for co-rotation with said other clamp; and
 one of a position indicator and a position sensor mounted on said frame member and the other of said position indicator and said position sensor mounted on said arc arm whereby when said clamps engage a pair of axle spindles of a vehicle axle, a position of said position indicator with respect to said position sensor indicates a toe-in setting of the spindles.

5,084,980

LASER ALIGNMENT SYSTEM FOR WELL EQUIPMENT

Robert A. Skopec, Dallas; Douglas E. Jeffers, Midland, and Freddy W. Hagins, Stanton, all of Tex., assignors to Oryx Energy Co., Dallas and Diamant Boart Stratabit, Houston, both of, Tex.

Filed Aug. 13, 1990, Ser. No. 566,620

Int. Cl.⁵ G01D 21/00

U.S. Cl. 33—286

19 Claims



1. Apparatus for aligning on a common assembly axis a first

component member and a second component member of a well tool assembly to a known angular relationship comprising:

a laser for producing a beam of light;
 a mirror with a mark thereon;
 means for attaching the laser to the first member with said laser directed along the common axis and with a first reference mark on a radius from the common axis to said laser adapted for aligning the laser with respect to a reference mark on the first member; and
 means for attaching said mirror with mark thereon to the second member with said mirror perpendicular to the common axis adapted to reflect the beam of said laser and with a second reference mark on the radius from the common axis to said mark on said mirror adapted for aligning the mirror with respect to a reference mark on the second member.

5,084,981

PROBE HEAD

David R. McMurtry, Wotton-Under-Edge; Thomas B. Jarman, Cirencester, and Simon J. Bennett, Painswick, all of United Kingdom, assignors to Renishaw plc, Gloucestershire, United Kingdom

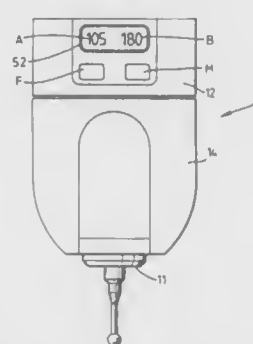
Filed Apr. 2, 1990, Ser. No. 502,870

Claims priority, application United Kingdom, Apr. 14, 1989, 8908537; Apr. 14, 1989, 8908538; Dec. 2, 1989, 8927312

Int. Cl.⁵ G01B 5/03

U.S. Cl. 33—556

22 Claims



1. A manually operable probe head for orienting a probe on the quill of a coordinate positioning machine comprising a support connectable to the quill; a rotor to which a probe is connectable; means providing rotation of said rotor relative to the support; indexing means providing a plurality of mechanically defined rest locations at discrete orientations of said rotor relative to said support; and indicating means, said indicating means comprising:
 a display provided on the probe head;
 generating means provided on the probe head for generating on said display a unique visual signal in respect of each said rest location;
 a memory provided on the probe head for storing data corresponding to at least one of said rest locations; and
 means provided on the probe head for indicating the relative position of the rotor and the support corresponding to a rest location which is stored in the memory.

5,084,982

COMBINED VERNIER GAUGE AND PROTRACTOR

Yee-Chang Feng, 2F., No. 166-5, Hsi Twen Road Sec. 3, Tai Chung City, Taiwan

Filed Oct. 10, 1990, Ser. No. 594,926

Claims priority, application Taiwan, Jun. 9, 1990, 79206290

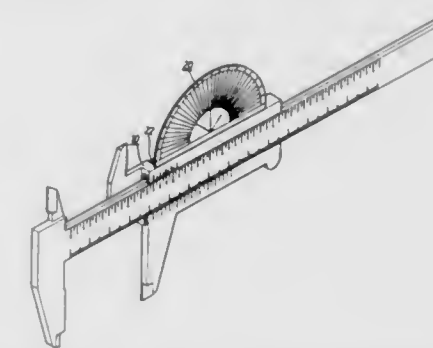
Int. Cl.⁵ G01B 5/14

U.S. Cl. 33—810

8 Claims

1. A combined vernier gauge and protractor comprising a primary member having thereon a regular scale, a secondary member slidably mounted on said primary member and having thereon a vernier scale capable of cooperating with said regu-

lar scale to enable said combined vernier scale and protractor to have a more accurate measurement, and a protractor having



a straight side portion, said straight side portion being pivotally mounted on said secondary member.

5,084,983

PRINTING PRESS PACKING GAUGE SUPPORT

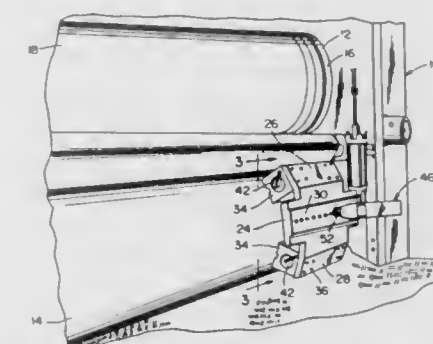
John D. Proffitt, 1436 River Rd., and Jerry D. Morrison, 114C Kraft Street, both of Clarksville, Tenn. 37040

Filed Jul. 16, 1990, Ser. No. 552,564

Int. Cl.⁵ G01B 3/22, 5/06

U.S. Cl. 33—834

12 Claims



1. A printing press packing gauge support for determining bearer surface height in relation to blanket surface height and to thereby check the "squeeze" between the plate of a plate cylinder and the blanket of a blanket cylinder, said gauge including an elongated base plate having opposite side longitudinal margins and opposite ends as well as inner and outer sides, said base plate including a row of a plurality of bores formed therethrough opening through said inner and outer sides and whose center lines are contained in the same plane, said longitudinal margins including opposite end pairs of abutment blocks supported therefrom at points spaced apart longitudinally along said margins and projecting inwardly of said inner side, said abutment blocks including outer surface portions disposed on a partial cylindrical path of predetermined radius of curvature for simultaneous seating engagement with a similar partial cylindrical area of the same radius of curvature, said row of bores including at least one end thereof projecting appreciably outwardly past the corresponding pair of abutment blocks, whereby said corresponding pair of abutment blocks may be engaged with circumferentially spaced blanket end portions and at least one bore at said one end of said row will be disposed over the corresponding blanket cylinder end bearer, said bores including outer ends opening through abutment portions of said outer side adapted to be engaged by an abutment member of a probe equipped indicator and disposed identical radial plane distances outward from the center axis of a cylindrical surface with which said outer surface portions are abutted.

5,084,984

NAIL-DRYER

Christian Duchoud, Marigny Saint Marcel, and Serge Brie, Bloye, both of France, assignors to Yves Saint Laurent Parfums, Neuilly Sur Seine, France

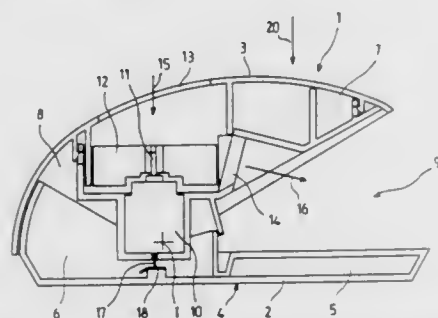
Filed Jul. 24, 1991, Ser. No. 735,257

Claims priority, application France, Jul. 31, 1990, 90 10008

Int. Cl.⁵ F26B 19/00

U.S. Cl. 34—48

9 Claims



1. Nail-dryer comprising a hollow body (1) in which are mounted:

fan blades (12) coupled to the end of the shaft (11) of an electric motor (10);
an independent electric power supply;
means of electrical connection (17, 18) for the electrical connection of the said motor (10) to the said independent electric power supply;
an air inlet (13) for admitting air sucked in by the blades (12);
an air outlet (14) providing an exit for the air driven by the blades (12) and directed towards a drying zone (9) intended to receive the fingertips or ends of toes of the user, characterised in that:

the hollow body (1) is in two parts hinged to each other, namely a base (2) and a cover (3),
the base (2) is shaped in such a way as to rest on a support, the cover (3) covers at least part of the base (2),
the cover (3) is hinged to the base along a transverse axis (1—1) allowing it to pivot so as to accommodate at least one open position in which the cover (3) allows access to a drying zone (9) located between the base (2) and the cover (3), and a closed position in which the cover (3) covers the base (2) and the said drying zone (9),
means of electrical connection, comprising means for switching (17, 18) connected in series between the independent power supply and the motor (10), are actuated by the cover (3) so as to establish the electrical connection and supply the motor (10) when the cover (3) is tipped into the open position, and so as to break the electrical connection and cut off the power supply to the motor (10) when the cover (3) is tipped into the closed position.

5,084,985

DRYING SECTION IN A PAPER OR BOARD MACHINE AND METHOD FOR GUIDING A WEB THEREIN

Jouko Ventola, Inkeroinen, Finland, assignor to Oy Tampella Ab, Tampere, Finland

Filed Jan. 23, 1989, Ser. No. 299,501

Claims priority, application Finland, Jan. 22, 1988, 880277

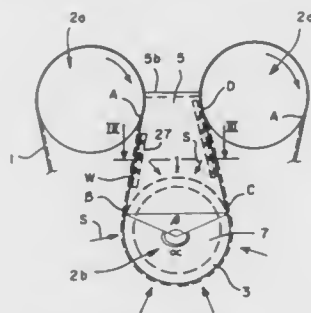
Int. Cl.⁵ F26B 5/00

U.S. Cl. 34—115

14 Claims

1. A drying section in a paper or board machine, wherein a web travels in a meander-like fashion around drying cylinders and which is provided with suction ducts for delivering web run stabilizing suction into the drying section, said drying section including a space formed at at least one of the cylinders by a meander-like travelling of said web, said space being confined in a direction perpendicular to the axis of rotation of the cylinders by the run of the web unsupported by a cylinder jacket and arriving at a cylinder, by the jacket of said cylinder unoccupied by the run of the web, and by the run of the web

unsupported by said cylinder jacket and departing from said cylinder, said cylinder including a hollow interior communicating with a suction means for delivering suction into the interior of said cylinder, connected to said suction duct at the cylinder gable, and a jacket surrounding said interior, said



jacket being provided with flow paths in the direction of the axis of rotation of said cylinder along the entire length of said jacket, said flow paths delivering said said cylinder both in a sector in which the web runs around said jacket of said cylinder and in a sector in which said jacket of said cylinder is unoccupied by the run of the web.

5,084,986

DISPOSABLE WARMER HOLDER

Akio Usui, Tochigi, Japan, assignor to Mycoal Warmers Company Limited, Tochigi, Japan

Continuation of Ser. No. 287,736, Dec. 21, 1988, abandoned.

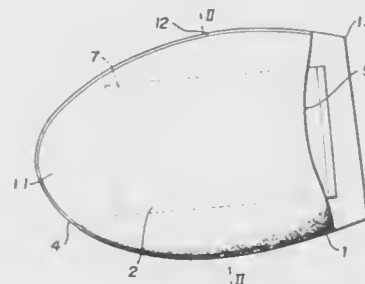
This application Jan. 2, 1991, Ser. No. 635,815

Claims priority, application Japan, Dec. 22, 1987, 62-322689; Nov. 14, 1988, 63-285901

Int. Cl.⁵ A61F 7/08; A43B 7/02, 7/04

U.S. Cl. 36—2.6

8 Claims



1. A half-size holder for a disposable warmer for a shoe, and which is substantially immovable in a shoe, the holder comprising:

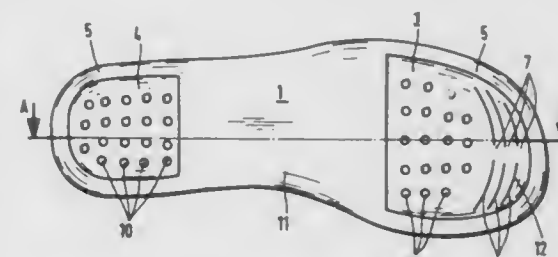
a permeable base member which has a length of about one-half the length of a shoe in which it is to be used, said length of said base member extending from a toe portion of said base member to a rear end portion of said base member, said base member having a widest part intermediate said toe portion and said rear end portion, said rear end portion of said base member being situated at a substantially mid-position between said widest part of said base member and a heel of a shoe;
a permeable closure member mounted on said base member so as to overlap said base member, said closure member being joined to said base member along peripheral edges thereof, leaving an inlet-and-outlet opening at the rear end portion of said holder for receiving a disposable warmer through said opening and for permitting insertion and removal of said disposable warmer through said opening; said holder being substantially flat and generally in the shape of a forward or toe portion of a shoe, and said holder being mountable to a sole portion of a shoe at a forward

portion of the shoe without extending to the heel portion of the shoe, with the widest intermediate part of said base member being arranged so as to be in substantially a widest part of the forward or toe portion of a shoe;

said base member comprising a fabric material layer, and a net member made of plastic material mounted thereon and interposed between said fabric material layer and said closure member, said net member having an irregular construction defining an unevenness along its thickness direction to define spaces so that said said base member and said net member hold much air, said net member defining an uneven horizontal surface;

said base member and said closure member having permeability values which are different from each other; and said holder having reversible means for providing different heating values to a wearer's foot, said reversible means comprising the holder which is flippable wherein said base member and said closure member have different permeability values.

least over approximately the front third of the outsole and wherein a front part of the transparent area is provided with



calibrated markings serving as a means for indicating proper shoe fit.

5,084,989

MOBILE BALLAST PLOW

Josef Theurer, Vienna, and Herbert Wörgötter, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

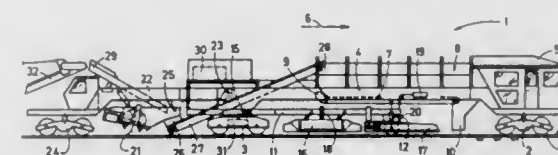
Filed Mar. 8, 1991, Ser. No. 666,723

Claims priority, application Austria, Mar. 21, 1990, A 669/90

Int. Cl.⁵ E02F 5/22

U.S. Cl. 37—104

6 Claims



1. A mobile machine for distributing and shaping ballast supporting a railroad track extending in a longitudinal direction, which comprises

(a) a machine frame supported by two undercarriages for mobility on the track in an operating direction,
(b) a ballast plow carrier frame arranged below the machine frame between the undercarriages and extending in the longitudinal direction, the carrier frame having one end linked to the machine frame and an opposite end supported by an undercarriage for mobility on the track, and
(c) a ballast plow vertically adjustably mounted on the carrier frame.

5,084,990

DRAGLINE BUCKET AND METHOD OF OPERATING THE SAME

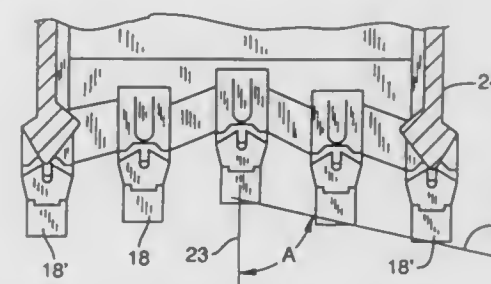
Terry L. Briscoe, Portland, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Aug. 6, 1990, Ser. No. 563,393

Int. Cl.⁵ E02F 3/46

U.S. Cl. 37—116

17 Claims



1. A method of operating a dragline bucket comprising: providing a bucket having a body defining side, rear and

5,084,988

SHOE, ESPECIALLY A CHILDREN'S SHOE WITH A TRANSPARENT SOLE AREA

Christoph Berger, Egloffstein, Fed. Rep. of Germany, assignor to Puma AG Rudolf Dassler Sport, Fed. Rep. of Germany

Filed Apr. 13, 1990, Ser. No. 503,615

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 8904652

Int. Cl.⁵ A43B 3/30, 13/12

U.S. Cl. 36—112

20 Claims

1. A shoe comprising an outsole and an upper, especially a children's shoe, with a front transparent area making possible an unobstructed view of the inside of the shoe, wherein the transparent area is formed within the outsole and extends at

bottom walls and an open front, said bucket defining a centerline between said side walls, said bottom wall terminating in a forward lip having a generally V-shaped configuration and equipped with excavating teeth, said teeth thereon being laterally spaced apart to define a gap between each pair of adjacent teeth and arranged to project successively forward in proceeding from the longitudinal centerline of said bucket toward said sidewalls; providing dragline, hoist line and dump line interconnected between said body and a prime mover; exerting a continuous pulling force on said dragline disposed substantially on said centerline of said bucket to drag the bucket over a material such that said spaced teeth engage and disrupt the material and stably hold the bucket against lateral turning to effectively collect the material in the bucket; and hoisting and dumping said bucket when the bucket is loaded.

5,084,991

PIPELINE PADDING APPARATUS AND METHOD

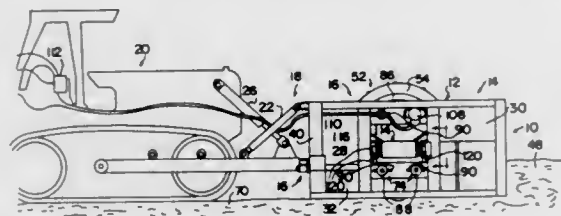
Thomas J. Cronk, Jr., P.O. Box 11189, Odessa, Tex. 79760

Filed Sep. 6, 1990, Ser. No. 579,077

Int. Cl.⁵ E02F 5/22; B07B 1/22, 1/42

U.S. Cl. 37—142.5

13 Claims



1. Pipe padding apparatus, comprising a box-like frame adapted to be moved along a row of excavated material along the side of a ditch in which a pipeline has been laid by a vehicle traveling along the same side of the ditch, said frame having side walls with openings therein and an open front to receive at least a portion of the excavated material as the frame is moved therealong, a generally cylindrically shaped, open ended, hollow drum, means supporting the drum between and from the side walls of the frame for rotation about an axis transverse to the row of excavated material, means for rotating the drum to cause the bottom thereof to move in the direction of travel of the frame, said drum having means thereabout for lifting excavated material which is received through said open front as the drum is so rotated, and means for screening coarse particles from the fines within the material which is lifted to the top of the drum and allowing the fines to fall into the hollow drum, and conveyor means mounted on the frame and extending in a direction generally parallel to the axis of rotation of the drum and through the open ends of the drum and the openings in the side walls of the frame so as to receive the fines as they fall into the drum and convey them into the ditch, said frame having a rear end which is open at least at the bottom portion thereof to permit the coarse particles to pass therethrough.

5,084,992

SNOW TILLER WITH COMPACTOR PAN

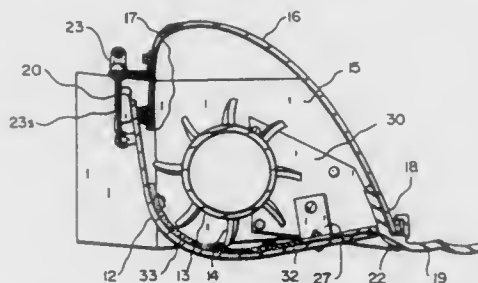
William B. Sinykin, Logan; Mark A. Benson, Wellsville, and Scott J. Hales, Logan, all of Utah, assignors to Logan Manufacturing Company, Logan, Utah

Filed Apr. 22, 1991, Ser. No. 688,899

Int. Cl.⁵ E01H 5/04, 4/00

U.S. Cl. 37—222

10 Claims



1. A vehicle-drawn snow grooming device for conditioning a path of snow for skiing, said device comprising: a snow tilling apparatus including an elongate tiller frame, an elongate snow cutter bar assembly secured rotatably to the frame and having a multiplicity of outstanding snow cutting teeth, power means to selectively power the cutter bar assembly when desired during operation of the grooming device, and a snow directing apron mounted upon the frame extending over the full length of the cutter bar assembly laterally thereto and the full length thereof, said snow directing apron having a leading edge forward of the cutter bar assembly and a horizontal trailing edge rearward thereof; and an elongate snow compacting member extending the full length of the apron and positioned to span the entire distance from the leading edge of the apron to the trailing edge thereof, said compacting member extending below the cutter bar assembly, so as to bear downwardly upon the snow; and releasable attaching means for selectively securing the snow compacting member in said position upon the snow tilling apparatus, so that the snow grooming device may be used selectively to till or to compact the snow of the path.

5,084,993

WORKSHEET AND SUPPORT FRAME APPARATUS

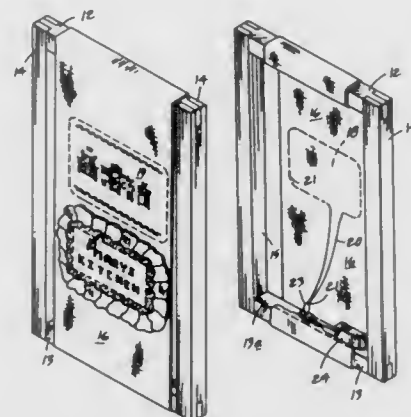
Mary L. Dahlheimer, Box 10116, Apo, N.Y. 09012

Filed Oct. 15, 1990, Ser. No. 597,543

Int. Cl.⁵ G09F 13/00; D06C 3/08

U.S. Cl. 40—547

4 Claims



1. A worksheet and support frame apparatus comprising, in combination, an elongate frame member, the frame member including a

top horizontal frame leg spaced from and parallel bottom horizontal frame leg, the top and bottom frame legs coextensively aligned relative to one another, and a first vertical frame-leg and a second vertical frame leg, each arranged parallel relative to one another and fixedly mounted to the top and bottom horizontal frame legs to define a rectangular configuration, and the bottom horizontal frame leg including a bottom horizontal surface positioned interiorly within the frame member in confronting relationship to a top horizontal surface of the top horizontal frame leg, and a fabric worksheet, including a lower terminal end and an upper terminal end, with the lower terminal end fixedly mounted to the bottom horizontal surface and the upper terminal end fixedly mounted to the top horizontal surface, with the fabric worksheet mounted to an exterior surface of the top and bottom horizontal frame and stretched therebetween, and at least one stitched pattern formed on an exterior surface of the fabric worksheet between the top and bottom horizontal frame leg, and including a continuous scalloped and ruffled trim web mounted to the frame member, and wherein the trim web is mounted to a rear surface of the frame member, and including a continuous fiber optic cable mounted to a rear surface of the fabric worksheet, the fiber optic cable including a fiber optic cable framework mounted to the rear surface of the worksheet in surrounding relationship to the stitched pattern, and the fiber optic cable joined at a junction, and an illumination source positioned in contiguous relationship relative to the junction including power means to effect selective illumination of the illumination source.

5,084,994

ADJUSTABLE VEHICLE-MOUNTED ADVERTISING SIGNS AND METHOD

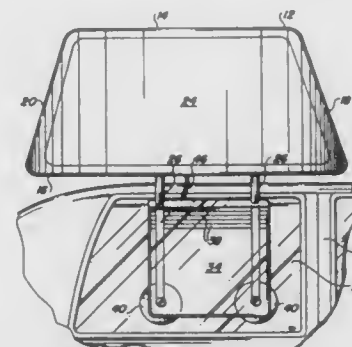
William A. Elmer, 1010 Temple Grove Ct., Winter Park, Fla. 32789

Filed Jul. 2, 1990, Ser. No. 546,714

Int. Cl.⁵ G09F 21/04

U.S. Cl. 40—591

17 Claims



1. Apparatus for displaying an advertisement above the roof of a vehicle, comprising: a vehicle having a wide window which extends generally vertically and approximately parallel to the direction of vehicle travel; an aerodynamic member having a leading edge, a trailing edge and side surfaces between the edges, the member having a longitudinal dimension between the edges and lateral dimensions between the side surfaces, the longitudinal dimension being substantially greater than the lateral dimensions; means including an upstanding race means for releasably attaching the aerodynamic member to the vehicle window with the side surfaces extending generally vertically, the attaching means including a window mount having a

portion dimensioned to pass across the top and engage the vehicle window; the upstanding brace mean rigidly joined with the window mounted at spaced points and joined with the aerodynamic member at spaced point, so as to prevent rotation of the aerodynamic member and maintain the longitudinal dimension extending in a direction generally parallel with the direction of vehicle travel; and wherein at least one of the side surfaces defines an area to which an advertising medium can be affixed.

5,084,995

FISHING JIGGING APPARATUS

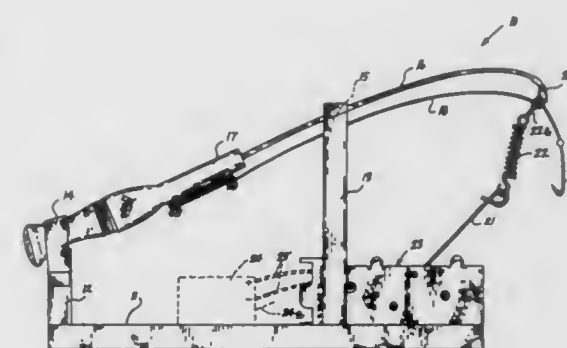
Arthur W. Beaudoin, 901 N. Jefferson St., Palmyra, Wis. 53156

Filed Dec. 24, 1990, Ser. No. 634,746

Int. Cl.⁵ A01K 89/00

U.S. Cl. 43—26.1

5 Claims



1. A fish jigging apparatus comprising, in combination, an elongate planar support base, the support base including a rear support fixedly and orthogonally mounted to a top surface of the support base, and a forward support spaced from and parallel to the rear support integrally and orthogonally mounted to the top surface of the support base, and a fishing pole organization including a fishing pole handle and a fishing pole body member, with the fishing pole handle mounted to an upper terminal end of the rear support and the fishing pole body member mounted to an upper terminal end of the forward support, and an outer eyelet mounted to an outer terminal end of the fishing pole body member remote from the fishing pole handle, and a fishing line directed from the fishing pole handle through the outer eyelet, and a fishing hook mounted to a free terminal end of the fishing pole line arranged for reciprocation, and a drive housing mounted to the top surface of the support base, the drive housing including a drive motor, and the drive motor including an output worm gear, the output worm gear operatively associated with a first driven gear, the first driven gear operatively associated with an output drive gear, the output drive gear operatively associated with a second driven gear, and the second driven gear including reciprocating rod means, the reciprocating rod means mounted to the second driven gear and through the outer eyelet to effect reciprocation of the outer eyelet.

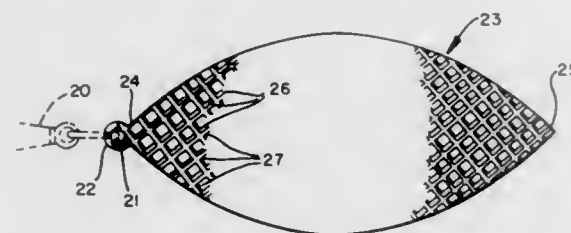
5,084,996
FISHING LURE LASER SURFACE PATTERN CUT
REFLECTIVE PATTERNED SPINNER BLADE

Chester G. Woodruff, Rte. 1, Box 42A, Fairmont, Okla. 73736,
 and Bob W. McKinney, Jr., 104 Breckenridge Rd., Enid,
 Okla. 73701

Filed Dec. 27, 1990, Ser. No. 634,539
 Int. Cl.⁵ A01K 85/01

U.S. Cl. 43—42.33

8 Claims



1. A fishing lure laser surface pattern cut on a twisted spinner blade comprising: a twisted spinner blade with the twist being in the blade body from a forward lure assembly connective end to the rear end of the blade; laser beam pattern cuts on side surface area of said twisted spinner blade that are narrow shallow surface cuts with spacing consistent with cuttings running in the approximate range of thirty thousand to one hundred fifty thousand cuts per inch; said laser line surface pattern cuttings spaced and shaped to intensify reflected light and to present a prismatic effect with the line cuts and density generating a color spectrum reflection on particles and plankton in water as the spinner blade is being moved in its spinning action with passage through the water.

5,084,997
FISHING LURE AND METHOD

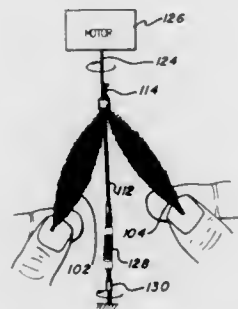
Frank A. DiPaola, 4231 Bluebird, Union Lake, Mich. 48085

Filed Mar. 15, 1990, Ser. No. 494,169

Int. Cl.⁵ A01K 85/00

U.S. Cl. 43—42.53

29 Claims



16. A method of making a fishing lure comprising the steps of:
 a) providing an elongated body portion including a strength bearing element having a core member helically wound about said core member, said core member including a plurality of fibers radially extending therefrom for forming a three dimensional body shape which is minnow like being wider at the center and narrowing at both ends, said central core member having memory characteristics such that it can be shaped and will retain its shape during fishing but is flexible to reduce the mechanical advantage of a fish when the fish is trying to shake the lure;
 b) attaching a fishing line receiving member at a first end of said core member; and
 c) attaching a fishing hook means to a second end of said core member.

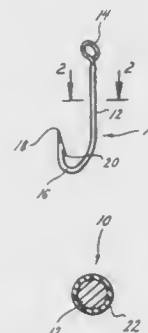
5,084,998
FISHHOOK WITH COATING OF LOW-FRICTION
MATERIAL

William T. Dixon, 2142 S. Fairway, Springfield, Mo. 65804
 Filed Apr. 2, 1990, Ser. No. 503,233

Int. Cl.⁵ A01K 83/00

U.S. Cl. 43—43.16

7 Claims



1. A fishhook comprising a shank, and a curved butt portion extending from one end of the shank, the shank, and butt portion being made of a first material, and a coating of a second material substantially covering the butt portion, said second material having a coefficient of static friction of less than 0.15, and wherein the curved butt portion includes a point at its end opposite the shank, the point being free of said coating thereby providing a sharp tip to facilitate penetration of the fishhook into the flesh of the fish.

5,084,999
FISH HOOK REMOVER

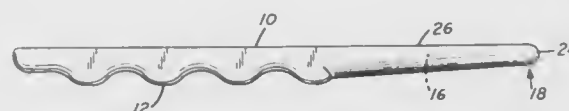
Harold F. Henry, 1165 Camelot, Pinckney, Mich. 48169

Filed Aug. 8, 1990, Ser. No. 564,134

Int. Cl.⁵ A01K 97/00

U.S. Cl. 43—53.5

3 Claims



1. A fish hook remover comprising a long slender body having a hand grip formed on the bottom of the body and a tapered substantially semi-circular open top trough extending to a tip end, a notch at the tip end on the bottom of the body, said notch at the bottom of the trough opposite the open top and spacing apart a pair of tips, said pair of tips together curved in cross-section perpendicular to the length of the body by the substantially half-circular form of the trough at the tip end and each tip separately substantially half elliptically curved in a direction perpendicular to the cross-section and extending between the notch and the corresponding top edge of the open top trough to thereby form a smooth blunt curve from the notch to the top edge.

5,085,000
DISPOSABLE BAIT BOX WITH PRE-MOISTENED
BEDDING

James A. Ford, 217 Davis Ave., Nampa, Id. 83651

Filed Mar. 16, 1990, Ser. No. 494,477

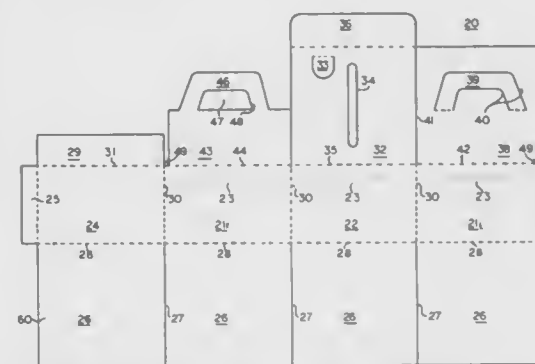
Int. Cl.⁵ A01K 97/04

U.S. Cl. 43—55

7 Claims

1. A disposable bait box comprising:
 a rectangular cardboard box having first and second opposing side walls and an attached back wall and an attached front wall;
 four bottom panels each attached along a bottom edge of the

back wall, front wall and first and second side walls and extending inwardly to form a four-layered box bottom;
 a front lip attached to and extending along the top edge of the front wall and extending downwardly into the interior of said box;
 a closure panel attached to the top edge and extending along the first side wall, said closure panel sized to cover the top of the box formed of the front and back walls, first and second side walls and the bottom panels;
 a closure panel handle attached to and extending normally up from said closure panel;
 a seal panel attached to the top edge and extending along the second side wall for positioning adjacent to and atop the closure panel;

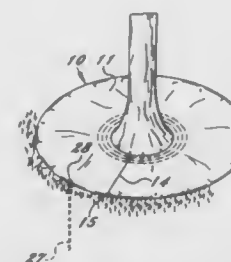


a seal panel handle attached to and extending normally up from the seal panel in a position adjacent to the closure panel handle when the seal panel is positioned atop the closure panel;
 a closure lid attached to the top edge and extending along the back wall for positioning atop the closure and seal panels, said closure lid having a slot formed therein for insertion therethrough of the closure and seal panel handles;
 a closure tab attached to and extending along the edge of the closure lid opposite that which is attached to the back wall, said closure tab formed for insertion into the interior of the box adjacent to the front lip; and
 a pull tab attached to and extending up from the closure lid.

5,085,001
STABILIZED MULCH SKIRT
 Michael S. Crawley, 704 Lakehurst Dr., Shelby, N.C. 28150
 Filed May 14, 1990, Ser. No. 522,918
 Int. Cl.⁵ A01G 17/00

U.S. Cl. 47—25

4 Claims



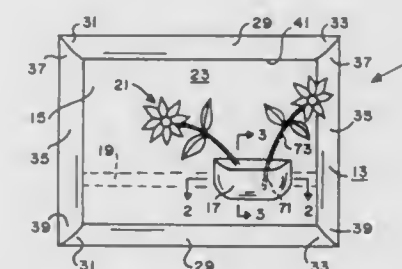
1. A mulch skirt for inhibiting the growth of ground cover such as weed and grass around a tree or post, said mulch skirt comprising a flexible waterproof sheet having an initial axial opening and a slit extending from the opening to a point on the periphery of the sheet and defining slit edge portions, means causing the slit edge portions to overlap in use, a plurality of radially spaced adjustment strips formed around the axial opening by successive concentric rows of serrations, whereby the mulch skirt can be custom-sized on the site to fit around a selected tree or post by removing an inner portion of the mulch

skirt along a selected row of serrations corresponding in diameter to the base diameter of the tree with which the mulch skirt is to be used, a stabilizing ring extending about the periphery of the flexible sheet, said stabilizing ring being split to define terminal ends which overlap each other in relaxed operative position and wherein the split in the stabilizing ring coincides with the slit in the flexible sheet so that overlapping of the terminal ends of the stabilizing ring causes corresponding overlapping of the slit edge portions of the flexible sheet, and means connecting the stabilizing ring to the flexible sheet to hold it in place.

5,085,002
PORTABLE ART OBJECT WALL DECORATION
 Jer-Shyang J. Lee, 8733 Carrollwood Cv. N., and Shin Y. Lee,
 8729 Carrollwood Cv. N., both of Cordova, Tenn. 38018
 Filed Sep. 24, 1990, Ser. No. 587,332
 Int. Cl.⁵ A01G 5/00

U.S. Cl. 47—41.12

5 Claims



1. An art object wall decoration having a front side and a rear side for hanging on a wall with said front side facing outwardly and said rear side being adjacent the wall upon which said art object wall decoration is hung, said art object wall decoration comprising:

- a frame means for hanging on a wall and for being moved to a new location if desired, said frame means defining an open space;
- a mat fixedly attached to said frame means and extending across said open space, said mat having a front side and a back side;
- a container having a cavity and an uncovered opening accessible from the front side of said art object wall decoration and communicating with said cavity for receiving a portion of an art arrangement in said cavity through said opening with the art arrangement being accessible for the changing thereof if desired;
- supporting means for supporting said container from said frame means with said container being supported on the front side of said mat, said supporting means including a mounting bracket fixedly mounted on said frame behind said mat adjacent said back side of said mat and out of sight when the art object wall decoration is viewed from the front thereof, and fastening means attached to said container, extending through said mat, and attached to said bracket means for supporting said container from said frame; and
- an art arrangement having a lower portion and an upper portion, said art arrangement being supported by said container with said lower portion thereof extending through said opening in said container into said cavity and with said upper portion of said art arrangement extending out of said container and accessible for the changing of said art arrangement as desired.

5,085,003

PLANT COVER/WRAP SYSTEM

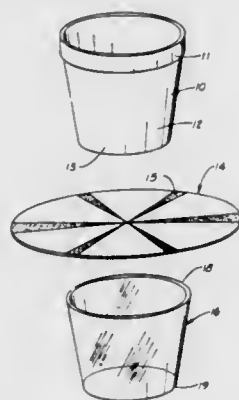
Pedro F. Garcia, Atlanta, Ga., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 149,002, Jan. 27, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,584

Int. Cl.⁵ A01G 9/02

U.S. Cl. 47-72

5 Claims



1. A method, comprising: providing a relatively stiff sheet of material; providing a flower pot having an upper end, a lower end, a bottom and an outer peripheral surface; providing a sleeve having an upper end with an opening extending therethrough adapted to be received over the flower pot and covering a substantial portion of the outer peripheral surface of the flower pot when received over the flower pot; cutting segmental notches in said sheet of material; placing the sheet of material over the upper end of the sleeve; placing the flower pot generally over the upper end of the sleeve and generally over the sheet of material; and lowering the flower pot into the opening in the sleeve until the flower pot is placed generally within the opening in the sleeve with the sleeve covering a substantial portion of the outer peripheral surface of the flower pot and with the sheet of material substantially covering the outer peripheral surface of the flower pot and being disposed generally between the sleeve and the outer peripheral surface of the flower pot with a portion of the sheet of material extending beyond the upper end of the sleeve and outwardly from the upper end of the flower pot, the sleeve engaging the sheet of material and holding the sheet of material against the outer peripheral surface of the flower pot and providing a decorative cover for the flower pot, the sleeve engaging and holding the sheet of material against the outer peripheral surface of the flower pot and providing the sole means for holding the sheet of material in position about the outer peripheral surface of the flower pot.

5,085,004

WINDOW LIFT MECHANISM

Gregory M. Beauprez, Toledo, Ohio, assignor to United Technologies Motor Systems, Inc., Columbus, Miss.

Continuation-in-part of Ser. No. 484,029, Feb. 22, 1990, abandoned. This application Jun. 29, 1990, Ser. No. 546,074

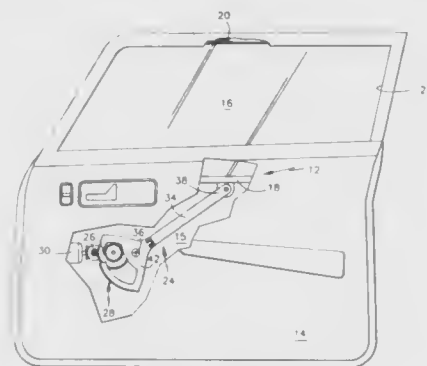
Int. Cl.⁵ E05F 15/00

U.S. Cl. 49-138

57 Claims

1. An automobile window lift assembly for an automobile window which sealingly engages an upper window seal in a closed position comprising lift arm means for raising and lowering a window along a path of travel between an open position and a closed position in sealing engagement with an upper window

seal, the window travel path comprising at least first and second sections, means for supplying rotative force for actuating the lift arm means to raise and lower a window, and means interconnected to the rotative force means and the lift



arm means for providing a first substantially constant mechanical advantage over said first section of the travel path and a second substantially constant mechanical advantage over said second section of the travel path, said second mechanical advantage being greater than said first mechanical advantage.

5,085,005

WEATHER STRIP FOR MOTOR VEHICLE

Takemasa Yasukawa, Tadanobu Iwasa, and Masanori Midooka, all of Inazawa, Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

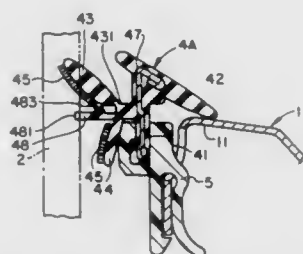
Filed Apr. 15, 1991, Ser. No. 684,772

Claims priority, application Japan, May 14, 1990, 2-50010[U]; Aug. 7, 1990, 2-209850; Aug. 7, 1990, 2-209851

Int. Cl.⁵ E05F 11/38

U.S. Cl. 49-377

11 Claims



1. A weather strip to be attached along a belt line of a door of a motor vehicle for wiping out an outer surface of a door glass when the door glass is raised and lowered, comprising: a base portion to be attached along the belt line of a door outer panel; a lip extending from said base portion obliquely upwardly toward the door glass so that an end of said lip contacts the outer surface of the door glass; a blade extending from said base portion under said lip in a direction of the outer surface of the door glass, an end of said blade contacting the outer surface of the door glass, whereby said blade turning upwardly and downwardly when the door glass is raised and lowered; and a projecting portion formed on an upper surface of said blade for pushing up a lower surface of said lip when said blade turns upwardly, whereby said end of said lip is detached from the outer surface of said door glass.

5,085,006

WEATHER STRIP FOR MOTOR VEHICLE

Keizo Hayashi, Nagoya; Kiyoshi Shigeki, Fukuroi, and Kazuo Ogawa, Inazawa, all of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

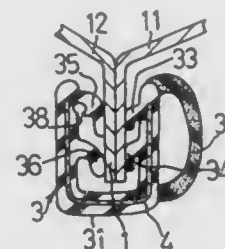
Continuation of Ser. No. 467,546, Jan. 19, 1990, abandoned. This application Feb. 13, 1991, Ser. No. 655,187

Claims priority, application Japan, Apr. 24, 1989, 1-47969[U]; Aug. 17, 1989, 1-96255[U]; Aug. 17, 1989, 1-96256[U]

Int. Cl.⁵ E06B 7/16

U.S. Cl. 49-482

7 Claims



1. A weather strip to be attached to a flange formed along a door opening or a door frame of a motor vehicle, comprising: a trim portion having a U-shaped cross-section so as to include a pair of opposed inner wall surfaces; a sealing portion formed on an outer surface of said trim portion; and flange retaining lips projecting from said inner wall surfaces of said trim portion inwardly for holding the flange; said flange retaining lips being composed of at least one flange retaining lip projecting from one of said opposed inner wall surfaces of said trim portion, and at least two flange retaining lips projecting from the other one of said opposed inner wall surfaces; one of said at least two flange retaining lips, which projects from adjacent an open end of said trim portion having a base portion and a tip portion, said tip portion having a thickness equal to or less than a thickness of said base portion, said trim portion having a longitudinally extending notch defined solely in said base portion and along said base portion closely adjacent said inner wall surface so that at said notch said base portion is thin enough to be ripped off, whereby when the weather strip is attached to a relatively thick flange, said one of said at least two flange retaining lips will be ripped off along said longitudinally extending notch along the length of said relatively thick flange, and when the weather strip is attached to a flange having locally varying thickness, said one of said at least two flange retaining lips will be ripped off along said longitudinally extending notch at portions corresponding to at least some thicker portions of the flange having locally varying thickness.

5,085,007

TORIC LENS FINING APPARATUS

Joseph Tusinski, Muskogee, Okla., assignor to Coburn Optical Industries, Muskogee, Okla.

Filed Sep. 11, 1989, Ser. No. 405,224

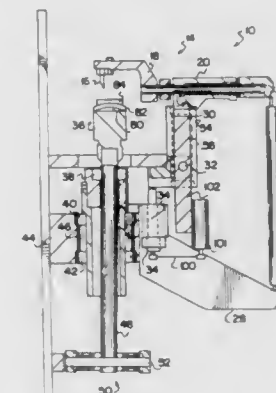
Int. Cl.⁵ B24B 7/00

U.S. Cl. 51-55

5 Claims

1. An apparatus for finishing a surface of an ophthalmic toric lens comprising: a frame; tool carrying means for carrying a tool having a compound arcuate toric surface, said tool carrying means having, a tool axis and a first end at which the tool is disposed, and a gimbal mounting connected to said tool axis and said frame so that said tool axis has two orthogonal degrees of angular movement; lens holding means connected to said frame for holding a lens in contact with the tool, the lens having a lens axis; motor means connected to said frame for driving said tool

carrying means in an orbital motion so as to cause the tool to move relative to the lens, thereby finishing the surface of the lens; and the length of said tool carrying means between said first end and said gimbal mounting being defined by the following equation: $L = 1/k\theta$, wherein: L = the length of said tool carrying means between said first end and said gimbal mounting, measured in meters



k = a constant dependent upon the value of the orbit desired, and θ = a half angle of orbit excursion of said tool carrying means measured in degrees comprise an angle between 0.25 and 2.25 degrees, this value minimizing the undesirable effect of angular disparity.

5,085,008

APPARATUS AND METHOD FOR CUTTING AND GRINDING MASONRY UNITS

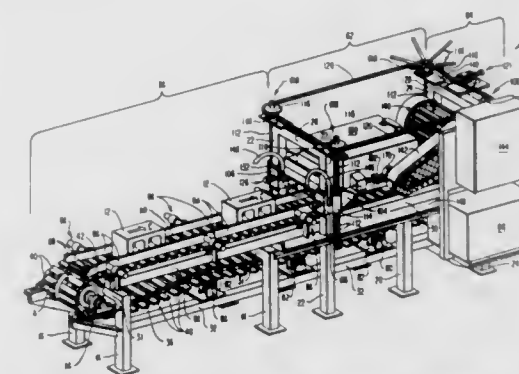
Gilbert M. Jennings, St. George; Scott Gledhill, Salt Lake City; Norman R. Stock, St. George, and Arthur T. Powell, Lehi, all of Utah, assignors to Versicut, Ltd., St. George, Utah

Filed Feb. 15, 1990, Ser. No. 480,244

Int. Cl.⁵ B24B 7/00

U.S. Cl. 51-74 R

61 Claims



1. An apparatus for processing masonry units into finished masonry building materials, said apparatus comprising: a. a frame; b. a chain movably supported from said frame along a conveyor path from an input station for the masonry units to an output station for the finished masonry building materials, said chain supporting and transporting the masonry units along said conveyor path and being comprised of a plurality of links connected in sequence to form an endless loop; and

c. an interchangeable processing tray assembly supported from said frame above and substantially parallel to said conveyor path, said processing tray assembly comprising tray means for supporting at least one of a plurality of different types of working heads rotatable mounted thereon, and further comprising a stabilization rack means for supporting roller means for vertically stabilizing said work piece, and attachment means for mounting said stabilization rack means to said processing tray means, in a spring-biased manner, and said working head effecting abrasion treatment of the masonry units as the masonry units supported by said chain are moved continually past said working head, said abrasion treatment producing from the masonry units finished masonry building materials of a predetermined size and surface finish quality.

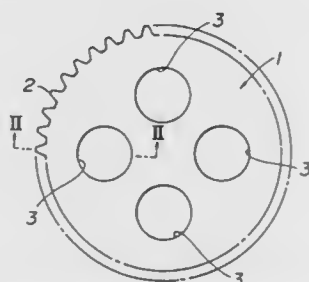
5,085,009

CARRIER FOR SUPPORTING WORKPIECE TO BE POLISHED

Akira Kinumura, Nara; Katsuhiko Koretomo, Takatsuki; Shuichi Yura, Nakama; Tatsuhiko Kuwano, Osaka, and Tsuguji Kimura, Soka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka; Okabe Mica Co., Ltd., Fukuoka and Fuji Spinning Co., Ltd., Tokyo, all of Japan
Filed Apr. 23, 1990, Ser. No. 513,090
Claims priority, application Japan, May 2, 1989, 1-112930
Int. Cl.⁵ B24B 5/00

U.S. Cl. 51—131.1

5 Claims



1. A carrier for supporting workpieces to be ground, wherein said carrier is meshed with a sun gear and an internal gear of a double-sided polisher, comprising, a mica laminate composed mainly of a plurality of mica sheets and impregnated with a thermo-setting resin, said mica laminate having teeth on its periphery for mesh with said sun gear and said internal gear and a plurality of holes for holding work pieces therein.

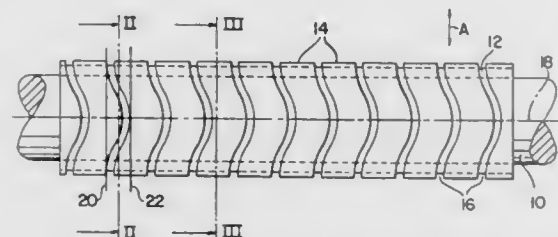
5,085,010

CONTACT ROLL FOR BELT GRINDING MACHINES

Rainer Grau, Kronach, Fed. Rep. of Germany, assignor to Hans Weber Maschinenfabrik GmbH, Kronach, Fed. Rep. of Germany
Filed Nov. 27, 1990, Ser. No. 619,129
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1989, 8914141[U]

Int. Cl.⁵ B24B 21/00

U.S. Cl. 51—141



1. A contact roll for a belt grinding machine with a steel core and a sleeve surrounding said core comprising an intermediate

layer covering at least a portion of the steel core and made of an elastically yieldable material and a plurality of outer elements of a hard material arranged on the outer surface of the intermediate layer and intended for engagement with the grinding belt, characterized in that the elements made of hard material are formed as closed rings which surround the elastic intermediate layer and which are separated axially from one another by ring grooves extending continuously around said sleeve and defined by axially facing edges of neighboring ones of said rings, said axially facing edges of said rings being so shaped and the widths of said grooves and the widths of said rings being so dimensioned that neighboring ones of said rings overlap one another several times in the circumferential direction of the contact roll.

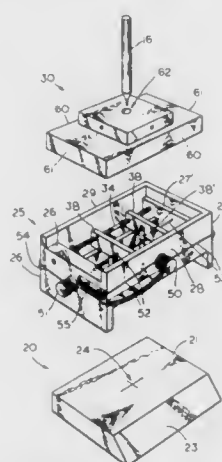
5,085,011

METHOD AND APPARATUS FOR MOUNTING AND FACETING GEMSTONES

C. R. Smith, P.O. Box 112, Kennesaw, Ga. 30144
Division of Ser. No. 68,528, Jul. 1, 1987, Pat. No. 4,864,778.
This application Oct. 16, 1989, Ser. No. 422,008
Int. Cl.⁵ B24B 19/00, 41/06

U.S. Cl. 51—216 LP

5 Claims



1. Apparatus for grinding or polishing flat facets of gemstones comprising, in combination, a mirror lap wheel base having mounting means for mounting the wheel base to rotary drive means, and a lap film adapted to be mounted flush upon said mirror lap wheel base, whereby a flat facet to be worked while mounted to a dop of a faceting machine may be placed upon the mirror lap wheel base and a reflected image of the facet observed for verification of flush contact with the base and subsequently worked by the lap film mounted flush to the base.

5,085,012

RECIPROCATING ABRADING OR POLISHING TOOL WITH IMPROVED SUCTION SYSTEM

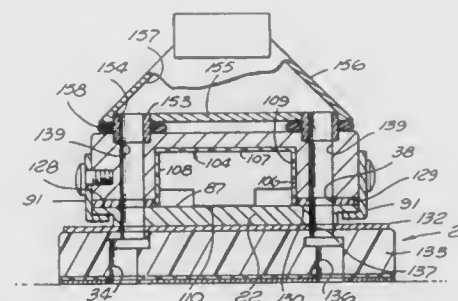
Donald H. Hutchins, Sierra Madre, Calif., assignor to Hutchins Manufacturing Company, Los Angeles, Calif.
Division of Ser. No. 538,245, Jun. 14, 1990, Pat. No. 5,001,869.
This application Sep. 21, 1990, Ser. No. 585,908
Int. Cl.⁵ B24B 55/06

U.S. Cl. 51—273

7 Claims

1. A portable abrading tool comprising:
a body to be held and manipulated by a user and carrying a motor;
a shoe which, in a predetermined position of the tool, is located beneath the body and is reciprocated relative to said body by said motor to abrade or polish an upwardly facing work surface, and which is adapted to carry a pad carrying an abrading element;
said pad containing passage means through which air and

abraded particles are withdrawn by suction from near the work surface; and
at least one bearing element interposed vertically between said body and said shoe and having upper and lower surfaces engaging a downwardly facing surface of said body and an upwardly facing surface of said shoe respectively to transmit force downwardly from the body through said bearing element to the shoe while permitting reciprocation of the shoe relative to the body;



said bearing element containing an opening extending generally vertically therethrough between said upper and lower surfaces of the bearing element and which communicates upwardly at said upper surface with an opening in said downwardly facing surface of the body, and communicates downwardly at said lower surface of the bearing element with an opening in said upwardly facing surface of the shoe leading to said passage means, to conduct air and particles from said passage means through said opening in the bearing element and through said body to a collection location.

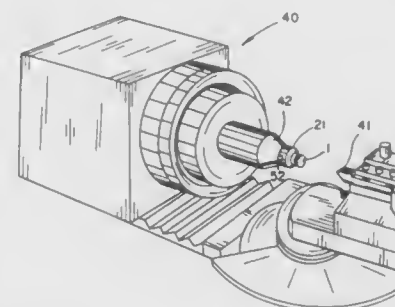
5,085,013

CONTACT LENS ORIENTATION METHOD AND APPARATUS

Vito S. Ascosi, 16043 Dorset Rd., Laurel, Md. 20707, and Robert O. Breece, 4811 Mercury Dr., Rockville, Md. 20853
Filed Apr. 12, 1990, Ser. No. 507,774
Int. Cl.⁵ B23B 3/00

U.S. Cl. 51—277

3 Claims



1. In a lens cutting machine for producing prescription contact lens including a base, an arbor assembly for holding a contact lens, a rotatable collet adapted to be adjustably tightened about said arbor and lens cutting means for making surface cuts on a contact lens blank, the improvement comprising: said arbor assembly consisting of an elongated arbor having one end adapted for placing a contact lens thereon and a ring having a central aperture and a diametrical slot on one face of said ring, said arbor being disposable through said central aperture and fixedly mating with said ring to align orientation marks on the contact lens blank in relationship to the diametrical slot on the ring; and said rotatable collet adapted to be adjustably tightened about said elongated arbor, said collet having a protrusion on one end thereof for mating with a periphery portion of said diametrical slot to perform a surface cut on a contact

lens blank, wherein the arbor assembly may be made to rotate 180 degrees such that the protrusion on the collet mates with an opposite periphery portion of the diametrical slot for effecting a ballasting cut on an opposing surface of the contact lens blank.

5,085,014

HONING TOOL AND METHOD FOR THE SURFACE MACHINING OF BORE WALLS

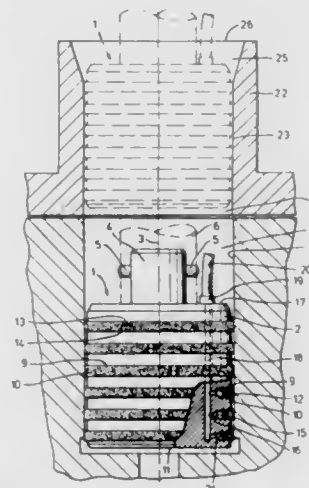
Gerhard Sandhof, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Maschinenfabrik Gehring GmbH & Co., Ostfildern, Fed. Rep. of Germany
Filed Aug. 9, 1990, Ser. No. 564,858

Claims priority, application European Pat. Off., Aug. 25, 1989, 89115678.8

Int. Cl.⁵ B24B 1/00

U.S. Cl. 51—290

15 Claims



1. A honing tool for machining a wall of a cylindrical bore, said honing tool comprising:
a tool body having a longitudinal axis and formed with a plurality of axially spaced grooves having bottom at the radially inner ends thereof;
a plurality of honing rings mounted in axially spaced relation in the grooves of said body, each honing ring having an inside surface and being mounted independently of the others and axially and radially split entirely through the full cross section of said ring, said rings being mounted in said grooves with an annular clearance between said groove bottoms and the inside surface of said rings thereby enabling the rings to freely expand and contract within their respective grooves independently of one another, the outer diameter of each said ring when said ring is uncompressed being slightly greater than said bore whereby compression of said rings when positioned in said bore resiliently preloads said rings so that the outer peripheries of said rings exert working pressure on said bore, and
means for rotating said tool body and thus said rings, the independent mounting and resilient preloading of each ring permitting one ring to move radially relative to the others so that each ring can adapt itself to the shape of the adjacent bore wall surface and exert resilient force thereon.

5,085,015

PROCESS FOR IMPROVING THE SURFACE OF LIQUID CRYSTAL POLYMERS

David F. Adcock, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 26, 1990, Ser. No. 543,384
Int. Cl.⁵ B24B 1/00; B24C 1/00

U.S. Cl. 51—319

17 Claims

1. A process for improving the surface of an article melt fabricated from a composition consisting essentially of a liquid crystal polymer and 0 to about 5 weight percent of filler, based on the weight of the liquid crystal polymer, wherein the surface to be improved, which is initially susceptible to peeling, is subjected to abrasion so as to remove at least about 0.01 mm of the surface thickness, whereby the surface acquires a smooth, matte finish and is no longer susceptible to peeling.

5,085,016

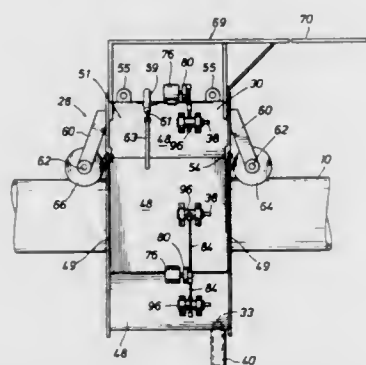
METHOD AND APPARATUS FOR CLEANING PIPE

James L. Rose, Houston, Tex., assignor to E. B. Thomas, Tex. Continuation of Ser. No. 470,819, Jan. 26, 1990, abandoned. This application Jan. 14, 1991, Ser. No. 639,777

Int. Cl.⁵ B08B 9/02; B05C 1/04

U.S. Cl. 51—129

14 Claims



1. Apparatus for cleaning a pipe supported above the ground adjacent a ditch for subsequent application of a coating; said apparatus comprising:

- a side boom tractor for supporting the pipe above the ground;
- a skid pulled by said side boom tractor adjacent a side of the pipe to be cleaned and having a pressurized source of cleaning material thereon;
- a self propelled carriage adjacent said side boom tractor adapted to be supported on the upper surface of the pipe for movement along the pipe to clean the exterior surface of the pipe, said self propelled carriage including:
- a housing having a pair of generally parallel opposed ends with aligned openings therein for receiving the pipe and an outer peripheral wall secured between said opposed ends and adapted to extend about the pipe to form an enclosed cleaning chamber;
- front and rear rollers mounted adjacent said opposed ends of said housing to contact the upper surface of the pipe to support the carriage thereon for movement along the pipe;
- means for driving at least some of said rollers for propelling said carriage along the pipe;
- a plurality of nozzles mounted on said housing and spaced at intervals about the outer peripheral wall of said housing; said nozzles having inner ends within said enclosed cleaning chamber for discharge of pressurized cleaning material in a high velocity stream against said pipe;
- pressurized fluid lines extending from said source of cleaning material on said skid to said nozzles and connected thereto externally of said housing for discharge of cleaning material in a pressurized stream from said nozzles; and
- means mounted externally on said housing to oscillate said

nozzles in a predetermined stroke for cleaning a predetermined surface area on the outside of the pipe.

5,085,017

DECOMPRESSION PANEL FOR A SEPARATION DEVICE IN AN AIRCRAFT

Mohammad Hararat-Tehrani, Bremen, Fed. Rep. of Germany, assignor to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany

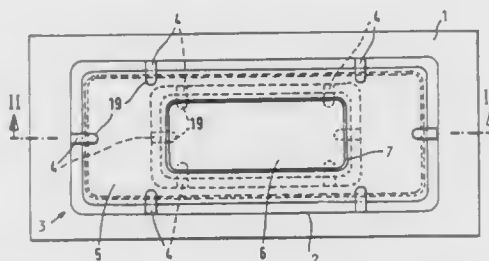
Filed Jan. 28, 1991, Ser. No. 646,888

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002447

Int. Cl.⁵ B64C 1/14

U.S. Cl. 52—1

14 Claims



1. A decompression panel for a separation device in an aircraft body, comprising a plurality of panel sections forming together said decompression panel, said panel sections including a central inner panel section and at least one outer panel section surrounding said inner panel section, a first set of mounting means including frangible elements for securing said inner panel section in a first hole of said outer panel section, a second set of mounting means also including frangible elements for securing said outer panel section in a second hole of said separation device, said frangible elements of said first set of mounting means being so arranged that said inner panel section is removable out of said outer panel section in a first direction (23) in response to a respective decompression, said frangible elements of said second set of mounting means being so arranged that said inner panel section and said outer panel section together are removable out of said separation device in a second direction (22) opposite to said first direction in response to a respective decompression.

5,085,018

EXTENDABLE MAST

Takayuki Kitamura, Yokosuka, and Koichi Yamashiro, Zama, both of Japan, assignors to Japan Aircraft Mfg., Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 482,206, Feb. 20, 1990, abandoned. This application Aug. 31, 1990, Ser. No. 577,082. Claims priority, application Japan, Jul. 19, 1989, 1-186780; Feb. 9, 1990, 2-28255

Int. Cl.⁵ E04H 12/18

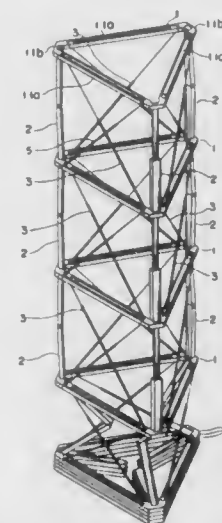
U.S. Cl. 52—108

4 Claims

1. An extendable mast constructed by freely swingably connecting a plurality of essentially rigid members to one another comprising:

- a plurality of battens extending transversely of the mast;
- a plurality of longerons extending longitudinally of the mast to connect adjacent battens;
- diagonals arranged along diagonal lines of a plurality of rectangles arranged between adjacent battens and around the periphery of said mast, with each of said plurality of rectangles being formed by two longerons adjacent to each other transversely of the mast and two of said plurality of battens adjacent to each other longitudinally of the mast, wherein each of said diagonals includes plural slider members which are extended by sliding said plural slider members relative to each other, and a maximum length of

such diagonal is defined by means for limiting the extent to which the slider members are slid relative to each other; each of said plurality of longerons includes a pair of first and second beam members, wherein respective opposed ends of these beam members are freely swingably connected to each other while ends thereof remote from each other are freely swingably connected to adjacent ones of said plu-



ality of battens, wherein the extendable mast is extended when these beam members are deployed and locked under overcenter conditions with said diagonals being extended to their longest length; and wherein at least a portion of one of the said pair of first and second beam members is received in the other of said pair when the mast is folded and said pair of beam members is folded on one another.

5,085,019

DOOR, WINDOW OR PANEL SECTION

Frederik C. van Herpen, Burgh Haamstede, Netherlands, assignor to Aipronk Promotie & Ontwilleling B.V., Holland, Netherlands

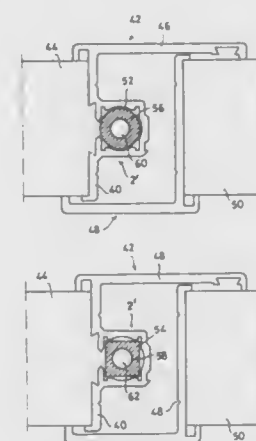
Filed Nov. 14, 1990, Ser. No. 613,077

Claims priority, application Netherlands, Nov. 16, 1989, 8902841

Int. Cl.⁵ E05C 5/00

U.S. Cl. 52—127.1

18 Claims



1. A panel section, comprising an elongated housing having a C-shaped cross-section, the C-shaped housing having a main portion and two side legs connected to the main portion thereby forming the C-shaped housing, the two side legs having end edges which face each other and at least partly closing

off the C-shaped housing, the C-shaped housing having an interior accommodating a closing element, central parts of inside surfaces of the two side legs, the main portion and the end edges having a surface rounded according to a prescribed radius, adjoining surfaces of said inside surfaces defining corners each comprising a right angle, and further comprising at least one flange extending from the housing adjacent an end edge in a direction opposite said adjacent end edge.

5,085,020

PORTABLE, ASSEMBLABLE-DISASSEMBLABLE STAIRCASE

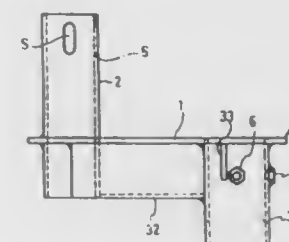
Keiichiro Yamazaki, 6-12-1 Kameido, Koto-Ku, Tokyo, Japan Filed Jan. 29, 1990, Ser. No. 471,516

Claims priority, application Japan, Jan. 27, 1989, 1-8030; Apr. 14, 1989, 1-94727; Apr. 14, 1989, 1-94728

Int. Cl.⁵ E04F 11/02

U.S. Cl. 52—183

2 Claims



1. A portable, assemblable-disassemblable staircase including a plurality of stair units to be assembled and disassembled, each of said stair units comprising:

- a horizontal base plate,
- an upward joint vertically installed at a rear end of said horizontal base plate, said upward joint containing three longitudinal elongated holes bored in a front, left, and right side walls thereof,
- a downward joint vertically installed at a front end of said horizontal base plate, said downward joint and said upward joints being formed of a quadrilateral case manufactured by bending and processing a metallic plate,
- three nuts fixedly installed in said downward joint,
- three bolts adapted to be spirally inserted into said three nuts through said three longitudinal elongated holes of said upward joint so as to insert and fix said downward joint of one stair unit into and to said upward joint of the other stair unit of said plurality of stair units so that the height of said plurality of stair units can be easily adjusted by the longitudinal elongated holes and the mutual stair units can be tightly secured to each other by three way securing members through three bolts and nuts, and
- a tread to be fixed to the upper surface of said horizontal plate, whereby the plurality of stair units are assembled by alternatively mating with said downward joint and said upward joint so that horizontal sections of the downward and upward joints can be perfectly prevented from circularizing to be unrotatable.

5,085,021

AUTOMOBILE GLASS PANE HAVING ELASTIC SEALING PROFILE

Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 84,867, Aug. 13, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 314,302

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627537

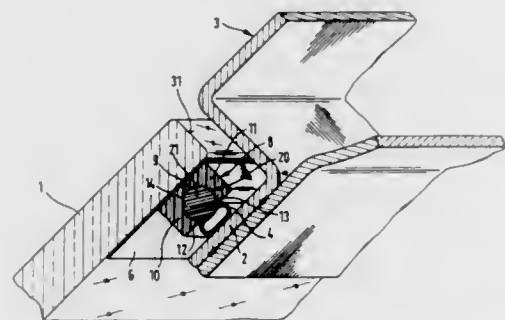
Int. Cl.⁵ E06B 3/62; B60J 1/00, 10/02

U.S. Cl. 52—208

5 Claims

1. A vehicle glass pane assembly for a vehicle having a window frame, comprising:

a glass pane;
a hardened profile strand comprising an extruded adhesive compound bonded to said glass pane and having an insertion groove, wherein said profile strand has a channel-shaped cross-section open opposite said glass pane at said insertion groove and includes projections oriented towards one another on opposite sides of said insertion groove; and
an elastic sealing profile secured in said insertion groove,



wherein said sealing profile comprises a rigid push-in portion fitted in said insertion groove and a sealing portion projecting out from said profile strand and constructed so as to be elastically deformable as compared to said push-in portion, said sealing portion pressing on the window frame, whereby there results a force transmitting form fitting connection between the profile strand and the sealing profile and a seal between said sealing portion and the window frame due to the elasticity of said sealing portion.

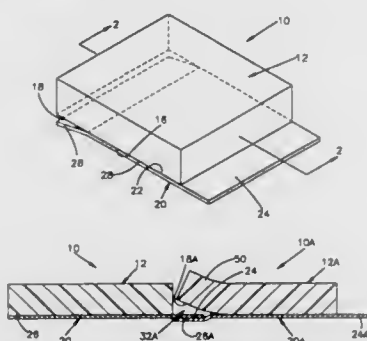
5,085,022

BUILDING INSULATION

Kenneth J. Paliwoda, Strongsville, Ohio, assignor to Therm-All, Inc., N. Olmsted, Ohio
Division of Ser. No. 472,033, Jan. 30, 1990, Pat. No. 5,001,879.
This application Oct. 26, 1990, Ser. No. 604,112
Int. Cl.⁵ E04B 1/62

U.S. Cl. 52—309.8

1 Claim



1. A method for installing pieces of insulation comprising the steps of:

- laying a first piece of insulation alongside a second piece of insulation;
- abutting an extending tab portion of the first piece of insulation against a portion of insulating material of the second piece of insulation;
- moving a portion of insulating material of the second piece of insulation from an initial position to allow the extending tab portion of the first piece of insulation to fall onto a nonextending tab portion of the second piece of insulation; and
- returning the moved back portion of insulating material of

the second piece of insulation to its initial position against the extending tab portion of the first piece of insulation.

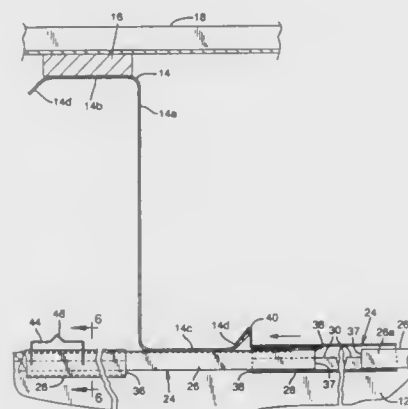
5,085,023

INSULATION SUPPORTING MEANS FOR METAL BUILDINGS

Clifford D. Duffy, P.O. Box 42, The Dalles, Oreg. 97058
Filed Jan. 25, 1991, Ser. No. 645,705
Int. Cl.⁵ F04B 1/74, 7/00

U.S. Cl. 52—410

4 Claims



1. Insulation supporting means for a building of the type using longitudinal purlins supported on uprights with lateral roof rafters, the purlins having a Z-shape in cross section with a base leg of the Z having a turned up free edge, said insulation supporting means comprising:

- a plurality of support strips extending laterally in spaced relation and spaced selectively for providing a bed frame for insulation,
- and locking structure on said support strips providing a locked suspended attachment of said strips on the turned up free edges of the purlins,
- said support strips comprising a pair of telescoping members providing adjustment in length for fitting to a purlin.

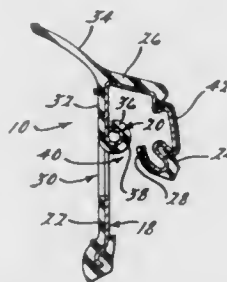
5,085,024

BELT WEATHERSTRIP WITH SPIRAL RETENTION LOCK

Ronnie Emmons, Lexington, Ky., and Robert A. Vaughan, Dearborn, Mich., assignors to The Standard Products Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 315,476, Feb. 24, 1989, Pat. No. 4,969,303. This application Jan. 18, 1990, Ser. No. 466,756
Int. Cl.⁵ E06B 7/16; B60R 13/06

U.S. Cl. 52—717.1

24 Claims



1. A molding for attachment to a vehicle having a flange edge, said molding comprising:

- a generally U-shaped metallic support member having an elastomeric cover thereon and having, in cross-section, first and second legs joined together by a web to form a channel, said first leg being relatively longer than said

second leg and said second leg having a free end which is reentrantly bent inwardly of said channel;
a spiraled section formed from a nonterminal portion of one leg of said support member, said spiraled section extending inwardly in a channel of said support member and having a portion of said elastomeric cover bonded thereon in opposition to the other leg of said support member.

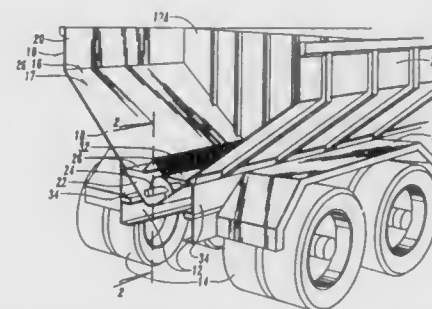
5,085,025

EXTRUDED TRUCK FRAME STRUCTURE

Donald L. Gaddis, Solon, Iowa, assignor to Courtesy Enterprises, Incorporated, Cedar Rapids, Iowa
Filed Oct. 9, 1990, Ser. No. 594,413
Int. Cl.⁵ E04C 3/32

U.S. Cl. 52—732

8 Claims



1. A truck frame beam, comprising,
an elongated vertically disposed web member having inner and outer surfaces, and upper and lower ends,
a support member on the upper end of said web member, said support member having oppositely disposed offset parallel support surfaces,
said support surfaces are angularly disposed with respect to said web member,
said support surfaces comprising a first surface that extends downwardly and inwardly from said web member, and a second surface that extends upwardly and outwardly with respect to said first surface.

5,085,026

CONICAL SEISMIC ANCHOR AND DRILL BIT FOR USE WITH UNREINFORCED MASONRY STRUCTURES

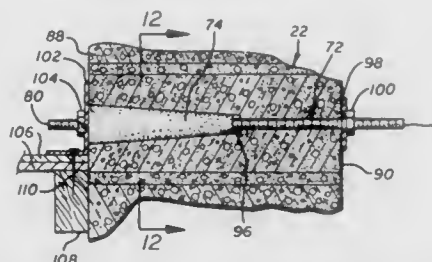
Scott A. McGill, and Sterling A. McGill, both of 21690 Wahoo Trail, Chatsworth, Calif. 91311

Filed Nov. 20, 1990, Ser. No. 615,908

Int. Cl.⁵ E04B 2/30; E05D 15/48

U.S. Cl. 52—741

20 Claims



1. A process for attaching a seismic anchor to a wall of an unreinforced masonry structure, the steps comprising:
drilling a generally frusto-conical cavity into the wall;
inserting a seismic anchor into the cavity, the seismic anchor including an attachment support rod having a first end and an adjacent portion thereof threaded for receiving a nut, and a frusto-conical plug having a larger end and a smaller end, placed over, surrounding and fixed to the support rod such that the larger end of the plug is situated next to the threaded end and adjacent portion of the support rod, such that the exterior frusto-conical surface of the plug

fully engages the interior frusto-conical surfaces of the wall cavity; and
securing the seismic anchor within the wall cavity.

5,085,027

PANEL EDGE CONSTRUCTION

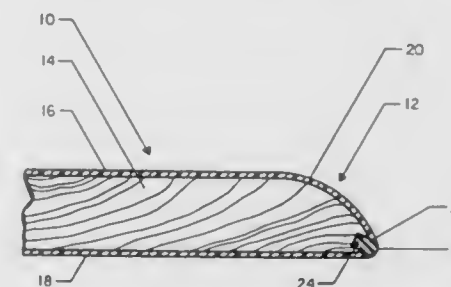
Duane G. McClung, Kalamazoo, and Thomas C. Mueller, Grandville, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Sep. 18, 1990, Ser. No. 584,130

Int. Cl.⁵ E04C 2/38

U.S. Cl. 52—811

12 Claims



1. A laminated panel having a generally rounded edge extending from an upper surface and terminating in a very small radius at a lower edge of said panel, said panel comprising a core, an upper thin layer of veneer overlying and bonded to said core and extending from said upper surface over said generally rounded edge to said very small radius at said lower edge, and a plug in said core in alignment with said very small radius, said radius being directly formed on said plug, and edges of said upper thin layer of veneer abutting said plug and being contiguous therewith to form a smooth contiguous surface therewith.

5,085,028

MACHINE FOR WRAPPING SUBSTANTIALLY PARALLELEPIPED COMMODITIES

Silvano Boriani, and Antonio Gamberini, both of Bologna, Italy, assignors to G. D. Societa Per Azioni, Bologna, Italy

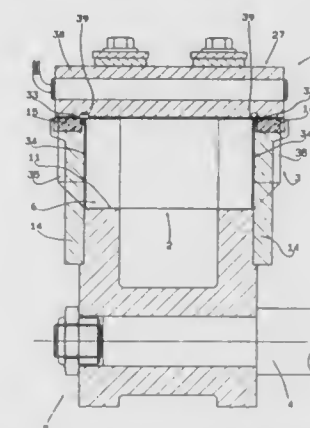
Filed Oct. 9, 1990, Ser. No. 594,566

Claims priority, application Italy, Oct. 11, 1989, 3649 A

Int. Cl.⁵ B65B 51/14

U.S. Cl. 53—234

2 Claims



1. A machine for providing substantially rectangular parallelepiped articles with wrappers, comprising:
a head arranged to be rotated about a longitudinal axis; said head being provided with a plurality of equi-angularly spaced radially arranged pockets having respective mouths opening radially outwardly of said head; each

pocket being defined by wall means including a radially inner wall arranged to confront one of two opposite side walls of a single substantially rectangular parallelepiped article while such article is being wrapped, two longitudinally spaced, parallel opposite end walls arranged to confront respective opposite end walls of said article; and a pair of angularly spaced, parallel opposite face walls arranged in planes parallel to said axis to confront respective opposite faces of said article; each said pocket having a width, depth and thickness which is sufficient to accommodate receiving a single said article, convolutely wrapped about said one side wall and said two faces by a substantially rectangular sheet of wrapping material that is wider than said article is tall sufficiently to provide two opposite longitudinal edge marginal portions for wrapping against opposite end walls of the package and two opposite end marginal portions that are sufficiently long as to permit them to be folded into a partially overlapping relationship with one another against the other of said side walls of said article; said wall means of said pocket defining four slots disposed where respective end walls and respective face walls adjoin and out through which respective parts of respective longitudinal edge marginal portions of a respective said sheet of wrapping material may protrude;

means for supplying a succession of respective said sheets of wrapping material, each across a respective said mouth of a respective said pocket at a loading station for said head; means for supplying a succession of respective said articles to be wrapped, each radially outwardly of and aligned with a respective said pocket at said loading station, on an opposite side of the respective said sheet of wrapping material from said mouth and for urging a respective said article into the respective said sheet of wrapping material and the resulting combination of article convolutely wrapped about said one side wall and said two faces thereof into the respective said pocket through the respective said mouth so that said respective parts of said respective said longitudinal edge marginal portions protrude out of the respective said pocket through the respective said four slots;

said head further including, for each pocket, a pair of reaction elements supported on the said end walls of the respective said pocket so as to have respective radially outer surfaces arranged to effectively form generally coplanar extensions, longitudinally of said head, of the other of said side walls of the respective said article received in the respective said pocket;

means for folding said two opposite end marginal portions of the respective said sheet of wrapping material into a partially overlapping relationship with one another against said other of said side walls of said article and said surfaces of said reaction elements; and

a sealing means arranged in a sealing station disposed angularly about said axis from said loading station, for sealing together, upon rotation of said wheel to bring a respective pocket from said loading station to said sealing station, said opposite end marginal portions of the respective said sheet, against support provided by said article and said reaction elements where said opposite end marginal portions overlap, throughout a length of seal which is longer than the distance between said opposite end walls of the respective said pocket; and

a pocket emptying means arranged at an exit station disposed angularly about said axis from said sealing station, for successively emptying each respective pocket of a respective resultingly convolutely wrapped article upon rotation of said wheel to bring a respective pocket from said sealing station to said exit station;

said sealing means comprising a heated plate arranged to be moved radially towards and away from said head; said heated plate having a sealing surface disposed in confront relation to said head and having two recesses formed therein and arranged to overly two respective edges of the respective article where respective end walls of said arti-

cle meet said other of said side walls of said article, for accommodating folds in the respective said piece of wrapping material as said sealing means is operated to heat seal said two opposite end marginal portions of the respective said sheet of wrapping material to one another.

5,085,029

CARTON TOP SEALING MECHANISM

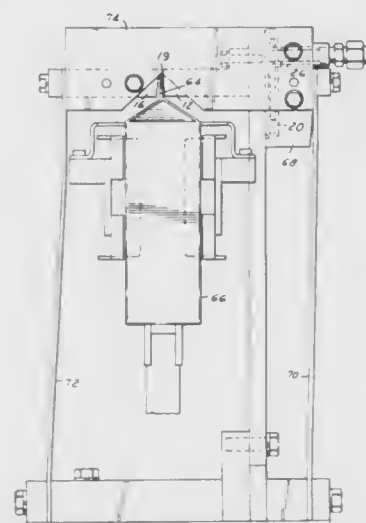
Leo J. Esper, Troy, Mich., assignor to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Dec. 4, 1990, Ser. No. 622,005

Int. Cl.⁵ B65B 51/14

U.S. Cl. 53—374.8

5 Claims



1. A sealing mechanism for sealing the top sealing fins of thermoplastic coated paperboard cartons, said mechanism comprising a fixed sealing jaw, an oppositely disposed movable sealing jaw, an enclosed expandable bladder operatively connected to said movable sealing jaw, and means communicating with the inside of said bladder for expanding same when said top sealing fins are positioned intermediate the fixed and movable jaws, to thereby move said movable sealing jaw and squeeze the sealing fins between the movable and fixed jaws to seal same, and converging rails positioned so as to urge said sealing fins into close proximity to one another in order to enter intermediate said fixed and movable sealing jaws.

5,085,030

METHOD OF TRANSFERRING AND STORING GLASS SHEETS AND TRAY USED IN METHOD

Toyoo Segawa; Sinkichi Syono, and Syuichi Suzue, all of Osaka, Japan, assignors to Nippon Sheet Glass, Co., Ltd., Osaka, Japan

Continuation of Ser. No. 205,557, Jun. 7, 1988, abandoned, which is a continuation of Ser. No. 10,986, Feb. 5, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 405,081

Claims priority, application Japan, Feb. 5, 1986, 61-23508

Int. Cl.⁵ B65B 23/20, 35/50

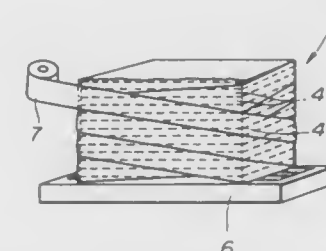
U.S. Cl. 53—399

2 Claims

1. A method of transferring a plurality of flat glass sheets from a first location to a second location utilizing a tray having disposed on its upper surface at least one slippage inhibiting damper, comprising the steps of;

horizontally stacking the plurality of glass sheets one by one on the tray at the first location such that the lowermost surface of the lowermost glass sheet is held in contact with the slippage inhibiting damper for resisting displacement of said lowermost glass sheet relative to the damper; helically wrapping packaging film around the sides of the horizontally stacked glass sheets without wrapping said

tray so as to resist surface displacement of the stacked glass sheets relative to each other when transferred and to form a unitary package thereof; and



transferring the unitary package together with said tray to the second location, said glass sheets being horizontally stacked on said tray during transfer.

5,085,031

TRANSVERSE ZIPPER APPLICATION FOR HORIZONTAL FORM, FILL AND SEAL MACHINE

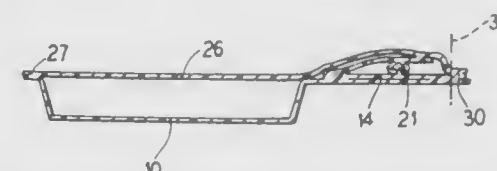
Daniel P. McDonald, Arlington Heights, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Feb. 15, 1990, Ser. No. 480,235

Int. Cl.⁵ B65B 47/00, 61/18

U.S. Cl. 53—412

13 Claims



1. A method of forming a series of tray containers from plastic sheet film comprising the steps of:

advancing a first continuous web of plastic film in a longitudinal direction of sheet feed; shaping the web to form a product containing pocket therein including outer peripheral flange areas;

laying, across the web, a doubled fastener strip to extend laterally across the web on a flange area with the strip having upper and lower layers and being folded transversely at an inner edge relative said pockets and including interlocking rib and groove fasteners extending therealong between the layer, and forming in the upper layer of said strip a frangible tear line inwardly of the rib and groove fasteners and outwardly of the folded edge of the strip whereby a tamper-evident closure is provided;

attaching the doubled strip to the first web;

laying a second web over the first web; and

attaching the second web to the upper layer of the strip only outwardly of and spaced from the tear line whereby an outer portion of the upper layer of the strip will remain with the second web when the tear line is separated and the fasteners are separated.

5,085,032

METHOD TO PREPARE A LEADING EDGE OF A PHOTOGRAPHIC FILM FOR FRAMING, A DEVICE EMPLOYING THE METHOD AND PHOTOGRAPHIC FILM THUS PREPARED

Facchini Edoardo, Via Molini 61/3, Cordenons (PN), Italy

Filed Oct. 12, 1989, Ser. No. 420,320

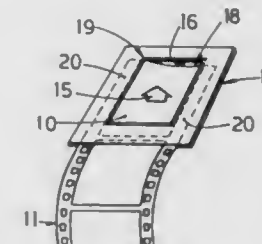
Claims priority, application Italy, Oct. 27, 1988, 83500 A/88

Int. Cl.⁵ B65B 63/00

U.S. Cl. 53—435

2 Claims

1. A method of mounting photographic film in a slide frame comprising the steps of shearing a leading edge of said film and



film to an opposite side edge of said film and being at a non-perpendicular angle to said direction of feed.

5,085,033

PROCESS FOR PREPARING A SOLID ENCAPSULATED MEDICAMENT

Dean M. Graham, Hobart, N.Y., assignor to D. M. Graham Laboratories, Inc., Hobart, N.Y.

Continuation-in-part of Ser. No. 7,272,734, Nov. 17, 1988, Pat. No. 4,936,074. This application Jun. 26, 1990, Ser. No. 544,183

The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.

Int. Cl.⁵ B65B 7/28, 63/08; A61K 9/64

U.S. Cl. 53—436

19 Claims

1. A method for preparing a solid, tamper evident encapsulated product capable of peroral delivery without delay of a medicament or other edible active ingredient, comprising:

a. preparing a flowable mixture comprising at least one orally administrable medicament in an ingestible matrix material having a melting point ranging up to about 100° C.;

b. introducing the mixture of Step a. into an ingestible hollow capsule in an amount sufficient to substantially completely fill the interior thereof;

c. heating the capsule containing the mixture of Step b. to a temperature sufficient to liquify said matrix material;

d. solidifying the mixture in the sealed capsule of Step c. to form said solid encapsulated product; and

e. sealing the capsule of Step d.;

wherein said mixture and said capsule in said solid encapsulated product are integral with each other, and together cause said solid encapsulated product to be tamper-evident.

5,085,034

METHOD OF PREPARING A BLOW MOLDED MAPLE SYRUP JUG

Richard G. Haas, South Deerfield, Mass., assignor to Hillside Plastics Inc., Sunderland, Mass.

Filed Oct. 22, 1990, Ser. No. 601,228

Int. Cl.⁵ B29C 45/00; B05D 3/02

U.S. Cl. 53—452

9 Claims

1. A method of manufacturing an extended life, blow molded, plastic container, particularly adapted for use for the storage of maple syrup, which method comprises:

a) blow molding a plastic container employing a high density polyethylene polymer;

b) treating the surface of the blow molded, high density polyethylene, plastic container to alter the surface thereof;

c) applying a thin, oxygen-barrier coating layer of an aqueous liquid latex composition consisting essentially of crystallizable polyvinylidene chloride-acrylate copolymer onto the treated surface of the plastic container;

d) drying the coating layer at a temperature of less than 100° F. and initially at a relative humidity of greater than about 50% to prevent rapid drying and the granulation of the coating layer at the beginning of the drying step to pro-

vide a dense, crystallized, continuous, oxygen-barrier, bonded coating layer; and
e) recovering the coated plastic container for use.

5,085,035

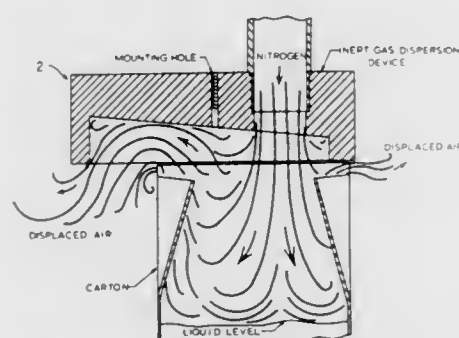
GAS DISPLACEMENT DEVICE FOR PACKAGING FOOD AND NON-FOOD PRODUCTS

Gerald A. Marano; Donald Evans, both of Mobile; Edwin D. Lomax, Satsuma, and James C. Harbison, Fairhope, all of Ala., assignors to International Paper Company, Purchase, N.Y.

Filed Oct. 5, 1990, Ser. No. 593,187
Int. Cl.⁵ B65B 31/04

U.S. Cl. 53—510

6 Claims



1. A gas displacement device for substituting inert gas for ambient air in a container prior to closing of an open top of said container, said open top having an opening of first and second predetermined dimensions along first and second mutually perpendicular axes thereof, respectively, comprising:
means for supplying a stream of inert gas to an outlet;
hood means for forming a blanket of inert gas in a predetermined volume of space which communicates with said outlet, said hood means having an opening which lies in a substantially horizontal plane, said opening of said hood means having a length along a first axis thereof which is greater than said first predetermined dimension and a width along a second axis thereof which is less than said second predetermined dimension, said second axis of said hood means being substantially perpendicular to said first axis of said hood means; and
means for displacing said container in a direction substantially parallel to said first axis of said hood means from a first position to a second position such that said opening of said container passes underneath said opening of said hood means with said first axis of said container being oriented substantially parallel to said first axis of said hood means and said second axis of said container being oriented substantially parallel to said second axis of said hood means, wherein said inert gas supplying means comprises a first circular cylindrical channel of first diameter which communicates with a source of inert gas, a second circular cylindrical channel of second diameter which communicates with said first circular cylindrical channel of first diameter and terminates at said outlet, said second diameter being greater than said first diameter, and said hood means comprises a chamber which communicates with said second circular cylindrical channel via said outlet, wherein said opening of said hood means has the shape of a rectangle with rounded corners, said length being the length of said rectangle and said width being the width of said rectangle.

5,085,036

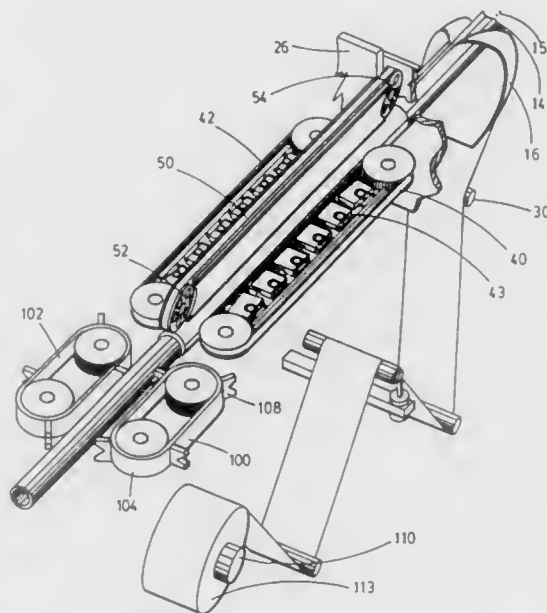
HIGH SPEED CONTACT SEALER

Alfred J. Evans, Raleigh; Thomas Whittlesey, Apex; Dennis J. May, Pittsboro; Grant K. Chen, Cary, and Edward P. Brinson, Raleigh, all of N.C., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Continuation of Ser. No. 426,815, Oct. 30, 1989, abandoned, and a continuation-in-part of Ser. No. 270,231, Nov. 4, 1988, abandoned. This application Nov. 21, 1990, Ser. No. 616,694
Int. Cl.⁵ B65B 9/20, 9/22, 41/12

U.S. Cl. 53—550

10 Claims



1. Improved apparatus for the manufacture of a length of closed film product from a length of flexible, flat film comprising, in combination:
(a) a support frame;
(b) a form member supported at one end by the frame and extending as a cantilever beam, generally horizontally, and defining an axis;
(c) a film form collar surrounding the form member, said film form collar constructed to fold the sides of a flat strip of film one over the other to thereby define a seam of a closed film product, surrounding the form member;
(d) means, mounted on the frame, for transporting the closed film product axially on the form member, said means for transporting comprising first and second transport members positioned on opposite sides of the form member and continuously frictionally engageable with film on the member and movable to transport the film therewith axially on the form member, and said means for transporting further comprising means for synchronously driving the first and second transporting means; and
(e) heat seal means mounted on the frame and including a solid, closed loop, moving band positionable over the seam to engage the seam for heat and pressure transfer to the film, said heat seal means further comprising means for driving the movable band in synchronization with the first and second transport means for simultaneous movement of the seam with the film on the form member;
(f) means for positioning the closed loop, movable band over the seam to engage the seam; the first and second transport members being positioned axially in positions substantially axially centered on the closed loop, moving band of the heat seal means.

5,085,037

MINIMIZING THE EFFECTS OF ICING IN THE INTAKES OF AEROSPACE PROPULSORS

John L. Scott-Scott, Warwick, England, assignor to Rolls-Royce plc, Derby, England

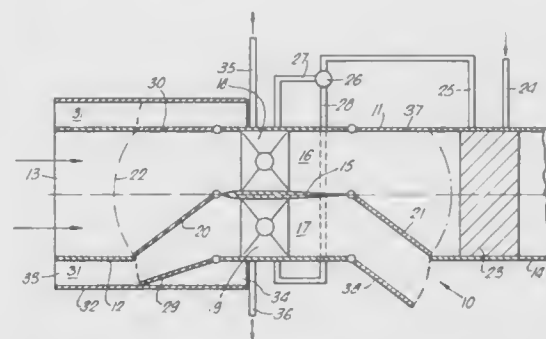
Filed Feb. 17, 1989, Ser. No. 314,702

Claims priority, application United Kingdom, Mar. 23, 1988, 8806890

Int. Cl.⁵ F02K 9/44

U.S. Cl. 60—39.093

8 Claims



1. An air intake suitable for directing an air flow to an aerospace propulsor including two or more heat exchangers arranged in parallel relationship so as to place substantially all of said air flow so directed in heat exchange relationship with a cryogenic fluid, air flow directing means and cryogenic fluid directing means being associated with said heat exchangers, said air flow directing means being so arranged as to provide that each of said heat exchangers is alternately exposed to the air flow directed to said propulsor and an air flow which is not directed to said propulsor, in such a manner that said propulsor is provided with a continuous air flow which has been placed in heat exchange relationship with said cryogenic fluid, said cryogenic fluid directing means being so arranged that said cryogenic fluid only flows through a heat exchanger when that heat exchanger is exposed to said air flow which is directed to said propulsor.

5,085,038

GAS TURBINE ENGINE

Michael T. Todman, Leamington SPA; Simon A. James, and Michael L. Parker, both of Coventry, all of England, assignors to Rolls-Royce plc, London, England

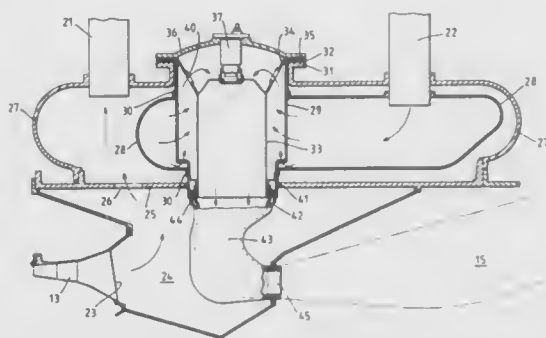
Filed May 16, 1990, Ser. No. 524,020

Claims priority, application United Kingdom, Jun. 28, 1989, 8914825

Int. Cl.⁵ F02C 7/10

U.S. Cl. 60—39.37

2 Claims



1. A gas turbine engine power unit including a regenerative heat exchanger and a gas turbine engine having a plurality of combustion chambers, the axes of which combustion chambers are arranged to be incident to the longitudinal axis of said engine, a first annular manifold located externally of the casing of said engine coaxial with the longitudinal axis of said engine.

engine and adapted to receive air exhaust from the compressor of said engine, means adapted to direct air from said first manifold to said regenerative heat exchanger, means adapted to return said air from said regenerative heat exchanger having been heated therein to a second annular manifold located wholly within and coaxial with said first manifold, and plurality of generally tubular members, each of said combustion chambers being located within and solely supported by a corresponding one of said generally tubular members, each of said generally tubular members being supported from said first manifold and at least partially located within said second manifold, adapted in turn to support said second manifold and additionally apertured to facilitate the flow of air from said second manifold to said combustion chambers to support combustion therein, said casing being apertured to receive each of said generally tubular members so as to facilitate the exhaust of combustion products from said combustion chambers to the turbine of said engine, said engine unit including a plurality of interconnecting ducts, each duct interconnecting one of said combustion chambers and the turbine of said gas turbine engine, wherein each of said interconnecting ducts and its corresponding combustion chamber are interconnected by sliding contact so that alignment is maintained therebetween notwithstanding any relative thermal expansion and contraction therebetween, each of said interconnecting ducts being double-skinned, the inner of said skins being in said sliding contact with said corresponding combustion chamber.

5,085,039

COANDA PHENOMENA COMBUSTOR FOR A TURBINE ENGINE

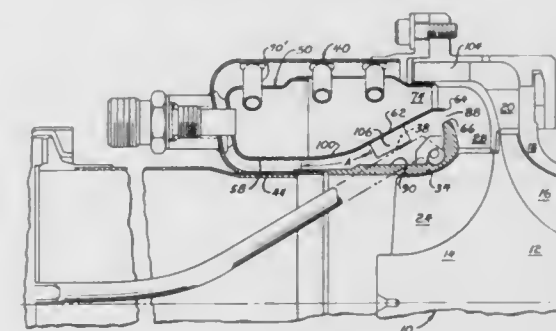
Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 7, 1989, Ser. No. 447,445

Int. Cl.⁵ F02C 3/05

U.S. Cl. 60—39.36

7 Claims



1. In a gas turbine engine having a rotary compressor, a radial flow turbine wheel coupled to the compressor, an annular combustor having a radially inner wall and a conical wall extending axially toward said turbine wheel and radially outwardly from said inner wall and being connected thereto and terminating in an outlet, a nozzle surrounding said turbine wheel and connected to said outlet, a compressed air plenum connected to said compressor and generally surrounding said combustor and terminating in a rear turbine shroud adjacent said turbine wheel and spaced from said conical wall to define a cooling air passage between said inner wall and said conical wall on the one hand and said plenum and said rear turbine shroud on the other and opening to a location in the vicinity of the nozzle, and structure of non-uniform shape on the surface of said rear shroud remote from said turbine wheel and facing said passage, the improvement wherein said engine is characterized by: the presence of means defining an interconnecting wall of smoothly curved shape joining said inner wall and said conical wall for causing a cooling air stream in said passage to attach itself to said interconnecting and conical walls; and the

absence of any aerodynamically smooth cover for said rear shroud and the structure of non-uniform shape thereon.

5,085,040

TORCH IGNITERS

John R. Tilston, Farnham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/00826, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO89/03960, PCT Pub. Date May 5, 1989

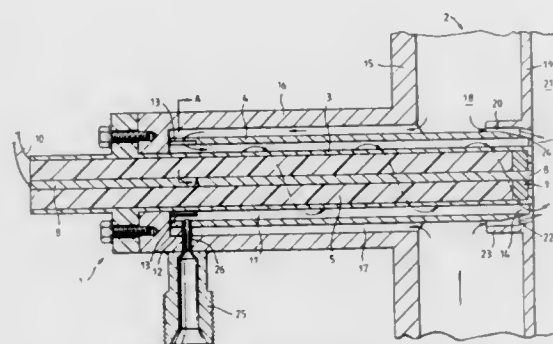
PCT Filed Oct. 13, 1988, Ser. No. 469,485

Claims priority, application United Kingdom, Oct. 19, 1987, 8724455

Int. Cl.⁵ F02C 7/266

U.S. Cl. 60—39.827

9 Claims



1. A torch igniter for a gas turbine engine, said engine including a means for supplying compressor bleed air, said igniter comprising:

- a flame lighter having a tip section and an electrical spark producing electrode at said tip section and an elongate body;
- a sleeve present around the body of the flame lighter and spaced therefrom so as to define therebetween a fuel/air passage, the sleeve being configured such that said passage, opens at a mouth portion around the tip section of the flame lighter,
- at least one air inlet which discharges said bleed air into the fuel/air passage at a position spaced from the passage mouth,
- at least one fuel inlet which discharges into the fuel/air passage at a position therein which is spaced from the passage mouth but is no further from the passage mouth than said at least one air inlet,
- an air blast atomizer lip means, within the mouth of the fuel/air passage operable, for producing an atomised spray of fuel in the vicinity of the tip section of the flame lighter from the fuel present in the fuel/air passage; and
- a conduit, supplied with said bleed air, into which said sleeve is located, said conduit and sleeve forming a cooling passageway for at least partial flow of said bleed air through said passageway and into said air inlet.

5,085,041

DUAL MODE ENGINE HAVING A CONTINUOUSLY OPERATED OXIDIZER PUMP

John L. Scott-Scott, Warwick, and Alan Bond, Oxford, both of England, assignors to Rolls-Royce plc, London, England

Filed Feb. 17, 1989, Ser. No. 314,703

Claims priority, application United Kingdom, Mar. 23, 1988, 8806895

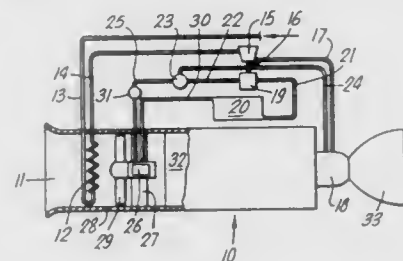
Int. Cl.⁵ F02K 9/78

U.S. Cl. 60—244

8 Claims

1. An aerospace propulsor comprising air compression means, combustion apparatus, and a propulsion nozzle adapted

to receive the products of combustion and thereby provide propulsive thrust, said combustion apparatus being arranged to receive fuel and, in a first mode of engine operation, air at least partially compressed by said air compression means, said propulsor additionally comprising a liquid oxidiser reservoir and pump means so that in a second mode of operation, liquid



oxidiser is pumped to said combustion apparatus by said pump means from said liquid oxidiser reservoir, turbine means being provided to power said air compression means, said turbine means being hydraulically driven by liquid oxidiser pumped from said reservoir by said pump means, said pump means being operative during both of said modes of engine operation.

5,085,042

SLOPE MOWER WITH REAR DRIVE ASSEMBLY

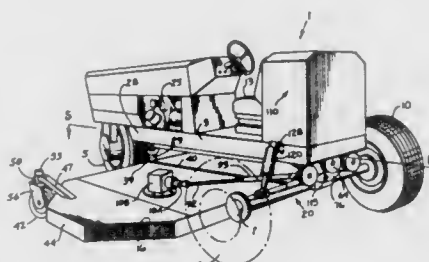
David L. Lansdowne, Hutchinson, Kans., assignor to DewEze Manufacturing, Inc., Harper, Kans.

Filed Jan. 25, 1991, Ser. No. 645,783

Int. Cl.⁵ A01D 34/06, 34/66

U.S. Cl. 56—6

16 Claims



1. A mower vehicle comprising:

- (a) a frame having front and rear ends;
- (b) wheel means connected to said frame;
- (c) a main drive shaft having an end portion; said shaft rotatably mounted to said frame, operably driving said wheel means and positioned longitudinally with respect to said frame; said shaft end portion located near said frame rear end;
- (d) power means mounted on said frame engaging and operably driving said main shaft drive;
- (e) mowing means connected to said frame and extending laterally therefrom;
- (f) mower drive means adjacent to and operably rotated by said shaft end portion;
- (g) a mower drive shaft rotated by said mower drive means and rotating said mowing means;
- (h) said frame is pivotally connected to said wheel means and has a generally vertical orientation when in operation; and
- (i) said mowing means includes a blade housing and a cutting blade mounted within said housing; said housing is pivotally

connected to said frame an swingable about a first axis extending longitudinally relative to said frame.

5,085,043

ELECTRO-MECHANICAL INTERLOCK AND MODULE SYSTEM FOR LAWN MOWER OR OTHER ELECTRICAL DEVICE

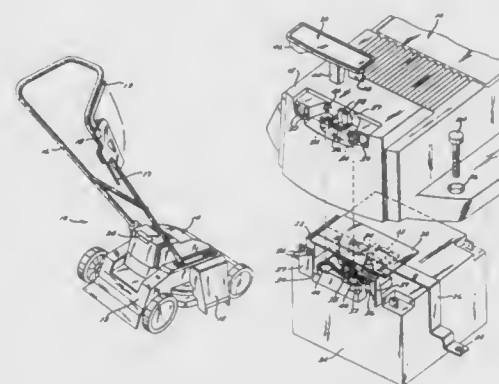
Kristoffer A. Hess, Brockville; Colin Dyke, North Augusta, and David M. Shaver, Brockville, all of Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 1, 1990, Ser. No. 532,038

Int. Cl.⁵ A01D 34/82, 75/18

U.S. Cl. 56—10.5

26 Claims



1. An electrically powered lawn mower comprising a mower deck, an electric motor mounted to the mower deck for rotatably driving a cutting blade located beneath the mower deck, a handle connected to the mower deck, a shroud covering the motor, a power circuit including a rechargeable battery for providing electrical power to the motor and an electrical connector adapted for connection to an external source of electrical current for charging said battery, a manually operable electric switch mounted to the handle and connected in said power circuit and having ON and OFF positions for controlling the application of electrical power to the motor, and an interlock system for controlling the enabling of said power circuit, including

an interlock switch connected in said power circuit and having an actuator for controlling the state of said interlock switch; said interlock switch having a first normal state for disabling said power circuit and a second state for enabling said power circuit, such that when said interlock switch is in said first state the electric motor cannot be energized by said power circuit regardless of the position of said handle mounted switch, and when said interlock switch is in said second state the electric motor is energizable by said power circuit in accordance with the position of said handle mounted switch;

means for mounting said interlock switch within said shroud adjacent a specially configured first opening in said shroud such that the actuator of said interlock switch is accessible through said first opening; and

a key member configured for insertion into said first opening in said shroud and including actuating means for engaging said actuator of said interlock switch and causing said interlock switch to switch from said first state to said second state to thereby enable said power circuit when said key member is fully inserted into said first opening in said shroud and further including means for blocking access to said electrical connector when said key member is fully inserted into said first opening in said shroud to thereby prevent said battery from being charged when said interlock switch is in said second state.

5,085,044

TWO-BLADE MOWER DECK WITH INFINITE HEIGHT ADJUSTMENT

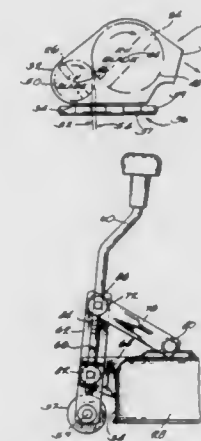
Edward Freier, Jr., Port Washington; Gary A. Hays, Cedarburg; John F. Jacque, and Kenneth H. Kias, both of Port Washington, all of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Sep. 24, 1990, Ser. No. 586,605

Int. Cl.⁵ A01D 34/66, 34/72

U.S. Cl. 56—13.5

12 Claims



1. A two blade mower deck for lawn and garden tractors, comprising:

- a primary cutting blade rotating about a first center point; and
- a secondary cutting blade having a smaller diameter than said primary blade, said secondary blade rotating about a second center point disposed laterally from and to the rear of said first center point relative to the direction of forward travel of the tractor with each of the tangents to the circles described by said primary and secondary cutting blades along the forward direction of travel extending through the described circle of the other blade.

5,085,045

DOUBLE TWIST SPINDLE APPARATUS

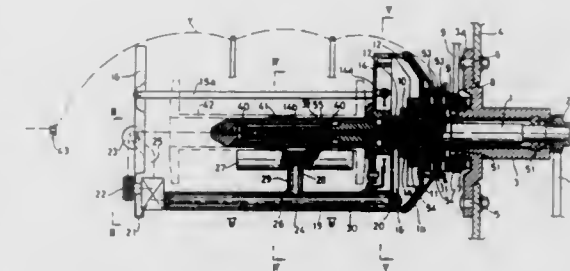
Yukio Takeuchi, Kanazu; Akio Nakahashi, Matto, and Shingo Kubota, Kanazawa, all of Japan, assignors to Kabushiki Kaisha Ishikawa Seisakusho Ltd., Kanazawa, Japan

Filed Jun. 6, 1990, Ser. No. 533,758

Int. Cl.⁵ D01H 7/86

U.S. Cl. 57—58.65

1 Claim



1. A double twist spindle apparatus, comprising:

- a hollow spindle rotatably supported by a bolster fixed to the main frame of machine;
- a bowl-shaped rotating disc unitarily arranged in the hollow spindle;
- a stationary member supported at an end portion of the hollow spindle and being kept under non-rotation state; hollow tubular portion unitarily arranged on the stationary

member at a coaxial position with the hollow spindle in series;

a bobbin holder positioned at outer periphery of the hollow tubular portion and being rotatably supported on the hollow tubular portion;

a take-up bobbin fitted on the bobbin holder and supported thereat;

a driving roller supported by the stationary member; pressing mechanism which always brings the driving roller in contact with outer periphery of the take-up bobbin;

a traverse guide supported by the stationary member and performs straight reciprocating motion in the direction parallel to the take-up bobbin;

yarn inserting holes arranged in the hollow spindle and hollow tubular portion;

yarn guiding means for guiding two lines of yarns to the yarn inserting holes and traverse guide;

first driving force inputting means for rotatively driving the hollow spindle directly;

second driving force inputting means for rotatively driving the driving roller;

transmission means for transmitting driving force of the second driving force inputting means to the driving roller;

a driver wheel which is rotatively driven by the second driving force inputting means and being rotatably supported by the bolster;

a driven wheel which stands opposite to the driver wheel with the rotating disc therebetween and being rotatably supported by the hollow spindle;

magnetic transmission means for transmitting driving torque of the driver wheel to the driven wheel by magnetic attracting force;

a driving shaft supported by the stationary member and being arranged in parallel with the take-up bobbin;

transmission means for transmitting the rotation of the driven wheel to the driving shaft;

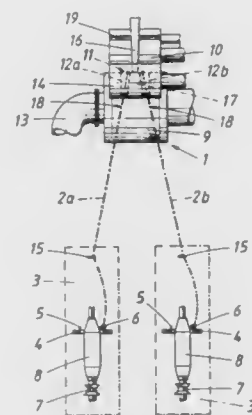
transmission means for transmitting the rotation of the driving shaft to the driving roller;

a tube rotatably fitted on the driving shaft;

an arm unitarily mounted on the tube and supporting the driving roller; and

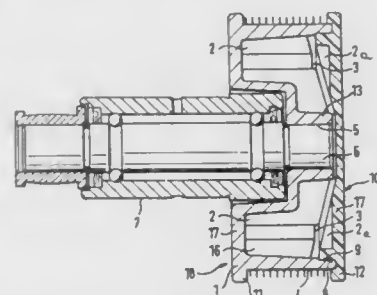
a spring means connected with the tube and energizing the tube in the direction the driving roller presses in contact with the take-up bobbin.

divide the drawn primary roving into two separate rovings,



- (d) feeding the two separate rovings directly from the conveying surface of the feed roller to the respective spinning stations, and
- (e) spinning each separate roving into a fine yarn.

5,085,047
OPENING ROLL FOR AN OPEN-END SPINNING DEVICE
 Eberhard Hofmann, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany
 Continuation of Ser. No. 392,216, Aug. 10, 1989, abandoned.
 This application Mar. 14, 1991, Ser. No. 671,165
 Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 8909448
 Int. Cl.⁵ D01H 4/10; D01G 15/14, 19/10
 U.S. Cl. 57—408 1 Claim



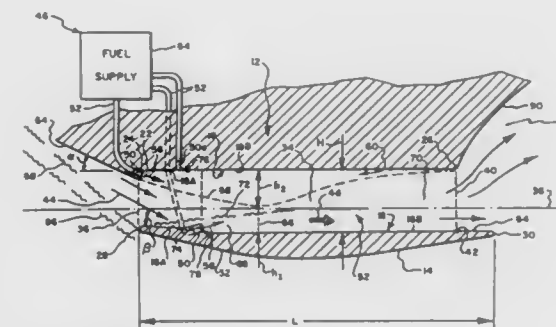
1. An opening roll for an open-end spinning device upon which clothing is carried, a shaft upon which said opening roll is non-rotatably mounted, said opening roll comprising:
- (a) a centrally located hub for receiving an end of said shaft, said hub having a longitudinal axis corresponding to a longitudinal axis of said shaft and outer and inner ends;
- (b) a ring shaped concentric surface radially spaced from said hub for receiving said clothing;
- (c) an end wall joining an inner end of said hub and said ring shaped concentric surface;
- (d) said ring shaped concentric surface and said hub having substantially the same length;
- (e) a plurality of circumferentially spaced ribs extending between said centrally located hub and said ring shaped concentric surface and also extending from said end wall to adjacent said outer end of said hub so that the length of said ribs are substantially the same as said length of said hub and said ring shaped concentric surface;
- (f) an enlarged surface means interposed in some of said ribs for providing a surface upon which pressure can be applied for ejecting said hub, said ring shaped concentric

5,085,046
PROCESS AND APPARATUS FOR FEEDING AT LEAST TWO DRAWN ROVINGS TO RESPECTIVE RING SPINNING STATIONS
 Ernst Febrer, Auf der Gugl 28, A-4020 Linz, Austria
 Filed Jan. 31, 1989, Ser. No. 304,723
 Claims priority, application Austria, Feb. 15, 1988, 330/88; Mar. 14, 1988, 682/88; Mar. 29, 1988, 834/88; Jun. 1, 1988, 1429/88; Jun. 9, 1988, 1497/88; Jun. 29, 1988, 1687/88; Jul. 22, 1988, 1876/88; Nov. 23, 1988, 2874/88
 Int. Cl.⁵ D01H 1/02, 5/72

- U.S. Cl. 57—315 14 Claims**
1. A process of spinning two fine yarns at respective ring spinning stations, which comprises the sequential steps of
- (a) drawing a primary roving in a drawing frame to form a drawn primary roving;
- (b) guiding the drawn primary roving to a conveying surface formed on a part of the periphery of a feed roller,
- (c) sucking air through two axially juxtaposed and peripherally extending suction zones in the conveying surface to

- surface, said end wall and said ribs from a mold without deformation and for permitting drilling and filling with material for balancing said opening roll;
- (g) said enlarged surface means extending from adjacent and outer end of said hub to said end wall, and
- (h) said centrally located hub, said ring shaped concentric surface, said plurality of circumferentially spaced ribs, said enlarged surface means and said end wall being a one piece unitary member.

5,085,048
SCRAMJET INCLUDING INTEGRATED INLET AND COMBUSTOR
 Paul H. Kutschenreuter, Jr., Loveland, and John C. Blanton, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
 Filed Feb. 28, 1990, Ser. No. 486,640
 Int. Cl.⁵ F02K 7/10
 U.S. Cl. 60—270.1 22 Claims



1. A scramjet engine comprising:
- a first surface including an aft facing step;
- a cowl including:
- a leading edge and a trailing edge;
- an upper surface and a lower surface extending between said leading edge and said trailing edge;
- said cowl upper surface being spaced from and generally parallel to said first surface to define an integrated inlet-combustor therebetween having an inlet for receiving and channeling into said inlet-combustor supersonic inlet airflow;
- means for injecting fuel into said inlet-combustor at said step for mixing with said supersonic inlet airflow for generating supersonic combustion gases; and further including a spaced pair of sidewalls extending between said first surface to said cowl upper surface and wherein said integrated inlet-combustor is generally rectangular and defined by said sidewall pair, said first surface and said cowl upper surface.

5,085,049
DIESEL ENGINE EXHAUST FILTRATION SYSTEM AND METHOD
 Julius J. Rim, 2743 Bloomfield Crossing, Bloomfield Hills, Mich. 48210, and Ho Rim, 601-4 Sinsa Dong, Kangnam-Ku, Seoul, Rep. of Korea
 Filed Jul. 9, 1990, Ser. No. 549,738
 Int. Cl.⁵ F01N 3/02
 U.S. Cl. 60—274 15 Claims

1. A filtration system for removing Diesel particulate matter and unburned hydrocarbons from exhaust gas of a motor vehicle powered by a Diesel engine, said filtration system being connected with an exhaust system of the motor vehicle, the Diesel engine having an air intake for aspiration, said filtration system comprising:
- a first filter connected with the exhaust system, said first

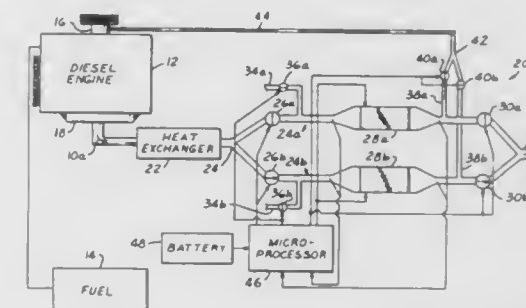
filter being structured so as to trap Diesel particulate matter from the exhaust gas;

a second filter connected with the exhaust system, said second filter being structured so as to trap Diesel particulate matter from the exhaust gas;

first valve means connected with the exhaust system for selecting at least one of said first and second filters for filtering said exhaust gas;

exhaust gas cooling means connected with said exhaust system upstream of said first and second filter means for providing a predetermined exhaust gas temperature at said first and second filters whereat said unburned hydrocarbons will condense out of said exhaust gas, said condensed unburned hydrocarbons at least in part condensing onto said trapped Diesel particulate matter;

ignition means connected with said first and second filters for selectively initiating regeneration of said first and second filters;



catalytic low temperature regeneration means present at each of said first and second filters during the respective regeneration thereof, said catalytic low temperature regeneration means providing for combustion of said Diesel particulate matter and said unburned hydrocarbons at a predetermined rate;

second valve means connected with said first and second filter means for selectively admitting air into one of said first and second filters when said one of said first and second filters is being regenerated;

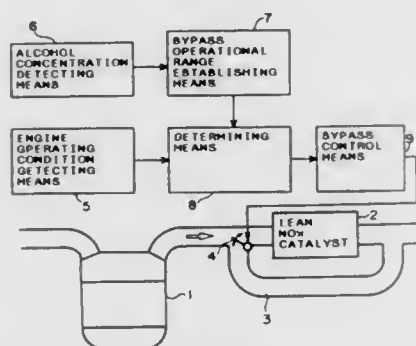
conduit means for routing combustion gases produced by said combustion in any of said first and second filters to the air intake of the Diesel engine, said predetermined rate of combustion producing said combustion gases at a rate which does not adversely affect performance of the Diesel engine; and

third valve means connected with said conduit means for selectively routing said gases produced by combustion in any of said first and second filters to the air intake of the Diesel engine.

5,085,050
EXHAUST GAS PURIFICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE USING ALCOHOL BLENDED GASOLINE FOR FUEL
 Kenji Katoh, Sunto, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
 Filed Nov. 27, 1990, Ser. No. 618,659
 Claims priority, application Japan, Dec. 1, 1989, 1-310570
 Int. Cl.⁵ F01N 3/20

- U.S. Cl. 60—288 8 Claims**
1. An exhaust gas purification system for an internal combustion engine using alcohol blended gasoline for a fuel and operable at various blend ratios of alcohol to gasoline, the system comprising:
- a catalyst installed in an exhaust conduit of the engine and constructed of zeolite carrying at least one kind of metal selected from transition metals and noble metals to reduce nitrogen oxides included in exhaust gas from the engine under an oxidizing gas condition and in the presence of hydrocarbons;

a bypass conduit connected to the exhaust conduit so as to bypass the catalyst;
a bypass valve adapted to switch flow of the exhaust gas between the catalyst and the bypass conduit;
engine operating condition detecting means for detecting various operating conditions of the engine;
alcohol concentration detecting means for detecting alcohol concentration of a fuel used in the engine;
bypass operational range establishing means for variably establishing a bypass operational range where the exhaust gas is caused to bypass the catalyst in response to the alcohol concentration detected by the alcohol concentration detecting means;



determining means for determining whether or not the detected engine operating condition is within the established bypass operational range; and
bypass control means for switching the bypass valve between causing the exhaust gas to flow through the bypass conduit when the engine operating condition is determined to be within the established bypass operational range and causing the exhaust gas to flow through the catalyst when the engine operating condition is determined to be outside the established bypass operational range.

5,085,051

DISPLACEMENT OF VARIABLE DISPLACEMENT PUMP CONTROLLED BY LOAD SENSING DEVICE HAVING TWO SETTINGS FOR LOW AND THIGH SPEED OPERATION OF AN ACTUATOR

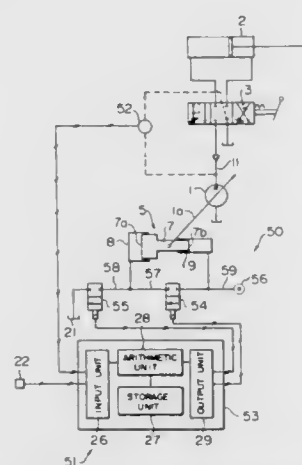
Toichi Hirata, Ushiku, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 373,337

Claims priority, application Japan, Jun. 29, 1988, 63-159221
Int. Cl.⁵ F16D 31/02

U.S. Cl. 60—368

5 Claims



1. A hydraulic drive system having a hydraulic pump of the

variable displacement type having displacement volume varying means, at least one hydraulic actuator driven by a hydraulic fluid discharged from said hydraulic pump, a directional control valve for controlling a flow of the hydraulic fluid supplied from said hydraulic pump to said actuator, and discharge control means for controlling a flow rate of the hydraulic fluid discharged from said hydraulic pump, said discharge control means including drive means for driving said displacement volume varying means and load-sensing control means for controlling operation of said drive means responsive to a differential pressure between a discharge pressure of said hydraulic pump and a load pressure of said actuator for holding said differential pressure at a setting value, said hydraulic drive system comprising:

instruction means operated exteriorly for instructing a change in the differential pressure between the discharge pressure of said hydraulic pump and the load pressure of said actuator;

differential pressure setting means for changing the setting value of said differential pressure in response to an instruction from said instruction means, said load-sensing control means including detector means for detecting the differential pressure between the discharge pressure of said hydraulic pump and the load pressure of said actuator, a controller for outputting control signals when the differential pressure detected by said detector means is different from a setting value, and valve means driven by said control signals, wherein

said controller includes a storage means for storing a plurality of differential pressure target values, and arithmetic means for selecting one of said plurality of stored differential pressure target values in response to the instruction from said instruction means and then defines the selected value as a setting value of said differential pressure, and said differential pressure setting means includes said storage means and said arithmetic means of said controller.

5,085,052

OPERATING SPEED CHANGE-OVER DEVICE

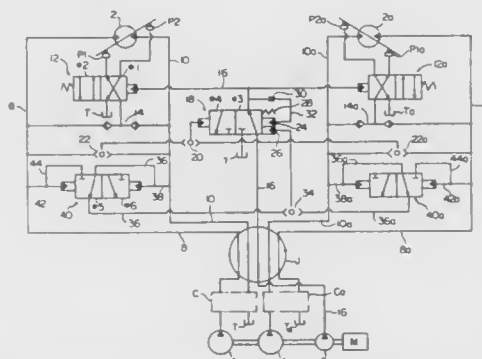
Masanobu Kawanaka, Kobe; Youichi Kondo; Junichi Tabata, both of Akashi, and Kimimasa Onda, Kobe, all of Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,934

Claims priority, application Japan, Mar. 9, 1990, 2-23261[U]
Int. Cl.⁵ F16D 31/02; F01B 3/00

U.S. Cl. 60—445

2 Claims



1. An operating speed change-over device comprising a capacity change-over valve for changing over the capacity of a variable displacement motor, and an automatic speed change-over valve for opening and closing a pilot fluid line that connects a pilot port of said capacity change-over valve to a pilot pump, wherein said automatic speed change-over valve has one pilot port which is connected to a pressurized fluid feed line leading to said motor and has another pilot port which is connected to the return fluid line of said motor, and is changed over by an effective differential pressure between the two fluid lines.

5,085,053

SWASHPLATE ASSEMBLY FOR A SWASHPLATE TYPE HYDRAULIC PRESSURE DEVICE

Tsutomu Hayashi, Tokyo; Noritaka Koga; Kiyoshi Katahira, both of Saitama; Atuo Hojo, Tokyo; Toshifumi Ito, Saitama; Mitsuru Saito, Tokyo; Yoshihiro Nakajima, Tokyo; Shinkichi Miyazawa, Tokyo, and Yoshihiro Yoshida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 291,441, Dec. 28, 1988, abandoned.

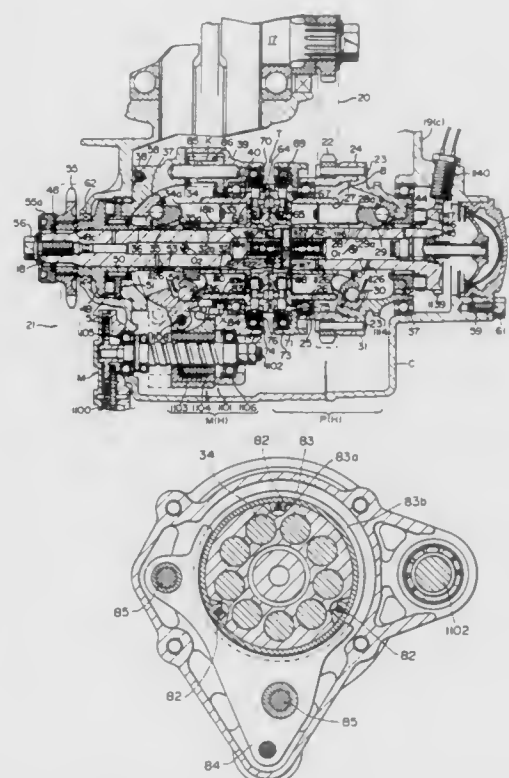
This application Feb. 20, 1990, Ser. No. 483,277

Claims priority, application Japan, Dec. 28, 1987, 62-332442; Nov. 25, 1988, 63-297391; Nov. 25, 1988, 63-297392; Nov. 25, 1988, 63-297393; Nov. 25, 1988, 63-297394; Nov. 25, 1988, 63-297395; Nov. 25, 1988, 63-297396; Nov. 25, 1988, 63-297397; Nov. 25, 1988, 63-297398; Nov. 25, 1988, 63-297399

Int. Cl.⁵ F16D 39/00

U.S. Cl. 60—488

30 Claims



30. A swashplate type hydraulic pressure device comprising: a cylinder having an axis;

a number of plungers axially slidably disposed in a number of cylinder bores which are arranged in said cylinder annularly round the axis thereof, each of the plungers having a spherical concave portion formed at a tip end thereof;

a swashplate holder disposed oppositely to the tip ends of said plungers; and
a swashplate rotatably supported on said swashplate holder and having a number of spherical protruding portions formed on a surface thereof to be abutted by spherical concave portions of the plungers;

wherein said spherical concave portions of plungers are each formed to have a radius of curvature larger than that of the associated spherical protruding portions of the swashplate and wherein a center point of engagement between the spherical concave portions of plungers and the associated spherical protruding portions of the swashplate is located radially outwardly of an axis of said plunger when said spherical protruding portions assume a position on a plane perpendicular to the axis of the cylinder.

5,085,054

SEALING MECHANISM IN STIRLING ENGINE

Hiroyuki Katsuda, Okazaki; Tomokimi Mizuno, Chiryu, and Tetsumi Watanabe, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

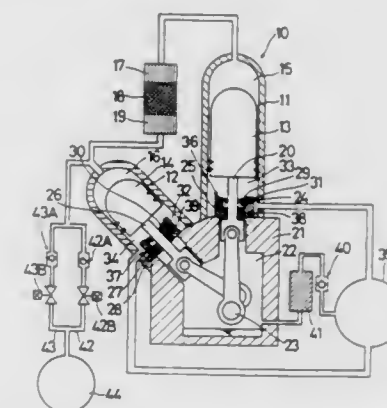
Filed Nov. 5, 1990, Ser. No. 608,820

Claims priority, application Japan, Nov. 7, 1989, 1-289393

Int. Cl.⁵ F02G 1/04

U.S. Cl. 60—517

4 Claims



1. A sealing mechanism in a Stirling engine comprising: an output deriving means;
a rod for connecting an operating piston defining an operating space and the output deriving means;
an intermediate member for supporting the rod in fluid-tight manner via a bush;
a sealing member secured to the intermediate member and including a lip in elastic engagement with the rod for assuring a fluid-tight fit therebetween;
an intermediate chamber defined between the sealing member and the operating piston;
a pressure chamber defined between the sealing member and the intermediate member;
a first check-valve allowing fluid-flow from the intermediate chamber to the pressure chamber and provided therebetween; and
a relief valve to be opened for releasing the pressure in the pressure chamber into a space for accommodating the output deriving means when the differential pressure therebetween exceeds a set value.

5,085,055

REVERSIBLE MECHANOCHEMICAL ENGINES COMPRISED OF BIOELASTOMERS CAPABLE OF MODULABLE INVERSE TEMPERATURE TRANSITIONS FOR THE INTERCONVERSION OF CHEMICAL AND MECHANICAL WORK

Dan W. Urry, Birmingham, Ala., assignor to The University of Alabama/Research Foundation, Birmingham, Ala.

Division of Ser. No. 410,018, Sep. 20, 1989, Pat. No. 5,032,271, which is a continuation of Ser. No. 163,088, Mar. 2, 1988, Pat. No. 4,924,689, which is a continuation-in-part of Ser. No. 900,895, Aug. 27, 1986, Pat. No. 4,783,523, and a

continuation-in-part of Ser. No. 62,557, Jun. 15, 1987, Pat. No. 4,898,926. This application Apr. 30, 1991, Ser. No. 693,814

Int. Cl.⁵ F03G 7/06

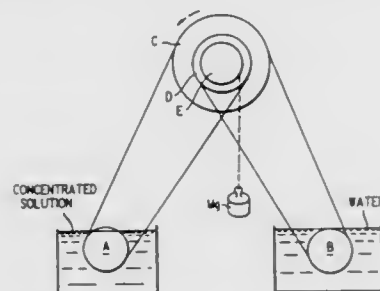
U.S. Cl. 60—527

6 Claims

1. A mechanochemical engine capable of converting chemical work to mechanical work, which comprises:

- a first pulley, attached to
- three concentric pulleys with said pulleys sharing a common axis;
- a second pulley, attached also to said three pulleys; and wherein said pulleys are attached by a strip or band of an elastomeric matrix capable of reversibly contracting and

relaxing by an inverse temperature transition; and wherein said first pulley is immersed in a salt solution having a



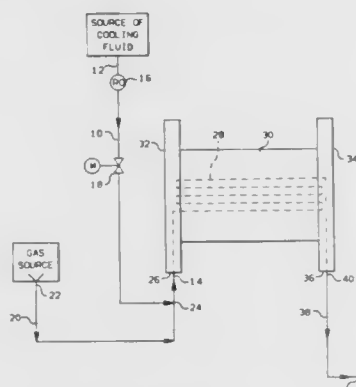
concentration which differs from a concentration of a bath in which the second pulley is immersed by at least 0.02 N.

5,085,056
METHOD AND APPARATUS FOR ATOMIZING
(PARTICULATING) COOLED FLUID SLUGS IN A
PULSED FLUID COOLING SYSTEM

Steven E. Page, Friendswood, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 22, 1990, Ser. No. 570,671
Int. Cl.⁵ F25D 17/02

U.S. Cl. 62-64

5 Claims



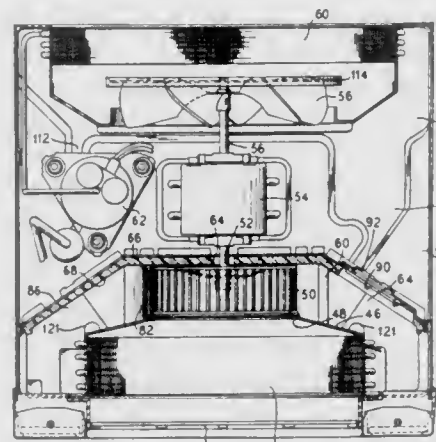
1. A method for cooling a hot body having a cooling channel formed therein, comprising the steps of: directing a liquid coolant through a first conduit having a first end and a second end; pulsating said liquid coolant within said first conduit so as to create a series of liquid coolant pulses passing through said first conduit towards said second end; directing a pressurized gas stream through a second conduit and into said first conduit so as to atomize each of said liquid coolant pulses in said first conduit resulting in a series of atomized liquid coolant pulses; directing said atomized liquid coolant pulses through the second end of said first conduit into the cooling channel formed in said hot body so as to vaporize said atomized liquid coolant pulses thereby forming vaporized liquid coolant and resulting in cooling of said hot body; and directing the thus formed vaporized liquid coolant from said cooling channel.

5,085,057
DUAL SIDE DISCHARGE ROOM AIR CONDITIONER
WITH FOAMED INSULATION AIR PASSAGE WALLS
Christopher M. Thompson, Smyrna; Timothy J. Campbell, Nashville; Leonard T. Farfaglia, deceased, late of Brentwood by Mary Farfaglia, heir; Billy P. Gipsen, Marshall County, and Thompson Matambo, Brentwood, all of Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 11, 1990, Ser. No. 522,179
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.⁵ F25D 23/12

U.S. Cl. 62-262

15 Claims



1. A room air conditioner comprising: an evaporator coil centered on a center line of and at a front side of said air conditioner; a condenser coil located at a rear side of said air conditioner; a barrier wall separating said evaporator coil from said condenser coil; an air moving device located in front of said barrier wall and centered behind said evaporator coil; a housing surrounding said air moving device defined by foamed insulation walls centrally located directly behind said evaporator coil and in front of said barrier wall, said air moving device being arranged in said housing so as to draw air in a stream from in front of said air conditioner through said evaporator coil and into said air moving device; a pair of openings in said housing defined by said foamed insulation, being substantially equal in size and shape and positioned on opposite sides of said air moving device, said housing, air moving device and openings defining means for dividing the air stream into two separate and substantially equal air streams after it has passed through said air moving device and to direct said separate air streams toward two separate air exit openings at said front side of said air.

5,085,058
BI-FLOW EXPANSION DEVICE
David A. Aaron, Reisterstown, and Piotr A. Domanski, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

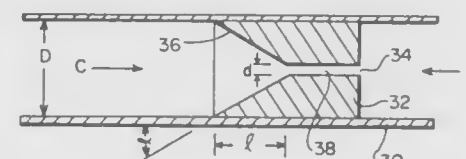
Filed Jul. 18, 1990, Ser. No. 553,831
Int. Cl.⁵ F25B 13/00

U.S. Cl. 62-324.6

6 Claims

1. A bi-flow expansion device for refrigerant in a heat pump having a cooling mode in which refrigerant flows through said expansion device in a first direction, and a heating mode in which refrigerant flows through said device in a second direction, said expansion device comprising a tubular member having a first refrigerant entrance-exit means at a first end, said

first entrance-exit means facing the direction from which refrigerant flows when said heat pump is in the cooling mode, a second refrigerant entrance-exit means at a second end, said second entrance-exit means facing the direction from which refrigerant flows when said heat pump is in the heating mode, at least one passage for refrigerant extending between said first



and second entrance-exit means, and means for changing the rate of flow of refrigerant through said expansion device upon a change in direction of flow of refrigerant between said first and second entrance-exit means, said means for changing the rate of flow of refrigerant comprising a less obstructive opening to refrigerant flow at said first entrance-exit means than at said second entrance-exit means.

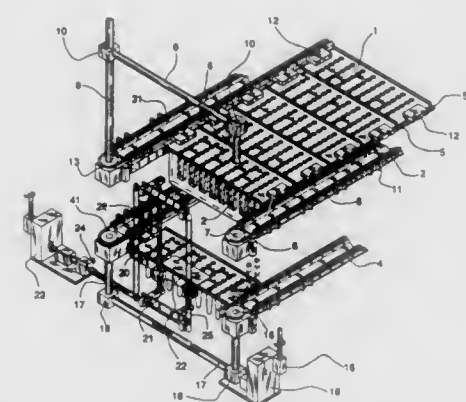
5,085,059
MACHINE FOR MAKING STICK ICES, WATER ICES,
AND THE LIKE

Franco Grigoli, and Franco Trabacchi, both of Milan, Italy, assignors to Sidam S.R.L., Cormano, Italy
Filed Aug. 1, 1990, Ser. No. 562,220

Claims priority, application Italy, Nov. 10, 1989, 22345 A/89
Int. Cl.⁵ A23G 9/18

U.S. Cl. 62-345

8 Claims



1. In a machine for making sorbets, ices with or without an inserted stick, including moving molds along a path with devices for filling the molds, freezing the filled product and then removing the frozen product, the improvement comprising: first guide means including production guide elements for moving mold plates, in succession, from a starting location to an end location, beyond the devices; and second guide means for returning mold plates to said starting location, including return guide elements positioned beneath said production guide, said second guide means moving said mold plates along said return guide elements at a higher speed than said first guide means moves the mold plates along the production guide elements.

5,085,060
CLIP RING TYPE ORNAMENTAL CLASP
Koji Matsushita, Sapporo, Japan, assignor to Ladies Houshoku Company Ltd., Sapporo, Japan

Filed Jul. 8, 1991, Ser. No. 727,019
Claims priority, application Japan, Mar. 2, 1991, 3-18302
Int. Cl.⁵ A44C 25/00

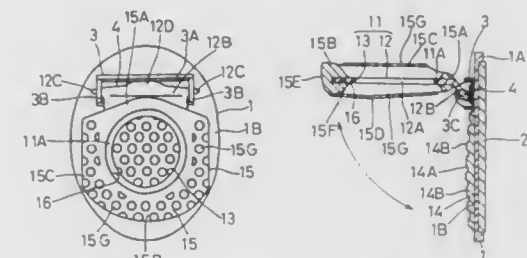
U.S. Cl. 63-2

2 Claims

1. A clip ring type ornamental clasp including an ornament body having an ornamental surface on the front side and a

gripping surface on the rear side thereof, an annular clip ring having a cloth threading hole and pivotally supported on said gripping surface of said ornament body through a ring support member for pivoting movements toward and away from said gripping surface of said ornament body, and a spring mounted on said ring support member and adapted to bias said clip ring constantly toward said gripping surface of said ornament body, characterized in that said ornamental clasp comprises:

an anti-slip member securely fixed on said gripping surface of said ornament body; and



an annular anti-slip cover structure fitted on said clip ring and having a lower anti-slip surface on the lower side thereof in face to face relation with said anti-slip member, said anti-slip cover structure having an opening of a larger diameter than said cloth threading hole of said clip ring to expose said inner marginal edge portions of said clip ring along said inner periphery of said anti-slip cover structure in a predetermined width.

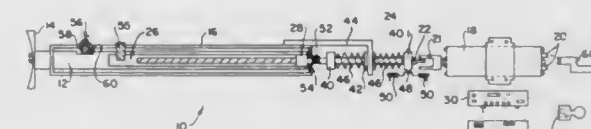
5,085,061
ANTI-THEFT DEVICE FOR MOTOR VEHICLES
Michael J. Maudsley, 6 Trevor Place, La Lucia, Durban, Natal Province, South Africa

Filed Sep. 4, 1990, Ser. No. 576,960
Claims priority, application South Africa, Sep. 1, 1989, 89/6730

Int. Cl.⁵ B60R 25/00

U.S. Cl. 70-225

15 Claims



1. An anti-theft device for a motor vehicle, which includes an elongate wheel lock bar, defining a longitudinal axis, securable to the body of a vehicle in a configuration in which it is displaceable between an inoperative position and two operative positions in which the bar can inhibit normal operation of a steered wheel of the vehicle one operative position being a position in which one end of the wheel lock bar bears against the tire of a steered wheel of a vehicle for inhibiting rotation of the said wheel and the other operative position being a position in which the steered wheel is turned about its vertical axis to the extent that the said end of the wheel lock bar is positioned adjacent the said wheel, blocking turning back of the said wheel;

displacement means for displacing the wheel lock bar between its inoperative and operative positions and for holding the bar in these positions; control means for controlling operation of the displacement means; and sensor means for sensing resistance to displacement of the wheel lock bar in a first direction of displacement, for deactivating the operation of the displacement means for as long as a predetermined degree of resistance to displacement is being sensed, and for permitting reactivation

of the operation of the displacement means for continuing displacement of the wheel lock bar in said first direction when said predetermined degree of resistance ceases to exist, said sensor means incorporated as part of the displacement means for displacing the wheel lock bar, and including switches for deactivating the displacement means while predetermined degrees of resistance to displacement is sensed.

5,085,062
KEYS AND RELATED MAGNETIC LOCKS TO CONTROL ACCESSES

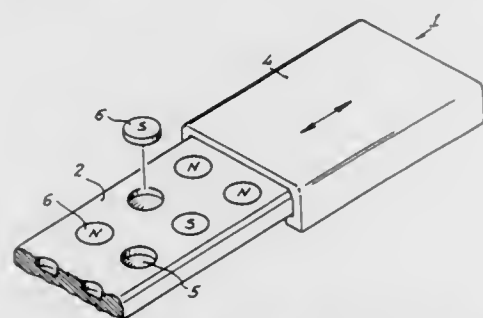
Juan Capdevila, Ctra. de Torelló, s/n. 08572 Sant Pere De Torelló, Barcelona, Spain, assignor to Juan Capdevila, Barcelona, Spain

Filed Sep. 27, 1989, Ser. No. 413,110
Claims priority, application Spain, Sep. 28, 1988, 8802942; Feb. 22, 1989, 8900650

Int. Cl.⁵ E05B 47/00

U.S. Cl. 70—276

11 Claims



1. In a magnetic locking system having keys and related magnetic locks, including a codifier circuit with a coded output signal transmitted to an electronic station that decodes and compares the output signal with a predetermined combination and actuates a means for releasing the related magnetic lock if the decoded output signal equals the combination, the improvement comprising a key comprising a bit with at least one recess arranged into at least one row of recesses, the at least one recess oriented transversely to the longitudinal axis of the key and capable being filled with a removable magnetized disk, the magnetized disk oriented in either magnetic polarity along the longitudinal axis of the at least one recess, the two possible orientations of the magnetic field of the magnetized disk and the possibility of an absence of a magnetic field if the at least one recess is empty forming a ternary state system of magnetic fields, the bit adapted to be covered by a slidable plate and provided with structure for holding the plate to the bit; and a lock comprising structure for receiving the key, at least one magnetic sensor disposed in juxtaposition in the key receiving structure to the at least one key recess in the key bit when the key is inserted in the key receiving structure, the at least one magnetic sensor detecting a particular state of the ternary magnetic field state system and outputting a corresponding signal to the codifier circuit.

5,085,063
BICYCLE HANDLEBAR LOCK
Laroy J. Van Dyke, Audubon, Pa., and Kenneth Cluff, Orem, Utah, assignors to Innovative Bicycle Products, Inc., Huntingdon Valley, Pa.

Filed Dec. 6, 1990, Ser. No. 622,927

Int. Cl.⁵ B62H 5/04; E05B 71/00

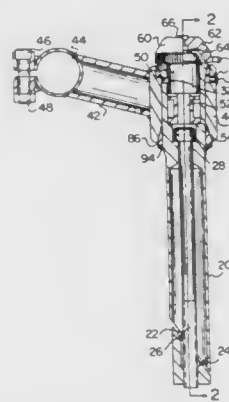
U.S. Cl. 70—218

16 Claims

1. A mechanism for discouraging theft of a bicycle having a wheel on a fork rotatable about an axis relative to a frame headstock for steering the bicycle, and a handlebar mount for manually positioning the fork, the mechanism comprising:

a first member having means for rigid attachment relative to the fork;

a second member having means for rigid attachment relative to the handlebar mount, the first and second members being rotatably coupleable and decoupleable at a locking junction, one of the first and second members having at least one aperture carrying a locking body and the other of the first and second members having a receptacle for receiving the locking body, the receptacle having a radially sloping edge contour, the aperture and the receptacle being correspondingly positioned and dimensioned such that the locking body resides within said aperture when the aperture and the receptacle are misaligned, and the locking body can be displaced partway into the receptacle to reside partly in the aperture and partly in the receptacle when the aperture and the receptacle are aligned;



a lock disposed at the locking junction of the first and second members, the lock having a cam movable between a first position wherein the cam urges the locking body from the aperture toward the receptacle, for fixing the first and second members against relative rotation, such that the bicycle can be operated, and a second position wherein the locking body is free to become retracted into the aperture by action of the sloping edge contour of the receptacle, such that the bicycle cannot be operated; wherein the first and second members define a concentrically arranged tube and cylinder, the tube and the cylinder having complementary conical tapers for securing the first and second members in an axial direction; and, means for fixing the first and second members at predetermined relative positions wherein the complementary conical tapers are urged together such that the first and second members are secured against relative axial displacement at a predetermined axial pressure.

5,085,064
DRUM TYPE WASHING AND DEHYDRATING MACHINE

Shoichi Hayashi; Hidetoshi Ishihara, and Atsushi Ueda, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 537,705

Claims priority, application Japan, Jun. 20, 1989, 1-157153

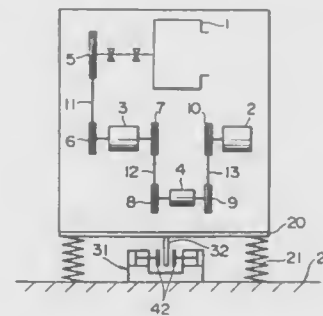
Int. Cl.⁵ D06F 37/24

U.S. Cl. 68—23.001

3 Claims

1. In a drum type washing and dehydrating machine having a base, with a treatment drum system installed thereon, supported elastically on the ground, the drum type washing and dehydrating machine comprising a vibration fixing device, said device having a clamping part and an actuator for actuating said clamping part, said clamping part being selectively affix-

able to said base by operating said actuator, and control means for detecting the vibrations of said base and for actuating said



actuator based on the detected vibration frequency of said base.

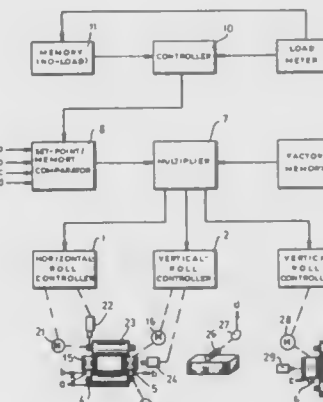
5,085,065
UNIVERSAL ROLL STAND AND METHOD OF OPERATING SAME

Bernd Onderka, Korschbroich; Georg Engel, Kaarst; Paul Mauk, Düsseldorf, and Hugo Feldmann, Alsdorf-Warden, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 373,877, Jun. 29, 1989, abandoned. This application Jun. 1, 1990, Ser. No. 532,258
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3821990

Int. Cl.⁵ B21B 37/00

U.S. Cl. 72—8

6 Claims



1. In a rolling method wherein a workpiece is advanced through a succession of universal roll stands each having a pair of rotatably positively driven horizontal rolls engaging horizontal surfaces of the workpiece and a pair of idling vertical rolls engaging vertical surfaces of the workpiece and normally only rotationally entrained by engagement with the advancing workpiece, a control method comprising the steps of: detecting the peripheral speed of the vertical rolls and generating an output corresponding thereto; detecting the peripheral speed of the horizontal rolls and generating an output corresponding thereto; dividing one of the roller outputs by the other roll output and generating a quotient corresponding thereto; comparing the quotient to a set point and generating an error signal corresponding to the difference; and varying the horizontal positions of the vertical rolls in accordance with the difference and so as to minimize the error signal.

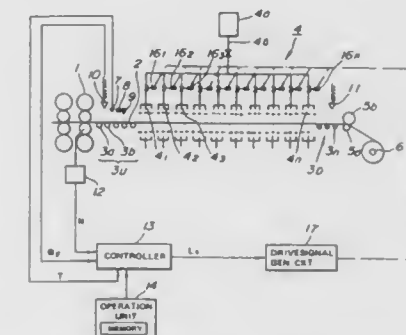
5,085,066
METHOD FOR SUPPRESSING FLUCTUATION OF WIDTH IN HOT ROLLED STRIP

Yuji Komami; Megumi Kan; Toshiyuki Tamai, and Ttaru Hishinuma, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Continuation of Ser. No. 415,410, Sep. 29, 1989, abandoned, which is a continuation of Ser. No. 159,723, Feb. 24, 1988, abandoned. This application Oct. 1, 1990, Ser. No. 593,336
Claims priority, application Japan, Feb. 24, 1987, 62-40629
Int. Cl.⁵ B21B 37/10, 45/02

U.S. Cl. 72—13

7 Claims



1. A method for suppressing fluctuation of width of a hot rolled strip transferred through a path extending from a finishing mill to a coiler in a hot rolling line comprising the steps of: maintaining the temperature of said hot rolled strip at an outlet of a finishing roll at a temperature slightly above the A_{r3} transformation temperature; air cooling said hot rolled strip while it travels through said path, continuing said air cooling to bring said hot rolled strip to a temperature below an A_{r3} transformation starting point, and continuing said air cooling to bring the temperature of said hot rolled strip below an A_{r3} transformation end point of said strip; and applying a liquid state cooling medium to said hot rolled strip after the temperature of the hot rolled strip has dropped to a value below said A_{r3} transformation end point.

5,085,067
METHOD AND ARRANGEMENT FOR AUTOMATICALLY ALIGNING A UNIVERSAL ROLLING MILL STAND AFTER THE STAND HAS BEEN CHANGED TO NEW TYPES OF SECTIONS

Hans-Jürgen Reismann, Duesseldorf; Burkhardt Porembka, Grevenbroich, and Walter Schmalz, Erkrath, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Division of Ser. No. 528,696, May 14, 1990. This application

Mar. 26, 1991, Ser. No. 675,187

Claims priority, application Fed. Rep. of Germany, May 24, 1989, 3916925; May 24, 1989, 3916927

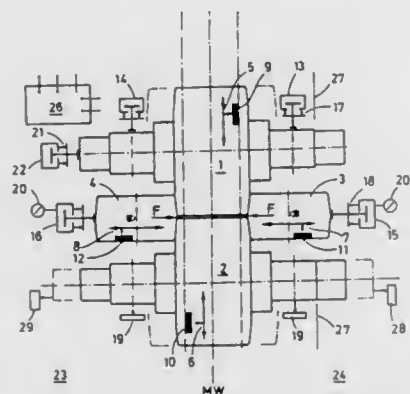
Int. Cl.⁵ B21B 13/08, 31/16

U.S. Cl. 72—20

6 Claims

1. In a method for automatically aligning horizontal rolls and vertical rolls in a universal rolling mill stand after the stand has been changed to new types of sections in a rolling mill train, wherein the rolls are adjusted electromechanically and are pressurized hydraulically, the improvement comprising the simultaneous determination of the spring characteristic constants of the stand and the automatic alignment of the horizontal rolls and vertical rolls of the stand by jointly determining the radial spring characteristic for the horizontal rolls, separately determining the radial spring characteristic for each vertical roll and separately determining the axial spring characteristic of one of the horizontal rolls in accordance with one of two axial directions defined by the horizontal rolls, moving the rolls electromechanically toward each other until a mo-

ment of contact, wherein a contact pressure is established at the moment of contact and the speed of the electromechanical adjustments of the rolls toward each other is reduced with the



increasing distance reduction and becomes zero at the moment of contact, and subsequently increasing the contact pressure to at least two pressure points and then relieving the pressure.

5,085,068

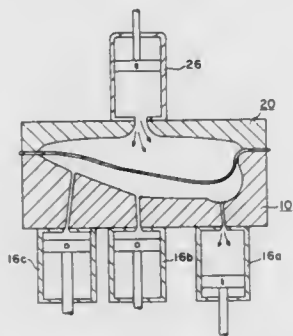
DIE FORMING METALLIC SHEET MATERIALS

Michael L. Rhoades, and Lawrence J. Rhoades, both of Pittsburgh, Pa., assignors to Extrude Hone Corporation, Irwin, Pa. Continuation-in-part of Ser. No. 641,773, Jan. 16, 1991. This application Jul. 23, 1991, Ser. No. 734,764

Int. Cl.⁵ B21D 26/02

U.S. Cl. 72—60

7 Claims



1. The method of die forming metallic sheet materials comprising the steps of:

- providing a die provided with a cavity and at least one exit port and said cavity filled with a viscous thermoplastic polymer;
- providing means for withdrawing said polymer from said cavity through said exit port;
- providing means to fix a metallic sheet in engagement with said die and enclosing said cavity;
- controllably withdrawing said polymer from said cavity while applying pressure to said sheet on the face opposite said cavity until said sheet is conformed to the shape of said die.

5,085,069

MULTI-PART ROLLING MILL HOUSING

James C. Walters, Jr., Louisville, Ky., assignor to Steel Technologies, Inc., Louisville, Ky.

Filed Nov. 26, 1990, Ser. No. 618,064

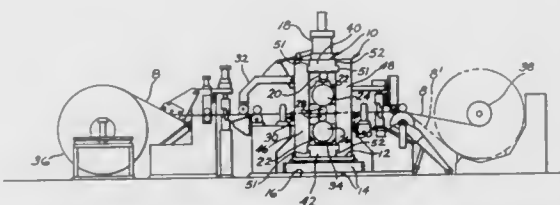
Int. Cl.⁵ B21B 31/02

U.S. Cl. 72—237

8 Claims

- A rolling mill housing for use in an assembly for rolling steel strip comprising a transversely extending bottom separator of unitary construction having a T-shaped cross section which includes

an upper T-arm portion and a lower T-leg portion, said upper portion extending forwardly and rearwardly beyond vertically extending forwardly and rearwardly facing surfaces of said lower portion, a transversely extending top separator having an inverted T-shaped cross-section which includes an upper T-leg portion and a lower T-arm portion, said lower T-arm portion extending beyond vertically extending forwardly and rearwardly facing surfaces of said upper T-leg portion, said top separator being vertically spaced from and disposed in registry with said bottom separator, two pairs of elongated vertically extending columns, each of said columns being rectangular in cross-section and defining a pair of spaced apart, transversely extending notches located on opposite end portions thereof, a first pair of



said columns being disposed in spaced apart relation behind said separators on opposite side edge portions thereof and a second pair of said columns being disposed in spaced apart relation in front of said separators on opposite edge portions thereof, rearwardly and forwardly projecting T-arms of said separators being inserted in close fitting relation in said notches to form a substantially rectangular frame opening for the passage of a steel strip there-through, and fastening means connected directly between upper and lower end portions of said columns, and both through said notches into said T-arms and adjacent said notches into said T-legs of both said top and bottom separators for securing said T-arms in said notches in close fitting relation.

5,085,070

CAPACITIVE FORCE-BALANCE SYSTEM FOR MEASURING SMALL FORCES AND PRESSURES

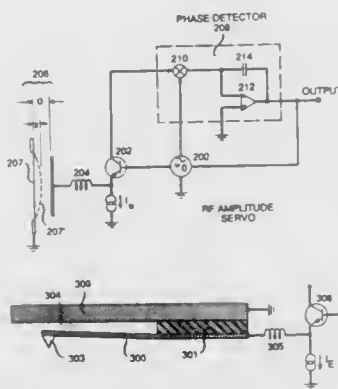
Gabriel L. Miller, Westfield, and Eric R. Wagner, South Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 7, 1990, Ser. No. 476,865

Int. Cl.⁵ G01B 5/28

U.S. Cl. 73—105

10 Claims



- A resonant phase shift apparatus for detecting changes in force or pressure, comprising a tuned circuit having a capacitor with at least one movable plate for sensing force or pressure changes,

an oscillator for driving the tuned circuit and operating at a frequency different from the natural frequency of the tuned circuit, and means for comparing deviations in the phase of the response of the tuned circuit to the phase of the oscillator to generate an error signal for controlling the amplitude of the oscillator output driving the tuned circuit. 10. A force or pressure sensor, which comprises a tuned circuit having a capacitor with a movable element adapted for sensing the force or pressure, an oscillator driving the tuned circuit and operating at a frequency different from the natural resonant frequency of the tuned circuit, means for generating an error signal by comparing the phase of the response from the tuned circuit to the phase of the oscillator output, the error signal being connected to control the amplitude of the oscillator output and to an output terminal of the sensor, whereby electrostatic force from voltage appearing across the capacitor deflects the movable element and changes the resonant frequency of the tuned circuit to the frequency of the oscillator and whereby application of the force or pressure to the movable element causes deviations in the error signal related to the magnitude of the force or pressure.

5,085,071

DRIVING POWER SOURCE UNIT FOR AUTOMOTIVE POWER TRANSMISSION TESTING APPARATUS EMPLOYING MOTOR

Fumio Mizushima; Takashi Goto, both of Shizuoka, and Michio Nawa, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

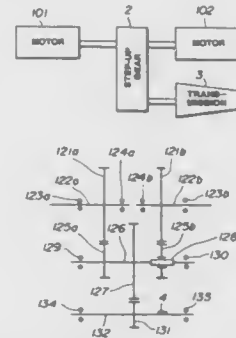
Filed Nov. 13, 1989, Ser. No. 436,342

Claims priority, application Japan, Nov. 14, 1988, 63-148307[U]

Int. Cl.⁵ G01M 15/00

U.S. Cl. 73—118.1

3 Claims



- A step-up gear unit comprising: a first input shaft connected to a first power source unit and carrying a first input gear for driving the later; a second input shaft connected to a second power source unit and carrying a second input gear for driving the later, said second power source unit being independent of said first power source for independently driving said second input gear from said first input gear; an output shaft connected to a work and carrying a sole output gear for rotation therewith; a first and second intermediate gears supported on a rotary shaft, said first intermediate gear being adapted to mesh with said first input gear, said second input gear, at least one of said first and second intermediate gear being movable for selectively engaging and disengaging with associated one of said first and second input shaft, said at least one of first and second intermediate gears being associated with means for permitting axial shifting of said at least one of first and second intermediate gears in a first position at which said at least one of first and second intermediate gears is engaged with the associated one of said first and second

input gears, and a second position at which said at least one of first and second intermediate gears is axially shifted away from the associated input gear for disconnecting gear train therebetween; a third intermediate gear rigidly secured on said rotary shaft for rotation therewith and constantly meshed with said output gear for driving latter; and wherein said axial shift permitting means includes spline coupling provided between said at least one of first and second intermediate gears and said rotary shaft.

5,085,072

DETECTION PROCESS AND DEVICE FOR AN ELECTRONIC INJECTION SYSTEM OF A MULTICYLINDER ENGINE

Yves Drutel, Brignais, and Denis Ranc, Saint Priest, both of France, assignors to Renault Vehicules Industriels, Lyons, France

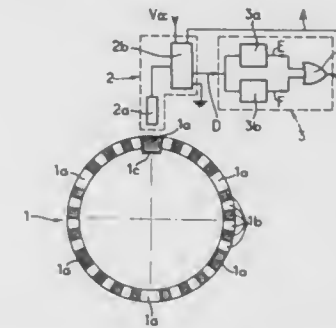
Filed Aug. 3, 1990, Ser. No. 562,273

Claims priority, application France, Aug. 3, 1989, 89 10488

Int. Cl.⁵ G01M 19/00

U.S. Cl. 73—119 A

11 Claims



- Detection device connected to an injection pump of a multicylinder engine for measuring the speed of rotation of the engine, pinpointing angularly the top dead center corresponding to each cylinder of the engine and performing a static timing of the injection pump, comprising: a rigid ring mounted on a rotation shaft of the pump inside the pump; a sensor sensitive to magnetic field attached inside the pump opposite the ring, wherein said sensor is a Hall-effect sensor comprising a sensitive element and an electronic shaping circuit to provide an analog signal which is proportional to the magnetic field generated by the ring and a corresponding digital signal; an electronic processing interface connected, on the one hand, to the sensor, and on the other hand, to a computer for control of the electronic injection; and said ring circumferentially comprising plural north and south magnetic poles distributed alternately over the entire circumference of the ring and grouped in equal angle sectors, the number of sectors being equal to the number of cylinders of the engine, each sector comprising at least two small consecutive poles and one large pole at one end.

5,085,073

THERMAL REMOTE ANEMOMETER SYSTEM

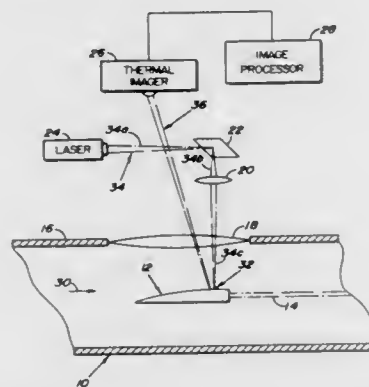
Joseph S. Heyman, Williamsburg; D. Michele Heath, Newport News; Christopher S. Welch, Gloucester; William P. Winfree, Williamsburg, and William E. Miller, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 22, 1988, Ser. No. 146,939

Int. Cl.⁵ G01F 9/00

U.S. Cl. 73-147

21 Claims



1. A method of characterizing a flow over a sample, comprising the steps of:

- remotely imparting a known total of thermal energy from a thermal energy source remote from said flow to a measurement surface area on said sample without the sample being in physical contact with said thermal energy source;
- remotely sensing the thermal energy imparted to said sample from said remote thermal energy source and radiated from said measurement surface area of said sample; and
- remotely determining a rate of change in heat over said measurement area of the sample from said radiated and remotely sensed thermal energy.

5,085,074

TEST DEVICE FOR DETERMINING ADHESIVE STRENGTH OF LACQUER ON A TUBE

Roger Nolte, Cologne; Herbert Röhrig, Berg-Gladbach, and Franz-Josef Roth, Cologne, all of Fed. Rep. of Germany, assignors to Madaus AG, Cologne, Fed. Rep. of Germany

Filed Mar. 14, 1991, Ser. No. 669,882

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1990, 4009081

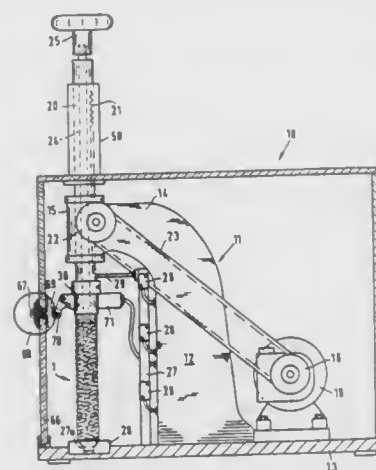
Int. Cl.⁵ G01N 3/32

U.S. Cl. 73-150 A

9 Claims

1. Test device for the determination of the strength of adhesion of a protective lacquering on the body of a collapsible tube, said device comprising a base plate with a recessed seating for the shoulder of a tube with a threaded neck and a compressing means engaging the open end of the tube body, said compressing means being mounted axially with respect to said tube, wherein the compressing means comprises a reciprocable rod (20) which, on the end thereof facing the base plate

(26), has a clamping head (30) for clamping the open end of the tube body and, in a conical recess in the base plate (26), there



is provided an internally threaded bore for screwing in the threaded neck of the tube (1).

5,085,075

DEVICE SIMULATING A RUNNING BIRD

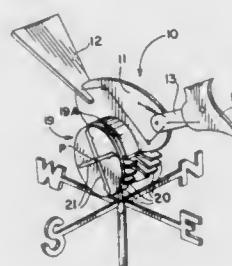
Ronald D. Baker, 1710 S. Gilbert Rd., #2208, Mesa, Ariz. 85204

Filed May 16, 1990, Ser. No. 525,341

Int. Cl.⁵ G01D 13/02

U.S. Cl. 73-188

11 Claims



1. A running bird simulating device comprising: an assembly of parts shaped to simulate a bird including the head, neck, body, and tail of a bird, said bird's head having a beak thereon and being coupled to a first end of said bird's neck, the distal end of said neck being pivotally coupled to said bird's body; said bird's tail being pivotally coupled to said body; a first linkage coupling said tail and said neck such that pivotal motion of one of said tail and said neck causes a complementary pivotal motion in the other one of said tail and said neck; said head being pivotally coupled to said neck and further comprising a second linkage coupling said body and said head such that pivotal motion of said neck with respect to said body causes pivotal motion of said head with respect to said neck whereby the orientation of said beak with respect to said body is determined.

5,085,076

INTEGRATED WATER STRAINER, METER, AND CROSSOVER CHECK VALVE

Lester B. Engelmann, Woodland, Calif., assignor to Ames Company, Inc., Woodland, Calif.

Filed Nov. 29, 1990, Ser. No. 619,646

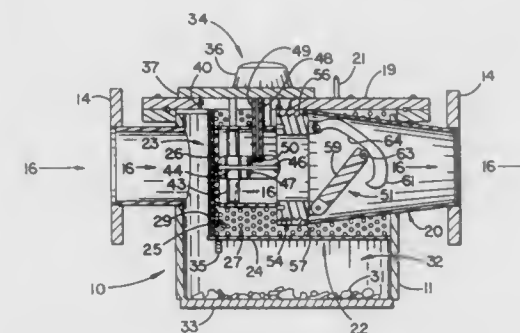
Int. Cl.⁵ G01F 7/00, 15/00

U.S. Cl. 73-197

15 Claims

1. In combination, a fluid flow meter and strainer, comprising:

- a. a housing, having an inlet port and an outlet port defining a fluid flow path therebetween, said housing further including an access port in a wall of said housing intermediate said inlet and outlet ports;
- b. strainer means for retaining solid particles and allowing passage of said fluid flow path therethrough, said strainer means defining an interior volume surrounding said outlet port, and further defining an exterior volume between said



strainer means and said inlet port, for the collection of solid particles;

- c. a strainer lid covering said access port, for allowing selective access into said interior volume; and,
- d. metering means located within said interior volume of said strainer means and positioned therein to intercept at least a portion of said fluid flow path, for measuring the rate of fluid flow through said housing.

5,085,077

ULTRASONIC LIQUID MEASURING DEVICE FOR USE IN STORAGE TANKS CONTAINING LIQUIDS HAVING A NON-UNIFORM VAPOR DENSITY

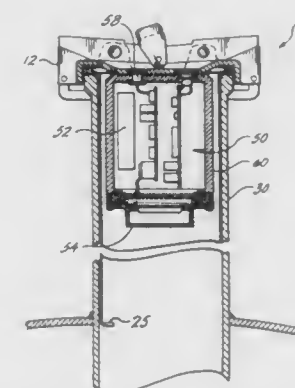
Charles E. Stapleton, Bellevue, and Jerauld T. Numata, Renton, both of Wash., assignors to Capscan Sales Incorporated, Kirkland, Wash.

Filed Jan. 7, 1991, Ser. No. 638,393

Int. Cl.⁵ G01F 23/28

U.S. Cl. 73-290 V

1 Claim



1. A liquid level detector mounted in a petroleum tank cap, for use in determining a level of a petroleum liquid product within a storage tank comprising: means for locking the petroleum tank cap to a fill pipe extending into the storage tank; ultrasonic transmitting means for transmitting an ultrasonic signal along a signal path directed at the petroleum liquid product stored in the tank; ultrasonic receiving means for receiving an ultrasonic signal reflected from the liquid stored in the tank; a reference reflector placed in the signal path, the reference reflector operating to reflect a reference signal back to the ultrasonic receiving means; timing means for determining a variable, T_R , representative

of a time required for the ultrasonic signal to travel to the reference reflector and back, and a variable, T_L , representative of a time for the ultrasonic signal to travel to a surface of the petroleum liquid product and back; and a processor for computing the level of the petroleum liquid product within the storage tank using an expression, $e^{\alpha T_L \beta_1 T_R \beta_2}$, which includes a compensation for a non-uniform vapor density of the petroleum liquid product, wherein e is approximately equal to 2.7183 and α , β_1 , and β_2 are empirically determined constants for the petroleum liquid product.

5,085,078

DEVICE FOR MEASURING FUEL LEVEL IN A MOTOR VEHICLE TANK

Christian Baux, Levallois, and Thierry Salaun, Montsoul, both of France, assignors to Jaeger, Perret, France

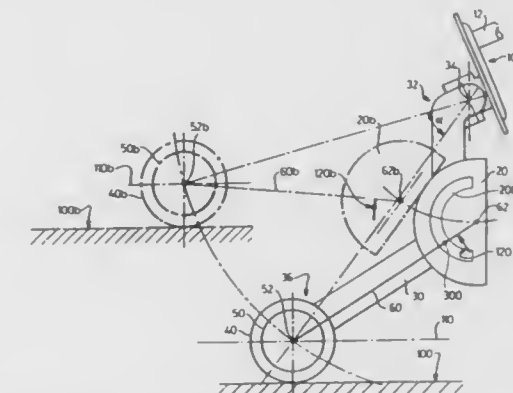
Filed Jun. 14, 1990, Ser. No. 537,644

Claims priority, application France, Jun. 15, 1989, 89 07949

Int. Cl.⁵ D01F 23/32

U.S. Cl. 73-313

14 Claims



1. A device for measuring a level of fuel in a motor vehicle tank, the device being of the type comprising: a base for fixing to a wall of the tank; a support mounted to rotate about a horizontal axis on a portion of the base inside the tank; a shoe carried at the bottom end of the support so that the shoe rests against the bottom of the tank; a resistor element carried by the support; a float carried by an arm which is mounted to rotate about a substantially horizontal axis on the support to track the level of fuel; and a cursor carried by the arm and resting on the resistor element so as to define between said cursor and an end of the resistor a resistance which varies as a function of the level of liquid contained in the tank, wherein the shoe is rigidly fixed on the support and defines a bearing envelope on the bottom of the tank which is circular and centered on a horizontal axis, said bearing envelope having a radius relative to said horizontal axis which is equal to a minimum measurable depth level, and the float having a center of buoyancy which moves on a circular arc which is centered on the axis of rotation of said arm and passes through the horizontal axis of the bearing envelope of said shoe.

5,085,079
ACCELEROMETER WITH MOUNTING/COUPLING STRUCTURE FOR AN ELECTRONICS ASSEMBLY
 Frederick V. Holdren, Bellevue, and Mitchell J. Novack, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

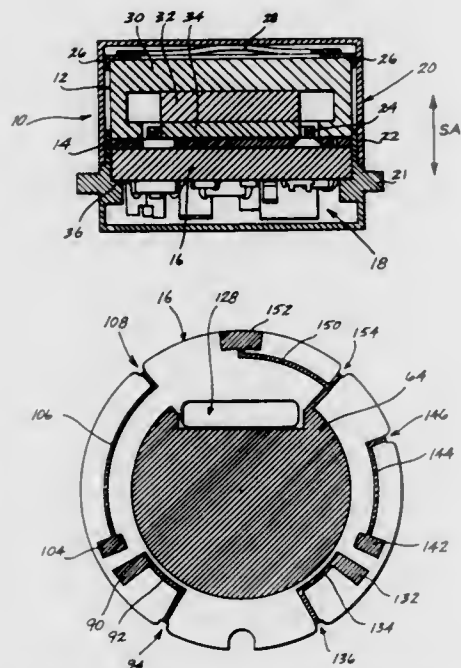
Filed Jun. 11, 1990, Ser. No. 535,760
 Int. Cl.⁵ G01P 15/13
 U.S. Cl. 73—517 B

8 Claims

5,085,080
TEMPERATURE AND PRESSURE MEASURING TECHNIQUE USING THE PHOTOACOUSTIC EFFECT AND MECHANICAL RESONANCE
 Chang Yu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Oct. 5, 1990, Ser. No. 593,835
 Int. Cl.⁵ G01N 29/12; G01H 13/00

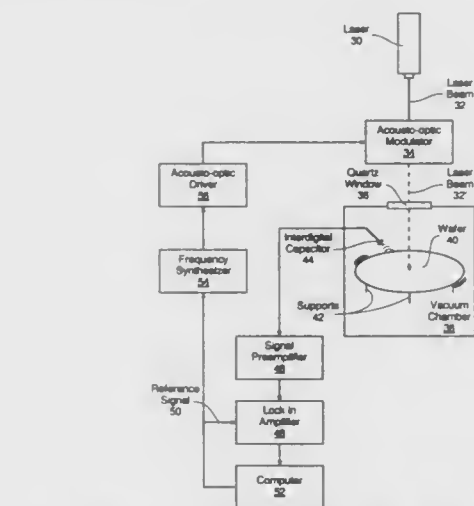
6 Claims



1. In an accelerometer for measuring acceleration along a sensing axis, the accelerometer comprising:

- a disk shaped acceleration sensitive structure having first and second sides and comprising a paddle, a support, means for supporting the paddle with respect to the support such that the paddle has a degree of freedom along the sensing axis, and sensing means for sensing the movement of the paddle with respect to the support;
- an electronics assembly including a sensing circuit, the sensing circuit including means operable when the sensing circuit is electrically coupled to the sensing means for producing a signal indicative of paddle movement with respect to the support along the sensing axis; and
- a cylindrical case within which the acceleration sensitive structure and the electronic assembly are mounted; the movement comprising:

- a mounting/coupling structure positioned within the case, the mounting/coupling structure comprising a disk-shaped, nonmagnetic, non-electrically conductive body having opposite first and second surfaces, the first surface being in contact with and providing support for the first side of the acceleration sensitive structure, the electronic assembly being mounted on the second surface of, and supported with respect to the case by, the mounting/coupling structure including coupling means for electrically coupling the sensing means to the sensing circuit, the coupling means comprising:
- an electrically conductive pad located on the first surface of the mounting/coupling structure in electrical contact with the sensing means, and
- an electrically conductive path located on the mounting/coupling structure and running between said pad on the first surface and the sensing circuit on the second surface.

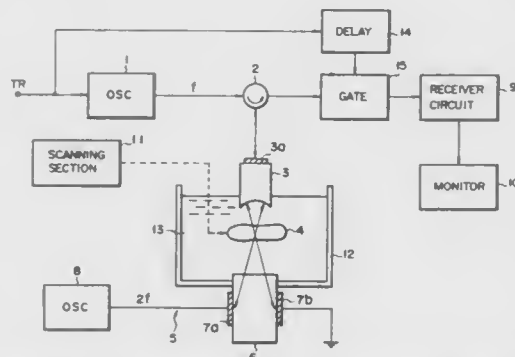


1. A method of measuring a physical aspect of an object using a laser source and an interdigital capacitor, comprising:
 - a) focusing a modulated laser beam on the object;
 - b) measuring the resulting vibration amplitude of the object with said interdigital capacitor;
 - c) determining the resonant frequency of the object by adjusting the modulation frequency of said laser beam until said resulting vibration amplitude of the object is maximized; and
 - d) comparing said resonant frequency to known resonant frequencies calibrated from similar objects with respect to said physical aspect, thereby obtaining a measurement of said physical aspect.

5,085,081
ULTRASONIC IMAGING APPARATUS WITHOUT PHASE DISTORTION
 Masahiro Ohno, Kunitachi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
 Continuation of Ser. No. 325,675, Mar. 16, 1989, abandoned.
 This application Nov. 15, 1990, Ser. No. 617,386
 Claims priority, application Japan, Mar. 26, 1988, 63-72600
 Int. Cl.⁵ G01N 29/04

U.S. Cl. 73—620

28 Claims



1. An apparatus for irradiating a material with an ultrasonic

wave and detecting ultrasonic characteristics of the material, comprising:

- means for scanning the material with an ultrasonic wave, the ultrasonic wave being transmitted toward a limited portion of the material;
- phase-conjugate wave generating means for receiving said ultrasonic wave transmitted through or reflected from the material and generating and directing a phase-conjugate wave of the ultrasonic wave to the material; and
- means for detecting the phase-conjugate wave transmitted through or reflected from the material.

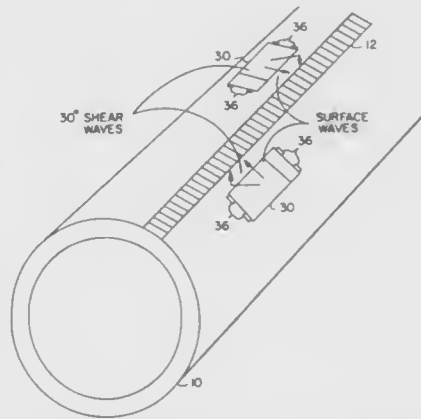
5,085,082
APPARATUS AND METHOD OF DISCRIMINATING FLAW DEPTHS IN THE INSPECTION OF TUBULAR PRODUCTS

Barry I. Cantor, John H. Flora, and Paul J. Latimer, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 24, 1990, Ser. No. 603,334
 Int. Cl.⁵ G01N 29/10

U.S. Cl. 73—622

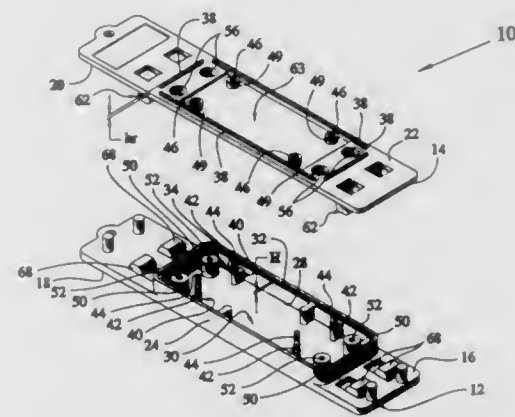
9 Claims



1. A method of discriminating between inner and outer diameter flaws for rapidly detecting a flaw having a through-wall depth greater than or equal to a preset depth in a tube formed with a weld line, comprising the steps of:
 - positioning externally on the tube at least two electromagnetic acoustic transducers substantially adjacent the weld line;
 - generating ultrasonic surface waves with said first electromagnetic acoustic transducer and propagating the ultrasonic surface waves along a surface of the weld line;
 - generating ultrasonic shear waves with said second electromagnetic acoustic transducer and propagating the ultrasonic surface waves through the weld line;
 - measuring reflected ultrasonic surface and shear waves and establishing signals indicative thereof for identifying flaws in and around the weld line;
 - determining from the ultrasonic wave signals whether an identified flaw is an outer diameter flaw or an inner diameter flaw, the outer diameter flaw being determined from both the ultrasonic surface and shear wave signals exceeding a preset level for each of the ultrasonic signals, the inner diameter flaw being determined from the ultrasonic shear wave signal exceeding its preset level with the ultrasonic surface wave signal being below a noise threshold level; and
 - providing an alarm for a flaw with a through-wall depth greater than or equal to a preset depth.

5,085,083
FABRICATED PLASTIC TEST SPECIMEN
 Richard J. Corr, and Ann D. Corr, both of P.O. Box 263, Quechee, Vt. 05059
 Filed Aug. 13, 1990, Ser. No. 566,098
 Int. Cl.⁵ G01N 3/00
 U.S. Cl. 73—760

7 Claims



1. A test specimen for comparing properties of plastics as they will perform in fabricated parts comprising:
 - a first plate having a first side and a second side;
 - a second plate having a first side and a second side, said second plate being attachable to said first plate;
 - a closed wall having an upper edge and a lower edge, said lower edge being attached to said first plate forming an open compartment with said first plate, and said upper edge forming a rim of said open compartment;
 - a groove in said rim creating a stepped rim;
 - a raised section on said first side of said second plate, said raised section being configured to slidably engage said groove in said rim;
 - ridges for ultra-sonic welding, said ridges configured to engage said groove in said rim of said compartment, said ridges being positioned on said second surface of said second plate;
 - posts attached to one of said plates;
 - post holes positioned in said other plate to engage said posts;
 - lugs attached to one of said plates for tapping with self threading screws;
 - screw holes positioned to align with said lugs in said other plate;
 - latches attaching to one of said plates; and
 - tabs provided on said other plate to engage said latches, whereby the properties of plastics as they will perform in fabricated parts can be compared.

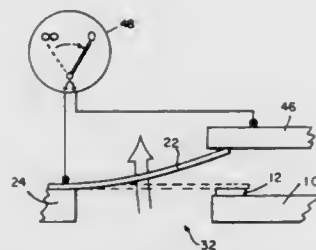
5,085,084
METHOD AND APPARATUS FOR TESTING LEAD BONDS AND DETECTING FAILURE
 Matthew M. Salatino, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.
 Filed Nov. 19, 1990, Ser. No. 615,358
 Int. Cl.⁵ G01N 3/08

U.S. Cl. 73—827

26 Claims

10. A tester of bonding of a plurality of leads connecting a device to frame comprising:
 - fluid means for applying fluid force directly to a bonding

surface of a group of said leads greater than one simultaneously; and



determining means for determining if any of said leads separates at their bonds in response to said fluid force.

5,085,085

DIRECTIONAL SEDIMENT AND POLLUTION MONITOR

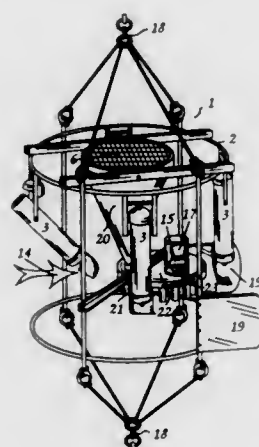
Roger Y. Anderson, 3201 Campus Blvd. NE., Albuquerque, N. Mex. 87106

Filed Mar. 26, 1990, Ser. No. 499,164

Int. Cl.³ G01N 1/00

U.S. Cl. 73—863.02

7 Claims



1. A directional sediment and pollution monitor adapted to be positioned in a body of water comprising:

- an array of several collecting tubes mounted on a framework structure with said tubes having an open and a closed end, each tube adapted to accumulate materials entering each said tube from a restricted geographic direction;
- baffle means positioned adjacent the open end of each tube for minimizing turbulence, reducing loss of materials, and eliminating entry of large organisms;
- compass means mounted on said framework structure and structurally connected to monitor said tubes for measuring geographic orientation of said tubes; and
- recording means for storing measurements of said geographic orientation of said tubes at time intervals thereby providing materials for measuring the direction, quantity, and rate of movement of natural and polluting substances.

5,085,086

ON-LINE LIQUID SAMPLERS

Julius T. Johnson, and Robert R. Johnson, both of 416 Jacolyn Dr., NW., Cedar Rapids, Iowa 52405

Filed Sep. 24, 1990, Ser. No. 589,412

Int. Cl.³ G01N 1/00

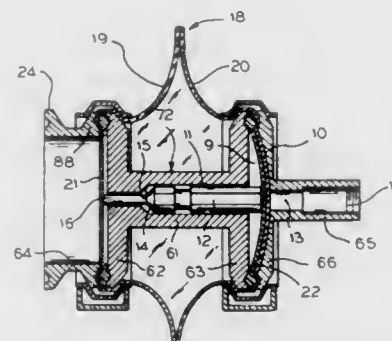
U.S. Cl. 73—863.86

13 Claims

1. An arrangement, including a sampling device and a sample-collecting means attachable thereto, for periodically with-

drawing small samples of sterilizable liquid flowing through a pipe, said device comprising

a housing,
means for mounting said housing on said pipe,
means for attaching said sample-collecting means to said device,
a valve movably disposed in said housing,
a normally open liquid intake port provided in said housing near the point where said housing is mounted on said pipe,
a normally closed sample discharge port in said housing, said valve being arranged to be periodically operated to close said intake port and thus trap a sample of the liquid in said housing,



means responsive to the pressure of said liquid sample to momentarily open said discharge port and thus permit said sample to flow into said collecting means,
said housing together with said collecting means being completely enveloped by a flexible high-temperature resistant enclosure one wall of which normally seals off said intake port, and
said valve having adjacent said intake port an extension designed, incident to its operation, to puncture said enclosure, whereby sterilization of the sampling device together with the collecting means attached thereto is made possible without exposure of said device to the atmosphere before said device is mounted on said pipe.

5,085,087

SAMPLING CORROSIVE FLUID

Gerhard Franck, Frankfurt, and Guenter Rumpf, Weilrod, both of Fed. Rep. of Germany, assignors to Hartmann & Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 9, 1990, Ser. No. 550,285

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923544

Int. Cl.³ G01N 1/22

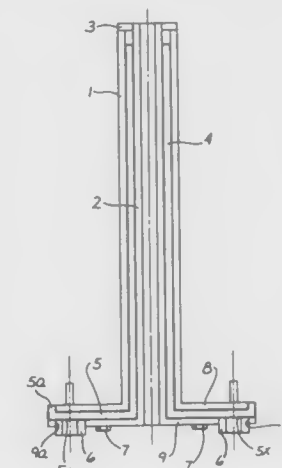
U.S. Cl. 73—864.73

1 Claim

1. Sampling device for sampling a corrosive medium, being comprised of an inner tube with a flange and an outer tube with a flange, the improvement comprising:

a metallic tube with a flange interposed between the inner and outer tubes, the inner and outer tubes with their respective flanges being made of synthetic material so that the metal intermediate tube serves as armoring being interposed between a coaxial synthetic tube arrangement as composed of said inner and outer tube;
the flange of the metal tube gripping around the flange of the outer tube; and

recess means provided in at least one of said synthetic flanges to expose a portion of the metal flange of the



intermediate tube as support surfaces for fastening structure.

5,085,088

DRIVE TRAIN ENERGY

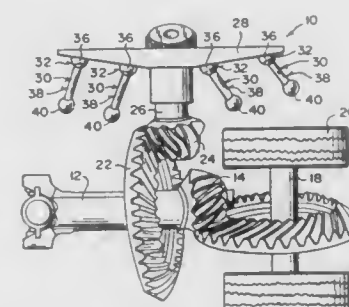
Antonio Robinson, 3850 Hudson Manor Terr. #2B, Riverdale, N.Y. 10463, and George Spector, 233 Broadway Room 3815, New York, N.Y. 10007

Filed May 23, 1991, Ser. No. 704,788

Int. Cl.³ F16H 33/08

U.S. Cl. 74—64

4 Claims



1. A drive train energy system for use in a motor vehicle, said system comprising a drive shaft, a drive shaft pinion being rotatably driven by said drive shaft, a differential crown wheel in transversely engaged relationship with said drive shaft pinion, said differential crown wheel being operable to drive a rear axle and a pair of wheels, said drive train energy system further comprising:

- a second crown wheel mounted to the drive shaft proximate the drive shaft pinion;
- a second pinion transversely engaged with said second crown wheel;
- a driven shaft connected to said second pinion;
- a flywheel connected to said driven shaft to be rotated thereby; and
- a plurality of flyballs spaced apart and pivotally connected to said flywheel so that when said flywheel is rotated and reaches a predetermined speed, said flyballs will pivot outwardly from said flywheel to increase the momentum of said flywheel to help maintain the speed of the rear wheels of the motor vehicle at higher speeds.

5,085,089

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

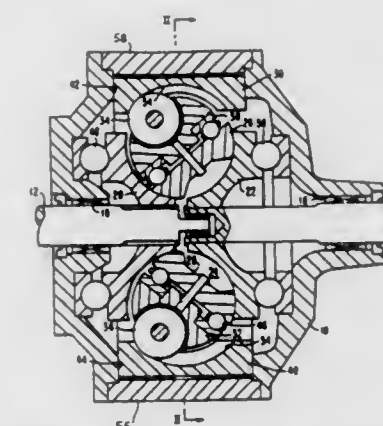
Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Feb. 6, 1991, Ser. No. 651,186

Int. Cl.³ F16H 13/10

U.S. Cl. 74—200

4 Claims



1. An infinitely variable traction roller transmission comprising: a support structure; two toric traction discs rotatably supported by said support structure, one for rotation with an input shaft and the other for rotation with an output shaft, said toric discs having opposite traction surfaces defining therebetween a toric cavity of circular cross-section; at least two motion transmitting traction rollers arranged in said toric cavity in radial symmetry and in engagement with said toric discs for the transmission of motion therebetween, each of said traction rollers being rotatably supported by a pivot trunnion for pivoting about a control axis which is essentially tangential to the center circle of said toric cavity, each of said pivot trunnions having at least one support roller mounted thereon and a partial circular path track structure arranged adjacent each pivot trunnion and supporting each support roller thereof, said track structures having end sections extending inwardly from the circular path so as to apply increased engagement forces to the traction rollers when the trunnions reach their pivot end positions.

5,085,090

ROTATION TRANSMITTING MECHANISM

Isamu Sugawara, Sagami, and Hidenori Ito, Atsugi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

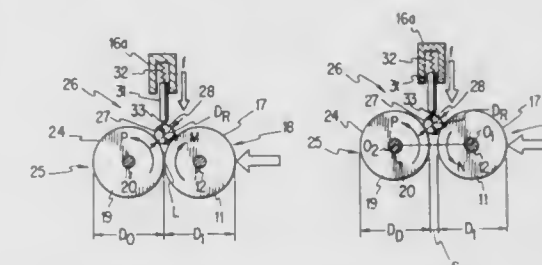
Filed Jan. 24, 1990, Ser. No. 469,386

Claims priority, application Japan, Jan. 27, 1989, 1-18055; Apr. 24, 1989, 1-105611

Int. Cl.³ F16H 15/00

U.S. Cl. 74—202

12 Claims



1. A power transmitting mechanism comprising: a movable power input member to which power is inputted; a movable power output member juxtaposed to said power input member for receiving power from said power input member and for outputting received power, at least one

member of said power input member and said power output member being cylindrical, said power input member and said power output member being relatively movable between a contact position, at which said power input member and said power output member contact one another at a contact portion therebetween, and a release position at which said power input member and said power output member are being released from a contact therebetween;

an intermediate transmission member having a shape of one of a cylinder and a sphere, and movable disposed on said power input member and said power output member so as to contact both said power input member and said power output member, said intermediate transmission member having an outer diameter which permits insertion of said intermediate transmission member between said power input member and said power output member, when said power input member moves in a first direction, so that said power input member and said power output member separate and said intermediate transmission member contacts both said power input member and said power output member at said release position thereof, said outer diameter being not larger than 1/10 of an outer diameter of said at least one member of said power input member and said power output member;

a first urging means for exerting a force on said intermediate transmission member, which force is set such that said intermediate transmission member is pushed back against said force, when said power input member moves in an opposite direction, which is opposite to said first direction, so that said power input and output members take said contact position, said force being directed toward said contact portion, so that said intermediate transmission member is inserted between said power input and output members when said input power member moves in said first direction; and

a second urging means for urging one of said power input member and said power output member toward the other of said power input member and said power output member, for producing, at said release position, a first friction force between said power input member and said intermediate transmission member and a second friction force between said intermediate transmission member and said power output member when said power input member moves in said first direction, and for producing a third friction force between said power input member and said power output member, at said contact position, when said power input member moves in said opposite direction, said first friction force enabling transmission of movement of said power input member to said intermediate transmission member, said second friction force enabling transmission of a rotation of said intermediate transmission member to said power output member, said third friction force enabling transmission of a movement of said power input member to said power output member.

5,085,091

LOW FRICTION TRACTION DRIVE ASSEMBLY

Juergen P. Stampa, Costa Mesa; Ronald T. Honda, Irvine, and James D. Hendry, Huntington Beach, all of Calif., assignors to Loral Aerospace Corp., New York, N.Y.

Continuation of Ser. No. 464,488, Jan. 12, 1990, abandoned. This application Jun. 3, 1991, Ser. No. 710,242

Int. Cl.⁵ F16H 13/02

U.S. Cl. 74—206

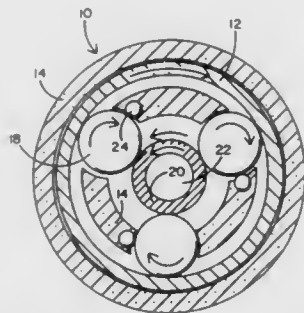
11 Claims

1. A traction drive assembly for a scanning mirror, comprising:

- a stationary annular retainer having arcuate separator portions, said separator portions having faces of lubricous material;
- an outer race adapted to be rotated in a first direction with respect to said retainer;
- an inner race coaxial with said outer race and said re-

tainer, arcs of said arcuate separator portions lying in a plane generally including said races;

- a plurality of drive balls interposed between said outer race and inner race so as to rotate said inner race in a direction opposite to that of said outer race, said drive balls being captured between said arcuate separator portions;



tions to prevent movement of said drive balls about the axis of said races and retainer, and being operationally biased into frictional engagement with said faces; and

- rotatable interface elements captured within said faces for rotation therein, said elements being interposed between said drive balls and said retainer to provide a low-friction contact between said drive balls and said faces.

5,085,092

GEAR TRANSMISSION FOR VEHICLE

Hidetaka Koga, Ebina, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

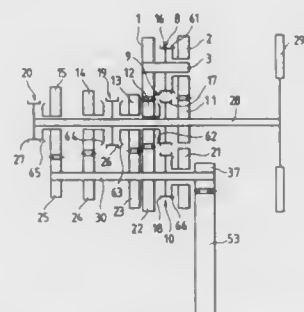
Filed Dec. 18, 1989, Ser. No. 452,089

Claims priority, application Japan, Dec. 22, 1988, 63-321968

Int. Cl.⁵ F16H 3/08

U.S. Cl. 74—333

4 Claims



1. A gear transmission for vehicles, having an input shaft to which a driving force of an engine is transmitted, an output shaft disposed in parallel with the axial direction of said input shaft, and a plurality of speed change gear trains disposed between said input and output shafts and meshed constantly with one another, comprising:

- a rotary shaft disposed in parallel with the axial directions of said input and output shafts,
- an input gear mounted on said input shaft, a reverse idle gear meshed constantly with said input gear and mounted on said rotary shaft,
- a reverse range gear meshed constantly with said reverse idle gear and mounted on said output shaft,
- an input side second speed range gear mounted on said input shaft,
- a first speed range gear meshed constantly with said second speed range gear and mounted on said rotary shaft,
- an output side second speed range gear meshed constantly with said input side second speed range gear and mounted on said output shaft,
- a first connecting means for operatively connecting said reverse idle gear and said first speed range gear together

to enable the driving force of said input shaft to be transmitted to said output shaft through said input gear, said reverse idle gear, said first speed range gear, said input side second speed range gear and said output side second speed range gear to establish a first speed range,

- a second connecting means for operatively connecting said input shaft and said input side second speed range gear together to enable the driving force of said input shaft to be transmitted to said output shaft through said input side second speed range gear and said output side second speed range gear, and

- a third connecting means for operatively connecting said reverse range gear and said output shaft together to enable the driving force of said input shaft to be transmitted to said output shaft through said input gear, said reverse idle gear and said reverse range gear.

5,085,093

POWER SPLITTING TRANSMISSION

Gunther Heidrich, Burgberg, Fed. Rep. of Germany, assignor to BHS-Voith Getriebetechnik GmbH, Fed. Rep. of Germany

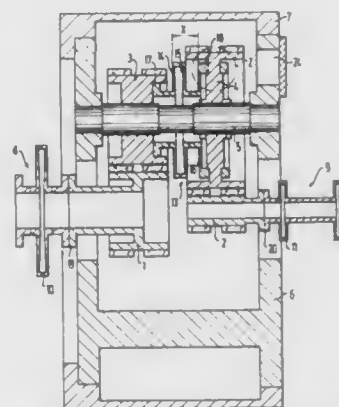
Filed May 20, 1991, Ser. No. 702,838

Claims priority, application Fed. Rep. of Germany, May 29, 1990, 4017226

Int. Cl.⁵ F16H 57/12

U.S. Cl. 74—411

21 Claims



1. A power splitting transmission comprising first and second axially aligned sun gears, an input drive mechanism having an input shaft, an output driven mechanism having an output shaft, said first sun gear being connected to said input shaft, said second sun gear being connected to said output shaft, a first set of at least three double power splitting gears connected to and being uniformly positioned over the circumference of said first sun gear, a second set of at least three double power splitting gears connected to and being uniformly positioned over the circumference of said second sun gear, said first and second sun gears being connected to each other through said first and second sets of double power splitting gears, said first and second sets of double power splitting gears being coupled to each other through first membrane couplings, a second membrane coupling located between said input shaft and said first sun gear, and a third membrane coupling located between said output shaft and said second sun gear, whereby said membrane couplings allow rotational axial displacement between respective elements which they connect.

5,085,094

DOOR OPERATOR COUPLING ASSEMBLY

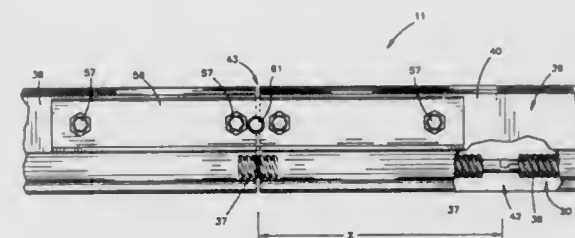
Charles W. Clawson, Alliance, and James W. Stottsberry, Massillon, both of Ohio, assignors to GMI Holdings, Inc., Alliance, Ohio

Filed Nov. 8, 1990, Ser. No. 610,523

Int. Cl.⁵ F16H 25/20; E05F 11/00; B23Q 3/00

U.S. Cl. 74—424.6

16 Claims



1. In a garage door operator having a motor-driven rotatable screw at least partially within non-rotatable guide means, a means guided by the guide means and movable longitudinally therealong by engagement with the screw and connectable to open and close the garage door, the screw being in at least first and second screw parts, a screw coupling adapted to interconnect adjacent ends of the first and second screw parts, the guide means being in at least first and second guide parts, and a guide coupling adapted to interconnect adjacent ends of the first and second guide parts, the improvement comprising the screw coupling being longitudinally spaced from the guide coupling wherein the screw coupling is completely contained and supported for rotation within one of said first and second guide parts.

5,085,095

GEARBOX SELECTOR MECHANISM

Jean J. Lasoen, Ville Preux, France, assignor to Massey-Ferguson Services N.V., Netherlands Antilles, Netherlands Antilles

PCT No. PCT/EP89/01565, § 371 Date Oct. 17, 1990, § 102(e) Date Oct. 17, 1990, PCT Pub. No. WO90/07662, PCT Pub. Date Jul. 12, 1990

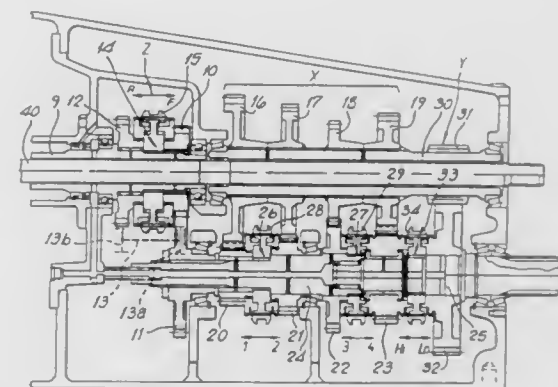
PCT Filed Dec. 18, 1989, Ser. No. 549,004

Claims priority, application United Kingdom, Dec. 24, 1988, 8830267

Int. Cl.⁵ F16H 63/44

U.S. Cl. 74—473 R

5 Claims



1. A selector mechanism for a gearbox in which one or more speed change couplers (28, 29) and one or more range change couplers (34) are operated by the same selector member (47).

said selector member operating the speed change coupler or couplers (28, 29), to engage a plurality of drive speeds when moved from a neutral plane (N) to speed selection positions (1, 2, 3, 4) in a speed change gate and operating the range change coupler or couplers (34) when moved to discrete range change positions (H, L), the mechanism being characterised in that on movement of the selector member (47) out of the speed change gate (1, 2, 3, 4) towards a desired range change position (H, L) the appropriate range change coupler (34) is moved towards an engaged position for the desired range and on movement of the selector member back towards the speed change gate (1, 2, 3, 4) from the desired range change position the movement of the said appropriate range change coupler (34) is completed to engage the desired range.

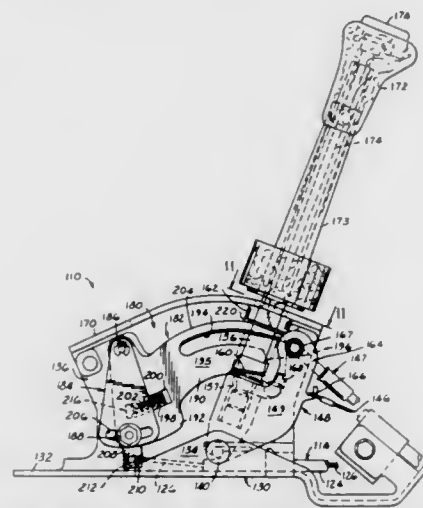
5,085,096

GEARSHIFT PARK INTERLOCK SYSTEM

William L. Behrens, Lake Orion, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Continuation of Ser. No. 448,480, Dec. 11, 1989, abandoned.
This application Apr. 26, 1991, Ser. No. 692,956
Int. Cl.⁵ G05G 9/00

U.S. Cl. 74—475

8 Claims



1. A shift selector interlock system for a motor vehicle automatic transmission comprising:

a shift lever mechanism including a support means, a selector lever with a handle end and a pivot end, said lever pivot end mounted on said support means for pivotal movement, a selector plate fixed to said support means and having a longitudinally extending detent slot receiving said lever therethrough, a plunger supported on said lever for limited axial movement thereon, resilient means biasing said plunger axially toward said lever handle end, means on said handle end operative to move said plunger axially toward said lever pivot end;

actuating means provided on said support means; retaining means adapted for receiving a locking slider from an ignition mechanism of the motor vehicle such that when the ignition mechanism is in a locked position said locking slider is adapted to engage with said retaining means;

linkage means extending between and interconnecting said actuating means and said retaining means, said actuating means providing movement to said linkage means in response to axial movement of said plunger, whereby when said locking slider engages with said retaining means said plunger is prevented by cam means from moving axially thereby locking said lever in position and when the ignition mechanism is in an on position said locking slider is adapted to disengage with said retaining means so that said plunger may axially move toward said pivot end

moving said cam means thereby allowing pivotal movement of said lever;
wherein said cam means further comprising a first cam member and a second coupling member both pivotally secured to said support means;
a biasing member is associated with said first cam member and said second coupling member; and
wherein said linkage means is coupled with said second coupling member so that said biasing member provides self-adjustment of said first cam member and said linkage means by moving said second coupling member in a direction away from said first cam member, whereby upon fastener means adjustably securing said second coupling member to said first cam member slack is taken up in said linkage means.

5,085,097

STEERING WHEEL CORE

Mitsuru Harata, Nagoya, and Hiroshi Yasuda, Aichi, both of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

Continuation of Ser. No. 234,146, Aug. 19, 1988, abandoned.

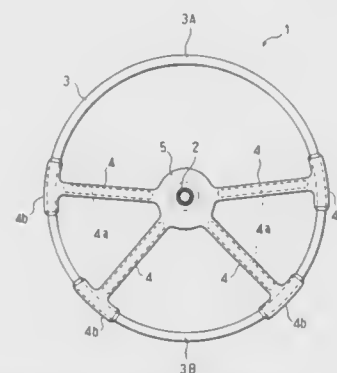
This application Jul. 16, 1990, Ser. No. 552,834

Claims priority, application Japan, Aug. 31, 1987, 62-217709; Feb. 24, 1988, 63-41420; Mar. 30, 1988, 63-42737[U]; Apr. 26, 1988, 63-103162

Int. Cl.⁵ C22C 21/08; B62D 1/04

U.S. Cl. 74—552

4 Claims



1. A steering wheel core, comprising

(a) a boss,

(b) a core piece of a ring part disposed around said boss, and
(c) core pieces of spoke parts interconnecting said boss and said core piece of said ring part, said core pieces of said spoke parts are plastic-deformable being formed by die casting an aluminum alloy containing magnesium, iron, manganese, silicon, and unavoidable impurities.

the content of said magnesium being not less than 1.5% by weight and less than 2.3% by weight based on the amount of said aluminum alloy,

the content of said manganese being not less than 0.4% by weight and not more than 0.6% by weight based on the amount of said aluminum alloy,

the content of said iron being not less than 0.4% by weight and not more than 1.0% by weight based on the amount of said aluminum alloy,

and the content of said silicon being not less than 0.2% by weight and not more than 0.4% by weight based on the amount of said aluminum alloy.

5,085,098

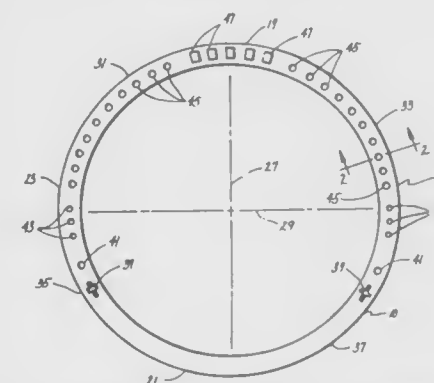
STEERING WHEEL COVER HAVING A PRAYER COUNTER MECHANISM THEREON

Larry J. Buckley, 19323 Surrey La., Northville, Mich. 48167
Filed Dec. 24, 1990, Ser. No. 633,077

Int. Cl.⁵ B02D 1/06; G05G 1/10

U.S. Cl. 74—558

10 Claims



1. An automobile steering wheel cover comprising an annular flexible cover member adapted to assume a circular plan configuration when placed on a steering wheel; said annular cover member having a left upper quadrant, a left lower quadrant, a right upper quadrant, and a right lower quadrant; means carried by said cover member for counting prayers with either right or left hands during the process of praying the Rosary; said counting means comprising single circumferentially-spaced protuberance counter locations in the lower left quadrant and in the lower right quadrant representing the Apostles Creed and the Our Father; said counting means further comprising three additional circumferentially-spaced protuberance counter locations in the lower left quadrant and in the lower right quadrant representing the Hail Mary; said counting means also comprising ten different circumferentially-spaced protuberance counter locations in the upper left quadrant and in the upper right quadrant representing a decade of the Hail Mary.

5,085,099

CAM LOBE HAVING ORIENTATING MEANS

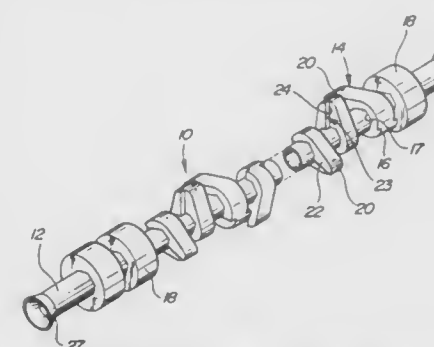
Robert W. Hughes, 2155 14 Mile Rd., Sterling Heights, Mich. 48077

Filed Jun. 8, 1990, Ser. No. 535,750

Int. Cl.⁵ F16H 53/00

U.S. Cl. 74—567

4 Claims



1. A camshaft assembly (10) comprising: a tubular shaft member (12) defining a longitudinal axis; a plurality of lobes (14) each having radially extending exterior side surfaces (22) and spaced along said longitudinal axis of said tubular shaft member (12); said assembly characterized by said side surfaces (22) of said lobes (14) having orientating means (23) thereon for positively positioning said lobes (14) in predetermined angular positions about said longitudinal axis, said lobes having been secured to said shaft member, each of said lobes (14) having a

pair of said side surfaces (22), said pair of side surfaces (22) being oppositely facing, said orientating means (23) including an axially extending shoulder (24) with each of said side surfaces (22), each of said shoulders (24) extending radially of said longitudinal axis.

5,085,100

GEAR SHROUDING SYSTEM

Charles L. Duello, Arlington, Tex., assignor to Bell Helicopter Textron Inc., Fort Worth, Tex.

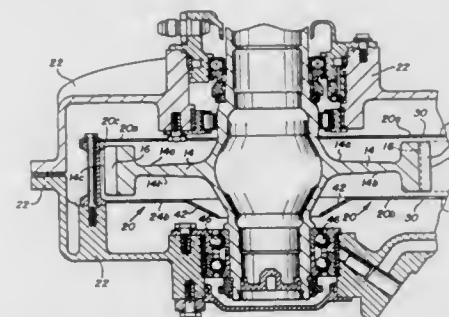
Continuation-in-part of Ser. No. 423,767, Oct. 18, 1989. This

application Jan. 24, 1991, Ser. No. 645,234

Int. Cl.⁵ F16H 57/04, 57/02

U.S. Cl. 74—606 R

5 Claims



1. In a high speed gear train including a gear case and a plurality of meshing gears, each gear having sides, teeth and an outer diameter, a shroud being disposed within the gear case the shroud comprising:

a pair of side walls disposed opposite the sides of each gear and adjacent to the gear outer diameter; and
an end wall disposed generally perpendicularly to said pair of side walls and being disposed parallel to the gear outer diameter, such that said shroud side walls and end wall substantially enclose the teeth of each of the plurality of gears within the gear train for substantially minimizing cooling fluid present within the gear case from contacting the gear train.

5,085,101

APPARATUS FOR EXERTING A BRAKING TORQUE UPON A ROTATING SHAFT

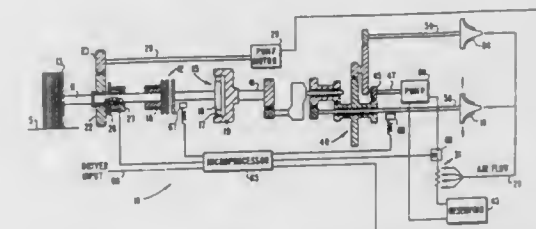
Thomas A. Oldfield, St. Augustine, Fla. assignor to Anchor Tech, Inc., St. Augustine, Fla.

Continuation-in-part of Ser. No. 310,199, Feb. 13, 1989, which is a continuation-in-part of Ser. No. 58,358, Jun. 4, 1987, Pat. No. 4,827,798. This application Mar. 16, 1989, Ser. No. 324,310

Int. Cl.⁵ F16H 47/06

U.S. Cl. 74—730.1

11 Claims



1. A device for providing a variable retarding torque upon a shaft, comprising:

an aerodynamic rotor;
primary clutch means for disengagably engaging said aerodynamic rotor with the rotating shaft, wherein said primary clutch means includes a torque limit clutch;
rotor control means responsive to independent preselected

signals and for permitting continuous variation of at least one input variable of said aerodynamic rotor; an inlet passage for directing inlet fluid to said aerodynamic rotor; and, wherein said rotor control means includes inlet flow control means for varying inlet fluid flow conditions to said aerodynamic rotor.

5,085,102

HYDRAULIC CONTROL APPARATUS FOR AUTOMATIC TRANSMISSIONS

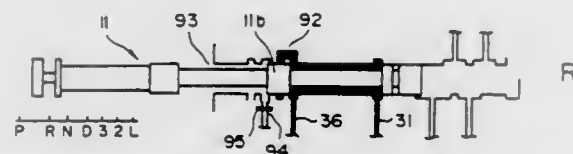
Yoshinobu Iwase; Shiro Sonoda; Kazuaki Watanabe; Isamu Minemoto, and Teruo Akashi, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 30, 1990, Ser. No. 501,770

Claims priority, application Japan, Mar. 30, 1989, 1-35518[U]
Int. Cl.⁵ F15C 3/02

U.S. Cl. 74—867

4 Claims



1. A hydraulic control apparatus for an automatic transmission having a mechanical parking mechanism, comprising: a manual valve disposed in the hydraulic control apparatus and having a parking position, reverse position, neutral position and at least one forward speed position; and a hydraulic circuit which establishes a reverse range associated with the reverse position of the manual valve; said manual valve being provided with a drain port for the reverse range for releasing, in the parking position, hydraulic pressure of said hydraulic circuit which establishes the reverse range; said drain port for the reverse range being provided with an orifice which limits release of hydraulic pressure, whereby the communication between said drain port for the reverse range and a port for establishing the reverse range is established upon selecting a position for said manual valve.

5,085,103

HYDRAULIC CONTROL APPARATUS FOR AUTOMATIC TRANSMISSIONS

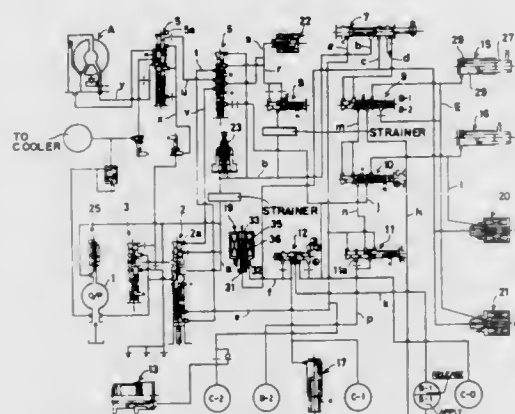
Masahiko Ando; Kazuhisa Ozaki, and Hiroshi Niki, all of Anjo, Japan, assignors to Aisin AW Co., Ltd., Japan

Filed May 25, 1989, Ser. No. 356,993

Claims priority, application Japan, May 27, 1988, 63-129776
Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—868

17 Claims



1. A hydraulic control apparatus for a vehicular automatic

transmission having a plurality of friction devices for selectively coupling a number of rotary elements in a planetary gear mechanism to one another, each friction device having an associated hydraulic operator for engaging the friction device responsive to engaging hydraulic pressure received by the hydraulic operator and a hydraulic circuit for controlling changeover of said friction devices by regulating the engaging hydraulic pressures received by said hydraulic operators, wherein said hydraulic circuit comprises:

- a source of fluid pressure;
- a plurality of shift solenoid valves, each of said shift solenoid valves being associated with one of said hydraulic operators, for directly controlling the engaging hydraulic pressure received by the associated hydraulic operator when a shift is made, each of said shift solenoid valves receiving fluid pressure and regulating said fluid pressure to the engaging hydraulic pressure responsive to a control signal, whereby said engaging hydraulic pressure is gradually changed for smooth operation of the associated hydraulic operator;
- a plurality of damping valves, each associated with a shift solenoid valve for receiving the engaging hydraulic pressure in parallel with the associated hydraulic operator, for reducing fluctuations in the engaging hydraulic pressure received by the associated hydraulic operator;
- a manual valve and a plurality of relay valves for controlling the sequence in which fluid pressure is communicated to said shift solenoid valves, said relay valves being controlled by said shift solenoid valves; and
- said solenoid valves being duty-controlled independently of one another.

5,085,104

HYDRAULIC CONTROL APPARATUS FOR VEHICLE POWER TRANSMITTING SYSTEM

Katsumi Kouno, Toyota; Yuji Hattori, Susono, and Kunio Morisawa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

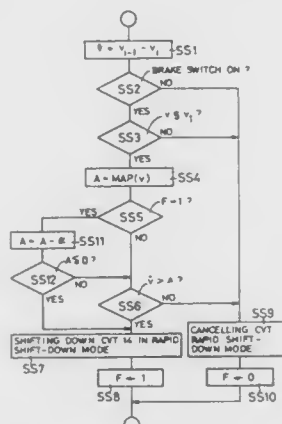
Filed Apr. 2, 1990, Ser. No. 502,625

Claims priority, application Japan, Apr. 12, 1989, 1-92130; Apr. 12, 1989, 1-92131; Apr. 12, 1989, 1-92132; Apr. 12, 1989, 1-92133; Dec. 7, 1989, 1-318190

Int. Cl.⁵ B60K 41/14

U.S. Cl. 74—866

31 Claims



1. An apparatus for controlling a power transmitting system for an automotive vehicle having a continuously variable transmission for transmitting power from an engine of the vehicle to drive wheels, with a controlled speed ratio of the transmission, said transmission including an actuating device for controlling said speed ratio, said apparatus comprising: vehicle speed determining means for determining a running speed of the vehicle;

vehicle deceleration determining means for determining a deceleration value of the vehicle; and control means including means for determining a first deceleration reference value based on the determined running speed of the vehicle, said first deceleration reference value varying with the running speed of the vehicle, said control means commanding said actuating device to shift down said transmission to lower said speed ratio in a rapid shift-down mode if the deceleration value of the vehicle determined by said vehicle deceleration determining means exceeds said first deceleration reference value.

being supplied to the predetermined fluid operated frictional device when the current gear ratio is established; means for detecting a vehicle speed of the motor vehicle and generating a vehicle speed indicative signal indicative of said vehicle speed detected; means for temporarily varying magnitude of said servo activating hydraulic fluid pressure in response to said vehicle speed indicative signal when the automatic transmission effects the downshift.

5,085,105

DOWNSHIFT CONTROL FOR AUTOMATIC TRANSMISSION

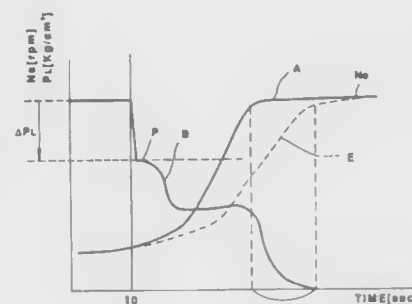
Tatsuo Wakahara, Kawasaki; Kazuyoshi Iwanaga, and Shigeru Ishii, both of Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 28, 1990, Ser. No. 485,889

Claims priority, application Japan, Feb. 28, 1989, 1-48757
Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—866

4 Claims



5,085,106

ELECTRIC SHIFT APPARATUS WITH REMOVABLE CONTROL MODULE

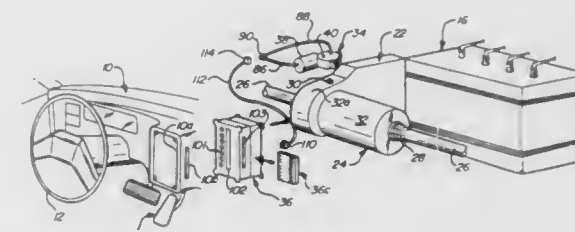
Terry L. Bubnash, Birmingham, Mich., assignor to Automotive Products (USA) Inc., Auburn Hills, Mich.

Filed Oct. 30, 1990, Ser. No. 607,142

Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—866

16 Claims



1. An electric shift control system for a motor vehicle of the type including a transmission control means adapted to be positioned in the vehicle passenger compartment for inputting operator shift requests, and means operative in response to inputted operator requests to shift the transmission to a shift position corresponding to the inputted operator request, characterized in that said control system includes a portable enabling module which is sized to be carried on the person of the vehicle operator and which is readily movable by the vehicle operator between an enabling position in which it is mechanically and electrically connected in said system to enable shifting of the transmission in response to the inputted operator requests and a disabling position in which it is mechanically and electrically disconnected from said system to preclude unauthorized shifting of the transmission.

1. In a motor vehicle having an engine and an automatic transmission drivingly connected to the engine, the automatic transmission effecting a downshift from a current gear ratio to a new gear ratio by discharging hydraulic fluid from a predetermined fluid operated frictional device associated with the current gear ratio to release the predetermined fluid operated frictional device after a command for the downshift has occurred; means for generating a servo activating hydraulic fluid pressure, said servo activating hydraulic fluid pressure

5,085,107

APPARATUS FOR CONTROLLING HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE VEHICLE TRANSMISSION, HAVING MEANS FOR CHANGING POWER TRANSMITTING CAPACITY WITH INPUT TORQUE

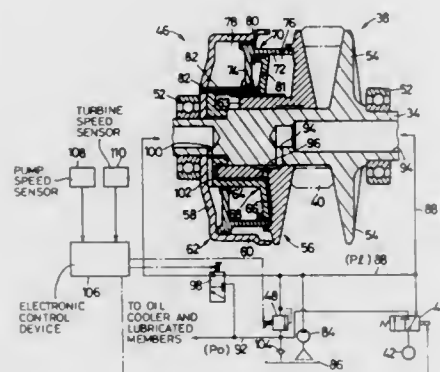
Yudai Tatara, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 7, 1990, Ser. No. 578,445

Claims priority, application Japan, Sep. 18, 1989, 1-241414
Int. Cl.⁵ F16H 9/18

U.S. Cl. 74—866

10 Claims



1. An apparatus for controlling a hydraulically operated continuously variable transmission for a motor vehicle, which has an input member, an output member and a lower transmitting member connecting the input and output members to affect power transmission therebetween, and whose power transmitting capacity changes with a pressure of engagement of said power transmitting member with said input and output member, comprising:

torque detecting means for detecting an input torque received by said input member of said continuously variable transmission;

a hydraulic actuator having a pressure-receiving surface defined by at least two fluid chambers and which receives a controlled pressure having at least two values, one of said values being larger than another of said values, for controlling said pressure of engagement of said power transmitting member; and

engagement pressure changing means responsive to said torque detecting means, for changing said pressure of engagement of said power transmitting member by selectively applying said values of said controlled pressure to at least one of said at least two chambers, to thereby change the area of said hydraulic actuator which receives the larger of said values, and so to thereby change the pressing force to said power transmitting member, with said input torque detected by said torque detecting means.

5,085,108

Patent Not Issued For This Number

5,085,109

MACHINE TOOL FOR PROCESSING WORK PIECE INTO NON-CIRCULAR CROSS-SECTIONAL CONFIGURATION

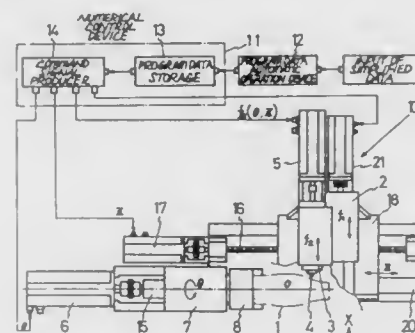
Miyake Hidehiko, Okayama, and Kajitani Kazuhiro, Kurashiki, both of Japan, assignors to Takisawa Machine Tool Co., Ltd., Okayama, Japan

Filed Apr. 14, 1989, Ser. No. 339,176

Claims priority, application Japan, Apr. 20, 1988, 63-99095
Int. Cl.⁵ B23B 3/00

U.S. Cl. 82—118

2 Claims



1. A machine tool for processing a work piece into a non-circular cross-sectional configuration comprising: a work piece (1) chucked to a main shaft and rotated continuously, a direction parallel to the rotation axis O of the work piece is referred to as a Z axis, a direction perpendicular to said rotation axis θ is an X axis and a rotational direction C is defined about the rotation axis θ ;

a Z axis servo motor (17);

a Z axis slider (18) moved by said Z axis servo motor;

a first X axis servo motor;

a first X axis slider (2) moved in said X axis direction by said first X axis servo motor said Z axis slider (18);

a second X axis servo motor (5);

a second X axis slider (3) finely movable at high speed on said first X axis slider (2) in the X axis direction by said second X axis servo motor (5);

a tool (4) secured to said second X axis slider (3);

said tool (4) being movable back and forth at respective positions in the Z axis and C axis directions by a previously programmed command value;

a spindle stock (7) including a rotational servo motor (6) for controlling said work piece (1) in the rotational direction; C

a numeral control device (11) which issues commands of high distributing speed in the three directions of the Z axis, rotational direction C, and second X axis in order to form the work piece into a non-circular cross-sectional configuration; and

an automatic operation device (12) for determining controlling program data;

wherein an amount of displacement of the second X axis servo motor (5) which is the movement command of the tool (4) in the X direction is calculated by finding coordinates at each position on the work piece form a function $f(\theta, Z)$ of a rotation angle θ from a reference plane of the work piece (1) and a distance Z from the reference point in the Z direction parallel to the rotational axis of said work piece, a non-circular cross-sectional contour is determined in the automatic operation device by inputting elements of the work piece in a simplified way by interpolated automatic operation, and the data is transmitted to the numeral control device so as to control the high speed fine movements caused by forward and reverse rotation of said second X axis servo motor provided with the tool.

5,085,110

CUTTING DEVICE FOR THE LONGITUDINAL CUTTING OF FOIL LENGTHS

Bernd Scholtysik, Munich, and Josef Birkmann, Fuerstentfeldbruck, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Agktiengesellschaft, Leverkusen, Fed. Rep. of Germany Division of Ser. No. 317,049, Feb. 27, 1989, abandoned, which is a continuation of Ser. No. 142,452, Jan. 11, 1988, abandoned.

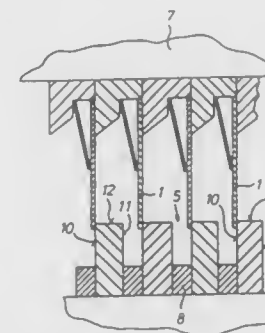
This application May 8, 1990, Ser. No. 520,766

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701716

Int. Cl.⁵ B26D 1/24

U.S. Cl. 83—34

6 Claims



1. The process of cutting foils carrying abrasive layers comprising the steps of

forming a sharp cutting edge on each of two cutting shoulders on each of a plurality of cylindrical keyway cutterbars by a grinding down procedure on each cutting shoulder to provide a rough depth at each shoulder of less than 0.2 micrometers so that the shoulders are equally ground down,

said cutterbars being rotatably mounted on a first shaft and each cutterbar is formed with a cylindrical curved surface between the cutterbar shoulders which in axial dimension is not less than the spacing between the cutterbars on said shaft and radial walls normal to the cylindrical surfaces forming the sharp cutting edges,

pressing circular roller blades against one of the cutting shoulders of respective cutterbars so as to provide one roller blade contacting each cutterbar, said blades mounted on a second shaft,

first, cutting a length of layer supporting foil into a plurality of narrow strips between said contacting roller blades and a first of said cutting shoulders, of said cutterbars, then second, cutting a length of said layer supporting foil into narrow strips between said contacting roller blades and a second of said cutting shoulders of said cutterbars, and supporting said narrow strips on the cylindrical surfaces during the cutting step.

and regrinding on each cutting shoulder to reestablish a rough depth at each shoulder of less than 0.2 micrometers so that the shoulders are equally ground down, and further cutting a length of layer supporting foil into narrow strips between said roller blades and said cutting shoulders, wherein the overlap in the contact of the roller blades with the cutter bars is in the range of from 0.2 to 1 mm.

5,085,111

APPARATUS FOR STACKING FLAT ARTICLES

Herbert Birkhofer, Brunswick, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany Filed Nov. 14, 1989, Ser. No. 436,043

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1988, 3838563

Int. Cl.⁵ B31B 1/64

U.S. Cl. 83—91

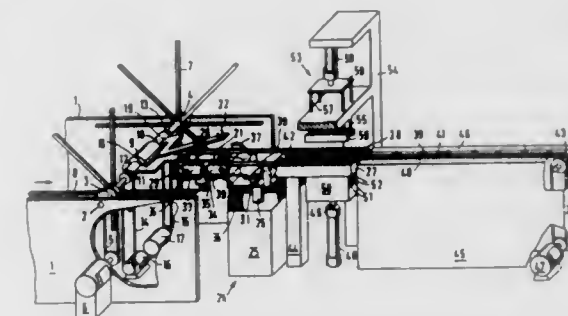
9 Claims

1. An apparatus for stacking flat articles, which have been severed by hot-wire welding from a continuous tubular or

semitubular plastic film and which have opening-defining edges adjacent to their center lines, comprising:

a wicketer forming a transfer apparatus having feeding arms, arranged in pairs and in a starlike array, secured to a shaft and rotating about a horizontal axis,

at least two radially disposed holding plates on which said bags are needled adjacent to their respective longitudinal center lines, said holding plates being provided in a stacking station and carrying upstanding stacking needles in order to form stacks of said flat articles, the at least two



radially disposed holding plates being rotatably mounted on the shaft,

separate respective drives connected to each of the radially disposed holding plates, said separate respective drives pivotally moving and consecutively rotating said radially disposed holding plates to a stacking position for receiving the articles,

means for removing the stacks from the radially disposed holding plates, and

means for moving the stacks away from the radially disposed holding plates.

5,085,112

SAW TOOTH AND HOLDER

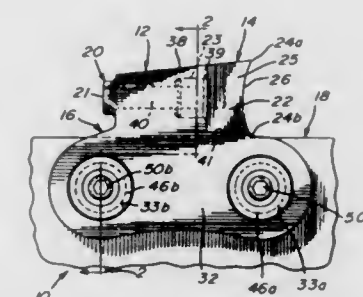
Charles D. MacLennan, 153 Cote St-Charles, Hudson Heights, Quebec, Canada J0P 1J0

Continuation-in-part of Ser. No. 469,853, Jan. 23, 1990, abandoned. This application Sep. 6, 1990, Ser. No. 578,165

Int. Cl.⁵ B27B 33/08

U.S. Cl. 83—840

4 Claims



1. A saw tooth and tooth holder combination for a cutting saw, the saw including a substrate, the tooth holder formed as a clevis straddling the substrate, each clevis holder including a U-shaped member having a pair of legs extending on either side of the substrate, and having a body portion formed at the bight of the U-shaped member straddling the substrate, the body defining a bore, the saw tooth including a tooth head having a small end and divergent surfaces extending to a large end with a concave recess formed at the large end of the head and forming cutting edges at the intersection of the concave recess and the divergent surfaces, a shank extending within the bore and attached to the head at the small end thereof, and the body

defining a tooth receiving seat including a platform and an abutment surface for receiving the divergent surfaces and the small end of the head respectively, the tooth including the tooth shank and head extending in a tangential axis to the substrate with the large end of the tooth head projecting in the direction of movement of the saw substrate, the legs defining recesses into which cupped sleeves are provided, and a bolt and nut extends through the substrate to retain the cupped sleeves against the substrate and thereby retain the tooth holder in position on the substrate.

5,085,113

CUTTER TEETH ASSEMBLY

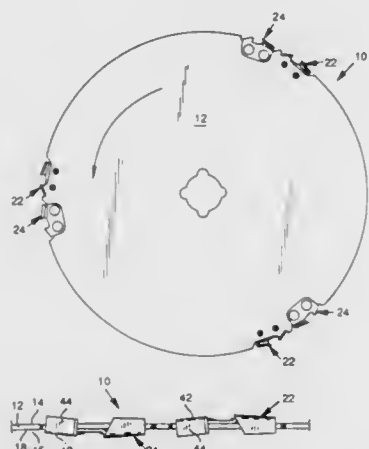
J. Dana Pinney, P.O. Box 877, Medford, Oreg. 97501
Continuation of Ser. No. 370,697, Jun. 23, 1989, Pat. No. 4,989,489, which is a continuation-in-part of Ser. No. 335,423, Apr. 10, 1989, Pat. No. 4,922,791, which is a continuation of Ser. No. 124,673, Nov. 24, 1987, Pat. No. 4,881,438, which is a continuation-in-part of Ser. No. 929,636, Nov. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 754,761, Jul. 15, 1985, abandoned. This application Jan. 3, 1991, Ser. No. 637,594

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.⁵ B27B 33/12

U.S. Cl. 83—840

13 Claims



1. A cutter teeth assembly comprising:
 - (a) a plurality of cutter teeth of alternating left and right configuration;
 - (b) a member interconnecting said teeth to enable them to be moved in a predetermined forward direction;
 - (c) each of said teeth comprising a flat, planar base portion having opposite, parallel side surfaces, a sidewall kerf cutting portion integral with said base portion extending upwardly therefrom and having an offset to one side of said base portion, and a kerf bottom cutting portion extending from said sidewall kerf cutting portion transversely across the plane of said base portion, said sidewall kerf cutting portion and said kerf bottom cutting portion each having a respective forward edge formed with a beveled surface defining a cutting edge adapted to cut a kerf in a workpiece of greater width than the width of said base portion between said side surfaces;
 - (d) a depth gauge element positioned forwardly of said cutting edge, said depth gauge element having an upwardly-extending sidewall portion and having a top plate extending substantially at a right angle to said sidewall portion transversely across the plane of said base portion a distance greater than said width of said base portion, said top plate having a forwardly-facing transverse leading edge and a rearwardly-facing transverse trailing edge and defining an upwardly-facing planing surface sloping upwardly from said transverse leading edge to said transverse trailing edge toward said cutting edge, said trans-

verse trailing edge of said top plate and said forward edge of said kerf bottom cutting portion being located at different respective heights above said base portion; and
(e) means mounting said depth gauge element for maintaining said transverse trailing edge of said top plate at a height below that of said forward edge of said kerf bottom cutting portion regardless of whether or not said cutter teeth are cutting said work-piece.

5,085,114

METHOD FOR FACILITATING REMOVAL OF INSULATION FROM WIRES

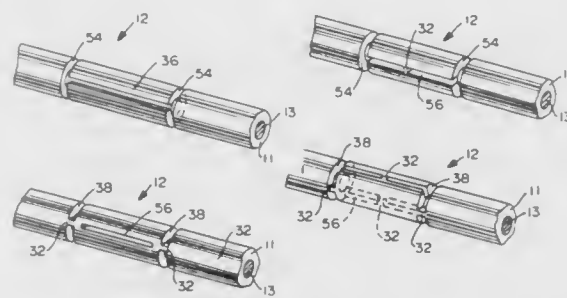
Robert W. DeRoss, Naperville; Ronald Dudek, Orland Park, and Dennis Stanhbel, Justice, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 4, 1990, Ser. No. 576,888

Int. Cl.⁵ H02G 1/12

U.S. Cl. 83—861

2 Claims



1. A method for slitting insulation surrounding a conductor of a portion of an electrical wire between ends of said wire to facilitate removal of a section of the insulation, comprising the steps of:
 - (a) simultaneously cutting two circumferential slits penetrating through the insulation down to the conductor perpendicular to the wire and at least one longitudinal slit penetrating through the insulation down to the conductor generally parallel to the wire and leading away from the circumferential slit; and
 - (b) leaving at least one completely unslit portion of the insulation in at least one of the circumferential and longitudinal slits having a length substantially less than the length of said circumferential or longitudinal slit to retain a section of the insulation on the conductor and which can be torn to remove the section with little force.

5,085,115

ELECTRIC GUITAR/VIOLIN

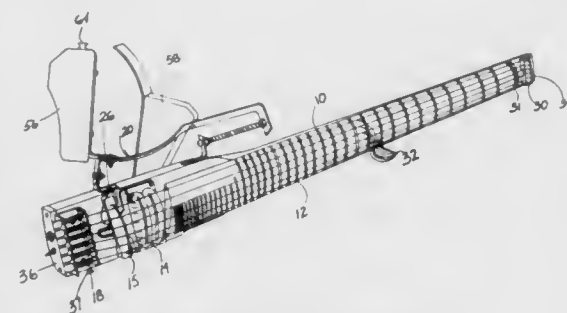
Robert Schlink, 78 Priscilla Ave., Providence, R.I. 02909

Filed Sep. 5, 1990, Ser. No. 578,075

Int. Cl.⁵ G10H 3/00; G10D 3/06

U.S. Cl. 84—310

17 Claims



1. A stringed musical instrument comprising:

- (a) an elongated rigid body having a tail end and a tapered neck end;
- (b) a symmetrically arched fingerboard affixed to the top surface of the body;
- (c) a symmetrically arched bridge and nut affixed to the top surface of the body providing a means for supporting strings above said fingerboard and allowing said strings to be played individually with a bow;
- (d) a means for adjusting string tension affixed to one end of the body;
- (e) a plurality of strings ranging from bass to treble anchored at one end and extending over the arched nut, fingerboard and bridge and being affixed to the means for adjusting string tension;
- (f) a means for converting acoustic vibrations to electronic impulses mounted in proximity to a source of string vibration; and
- (g) an adjustable support means comprising a balance point substantially in contact with the player's chest or shoulder area and a stabilizing point substantially in contact with said player's chin or neck area with said support means disposed in relation to said bridge so as to locate said bridge substantially in front of and below said player's chin and approximately in the center of said player's upper chest when said instrument is played with a bow passing over said player's shoulder or clavicle whereby scale lengths up to and including that of the standard guitar are made practical.

5,085,116

AUTOMATIC PERFORMANCE APPARATUS

Takuya Nakata; Hitoshi Makita; Takashi Hirakata, and Shingo Kawasaki, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

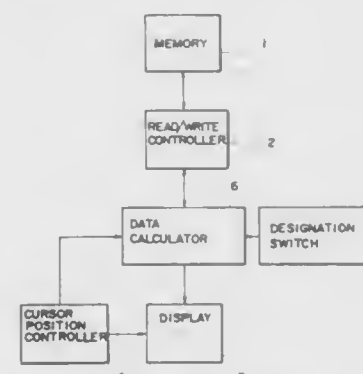
Filed Jun. 15, 1989, Ser. No. 366,583

Claims priority, application Japan, Jun. 23, 1988, 63-153372

Int. Cl.⁵ G10G 1/00, 3/04

U.S. Cl. 84—609

7 Claims



1. An automatic performance apparatus for performing an automatic performance in accordance with musical performance data, comprising:
 - (a) memory means for storing the musical performance data for controlling generation of musical tones in accordance with a progress of a music piece;
 - (b) read/write control means for storing input data in said memory means and reading out and outputting the performance data stored in said memory means;
 - (c) display means for displaying a staff, a cursor, and at least one note character whose shape changes correspondingly with a note length designated by said input data;
 - (d) cursor position control means for controlling a cursor position;
 - (e) note designating means for designating a note character displayed on said display means in correspondence with the cursor position; and
 - (f) data calculating means for calculating at least one of pitch, key-on timing, key-off timing, note interval and note

length data associated with a designated note character on the basis of the musical performance data read out from said memory means and a moving direction and amount of the cursor and supplying the calculated data to said read/write control means and said display means, wherein at least one of a position and shape of a note character displayed on said display means is changed in real time in accordance with movement of the cursor.

5,085,117

ELECTRONIC MUSICAL INSTRUMENT WITH ANY KEY PLAY MODE

Hiroshi Morokuma; Shigeru Matsuyama, and Takashi Akutsu, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

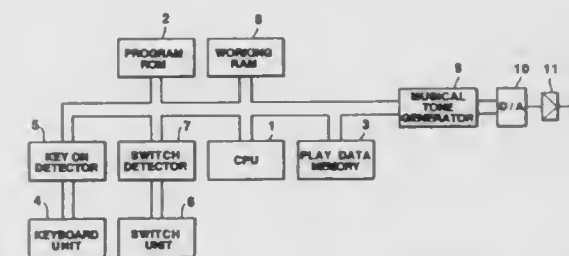
Filed Oct. 4, 1990, Ser. No. 592,556

Claims priority, application Japan, Oct. 6, 1989, 1-117684[U]; Oct. 6, 1989, 1-117685[U]; Oct. 11, 1989, 1-118976; Jul. 17, 1990, 2-75253

Int. Cl.⁵ G10B 3/10; G10H 1/02

U.S. Cl. 84—615

9 Claims



1. An electronic musical instrument comprising:
 - (a) a plurality of pitch designation means divided into a plurality of group designation means, said pitch designation means being operable to designate pitches;
 - (b) pitch data storage means for storing pitch data indicating pitches of melody tones constituting a melody;
 - (c) readout means for sequentially reading out the pitch data from said pitch data storage means;
 - (d) tone generation processing means for executing tone generation processing on the basis of the pitch data read out by said readout means; and
 - (e) control means for enabling said tone generation processing means to execute tone generation processing responsive to both of:
 - (i) operation of at least one of said pitch designation means; and
 - (ii) when none of said pitch generation means in a group designation means including previously operation pitch designation means is subsequently operated; and
 - (f) said control means disabling said tone generation processing means from executing the tone generation processing when at least one pitch designation means in a group designation means including any previously operation pitch designation means is subsequently operated.

5,085,118

AUTO-ACCOMPANIMENT APPARATUS WITH AUTO-CHORD PROGRESSION OF ACCOMPANIMENT TONES

Makoto Sekizuka, Iwata, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Filed Dec. 19, 1990, Ser. No. 630,191

Claims priority, application Japan, Dec. 21, 1989, 1-332340

Int. Cl.⁵ G10H 1/38, 1/42

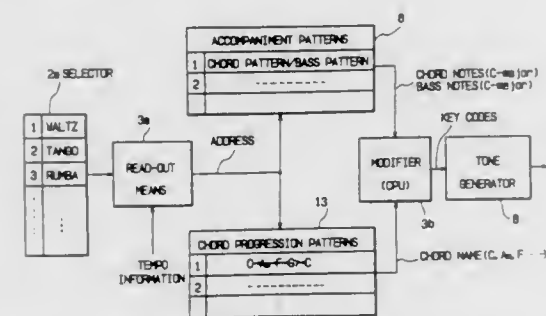
U.S. Cl. 84—635

9 Claims

1. An automatic accompaniment apparatus having an accompaniment pattern storage means in which accompaniment pattern data for auto-accompaniment performance is stored for each rhythm, the apparatus comprising:

chord progression pattern storage means in which chord progression patterns are preset for respective types of rhythm;

rhythm selection means for selecting one of rhythms;
read-out means for reading out said accompaniment pattern data and said chord progression pattern data respectively out of said accompaniment pattern storage means and said chord progression pattern storage means in response to a type of rhythm selected through said rhythm selection means;



data processing means receiving said accompaniment pattern data and said chord progression pattern data from said read-out means and generating accompaniment tone data by modifying accompaniment notes in the accompaniment pattern data in accordance with chord progression specified by said chord progression pattern; and
tone generating means for generating accompaniment tones in accordance with said accompaniment tone data generated in said data processing means.

5,085,119

GUITAR-STYLE SYNTHESIZER-CONTROLLERS

John F. Cole, 4 Ilford Close, Luton, Bedfordshire, England

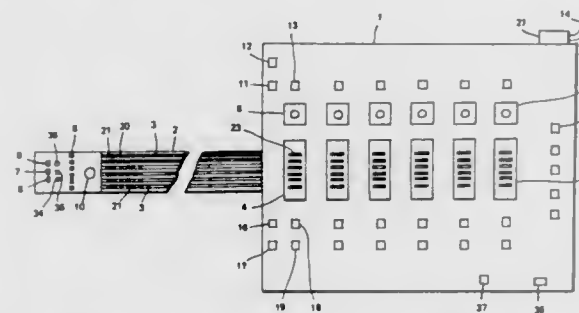
Filed Jul. 19, 1990, Ser. No. 554,409

Claims priority, application United Kingdom, Jul. 21, 1989, 8917005

Int. Cl.⁵ G10H 3/06, 3/14, 1/02

U.S. Cl. 84—724

19 Claims



1. A guitar-style synthesizer-controller comprising a body having a playing face with a pluck or strum region having an array of individual pluck-sensitive means for sensing a plucking motion to generate notes, an arm attached to the body and carrying a plurality of elongate lines of frets spaced alternately with note-selection for selecting means, switch means adjacent to said pluck-sensitive means, said frets and said note-selection means for controlling note parameters an interface which is arranged to produce digital output signals, wherein the frets and note-selection means are resiliently displaceable in at least one direction and displacement sensing means are associated therewith to provide output signals representative of such movement, and wherein the pluck-sensitive means are mounted on pluck boards, each of which boards is resiliently movable in at least one direction with displacement means

associated therewith to provide output signals representative of such movement.

5,085,120

ELECTRONIC STRINGED MUSICAL INSTRUMENT WITH PARAMETER SELECTING FUNCTION

Shiro Isbiguro, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

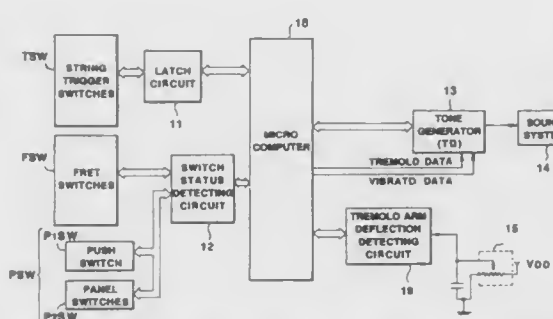
Filed Dec. 20, 1989, Ser. No. 453,955

Claims priority, application Japan, Dec. 26, 1988, 63-167912[U]

Int. Cl.⁵ G10H 1/02

U.S. Cl. 84—737

7 Claims



1. An electronic stringed musical instrument for generating a musical tone signal with a pitch which is designated by a pitch designating operation in response to a plucking operation for each of at least one string stretched on a main body of the stringed musical instrument, comprising:

a manually operable lever which has a shape of a bar deflectably mounted on the main body of said stringed musical instrument and being positioned adjacent to said at least one string;

a single push switch attached to one end of said manually operable lever;

kind selecting means coupled to said single push switch for each time when said single push switch is pushed, selecting a kind of parameter of a musical tone which parameter is difference from a kind of parameter previously selected by the push switch; and

parameter varying means coupled to said manually operable lever for varying a value of a parameter of the kind selected by said kind selecting means in accordance with an amount of deflection of said manually operable lever.

5,085,121

BRAIDED PRODUCT AND METHOD AND APPARATUS FOR PRODUCING SAME

Donald Richardson, 14 East Road, Atkinson, N.H. 03811

Filed Feb. 9, 1990, Ser. No. 478,088

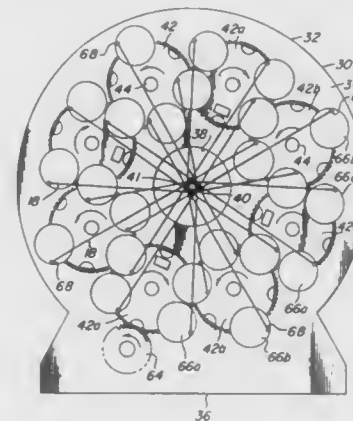
Int. Cl.⁵ D04C 3/00

U.S. Cl. 87—29

7 Claims

1. A Maypole braiding machine for producing a tubular braided structure having a uniform braid pattern comprising, a base plate, an even number of drivers rotatably mounted on said base plate in a circle, the center of said circle defining a braid point, means for rotating said drivers at the same speed with adjacent drivers rotating in opposite directions, a plurality of carriers supported and driven by said drivers, the number of said carriers being three times the number of said drivers, said drivers directing half of said carriers in one direction along an endless sinuous path about said braid point, and the other half of said carriers in the opposite direction along an endless intersecting sinuous path around said braid point such that each carrier passes alternately outside of three carriers and

inside of three carriers traveling in the opposite direction so as to provide a tubular braided structure having a three over and



three under braiding pattern around said braid point during operation.

5,085,122

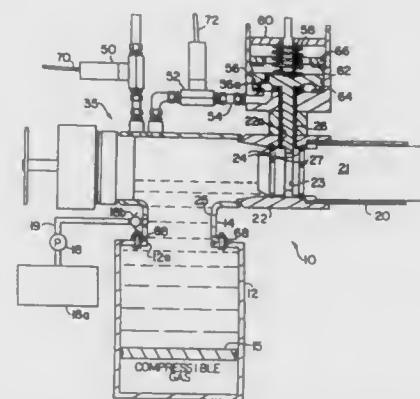
FIRING ASSEMBLY FOR STORED ENERGY LAUNCHER
Gary R. Berlam, Warwick; Laurent C. Bissonnette, Narragansett; Nicholas Bitsakis, Portsmouth; Peter R. Bodycoat, Newport, and George M. Duarte, Cranston, all of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 7, 1991, Ser. No. 652,155

Int. Cl.⁵ F41F 3/08

U.S. Cl. 89—1.81

9 Claims



9. A method of launching a projectile comprising the steps of:

providing a submersible assembly including a launch tube and impulse tank;

loading a projectile into the launch tube, and latching the projectile in the launch tube such that the aft end of the projectile cooperates with the breach end to define a breach chamber;

pressurizing the breach chamber and impulse tank from a source of fluid under pressure;

submerging the launch tube and tank assembly; and

electrically operating a valve provided in the submerged assembly from a remote location to direct pressurized fluid to a fluid actuator from the breach chamber of the launch tube in order to unlatch the projectile simultaneously with providing fluid pressure from the impulse tank instantaneously to the aft end of the projectile.

5,085,123

LARGE-CALIBER GUNS

Ulf Rosell, Granbergssdal; Mats Karlsson, and Johan Ternsjö, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

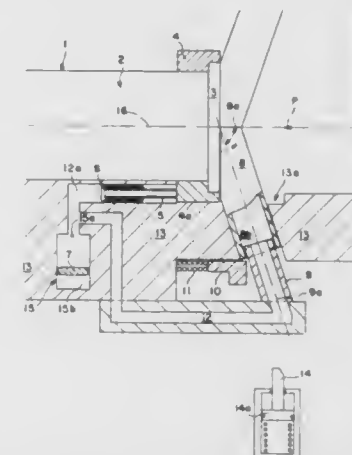
Filed May 9, 1990, Ser. No. 520,224

Claims priority, application Sweden, May 9, 1989, 8901626

Int. Cl.⁵ F41A 15/10

U.S. Cl. 89—4.2

17 Claims



1. A device used in a weapon for controlling the train of motion partly of an ammunition unit during the ramming thereof in the weapon, and partly of the case of the ammunition unit on firing of the gun, said device comprising:

impact means adapted upon ramming of the ammunition unit, for interacting with and retarding the ammunition unit;

an energy storing means chargeable through said impact means with kinetic energy existing in the retarding ammunition unit;

means responsive to said energy transmitted from said energy storing means for activating closing of a breech block;

wherein said breech block, during its activation to its closed position is adapted to retain the case of the ammunition unit during said firing and during a predetermined portion of the rearwardly directed movement in the gun occasioned by firing; and

wherein said impact means includes an impact member interactable with a flange on the case and displaceable in the longitudinal direction of the gun, and an impact spring means interactable with said impact member and with an impact piston.

5,085,124

DIRECTIONAL CONTROL VALVE FOR PNEUMATIC CYLINDER

Takashi Kimura, Nagoya, Japan, assignor to Hirotaki Manufacturing Co., Ltd., Nagoya, Japan

Division of Ser. No. 442,210, Nov. 28, 1989. This application Jan. 11, 1991, Ser. No. 640,149

Claims priority, application Japan, Dec. 5, 1988, 63-307186

Int. Cl.⁵ F15B 13/043

U.S. Cl. 91—433

5 Claims

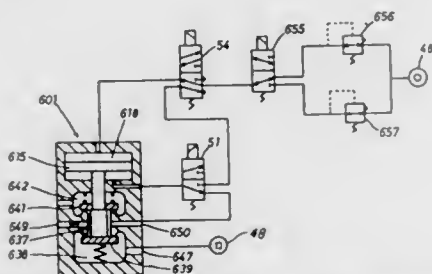
1. A directional control valve for a pneumatic cylinder having a cylinder housing, a piston dividing the cylinder housing into two chambers, and a rod connected to the piston, the directional control valve comprising:

a control valve housing having an ambient pressure chamber communicating with an atmosphere surrounding both the pneumatic cylinder and the directional control valve;

a first pressure chamber communicating with an air supply;

a second pressure chamber communicating with one of the chambers of the cylinder housing;

- a first valve means for selectively allowing communication between the first pressure chamber and the second pressure chamber; and
- a second valve means for selectively allowing communication between the second pressure chamber and the ambient pressure chamber; and further comprising:
- a control means for controlling closing, partially opening, and fully opening one of the first valve means and the second valve means, wherein the control valve housing further defines a control means cavity and the control means comprises:
- a pressure controlling piston movably mounted in the control means cavity, where a pressure receiving chamber is formed between the control valve housing and a first side of the pressure controlling piston;
- a back pressure chamber formed between the control valve housing and a second side of the pressure controlling piston;



- a linkage means secured to the pressure controlling piston for opening one of the first valve means and the second valve means corresponding to a movement of the pressure controlling piston; and
- the directional control valve further comprises an air supply/removal means for selectively supplying air to and removing air from the back pressure chamber and the pressure receiving chamber, the air supply/removal means comprising:
- a third valve means for allowing the pressure receiving chamber to selectively communicate with the second pressure chamber, the air supply, and the atmosphere; and
- a fourth valve means for allowing the back pressure chamber to selectively communicate with the air supply and the atmosphere, in which the fourth valve means further communicates with the third valve means.

5,085,125

OPTICALLY CONTROLLED TRANSDUCER

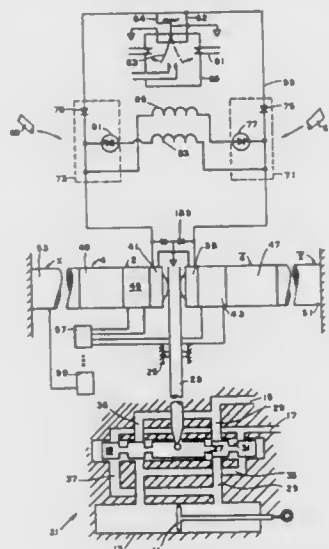
Stephen M. Emo, Elkhart, and Terrance R. Kinney, South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.
Filed Dec. 21, 1990, Ser. No. 632,210
Int. Cl.⁵ F15B 13/044

U.S. Cl. 91—459

3 Claims

1. An optically controlled fluid powered actuator having a fluid powered electrical generator driven by pressurized air to develop its sole source of electrical energy, said electrical generator being connected to first piezoelectric means through switch means, a pair of optical fibers each for conveying a wavelength division multiplexed optical signal to said switch means, said first piezoelectric means having a pair of opposed stacks of piezoelectric elements for converting said electrical energy into mechanical motion, said opposed stacks each having a relative length formed by a geometric sequence of piezoelectric elements, said switch means having two sets of electrical switches, each set of switches being responsive to said wavelength division multiplexed optical signals to allow electrical energy from said electrical generator to be selectively communicated to corresponding ones of the piezoelectric elements in an associated stack of piezoelectric elements, said piezoelectric elements responding to said electrical energy by expanding and contracting to develop said mechanical motion, said optical signals being in a pure binary code whereby the magnitude of said mechanical motion of the piezoelectric

element is directly proportional to the magnitude of the wavelength division multiplexed optical signal, a movable spool type fluid control valve connected to a fluid powered piston, a lever coupling the opposed stacks of piezoelectric elements



with the fluid control valve whereby movement of said lever is dependent on said mechanical motion of said piezoelectric elements to corresponding move the lever and position the control valve to allow pressurized fluid to operate the piston.

5,085,126

PNEUMATIC PERCUSSION TOOL WITH RELATIVELY MOVABLE HEAD VALVES

Kenzi Mukoyama, Anjo, Japan, assignor to Makita Electric Works, Ltd., Anjo, Japan

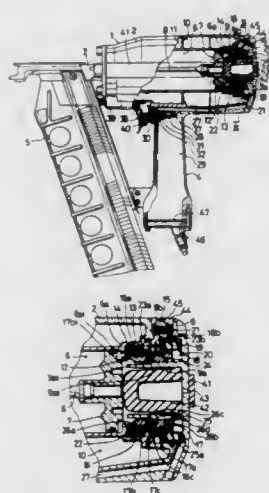
Filed Jan. 8, 1991, Ser. No. 639,246

Claims priority, application Japan, Jan. 10, 1990, 2-3847

Int. Cl.⁵ F15B 11/08, 13/04

U.S. Cl. 91—426

12 Claims



1. A pneumatic percussion tool comprising:
- a body;
- a cylinder mounted within said body;
- a percussion piston connected with a driver for percussion operation and reciprocally movable within said cylinder;
- a percussion piston chamber formed in said body and communicating with said cylinder at a stroke end of said percussion piston;

- a main air chamber formed in said body for storing compressed air supplied from a compressed air source;
- a head valve chamber formed in said body;
- a change-over valve operable by an operator for selectively connecting said head valve chamber with said compressed air source or the outside of said body; and
- a head valve device disposed in said body for interconnecting said percussion piston chamber, said main air chamber, said head valve chamber and the outside of said body;

said head valve device comprising:

first and second head valves disposed in said body and movable in response to the pressure variation in said head valve chamber;

said first and second head valves being positioned at a first position for preventing communication between said main air chamber and said percussion piston chamber while permitting communication between said percussion piston chamber and the outside of said body and preventing communication between said head valve chamber and the outside of said body when the compressed air is introduced into said head valve chamber through said change-over valve;

said first and second head valves being movable from said first position to a second position for permitting communication between said main air chamber and said percussion piston chamber while preventing communication between said percussion piston chamber and the outside of said body and between said head valve chamber and the outside of said body when the compressed air has been discharged to the outside through said change-over valve; and

said first and second head valves being moved from said first position to said second position in such a manner that said first head valve firstly moves toward said second position prior to the movement of said second head valve for permitting communication between said head valve chamber and the outside of said body, so that the air within said head valve chamber can be quickly discharged to the outside of said body.

5,085,127

CAVITATION RESISTANT HYDRAULIC CYLINDER BLOCK PORTING FACES

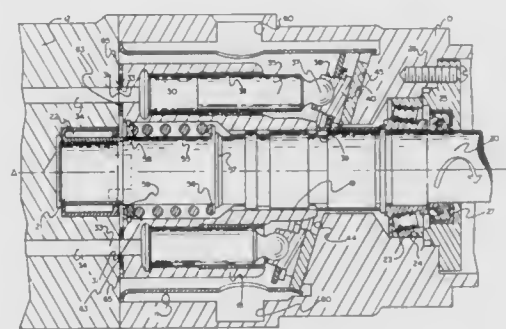
Charles J. Gantzer, South Beloit, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 29, 1990, Ser. No. 502,167

Int. Cl.⁵ F01B 13/04

U.S. Cl. 91—499

11 Claims



1. A hydraulic axial displacement pump or motor comprising:
- a housing;
- a rotatable cylinder block in said housing and including a plurality of bores;
- a piston in each of said bores and reciprocable therein upon rotation of said cylinder block;
- a valve member having inlet and outlet ports and in abutment with said cylinder block;

each of said bores having a port opening to said ports in said valve member to establish fluid communication therewith; a raised porting face on said cylinder block about each of the ports to said bores and abutting said valve member, said porting face being formed of a hard, erosion resistant material and further characterized by an absence of bearing material; and

at least one stabilization foot extending from said cylinder block toward said valve member and formed of bearing material.

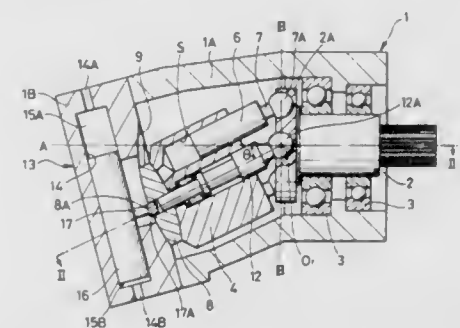
5,085,128

VARIABLE DISPLACEMENT BENT AXIS TYPE HYDRAULIC MACHINE

Shigetaka Nakamura, Yasuharu Gotoh, both of Tsuchiura, and Eiki Izumi, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan
Filed Mar. 1, 1991, Ser. No. 663,001
Int. Cl.⁵ F01B 13/04

U.S. Cl. 91—504

3 Claims



1. A variable displacement bent axis type hydraulic machine including: a cylindrical casing provided with a head casing; a rotational shaft extended into said casing and formed with a drive disc at the inner end thereof; a cylinder block provided in said casing for rotation with said rotational shaft and axially bored with a plural number of cylinders; a plural number of pistons reciprocally received in the respective cylinders of said cylinder block and each having one end thereof pivotally supported on said drive disc; a valve plate having one end face thereof held in sliding contact with said cylinder block and being rockable at the other end face along a tilt-sliding surface on said head casing; a center shaft rotatably supporting said cylinder block between said valve plate and rotational shaft; and a tilt angle sensor mechanism adapted to detect the tilt angle of said valve plate with respect to said tilt-sliding surface; characterized in that said tilt angle sensor mechanism comprises: a support shaft rotatably supported on a side wall of said casing at a position deviated toward said valve plate from the pivoting point of said center shaft; a rocking lever having one end thereof securely fixed to said support shaft and the other end pivotally supported at one side of said valve plate; and an angle sensor adapted to detect the rotational angle of said support shaft as caused by rocking movement of said rocking lever.

5,085,129

JOINT SYSTEM

Larry M. Dugan, Boulder, Colo., assignor to Golden Technologies Company, Inc., Golden, Colo.

Filed Mar. 8, 1991, Ser. No. 666,234

Int. Cl.⁵ F16J 1/10; F01B 11/02

U.S. Cl. 92—84

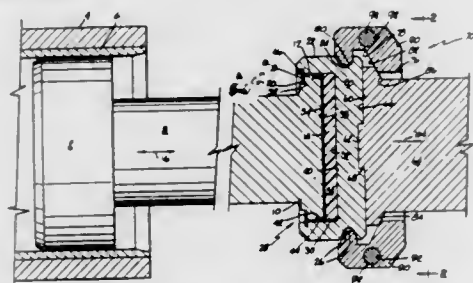
19 Claims

1. A joint for increasing the working life of a pump having a cylinder and a piston mounted for reciprocation in the cylinder comprising:

a piston rod extending from said piston and having a longitudinal axis;

said piston rod having a generally planar end surface;

reciprocating driving means for reciprocating said piston rod and therefore said piston in said cylinder;
said reciprocating driving means having a longitudinal axis;
a member located between said piston rod and said reciprocating driving means and having a cavity formed therein;
said cavity having a generally cylindrical inner surface and a generally planar end surface of said piston rod being located in said cavity;
retaining means for retaining said planar end surface of said piston rod in said cavity;
said retaining means located to form a space defined by said planar end surface of said piston rod, said generally cylindrical inner surface and said generally planar bottom surface when said piston rod is in contact with said retaining ring;



a solid, deformable, non-compressible material located in said space;
said solid, deformable, non-compressible material having a volume less than the volume of said space to permit limited relative movement between said planar end surface of said piston rod and said generally planar bottom surface to deform said solid, deformable, non-compressible material until it fills said space and the non-compressible characteristic thereof functions to distribute the forces applied by said member uniformly across said generally planar end surface; and
coupling means for connecting said member and said reciprocating driving means so that the reciprocal movement of said reciprocating driving means reciprocates said coupling means, said member and said piston rod.

5,085,130

Patent Not Issued For This Number

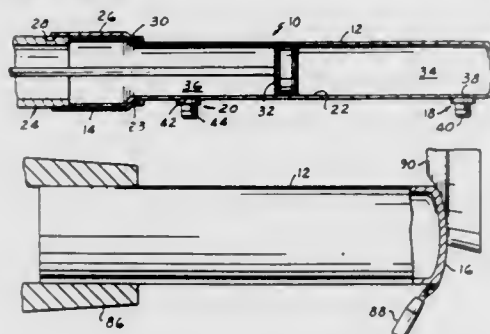
5,085,131

HYDRAULIC CYLINDER FOR AUTOMOTIVE STEERING SYSTEMS AND THE LIKE

Brian F. Barrett, Garden City, and Frank H. Firek, Northville, both of Mich., assignors to Prime Tube, Inc., Plymouth, Mich.
Filed Oct. 2, 1990, Ser. No. 608,577
Int. Cl.⁵ F01B 11/02; B23P 15/06

U.S. Cl. 92-169.1

11 Claims



1. A power steering cylinder for attachment to a housing to shift a piston relative thereto, said cylinder comprising:

an elongated cylindrical tube having first and second ends and a central region therebetween;
said first end being suitable for receiving the piston through and provided with means for attachment to the housing;
said second end being formed closed utilizing a spin forming process to create an integral pressure tight end;
said central region having a smooth uniform circular cross section inner diameter having an inner diameter tolerance no greater than 1% of said inner diameter for sealingly cooperating with said piston as the piston shifts axially within the tube central region between an operably fully extended position and an operably fully retracted position to define a variable displacement cavity bounded by the sides of the tube, said second end and the piston; and
means for connecting the variable displacement cavity to a source of fluid.

5,085,132

VENTILATING APPARATUS

Kazutoshi Ikeda, Inazawa; Hiroshi Kuriyama, Hashima; Tetsumi Ichioka, Iwakura, and Ryouji Matsuoka, Nakashima, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

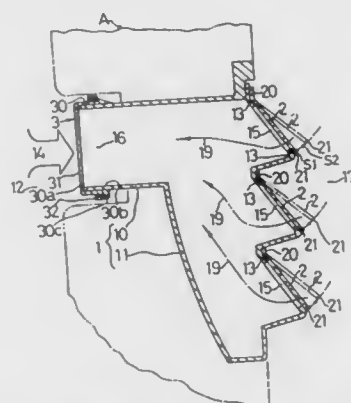
Filed Jan. 30, 1991, Ser. No. 648,520

Claims priority, application Japan, Jan. 31, 1990, 2-8617[U]

Int. Cl.⁵ B60H 3/06

U.S. Cl. 98-2.11

7 Claims



1. A duct including an indoor air inlet port for taking in indoor air, said indoor air inlet port communicating with an inside of an automobile room, and an indoor air outlet port for discharging said indoor air to an outside of said automobile room, said indoor air outlet port communicating with said outside of said automobile room;

a one-way valve fixed at one end thereof to an upper part of said indoor air outlet port, an opposite end of said one-way valve being swingable around said one end for opening and closing said indoor air outlet port, said opposite end of said one-way valve moving away from a peripheral part of said indoor air outlet port for opening said indoor air outlet port when discharging said indoor air to said outside of said automobile room; and

a filter for purifying contaminated outdoor air intruding from said outside of said automobile room by way of said indoor air outlet port.

5,085,133

EXHAUST EXTRACTION SYSTEM FOR WELDING SITE

Paul D. Hickling, and Michael S. Belchos, both of Scarborough, Canada, assignors to Diesel Equipment Limited, Toronto, Canada

Filed Oct. 29, 1990, Ser. No. 604,167

Int. Cl.⁵ F23J 11/00

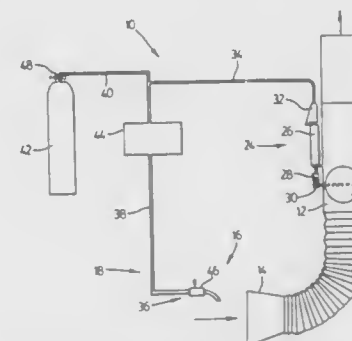
U.S. Cl. 454-63

4 Claims

1. In an exhaust extraction system for removing noxious

fumes from a welding site which is located in a welding workstation:

- an exhaust duct through which the fumes are vented to atmosphere;
- a damper in the exhaust duct having a damper control mechanism that is operable to displace the damper to and from between an open position and a closed position to open and close the exhaust duct;
- a welding machine; and
- a supply of pressurized inert shielding gas delivered under pressure through a supply line to the welding site and to said damper control mechanism, wherein the pressure in



the supply line changes when the welding machine is activated and deactivated, said supply line communicating with said damper control mechanism such that the change in pressure in the supply line that occurs when the welding machine is activated serves to open the damper and the change in pressure in the supply line that occurs when the welding machine is deactivated serves to close the damper;

whereby the exhaust duct will be open when the welding machine is activated to perform a welding position which generates noxious fumes and closed when the welding machine is deactivated.

5,085,134

SMOKER'S BOOTH

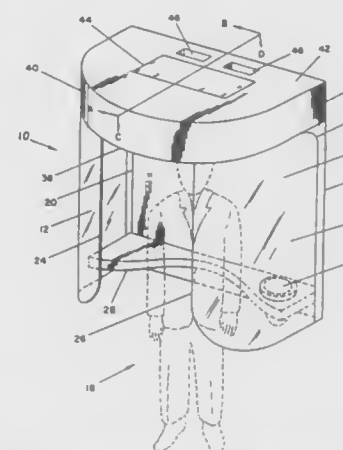
Joseph S. Hofstra, 327 Hathaway Cir., Los Lunas, N. Mex. 87031; Ronald J. Karaskiewicz, 9301 La Grima de Oro, NE., Albuquerque, N. Mex. 87111, and Mark R. Fischer, 5704 Flor del Rey, NW., Albuquerque, N. Mex. 87120

Filed May 17, 1990, Ser. No. 525,327

Int. Cl.⁵ B08B 15/02

U.S. Cl. 454-67

28 Claims



1. A smoker's booth for receiving and accommodating one or more smokers and for isolating smokers and tobacco smoke, said smoker's booth comprising:
walled enclosure means;

ceiling means;

smoker's access means disposed in said walled enclosure means for providing ingress and egress for the smokers; and

means for venting tobacco smoke from said walled enclosure means and away from the vicinity proximate to said walled enclosure means, wherein said venting means further directs the tobacco smoke along a single flow path extending forwardly within said smoker's booth, and thereafter extending rearwardly within said smoker's booth, whereby the tobacco smoke is prevented from exiting said smoker's booth through said smoker's access means.

5,085,135

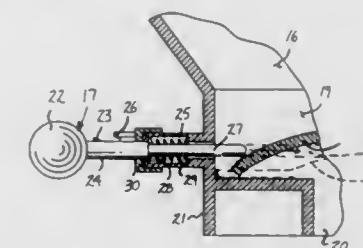
COFFEE MAKER BREW POT VALVE APPARATUS

Gary E. Collignon, P.O. Box 258, Tahoe City, Calif. 95730
Filed Jul. 16, 1990, Ser. No. 553,257

Int. Cl.⁵ A47J 31/02

U.S. Cl. 99-299

4 Claims



1. A coffee maker valve apparatus in combination with a coffee maker, including a housing top, a support column mounted to the housing top, and a base, the base underlying a brew pot, the brew pot selectively mounted to the housing top, and the brew pot including an upper longitudinally aligned section and a lower longitudinally aligned section, wherein the upper and lower sections are coaxially aligned relative to one another, and

the lower section defined by a cylindrical housing, the cylindrical housing including a central flow cavity underlying the upper section, and

the central flow cavity overlying an output conduit, and a valve member reciprocally mounted within the central flow cavity, and

wherein the central flow cavity includes a convex deflector plate overlying the output conduit, the deflector plate formed of a memory retentive deformable material, and wherein the valve member is cooperative with the deflector plate, wherein the valve member is spaced from the deflector plate in a first position and is engaged with the deflector plate in a second position to depress the deflector plate to effect overlying sealing of the output conduit preventing fluid flow therethrough, and

wherein the valve member includes a valve boss integrally and orthogonally mounted within the central flow cavity, the central flow cavity defining a cylindrical lower chamber, and the valve member further including a first shaft reciprocally and coaxially directed through the valve boss, the first shaft defined by a first diameter, and a second shaft integrally and coaxially mounted to a forward end of the first shaft, wherein the second shaft extends interiorly of the flow cavity, and a spring member mounted within the boss and captured between the first shaft and the lower chamber to bias the first and second shaft rearwardly to the first position.

5,085,136

MECHANICAL DEVICE FOR LOCKING AND UNLOCKING THE BREAD HOLDER OF A TOASTER
 Roger Eisenberg, Marly, France, assignor to SEB S.A., Selo-
 gey, France

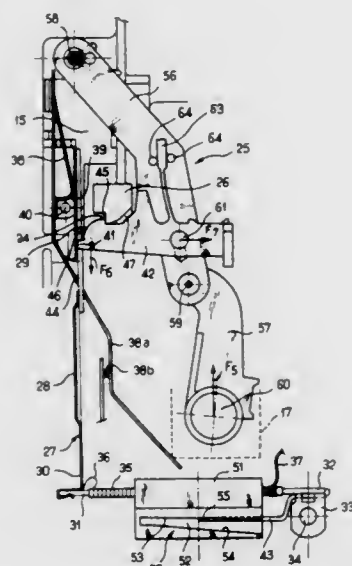
Filed Jan. 25, 1990, Ser. No. 470,368

Claims priority, application France, Feb. 1, 1989, 89 01276

Int. Cl.⁵ A47J 37/08

U.S. Cl. 99—391

1 Claim



1. A toaster comprising a bread holder (17) having means (17a) for directly mounting an actuation member thereon, guide means (18, 19, 20) to provide a sliding direction for raising and lowering the bread holder (17), a return spring (21) for applying a raising force (F_s) to the bread holder (17), and a plate (15) disposed at one end of the toaster, said plate (15) carrying a mechanical device (25) for locking and unlocking the bread holder (17) in a low position, wherein said mechanical device (25) comprises an upper connecting rod (56) and a lower connecting rod (57) having respective first ends articulated with each other and second ends opposite said first ends, respectively, the plate (15) comprising a fixed point (58) at which said second end of the upper connecting rod (56) is articulated, said second end of the lower connecting rod (57) being articulated with the holder (17), said mechanical device (25) further comprising an intermediate lever (42) articulated with one of said upper and lower connecting rods (57), an end of said intermediate lever (42) comprising a tip (24), a retaining catch (45) being provided on the plate (15), said tip (24) being engageable with said retaining catch (45) when the holder (17) is moved into the low position, said end of the intermediate lever (42) further comprising a projection (41), wherein control means are provided to disengage the tip (24) from the catch (45), said control means comprising a single blade (27) and a bimetallic strip (31) disposed substantially perpendicular to each other, the bimetallic strip (31) having a first end (32) mounted on the plate (15) and a second end, the blade (27) having one end connected to said second end of the bimetallic strip (31) and extending substantially transverse to the intermediate lever (42) when the tip (24) is engaged with the catch (45), the blade (27) comprising a window (44) disposed to come into registry with and receive said projection (41) when said bimetallic strip (31) is heated and pushes said blade (27) lengthwise in one direction and to apply a transverse traction force (F_6) to the intermediate lever (42) to disengage the tip (24) from the catch (45) when the bimetallic strip (31) cools and pulls the blade (27) lengthwise in the opposite direction.

5,085,137

EQUIPMENT FOR THE PREPARATION OF POTATO CHIPS

George P. Mottur, Danville; Dennis L. Kishbaugh, Berwick; Hilbert J. Cope, Jr., Berwick, and Edward W. Cooper, Wap-
 wallopen, all of Pa., assignors to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 298,013, Feb. 7, 1989, abandoned, which is a division of Ser. No. 76,689, Jul. 22, 1987, Pat. No. 4,844,930. This application Jun. 3, 1991, Ser. No. 709,791

Int. Cl.⁵ A47J 37/12

U.S. Cl. 99—404

24 Claims



1. A continuous frying apparatus for making potato chips, comprising:

an elongated vessel for containing a heated liquid frying medium, said vessel having an entrance end for receiving uncooked potato slices for immersion in the frying medium and an exit end from which the potato chips are removed after frying;
 means for supplying a heated liquid frying medium to the vessel through a first inlet port located near the entrance end thereof to define the start of a first frying zone;
 means for supplying a heated liquid frying medium to the vessel through a second inlet port located downstream of said first inlet port to define the start of a second frying zone;
 means for supplying a heated liquid frying medium to the vessel through a third inlet port located downstream of said first and second inlet ports to define the start of a third frying zone;
 means for conveying the potato slices sequentially through said first, second and third frying zones;
 means for compacting and agitating the potato slices in the second frying zone in order to achieve complete folding, without agglomeration, in at least 30% by weight of finished potato chips; and
 means for controlling the flow rate and temperature of the heated liquid frying medium supplied through each of said first, second and third inlet ports in a manner such that the temperatures of the first, second and third frying zones can be independently regulated, wherein frying of the potato slices occurs at temperatures which do not exceed about 300° F. (149° C.) in any of said first, second and third frying zones, and wherein said means for compacting and agitating potato slices are confined in space to said second frying zone.

5,085,138

FOOD PRODUCTION APPARATUS FOR THE PRODUCTION OF FOOD AND NOVEL FOOD PRODUCT
 Amos Fehr, and Joseph Chong, both of 4572 Erie Ave., Niagara Falls, Ontario, L2E 3N3, Canada

Division of Ser. No. 436,768, Nov. 15, 1989, which is a division of Ser. No. 337,638, Apr. 13, 1989, Pat. No. 5,012,726. This application Mar. 12, 1991, Ser. No. 668,242

Claims priority, application Canada, Jun. 30, 1988, 571,001

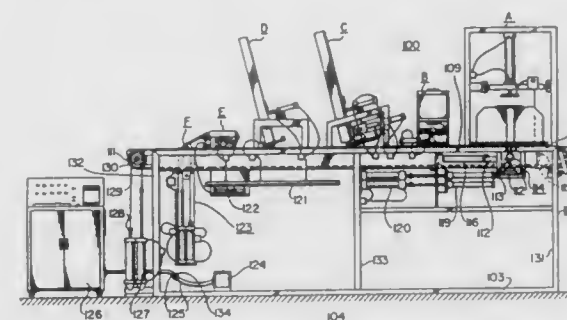
Int. Cl.⁵ A21C 9/00; A23P 1/00

U.S. Cl. 99—450.6

23 Claims

1. Food production apparatus comprising:
 a) a supporting frame structure;
 b) conveying means mounted upon said frame structure, said conveying means passing a plurality of work stations; intermittent moving means for intermittently moving a selected area on said conveying means from one work station to a subsequent work station downstream thereof;

c) a dough sheet feeding mechanism positioned at a first work station adjacent to said continuous conveying means, said feeding mechanism having means for intermittently providing a substantially-square shaped sheet of dough at a diamond orientation on said selected area of said conveying means while said conveying means is stationary;
 d) at least one food stuff loading mechanism at a second work station downstream from said dough sheet feeding mechanism and operable to load foodstuff onto a discrete region of said sheet of dough while said sheet of dough is resting on said conveying means at said second work station and while said conveying means is stationary;
 e) a loaded dough sheet folding mechanism at a third work station downstream from said second work station, said folding mechanism having longitudinally-spaced apart, mutually-opposed means which are operable to hold a loaded sheet of dough which is in a diamond-shaped configuration in place, and transversely-spaced apart, mutually-opposed means which are operable to raise opposed



transverse corners of said loaded diamond-shaped sheet of dough and to fold them inwardly to meet and overlap slightly at the centre, thereby to provide a hexagonally-shaped, overlapped-folded, loaded sheet of dough, while said conveying means is stationary;
 f) a loaded, folded dough sheet rolling mechanism operable at a fourth work station downstream from said third work station and operable to provide a generally-cylindrical, overlapped-folded, loaded, rolled dough product, while said conveying means is stationary;
 g) means for discharging said generally-cylindrical overlapped-folded, loaded, rolled dough product from said conveying means; and
 h) synchronizing means for synchronizing intermittent advancing movement of said conveying means with the sequential operation of said dough sheet feeding mechanism, with said dough sheet loading mechanism, with said loaded, folded, dough sheet rolling mechanism and with said discharge means.

5,085,139

AUTOMATIC EGG SHELLING MACHINE ON CONTINUOUS PARALLEL LINES, CIRCULATING ON VERTICAL PLANES

Giorgio Pellegrinelli, Brughiero, Italy, assignor to Pelbo S.r.l., Brughiero, Italy

PCT No. PCT/IT88/00069, § 371 Date May 17, 1990, § 102(e)

Date May 17, 1990, PCT Pub. No. WO89/05097, PCT Pub.

Date Jun. 15, 1989

PCT Filed Sep. 30, 1988, Ser. No. 474,039

Claims priority, application Italy, Nov. 30, 1987, 22810 A/87

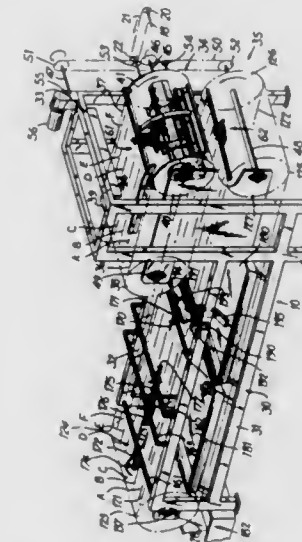
Int. Cl.⁵ A23J 1/09; A47J 43/14

U.S. Cl. 99—500

3 Claims

1. Automatic egg shelling machine characterized in that it has a plurality of parallel production lines (A, B, C, D, E, F) placed side by side travelling along endless paths in vertical planes, each composed of two half-circuits, one above the other, an upper one of the half-circuits for carrying and conveying shelling devices (61) along vertical endless paths for

collecting eggs as they are supplied on an egg feeding device (11) and for breaking their shells and a lower one of the half-circuits for carrying and conveying collecting devices (62) to collect the yolks and whites, speed of said two half-circuits being equal but moving in opposite directions, operative planes of said half-circuits being regulated so that during operation meeting is assured between an upward moving collecting device (62) and a downward moving shelling device (61), said



upper half-circuits being formed of a pair of lateral continuous chains (36) (37) moving around horizontal axes along paths in vertical planes and connected by transversal bars (60) each of which carries one of the egg shelling devices (61) on each half-circuit set side by side, while the lower half-circuits are formed of a pair of continuous lateral chains (121) (122) moving around horizontal axes along paths in vertical planes and connected by transversal bars (131) each carrying one of the collecting devices (62) on each half-circuits set side by side.

5,085,140

PRESSER BELT SEPARATING APPARATUS

Helmut Kunig, Bad Schwartau, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & CO KG, Lubeck, Fed. Rep. of Germany

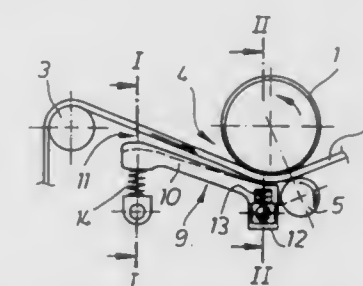
Filed Oct. 10, 1990, Ser. No. 594,931

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1989, 3934087

Int. Cl.⁵ B30B 9/20

U.S. Cl. 100—121

8 Claims



1. A presser belt separating apparatus for separating material processed in the form of non-flowable and flowable constituents mixed with each other, in particular at least one of sinews, tendons and cartilages from meat portions, said apparatus comprising:

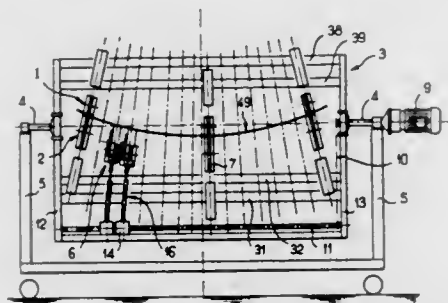
a perforated drum driven to rotate and having a perforated circumferential surface;

a presser belt driven in a downstream direction toward said drum and engaging a portion of said circumferential surface;
 a presser roller;
 tensioning and presser means for tensioning and pressing said presser belt arranged upstream of said presser roller with respect to the direction in which said presser belt is driven;
 said presser belt being pressed against said circumferential surface by said presser roller and said tensioning and said presser means and, together with said circumferential surface, forming a draw-in wedge for drawing in the material to be processed between the presser belt and the perforated drum;
 lateral walls for guiding said presser belt and forming a lateral boundary for said draw-in wedge;
 means for pressing with adjustable force said tensioning and presser means against said drum in a substantially radial direction with respect to said drum;
 said presser belt having a width extending in a direction between said lateral walls and a central area along a mid-portion of said width; and
 said tensioning and presser means extending over said width of said presser belt and having a surface contour engaging said belt that forms a curvature in the central area of said presser belt at an upstream region of said tensioning and presser means, said surface contour decreasing in curvature from said upstream region of said tensioning and pressure means toward a downstream region of said tensioning and presser means.

5,085,141

DEVICE FOR THE DRIVE OF DRIVING ROLLERS OF A CALENDER FOR LAMINATED GLAZINGS AND CALENDER EQUIPPED WITH THIS DEVICE

Francis M. Triffaux, Thourotte, France, assignor to Saint-Gobain Vitrage International, Courbevoie, France
 Filed Nov. 14, 1989, Ser. No. 436,348
 Claims priority, application France, Nov. 14, 1988, 88 14742
 Int. Cl.⁵ B30B 3/04; B32B 17/06, 31/20
 U.S. Cl. 100—155 G 9 Claims

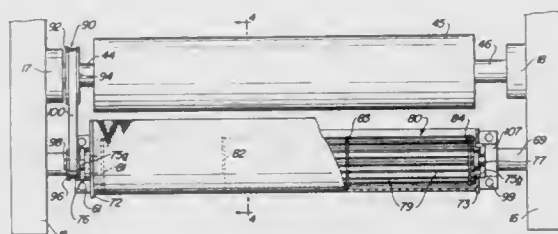


1. A calender for pressing curved laminated glazings, comprising:
 a mobile frame;
 pressing means mounted to said frame for pressing the curved laminated glazings, said pressing means including at least one series of pressing rollers mounted for vertical movement to follow the curvature of the laminated glazings, said at least one series of pressing rollers including at least one driven roller;
 roller driving means including a rigid horizontal drive shaft mounted for rotation in said frame and connected to a driving motor for driving the drive shaft; and
 transmission means for transmitting a rotation of said drive shaft to each said at least one driven roller, comprising at least one bevel gear unit slidably mounted to said drive shaft and a vertically extending, variable length jointed unit connected between each said at least one bevel gear unit and a corresponding said at least one driven roller.

5,085,142

DAMPENING FLUID EVAPORATOR

Maurice D. Smith, 4440 Northcrest, Dallas, Tex. 75229
 Continuation of Ser. No. 165,519, Mar. 8, 1988, abandoned. This application Nov. 28, 1990, Ser. No. 622,323
 Int. Cl.⁵ B41F 7/26, 7/36
 U.S. Cl. 101—148 16 Claims

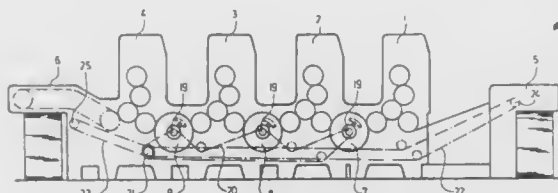


1. A method of evaporating liquid from the surface of a roller which rotates about an axis in a printing press comprising the steps of: rotating a roller; supporting fan means having blade means extending longitudinally of substantially the entire length of the roller such that ends of the blade means are positioned adjacent opposite ends of the roller in the printing press; and coupling the fan means such that rotation of the roller imparts force to drive the blade means such that the speed of rotation of the blade means changes when the speed of rotation of the roller changes.

5,085,143

SHEET-SIZE MULTIPLE-ADJUSTMENT DRIVE FOR A SHEET-FED ROTARY PRINTING MACHINE

Willi Becker, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
 Filed Jun. 22, 1990, Ser. No. 542,424
 Claims priority, application Fed. Rep. of Germany, Jun. 24, 1989, 3920821
 Int. Cl.⁵ B41F 5/02
 U.S. Cl. 101—183 12 Claims

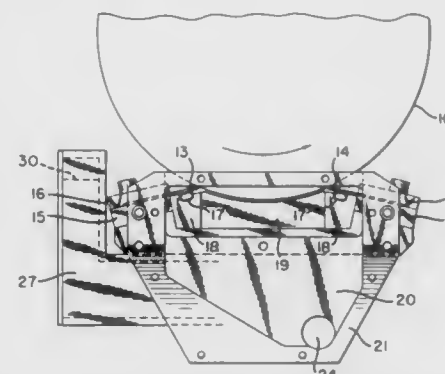


1. Device for adjusting elements which are adjustable in dependence upon sheet size for gripping and guiding sheets in a sheet-fed rotary printing machine, wherein the adjustable elements are connected to driveable actuating members, comprising a common actuating-drive unit to which the actuating members of a plurality of the adjustable elements are connectible, the adjustable elements being movable by means of rotatably mounted actuating shafts, said actuating shafts extending out of the printing machine at one end thereof and being connectible by means of an endlessly revolving driving member to said common actuation-drive unit, said actuating shafts of the adjustable elements of a plurality of consecutive printing units of the printing machine, and actuating members of a sheet feeder as well as of a sheet delivery of the printing machine being connectible to said actuating-drive unit, said actuating drive unit comprising a gear transmission with a plurality of output gears and a variable transmission for transmitting actuating motion from said output gears to the actuating members, said actuating-drive unit comprising a servo-motor and a speed-transforming gear unit connectible to one another, and a releasable coupling for releasing said speed-transforming gear unit.

5,085,144

INK FOUNTAIN APPARATUS

Jan C. R. Lindstrom, Lancaster; Jack Bryer, York, and Robert J. Talarico, Mechanicsburg, all of Pa., assignors to Motter Printing Press Co., York, Pa.
 Filed May 3, 1990, Ser. No. 518,658
 Int. Cl.⁵ B41F 31/04, 31/05
 U.S. Cl. 101—363 6 Claims

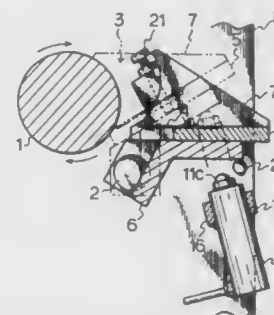


1. An ink fountain apparatus for supplying ink to a rotary cylinder of a printing press comprising an ink fountain adapted to be mounted beneath the cylinder, said ink fountain having upstream and downstream sides, a doctor blade clamped on each of the upstream and downstream sides and extending over the ink fountain to engage the cylinder, an overflow ink barrier at at least one end of the ink fountain and having an upper curved end adapted to be closely spaced to the cylinder to provide an overflow wall for the discharge of ink from the ink fountain, an end cap for the fountain and defining a drain chamber therein to receive the ink which overflows the ink barrier, doctor blade deflecting means beneath each doctor blade for urging the doctor blade upwardly against the cylinder, supports for said doctor blade deflecting means, said supports extending longitudinally within the ink fountain adjacent said upstream and downstream sides defining with the blades longitudinal channels for the discharge of ink into the drain chamber within said end cap.

5,085,145

REMOTE CONTROL DEVICE FOR INK GROOVE WIDTH

Hideo Ohta, Tokyo; Yasuhiro Matsumoto, Sayama, and Masaru Kurihara, Kawasaki, all of Japan, assignors to Kabushi Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan
 Filed Feb. 1, 1991, Ser. No. 649,072
 Claims priority, application Japan, May 12, 1990, 2-49191[U]
 Int. Cl.⁵ B41F 1/46
 U.S. Cl. 101—363 1 Claim



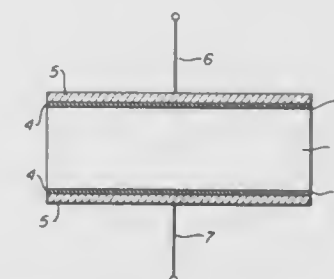
1. In an ink groove to have its one face defined by the circumference of an ink fountain roller and its other face defined by an oblique assembly, to have a V-shaped section, a device for controlling the width of an ink groove remotely, comprising:
 drive means for turning said oblique assembly, between a

position for forming said ink groove, when actuated, and another position for forming none of said ink groove;
 drive pressure supply means for actuating said drive means remotely;
 said drive means includes a cylinder for extending, when supplied with fluid pressure, to bring one side of said oblique assembly into said ink groove forming position, and fluid pressure supply means for supplying said cylinder with said fluid pressure; and
 said cylinder includes an extendable rod, a ball embedded so rollably in the leading end of said rod as to roll when in contact with said oblique assembly, and a return spring for retracting said rod.

5,085,146

ELECTROEXPLOSIVE DEVICE

Thomas A. Baginski, Auburn, Ala., assignor to Auburn University, Auburn, Ala.
 Filed May 17, 1990, Ser. No. 525,334
 Int. Cl.⁵ F42B 3/13
 U.S. Cl. 102—202.5 8 Claims

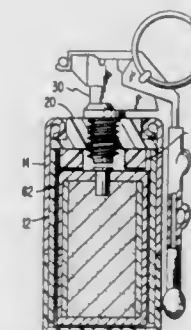


1. An electroexplosive device comprising:
 a semiconductor having its top and bottom surfaces treated by adding a controlled amount of one or more dopants so that a difference in Fermi levels is established between the surfaces and the inner substrate of the semiconductor; and,
 a means of applying electrical energy across the energy barrier resulting from the difference in said Fermi levels.

5,085,147

DISTRACTION DEVICE

Robert J. Gold, 12407 MoPac Expressway N. 100, Suite 191, Austin, Tex. 78758; Wesley C. Leffel, 310 Bushnell Way, Grants Pass, Oreg. 97527, and Albert G. Myka, P.O. Box 5337, Orange, Calif. 92613
 Filed Oct. 1, 1990, Ser. No. 591,674
 Int. Cl.⁵ F42B 8/12
 U.S. Cl. 102—486 9 Claims



9. A stun grenade comprising
 a generally tubular housing having open ends;
 a munitions container slidable into and out of one end of said housing, said munitions container having an ignitable separation charge, a primary charge and a mounting

sleeve surrounding and extending beyond said separation charge;
closure means at the other end of said housing attachable to a fuze, said closure means including a fuze retention disk comprising
a main body,
an annular flange protruding radially from said main body,
means defining an internally threaded opening passing through said main body for engaging external threads on said fuze, and
a plurality of spikes protruding from said main body into said housing, said spikes being arranged to engage and support said mounting sleeve; and
means for securing said fuze retention disk in said other end of said housing, whereby said munitions container is held within said housing on said retention disk spikes until said fuze ignites and ignites said separation charge, whereupon said munitions container is expelled from said housing.

5,085,148

TOY WITH REMOTE CONTROL TRACK SWITCHING
Sunao Konno, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan

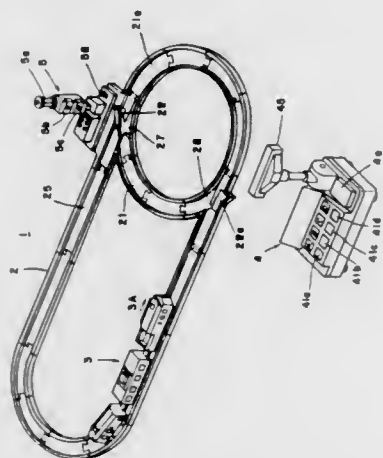
Filed May 17, 1990, Ser. No. 524,384

Claims priority, application Japan, Aug. 24, 1989, 1-98628[U]

Int. Cl.⁵ E01B 23/06

U.S. Cl. 104—130

20 Claims



1. A track toy comprising:
infrared signal transmission means for transmitting at least one type of infrared signal;
a track having at least one changeover element movable between two operative positions;
drive means coupled to the at least one changeover element for driving the changeover element between the two operative positions;
infrared signal receiver means associated with each at least one changeover element for receiving the at least one type of infrared signal transmitted by the infrared signal transmission means;
control means operatively coupled to the infrared signal receiver means and the drive means, for outputting a drive command signal to the drive means when the received type of infrared signal matches a predetermined type of infrared signal corresponding to the at least one changeover element;
wherein the track includes a plurality of changeover elements and the infrared signal transmission means transmits plural types of infrared signals, each type of signal corresponding to one of the plural changeover elements, and the control means associated with each infrared signal receiver means includes discrimination means for comparing the plurality of transmitted signals to the predetermined types of infrared signals, each type of signal corresponding to one of the plural changeover elements, and to

control means associated with each infrared signal receiver means and outputting the corresponding drive command when the predetermined and transmitted infrared signals match;
wherein the drive means includes an electric drive motor operatively coupled to each changeover element;
wherein each changeover element includes a pivotal lever movable between the two operative positions on an upper surface of a segment of track; and
wherein each changeover element further includes an actuating arm disposed on a lower surface of the track segment and having a common pivot axis with the pivotal lever, the pivotal lever being elastically connected to actuating arm by a resilient member.

5,085,149

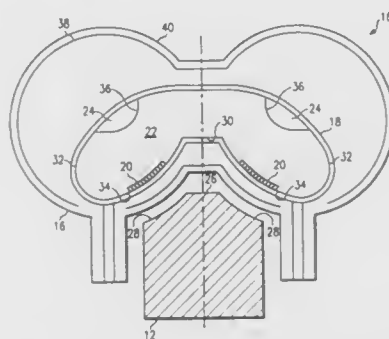
GROUND VEHICLE SUSPENSION AND GUIDANCE AND ELECTROMAGNETIC SYSTEM THEREOF WITH MULTIPLE SURFACE ARCuate REACTION RAILS
Frederick R. Huson, The Woodlands, Tex., assignor to Houston Area Research Center, The Woodlands, Tex.

Filed Apr. 6, 1990, Ser. No. 505,922

Int. Cl.⁵ B60L 13/04

U.S. Cl. 104—281

14 Claims



1. A system for supporting and guiding a vehicle with respect to a first rail, comprising:
a first superconducting magnet supported from said vehicle, having first and second surfaces for opposing first and second top conductive surfaces, respectively, of said first rail, said first magnet comprising:
first and second conductors, disposed near said first and second surfaces of said magnet, respectively, for carrying current so as to generate a repelling magnetic force between said first surface of said first magnet and said first top conductive surface of said first rail, and between said second surface of said first magnet and said second top conductive surface of said first rail; and
a shield positioned over said first and second conductors; and
means for cooling said first and second conductors sufficiently to become superconducting;
wherein said first and second surfaces of said first magnet are at an angle relative to one another such that the repelling forces between said first magnet and said first and second top conductive surfaces of said first rail result in a net levitating force and laterally guide said vehicle along said first rail.

5,085,150

TROLLEY BODY WITH EMBEDDED INSERTS FOR AXLES HAVING A PERIPHERAL GROOVE CAST INTO BODY

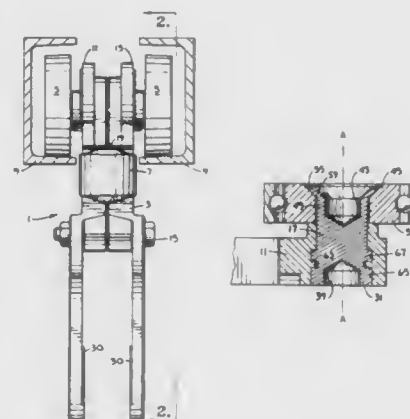
Archie S. Moore, Kansas City, Mo., and Robert J. Teske, Eudora, Kans., assignors to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Mar. 20, 1990, Ser. No. 496,257

Int. Cl.⁵ B61B 3/00

U.S. Cl. 105—150

3 Claims



2. A trolley for a power and free conveyor system, comprising:
(a) preformed machinable metal inserts for axles; and
(b) a body formed from casting austempered iron about a portion of said axles such that said axles are rigidly secured with said body and extend outwardly therefrom; each of said axles constructed from hexagonally-shaped machine stock and has a transverse groove about a portion thereof embedded in said body.

5,085,151

BOGIE FRAME FOR RAILWAY VEHICLE AND METHOD THEREOF

Kanji Wako, Tokyo; Tetsujiro Fukui, and Yusuke Tanaka, both of Utsunomiya, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha and Railway Technical Research Institute, both of Tokyo, Japan

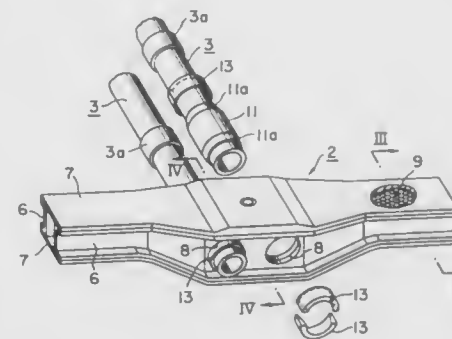
Filed Feb. 1, 1991, Ser. No. 648,174

Claims priority, application Japan, Feb. 5, 1990, 2-25514

Int. Cl.⁵ B61F 5/00

U.S. Cl. 105—206.1

8 Claims



1. A bogie frame for a railway vehicle, comprising:
a pair of side beams each formed of elongated plate members of a fiber reinforced plastic material with a substantially box-shaped cross section;
at least one cylindrical horizontal beam stretched between the paired side beams and formed of the fiber reinforced plastic material;

a honeycomb core filled up in an inner hollow portion of each of said side beams; and
said side beams having opposing side portions with coupling holes, said horizontal beam having end portions being inserted into said holes of said side beams.

5,085,152

WELL CAR CROSSBEARER SIDE CONNECTION

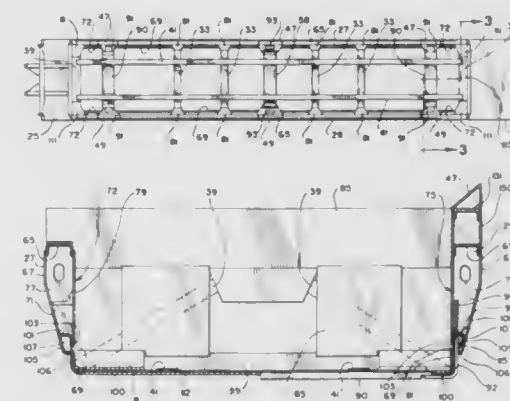
Eugene R. Tylisz, Michigan City, and Phillip G. Przybylinski, Schererville, both of Ind., assignors to Trinity Industries, Dallas, Tex.

Continuation-in-part of Ser. No. 440,903, Nov. 22, 1989, Pat. No. 5,000,633, and a continuation-in-part of Ser. No. 460,576, Jan. 3, 1990, Pat. No. 5,017,066. This application Aug. 29, 1990, Ser. No. 575,414

Int. Cl.⁵ B61D 3/20

U.S. Cl. 105—419

14 Claims

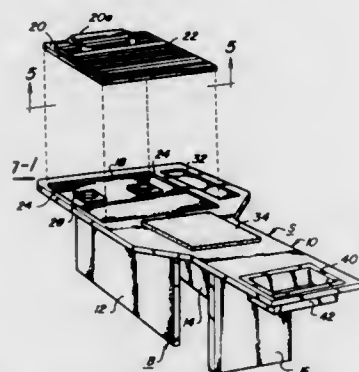


1. A railroad well car with a longitudinal and transverse axis for carrying containers of selected length comprising:
truck supported end portions;
side walls operatively interconnecting said end portions forming a container-receiving well, said side walls being formed with a continuous exterior side sheet extending between the end portions and having a substantially vertical top panel merging into an inwardly angled lower panel, a first chord extending the length of the top panel and spaced vertical side plates interior the side sheet defining the sides to the well;
a Z-section side sill mounted to the bottom of each side wall with a top flange internal the side wall extending inwardly from the side sheet to the plane of the side plate, an inwardly directed bottom flange extending into the well for attachment to an associated crossbearer, a vertical web interconnecting the flanges, the top flange, lower panel and web being joined to one another to form a substantially trapezoidal section;
an angled interior bracket with a vertical leg adjacent the side sill web and a horizontal arm adjacent to and extending inwardly further than the side sill bottom flange;
an L-shaped exterior container supporting member with a vertical portion adjacent the side sill web extending above the lower panel and a horizontal portion adjacent to and extending inwardly further than the side sill bottom flange, triangular reinforcements flanking said vertical portion and affixed thereto and affixed to said side sill web reinforcing the vertical portion and side sill web with one another;
said angled interior bracket having a longitudinal dimension adjacent side sill being substantially greater than the dimension in the same direction of said exterior supporting member;
the sill, with the interior bracket and exterior member forming a container supporting laminated structure;
an internal angled bracing plate located within each side wall trapezoidal section.

5,085,153
DESK STRUCTURE
Carl B. McKee, 29971 Homeland Ave., New Hudson, Mich. 48165

Filed Jun. 6, 1990, Ser. No. 533,803
Int. Cl.⁵ A47B 23/00
U.S. Cl. 108—44

1 Claim

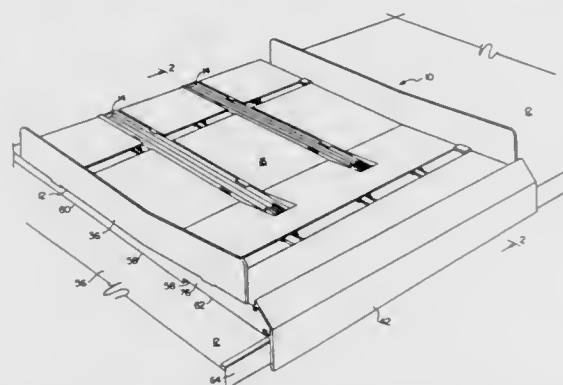


1. A desk structure to be removably positioned upon an arm rest located between a pair of seats disposed in side by side relation in a driver-operated vehicle, said arm rest including top, rear and side walls, said desk structure comprising a substantially rectangular three-sided box-like supporting framework enclosing said arm rest in the close-fitting contact with the top, rear and side walls of said arm rest, the vertical dimension of said framework being uniform around its three sides for contact with said pair of vehicular seats, and a table top member of relatively greater width at one end than at the opposite end rigidly secured to said supporting framework in overlying relation to said framework, said table top member at said opposite end being provided with a first cavity to receive a mobile telephone or other communication apparatus, a second cavity in said one end of said table top member is provided for a removable writing tablet, and a third cavity is provided between said second cavity and said first cavity having a cushioning cover means for resting a vehicle passenger's forearm.

5,085,154
EXPANDABLE TRAY ASSEMBLY
Milton Merl, New York, N.Y., assignor to Marlboro Marketing, Inc., New York, N.Y.

Filed May 19, 1989, Ser. No. 354,904
Int. Cl.⁵ A47B 13/08
U.S. Cl. 108—90

11 Claims



1. An expandable tray assembly adapted to carry items for sale of display and adapted to be supported on a generally horizontal shelf having a front and a rear longitudinal edge for increasing the effective depth of such shelf so as to allow more items to be carried thereon, comprising:
at least one track;
means for mounting said track on such a horizontal shelf

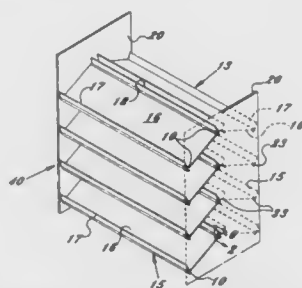
having a front and a rear longitudinal edge so that said track will remain fixed with respect to the shelf and will extend transversely to the front longitudinal edge of the shelf;

a tray member for carrying the display items, said tray member having a front portion and an open rear portion and having means to slidably secure said tray member to said track for sliding movement of said tray member with respect to said track, and relatively toward and away from the rear longitudinal edge of the shelf upon such mounting of said track on the shelf, between a first position in which said front portion of said tray member will be generally aligned with the front longitudinal edge of the shelf and a second position in which said front portion of said tray member will extend forwardly of the front longitudinal edge on the shelf; and
locking means for releasably locking said tray member in said two positions thereof.

5,085,155
SHELF ASSEMBLY
Donald M. Ballard, 16700 Tinker Pl., Huntersville, N.C. 28078
Filed Jul. 29, 1991, Ser. No. 737,249
Int. Cl.⁵ A47B 3/00

U.S. Cl. 108—111

6 Claims



1. A shelf assembly comprising at least one three-dimensional shelf and a pair of vertical end panels, said three-dimensional shelf comprising at least two planar components and a pair of profiles, each profile being shaped to define two channels, each channel being shaped to conform with and receive one longitudinal edge of one of the planar components of the shelf, one channel in each profile opening in a selected direction when the shelf assembly is assembled, and the second channel in each profile opening at an angle relative to the one channel, said profiles extending between the end panels, means connecting the two profiles to the end panels, one of said planar components being a base component and another of the planar components being an angular component that extends at an angle to the base component when the shelf assembly is assembled, whereby the base component of the shelf is seated in the channels of both profiles that open in said selected direction and the angular component of the shelf is seated in the angularly opening channel of one profile.

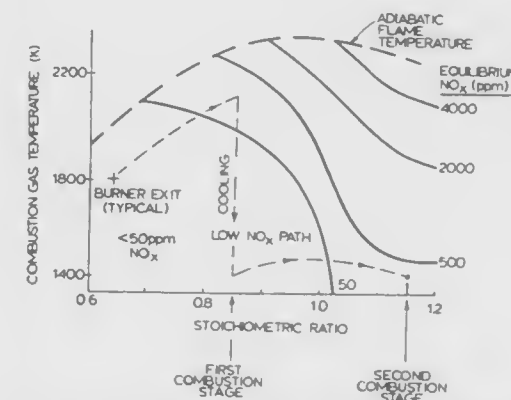
5,085,156
COMBUSTION PROCESS
Owen W. Dykema, Canoga Park, Calif., assignor to TransAlta Resources Investment Corporation, Calgary, Canada
Filed Jan. 8, 1990, Ser. No. 461,939
Int. Cl.⁵ F23D 1/00

U.S. Cl. 110—347

13 Claims

1. A combustion process for a nitrogen-bearing solid fuel comprising the steps of:
(a) introducing said fuel into a first combustion zone;
(b) combusting said fuel in said first combustion zone under a condition of fuel-rich stoichiometry at an oxygen to fuel stoichiometric ratio of from 0.45 to 0.80 and at a temperature in the range of from 1500 K. to 1800 K. whereby

fuel-rich combustion products are produced and undesirable nitrogenous compounds are reduced to low levels;
(c) passing said fuel-rich combustion products into a two-stage final combustion zone;
(d) combusting said fuel-rich combustion products in the first stage of said final combustion zone under a condition of fuel-rich stoichiometry at an oxygen to fuel stoichiometric ratio of from 0.80 to 1.0 and at a temperature in the range of from 1500 K. to 2200 K. to produce combustion



products having nitrogenous oxide levels reduced substantially to near zero while substantially burning out combustibles virtually free from generation of any additional thermal nitrogenous oxides; and
(e) thereafter, combusting said combustion products in the second stage of said final combustion zone at an oxygen to fuel stoichiometric ratio of greater than 1.0 and at a temperature of less than 1500 K. to facilitate substantially complete fuel burnout in the second stage of said final combustion zone.

5,085,157
SEWING MACHINE WITH AN ADJUSTABLE CUTTING DEVICE

Detlef Jung, Gerhard Riss, both of Bielefeld, and Heinz Niehaus, Enger, all of Fed. Rep. of Germany, assignors to Dürkopp Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1990, Ser. No. 581,033
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1989, 3930562

U.S. Cl. 112—68

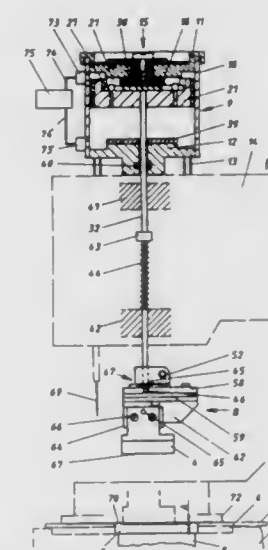
Int. Cl.⁵ D05B 3/06

14 Claims

1. an adjustable cutting device in a sewing machine, comprising:

a mover fastened to a frame of the sewing machine;
a rod depending from the mover and mounted so as to be moveable in a vertical direction by the mover;
a block connected at a lower portion of said rod, a moveable cutting member being fastened to the block, the moveable cutting member cooperating for cutting with a second cutting member on the frame;
the block being secured by guide means against rotation with respect to the frame; the block being connected to the rod; and by loosening the connection, the rod being moveable rotationally in response to rotation of a displacement member in the mover; and
means for converting the rotational movement of the rod into

movement of the block axially of the rod, whereby the rotation of the rod moves the movable cutting member



vertically with respect to the second cutting member without changing a relative angle defined between them.

5,085,158
SEWING MACHINE WITH PIPING STRIP CUTTING AND TRANSFER DEVICE

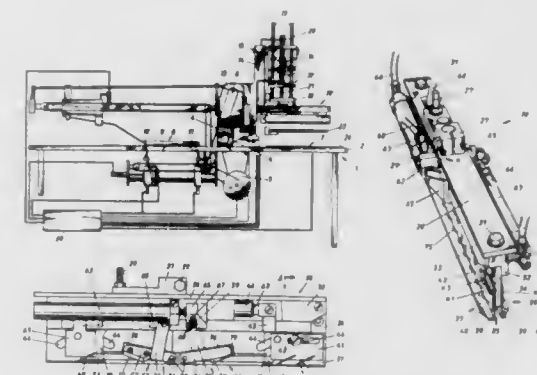
Heinz Goldbeck, Bielefeld, and Werner Meyer, Enger, both of Fed. Rep. of Germany, assignors to Dürkopp Adler A.G., Fed. Rep. of Germany

Filed Mar. 9, 1990, Ser. No. 491,433
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1989, 3907571

U.S. Cl. 112—114

Int. Cl.⁵ D05B 3/18

14 Claims



1. A device for transferring a piping strip from a presentation area of a sewing machine, to a sewing workpiece lying on a work area of the sewing machine;
said transferring device comprising a gripper including a rail and rows of oblique gripping needles, and moving means for moving said needles into a position protruding from the rail, thereby gripping the piping strip;
means for moving the gripper from the piping-strip presentation area, to the work area; and
cutting means mounted on the gripper between the rows of gripping needles, for cutting at least one end of the piping strip.

5,085,159

NEEDLE THREAD FEED REGULATING DEVICE FOR OVERSEAMING SEWING MACHINE

Takashi Kasuda, Yukihiko Nishimura, Shozo Hikiguchi, Minoru Nakano, Eiji Yasuda, and Kazuo Noguchi, all of Osaka, Japan, assignors to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan

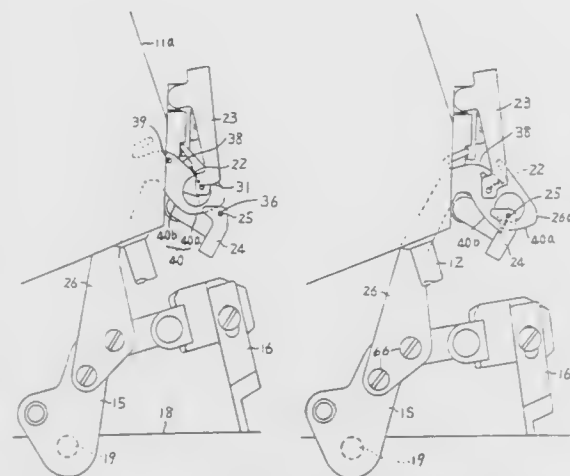
Filed Mar. 31, 1989, Ser. No. 332,016

Claims priority, application Japan, Apr. 1, 1988, 63-45211[U]; Apr. 13, 1988, 63-91970

Int. Cl.⁵ D05B 63/00

U.S. Cl. 112—246

9 Claims



1. A needle thread feed regulating device for an overedge sewing machine for forming safety stitches composed of double chain stitches and overedge stitches, said sewing machine comprising a main shaft, a sealed frame, thread tension devices mounted on the sealed frame, a needle bar mechanism provided in the sealed frame for moving a needle bar reciprocatingly in a vertical direction in cooperation with the main shaft, needles mounted on a lower end of the needle bar, which projects downwardly from the sealed frame, loopers for forming double chain stitches and overedge stitches in cooperation with the needles, and a knife lever affixed to an end of a knife shaft, said knife shaft projecting outwardly from the sealed frame and oscillating in cooperation with the main shaft, said needle thread feed regulating device comprising: thread guide means mounted on said sealed frame between said thread tension devices and said needles; eyelets provided in the thread guide means for containing needle threads for double chain stitches and overedge stitches; and a cam plate mounted on said knife lever, said cam plate having cam parts which engage with the needle threads for double chain stitches and overedge stitches between the eyelets and thereby withdraw the needle threads from a needle thread supply and regulates the feed amount of the needle threads for double chain stitches and overedge stitches, the cam plate being oscillated in cooperation with the main shaft so as to engage with the needle thread for double chain stitches, until the needle for double chain stitches descends from an upper position into a triangle having sides defined by said looper for forming double chain stitches, a needle thread loop hooked on the looper and a looper thread, to absorb the looseness of the needle thread loop caused by the descending motion of the needle.

5,085,160

THREAD CUTTING DEVICE FOR USE IN A SEWING MACHINE

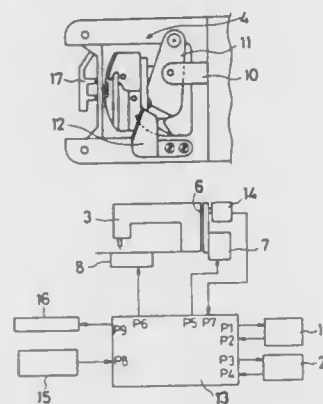
Tadaaki Hashiride, Okazaki; Toshiyuki Nakai, Tnyoake, and Hisaharu Goto, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 25, 1990, Ser. No. 603,147

Claims priority, application Japan, Oct. 26, 1989, 1-279376 Int. Cl.⁵ D05B 65/02, 69/36

U.S. Cl. 112—300

4 Claims



1. A thread cutting device for use in a sewing machine comprising:

- driving means for driving an upper shaft;
- a moving blade connectable to said driving means via a clutch mechanism so as to be rotated by said driving means during an on-condition of the clutch mechanism;
- a stationary blade positioned to cut a thread held by a holding member, in cooperation with said moving blade;
- detecting means for detecting the termination of movement of the moving blade while said moving blade and said driving means are connecting by said clutch mechanism, and for stopping movement of said driving means in response to a detected termination of said movement;
- range detecting means for detecting the rotation angle of said upper shaft when said driving means is stopped by said detecting means; and
- restarting means for restarting said driving means based on a signal from said range detecting means.

5,085,161

VESSEL HULL AND CONSTRUCTION METHOD

Joseph Cuneo, Hastings on the Hudson, N.Y.; Charles Garland, Williamsburg; Richard A. Goldbach, Norfolk, both of Va.; Robert D. Goldbach, Millford, Pa.; Frank E. McConnell, Norfolk, Va., and Edmund G. Tornay, New York, N.Y., assignors to Metro Machine Corporation, Norfolk, Va. and Marinex International, Inc., Hoboken, N.J.

Filed Jun. 5, 1990, Ser. No. 532,329

Int. Cl.⁵ B63B 3/02

U.S. Cl. 114—65 R

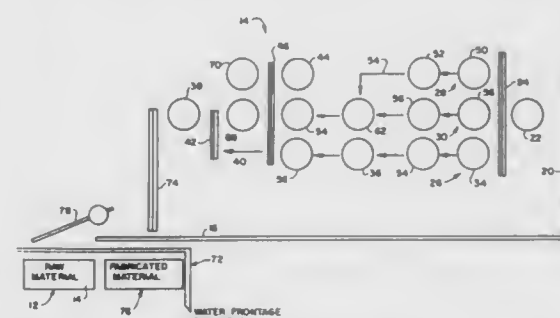
31 Claims

1. A vessel hull construction, comprising:

- a first plurality of outwardly convex, cylindrically arcuate steel plates welded to one another in series at joints along respective adjoining longitudinal edges to provide an outer hull having a bottom and two laterally opposite sides with one interruption located medially of said bottom of said outer hull;
- a second plurality of outwardly convex, cylindrically arcuate steel plates, welded to one another in series at joints along respective adjoining longitudinal edges to provide an inner hull having a bottom and two laterally opposite sides with one interruption located medially of said bottom of said inner hull;
- said inner hull being arranged within said outer hull so that the bottom of said inner hull spacedly confronts the bot-

tom of said outer hull and the laterally opposite sides of said inner hull spacedly confront the respective laterally opposite sides of said outer hull;

a plurality of longitudinal steel rib plates arranged between said inner and outer hulls and each having an outer longitudinal edge welded in a respective said joint between two plates of said first plurality of steel plates and an inner longitudinal edge welded in a respective said joint between two plates in said second plurality of steel plates;



- a medially arranged, longitudinally extending duct keel disposed in both said interruptions and weldedly joined to longitudinal edges of respective adjoining plates of said first and second plurality of steel plates; and
- a transverse bulkhead located within said inner hull and having an outer perimeter welded to a plurality of the plates of said second plurality of steel plates.

5,085,162

UNITARY SELF-SUPPORTING WOOD DECK INSERT FOR BOATS

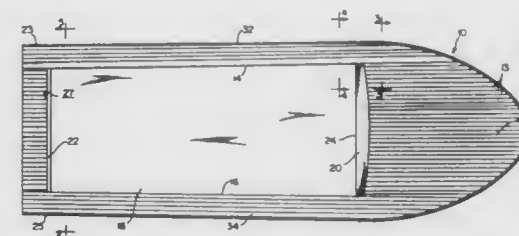
John P. Petrich, Tacoma, Wash., assignor to The Trust of John P. Petrich, Tacoma, Wash.

Filed Sep. 17, 1990, Ser. No. 583,507

Int. Cl.⁵ B63B 3/48

U.S. Cl. 114—85

8 Claims



- 1. A self-supporting unitary wooden deck insert for power boats with fiberglass hulls, comprising:
- two longitudinal wooden plank braces which extend substantially the length of the deck insert, defining over a portion of their length the longitudinal boundaries of an open cockpit area for the boat;
- forward and rear wooden beam members which extend laterally across the deck insert between the plank braces, defining over at least a portion of their lengths the front and rear boundaries of the cockpit;
- first and second pluralities of wooden deck planks, secured together along their respective longitudinal sides, extending respectively outboard of the two plank braces and fore and aft of the beam members, thereby defining the portions of the deck insert which are laterally outboard of the cockpit;
- a third plurality of wooden deck planks, secured together along their respective longitudinal sides and extending between the plank braces forward of the forward beam member, thereby defining the forward portion of the deck insert; and
- a fourth plurality of wooden deck planks, secured together

along their respective longitudinal sides and extending between the longitudinal plank braces to the rear of the rear beam member, thereby defining the aft portion of the deck insert, wherein the deck insert has a boundary edge which is configured to mate with the top edge of a fiberglass boat hull for attachment thereto, the deck insert being thereby supported by the top edge of the hull, wherein the deck insert is otherwise characterized by the absence of spars or other support frame members.

5,085,163

WEIGHT RELEASE SYSTEM

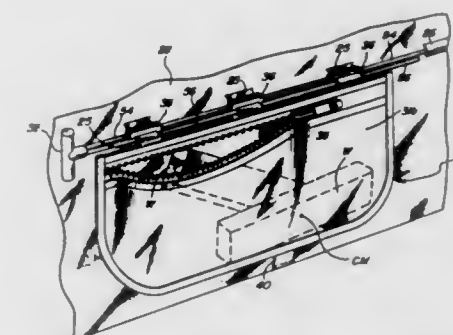
Charles E. VanTassel, Oceanside, and Scott P. Seligman, Carlsbad, both of Calif., assignors to Sea Quest, Inc., Carlsbad, Calif.

Filed Sep. 1, 1989, Ser. No. 402,540

Int. Cl.⁵ B63C 11/30

U.S. Cl. 114—315

16 Claims



1. A weight release system for selectively releasing a weight from a body, comprising:

- (a) a retaining member for retaining a weight therewithin;
- (b) an attachment pivotally connecting the retaining member to the body about an axis;
- (c) a releasable engagement releasably securing the retaining member to the body distal the attachment so as to retain the weight relative to the body so that the center of mass of the weight is disposed substantially interjacent the attachment and the releasable engagement; and
- (d) a release mechanism mechanically connected to the releasable engagement to provide the selective release of the retaining member from the body.

5,085,164

SWIM PLATFORM FOR A PONTOON BOAT

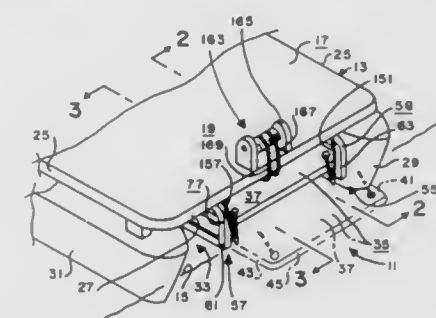
David R. Whitton, Paragould, Ark., assignor to Lary M. Whitton, West Memphis, Ark., a part interest

Filed Jan. 17, 1991, Ser. No. 642,865

Int. Cl.⁵ B63B 17/00

U.S. Cl. 114—362

16 Claims



1. A platform assembly for use with a body of water and a boat floating upon said body of water, said platform assembly comprising:

- a) a platform member; said platform member having a first side and a second side; and
- b) track means for mounting said platform member to said boat and for allowing said platform member to move between a first position above said body of water and a second position adjacent said body of water; said track means including first track means for mounting said first side of said platform member to said boat; said track means including second track means for mounting said second side of said platform member to said boat; said first track means including a first track member for being attached to said boat, said first track member of said first track means having a first end and a second end; said first track means including a first follower means attached to said first side of said platform member for being guided by said first track member of said first track means between said first and second ends thereof; said first track means including a second track member for being attached to said boat, said second track member of said first track means having a first end and a second end; said first track means including a second follower means attached to said first side of said platform member a spaced distance from said first follower means of said first track means for being guided by said second track member of said first track means between said first and second ends thereof.

5,085,165

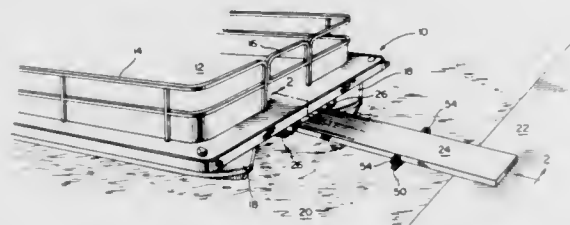
GANGPLANK FOR A PONTOON BOAT

William P. Reed, 11085 Chipmunk Rd., Apple Valley, Calif. 92308

Filed Apr. 6, 1990, Ser. No. 505,419
Int. Cl.⁵ B63B 17/00

U.S. Cl. 114—362

8 Claims



1. A system for gaining access to and exiting from a boat, said system comprising:
a boat having a deck,
guide rails located below the deck,
a guide section mounted on said guide rails,
a gangplank pivotably mounted to the guide section, said gangplank including a longitudinally extending rib,
a cable having two ends connected to the guide section for extending and retracting the gangplank according to a direction of movement of the cable, and
a guide roller mounted below the deck for engaging the rib to raise and lower the gangplank during extension and retraction of the gangplank.

5,085,166

LASER VAPOR DEPOSITION APPARATUS

Kazuhiro Oka; Takeshi Morita; Seigo Hiramoto, and Toshio Kagawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1990, Ser. No. 519,832

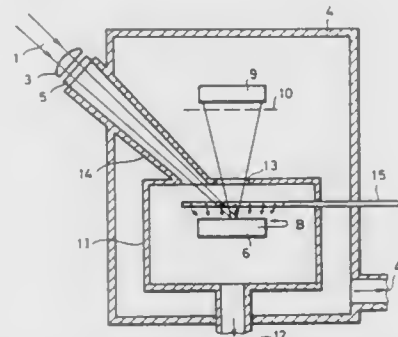
Claims priority, application Japan, May 24, 1989, 1-131807
Int. Cl.⁵ C23C 14/24, 14/28

U.S. Cl. 118—50.1

27 Claims

1. A laser vapor deposition apparatus comprising:
a vacuum chamber, having an exhaust port, for enclosing therein a material to be vaporized and a substrate;
a laser beam source for irradiating said material with a laser

- beam to thereby vaporize said material, so that a desired film is deposited on said substrate;
a gas supply source for supplying, in the vicinity of the surface of said material, a gas which can prevent changes in properties of said material which could be caused by the irradiation with said laser beam;



means for withdrawing said gas from said vacuum chamber substantially without permitting said gas to contact said substrate, whereby said substrate remains unaffected by said gas.

5,085,167

APPARATUS FOR APPLYING COATING MATERIAL TO A SUBSTRATE

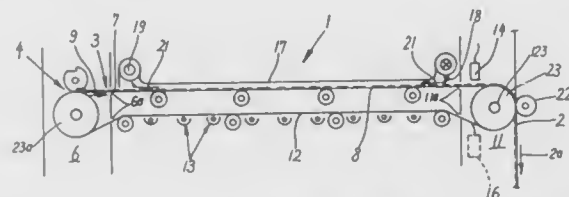
Albert Hebels, Hamburg, Fed. Rep. of Germany, assignor to Pagendam GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 27, 1990, Ser. No. 558,579

Int. Cl.⁵ B05C 3/18, 9/14

U.S. Cl. 118—65

7 Claims



1. Apparatus for coating a running substrate with a coating material, comprising at least one heatable endless carrier defining an elongated path having a first portion adjacent the running substrate, a second portion and a third portion; means for driving said carrier in a predetermined direction so that successive increments of the carrier repeatedly advance serially along said first, second and third portions of said path; means for applying to the carrier a film of coating material in said third portion of said path; means for transferring the film from the carrier onto the substrate in the first portion of said path; and means for heating the carrier in the second portion of said path so that successive increments of the carrier are preheated at the time such increments receive a film of coating material in the third portion of said path.

5,085,168

DEVICE FOR COATING WEB MATERIAL

Hans-Peter Sollinger, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jun. 14, 1990, Ser. No. 537,573

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920445; Mar. 16, 1990, 4008435

Int. Cl.⁵ B05C 11/04

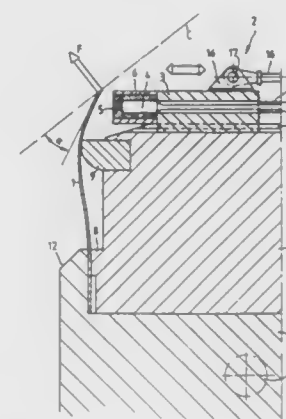
U.S. Cl. 118—126

16 Claims

1. A coating device for the coating of web material, comprising:
a doctor blade clamped and supported on a doctor beam by

- a clamping member, said doctor blade having a contact edge and acting on said web material at said contact edge with a contact force applied through a deflection of said doctor blade,

an adjustable support member situated between said clamping member and said contact edge, said adjustable support member being adaptable to generate a bending force on said doctor blade to deflect said blade, said deflected



doctor blade having a bowed portion generally adjacent said web, and
a plurality of magnets arranged in a row on said doctor beam between said support member and said web and positioned generally parallel to said contact edge of said doctor blade, said magnets being adapted to apply magnetic traction forced for profile adjustment of a coating applied to said web, wherein said magnetic traction forces act on said bowed section of said doctor blade.

5,085,169

METHOD OF AND APPARATUS FOR APPLYING A PAINT

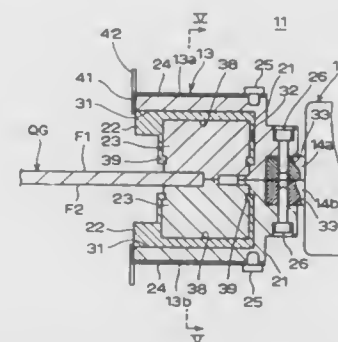
Shinji Okuda, Hyogo; Hiroshi Maeda, and Tsuyoshi Nagata, both of Osaka, all of Japan, assignors to Sunstar Engineering Inc., Osaka, Japan

Filed Nov. 16, 1989, Ser. No. 438,343

Claims priority, application Japan, Nov. 28, 1988, 63-155489[U]; Nov. 28, 1988, 63-301647; Nov. 28, 1988, 63-301648
Int. Cl.⁵ B05C 1/00

U.S. Cl. 118—205

4 Claims



1. A method for applying a paint employing:
paint-coating members provided respectively with main bodies which can open and close;
a paint-coating means provided on each of said main bodies, said paint-coating means, which is made of elastic material and soaked with paint, being provided with coating portions which are contoured so as to conform with coating surfaces of an object that is to be coated with said paint;
a means for supplying paint, said means being provided with

a paint-supplying means which is soaked with said paint; and

a manipulator which moves said paint-coating members; and wherein said method comprises the steps of:
moving said paint-coating members via said manipulator so that said paint-supplying means is positioned between said coating portions;
closing said paint-coating members and pressing said coating portions against said paint-supplying means so that said paint-coating means is soaked with said paint;
opening said paint-coating members;
moving said paint-coating members via said manipulator so that said coating surfaces of said object are positioned between said coating portions;
closing said paint-coating members; and
moving said paint-coating members via said manipulator so that said coating portions move along said surfaces.

3. An apparatus for supplying a paint to a paint coating means in which:

a main body formed in U-shape is provided; and
a groove is formed on an inner surface of said main body; and
wherein said main body is provided with:
a plurality of orifices opened on a top surface of said groove; and
a port communicated to said orifices; wherein
a paint-supplying means of plate like form which is soaked with paint is attached to said groove, said paint-supplying means being provided with an exposed portion with which said paint-coating means come in contact; and
a paint supplying apparatus through which paint is pressure transferred is connected to said port and paint supplied through said port flows out of said orifices and permeates into said paint-supplying means and disperses so that said paint permeates into said paint-coating means via said exposed portion which is in contact with said paint-coating means.

5,085,170

FLUIDIZED BED APPARATUS, IN PARTICULAR FOR GRANULATION OF PULVERULENT SUBSTANCE

Herbert Hüttlin, Daimlerstrasse 7, 7853 Steinen, Fed. Rep. of Germany 7853

PCT No. PCT/EP89/00194, § 371 Date Oct. 25, 1989, § 102(e) Date Oct. 25, 1989, PCT Pub. No. WO89/07978, PCT Pub. Date Sep. 8, 1989

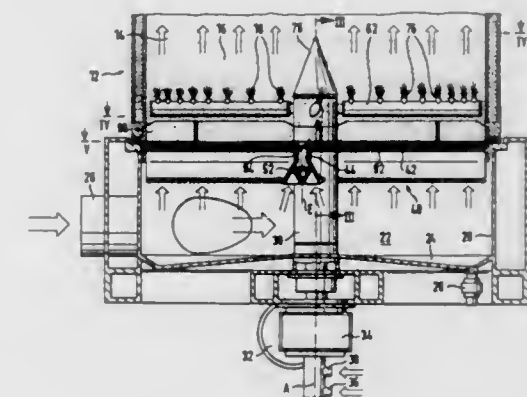
PCT Filed Feb. 28, 1989, Ser. No. 445,737

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1988, 3806543

Int. Cl.⁵ B05C 5/02

U.S. Cl. 118—303

12 Claims



1. In a fluidized bed apparatus for granulation of pulverulent substance comprising
a container in which a treatment space is arranged for the substance and therebelow a wind chamber, and

a rotor having a circular rotor disc which defines the wind chamber at the top, is rotatably drivable about an upright central axis and having at least one opening which is elongated in approximately radial direction and which permits a gas stream from the wind chamber into the treatment space, the improvement comprising construction of the rotor disc as a single partition between the wind chamber and the treatment space, a closure means coupled with each opening of the rotor disc which is open in normal operation but can be closed for stopping the apparatus, at least one retaining blade above the rotor disc stationarily arranged to prevent the substance lying on the rotor from rotating with the latter, and nozzles for spraying the substance in the treatment space arranged in each gas stream which has passed through one of the openings, said nozzles being distributed over the radial length of said stream and rotating therewith on rotation of the rotor.

5,085,171

COMPLIANT DOCTOR BLADE

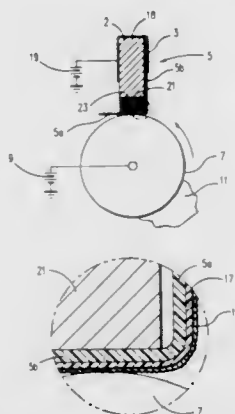
Larry O. Aulick, Cynthia; Donald W. Stafford, and Ajay K. Suthar, both of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Jun. 10, 1991, Ser. No. 712,382

Int. Cl.⁵ G03G 15/08

U.S. Cl. 118—653

18 Claims



1. An electrically energized doctor blade for metering charged electrophotographic toner held on a developer roller by physically contacting a sector of said roller with a surface of said blade which is electrically charged, said blade comprising a compliant backing member, a supporting member to position said blade adjacent to said roller, a layer having an irregular surface bound to said backing member on a surface of said backing member facing said roller, and a metal layer on at least the lower regions of the irregular surface of said surface facing said roller.

5,085,172

DISCHARGE SYSTEM FOR MILK AND AN AUTOMATIC MILKING SYSTEM PROVIDED WITH SUCH A DISCHARGE SYSTEM

Fokko P. Borgman, Nieuw Vennep; Erik A. Aurik, Amsterdam, and Jacobus P. Dessing, Cruquius, all of Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed May 22, 1990, Ser. No. 533,077

Claims priority, application Netherlands, May 26, 1989, 89.01339

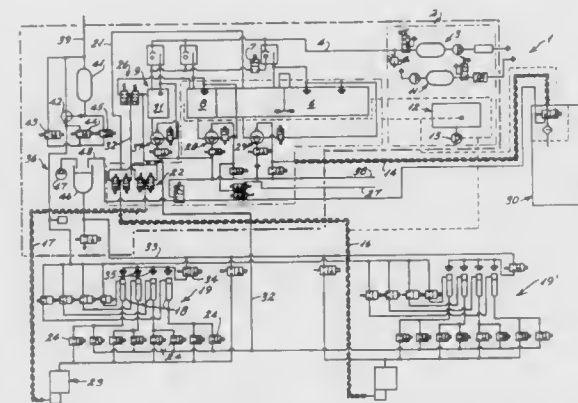
Int. Cl.⁵ A01J 9/04

U.S. Cl. 119—14.09

17 Claims

1. In a system for discharging milk including at least one milking cup and a milk storage tank, the improvement comprising:

an intermediate reservoir; collection tank means for storing milk unsuitable for human consumption; switching means for switching milk from said at least one milking cup and selectively routing the milk to a destination of either said intermediate reservoir or said collection tank means;



first means for conducting milk from said at least one milking cup to said switching means; second means for conducting milk from said switching means to said intermediate reservoir and said collection tank means; and third means for conducting milk from said intermediate reservoir to said milk storage tank.

5,085,173

SELF FEEDER FOR ANIMALS

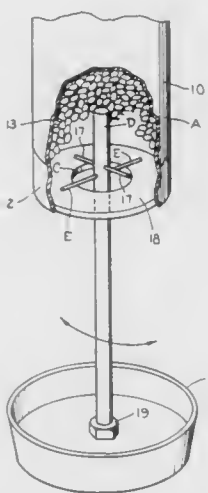
Michael R. Powers, Rte. 1, Hwy. 221, Enoree, S.C. 29335

Filed Feb. 22, 1991, Ser. No. 659,228

Int. Cl.⁵ A01K 5/00

U.S. Cl. 119—53.5

9 Claims



1. A self feeder for animals comprising: a vertical hopper of substantially circular cross section having an open top for receiving granular animal feed; a shelf-like bottom formed in said vertical hopper for retaining said feed in said hopper; a feed discharge passage in said shelf-like bottom consisting essentially of an opening in said bottom for discharging feed upon demand of the animal being fed; an upright rod extending above, below and through said feed discharge passage;

said upright rod being of such a size as to define a feed opening thereabout within said feed discharge passage; circumferentially spaced transverse supports extending substantially normal to said upright rod across said shelf-like bottom, supporting said upright rod, and aiding in the measuring and gravity discharging said feed through said feed discharge passage; a feeding bowl carried by a lower end of said rod having an open top for receiving the feed discharged by gravity therein; and said rod extending upwardly into said hopper for a distance wherein movement of the rod aids in agitating the feed sufficiently for feeding a predetermined quantity by gravity into the feeding bowl; whereby the animal by the act of feeding moves the bowl and the rod in response thereto sufficiently to feed a desired amount of feed into the bowl.

5,085,174

PET TRAINER

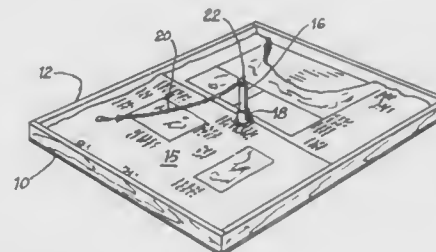
Norm Etkin, San Diego, Calif., assignor to Beverly L. Sokolis, San Diego, Calif., a part interest

Filed Oct. 26, 1990, Ser. No. 603,384

Int. Cl.⁵ A01K 29/00

U.S. Cl. 119—169

5 Claims



1. A pet trainer comprising:

- (a) flat panel;
- (b) a raised peripheral lip around said panel;
- (c) a tether mounted substantially centrally of said panel to connect to the collar of a pet;
- (d) said panel being of planform dimensions on the order of 23" by 27.5" which is substantially identical to the planform dimensions of an outfolded newspaper sheet such that an outfolded newspaper sheet will lie flat on said panel inside said peripheral lip.

5,085,175

ANIMAL LITTER

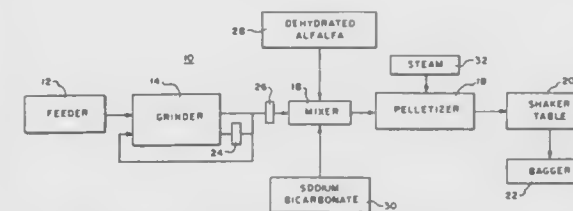
Luther D. Clements, Jr., Lincoln, and Holmes, Carlton S., Grant, both of Nebr., assignors to Board of Regents, University of Nebraska, Lincoln, Nebr.

Filed Dec. 26, 1990, Ser. No. 633,965

Int. Cl.⁵ A01K 1/015

U.S. Cl. 119—171

19 Claims



1. An animal litter comprising at least 50 percent by weight of seed hull and other materials selected for their deodorizing ability; said animal litter being without substantial separate binder, whereby the seed hulls are relied upon for binding;

the seed hulls including at least one percent by weight fatty acid.

5,085,176

METHOD OF AND APPARATUS FOR GENERATING AND INJECTING HYDROGEN INTO AN ENGINE

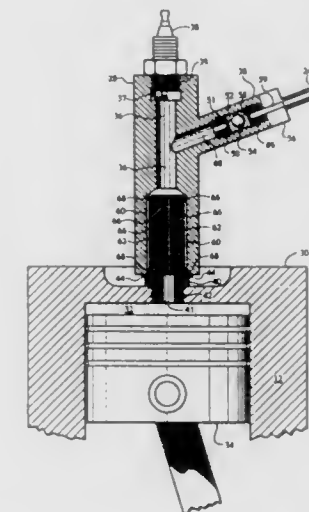
William J. Brinkley, III, 605 E. Eastport St., Iuka, Miss. 38852

Filed Dec. 26, 1990, Ser. No. 633,932

Int. Cl.⁵ F02B 43/00

U.S. Cl. 123—3

28 Claims



1. A method of generating and injecting hydrogen into the combustion chamber of an engine comprising: providing an ignition chamber in communication with the combustion chamber of an engine; placing a catalyst in said ignition chamber; heating said catalyst; feeding a reactant into said ignition chamber for reaction with said catalyst to generate hydrogen in said ignition chamber; drawing a portion of said hydrogen from said ignition chamber into said combustion chamber; igniting said hydrogen to cause an explosion and burning of said hydrogen in said ignition chamber and said combustion chamber; and exposing said catalyst to said hydrogen explosion.

5,085,177

MANIFOLD TUNING

Thomas T. Ma, Chelmsford, Great Britain, assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/GB89/01047, § 371 Date Mar. 11, 1991, § 102(e) Date Mar. 11, 1991, PCT Pub. No. WO90/02869, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 6, 1989, Ser. No. 663,900

Claims priority, application United Kingdom, Sep. 9, 1988, 8821191

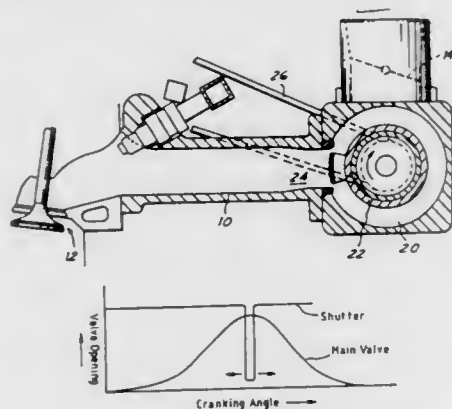
Int. Cl.⁵ F02M 35/10

U.S. Cl. 123—52 MB

6 Claims

1. An internal combustion engine having a plurality of cylinders each with a camshaft operated main inlet and main exhaust valve, and a manifold system which comprises a plurality of tracts each leading to a main valve of a respective cylinder and a plurality of secondary valves each disposed at a distance along one of the tracts in series with a respective main valve and arranged to open and close at an engine speed dependent phase angle relative to the valve camshaft during each engine cycle so as to create a pressure wave which propagates at the speed of sound at least once along the length of the tract and reaches the associated main valve as the latter valve is closing,

characterised in that each secondary valve is open at the instant of opening of the associated main valve and is operative, while the associated main valve remains open, to interrupt for a predetermined cranking angle the flow of the column of air



in the section of the tract between the secondary valve and the associated main valve, thereby creating the desired pressure wave, the latter propagating initially in the direction of the main valve.

5,085,178

INTAKE PIPING STRUCTURE FOR MULTI-CYLINDER ENGINE

Mitsuo Hitomi, and Toshihiko Hattori, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

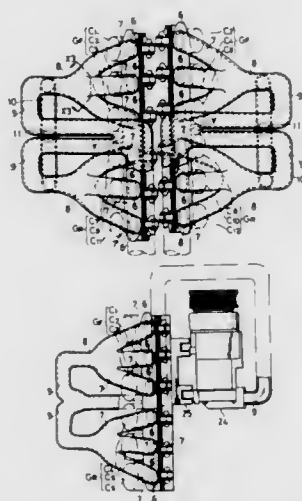
Filed Mar. 29, 1991, Ser. No. 677,227

Claims priority, application Japan, Mar. 29, 1990, 2-86325

Int. Cl.⁵ F02M 35/10

U.S. Cl. 123—52 M

28 Claims



1. An intake piping structure for a multi-cylinder engine having plural cylinders disposed in a direction parallel to a crank axis; wherein:

said plural cylinders are grouped into a first cylinder group in which each of plural cylinders located on one end side in the direction parallel to the crank axis are so disposed as to have an equal distance of an inspiration stroke and a second cylinder group in which plural cylinders located on the other end side in the direction parallel to the crank axis are so disposed as to have an equal distance of an inspiration stroke; and an individual air intake passage for each of the cylinders is connected to an air intake port for each of the respective

cylinders having an opening on one side surface of a cylinder head; each individual air intake passage for the first cylinder group is so disposed as to extend over the corresponding cylinder head and connected to a first merged air intake passage in a position over the corresponding cylinder head; each individual air intake passage for the second cylinder group is so disposed as to extend over the corresponding cylinder head and connected to a second merged air intake passage in a position over the corresponding cylinder head; and each of the first merged air intake passage and the second merged air intake passage is so disposed as to extend toward a middle position between the first cylinder group and the second cylinder group, then to be curved toward one side of the corresponding cylinder head and eventually to be united together with each other.

5,085,179

DOUBLE POPPET VALVE APPARATUS

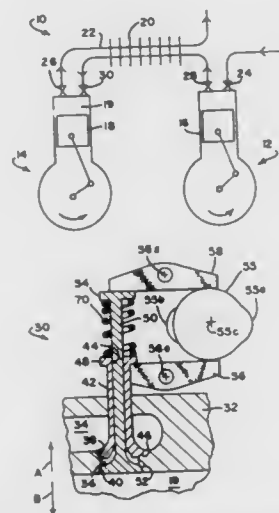
Henry B. Faulkner, Dover, Mass., assignor to Ingersoll-Rand Company, Woodcliff, N.J.

Filed Jun. 1, 1989, Ser. No. 359,979

Int. Cl.⁵ F02B 33/06

U.S. Cl. 123—70 R

12 Claims



1. A combustion engine system, comprising: a compressor portion; an expander portion operably connected with the compressor portion, the expander portion including a combustion chamber wall defining a combustion chamber; a port formed in the wall; a first valve member mounted in the port; a second valve member concentrically mounted within the first valve member; resilient means engaged between the first and second valve members for urging each of the members into a respective seated position; and means for moving the first valve member in a first direction out of its seated position and for moving the second valve member in a second direction, out of its seated position, opposite the first direction.

5,085,180

CRANK CHAMBER STRUCTURE FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

Katsumi Torigai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

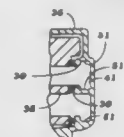
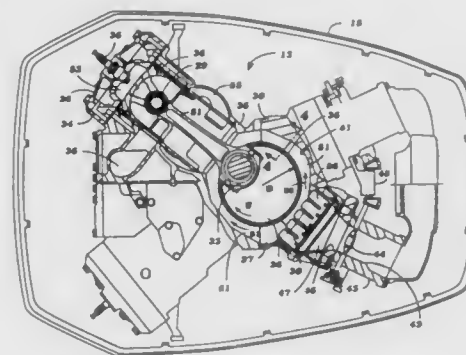
Filed Nov. 20, 1990, Ser. No. 615,979

Claims priority, application Japan, Nov. 22, 1989, 1-301906

Int. Cl.⁵ F02B 25/14

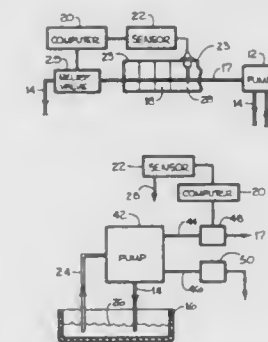
U.S. Cl. 123—73 A

8 Claims



1. A two cycle, crankcase compression internal combustion engine having at least one combustion chamber, comprising a crankcase assembly including an inner wall forming portion, a crankshaft rotatably journaled within said crankcase assembly, at least one crank web positioned within said crankcase assembly and which cooperates in defining at least one crank chamber within said crankcase assembly, at least one intake passage for delivering a charge to said crank chamber, and wherein said inner wall forming portion includes an inwardly extending member having a groove formed therein on at least one side of a line segment extending between said intake passage and the axis of said combustion chamber, said groove being expanded axially from at least one side of said inwardly extending member and expanded outwardly around said crank chamber to cooperate in defining a transfer passage for communicating said intake passage with said combustion chamber.

ent selected pressure levels during operation of said hydraulic valve lifters, said selected pressure determined by



the operational requirements of said internal combustion engine.

5,085,182

VARIABLE VALVE TIMING ROCKER ARM ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Makoto Nakamura; Shigeru Sakuragi; Yutaka Matayoshi, all of Yokosuka; Keiichi Maekawa, Yokohama; Seinosuke Hara, and Shoji Morita, both of Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Atsugi Unisia Corp., Atsugi, Japan

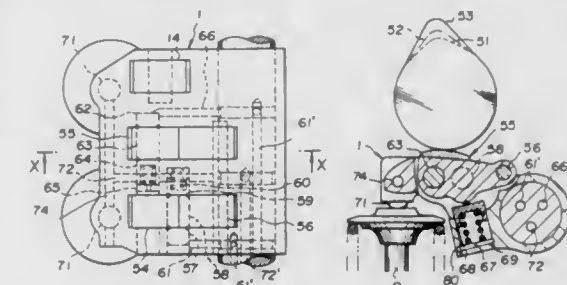
Filed Sep. 25, 1990, Ser. No. 587,939

Claims priority, application Japan, Sep. 25, 1989, 1-248677

Int. Cl.⁵ F01L 1/34, 1/18

U.S. Cl. 123—90.16

7 Claims



1. In an internal combustion engine having a cylinder head and a poppet valve which is associated with said cylinder head and a rocker shaft:

a first rocker arm, said first rocker arm being pivotally mounted on the rocker shaft, arranged to engage a stem of the poppet valve and to engage a first cam having a profile suited for low speed engine operation; a second rocker arm, said second rocker arm being pivotally mounted on said first rocker arm, arranged to engage a second cam having a profile suited for high speed engine operation; hydraulically operated engagement means for selectively connecting said first and second rocker arms in a manner wherein relative movement therebetween is prevented; and a lost motion spring mounted on said first rocker arm and arranged to engage said second rocker arm in a manner which biases said second rocker arm against said second cam.

5,085,181

ELECTRO/HYDRAULIC VARIABLE VALVE TIMING SYSTEM

James J. Feuling, Ventura, Calif., assignor to Feuling Engineering, Inc., Ventura, Calif.

Filed Jun. 18, 1990, Ser. No. 539,238

Int. Cl.⁵ F01L 1/34, 9/02

U.S. Cl. 123—90.12

11 Claims

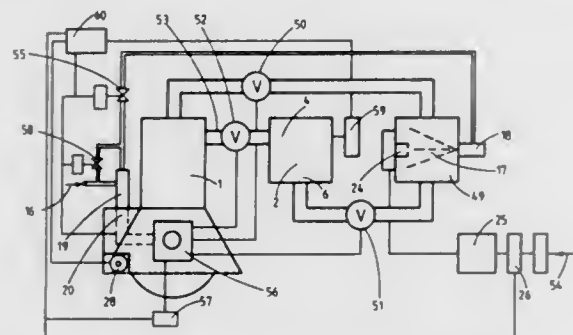
1. In an internal combustion engine having hydraulic valve lifters comprising: a source of pressurized oil for operating said hydraulic valve lifters and means for selectively varying elevating and lowering the pressure of said pressurized oil through a range of differ-

5,085,183

STARTING MEANS FOR CHAR BURNING ENGINES
Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514
Continuation-in-part of Ser. No. 471,599, Jan. 29, 1990, Pat. No. 5,002,024. This application Dec. 21, 1990, Ser. No. 633,256
Int. Cl.⁵ F02N 17/02

U.S. Cl. 123—179.21

16 Claims



1. In a char burning engine comprising at least one combined means for compressing and expanding gases, each said combined means comprising: a char fuel reaction chamber supplied with a char fuel and comprising a refuel end and an ash removal end; an internal combustion engine mechanism comprising a variable volume chamber for compressing and expanding gases and drive means for driving said internal combustion engine mechanism and for varying the volume of said chamber through repeated cycles each cycle comprising a compression time interval followed by an expansion time interval; a fixed open gas flow connection between said refuel end of said char fuel reaction chamber and said variable volume chamber of said internal combustion engine mechanism;

an improvement comprising adding to each said combined means for compressing and expanding:

a separate starting reaction chamber;

a first changeable gas flow connection from said variable volume chamber of said internal combustion engine to said starting reaction chamber;

a second separate changeable gas flow connection from said ash removal end of said char fuel reaction chamber to said starting reaction chamber which connects into said starting reaction chamber at a place different from that connected into by said first changeable gas flow connection; means for opening and closing said fixed open gas flow connection between said refuel end of said char fuel reaction and said variable volume chamber of said internal combustion engine mechanism so that this connection is modified into a changeable gas flow connection;

a liquid fuel supply source;

means for injecting liquid fuel into said starting reaction chamber and comprising:

nozzle means for creating an atomized liquid spray inside said starting reaction chamber;

pumping means for pumping liquid fuel from said liquid fuel supply source to said nozzle means;

pump actuator means for actuating said pumping means, and driven by said drive means of said internal combustion engine mechanism, so that liquid fuel is pumped to said nozzle means only during each said compression time interval and throughout essentially all of each said compression time interval of said internal combustion engine mechanism;

liquid shut off means for opening and stopping said pumping of liquid fuel from said liquid fuel supply source to said nozzle means;

means for cranking said internal combustion engine mechanism when said char burning engine is to be started so that said cranking can be continued through a warmup time interval for heating said char fuel to that temperature at

which some of it reacts appreciably with oxygen gas in adjacent compressed gas,

and said cranking can be continued through a heatup time interval for heating said char fuel to that temperature at which some of it reacts rapidly with oxygen gas in adjacent compressed gas,

and said cranking can be continued through a startup time interval for heating a sufficient portion of said char fuel to said rapid reaction temperature so that said char burning engine is capable of cranking itself,

and said cranking means can be turned off when said char burning engine is capable of cranking itself;

ignition means for igniting said atomized liquid fuel spray within said starting reaction chamber during each said compression time interval of said internal combustion engine mechanism and comprising means for turning said ignition means on and off;

valve drive means for opening and closing said several changeable gas flow connections and comprising adjustment means, and driven by the drive means of said internal combustion engine mechanism, so that during engine cranking warmup time interval and heatup time interval:

said char fuel reaction chamber can be open to said starting reaction chamber during each compression time interval and during each expansion time interval;

said starting reaction chamber can be open to said variable volume chamber of said internal combustion engine mechanism during each compression time interval and is closed thereto during each expansion time interval;

said char fuel reaction chamber can be open to said variable volume chamber of said internal combustion engine mechanism during each expansion time interval and is closed thereto during each compression time interval;

and also so that during engine cranking after said heatup time interval and whenever said char burning engine is capable of cranking itself:

said char fuel reaction chamber can be open to said variable volume chamber of said internal combustion engine mechanism during each compression time interval and during each expansion time interval;

said starting reaction chamber can be closed to said variable volume chamber of said internal combustion engine mechanism and to said char fuel reaction chamber during each compression time interval and during each expansion time interval;

means for actuating said liquid shut off means so that during engine cranking warmup time interval and heatup time interval said liquid shut off means can be open to allow pumping of liquid fuel to said nozzle means;

and also so that during engine cranking after said heatup time interval and whenever said char and oil burning engine is capable of cranking itself,

said liquid shut off means can be closed to stop pumping of liquid fuel to said nozzle means.

5,085,184

DEVICE FOR REDUCING STARTING LOAD ON INTERNAL COMBUSTION ENGINE

Yoshikazu Yamada, and Hiroyuki Nakano, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1990, Ser. No. 581,775

Claims priority, application Japan, Sep. 20, 1989, 1-244430
Int. Cl.⁵ F01L 13/08

U.S. Cl. 123—182.1

7 Claims

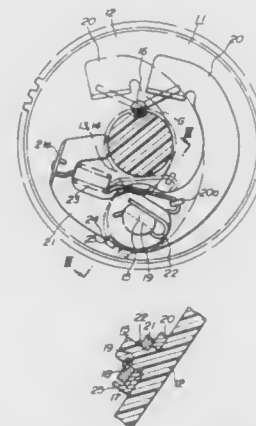
1. A device for reducing a load which is imposed on an internal combustion engine when the engine is started, the internal combustion engine having an intake or exhaust valve tappet, said device comprising:

a rotatable camshaft having a cam for sliding contact with the intake or exhaust valve tappet;

a wheel fixed coaxially to said camshaft, said wheel having a support shaft integrally formed on a side thereof and extending parallel to the axis of said camshaft;

a tappet lifting member rotatably supported on said wheel, said tappet lifting member having a cam movable into and out of a base circle of said cam of the camshaft;

a weight swingable about said support shaft, said weight having a distal end pivotally coupled to said tappet lifting member and a proximal end rotatably supported on said support shaft; and



urging means, fixedly supported on said support shaft, for urging said weight toward said camshaft to move said cam of the tappet lifting member out of said base circle to press the intake or exhaust valve tappet and for defining a maximum position for outward swinging movement of said weight about said support shaft under centrifugal forces in response to rotation of said camshaft, which are produced against the urging of said urging means on said weight.

5,085,185

POWDER-LUBRICANT PISTON RING FOR DIESEL ENGINES

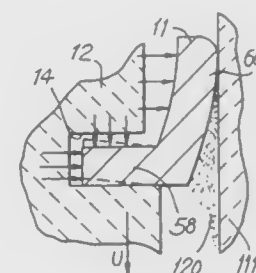
Hooshang Heshmat, Niskayuna, N.Y., assignor to Mechanical Technology, Incorporated, Latham, NY

Filed Sep. 14, 1990, Ser. No. 582,473

Int. Cl.⁵ F02F 3/00

U.S. Cl. 123—193 P

18 Claims



3. In a diesel engine fueled by coal-water slurry, a piston comprising:

a distal end including a piston head impinging upon a combustion chamber formed between the piston and a cylinder of the diesel engine;

a proximal end including means for attaching the piston to a reciprocating arm means;

a heat dam between said distal end and said proximal end, said heat dam including a portion of substantially decreased diameter thereby forming a debris chamber within the piston;

said distal portion including a particulate return valve communicating from said debris chamber to said combustion chamber wherein residue from said coal-water slurry is

returned from said debris chamber to said combustion chamber; and

at least one powder-lubricated ring circumferentially extending around said piston head wherein lubricant powder is disposed between said powder-lubricated ring and a wall of said cylinder.

5,085,186

CRANKSHAFT AND JOURNAL ARRANGEMENT FOR ENGINE

Manabu Kobayashi, Iwata, Japan, assignor to Yamaba Hatsudoki Kabushiki Kaisha, Iwata, Japan

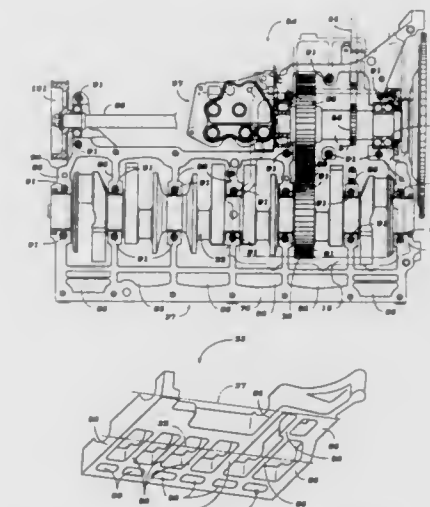
Filed Jul. 26, 1990, Ser. No. 558,829

Claims priority, application Japan, Jul. 28, 1989, 1-195649;
Aug. 31, 1989, 1-222966

Int. Cl.⁵ F02F 7/00

U.S. Cl. 123—195 R

33 Claims



24. An internal combustion engine comprised of a cylinder block with a plurality of aligned cylinder bores, a crankcase portion formed in said cylinder block at the base of said cylinder bores and defined by an outer peripheral edge of said cylinder block crankcase portion, a crankcase member affixed to said cylinder block crankcase portion and defining therewith, at least in part, a crankcase chamber, a crankshaft having a plurality of spaced bearings and journaled thereby within said crankcase chamber and driven by pistons contained within said cylinder bores, said crankcase member comprising a unitary assembly forming a plurality of spaced bearing caps cooperating with bearings formed by said cylinder block for journaling said crankcase, said crankcase member further comprising an outer peripheral surface defining a closure around the said outer peripheral edge of said cylinder block crankcase portion.

5,085,187

INTEGRAL ENGINE OIL PUMP AND PRESSURE REGULATOR

Gregg T. Black, Livonia, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 11, 1991, Ser. No. 667,146

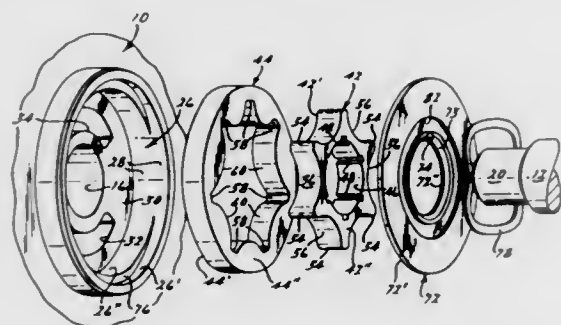
Int. Cl.⁵ F01M 1/02

U.S. Cl. 123—196 R

8 Claims

1. For an internal combustion engine, a combination oil pump and pressure regulator for a pressurized lubrication system, comprising: a pump housing formed in a recess in an interior wall of the engine, the recess having an end wall portion and a cylindrical outer wall portion; inner and outer pump elements arranged in coplanar relationship and housed substantially within the recess, the elements having first side surfaces

in sliding engagement with the end wall of the recess; means including the crankshaft for rotating the pump elements; oil inlet means and oil outlet means through the recess's end wall for introducing and discharging oil to and from the pump elements to pumping spaces formed between the elements; a cover member having a flat surface normally abutting the second side surfaces of the pump elements; yieldable means to



urge the cover's flat surface against the second side surfaces of the elements so that as the elements are rotated, oil is drawn from the inlet means, through the pump spaces and out the outlet means, whereby the yieldable means permits the cover to move away from the elements in response to a pressure force created by a predetermined high oil pressure at the pump outlet to thereby pass oil from the pump to reduce oil pressure.

5,085,188

MODULAR LUBRICATION/FILTER SYSTEM

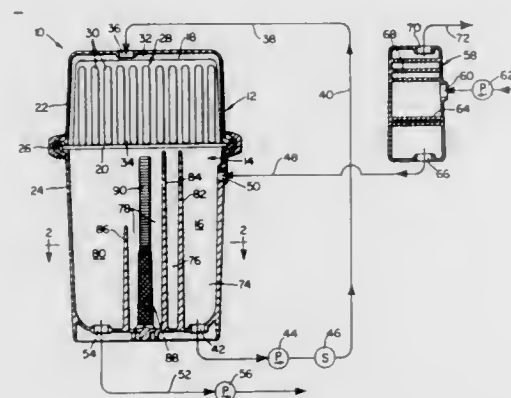
James A. Gasparri, North Providence; Joseph A. Borgia, Cranston; Paul C. Randall, Warwick; Edmond H. Cote, Jr., Warren, and Anthony J. Caronia, East Greenwich, all of R.I., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 3, 1990, Ser. No. 622,886

Int. Cl.³ F01M 11/03

U.S. Cl. 123—196 R

19 Claims



1. Lubrication system for internal combustion engine comprising a housing separate from said engine, said housing defining a chamber therewithin, means dividing said chamber into a filtering section and a sump section, a filter element for filtering engine lubricating oil mounted in said filtering section, conduit means for communicating lubricating oil from said engine to said sump section and from said sump section to said engine, transfer pump means for pumping lubricating oil from said engine to said sump section and from said sump section to said engine through the conduit means, and recycling pump means separate from said transfer pump means for pumping oil from said sump section to said filtering section, said lubricating oil being returned to said sump section after passing through the filter element, said recycling pump means having an inlet side communicated to said sump section and an outlet side communicated to said filtering section whereby said lubricating oil is pumped from said sump section into said filtering section for

filtering by said filter element before being returned to said sump section.

5,085,189

AIR-ASSISTED FUEL INJECTION APPLIED IN THE TWO-STROKE ENGINE OF FLAME-JET IGNITION TYPE

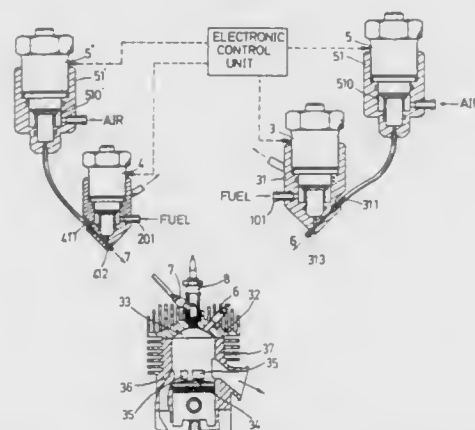
Huei-Huay Huang, and Rong-Fang Hong, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 20, 1991, Ser. No. 672,674

Int. Cl.³ F02B 13/00, 19/10; F02M 67/02

U.S. Cl. 123—275

7 Claims



1. An air-assisted fuel injection applied in the two-stroke engine of flame-jet ignition type, comprising:

a fuel circuit wherein a fuel pump and a fuel pressure regulator supply a stable fuel pressure for said fuel circuit; a compressed air source including an air pump driven by engine crank shaft, and an air pressure regulating valve to produce suitable air pressure; with respect to each cylinder of the engine, the system should have four electromagnetic valves, including: a main air injection electromagnetic valve and a subsidiary air injection electromagnetic valve both of which are connected to said compressed air source, a main fuel injection electromagnetic valve and a subsidiary fuel injection electromagnetic valve, both of which are connected to said fuel pressure source; wherein an electronic control unit is used to control the injection of fuel and compressed air from aforesaid electromagnetic valves, whereby said main air injection electromagnetic valve injects high speed flowing air which meets the fuel injected from said main fuel injection electromagnetic valve at a fuel-air cross, the fuel being further crashed by and mixed with the air in a fuel-air mixing passage, and being rapidly transferred to a main injection nozzle disposed on the cylinder or cylinder head of engine, said sub. air injection electromagnetic valve injected high speed flowing air which meets the fuel injected from said sub-fuel injection electromagnetic valve at a fuel-air cross, the fuel being further crashed by and mixed with the air in a fuel-air mixing passage, and being rapidly transferred to a subsidiary fuel injection nozzle disposed on a flame-jet-forming plug, which is disposed on the cylinder head and includes a prechamber cavity to which a spark plug and said subsidiary injection nozzle are secured, the injected fuel-air mixture scavenge the original burned residual gas and is ignited by the spark discharge of the spark plug in said prechamber cavity, and then specifically shaped flame jet is injected through the orifice of the flame-jet-forming plug's tip, said specifically shaped flame jet penetrate and ignite said fuel-air mixture in main combustion chamber, where the mixture is formed by the fuel spary injected from main injection nozzle and the scavenging pure air from each scavenging port, said electronic con-

trol unit C controlling said fuel injection and air injection electromagnetic valves by means of calculating the signals detected and transmitted by each sensor of engine condition, and the current pulse output timing will determine the injection timing of each electromagnetic valve relatively to engine crank angle, while the pulse width will determine fuel injection amount and air injection amount of said electromagnetic valves.

5,085,190

ERROR-CORRECTED AUTOMATIC CONTROL SYSTEM

Manfred Birk, Oberriexingen; Reinhard Fenchel, Calw-Altbürg; Norbert Müller, Tamm, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

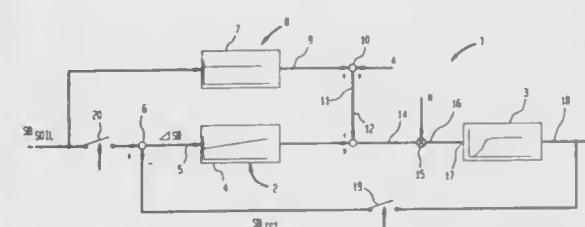
Filed Jan. 29, 1991, Ser. No. 647,587

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008669

Int. Cl.³ F02D 31/00

U.S. Cl. 123—357

15 Claims



1. A method for operating an automatic control system for injecting fuel into an internal combustion engine, with the control system being capable of correcting errors caused by deviations that occur due to operating tolerances of injection system components, and with a controlling element (7), operating as a precontrol (8), and a controller (2) being operated in parallel in the control system, the method comprising:

determining a first deviation signal value (A) substantially in a middle of a regulating range for fuel injection control; determining a second deviation signal value (M) substantially near one of the end points of the regulating range for fuel injection control; and feeding the first and second deviation signals to the control system as correction signals for a fuel injection signal being processed by the control system, with the corrections to the fuel injection signal being contemporaneous with a particular operations point of the controller (2).

5,085,191

TACHOMETER SIGNAL GENERATING DEVICE

Hiroshi Okuda, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

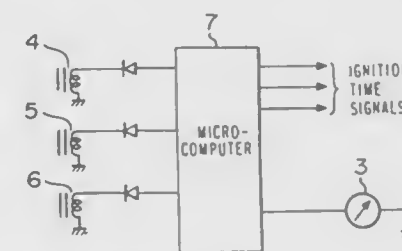
Filed Jan. 7, 1991, Ser. No. 637,906

Claims priority, application Japan, Jan. 17, 1990, 2-6329

Int. Cl.³ F02D 41/34; F02P 5/15; G01P 3/481

U.S. Cl. 123—414

2 Claims



1. A tachometer signal generating device which comprises: signal coils which generate pulse signals corresponding to predetermined crank angle positions in synchronism with revolution of an engine, and a microcomputer which

generates ignition control signals or fuel control signals on the basis of the pulse signals and which generates a tachometer signal of 6 pulses/one revolution.

5,085,192

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM AND CLEANING DEVICE

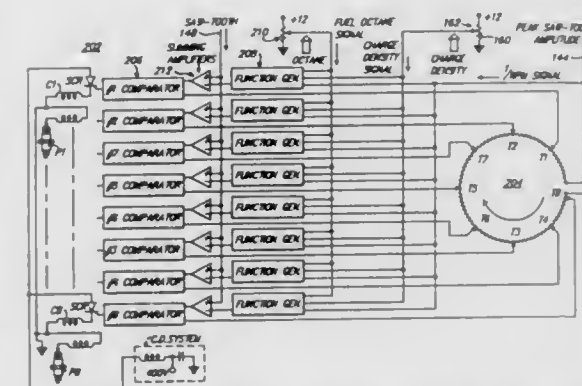
John A. McDougal, 2801 S. Port Hwy., A-4, Flint, Mich. 48507, and John W. Lennington, Ypsilanti, Mich., assignors to John A. McDougal, Detroit, Mich.

Continuation of Ser. No. 588,026, Sep. 25, 1990, Pat. No. 5,029,567, which is a continuation of Ser. No. 460,289, Jan. 3, 1990, Pat. No. 4,993,371, which is a continuation of Ser. No. 310,837, Feb. 14, 1989, Pat. No. 4,960,093, which is a continuation of Ser. No. 187,933, Apr. 29, 1988, Pat. No. 4,809,662, which is a continuation of Ser. No. 137,195, Dec. 23, 1987, abandoned, which is a division of Ser. No. 873,075, Jun. 2, 1986, Pat. No. 4,718,381, which is a continuation of Ser. No. 651,042, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 374,803, May 14, 1982, Pat. No. 4,471,737, which is a continuation of Ser. No. 161,282, Jun. 20, 1980, abandoned, which is a division of Ser. No. 934,322, Aug. 16, 1978, Pat. No. 4,257,373, which is a division of Ser. No. 800,959, May 26, 1977, Pat. No. 4,116,173, which is a continuation of Ser. No. 572,167, Apr. 28, 1975, abandoned, which is a division of Ser. No. 336,559, Feb. 28, 1973, Pat. No. 3,903,856. This application Jun. 4, 1991, Ser. No. 710,141

Int. Cl.³ F02P 5/15

U.S. Cl. 123—416

6 Claims



2. In an ignition system for a multi-cylinder engine having predictable variations in the performance of at least two cylinders of said engine, function generator means for producing an output signal indicative of a spark advance value individually for each said cylinders which is dependent at least in part upon said predictable variations in performance and the values of a plurality of engine operating parameters.

5,085,193

FUEL INJECTION CONTROL SYSTEM FOR A TWO-CYCLE ENGINE

Koji Morikawa, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1990, Ser. No. 528,576

Claims priority, application Japan, May 30, 1989, 1-137759

Int. Cl.³ F02M 41/00

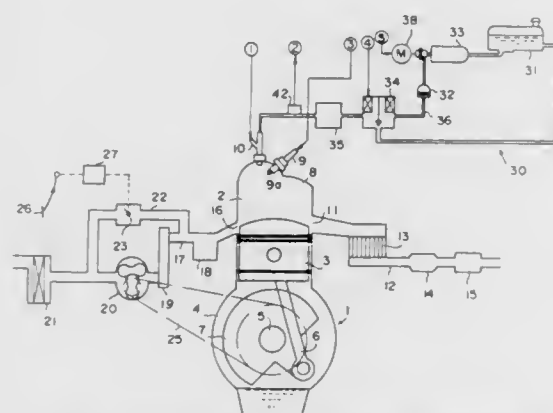
U.S. Cl. 123—458

4 Claims

1. In a fuel injection control system of a two cycle engine having an intake passage for inducing air into a cylinder of the engine, a fuel injector disposed on said cylinder for injecting an amount of fuel pressurized by a high pressure pump, a scavenge pump driven by said engine and disposed in an intake pipe connected to said cylinder, a control valve disposed in a bypass provided around the scavenge pump communicating with said cylinder for controlling power of said engine, an engine speed

sensor for detecting engine speed and for producing a corresponding engine speed signal, an accelerator pedal sensor for detecting depressing degree of an accelerator pedal operatively connected with the control valve and for producing a corresponding degree signal, and a fuel pressure sensor for detecting pressure of said fuel fed to the fuel injector and for producing a corresponding pressure signal, the improvement of the system which comprises:

- detecting means responsive to said degree signal and said engine speed signal for determining engine load and for generating a corresponding engine load signal;
- a detector responsive to said pressure signal for detecting actual fuel pressure of said fuel fed to the fuel injector and for producing a corresponding actual fuel pressure signal;
- fuel injector pulse width setting means responsive to said engine load signal for providing a fuel injection pulse width and for producing a corresponding fuel injection pulse width signal;
- a calculator responsive to said degree signal for calculating a correcting quantity of said fuel in dependency on a changing rate of said depressing degree indicating acceleration and for producing a corresponding correcting quantity signal; and
- correcting means responsive to said correcting quantity signal and said fuel injection pulse width signal for opera-



tively correcting the fuel injection pulse width and for producing a corresponding correcting signal so as to operatively increase the fuel injection pulse width with acceleration;

injection timing setting means responsive to said load signal for calculating injection timing of said fuel and for generating a corresponding injection timing signal which advances with increasing engine load;

first driving means responsive to said correcting signal and said injection timing signal for injecting said amount of fuel, said amount increasing with increasing said engine load by the advancing of said injection timing;

fuel pressure setting means responsive to said load signal for calculating a desired fuel pressure and for generating a corresponding desired fuel pressure signal;

a comparator responsive to said desired fuel pressure signal and said actual fuel pressure signal for deriving the difference between said desired and said actual fuel pressure and for producing a corresponding difference signal; and second driving means responsive to said difference signal for controlling said pressure of said fuel fed to the fuel injector as an increasing function of said engine load, whereby said engine is accurately controlled at any operating condition, by stratified charging at light engine load conditions, and by homogeneously inducing air fuel mixture into said cylinder at heavy load conditions.

5,085,194 METHOD OF DETECTING ABNORMALITY IN AN EVAPORATIVE FUEL-PURGING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Shigetaka Kruoda; Hisashi Igarashi; Hidekazu Kano, and Takeshi Suzuki, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

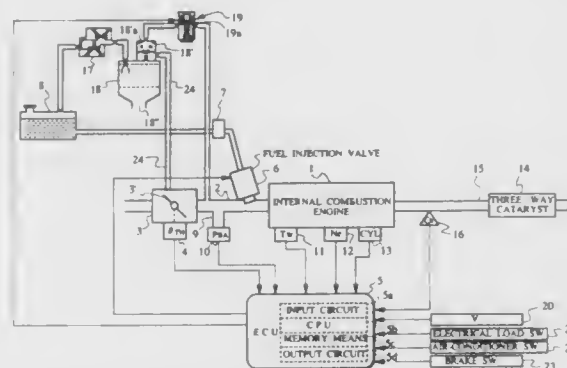
Filed Apr. 8, 1991, Ser. No. 681,937

Claims priority, application Japan, May 31, 1990, 2-142824; Aug. 6, 1990, 2-207914

Int. Cl.⁵ F02D 41/22; F02M 25/08

U.S. Cl. 123—479

16 Claims



1. In a method of detecting abnormality in an evaporative fuel-purging system for an internal combustion engine having a fuel tank, and an intake passage, said evaporative fuel-purging system having a canister for adsorbing evaporative fuel from said fuel tank, and a purging passage through which said evaporative fuel is purged from said canister into said intake passage, said engine having a sensor for detecting a parameter reflecting an amount of said evaporative fuel purged into said intake passage, the improvement comprising the steps of:

- (1) determining whether or not said engine is in a predetermined operating condition after completion of warming-up of said engine;
- (2) temporarily inhibiting said purging of said evaporative fuel into said intake passage when it is determined that said engine is in said predetermined operating condition;
- (3) obtaining a first value based on said parameter during said temporary inhibition of said purging of said evaporative fuel;
- (4) obtaining a second value based on said parameter during execution of said purging of said evaporative fuel carried out after said temporary inhibition of said purging of said evaporative fuel;
- (5) comparing said first value with said second value; and
- (6) determining whether or not there is abnormality in said evaporative fuel-purging system, based on a result of said comparison.

5,085,195

INJECTION TIMING CONTROL DEVICE FOR
DISTRIBUTOR-TYPE FUEL INJECTION PUMPS
Fumitsugu Yoshizu, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,940

Claims priority, application Japan, Jul. 20, 1989, 1-85367[U]

Int. Cl.⁵ F02M 41/00

U.S. Cl. 123—502

11 Claims

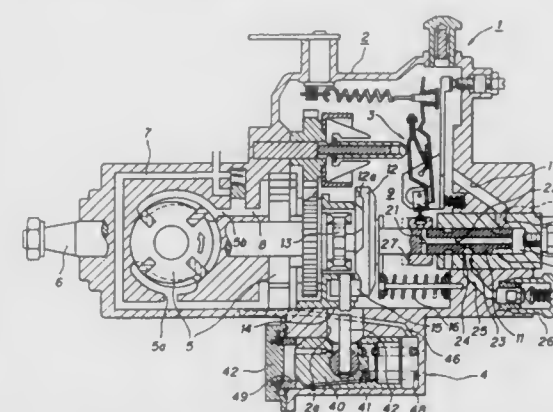
1. An injection timing control device for a distributor-type fuel injection pump, comprising the combination of:

- a pump housing defining therein a pump chamber, a cylinder provided on said pump housing, a timer piston slidably received within said cylinder, said timer piston having end faces, a roller holder connected to said timer piston, means for applying pressure within said pump chamber to said

timer piston at one end face of said timer piston within said cylinder, first spring means for urging said timer piston at another end face thereof against said pressure, and wherein said timer piston is slidably moved within said cylinder in response to a difference between said pressure within the pump chamber and the force of said first spring means to thereby rotate said roller holder for varying the fuel injection timing;

a movable seat member, said movable seat member having one end thereof disposed for urging contact with said one end face of said timer piston, said one end face of said timer piston having a total effective pressure receiving area at which said pressure acts on upon said timer piston, said total effective pressure receiving area being decreased when said one end of said seat member is in urging contact with said one end face of said timer piston;

second spring means for urging said seat member toward said timer piston; and



stopper means associated with said seat member and operable to allow said seat member to be moved by the force of said second spring means toward said timer piston so as to have said one end thereof kept in urging contact with said one end face of said timer piston while said timer piston moves from a first position, in which the fuel injection timing is most retarded, to a second position, in which the fuel injection timing is advanced by a predetermined amount, and to inhibit said seat member from being moved by the force of said second spring means toward said timer piston to bring said one end of said seat member out of contact with said one end face of said timer piston after said timer piston is moved beyond said second position in a direction of further advancing the fuel injection timing, wherein said total effective pressure receiving area is increased when said one end of said seat member is out of contact with said one end face of said timer piston, whereby the fuel injection timing advances at a higher rate with respect to the pump rotational speed.

5,085,196

FUEL INJECTION PUMP FOR INTERNAL
COMBUSTION ENGINES

Josef Hain, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00235, § 371 Date Dec. 18, 1990, § 102(e)

Date Dec. 18, 1990, PCT Pub. No. WO90/12957, PCT Pub.

Date Nov. 1, 1990

PCT Filed Mar. 23, 1990, Ser. No. 623,928

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1989, 3912624

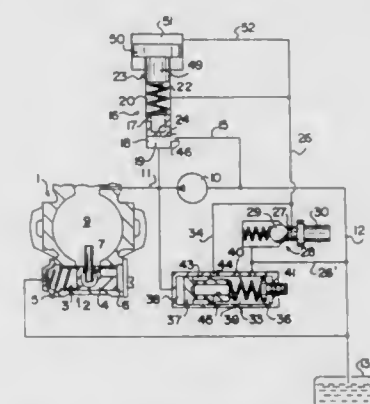
Int. Cl.⁵ F02M 37/04

U.S. Cl. 123—502

3 Claims

1. A fuel injection pump for internal combustion engines, in particular for distributor-type injection pumps, having an injection onset adjuster (2), said injection onset adjuster (2) includes an adjuster piston (4) that is adjustable counter to a restoring force (5) by an rpm-dependent control pressure of a

pressure medium, a feed pump (10) driven in synchronism with the fuel injection pump and the feed pressure of which is controlled as a control pressure by a pressure control valve (16), divides a pressure chamber (19) from a restoring chamber (20) that receives the restoring spring (22), said restoring chamber communicates continuously with the pressure chamber (19) via a throttle (24), wherein upon a control motion of the adjustable control piston (17) an outflow throttle (46) from the pressure chamber (19) to a relief chamber (13) is controlled and the



restoring chamber (20) communicates with the relief chamber (13) via a relief line containing a controllable pressure valve (28, 56), said restoring spring (22) of the pressure control valve (16) is supported on an adjustable stop (23), which on a side remote from the restoring chamber (20) has a pressure face that is larger than the side toward the restoring chamber, which pressure face defines a work chamber (51) that communicates via a throttle (24, 55) with the pressure chamber (19) of the pressure control valve (16).

5,085,197

ARRANGEMENT FOR THE DETECTION OF
DEFICIENCIES IN A TANK VENTILATION SYSTEM

Gerhard Mader, Thalmassing; Hans Meixner, Haar, and Hans Schreiber, Lappersdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

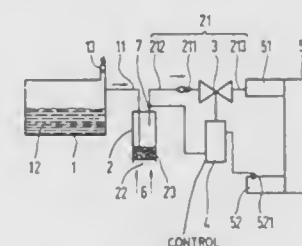
Filed Jul. 26, 1990, Ser. No. 558,674

Claims priority, application European Pat. Off., Jul. 31, 1989, 89114122

Int. Cl.⁵ F02M 33/02

U.S. Cl. 123—520

8 Claims



CONDITION	DEFECT CONDITION TABLE		
	GAS FLOW SIGNAL	VENTILATION VALVE CONTROL SIGNAL	LAMBDA PROBE SIGNAL
1	FLOW	CLOSED	
2	NO FLOW	OPEN	
3		OPEN	UNCHANGED

1. An arrangement for the detection of defects in a tank ventilation system having a fuel tank, an active carbon filter having an input connected to an output of the fuel tank, a tank ventilation valve connected between an intake section of an internal combustion engine and an output of the active carbon filter, a lambda probe at an exhaust section of the internal combustion engine which generates a probe signal, and a control unit which provides a control signal for actuating the tank

ventilation valve so as to either open or block gas flow from the output of the filter to the intake section of the internal combustion engine, comprising:

flow sensor means arranged to measure the gas flow from the output of the filter to the tank ventilation valve and for generating a corresponding flow signal; and
said control unit having means for comparing said probe signal from the lambda probe to the control signal which actuates the tank ventilation valve, and for providing an error signal in case the probe signal from the lambda probe remains unchanged for a defined period of time when the control signal being supplied is for opening the control valve.

5,085,198

LOW PRESSURE FUEL SUPPLY SYSTEM FOR A FUEL INJECTION PUMP

Peter J. Bartlett, Sittingbourne, Kent, and Peter F. Bradford, Sudbury, Suffolk, both of United Kingdom, assignors to Lucas Industries Public Limited Company, Birmingham, United Kingdom

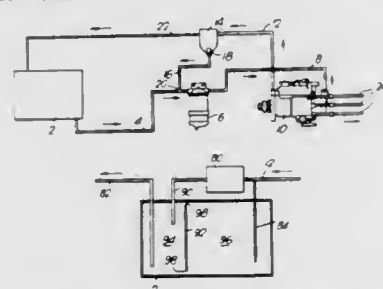
Filed Aug. 2, 1990, Ser. No. 561,700

Claims priority, application United Kingdom, Aug. 4, 1989, 8917872

Int. Cl.⁵ F02M 31/14

U.S. Cl. 123—510

20 Claims



1. A low pressure fuel supply system for supplying fuel which tends partially to solidify at low temperatures and whose viscosity increases with decreasing temperature, comprising:

- a fuel tank;
- a fuel injection pump having an inlet, a high pressure outlet and a fuel return outlet;
- a fuel filter;
- a fuel supply line extending from said tank, via said filter, to said injection pump inlet;
- a fuel recirculation circuit for recirculating fuel warmed by said injection pump along a path extending from said injection pump return outlet, through said filter to said injection pump inlet;
- a permanent bleed pipe extending to said fuel tank from a portion of said recirculating circuit between said injection pump return outlet and said filter, said permanent bleed pipe having a first end which forms a junction with said portion of said fuel recirculation circuit and having a second end which opens into said fuel tank, said permanent bleed pipe having flow-resistance-determining dimensions such that said pipe presents increasing resistance to the flow of fuel therein with decreasing fuel temperature so that said permanent bleed pipe carries little flow at low temperatures of the fuel therein, most of the warmed fuel from said injection pump return outlet being directed into said filter, and so that under normal operating conditions when the fuel temperature is higher, said permanent bleed pipe returns more of said warmed fuel from said injection pump return outlet to said fuel tank, thus preventing overheating of the fuel and of said injection pump; and

means for maintaining under all operating conditions of said fuel supply system a fuel pressure difference between said ends of said permanent bleed pipe with pressure at said first end always being higher than pressure at said second end.

5,085,199 V-TYPE ENGINE EQUIPPED WITH A SUPERCHARGING DEVICE

Osamu Sado, Higashiroshima, and Shunji Masuda, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

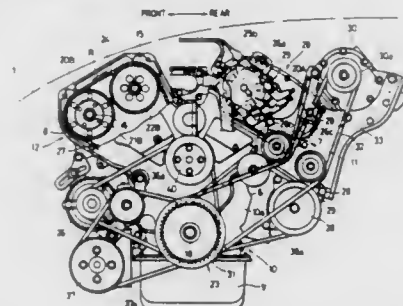
Filed Jan. 26, 1990, Ser. No. 470,741

Claims priority, application Japan, Jan. 31, 1989, 1-22366

Int. Cl.⁵ F02B 33/00, 53/00

U.S. Cl. 123—559.1

9 Claims



1. A V-type engine equipped with a supercharging device, the V-type engine comprising:

- an engine body having first and second cylinder banks formed in the V-shape and a crank shaft disposed therein, wherein a lengthwise direction extends along the engine in a direction in which said cylinder banks extend and a widthwise direction extends transverse to the lengthwise direction,
- a pair of camshafts disposed in said first and second cylinder banks, respectively,
- an endless belt engaged with each of one end portions of the camshafts and one end portion of the crank shaft in such a manner that said first cylinder bank is disposed on a tension side of said endless belt wherein the tension side of the endless belt is upstream from the crank shaft and a slack side of the endless belt is downstream from the crank shaft with respect to a direction of movement of the endless belt, and
- an engine-driven supercharger mounted on the engine body to jut out widthwise from said first cylinder bank and driven to rotate by the crank shaft through an additional endless belt engaged with the engine-driven supercharger and said one end portion of the crank shaft thereby providing a widthwise mounting of the engine driven supercharger while preventing excessive leaning of the cylinder banks.

5,085,200

SELF-ACTUATING, DRY-FIRE PREVENTION SAFETY DEVICE FOR A CROSSBOW

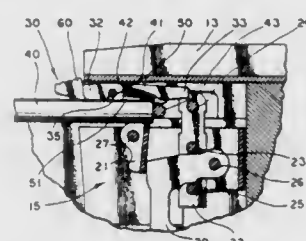
Bernard Horton-Corcoran, Ross-Shire, Scotland, and Nicholas Rowlandson, Denbigh Clwyd, Wales, assignors to Horton Manufacturing Company Inc., Stow, Ohio

Filed Jan. 9, 1991, Ser. No. 639,004

Int. Cl.⁵ F41B 5/00

U.S. Cl. 124—25

25 Claims



10. A device for preventing an inadvertent activation of a trigger mechanism of a crossbow without an arrow in place comprising a stop block; said stop block including a body member to engage a portion of the trigger mechanism; said

body member including an arrow contacting surface which when engaged by the arrow upon placement of the arrow into position to be fired will move said body member out of engagement with the trigger mechanism.

5,085,201

ARROW REST FOR ARCHERY BOWS

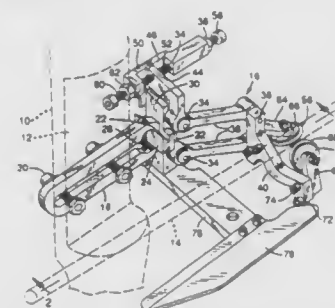
John E. Tepper, and Timothy T. Tepper, both of P.O. Box 7, Shady Cove, Oreg. 97539

Filed Nov. 20, 1990, Ser. No. 616,103

Int. Cl.⁵ F41B 5/22

U.S. Cl. 124—44.5

18 Claims



1. An arrow rest arranged for use with an archery bow and arranged to support an arrow in drawn condition, said arrow rest comprising:

- a support bracket arranged for attachment to a bow, an arrow rest carrier,
- a pair of opposing spaced arrow rest members on said arrow rest carrier and forming a cradle support on which an arrow to be shot is arranged to be seated,
- and resilient parallel linkage means comprised of a pair of upper and lower arms pivotally disposed on transverse horizontal axes and extending rearwardly supporting said arrow rest carrier pivotally on said support bracket,
- said parallel linkage means supporting said arrow rest carrier in an upper rest position and providing downward movement of said arrow rest members to compensate for a downward bowed deflection in the arrow shaft and at the same time to support the arrow in its original flight path during such downward movement, and
- a yieldable stop means comprised of a stop limiting upward pivoted movement of the parallel linkage means and spring means permitting yieldable downward depression thereof.

5,085,202

BURNER CONSTRUCTION AND METHOD OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

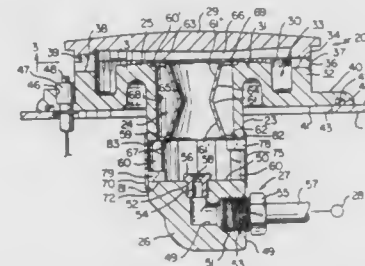
Division of Ser. No. 448,935, Dec. 12, 1989, Pat. No. 5,002,038.

This application Nov. 15, 1990, Ser. No. 613,406

Int. Cl.⁵ F24C 3/00

U.S. Cl. 126—39 R

2 Claims



1. In a method of making a burner construction comprising a burner body means having a chamber means therein and having opposed end means one of which is open to said chamber means and the other of which has means for interconnecting a source of fuel to said chamber means, and a removable

cap means closing said one end means of said body means, said burner construction having port means interconnecting said chamber means to the exterior of said burner construction and through which said fuel can issue to burn externally to said burner construction, the improvement comprising the steps of forming said body means to have an annular surface means interrupted by a plurality of radially disposed and spaced apart U-shaped groove means with each groove means having a rounded end and substantially straight and parallel sides terminating at said annular surface means at the other end thereof, forming said body means to have a shoulder means in said chamber means, disposing a removable venturi section in said chamber means through said one end means of said body means so that an upper end of said venturi section rests on said shoulder means to support said venturi section on said body means, and forming said cap means to have an annular surface means cooperating with said annular surface means of said body means to close said groove means on said other end thereof whereby said groove means define said port means.

5,085,203

MOVABLE GRILL FOR A BARBECUE

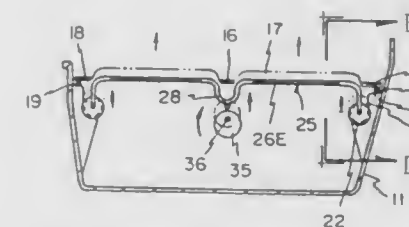
Claude Jette, 104 Confederation Drive, Apt. 1001, St. Thomas, Ontario, Canada N5P 4C1

Filed Jan. 11, 1991, Ser. No. 641,128

Int. Cl.⁵ F24C 3/00

U.S. Cl. 126—41 R

7 Claims



1. A compound grill rack, for grilling food, that comprises:
 - (a) two interleaving racks, each rack carrying a family of spatially disposed support members in a common plane so that a support member of one family is adjacent to that of another family; and,
 - (b) means for vertically moving one of said racks relative to the other so as to pass said one rack through said other rack into a superadjacent plane relative thereto, so said other rack now becomes a bearing surface for said food.

5,085,204

MOUNTING OF DOOR GASKET

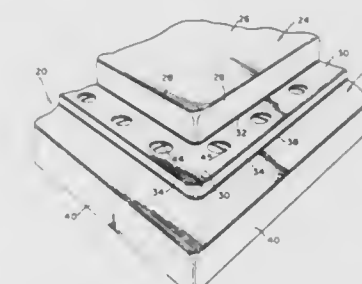
James D. Moyer, 301 N. Woodmont Dr., Downingtown, Pa. 19335

Filed Jul. 17, 1991, Ser. No. 731,650

Int. Cl.⁵ F23M 7/00

U.S. Cl. 126—190

20 Claims



1. A door assembly for receiving a roll-type gasket, said door assembly comprising a door panel including a projecting panel portion for reception in an opening, said panel portion

together with an outer peripheral part of said door panel defining a peripheral corner in which a roll-type gasket is to be seated, said corner being formed by a planar surface on said outer peripheral part and a cooperating normal wall on said projecting panel portion, and anchoring tabs on said planar surface for penetrating a roll-type gasket, said anchoring tabs facing said normal wall.

5,085,205

FUEL-FIRED WATER HEATED WITH COMBINATION DRAINAGE PAN AND COMBUSTION AIR FLOW CONTROL APPARATUS

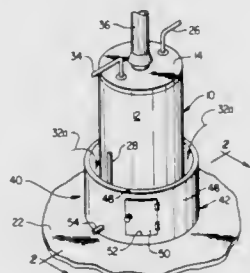
Jacob H. Hall, Montgomery, and Timothy E. Powell, Tallahassee, both of Ala., assignors to Rheem Manufacturing Company, New York, N.Y.

Filed May 9, 1991, Ser. No. 698,479

Int. Cl.⁵ F24H 1/00

U.S. Cl. 126—363

15 Claims



1. Fuel-fired water heater apparatus comprising:

- a water heater body having a lower end with leg means thereon for supporting said body on a floor with said lower end spaced upwardly therefrom, said lower end having an air inlet formed therein;
- a fuel burner supported by said body and positioned above said lower end, said fuel burner being operative to receive and combust a mixture of fuel from a source thereof and combustion air flowing through said air inlet, said fuel burner, when said water heater body is operatively supported on said floor, having a vertical height above said floor of less than 18";

combination drainage pan and combustion air flow control means for receiving and draining away water leaking from said water heater body, and for assuring that burner combustion air entering said air inlet is supplied thereto from a location substantially higher than burner height above the floor, said combination drainage pan and combustion air flow control means including a drain pan structure having:

- a bottom wall positionable on the floor and upon which said leg means may be rested,
- a vertical side wall portion sized and configured to outwardly circumscribe a lower end portion of said water heater body with an upper end of said vertical side wall portion positioned substantially higher than the vertical height of said fuel burner and at least approximately 18" above said floor, and
- outlet means connected to a lower end section of said vertical side wall portion and operative to drain away water leaking from within and adjacent said water heater body and received in said drain pan structure.

5,085,206

SYSTEM FOR INITIALIZING POSITIONS OF TARGET LOCATING ARM AND DEVICE FOR FIRING FOCUSED SHOTS

Jean-Louis Mestas, Chassieu; Bernard Lacruce, Lyons, and Dominique Cathignol, Genas, all of France, assignors to Technomed International and INSERM, both of Paris, France

Continuation of Ser. No. 139,437, Dec. 30, 1987, abandoned.

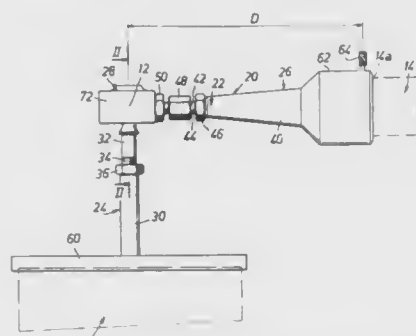
This application Oct. 9, 1990, Ser. No. 595,679

Claims priority, application France, Dec. 31, 1986, 86 18441

Int. Cl.⁵ A61B 8/08, 17/22

U.S. Cl. 128—24 EL

15 Claims



1. A method of coordinating the initial "reference" position in three dimensions of a device for triggering and focusing shots on a target point with the initial "reference" position of a locating arm, comprising the steps of:

- providing a device for triggering and focusing shots on a target point;
- providing a locating arm having a free end for supporting a removable locating probe, said probe replaceable by calibration means, for locating the position in three dimensions of a target whereupon the target point of the device for triggering and focusing shots may be brought into coincidence with the target;
- adjusting the distance between the free end of the locating arm and the device for triggering and focusing shots by said calibration means to a "reference" distance value;
- setting, in three dimensions, the position of the device for triggering and focusing shots and of the locating arm, when adjusted by the calibration means, as the initial "reference" position, in three dimensions, of the device for triggering and focusing shots and of the locating arm, respectively;
- using said initial "reference" position for subsequently bringing the target point of the device for triggering and focusing shots into coincidence with the target from knowledge of a given position of the free end of the locating arm as determined by said "reference" distance value.

5,085,207

DEVICE FOR DEEP MASSAGE AND METHOD OF USING

Russell D. Fiore, 9 Raymond St., Lincoln, R.I. 02865

Filed Jan. 28, 1991, Ser. No. 646,287

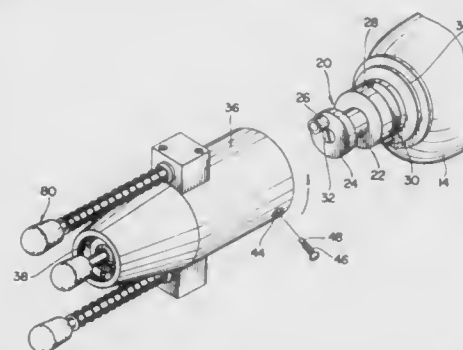
Int. Cl.⁵ A61H 1/00

U.S. Cl. 128—32

9 Claims

- 6. A device for the deep frictional massage of small concentrated areas of the human patient's body below skin areas thereof such as tendons and the like comprising, a body having opposed ends with holding means at one end thereof whereby the device can be held and operated by a human operator and massaging means mounted on the other end thereof, said massaging means including a manipulator finger adapted to contact and penetrate into the skin of said human patient at a central point of contact and move in a reciprocating back and forth linear stroke motion relative to said body and stabilizing means for holding the position of said massaging means relative to the skin of said patient, said stabilizing means including

resiliently mounted holding means for contacting the patient's skin at at least two generally opposed points disposed radially outward of said center point of contact of said finger with said skin and means for controlling the stroke speed of said manipulator finger, said body having a forward end to which a housing is attached, said housing having open rear and front ends, said body including a motor for driving a drive head in turn projecting forward of said body forward end and into said housing open rear end, said manipulator finger including a



shaft having inner and outer ends positioned in said housing open front end and drive connection means in said housing in turn connecting said drive means to said shaft, said shaft outer end projecting outwardly of said housing front end and terminating in a removable friction head, said stabilizing means holding means including a pair of pins mounted at the forward end of said housing, said pins being resiliently forwardly urged and rearwardly retractable and terminating at forward ends thereof in a removable friction head for firmly contacting the patient's skin.

5,085,208

METHOD OF MASSAGE AND PREPARATION THEREFOR

Angelo S. Massaro, 549 Belgrove Dr., Kearny, N.J. 07032

Filed Jan. 7, 1991, Ser. No. 639,115

Int. Cl.⁵ A61H 7/00; A01N 65/00

U.S. Cl. 128—67

17 Claims

- 8. A preparation useful for enhancing body massage and for relieving muscle aches and joint pains comprising lemon oil in an amount of about 10-15% by volume and lemon juice in an amount of 85-90% by volume.

5,085,209

PENILE ERECTION ENHANCING COLLAR AND METHOD

G. Howard Gottschalk, 8618 Sepulveda, Los Angeles, Calif. 90045

Filed Mar. 13, 1989, Ser. No. 322,625

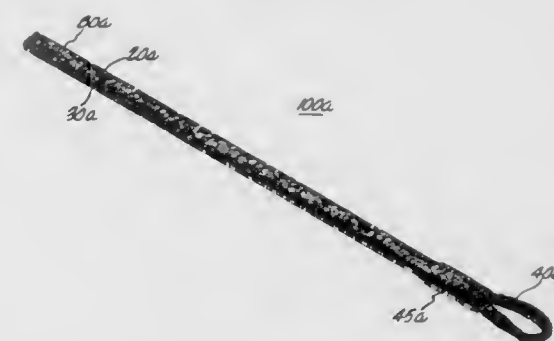
Int. Cl.⁵ A61F 5/41

U.S. Cl. 600—41

16 Claims

- 1. A method for maintaining erection of the penis during copulation comprising the steps of:
 - encircling the base of the penis and scrotum at the junction of the pubis prior to penial tumescence with a device comprising: a single band of material being at least of a length sufficient to both encircle the base of the penis and scrotum at the junction of the pubis in one circle and having portions comprised of an interlocking material to interconnect against itself when so encircled, and further including a loop extending from an end of said interlocking material;
 - pulling an end of said device through said loop;

cinching the one circle of said band of the device as tightly as possible against said junction; and



interconnecting said band against itself for maintaining the tightly cinched one circle of said band around said junction.

5,085,210

SLEEVE FOR MAINTAINING POSITION OF ORTHOPEDIC KNEE BRACE

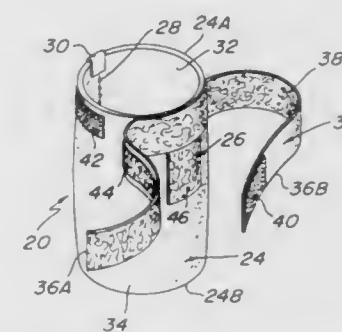
Kirby Smith, III, 2942 Cheshire Dr., Marietta, Ga. 30062

Filed Oct. 9, 1990, Ser. No. 594,766

Int. Cl.⁵ A61F 5/00

U.S. Cl. 602—26

25 Claims



- 1. A sleeve to hold an orthopedic knee brace in place on the knee of a person, said brace including a first portion extending below said knee and a second portion extending above said knee, said sleeve being a hollow cylindrical member having a closed sidewall comprising a top end, a bottom end, an inner surface, and an outer surface, said sidewall being formed of an elastic material to enable it to be stretched so that it can be located on the leg of the person to encircle the person's calf with the top end of said sidewall being located above the widest portion thereof, said sidewall additionally comprising sleeve position holding means, and brace mounting means, said inner surface of said sidewall being frictionally resistant to sliding on the skin of the person when said sleeve is in place on said calf, whereupon said sleeve stays in place, said sleeve position holding means comprising a strap member formed of a material resistant to stretching, said strap member having a portion fixedly secured to said sidewall adjacent said top end and an elongated free end portion, said free end portion being arranged to be wrapped around at least a portion of said sidewall adjacent said top end and to be releasably secured in that position so that said strap member substantially encircles said sidewall with the inside diameter of the portion of said sidewall underlying said strap member being confined by said strap member to a diameter which is less than the diameter of the widest portion of the wearer's calf, whereupon said sidewall is precluded from stretching and slipping down said calf, said brace mounting means comprising a first member fixedly secured to said sleeve at a predetermined position thereon, said first portion of said brace being arranged to be releasably

secured to said first member to hold said brace in position with respect to said knee.

5,085,211

PLASTER CAST MOLD AND LINER

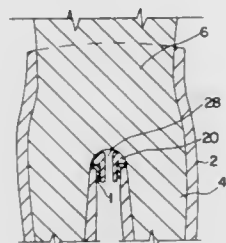
Linda Zavasnik, 10 Lands End Rd., Travelers Rest, S.C. 29690, and Philip L. Reid, Duncan, S.C., assignors to Linda Zavasnik, Travelers Rest, S.C.

Filed Aug. 22, 1990, Ser. No. 571,087

Int. Cl.⁵ A61F 5/04

U.S. Cl. 600—8

6 Claims



1. A mold for use with a full pelvic to provide an opening around an anal/genital region of a patient, said mold for use between said pelvic cast and said anal/genital region and constructed so as to include a single place of substantially rigid material comprising:

- an arcuate oblong frame having a uniform undersurface and an outer surface, said frame defining a mold passage in communication with said undersurface and said outer surface;
- a sleeve, lining said mold passage, and extending in a near perpendicular fashion from said outer surface.

5,085,212

PORTABLE SOLAR TANNING BOX

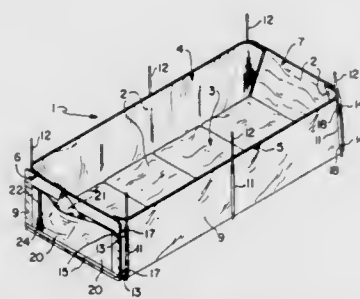
Sandra D. DeCosta, 1535 Wapping Rd., Middletown, R.I. 02840

Filed May 10, 1991, Ser. No. 698,101

Int. Cl.⁵ A61H 33/00

U.S. Cl. 128—372

9 Claims



1. In an foldable, portable solar tanning box of sun reflective fabric having a floor and a pair of side and a pair of end walls hingedly connected to the floor, the improvement comprising, cooperating fastener means secured to each of the end walls and adjacent portions of the side walls for holding the side and end walls in an erected position, the fastener means on one end wall cooperating to fastener with the fastener means on the other end wall for holding the fabric in a folded position, whereby the fastener means on the end walls are employed for not only holding the box in the erected position but also for holding the box in the folded position.

5,085,213

HEMODYNAMICALLY RESPONSIVE SYSTEM FOR AND METHOD OF TREATING A MALFUNCTIONING HEART

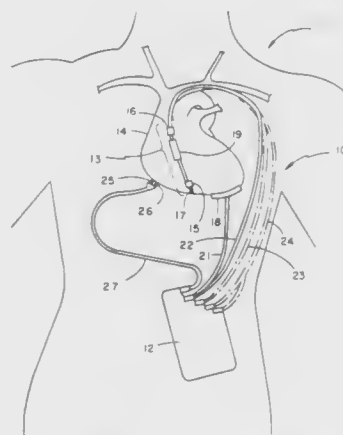
Todd J. Cohen, Mountain View, Calif., assignor to Leonard Bloom, Towson, Md., a part interest

Filed Jun. 1, 1990, Ser. No. 531,866

Int. Cl.⁵ A61N 1/00

U.S. Cl. 128—419 D

39 Claims



1. In a system for treating a malfunctioning heart of the type which includes storage means for storing electrical energy, electrode means for electrically coupling the storage means to the heart, determining means for determining right atrial pressure or central venous pressure and right ventricular pressure, means responsive to an output from the determining means for providing a first signal representative of an increase of at least a predetermined amount in the right atrial pressure or central venous pressure, means responsive to an output from the determining means for developing a second signal representative of a decrease of at least a given amount in right ventricular pressure, and means responsive to the first signal and the second signal for charging and enabling discharge of the electrical energy stored by the storage means across the electrode means upon presence of both the first and the second signals.

5,085,214

INFLATABLE CUSHION FOR SUPPORTING AN EXTREMITY

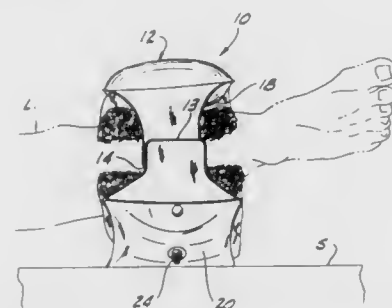
Patrick J. Barrett, St. Louis, Mo., assignor to Twenty-First Century Products, Incorporated, St. Louis, Mo.

Filed Oct. 18, 1990, Ser. No. 600,011

Int. Cl.⁵ A61G 15/00; A61F 5/37

U.S. Cl. 128—845

6 Claims



1. An inflatable cushion for elevation of an extremity with respect to a surface supporting the cushion, the inflatable cushion comprising, an inflatable bladder having first and second opposite ends and inner and outer faces,

inlet means for admitting air into the bladder for inflation thereof, means for selectively sealing and unsealing said inlet means, means for releasably fastening said first end of the bladder to said second end, lining means made of a soft absorbent material, means for releasably connecting said lining means to said inner face of the bladder such that the lining substantially covers said inner face of the bladder, the bladder being adapted to be inflated, wrapped around the extremity and secured by said fastening means such that the bladder completely encircles the extremity, said inner face of the bladder facing inwardly with said lining means disposed between the bladder and the extremity and engaging the extremity, an area of said inner face underlying the extremity resiliently deforming under the weight of the extremity such that the weight of the extremity is supported substantially uniformly over said underlying area of said inner face, and said outer face of the bladder facing outwardly with a portion of said outer face engaging the surface.

5,085,216

NASOGASTRIC/NASOINTESTINAL ENTERAL FEEDING TUBE AND METHOD FOR AVOIDING TRACHEOBRONCHIAL MISPLACEMENT

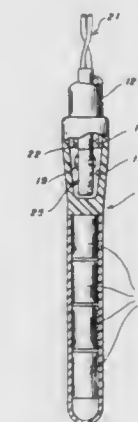
Robert L. Henley, Jr., 5602 N. 22nd Dr., Phoenix, Ariz. 85015, and Richard W. Weber, Jr., 7535 Ter., Kansas City, Mo. 64114

Continuation-in-part of Ser. No. 384,505, Jul. 25, 1989. This application Apr. 12, 1991, Ser. No. 685,230

Int. Cl.⁵ A61M 31/00

U.S. Cl. 128—636

6 Claims



1. A feeding tube assembly for avoiding tracheobronchial misplacement comprising:

- an elongated, flexible, thin walled tube tending to collapse when a suction intended to draw fluid therethrough is placed on it, said tube having a lumen, a proximal end and a distal end, and having perforations therethrough along a preselected portion of the distal end of said tube, said perforations providing fluid communication from said lumen to the outside of said tube;
 - a removable, semi-rigid stiffening means in the lumen of said tube for stiffening the tube for nasoesophageal insertion into a patient, said means having a distal end adjacent the perforations and a proximal end extending beyond the proximal end of the tube comprising handle means for removing the stiffening means from the lumen after the tube has been inserted into the patient,
 - a pH indicator means carried by the distal end of the stiffening means, said indicator means undergoing a color change in the presence of stomach acid, said indicator means being removed with the stiffening means when the stiffening means is removed from the lumen by the handle means
- whereby the operator inserting the tube into the patient and removing the stiffening means can determine that the tube has contacted stomach acid and is not misplaced in the patient's tracheobronchial tree by verifying that the pH indicator means carried by the stiffening means has undergone a color change.

5,085,217

PAD FOR THE LIVING BODY STIMULUS ELECTRODE

Chuji Shimizu, Tokyo, Japan, assignor to Fukuda Denshi Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 443,562, Nov. 29, 1989, abandoned, which is a continuation of Ser. No. 265,593, Nov. 1, 1988, abandoned. This application Nov. 6, 1990, Ser. No. 609,143

Claims priority, application Japan, Dec. 7, 1987, 62-185462; Aug. 29, 1988, 63-112971

Int. Cl.⁵ A61N 1/04; A61B 5/04

U.S. Cl. 128—640

7 Claims

1. A pad for securing a stimulus electrode plate on a living body, the stimulus electrode plate being provided with first and second electrode plates positioned close to each other and

5,085,215

METABOLIC DEMAND DRIVEN RATE-RESPONSIVE PACEMAKER

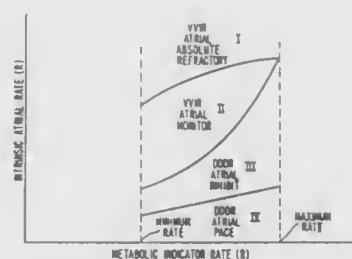
Tibor A. Nappholz, Englewood, Colo.; Scott Swift, Miami, Fla.; John R. Hamilton, and Matthew J. Gani, both of Littleton, Colo., assignors to Teletronics Pacing Systems, Inc., Englewood, Colo.

Filed Mar. 20, 1990, Ser. No. 497,002

Int. Cl.⁵ A61N 1/368

U.S. Cl. 128—419 PG

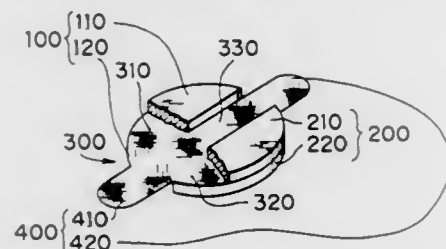
78 Claims



12. A dual-chamber rate-responsive pacemaker, comprising: means for generating ventricular pacing pulses; means for sensing atrial heartbeats; means for determining a metabolic indicator rate; means for deriving a maximum atrial tracking rate as a function of said metabolic indicator rate; means for comparing said maximum atrial tracking rate with the rate of operation of said atrial heartbeat sensing means over a plurality of cardiac cycles, and depending on the pattern of the results of the comparison for classifying whether the atrial heartbeat rate is physiological or pathological; and control means operative when the atrial heartbeat rate is physiological for keying the operation of said ventricular pacing pulse generating means to the operation of said atrial heartbeat sensing means, and operative when the atrial heartbeat rate is pathological for keying the operation of said ventricular pacing pulse generating means to said metabolic indicator rate independent of the operation of said atrial heartbeat sensing means.

integral with a body of a low frequency medical treatment apparatus, the pad comprising:

- an insulated substrate sheet having a profiled portion and provided with a grip projecting outwardly from the profiled portion, said profiled portion having a front side confronting the living body and a rear side confronting the stimulus electrode plate, said profiled portion having a first portion, a second portion and a center portion defined between the first and second portions;
- a first pad disposed on said first portion, said first pad having a first gelhydrate layer and a second gelhydrate layer, said first gelhydrate layer being positioned on said front side of said first portion, and said second gelhydrate layer being positioned on said rear side of said first portion, said first



- and second gelhydrate layers being electrically connected to each other, and having conductive and adhesive characteristics; and
- a second pad disposed on said second portion, said second pad having a third gelhydrate layer and a fourth gelhydrate layer, said third gelhydrate layer being positioned on said front side of said second portion, and said fourth gelhydrate layer being positioned on said rear side of said second portion, said third and fourth gelhydrate layers being electrically connected to each other, and having conductive and adhesive characteristics; and
- said second and fourth gelhydrate layers being adhesively mountable on the first and second electrode plates, respectively.

5,085,218

BIPOLAR MYOCARDIAL POSITIVE FIXATION LEAD WITH IMPROVED SENSING CAPABILITY

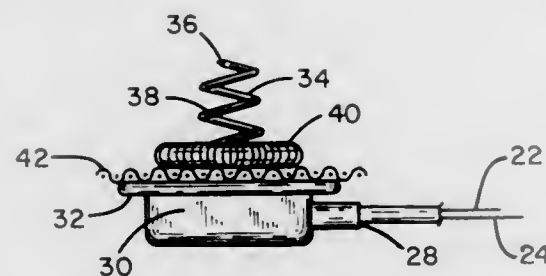
Ronald W. Heil, Jr., Roseville; Robert W. Wickham, Jr., Harris, and Edward D. Kubitschek, Shoreview, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Aug. 31, 1990, Ser. No. 575,879

Int. Cl.⁵ A61B 5/0402; A61N 1/05

U.S. Cl. 128—642

7 Claims



1. A bipolar, positive fixation myocardial screw-in lead comprising:
 - (a) an elongated flexible plastic lead body having a proximal end and a distal end;
 - (b) first and second elongated flexible conductors extending through said lead body from said proximal end to said distal end, said first and second conductors being insulated from one another within said lead body;
 - (c) an enlarged insulating electrode supporting lead head

affixed to said distal end of said lead body, said lead head having a generally planar exterior surface;

- (d) a first conductive, generally rigid, helically-shaped electrode of open convolutions having one end supported by said head and extending normally to said planar exterior surface and terminating in a free end and being electrically connected to said first conductor;
- (e) a second conductive, generally rigid, helically-shaped electrode of substantially open but closely spaced convolutions sufficient to allow tissue ingrowth and formed as an annulus of generally round cross-section and supported on said planar exterior surface surrounding said first electrode, said second electrode being electrically connected to said second conductor.

5,085,219

ADJUSTABLE HOLDERS FOR MAGNETIC REASONANCE IMAGING RF SURFACE COIL

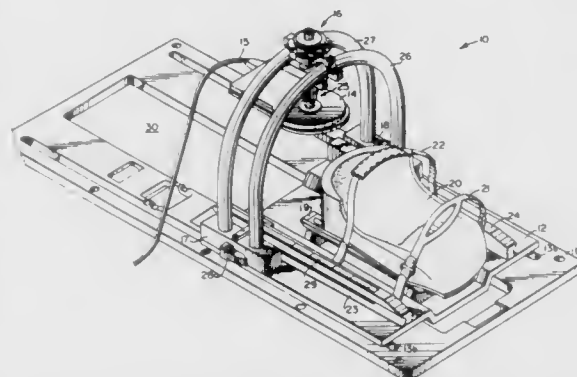
Douglas A. Ortendahl; Brenda G. Nichols, both of S. San Francisco; Ernesto Zepeda, Daly City; Matthias Gyori, Redwood City, and Louis T. Kircos, Sausalito, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 30, 1987, Ser. No. 114,343

Int. Cl.⁵ A61B 5/055

U.S. Cl. 128—653.5

19 Claims



1. An adjustable holder for a magnetic resonance imaging RF surface coil for imaging a body part, said holder comprising:
 - first adjusting means for allowing movement of said magnetic resonance imaging RF surface coil to a first predetermined point along a longitudinal axis of said holder, said first positioning means consisting essentially of
 - (a) means for allowing orbital movement of said magnetic resonance imaging RF surface coil about said longitudinal axis;
 - (b) means for allowing movement of said magnetic resonance imaging RF surface coil along a path transverse to said longitudinal axis to a predetermined radial distance from said longitudinal axis; and
 - (c) means for allowing pivotal movement of said magnetic resonance imaging RF surface coil in a step-wise manner about an axis substantially parallel to said longitudinal axis; and
 - second adjusting means for allowing movement of said holder in a direction parallel to said longitudinal axis to said second predetermined point.

5,085,220

DOPPLER FLOW SENSING DEVICE AND METHOD FOR ITS USE

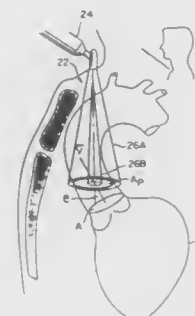
Bruce M. Nudell; Robert R. Entekin, both of King County, Wash.; Robert Skidmore, Bitton, and Nicholas P. Luckman, Bristol, both of Great Britain, assignors to SpaceLabs, Inc., Redmond, Wash.

Filed Oct. 5, 1989, Ser. No. 417,525

Int. Cl.⁵ A61B 8/06

U.S. Cl. 128—661.09

34 Claims



1. A method for locating the flow of a fluid through a vessel in a body, comprising the steps of:
 - (a) producing a first ultrasonic transducer having a first directivity pattern;
 - (b) producing a second transducer, including an array of transducer elements, each transducer element having a distinct directivity pattern which is different from the directivity pattern of the first transducer;
 - (c) generating a transmitting signal;
 - (d) driving the first ultrasonic transducer by said transmitting signal to transmit ultrasonic energy into the body;
 - (e) receiving the transmitted ultrasonic energy that is reflected within the body through each transducer element in the second ultrasonic transducer;
 - (f) producing a received signal from the ultrasonic energy received by each transducer element in the second transducer; and
 - (g) processing the received signals to produce a signal representative of a direction to move the first transducer to locate the flow of the fluid.

5,085,221

ULTRASONIC IMAGING PROBE

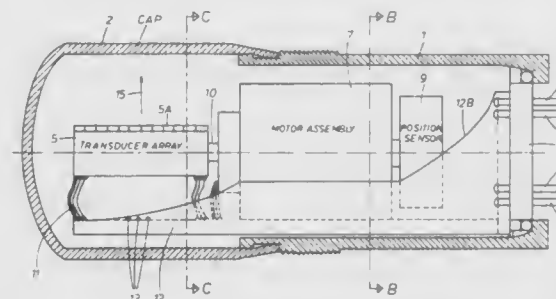
Kjell A. Ingebrigtsen, Trondheim, Norway, and William C. Aurand, Lewistown, Pa., assignors to Interspec, Inc., Ambler, Pa. and Vingmed Sound A/S, Norway

Filed Jun. 14, 1990, Ser. No. 538,109

Int. Cl.⁵ A61B 8/12

U.S. Cl. 128—660.1

20 Claims



1. An ultrasonic diagnostic scanning probe, comprising:
 - a substantially cylindrical housing (1) having a peripheral wall and a longitudinal axis;
 - an end cap (2) mounted on said housing (1) and closing a

forward end of the housing, said end cap having an inner periphery;

- a multielement ultrasonic transducer array (5) formed of a plurality of elongated transducer elements (5A) disposed in substantially parallel, side-by-side relation and operable for emitting an ultrasonic beam from said array (5) in a main ultrasonic emitting direction (15);
- an operatively-rotatable axle (10) carrying said transducer array (5) for rotating the array and extending substantially transverse to the elongation of said transducer elements (5A) and to said main ultrasonic emitting direction (15);
- drive means (7) for rotating said rotatable axle (10), said drive means being substantially centrally disposed within said housing (1) and defining a longitudinally-extending, cross-sectionally arcuate passageway between said drive means (7) and said housing peripheral wall;
- a flexible first flat cable (11) comprising a plurality of electrical conductors connected at one end to said transducer array (5), said first cable (11) extending substantially radially outwardly from said array (5) toward and proximate to said end cap inner periphery; and
- a second flat cable (12) comprising a plurality of electrical conductors at least equal in number to said plurality of conductors of said first cable (11), said second cable (12) extending within and along said passageway and substantially parallel to said housing axis, and having an arcuate cross-sectional configuration for facilitating accommodation of the second cable (12) in said passageway.

5,085,222

Patent Not Issued For This Number

5,085,223

MINIATURIZED PRESSURE SENSOR HAVING MEANS FOR PROTECTION OF DIAPHRAGM

Tenerz Lars, Ringgatan; Håk Bertil, Sportfiskargatan; Lonn Roman; Hammarström Ola, both of Flogstavägen, and Engström Tomas, Karlsrogatan, all of Sweden, assignors to Radi Medical Systems AB, Uppsala, Sweden

PCT No. PCT/SE89/00422, § 371 Date Mar. 28, 1990, § 102(e) Date Mar. 28, 1990, PCT Pub. No. WO90/01294, PCT Pub. Date Feb. 22, 1990

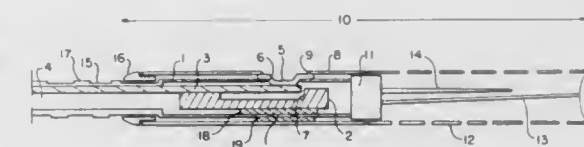
PCT Filed Jul. 28, 1989, Ser. No. 469,555

Claims priority, application Sweden, Jul. 29, 1988, 8802765

Int. Cl.⁵ A61B 5/02

U.S. Cl. 128—675

10 Claims



1. A miniaturized pressure transducer assembly, comprising:
 - an outer tube;
 - an inner tube disposed coaxially therein, thereby defining an annular space therebetween, said inner tube being in communication with atmospheric pressure;
 - an annular joint located between a proximal end of said outer tube and an exterior wall of said inner tube;
 - said inner and outer tubes each having a cooperating aperture defined near distal ends thereof;
 - a diaphragm filling said aperture, said diaphragm being disposed in said annular space;
 - a pressure transducer unit disposed within said inner tube, said pressure transducer unit moved by a movement of said diaphragm; and
 - a distal end cap attached to said inner and outer tubes.

5,085,224

PORTABLE SIGNALLING UNIT FOR AN EKG

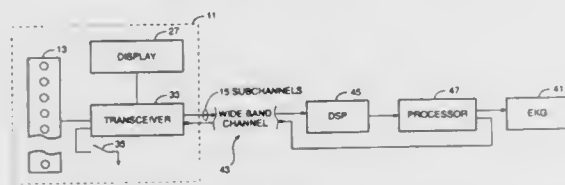
Peter M. Galen; Susan R. Hart, and William E. Saltzstein, all of McMinnville, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 25, 1990, Ser. No. 529,015

Int. Cl.⁵ A61N 5/0402

U.S. Cl. 128—696

11 Claims



1. A portable unit for monitoring EKG functioning comprising,
- a terminal block having wire contact means connected to the block for terminating EKG leadwires from a subject to be connected to the leadwires,
 - a signal transceiver housed in the block and communicating with said wire contact means, having means for encoding signals from the wire contact means for transmission to a remote EKG and having receiver means for decoding signals from a remote source associated with the EKG,
 - a bidirectional communications channel connected to said signal transceiver on one end and having a remote second end connected to the remote source, the channel carrying signals in both directions therebetween,
 - signal processor means connected to the EKG apparatus and to said remote second end of the communications channel for evaluating the quality of signals received from said transceiver.

5,085,225

ELECTRODE MATRIX FOR MONITORING BACK MUSCLES

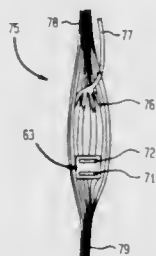
Carlo J. DeLuca, Wellesley, and Serge H. Roy, Duxbury, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed May 30, 1990, Ser. No. 530,324

Int. Cl.⁵ A61B 5/0492

U.S. Cl. 128—733

20 Claims



1. A method for analyzing muscle function comprising the steps of:
- forming a plurality of electrodes each having a pair of elongated, substantially parallel detection surfaces;
 - locating in a human body a muscle group activatable to produce a given torque;
 - fixing each of said electrodes over a different muscle in said group with said detection surfaces oriented substantially perpendicular to muscle fiber direction in said muscle;
 - activating each of said different muscles in said group to generate therein myoelectric signals detected by said electrodes; and
 - processing said myoelectric signals detected by said electrodes.

5,085,226

FORCE MONITORING APPARATUS FOR BACK MUSCLES

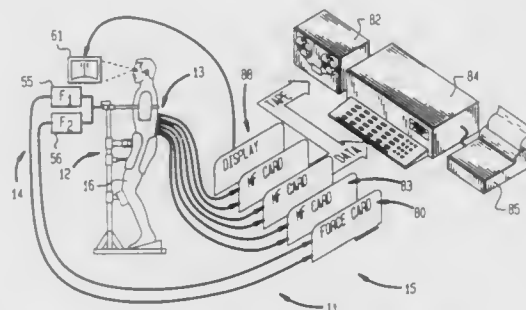
Carlo J. DeLuca, and L. Donald Gilmore, both of Wellesley, Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed May 30, 1990, Ser. No. 530,300

Int. Cl.⁵ A61B 5/0488

U.S. Cl. 128—733

17 Claims



1. A muscle function analysis system comprising:
- base means;
 - restraint means supported by said base means and shaped and arranged for receiving and immobilizing one portion of a person's body, said one portion retaining a muscle group concurrently activatable to produce a body function;
 - electrode means adapted for coupling to said muscle group for receiving myoelectric signals generated by muscle activity therein;
 - processing means coupled to said electrode means for processing said myoelectric signals;
 - constraint means supported by said base means and adapted for resisting body movement in response to muscle activity in said muscle group, said constraint means adapted for dividing the force generated by said muscle activity into a plurality of components, each corresponding to the relative force contributions of different muscles in said muscle group;
 - a plurality of sensors coupled to said constraint means and capable of independent actuation for providing said processing means with a plurality of outputs each dependent on the value of a different one of said components; and
 - indicator means coupled to said processing means and controlled thereby for providing the person with information determined by a comparison of said outputs.

5,085,227

CONDUCTIVE CUTANEOUS COATING FOR APPLYING ELECTRIC CURRENTS FOR THERAPEUTIC OR BEAUTY TREATMENT

Gérard Ramon, 31380 Montastruc-la-Conseillère, Gragnague, France

Filed Feb. 15, 1990, Ser. No. 480,613

Claims priority, application France, Feb. 15, 1989, 89 01949

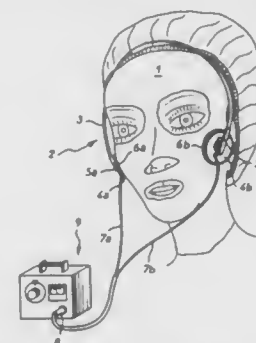
Int. Cl.⁵ A61N 1/18

U.S. Cl. 128—792

17 Claims

1. A disposable conductive cutaneous coating for application to an area of a person's skin for use in applying electric currents for therapeutic or beauty treatment, said coating comprising a layer of a settable composition, spread over an area of skin and having substantial electrical conductivity during setting but substantially no conductivity when set, the improvement wherein the composition is a gel progressively polymerizable when brought into contact with air and comprises a ternary

mixture consisting essentially of polyvinyl alcohol, ethanol and water, and a plastifier physiologically acceptable for topical



application, whereby upon setting the coating is removable from the person's skin.

5,085,228

STARCH BASED NATURAL ADHESIVES USED IN CIGARETTE MANUFACTURE

Neil T. Mooney; Judith M. Liddle; Wayne C. Wright, all of Slough, and Geoffrey Smith, Urmston, all of England, assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed May 21, 1990, Ser. No. 526,205

Int. Cl.⁵ A24C 5/24

U.S. Cl. 131—37

19 Claims

1. An adhesive composition for use in cigarette manufacturing comprising a starch composition which is a mixture of a crosslinked starch with a fluidity or converted starch, said starches having an amylopectin content of at least 70% by weight, and said starch composition prepared by cooking said starch mixture at a temperature of at least 100° C. and pressure of at least 30 psi, the adhesive composition having a solids content of about 10 to 60% and a Brookfield viscosity of about 500 to 20,000 cps at 22.5° C.

5,085,229

METHOD AND APPARATUS FOR FORMING CONTINUOUS CIGARETTE RODS

Bernard Tallier, Gorgier, and Michael Lauenstein, Cormondrèche, both of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

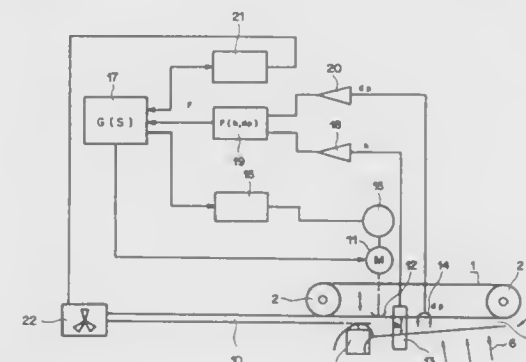
Filed May 21, 1990, Ser. No. 525,702

Claims priority, application Switzerland, May 25, 1989, 2012/89

Int. Cl.⁵ A21C 5/18

U.S. Cl. 131—84.4

13 Claims



1. Apparatus for forming a continuous rod in cigarette manufacture, comprising:
- a conveyor belt;
 - air flow suction means capable of conveying a flow of tobacco particles with the aspirated air and of concentrating

these particles in the form of a layer pressed against said conveyor belt; and

- means for controlling the thickness of said layer of tobacco comprising:
- a trimmer,
- first measurement means before said trimmer for measuring the porosity of said layer of tobacco,
- second measurement means before said trimmer for measuring the height of said layer of tobacco,
- signal processing means capable of producing a control parameter starting from measurement signals transmitted by said first and second measurement means, and
- adjustment means reacting to the instantaneous value of said parameter for adjusting the action of said trimmer.

5,085,230

SMOKER'S APPLIANCE

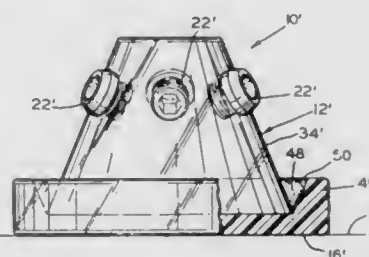
Bernard J. Roman, 7241 Wembley Ter., Toledo, Ohio 43617

Filed Sep. 13, 1990, Ser. No. 581,807

Int. Cl.⁵ A24F 19/14

U.S. Cl. 131—235.1

23 Claims



1. In a smoker's appliance for retaining a cigarette having at least one receptacle for a cigarette, the receptacle comprising:
- a tubular body having a longitudinally extending aperture of polygonal cross section formed therein, said aperture extending between an outer end and an inner end of said body and having walls for abutting and retaining a lighted end of a cigarette in a dormant state for an extended period of time, wherein said body has a radially outwardly extending flange formed at the outer end thereof.

5,085,231

HAT-LIKE APPARATUS FOR DIRECTING AIR FLOW

Ronald A. Johnson, Rte. 1, Box 254, Union Grove, N.C. 28689

Filed May 8, 1990, Ser. No. 520,669

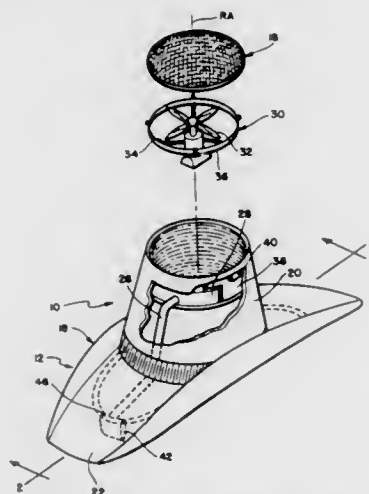
Int. Cl.⁵ A24F 13/00

U.S. Cl. 131—329

11 Claims

1. A hat-like apparatus for directing air adjacent the head of a person, comprising:
- a housing removably mountable on the person's head; and
 - means mounted to said housing, for directing a stream of air

to flow adjacent the person's head, said air directing means including means for selectively positioning an air



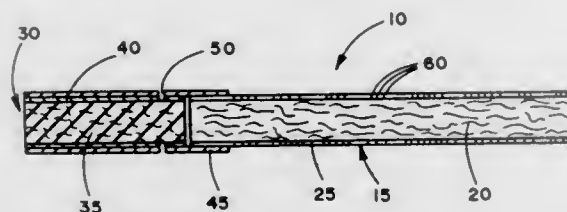
flow opening along a path extending at least partially about the person's head.

5,085,232 CIGARETTE

Mark L. Raker; William R. Cook, both of Clemmons, and Donna J. Wilson, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Jul. 12, 1990, Ser. No. 551,975
Int. Cl.⁵ A24D 1/02

U.S. Cl. 131-365

15 Claims



1. A cigarette comprising:
 - (a) a rod of smokable material contained in a circumscribing paper wrapping material thereby forming a smokable rod; the wrapping material (i) having a cellulosic base web containing inorganic filler including magnesium hydroxide, (ii) having a basis weight of greater than about 40 g/m², (iii) having organic acid in a disassociated and/or non-disassociated form which has been incorporated into the paper in non-disassociated form, and (iv) including water soluble alkali metal salt in an amount greater than about 35 mg alkali metal ions per gram of dry base web, the paper having a weight ratio of potassium ions to sodium ions within the paper of greater than about 100:1;
 - (b) a filter element positioned adjacent one end of the tobacco rod; and
 - (c) tipping material circumscribing the filter element and an adjacent region of the tobacco rod.

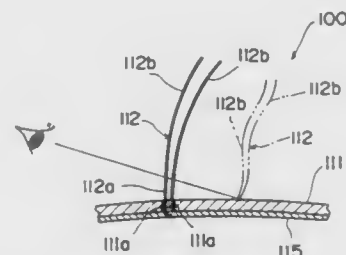
5,085,233 WIG HAVING COLORLESS CAMOUFLAGE ROOT PORTIONS

Nobumoto Motoori, and Kousuke Mochizuki, both of Tokyo, Japan, assignors to Aderans Co., Ltd., Tokyo, Japan
Filed Dec. 14, 1989, Ser. No. 450,479
Claims priority, application Japan, Dec. 29, 1988, 62-170231[U]

Int. Cl.⁵ A41G 5/00

U.S. Cl. 132-54

13 Claims



1. A wig comprising:
 - a wig base having an outer convex surface, and formed of at least one material selected from the group consisting of synthetic skin and net;
 - a plurality of hairs planted to said outer convex surface of said wig base, wherein
 - each of said hairs has a pair of hair sections and a colorless camouflage portion located between said pair of hair sections, said camouflage portion being fixedly mounted to said wig base.

5,085,234 FINGERNAIL SHIELDING METHOD

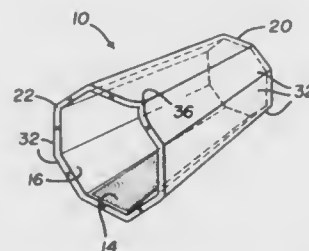
Gloria Silverman, 7491 NE. Federal Hwy. C-5 #186, Boca Raton, Fla. 33487

Filed Dec. 14, 1990, Ser. No. 633,218

Int. Cl.⁵ A45D 29/00

U.S. Cl. 132-73

3 Claims



1. A method of protecting drying polish on the nail of a finger, using a shield in the form of a tube having a cross-section formed of a plurality of essentially flat sides, and having an inner surface coated with an adhesive, the adhesive being a strip of tape having adhesive on both sides, comprising the steps of:
 - securing the strip of tape on the inside of the tube along one of the plurality of essentially flat sides,
 - placing the shield around the finger and over the nail, without touching the nail,
 - orienting the shield so that the adhesive is adjacent to the side of the finger opposite the nail,
 - pressing the side of the finger opposite the nail against the adhesive to secure the shield to the finger,
 - leaving the shield secured to the finger until the polish hardens,
 - pulling the finger out of the adhesive and withdrawing the finger from the shield.

5,085,235 REFLEXOLOGY NAIL STIMULATOR

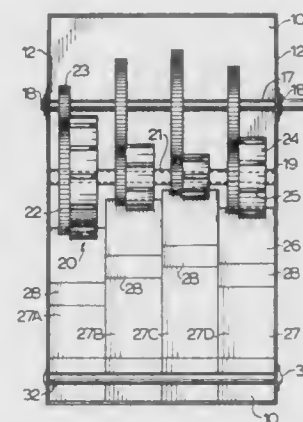
William Rossmo, 158 Mt. Allison Crescent, Saskatoon, Saskatchewan, Canada S7H 4A5

Filed Aug. 10, 1989, Ser. No. 392,080

Claims priority, application Canada, Aug. 12, 1988, 574677
Int. Cl.⁵ A45D 29/05

U.S. Cl. 132-75.8

20 Claims



1. A reflexology stimulating device for fingernails comprising a base, a plurality of finger supporting means on said base for supporting respective fingers thereon, individual non-abrasive fingernail contacting stimulator means for each finger, means mounting the stimulator means in positions confronting and spaced from the respective finger supporting means, and stimulator actuating means for periodically moving the fingernail contacting stimulator means towards and away from the respective finger supporting means thereby to make periodic contact with the fingernails of the fingers supported by said supporting means.

5,085,236 DENTAL FLOSS MACHINE

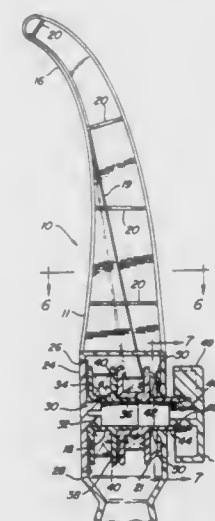
Billie L. Odneal, 309 Telegraph Rd., Apt. #3, Pontiac, Mich. 48053, and Charles S. Seidel, 436 Girard St., Royal Oak, Mich. 48087

Filed Jan. 3, 1991, Ser. No. 637,320

Int. Cl.⁵ A61C 15/00

U.S. Cl. 132-325

7 Claims



1. A dental flossing attachment for a power toothbrush having an oscillating drive shaft comprising:

an elongated housing having a receptacle at a first end removably connected to the drive shaft;
a pair of spaced prongs at a second end of the housing;
a supply spool mounted for rotation about an axis on an intermediate portion of said housing between said first and second ends;
a take-up spool separately connected to said supply spool for rotation about said axis independently of said supply spool and being selectively locked to said supply spool;
a supply of dental floss wound around said supply spool and extending from said supply spool to said second end between said spaced prongs and to said take-up spool;
means for holding floss tightly between said pair of prongs wherein said supply spool is held against rotation; and
means located between a face of said take-up spool and said housing for biasing said take-up spool into engagement with said supply spool.

5,085,237 ASBESTOS REMOVAL EQUIPMENT

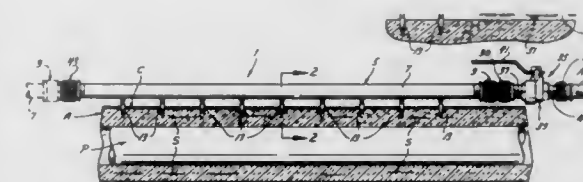
Charles J. Milligan, 2635 Summit, St. Louis, Mo. 63114

Filed Aug. 10, 1989, Ser. No. 392,372

Int. Cl.⁵ B08B 3/02

U.S. Cl. 134-104.2

11 Claims



1. Apparatus for removing an asbestos type insulation material from around appliances, and pipes the insulation being covered by a hardened shell, the apparatus comprising: wetting means including at least one fluid injector adapted for puncturing the hardened cover, for penetrating at least partially through the thickness of the insulation and for injecting a wetting solution into the insulation thus penetrated, fluid delivery means for delivering a fluid such as a surfactant to the wetting means, to be discharged into the insulation to saturate the insulation so it can be removed.

5,085,238 VAPOR DEGREASING APPARATUS

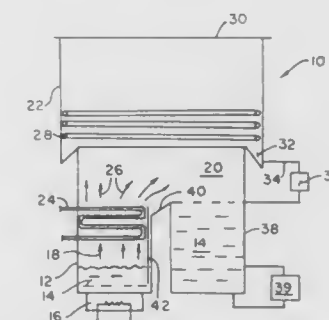
Ronald S. Baldwin, Shelton, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Mar. 4, 1991, Ser. No. 663,730

Int. Cl.⁵ B08B 7/04

U.S. Cl. 134-105

7 Claims



1. In a vapor degreasing apparatus the combination of a first chamber comprising a boiling sump having first heating means for raising the temperature of a liquid solvent contained therein to its boiling point for providing solvent in its vapor state; a second chamber communicating with said first chamber for

receiving the solvent in its vapor state in a vapor zone area and including condensing means disposed above the vapor zone area for condensing the solvent and returning it to its liquid state, and means for returning the liquid state solvent from said second chamber to said first chamber, the improvement comprising second heating means disposed for raising the temperature of the vapor state solvent in said first chamber to a superheated state before the vapor state solvent responsive to convection flow is received in the vapor zone area of said second chamber.

5,085,239

STRUCTURE OF SAFETY UMBRELLA

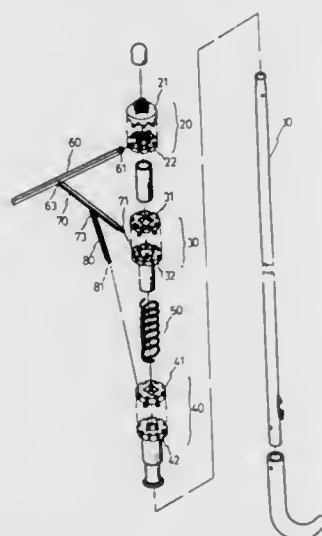
Teng Chin-Hung, No. 12, Alley 2, Lane 186, Sec. 2, San Ming Rd., Panchiao City, Taipei Hsien; Lin-chang Zou, No. 117, Sec. 2, Chung Shan Rd., Kuang Fu Hsien, Hua Lien Hsien, and Frank Yu, No. 25, Lih Hsing La., Lih Hsing St., I Lan City, 1 Lan Hsien, all of Taiwan

Filed Feb. 5, 1991, Ser. No. 650,854

Int. Cl.⁵ A45B 19/00

U.S. Cl. 135—25.33

1 Claim



1. An umbrella comprising an umbrella cover stretched over a plastic folding radial frame, said plastic folding radial frame being comprised of a main shaft with an upper nest plate fixedly secured thereto at the top, an intermediate nest plate movably mounted thereon at the middle and a lower nest plate movably mounted thereon at a lower position, a plurality of main ribs having each an end fastened in said upper nest plate for securing said umbrella cover, a plurality of auxiliary ribs having each an end pivotably fastened in said main ribs and an opposite end pivotably fastened in said intermediate nest plate, and an opposite end pivotably fastened in said lower nest plate, and characterized in that:

said upper, intermediate and lower nest plates are identical in structure and each comprised of an upper circular member connected with a lower circular member, said upper circular member comprising a plurality of pawls and retaining holes symmetrically made at the bottom around an axle hole made at the center thereof, and a plurality of notches equidistantly made around its periphery, said notches having each a crossed retaining groove extending therefrom at two opposite sides, said lower circular member having a plurality of pawls and retaining holes at the top around an axle hole at the center thereof for connection with the pawls and retaining holes of said upper circular member respectively, and a plurality of openings around its periphery corresponding to the notches of said upper circular member, said openings having each a crossed retaining groove extending therefrom at two

opposite sides and corresponding to the crossed retaining groove of said upper circular member; said main ribs being relatively longer than said auxiliary ribs and said supporting ribs, having a flat projecting portion at its one end with two opposite dowels bilaterally extending outward therefrom, and an elongated sloping groove at its bottom and gradually reduced from a wider entrance, and two unitary flanges bilaterally disposed at said wider entrance with a small hole each made thereon; said auxiliary ribs having each two opposite dowels bilaterally respectively extending outward from each of the two flat projecting portions at the two opposite ends thereof, an elongated sloping groove at the bottom, and two unitary flanges bilaterally disposed at the middle of the elongated sloping groove thereof with a small hole each made thereon;

said supporting ribs being relatively shorter, having each two opposite dowels bilaterally respectively extending outward from each of the two flat projecting portions at the two opposite ends thereof for connection to the flanges of said auxiliary ribs and said lower nest plate; said umbrella cover being made in shape for stretching over said folding radial frame, having a plurality of corners around its periphery, a fastening cap each at said corners for securing the opposite end of said main ribs, and a plurality of snap fastening elements on each radial line thereof for securing said main ribs to the umbrella cover.

5,085,240

SHELTER STRUCTURE

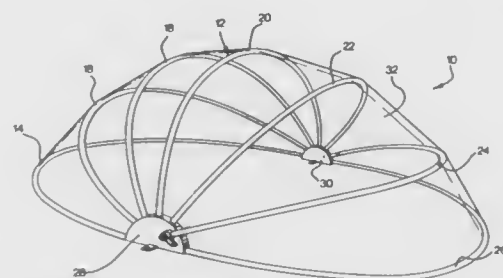
Tomislav F. Littledeer, 1961 Gertrude, Chambly, Quebec, Canada J3L 4G3

Filed May 24, 1991, Ser. No. 705,592

Int. Cl.⁵ E04H 15/48

U.S. Cl. 135—109

13 Claims



1. A shelter structure, comprising:

- a supporting framework including a pair of spaced apart rib holders, each of said rib holders comprising a plurality of stationary receptacles;
- a plurality of rib members radiating from said rib holders and extending therebetween to form a skeleton frame, said rib members having end portions removably mounted to respective stationary receptacles of said rib holders;
- a flexible skin covering at least part of said skeleton frame; and
- a movable receptacle mounted for movement to each rib holder, the movable receptacle being capable to removably receive the end portions of a rib member, whereby to erect said shelter said rib members are mounted in stationary receptacles of said rib holders to form said skeleton frame, said flexible skin is mounted to said skeleton frame and a selected rib member is transferred from respective stationary receptacles to movable receptacles allowing the selected rib member to move relatively to said supporting framework.

5,085,241

PROCESS FOR CONTROLLING A LEAKAGE CAVITY OF A VALVE AND AN APPARATUS THEREFOR

Hans O. Mieth, Sandkrug 3, D-2058 Schnakenbek, Fed. Rep. of Germany

PCT No. FCT/EP88/00027, § 371 Date Sep. 2, 1988, § 102(e)

Date Sep. 2, 1988, PCT Pub. No. WO88/05512, PCT Pub.

Date Jul. 28, 1988

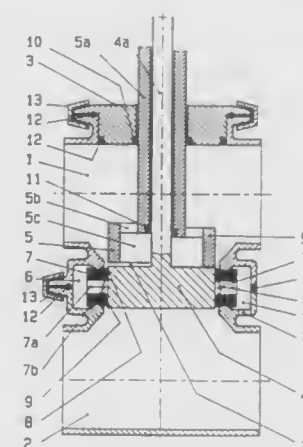
PCT Filed Jan. 15, 1988, Ser. No. 252,364

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1987, 3701027

Int. Cl.⁵ F16K 11/20, 51/00; B08B 9/00

U.S. Cl. 137—1

63 Claims



1. A process for controlling a leakage cavity of a valve having a valve casing defining a first interior volume and a second interior volume, the valve being provided with a closing member, two sealing places disposed in series on the valve casing and a leakage cavity disposed between the sealing places and connected to the interior volumes of the valve casing via a connection and to the outside of the valve via a flow passage in the valve casing, the sealing places cooperating with the closing member (1) to prevent the flow of fluid between the first interior volume and the second interior volume and (2) to completely close off the connection of the leakage cavity to the interior volumes of the valve casing in a closed position of the valve, comprising:

controlling the connection between the leakage cavity and the interior volumes of the valve casing in positions other than the closed position of the valve, when the first and second interior volumes are in fluid communication with one another, by placing another element in cooperation with the two sealing places to close the connection between the leakage cavity and the interior volumes of the valve casing when the valve is in positions other than the closed position.

5,085,242

METHOD AND APPARATUS FOR THE REMOVAL OF BLACK OIL RESIDUES FROM TANKS

Ian Ripley, and Anthony H. Needham, both of Cleveland, Great Britain, assignors to Great Eastern (Bermuda) Ltd., New York, N.Y.

Filed Jan. 16, 1990, Ser. No. 464,873

Claims priority, application United Kingdom, Feb. 1, 1989, 8902172

Int. Cl.⁵ B08B 3/10; F17D 1/18

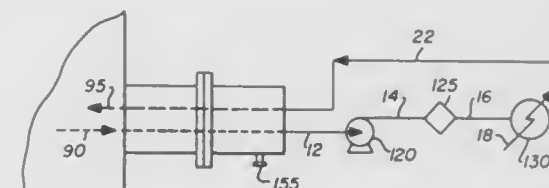
U.S. Cl. 137—13

19 Claims

1. A process for the mobilization and removal of black oil residue from an enclosed tank characterized in:

- a) having a layer of mobilized black oil residue formed over a layer of water within the tank;
- b) heating at least a portion of the black oil residue by a heating means located inside of the tank to the extent that

at least the portion of the black oil residue becomes mobilized above the water layer; and then



c) removing the mobilized black oil residue from the tank by localized negative pressure located at the portion of the residue which has become mobilized.

5,085,243

HYDRAULIC ISOLATION VALVE FOR RAILWAY VEHICLE

Padmanab L. Gowda, Greer, S.C., assignor to Westinghouse Air Brake Company, Spartanburg, S.C.

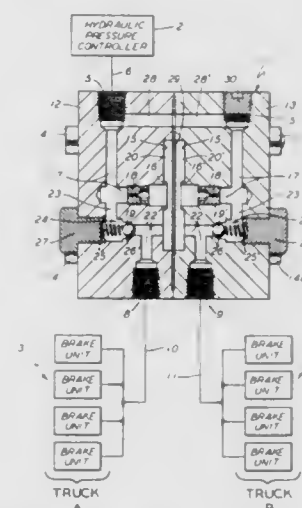
Continuation-in-part of Ser. No. 655,474, Feb. 14, 1991,

abandoned. This application May 29, 1991, Ser. No. 708,118

Int. Cl.⁵ F60T 17/18

U.S. Cl. 137—118

10 Claims



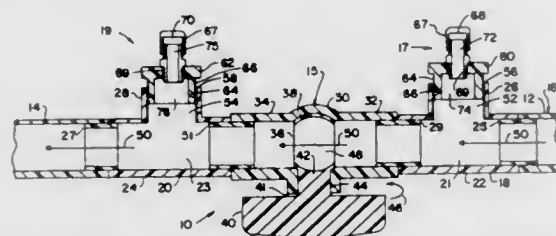
1. In a hydraulic brake system of a railway vehicle, an isolation valve device for interrupting hydraulic pressure communication between a hydraulic pressure controller and the brake units of one truck of the railway vehicle when a hydraulic leak exists thereat, without interrupting hydraulic pressure communication between the pressure controller and the brake units of the other truck of the railway vehicle, said isolation valve device comprising:

- (a) a primary inlet connected to hydraulic pressure controller;
- (b) first and second outlets connected to the brake units of said one truck and said other truck of said railway vehicle, respectively;
- (c) a cavity;
- (d) a diaphragm member separating said cavity into first and second chambers, each said chamber having an annular valve seat with which the respective opposing sides of said diaphragm are cooperatively arranged to provide first and second flow control valves;
- (e) a first passageway between said primary inlet and said first outlet, said valve seat of said first chamber separating said first passageway into an upstream portion and a downstream portion;
- (f) a second passageway between said primary inlet and said second outlet, said valve seat of said second chamber separating said second passageway into an upstream por-

- tion and a downstream portion, said primary inlet being common to said upstream portion of said first and second passageways;
- (g) first and second fluid flow restrictors in said upstream portions of respective ones of said first and second passageways;
- (h) first and second bypass passages between said upstream and downstream portions of respective ones of said first and second passageways; and
- (i) first and second one-way check valves in said first and second bypass passages, respectively.

5,085,244

ASSEMBLY FOR CLEANING A DRAIN CONDUIT
Douglas H. Funk, 6103 Lakefront Dr., Fort Myers, Fla. 33908
Filed Mar. 14, 1991, Ser. No. 669,367
Int. Cl.⁵ B08B 3/04, 9/06; F16K 5/06
U.S. Cl. 137—240 12 Claims



1. An assembly for cleaning a drain conduit comprising: first and second conduit sections that are communicably connected to respective upstream and downstream sections of said drain conduit;
- valve means attachably interconnecting said first and second conduit sections;
- means for selectively opening said valve means to permit communication between said first and second conduit sections and closing said valve means to restrict communication between said first and second conduit sections;
- a first connector section communicably attached to and extending transversely from said first conduit section and having first engagement means that are selectively engaged by one of a pressure source and a vacuum source to introduce, when said valve means are closed, one of a pressure and vacuum, respectively, into said first conduit section, whereby said upstream section of said drain conduit is cleaned of blockages and debris therein; and
- a second connector section communicably attached to and extending transversely from said second conduit section and having second distinct and spaced apart engagement means that are selectively engaged by one of a pressure source and a vacuum source to introduce one of a pressure and vacuum, respectively, into said second conduit section, whereby said downstream section of said drain conduit is cleaned of blockages and debris therein.

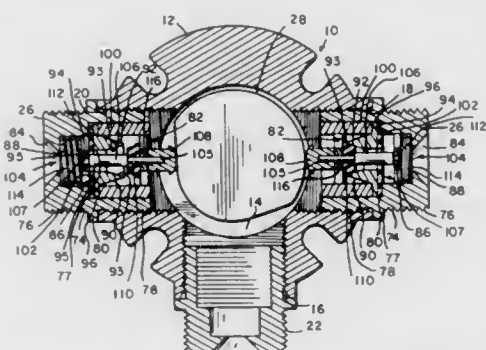
5,085,245

FLOW CONTROL VALVE CARTRIDGE
Lee A. Grove, Elkhart, Ind., assignor to Remote Controls, Inc., Mishawaka, Ind.
Continuation-in-part of Ser. No. 532,064, Jun. 1, 1990, which is a continuation-in-part of Ser. No. 427,255, Oct. 25, 1989, Pat. No. 4,947,886, which is a continuation-in-part of Ser. No. 341,474, Apr. 21, 1989, Pat. No. 4,884,595. This application Dec. 4, 1990, Ser. No. 621,777
Int. Cl.⁵ F16K 11/18, 43/00, 55/14
U.S. Cl. 137—454.5 15 Claims

1. A flow control device, comprising
a body having a fluid-holding chamber therein;
the body having an inlet port opening into the chamber for coupling the chamber to a supply of a fluid flow under a

positive pressure and an outlet port opening into the chamber; and
a valve cartridge removably received in at least one of the inlet and outlet ports of the body of the flow control device;

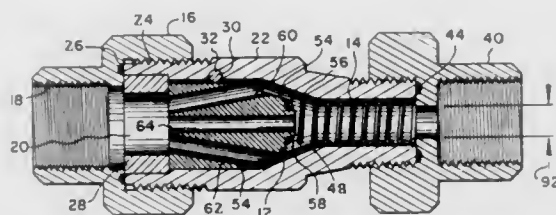
said valve cartridge comprising a body having an inlet, an outlet, and a fluid flow passageway extending therebetween, a collapsible tubing mounted in the fluid flow passageway, the collapsible tubing having an inlet opening to the inlet of the valve cartridge's body and an outlet opening to the outlet of the valve cartridge's body, and means secured in the fluid flow passageway for selectively



blocking and unblocking the inlet of the collapsible tubing to block and unblock fluid flow therethrough, and actuating means, disposed in the fluid-holding chamber, for actuating said selectively blocking and unblocking means, wherein blocking the inlet of the collapsible tubing with said selectively blocking and unblocking means causes a decrease in pressure in the collapsible tubing downstream of its inlet which causes fluid pressure in the fluid flow passageway surrounding the collapsible tubing to collapse a portion of the collapsible tubing around said selectively blocking and unblocking means downstream of the collapsible tubing's inlet to further block fluid flow through the collapsible tubing and the valve cartridge.

5,085,246

PLURAL-RATE SURGE-SUPPRESSING VALVE
Ralph E. Grinke, Rte. 4, Box 55, Beloit, Wis. 53511
Filed May 22, 1990, Ser. No. 527,044
Int. Cl.⁵ F16K 17/30
U.S. Cl. 137—504 13 Claims



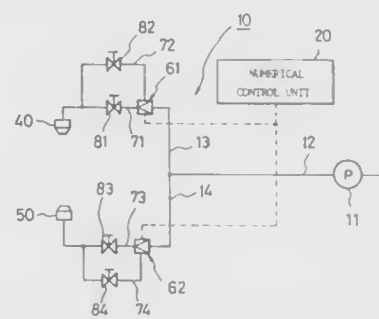
1. A plural-rate surge-suppressing fluid valve responsive to sudden increases in upstream flow, comprising
a valve body having inlet and outlet chambers;
a valve seat located between said chambers;
a movable cylindrical valve member having an upstream face in continuous communication with said inlet chamber and having first and second downstream faces, said first downstream face mating with said valve seat when the movable valve member is in a first position, and said second downstream face being in continuous communication with said outlet chamber, which as a smaller portion outlet bore having a cross-sectional area that is minutely restrictive of the full flow rate of said valve member, first

flow tubular passages means disposed at an angle from a centerline and extending from said upstream face to said first downstream face, wherein fluid-handling capability of said first flow tubular passages means being such as to pass substantially unimpeded only a fluid flow having a rate less than a predetermined allowable maximum;

second flow tubular passage means having a cross-sectional area less than said first flow passages and extending from said upstream face to said second downstream face, wherein fluid-handling capability of said second flow tubular passage means being restricted to a rate less than that of said first flow tubular passages means; and
means for resiliently urging said movable valve member away from said valve seat to a second position;
whereby the effect of the resilient urging means is overcome by the force of impeded fluid flow in said first flow tubular passages means upon the occurrence of a surge in excess of said predetermined allowable maximum flow of fluid through said valve to thereby move said valve member to said first position to close said first flow tubular passages means.

5,085,247

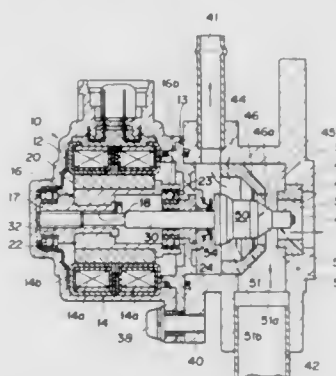
MACHINING FLUID SUPPLY DEVICE FOR A WIRE CUT ELECTRIC DISCHARGE MACHINE
Izumi Higashi, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP89/01220, § 371 Date Jul. 10, 1990, § 102(e) Date Jul. 10, 1990, PCT Pub. No. WO90/06202, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 5, 1989, Ser. No. 536,555
Claims priority, application Japan, Dec. 10, 1988, 63-311010
Int. Cl.⁵ B23H 7/36
U.S. Cl. 137—601 7 Claims



1. A machining fluid supply device for use with a wire cut electric discharge machine having upper and lower nozzles and adapted to carry out electric discharge in a desired one of a plurality of different machining modes including first and second machining modes, comprising:
a machining fluid supply source;
first and second supply lines respectively interposed between said machining fluid supply source and the upper nozzle;
third and fourth supply lines respectively interposed between said machining fluid supply source and the lower nozzle;
selector means for selectively permitting supply of machining fluid simultaneously through either said first and third supply lines or said second and fourth supply lines; and
control means for controlling said selector means;
wherein, in the first machining mode, the machining fluid is supplied from the upper and lower nozzles through the first and third supply lines at flow rates suited to the first machining mode, and in the second machining mode, the machining fluid is supplied through the second and fourth supply lines at flow rates suited to the second machining mode.

5,085,248

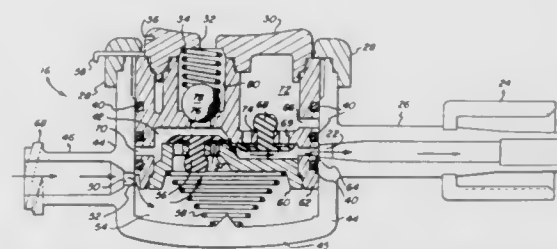
FLOW CONTROL DEVICE
Kouichi Iwata, and Katsuyoshi Fukaya, both of Oobu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Mar. 13, 1991, Ser. No. 668,630
Claims priority, application Japan, Mar. 26, 1990, 2-76491
Int. Cl.⁵ F16K 1/44, 11/02
U.S. Cl. 137—625.48 4 Claims



1. A flow control device comprising:
a casing with a single actuator incorporated therein;
an operating shaft projected from said casing and actuated for axial reciprocating motion by said actuator;
a fluid dispensing housing fixed to said casing and having an interior space in which said projecting, operating shaft is accommodated, said fluid dispensing housing having first and second fluid outlet ports and a single fluid inlet port;
a first valve seat provided within said housing in a position between said first fluid outlet port and said fluid inlet port to divide the interior space of the housing into first and second by-pass spaces, said first valve seat having an opening concentric with said operating shaft;
a second valve seat provided within said housing in association with said second fluid outlet port and having an opening concentric with said operating shaft; and
a single valve body fixed concentrically to said operating shaft in said housing and having two valve portions formed on the outer peripheral surface thereof contiguously with each other, said two valve portions being a first valve portion for controlling the flow rate of fluid in cooperation with the opening of said first valve seat and a second valve portion for controlling the flow rate of fluid in cooperation with the opening of said second valve seat.

5,085,249

VALVE FOR A VASCULAR DILATING DEVICE
William B. Dragan, Easton, and John J. Discko, Jr., Hamden, both of Conn., assignors to Centrix, Inc., Milford, Conn.
Filed Jun. 1, 1990, Ser. No. 531,575
Int. Cl.⁵ F16K 11/02
U.S. Cl. 137—879 6 Claims



1. An improved valve for use in a vascular dilating device for performing a coronary angioplasty procedure comprising:
a cup shaped body having a first and second aperture therein;

a piston, adapted to slide within said body and capable of being placed into a first and second position, having a plurality of chambers therein, a plurality of openings in the perimeter of the piston wall adjacent said body, and a passage extending substantially transversely from one end to the other;

biasing means, placed within said body, for biasing said piston upward into said first position forming an inlet chamber between the bottom of said piston and the bottom of said body;

one of said plurality of openings being on inlet chamber opening, said inlet chamber opening permitting flow between said first aperture and said inlet chamber when said piston is in said first position; and

a one way inlet valve permitting fluid to enter said passage from said inlet chamber;

one of said plurality of openings being a passage outlet opening, said passage outlet opening permitting flow between said passage and said second aperture when said piston is in said first position;

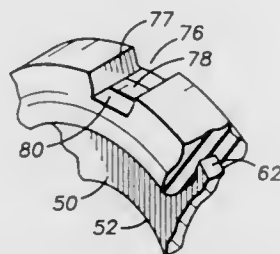
one of said plurality of chambers being a pressure release chamber;

one of said plurality of openings being a pressure release inlet opening permitting flow between said second aperture and said pressure release chamber when said piston is in said second position;

a one way outlet valve permitting fluid to enter said passage from said pressure release chamber;

one of said plurality of openings being a pressure release outlet opening, said pressure release outlet opening permitting flow between said passage and said first aperture when said piston is in said second position.

5,085,250
ORIFICE SYSTEM
Ray Kendrick, Katy, Tex., assignor to Daniel Industries, Inc., Houston, Tex.
Filed Dec. 18, 1990, Ser. No. 629,130
Int. Cl.⁵ F15D 1/02
U.S. Cl. 138—44 23 Claims



23. An orifice installation for measuring flow in pipes in which fluids may flow, comprising:

an orifice plate having an outer circumference;

a seal surrounding said outer circumference;

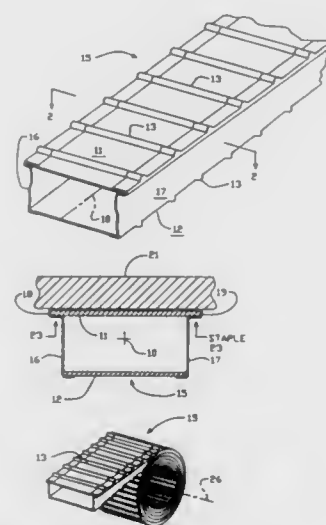
a plate carrying device having an interior opening sized to receive said orifice plate and said surrounding seal;

a fitting for holding said plate, said seal having a sealing surface sealingly engaging said fitting and a nonsealing surface;

said seal having grooves in said nonsealing surface exposing said outer circumference;

means for close tolerance contacting of said plate carrying device with said exposed outer circumference to center said orifice plate in said plate carrying device.

5,085,251
RECTANGULAR FLEXIBLE DUCT
Andrew Popelka, Acton, and Paul H. Sarkisian, Watertown, both of Mass., assignors to Electric Power Research Institute, Calif.
Filed Jun. 27, 1990, Ser. No. 544,840
Int. Cl.⁵ F16L 11/11
U.S. Cl. 138—119 5 Claims



1. A rectangular, collapsible and rollable heating and ventilating duct having a continuous extended length along a predetermined extended axis comprising:

top and bottom walls above and below said extended axis formed of relatively semi-rigid hard but flexible plastic-like material reinforced for rigidity by spaced rib means perpendicular to said extended axis but rollable around a roll axis with said ribs forming elements of said roll parallel to said roll axis;

a pair of side walls connecting said top and bottom walls to form an airtight duct, said side walls being relatively flexible and collapsible to allow said top and bottom walls to be pushed together and to allow the pushed together combination to be rolled up around said roll axis, said side walls accommodating the different effective roll diameters of said top and bottom walls.

5,085,252
METHOD OF FORMING VARIABLE CROSS-SECTIONAL SHAPED THREE-DIMENSIONAL FABRICS
Mansour H. Mohamed, Raleigh, N.C., and Zhong-Huai Zhang, Shanghai, China, assignors to North Carolina State University, Raleigh, N.C.
Filed Aug. 29, 1990, Ser. No. 574,693
Int. Cl.⁵ D03D 41/00, 47/04, 13/00
U.S. Cl. 139—22 14 Claims

1. A method for weaving a three-dimensional fabric having a variable predetermined cross-sectional shape comprising the steps of:

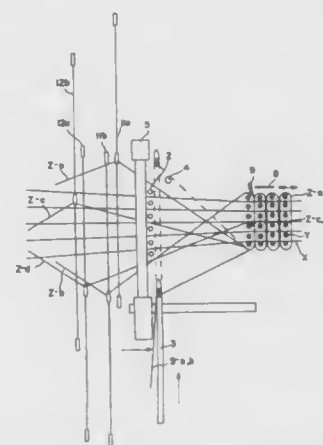
a. providing a plurality of layers of warp yarns which are in horizontal and vertical alignment and maintained under tension, said layers of warp yarns defining a variable predetermined cross-sectional shape;

b. selectively inserting a plurality of parallel weft yarns which are connected by a loop at the respective fore ends thereof into spaces between said layers of warp yarn, said parallel weft yarns being inserted a predetermined and differential horizontal distance from at least one side of said warp yarn cross-sectional shape in accordance with the shape of the fabric being formed;

c. threading selvage yarn through the loops at the fore ends of said weft yarns;

d. bringing a reed into contact with the fell of the fabric being formed;

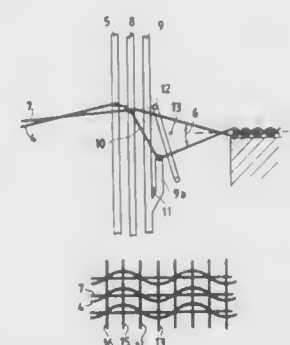
e. inserting vertical yarns into spaces between vertical rows of said warp yarns in a direction substantially perpendicular to both said warp and said parallel weft yarns, said vertical yarns being selectively threaded through a plural-



ity of harnesses so as to be separated into a predetermined plurality of vertically movable yarn systems by said harnesses in accordance with the shape of the fabric being formed, and said yarn systems being selectively vertically moved by said harnesses to insert said vertical yarns into said fabric; and

f. forming a three-dimensional fabric by repeating the steps (a)-(e) after insertion of said vertical yarns.

5,085,253
LENO WEAVING WITH STATIONARY WARP THREADS AND SHIFTING CROSS THREADS
Carmelo Motta, Via F.lli Baracca, 22 Monza (Milan), Italy
Filed Nov. 9, 1989, Ser. No. 433,791
Claims priority, application Italy, Nov. 15, 1988, 22624 A/88
Int. Cl.⁵ D03C 7/00
U.S. Cl. 139—50 5 Claims



1. A method of producing a leno or cross weaving texture alternating with successive weft insertions, a cross warp thread being crossed with at least one stationary warp thread alternately from one side to an opposite side of the stationary warp thread, said method comprising the steps of:

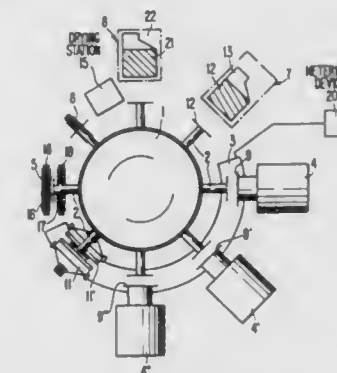
(a) providing a line segment connecting, at an upstream side of a beating reed, two planes perpendicular to the weaving plane, one of said two planes lying on one side of said stationary warp thread, the other of said two planes lying on the opposite side of said stationary warp thread, said line segment being formed by a longitudinal portion of said stationary warp thread;

(b) inclining said line segment so as to cause said line segment to cross the weaving plane alternately from an upper

side of said one plane to an under side of said opposite plane, and from an under side of said one plane to an upper side of said opposite plane; and

(c) moving said cross warp thread in a perpendicular direction relative to the weaving plane and above said line segment being inclined so that said cross warp thread during its movement is caused to slide along said inclined line segment toward said one plane or toward said opposite plane, so as to cross said stationary warp thread, thus producing the leno or cross weaving texture.

5,085,254
PROCESS AND DEVICE FOR THE CONTINUOUS FILLING OF FIBER STRUCTURE ELECTRODE FRAMES PROVIDED WITH CURRENT DISCHARGE USE
Otwin Imhof, Nürtingen, Fed. Rep. of Germany, assignor to Deutsche Automobilgesellschaft mbh, Fed. Rep. of Germany
Continuation of Ser. No. 373,444, Jun. 30, 1989, abandoned.
This application Jan. 7, 1991, Ser. No. 640,507
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822197
Int. Cl.⁵ H01M 4/28; B65G 49/04
U.S. Cl. 141—1.1 23 Claims



1. A process for continuous vibration filling with an active compound of discrete porous fiber structure electrode plaques for electric accumulators, each plaque having a current discharge lug, the process comprising the steps of:

a) transporting with a transport device an individual freely vertically suspended porous fiber structure electrode plaque secured by its current discharge lug to a vessel filled with a vibrating active compound;

b) immersing all sides of vertically suspended plaque in the vessel filled with a vibrating active compound;

c) transporting the vertically suspended plaque through the vibrating active compound until filled with the active compound;

d) removing the plaque from the vessel once filled;

e) cleaning excessive active compound from the plaque; and

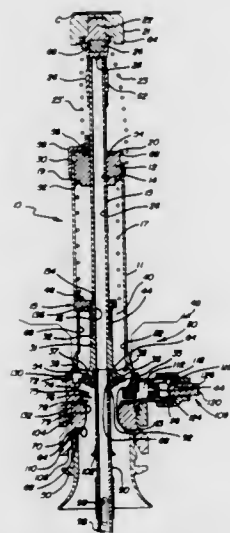
f) detaching the filled and cleaned plaque at a removal station from the transport device.

5,085,255
FILLING VALVE APPARATUS
Robert W. LaWarre, Sr., Cocoa, and Robert W. LaWarre, Jr., Titusville, both of Fla., assignors to Lawarre Precision Technologies Inc., Titusville, Fla.
Division of Ser. No. 550,729, Jul. 10, 1990, which is a continuation-in-part of Ser. No. 383,880, Jul. 20, 1989, Pat. No. 4,979,546, which is a continuation-in-part of Ser. No. 207,546, Jun. 16, 1988, abandoned. This application Mar. 25, 1991, Ser. No. 674,460
Int. Cl.⁵ B65B 3/18, 31/00
U.S. Cl. 141—39 9 Claims

1. A filling valve assembly for filling containers with a liquid, said assembly comprising:

housing means having an orifice for allowing liquid to flow therethrough and including an inlet for allowing liquid to flow into said housing means and said orifice, an outlet to allow liquid to flow out of said housing means and said orifice, and establishing a valve seat between said inlet and said outlet;

valve means movable within said orifice between said inlet and said outlet and including sealing means for moving against said valve seat for preventing liquid from flowing through said orifice to said outlet and moving away from said valve seat for allowing liquid to flow through said orifice to said outlet;



said valve means including a valve stem having a passage-way for allowing gas to pass therethrough and extending out of said housing means;

lower guide means secured to said housing means and providing a shoulder and base stop, and including an aperture for slideably retaining said valve stem therein;

upper guide means slideably retained within said housing means and connected to said valve stem providing a lower shoulder therein;

said lower guide means including a groove extending longitudinally adjacent said valve stem including a key cooperating with said groove for preventing rotation of said valve stem within said housing, said key located above the flow of liquid into said orifice.

5,085,256

DRIFT STABILIZATION CHECK

Joseph J. Kircher, Palatine; Jane M. Zeisloft, Barrington, and James Martucci, Libertyville, all of Ill., assignors to Clintec Nutrition Co., Deerfield, Ill.

Filed Mar. 29, 1990, Ser. No. 500,915
Int. Cl.⁵ B65B 3/28

U.S. Cl. 141—083

13 Claims

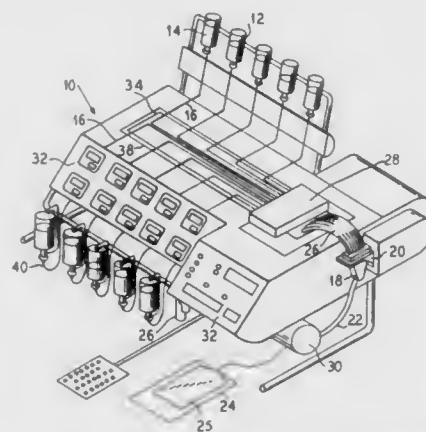
1. A device for accurately transferring fluids from a plurality of source containers to a receiving container, comprising:

a removable transfer set providing fluid communication between the plurality of source containers and the receiving container;

means for measuring quantities of transferred fluids;

monitoring means for determining whether the means for

measuring can measure within a preselected degree of certainty; and



means for preventing transfer of fluid after installation of the transfer set until the means for measuring can measure within the preselected degree of certainty.

5,085,257

SUMP COVER CONTAINMENT ASSEMBLY

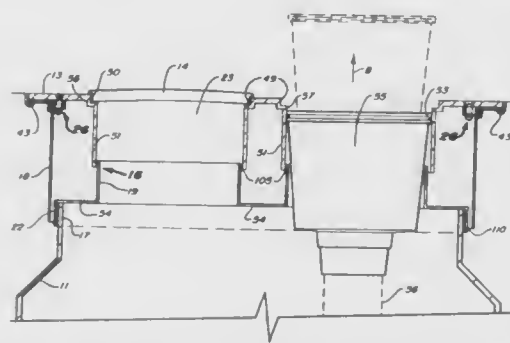
Philip E. Smith, 2781 Rancho Rd., Redding, Calif. 96002

Filed Apr. 17, 1990, Ser. No. 510,271

Int. Cl.⁵ B65B 3/06; B67P 5/00

U.S. Cl. 141—86

7 Claims



1. A sump cover containment assembly for use with a containment sump which has a top end with a hole therein, comprising:

a substantially hollow frame having an open top end and an open bottom end sized, shaped and oriented so that said bottom end fits around said top end of said containment sump;

a sump cover positionable over said top end of said frame, having at least one downward extension and at least one access hole extending through said at least one downward extension, said at least one access hole being of proper size, shape and orientation to facilitate positioning of a spill collector therein;

a lid for covering each of said at least one access holes in said sump cover;

first sealing means for sealing said lid to said sump cover; second sealing means for sealing said sump cover to said frame to minimize intrusion of surface water into said substantially hollow frame, and

a sump shield substantially covering said top end of said containment sump, having a downward lip which extends downward about said containment sump between said frame and said containment sump, and an upward extension having a hole therein sized, shaped and oriented to mate with said at least one downward extension of said sump cover and to facilitate positioning of said spill collector therein.

5,085,258

FUEL DISPENSING NOZZLE IMPROVEMENT

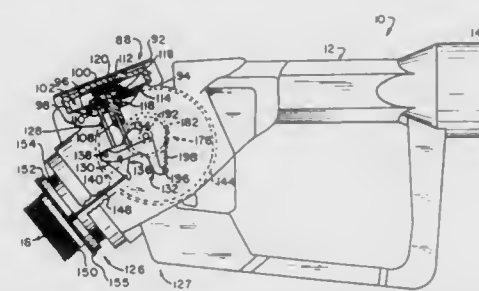
Arthur C. Fink, Jr., Lonedell, and Thomas O. Mitchell, Maryland Heights, both of Mo., assignors to Husky Corporation, Pacific, Mo.

Filed Sep. 24, 1990, Ser. No. 587,076

Int. Cl.⁵ B65B 3/18, 57/14, 31/06

U.S. Cl. 141—207

13 Claims



1. In a nozzle for dispensing fuel from a fuel source into a container such as a fuel tank, the nozzle having a body in which is formed a passage for fuel flow through the body, a spout attachable to the body in fluid communication therewith for fuel flow from the body, through the spout, into the tank, a valve interposed in the passage controlling fuel flow through the body, a bellows fitting over the spout and sealingly engaging the inlet of the container when the spout is inserted thereto to prevent fuel vapors from escaping into the atmosphere, and a vapor return path for fuel vapors to be returned to the fuel source, the improvement comprising means controlling operation of the valve to control fuel flow through the nozzle and including means responsive to effect bellows movement when the spout is inserted into the container to open the valve and to effect bellows movement when the spout is withdrawn to close the valve, means responsive to a vapor pressure change within the vapor return path to effect valve closing when the pressure level indicates the return path is substantially restricted thereby preventing fuel vapors from escaping into the atmosphere, the opening and closing of the valve is effected by a shaft connected to a movable plate, the plate being constrained by a movable pin prior to insertion of the spout into the container, the bellows responsive means including means for moving the pin away from the plate, as the bellows moves, to free the plate for movement allowing the valve to open, one end of the pin bears against the plate and the bellows responsive means includes a lever having a lever arm bearing against the other end thereof, movement of the lever in one direction moving the pin against the plate constraining its movement, and movement of the lever in the opposite direction moving the pin away from the plate and freeing the valve to open, the bellows responsive means includes a spring loaded sleeve installed over the nozzle outlet and movable in response to movement of the bellows, and a link interconnecting the lever and sleeve for movement of the sleeve to produce a corresponding movement of the lever in the direction freeing the pin for movement, a second lever to which one end of the link is connected for movement of the sleeve to move said second lever, said link is connected to one arm of said second lever, and the first said lever is pivotally connected to a second arm thereof whereby movement of the link rotates said second lever about its pivot causing rotation of the first said lever.

5,085,259

TIRE TREAD

René Goergen, Colmar-Berg, and Pierre Kummer, Bereldange, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 16, 1990, Ser. No. 552,735

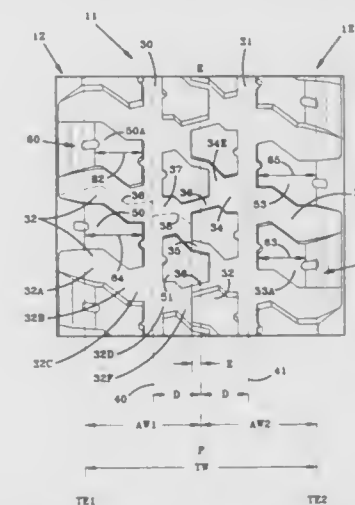
Int. Cl.⁵ B60C 11/03

U.S. Cl. 152—209 R

13 Claims

1. A tire tread comprising an elastomeric substance, extending circumferentially about the axis of rotation of a tire and

having a pair of lateral edges, and an equatorial plane centered between the lateral edges and perpendicular to the axis of rotation of the tire, said tread having first and second straight grooves therein which extend circumferentially about the tire, one of said straight grooves being disposed on either side of the equatorial plane of the tire and delimiting a central portion and two shoulder portions, a plurality of laterally extending wide zig-zag grooves on each side of the equatorial plane each having two sets of legs, the first set having three legs, a first, a second, and third, the first set of legs extending across the shoulder portion and the second set having two legs, a fourth and a fifth, the second set of legs extending into the central portion, the center lines of said first and second sets of legs being circumferentially offset from each other at said straight circumferential groove by at most half the distance between the centerlines of adjacent laterally extending zig-zag grooves,



wherein the centerline of each of the legs form an angle with respect to a plane parallel to the equatorial plane, the first leg's centerline forming an angle between 80° and 90°, the second leg's centerline forming an angle between 50° and 60°, the third leg's centerline forming an angle between 80° and 90°, the centerline of the fourth leg forming an angle between 80° and 90°, and the centerline of the fifth leg forming an angle between 45° and 55°, the centerline of the first leg, intersecting a tread edge, and the centerlines of the third and fourth legs, intersecting a circumferentially extending groove and wherein the lateral sides of the fifth leg of each said laterally extending wide zig-zag groove extend towards the equatorial plane via two circumferentially spaced narrow grooves which merge each into one of the two circumferentially spaced narrow grooves extending from the fifth leg of a laterally extending wide zig-zag groove situated on the opposite side of the equatorial plane, defining thereby rows of interpenetrating blocks.

5,085,260

HEAVY DUTY RADIAL TIRE WITH A CARCASS TURNUP PORTION HAVING SPECIFIC DIMENSIONS

Kiyoshi Ueyoko, Osaka; Yasuyoshi Mizukoshi, Toyota; Kazu-shige Ikeda, Kobe, and Munemitsu Yamada, Akashi, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Dec. 28, 1988, Ser. No. 291,228

Int. Cl.⁵ B60C 9/02, 15/00

U.S. Cl. 152—554

4 Claims

1. A tire and rim assembly comprising a rim and a radial tire mounted thereon,

said radial tire comprising:

a pair of bead cores one disposed in each bead portion of the tire;

a carcass extending across the bead portions and turned up

around in both edge portions around said bead cores from the axially inside to the outside thereof to form two carcass turnup portions and one carcass main portion therebetween, said carcass having at least two plies of organic fiber cords arranged at 75 to 95 degrees to the equatorial plane of the tire;

a belt disposed on the radially outside of said carcass and having at least two plies of cords;

a tread disposed radially outward of said belt; and
a pair of bead apexes one disposed radially outward of each bead core between the carcass turnup portion and the carcass main portion and extending radially outwardly and tapering from the bead core,

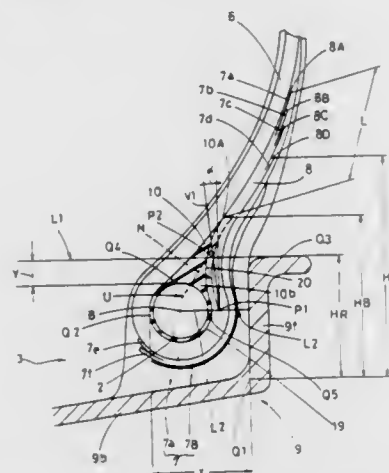
said rim comprising:

a rim base on which the tire bead portions are seated;

a flange extending radially outwardly from the rim base along the outside of the tire bead portion, characterized in that, in at least one of the bead portions,

the height (HB) of the radially outer end of said bead apex from the bead base is larger than the height (HR) of the rim flange from the rim base;

the height (HB) of the radially outer end of said bead apex from the bead base is smaller than the height (H1) of the lowest turnup portion in the turnup portions of the carcass plies in said carcass turnup portion from the bead base;

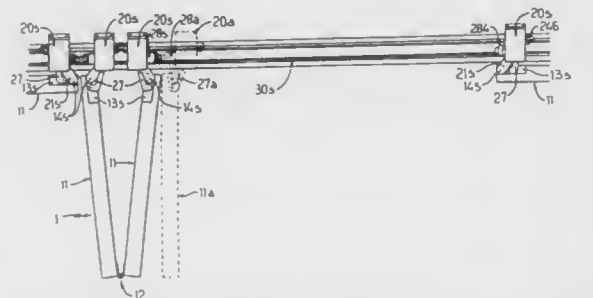


a thickness center line (N) of said carcass turnup portion between two points P1 and P2 on the center line (N) is curved so as to be located axially inward of a straight line drawn between said points P1 and P2, where the point P1 is an intersection of the center line (N) with a straight line (L2) passing through the center of gravity of the bead core in the axial direction of the tire, and the point P2 is an intersection of an axially straight line (L1) passing through the radially outer end (Q3) of said flange of the rim with a radially oriented line (V1) passing through said point P1 and inclined axially inwardly at an angle (alpha) between 0 and 20 degrees with respect to the radial direction of the tire from the point P1; and

an outer edge part (L) of the turnup portion of one carcass ply adjacent to the bead core, said outer edge part (L) having a radially outer edge and a radially inner edge, said outer edge part (L) contacting the carcass main portion and the outer carcass ply or plies terminating between the radially outer edge and inner edge of said edge part (L); wherein

the quotient (Y/HR) of the radial distance (Y) from the radially outer end (Q3) of said flange of the rim to the radially outer end (Q4) of the bead core, to said rim flange height (HR) is in a range of 0 to 0.3.

5,085,261
LONGITUDINALLY SLIDING ACCORDION DOOR
Guido Bortoluzzi, Belluno, Italy, assignor to Molteni & C. S.p.A., Milan, Italy
Filed Jun. 15, 1989, Ser. No. 366,421
Claims priority, application Italy, Jun. 17, 1988, 45736 A/88
Int. Cl.³ E05D 15/26
U.S. Cl. 160—199 9 Claims



1. Accordion door structure of a piece of furniture, or the like, having a frame, said structure comprising:
upper and lower guide members extending longitudinally and fixed at upper and lower parts of the frame, respectively;

an accordion door including at least two wings having respective first vertically extending sides which confront one another and respective second vertically extending sides opposite thereto, and hinge means for hinging said wings to one another along a hinge axis extending vertically along said first sides thereof in a manner which allows said wings to be rotated relative to one another about said axis;

support elements slidably mounted to said upper and said lower guide members, respectively;

each of said support elements being a truck having a set of wheels rotatably supported thereon and an arm projecting therefrom so as to form a cantilever, two of the wheels in said set spaced along a y-axis extending transversely of said guide members and having axes of rotation parallel to said y-axis, two of the wheels in said set spaced from one another along an x-axis extending longitudinally of said guide members and orthogonal to said y-axis and having axes of rotation parallel to said y-axis, and two of the wheels in said set being spaced apart along said x-axis and having axes of rotation parallel to a z-axis orthogonal to both said x and said y axes;

said wings of the accordion door being pivotally connected, at upper and lower ends of each of said second vertically extending sides thereof, to a said arm of a respective one of said support elements so as to be supported in the piece of furniture, or the like, in a cantilever manner by said support elements;

said support elements being slidable along said guide members so as to enable said accordion door to be moved between a closed position at which said wings thereof are coplanar, and an open position at which said wings are folded about said hinge axis and said second vertically extending sides are located close to one another;

each of said support elements having spreading means, operatively connected to the respective one of said wings that is pivotally connected to the arm thereof, for causing the second vertically extending side of the respective one of said wings to translate in a direction along said guide members toward the first vertically extending side of said respective one of said wings when said respective one of said wings is pivoted about the arm of the support element to which it is pivotally connected,

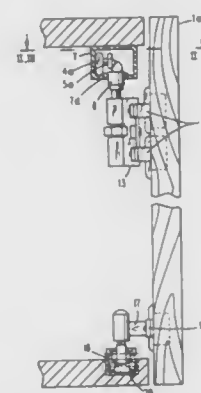
whereby when said accordion door is moved from said open position to said closed position thereof by sliding first ones of said support elements pivotally connected to one of said wings along said guide members toward second ones of said support elements pivotally connected to the other of

said wings, said wings rotate relative to one another about said hinge axis and said other of said wings pivots about the arms of each of said support elements to which it is pivotally connected thereby causing the spreading means of said support elements pivotally connected to said other of said wings to move the second vertically extending side thereof away from any structure adjacent thereto in said closed position; and

each of said support elements having a spacer fixed relative thereto,

the fixed spacers of the support elements which are pivotally connected to one of said wings at the upper and lower ends of the second vertically extending side thereof being respectively aligned, in the longitudinal direction of said guide members, with the fixed spacers of the support elements which are pivotally connected to the other of said wings, the aligned spacers abutting one another when the accordion door is in said open position thereof so as to maintain said wings spread apart to a predetermined extent while said wings are folded about said hinge axis.

5,085,262
DEVICE FOR SUPPORTING FOLDING DOORS
Yoshiji Tutikawa, Osaka, Japan, assignor to Daiyusu Kinzoku Co., Ltd., Osaka, Japan
Continuation of Ser. No. 308,619, Feb. 10, 1989, abandoned.
This application Aug. 27, 1990, Ser. No. 572,352
Int. Cl.³ E05D 15/26
U.S. Cl. 160—199 16 Claims



1. Apparatus for securely and movably supporting a pair of folding doors hinged to each other at their respective adjacent vertical sides, comprising:

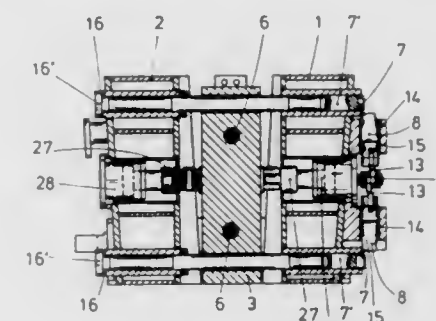
an upper rail member, comprising flanges respectively defining elongate horizontal first and second parallel upper door guide rails;

a lower rail member, comprising flanges respectively defining elongate horizontal first and second parallel lower door guide rails disposed respectively below and parallel to said first and second upper door guide rails;

first door support means for pivotably supporting a first one of said pair of folding doors solely on said first upper door guide rail, attached to said first door at a predetermined distance from the hinged side thereof and engaging with said first and second upper guide rails and said first and second lower guide rails to be movably guided therealong; and

second door support means for pivotably supporting a second one of said pair of folding doors solely on said second upper door guide rail, attached to said second door at a predetermined location from the hinged side thereof and engaging with said first and second upper guide rails and said first and second lower guide rails to be supported by and movably guided therealong.

5,085,263
CONTINUOUS CASTING MOLD
Josef Deussen, Heinsberg, and Dieter Böttger, Düsseldorf, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Filed Sep. 11, 1990, Ser. No. 580,862
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1989, 3930265
Int. Cl.³ B22D 11/04
U.S. Cl. 164—436 6 Claims



1. In a continuous casting mold, the mold including two long side walls mounted opposite each other on support frames, and short side walls clamped between the long side walls, wherein the short side walls are movable toward each other for the purpose of adjusting the width of the mold, mechanical clamping elements for chucking the short side walls between the long side walls, wherein the mechanical clamping elements are connected to hydraulic piston-cylinder units, the support frames with the long side walls being arranged in the continuous casting mold and being connected to the clamping elements such that the support frames can be moved toward each other and apart from each other and wherein the mechanical clamping elements are pull rods, the pull rods connecting the two support frames, the improvement comprising the pull rods each having at an end thereof a groove, means for inserting a key into each groove when chucking the short side walls, wherein the key is in connection through a push rod and a swivel bearing with a hydraulic piston-cylinder unit, such that a contact pressure force of the long side walls acting on the short side walls is exactly adjustable by the pressure acting from the hydraulic piston-cylinder unit on the key.

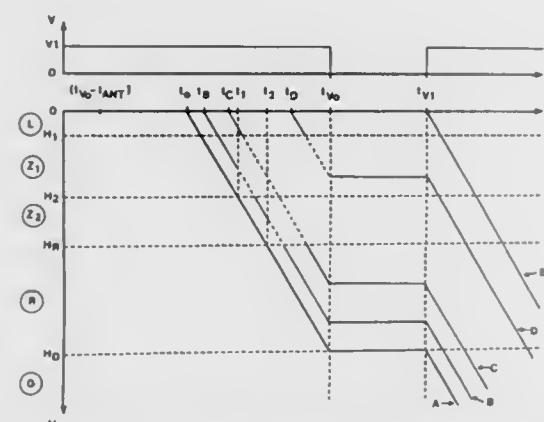
5,085,264
PROCESS FOR ADJUSTING THE SECONDARY COOLING OF A MACHINE FOR CONTINUOUS CASTING OF METAL PRODUCTS
Jean-Marc Jolivet, Rurange-Lès-Thionville, and Laurent Sosin, Serfange, both of France, assignors to Irsid, Puteaux, France
Filed Feb. 27, 1990, Ser. No. 485,524
Claims priority, application France, Feb. 27, 1989, 89 2927
Int. Cl.³ B22D 11/124, 11/22
U.S. Cl. 164—455 2 Claims

1. In a process for cooling a metal product during casting of said product in a continuous casting machine, said process comprising the steps of

(a) in a bottomless ingot mold defining a size of said product, primary cooling metal in a liquid state, producing a solidified outer shell surrounding a liquid core of said product;

(b) secondary cooling by applying a flow of cooling fluid to a free surface of said outer shell of said product in a secondary cooling section beginning immediately below said ingot mold and extending on a portion of a metallurgical length of said machine, said secondary cooling section being divided into n staggered independent zones within which said flow of said cooling fluid varies according to a casting speed of said product;

- (c) after said secondary cooling section, allowing said product to cool naturally until it is completely solidified;
- (d) selecting a point HD of said metallurgical length of said machine, located downstream of said secondary cooling section, beyond which it is no longer desired to control a temperature of said product; and
- (e) compensating for an undesired change in surface temperature of said product at said point HD by applying anticipatory secondary cooling, said change in surface temperature being due to a modification in casting speed of casting commencing at a time t_{v0} which is still in the future, said anticipatory secondary cooling consisting in modifying the flow of cooling fluid in different said independent zones of said secondary cooling section; the improvement consisting of:



- (f) determining, by means of the speed of casting, a time t_0 at which commences, at the upper part of the ingot mold, a portion of product which, at said time t_{v0} , will reach said point HD;
- (g) determining times $t_1, \dots, t_i, \dots, t_n$ at which the portion of product commencing at t_0 will emerge from zones 1, ..., i, ..., n of said secondary cooling section;
- (h) imposing in said zone i, from time t_i , a flow of cooling fluid adapted to compensate for said change in temperature; and
- (i) from said time t_{v0} , using again a cooling method in which flows of cooling fluid in said n zones of said secondary cooling section vary according to the actual speed of casting of said product.

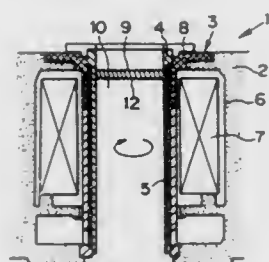
5,085,265
METHOD FOR CONTINUOUS CASTING OF MOLTEN STEEL AND APPARATUS THEREFOR
 Hironori Yamamoto, Chitoshi Matsumura, and Kentaro Mori, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 672,373
 Claims priority, application Japan, Mar. 23, 1990, 2-74342
 Int. Cl.⁵ B22D 27/02

U.S. Cl. 164—468 16 Claims

1. An apparatus for continuous casting of molten steel, comprising:
 a continuous casting mold;
 an electromagnetic stirring coil for generating a shifting magnetic field shifting in a horizontal plane, which rotates and flows molten steel inside said mold and which is installed outside said mold; and
 a screen of ferromagnetic substance positioned between said mold and the electromagnetic stirring coil at a height including a level of meniscus.
8. A method for continuous casting of molten steel, comprising the steps of:
 pouring molten steel into a continuous casting mold;
 applying an electromagnetic force to the molten steel in said mold by means of a shifting magnetic field generated by an

electromagnetic coil installed outside the continuous casting mold wherein said magnetic field shifting in a horizontal plane; and



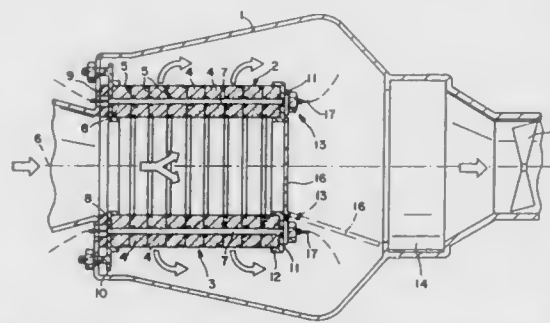
shielding said electromagnetic force by means of a screen of ferromagnetic substance installed between said mold and said electromagnetic coil at a height including a level of meniscus.

5,085,266
MOTOR VEHICLE FILTER IN THE INLET STREAM OF A HEATING SYSTEM OR AIR-CONDITIONING SYSTEM OF A MOTOR VEHICLE

Klaus Arold, and Heinz Koukal, both of Sindelfingen, Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Aug. 7, 1991, Ser. No. 741,352
 Claims priority, application Fed. Rep. of Germany, Sep. 24, 1990, 4030145

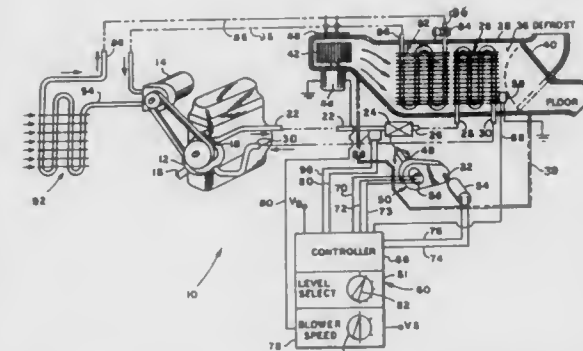
Int. Cl.⁵ B60H 3/06 4 Claims



4. A process for regenerating a tubular configured filter arranged in an inlet of a motor vehicle heating/air-conditioning system, comprising the steps of:
 closing a flap arranged at one end of the filter which is comprised of activated-carbon discs separated from one another by intermediate layers of heat conducting material and held thereto by heatable armatures penetrating the discs in a direction of the central longitudinal axis of the filter and being directly heat-connected to the intermediate layers;
 heating the armature so as to heat the intermediate layers and the discs so as to regenerate the discs; and
 creating a reverse air flow through the discs to the outside of the motor vehicle.

5,085,267
COMPENSATING FOR WATER PRESSURE VARIATIONS IN A TEMPERED AIR SYSTEM FOR VEHICLE PASSENGER COMPARTMENTS
 Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio

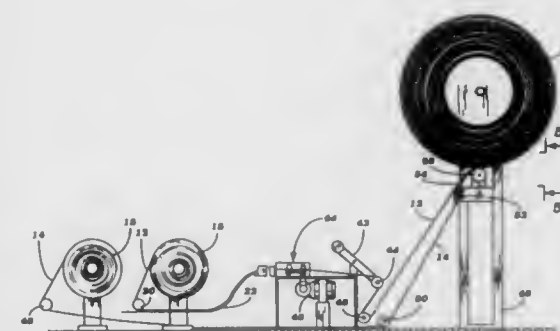
Filed Jun. 18, 1990, Ser. No. 539,400
 Int. Cl.⁵ F25B 29/00; B60H 1/02; G05D 23/00
 U.S. Cl. 165—2 7 Claims



6. A method of regulating the temperature of blower discharge air in a vehicle passenger compartment heating system;
 (a) providing an exothermic heat exchanger and flowing heated liquid therethrough from an engine driven pump;
 (b) forcing a flow of air over the heat exchanger and directing the flow into the vehicle passenger compartment;
 (c) providing a motor driven valve for controlling liquid flow from the pump to the heat exchanger and providing an electrical indication of the condition of said valve;
 (d) sensing the temperature of the air flow over said heat exchanger and providing an electrical temperature signal;
 (e) sensing the pressure of said liquid from said pump and generating an electrical signal indicative of the pressure;
 (f) generating an electrical reference signal indicative of a user selected relative temperature signal;
 (g) summing said indication of valve condition, said temperature signal, said pressure signal and said reference signal;
 (h) driving said valve motor until said sum is zero and modulating said valve condition for maintaining said sum at zero.

5,085,268
HEAT TRANSMISSION ROLL AND A METHOD AND AN APPARATUS FOR MANUFACTURING SUCH A ROLL
 Sven M. Nilsson, Smakulleavagen 18, S-430 50 Kallered, Sweden
 Continuation-in-part of Ser. No. 319,442, Nov. 6, 1981, abandoned. This application Aug. 19, 1983, Ser. No. 524,826
 The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
 Int. Cl.⁵ F26D 19/00

U.S. Cl. 165—8 28 Claims



1. An improved roll intended for transmission of heat, com-

prising two superposed webs of material and a core sleeve having a longitudinal axis about which the roll rotates in use, said webs being wound about said core sleeve, the first one of said webs provided with transverse equidistantly spaced ridges defining substantially unrestricted longitudinally extending flow channels extending parallel to said axis and the second one of said webs provided with lengthwise ribs, the improvement comprising indentations formed in the ridges of said first web at the ridge tops as well as the ridge bases, said ribs formed in said second web engaging in said indentations formed in the first web to mechanically interlock said webs.

10. A heat exchanger comprising two metal webs arranged in superposed relationship and wound about a core, a first of said webs being formed with corrugations extending in the crosswise web direction, said corrugations forming axially extending channels throughout said heat exchanger, said heat exchanger forming, in its operational condition, a rotating wheel wherein the exchange of heat is obtained by rotating the wheel between flows of fluid of different temperatures so that said fluid flows exchange heat with the walls of said channels, said two webs being joined together through mutual frictional abutment, said second web being highly tensioned in its lengthwise direction, whereby the two webs will be pressed hard together, said second web being attached at its outer end relative to the rest of the wheel, said second web having a wavy configuration with said waves extending in the lengthwise web direction, said waves pressing into the ridges and depressions of the corrugations formed in said first web for interlocking said webs together.

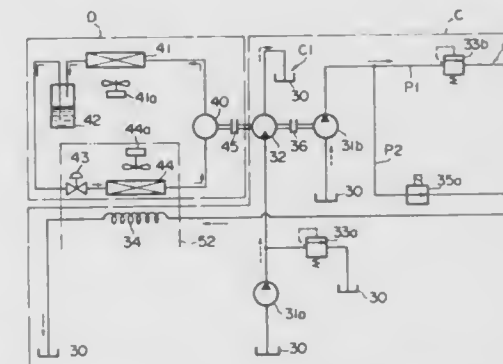
13. An apparatus as claimed in claim 10 wherein the webs of material are a foil.

5,085,269
HYDRAULICALLY DRIVEN HEATING AND AIR CONDITIONING SYSTEM FOR VEHICLES SUCH AS MOBILE CRANES

Yorikazu Aoki, Maebashi, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Oct. 23, 1990, Ser. No. 601,354
 Claims priority, application Japan, Oct. 23, 1989, 1-123834[U]; Feb. 20, 1990, 2-16102[U]
 Int. Cl.⁵ B60H 1/00

U.S. Cl. 165—43 16 Claims



1. An air conditioning system for vehicles including a hydraulic circuit having a hydraulic motor and a radiator radiating the heat of a hydraulic oil, and a refrigerating circuit having a compressor connected to said hydraulic motor and an evaporator disposed in an air conditioning air duct, said air conditioning system comprising:

a first hydraulic pump provided in said hydraulic circuit for supplying said hydraulic oil to said hydraulic motor and a second hydraulic pump provided in said hydraulic circuit for supplying said hydraulic oil to said radiator, said radiator being disposed in said air conditioning air duct;
 a first clutch mechanism provided between said hydraulic

motor and said compressor for controlling the connection of said hydraulic motor and said compressor;
 a first fluid pathway defined between said radiator and said second hydraulic pump and a second fluid pathway extending in parallel to said first fluid pathway;
 a valve means provided in said first fluid pathway for generating a pressure difference in said hydraulic oil between the entrance and exit sides of said valve means; and
 a first switching means provided in said hydraulic circuit for switching the flow of said hydraulic oil between said first pathway where said valve means is located and said second pathway.

5,085,270

DUAL ANGLE HEAT PIPE AIR PREHEATER

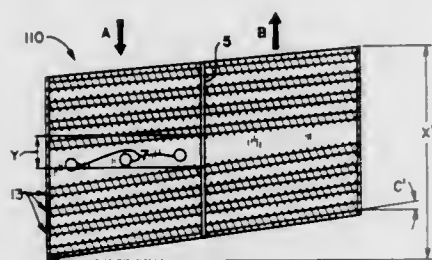
Wayne S. Counterman, Wellsville, and Thomas G. Mergler, Bolivar, both of N.Y., assignors to ABB Air Preheater, Inc., Wellsville, N.Y.

Filed Dec. 21, 1990, Ser. No. 632,267

Int. Cl.⁵ F28G 9/00; F28D 15/02

U.S. Cl. 165—95

4 Claims



1. An improved heat pipe heat transfer device, of the type comprising a multiplicity of heat pipes and soot blower means for removing particulate matter which may collect thereon, said heat pipes each having a condenser end and an evaporator end, said heat pipes being arranged in a plurality of superposed planar rows inclined relative to the horizontal, with said condenser ends being elevated relative to said evaporator ends; the improvement comprising:

said rows of heat pipes including a first group of rows inclined at a first absolute inclination and a second group of rows inclined at a second absolute inclination angle, said soot blower means being disposed between said first group of rows and said second group of rows.

5,085,271

HEAT ACCUMULATION SYSTEM AND METHOD OF OPERATING THE SAME

Michio Yanadori, Ryugasaki; Toshihiko Fukushima, Tsuchiura, and Yoshifumi Kunugi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

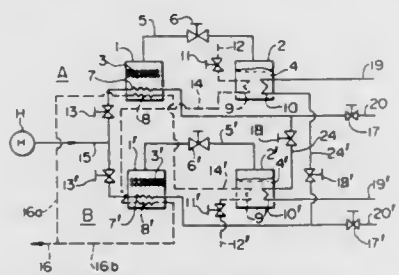
Filed May 24, 1989, Ser. No. 356,235

Claims priority, application Japan, May 25, 1988, 63-125751

Int. Cl.⁵ F28D 21/00; F25B 17/08

U.S. Cl. 165—104.12

18 Claims



6. A heat accumulation system comprising:

a least two chemical heat accumulation units each including a first vessel accommodating a chemical reaction material, a second vessel accommodating a reaction medium, and

gas introducing means for introducing a gas generated in one of said vessels into the other of said vessels;
 heat supplying means provided for said chemical heat accumulation units and capable of introducing heat from a heat source into said first vessel of one of said chemical heat accumulation units so as to heat said chemical reaction material to thereby generate gas in said first vessel and further introducing the heat remaining after heating of said chemical reaction material into said second vessel of the other chemical heat accumulation unit so as to heat said reaction medium in said second vessel to thereby generate gas in said second vessel, said gases flowing through said gas introducing means;

heat recovery means for causing a heat medium to flow through said second vessel of one of said chemical heat accumulation units in heat exchanging relationship with said reaction medium therein and then through said first vessel of the other chemical heat accumulation unit in heat exchanging relationship with said chemical reaction material therein to thereby recover heat generated as a result of a heat-generating reaction of said reaction material in said first vessel of said chemical heat accumulation unit;

wherein said heat supplying means comprises first and second pipe lines for conveying a medium heated by said heat source, said first pipe line extending through the first vessel of said one chemical heat accumulation unit in a heat exchange relationship with the chemical reaction material therein and then through the second vessel of said other chemical heat accumulation unit in a heat exchange relationship with the reaction medium therein said second pipe line extending through the first vessel of said other heat accumulation unit in a heat exchange relationship with the chemical reaction material therein and then through the second vessel of said one chemical heat accumulation unit in a heat exchange relationship with the reaction material therein; and

wherein valve means are provided for alternately closing said first and second pipe lines so that operation phases of said chemical heat accumulation units are alternately switched.

5,085,272

SPINE FIN HEAT EXCHANGER AND METHOD AND APPARATUS FOR PRODUCING SAME

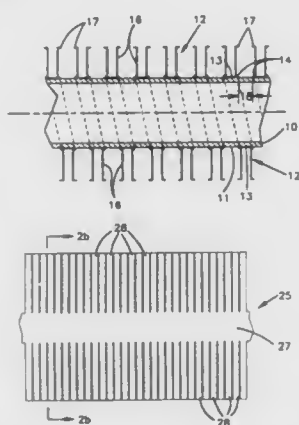
Herbert J. Venables, IV, Chagrin Falls, Ohio, assignor to The Venables Machine and Tool Company, Cleveland, Ohio

Filed Feb. 11, 1991, Ser. No. 653,243

Int. Cl.⁵ F28F 1/36

U.S. Cl. 165—184

14 Claims



1. A spine fin heat exchanger tube comprising a tube having an outer surface, an elongated strip helically wrapped around said tube, said strip having an imperforate base portion having a predetermined width engaging said outer surface along a helical path, said helical path being formed with a helix angle

resulting in a helix lead substantially larger than said predetermined width so that each portion of said base portion is spaced from the next adjacent base portion, said strip providing a multiplicity of separate spines cantileverly extending from at least one side of said base portion, said spines each providing a radial portion extending substantially radially relative to said tube and a free end portion extending laterally from said radial portion in a direction away from said one side.

11. A strip of spine fin material adapted to be wrapped on a tube to form a heat exchanger tube comprising an elongated strip of material having an imperforate base portion and an array of a multiplicity of cantilever spines extending from each side of said base portion, said spines each providing an inner portion adjacent said base portion extending substantially perpendicular relative to said base portion and a free end portion extending laterally from said inner portion in the same direction.

5,085,273

CASING LINED OIL OR GAS WELL

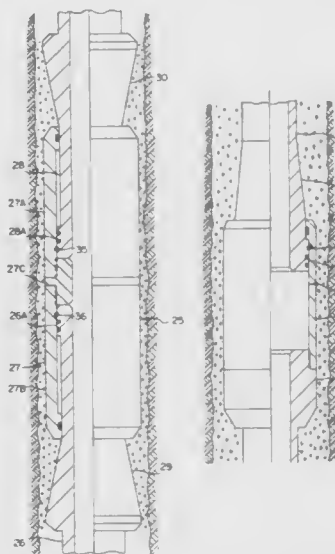
Malcolm G. Coone, Katy, Tex., assignor to Davis-Lynch, Inc., Houston, Tex.

Filed Oct. 5, 1990, Ser. No. 593,686

Int. Cl.⁵ E21B 17/08, 33/14; F16L 27/12

U.S. Cl. 166—242

11 Claims



1. In an oil or gas well having a well bore which penetrates a production zone and a casing string which is anchored in the well bore by a column of cement bonded to the casing string and well bore, the improvement comprising

at least one axially extendable connector installed as a part of the casing string opposite the well bore above the formation, and

at least one axially contractible connector installed as part of the casing string opposite the zone, said extendable connector including a first tubular member having one end telescopically and sealably reciprocable within the end of a second tubular member between contracted and extended positions, and means connecting the first member in its contracted position, said first member having an outer conical surface and said connection being releasable to permit said conical surface to move away from the adjacent surface of the cement column as the casing string above the zone is placed in tension, and

said contractible connector including a first tubular member having one end telescopically and sealably reciprocable within the end of a second tubular member between extended and contracted positions, and

means connecting the first of the contractible connectors in its extended positions, said first member of the contractible member having an outer conical surface, and said connection being releasable to permit said conical surface thereof to move away from the adjacent surface of the cement column as the casing string opposite the zone is placed in compression.

5,085,274

RECOVERY OF METHANE FROM SOLID CARBONACEOUS SUBTERRANEAN OF FORMATIONS

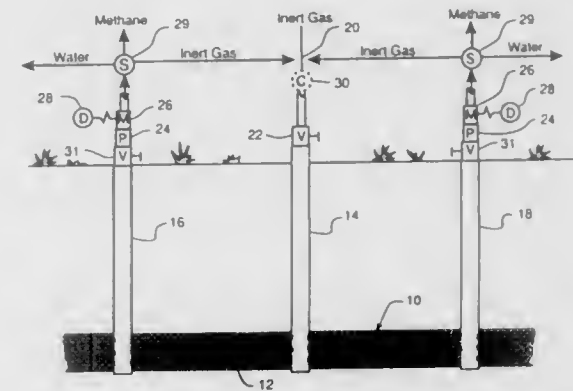
Rajen Puri, and Dan Yee, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 11, 1991, Ser. No. 653,827

Int. Cl.⁵ E21B 43/16, 43/40

U.S. Cl. 166—252

20 Claims



1. A method of recovering methane from a solid carbonaceous subterranean formation penetrated by an injection well and first and second production wells, the method comprising the steps of:

- injecting a gas that desorbs methane into the subterranean formation through the injection well in a manner to cause methane to be desorbed and move towards first and second production wells;
- monitoring a ratio of injected desorbing gas-to-methane recovered from the first and the second production wells; and
- restricting a flow of recovered fluids from the first or the second production well with the highest monitored ratio.

16. A method of recovering methane from a solid carbonaceous subterranean formation having a first layer and a second layer, both layers being penetrated by an injection well and one or more production wells, the method comprising the steps of:

- injecting a gas that desorbs methane through the injection well into the first layer and the second layer of the subterranean formation;
- monitoring a rate of recovery of injected desorbing gas for the first and second layers of the subterranean formation; and
- restricting a flow of recovered fluids from the first or second layer with the highest monitored recovery rate of injected desorbing gas.

5,085,275

PROCESS FOR CONSERVING STEAM QUALITY IN DEEP STEAM INJECTION WELLS

Michel Gondouin, San Rafael, Calif., assignor to S-Cal Research Corporation, San Rafael, Calif.

Filed Apr. 23, 1990, Ser. No. 512,317

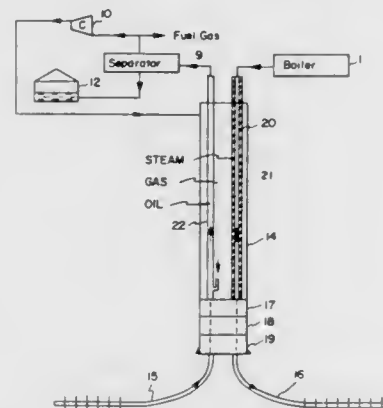
Int. Cl.⁵ E21B 43/24, 43/40

U.S. Cl. 166—303

16 Claims

1. A process for reducing the degradation of the quality of steam cyclically injected into Heavy Oil reservoirs in which a

cased vertical well is connected to a plurality of substantially horizontal drainholes, comprising subjecting each of said drainholes to cyclic steam injection and oil production, one after the other and sequentially connecting said drainholes



through a Downhole Valve Section to an insulated steam tubing and to a production tubing carrying hot reservoir fluids to the surface, mixed with a warm lifting fluid supplied from the surface.

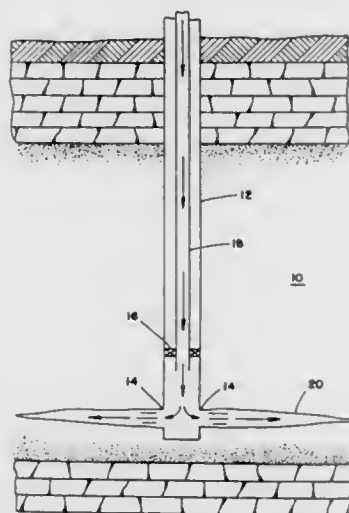
5,085,276

PRODUCTION OF OIL FROM LOW PERMEABILITY FORMATIONS BY SEQUENTIAL STEAM FRACTURING
Luis F. Rivas, Bakersfield, Calif.; John Reis, Austin, Tex., and Mridul Kumar, Placentia, Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Aug. 29, 1990, Ser. No. 574,625
Int. Cl.⁵ F21B 43/24

U.S. Cl. 166—303

12 Claims



1. A method of improving the steam-to-oil ratio and vertical coverage of a cyclic steam injection process in an oil bearing subterranean formation having low relative permeability as a result of formation morphology, comprising the steps of:

- drilling and casing a wellbore which traverses the subterranean formation;
- perforating the casing to create fluid communication between the formation and the interior of the wellbore;
- cyclically injecting an amount of wet steam in a short cycling sequence sufficient to heat the formation through controllably induced formation fractures while minimizing leakoff from said fractures outside the formation; and
- cyclically producing formation hydrocarbons upon cessation of a steam injection cycle, by reflashing said steam

through the wellbore, said reflashed steam having sufficient pressure to drive said hydrocarbons from the formation to the induced fractures and to the surface without the aid of a pump in the wellbore.

5,085,277

SUB-SEA WELL INJECTION SYSTEM

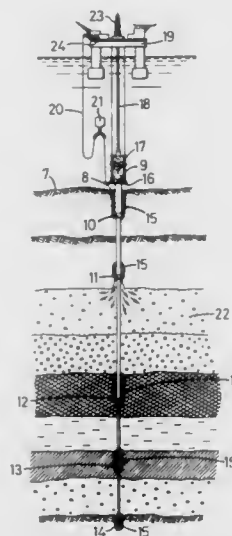
Hans P. Hopper, Aberdeen, Great Britain, assignor to The British Petroleum Company, p.l.c., London, England
Filed Nov. 5, 1990, Ser. No. 609,356

Claims priority, application United Kingdom, Nov. 7, 1989, 8925075

Int. Cl.⁵ E21B 33/035

U.S. Cl. 166—341

12 Claims



1. Apparatus for injecting unwanted slurries or fluids resulting from drilling or other operations into an annulus of a sub-sea well, being surrounded by a drilling guide base positioned on an underwater surface and having an outer well head housing and casing, the pathway for the injection being through the guide base and outer housing without modification of the well head housing proper, said pathway comprising:

- pipework on the guide base leading to a port in the outer well housing,
- a fail safe isolation valve on the guide base joined to the pipework, and
- a coupling on the guide base joined to the fail safe isolation valve to which a line from a surface vessel or platform can be attached.

5,085,278

FOAM PROPORTIONING INDUCTOR APPARATUS

Loren L. Keltner, Kansas City, Mo., assignor to T. D. F. Partnership, Kansas City, Kans.

Filed Oct. 15, 1990, Ser. No. 597,074

Int. Cl.⁵ A62C 35/00, 35/02

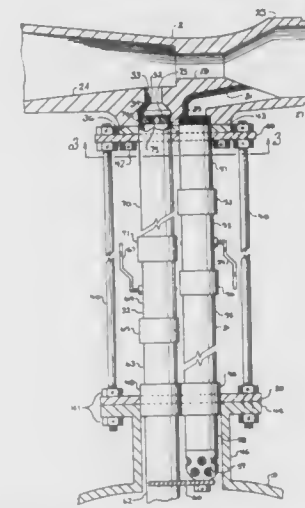
U.S. Cl. 169—15

3 Claims

- A foam proportioning inductor apparatus comprising:
 - a supply reservoir tank for providing a quantity of fluid concentrate;
 - inductor nozzle means positioned atop said tank as a unit and movable therewith, said nozzle means having a through passage for flow of water and an interior constriction inducing a pressure drop in the flow of water through said nozzle means, said nozzle means having inflow and outflow ends for joining to inflow and outflow lines;
 - mounting means including a spacer defining a connector area supporting said inductor nozzle means atop said tank;
 - supply line means separate from said mounting means and

branching from said nozzle means prior to said constriction and extending downwardly through said connector area and into said tank for providing a change of water therein;

e) fluid concentrate outflow line means separate from said mounting means extending from said supply reservoir and upwardly through said connector area and into said inductor nozzle means and joining said through passage after



said constriction for drawing fluid concentrate into the flow of water;

- orifice means in said fluid concentrate outflow line means for proportioning the flow of fluid concentrate from said tank into the flow of water through said inductor nozzle means; and
- said outflow line means including means for removal and replacement for selection of an outflow line means having an orifice means of selected size.

5,085,279

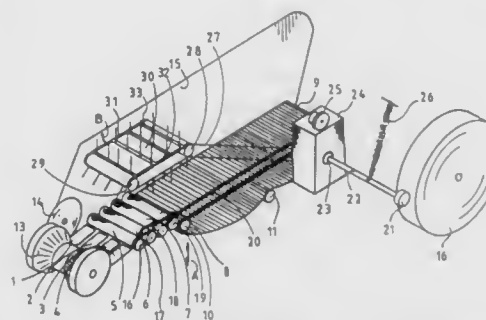
LIFTER FOR POTATOES AND OTHER SUBTERRANEAN VEGETATION PRODUCTS

Jens P. Kvistgaard, Hestbækvej 31, Linde, Holstebro, Denmark
Continuation of Ser. No. 89,820, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 795,350, Oct. 29, 1985, abandoned. This application May 12, 1989, Ser. No. 352,124
Claims priority, application Denmark, Feb. 29, 1984, 1260/84, Feb. 27, 1985 PCT/DK85/00016

Int. Cl.⁵ A01D 17/00

U.S. Cl. 171—4

15 Claims



1. A lifter for lifting subterranean vegetation products, the lifter comprising supporting wheel means for supporting the lifter, unearthing means adapted to be inserted under the vegetation products for cutting a ribbon of earth containing subterranean vegetation products to be lifted by the lifter, an endless moving conveyor means positioned behind the unearthing means for receiving the ribbon of earth containing subterranean vegetation products and upwardly guiding the lifted vegetation products, said conveyor means having a structure

which permits earth to fall down through the conveyor means to the ground while upwardly conveying the vegetation products, more than one delivery roll means, each having a smooth cylindrical outer surface, disposed from a rear edge of the unearthing means to a front edge of the conveyor means, said delivery roll means being parallel to one another and all located in rather close proximity to one another for delivering vegetation products and earth from the unearthing means to the conveyor means, and drive means for rotationally driving at least one of said delivery roll means.

5,085,280

DRILL RIG SHUT-OFF SYSTEM

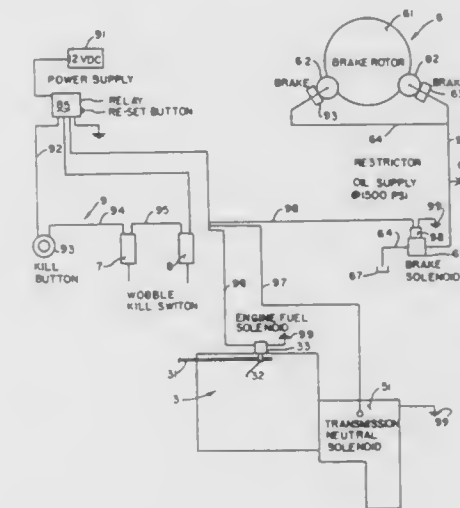
Charles L. Rassieur, St. Louis, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Jul. 13, 1989, Ser. No. 379,200

Int. Cl.⁵ B23Q 6/00

U.S. Cl. 173—12

15 Claims



1. A safety shut-off system for a rotary drill rig having a support structure and a drill spindle carried by said support structure, a drive train connected to rotate said drill spindle and an internal combustion engine operatively connected to said drive train to rotate said drill spindle, the improvement comprising a brake in said drive train and at least one physically actuatable shut-off switch adjacent said drill spindle, said switch being part of an electric circuit connected to means for actuating said brake and acting, when said switch is physically actuated, to actuate said brake to stop rotation of said drill spindle.

5,085,281

SLIDE HAMMER APPARATUS

Patrick H. Selly, 805 SW. 3rd Ave., Faribault, Minn. 55021
Filed Oct. 2, 1990, Ser. No. 591,945

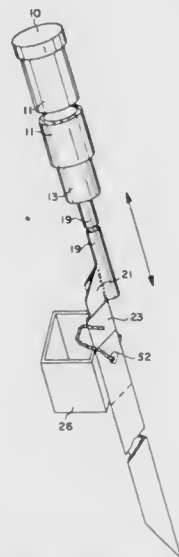
Int. Cl.⁵ B25D 1/16

U.S. Cl. 173—91

13 Claims

1. A slide hammer for driving a stake member into the ground, the stake member having a top edge, two legs having leg portions transversely extending at an angle relative to one another, and a side surface, the slide hammer comprising an axially elongated mounting member having a lower end portion that has a lower terminal transverse edge and a top end portion, an anvil mounted to the top end portion and having a top surface, a longitudinally elongated slide member longitudinally reciprocally mounted on the mounting member for upward and downward movement relative to the mounting member and having upper and lower end portions, a cap mounted by the slide member upper end portion for delivering a hammering blow to the anvil top surface when the slide member is moved downwardly relative to the mounting member, and a

hammer member fixedly attached to the mounting member lower end portion and having a terminal transverse lower edge extending transversely away from the mounting member for abutting against the stake top edge to transmit a hammering force to the stake, the hammer member transverse lower edge being substantially more closely adjacent to the mounting



member top end portion than the mounting member lower transverse edge while the mounting member lower end portion extends downwardly along the side surface of the stake, the hammer member having plate portions transversely extending at substantially the same angle relative to one another that the stake leg portions extend relative to one another.

5,085,282

METHOD FOR DRILLING A WELL WITH EMULSION DRILLING FLUIDS

Arthur H. Hale, and George C. Blytas, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

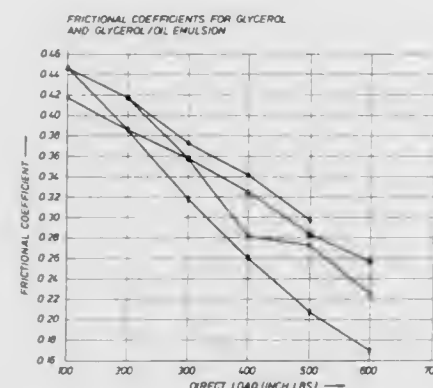
Continuation-in-part of Ser. No. 503,496, Mar. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 377,740, Jul. 17, 1989, abandoned, which is a division of Ser. No. 167,968, Mar. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 373,606, Jun. 30, 1989, abandoned, which is a division of Ser. No. 167,660, Mar. 14, 1988, abandoned, and a

continuation-in-part of Ser. No. 353,195, May 12, 1989, abandoned, which is a division of Ser. No. 167,769, Mar. 14, 1988, abandoned. This application Mar. 19, 1991, Ser. No. 671,628

Int. Cl.⁵ E21B 21/00, 49/00

U.S. Cl. 175—40

8 Claims



1. A method for drilling a well, comprising:

rotating a drillstring to cut a borehole into the earth; circulating water base drilling fluid through the drill string and through the annulus between the drill string and the wall of the borehole; checking the drilling fluid or evidence of at least one problem of (a) freezing, (b) gas hydrate formation, (c) shale dispersion, and (d) fluid loss; and adding an oil-in-alcohol emulsion to the drilling fluid in an amount sufficient to substantially prevent said at least one problem from occurring, said alcohol being in a concentration of from about 1 to 60 weight percent based on the total weight of the drilling fluid, and said alcohol being selected from the group consisting of (1) an alcohol having less than 8 hydroxyl groups and less than 16 carbon atoms, (2) an acyclic polyol having 3 to 80 carbon atoms and 2 to 60 hydroxyl groups; (3) a monoalicyclicpolyol having 5 to 30 carbon atoms and 2 to 10 hydroxyl groups; and (4) a cyclicetherpolyol having 6 to 1800 carbon atoms, 2 to 450 hydroxyl groups, and 2 to 600 ether linkages.

5,085,283

METHOD AND TOOL STRING FOR CURVING A VERTICAL BOREHOLE HORIZONTALLY

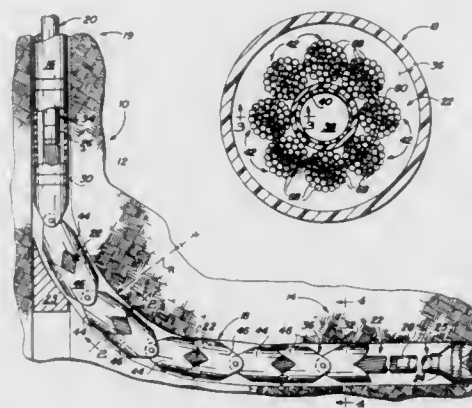
Ed O. Seabourn, 1928 N. McKinley, and William R. Erickson, Box 1100, both of Hobbs, N. Mex. 88240

Filed Sep. 7, 1990, Ser. No. 578,980

Int. Cl.⁵ E21B 7/08, 17/20, 17/22

U.S. Cl. 175—61

13 Claims



1. A flexible tool string for curving a vertical borehole laterally towards the horizontal, comprising, in combination: an elongated flexible casing string having a longitudinal central axis that can bend to conform to a segment of a curve; a connector by which said flexible casing string can be attached to a relatively inflexible casing string; an elongated flexible drill string rotatably received within said flexible casing string with there being an annulus formed between the flexible casing string and flexible drill string;

said flexible drill string has a central fluid conveying conduit made of resilient material, said central fluid conveying conduit is surrounded by a plurality of longitudinally extending elongated flexible members that jointly encapsulate said central fluid conveying conduit and forms an outer elongated housing for the flexible drill string;

a connector at opposed ends of said flexible drill string by which one end of said flexible drill string can be attached to a relatively inflexible drill string which can impart rotation into said flexible drill string;

said central fluid conveying conduit is an elastomeric conduit and said plurality of flexible members are circumferentially arranged thereabout on a common circle and are connected together at spaced intervals to form the outer elongated housing;

and a drill bit attached to a connector at the other end of said

flexible drill string for penetrating a formation when rotated by said flexible drill string.

10. Method of drilling a borehole having an upper vertical length that is curved into a lower lateral length; comprising the steps of:

1. forming said vertical length of said borehole with a relatively inflexible drill string that is rotatably received within a relatively inflexible casing string;
2. curving the lower end of said vertical length of said borehole into a lateral length by:
 - a. connecting a relatively flexible drill string to the lower end of the relatively inflexible drill string and connecting a relatively flexible casing string to the lower end of the relatively inflexible casing string;
 - b. attaching a bit to the terminal end of said relatively flexible drill string;
 - c. diverting the bit from the vertical borehole to form a lateral borehole while rotating the bit of imparting rotation into said inflexible drill string;
 - d. surrounding said flexible drill string with said flexible casing which comprises a spiral; and
 - e. making said flexible casing into a spiral which extends from a casing connector at a lower end thereof to a casing connector at an upper end thereof and which can bend into a radius of curvature required for the vertical part of the borehole to be turned laterally;
 - f. using said flexible casing downhole in the lateral borehole to subsequently produce the formation through the flexible casing, whereby fluid flows from the formation, into the flexible casing, and uphole to the surface of the ground.

5,085,284

HYBRID PNEUMATIC PERCUSSION ROCK DRILL

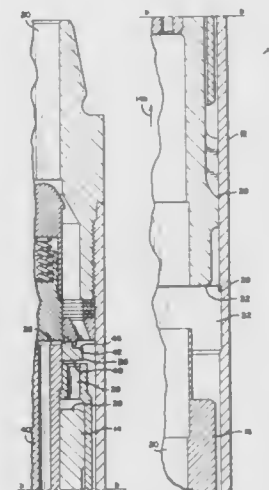
Chuen-Cheng Fu, Roanoke, Va., assignor to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Dec. 26, 1989, Ser. No. 457,224

Int. Cl.⁵ E21B 4/14; F01L 25/04

U.S. Cl. 175—296

28 Claims



10. A percussion apparatus comprising:

- a piston reciprocally disposed within the percussive apparatus between a drive position and a return position, the piston having a drive pressure surface and a return pressure surface whereby fluid pressure applied to the drive pressure surface biases the piston towards the return position and fluid pressure applied to the return pressure surface biases the piston towards the drive position;
- a first pressure means for applying a first fluid pressure to the return pressure surface, application of the first fluid pressure being dependent upon the position of the piston relative to the percussion apparatus; and
- a second pressure means for applying a second fluid pressure

to the drive pressure surface, application of the second fluid pressure being dependent upon pressure produced by the piston, wherein the first pressure means and the second pressure means operate independently.

5,085,285

COMPENSATING RING FOR A DOWN HOLE HAMMER

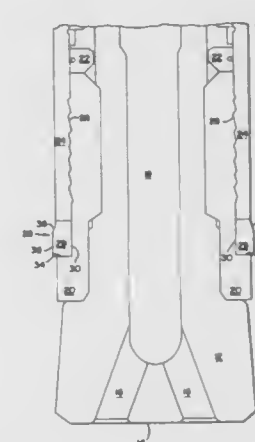
John Elsby, Leeming; John U. Dewar, South Guildford; Andrew Greathead, Woodvale, and Brian T. Sanfey, Connolly, all of Australia, assignors to D.T.A. Pty. Ltd., Bayswater, Australia

Filed Jul. 17, 1990, Ser. No. 553,337

Int. Cl.⁵ E21B 10/36, 17/10

U.S. Cl. 175—325

6 Claims



1. A reverse circulation down hole hammer comprising an outer sleeve, a drive sub held in the outer sleeve, a drill bit retained in the drive sub, and a sacrificial compensating ring, said sacrificial compensating ring comprising a first inner surface and a second outer surface, the diameter of the second outer surface being greater than that of the outer sleeve and substantially the same as that of the drill bit, the sacrificial compensating ring being located between the outer sleeve and the drive sub such that they are longitudinally spaced apart and said outer surface is partially protuberant of said outer sleeve.

5,085,286

CAR-SPEED CONTROL SYSTEM

Tsutomu Danzaki; Toshio Iwaoka; Yuichi Yamaguchi, and Akihiko Tsukahara, all of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Kanagawa, Japan

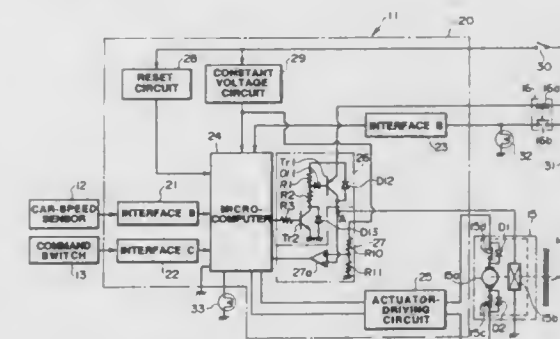
Filed Jan. 8, 1991, Ser. No. 638,593

Claims priority, application Japan, Jan. 9, 1990, 2-2161

Int. Cl.⁵ B60K 31/04

U.S. Cl. 180—179

3 Claims



1. A car-speed control system comprising: a car-speed detecting means for generating a speed signal in response to an actual car-speed;

a switch means for outputting a cruise command signal;
 an actuator for driving a throttle means through an electromagnetic clutch means;
 an actuator driving means for driving said actuator in one direction or the reverse direction;
 a clutch-driving means for changing said electromagnetic clutch means of said actuator off and on;
 a car speed memory means for memorizing the speed signal generated by the car-speed detecting means in response to operation of said switch means;
 a control means for controlling said actuator-driving means in accordance with difference between actual car-speed and memorized car-speed and for controlling working of said clutch-driving means; and
 a comparing means for detecting a voltage level of said clutch-driving means and comparing said voltage level with a reference voltage level set equally to an exciting voltage of said electromagnetic clutch means when the electromagnetic clutch means is in an unexcited state, and for changing said actuator-driving means to its non-driving state if said voltage level of the clutch-driving means is higher than said exciting voltage of the electromagnetic clutch means.

5,085,287

CRUISE CONTROL APPARATUS FOR A VEHICLE
 Yoshiyuki Utsumi, and Kazuyori Katayama, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

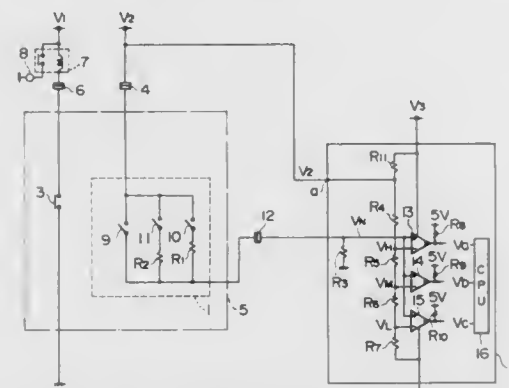
Filed Dec. 21, 1990, Ser. No. 631,503

Claims priority, application Japan, Dec. 26, 1989, 1-341434

Int. Cl.⁵ B60K 31/04

U.S. Cl. 180—179

3 Claims



1. A cruise control apparatus for a vehicle comprising:
 a cruise control switch having a plurality of switch elements connected in parallel with each other, said cruise control switch having an output terminal and an input terminal, said switch elements being selectively operated to change the output voltage at the output terminal of said cruise control switch so as to provide a plurality of command signals for setting and cancelling cruise control;
 a control unit connected to the output terminal of said cruise control switch for performing a plurality of different cruise control operations in response to the cruise control command signals from said cruise control switch, said control unit including a plurality of comparators each having a first input terminal connected to the output terminal of said cruise control switch and a second input terminal supplied with a reference voltage;
 a primary power supply connected to the input terminal of said cruise control switch for supplying power to said switch elements therein, said primary power supply being also connected to said control unit in such a manner that the second input terminals of said comparators are thereby

supplied with a plurality of different reference voltages; and
 a secondary power supply connected to the second input terminals of said comparators for shifting the reference voltages at the second input terminals of said comparators to a fail-safe side when said primary power supply fails.

5,085,288

TRACTION CONTROL SYSTEM FOR CONTROLLING SLIP IN A DRIVING WHEEL OF A VEHICLE

Shuji Shiraishi; Takashi Nishihara; Hironobu Kiryu, and Naoki Omomo, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 181,948, Apr. 15, 1988, Pat. No. 4,912,967.

This application Jan. 10, 1990, Ser. No. 463,202

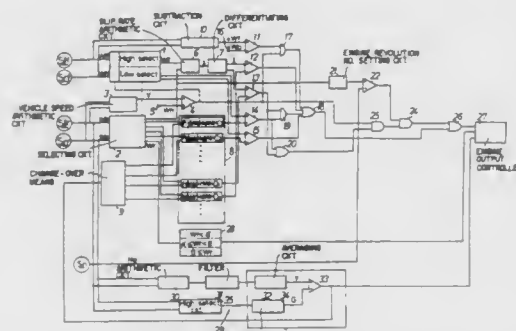
Claims priority, application Japan, Apr. 17, 1987, 62-94391; Oct. 2, 1987, 62-250166

The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.⁵ B60K 31/00

U.S. Cl. 180—197

2 Claims



1. A traction control system for controlling slip in a driving wheel of a vehicle by reducing a torque of the driving wheel based on a reference slip value, comprising:
 a bumpy road detector means for detecting a bumpy road;
 a reference slip value change-over means for changing said reference slip value in response to a condition of a road surface detected by said bumpy road detector means; and
 wherein said bumpy road detector means includes:
 a plurality of wheel speed detectors for detecting corresponding wheel speeds at a plurality of wheels of the vehicle;
 an arithmetic circuit for calculating a difference between the wheel speeds detected by the individual wheel speed detectors;
 a filter receiving an output from said arithmetic circuit and passing components in a predetermined frequency band to an output; and
 a determination circuit means, receiving said filter output, for determining if the vehicle is traveling on a bad or bumpy road, in response to the filter output, and outputting a signal indicative thereof.

5,085,289

SHOCK-ABSORBING RESILIENT COUPLING

John H. Chance, Rte. #3, Hereford, Tex. 79045

Division of Ser. No. 243,060, Sep. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 935,038, Nov. 26, 1986, abandoned. This application May 2, 1990, Ser. No. 521,127

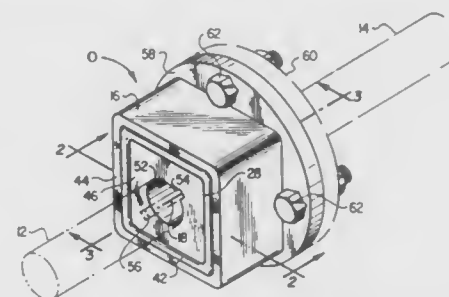
Int. Cl.⁵ B60K 17/00

U.S. Cl. 180—383

44 Claims

1. A torque transmitting coupling having a high torque to speed range suitable for use in the drive train of a diesel engine truck or the like comprising:
 an hollow first member having a polygonally shaped interior surface concentrically disposed about an axis of rotation;
 an interior second member disposed coaxially with the axis

of rotation of the hollow member and having a similarly shaped polygonal exterior surface concentrically disposed about the axis of rotation within the interior surface to form an annular cavity such that the first and second members can rotate to a limited degree one relative to the other before contacting;
 first means associated with the hollow first member and second means associated with the interior second member for connecting the coupling in a torque transmitting application; and
 a substantially incompressible yet flowable resilient material disposed within the annular cavity and being bonded at the interfaces with both the interior surface and the exterior surface with sufficient tenacity to remain bonded to both throughout the intended life of the coupling when the coupling is employed for its intended use, the resilient



material having an unstressed shape when no torque is being transmitted through the coupling and being deformed by torque applied to the coupling, the deformation occurring as the result of bulk material flow resulting from the change in shape of the annular cavity, the material exhibiting a tendency to return to the unstressed shape when the torque is reduced, the resilient material exhibiting a bulk damping characteristic which resists material flow as the stress is both increased and decreased whereby when the coupling is subjected to vibratory torque loads, which produces alternate relative directions of rotation between the members, the resilient material will be deformed to greater and lesser degrees and the vibratory loads will be dampened in both relative rotational directions as a result of the bonded interfaces between the material and the first and second members.

5,085,290

FOLDAWAY STOOL MOUNTED TO INSIDE OF CABINET DOOR

Edward C. Guirlinger, 7170 E. Main St., Reynoldsburg, Ohio 43068

Filed Feb. 21, 1991, Ser. No. 658,493

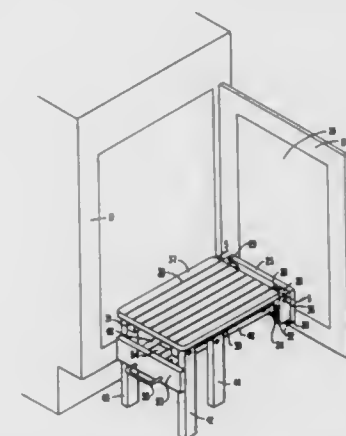
Int. Cl.⁵ E06C 9/00

U.S. Cl. 182—77

11 Claims

11. A folding stool for attaching to the inside of a cabinet door, comprising:
 a support structure for attaching to said inside of a cabinet door;
 a flat step pivotably attached at a first end to said support structure;
 first and second outside legs pivotably attached to a second end of said step opposite said first end of said step;
 first and second inside legs pivotably attached to said step near a midpoint between said first and second ends;
 first and second linkage members pivotably attached at a first end to said support structure and pivotably attached to said first and second inside legs, respectively, between

said first end and a second end of said linkage members; and
 a handle structure attached to said outside leg;



said second end of said linkage members being pivotably coupled to one of said outside legs and said handle structure.

5,085,291

SAFETY LADDER

Daniel O. Narramore, HCO 3 Box 74, Palo Verde, Ariz. 85343

Filed Jan. 22, 1991, Ser. No. 643,499

Int. Cl.⁵ E06C 1/14

U.S. Cl. 182—106

10 Claims



1. A portable safety ladder including in combination:
 a pair of first and second elongated, straight spaced-apart parallel main support members, each with a lower end and an upper end;
 a plurality of spaced steps, each having first and second ends located in a plane parallel to the plane of said first and second spaced-apart parallel main support members, and spaced a pre-determined distance therefrom;
 means for connecting the first ends of each of said steps with said first main support member, and for connecting the second ends of each of said spaced steps with said second main support member to suspend said steps from said first and second main support members; and
 wherein said first and second main support members serve as handrails for said safety ladder, with the lower ends thereof placed on a lower surface and the second ends thereof engaging an upper surface with said spaced steps suspended therefrom by said connecting means.

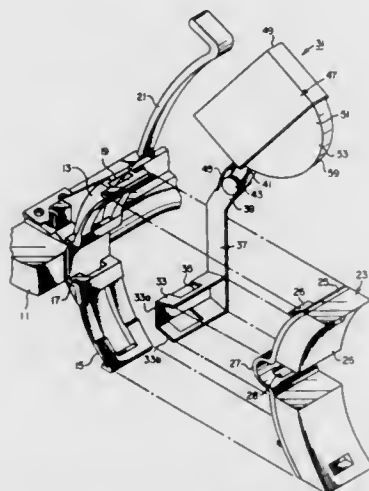
5,085,292
APPARATUS FOR LUBRICATING RAILROAD VEHICLE WHEEL FLANGES

Darrel D. Dial, 11255 Highway 80 W. Suite 105, Aledo, Tex. 76008

Continuation-in-part of Ser. No. 167,027, Mar. 11, 1988, Pat. No. 4,915,195. This application Oct. 23, 1989, Ser. No. 425,697 Int. Cl.⁵ B61K 3/00

U.S. Cl. 184—3.2

5 Claims



1. In a railroad vehicle having a plurality of wheels, each wheel having a cylindrical tread and a flange, the vehicle having a braking system with a brake beam having on each end a beam head to which is mounted a brake shoe, each brake shoe having a pad for contact with the tread, an improved apparatus for applying a lubricant to the flange, comprising in combination:

- a support member;
- means for sandwiching the support member between the brake shoe and beam head;
- an arm joined to the support member and extending from the support member in a circumferential direction relative to the wheel;
- a lubricant member; and
- connecting means for connecting the lubricant member to the arm and for urging the lubricant member into contact with the flange.

5,085,293
APPARATUS FOR AUTOMATICALLY SEALING THE SPACE BETWEEN AN ELEVATOR SHAFT AND AN ELEVATOR CAR

Michael Aime, Maurepas, France, assignor to Inventio AG, Switzerland

Continuation of Ser. No. 382,903, Jul. 20, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 662,323

Claims priority, application Switzerland, Jul. 25, 1988, 02833/88

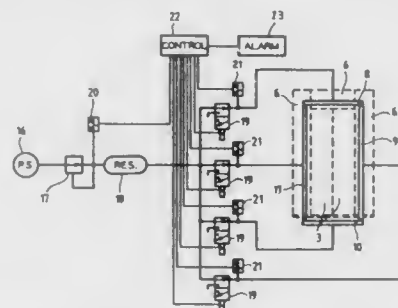
Int. Cl.⁵ B66B 9/00

U.S. Cl. 187—1 R

18 Claims

1. An apparatus for sealing the space between an elevator shaft wall and the opening of an elevator car when the car is stopped at a floor, comprising: an inflatable hollow body attached to an elevator car about a car door opening and an associated car door and adapted to be inflated by an application of a pressured fluid medium to close a space between the car and a wall of an elevator shaft in a draftproof and weatherproof manner when the car is stopped at a floor; a source of pressured fluid medium connected to said body through a valve; and an elevator control means connected to said valve for inflating said body after the car arrives at a stopping point and deflating said body before the car departs the stopping

point, said elevator control controlling movement of the car in the shaft and operation of the car door and automatically



controlling said valve independently of the operation of the car door.

5,085,294
ELEVATOR CONTROL APPARATUS

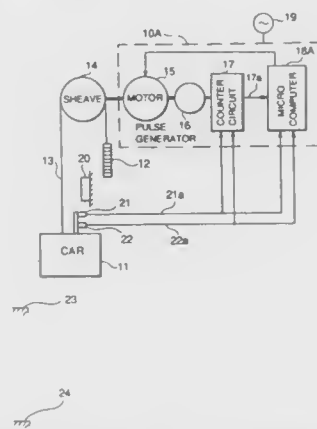
Shigemi Iwata, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1990, Ser. No. 528,844

Claims priority, application Japan, May 29, 1989, 1-132848 Int. Cl.⁵ B66B 3/02

U.S. Cl. 187—134

5 Claims



1. An elevator control apparatus comprising: drive means for driving an elevator car; a pulse generator connected to said drive means for generating a selected number of pulses, the selected number being proportional to the travel distance of the car; computing means for computing present position of the car by counting the number of pulses from said pulse generator; computing means for computing a predicted stop position of the car in case of power failure while the car is in motion; first memory means for storing data which is computed by said computing means for predicting stop position, said first memory means retaining the data during power failure; second memory means for storing data indicative of the present position of the car computed on the basis of the number of pulses generated from said pulse generator; control means for controlling said drive means based on the present position of the car and based on the data which is stored in said second memory means; and computing means for correcting a parameter indicative of car position at power failure upon recovery from power failure, based on the data stored in said first and second memory means and the present position of the car.

5,085,295
BRAKE ROTOR AND STATOR DISCS WITH MULTIPLE RINGS JOINED BY PINS

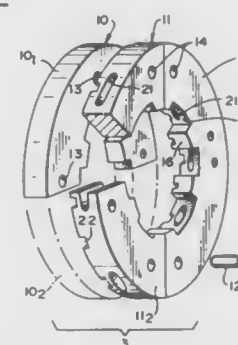
Yves P. Wautelet, Croissy sur Seine, and Charles Manin, Caluire, both of France, assignors to Carbone Industries, Bagnot Cedex, France

Continuation of Ser. No. 304,024, Jan. 31, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,034

Claims priority, application France, Feb. 2, 1988, 88 01414 Int. Cl.⁵ F16D 65/00, 65/12

U.S. Cl. 188—73.2

21 Claims



1. A disk brake system for a rotary shaft non-demountably attached to a non-rotating structure so as to rotate about a rotating axis, comprising:

- a) a rotor disc assembly comprising a plurality of rotor rings, each rotor ring comprising a plurality of rotor sectors;
- b) means connecting the rotor rings together such that joints between adjacent rotor sectors of one rotor ring are angularly offset with respect to joints between adjacent sectors of an adjacent rotor ring, wherein the means connecting the rotor rings comprises a plurality of holes defined by the rotor sectors located so as to be in alignment between adjacent rotor rings and a pin inserted in each aligned hole so as to extend only between adjacent rotor rings;
- c) first connection means attaching the rotor disc assembly to the rotatable shaft so as to rotate therewith, wherein the first connection means comprises teeth provided on a peripheral edge of one of the rotor disc assembly and rotary shaft, and cooperating splines formed on the other of the rotor disc assembly and rotary shaft;
- d) two independent stator disc assemblies disposed on opposite sides of the rotor disc assembly and comprising stator rings held by static supports centered on the rotary shaft by means of bearings, the stator rings comprising a plurality of stator sectors;
- e) means connecting the stator rings together such that joints between adjacent stator sectors of one stator ring are angularly offset with respect to joints between adjacent stator sectors of an adjacent stator ring, wherein the means to connect the stator rings together comprises a plurality of holes defined by the stator sectors located so as to be in alignment between adjacent stator rings, and a pin inserted in each aligned hole so as to extend only between adjacent stator rings;
- f) second connection means for non-rotatably attaching the stator disc to the nonrotating structure, wherein the second connection means comprises slidable connection means interposed between the static supports and the bearings so as to permit an axial displacement of said static supports and to define an axial ventilation gap therebetween; and
- g) actuating means operatively interposed between the non-rotating structure and the static supports to axially move the static supports and the stator rings into and out of contact with the rotor disc assembly so as to provide a braking force to the rotatable shaft when the stator rings are pressed against the opposite sides of the rotor disc assembly.

5,085,296
MECHANICALLY ACTUATED BRAKE WITH AUTOMATIC ADJUSTMENT

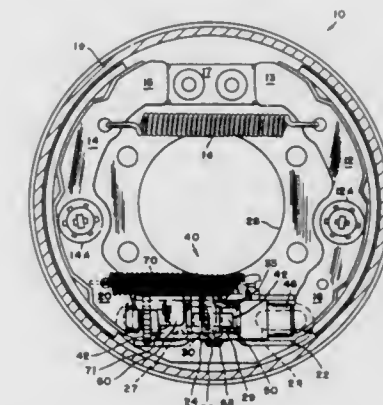
Clyde E. Carr, Galien, Mich.; Orla L. Holcomb, Jr., South Bend, and Louis S. Rodino, Elkhart, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 23, 1990, Ser. No. 572,195

Int. Cl.⁵ F16D 65/22

U.S. Cl. 188—79.55

18 Claims



17. A drum brake with automatic adjustment, comprising a support plate providing support for a pair of brake shoes disposed oppositely from one another, first and second pairs of brake shoe ends connected at the first pair of ends by spring means urging the first pair of brake shoe ends toward one another, an adjuster mechanism located between the second pair of brake shoe ends, the mechanism comprising a star wheel having a shaft received by the mechanism, and the shaft of the star wheel including a seal member thereabout which is seated rotatably in a longitudinal opening of an annular housing of the mechanism, so that said star wheel rotates easily relative to the annular housing.

5,085,297
FRICTIONAL DAMPER
Hans-Peter Bauer, Ziegelhütte 9; Hans J. Bauer, Am Eichenhain 8, and Ludwig Stadelmann, Schopperstrasse 14, all of D-8503 Altdorf, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 551,222

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923087

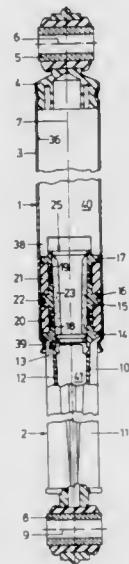
Int. Cl.⁵ F16F 7/08

U.S. Cl. 188—129

26 Claims

1. A frictional damper for washing machines with a spin cycle, comprising a substantially circular cylindrical housing (1) having an axis (7), an interior space (40) and an inner wall (36) and a tappet (2) coaxial with said cylindrical housing (1), said tappet displaceable inside said housing (1) and extending out of said housing (1) with one end, another end of the tappet (2) being provided with an approximately cylindrical friction piston (13), the friction piston (13) having at least one approximately circular cylindrical support segment (18, 19) and bracing flanges (14 to 17) extending radially from said axis (7) beyond the support segment (18, 19) and limiting the support segment (18, 19) at fixed distances in the direction of said axis (7), a friction coating (20, 21) made of an elastically resilient material being disposed on the support segment (18, 19) and between the bracing flanges (14 to 17) and being elastically pressed against the inner wall (36) of the housing (1), and a grease storage chamber (23) being formed on the friction pis-

ton (13), wherein said grease storage chamber (23) is provided within the friction piston (13) and is connected with the at least



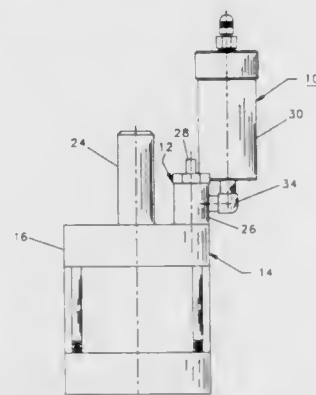
one support segment (18, 19) by way of at least one grease channel (34).

5,085,298
PRESSURE COMPENSATING RELIEF AND REFILL SYSTEM

Phillip A. Sollami, 1300 E. Pine, Herrin, Ill. 62948
Filed Sep. 10, 1990, Ser. No. 579,737
Int. Cl.⁵ F01C 9/00

U.S. Cl. 188—314

3 Claims



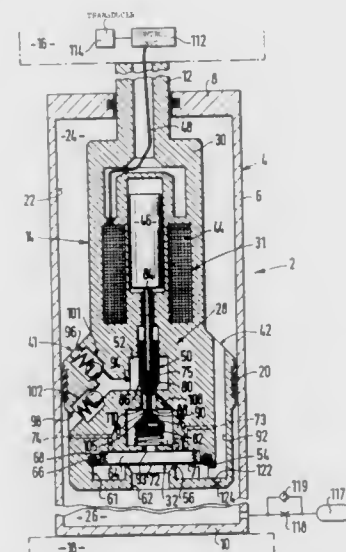
1. A manually operable hydraulic torque resistance device comprising in combination
first housing means sealably enclosing a generally cylindrical bore,
stator means and manually rotatable radial vane means respectively mounted in said bore and dividing said bore into two pressure chambers located between the radial sides of said vane means and said stator means,
second housing means defining a reservoir chamber therein for retaining a supply of liquid,
a plug member mounted in said reservoir chamber,
a liquid outlet port in said second housing means for carrying liquid between said reservoir chamber and said two pressure chambers,
a first bypass conduit extending through said plug member and connected between said port and said reservoir chamber,
first check valve means mounted in said bypass conduit and oriented to permit the flow of liquid from said reservoir chamber to said pressure chambers when the pressure in

said reservoir chamber exceeds the pressure in said pressure chambers by a first predetermined value,
a second bypass conduit extending through said plug member and connected between said port and said reservoir chamber,
second check valve means mounted in said second bypass conduit and oriented to permit the flow of liquid from said pressure chambers to said reservoir chamber when the pressure in said pressure chambers exceeds the pressure in said reservoir chamber by a second predetermined value,
a third bypass conduit means extending through said plug member and connected between said reservoir chamber and said pressure chambers,
said third bypass conduit means providing a continuously open restrictive passage between said reservoir chamber and said pressure chambers, and
orifice means disposed in said third bypass conduit to permit liquid to flow between said reservoir chamber and said pressure chambers as the volume of liquid in said pressure chambers expands and contracts as a result of temperature changes of said liquid in said pressure chambers,
said first, second, and third bypass conduits being rectilinear holes which extend in spaced apart parallel relationship through said plug.

5,085,299
SHOCK ABSORBER WITH TWO SEAT VALVE
Ewald Spiess, Vaihingen/Enz 2, and Michael Tischer, Abstatt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 23, 1990, Ser. No. 483,854
Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917064

Int. Cl.⁵ F16F 9/46
U.S. Cl. 188—319

16 Claims

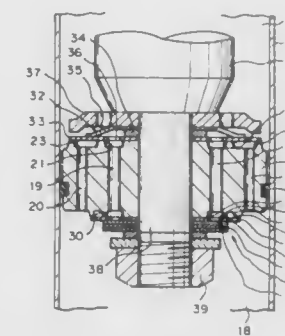


1. A shock absorber, which comprises a cylinder, a damper piston displaceable in said cylinder, said damper piston dividing said cylinder into first and second work chambers, at least one valve assembly which determines a pressure of a pressure fluid in one of said first and second work chambers, said valve assembly including a valve body, a restoring force means, a first valve seat and a second valve seat, and control means for operating said valve body, said valve body includes a first valve operative relative to said first valve seat and a second valve operative relative to said second valve seat, a predetermined throttle restriction, said first valve being normally adjustable toward said first valve seat by said control means, and in an event of a defect to said control means, said second valve

is forced against said second valve seat (88) by said restoring force means, and in that case, fluid under pressure can flow through said predetermined throttle restriction (90, 108, 110).

5,085,300
HYDRAULIC DAMPER
Tetsuo Kato, and Tomio Imaizumi, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan
Filed Oct. 23, 1989, Ser. No. 425,844
Claims priority, application Japan, Oct. 25, 1988, 63-268991; Jun. 16, 1989, 1-153722
Int. Cl.⁵ F16F 9/52
U.S. Cl. 188—322.15

6 Claims

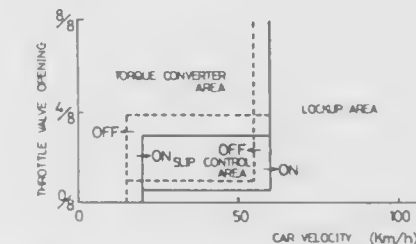


1. A hydraulic damper comprising:
a cylinder having an interior in which a working fluid is adapted to be disposed, and a longitudinal axis;
means for partitioning said interior of said cylinder into two fluid chambers and for causing the working fluid to flow between said two fluid chambers, said partitioning means including passage means for providing fluid communication between said two fluid chambers, and piston means, axially slidably mounted in said interior of said cylinder, for forcing the working fluid through said passage means; and
damping force generation means, for generating a damping force by controlling the flow of the working fluid through said passage means, comprising
a large diameter valve disc mounted adjacent said passage means,
a smaller diameter valve disc stacked against a surface of said large diameter valve disc opposite said passage means and having a diameter smaller than the diameter of said large diameter valve disc,
an inner pressure chamber formed adjacent said passage means, radially inwardly of an outer circumference of said large diameter valve disc and against a surface of said large diameter valve disc opposite said smaller diameter valve disc,
an outer pressure chamber formed adjacent and in fluid communication with said passage means, radially outwardly of said inner pressure chamber, radially outwardly of an outer circumference of said smaller diameter valve disc, radially inwardly of said outer circumference of said large diameter valve disc opposite said smaller diameter valve disc, said outer pressure chamber comprising a plurality of chambers spaced circumferentially about said longitudinal axis of said cylinder, and
a partition wall defined between said inner and outer pressure chambers and a passage formed through said partition wall and communicating between said inner and outer pressure chambers, said outer pressure chamber communicating with said passage means through said passage and said inner pressure chamber.

5,085,301
LOCKUP CONTROL DEVICE OF A FLUID TRANSMISSION

Hiroyuki Imamura; Takafumi Kurata; Hiroaki Yokota, all of Shizuoka, and Naoyuki Noguchi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Jatco Corporation, Shizuoka, both of Japan
Filed Sep. 26, 1990, Ser. No. 589,783
Int. Cl.⁵ B60K 41/02; F16H 45/02
U.S. Cl. 192—0.076

24 Claims



1. A lockup control device in a fluid transmission comprising:
a lockup device which connects an input shaft directly with an output shaft of a fluid transmission;
control means which controls engagement and release of said lockup device on the basis of a preset lockup control pattern wherein a lockup engaging region is predetermined in accordance with a vehicle driving condition;
load changing state detecting means which detects a changing state of engine load; and
lockup control pattern changing means which changes the lockup control pattern of said control means from said preset lockup control pattern to another lockup control pattern in which a lockup engaging region is expanded as compared with the lockup engaging region of said preset lockup control pattern;
wherein said lockup control pattern changing means changes the lockup pattern to said another lockup control pattern during a certain period of time under a limited deceleration condition wherein a change rate of the load detected by the load changing state detecting means exceeds a negative set value so that an engine brake force can be sufficiently applied during the certain period of time upon occurrence of such a limited deceleration condition even when the change rate of the load no longer exceeds the negative set value within the certain period of time.

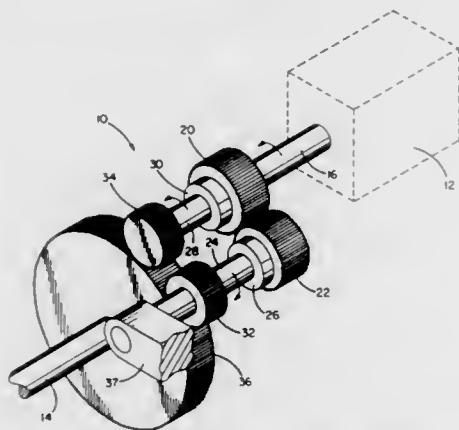
5,085,302
MARINE REVERSE REDUCTION GEARBOX
Peter C. Kriesels, Rio, Wis., assignor to The Falk Corporation, Milwaukee, Wis.
Filed Dec. 18, 1990, Ser. No. 628,875
Int. Cl.⁵ F16H 3/14

U.S. Cl. 192—51

11 Claims

1. A method for operating a marine reduction gear, comprising:
connecting said marine reduction gear in torque transmitting relation with an engine;

connecting said marine reduction gear in torque transmitting relation with a propeller shaft;



variably transmitting torque in a first rotational direction between said first and second connecting means; and simultaneously inhibiting rotation of said propeller shaft.

5,085,303

DRAG-FREE STRUT-TYPE SYNCHRONIZER

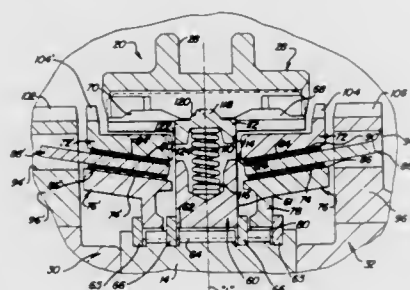
Barry L. Frost, DeWitt, N.Y., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Oct. 1, 1990, Ser. No. 591,129

Int. Cl.⁵ F16D 23/06

U.S. Cl. 192—53 F

10 Claims



1. In a synchronizer clutch and gear assembly comprising, a longitudinally extending main shaft having an externally splined hub fixed thereon, a first gear journaledly mounted on said main shaft adjacent one axial side of said hub and having an externally splined tooth surface, a shift sleeve having an internally splined tooth surface slidably intermeshed with said hub external splined tooth surface for axial movement thereon in a first direction from a neutral position to an operative position such that upon said shift sleeve internally splined tooth surface being moved into engagement with said first gear spline surface said clutch is operative to couple said first gear in rotation with said main shaft, a blocker ring having first friction surface means and defining a clearance with cooperating second friction surface means adapted for rotational movement with said main shaft, a strut adapted to engage said internally splined tooth surface of said shift sleeve, spring means for urging said strut into engagement with said shift sleeve such that said strut moves into engagement with said blocker ring during the axial shifting operation of said shift sleeve toward said first gear to effect frictional engagement of said first and second friction surface means, the improvement comprising;

ramped groove means circumferentially formed on said internally splined tooth surface of said shift sleeve such that said spring means acts to bias said strut into engagement with said ramped groove means when said strut is moved out of said neutral position upon axial movement of said shift sleeve toward said operative position, wherein said ramped groove means comprises:

a longitudinally extending and radially outwardly inclined

surface formed in said internally splined tooth surface of said shift sleeve, said inclined surface defining a ramp angle relative to a longitudinal axis of said shift sleeve which is substantially equal to or greater than the friction angle between said strut and said shift sleeve internal splines, wherein said spring means coacts with said ramped groove means for generating an axially directed engagement force between said strut and said inclined surface for reducing frictional resistance to continued axial movement of said shift sleeve in said first direction upon synchronized engagement with said first gear splined surface;

stop means for limiting the axial movement of said shift sleeve in said first direction to a predetermined maximum length of axial travel; and

surface means provided intermediate a first end of said inclined surface and said stop means for coacting with said spring means to exert a substantially radially directed force on said strut, said surface means extending substantially parallel to said longitudinal axis and being operable for increasing frictional resistance to continued axial movement of said shift sleeve in said first direction prior to said shift sleeve engaging said stop means.

5,085,304

AUTOMATIC FREE-WHEELING HUB ASSEMBLY

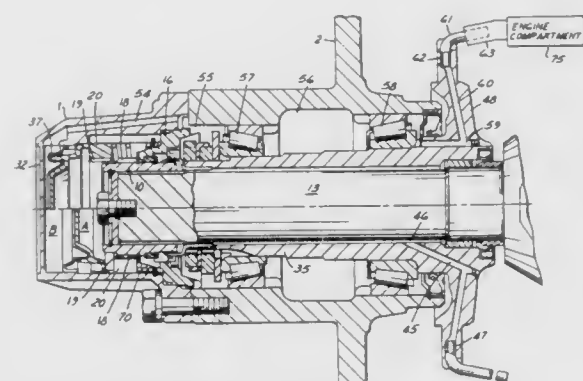
Elton Barroso, Sao Paulo, Brazil, assignor to AVM Auto-Equipamentos, Ltda., Brazil

Filed Apr. 30, 1990, Ser. No. 516,199

Int. Cl.⁵ F16D 25/061; B60K 23/08

U.S. Cl. 192—67 R

16 Claims



1. A free-wheeling hub assembly comprising:

a driven axle;

a wheel hub disposed radially outwardly of said axle;

a fixed spindle member received radially between said wheel hub and said axle, receiving said axle at an inner peripheral portion thereof and mounting said wheel hub at an outer peripheral portion thereof;

means to selectively connect said driven axle to drive said wheel hub including a source of pressure selectively connected to a control pressure chamber, a diaphragm having first and second faces, said diaphragm sealing said control pressure chamber upon said first face of said diaphragm and defining a second chamber upon said second face of said diaphragm, spring means to bias said diaphragm in a direction against the pressure in said control pressure chamber, the connection of pressure to said control pressure chamber moving said diaphragm against said spring bias to selectively engage or disengage said driven axle to drive said wheel hub; and

vent means connecting said second chamber to a space that is relatively free from dirt.

5,085,305

CAM-OPERATED, POSITIVE CLUTCH WITH ELECTROMAGNETIC ACTUATOR

Yen-Feng Cheng, c/o Hung Hsing Patent Service Center, P.O.

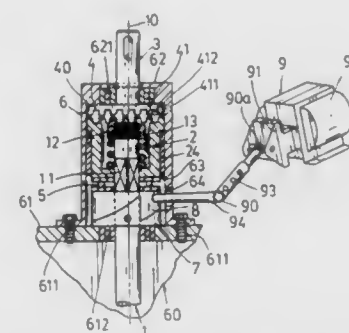
Box 55-1670, Taipei (10477), Taiwan

Filed Dec. 10, 1990, Ser. No. 624,642

Int. Cl.⁵ F16D 11/10, 27/00

U.S. Cl. 192—67 R

1 Claim



1. A lever twisted and thrust clutch comprising: a first coupling member having a plurality of first coupling teeth annularly formed on a first contacting disk of said first coupling member slidably secured on a first transmission shaft;

a second coupling member having a plurality of second coupling teeth annularly formed on a second contacting disk engageable with said first coupling teeth, and secured to a second transmission shaft;

a sleeve having a fixing plate secured to a base housing formed with a first bearing therein for rotatably mounting the first transmission shaft and an end plate opposite to said fixing plate formed with a second bearing therein for rotatably mounting the second transmission shaft, and having a cylindrical hole formed inside said sleeve for rotatably receiving both said coupling members in said sleeve;

a stationary cam fixed in said sleeve and having the first transmission shaft rotatably mounted therein; a thrusting cam having the first transmission shaft rotatably received therein and operatively thrust by said stationary cam; and

an electromagnetic controller operatively driving said thrusting cam in relation to said stationary cam for coupling both said coupling members for transmitting an output force from said first transmission shaft to said second transmission shaft or vice versa;

said stationary cam including a central hole engageable with said first shaft, a plurality of first ratchet teeth circumferentially formed on said stationary cam, and a fixing screw for fixing said stationary cam in said sleeve, each said first ratchet tooth including a first sloping surface inclinedly formed on said stationary cam around a longitudinal axis of said first shaft and sloping upwardly rightwardly with respect to a rightward attraction direction as attracted by said electromagnetic controller for vertically erecting said first shaft, and a first vertical surface parallel to said axis intersecting two adjacent said first sloping surfaces of two neighbouring said first ratchet teeth;

said thrusting cam including a second central hole engageable with said first shaft, and a plurality of second ratchet teeth circumferentially formed on said thrusting cam, each said second ratchet tooth including a second sloping surface inclinedly formed thereon around said axis of said first shaft and sloping downwardly leftwardly in relation to said first sloping surface corresponding to the rightward attraction direction by said electromagnetic controller to be tangentially engageable with said first sloping surface of said stationary cam and a second vertical surface parallel to said first vertical surface intersecting two adjacent

second sloping surfaces of two neighbouring said second ratchet teeth; and

said electromagnetic controller including: a core latch electromagnetically attracted rightwardly by a coil wound therearound, an adjusting rod universally pivotally connected to said core latch, and an actuating rod universally pivotally connected to said adjusting rod having an outer end of said actuating rod secured to a circumferential surface of said thrusting cam by passing through a slot formed in said sleeve, said sleeve rotatably holding both said cams in said sleeve.

5,085,306

RELEASABLE COUPLING FOR SHAFT ELEMENTS

Wolfgang Beigang, Felderhoferbrücke, Fed. Rep. of Germany, assignor to GKN Automotive AG, Siegburg, Fed. Rep. of Germany

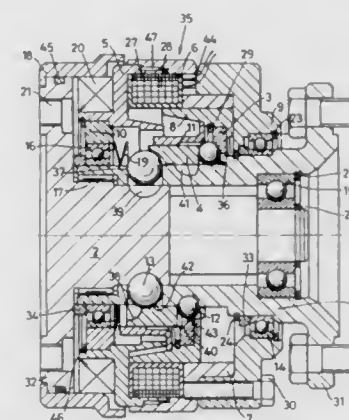
Filed Apr. 6, 1990, Ser. No. 506,434

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911122

Int. Cl.⁵ F16D 11/06

U.S. Cl. 192—79

11 Claims



1. A coupling for establishing a releasable torque transmitting connection between a hollow shaft element and a journal element co-axially positioned therein; comprising:

a plurality of coupling members provided in apertures in the hollow shaft element, and radially movable therein;

a plurality of recesses in the journal element, in which the coupling members are respectively engageable when in radially inner positions for torque transmission between the shaft element and journal element;

an operating sleeve movable axially on the shaft element, having apertures therein and an annular operating face engageable with the coupling members for effecting radial inward movement thereof, and further having a frusto-conical retaining face engageable with the coupling elements to hold them in their radially inner positions;

means for providing a returning force against which the operating sleeve is movable to its position wherein it has caused the coupling members to move inwardly;

radially displaceable locking members for locking the operating sleeve axially in said position, locking members being received in the apertures of the operating sleeve in fixed circumferential positions while being able to undergo said radial displacement, an annular groove being provided in said hollow shaft element, in which annular groove said locking members are engageable, upon their radial inward displacement, axially to lock the operating sleeve; and

a locking sleeve movable axially and having an annular operating face for effecting said radial inward displacement of the locking members and further having a locking face for holding the locking members in their radially

inwardly displaced positions wherein they engage the groove in the shaft element.

5,085,307 CLUTCH DISC

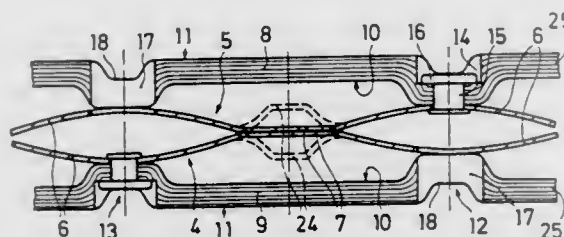
Erich Scheer, Prosselsheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany
Filed Mar. 25, 1991, Ser. No. 674,561

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010543

Int. Cl.⁵ F16D 69/04, 13/38

U.S. Cl. 192—107 C

6 Claims



1. Clutch disc for a motor vehicle friction clutch comprising a hub (2) with a lining carrier arrangement (4, 5) arranged thereon and friction rings (8, 9) in the form of discs, closed into a ring, axially on both sides of the lining carrier arrangement (4, 5), wherein the friction rings (8, 9) are fastened by means of rivets (15) on the lining carrier arrangement (4, 5) and, on their sides axially remote from the lining carrier arrangement (4, 5), have depressions (12, 13) for countersunk reception of heads (16) of the rivets (15), and wherein the friction rings (8, 9) are provided, on their sides axially facing the lining carrier arrangement (4, 5), with elevations which axially oppose the depressions (12, 13), the lining carrier arrangement having at least one axially resilient lining carrier (4, 5) forming wave crests and wave troughs (7) which succeed one another in a peripheral direction, the friction rings (8, 9) resting directly on the wave crest (6) with their elevations formed by bulges (12, 13) of their disc shape and being riveted in a region of the wave crests, the bulges (12, 13) having a groove shape and extending substantially radially.

5,085,308

APPARATUS FOR COLLECTING ARTICLES

Rene Wilhelm, Zurich, Switzerland, assignor to EGAPRO Patent AG, Steckborn, Switzerland

Continuation-in-part of Ser. No. 228,101, Aug. 15, 1988. This application Oct. 30, 1989, Ser. No. 428,394

Claims priority, application Japan, Aug. 10, 1987, 62-3057; Switzerland, May 10, 1988, 1771/88

Int. Cl.⁵ G07F 7/06, 17/34

U.S. Cl. 194—205

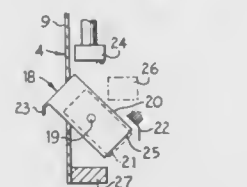
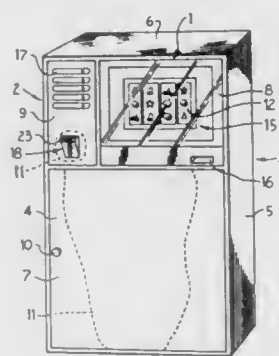
5 Claims

1. Apparatus for receiving and selectively collecting articles, comprising:
a casing;
a container for accepting an article to be selectively collected, having side walls, a flap on the first end and an open bottom on the second end;
a recognition device for selecting or rejecting an article in the container;
an article retaining stop for retaining the article in the container during recognition;
means for reducing the shape of a selected article retained in the container, said means for reducing the shape being connected to said recognition device;
a pivot shaft mounted between said side walls and said casing, said pivot shaft defining a container pivot axis whereby said container is pivotable about said container pivot axis into an inclined position and into a position of

axial alignment with said means for reducing the shape of said selected article;

a collecting device for receiving an article reduced in shape by said means for reducing the shape of a selected article, whereby said article reduced in shape is transferred from said container to said collecting device when said container is in said inclined position;

a gaming device electrically connected to said recognition device, said gaming device comprising an integral gaming



machine having means to determine randomly whether to award a prize and having an optical display portion comprised of a plurality of rotating rollers, each rotating roller provides on its circumferential surface a sequence of visible displays of symbols that represent winning of a prize when said symbols on said rotating rollers are aligned in predetermined combinations; and
a prize dispenser connected to the gaming machine, whereby a prize is dispensed when said symbols are aligned in one of said predetermined combinations.

5,085,309

ELECTRONIC COIN DETECTOR

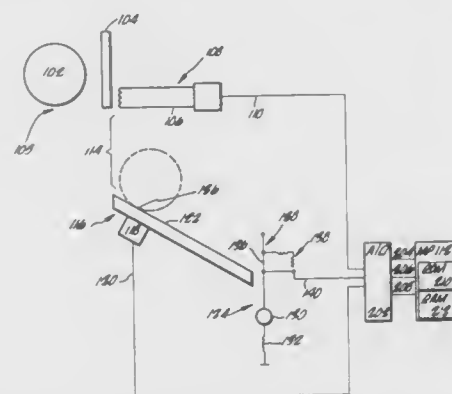
Phil A. Adamson, 32220 Oakshore Dr., Westlake Village, Calif. 91361, and Andrew J. Yeiser, Huntington Beach, Calif.

Filed Jun. 7, 1989, Ser. No. 363,260

Int. Cl.⁵ G07D 5/04

U.S. Cl. 194—317

9 Claims



1. An electronic device for detecting the presence of a coin which may be one of a number of predetermined denominations, comprising
means for generating a sequence of signals, each responsive

to an instantaneous weight measurement of a moving coin; and
means for interpreting said sequence of signals and for determining a weight and diameter of said coin.

5. A method for detecting the presence of a coin which may be of any number of selected denominations, comprising the steps of
generating a sequence of signals, each responsive to an instantaneous measurement of a force applied by a moving coin; and
interpreting said sequence of signals to determine a weight and diameter of said coin.

5,085,310

SORTING UNIT FOR BELT CONVEYOR PLANTS

Mario Scata, and Adolfo Passero, both of Teramo, Italy, assignors to MPA-Meccanizzazione Postale e Automazione SpA, Teramo, Italy

PCT No. PCT/EP87/00648, § 371 Date Jun. 28, 1988, § 102(e) Date Jun. 28, 1988, PCT Pub. No. WO88/03508, PCT Pub. Date May 19, 1988

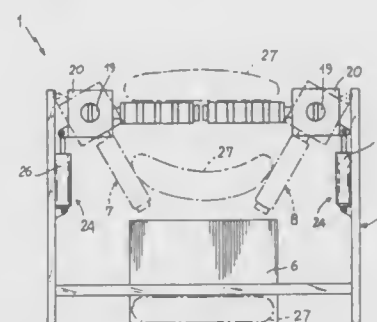
PCT Filed Oct. 31, 1987, Ser. No. 223,202

Claims priority, application Italy, Nov. 6, 1986, 23610 B/86

Int. Cl.⁵ B65G 47/46

U.S. Cl. 198—369

12 Claims



1. A sorting unit for belt conveyor plants, of the type comprising a first sorting conveyor belt extending among first transmission rollers and revolvingly oscillating around a first oscillation axis, said axis extending in parallel and close to a longitudinal edge of said first sorting belt, first actuating means to actuate the first sorting belt during at least a part of a sorting operation and oscillation axis, bringing it from a rest position, where it lays horizontally flush with other conveyor belts being part of said sorting plant, to a delivery position where it is inclined with respect to said other conveyor belts, and vice versa, characterized in that said sorting unit comprises a second sorting belt extending among second transmission rollers and placed adjacent the first sorting belt at a side thereof opposite said longitudinal edge of said first sorting belt, as well as revolvingly oscillating around a second oscillation axis running in parallel and close to a longitudinal edge of said second sorting belt opposite the first sorting belt, second actuating means to actuate said second sorting belt in the same direction and at the same speed as the first sorting belt during said part of a sorting operation, and second control means to rotate the second sorting belt around the second oscillation axis bringing it from a rest position in which it is horizontally flush with said other conveyor belts, to a delivery position in which it is inclined with respect to said other conveyor belts, and vice versa, said first and second control means simultaneously operating on the relevant sorting belts during said part of said sorting operation, these latter being symmetrically aligned in respect with further conveyor belts.

5,085,311

IN-LINE ACCUMULATOR WITH ZERO BACKLINE PRESSURE

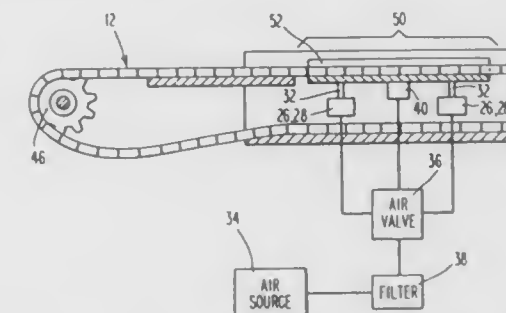
Gene Garro, 646 N. Saratoga Dr., Moorestown, N.J. 08057

Filed Feb. 27, 1990, Ser. No. 485,606

Int. Cl.⁵ B65G 47/26

U.S. Cl. 198—460

15 Claims



1. An in-line accumulator for a conveyor, comprising:
(a) conveyor means having a plurality of chain links forming a continuous loop, each said link having a plate forming a top surface and a tab extending transversely from said link and spaced below said plate;
(b) a carrying way having a moveable portion, said carrying way moveable portion having means for engaging each of said chain links between said plate and said tab;
(c) a pair of wear surfaces, each of which is disposed on a respective side of said conveyor means;
(d) means for driving said conveyor means; and
(e) means for displacing a portion of said continuous loop of chain links relative to said wear surfaces to provide zero backline pressure, said displacing means operatively connected to said moveable portion of said carrying way.

5,085,312

PARTS HANDLING MACHINE

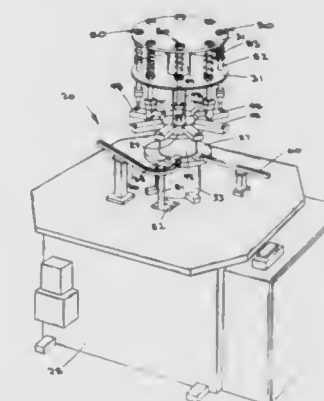
James E. Ribordy, South Beloit, Ill., and Teresa D. Popanz, Beloit, Wis., assignors to Rinky-Dink Systems, Inc., Roscoe, Ill.

Filed Feb. 26, 1991, Ser. No. 661,419

Int. Cl.⁵ B65H 1/00

U.S. Cl. 198—463.4

10 Claims



7. A machine for handling parts adapted to be delivered one-by-one to a receiving station at the machine, said machine comprising a base, a shuttle supported on said base to oscillate back and forth about an upright axis between said receiving station and an angularly spaced transfer station, said shuttle obtaining a part at said receiving station and transferring the part angularly to said transfer station, a turntable mounted on said base above said shuttle and intermittently rotatable about said upright axis, a plurality of angularly spaced and generally horizontal part holders rotatable with and extending generally

radially from said turntable, there being two adjacent leading and trailing part holders located above and on opposite downstream and upstream sides, respectively, of said transfer station every other time said turntable dwells, a transfer mechanism for selectively picking up and releasing a part, said transfer mechanism being movable upwardly and downwardly on said base and having a home position, means for moving said transfer mechanism downwardly through a stroke of predetermined length and along a predetermined path from said home position, through a space between said two adjacent part holders and to said transfer station every other time said turntable dwells whereby said transfer mechanism picks up a part at said transfer station, said moving means thereafter shifting said transfer mechanism upwardly along said predetermined path to said home position, means for thereafter indexing said turntable to cause the trailing one of said two adjacent holders to advance angularly to and to dwell in a receiving position directly above said transfer station and directly below the home position of said transfer mechanism, means for thereafter shifting said transfer mechanism downwardly through a stroke shorter than said predetermined length so as to place the part on said one holder, said shifting means thereafter retracting said transfer mechanism upwardly toward said home position, said indexing means thereafter rotating said turntable to move said one holder to the downstream side of said transfer station and to move another holder to the upstream side of said transfer station.

5,085,313

SEAL ASSEMBLY

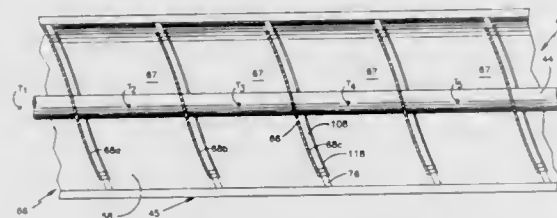
John R. Naumec, Willimantic, and Joseph E. Faucher, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 7, 1990, Ser. No. 609,864

Int. Cl.⁵ B65G 33/26

U.S. Cl. 198—659

6 Claims



1. A seal assembly which extends between two members having facing surfaces which are separated by a gap G, the seal assembly being adapted to block the movement of medium between the surfaces, the two facing surfaces being capable of relative movement in a first direction which comprises:

a plurality of seal elements, each seal element having a flap aligned with the adjacent flap in the direction of movement, each flap extending from the first member and having an average width W as measured in the direction of relative movement, an average height H measured from the surface of the first member and a sealing length L measured perpendicular to the direction of movement and parallel to the surfaces;

wherein the width is generally oriented in a direction which faces the medium to be sealed, the height H of each flap is greater than the sealing length L and the sealing length L is greater than the width W to provide stiffness perpendicular to the direction of movement to block movement of the medium and flexibility to accommodate changes in the gap G between the surfaces and wherein the flaps are replaceably fixed to the first member.

5,085,314

TRANSFER APPARATUS

Alan Higson, Lytbam St Annes, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, Great Britain

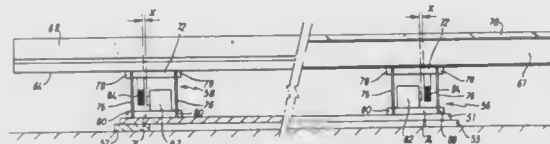
Filed Feb. 25, 1991, Ser. No. 660,047

Claims priority, application United Kingdom, Mar. 7, 1990, 9005082.4

Int. Cl.⁵ B65G 27/00

U.S. Cl. 198—755

9 Claims



1. A transfer apparatus comprising a platform arranged to be vibrated so as to transfer objects thereon, wherein the improvement comprises, the platform comprises two members which extend in adjacent parallel relationship in a substantially linear direction, a plurality of vibrator means for oscillating the members independently of each other in out-of-phase relationship in said linear direction, a relatively heavy base provided for supporting the vibrator means, and cushion elements affixed onto the members for supporting the object, each which cushion element comprises a multiplicity of flexible synthetic polymer fibres having a thickness not greater than about 45 microns and packed in a backing, the fibres having a length not greater than about 2.5 mm above the backing and an inclined orientation of at least 70° from the backing in a direction selected to arrange a desired direction of transfer of the object when the members are oscillated by the vibrator means.

5,085,315

WIDE-RANGE BLADE PITCH CONTROL FOR A FOLDING ROTOR

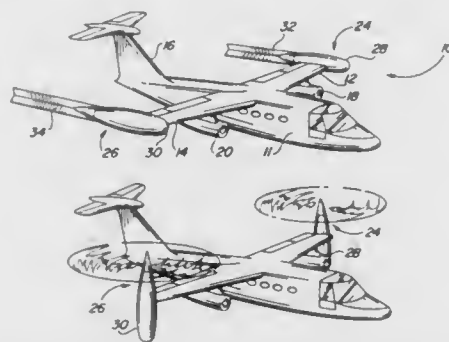
Kenneth W. Sambell, 2625 E. Kenwood St., Mesa, Ariz. 85203

Filed May 5, 1989, Ser. No. 347,754

Int. Cl.⁵ B64C 27/22

U.S. Cl. 244—7 R

11 Claims



1. A control apparatus for an aircraft, said aircraft including a rotatable mast including a hub through which the mast axis extends and at least one blade pivotally mounted on said hub having a folding axis generally transverse to the blade about which the blades fold and a pitch axis generally longitudinal of said blade about which pitch change occurs, first control means for moving said blade about its folding axis between a folded position substantially parallel with the axis of rotation of said mast and an operative position substantially normal thereto, second control means for positioning said blade about its pitch change axis, said mast being convertible between substantially horizontal and substantially vertical positions, said first and second control means being responsive to pilot operated control members, the improvement comprising:

(a) pitch change means cooperative with said second control

means and including a motion transmitting member responsive to said second control member;

(b) motion amplification means interposed between said blade and said second control means whereby the range of control motion of said motion transmitting means is amplified; and

(c) said motion transmitting means including a push-pull tube disposed generally parallel to one of said blade folding or mast axes to permit pitch changes to be made during blade folding and unfolding.

5,085,316

BLANK FOR PACKAGE AND ASSEMBLED PACKAGE FOR DISPLAY

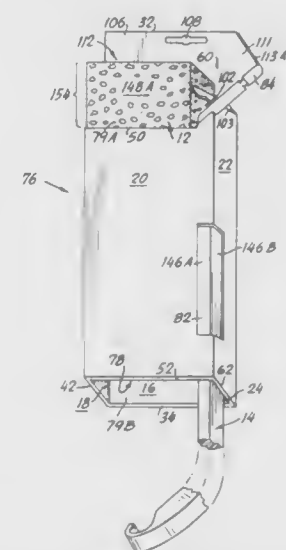
Scott C. Pearce, Cincinnati; William H. Perkins, Oxford; Daniel Brod, and Stan Brod, both of Cincinnati, all of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Mar. 8, 1991, Ser. No. 666,288

Int. Cl.⁵ B65D 65/12, 5/02

U.S. Cl. 206—223

28 Claims



1. A blank for erection into a package for holding an essentially rectangular first component and a generally elongate second component, the blank comprising:

a rear panel;

a first side panel;

a front panel having a top edge;

a second side panel having a top edge, and

a side flap panel;

each of said panels being laterally, adjacently connected one to the other to form a first lateral fold line between the rear and first side panels, a second lateral fold line between the first side and front panels, a third lateral fold line between the front and second side panels, and a fourth lateral fold line between the rear and side flap panels, the second side and side flap panels each having a free lateral edge, the package being formable about said lateral fold lines to define a compartment having opposed openings with the second side panel being superpositionally bonded to the side flap panel;

said second side panel having a pair of transverse opposed cuts extending to said third fold line and a first short fold line lateral to said third fold line extending to the ends of said pair of cuts, said pair of cuts and said third fold line and said short fold line forming a first rectangular panel section; said front panel having a pair of transverse opposed cuts extending to said third fold line and a second short fold line lateral to said third fold line extending to the ends of said pair of cuts, said pair of cuts and said third fold line and said second short fold line forming a second rectangular panel section, said first and second rectangular panel sections being joined at said third fold line and

capable of forming pocket means within the compartment of the erected package;

whereby in the erected package the second component is receivable by the pocket and the first component is receivable by the compartment, the first component being in cooperative abutting relationship with the first side, front and rear panels and the second component, and the second component being in further cooperative abutting relationship with the front and second side panels, such abutting cooperative relationships substantially preventing transverse and lateral movement of the components relative to the erected package.

5,085,317

LIQUID-CONTAINING CONTAINER

Svend V. Jensen, Roskilde, and Erik F. Andersen, Helsingør, both of Denmark, assignors to Flügger A/S, Rødovre, Denmark

PCT No. PCT/DK89/00057, § 371 Date Sep. 11, 1990, § 102(e) Date Sep. 11, 1990, PCT Pub. No. WO89/08590, PCT Pub. Date Sep. 21, 1989

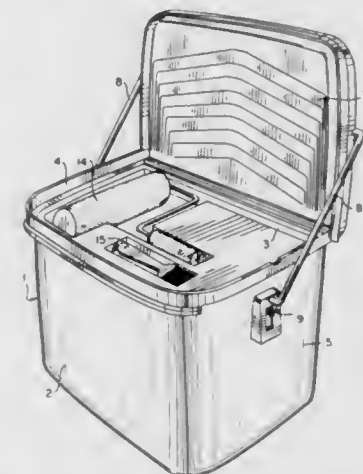
PCT Filed Mar. 15, 1989, Ser. No. 572,934

Claims priority, application Denmark, Mar. 15, 1989, 1410/88

Int. Cl.⁵ B65D 25/04

U.S. Cl. 206—229

5 Claims



1. A liquid-containing container comprising a removable lid; a liquid within the container; a liquid-tight membrane forming a liquid-tight seal in said container between said liquid and said lid; and a tool holding member within said container, said tool holding member having a recess and being attached to said membrane such that said recess is protected from contact by said liquid.

5,085,318

SECURED DISC FOLDER

Kathy L. Leverick, 6345 Janes La., Naples, Fla. 33942

Filed Nov. 19, 1990, Ser. No. 615,323

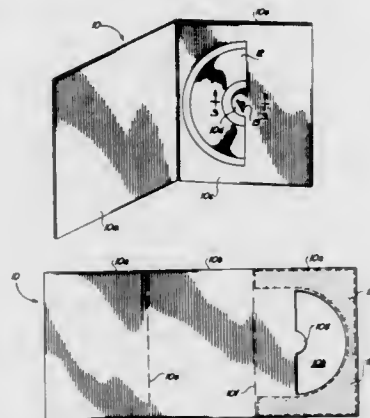
Int. Cl.⁵ B65D 85/57

U.S. Cl. 206—312

4 Claims

2. A folder for holding, displaying and securing a disc having a hole in its center including a rectangular sheet of card stock, said sheet being scored and folded to form three equal rectangular sections, a semicircular section being cut out of one of the two end sections of the sheet leaving a semicircular tab at the center of the cut out section, the diameter of the semicircular cut out section lying parallel to the sheet's fold and sized slightly larger than the diameter of the disc, the end section of the sheet containing the cut out being

folded over and glued to the center section of the sheet to form a pocket sized to receive one half of the disc, the semicircular tab sized to cover that portion of the disc surrounding the hole in its center, and



the end section of the sheet which does not carry the disc being folded over the disc to serve as the cover of the folder, and means attached to the semicircular tab for securing the disc within the folder.

5,085,319

BOW AND ARROW STORAGE DEVICE

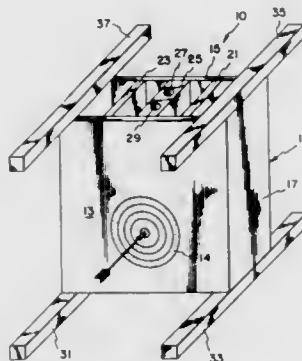
Gerald L. Wellman, and Terri A. Wellman, both of 5883 Miller Rd., Hillman, Mich. 49746

Filed May 22, 1991, Ser. No. 704,189

Int. Cl.⁵ B65D 85/20

U.S. Cl. 206—315.11

7 Claims



1. A bow and arrow storage device, comprising:
 - a) a housing having a plurality of chambers;
 - b) said housing being supported on a ground surface by support means; and
 - c) at least one bow support comprising an elongated bar mounted on said housing and overhanging two sides of said housing.

5,085,320

BAG FOR CARRYING A GAME BALL

Gregory D. Scott, Wasilla, Ak., assignor to SGS International, Sandy, Utah

Filed May 30, 1990, Ser. No. 530,598

Int. Cl.⁵ B65D 30/10, 33/06

U.S. Cl. 206—315.9

4 Claims

1. A bag for carrying a game ball, the bag comprising: two, substantially symmetrical, cup-shaped members, a portion of one cup-shaped member being non-releasably attached to a portion of the other cup-shaped member, and

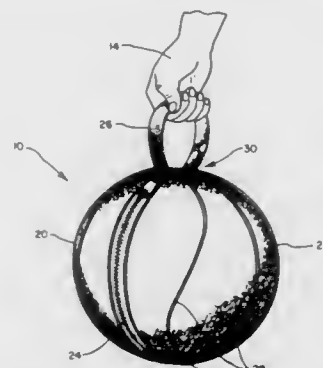
each said cup-shaped member being formed of a flexible material;

means for releasably fastening the two cup-shaped members together so as to form a hollow bag;

wherein the two cup-shaped members are configured such that, when releasably fastened together, the said hollow bag formed thereby is substantially the same size and shape as said game ball; and

a handle secured adjacent said portions of the two cup-shaped members which are non-releasably attached to each other.

4. A bag for carrying a basketball, the bag comprising: two, substantially hemispherical members, a portion of one hemispherical member being non-releasably attached to a



portion of the other hemispherical member, each said hemispherical member being formed of a flexible material, and each hemispherical member being provided with reinforcing ribbing;

a zipper for releasably fastening the two hemispherical members together so as to form a hollow, substantially spherical bag;

wherein the two hemispherical members are configured such that, when releasably fastened together, the said hollow bag formed thereby is substantially the same size as said basketball; and

a handle secured adjacent said portions of the two hemispherical members which are non-releasably attached to each other.

5,085,321

CARRIER FOR AN INTEGRATED CIRCUIT PACKAGE

Hwee S. Chew, Singapore, Singapore, assignor to Microfits & Methods Pte. Ltd., Singapore, Singapore

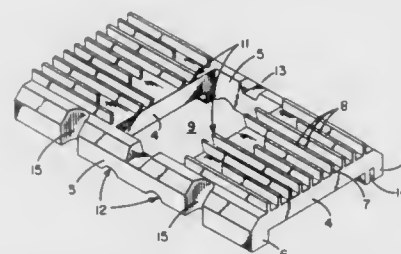
Filed Apr. 12, 1990, Ser. No. 508,855

Claims priority, application United Kingdom, Jun. 21, 1989, 8914212

Int. Cl.⁵ B65D 85/42

U.S. Cl. 206—331

2 Claims



1. A carrier for an integrated circuit package with projecting leads, the carrier comprising a body having a window in alignment with which the package is arranged to be supported, a surface with channels extending away from the window for respective leads, side wall portions having a pair of recesses formed therein at their undersides and a recess formed at their

top sides intermediate the recesses at their undersides, and grippers at a pair of opposite edges of the window, wherein the grippers are undercut, so as to overlies the package, the body being resiliently flexible to enable it to be bent so as to increase the spacing of the opposed grippers for introduction of a package which is subsequently held in position by the grippers upon return of the body to its normal configuration.

5,085,322

BOTTOM-LOAD VIDEO CASSETTE CONTAINER

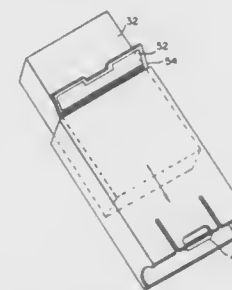
Michael Lax, Oyster Bay Cove, N.Y., assignor to Autronic Plastics, Inc., Westbury, N.Y.

Filed Aug. 24, 1990, Ser. No. 572,185

Int. Cl.⁵ B65D 85/672

U.S. Cl. 206—387

25 Claims



1. A video cassette storage container, comprising: an enclosure having substantially the same shape as, and being slightly larger than, a video cassette; said enclosure having upper, lower and sidewall surfaces, and top and bottom ends, wherein the top end is enclosed and the bottom is open to receive a video cassette for storage; a pair of slits in said upper surface or said lower surface extending to said bottom end to form an integral spring tab resiliently connected to said enclosure and oriented so as to be manually pivotable to release said video cassette for removal from said enclosure, said spring tab being formed integrally with and extending from the upper surface or the lower surface to partially enclose the bottom end of said enclosure to contact and retain a video cassette stored therein; a pair of apertures in said upper surface or said lower surface, wherein each of said apertures is formed at a corresponding end of one of said pair of slits to relieve stress during manual pivoting of said spring tab; and grommets formed around said apertures.

5,085,323

CARTON HAVING A PERFORATION CUT SCORE OPENING AND A CARTON BLANK FOR FORMING THE SAME

Morris W. Kuchenbecker, and Raymond V. Maroszek, both of Neenah, Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Filed Sep. 18, 1990, Ser. No. 584,050

Int. Cl.⁵ B65D 5/54

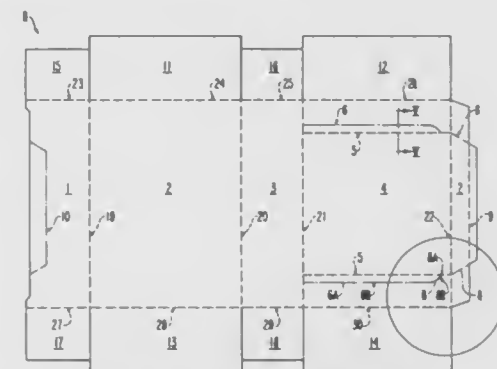
U.S. Cl. 229—207

24 Claims

1. An opening device formed in a panel of a paperboard carton for facilitating the formation of an opening in said carton comprising:

an opening force receiving means adjacent said panel; at least one through cut segment formed in an outer surface of said panel extending from an edge of said opening force receiving means and into said panel to a termination point; at least one perforated line of weakness extending substantially colinear with said through cut segment and spaced a predetermined distance from said termination point of said through cut segment; and at least one partially cut line of weakness formed in said outer surface of said panel, said partially cut line of weak-

ness having a major portion extending substantially parallel to said perforated line of weakness and a minor portion which extends from said major portion toward said through cut segment substantially at said termination point forming an initiation point of a ply separation in said panel between said perforated line of weakness and said partially cut line of weakness;



wherein the ply separation of said paperboard carton occurs at a region of weakness between said perforated line of weakness and said partially cut line of weakness when an opening force is applied to said opening force receiving means.

5,085,324

SCREEN FOR PROCESSING CONVEYED GOODS

Bengt L. A. Dehlé, Trelleborg, Sweden, assignor to Trelleborg AB, Trelleborg, Sweden

PCT No. PCT/SE89/00111, § 371 Date Oct. 12, 1989, § 102(e) Date Oct. 12, 1989, PCT Pub. No. WO89/08509, PCT Pub. Date Sep. 21, 1989

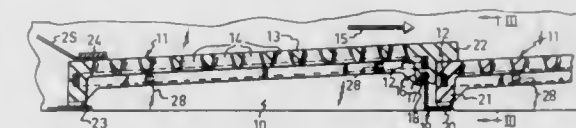
PCT Filed Mar. 8, 1989, Ser. No. 424,217

Claims priority, application Sweden, Mar. 8, 1988, 8800805

Int. Cl.⁵ B07B 1/46

U.S. Cl. 209—399

4 Claims



1. A stepped screen comprising screen cloth elements (11) mounted after each other in a screen frame (10) and having a rigid reinforcing frame (12) integrated in a rubber cloth (13), said screen cloth elements being mounted in said screen frame (10) by snap lock means (16, 17; 18), characterised in that the ends of the screen cloth elements (11) mounted after each other are overlapping thereby forming said stepped screen, that one part (16, 17) of said snap lock means (16, 17; 18) is integrally formed with and arranged adjacent one end of the underside of each screen cloth element (11), that the other part (18) of the snap lock means is arranged at the upper edge of a supporting element (19) included in said screen frame (10), and that the other end of each screen cloth element (11) rests on a projecting abutment surface on said supporting element (19).

5,085,325

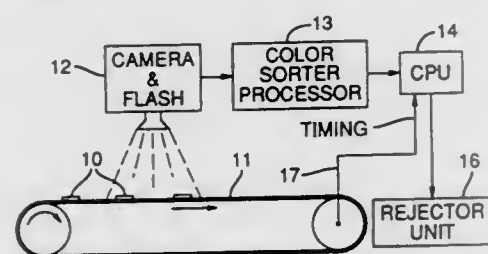
COLOR SORTING SYSTEM AND METHOD

Clarence S. Jones, Los Altos, Calif.; Arthur W. Coolidge, White City; Dennis Cavin, deceased, late of Medford, both of Oreg. by Nan Hai Cavin, legal representative; Norman L. Betts, Sunnyvale; Jeffrey M. Moser, Oakland, both of Calif., and Kenneth J. McGarvey, Central Point, Oreg., assignors to Simco/Ramic Corporation, Medford, Oreg.

Continuation-in-part of Ser. No. 165,490, Mar. 8, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 415,056
Int. Cl.⁵ B07C 5/342

U.S. Cl. 209—580

31 Claims



1. Apparatus for processing moving items having a plurality of color values, comprising:

a look up table with addressable memory locations corresponding to said color values and with an indicating datum stored at each of said locations indicating an item or a portion thereof has acceptable or rejectable color values; color camera means for capturing an image of said moving items;

normalizing means for providing normalized color values of said image from said color camera means;

addressing means using said normalized color values for addressing said look up table;

color value expanding means for providing around a central color value a range of color values having said indicating datum stored in corresponding look up table locations to compensate for any one of system noise, a range of color variation, or optical variations; and

memory means responsive to said stored datum in said look up table locations corresponding to the captured image of the moving items for storing processing data used to process said moving items.

5,085,326

LOAD LOCK HOLDER

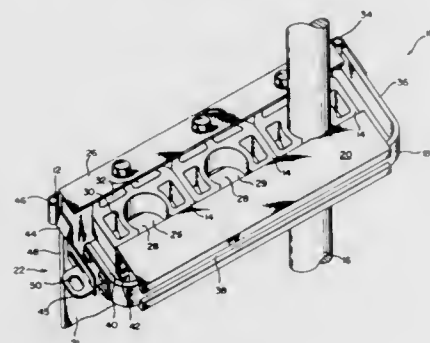
Michael T. Russell, Kirkland, and A. Bruce Bliven, Renton, both of Wash., assignors to Paccar Inc., Bellevue, Wash.

Filed Jun. 20, 1990, Ser. No. 541,267

Int. Cl.⁵ E05B 73/00

U.S. Cl. 211—4

17 Claims



1. A load lock holder, comprising:

a main support bracket for mounting a load lock holder to a wall; and

a plurality of clips coupled to the main support bracket, each clip having a clamping area with a middle width lock, the

clip having a front, outermost surface and an entrance slot at said outermost surface at the front of the clamping area, the slot having an entrance width at the outermost surface of the clip the entrance width being less than the middle width of the clamping area so that the load lock must be forced through the slot before entering into the clamping area and the clip will hold the load lock in place regardless of the orientation of the load lock holder, the entrance slot at said outermost surface spaced outwardly perpendicularly from a rear inside surface of the clamping area at a distance less than the middle width of the clamping area so that the clamping area holds the load lock with no fore or aft gap between the load lock and the clip to prevent movement of the load lock relative to the clip.

5,085,327

SPORTS EQUIPMENT ORGANIZER

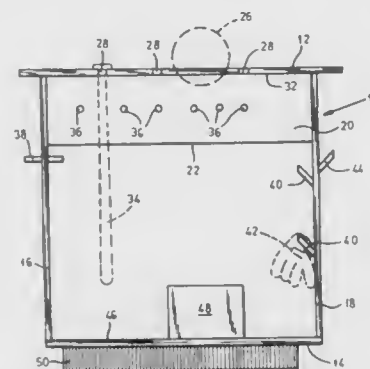
Alan S. Mercer, Jr., and Alan S. Mercer, Sr., both of 11 Windsorville Rd., Broad Brook, Conn. 06016

Continuation of Ser. No. 486,200, Feb. 28, 1990. This application Oct. 9, 1990, Ser. No. 594,035

Int. Cl.⁵ A47F 7/00

U.S. Cl. 211—13

1 Claim



1. A sports equipment organizer comprising an open front frame with a top element joined in perpendicular relationship to two vertical parallel side members and a back member, said back member joined in perpendicular relationship to said side members and adjacent to the top member, said side members extending to and joining a bottom member in perpendicular relationship; said top member has a plurality of different diameter holes therethrough for holding sports balls of different diameters and a plurality of semicircular holes along a front edge thereof for holding bats vertically; said back member has a plurality of spaced members projecting toward said open front frame to hang articles of clothing therefrom within said open front frame sports organizer; said side members having a plurality of horizontal and upwardly tilted pegs projecting both inside and outside of said open front frame from which to hang sports equipment and articles of clothing; said bottom member being supported by a base beneath a bottom thereof to hold said bottom member somewhat elevated, said bottom member having a top side for supporting sports shoes and an open top box for storage of balls; said joined top element, side members, back member, bottom member and base acting in concert to form said sports equipment organizer.

5,085,328

BROCHURE DISPLAY SYSTEM

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inglewood, Calif.

Filed Oct. 15, 1990, Ser. No. 597,792

Int. Cl.⁵ A47F 7/00

U.S. Cl. 211—55

8 Claims

1. A brochure display system comprising:

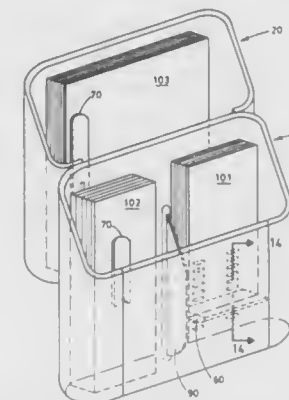
a brochure pocket having a bottom and an enclosure that includes a back wall and a front wall, the back wall having

a plurality of vertically arranged divider notches substantially at a center thereof;

a top of the brochure pocket being substantially open for insertion of a plurality of brochures therein;

a demountable vertical divider vertically separating the brochure pocket into two halves, the vertical divider comprised of a substantially flat support flange and a substantially flat divider vane extending perpendicularly from a forward side of the support flange, and a plurality of downward extending substantially L-shaped hooks extending perpendicularly from a rearward side of the

second base members at locations thereon spaced from said first ends thereof for pivotal movement relative thereto about respective third and fourth axes which are each substantially parallel to said first axis, at least said first base member having a second end spaced from said first end thereof and said third axis being between said first and second ends of said first base member, at least said first base member having an upwardly facing support surface on a portion thereof between said third axis and said second end so that said upper surface thereof is available for supporting an edge portion of said sheet of building material thereon.



5,085,330

DRINKING BOTTLE ATTACHMENT

Kenneth R. Paulin, 13428 Oro Grande St., Studio A, Sylmar, Calif. 91342

Filed Mar. 13, 1991, Ser. No. 668,621

Int. Cl.⁵ B65D 1/04, 41/26, 23/04

U.S. Cl. 215—6

17 Claims

support flange, the hooks demountably engaging the divider notches carried by the back wall;

a brochure support shelf having a width that is approximately one-half of the width of the brochure pocket;

means for attaching the brochure support shelf to the back wall of the brochure pocket at variable heights relative to the bottom of the brochure pocket and on either side of a vertical center of the brochure pocket so that different height brochures may be supported on either side of the vertical center in the same brochure pocket with a top of each brochure at substantially the same height.

5,085,329

SHEETING SUPPORT

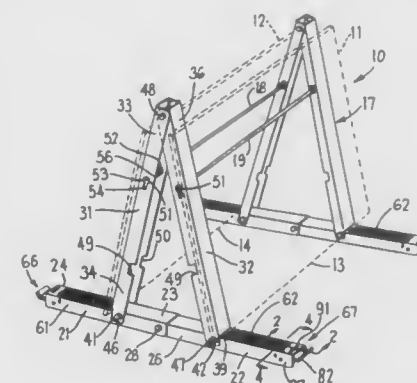
John W. Crowell, 6320 Litotier, and Jeffrey L. Kellerman, 8055 W. Long Lake Dr., both of Kalamazoo, Mich. 49002

Filed Dec. 7, 1990, Ser. No. 624,147

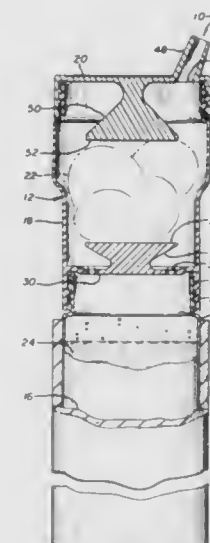
Int. Cl.⁵ B66C 23/72

U.S. Cl. 211—195

19 Claims



1. A collapsible support for a sheet of building material, comprising: first and second base members which each have a first end and which are coupled to each other at said first ends for relative pivotal movement about a first axis; first and second legs which each have upper and lower ends and which are coupled to each other in the region of said upper ends for relative pivotal movement about a second axis substantially parallel to said first axis, said lower ends of said first and second legs being respectively pivotally coupled to said first and



1. A drinking apparatus for separately storing a carbonated beverage and ice cream in close proximity to one another, and selectively mixing the beverage and the ice cream to provide a drink having the flavor of an ice cream float, the drinking apparatus comprising:

a bottle including a cup-like body for storing the beverage, and a threaded neck;

a bottle attachment housing for storing the ice cream, including a threaded flange at one end dimensioned to engage the threaded bottle neck to secure the attachment housing to the bottle, a barrier adjacent to the threaded flange for separating the ice cream from the beverage, means for permitting the beverage to flow past the barrier into the housing, a lower platform extending upwardly from the barrier for supporting the ice cream within the housing, and a second threaded housing end opposite to the housing threaded flange; and

a housing cap including a threaded flange dimensioned to engage the second threaded housing end to secure the cap to the housing, and an aperture for permitting the drink to be drawn from the drinking apparatus, wherein the cap and the housing define a chamber for the ice cream.

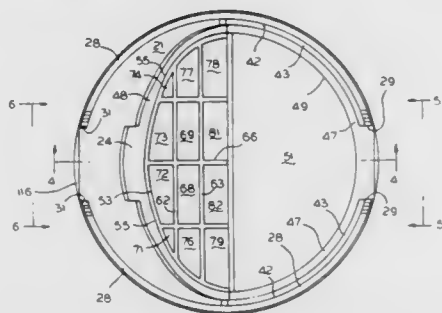
5,085,331

SPOONING CLOSURE

Robert J. Groya, Norridge, and Richard W. Hofmann, Chicago, both of Ill., assignors to Magenta Corporation, Chicago, Ill.
Filed Feb. 26, 1990, Ser. No. 485,246
Int. Cl.⁵ B65D 47/00

U.S. Cl. 215—245

22 Claims



1. A spooning closure for a container comprising a top, a skirt, and a first and second locking means, the top including a fixed portion and a spooning lid pivotally hinged to the fixed portion, said spooning lid adapted to pivot from a closed position to an open dispensing position, said skirt being connected to said fixed portion, and bounding said spooning lid when in the closed position, said first locking means adapted to releasably lock said spooning lid in a closed position, said second locking means adapted to releasably lock said spooning lid in an open dispensing position, said second locking means comprises a tongue extending from said spooning lid and a locking slot formed on the top side of said skirt adjacent said fixed portion, said locking slot being sized to receive and frictionally engage said tongue.

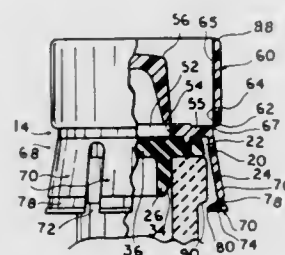
5,085,332

CLOSURE ASSEMBLY

William A. Gettig, and Larry E. Shook, both of Millheim, Pa., assignors to Gettig Technologies, Inc., Spring Mills, Pa.
Filed Apr. 11, 1991, Ser. No. 683,814
Int. Cl.⁵ B65D 41/62

U.S. Cl. 215—249

11 Claims



1. In a closure assembly for a vial having a rim surrounding a neck opening and with said rim including an outer peripheral surface provided with a lower shoulder, the improvement comprising:
said closure assembly including a cap device and a resilient stopper,
said cap device including a cap including a top wall having an outer periphery, said cap device provided with a radially displaceable skirt portion depending from said top wall outer periphery, said skirt portion having inwardly directed locking means thereon,
an outer sleeve having an inner surface juxtaposed said top wall outer periphery,
said stopper including a top wall having a central septum

area surrounded by a rim adapted to be disposed atop the vial rim,
said cap top wall overlying said stopper rim with said skirt portion adapted to overlie the vial rim peripheral surface, said outer sleeve axially shiftable to overlie said skirt portion and radially inwardly biasing said skirt portion with said skirt portion locking means adapted to engage the vial rim shoulder to clampingly retain said stopper rim atop the vial rim.

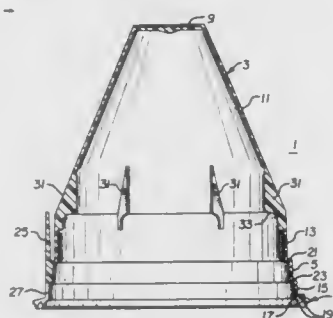
5,085,333

TAMPER EVIDENT CONTAINER OVERCAP MOLDED IN STRAIGHT DRAW MOLD

Herbert V. Dutt, Venetia, Pa.; Gary L. Meneu, Wheeling, W. Va., and Stephen F. Royal, Woodridge, Ill., assignors to Continental Plastics, Inc., Triadelphia, W. Va.
Filed Mar. 15, 1991, Ser. No. 670,006
Int. Cl.⁵ B65D 41/32

U.S. Cl. 215—250

17 Claims



1. An overcap for a container having a neck joined to a body portion by a generally laterally extending shoulder, said overcap comprising:
a ring member having an axially extending flange of a first lateral dimension, and a generally laterally extending flange extending laterally outward from said axially extending flange, said generally laterally extending flange being secured to said generally laterally extending shoulder on said container;
a cap member having an axially extending skirt with a second lateral dimension which is smaller than said first lateral dimension;
a tear band having a third lateral dimension which is between said first and second lateral dimensions and having first and second axial edges;
generally laterally extending first tearable connection means connecting said first axial edge of said tear band to said axially extending flange of said ring member;
generally laterally extending second tearable connection means connecting said second axial edge of said tear band to said skirt on said cap member; and
a pull tab secured to said tear band for applying a force to said tear band to tear said first and second tearable connection means and separate said cap member from said ring member which remains secured to said container shoulder, said pull tab being aligned such that it forms no undercuts.

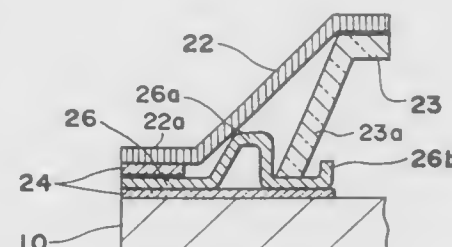
5,085,334

FLAT PANEL DISPLAY DEVICE

Mitsunori Katano; Fumio Yamazaki, and Hiroyuki Yamakita, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 492,573, Mar. 13, 1990, Pat. No. 5,031,788.
This application Nov. 1, 1990, Ser. No. 608,488
Claims priority, application Japan, Mar. 13, 1989, 1-59913; May 8, 1989, 1-114738; Aug. 31, 1989, 1-226275
Int. Cl.⁵ H01K 1/36

U.S. Cl. 220—2.2

5 Claims



1. A vacuum envelope, comprising:
a glass plate having a peripheral edge portion;
an outer container for mounting on said glass plate and having a peripheral edge portion;
a pressure tight container within said outer container and having a peripheral edge;
a joining means between the peripheral edge portion of said glass plate and the peripheral edge portion of said outer container for joining said peripheral edges to each other, said joining means having a joining member connected to the peripheral edge of said outer container and a frit on the peripheral edge of said glass plate to which said joining member is connected; and
a buffer means of a deformable spreadable material engaged between the peripheral edge of said pressure tight container and one of said joining means and said glass plate.

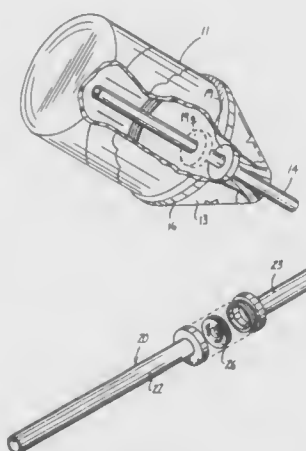
5,085,335

DRINKING CUP APPARATUS

Donna Carbaugh, 15 Page St., Las Vegas, Nev. 89110
Filed Mar. 4, 1991, Ser. No. 663,678
Int. Cl.⁵ A47G 19/22

U.S. Cl. 220—709

1 Claim



1. A drinking cup apparatus, comprising,
a cup member symmetrically defined about a cup axis, including an upper terminal end, with a lid mounted to the upper terminal end, wherein the lid is symmetrically configured about the cup axis, and
the lid including a guide bore coaxially directed through the lid, and
a drinking tube slidably mounted through the guide bore,

and wherein the guide bore is defined by a guide bore diameter and the drinking tube is defined by a tube diameter, wherein the tube diameter is less than the guide bore diameter, and
wherein the lid includes a resilient annular skirt, the resilient annular skirt is securable about the upper terminal end of the cup member to frictionally secure the annular skirt and lid to the cup member, and
wherein the guide bore includes a flexible tubular guide coaxially defined about the guide bore and fixedly mounted coaxially of the lid, and
wherein the drinking tube includes an abutment disk fixedly mounted about the drinking tube below the tubular guide, wherein the abutment disk is defined by an abutment disk diameter greater than the guide bore diameter to prevent removal of the drinking tube when mounted within the cup member and the guide bore, and
wherein the abutment disk includes an upper externally threaded cup-shaped disk and a lower internally threaded cup-shaped disk, the upper externally cup-shaped disk includes an upper drinking tube secured to the upper cup-shaped disk, and the lower drinking tube secured to the lower cup-shaped disk, wherein the upper and lower drinking tubes are coaxially aligned relative to one another, and the upper and lower cup-shaped disks define a disk cavity therebetween when the upper and lower disks are in an assembled configuration, and
including a fluid soluble food component tablet positioned within the disk cavity to enhance flavor of fluid directed through the drinking tube.

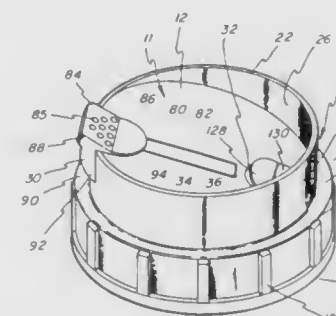
5,085,336

CAP ASSEMBLY

L. Grant Lynd, Canal Winchester, Ohio, assignor to Lynd Properties, Inc., Columbus, Ohio
Filed Mar. 11, 1991, Ser. No. 667,127
Int. Cl.⁵ A47G 19/22

U.S. Cl. 220—708

21 Claims



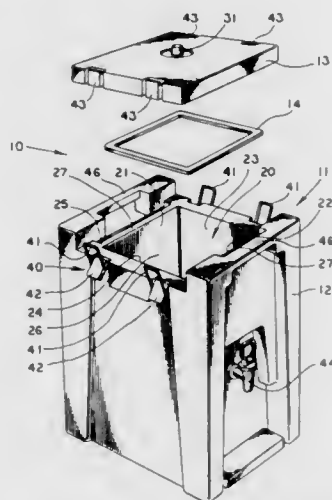
1. A cap assembly for drinking of liquids comprising
a top wall, said top wall having a first aperture and a second aperture formed therein,
a wall member extending upwardly from at least a portion of said top wall, said wall member having an upper edge, said top wall being inclined relative to said upper edge, and
first and second aperture closing members both independently, and selectively adjustable to a first aperture and a second position, said first aperture closing member comprising a base portion, said base portion having a channel formed therethrough, said base portion when said first aperture closing member is adjusted to said first position forming a seal across said first aperture, said base portion when said first aperture closing member is adjusted to said second position having said channel cooperate with said first aperture to form a passage through said cap for the drinking of a liquid, said second aperture also forming a passage through said cap for the drinking of a liquid.

5,085,337 SHOCK RESISTANT GASKETING SYSTEM FOR LIQUID CONTAINERS

Chester M. Kos, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed May 24, 1990, Ser. No. 527,953
Int. Cl.⁵ B65D 51/16

U.S. Cl. 220—204

9 Claims



1. A container with a shock resistant gasketing system comprising a resilient gasket, a base having an enclosed area and substantially four sides, a rim defining an opening into said enclosed area and having a retaining wall groove on only two of said substantially four sides, said rim also having a gasket seat contiguous with said opening into said enclosed area and contiguous with said retaining wall groove, a cover affixable to said base and closing said opening into said enclosed area when said cover is affixed to said base, means for securing said cover to said base, said cover having a retaining wall structurally corresponding to said retaining wall groove of said base, such that said retaining wall fits within said retaining wall groove when said cover is affixed to said base, wherein said gasket is positioned on said gasket seat and impinged between said base and said cover when said cover is affixed to said base.

5,085,338 METHOD OF TREATING MEDICAL WASTES AND CONTAINERS TO BE USED FOR THE TREATMENT METHOD

Jitsuo Inagaki, 71, Aza Kamiyashiki, Oaza Itsusiki, Itsusikicho Hazugun, Aichi, Japan
Division of Ser. No. 534,231, Jun. 7, 1990, abandoned, which is a division of Ser. No. 337,078, Apr. 12, 1989, Pat. No. 4,940,157.

This application Jan. 4, 1991, Ser. No. 637,551
Claims priority, application Japan, Feb. 27, 1989, 1-43120
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

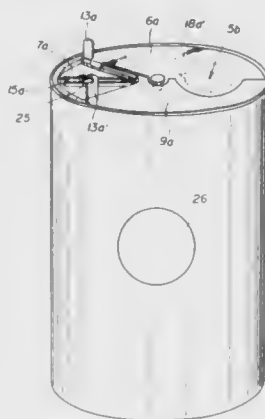
Int. Cl.⁵ B65D 51/18

U.S. Cl. 220—254

15 Claims

1. An article for treatment of medical wastes comprising a container having an opening, a lid section including a certain amount of elastic filler material between an inner lid and a top lid and rigidly fitted into the opening of the container, a pair of input ports provided on said lid section for disposing medical wastes therethrough and a rotary lid for opening and closing said input ports, wherein said input ports are provided with a larger opening and a smaller opening which is in communica-

tion with the larger opening and so dimensioned to come into engagement with a needle of a syringe so that the needle can be



removed from the syringe by pulling up the syringe from the opening.

5,085,339 RECLOSABLE CONTAINER CLOSURE

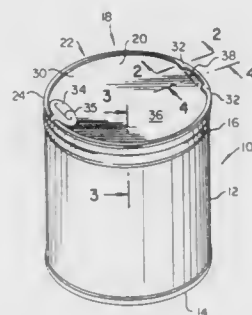
Donald J. Roth, Westport; William M. Heyn, New Canaan, and Donald G. Sauer, Harwinton, all of Conn., assignors to Polyester Packaging, Incorporated, Norwalk, Conn.

Filed Oct. 1, 1990, Ser. No. 591,275

Int. Cl.⁵ B65D 17/32, 43/16

U.S. Cl. 220—269

6 Claims



1. A closure for a container, said closure comprising a frame member and an end panel, said frame member comprising an injection molded plastic ring member, means for attaching said end panel to said ring member, means for securing said frame member and said end panel to a container body, said end panel including a displaceable panel portion, means for displacing said panel portion from at least a portion of said ring member for providing an opening in said closure for gaining access to an interior of said container, and means for releasably securing said end panel over said opening for reclosing said opening, said means for releasably securing said end panel for reclosing said opening comprising means on said ring member cooperating with means on said end panel, said means on said end panel comprising a pull tab, and said means on said ring member comprising means for capturing said pull tab and securing said end panel over said opening.

5,085,340 SYSTEM FOR LOCKING A WASTE RECEPTACLE

André G. Doxey, Shaker Heights, and John L. Hradisky, Medina, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 28, 1990, Ser. No. 635,744

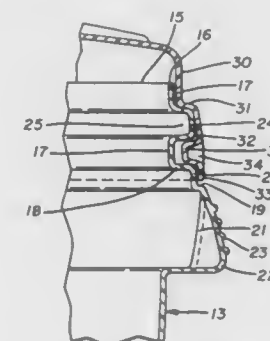
Int. Cl.⁵ B65D 41/06

U.S. Cl. 220—298

14 Claims

1. A receptacle comprising a generally cylindrical base

container portion defined by generally vertical walls forming a generally circular open top, a generally circular cover for closing said open top, a plurality of circumferentially spaced lug means extending outwardly from said base container portion, handles extending outwardly from said base container portion and aligned with said lug means, nub means extending



downwardly from each said lug means, and a plurality of similarly spaced locking lug means on said cover defined by slots in said cover, said locking lug means on said cover being adapted to abut said nub means and engage said lug means in a single locked position by aligning said slots with said handles to hold said cover on said base container portion.

5,085,341 TRASH BIN SYSTEM

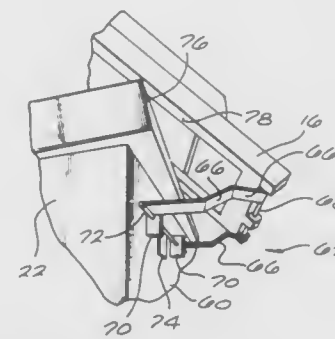
Allan M. Hodge, P.O. Box 202005, San Diego, Calif. 92120-0925

Filed Sep. 12, 1990, Ser. No. 581,458

Int. Cl.⁵ B65D 43/16

U.S. Cl. 220—331

27 Claims



18. A trash bin system comprising:
a commercial trash bin having front, rear and side walls;
at least one lid on said trash bin;
first and second hinge linkages;
means for pivotally mounting one end of each of said hinge linkages at a rear edge of said lid; and
means for pivoting an opposite end of each of said linkages to said trash bin at a fixed pivot point on the rear wall of said bin spaced a distance downward from said rear edge so that said lid is adapted to slide in forward and backward directions on a top edge of said rear wall, while remaining in contact with said top edge in order to facilitate opening and closing of said lid, and to remain stationary in a partially open configuration.

5,085,342 BAG SUPPORT FOR TRASH CANS

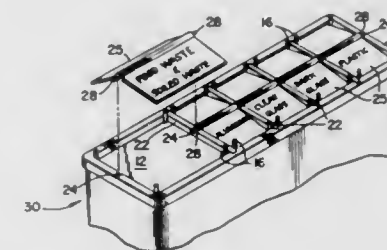
Glenn G. Strawder, 9200 Edwards Way #1116, Adelphi, Md. 20783

Continuation-in-part of Ser. No. 307,912, Feb. 9, 1989, Pat. No. 4,905,853. This application Jan. 22, 1990, Ser. No. 468,157

Int. Cl.⁵ B65D 90/04

U.S. Cl. 220—404

8 Claims



1. Apparatus for positioning a plurality of flexible bags adjacent to each other, comprising:
support means in the form of a receptacle terminating in an upper open end for positioning at least first and second bags of flexible material, adjacent to each other, with the upper end of each of said first and second bags open, said support means including projections adjacent said upper end, and extending generally vertically above and away from said upper open end of said support means, for engaging said flexible bags and holding such bags in place, first and second rotatable lids for said first and second bags, respectively, each said lid at least partially closing the open upper end of its complementary bag when such bag is positioned in said support means, and means for mounting said rotatable lids by the upper end of said support means, each of said lids being rotatable to a position at which objects may be inserted into the bag complementary to the lid, a divider positioned between said first and second bags, said divider having a top surface, said support means having two end walls, said end walls having a top surface, said end walls and said divider each having a groove in its top surface, said grooves being positioned along a substantially straight line, said means for mounting said rotatable lids comprising a shaft that rides in said grooves.

5,085,343 NESTED TANK CONSTRUCTION

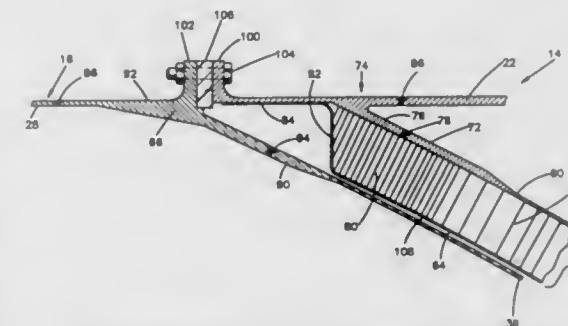
Antony B. Scarr, Slidell, La., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Oct. 23, 1989, Ser. No. 425,805

Int. Cl.⁵ B65D 21/02

U.S. Cl. 220—445

15 Claims



1. A nested tank construction for pressurized materials comprising:
first and second cylindrical tanks;

means connecting said tanks together so that they are axially aligned;

said first tank comprising a dome end which is inverted so that it extends inwardly into the first tank and is under compression loading when exposed to pressure within said first tank;

said second tank comprising a dome end separate from said first tank dome end which extends outwardly from said second tank and is under tension loading when exposed to pressure within said second tank;

said first and second tank dome ends having a matching geometry, said second tank dome end being nested into the first tank dome end;

said first tank dome end comprising:

- a aluminum membrane having a concave face;
- a honeycomb core adhered to said concave face of said aluminum membrane and thus having a concave face; and
- a fiber composite face sheet adhered to the concave face of said honeycomb core;

said nested dome ends being spaced part and defining a gap between the face sheet of said first tank dome end and said second tank dome end.

5,085,344

APPARATUS FOR CLOSING AND/OR REGULATING THE DISCHARGE OR TAPPING OF MOLTEN METAL
Ulrich Hintzen, Taunusstein-Watzahn, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

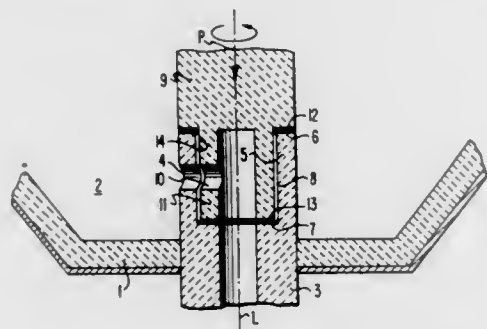
Filed Nov. 27, 1990, Ser. No. 618,947

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1989, 3939241

Int. Cl.⁵ B22D 41/14

U.S. Cl. 222—590

21 Claims



1. An apparatus for closing and/or regulating the discharge or tapping of molten metal from a metallurgical vessel, said apparatus comprising:

- a ceramic stator member to be fixed to a metallurgical vessel and having a pipe-shaped portion having extending therethrough at least one lateral opening;
- a ceramic rotor member having a pipe-shaped portion having extending therethrough at least one lateral opening;
- said stator and rotor members being coaxially assembled with said pipe-shaped portion of a first of said members being fitted over and surrounding said pipe-shaped portion of a second of said members and with said lateral openings of said first and second members located at the same position axially of said members, whereby said rotor member is rotatable relative to said stator member to bring said lateral openings thereof into and out of alignment;
- said pipe-shaped portions of said first and second members having radially confronting respective cylindrical inner and outer sealing surfaces onto which open said respective lateral openings, said inner and outer sealing surfaces sealingly engaging to define a primary seal to prevent leakage of molten metal;
- whereby during use said inner and outer sealing surfaces

may become worn or expand, such that said primary seal would not prevent leakage of molten metal;

said stator and rotor members having respective axially confronting end sealing surfaces annularly surrounding the common coaxial axis of said members; and

said rotor member being axially movable, at least when said primary seal will not prevent leakage of molten metal, to press end sealing surface of said rotor member against said end sealing surface of said stator member at a pressure sufficient to form secondary seal means for preventing leakage of molten metal.

5,085,345

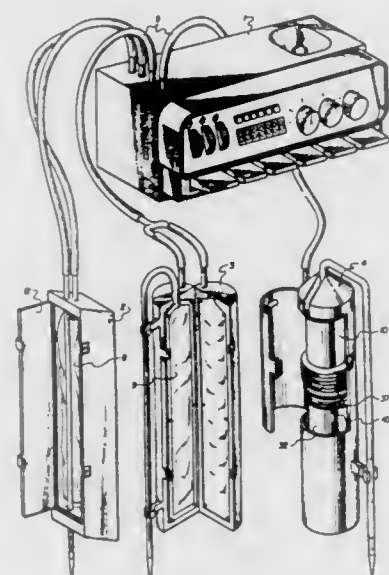
HYDRAULIC DISPENSER

John R. Wells, 4372 Keystone Ave., Culver City, Calif. 90024
Continuation of Ser. No. 722,429, Apr. 12, 1985, abandoned, which is a continuation of Ser. No. 513,780, Jul. 15, 1983, abandoned. This application Sep. 22, 1989, Ser. No. 411,225

Int. Cl.⁵ B65D 35/28

U.S. Cl. 222—95

12 Claims



1. A hydraulic dispenser for aspirating and expressing a sample liquid using a hydraulic liquid comprising:

- a magazine which is both insertable and purgable for holding the sample liquid and
- a hydraulic press which includes a hydraulic pump for generating a displacement of the hydraulic liquid, a magazine coupler for coupling the hydraulic pump and said magazine, and a housing for enclosing the hydraulic liquid and for hydraulically connecting the hydraulic pump to the magazine coupler,
- said magazine including an enclosure for holding the sample liquid, the enclosure having a topmost part and being both expandable and collapsible and including a tubular spout connected to and communicating with the topmost part of the enclosure of said magazine, the tubular spout for guiding the sample liquid which is aspirated into and expressed from the enclosure of said magazine, said magazine adapted to be inserted into and coupled to the magazine coupler,
- the hydraulic pump including means for generating a reflux displacement of the enclosed hydraulic liquid and for generating a quantitative positive displacement of the enclosed hydraulic liquid,
- the coupler for transmitting the reflux displacement between the hydraulic pump and said magazine for expanding the enclosure of said magazine and aspirating sample liquid through the tubular spout and into the enclosure, whereby sample liquid is aspirated through the tubular spout

and into the enclosure of said magazine by reflux displacement generated by the hydraulic pump,

the coupler for transmitting the quantitative positive displacement between the hydraulic pump and said magazine for collapsing the enclosure of said magazine and firstly expressing substantially all air entrapped therein through the tubular spout and secondly expressing sample liquid contained therein through the tubular spout,

whereby firstly air is substantially eliminated from said magazine and hydraulic contact is established between the hydraulic pump and the sample liquid contained within said magazine and

whereby secondly the expressed sample liquid is dispensed from said magazine by quantitative positive hydraulic displacement generated by the hydraulic pump.

5,085,346

FLUID DISPENSING KIT

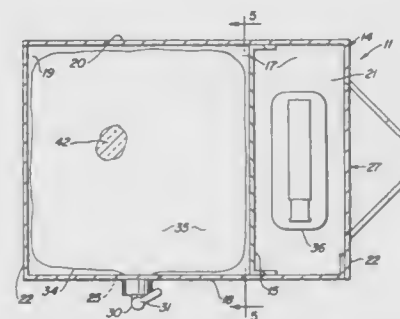
Danny J. Wright, P.O. Box 9680, Amarillo, Tex. 79105

Continuation of Ser. No. 294,054, Jan. 5, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 635,400

Int. Cl.⁵ B67D 5/60

U.S. Cl. 222—143

16 Claims



1. In a shipping and storage carton for fluid materials of the type comprising a sealed collapsible non-permeable bag-like fluid storage container housed and supported within an essentially rigid box-like container adapted for flat-shelf storage and a dispensing spigot connected to said fluid container and accessible outside said rigid container, the improvement comprising: a storage compartment provided within said rigid container separated from said fluid container by an essentially rigid wall separating and excluding said fluid container from said storage compartment, said storage compartment being accessible from the exterior of said rigid container without disturbing said fluid container; a portable dispenser of smaller capacity than said fluid container adapted to be removably housed in said storage compartment and to be fillable and refillable with fluid from said fluid container through said dispensing spigot, at least a portion of said spigot being comprised of a material transmissive of the color of the fluids stored in said fluid storage container; and said portable dispenser being comprised of a material transmissive of the color of the fluid contained therein such that the color of the fluid in said portable dispenser may be visually compared with the color of the fluid in said fluid storage container.

5,085,347

PRESSURIZED DISPENSER PACKAGE

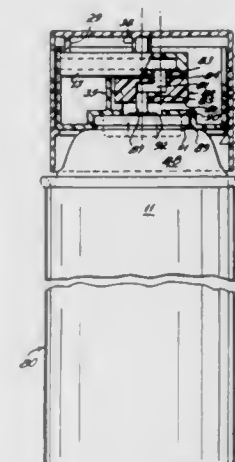
Thomas H. Hayes, Lancaster, and Lewis C. LoMaglio, Pickerington, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 361,379, Jun. 5, 1989, Pat. No. 5,016,783, which is a continuation-in-part of Ser. No. 186,262, Apr. 26, 1988, Pat. No. 4,836,423. This application Jan. 24, 1991, Ser. No. 645,097

Int. Cl.⁵ B67B 5/00

U.S. Cl. 222—153

11 Claims



1. A pressurized dispenser package for an aerosol material comprising:

- a pressurized container for the aerosol material, said pressurized container having a valve stem located on one end thereof for releasing the aerosol material contained therein when actuated;
- a nozzle having an outlet;
- means for connecting said nozzle to the valve stem of said pressurized container and for communicating the interior of said pressurized container with said nozzle when the valve stem is actuated;
- a hollow cover mounted on said container adjacent said nozzle for rotational and reciprocable motion;
- said cover operatively coupled to the valve stem for pushing the valve stem to actuate the valve stem when said cover is reciprocated in a downward direction; and
- means for moving said nozzle outlet into and out of said cover during a rotary movement of said cover.

5,085,348

RECLOSABLE CONTAINER HAVING A POURING SPOUT

Peter Huerlimann, Konolfingen, and Eugene Van Meir, Fribourg, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 321,644, Mar. 8, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 607,596

Claims priority, application European Pat. Off., Mar. 17, 1988, 88104221

Int. Cl.⁵ B67D 5/32

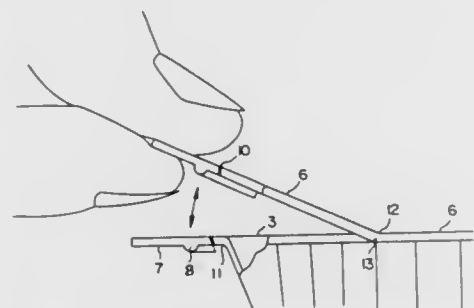
U.S. Cl. 222—153

11 Claims

1. A reclosable container comprising:

- a base;
- a sidewall extending from the base defining a container portion which has a shape selected from the group of shapes consisting of a substantially cylindrical shape and a substantially frustoconical shape and defining a pouring spout and extending to an upper rim comprised of a container rim portion merged integrally with a V shaped pouring spout rim portion and with a rim tab which extends about and away from the pouring spout rim and

which is separated from the pouring spout rim by a V shaped cut out slit which follows the contour of the pouring spout rim and which thereby defines an opening between the rim tab and an outer edge of the pouring spout rim;



a lid welded to the container portion upper rim, the pouring spout rim and the rim tab for covering the container; and a holding portion integral with the sidewall.

5,085,349

RESILIENT VALVE AND DISPENSING SYSTEM FOR BICYCLISTS

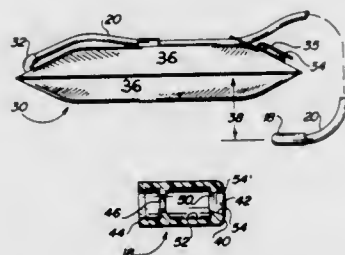
Roger R. Fawcett, P.O. Box 4972, Odessa, Tex. 79760

Filed Feb. 8, 1990, Ser. No. 477,708

Int. Cl.⁵ A45F 3/00

U.S. Cl. 222-175

13 Claims



1. A system for delivering liquid from a container of fluid to a person's mouth comprising:

a unitary resilient valve of a size to be received within a person's mouth; said valve being an elongated hollow body member having an open inlet end opposed to an outlet end; means forming a fluid supply chamber within said body member that communicates with said inlet and outlet ends, means by which said open end is connected to one end of a length of tubing, and means connecting the other end of the length of tubing to a container of fluid to thereby supply fluid flow to the supply chamber;

a closure member at said outlet end providing means forming a normally closed slit in said closure member which extends therethrough and thereby communicates the supply chamber with ambient whenever the slit is deformed into an opened position, said slit is arranged laterally relative to the elongated hollow body and is biased into a closed position by the memory of the resilient body, and thereby precludes fluid flow therethrough and can be opened to enable fluid flow therethrough;

said closure member includes an outwardly curved outer wall and an inner chamber wall that slopes inwardly in an upstream direction in opposition to said outer wall; said slit is formed in the inwardly sloped wall; the slope of said inner chamber wall, together with the memory of the material from which the closure member is made, determines the hydrostatic head that must be effected upstream of the closure member for flow to occur through the slit when the valve is in the normally closed configuration; whereby: a liquid supply, when placed in said container, provides a fluid source for said supply chamber; and,

when said valve body member is deformed to open said slit, fluid flows from said supply chamber and flows away from the valve where the contents of the chamber are made available to be ingested by a person.

5,085,350

PUMP ASSEMBLY WITH CONTAINER FOR STORING LIQUID IN ISOLATION FROM AMBIENT AIR

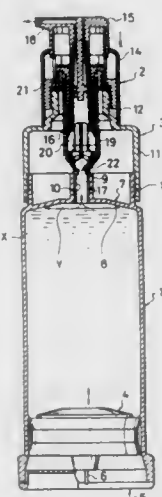
Koichi Sugita, Chiba, Japan, assignor to Kabushiki Kaisha Top, Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,534

Int. Cl.⁵ G01F 11/00

U.S. Cl. 222-260

12 Claims



1. A pump assembly comprising:
a substantially cylindrical container storing a liquid therein, said container having open opposite ends;
a pump mounted on one end of said container and having a suction port for drawing the liquid from said container and an outlet port for discharging the liquid;
a gasket slidably inserted in the opposite end of said container in contact with the liquid stored in the container, for sealing the liquid in said container, said gasket being slidable toward said pump when the liquid stored in said container is gradually discharged out by said pump; and
a slanted portion disposed in and integral with said one end of the container and having a substantially conical slanted surface extending continuously from an inner peripheral surface of said container and converging away from said gasket, said slanted portion having a projection projecting outwardly from said container substantially at the converging end of said slanted surface, said projection having a through hole communicating with the interior space of said container, said suction port being fitted in said through hole such that a tip end of said suction port lies substantially flush with said converging end of said slanted surface.

5,085,351

ADJUSTABLE DOSE DISPENSER

James H. Martin, 8322 County Line Rd., Burr Ridge, Ill. 60521

Filed Nov. 5, 1990, Ser. No. 608,690

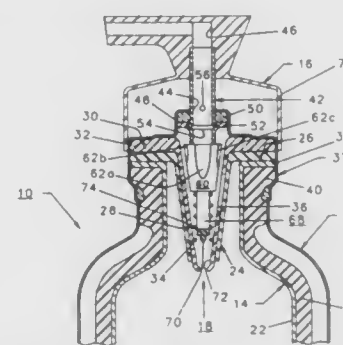
Int. Cl.⁵ B65D 83/14

U.S. Cl. 222-287

9 Claims

4. A dispenser for dispensing an adjustable dose of fluid in response to each actuation of said dispenser, comprising in combination
reservoir means for containing a supply of liquid under pressure,
a nozzle for dispensing a quantity of said liquid supplied thereto,

a plurality of metering chamber recesses mounted within said reservoir means,
first valve means connected between said metering chamber recesses and said reservoir for communicating said metering chamber recesses to said reservoir when said valve means is in a first position and for sealing said metering chamber recesses from said reservoir when said valve means is in a second position,
second valve means connected between said metering chamber recesses and said nozzle when said second valve



means is in a first position and for sealing said metering chamber recesses from said nozzle when said second valve means is in a second position,
said first and second valve means being interconnected for simultaneous operation,
manually adjustable means for selecting one of said metering chamber recesses, and
means for expelling the liquid from the selected one of said metering chamber recesses when said first valve means is in said second position and said second valve means is in said first position.

5,085,352

DISPENSER FOR DISCHARGING MATERIAL AND HAVING RELATIVELY ROTATABLE MALE AND FEMALE SCREWS

Toshiyuki Sasaki, and Takeshi Nagaki, both of Tokyo, Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/00070, § 371 Date Aug. 29, 1989, § 102(e) Date Aug. 29, 1989, PCT Pub. No. WO89/07078, PCT Pub. Date Aug. 10, 1989

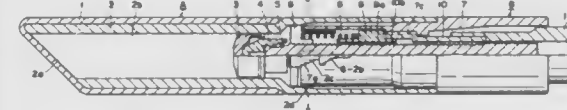
PCT Filed Jan. 26, 1989, Ser. No. 415,220

Claims priority, application Japan, Jan. 30, 1988, 63-11619; Jul. 11, 1988, 63-91591

Int. Cl.⁵ B65D 8/854

U.S. Cl. 222-327

6 Claims



1. A dispenser, comprising:
an elongated container having a storage portion for storing material to be dispensed;
a female screw member fitted in the interior of said elongated container and held against longitudinal movement therealong;
a male screw member having a press portion at one end thereof engaged with material in said storage portion and rotatably engageable with said female screw member for, when said male screw member is moved axially within said elongated container, a material stored in said storage portion is pressed by said press portion and discharged out of said dispenser;
means connected to said screw members for rotating said

screw members relative to each other for axially moving said male screw member within said container relative to said female screw member;
said female screw member having a plurality of parts, at least one of which is threaded, movable inwardly and outwardly of said male screw member for changing the diameter of said female screw member for engaging the female screw member with said male screw member and releasing the engagement of said female screw member and said male screw member; and
means engaged by said female screw member for moving said parts inwardly into engagement with said male screw member and holding said parts in such engagement.

5,085,353

ACTUATOR FOR LIQUID EJECTION

Ryosuke Inui, Yamagata, and Susumu Matsubara, Tokyo, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo and Kabushiki Kaisha Tatsumi Kogyo, Yamagata, both of, Japan

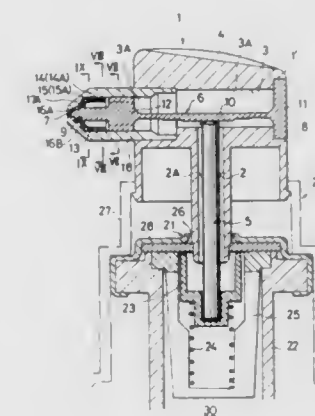
Filed Jan. 11, 1991, Ser. No. 651,293

Claims priority, application Japan, Jan. 12, 1990, 2-2231[U]; Dec. 28, 1990, 2-415948

Int. Cl.⁵ B65D 83/00

U.S. Cl. 222-402.13

8 Claims



1. An actuator for liquid ejection, which is adapted to be mounted on a container filling therein a pressurized fluid, and comprises:

a fluid-introduction passage, which is adapted to be communicated with a valved spout of the container;
a fluid-discharging passage intersecting with a distal end of said fluid-introduction passage, and forming a ejection spout at a tip portion thereof;
an actuating rod coaxially disposed in said fluid-introduction passage, a proximal end thereof being adapted to press open the valved spout of the container, and a distal end portion thereof being projected into said fluid-discharging passage;
an elastic rod-like member disposed in and along said fluid-discharging passage, a proximal end portion thereof being secured to the proximal end portion of said fluid-discharging passage, and a middle portion thereof crossing over the distal end portion of said actuating rod;
a plug attached to the distal end portion of said actuating rod, and adapted to close said ejection spout formed at the tip portion of said fluid-discharging passage, said plug being forced to move backward to open the ejection spout as said elastic rod-like member is forced to be arched by a pushing movement of said actuating rod against the middle portion of said elastic rod-like member, thereby communicating said ejection spout with said fluid-discharging passage.

5,085,354

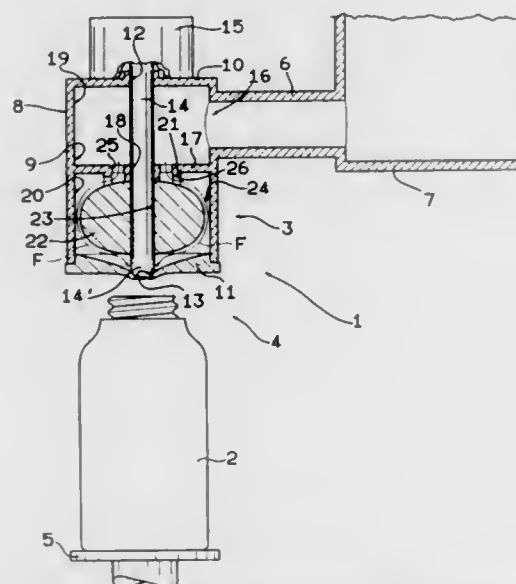
DISPENSER DEVICE FOR LIQUID SUBSTANCES

Claudio Sogliani, Cere di Virgilio, and Carlo Corniani, Mar-mirolo, both of Italy, assignors to Azionaria Costruzioni Mac-chine Automatiche A.C.M.A. S.p.A., Bologna, Italy
Filed Jun. 29, 1990, Ser. No. 545,748

Claims priority, application Italy, Jul. 6, 1989, 3544 A/89
Int. Cl.⁵ B67C 3/00

U.S. Cl. 222—504

3 Claims



1. Dispenser device for liquid substances comprising a chamber for receiving a liquid substance, said chamber being of substantially cylindrical shape with an upper disc-like wall, a lower disc-like wall, and a cylindrical side wall arranged between said upper and lower disc-like wall, said cylindrical side wall of said chamber defining an inner surface, said lower disc-like wall being provided with a lower central hole which defines a valve seat, said upper disc-like wall being provided with an upper central hole which is coaxial with said lower central hole, said dispenser device further comprising a reciprocating shaft slidably accommodated through said upper central hole and arranged inside said chamber, said shaft defining a vertical axis and an out of said valve seat, said upper disc-like wall further being provided with passage hole means for receiving a liquid substance into said chamber, said passage hole means being arranged substantially circumferentially around and proximate to said shaft, said dispenser device further comprising a flow deflector element which is rigidly fixed inside said chamber, said flow deflector element being provided with a through hole which extends along said vertical axis of said shaft and in which said shaft is slidably accommodated, said flow deflector element being a toroidal doughnut-shaped body defining an upper curved surface arranged facing said passage hole means of said upper disc-like wall and a maximum horizontal circumference which closely flanks said inner surface of said cylindrical side wall of said chamber, a circular gap being defined between said maximum horizontal circumference of said flow deflector element and said inner surface of said cylindrical side wall of said chamber, said circular gap having a substantially uniform narrow width, whereby upon disengagement of said lower valve element end of said shaft from said valve seat, said liquid flows through said passage hole means and follows a substantially laminar flow path around said flow deflector element from said upper curved surface through said circular gap and finally through said lower central hole in said lower disc-like wall of said chamber.

5,085,355

LIQUID STORAGE CONTAINER PREVENTING LIQUID BACKFLOW

Shigeru Yoshimura, Yokohama; Tetsuo Suzuki, Kawasaki, and Makoto Takemura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 945,769, Dec. 23, 1986, Pat. No. 4,848,602.
This application May 31, 1989, Ser. No. 359,410

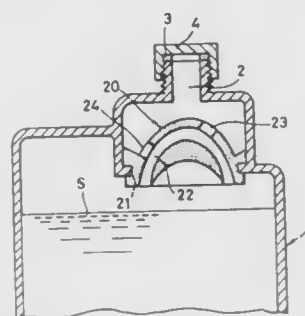
Claims priority, application Japan, Dec. 28, 1985, 60-297558; Dec. 28, 1985, 60-297559

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.⁵ B67D 3/00

U.S. Cl. 222—564

10 Claims



1. A liquid container comprising:
a supply port for supplying liquid; and
liquid path forming means provided in said liquid container for preventing direct backflow of liquid in said container to said supply port, said liquid path forming means including:
a projecting member having a sloped surface provided below said supply port;
means for defining a first flow path for passing liquid there-through, said means including a lowermost section of said sloped surface and defining a first port; and
means for defining a second flow path for passing liquid into said container, said means including a portion of said projecting member and defining a second port, wherein the second port is in communication with a lowermost portion of the second flow path, and the first port is in communication with an intermediate portion of the second flow path.

5,085,356

REFRACTORY SHUTOFF ASSEMBLY AND ROTOR AND STATOR THEREFOR

Rolf Waltenspühl, Hünenberg, Switzerland, assignor to Stopine Aktiengesellschaft, Baar, Switzerland

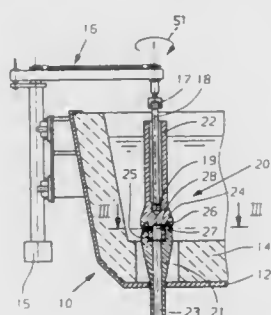
Filed Jun. 19, 1990, Ser. No. 540,627

Claims priority, application Switzerland, Jul. 11, 1989, 02593/89

Int. Cl.⁵ B22D 41/08

U.S. Cl. 222—598

30 Claims



1. A refractory shutoff assembly for controlling the dis-

charge of molten metal from a metallurgical vessel, said assembly comprising:

a refractory tubular stator to be mounted in a wall of a metallurgical vessel, said stator having an axial opening therethrough, inner and outer surfaces, and at least one transverse opening extending between said inner and outer surfaces;

a refractory rotor including inner and outer tubular sections arranged concentrically relative to each other, at least one of said inner and outer tubular sections having there-through at least one transverse opening;

said rotor being arranged with respect to said stator to be within the interior of the metallurgical vessel and with an outer surface of said inner tubular section sealing with said inner surface of said stator, and with an inner surface of said outer tubular section sealing with said outer surface of said stator; and

said rotor being movable relative to said stator between a closed position, whereat said at least one transverse opening in said at least one tubular section of said rotor is isolated from said at least one transverse opening in said stator, and an open position whereat said transverse openings are in alignment.

5,085,357

COLLAPSIBLE GARMENT HANGER WITH HOOK RECESS

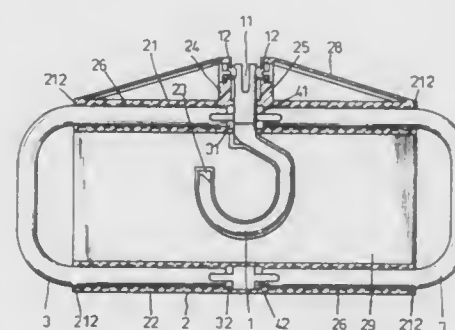
Ken-Wang Chen, 50, Lane 274, Chung Cheng S. Rd., Yang Kang Hsiang, Tainan Hsien, Taiwan

Filed Apr. 17, 1991, Ser. No. 686,399

Int. Cl.⁵ A47G 25/40, 25/14

U.S. Cl. 223—89

2 Claims



1. A foldable garment hanger comprising:

a hook portion and a cylindrical post being extended downwardly from said hook portion with a notch being formed in the lower half of said cylindrical post and two flanges connected to sides of said notch;

a frame having an upper and a lower hollow pipe and a board being formed inbetween said pipes; said upper pipe has its center portion cut off and at each cut end of said upper pipe extends a flat plate raised upwardly; each of said flat plates has a hole and extends to a support from the top of the plate down to the outer end of said upper pipes; said board has a recess being shaped like said hook in a reversed position; said upper and lower pipes have teeth being serially formed inside and a block ring being located at each inner end of said pipes;

two U-shaped shoulders having an elastic stopper and a notch at each end to engage with said teeth of said two pipes; wherein further said each flange engages one of holes in said 7 plates.

5,085,358

ADJUSTABLE CLOTHES HANGER

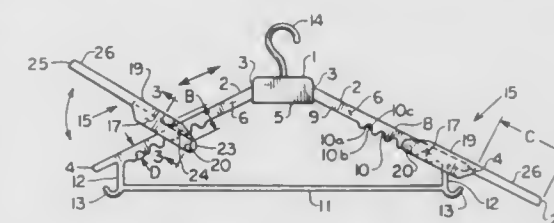
Peter Ar-Fu Lam, 18C Block 3, Hong Kong Garden, Castle Peak Road, Tsing Lung Tau, N.T., Hong Kong, Hong Kong

Filed Oct. 11, 1990, Ser. No. 595,544

Int. Cl.⁵ A47G 25/44, 25/20, 25/14

U.S. Cl. 223—94

17 Claims



1. A clothes hanger comprising:

a suspension member;
first and second elongated support arms extending symmetrically from near said suspension member, said support arms each having a first end proximate to said suspension member and a second end distal from said suspension member;

first and second extender arms respectively supported on said first and second support arms;

each extender arm having an inner terminal end toward the suspension member and an outer terminal end away from the suspension member; and

a locator element on each extender arm engageable to any one of a series of aligned mating locator elements on its respective support arm for fixing the position of the extender arm in aligned relationship with the support arm at a preselected position to present an effectively continuous clothing support which is adjustable in length for an item of clothing;

each extender arm and its respective support arm having cooperative means for allowing pivoting in a given direction of the extender arm out of alignment with the support arm such that upon pivoting the locator element of the extender arm will move out of engagement with the mating locator element of the support arm and upon reverse pivoting into alignment the locator element of the extender arm will move into engagement with a mating locator element of the support arm; and

the extender arm and the support arm being adapted for allowing axial sliding movement of the extender arm along the support arm when in the said pivoted position to permit locating the locator element of the extender arm in position for engagement with any selected locator element of the support arm upon reverse pivoting into the aligned relationship of the support arm and the extender arm;

each extender arm inner terminal end having first and second spaced parallel side walls, extending along opposite sides of the support arm, the second one of said side walls terminating at its inner terminal end a distance short of the point of termination of the first one of said side walls at its inner terminal end thereby defining an opening whereby upon pivoting the extender arm, the opening may be aligned with the height of the support arm permitting the extender arm to be assembled onto or disassembled from the support arm by lateral movement therebetween.

5,085,359

GARMENT ACCESSORY DEVICE TO REMOVE PANTS WITH CONSTRICTED CUFFS

Carmen J. Thomas, 905 N. Federick St., Arlington, Va. 22205

Filed Jun. 15, 1990, Ser. No. 546,370

Int. Cl.⁵ A47G 25/90

U.S. Cl. 223—111

12 Claims

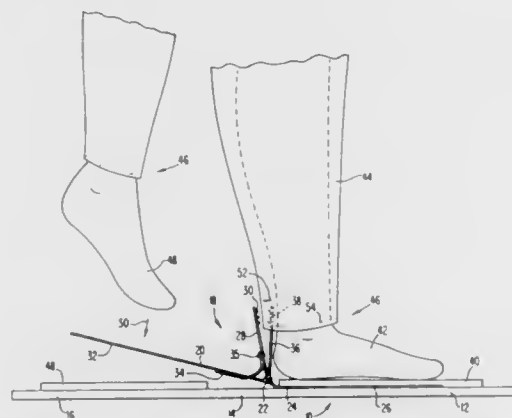
9. A pants puller for use by a woman wearing pants with constricted cuffs, comprising:

a base having a front portion, a rear portion, and an intermediate portion between the front and rear portions, the woman stepping onto the base with her toes oriented toward the front portion; and

clamping means for clamping the fabric of one of the cuffs while the woman withdraws her leg, the clamping means including

a stationary clamp member having an arm which is affixed to the forward portion of the base and having a clamping arm which extends upward from the base above the intermediate portion thereof, the arms of the stationary clamp member being disposed at an angle greater than 90°,

a movable clamp member having a clamping arm and a further arm, the arms of the movable clamp member being disposed at an angle less than 90°,



means for pivotally mounting the movable clamp member so that the further arm of the movable clamp member is disposed above the rear portion of the base and so that the clamping arm of the movable clamp member extends upward from the base above the intermediate portion thereof and is positioned between the clamping arm of the stationary clamp member and the forward portion of the base, the clamping arms being pivotable between an open and a closed position relative to each other,

gripper members on the movable clamping arms, and

means for biasing the clamping arms in their open position to receive said one of the cuffs of a woman who steps onto the forward portion of the base, the clamping arms thereafter being moved to their closed position when the woman steps onto the further arm of the movable clamp member.

5,085,360

SPARE TIRE MOUNTED BICYCLE RACK

Christopher S. Fortune, Verona, and Ervin L. Severson, Oregon, both of Wis., assignors to Graber Products, Inc., Madison, Wis.

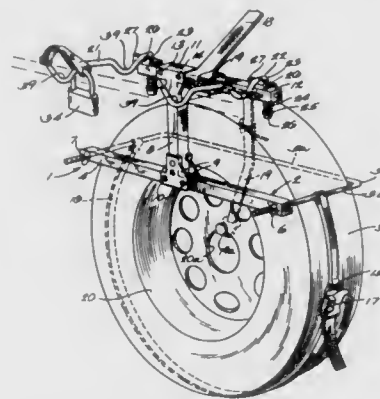
Filed Dec. 28, 1990, Ser. No. 635,669
Int. Cl.⁵ B60P 3/363

U.S. Cl. 224—42.13

14 Claims

1. A bicycle carrier comprising:
a rack with an opening adapted to receive and embrace an upper portion of a spare tire,
strap means fastened to the rack to secure the rack to the tire,
an upright standard mounted on said rack,
means for securing a beam to said standard to maintain said

beam in a laterally extending direction with respect to a vehicle carrying the spare tire, and



means on said beam for securing a bicycle frame to said beam.

5,085,361

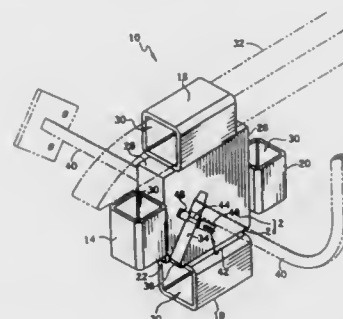
BURGLAR BAR BREAKING TOOL

Barry K. Wagner, 10521 Hermanos, San Diego, Calif. 92124
Filed Jul. 23, 1990, Ser. No. 556,288

Int. Cl.⁵ B26F 3/00

U.S. Cl. 225—102

14 Claims



1. A burglar bar breaking tool, comprising:
a solid block of metallic material having an outer peripheral edge and a series of slots for selectively receiving the end of a prying tool arranged end to end at spaced intervals around the peripheral edge of the block; and
the block having a recess extending inwardly from the peripheral edge for engaging transversely over a burglar bar to allow torque to be applied to the burglar bar via a prying tool inserted in a selected slot.

5,085,362

GRAVITY-HELD ALIGNMENT MEMBER FOR MANUFACTURE OF A LEADLESS CHIP CARRIER

Jack Art, Modesto, Calif., and Douglas J. Levad, Colorado Springs, Colo., assignors to Atmel Corporation, San Jose, Calif.

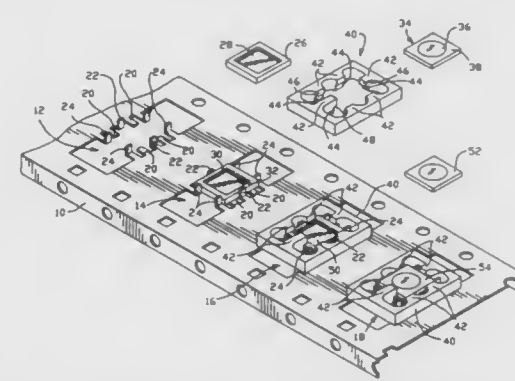
Filed Jan. 16, 1991, Ser. No. 642,031
Int. Cl.⁵ B23K 1/14

U.S. Cl. 228—49.1

13 Claims

1. An apparatus for use in hermetically sealing of a lid to a base of a leadless chip carrier comprising,
a base of a leadless chip carrier, said base having a die-receiving cavity to house an integrated circuit chip,
a carrier lid adapted to be secured to said base to hermetically seal said die-receiving cavity of said base,
a support means for retaining said base in a substantially fixed, generally horizontal position, and
an alignment member releasably coupled to said support means, said alignment member having first and second

levels, said first level having a configuration to receive said base, said second level having a configuration to receive said carrier lid and to maintain said carrier lid in



generally fixed horizontal registration with respect to said base, gravitational force thereby being the primary force for maintaining said carrier lid in contact with said base during hermetical sealing of said carrier lid to said base.

5,085,363

METHOD OF WELD REPAIRING OF A SECTION OF A METALLIC CYLINDRICAL MEMBER

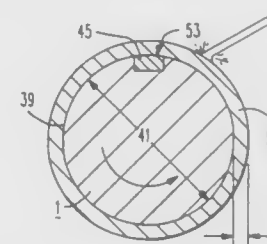
John A. Sims, Concord, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1990, Ser. No. 608,142

Int. Cl.⁵ B23K 31/00

U.S. Cl. 228—119

15 Claims



1. A method of weld repairing a section of a metallic cylindrical member having an initial diameter to remove defects in the surface thereof, which section has a keyway in the surface area thereof comprising:

mechanically removing the surface of said section of said cylindrical member, to a depth less than the depth of said keyway, to remove the surface defects and provide a welding surface;
inserting a key member, of a material that is weld compatible with the metallic material of the section of the cylindrical member, in said keyway to provide a key member surface flush with said welding surface;
recording the location of said keyway in said cylindrical member;
depositing a weld metal over said welding surface and said key member surface to provide weld metal thereon, such that the section of the cylindrical member with said weld metal is larger in diameter than said initial diameter;
machining said weld metal to provide a layer of weld metal on the section of the cylindrical member of a diameter equal to said initial diameter; and
removing the key member from said keyway to provide a repaired section of the cylindrical member of said initial diameter having said keyway in the surface area thereof.

5,085,364

PRESSURE-SENSITIVE ADHESIVE FOR TEMPORARILY SECURING ELECTRONIC DEVICES

Mitsuo Ishikawa, and Shigeaki Watarai, both of Tokyo, Japan, assignors to Senju Metal Industry Co., Ltd. and Nihon Junyaku Co., Ltd., both of Tokyo, Japan

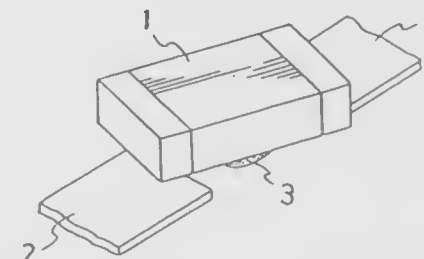
Filed Sep. 5, 1990, Ser. No. 577,716

Claims priority, application Japan, Sep. 5, 1989, 1-228423; Nov. 15, 1989, 1-296680

Int. Cl.⁵ H05K 3/34; H01L 21/58; B23K 1/00

U.S. Cl. 228—139

13 Claims



1. In a method for soldering electronic devices on a printed circuit board, the improvement comprising temporarily securing the electronic devices on the board with a pressure-sensitive adhesive during soldering, said pressure-sensitive adhesive consisting essentially of a resinous material having a dynamic modulus of elasticity in the range of from 10⁴ to 10⁹ dyne/cm² as measured at the soldering temperature of the electronic devices with a frequency of applied vibrations of 10 Hz.

5,085,365

WATER-SOLUBLE SOLDERING FLUX

Raymond L. Turner, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 15, 1990, Ser. No. 523,765

Int. Cl.⁵ B23K 1/20

U.S. Cl. 228—223

14 Claims

1. A method for soldering a metal comprising applying to a surface a soldering flux, heating said metal to a desired soldering temperature, and applying solder to said surface, characterized in that said soldering flux consists essentially of (a) a water-soluble organic acid having at least two carboxylic acid groups and (b) at least one non-toxic carrier selected from the group consisting of water, alcohols, terpenes and mixtures thereof.

5,085,366

HIGH GLOSS PAPER CUP

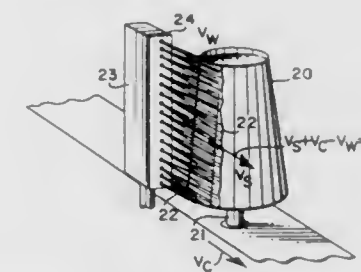
Ronald A. Durgin, Eldersburg; Derek S. Matheson, Baltimore, both of Md.; Delvin K. Border, Glen Rock, Pa.; Carlton L. Kennet, Sykesville, Md., and Daniel E. Hammett, Brodbecke, Pa., assignors to Sweetheart Cup Company, Chicago, Ill.

Division of Ser. No. 358,007, May 26, 1989, Pat. No. 5,039,560.
This application Jun. 27, 1991, Ser. No. 722,314

Int. Cl.⁵ B65D 3/28

U.S. Cl. 229—1.5 B

5 Claims



1. A paper cup of the type having a smooth, high gloss

coating and being produced by the method comprising the steps of:

- applying a substantially uniform coating of melted wax material to at least the outside surface of said container;
- maintaining the temperature of said wax coating at a temperature above its melting point;
- imparting a constant angular velocity to said container; and
- applying a substantially uniform thin film of liquid coolant to said outside surface of said container, said coolant having a linear velocity substantially equal to said absolute surface velocity of said container and being applied substantially tangential to said outside surface.

5,085,367

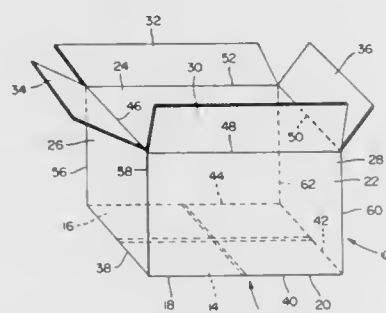
CORRUGATED CARDBOARD BOXES WITH INCREASED COMPRESSION STRENGTH

Ronald Carstens, 209 Edith Point, Anacortes, Wash. 98221
Filed May 3, 1991, Ser. No. 695,527

Int. Cl.⁵ B65D 5/42

U.S. Cl. 229—3.5 R

10 Claims



1. A corrugated cardboard box comprising base panel means, upright walls, top panel means, horizontal edges between the base panel means and the walls, further horizontal edges between the top panel means and the walls, and vertical edges between the respective walls wherein compression strength of the box is increased by the provision of mechanical perforations extending through the cardboard along at least some of the horizontal edges, and a layer of a chemical strength enhancing additive extending along at least some of the vertical edges.

5,085,368

SYSTEM FOR CONTROLLING POULTRY HOUSE WINDOW CLOSURES

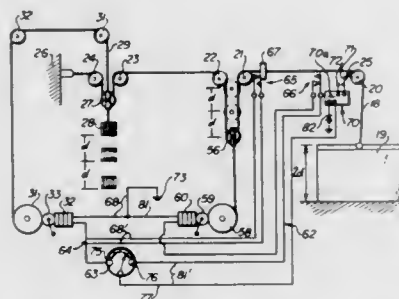
John B. Beckman, 136 Adamson Dr., Cedartown, Ga. 30125, and
Martio Blickstein, 3745 Wildwood Ct., Alpharetta, Ga. 30201

Filed Oct. 22, 1990, Ser. No. 600,719

Int. Cl.⁵ F24F 13/08

U.S. Cl. 236—49.3

19 Claims



1. In a poultry house having ventilating openings and closure means for controlling the flow of air through the ventilating openings by positioning the closure means at greater and

lesser air flow restrictive positions, a system for controlling the position of the closure means which comprises:

- a space condition sensing means for sensing levels of a condition of the air within the poultry house such as temperature, humidity or air quality;
 - a cable adapted to be coupled with the closure means;
 - first cable positioning means of weight sufficient to move the closure means from a position with less of the closure weight supported by the cable towards another position with more of the closure weight supported by the cable;
 - support means for releasably supporting said first cable positioning means;
 - first control means coupled with said space condition sensing means and said support means for releasing said releasable support means in response to said condition sensing means sensing a selected level of the condition of the air within the poultry house and thereby permit said first cable positioning means to lower and move said cable and thereby move the closure means from said one position towards said other position;
 - second cable positioning means of weight insufficient to support the closure at the one position or to effect movement of the closure means from said one position to said other position when loaded upon said cable;
 - hold-down means for releasably holding down said second cable positioning means, and
 - second control means coupled with said condition sensing means and said hold-down means for releasing said releasable hold-down means and thereby permit said second cable positioning means to raise said cable to move the closure means towards said one position,
- whereby upon coupling the cable to the closure means and routing the cable under the first and second cable positioning means under tension the closure means may be moved at least one full cycle between greater and, lesser air flow restricted positions in response to reversed changes in sensed conditions of the air in the poultry house.

5,085,369

FUEL INJECTOR

Tsuneaki Aoki; Toshiro Makimura, and Kaneo Imamura, all of
Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha,
Obu, Japan

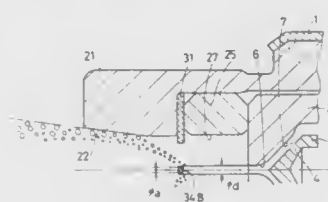
Filed Oct. 31, 1990, Ser. No. 606,904

Claims priority, application Japan, Nov. 15, 1989, 1-296382

Int. Cl.⁵ B05B 1/26; F02M 51/06

U.S. Cl. 239—5

6 Claims



1. In a fuel injector including:
a valve housing having a fuel injection hole formed at a front end of said valve housing;
a valve movably provided in said valve housing so as to open and close said fuel injection hole;

a nozzle fixedly mounted to the front end of said valve housing; and
a fuel colliding member provided in said nozzle and positioned in alignment with said fuel injection hole in front thereof;

the improvement characterized in that said fuel colliding member comprises a plate like member formed at a central joining portion of a plurality of bridging portions extending from a side of inner circumferential face of said nozzle to center, and that a size of said fuel colliding member is smaller in cross section perpendicular to an axis of said fuel injector than that of said fuel injection hole.

5,085,370

COMPACT SPRAY GUN

James E. Smith, St. Petersburg, Fla., assignor to Graves Spray Supply, Incorporated, Clearwater, Fla.

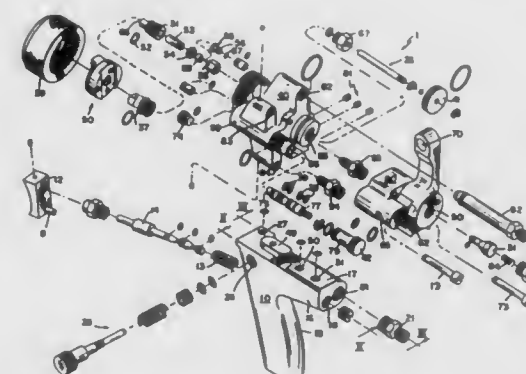
Continuation of Ser. No. 436,026, Nov. 14, 1989, Pat. No. 4,948,048, which is a division of Ser. No. 330,460, Mar. 30, 1989, Pat. No. 4,925,104, which is a division of Ser. No. 150,142, Jan. 29, 1988, Pat. No. 4,848,665. This application Jun. 15, 1990, Ser. No. 538,905

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.⁵ B05B 7/12

U.S. Cl. 239—71

11 Claims



1. A spray gun apparatus for applying at least two components to a work piece comprising:
a housing;
a first valve for controlling dispensing of a first component and having a packing seal for sealing said first valve in a first bore in said housing;
a second valve for controlling dispensing of a second component and having a seal for sealing said second valve in a second bore in said housing; and
said first valve including a packing cartridge which is adjustable by turning a first valve seat threadably received in said first bore.

5,085,371

FOAM CREATING NOZZLE SYSTEM

Clive R. Paige, Winkfield, England, assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Jun. 15, 1990, Ser. No. 538,535

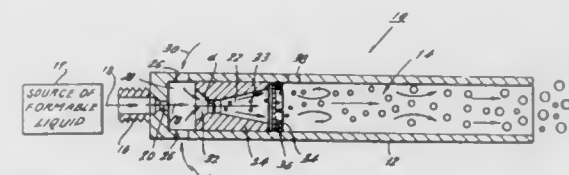
Int. Cl.⁵ 239 428.5, 432; B05B 7/30, 7/04

U.S. Cl. 239—343

10 Claims

1. A nozzle assembly, comprising:
a housing defining a passageway having an upstream end and a downstream end;
a mixing chamber toward said passageway upstream end;
a venturi tube located in said passageway downstream of said mixing chamber;
first means in said passageway into said mixing chamber for permitting a first stream of ambient air to enter said mixing chamber;
second means for injecting a stream of a foamable liquid from a source external to said nozzle assembly into said

mixing chamber and then into said venturi tube in such a manner that ambient air is drawn into said mixing chamber through said first means and is mixed with foamable liquid as foamable liquid passes through said venturi tube and a mousse-like mixture of air and foamable liquid is created downstream of said venturi tube and travels through said passageway and out said downstream and of said passageway;



third means in said passageway for permitting a second stream of ambient air to enter into said passageway at a location downstream of said venturi tube to increase the velocity at which said mousse-like mixture exits said downstream end of said passageway; and
a grate in and across said passageway downstream of said venturi tube and upstream of said third means.

5,085,372

MANURE SPREADERS

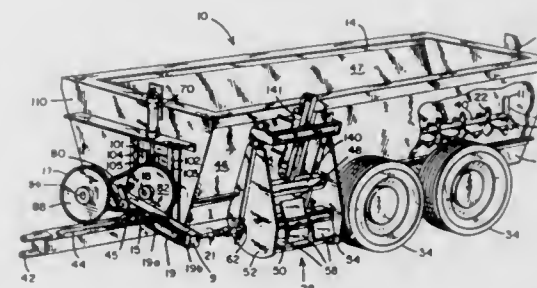
Mervin G. Martin, Myerstown, Pa., assignor to Hedlund Manufacturing Co., Inc., Boyceville, Wis.

Division of Ser. No. 310,046, Oct. 9, 1981, Pat. No. 4,993,632, which is a continuation-in-part of Ser. No. 170,034, Jul. 10, 1980, abandoned, and a continuation-in-part of Ser. No. 172,976, Jul. 28, 1980, Pat. No. 4,362,272. This application Nov. 28, 1989, Ser. No. 443,013

Int. Cl.⁵ A01C 23/00

U.S. Cl. 239—675

7 Claims



1. In a manure spreader having an elongated hopper for storing manure to be spread, said hopper having downwardly and inwardly sloped side walls, the combination comprising: a conveyor auger having a shaft; means for mounting said auger at the bottom of said hopper for movement between a raised position and a lower position said auger conveying said manure to a discharge opening at a forward position in a side wall of said hopper when said auger is in the lower position; impeller means including a blade assembly mounted adjacent said side wall of said hopper to receive said manure passing through said discharge opening for imparting an overhead impact motion and spreading said manure to one side of said spreader; drive means for said auger including: an input drive shaft adapted to be connected to a power take-off shaft of a tractor, first chain drive means coupled to said input drive shaft for driving said auger in rotation while permitting said auger to be moved between said raised and said lower positions, second chain drive means coupled to said input shaft for driving said impeller means in rotation, and reversing drive means for reversing the direction of one of said auger and impeller means relative to the other.

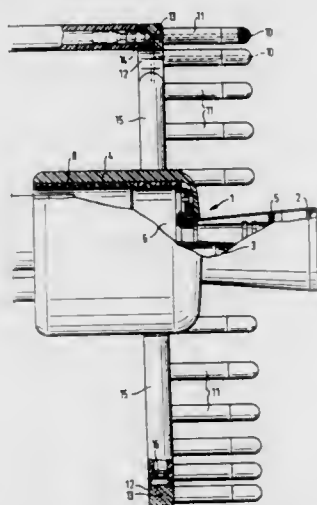
5,085,373
APPARATUS FOR COATING WORKPIECES
ELECTROSTATICALLY

Hans Behr, Stuttgart; Kurt Vetter, Remseck; Rolf Schneider, Burgstetten, and Fred Luderer, Leutenbach, all of Fed. Rep. of Germany, assignors to Behr Industrieanlagen GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 489,270, Mar. 6, 1990, abandoned, which is a division of Ser. No. 411,223, Sep. 29, 1989, Pat. No. 4,955,960, which is a continuation of Ser. No. 166,193, Mar. 10, 1988, abandoned. This application Nov. 7, 1990, Ser. No. 610,444 Int. Cl.⁵ B05B 5/02

U.S. Cl. 239—690

12 Claims



1. An apparatus for electrostatically coating workpieces with an electrically conductive coating material, said apparatus comprising: a spraying device having an atomizer, an external housing (4) fabricated from an insulating material, an internal housing (6) disposed within said external housing (4) and supporting said atomizer (1), said atomizer (1) including a spraying head (2) extending from said internal housing (6); a supply line (3) for conducting coating material from a storage-system to said spraying head (2), said supply line (3) and said spraying head (2) being at ground potential; charging electrodes (10) having exposed front ends distributed radially about said spraying head (2) and connected to a high-voltage supply for charging the coating material and producing an electric field; an electrode-holding arrangement (11, 12, 15) made of an insulating material for encasing said charging electrodes (10), said electrode-holding arrangement (11, 12, 15) including at least one support (15) extending from said external housing (4); said apparatus characterized by at least a portion of said insulating material of said external housing (4) and said electrode-holding arrangement (11, 12, 15) being composed of a fluorocarbon.

5,085,374
SPRAY PAINTING APPARATUS ARM SUPPORT

Masaharu Okuda; Kouichiro Asami, both of Tokyo, and Hei-shiro Nagasaki, Yamato, all of Japan, assignors to Taikisha, Ltd., Tokyo, Japan

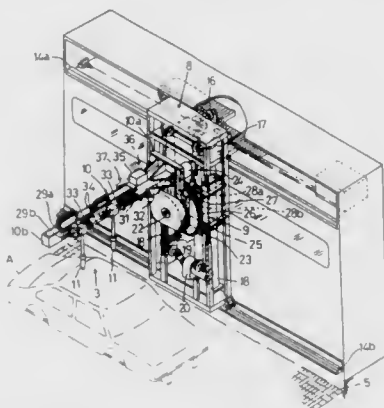
Filed Oct. 4, 1990, Ser. No. 592,671
Claims priority, application Japan, Oct. 5, 1989, 1-260941
Int. Cl.⁵ B05D 1/02

U.S. Cl. 239—751

5 Claims

1. A spray painting apparatus comprising:
an arm attached with a spray nozzle;
a support unit for pivotably supporting the arm via a pivot shaft;
an arc-shaped guide provided to either said arm or said support unit and being coaxial with and larger in diameter than said pivot shaft;
drive means provided to the other and said arm and said

support unit so as to move either said support unit or said arm relative to and along a periphery of said arc-shaped guide thereby pivoting said arm; and
peripheral support means for supporting said arm along a



rotary axis thereof at a position on the outside of said pivot shaft within a pivotable stroke of said arm, while permitting said pivot motion of the arm, said peripheral support means including an arc-shaped rail coaxial with said pivot shaft.

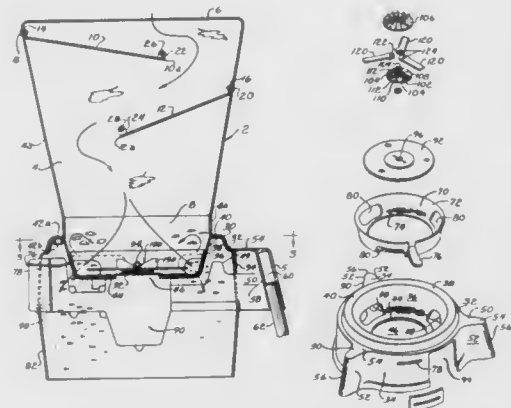
5,085,375
LEAF MULCHER

Edward M. Haworth, Woodstock, Ill., assignor to Cotter & Company, Chicago, Ill.

Filed Dec. 21, 1990, Ser. No. 632,005
Int. Cl.⁵ B02C 18/12

U.S. Cl. 241—55

19 Claims



1. A mulcher for shredding vegetation comprising
hopper means including an upright upper hopper, said hopper having an upper inlet for introducing vegetation to be shredded in said housing means,
blade assembly means being mounted in said housing means beneath said upper hopper for shredding vegetation being introduced,
said blade assembly means includes a plurality of cutting blades having outermost free ends and inner fixed ends, said cutting blades being mounted for rotation about a generally vertical axis,
said housing means having discharge means being disposed at a position radially outward from said vertical axis adjacent the outermost tips of said cutting blades,
said blade assembly means further includes flow means for causing an air flow through said housing means for moving the vegetation through said housing means,
said housing means including a circumferentially extending

wall positioned in surrounding relationship to said blade assembly means, and
said discharge means includes a plurality of openings in said wall disposed radially beyond said outermost tips of said cutting blades.

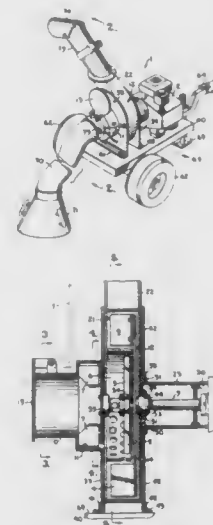
5,085,376
COMMERCIAL-GRADE GRINDING AND MULCHING
MACHINE

John L. Litchenburg, Chanute, Kans., assignor to Tolle Mfg. Co., Inc., Denver, Colo.

Filed May 6, 1991, Ser. No. 695,939
Int. Cl.⁵ B02C 13/10

U.S. Cl. 241—56

2 Claims



1. An apparatus for reducing landscape debris including leaves, grass clippings, brush and small branches to mulch, the apparatus comprising:

- a cylindrical intake chamber having an opening therein for receiving said landscape debris and having a first cross-sectional area;
- a cylindrical cutting chamber connected to said intake chamber and having a second cross-sectional area that is greater than said first cross-sectional area;
- said cutting chamber containing a plurality of cooperating fixed and rotating cutting knives;
- a cylindrical hammer chamber connected to said cutting chamber and having a third cross-sectional area greater than said second cross-sectional area;
- said hammer chamber including a plurality of free-swinging hammers;
- a perforated grinding ring surrounding said hammer chamber, said hammers being adapted to grind said debris to a size that will pass through the perforations in said grinding ring;
- a donut shaped blower chamber surrounding said perforated grinding ring, means forming an exit opening in said blower chamber;
- a plurality of fan blades positioned to rotate through said blower chamber to exhaust air through said exit opening and provide vacuum pressure within said hammer chamber that operably functions to cause air and debris introduced into said intake chamber opening to be drawn through said cutting chamber and said hammer chamber; and
- means for driving said rotating cutting knives, said hammers and said fan blades.

5,085,377
PROCESS FOR FEEDING PAPER ROLLS TO WEB-FED
ROTARY PRESSES AND DEVICE FOR CARRYING OUT
THE PROCESS

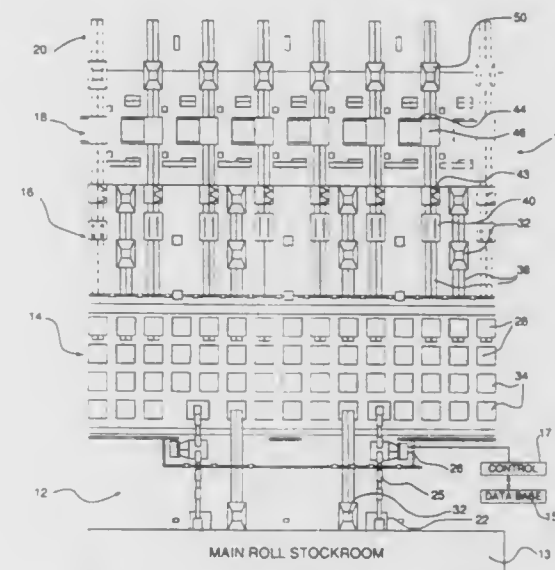
Jean Rohrer, and Ernst Lehmann, both of Bern, Switzerland, assignors to Maschinenfabrik WIFAG, Wyleringstrasse, Switzerland

Filed Mar. 30, 1990, Ser. No. 503,385
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1989, 3910444

U.S. Cl. 242—58.6

Int. Cl.⁵ B65H 19/12

19 Claims



1. A process for feeding paper rolls to web-fed rotary presses, in which each paper roll is brought from a main roll stockroom used for long-term storage to a roll stand of the web-fed rotary press, comprising the steps of:

- providing paper roll sites in an intermediate roll stockroom;
- conveying paper rolls from the main roll stockroom to the intermediate roll stockroom via a first conveying device to reach a zone of action of a second conveying device;
- providing said second conveying device in the form of an overhead crane system for freely accessing said paper roll sites; prior to reaching said zone of action of said second conveying device reading information in the form of indicia provided on the paper roll via a data acquisition device for storing data of the paper roll including roll weight, basis weight and paper grade along with coordinates of the site of the intermediate roll stockroom determined for the roll, said site being freely and selectively accessible by said second conveying device;
- moving a paper roll from said zone of action by said second conveying device to said determined site of said sites of the intermediate roll stockroom including engaging the paper roll with the crane system at said zone of action, moving the crane system and paper roll above said sites of the intermediate roll stockroom to said determined site and depositing the paper roll at said determined site; subsequently transferring the paper roll from the determined site to a roll cart system via said second conveying means including engaging the paper roll with the crane system at said determined site, moving the crane system and the paper roll above said sites of the intermediate roll stockroom to said roll cart system and depositing the paper roll in a roll cart of said roll cart system; and, subsequently moving the roll to one of an unpacking and bonding preparation station and a roll stand via said roll cart system.

5,085,378

SYSTEM FOR PREPARING ROVING BOBBINS

Hermann Güttler, Uhingen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

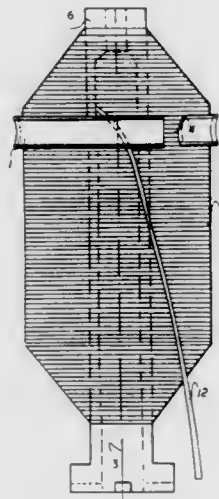
Filed Jul. 6, 1990, Ser. No. 549,395

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923071

Int. Cl.⁵ B65H 55/00

U.S. Cl. 242—172

9 Claims



1. In combination:

- a roving bobbin having a multiplicity of roving windings and a free end carried on an elongated bobbin core, the bobbin being formed adjacent the windings with a radially outwardly open seat; and
- an annular elastically deformable ring engaged at least partially around the windings on the bobbin, retaining the free end tightly against the windings, and elastically engageable in the seat.

5,085,379

METHOD OF CONTROLLING REEL DRIVE

Gohji Uchikoshi, Higashimusayama, and Keiji Sano, Futyu, both of Japan, assignors to Nakamichi Corporation, Kodaira, Japan

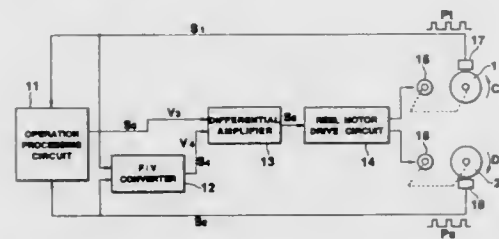
Filed May 3, 1990, Ser. No. 518,128

Claims priority, application Japan, May 10, 1989, 1-116848

Int. Cl.⁵ G11B 15/32

U.S. Cl. 242—186

11 Claims



11. A method of controlling reel drive so that a magnetic tape is transported from one reel of first and second reels to the other between them at predetermined transport velocity, comprising the steps of:

- determining a ratio of a second rotational number C_2 indicating variation in a turn number on said second reel after said magnetic tape begins to be transported to a first rotational number C_1 indicating variation in a turn number on said first reel after said magnetic tape begins to be transported to be α ;
- determining a ratio of a winding radius of said second reel to

that of said first reel to be β at the point when said magnetic tape begins to be transported;

forming a control signal based on the following equations:

$$R_1/R_0 = (\alpha^2 + 2\alpha\beta - 1)/(\alpha^2 + 1) \quad (1)$$

$$R_2/R_0 = (2\alpha + \beta - \alpha^2\beta)/(\alpha^2 + 1) \quad (2)$$

wherein R_1 equals a winding radius of said first reel after the magnetic tape begins to be transported, R_2 equals a winding radius of said second reel after the magnetic tape begins to be transported and R_0 equals a winding radius of said first reel at the point when the magnetic tape begins to be transported; comparing said control signal with a rotational angular velocity information of said first and second reels actually detected whereby a rotation of at least one of said first and second reels is controlled;

memorizing one of said first and second rotational numbers C_1 and C_2 when the other rotational number reaches a predetermined rotational number in the case of said magnetic tape being transported in a direction in which both of said first and second rotational numbers C_1 and C_2 increase;

and correcting said ratio α based on said memorized rotational information in the case of said magnetic tape being transported in a direction in which both of said first and second rotational numbers C_1 and C_2 decrease.

5,085,380

PROJECTILE GUIDANCE

Arthur E. M. Barton, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

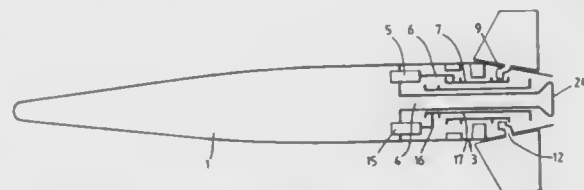
Filed Sep. 6, 1988, Ser. No. 246,140

Claims priority, application United Kingdom, Sep. 10, 1987, 8721291

Int. Cl.⁵ F42B 10/64

U.S. Cl. 244—3.21

3 Claims



1. Airfoil actuating system for a projectile comprising: a tubular member mounted in the projectile for fore and aft movement with respect to the projectile, a crank member coupled between a projectile airfoil and the tubular member for said fore and aft movement of the tubular member to turn the airfoil, and a push-pull actuator for driving said fore and aft movement of the tubular member, wherein a portion of at least one of said push-pull actuator and said crank member is engaged in an annular channel formed in the tubular member so that the tubular member and said portion can rotate relative to one another.

5,085,381

DEPLOYABLE AERODYNAMIC AEROSURFACE

Carl M. Spiroff, Granite City, Ill.; Lawrence J. Long, St. Louis, Mo.; Ward F. Winkelmann, St. Charles, Mo., and Harold F. Steinmetz, St. Louis, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 29, 1991, Ser. No. 677,060

Int. Cl.⁵ F42B 13/32

U.S. Cl. 244—3.240

12 Claims

1. An aerodynamic deployment apparatus comprising: an aerosurface mounted on an aerial vehicle for in-flight movement relative thereto from a folded position to an unfolded

5,085,382

CANOPY ASSEMBLY

John Larkin, Belfast, and George Carlisle, deceased, late of Belfast, both of Ireland by Ida Maude Carlisle, legal representative, assignors to Short Brothers PLC, Belfast, Northern Ireland

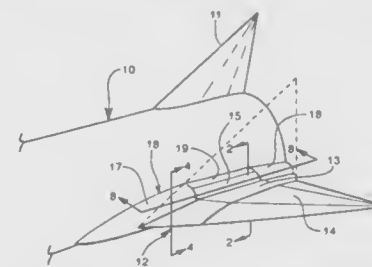
Filed May 1, 1989, Ser. No. 345,851

Claims priority, application United Kingdom, Apr. 29, 1988, 8810217

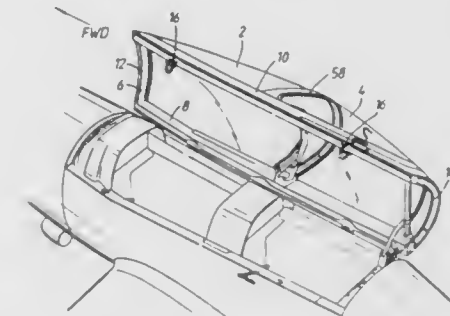
Int. Cl.⁵ B64C 1/14

U.S. Cl. 244—121

13 Claims



ployment of said aerosurface at a predetermined angular rate; and means for deflecting said control surface successively in opposite directions relative to said base member during deployment to successively accelerate and decelerate said angular rate of deployment of said aerosurface.



1. A canopy assembly comprising a canopy, a support frame, a clamp member, and a release agent, wherein the canopy is mounted on the support frame and has a forward portion which has inner and outer surfaces and a forward edge and wherein said forward portion is secured to the support frame by said clamp member and the release agent is applied to the forward edge and to those parts of the inner and outer surfaces which are held by the clamp member so as to allow local longitudinal movement of said forward portion with respect to the support frame in the event of frontal impact.

5,085,382

DEVICE FOR INTERCEPTING AND RETAINING CARGO IN A TRANSPORT SPACE

Robert Finkenbeiner, Harpstedt, Fed. Rep. of Germany, assignor to Deutsche Airbus Gesellschaft mit beschränkter Haftung, Hamburg, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 390,621

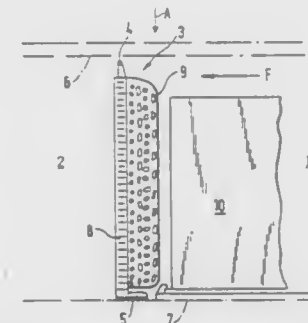
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1988, 3827279

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.⁵ B64D 1/10

U.S. Cl. 244—118.1

13 Claims



1. A device for separating in an aircraft body a cargo space from another space and for absorbing impact loads when a piece of cargo moving in a forward direction bumps into said device to retain said piece of cargo in said cargo space, comprising a rigid base wall for taking up impact loads, means for releasably and rigidly securing said single rigid base to said aircraft body, a protective shock absorbing wall section exclusively attached to said single rigid base wall on a side facing said cargo space in a direction opposite to said forward direction, said shock absorbing wall section comprising a plurality of energy absorbing layers arranged one behind the other in said forward direction, said energy absorbing layers facing said cargo, said energy absorbing layers and said single rigid base wall forming an integral structural unit.

5,085,384

POWER LINE ATTACHMENT SYSTEM

Volker Kasubke, Neunkirchen, Fed. Rep. of Germany, assignor to Hydac Technology GmbH, Sulzbach/Saar, Fed. Rep. of Germany

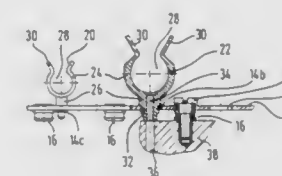
Filed Nov. 23, 1990, Ser. No. 617,034

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938923

Int. Cl.⁵ F16L 3/22

U.S. Cl. 248—62

22 Claims



1. A system for attaching power lines, comprising: at least one base plate formed of a flexible strip with a thick-

ness between about 0.1 mm and about 5.0 mm, said base plate having longitudinal free edges and being essentially planar in directions transverse to said longitudinal free edges;

a hole pattern formed in said base plate of holes passing completely through said base plate, said pattern having rows of said holes extending at least partially parallel to one another at a predetermined spacing, said holes of at least some of said rows having dimensions to form definite kink points under bending stress thereat; and

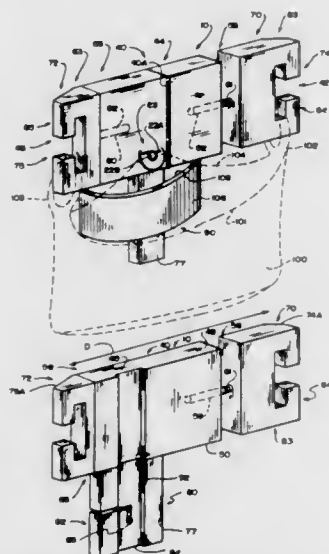
first elements detachably coupled to said base plate, said first elements having main body means for receiving and retaining power lines and having pedestal means for engaging said first elements in said holes.

5,085,385 BAG HOLDER

George T. Breitenstein, Apt. 1408 Namsan Mansion; 726-74 Hamnam Dong, Yongsan-Ku, Seoul, Rep. of Korea
Division of Ser. No. 417,648, Oct. 5, 1989, Pat. No. 5,044,585.
This application Apr. 23, 1991, Ser. No. 689,538
Int. Cl.⁵ B65B 67/04

U.S. Cl. 248—99

12 Claims



1. A bag holder for cooperating with a bag having a pair of hand grips, said bag holder comprising:

an elongated body having a first end, a mid-portion and a second end;

a tongue positioned at said mid-portion of said body with said tongue having a flat shape in order to be slideably received and extend through in use a finger opening of a handle secured to a cabinet to thereby secure said holder to said cabinet; and

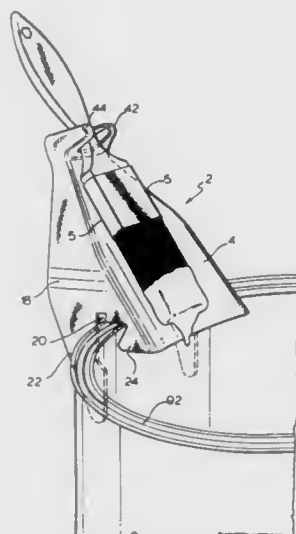
a first and a second center-opened slot bag gripping means for securely and supportingly receiving a portion of the hand grip of the bag such that in use the bag is secured and supported when said holder is positioned in any one of a plurality of positions, with each first and second center-opened slot gripping means defining a center-opened slot, with one of said first and said second open-loop bag gripping means being positioned at said first and said second end of said elongated body, respectively.

5,085,386 PAINTBRUSH HOLDER

Thomas W. Hicks, 7 Heather Street, Toronto, Ontario, Canada M4R 1Y2, and Ron Hodgins, Guelph, Canada, assignors to Thomas W. Hicks, Richmond Hill, Canada
Filed Mar. 27, 1990, Ser. No. 499,968
Int. Cl.⁵ A46B 17/02

U.S. Cl. 248—110

16 Claims



1. A paintbrush holder comprising a brush support portion, a brush handle engaging portion, a container engaging portion, said brush support portion cooperating with said brush handle engaging portion to support a brush secured therein at an angle to allow paint which drips from such brush to flow down said support away from said handle engaging portion, said handle engaging portion being located at one end of said brush support portion and projecting forward thereof for engaging a restricted area in the length of a handle of a brush, said container engaging portion including a slotted arrangement adjacent one end of said brush support opposite said brush handle engaging portion with said slotted arrangement including two separate and distinct grip areas, said two separate and distinct gripping areas including a first cavity sized for engaging the rim of a conventional paint can and a second cavity opening onto said first cavity and of reduced size relative thereto for engaging a rim of a paint tray.

5,085,387 WATER HEATER SUPPORT SYSTEM

Brent Peterson, Springville, and Verl Hovey, Orem, both of Utah, assignors to Quake Safe Corporation, Provo, Utah
Filed Mar. 8, 1991, Ser. No. 666,831
Int. Cl.⁵ A47G 23/02

U.S. Cl. 248—154

10 Claims

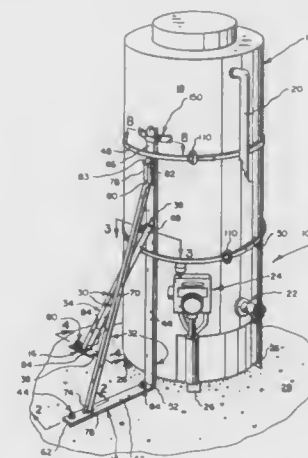
1. In combination, a vertically erect water heater comprising an internal reservoir, means of the water heater which conceals and supports water therein and externally connected energy means by which the water in the water heater is heated and a water heater support frame adapted to resist external loads such as earthquake shocks from tipping over the water heater severing the energy means so as to create an energy danger for humans, the water heater support frame comprising:

at least one vertical member;

means connecting the vertical member to the water heater so that externally imposed motion forces such as earthquake shocks imposed upon the water heater are transferred to the vertical member so that the water heater does not tip over;

at least one horizontal member anchored to a floor site to

which the externally imposed motion forces are transferred;



at least one diagonal member spanning angularly between and rigidly connected to the vertical and horizontal members.

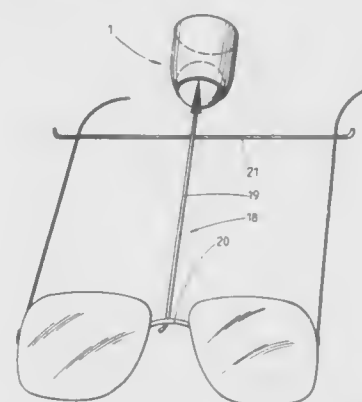
5,085,388 HOLDER WITH ADJUSTING BODY, IN PARTICULAR FOR SPECTACLE FRAMES, SPECTACLE MOUNTING FRAMES OR THE LIKE

Hans-Werner Creutz, Wittelsbacher-Strasse 48, D-5040 Brühl, Fed. Rep. of Germany
Filed Aug. 15, 1990, Ser. No. 567,945
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1990, 9002566[U]

Int. Cl.⁵ A47F 7/00

U.S. Cl. 248—288.5

15 Claims



1. A holder, in particular for spectacle frames, spectacle mounting frames or the like, comprising: an adjusting body; a foot member; and a holder housing; wherein said foot member threadably engages said holder housing to adjustably mount said adjusting body in said holder housing and said adjusting body is arranged to be steplessly adjustable in three dimensions, said adjusting body comprises resiliently yielding material having a receiving socket for resiliently detachably supporting an end of at least one ear piece of a spectacle frame or a spectacle mounting frame, and said foot member is adapted to mount said holder to a support.

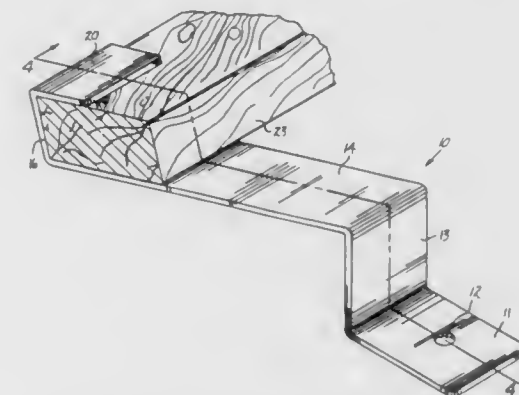
5,085,389 BUILDING STUD SUPPORT

Joseph M. Levesque, P.O. Box 468 Hillside Ave., E. Barre, Vt. 05649

Filed Apr. 16, 1991, Ser. No. 685,883
Int. Cl.⁵ A47H 1/10

U.S. Cl. 248—300

5 Claims



1. A building stud support, comprising, a serpentine bracket member, including a first planar flange plate, and a second planar flange plate integrally mounted to the first planar flange plate at a first junction line, and the second flange plate fixedly and integrally mounted to a third flange plate at a second junction line, and the third flange plate extending downwardly relative to the second flange plate defining a first acute angle therebetween, and the third flange plate integrally mounted to a fourth flange plate at a third junction line, and the fourth flange plate fixedly and integrally mounted to a fifth flange plate defining an orthogonal relationship therebetween, wherein the fifth flange plate extends over the third flange plate and defines a "C" shaped cavity within the fifth flange plate, fourth flange plate, and third flange plate.

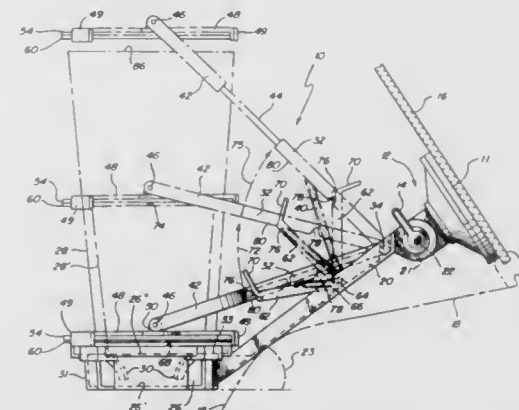
5,085,390 CONTAINER HOLDER

Kevin M. Murphy, 627 Longfellow Ave., Hermosa Beach, Calif. 90254

Filed Mar. 4, 1991, Ser. No. 663,689
Int. Cl.⁵ A47K 1/08

U.S. Cl. 248—311.2

20 Claims



1. A container holding device comprising in combination: a mounting means having a suction cup holding means operated by a lever actuator for fixing said holding devices to a smooth surface;

a first elongated arm rotatably attached to said mounting means;
a container holder having a sidewall and a plurality of supporting surfaces fixedly attached to said elongated arm at an angle thereto for supporting different size containers on said supporting surfaces;
a second elongated arm rotatable with respect to said mounting means and said first arm;
biasing means held between said first and second arms for biasing said arms together; and
lid means rotatably carried in said second arm for engagement with a container supported in said container holder by action of said biasing means.

5,085,391

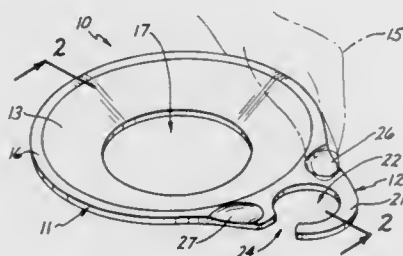
PLATE AND GLASS HOLDER

Irvin A. Berger; Barbara J. Berger, both of 24532 Eilat St., Woodland Hills, Calif. 91367; Neil C. Schneider, and Karen J. Schneider, both of 23246 Covello St., West Hills, Calif. 91304
Filed Jun. 15, 1990, Ser. No. 538,991

Int. Cl.⁵ B65D 21/02

U.S. Cl. 248—311.2

10 Claims



1. A device for supporting a plate and a beverage container with just one hand, comprising:
a body of material having the form of a circularly shaped bottomless plate approximately the size of a conventional circularly shaped plate to be supported;
the body of material defining just one bottomless depression in which to support the plate and just one bottomless opening in which to support a beverage container next to the plate;
the body of material also defining an accessway to the bottomless opening, which accessway is dimensioned and arranged to enable passage of the stem of a conventional wine glass to a position such that the stem extends through the opening; and
the bottomless depression being so configured that the body of material has an upper surface with a shape generally conforming to the underside of the plate in order to cradle the plate in a close supporting relationship such that a substantial majority of the body of material is disposed beneath the plate in a position generally out of the sight of an individual viewing the device from a position above the plate.

5,085,392

MOUNTING APPARATUS FOR SECURING AN ELECTRICAL APPLIANCE TO A SUSPENDED CEILING STRUCTURE

Anthony M. Perna, 779 Jaques Ave., Rahway, N.J. 07065
Filed Dec. 28, 1988, Ser. No. 291,214

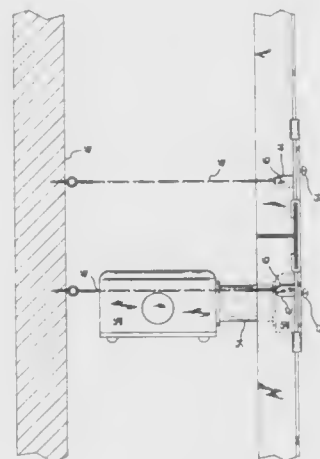
Int. Cl.⁵ F16B 1/00

U.S. Cl. 248—343

4 Claims

1. Mounting apparatus for securing an electrical apparatus to a suspended ceiling structure, comprising:
a support assembly having a ceiling engagement portion, said portion comprised of four pairs of tabs arranged on a common support member for engagement with support grid members of the suspended ceiling structure at an intersection of intersecting grid members thereof, cooperating with the ceiling structure to prevent horizontal

movement of said support assembly with respect to the ceiling structure, a load support portion said load support portion comprises at least one upright tab, and a support cable interconnecting said tab to a load bearing member of the ceiling structure and an electrical coupling portion;



said electrical coupling portion defining housing within which electrical connections between a source of electrical power and the electrical appliance may be made; and said support assembly having a mounting means to which an electrical appliance may be attached.

5,085,393

HANGER ASSEMBLY METHOD AND APPARATUS

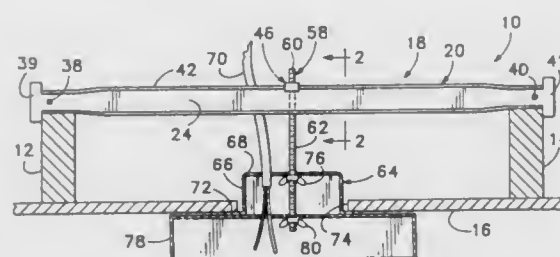
Patrick V. Ryan, 6615 Abraham La., Albany, Oreg. 97321

Filed Jul. 24, 1990, Ser. No. 557,545

Int. Cl.⁵ E04B 5/52

U.S. Cl. 248—343

22 Claims



1. A method for hanging a fixture comprising the steps of:
cutting a hole in a ceiling suspended from a set of truss beams or the like;
placing a rail assembly having a pair of elongate, spaced-apart, substantially parallel rails on an upwardly directed surface of a pair of truss beams or the like with the rail assembly over the ceiling hole, so that each of said rails substantially span the space between said truss beams;
placing a threaded rod between the rails so that it extends downwardly through the ceiling hole;
substantially fixing the rod against downward movement;
inserting the lower end of the rod through a hole in a junction cup having a downwardly directed opening with a surrounding lip;
threading a nut onto the lower end of said rod;
tightening said nut against said junction cup until said lip is flush against the ceiling and said rod is in tension thereby fixing said rail assembly, said rod and said cup against movement; and
mounting a fixture on said junction cup.

5,085,394

FLAT DISPLAY SUPPORTING MECHANISM

Katsuhiro Torii, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

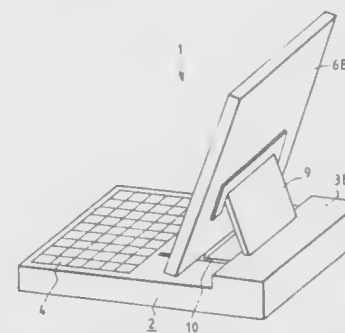
Filed Jan. 24, 1990, Ser. No. 469,623

Claims priority, application Japan, Feb. 7, 1989, 1-13344

Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—455

5 Claims



1. A flat display supporting mechanism, for supporting a flat display and allowing opening and closing movement of the flat display on a device body, comprising:

a device body having a top surface;
a flat display having a back portion and a lower portion;
a link operatively coupled between said top of said device body and the back of the said flat display to facilitate pivotal motion of the flat display about a first end of said link and to facilitate pivotal motion of a second end of said link about said top of said device body, wherein said pivotal link between said flat display and said first end of said link forms a link angle; and
guide means formed on said device body for guiding said lower portion of said flat display along said top surface of said device body away from said link as said link angle increases to a maximum during opening movement of said flat display and toward said link as said link angle decreases to a minimum during closing movement.

5,085,395

EQUIPMENT SECURITY APPARATUS AND KIT

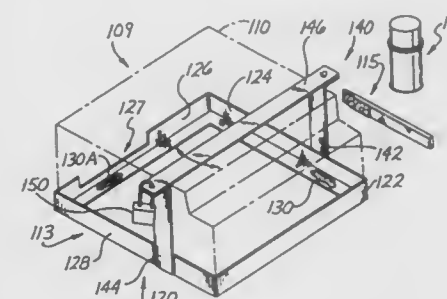
Wayne K. Frater, and Joseph C. Spitzer, both of San Diego, Calif., assignors to Mardesich Enterprises, Inc., San Diego, Calif.

Filed Mar. 13, 1990, Ser. No. 492,737

Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—552

10 Claims



1. A security kit for attaching equipment to be protected to a supporting surface, comprising:
cradle means for receiving and retaining the equipment in a fixed position;
said cradle means including base means being composed of a thermally conductive material and being adapted to receive the bottom of the equipment;
adhesive means secured to the underside of said base means of said cradle means for forming an adhesive bond remov-

ably between said cradle means and the supporting surface;

cooling means adapted to be applied to an upper surface of said base means with the equipment removed for cooling it and said adhesive means disposed thereunder to disable temporarily adhesive bonds to permit and authorized person to remove the cradle means from said supporting surface, whereby said cradle means may be relocated to a new location and adhesively secured to another supporting surface; and
wherein the cooling means is a gaseous substance.

5,085,396

BED STRUCTURE FOR SUPPORTING ENGINES AND AUXILIARY UNITS

Kjell Månsson, Floda, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

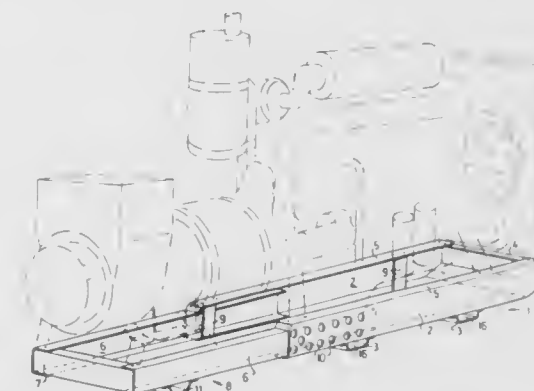
Filed Feb. 4, 1988, Ser. No. 159,419

Claims priority, application Sweden, Feb. 9, 1987, 8700482

Int. Cl.⁵ F16M 3/00

U.S. Cl. 248—678

12 Claims



1. A combustion engine support bed comprising first frame elements having support surfaces adapted to support a combustion engine and second frame elements having support surfaces adapted to support a separate auxiliary unit to be connected to the engine, said second frame elements being connected to the first frame elements so as to be adjustable to a transporting mode of the support bed, at least the major part of said second frame elements being located within the confines of the horizontal extensions of the respective first frame elements in said transporting mode of the support bed, and also such as to be adjustable to an operational mode of said support bed, in which said second frame elements form an extension of the first frame elements, at least one of the frame elements having means defining plural spaced openings within which the tines of a fork-lift device can be inserted for the purpose of lifting the bed with a unit mounted thereon, and ground-engaging means mounted on and extending below said second frame elements to support said second frame elements on the ground.

5,085,397

STACKABLE SUPPORT APPARATUS

Daniel L. Henkel, 9595 W. 70th Ave., Arvada, Colo. 80004

Filed Aug. 22, 1990, Ser. No. 571,396

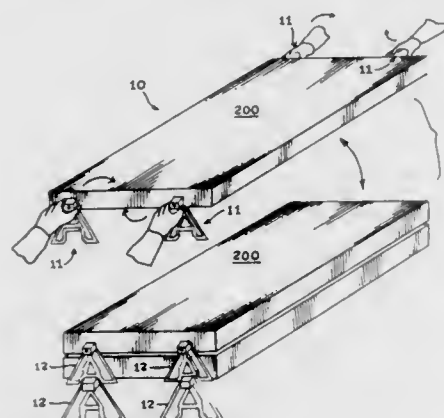
Int. Cl.⁵ F16M 11/00

U.S. Cl. 248—688

5 Claims

1. A support apparatus for supporting and suspending a plurality of workpieces at vertically spaced intervals relative to one another; wherein, the support apparatus comprises:
a plurality of identical generally A-shaped support units, wherein each support unit comprises a support member having an enlarged head element provided with a pair of downwardly depending support legs which are connected together by a cross-piece element to form a central recess;

wherein, the bottom of the cross piece element is provided with a transverse stepped shoulder; extending substantially across the length of said cross-piece element and, wherein the enlarged head element is dimensioned to be



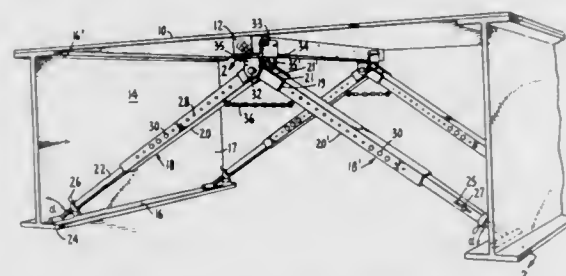
received in the central recess in said cross-piece element and further provided with a transverse stepped recess which is the reciprocal of the stepped shoulder on said cross-piece element.

5,085,398 ADJUSTABLE FORM BRACE

Grove R. Holcomb, 1135 Pine Ridge Dr., and Bruce M. Douglas, 4370 Bridle Way, both of Reno, Nev. 89509
Continuation of Ser. No. 412,848, Sep. 26, 1989, abandoned, which is a division of Ser. No. 260,185, Oct. 19, 1988, Pat. No. 4,880,203. This application Mar. 29, 1991, Ser. No. 679,812
Int. Cl.⁵ E04G 11/38, 11/50

U.S. Cl. 249-24

17 Claims



1. An elevated concrete forming apparatus comprising:
 - a first support beam and a second support beam, said second support beam positioned substantially parallel to and spaced away from said first support beam;
 - a form floor suspended between said first and second support beams, said form floor having a top surface and a bottom surface;
 - a shoring member placed against the bottom surface of said form floor between said first and second support beams;
 - at least one adjustable brace for supporting said shoring member, said brace having:
 - a first leg and a second leg, each said leg having an upper portion and a lower portion,
 - a fastening means for attaching together the upper portions of the first and second legs for permitting pivotal movement of the lower portions of the legs in a single plane,
 - a supporting means attached to said fastening means for supporting said shoring member, and,
 - a height adjusting means for adjusting the vertical position of said supporting means relative to said concrete form floor;
 - said lower portion of said first leg being placed against said first support beam and the lower portion of said second

leg being placed against said second support beam, and said supporting means being placed against said shoring member, for distributing in a single plane substantially perpendicular to the first and second support beams a compressive load received from the shoring member when concrete is poured onto the top surface of the form floor.

5,085,399 AUTOMATICALLY OPERATING VALVE FOR REGULATING WATER FLOW AND FAUCET PROVIDED WITH SAID VALVE

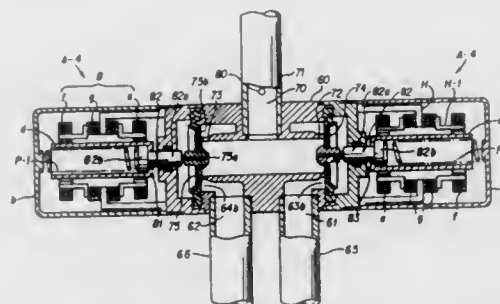
Osamu Tsutsui; Hisato Haraga; Kinya Arita; Atsuo Makita; Hirofumi Takeuchi, and Ryoichi Tsukada, all of Chigasaki, Japan, assignors to Toto Ltd., Fukuoka, Japan
Continuation of Ser. No. 246,461, Sep. 19, 1988, Pat. No. 4,971,106. This application Apr. 6, 1990, Ser. No. 506,404
Claims priority, application Japan, Sep. 30, 1987, 62-24844; Feb. 6, 1988, 63-26169; Feb. 23, 1988, 63-41094; Mar. 17, 1988, 63-65277

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.⁵ F16K 31/365

U.S. Cl. 251-30.03

5 Claims



1. An automatically operating valve for regulating water flow comprising:
 - a) a casing having inflow passage means at one side thereof and outflow passage means at other side thereof and a communicating portion disposed in said casing and having valve seat means formed therein, said inflow passage means and said outflow passage means communicating with each other by way of said communicating portion,
 - b) valve body means operably disposed in said casing and capable of moving toward or away from said valve seat means and coming into contact with said valve seat means for regulating flow of water through said communicating portion,
 - c) piezoelectric actuator means for operating said valve body means, said piezoelectric actuator means comprising a cylindrical piezoelectric actuator body made of a plurality of ring-like piezoelectric elements, a plunger which is concentrically disposed in said actuator body, said plunger being reciprocable axially within said actuator body upon activation of said piezoelectric elements and having a distal end thereof engaged with said valve body means, and clamping piezoelectric elements disposed around said plunger for applying a clamping force to said plunger, and
 - d) plunger returning means for returning said plunger to an original position when the clamping force of said clamping piezoelectric elements is released.

5,085,400 VALVE

Hans C. Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

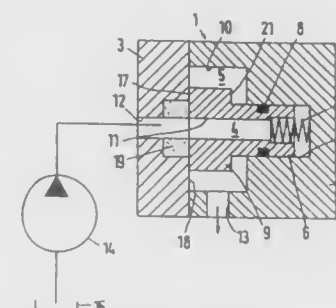
Filed May 28, 1991, Ser. No. 706,001

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1990, 4021580

Int. Cl.⁵ F16K 31/02

U.S. Cl. 251-129.06

11 Claims



1. A valve for controlling the flow of pressurized fluid comprising a valve housing having an axially extending piston chamber, a first fluid connecting bore opening to the chamber and a second fluid connecting bore opening to the chamber, a valve seat having a front face, a piston having a front face, a piston surface facing away from the piston front face for pressurized fluid acting thereagainst, and being movable in the chamber between an open position and a closed position having its front face resting against the valve seat face to permit a leakage flow gap between the faces when pressurized fluid acts against the piston surface and substantially block fluid flow between the first bore and the second bore, an insert mounted in the front face of one of the piston and the valve seat that is deformable by supplying a physical parameter to enlarge the gap between the faces, and a spring in the piston chamber for urging the piston toward the piston closed position.

5,085,401 LOW POWER VALVE ACTUATOR

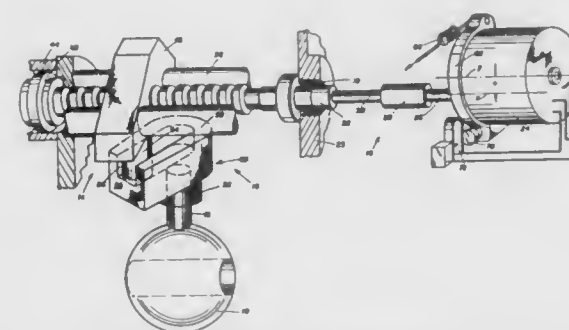
Robert J. Botting, Simi Valley, and Howard L. Ledeen, Flintridge, both of Calif., assignors to H. L. Ledeen Associates, Sun Valley, Calif.

Filed Jul. 16, 1990, Ser. No. 552,885

Int. Cl.⁵ F16K 31/04, 31/528

U.S. Cl. 251-129.11

4 Claims



1. A low power actuator for a quarter-turn valve comprising:
 - a motor drive with output shaft;
 - an Acme drive screw coupled to said output shaft;
 - thrust bearing means rotatably receiving and drive screw while preventing axial movement thereof;
 - a traveling block with Acme nut threaded on said drive screw;
 - a pair of fixed, elongated guide members parallel to and on opposite sides of said drive screw slidably engaged by said

traveling block to guide said traveling block in a fixed linear path and to prevent rotation thereof;
a rotatable output member adapted to be mounted on the stem of a quarter-turn valve; and
a motion converting device for converting linear movement of said traveling block into 90° rotary movement of said output member,
said actuator also including:
spring means holding said motor drive against rotation as torque increases;
electrical switch means operable when engaged to de-energize said motor drive; and
striker means operative when the torque produced by said motor reaches a predetermined level to engage said electrical switch.

5,085,402 HIGH SPEED SOLENOID VALVE ACTUATOR

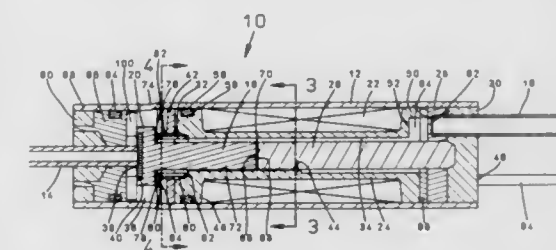
Gerald W. O'Dell, Old Lyme, Conn., assignor to The Lee Company, Westbrook, Conn.

Filed Aug. 10, 1990, Ser. No. 565,510

Int. Cl.⁵ F16K 31/06

U.S. Cl. 251-129.21

20 Claims



1. An electromagnetic actuator comprising
 - A. armature means comprising a first rod shaped section and a second section of increased radius,
 - B. stator means comprising a generally cylindrical housing having a first pole piece and a second pole piece, the stator means defining a flow path axially extending through the stator means, and
 - C. coil means contained within the stator means, wherein the stator means and the armature means defined a closed electromagnetic circuit upon excitation of the coil means, the circuit comprising a first air gap between the rod section of the armature and the first pole piece and a second air gap between the increased radius armature section and the second pole piece, the plane of both air gaps being normal to the axis of the armature.

5,085,403 GATE VALVES

Petrus A. Dierikx, Bergen op Zoom, Netherlands, assignor to R.M.I. Holland B.V., Bergen op Zoom, Netherlands

Division of Ser. No. 282,581, Dec. 12, 1988, Pat. No. 4,972,577.

This application Jul. 20, 1990, Ser. No. 554,914

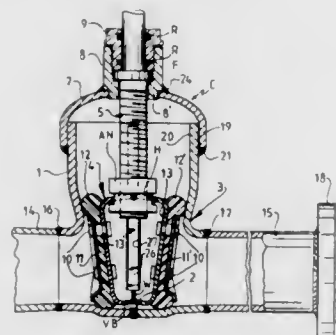
Int. Cl.⁵ F16K 31/00

U.S. Cl. 251-327

7 Claims

1. A gate valve assembly prepared by a method comprising the steps of:
 - mating two disk-like stamped metal valve body halves while capturing an actuating nut between the mated halves;
 - welding the mated valve body halves together to provide a hollow wedge-shaped metal valve body with actuating nut captured between the halves;
 - cooling the metal valve body and then placing heat-sensitive resilient discs against converging opposite sides of the wedge shaped metal valve body and mechanically sandwiching such heat-sensitive resilient discs against opposite sides of the metal wedge shaped valve body to leave

circumferential margins of the heat-sensitive resilient discs exposed for sealing purposes to provide a valve body assembly with actuating member captured thereby; inverting the valve body assembly and confining it within a closed environment defined by stamped metal housing components which, when welded together form a completed gate valve assembly, while supporting, locating and guiding the valve body assembly within the closed environment in minimal contact with the stamped metal housing components;



welding the stamped metal housing components together along a weld seam to provide a completed gate and valve assembly, whereby damaging heat transfer to the heat-sensitive resilient discs from the welding of the stamped metal housing components is avoided by the minimal contact of the valve body assembly with the housing components; and moving the valve body assembly within the housing components during the welding of the housing components together to alter the proximity of the valve body assembly to the weld seam, whereby heat damage to the heat-sensitive resilient discs is avoided during this welding step.

5,085,404

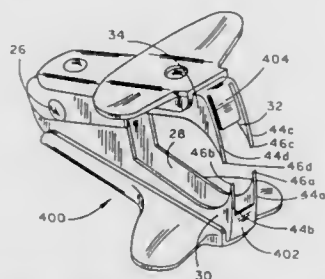
STAPLE REMOVING DEVICE

Douglas L. Thieleke, Grimes, and Douglas A. Callison, Des Moines, both of Iowa, assignors to D.L.T. Mfg. Corp., Johnston, Iowa

Filed Aug. 14, 1989, Ser. No. 393,260
Int. Cl.⁵ B25C 11/00

U.S. Cl. 254—28

4 Claims



1. A staple removing device, including an upper jaw member having a first and second side sections and a lower jaw member having third and fourth side sections, the upper jaw member being pivotally connected to the lower jaw member, the device comprising:

- a first plate member integral with the upper jaw member, the first plate member positioned between the first and second side sections;
- a second plate member integral with the lower jaw member, the second plate member positioned between the third and fourth side sections movable to a contact position with the first plate member when the upper and lower jaw mem-

bers are moved toward each other so that a staple is engageable between the first and second plate members; and wherein the first jaw member includes a first gap and a second gap, the first gap being located between the first plate member and the first side section, the second gap being located between the first plate member and the second side section such that the third side section is received within the first gap and the fourth side section is received within the second gap when the first and second plate members are in contact with each other.

5,085,405

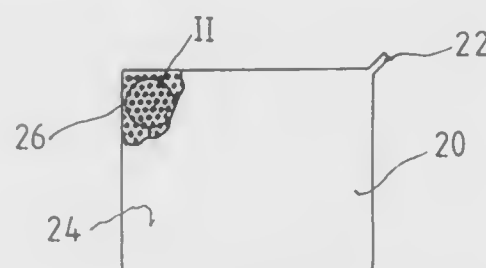
HOISTING CUSHION WITH TWO REINFORCED WALLS

Manfred Vetter, Burg Langendorf, D-5352 Zülpich-Langendorf, Fed. Rep. of Germany
Filed Dec. 13, 1990, Ser. No. 626,970
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 8914694[U]

Int. Cl.⁵ B66F 3/24

U.S. Cl. 254—93 HP

12 Claims



1. A hoisting cushion with two reinforced walls that is manufactured of one of a rubber material and a rubber-like material wherein the two walls of the cushion are lined at their margins and define an hermetically sealed inner space that is accessible via a nipple and have a contoured external surface that is sited outside of the reinforcing and exhibits circular, disc-shaped protrusions that are arranged in a pattern, and the protrusions protrude outwardly beyond the otherwise flat, protrusion-free surface of the walls, and have a diameter of 10 to 30 mm and protrude 0.2 to 5 mm beyond the protrusion-free surface of the walls, and which protrusions are arranged in such a way that the distance to the next adjacent protrusion is less than the diameter of the protrusions, and the surface area of the protrusions amounts to at least 30% of the total external surface area.

5,085,406

THUMB WHEEL FOR A JACK

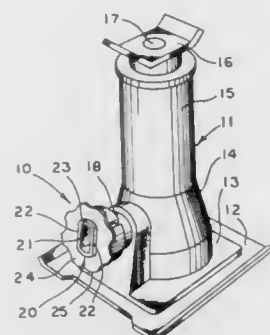
Gary E. Schmaltz, Three Oaks, Mich., assignor to Ausco Products, Inc., Benton Harbor, Mich.

Filed Dec. 5, 1990, Ser. No. 622,751

Int. Cl.⁵ B66F 3/18

U.S. Cl. 254—103

15 Claims



1. A screw jack comprising a load bearing frame, a side gear housing, an end of a side gear extending outwardly from said

housing, said load bearing frame moving upwardly and downwardly in response to selective rotation of said side gear end, a peripheral lip on said housing, wheel plate means for engaging said side gear end, a generally cylindrical collar extending from said wheel plate means toward said housing, and barb means positioned circumferentially near the end of said collar for engaging said peripheral lip on said housing so that rotation of said wheel plate means rotates said collar with respect to said housing and at the same time rotates said side gear end to move said load bearing frame.

5,085,407

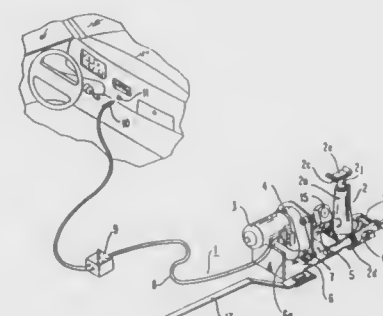
MOTORIZED JACK

Edward M. Lonon, 155 Sanford St., East Orange, N.J. 07018
Continuation-in-part of Ser. No. 437,644, Nov. 17, 1989, abandoned. This application Mar. 19, 1990, Ser. No. 499,219

Int. Cl.⁵ B66F 3/18

U.S. Cl. 254—103

13 Claims

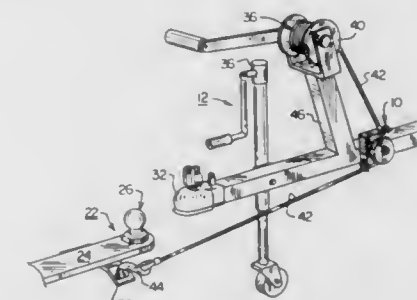


1. A motorized jack assemblage comprising a kit adapted to collaborate with a jack having gearing means for raising or lowering a vehicle, said jack having a hollow cylindrical housing mounted on a supporting base, and a load supporting shaft coaxially mounted in said housing and comprising means for raising and lowering said load supporting shaft in vertical relation to said housing; which kit comprises in combination:

- a supporting plate;
- a direct current motor;
- a cable comprising terminal means constructed to connect said motor in energy transfer relation to a source of power available in said vehicle;
- reduction gear linkage connected in driven relation to said motor;
- a drive shaft connected to be driven in rotation by said reduction gear linkage;
- mechanical coupling means connected to be detachably coupled in mating relation between said drive shaft and said jack whereby connection of said coupling through a socket in the base of said jack is constructed to actuate the gearing means in said jack to cause the load supporting shaft of said jack to be raised or lowered in said cylindrical housing in response to the direction of rotation of said shaft; and
- electrical switching means connected to said cable having positive, negative and neutral current flow positions when said cable is connected to a source of power, for controlling the operation of said motor in driving relation to said reduction gear linkage and said drive shaft to raise or lower or stop the motion of said load supporting shaft in said jack housing in accordance with the position of said switch.

5,085,408
TRAILER CONNECTING GUIDE
Ronald L. Norton, Route #2, Box 683, Graham, N.C. 27253, and James R. Turner, 1233 Rockledge Dr., Burlington, N.C. 27217
Filed Apr. 23, 1990, Ser. No. 512,877
Int. Cl.⁵ B66D 1/36; B60D 1/36
U.S. Cl. 254—325

8 Claims



1. A guide plate for a pulley for receiving and guiding a cable, said pulley including attachment means for attaching said pulley to a frame, said guide plate comprising:

- (a) a generally flat support plate adapted to be received between said pulley and said attachment means, said support plate being positioned substantially parallel to the plane defined by said pulley; and
- (b) guide means attached along one edge of said support plate adjacent to said pulley for limiting the lateral movement of said cable when said cable is received in said pulley, thereby preventing said cable from disengaging with said pulley, wherein said guide means includes a pair of side walls perpendicular to said support plate and adjacent to one another, each of said side walls having an open end elongated slot for removably receiving said cable.

5,085,409

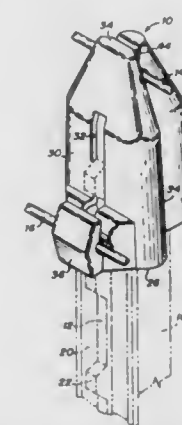
WIRE HOLDING CAP FOR POST

Franklin W. Teixeira, 583 St. John St., Pleasanton, Calif. 94566
Filed Feb. 11, 1991, Ser. No. 653,774

Int. Cl.⁵ B21F 27/00

U.S. Cl. 256—48

15 Claims



1. A cap mountable on top of a support post for connecting at least one wire of predetermined diameter thereto, said cap comprising:

- a portion for fitting closely to an upper portion of said post and having a lower margin;
- a crown portion projecting from the closely fitting portion for projecting to a location spaced above the top of the post, said projecting portion defining a cavity for longitudinal alignment with said wire for holding said wire adjacent the post, a narrow throat extending laterally from the cavity and having a least dimension slightly larger than

the diameter of the wire to be held, and a flared mouth extending from the throat and opening in an upwardly direction, whereby the wire can be moved laterally from a position adjacent the flared mouth, through the narrow throat, to a position within the cavity and can be removed therefrom in a reverse manner.

5,085,410

MODULAR PROCESSING SYSTEM

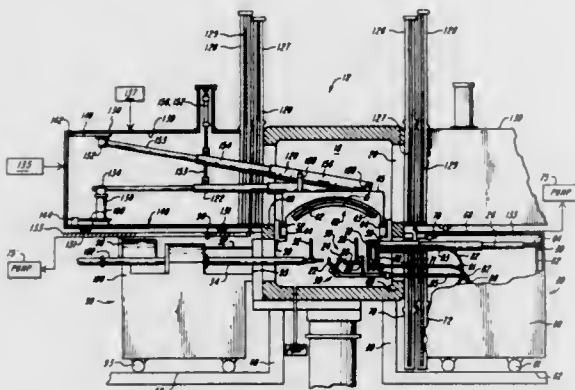
Lester M. Fiehn, Idaho Falls, Id., assignor to Jersey Nuclear-Avco Isotopes, Inc., Florham Park, N.J.

Filed Dec. 14, 1989, Ser. No. 450,816

Int. Cl.⁵ B01D 5/00

U.S. Cl. 266-44

30 Claims



1. Apparatus for supporting material processing means within a predetermined atmosphere, comprising:
an enclosure elongate in an axial direction and having at least one axially separated internal processing area said enclosure including means for containing said atmosphere in sealed separation from the environment of said enclosure; said at least one processing area having at least one access port;
a plurality of mobile transfer casks, each having a material processing means stored in an interior region, and each having an access port disposed along one side thereof;
means for coupling the access port of said casks to the access ports of said enclosure and containing said predetermine atmosphere;
means for alternately sealing an opening the interiors of said casks to the internal processing areas of said enclosure;
means for alternately housing, within each of said transfer casks, said material processing means and for extending said processing means form said cask into an internal processing area of said enclosure.

5,085,411

APPARATUS FOR PROCESSING GRAIN-ORIENTED ELECTRICAL STEEL STRIP

Yoshinao Tanaka, Tokyo; Takaaki Ohsawa, and Akira Tanabe, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 4, 1990, Ser. No. 621,762

Claims priority, application Japan, Dec. 7, 1989, 1-316453
Int. Cl.⁵ B21B 39/02

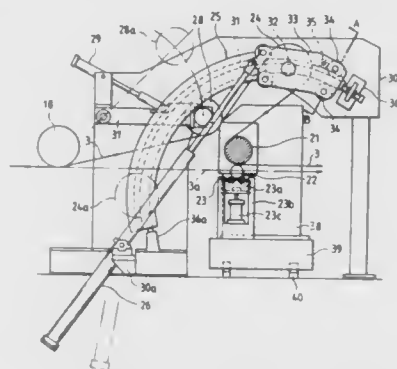
U.S. Cl. 266-102

9 Claims

1. An apparatus for processing grain-oriented electrical steel strip comprising a unit for passing the strip along a horizontal pass line, a groove-scribing unit for cutting longitudinal grooves in the surface of the strip by means of a groove-scribing roll mounted on a pressing roll with means to adjust the roll gap therebetween, the two rolls holding the strip therebetween, and a unit for forming an insulation coating on the

surface of the strip provided on the exit side of the groove-scribing unit said groove-scribing unit comprising:

means for guiding the travel of a bridge roll extending from above the groove-scribing roll to below the pass line of the strip;
means for holding a bridge roll adapted to move along the bridge roll guiding means;
a bridge roll rotatably attached to the bridge roll holding means; and
means for moving the bridge roll holding means along the bridge roll guiding means with the strip passed around the bridge roll;



whereby the strip can be selectively passed to the insulation coating forming unit either after scribing longitudinal grooves in the surface thereof by means of the groove-scribing and pressing rolls by holding said rolls close to each other and holding the strip therebetween which is supplied thereto by way of the bridge roll positioned above the groove-scribing roll, or without scribing longitudinal grooves in the surface of the strip by allowing it to travel forward without contacting the groove-scribing and pressing rolls by keeping said rolls away from each other with the bridge roll positioned below the pass line.

5,085,412

SHOCK STRUT

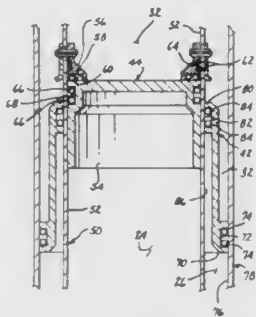
Leslie D. Peterson, Tempe, and Bruce A. Friedrich, Phoenix, both of Ariz., assignors to Simula, Inc., Phoenix, Ariz.

Filed May 14, 1990, Ser. No. 523,325

Int. Cl.⁵ B60G 19/04

U.S. Cl. 267-64,26

7 Claims



1. A telescopic shock strut for absorbing high energy levels, said shock strut comprising in combination:

a) an oil chamber for housing a quantity of hydraulic fluid;
b) a piston for housing a first annular gas chamber having concentric cylindrical walls and a gas disposed therein and a second cylindrical gas chamber having a gas disposed therein, said piston being disposed in telescoping relationship with said oil chamber and positionally responsive to compressive forces imposed upon said shock strut;
c) first means responsive to the pressure within said compartment for compressing said first annular gas chamber

to increase the pressure therein in response to an increase in pressure within said oil chamber and resulting from telescopic compression of said shock strut, said first compressing means comprising an annular piston including an annularly outwardly extending ring, first seal means for sealing said annularly outwardly extending ring with one of said cylindrical walls, an annularly inwardly extending ring and second seal means for sealing said annularly inwardly extending ring with the other of said cylindrical walls;

d) second means responsive to the pressure within said compartment for compressing said second cylindrical gas chamber to increase the pressure therein in response to the pressure within said first gas chamber exceeding a predetermined level, said second compressing means comprising a further piston translatable within said second cylindrical gas chamber; and
e) said piston including a disc for segregating said oil chamber from a compartment for receiving oil from said oil chamber, an orifice for accommodating flow of oil intermediate said oil chamber and said compartment, a disc spring valve for accommodating flow of oil from said oil chamber to said compartment under a pressure greater than a threshold pressure, said disc spring valve including an annular disc having an inner and an outer perimeter, an annular fulcrum for supporting said annular disc radially outwardly of the inner perimeter.

5,085,413

RUBBER MOUNTING

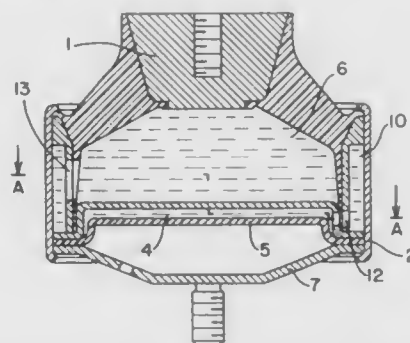
Tillman Freudenberg, Weinheim, and Ulrich Freudenberg, Hirschberg, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany
Filed Feb. 2, 1990, Ser. No. 473,773

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 3903230

Int. Cl.⁵ B60G 15/04

U.S. Cl. 267-140.1 A

8 Claims



1. A rubber mounting which has a hydraulic damping device for damping vibrations of a predetermined frequency and which has an axial direction comprising: working and equalization chambers joined by a connecting passage and filled with a hydraulic liquid, the working chamber being limited by an elastomeric member, the connecting passage being channel-like configured and dimensioned such that when subject to vibrations of the frequency to be damped, the enclosed liquid volume resonates and that the connecting passage is narrowed to a throttle only in the area of a point which has a throttle flow cross section and which has a throttle length in the axial direction, the length being smaller than a diameter d resulting from a circle formula $\pi n^2/4$ based on the surface of the throttle flow cross section, the connecting passage having a flow cross section and the ratio of the flow cross section of the connecting passage and the flow cross section of the throttle being between 2:1 and 6:1.

5,085,414

JIG FOR FORMING TRUSSES AND THE LIKE

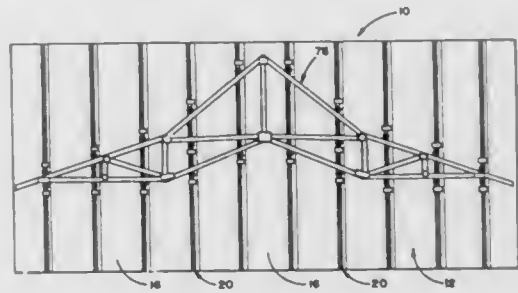
Austin S. Weaver, 6620 - 96th Ave., Zeeland, Mich. 49464

Filed Apr. 27, 1990, Ser. No. 515,603

Int. Cl.⁵ B30B 3/02

U.S. Cl. 269-37

6 Claims



1. A locating unit for a jig, comprising an elongated channel and at least one stop unit including a stop, a clamp member, and locking means, the channel having a pair of opposed parallel sides terminating in a respective pair of opposed upper lips extending inwardly therefrom to define an open top of the channel, the stop being of a disk form adapted to be slidably seated on the lips, the clamp member being slidably receivable in the channel below the stop, the locking means interconnecting the stop and the clamp member and being operable from above the stop to releasably fix the location of the stop unit along the length of the channel.

5,085,415

WINDSHIELD INSTALLATION TOOL

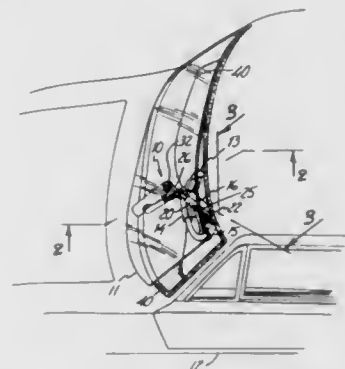
Craig A. Shaver, 37888 Riviera Rd., St. Cloud, Minn. 56303

Filed Apr. 17, 1990, Ser. No. 510,106

Int. Cl.⁵ B23Q 1/00

U.S. Cl. 269-69

6 Claims



1. An installation tool for providing aid in manual installation of relatively large coverings for openings in vehicles, said installation tool comprising:

a base means having a mounting means therein capable of being temporarily mounted on a surface within passenger compartments of said vehicles in which a cover is to be installed across an opening provided therein; and
a cover support means having an extension means supported by said base means which is capable of extending some portions of said cover support means a selectable distance from said base means, said cover support means having a cover engagement means supported by said extension means with a surface thereof being formed by a material relatively resistant to a said cover sliding thereon, said cover engagement means being capable of being extended by said extension means through said openings in said vehicles if said base means is mounted on a said surface therein to hold separated from that said vehicle, at least in part, a said cover for said opening therein.

5,085,416

STERILIZED FOOD CUTTING BOARD

Teruyoshi Miyake, and Tatuo Yamamoto, both of Tokyo, Japan, assignors to Chyugoku Paalu Distributing Corporation; Shinan New Ceramic Corporation and Shinagawa Fuel Co., Ltd., all of Tokyo, Japan

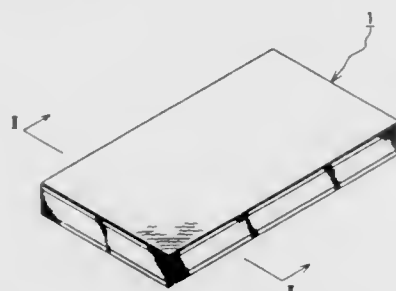
Filed Mar. 21, 1990, Ser. No. 496,676

Claims priority, application Japan, Dec. 27, 1989, 1-338948

Int. Cl.⁵ B23Q 3/00

U.S. Cl. 269—289 R

4 Claims



1. A food cutting board comprising a core having an outer layer on at least one surface, said outer layer comprising an organic polymer containing an antibacterial Zeolite, said outer layer having a thickness of at least 3 mm and an exposed surface having a rugose finish, thereby providing a non-slip surface having an increased area for exposure of said antibacterial Zeolite during use.

5,085,417

METHOD OF ENCODING STACKS OF PRINTED MATERIAL

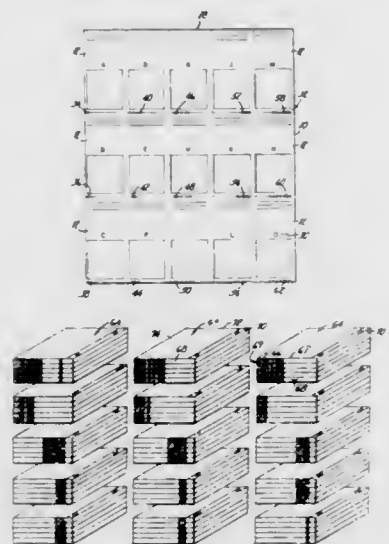
David L. Copham, Forest Lake, Minn., assignor to Liberty Share Draft and Check Printers, Inc., Mounds View, Minn.

Filed Dec. 1, 1991, Ser. No. 444,285

Int. Cl.⁵ B41F 13/54

U.S. Cl. 270—1.1

24 Claims



1. A method of printing an identification code onto a plurality of defined areas of a sheet of paper, multiple printed sheets being stacked and cut into individual stacks with at least one coded edge of each individual stack bearing a coded image formed by printing a unique identification code on each area, the method comprising the steps of:
defining a unique identification code for each of said areas;
printing each area with the unique identification code de-

fining for that area, the unique identification code of an area being in contact with a boundary or edge of that area; forming a stack of sheets; and cutting the stack of sheets along each boundary between adjacent areas to form a plurality of individual stacks and forming at least one coded edge on each individual sheet in the stack, wherein the coded image is formed from a plurality of staked coded edges.

5,085,418

RECIRCULATING DOCUMENT FEEDER HAVING A CROSS-TRACK REGISTRATION MECHANISM AND METHOD

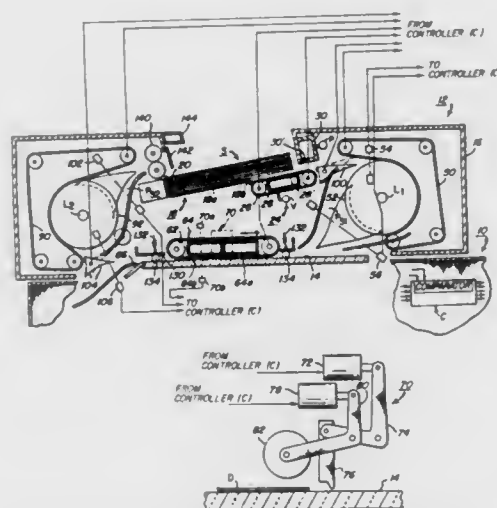
Alan E. Rapkin, Fairport, and John E. Cockayne, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1990, Ser. No. 617,337

Int. Cl.⁵ B65H 9/00

U.S. Cl. 271—3.1

7 Claims



1. An improved recirculating document feeder for presenting sheets from a document sheet stack individually to a station of a reproduction apparatus for reproducing information contained on such sheets, said improved recirculating document feeder comprising:

means for supporting a document sheet stack with a selected side of each document sheet facing up and with the selected side of the topmost document sheet in said stack for ready viewing;

means, defining a feed path extending away from and then back to said document stack supporting means, for directing sheets from a document sheet stack on said document stack supporting means into association with said reproduction apparatus station and then back to such stack, said feed path defining with said document stack supporting means a closed-loop that inverts a document sheet and directs the sheet into association with said reproduction apparatus station selected side down and then inverts the document sheet again and directs the sheet to such stack selected side up;

means, operatively associated with said document stack supporting means and said path defining means, for selectively feeding respective sheets from the stack seriatim about said feed path;

means for selectively registering a document sheet fed about said sheet feed path in the in-track direction at said reproduction apparatus station; and

a registration assembly including sheet moving means and stop means supported for movement between a position in operative association with said reproduction apparatus station and a position remote therefrom, and means for selectively moving said sheet moving means and said stop

5,085,419

PAPER FEEDER INSERT TRAY

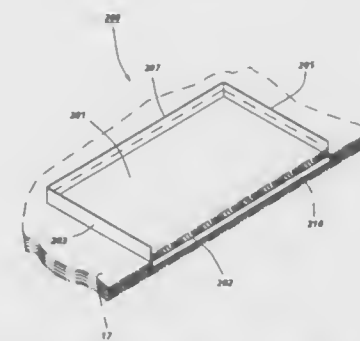
Conrad J. Bell, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1991, Ser. No. 647,853

Int. Cl.⁵ B65H 5/26

U.S. Cl. 271—9

3 Claims



1. A copy media auxiliary insert tray, comprising:
a first portion thereof for supporting a stack of copy media in a horizontal plane;
a second portion thereof connected to said first portion including a rear end member and side members configured orthogonally with respect to said first portion and extending upward with respect to said first portion in order to position the stack of copy media for feeding from said first portion of said media insert tray; and a third portion located at the sheet exiting end of said first portion that extends orthogonally downward with respect to said first portion, said third portion being adapted to be placed against the front end of an existing stack of copy media in order to properly locate the copy media in the insert tray with respect to a sheet feed means.

5,085,420

SHEET FEEDING APPARATUS

Junichi Sata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

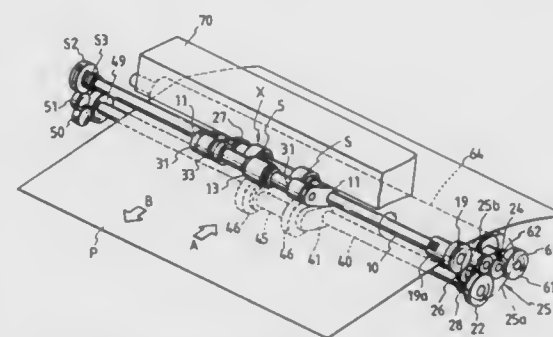
Filed Jul. 17, 1990, Ser. No. 553,412

Claims priority, application Japan, Jul. 18, 1989, 1-186941; Sep. 5, 1989, 1-228394

Int. Cl.⁵ B65H 3/06

U.S. Cl. 271—114

18 Claims



1. A sheet feeding apparatus comprising:
first rotary means for feeding a sheet material,
second rotary means arranged at a downstream side of said

first rotary means in a sheet feeding direction, for further feeding the sheet material;
a driving source for rotating said first and second rotary means;

transmitting means adapted to be engaged to rotate said first rotary means in the sheet feeding direction and to be disengaged to stop said second rotary means, when said driving source is rotated in one direction, and adapted to be disengaged to rotate said second rotary means in the sheet feeding direction, when said driving source is rotated in the other direction; and

prohibiting means for preventing rotation of said first rotary means in a sheet returning direction at the start of rotation of said driving source in the other direction.

5,085,421

DUAL BIN PAPER FEED TRAY FOR AN IMAGE REPRODUCTION MACHINE SUCH AS A PRINTER OR COPIER

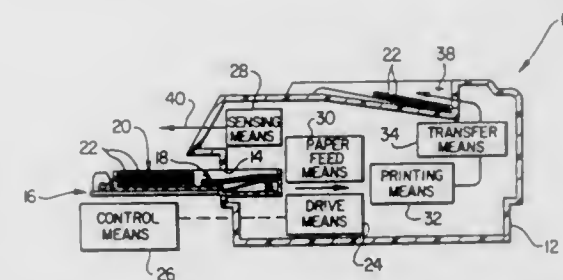
Charles Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Mar. 4, 1991, Ser. No. 664,407

Int. Cl.⁵ B65H 1/26

U.S. Cl. 271—155

31 Claims



1. A method of supplying paper to an image reproduction machine, such as a printer or copier, having a housing, an opening formed in said housing, feed means operative to feed paper into said housing from a paper supply stack disposed adjacent said opening, and printing means for imprinting paper fed into said housing, said method comprising the steps of:

loading front and rear stacks of cut paper sheets respectively into front and rear areas of a paper feed tray;
forwardly inserting the loaded paper feed tray into said housing opening;
utilizing said feed means to sequentially feed paper sheets from said front stack into said machine until said front stack is totally depleted;
moving said rear stack from the rear tray area into the front tray area previously occupied by said front stack; and
utilizing said feed means to sequentially feed paper sheets into said image reproduction machine from the rear stack disposed in said front tray area.

5,085,422

IMAGE FORMING APPARATUS

Seiji Sagara, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,562

Claims priority, application Japan, Sep. 16, 1989, 1-240425

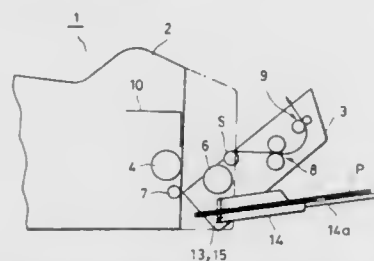
Int. Cl.⁵ B65H 1/00

U.S. Cl. 271—162

12 Claims

1. An image forming apparatus comprising:
a main body;
a paper-feed unit;
paper-feed unit support means for openably and closably supporting said paper-feed unit by said main body;
a tray attached to and supported by said paper-feed unit, said tray mounted so as to be swingable between a non-operat-

ing position wherein said tray is housed in a generally vertical position in said paper-feed unit and an operating position wherein said tray is in a position for mounting a sheet material; and



stopper means provided in said main body of the image forming apparatus for holding said tray at the operating position, wherein said paper-feed unit support means positions the paper-feed unit in either the opened or the closed state while said tray is held at the operating position.

5,085,423

SHEET FEEDING DEVICE

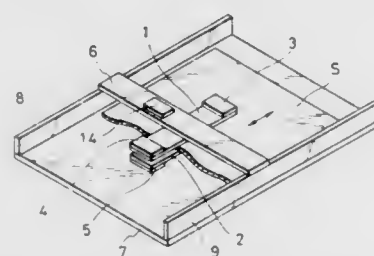
Yoshifumi Nishimoto, Yokohama; Masahiko Igaki, Tokyo; Kenichi Kataoka; Naruto Sugimoto, both of Yokohama; Hiroyuki Seki, Urawa, and Atsushi Kimura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 27, 1990, Ser. No. 544,380

Claims priority, application Japan, Jun. 28, 1989, 1-166455

Int. Cl.⁵ B65H 5/10

U.S. Cl. 271-266

12 Claims



4. A sheet feeding device, comprising:
at least one vibration member that is provided in contact with a sheet to be fed and that generates a vibration to feed the sheet therein in response to an applied electrical signal; and
means for changing pressure force between said vibration member and the sheet in accordance with a characteristic of the sheet.

5,085,424

LAMINATED PLAYING SURFACE

Sidney B. Wood, Jr., South Hampton, N.Y., assignor to Grandstand International Corp., Woodside, N.Y.

Filed Aug. 2, 1990, Ser. No. 562,040

Int. Cl.⁵ E04C 13/00

U.S. Cl. 272-3

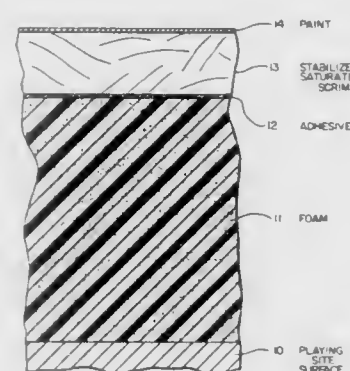
20 Claims

20. A laminated playing surface installed at a playing site comprising

- a chemically blown polyolefin foam sheet formed of one of the group consisting of polyvinylchloride and polyethylene;
- a slow-curing solvent adhesive covering one surface of the foam sheet;
- a scrim sheet of non-woven polyester fibers disposed over and laminated to the adhesive-covered foam sheet;
- a styrene-butadiene latex stabilizing agent in said scrim

sheet capable of contraction of the lamination when heated;

- said lamination being laid on the playing site with opposed edge portions of the laminations affixed thereto;



- said lamination being stretched substantially free of wrinkles by contraction resulting from heating of the stabilizing agent;

- a water-based latex acrylic paint covering that surface of the scrim sheet opposite the foam sheet and causing additional contraction and stretching of the lamination.

5,085,425

WORKOUT HORSE

Charles S. Collins, 1 Ulverscroft Cottage, Bakeham Lane, Englefield Green, Egham, Surrey, and Roger M. Whelan, Bracknell, both of England, assignors to Charles S. Collins, Egham, England

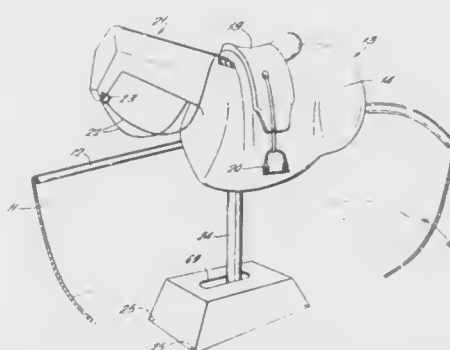
Filed Jul. 2, 1990, Ser. No. 547,044

Claims priority, application United Kingdom, Jul. 3, 1989, 8915233

Int. Cl.⁵ A63G 13/08

U.S. Cl. 272-53.1

9 Claims



1. A workout horse comprising a stationary base frame, a body portion on which a rider sits mounted on an upper support which is movable relative to the base frame, and drive means interconnecting the base frame and the upper support for continuously reciprocating the upper support and thereby the body portion forwards and backwards relative to the base frame along an intended rotary path, wherein for providing the body portion with the simulated movement of a horse at one end of the upper movable support a rigid link is pivotally connected between the upper support and the base frame, the other end of the upper support being supported above the base frame by a separate linkage spaced from the rigid link in the direction of movement of the upper support, and the drive means is mounted offset from the linkage in said direction of movement and comprises two cranks driven by an electric motor, the first crank being connected directly to the upper support to effect said reciprocal motion of the upper support, and the second crank being connected to said linkage between the upper support and the base frame whereby substantially

horizontal driving movement of the second crank effects vertical extension or contraction of the linkage thereby changing the attitude of the upper support relative to the base frame, the combined action of the first and second cranks effecting a movement of the upper support and thereby the body portion which simulates the movement of a horse.

5,085,426

INTEGRATED DRIVE AND ELEVATION SYSTEM FOR EXERCISE APPARATUS

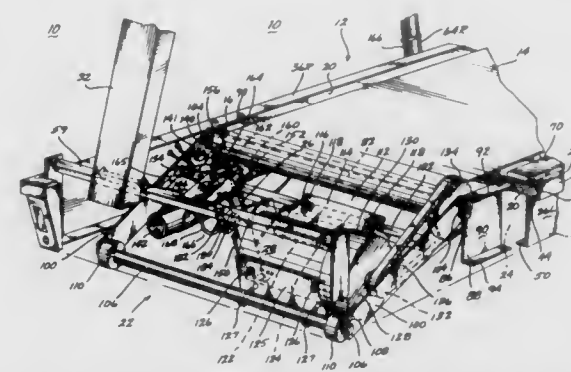
Rick Wanzer, Bothell; Cole J. Dalton, Seattle, and Wes Williams, Kirkland, all of Wash., assignors to Precor Incorporated, Bothell, Wash.

Filed Jul. 30, 1990, Ser. No. 561,451

Int. Cl.⁵ A63B 23/06

U.S. Cl. 272-69

20 Claims



10. An integrated drive and elevation system for an exercise apparatus powered by a motor and having a main frame and a powered rotating element associated with a function of the apparatus, the powered rotating element rotatably mounted on the main frame about a first axis, the integrated drive and elevation system comprising:

- a subframe;
- means for connecting the subframe to the main frame to enable the subframe to pivot relative to the main frame about the first axis;
- means for selectively altering the orientation of the subframe relative to the main frame and then maintaining the orientation of the subframe relative to the main frame about the first axis;
- means for mounting the motor on the subframe; and
- drive train means for drivingly interconnecting the motor with the powered rotating element.

5,085,427

PORTABLE MULTI-PURPOSE RACK FOR USE ON EXERCISE EQUIPMENT

Bruce Finn, Hudson, N.Y., assignor to Finnish Line Products Incorporated, Hudson, N.Y.

Filed Mar. 20, 1990, Ser. No. 496,865

Int. Cl.⁵ A63B 22/02; A47B 19/00

U.S. Cl. 272-69

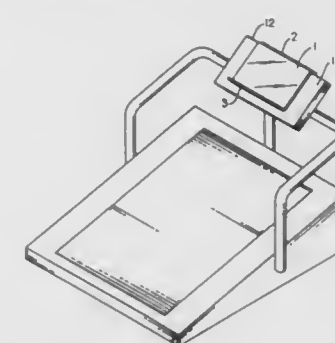
7 Claims

1. A system for supporting articles including reading materials or the like on exercise equipment comprising:

- a piece of exercise equipment having a display screen thereon;
- a portable rack mounted on the display screen, said rack comprising:
 - a transparent planar surface having an upper end, a lower end, an underside and a topside;
 - a first flange protruding from the upper end of the planar surface in a first direction, said first flange and said upper end being connected by a first corner area;
 - a second flange protruding from the lower end of the planar surface in a second direction, said second flange and said lower end being connected by a second corner

area wherein the underside of the transparent planar surface between the second corner area and the first corner area is a flat surface;

the first flange being mounted over the upper edge of the



display screen of the piece of exercise equipment and the underside of the transparent planar surface contacting the surface area of the display screen, and the second flange and topside of the planar surface are capable of supporting a book or similar article thereon.

5,085,428

BABY WALKER

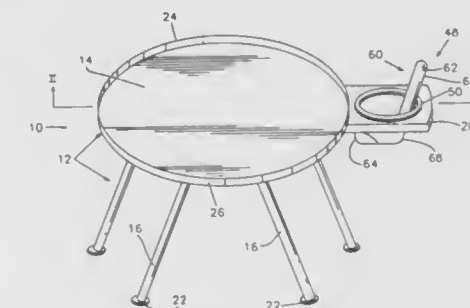
Daniel R. Fermaglich, and Lois F. Fermaglich, both of 9 Van Duyn Road, Mountain Lakes, N.J. 07046

Filed May 24, 1990, Ser. No. 528,724

Int. Cl.⁵ H63B 23/06

U.S. Cl. 272-70

10 Claims



1. An infant walker adapted for use in a substantially stationary location on a support surface, such as a floor, comprising a frame having a central axis and an outer circumferential edge; mounting means for mounting said frame above the support surface such that said frame is maintained in a substantially horizontal orientation with its said central axis extending vertically and such that said frame is substantially immovable relative to the support surface; supporting means, positioned adjacent to said outer circumferential edge of said frame, for supporting an infant for rotation about an axis of rotation of said supporting means, said supporting means including a seat sized and shaped so as to permit an infant to sit thereon; and suspending means for suspending said seat above the support surface such that an infant in said seat has its legs in engagement with the support surface and such that said seat is revolvable about said central axis of said frame in a circular path which circumscribes said outer circumferential edge of said frame, said suspending means including rotating means for enabling said seat to freely rotate about said axis of rotation of said supporting means, whereby an infant in said seat can walk around said frame along said circular path and/or spin about said axis of rotation.

5,085,429

MUSCULATURE EXERCISING METHOD

Martin A. Van Der Hoeven, 3330 Carlsbad Blvd., Carlsbad, Calif. 92008

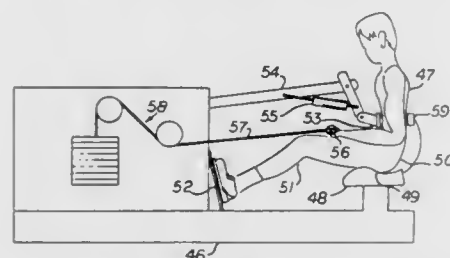
Continuation-in-part of Ser. No. 395,537, Aug. 18, 1989, Pat. No. 5,005,832, and a continuation-in-part of Ser. No. 360,133, Jun. 1, 1989, Pat. No. 4,966,363, which is a continuation-in-part of Ser. No. 156,404, Feb. 16, 1988, Pat. No. 4,848,740. This application Oct. 25, 1990, Ser. No. 603,454

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.⁵ A63B 23/02

U.S. Cl. 272-93

4 Claims



1. A method for exercising one's abdominal musculature which comprises:

- assuming a seated position with legs extended in an oblique direction;
- pushing one's feet against a substantially vertical stop;
- tilting one's pelvis posteriorly while resting the abdomen forwardly against a resiliently and horizontally movable barrier, and holding one's thoracic spine area in a forwardly bent position; and
- pulling and holding a horizontally tensioned tow-line with both hands, bringing one's arms to a substantially vertical position with elbows bent.

5,085,430

MULTIPLE STATION EXERCISE APPARATUS

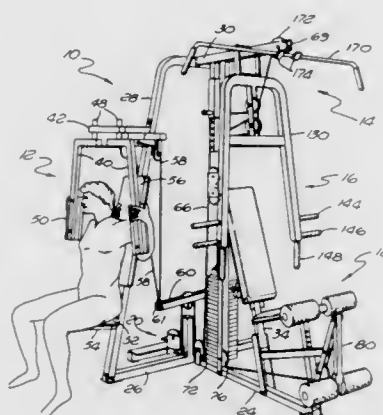
Theodore G. Habing, Long Beach, Calif., assignor to Pacific Fitness Corporation, Sante Fe Springs, Calif.

Filed Feb. 20, 1991, Ser. No. 658,077

Int. Cl.⁵ A63B 21/06

U.S. Cl. 272-117

9 Claims



1. An exercise apparatus for use by an operator comprising:

- a frame;
- a first lever arm pivotally coupled to said frame;
- an exercise station disposed on said frame and having at least one operable member moveable by the operator;
- a first cable coupling said operable member to said lever arm;
- resistance means comprising a weight stack, a selectable

portion of which is selected by the operator for resisting movement of said operable member by the operator; and resistance communication means coupled to said resistance means and said first lever arm for coupling said resistance means to said operable member, said resistance communication means comprising a second cable, a first pulley coupled to said frame and a second pulley coupled to said lever arm.

5,085,431

GOLF TEE AND PLACEMENT TOOL

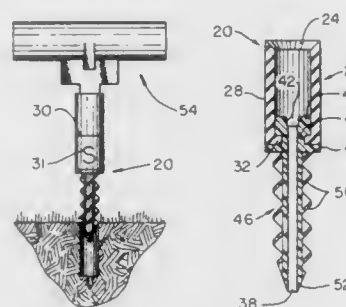
Robert M. McGuire, 1454 Everett Way, Roseville, Calif. 95678

Filed Oct. 12, 1989, Ser. No. 420,546

Int. Cl.⁵ A63B 57/00

U.S. Cl. 273-33

8 Claims



1. In combination, a golf practice device that supports a golf ball above the ground at a desired height, a portion of the device remaining in the ground until its desired removal by a golfer, said golf ball freeing device comprising:

- (a) a golf tee having a plant riser portion to support a golf ball and a rigid anchor portion having a spiraling flute on its external surface to secure said tee in the ground, said anchor having a stabilizer bore passing through its longitudinal axis;
- (b) a placement tool for engaging and placing said golf tee in the ground comprising a tool handle, a torque shaft secured to said handle for engaging the anchor and a stabilizer extending from the torque shaft into the stabilizer bore and sleeve means for making a hole in the ground slidably carried with and by said torque shaft for engaging the ground and making said hole whereby said anchor is inserted into said hole for placement of said golf tee into the ground; and
- (c) interlocking means for transferring vertical and rotational forces applied to said placement tool via the shaft to said anchor whereby said anchor can be screwed into the ground at said hole.

5,085,432

GOLF TEE MANUFACTURING METHOD

Katsuji Takeno, 15-47, Nagayoshi Deto 6-chome, Hirano-ku, Osaka, Japan, assignor to Katsuji Takeno, Osaka, Japan

Continuation of Ser. No. 200,556, May 31, 1988, abandoned.

This application Aug. 7, 1990, Ser. No. 563,943

Claims priority, application Japan, May 31, 1987, 62-85310[U]; May 31, 1987, 62-85311[U]; Sep. 19, 1987, 62-235692

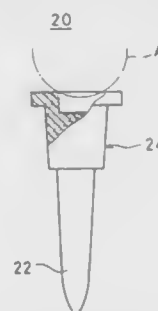
Int. Cl.⁵ A63B 57/00

U.S. Cl. 273-33

1 Claim

- 1. A method of making a golf tee comprising the steps of: providing a material composition of 90% by weight of pulverized granite, 8% by weight of pulp, 1.5% by weight of starch and 0.5% by weight of preservative and anti-mildew agents;
- kneading the above ingredients into a water-soluble moldable composition; and

molding the composition into the shape of a golf tee, and drying and hardening the molded composition by the



application of heat for three hours at a temperature of 50°-65° C.

5,085,433

AUXILIARY FOLDING HANDLE

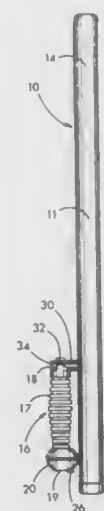
Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems & Procedures, Inc., Appleton, Wis.

Filed Apr. 17, 1991, Ser. No. 686,650

Int. Cl.⁵ F41B 15/02

U.S. Cl. 273-84 R

18 Claims



1. An auxiliary folding handle attachment for an elongated shaft having a longitudinal axis, a first gripping end and a second end, the folding handle attachment comprising:

- a. a handle having a first end for fitting against the shaft, a second exterior end, and an axially aligned bore extending therethrough;
- b. a rod centrally disposed within the bore of the handle, the rod including a stationary mounting post with a first end for fitting against the shaft and a second end, and a handle post having a first end hingedly attached to the second end of the mounting post and a second end for securing the handle to the rod; and
- c. a lock for releasably locking the handle attachment to the elongated shaft at a position perpendicular to the elongated shaft.

5,085,434

MAGNETIC INDICATOR DEVICE

Luis A. Soto, II, 5702 Braesheather, Houston, Tex. 77096

Filed Nov. 1, 1990, Ser. No. 607,736

Int. Cl.⁵ A63F 5/04; A63H 33/26

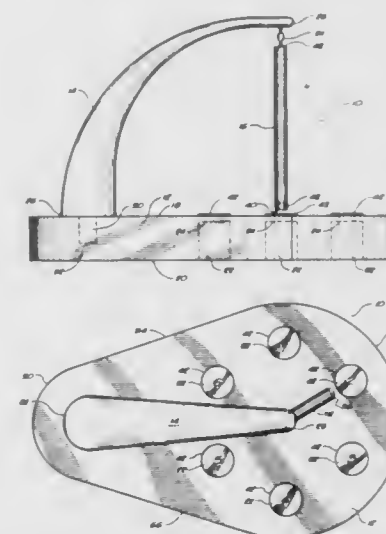
U.S. Cl. 273-138 A

16 Claims

- 13. An apparatus comprising: a base;
- a plurality of magnetic members fastened in a circular pat-

tern to said base, each of said magnetic members having a similar magnetic pole adjacent to a top surface of said base;

an arm connected to said base, said arm having a portion above said plurality of magnetic members;



a magnet suspended from said portion of said arm so as to be magnetically interactive with said plurality of magnetic members; and

a plurality of indicator pads fastened to said top surface of said base in a position corresponding to said plurality of magnetic members.

5,085,435

METHOD OF USING A RANDOM NUMBER SUPPLIER FOR THE PURPOSE OF REDUCING CURRENCY HANDLING

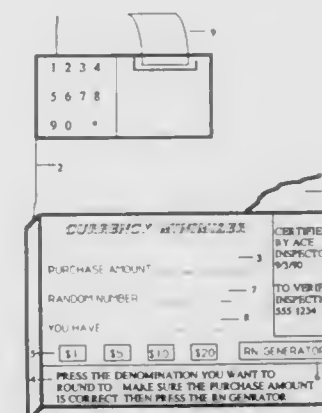
Michael T. Rossides, 1341 Kennedy St., NW., Washington, D.C. 20011

Continuation-in-part of Ser. No. 571,126, Aug. 22, 1990, abandoned. This application Nov. 7, 1990, Ser. No. 609,063

Int. Cl.⁵ A63F 9/00; G06F 15/28

U.S. Cl. 273-138 A

1 Claim



1. In a payment by a first party of money to a second party for a commodity, a method of betting between a first party and a second party for the purpose of reducing currency handling requirements comprising the steps of:

- a. providing a denomination of currency, said denomination of currency representing a monetary amount equal to a

- plurality of smaller units of currency, wherein each smaller unit of currency has an integral value of "1";
- b. providing a means for randomly generating an integer from a set of consecutive integers, the number of different integers capable of being selected being equal to the total number of smaller units represented in said denomination of currency wherein said set of consecutive set of integers comprises integers starting at the smallest integer "1" and ending with the largest integer equal to the total number of smaller units represented in said denomination of currency;
- c. representing the amount of money intended to be paid as an integer by converting the amount of money intended to be paid to smaller units;
- d. operating said means for randomly generating an integer;
- e. comparing the randomly generated integer with the amount of money integer intended to be paid, if said randomly generated integer is greater than amount of money integer intended to be paid, then said first party pays nothing to said second party and said first party receiving said commodity, if said randomly generated number is equal to or less than the amount of money integer intended to be paid, then the first party pays the second party said denomination of currency and said first party receiving said commodity.

5,085,436

SLOT MACHINE WITH LONG AND SHORT PSEUDO REEL STRIP

Nicholas L. Bennett, Mosman NSW, Australia, assignor to Ainsworth Nominees Pty., Ltd., Rosebery, Australia
Filed Jul. 27, 1990, Ser. No. 558,357
Int. Cl.⁵ A63F 5/04

U.S. Cl. 273-143 R

20 Claims

	JACK	C	B	A
1	Q	1	1	1
2	Q	2	2	2
3	K	3	3	3
4	9	4	4	4
5	J	5	5	5
6	B	6	6	6
7	10	7	7	7
8	K	8	8	8
9	Q	9	9	9
10	J	10	10	10
11	10	11	11	11
12	Q	12	12	12
13	B	13	13	13
14	10	14	14	14
15	J	15	15	15
16	JACKPOT1	16	16	16
17	10	17	17	17
18	J	18	18	18
19	JACKPOT2	19	19	19
20	10	20	20	20

PSEUDO REEL STRIPS

1. A slot machine comprising:
display means including a plurality of display positions for displaying indicia, the display means having a separate indicia display means for displaying indicia for each display position, each indicia display means being arranged to display an indicium which is selected from a set of possible indicia for a corresponding display position; and random selection means for selecting the indicia to be displayed on the display positions of said display means, said random selection means including
random number generation means for selecting a random number from a set of numbers having a number uniquely corresponding to each of the indicium of a set of possible indicia for at least one display position, wherein the random number generation means has
a first table of numbers containing each number in the set of numbers,
at least one further table of numbers containing a sub-set of the set of numbers, and
for the at least one display position, selection means for selecting between the first and at least a second table as a

selected table to be used for a current game on the machine whereby the random number generation means selects from the selected table and said indicia display means for the at least one display position is responsive to the selected random number so as to display a corresponding indicia at the at least one display position.

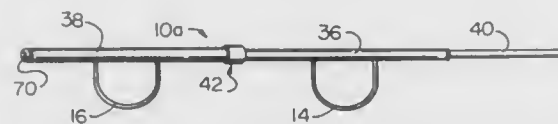
5,085,437

CHIPPING AND PUTTING PRACTICE DEVICE

Joseph F. Leitao, 500 Foggy Ridge Pkwy., Lutz, Fla. 33549
Continuation-in-part of Ser. No. 626,013, Dec. 12, 1990, Pat. No. 5,040,798. This application May 3, 1991, Ser. No. 695,461
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.⁵ A63B 69/36

U.S. Cl. 273-183 B

11 Claims



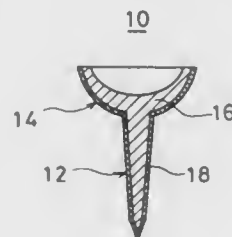
1. A chipping and putting practice device comprising a rigid elongated shaft having an attachment means including a first and second attachment loop attached thereto aligned longitudinally relative to each other along the same side of said rigid elongated shaft on opposite end portions thereof to receive the golfer's arms therethrough, said rigid elongated shaft comprising a first and second shaft section disposed in telescoping relationship relative to each other to selectively vary the length of said rigid elongated shaft to adjust the distance between said first and second attachment loops relative to each other, said rigid elongated shaft having a length permitting said rigid elongated shaft to lay across the inside portion of each elbow while the golfer is addressing a golf ball for a chipping or putting stroke such that each corresponding forearm, elbow and shoulder is held in a symmetrical/mirror image position relative to the corresponding forearm, elbow and shoulder on the opposite side of the body to prevent relative movement between corresponding forearms, elbows and shoulders such that said chipping and putting device restricts relative movement between corresponding forearms, elbows and shoulders to maintain the club shaft in a substantially vertical position throughout the entire stroke whereby the golfer creates a one piece take-a-way stroke by movement of the upper portion of the golfer's body.

5,085,438
GOLF TEE

Katsuji Takeno, 15-47, Nagayoshi Deto 6-chome, Hirano, Osaka, Japan, assignor to Katsuji Takeno, Osaka, Japan
Filed Mar. 29, 1990, Ser. No. 500,893
Claims priority, application Japan, Mar. 30, 1989, 1-82350
Int. Cl.⁵ A63B 57/00

U.S. Cl. 273-212

2 Claims



1. A golf tee comprising:

a unitary body having the shape of a standard golf tee and made of a clay material which is efflorescent, and an irradiated synthetic resin layer formed on the surface of said body, said synthetic resin layer being a mixture of a reactive oligomer, a reactive monomer, an optical initiator and an antifoaming agent.

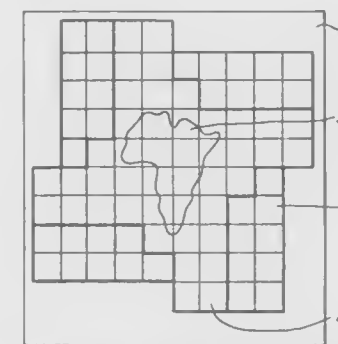
5,085,439

GAME BOARD, QUERY CARDS AND METHOD OF PLAYING A BLACK HISTORY GAME

Willie C. Lott, 3310 Chalfont Dr., Houston, Tex. 77066
Filed Feb. 12, 1991, Ser. No. 654,050
Int. Cl.⁵ A63F 3/00

U.S. Cl. 273-236

2 Claims



1. A folding multicolored game board with a plurality of squares equally divided amongst and apportioned to each of four playing positions with these squares further subdivided at each playing position into two sets of a plurality of playing squares with both sets being of a different color, a plurality of these squares being outlined over a representation of the continent of Africa on the game board and each country of Africa being outlined, all squares have a number printed in them that corresponds to the total of the dots that might occur with the roll of a pair of dice, a plurality of these square having numbers and printed subject titles in them, a plurality of game cards called query cards some of which are general subject cards providing questions, answer, scoring, and game instructions corresponding to the squares which contain numbers only, and a plurality of specific query cards providing questions, answers, scoring, and game instructions corresponding to the game board squares containing the appropriate specific subject titles.

5,085,440

BOARD GAME DEVICE

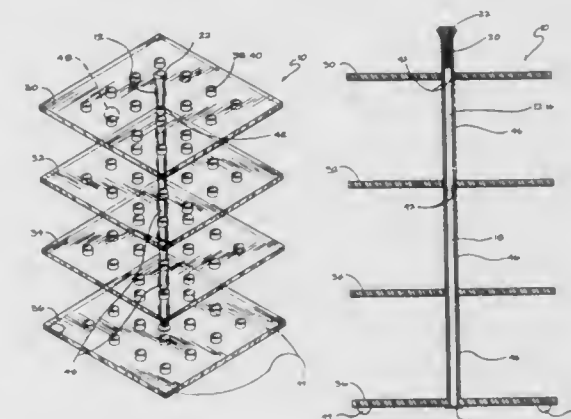
Ivan Van Dam, 5099 - 143rd Cir., Savage, Minn. 55378
Filed Dec. 28, 1990, Ser. No. 635,349
Int. Cl.⁵ A63F 3/00

U.S. Cl. 273-241

19 Claims

1. A three dimensional, multiplanar board game device for which the game object is to place a plurality of game markers on the device in a straight line in any dimension, comprising:
(a) a plurality of transparent boards each with a configured aperture therethrough and a square grid of marker seats, the number of the seats per each board equaling the number of the boards to the power of two;
(b) a support shaft configured in cross section as to nonrotatably pass through the configured aperture of each board

to nonrotatably align the boards and the grids in vertical arrangement with respect to each other, and



- (c) spacer means to support the boards on the shaft in spaced relation adequate to permit hand insertion between the boards.

5,085,441

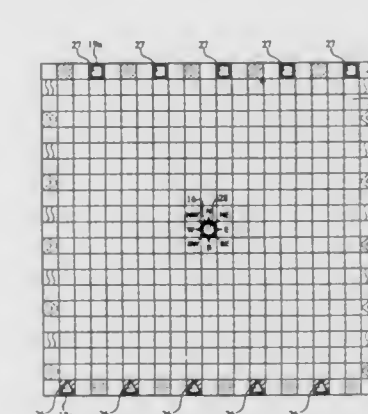
METHOD OF PLAYING A BOARD GAME

Fernando J. Jova, 599 W. Westfield Blvd., #25, Indianapolis, Ind. 46204

Filed Sep. 19, 1990, Ser. No. 585,225
Int. Cl.⁵ A63F 3/00

U.S. Cl. 273-248

12 Claims



1. A method for playing a board game which includes a game board having a playing surface having a plurality of subunits thereon, one or more random movement pieces movable periodically from subunit to subunit in an unpredictable manner during the course of a game, one or more counters for each player of the game which are movable from subunit to subunit during the course of the game toward an objective which includes an interaction with one of the one or more random movement pieces, first designating means for designating the number of subunits of movement of at least one of the one or more counters, and second designating means for designating the number of subunits of movement and the direction of movement of the at least one random movement piece; the method comprising:

- A. each player of the game in sequence taking a turn by operating the first designating means to designate the number of subunits of movement of at least one of his one or more counters, the player thereafter moving the at least one of his one or more counters by the number of subunits designated by the first designating means in a direction of his choice;
B. each player, in sequence, operating the second designat-

ing means to designate the movement of at least one of the one or more random movement pieces and moving the at least one of the one or more random movement pieces by the number of subunits and in the direction designated by the second designating means; and repeating Steps A and B until one player achieves the objective with each of his one or more counters.

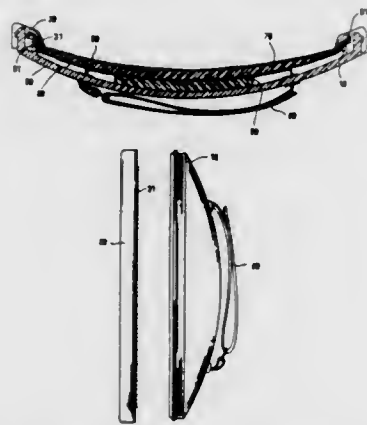
5,085,442

ARTICLES OF PLAY FOR USE IN THE GAME OF CATCH
Miryoung Lee, West Covina, Calif., assignor to Many Amazing Ideas, Walnut, Calif.

Continuation-in-part of Ser. No. 490,301, Mar. 8, 1990, Pat. No. 4,995,617. This application Jan. 15, 1991, Ser. No. 642,278
Int. Cl.⁵ A63B 67/00

U.S. Cl. 273—346

17 Claims



1. Articles of play or sport, for use with the game of catch, comprising:

- (a) a missile having substantially all of its surface defined by a multitude of irregular filamentary formations, and
- (b) a multi-layer mitt for use by a participant in the game of catching said missile, said multi-layer mitt including a rigid concave rear layer, a first intermediate flexible layer, a second intermediate flexible layer, and a front layer having substantially all of its front surface defined by a multitude of irregular filamentary formations, said first intermediate flexible layer occupying a surface area less than the surface area of said rear layer, and said second intermediate flexible layer occupying a surface area substantially equal to the surface area of said rear layer, said front layer being retained in place by a retaining ring having an inner edge, the inner edge including a plurality of teeth which contact a portion of said front layer, to prevent said front layer from separating from said second intermediate flexible layer.

5,085,443

LABYRINTH SEAL

Robert L. Richards, Dickinson, Tex., assignor to Amoco Corporation, Chicago, Ill.

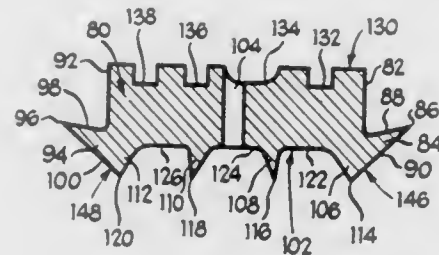
Filed May 29, 1990, Ser. No. 529,895
Int. Cl.⁵ F16J 15/447

U.S. Cl. 277—53

18 Claims

1. A floating labyrinth seal comprising:
a first side in alignment with a radial axis and a second side opposite said first side, said first and said second side each including a generally axially extending inclined tooth, and an inner-axial surface in alignment with an axial axis and an outer-axial surface opposite said inner-axial surface having at least one purge opening extending to said inner-

axial surface, said inner-axial surface including at least four teeth each having an apex extending substantially



inwardly toward the axial axis having grooves therebetween.

5,085,444

DUST SEAL FOR SLIDING TYPE BUSH

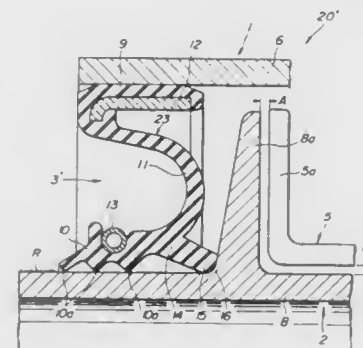
Takuya Murakami, Atsugi; Toshibiko Kakimoto, Isehara; Shigeki Dake, Masuda; Junzo Ishimaru, Hiratsuka; Yuji Kyoi, Chiba; Masanao Kameda, and Nobuyuki Tamura, both of Chiba, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama; Keeper Co., Ltd., Tokyo and Kinugawa Rubber Ind. Co., Ltd., Chiba, all of Japan

Continuation of Ser. No. 304,078, Jan. 31, 1989, abandoned. This application Jun. 5, 1990, Ser. No. 534,319

Claims priority, application Japan, Feb. 12, 1988, 63-28860
Int. Cl.⁵ F16J 9/06

U.S. Cl. 277—154

7 Claims



1. A sliding type bush comprising:
concentric inner and outer sections movable relative to each other; and
a dust seal for providing a seal between said inner and outer sections;
said inner section having a flange abuttingly engageable with said outer section for limiting movement of said inner section relative to said outer section;
said dust seal having a fitting portion fitted in said outer section, an annular seal lip portion in sliding contact with an outer circumferential surface of said inner section and an annular flexible portion interconnecting said fitting portion and said seal lip portion;
said dust seal further having on an inner side thereof and at a junction between said flexible portion and said seal lip portion an annular projection for contact with said flange and said outer circumferential surface of said inner section; and
said fitting portion having an outer end located more remotely from said flange than an inner end, and said seal lip portion having an inner end located nearer to said flange than an outer end, said flexible portion extending curvedly between said outer end of said fitting portion and said inner end of said seal lip portion for allowing axial movement of said inner section relative to said outer section while holding said annular projection in contact with said

flange and said outer circumferential surface of said inner section under a bias of said flexible portion.

5,085,445

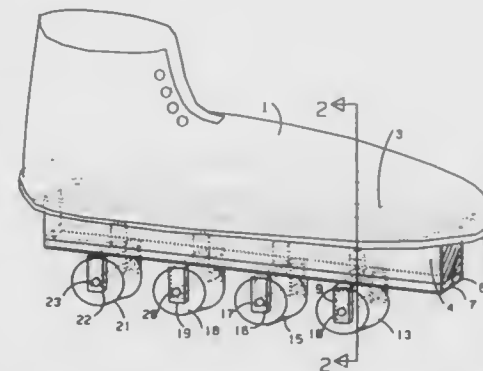
SKATE CUSHIONING DEVICE

Willis G. Boyden, Box 83533, Los Angeles, Calif. 90083
Filed Mar. 11, 1991, Ser. No. 667,219

Int. Cl.⁵ A63C 1/00

U.S. Cl. 280—11.22

1 Claim



1. A roller skate cushioning device to be used to cushion the roller skate from skate surface vibration comprising:

- a skate shoe, said shoe being attached to a skate heel-sole, said skate heel-sole being attached to one flat side of a skate platform, said skate platform being a strong thin, flat piece rectangular in shape, the long axis of said flat side being contiguous to the long axis of said skate heel-sole, the length of said skate platform being somewhat less than the length of said heel-sole, the width of said skate platform being somewhat less than the width of said heel-sole,
 - a skate body being rectangular in shape, said skate body having a length equal to the length of said skate platform, said skate body having a width of approximately half the width of said skate platform,
 - said skate body having a depth of about one inch, said skate body being attached to said skate platform, the upper lengthwise side of said skate body being contiguous to the lower flat side of said skate platform, said skate body being centered in the middle of the long axis of said skate platform,
 - a plurality of vertically displaced compression rod holes being inserted in said skate body intersecting the lengthwise central axis of said skate body for about three quarters of an inch, said compression rod holes being equal in number to the rollers
- compression rods having a top cylindrical portion of radius slightly less than the radius of said compression rod holes, the length of said top portion being approximately equal to one-half inch, a middle portion of said compression rod being about one quarter inch in length and having a flat area on both sides of said middle portion, said middle portion having a width between said flat area on both sides of said middle portion that is less than the diameter of said top cylindrical portion, lower portion of said compression rod being U-shaped with the two days of said U-shaped lower portion extending downward for about one inch, said legs being flat, rectangular pieces, parallel to each other, and approximately one quarter inch apart, the width of said legs being about one-half inch, the cross piece of said U-shaped lower portion being rectangular in shape, said cross piece extending between the top part of said legs, said cross piece being joined, centered with and contiguous with the bottom face of said middle portion, each of said legs having an axle hole for an axle insertion about one quarter of an inch from the bottom of said legs, said axle holes being centered and opposing each other,

said compression rods being inserted in said compression rod holes,
a compression spring being placed in each of said compression rod holes between the downward-pointing face of said compression hole and the upward-pointing face of said compression rods,
a roller axle, roller being inserted in each of said axle holes, a left bottom plate and a right bottom plate comprising two long flat rectangular pieces, to act as stays and positioners, the length of said left and right bottom plates being equal to the length of said skate body, the widths of said left and right bottom plates being equal and somewhat less than half the width of said skate body, said left and right bottom plates attached to the respective left and right bottom sides of said skate body, the inner edges of said left and right bottom plates abutting said flat areas of said middle portion of said compression rods.

5,085,446

PORTABLE SPORTSMAN SEATING APPARATUS

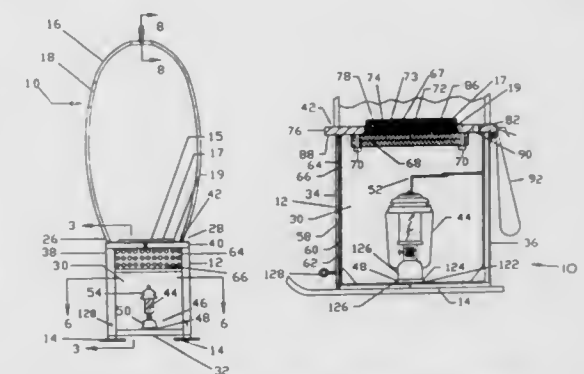
Larry D. Hoffman, 2018 Housel Craft Rd., Bristolville, Ohio 44402

Filed Jun. 20, 1990, Ser. No. 541,135

Int. Cl.⁵ B62B 13/00

U.S. Cl. 280—19.1

3 Claims



1. A portable sportsman seating apparatus including
a seat frame having a chamber and a seating surface on top of the chamber;
at least one ski having said seat frame mounted on said one ski for movement of the apparatus between locations;
a lantern mounted in said chamber;
said seat frame chamber having a bottom portion with at least one aperture therethrough to allow air to flow therethrough into said chamber to support combustion of said lantern in said chamber;
said seat frame chamber further defined by a plurality of sides, one of said sides of said chamber formed at least in part from a material that allows light to pass therethrough and another of said sides forms and defines the top of said chamber and has at least a portion formed from a material having apertures therethrough to allow the flow of heated air from the chamber; and
means for securing said lantern to said seat frame, said lantern having a base and a top, said lantern securing means including bottom lantern support means for removably securing the base of said lantern to said seat frame and a top lantern support means for removably securing said top of said lantern to said seat frame.

5,085,447

FOLDING FURNITURE STRUCTURE

Jacques J. Audibert, 59 avenue de la Bourdonnais, 75007 Paris, France

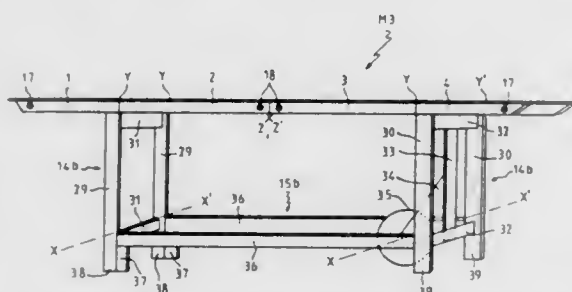
Filed Aug. 2, 1990, Ser. No. 561,897

Claims priority, application France, Aug. 10, 1989, 89 10760; Feb. 12, 1990, 90 01603

Int. Cl.⁵ B62B 1/04; A47B 3/083

U.S. Cl. 280—30

4 Claims



1. A folding table having a folded and unfolded configuration, and comprising:

- a table top supported above a horizontally-extending frame, said frame including a ground engaging wheel adjacent one end and ground-engaging support means adjacent the opposite end of said frame;
- said table top comprised of two inner top sections having inner ends hinged together and two outer top sections having inner ends hinged to a respective outer end of said inner top sections;
- first and second leg means having upper and lower ends, a lower end portion of each leg means being pivoted to respective opposing ends of said frame and the upper end of each leg mean being fixedly secured to respective ones of said outer top sections;

whereby in said folded configuration the two inner top sections are folded into an upright parallel position next to each other, the two outer top sections are folded into an upright parallel position next to the two inner sections, each of said leg means extend horizontally along said frame parallel thereto, and said wheel and said ground-engaging supports support the table above the ground thereby permitting the folded table to be moved by rolling, and in said unfolded configuration the two inner and two outer top sections define a single planar, horizontally extending table top surface in vertically spaced-apart relation to the frame and the leg means engage the ground and extend vertically upwardly from the frame.

5,085,448

STACKABLE CONTAINERS

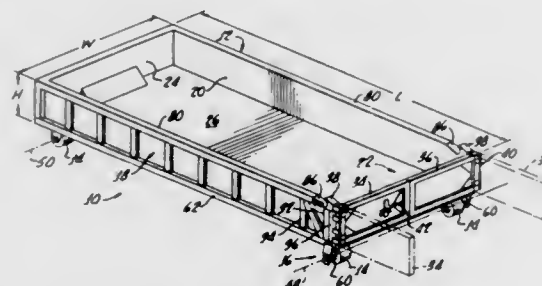
Don B. Shubin, 25 Bayberry, Irvine, Calif. 92715

Filed Jun. 13, 1990, Ser. No. 537,486

Int. Cl.⁵ B60P 1/64

U.S. Cl. 280—33,998

33 Claims



13. A stackable roll-box which comprises:

- a generally rectangular bin having first and second opposing sides, first and second ends, and a bottom;
- wheels mounted to the bottom of said bin at the four corner regions thereof, said wheels being positioned for enabling the roll-off box to be rolled in a longitudinal direction along a surface; and
- first and second rollers mounted to bottom regions of the bin adjacent to one of said first and second ends, each of said first and second rollers being positioned outboard of an associated one of said wheels, said first and second rollers being mounted directly beneath an associated one of said first and second sides, and said first and second rollers each having the same outer diameter and being mounted on a common transverse rotational axis.

5,085,449

CUTTER HAVING A SINGLE BLADE FOR A SAFETY BELT

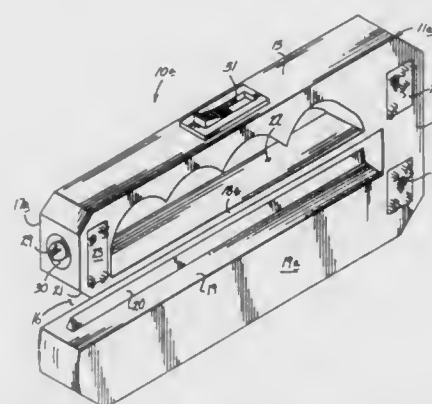
William Hudson, 2723 Veteran Ave., Los Angeles, Calif. 90064

Filed Nov. 5, 1990, Ser. No. 608,848

Int. Cl.⁵ B60R 7/04; B26B 17/00

U.S. Cl. 280—801

2 Claims



1. A seat belt escape apparatus comprising, in combination, a unitary housing, the unitary housing including a cavity directed therewithin, the cavity including a cutting blade mounted within the cavity, and further including a flexible seat belt, the flexible seat belt including first fastening means, and the unitary housing including second fastening means for securement of the unitary housing to the first fastening means by the second fastening means, and wherein the housing includes a top wall, a first side wall spaced from and parallel to a second side wall, a rear end wall, and a forward end wall, the cavity defined by a "V" shaped cavity defining an upper planar jaw wall and a lower planar jaw wall, the upper and lower planar jaw walls arranged orthogonally relative to the first and second side walls and defining an acute angle between the upper planar jaw wall and the lower planar jaw wall, and the cutting blade orthogonally and fixedly mounted to the lower planar jaw wall, and

wherein the first fastening means includes a plurality of seat belt fastener strips fixedly mounted to the seat belt, and the second fastening means includes a plurality of hook and loop housing fastening strips mounted to the first side wall of the housing, and further including a handle opening directed coextensively through the first side wall and the second wall between the top wall of the housing and the upper planar jaw wall, and the handle opening including a serpentine upper surface adapted for enhanced manual grasping of the housing.

5,085,450

STEP STALL PREVENTION FOR VEHICLE STEPS

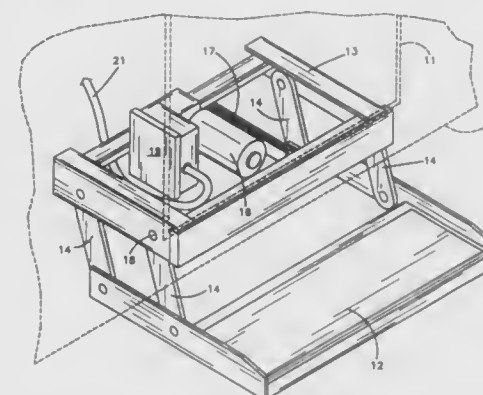
Larry DeHart, Sr., Placentia, Calif., assignor to The Dometic Corporation, Evansville, Ind.

Filed Dec. 13, 1990, Ser. No. 626,981

Int. Cl.⁵ B60R 3/02

U.S. Cl. 280—166

11 Claims



1. In a system for extending and retracting a step, including an electric motor, coupling means connecting said step and motor operable to extend and retract the step, and a circuit for energizing the motor, the improvement wherein said circuit comprises a first circuit means including a circuit breaker and connected to selectively energize said motor via said circuit breaker in one rotation direction to cause said coupling means to extend and retract said step, and second circuit means operative during an open condition of said circuit breaker for energizing said motor in an opposite rotation direction to cause said coupling means to retract said step.

5,085,451

UNIVERSAL MOUNTING HITCH

James R. Schweigert, Plymouth, Minn., assignor to JRCO, Inc., New Hope, Minn.

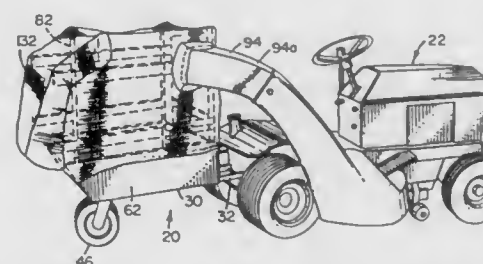
Continuation of Ser. No. 107,120, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 899,755, Aug. 21, 1986, Pat. No. 4,699,393, which is a continuation of Ser. No. 648,763, Sep. 7, 1984, abandoned. This application Jan. 25, 1990, Ser. No. 469,927

The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.

Int. Cl.⁵ B60D 1/02

U.S. Cl. 280—460.1

11 Claims



1. A multi-purpose trailer for removable attachment to a towing vehicle such as a garden tractor, comprising:
- a support framework having a front end facing the towing vehicle when attached thereto and an oppositely facing back end;
 - at least one swivel-mounted, ground-engaging wheel interconnected with the support framework for supporting the support framework above a surface of the ground;
 - hitch means for connecting the trailer to the towing vehicle;
 - a trailer box supported by the support framework, the trailer box and support framework including cooperating

mounting means removed from the ground-engaging wheel for pivotally interconnecting the trailer box to the support framework for pivotal movement of the trailer box about a generally horizontal axis, wherein said horizontal axis is removed from an axle of said swivel-mounted, ground-engaging wheel; and

- cover means interconnected to the trailer box for defining an enclosed area above the trailer box, said cover means including a perforated portion through which air can flow, said cover means enabling air to flow from the enclosed area above the trailer box through the perforated portion of said cover means and into the ambient air surrounding the enclosed area, said cover means further including inlet means whereby material such as grass clippings can be received into the enclosed area above the trailer box, said cover means being positionable in a closed configuration and an open configuration, in the open configuration the cover means exposes a back portion of the enclosed area above the trailer box, whereby material such as grass clippings can be readily removed from the enclosed area above the trailer box when the trailer box is pivoted into a substantially upright position.

5,085,452

INTERCHANGEABLE TOWING BALL ASSEMBLY

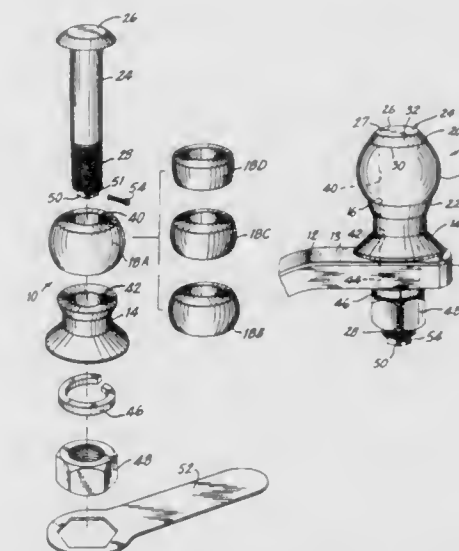
Joseph J. Janciro, 220 Hopper St., Hackensack, N.J. 07601

Filed Aug. 27, 1990, Ser. No. 572,691

Int. Cl.⁵ B62D 1/06

U.S. Cl. 280—511

4 Claims



1. In a kit for a trailer ball assembly to be mounted on a tongue affixed to a vehicle, the kit including a plurality of interchangeable balls of differing spherical diameters, the plurality of balls corresponding to a plurality of tractor sockets, such that any selected one of the tractor sockets will be accommodated by the selection of a corresponding one of the plurality of balls for inclusion in the trailer ball assembly:

each ball being generally spherical in shape, having a first surface and a diametrically opposite second surface, and being sized to engage the corresponding selected trailer socket in a close mating relationship;

each ball being truncated at the first surface so that the first surface of every ball has the same shape and dimensions;

each ball having an opening extending diametrically there-through from the center of the first surface to the opposite second surface of the ball;

a base having an upper surface for mating with the second surface of the selected one of the plurality of balls and a lower surface for mating with the tongue;

the base having an opening therethrough capable of being aligned with the opening in the selected ball; and a bolt sized to fit in the aligned openings in the selected ball and the base in order to permit assembling of the trailer ball assembly with the selected ball, the bolt having opposite ends, a head at one of the opposite ends of the bolt and a threaded portion adjacent the other of the opposite ends of the bolt, the head having an upper surface and a lower surface having a shape and dimensions essentially matching the shape and dimensions of the first surface of each ball such that, upon assembly, the lower surface is complementary to the first surface of the selected ball with which the head is in contact and the upper surface is essentially continuous with the spherical surface of the selected ball.

5,085,453

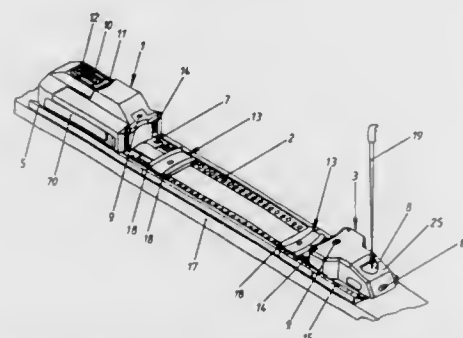
AUTOMATICALLY RELEASABLE SKI BINDING UNIT
Heinz H. Bildner, Seebuck, Fed. Rep. of Germany, assignor to Implementors Overseas Limited, Douglas, United Kingdom
PCT No. PCT/EP88/01076, § 371 Date Jul. 28, 1989, § 102(e)
Date Jul. 28, 1989, PCT Pub. No. WO89/04701, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 25, 1988, Ser. No. 391,550
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740327

Int. Cl.⁵ A63C 9/08

U.S. Cl. 280—612

15 Claims



1. In an automatically releasable ski binding unit, comprising front and heel parts, a mechanical boot retaining system, an electronic control system powered by a battery power source, and a release system for the ski boot, the improvement wherein:

the front part is tiltable about an axis which extends transversely of the longitudinal axis of the ski, and the heel part includes a housing, a backing member mounted to said housing for movement along said longitudinal axis, a sole holder which is movable longitudinally with respect to the housing and disposed to be engaged by said backing member and urged forward responsively to forward movement of said backing member to engagingly lock said ski boot to said heel unit, first spring means disposed within said housing and mounted for movement along said longitudinal axis and disposed when compressed to urge said backing member forward along said housing against said sole holder, locking means for releasably holding said first spring means affixed to said housing in said compressed state and including key means for operating said locking means to a released state to release said heel part from said ski boot, electromagnet means associated with said control system for actuating said key means to release said first spring means upon energization of said electromagnet, signal receiver means disposed within said housing for connecting said control system to said power source, signal transmitter means operably responsive to movement of said sole holder beyond a given rearward limit for actuating said signal receiver means to connect said control system to said current supply, timing means for energizing said electromagnet means a given time after actuation of said signal receiver means, and wherein said

signal transmitter means is guided in said backing member for backward movement and includes second spring means for providing resistance to said backward movement, said signal transmitter means having a front portion disposed to engage said sole holder.

5,085,454

CROSS-COUNTRY SKI BINDING

Marc Provence, Thorens Les Glières, and Gerard Graillat, Annecy, both of France, assignors to Salomon S.A., Annecy Cedex, France

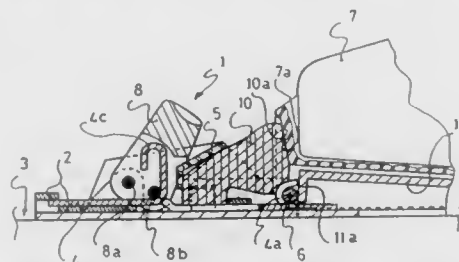
Filed Jul. 10, 1989, Ser. No. 377,555

Claims priority, application France, Jul. 13, 1988, 88 09983

Int. Cl.⁵ A63C 9/18

U.S. Cl. 280—615

9 Claims



1. A binding for a cross-country ski shoe, the shoe comprising a nose and a journal axle for movement of the shoe about an axis transverse to the longitudinal axis of a ski, said binding being movable between an open and closed position, said binding comprising:

- (a) an elastic element located adjacent the nose of the shoe for exerting a return force on the nose of the shoe when the shoe is lifted from an upper surface of the ski by pivoting around the journal axle;
- (b) means for mounting said elastic element for movement towards and away from the nose of the shoe, whereby said elastic element is brought into compression against the shoe during closing of the binding, wherein said means for mounting said elastic element includes a base adapted to be mounted on the ski and a movable carriage mounted for movement relative to said base, said elastic element being mounted on said movable carriage, said movable carriage being mounted for sliding movement on said base; and
- (c) a lever mounted on said base and cooperating with said movable carriage to control movement of said movable carriage, a part extending from said movable carriage, said lever being pivotally mounted on said base and including means for cooperating with said part.

5,085,455

SPORTING BOARD WITH TWO BOOT BINDINGS

Martin Bogner, Ostfildern, Fed. Rep. of Germany, and Henri Peyre, Saint Benin d'Azy, France, assignors to Look S.A., Nevers, France

Filed Jul. 27, 1989, Ser. No. 386,522

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825681

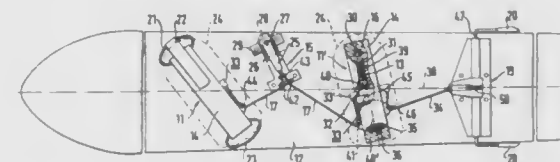
Int. Cl.⁵ A63C 9/00

U.S. Cl. 280—618

14 Claims

1. Sporting board comprising: a board member having a longitudinal direction and two boot bindings for securing a skier's boots to the board member, each boot binding having a respective longitudinal axis arranged at a considerable angle to said longitudinal direction of said board member, each said boot binding comprising an associated base plate secured to the board and a release plate associated with a respective one of said skier's boots, said base plates being longitudinally spaced along said board member, each said release plate being arranged above the associated base plate in alignment therewith,

a latching mechanism located between each said release plate and the associated base plate to secure each said release plate to the associated base plate and to release each said release plate from the associated base plate when a predetermined torsional load is exerted on said release plate relative to the associated base plate and when a predetermined tilting load is exerted on said release plate relative to said base plate, a common actuation and safety release mechanism for both said latch mechanisms, respective coupling means for coupling each said latch mechanism to said common actuation and safety release mechanism,



anism, said common actuation and safety release mechanism being releasable by hand and releasable in response to an excessive force applied to it by either of said latch mechanisms via the respectively associated coupling means, wherein said common actuation and safety release mechanism comprises a single spring means, and said coupling means are connected in force-sharing manner to said spring means, whereby release of said common actuation and safety release mechanism results in the simultaneous release of said release plates from the associated base plates.

5,085,456

RELEASE BINDING WITH PLATE

Hans Horn, Bern, Switzerland, assignor to Skis Rossignol S.A., Voiron, France

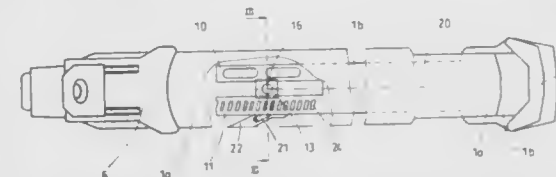
Filed Oct. 25, 1990, Ser. No. 603,472

Claims priority, application France, Nov. 13, 1989, 89 14842

Int. Cl.⁵ A63C 9/08

U.S. Cl. 280—618

4 Claims



1. A release binding for a ski comprising an underfoot plate (1) mounted pivotally on the ski (2) about a vertical axis (3), wherein the pivotable mounting of the plate on the ski is ensured by two profiled parts, male and female (14, 16) respectively, one (14) of which is integral with the plate and the other (16) integral with the ski, these two profiled parts being assembled with one another in a rotary manner by means of a bayonet device, one of said profiled parts having to this end at least one radial finger (25) and the other profiled part at least one groove having a descending portion (28) with an opening formed at an upper end of said descending portion and a portion in the form of a circular arc (29) connected to a lower end of said descending portion, said circular arc portion being centered on the pivoting axis and being of such a length so as to permit the rotation of the plate necessary for the disengagement of the binding while preventing disengagement of the plate from said ski.

5,085,457

INDEPENDENT FRONT AIR SUSPENSION APPARATUS AND METHOD

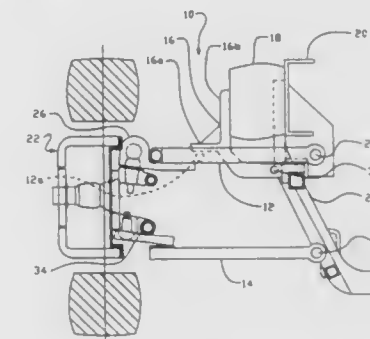
Jonathan Young, Fremont, Calif., assignor to Paccar Inc., Bellevue, Wash.

Continuation of Ser. No. 409,248, Sep. 19, 1989, abandoned. This application May 13, 1991, Ser. No. 702,131

Int. Cl.⁵ B60G 3/20, 11/28

U.S. Cl. 280—693

6 Claims



3. An independent front suspension for a truck having an axle assembly capable of articulation about a vertical axis, comprising:

- truck chassis frame rail means having a substantially vertically oriented side and providing a primary support structure for said truck, said frame rail means extending longitudinally along a side of said truck;
- a suspension frame connected to said frame rail means;
- an axle suspension assembly movably mounted to said suspension frame for vertical displacement relative thereto;
- an axle assembly mounted to said axle suspension assembly, said axle assembly articulating about a vertical axis to enable steering;
- a substantially horizontally oriented compression spring means mounted transversely to said vertically oriented side of said frame rail means; and
- rocker means having one end pivotally connected to said suspension frame and independent of said axle suspension assembly, said rocker means bearing against said axle suspension assembly and said horizontally mounted compression spring means, said rocker arm means producing substantially horizontal compression of said compression spring means against said side of said frame rail means upon vertical displacement of said axle suspension assembly.

5,085,458

ATTITUDE CHANGE SUPPRESSION CONTROL SYSTEM FOR ACTIVE SUSPENSION SYSTEM WITH HIGH SENSITIVITY OF VEHICULAR ATTITUDE CHANGE

Katsuya Kii, Nara; Kunio Katada, Tochigi; Yuji Okuyama, Tochigi, and Takashi Yonezawa, Tochigi, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 8, 1990, Ser. No. 564,495

Claims priority, application Japan, Aug. 9, 1989, 1-206568; Aug. 9, 1989, 1-206569

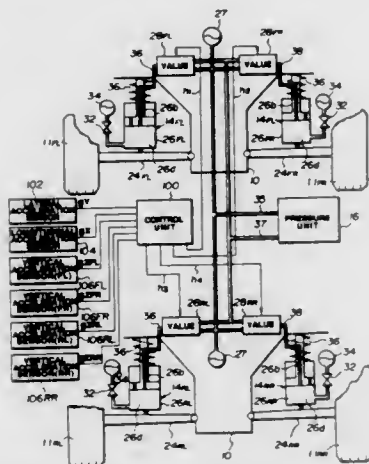
Int. Cl.⁵ B60G 11/26

U.S. Cl. 280—707

35 Claims

1. An active suspension system comprising: suspension systems, each being disposed between a vehicular body and a road wheel, each of said suspension systems including a variable pressure working chamber for generating a damping force acting against relative displacement between the vehicular body and the road wheel; a hydraulic system connected to said working chambers for adjusting fluid pressure therein, said hydraulic system including pressure control valves for respectively controlling introduction and draining of pressurized fluid to said

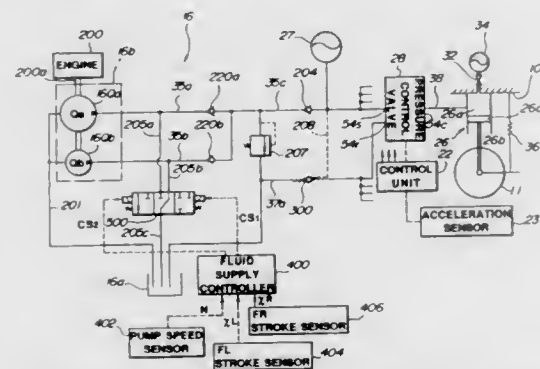
working chambers for adjusting the fluid pressure in said working chambers;
first sensors for monitoring a vertical displacement of the vehicular body at mutually different positions of the vehicular body for producing first sensor signals respectively representative of the vertical displacement of the vehicular body at the different positions; and



control means responsive to the first sensor signals from said first sensors to determine a vehicular attitude variation, said control means outputting control signals based on the vehicular attitude variation to the pressure control valves respectively to provide control pressure in the working chambers of said suspension systems for thereby suppressing the vehicular attitude variation.

5,085,459
PRESSURE SUPPLY NETWORK FOR ACTIVE SUSPENSION SYSTEM AND CONTROL THEREFOR
Masaharu Sato; Naoto Fukushima; Yukio Fukunaga; Yohsuke Akatsu; Itaru Fujimura, and Kensuke Fukuyama, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 28, 1990, Ser. No. 500,322
Claims priority, application Japan, Mar. 30, 1989, 1-79745
Int. Cl.⁵ B60G 17/04
U.S. Cl. 280—707 27 Claims

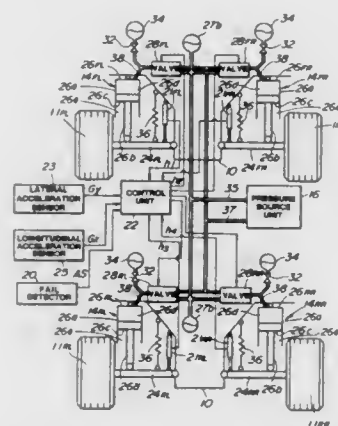


1. A fluid supply system for an active suspension system for supplying fluid pressure for a hollow working cylinder via a pressure control valve for adjusting suspension characteristics in order to suppress vehicular attitude change and absorb road shock vibration, said system comprising:
a pressurized fluid source unit for circulating pressurized fluid through a fluid circuit extending via said pressure control valve and said working cylinder;
a sensor means for monitoring relative displacement between a vehicular body and a suspension member rotat-

ably supporting a road wheel for producing a relative displacement magnitude indicative signal;
first means for deriving a predicted fluid flow amount through said fluid circuit on the basis of a said relative displacement indicative signal to produce a predicted fluid flow amount indicative signal; and
second means for deriving a fluid supply amount from said pressurized fluid source unit on the basis of said predicted fluid flow amount for controlling said pressurized fluid source unit in order to adjust the supply amount of fluid toward the derived fluid supply amount wherein said fluid circuit includes a supply line for supplying the pressurized fluid to said pressure control valve and a drain line for recirculating the pressurized fluid to said pressurized fluid source unit, and said pressurized fluid source unit includes a by-pass line connecting between said supply line and said drain line for by-passing said pressure control valve and a flow control valve means disposed within said by-pass line for adjusting pressurized fluid recirculation rate through said by-pass line for adjusting fluid supply amount to said pressure control valve to said derived amount.

5,085,460
WORKING FLUID CIRCUIT FOR AUTOMOTIVE ACTIVE SUSPENSION SYSTEM WITH ENHANCED TAKE-UP CHARACTERISTICS UPON INITIATION OF OPERATION

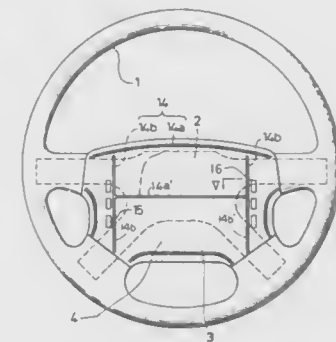
Keoro Takahashi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan
Filed Jul. 10, 1990, Ser. No. 550,749
Claims priority, application Japan, Jul. 11, 1989, 1-178671
Int. Cl.⁵ B60G 11/26
U.S. Cl. 280—707 17 Claims



1. A working fluid circuit system for an active suspension system of an automotive vehicle, comprising:
an active cylinder disposed between a vehicular body and a vehicular wheel and defining therein a working chamber filled with a working fluid contained at a variable pressure therein;
a pressure source unit for pressurizing the working fluid for circulation, said pressure source unit being connected to a power switch for maintaining operation while the power switch is maintained in an ON position;
a fluid circuit connecting said working chamber and said pressure source unit for circulating the working fluid therethrough;
a pressure control valve disposed within said fluid circuit for adjusting a fluid pressure in said working chamber, said pressure control valve being operable between a first position for introducing pressurized fluid for increasing said fluid pressure in said working chamber, a second position for draining pressurized fluid from said working chamber for decreasing said fluid pressure and a third

position for blocking fluid communication between said pressure source unit and said working chamber;
fluid supply control means disposed in said fluid circuit between said pressure source unit and said pressure control valve, said fluid supply control means being operable in a first position for supplying pressurized fluid from said pressure source unit to said pressure control valve and in a second position for blocking fluid supply therethrough, said fluid supply control means being maintained at said second position while said power switch is maintained at an OFF position and responsive to switching of said power switch to said ON position thereof to switch the position of said fluid supply control valve from said second position to said first position with a predetermined delay period; and
flow restriction means arranged in parallel with said fluid supply control means, for restricting fluid flow therethrough during said predetermined delay period.

5,085,461
AIR BAG MOUNT DEVICE FOR STEERING WHEEL INCLUDING CONTROL SWITCHES
Keiichi Shibata, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 23, 1990, Ser. No. 497,854
Claims priority, application Japan, Mar. 24, 1989, 1-72626
Int. Cl.⁵ B60R 21/22
U.S. Cl. 280—731 11 Claims

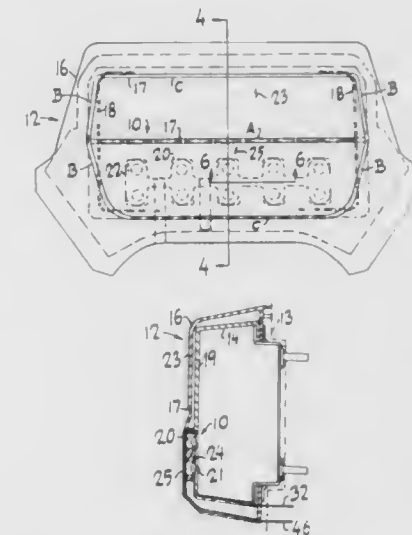


1. An air bag mount device for mounting an air bag unit on a steering wheel device, comprising:
an air bag body, which is to be inflated, in the air bag unit, an air bag cover provided in the air bag unit for covering the air bag body,
a bag storing portion provided in the air bag unit for receiving the air bag body, and
control switch means for controlling accessories mounted on a vehicle, wherein
the air bag cover is formed with a breakable split line along which the air bag cover is split to form an opening through which the air bag body expands when it is inflated, and
the control switch means is arranged in said bag storing portion, each control switch means including an operating portion located on the air bag cover outside of opposite ends of the breakable split line and laterally outwardly of said air bag body prior to inflation of said air bag body.

5,085,462
AIRBAG AND VEHICLE HORN SWITCH ASSEMBLY
Quentin E. Gaultier, 16 Winding Way, North Caldwell, N.J. 07006

Filed Jun. 29, 1990, Ser. No. 546,565
Int. Cl.⁵ B60R 21/16; H01H 9/00
U.S. Cl. 280—731 34 Claims
23. An apparatus for operating a motor vehicle horn, wherein the motor vehicle has a driver side airbag supported within the steering wheel, comprising:
an airbag module including an inner cover supported above

the hub of the steering wheel for receiving the driver side airbag and including a first release portion which opens outwardly when the airbag is deployed to permit the airbag to pass therethrough, and remains coupled to the other portions of the inner cover to prevent any portions thereof from striking a passenger in the vehicle when the airbag is deployed, the airbag module further including an outer cover fitted over the inner cover and including a flexible wall for urging toward the inner cover, the flexible wall including a second release portion which opens outwardly when the airbag is deployed to permit the airbag to pass therethrough and remains coupled to the other portions of the outer cover to prevent any portions

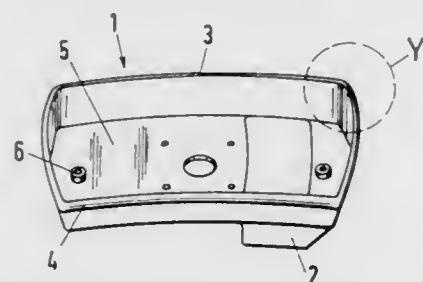


thereof from striking a passenger in the vehicle when the airbag is deployed;
a first contact coupled to the first release portion of the inner cover to prevent the first contact from being forced loose and striking a passenger in the vehicle when the airbag is deployed; and
a second contact coupled to the first release portion of the inner cover to prevent the second contact from being forced loose and striking a passenger in the vehicle when the airbag is deployed, the second contact being spaced apart from the first contact for contacting the first contact upon the flexible wall of outer cover being urged toward the inner cover to actuate the horn switch and, in turn, operate the horn.

5,085,463
GAS BAG APPARATUS FOR PROTECTION AGAINST IMPACT
Martin Kreuzer, Neckarsulm, Fed. Rep. of Germany, assignor to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany
Continuation of Ser. No. 428,149, Oct. 26, 1989, abandoned.
This application Mar. 7, 1991, Ser. No. 668,802
Claims priority, application Fed. Rep. of Germany, Nov. 1, 1988, 3837086
Int. Cl.⁵ B60R 21/26
U.S. Cl. 280—731 4 Claims

1. A carrier for an impact protection gas bag apparatus for integration into a motor vehicle, the carrier comprising: an integral member composed of thermoplastic material reinforced by glass mats, wherein the integral member has a bottom wall for mounting on a steering wheel, side walls extending upwardly from the bottom wall for enclosing a gas generator, a deep-drawn portion in the bottom wall configured to receive a folded gas bag connected to the gas generator and wherein the side walls have an uppermost portion facing away

from the steering wheel when the carrier is mounted and on which a covering is disposed over the member, wherein the



uppermost portion comprises a relatively wide circumferential rim extending from the side walls outwardly of the member and to which the covering is connected during use.

5,085,464

AIR BAG FIRING CIRCUIT

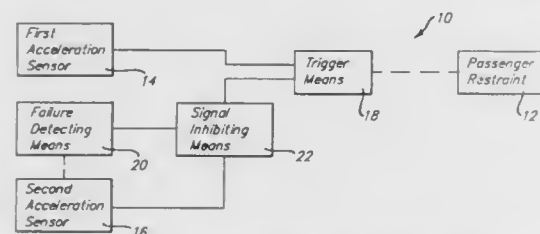
Leonard W. Behr, Pontiac, and Craig W. White, Grosse Pointe, both of Mich., assignors to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Nov. 14, 1990, Ser. No. 612,783

Int. Cl.⁵ B60R 21/32

U.S. Cl. 280—735

3 Claims



1. A control circuit for a vehicle passenger safety restraint comprising:

- first means operative to generate an output signal in response to an acceleration input exceeding a first threshold;
- second means operative to generate said output signal in response to an acceleration input exceeding a second threshold;
- trigger means, in communication with said first and second signal-generating means, for actuating said passenger restraint upon receipt of said output signal;
- failure-detecting means for detecting a malfunction of said second signal-generating means; and
- means responsive to said failure detecting means for inhibiting the communication of said output signal from said second signal-generating means to said trigger means.

5,085,465

AIR BAG STRUCTURE FOR AN AUTOMOTIVE VEHICLE

Isao Hieahim, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 7, 1990, Ser. No. 578,656

Claims priority, application Japan, Sep. 7, 1989, 1-234323

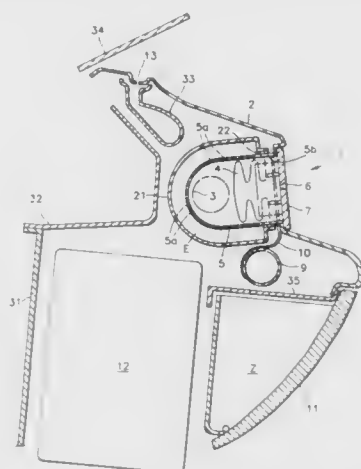
Int. Cl.⁵ B60R 21/30

U.S. Cl. 280—738

10 Claims

1. An air bag structure for an automotive vehicle which is mounted on an instrument panel in front of a passenger seated on a front seat of the vehicle, comprising:
- an inflator for generating gas;
 - an air bag for receiving the gas generated by the inflator;
 - a casing for enclosing the inflator and the air bag, said casing including a plurality of aspiration holes formed therein through which air is introduced into the air bag when the air bag is inflated by ignition of said inflator; and
 - a cover member for surrounding and covering the casing,

said cover member being spaced from the casing so that air is introduced into the air bag, through the aspiration



holes, from an air passage between the cover member and the casing.

5,085,466

AUTOMOBILE STEERING SYSTEM EQUIPPED WITH AN AIR BAG

Hiroshi Nakatsuka; Isao Hirashima; Masatoshi Takayama, and Shigefumi Kohno, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

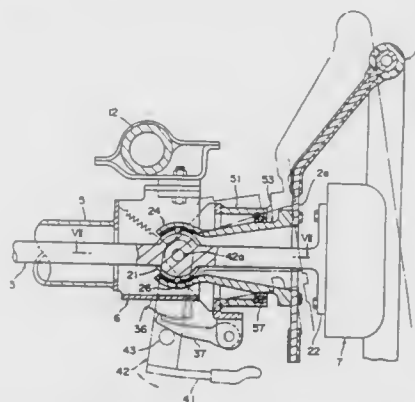
Filed Nov. 15, 1990, Ser. No. 613,992

Claims priority, application Japan, Nov. 22, 1989, 1-303845; Oct. 16, 1990, 2-278508

Int. Cl.⁵ B62D 1/18; B60R 21/16

U.S. Cl. 280—775

5 Claims



1. A steering system for use in an automotive vehicle, said steering system comprising:
- a steering shaft inclined at a fixed and unchangeable angle with respect to a vehicle body;
 - an air bag module securely mounted on one end of said steering shaft; and
 - a steering wheel pivotally mounted to an intermediate portion of said steering shaft such that said steering wheel is tiltable vertically upwardly and downwardly about a horizontal axis relative to said steering shaft.

5,085,467

ENERGY ABSORBING SUPPORT MEMBER FOR A STEERING COLUMN

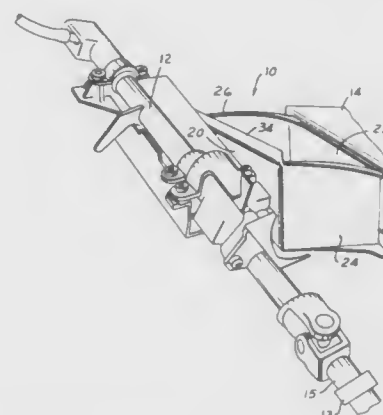
Dale W. Converse, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1990, Ser. No. 629,801

Int. Cl.⁵ B62D 1/19

U.S. Cl. 280—777

11 Claims



1. An energy-absorbing support member for supporting a vehicle steering column in fixed position relative to a vehicle frame member, wherein the steering column is axially collapsible in response to a force exceeding a pre-determined magnitude applied along the axis of the steering column, comprising:
- a side wall member having a first end adapted to be secured to the steering column, a second end adapted to be secured to the vehicle frame member, an upper edge portion and a lower edge portion;
 - at least one of said upper and lower edge portion being tapered and thereby increasing in width from one side end to the other said end;
 - said side wall member being bendable about a plastic hinge axis movable along said at least one tapered edge portion in response to the axial collapse of said steering column, whereby said side wall member will be caused to bend about said plastic hinge axis to progressively absorb impact energy of increasing amount and at a controlled rate;
 - said side wall member including (i) a main body portion adapted to lie in a plane disposed generally normally to the steering column axis and (ii) a flange at said at least one tapered edge portion extending generally normally of said main body portion along a fold generated about a radius, and
 - said flange increasing in width from a portion of substantially no width at said first end to a point of maximum width at said second end to provide the taper to said at least one tapered edge portion, and whereby upon axial collapse of said steering column said at least one tapered edge portion will be caused to roll back toward a position disposed generally within the plane of said main body portion.

5,085,468

VEHICLE STORAGE TANK HEADBOARD

Keith Billotte, 2213 Willow La., Clearfield, Pa. 16858

Filed Jul. 23, 1990, Ser. No. 556,838

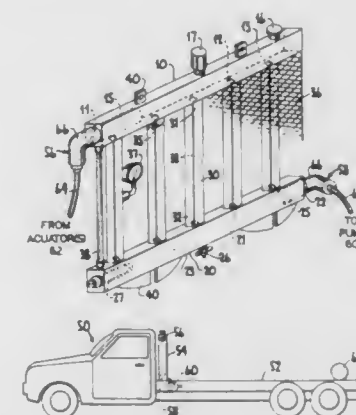
Int. Cl.⁵ B60P 3/00

U.S. Cl. 280—831

19 Claims

1. In combination with a vehicle a protective and hydraulic system, comprising:
- a vehicle having a bed behind a cab;
 - a vehicle headboard including at least one hollow body having a substantially closed inner volume defining a hydraulic oil storage tank for use in a hydraulic system on

the vehicle, and externally defining a protective barrier elongated in mutually perpendicular directions; means for mounting the hollow body substantially forward on the vehicle bed and parallel to a rear of the cab of said vehicle; and,



connection means for connecting the inner volume to a hydraulic pump and actuator, whereby said protective barrier protects said cab from a load on said vehicle bed.

5,085,469

FLEXIBLE COMPOSITE RECORDING MATERIAL FOR FACSIMILE MACHINES

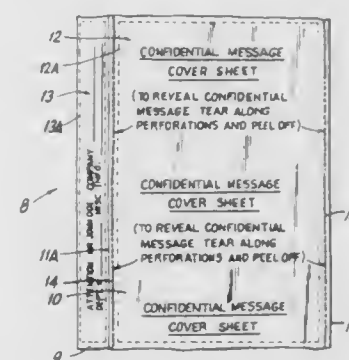
Peter D. Castro, New York, N.Y., assignor to International Integrated Communications, Ltd., New York, N.Y.

Filed Nov. 13, 1990, Ser. No. 612,325

Int. Cl.⁵ B42D 15/00

U.S. Cl. 283—94

26 Claims



1. Flexible composite material upon which a facsimile message having a confidential and non-confidential message portion, can be recorded, said flexible composite material comprising:
- a recording layer upon which one or more facsimile messages can be recorded, said recording layer having a pre-determined width and longitudinal extent; and
 - a cover layer disposed over a longitudinally extending portion of said recording layer so as to define a confidential recording area, each said message recording area extending along the entire longitudinal extent of said recording layer, said cover layer permitting recording of said non-confidential message portion upon said non-confidential message recording area and recording of said confidential message portion upon said confidential message recording area, while concealing said confidential message portion until said cover layer is removed from over said confidential message recording area.

5,085,470

COMBINED POST CARD AND CHECK

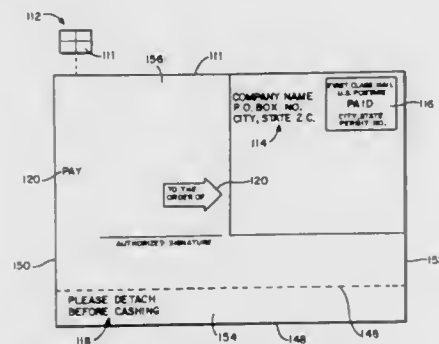
John A. Peach, Monticello; Paul H. Korba, Lakeland, and Kenneth M. Rapp, St. Paul, all of Minn., assignors to Fulfillment Systems Inc., Monticello, Minn.

Division of Ser. No. 328,109, Mar. 23, 1989, Pat. No. 5,053,955. This application Feb. 4, 1991, Ser. No. 649,970

Int. Cl.⁵ B42D 15/00

U.S. Cl. 283—58

13 Claims



1. A postal check including:

a unitary, planar sheet of postal check stock having obverse and reverse surfaces and a means to facilitate severance of the sheet into a removal section and a remainder section, with said removal section having respective removal obverse and removal reverse surface portions of said obverse and reverse surfaces, and with said remainder section having respective remainder obverse and remainder reverse surface portions of said obverse and reverse surfaces;

an image of a check printed on the obverse surface, including selected check information printed with a first machine readable ink and in a first machine readable format, said selected check information located on the remainder obverse surface portion of said obverse surface; and

an image of a mailing address printed on said obverse surface, including selected mailing address information printed with a second machine readable ink and in a second machine readable format, said selected address information located on the removal obverse surface portion of said obverse surface.

5,085,471

DOUBLE CONTAINMENT PIPE JOINT ASSEMBLY

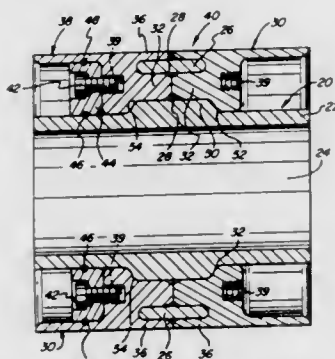
Christopher G. Ziu, Somerville, Mass., assignor to Double Containment Systems, Monroe, Conn.

Filed Apr. 4, 1991, Ser. No. 682,193

Int. Cl.⁵ F16L 39/00

U.S. Cl. 285—133.1

16 Claims



1. A double containment pipe joint assembly comprising: a first pipe fitting having a tubular portion and a bore there-through extending along a longitudinal axis of said tubular

portion and at least one end surface adapted to be joined to a first pipe;

a second fitting having an end face adapted to be secured to a second or containment pipe concentrically mounted about the tubular portion of said first fitting;

one of said first and second fittings having identical portions mounted in mirror-image relation about an axis perpendicular to said longitudinal axis of said tubular portion through the other of said fittings on a ring provided on the other of said first or second fittings,

said one of said first and second fittings being mounted in mirror-image relation by a plurality of tabs provided about the circumference of said one of said first and second fittings received within correspondingly shaped openings in the ring of said other of said first and second fittings.

5,085,472

TUBE COUPLING SLEEVES

Timothy S. Guest, Maidenhead, United Kingdom, assignor to John Guest Engineering Limited, Middlesex, United Kingdom

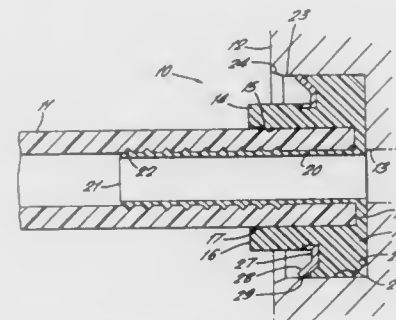
Filed Dec. 15, 1989, Ser. No. 452,226

Claims priority, application European Pat. Off., Dec. 16, 1988, 88311936

Int. Cl.⁵ F16L 41/08

U.S. Cl. 285—158

19 Claims



1. A tube coupling sleeve for coupling a tube to a body member, said sleeve comprising: a throughway with one end thereof adapted to receive an end part of a tube; releasable gripping means in said throughway for receiving and holding the end part of the tube in the throughway; detent means mounted on an outer surface of the sleeve for permitting insertion of the sleeve into a bore in a body member and for resisting extraction of the sleeve from the bore; an encircling annular shoulder on said sleeve outer surface, said shoulder facing towards said one end of said sleeve; said detent means comprising an annular ring mounted in engagement with said annular shoulder, said ring having a plurality of resilient fingers around its outer periphery which project outwardly beyond said annular shoulder and which are angled towards said one end of said sleeve, said annular shoulder supporting said angled resilient fingers, whereby said plurality of resilient fingers can readily flex inwardly to allow the sleeve to be inserted into said bore in said body member but are restrained from outward flexing to resist withdrawal of the sleeve from the bore.

5,085,473

AIR ACTUATED CAR CURTAIN DEVICE

De Q. Yang, Miami, Fla., assignor to Yuhe Yang, N. Miami, Fla.

Filed Oct. 9, 1990, Ser. No. 594,589

Int. Cl.⁵ B60J 3/02

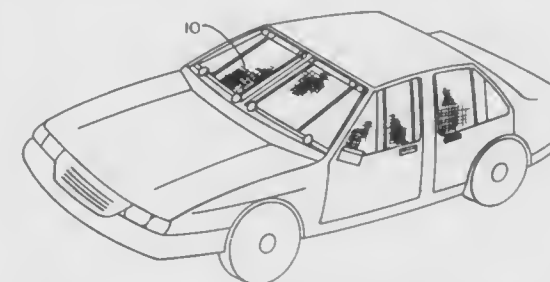
U.S. Cl. 296—141

7 Claims

1. An air actuated curtain device for vehicles having windshield and windows, comprising:

A. a plurality of spring loaded roll-on curtain means for covering said windshield and windows with a flexible curtain sheet member and said curtain means including

mandrel means, each one of said curtain means having at least one distensible air duct means substantially perpendicularly disposed with respect to said mandrel means and said distensible air duct means includes an air inlet assembly;



B. a conduit member connected to said air inlet assembly;

C. air compressor means for supplying compressed air to said distensible air duct means through said conduit means; and

D. means for powering said air compressor means.

5,085,474

REVERSIBLE DOOR LATCH OPENER

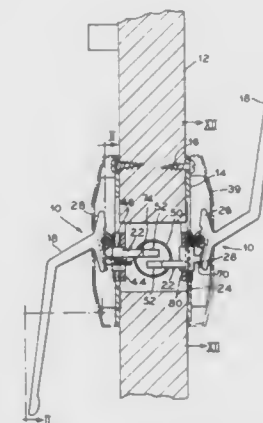
George F. Toledo, Fall Brook, and John E. Betts, Garden Grove, both of Calif., assignors to Thomas Industries Inc., Los Angeles, Calif.

Filed Aug. 14, 1990, Ser. No. 566,776

Int. Cl.⁵ E05C 15/20

U.S. Cl. 292—92

20 Claims



1. A door latch opener comprising:

a base plate having a central opening and a pair of upstanding side walls, said side walls having two pairs of laterally aligned openings therethrough;

a handle reversibly mounted by means of a pivot pin, extending through a selected one of said two pairs of openings in said side walls on said base plate, to pivot about a first axis;

an actuator mounted by means of a pivot pin, carried on a pivot plate member, the pivot plate member being reversibly mounted on said base plate, to pivot about a second axis perpendicular to said first axis;

said handle having projections extending oppositely perpendicular from said first axis generally parallel to said second axis, a first of said projections being engageable with said actuator when said handle is pivotally mounted in a first orientation relative to said base plate and a second of said projections being engageable with said actuator when said handle is pivotally mounted in an opposite orientation relative to said base plate.

5,085,475

EXIT-DELAYING MECHANISM, FOR A PANIC EXIT DEVICE

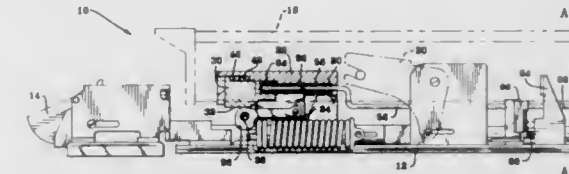
Marlin Austin, Speedway; Michael Cain, Noblesville, and Paul J. Haack, Carmel, all of Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed Jun. 3, 1991, Ser. No. 709,167

Int. Cl.⁵ E05C 3/08

U.S. Cl. 292—92

9 Claims



said first means comprises linkage-movement blocking means movable in said first direction, and a second, opposite direction, and having means, responsive to movement of said blocking means in said second direction, for permitting movement of said linkage.

5,085,476

DRUM RING SEAL

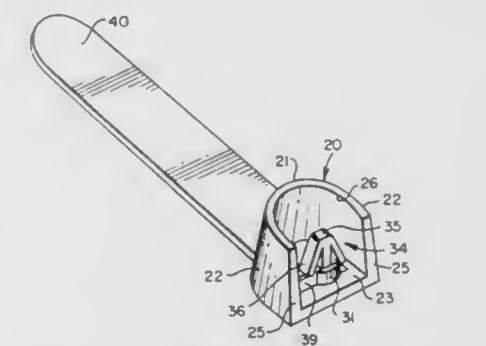
Charles Fuehrer, Scarsdale, N.Y., assignor to Stoffel Seals Corporation, Tuckahoe, N.Y.

Filed Apr. 9, 1991, Ser. No. 682,524

Int. Cl.⁵ E05C 19/18

U.S. Cl. 292—307 R

4 Claims



1. A seal for use with a drum lug ring which projects from a retaining element, said lug ring having an outer periphery and an opening, comprising a housing having top and bottom means, and wall means extending from the top to the bottom means, said wall means including a continuous wall along the sides and a front end of said housing, said wall means leaving open a back end of said housing, said bottom means being open, the housing being of a size to enclose closely the outer periphery of the lug ring when the back end of the housing is closed.

positioned against the element from which the lug ring extends, said top means having a stem extending downwardly therefrom within the housing and of a size to be received in said opening and a flexible tapered head portion extending from said stem and having a lower end adapted to enter said opening, said head portion inclined upwardly and outwardly from said lower end, said tapered head portion terminating in spaced relation below said top means, said tapered head portion being compressible to enter said ring opening and to re-expand to prevent withdrawal of said head portion through said opening when said stem is received in said opening, and strap means extending outwardly from said top means, said stem being connected to said top means by a portion of reduced thickness, whereby said seal may be separated from said ring by pulling said strap means to cause said stem to separate from said top means at the portion of reduced thickness.

5,085,477

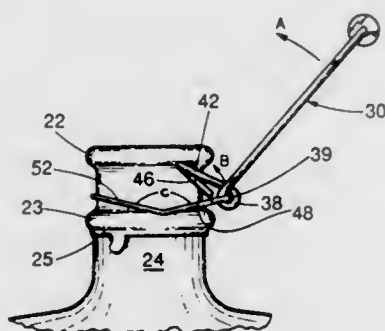
WATER BOTTLE NECK CLAMP

Paul L. Gagnon, P.O. Box 267, Port Hueneme, Calif. 93041

Filed Jul. 5, 1991, Ser. No. 726,252

Int. Cl.⁵ B65D 23/10; B65G 7/12

U.S. Cl. 294—28



1. A clamp for a water bottle neck comprising:
- a lever comprising a handle means with opposing side arms joined at a hinge means with an abutment means, said abutment means comprising an abutment segment extending about perpendicular from said handle means;
 - a neck engagement means comprising a neck section having opposing sides which extend to a respective joint and form an obtuse angle with a respective pivot arm, each of said pivot arms being located beneath said abutment segment to provide an engagement with said abutment segment when said segment is rotated downwardly.

5,085,478

CUSHIONING STEP FOR A SHOVEL AND THE LIKE

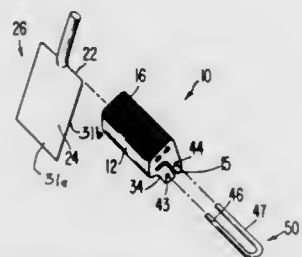
Charles A. Seifert, Bexley, and David R. Bonnes, Westerville, both of Ohio, assignors to The Union Fork & Hoe Company, Columbus, Ohio

Filed Aug. 10, 1990, Ser. No. 565,487

Int. Cl.⁵ A01B 1/00

U.S. Cl. 294—60

12 Claims



1. A step for a foot-engaging portion of a garden tool having an earth-penetrating blade, such as a shovel, comprising:
- an elongated, elastomeric member having a body generally

defined by an upper, foot-engaging surface, a forward surface, a rearward surface, a lower surface, and a pair of opposed end surfaces, said body being generally divided into a forward portion and a rearward portion by a blade-receiving slot therein, said slot having a generally L-shaped configuration; and

a pair of elongated, clip-receiving slots in said body respectively located in the forward and rearward portions of said body for receiving a clip when said step member is positioned, on the blade of the garden tool so that the blade is in said blade-receiving slot.

5,085,479

VERTICALLY MANIPULATED RATCHET FISHING TOOL

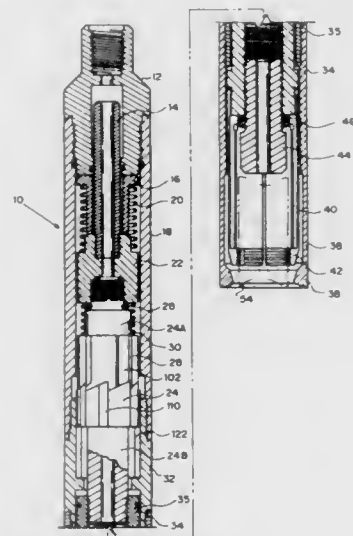
William T. Taylor, Rte. #2, Box 1542, Warren, Tex. 77664

Continuation-in-part of Ser. No. 276,889, Nov. 28, 1988, abandoned, and a continuation-in-part of Ser. No. 256,592, Oct. 13, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 375,667

Int. Cl.⁵ E21B 31/18, 31/20

15 Claims U.S. Cl. 294—86.17

7 Claims



1. A well fishing tool comprising:
- (a) a generally cylindrical tool body connected with and enclosing a ratcheting means, an operating shaft mounted to reciprocate with respect to said body and connected to said ratcheting means, and a well fish grasping means having a first element connected with said tool body and a second element connected with said operating shaft, said grasping means operating to grasp a fish with said operating shaft being in a first axial position with respect to said tool body and to be free of said fish with said operating shaft being in a second axial position with respect to said tool body, said ratcheting means being adapted to be successively moved axially with each successive movement rotating a rotary ratchet member to retain said operating shaft alternately in said first axial position and in said second axial position;
 - (b) wherein said ratchet member comprises: a plurality of ratchet splines comprising a plurality of spline teeth with spline ramps and spline faces defined about an outer radius of said ratchet member; and a plurality of ratchet teeth, each comprising a sliding ramp and a stop face, said ratchet teeth defined in a circular set about an inner radius relative to and coincident with said spline teeth;
 - (c) a cam guide member comprising a plurality of axially aligned cam splines comprising cam spline teeth with cam spline ramps and cam spline faces defined about an outer radius of said cam guide member; and a plurality of cam

- teeth, each comprising a sliding ramp and a stop face, said cam teeth defined in a circular set about an inner radius relative to and coincident with said spline teeth;
- (d) said cam teeth and said ratchet teeth being adapted to successively mesh together as said ratchet member is being advanced around said guide member and said ratchet spline teeth being adapted to be aligned with said cam spline teeth with each alternate advancement of said ratchet teeth with respect to said cam teeth;
- (e) a cam body member forming body teeth with body ramps and body faces and spline grooves disposed alternately between said body teeth and having groove faces corresponding with said body faces;
- (f) said cam splines being respectively fitted into said body spline grooves to a depth causing said cam spline ramps to form an extension of said body ramps and operating to hold said ratchet spline teeth in said first axial position when said ratchet spline teeth are registered with said cam spline teeth and in said second axial position when said ratchet spline teeth are out of registry with said cam spline teeth;
- (g) flexible spring means being adapted to maintain and return said guide cam to said operating first position each time said operating shaft is moved from said first position to a second position;
- (h) said ratchet spline teeth sliding along both said cam spline teeth and said body teeth and alternately along only said body teeth responsive to alternate axial movements between said first position and said second position.

5,085,480

CAM OPERATED WORKPIECE ENGAGING APPARATUS

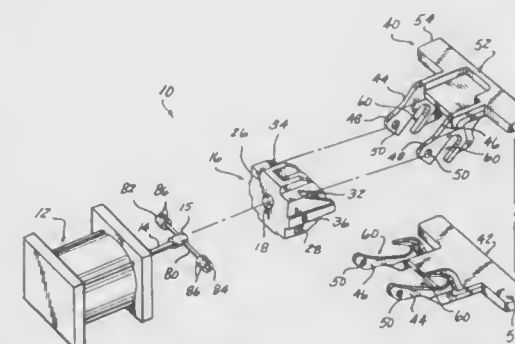
Donald T. Jackson, 1159 Ashley, Troy, Mich. 48098

Continuation of Ser. No. 506,671, Apr. 9, 1990, abandoned. This application Jul. 15, 1991, Ser. No. 730,582

Int. Cl.⁵ B25J 15/00

U.S. Cl. 294—116

9 Claims



1. An apparatus for engaging workpieces comprising:
- linear drive means having a reciprocally extendable and retractable linear drive member;
 - first and second, identical, workpiece engaging means, each having first and second ends, the first and second workpiece engaging means disposed in opposed, inverted positions with respect to each other and pivotally connected at the first ends to the linear drive means;
 - first and second identical cam means formed in the first and second workpiece engaging means, respectively, the first and second cam means being disposed in opposed, inverted relation with respect to each other, each of the first and second cam means having linear and non-linear portions contiguous with and disposed at an obtuse angle relative to each other;
 - cam follower means, mounted on the drive member, and engaging the first and second cam means in the first and second workpiece engaging means, for pivoting the first and second workpiece engaging means between first and

second positions as the linear drive member reciprocates; and

first and second workpiece engaging surfaces, respectively formed on the second ends of each of the first and second workpiece engaging means, for engaging a workpiece when in a second, closed position.

5,085,481

CONSOLE

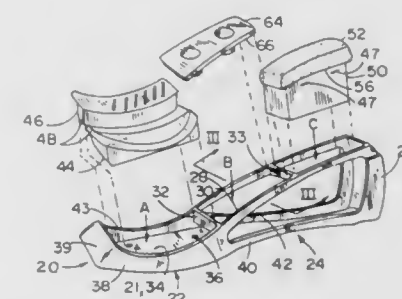
William J. Fluharty, and Thomas E. Arbisi, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Aug. 15, 1990, Ser. No. 567,789

Int. Cl.⁵ B60R 7/00

U.S. Cl. 296—37.8

19 Claims



9. A system for holding multiple components in a vehicle comprising:
- a front member having an upwardly facing opening; a rear member spaced a distance rearward of said front member and in substantial alignment therewith;
 - a plurality of curvilinear rails of narrow, vertical and horizontal dimension integrally extending from said front member to said rear member and forming an open framework having upwardly facing window means and an open space below said window means for receiving and holding components securely in an installed position on said rails;
 - a plurality of separate, different, insertable components having differently shaped configurations which mateably set within said window means defined by said rails and are held in place by said rails;
 - at least one of said components extending downwardly into said open space;
 - means for securing said components to said rails within said window means; and
 - means for securing said rails to a vehicle.

5,085,482

SEAT BACK MOUNT

Philip M. Moehlman, Farmington Hills, and Syed A. Shahab, Bloomfield Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 13, 1990, Ser. No. 582,466

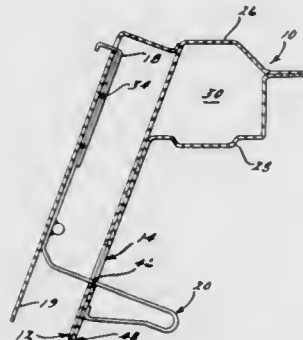
Int. Cl.⁵ B60N 2/00

U.S. Cl. 296—63

5 Claims

1. A mounting assembly for the rear seat back of a vehicle, the seat having a rearwardly facing substantially rigid frame portion and the vehicle having a body panel defining a substantially vertical plane for receiving a seat frame portion in confronting relationship, the mounting assembly comprising:
- means defining a plurality of vertically elongated apertures in said body panel; and
 - a plurality of clip members fixedly secured to said seat frame

and engageable in snap-fit relationship with said body panel through said apertures in response to movement of



said seat back in a substantially horizontal direction toward said body panel.

5,085,483

CONVERTIBLE TOP LATCHING MECHANISM

Michael Alexander, Grosse Ile, Mich., assignor to ASC Incorporated, Southgate, Mich.

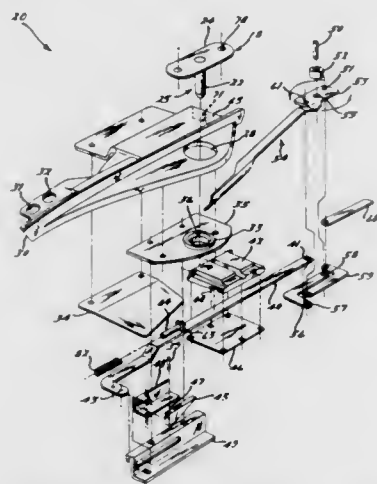
Continuation of Ser. No. 438,744, Nov. 18, 1989, abandoned.

This application Apr. 1, 1991, Ser. No. 678,756

Int. Cl.⁵ E05C 9/16; B60J 7/10

U.S. Cl. 296—121

12 Claims



1. In a convertible-type vehicle having a foldable convertible top with a header bow disposed in the convertible top, the vehicle also having a windshield with a windshield header attached thereto, an apparatus for latching the header bow to the windshield header, the improvement comprising:

(a) a latch pin fixedly attached to the header bow and depending therefrom, the latch pin having a cutaway section and a lip extending outwardly therefrom below the cutaway section; and

(b) a keeper assembly mounted to the windshield header which retentively and disengageably receives the latch pin, the keeper assembly comprising:

(1) a receiving plate having a hole therethrough which receives the latch pin;

(2) a transfer arm supported for slidable movement with respect to the receiving plate;

(3) a retaining member operatively connected to the transfer arm and which passes below the receiving plate, the retaining member dimensioned to fit in the cutaway section of the latch pin to disengageably retain the latch pin in engagement therewith, the retaining member also moving linearly parallel to an axis defined by the transfer arm when engaging and disengaging the latch pin;

(4) a pivot pin fixedly attached to the windshield header; and

(5) a handle pivotally mounted on the pivot pin and which is operatively connected to the transfer arm for slidably moving the transfer arm outwardly in the windshield header substantially along an axis defined by the transfer arm when the handle is pivotally rotated about the pivot pin to disengage the retaining member from the latch pin.

5,085,484

VEHICLE UNDERFRAME STRUCTURE FOR REDUCING TORSIONAL DEFORMATION THEREOF

Takeo Mori, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

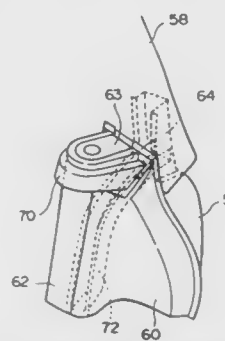
Filed Feb. 20, 1990, Ser. No. 481,228

Claims priority, application Japan, Feb. 20, 1989, 1-18541[U]

Int. Cl.⁵ B62D 21/02

U.S. Cl. 296—204

13 Claims



1. In a framing structure of a vehicle, an improvement comprising:

elongated side sills disposed on each side in a lower portion of said vehicle, parallel to a longitudinal axis of said vehicle;

rear spring supports disposed behind each said side sill; side members connected to each said side sill and extending towards a rear end of the vehicle;

connection members for reinforcing each said side member by interconnecting rear ends of each said side sill to each said spring support respectively, said members being substantially straight, and lying in a substantially straight line, said side members, said side sills, and said spring supports being interconnected so as to be parallel to the longitudinal axis of the vehicle, when viewed in a plan view;

first reinforcers disposed in parallel to a transverse axis of the vehicle on an outside of each said spring support; and second reinforcers disposed vertically and connected to each said first reinforcer,

each of said first and second reinforcers supporting said spring supports, respectively, thereby improving the rigidity thereof, and therefore the rigidity in the connection between the main body and the rear body, and the bending and torsional rigidity of the framing structure.

5,085,485

SIDE MEMBER OF A VEHICLE BODY STRUCTURE

Willi Wurl, Niefern-Oeschelbronn, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 668,147

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009401

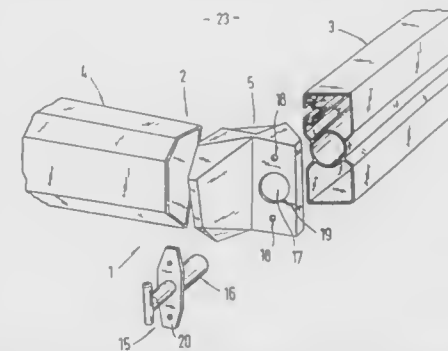
Int. Cl.⁵ B62D 21/00

U.S. Cl. 296—204

18 Claims

1. A member of a vehicle body structure, said member being formed by an extruded section made of a light metal, comprising:

a central tube portion, including means for receiving a portion of an impact absorbing damper of a bumper arrangement;



at least two outer hollow-section portions arranged on substantially opposite sides of the tube portion; and diagonally extending webs connected between the hollow-section portions and the tube portion.

5,085,486

TABLE AND ROCKING APPARATUS

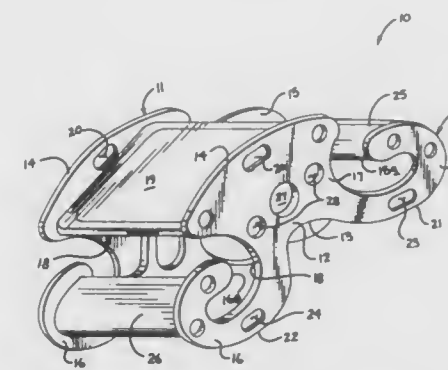
Todd L. Johnson, 9670 12th Ave. S., Bloomington, Minn. 55425

Filed May 2, 1991, Ser. No. 694,780

Int. Cl.⁵ A47C 13/00

U.S. Cl. 297—3

3 Claims



1. A table and rocking apparatus comprising, in combination,

a plurality of spaced parallel side walls, each of a mirror image and coextensive configuration relative to one another, with each side wall including a top arcuate convex edge and a central plate orthogonally and fixedly mounted between the side walls adjacent the top arcuate convex edge, and

a first hand grip opening directed through each side wall between each top arcuate convex edge and a top surface of the central plate, and

each side wall further including a rear "C" shaped leg extending laterally and rearwardly of the central plate and a forward "C" shaped leg extending laterally and forwardly of the central plate, wherein the rear and forward "C" shaped leg of each side wall includes a respective rear and forward "C" shaped arcuate bottom surface to accommodate support of the apparatus in a first position, wherein the top arcuate convex edge of each side wall supports the apparatus in an inverted second position, and

wherein each central plate includes a rear "C" shaped central plate side edge and a forward "C" shaped central plate side edge spaced on opposed sides of each central plate, wherein the rear "C" shaped leg of each side wall includes a rear "C" shaped leg end surface projecting medially and adjacent the rear "C" shaped central plate side edge, and each forward "C" shaped leg includes a forward "C" shaped leg end surface projecting medially and adjacent

the forward "C" shaped central plate side edge, and a rear seat plate orthogonally and fixedly mounted between each rear "C" shaped leg adjacent the rear "C" shaped leg end surface of each rear "C" shaped leg, and a forward seat plate orthogonally and fixedly mounted between each forward "C" shaped leg adjacent each forward "C" shaped leg end surface of each forward "C" shaped leg, and each rear "C" shaped leg includes a second handle opening opening directed therethrough adjacent the rear "C" shaped leg arcuate bottom surface of each rear "C" shaped leg, and each forward "C" shaped leg includes a third handle opening directed therethrough adjacent each forward "C" shaped leg arcuate bottom surface, and

including a seat flange fixedly and orthogonally mounted to a bottom surface of the central plate oriented medially and parallel to the side walls and further oriented orthogonally relative to the rear and forward seat plates and positioned medially of the rear and forward seat plates, wherein the seat flange includes a concave flange top surface to accommodate an individual seated thereon.

5,085,487

SEAT WITH FOAMED PLASTIC PADDING AND PROCESS FOR ITS MANUFACTURE

Rudolf Weingartner, Neuhofen a.d. Krems; Johann Moseneder, Grieskirchen, and Bernhard Eder, Linz/Donau, all of Austria, assignors to Schaumstoffwerk Greiner Gesellschaft mbH, Kremsmunster, Austria

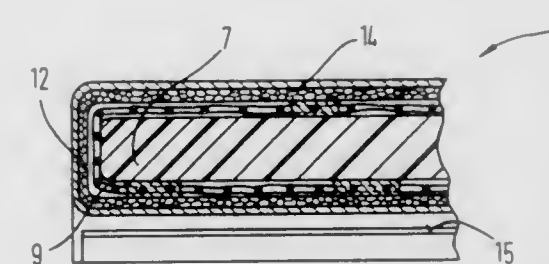
Division of Ser. No. 458,733, Dec. 13, 1989. This application Jan. 18, 1991, Ser. No. 643,854

Claims priority, application Austria, Jun. 2, 1987, 1396/87; Dec. 9, 1987, 3224/87; Apr. 20, 1988, 1005/88; PCT Int'l Appl., Jun. 3, 1988, PCT/AT88/00041

Int. Cl.⁵ A42C 27/14

U.S. Cl. 257—452

55 Claims



1. A seat, in particular, for vehicles with a padding of foamed plastics comprising:

a supporting body made from an open-cell elastic plastic foam with a first specific gravity;

a flame-resistant upholstery material;

said supporting body connected to said upholstering material with a flame-retardant layer made of an open-cell elastic foamed plastic with a second specific gravity different from the first;

a non-flammable intermediate layer between said supporting body and said flame-retardant layer, which may be formed by an upholstery material; and

said intermediate layer is formed from a lattice or mesh of high temperature resistant fibers or threads.

5,085,488

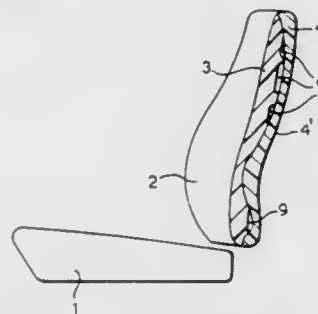
SEAT BACKREST WITH A LAYERED STRUCTURE
Antonio Dal Monte, Rome, Italy, assignor to Fiat Auto SpA, Turin, Italy

Continuation of Ser. No. 548,540, Jun. 5, 1990, abandoned. This application Aug. 7, 1991, Ser. No. 742,530

Claims priority, application Italy, Jun. 5, 1989, 67552 A/89
Int. Cl.⁵ A47C 7/02

U.S. Cl. 297—460

2 Claims



1. A backrest for a seat comprising a rigid base member having a curved profile defining upper and lower transverse concave recesses in a front surface thereof and first and second layers of foam material with said first layer having a rigidity greater than said second layer;

said first layer having front and rear surfaces with curved profiles substantially the same as the curved profile of said base member, said rear surface of said first layer being disposed in engagement with said front surface of said base member, said second layer having a substantially straight front surface and a rear surface with a curved profile substantially the same as the curved profile of said front surface of said first layer and disposed in engagement therewith, and said rear surface of said second layer having a plurality of transversely extending, open-ended cavities therein only in areas adjacent said transverse concave recesses, there being no cavities in other areas of said second layer which are not adjacent said recesses.

5,085,489

ANTI-LOCK BRAKE CONTROL SYSTEM

Reiner Emig, Tamm, and Werner Politz, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/00091, § 371 Date Aug. 28, 1990, § 102(e) Date Aug. 28, 1990, PCT Pub. No. WO89/08571, PCT Pub. Date Sep. 21, 1989

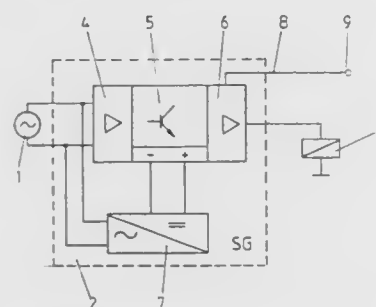
PCT Filed Feb. 2, 1989, Ser. No. 573,027

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808724

Int. Cl.⁵ B60T 8/38

U.S. Cl. 303—91

1 Claim



1. Anti-lock brake control system for a trailer having wheels which rotate at respective speeds and having a brake light line

to which power is supplied during the braking of the wheels, said system comprising

sensors for sensing the speeds of the wheels and generating wheel speed signals therefrom,

an electronic control unit which generates brake pressure control signals from said wheel speed signals, said electronic control unit deriving power exclusively from the signals generated by the sensors,

a power amplifier for amplifying the brake pressure control signals generated by the electronic control unit, the power for said amplifier being supplied via said brake light line, and

a brake pressure control unit containing solenoid valves to which the amplified brake pressure control signals are supplied.

5,085,490

ELECTRIC-MOTOR-DRIVABLE PRESSURE GENERATOR FOR A HYDRAULIC BRAKE SYSTEM FOR A VEHICLE

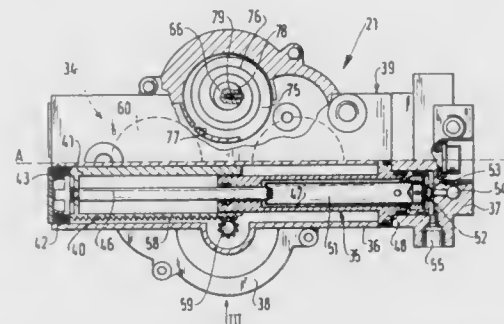
Walter Steinhauser, Schwieberdingen; Guenter Kaes, Stuttgart; Wolfgang Maisch, Schwieberdingen, all of Fed. Rep. of Germany, and Alwin Stegmaier, North Charleston, S.C., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 23, 1990, Ser. No. 555,698

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928109

Int. Cl.⁵ B60T 8/34

U.S. Cl. 303—113 TR

3 Claims



1. An electromotor-drivable pressure generator (35) for a hydraulic vehicle brake system (10),

which has

a plunger piston (46),

a rack with teeth (58) connected at least indirectly to the plunger piston,

between an electric drive motor (60) and the rack, wherein a pinion (59) on a pinion drive shaft of the toothed gear drive driven by the drive motor meshes with the rack,

a spiral spring (76), one end of said spiral spring engaging said pinion drive shaft and on the other end at least indirectly engaging a housing part (36) of the pressure generator, said spiral spring being operative to restore said plunger piston to its outset position toward a stop sleeve (43) counter to an action of the drive motor,

and a free-wheeling clutch system (68) between a shaft portion (65) of the pinion drive shaft and a gear wheel (67) mounted on the shaft portion, wherein upon arrival of the plunger piston on the stop sleeve, the free-wheeling clutch system disconnects the drive train between the drive motor and said pinion drive shaft.

5,085,491

MOUNTING PLATE ASSEMBLY FOR CABINET HINGES
Karl Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

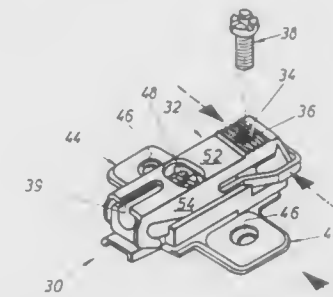
PCT No. PCT/EP88/01044, § 371 Date Jun. 29, 1990, § 102(e) Date Jun. 29, 1990, PCT Pub. No. WO89/05387, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 17, 1988, Ser. No. 392,955

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741686; Feb. 9, 1988, 3803830; Jun. 1, 1988, 3818649
Int. Cl.⁵ A41F 11/00

U.S. Cl. 312—329

28 Claims



1. A mounting plate assembly for an adjustable mounting of a wall-related part of a cabinet hinge having a carcass-related part, the assembly being composed of two separable mounting plates, a bottom mounting plate nearer the wall is fastenable permanently to the wall, and an upper mounting plate more remote from the wall for adjustably holding the carcass-related part of the hinge, a resilient catch mechanism for fastening the upper mounting plate to the bottom mounting plate, the bottom mounting plate having a front end area facing a door, said front end area of said bottom mounting plate having at least one hook projection, said upper mounting plate having a bottom on which is located a hook receptacle with which said hook projection is associated, said hook projection and said hook receptacle having associated engagement surfaces complementary to each other and at least sectionally approximately acute, and said resilient catch mechanism being provided with a handle for releasing snap-fastening between the mounting plates, comprising

said upper mounting plate including an end portion pointing toward an interior of a cabinet wherein at least said end portion pointing toward the interior of the cabinet partially covers said bottom mounting plate, said end portion including two bows which are resiliently flexible and parallel to a surface of the wall, each of said bows having a catch section, said bottom mounting plate having catch recesses associated with and matingly locked with each said catch section, said catch sections and said catch recesses being disengageable by pinching said bows together parallel to said surface of said wall; each bow having a handle accessible for applying pressure directed against one another parallel to the surface of said wall when said two mounting plates are in a snapped-together position.

5,085,492

OPTICAL FIBER WITH ELECTRICAL ENCODING

Wayne E. Kelsoe, Saratoga, and David M. Buzawa, San Jose, both of Calif., assignors to Iris Medical Instruments, Inc., Mountain View, Calif.

Filed Oct. 1, 1990, Ser. No. 590,899

Int. Cl.⁵ G02B 6/32

U.S. Cl. 385—60

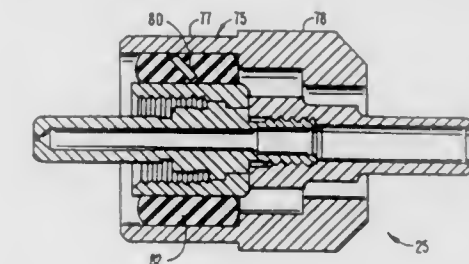
24 Claims

1. A fiber optic connector for use with a complementary connector, comprising:

means for holding the end of an optical fiber;

an engagement member, connected to the holding means, configured for positive mechanical and electrical engagement with an engagement portion of the complementary

connector so as to maintain the holding means registered to the complementary connector;
a contact element mechanically supported by the engagement member and configured for electrical engagement



5,085,494

FIBER OPTIC SPLICE MEANS AND METHOD

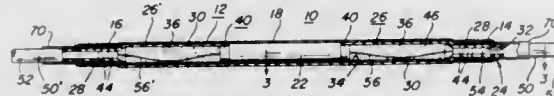
Laurence N. Wesson, Blue Bell, and Nellie L. Cabato, Plymouth Meeting, both of Pa., assignors to Aurora Optics, Inc., Blue Bell, Pa.

Filed Oct. 29, 1990, Ser. No. 605,534

Int. Cl.⁵ G02B 6/26

U.S. Cl. 385—98

25 Claims



1. A fiber optic splice means for splicing a fiber optic cable having an optic fiber with a protective buffer casing comprising a pair of fiber retaining elements each having first and second portions, the first portion of each element having an end with an opening for receiving an end of an optic fiber with its protective buffer casing of a cable which is to be spliced while the second portion of each element has an end with an opening for having the optic fiber without its buffer casing extend externally therethrough, each retaining element has a cavity which extends between the openings of its first and second portions and provides a fiber deflection chamber there-within for receiving and protecting therein the optic fiber without its buffer casing, the first portions of the retaining elements are deformable by crimping for securing and retaining therewith the optic fiber and its buffer casing received therewithin; and an elongated tubular unit having first and second end sections and a central section, each end section having an opening for receiving therein a respective one of the pair of retaining elements with its second portion positioned inwardly and each end section of the tubular unit being deformable by crimping for securing each of the first portions of its retaining element with the tubular unit, and the tubular unit has an optical fiber alignment means within its central section for receiving therinto the optic fibers which extend externally from the second portions of the retaining elements for aligning and optically joining together their ends; each of the second portions of the retaining elements has a guide means enclosing the opening of its end, and each guide means has an opening for guiding therethrough and aligning the end of the optic fiber for extending externally thereof and being received into the alignment means of the tubular unit.

5,085,495

MULTI-SCREEN PROJECTOR

Yoshiaki Iwahara; Masanori Ogino; Masutomi Ohta, all of Yokohama; Sboji Kuroda, Odawara; Yuzo Tamura, and Yukihiko Kobayashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 661,112

Claims priority, application Japan, Feb. 28, 1990, 2-45381; Dec. 26, 1990, 2-417591

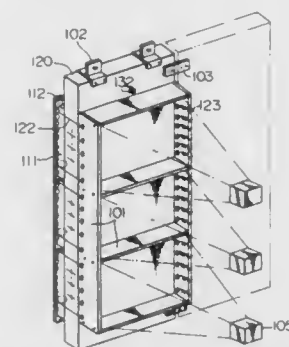
Int. Cl.⁵ G03B 21/60

U.S. Cl. 359—455

25 Claims

1. A multi-screen projector comprising:
n x m unit projectors arranged horizontally in m columns and vertically in n rows like a matrix, where n and m are positive integers either of which is two or more;
transmissive screen means comprising at least three-layer sheet means connected together in m columns, each column of said three-layer sheet means comprising (i) at least n rows of unit Fresnel sheets, (ii) a front sheet comprising a single front sheet element or n front sheet elements covering the n row, said front sheet having lenticular stripes for diffusing light horizontally, and (iii) a transparent reinforcing sheet on which each row of unit Fresnel

sheets and said front sheet are placed in a laminated manner;
light shielding means mounted on a light incident side of said reinforcing sheet; and



wires and springs connecting said light shielding means to at least right and left edges of said front sheet to produce tension so as to urge said front sheet toward said reinforcing sheet.

5,085,496

OPTICAL ELEMENT AND OPTICAL PICKUP DEVICE COMPRISING IT

Yoshio Yoshida; Takahiro Miyake; Yasuo Nakata; Yukio Kurata; Nobuo Ogata, all of Tenri; Tetsuo Ueyama, Nara, and Hideaki Sato, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

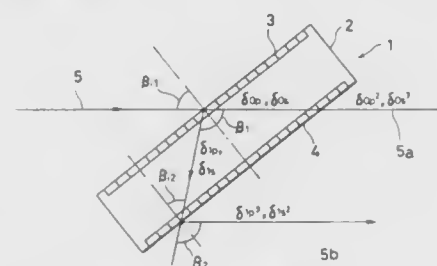
Filed Mar. 28, 1990, Ser. No. 500,292

Claims priority, application Japan, Mar. 31, 1989, 1-81707; Jun. 9, 1989, 1-148100; Sep. 8, 1989, 1-234204; Nov. 8, 1989, 1-290710; Nov. 15, 1989, 1-298105

Int. Cl.⁵ G02B 5/18, 5/30

U.S. Cl. 359—569

30 Claims



1. An optical element comprising:
a flat, transparent base having a plurality of faces; and
a diffraction grating, formed on one of said plurality of faces, having grating lines arranged at a grating pitch approximately equal to the wavelength of a light incident to said diffraction grating, said incident light being of a predetermined wavelength,
said base being a substrate made of a material having an optical anisotropy property,
a thickness of said substrate being predetermined such that a phase difference between phases of a P polarization and an S polarization contained in said light incident to said diffracting grating, and a phase difference between the phases of said P polarization and said S polarization occurring upon said light propagating through said substrate, cancel out.

5,085,497

METHOD FOR FABRICATING MIRROR ARRAY FOR OPTICAL PROJECTION SYSTEM

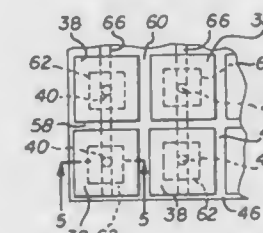
Gregory Um, Torrance, and Andrei Szilagyi, Los Angeles, both of Calif., assignors to Aura Systems, Inc., El Segundo, Calif.

Filed Mar. 16, 1990, Ser. No. 494,579

Int. Cl.⁵ G02B 27/00

U.S. Cl. 359—848

75 Claims



1. A method for fabricating an array of mirrors for an optical projection system, said method comprising the steps of:
forming an array of holes between a top surface and a bottom surface in an electrically insulative substrate;
filling said holes with an electrically conductive material;
mounting a plurality of piezoelectric pedestals on said top surface of said substrate wherein each of said pedestals is disposed over a respective one of said holes so that a first face of each of said pedestals is electrically connected to said conductive material in said respective one of said holes;
mounting a plurality of mirrors on said pedestals wherein each of said mirrors is disposed on at least one of said pedestals; and
electrically connecting a second face of each of said pedestals to a common circuit node.

5,085,498

OPTICALLY SWITCHING FERROELECTRIC LIQUID CRYSTAL LIGHT VALVE

Shuhei Yamamoto, and Naoki Kato, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

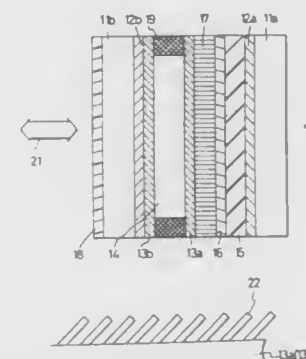
Filed Mar. 23, 1989, Ser. No. 328,118

Claims priority, application Japan, Mar. 23, 1988, 63-68967; Mar. 23, 1988, 63-68970; Sep. 28, 1988, 63-242999

Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—70

7 Claims



1. A liquid crystal device of multi-layer structure with front and rear faces, having two optically different stable states and switchable therebetween by a bias voltage, the device comprising:

- a liquid crystal layer composed of ferroelectric liquid crystal composition;
- a pair of front and rear alignment layers sandwiching there-between the liquid crystal layer to establish the two optically different stable states in the liquid crystal layer, each alignment layer comprising an obliquely evaporated sili-

con monoxide film evaporated at an evaporation angle between 75 to 85 degrees and having a tilted micro column structure effective to establish the bistable state in the liquid crystal layer;
a front electrode layer adjacent to the front alignment layer; an optically reflecting layer adjacent to the rear alignment layer;
a photoconductive layer comprising a hydrogenated amorphous silicon film disposed on the optically reflecting layer and responsive to the incident light incident from the rear face to increase its electroconductivity;
a rear electrode layer disposed on the photoconductive layer and cooperative with the front electrode layer to apply the bias voltage between the multi-layer structure including the liquid crystal layer and the photoconductive layer such that an effective bias voltage is applied across the liquid crystal layer through the increased electroconductivity portion of the photoconductive layer to thereby effect the switching between the two stable states; and
a pair of front and rear transparent substrates for sandwiching therebetween the multi-layer structure.

5,085,499

FIBER OPTICS SPECTROCHEMICAL EMISSION SENSORS

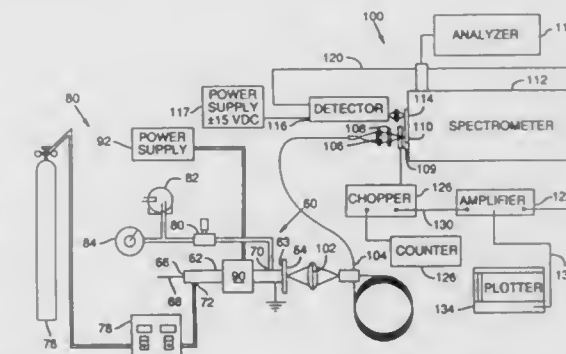
Jeffrey W. Griffin, Kennewick, and Khris B. Olsen, West Richland, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Sep. 2, 1988, Ser. No. 239,778

Int. Cl.⁵ G01N 21/67, 21/68, 21/69

U.S. Cl. 356—311

11 Claims



3. A method of analyzing an ambient fluid analyte for the presence of selected chemical species comprising:
providing an elongate capillary tube defining a tube axis and having first and second ends and including an analyte port coupled to the first end to receive the fluid analyte, a gas inlet port adjacent the first end, coupled to a source of working gas suitable for maintaining a plasma, and a gas outlet port adjacent the second end;
applying a vacuum to the gas outlet port to draw the working gas and the ambient fluid analyte through the tube toward the gas outlet port; and
applying RF electrical excitation to the tube intermediate the gas inlet and outlet ports to maintain a plasma in the tube for exciting components of the analyte.

5,085,500

NON-IMAGING LASER PARTICLE COUNTER

James L. Blesener, White Bear Lake, Minn., assignor to TSI Incorporated, St. Paul, Minn.

Filed Nov. 28, 1989, Ser. No. 442,546

Int. Cl.⁵ G01N 21/00, 15/06

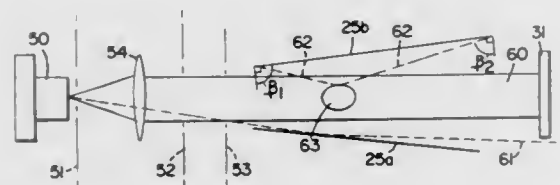
U.S. Cl. 356—338

20 Claims

1. A continuous flow particle counter apparatus, of the type wherein a sample fluid is passed through a beam of light, wherein the intersection of the sample fluid flow and the beam

of light define a sensing volume, and wherein particles suspended in the sample fluid scatter light, the particle counter comprising:

- (a) a light source means for generating the beam of light;
- (b) sensor means for directly collecting the scattered light and for generating signals responsive to the scattered light



and wherein said sensor means are arranged and configured to reflect stray light from the vicinity of said light source means and absorb the scattered light from particles intersecting the sensing volume, said sensor means being oriented at an oblique angle with respect to the beam of light, whereby reimaging optics are not required.

5,085,501

FIBER OPTIC GYROSCOPE USING OPTICAL WAVEGUIDE COUPLERS

Kazubiro Sakuma, Fuchu; Aritaka Ohno, Hachioji; Eiichi Asami, Hanno, and Ryoji Kaku, Tachikawa, all of Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

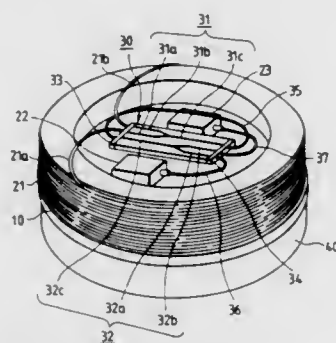
Filed Feb. 9, 1990, Ser. No. 477,559

Claims priority, application Japan, Feb. 15, 1989, 1-37275

Int. Cl.⁵ G01C 19/64; G02B 6/12

U.S. Cl. 356—350

15 Claims



1. A fiber optic gyroscope comprising: an optical fiber coil forming a ring interferometer; a light source; a photodetector; and an optical integrated circuit substrate means disposed inside said optical fiber coil and connected to said light source, to said photodetector and to both ends of said optical fiber coil; said optical integrated circuit substrate means having formed thereon a first optical waveguide coupler including first and second branches connected at one ends thereof to said light source and said photodetector via first and second connecting optical fibers, respectively, and each extending from an edge of said optical integrated circuit substrate means substantially in parallel in a first direction but gradually approaching each other and coupled together at their other ends to a first trunk extending from the juncture of said first and second branches in said first direction to a free end of said first trunk which is disposed adjacent another edge of said optical integrated circuit substrate means, and a second optical waveguide coupler including third and fourth branches connected at one ends thereof to

the one and the other end of said optical fiber coil, respectively, and each extending from an edge of said optical integrated circuit substrate means substantially in parallel in a second direction but gradually approaching each other and coupled together at their other ends to a second trunk extending from the juncture of said third and fourth branches in said second direction to a free end of said second trunk which is disposed adjacent another edge of said optical circuit substrate means, said first and second trunks having their free ends interconnected to one another via a third connecting optical fiber.

5,085,502

METHOD AND APPARATUS FOR DIGITAL MOIRE PROFILOMETRY CALIBRATED FOR ACCURATE CONVERSION OF PHASE INFORMATION INTO DISTANCE MEASUREMENTS IN A PLURALITY OF DIRECTIONS

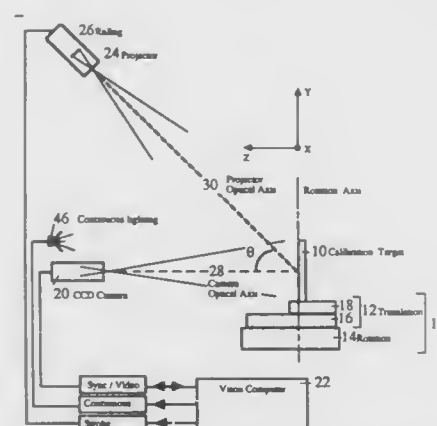
Kenneth H. Womack, Rochester; Brian J. Kwarta, Pittsford; David H. Outtersen, Victor, and James R. Reda, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1987, Ser. No. 45,110

Int. Cl.⁵ G01B 11/24

U.S. Cl. 356—376

35 Claims



1. A method for measuring the profile of an object by digital moire interferometry which comprises the following steps: calibrating a volume in space in which volume the object is disposed during measurement to provide reference phase information identifying the locations in distance from an origin of a coordinate system of a multiplicity of sets of positions in said volume, each of said sets being in a different one of a multiplicity of parallel planes spaced a known distance from each other in said volume; obtaining phase information from the profile of said object in said volume at said plurality of positions; identifying from the phase information obtained from said profile, the ones of said planes on opposite sides of said profile; and determining from the differences between said phase information from said profile and said sets of phase information for said planes on said opposite sides of said profile absolute distance measurements of the dimensions of said profile, at least through a cross-section thereof.

5,085,503

SPATIAL LIGHT MODULATING ELEMENT USING UNIAXIAL SINGLE CRYSTAL OF OXIDE AS INSULATING LAYER

Yukihisa Osugi; Hiroaki Abe, and Yoshinari Kozuka, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

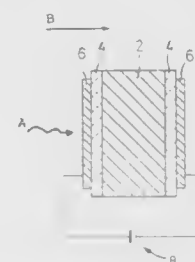
Filed Sep. 19, 1990, Ser. No. 584,612

Claims priority, application Japan, Sep. 19, 1989, 1-243207

Int. Cl.⁵ G02F 1/03; G02B 5/30, 1/19

U.S. Cl. 359—246

8 Claims



1. A spatial light modulating element including an electrooptic and photoconductive single crystal plate having an electrooptic effect and photoconductivity, a light-transmitting insulating layer provided on at least one of opposite surfaces of said electrooptic and photoconductive single crystal plate, and a pair of transparent electrodes provided for applying an electric field to said insulating layer and said single crystal plate, wherein the improvement comprises:

said insulating layer being formed from a Z-axis cut uniaxial single oxide crystal which is crystallographically oriented such that a Z-axis of said uniaxial single oxide crystal is parallel to a direction which light travels through said crystal, whereby said insulating layer exhibits neither birefringence, nor an electrooptic effect in a direction of said electric field.

5,085,504

CONTROL SYSTEM FOR ADJUSTING THE REAR VIEW MIRROR OF A VEHICLE IN RESPONSE TO THE POSITION OF THE STEERING GEAR

Kaj B. Jensen, Skovbrynet 24, 2. tv, DK-4700 Naestved, Denmark, assignor to Kaj-Berg Jensen; Benita Berg Jensen; Bent Pedersen and Inge Pedersen, all of Naestved, Denmark

PCT No. PCT/DK87/00116, § 371 Date Jan. 30, 1990, § 102(e) Date Jan. 30, 1990, PCT Pub. No. WO89/00935, PCT Pub. Date Feb. 9, 1989

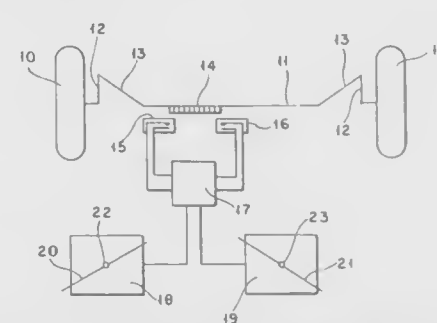
PCT Filed Oct. 1, 1987, Ser. No. 460,880

Claims priority, application Denmark, Aug. 3, 1987, PCT/DK87/00097

Int. Cl.⁵ G02B 7/18

U.S. Cl. 359—843

3 Claims



1. A control system for adjusting the angular position of two rear view mirrors one each on opposite sides of a vehicle in respective response to the turning of the vehicle towards either of its sides by a vehicle steering mechanism, the system including a magnet and first and second reed contacts, said magnet

being disposed between said first and second contacts, and said magnet and said contacts being positioned with respect to a moveable part of the steering mechanism so that said magnet moves with respect to said contacts upon steering movements, the first reed contact being adapted to cause the first of the rear view mirrors to rotate through a predetermined angle only after movement of the moveable part in a first direction past a first predetermined point during turning of the vehicle, said second reed contact being adapted to cause the second of the rear view mirrors to rotate through a predetermined angle only after movement of said movable part in a second direction opposite to that of said first direction past a second predetermined point, said first contact being further adapted to maintain said first mirror in its rotated position for all subsequent movements of the moveable part while still beyond said first predetermined point, said second contact being further adapted to maintain said second mirror in its rotated position for all subsequent movements of the moveable part while still beyond said second predetermined point, and each of said first and second contacts being further adapted to cause the corresponding first and second mirror, respectively, to rotate back to its original position in response to the return of the movable part, in a direction opposite to the said first and second directions, respectively, back past the respective ones of said first and second predetermined points.

5,085,505

OVERHEAD PROJECTOR

Michiro Tsuchida, Yokohama, Japan, assignor to Nipox Kabushiki Kaisha, Japan

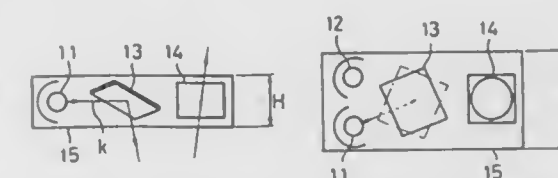
Filed Dec. 18, 1990, Ser. No. 628,885

Claims priority, application Japan, Dec. 28, 1989, 1-150068

Int. Cl.⁵ G03B 21/28

U.S. Cl. 353—98

1 Claim



1. An overhead projector comprising two light sources, a first reflection mirror that reflects a light from an illuminating light source of said light sources toward a reflection type light collection lens and a projection lens that projects a light reflected from said light collection lens onto a screen via a second reflection mirror, while said two light sources, said first reflection mirror and said projection lens being arranged parallel and housed together in a longitudinal direction of an overhead cabinet, wherein the light axes of said two light sources are directed toward a center portion of a mirror surface of the first reflection mirror, said two light sources are mounted parallel laterally in said overhead cabinet, and said first reflection mirror is mounted in such a manner that said first reflection mirror is rotatable around said center portion of the mirror surface.

5,085,506

APPARATUS AND METHOD OF FORMING AND PROJECTING HIGH PRECISION OPTICAL IMAGES

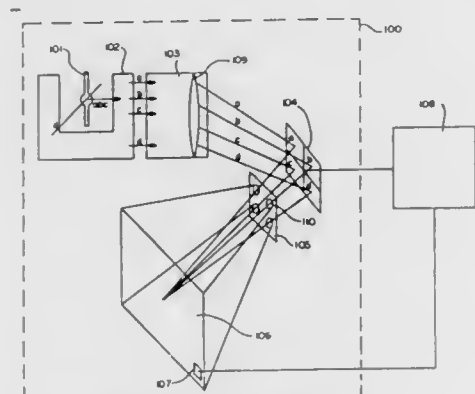
Frederic J. Kahn, Palo Alto; Paul N. Kendrick, Sunnyvale; Jerry Leff, Saratoga; Linden J. Livoni, Los Gatos; Bryan E. Loucks, Los Altos Hills; David E. Stepper, Cupertino, and Kenneth G. Witte, San Jose, all of Calif., assignors to Greyhawk Systems, Inc., Milpitas, Calif.

Continuation of Ser. No. 273,483, Nov. 21, 1988, Pat. No. 4,969,734. This application Nov. 6, 1990, Ser. No. 610,281 The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.⁵ G03B 21/00

U.S. Cl. 353—122

7 Claims



1. A projection apparatus including a light source, an image object plane containing at least two spaced images, optical means disposed to receive light from said source and form at least two beams and directing one of said beams on each of said images, at least two spaced multielement projection lenses in which the power is concentrated primarily on the inner elements and achromatization is concentrated primarily in the outer elements to provide lenses with front to rear surface lengths less than half the focal length to provide a compact design with relatively small off-axis angle, high resolution and low distortion, said projection lenses positioned to receive light from said images and direct the light from said images onto a receiving plane so that the images are in coregistration.

5,085,507

DEVICE FOR THREE DIMENSIONAL TRACKING OF AN OBJECT

Rodney D. Williams, Plano, and Felix Garcia, Jr., Round Rock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1989, Ser. No. 457,439

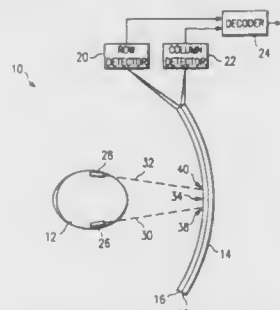
Int. Cl.⁵ G01B 11/26

U.S. Cl. 356—152

45 Claims

1. A device for tracking the position of an object in three dimensions comprising: a sensor comprising a sensing array, said sensor operable to track the position of beams incident on said sensing array; a first beam generator coupled to the object and operable to

transmit a first beam along only a first optical axis from the object to said sensing array; and



a second beam generator coupled to the object and operable to transmit a second beam along only a first optical axis from the object to said sensing array.

5,085,508

BEAM ALIGNMENT APPARATUS AND METHOD USABLE WITH PROJECTED BEAM SMOKE DETECTOR SYSTEMS

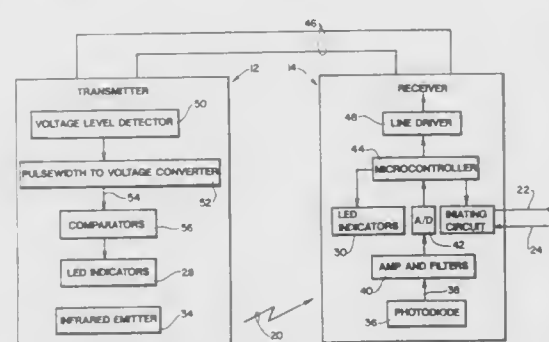
Dan Hawkinson, Aurora, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Jan. 16, 1990, Ser. No. 465,927

Int. Cl.⁵ G01B 11/26

U.S. Cl. 356—153

9 Claims



1. A system for aligning a radiant energy beam transmitted between spaced-apart transmitter-receiver units displaceable with respect to one another comprising: a source of radiant energy carried by the transmitter and a sensor carried by the receiver; a processing circuit carried by the receiver, coupled to said sensor, including means for comparing the sensed radiant energy to a plurality of predetermined thresholds and for generating electrical signals corresponding to the results thereof; a plurality of lightable alignment indicating members carried by the receiver and coupled to said processing circuit with an increasing number of said members illuminated in response to sensing a greater degree of radiant energy from said source, as said source is displaced relative to said transmitter; means for communicating information extending, at least in part, between the transmitter and the receiver; circuitry, carried by the receiver, for generating a transmittable indicium and for transmitting same to the transmitter; indicia sensing circuitry carried by the transmitter and coupled to said communicating means; circuitry carried by the transmitter for converting a sensed indicium to a corresponding electrical signal; circuitry carried by the transmitter for comparing said electrical signal to a second plurality of predetermined thresholds; and

a second plurality of lightable alignment indicating members carried by the transmitter and coupled to said comparing circuitry with an increasing number of said members illuminated in response to a greater degree of radiant energy from said source being sensed at the receiver as said source is displaced relative to said transmitter.

5,085,509

APPARATUS AND METHOD FOR ALIGNING AN OPTICAL BEAM

Jean-Paul Gaffard, Fontainebleau; Robert Ravelet, Longjumeau; Genevieve Chabassier, Paris, and Jacques Griffaton, Chalon sur Saone, all of France, assignors to Framatome, Courbevoie, France

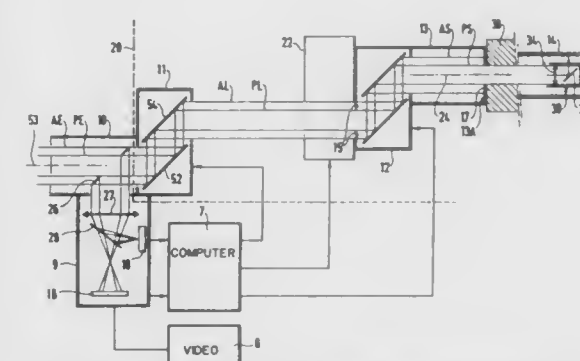
Filed Feb. 28, 1989, Ser. No. 316,749

Claims priority, application France, Feb. 29, 1988, 88 02473

Int. Cl.⁵ G01B 11/26; B23K 26/02

U.S. Cl. 356—153

8 Claims



1. An alignment system for a light beam, said system comprising: (a) an emitter for receiving a main inlet beam constituted by a main radiation and for transmitting it in the form of a main link beam, said emitter comprising a direction controlling means for controlling a direction of said main link beam; (b) a movable receiver at a distance from said emitter for receiving said main link beam and for applying thereto a controllable angular deflection adapted to transform said main link beam into a main outlet beam aligned on a utilization axis related to a structure external to said alignment system; and (c) optical aiming means comprising: (i) an auxiliary source for generating auxiliary radiation in the form of an auxiliary inlet beam aligned on the path of said main inlet beam, whereby said auxiliary inlet beam is transformed by said emitter into an auxiliary link beam aligned on the path of said main link beam, and said auxiliary link beam is transformed by said receiver into an auxiliary outlet beam aligned on the path of said main outlet beam; (ii) emitter control means responsive to a fraction of the radiation of said auxiliary link beam received by said receiver in order to control said emitter for causing said auxiliary link beam and said main link beam to be directed towards said receiver, said emitter control means comprising a retroreflector assembly connected to said receiver and constituted by a plurality of retroreflectors each returning a corresponding portion of said link beam back along the direction of said link beam in order to constitute a retroreflected beam; (iii) a retroreflected beam detector connected to said emitter and forming an image of said retroreflector assembly on an image analyzer system for detecting the position of said receiver relative to said link beam; and (iv) receiver control means responsive to a fraction of the radiation of said auxiliary link beam received by said receiver in order to control said angular deflection for

causing said main outlet beam and said auxiliary outlet beam to be aligned on said utilization axis; (v) wherein said auxiliary inlet beam is a tubular beam formed coaxially around said main inlet beam, said emitter and receiver control means being located off the path of said main radiation and comprising reflector means for receiving parts of said link and outlet auxiliary beam, respectively, and for reflecting said parts towards said emitter.

5,085,510

PHARMACEUTICAL TABLET VISION INSPECTION SYSTEM

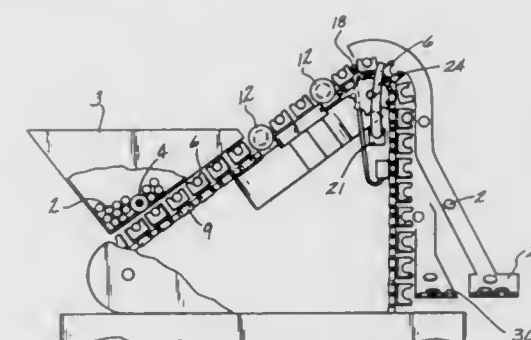
William H. Mitchell, Cranford, N.J., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 28, 1990, Ser. No. 574,166

Int. Cl.⁵ H04N 7/18

U.S. Cl. 356—237

7 Claims



1. A visual inspection system particularly adapted for inspecting pharmaceutical tablets comprising: a. a first pair of two-dimensional charge couple device photoelectric detection means positioned for detecting the light intensity within predetermined inspection areas on opposing sides of a tablet and for generating a detection signal which varies with the light intensity detected by said photoelectric means; b. a second pair of two-dimensional charge couple device photoelectric detection means positioned for detecting the light intensity within predetermined inspection areas on opposing sides of a tablet and for generating a detection signal which varies with the light intensity detected by said photoelectric means; c. a conveyor means for sequentially presenting tablets to said photoelectric detector means, said first pair and second pair of photoelectric detector means disposed along said conveyor means and said first pair and second pair of photoelectric detector means separated by an even number of tablets; d. signal processing means for comparing said detection signals to at least one predetermined standard to generate at least one selection; e. transducer means responsive to said selection signal; and f. separation means responsive to said transducer means for separating said tablets into at least two groups in accordance with said selection signal.

5,085,511

LOADED SHOTGUN SHELL TESTING APPARATUS USED TO VISUALLY INSPECT, VIA TRANSMITTED LIGHT IMAGES, THE INTERNAL ARRANGEMENT OF THE POWDER, WAD, AND SHOT

Howard L. Grisel, 1224 Newton Creek Rd., Roseburg, Ore. 97470

Filed Feb. 28, 1990, Ser. No. 486,166

Int. Cl.⁵ G01N 21/88

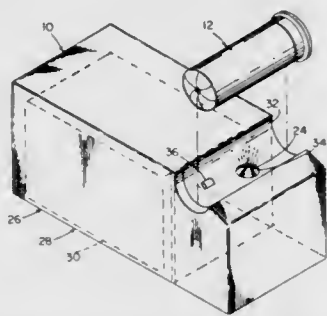
U.S. Cl. 356—239

10 Claims

1. A shotgun shell testing apparatus which creates an optical

image observable by a shooter to inform the shooter if his or her shotgun shell has or has not a specified arrangement of the powder, wad, and shot located within the fiber derivative portions of the shell casing, to thereby enable the shooter to only include correctly loaded shotgun shells in a group of them which he or she will shoot in a competitive shooting tournament, or during hunting, comprising:

- a hollow housing;
- an electric light source in the hollow housing;
- an electrical energy source in the hollow housing;
- a shotgun shell receiving portion of the hollow housing;
- an electrical switch on the hollow housing;
- a viewing locale on the hollow housing; and



g) electrical circuitry in the hollow housing interconnecting the electrical light source, the electrical energy source, and the electrical switch; whereby upon closure of the electrical switch electrical energy from the electrical energy source, via the circuitry, turns on the electric light source, and light is directed toward the shotgun shell receiving portion and the viewing locale of the hollow housing, so that when a shotgun shell is placed in this receiving portion of the hollow housing and observed, the shooter will see an image, which he or she will analyze to determine whether or not the shotgun shell has been loaded according to the specified arrangement of the powder, wad, and shot, before he or she enters a competitive shooting tournament, or during hunting.

5,085,512

APPARATUS FOR THE MOVING OF LIQUID, PASTY AND/OR POURABLE MEDIA

Michael Doman, Travemünde Allee 63, 2400 Lübeck, Fed. Rep. of Germany

Continuation of Ser. No. 352,476, May 16, 1989, abandoned.

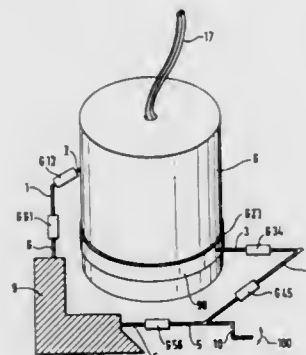
This application Nov. 8, 1990, Ser. No. 610,457

Claims priority, application Fed. Rep. of Germany, May 16, 1988, 3816654

Int. Cl.⁵ B01F 11/00; F16H 21/46

U.S. Cl. 366—219

14 Claims



1. An articulated apparatus adapted to be actuated for the

purpose of moving media in the vicinity of the apparatus, comprising:

a plurality of at least six links, each of said links connected only serially by two swivel connections to a respective two neighboring ones of said links to form a closed articulated chain having only said plurality of links, said swivel connections defining at least six swivel axes (A12, A23, . . .), each of said swivel axes substantially intersecting angularly with at least two swivel axes of said neighboring links at a respective at least two positions (P1, P2, . . .), wherein each angle (W1, W2, . . .) formed by the intersection of two swivel axes at a position is fixed, only a first one of said links is fixed in space, and only two other, second and third of said links, are connected to the first link;

first means connected to at least one link other than said first, second, or third links, for contacting and moving the media in response to the articulated movement of the chain; and

second means, connected only to one of the second or third links, for imparting reciprocating motion to said one second or third link and articulated motion to the chain, for moving said media.

5,085,513

ARRANGEMENT FOR MIXING POWDER WITH LIQUID

Nemo Ivarson, Skönviksvägen 253, S-12242 Enskede, Sweden

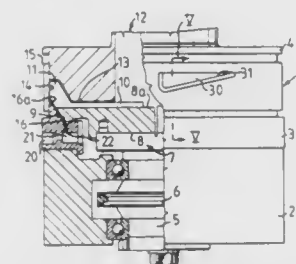
Filed Aug. 15, 1989, Ser. No. 394,502

Claims priority, application Sweden, Sep. 13, 1988, 8803219

Int. Cl.⁵ B01F 5/06, 15/02

U.S. Cl. 366—155

7 Claims



1. In an apparatus for continuously mixing liquid and powder together to form an at least substantially homogenous mixture, comprising a housing, a rotor provided with guide means and journaled for rotation about a vertical axis in said housing, means for delivering powder to the rotor, and means for delivering liquid to the housing and for dispersing the liquid so as to form a liquid annulus therein, the guide means provided on said rotor being configured to throw the powder outwards and into the liquid annulus as the rotor rotates; the improvement wherein the rotor (7) has an inverted conical peripheral surface (9); the housing (1) has a stationary conical surface (16) which surrounds the peripheral surface of the rotor and which has an extension (16a) which extends upwardly beyond the peripheral surface of said rotor; said liquid delivery means (22) discharges into a gap (19) defined between the conical housing surface (16) and the conical rotor surface (9), said rotor surface (9) being configured to impart rotational movement to said liquid such as to form a rotating liquid film on the conical wall of said housing; the guide devices (10) on the rotor being configured to throw powder towards and in contact with the liquid film on said extension (16a) of the conical housing wall (16) above the conical peripheral surface of said rotor; and wherein a mixture outlet is provided above said conical surface of said housing.

5,085,514

TECHNIQUE OF FORMING A SEPARATE INFORMATION BEARING PRINTED PATTERN ON REPLICAS OF A HOLOGRAM OR OTHER SURFACE RELIEF DIFFRACTION PATTERN

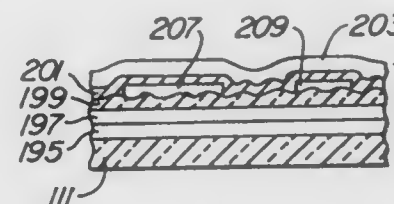
Donald W. Mallik, North Tarrytown, and Salvatore F. D'Amato, Floral Park, both of N.Y., assignors to American Bank Note Holographics, Inc., Elmsford, N.Y.

Division of Ser. No. 399,812, Aug. 29, 1989. This application Apr. 16, 1991, Ser. No. 686,250

Int. Cl.⁵ G03H 1/02

U.S. Cl. 359—2

19 Claims



14. In a combination of an article having a hologram or diffraction grating device attached to a surface thereof, said device including a substantially transparent substrate having a relief pattern formed on a surface thereof facing said article, said surface relief pattern being characterized by diffracting light reflected therefrom through said substrate to form an image or other light pattern recorded therein, the improvement wherein a graphical pattern is attached to only a portion of the substrate surface containing the surface relief pattern and in shape that conveys visual information independent of said image or other light pattern, said graphical pattern including a material having substantially the same refractive index as said substrate surface portion to substantially eliminate the effect of the surface relief pattern to diffract incident light in said portion, whereby said graphical pattern may be viewed simultaneously with the image or other light pattern formed in light reflected from the surface relief pattern in other portions of the substrate surface.

5,085,515

METHOD AND APPARATUS FOR INSPECTING QUALITY OF MANUFACTURED ARTICLES

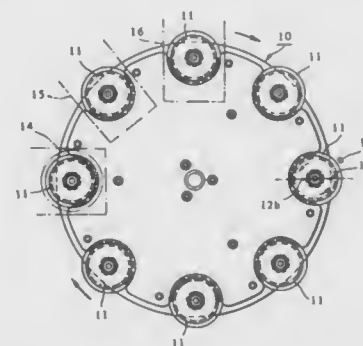
Hajime Itoh; Atsuo Ito; Yoshihiro Inoue, all of Omiya, and Hiroshi Ishizaki, Shizuoka, all of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Feb. 8, 1990, Ser. No. 476,725

Int. Cl.⁵ G01B 11/00; G01N 9/04; B21B 33/02

U.S. Cl. 356—398

4 Claims



1. A method for inspecting an attachment on a surface of a manufactured article, comprising the steps of:
(a) providing sensing means adjacent to said article;
(b) operating said sensing means to sense said surface of said article while causing one of said sensing means and said article to rotate about an axis perpendicular to said surface of said article, to thereby obtain a signal which has peaks

corresponding to the attachment on the surface of said article wherein said sensing means comprises a plurality of sensors disposed so as to sense points on said surface which are spaced by different distances from said axis perpendicular to said surface; and

(c) subsequently processing said signal and analyzing the processed signal based on said peaks including the step of obtaining information as to the position of the attachment by comparing the positioning of the peaks with respect to each other, to thereby obtain information as to the attachment on said surface of said article.

5,085,516

PROCESS FOR DETERMINING AND MONITORING THE SHAPE OF THE EDGES OF A CURVED OBJECT AND APPARATUS THEREFOR

Gérard Bertrand, Clamart; Gérard Imbert, Le Plessis-Robinson, and Gabriel Narduzzo, Mons-en-Bareuil, all of France, assignors to Societe Generale pour les Techniques Nouvelles SGN, France

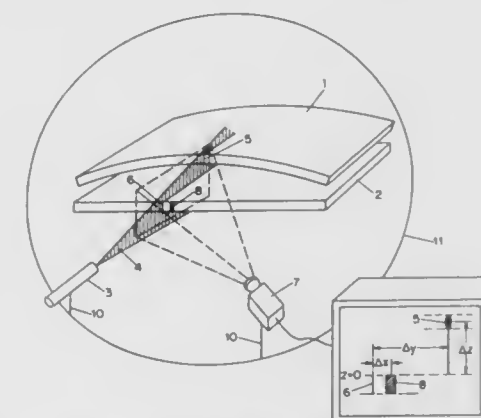
Filed Sep. 20, 1989, Ser. No. 409,710

Claims priority, application France, Sep. 23, 1988, 88 12489

Int. Cl.⁵ G01B 11/00

U.S. Cl. 356—394

8 Claims



distance between the edges of said monitored object and said edges of said reference in the plane of said reference; and
comparing said spacing and said distance values, after correcting for a trimming operation, with data relative to said curved object.

5,085,517 AUTOMATIC HIGH SPEED OPTICAL INSPECTION SYSTEM

Curt H. Chadwick, 220 Wooded View Rd., Los Gatos, Calif. 95032; Robert R. Sholes, 170 Middlefield Rd., Boulder Creek, Calif. 95006; John D. Greene, 2275-6 Kinsley St., Santa Cruz, Calif. 95062; Francis D. Tucker, III, 2809 Tramanto Dr., San Carlos, Calif. 94070, and Michael E. Fein, 1909 Limetree Ln., Mountain View, Calif. 94040; P. C. Jann, 2630 Warburton, Santa Clara, Calif. 95050; David J. Harvey, 425 Dallas Dr., Campbell, Calif. 95008; William Bell, 685 Estonia Ct., San Jose, Calif. 95123; Bin-Ming B. Tsai, 19801 Scotland Dr., Saratoga, Calif. 95070; Walter I. Novak, 15851 Miradero Dr., San Jose, Calif. 95127; Mark J. Wihl, 34669 Brickette Ct., Tracy, Calif. 95376

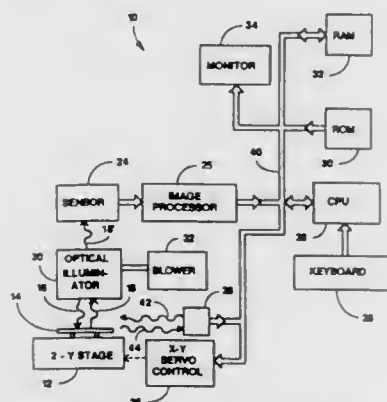
Filed Oct. 31, 1989, Ser. No. 429,963

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁵ G01B 11/30

U.S. Cl. 356—394

56 Claims



1. Inspection apparatus for inspecting surface features of a substrate comprising:
memory means for storing the desired features of the surface of the substrate;
illumination means for critical illumination of a region of the surface of the substrate to be inspected;
TDI sensor means for imaging the region of the substrate illuminated by the illumination means; and
comparison means responsive to the memory and TDI sensor means for comparing the imaged region of the substrate with the stored desired features of the substrate.

5,085,518 BEARING AND SEAL ASSEMBLY

Luc Langouet, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Jul. 23, 1991, Ser. No. 734,747

Int. Cl.⁵ F16C 38/72

U.S. Cl. 384—477

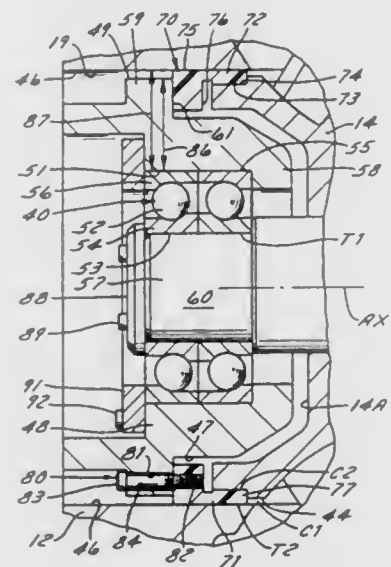
10 Claims

1. A bearing and seal assembly for supporting a rotor that has a rotating sealing surface, for rotation about an axis in a rotating machine of the type including a housing having a rotor receiving bore defined by an inner peripheral surface concentric with said axis within which said rotor rotates comprising:
a nonrotatable support means having,
a bearing support member dimensioned to loosely fit inside of said inner peripheral surface of said rotor receiving bore so as to be radially movable relative to said axis,

a bearing receiving portion on said bearing support member,
a bearing member secured on said bearing receiving portion to rotatably mount said rotor on said bearing support member and having a radially outer portion,
a seal receiving seat on said bearing support member, and
a seal member nonrotatably mounted on said seat in sealing relation thereto and having an outer peripheral portion dimensioned to have a close tolerance nonrotating fit with said inner peripheral surface of said rotor receiving bore, an inner peripheral portion and a nonrotating sealing surface dimensioned to have close tolerance sealing gap with said rotating sealing surface of said rotor;

said bearing support member having a radial dimension that is less than the radial dimension between said radially outer portion of the bearing member and said inner peripheral surface of said bore to permit radial adjustment of said rotor axis to locate said rotor sealing surface in a position of concentricity with said nonrotating sealing surface of said seal; and
a releasable clamping means for securing said seal on said bearing members to lock said rotor and seal surfaces together in said position of concentricity.

6. A bearing and seal assembly for supporting a rotor that has a rotating sealing surface, for rotation about an axis in a rotating machine of the type including a housing having a rotor receiving bore defined by an inner peripheral surface concentric with said axis within which said rotor rotates comprising:



a nonrotatable bearing support member dimensioned to loosely fit inside of said inner peripheral surface of said rotor receiving bore so as to be radially movable relative to said axis and having a seal receiving seat and a bearing receiving portion;
a bearing member secured in said bearing receiving portion to rotatably mount said rotor on said bearing support;
a seal member nonrotatably mounted on said seat in sealing relation thereto and having an outer peripheral portion dimensioned to have a close tolerance nonrotating fit with said inner peripheral surface of said rotor receiving bore, a nonrotating sealing surface dimensioned to have a close tolerance sealing gap in concentric facing relation to said rotating sealing surface of said rotor and an inner peripheral portion dimensioned to allow said bearing support member to be adjusted radially relative to said seal member to locate said rotor sealing surface in a position of concentricity with said nonrotating sealing surface; and

a releasable clamping means for securing said bearing support member on said seal member so that said seal will support and position said bearing support, bearings and rotor in said position of concentricity relative to said axis.

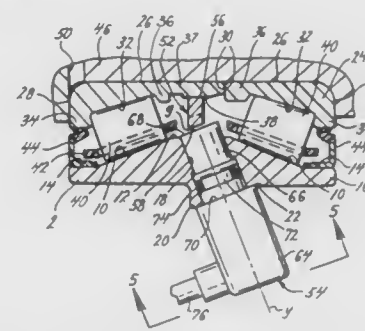
5,085,519 BEARING ASSEMBLY WITH SPEED SENSOR AND PROCESS FOR ASSEMBLING THE SAME John D. Dougherty, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jul. 5, 1991, Ser. No. 726,253

Int. Cl.⁵ F16C 19/38

U.S. Cl. 384—448

12 Claims



1. A bearing assembly having an axis of rotation, said bearing assembly comprising: an outer race having a pair of raceways presented inwardly toward the axis of rotation and a bore which is offset from the raceways and lies at an oblique angle with respect to the axis of rotation; a pair of inner races located within the outer race and each having a raceway that is presented outwardly toward a raceway of the outer race, so that the one raceway of the outer race encircles the raceway of one of the inner races and the other raceway of the outer race encircles the raceway of the other inner race, one of the inner races having an axially directed seat; rolling elements arranged in two rows between the raceways of the outer and inner races; seals located between the outer race and the two inner races to isolate the region in which the raceways and the two rows of rolling elements are located and into which the inner end of the oblique bore opens; a sensor located in the oblique bore and having an inner end which is in the region isolated by the seals; and a target wheel located on the axially directed seat of the one inner race such that it can be moved axially on the seat, the target wheel having an operative surface which is oblique to the axis of rotation and is presented toward the inner end of the sensor such that a gap exists between the operative surface and the inner end of the sensor, with the size of the gap being dependent on the position of the target wheel along the axially directed seat, the target wheel along its operative surface cooperating with the sensor to produce a pulsating signal when inner races rotate within the outer race, with the frequency of the signal reflecting the angular velocity.

5,085,520 NOSE CONE BEARING ARRANGEMENT

Steven J. Fujan, Sand Springs, Okla., assignor to Terex Corporation, Green Bay, Wis.

Filed Dec. 10, 1990, Ser. No. 624,968

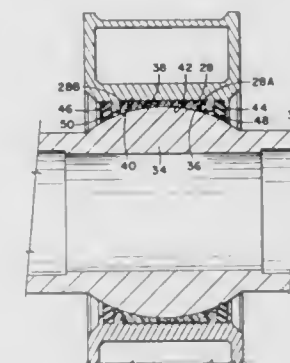
Int. Cl.⁵ F16C 23/04

U.S. Cl. 384—203

10 Claims

1. An improved bearing arrangement for mounting an axle box to a frame cross-tube of an off road vehicle, the axle box having an internal cylindrical bearing cavity therein and an internal circumferential groove therein spaced from and to both sides of said internal cylindrical bearing cavity, the bearing arrangement comprising:
a double truncated spherical bearing surface formed on and encompassing a truck frame cross-tube;
a toroidal plastic bearing member having an external cylindrical surface receivable within and conforming to said

axle box internal cylindrical bearing cavity and having a circumferential internal concave bearing surface engaging with and conforming to said cross-tube spherical bearing surface; and



a toroidal elastomeric wiper member received in each of said grooves, each wiper member having an inner circumferential surface engaging with and conforming to a circumferential portion of said frame cross-tube spherical bearing surface.

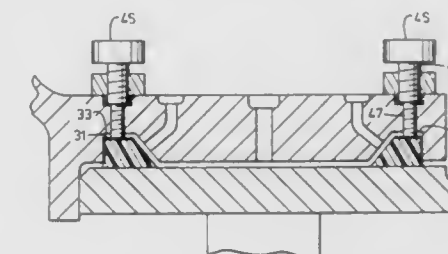
5,085,521 SQUEEZE FILM DAMPER SEAL Anant P. Singh, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jan. 14, 1991, Ser. No. 640,785

Int. Cl.⁵ F16C 27/00

U.S. Cl. 384—99

6 Claims



- a pair of spaced apart concentric grooves in said circumferential wall of said housing with said squeeze film space therebetween,
- said grooves having a diagonal cross-section,
- a pair of piston ring seals in said grooves,
- said piston ring seals having a complementary diagonal cross-section to fit in said grooves in interfitted relationship to define a diagonal zone between the groove diagonal and its ring diagonal, with the diagonal of said diagonal cross-section of each ring facing in a direction towards each other,
- oil supply means connected to supply oil under pressure directly to the said diagonal zones between the groove diagonal and ring diagonal and
- mechanical adjustment means in said housing to provide a compressive force on said rings to urge said rings into sealing engagement with said bearing support.

5,085,522

RETURN GUIDE FIXING STRUCTURE FOR A LINEAR GUIDE APPARATUS

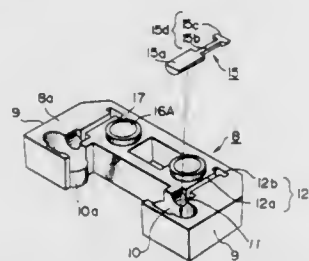
Masaru Hattori, Gumma, and Toru Tsukada, Maebashi, both of Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Aug. 5, 1991, Ser. No. 740,156

Claims priority, application Japan, Aug. 7, 1990, 2-83845[U]
Int. Cl.⁵ F16C 29/06

U.S. Cl. 384—45

1 Claim



1. In a linear guide apparatus having a guide rail with axial ball rolling grooves formed in both lateral sides and extending in an axial direction, a slider main body movably and loosely fitted on the guide rail and having ball rolling grooves respectively opposing the ball rolling grooves of the guide rail and having through bores acting as a ball return passages formed in parallel with the ball rolling grooves of the slider main body, end caps respectively joined to opposite ends of the slider main body, each of the end caps including a pair of curved paths for bringing the ball rolling grooves into communication with the ball return passages, and a plurality of balls rollably inserted in the ball rolling grooves, a return guide fixing structure comprising:

- a pair of return guides formed in each of the end caps, each of the return guides having a return guide main body and a return guide attaching portion formed concentrically with the return guide main body;
- a pair of return guide main body fitting grooves formed in a joining surface of each of the end caps so that the return guide main body fitting grooves respectively cross the curved paths in the end caps; and
- a pair of return guide attaching portion fitting grooves respectively extending upwardly from the return guide main body fitting grooves so that the return guide main body and the return guide attaching portion are respectively fitted into the return guide main body fitting groove and the return guide attaching portion fitting groove.

5,085,523

SLIDE RELEASE MECHANISM

James D. Hobbs, Plainfield, Ind., assignor to General Devices Co., Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 389,958, Aug. 7, 1989, Pat. No. 4,993,847. This application Aug. 22, 1990, Ser. No. 570,880

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

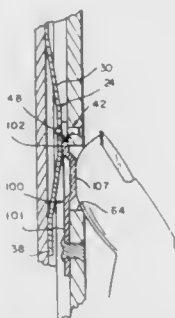
Int. Cl.⁵ F16C 29/04; A47B 88/00

U.S. Cl. 384—21

17 Claims

1. A slide track assembly comprising first and second slide tracks, means for coupling the second slide track to the first slide track for sliding movement thereon, means for blocking relative movement of the first and second slide tracks to establish a locked connection therebetween, the blocking means including a locking pin mounted on the second slide track and spring means mounted on the first slide track for yieldably engaging the second slide track upon alignment of the first and second slide tracks in a predetermined position, the spring means including a flexible strip formed to include an aperture situated to receive the locking pin therein upon movement

of the first and second slide tracks to said predetermined position, and



means attached to the second slide track for selectively unlocking the blocking means to break the locked connection between the first and second slide tracks to permit relative movement therebetween.

5,085,524

TABLESLIDE ASSEMBLY

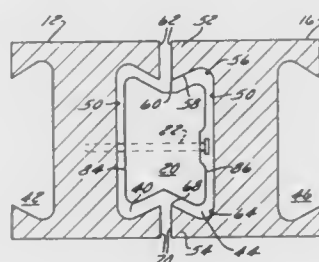
Thomas J. Reiss, Jr., Watertown, Wis., assignor to Watertown Tableside Company, a division of Consolidated Industries, Inc., Watertown, Wis.

Continuation of Ser. No. 428,210, Oct. 27, 1989, Pat. No. 4,936,691, which is a continuation of Ser. No. 275,116, Nov. 22, 1988, Pat. No. 4,925,319. This application Mar. 14, 1990, Ser. No. 493,502

Int. Cl.⁵ F16C 17/00

U.S. Cl. 384—17

1 Claim



1. An extendable tableslide assembly for supporting a supplemental table-top leaf of an extension table, comprising:
- a first wooden slide member having a first bearing surface and having a first longitudinal channel disposed on said first bearing surface;
 - a second wooden slide member having a second bearing surface disposed opposite to and adjacent to said first bearing surface and having a second longitudinal channel disposed on said second bearing surface; and
 - a plastic guide block disposed between and joining said first and second wooden slide members and having a first projection for receipt within said first channel and a second projection for receipt within said second channel, said plastic guide block being suitably configured such that said bearing surfaces of said wooden slide members are substantially free from contact with respect to each other, with respect to said plastic guide block, and with respect to any member affixed to said plastic guide block or said bearing surfaces during extension and retraction of said assembly;
- wherein said first projection is rigidly secured within said first channel and said second projection is slidably engaged within said second slide member, and wherein said plastic guide block exhibits a high degree of lubricity to thereby minimize friction between said second projection of said plastic guide block and said second wooden slide member during extension and retraction of said assembly.

5,085,525

SCANNING INFRARED TEMPERATURE SENSOR WITH SIGHTING APPARATUS

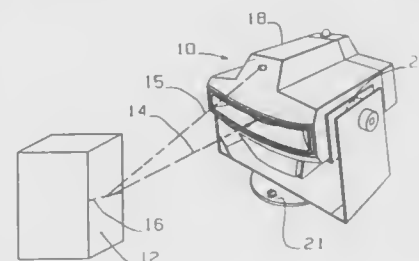
George Bartosiak, Naperville; Sam Paris, Chicago; Jeffrey M. Kresch, Gurnee; William J. Danley, Highland Park; Eugene F. Kalley, St. Charles, and Arthur E. Goldberg, Evanston, all of Ill., assignors to Square D Company, Palatine, Ill.

Filed Oct. 19, 1990, Ser. No. 601,479

Int. Cl.⁵ G01J 5/08

U.S. Cl. 374—124

43 Claims



1. In a scanning radiation sensor having a scanning radiation sensing element assembly, the improvement being a sighting apparatus for locating a target whose temperature is to be sensed, comprising:

a source of light having a preselected minimum wavelength significantly greater than the wavelength of peak relative response of human eye perception of visible light; means for scanning a beam of light from said light source to produce a marking line of light on the target to coincide with where temperatures are to be sensed by said sensing element assembly; and means for enhancing viewability of the marking line including a sighting camera with a display screen for viewing the target and marking line thereon and having a relative response to light with wavelengths approximately equal to that of the laser light source which is significantly greater than that of the relative response of human eye perception to brighten display of the marking line on said screen.

5,085,526

COMPACT PROGRAMMABLE TEMPERATURE DETECTOR APPARATUS

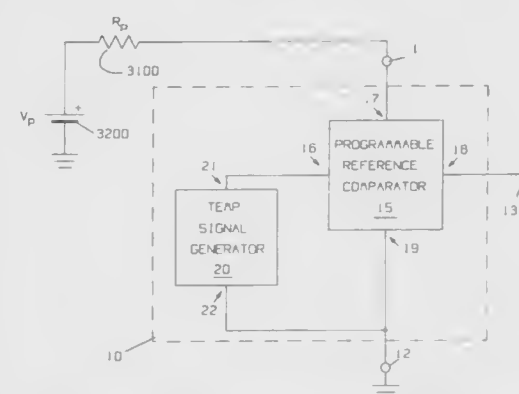
Carl K. Sawtell, San Jose; Marc E. Dagan, Mountain View, and Frederic S. Bandy, Milpitas, all of Calif., assignors to Astec International, Ltd., Hong Kong

Filed Jul. 26, 1990, Ser. No. 558,820

Int. Cl.⁵ H01K 3/08; H03K 5/26

U.S. Cl. 374—101

25 Claims



1. A programmable temperature detector for generating a signal specifying the relationship of a measured temperature to a selected temperature transition point, said detector comprising:
- a first terminal and a second terminal, said programmable

temperature detector being powdered by the potential difference between said first and second terminals; signal means for generating a plurality of signal pairs, each said signal pair comprising a first signal related to said measured temperature and a second signal specifying a selectable transition reference, each said signal pair associated with a temperature transition point; and reference comparison means for sensing a program signal on said first terminal, for selecting one of said signal pairs in response to said sensed program signal, and for generating a comparison signal related to the difference of said first and second signals of said selected signal pair.

5,085,527

COMPUTER CONTROLLED MICROWAVE OVEN WATER CONTENT DETERMINATION

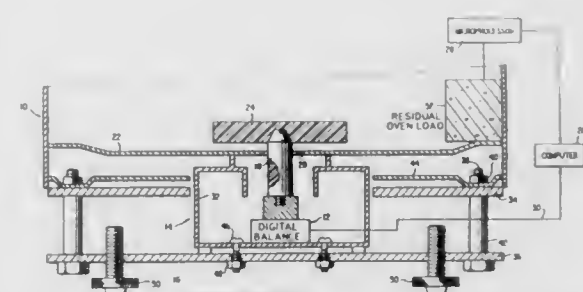
Paul A. Gilbert, Vicksburg, Miss., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 19, 1988, Ser. No. 259,661

Int. Cl.⁵ G01N 25/02; G01G 23/00

U.S. Cl. 374—14

20 Claims



1. A method for determining the volatile material content of a sample, comprising the steps of:
- a. disposing the sample on a weighing platform located within an enclosure;
 - b. determining the initial weight of the sample;
 - c. applying microwave energy to the sample during a variable drying period, said variable drying period including a plurality of portions;
 - d. monitoring the rate of weight loss of the sample during the drying period; and
 - e. controlling the application of microwave energy to the sample during the variable drying period in response to the monitored weight loss rate to determine the length of the variable drying period with said microwave energy being applied intermittently during a portion of the variable drying period thereby precisely controlling the drying of the sample;
 - f. determining the final weight of the sample at the end of the variable drying period; and
 - g. determining the loss of volatile material by using the final weight and the initial weight.

5,085,528

DATA CARD AND SERIAL PRINTER USING SAME

Koichi Sugino, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,686

Claims priority, application Japan, May 31, 1989, 1-138518

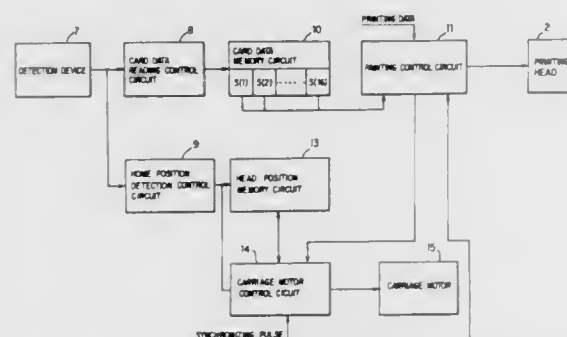
Int. Cl.⁵ B41J 5/30

U.S. Cl. 400—61

5 Claims

1. A serial printer comprising:
- a data card for setting functions and/or specification of a printer having a plurality of data areas so formed that data can be written in, and having a standard mark positioned at one side of said data areas to provide a reference position;

a card receiver into which said data card is detachably inserted;
a detection device for reading data in said data card;
one of said card receiver and said detection device being fixedly mounted within said serial printer, and the other of said receiver and detection device being mounted on a carriage, said carriage having a printing head thereon;



memory means for storing the data read by said detection device; and
control means for controlling a printing mechanism according to data stored in said memory means;
said data areas and said standard mark being aligned in series in a direction of movement of the other of said receiver and said detection device.

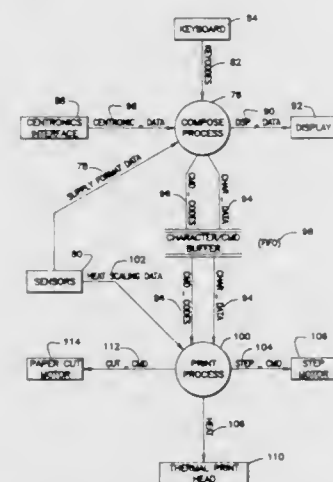
5,085,529 THERMAL PRINTING SYSTEM WITH ENCODED SHEET SET

Thomas K. McGourty, and Lawrence F. McGourty, both of Paso Robles, Calif., assignors to Insignia Systems, Inc., Plymouth, Minn.

Continuation-in-part of Ser. No. 258,375, Oct. 17, 1988, abandoned. This application May 22, 1990, Ser. No. 527,037
Int. Cl.⁵ B41J 2/355

U.S. Cl. 400—120

26 Claims



1. A print sheet set for a thermal printer, comprising:
a print sheet,
a heat sensitive image transfer sheet overlying said print sheet, and
identifiers on said print sheet for controlling a thermal printer by indicating an optimal amount of thermal energy for printing on said print sheet using said image transfer sheet, a size of at least one print field within said print sheet, and an appropriate size of data to be printed commensurate with said size of said print field.

5,085,530 SINGLE MOTOR MOVING RIBBON AND EXCHANGING CHARACTER HOLDING MEMBER, ALL ON PRINT CARRIER

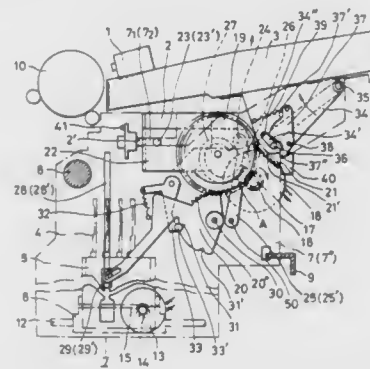
Hideo Saito, Mitsukaido; Tadashi Kimura, Iwai, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 73,216, Jul. 14, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 449,326

Claims priority, application Japan, Jul. 17, 1986, 61-168289
Int. Cl.⁵ B41J 1/30

U.S. Cl. 400—171

2 Claims



1. A printer for recording on a recording medium, comprising:
a platen;
an ink ribbon mounting section;
displacement means for displacing an ink ribbon mounted on said ink ribbon mounting section between a recording position and a retracted position retracted from said recording position, said displacement means having a first gear arrangement including a primary gear for driving said displacement means between the recording position and the retracted position;
a carrier reciprocally moveable along said platen, said carrier having a containing section for a character holding member for holding characters;
a character holding member mounting section;
a hammer for pressing the characters of said character holding member to said recording medium through the ink ribbon mounted on said ink ribbon mounting section;
mounting means for detachably mounting said character holding member contained in said containing section on said character holding member mounting section, said mounting means having a second gear arrangement including said primary gear for driving said mounting means to mount said character holding member; and
a driving motor for driving said primary gear to actuate said first gear arrangement to displace said ink ribbon mounted on said ink ribbon mounting section and to actuate said second gear arrangement to mount said character holding member contained in said character holding member on said character holding member mounting section.

5,085,531 CASSETTE FOR A PRINTING RIBBON FOR TYPEWRITERS

Claudio Gillio, Brosso Canavese, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Mar. 18, 1990, Ser. No. 492,807

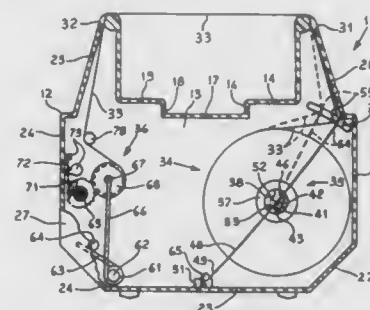
Claims priority, application Italy, Mar. 20, 1989, 67190 A/89
Int. Cl.⁵ B41J 33/52

U.S. Cl. 400—234

21 Claims

13. A cassette for a printing ribbon for typewriters comprising a supply spool with a tube on which a printing ribbon is wound, said tube having an internal surface; a receiving spool on to which the printing ribbon is wound again after having been used; a brake and take up device which operates on said

tube and on the printing ribbon which is being unwound from the supply spool; and a casing having support means for accommodating and rotatably supporting said supply spool and said receiving spool; wherein the brake and take up device comprises a brake shoe fulcrumed in the casing internally to said tube and having an external surface for cooperating with the internal surface of said tube, the improvement comprising an arrest member fixed to the casing near to said tube, coupling means carried by said brake shoe, and a spring wire for regulating the tensioning of the printing ribbon which is being unwound from the supply spool; said spring wire having one end cooperative with the casing, another end cooperative with the printing ribbon which is being unwound from the supply spool, a first intermediate portion



cooperative with the arrest member and a second intermediate portion cooperative with said coupling means;
wherein said spring wire is capable of positively controlling the brake shoe to position it from a first position in which said external surface is engaged against the internal surface of the tube and it brakes the supply spool to a second position in which said external surface is spaced from the internal surface and it releases the supply spool to rotate freely; and
wherein the spring wire is prestressed to perform the function of a take up element to regulate the tensioning of the printing ribbon with its other end while the printing ribbon unwinds from the supply spool and while the external surface of said brake shoe is in its first position.

5,085,532 MULTIPLE RIBBON MANDRIL FOR MULTIPLE PRINT HEAD PRINTERS

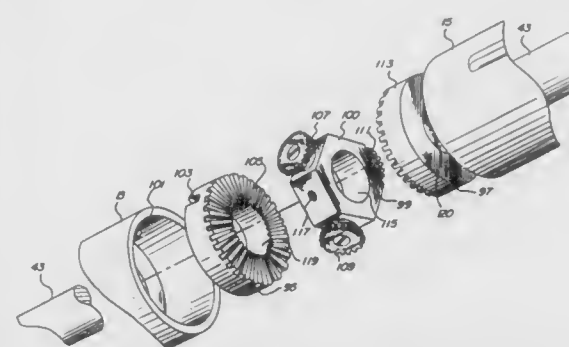
Ronald V. Surya, Laguna Hills, and Albert M. Kritz, Laguna Niguel, both of Calif., assignors to Pierce Companies, Inc., Santa Ana, Calif.

Filed Feb. 15, 1990, Ser. No. 480,221

Int. Cl.⁵ B41J 33/22

U.S. Cl. 400—234

20 Claims



1. In a reel to reel system wherein multiple rolls of ribbon material are carried by a single mandril and each roll must be wound or unwound taut even when the diameters of the rolls vary, the improvement therein comprising:
a single mandril with multiple independently rotatable

sleeve sections, one said sleeve section for each roll of ribbon to be carried by said mandril;
a differential mechanism connecting the independently rotatable sleeve sections together, thereby allowing the sleeve sections to rotate together at the same rotary speed or at different rotary speeds;
at least one length of highly elastic material having ends stretched along a length of each of said sleeve sections for a defined distance therealong; and
means for fastening the ends of each said length of elastic material;
whereby a roll of ribbon may be slid on each of said sleeve sections over said length of elastic material, and locked to the sleeve section by a twist with respect to said sleeve section.

5,085,533 THERMAL PRINTER

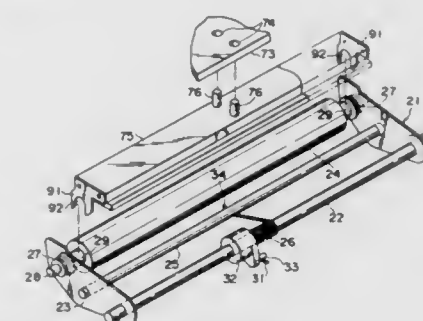
Satoshi Kitahara, Mishima; Kazuaki Sugimoto, Numazu; Akio Yamamoto, Mishima, and Ikuzo Sugiura, Sagami-hara, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 595,355

Claims priority, application Japan, Oct. 13, 1989, 1-265240
Int. Cl.⁵ B41J 11/14

U.S. Cl. 400—652

9 Claims



1. A thermal printer comprising:
a support body;
a head frame supported by said support body;
an elongate line thermal head for printing data on a recording medium, said elongated line thermal head being attached to said head frame and having a longitudinal axis;
a platen unit including:
a platen having a pair of axial end portions, said platen being positioned to oppose said thermal head, and said platen having a longitudinal axis substantially parallel to the longitudinal axis of the thermal head; and
supporting means for supporting said platen to be movable between a contact position where said platen contacts said thermal head and a separated position where said platen is spaced apart from said thermal head;
said support means including:
a support shaft attached to said support body and extending substantially in parallel to said platen;
a pair of support members rotatably supported on the support shaft and supporting the pair of axial end portions of said platen respectively; and
an intermediate shaft positioned between said platen and said support shaft, said intermediate shaft having two end portions which are rotatably supported by a respective one of said pair of support members; and
pressing means, including biasing means for biasing said supporting means toward said thermal head, for pressing said platen onto said thermal head and for applying a predetermined printing pressure to said thermal head.

5,085,534 MECHANICAL PENCIL LEAD PROTECTION PIPE WITH PROTUBERANCE

Kamakura Kenichi, Saitama; Nobuo Murasawa, Chiba; Tsukasa Sasaki, Saitama; Yuichi Miyahara, Saitama; Hiroaki Okabayashi, Saitama; Tetsuya Sugiyama, Saitama; Masamitsu Nagahama, Saitama, and Tsuruo Nakayama, Saitama, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP90/00219, § 371 Date Oct. 4, 1990, § 102(e) Date Oct. 4, 1990, PCT Pub. No. WO89/09896, PCT Pub. Date Sep. 7, 1990

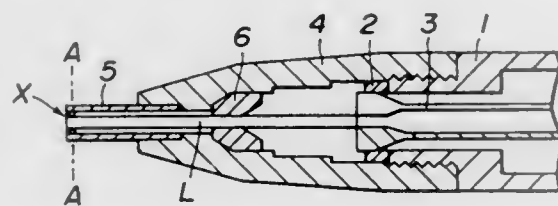
PCT Filed Feb. 23, 1990, Ser. No. 582,839

Claims priority, application Japan, Feb. 27, 1989, 1-21621; Mar. 30, 1989, 1-37047; Aug. 18, 1989, 1-96577; Aug. 23, 1989, 1-98128; Oct. 31, 1989, 1-128142; Oct. 31, 1989, 1-128143

Int. Cl.⁵ B43K 21/22

U.S. Cl. 401-65

5 Claims



1. A mechanical pencil having a lead protection pipe at the tip thereof, wherein powder is dispersed and deposited to the inner surface of said lead protection pipe to form a protuberance having a surface having a hardness equal to, or higher than, that of a writing lead.

5,085,535 LOCATING MECHANISM

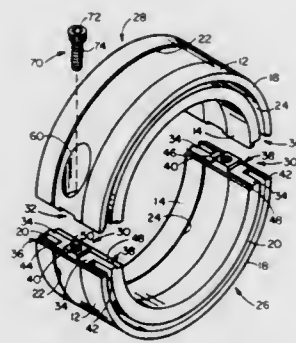
Joseph R. Solberg, 1515 Wisconsin Ave., Little Chute, Wis. 54140, and John B. Harvey, Rte. 2, New London, Wis. 54961

Filed Apr. 12, 1991, Ser. No. 684,880

Int. Cl.⁵ F16D 1/00

U.S. Cl. 403-24

8 Claims



1. A locating mechanism, comprising: (a) first and second complementary, semi-circular metallic members, each of said members having two mating surfaces interengageable with the opposed two surfaces of the other member and cooperating for radial and axial alignment to form an engagement an open-ended cylindrical body having opposed marginal walls; (b) each of said surfaces of said first member being the mirror image of one another and having (i) a first orthogonal recess at the outer periphery thereof and extending the axial length thereof to provide a first female keyway, (ii) a second orthogonal recess at the inner periphery thereof and extending the axial length thereof to provide a second female keyway, and (iii) a centrally disposed land to provide a male key; (c) each of said surfaces of said second member being the mirror image of one another and having orthogonal projections at the outer and inner peripheries of the surface to provide male keys, said

projection at the outer periphery being complementary in shape and mating with said first recess and said projection at the inner periphery being complementary in shape and mating with said second recess, whereby on mating, said first and second members are referenced for fitting in a radial direction to inhibit radial movement thereof; (d) said second member having a centrally disposed recess for receiving said land, whereby on mating, said first and second members are referenced for fitting in an axial direction to inhibit axial movement thereof; and (e) interconnecting means to rigidly unite said first and second members.

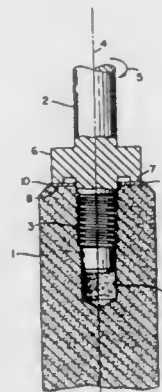
5,085,536 STRENGTHENED GRAPHITE-METAL THREADED CONNECTION

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Industrial Gases Technology Corp., Danbury, Conn. Continuation-in-part of Ser. No. 863,615, May 15, 1986, Pat. No. 4,685,822. This application Aug. 7, 1987, Ser. No. 82,529 The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.⁵ F16B 21/20

U.S. Cl. 403-343

22 Claims



1. In a graphite shaft with a female thread adapted for threaded connection with a metal shaft having a male thread driven so as to tighten the joint between the shafts, said graphite shaft having an end surface, a portion of which comes into contact with a seating surface of a flange portion of said metal shaft upon the fastening of the shafts through said threaded connection, the improvement comprising a solid coating bonded to the portion of the end surface of the graphite shaft that is positioned to contact said seating surface of the metal shaft flange, said coating comprising solid material that remains solid and is hard and adherent to said surface of the graphite shaft upon use of said threaded connection, said solid material having been deposited by coating said graphite surface with a solution or colloidal dispersion of said material and drying said solution or colloidal dispersion, leaving said solid material bonded to said graphite surface, the solid coating serving to substantially increase the friction between the graphite and metal contacting surfaces,

whereby the torque strength of the threaded connection is increased such as to enable said threaded connection to have a greatly increased ability to transmit driving torque from the metal shaft of the graphite shaft.

5,085,537 METHODS AND APPARATUS FOR DISPENSING, MIXING, AND APPLYING COATING CONSTITUENTS TO TRAFFIC SURFACES

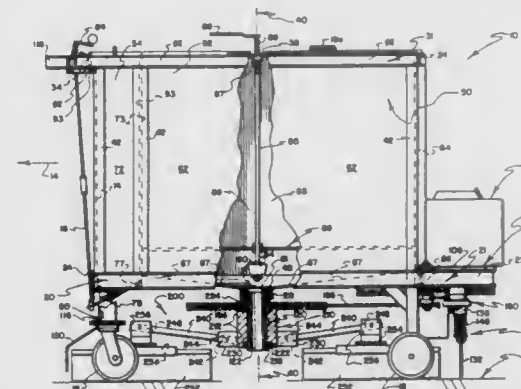
Alexander Laditka, 4741 Dalebridge #C-10, Warrensville Hts., Ohio 44128

Continuation-in-part of Ser. No. 368,084, Jun. 19, 1989, Pat. No. 4,958,955, which is a continuation of Ser. No. 213,449, Jun. 28, 1988, abandoned, which is a continuation of Ser. No. 85,253, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 892,337, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 532,742, Sep. 16, 1983, Pat. No. 4,603,999, which is a continuation-in-part of Ser. No. 408,484, Aug. 16, 1982, Pat. No. 4,477,203. This application Sep. 24, 1990, Ser. No. 586,909

Int. Cl.⁵ E01C 7/06, 23/08, 19/22

U.S. Cl. 404-75

41 Claims



1. A method of applying to a traffic surface a coating composition consisting of plural ingredients, herein the method comprises the steps of:

- depositing a plurality of coating composition ingredients upon a traffic surface to be coated;
- bringing into contact with the deposited ingredients at least one set of rotary tools, with each such set of rotary tools including an associated rotary structure having a plurality of associated depending blades that are arranged in an array about an associated center axis that extends substantially normal to the traffic surface, and having connection means movably connecting at least selected ones of the associated blades to the associated rotary structure so that, when the associated rotary structure and the associated blades are rotated about the associated center axis, at least said selected ones of the associated blades are permitted to move a limited amount relative to the associated rotary structure so as to accommodate the character of such portions of the traffic surface as pass beneath said selected associated blades and to maintain relatively close, substantially parallel contact with such portions of the traffic surface;
- rotating said at least one set of rotary tools about its associated center axis with at least said selected associated blades being urged into substantially continuous contact with the traffic surface and into contact with the deposited ingredients to effect a rapid mixing of the ingredients to a condition of substantially uniform consistency;
- applying the coating that results from the mixing of said ingredients to the traffic surface by continuing to rotate said at least one set of rotary tools about its associated center axis, with at least said selected associated blades moving relative to their associated rotary structure as is needed to conform to the contour of and to substantially maintain contact with such traffic surface portions as are being coated; and,
- with the step of depositing a plurality of coating composition ingredients upon a traffic surface being carried out

substantially simultaneously with each of the other steps recited above, and including the steps of:

- ducting a flow of at least a portion of the coating composition ingredients that are to be deposited to and through a discharge station so as to deposit the flow of ingredients onto traffic surface portions that underlie the discharge station, with the discharge station being located substantially centrally with respect to at least one array of the rotating, depending blades; and,
- moving the center axis of said at least one array along a path of travel that extends across the traffic surface to be coated so that the associated rotating, depending blades are brought into engagement with the deposited coating composition ingredients to effect said mixing of coating composition ingredients and said application of the resulting coating to the traffic surface.

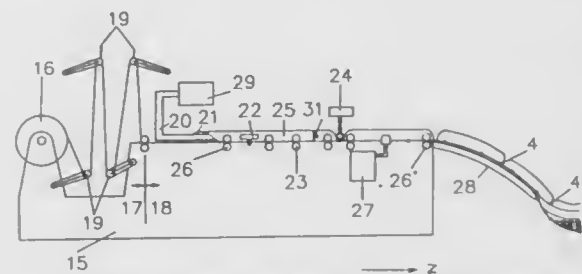
5,085,538 PETROLEUM CONTAINMENT BARRIER FOR RECOVERING FLOATING PETROLEUM

Colin G. Campbell, P.O. Box 38, Sugar Hill, N.H. 03585 Division of Ser. No. 341,581, Apr. 21, 1989. This application Jul. 17, 1990, Ser. No. 554,125

Int. Cl.⁵ F02B 15/04

U.S. Cl. 405-66

20 Claims



1. An elongate unitary floatation containment barrier, for containing a spilled product floating on water, comprising:

- an elongate tubular section having a plurality of spaced transverse seams dividing the tubular section into a plurality of discrete floatation compartments for providing floatation of the containment barrier when in use;
- an elongate keel means having an elongate edge connected with said elongate tubular section said elongate keel means comprising an impermeable elongate portion located adjacent said elongate tubular section;
- a plurality of spaced apart weight means attached to said keel means remote from said elongate tubular section for maintaining said keel means in a vertical position when the barrier is in use; and
- said containment barrier being an elongate continuous strip of a strong bondable material which has a thickness of about 10 mils thereby to facilitate on site manufacture of the continuous containment barrier of a substantially infinite length having the elongate continuous strip of material extending the entire length of the containment barrier thereby enabling the continuous containment barrier to encompass substantially any desired spilled product floating on water.

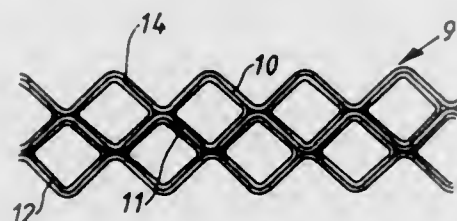
5,085,539
METHOD AND ARRANGEMENT FOR INFLUENCING THE INTERACTION BETWEEN A LAYER OF EARTH AND A STRUCTURE SITUATED IN ASSOCIATION WITH THE LAYER OF EARTH

Karl R. Massarsch, Waterloo, Belgium, assignor to S.A. Compagnie Internationale des Pieux Armes Frankignoui, Belgium
 PCT No. PCT/SE88/00455, § 371 Date Mar. 7, 1990, § 102(e) Date Mar. 7, 1990, PCT Pub. No. WO89/02505, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 6, 1988, Ser. No. 466,424
 Claims priority, application Sweden, Sep. 9, 1987, 8703503
 Int. Cl.⁵ E02D 31/08

U.S. Cl. 405—229

19 Claims

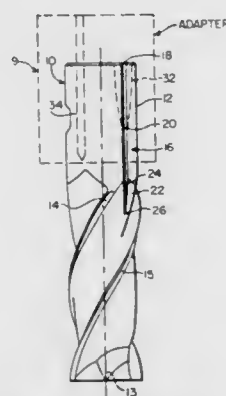


1. Method for influencing the interaction between a layer of earth and a structure situated in association with the layer of earth, comprising the steps of: forming a shaft in the layer of earth in direct association with the structure; filling said shaft with a material; providing a casing filled with a medium; and inserting said casing filled with the medium in said material whereby said material surrounds said casing and said material and said casing together support the structure situated in association with the layer of earth.

5,085,540
ENDMILL WITH NOTCHED SHANK
 Joseph A. Pagliaccio, Bayville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
 Continuation of Ser. No. 496,590, Mar. 21, 1990, abandoned.
 This application Jul. 5, 1991, Ser. No. 727,389
 Int. Cl.⁵ B23P 15/28

U.S. Cl. 407—11

1 Claim



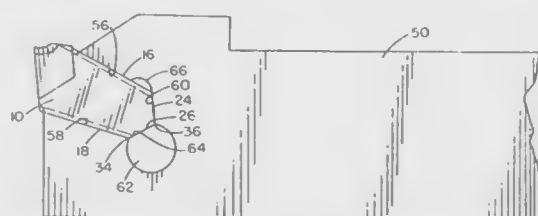
1. A system for delivering lubrication to a cutting tool surface comprising:
 a cutting tool having a shank section and a flute section;
 a plurality of symmetrically displaced longitudinal notches formed in the surface of the shank section maintaining high speed dynamic balance of the tool;
 each notch extending only between the shank section and a relief area of the flute section;
 an end of each notch, existing at an interface between the notch and the flute section, being tapered for directing fluid flow into the relief area and subsequently into each flute;
 an adapter for holding the shank section and having an

interior space communicating with each notch for forcing pressurized lubrication flow from the interior of the adapter through each notch for flushing each flute.

5,085,541
METAL-CUTTING INSERT
 Vandell E. Simpson, III, Kent, Ohio, assignor to Manchester Tool Company, Akron, Ohio
 Filed Sep. 13, 1990, Ser. No. 582,677
 Int. Cl.⁵ B26D 1/00

U.S. Cl. 407—110

4 Claims



1. A metal-cutting insert suitable for performing cut-off and grooving operations and of the so-called self-gripping type adapted for use with a support blade that has a recess with opposed first and second insert-gripping surfaces that converge inwardly of the recess in which a body portion of the insert is adapted to be received and frictionally gripped by said surfaces and that has a straight insert-locating surface at the rear of the recess that terminates at one end at a relief contour that intersects with an inward end of the first gripping surface and at the other end at a key-receiving aperture that intersects with an inward end of the second gripping surface, the aperture serving to facilitate removal of the gripped insert, said insert comprising:

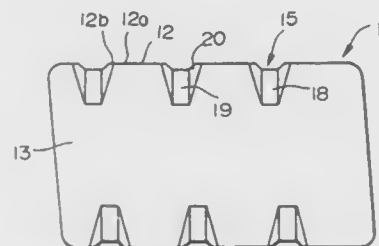
a front end with a cutting edge, first and second elongated straight grippable surfaces extending in converging relationship rearwardly from the front end, with a concave transverse contour, and a rear end defined by first and second straight end surfaces of approximately equal length that intersect each other in an included obtuse angle, the first and second end surfaces extending respectively from the first and second grippable surfaces, the intersection of the end surfaces being located on the insert at a location to coincide with the intersection of the insert-locating surface and the key-receiving aperture when the insert is fully received within the support blade recess.

5,085,542
INDEXABLE CUTTING INSERT
 Masaaki Nakayama, and Masayuki Okawa, both of Tokyo, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Aug. 22, 1990, Ser. No. 570,854
 Claims priority, application Japan, Aug. 23, 1989, 1-98339[U]
 Int. Cl.⁵ B26D 1/00

U.S. Cl. 407—114

8 Claims



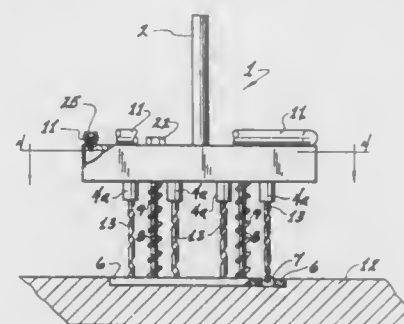
1. An indexable cutting insert comprising:
 (a) at least one cutting surface;
 (b) at least one flank intersecting with said cutting surface;

(c) a cutting blade defined along the cross line between said cutting surface and said flank;
 (d) at least one primary nick formed on said flank, so as to extend in a direction perpendicular to said cutting blade;
 (e) at least one secondary nick formed on said cutting surface in succession to said primary nick so as to extend in a direction perpendicular to said cutting blade and such that the depth of said secondary nick becomes progressively less as said secondary nick extends perpendicularly away from said cutting blade; and
 (f) said primary nick being defined by a bottom surface and two sidewalls, said secondary nick being defined by a bottom surface and two sidewalls, and the distance between crossing points of said sidewall surfaces of said primary nick to said cutting blade is less than the distance between crossing points of said sidewall surfaces of said secondary nick to said cutting blade.

5,085,543
HINGE/DOOR DRILL
 William E. Click, 2465 Love Rd., Grand Island, N.Y. 14072
 Filed Mar. 25, 1991, Ser. No. 674,106
 Int. Cl.⁵ B23B 41/00

U.S. Cl. 408—48

18 Claims



1. A portable hand tool to drill pilot holes for the standard 4½ inch hinge used on doors, said hand tool being capable of being powered and driven by a standard hand-operated electric drill and comprising the following elements:

- a power spindle drive shaft for being connected to the electric drill;
- an enclosed sprocket box, said box containing five sprockets surrounded by an endless chain, one of which sprockets surrounds a portion of the drive shaft within the sprocket box, and the other four of which sprockets surround portions of drill shafts located within the sprocket box;
- four drill collars outside the sprocket box, on the side of the sprocket box opposite the side from the side where the drive shaft enters the sprocket box, said drill collars being extensions of or mechanically coupled to the drill shafts located within the sprocket box and said collars being capable of receiving drills within same and possessing means for tightening the drills within the collars;
- a handle for the hand tool connected to the sprocket box;
- the aforesaid opposite sides of the sprocket box being rigid structural members of the box and being rigidly spaced and separated within the box by at least two diagonally opposite spacing members near corners of the box;
- a base plate distant from the sprocket box opposite the side of the sprocket box containing the drill collars, said base plate being kept distant from and parallel to the sprocket box by means of springs surrounding guide shafts, the ends of the springs being located between the base plate and the sprocket box and pushing against the facing surfaces of each, one end of each guide shaft being threaded or welded into openings in the base plate and the opposite end of each guide shaft terminating in heads on

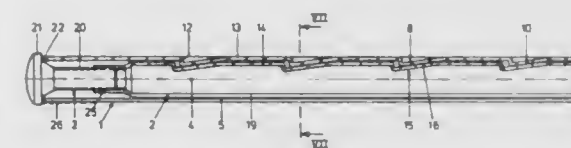
the side of the sprocket box where the drive shaft enters; and
 G. said base plate possessing four holes in same for the drilling of pilot holes for the standard 4½ inch hinge used on doors in the majority of commercial buildings.

5,085,544
EXPANDING PLUG AND A METHOD TO MANUFACTURE SAME
 Anton Gerhard, Nuremberg, Fed. Rep. of Germany, assignor to Töge-Dübel A. Gerhard GmbH, Nuremberg, Fed. Rep. of Germany
 Filed Oct. 2, 1990, Ser. No. 591,893
 Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933353

Int. Cl.⁵ F16B 13/04

U.S. Cl. 411—33

12 Claims



4. An expanding plug comprising:
 an expanding sleeve (1) bent from a sheet metal blank made in one piece and provided with a continuous longitudinal slot (5), and with an internal surface (9), on which inclined surfaces (10) are provided, and with a rim (22) at one end of the expanding sleeve (1);
 an expanding body (2) bent from a sheet blank made in one piece, arranged in the expanding sleeve (1) and having an inner thread (18) and provided on an external surface (14) with several expanding surfaces (16) one arranged behind the other in a longitudinal direction of the expanding body (2) and bearing against said inclined surfaces (10); and
 a screw (3) having an external thread engaging with the inner thread (18) of the expanding body (2), and with a head (21) bearing against the said rim (22) of the expanding sleeve (1);
 wherein the inclined surfaces (10) are provided on projections (8) of the expanding sleeve (1) directed radially inwards and engaging with recesses (15) of the expanding body (2) limiting the expanding surfaces (16), said projections (8) cooperating with said recesses (15) to provide means for expanding said expanding sleeve (1) by widening its slot (5) on pulling of the expanding body (2) in a direction toward the rim (22) of the expanding sleeve (1) to cause the inclined surfaces (10) to press outwardly from the action of the expanding surfaces (16).

5,085,545
EXPANSIBLE RIVET FOR SECURING TOGETHER OVERLAPPED PANELS
 Atsushi Takahashi, Yokohama, Japan, assignor to Nifco Inc., Kanagawa, Japan
 Continuation of Ser. No. 870,165, Jun. 3, 1986, abandoned. This application Jul. 31, 1990, Ser. No. 561,373
 Claims priority, application Japan, Jun. 19, 1985, 60-91501[U]
 Int. Cl.⁵ F16B 13/06

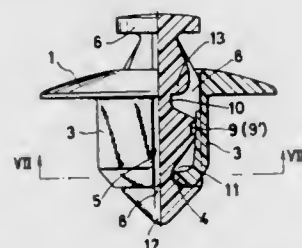
U.S. Cl. 411—45

5 Claims

1. An expansible rivet for securing together overlapped panels comprising:
 a female member including a flange having a hole and a plurality of elastic legs extending from the lower surface of said flange surrounding said hole and defined by axially formed elongated notches, each of said elastic legs having a radially inward protuberance formed at a respective lower end; and
 a male member including a head having an outside diameter dimensioned to fit in the opening of said flange and a body

portion extending from a lower surface of said head and capable of proceeding through said hole in said flange and a space surrounded by said plurality of elastic legs, said body portion having an intermediate raised portion of lesser diameter than said outside diameter of the head and recessed portions formed thereover and thereunder, the protuberances of said elastic legs engaging with said raised portion when a top of said head is substantially flush with a top of said flange and being received in one of said recessed portions otherwise;

said body portion of said male member including a plurality of axially elongate fins extending radially from the axis so as to be slidably received in the axially elongate notches between adjacent elastic legs, said raised portion and said



recessed portions thereover and thereunder being formed between adjacent ones of said fins, said recessed portion under said raised portion terminating in a conical end portion having a pointed free end and having a diameter substantially equal to the diameter of said head and larger than said lesser diameter of said intermediate raised portion, said fins axially extending along said body portion of said male member including said recessed portion formed over and under said raised portion and radially extending to substantially the same diameter as the diameter of said conical end portion, said conical end portion supporting said protuberances of said elastic legs when said protuberances of said elastic legs are received in the lower recessed portion of the body portion.

5,085,546

MOUNTING ASSEMBLY WITH AN EXPANSIBLE ANCHOR AND A MOUNTING TOOL

Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal, Fed. Rep. of Germany

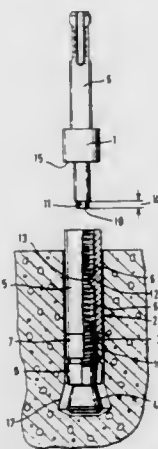
Filed Oct. 10, 1990, Ser. No. 595,302

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1989, 3933813

Int. Cl.⁵ F16B 13/06

U.S. Cl. 411—55

3 Claims



1. A mounting assembly comprising an expansible anchor including a threaded bolt having an expander body, an expansi-

ble sleeve, a shank member having an internal bore and an internal thread that enables said shank member to be screwed on said threaded bolt to provide for expansion of said expansible sleeve over said expander body, said internal bore having walls and a diameter that is less than a diameter of said internal thread; and a mounting tool adapted to be clamped in a drill chuck of a drilling machine and the mounting tool having a polyhedron end portion shaped like a polyhedron and having lateral faces and edges for engaging the walls of said internal bore of said shank member, and said internal bore with the walls and said polyhedron end portion provided with the lateral faces and edges being structured so that, when said mounting tool engages said internal bore, when said mounting tool is clamped in said drill chuck and when said drilling machine is operated, the lateral faces of said polyhedron end portion engage with the walls of said internal bore, so that said shank member rotates with said mounting tool and is screwed onto said threaded bolt.

5,085,547

SCREW FIXING DEVICE FOR A CONCRETE CONSTRUCTION ELEMENT

Gérard L. Vanotti, Maillat, France, assignor to Etablissements Vape S.A., Saint-Martin-du-Fresne, France

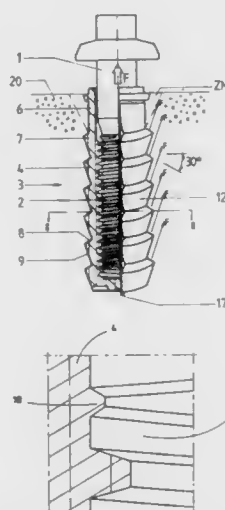
Continuation of Ser. No. 485,254, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 409,256, Sep. 19, 1989, abandoned. This application Jul. 12, 1991, Ser. No. 730,032

Claims priority, application France, Sep. 19, 1988, 88 12185

Int. Cl.⁵ F16B 13/06

U.S. Cl. 411—72

1 Claim



1. A screw fixing device for a concrete construction element, comprising a screw having a cylindrical core and a sheath of synthetic material intended to be fixed into the concrete element, this sheath possessing internally a thread corresponding to the thread of the screw and, externally, peripheral anchoring ribs of triangular cross section and two longitudinal ribs, the sheath of synthetic material further being surrounded by a metal sheath comprising two shells which are mutually assembled by crimping along the longitudinal ribs of the sheath of the synthetic material, wherein the upper part of the sheath possesses no peripheral ribs, wherein the inclination of the flanks of the peripheral ribs facing the entry to the sheath is approximately 30°, wherein the metal sheath bears of these flanks but has a play (Jd) relative to the other flanks of the peripheral ribs, and wherein the threads of the screw and of the sheath are trapezoidal in cross section, the section of the rib constituting the inlet of the thread of the sheath decreasing progressively, the dimensions of the said section decreasing progressively.

according to a similarity transformation towards the sheath inlet.

5,085,548

NUT AND SNAP RING POSITION LOCKING DEVICE

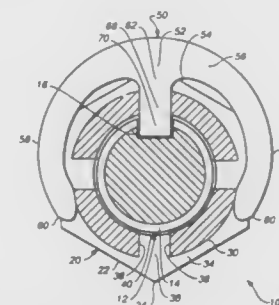
Mervyn W. Moyles, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1991, Ser. No. 693,742

Int. Cl.⁵ F16B 39/04, 21/18

U.S. Cl. 411—316

22 Claims



1. A position locking device for use with an externally-threaded round shaft having at least one axial keyway of rectangular cross-section, comprising:

an internally-threaded nut disposed to engage with the externally-threaded shaft, said nut having a proximate end face and a circumferential groove oriented perpendicular to the nut internal thread axis, said groove having a cylindrical groove bottom surface concentric with the axis of said internal thread and a proximate groove wall surface and a distal groove wall surface each groove wall surface being substantially perpendicular to said groove bottom surface, said nut further having at least one parallel-walled flat-bottomed radial slot running across the proximate end face in a direction radially outward from the nut internal thread axis with the flat bottom parallel to the plane of said circumferential groove and of depth extending from said proximate end face to the distal wall of said groove; and

a flat planar snap ring of generally semi-circular shape being symmetric about a central base region, having two symmetrically-opposed inwardly-curving arms extending outward from said base region and having a flat-tipped straight tang centered between said arms and extending from said base region in the direction toward the arm tips, said arms disposed to engage the nut circumferential groove with the arm tips gripping the groove bottom surface and said tang disposed to engage with and extend through a nut radial slot to engage with an axial keyway of a shaft engaged with said nut.

5,085,549

THREE-AXIS VARIABILITY COMPENSATING FASTENER

Kelly J. Londry, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1990, Ser. No. 632,566

Int. Cl.⁵ F16B 21/00, 9/00

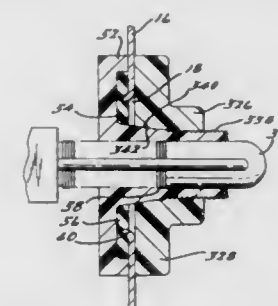
U.S. Cl. 411—339

14 Claims

1. A mounting system for securing a component to a panel comprising:

an elongated stud carried with the component; a hole formed through the panel being sized to permit insertion of the stud along its axis of elongation to provide substantial diametrical clearance therebetween; and a fastener assembly variably axially positionable along the

stud axis of elongation, carried within the diametrical clearance and clampingly secured to the panel to provide



variable positioning of the component with respect to three mutually perpendicular axes.

5,085,550

LOCKING NUT ASSEMBLY

Thomas J. Kendrick, 29, Mount Road, Wombourne, Staffordshire, United Kingdom

PCT No. PCT/GB89/00331, § 371 Date Oct. 26, 1990, § 102(e)

Date Oct. 26, 1990, PCT Pub. No. WO89/09344, PCT Pub.

Date Oct. 5, 1989

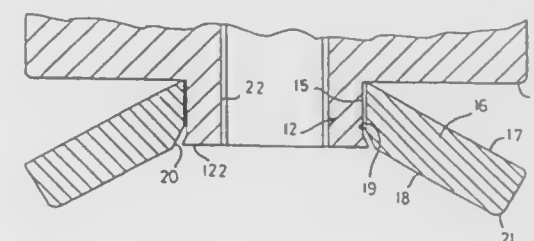
PCT Filed Mar. 28, 1989, Ser. No. 573,320

Claims priority, application United Kingdom, Mar. 31, 1988, 8807677

Int. Cl.⁵ F16B 37/08, 39/22

U.S. Cl. 411—432

10 Claims



1. A locking nut assembly comprising a nut having a head adapted for engagement by a driving tool, a spigot extending from one end of the head, a screw-threaded bore extending continuously through the head and the spigot, the spigot being of smaller cross-sectional dimensions than the head so that a generally annular shoulder is provided at the junction of the head and the spigot, the spigot consisting of a relatively thin wall bounded by said screw-threaded bore and by a cylindrical outer surface; and a separate dished washer having a convex face mounted on the spigot; characterised in that the washer has a cylindrical bore which is a close running fit on the outer surface of the spigot, in that the spigot has a length equal to or slightly less than the thickness of the washer, in that the washer is mounted on the spigot with its convex face adjacent to the shoulder, and in that, when a compressive force is applied to the locking nut assembly in a direction parallel to the longitudinal axis of the screw-threaded bore which is sufficient to flatten the washer, the spigot is gripped in the bore of the washer and the wall of the spigot is deformed inwardly by contraction of the bore of the washer.

5,085,551

BOOK BLOCK SEWING METHOD AND APPARATUS
Ulrich Erdbories, Rahden, Fed. Rep. of Germany, and Robert C. Schuler, Woodcliff Lake, N.J., assignors to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

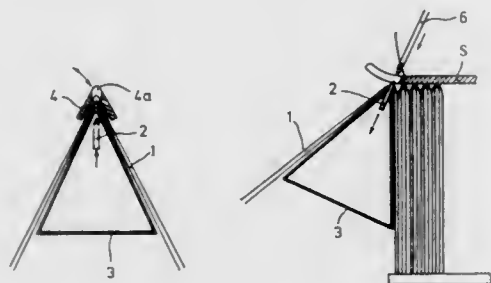
Filed Apr. 15, 1991, Ser. No. 685,523

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012082

Int. Cl.⁵ B42B 2/00

U.S. Cl. 412-6

8 Claims



1. In a method for sewing together individual book block sections to define a book block, the sewing being accomplished with the aid of a sewing saddle which transfers the book block section from a feed position to a sewing position, the book block section being pre-pierced at plural predetermined locations by an array of piercing needles prior to sewing and while supported on the sewing saddle, the improvement comprising: activating the pre-piercing needles when the sewing saddle is in the feed position with a book block section supported thereon to thereby pre-pierce the block section; maintaining the pre-piercing needles in engagement with the book block section during the transfer thereof from the feed position to the sewing position; and retracting the pre-piercing needles prior to initiation of the sewing operation.

5,085,552

SURGE FEEDER FOR FEEDING REFUSE MATERIAL INTO A FURNACE

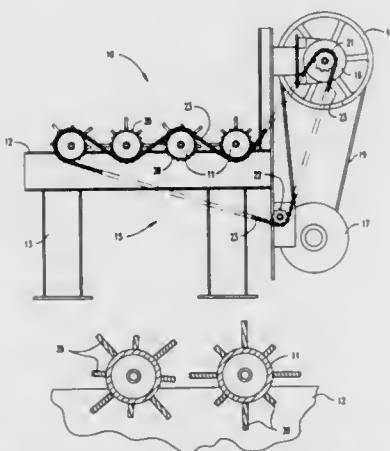
Robert R. Lennon, Carmel, Ind., assignor to Miller Hoff, Inc., Indianapolis, Ind.

Filed Feb. 26, 1990, Ser. No. 484,851

Int. Cl.⁵ B02C 4/02, 23/02; F23G 5/44

U.S. Cl. 414-196

6 Claims



1. A surge feeder for feeding refuse material into a furnace having a feed opening, comprising:
a first plurality of rollers;
a second plurality of rollers spaced vertically above said first plurality of rollers;

a base rotatably supporting said first and second plurality of rollers above the feed opening to the furnace; and
a means for counter-rotatably driving said first and second plurality of rollers;
wherein each said roller has a plurality of paddles extending continuously along substantially the entire length of said roller, said paddles projecting radially from said roller and fixedly mounted thereto at locations angularly spaced apart on said roller, said paddles having a plurality of different heights.

5,085,553

DEVICE FOR THE TRANSPORT OF CARRIERS FROM AND TO A POSITIONING DEVICE AND SELECTION DEVICE FOR USE IN SUCH A DEVICE

Henricus J. J. Bouwens, and Albert R. J. Bertram, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 158,966, Feb. 22, 1988, abandoned.

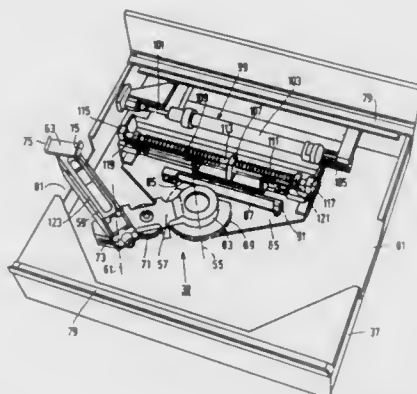
This application May 23, 1990, Ser. No. 529,689

Claims priority, application Netherlands, Jul. 14, 1987, 8701649

Int. Cl.⁵ B65G 35/00

U.S. Cl. 414-331

13 Claims



1. A device for the transport of carriers from and to a positioning device, including containers for said carriers which are grouped in a vertical direction in said containers, said containers being displaceable in a horizontal direction, a selection device capable of being coupled to said containers, a gripper mechanism being provided with said selection device said gripper mechanism being displaceable in the horizontal direction and capable of being coupled with carriers for displacement of such carriers in the horizontal direction, said gripper mechanism including transport means which functions to transport a predetermined carrier through a horizontal distance equal to a multiple of the length of said transport means by being coupled to one end of said predetermined carrier and undergoing a first rotation which moves said predetermined carrier substantially twice the length of said transport means, said transport means undergoing a second rotation which cancels said first rotation and being coupled to the other end of said predetermined carrier and undergoing a third rotation which moves said predetermined carrier substantially an additional two lengths of said transport means.

5,085,554

GARBAGE TRUCK

Johannes Kirchhoff, Langerfeldstrasse 55,, 5860 Iserlohn, and Hans Klossek, Erich-Norrenberg-Strasse 1, both of 5860 Iserlohn,, Fed. Rep. of Germany

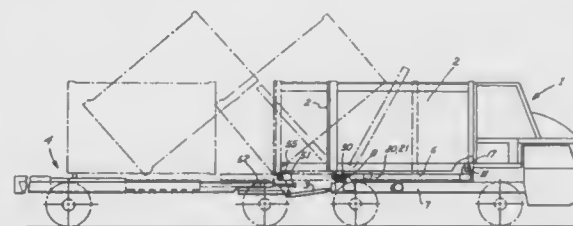
Filed Aug. 23, 1990, Ser. No. 572,177

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1989, 3927867

Int. Cl.⁵ B60P 1/64; B65F 9/00

U.S. Cl. 414-346

4 Claims



1. A truck for picking up, depositing and transporting containers which are adapted to be coupled to the truck, the truck comprises, in combination,
a chassis having a rear portion;
a pivoted frame pivotally connected and movable by a first hydraulic piston-cylinder with about a transverse axis disposed in the rear portion of the chassis;
a carriage movably mounted to the pivoted frame, the carriage adapted to be moved in a reciprocable fashion by a second hydraulic piston-cylinder unit and adapted to be coupled to a transport container by a hook to displace the transport container on the pivoted frame; and means for transferring the transport container from the truck to the ground or to a trailer connected to the truck, the transferring means comprising a means for pivotally moving the pivoted frame through an arc of 180°.

5,085,555

SPRING BIASED VEHICLE ACCESS RAMP

Roger Vartanian, Box 64, Saw Creek Estates, East Stroudsburg, Pa. 18322

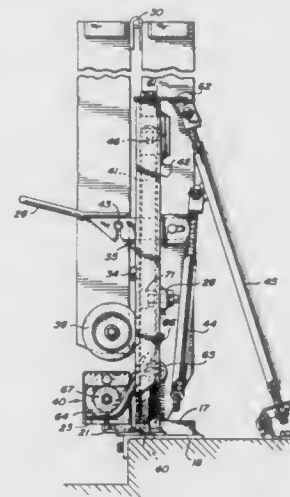
Continuation of Ser. No. 275,276, Nov. 23, 1988, Pat. No. 4,966,516. This application Jul. 18, 1990, Ser. No. 554,705

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.⁵ B60P 1/44

U.S. Cl. 414-537

10 Claims



1. An access ramp for a vehicle doorway, comprising:
a plate rigidly attachable along a horizontal edge of the doorway;
a ramp including a proximal section and a distal section

attached to one another at a hinge knuckle such that the proximal section and distal section are foldable in one direction at the hinge knuckle and become fixed in colinear alignment in an opposite direction when unfolded;
a hinge attached to the plate and to the proximal section of the ramp, the hinge defining a hinge axis along side edge of the doorway;

at least one spring biasing assembly having a housing rigidly attached to the plate and a helical spring disposed in the housing, the helical spring having a first end protruding along a first tangent of the helical spring and bearing against the proximal section of the ramp, and a second end protruding along a second tangent of the helical spring and bearing against one of the housing and the plate, the spring biasing assembly urging the proximal section of the ramp upwardly around the hinge axis and thereby biasing the ramp into a folded configuration in the vehicle doorway, the helical spring defining an axis parallel to the hinge axis and spaced from the hinge axis, and further comprising a contact stud including a roller on the proximal section of the ramp, the first end of the helical spring bearing against the proximal section of the ramp at the roller.

5,085,556

INDUSTRIAL ROBOT APPARATUS

Sadayuki Ohtomi, Inazawa, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

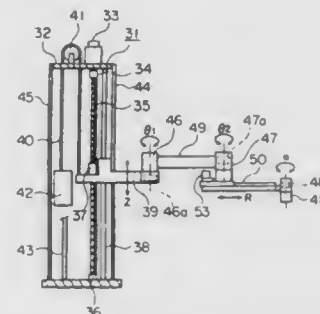
Filed Jun. 12, 1990, Ser. No. 536,868

Claims priority, application Japan, Jun. 14, 1989, 1-149535

Int. Cl.⁵ B25J 9/00

U.S. Cl. 414-744.3

3 Claims



1. An industrial robot apparatus for palletizing loads on pallets or depalletizing said loads from said pallets, comprising:
a robot body;
a slider supported on said robot body, said slider being movable in a first direction;
slider moving means for moving said slider;
a first arm, a proximal end of said first arm provided on one end of said slider, said first arm being rotatable parallel to a plane perpendicular to the first direction;
first rotation means provided on said proximal end of said first arm for rotating said first arm;
a second arm, a proximal end of said second arm provided below a distal end of said first arm, said second arm being rotatable parallel to the perpendicular plane and substantially rectilinearly extendible and retractable parallel to the perpendicular plane;
second rotation means provided on said proximal end of said second arm for rotating said second arm;
extension/retraction means for substantially extending said second arm or retracting said second arm to a position under said first arm;
a wrist provided on a distal end of said second arm, said wrist being rotatable parallel to the perpendicular plane and movable to a desired position for holding one of said loads by extending or retracting said second arm; and
third rotation means provided on said distal end of said

second arm for rotating said wrist, such that said wrist is positionable to said desired position over one of said pallets without said robot apparatus interfering with adjacent palletized loads.

5,085,557

LARGE PART ROLLOVER DEVICE

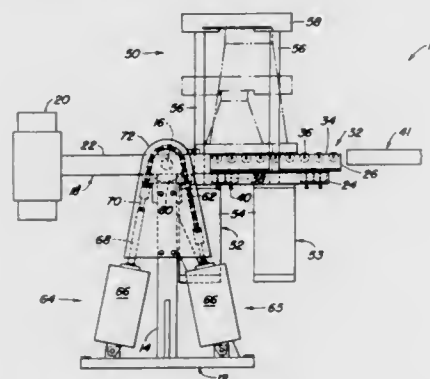
Sarkis A. Koltoonian, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 17, 1990, Ser. No. 628,244

Int. Cl.⁵ B65G 47/248

U.S. Cl. 414—778

7 Claims



1. A roll-over device comprising:
 - a support frame;
 - a roll-over frame pivotally supported by the support frame, the roll-over frame comprising a support plate, a counterweight mounted at an end of a beam which is attached to the support plate, a low friction conveyor member mounted on the support plate for slidably receiving a part to be rolled over, resilient means for resiliently coupling the conveyor member to the support plate, and an abutment member mounted on the support plate;
 - a clamping mechanism mounted on the support plate and operable to releasably hold the part on the roll-over frame, the part moving the conveyor member towards the support plate and the part engaging the abutment member upon actuation of the clamping mechanism; and
 - means for pivoting the roll-over frame.

5,085,558

WAFER HANDLING SYSTEM

Orest Engelbrecht, Ridgefield, Conn., assignor to SVG Lithography Systems, Inc., Wilton, Conn.

Division of Ser. No. 351,741, Apr. 17, 1989, Pat. No. 4,973,217,

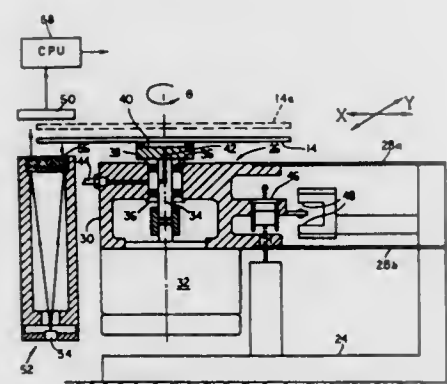
Division of Ser. No. 12,538, Feb. 9, 1987, Pat. No. 4,846,626.

This application Sep. 4, 1990, Ser. No. 577,209

Int. Cl.⁵ B65G 47/24

U.S. Cl. 414—786

3 Claims



1. A method of precisely positioning a semiconductor disc

having a center and edge and bearing Θ indicia on a transport stage prior to optical exposure in a lithographic process comprising the steps of:

- rotating the wafer on a spinner about an axis normal to its major plane;
- detecting the displacement of the wafer edge relative to a fixed spatial location during said rotating step;
- determining, from the edge displacement, the displacement of the wafer center along orthogonal X and Y axes from the axis of rotation;
- detecting the Θ indicia during said rotating step;
- stopping rotation of the wafer with its Θ indicia substantially located in a predetermined angular position;
- calculating orthogonal X and Y axes offsets to compensate for wafer center displacement and remaining displacement of the Θ indicia;
- positioning the transport stage based on said calculating step along orthogonal X and Y axes to compensate for wafer center displacement and for the remaining displacement of the indicia from the predetermined angular position; and
- depositing the wafer from the spinner onto the transport stage whereby said wafer is accurately positioned thereon in X, Y and Θ .

5,085,559

COMPOSITE VANE

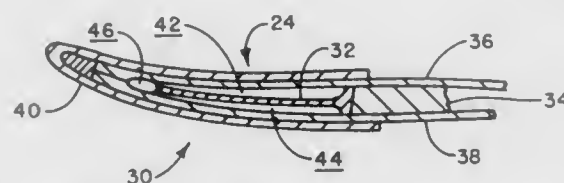
Lewis J. Stoffer, and Andrew MacGee, both of Cincinnati, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 16, 1990, Ser. No. 509,926

Int. Cl.⁵ F01D 5/08

U.S. Cl. 416—95

7 Claims



1. An improved composite airfoil, said improved composite airfoil providing anti-icing and foreign object damage protection, the improvement comprising:
 - a means for conducting heat to a leading edge of said airfoil, said means being composed of a metal, said means having composite skins thereon such that a plurality of air ducts are provided along the length of said means for conducting heat of said improved composite airfoil, said means for conducting heat being a metal dart comprising:
 - a leading edge, said leading edge having an aerodynamic shape;
 - a fin, said fin being connected to said leading edge at a rear section of said leading edge;
 - at least one dam, said at least one dam being connected to a rearward edge of said fin and extending perpendicularly therefrom in both directions; and
 - a plurality of opening means through said dart for the purpose of connecting the composite skins together, said composite skins and said dart forming a plurality of longitudinal hot air ducts.

5,085,560

LOW CONTAMINATION BLENDING AND METERING SYSTEMS FOR SEMICONDUCTOR PROCESSING

Raymon F. Thompson, and Aleksander Owczarz, both of Kalispell, Mont., assignors to Semitool, Inc., Kalispell, Mont.

Filed Jan. 12, 1990, Ser. No. 464,101

Int. Cl.⁵ F04B 9/08; G01F 11/08

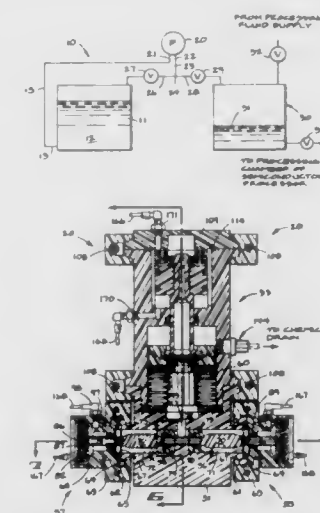
U.S. Cl. 417—53

8 Claims

7. A process for accurately blending at least two liquid

components including at least a first component and a second component, comprising:

- supplying a desired quality of the component from a first component supply container to a blending container;
- opening a recycle valve means to allow recycle flow of second component from a second component supply container through a pump and back to said second component supply container;
- pumping second component in said recycle flow using said pump which performs a pumping process comprising:
 - controlling an outlet valve solenoid to control pneumatic gas to an outlet valve actuator;
 - closing an outlet valve into an outlet valve closed position using said outlet valve actuator;
 - controlling an inlet valve solenoid to control pneumatic gas to an inlet valve actuator;
 - opening said inlet valve using said inlet valve actuator into an inlet valve open position;
 - controlling a bellows actuator solenoid to control pneumatic gas to a pneumatic bellows actuator;
 - actuating a pump bellows member using said bellows actuator to increase displacement of a pumping chamber;
 - controlling said inlet valve solenoid to control pneumatic gas to said inlet valve actuator;



- closing the inlet valve into an inlet valve closed position using the inlet valve actuator;
- controlling said outlet valve solenoid to control pneumatic gas to said outlet valve actuator;
- opening said outlet valve into an outlet valve open position using said outlet valve actuator;
- controlling said bellows actuator solenoid to control pneumatic gas to the pneumatic bellows actuator;
- actuating said pump bellows member using said bellows actuator to decrease displacement of a pumping chamber and discharge second component through the outlet valve;
- continuing said recycle flow for sufficient time to fill second component conduits with second component and remove entrained gas therefrom;
- closing said recycle valve means to discontinue recycle flow;
- opening a fluid delivery valve means which controls delivery of second component to said blending container;
- pumping second component to said blending container using said pumping process defined hereinabove;
- counting to indicate discharge cycles of the pump bellows after opening of the fluid delivery valve means to indicate the flow of the second component into the blending container;

controlling discharge of second component into the blending container using information from said counting step.

5,085,561

GAS REMOVAL PUMP FOR LIQUID

Hisashi Yano, Yokohama; Junsuke Yabumoto, Atsugi, and Akiharu Kitada, Kawasaki, all of Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan

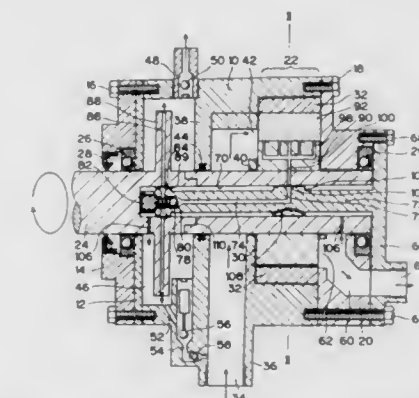
Filed Dec. 7, 1990, Ser. No. 626,613

Claims priority, application Japan, Dec. 12, 1989, 1-320508

Int. Cl.⁵ F04B 39/04

U.S. Cl. 417—313

21 Claims



1. A gas removable pump for liquid comprising:
 - a housing having an inlet for introducing a liquid containing gaseous contaminants therein and an outlet for feeding the liquid therefrom;
 - a drive shaft extending into said housing, said drive shaft having formed therein an axial bore;
 - a rotary pump disposed within said housing between said inlet and said outlet, said rotary pump including a rotor secured to said drive shaft for co-rotation therewith and a plurality of vanes extending outward from the rotor defining separator cell means for separating the liquid containing gaseous contaminants passing therethrough into a gas-rich liquid and a gas-poor liquid by centrifugal force upon rotation of said drive shaft;
 - a discharging chamber for receiving said gas-rich liquid defined within said housing, said discharging chamber being separated from said rotary pump by a partition;
 - a stationary shaft extending in said axial bore between said rotary pump and said discharging chamber;
 - connecting means formed in said drive shaft and said stationary shaft for selectively connecting each said separator cell means with said discharging chamber; and
 - ejecting means for ejecting into said discharging chamber said gas-rich liquid separated by said separator cell means.

5,085,562

MICROPUMP HAVING A CONSTANT OUTPUT

Harald van Lintel, Martigny, Switzerland, assignor to Westonbridge International Limited, Dublin, Ireland

Filed Apr. 4, 1990, Ser. No. 503,977

Claims priority, application Switzerland, Apr. 11, 1989, 01369/89

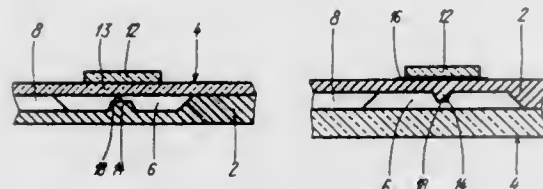
Int. Cl.⁵ F04B 35/04

U.S. Cl. 417—413

21 Claims

1. A micropump comprising a plurality of wafers sealed to one another so as to form a pumping chamber defined by two bonded wafers defining a cavity formed by etching at least one of said bonded wafers, at least one inlet valve and at least one outlet valve enabling the pumping chamber to communicate with one inlet channel and one outlet channel respectively, said micropump also comprising a control element arranged to resiliently displace a part of one of said bonded wafers constituting a flexible wall of the pumping chamber between a first

position in which said flexible wall is relatively far from an opposing wall of the pumping chamber when said control element is not active and a second position in which said flexible wall is closer to said opposing wall when said control



element is active, the displacements of said flexible wall causing suction of a fluid into the pumping chamber or the delivery thereof, and said pumping chamber comprising a stop means which defines said second position of said flexible wall.

5,085,563

RECIPROCATING PUMP OR MOTOR

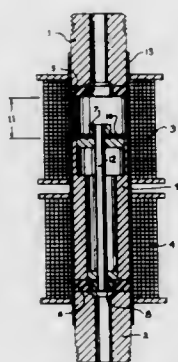
Wayne M. Collins, and Michael R. Collins, both of Oconomowoc, Wis., assignors to Collins Development Corporation, Milwaukee, Wis.

Filed Jan. 26, 1990, Ser. No. 470,909

Int. Cl.⁵ F04B 17/04

U.S. Cl. 417-417

10 Claims



1. A linear motion reciprocating pump comprising a cylindrical housing, a magnetically permeable plunger mounted for reciprocal motion in said housing, said plunger including means to permit the passage of fluid from one end of said housing through said plunger to the other end of said housing, a power coil mounted on said one end of said housing for attracting said plunger toward said one end, a reset coil mounted on said other end of said housing for attracting said plunger toward said other end of said housing, and an electrical circuit operatively connected to energize said coils, said circuit including means for alternately controlling the energization of said coils in phase to reciprocate said plunger in said housing whereby the voltage across the energized coil crosses through zero, causing said plunger to be expelled from said energized coil just prior to energization of the other coil.

5,085,564

FLEXIBLE DRIVE SHAFT

Roger L. Naylor, Lancashire, and David K. Morris, Warrington, both of England, assignors to Mono Pumps Limited, Audenshaw, United Kingdom

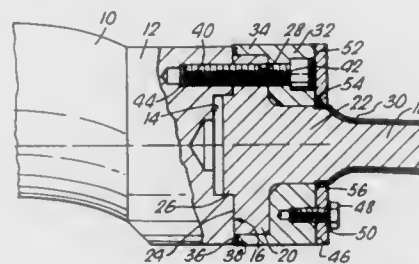
Filed May 15, 1990, Ser. No. 523,434

Claims priority, application United Kingdom, May 17, 1989, 8911304

Int. Cl.⁵ F04C 2/00

U.S. Cl. 418-48

9 Claims



3. A flexible drive shaft for a helical gear pump, said drive shaft comprising an elongate metal shaft having first and second ends; an enlarged integral head formed on at least one of the first and second ends of said shaft; means defining at least one hole passing axially through said enlarged head and adapted to cooperate with fixing means comprising means defining at least one bolt adapted to pass axially through said at least one hole and be screwed into said one end of the rotor effective to firmly hold said enlarged head in abutting, driving engagement with the rotor of said helical gear pump; connecting means effective to connect to other end of the drive shaft to a drive motor and a plastics material coating extending along substantially the full length of said shaft between said fixing means and said connecting means.

5,085,565

AXIALLY COMPLIANT SCROLL WITH ROTATING PRESSURE CHAMBERS

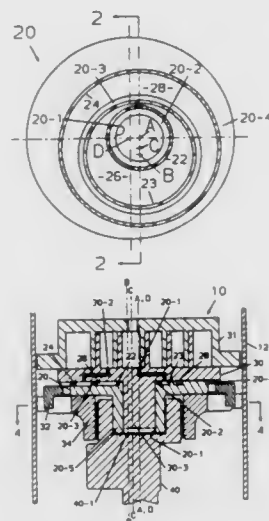
Thomas R. Barito, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 24, 1990, Ser. No. 586,643

Int. Cl.⁵ F04C 18/04

U.S. Cl. 418-55.4

14 Claims



1. In a scroll compressor means having a fixed scroll, an orbiting scroll having an axis, a crankshaft rotatable about an axis spaced from said axis of said orbiting scroll for driving said orbiting scroll, axial compliant means comprising:

seal plate means rotatably driven by said crankshaft about said axis of said crankshaft; seal means carried by said seal plate means and including an inner seal having an axis generally coaxial with said axis of said orbiting scroll and an outer seal having an axis spaced from said axes of said crankshaft and said orbiting scroll; said seal means, said seal plate means and said orbiting scroll coacting to define pressure pocket means eccentrically located with respect to said axes of said crankshaft and said orbiting scroll such that said pressure pocket means rotate with respect to said axis of said orbiting scroll.

5,085,566

APPARATUS FOR MANUFACTURING ORIENTED MULTI-PLY TAPES

Frank Bosse, Tecklenburg; Karl-Heinz Lage, and Rainer Klose, both of Lengerich, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

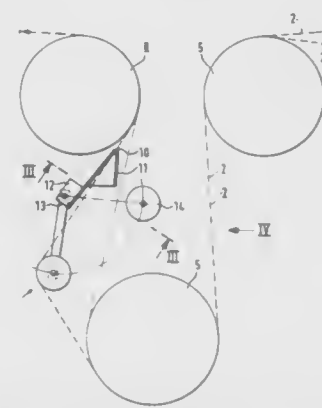
Filed Dec. 18, 1989, Ser. No. 451,344

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, 3842764; Mar. 20, 1989, 3909092

Int. Cl.⁵ B29C 53/02

U.S. Cl. 425-66

3 Claims



1. An apparatus for manufacturing oriented tapes folded on themselves, said apparatus comprising a stretching and setting mechanism including godets, over which a tape is caused to move in the form of consecutive loops, two of said godets folding means interposed between two of said godets for folding of the tape, said folding means including a bottom plate extending substantially parallel to incoming tape, and shell-like folding portions laterally adjoining said bottom plate and having openings facing each other and having a radius of curvature decreasing in the direction of travel of the tape and in said direction converging towards each other so that a final distance between said folding portions is approximately as large as a width of a non-folded middle portion of the tape.

5,085,567

EXTRUSION SYSTEM FOR PLASTICS PIPES

Neumann, Ulrich, Bad Oeynhauser, Fed. Rep. of Germany, assignor to INOEX GmbH Innovationen und Ausrichtungen für die Extrusionstechnik, Bad Oeynhausen, Fed. Rep. of Germany

Filed Feb. 26, 1990, Ser. No. 485,160

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1989, 3906363

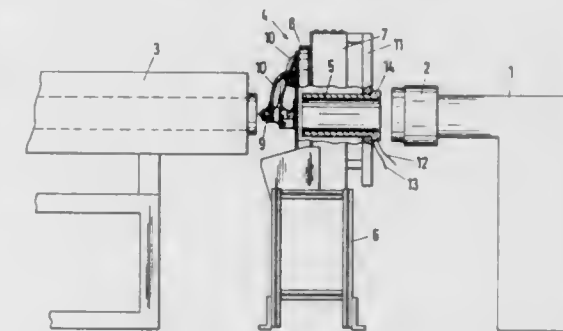
Int. Cl.⁵ B29C 47/90

U.S. Cl. 425-71

3 Claims

1. Device for producing hollow plastic pipes having a predetermined wall thickness, comprising extruding means for producing soft hollow plastic tubing having a wall thickness from a raw material, a cooling means disposed downstream of said extruding means

for hardening said tubing into said plastic pipes after the wall thickness of said plastic tubing has been calibrated, independent calibrating sleeve means disposed between said extruding means and said cooling means for adjusting the wall thickness of said tubing, said calibrating sleeve means being separated from said extruding means and said cooling means, said calibrating sleeve means including an inner wall defining a central passage for receiving said tubing, said calibrating sleeve means having a first channel means distributed along said inner wall for applying a liquid directly to said tubing for lubricating the tubing with respect to said inner wall and for cooling said tubing and a second channel means distributed along said inner wall



which is spatially separate from but interleaved with said first channel means for applying a vacuum to said tubing to draw the tubing against said inner wall simultaneously with said cooling and lubricating for enabling said tubing to leave said calibrating sleeve with a uniform temperature and with adequate dimensional stability to enable it to be measured with respect to its thickness, said first and second channel means being open to said central passage and measuring means disposed in a gap between said calibrating sleeve means and said cooling means for measuring the thickness of the wall of said tubing after it has passed through said calibrating sleeve means.

5,085,568

POUR HEAD SEAL ASSEMBLY FOR A MOLD FOR FORMING COMPOSITE ARTICLES

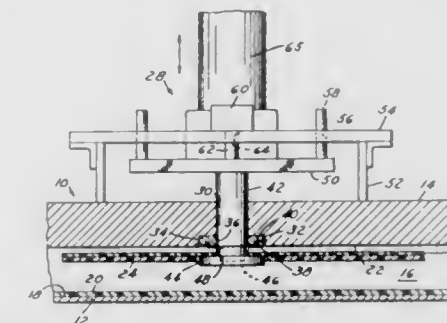
Michael Turgeon, Rochester, and Jeffrey Kielinen, Epping, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Feb. 25, 1991, Ser. No. 659,629

Int. Cl.⁵ B29C 39/10, 39/24

U.S. Cl. 425-125

11 Claims



1. For use with a mold including a cavity part and a lid joined together to form a cavity with a mold surface, a pre-formed shell supported by the mold surface, and a film layer supported by said lid, a pour head seal assembly comprising a first opening formed through one of the cavity part and the lid, a recess formed around said opening within said cavity, a backing ring mounted in said recess, an O-ring seal mounted on

said backing ring, a nozzle slidably mounted through said opening and said backing ring and having an end thereof extended into said cavity, a clamp plate collar mounted on the end of said nozzle within said cavity, a source of supply of foam precursors operatively connected to said nozzle exterior of said mold, a second opening formed in one of said preformed shell and said film layer for mounting around said nozzle intermediate said clamp plate collar and said O-ring seal, and cylinder means operatively connected to said nozzle for selectively moving said clamp plate collar toward said O-ring seal to confine said one of said preformed shell and said film layer therebetween to eliminate foam leakage around said nozzle.

5,085,569

DEVICE FOR RECOVERING, BY MELTING, THE METAL CONSTITUTING A FUSIBLE CORE

Yves Dauphin, Brussels, Belgium, assignor to Solvay & Cie (Société Anonyme), Brussels, Belgium

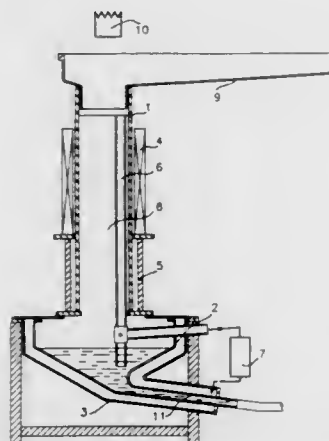
Filed Jun. 11, 1990, Ser. No. 536,344

Claims priority, application France, Jun. 12, 1989, 89 07842

Int. Cl.⁵ B29C 35/02, 71/00; H05B 6/10

U.S. Cl. 425—174.8 R

5 Claims



1. A device for recovery, by melting, of metal constituting a fusible core employed for moulding a hollow plastic article, comprising a bath of a liquid heated to a temperature at least equal to the melting temperature of said metal, means for introducing and holding the hollow article in said bath and means for heating, using electrical induction, the fusible core of the hollow article immersed in the bath, said bath being contained in a leakproof enclosure made of an electrically nonconductive material which withstands the temperature of the bath and said means of heating using electrical induction being arranged outside and around said enclosure.

5,085,570

PRESS FOR FORMING BODIES

Johann Leinweber, Wr. Neustadt, Australia, assignor to Leinweber Maschinen Gesellschaft M.B.H. & Co. KG, Wr. Neustadt, Australia

Filed Mar. 4, 1991, Ser. No. 664,062

Int. Cl.⁵ B29C 43/00

U.S. Cl. 425—195

5 Claims

1. A press for making rigid bodies out of fluent particles, the press comprising:

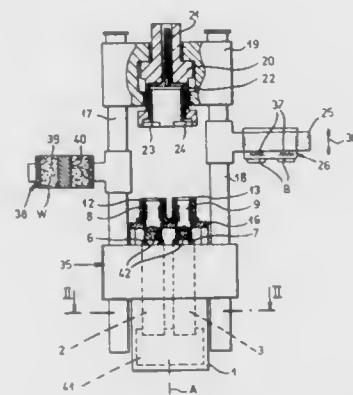
- a frame;
- a cylinder block in the frame formed with a plurality of parallel cylinder bores;
- respective pistons axially displaceable in the bores of the block;
- respective little piston plungers fixed releasably to and projecting outward from the pistons;
- respective little dies mounted on the frame and forming

cavities in which the little plungers are complementarily engageable, the little plungers being displaceable between advanced positions generally filling the respective dies and retracted positions withdrawn inside the respective dies;

means including a holder for positioning workpieces of the particles in partially compacted condition in line with the cavities of the little dies;

means including respective little pushout plungers displaceable on the frame for pushing the workpieces out of the holders into the respective dies;

a counter piston displaceable hydraulically on the frame against the cavities after the workpieces have been pushed thereinto;



means for pressurizing the cylinders of the block and thereby pushing the little piston plungers into the cavities and compressing the workpieces therein against the counter piston;

a bridge element releasably engageable with at least two of the pistons instead of two of the little piston plungers;

a relatively big piston plunger carried on the bridge element instead of the little piston plungers;

a relatively big die mountable on the frame instead of the little dies and forming a cavity in which the big piston plunger is complementarily engageable; and

a relatively big pushout plunger displaceable on the frame instead of the little pushout plungers and operable like the little pushout plungers to push a workpiece out of the holder into the relatively big die.

5,085,571

MOLD CONTAINING AN ADJUSTABLE KEY

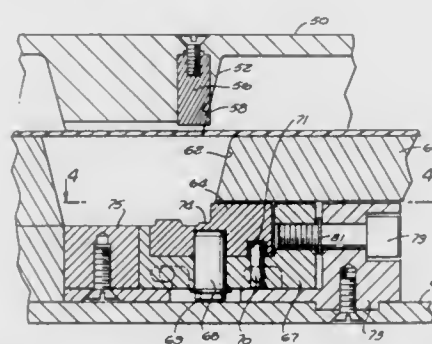
Wayne Congleton, Walnut, Calif., assignor to Dolco Packaging Corporation, Sherman Oaks, Calif.

Filed Dec. 11, 1989, Ser. No. 449,657

Int. Cl.⁵ B29C 43/40, 51/32

U.S. Cl. 425—292

9 Claims



1. In a mold for forming a contoured container with an opening having a lower edge from a sheet of deformable material, said mold including

upper and lower mold parts having die surfaces in conforming relation to one another, shaped to define the contours of said container;

means for supporting said mold parts, spaced from one another a distance sufficient to permit insertion of said sheet between said mold parts;

means for closing said mold parts toward one another along a path of travel to form said container; and

upper and lower keys mounted in said upper and lower mold parts, respectively, where said keys have flat shear surfaces, and where said keys are mounted so that said shear surfaces confront each other to form said opening as said mold parts close,

where the improvement comprises at least one of said keys is mounted so that its shear surface pivots on a plane normal to said path of travel.

5,085,572

MULTIPLE TIP TORPEDO HEATER

David Leverenz, Elk Grove Village, Ill., assignor to Fast Heat Element Manufacturing Co., Inc., Elmhurst, Ill.

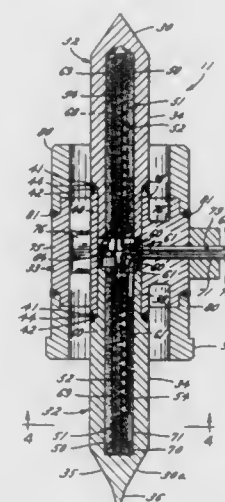
Continuation-in-part of Ser. No. 179,531, Apr. 8, 1988, Pat. No. 4,913,912, which is a continuation-in-part of Ser. No. 913,020, Sep. 29, 1986, Pat. No. 4,755,126, which is a continuation-in-part of Ser. No. 817,008, Jan. 8, 1986, abandoned. This application

Apr. 2, 1990, Ser. No. 502,903

Int. Cl.⁵ B29C 45/22

U.S. Cl. 425—549

12 Claims



1. A torpedo heater assembly comprising an elongated body having an exposed outer cylindrical surface with tips at opposite ends thereof over which a fluid material may be directed at an elevated temperature, said body being formed with an internal bore adjacent each said tip, electrically operated means disposed in the bore of each said tip for heating said tips, means for electrically coupling said heating means to a power source, means for supporting said torpedo heater body concentrically in a fluid passageway bore, said supporting means including an outer collar portion surrounding said body in spaced relation thereto and having an axial length sufficiently long for providing stable support for said elongated body and a plurality of circumferentially spaced radial elements concentrically supporting said torpedo heater body within said outer collar portion while permitting passage of fluid material between said body and outer collar portion, and said outer collar portion and radial supporting elements being made of a softer metal material than said tips.

5,085,573

HOT SURFACE IGNITION SYSTEM FOR A GAS FURNACE, CONTROL DEVICE THEREFOR AND METHODS OF MAKING THE SAME

Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 356,871, May 24, 1989, Pat. No. 4,976,605.

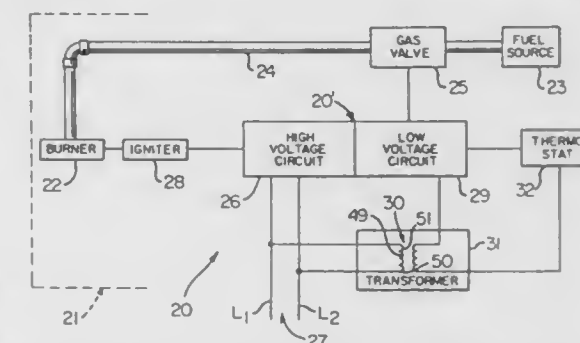
This application Oct. 1, 1990, Ser. No. 591,551

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.⁵ F23N 5/00

U.S. Cl. 431—6

6 Claims



1. In a method of making a hot surface ignition system for a gas furnace or the like, said method comprising the steps of forming said system to comprise a burner means, a settable thermostat means, an electrically operable gas valve, control means, and an electrically operable hot surface igniter means disposed so as to be in the path of gas issuing from said burner means that is adapted to be fed said gas from a source thereof through said gas valve when said control means has been activated by said thermostat means to operate said igniter means and said gas valve in a certain sequence, forming said control means to have lockout means for deactivating said system should ignition of said gas issuing from said burner means not take place by the end of said certain sequence, forming said control means to have resetting means for causing said control means to be reactivated to be adapted to repeat said certain sequence of said system when said resetting means is activated, forming said control means to have means for selecting said certain sequence to have one or more attempts of said control means to ignite said gas at said burner means before said lockout means can deactivate said system, forming said means for selecting said certain sequence to comprise a clock means having an input means, and forming said control means to have an electrical line means for interconnecting said thermostat means to said input means of said clock means, the improvement comprising the steps of forming said resetting means to comprise a manually operated electrical switch means that is remote from said thermostat means and which must be manually moved to a certain position thereof to activate said resetting means, forming said resetting means to comprise a latching relay means having a coil means disposed in said line means, and forming said control means to cause said coil means of said relay means to be operated to one condition thereof that deactivates said system when ignition of said gas issuing from said burner means does not take place at the end of said certain sequence.

5,085,574

FAIL-SAFE VALVE RELAY DRIVER CIRCUIT FOR GAS BURNERS

Larry E. Wilson, Marion, Ind., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed Oct. 12, 1989, Ser. No. 420,203

Int. Cl.⁵ F23N 5/20

U.S. Cl. 431—6

6 Claims

1. An electrical fail-safe valve drive circuit for a gas valve

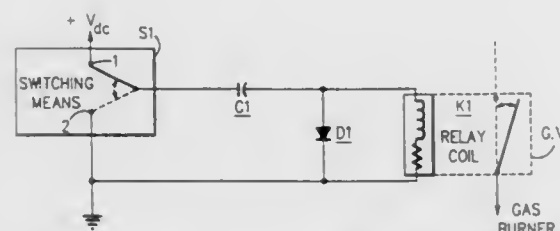
supplying gas to a gas burner controlling the flow of gas to the burner through the valve, comprising:

switching input drive signal means (S1) in operation supplying a cyclical DC input signal having a frequency and voltage amplitude with respect to a reference point (e.g. "ground");

a capacitive element (C1) and, in series therewith, a valve relay inductance coil (K1) controlling the opening of the valve, said inductance coil being connected between said capacitive element and said reference; said capacitive element being charged up during a portion of the cycle of the input signal and discharging during another portion of the cycle of the input signal, the current in said relay coil being replenished while said capacitive element discharging; and

a uni-directional current element (D1) in series with said capacitive element to said reference and in parallel across said inductance coil;

said switching means (S1) being connected across one side of said capacitive element and said reference and one side of said inductance coil; and operating at a sufficiently high rate that the replenished current in said relay coil does not significantly decay during the charging of the capacitive element; said switching means, said capacitive element, said relay coil, and said uni-directional current element being the only operative circuit elements in the fail-safe valve drive circuit.



5. A method of driving an electrically controlled gas valve supplying gas to a gas burner controlling the flow of gas to the burner through the valve in a fail-safe manner, through a driver circuit including

switching input drive signal means (S1) in operation supplying a cyclical DC input signal having a frequency and voltage amplitude with respect to a reference point (e.g. "ground");

a capacitive element (C1) and, in series therewith, a valve relay inductance coil (K1) controlling the opening of the valve, said inductance coil being connected between said capacitive element and said reference; and

a uni-directional current element (D1) in series with said capacitive element to said reference, and in parallel across said inductance coil;

comprising the following steps:

(a) charging said capacitive element during a portion of the cycle of the input signal and discharging it during another portion of the cycle of the input signal;

(b) replenishing the current in said relay coil while said capacitive element is discharging;

(c) operating the switching means at a sufficiently high rate that the replenished current in said relay coil does not significantly decay during the charging of the capacitive element; and

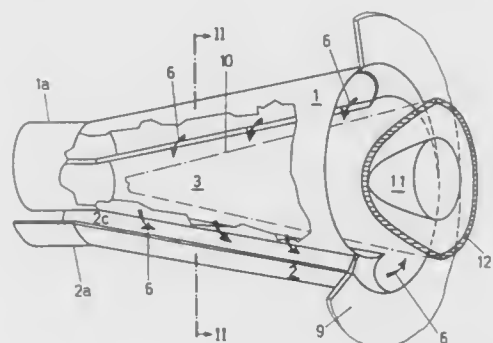
(d) utilizing only said switching means, said capacitive element, said relay coil and said uni-directional current element as the total operative elements in said driver circuit.

5,085,575 METHOD FOR PREMIXED COMBUSTION OF A LIQUID FUEL

Jakob Keller, Dottikon, and Jürgen Haumann, Klingnau, both of Switzerland, assignors to ASEA Brown Boveri, Baden, Switzerland

Filed Dec. 19, 1990, Ser. No. 630,239
Claims priority, application Switzerland, Dec. 19, 1989, 4543/89

U.S. Cl. 431—8 Int. Cl.⁵ F23C 5/00 4 Claims



1. A method for premixed combustion of a fuel in a burner having a first partial conical body having a longitudinal centerline and a second partial conical body having a longitudinal centerline, said first and second partial conical bodies being positioned adjacent one another with the respective centerlines thereof in parallel offset relation so as to form a substantially conical core body having two longitudinally extending tangential inlet openings for feeding into an internal space of the core body, said burner further including a duct communicating with each of said inlet openings and at least one liquid fuel nozzle in each said duct, said method comprising the steps of:

discharging liquid fuel from each of said nozzles; and permitting said fuel to be vaporized in the respective ducts to form a gaseous fuel in the respective ducts, the gaseous fuel entering the internal space of the core body and being discharged and combusted to form a flame front at a large diameter end of said core body,

wherein said ducts are positioned external to said core body such that said partial conical bodies screen the discharged liquid from radiation from the flame front and such that only the evaporated gaseous fuel enters the radiation region of the flame.

5,085,576 APPARATUS AND METHOD FOR DETECTING LEAKS IN A SYSTEM FOR DELIVERING GASEOUS FUEL

Ulrich Bonne, Hopkins; George J. Tate, Edina, and Edward Schwarz, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 10, 1990, Ser. No. 550,784
Int. Cl.⁵ F23N 5/24

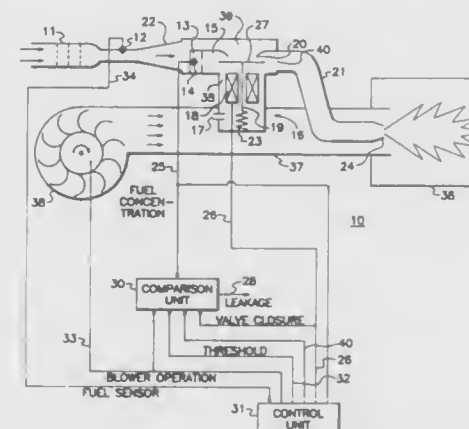
U.S. Cl. 431—22 16 Claims

1. In a combustion system of the type having a combustion chamber; a source of pressurized gaseous fuel; an air duct for carrying combustion air to the combustion chamber; means for inducing air flow in the air duct to the combustion chamber; a fuel injection nozzle within the air flow; a valve for regulating flow of the fuel, said valve closing responsive to a closure signal; a first pipe conducting the fuel from its source to the valve; a second pipe conducting the fuel from the valve to the nozzle; and a control unit providing the closure signal to the valve; an improvement for sensing leaking of fuel by the valve, comprising in the valve, an outlet chamber and means for injecting a preselected flow rate of air into the outlet chamber, the improvement further comprising

a) a sensing chamber in indirect flow communication with at

least on of the second pipe and the outlet chamber of the valve;

b) a sensor within the sensing chamber, said sensor providing a sensor signal having a value representative of the fuel concentration in the air within the sensing chamber; and

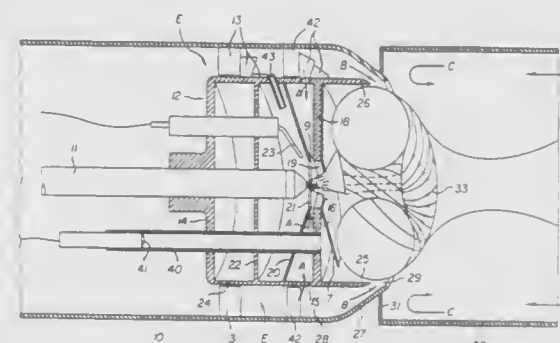


c) comparison means receiving the sensor and closure signals for providing a leakage signal responsive to both the closure signal and a predetermined deviation in the value of the sensor signal from a predetermined standard.

5,085,577 BURNER WITH TOROIDAL-CYCLONE FLOW FOR BOILER WITH LIQUID AND GAS FUEL

Rudolf Müller, Aigle, Switzerland, assignor to MEKU Metallverarbeitung GmbH, Daugingen, Fed. Rep. of Germany
Filed Dec. 20, 1990, Ser. No. 630,992

U.S. Cl. 431—265 11 Claims



1. A fuel burner apparatus for establishing toroidal-cyclone flow of liquid fuel and comburant gas comprising:

a generally cylindrical outer shell;

a generally cylindrical inner shell mounted coaxially in the outer shell and providing an annular space therebetween for passage of comburant gas;

said inner and outer shells having open forward downstream ends comprising means for providing a constricted annular gas discharge opening for directing gas toward the axis of said shells;

means in the space between said inner and outer shells for causing gas to swirl in said space in its passage to said constricted annular opening;

a nozzle for supplying fuel extending coaxially within the inner and outer shells upstream of said air discharge opening;

plates means extending across the end of said inner shell remote from said air discharge opening for preventing entry of gas into said inner shell through said remote end; means adjacent said fuel nozzle for initiating combustion; a baffle in said inner shell upstream of the comburant gas discharge opening and downstream of said fuel nozzle

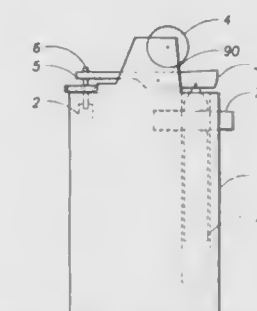
extending generally transversely of the axis of said shells and having a central orifice, and radial slots therethrough inclined to the plane of said baffle for causing comburant gas passing through said slots in said baffle to swirl; and means for enabling flow of comburant gas from the space between said inner and outer shells into a space in said inner shell upstream of said baffle for passage into and through said slots in said baffle; whereby swirling gas passes through said constricted annular opening and aspirates swirling comburant-gas which has passed through said slots in said baffle.

5,085,578 CHILD-RESISTANT LIGHTER WITH GAS AND SPARK CONTROL

Robert M. Hunter, 320 S. Willson Ave., Bozeman, Mont. 59715
Continuation-in-part of Ser. No. 421,786, Oct. 16, 1989, Pat. No. 5,017,128. This application Oct. 9, 1990, Ser. No. 594,091

The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.
Int. Cl.⁵ F23D 11/36

U.S. Cl. 431—277 9 Claims



1. A flint and spark wheel lighter improved to provide child resistance having a lighter body, a portion of which contains a compressed, flammable fluid, a valve on an opening in said body portion that allows the fluid to discharge from said body portion, depressible means for opening and closing said valve, and rotatable means for igniting said discharged fluid, the improvement comprising

means for preventing the rotation of said rotatable means for igniting, said means for preventing being attached to said means for opening and closing said valve, and said means for preventing being engagable with said rotatable means for igniting,

wherein said means for preventing allows the rotation of said rotatable means for igniting only when said depressible means for opening and closing said valve is depressed and said means for preventing is disengaged from said rotatable means for igniting.

5,085,579 POWERED CHAMBER COMBUSTION SYSTEM AND BURNER THEREFOR

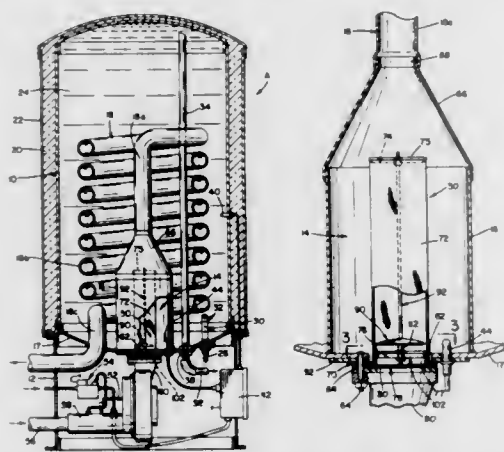
Henry J. Moore, Jr., Playa Del Rey, and Bijan Gidanian, Granada Hills, both of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio

Filed Mar. 25, 1991, Ser. No. 674,124
Int. Cl.⁵ F23D 3/40

U.S. Cl. 431—326 47 Claims

1. A powered assist type gas burning heating apparatus comprising an outer chamber, a closed inner combustion chamber sealed within said outer chamber, a burner comprising a burner tube disposed vertically within said combustion chamber and having an open lower end, a closed upper end, and a multiplicity of fine openings in the wall thereof, a blower for forcing a combustible gas/air mixture upwardly into the said burner tube through the said lower end thereof and out

through the said burner tube wall openings into the said combustion chamber, and igniter means located within the said combustion chamber at the bottom region thereof for igniting the said combustible gas/air mixture therein, said burner tube having a deflector plate supported in a transverse position therein for free vertical movement in said transverse position from a lowered inoperative idle position in said burner tube to an upper operative position therein by the pressure thereagainst of the said combustible gas/air mixture as it is forced



upwardly into the burner tube by said blower at the start of a heating cycle of the said apparatus, said deflection plate operative to be moved part way upwardly in the said burner tube by the combustible gas/air mixture initially entering the bottom of the burner tube from the said blower and to thereby deflect laterally out through the said burner tube openings at the bottom region of the burner tube and into the bottom region of the said combustion chamber the said initially entering combustible gas/air mixture to cause immediate ignition thereof in said combustion chamber by the said igniter means.

5,085,580

PREHEATER FOR FLAT GLASS SHEETS

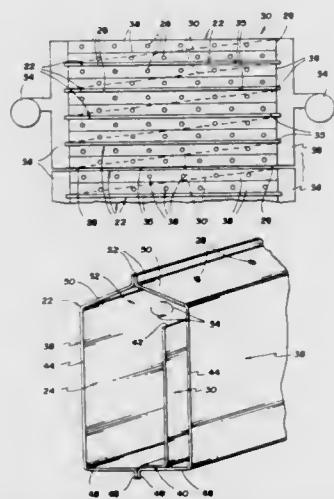
Pauli T. Reunamaki, Tampere, Finland, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Nov. 30, 1990, Ser. No. 621,028

Int. Cl.⁵ F27B 9/28

U.S. Cl. 432—59

10 Claims



1. A preheater for preheating flat glass sheets prior to further heating to a higher temperature within a furnace, the preheater comprising:

a conveyor for conveying a flat glass sheet to be preheated

in a direction of conveyance along a plane of conveyance; and

a pair of opposed forced convection heaters each of which includes a plurality of elongated housings that extend transversely with respect to the direction of conveyance, each elongated housing defining a plenum and having opposite ends through which hot gas is supplied from opposite directions into the plenum, each elongated housing having an array of outlets that face the plane of conveyance to deliver the hot gas from the plenum to the conveyed flat glass sheet, each elongated housing including an elongated baffle that extends diagonally within the plenum between the opposite ends of the housing, and each baffle being spaced from the outlets of the housing such that the plenum has a mixing chamber where the hot gas supplied from both directions mixes prior to flow through the outlets in a manner that provides uniform flow of hot gas through the outlets between the housing ends.

5,085,581

METHOD AND APPARATUS FOR REMOVING VOLATILE HYDROCARBONS FROM PARTICULATE SOILS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

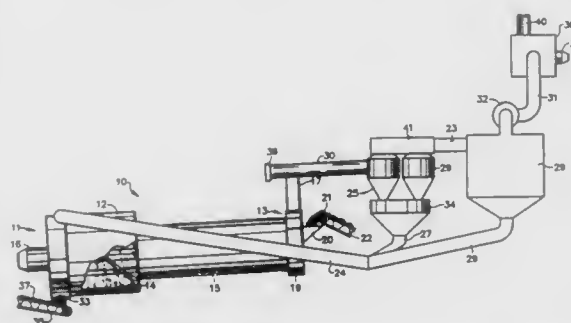
Division of Ser. No. 395,604, Aug. 18, 1989, Pat. No. 4,957,429.

This application May 24, 1990, Ser. No. 528,689

Int. Cl.⁵ F27B 7/00

U.S. Cl. 432—103

7 Claims



1. Apparatus for heating solid particulate mineral compositions comprising:

a counterflow rotatable drum having a first end and an opposite second end, a first portion of said drum extending from said first end for a first length and having a first diameter along said first length, and

a second portion of said drum secured to and extending from said first portion to said second end for a second length and having a second diameter along said second length, said second diameter being less than said first diameter,

a burner adjacent said first end for introducing and directing hot gases of combustion into said first portion of said drum toward said second end, means for introducing particulate composition into said drum at said second end, means for directing said particulate composition along said drum from said second end toward said first end, and means for recovering composition at said first end,

means for removing a gaseous mixture of organic volatiles, gases of combustion and fine particles of said particulate composition adjacent said second drum end,

means for separating fine particles of said particulate composition from said gaseous mixture, and

means for returning the separated fine particulate composition particles to said first portion of said drum.

5,085,582

SILICON NITRIDE CONTAINERS FOR THE SINTERING OF SILICON NITRIDE CERAMICS

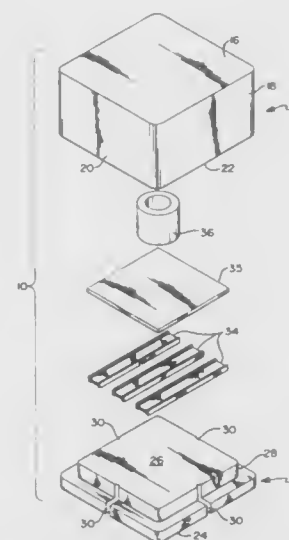
James P. Edler, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 24, 1990, Ser. No. 557,520

Int. Cl.⁵ F27B 14/00

U.S. Cl. 432—156

21 Claims



1. An enclosable vessel for containing silicon nitride article during sintering in a furnace to protect the silicon nitride article from thermal decomposition and contamination reactions with furnace materials, comprising:

a closable walled container formed of silicon nitride having an opening to allow interior placement of the silicon nitride article within the walled container, wherein said container is usable in said furnace for sintering a silicon nitride article such that the closable walled container fits inside the furnace and affords protection to the silicon nitride article being sintered by enclosing it and protecting the article from contact with thermally decomposed material from the furnace.

5,085,583

PORTABLE LOADMAKE/LOADBREAK SWITCH AND LIVELINE EYEBOLT TERMINAL CLAMP

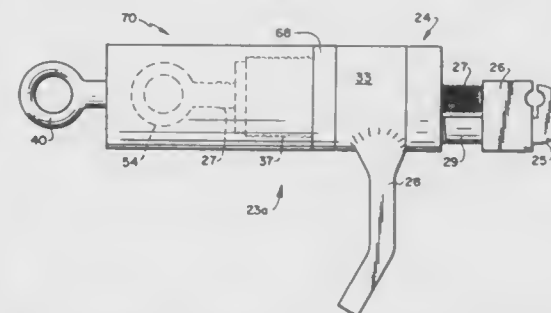
Warren E. Amos, 1528 Hybla Rd., Richmond, Va. 23236, and Michael Chupka, 3601 Stoney Ridge Rd., Midlothian, Va. 23112

Filed May 10, 1991, Ser. No. 698,086

Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—479

17 Claims



10. A loadmake/loadbreak switch assembly comprising: first and second terminal clamps, each of the terminal clamps comprising:

a said first part, comprising clamping jaws and a means for operating the clamping jaws, the clamping jaws being

closed when the means for operating the clamping jaws is rotated in a first direction with respect to the clamping jaws; and

a said second part, which includes a securing means for securing said second part to said first part such that when said second part is secured to said first part a rotation of said second part in a direction opposite to said first direction leaves the means for operating the clamping jaw stationary with respect to the clamping jaws;

first and second electrically conducting leads;

a high amperage switch;

an operating handle for opening and closing the high amperage switch;

a fuse; and

wherein the said first part of the first terminal clamp, the first lead, the said first part of the second terminal clamp, the second lead, the high amperage switch and the fuse are connected in series such that an electrical connection is established from the said first part of the first terminal clamp, through the first lead, through the high amperage switch, through the fuse, through the second lead, and to the said first part of the second terminal clamp when the operating handle is positioned to close the high amperage switch.

5,085,584

INTRAORAL DISCLUDER DEVICE AND METHOD

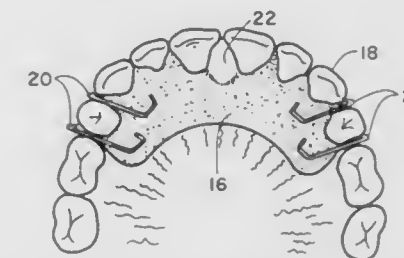
James P. Boyd, 9355 Vervain St., San Diego, Calif. 92129

Filed Jul. 1, 1991, Ser. No. 723,900

Int. Cl.⁵ A61C 3/00

U.S. Cl. 433—6

6 Claims



1. An intraoral discluder device which comprises:

a plate configured to lie adjacent to the interior surface of the upper anterior teeth of a patient;

a dome on said plate adapted to extend toward the lower anterior teeth when said plate is in place in said patient's mouth;

said dome configured to contact at least one lower anterior tooth when in place in said patient's mouth prior to any contact between the upper and lower posterior teeth; and at least one orthodontic wire means for securing said plate in place in said patient's mouth.

5,085,585

DENTAL MEDICAMENT APPLICATOR AND METHOD OF USE

Alan W. Zimble, 6 McDaniel Ave., Wilmington, Del. 19803

Filed Feb. 5, 1991, Ser. No. 650,627

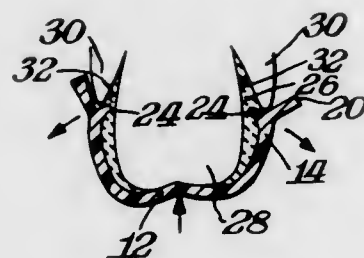
Int. Cl.⁵ A61G 17/02; A61C 5/00

U.S. Cl. 433—80

3 Claims

1. A customized dental medicament applicator comprising a trough shaped body member made of a resilient material and having a U-shaped base portion, a peripheral wall extending outwardly along the complete periphery of said base portion, said peripheral wall including an apical edge and a labial wall portion and an oppositely disposed lingual wall portion said labial wall portion having an outer surface and an inner surface, said lingual wall portion having an outer surface and an inner surface, said inner surfaces being contoured to conform to the anatomy of the teeth of the individual user, the contour

of each of said inner surfaces including means in the form of a peripheral collar located near said apical edge to be positioned at the gum pockets when said applicator is mounted to the teeth, said collar having a wedge shaped elevational cross section, said wedge shaped collars on said lingual wall portion and on said labial wall portion being inclined toward each, each of said wedge shaped cross sections having a point disposed for penetrating the gum pocket, the distance between



said lingual wall portion and said labial wall portion at said points of said collars being closer than the distance between said wall portions immediately above and immediately below said collars at the anatomical area of each tooth whereby said points of said collars may be disposed in the gum pockets on each side of each tooth so that a medicament in said member may be forced along the teeth and into the gum pockets when said applicator is snapped on to the teeth.

5,085,586

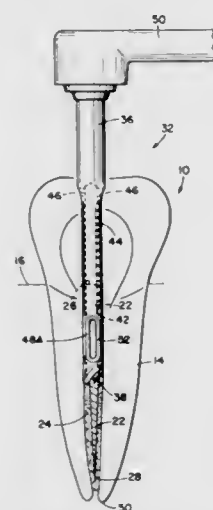
METHOD AND APPARATUS FOR INSTALLING A POST IN A TOOTH HAVING AN EXISTING ENDODONTIC OBTURATOR THEREIN

William B. Johnson, 5010 E. 68th St., Suite 104, Tulsa, Okla. 74136

Filed Aug. 28, 1990, Ser. No. 574,214
Int. Cl.⁵ A61C 5/02

U.S. Cl. 433—224

17 Claims



1. A method of installing a post in a tooth having a metal obturator therein comprising:
drilling a borehole in the tooth with a tubular burr having a tubular opening therein of internal diameter at least slightly greater than the diameter of the obturator to thereby provide a borehole of selected internal diameter and having the metal obturator remaining centrally therein, the obturator serving to assist in guiding the tubular burr; and
inserting a tubular post into the drilled borehole, the post receiving the metal obturator therein.

5,085,587

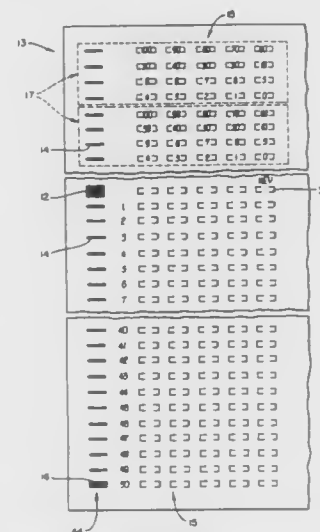
SCANNABLE FORM AND SYSTEM

Paul DesForges, San Dimas, and Michael Prutz, Orange, both of Calif., assignors to Scantron Corporation, Tustin, Calif.

Filed Aug. 7, 1990, Ser. No. 563,443
Int. Cl.⁵ G09B 7/00

U.S. Cl. 434—355

19 Claims



1. A scannable form combining multiple response inputs and numeric value inputs, the form having:

- a. an elongate rectangular shape with first and second generally straight longitudinal edges;
- b. at least one response column parallel to the first longitudinal edge;
- c. a single control mark column, parallel to the first longitudinal edge and parallel to the response column but spaced therefrom, the control mark column containing, in a direction parallel to the first longitudinal edge:
 - (1) a first set of response control marks having a first length;
 - (2) a second set of response control marks having a second length;
 - (3) a start-of-form mark having a third length different from the length of the response control marks; and
 - (4) an end-of-form mark having a fourth length different from the length of the response control marks and from the length of the start-of-form mark;

the first set of response control marks being column aligned with start-of-form mark and before the second set of response control marks, the start-of-form mark being column aligned before the second set of response control marks, and the second set of response control marks being column aligned before the end-of-form mark; and

- d. a response row corresponding to each response control mark, each response row being row aligned with the corresponding response control mark perpendicular to the first longitudinal edge, each response row containing at least one response receiving space, and each response receiving space being aligned in said at least one response column;

wherein the first set of response control marks and associated response rows are organized into at least one numeric value block for indicating a numeric value, and wherein each numeric value block includes at least one response control mark and associated response row.

12. A form scanning system including:

- a. a scannable form having:
 - (1) an elongate rectangular shape with first and second generally straight longitudinal edges;
 - (2) at least one response column parallel to the first longitudinal edge;
 - (3) a single control mark column, parallel to the first

longitudinal edge and parallel to the response column but spaced therefrom, the control mark column containing, in a direction parallel to the first longitudinal edge:

- (i) a first set of response control marks;
- (ii) a second set of response control marks;
- (iii) a start-of-form mark; and
- (iv) an end-of-form mark;

the first set of response control marks being column aligned with the start-of-form mark and before the second set of response control marks, the start-of-form mark being column aligned before the second set of response control marks, and the second set of response control marks being column aligned before the end-of-form mark; and

- (4) a response row corresponding to each response control mark, each response row being row aligned with the corresponding response control mark perpendicular to the first longitudinal edge, each response row containing at least one response receiving space, and each response receiving space being aligned in said at least one response column;

wherein the first set of response control marks and associated response rows are organized into at least one numeric value block for indicating a numeric value, and wherein each numeric value block includes at least one response control mark and associated response row; and

- b. scanning apparatus, for use with the scannable form, for scanning a numeric value block and interpreting response in the response rows of the numeric value block as a numeric value.

16. A method for tallying data by using a scannable form combining multiple response inputs and numeric value inputs, the form having an elongate rectangular shape with first and second generally straight longitudinal edges, at least one response column parallel to the first longitudinal edge, a single control mark column parallel to the first longitudinal edge and parallel to the at least one response column but spaced therefrom in a direction parallel to the first longitudinal edge, the control mark column having a first set of response control marks being column aligned with a start-of-form mark and before a second set of response control marks, and the second set of response control marks being column aligned after the start-of-form mark and being column aligned before an end-of-form mark, and a response row being row aligned with a corresponding response control mark and perpendicular to the first longitudinal edge, each response row containing at least one response receiving space, and each response receiving space being aligned in said at least one response column, wherein the first set of response control marks and associated response rows are organized into at least one numeric value block for indicating a numeric value; wherein said method includes the steps of:

- a. marking selected response inputs of the scannable form with data to be tallied;
- b. marking selected numeric value inputs of the scannable form to represent at least one numeric value;
- c. scanning the scannable form to detect responses to the response inputs;
- d. scanning the scannable form to detect the value of at least one numeric value input; and
- e. providing the result of a mathematical operation between selected response and the at least one numeric value input.

5,085,588

BACTERIAL PROMOTERS INDUCIBLE BY PLANT EXTRACTS

Sharon R. Long, 838 La Jennifer; John T. Mulligan, 946 VanAuken Cir., both of, Palo Alto, Calif. 94306, and Thomas T. Egelhoff, Dept. of Bio. Sci., Stanford Univ., Stanford, Calif. 94305

Filed Oct. 18, 1985, Ser. No. 788,911

Int. Cl.⁵ C12P 21/00; C12N 15/00; C12R 1/41; C07H 15/12
U.S. Cl. 435—69.1

22 Claims



1. A process for producing a polypeptide in bacteria in association with the presence of a plant host, said process comprising the steps of:

- transforming bacteria with a structural gene encoding the polypeptide, wherein the polypeptide is fused downstream from and under control of a transcriptional initiation regulatory promoter region, the region being responsive for transcriptional initiation to a plant exudate in the presence of a *Rhizobium nod D* gene product;
- infecting a root of said plant host with the transformed bacteria; and
- growing the plant host, whereby said polypeptide is produced.

5,085,589

GROUNDING BOARDLOCK FOR CONNECTOR

Ko-Chien Kan, Taipei, Taiwan, assignor to Foxconn International, Inc., Sunnyvale, Calif.

Filed Jan. 24, 1991, Ser. No. 645,554

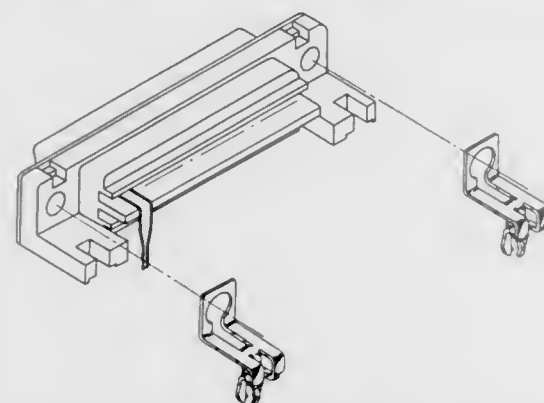
Int. Cl.⁵ H01R 4/66

U.S. Cl. 439—92

5 Claims

1. A boardlock for a connector comprising:
a metallic strip having a vertical portion adapted for fastening to the connector;
an integral horizontal portion extending perpendicularly from the vertical portion and adapted to overlie an adjacent parallel portion of the connector;
at least a pair of laterally spaced side legs formed from laterally spaced portions of the horizontal portion bent perpendicularly out of the plane of said horizontal portion, said side legs lying in a plane perpendicular to the longitudinal dimension of said metallic strip;
at least a pair of auxiliary legs formed from portions of the horizontal portion intermediate said laterally spaced portions and bent perpendicularly out of the plane of said horizontal portion, said pair of auxiliary legs being spaced apart in the direction of said longitudinal dimension and lying in a median plane including said longitudinal dimension; and

an upper outwardly inclined cam surface and a lower inwardly inclined cam surface formed on each leg, said legs



of said pairs of legs being equally spaced circumferentially about a central axis perpendicular to said horizontal portion of said metallic strip.

5,085,590

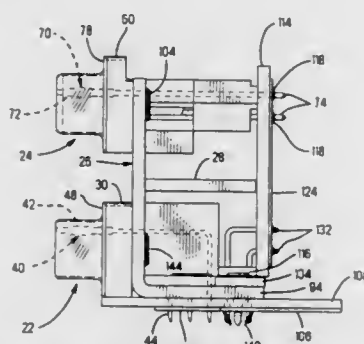
SHIELDED STACKABLE CONNECTOR ASSEMBLY
Michael D. Galloway, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 30, 1990, Ser. No. 606,023

Int. Cl.⁵ H01R 4/66

U.S. Cl. 439—95

10 Claims



1. A stacked electrical connector assembly for mounting on a circuit board, comprising:

- a bracket having first and second bracket members, said bracket having a shield member electrically commoned with at least one of said first and second bracket members;
- a first electrical connector having a housing with terminals secured therein, said first electrical connector terminals interconnectable with traces on the circuit board when the assembly is mounted thereon, said first electrical connector secured to said first and second bracket members on a first side of said shield member; and
- a second electrical connector having a housing with terminals secured therein, said second electrical connector terminals interconnectable with traces on the circuit board when the assembly is mounted thereon, said second electrical connector secured to said first and second bracket members on a second side of said shield member with the shield member extending at least partially between the housings of said first and second connectors, said first electrical connector terminals and said second electrical connector terminals defining collectively an assembly array of terminals that are simultaneously positionable proximate traces on the circuit board when the assembly is mounted thereon, whereby the portion of the shield member extending between the housings of the first and second connectors shields each of the first and second connectors from the other.

5,085,591

SAFETY PLUG WITH PRONG LOCKS

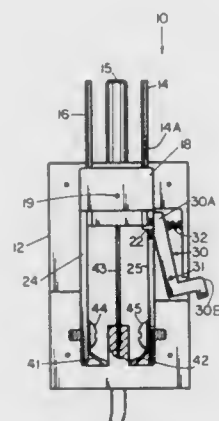
Charles C. Warren, Sr., and Shirley J. Warren, both of P.O. Box 4725, Estes Park, Colo. 80517

Filed Nov. 5, 1990, Ser. No. 575,988

Int. Cl.⁵ H01R 13/44

U.S. Cl. 439—131

6 Claims



1. An electrical plug for attachment to the end of an electrical power cord having at least two electrical wires therein, said plug comprising:

- (a) a body member having first and second ends;
- (b) a plurality of spaced-apart plug prongs carried by said body member and being slidably movable between (i) a retracted position in which said prongs are within said body member, and (ii) an extended position in which said prongs project forwardly from said first end of said body member; wherein said prongs are electrically connected to said electrical wires in said body member; wherein one of said prongs includes an aperture extending transversely therethrough;
- (c) an arm attached to said prongs for slidable movement relative to said body member for movement of said prongs between said retracted and extended positions; and
- (d) lock means for locking said prongs selectively in said retracted position and in said extended position; wherein said lock means comprises a pin which is movable between inward and outward positions; wherein when said prongs are in said retracted position and said pin is in said inward position, said pin extends into said aperture and prevents said prongs from moving to said extended position.

5,085,592

CONNECTOR WITH SHORT CIRCUIT AND CONNECTOR ASSEMBLY

Shigemi Sekiguchi, Kiryu, Japan, assignor to Hosiden Corporation, Osaka, Japan

Filed Jan. 25, 1991, Ser. No. 645,792

Claims priority, application Japan, Jan. 25, 1990, 2-6693[U]

Int. Cl.⁵ H01R 13/703

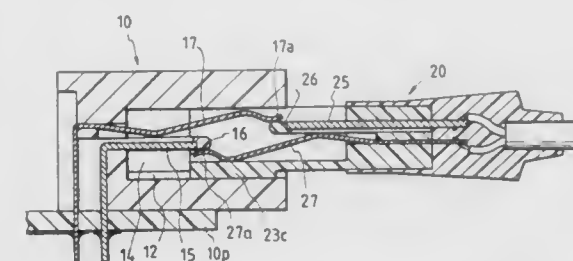
U.S. Cl. 439—188

8 Claims

- 1. A connector with a short circuit, comprising: an insulator body having a contact piece housing compartment open at at least its front;
- fixed contact piece means fixed in said insulator body, with its front half portion extending toward said opening in said contact piece housing compartment;
- insulating engaging means provided in a manner to extend a predetermined length forwardly of the tip of said fixed contact piece means; and
- movable contact piece means having a rear end portion which is fixed in said insulator body in spaced relation to said fixed contact piece means, a front end portion which is disposed in side-by-side relation to said fixed contact

piece means in said contact piece housing compartment and extends beyond said insulating engaging means toward said opening, and an intermediate portion which is normally held in elastic contact with said fixed contact piece means but is pushed out of contact therewith by the insertion of a mating connector;

said insulating engaging means including a frame-shaped



support piece extending from said insulator body into said contact piece housing compartment and having a window and an insulating engaging portion formed in a tip end portion of said frame-shaped support piece, said fixed contact piece means being fitted in said window of said frame-shaped support piece, and said movable contact piece means making elastic contact with said fixed contact piece means in said window.

5,085,593

ELASTICITY-ENHANCED CONTACT ELEMENT OF ELECTRICAL CONNECTOR

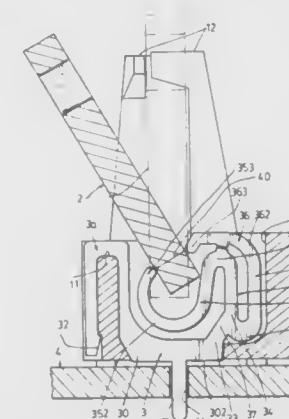
Kenny Tuan, 5F, No. 30, Lane 423, Yuan-San Rd., Chung-Ho City, Taipei Hsien, Taiwan

Filed Jan. 14, 1991, Ser. No. 640,807

Int. Cl.⁵ H01R 23/70

U.S. Cl. 439—326

2 Claims



1. In an electrical connector comprising a connector base having an elongate socket longitudinally formed in the connector base, a plurality of slots transversely formed in said elongate socket for receiving a plurality of contact elements therein, a daughter printed circuit board inserted through the socket to be clamped by the plurality of the contact elements for connecting the daughter board to a mother board secured to the connector base; each said contact element including:

- a base portion having a supporting leg member protruding downwardly from said base portion to be fixed in the mother board;
- an embedding portion formed on a first side of said base portion engaged with the slot formed in said connector base; and
- a clamping portion formed on a second side of said base portion opposite to said embedding portion for clamping said daughter board;

the improvement which comprises:

- said clamping portion of said contact element including: a pendulum arm member secured to a basic pivot portion formed on said base portion; and intermediate pivot portion secured to an extended end portion of said pendulum arm member opposite to said basic pivot portion;
- a first spring contact member bifurcated inwardly from said intermediate pivot portion and interpolatively wound to form a plurality of inner deflective spring bow portions arcuately bent along a first winding path of said first spring contact member, and formed with a first contact protrusion on an upper end portion of said first spring contact member; and
- a second spring contact member bifurcated outwardly from the intermediate pivot portion and extrapolatively wound to form a plurality of outer deflective spring bow portions arcuately bent along a second winding path of said second spring contact member to generally surround said first spring contact member within the socket in said connector base, and formed with a second contact protrusion on an upper end portion of said second spring contact member oppositely facing said first contact protrusion for clamping the daughter board therebetween.

5,085,594

SOLDER-FREE PLUG-CABLE CONNECTION SYSTEM
Ruedi Kaelin, Breitenweg 22A, CH-5703 Seon, Switzerland

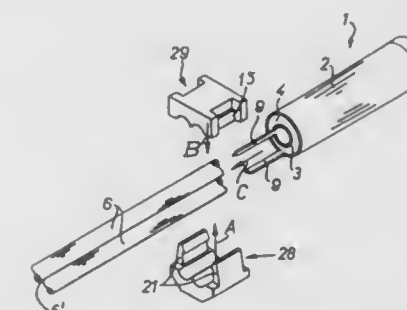
Filed Jun. 25, 1991, Ser. No. 720,940

Claims priority, application Switzerland, Jul. 10, 1990, 2303/90

Int. Cl.⁵ H01R 4/24

U.S. Cl. 439—427

13 Claims



1. Solder-free plug-cable connection system, for connecting a plug (1) having at least two electrically conductive plug elements (2, 3) and an electrical plug insulation means (4) separating said plug elements, with a cable (6) having at least two electrically conductive wire means (10) and cable insulation means (12) surrounding and separating said conductive wire means and insulating said wire means with respect to each other,

- said system comprising, in accordance with the invention, a connection arrangement between said plug (1) and an end portion of said cable (6) while providing a solder-free electrical connection between said conductive plug elements (2, 3) and said connection wire means (10), which arrangement comprises
- extended, pointed fingers or prongs (9) projecting from said conductive plug elements (2, 3), positioned for penetration between the conductive wire means (10) and the cable insulation means (12) surrounding said wire means, and for engagement, and hence electrical connection with said wire means;
- a clamping element (16) tightly surrounding the cable end portion (6) in the region of penetration of said fingers or prongs (9) into the cable; and
- an injection-molded jacket (7) of insulating, flexible material surrounding the end portion of the cable (6) and at least part of said plug elements.

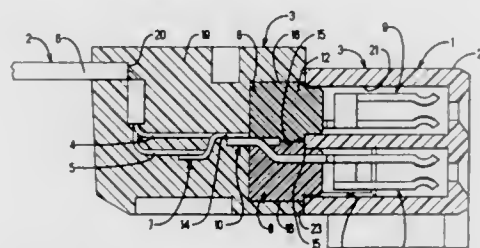
5,085,595

SIDE ENTRY CABLE ASSEMBLY

Keith S. Koegel, Linglestown, and Ronald M. Weber, Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 5, 1991, Ser. No. 681,215
Int. Cl.⁵ H01R 9/07

U.S. Cl. 439—494

12 Claims



1. An electrical cable assembly comprising: first and second insulative housing blocks, each housing block having a contact receiving side, a series of wire receiving channels in the housing block communicating with the contact receiving side, multiple electrical contacts on the housing block being intercepted by alternate channels of the series of channels, other alternate channels of the series of channels intercepting spaces between adjacent contacts,

the housing blocks meet such that the contacts of one of the housing blocks are intercepted by the other alternate channels of the other of the housing blocks, and wires of at least one electrical cable being aligned along corresponding channels of at least one or the other of said housing blocks for attachment to corresponding electrical contacts intercepted by said corresponding channels.

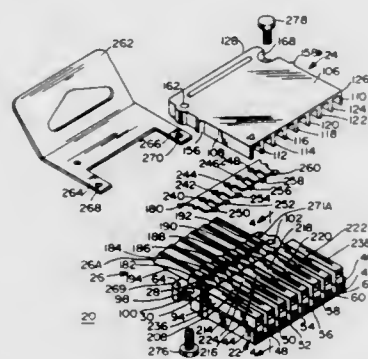
5,085,596

SHIELDED ELECTRICAL CONNECTOR

David C. Bowen, Downers Grove; Philip J. Dambach, Naperville; Joseph W. Nelligan, Jr., LaGrange Park, and Irvin R. Triner, Willow Springs, all of Ill., assignors to Molex Incorporated, Lisle, Ill.
Division of Ser. No. 587,137, Sep. 24, 1990. This application Jun. 3, 1991, Ser. No. 709,524
Int. Cl.⁵ H01R 9/07

U.S. Cl. 439—497

25 Claims



1. An electrical connector for terminating a plurality of cables at a wire receiving end of said electrical connector, each of cables has at least one signal wire and a drain wire, said electrical connector comprising:

first and second conductive outer housing means adapted to be mated together;
ferrule means attached to at least one of said cables and coupled to said drain wire in said cable;
bus bar means having resilient finger means, said bus bar means contacting said ferrule means and said finger means engaging at least one of said first and second outer housing

means when said first and second outer housing means are mated together; and
ground means disposed in said electrical connector and coupled to said bus bar means.

5,085,597

CORROSION PROTECTION APPARATUS

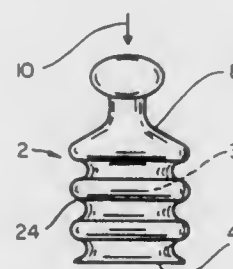
Martha F. Story, Atlanta, Ga.; Glen W. Ragland, St. Louis, Mo.; William H. Humphries, Patterson, Calif.; Lowell Koht, Foster City, Calif., and William D. Uken, Fremont, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 523,158, May 14, 1990, abandoned, which is a continuation of Ser. No. 398,697, Aug. 25, 1989, abandoned, which is a continuation of Ser. No. 320,351, Mar. 8, 1989, abandoned, which is a continuation of Ser. No. 253,302, Sep. 30, 1988, abandoned, which is a continuation of Ser. No. 183,366, Apr. 12, 1988, abandoned, which is a continuation of Ser. No. 767,555, Aug. 20, 1985, abandoned. This application Mar. 28, 1991, Ser. No. 677,021

Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—521

20 Claims



1. An apparatus for protecting a substrate, comprising:
a first reservoir; and
an elastic gel having a cone penetration value between 100 and 350 (10⁻¹ mm) and an ultimate elongation of at least 200%, the gel being contained within the reservoir prior to contacting the substrate;
means for pumping at least some of the gel out of the reservoir and in contact with the substrate so as not to exceed the ultimate elongation of the gel and so as to at least partially collapse the reservoir.

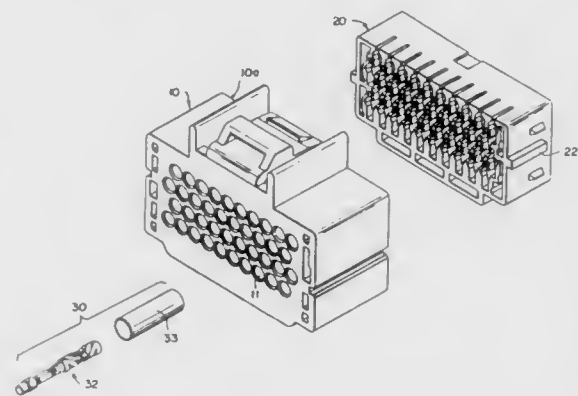
5,085,598

DOUBLE LOCKING TYPE ELECTRICAL CONNECTOR

Yoshiji Kinoshita, Isehara, Japan, assignor to AMP Incorporated, Harrisburg, Pa.
Filed May 14, 1991, Ser. No. 700,026
Claims priority, application Japan, May 14, 1990, 2-123689
Int. Cl.⁵ H01R 13/40

U.S. Cl. 439—595

5 Claims



1. An electrical connector comprises an insulated housing

(10) having grooves (10b) and multiple electrical contact-receiving chambers (11) including lances (12) for engaging contact sections (30) of electrical contacts (32) when inserted into the contact-receiving chambers (11), a double-locking member (20) having ribs (22a) slidably receiving in said grooves (10b) for moving said member (20) in said housing (10) in a first direction parallel to the contact-receiving chambers (11) and having contact-interlocking parts (21a) for engaging said contact sections (30) when said double-locking member (20) is moved in a second direction perpendicular to the contact-receiving chambers (11).

5,085,599

CONNECTOR

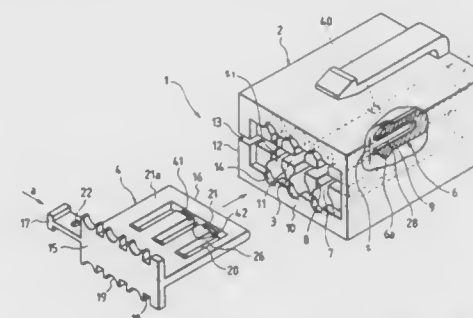
Toshiro Maejima; Kazuaki Sakurai; Seiji Kozono; Mitsuhiro Totsuka, and Toshiharu Kudo, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed May 13, 1991, Ser. No. 699,014

Claims priority, application Japan, May 16, 1990, 2-124208

Int. Cl.⁵ H01R 13/40

U.S. Cl. 439—595

5 Claims



1. A connector wherein at least one flexible retaining piece for engagement with at least one terminal is disposed in an associated terminal receiving chamber of a housing body, and a spacer for preventing the flexing of said flexible retaining piece is inserted into a gap which allows the flexing of said flexible retaining piece, said connector comprising an improvement wherein an abutment wall is provided in said housing body in opposed relation to a side surface of said flexible retaining piece for contacting the latter when said retaining piece fails to engage with the associated terminal; said spacer is provided in said gap so as to slide in a direction perpendicular to said side surface of said flexible retaining piece; and engaging holes and flexure prevention portions for said flexible retaining pieces are provided on said spacer, and are arranged in the direction of slide of said spacer.

5,085,600

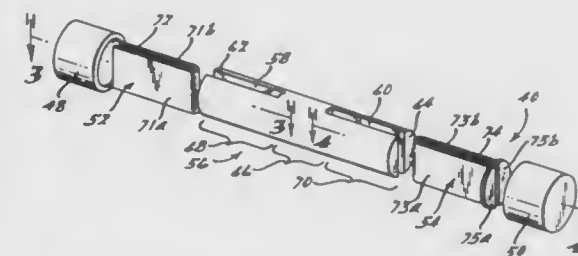
AUTOMOTIVE BLADE-TO-FERRULE FUSE ADAPTER

Matthew S. Damron, 26535 Van Born Rd., Taylor, Mich. 48180
Filed Mar. 1, 1991, Ser. No. 663,269

Int. Cl.⁵ H01R 13/66

U.S. Cl. 439—621

20 Claims



1. An automotive fuse adapter for allowing a blade-type

automotive fuse to be used in a glass ferrule-type automotive fuse socket, the fuse adapter comprising:

an elongated substantially rigid body having an two end portions electrically insulated from one another, with each such end portion having an elongated slot formed therein;

two blade contact means, each disposed within a respective one of the slots in the body and made of electrically conductive material formed in a preselected shape, and each for receiving therein and making electrical contact with one blade of a blade-type automotive fuse; and

two end cap means, each being fixed about a respective end portion of the body and in electrical contact with a respective one of the blade contact means, for making electrical contact with and for being received within an electrically conductive retaining clip used within a standard size socket for an automotive glass ferrule fuse.

5,085,601

REDUCED INSERTION FORCE ELECTRICAL CONNECTOR

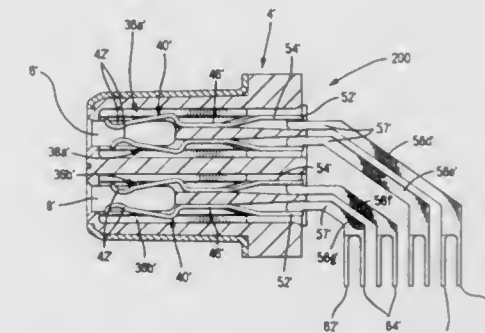
Randolph L. Buchter, Harrisburg, Pa., and Randy G. Simmons, Lewisville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 11, 1990, Ser. No. 625,567

Int. Cl.⁵ H01R 17/00

U.S. Cl. 439—660

9 Claims



1. An electrical connector for mating with a complementary connector having a body, the connector comprising:

a dielectric housing having a mating face, said housing having first and second elongate substantial parallel cavities in said mating face for receiving terminals of a complementary connector, said cavities extending longitudinally of the housing and defining opposed sidewalls, each of said cavities having a first and second row of contacts secured therein, each of said rows of contacts extending longitudinally of said housing along a respective sidewall, each of the contacts in the first and second rows of said first and second cavities having a deflectable mating portion within the respective cavity proximate said mating face, the deflectable mating portion of the contacts in said first row of contacts in each of said first and second cavities being closer to the mating face than the deflectable mating portion of the contacts in said second row of contacts in each of said first and second cavities, the deflectable mating portion of each contact extending into a respective cavity away from a respective sidewall in an unbiased position, and upon reception of terminals of a complementary connector in the cavities, said contacts being biased toward said respective sidewall by a normal force between the terminals and the contacts, the deflectable mating portion of the first row of contacts of each cavity extending into the respective cavity in opposed directions, the deflectable mating portion of the second row of contacts of each cavity extending into the respective cavity in opposed directions and in each cavity in a direction opposite to the deflectable mating portion of the first row of contacts, whereby portions of a complementary

connector having terminals are receivable in the first and second cavities such that normal forces caused by the reaction between the terminals of a complementary connector and the first row of contacts in each of the first and second cavities are substantially canceled and normal forces caused by the reaction between the terminals of a complementary connector and the second row of contacts in each of the first and second cavities are substantially canceled.

5,085,602
ELECTRICAL CIRCUIT BOARD MOUNTING APPARATUS AND METHOD

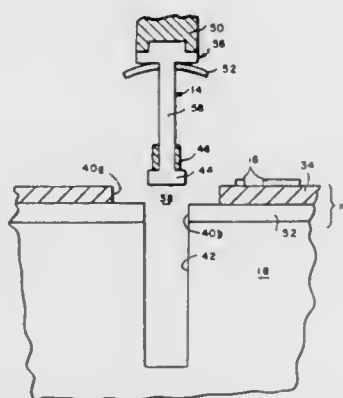
Ralph E. Bauman, Lancaster, and Horace W. Seymour, III, Landisville, both of Pa., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 16,145, Feb. 18, 1987, abandoned. This application Aug. 11, 1989, Ser. No. 391,681

Int. Cl.⁵ H01R 4/02

U.S. Cl. 439—874

22 Claims



1. An apparatus for securing an electrical circuit board to an electrical housing, comprising:

- A) a shaft having a first transverse cross-sectional area;
- B) a first end of the shaft having a second transverse cross-sectional area greater than the first transverse cross-sectional area;
- C) means for engaging the electrical circuit board, said means adapted to fit around the shaft and to engage the first end of the shaft; and
- D) means for holding solder disposed on the shaft opposite to the first end, the means for holding solder adapted to be inserted into a mounting bore in the electrical housing.

5,085,603
MARINE DRIVE WITH STEERING TORQUE COMPENSATION

William Haluzak, Hartford, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 19, 1990, Ser. No. 630,016

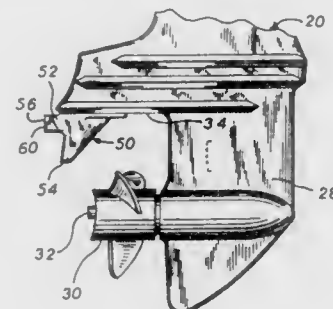
Int. Cl.⁵ B63H 25/42

U.S. Cl. 440—51

5 Claims

1. A marine drive comprising a lower gearcase having a submerged propeller driven in one direction of rotation and producing steering torque in a given direction when said drive is trimmed in, the more said drive is trimmed in the greater said steering torque, said gearcase having an anti-ventilation plate above said propeller, and a trim tab extending downwardly from said anti-ventilation plate generally above and rearward of said propeller, at least the upper portion of said trim tab being shrouded by said anti-ventilation plate when said drive is trimmed out, said trim tab having a variable compensation flair on one side thereof at said upper portion, said flair extending downwardly a given length along said trim tab and tapered to have increasing lateral width from the bottom of said flair to the top of said flair such that the more said drive is trimmed in the more of said flair is unshrouded by said anti-ventilation

plate, such that said flair diverts mainstream water flow therearound which produces increased force on the flair side of said trim tab and reduced force on the other side of said trim tab opposite said flair which counteracts said steering torque, the more said drive is trimmed in the greater the lateral width of



5,085,604

RELIEF VALVE FOR TILT DEVICE

Akihiro Onoue, Hamamatsu; Hideki Saitoh, and Masahiro Furuki, both of Numazu, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

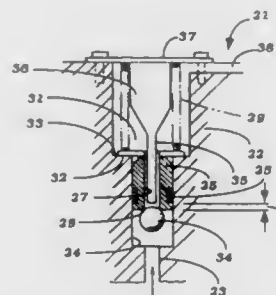
Continuation of Ser. No. 380,093, Jul. 14, 1989, abandoned. This application Nov. 28, 1990, Ser. No. 619,667

Claims priority, application Japan, Jul. 15, 1988, 63-175097

Int. Cl.⁵ F16K 15/08

U.S. Cl. 440—61

9 Claims



1. A relief valve arrangement for a hydraulic system in an outboard drive unit having a transom bracket affixed to a hull of a watercraft, pivot means for rotatably securing said outboard drive unit to said transom bracket for tilt and trim movement about a generally horizontally disposed axis, and a tilt device for controlling the tilt and trim of said outboard drive unit, said relief valve arrangement being embodied in said tilt device and comprising a fluid chamber defined by a bore and having a high pressure fluid inlet formed in a wall closing one end of said bore and a fluid outlet spaced from said bore, a unitary, annular valve seat member having its outer periphery slideably directed by said bore and having an internal opening defining a passage between said fluid inlet and said fluid outlet, said valve seat member having an area exposed to the fluid pressure at said fluid inlet tending to move said valve seat member in a first direction, biasing means urging said valve seat member in a second direction opposite to said first direction, a valve member engagable with said valve seat member solely by the pressure introduced through said fluid inlet and movable within said bore relative to said valve seat member from a first opened position to a second closed position wherein the flow through said valve seat member passage is

precluded, first stop means for limiting the degree of movement of said valve member in said first direction for permitting said valve seat member to move away from said valve member and open said passage for relief of pressure in said fluid inlet through flow through said passage to said fluid outlet, and an adjustable retainer plate to which said first stop means is affixed and which forms a reaction surface for said biasing means.

5,085,605

METHOD OF ENCAPSULATING AN AC POWER TYPE EL PANEL

Takaharu Itani, Yokohama; Masaru Nikaido, Miura, and Hideki Yamaguchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

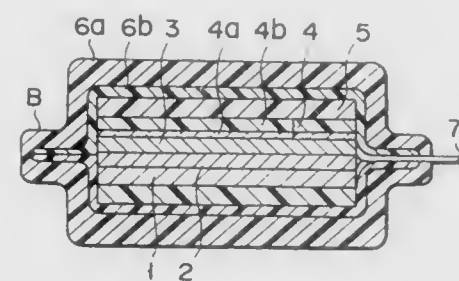
Filed Aug. 27, 1990, Ser. No. 572,560

Claims priority, application Japan, Aug. 28, 1989, 1-218516; May 30, 1990, 2-138335

Int. Cl.⁵ H05B 33/04

U.S. Cl. 445—25

6 Claims



1. A method of manufacturing an AC power type EL panel, comprising the steps of:

- forming a reflective insulating layer on a first electrode;
- forming a light-emitting layer on said reflective insulating layer;
- providing a second electrode on said light-emitting layer;
- connecting leads from said first and second electrodes to obtain an AC power type EL element;
- forming thermoplastic adhesive layers on a pair of protective films having a size larger than that of said first and second electrodes;
- bonding one protective film to upper surface of said AC power type EL element and the other protective film to lower surface of said AC power type EL element by thermocompression from the above and below to seal said AC power type EL element; and
- cutting the end portions of said thermocompression-bonded protective films into a predetermined shape by using a laser, thus fusing the end portions of said protecting layers, wherein a thickness ratio of said protective film to said thermoplastic adhesive layer falls within the range of 5:1 to 2:1.

5,085,606

METHOD OF MANUFACTURE FOR POST-MASK DEFLECTION TYPE TENSION MASK COLOR CATHODE RAY TUBE

Sam Kaplan, Chicago, and Robert Adler, Northfield, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 336,478, Apr. 12, 1989. This application Dec. 28, 1990, Ser. No. 635,083

Int. Cl.⁵ H01J 29/07, 9/00

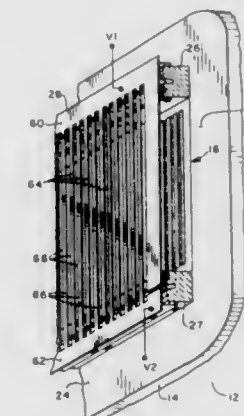
U.S. Cl. 445—30

15 Claims

1. For use in the manufacture of a post-mask-deflection color cathode ray tube having a faceplate with a centrally located screen composed of colored-light-emitting phosphor stripes, a method comprising:

- providing two support structures for supporting a mask and

securing said support structures on said faceplate on opposed sides of said screen; providing a foil shadow mask in the form of metal strips separable into intercalated periodic first and second arrays of electrically conductive strips; positioning said mask across said support structures with said strips aligned with said stripes of said screen; securing the ends of the strips of each of said arrays in tension to said support structures; and



cutting in staggered fashion the ends of said strips to cause said first and second arrays to take the form of mutually insulated, interleaved combs, whereby predetermined different electrical potentials applied to said arrays will cause electron beams passing through the mask to be deflected by the electrical fields created between said strips.

5,085,607

TOY THAT STABLY EXHIBITS DIFFERENT COLORS WITH INDICATOR FOR PROPER TEMPERATURE APPLICATION

Yutaka Shibahashi, Aichi; Tsutomu Kito, Gifu; Norikazu Nakasuiji, and Hiroshi Inagaki, both of Aichi, all of Japan, assignors to The Pilot Ink Co., Ltd., Nagoya, Japan

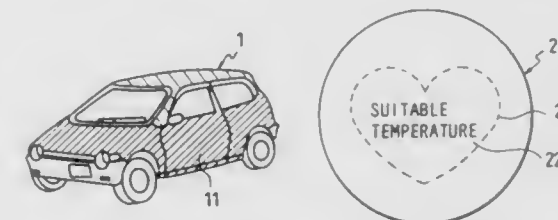
Filed Oct. 12, 1990, Ser. No. 596,316

Claims priority, application Japan, Oct. 14, 1989, 1-119867[U]

Int. Cl.⁵ A63H 33/00

U.S. Cl. 446—14

32 Claims



1. A toy at least one section thereof bearing a color memory dye comprising an electron-supplying organic coloring compound, an electron accepting compound and an ester; said color memory dye assuming a first color below t_1 ($^{\circ}\text{C}.$) and a second color above t_2 ($^{\circ}\text{C}.$), wherein $t_2 > t_1$, $0 \leq t_1$, $t_2 \leq 50^{\circ}\text{C}.$ and $5 \leq t_2 - t_1 \leq 35$, both of said first and second colors capable of being displayed between t_1 and t_2 ; and a temperature sensitive visual indicator, said temperature sensitive visual indicator being visible when at least one of said first and second colors is displayed and said temperature sensitive visual indicator operating to communicate written or pictorial information, said written or pictorial information conveying how to display the other of said first or second colors.

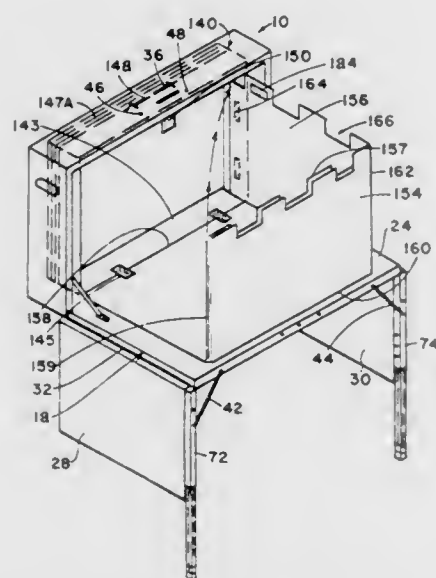
5,085,608

COLLAPSIBLE DESK WITH DOLLHOUSE

De Maris C. Turner, 7471 S. Marion, Tulsa, Okla. 74136
Division of Ser. No. 273,370, Nov. 17, 1988, Pat. No. 4,919,498,
which is a continuation-in-part of Ser. No. 144,048, Jan. 14,
1988, abandoned. This application Mar. 22, 1990, Ser. No.
497,240

The portion of the term of this patent subsequent to Apr. 24,
2007, has been disclaimed.

Int. Cl.⁵ A63H 33/04, 3/52; A47B 77/10
U.S. Cl. 446—75 3 Claims



1. A collapsible convertible desk assembly for attachment to a wall, which comprises:

- a box-like storage cavity having a first and second side frame, a top frame, a bottom frame, each having a back edge, a back member mounted to said first and second side frame, said top frame and said bottom frame, at a distance from the back edge of each such that said top frame has a top overhang and said bottom has a bottom overhang;
- attachment bracket means attached to the underside of said top overhang member and to the top side of said bottom overhang for attachment to said wall;
- a single piece planar desk member having a flat work surface on one side and a flat opposite side, a first side edge, a second side edge, and a front and back edge, said back edge hingedly mounted to a front edge of said bottom frame;
- a first door having a top edge that is hinged to said first side edge of said desk member;
- a second door having a top edge that is hinged to said second side edge of said desk member, each of said first and second doors pivotal about said hinge between a first position which is parallel with said desk member and a second position which is at least 90° therefrom;
- first and second latching bracket means to selectively retain said respective first and second doors in one of said first position or said second position; and
- including a collapsible dollhouse insert including storage/-carrying case mounted in said storage cavity which is of sufficient size so that when said desk member is in its upper closed position the dollhouse insert is stored between said back of said storage cavity and said desk member, said dollhouse insert including a hingedly connected dollhouse back, a front wall, two end walls, and a floor, said front wall and end walls including openings representing windows and/or doors.

5,085,609

PUPPET THEATER WITH SOUND TRACK AND CUED LIGHTS

Walter Haberle, Gronauer Weg 16, Bad Vilbel, Fed. Rep. of Germany 6368

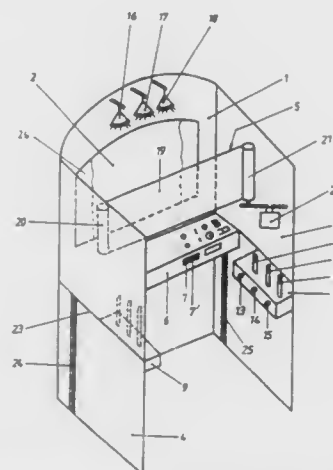
Filed Mar. 19, 1990, Ser. No. 495,426

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 8913920[U]

Int. Cl.⁵ A63J 19/00

U.S. Cl. 446—83

20 Claims



1. A puppet theater for use in a performance with a plurality of puppets, including a front wall having a stage, a side wall at each vertical side of said front wall, and a playback device having a sound medium, the improvement comprising: a plurality of electrically actuable displays including one said display for each of said plurality of puppets; and control signal means comprising display control means for triggering each said display, wherein said control signal means are recorded on the sound medium of said playback device.

5,085,610

DUAL SOUND TOY TRAIN SET

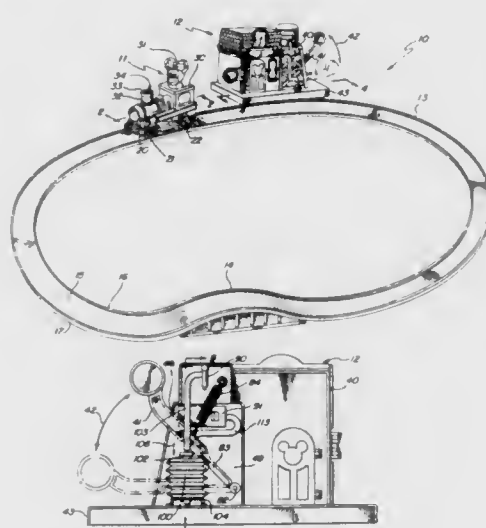
Robert W. Engel, Thousand Oaks; Joseph W. Franke, Van Nuys; Alex R. Piyevsky, Reseda, and Enis J. Unalp, Claremont, all of Calif., assignors to Mattel, Inc., El Segundo, Calif.

Filed May 16, 1991, Ser. No. 700,834

Int. Cl.⁵ A63H 19/10, 30/00

U.S. Cl. 446—175

10 Claims



1. A dual sound toy comprising:

a track;
a toy vehicle movable on said track having battery-powered propulsion means;
control means responsive to a first inaudible sound frequency within said toy for causing said propulsion means to alternate between operative or inoperative states each time said first sound energy is received; and
sound producing means for simultaneously producing sound energy at said first sound frequency and sound energy at a second audible sound frequency.

5,085,611

AMUSEMENT DEVICE FOR A WHEEL

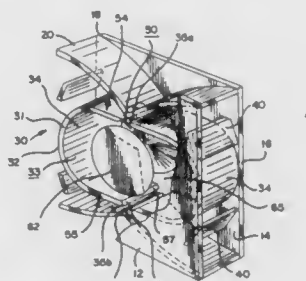
Gerald R. Sorensen, Elgin; Raymond J. Gradecki, Mundelein, and Daniel J. E. Finkiewicz, Elk Grove Village, all of Ill., assignors to NCM International, Inc., Arlington Heights, Ill.

Filed Sep. 17, 1990, Ser. No. 583,872

Int. Cl.⁵ A63H 5/00, 1/28; B62J 3/00

U.S. Cl. 446—216

15 Claims



1. A double reversible whistle:

- a housing having upper and lower portions, each portion having a first and second end, the housing defining a resonance chamber;
- a first whistle element on the upper housing portion;
- a second whistle element on the lower housing portion;
- a first wind scoop on the first end of the upper housing portion, the first wind scoop having a wind directing surface in wind communication with the first whistle element;
- a second wind scoop on the second end of the upper housing portion, the second wind scoop having a wind directing surface in wind communication with the first whistle element;
- a third wind scoop on the second end of the lower housing portion, the third wind scoop having a wind directing surface in wind communication with the second whistle element;
- a fourth wind scoop on the first end of the lower housing portion, the fourth wind scoop having a wind directing surface in wind communication with the second whistle element.

5,085,612

APPARATUS FOR TRANSPORTING SAUSAGES FILLED IN A CONTINUOUS SAUSAGE CASING

Gerhard Müller, Schemmerhofen, and Albert Hermann, Biberach/Riss, both of Fed. Rep. of Germany, assignors to Albert Handtmann Maschinenfabrik GmbH & Co., KG, Biberach/Riss, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 580,571

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 8912219[U]

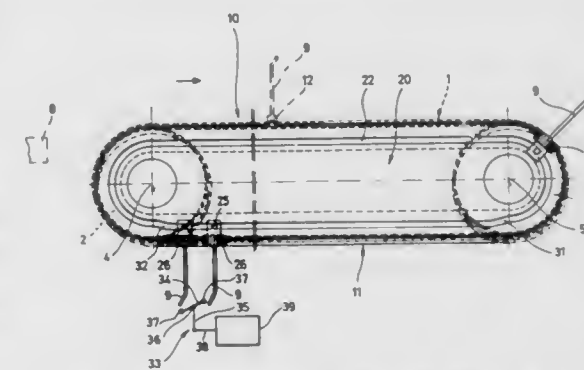
Int. Cl.⁵ A22C 25/18

U.S. Cl. 452—51

19 Claims

1. Apparatus for transporting continuous sausage casing in the form of suspended loops comprising an endless conveyor belt circulating continuously around 2 deflection wheels, a first leg of travel of the belt between said wheels serving as a transport leg where the sausage loops are transported by the conveyor belt and a second leg of travel a free leg where the

conveyor belt is free of the sausage loops, means for rotating at least one of said wheels to drive said belt, a plurality of reception hooks for holding the loops of casing, guide means for supporting and guiding said hooks for movement in a fixed endless path compatible with the path of travel of said con-



veyor belt, means for positively connecting said hooks to said belt in spaced relationship with one another for travel therewith through said transport leg and means for disengaging said positive connection at the end of the transport leg and for frictionally connecting said hooks to the conveyor belt for travel therewith through said free leg.

5,085,613

APPARATUS FOR GAINING SINGLE ORGANS FROM THE BELLY CAVITY OF FISH

Dieter Ketels, Kühn, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

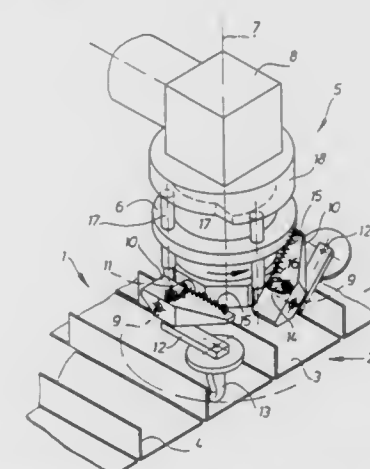
Filed Feb. 20, 1991, Ser. No. 657,837

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4006046

Int. Cl.⁵ A23B 4/03

U.S. Cl. 452—110

18 Claims



1. An apparatus for processing decapitated fish having a tail end, a decapitation end, a belly including a belly cavity, a back and a longitudinal axis extending between the decapitation end and the tail end, for the purpose of gaining organs from the fish, in particular the gonads present in the belly cavity wherein the fish are conveyed for processing by conveying means having troughs defined by a trough bottom and provided with upstanding supporting webs, said trough receiving fish between the supporting webs with a fish side resting on the trough bottom, said conveying means including means for retaining the fish by engaging the fish tail area and said conveying means being further for conveying the fish in a convey-

ing direction transverse to the longitudinal axis of the fish, comprising:

means for pressing a fish in said trough between said supporting webs including a pressing element for engaging the fish from a bottom side of the fish belly, and for progressively massaging the belly area from a tail-end part of the belly cavity toward a decapitation-end portion of the belly cavity;

means for controlling a movement of said pressing means to move said pressing element, at least while said pressing element engages said fish, along a plane that is essentially parallel to said trough bottom and slightly spaced from said trough bottom;

said pressing means including a rotational body supporting said pressing element and driven under control of said controlling means to rotate about an axis perpendicular to a plane defined by said trough bottom at a speed of rotation being synchronized with the speed of conveyance of said troughs; and

said pressing element being mounted for resilient displacement in the direction of conveying.

5,085,614

TENDERIZING DEVICE ESPECIALLY FOR BUTCHERY MEAT

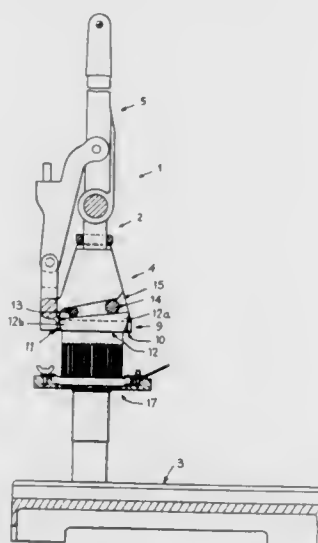
Jean Alain Bourret, Paris, France, assignor to Societe de Construction L.B., St. Georges Cedex, France

Filed Mar. 28, 1991, Ser. No. 676,334

Claims priority, application France, Mar. 28, 1990, 90 03962
Int. Cl.⁵ A22C 9/00

U.S. Cl. 452-141

8 Claims



1. Tenderizing device especially for butchery meat, comprising a stand (2) equipped with a base (3) for receiving the meat, removable blades having upper projecting parts and with a blade carrier assembly (4) guided in displacement in the stand towards the base under the control of actuating means (5), characterised in that the said blade carrier assembly (4) takes the form of a U-shaped block, the lower part (9) of which comprises two parallel and spaced supporting branches (10, 11), on which rest said upper projecting parts (12a, 12b) of the blades (12), and removable means (13, 14) for blocking the blades, interacting with the upper surface of the blades (12) and the lateral branches (4a, 4b) of the U-shaped block, in order to block the blades in position.

5,085,615

REDUCING THE DEVELOPMENT OF PALE, SOFT AND EXUDATIVE PORK

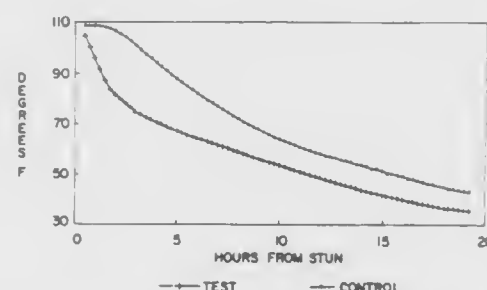
Larry C. Gundlach, Madison; Paul F. Gould, Waunakee, and Gary R. Skaar, Marshall, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 19, 1991, Ser. No. 657,027

Int. Cl.⁵ A22B 5/00

U.S. Cl. 452-198

32 Claims



1. A method for conditioning freshly killed hog carcasses, comprising:

supporting a freshly killed hog carcass such that the hind leg portions of the carcass are readily accessible;

slitting a hind leg portion of the carcass in close proximity to the hind leg muscles generally along the femur of the hind leg portion of the carcass, said slitting procedure forming a pocket area within the hind leg portion of the carcass;

inserting a quantity of solid carbon dioxide into the pocket area thus formed, said quantity of solid carbon dioxide being at least adequate to reduce the temperature of the hind leg portion and being less than a quantity which freezes a substantial portion of the hind leg portion; and reducing the temperature of the thus-treated hind leg portion substantially throughout the hind leg portion within about 1 hour from initiation of said inserting step, wherein sublimation of said solid carbon dioxide contributes substantially to said temperature reducing step.

5,085,616

CLEANING SYSTEM FOR A COMBINE

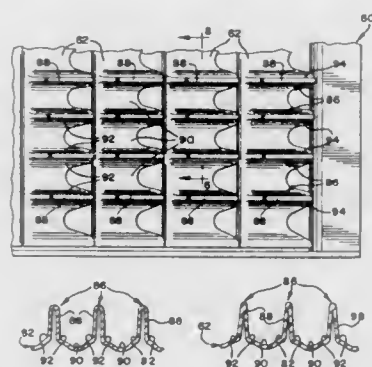
Robert A. Matousek, Minooka, and Jon E. Ricketts, Viola, both of Ill., assignors to Case Corporation, Racine, Wis.

Filed Feb. 13, 1991, Ser. No. 654,740

Int. Cl.⁵ A01F 12/44

U.S. Cl. 460-10

8 Claims



5. A cleaning system for a crop harvesting apparatus having an apparatus for separating chaff and grain from harvested crop material, said cleaning system comprising:

a foraminous crop material receiving and separating platform through which heavier grain particles may gravitate while lighter chaff particles may remain behind, said platform including a series of transversely extending and

adjustable slats presenting an upper surface in confronting relation to said separating apparatus;

means for directing a stream of air through the platform for entraining separated chaff particles and carrying same toward a discharge area;

means for reciprocating said platform in a fore-and-aft direction to facilitate separation of the chaff and grain particles; and

a plurality of transversely adjacent baffle means extending in a fore-and-aft direction along substantially the entire length of said platform, said baffle means having a cumulative effect of inhibiting a disproportionate granular accumulation of chaff and grain particles adjacent a downhill side of said platform when the harvesting apparatus is tilted during slop harvesting, and wherein each of said baffle means are movable conjointly with and in response to adjustment of said slats of said platform.

5,085,617

VANE DAMPER ASSEMBLY FOR A TORQUE CONVERTER

Dale A. Stretch, Wixom, Mich., assignor to Eaton Corporation, Cleveland, Ohio

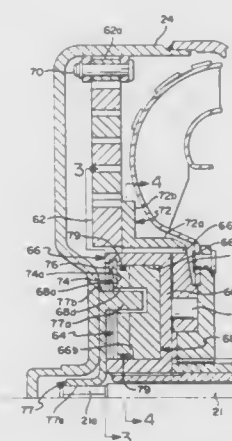
Filed Jun. 22, 1989, Ser. No. 370,320

The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.

Int. Cl.⁵ F16D 3/80, 47/06

U.S. Cl. 464-27

5 Claims



1. A torsion damping assembly adapted to be disposed in a driveline torque converter housing filled with incompressible torque converter fluid, immersed in the fluid, and drivingly connected between rotatably mounted input and output drives; the assembly including resilient means for transmitting driveline torque between the drives and an expandable chamber mechanism for hydraulically damping driveline torsionals; the mechanism including first and second relatively movable members, means for serially connecting the first member and the resilient means between the drives, and means for drivingly connecting the second member to one of the drives and in parallel driving connection with the resilient means; the members defining at least two chambers varying inversely in volume in response to flexing of the resilient means; passage means for communicating each of the volumes with the fluid in the torque converter housing; characterized by:

the means for drivingly connecting the second member to the one drive including valving means for at least partially closing the passage means communicating with the chamber decreasing in volume.

5,085,618

STEERING DEVICE FOR USE IN A TOY CAR

Takashi Mochizuki, Shimizu, Japan, assignor to Kabushiki Kaisha Tamiya Mokei, Shizuoka, Japan

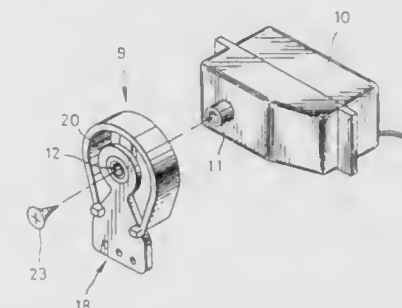
Continuation of Ser. No. 317,718, Mar. 2, 1989, abandoned. This application Nov. 2, 1990, Ser. No. 608,024

Claims priority, application Japan, Mar. 9, 1988, 63-30418

Int. Cl.⁵ A63H 17/36

U.S. Cl. 464-185

11 Claims



1. A steering device for a toy car adapted to be coupled to an output shaft of a servo, said device comprising:

a first member having a central portion including an axially extending hollow-cylindrical portion for attachment to the servo output shaft and having a pair of resilient arm portions with free ends, said pair of resilient arm portions being attached to the central portion at a location intermediate the free ends and extending from opposite sides of the attached location with the free ends spaced a predetermined distance from one another; and

a second member having a head portion rotatably mounted to the axially extending hollow cylindrical portion and having an extended portion longitudinally extending from the head portion between the free ends of the resilient pair of arms of the first member;

said first member being fixedly connected to and rotatable with the output shaft as a servo output member, the second member having means for attachment to a steering link of a toy car, and engaging the pair of arms to rotate with said first member as a steering link input member.

5,085,619

DUAL PINION ANTI-BACKLASH TENSIONER FOR A ROBOT

Nobutoshi Torii, Hachioji; Susumu Ito, and Akihiro Terada, both of Yamanashi, all of Japan, assignors to Fanuc Ltd, Yamanashi, Japan

PCT No. PCT/JP90/00238, § 371 Date Oct. 30, 1990, § 102(e) Date Oct. 30, 1990, PCT Pub. No. WO90/09872, PCT Pub. Date Sep. 7, 1990

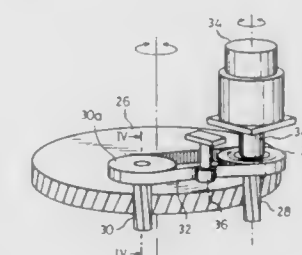
PCT Filed Feb. 27, 1990, Ser. No. 602,226

Claims priority, application Japan, Mar. 2, 1989, 1-48474

Int. Cl.⁵ F16H 7/12

U.S. Cl. 474-138

3 Claims



1. A joint structure incorporated into an industrial robot to drive a movable robot element of the industrial robot through a gear transmission mechanism, the joint structure comprising: a driven gear articulated to the movable robot element;

two drive pinions in mesh with said driven gear, respectively, at two different positions on said driven gear; a belt transmission mechanism operatively connecting said two driving pinions; an adjustable tensioner engaging the belt transmission mechanism to provide a tension adjustment to thereby cause said belt transmission mechanism to press respective teeth of said two drive pinions against teeth of said driven gear, respectively, in opposite directions, whereby backlash between the meshing teeth is eliminated; and a rotative drive source connected to one of said two drive pinions.

5,085,620

MULTI-GEAR CLUSTER FOR BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Corporation, Osaka, Japan

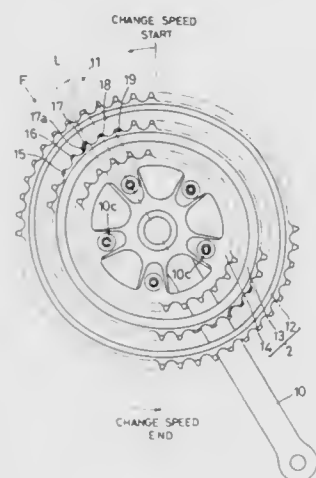
Filed Sep. 10, 1990, Ser. No. 579,962

Claims priority, application Japan, Sep. 12, 1989, 1-236032

Int. Cl.⁵ F16H 55/30

U.S. Cl. 474—152

10 Claims



1. A multi-gear cluster for a bicycle having at least two gears of different diameters, the cluster comprising: disengagement-facilitating means for facilitating a disengaging motion of a drive chain from the teeth of the larger gear and a shifting motion of the chain from the larger gear toward the smaller gear, said disengagement-facilitating means being provided at a peripheral part of each gear other than the smallest gear, said disengagement-facilitating means including a first tooth having a reduced height and a second tooth positioned rearwardly of the first tooth relative to a direction of rotation thereof, wherein the teeth of the smaller gear are provided with a phase arrangement relative to said disengagement-facilitating means of the larger gear such that said chain comes into engagement with the teeth of said smaller gear to be engaged while the disengagement-facilitating means engages with an inner face of a link element of the chain when the chain is shifted toward the smaller gear.

5,085,621

MULTI-STAGE SPROCKET ASSEMBLY FOR BICYCLE
Masashi Nagano, Izumi, Japan, assignor to Shimano Corporation, Osaka, Japan

Filed Feb. 19, 1991, Ser. No. 657,471

Claims priority, application Japan, Feb. 28, 1990, 2-50153

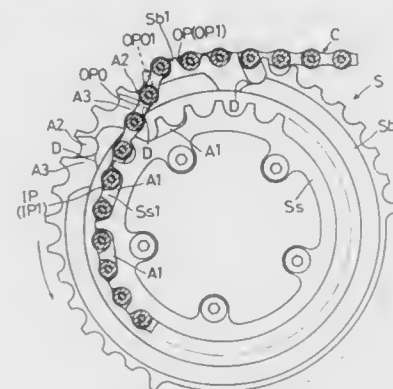
Int. Cl.⁵ F16H 9/00

U.S. Cl. 474—160

5 Claims

1. A multi-stage sprocket assembly for a bicycle, the assembly comprising:

a larger sprocket and a smaller sprocket attached adjacent to each other; wherein said larger sprocket has a concave portion defined in a side face thereof opposite to said smaller sprocket, said concave portion being configured along a moving



path of an interfering plate portion of a drive chain shifting from said smaller sprocket to said larger sprocket, said interfering plate portion being positioned forwardly in a drive rotation direction of said sprocket assembly relative to an engagement-leading plate portion of the chain which first engages a tooth of said larger sprocket.

5,085,622

SLIDING ROOF AND/OR SLIDING-LIFTING ROOF FOR MOTOR VEHICLES

Georg Kohlpaintner, Martinsried, and Horst Bienert, Gauting, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

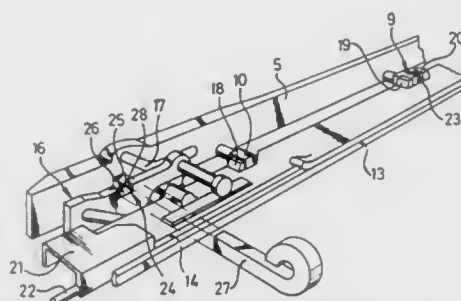
Filed Mar. 7, 1990, Ser. No. 489,547

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 3907932

Int. Cl.⁵ B60J 7/05

U.S. Cl. 296—222

19 Claims



1. Roof for motor vehicles with a cover that is guided on lateral guide rails, and a rear end of the cover being able to at least be lowered from a roof opening in a stationary roof surface by a mounting mechanism, with which the cover is slid beneath the stationary roof part, said cover carrying a hold-down device near front and rear edge areas on each of opposite lateral sides thereof for holding said cover down due to coaction with a fixed roof part when it is displaced from a closed position, each rear and front hold-down device coacting with a respective guideway on a respective one of the guide rails in the closed position for providing guidance against longitudinal movement of the cover, and with an adjustment mechanism for the positional alignment of the cover and mounting mechanism in the closed position of the cover, wherein one of the hold-down devices, in the closed position of cover, is fixed relative to sliding in a lengthwise direction of the roof, and wherein said adjustment mechanism serves as a means by which said mounting mechanism is alignable relative

to the cover, which is fixed in the lengthwise direction by said one of the hold-down devices, by temporarily interlocking said mounting mechanism with said cover and fixing them in only a single, predetermined position relative to each other and in a manner which is disengageable for normal operation on the roof.

5,085,623

BAR SCORING APPARATUS

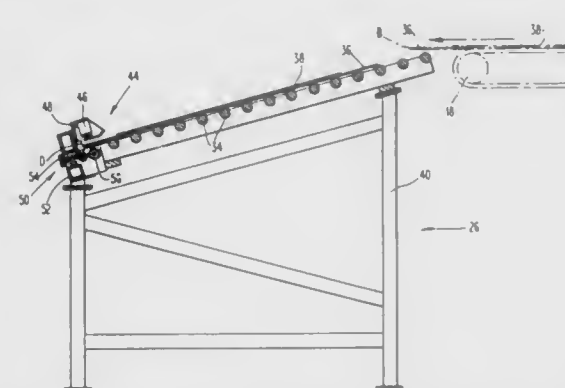
John M. Mitchard, Cherry Hill, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Feb. 6, 1990, Ser. No. 475,663

Int. Cl.⁵ B31B 1/25; B65H 9/04, 9/08

U.S. Cl. 493—400

15 Claims



1. Apparatus for producing a scored box blank by applying a plurality of scores on a corrugated box blank having transverse edges and lateral edges, comprising: means for moving the box blank in a first direction along a substantially horizontal plane; first conveyor means for receiving the box blank from said horizontal plane, a transverse leading edge entering the first conveyor means, said first conveyor means including a plurality of rollers disposed in a plane that is inclined downwardly from said horizontal plane, said inclined plane having a first edge adjacent said horizontal plane and a second edge opposite said first edge; first carriage means for moving the box blank in a second direction, perpendicular to said first direction, along said inclined plane, said first carriage means coupled for movement upon said first conveyor means; first clamp means for grasping the box blank, said first clamp means connected to said first carriage means; means for stopping the transverse leading edge of the box blank at said second edge, said stopping means adapted to align said transverse leading edge of the box blank, in a position perpendicular to said first direction; second conveyor means adjacent said first conveyor means, said second conveyor means including a plurality of rollers disposed in a plane and attached to a frame that is movable through a predetermined arc; a scoring press disposed between said first conveyor means and said second conveyor means substantially in said inclined plane; second carriage means for moving the box blank in said second direction along said movable plane, said second carriage means coupled for movement upon said second conveyor means, said second carriage means further comprising means for incrementing the box blank along said inclined plane beneath said scoring press to said movable plane, said incrementing means including means for activating said scoring press to apply a score on the box blank at preselected points therealong; and second clamp means for grasping the box blank, said second clamp means connected to said second carriage means, whereby said frame is adapted to move through said pre-

terminated arc after the box blank has been moved by said second carriage means entirely beneath said scoring press.

5,085,624

APPARATUS AND PROCESS FOR THE ZIGZAGGED FOLDING AND STACKING OF A WEB OF MATERIAL
Willi Felix, Strengebach, Switzerland, assignor to Jos. Hun-

keler, Ltd., Wilkon, Switzerland

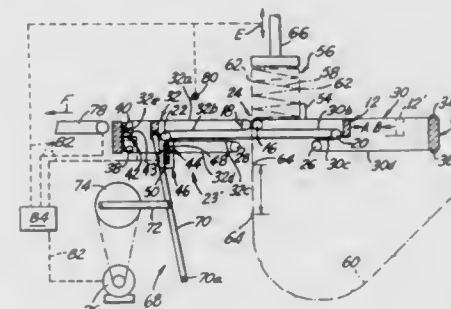
Filed Oct. 23, 1989, Ser. No. 425,422

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1988, 3836214

Int. Cl.⁵ B65H 45/20, 45/101

U.S. Cl. 493—413

23 Claims



1. In a stack-forming apparatus for producing finished stacks of zigzag folded sections from a continuous web of material fed from below, said apparatus comprising a rack having a reciprocatingly translatable driven carriage; two deflection members on said carriage forming a web feeding gap oriented essentially perpendicularly to the reciprocal motion of the carriage and translatable therewith between two end positions separated at least by the length of a web section; first and second support elements in the form of belts which have stack-supporting upper sides, which pass around the deflection members, and which have lower sections; length compensating arrangements that compensate for changes in the length of the support elements' upper sides due to translation of the carriage; holding elements that fix said support elements relative to the rack during stack formation; and carriage drive means for reciprocatingly translating the carriage, the improvement comprising: a. said first support element being of endless design; b. for said first support element, a deflection arrangement mounted on said rack and defining an end of said element's stack supporting side remote from said deflection members; c. the holding element for said first support element being operable from an hold position to a rest position; d. selectively engageable first support element drive means for conveying away finished stacks, and e. a first support element control including means for switching the holding element to its hold position during stack formation and to its rest position for conveying away finished stacks and including means for disengaging the first support element drive means for stack formation and engaging it for conveying away finished stacks.

5,085,625

CHOPPER FOLD DEVICE FOR A FOLDER

Noriyuki Kojima, Chiba, Japan, assignor to Komori Corporation, Tokyo, Japan

Filed Apr. 3, 1991, Ser. No. 679,804

Claims priority, application Japan, Apr. 23, 1990, 2-105257

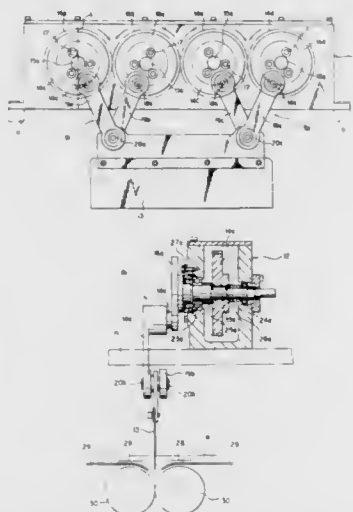
Int. Cl.⁵ B65H 37/06, 45/18

U.S. Cl. 493—444

5 Claims

1. A chopper type folding device wherein a chopper blade is supported by at least two linear feeding crank mechanisms along a longitudinal direction of said chopper blade, characterized that each said linear feeding crank mechanism comprises: a pair of oppositely rotating crank members along said longi-

tudinal direction of said chopper blade, each said crank member having the same throw, and two connecting rods each having an upper end connected to one of said each of crank members by a bearing pin and



lower ends coaxially connected to an upper end of said chopper blade by a bearing pin, respectively, each said connecting rod being of equal length, whereby the chopper blade reciprocates to fold a sheet of material between two folding rollers.

5,085,626 PHYSIOTHERAPEUTIC APPARATUS PROVIDED FOR PRODUCING A MAGNETIC FIELD TO BE USED AS A THERAPEUTIC MEANS

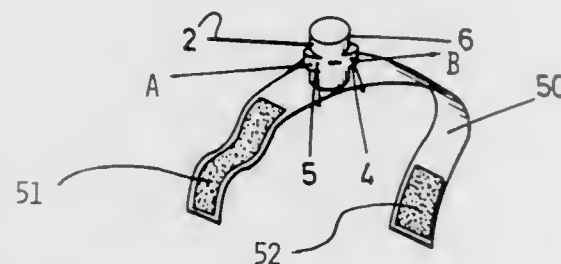
Guy Frey, Bruxelles, Belgium, assignor to Alstom International S.A., Brussels, Belgium

Filed Dec. 5, 1989, Ser. No. 446,334

Claims priority, application Belgium, Dec. 6, 1988, 8801372
Int. Cl.⁵ A61N 2/02

U.S. Cl. 600—13

20 Claims



1. A physiotherapeutic apparatus comprising means for generating a concentrated magnetic field to be directly induced for therapeutic purposes into a living body to be treated, said magnetic field generating means including an induction coil having a solenoid and a substantially straight core fixed inside said solenoid, said coil having a length at least twice the diameter of the core, the magnetic field having poles located, respectively, at opposite ends of the core; an electric current generator connected to said induction coil; and means for orienting said coil to selectively place either one of said poles of the magnetic field in direct contact with the body to be treated.

5,085,627 METHOD FOR TREATMENT OF DISEASES OF THE OPTIC TRACT

Svyatoslav N. Fedorov; Leonid F. Linnik; Gennady M. Antropov; Leonid N. Arnautov; Vladimir V. Ippolitov; Valentin F. Streletsov; Alexandr P. Stromakov, and Nina A. Shigina, all of Moscow, U.S.S.R., assignors to Mezhotraslevoi Nauchno-Tekhnichesky Komplex "Mikrokhirurgia Glaza", Moscow, U.S.S.R.

Continuation of Ser. No. 341,571, Apr. 21, 1989, abandoned.

This application Jun. 11, 1991, Ser. No. 713,578

Claims priority, application U.S.S.R., Aug. 18, 1988, 4469065
Int. Cl.⁵ A61N 2/04

U.S. Cl. 600—14

4 Claims



1. A method for the treatment of diseases of the optic tract, comprising applying a rotating magnetic field at a variable angular velocity synchronized with the pulse rate of the internal carotid artery in any sequence to the bridge of the nose, to the upper portion of the orbit of both eyes with the eyelids closed, to the temporal areas close to the external orbital margin of both eyes, to both of the auriculo-temporal regions at the level of a projection of the optic decussation, and to the region of a projection of the visual analyzers on the occipital protuberances.

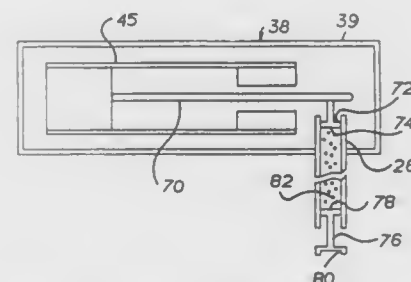
5,085,628 IMPLANTABLE HEARING AID COUPLER DEVICE

A. Maynard Engebretson, Ladue, and John Fredrickson, Clayton, both of Mo., assignors to Storz Instrument Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 242,365, Sep. 9, 1988, Pat. No. 4,988,333. This application Oct. 12, 1989, Ser. No. 420,292
Int. Cl.⁵ H04R 25/00

U.S. Cl. 600—25

9 Claims



1. An acoustic coupler for transferring pressure vibrations generated by the movement of an armature of an inductive coil to a portion of a human ear comprising: container means for acoustic signal transfer having a first end and a second end; first piston means for connection to the armature and movably disposed in said first end of said container means; second piston means for connection to ear structure and movably disposed in said second end of said container means; and means for attaching said second piston means to said portion of a human ear.

5,085,629 BIODEGRADABLE STENT

Jay Goldberg, Northbrook, Ill., and Richard Sinclair, Columbus, Ohio, assignors to Medical Engineering Corporation, Del.

Continuation-in-part of Ser. No. 254,547, Oct. 6, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 414,651

Int. Cl.⁵ A61M 5/00; A61F 2/04

U.S. Cl. 604—8 32 Claims
1. A biodegradable, biocompatible, resorbable, ureteral stent having retaining means to prevent migration from a predetermined position in the ureter, said stent comprising a terpolymer of:

- (a) L(-) lactide
- (b) glycolide, and
- (c) epsilon-caprolactone.

5,085,630 OXYGENATED FLUOROCARBON NUTRIENT SOLUTION

Jewell L. Osterholm, Radnor, and Glenn D. Frazer, Wynwood, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 333,658, Apr. 5, 1989, Pat. No. 4,982,691, and a continuation-in-part of Ser. No. 238,982, Aug. 24, 1988, Pat. No. 4,840,617, Ser. No. 183,536, Apr. 14, 1988, Ser. No. 428,900, Sep. 30, 1982, Pat. No. 4,758,431, and Ser. No. 582,961, Feb. 23, 1984, Pat. No. 4,686,085, which is a division of Ser. No. 428,850, Sep. 30, 1982, Pat. No. 4,445,500, which is a division of Ser. No. 354,346, May 19, 1989, Pat. No. 4,445,886, which is a continuation-in-part of Ser. No. 139,886, Dec. 30, 1987, Pat. No. 4,378,797, said Ser. No. 428,900, is a division of Ser. No. 354,346, said Ser. No. 428,850, is a division of Ser. No. 139,886. This application May 21, 1990, Ser. No. 507,361
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.⁵ A61M 1/00

U.S. Cl. 604—28 8 Claims
1. A method of treating hypoxic-ischemic neurologic tissue in mammals, comprising:

- (a) providing a physiologically acceptable synthetic oxygenatable fluid comprising bis-perfluorobutyl ethylene with a synthetic electrolyte-containing cerebrospinal aqueous fluid to produce a physiologically acceptable emulsion;
- (b) oxygenating said oxygenatable fluid to produce an oxygenated fluid;
- (c) injecting a substantially continuous stream of said oxygenated fluid into the cerebrospinal fluid pathway, at a first injection point;
- (d) substantially continuously withdrawing fluid from said cerebrospinal fluid pathway at a second point which is selected to create a circulation of said oxygenated fluid in the vicinity of said ischemic tissue, whereby ischemic neurologic tissue will be oxygenated and otherwise nourished by said fluid.

5,085,631 METHOD AND KIT FOR ADMINISTERING SPINAL SUBARACHNOID ANESTHESIA

Barbara Leighton, Philadelphia, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

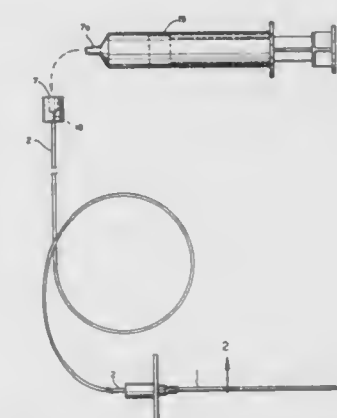
Continuation of Ser. No. 227,409, Aug. 2, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 488,467

Int. Cl.⁵ A61M 19/00

U.S. Cl. 604—28 14 Claims
1. A method of administering spinal anesthesia to a patient, comprising the steps of:

- (a) providing an introducer assembly comprising at least three components, said three components including:
 - (i) an outer epidural needle having a distal tip;
 - (ii) an inner subarachnoid needle having a distal tip; and
 - (iii) a spinal subarachnoid catheter closely approximated to and slidably disposed around said inner subarach-

noid needle and slidably positioned within said outer epidural needle, said catheter comprising a distal tip and a proximal tip;
(b) introducing said epidural needle into an epidural space until said distal tip of said epidural needle is in close proximity to a dural membrane;
(c) advancing said subarachnoid catheter and subarachnoid needle through said epidural needle until the dural mem-



brane is fully penetrated by said distal tip of said catheter and said distal tip of said subarachnoid needle;
(d) withdrawing said subarachnoid needle from within said catheter while leaving said catheter in place;
(e) withdrawing said epidural needle from around said catheter; and
(f) introducing anesthesia into a spinal subarachnoid space through said proximal tip of said catheter to anesthetize said patient.

5,085,632 CATHETER AND METHOD FOR THE MANUFACTURE THEREOF

Yoshito Ikada, Uji; Toshiyuki Okada, Takarazuka; Tatsuya Kawai, and Michiaki Yoshimoto, both of Hiroshima, all of Japan, assignors to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Filed Apr. 10, 1990, Ser. No. 507,376

Claims priority, application Japan, Aug. 10, 1989, 1-207398
Int. Cl.⁵ A61M 1/00

U.S. Cl. 604—29

5 Claims



1. A catheter comprising a tube and a cuff provided around the circumference of said tube, wherein the cuff comprises a porous material consisting essentially of a vinyl alcohol polymer having collagen chemically grafted to the surface of the porous material.

5,085,633 METHOD OF FORMING SUCTION SWAB

Paul H. Haniff, Barrington, and Donald R. Harrel, Woodstock, both of Ill., assignors to Sage Products, Inc., Crystal Lake, Ill.

Continuation of Ser. No. 570,886, Aug. 22, 1990, abandoned. This application Jun. 19, 1991, Ser. No. 717,858

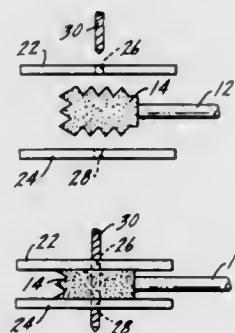
Int. Cl.⁵ A61M 1/00

U.S. Cl. 604—35 9 Claims
1. A method of forming a suction swab, comprising the steps of

- a. installing a resilient compressible tip on an end of an

elongated, hollow stem, with the tip enveloping the end of the stem,

- b. locating the tip between a pair of displaceable clamp plates, the plates each having a drill aperture, with the apertures being in registration with each other and with the tip being in alignment with the apertures,



- c. compressing the tip between the plates with the stem being located between the apertures,
d. boring a hole through the compressed tip and the hollow stem by drilling through said apertures, and
e. releasing the tip from the plates.

5,085,634

MEDICAMENT AND SUPPORT

Albert M. Lackney, 1795 TR 320 SE, Crooksville, Ohio 43731

Filed Sep. 19, 1990, Ser. No. 584,601

Int. Cl.⁵ A61J 7/00

U.S. Cl. 604—77

9 Claims



1. In combination, an oral medicament secured to a support comprising:

- a) an elongated support having first and second ends including means for securing a solid medicament thereto, said securing means comprising:
a frame attached to said first end of said support, said frame including at least one cavity therein and a plurality of orifices on the surface thereof communicating with said cavity for securing said medicament to said support; and
b) a solid medicament filling said cavity, extending through said orifices, and substantially covering the exterior of said frame;
whereby said oral medicament secured to said support allows sucking of said medicament while presenting inadvertent swallowing of said medicament or said support.

5,085,635

VALVED-TIP ANGIOGRAPHIC CATHETER

Andrew H. Cragg, 26 Oak Park Dr., Iowa City, Iowa 52240

Filed May 18, 1990, Ser. No. 524,851

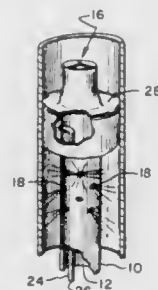
Int. Cl.⁵ A61M 29/00

U.S. Cl. 604—96

6 Claims

1. A catheter insertable over a guidewire for introducing a fluid into a vessel of the human body, said catheter comprising a long hollow flexible tube of the desired length having a small diameter and a proximal end and a distal end, said tube having a thin wall extending between said ends to define a passageway extending throughout the length of the tube and terminating at the distal end, a plurality of side holes extending through the wall of the tube near its distal end to provide for the discharge

of fluid from the passageway through the holes in the wall and into the vessel, and means closing the distal end and preventing



the discharge of fluid from the passageway through the distal end, said means opening during the passage of the guidewire through the distal end.

5,085,636

BALLOON CATHETER WITH INFLATION-DEFLATION VALVE

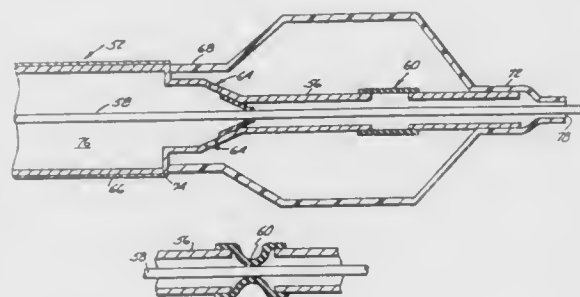
Matthew M. Burns, Minneapolis, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation of Ser. No. 297,078, Jan. 13, 1989, abandoned. This application Oct. 11, 1990, Ser. No. 596,573

Int. Cl.⁵ A61M 29/02

U.S. Cl. 604—99

27 Claims



1. An angioplasty balloon catheter assembly comprising:
a guide wire;
a shaft having a proximal end and a distal end, and having a lumen which extends longitudinally therethrough from the proximal end to the distal end and which is adapted to receive the guide wire therein;
an inflatable balloon at the distal end of the shaft and having an interior in fluid communication with the lumen;
director means connected to the distal end of the shaft and extending through the balloon to the distal end of the balloon for defining a path for the guide wire from the lumen, through the balloon and distally therefrom;
first valve means positioned across the path which permits movement of the guide wire freely therethrough for providing a fluid tight seal across the path only when positive fluid pressure is applied through the lumen to the interior of the balloon; and
second valve means positioned across the path which permits movement of the guide wire freely therethrough for providing a fluid tight seal across the path only when net negative fluid pressure is created in the lumen and balloon interior for deflation thereof.

5,085,637

Patent Not Issued For This Number

5,085,638

SINGLE USE DISPOSABLE SYRINGE

David Farbstein, 3 Ben-Yacov Street, Achuza, Haifa, Israel, and Miriam Ochshorn, 500 E. 63rd St., #8C, New York, N.Y. 10021

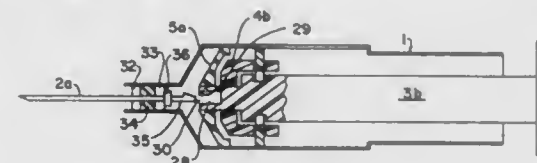
Filed Dec. 29, 1988, Ser. No. 291,512

Claims priority, application Israel, Mar. 31, 1988, 85937; Jun. 7, 1988, 86656

Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—110

12 Claims



1. A syringe comprising a tubular housing having an entrance for a plunger at one end and an outlet for fluid at the other end, a plunger disposed in said housing and movable relative to the housing between a rear position and a forward position, and means for preventing the plunger from drawing liquid into the syringe once it has been pushed to said forward position;

wherein said plunger comprises a piston and piston rod releasably coupled to one another, and means for releasably coupling said piston to said piston rod when initially drawing fluid into said syringe as said plunger is moved to said rear position and for disengaging said piston from said piston rod when ejecting fluid from said syringe as said plunger is pushed toward said forward position so that the piston rod cannot pull the piston back to draw more fluid into the syringe, said means for releasably coupling said piston to said piston rod including a spring washer circumferentially disposed about said piston rod and engaging said piston and piston rod when under radial compression and releasing said piston from said piston rod when the radial compression of the washer is released, and means for radially compressing said washer when initially drawing fluid into said syringe as said plunger is moved to said rear position and releasing the radial compression of said washer as said plunger is moved toward said forward position.

5,085,639

SAFETY WINGED NEEDLE MEDICAL DEVICES

Dana W. Ryan, Franklin, Tenn., assignor to Ryan Medical, Inc., Brentwood, Tenn.

Continuation-in-part of Ser. No. 162,569, Mar. 1, 1988, and a continuation-in-part of Ser. No. 224,920, Jul. 27, 1988, Pat. No. 4,923,445, and a continuation-in-part of Ser. No. 257,407, Oct. 13, 1988, and a continuation-in-part of Ser. No. 303,588, Jan. 27, 1989. This application Oct. 4, 1989, Ser. No. 416,927

Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—110

30 Claims

1. A medical device for assembly with a hollow needle, comprising:

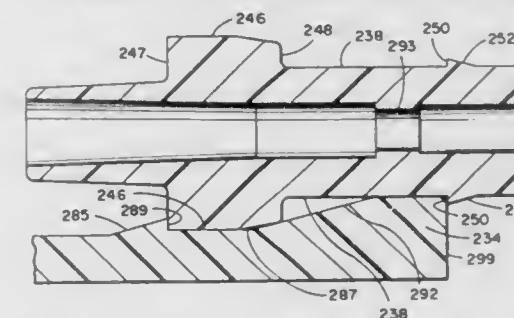
- a) an inner tube member having a passageway therethrough, a front end through which the hollow needle can extend, a rear end with said passageway extending therethrough; and
an outer surface having a circumferential first groove, a shoulder forwardly adjacent said first groove and a first inner tube ramp rearwardly adjacent said first groove, a first end of said first inner tube ramp being located at said first groove and constituting a first abutment surface, said first inner tube ramp decreasing in circumference as it extends towards said rear end, wherein said

shoulder subscribes a larger cross-section area through said inner tube member than said first inner tube ramp, and said shoulder terminates at its front end in a second abutment surface; and

- b) a resiliently flexible hollow outer shield member having an inner surface, most of said inner surface subscribing a slightly larger cross-section than most of said outer surface of said inner tube member, a front end having a substantially unrestricted opening therein for permitting said inner tube member to be loaded therethrough during assembly of said medical device,

at least one winged member attached to and flexible extending outwardly from said shield member, a rear end having an opening therein;

first and second ramps located towards said rear end of said outer shield member, extending inwardly from said inner surface of said outer shield member, and subscribing smaller cross-sectional areas as they extend toward said rear end, said first ramp being forward of said second ramp and terminating in a third abutment surface, said second ramp terminating in a protrusion, said first range at said third abutment surface subscribing a



substantially larger diameter than said second ramp at said protrusion, wherein

the cross-sectional area subscribed by said protrusion of said outer shield member is substantially smaller than the circumference of said shoulder of said inner tube member, and wherein

in a first locking position said outer shield member is in locking engagement with said inner tube member, said third abutment surface is forward of said second abutment surface, said shoulder engages said inner surface of said outer shield member between said first and second ramps, and said first abutment surface is rearward of said rear end of said shield member such that attempted movement of said outer shield member backward relative to said inner tube member is stopped by abutment of said second and third abutment surfaces and by the abutment of said first abutment surface and the rear end of said outer shield member, and attempted movement of said shield member forward relative to said inner tube member is stopped by the engagement of said shoulder and said second ramp.

5,085,640

NON-REUSABLE MEDICAL NEEDLE APPARATUS

Andrew H. Gibbs, 3678 S. Walton Ave., Yuba City, Calif. 95993

Filed Apr. 6, 1990, Ser. No. 505,925

Int. Cl.⁵ A61M 5/00

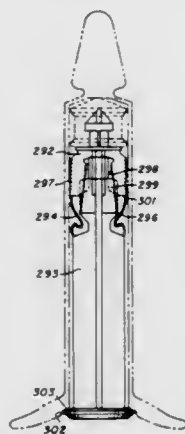
U.S. Cl. 604—110

8 Claims

1. A non-reusable medical needle apparatus for transferring fluid, said apparatus comprising:

- a case with an elongated cavity therein, said case having an open end and a relatively closed end,
a hollow needle projecting from the closed end of the case during fluid transfer, said needle being in fluid flow communication with the elongated cavity,
an operating member having one end fitting into the cavity

through the open end of the case and having an opposite end projecting outwardly therefrom, means for restraining the case with two fingers of one hand while applying thumb pressure with the same hand to the outwardly projecting end of the operating member in a direction towards the case,



means responsive to thumb pressure on the operating member for actuating fluid transfer, and integrally molded plastic means that deforms in response to thumb pressure on the operating member for rendering the apparatus non-reusable after fluid transfer, said plastic means being separate from the case.

5,085,641

CONVENIENTLY CARRIED FREQUENT USE AUTO-INJECTOR WITH IMPROVED CAP STRUCTURE

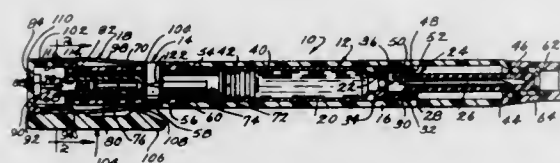
Stanley J. Sarnoff, Bethesda; Claudio Lopez, Gaithersburg, both of Md., and N. Lawrence Dalling, Cross Junction, Va., assignors to Survival Technology, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 380,459, Jul. 17, 1989. This application Apr. 12, 1990, Ser. No. 507,795

Int. Cl.⁵ A61M 5/20

U.S. Cl. 604—134

24 Claims



1. An auto-injector particularly suited to be carried on the person of a user comprising a medicament cartridge assembly, a stressed spring assembly and means mounting said assemblies together in cooperating relation in a storage position with respect to one another so as to provide an exterior housing body structure having a needle extension end and an opposite end and a cap structure extending over the opposite end of the housing body structure, said cap structure and said housing body structure when said assemblies are mounted together in cooperating relation in said storage position defining an exterior configuration of a size and shape approximately the same as that of a conventional fountain pen, said cap structure being of generally tubular construction having an open end and an opposite closed end portion and an elongated clip having one end fixed to the closed end portion of said cap structure, said elongated clip extending longitudinally along the tubular construction of said cap structure and having a free end biased to engage with the exterior of said cap structure adjacent the open end thereof whereby said clip serves to

secure said cap structure and said housing body within a pocket on the person of a user, said medicament cartridge assembly including means defining a container, a liquid medicament with said container and a hypodermic needle disposed in a storage position and movable therefrom into an extended operative position,

said releasable stressed spring assembly including spring means, releasable means for retaining said spring means in a stressed storage position and releasing means operable in response to a predetermined manual actuating procedure to release said releasable means so that said spring means moves (1) said hypodermic needle into said extended operative position during which the hypodermic needle moves outwardly of the needle extension end of said housing body structure through the skin and into the adjacent tissue of a user and (2) said liquid medicament outwardly through said hypodermic needle into the tissue of the user,

said releasing means including manually movable means extending beyond the opposite end portion of said housing body structure into and exterior position suitable for manual engagement so as to be manually moved during the manual actuating procedure to which said releasing means is responsive to release said releasable means,

means between said housing body structure and said cap structure for detachably securing said cap structure on said housing body structure (1) in said storage position in open ended telescopic relation with an opposite end portion of said housing body structure covering said manually movable means so as to prevent the manual engagement of said manually movable means without said cap structure being detached from said storage position with respect to said housing body structure and (2) in a final position in open ended telescopic relation with a needle extension end portion of said housing body structure covering said hypodermic needle in said extended operating position after withdrawal from the injection site,

said cap structure when in said positions with said housing body structure serving the plural purposes of (1) facilitating the securement of the cap structure and housing body structure with the user's pocket, (2) alleviating the likelihood of an unwanted release of the releasable means with a resultant unwanted movement of said hypodermic needle and an unwanted movement of the liquid medicament outwardly of the hypodermic needle, and (3) protecting against an unwanted contact with the hypodermic needle while in said extended operative position after withdrawal from the injection site,

said assembly securing means including a forward tubular housing member having means on the forward end thereof defining the needle extension end of said housing body structure,

said stressed spring assembly including a rearward housing member fixed to said forward housing member defining the opposite end of said housing body structure, said stressed spring assembly also including said cap structure, said means detachable securing said cap structure in said storage position being on said cap structure and said rearward housing member,

said manually movable means including an actuating member mounted for movement from a storage position into an actuating position,

said predetermined manual actuating procedure to which releasing means is responsive to release said releasable means including a relative movement of said actuating member with respect to said rearward housing member into said actuating position by manually moving the same toward said forward housing member with a thumb which the needle extension end of said housing body structure is retained in an operative position with the skin of the user at the location where the injection is to take place, said container being mounted within said forward tubular housing member for movement from the storage position

thereof into an extended position within said forward housing member, said medicament cartridge assembly further including a hub assembly connecting a rearward end of said hypodermic needle with a forward end of said container for movement therewith, a resilient sheath extending over said hypodermic needle when said hypodermic needle is in the storage position thereof, said container having a piston slidably sealingly mounted in a rearward end portion thereof in engagement with the liquid medicament within said container operable to be moved by said spring means into an extended position during which (1) said container is moved into its extended position, (2) said hypodermic needle is moved with said container through said sheath and into the tissue of the user while said sheath is compressed within said forward housing member and (3) said liquid medicament is moved out of said hypodermic needle into the tissue of the user, said hub assembly having a seal therein normally sealing the liquid medicament from contact with said needle operable to burst in response to the initial portion of the movement of said piston within said container.

5,085,642

CONVENIENTLY CARRIED FREQUENT USE AUTOINJECTOR

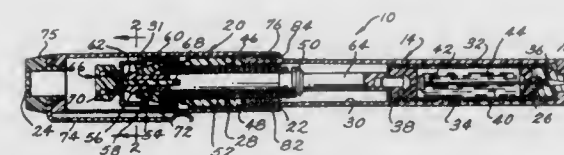
Stanley J. Sarnoff, Bethesda, and Claudio Lopez, Gaithersburg, both of Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Jul. 17, 1989, Ser. No. 380,459

Int. Cl.⁵ A61M 5/20

U.S. Cl. 604—134

20 Claims



1. An autoinjector comprising housing means defining an exterior configuration of a size and shape approximately the same as that of a conventional fountain pen, said housing means including a housing body assembly of elongated generally cylindrical configuration having a needle extension end and an opposite end and a separate housing cap structure of elongated generally cylindrical configuration having an open end and an opposite closed end,

means between said housing body assembly and said housing cap structure for detachably securing said separate housing cap structure in open ended telescopic relation with the opposite end portion of said housing body assembly, said housing body assembly defining an interior chamber, a medicament cartridge assembly mounted in a storage position within said interior chamber adjacent the needle extension end of said housing body assembly including a container, a liquid medicament within said container and a hypodermic needle disposed in a storage position and movable therefrom into an extended operative position, a releasable stressed spring assembly carried by said housing body assembly adjacent the opposite end thereof including spring means, releasable means for retaining said spring means in a stressed storage position within said chamber and releasing means operable in response to a predetermined manual actuating procedure to release said releasable means so that said spring means moves (1) said hypodermic needle into said extended operative position during which the hypodermic needle moves outwardly of the needle extension end of said housing body assembly through the skin and into the adjacent tissue of a user and

(2) said liquid medicament outwardly through said hypodermic needle into the tissue of the user, said releasing means including manually movable means extending from the opposite end of said housing body assembly into an exterior position suitable for manual engagement so as to be manually moved during the manual actuating procedure to which said releasing means is responsive to release said releasable means,

said manually movable means including a safety member mounted in said exterior position extending from the opposite end of said housing body assembly for manual removal from said exterior position, said safety member having means for (1) preventing said releasing means from releasing said releasable means when said safety member is in said exterior position and (2) enabling said releasing means to release said releasable means in response to said predetermined manual actuating procedure which includes an initial manual engagement of said safety member and removal thereof from said exterior position, said housing cap structure covering said safety member when said housing cap structure is secured to said housing body assembly so as to prevent the manual engagement of said safety member without said housing cap structure being detached from said housing body assembly.

5,085,643

SYRINGE, ADAPTOR, AND CHECK VALVE COMBINATION FOR PARENTERAL INFUSER

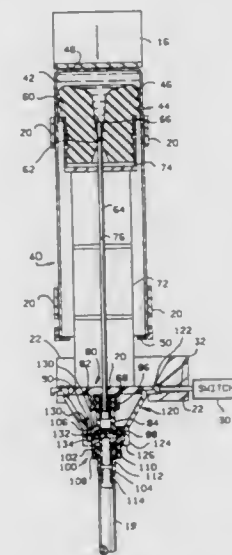
Mark E. Larkin, Lindenhurst; John E. Ogden, Libertyville, and Dale V. Moeller, Wadsworth, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 2, 1989, Ser. No. 360,965

Int. Cl.⁵ A61M 1/00

U.S. Cl. 604—152

5 Claims



1. For use in a parenteral infuser comprising a cradle adapted to receive an annular or disc-shaped element fitting into the cradle and a switch adapted to disable the parenteral infuser unless such an element is fitted into the cradle, a combination comprising:

- a. a syringe having a chamber adapted to hold an infusible liquid and including
 1. a vial having a tubular wall with a closed end and an open end, having a longitudinal axis, and enclosing the chamber except at one end opposite the closed end of the vial,
 2. a plunger arranged within the vial, in liquid-tight relation to the tubular wall of the vial, for relative movement of the plunger and the vial along the axis of the vial, the plunger having an axial hole and closing the

chamber liquid-tightly at the end opposite the closed end of the vial except at the axial hole,

3. a tubular needle extending axially through the open end of the vial, and liquid-tightly through the axial hole of the plunger, and
4. a flange mounted around the tubular needle in fixed, spaced relation to the plunger, the flange being too small to fit into the cradle,
- b. a first set of male and female tubular connectors adapted to be releasably connected to each other, the first set of tubular connectors including a first connector axially attached to the flange of the syringe so as to communicate with the tubular needle and a second connector;
- c. an adaptor having an upper portion including an outer rim adapted to fit into the cradle and an inner rim adapted to fit over the flange of the syringe and a lower tubular portion axially spaced from the upper portion;
- d. a check valve having a fluid inlet, a fluid outlet, and means for allowing fluid to flow only from the inlet to the outlet, said valve adapted to fit in the tubular portion of the adaptor and fluidly connected to the first connector at the fluid inlet by the second connector of the first set of tubular connectors so as to allow the infusible liquid to flow from the chamber, through the tubular needle, and through the check valve, but not oppositely, when the adaptor is fitted over the flange of the syringe and into the cradle and the first and second connectors of the first set of tubular connectors are connected to each other; and
- e. a second set of tubular connectors adapted to be releasably connected to each other, the second set of tubular connectors including a first connector attached to the fluid outlet of the check valve and axially extended from the tubular portion of the adaptor and a second connector adapted to connect a tube leading toward a site for parenteral infusion of a patient.

5,085,644

STERILIZABLE MEDICATION INFUSION DEVICE WITH DOSE RECHARGE RESTRICTION

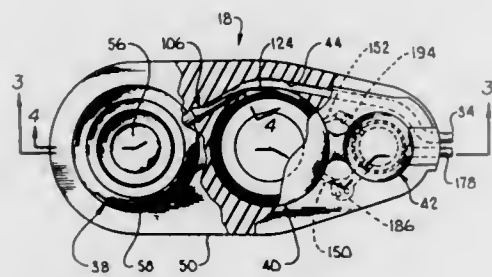
David A. Watson, Goleta, and Mark J. Licata, Santa Barbara, both of Calif., assignors to Pudenz-Schulte Medical Research Corporation, Goleta, Calif.

Continuation-in-part of Ser. No. 679,658, Apr. 2, 1991, and a continuation-in-part of Ser. No. 503,426, Apr. 2, 1990. This application May 20, 1991, Ser. No. 703,247

Int. Cl.⁵ A61M 11/00

U.S. Cl. 604—153

32 Claims



1. A fluid control assembly, comprising:
 - a self-recharging, manually actuatable pump for discharging a measured amount of fluid from a pumping chamber;
 - means for conducting pump recharge fluid into the pumping chamber;
 - means for conducting discharge fluid from the pumping chamber;
 - valve means for controlling the flow of discharge fluid from the pumping chamber, the valve means forming a portion of the discharge fluid conducting means;
 - an alternate fluid conduit extending between the pumping chamber and a portion of the discharge fluid conducting means within the valve means; and
 - means for preventing the passage of liquid fluid through the

alternate fluid conduit, and yet permitting the passage of gaseous fluid therethrough.

5,085,645

APPARATUS AND METHOD FOR A CATHETER ADAPTER WITH VALVE

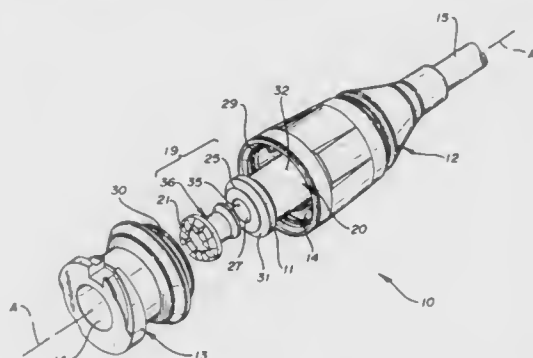
Edmund R. Purdy, Fruit Heights; Mark A. Crawford, Sandy; Timothy J. Erskine, and Gerald H. Peterson, both of Salt Lake City, all of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 15, 1990, Ser. No. 569,797

Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—167

11 Claims



1. An over the needle catheter with a needle and hub assembly and a catheter adapter having an integral valve comprising:
 - a catheter adapter having a distal part and a proximal part joined together to form a passage therethrough along an axis thereof, the distal part connecting to a catheter tube for providing fluid communication therewith and through the passage;
 - a valve assembly positioned within the passage about the axis and having an elongate resilient member captured within the passage and between the distal part and the proximal part for a compression fit therebetween to thereby normally prevent fluid communication through the passage;
 - a proximal portion of the valve assembly provided to be engaged by a fluid dispenser fitting shaped to extend into the passage of the proximal part and axially compress the elongate resilient member when the fluid dispenser fitting is within the catheter adapter proximal part;
 - a valve seat disposed within the passage and on the proximal part, the valve seat being formed as a generally frusto conical surface located coaxial about the axis and facing the distal part of the catheter adapter in position to engage a chamfered surface on the elongate resilient member to form a seal therebetween preventing fluid communication when the elongate resilient member is compressed between the distal part and the proximal part and allowing fluid communication when the seal is broken by axial compression of the elongate resilient member by the fluid dispenser fitting;
 - a needle hub assembly having a hub which conjugates with the proximal part of the catheter adapter and a needle on the hub extending from the hub and through the passage when the hub is conjugated with the proximal part of the catheter adapter, and
 - an internal cavity on the elongate resilient member extending axially and distally from the chamfered surface to a septum like end across the elongate resilient member for permitting the needle to pass through the septum like end in a resealable fashion upon placement and withdrawal of the needle therethrough.

5,085,646

IMPLANT PASSAGEWAY

Jan A. Svenson, Solhemsgatan 16, Huskvarna S-561 35, and Robert Axelsson, Box 4010, Huskvarna S-561 04, both of Sweden

PCT No. PCT/SE88/00222, § 371 Date Nov. 27, 1990, § 102(e)

Date Nov. 27, 1990, PCT Pub. No. WO89/10727, PCT Pub.

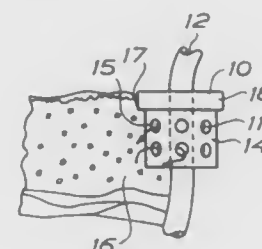
Date Nov. 16, 1989

PCT Filed May 2, 1988, Ser. No. 613,549

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—175

2 Claims



1. Implant passageway for connection of body cavities, vessels and other organs to a device externally of the body, having a biocompatible surface and comprising a tubular element forming a through passage and peripheral grooves on the outside of the curved surface thereof inwardly of an end portion having a smooth surface, and a socket surrounding the tubular element and forming through holes in register with said grooves and together with the tubular element defining a number of passage networks with a minimum cross-sectional dimension of 30 μ m for controlled growth of surrounding tissue thereto in order to prevent epothelium from growing down around the passageway and achieve a reliable and permanent retention thereof.

5,085,647

RIGID NEEDLE COVER WITH NEEDLE SEALING PLUG AND METHOD OF MANUFACTURE THEREOF

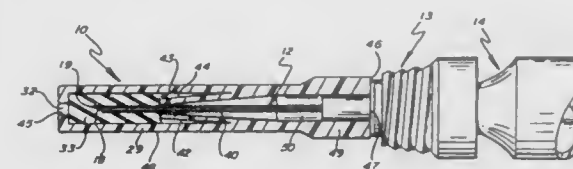
William D. Henderson, Daytona Beach, and Roger L. Crouse, Ormond Beach, both of Fla., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 7, 1991, Ser. No. 666,164

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—192

19 Claims



tric outer shell (6) along its length spaced apart from said first point, the thickness of said first resin (2) tapering in a decreasing fashion as it passes from said first point to said second point and the thickness of said second resin (4) tapering inversely to the taper of said first resin (2) as it passes from said first point to said second point, and wherein the hardness of the innermost resin (2) exceeds the hardness of the outermost resin (4) in the interior tubular portion and the hardness of the concentric outer shell exceeds the hardness of said second resin (4).

5,085,650

GYNECOLOGICAL URETHRAL SUPPOSITORY

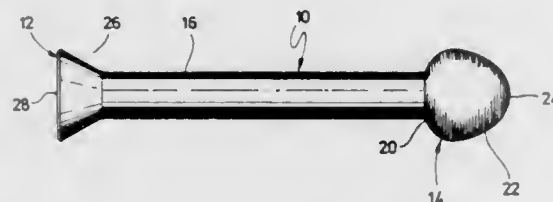
Frank A. Giglio, 1265 Nottingham La., Beaumont, Tex. 77706

Filed Oct. 20, 1989, Ser. No. 424,707

Int. Cl.⁵ A61F 15/00

U.S. Cl. 604—288

1 Claim



1. A urethral suppository comprising:
- a relatively long, relatively small diameter shaft;
 - a bulbous head extending from a rounded nose through a relatively gradually outwardly curving insertion surface having an axial length equaling about two thirds of the overall length of the head and a relatively sharply curving retention surface extending from the intersection with the insertion surface which is the maximum diameter of the head to an intersection with the shaft, the intersection between the retention surface and the insertion surface not comprising a sharp edge or corner;
 - a conical tail including an outwardly tapered retaining surface extending from the shaft to a base having a diameter substantially greater than the maximum diameter of the bulbous head;
 - said shaft, head, and tail comprising a unitary structure and being formed entirely from a medicament; and
 - said shaft, head, and tail characterized by the following dimensions:

A.	Shaft	Diameter	5.0 mm
		Axial Length	37.0 mm
B.	Head	Diameter	8.0 mm
		Axial Length	8.0 mm
C.	Base	Diameter	11.2 mm
		Axial Length	5.0 mm

5,085,651

OCULAR VIAL

Daniel Py, 22 Ferncliff Ter., Short Hills, N.J. 07078

Filed Mar. 13, 1989, Ser. No. 322,761

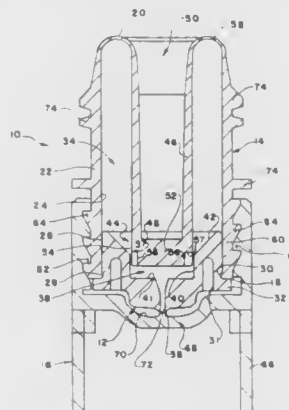
Int. Cl.⁵ A61M 35/00

U.S. Cl. 604—298

11 Claims

1. An ocular treatment apparatus for applying medicament into an eye, said apparatus comprising:
- a vial defining first and second cavities, said first cavity being in fluid communication with said second cavity for receiving a predetermined volume of medicament therefrom, said vial having formed therein an orifice in fluid communication with said first cavity for releasing a substantially predetermined volume of medicament therefrom;
 - a piston member, said piston member being moveable within

said first cavity for displacing a substantially predetermined volume of medicament from said first cavity through said orifice and into the eye, the piston member and/or a surface defining the first cavity including



means for removing air from the medicament released from the first cavity into the eye.

5,085,652

POUCH WITH MOUNTING MEMBER FOR REMOVABLE ADHESIVE FILTER

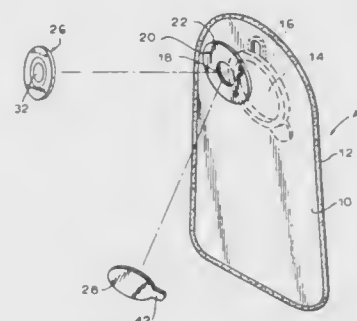
Kenneth A. Johnsen, Piscataway, and Frank Freeman, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Princeton, N.J.

Filed Jun. 16, 1989, Ser. No. 367,237

Int. Cl.⁵ A61F 5/44

U.S. Cl. 604—333

10 Claims



1. A device comprising a collection receptacle in the form of a thin walled pouch, said pouch enclosing a space, said pouch wall comprising a vent through which gases, from said space may escape and means for receiving bodily waste discharged by a patient, a mounting member having an interior surface permanently affixed to said pouch wall surrounding the vent and an exterior surface, said member having an opening aligned with the vent, such that passage of gases through the vent is substantially unobstructed by said member and a filter element, adhesive means for removably mounting said filter element on said exterior surface of said member, in alignment with the vent, such that the gases are filtered through said filter element as they pass through the vent.

5,085,653

DURABLE AND REUSABLE INCONTINENT UNDERPADS

Harry Levy, 219-04 Stewart Rd., Hollis Hills, N.Y. 11427

Filed Dec. 10, 1990, Ser. No. 625,150

Int. Cl.⁵ A61F 13/15

U.S. Cl. 604—358

7 Claims



1. A durable and reusable incontinent underpad, comprising:
- a first layer of one of woven or knit fabric;
 - a second layer of non-woven felt, cooperating with said first layer providing a high absorbency characteristic for said underpad to urine, fluids, moisture and body wastes;
 - a third layer of polyurethane film;
 - a fourth layer of one of woven or knit fabric, cooperating with said third layer providing a high leakage preventing characteristic for said underpad to urine, fluids, moisture and body wastes absorbed by said first and second layers;
 - a first adhesive lamination joining said second and third layers together;
 - a second adhesive lamination joining said third and fourth layers together; and
 - means quilting said first and second layers together.

5,085,654

DISPOSABLE GARMENT WITH BREATHABLE LEG CUFFS

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 473,510, Feb. 1, 1990, abandoned,

which is a continuation of Ser. No. 222,329, Jul. 20, 1988,

abandoned, which is a continuation of Ser. No. 921,796, Oct. 17,

1986, abandoned, which is a continuation of Ser. No. 522,438,

Aug. 11, 1983, abandoned, which is a continuation-in-part of Ser.

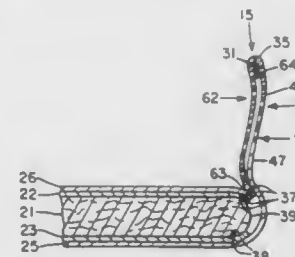
No. 441,825, Nov. 15, 1982, abandoned. This application Apr. 22,

1991, Ser. No. 689,136

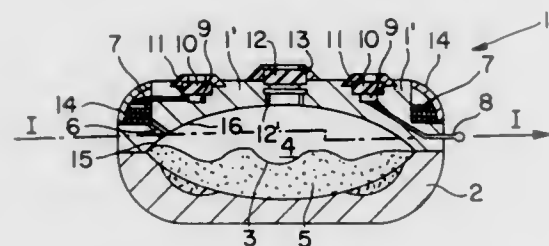
Int. Cl.⁵ A61F 13/15, 13/20

U.S. Cl. 604—370

11 Claims



medicament provided in said first chamber (4), characterized in



that a porous hollow fiber capillary (15) disposed at the outlet opening of said first chamber (4) is provided as a filter.

5,085,657

ELECTROSURGICAL INSTRUMENT

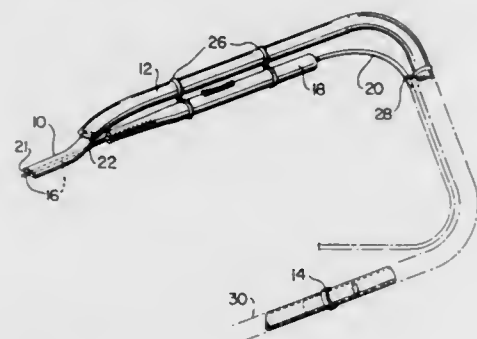
Haim Ben-Simhon, 78-280 Mc Clelland Road, Nepean, Ontario, Canada K2L 8P8

Continuation of Ser. No. 341,956, Apr. 24, 1989, abandoned, which is a continuation of Ser. No. 475,145, Mar. 14, 1983, abandoned. This application Oct. 9, 1990, Ser. No. 594,704

Int. Cl.⁵ A61B 17/39

U.S. Cl. 606-42

13 Claims



1. The combination of:

- A) a cutting-coagulation scalpel including a handle, an electrical lead to said handle, switch means on said handle, a blade electrode mounted at one end of said handle and connected to said electrical lead through said switch means on said handle for selectively activating and deactivating said blade electrode for cutting action or for coagulation action; and
- B) a suction tube removably mounted on said handle, said suction tube being connectable to a source of suction and comprising a modified L-shaped hard plastic transparent tube having a longitudinal arm and an angular arm, with an angle of 135° between said longitudinal arm and said angular arm, said longitudinal arm having an open end and a back end, and being provided, at said open end, with an orifice, and, at said back end, with a thickened wall having a slot therethrough allowing penetration of said blade electrode therethrough, a soft plastic tube, said angular arm being connected to said soft plastic tube, said soft plastic tube having a first set of hooks thereon, said first set of hooks each comprising two rings, one ring completely encircling said soft plastic tube, the other ring being constituted by two flexible arms to allow said handle to pop in between a gap between said two flexible arms thereby allowing said ring to be mounted on, and being positively attached to, said handle, and having a further set of hooks thereon for holding only said electric lead, each of said further set of hooks having a closed ring encircling said soft tube and an open ring, said open ring being formed by two flexible arms, each of said further set of hooks being sized to allow said electrical lead of said cutting-coagula-

tion scalpel to be engaged and disengaged in it, said blade electrode penetrating said modified L-shaped tube through said slot in said back end of said longitudinal arm, and being held in the center thereof by said thickened wall and protruding out of said orifice so that said blade electrode approaches cut and coagulated tissue area, and a tap disposed on said suction tube, said tap being selectively operable to connect said suction tube to said source of suction, or to disconnect said suction tube from said source of suction.

5,085,658

NEUROSURGICAL PATHOLOGICAL TISSUE REMOVING DEVICE

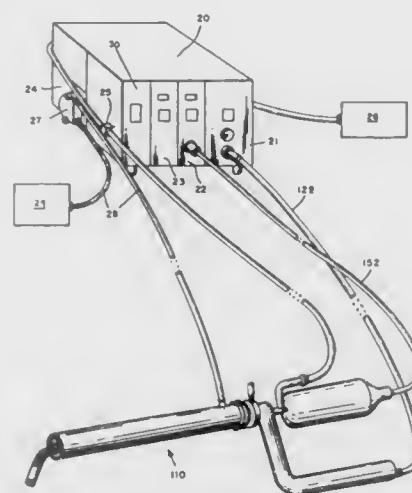
William F. Meyer, Walnut, Calif., assignor to Percutaneous Technologies, Walnut, Calif.

Filed Sep. 5, 1989, Ser. No. 403,185

Int. Cl.⁵ A61B 17/36

U.S. Cl. 606-46

9 Claims



1. An endoscopic resecting system for viewing and resecting pathological tissue within the central nervous system, said endoscopic resecting system comprising:

- a. a compartmentalized hollow tube with a first compartment of a first set of dimensions, a second compartment of a second set of dimensions larger than said first set of dimensions and a third compartment of a third set of dimensions smaller than said first set of dimensions;
- b. visualizing means for directly viewing the pathological tissues within the central nervous system, a portion of said visualizing means being disposed in said first compartment;
- c. illuminating means for providing illumination of the pathological tissue within the central nervous system, a portion of said illuminating means being disposed in said first compartment;
- d. resecting means for resecting the pathological tissue within the central nervous system, a portion of said resecting means being disposed in said second compartment;
- e. inletting means for inletting a transport fluid to said resected pathological tissue within the central nervous system, a portion of said inletting means being disposed in said third compartment;
- f. electrocoagulating means for controlling bleeding, said electrocoagulating means being disposed in said second compartment;
- g. protecting means for protecting normal tissue surrounding the pathological tissue within the central nervous system, said protecting means being disposed externally and mechanically coupled to said compartmentalized hollow tube; and
- h. outletting means for outletting said transport fluid to the

suctioning device, a portion of said outletting means being disposed in said second compartment whereby said visualizing means, said illuminating means, said resecting means, said inletting means and said outletting means all function in an interated and coordinated manner.

5,085,659

BIOPSY DEVICE WITH BIPOLAR COAGULATION CAPABILITY

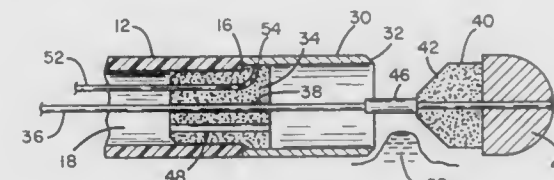
Mark A. Rydell, Golden Valley, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.

Filed Nov. 21, 1990, Ser. No. 616,562

Int. Cl.⁵ A61B 17/39

U.S. Cl. 606-47

12 Claims



4. A biopsy instrument comprising:

- (a) an elongated flexible plastic tube having a proximal end, a distal end and a lumen extending from said proximal end to said distal end;
- (b) a tubular metal sleeve having a proximal end of affixed to said distal end of said tube, said sleeve having a distal end having an annular edge beveled to a sharp edge;
- (c) an elongated longitudinally movable conductive rod extending through said lumen from said proximal end of said tube and beyond said distal end of said sleeve;
- (d) an insulating anvil having a distal end and an outer dimension adapted to fit within said metal sleeve with a close tolerance and affixed to said conductive rods;
- (e) a conductive electrode secured to the distal end of said anvil and electrically joined to said conductive rod;
- (f) means mounted on said proximal end of said rod for imparting longitudinal movement to said anvil for drawing said anvil into said sleeve or displacing a conductive wire extending from said proximal end of said plastic tube through said lumen and electrically connected to said metal sleeve said anvil out of said sleeve.

5,085,660

INNOVATIVE LOCKING PLATE SYSTEM

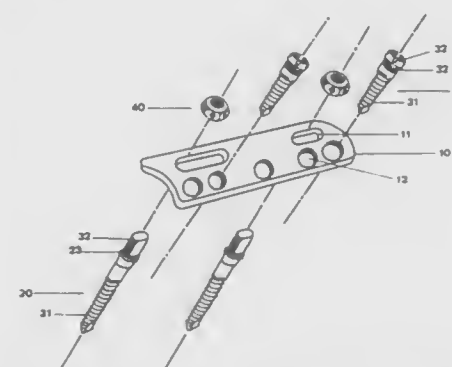
Kwan C. Lin, 45 Duncan St., Staten Island, N.Y. 10304

Filed Nov. 19, 1990, Ser. No. 615,390

Int. Cl.⁵ A61F 5/04

U.S. Cl. 606-73

3 Claims



1. A locking plate system for locking together adjacent bones or vertebral tubercles comprising:

- a) a plurality of locking pins, each locking pin having a threaded end adapted to be threaded into a bone or verte-

bral tubercle, a locking end and a stopping protrusion located between the threaded end and locking end;

- b) a plate defining a first plurality of locking bores adapted to non-rotatably accept the locking ends of the locking pins such that the locking ends extend through the plate thereby enabling a side of the plate facing the bone or vertebral tubercle to rest on the stopping protrusions to prevent movement of the plate toward a bone or vertebral tubercle, the plate further defining a plurality of threaded bores;
- c) a plurality of screwing pins, each screwing pin having a first threaded portion adapted to be threaded into a bone or vertebral tubercle and a second threaded portion adapted to be threaded into a threaded bore of the plate; and,
- d) locking devices engageable with the locking ends of the locking pins after they have passed through the locking bores of the plate to hold the plate assembled to the locking pins.

5,085,661

SURGICAL FASTENER IMPLANTATION DEVICE

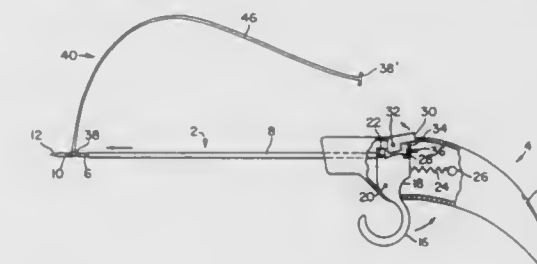
Gerald Moss, R.D.#1, West Sand Lake, N.Y. 12196

Filed Oct. 29, 1990, Ser. No. 605,270

Int. Cl.⁵ A61B 17/00

U.S. Cl. 606-139

14 Claims



1. In combination a fastener insertion device and shaped a fastener for insertion into a body, said fastener being of the type having an elongated head portion and a filament portion wherein said filament portion is attached to a center portion of said head portion, wherein said insertion device comprises:

- a needle means having a front pointed end and a longitudinal axis;
- a sleeve means movably located on said needle means;
- a sleeve translating means attached to said sleeve means and capable of moving said sleeve means on said needle means between a first position and a second position; and
- a fastener receiving means located on said needle means adjacent the pointed end of said needle whereby when said sleeve means is in said first position, said sleeve means is capable of maintaining a head portion of a fastener within said fastener receiving means and when said sleeve means is in said second position, a head portion of a fastener can be inserted into or ejected from the fastener receiving means.

5,085,662

ATHERECTOMY CATHETER AND RELATED COMPONENTS

Lloyd K. Willard, Miltna, Minn., assignor to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Nov. 13, 1989, Ser. No. 435,280

Int. Cl.⁵ A61B 17/22

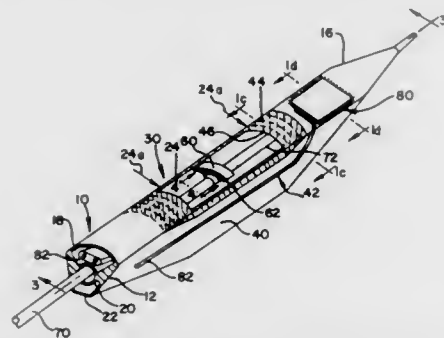
U.S. Cl. 606-159

18 Claims

1. In an atherectomy catheter comprising a catheter shaft having a proximal end portion and a distal end portion, and a laterally facing cutting window located in the distal end portion, the improvement comprising:

- a cutter element mounted in the distal end portion for axial motion and alignable with the cutting window, said cutter

element defining a sharpened cutting edge oriented to cut material which has passed through the cutting window as the cutter element is moved axially toward the proximal end portion;
wherein the cutter element is mounted on a motion transmitting member;



wherein the catheter shaft defines a lumen that receives and supports the motion transmitting member for axial movement; and
wherein the motion transmitting member and the lumen extend distally of the cutter element such that the motion transmitting element is captured by the lumen and guided for axial movement both proximally and distally of the cutter element.

5,085,663

SURGICAL KNIFE WITH ANGULAR CUT CONTROL AND METHOD OF USING THE SAME

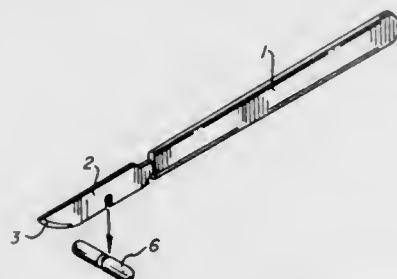
Bernard Tarr, 1688 Meridian Ave., Miami Beach, Fla. 33139
Continuation of Ser. No. 457,950, Dec. 27, 1989, abandoned.

This application Jun. 27, 1991, Ser. No. 724,468

Int. Cl.⁵ A61B 17/32

U.S. Cl. 606—172

5 Claims



1. A surgical knife having a handle portion and blade portion extending along a single longitudinal axis, the blade having side faces and upper and lower edges with a cutting edge extending from one end of the upper edge of the blade and curving around the end portion of the blade and along the lower edge portion of the blade and terminating intermediate the length of the lower edge portion of the blade, roller means mounted in a nonadjustable fixed position on the blade along the lower edge portion of the blade whereby substantially all of the cutting edge of the knife is disposed between the roller means and said end portion of the upper edge of the blade, said roller means extending on both sides of the blade laterally with respect to the plane of the blade, the roller means on each side of the blade being of sufficient length to maintain directional stability of the blade when in use whereby when said roller means engages the skin to be cut said roller means smoothes the skin surface, maintains the cutting edge of the blade at a right angle with respect to the skin surface being cut and provides a pivot point on the skin surface so that the depth of the cut in the skin surface may be adjusted by raising or lowering the handle portion of the knife.

5,085,664

DISOBSTRUCTOR DILATOR DEVICE FOR URINARY PATHOLOGY

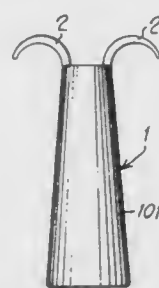
Luigi Bozzo, 7, via Trieste, Genova, Italy

Filed Jul. 13, 1989, Ser. No. 379,218

Claims priority, application Italy, Jul. 22, 1988, 12527 A/88
Int. Cl.⁵ A61F 2/02

U.S. Cl. 606—191

6 Claims



1. A dilator device employed in the urinary tract of male to ensure the openness of the urethral channel in the cervicourethral zone between the vesical neck and the striated sphincter of the urethra, comprising a tubular body open at its ends, said ends being designated as the upper end and the lower end with reference to the position of the device in place applied to the patient in upright position, said tubular body having a length which is smaller than the distance between the vesical neck and the striated sphincter, in which the lower end has a greater cross section than that of the upper end, and anchoring means intended to cooperate with the vesical neck, being provided at the upper end of said tubular body.

5,085,665

PROSTHETIC DEVICE FOR VIGOROUS ACTIVITIES

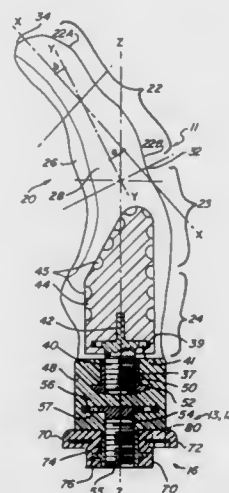
Robert Radocy, 2860 Pennsylvania Ave., Boulder, Colo. 80303,
and Ronald E. Dick, Magnolia Star Rte. Box 733, Nederland,
Colo. 80466

Filed Jul. 6, 1982, Ser. No. 395,322

Int. Cl.⁵ A61F 2/54

U.S. Cl. 623—57

12 Claims



1. A prosthetic hand mountable on a terminal portion of a prosthetic limb apparatus for use in athletic activities and the like for simulating certain dynamic biomechanical functions of a natural hand comprising:

(a) a resilient one piece integrally formed scoop-shaped member comprising an integral unit finger portion, a palm portion and a heel portion which together provide a continuous front surface, back surface and peripheral edge surface, said member having an elastic memory and being

movable under load between a normal unstressed state and a plurality of relatively large deformation stressingly deformed states by elastic deformation to enable said member to absorb energy in transformation from said unstressed state to said stressingly deformed states and to release energy in a controllable form during elastic trans-

formation from said stressingly deformed states to said unstressed state; and

(b) attachment means embedded in said member for removably mounting said resilient member on the prosthetic limb apparatus.

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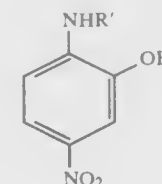
UMI

CHEMICAL

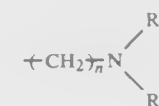
5,085,666 NITROANILINES AND HAIR-DYEING COMPOSITIONS IN WHICH THEY ARE PRESENT

Andree Bugaut, Boulogne-Billancourt, and Alex Junino, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France Division of Ser. No. 819,636, Jan. 17, 1986, Pat. No. 4,973,757, which is a continuation of Ser. No. 410,981, Aug. 24, 1982, abandoned. This application Aug. 20, 1990, Ser. No. 570,046
Claims priority, application France, Aug. 26, 1981, 81 16316; Nov. 30, 1981, 81 22424
Int. Cl.⁵ A61K 7/13; C07C 211/49

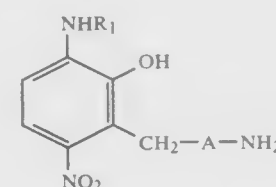
U.S. Cl. 8—408 21 Claims
1. A composition suitable for dyeing keratin fibres which comprises at least one dyestuff corresponding to the formula:



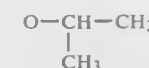
in which R' denotes alkyl, CH₂CHOHCH₃, polyhydroxyalkyl, alkoxyalkyl or aminoalkyl of the formula:



in which R₁ and R₂, which are identical or different, denote hydrogen, alkyl or monohydroxyalkyl or polyhydroxyalkyl and n denotes an integer from 2 to 4, or of the formula:

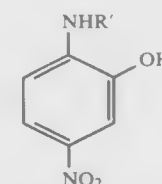


in which R₁ denotes a group —CH₂CH₂OH or CH₂CHOH—CH₃ and A denotes a group OCH₂CH₂ or

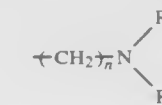


or a cosmetically acceptable salt thereof and a cosmetically acceptable carrier or diluent.

16. A compound having the formula:



in which R' denotes an alkoxyalkyl group or an aminoalkyl group of the formula:



in which R₁ and R₂, which are identical or different, denote hydrogen, alkyl, mono or polyhydroxyalkyl and n denotes an integer from 2 to 4.

5,085,667 STAIN RESISTANCE OF NYLON CARPET: CATIONIC-DYEABLE NYLON FIBERS DYED WITH ACID DYE

William G. Jenkins, Lexington, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

(III) Continuation-in-part of Ser. No. 519,237, May 4, 1990, abandoned. This application Jul. 12, 1990, Ser. No. 552,178
Int. Cl.⁵ D06P 3/00

U.S. Cl. 8—539 9 Claims
1. A process of dyeing cationic-dyeable nylon fibers comprising dyeing said fibers with an acid dye or a premetallized acid dye at a pH of from about 4.0 to 6.5 and fixing the dye to the fibers.

5,085,668 SINGLE-STEP PRINTING OF CELLULOSE FIBERS WITH TRIPHEN-DIOXAZINE REACTIVE DYES AND WITH SODIUM ACETATE OR SODIUM TRICHLORO-ACETATE AS ALKALI

Gerhard Pelster, Kelkheim, and Wolfram Sehidlo, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 418,527, Oct. 3, 1989, abandoned. This application Oct. 24, 1990, Ser. No. 602,754
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833864

Int. Cl.⁵ D06P 1/38, 3/66; C09B 62/00
U.S. Cl. 8—549 3 Claims

(IIB) 1. A process for the single-step printing of textile material which consists of cellulose fibers or contains cellulose fibers blends with other fibers with fiber-reactive triphen-dioxazine dyes, which comprises adding to the print pastes at least one triphen-dioxazine dye and as the sole fixing alkali

a) per reactive group of the dye used from 10 to 20 times the stoichiometric amount of sodium acetate (calculated on the anhydrous product) or b) 20–40 g of sodium trichloroacetate per kg of print paste or c) a mixture of 20–40 g of sodium trichloroacetate per kg of print paste and 15–30 g of sodium acetate trihydrate per kg of print paste and fixing the prints produced therewith, after drying, by steaming with saturated steam at temperatures within the range of 102°–110° C.

5,085,669 PROCESS FOR STABILIZING A LEUCO-DYE SOLUTION BY MEANS OF A PIPERIDINE DERIVATIVE

Hans-Dieter Frommelt, Wiesbaden, and Hartmut Wiezer, Epstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

(III) Filed Oct. 6, 1989, Ser. No. 418,335
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1988, 3834299

Int. Cl.⁵ C09B 67/18; C07D 211/46, 211/94, 221/20
U.S. Cl. 8—568 14 Claims

1. A process for stabilizing a leuco-dye solution in an organic solvent against oxidation in air, comprising the step of adding to said solution a compound which comprises at least one 2,2,6,6-tetraalkylpiperidine, 2,2-dialkylpiperidine-6-spiro-cycloalkane or piperidine-2,6-dispiro-cycloalkane grouping.

5,085,670

PRODUCTION OF POTASSIUM CHLORIDE CRYSTALS

Lisa B. Quencer, Shepherd, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sep. 17, 1990, Ser. No. 583,893
Int. Cl.⁵ C01D 3/24, 3/04

U.S. Cl. 23—302 R

3 Claims

1. A process for producing potassium chloride crystals from a synthetic or naturally occurring brine comprising carrying out the crystallization in the presence of an amount of an alkylated diphenyl ether disulfonic acid or salt thereof effective to result in the production of crystals larger than those produced in the absence of said acid or salt, wherein the alkyl group is a branched C₁₂ moiety with a degree of monoalkylation greater than about 95 percent.

5,085,671

METHOD OF COATING ALUMINA PARTICLES WITH REFRACTORY MATERIAL, ABRASIVE PARTICLES MADE BY THE METHOD AND ABRASIVE PRODUCTS CONTAINING THE SAME

Lawrence L. Martin; Jonathan Storer, and Michael W. Carpenter, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 2, 1990, Ser. No. 517,931
Int. Cl.⁵ B24D 3/00

U.S. Cl. 51—293

20 Claims

1. Abrasive particles, each particle of which comprises an alumina-based core coated with a substantially uniform refractory material at an average coating thickness of less than 100 nm.

5,085,672

Patent Not Issued For This Number

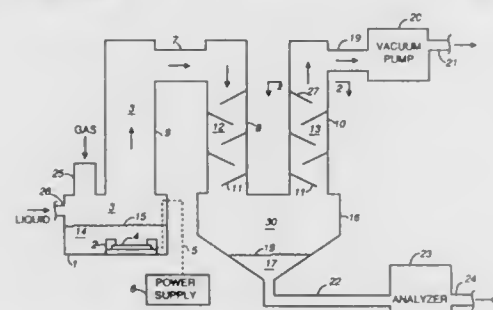
5,085,673

COMPACT AIR SCRUBBER

Bill F. Beutley, Santa Fe; James H. Jett; John C. Martin, both of Los Alamos, and George C. Saunders, Espanola, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Mar. 19, 1991, Ser. No. 671,330
Int. Cl.⁵ B03C 3/00

U.S. Cl. 55—10

19 Claims



1. A method of removing material from a gas comprising:
 - a. generating a mist from a liquid in a reservoir using a piezoelectric ultrasonic transducer located in said reservoir;
 - b. mixing said gas with said mist;
 - c. passing said mixture in a downward direction through a first separation zone having downwardly angled baffles;
 - d. passing, in an upward direction, the gaseous stream exiting said first separation zone through a second separation zone having downwardly angled baffles; and
 - e. collecting liquid, which contains at least a portion of said material, at the lower ends of said separation zones.

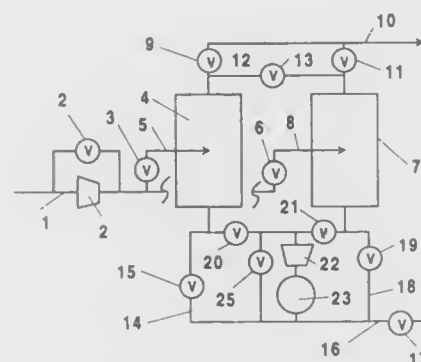
5,085,674

DUPLEX ADSORPTION PROCESS

Frederick W. Leavitt, North Tonawanda, N.Y., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.
Filed Oct. 25, 1990, Ser. No. 603,479
Int. Cl.⁵ B01D 53/04

U.S. Cl. 55—26

27 Claims



1. A duplex pressure swing absorption process for separating a fed gas mixture in a system having at least one pressure swing adsorption stage containing absorbent material capable of absorbing a more selectively absorbable heavy component from said feed gas mixture containing said component and a less selectively absorbable light component, thereby forming an absorption front of said more selectively absorbable heavy component in said absorbent stage, said absorbent stage having a normal bed portion and an inverted bed portion and undergoing, on a cyclic basis, a processing sequence comprising:

- (a) passing said more selectively absorbable heavy component at an upper absorption pressure to the bottom end of the inverted bed portion of said stage to displace less selectively absorbable light component thereon, the effluent gas thus displaced from the upper end of said inverted bed portion being passed into the lower end of the normal bed portion of said stage at said upper absorption pressure for passage forward therethrough;
- (b) discharging less selectively absorbable light component from the upper end of the normal bed portion of said stage;
- (c) depressurizing said stage from said upper absorption pressure to a lower desorption pressure;
- (d) passing less selectively absorbable light component gas to the upper end of the normal bed portion at said lower desorption pressure for passage therethrough in a backward direction, thus displacing previously absorbed heavy component therefrom, the effluent gas thus displaced from the bottom end of the normal bed portion being passed into the upper end of said inverted bed portion at said lower desorption pressure to displace additional quantities of heavy component therefrom at said lower desorption pressure;
- (e) discharging heavy component from the bottom end of said inverted bed portion at said lower desorption pressure;
- (f) pressurizing said stage from said lower desorption pressure to the upper absorption pressure;
- (g) introducing said feed gas mixture to said stage at an intermediate point between said normal bed portion and said inverted bed portion during at least one of said steps (a), (c), (d) and (f); and
- (h) repeating said steps (a)–(g) on a cyclic basis with additional quantities of said feed gas mixture, whereby the less selectively absorbable light component and the more selectively absorbable heavy component are both recovered at enhanced purity and recovery levels.

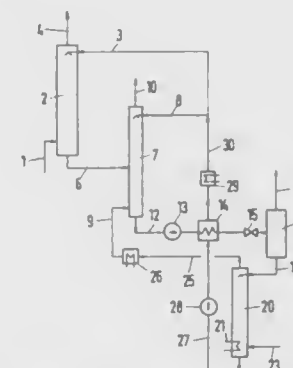
5,085,675

PROCESS OF REGENERATING A HIGH-BOILING SCRUBBING SOLUTION WHICH CONTAINS CO₂ AND H₂S

Manfred Kriebel, Frankfurt am Main; Gerhard Grünewald, Mainz-Gonsenheim, and Hans-J. Fritzsche, Reichelsheim, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed May 3, 1990, Ser. No. 518,639
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1989, 3922785
Int. Cl.⁵ B01D 19/00

U.S. Cl. 55—44

7 Claims



1. In the purification of a gas containing CO₂ and H₂S wherein the gas is purified at a temperature from about 5° C. to 70° C. with a scrubbing solution having a boiling point above about 100° C. at atmospheric pressure to produce a purified gas and a spent scrubbing solution, said spent scrubbing solution being treated in a re-absorption zone and mixed gases are withdrawn from said zone, the spent scrubbing solution withdrawn from said zone being fed to an expansion zone, the solution fed to the expansion zone having a temperature of at least about 60° C. and a pressure of at least 2 bars, expanding the scrubbing solution into the expansion zone thereby to flash off a gas which is rich in H₂S, withdrawing the flashed-off gas from the expansion zone, subjecting the scrubbing solution coming from the expansion zone to hot regeneration by stripping the scrubbing solution at a temperature below its boiling temperature with an inert gas substantially to remove the residual loading of the scrubbing solution, withdrawing regenerated scrubbing solution from said regeneration and recycling at least a portion thereof to said purification, withdrawing inert gas-containing mixed gases from said regeneration and feeding said mixed gases into said re-absorption zone.

7. In the purification of a gas containing CO₂ and H₂S wherein the gas is purified at a temperature from about 5° C. to 70° C. with a scrubbing solution having a boiling point above about 100° C. at atmospheric pressure to produce a purified gas and a spent scrubbing solution, said spent scrubbing solution being treated in a re-absorption zone and mixed gases are withdrawn from said zone, the spent scrubbing solution withdrawn from said zone being fed to an expansion zone, the solution fed to the expansion zone having a temperature of at least about 60° C. and a pressure of at least 2 bars, expanding the scrubbing solution into the expansion zone thereby to flash off a gas which is rich in H₂S, withdrawing the flashed-off gas from the expansion zone, subjecting the scrubbing solution coming from the expansion zone to hot regeneration by stripping the scrubbing solution at a temperature below its boiling temperature with an inert gas substantially to remove the residual loading of the scrubbing solution, withdrawing regenerated scrubbing solution from said regeneration and recycling at least a portion thereof to said purification, withdrawing inert gas-containing mixed gases from said regeneration and feeding said mixed gases into the initial gas purification zone.

5,085,676

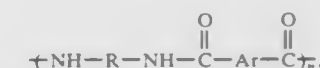
NOVEL MULTICOMPONENT FLUID SEPARATION MEMBRANES

Okan M. Ekiner, Wilmington, Del.; Richard A. Hayes, Parkersburg, W. Va., and Phillip Manos, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 4, 1990, Ser. No. 622,419
Int. Cl.⁵ B01D 53/22, 71/64, 71/68

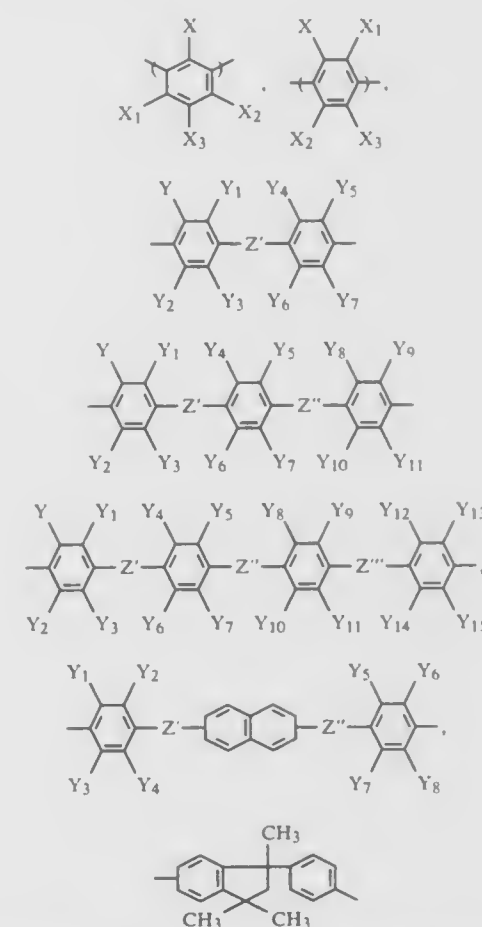
U.S. Cl. 55—158

78 Claims

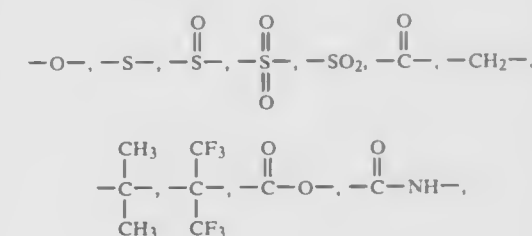
1. A multicomponent membrane comprising, a porous polymeric substrate and a polyamide separating layer for separating gases, wherein said polyamide has the formula

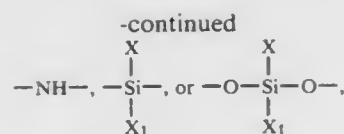


where R is one of either

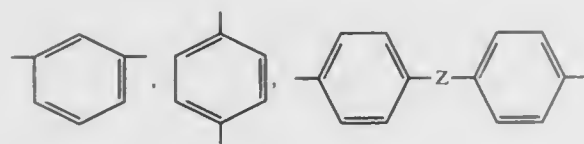


or mixtures thereof where Z', Z'', and Z''' are independently a carbon-carbon single bond,

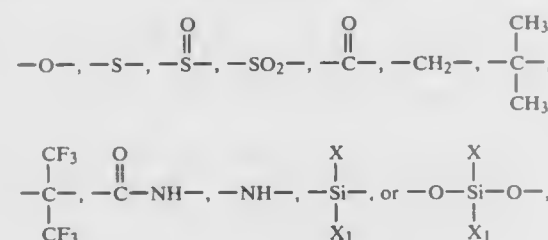




or mixtures thereof, Ar is



where Z is a carbon-carbon single bond,



or mixtures thereof, n is an integer such that the polymer is of film-forming molecular weight, —X, —X₁, —X₂ and —X₃ are independently hydrogen, alkyl groups of 1 to 6 carbon atoms, alkoxy groups of 1 to 5 carbon atoms, phenyl or phenoxy groups, and —Y, —Y₁, —Y₂, —Y₃, —Y₄, —Y₅, —Y₆, —Y₇, —Y₈, —Y₉, —Y₁₀, —Y₁₁, —Y₁₂, —Y₁₃, —Y₁₄, —Y₁₅ independently are X, X₁, X₂, X₃, halogen, or alkyl groups of 1 to 6 carbon atoms.

5,085,677

OIL DEAERATOR DEVICE

Daniel Ville, Meudon la Foret, and Jean-Paul Vives, Saint Gratien, both of France, assignors to Societe Anonyme Dite Hispano-Suiza, Saint-Cloud, France

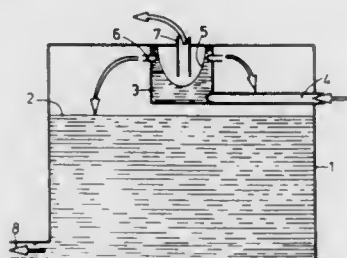
Filed Mar. 26, 1991, Ser. No. 674,882

Claims priority, application France, Mar. 28, 1990, 90 03936

Int. Cl.⁵ B01D 45/12

U.S. Cl. 55—205

3 Claims



1. In an oil tank, an oil deaerator device comprising a cylindrical chamber disposed with its axis substantially vertical, an inlet duct opening tangentially into the lower portion of said chamber for introducing pressurized oil laden with air bubbles into said chamber, a plurality of outlet ducts leading tangentially from the upper portion of said chamber for the discharge of deaerated oil from the chamber to the tank, and an axial outlet duct situated in the upper portion of said chamber for the discharge of air from said chamber and the tank, said device being disposed inside said tank in the upper part thereof above the normal level of oil in said tank.

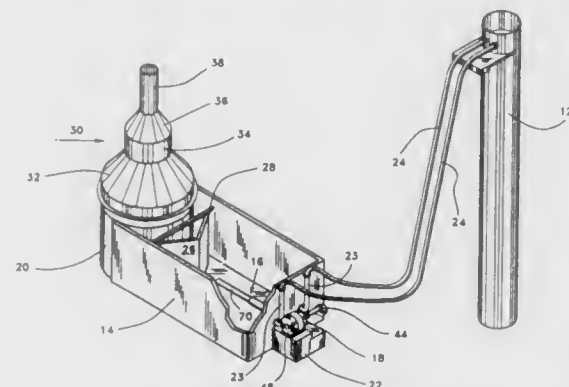
5,085,678
EXHAUST GASES AND PARTICULATE CAPTURE SYSTEM

Robert B. Woltman, 213 N. Second St., Barstow, Calif. 92311
Filed Jan. 22, 1991, Ser. No. 644,899

Int. Cl.⁵ B01D 47/10

U.S. Cl. 55—227

20 Claims



1. A exhaust gases and particulate capture system comprising
a) a tank containing water,
b) an aspirator unit mounted to the tank, the aspirator unit including an entrance opening, a mixing chamber, a barrel segment and a nozzle,
c) a pump attached to the entrance opening of the aspirator unit for introducing water into the mixing chamber of the aspirator unit,
d) exhaust gases intake line connected to the mixing chamber of the aspirator unit for bringing exhaust gases from a smokestack to the aspirator unit whereby the water and exhaust gases combine and are cleaned and scrubbed in the barrel segment,
e) the nozzle including an exit end from which the combined water and exhaust gases are introduced into the water in the tank, and
f) a secondary stack connected to the tank at a location downstream from the exit end of the nozzle whereby the exhaust gases are mixed with the water to create a combined mixture, a turbulent cleaning and scrubbing of the mixture occurs in the barrel segment and the combined mixture is dispersed from the nozzle into the water tank.

5,085,679

GLASS SPINNER MANUFACTURE

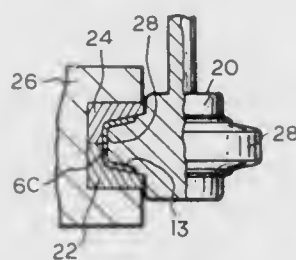
Jay W. Hinz; Richard D. Lawson, both of Newark, Ohio, and Mott J. Blake, Huntington, W. Va., assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Nov. 23, 1990, Ser. No. 617,240

Int. Cl.⁵ C03B 37/04

U.S. Cl. 65—1

16 Claims



9. In a method comprising: providing a glass fiber forming spinner at a fiber forming location and forming glass fibers with said spinner, the improvement wherein said providing

step comprises: fabricating an oxide dispersion strengthened metal powder into an annular cylindrically shaped billet; ring-rolling said billet sufficiently to form a seamless annular member capable of being recrystallized to a coarse grain structure and having a central rectilinear portion and upper and lower flanges extending inwardly therefrom; forming a plurality of glass forming apertures in said central portion, said forming being done either before or after a recrystallizing heat treatment, and heat treating said member to recrystallize said member into a coarse grain structure and wherein said central portion contains grains which are axially and circumferentially elongate.

5,085,680
DEFORMABLE SIDE SEAL FOR FURNACES AND METHOD FOR USING

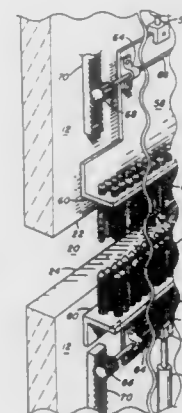
John E. Bender, Mars, and Robert G. Frank, Sarver, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1990, Ser. No. 576,821

Int. Cl.⁵ C03B 25/087

U.S. Cl. 65—118

14 Claims



12. In a method of heating a glass sheet in a furnace of the type having a chamber, said chamber having an entrance end and an exit end and a slot through at least one wall portion, said slot extending between the exit and entrance ends, a glass sheet handling device mounted in the chamber and a support member extending through the slot engaging the handling device; the method includes the steps of supporting a sheet by the handling device, acting on the support member to move the handling device and sheet through the furnace along a sheet movement path between the exit and entrance ends of the furnace while heating the sheet, wherein heat from inside the furnace passes through the slot, wherein the improvement comprises:

mounting a plurality of discrete elongated springs each having a longitudinal axis such that the longitudinal axis of the springs in a non-working position overlies the slot, and lies in a plane transverse to a plane containing the sheet movement path and parallel to the sheet movement path and the springs in a working position are bent toward an end of the furnace; and moving the handling device to move the sheet through the furnace wherein the handling device as it moves over the springs moves them toward the working position and as it passes over the springs allows them to move to the non-working position to maintain a barrier limiting movement of atmosphere between the inside and outside of said furnace chamber.

5,085,681
FERTILIZER MATERIALS BASED ON METALLURGICAL SLAGS AND METHODS OF MAKING THE SAME

Nicholas A. Boukidis, 33430 Hunt Club Rd., Libertyville, Ill. 60048

Continuation of Ser. No. 14,780, Feb. 13, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 295,112

Int. Cl.⁵ C05C 9/00; C05D 3/04

U.S. Cl. 71—29

6 Claims

1. An agricultural fertilizer material resistant to agglomeration, powering and burning of plant life comprising expanded blast furnace slag, said slag being substantially free of granulated slag, having a water content in the range about 3% to 5% and mixed with about 10% to 35% by weight of a mixture of nitrogen, phosphoric acid and potash as conventional nutrient salts, said salts and nitrogen being present in amounts sufficient to provide at least 1% by weight of nitrogen on the total mix and said slag having a CaO equivalent of about 20% to 25%.

5,085,682

METHOD AND COMPOSITIONS FOR STIMULATING VESTICULAR-ARBUSCULAR MYCORRHIZAL FUNGI USING ISOFLAVONOIDS

Gene R. Safir, Muraleedharan G. Nair, and Jose O. Siqueira, all of East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

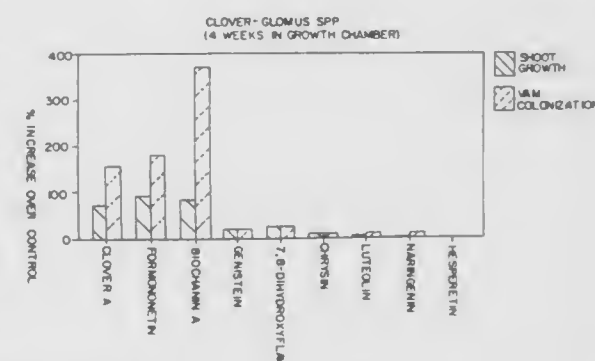
Division of Ser. No. 444,838, Dec. 4, 1989, Pat. No. 5,002,603.

This application Oct. 1, 1990, Ser. No. 591,420

Int. Cl.⁵ A01N 43/16; C07F 311/36

U.S. Cl. 71—88

12 Claims



1. A composition useful for stimulating the growth of a plant which comprises:
(a) an isoflavonoid compound; and
(b) a plant material as a seed or propagule containing the compound as an additive in an amount which stimulates the growth of the plant material to a mature plant when the plant material is grown in a soil or a planting material in the presence of VAM fungi.

X is nitrogen or a methine group $=CR^8$ —where R^8 is one of the radicals R^3 , or R^8 and R^3 together form a member of the group consisting of 1-azabuta-1,3-diene-1,4-diyl and 2-azabuta-1,3-diene-1,4-diyl;
Y is N and Z is CH, or
Y is CH and Z is N,
and its salts which can be used in agriculture.

5,085,686

SALICYLALDEHYDE DERIVATIVES AND SALICYCLIC ACID DERIVATIVES AND THEIR SULFUR ANALOGS AND THEIR USE AS HERBICIDES

Uwe J. Vogelbacher, Ludwigshafen; Karl Eicken, Wachenheim; Joachim Rheinheimer, Ludwigshafen; Norbert Goetz, Worms; Albrecht Harreus; Gerhard Paul, both of Ludwigshafen; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 13, 1990, Ser. No. 537,129

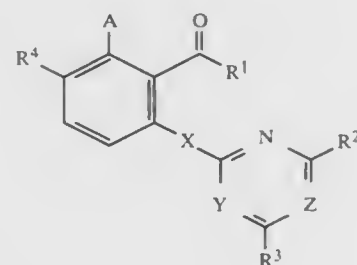
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1989, 3919435

Int. Cl.⁵ C07D 239/34, 239/52, 239/60; A01N 43/54

U.S. Cl. 71—92

6 Claims

1. Salicylaldehyde derivatives and salicylic acid derivatives and their sulfur analogs of the formula I



where

 R^1 is hydrogen;

succinyliminoxy;

a 5-membered heteroaromatic radical selected from the group consisting of pyrrolyl, pyrazolyl, imidazolyl and triazolyl which may carry from one to four halogen atoms and/or one or two of the following radicals: C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy and/or C_1 - C_4 -alkylthio;

a radical $-OR^5$ or a radical $ON-CR^6R^7$, where

R^5 is hydrogen, an alkali metal cation, one equivalent of an alkaline earth metal cation or an organic ammonium ion;

C_3 - C_{12} -cycloalkyl which may carry from one to three C_1 - C_4 -alkyl radicals; C_1 - C_{10} -alkyl which may carry from one to five halogen atoms and/or one of the following radicals: C_1 - C_4 -alkoxy, C_1 - C_4 -alkylthio, cyano, C_1 - C_8 -alkylcarbonyl, C_1 - C_8 -alkoxycarbonyl, C_3 - C_{12} -cycloalkyl, phenyl, phenoxy or phenylcarbonyl, where the aromatic radicals may in turn carry from one to five halogen atoms and/or from one to three of the following radicals: C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy and/or C_1 - C_4 -alkylthio;

C_1 - C_{10} -alkyl which may carry from one to five halogen atoms and carries one of the following radicals: a 5-membered heteroaromatic radical selected from the group consisting of pyrrolyl, pyrazolyl, imidazolyl and triazolyl which may carry from one to four halogen atoms and/or one or two of the following radicals: C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy and/or C_1 - C_4 -alkylthio;

C_2 - C_6 -alkyl which carries one of the following radicals in

the 2-position; C_1 - C_6 -alkoxyimino, C_3 - C_6 -alkenyloxyimino, C_3 - C_6 -haloalkenyloxyimino or benzyloxyimino, C_3 - C_6 -alkenyl or C_3 - C_6 -alkynyl, where these groups may in turn carry from one to five halogen atoms;

phenyl which is unsubstituted or monosubstituted to trisubstituted by C_1 - C_4 -alkyl or by C_1 - C_4 -alkoxy or monosubstituted to pentasubstituted by halogen;

R^6 and R^7 are each C_1 - C_{20} -alkyl which may carry phenyl, C_1 - C_4 -alkoxy and/or C_1 - C_4 -alkylthio, or are each phenyl or together form a C_3 - C_{12} -alkylene chain which may carry from one to three C_1 - C_3 -alkyl groups;

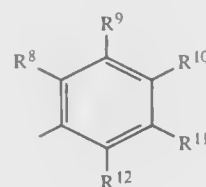
R^2 and R^3 are each C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy and/or C_1 - C_4 -alkylthio;

X is oxygen or sulfur;

Y is N and Z is a methine group $=CH$ —or Y is a methine group $=CH$ —and Z is N;

R^4 is hydrogen, halogen, C_1 - C_4 -alkyl, cyano or C_1 - C_4 -haloalkyl;

A is an unsubstituted or monosubstituted to trisubstituted, or with halogen as substituent, monosubstituted to pentasubstituted phenyl radical



where

 R^8 to R^{12} are each hydrogen, halogen, cyano or nitro;

C_3 - C_6 -alkenyl, C_3 - C_6 -alkenyloxy, C_3 - C_6 -alkynyloxy or C_3 - C_6 -alkynyl, where these groups may in turn carry from one to five halogen atoms;

di- C_1 - C_4 -alkylamino or C_3 - C_8 -cycloalkyl which may carry from one to three C_1 - C_4 -alkyl radicals;

 C_1 - C_{10} -alkoxycarbonyl or C_1 - C_4 -alkylthio;

phenoxy, where the aromatic radical may carry from one to five halogen atoms and/or from one to three of the following radicals: C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl; C_1 - C_4 -haloalkoxy, C_1 - C_4 -alkoxy or C_1 - C_4 -alkylthio; and C_1 - C_{10} -alkyl or alkoxy which may carry from one to five halogen atoms and/or one of the following radicals: C_1 - C_4 -alkoxy, C_1 - C_4 -alkylthio, phenyl or phenoxy, where the aromatic radicals may in turn carry from one to five halogen atoms and/or from one to three of the following radicals: C_1 - C_4 -alkyl, C_1 - C_4 -haloalkyl, C_1 - C_4 -haloalkoxy or C_1 - C_4 -alkylthio;

or A is a 5-membered heteroaromatic radical having from 2 to 4 nitrogen atoms or one or two nitrogen atoms and additionally one sulfur or oxygen atom in the ring, which may carry from one to three halogen atoms and/or from one to three of the following radicals: nitro, cyano, C_1 - C_4 -alkyl, C_1 - C_4 -alkylthio, C_1 - C_4 -haloalkyl or phenyl which is unsubstituted or substituted by from one to three halogen atoms and/or from one to three methyl groups selected from the group consisting of pyrazol-1-yl, 4-methylpyrazol-1-yl, 3,5-dimethylpyrazol-1-yl, 3,4,5-trimethylpyrazol-1-yl, 4-chloropyrazol-1-yl, 4-phenylpyrazol-1-yl, 4-isopropylpyrazol-1-yl, 4-nitropyrazol-1-yl, imidazol-1-yl, 4,5-dimethylimidazolyl, 2-methyl-4,5-dichloroimidazolyl, 4(5)-nitroimidazol-1-yl, [1,2,4]-triazol-1-yl, 3(5)-methyl-[1,2,4]-triazol-1-yl, [1,2,3]-triazol-1-yl, 4,5-dimethyl-[1,2,3]-triazol-1-yl, [1,2,3,4]-tetrazol-1-yl, 1-methylpyrazol-4-yl, 1-phenylpyrazol-4-yl, 1,3,5-trimethylpyrazol-4-yl, 1-methylpyrazol-5-yl, 1-phenyl-

pyrazol-5-yl, 1-methylpyrazol-3-yl, 1-phenylpyrazol-3-yl, 1-methylimidazol-2-yl, 1-methylimidazol-5-yl, 1-phenylimidazol-5-yl, 1-phenyl[1,2,3]-triazol-4-yl, isoxazol-5-yl, isoxazol-4-yl, 3-methylisoxazol-5-yl, 3-isopropyl-isoxazol-5-yl, 3-phenylisoxazol-5-yl, oxazol-2-yl, 2-methyloxazol-4-yl, thiazol-4-yl, 2-benzthiazol-4-yl, 4-methylthiazol-2-yl, 4-methylthiazol-5-yl, 4-phenylthiazol-2-yl and phenylthiazol-5-yl;

thienyl which may carry from one to three halogen atoms and/or from one to three of the following radicals: C_1 - C_4 -alkyl, C_1 - or C_2 -haloalkyl or nitro;

pyridyl which may carry from one to three halogen atoms and/or from one to three of the following radicals: C_1 - C_4 -alkyl; C_1 - or C_2 -haloalkyl or nitro;

a naphthyl, quinolyl, indazolyl or benzotriazolyl radical, each of which may carry from one to three halogen atoms and/or from one to three of the following radicals: C_1 - C_4 -alkyl or C_1 - or C_2 -haloalkyl,

and environmentally compatible salts of the compounds I.

5,085,687

HERBICIDAL SUBSTITUTED

4-SULPHONYLAMINO-2-AZINYL-1,2,4-TRIAZOL-3-ONES

Klaus-Helmut Müller, Duesseldorf; Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus König, Odenthal; Hans-Jochem Riebel; Peter Babczinski, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 382,163, Jul. 19, 1989, Pat. No. 4,988,381.

This application Sep. 17, 1990, Ser. No. 583,915

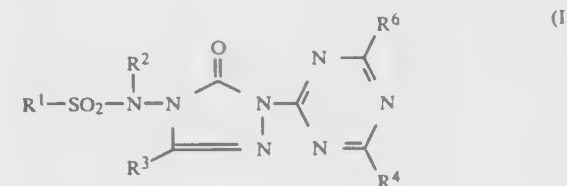
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825602; Jan. 16, 1989, 3901084

Int. Cl.⁵ A01N 43/68, 43/66; C07D 403/04, 403/14

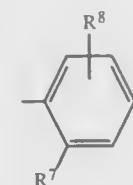
U.S. Cl. 71—93

4 Claims

1. A compound of the formula



in which

 R^1 represents the radical

where

R^7 and R^8 are identical or different and represent hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, C_1 - C_6 -alkoxy (which is optionally substituted by fluo-

rine, chlorine, bromine, cyano, carboxyl, C_1 - C_4 -alkoxycarbonyl, C_1 - C_4 -alkylaminocarbonyl, di- $(C_1$ - C_4 -alkyl)aminocarbonyl, hydroxyl, C_1 - C_4 -alkoxy, formyloxy, C_1 - C_4 -alkyl-carbonyloxy, C_1 - C_4 -alkoxycarbonyloxy, C_1 - C_4 -alkylamino-carbonyloxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphonyl, C_1 - C_4 -alkylsulphonyl, di- $(C_1$ - C_4 -alkyl)aminosulphonyl, C_3 - C_6 -cycloalkyl or phenyl), represent C_2 - C_6 -alkenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1 - C_4 -alkoxycarbonyl, carboxyl or phenyl), represent C_2 - C_6 -alkynyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1 - C_4 -alkoxy-carbonyl, carboxyl or phenyl), represent C_1 - C_4 -alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxy, C_1 - C_4 -alkoxy-carbonyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphonyl or C_1 - C_4 -alkylsulphonyl), represent C_1 - C_4 -alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1 - C_4 -alkoxy-carbonyl, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphonyl or C_1 - C_4 -alkylsulphonyl), represent C_3 - C_6 -alkenyloxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1 - C_4 -alkoxy-carbonyl, carboxyl or phenyl), represent C_2 - C_6 -alkenylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1 - C_3 -alkylthio or C_1 - C_4 -alkoxycarbonyl), C_3 - C_6 -alkynyloxy, C_3 - C_6 -alkynylthio or represent the radical $-S(O)_p-R^9$, where p represents the numbers 1 or 2 and

R^9 represents fluorine, C_1 - C_4 -alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1 - C_4 -alkoxy-carbonyl), C_3 - C_6 -alkenyl, C_3 - C_6 -alkynyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkoxy- C_1 - C_4 -alkylamino, C_1 - C_4 -alkylamino, di- $(C_1$ - C_4 -alkyl)-amino or represents the radical $-NOR^{10}$, where

R^{10} represents C_1 - C_6 -alkyl (which is optionally substituted by fluorine, chlorine, cyano, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphonyl, C_1 - C_4 -alkyl-carbonyl, C_1 - C_4 -alkoxycarbonyl, C_1 - C_4 -alkylaminocarbonyl or di- $(C_1$ - C_4 -alkyl)amino-carbonyl), represents C_3 - C_6 -alkenyl (which is optionally substituted by fluorine, chlorine or bromine), C_3 - C_6 -alkynyl, C_3 - C_6 -cycloalkyl, C_3 - C_6 -cycloalkyl- C_1 - C_2 -alkyl, phenyl- $(C_1$ - C_2 -alkyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1 - C_4 -alkyl, C_1 - C_4 -alkoxy or C_1 - C_4 -alkoxy-carbonyl), represents benzyldryl or represents phenyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1 - C_4 -alkyl, trifluoromethyl, C_1 - C_4 -alkoxy, C_1 - C_2 -fluoroalkoxy, C_1 - C_4 -alkylthio, trifluoromethylthio or C_1 - C_4 -alkoxycarbonyl),

R^7 and/or R^8 furthermore represent phenyl or phenoxy, C_1 - C_4 -alkylcarbonylamino, C_1 - C_4 -alkoxy-carbonylamino, C_1 - C_4 -alkylaminocarbonyl-amino, di- $(C_1$ - C_4 -alkyl)-aminocarbonylamino, or represent the radical $-CO-R^{11}$, where

R^{11} represents C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_3 - C_6 -cycloalkoxy, C_3 - C_6 -alkenyloxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylamino, C_1 - C_4 -alkoxyamino, C_1 - C_4 -alkoxy- C_1 - C_4 -alkyl-amino or di- $(C_1$ - C_4 -alkyl)-amino (which are optionally substituted by fluorine and/or chlorine),

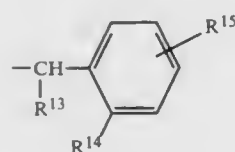
R^7 and/or R^8 furthermore represent C_1 - C_4 -alkylsulphonyloxy, di- $(C_1$ - C_4 -alkyl)-aminosulphonylamino or the radical $-CH=N-R^{12}$, where

R^{12} represents C_1 - C_6 -alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphonyl or C_1 - C_4 -alkylsulphonyl, represents benzyl which is optionally substituted by fluorine or chlorine, represents C_3 - C_6 -alkenyl or C_3 - C_6 -alkynyl, each of which is optionally substituted by fluorine or chlorine, rep-

resents phenyl which is optionally substituted by fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, represents C₁-C₆-alkoxy, C₃-C₆-alkenoxo, C₃-C₆-alkinoxy or benzyloxy, each of which is optionally substituted by fluorine, and/or chlorine, represents amino, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)-amino, phenylamino, C₁-C₄-alkyl-carbonylamino, C₁-C₄-alkoxy-carbonylamino, C₁-C₄-alkylsulphonylamino or represents phenylsulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methyl,

where furthermore

R¹ represents the radical

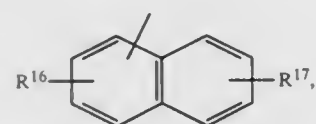


where

R¹³ represents hydrogen or C₁-C₄-alkyl,

R¹⁴ and R¹⁵ are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or chlorine), C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C₁-C₄-alkoxycarbonyl, C₁-C₄-alkylsulphonyl or di-(C₁-C₄-alkyl)-aminosulphonyl; where furthermore

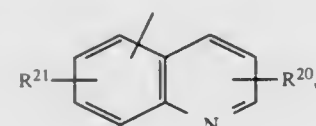
R¹ represents the radical



where

R¹⁶ and R¹⁷ are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or chlorine) or C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine); where furthermore

R¹ represents the radical

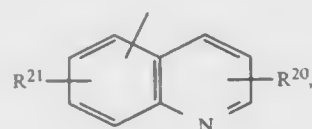


where

R¹⁸ and R¹⁹ are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or chlorine), C₂-C₄-alkenyl (which is optionally substituted by fluorine and/or chlorine), C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine), represents C₁-C₄-alkylthio, C₁-C₄-alkylsul-

phanyl or C₁-C₄-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), and represents di-(C₁-C₄-alkyl)-aminosulphonyl, C₁-C₄-alkoxy-carbonyl, dimethylaminocarbonyl or dioxolanyl; where furthermore

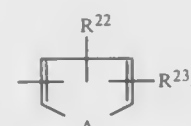
R¹ represents the radical



where

R²⁰ and R²¹ are identical or different and represent hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or bromine), C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine), represents C₁-C₄-alkylthio, C₁-C₄-alkylsulphonyl or C₁-C₄-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), or represent di-(C₁-C₄-alkyl)-aminosulphonyl; where furthermore

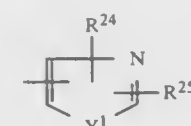
R¹ represents the radical



where

R²² and R²³ are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, C₁-C₄-alkyl (which is optionally substituted by fluorine, chlorine, C₁-C₄-alkoxy and/or C₁-C₄-halogenalkoxy), C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine), C₁-C₄-alkylthio, C₁-C₄-alkylsulphonyl or C₁-C₄-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), di-(C₁-C₄-alkyl)-aminosulphonyl or C₁-C₄-alkoxycarbonyl, and A represents oxygen, sulphur or the group N—Z¹, where Z¹ represents hydrogen, C₁-C₄-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C₃-C₆-cycloalkyl, benzyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine or nitro), C₁-C₄-alkylcarbonyl, C₁-C₄-alkoxy-carbonyl or di-(C₁-C₄-alkyl)-aminocarbonyl; where furthermore

R¹ represents the radical



-continued

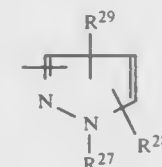
where

R²⁴ and R²⁵ are identical or different and represent hydrogen, C₁-C₄-alkyl, halogen, C₁-C₄-alkoxycarbonyl, C₁-C₄-alkoxy or C₁-C₄-halogenalkoxy,

Y¹ represents sulphur or the group N—R²⁶, where

R²⁶ represents hydrogen or C₁-C₄-alkyl; where furthermore

R¹ represents the radical



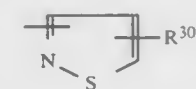
where

R²⁷ represents hydrogen, C₁-C₄-alkyl, benzyl, (iso)-quinolinyl or phenyl,

R²⁸ represents hydrogen, halogen, cyano, nitro, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or chlorine), C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine), dioxolanyl or C₁-C₄-alkoxy-carbonyl and

R²⁹ represents hydrogen, halogen or C₁-C₄-alkyl; where furthermore

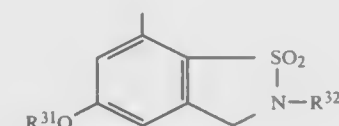
R¹ represents the radical



where

R³⁰ represents hydrogen, halogen, C₁-C₄-alkyl, C₁-C₄-halogenalkyl, C₁-C₄-alkoxy, C₁-C₄-halogenalkoxy or C₁-C₄-alkoxy-carbonyl; where furthermore

R¹ represents the radical



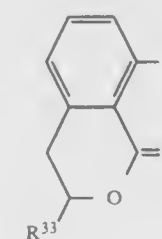
where

R³¹ represents C₁-C₄-alkyl and

R³² represents C₁-C₄-alkyl; where furthermore

R¹ represents the radical

-continued



where — R³³ represents hydrogen or methyl

in which furthermore

R² represents hydrogen or the group —SO₂—R¹,

in which furthermore

R³ represents hydrogen, fluorine, chlorine, bromine, iodine, hydroxyl, mercapto, amino or an optionally fluorine- and/or chlorine-substituted radical selected from the group consisting of C₁-C₄-alkyl, C₃-C₆-cycloalkyl, benzyl, phenyl, C₁-C₄-alkoxy, C₃-C₄-alkenylthio, C₃-C₄-alkylthio, C₁-C₄-alkylsulphonyl, C₁-C₄-alkylsulphonyl, C₃-C₄-alkenylthio, C₃-C₄-alkylthio, benzylthio, benzylthio, C₁-C₄-alkylamino and di-(C₁-C₄-alkyl)-amino,

R⁴ represents hydrogen, fluorine, chlorine, bromine, hydroxyl, amino, C₁-C₄-alkyl, C₁-C₄-halogenalkyl, C₁-C₂-alkoxy-C₁-C₂-alkyl, C₁-C₄-alkoxy, C₁-C₄-halogenalkoxy, C₁-C₂-alkoxy-C₁-C₂-alkoxy, C₁-C₄-alkylthio, C₁-C₄-halogenalkylthio, C₁-C₄-alkylsulphonyl, C₁-C₄-alkylamino or di-(C₁-C₂-alkyl)-amino, and

R⁶ represents hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-halogenalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphonyl, C₁-C₄-alkylsulphonyl, C₁-C₄-alkylamino, dimethylamino or diethylamino, or a salt thereof.

3. A herbicidal composition comprising a herbicidally effective amount of a compound or salt thereof according to claim 1 or 2 and an inert diluent.

5,085,688

CERTAIN 2-(2-CHLORO-3-ALKOXY-4-SUBSTITUTED BENZOYL)-5-METHYL-5,1,3-CYCLOHEXANEDIONES AS HERBICIDES

William J. Michaely, Richmond; Gary W. Kraatz, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

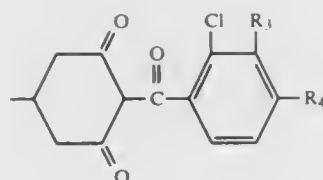
Continuation of Ser. No. 128,128, Feb. 23, 1988, Pat. No. 5,006,158, which is a division of Ser. No. 880,370, Jun. 30, 1986, Pat. No. 4,780,127, which is a continuation-in-part of Ser. No. 772,593, Sep. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 634,408, Jul. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 587,331, Mar. 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 532,869, Sep. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 464,251, Feb. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 361,658, Mar. 25, 1982, abandoned. This application Nov. 1, 1990, Ser. No. 607,956. The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.⁵ A01N 35/4; C07C 49/303

U.S. Cl. 71—103

3 Claims

2. A method of controlling undesirable vegetation comprising applying to the area where control is desired an herbicidally effective amount of a compound having the structural formula



wherein

R₃ is methoxy or ethoxy and
R₄ is bromine, methylsulfonyl or ethylsulfonyl and their salts.

5,085,689

CYCLOHEXENONE COMPOUNDS AND THEIR USE AS HERBICIDES OR PLANT GROWTH REGULATORS

Juergen Kast, Boehl-Iggelheim; Norbert Meyer, Ladenburg; Ulf Misslitz, Neustadt; Juergen Schubert, Mannheim; Johann Jung, Wilhelm Rademacher, both of Limburgerhof; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 10, 1990, Ser. No. 594,949

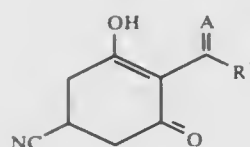
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934204

Int. Cl.⁵ A01N 37/34; C07C 255/46, 255/50

U.S. Cl. 71-105

8 Claims

1. A cyclohexenone of the formula



where the substituents have the following meanings

R¹ is

- (a) C₁-C₂₀-alkyl, C₂-C₂₀-alkenyl, C₂-C₂₀-alkynyl or C₂-C₄-cycloalkyl, each of which is unsubstituted or bears one or more halogen substituents,
- (b) C₂-C₄-alkoxyalkyl,
- (c) C₂-C₄-alkylthioalkyl, or
- (d) benzyl or phenyl,

each of the aromatic nuclei being unsubstituted or bearing from one to three halogen, cyano, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkyl or nitro substituents;

A is NOR² where:

R² is C₁-C₄-alkyl, C₂-C₄-alkenyl or C₂-C₄-alkynyl, each of which is unsubstituted or bears one or more substituents selected from the group consisting of halogen, C₁-C₄-alkoxy, and phenyl radicals being unsubstituted or bearing from one to three halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkyl or nitro substituents; or their agriculturally utilizable salts.

5,085,690

PREPARATION OF IRON WHISKERS

Franz L. Ebenhoech, Ludwigshafen, and Reinhold Schlegel, Hassloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 20, 1990, Ser. No. 615,844

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1989, 3940347

Int. Cl.⁵ C21B 15/04

U.S. Cl. 75-362

4 Claims

1. A process for producing iron whiskers by the thermal decomposition of iron pentacarbonyl vapor in an indirectly heated cylindrical empty-space decomposer which comprises: passing the iron pentacarbonyl vapor into the empty-space decomposer at an inlet point having a cross-section which measures from 10 to 40% of the cross-section of the empty-space decomposer, maintaining the mass flow density of the iron pentacarbonyl vapor, based on the cross-section of the empty-space decomposer, at from 0.01 to 0.07 kg per square meter per second, and the temperature in the empty-space decomposer being at no point below 360° C.

5,085,691

METHOD OF PRODUCING GENERAL-PURPOSE STEEL

Anatoly Y. Nakonechny, ulitsa Kuibysheva, 195, kv. 56, Donetsk; Manat Z. Tolymbekov, ulitsa Botanicheskaya, 14, kv. 57, Karaganda; Alexandr G. Ponomarenko, ulitsa Artema, 134, kv. 13; Vladimir N. Radchenko, prospekt Komsomolsky, 17, kv. 18, both of Donetsk; Alexandr A. Bulyanda, ulitsa Nakhimova, 24, kv. 3, Zhdanov; Vladimir G. Mizin, ulitsa Lenina, 23, kv. 27, Chelyabinsk; Gennady Z. Gizatulin, prospekt Stroitelei, 119-a, kv. 44, Zhdanov, and Jury F. Vyatkin, ulitsa Pirogova, 202, kv. 24, Moscow, all of U.S.S.R.

PCT No. PCT/SU88/00146, § 371 Date Feb. 23, 1990, § 102(e) Date Feb. 23, 1990, PCT Pub. No. WO90/01071, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 26, 1988, Ser. No. 459,742

Int. Cl.⁵ C21B 7/072

U.S. Cl. 75-546

5 Claims

1. A method of producing general-purpose steel comprising preparing a carbon-containing semiproduct, tapping the carbon-containing semi-product in the presence of a slag-forming material into a ladle, said carbon-containing semi-product being tapped into the ladle in a first portion in an amount of no less than 0.25 and no more than 0.5 of the total mass of the carbon-containing semi-product and a second portion amounting to the balance of the carbon-containing semi-product, continuously adding a thermally pre-treated oxide material during the addition of the second portion of the carbon-containing semi-product and terminating the addition of said thermally pre-treated oxide material before the addition of the second portion of the carbon-containing semi-product is concluded, and adding a reducer after the addition of the thermally pre-treated oxide material is terminated and prior to the completion of the addition of the second portion of the carbon-containing semi-product.

5,085,692

RECOVERY OF SILVER VALUES FROM CHLORIDES INCLUDING SILVER CHLORIDE

Christopher A. Pickles, Newburgh; James M. Toguri, Mississauga; Hieu Truong, Orleans, and Janet G. Clark, Ottawa, all of Canada, assignors to Royal Canadian Mint, Ottawa, Canada

Filed Aug. 27, 1990, Ser. No. 572,565

Claims priority, application Canada, Sep. 28, 1989, 614229

Int. Cl.⁵ C22B 11/00

U.S. Cl. 75-634

15 Claims

1. A process for the recovery of silver values from residues including silver chloride, comprising the steps of smelting the chloride residue with an alkali metal silicate, in the presence of a flux, to form an alkali metal oxide without generating gases

that would result in foaming during smelting to a material extent, reacting the alkali metal oxide with silver chloride to provide metallic silver values above which there is a slag, and separating said silver values from the slag.

5,085,693

HYDRAZINE BATH FOR CHEMICAL DEPOSITION OF PLATINUM AND/OR PALLADIUM, AND METHOD OF MANUFACTURING SUCH A BATH

Pierre Josso, Issy les Moulineaux; Serge Alperine, Paris; Pierre Steinmetz, and Anne Constantini-Friant, both of Vandoeuvre les Nancy, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon Sous Bagneux, France

Filed Oct. 10, 1990, Ser. No. 597,647

Claims priority, application France, Oct. 11, 1989, 89 13294

Int. Cl.⁵ C23C 18/44

U.S. Cl. 106-1.28

15 Claims

1. An aqueous bath for chemical deposition of platinum and/or palladium, said bath comprising an oxalate compound of the metal or each of the metals to be deposited, hydrazine as a reducing agent, ethylenediamine as a complexing agent, and at least one stabilizing agent, wherein said bath contains essentially no chloride ions, is highly basic and has an autocatalytic effect.

5,085,694

POLISH COMPOSITIONS

Martin E. Cifuentes, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 4, 1991, Ser. No. 664,006

Int. Cl.⁵ C09G 1/00

U.S. Cl. 106-3

24 Claims

1. In a conventional polish composition containing at least one member selected from the group consisting of waxes, solvents, thickening agents, abrasives and emulsifiers, the improvement comprising incorporating into said polish composition a silylated polyether film former containing at least one polyoxyalkylene block selected from the group consisting of polyoxyethylene and polyoxypropylene in its molecule said polyoxyalkylene block being attached through an organic connecting group to a silicon atom bearing at least one hydrolyzable group.

5,085,695

PROTECTIVE FURNITURE POLISH COMPOSITION

Neil A. Randen, and Vinu Patel, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 13, 1990, Ser. No. 552,318

Int. Cl.⁵ C08J 3/00; C09G 1/04

U.S. Cl. 106-8

21 Claims

6. The composition of claim 1 containing a fragrance in an amount up to 0.5% of said composition.

5,085,696

METHODS AND COMPOSITIONS FOR TREATING METALS BY MEANS OF WATER-BORNE POLYMERIC FILMS

Frank A. Muller, West Los Angeles, and Arnold E. Zaelke, South Gate, both of Calif., assignors to Atochem North America, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 679,879, Apr. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 575,042, Aug. 19, 1990, abandoned. This application Jul. 25, 1991, Ser. No. 735,481

Int. Cl.⁵ C09K 15/04; C23F 11/00

U.S. Cl. 106-14.16

13 Claims

1. A formulation for coating the surface of a metal comprising, in percent by weight, (a) about 30-90% of an aqueous emulsion of a thermoplastic or thermosetting acrylic polymer, (b) about 1-5% of a water-soluble, blocked zirconium catalyst

selected from ammonium zirconium carbonate or an alkanolamine chelate of zirconium oxide, (c) a mixture of water and a volatile organic solvent selected from propyl alcohol, isopropyl alcohol, glycol ethers, n-methylpyrrolidone, and combinations thereof, the water comprising about 8-55% of the formulation and the solvent about 3-20%, and (d) about 0.3-3.0% of a corrosion additive selected from 2-mercapto benzothiazole, sodium 2-mercapto benzothiazole, 2-mercapto benzimidazole, sodium 2-mercapto benzimidazole, and tolyltriazole.

5,085,697

METHOD OF FORMING A TENTATIVE SURFACE PROTECTIVE COATING

Tetsuya Kimura; Toshihiro Fujii, and Hiroki Nii, all of Fukuyama, Japan, assignors to Hayakawa Rubber Co., Ltd., Japan

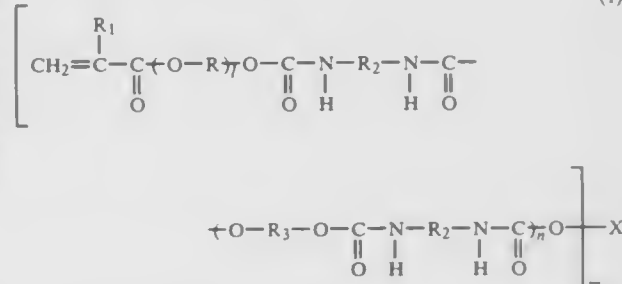
Division of Ser. No. 215,564, Jul. 6, 1988. This application Mar. 12, 1990, Ser. No. 491,865

Int. Cl.⁵ C09D 11/00; C08F 00/00; B05D 3/06

U.S. Cl. 106-20

7 Claims

1. An ink composition comprising, 100 parts by weight of an ultraviolet ray-curable rubbery elastomer of the formula:



wherein R is an alkylene group having 2-8 carbon atoms, R₁ is H or CH₃, R₂ is a residue of a diisocyanate, R₃ is a residue of a dihydric alcohol from which at least one hydroxyl group is removed, X is a liquidus dienic rubber having an average molecular weight of from about 1,000 to about 10,000 and at least one hydroxyl group from which at least one hydroxyl group is removed, l is an integer of 1-4, n is an integer of 1-12, and m is a number of 1 < m < 3,

10-200 parts by weight of an ethylenically unsaturated monomer, and

0.1-10 parts by weight of a photosensitizer, and further optionally comprising at least one of

0.01-10 parts by weight of a thermopolymerization inhibitor,

0.001-10 parts by weight of a dye or pigment,

0.1-10 parts by weight of a defoamer,

0.5-200 parts by weight of a thickener,

0.1-10 parts by weight of a peeling aid,

5-20 parts by weight of a rubber selected from the group consisting of polybutadiene rubber, isoprene rubber, chlorosulfonated polyethylene rubber, natural rubber, and polybutylene rubber, and

5-20 parts by weight of an organic solvent for imparting a screen printing property to the ink composition.

5,085,698

AQUEOUS PIGMENTED INKS FOR INK JET PRINTERS
Sheau-Hwa Ma, Chadds Ford, Pa.; Howard Matrick, Highlands, N.J.; Arthur C. Shor, Concordville, Pa., and Harry J. Spinelli, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 11, 1990, Ser. No. 508,145
Int. Cl.⁵ C09D 11/10

U.S. Cl. 106—20 25 Claims

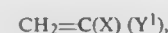
1. A pigmented ink comprising an aqueous carrier medium and particles of pigment stabilized by an AB or BAB block copolymer wherein:

(a) the A segment is a hydrophobic homopolymer or copolymer of an acrylic monomer having the formula



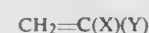
wherein X is H or CH₃, and Y is C(O)OR₁, C(O)NR₂R₃, or CN, wherein R₁ is an alkyl, aryl, or alkylaryl group having 1 to 20 carbon atoms, and R₂ and R₃ are hydrogen or an alkyl, aryl, or alkylaryl group having 1 to 9 carbon atoms; said A segment having an average molecular weight of at least approximately 300 and being water insoluble; and

(b) the B segment is a hydrophilic polymer, or salt thereof, of (1) an acrylic monomer having the formula



wherein X is H or CH₃, and Y¹ is C(O)OH, C(O)NR₂R₃, C(O)OR₄NR₂R₃ or C(O)OR₅; wherein R₂ and R₃ are hydrogen or an alkyl, aryl, or alkylaryl group having 1 to 9 carbon atoms; R₄ is an alkyl diradical having 1 to 5 carbon atoms; and R₅ is an alkyl group having 1 to 20 carbon atoms and containing one or more hydroxyl or ether groups; or

(2) a copolymer of the acrylic monomer of (1) with an acrylic monomer having the formula



where X and Y are the substituent groups defined for said A segment; said B segment having an average molecular weight of at least approximately 300 and being water soluble, with the proviso that said B segment(s) constitute approximately 10 to 90% of said block copolymer, by weight.

5,085,699

AMNIOPOLYESTER RESINS AS DILUTION EXTENDERS FOR ZINC-CONTAINING METAL RESINATE INKS

G. Frederick Hutter, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 8, 1991, Ser. No. 682,121
Int. Cl.⁵ C09D 11/08

U.S. Cl. 106—30 8 Claims

1. A zinc-containing metal resinate modified with a linear or branched polyester comprising the condensation reaction product of:

- an aliphatic, cycloaliphatic, or aromatic carboxylic acid containing from 2 to 4 carboxyl groups or their anhydride equivalents, and from 4 to 54 carbon atoms, or a mixture of such acids and anhydrides; and
- an aminoalcohol containing at least 1 tertiary amine group and from 2 to 5 hydroxyl groups, or a mixture of such aminoalcohols;
- where the ratio of the reactants are such that the equivalent weight of the polymer per amine group is in the range of 200 to 600; and
- the polyester is soluble in aliphatic or aromatic hydrocarbons.

5,085,700

HIGH PURITY, HIGH TEMPERATURE PIPE THREAD SEALANT PASTE

Ronald A. Howard, Brook Park, Ohio, assignor to UCAR Carbon Technology Corporation, Danbury, Conn.
Division of Ser. No. 390,730, Aug. 8, 1989, abandoned, which is a division of Ser. No. 187,846, Apr. 29, 1988, Pat. No. 4,872,914.

This application Nov. 2, 1990, Ser. No. 608,396
Int. Cl.⁵ C09K 3/10, 3/12; H01B 1/06; F16L 33/18

U.S. Cl. 106—33 9 Claims

1. A pipe joint comprising a threaded male and female fitting joined together with the threads on each fitting engaging the threads on the other fitting, the threaded engagement between said male and female fitting including void spaces which are substantially filled with a seal paste composition consisting essentially of from about 30 to about 80 percent by weight of natural flake graphite particles of a size sufficient to pass through a 100 Tyler mesh sieve and a liquid carrier comprising petrolatum and mineral oil.

5,085,701

POLYMER-MODIFIED BITUMEN (PMB)

Michael Müller, Alsbach-Hähnlein; Horst Pennewiss, Darmstadt-New-Kranichstein, and Juergen Gebhardt, Schaaheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 1, 1990, Ser. No. 531,584

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917815

Int. Cl.⁵ C08L 95/00; C09D 4/00, 101/00, 201/00

U.S. Cl. 106—273.1 6 Claims

1. A polymer-modified bitumen (PMB) having improved elastic restoration prepared by blending from 0.5–20 wt. % of a polymer material in bitumen, said polymer additive, which may be comprised of various polymers, being comprised of from 20–100wt. % of a polyalkyl (meth)acrylate comprising monomer units as follows:

- 50–100 wt. % of alkyl (meth)acrylates containing alkyl groups of 8–26 C atoms;
- 0–30 wt. % of alkyl (meth)acrylates containing alkyl groups of 1–7 C atoms; and
- 0–20 wt. % of other monomers, optionally containing functional groups;

and said polymer having a molecular weight Mw > 1,000,000, corresponding to a viscosity number $\eta_{sp}/C > 120$ ml/g as measured in chloroform at 20° C.

5,085,702

ACCELERATORS FOR CATIONIC AQUEOUS BITUMINOUS EMULSION-AGGREGATE SLURRIES

Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

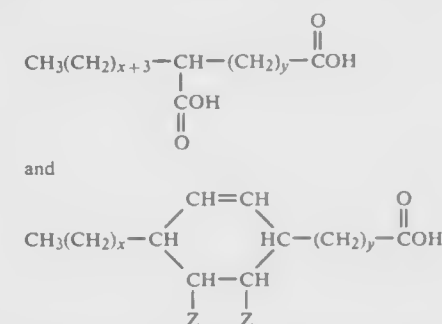
Division of Ser. No. 446,809, Dec. 6, 1989, This application Feb. 15, 1991, Ser. No. 655,805

Int. Cl.⁵ C08L 95/00

U.S. Cl. 106—277 3 Claims

1. An improved process for preparing a paving slurry seal mixture of a cationic aqueous bituminous emulsion and mineral aggregate capable of being worked comprising mixing a densely graded mineral aggregate passing through No. 4 and at least 80% retained on 200 mesh screen, and from about 4% to about 16% water, based on the weight of the mineral aggregate, containing up to 3% of an inorganic additive to reduce the setting time of the mixture to prewet the aggregate, and mixing the prewetted aggregate with from about 8% to about 20% of an oil in water type emulsion, based on the weight of the mineral aggregate, wherein the emulsion is comprised of from about 30% to about 80% bitumen, based on the weight of the emulsion, from about 0.1% to about 10% of a cation-active emulsifier based on the weight of the emulsion, wherein the emulsifier is selected from the group consisting of reaction products of a polyamine with resin acids reacted with maleic

anhydride or fumaric acid, and water to make up 100% by weight of the emulsion, the emulsion having a pH in the range of from 2–7, wherein the improvement comprises adding to the aggregate prewet water from 0.2% to 0.7% of one or more additives selected from the group consisting of (1) tall oil fatty acids, (2) polycarboxylic acid selected from the group consisting of



wherein x and y are integers from 3 to 9, x and y together equal 10–14, at least one Z is a carboxylic acid group and any remaining Z is hydrogen and (3) the reaction product of a lesser molar amount of a polyamine with a greater molar amount of said polycarboxylic acid to give cationic bituminous emulsions of reduced cure times.

5,085,703

Patent Not Issued For This Number

5,085,704

ACCELERATORS FOR CATIONIC AQUEOUS BITUMINOUS EMULSION-AGGREGATE SLURRIES

Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

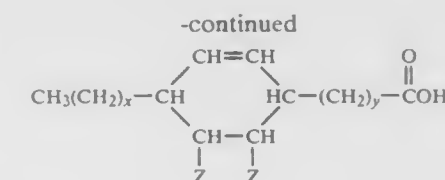
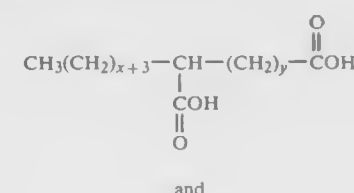
Division of Ser. No. 446,809, Dec. 6, 1989, which is a division of Ser. No. 322,916, Mar. 14, 1989, abandoned. This application

Feb. 15, 1991, Ser. No. 655,722

Int. Cl.⁵ C08L 95/00, 91/00

U.S. Cl. 106—277 3 Claims

1. An improved process for preparing a paving slurry seal mixture of a cationic aqueous bituminous emulsion and mineral aggregate capable of being worked comprising mixing a densely graded mineral aggregate passing through No. 4 and at least 80% retained on 200 mesh screen, and from about 4% to about 16% water, based on the weight of the mineral aggregate, containing up to 3% of an inorganic additive to reduce the setting time of the mixture to prewet the aggregate, and mixing the prewetted aggregate with from about 8% to about 20% of an oil in water type emulsion, based on the weight of the mineral aggregate, wherein the emulsion is comprised of from about 30% to about 80% bitumen, based on the weight of the emulsion, from about 0.1% to about 10% of a cation-active emulsifier based on the weight of the emulsion, wherein the emulsifier is selected from the group consisting of reaction products of a polyamine with sulfonated fatty acids and water to make up 100% by weight of the emulsion, the emulsion having a pH in the range of from 2–7, wherein the improvement comprises adding to the aggregate prewet water 0.05% of one or more additives selected from the group consisting of (1) tall oil fatty acids, (2) polycarboxylic acid selected from the group consisting of



wherein x and y are integers from 3 to 9, x and y together equal 10–14, at least one Z is a carboxylic acid group and any remaining Z is hydrogen, (3) fumarized or maleinized rosin, (4) a polyamine condensate formed by the reaction product of a lesser molar amount of a polyamine with a greater molar amount of said polycarboxylic acid, and (5) the polyamine condensate post-reacted with fumarized or maleinized rosin to give cationic bituminous emulsions of reduced cure times.

5,085,705

ALUMINA-SILICA-SULFATES, METHOD OF PREPARATION AND COMPOSITIONS

Michael C. Withiam, Elkton, Md., assignor to J.M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 296,095, Jan. 12, 1989, Pat. No. 5,030,284.

This application Jan. 7, 1991, Ser. No. 637,917

Int. Cl.⁵ C09B 14/04

U.S. Cl. 106—287.17 48 Claims

9. A rubber composition, comprising a rubber; and at least a bulking and reinforcing amount of an alumina-silica-sulfate containing a sulfate network of the formula



wherein

R is selected from the group consisting of alkali and alkaline earth metal oxides, transition metals capable of forming sulfate salts and mixtures thereof;

x is about 0.001 to 0.5;

y is about 0.01 to 3.00;

z is about 0.01 to 3.00; and

p is about 0 to 100.00.

5,085,706

SYNTHETIC PIGMENT HAVING THE COLOR OF NATURAL UNCALCINED UMBER AND ITS USE

Peter Kuske, and Gunter Buxbaum, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 22, 1991, Ser. No. 733,329

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1990, 4024566

Int. Cl.⁵ C09C 1/22

U.S. Cl. 106—456 12 Claims

1. A synthetic pigment having the color of natural uncalcined umber which has an iron content, expressed as Fe₂O₃, of more than 85% by weight and a content of silica of less than 0.1% by weight.

5,085,707

DEFINED AND DELAMINATED KAOLIN PRODUCT

Wayne M. Bundy, Lebanon; John A. Manasso, Belle Mead, and Joseph P. Berberich, Barnegat, all of N.J., assignors to Georgia Kaolin Company, Inc., Elizabeth, N.J.

Continuation-in-part of Ser. No. 197,357, May 23, 1988, Pat. No. 4,943,324. This application Jun. 14, 1990, Ser. No. 537,979

Int. Cl.⁵ C04B 14/10

U.S. Cl. 106—486 8 Claims

1. A kaolin paper coating composition comprising a suspension in water of defined and delaminated uncalcined kaolin clay particles having a narrow particle size distribution such that at least 70% of the kaolin particles therein have a particle size of at least 0.3 microns and less than 2 microns in equivalent

spherical diameter, said kaolin particles being produced by delaminating and defining a base kaolin clay which is an uncalcined kaolin having a brightness of at least 89, so as to remove a substantial portion of the colloidal particle content from the base kaolin clay, and having increased opacifying and gloss properties when compared to the base kaolin clay.

5,085,708

LIGNOSULFONATES, OXYCARBOXYLATES, POLYCARBOXYLATES, AND POLYOXYALKYLENE, ALKYLARYL AND ALKYL ETHERS ADMIXTURES FOR ULTRA-DRY MIX CONCRETE

Yoshitaka Moriya, Chiba; Hiroshi Nomachi; Makoto Takada, both of Chigasaki; Yukihide Takatsu, Hiratsuka, and Kenichi Umezawa, Fujisawa, all of Japan, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 298,458, Jan. 18, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 645,386

Claims priority, application Japan, Jan. 20, 1988, 63-8387

Int. Cl.⁵ C04B 24/00, 24/02, 24/10

U.S. Cl. 106—819

7 Claims

1. An admixture for ultra-dry-mix concrete containing cement or cement and fly ash, containing (A) one or more varieties of cement dispersing agents selected from the group consisting of lignosulfonates, oxycarboxylates and polycarboxylates, and (B) one or more varieties of nonionic surface-active agents selected from the group consisting of polyoxyalkylene alkylaryl and alkyl ethers with a hydrophilic-lipophilic balance (HLB-value) of 8 to 17, (A) and (B) being present in quantities such that:

- when (A) is a lignosulfonate or an oxycarboxylate, it comprises from 0.15 to 0.80% by weight of cement or cement and fly ash, and when (A) is a polycarboxylate it comprises from 0.02 to 0.20% by weight of cement or cement and fly ash;
- when (A) is a lignosulfonate, (B) is present in an amount from 1 to 35 parts by weight per 100 parts of (A); and
- when (A) is an oxycarboxylate or a polycarboxylate, (B) is present in an amount 1 to 100 parts by weight per 100 parts of (A).

5,085,709

METHOD FOR TREATING NATURAL GAS EQUIPMENT
Richard L. Morris, Duncanville, and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 14, 1990, Ser. No. 493,180

The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.⁵ G21F 9/00

U.S. Cl. 134—3

19 Claims

1. A method of decontaminating natural gas processing equipment and media having adherent mineral deposits of alkaline earth metal sulfates containing radioactive components, which method comprises (i) converting the alkaline earth metal sulfates in the deposit to soluble form by contacting the deposit with an aqueous composition comprising a chelating agent and a synergist at a pH from 10 to 13, to dissolve the deposit in the composition and remove it from the equipment.

5,085,710

METHOD OF USING AN AQUEOUS CHEMICAL SYSTEM TO RECOVER HYDROCARBON AND MINIMIZE WASTES FROM SLUDGE DEPOSITS IN OIL STORAGE TANKS

Michael L. Goss, Houston, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 31, 1989, Ser. No. 429,360

Int. Cl.⁵ B08B 9/08

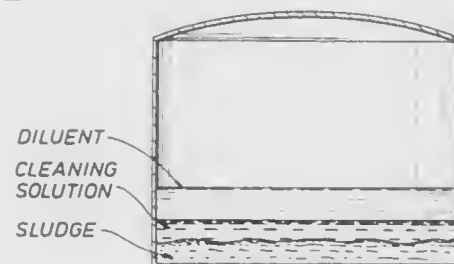
U.S. Cl. 134—22.14

15 Claims

1. A process for separating and removing the hydrocarbon, water and solid components of sludge deposited in an oil storage tank which comprises:

- introducing a sufficient amount of a nonionic surfactant

in an aqueous solution to form a layer of the solution above the sludge layer; said nonionic surfactant comprising: C₈-C₁₂ alkylphenol-ethylene oxide adducts of about 55%-75% by weight ethylene oxide, and at least one castor oil-ethylene oxide adduct of about 55%-75% by weight ethylene oxide; said nonionic surfactant being



present in a quantity sufficient to separate hydrocarbon component from the sludge without forming an emulsion, (b) adding a diluent, immiscible with the aqueous layer, for extracting the hydrocarbons, and (c) separately draining the diluent layer and aqueous layer from the tank.

5,085,711

PHOTOVOLTAIC DEVICE

Masayuki Iwamoto, Itami; Koji Minami, Higashiosaka, and Kaneo Watanabe, Anpachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

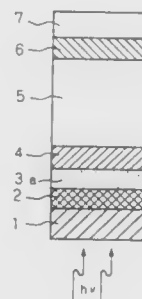
Filed Feb. 15, 1990, Ser. No. 480,453

Claims priority, application Japan, Feb. 20, 1989, 1-39921; Feb. 20, 1989, 1-39922

Int. Cl.⁵ H01L 31/06, 31/075

U.S. Cl. 136—258

19 Claims



1. A photovoltaic device with a substrate and a multiplicity of layers formed in overlying sequence on a surface of the substrate, comprising:

- an electrode on said surface of the substrate; and
 - a semiconductor layer comprising a microcrystalline semiconductor layer and an amorphous semiconductor layer, with said microcrystalline semiconductor layer on said electrode;
- wherein a film containing an element which reacts with an element in said microcrystalline semiconductor layer to accelerate microcrystallization of said microcrystalline semiconductor layer is disposed at the boundary between said electrode and said microcrystalline semiconductor layer and wherein said element in said film is selected from the group consisting of nitrogen and phosphorus.

5,085,712

IRON/COPPER/CHROMIUM ALLOY MATERIAL FOR HIGH-STRENGTH LEAD FRAME OR PIN GRID ARRAY
Kunio Watanabe; Satoshi Nishimura, both of Sagami, and Kunishige Kaneko, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 385,351, Jul. 27, 1989, abandoned, which is a division of Ser. No. 198,496, May 25, 1988, Pat. No. 4,869,758. This application May 23, 1990, Ser. No. 527,710

Claims priority, application Japan, May 26, 1987, 62-127193; Jul. 7, 1987, 62-167902

Int. Cl.⁵ C22D 1/08

U.S. Cl. 148—2

7 Claims

1. A process for the preparation of an iron/copper/chromium alloy material for a high-strength lead frame or pin grid array, which consist essentially of continuously casting a thin cast piece of an iron/copper/chromium alloy comprising 20 to 90% by weight of Cu and 2.5 to 12% by weight of Cr, with the balance being Fe and unavoidable impurities, at a cooling speed of at least 100° C./sec, cold-working the cast piece and subjecting the cast piece to an aging treatment at a temperature of 450° to 650° C. for 20 to 500 minutes.

5,085,713

METHOD OF FORMING A PARTIALLY CARBURIZED STARTER OUTPUT SHAFT

Akira Morishita, and Keiichi Konishi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

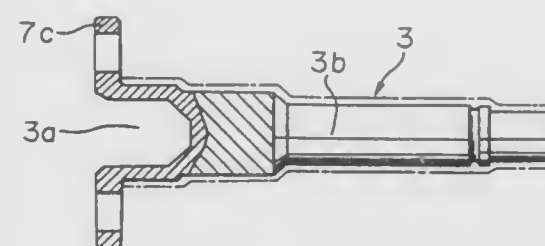
Filed Jul. 20, 1989, Ser. No. 382,442

Claims priority, application Japan, Jul. 22, 1988, 63-184040

Int. Cl.⁵ C21D 8/22, 9/30

U.S. Cl. 148—12.1

1 Claim



1. A method of forming a rotary output shaft for a starter motor device having a planet gear speed reducing device, said rotary output shaft having at one end thereof a carrier portion (7c) for supporting planet gears and being adapted to transfer revolutions of the rotary output shaft reduced by the planet gear speed reducing device to a pinion driving device which is slidably supported on a shaft portion (3b) of the rotary output shaft, comprising the steps of: forging a steel blank to form a product having a shape similar to the rotary output shaft but having larger outer dimensions, subjecting at least the carrier portion of the forged product to a plating treatment for preventing carburization, subjecting the entire product to a carburizing treatment, and surface finishing a locally carburized portion of the product, wherein said locally carburized portion is surface finished by a grinder and the uncarburized plated carrier portion is finished by the cutter of a cutting machine selected from a group consisting of a lathe, a milling machine and a drilling machine, wherein said forging forms a recess (3a) surrounded by the carrier portion for accommodating an end of a motor armature shaft, and said recess is also subjected to said plating treatment, and wherein said plating is copper plating.

5,085,714

METHOD OF MANUFACTURING A STEEL SHEET
Mitsuru Kitamura, and Shunichi Hashimoto, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

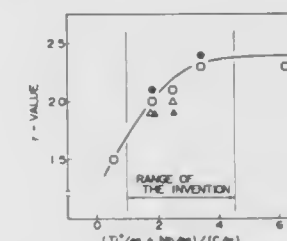
Filed Aug. 9, 1990, Ser. No. 564,756

Claims priority, application Japan, Aug. 9, 1989, 1-206305; Sep. 5, 1989, 1-230873; Nov. 2, 1989, 1-286853

Int. Cl.⁵ C21D 8/04

U.S. Cl. 148—16.5

12 Claims



	ANNEALING IN CARBURIZING GAS ATMOSPHERE	ANNEALING IN INERT GAS ATMOSPHERE
STEEL WITHOUT B	○	●
STEEL WITH B	△	▲

1. A method of manufacturing steel sheets by applying continuous annealing after applying hot rolling by a customary method to steel material, containing less than 0.007 wt % of C, less than 0.1 wt % of Si, from 0.05 to 0.50 wt % of Mn, less than 0.10 wt % of P, less than 0.015 wt % of S, from 0.005 to 0.05 wt % of sol.Al and less than 0.006 wt % of N, further, containing Ti and/or Nb added solely or in combination within such a range that the relationship of the effective amount of Ti (referred to as Ti*) and the amount of Nb in accordance with the following formula (1) with the amount of C can satisfy the following formula (2):

$$Ti^*(wt\%) = \text{total } Ti(wt\%) - ((48/32) \times S(wt\%) + (48/14) \times N(wt\%)) \quad (1)$$

$$1 \leq (Ti^*/48 + Nb/93) / (C/12) \leq 4.5 \quad (2)$$

and the balance of Fe and inevitable impurities, wherein continuous carburization and/or nitriding is applied, simultaneously, with the annealing such that the amount of solid-solute C and/or the amount of solid-solute N in the steel sheet is from 2 to 30 ppm.

5,085,715

MAGNETICALLY ANISOTROPIC BOND MAGNET, MAGNETIC POWDER FOR THE MAGNET AND MANUFACTURING METHOD OF THE POWDER

Masatoshi Tokunaga, Fukaya; Yasuto Nozawa, and Katsunori Iwasaki, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Division of Ser. No. 366,160, Jun. 14, 1989, Pat. No. 4,952,239, which is a continuation of Ser. No. 26,969, Mar. 17, 1987, Pat. No. 4,921,553. This application Dec. 4, 1989, Ser. No. 443,242

Claims priority, application Japan, Mar. 20, 1986, 61-62174; May 9, 1986, 61-106187

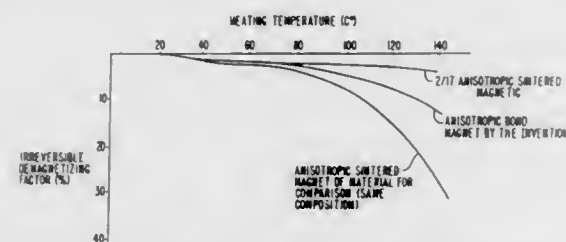
Int. Cl.⁵ H01F 1/02

U.S. Cl. 148—101

16 Claims

1. Method of manufacturing anisotropic magnetic powder for a magnetically anisotropic bond magnet, comprising the steps of rapidly-quenching the molten metal of an R-TM-B-M alloy, wherein R is at least one of the rare earth elements including Y, TM is Fe or Fe a part of which has been substituted with Co, B is boron, and M is at least one additive selected from the group consisting of Si, Al, Nb, Zr, Hf, P and C.

to make flakes of the alloy, compacting the flakes to form a high density body, plastically deforming the body to produce



an average crystal grain size of 0.01–0.5 μm and magnetic anisotropy, and crushing the plastically deformed body.

5,085,716 HOT WORKED RARE EARTH-IRON-CARBON MAGNETS

Carlton D. Fuerst, Royal Oak, and Earl G. Brewer, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 482,124, Feb. 20, 1990, abandoned. This application Dec. 5, 1990, Ser. No. 622,690
Int. Cl.⁵ H01F 1/053

U.S. Cl. 148—301

3 Claims



1. An anisotropic permanent magnet comprising a principal phase of hot work aligned, flat, fine crystal grains of the tetragonal crystal phase $\text{RE}_2\text{TM}_{14}\text{C}_x\text{B}_{1-x}$ and an intergranular minor phase, R is one or more rare earth elements taken from the group consisting of neodymium, praseodymium or mixtures of neodymium and/or praseodymium with one or more other rare earth elements that make up no more than 40 atomic percent of the total rare earth content, TM is iron or mixtures of iron with cobalt, and where the value of x is from 0.2 to 1.0, the flat grains being on the average no greater than about 1000 nm in greatest dimension.

5,085,717 AUTOPYROLYZABLE COMPOSITION FOR AEROBIC PROPULSION, THE OXIDIZING AGENT OF WHICH IS AN EXPLOSIVE

Jean-Daniel M. Berard, 6, rue de la Sorbonne, 75005 Paris; Bernard E. Finck, 8, rue Léopold Vandries, 91100 Corbeil Essonnes; Gérard Doriath, 19, avenue du Midi, 91760 Itteville, and Christian M. Perut, 7c, avenue du Bois Chapet, 91540 Mennecy, all of France

Filed Jul. 29, 1980, Ser. No. 178,541

Claims priority, application France, Aug. 14, 1979, 79 20728
Int. Cl.⁵ C06B 45/10

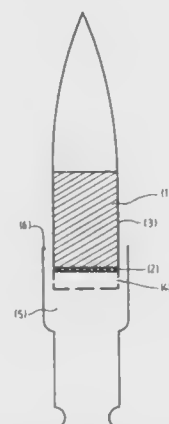
U.S. Cl. 149—19.9

12 Claims

1. An autopyrolyzable, solid organic composition for aerobic propulsion, said composition consisting essentially of a solid oxidizing agent, a binder and at least one cross-linking agent, and generating reducing gases upon autopyrolysis of its components,

said solid oxidizing agent being a nitro or nitrate, organic explosive material wherein the amount, by weight, of oxygen atoms bonded to the nitrogen atoms of the said

nitro or nitrate groups exceeds 40 percent relative to the total weight of the molecule, said binder being a polyalkadiene having functional terminal groups reactive with said cross-linking agent, and



wherein said solid oxidizing agent is present in an amount equal to or higher than the minimum amount of oxidizing agent required for causing autopyrolysis of said composition and less than 40 percent by weight relative to the total weight of said solid oxidizing agent, binder and crosslinking agent.

5,085,718 PROCESS FOR BONDING A CARDBOARD BLANK LAMINATED WITH PLASTIC FILM, PARTICULARLY FOR HINGE-LID CIGARETTE PACKETS

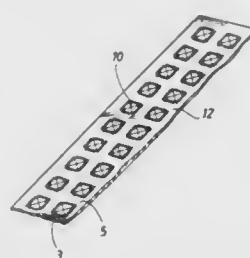
Gerhard Wank, 2080 Pinneberg, and Berthold Winter, 2000 Hamburg, both of Fed. Rep. of Germany
Filed Feb. 2, 1990, Ser. No. 473,669

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 3903201

Int. Cl.⁵ B65B 7/20

U.S. Cl. 156—69

8 Claims



1. A process for bonding a plastic-coated cardboard blank comprising the steps of:

- a) contacting the plastic coated surface of the blank with a tool having tips with cutting surfaces to penetrate the plastic coating and to create a plurality of depressions in the cardboard blank thereby creating a treated surface;
- b) applying an adhesive to the treated surface whereby the adhesive penetrates in the depressions; and
- c) compressing the adhesive-containing surface with an area of the cardboard blank to which the surface is to be bonded.

5,085,719 VARIABLE RATE WELDING OF THERMOPLASTIC BELTS

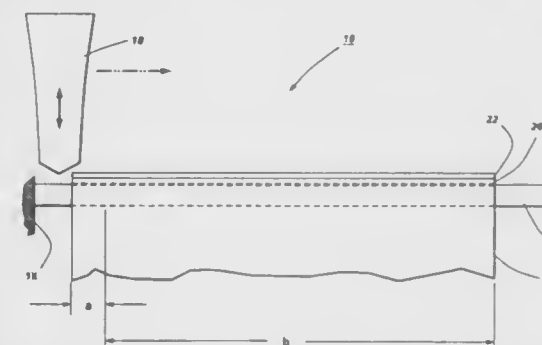
David A. Eck, Oklahoma City, Okla., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 14, 1990, Ser. No. 583,057

Int. Cl.⁵ B32B 31/16

U.S. Cl. 156—73.4

18 Claims



1. A process for welding comprising providing sheet material comprising a thermoplastic polymer, overlapping edges of said sheet material to form a lap joint, supporting said lap joint on an anvil, and welding said lap joint by contacting and traversing said lap joint with an ultrasonic welding horn, the improvement comprising initially contacting and traversing a first portion of said lap joint with said welding horn at a first predetermined traverse rate and thereafter increasing said first traverse rate to a final higher predetermined traverse rate over a second portion of said lap joint while maintaining said horn at a substantially constant frequency during the entire welding pass through said first and second portions.

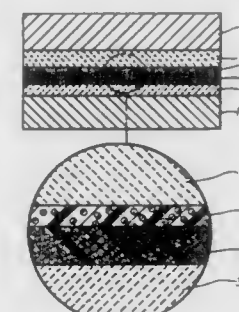
5,085,720 METHOD FOR REDUCING SHRINKAGE DURING FIRING OF GREEN CERAMIC BODIES

Kurt R. Mikeska, Wilmington; Daniel T. Schaefer, Newark, and Richard H. Jensen, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 466,934, Jan. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 295,803, Jan. 10, 1989, abandoned. This application Apr. 29, 1991, Ser. No. 692,651

Int. Cl.⁵ B32B 18/00

U.S. Cl. 156—89

27 Claims



1. A method for reducing X-Y shrinkage during firing of a green ceramic body comprising the sequential steps of

- a. Providing a green ceramic body comprising an admixture of finely divided particles of ceramic solids and sinterable inorganic binder dispersed in a volatilizable solid polymeric binder;
- b. Applying to a surface of the green ceramic body a flexible release layer comprising finely divided particles of non-metallic inorganic solids dispersed in volatilizable organic medium comprising at least 10% by volume, basis non-metallic inorganic solids, of volatilizable polymeric

binder, the Penetration of the sinterable inorganic binder being no more than 50 μm ;

- c. While maintaining unidirectional pressure normally to the exposed surface of the release layer, firing the assemblage at a temperature and for a time sufficient to effect volatilization of the polymeric binders from both the green tape and the release layer, sintering of the inorganic binder in the green tape without incurring radial bulk flow of the sintered tape, and the formation of interconnected porosity in the release layer;
- d. Cooling the fired assemblage;
- e. Releasing the pressure from the cooled assemblage; and
- f. Removing the porous release layer from the surface of the sintered ceramic green tape.

5,085,721 METHOD OF FITTING AN IMPACT-RESISTING ANTI-LACERATIVE WINDOW UNIT

Itsuo Tanuma, Sayama; Hideo Takelchi, Tanashi; Masashi Segawa, Kodaira, and Toshio Honda, Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Division of Ser. No. 90,290, Aug. 28, 1987, Pat. No. 4,945,002.

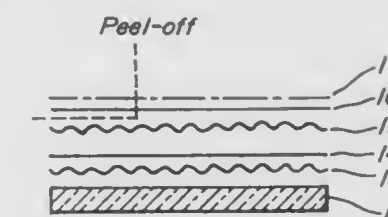
This application May 3, 1990, Ser. No. 519,519

Claims priority, application Japan, Aug. 28, 1986, 61-200008; Sep. 29, 1986, 61-228277

Int. Cl.⁵ B60J 1/02; B32B 31/18

U.S. Cl. 156—108

13 Claims



1. A method of fitting to a window frame or an automobile body an anti-lacerative laminate comprising two exterior plate-like members comprising a hard coated transparent organic polymer as an outermost plate-like member on a person's side and an inorganic transparent material as a plate-like member on an open air side, and further comprising a multilayer structure intermediate film made of at least two kinds of polymers having different breaking strengths, said multilayer structure intermediate film being interposed between the two exterior plate-like members, said method comprising the steps of: removing a fitting portion of the hard coated transparent organic polymer and of the multilayer structure intermediate film from the fitting portion of the anti-lacerative laminate through peeling while at least one layer of the high breaking strength material layer in the multilayer structure intermediate film on the person's side remains as part of the laminate thereby exposing a fitting surface, applying adhesive to the window frame or the automobile body, and fitting the laminate to the window frame or the automobile body, such that the fitting surface of the laminate is placed against the window frame or the automobile body.

5,085,722

METHOD OF MANUFACTURE OF A COMPOSITE MATERIAL OF METAL AND PLASTIC

Seigfried Sikorski, Munchen, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen-Union Munchen GmbH, Munchen, Fed. Rep. of Germany

Division of Ser. No. 202,792, Jun. 3, 1988, Pat. No. 4,954,387.

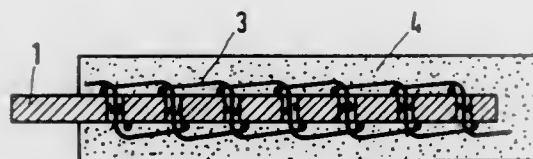
This application Apr. 20, 1990, Ser. No. 512,753

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718676

Int. Cl.⁵ B29C 53/56

U.S. Cl. 156—169

7 Claims



1. A method of manufacturing a composite material comprising:
- providing a metal substrate having a plurality of apertures distributed therein,
 - providing a reinforcing fibers which are to reinforce the metal substrate,
 - applying a plastic material in melt state onto at least one of the metal substrate and said reinforcing fibers,
 - winding the fibers through the apertures in said substrate such that the fibers do not contact the substrate in the apertures and are isolated thereat from the substrate by said plastic material, and
 - embedding the substrate with the fibers wound through the apertures thereof into a plastic material to form a composite of the metal substrate and the wound fibers embedded in the plastic material.
- superimposing a plurality of the composites as plies to form a laminate thereof during cross-linking and curing of the plastic material.

5,085,723

PROCESS AND APPARATUS FOR PRODUCING MAGNETIC DISKETTE

Masao Nakaki, Mito, and Susumu Aoyama, Hitachi, both of Japan, assignors to Hitachi Setsubi Engineering Co., Ltd., Hitachi, Japan

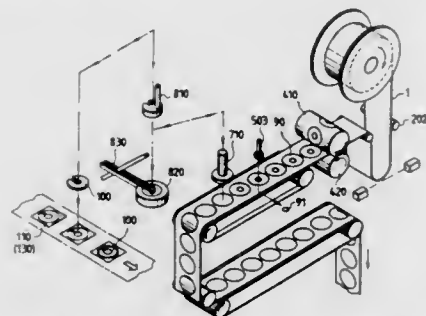
Filed Jul. 25, 1990, Ser. No. 557,701

Claims priority, application Japan, Jul. 31, 1989, 1-198696

Int. Cl.⁵ B32B 31/00

U.S. Cl. 156—250

24 Claims



1. A process of producing a magnetic diskette comprising a pair of halves forming a shell, a magnetic disc sheet placed in the shell and liners disposed between the magnetic disc sheet and the shell, said liners each having an outer periphery, an inner periphery for a central opening and a window for a head, said process comprising the steps of:

cutting a nonwoven fabric sheet to form a piece for the liner,

the piece having the outer periphery and the inner periphery and being separable from but fitted in the sheet; separating the piece from the sheet; transferring the separated piece to a positioning device to fix a positional relation of the separated piece to the positioning device; cutting the separated piece at the positioning device to form the window, thereby to provide a finished liner; and holding the separated piece at the positioning device by a transfer head, and transferring the finished liner, through moving the transfer head, to the shell, to place the liner on a predetermined position of the shell.

5,085,724

PROCESS AND APPARATUS FOR THE PRODUCTION OF (FILM) PACKS AND (FILM) PACK

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

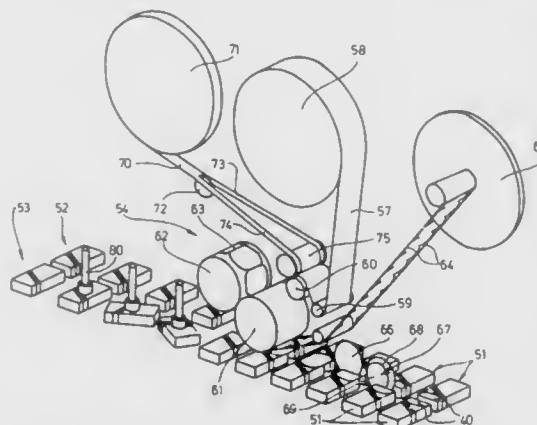
Filed May 1, 1990, Ser. No. 517,112

Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915192

Int. Cl.⁵ B32B 31/18

U.S. Cl. 156—256

13 Claims



1. A process for the production of film packs for paper handkerchiefs, wherein each pack is provided with a tear-open tab having an individual adhesive tape resting on an outside surface of the pack, said process comprising the steps of:
- severing a double-width adhesive tape (55) from a longitudinally extending web (57) of tape material which has on one side thereof an adhesive coating and which has a transverse width corresponding at least to a dimension of two individual adhesive tapes (40) lying next to each other;
 - applying the double-width adhesive tape simultaneously to respective opening tabs on corresponding sides of two adjacent ones of the packs so that said adhesive coating bonds to the opening tabs; and
 - then cutting the double-width tape (55) along a center line thereof between the two adjacent packs to produce two packs each of which has an individual adhesive tape (40) bonded thereto.

5,085,725

METHOD OF CHEMICAL BONDING OF SOLID PROPELLANT GRAINS TO THE INTERNAL INSULATION OF AN INTERCEPTOR MOTOR

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1990, Ser. No. 564,897

Int. Cl.⁵ C06B 45/00; C06D 5/00

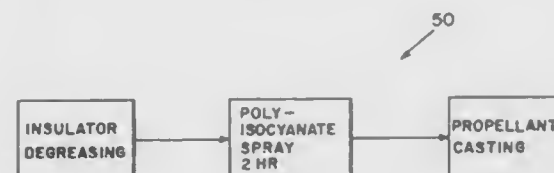
U.S. Cl. 156—281

3 Claims

1. A method of chemical bonding an isocyanate curable solid

propellant composition to the outer surface of the internal insulation of an interceptor solid rocket motor, said method comprising:

- (i) providing a solid propellant rocket motor case having said internal insulation installed therein;
- (ii) degreasing the outer surface of said insulation to yield a degreased insulation surface;
- (iii) spraying said degreased insulation surface with the trimer of 1,6-hexanediisocyanate which is chemically reactive with said degreased insulation surface, said trimer of 1,6-hexanediisocyanate prepared by the process set forth under (a)-(c) below which comprises:
 - (a) reacting 1,6-hexanediisocyanate with water to form 1-amino-6-hexanediisocyanate;
 - (b) reacting said 1-amino-6-hexanediisocyanate with an additional molecule of 1,6-hexanediisocyanate to form 7-aza-8-oxo-1,6-pentadecanediisocyanate; and,



- (c) reacting said 7-aza-8-oxo-1,6-pentadecanediisocyanate with another molecule of 1,6-hexanediisocyanate to form the trisocyanate whose chemical name in accordance with the International Union of Pure and Applied Chemistry is 7-aza-8-oxo-7-pentadecanediisocyanate;
- (iv) placing said solid propellant composition onto said trimer of 1,6-hexane diisocyanate which is chemically reactive with said solid propellant composition; and,
- (v) forming a chemical bond between said solid propellant composition and said insulation surface with said trimer of 1,6-hexanediisocyanate with which said solid propellant composition and said insulation chemically react to form a chemical bonding to thereby complete said method of chemical bonding said isocyanate curable solid propellant composition to said surface of said internal insulation of an interceptor solid rocket motor.

5,085,726

METHOD OF ADHESION WITH A SULFIDE GROUP CONTAINING ADHESIVE

Ikuro Omura, Junichi Yamauchi, and Mitsunobu Kawashima, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 379,666, Jul. 13, 1989, which is a continuation of Ser. No. 103,685, Oct. 2, 1987, abandoned. This application Dec. 26, 1990, Ser. No. 633,959

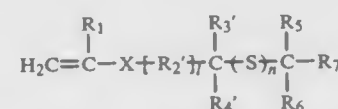
Claims priority, application Japan, Oct. 6, 1986, 61-238946

Int. Cl.⁵ C09J 5/00

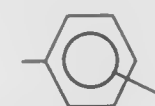
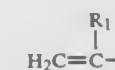
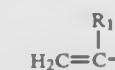
U.S. Cl. 156—307.3

7 Claims

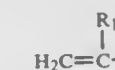
1. In a method of adhering a metal to a second material, the improvement which comprises:
- adhering said metal to said second material with an adhesive composition containing a monomer having at least one polysulfide group joined to a saturated carbon atom and at least one olefinic double bond and which has the formula:



wherein R₁ is hydrogen or methyl; 1 is 0 and X is —COO—, —OOC—, —CONH—, —COS—, —SOC—, —S— or

R₂ is a C₁-C₄₀ organic group, which may contain agroup and/or polysulfide group; R₃' and R₄' each denote a C₁-C₄₀ organic group, which may contain a

group and/or polysulfide group, hydrogen atom, mercapto group, or halogen atom; at least two of R₂', R₃' and R₄' may join to each other to form a cyclic structure when R₃' and/or R₄' is an organic group R₅, R₆, and R₇ each denote a C₁-C₄₀ organic group, which may contain a



group and/or polysulfide group, hydrogen atom, mercapto group, or halogen atom, at least two of R₅, R₆, and R₇ may join to each other to form a cyclic structure when they are organic groups; and n denotes an integer of 2 to 6.

5,085,727

PLASMA ETCH APPARATUS WITH CONDUCTIVE COATING ON INNER METAL SURFACES OF CHAMBER TO PROVIDE PROTECTION FROM CHEMICAL CORROSION

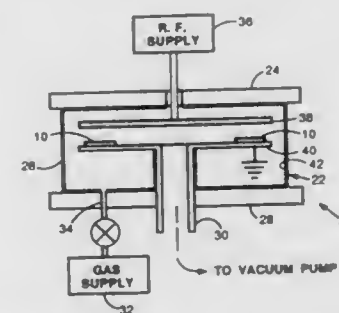
Robert J. Steger, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed May 21, 1990, Ser. No. 526,220

Int. Cl.⁵ H01L 21/306; B44C 1/22

U.S. Cl. 156—345

14 Claims



1. In an apparatus for plasma etching semiconductor wafers comprising an aluminum plasma etch chamber, a source of reactant gases and means for admitting such gases into said chamber, and an electromagnetic energy source electrically coupled to an electrode in said chamber to generate a plasma therein; the improvement which comprises a conductive coating formed on the inner aluminum surfaces of said chamber capable of protecting said aluminum surfaces from chemical attack by said reactant gases used in said chamber during said plasma etching.

5,085,728

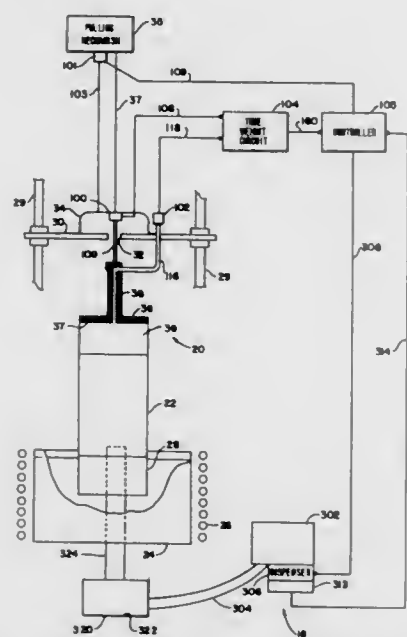
SYSTEM FOR CONTROLLING CRYSTAL GROWTH APPARATUS AND MELT REPLENISHMENT SYSTEM THEREFOR

Brian H. Mackintosh, Concord, and Lawrence Eriss, Sudbury, both of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Continuation-in-part of Ser. No. 46,991, May 5, 1987, abandoned. This application Mar. 12, 1990, Ser. No. 492,886 Int. Cl.⁵ C30B 15/34

U.S. Cl. 156—601

16 Claims



1. A melt replenishment system for replenishing the melt in an apparatus for growing a tubular crystalline body of a selected material, the apparatus comprising a crucible for containing a melt of said selected material, heating means for heating said crucible, growing means for growing a tubular crystalline body from said melt, said growing means comprising (1) seed holder means for supporting a seed onto which said tubular crystalline body is grown and (2) pulling means for pulling said seed holder means and said tubular crystalline body away from said crucible;

said melt replenishing system comprising:

a container for storing solid particles of said selected material;

dispenser means coupled with the container for transporting a selected quantity of particles of said selected material from said container to said crucible in response to a control signal;

weight value generating means for generating an output signal that is representative of the weight of a mass of particles of said selected material stored in said container; weight sensor means for generating an output signal that is representative of the weight of said growing tubular crystalline body, said seed, and said seed holder means;

pressure sensor means for generating an output signal that is representative of the pressure inside said body; and

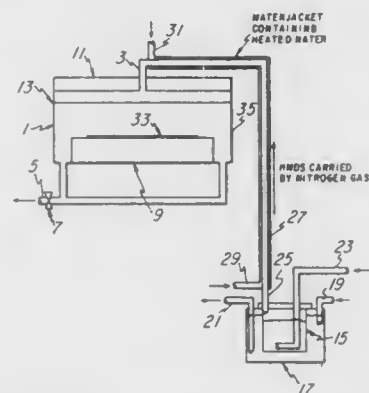
controller means coupled to said weight value generating means, said weight sensor means, said pressure sensor means, and said dispenser means for controlling the operation of said melt replenishing system responsive to the output signals of said weight value generating means, said weight sensor means, and said pressure sensor means, so as to ensure that the level of melt in said crucible remains within predetermined limits during growth of said tubular crystalline body.

5,085,729

UNIFORMITY USING STAGNANT SILYLATION

Cesar M. Garza, Plano; Ricky A. Jackson, Garland, and Ryan E. Priebe, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 7, 1990, Ser. No. 579,120
Int. Cl.⁵ H01L 21/306; B44C 1/22; B05D 3/06; G03C 5/00
U.S. Cl. 156—628 20 Claims



1. A method of providing uniform concentration of a silylating agent across the surface of a semiconductor wafer comprising the steps of:

(a) providing an enclosable chamber having an inlet and an exhaust;

(b) providing a semiconductor wafer having a resist on said semiconductor wafer having a novolak component containing at least one of hydroxyl and phenyl groups;

(c) placing said semiconductor wafer in said chamber;

(d) closing said exhaust;

(e) passing a carrier gas containing a silylating agent therein through said inlet into said chamber to provide a predetermined state of silylating agent in said chamber; and

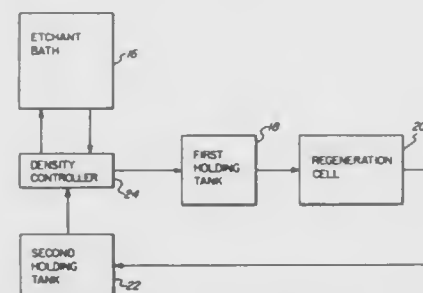
(f) allowing said silylating agent to reside in said chamber for a predetermined period to form regions of silicon at said exposed predetermined portions.

5,085,730

PROCESS FOR REGENERATING AMMONIACAL CHLORIDE ETCHANTS

John L. Cordani, Waterbury, Conn., assignor to MacDermid, Incorporated, Waterbury, Conn.

Filed Nov. 16, 1990, Ser. No. 614,725
Int. Cl.⁵ B44C 1/22; C23F 1/00; C23C 1/12; C25B 15/00
U.S. Cl. 156—642 11 Claims



1. A process for the direct electrolytic regeneration of a chloride-based ammoniacal copper etchant bath substantially without generating gaseous chlorine, which process comprises subjecting said bath to electrolysis employing an etch resistant metal cathode and an anode selected from the group consisting of carbon, an etch resistant metal, and an etch resistant metal coated with a layer of a conductive noble metal oxide.

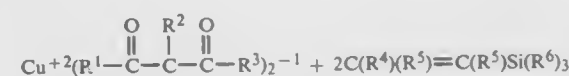
5,085,731

VOLATILE LIQUID PRECURSORS FOR THE CHEMICAL VAPOR DEPOSITION OF COPPER

John A. T. Norman, Whitehall, and Beth A. Muratore, Elverson, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 4, 1991, Ser. No. 650,332
Int. Cl.⁵ C23C 16/14; B44C 1/22; C03C 15/00
U.S. Cl. 156—646 11 Claims

10. A process for selectively etching a copper film from the surface of a substrate, said process comprising: contacting the substrate having a copper film surface with an organometallic copper complex and a silylolefin ligand, both in the gas phase, wherein said complex and said silylolefin ligand are represented by the structural formulae:



wherein R¹ and R³ are each independently C₁-C₈ perfluoroalkyl, R² is H, F or C₁-C₈ perfluoroalkyl, R⁴ is H, C₁-C₈ alkyl, or Si(R⁶)₃, each R₅ is independently H or C₁-C₈ alkyl and each R₆ is independently phenyl or C₁-C₈ alkyl.

5,085,732

METHOD FOR REMOVING A SELENIUM-CONTAINING LAYER FROM A ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Mitsubide Nakamura, and Shiro Kimura, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1989, Ser. No. 409,681
Claims priority, application Japan, Sep. 26, 1988, 63-238875
Int. Cl.⁵ C23F 1/00

U.S. Cl. 156—656

4 Claims

1. A method for removing an amorphous selenium-containing photosensitive layer from an electrophotographic photoreceptor comprising an electroconductive metallic substrate having thereon an amorphous selenium-containing photosensitive layer, said method comprising applying an aqueous 5-50 weight percent solution of sodium thiourea at a temperature of 25° C. to 65° C. onto the amorphous selenium-containing photosensitive layer until the amorphous selenium-containing layer is effectively removed from the metallic substrate.

5,085,733

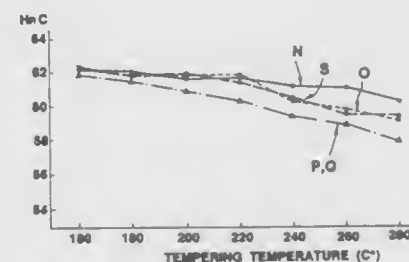
ROLLING STEEL BEARING

Nobnaki Mitamura, Kawasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 572,480
Claims priority, application Japan, Aug. 24, 1989, 1-217689; Nov. 13, 1989, 1-294288
Int. Cl.⁵ C22C 38/18; C21D 9/36

U.S. Cl. 148—319

4 Claims



1. A rolling bearing, comprising:

racetracks; and

a rolling element, at least one of the races and the rolling element being made of a rolling contact parts steel consisting essentially of: C: about 0.2-0.6 wt. %, Si: about 0.3-2.0

wt. %, Cr: about 0.5-2.5 wt. %, Mn: about 0.3-1.7 wt. %, O: not more than 12 ppm, and the balance of Fe and any inevitable impurity, the one of the races and the rolling element being carbonitrided, quenched to be hardened, and then, finally, high temperature tempered at about 240° C.-550° C. such that carbides are precipitated in the hardened surface layer of the one of the races and the rolling element, the size of the carbides being 0.5-1.0 μm in diameter, and the content of the carbides in the surface layer being about 20-50 vol %, wherein the average content of retained austenite in the one of the races and the rolling element is not more than about 3 vol %.

5,085,734

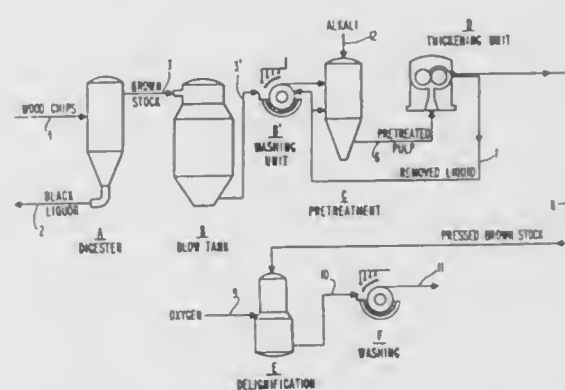
METHODS OF HIGH CONSISTENCY OXYGEN DELIGNIFICATION USING A LOW CONSISTENCY ALKALI PRETREATMENT

Bruce F. Griggs, Ewing, N.J., assignor to Union Camp Patent Holding, Inc., Princeton, N.J.

Continuation of Ser. No. 311,669, Feb. 15, 1989, abandoned. This application Mar. 2, 1990, Ser. No. 489,845
Int. Cl.⁵ D21C 9/12, 9/147

U.S. Cl. 162—19

14 Claims



1. A process for producing bleached wood pulp, said process including a high consistency oxygen delignification step and comprising:

cooking wood to provide unbleached brownstock;

pretreating said unbleached brownstock prior to the oxygen delignification step by uniformly mixing the unbleached brownstock with an aqueous alkaline solution at a pulp consistency of about 0.5 to 4.5% by weight, said aqueous alkaline solution being present in an amount effective to promote delignification in a subsequent high consistency oxygen delignification step;

mixing the unbleached brownstock at a consistency of about 0.5 to 4.5% by weight, and continuing the alkali pretreatment without removing the alkaline solution for at least a predetermined time at a predetermined temperature and pressure, said predetermined time, temperature and pressure being selected to effect an uninterrupted completion of the pretreatment of the unbleached brownstock and thereby provide substantially uniform pretreatment to ensure that all brownstock fibers are exposed to a uniform application of the aqueous alkaline solution with an amount of alkaline material which, after increasing the consistency of the pulp for subsequent high consistency oxygen delignification, is sufficient to cause an increase in the delignification of the unbleached brownstock pulp without a corresponding decrease in pulp viscosity during the subsequent high consistency oxygen delignification step as compared to unbleached brownstock which is treated at high consistencies with an alkaline solution;

at the completion of the pretreating step, removing liquid from the pretreated brownstock to increase its consistency to at least about 20% to form pretreated, high consistency

brownstock while retaining at least about 1.9 percent by weight based on the dry weight of the pulp of alkaline material on the increased consistency pulp for subsequent high consistency oxygen delignification, wherein the brownstock fibers containing the aqueous alkaline solution are directly passed from the pretreatment step to the liquid removal step;

recycling substantially all of the liquid removed from the pretreated brownstock during the liquid removal step directly to the unbleached brownstock pretreating step; and

substantially delignifying said pretreated high consistency brownstock during oxygen delignification.

5,085,735

METHOD OF REFINING CELLULOSIC FIBROUS MATERIAL WITH SUCCESSIVE EXPANSIONS BEFORE IMPACTS, AND EXPANSIONS, TO ACHIEVE INCREASED FIBER FLEXIBILITY

Bengt Nilsson, Skoghall, Sweden, assignor to Kamyr AB, Karlstad, Sweden

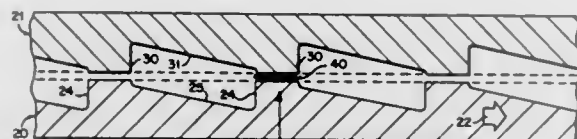
Division of Ser. No. 402,541, Sep. 5, 1989, Pat. No. 5,039,022.

This application Aug. 23, 1990, Ser. No. 571,210

Int. Cl.⁵ B02C 7/12; D21B 1/16, 1/34

U.S. Cl. 162—26

1 Claim



1. A method of refining a slurry of cellulosic fibrous material into paper pulp using a pair of relatively rotatable refiner elements, each having a plurality of bars with grooves therebetween, comprising the step of effecting relative rotational movement of the elements with respect to each other to continuously and successively provide a moving tension field, with successive compressions before impacts, and expansions, to achieve increased fiber flexibility, more fiber rolling motion and less fiber cutting than conventional refining, said method further including the steps of providing grooves with sloping bottoms between a plurality of upstanding bars on each of said refiner elements, each bottom sloping downwardly from adjacent one bar to adjacent the next bar at an angle between 1°–30° to a straight line extending between said bars, and each groove having a width of about 10–50 mm.

5,085,736

TEMPORARY WET STRENGTH RESINS AND PAPER PRODUCTS CONTAINING SAME

David W. Bjorkquist, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 215,132, Jul. 5, 1988, Pat. No. 5,008,344.

This application Jan. 30, 1991, Ser. No. 647,958

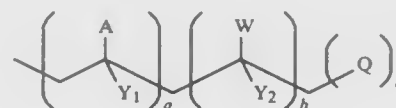
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.

Int. Cl.⁵ D21H 17/38

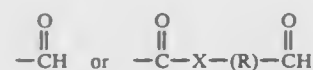
U.S. Cl. 162—168.2

20 Claims

1. A paper product comprising a sheet of fibrous materials and from about 0.005% to about 5.0% by weight of said fibrous materials of a temporary wet strength resin comprising a polymer characterized by the substantially complete absence of nucleophilic functionalities and having the formula:



wherein: A is



and X is —O—, —NH—, or —NCH₃—, and R is an unsubstituted group; Y₁ and Y₂ are independently —H, —CH₃ or a halogen; W is a nonnucleophilic, aliphatic amide; Q is a cationic monomeric unit; the mole percent of a is from about 1% to about 70%; the mole percent of b is from about 10% to about 90%; and the mole percent of c is from about 1% to about 40%; said resin having an average molecular weight of between about 40,000 and about 400,000.

5,085,737

APPARATUS FOR THE DEWATERING OF A WEB OF CELLULOSIC MATTER OR A WEB OF MATERIAL FOR THE PASTEBOARD OR CARDBOARD PRODUCTION

Edgar Brogyanyi, Graz; Gisela Stummer, Kumberg; Franz P. Kittel, and Roland Schick, both of Graz, all of Austria, assignors to Maschinenfabrik Andritz Aktiengesellschaft, Graz, Austria

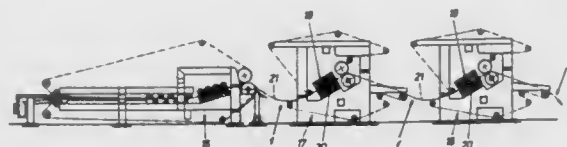
Filed Jun. 8, 1990, Ser. No. 536,102

Claims priority, application Austria, Jun. 9, 1989, 1424/89

Int. Cl.⁵ D21F 3/04

U.S. Cl. 162—359

49 Claims



1. An apparatus for the dewatering of a web of material for the production of pasteboard or cardboard, comprising:

endless screen belts and means for circulating said endless screen belts;

a first dewatering zone with at least two of said screen belts circulating in opposite directions so as to force the web material through and away from said first dewatering zone;

a second dewatering zone positioned downstream from said first dewatering zone with at least two of said screen belts circulating in opposite directions so as to force the web material through and away from said second dewatering zone;

said first and second dewatering zones being dimensioned and arranged so as to provide an open area between said first and second dewatering zones and to pass the web along and without a screen belt through the open area in an unsupported and freely suspended state, and said apparatus being structured and arranged such that the freely suspended web, while passing through the open area, curves downwardly;

heating means for heating the web, said heating means being positioned adjacent a first surface of the web and downstream from said first dewatering zone;

a dewatering device positioned on an opposite surface of the web and in opposing relationship with said heating means.

5,085,738

METHOD AND APPARATUS FOR THERMAL CONVERSION OF ORGANIC MATTER

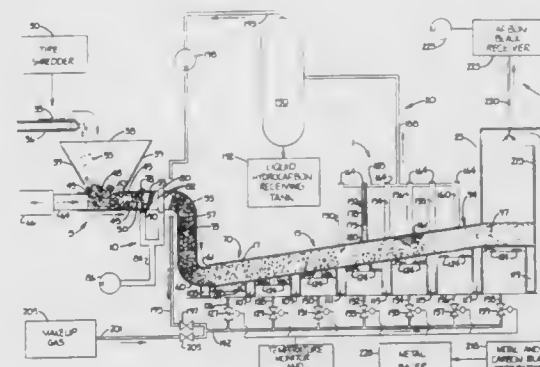
Windel L. Harris, P.O. Box 572, Neosho, Mo. 64850, and James R. Donnohue, Rte. 6, Box 348-A, Springdale, Ark. 72764

Continuation-in-part of Ser. No. 342,056, Apr. 24, 1989, Pat. No. 4,925,532. This application May 7, 1990, Ser. No. 520,025

Int. Cl.⁵ C10B 1/08, 47/26

U.S. Cl. 201—11

3 Claims



1. An apparatus for thermal conversion of hydrocarbons in organic material to a gaseous state; said apparatus comprising:

(a) an elongate tubular chamber having an upper side, a first portion and a second portion; said chamber being substantially axially inclined relative to the horizontal with said first portion lower than said second portion;

(b) molten lead contained in and substantially filling said chamber;

(c) a hopper for receiving the organic material;

(d) a cylindrical infed tube having a horizontal section and a discharge end; said horizontal section flow connected to said hopper for receiving the organic material from said hopper; said horizontal section having an outer wall with at least one aperture through said outer wall; said discharge end flow connected to said chamber first portion;

(e) a ram located within said infed tube horizontal section for advancing organic material from said horizontal section to said chamber first portion;

(f) ram propelling means for operably driving said ram;

(g) a collar circumferentially surrounding said infed tube and flow connected to said aperture on said horizontal section;

(h) a first vacuum line flow connected to said collar;

(i) a first vacuum pump flow connected to said vacuum line and for drawing air from the organic material in said horizontal section through said aperture and through said collar for discharge outside of said horizontal section;

(j) a plurality of spaced gas burners located below said chamber;

(k) a plurality of burner fuel lines each being respectively connected to said burners; each of said burner fuel lines having a valve and connected to a main fuel line at an end thereof;

(l) temperature control means operably sensing temperatures within said chamber and operating said fuel line valves to control heating of said chamber by each burner so as to maintain desired temperatures within each segment of said chamber;

(m) a plurality of tubes spaced along and flow connected to said chamber upper side; each of said tubes having a filter located therein;

(n) a condenser flow connected to each of said tubes;

(o) a liquid flow connected to each of said tubes;

(p) a noncondensed hydrocarbon gas line flow connected to said condenser at one end thereof and flow connected to said main fuel line at an opposite end thereof;

(q) a second vacuum pump flow connected to said gas line and urging condensed hydrocarbons therethrough;

(r) a reservoir having an overflow wall; said reservoir being flow connected to said chamber;

(s) a third vacuum line located above said reservoir;

(t) a carbon black receiver flow connected to said third vacuum line; and

(u) a third vacuum pump flow connected to said carbon black receiver and operably urging light carbon black particles from said reservoir to said carbon black receiver.

5,085,739

SEPARATION OF THE PROPYL ALCOHOLS FROM WATER BY AZEOTROPIC OR EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and Zuyin Yang, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Jan. 30, 1991, Ser. No. 648,025

Int. Cl.⁵ B01D 3/36, 3/40; C07C 29/84

U.S. Cl. 203—18

4 Claims

1. A method for recovering isopropanol from a mixture of isopropanol and water which comprises distilling a mixture of isopropanol and water in the presence of about one part of an extractive agent per part of isopropanol-water mixture, recovering water as the overhead product and obtaining the isopropanol and the extractive agent from the stillpot, wherein said extractive agent consists of one material selected from the group consisting of methyl benzoate, butyl benzoate, 3-pentanone, 4-methyl-2-pentanone, 2-pentanone, methyl isoamyl ketone, n-butyl acetate, 3-methyl-2-butanone, ethylene glycol methyl ether, n-amyl acetate, isobutyl acetate, propyl butyrate, isobutyl isobutyrate, n-hexyl formate, butyl butyrate, ethyl butyrate, ethyl caproate, hexyl acetate, mesityl oxide, propylene glycol isobutyl ether, 2-undecanone, 3-octanone, 2-heptanone, propiophenone, and nitrobenzene.

5,085,740

SEPARATION OF ALKENES FROM ALKANES

Fu-Ming Lee, and Ronald E. Brown, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

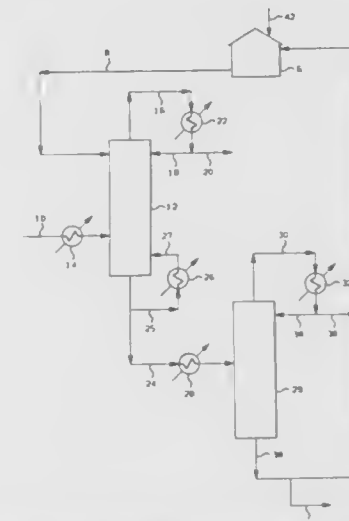
Filed Oct. 26, 1990, Ser. No. 604,720

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.⁵ B01D 3/40

U.S. Cl. 203—51

25 Claims



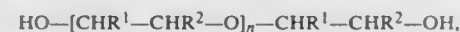
1. A process for separating at least one alkene containing 4–10 carbon atoms per molecule from at least one close-boiling alkane containing 4–10 carbon atoms per molecule by extractive distillation, comprising:

tive distillation of a feed consisting essentially of said at least one alkene and said at least one alkane in the presence of a solvent consisting essentially of a mixture of

- (a) at least one N-alkyl-2-pyrrolidone, wherein the alkyl group contains 1-3 carbon atoms, and
 - (b1) at least one sulfone compound containing 4-8 carbon atoms per molecule;
- wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one alkene and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one alkene and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one alkene is separated from said solvent and recovered from said bottoms product.

18. A process for separating at least one alkene containing 4-10 carbon atoms per molecule from at least one close-boiling alkane containing 4-10 carbon atoms per molecule by extractive distillation of a feed consisting essentially of said at least one alkene and said at least one alkane in the presence of a solvent consisting essentially of a mixture of

- (a) at least one N-alkyl-2-pyrrolidone, wherein the alkyl group contains 1-3 carbon atoms,
- (b1) at least one sulfone compound containing 4-8 carbon atoms per molecule, and
- (b2) at least one glycol compound having the general chemical formula of



wherein n can be 0, 1, 2, 3 or 4, and R¹ and R² can be independently selected from the group consisting of hydrogen and methyl;

wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one alkene and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one alkene and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one alkene is separated from said solvent and recovered from said bottoms product.

5,085,741

EXTRACTIVE DISTILLATION OF LOW BOILING ALKENE/ALKANE MIXTURES

Ronald E. Brown, Anthony L. Rouse, and Fu-Ming Lee, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1991, Ser. No. 644,782

Int. Cl.⁵ B01D 3/40

U.S. Cl. 203-53

16 Claims

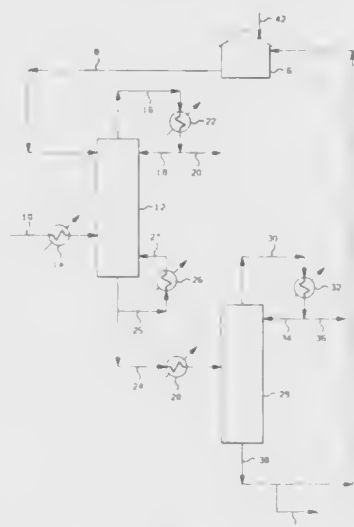
1. A process for separating propylene from propane by extractive distillation of a feed consisting essentially of propylene and propane, said process employing a solvent which consists essentially of propylene carbonate;

wherein cuprous salts are essentially absent from said solvent; wherein said process produces (i) an overhead product which contains a smaller volume percentage of propylene and a larger volume percentage of propane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of propylene and a smaller volume percentage of propane than said feed; and wherein propylene is separated from said solvent and recovered from said bottoms product.

5. A process for separating propylene from propane by extractive distillation of a feed consisting essentially of propylene and propane, said process employing a solvent consisting essentially of a mixture of propylene carbonate and about 2-10 weight-% water;

wherein cuprous salts are essentially absent from said solvent; wherein said extractive distillation process produces (i) an overhead product which contains a smaller volume

percentage of propylene and a larger volume percentage of propane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percent-



age of propylene and a smaller volume percentage of propane than said feed; and wherein propylene is separated from said solvent and recovered from said bottoms product.

5,085,742

SOLID OXIDE ELECTROCHEMICAL CELL FABRICATION PROCESS

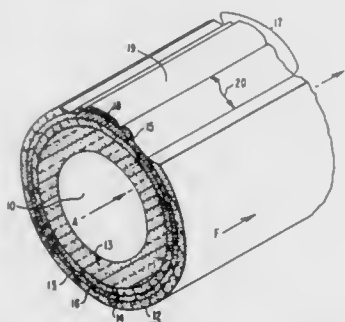
Walter J. Dollard, Churchill Borough; George R. Folser, Lower Burrell, both of Pa.; Uday B. Pal, Cambridge, Mass., and Subhash C. Singhal, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1990, Ser. No. 597,608

Int. Cl.⁵ H01M 6/00, 8/00

U.S. Cl. 205-188

10 Claims



1. A method of bonding an electrolyte, and an outer electrode layer on a porous, doped lanthanum manganite tubular electrode, comprising the steps:

- (A) thermal spraying a thin, axially elongated, electrically conductive, ceramic oxide interconnection strip over a narrow segment of a porous, doped lanthanum manganite tubular electrode, and then
- (B) thermal spraying yttria stabilized zirconia over the remaining portion of the lanthanum manganite tubular electrode to provide a high temperature oxygen ion conductive electrolyte layer having an open pore structure, which overlaps a portion of the interconnection strip, and then
- (C) forming a coating of particles of an electronic conductor on the electrolyte, and then
- (D) pressurizing the outside of the electrolyte layer, and then

- (E) feeding halide vapors of yttrium and zirconium to the outside of the electrolyte layer, where the vapors penetrate into the pores of the electrolyte without initiating formation of a metal oxide, and then applying a source of oxygen to the inside of the porous, tubular electrode to contact the inside of the electrolyte layer, and then
- (F) heating the tube and electrolyte to a temperature sufficient to cause oxygen reaction with the halide vapors, closing electrolyte pores, and inducing oxygen ions to diffuse through the electrolyte causing reaction with the halide vapors, to form a metal oxide coating on and between the particles of electronic conductor, which coating is attached to the electrolyte layer, providing a porous exterior electrode.

5,085,743

ELECTRODE FOR CURRENT-LIMITED CELL, CELL INCLUDING THE ELECTRODE METHOD FOR USING THE CELL AND A METHOD OF MAKING THE ELECTRODE

N. R. K. Vilambi Reddy, Salem, N.H.; Everett B. Anderson, Reading, and Earl J. Taylor, Chelmsford, both of Mass., assignors to Physical Sciences, Inc., Andover, Mass.

Filed May 2, 1990, Ser. No. 518,071

Int. Cl.⁵ C25D 5/18

U.S. Cl. 205-105

18 Claims

1. A method for making a sheet-shaped, current-limited, catalytic, gas-sensing electrode having a flexural strength of at least about 2000 kilopascals, comprising the steps of:

- (a) bringing an exposed face of a self-supporting, electrically conducting sheet having a thickness of at least about 30 micrometers and a flexural strength of at least 2000 kilopascals into contact with an electrolyte containing ions of a catalytic metal, said electrolyte being in electrical contact with a counterelectrode,
- (b) applying a pulsed-D.C. current to said self-supporting sheet and said counterelectrode, until catalytic metal has been deposited on said exposed face of said electrically-conducting sheet, thereby providing a catalytic metal-coated self-supporting electrically conducting sheet,
- (c) applying to the thus-coated face of the catalytic metal-coated self-supporting electrically conducting sheet a hydrophobic polymer layer which is thick enough to limit reducible or oxidizable gas diffusion into said catalytic metal-coated self-supporting electrically-conducting sheet such that, when the catalytic metal-coated self-supporting electrically conducting sheet with the applied hydrophobic layer is utilized as a catalytic, gas-sensing electrode in a primary or secondary current-generating cell to generate current, density of said current cannot exceed 20 mA/cm².

5,085,744

ELECTROPLATED GOLD-COPPER-ZINC ALLOYS

William R. Brasch, Nesconset, N.Y., assignor to LeaRon, Inc., Freeport, N.Y.

Filed Nov. 6, 1990, Ser. No. 609,671

Int. Cl.⁵ C25D 3/56, 3/62, 3/58

U.S. Cl. 205-148

42 Claims

1. A solution for electroplating a gold-copper-zinc alloy which comprises:

- a source of cyanide ions
- a soluble gold compound present as a gold cyanide complex in the solution;
- a soluble copper compound present forming a copper cyanide complex in the solution;
- a soluble zinc compound capable of at least partially as a zincate complex in the solution; and
- a source of hydroxide ions in an amount sufficient to form a zincate complex with the zinc compound, said solution having a pH of at least about 11.

5,085,745

METHOD FOR TREATING CARBON STEEL CYLINDER

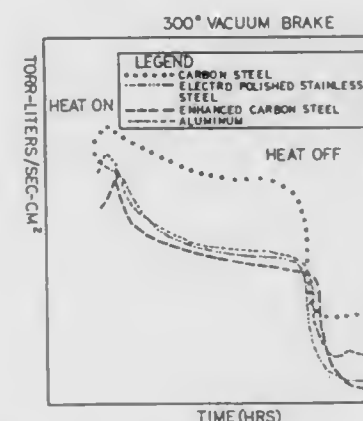
Scott A. Farber, Chicago, Ill., and Francis V. Bellafiore, Louisville, Ky., assignors to Liquid Carbonic Corporation, Chicago, Ill.

Filed Nov. 7, 1990, Ser. No. 610,259

Int. Cl.⁵ C25F 1/00, 3/06, 3/24

U.S. Cl. 204-129.35

8 Claims



5. A method for treating a carbon steel cylinder to provide a smooth, inert, substantially particulate free inner surface comprising the steps of forming an open ended cylinder from carbon steel, the side walls of said cylinder being thicker than the desired final thickness of said cylinder side walls, honing the interior of said cylinder side walls to remove at least some of said excess side wall thickness, forming and tapping a tapered neck in said open end of said cylinder and electropolishing the interior of said cylinder with a chromium rich electroplating solution to provide a surface layer extending to a depth of about 200 Angstroms and wherein the carbon level in said surface layer is at least about 1 percent, the chromium level is at least about 3 percent and the iron content is less than about 80 percent.

5,085,746

METHOD OF FABRICATING SCANNING TUNNELING MICROSCOPE TIPS

Inga H. Musselman, Durham, and Phillip E. Russell, Apex, both of N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Sep. 10, 1990, Ser. No. 579,892

Int. Cl.⁵ C25F 3/02, 3/16

U.S. Cl. 204-129.4

28 Claims

1. A method of fabricating a double-tapered scanning tunneling microscope tip from a wire formed from platinum, iridium, or a platinum/iridium alloy, said tip comprising an elongate wire, and intermediate conical portion formed at one end of said elongate wire, and an end conical portion formed at the apex of said intermediate conical portion and axially therewith, with a tip formed at the apex of said end conical portion, said method comprising:

- (a) immersing one end of the wire in a bath of an acidic aqueous etchant solution containing an alkaline earth salt, with the wire positioned substantially perpendicularly to the surface of the solution; and
- (b) etching said wire in said bath to form said intermediate conical portion; and then
- (c) ceasing said etching step while said tip is immersed in and in electrical contact with said bath so that said end conical portion is formed on said intermediate conical portion.

5,085,747

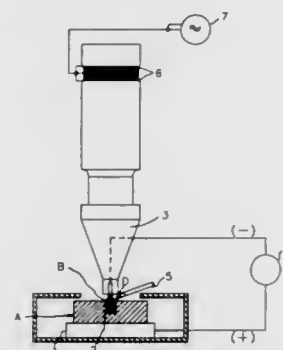
ULTRASONIC MACHINING METHOD

Akio Nikano, 14-1, Ichikawaminami 3-chome, Ichikawa-shi, Chiba-ken, Japan

Continuation-in-part of Ser. No. 430,279, Oct. 31, 1989, Pat. No. 5,062,933. This application Apr. 4, 1991, Ser. No. 680,314
Claims priority, application Japan, Nov. 27, 1990, 2-326520
Int. Cl.⁵ B23H 3/08, 7/38

U.S. Cl. 204—129.46

2 Claims



1. An ultrasonic machining method which comprises applying an electric current across the electrolysis region between a workpiece and a tool of an ultrasonic machine which are positioned a certain distance apart, while supplying said electrolysis region at a prescribed flow rate with an electrolyte containing soft spheres made of a polymeric material and composed of the core and shell which differ in molecular weight, having a particle diameter of 0.5–2.5 μ and a specific gravity which permits them to suspend in the electrolyte when immersed therein, and ultrasonically vibrating the tool in the direction perpendicular to the flow direction, thereby promoting the rotary motion of the soft spheres rotatingly moving together with the electrolyte and causing the soft spheres to approach the passive state film which forms on the work surface and to give a grinding action to the passive state film for its removal by the extremely small elastic breakage, and causing the soft spheres to catch the residue of the passive state film by the ionic attracting action that occurs on their surface and discharging the electrolyte and soft spheres from the electrolysis region.

5,085,748

PROCESS FOR ENRICHING CARBON 13

Makoto Yamasaki, Yoshiharu Horita, both of Yokohama; Takashi Otsubo, Kawasaki; Takumi Kono, Kawasaki; Tomozumi Murata, Kawasaki; Yuji Fujioka, Kawasaki; Koichi Chiba, Kawasaki; Maki Sato, Kawasaki; Naoya Hamada, Sagami-hara; Shigeyoshi Arai, Kyoto; Syohei Isomura, and Hayato Kaetsu, both of Wako, all of Japan, assignors to Nippon Steel Chemical Co., Ltd.; Nippon Steel Corporation, both of Tokyo and Rikagaku Kenkyusho, Wako, all of Japan
Filed Jan. 23, 1990, Ser. No. 468,674

Claims priority, application Japan, Jan. 24, 1989, 1-13214; Mar. 28, 1989, 1-73780; Mar. 30, 1989, 1-76545; Mar. 31, 1989, 1-78314

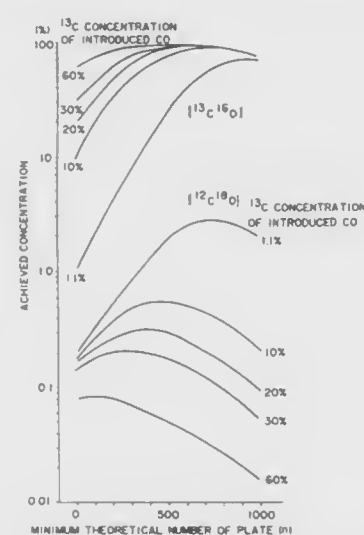
Int. Cl.⁵ B01D 5/00

U.S. Cl. 204—157.2

10 Claims

1. A process for enriching carbon 13 comprising mixing a halogenomethane selected from the group consisting of CHClF_2 and CBr_2F_2 containing carbon 13 of natural isotopic abundance with an additive gas selected from the group consisting of an oxygen-containing oxidizing agent, a gas mixture of oxygen-containing oxidizing agent and at least one of a halogen and a hydrogen halide, irradiating the resulting raw material gas mixture by a carbon dioxide laser thereby selectively dissociating the halogenomethane of carbon 13 with-

drawing a product having carbon 13, concentration of 10 to 90% from the reaction mixture, converting said enriched prod-



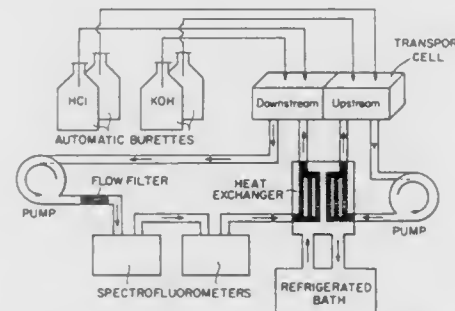
5,085,749

DYNAMICALLY CONTROLLED MEMBRANE

Paul E. Grimshaw, Arlington; Alan J. Grodzinsky, Lexington, and Martin L. Yarmush, Sharon, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of Ser. No. 324,381, Mar. 14, 1989. This application Jul. 24, 1989, Ser. No. 384,722Int. Cl.⁵ C25B 1/00; B01D 61/42

U.S. Cl. 204—182.1

10 Claims



1. A method of dynamically controlled protein separation employing a polyelectrolyte membrane, wherein a selected protein is separated from a mixture of proteins, comprising: determining an appropriate pH and an appropriate ionic strength of an electrolyte bathing solution, and determining an electric field to be applied across the membrane; contacting each side of the membrane with the electrolyte bathing solution having a pre-selected pH and a pre-selected ionic strength, thereby producing the appropriate degree of membrane hydration to obtain a desired permeability of the polyelectrolyte member to each of the proteins in the mixture; and applying a pre-selected electric field across the membrane, thereby producing electroosmotic convention of each of the proteins in the mixture, within the membrane, such that the electroosmotic convention, either acting alone or in combination with one or more effects selected from the group consisting of electromechanical deformation of the membrane matrix and effective pore size, changes in the electrostatic partitioning of each of the proteins in the mixture within the membrane, and electrophoresis of each

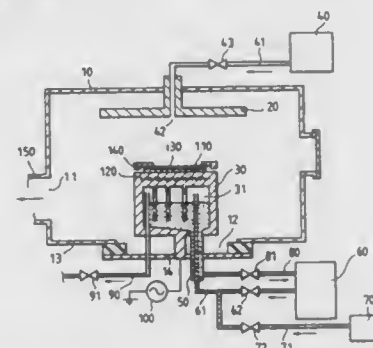
5,085,750

PLASMA TREATING METHOD AND APPARATUS THEREFOR

Minoru Soraoka, Kudamatsu; Yoshinao Kawasaki, Yamaguchi; Katsuyoshi Kudo, and Tsunehiko Tsubone, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 14, 1989, Ser. No. 338,038Claims priority, application Japan, Apr. 20, 1988, 63-95601
The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.Int. Cl.⁵ B44C 1/22; H01L 21/306; C03C 15/00

U.S. Cl. 204—192.32

9 Claims



1. A plasma treating method comprising the steps of supplying a liquid refrigerant whose temperature is not higher than 0° C. into a specimen table having a specimen place surface; cooling a specimen placed on said specimen place surface; treating the thus cooled specimen utilizing a gas plasma; supplying a pressurized gas into said specimen table and thereby discharging said liquid refrigerant retained in said specimen table outside said specimen table; and returning a temperature of said specimen table, including said specimen place surface, from which said liquid refrigerant is discharged from a temperature lower than 0° C. to a temperature higher than a dew point temperature under atmospheric pressure of an atmospheric gas around said specimen table.

5,085,751

Patent Not Issued For This Number

5,085,752

ELECTROLYTIC CELL

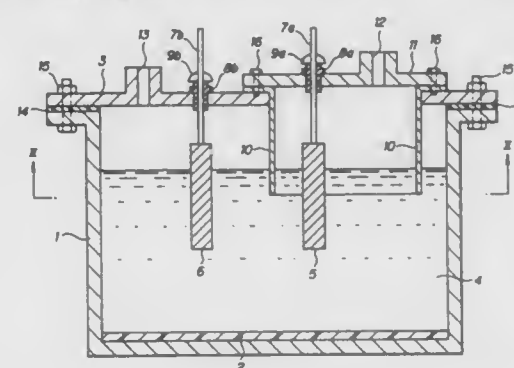
Naruyuki Iwanaga; Tosiaki Yamaguchi; Nobuhiko Fujieda, and Yoshihiro Tsuzikawa, all of Yamaguchi, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Oct. 10, 1990, Ser. No. 595,284

Claims priority, application Japan, Oct. 26, 1989, 1-277248; Nov. 30, 1989, 1-309092; Nov. 30, 1989, 1-309093

Int. Cl.⁵ C25B 9/00, 11/04

U.S. Cl. 204—243 R

7 Claims



1. An electrolytic cell for producing a nitrogen trifluoride

gas by a molten $\text{NH}_4\text{F-HF}$ or $\text{KF-NH}_4\text{HF}$ salt electrolysis which comprises a nickel anode, a nickel cathode and a partition plate separating the nickel anode and the nickel cathode, the distance between the nickel anode and the partition plate and the distance between the nickel cathode and the partition plate each being in the range of 30 to 200 mm.

5,085,753

WATER PURIFIER

Mark Sherman, St. Louis, Mo., assignor to Floatron, Inc., St. Louis, Mo.

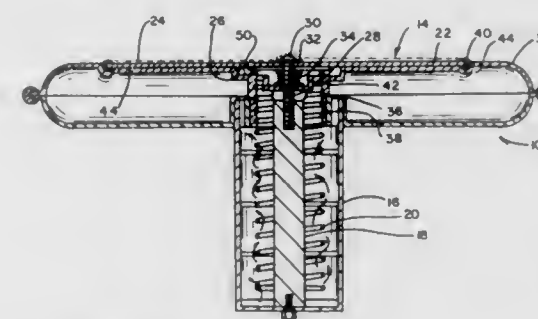
Continuation of Ser. No. 301,177, Feb. 21, 1989, abandoned.

This application Apr. 17, 1990, Ser. No. 510,104

Int. Cl.⁵ C25B 9/00, 15/08

U.S. Cl. 204—267

15 Claims



1. A water purifier comprising:

a buoyant housing;
a solar photovoltaic cell supported by the housing;
a plurality of electrodes, including an anode and a cathode, wherein the cathode is a spiral wound wire generally supported by the housing and the anode is substantially enclosed by the cathode and the anode is generally supported by the device;
a suitable substrate supports the solar cell, the substrate including means for providing suitable conductive connections between the solar cell and an anode conductive connection and a cathode conductive connection, including a conductive ring on the substrate undersurface; and an aperture defined by the buoyant housing and receiving a conductive bolt to which the anode is removably attached, the conductive bolt conductively connected to the solar cell.

5,085,754

CATION EXCHANGE MEMBRANE HAVING HIGH DURABILITY WITH DIFFUSION COATING ON MARGINAL AREAS OF THE MEMBRANE

Hiroshi Sagami, and Hisashi Wakamatsu, both of Kanagawa, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

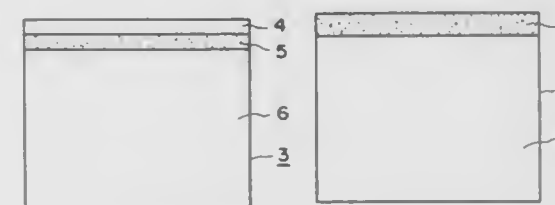
Filed Jul. 5, 1990, Ser. No. 548,608

Claims priority, application Japan, Jul. 7, 1989, 1-174168

Int. Cl.⁵ C25B 13/06

U.S. Cl. 204—296

10 Claims

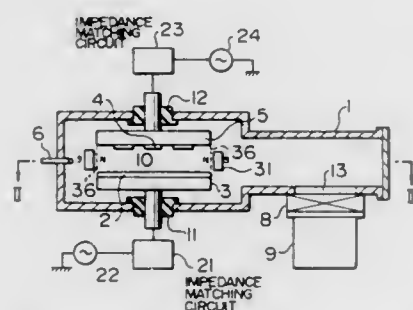


7. A cation exchange membrane for use in electrolysis of an alkali metal chloride, comprising:
a quadrilateral base membrane comprising a layer of a cation exchange fluorocarbon polymer and having two surfaces

each having four marginal areas respectively extending adjacent to and along four sides of the quadrilateral base membrane, said fluorocarbon polymer comprising a cation exchange fluorocarbon polymer obtained by copolymerization of at least one monomer selected from fluorinated vinyl compounds and at least one monomer selected from vinyl compounds having a functional group converted into a carboxylic acid type ion exchange group and vinyl compounds having a functional group converted into a sulfonic acid type ion exchange group, and a diffusion coating disposed on only the marginal areas where at least one marginal area of said four marginal areas of one surface of the base membrane is coated, wherein said diffusion coating permits an alkali metal hydroxide formed by electrolysis of an alkali metal chloride to diffuse therethrough at a diffusion velocity greater than that at which the alkali metal hydroxide diffuses through the fluorocarbon polymer layer.

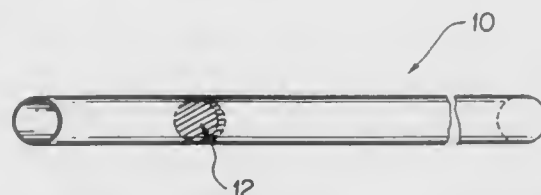
5,085,755
SPUTTERING APPARATUS FOR FORMING THIN FILMS
Eiji Setoyama; Mitsuhiro Kamei, both of Hitachi, and Yasunori Ohno, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,461
Claims priority, application Japan, Dec. 19, 1988, 63-318418
Int. Cl.⁵ C23C 14/34
U.S. Cl. 204—298.16 7 Claims



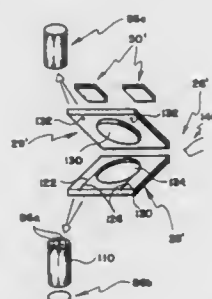
1. An apparatus for forming a thin film of a given material on a substrate, comprising:
a vacuum vessel;
a first electrode provided in said vacuum vessel being adapted to support a target plate of said given material;
a second electrode provided opposite to said first electrode in said vacuum vessel to form a discharge space between said first and second electrodes, said second electrode being adapted to support said substrate;
gas supplying means for supplying a sputtering gas into said discharge space;
power source means for applying a discharge voltage between said first and second electrodes to generate a discharge plasma from said sputtering gas; and
magnetic field generating means including a plurality of magnetic elements disposed at predetermined intervals around a periphery of said discharge space, said magnetic elements producing respective static magnetic fields and having respective magnetization directions lying on respective axes, said axes extending towards said discharge space, said magnetization directions of said magnetic elements being alternately reversed around said periphery of said discharge space, thereby producing static magnetic fields between adjacent ones of said magnetic elements, said static magnetic fields extending substantially along said periphery of said discharge space.

5,085,756
COLUMN SEPARATION SYSTEM FOR ELECTROPHORESIS WITH SAMPLE PRETREATMENT
Sally A. Swedberg, Santa Cruz, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 21, 1990, Ser. No. 570,480
Int. Cl.⁵ G01N 27/26
U.S. Cl. 204—299 R 7 Claims



1. An apparatus, useful for separating molecules by capillary electrophoresis, comprising:
an elongated tube having a substantially cylindrical bore, said elongated tube defining a first portion and a second portion, wherein the first portion includes means for filtering molecules on the basis of molecular weight, the second portion of a construction sufficient to permit separations of molecules by electrical charge when flowed through the bore, the first and second portions in sequential fluid communication.

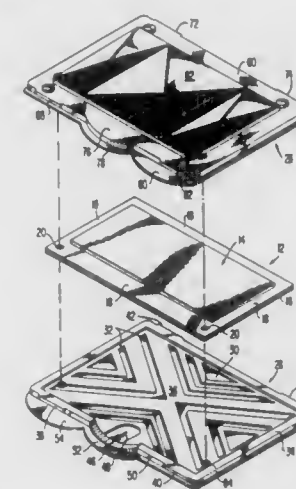
5,085,757
INTEGRATED TEMPERATURE CONTROL/ALIGNMENT SYSTEM FOR HIGH PERFORMANCE CAPILLARY ELECTROPHORETIC APPARATUS
Barry L. Karger, Newton, and Robert J. Nelson, Boston, both of Mass., assignors to Northeastern University, Boston, Mass.
Continuation-in-part of Ser. No. 125,539, Nov. 25, 1987, Pat. No. 4,898,658. This application Aug. 28, 1989, Ser. No. 399,600
Int. Cl.⁵ G01N 27/26; B01D 57/02
U.S. Cl. 204—299 R 11 Claims



1. An integrated temperature control/alignment system for high performance capillary electrophoresis, comprising:
means for thermoelectrically regulating heat transfer between the capillary column and the ambient environment to maintain the capillary column at a predetermined electrophoretic operating temperature; and
means for mounting the capillary column in a predetermined position as part of a capillary electrophoretic apparatus, said mounting means being formed from an electrically insulative, high thermally conductive material and configured to envelope the capillary column over substantially the entire working length thereof to provide efficient heat transfer between the capillary column and said mounting means to maintain the capillary column at said predetermined electrophoretic operating temperature, and wherein said thermoelectric regulating means is disposed in thermal contact with said mounting means, said mounting means including means for physically engaging respective ends of the capillary column.

capillary column to lock the capillary column in said predetermined position within said mounting means, and means for disposing the intermediate portion of the capillary column within said mounting means in thermal contact therewith, said disposing means being configured to accommodate the intermediate portion of capillary columns of varying lengths wherein the working length of the capillary column may be varied in predetermined increments for different electrophoretic separations.

5,085,758
CONTAINER FOR ELECTROPHORETIC GEL
Philip A. Guadagno, Vidor, and Terry L. McNeely, Beaumont, both of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.
Division of Ser. No. 527,354, May 23, 1990, Pat. No. 5,045,173.
This application May 10, 1991, Ser. No. 698,383
Int. Cl.⁵ B65D 85/48; B01D 61/42
U.S. Cl. 204—299 R 12 Claims

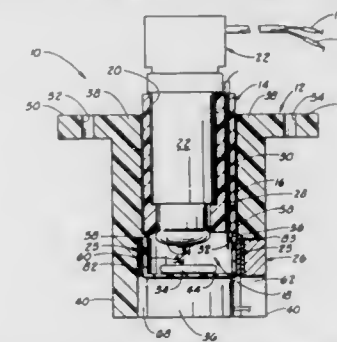


1. A container having top and bottom portions for protecting and enclosing an electrophoresis plate, the container comprising:
one of said top and bottom portions configured as a generally flat rectangular base having an upwardly extending peripheral rim, said rim having a plurality of laterally outwardly extending projections; and
the other of said top and bottom portions being configured as a generally rectangular base and having a plurality of generally laterally outwardly extending projections having complementary undercuts;
the projections on said one container portion being positioned and configured for sealingly engaging the complementary undercuts on said other container portion.

5,085,759
APPARATUS FOR RAPID BIOLOGICAL OXIDATION DEMAND OF LIQUIDS
Alan R. Harker, Stillwater, Okla., assignor to Duncan Instrument Company, Oklahoma City, Okla.
Filed Nov. 13, 1989, Ser. No. 436,450
Int. Cl.⁵ G01N 27/40
U.S. Cl. 204—408 20 Claims

1. A cell assembly for use in determining the biological oxidation demand of a liquid sample in the presence of a culture medium, the cell assembly comprising:
a cell body member having a vertically disposed plunger chamber and a sample holding chamber communicating with the plunger chamber, the cell body member further including a peripherally extensive plunger stop shoulder formed between the plunger chamber and the sample holding chamber;

electrode means for generating a signal in proportion to the amount of dissolved oxygen content of the liquid sample and the culture medium in the sample holding chamber; plunger means extensive into the plunger chamber for supporting the electrode means such that the electrode means extends into the sample chamber and into contact with the liquid sample and the culture medium disposed therein, the plunger means comprising:
a tubular plunger member having an upper end, a lower end, an electrode receiving bore longitudinally extending therethrough, a thermocouple receiving bore, and a spatially disposed fluid injection bore extending longitudinally therethrough, each of the thermocouple receiving bore and the fluid injection bore openly communicating with the sample holding chamber of the cell body member; and
a peripherally extensive electrode stop shoulder disposed near the lower end of the tubular plunger member so as to extend into the electrode receiving bore and abuttingly engage the electrode means, the plunger stop shoulder and the electrode stop shoulder cooperating to provide the

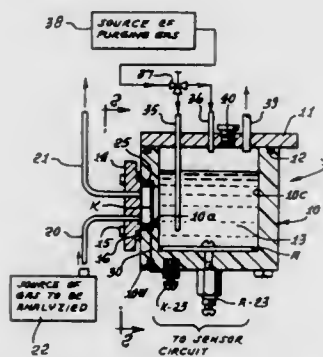


sample holding chamber with a predetermined volume when the electrode means is disposed within the electrode receiving bore of the tubular plunger member and the tubular plunger member is disposed within the plunger chamber of the cell body member;
stirrer means for agitating the liquid sample and culture medium in the sample holding chamber at a substantially constant rate to provide a substantially homogeneous mixture of the liquid sample and the culture medium;
temperature of the liquid sample and the culture medium in the sample holding chamber, the temperature sensor means comprising:
a thermocouple disposed within the thermocouple receiving bore of the tubular plunger member for generating a signal indicative of the temperature of the homogeneous mixture of the liquid sample and the culture medium in the sample holding chamber; and
temperature control means supported by the cell body member in close proximity to the sample holding chamber for selectively heating and cooling the liquid sample and culture medium in the sample holding chamber in order to maintain same at a predetermined temperature.

5,085,760
ELECTROCHEMICAL GAS SENSORS
Mohammed Razaq, Hacienda Heights; Atulbhai S. Shah, San Dimas, and Harold W. Pust, Huntington Beach, all of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.
Continuation of Ser. No. 404,680, Sep. 8, 1989, abandoned. This application Aug. 6, 1990, Ser. No. 563,811
Int. Cl.⁵ G01N 27/26 16 Claims

1. An electrochemical sensing cell for sensing the concentration of an electrochemically active gas including oxygen in a gas mixture including concentrations of said active gas in the parts per billion range, comprising an electrically insulative container having an aperture in one of the side walls, cathode electrode means mounted to the apertured wall of the container whereby only one surface of the electrode is exposed to the inside of the container, anode electrode means supported

within the container, a fluid electrolyte adapted to be stored within the container for wetting said anode electrode means and said one surface of said cathode electrode means, said cathode electrode means being constructed and defined as a composite structure with an electrically conductive gas diffusion, hydrophobic surface arranged on the opposite side of said one surface exposed to the inside of the container and with the electrically conducting, hydrophobic, gas diffusion layer adapted for conveying gas therethrough for permitting measurements in the parts per billion range and a silver or gold catalyst with a surface area on the order of 150 square meters per gram dispersed on a carbon support and adapted to be wet by an electrolyte stored in the container to cause the electro-



chemically active gas conveyed through the gas diffusion surface to react at the catalyst surfaces, the hydrophobic surface blocking the flow of electrolyte outside of said catalyst surface, and means for continuously circulating said gas mixture to be analyzed for exposure to the gas diffusion surface of the cathode electrode means to be diffused therethrough to the catalyst layer so that the active gas is reacted at the catalyst surface with a minimum amount of dissolution of said active gas in the electrolyte and thereby providing an electrical current flow from said cathode means to said anode means representative of the concentrations of the sensed electrochemically active gas including in parts per billion range.

5,085,761

Patent Not Issued For This Number

5,085,762

CATALYTIC CRACKING OF HYDROCARBONS

Robert P. L. Absil, Mantua; Emmerson Bowes, Hopewell, both of N.J.; Gary J. Green, Yardley, Pa.; David O. Marler, Deptford; David S. Shihabi, Pennington, both of N.J., and Richard F. Socha, Newtown, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 5, 1990, Ser. No. 548,349
Int. Cl.⁵ C10G 11/05

U.S. Cl. 208—120

14 Claims

1. In a catalytic cracking process in which a hydrocarbon feed is cracked in a cracking zone in the absence of added hydrogen and in the presence of a circulating inventory of solid acidic cracking catalyst which acquires a deposit of coke that contains chemically bound nitrogen while the cracking catalyst is in the cracking zone, the coked catalyst being circulated to a regeneration zone to convert the coked catalyst to a regenerated catalyst with the formation of a flue gas comprising nitrogen oxides, the improvement comprising: incorporating into the circulating catalyst inventory an amount of additive particles comprising a synthetic porous crystalline material containing copper metal or cations, the synthetic crystalline material being characterized by an X-ray diffraction pattern including values substantially as set out in Table I of the specification, to reduce the content of nitrogen oxides in the flue gas.

5,085,763

CATALYST AND ITS USE FOR A CATALYTIC DEWAXING PROCESS

Pierre Dufresne, Rueil Malmaison; Henri Kessler, Wittenheim, and Jean-Louis Guth, Mulhouse, all of France, assignors to Institut Francais Du Pétrole, Malmaison, France

Filed Nov. 24, 1989, Ser. No. 440,875

Claims priority, application France, Nov. 24, 1988, 88 15500
Int. Cl.⁵ C10G 11/05

U.S. Cl. 208—120

5 Claims

1. A process for dewaxing of petroleum fractions to provide an improvement in the cold flow properties of said petroleum fractions which comprises contacting a petroleum fraction charge under dewaxing conditions with a catalyst containing by weight:

- (a) 2 to 95% of a zeolite of MFI structure or a silica with MFI framework topology, said zeolite or said silica having been synthesized in a fluoride medium and having a fluoride content between approximately 0.02 and 1.5% by weight, said zeolite or said silica being characterized by an X-ray diffraction diagram shown in Table I of the specification,
- (b) 0.5 to 98% of a matrix, and
- (c) 0.5 to 30% of at least one group VIII or VI B metal of the periodic classification of elements.

5,085,764

PROCESS FOR UPGRADING COAL

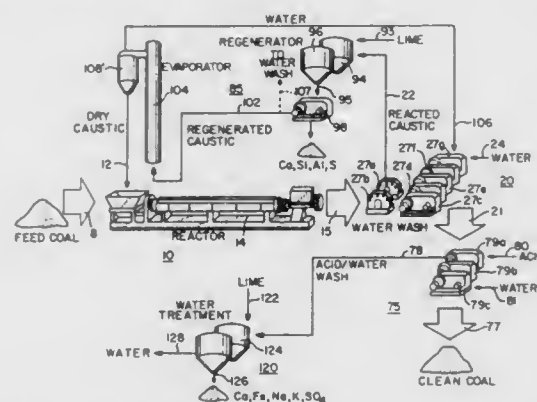
Robert A. Meyers, Tarzana; Walter D. Hart, Upland, and Loren C. McClanathan, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 419,659, Oct. 11, 1989, which is a continuation of Ser. No. 770,324, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 486,276, Mar. 10, 1983, Pat. No. 4,545,891. This application Dec. 19, 1989, Ser. No. 452,794

Int. Cl.⁵ C10G 1/00

U.S. Cl. 208—404

37 Claims



1. A process for reducing the sulfur content and ash content of a feed coal containing sulfur and mineral matter, the process comprising the steps of:

- (a) treating the feed coal in a reaction zone with fused alkali metal caustic at an elevated temperature to remove mineral matter and sulfur from the feed coal yielding (i) a caustic-treated coal and (ii) water-soluble compounds comprising alkali metal, mineral matter, and sulfur;
- (b) combining the caustic-treated coal and water-soluble compounds in a water wash zone with sufficient wash water to reduce the temperature of the caustic-treated coal and dissolve the bulk of the water-soluble compounds before the water-soluble compounds convert to water-insoluble compounds that precipitate on the caustic treated coal, the residence time of the caustic-treated coal in the water wash zone being less than about 90 minutes;

- (c) maintaining the temperature in the water wash zone at less than about 200° F.; and
- (d) separating the caustic-treated coal from spent wash water containing dissolved water-soluble compounds, the separated coal having a sulfur content lower than the sulfur content of the feed coal and an ash content lower than the ash content of the feed coal.

5,085,765

CONVEYING AND SEPARATION UNIT FOR BALLISTIC PROJECTILE ARRESTERS

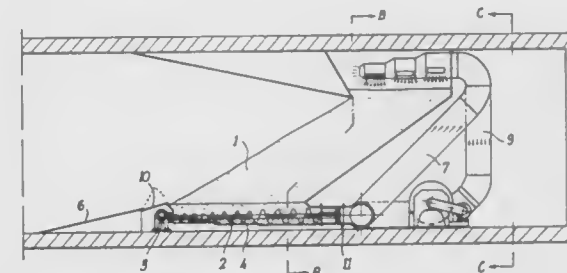
Mario Salabé, and Adelio Rossi, both of Rome, Italy, assignors to Impresa Costruzioni Soc. Fra. S.a.r.l., Rome, Italy

Filed May 17, 1990, Ser. No. 524,386

Claims priority, application Italy, May 22, 1989, 47980 A/89
Int. Cl.⁵ B03B 9/00

U.S. Cl. 209—2

10 Claims



1. A firing range having a firing floor, means for arresting ballistic projectiles comprising a heap of granular material extending above the floor, means at the bottom of said heap for mechanically conveying granular material and projectiles therein comprising at least one worm screw having at least three different diameters the sizes of which progressively increase in the direction of movement of said material and projectiles, a half cylinder open at the top in which said worm screw is positioned, and means for driving said worm screw, pneumatic conveying means comprising conduits and a fan for receiving granular material and projectiles from said worm screw, and for conveying only said granular materials to the top of said heap and for depositing said conveyed granular material onto said heap, said mechanical conveying means and said pneumatic conveying means being at substantially the level of said firing floor.

5,085,766

FILTER FOR CLEANING FLUIDS

Rainer Born, Achim, Fed. Rep. of Germany, assignor to ME/BO/CO Verfahrenstechnik GmbH & Co. KG, Achim-Baden, Fed. Rep. of Germany

Filed Sep. 19, 1989, Ser. No. 409,565

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1988, 8811851[U]

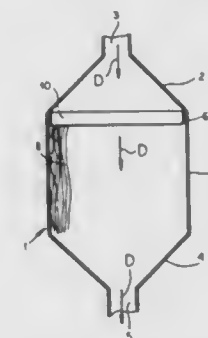
Int. Cl.⁵ B01D 33/00, 39/00; C02F 3/08

U.S. Cl. 210—150

8 Claims

1. A filter for cleaning a fluid, comprising: a housing having an inlet and an outlet and traversed by said fluid from said inlet to said outlet; a plurality of support bars disposed in said housing between said inlet and said outlet; and a filling in said housing comprising a multiplicity of flexible, unordered, nonuniformly moving foil strips composed of a synthetic resin, coated with active carbon and carrying a contaminant-degrading biological culture, said strips being gathered in bundles twisted together in central regions thereof and suspended from said support bars with

said twisted central regions lying over and clamped against said support bars and said strips hanging down



therefrom, said bundles of strips being fastened to said support bars at said twisted central regions.

5,085,767

SWIMMING POOL SKIMMING APPARATUS

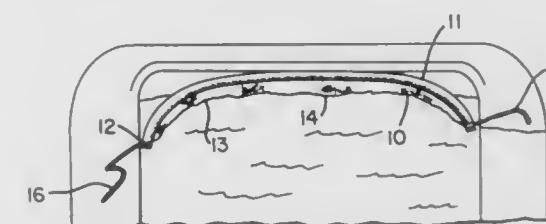
John A. Beers, 18605 McCoy Ave., Port Charlotte, Fla. 33945

Continuation-in-part of Ser. No. 519,930, May 7, 1990, abandoned. This application Dec. 11, 1990, Ser. No. 625,979

Int. Cl.⁵ E04H 4/16

U.S. Cl. 210—169

7 Claims



1. A swimming pool water skimming apparatus for removing large objects as well as corralling and removing the finer debris and scum comprising:

buoyant tubular means having a first and a second end, said tubular means consisting of a plastic or rubber tube sealed at said first and second ends and said first end having valve means for inflating said tubular means, fibrous absorbent material means covering the entire length of said tubular means, and suspended from said tubular means within said water, fastening means located at said first and second ends, said fastening means comprising straps for cinching said fibrous absorbent material to said tubular means, and operating means affixed to said fastening means for operating or controlling said skimming apparatus.

5,085,768

WELDED FUEL TANK

Sadatosh Murakami; Satoru Yamasaki, and Tatsumi Harada, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushika Kaisha, Japan

Division of Ser. No. 318,641, Mar. 3, 1989. This application Oct. 31, 1990, Ser. No. 606,951

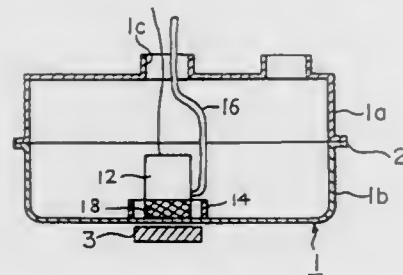
Claims priority, application Japan, Sep. 3, 1988, 63-56828; Sep. 3, 1988, 63-56829; Sep. 3, 1988, 63-56830
Int. Cl.⁵ B01D 35/02

U.S. Cl. 210—222

7 Claims

1. A fuel filtration apparatus comprising: a fuel tank having a seam weld; a fuel pump having a suction port disposed inside the fuel tank; a fuel filter element disposed in the fuel tank and having a

chamber communicating with the suction port of the fuel pump; and



a magnet disposed inside the chamber of the fuel filter element for collecting magnetic particles.

5,085,769

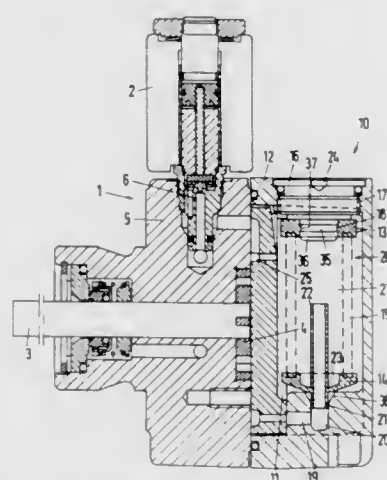
FUEL FILTER ASSEMBLY FOR AN OIL BURNER PUMP
Jørn H. Klausen, Nordborg, and Peter Frøsløv, Sydals, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Filed Jul. 2, 1990, Ser. No. 546,864

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1989, 3924096

Int. Cl.⁵ B01D 27/08

U.S. Cl. 210—232

7 Claims



1. Oil (An oil) burner pump filter apparatus comprising a housing having a chamber that has an access opening, a cover removable from the housing for closing the access opening, and a filter cartridge removably insertable into the housing and having an interior, the cartridge having a first end portion, a second end portion and a hollow cylindrical filter fabric interconnecting the two cartridge end portions, the cartridge being removed from the chamber by removal of the cover from the housing, the cartridge and cover having cooperating means for securing the first end portion to the cover for movement therewith, the housing having a fluid passage portion opening into the chamber and extending axially from the chamber in a direction away from the cover, and the cartridge second end portion being more remote from the cover than the cartridge first end portion and having a main body portion defining a supply connector, said supply connector including a first tubular end portion extending axially away from the main body portion and into the passage portion in sealing relationship with the passage portion when the cover closes the access opening, the supply connector first end portion being of a substantially smaller outer diameter than the main body portion, said supply connector defining a passageway fluidly connecting said fluid passage portion to the cartridge interior for conducting oil therethrough.

5,085,770

OIL SEPARATOR

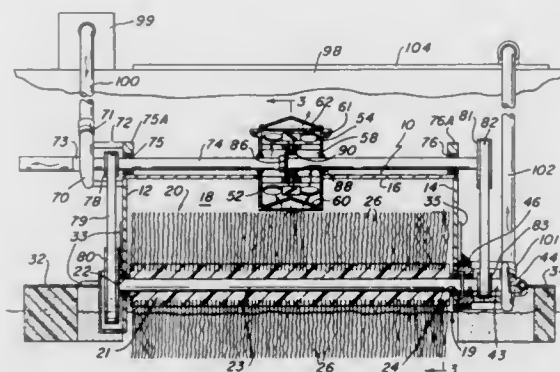
H. Alfred Eberhardt, Hale Fire Pump Co., 700 Spring Mill Ave., Conshohocken, Pa. 19428

Filed Oct. 3, 1990, Ser. No. 592,350

Int. Cl.⁵ E02B 15/04

U.S. Cl. 210—242.3

12 Claims



1. An oil separator for use in cleaning up oil spills from a body of water containing the same comprising:
means providing a housing having an opening overlying the body of water containing the oil spill,
a brush rotatably mounted in said housing to extend through said opening therein and for movement through a circular path including a first portion wherein said brush dips into and moves through the oil/water mixture near the surface of said body of water to pick up oil adhering to the brush surfaces and a second portion located above the surface of said body of water,
means for driving said brush,
means for wiping oil from said brush surfaces thereof as said brush moves through said second portion of said circular path to thereby separate the oil,
means for collecting the wiped off oil in a container,
means for pumping the collected oil from said container thereof to a surface location, said oil pumping means including a pump and means for driving said pump,
said brush driving means and said pump driving means including a water driven turbine constructed and arranged to cause rotation of said brush and operation of said pump, said water driven turbine including a housing and a bladed impeller mounted for rotation within said housing, said housing having an inlet and an outlet for directing water into and out of said housing for driving said impeller,
float means constructed and arranged to support the oil separator near the surface of the body of water containing the oil spill so that said brush is positioned to move through said circular path,
a main pump having a suction and a discharge and lines for connecting the discharge of said main pump to the inlet of said water driven turbine for driving the same, and
means for supplying water to the suction of said main pump from the body of water containing the oil spill.

5,085,771

CENTRIFUGAL FILTER CASING

Tien-Hung Huang, 2F., No. 34, Alley 20, Lane 284, Wu Hsing Str., Taipei, Taiwan

Filed May 15, 1991, Ser. No. 700,292

Int. Cl.⁵ B01D 29/17, 29/37

U.S. Cl. 210—332

10 Claims

1. A liquid filter, comprising a cylindrical casing disposed in vertical position having a top opening, a flange around said top opening, said flange having a plurality of screw rods at the top, a circular top cover fastened on the screw rods of said flange by lock nuts to block up said top opening, a cylindrical bottom projection vertically extending downwards at the bottom, a small drain pipe transversely extending from said cylindrical

bottom projection for discharging water or liquid out of said cylindrical casing, a first ring-shaped division plate transversely internally disposed at an upper position, said first ring-shaped division plate having a plurality of screw rods at the top, a second ring-shaped division plate transversely internally disposed at a position below said first ring-shaped division plate, said first ring-shaped division plate defining therein a circular passage in diameter slightly smaller than the circular passage defined within said second ring-shaped division plate, said first and second ring-shaped division plates being to divide the holding space of said cylindrical casing into a first filtration chamber at the bottom, a second filtration chamber at the middle and a post-filtration chamber at the top, a feed pipe having a terminal end transversely inserted in said first filtration chamber, said terminal end having an outlet hole at one side to guide water or liquid to flow along the inner wall of said cylindrical casing, a flushing pipe transversely inserted in said second filtration chamber, an outlet pipe transversely fastened in said post-filtration chamber, a perforated cylinder set in said first filtration chamber, said perforated cylinder having a top flange mounted on the screw rods on said first ring-shaped division plate and locked in place by lock nuts, a cylindrical wire gauze filter disposed in said first filtration chamber covering over said perforated cylinder, a perforated convex metal

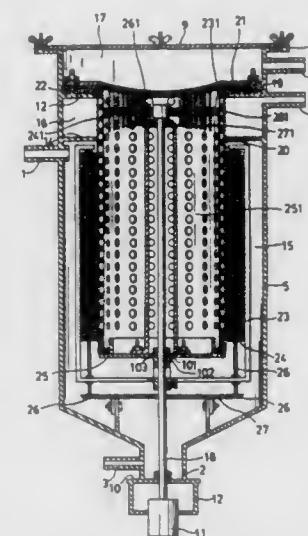


plate fixedly secured to said perforated cylinder at the top with a circular filter firmly retained therebetween, said circular filter having a smooth, elastic, convex filtration surface disposed at the bottom, wherein said drain pipe is relatively much smaller than said feed pipe so that feeding water or liquid at lower pressure which is continuously pumped through said feed pipe along the inner wall of said cylindrical casing into said first filtration chamber can be gradually accumulated inside said cylindrical casing and induced by said drain pipe to rotate in said cylindrical casing so as to form a lower constant flowing fluid pressure permitting the mid-stream of the accumulated rotating flow of water or liquid to continuously penetrate through said cylindrical wire gauze filter, said perforated cylinder, said circular filter and said convex perforated plate into said post-filtration chamber and then discharge out of said cylindrical casing through said outlet pipe, so as to form mid-stream osmosis filtration effect in straining rotation fluid at constant fluid pressure; filtered water or liquid is partly pumped into said second filtration chamber through said flushing pipe to flow downwards along the outer surface of said cylindrical wire gauze filter so as to move fibrous or other debris away from said cylindrical wire gauze to discharge through said drain pipe, so as to form different fluid pressure on the straining media.

5,085,772

FILTER FOR FILTRATION OF FLUIDS

Thomas Busch-Sorensen, Holte, Denmark, assignor to Eskofot A/S, Ballerup, Denmark

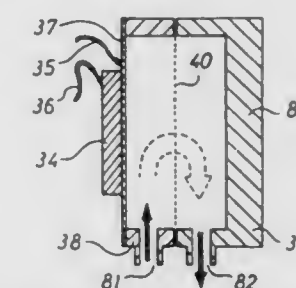
Filed Sep. 14, 1990, Ser. No. 582,098

Claims priority, application Denmark, Sep. 15, 1989, 4571/89

Int. Cl.⁵ B01D 33/03

U.S. Cl. 210—388

3 Claims



1. A filter for filtering a given fluid having a given velocity of sound propagation, comprising:
wall means defining a housing having an internal chamber, at least one inlet to said chamber and at least one outlet from said chamber, so that a supply of said fluid may be flowed into and out of said chamber respectively through said inlet and said outlet;
at least one filter cloth means arranged in said chamber so that said supply in flowing from said inlet to said outlet through said chamber must flow through said filter cloth means;
a supply of said fluid flowing through said chamber from said inlet to said outlet;
an acoustic field producing means coupled to said wall means and producing in said chamber a standing wave acoustic field having a given wavelength;
each said at least one filter cloth means being disposed substantially at a respective pressure node or velocity antinode of said acoustic field.

5,085,773

ANTI-STATIC FUEL FILTER

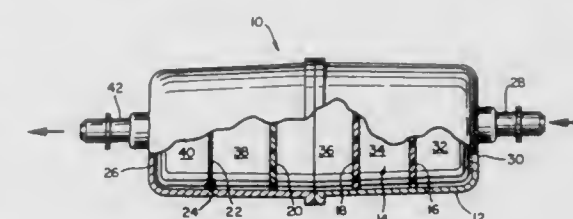
Daniel R. Danowski, Richmond, R.I., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Nov. 6, 1990, Ser. No. 609,569

Int. Cl.⁵ B01D 35/06, 35/02, 35/22

U.S. Cl. 210—446

10 Claims



1. Fuel filter for filtering fuel communicated to the engine of a motor vehicle and for inhibiting the generation of electrostatic charges in the fuel passing through the filter comprising an electrically non-conductive housing defining a chamber therewithin, an inlet fitting carried by said housing for communicating fuel into said chamber and an outlet fitting carried by said housing for communicating fuel out of said chamber, an upstream filter disc in said chamber cooperating with a downstream filter disc having a pore size smaller than said upstream filter disc, said upstream and downstream filter discs spaced from each other in said chamber to define a section of said chamber between said filter discs, each of said filter discs generating an upstream electrostatic charge in the fuel upstream of the filter discs and a downstream electrostatic charge

in the fuel downstream of the filter discs as the fuel passes through the filter discs, the upstream electrostatic charge generated by each of said filter discs being of opposite polarity of the downstream electrostatic charges generated by each filter disc, whereby the upstream electrostatic charge generated by said downstream filter disc in said section cancel the electrostatic charges generated by said upstream filter disc in said section thereby neutralizing the electrostatic charges in said section and thereby preventing electrical discharge through said non-conductive housing and breakdown of the material of said housing.

5,085,774

POLYMERIC MEMBRANES

Okan M. Ekiner, and George Vassilatos, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 30, 1990, Ser. No. 574,870

Int. Cl.⁵ E01D 71/58

U.S. Cl. 210—500.23

5 Claims

1. An improved polymeric membrane that shows substantially the same or greater selectivity with increased draw ratio of manufacture comprising,

an asymmetric polymeric membrane of a hydrophilic, aromatic polymer that has a non-linear subunit in the repeating unit of the main polymer chain

said membrane having a selectivity with respect to at least one pair of gases.

said selectivity remaining substantially constant or increasing as said draw ratio of manufacture of said polymeric membrane increases.

5,085,775

THIN FILM COMPOSITE ULTRAFILTRATION MEMBRANE

A. Xavier Swamikannu, Mount Prospect, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 5, 1990, Ser. No. 622,564

Int. Cl.⁵ B01D 39/00

U.S. Cl. 210—500.27

23 Claims

1. A thin film composite membrane formed by the steps of preparing a solution comprising a polyelectrolyte complex composed of a polyanion and a polycation, casting said solution on a microporous support to form a thin film on the support, draining the excess solution, curing the thin film-coated support, and recovering the resultant thin film composite membrane.

5,085,776

COMPOSITE MEMBRANES FOR FLUID SEPARATIONS
Ingo Blume, Hengelo, Netherlands; Klaus-Viktor Peinemann, Reinbeck, Fed. Rep. of Germany; Ingo Pinnau, Austin, Tex., and Johannes G. Wijmans, Menlo Park, assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

Continuation of Ser. No. 516,181, Apr. 30, 1990, Pat. No. 4,990,255, which is a continuation of Ser. No. 361,024, Jun. 2, 1989, Pat. No. 4,931,181. This application Jan. 31, 1991, Ser. No. 647,748

Int. Cl.⁵ B01D 61/36, 67/00

U.S. Cl. 210—500.27

15 Claims

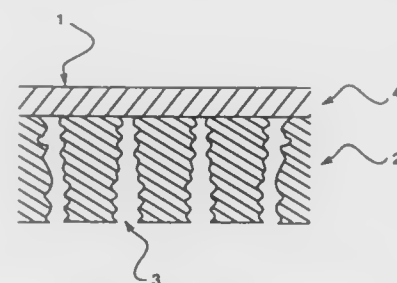
1. A composite separation membrane comprising a two-layer composite of a support membrane layer and a permselective membrane layer, said composite separation membrane being prepared by a process comprising:

(a) providing a support membrane layer characterized by permeation rates $P_{1(A)}/l_1$ respectively of components A and B of a fluid mixture, wherein l_1 is the thickness of the support membrane layer and $P_{1(A)}$ and $P_{1(B)}$ are the permeabilities to components A and B;

(b) providing a permselective material characterized by permeabilities $P_{2(A)}$ and $P_{2(B)}$ respectively to said components A and B, and by intrinsic selectivity α ;

(c) determining an appropriate selectivity $\alpha_{A/B}$ for said

composite separation membrane for component A over component B;



(d) determining a thickness l_2 for said permselective membrane layer which satisfies the relationship:

$$\alpha_{A/B} = \frac{l_1/P_{1(B)} + l_2/P_{2(B)}}{l_1/P_{1(A)} + l_2/P_{2(A)}}$$

(e) coating said support membrane layer with said permselective material to create a permselective membrane layer of thickness l_2 .

5,085,777

REVERSE OSMOSIS MEMBRANES OF POLYAMIDEURETHANE

Samuel D. Arthur, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1990, Ser. No. 586,038

Int. Cl.⁵ B01D 61/08, 67/00, 69/00, 71/54

U.S. Cl. 210—500.38

27 Claims

1. A method comprising: manufacturing a reverse osmosis membrane that shows improved solute rejection and solvent flux, by,

casting a polymeric solution into a support to provide a microporous polymeric substrate

treating said substrate with a polyfunctional amine to provide an impregnated substrate, and

treating said impregnated substrate with a solution of a haloformyloxy-substituted acyl halide to provide a reverse osmosis membrane with a polyamideurethane separating layer that shows improved solute rejection and solvent flux.

17. A reverse osmosis membrane comprising a polyamideurethane separating layer on a polymeric substrate having properties enabling improved salt rejection, flux and productivity and having properties for enabling improved salt rejection, flux and productivity.

5,085,778

PROCESS FOR DEHYDRATION OF ORGANIC OXYGENATES

John Reale, Jr., Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 563,017, Aug. 6, 1990, Pat. No. 5,032,278.

This application Jan. 22, 1991, Ser. No. 644,365

Int. Cl.⁵ B01D 71/58

U.S. Cl. 210—500.39

4 Claims

1. A cross-linked non-porous polyimine membrane wherein cross-linking is effected by a process wherein the improvement consists of thermally cross-linking said polyimine sufficient to provide a non-porous membrane layer.

5,085,779

POLYETHYLENIMINE MATRIXES FOR AFFINITY CHROMATOGRAPHY

Laura J. Crane, Buttzville, N.J., and Sunil V. Kakodkar, Bethlehem, Pa., assignors to J. T. Baker, Inc., Phillipsburg, N.J.
Continuation of Ser. No. 362,725, Jun. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 191,223, May 6, 1988, abandoned. This application May 17, 1991, Ser. No. 703,576

Int. Cl.⁵ B01D 15/08

U.S. Cl. 210—635

6 Claims

1. In a method of separating or purifying a substance from solution by binding the substance in solution with an affinity matrix having a ligand for the substance covalently bound to the affinity matrix, the improvement comprising employing as the affinity matrix a solid phase support selected from the group containing of:

(a) a support of the general formula

Silica-PrSi-PEI-(R)_x

wherein Silica-PrSi-PEI is a covalently bound, non-cross-linked polyethylenimine bonded phase solid support which is the reaction particle of (1) a) particulate silica gel having an average particle diameter of from about 1 to 200 microns and an average pore size of from about 0 to 1000 Angstrom units, or b) particulate controlled pore glass having an average particle diameter of from about 1 to about 200 microns and an average pore size of from about 0 to about 1000 Angstrom units, with (2) polyethyleniminopropyl trimethoxy silane having an average molecular weight of from about 400 to about 1800, or

(b) the weakly acidic carboxylated product of the Silica-PrSi-PEI-(R)_x solid support with a dibasic acid anhydride, said carboxylic product containing from about 0.3 to about 1.2 carboxyl milliequivalents per gram,

and wherein R in the case of the non-weakly acidic carboxylated support is the residue of any chemically reactive moiety capable of undergoing nucleophilic substitution at two separate sites, such that R becomes covalently linked to both primary and secondary amino groups of the PEI at one such site while having the other site available and reactive for subsequent nucleophilic substitution under non-denaturing conditions by an affinity chromatography ligand to form a second covalent bond stable under aqueous hydrolytic buffer conditions and x is a positive integer less than or equal to the total number of primary or secondary amino groups in the PEI moiety, and in the case of the weakly acidic carboxylated support R is the residue of any chemically reactive moiety capable of facilitated nucleophilic displacement of the carboxyl hydroxyl to form a covalent bond at the carboxyl carbon, creating thereby a sufficiently electrophilic site, so as to be readily displaced at the carboxyl carbon by a nucleophilic functional group on an affinity chromatography ligand, and x is a positive integer less than or equal to the total number of carboxyl groups in the carboxylated PEI moiety, said support having an affinity chromatography ligand for the substance covalently bound to the support.

5,085,780

USE OF CATIONIC CHARGE MODIFIED FILTER MEDIA

Eugene A. Ostreicher, Farmington, Conn., assignor to Cuno, Incorporated, Meriden, Conn.

Division of Ser. No. 335,995, Apr. 7, 1989, Pat. No. 4,981,591.

This application Nov. 27, 1990, Ser. No. 618,749

Int. Cl.⁵ B01D 15/00

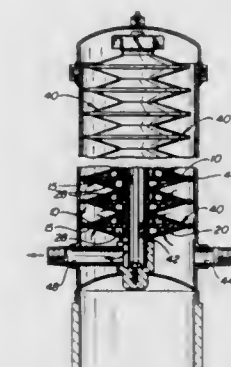
U.S. Cl. 210—683

1 Claim

1. A process for removing anionic contaminants from an aqueous fluid containing said contaminants, said fluid having a pH up to about 12, comprising passing said fluid through a filter media comprising filter elements of cellulose fiber and silica based particulate or fiber and a charge modifying system bonded to the surfaces of the elements, whereby said contaminants

are electrokinetically captured and absorbed onto said media, the charge modifying system including:

a primary charge modifying agent which is a water soluble organic polymer capable of being adsorbed onto the elements and having a molecular weight of greater than about 1000, each monomer of the polymer having at least



one epoxide group capable of bonding to the surfaces of the elements and quaternary ammonium groups;

and a secondary charge modifying agent bonded to a portion of the epoxy groups on the organic polymer, wherein said secondary charge modifying agent is an aliphatic polyamine having at least one primary amine or at least two secondary amines.

5,085,781

SEPARATING AGENT, SEPARATOR AND METHOD OF SEPARATING CELL OR VIRUS

Sumiaki Tsuru; Akihiko Yokoo; Takeshi Ichitsuka, and Tsuneo Hiraide, all of Tokyo, Japan, assignors to Asahi Kogyo Kogyo Kabushiki Kaisha, Tokyo, Japan

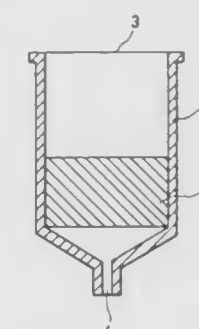
Filed Feb. 28, 1990, Ser. No. 486,220

Claims priority, application Japan, Feb. 28, 1989, 1-48000; Mar. 1, 1989, 1-49175; Mar. 23, 1989, 1-71342; Jun. 19, 1989, 1-156195

Int. Cl.⁵ B01D 15/00, 39/02, 39/14

U.S. Cl. 210—692

34 Claims



27. A method of separating at least one of cells and viruses comprising:

passing a biological fluid containing at least one of cells and viruses through at least one column filled with a separating agent, wherein said separating agent comprises:

a separating agent comprising a first distribution and a second distribution of porous calcium phosphate granules having an open cell structure, said first distribution of porous calcium phosphate granules having a distribution of micropores ranging from 20 to 500 nm in average pore size, and said second distribution of porous calcium phosphate granules having a distribution of small pores ranging from 1 to 50 μm in average pore size.

31. A method of separating at least one of cells and viruses comprising:

passing a biological fluid containing at least one of cells and viruses through at least one column filled with a separating agent, wherein said separating agent comprises:
a separating agent comprising a first element which comprises a polyvinyl acetal resin having an open cell structure and an average pore size of 10 to 1000 μm , and a second element applied on said first element which includes a layer of porous calcium phosphate granules having an average granule size of 10 to 2000 μm .

5,085,782

PROCESS FOR CONTROLLING THE PH OF A BRINE
Darrell L. Gallup, Chino, and Manuel E. Obando, Whittier, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 28, 1990, Ser. No. 635,478
Int. Cl.⁵ C02F 5/02; B01D 53/34

U.S. Cl. 210—696

23 Claims

1. A process for recovering and using non-condensable gases produced during flashing of a geothermal brine, said gases comprising a major amount of carbon dioxide and a minor amount of hydrogen sulfide, said process comprising:

- introducing said noncondensable gases into a condensate of steam derived from the brine in the presence of an oxidizing agent to form a mixture,
- maintaining the mixture at a pH in excess of 7 for a time sufficient to oxidize substantially all of the hydrogen sulfide,
- introducing the mixture into a gas-liquid separation zone and recovering a carbon dioxide-containing gas substantially free of sulfide, and
- introducing the carbon dioxide-containing gas into a geothermal brine to lower the pH thereof.

8. A process for reducing the amount of scale formed during processing of a geothermal brine in which process there is produced a condensate of steam derived from the brine and noncondensable gases comprising a major amount of carbon dioxide and a minor amount of H_2S comprising:

- introducing the noncondensable gases into the condensate in the presence of an oxidizing agent to form a mixture,
- maintaining the mixture at a pH of at least about 7 for a time sufficient to oxidize substantially all of the hydrogen sulfide,
- introducing the mixture into a gas-liquid separation zone,
- recovering the noncondensable gases substantially free of hydrogen sulfide from the separation zone, and
- introducing the recovered noncondensable gases into the brine process to reduce its scaling potential.

16. A process for producing a substantially pure carbon dioxide gas stream from noncondensable gases produced during processing of a geothermal brine, during which processing there also is produced a condensate of steam derived from the geothermal brine, said noncondensable gas comprising carbon dioxide, water vapor and a minor amount of hydrogen sulfide, said process comprising:

- introducing the noncondensable gases into the condensate of steam in the presence of an oxidizing agent to form a mixture,
- maintaining the mixture at a pH within the range from about 7 to 8 under superatmospheric pressure for a time sufficient to oxidize in excess of 95 percent of the hydrogen sulfide,
- introducing the mixture into a gas-liquid separation zone, and
- withdrawing from the gas-liquid separation zone a gas stream substantially free of hydrogen sulfide and comprising a major amount of carbon dioxide and a minor amount of water vapor.

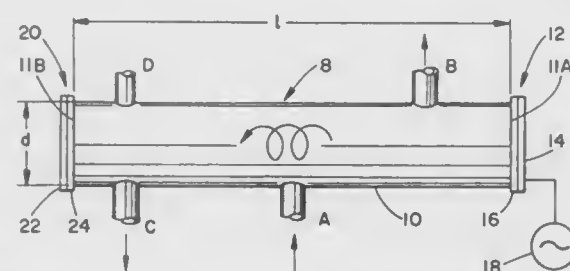
5,085,783 ACOUSTICALLY DRIVEN PARTICLE SEPARATION METHOD AND APPARATUS

Donald L. Feke, Chesterland, and Thomas L. Tolt, North Olmsted, both of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Aug. 16, 1990, Ser. No. 568,604
Int. Cl.⁵ B01D 17/06

U.S. Cl. 210—748

18 Claims



1. A method for separating particles from a fluid suspension, comprising the steps of:

- providing an elongated chamber having closed ends;
- supplying the elongated chamber with a fluid medium in which particles to be separated are suspended; and
- propagating acoustic waves through the fluid medium in the chamber, the acoustic waves being directed generally along the length of the chamber and being varied in frequency within a desired frequency range including a nominal frequency resonant to the chamber, to urge particles toward one end of the chamber.

5,085,784

USE OF CATIONIC CHARGE MODIFIED FILTER MEDIA

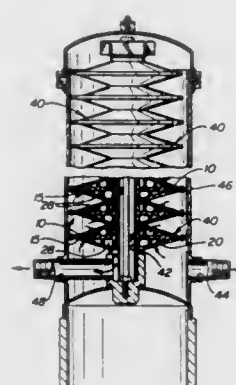
Eugene A. Ostreicher, Farmington, Conn., assignor to Cuno, Incorporated, Meriden, Conn.

Division of Ser. No. 335,995, Apr. 7, 1989, Pat. No. 4,981,591.
This application Nov. 27, 1990, Ser. No. 618,462

Int. Cl.⁵ B01D 37/00

U.S. Cl. 210—767

6 Claims



1. A process for removing particulate contaminants from a fluid containing said contaminants comprising passing the fluid through a filter media comprising filter elements of cellulose fiber and silica based particulate or fiber and a charge modifying amount of a cationic charge modifying system bonded to surfaces to said elements, the system comprising:

- a primary charge modifying agent which is a water soluble organic polymer capable of being adsorbed onto elements and having a molecular weight of greater than about 1000, each monomer of the polymer having at least one epoxide group capable of bonding to the surfaces of the elements and quaternary ammonium groups;

and a secondary charge modifying agent bonded to a portion of the epoxy groups on the organic polymer, wherein said secondary charge modifying agent is an aliphatic polyamine having at least one primary amine or at least two secondary amines.

5,085,785

PROCESS FOR PURIFYING PSYLLIUM HUSK USING LIQUID FLUORINATED HYDROCARBONS WITH DIFFERENT DENSITIES AS SEPARATION MEANS

Allan T. Reeves, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 28, 1991, Ser. No. 676,685

Int. Cl.⁵ B03D 1/00; C02F 1/24

U.S. Cl. 210—767

17 Claims

1. A process for purifying impure psyllium husk comprising the steps of:

- combining impure psyllium husk with liquid fluorinated hydrocarbon having a density whereby the psyllium husk is differentiated from at least a portion of the impurities;
- separating the psyllium husk having increased purity from the impurity differentiated by step (a);
- optionally repeating one or more times steps (a) and (b) at a different density to differentiate and separate remaining impurities from the psyllium husk; and
- collecting the psyllium husk having improved purity.

5,085,786

AQUEOUS FILM-FORMING FOAMABLE SOLUTION USEFUL AS FIRE EXTINGUISHING CONCENTRATE

Roger R. Alm, Lake Elmo, and Richard M. Stern, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 24, 1991, Ser. No. 645,557

Int. Cl.⁵ A62D 1/00

U.S. Cl. 252—8.05

19 Claims

1. An aqueous film-forming foamable solution comprising (a) fluoroaliphatic amphotericsurfactant, (b) fluoroaliphatic anionic surfactant, and (c) hydrocarbon surfactant comprising alkyl ether sulfate having an alkyl group of 6 to 10 carbon atoms.

5,085,787

CROSSLINKED VINYLAMINE POLYMER IN ENHANCED OIL RECOVERY

Robert K. Pinschmidt, Jr., Allentown; Bheema R. Vijayendran, Emmaus, both of Pa., and Ta-Wang Lai, Taipei, Taiwan, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 443,304, Nov. 29, 1989, Pat. No. 4,973,410. This application Jun. 20, 1990, Ser. No. 541,234

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.⁵ C09K 7/02; E21B 43/00

U.S. Cl. 252—8.551

6 Claims

1. A method for enhancing the production of oil or gas from a subterranean formation which comprises injecting into said formation a fluid containing a viscosifying amount of a vinylamine polymer crosslinked with a multi-functional organic compound selected from the group consisting of dialdehydes, diepoxides, diacrylates, diisocyanates and dihalides; an inorganic compound containing multi-valent anions selected from the group consisting of titanates, zirconates, phosphates, and silicates; and an inorganic cation capable of complexing with said polymer selected from the group of Cu^{+2} , Fe^{+3} , Fe^{+2} and Zn^{+2} .

5,085,788

OIL SOLUBLE DISPERSANT ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

Jacob Emert, Brooklyn, N.Y., and Robert D. Bundberg, Bridgewater, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 122,832, Nov. 19, 1982, abandoned.
This application Jul. 27, 1990, Ser. No. 562,111

Int. Cl.⁵ C10M 133/16, 149/12

U.S. Cl. 252—951.5 A

41 Claims

1. An oil soluble composition useful as lubricating oil dispersant additive consisting essentially of reaction product of:

- nitrogen containing adduct consisting essentially of reaction product of (a) long chain hydrocarbyl substituted mono- or dicarboxylic acid or its anhydride, said long chain hydrocarbyl having a number average molecular weight of from about 500 to about 6,000 and (b) polyamine containing at least two reactive amino groups selected from the group consisting of primary amino groups, secondary amino groups and mixtures thereof, said adduct containing at least one reactive amino group; and
- at least one polyepoxide.

5,085,789

FERROFLUID COMPOSITIONS

Atsushi Yokouchi, Yokohama, and Toshikazu Yabe, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 226,794, Aug. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 163,795, Mar. 3, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 515,353

Claims priority, application Japan, Mar. 3, 1987, 62-48064; Feb. 19, 1988, 63-37029

Int. Cl.⁵ H01F 1/28

U.S. Cl. 252—62.52

3 Claims

1. A ferrofluid composition consisting essentially of:

- fine particles of ferromagnetic material;
- a liquid carrier which comprises an alkylnaphthalene;
- a surfactant consisting of a direct combination of a hydrophilic portion and a hydrophobic portion, the hydrophobic portion consisting of an alkylnaphthalene structure "substantially identical to the alkylnaphthalene structure of said liquid carrier".

5,085,790

PHASE CHANGE MATERIALS AND USE THEREOF

Gerd Hormansdorfer, Kastanienek 6A, D-3167 Bergdorf-Beinhorn, Fed. Rep. of Germany

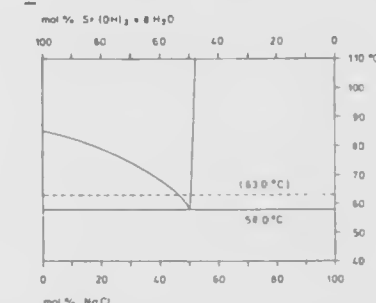
Filed Jun. 5, 1990, Ser. No. 534,129

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918371; Dec. 12, 1989, 3940985

Int. Cl.⁵ C09K 5/00

U.S. Cl. 252—70

11 Claims



- A heat transfer composition comprising at least two members selected from the group consisting of:
a) strontium hydroxide octahydrate;
b) lithium hydroxide monohydrate; and

c) non-hydrate forming chlorides or nitrates, wherein for a mixture comprising a) and b) the composition contains from about 40 to about 60 mol % of one hydroxide hydrate relative to the other hydroxide hydrate and for a composition containing c) and a) or b), the composition contains from about 5 to about 40% by weight of total c) based on the total weight of hydroxide hydrate.

5,085,791

CORROSION-INHIBITED ANTIFREEZE/COOLANT COMPOSITION CONTAINING CYCLOHEXANE ACID(S)
Jeffrey M. Burns, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 1, 1990, Ser. No. 590,740
Int. Cl.⁵ C09K 5/00; C23F 11/12

U.S. Cl. 252—79 23 Claims

1. A corrosion-inhibited antifreeze composition comprising from about 80 to about 99 weight percent of a liquid alcohol freezing point depressant and from about 20 to about 1 weight percent of at least one cyclohexane acid employed as a corrosion inhibitor.

5,085,792

SYNTHETIC TRACTION FLUID

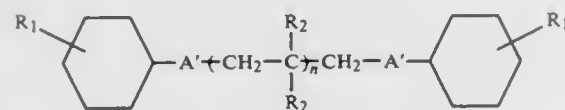
Yoshimura Narihiko; Hirotaka Tamizawa, and Yasuji Komatsu, all of Saitama, Japan, assignors to Toa Nenryo Kogyo, K.K., Tokyo, Japan

Continuation of Ser. No. 65,826, Jun. 23, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,524

Int. Cl.⁵ C10M 105/36, 129/72

U.S. Cl. 252—79 12 Claims

1. A traction fluid comprising:
(i) at least one diester or its derivative represented by the formula



wherein A' is the ester linkage —COO—, or —OOC—, n is an integer of 1 to 6, R₁ is independently selected from hydrogen and alkyl groups containing from 1 to 8 carbon atoms, and R₂ is independently selected from alkyl groups containing from 1 to 3 carbon atoms; and
(ii) from 0.1 to 70 wt. % of at least one branched poly-alpha-olefin selected from the group consisting of branched poly-alpha-olefins having an average molecular weight of from 500 to 10,000.

5,085,793

CORROSION-INHIBITED ANTIFREEZE/COOLANT COMPOSITION

Jeffrey M. Burns; John R. Sanderson; John M. Larkin, and David R. McCoy, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,763
Int. Cl.⁵ C09K 5/00; C23F 11/12

U.S. Cl. 252—79 14 Claims

1. A corrosion-inhibited antifreeze composition consisting of from about 80 to about 99 weight percent of a liquid alcohol freezing point depressant and from about 20 to about 1 weight percent of at least one hydroxyl-substituted aromatic carboxylic acid, said acid having the hydroxyl radical disposed proximate to the carboxyl radical.

5,085,794
OLIGOMER CONTAINING PHOSPHINATE COMPOSITIONS AND THEIR METHOD OF MANUFACTURE

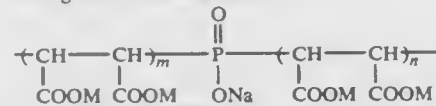
James F. Kneller, LaGrange Park; Vytas Narutis, Riverside; Barbara E. Fair, Downers Grove, and Donald A. Johnson, Batavia, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 25, 1990, Ser. No. 514,444
Int. Cl.⁵ C02F 5/10; C23F 11/10

U.S. Cl. 252—82 3 Claims

1. A phosphinate containing composition comprising:

Ingredients	Mole Percent - Less Than
A. Monosodium phosphinicoicis (Succinic Acid)	22
B. Monosodium phosphinico succinic acid	26
C. Sodium phosphono succinic acid	12
D. Sodium phosphate	5
E. Sodium phosphite	6
F. Sodium hypophosphite, and	6
G. A phosphinico succinic acid oligomer having the structural formula:	



wherein the sum of A + B + C + D + E + F is from 60 to 68 mole % and G is from 32 to 40 percent, M is H or Na and m and n are either 0 or a small whole number with the proviso that either m or n is a small whole number and the sum of m plus n is greater than 2.

5,085,795

WATER-BASED COMPOSITIONS FOR REMOVING STAINS FROM FABRICS

Kolazi S. Narayanan, Palisades Park, and Paul D. Taylor, West Milford, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Feb. 21, 1991, Ser. No. 658,722
Int. Cl.⁵ C09D 9/00; C11D 7/22, 7/50

U.S. Cl. 252—162 4 Claims

1. A water-based, stain-remover composition for effectively removing a wide variety of stains from fabrics consisting essentially of:

- (a) 5–20% by weight NMP,
- (b) 5–20% by weight BLO,
- (c) 40–88% by weight water, and
- (d) 1–10% by weight surfactant, and, optionally, including a base-buffer to provide a pH of about 7–12.

5,085,796

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE, ETHANOL AND A MONO- OR DI-CHLORINATED C₂ OR C₃ ALKANE

Leonard M. Stachura, Hamburg; Peter B. Logsdon, North Tonawanda; Ellen L. Swan, Ransomville, and Rajat S. Basu, Williamsburg, all of N.Y., assignors to Allied-Signal Inc., Morris Township, N.J.

Filed Aug. 15, 1990, Ser. No. 567,834

Int. Cl.⁵ C11D 7/30, 7/50; C23G 5/028; B08B 3/00

U.S. Cl. 252—171 64 Claims

1. Azeotrope-like compositions consisting essentially of from about 52 to about 98.8 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 40 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2-dichloro-1,2,2-trifluoroethane and a mixture of 1,1-dichloro-2,2,2-trifluoroethane and

1,2-dichloro-1,2,2-trifluoroethane, from about 0.1 to about 4 weight percent ethanol and from about 0.1 to about 4 weight percent of a mono- or di-chlorinated C₂ or C₃ alkane selected from the group consisting of 1-chloropropane, 2-chloropropane and 1,1-dichloroethane; wherein when said chlorinated alkane is 2-chloropropane said azeotrope-like compositions boil at about 31.5° C. at 760 mm Hg and wherein when said chlorinated alkane is 1,1-dichloroethane, and azeotrope-like compositions boil at about 31.9° C. at 760 mm Hg.

5,085,797

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, A MONOCHLORINATED C₃ ALKANE AND OPTIONALLY AN ALKANOL

Ellen L. Swan, Niagara, and Rajat S. Basu, Erie, both of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 11, 1990, Ser. No. 580,882

Int. Cl.⁵ C11D 7/30, 7/50; C23G 5/028; B08B 3/00

U.S. Cl. 252—171 34 Claims

1. Azeotrope-like compositions consisting essentially of from about 95.5 to about 99.9 weight percent 1,1-dichloro-1-fluoroethane and from about 0.01 to about 4.5 weight percent 1-chloropropane which boil at about 32.2° C. at 760 mm Hg; or from about 88.3 to about 99.9 weight percent 1,1-dichloro-1-fluoroethane and from about 0.01 to about 11.7 weight percent 2-chloropropane which boil at about 32.2° C. at 760 mm Hg; or from about 91.6 to about 98.99 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 4 weight percent methanol and from about 0.01 to about 4.4 weight percent 1-chloropropane which boil at about 30.3° C. at 760 mm Hg; or from about 84.3 to about 98.99 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 4 weight percent methanol and from about 0.01 to about 11.7 weight percent 2-chloropropane which boil at about 29.8° C. at 760 mm Hg; or from about 92.5 to about 98.95 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 2.5 weight percent ethanol and from about 0.05 to about 5 weight percent 1-chloropropane which boil at about 31.9° C. at 760 mm Hg; or from about 88.9 to about 98.95 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 2.5 weight percent ethanol and from about 0.05 to about 8.6 weight percent 2-chloropropane which boil at about 31.7° C. at 760 mm Hg wherein the azeotrope-like components of the compositions consist of 1,1-dichloro-1-fluoroethane, a mono-chlorinated C₃ alkane and optionally methanol or ethanol.

5,085,798

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, CYCLOPENTANE AND OPTIONALLY AN ALKANOL

Ellen L. Swan, Ransomville; Rajat S. Basu, Williamsburg, and Richard M. Hollister, Buffalo, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 11, 1990, Ser. No. 580,897

Int. Cl.⁵ C11D 7/30, 7/50; C23G 5/028; B08B 3/00

U.S. Cl. 252—171 19 Claims

1. Azeotrope-like compositions consisting essentially of from about 93.9 to about 99.99 weight percent 1,1-dichloro-1-fluoroethane and from about 0.01 to about 6.1 weight percent cyclopentane which boil at about 32.2° C. at 760 mm Hg; or from about 85.5 to about 98.99 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 4 weight percent methanol and from about 0.01 to about 10.5 weight percent cyclopentane which boil at about 29.7° C. at 760 mm Hg; or from about 90 to about 99.94 weight percent 1,1-dichloro-1-fluoroethane, from about 0.05 to about 2 weight percent ethanol and from about 0.01 to about 8 weight percent cyclopentane which boil at about 31.9° C. at 760 mm Hg wherein the azeotrope-like components of the compositions consist of 1,1-dichloro-1-

fluoroethane, cyclopentane and optionally methanol or ethanol.

5,085,799

LIQUID CRYSTAL COMPOSITION

Itsuo Shimizu, Chiba; Kenji Furukawa, Kanagawa, and Masami Tanaka, Chiba, all of Japan, assignors to Chisso Corporation, Japan

PCT No. PCT/JP88/01229, § 371 Date Aug. 4, 1989, § 102(e) Date Aug. 4, 1989, PCT Pub. No. WO89/05337, PCT Pub. Date Jun. 15, 1989

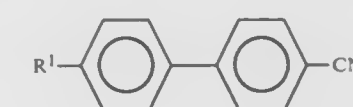
PCT Filed Dec. 7, 1988, Ser. No. 392,965

Claims priority, application Japan, Jul. 12, 1987, 62-308898

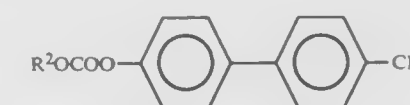
Int. Cl.⁵ C09K 19/12, 19/52, 19/06

U.S. Cl. 252—299.66 13 Claims

1. A liquid crystal composition which comprises at least two components A and B, said component A comprising at least one of 4-n-alkyl-4'-cyanobiphenyls represented by the formula (1)



wherein R¹ is an alkyl group having 8, 9, 10, 11 or 12 carbon atoms, and said component B comprising at least one of 4-n-alkoxycarbonyloxy-4'-cyanobiphenyls represented by the formula (2)



wherein R² is an alkyl group having 8, 9, 10, 11 or 12 carbon atoms, a ratio of the component A to the component B being from 75 to 95:5.

5,085,800

GLYCOL DISPERSION OF PRECIPITATED CALCIUM CARBONATE

Shiro Minayoshi; Naofumi Saitoh; Toshio Higashi, and Noritugu Ebisuya, all of Akashi, Japan, assignors to Maruo Calcium Company, Limited, Akashi, Japan

Continuation of Ser. No. 215,489, Jul. 6, 1988, abandoned. This application Jan. 2, 1991, Ser. No. 634,962

Int. Cl.⁵ B01J 13/00

U.S. Cl. 252—309 3 Claims



1. A glycol dispersion consisting of precipitated calcium carbonate and glycol prepared by wet-grinding a glycol slurry composed of glycol and precipitated calcium carbonate meeting the requirements described below in (a) and (b) under the conditions described below in (c);

(a) the primary particle size D₁ calculated by the following formula (1) from the specific surface area S₁ measured by the BET method is not less than 0.1 μm:

$$D_x = 60,000/2.7S_x$$

wherein,

D_x : is the average particle size (μm) of precipitated calcium carbonate calculated from the specific surface area measured by the BET method; and

S_x : is the specific surface area (cm^2/g) of precipitated calcium carbonate measured by the BET method;

(b) the ratio R_1 of the 50% weight average particle size d_1 of particle size distribution measured in an aqueous medium by the use of Light Transmission Centrifugal Precipitation-Type Particle Size Distribution Measuring Device (manufactured by Shimadzu Seisakusho Ltd.) to the aforesaid D_1 satisfies the following formula (2):

$$R_1 = d_1/D_1 \leq 7 \quad (2);$$

(c) the ratio R_2 of the aforesaid primary particle size D_1 to the primary particle size D_2 calculated by the aforesaid formula (1) from the specific surface area S_2 of wet-ground precipitated calcium carbonate measured by the BET method satisfies the following formula (3):

$$R_2 = D_1/D_2, 1 < R_2 \leq 10 \quad (3).$$

5,085,801

TEMPERATURE INDICATORS BASED ON POLYDIACETYLENE COMPOUNDS

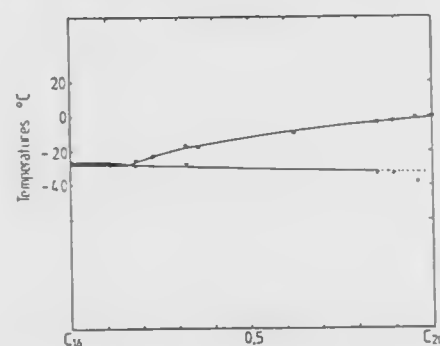
Annette Thierry, and Jacques Le Moigne, both of Strasbourg, France, assignors to Centre National De La Recherche Scientifique, Paris, France

Continuation of Ser. No. 512,610, Apr. 23, 1990, abandoned, which is a continuation of Ser. No. 141,608, filed as PCT/FR87/00145, Apr. 30, 1987, abandoned. This application Jun. 19, 1991, Ser. No. 717,869

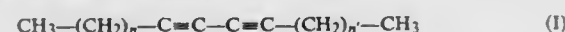
Claims priority, application France, Apr. 30, 1986, 8606320 Int. Cl.³ G01N 31/22

U.S. Cl. 252—408.1

14 Claims



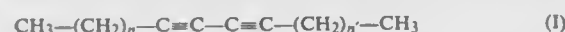
1. A temperature indicator for detecting whether the temperature of an article has exceeded a selected temperature threshold which comprises a chemically inert substrate and deposited on the substrate at least one polydiacetylene compound exhibiting irreversible thermochromism so that the compound undergoes a change from a blue color to a red color at the selected temperature and obtained by the polymerization of a monomer of formula (I):



in which n and n' are identical or different integers between 2 and 21, or of a mixture of such monomers, the monomer or monomers being in the crystalline state during the polymerization and the polymerization being carried out to obtain a blue color.

7. A temperature indicator for detecting whether the temperature of an article has exceeded a selected temperature threshold which comprises a mixture of a thermoplastic and at least one polydiacetylene compound exhibiting irreversible

thermochromism so that the compound undergoes a change from a blue color to a red color at the selected temperature and obtained by the polymerization of a monomer of formula (I):



in which n and n' are identical or different integers between 2 and 21, or of a mixture of such monomers, the monomer or monomers being in the crystalline state during the polymerization and the polymerization being carried out to obtain a blue color, the thermoplastic being inert to the polydiacetylene compound or compounds.

5,085,802

TIME TEMPERATURE INDICATOR WITH DISTINCT END POINT

Thomas J. Jalinski, Waunakee, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Jan. 31, 1991, Ser. No. 648,712

Int. Cl.³ G01N 31/00

U.S. Cl. 252—408.1

15 Claims

1. A time-temperature integrating indicator comprising: a first specific reaction pair including an active reagent and a substrate specific to said active reagent, said first specific reaction pair being reactive to form a first reaction product said first reaction product tending to cause the pH value to change in an acidic or a basic first direction away from neutrality;

a second specific reaction pair including an active reagent and a substrate specific to said active reagent, said second specific reaction pair being reactive to form a second reaction product, said second reaction product tending to cause the pH value to change in a second direction opposite said first direction and beyond neutrality;

said first reaction product and said second reaction product in turn being reacted to form a third reaction product, said third reaction product including a stable pH buffer which maintains the pH at a stable value on the second direction side of neutrality until said second reaction product is no longer produced, said substrate in said first specific reaction pair being present in a stoichiometric excess amount over the amount of the substrate in said second specific reaction pair; and

at least one pH-sensitive dye exhibiting one color for a pH in a basic pH range and a second different color for a pH in an acidic pH range, whereby said time-temperature integrating indicator exhibits a rapid and distinct color change from one to the other of said first and second colors after a predetermined amount of time has elapsed upon exposure to relatively constant temperatures, or after a relatively shorter period of time has elapsed, upon exposure to elevated temperatures.

5,085,803

METHOD OF PREPARING A CONDUCTIVE SILICONE RUBBER PARTICULATE

Haruki Wakita, Koji Shimizu, and Mitsuo Hamada, all of Chiba, Japan, assignors to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed May 29, 1990, Ser. No. 529,993

Claims priority, application Japan, May 29, 1989, 1-135399 Int. Cl.³ H01B 1/24

U.S. Cl. 252—511

5 Claims

1. A method for the preparation of conductive silicone rubber particulate, consisting of the preparation of a mixture comprising

- (A) 100 weight parts silicone rubber particulate which does not contain an electrically conductive material with an average particle diameter of 0.1 to 100 micrometers,
- (B) 1.0 to 40 weight parts carbon black,
- (C) 0.1 to 20 weight parts surfactant, and

(D) an arbitrary quantity of water, sufficient to uniformly disperse components (A), (B), and (C), and then removing the water from said mixture, yielding silicone rubber particulate having the outer surface coated with carbon black.

5,085,804

REFRACTORY ELECTRICAL DEVICE

Malcolm E. Washburn, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Division of Ser. No. 258,307, Oct. 14, 1988, which is a continuation-in-part of Ser. No. 120,291, Nov. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 669,399, Nov. 8, 1984, abandoned. This application Feb. 25, 1991, Ser. No. 659,648

Int. Cl.³ H01B 1/18

U.S. Cl. 252—516

11 Claims

1. An igniter for fluid fuels comprised of a hot zone and cold ends consisting essentially of a sintered mixture of 5 to 50% by volume of molybdenum disilicide and 50 to 95% by volume of a mixture of silicon carbide and silicon nitride; 4% or less of open porosity, a room temperature flexural strength of at least 30,000 psi (207 MPa), a resistivity range of from 0.0001 to 90 ohm centimeters, a ratio of room temperature resistivity to that at 1200° C. of from 0.2 to 19.8, a response time from room temperature to about 1200° C. of less than 25 seconds, said igniter consuming from about 20 to about 50 watts per square centimeter of radiating surface at 1200° C.

5,085,805

ELECTRICALLY CONDUCTING, IR REFLECTING, FLUORINE-DOPED TIN OXIDE ORGANIC COMPOUND

Erich Ruf, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG

Division of Ser. No. 492,087, Mar. 12, 1990, Pat. No. 5,043,186. This application Mar. 27, 1991, Ser. No. 675,797

Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915232

Int. Cl.³ C03C 17/25

U.S. Cl. 252—518

4 Claims

1. A composition for applying electrically conductive, IR reflecting layers on the surface of glass, ceramic or enamel comprising a solution of 50 to 80% by weight of mixture of alkyltin oxide and trifluoroacetic acid dissolved in an organic solvent, wherein the mixture of alkyltin oxide and trifluoroacetic acid is selected from the group consisting of

- a) monobutyltin oxide and trifluoroacetic acid in a molar ratio of monobutyltin oxide : trifluoroacetic acid ranging from 1 : <3 to 1 : 0.15,
- b) dibutyltin oxide and trifluoroacetic acid in a molar ratio of dibutyltin oxide : trifluoroacetic acid ranging from 1 : <2 to 1 : 0.74 or
- c) tributyltin oxide and trifluoroacetic acid in a molar ratio of tributyltin oxide : trifluoroacetic acid ranging from 1 : <2 to 1 : 0.15.

5,085,806

CONDUCTIVE MATERIAL AND PROCESS FOR PREPARING THE SAME

Yoshiyuki Yasutomi, Katsuta; Tadahiko Miyoshi, Hitachi; Masahisa Sobue, Mito; Nobuyuki Yamashita; Hiroshi Nagase, both of Hitachi; Kiyohiko Tanno, Katsuta; Shoji Arimoto, Kamakura, and Fumio Jooraku, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,307

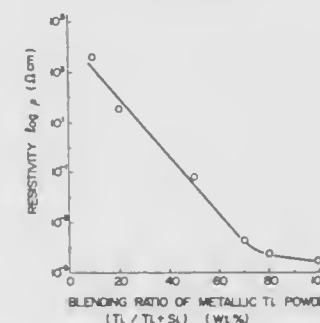
Claims priority, application Japan, Mar. 7, 1988, 63-51487 Int. Cl.³ C04B 35/58

U.S. Cl. 252—518

4 Claims

1. A process for producing an electrically conductive ceramic composite, which comprises forming a first molding mixture consisting essentially of at least one inorganic compound selected from the group consisting of a carbide, nitride, oxide, boride, silicide and oxynitride, at least one of Si powder

and Al powder and a molding binding, further forming another molding mixture consisting essentially of a powder of at least one metal selected from Ti, Zr, V, Nb, Ta, Cr, W, Fe and Ni and a binder, integrally molding both said first molding mixture and said another molding mixture in alternate layers to form an integral molding having a particle volume packing density of at least 60 vol %, heating said integral molding to remove said binder therefrom, further heating the integral molding in a nitriding gaseous atmosphere containing no CO



Gas, to produce a reaction-sintered body of electrically conductive nitride produced from said powder of at least one metal, with substantially all of the metal powder in the said another molding mixture being converted into the nitride, whereby the conductive nitride and a reaction-sintered body of said at least one inorganic compound and at least one of silicon nitride and aluminum nitride produced from said Si powder and Al powder are alternately arranged, wherein said at least one of silicon nitride and aluminum nitride are contained in an amount of 90% by volume or less.

5,085,807

FLAME-RETARDANT LIQUID CRYSTAL POLYESTER COMPOSITION, PROCESS FOR PREPARATION THEREOF AND INJECTION-MOLDED ARTICLE COMPOSED THEREOF

Masaru Okamoto, Tokai; Yasunori Ichikawa, Nagoya; Toshiohide Inoue, Ichinomiya, and Toru Yamanaka, Nagoya, all of Japan, assignors to Toray Industries, Inc., Japan

Filed May 14, 1990, Ser. No. 523,030

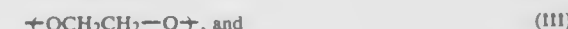
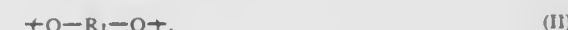
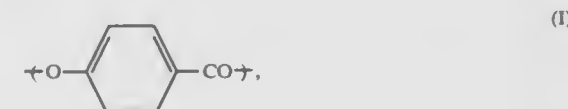
Claims priority, application Japan, May 15, 1989, 1-122050; Dec. 12, 1989, 1-323380; Jan. 5, 1990, 2-000856

Int. Cl.³ C09K 21/00

U.S. Cl. 252—609

26 Claims

1. A flame-retardant liquid crystal polyester composition which comprises (A) 100 parts by weight of a liquid crystal polyester comprising structural units represented by the following formulae (I), (II), (III) and (IV), in which the amount of structural units (I) and (II) is 77 to 95% by mole based on structural units (I), (II) and (III), the amount of structural units (III) is 23 to 5% by mole based on structural units (I), (II) and (III), and the structural units (I)/structural units (II) molar ratio is from 75/25 to 95/5, and (B) 0.5 to 30 parts by weight of a polymeric flame retardant having an average dispersed particle diameter not larger than 2.5 μm , wherein the aforementioned formulae are:



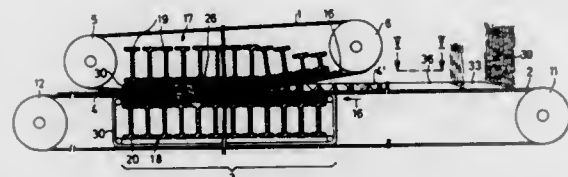
5,085,812 **METHOD OF AND PLANT FOR THE MANUFACTURE OF WOOD CHIPBOARDS AND SIMILAR BOARD MATERIALS**

Karl-Heinz Ahrweiler, Willich, and Bernd Heimes, Munchen-Gladbach, both of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & CO KG, Krefeld, Fed. Rep. of Germany

PCT No. PCT/DE88/00064, § 371 Date Aug. 16, 1989, § 102(e) Date Aug. 16, 1989, PCT Pub. No. WO88/06082, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 11, 1988, Ser. No. 408,507
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704940

Int. Cl.⁵ B30B 5/06
U.S. Cl. 264—37 14 Claims



1. A method for continuously manufacturing wood chip boards and wood fiber boards composed of particles bonded by a bonding agent, which together form a main filling cured under heat and pressure in a double-belt press having a pressing zone formed between a metal bottom belt for forming the bottom surface of the board material and a metal top belt for forming the top surface of the board material, and a support structure for pressing the belts together wherein the bottom and top metal forming belts rotate in opposite directions to carry particles fed into the double-belt press through the pressing zone, said method comprising the steps of:

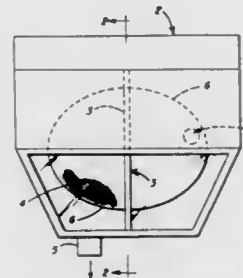
- spreading the main filling on a horizontal portion of the bottom forming belt;
- spreading an edge filling formed from unbonded particles on an edge portion of the bottom forming belt such that the edge filling extends from at least one edge of the main filling to at least one edge region of the bottom forming belt; and
- transmitting the necessary heat and pressure from the support structure through the bottom and top forming belts to cure the main filling and form a web from which the board materials are made by compressing the main filling and edge filling between the support structure and the bottom and top forming belts.

5,085,813 **DUST FREE PAN GRANULATOR AND METHOD OF OPERATION**

Terry L. Corbett, Blue Springs, Mo., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 15, 1990, Ser. No. 538,638
Int. Cl.⁵ B29C 67/02

U.S. Cl. 264—117 4 Claims



1. A granulating device comprising a rotatable pan in which

a dust barrier which is a sheet is positioned in the pan and extends from top to bottom down the middle of the pan in a manner such that the pan is divided into two sections, an inlet through which material to be granulated may be introduced into one of the sections of the pan, a discharge outlet from the other section of the pan and a ventilation device positioned over the section of the pan in which the inlet is located in a manner such that dust present in that section is prevented from entering the other section of the granulator.

3. A granulation process in which

(a) a solid material which is to be granulated is fed to a device comprising:

- a rotatable pan in which a dust barrier which is a sheet is positioned in the pan and extends from top to bottom down the middle of the pan in a manner such that the pan is divided into two sections,
- an inlet through which the material to be granulated is introduced into one of the sections of the pan,
- a discharge outlet from the other section of the pan and
- a ventilation device positioned over the section of the pan in which the inlet is located in a manner such that dust present in that section is prevented from entering the other section of the granulator, and

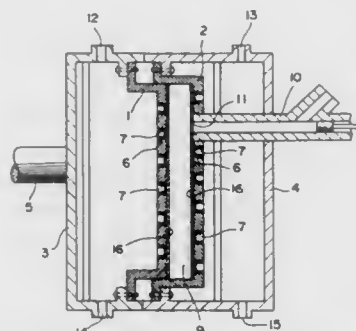
(b) the granulated material is collected therefrom.

5,085,814 **PRODUCTION PROCESS OF EXPANSION-MOLDED ARTICLE**

Makoto Kamiyama; Shigeo Nakada, both of Kanuma; Kouji Ikeda, Utsunomiya; Hiroshi Usui; Kazutoshi Sasaki, both of Kanuma, and Hiroshi Yamamoto, Utsunomiya, all of Japan, assignors to JSP Corporation, Tokyo, Japan

Filed Dec. 19, 1990, Ser. No. 631,094
Claims priority, application Japan, Dec. 21, 1989, 1-331700; Aug. 23, 1990, 2-222122

Int. Cl.⁵ B29C 35/06, 33/04
U.S. Cl. 264—126 13 Claims

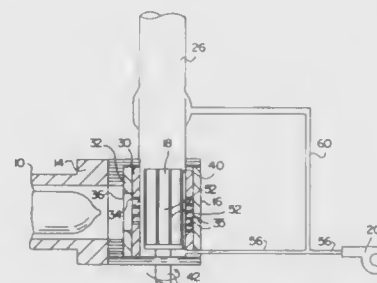


1. A process for producing an expansion-molded article by filling prefoamed thermoplastic particles in a mold cavity formed in combination of mold sections through each of which plural heating medium holes are defined, and then feeding a heating medium through the holes to heat and fusion-bond the particles into the article conforming with the mold cavity, wherein each of the mold sections is covered by a permeable porous sheet having an average pore size of from about 10 Å to 100 nm, at least over the heating medium holes on a side of the mold cavity.

5,085,815 **PROCESS OF RECOVERING AND CONVEYING SHAPED POLYMER EXTRUDATE**

Richard C. Yeh, Westfield, and Shiaw T. Ju, Edison, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 26, 1989, Ser. No. 456,807
Int. Cl.⁵ B29B 9/00; B29C 47/00
U.S. Cl. 264—142 14 Claims



1. A method of recovering and conveying shaped polymer extrudate comprising the steps of extruding a polymer containing water in an extruder; passing the extruded polymer through a die sleeve to dewater the extruded polymer,

said die sleeve including a cylindrical surface and a plurality of die openings of non-circular derived cross-sectional configuration formed in said cylindrical surface through which the extruded polymer is passed; cutting the dewatered polymer with a rotatable cutter mounted concentrically in said die sleeve, said cutter including a body having a cylindrical surface, an open interior, a plurality of cutting openings formed in said cutter cylindrical surface communicating with said cutter open interior to define cutting blades for cutting the dewatered polymer and at least one opening in said body in communication with said open interior for receiving a flow of gas; and causing gas to flow through said opening into said open interior to carry the cut dewatered polymer away from said cutter.

5,085,816 **PROCESS FOR PREPARING LAMINAR ARTICLES FROM A MIXTURE OF A POLYOLEFIN AND ETHYLENE/VINYL ALCOHOL COPOLYMERS**

Elizabeth F. McCord, Yorklyn, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 351,921, May 15, 1989, Pat. No. 4,971,864.
This application Aug. 9, 1990, Ser. No. 564,146
Int. Cl.⁵ B29C 49/04, 49/22

U.S. Cl. 264—171 18 Claims
1. A process for manufacturing a laminar, shaped article of polymeric material comprising the steps of:

- establishing a melted, heterogeneous blend of polyolefin, an ethylene-vinyl alcohol copolymer containing about 20-60% by weight of ethylene units and having a melting point at least about 5° C. higher than the polyolefin, and a compatibilizer comprising a polyolefin backbone having grafted thereon cyclic anhydride moieties, in an amount such that the carbonyl content of the compatibilizer is about 0.3-4.0% by weight, said polyolefin backbone prior to grafting being miscible with said polyolefin, the quantity of said compatibilizer in the blend being such that the ratio of the weight of carbonyl groups to the weight of the ethylenevinyl alcohol copolymer is about 0.0014:1 to about 0.006:1;
- extending a body of the melt; and
- cooling the extended body to below the melting point of the polyolefin.

5,085,817 **PROCESS FOR PREPARING A METALLIZED POLYETHYLENE PLEXFILAMENTARY FILM-FIBRIL SHEET**

David C. Jones, Midlothian, and Chi-Chang Lee, Richmond, both of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 610,760, Nov. 8, 1990, Pat. No. 5,057,351, which is a division of Ser. No. 377,682, Jul. 10, 1989, Pat. No. 4,999,222. This application Jul. 23, 1991, Ser. No. 734,767
Int. Cl.⁵ B29C 67/20 5 Claims

U.S. Cl. 264—175 5 Claims
1. A process for preparing a high gloss polyethylene plexifilamentary film-fibril sheet comprising:

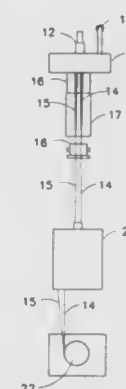
- hot calendering a polyethylene plexifilamentary film-fibril sheet to a specular gloss on at least one side of at least 28 percent by passing the sheet through a nip, with a pressure of at least 18 kilograms per centimeter, wherein a first roll in the nip is a metal roll with a surface smoothness of no greater than 5 rms micro-inch and is maintained at a temperature sufficient to heat a surface of the sheet to between 0° to 8° C. below the melting point of the polyethylene sheet and a second roll in the nip has a 70 Shore A durometer hardness or less.

5,085,818 **PROCESS FOR DIMENSIONALLY STABLE POLYESTER YARN**

Maxwell C. Hamlyn, Cary; Thomas H. Luck, Sanford, both of N.C., and Charles J. Nelson, Chesterfield, Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 292,864, Jan. 3, 1989, abandoned. This application Jun. 26, 1990, Ser. No. 545,321
Int. Cl.⁵ D01F 6/62 24 Claims

U.S. Cl. 264—210.6 24 Claims



1. A process for production of a dimensionally stable drawn polyethylene terephthalate multifilament yarn having filaments of at least 2.5 denier per filament comprising the steps of:

- extruding a polyethylene terephthalate polymer melt through a spinnerette having a plurality of extrusion orifices to form filaments, said extrusion orifices having a diameter D of less than 0.055 inches;
- advancing the extruded multifilament yarn first through a delay zone then through a quenching zone to solidify the filaments in a controlled manner;
- withdrawing the solidified multifilament yarn from the quenching zone at a desired spinning speed V; whereby steps a) through c) are performed under conditions to form a partially-oriented multifilament yarn having an undrawn birefringence (Δn_u) of at least 0.020 and wherein $\Delta n_u = R/V^{2.0}IV^{2.4}$ where IV is the intrinsic viscosity of the undrawn yarn and is at least 0.80 and R is at least 9.0×10^{-3} ; then
- hot drawing the partially-oriented multifilament yarn.

5,085,819

HEAT-RESISTANT RESIN COMPOSITIONS, AND HEAT-RESISTANT MOLDED OR FORMED ARTICLES AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yukio Ichikawa; Yo Iizuka, all of Iwaki; Makoto Fukuda, Kasukabe; Toshio Enoki, Iwaki; Katto Takayuki, Iwaki; Yasuo Sakaguchi, Iwaki, and Zenya Shiiki, Iwaki, all of Japan, assignors to Kureha Kabaku Kogyo K.K., Japan
Division of Ser. No. 194,016, May 12, 1988, Pat. No. 4,895,893.
This application May 19, 1989, Ser. No. 354,043
Claims priority, application Japan, May 15, 1987, 62-118619; May 7, 1988, 63-109921

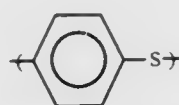
Int. Cl.⁵ B29C 45/00

U.S. Cl. 264—235

6 Claims

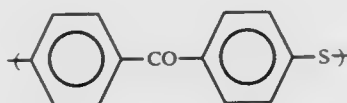
1. A method for the production of a heat-resistant article, comprising injection-molding a resin composition using a cylinder temperature of 270° to 400° C., a mold temperature of 50° to 250° C., an injection holding pressure of 10 to 5000 kg/cm² and an injection molding cycle of 1 to 600 seconds and optionally, annealing the thus-molded product at 120° to 250° C. for 10 to 600 minutes, said resin composition formed by mixing:

(A) 100 parts by weight of a poly(arylene sulfide) of a substantially linear structure containing 50% by weight or higher of recurring units of the formula:



and having a logarithmic viscosity number of 0.1 to 1.0 dl/g in a 1-chloronaphthalene solution at a polymer solution of 0.4 g/dl and a temperature of 208° C.;

(B) from a lower limit of 0.01 to an upper limit of less than 25 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula:



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, T_m being 310°–380° C.;
(b) residual melt crystallization enthalpy, ΔH_{mc} (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, T_{mc} (420° C./10 min) being at least 210° C., wherein ΔH_{mc} (420° C./10 min) and T_{mc} (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min, and then held at 420° C. for 10 minutes; and

(c) reduced viscosity being 0.2 to 2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 wt. % sulfuric acid; and

(C) at least one filler selected from the group consisting of fibrous fillers and inorganic nonfibrous fillers in a proportion of 0 to 400 parts by weight per 100 parts by weight of said poly(arylene sulfide) and said poly(arylene thioether-ketone).

5,085,820

METHOD OF CONSTRUCTING TUBULAR SPARS

Ian C. Howlett, Chestnut Cottage, Beaulieu, Hampshire S042 7YB, England

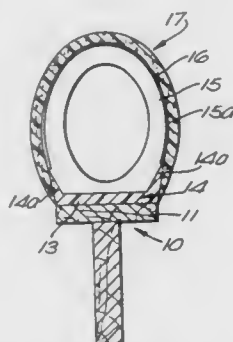
Filed Apr. 11, 1990, Ser. No. 508,144

Claims priority, application United Kingdom, Apr. 12, 1989, 8908279

Int. Cl.⁵ B29C 41/20, 43/20

U.S. Cl. 264—255

8 Claims



1. A method of constructing a tubular spar, comprising: placing at least one first layer of plastic material in a channel section mold, the channel section mold having a base and at least one wall section extending in a longitudinal direction, to form the at least one first layer of plastic material into a first part of a periphery of a tubular spar; allowing the first part of the periphery of the tubular spar to at least partly harden in the channel section mold against the base and against the at least one wall section; thereafter removing the at least one wall section from the base of the mold; placing a plurality of longitudinally spaced formers against the first part of the periphery of the tubular spar; placing a sheet-like skin over the formers; securing the skin to the formers; and thereafter placing at least one second layer of plastic material into contact with the skin to form a second remaining part of the periphery of the tubular spar to complete the tubular spar.

5,085,821

PREPARATION OF MULTI-LAYER DRAWN POLYESTER BOTTLES

Shigezo Nohara, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 910,794, Sep. 22, 1986, abandoned, which is a continuation of Ser. No. 604,472, Apr. 27, 1984, abandoned. This application Nov. 18, 1988, Ser. No. 273,726

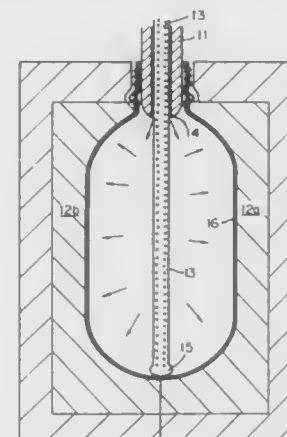
Claims priority, application Japan, Apr. 28, 1983, 58-73893
Int. Cl.⁵ B29C 49/22

U.S. Cl. 264—515

14 Claims

1. A process for the preparation of a multi-layer polyester bottle, which comprises forming by co-extrusion, a multi-layer pipe of an ethylene-vinyl alcohol copolymer layer having an ethylene content lower than 50 mole % as an intermediate layer acting as a gas barrier resin layer, a polyester resin as inner and outer base layers and an adhesive layer interposed between the two resin layers, cutting the pipe into a predetermined length, heating one end of the cut pipe and pressing the heated end of the cut pipe by male and female molds having a cavity and projections corresponding to a bottom shape, thereby closing one end of the cut pipe by fusion bonding to form a bottom portion, forming the other end of the cut pipe into a neck portion having an opening on the top end and a fitted or screwed part on the periphery, pre-heating the so-obtained preform at a drawing temperature of 85° to 120° C. and blow-drawing the preform in the circumferential direction substantially simultaneously with drawing in the axial direction and at a draw ratio such that the draw ratio in the circumferen-

tial direction is higher than the draw ratio in the axial direction to form a multi-layer bottle, wherein the intermediate layer of the ethylene-vinyl alcohol copolymer is biaxially molecularly oriented so that the orientation coefficient (l) in the axial



direction of the bottle and the orientation coefficient (m) in the circumferential direction of the bottle, each being determined according to the polarized fluorimetry, satisfy such requirements that the value of l+m is at least 0.2 and the value of |l-m| is smaller than 0.1.

5,085,822

METHOD FOR STRETCH BLOW MOLDING AND UNIFORMLY COOLING A HOLLOW HEAT-RESISTANT

Shinichi Uehara; Kouichi Satou, and Seigo Baba, all of Ueda, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

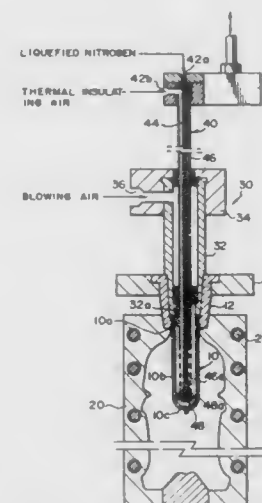
Filed Aug. 27, 1990, Ser. No. 572,407

Claims priority, application Japan, Aug. 31, 1989, 1-224853

Int. Cl.⁵ B29C 49/12, 49/58, 49/66

U.S. Cl. 264—528

8 Claims



1. A method for stretch blow molding a preform into a hollow container having a heat-resistant property, comprising the steps of:

positioning the preform in place within a heated blow mold; biaxially stretching and blow molding said preform into said hollow container by longitudinally stretching said preform under the action of a stretching rod moved forwardly while causing a forward end of said stretching rod to engage the internal bottom of said preform and by transversely stretching said preform under the action of blowing fluid blown out from a blow core located within the neck portion of said preform; holding said hollow container within said blow mold under

a blowing pressure and heat setting said hollow container by maintaining said hollow container heated for a predetermined period of time;

cooling said hollow container, which has been heat set, by a cooling medium blown out from the forward end of said stretching rod at least during backward movement of said stretching rod away from the internal bottom of said reform; and

thereafter removing said hollow container from said blow mold.

5,085,823

LATCH ASSEMBLY FOR A CONTROL ROD DRIVE

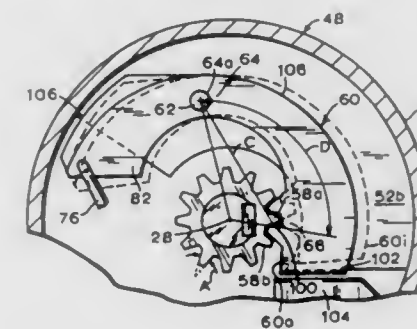
Edward Y. Gibo, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Mar. 5, 1991, Ser. No. 664,740

Int. Cl.⁵ G21C 7/14

U.S. Cl. 376—232

10 Claims



1. A control rod drive for positioning a control rod in a nuclear reactor vessel comprising:

a shaft;
a ballnut positioned over said shaft and being translatable upon rotation of said shaft;
a piston disposed coaxially with said shaft and on said ballnut for positioning said control rod;
means for selectively rotating said shaft in a first direction and in a second direction, opposite to said first direction;
a housing surrounding a portion of said shaft;
a gear fixedly joined to said shaft, said gear having a plurality of circumferentially spaced gear teeth;
a latch arm pivotally joined to said housing, and having at least one latch tooth facing said gear teeth; and
means for selectively positioning said latch arm in an engaged position to abut said latch tooth against a first one of said gear teeth for preventing rotation of said shaft in said first direction, and in a disengaged position to space said latch tooth away from said gear teeth for allowing said shaft to rotate without obstruction between said gear teeth and latch tooth for translating said ballnut and in turn said piston for inserting and withdrawing said control rod in said reactor vessel.

5,085,824

NUCLEAR REFUELING PLATFORM DRIVE SYSTEM

Francis R. Busch, Morgan Hill, and David L. Faulstich, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jan. 31, 1991, Ser. No. 648,093

Int. Cl.⁵ G21C 19/00

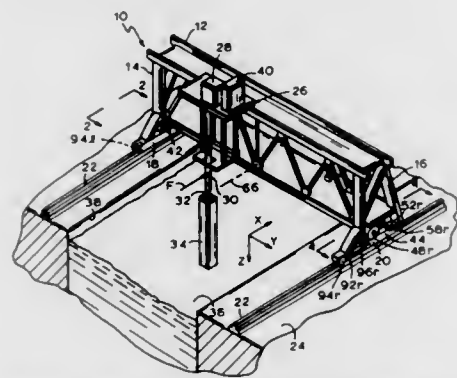
U.S. Cl. 376—268

14 Claims

1. A drive system comprising:
a gantry including a bridge having longitudinal and transverse axes and supported by spaced first and second end frames joined to first and second drive trucks for moving said bridge along said transverse axis;
first means for driving said first drive truck;

second means for driving said second drive truck being independent from said first driving means; and means for controlling said first and second driving means for reducing differential transverse travel between said first and second drive trucks, due to a skewing torque acting on said bridge, to less than a predetermined maximum, said controlling means being in the form of an electrical central processing unit and including:

a closed-loop first velocity control means for controlling velocity of said first drive truck by providing a first command signal to said first driving means;



a closed loop second velocity control means for controlling velocity of said second drive truck by providing a second command signal to said second driving means; and

an auxiliary closed-loop travel control means for sensing a difference in travel of said first and second drive trucks and for combining a travel error signal with at least one of said first and second command signals for changing velocity of a respective one of said first and second drive trucks for reducing said differential transverse travel between said first and second drive trucks to less than said predetermined maximum.

5,085,825

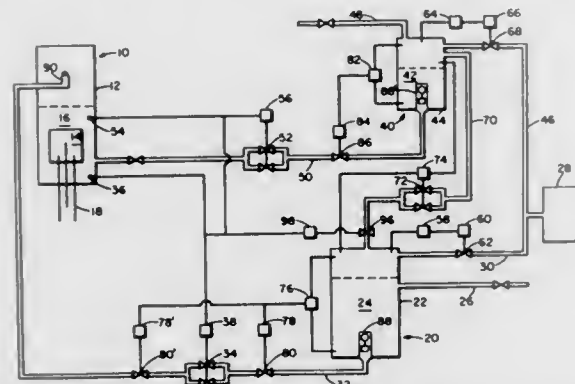
STANDBY SAFETY INJECTION SYSTEM FOR NUCLEAR REACTOR PLANTS

Douglas M. Glantz, and Mauro Cavaglione, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed May 3, 1991, Ser. No. 695,116
Int. Cl.⁵ G21C 9/02

U.S. Cl. 376-282

16 Claims



1. A multiple liquid standby safety injection system for nuclear reactor plants, comprising the combination of:

a nuclear reactor plant including a reactor pressure vessel containing a core of fissionable nuclear fuel;

a first water tank for containing cooling water and gas under pressure for propelling the water through an injection system including a valve controlled conduit making fluid

communication from said first tank to the nuclear reactor pressure vessel above the fuel core for supplying cooling water to the fissionable fuel during an emergency;

a second solution tank for containing a water solution of a soluble neutron absorbent compound and gas under high pressure for propelling the neutron absorbent water solution through an injection system including a valve controlled conduit making fluid communication from said second tank to the nuclear reactor pressure vessel for supplying neutron absorbent solution to the core of fissionable fuel during an emergency;

a source of high pressure compressed propelling gas having a valve controlled conduit making fluid communication therefrom to each of the first water tank and the second solution tank to provide pressurized gas to the tanks for propelling their contents through their respective injection systems into the nuclear reactor pressure vessel by means of their respective valve controlled conduits;

sensing means monitoring the nuclear reactor pressure vessel operating the valves controlling flow in the conduits making fluid communication between the first water tank and the pressure vessel, and between the second solution tank and the pressure vessel; and

a propellant pressurized gas supply and distribution system comprising a fluid conveying conduit having a flow controlling valve making fluid communication between the first water tank and the second solution tank and having pressure monitoring and sensing means in both the first water tank and second solution tank for regulating an actuating mechanism operating the flow controlling valve whereby fluid flow of pressurized gas between the first water tank and the second solution tank is determined by their relative pressures.

5,085,826

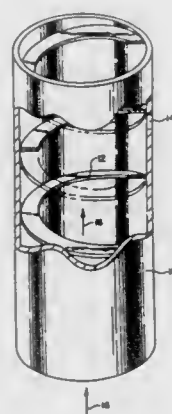
STEAM DRYER

Willem J. Oosterkamp, Los Gatos, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Dec. 20, 1990, Ser. No. 633,750
Int. Cl.⁵ G21C 15/16

U.S. Cl. 376-371

5 Claims



1. A separator for dividing a steam/water mixture into its liquid and steam components, comprising a pipe having an empty central portion and an annular spiral strip which is attached to its inside wall, said pipe having ports for removal of liquid water divided from said mixture.

5,085,827

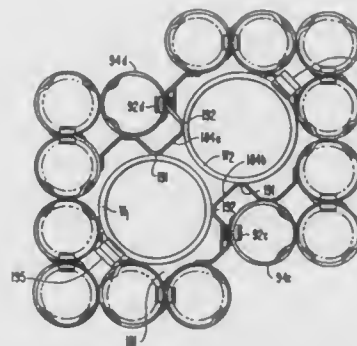
NUCLEAR FUEL ASSEMBLY SPACER AND LOOP SPRING WITH ENHANCED FLEXIBILITY

Eric B. Johansson; Gerald M. Latter, and Michael V. Curulla, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 457,447, Dec. 27, 1989. This application
Feb. 6, 1991, Ser. No. 652,340
Int. Cl.⁵ G21C 3/32

U.S. Cl. 376-444

3 Claims

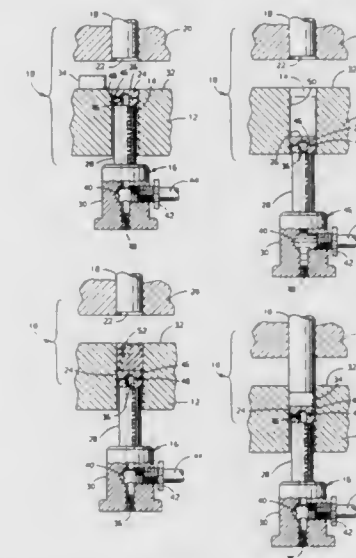


1. In a fuel bundle having a surrounding channel, an upper tie plate, a lower tie plate, a plurality of fuel rods and a pair of water rods, wherein said fuel rods are arranged in a matrix and positioned in parallel upstanding relation to one another between said upper and lower tie plates, said pair of water rods are arranged side-by-side and positioned centrally of said fuel bundle such that said water rod pair occupies seven matrix positions centrally of said matrix, said pair including a first water rod occupying a first three positions in said matrix and part of a fourth position, the second water rod of said water rod pair occupying a second three positions in said matrix and part of said fourth position, a system for the securing of the paired water rods comprising in combination;

first and second U-shaped spacers, each spacer having a portion that extends between said water rods, each portion bearing against each water rod to maintain the water rods in spaced relationship; and

means for biasing said water rods against said U-shaped spacers.

part of generally self-sustaining strength and a density of about five grams per cubic centimeter or higher,



the improvement where the solid lubricant is applied as a suspension of solid lubricant particles in a volatile, chlorine-free, fluorinated hydrocarbon liquid.

5,085,829

OXIDATION RESISTANT FE-CR-AL STEEL

Kazuhide Ishii, Shimizu; Hiroshi, and Tatsuo Kawasaki, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Dec. 21, 1990, Ser. No. 632,058
Claims priority, application Japan, Dec. 25, 1989, 1-332632;
Feb. 23, 1990, 2-41101

Int. Cl.⁵ C22C 38/06, 38/18

U.S. Cl. 420-79

2 Claims

1. An oxidation-resistant Fe-Cr-Al steel comprising: u to but not more than about 0.05 wt% of C; from about 0.1 wt% to about 1.0 wt% of Si; up to but not more than about 1.0 wt% of Mn; from about 3.0 to 7.5 wt% of Cr; from about 4.5 to 6.5 wt% of Al; up to but not more than about 0.05 wt% of N; one or more elements selected from the group consisting of 1), from about 0.01 wt% to 0.3 wt% of Zr, 2), from about 0.01 wt% to 0.03 wt% of Ti, and 3), from about 0.001 wt% to 0.2 wt%, expressed as a total, of Y, La, Ce, Pr, Nd and Hf; and the balance substantially Fe and incidental inclusions.

5,085,828

COLD PRESS DIE LUBRICATION METHOD

Jon C. Shain, Anderson, and James W. Herchenroeder, Fishers, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 15, 1991, Ser. No. 700,744
Int. Cl.⁵ G22F 1/00

U.S. Cl. 419-66

4 Claims

1. In the method of cold pressing a rare earth element-containing alloy powder of RE₂TM₁₄B precursor composition into a compacted body, preparatory to a hot working operation on the compacted body, utilizing an open-to-the-air press of the type comprising at least one die member defining a material-receiving die cavity with a die wall and opposing pressing members, at least one of which is adapted to move reciprocally in the die cavity, to compress material placed there, said method comprising

applying a solid lubricant film to the cavity-defining wall which is at substantially ambient temperature,

charging a predetermined quantity of a lubricant- and binder-free rare earth element-containing alloy powder to the lubricated cavity,

consolidating the powder in the die cavity by pressing member action at ambient temperature to form a green com-

5,085,830

PROCESS FOR MAKING ALUMINUM-LITHIUM ALLOYS OF HIGH TOUGHNESS

Donald Webster, Saratoga, Calif., assignor to Comalco Aluminum Limited, Melbourne, Australia

Filed Mar. 24, 1989, Ser. No. 328,364
Int. Cl.⁵ C22C 1/02

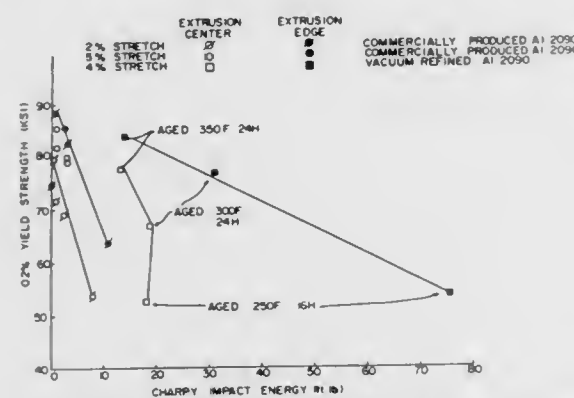
U.S. Cl. 420-528

14 Claims

1. A process for preparing a high strength high toughness aluminum alloy, comprising the steps of:

heating a melt comprised of an aluminum base metal and lithium including at least 1 ppm of an alkali metal impurity selected from the group consisting of sodium, potassium,

rubidium and cesium, to a temperature greater than the melting point of the alloy;



and refining the alloy in a vacuum for a sufficient time to reduce each alkali metal impurity to a concentration less than about 1.0 ppm.

5,085,831
APPARATUS FOR CONTINUALLY AND AUTOMATICALLY MEASURING THE LEVEL OF A WATER TREATMENT PRODUCT IN BOILER FEEDWATER

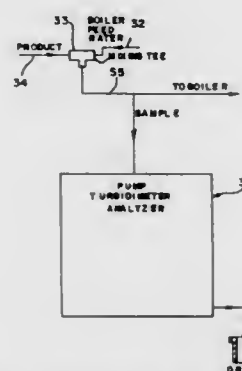
James J. Hickey, Palos Heights, Ill., and William L. Adamson, Olympia, Wash., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 422,566, Oct. 17, 1989, abandoned.

This application Mar. 15, 1991, Ser. No. 670,491

Int. Cl.⁵ G01N 21/83

U.S. Cl. 422—62



1. Apparatus for continuously and automatically measuring the level of a water treatment product in boiler feedwater by taking a sample from a boiler feedwater line and developing turbidity in the sample and measuring the turbidity, wherein the product includes a copolymer of acrylamide and acrylate and a copolymer of acrylic acid and sodium vinyl sulphonate and is added to the feedwater for treating hardness and scale formable on heat transfer surfaces, said apparatus comprising,

a photometer comprising a measuring cell in a cylinder constructed so as to receive the sample to be photometrically measured for turbidity, said cell comprising an inlet and an outlet and a piston received in the cylinder, said piston being positioned and arranged so as to be movable in the cylinder through intake and discharge strokes, wherein the intake stroke loads the cell with a portion of the just measured reacted sample and a portion of new reacted sample,

a reagent supply means containing a reagent that will only react with the total acrylate component of the product in the feedwater sample to produce a turbidity as a measure of the level of product in the feedwater,

a sample inlet line for connecting to the boiler feedwater line,

a reagent inlet line connected to the reagent supply means, metering pump means comprising inlets and outlets with the inlets connected to the sample and reagent inlet lines so as to provide the required volume of sample to reagent,

a pinch valve having upper and lower oppositely working pinch members constructed so as to pinch lines to control flow direction in the lines, said sample and reagent inlet lines extending through one of the upper or lower pinch members of the pinch valve to said metering pump means, means for mixing the sample and reagent to form a reacted sample to be measured for turbidity, said sample and reagent inlet lines exiting from the pump means outlets and extending through the other of said upper or lower pinch members of said pinch valve to said mixing means, a reacted sample outlet line extending from the mixing means connected directly to the inlet of the measuring cell, the outlet of the cell being connected directly to a drain line, said drain line constructed so as to prevent the leakage of any air bubbles back into the cell,

and means driving the pinch valve, the metering pump means, and the piston in the cylinder in timed relation, whereby the pinch valve opens the lines in the upper pinch member while closing the lines in the lower pinch member and opens the lines in the lower pinch member when closing the lines in the upper pinch member, and said driving means sequentially drives said pinch valve and said metering pump means to provide controlled flow of sample, reagent and reacted sample through the lines to the cell.

5,085,832
DISPENSING MECHANISM

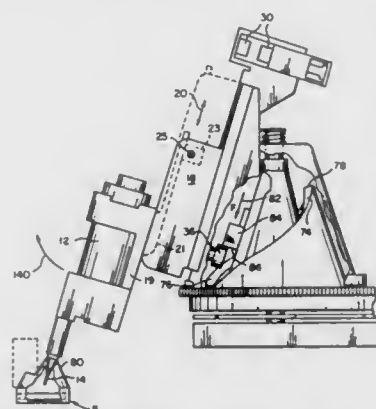
James D. Shaw, Hilton, and Nicholas Want, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 556,692, Jul. 20, 1990, abandoned. This application Jul. 5, 1991, Ser. No. 726,138

Int. Cl.⁵ G01N 35/00

U.S. Cl. 422—63

9 Claims



1. In a liquid dispensing mechanism for use in an analyzer and comprising a pump, a tip support on said pump for holding a liquid-containing tip, means for moving said pump and said tip support vertically and rotationally between at least two operative positions in which liquid is either aspirated into a tip or dispensed from a tip on said tip support, and inoperative positions above and between said operative positions, said moving means including a rotatable three-dimensional cam, a cam follower mounted to move on said cam, and means for rotating said cam about a vertical axis between said at least two operative positions in response to command signals,

the improvement wherein said moving means further includes a carrier mounted over and surrounding said cam, said pump being slidably mounted for reciprocation on said carrier and attached to said cam follower, said carrier

having a slot therein constructed to permit passage through said carrier of said pump cam follower to said cam, said slot extending in a direction that falls in a plane through said axis of rotation, means for frictionally coupling said carrier to said cam to rotate with said cam, and means for limiting the rotation of said carrier but not said cam between two circumferential positions on said cam that correspond to said at least two operative positions, to force said cam follower to move relative to said cam.

5,085,833
LIQUID DRAIN TRAP DEVICE

Yukio Mitsuhashi, Yokohama, Japan, assignor to Tosoh Corporation, Yamaguchi, Japan

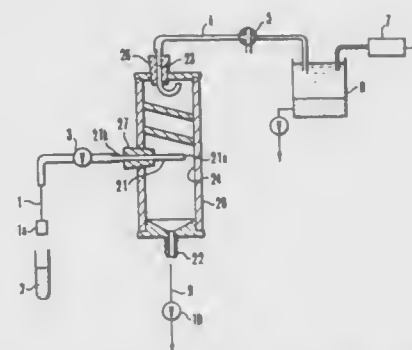
Filed Sep. 12, 1988, Ser. No. 243,347

Claims priority, application Japan, Sep. 11, 1987, 62-227755

Int. Cl.⁵ B01D 19/02

U.S. Cl. 422—99

4 Claims



1. A negative-pressure relay type liquid drain trap device for use in a biochemical analysis system, said trap comprising a vertically-elongated hollow container, a liquid drain pipe connected to the side wall of said container having an end section projecting into the interior of said container and negative-pressure suction means provided in an upper side of said container so as to maintain the interior of said container under a negative pressure and exert a suction force to drain a liquid from another container through said pipe into the container, said liquid drain pipe being made of fluorine resin material at least at said end section projecting into the interior of said container so as to substantially prevent the formation of foam in the liquid being drained through said pipe.

5,085,834
METHOD FOR SEPARATING BY USING CROWN COMPOUNDS PLUTONIUM FROM URANIUM AND FROM FISSION PRODUCTS IN THE INITIAL STAGES FOR THE REPROCESSING OF IRRADIATED NUCLEAR FUELS

Marc Lemalre, Villeurbanne; Alain Guy, Pontcarre; Jacques Foos, Orsay; Rodolphe Chomel, Orange; Pierre Dautreuiligne, Bagnols/Seze; Thierry Moutarde, Piolenc; Vincent Guyon, Paris, and Henri Le Roy, Equeurdreville, all of France, assignors to Cogema-Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, France

Filed Dec. 11, 1990, Ser. No. 625,551

Claims priority, application France, Dec. 15, 1989, 89 16636; Dec. 15, 1989, 89 16638

Int. Cl.⁵ B01D 11/00

U.S. Cl. 423—8

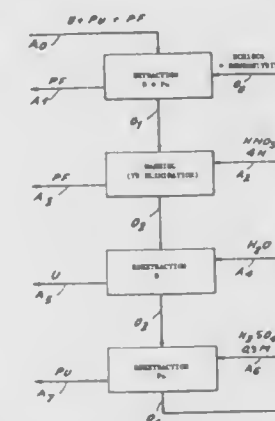
18 Claims

1. Method to separate plutonium (IV) from uranium and fission products present in an aqueous solution AO obtained when reprocessing irradiated nuclear fuel elements and containing almost all the plutonium derived from these elements, wherein it includes the following successive stages:

1) placing the aqueous solution AO in contact with an organic solution O₀ including at least one crown compound so as to obtain an organic solution O1 containing uranium

and plutonium, and an aqueous solution A1 containing fission products,

2) re-extracting the uranium extracted from the organic solution O1 by placing the solution O1 in contact with an aqueous solution A4 constituted by water or a nitric aque-



ous solution so as to obtain an aqueous solution A5 containing uranium and an organic solution O3 containing plutonium, and

3) recovering the plutonium present in the organic solution O3 by placing the solution in contact with an aqueous solution A6 of a hydrophilic acid.

5,085,835
PROCESS FOR RECOVERING RHODIUM
Jürgen Weber, Oberhausen; Ludger Bexten, Hünxe; Dieter Kupies, Duisburg; Peter Lappe, Dinslaken, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 409,119, Sep. 19, 1989, abandoned. This application Aug. 20, 1991, Ser. No. 750,709
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833427

Int. Cl.⁵ C22B 3/26

U.S. Cl. 423—22

69 Claims

1. A process for recovering rhodium from an aqueous solution containing rhodium complex compounds, said method comprising oxidizing said solution in the presence of an excess, based on said rhodium, of a water-soluble carboxylic acid salt of a carboxylic acid having 7 to 22 carbon atoms, and separating the rhodium as a water-insoluble compound, oxidizing said aqueous solution at 20° to 120° C. with a first oxidant comprising hydrogen peroxide or a substance forming hydrogen peroxide and with a second oxidant comprising oxygen or an oxygen-containing gas.

5,085,836
PROCESS FOR DESILVERING SILVER HALIDE PROCESSING FLUIDS
Barbara T. Booker, Spartanburg, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 3, 1990, Ser. No. 620,890
Int. Cl.⁵ C22D 11/04

U.S. Cl. 423—34

6 Claims

1. A method to remove trace amounts of dissolved silver from a silver halide waste processing fluid having thiosulfate contained therein comprising the following steps:

- adding sufficient acid to reduce the pH of said fluid to a range of from 2.3 to 2.6;
- adding sufficient powdered iron to reduce substantially all the trace, dissolved silver to silver solids;
- increasing said pH to a range of from 7 to 8.5.

5,085,837

METHOD FOR PURIFYING TiO₂ ORE BY ALTERNATE LEACHING WITH AN AQUEOUS SOLUTION OF AN ALKALI METAL COMPOUND AND AN AQUEOUS SOLUTION OF MINERAL ACID

Tze Chao, Newark, and George H. Senkler, Jr., Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 225,432, Jul. 28, 1988, Pat. No. 5,011,666.

This application Dec. 27, 1990, Ser. No. 634,792

Int. Cl.⁵ C22B 34/10

U.S. Cl. 423—82

26 Claims

1. Process for purifying TiO₂ ore containing impurities of iron, alkali metal, alkaline earth metal, rare earth metal, aluminum, phosphorus, thorium, uranium, chromium, manganese, silicon, vanadium, and yttrium, said process consisting essentially of subjecting the ore to two or more leaching treatments, said leaching treatments:

- alternating between use of an aqueous solution of a mineral acid and an aqueous solution of an alkali metal compound selected from the group consisting essentially of alkali metal carbonates, hydroxides or mixtures thereof, and wherein the treatment with an aqueous solution of an alkali metal carbonate occurs first, and
- being conducted at a temperature, pressure, and time, and with an amount and concentration of an aqueous solution of a mineral acid and an aqueous solution of an alkali metal compound, which are sufficient to solubilize substantially the iron, alkali metal, alkaline earth metal, rare earth metal, aluminum, phosphorus, thorium, uranium, chromium, manganese, silicon, vanadium, and yttrium impurities present to form a leachate, and wherein the leachate formed is removed prior to the next leaching treatment.

5,085,838

THERMAL MODIFICATION OF ASBESTOS

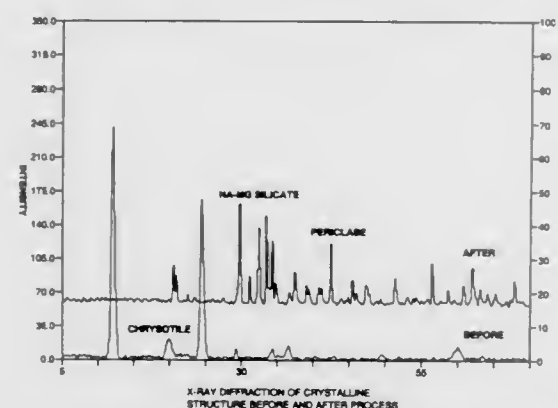
Glenn M. Mason, Laramie, Wyo., assignor to Western Research Institute, Laramie, Wyo.

Continuation-in-part of Ser. No. 356,893, May 25, 1989, abandoned. This application Jul. 19, 1990, Ser. No. 554,488

Int. Cl.⁵ C01B 33/24; B09B 3/00; A62D 3/00

U.S. Cl. 423—167

6 Claims



1. A method for converting asbestos to a nonhazardous form comprising:

mixing said asbestos with a sufficient amount of flux selected from the group consisting of trona, sodium oxide, sodium carbonate, sodium phosphate, sodium bicarbonate, borax and mixture thereof; and heating within the temperature range of about 815° to about 1000° C. until said asbestos reacts with said flux to form a different crystalline structure containing sodium.

5,085,839

APPARATUS FOR THE PREVENTION OF ACID GAS EXCURSIONS

David E. Scott, Phillip Celaya, both of Houston; Brent A. McCune, Seabrook, and Tom A. Wellborn, Houston, all of Tex., assignors to Lyondell Petrochemical Company, Houston, Tex.

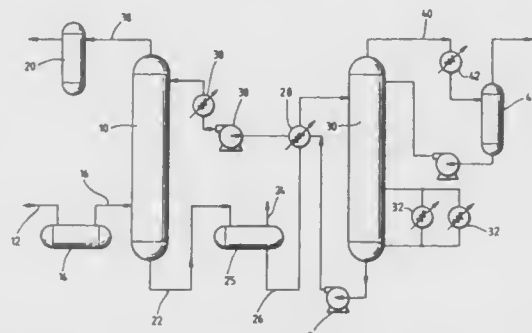
Continuation of Ser. No. 461,613, Jan. 8, 1990, abandoned.

This application Apr. 23, 1991, Ser. No. 690,380

Int. Cl.⁵ C01B 17/16, 31/20

U.S. Cl. 423—210

16 Claims



1. A process for reducing the concentration of an acid gas component of a gas stream comprising:

- countercurrently contacting a gas stream containing an acid gas with a stream of an aqueous amine in a vessel under conditions to create an exothermic zone of reaction within the vessel;
- monitoring the temperature within said vessel at each of at least three separate points spaced along the vessel to detect the location of said zone in said vessel; and
- controlling the flow of the amine relative to the gas in said vessel in response to the temperature monitored at said points to maintain a temperature profile along said zone such that the temperature proximate the middle of said zone is higher than the temperatures at the ends of said zone.

5,085,840

PROCESS FOR THE REDUCTION OF NITROGEN OXIDES CONTAINED IN EXHAUST GASES

Wolfgang Held, Axel König, both of Wolfsburg, and Lothar Puppe, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1991, Ser. No. 646,815

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1990, 4003515

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

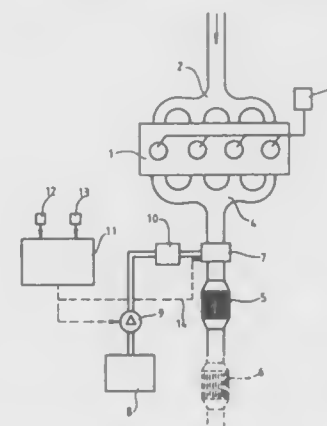
Int. Cl.⁵ B01D 47/00; B01J 8/00; C01B 21/00

U.S. Cl. 423—212

4 Claims

1. In an improved process for the reduction of nitrogen oxides in engine exhaust gases under oxidizing conditions by contacting the gases with urea and a zeolite catalyst,

the improvement comprises contacting the gases with a zeolitic catalyst containing 0.1 to 20% by weight of oxides



of the transition elements of Periods 4, 5 and 6 of the Periodic Table of Elements or oxides of the rare earths.

5,085,841

METHOD FOR REDUCTION OF POLLUTION FROM COMBUSTION CHAMBERS

Barnett J. Robinson, 501 Boylston St., Brookline, Mass. 02146

Filed Jul. 13, 1990, Ser. No. 553,436

Int. Cl.⁵ B01J 8/02; C01B 21/00, 17/10

U.S. Cl. 423—213.5

6 Claims

1. A method for reducing pollution emitted from combustion chambers during a combustion in air of a carbonaceous fuel, the method comprising a step of introducing a mixture of precious metals including platinum, rhodium and rhenium to the flame zone of combustion chambers homogeneously, wherein said mixture contains not more than 15 mg of said metals per 24 kg of fuel, said mixture is borne by gases in the flame zone during a combustion of the fuel for simultaneously enhancing oxidation of carbon of the fuel and inhibiting oxidation of nitrogen of the air, and said mixture contains 1–9 mg platinum, 0.3–3 mg rhodium and 0.3–3 mg rhenium.

5,085,842

PROCESS FOR SCAVENGING HYDROGEN SULFIDE USING GLYOXAL

Christoph Porz, Bonn; Bernd Christensen, Liederbach; Elena Kyaw-Naing, Schwalbach; Walter Gulden, Hofheim am Taunus, and Erich F. Paulus, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 23, 1991, Ser. No. 644,843

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002132

Int. Cl.⁵ B01D 53/14; C07C 7/11

U.S. Cl. 423—226

11 Claims

1. A purification process for crude natural gas, crude petroleum gas, or synthesis gas containing hydrogen sulfide, which comprises introducing a said hydrogen sulfide-containing gas into an aqueous glyoxal solution of at least 15% by weight strength, a solid precipitated reaction product binding the hydrogen sulfide being obtained and a cleaned gas stream being recovered.

5,085,843

METHOD OF DESULPHURIZING HOT WASTE GAS

Stig Rasmussen, Gadstrup; Bjarne Rasmussen, Copenhagen, and Karsten S. Felsvang, Allerød, all of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

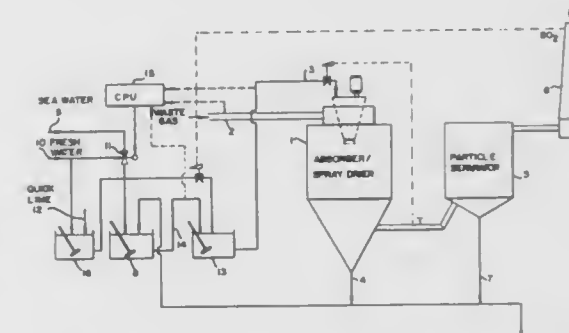
Filed Jul. 16, 1990, Ser. No. 552,645

Claims priority, application Denmark, Jul. 17, 1989, 3519/89

Int. Cl.⁵ C01B 17/05

U.S. Cl. 423—242

8 Claims



1. In the method of desulfurizing hot waste gas, containing acid components comprising at least sulfur oxides, by a spray drying, absorption process comprising:

- contacting an absorbent suspension of more than the stoichiometric required proportion of slaked lime and/or limestone absorbent in water, containing an effective amount of chloride, to promote the reaction between said slaked lime and/or limestone and sulfur oxides in said waste gas in a given amount of time at a prescribed temperature;
 - reacting said slaked lime and/or limestone in said suspension with said sulfur oxides in said waste gas, while substantially simultaneously spray drying said suspension by said hot waste gas to evaporate water from said absorbent suspension and to form a powdery product comprising a reaction product of said slaked lime and/or limestone and said sulfur oxides, which powdery product also contains chloride;
 - causing the temperature of gas, containing said powdery product, leaving said spray drying to be at a temperature of about 8° to 40° C. above its adiabatic saturation temperature, the differences in these temperatures being defined as ΔT;
 - separating at least a portion of said powdery product from said gas; and
 - recycling a portion of said powdery product to the formation of said absorbent suspension;
- the improvement, whereby substantially minimizing said ΔT, while also minimizing the excess of said absorbent exceeding stoichiometry with respect to the sulfur content of said waste gas which is required to remove substantially all of said sulfur content from said waste gas, which comprises, during said spray drying and reaction, at least intermittently:
- determining the chloride content (I) of said absorbent suspension;
 - determining said ΔT (II);
 - maintaining the chloride content of said suspension between greater than 0% and below about 7%;
 - adjusting at least one of (I) or (II), such that any changes in said chloride content and in said ΔT are in the same direction and are cumulatively sufficient to maximize the reaction of said acid components and said slaked lime and/or limestone, and to substantially avoid the formation of sticky, adhesive products.

5,085,844

SORPTION OF TRIALKYL ARSINES

Gerhard P. Nowack; Tin-Tack P. Cheung, both of Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 28, 1990, Ser. No. 619,166
Int. Cl.⁵ B01D 53/14; C07C 7/12

U.S. Cl. 423—245.1

22 Claims

12. A process for at least partially removing trialkyl arsines from gases comprising the step of contacting a gaseous feed which contains at least one trialkyl arsine with a solid sorbent material consisting essentially of (a) elemental sulfur and (b) an inorganic support material; wherein said contacting is carried out at such contacting conditions as to obtain a product having a lower trialkyl arsine content than said feed, and the spent sorbent material contains that portion of said at least one trialkyl arsine which has been removed from said feed; and wherein the content of said at least one trialkyl arsine in said feed is such as to provide a level of about 1 ppb to about 0.1 weight-% As.

5,085,845

PRODUCTION AND USE OF CRYSTALLINE HYDROGEN-PHOSPHATE COMPOUNDS HAVING LAYER STRUCTURE

Shiunkichi Ueda, Izumiotsu; Tomoe Suita, Ibaraki; Masahiko Murakami, Osaka, and Mitsutomo Tsubako, Nishinomiya, all of Japan, assignors to Tayca Corporation, Osaka, Japan

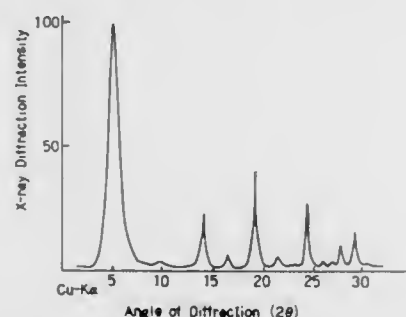
Filed Oct. 25, 1990, Ser. No. 603,051

Claims priority, application Japan, Nov. 2, 1989, 1-286684; May 16, 1990, 2-127814

Int. Cl.⁵ C01B 15/16, 25/26

U.S. Cl. 423—308

9 Claims



1. A process for preparing a crystalline layered hydrogen-phosphate which comprises reacting a tetravalent metal compound and a phosphoric acid source at an elevated temperature while introducing steam into the reaction system from outside the reaction system.

5,085,846

PROCESS FOR PRODUCING PHOSPHOROUS ACID
Edward J. Lowe, Stourbridge, and William S. Holmes, Wolverhampton, both of England, assignors to Albright & Wilson Limited, Oldbury, England

Filed Apr. 11, 1991, Ser. No. 685,460

Claims priority, application United Kingdom, Apr. 12, 1990, 9008406

Int. Cl.⁵ C01B 25/16

U.S. Cl. 423—316

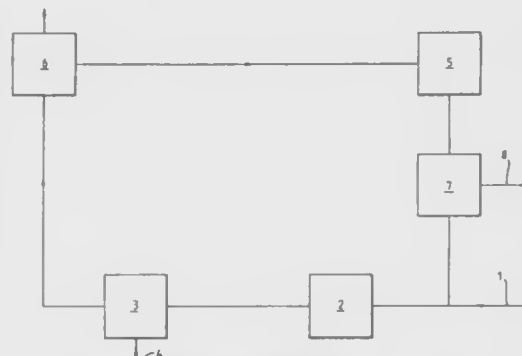
21 Claims

1. A process for the production of phosphorous acid by the reaction of phosphorus trichloride with a mixture of phosphorous acid and hydrochloric acid, said process consisting of the following steps:

- continuously recycling the mixture in a loop apparatus at a temperature in the range of 50° C. to 180° C.;
- adding water to and passing phosphorus trichloride into said recycling mixture so as to generate a condition of turbulent flow at the point of contact of the phosphorus trichloride and the recycling mixture, whereby a reaction product, comprising an aqueous solution of phosphorous

and hydrochloric acids as a continuous liquid phase and gaseous hydrogen chloride as gas bubbles of disperse phase, is produced, the amount of water added is sufficient to hydrolyze the phosphorus trichloride;

- separating said gaseous hydrogen chloride;



- cooling said reaction product; and
- recycling at least a portion of said reaction product and repeating steps (ii), (iii) and (iv) thereon to produce a more highly concentrated solution of phosphorus acid.

5,085,847

APPARATUS FOR PRODUCING A FAST DISSOLVING GRANULAR PRODUCT

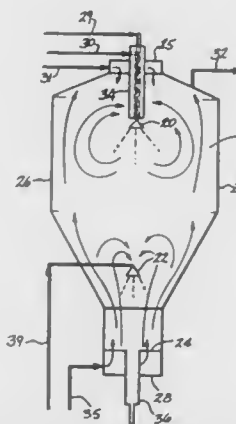
John H. Shaffer, Cleveland, and William L. Kurtz, Chattanooga, both of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed May 18, 1989, Ser. No. 353,571

Int. Cl.⁵ C01B 11/06

U.S. Cl. 423—474

30 Claims



1. A process for the production of calcium hypochlorite from hypochlorous acid comprising the steps of:

- mixing aqueous sodium hydroxide and gaseous chlorine to produce hypochlorous acid;
- mixing aqueous hypochlorous acid and lime to produce an aqueous calcium hypochlorite slurry;
- feeding the calcium hypochlorite in slurry form to a spray dryer to form granular particles by spraying generally downwardly atomized calcium hypochlorite into a cocurrent first drying gas air flow stream separate from the sprayed stream of atomized calcium hypochlorite to dry the atomized calcium hypochlorite;
- collecting the granular particles in a fluidized bed at the bottom of the dryer;
- forcing dust particles in the fluidized bed upwardly from the bed of granular particles into the generally downwardly sprayed atomized calcium hypochlorite to cause the dust particles to increase in size to minimize the dust in the bed of granular particles; and

- further drying the granular particles by forcing a second drying gas flow stream through the fluidized bed to obtain a final moisture content in the granular particles.

5,085,848

METHOD OF TREATING INFLAMMATORY DISEASES USING A RADIOLABELED FERRIC HYDROXIDE CALLOID

Robert W. Atcher, Chicago, and John J. Hines, Glen Ellyn, both of Ill., assignors to The United States of America as Represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 580,450, Sep. 11, 1990, Pat. No. 5,030,441.
This application Apr. 16, 1991, Ser. No. 685,763

Int. Cl.⁵ A61K 43/00

U.S. Cl. 424—1.1

2 Claims

1. A method of treating inflammatory diseases of the joints comprising administering to a host an effective amount of a ferric hydroxide colloid having an alpha emitting radionuclide essentially only on the outer surfaces thereof to the diseased joint.

5,085,849

D-LIMONENE CONTAINING SPACE OR ROOM AEROSOL DEODORANT

Dennis Sampson, Maplewood, and Robert M. Smith, Ballwin, both of Mo., assignors to Par-Way Group, Costa Mesa, Calif.

Filed Jul. 20, 1990, Ser. No. 556,361

Int. Cl.⁵ A61L 9/04

U.S. Cl. 424—45

16 Claims

1. A process for making a non-flammable, aerosol, d-Limonene composition comprising:
- preparing a pumpable aerosol concentrate having a viscosity under 500 cps by:
 - forming an oil phase by:
 - mixing a citrus oil distillate containing substantial amounts of d-Limonene in an amount of 60 to 70 parts by weight with 1.0 to 3.5 parts by weight of an emulsifier composed of polyethylene glycol nonylphenyl ether or petroleum sulfonic acid; forming a water phase by:
 - adding 20 to 30 parts by weight of water to a tank;
 - adjusting the pH of said water in said tank to between 8.5 and 10;
 - adding the oil phase to the water phase under vigorous mixing to form a low viscosity water-in-oil phase concentrate;
 - pumping said water-in-oil phase concentrate to a concentrate filler;
 - filling an aerosol can with the water-in-oil phase concentrate;
 - charging a alkane propellant to concentrate filled aerosol can in an amount of 25 to 40% by weight of the water-in-oil concentrate contained in the aerosol can;
 - maintaining the charged aerosol at room temperature for 12 to 24 hours prior to use so that a single phase non-flammable oil-in-water emulsion having high viscosity is found.

5,085,850

ANTI-PLAQUE COMPOSITIONS COMPRISING A COMBINATION OF MORPHOLINOAMINO ALCOHOL AND METAL SALTS

Pauline H. Pan, Morris Plains; Steven S. Dills, Hackettstown; Donald M. Lynch, Flemington, and Lori D. Kumar, Princeton, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 9, 1990, Ser. No. 612,037

Int. Cl.⁵ A61K 7/16

U.S. Cl. 424—49

11 Claims

1. An oral composition having synergistic activity in inhibiting the growth of plaque bacteria comprising in combination a synergistic pharmaceutically effective amount of a) a morpholinoamino alcohol or pharmaceutically-acceptable acid salt thereof, wherein said morpholinoamino alcohol has the chemi-

cal wherein R₁ is a straight or branched alkyl group containing 8 to 16 carbon atoms at the 2- or 3-position of the morpholino ring, and R₂ is a straight or branched alkyl group containing 2 to 10 carbon atoms terminating with a hydroxy group and b) a divalent metal cation, wherein said metal is selected from the group consisting of zinc, copper, magnesium, calcium, cobalt, nickel, iron, manganese, chromium, titanium, vanadium, scandium, yttrium, zirconium, niobium, molybdenum, technetium, ruthenium, rhodium, palladium, silver, cadmium, strontium, barium, tungsten, platinum, gold and mercury and salts thereof selected from the group consisting of chlorides, oxides, carbonates, hydroxides, citrates, acetates, lactates and salicylates.

5,085,851

DENTAL PLAQUE-DEGRADING COMPOSITIONS

Gentaro Okada, Shizuoka; Hirofumi Akano, Handa; Takeshi Sato, Handa; Hajime Okumura, Handa, and Kawamura, Kounan, all of Japan, assignors to Nakano Vinegar Co., Ltd., Handa, Japan

Filed Jul. 16, 1990, Ser. No. 552,533

Claims priority, application Japan, Jul. 29, 1989, 1-195424

Int. Cl.⁵ A61K 7/16, 7/28, 9/68

U.S. Cl. 424—50

7 Claims

1. A dental plaque-degrading composition in the form of a dentifrice, a denture detergent, a troche, a mouth wash, a chewing gum or a candy comprising endodextranase produced by *Anthrobacter globiformis* W31 (NRRL B-4428) in an amount effective to degrade dental plaque.

5,085,852

ANTIMICROBIAL ORAL COMPOSITIONS

Todd J. Banks, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 19, 1991, Ser. No. 688,184

Int. Cl.⁵ A61K 7/16, 7/20, 9/16

U.S. Cl. 424—53

16 Claims

1. Granule oral compositions for treating and/or preventing microbial infections in the oral cavity of humans or lower animals in need of such treatment comprising:

- a safe and effective amount of monoperphthalic acid compound; and
- a suitable buffered carrier material(s) comprising:
 - a soluble bicarbonate salt;
 - a soluble phosphate salt; and
 - citric acid

wherein at least 70% of the particles of component(s) (b) are from about 40 microns to about 500 microns.

5,085,853

FLAVOR FOR PEROXIDE-BICARBONATE ORAL COMPOSITIONS

David R. Williams, Monroe, and Christine W. Ryles, Milford, both of Conn., assignors to Chesebrough-Pond's U.S.A., Division of Conopco, Inc., Greenwich, Conn.

Filed Jun. 24, 1991, Ser. No. 719,871

Int. Cl.⁵ A61K 7/16, 7/20, 33/40

U.S. Cl. 424—53

6 Claims

1. An oral toothpaste composition comprising:
- a first component which is a gel comprising:
 - a peroxygen compound present in an amount from about 0.1 to 10% by weight of the first component;
 - a first flavor agent which is reactively incompatible with bicarbonate salts, said first flavor agent being selected from the group consisting of methyl salicylate, cinnamic aldehyde, clove oil, and mixtures thereof and being present in an effective amount to impart a flavor taste;
 - a second component which is a paste comprising:
 - a bicarbonate salt present in an amount from about 0.5 to about 80% by weight of the second component;
 - a second flavor agent which is reactively compatible

with said bicarbonate salt, said second flavor agent being menthol and present in an effective amount to impart a flavor taste, said components being held in separate compartments of a dual compartment dispenser container so as to hold storage stable said flavored gel and paste in isolation from one another until intermingled when dispensed, and relative amounts of said first and second components ranging from about 2:1 to 1:20; and said paste being free from concentrations of methyl salicylate, cinnamic aldehyde, clove oil and mixtures thereof which would tend to brown or gas said paste under storage conditions.

5,085,854

TRANSLUCENT COSMETIC EMULSION

Morinobu Fukuda, Kanagawa; Yoshitsugu Kamata, Chiba, and Masahiko Asahi, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 368,511, Jun. 20, 1989, abandoned.

This application Apr. 5, 1991, Ser. No. 681,424

Claims priority, application Japan, Jun. 20, 1988, 63-150191

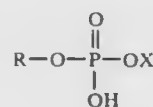
Int. Cl.⁵ A61K 7/02, 7/04, 7/06, 7/48

U.S. Cl. 424—63

6 Claims

1. A translucent cosmetic emulsion having an emulsion particle size of approximately from 10 to 200 nm comprising the following components (a) to (d):

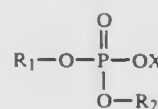
(a) a monoalkyl phosphate represented by formula (I):



wherein

R represents a β -branched alkyl group having from 8 to 36 carbon atoms; and

x represents an alkali metal or an organic basic group; or a dialkyl phosphate represented by formula (II):



wherein R₁ and R₂ each represent a hydrocarbon group having from 10 to 24 carbon atoms; and X is as defined above;

(b) at least one nonionic surfactant, wherein said surfactant has an HLB value of from 7 to 20, and wherein when two or more nonionic surfactants are present, said surfactants together have an HLB value of from 7 to 20;

(c) an oily matrix, wherein said oily matrix represents a member selected from the group consisting of hydrocarbons, ester oils, glycerides, silicone oils, higher fatty acids and higher alcohols; and

(d) water, wherein component (a) is present in an amount of from 0.005 to 1.00% by weight; component (b) is present in an amount of from 0.1 to 5.0% by weight; component (c) is present in an amount of from 1.0 to 5.0% by weight; and component (d) is present in an amount of from 40.00 to 90.0% by weight.

5,085,855

SILICONE BASED COSMETIC PRODUCT

Kathleen M. Shore, Irving, Tex., assignor to Mary Kay Cosmetics, Inc., Dallas, Tex.

Filed Jul. 18, 1990, Ser. No. 553,646

Int. Cl.⁵ A61K 7/025, 7/027

U.S. Cl. 424—64

7 Claims

1. Lip color formulations comprising: from about 10% to about 35% of a dimethicone siloxane

having a viscosity at 25° C. of from about 500 centistokes to about 1500 centistokes;

from about 10% to about 35% lanolin oil having an acid value ≤ 2.0 , a saponification number from about 100 to about 120 and an iodine number from about 18 to about 40; from about 5% to about 15% of a lanolin wax having an iodine number from about 18 to about 36, a hydroxyl number from about 20 to about 35, a saponification number from about 90 to about 110, and a melting point from about 45° C. to about 55° C.;

from about 10% to about 20% of a lanolin oil/stearalkonium hectorite gelling agent;

from about 10% to about 30% of hydrocarbon-derived polymers selected from the group comprising polybutenes and ethylene vinyl acetate copolymers; and,

from about 15% to about 45% of a dry color mix.

5,085,856

COSMETIC WATER-IN-OIL EMULSION LIPSTICK COMPRISING A PHOSPHOLIPID AND GLYCEROL FATTY ACID ESTERS EMULSIFYING SYSTEM

Patrick J. Dunphy, Wellingborough, England; Alan J. Meyers, Trumbull, Conn., and Richard T. Rigg, New York, N.Y., assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.

Filed Jul. 25, 1990, Ser. No. 558,140

Int. Cl.⁵ A61K 7/027

U.S. Cl. 424—64

9 Claims

1. A cosmetic water-in-oil emulsion lipstick which comprises:

i) from 0.2 to 2% by weight of a first emulsifier which is a phospholipid selected from the group consisting of: phosphoglycerides, lysophosphoglycerides, sphingomyelins and mixtures thereof;

ii) from 0.2 to 10% by weight of a second emulsifier selected from the group consisting of glycerol monoalkanoates, glycerol monoalkanoates, glycerol dialkanoates, glycerol dialkanoates and mixtures thereof;

iii) from 2 to 97% by weight of oil liquid at room temperature;

iv) from 1 to 25% by weight of wax;

v) an effective amount of water to moisturize lips; and

iv) a sufficient amount of a pigment for coloring lips.

5,085,857

CONDITIONING SHAMPOO COMPRISING A SURFACTANT, A NON-VOLATILE SILICONE OIL AND GUAR HYDROXYPROPYLTRIMONIUM CHLORIDE AS A CATIONIC CONDITIONING POLYMER

Euan S. Reid, Bebington, and Andrew M. Murray, Parkgate, both of Great Britain, assignors to Chesebrough-Pond's USA Co., Greenwich, Conn.

Filed Dec. 3, 1990, Ser. No. 621,482

Claims priority, application United Kingdom, Dec. 4, 1989, 8927385.8; Jul. 23, 1990, 9016101.9

Int. Cl.⁵ A61K 7/06, 7/75

U.S. Cl. 424—70

10 Claims

1. An aqueous shampoo composition comprising, in addition to water,

(a) from 2 to 40% by weight of surfactant selected from the group consisting of anionic, nonionic, amphoteric and surfactant mixtures thereof;

(b) from 0.01 to 3% by weight of cationic conditioning polymer which is guar hydroxypropyltrimonium chloride;

(c) from 0.1 to 10% by weight of an insoluble, non-volatile silicone, present as emulsified particles with an average particle size of less than 2 μm .

5,085,858

THIOGLYCOLAMIDE-FUNCTIONAL SILOXANES

Daniel J. Halloran, and Padmakumari J. Varaprath, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 462,185, Jan. 9, 1990, Pat. No. 5,068,378.

This application Mar. 11, 1991, Ser. No. 667,122

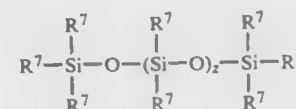
Int. Cl.⁵ A61K 7/09; A45D 7/04

U.S. Cl. 424—71

6 Claims

1. A hair treating composition comprising

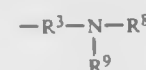
(A) a thioglycolamide functional siloxane of the formula



and

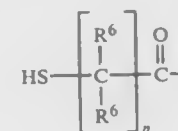
(B) a delivery means;

wherein each R⁷ is independently selected from the groups consisting of an alkyl group containing 1 to 6 carbon atoms, an aryl group containing 6 to 10 carbon atoms, and a thioglycolamide functional group having the formula:



where each R³ is independently selected from a straight or branched chain alkylene group consisting of 1 to 6 carbon atoms;

R⁸ is selected from the group consisting of the hydrogen atom and a thioglycol functional group having the general formula



where each R⁶ is independently selected from the groups consisting of the hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, an aryl group containing 6 to 10 carbon atoms, and the group NH₂ and n has the value of 1 to 6;

R⁹ is selected from the group consisting of the hydrogen atom, a straight or branched chain alkyl group consisting of 1 to 6 carbon atoms and the group —R³—N(R¹—O)—H,

where R¹⁰ is selected from the group consisting of R⁸, an alkyl group containing 1 to 6 carbon atoms, an aryl group containing 6 to 10 carbon atoms; with the provision that at least one of the R⁸ or R¹⁰ groups is the thioglycol functional group;

with the provision that at least one R⁷ group be a thioglycolamide functional group, and z has the value of 1 to 10.

5,085,859

HAIR FIXATIVES

Daniel J. Halloran, and Judith M. Vincent, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 548,810, Jul. 6, 1990. This

application Nov. 5, 1990, Ser. No. 609,488

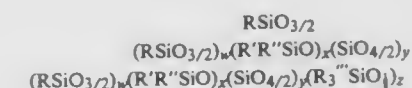
Int. Cl.⁵ A01K 7/11

U.S. Cl. 424—71

10 Claims

1. A hair treating composition comprising a mixture of at least one solvent and a film forming material which is an interpenetrating polymer network including a substituted vinyl copolymer having polar functionality selected from the group

consisting of acrylic, carboxylate, ether, and derivatives thereof, and an organosilicon compound which is a nonpolar silsesquioxane having a formula selected from the group consisting of



and hydroxy, alkoxy, aryloxy, and alkenoxy, derivatives thereof, wherein R, R', R'', and R''', are selected from the group consisting of alkyl, alkenyl, aryl, and alkylaryl, radicals having from one to twenty carbon atoms; x, y, and z, are each integers having a value of from zero to about one thousand, and w is an integer having a value of from one to about one thousand.

5,085,860

REDUCING COMPOSITION FOR THE PERMANENT DEFORMATION OF HAIR CONTAINING AS A REDUCING AGENT, AN AMINO MERCAPTOALKYLAMIDE OR A SALT THEREOF

Alex Junino, Livry Gargan, and Gérard Malle, Villiers S/Morin, both of France, assignors to L'oreal, Paris, France

Filed Nov. 19, 1990, Ser. No. 615,626

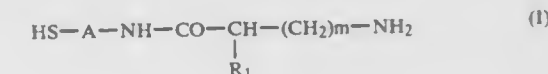
Claims priority, application France, Nov. 20, 1989, 89 15182

Int. Cl.⁵ A61K 7/09; A45D 7/04

U.S. Cl. 424—72

20 Claims

1. A cosmetic composition for the first stage of a permanent deformation of hair operation, said composition comprising, in a cosmetically acceptable vehicle, as a reducing agent, at least one amino mercaptoalkylamide having the formula



wherein

A represents the divalent radical, —(CH₂)_n— wherein n is a whole number between 2 and 5, or the divalent radical, —(CH₂)₂—O—(CH₂)₂—,

m is 0 or a whole number between 1 and 4,

(i) when m is 0, R₁ represents hydrogen, methyl, ethyl, isopropyl, isobutyl, 2-methyl butyl, benzyl, 4-amino butyl, 3-guanidino propyl, 2-methylthioethyl, carboxymethyl or 2-carboxyethyl, and

(ii) when m is a whole number from 1 to 4, R₁ represents hydrogen or lower alkyl having 1–5 carbon atoms, and the salts of said compound of formula (I).

5,085,861

BIOERODABLE IMPLANT COMPOSITION COMPRISING CROSSLINKED BIODEGRADABLE POLYESTERS

Tobin N. Gerhart, Brookline, and Wilson C. Hayes, Lincoln, both of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Division of Ser. No. 24,973, Mar. 12, 1987, Pat. No. 4,843,112.

This application May 12, 1989, Ser. No. 337,472

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

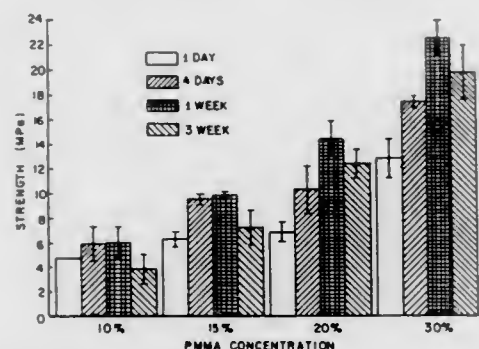
Int. Cl.⁵ A61K 31/74, 6/08

U.S. Cl. 424—78.17

11 Claims

1. A composition comprising a particulate biocompatible resorbable calcium salt, a sintered particulate calcium phosphate ceramic and a biologically active agent dispersed in a polymer matrix formed by cross-linking a biodegradable poly-

ester of a dicarboxylic acid comprising fumaric acid and a polyhydric C₂-C₆ alcohol with about 5 to about 20% by



weight of methyl methacrylate, said polyester having a number average molecular weight of about 500 to about 1200.

5,085,862

GENETIC DETOXIFICATION OF PERTUSSIS TOXIN

Michel H. Klein, Willowdale; Heather A. Boux, Aurora; Stephen A. Cockle, Richmond Hill; Sheena M. Loosmore, Aurora, and Gavin R. Zealey, Concord, all of Canada, assignors to Connaught Laboratories Limited, Willowdale, Ontario, Canada

Filed Nov. 23, 1988, Ser. No. 275,376

Claims priority, application United Kingdom, Nov. 24, 1987, 8727489

Int. Cl.⁵ A61K 39/02

U.S. Cl. 424-92 16 Claims
1. An immunoprotective genetically detoxified mutant of pertussis holotoxin.

5,085,863

TUBE PROVIDED WITH A WHITE BISMUTH SALT CONTAINING BISMUTH COMPOUND MIXTURE AS X-RAY OPAQUE AGENT

Keigo Goshiki, Saitama, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1990, Ser. No. 510,073

Claims priority, application Japan, Apr. 21, 1989, 1-103065

Int. Cl.⁵ A61M 25/00, 5/178

U.S. Cl. 424-423 14 Claims
1. A tube comprising a wall formed from thermoplastic material, at least a portion of the wall comprising a resin and agent mixture of a thermoplastic resin and an X-ray opaque agent, the X-ray opaque agent being present in an amount of about 3 to 25% by weight and comprising a white bismuth compound mixture of bismuth oxide and white bismuth salts, said bismuth compound mixture having a bismuth content of 83 to 88% by weight, said resin being selected from the group consisting of fluororesins and polyurethanes.

5,085,864

INJECTABLE FORMULATION FOR LIPOPHILIC DRUGS

John B. Cannon, Grayslake; Chung-Chiang Hsu, Libertyville; Karen J. Papp, Waukegan, and N. Adeyinka Williams, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 428,803, Oct. 30, 1989, abandoned. This application May 20, 1991, Ser. No. 704,656

Int. Cl.⁵ A61K 37/22

U.S. Cl. 424-450 9 Claims
1. An injectable composition containing micelles which comprise a therapeutically effective amount of a lipophilic drug selected from the group consisting of erythromycin and clarithromycin and at least one bile salt.

5,085,865

SUSTAINED RELEASE PHARMACEUTICAL PREPARATIONS CONTAINING AN ANALGESIC AND A DECONGESTANT

Ammunje S. Nayak, Great Meadows, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 12, 1989, Ser. No. 336,929

Int. Cl.⁵ A61K 9/22, 9/24

U.S. Cl. 424-472 7 Claims

1. An orally administrable pharmaceutical tablet having at least two layers, comprising a first and a second layer directly compression bonded to each other,

- wherein said first layer is readily susceptible to disintegration in the stomach and comprises an effective amount, for immediate-release, of an orally active analgesic, and
- wherein said second layer displays increased resistance to disintegration and erosion in the gastrointestinal tract relative to said first layer and comprises an effective amount, for sustained-release over a 12 hour time period, of an orally active decongestant admixed with from about 25% to about 90% by weight of the decongestant composition layer of a sustained-release agent comprising one or more hydrogels selected from the group consisting of water soluble hydroxyalkylcelluloses wherein said orally active decongestant is selected from the group consisting of pseudoephedrine, pseudoephedrine hydrochloride and pseudoephedrine sulfate.

5,085,866

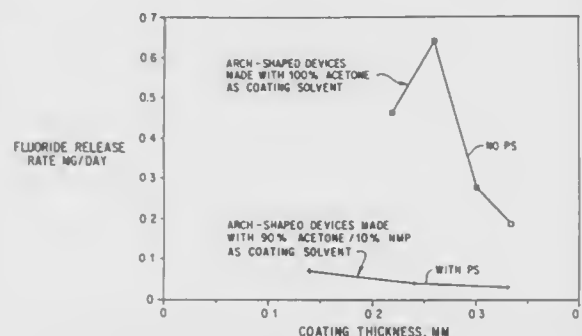
METHOD OF PRODUCING ZERO-ORDER CONTROLLED-RELEASED DEVICES

Donald R. Cowsar, Birmingham, Ala.; Richard L. Dunn, Fort Collins, Colo., and Thomas J. Laughlin, Germantown, Tenn., assignors to Southern Research Institute, Birmingham, Ala.

Filed Dec. 2, 1988, Ser. No. 279,216

Int. Cl.⁵ A61K 9/14

U.S. Cl. 424-481 17 Claims



1. An improved method of producing a reservoir device having a zero-order rate controlling membrane, comprising the steps of:

- spraying a solution onto a core comprised of an agent to form a rate controlling membrane coating thereon, said solution comprising effective amounts of a first polymer and a solvent having a first component which is a rapidly evaporating solvent having a first boiling point and a second component which is a slowly evaporating plasticizing solvent having a second boiling point higher than said first boiling point;
- allowing said first component to evaporate from said coating; and
- removing said plasticizing solvent from said coating.

5,085,867

METHOD FOR TREATING GASTRIC ULCER WITH SULGLYCOTIDE AND HYDROPHILIC POLYMER

Giancarlo Farolfi; Giovanni Gazzani, both of Como; Riccardo Niada, Varese, and Marisa Mantovani, Villa Guardia, all of, assignors to Crinos Industria Farmacobiologica SpA, Villa Guardia, Italy

Division of Ser. No. 138,400, Dec. 18, 1987, Pat. No. 4,937,079. This application Mar. 30, 1990, Ser. No. 501,698

Claims priority, application Italy, Jan. 12, 1987, 19048 A/87

Int. Cl.⁵ A61K 9/14, 9/20, 37/02, 47/38

U.S. Cl. 424-485 4 Claims
1. A method for protecting an animal against gastric ulcer which comprise orally administering to the animal a gastroprotective amount of sulglycotide together with a hydrophilic polymer selected from the group consisting of methylcellulose pectin and tragacanth gum, such that the ratio of sulglycotide per part by weight to the hydrophilic polymer per part by weight is between 1:2 and 1:5.

5,085,868

LIQUID DOSAGE FORM FOR ALL ORAL ADMINISTRATION OF A PHARMACEUTICALLY ACTIVE SUBSTANCE

Kjell J. Mattsson; Alf G. M. Nicklasson, and Rolf Sjöqvist, all of Södertälje, Sweden, assignors to Astra Lakemedel Aktiebolag, Södertälje, Sweden

Continuation of Ser. No. 127,918, Dec. 2, 1987, abandoned. This application Sep. 17, 1990, Ser. No. 584,385

Claims priority, application Sweden, Dec. 22, 1986, 8605515

Int. Cl.⁵ A61K 9/16, 9/50, 31/43

U.S. Cl. 424-490 8 Claims
1. An oral pharmaceutical dosage form comprising an encapsulated pharmaceutically active substance and a pharmaceutically acceptable nonaqueous liquid wherein the active substance is encapsulated in a coating, selected from the group consisting of ethylcellulose, carnauba wax and a combination of carnauba wax and beeswax which coating is applied by spray drying and spray chilling in an a solvent system which does not contain a halogenated solvent.

5,085,869

PHARMACEUTICAL GRANULATE

Margaretha Olthoff, Rijswijk; Bernardus L. J. Dijkgraaf, Delft, and Piet J. Akkerboom, Zoetermeer, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Feb. 24, 1989, Ser. No. 315,268

Claims priority, application European Pat. Off., Feb. 25, 1988, 88200346

Int. Cl.⁵ A61K 9/16, 33/06

U.S. Cl. 424-499 15 Claims
1. A process for the preparation of a pharmaceutical granulate, which can uninterruptedly flow through a flow cup orifice not wider than 12 mm, and after placing it in water, readily results in a smooth dispersion, free of coarse lumps, comprising the steps of:

- mixing a therapeutically useful substance having a solubility in water of less than 10 wt %, a cellulose product selected from the group consisting of microcrystalline cellulose, microfibrillated cellulose and mixtures thereof, and 0-0.5 wt % of a wet binder substance based on the weight of said therapeutically useful substance with water to form a wet mass;
- processing said wet mass to form a granulate;
- passing said wet mass through a first woven wire screen;
- drying the sieved granulate;
- passing the dried granulate through a second woven wire screen; and
- collecting the resulting granulate.

5,085,870

SILANOL-BASED PRODUCT FOR CARE OF THE SUPERFICIAL LYMPHATIC VESSELS

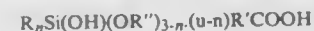
Marie-Christine Seguin, and Jean Gueyne, both of Perigord 1, 6 Lacets Saint-Leon, Monte Carlo, Monaco

Continuation of Ser. No. 241,601, Sep. 8, 1988, abandoned. This application Sep. 5, 1990, Ser. No. 577,794

Claims priority, application France, Sep. 9, 1987, 87 12480

Int. Cl.⁵ A61K 31/225, 35/78, 33/00, 37/00

U.S. Cl. 424-547 13 Claims
1. Aqueous composition for care for the superficial lymphatic vessels, comprising water containing 0.05 to 0.5% by weight of an aqueous extract of mollusk shells and 0.05 to 0.5% by weight of silanol derivative of the formula



where R is C₁ to C₁₈ alkyl, R'COOH is a pharmaceutically acceptable acid, each R' is individually H or C₁ to C₁₈ alkyl, n is 1 to 3.

5,085,871

FEED COMPOSITION FOR FOWLS

Hiroshi Horikawa; Akira Fukazawa, and Tetsuya Hori; Kunihiko Ishii, all of Tochigi, Japan, assignors to C. Itob Feed Mills and Meiji Seika Kaisha, Ltd., both of, Japan

Continuation of Ser. No. 348,286, May 5, 1989, abandoned. This application May 14, 1988, Ser. No. 523,182

Claims priority, application Japan, May 12, 1988, 63-113453

Int. Cl.⁵ A23K 1/00

U.S. Cl. 426-2 5 Claims
1. A method for feeding of fowl comprising feeding chicks of up to ten weeks of age with a calcium increasing effective amount of a feed composition consisting essentially of:

- 12% to 25% by weight crude protein,
- 3% to 10% by weight crude fat,
- 1% to 4.5% by weight calcium, and
- 0.01% to 1% by weight of a composition obtained by digesting casein with a proteolytic enzyme and concentrating and drying the entire casein phosphopeptide containing digestive product.

5,085,872

METHOD OF MANUFACTURING A CHEWING GUM BASE

Mansukh M. Patel, Downers Grove, and Charles M. Copper, Willowbrook, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Aug. 16, 1990, Ser. No. 568,462

Int. Cl.⁵ A23G 3/30

U.S. Cl. 426-4 17 Claims
1. A method of manufacturing a chewing gum base blend comprising the following steps:

- providing conventional low fat gum base comprising elastomer; resins; wax; filler; and from about 1% to about 15% by weight of a component selected from the group consisting of fat, oil, and mixtures thereof;
- providing HFO gum base comprising filler; low molecular weight polyvinyl acetate; elastomer; emulsifier and from about 20% to about 50% by weight of a component selected from the group consisting of fat, oil and mixtures thereof; and
- mixing conventional low fat gum base and HFO gum base at a temperature of from about 60° F. to about 180° F., and in such amounts so that the resulting chewing gum base blend comprises from about 2% to about 50% by weight HFO gum base.

5,085,873

PROCESS FOR THE TREATMENT OF A NON-LIQUID FOOD PRODUCT FOR ASSURING ITS MICROBIAL DECONTAMINATION

Michel Degre, Las Taplos, assignor to Bio Sere Laboratoires S.A., Saint Afrique, France

Filed May 11, 1990, Ser. No. 521,978

Int. Cl.⁵ A23B 4/20, 4/22; A23L 3/3463

U.S. Cl. 426—8

18 Claims

1. A process for the treatment of a non-liquid hydrated food product containing at least 20% of water for assuring the microbial decontamination thereof with respect to bacteria of the genus *Listeria*, the process comprising depositing on the surface of said hydrated product a quantity of an LP system preparation effective for destruction of pathogenic organisms comprising a mixture of lactoperoxidase enzyme, a thiocyanate and an oxygen donor.

5,085,874

FEEDING-STUFF

Hans Jungvid, Veddige, Sweden, assignor to Hans Jungvid Aktiebolag, Veddige, Sweden

Filed Mar. 20, 1989, Ser. No. 573,303

Claims priority, application Sweden, Mar. 28, 1988, 8801142

Int. Cl.⁵ A23K 1/08

U.S. Cl. 426—41

8 Claims

1. A starting feed-stuff for administration to young animals selected from the group consisting of piglets, ruminants, and deer during the first weeks of life consisting essentially of 18 to 26% by weight of whey, 3 to 8.5% by weight of casein, 30 to 36% by weight of fat, 6 to 10% by weight of vegetable protein, 10 to 32% by weight of animal protein, 2 to 15% by weight of pregelatinized starch wherein the starch is substantially free from fibres and other carbohydrate complexes that bind iron, 1% of organic acid, 1% by weight of lyzed yeast, 1% by weight of dextrose, and 1.5 to 3% by weight of vitamins and minerals wherein the lactose level of the feed-stuff is substantially the lactose level in milk from the mother of the young animal and wherein the ratio of casein to whey proteins is substantially the ratio in milk from the mother of the young animal.

5,085,875

PROCESS OF MAKING A YEAST FIBER COMPOSITION

Liisa Penttila, Espoo, and Timo Vaara, Helsinki, both of Finland, assignors to Alko Ltd., Helsinki, Finland

Filed Oct. 15, 1990, Ser. No. 598,178

Int. Cl.⁵ A23L 1/29

U.S. Cl. 426—62

23 Claims

1. Process for preparing a yeast cell composition comprising: selecting food grade yeast cells; preparing a biomass of unruptured cells from the selected yeast cells; heating the unruptured yeast cells once and without additional treatment in an acidic or basic aqueous solution such that the contents of the yeast cells are extracted and a majority of the yeast cells are maintained in spherical form; and washing the heated yeast cells at least twice with water wherein the composition remaining after the steps of heating and washing comprises at least about 40% by weight of fiber and less than about 0.08% by weight of nucleic acid.

5,085,876

FAST DISSOLVING SWEETENING AGENT INCLUDING CARAMEL

Josef H. K. Tsau, Skokie, Ill., assignor to The NutraSweet Company, Deerfield, Ill.

Continuation-in-part of Ser. No. 271,977, Nov. 16, 1988,

abandoned. This application Jul. 3, 1990, Ser. No. 547,659

Int. Cl.⁵ A23L 1/236

U.S. Cl. 426—92

13 Claims

1. A consumable product in granular or powder form comprising a mixture of a sweetening agent selected from the group consisting of aspartame, saccharin, cyclamates, acesulfame-K, trichlorogalactose, alitame, all salts and mixtures thereof and a dehydrated caramel, said sweetening agent present in said mixture in an amount from about two times to about two hundred times the amount of said caramel by weight, said consumable product having a dissolution rate faster than said sweetening agent alone and wherein said sweetening agent comprises at least 70% by dry weight of said product and said caramel comprises from 0.5 to 30% by dry weight of said product.

5,085,877

COMPOSITION AND METHOD FOR IMPROVING ADHERENCE OF FAT-BASED COATINGS TO FROZEN FAT-BASED CONFECTIONS

Gary G. Youcheff, Maytown; Stephen M. Wodke, Lancaster, and Douglas W. Perkins, Mount Joy, all of Pa., assignors to Mars, Incorporated, McLean, Va.

Continuation of Ser. No. 392,104, Aug. 10, 1989, abandoned.

This application Dec. 12, 1990, Ser. No. 626,387

Int. Cl.⁵ A23G 9/00

U.S. Cl. 426—100

9 Claims

1. A method for enhancing the adherence of a coating to a frozen fat-based confection comprising applying a composition to the surface of a frozen fat-based confection as an interface layer between said frozen fat-based confection and said coating, said composition comprising an effective amount of maltodextrin, in an aqueous solution, to enhance the adherence of said coating to said frozen fat-based confection without substantially affecting the taste and texture of said frozen fat-based confection.

5,085,878

DEOXIDIZER PACKAGE

Hidetoshi Hatakeyama, and Takashi Kashiba, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Japan

Continuation of Ser. No. 278,363, Nov. 30, 1988, Pat. No. 4,996,068. This application Aug. 27, 1990, Ser. No. 572,427

Claims priority, application Japan, Dec. 2, 1987, 62-303281;

Dec. 2, 1987, 62-303282; Dec. 2, 1987, 62-303283; Sep. 26, 1988, 63-238919

The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.

Int. Cl.⁵ A23L 1/025, 3/34, 3/36; C09K 15/02

U.S. Cl. 426—107

18 Claims

6. A food pack to be treated by a microwave radiation comprising:

a food having a water content of 8% or more; a deoxidizer package including a deoxidation composition containing iron powder, a metal halide, and a material to dissipate heat generated in said iron powder upon irradiation with microwaves comprising a powder filler having a water solubility of about zero, a particle size of 60 mesh or finer and a specific surface area of 50 m²/g or less, said powder filler being contained in amount of 100 volume parts or more for 100 volume parts of said iron powder, said deoxidizer package further including a gas permeable packaging material containing said deoxidation composition and having a gas permeability of 1,000 seconds/100 cc or less in terms of Gurley gas permeability; and a pack container in which said food and said deoxidizer

package are hermetically packed and which is made of a material having an oxygen permeability of 200 ml/m² 24 hr atm or less.

5,085,879

LOBSTER PACKAGING AND DISPLAY UNIT

Gabriel Elbaz, 4200 W. Sherbrooke, Suite 12, Montreal, Canada H3C 1Z4

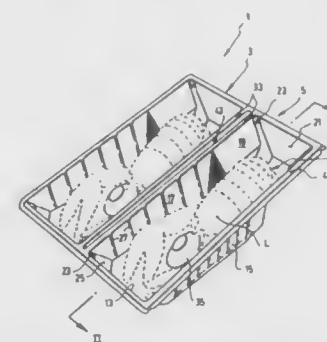
Continuation-in-part of Ser. No. 600,749, Oct. 22, 1990,

abandoned. This application Jul. 23, 1991, Ser. No. 734,743

Int. Cl.⁵ B65D 85/00, 1/34

U.S. Cl. 426—129

21 Claims



1. A lobster packaging and display unit comprising at least one tray shaped and sized to receive and conform to a lobster contained therein and to display the lobster to best advantage, wherein:

- said at least one tray comprises:
 - a bottom wall having a front bottom wall portion and a rear bottom wall portion;
 - a front end wall;
 - a pair of side walls each having a front side wall portion and a rear side wall portion; and
 - a rear end wall;
- the rear bottom wall portion, the rear side wall portions and the rear end wall are configured and oriented relative to each other so as to form a niche that is sufficiently narrow and deep to snugly receive and retain the tail of the lobster with said tail in folded position under itself;
- the front bottom wall portion, the front side wall portions and the front end wall are configured and oriented relative to each other so as to form a space wide enough to receive the head and claws of the lobster with said claws extending fully forward on said space without substantially overlapping each other;
- the side walls, front end wall and rear end walls have upper edges that extend perpendicularly to each other in a same plane to define a continuous rectangular opening on top of said at least one tray, said opening being at least as long as said bottom wall and at least as wide as said space;
- the front bottom wall portion comprises a short upwardly projecting boss positioned centrally just in front of the head of the lobster, between the claws, said boss being in the shape of a truncated cone; and
- the front bottom wall portion is generally flat and the rear bottom wall portion is angled upwardly rearwardly relative to said front bottom wall portion to raise the tail of the lobster with respect to its claw.

5,085,880

PROCESS FOR THE PREPARATION OF BLEACHED VEGETABLE PULPS

Michel Devic, Sainte-Foy-les-Lyon, France, assignor to Atochem, Puteaux, France

Filed Sep. 21, 1990, Ser. No. 586,230

Claims priority, application France, Sep. 21, 1989, 89 12616

Int. Cl.⁵ A23L 1/277

U.S. Cl. 426—253

28 Claims

1. Process for the preparation of bleached and dried vegeta-

ble pulps comprising bleaching vegetable pulp with hydrogen peroxide and simultaneously drying said vegetable pulp by vaporizing the water in the pulp by means of a dry gaseous atmosphere circulating in contact with said pulp.

5,085,881

PROCESS FOR FRACTIONATING DRIED MILK PRODUCTS

Hans G. Moeller, Uelzen, Fed. Rep. of Germany, assignor to Kali-Chemie AG, Hannover, Fed. Rep. of Germany

Filed Dec. 19, 1990, Ser. No. 630,180

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1989, 3942028

Int. Cl.⁵ A23C 1/14

U.S. Cl. 426—491

11 Claims

1. A process for fractionating dried milk or dried milk products, said process comprising the steps of:

- extracting said dried milk or dried milk products with an extracting amount of a liquid extraction agent which contains from 40 to 100 wt-% carboxylic acids and/or carboxylic acid esters and 0 to 60 wt-% water to obtain a liquid extract; and
- separating solid residues from said liquid extract.

5,085,882

METHOD FOR THE COOLING OF A PRODUCT FLOW CONTAINING SOLID AND/OR SEMISOLID FOODSTUFF PARTICLES

Hans Rausing, Wadhurst, England, assignor to Tetra Pak Holdings S.A., Pully, Switzerland

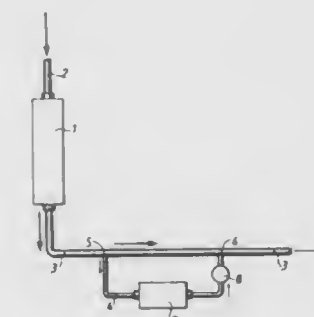
Filed Oct. 31, 1990, Ser. No. 606,615

Claims priority, application United Kingdom, Nov. 10, 1989, 8925405

Int. Cl.⁵ A23L 3/00

U.S. Cl. 426—524

5 Claims



1. A method for the cooling of a heated product flow containing solid and/or semisolid particles of foodstuff character, comprising the steps of:

- separating the flow at a separation point into a high particle flow having particles greater than a predetermined size and a low particle flow having particles smaller than said predetermined size;
- cooling said low particle flow; and
- subsequently mixing said low particle flow with said high particle flow downstream of said separation point whereby said cooled low particle flow serves as a cooling medium for said high particle flow.

5,085,883

BLEND OF DIETARY FIBER FOR NUTRITIONAL PRODUCTS

Kelth A. Garleb, Powell; James N. Chmura, Pickerington; Paul S. Anloague, Columbus; Mary B. Cunningham, and David C. Sertl, both of Westerville, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 27, 1991, Ser. No. 722,437

Int. Cl.⁵ A23L 2/38

U.S. Cl. 426—590

26 Claims

1. A dietary fiber system for use in a nutritional product wherein the fiber system as a whole comprises by weight: 5% to 50% dietary fiber which is both soluble and fermentable; 5% to 20% dietary fiber which is both soluble and non-fermentable; and 45% to 80% dietary fiber which is both insoluble and non-fermentable.

5,085,884

REDUCED CALORIE POTATO CHIPS AND OTHER LOW MOISTURE FAT-CONTAINING FOODS HAVING LESS WAXINESS AND IMPROVED FLAVOR DISPLAY

Jerry D. Young, Cincinnati; Jeffrey J. Kester, West Chester; Thomas J. Wehmeier, Cincinnati; Mary M. Fox, Fairfield, and James C. Letton, Forest Park, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 26, 1990, Ser. No. 514,800

Int. Cl.⁵ A23D 9/00

U.S. Cl. 426—611

50 Claims

1. A low moisture food having nonfat ingredients and containing a fat composition having a thixotropic area of about 200,000 pascals/second or less at 92° F. (33.3° C.), and which comprises:

A. from about 10 to 100% of a nondigestible fat component having a Solid Fat Content (SFC) profile slope between 98.6° F. (37° C.) and 70° F. (21.1° C.) of from 0 to about -0.75 and comprising:

- (1) from about 60 to about 99% of a liquid nondigestible oil having a complete melting point below about 37° C.; and
- (2) from about 1 to about 40% solid polyol fatty acid polyesters having a complete melting point above about 37° C., wherein said polyol has at least 4 hydroxyl groups and wherein the ester groups comprise a combination of:

(a) C₁₂ or higher unsaturated fatty acid radicals, C₂-C₁₂ saturated fatty acid radicals or mixtures thereof, and
(b) at least about 15% C₂₀ or higher saturated fatty acid radicals, wherein the molar ratio of (a) to (b) radicals is from about 1:15 to about 2:1 and wherein at least 4 of said hydroxyl groups are esterified; and

B. from 0 to about 90% of a digestible triglyceride fat or oil.

5,085,885

PLASMA-INDUCED, IN-SITU GENERATION, TRANSPORT AND USE OR COLLECTION OF REACTIVE PRECURSORS

Henry C. Foley; Robert D. Varrin, Jr., and Sourav K. Sengupta, all of Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Sep. 10, 1990, Ser. No. 579,772

Int. Cl.⁵ B05D 5/12

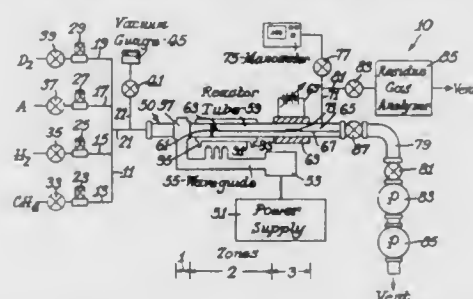
U.S. Cl. 477—38

14 Claims

1. A process for treating a substrate with a hydride or organometallic species, comprising the steps of:

- a. forming a microwave plasma in an irradiated zone which is irradiated with microwave energy, and utilizing said irradiated zone to form, from a volatile or volatilizable species which is heterolytically or homolytically fissionable in said irradiated zone, a reactive gas or gases containing free radicals, ions, or mixtures of free radicals and ions,
- b. conveying and directing, downstream from the irradiated zone, a said reactive gas containing free radicals, ions, or

mixtures of free radicals and ions of said volatile or volatilizable species to a reaction zone located downstream from and distinct from said irradiated zone and containing a target comprising a liquid or solid metal or metalloid of the transition series of elements or of Groups Ia to VIa of the Periodic Table, thereby forming a gaseous product



containing a hydride or organometallic compound or a mixture thereof, a flow of said reactive gas being thereby directed from the irradiated zone to said target,

- c. conveying the said gaseous hydride or organometallic product further downstream to a treatment zone containing a substrate, and causing the gaseous product or a decomposition product thereof to contact said substrate.

5,085,886

PHOTODEFINABLE INTERLEVEL DIELECTRICS

Joseph J. Zupancic, Bensenville, Ill.; Daniel C. Blazej, Annandale, and Howard A. Fraenkel, Lebanon, both of N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 19, 1990, Ser. No. 630,107

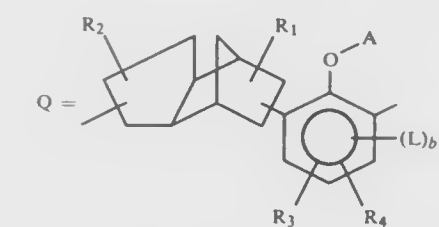
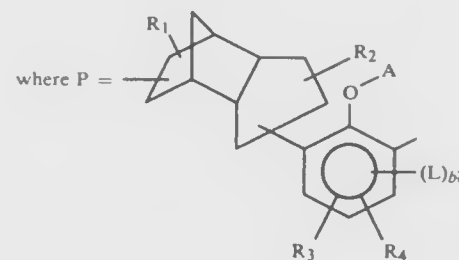
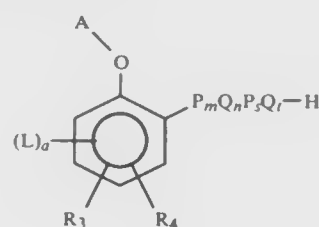
Int. Cl.⁵ B05D 3/06

U.S. Cl. 427—43.1

11 Claims

1. A method of forming a polymer on a substrate in a predetermined pattern comprising:

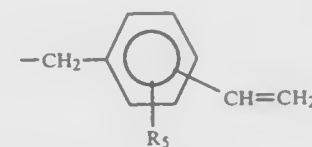
- (a) coating a substrate with a prepolymer which is an ether of the reaction product of dicyclopentadiene with phenol having the formula



with

R₁, R₂=H or alkyl of 1-10 carbon atoms;R₃=methyl;R₄=H;

A=H



an alkyl moiety containing 1 to 10 carbon atoms, a cycloalkyl moiety having 5 to 10 carbon atoms, or benzyl, subject to the constraint that at least 50% of all A's are the vinyl benzyl moiety;

L=Br or Cl;

a=0, 1, or 2;

b=0 or 1;

m, n, s, and t are 0 or an integer, and m+n+s+t=z is an integer from 1-10; and

R₅=H, an alkyl moiety of 1-10 carbon atoms, a halogen or alkoxy moiety, or a monovalent aromatic radical.

- (b) irradiating the coated prepolymer of (a) through a masking pattern to selectively crosslink the portion of said coating being irradiated;
- (c) selectively dissolving the non-irradiated part of the prepolymer coating of (a); and
- (d) curing the crosslinked portion of the prepolymer coating by heating at a temperature in the range of 100° C. to 300° C. for a time sufficient to further crosslink said crosslinked coating and to transform the prepolymer to an infusible glassy solid.

5,085,887

WAFER REACTOR VESSEL WINDOW WITH PRESSURE-THERMAL COMPENSATION

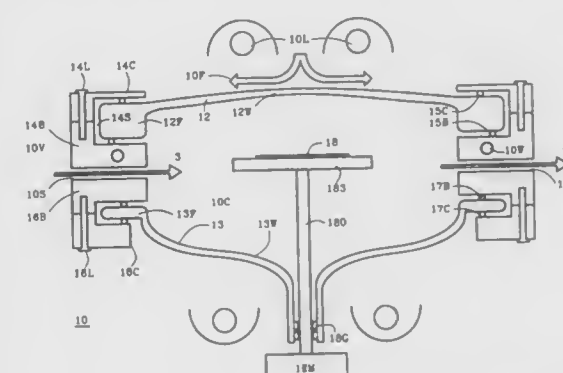
David V. Adams, and Roger N. Anderson, both of San Jose, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Sep. 7, 1990, Ser. No. 579,741

Int. Cl.⁵ C23C 16/48, 16/56

U.S. Cl. 427—55

24 Claims



1. A reactor for processing semiconductor wafers at an elevated temperature in a processing gas at a reduced pressure, comprising:

reactor vessel having a wafer chamber for containing at least one semiconductor wafer during processing, and having a heating port through the reactor vessel to the chamber; radiant energy heating means outside of the reactor vessel for radiating energy through the heating port into the chamber to elevate the temperature of the wafer; gas means for introducing the processing gas into the chamber and for evacuating the processing gas from the chamber;

cover member mounted over the heating port, having a central window portion and a peripheral flange portion; the central window portion formed of a material which is generally transparent to the radiant energy from the heating means for passing the radiant energy into the chamber, and having an outward bow defining a convex outside surface and a concave inside surface for opposing the compressive force created by the reduced pressure within the chamber; and

the peripheral flange portion supporting the window portion, and for radially confining the window portion in response to thermal expansion within the window portion for enhancing the outward bow of the window portion.

5,085,888

METHOD FOR FORMING THIN MG₂ FILM AND LOW-REFLECTION FILM

Takeshi Morimoto, and Yasuhiro Sanada, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan PCT No. PCT/JP90/00222, § 371 Date Dec. 11, 1990, § 102(e) Date Dec. 11, 1990

PCT Filed Feb. 23, 1990, Ser. No. 598,640

Claims priority, application Japan, Feb. 23, 1989, 1-41862; Apr. 6, 1989, 1-85740

Int. Cl.⁵ B05D 5/12

U.S. Cl. 427—108

17 Claims

1. A method for forming a thin MgF₂ film on a substrate, which comprises coating a substrate with a liquid containing an Mg salt and a BF₃ complex salt and subsequently heating the coating to form a film MgF₂ film.

5,085,889

PROCESS FOR THE PREPARATION OF MAGNETIC PARTICLE DISPERSIONS USING BALL MILLS AND GRINDING MEDIA

Horst Platz, Willstaett; Peter Engelhardt, Plankstadt; Friedrich Sommermann, Kehl; Albert Kohl, Laumersheim; Juergen Klausmann, Offenburg; Reinhold Baur, Ortenberg; Peter Heilmann, Bad Duerkheim, and Hermann Roller, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 494,475

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 3912082

Int. Cl.⁵ G11B 23/00; B02C 17/00

U.S. Cl. 427—128

4 Claims

1. A process for the production of a magnetic recording medium, which comprises combining magnetic material having a particle size of 0.1-2 μm and a BET surface area of not less than 14 m²/g in a mixture comprising at least one solvent, at least one organic polymer binder, at least one dispersant, but being substantially free of abrasive particles to produce a first dispersion; grinding the first dispersion in a first stirred ball mill, which ball mill contains grinding media having a diameter of 0.2-3.0 mm and a density of 3.6-3.9 g/cm³ to form a second dispersion, treating the second dispersion in a ball mill containing grinding media having a diameter of more than 2.0 mm and a density greater than 4.2 g/cm³ to prepare a third dispersion, which dispersion has a viscosity, measured at 25° C., of not less than 50 mPa.s; applying the third dispersion as a layer to a substrate; and reducing the liquid content of the layer to produce a magnetic recording medium.

5,085,890

METHOD FOR PREPARING INDICIA-CONTAINING ARTICLE

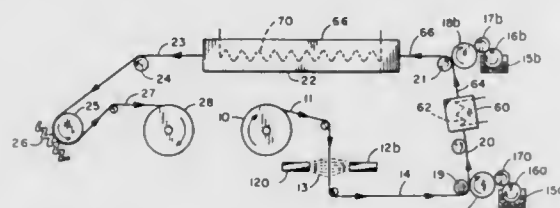
Vitas Niaura, Western Springs; Jeffery A. Oxley, Naperville, both of Ill., and Elio E. Tarika, New Canaan, Conn., assignors to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 326,560, Mar. 24, 1989, Pat. No. 4,985,260, which is a continuation-in-part of Ser. No. 191,100, May 6, 1988. This application Aug. 30, 1990, Ser. No. 574,850

Int. Cl.⁵ B05D 5/12

U.S. Cl. 427—149

27 Claims



14. A method for preparing a flexible article comprising a substrate and an indicia thereon comprising the steps of:

- providing a plasticized cellulose article having less than about 38% weight moisture [based on the weight of bone dry cellulose];
- applying a first binder-sealant and organic solvent mixture as a coating to the cellulose substrate as a portion of a desired indicia, and evaporating said organic solvent from said coating to form a dry layer adhered to said cellulose substrate, said first binder-sealant having a melting point above about 100° F. and being water insoluble;
- applying from an aqueous solution as another portion of said indicia a water soluble colorant layer with its under surface superimposed on the top surface of the dry first binder-sealant layer, and drying at least the applied colorant layer so as to be in adhering and nondiffusible relationship with said first binder-sealant;
- applying as still another portion of said indicia a second binder-sealant and organic solvent mixture coating over the colorant layer upper surface with the coating perimeter outwardly extending beyond and enclosing the colorant extremities, said second binder-sealant having a melting point above about 100° F. and being water insoluble; and
- evaporating said organic solvent from said coating of d) to form a second binder-sealant dry coating entirely enclosing the dry colorant layer with at least one of said first and second binder-sealant perimeters outwardly extending beyond the colorant layer extremities so as to directly contact the surrounding substrate in adhering relationship therewith; the first binder-sealant, colorant, second binder-sealant sandwich indicia being substantially completely transferable from said cellulose surface to a contiguous edible surface in the presence of moisture.

5,085,891

EDGE SEALING APPARATUS AND METHOD

Ronald F. Evans, Pangkor, Singapore, assignor to Nordson Corporation, Westlake, Ohio

Filed Jul. 16, 1990, Ser. No. 553,994

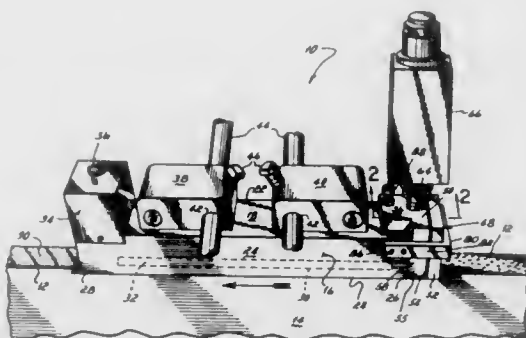
Int. Cl.⁵ B05D 3/12; 5/00; 1/26; B05C 3/20

U.S. Cl. 427—277

12 Claims

- Apparatus for sealing an edge of a board, comprising: an iron body having a leading end and a presser surface formed with a shape which conforms to the shape of an edge of the board;
- a nozzle located at said leading end of said iron body, said nozzle comprising:
 - a first blade mounted to said leading end of said iron body, said first blade being formed with a passage connected to said supply means;

- a second blade carried by said iron body;
- a shim connected between said first and second blades, said shim being formed with a slot defining said discharge outlet of said nozzle, said slot being connected to said passage in said first blade to receive sealing material and to discharge the sealing material onto the edge of the board; and



supply means for supplying sealing material to said nozzle, the sealing material being emitted from said discharge outlet of said nozzle onto the edge of the board and thereafter pressed into the edge of the board by said presser surface of said iron body to seal the edge of the board.

5,085,892

LAUNDRY DRYER SHEET

Raynold J. Corona; James E. Borland, and Kim R. Smith, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 476,540, Feb. 7, 1990, abandoned. This application Oct. 1, 1990, Ser. No. 591,215

Int. Cl.⁵ B05D 3/12

U.S. Cl. 427—365

10 Claims

- A process for preparing a laundry dryer sheet which comprises (A) coating an absorbent flexible substrate with a molten tert-amine oxide wherein the molecules correspond to the formula $RR'R''NO.nH_2O$ in which R is a primary alkyl group containing 8–24 carbons; R' is methyl, ethyl, or 2-hydroxyethyl; R'' is independently selected from methyl, ethyl, 2-hydroxyethyl, and primary alkyl groups containing 8–24 carbons; and n is 0, 1, or 2, at least some of the molecules being dihydrate molecules, and (B) solidifying the amine oxide.

5,085,893

PROCESS FOR FORMING A COATING ON A SUBSTRATE USING A SILSESQUOXANE RESIN

Keith D. Weiss, and Cecil L. Frye, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 590,710, Oct. 1, 1990, Pat. No. 5,045,592, Division of Ser. No. 386,450, Jul. 28, 1989, Pat. No. 4,999,397.

This application Apr. 29, 1991, Ser. No. 692,871

Int. Cl.⁵ B08D 3/02

U.S. Cl. 427—387

4 Claims

- A method for the formation of a protective coating of a silsesquioxane resin on a substrate comprising the steps of:
 - coating said substrate with a solution comprising a non-sulfur containing polar organic solvent containing therein a composition of the formula $(RSi(OH)_xO_{3-x/2})_n$ where R is a hydrogen or a methyl group, provided R is at least 50% hydrogen, n is an integer greater than about 8, and x is a number between 0 and 2, and where the silanol content in said composition is from about 1–10% by weight, and
 - evaporating said solvent and thereby deposit an insoluble silsesquioxane coating on said substrate.

5,085,894

METHOD OF BONDING SILICONE ELASTOMER TO A SUBSTRATE

Carlo Pascucci, Brussels, and Andreas T. F. Wolf, Nivelles, both of Belgium, assignors to Dow Corning S.A., Valbonne, France

Filed Jan. 25, 1991, Ser. No. 645,930

Claims priority, application United Kingdom, Feb. 7, 1990, 9002716

Int. Cl.⁵ B05D 3/02

U.S. Cl. 427—387

7 Claims

- A method for bonding a silicone elastomer to a substrate which comprises treating a substrate by contacting a surface of said substrate with treating agent consisting of a liquid polydiorganosiloxane wherein the organo radicals attached to silicon are monovalent groups having up to 18 carbon atoms selected from the group consisting of hydrocarbon groups and halogenated hydrocarbon groups, and thereafter applying to the treated surface a room temperature vulcanisable silicone elastomer-forming composition.

5,085,897

FIRE RETARDANT INSULATION SPRAY COATING METHOD

John S. Luckanuck, Burlington, Canada, assignor to Radix-x/World, Ltd., Burlington, Canada

Filed Apr. 2, 1990, Ser. No. 502,932

The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.

Int. Cl.⁵ B05D 3/02; 1/02; B32B 9/06

U.S. Cl. 427—421

14 Claims

- A method for protecting steel columns and beams in a commercial building construction from twisting when subjected to fire, which comprises coating said columns and beams with a mixture consisting essentially of a liquid alkali-metal silicate, 5 to 50% by weight of an inert mineral filler selected from perlite and vermiculite, 2 to 25% by weight of a mineral powder which will intumesce with said silicate and form a non-porous ceramic coating when subjected to fire, said mineral powder being a member selected from the class consisting of aluminum trihydrate and Wollastonite.

5,085,895

POLYOLEFIN RESIN COMPOSITION

Tadashi Asanuma; Kazuhiko Yamamoto; Junko Ohnaka, all of Osaka, and Yoshiko Tokura, Wakayama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 284,605, Dec. 15, 1988, abandoned. This application Jul. 18, 1990, Ser. No. 555,670

Claims priority, application Japan, Dec. 16, 1987, 62-316023; Dec. 22, 1987, 62-324669; Dec. 22, 1987, 62-324671; Feb. 3, 1988, 63-022063; Feb. 16, 1988, 63-031790; Apr. 8, 1988, 63-085469; May 18, 1988, 63-119373; May 24, 1988, 63-124958; Jul. 11, 1988, 63-171020

Int. Cl.⁵ B32B 9/04; C08F 30/08

U.S. Cl. 427—393.5

30 Claims

- A process for preparing an article having a first layer and a second layer bonded with an adhesive layer comprising applying between said first layer and said second layer a polyolefin resin composition containing a random copolymer of an α -olefin and an alkenylsilane represented by the formula (I)



wherein n is 0 or an integer of from 1 to 12, R is selected from the group consisting of a methyl and a phenyl radical, and m is an integer of from 1 to 3.

5,085,896

LATEX-MODIFIED ASPHALT EMULSION TIECOAT MASTIC COATING SYSTEM

Allen P. Marks, Richboro, Pa., and Ronald L. Frantz, Riverton, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

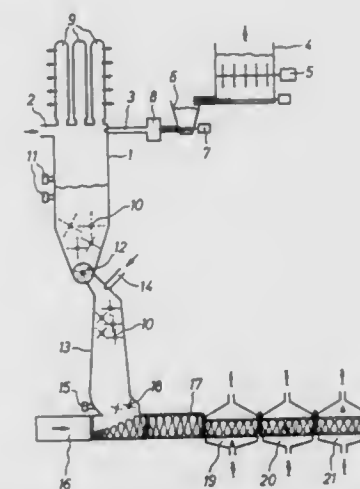
Filed Jun. 28, 1990, Ser. No. 545,433

Int. Cl.⁵ B05D 3/02; C08L 95/00

U.S. Cl. 427—412.1

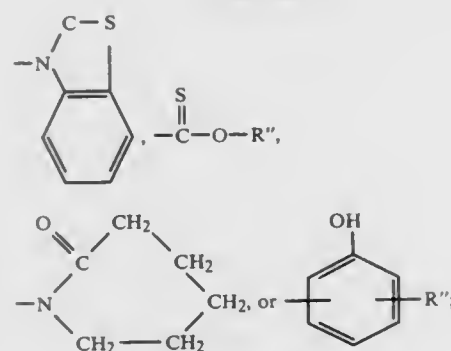
5 Claims

- A method for improving the quality of a mastic coating system comprising:
 - forming an aqueous tiecoat composition incorporating an asphalt emulsion containing admixed therein at least one latex polymer having a glass transition temperature of less than about 10° C., where said composition contains from about 5% latex solids and 95% asphalt emulsion solids to about 85% latex solids and 15% asphalt emulsion solids, based on the % total solids in the admixture,
 - applying the tiecoat composition to a substrate surface; and
 - applying a mastic topcoat onto the tiecoat composition.



- An insulating board comprising a mixture of discrete paper platelets having an edge length of 1 to 5 mm derived by comminuting paper substantially free from any surface coating or fillers and pretreated with an anti-rot additive, natural fibers having an edge length of 5 to 100 mm, and at least one component selected from the group consisting of an adhesive and aluminum sulfate.

-continued



R'' is an alkyl group of from about 1 to 4 carbon atoms; and R''' is an alkyl group of from about 1 to 4 carbon atoms or an aryl group.

5,085,906

ADHESIVE LABEL FOR ADHERING TO A CONTAINER AND CONTAINERS MADE THEREWITH

Hans-Peter Ast, Brannenburg; Eberhard Paech, Holzkirchen, and Werner Amberger, Munich, all of Fed. Rep. of Germany, assignors to Zweckform Etikettentechnik GmbH, Holzkirchen, Fed. Rep. of Germany

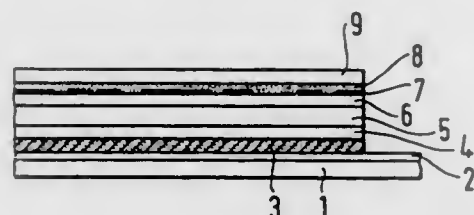
Filed Oct. 31, 1989, Ser. No. 429,646

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 3838027

Int. Cl.⁵ G09F 3/00

U.S. Cl. 428—36.92

12 Claims



1. Adhesive label for applying to a container, comprising a base layer, which includes on its underside an adhesive layer and on its upper side an imprint; and a film adhered to the upper side of the base layer by means of a laminating adhesive, wherein the base layer comprises a foamed polypropylene core layer and a pair of polypropylene layers, the foamed polypropylene layer being covered on both sides with the polypropylene layers, and wherein the film consists essentially of polypropylene.

5,085,907

ABRASION-RESISTANT PROTECTIVE LAMINATES

Thomas M. Smith, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

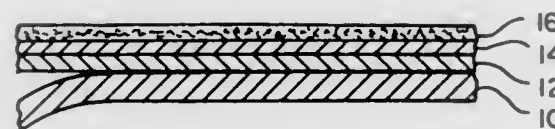
Continuation of Ser. No. 210,280, Jun. 23, 1988, abandoned.

This application Sep. 4, 1990, Ser. No. 577,839

Int. Cl.⁵ B32B 7/06; C09J 7/02

U.S. Cl. 428—40

12 Claims



1. A multi-layer sheet material that is useful as a protective

laminates; said multi-layer sheet material consisting essentially of:

- (1) a strippable carrier comprised of a flexible sheet material;
- (2) an abrasion-resistant layer which overlies said carrier and is releasably bonded thereto, said abrasion-resistant layer having been cured by in situ radiation-curing;
- (3) a thin structural interlayer of flexible laminatable sheet material which overlies said abrasion-resistant layer and is permanently bonded thereto, as a result of said in situ radiation-curing of said abrasion-resistant layer, said interlayer being very thin in relation to the thickness of said carrier;

and (4) an adhesive layer overlying said interlayer; said multi-layer sheet material being adapted to be bonded to a substrate by means of said adhesive layer and said carrier being adapted to be stripped from said abrasion-resistant layer to thereby provide a protective laminate on said substrate which has an abrasion-resistant surface.

5,085,908

LIGHTSAFE MASKING FILM

Shinichi Sano, Saitte; Hisashi Shimokawahara, Higashikatsushika, and Hiroshi Maruyama, Misato, all of Japan, assignors to Somar Corporation, Japan

Filed Feb. 2, 1989, Ser. No. 305,129

Int. Cl.⁵ B30B 7/06

U.S. Cl. 428—40

7 Claims

1. A lightsafe masking film, comprising a transparent substrate, and a transparent, lightsafe layer peelably provided over the surface of the substrate and containing (a) a nitrile rubber, (b) a vinyl chloride/vinylidene chloride copolymer having an average polymerization degree of 300–600 and a weight ratio of the vinyl chloride units to the vinylidene chloride units of 60:40 to 95:5, and (c) a lightsafe substance, the weight ratio of component (b) to component (a) being in the range of 50:50 to 95:5, said lightsafe layer blocking light having a wavelength of 300–550 nm.

5,085,909

SQUARYLIUM COMPOUNDS AND OPTICAL INFORMATION RECORDING MEDIUM USING THE SAME

Tsutomu Satoh, Yokohama; Ikuro Shimizu, and Yukiyoshi Ito, both of Yokkaichi, all of Japan, assignors to Ricoh Company, Ltd. and Kyowa Hakko Kogyo Co., Ltd., both of Tokyo, Japan

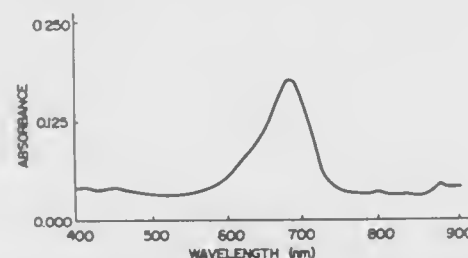
Continuation-in-part of Ser. No. 341,325, Apr. 20, 1989, abandoned. This application Mar. 16, 1990, Ser. No. 495,715

Claims priority, application Japan, Apr. 28, 1988, 63-106944

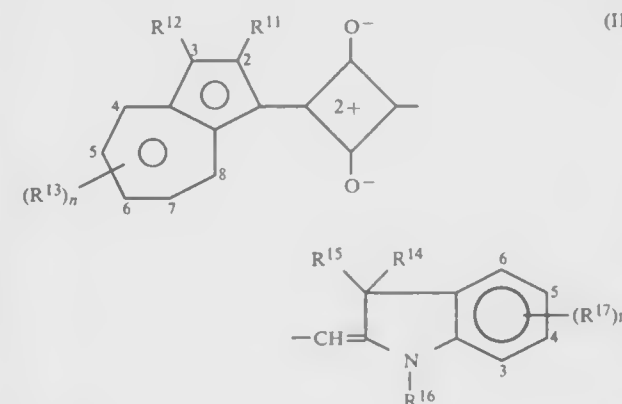
Int. Cl.⁵ B32B 3/02

U.S. Cl. 428—64

4 Claims



1. An optical information recording medium comprising a substrate, and a recording layer formed on said substrate, which comprises a squarylium compound having formula (II):



wherein

R¹¹ and R¹² each represent hydrogen, an alkyl group having 1 to 8 carbon atoms, an aralkyl group, or an aryl group, or R¹¹ and R¹² form an aromatic, heterocyclic or alkylene ring which may have a substituent, in combination with two adjacent carbon atoms in the ring to which R¹ and R¹² are bonded;

R¹³ represents an alkyl group having 1 to 8 carbon atoms, an aralkyl group, an aryl group or an alkoxy group having 1 to 8 carbon atoms; n is an integer of 0 to 5, and when n is 2 to 5, R¹³s may be the same or different, or form an aromatic, heterocyclic or alkylene ring which may have a substituent, in combination with two adjacent carbon atoms in the ring to which R¹³s are bonded;

R¹⁴ and R¹⁵ each represent an alkyl group having 1 to 8 carbon atoms;

R¹⁶ represents an alkyl group having 1 to 8 carbon atoms, an aralkyl group or an aryl group;

R¹⁷ represents a halogen, an alkyl group having 1 to 8 carbon atoms, an aralkyl group, an aryl group or an alkoxy group having 1 to 8 carbon atoms; m is an integer of 0 to 4, and when m is 2, 3 or 4, R¹⁷s may be the same or different, or form an aromatic, heterocyclic or alkylene ring which may have a substituent, in combination with two adjacent carbon atoms in the ring to which R¹⁷s are bonded.

5,085,910

OPTICAL DATA RECORDING MEDIUM AND METHOD OF MANUFACTURING THE SAME

Seiichi Matsushima, Tsukuba; Masahide Yagi, Toride; Masahiro Suzuki, and Yasuyuki Mori, both of Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

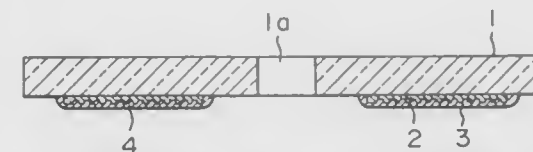
Filed Jul. 9, 1990, Ser. No. 550,016

Claims priority, application Japan, Jul. 12, 1989, 1-178177

Int. Cl.⁵ B32B 3/02

U.S. Cl. 428—64

12 Claims



1. An optical data recording medium comprising at least one glass substrate and at least one recording layer carried by at least one of said glass substrates, each said glass substrate being composed of a glass plate, said glass plate including a first and a second surface, at least one of said first and second surfaces having a surface layer containing metallic tin or a tin compound said surface layer extending from said at least one of said first and second surfaces inward toward the center of said glass plate, the content of the metallic tin or tin compound in said surface layer adjacent said at least one of said first and second

surfaces being regulated by polishing to be no more than 1.3 wt % of 1 cm² × 1 micron meter thick of said surface layer, and said glass plate being treated by a chemically reinforcing treatment.

5,085,911

FLEXIBLE MAGNETIC DISC WITH A TWO LAYER PROTECTIVE COATING WHICH TOP LAYER IS A ULTRA VIOLET RADIATION CURED COMPOUND WITH SPECIFIED ELASTICITY MODULUS

Mikihiko Kato; Yasushi Endo, and Toshio Kawamata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

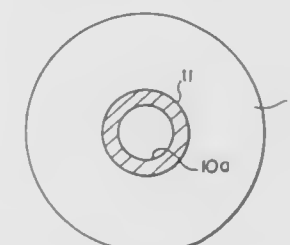
Filed Jun. 12, 1990, Ser. No. 536,859

Claims priority, application Japan, Jun. 13, 1989, 1-150266; Mar. 7, 1990, 2-55848

Int. Cl.⁵ G11B 23/00

U.S. Cl. 428—65

8 Claims



5,085,912

WEAR RESISTANT FLOOR COVERING

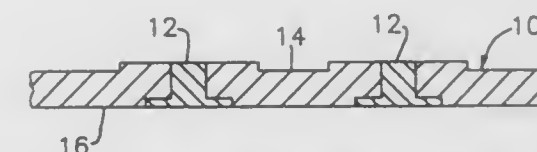
Louis Algieri, 103-17 Metropolitan Ave., Forest Hills, N.Y. 11375

Filed Nov. 29, 1989, Ser. No. 442,665

Int. Cl.⁵ B32B 3/10

U.S. Cl. 428—67

10 Claims



1. A floor covering comprising a flooring material, having a top side and an underside, and a plurality of durable inserts, each of said inserts having an upper surface, a bottom surface having a surface area larger than the upper surface, a collar and a stem, wherein said inserts are sized so that the bottom surface of the insert is flush with at least the underside of the flooring material and the height of the insert is not less than the height of the flooring material.

5,085,913

SILICONE MATERIAL

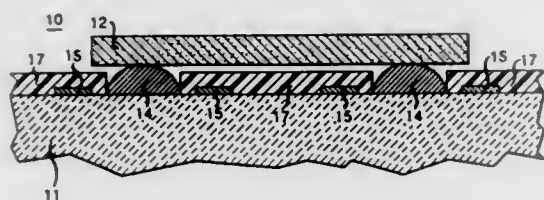
Ching-Ping Wong, Lawrenceville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1990, Ser. No. 515,963

Int. Cl.⁵ B32B 9/04; B31B 31/26

U.S. Cl. 428—76

13 Claims



1. An article of manufacture comprising an electronic device having on at least one surface thereof a cured dielectric material for insulating the electronic device comprising a silicone resin characterized in that:

the dielectric material consists essentially of (a) about twenty-one to twenty-five percent by weight of a silicone resin selected from the group consisting of dimethylsiloxane, dimethyl-methylphenylsiloxane, dimethyl-diphenylsiloxane, and mixtures thereof, (b) about seventy to eighty percent by weight of a silica filler, (c) about 0.5 to 0.7 percent by weight of a tin catalyst, and (d) about 0.57 to 0.26 percent by weight of copper (II) benzoylacetate.

5,085,914

THERMOPLASTIC MATERIAL CONTAINING TOWEL

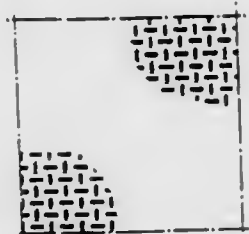
Lee E. Perdelwitz, Jr., Tacoma; Gustav O. Pfeiffer, Auburn; Amar N. Neogi, Seattle; Ronald H. Iff, Puyallup, and Hareesh R. Mehta, Federal Way, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 384,218, Jul. 21, 1989, Pat. No. 5,030,500. This application Jul. 20, 1990, Ser. No. 556,731

Int. Cl.⁵ B32B 3/10

U.S. Cl. 428—137

13 Claims



1. A durable towel comprising:

an absorbent core comprising a mixture of plural types of fibers, at least one of the fibers being heat bondable, the core being heat bonded and having a basis weight of from about fifty to one hundred and fifty g/m², the heat bondable fibers of the core being present in an amount of from about 15% to 40% of the total dry weight of the core; the towel including at least one cover sheet secured to the core, the cover sheet being stretchable no more than eighty percent of its length; the towel having densified bond areas at its interior, the densified bond areas occupying from about 3% to about 20% of the surface of that towel; and the towel on average being launderable at least five times without tearing or separation of the core and cover sheet.

5,085,915

MAGNETIC RECORDING MEDIUM

Kazuaki Taga, Takeshi Tsuda, Hiroo Inaba, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 467,467, Jan. 19, 1990, abandoned. This application Jan. 11, 1991, Ser. No. 640,512

Claims priority, application Japan, Jan. 20, 1989, 1-11259

Int. Cl.⁵ G11B 23/00

U.S. Cl. 428—141

8 Claims

1. A magnetic recording medium which comprises a plurality of magnetic layers comprising at least first and second magnetic layers containing ferromagnetic particles which layers are successively formed on a surface of a polyethylene terephthalate support, wherein said support contains inert inorganic particles consisting essentially of particles having an average particle size of from 0.5 to 0.7 microns and a standard deviation of 0.1 microns or less and a Mohs' hardness of from 3 to 8, and both front and back surfaces of said support have a center-line average roughness (Ra) of 16 nm or less and a density of protrusions (Ds) of 6000/mm² or more in the case of protrusions of 0.7 microns or more.

5,085,916

HIGH-PERFORMANCE DIELECTRIC FILM WITH IMPROVED THERMAL STABILITY

Thomas Wilhelm, Tausnusstein; Gunter Schloegl, Kelkheim; Lothar Bothe, Mainz-Gonsenheim, and Guenther Crass, Tausnusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

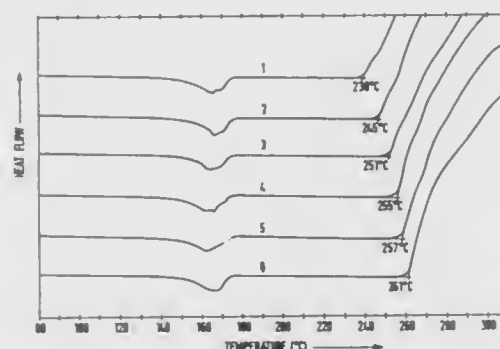
Filed Sep. 15, 1989, Ser. No. 407,942

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1988, 3831355

Int. Cl.⁵ B32B 3/00, 15/08

U.S. Cl. 428—156

20 Claims



1. A biaxially oriented dielectric film of high-purity electrical film raw material which comprises a propylene polymer and a stabilizer for the propylene polymer, wherein the organic neutralizing agent content of the raw material is less than or equal to 100 ppm, wherein the stabilizer content of said raw material is less than or equal to about 1.2% by weight, based on the weight of the dielectric film, and wherein the idealized thermo-oxidation temperature of the film is about 250° to 300° C.

5,085,917

FABRIC HAVING RAVEL RESISTANT SELVAGES AND METHOD FOR IMPARTING THE SAME

William P. Hodnett, III, Martinsville, Va., assignor to Thor Radiation Research, Inc., Martinsville, Va.

Filed Apr. 10, 1990, Ser. No. 507,680

Int. Cl.⁵ B32B 3/08; B05D 3/06, 3/12; D03D 47/40, 49/70

U.S. Cl. 428—173

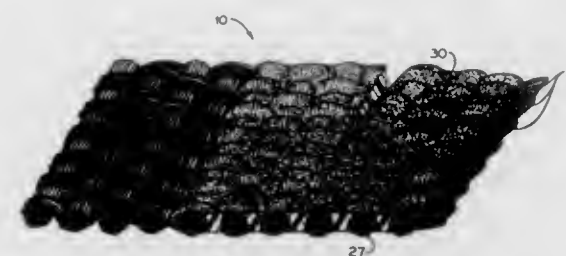
26 Claims

1. A fabric characterized by having ravel resistant selvages, said fabric comprising a fabric base formed of interengaged strands and having a selvage along at least one longitudinal

side edge thereof, and a radiation cured crosslinked coating composition applied to said selvage to provide ravel resistance thereto, said radiation cured crosslinked coating composition comprising a copolymer of an elastomeric-forming low viscosity monofunctional acrylate monomer and a reactive polyfunctional acrylate monomer.

19. A method of forming a ravel resistant selvage in a fabric comprising the steps:

- advancing a fabric formed of interengaged strands and having a selvage area along at least one longitudinal side edge thereof along a predetermined path of travel to and through a coating application station;
- depositing onto the selvage area of the fabric at the coating application station, an uncured radiation curable



uncrosslinked coating composition comprising an elastomeric-forming low viscosity monofunctional acrylate monomer and a reactive polyfunctional acrylate monomer;

- advancing the coated fabric from the coating application station to and through a curing station and subjecting the coated selvage area of the fabric to radiation while at the curing station to polymerize and cure the radiation curable coating composition into a hardened cured crosslinked polymer composition which will bond together the strands in the selvage area to provide ravel resistance; and
- advancing the thus cured fabric from the curing station to a trimming station and trimming the fabric in the selvage area containing the cured and hardened composition.

5,085,918

PRINTED RETROREFLECTIVE SHEET

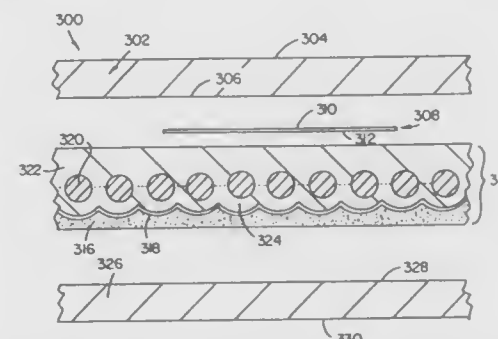
J. Sundar Rajan, and Vincent J. Mako, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 15, 1990, Ser. No. 524,147

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—195

7 Claims



1. A reflective sign comprising a retroreflective sheet:

- having an image bearing surface, intended to be seen by an observer, which comprises a polymer selected from the group consisting of polyalkylacrylates, polyalkylmethacrylates, polyesters, vinyl polymers, polyurethanes, cellulose esters, fluoropolymers, polycarbonates, polyolefins, polyvinyl acetals, ionomeric copolymers and copolymers

of ethylene or propylene with acrylic acid, methacrylic acid, or vinyl acetate;

B. said image bearing surface having printed thereon an image derived from a solid toner comprising:

- a colorant;
- a transparent polymeric binding agent, which adheres to said image bearing surface, selected from the group consisting of alkyl substituted acrylic and methacrylate polymers with alkyl groups having 1-9 carbon atoms, polyvinyl acetals, polyolefins, polyesters and vinyl resins; and
- a charge carrier selected from the group consisting of: acrylic polymers with functional groups having at least an amine nitrogen or quaternary ammonium nitrogen; methacrylic polymers with functional groups having at least an amine nitrogen or quaternary ammonium nitrogen; and azine dyes.

5,085,919

METHOD FOR PRINTING TEXTILE PRODUCTS AND TEXTILE PRODUCTS OBTAINED THEREBY

Masato Yamate, 612-2, Oaza-managura, Ekiya-cho, Fukuyama-shi, Hiroshima-ken, Japan

Division of Ser. No. 417,252, Oct. 5, 1989, Pat. No. 4,992,099.

This application Aug. 28, 1990, Ser. No. 574,206

Claims priority, application Japan, Oct. 6, 1988, 63-253324

Int. Cl.⁵ B32B 3/16, 9/04; B05D 5/00

U.S. Cl. 428—196

8 Claims

1. A method for printing textile products comprising the steps of printing a design on the textile surface at room temperature under ambient pressure with a printing paste of a uniformly kneaded mixture comprising 100 wt. parts of egg yolk, 1-10 wt. parts of a preservative, 1-10 wt. parts of a lower alcohol, 20-40 wt. parts of an alkyd paint and 5-30 wt. parts of a water soluble resin clear paint, fixing said alkyd paint together with the paste on the textile product by drying the textile, removing the residual paste from the textile by washing with water, and drying the textile product.

5,085,920

NONWOVEN WIPE HAVING IMPROVED GREASE RELEASE

Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Nee-nah, Wis.

Filed Apr. 30, 1990, Ser. No. 516,496

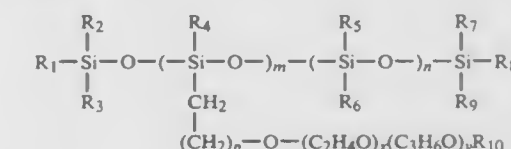
Int. Cl.⁵ B32B 33/00; D04H 1/54, 1/56, 1/72

U.S. Cl. 428—198

16 Claims

1. A nonwoven wipe having improved grease release which comprises a meltblown polyolefin web having a basis weight of from about 17 to about 204 g/m², in which:

A. said meltblown polyolefin web has at or on the surfaces of the fibers thereof at least one additive having the general formula,



in which:

- R₁-R₉ are independently selected monovalent C₁-C₃ alkyl groups;
- R₁₀ is hydrogen or a monovalent C₁-C₃ alkyl group;
- m represents an integer of from 1 to about 4;
- n represents an integer of from 0 to about 3;
- the sum of m and n is in the range of from 1 to about 4;
- p represents an integer of from 0 to about 5;

- (7) x represents an integer of from 1 to about 10;
 (8) y represents an integer of from 0 to about 5;
 (9) the ratio of x to y is equal to or greater than 2;
 (10) said additive has a molecular weight of from about 350 to about 1,400; and
 (11) said additive is present in an amount of from about 0.5 to about 5 percent by weight, based on the amount of thermoplastic polyolefin; and

B. said wipe has been pattern bonded by the application of heat and pressure in the ranges of from about 80° C. to about 180° C. and from about 150 to about 1,000 pounds per linear inch, respectively, employing a pattern with from about 10 to about 250 bonds/inch² covering from about 5 to about 30 percent of the wipe surface area.

5,085,921

DECORATIVE LAMINATES WITH HEAT RELEASE REDUCING AND INK DISCOLORATION PREVENTIVE PROTECTIVE LAYER

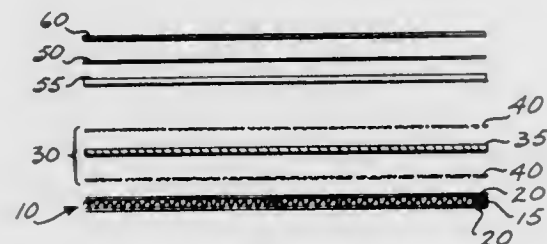
Jay A. Jayarajan, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 227,426, Jul. 29, 1988, abandoned, which is a continuation of Ser. No. 39,990, Apr. 20, 1987, abandoned. This application Dec. 27, 1989, Ser. No. 462,322

Int. Cl.⁵ B32B 3/18, 15/08

U.S. Cl. 428—204

46 Claims



1. In a decorative laminate formed of a rigidity imparting substrate layer and a decorative layer formed by a decorative ink, said decorative laminate including one or more resinous layers including a curable resin that, when cured, creates reaction products that could destroy the integrity of said decorative ink by causing said decorative ink to discolor, said decorative laminate being formed by a heat and pressure laminating process, the improvement comprising a barrier layer that (i) is impermeable to said reaction products created when said curable resin is cured that could destroy the integrity of said decorative ink, (ii) is located in said decorative laminate such that said decorative layer lies on one side of said barrier layer and all resinous layers that create said reaction products when said curable resin is cured lie on the other side of said barrier layer, and (iii) forms a heat sink once the decorative laminate is used after said resin is cured.

3. The improved decorative laminate claimed in claim 1, wherein said barrier layer includes a sheet of protective material that is impermeable to said reaction products created when said curable resin is cured that could destroy the integrity of said decorative ink by causing said decorative ink to discolor and wherein the decorative laminate includes an exposed outer layer on the opposite side of said decorative layer from said barrier layer, the surface of said exposed outer layer opposite the decorative layer forming the exposed outer surface of the decorative laminate, said exposed outer layer comprising a thermoplastic film.

5. The improved decorative laminate claimed in claim 3, wherein said sheet of protective material is a sheet of aluminum foil.

5,085,922

PRINTED CIRCUIT BOARD

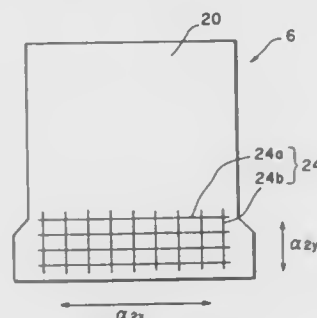
Yasuhiro Murasawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 22, 1990, Ser. No. 526,844

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—209

8 Claims



1. A printed circuit board comprising:

- a printed wiring board including
 - a first insulating plate containing first reinforcing fibers lying along a first direction, and
 - printed wiring formed on said first insulating plate; and
- a terminal board including
 - a second insulating plate containing second reinforcing fibers lying along a second direction and made of the same material as said first insulating plate, said second insulating plate being bonded to said printed wiring board, and
 - electrode terminals formed on said second insulating plate and electrically connected to said printed wiring, wherein the first and second directions are in substantial parallel alignment.

5,085,923

HEAT-CONDUCTIVE ALUMINUM NITRIDE SINTERED BODY AND METHOD OF MANUFACTURING THE SAME

Akira Yamakawa, Masaya Miyake, Hitoyuki Sakanoue, Hisao Takeuchi, Koichi Sogabe, and Akira Sasame, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 303,284, Jan. 26, 1989, Pat. No. 5,034,357.

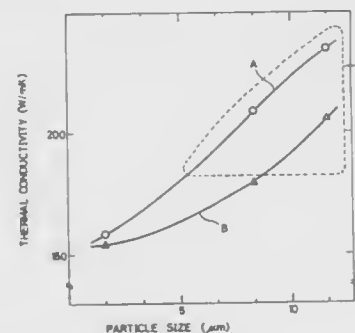
This application Apr. 17, 1991, Ser. No. 686,658

Claims priority, application Japan, Feb. 8, 1988, 63-28270

Int. Cl.⁵ B32B 18/00

U.S. Cl. 428—209

6 Claims



A 70% 0.05μm, 30% 0.7μm
 B 70% 0.3μm, 30% 0.7μm
 C PRESENT INVENTION

1. A circuit board, comprising a substrate made of an aluminum nitride sintered body, a circuit pattern on at least a major surface of said substrate, said circuit pattern including a conductive paste, said aluminum nitride sintered body comprising 0.01 to 0.8 wt% of a rare earth element, 0.2 to 0.5 wt% of

oxygen, 0.001 to 0.1 wt% of carbon, the remainder being aluminum nitride consisting essentially of aluminum nitride particles and intergranular phases existing between said aluminum nitride particles, said intergranular phases having a size not more than one micron, and wherein the intergranular phases contain at least two elements selected from the group consisting of rare earth elements, aluminum, oxygen, nitrogen and carbon, said substrate having a surface roughness of not more than 5 microns.

5,085,924

UV-CURABLE PRE-CROSSLINKED EPOXY FUNCTIONAL SILICONES

Richard P. Eckberg, Saratoga Springs, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 498,168, Mar. 23, 1990, Pat. No. 4,987,158. This application Oct. 25, 1990, Ser. No. 603,080

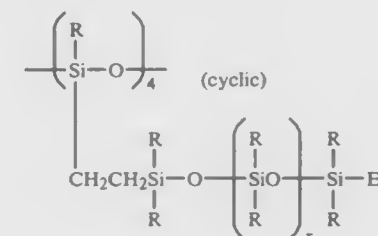
Int. Cl.⁵ B32B 3/00, 7/00, 15/00

U.S. Cl. 428—209

13 Claims

1. An article of manufacture, comprising a substrate having disposed on the surface thereof a coating comprising the cured product of an ultraviolet radiation-curable composition, comprising:

- a pre-crosslinked epoxy-functional diorganopolysiloxane having the general formula:



wherein E represents an epoxy-functional organic radical having from 2 to 20 carbon atoms; R is individually a lower alkyl radical having 1 to 8 carbon atoms; and x is a value of from 10 to about 200; and

- a catalytic amount of an onium salt photocatalyst or a combination of onium salt photocatalysts.

5,085,925

OPTICAL RECORDING MEDIUM

Mizuo Hiraoka, and Hiroyuki Imataki, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

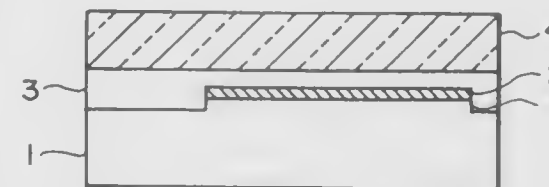
Continuation of Ser. No. 229,966, Aug. 9, 1988, abandoned. This application Oct. 16, 1990, Ser. No. 598,748

Claims priority, application Japan, Aug. 12, 1987, 2-199952

Int. Cl.⁵ B41M 05/26; G11B 07/24; B42D 15/02

U.S. Cl. 428—215

12 Claims



1. An optical recording medium which comprises an optical recording layer provided on a substrate, a protective material and a bond layer for bonding the optical recording layer to the protective material, the bond layer having a thermoplastic adhesive comprising: (A) a tackifier and at least one of (B) an ethylene-acrylic acid copolymer, an ethylene-acrylate ester copolymer, or an ethylene-maleic anhydride-acrylic acid terpolymer.

5,085,926

NEAT REFLECTING GLASS WITH MULTILAYER COATING

Yasunobu Iida, Matsusaka; Masato Nakamura, Mie Prefecture; Nobuyuki Takeuchi, Ise, and Keiji Onishi, Matsusaka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

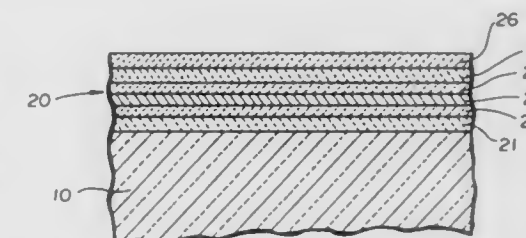
Filed Feb. 26, 1990, Ser. No. 484,810

Claims priority, application Japan, Feb. 27, 1989, 1-45644

Int. Cl.⁵ B32B 17/06

U.S. Cl. 428—216

10 Claims



1. A heat reflecting glass plate, comprising a transparent glass plate and a multilayer coating formed on one side of the glass plate, the multilayer coating comprising:

- a first layer which is a film of an oxide of a metal selected from the group consisting of Ti, Zr, Ta, Sn and Cr deposited on the glass surface and has a thickness in the range from 250 to 800 Å;
 - a second layer which is a film of an oxynitride of a metal selected from the group consisting of Ti, Zr, Ta, Cr, Ni-Cr alloy and stainless steel deposited on said first layer and has a thickness in the range from 30 to 200 Å;
 - a third layer which is a film of a metal selected from the group consisting of Ti, Zr, Ta, Cr, Ni-Cr alloy and stainless steel deposited on said second layer and has a thickness in the range from 30 to 150 Å;
 - a fourth layer which is a film of an oxynitride of a metal selected from the group consisting of Ti, Zr, Ta, Cr, Ni-Cr alloy and stainless steel deposited on said third layer and has a thickness in the range from 30 to 200 Å;
 - a fifth layer which is a film of an oxide of a metal selected from the group consisting of Ti, Zr, Ta, Sn and Cr deposited on said fourth layer and has a thickness in the range from 250 to 800 Å; and
 - a sixth layer which is a film of an oxynitride of an alloy selected from the group consisting of Si-Ti alloy and Si-Ni alloy deposited on said fifth layer as the outermost layer and has a thickness in the range from 400 to 2000 Å;
- the multilayer coating being formed such that the heat reflecting glass plate is not lower than 30% in transmittance for visible light, not higher than 60% in transmittance for solar radiation and not higher than 20% in reflectance for visible light.

5,085,927

STRETCH FILM CLING ENHANCEMENT BY ADDITION OF ELASTOMERS

Gregory L. Dohrer, Broken Arrow, Okla., assignor to Paragon Films, Inc., Broken Arrow, Okla.

Filed Apr. 10, 1990, Ser. No. 507,311

Int. Cl.⁵ B32B 7/02, 27/08, 27/32; B65B 53/00

U.S. Cl. 428—220

18 Claims

1. A stretch wrap film comprising layers A and B wherein layer A has a cling force to another layer A of at least about 150g, measured according to ASTM D4649, and wherein layer A comprises at least one linear styrenic elastomer and a tackifier, said linear styrenic elastomer having a melt index as measured by ASTM 1238 Condition G of from about 5 to about 10g.10 mins and containing less than about 30 wt.% styrene; and said B layer is comprised of a polyolefin.

5,085,928

FIBER REINFORCED COMPOSITES COMPRISING UNI-DIRECTIONAL FIBER LAYERS AND ARAMID SPUNLACED FABRIC LAYERS

William H. Krueger, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 6, 1989, Ser. No. 334,242

Int. Cl.⁵ B32B 27/34, 5/12; D04H 00/00; C09J 7/00
U.S. Cl. 428—287 6 Claims



1. A fiber reinforced composite comprising one or more layers of unidirectional fibers contacting and alternating with one or more layers of a porous aramid spunlaced fibrous material, said aramid spunlaced fibrous material having a basis weight of up to about 20 percent of the continuous layers of unidirectional fibers, said fibers and said aramid spunlaced fibrous material being embedded in a thermoplastic resin, said porous aramid spunlaced fibrous material having a melting point greater than said thermoplastic resin.

5,085,929

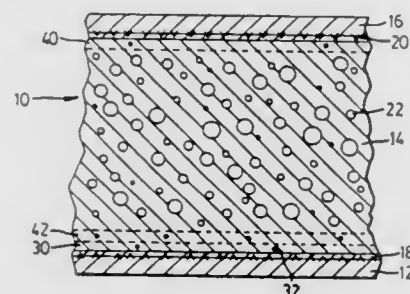
GYPSUM BOARD

R. Bruce, Brantford, and Dimitrios Mitakidis, Oakville, both of Canada, assignors to Domtar Inc., Montreal, Canada
Filed Feb. 17, 1989, Ser. No. 311,908

Int. Cl.⁵ B32B 3/26

U.S. Cl. 428—309.9

9 Claims



1. Wallboards, suitable for use in constructing interior walls and ceilings of buildings, comprising:

- (1) a core of foamed gypsum with a multiplicity of relatively large voids substantially uniformly distributed throughout and having a first specific gravity, said core having top, bottom, side and end surfaces, with the top and bottom surfaces being substantially parallel to each other;
- (2) fibrous material cover sheets disposed on and in substantially the entire top and bottom surfaces, wherein interfaces between the fibrous material cover sheets and the top and bottom surfaces of the gypsum core are established and wherein the interfaces are a mixture of fibers from the cover sheets and gypsum from the core; and
- (3) a first stratum of the gypsum core wherein said first stratum does not contain any substantial number of voids, has a specific gravity of at least 0.95, has a specific gravity significantly greater than said first specific gravity and is disposed substantially parallel to and substantially next to at least one of said interfaces, but spaced from said interface a distance sufficient that fibers of said cover sheet disposed in said interface do not substantially protrude

into said stratum and said stratum is substantially free from said fibers.

5,085,930

PARTICULATE THERMOSETTING ADHESIVE COMPOSITIONS

Marcel Widmann, Belleville, and James H. Hickey, Picton, both of Canada, assignors to BTL Specialty Resins Corp., Toledo, Ohio

Division of Ser. No. 297,691, Jan. 18, 1989, Pat. No. 4,945,000.
This application May 21, 1990, Ser. No. 526,730

Int. Cl.⁵ B32B 5/16

U.S. Cl. 428—323

19 Claims

1. An article of manufacture comprising a particulate thermosetting adhesive composition and a substrate, wherein said adhesive composition comprises individual free flowing finely divided discrete particles of substantially water insoluble inorganic particulate matter inert to and coated with a thermosetting resin comprising at least one aldehyde condensation product selected from the group consisting of phenol, resorcinol, melamine, urea, acetone, dicyandiamide, and mixtures thereof; and wherein the amount of particulate matter varies from about 1 to 240 parts by weight per 100 parts by weight of the solids content of the thermosetting resin.

5,085,931

MICROWAVE ABSORBER EMPLOYING ACICULAR MAGNETIC METALLIC FILAMENTS

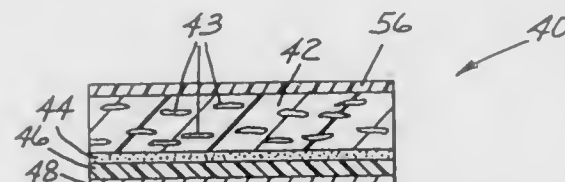
Charles E. Boyer, III; Eric J. Borchers; Richard J. Kuo, and Charles D. Hoyle, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 302,427, Jan. 26, 1989, abandoned. This application Jul. 3, 1990, Ser. No. 547,397

Int. Cl.⁵ B32B 5/16; H01B 1/02; H01C 00/00

U.S. Cl. 428—328

26 Claims



1. An insulating microwave radiation absorber which comprises acicular poly-crystalline magnetic metallic filaments having an average length of about 10 microns or less, diameters of about 0.1 micron or more, and aspect ratios between 50:1 and 10:1, dispersed in a dielectric binder; whereby the dimensions and magnetic and metallic natures of the filaments enable the absorber to absorb radiation in the microwave region of approximately 2 to 20 GHz.

5,085,932

TRANSPARENT PLASTIC PRINTING FILM

Noboru Fujita; Toru Orisaka; Akira Haneda; Yuukichi Miyokawa, and Jun Arikawa, all of Sayama, Japan, assignors to Dynic Corporation, Kyoto, Japan

Continuation of Ser. No. 259,491, Oct. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 145,500, Dec. 8, 1987, abandoned which is a continuation-in-part of PCT/JP87/00191, Mar. 27, 1987. This application May 14, 1990, Ser. No. 523,251

Claims priority, application Japan, Apr. 9, 1986, 61-80158; Apr. 18, 1986, 61-90819; Apr. 21, 1986, 61-91668; May 13, 1986, 61-110417; Jul. 19, 1986, 61-170645; Jan. 20, 1987, 62-8950

Int. Cl.⁵ B41M 5/00

U.S. Cl. 428—331

14 Claims

1. A composite transparent plastic printing film suitable for printing with an oil ink of the oxidative polymerization type containing fluidable ingredients including a drying oil and a

petroleum solvent having a high boiling point, said printing film, comprising:

- a transparent plastic film; and
- an ink-setting layer provided on at least one side of said transparent plastic film, said ink-setting layer consisting essentially of one or more resin materials which swell by absorbing the fluidable ingredients contained in the oil ink and a silica sol having a particle size of 3–100 μm for improving blocking resistance and scratch resistance, and for preventing triboelectrification.

5,085,933

FILM FOR USE AS THERMOSENSITIVE STENCIL PRINTING CARDBOARD SHEET

Kotaro Katoh; Hiroshi Tomita, and Kazuyoshi Saitoh, all of Sagami-hara, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Jul. 6, 1990, Ser. No. 549,061

Claims priority, application Japan, Jul. 6, 1990, 1-173088

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—332

14 Claims

1. A film for a thermosensitive stencil printing base sheet having a planar orientation coefficient of 0.90 to 0.98, comprising a biaxially stretched film of a thermoplastic resin having a thickness of 0.2 to 7 micrometers, said film showing at least two fusion peaks in its DSC temperature elevation measuring chart (the rate of temperature elevation 20° C./min.), at least two fusion peaks having the following relation:

$$T_{mp}(\text{max}) \leq 260 (^{\circ}\text{C.})$$

$$T_{mp}(\text{min}) \geq 90 (^{\circ}\text{C.})$$

$$\Delta T_{mp} \geq 10 (^{\circ}\text{C.})$$

$$5(\text{cal/g}) \leq \Delta H_u(\text{total}) \leq 13(\text{cal/g})$$

$$0.05 \leq \Delta H_u(\text{min})/\Delta H_u(\text{total}) \leq 0.9$$

wherein

$T_{mp}(\text{max})$ is the temperature ($^{\circ}\text{C.}$) of the fusion temperature on the highest temperature side,

$T_{mp}(\text{min})$ is the temperature ($^{\circ}\text{C.}$) of fusion peak on the lowest temperature side,

ΔT_{mp} is $T_{mp}(\text{max}) - T_{mp}(\text{min})$,

$\Delta H_u(\text{total})$ is the total fusion energy (cal/g), and

$\Delta H_u(\text{min})$ is the fusion energy (cal/g) of the fusion peak on the lowest temperature side.

5,085,934

REVERSIBLE THERMOSENSITIVE RECORDING MATERIAL

Yoshihiko Hotta, Mishima; Syoji Maruyama, Yokohama, and Makoto Kawaguchi, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 4, 1990, Ser. No. 519,028

Claims priority, application Japan, May 31, 1989, 1-140109

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.⁵ B41M 5/26

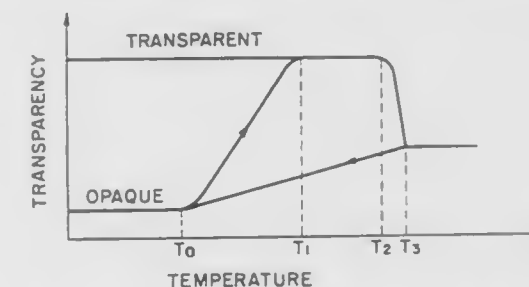
U.S. Cl. 428—335

11 Claims

1. A reversible thermosensitive recording material comprising:

- (a) a support, and
- (b) a reversible thermosensitive recording layer formed thereon, which comprises a matrix resin, and low-molecular-weight components of (i) at least one higher fatty acid having 16 or more carbon atoms and (ii) at least one aliphatic saturated dicarboxylic acid having 20 or more

carbon atoms, dispersed in said matrix resin, with the ratio by weight of the amount of said higher fatty acid to the



amount of said aliphatic saturated dicarboxylic acid being in the range of 95:5 to 50:50.

5,085,935

FLUX SPREADING THIN FILM MAGNETIC DEVICES

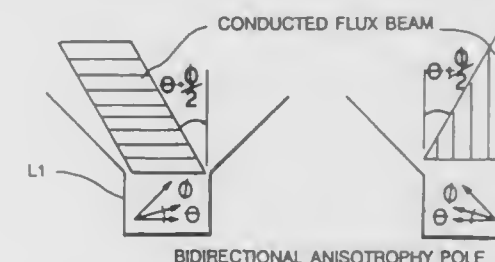
Michael L. Mallary, Berlin, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 227,808, Aug. 3, 1988. This application Jun. 2, 1989, Ser. No. 360,421

Int. Cl.⁵ G11B 23/00; H01F 10/08

U.S. Cl. 428—336

78 Claims



1. A magnetic device for conducting signal flux there-through, comprising:

- a plurality of magnetic layers, a first one of said layers including first magnetic domains oriented to cause said signal flux to conduct by rotation in a first direction through said layer, and a second one of said layers having second magnetic domains oriented differently from said first domains to cause said signal flux to conduct by rotation in a second, different direction through said one layer, said layers being arranged so that said first magnetic domains of said first layer are disposed adjacent to said second magnetic domains of said second layer, and said layers being coupled to each other to allow said signal flux to pass between said layers to that said signal flux conducts by rotation through said device by following said first and second directions.

5,085,936

WATERMARKED PAPER SHEET FOR USE IN XEROGRAPHIC IMAGING PROCESSES

Peter T. Herdman, High Wycombe, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Filed Jan. 10, 1989, Ser. No. 295,375

Claims priority, application United Kingdom, Jan. 18, 1988, 8801044; Jul. 14, 1988, 8817113

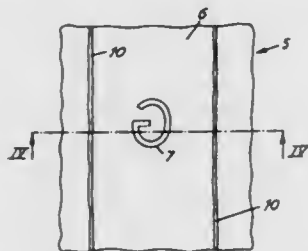
Int. Cl.⁵ B32B 29/06; B05D 5/06

U.S. Cl. 428—337

8 Claims

1. A watermarked paper sheet for use in a xerographic ion deposition or magnetographic printing process, in which the sheet has print receiving and reverse sides, the print receiving

side of the sheet having a surface resistivity of between 5×10^{10} and 5×10^{12} ohms per square and a Bendsten roughness



of not more than 300 milliliters, and the reverse side being formed with a watermark.

5,085,937

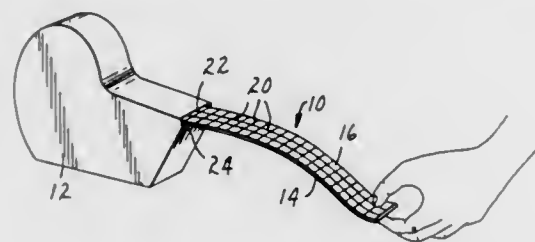
PARTICULATE MONITORING TAPE

Leroy J. Herauf, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 400,668, Aug. 30, 1989, Pat. No. 5,080,972. This application Feb. 11, 1991, Ser. No. 653,784 Int. Cl.⁵ B32B 7/12, 15/04

U.S. Cl. 428—343

10 Claims



1. An article for sampling particulates on a surface, comprising:
 - a durable film backing fabricated from a sheet of dimensionally stable polymeric material, said film backing having a primary surface and having a grid pattern on said primary surface, for visually dividing said film backing into areas of predetermined size;
 - a transparent adhesive coating affixed to said primary surface of said film backing; and
 - said film backing being pigmented to provide a contrast with said grid pattern.

5,085,938

CHEMICALLY TREATED FIBERS AND METHOD OF PREPARING AND METHOD OF USING TO REINFORCE POLYMERS

Johnson C. Watkins, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1989, Ser. No. 441,208

Int. Cl.⁵ D02G 3/00; B32B 9/00; C08G 77/04, 77/20

U.S. Cl. 428—378

30 Claims

1. Chemically treated high modulus fiber having thereon an aqueous chemical treating composition, comprising:
 - a. water soluble, silylazide in an effective coupling agent amount,
 - b. at least one stabilizing agent selected from the group consisting of: 1) fortified oil-in-water dispersion of a matrix-compatible film forming polymer; 2) silylated poly(vinyl alcohol) and copolymers; 3) at least medium molecular weight poly(vinyl alcohol) and copolymers, having a weight average molecular weight of around 30,000 to 105,000; and 4) unsaturated organo-compounds selected from the group consisting of methacrylamide-containing organosilane, vinyl-containing organosilanes, methacryloxypropyltrimethoxysilane, b-(N-vinylbenzyl-amino)ethyl-gamma-aminopropyltrimethoxysilane mono-

hydrogen chloride; where the silane has groups selected from groups consisting of: alkoxy, hydroxy, acryloxy groups and a mixture thereof; and unsaturation-containing organic monomers reactable with the matrix polymer; and mixtures thereof,

- c. fiber lubricant essentially free of any primary or secondary nitrogen containing moieties and present in an effective lubricating amount, and
- d. water to given an effective total solids and viscosity for the treating composition for application to the fibers, where the amount of the chemical treating composition on the fiber is in the range of about 0.1 to about 1.5 percent LOI.

5,085,939

THIN FILM-COATED POLYMER WEBS

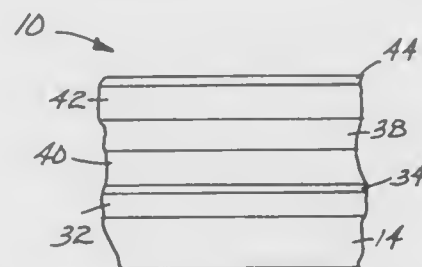
Robert P. Wenz, Cottage Grove; Michael F. Weber, Shoreview, and Ravindra L. Arudi, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 24, 1990, Ser. No. 602,792

Int. Cl.⁵ B32B 9/04; B23K 15/00; B44C 1/22; B29C 37/00

U.S. Cl. 428—411.1

28 Claims



1. A thin film-coated polymer web, comprising:
 - a) a polymer web, wherein the polymer web has been purified with an amount of electron beam radiation sufficient to reduce the amount of low mass residual contaminants that outgas from the surface and body of the polymer web;
 - b) a thin film electronic device deposited onto the polymer web.

5,085,940

DECORATIVE LAMINATE HAVING CORE SHEET IMPREGNATED WITH VINYL ESTER RESIN

Andrew Dion, Temple, Tex., assignor to Ralph Wilson Plastics Co., Temple, Tex.

Filed Aug. 17, 1990, Ser. No. 569,176

Int. Cl.⁵ B32B 27/38

U.S. Cl. 428—413

28 Claims

1. A laminate which comprises at least one core sheet having impregnated therein, at least a partially cured, core sheet treating composition comprising a vinyl ester resin derived from an epoxide terminated resin and an ethylenically unsaturated organic carboxylic acid.

5,085,941

MAGNETIC RECORDING MEDIUM WITH HYDROXY FUNCTIONAL, SULFONATED BINDER SYSTEM

Takatoshi Ohkubo, Atsugi, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 437,646, Nov. 16, 1989, which is a continuation-in-part of Ser. No. 315,304, Mar. 1, 1989, abandoned. This application May 23, 1991, Ser. No. 704,443

Int. Cl.⁵ G11B 23/00

U.S. Cl. 428—424.6

15 Claims

1. A composite for magnetic recording, comprising:
 - (a) a substrate having a front side and a backside;
 - (b) a first cured coating on the front side of the substrate,

wherein said first cured coating is obtained from reactants comprising:

- (i) from about 10 to about 90 parts by weight of a curable, sulfonated, hydroxy-functional polyurethane polymer, which comprises a first plurality of SO_3M groups pendant from the polyurethane polymer backbone, wherein the polyurethane polymer has an SO_3M equivalent weight of from about 2,000 to about 100,000, and wherein M is selected from the group consisting of H^+ , Li^+ , Na^+ , K^+ , NR_4^+ where R can be H^+ or an alkyl group, and mixtures thereof; and a first plurality of cross-linkable hydroxyl groups wherein the polyurethane polymer has a hydroxyl equivalent weight of from about 500 to about 10,000, and wherein at least a majority of the hydroxyl groups are pendant from the polyurethane polymer backbone at locally hydrophobic sites; and

- (ii) from about 10 to about 90 parts by weight of a curable, sulfonated, hydroxy-functional vinyl chloride copolymer, which comprises a second plurality of SO_3M groups pendant from the vinyl chloride copolymer backbone, wherein the vinyl chloride copolymer has an SO_3M equivalent weight of from about 2,000 to about 100,000, and wherein M is selected from the group consisting of H^+ , Li^+ , Na^+ , K^+ , NR_4^+ where R can be H^+ or an alkyl group, and mixtures thereof; and a second plurality of cross-linkable hydroxyl groups wherein the vinyl chloride copolymer has a hydroxyl equivalent weight of from about 500 to about 10,000; and

- (c) a magnetizable pigment dispersed in said first cured coating;

wherein said polyurethane polymer is obtained by reacting a sulfonated polyisocyanate prepolymer having at least two reactive isocyanate groups and having substantially no hydroxy functionality with a hydrophobic polyol having at least three reactive hydroxy groups, wherein said hydrophobic polyol is present in a sufficient amount such that there is at least about a 67% excess of reactive hydroxy groups relative to reactive isocyanate groups.

5,085,942

SEALANT PRODUCT, LAMINATE THEREOF, AND PNEUMATIC TIRE CONSTRUCTED THEREWITH

Sung W. Hong, Cheshire, and Philip J. Cangelosi, Waterbury, both of Conn., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Division of Ser. No. 80,842, Aug. 3, 1987, Pat. No. 4,913,209, Continuation-in-part of Ser. No. 44,628, May 1, 1987, which is a division of Ser. No. 693,090, Jan. 21, 1985, Pat. No. 4,664,168.

This application Mar. 21, 1990, Ser. No. 497,051

Int. Cl.⁵ B32B 25/04

U.S. Cl. 428—492

20 Claims



1. A sealant product consisting essentially of an extruded, generally flat strip of a surface-detackified homogeneous mixture of
 - (i) high molecular weight and low molecular weight elastomers present in a weight ratio (high mol wt/low mol wt) greater than 1;
 - (ii) a processing aid selected from a homogenizer and a tackifier, provided that the combined weight of homogenizer and tackifier is at least equal to that of the high molecular wt elastomer;
 - (iii) a curing agent, effective at a temperature in the range from about 250°–450° F. and a pressure in the range from about 200–500 psig to substantially fully cure said high

molecular wt and low molecular wt elastomers to the extent determined by the molar amount of curing agent which is present in the range from about 0.8 to about 3.0 millimoles per 100 g of high molecular wt elastomer; and, (iv) a stabilizer in an amount from about 0.1 to about 1.0 part per 100 parts of combined high and low molecular wt elastomers;

said mixture having a room temperature peak Mooney viscosity in the range from above 70 to about 110, which viscosity is substantially the same after said mixture is extruded; and,

said strip having its upper and lower surfaces coated with a detackifier in an amount effective to negate adhesion of the surfaces to metal, said detackifier being removably coated upon one surface of said strip.

5,085,943

POLYPROPYLENE FILMS

Allan J. Crighton, Somerset, and Blair G. W. Syme, Stockport, both of England, assignors to Courtaulds Films & Packaging (Holdings) Ltd., England

Filed Jun. 22, 1989, Ser. No. 372,342

Claims priority, application United Kingdom, Nov. 16, 1987, 8726814

Int. Cl.⁵ B32B 27/00

U.S. Cl. 428—500

8 Claims

1. A biaxially oriented polypropylene film containing from 1 to 40 percent by weight of a hydrocarbon resin, the resin being substantially miscible with the polypropylene, and the film being sequentially biaxially oriented and having a cease retention of at least 50% as measured by ASTM D920-49.

5,085,944

RARE EARTH METAL-SERIES ALLOYS FOR STORAGE OF HYDROGEN

Kazuo Ebato, and Keiji Tamura, both of Tokyo, Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

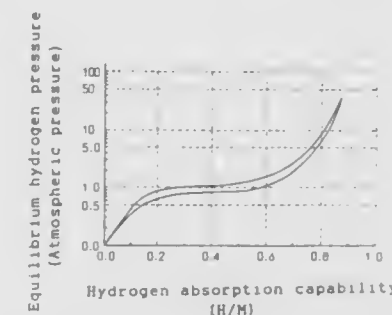
Filed Jul. 27, 1990, Ser. No. 558,660

Claims priority, application Japan, Aug. 25, 1989, 1-217544

Int. Cl.⁵ C22C 19/03, 28/00; C01B 6/24

U.S. Cl. 428—570

5 Claims



1. A rare-earth metal series alloy for storage of hydrogen, the alloy having a composition represented by the following general formula as an atomic ratio:



(wherein Rem is at least one of rare earth elements, M is at least one of Cu, Nb, Si and Zr, $2.5 < w < 5.5$, $0 < x < 2.0$, $0 < y < 2.0$, $0 < z < 2.0$, $0.01 \leq x < 2.0$, $0.01 \leq y < 2.0$, $0.01 \leq z < 2.0$ and $4.0 \leq w + x + y + z \leq 6.0$).

2. The rare-earth metal series alloy according to claim 1, wherein surfaces of powdered alloy are coated with thin films of at least one metal selected from Pd, Cu and Ni.

5,085,945
**PRODUCTION OF METAL MATRIX COMPOSITES
 REINFORCED WITH POLYMER FIBERS**

David I. Yun; Que-Tsang Fang, both of Murrysville, and Caroline Wei-Berk, Aston, all of Pa., assignors to Aluminium Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 267,844, Nov. 7, 1988. This application Aug. 14, 1990, Ser. No. 567,037

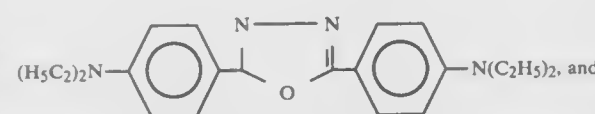
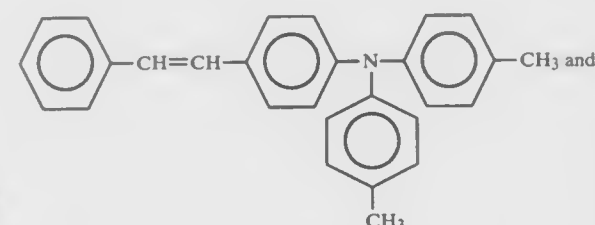
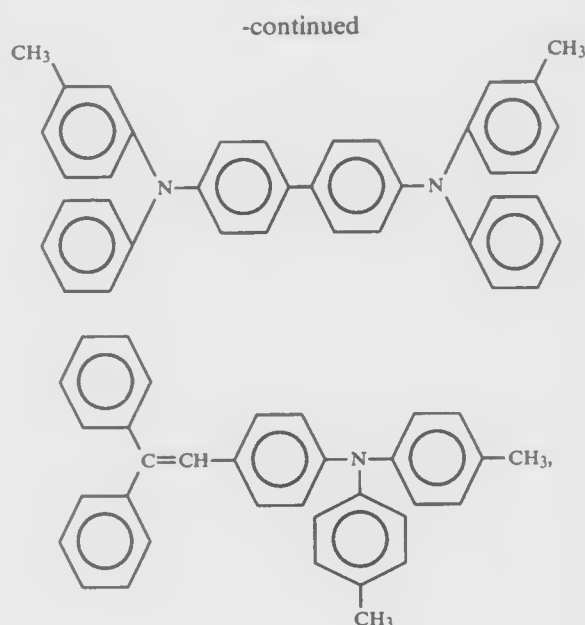
Int. Cl.⁵ C22C 1/08, 21/00

U.S. Cl. 428—614

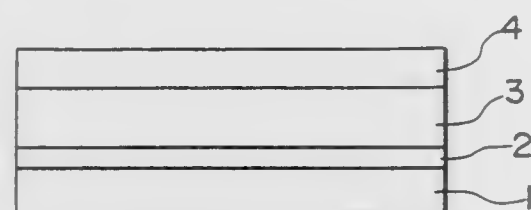
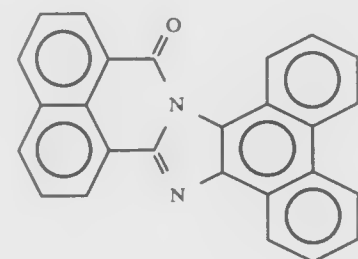
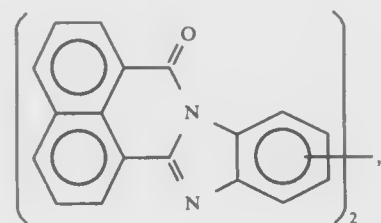
4 Claims



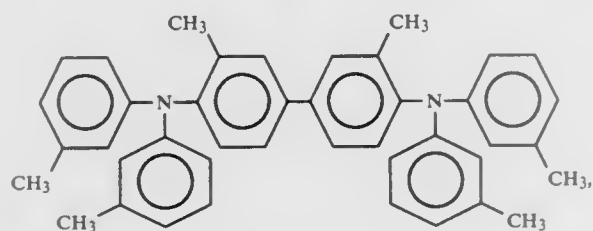
1. A metal matrix composite material comprising:
 uncoated polymer fibers; and
 an aluminum alloy matrix having a melting temperature of greater than 600° C.



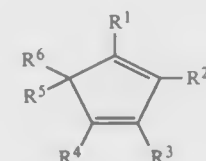
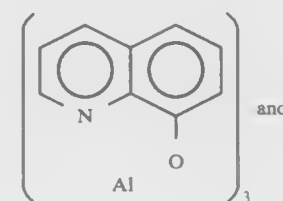
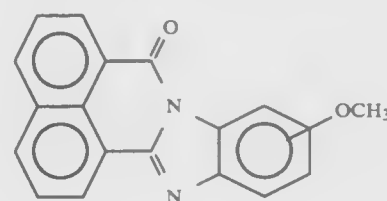
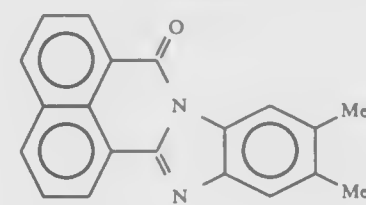
a fluorescent organic compound having electron-transporting property selected from the group consisting of



1. An electroluminescence device comprising:
 a positive electrode;
 a luminescence layer in direct contact with said positive electrode, said luminescence layer consisting of an organic compound having positive-hole-transporting property selected from the group consisting of



-continued



wherein R¹, R², R³, R⁴, R⁵ and R⁶ each independently represent hydrogen, alkyl of 1 to 10 carbon atoms which may have a substituent, alicyclic of 5 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms which may have a substituent, halogen, acyl, hydroxyl, aryloxy, aryl which may have a substituent, allyl or aldehyde; and
 a negative electrode in direct contact with said luminescence layer.

5,085,947
ELECTROLUMINESCENCE DEVICE

Shogo Saito, Fukuoka; Tetsuo Tsutui, Kasuga, and Chihaya Adachi, Oonojo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1989, Ser. No. 459,326

Claims priority, application Japan, Mar. 23, 1989, 1-072767

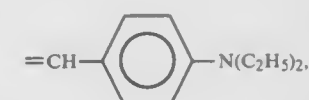
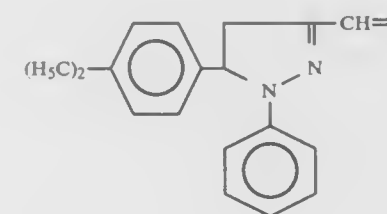
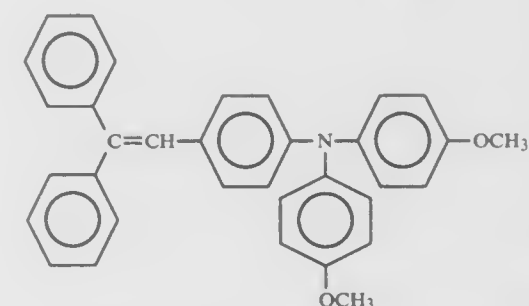
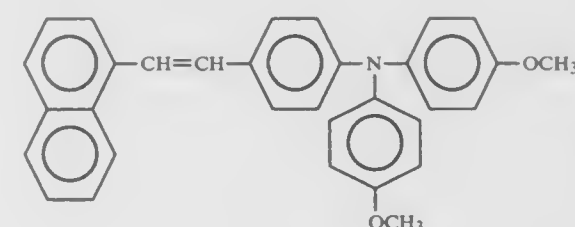
Int. Cl.⁵ H01J 1/62

U.S. Cl. 428—690

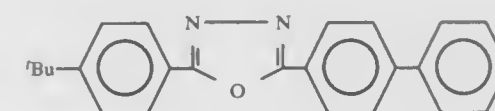
12 Claims



1. An electroluminescence device comprising:
 a positive electrode;
 a luminescence layer in direct contact with said positive electrode, said luminescence layer consisting of a first organic compound having positive-hole transport and luminous properties selected from the group consisting of



and a second organic compound having electron-transporting property of the formula



wherein 'Bu is tert-butyl; and
 a negative electrode in direct contact with said luminescence layer.

5,085,948
**ALKALI METAL THERMOELECTRIC POWER
 GENERATOR**

Moriaki Tsukamoto, Ibaraki, and Hisamichi Inoue, Takahagi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,413

Claims priority, application Japan, Feb. 13, 1990, 2-029602

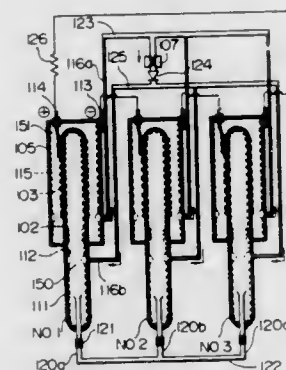
Int. Cl.⁵ H01M 10/39

U.S. Cl. 429—11

14 Claims

1. An alkali metal thermoelectric power generator of the type using a plurality of thermoelectric converters which convert thermal energy to electrical energy by utilizing the phenomenon that an alkali metal provided in two spatial regions which are arranged respectively on each side of a solid electrolyte diffuses across this solid electrolyte if the alkali metal density of one region is different from that of the other region, each of the thermoelectric converters including:
 first shell members which define a first spatial region in the form of an airtight chamber and a part of which is formed

of a solid electrolyte exhibiting an ionic conductivity for ions;
 a second shell member which defines a second spatial region in the form of an airtight chamber and which includes that part of the first shell members which is formed of a solid electrolyte, as a common partition,
 an alkali metal which is in contact with the partition made of a solid electrolyte in the first spatial region and which is in a vapor-liquid coexistent state when the power generator is in operation;
 a porous electrode which is provided in the second spatial region in such a manner as to be in electrical contact with the partition and as to cover the partition and which has a sufficient number of pores to allow passage of the alkali metal;
 an external electron conductor means which conductively connects the alkali metal in the first spatial region to the porous electrode;
 a first means exhibiting capillarity which is provided in the first spatial region along the surface of the first shell members;



a second means which is provided in the second spatial region along the surface of the second shell member except for that portion thereof which is formed of a solid electrolyte; and
 a heating means which heats the first spatial region so as to keep the temperature of the first spatial region to be higher than that of the second spatial region;
 the alkali metal thermoelectric power generator comprising:
 a plurality of thermoelectric converters which are connected in electrical series by the external electronic conductor means;
 piping for returning the alkali metal condensed in the respective second spatial regions of the thermoelectric converters to the respective first regions of the thermoelectric converters via a common pump; and
 a connection piping consisting of a plurality of connection pipes which connect the respective first spatial regions of the thermoelectric converters to one another in such a manner as to allow them to communicate with one another, the respective open ends of the connection pipes being positioned in those sections of the respective first spatial regions where only the vapor phase alkali metal exists.

5,085,949

FUEL CELL GENERATION SYSTEM

Robert A. Sanderson, Wethersfield, Conn.; Katsunori Sakai, Yokohama, Japan; Takeshi Kuwabara, Hachioji, Japan, and Takashi Amemiya, Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 5, 1991, Ser. No. 650,761

Int. Cl. H01M 8/04

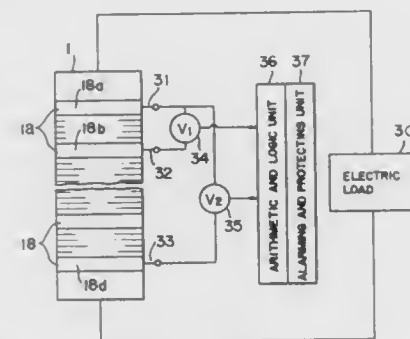
U.S. Cl. 429-23

4 Claims

1. In a fuel cell generation system comprising a cell stack consisting of a plurality of cells, said cell having a fuel electrode, an oxidizer electrode, and an electrolyte layer located

between said both electrodes, a fuel cell main body having a plurality of cooling plates for absorbing heat generated in said cell, said plate being located between said cells, and having a line for supplying a coolant through said cooling plate, said fuel

cell generation system comprising;



a reference voltage source for supplying a reference voltage, and
 a determining means for comparing an output voltage of at least one cell located at an upper portion of said cell main body with said reference voltage and determining if an abnormal state occurs on said cooling line.

5,085,950

FUEL CELL

Ivar I. Primdahl, Copenhagen, Denmark, assignor to Haldor Topsoe A/S, Denmark

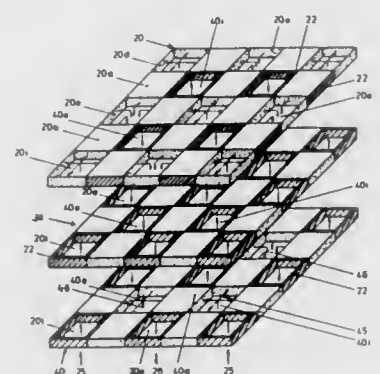
Filed Dec. 4, 1990, Ser. No. 621,862

Claims priority, application Denmark, Dec. 5, 1989, 6121/89

Int. Cl. H01M 8/10

U.S. Cl. 429-30

7 Claims



1. A fuel cell comprising an electrolyte membrane sandwiched between two electrode sheets, wherein
 a fuel cell comprising an electrolyte membrane sandwiched between a first and second electrode sheet, wherein
 the first electrode sheet being divided into a number of parallel subareas, in which any second subarea being provided in alternating order with at least an inlet channel and an outlet channel for a first reactant gas through the sheet and with a first electrode active porous layer intermediate to those channels, and any interjacent subarea, in alternating order with at least an inlet channel and at least an outlet channel for a second reactant gas through the sheet and with the first electrode active porous layer intermediate to those channels, the inlet and outlet channels for the second reactant gas being confined against the first electrode active layers by gas impermeable edge-strips;

the second electrode sheet being divided into a number of parallel subareas in which any second subarea being provided in alternating order with at least an inlet channel

and an outlet channel for the first reactant gas through the sheet and with a second electrode active porous layer intermediate to those channels, and any interjacent subarea, in alternating order with at least an inlet channel and at least an outlet channel for the second reactant gas through the sheet and with the second electrode active porous layer intermediate to those channels, the inlet and outlet channels for the first reactant gas being confined against the second electrode active layers by gas impermeable edge-strips; and
 the electrolyte membrane being provided with inlet and outlet channels corresponding with compatible channels through the first and second electrode sheet.

5,085,951

VENTED BATTERY

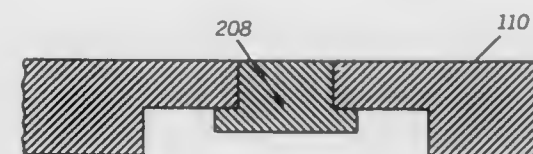
Russell E. Gyenes, and Raymond J. Kleinert, III, both of Sunrise, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1990, Ser. No. 617,750

Int. Cl. H01M 2/12

U.S. Cl. 429-86

6 Claims



1. A battery, comprising:
 a battery housing having an aperture therethrough; and
 a battery contact formed from sintered metal covering said aperture, the battery contact also serving as a vent for the battery.

5,085,952

SOLID STATE CELL ELECTROLYTE

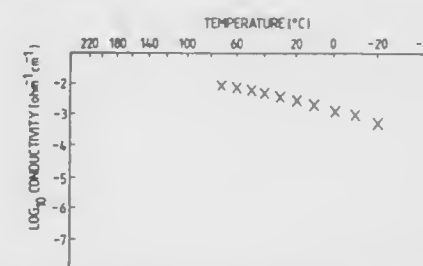
John M. North, Compton, United Kingdom, assignor to Gould Inc., Eastlake, Ohio

Continuation of Ser. No. 421,085, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 151,152, Feb. 1, 1988, abandoned. This application Jan. 15, 1991, Ser. No. 642,136
 Claims priority, application United Kingdom, Feb. 18, 1987, 8703736; Feb. 26, 1987, 8720140

Int. Cl. H01M 10/40

U.S. Cl. 429-192

5 Claims



1. A solid state electrochemical cell comprising a lithium-containing anode, a cathode, and a solid polymer electrolyte comprising a complex of poly(ethene oxide) and a lithium salt which is capable of conducting lithium ions, wherein said complex of poly(ethene oxide) is associated with a mixture comprising ethylene carbonate and propylene carbonate and wherein the cell can deliver 60 percent of its initial cathode utilization after discharging and charging for 85 cycles.

5,085,953

VITREOUS COMPOSITIONS BASED ON LLPO, AND LIPO, AS NETWORK FORMERS AND NETWORK MODIFIERS

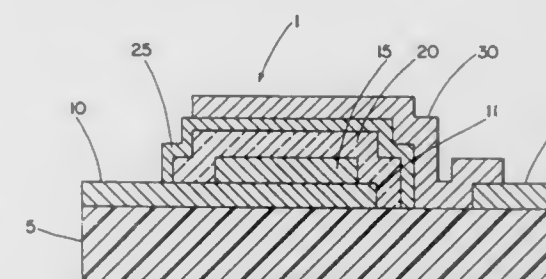
James R. Akridge, Middleburg Heights, and Steven D. Jones, North Ridgeville, both of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Sep. 18, 1990, Ser. No. 584,553

Int. Cl. H01M 6/18

U.S. Cl. 429-193

21 Claims



1. A precursor mixture corresponding to the formula:



wherein:

A is either Li_3PO_4 or LiPO_3 ;

X is a halide;

x is a real number greater than or equal to 0 and less than or equal to 0.68;

y is a real number greater than or equal to 0 and less than or equal to 0.33;

x+y is a real number greater than 0 and less than 1; and

z is a real number greater than or equal to 0.55 and less than or equal to 1.2.

5,085,954

ORGANIC ELECTROLYTE SOLUTION TYPE CELL

Fusaji Kita, Suita; Akira Kawakami, Takatsuki, and Kozo Kajita, Shiga, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

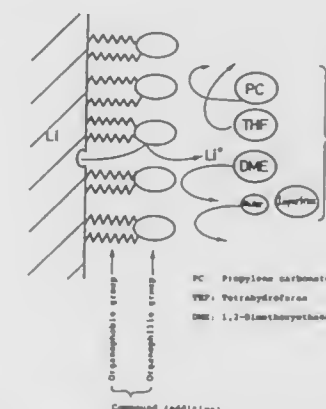
Filed Mar. 27, 1990, Ser. No. 499,667

Claims priority, application Japan, Mar. 31, 1989, 1-81681

Int. Cl. H01M 10/40

U.S. Cl. 429-194

13 Claims



1. An organic electrolytic solution cell comprising an electrolytic solution of a lithium salt dispersed in a polar solvent which comprises a monoamine compound consisting of an amino group and at least one linear alkyl group of at least three carbon atoms bonded to said amino group.

5,085,955

NON-AQUEOUS ELECTROCHEMICAL CELL

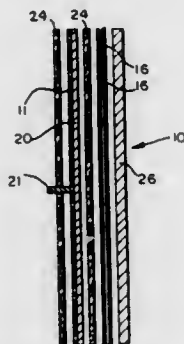
Robert A. Cipriano, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 21, 1990, Ser. No. 616,974

Int. Cl.⁵ H01M 6/14

U.S. Cl. 429—197

19 Claims



1. A non-aqueous electrochemical cell comprising an anode, a cathode and a non-aqueous electrolyte, said anode comprising a substrate having a mixture of at least two elements selected from the group consisting of sodium, potassium, cesium and rubidium, and said anode having a skin or coating of an alkali metal.

5,085,956

FIBER-STRUCTURE ELECTRODE SUPPORT WITH WELDED-ON CURRENT DISCHARGE LUG AND PRODUCTION METHOD THEREFOR

Otwin Imhof, Nürtingen, and Holger Kistrup, Esslingen, both of Fed. Rep. of Germany, assignors to Deutsch Automobilgesellschaft, Fed. Rep. of Germany

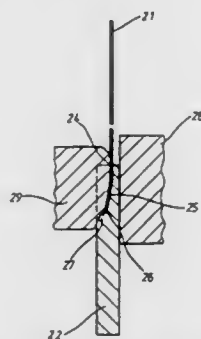
Filed Oct. 19, 1990, Ser. No. 599,983

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935368

Int. Cl.⁵ H01M 4/64

U.S. Cl. 429—211

4 Claims



1. A fiber-structure electrode of metallized synthetic fibers having a thickness of between 0.3 to 4 mm, with a welded-on, thin current discharge lug having a thickness of between about 0.1 and 0.6 mm pressed into the fiber-structure electrode support such that a surface of parts of the current discharge lug most elevated are below the pressed surface of the fiber-structure electrode, and the current discharge lug is impressed strongly and parallel to the opposite fiber-structure electrode surface in a zone over-lapping the electrode, the strongly impressed zone of the current discharge lug is adjoined by a second zone of the current discharge lug in which the lug rises with an inclination of 10° to 30° in relation to a lower side of the fiber-structure electrode in the direction of an upper side of the fiber-structure electrode, with a gradual, kinkless transition between the first zone and the second zone, and an entire periphery of a border of the current discharge lug surrounding the second zone being applied without any kinks, the end edge

of the flanged-on border of the current discharge lug laying flush with the pressed surface of the fiber-structure electrode around the entire periphery and the pressed region surrounding the current discharge lug passing without any kinks into the normal thickness of the fiber-structure electrode.

5,085,957

METHOD OF REPAIRING A MASK

Kunibiro Hosono, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

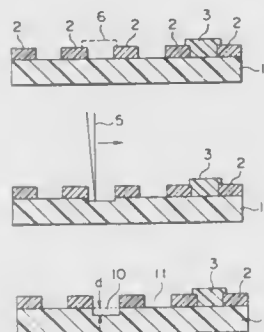
Filed Aug. 13, 1990, Ser. No. 566,114

Claims priority, application Japan, Apr. 18, 1990, 2-100357

Int. Cl.⁵ G03F 9/00

U.S. Cl. 430—5

3 Claims



1. A method of repairing a mask in which a transparent defect region of a phase shifting mask where a shifter pattern intended to be formed on a mask substrate is missing, comprising etching the substrate at the defect region with an ion beam to a depth such that the phase of light passing through the etched region is opposite to the phase of light passing through transparent regions of the substrate where no shifter patterns are formed.

5,085,958

MANUFACTURING METHOD OF PHOSPHOR FILM OF CATHODE RAY TUBE

Su-Min Jeong, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi-do, Rep. of Korea

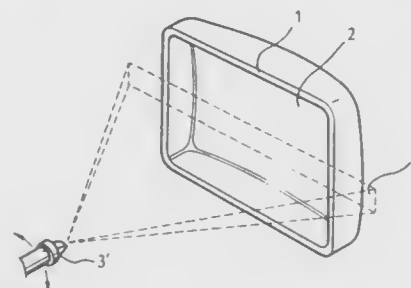
Filed Aug. 29, 1990, Ser. No. 574,080

Claims priority, application Rep. of Korea, Aug. 30, 1989, 89-12395

Int. Cl.⁵ G03C 5/00

U.S. Cl. 430—25

2 Claims



1. A manufacturing method of phosphor film for use in a color cathode ray tube comprises the steps of: forming a photoresist layer on the inner surface of a panel provided with black matrix; drying said photoresist layer and exposing it to the light to form a predetermined pattern; spraying phosphor powder, in such a manner that a sprayed area is in the form of stripe having shorter width than the length of the sides of the bottom surface of panel and said

sprayed area is moved along the vertical direction or the horizontal direction over the bottom surface of said panel; developing the desired phosphor stripe, in such a manner that compressed air or developing water is supplied on the inner surface of the panel coated with phosphor powder.

5,085,959

SE OR SE ALLOY ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Urabe Kazuyuk, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Japan

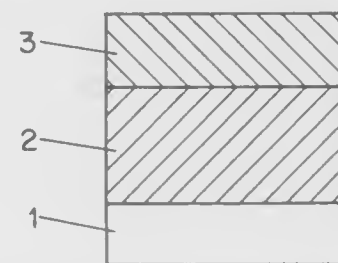
Filed Aug. 9, 1989, Ser. No. 391,475

Claims priority, application Japan, Aug. 11, 1988, 63-200884 The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.⁵ G03G 5/047, 5/09

U.S. Cl. 430—58

8 Claims



1. An electrophotographic photoreceptor comprising a charge transportation layer comprising a photosensitive material selected from the group consisting of amorphous selenium and selenium alloy containing a hole mobility enhancing material selected from the group consisting of tungsten dioxide (WO₂), tungsten trioxide (WO₃), manganese tetraoxide (MnO₄), phosphorous acid (H₃PO₄), sulfurous acid (H₂SO₃) and arsenous anhydride (HAsO₂) in an amount effective to rapidly attenuate negative charge and comprising a charge generation layer selected from the group consisting of amorphous selenium and selenium alloy.

2. An electrophotographic photoreceptor comprising a charge transportation layer comprising a photosensitive material selected from the group consisting of amorphous selenium and selenium alloy containing a hole mobility enhancing material selected from the group consisting of cobalt (Co), iron (Fe), copper (Cu), mercury (Hg) and silver (Ag) in an amount effective to rapidly attenuate negative charge, and comprising a charge generation layer selected from the group consisting of amorphous selenium and selenium alloy.

5,085,960

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND IMAGE FORMING PROCESS

Yutaka Akasaki, Hidekazu Aonuma, Kazuya Hongo, Katsuhiko Sato, Katsumi Nukada, and Teruomi Marumo, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 656,015, Feb. 14, 1991, abandoned, which is a continuation of Ser. No. 416,766, Oct. 4, 1989, abandoned. This application Jun. 20, 1991, Ser. No. 722,405

Claims priority, application Japan, May 16, 1988, 63-116856; Oct. 5, 1988, 63-249739

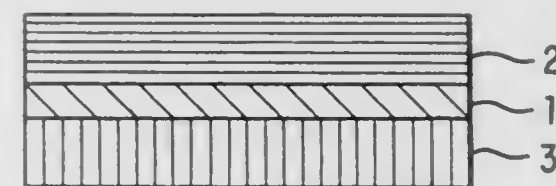
Int. Cl.⁵ G03G 5/047, 5/09

U.S. Cl. 430—58

15 Claims

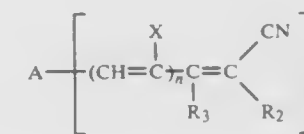
1. An electrophotographic photosensitive member having a charge generating layer and a charge transporting layer successively formed on a support, wherein the charge generating layer has a thickness of from about 0.05 μm to about 5 μm and the charge transporting layer has a thickness from about 5 μm to 50 μm and wherein the charge generating layer contains (1) a charge generating pigment having a positive hole transporting property, (2) at least one compound having a formula

selected from the group consisting of the following formulae (1a) and (1b), and (3) a binder resin;



(1a)

wherein A represents an aromatic group which may be substituted or a heterocyclic group which may be substituted, X represents a hydrogen atom or a halogen atom, R₁ represents a hydrogen atom, an alkyl group or a cyano group when n is 0, or a hydrogen atom, an alkyl group, a cyano group or an acryl group when n is 1, n represents 0 or 1, and m represents 1 or 2;



(1b)

wherein A represents an aromatic group which may be substituted or a heterocyclic group which may be substituted, X represents a hydrogen atom or a halogen atom, R₂ represents a cyano group, an aryl group, an alkoxy carbonyl group, or aryloxy carbonyl group, an aminocarbonyl group, an acyl group, a benzoyl group which may be substituted or a phenyl group which may be substituted, R₃ represents a hydrogen atom, an alkyl group or a cyano group, n represents 0 or 1, and m represents 1 or 2.

5,085,961

MULTILAYER ORGANIC PHOTOCONDUCTOR

Peter Gregory, Bolton, and Raymond White, Radcliffe, both of England, assignors to Imperial Chemical Industries plc, London, England

Continuation of Ser. No. 347,009, May 4, 1989, abandoned. This application Dec. 27, 1990, Ser. No. 632,659

Claims priority, application United Kingdom, May 6, 1988, 8810687

Int. Cl.⁵ G03G 5/047

U.S. Cl. 430—59

6 Claims

1. An organic photoconductor comprising an electrically conducting support, a charge generation layer containing dibromoanthanthrone and a metal-free phthalocyanine in the alpha- or X-form, both the dibromoanthanthrone and phthalocyanine being dispersed in a same single resin, and a charge transport layer containing a charge transport material selected from the group consisting of leuco di-arylmethanes, leuco tri-arylmethanes, hydrazones and triarylamines.

5,085,962
METHOD AND APPARATUS FOR REDUCING RELIEF
IN TONER IMAGES

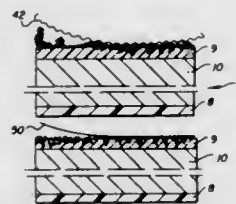
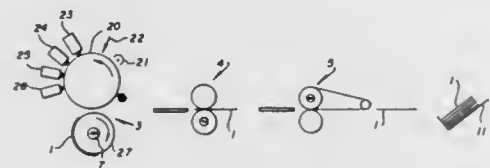
Muhammad Aslam, Rochester, and Thomas J. Farnand, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1990, Ser. No. 528,516

Int. Cl.⁵ G03G 13/20, 15/20

U.S. Cl. 430—99

12 Claims



1. A method of treating a thermoplastic layer on a receiving sheet, said layer carrying a toner image, which toner image exhibits varying levels of relief according to varying amounts of toner making up the image, said method comprising: positioning said receiving sheet between a first pair of pressure members, one of said members having a rough textured surface, heating said thermoplastic layer to at least its softening point, applying sufficient pressure between said first pair of pressure members to form a textured surface of toner and thermoplastic, then positioning said receiving sheet between a second pair of smooth surfaced pressure members in the presence of sufficient heat to soften said thermoplastic layers, and applying sufficient pressure between said second pair of pressure members to further reduce said relief and increase the gloss of said surface.

5,085,963
DRY DEVELOPER WITH POLYETHYLENE POWDER
Chiaki Suzuki; Koichi Kumashiro; Tetsu Torigoe; Takaichi Kimura, and Takayoshi Aoki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,638

Claims priority, application Japan, Sep. 26, 1989, 1-248135
Int. Cl.⁵ G03G 9/097, 9/107

U.S. Cl. 430—106.6

8 Claims

1. A dry developer for an electrophotographic process, said dry developer comprising a toner and a dispersion type carrier composed of a resin and a magnetic powder, wherein fine powder having a molecular weight of not larger than 10,000, a density of at least 0.95, and an average volume diameter of not larger than 15 μ m is externally added to the toner or directly mixed with the developer.

5,085,964
CARRIER FOR DEVELOPER
Hideaki Kawata; Masatomi Funato; Kiminori Umeda; Nobuaki Kawano, and Koji Honda, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1990, Ser. No. 550,990

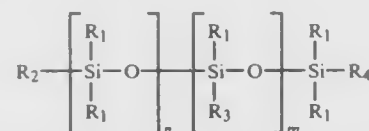
Claims priority, application Japan, Jul. 14, 1989, 1-183150
Int. Cl.⁵ G03G 9/10

U.S. Cl. 430—106.6

7 Claims

1. A carrier for a developer, which has a coating layer formed on a carrier core material, said coating layer compris-

ing a silicone oil represented by the following general formula:



where R₁ represents an alkyl group having 1 to 4 carbon atoms or a phenyl group, R₂, R₃ and R₄ represent an alkyl group having 1 to 4 carbon atoms, a phenyl group or a monovalent organic group having at least one vicinal epoxy group, with the proviso that at least one of R₂, R₃ and R₄ is a monovalent organic group having at least one vicinal epoxy group, and n and m are positive integers.

5,085,965
NEGATIVE TONER FOR DEVELOPING LATENT
ELECTROSTATIC IMAGES

Toshiki Nanya, Mishima; Kimitoshi Yamaguchi, Numazu; Kazuo Tsubuko, Numazu; Toshihiko Takahashi, Numazu; Hiromitsu Kawase, Numazu, and Makoto Ookawara, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,210

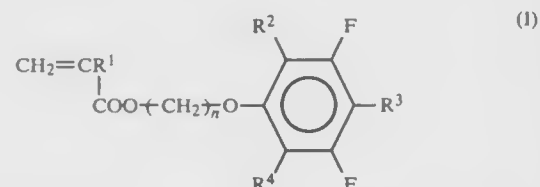
Claims priority, application Japan, Mar. 27, 1989, 1-074558

Int. Cl.⁵ G03G 9/087

U.S. Cl. 430—109

29 Claims

1. A negatively chargeable toner for developing latent electrostatic images comprising a coloring agent and a resin component which comprises a homopolymer of a first monomer of formula (I) or a copolymer of said first monomer and a second monomer:



wherein R¹ represents -H or -CH; R² and R³ each represent -CN, -COOH or -NO₂; R⁴ represents -F, -Cl or -Br; and n is an integer of 1 to 10.

5,085,966
NON-AQUEOUS DISPERSING AGENT AND LIQUID
DEVELOPING AGENT FOR ELECTROSTATIC
PHOTOGRAPHY

Nobuo Suzuki; Yutaka Sakasai, both of Kanagawa, and Eiichi Kato, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1990, Ser. No. 589,577

Claims priority, application Japan, Sep. 28, 1989, 1-253252; Aug. 2, 1990, 2-205373

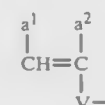
Int. Cl.⁵ G03G 9/135

U.S. Cl. 430—115

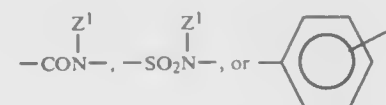
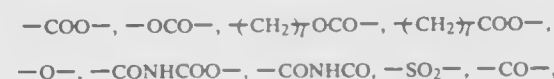
4 Claims

1. A liquid developing agent for electrostatic photography, which contains one or more of a pigment or dye, a resin insoluble in or swellable with a carrier liquid and a pigment or dye as coated with the resin, and a dispersing agent and a charge-adjusting agent in a non-aqueous solvent carrier liquid having a dielectric constant of 3 or less and a volume specific resistance of 10⁹ Ω cm or more, wherein the dispersing agent comprises a graft copolymer, wherein monomer(s) to constitute the graft portion(s) of the graft copolymer is(are) at least one or more macromonomers each having a terminal polymerizable functional group, wherein the graft copolymer is substantially soluble in a non-aqueous solvent having a dielectric constant of

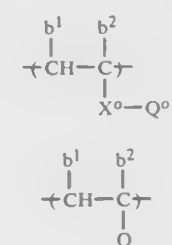
3 or less and a volume specific resistance of 10⁹ Ω cm or more, and wherein said graft copolymer is a copolymer comprising (1) at least one mono-functional macromonomer (M) having a weight average molecular weight of from 1 \times 10³ to 4 \times 10⁴, and (2) at least one monomer represented by formula (III), said monofunctional macromonomer (M) having a polymerizable double bond group represented by formula (I) bonded to only one terminal of a polymer main chain containing at least one kind of a polymer component represented by formula (IIa) or (IIb):



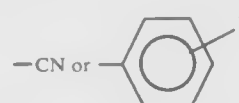
wherein V is



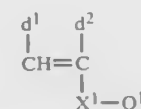
(wherein Z¹ is hydrogen atom or a hydrocarbon group and 1 represents an integer of from 1 to 3); a¹ and a², which may be the same or different, each is a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, -COO-Z², or -COO-Z² bonded via a hydrocarbon group (wherein Z² is a hydrogen atom or a hydrocarbon group which may be substituted:



wherein X⁰ has the same meaning as V in formula (I); Q⁰ is an aliphatic group having from 1 to 22 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; Q is



wherein Y is a hydrogen atom, a halogen atom, an alkoxy group, or -COOZ³ (wherein Z³ is an alkyl group, an aralkyl group, or an aryl group); and b¹ and b², which may be the same or different, have the same meanings as a¹ and a² in formula (I):



wherein X¹ has the same meaning as X⁰ in formula (IIa); Q¹ has the same meaning as Q⁰ in formula (IIa); and d¹ and d², which may be the same or different, have the same meanings as a¹ and a² in formula (I); with the proviso that, in the component of the macromonomer (M) represented by formula (IIa) and in the com-

ponent of the monomer represented by formula (III), at least one of Q⁰ and Q¹ is an aliphatic group having from 8 to 22 carbon atoms.

5,085,967
WET-TYPE ELECTROSTATIC PHOTOGRAPHIC
TRANSFERRING METHOD

Tetuo Usui; Nobuo Suzuki; Yutaka Sakasai, and Hisao Oh-Ishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1990, Ser. No. 495,956

Claims priority, application Japan, Mar. 22, 1989, 1-70158
Int. Cl.⁵ G03G 13/16, 13/10

U.S. Cl. 430—126

11 Claims

1. A method of transferring an image by a wet-type electrostatic photographic system which comprises developing an electrostatic latent image formed on an image-carrying member with an electrostatic photographic liquid developer containing at least toner particles and a carrier liquid, and transferring the toner image from the toner image-carrying member to a member to which the image is to be transferred, by one transferring step or a plurality of transferring steps, wherein the transferring step includes at least the following steps:

- (1) a step to substantially dry the toner image;
- (2) a step to supply a non-aqueous solvent having a volume resistance of at least 10⁹ Ω -cm and a dielectric constant of not more than 3 into a clearance between the toner image-carrying member and the member to which the image is to be transferred; and
- (3) a step to transfer the toner image to the member to which the image is to be transferred.

5,085,968
AMORPHOUS, LAYERED, PHOTOSENSITIVE
MEMBER FOR ELECTROPHOTOGRAPHY AND ECR
PROCESS

Takashi Hayakawa, Nara; Shiro Narikawa, Kashihara, and Kunio Obashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 372,019, Jun. 27, 1989. This application Dec. 3, 1990, Ser. No. 620,828

Claims priority, application Japan, Jun. 28, 1988, 63-161977; Nov. 29, 1988, 63-303324

Int. Cl.⁵ G03G 5/82

U.S. Cl. 430—128

16 Claims

1. A process for manufacturing a photosensitive member for electrophotography comprising depositing by electron cyclotron resonance a photoconductive layer on a conductive substrate; said photoconductive layer comprising two amorphous layers, with one of said two amorphous layer being composed of amorphous silicon germanium; said depositing being performed under conditions to obtain in said layer of amorphous silicon a member selected from the group consisting of hydrogen, halogen and mixtures thereof at a range of from greater than 40 to about 65 atomic %, and to obtain in the layer of amorphous silicon germanium a member selected from the group consisting of hydrogen, halogen and mixtures thereof at a range of from greater than 40 to about 65 atomic %.

5,085,969
PHOTOPOLYMERIZABLE IMAGE-RECEIVING SHEET
MATERIAL AND PROCESS FOR THE FORMATION OF
A TRANSFERRED IMAGE

Tomizo Namiki; Tamotsu Suzuki, and Fumiaki Shinozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 16, 1990, Ser. No. 494,338

Claims priority, application Japan, Mar. 17, 1989, 1-65064
Int. Cl.⁵ G03C 1/90, 1/68, 1/12

U.S. Cl. 430—260

4 Claims

1. An image-receiving sheet material to be used for the

formation of a transferred image by transferring a transferable image formed on an image-forming layer of a photo-sensitive material onto said image-receiving sheet material and then retransferring said image onto a permanent substrate, wherein said image-receiving sheet material comprises a substrate and first and second image-receiving layers located adjacent each other and comprising organic high polymer(s), wherein said second image-receiving layer is to be transferred onto the permanent substrate and further comprises the following components (I), (II) and (III):

- (I) at least one of said organic high polymers;
 (II) at least one ethylenically polyfunctional monomer having a boiling point of 150° C. or above under atmospheric pressure; and
 (III) a photopolymerization initiator;
 wherein said organic high polymer present in the first image-receiving layer is at least one vinyl acetate copolymer selected from the group consisting of a vinyl chloride/vinyl acetate copolymer, a vinyl chloride/vinyl acetate/maleic acid copolymer and an ethylene/vinyl acetate copolymer, and
 wherein said organic high polymer present in the second image-receiving layer is a mixture of alcohol-soluble nylon and a styrene-maleic acid copolymer resin, a mixture of alcohol-soluble nylon and polyvinyl butylal or an acryl resin; and
 wherein delamination occurs between said first image-receiving layer and said second image-receiving layer.

5,085,970

IMAGE FORMING METHOD

Kimataka Kameoka; Ken-ichi Kuwabara; Toshiro Takahashi; Shigenori Moriuchi; Morio Yagihara; Yoshio Inagaki, and Keiichi Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 243,142, Sep. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 24,757, Mar. 11, 1987, abandoned. This application Sep. 13, 1990, Ser. No. 581,435

Claims priority, application Japan, Mar. 11, 1986, 61-53461; Apr. 7, 1986, 61-79531

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.⁵ G03C 5/04, 1/36

U.S. Cl. 430—264

12 Claims

1. A method for forming an image, which comprises providing a photosensitive material comprising at least one light-sensitive silver halide emulsion layer and having a γ value greater than 10, the capability of being handled under bright light, and subjecting said light-sensitive layer to image-wise exposure to light substantially exclusive of wavelengths of 370 nm or shorter, said image-wise exposure to light being substantially exclusive of wavelengths of 370 nm or shorter is effected by a least one of positioning an optical filter for ultraviolet absorption between a light source and the photosensitive material and using a light source not having emission energy in a wavelength region below 370 nm, wherein a hydrazine derivative is contained in at least one of said light-sensitive silver halide emulsion layer or in another hydrophilic colloid layer of the photosensitive material.

5,085,971

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Kazunobu Katoh, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 15, 1990, Ser. No. 523,690

Claims priority, application Japan, May 16, 1989, 1-122346

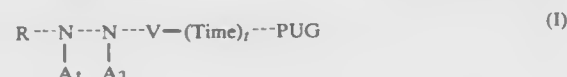
Int. Cl.⁵ G03C 1/06

U.S. Cl. 430—264

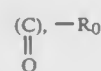
9 Claims

1. A silver halide photographic material comprising a support having thereon a hydrophilic colloid layer which contains gelatin wherein said hydrophilic colloid layer contains fine polymer particles which contain a redox compound and a hydrazine compound which is not the same as the redox com-

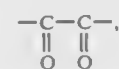
pound is contained in said hydrophilic colloid layer and/or in another hydrophilic colloid layer, wherein the redox compound is represented by general formula (I) indicated below:



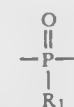
wherein both A₁ and A₂ represent hydrogen atoms, or one represents a hydrogen atom and the other represents a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or



(wherein R₀ represents an alkyl group, an alkenyl group, an aryl group, an alkoxy group or an aryloxy group, and l represents 1 or 2); Time represents a divalent linking group, and t represents 0 or 1; PUG represents a development inhibitor; V represents a carbonyl group,



a sulfonyl group, a sulfoxy group,



(where R₁ represents an alkoxy group or an aryloxy group), an iminomethylene group or a thiocarbonyl group; and R represents an aliphatic group, an aromatic group or a heterocyclic group.

5,085,972

ALKOXYALKYL ESTER SOLUBILITY INHIBITORS FOR PHENOLIC RESINS

Dennis E. Vogel, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 26, 1990, Ser. No. 618,212

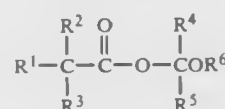
Int. Cl.⁵ G03C 1/492; C08F 2/46; C08J 3/28

U.S. Cl. 430—270

11 Claims

1. A photoimageable composition comprising:

- (a) a binder soluble in aqueous base;
 (b) an acid sensitive solubility inhibitor comprising an ester of the formula:



wherein:

R¹, R², and R³ individually represent alkyl having from 1 to 18 carbon atoms or phenyl, the phenyl optionally substituted with halogen, methyl, or ethyl; or any two of R¹, R², and R³ can together form a cyclic ring structure having from 5 to 18 carbon atoms; or R¹, R², and R³ together may form a polycyclic structure having from 8 to 18 carbon atoms;

R⁴ and R⁵ are individually C₁ to C₆ alkyl or hydrogen, with the proviso that at least one of R⁴ and R⁵ must be hydrogen; and

R⁶ is lower alkyl having from 1 to 6 carbon atoms or R⁵ and R⁶ may together form a cyclic alkyl ether group.

5,085,973

COLORED FILTER ELEMENT CONTAINING LAYERS OF POLYMERIZABLE COMPOSITION

Tokihiko Shimizu, Nara, and Kesanoo Kobayashi, Shizuoka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 374,977, Jul. 3, 1989, abandoned. This

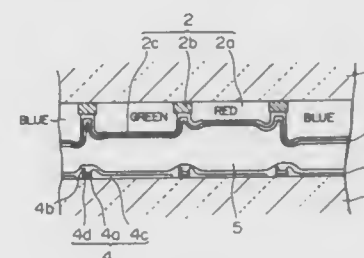
application Jun. 13, 1991, Ser. No. 715,017

Claims priority, application Japan, Jul. 25, 1988, 63-184979

Int. Cl.⁵ G03C 1/76

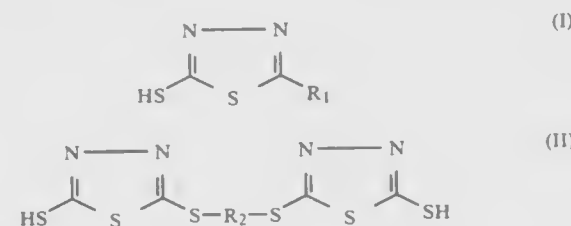
U.S. Cl. 430—271

1 Claim

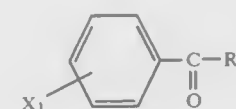


1 --- TRANSPARENT SUBSTRATE 4 --- TFT DRIVING PART
 2 --- COLOR FILTER 4a --- GATE ELECTRODE
 2b --- BLACK MATRIX 4b --- SOURCE LINE
 2c --- TRANSPARENT ELECTRODE 4c --- DRAIN ELECTRODE
 3 --- ORIENTED PLATE 5 --- TN LIQUID CRYSTAL

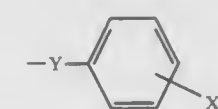
1. A color filter prepared by providing red, green and blue image elements, comprising a photosensitive resin and a pigment, and a black matrix on a transparent substrate and further providing a transparent electrode layer either on the image elements thus formed or on said transparent substrate, said photosensitive resin comprising a polyfunctional acrylate monomer, an organic polymer binder and a photopolymerization initiator, said photopolymerization initiator consisting of at least one member selected from the 2-mercapto-5-substituted thiazole compounds represented by the following general formula (I) and/or general formula (II), a phenyl ketone compound represented by the following general formula (III), and a 2,4,5-triphenylimidazolyl dimer composed of two lophine residues combined to each other through intermediation of a single covalent bond:



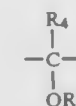
wherein R₁ represents alkyl group, alkylthio group or aralkylthio group, and R₂ represents substituted or unsubstituted alkylene group;



wherein X₁, identical or different, represents hydrogen atom, alkyl group having 1 to 6 carbon atoms, alkoxyalkyl group having 1 to 6 carbon atoms, alkoxyalkyl group having 1 to 6 carbon atoms, alkoxyalkyl group having 1 to 6 carbon atoms, alkoxyalkyl group having 1 to 6 carbon atoms or halogen atom, and R₃ represents hydrogen atom or a group represented by the following general formula (IV):



wherein Y represents single bond or a group of the following formula



wherein R₄ represents hydrogen atom or OR₅, and R₅ represents hydrogen atom or alkyl group having 1 to 6 carbon atoms.

5,085,974

PHOTOPOLYMERIZABLE MIXTURE, AND A RECORDING MATERIAL PRODUCED THEREFROM

Werner Frass, Wiesbaden; Dieter Mohr, Budenheim, and Klaus Rode, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,426

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710282

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.⁵ G03F 7/031

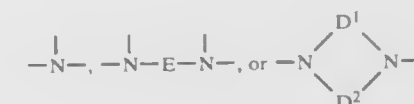
U.S. Cl. 430—284

19 Claims

1. A photopolymerizable mixture consisting essentially of:
 a) a polymeric binder present in an amount sufficient to form a uniform layer,
 b) an acrylate or alkacrylate of a polyhydric alcohol represented by the formula



in which
 Q denotes



R denotes an alkyl, hydroxyalkyl or aryl group, R¹ and R² each denote a hydrogen atom, an alkyl group or an alkoxyalkyl group.

R³ denotes a hydrogen atom, a methyl group or an ethyl group.

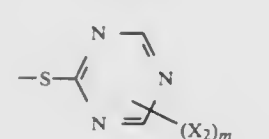
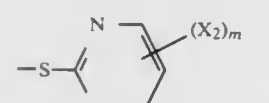
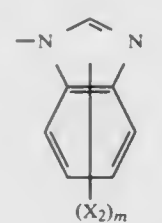
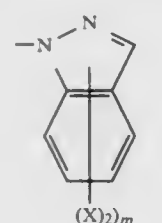
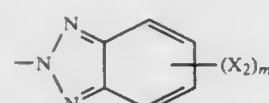
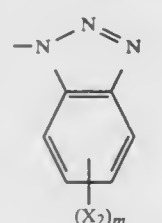
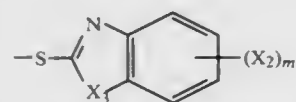
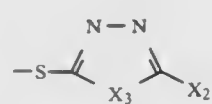
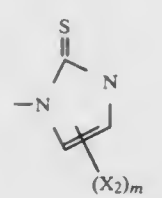
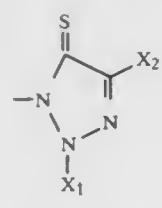
X¹ denotes a saturated hydrocarbon group having 2 to 12 carbon atoms.

X² denotes a (c+1)-valent saturated hydrocarbon group in which up to 5 methylene groups may be replaced by oxygen atoms.

D¹ and D² each denote a saturated hydrocarbon group having 1 to 5 carbon atoms.

E denotes a saturated hydrocarbon group having 2 to 12 carbon atoms, a cycloaliphatic group which has 5 to 7 ring members and which contains, where appropriate,

-continued

wherein X₁ is a substituted or unsubstituted aliphatic group

- (IIg) with 1 to 4 carbon atoms, wherein the substituent group is selected from the group consisting of an alkoxy group, an alkoxycarbonyl group, a hydroxyl group, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfonamido group, a sulfamoyl group, an amino group, an acyloxy group, a cyano group, a ureido group, an acyl group, a halogen atom and an alkylthio group, wherein the number of carbon atoms contained in these substituent groups is 3 or less, or a substituted phenyl group, wherein the substituent group is selected from the group consisting of a hydroxyl group, an alkoxycarbonyl group, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfonamido group, a sulfamoyl group, an acyloxy group, a ureido group, a carboxyl group, a cyano group, a nitro group, an amino group, and an acyl group, wherein the number of carbon atoms contained in these substituent groups is 3 or less,

- (IIh) wherein X₂ denotes a hydrogen atom, an aliphatic group, a halogen atom, a hydroxyl group, an alkoxy group, an alkylthio group, an alkoxycarbonyl group, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfonamido group, a sulfamoyl group, an acyloxy group, a ureido group, a cyano group, a nitro group, an amino group, an alkoxycarbonylamino group, an aryloxycarbonyl group, or an acyl group,

- (IIi) wherein X₃ is an oxygen atom, a sulfur atom, or an imino group with 4 or less carbon atoms, wherein m denotes an integer equal to 1 or 2, with the proviso that the total number m of carbon atoms contained in X₂ is 8 or less, and when m is 2, two X₂ groups are the same or different.

5,085,980

PHOTOGRAPHIC ELEMENT CONTAINING WATER-ABSORBING COMPOUND

Toshiaki Aono; Koichi Nakamura, and Takeshi Shibata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 344,524, Apr. 26, 1989, abandoned, which is a continuation of Ser. No. 811,859, Dec. 20, 1985, abandoned. This application Mar. 12, 1991, Ser. No. 667,368 Claims priority, application Japan, Dec. 28, 1984, 59-277778 Int. Cl.⁵ G03C 1/06

- (IIk) U.S. Cl. 430—531 16 Claims

1. A silver halide photographic light-sensitive material comprising a support and at least one silver halide emulsion layer, wherein at least one layer of said silver halide photographic light-sensitive material contains a highly water-absorbing high molecular weight compound having a degree of swelling for water of 5 or more in an amount sufficient to accelerate time of development processing and/or dye transfer, wherein the highly water-absorbing high molecular weight compound is a saponified product of a copolymer composed of at least one vinyl ester and ethylenically unsaturated carboxylic acid or derivatives thereof, or a hydrolyzate of an acrylonitrile type polymer.

5,085,981

PHOTOGRAPHIC SILVER HALIDE ELEMENT WITH PROTECTIVE LAYER

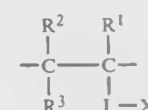
(IIl) Wolfgang Himmelmann; Prem Lalvani, both of Leverkusen; Hans-Theo Buschmann, Cologne, and Günter Helling, Odenthal, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany Filed Apr. 19, 1990, Ser. No. 511,250

Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914567 Int. Cl.⁵ B03C 1/82

- (IIm) U.S. Cl. 430—536 6 Claims

1. A photographic silver halide element comprising a support, at least one photosensitive silver halide emulsion layer and a protective layer on that side of the at least one silver halide emulsion layer remote from the support, the protective

layer containing in combination (a) in a quantity of from 50 to 250 mg/m² of said protective layer of a polymeric compound (I) containing at least 0.2 mol-% recurring units corresponding to the following formula



in which

R¹, R² and R³ may be the same or different and represent hydrogen, alkyl or halogen,

L is a chemical bond or a standard binding link and

X is a reactive group capable of reacting to provide chemical linkage in the protective layer and selected from the group consisting of halogen, epoxy, imido, —NCO, —CH=CH₂, —C(CH₃)=CH₂ or —CN

and (b) in quantity of from 50 to 500 mg/m² of said protective layer of a finely divided crystalline SiO₂-dispersion having a particle size distribution in which less than 0.2% by volume of the SiO₂ particles are larger than 4 μm and having an average particle diameter (number average) of from 0.7 to 1.2 μm.

5,085,982

METHOD OF DETECTING SPECIFIC SUBSTANCES BY SELECTIVE GROWTH OF LIVING CELLS

Douglas H. Keith, Monrovia, Calif., assignor to City of Hope, Duarte, Calif.

Filed Jun. 12, 1986, Ser. No. 873,504

Int. Cl.⁵ C12Q 1/68, 1/70; G01N 33/543

U.S. Cl. 435—5

6 Claims

1. A process for detecting the presence of a target molecule which comprises:

binding said target molecule to a substrate, combining said target molecule with a target molecule specific probe to form a target molecule-probe combination, said probe bearing one of a pair of moieties which bind inter se,

binding said target molecule probe combination to a phagemid bearing the other one of said pair of moieties which bind inter se,

the plasmid portion of said phagemid containing a signal encoding DNA

transfecting said phagemid into a lysogenic cell effective to express the signal encoding DNA present in the plasmid portion of said phagemid

replicating said transfected cell

detecting the expression of said signal encoding DNA by the replicated cells

and relating the detected signal to the presence of the target molecule.

5,085,983

DETECTION OF HUMAN TUMOR PROGRESSION AND DRUG RESISTANCE

Kevin J. Scanlon, Pasadena, Calif., assignor to City of Hope, Duarte, Calif.

Continuation-in-part of Ser. No. 234,096, Aug. 19, 1988, which is a continuation-in-part of Ser. No. 46,127, May 5, 1987, abandoned. This application May 17, 1989, Ser. No. 352,994

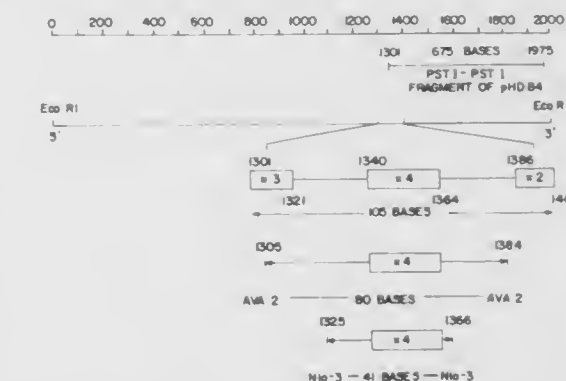
Int. Cl.⁵ C12Q 1/68; C12P 19/34; G01N 33/566; C07H 15/12 U.S. Cl. 435—6

28 Claims

1. A method for determining the presence or absence of cancer in a human patient which comprises:

(i) selecting a human gene from the group consisting of the dihydrofolate reductase gene, the DNA polymerase beta gene, the dTMP synthase gene, the c-fos gene, the c-myc gene and the H-ras gene, the transcripts of which, if said patient has cancer, contain a DNA marker having a target

DNA sequence which is not present in the transcripts from the same gene if said patient does not have cancer; (ii) analyzing the transcripts of said gene to determine the



presence or absence of said DNA marker, said analysis comprising a determination of whether or not a probe complementary to said target sequence, when said patient has cancer, will hybridize to said target sequence.

5,085,984

NOVEL TYPE VI BACTERIAL FC RECEPTORS

Michael D. P. Boyle, and Kathleen J. Reis, both of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 131,071, Dec. 10, 1987, Pat. No. 4,948,725.

This application Apr. 23, 1990, Ser. No. 513,144

Int. Cl.⁵ C12Q 1/00; G01N 33/53; C23N 15/00; C12P 1/04 U.S. Cl. 435—7.2 37 Claims

1. A process for using a type VIFc receptor for the identification of rat antibodies, said process comprising:

(a) contacting said rat antibodies, or medium containing said antibodies, with a labeled or immobilized type VI Fc receptor characterized by (1) having a molecular weight of about 43,000 daltons or about 90,000 daltons, (2) being antigenically distinct from known Fc receptors type I, II and III, and (3) displaying unique immunological profiles when compared to known type IV and type V receptors; and

(b) identifying rat antibodies which bind to said receptors.

5,085,985

MONOCLONAL ANTIBODIES AND THEIR USE IN A METHOD FOR MONITORING SUBSETS OF ACTIVATED T CELLS

Vernon C. Maino, and Marina E. Janszen, both of Los Altos, Calif., assignors to Becton Dickinson & Co., Franklin Lakes, N.J.

Filed Nov. 12, 1987, Ser. No. 119,745

Int. Cl.⁵ G01N 33/577

U.S. Cl. 435—7.24 13 Claims

1. A method for monitoring subpopulations of activated T lymphocytes in a sample comprising the steps of:

(a) isolating a cell sample containing activated T lymphocytes;

(b) combining said cell sample with a first monoclonal antibody selected from the group consisting of anti L-35 (ATCC HB 9050) and anti L-36 (ATCC HB 9051), said first monoclonal antibody being conjugated to a first fluorescent dye, and with a second monoclonal antibody selected from the group consisting of anti-CD5, anti-CD8, anti-CD4 and anti-CD3 monoclonal antibodies, said second monoclonal antibody being conjugated to a second fluorescent dye, said first and second fluorescent dyes having emission wavelengths which differ a sufficient amount to produce separately detectable signals, wherein

said first and second monoclonal antibodies bind to said activated T lymphocytes;
 (c) detecting fluorescence emission from said first and second fluorescent dyes; and
 (d) monitoring subpopulations of activated T lymphocytes in said sample as a function of said detected fluorescence emission.

5,085,986

DIAGNOSTIC TEST KIT AND METHOD FOR DETERMINATION OF CHLAMYDIAL ANTIGEN USING A MEMBRANE HAVING SURFACE HYDROXY GROUPS
 John C. Mauck, and Bradley P. Boyer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 14, 1989, Ser. No. 366,100

Int. Cl.³ G01N 33/571

U.S. Cl. 435—7.36

20 Claims

1. A method for the determination of a chlamydial antigen comprising:

- contacting chlamydial antigen extracted from a specimen suspected of containing chlamydial organisms with a polyamide microporous filtration membrane having a plurality of hydroxy groups on the surface thereof, and which has an average pore size of from about 1 to about 10 μ meter, for a sufficient time to bind said extracted antigen to said membrane;
- contacting chlamydial antigen bound to said membrane with chlamydial antibody so as to form an immunological complex on said membrane; and
- determining the presence of said complex on said membrane as a measure of the presence of chlamydial organisms in said specimen.

5,085,987

IMMUNOSEPARATING STRIP

John D. Olson, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 13,615, Feb. 12, 1987, Pat. No. 4,963,468, which is a continuation-in-part of Ser. No. 904,597, Sep. 5, 1986, Pat. No. 4,959,307. This application Aug. 13, 1990, Ser. No. 566,949

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.³ G01N 33/538, 33/543, 33/548

U.S. Cl. 435—7.91

15 Claims

1. A device for determining the presence of an analyte that is capable of binding specifically to an antibody in a test solution comprised of an antibody for said analyte, a conjugate of said analyte and a label, and a sample suspected of containing the analyte, said device comprising

a piece of bibulous material capable of traversal by said test solution by capillary migration, said bibulous material having a contact portion for contacting said test solution and

a receptor for said conjugate non-diffusively bound to a situs on said bibulous material separated from said contact portion, the surface area of said situs being less than that of said bibulous material, said bibulous material further containing a second antibody capable of binding said antibody for said analyte, said second antibody being non-diffusively bound to said bibulous material at least at a portion thereof between said situs and said contact portion.

5,085,988

IMMUNOSEPARATING STRIP

John D. Olson, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 904,597, Sep. 5, 1986, Pat. No. 4,959,307. This application Jul. 5, 1990, Ser. No. 548,046. The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.³ G01N 33/538, 33/543, 33/548

U.S. Cl. 435—7.91

19 Claims

1. A device for determining the presence of an analyte that is capable of binding specifically to an antibody in a test solution comprised of an antibody for said analyte, a conjugate of said analyte and a label, and a sample suspected of containing the analyte, said device comprising:

a bibulous strip capable of traversal by said test solution by capillary migration, said strip having a contact portion for contacting said test solution and

a receptor for said conjugate non-diffusively bound to a situs on said strip separated from said contact portion, the surface area of said situs being less than that of said strip, said strip further containing a second antibody capable of binding said antibody, said second antibody being non-diffusively bound to said strip at least between said situs and said contact portion.

5,085,989

METHOD AND REAGENT FOR QUANTITATIVE ANALYSIS OF 3-OXO-5 β -STEROID

Koji Ushizawa, and Takae Shigihara, both of Tokyo, Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo, Japan. Continuation of Ser. No. 80,918, Aug. 3, 1987, abandoned. This application Aug. 28, 1990, Ser. No. 574,525

Claims priority, application Japan, Nov. 11, 1986, 61-268313. Int. Cl.³ C12Q 1/26, 1/32

U.S. Cl. 435—26

6 Claims

1. A method of quantitatively analyzing for a 3-oxo-5 β -steroid, which comprises:

contacting a sample containing said steroid with 3-oxo-5-steroid- Δ^4 -dehydrogenase and a reducible, chromophoric tetrazolium agent and allowing the dehydrogenase to oxidize the steroid while at the same time reducing the chromophoric agent to a colored substance; and measuring the optical density of the colored substance thereby quantitatively analyzing for said 3-oxo-5-steroid.

5,085,990

TEICOPLANIN-LIKE DERIVATIVES

Giancarlo Lancini, Pavia; Angelo Borghi, Milan; Piero Antonini, Arluno, and Raffaele Palumbo, Brindis, all of Italy, assignors to Gruppo Lepetit S.P.A., Milano, Italy

Continuation of Ser. No. 214,231, Jul. 1, 1988, abandoned. This application May 10, 1991, Ser. No. 701,355

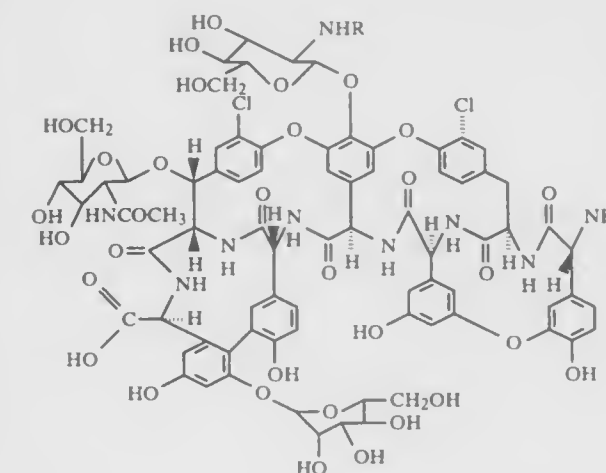
Claims priority, application United Kingdom, Sep. 7, 1987, 8720980

Int. Cl.³ C12R 1/045; C12P 21/04

U.S. Cl. 435—71.3

6 Claims

1. A process for preparing a teicoplanin-like compound of the formula



wherein:

R is 6-methyloctanoyl or n-nonanoyl, or an addition salt thereof with acids or bases, which comprises cultivating *Actinoplanes teichomyceticus* ATCC 53649 under aerobic conditions in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts, at a temperature between 20° C. and 40° C., separating and isolating said compound by means of chromatographic procedures.

5. *Actinoplanes teichomyceticus* ATCC 53649.

5,085,992

MICROBIAL TRANSFORMATION PROCESS FOR ANTIHYPERTENSIVE PRODUCTS

Shieh-Shung T. Chen, Morganville, and George Doss, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J. Division of Ser. No. 554,639, Jul. 19, 1990. This application Feb. 25, 1991, Ser. No. 659,641

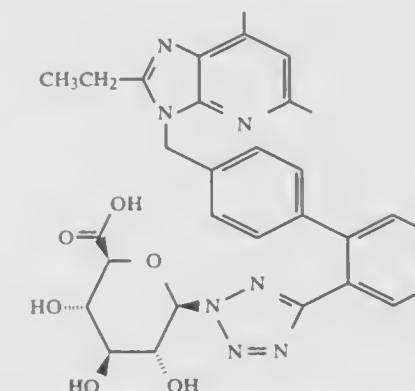
Int. Cl.³ C12P 17/18, 17/10; C12N 1/00

U.S. Cl. 435—119

4 Claims

1. A process for the preparation of a compound represented by formula (I)

(I)



comprising the steps of culturing a microorganism *Streptomyces* sp. MA 6751 (ATCC No. 55043) in a nutrient medium containing assimilable sources of nitrogen and carbon and substrate compound (II) under aerobic conditions at a pH range of 6 to 8 and a temperature range of 26° C. to 29° C. for a period of time of 10 to 30 hours.

5,085,993

COENZYME-INDEPENDENT L-SORBOSONE DEHYDROGENASE FROM PSEUDOMONAS PUTIDA

Akiko Fujiwara, and Tatsuo Hoshino, both of Kamakura, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 13, 1988, Ser. No. 283,706

Claims priority, application European Pat. Off., Dec. 24, 1987, 87119187.0

Int. Cl.³ C12P 7/60; C12N 9/02, 1/00

U.S. Cl. 435—138

6 Claims

1. An enzyme wherein said enzyme is a homogenous protein having the L-sorbosone dehydrogenase activity for converting L-sorbosone to 2-keto-L-gulononic acid in the presence of an electron acceptor without the need for a coenzyme where said protein has a molecular weight of 47,000 \pm 5,000 as measured by sodium dodecyl sulfate polyacrylamide gel electrophoresis with said activity of said protein being optimal at a pH of from about 7 to about 8 and at a temperature of from about 20° C. or to about 40° C.

5,085,994

PROCESS FOR THE ACCELERATED AGEING AND TREATMENT OF IRIS RHIZOMES

Jean-Claude Baccou, Montpellier; Jean-Marie Bessiere, St. Clement; Patrick Boisseau, Provence; Pierre Faugeras, Pour St. Espris; Nicholas Jouy, Juvignac; Elysabette Peyrot, Saint Cyr Au Mo, and Yves Sauvaire, Montferrier Sur, all of France, assignors to Commissariat A L'Energie Atomique and Universite des Sciences et Techniques Du Languedoc, both of, France

Filed Oct. 26, 1990, Ser. No. 604,572

Claims priority, application France, Oct. 26, 1989, 89 14042

Int. Cl.³ C12P 7/26; C12N 13/00

U.S. Cl. 435—148

14 Claims

1. Process for prematurely ageing at least one part of a plant material containing triterpenoids precursors of irones consist-

ing of irradiating after harvesting said part of the plant material with ionizing radiation at a dosage rate from 0.5 to 100 grays/minute for transforming said plant material precursors into irones.

5,085,995

METHOD FOR PRODUCING SAFFRON STIGMA-LIKE TISSUE AND METHOD FOR PRODUCING USEFUL COMPONENTS FROM SAFFRON STIGMA-LIKE TISSUE
Masako Otsuka, Souka; Hiroshi Saimoto, Misato; Yumiko Murata, Ageo, and Masao Kawashima, Warabi, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,037

Int. Cl.⁵ C12N 5/04; C12P 1/00

U.S. Cl. 435—240.45

10 Claims

1. A method for producing stigma-like tissue from a saffron flower, comprising the step of:

culturing a corolla tube of a saffron flower by tissue culture in a medium containing at least an auxin, a cytokinin and sucrose, wherein said auxin is present in a concentration of not less than 0.1 ppm, said cytokinin is present in a concentration of not less than 1.0 ppm, and sucrose is present in an amount of 5 to 12 wt % for a time sufficient for the development of stigma-like tissue.

5,085,996

MICROORGANISM GROWTH ACCELERATION MEDIUM CONTAINING AN EFFECTIVE AMOUNT OF PICOLINIC ACID OR METAL PICOLINATE TO PROMOTE GROWTH OF THE MICROORGANISM

Gary W. Evans, Route 1, County Rd., 13 Box 86-B, Puposky, Minn. 56667

Division of Ser. No. 07/225,977, Jul. 29, 1988. This application Oct. 9, 1990, Ser. No. 595,031

Int. Cl.⁵ C12N 1/38, 1/32; C12R 1/19, 1/865

U.S. Cl. 435—244

6 Claims

1. A microorganism growth media having no substantial quantity of active microorganisms, comprising:

- a microorganism nutrient; and
- a growth promoter selected from picolinic acid and a metal picolinate, in an amount sufficient to produce an effective growth promoting concentration of picolinate up to about 400 ng/ml in said growth media.

5,085,997

METHOD OF SEPARATING YEASTS FROM FERMENTATION LIQUORS

Hans Müller, Erlenbach, Switzerland, assignor to DrM, Dr. Müller AG, Männedorf, Switzerland

Continuation of Ser. No. 634,618, Jul. 26, 1984, abandoned. This application Oct. 22, 1990, Ser. No. 602,389

Claims priority, application Switzerland, Jul. 27, 1983, 4106/83

Int. Cl.⁵ C12N 1/02, 1/16, 1/18; C12P 7/06

U.S. Cl. 435—261

11 Claims

1. A method of producing compressed baking yeasts from a fermentation liquid produced in a fermentation tank, wherein filter means having a filter container and a plurality of filter elements vertically suspended in the filter container and coated with a filter cloth are directly connected to the fermentation tank, the method comprising the steps of discharging a fermentation liquor from the fermentation tank and forcing the fermentation liquor continuously through said filter means in the direction of filtration from outside to inside of said filter elements so as to filter out said liquor, whereby a yeast filter cake is built upon the filter cloth of the filter elements; emptying the residual liquor from the filter container; washing said filter cake with a washing liquid; blowing off said filter cake with a pressurized gas for dewatering said filter cake to achieve 29% to 33% by weight of a dry yeast substance; then supplying pressurized gas into said container in a direction opposite to the direction of filtration so that the filter cake is loosened from the

filter cloth of said filter elements; and discharging the loosened and dry yeast filter cake from said container.

5,085,998

BIODEGRADATION OF 2,4,6-TRINITROTOLUENE BY WHITE-ROT FUNGUS

Carmen A. Lebron, Camarillo; Leslie A. Karr, Ventura, both of Calif.; Tudor Fernando, Logan, and Steven D. Aust, North Logan, both of Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 7, 1991, Ser. No. 700,854

Int. Cl.⁵ C12P 1/02; C12R 1/645; C12N 1/16

U.S. Cl. 435—262

5 Claims

1. A process of biodegrading 2,4,6-Trinitrotoluene contained in a liquid to improve the environmental characteristics thereof comprising the steps of:

- providing in a liquid culture medium a white-rot fungus, *Phanerochaete chrysosporium* strain VKM F-1767 which is in a secondary metabolic state;
- biodegrading the 2,4,6-Trinitrotoluene in the liquid by immersing the 2,4,6-Trinitrotoluene in the liquid culture medium for a sufficient time period to allow the white rot fungus, *Phanerochaete chrysosporium* strain VKM F-1767 to degrade the 2,4,6-Trinitrotoluene, while at least at a predetermined time interval exposing the fungus to oxygen.

5,085,999

METHOD, APPARATUS, AND REACTANT FOR REMOVAL OF PAINT AND EPOXIES FROM METALLIC BEVERAGE CONTAINERS USING MICROORGANISMS
Gail L. A. Bowers-Irons; Quynh K. Tran, and Robert J. Pryor, all of Salt Lake City, Utah, assignors to Technical Research, Inc., Salt Lake City, Utah

Filed Aug. 31, 1989, Ser. No. 401,070

Int. Cl.⁵ B08B 7/00

U.S. Cl. 435—264

16 Claims

1. A method of removing from a metallic surface paint, epoxies and comestible polymeric coatings comprising:

contacting the coating on a metallic surface with a reagent comprising, in admixture organisms predetermined to be capable of removing said coating from metallic surfaces and a nutrient medium capable of maintaining said organisms and enabling said organisms to remove said coating, said organisms being selected from the group consisting of bacteria having deposit accession number ATCC 53922, mutated bacteria derived from bacteria having deposit accession number ATCC 53922, host cell organisms containing DNA derived from bacteria having deposit accession number ATCC 53922, and mixtures thereof; and maintaining said contact for a time sufficient to disrupt the adhesion of said coating to the metallic surface.

5,086,000

PROCESS FOR THE PREPARATION OF ALKYLENE-BIS(2-PYRIDYLAMINE) COMPOUNDS AND KARL FISCHER REAGENTS AND METHODS UTILIZING SUCH COMPOUNDS

Rolf Poblke, Mühlthal, and Wolfgang Fischer, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 20, 1990, Ser. No. 616,132

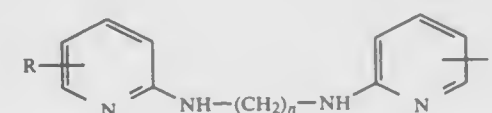
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1989, 3938561.2

Int. Cl.⁵ G01N 33/18; C07D 213/36

U.S. Cl. 436—42

8 Claims

1. A process for the preparation of alkylenebis(2-pyridylamine) compounds of formula I



in which each R is independently H or C₁ to C₆-alkyl and n is 2-8,

comprising reacting a 2-halopyridine or C₁ to C₆-alkyl derivative thereof with a corresponding alkylendiamine.

8. A Karl Fischer reagent for determining the presence of water in a sample comprising a compound of formula I of claim 1, sulfur dioxide and iodine.

5,086,001

AUTOMATED TEST METHOD FOR EVALUATING THE PHYSICAL COMPATIBILITY OF INTRAVENOUS DRUGS IN SOLUTIONS

Nancy C. Leissing, Lake Forest, and Diana Oskroba, McHenry, both of Ill., assignors to Baxter International, Inc., Deerfield, Ill.

Filed Dec. 1, 1989, Ser. No. 445,234

Int. Cl.⁵ G01N 21/00, 21/75

U.S. Cl. 436—171

9 Claims

1. An automated process for evaluating the physical compatibility of two or more pharmaceutical chemicals in solution comprising the steps of:

- providing at least first and second pharmaceutical chemicals in solution;
- mixing said chemical solutions in predetermined relative quantities;
- measuring the absorption of said mixture at a first wavelength within the visual spectrum to detect both changes in color and changes in physical properties caused by mixing of the said chemical solutions;
- measuring the absorption of said mixture at a second wavelength above the visual spectrum to detect only changes in physical properties caused by mixing of said chemical solutions; and
- comparing the absorption measured at the first wavelength with the absorption measured at the second wavelength to differentiate between solely color changes and physical property changes (with or without color changes) caused by said mixing.

5,086,002

ERYTHROCYTE AGGLUTINATION ASSAY

Carmel J. Hillyard, Brisbane; Dennis B. Rylatt, Rosalie; Bruce E. Kemp, Kew, and Peter G. Bundesen, Fig Tree Pocket, all of Australia, assignors to Agen Biomedical, Ltd., Acacia Ridge, Australia

Continuation-in-part of Ser. No. 143,343, Jan. 13, 1988, Pat. No. 4,894,347, which is a continuation-in-part of Ser. No. 111,313, Oct. 22, 1987, abandoned. This application Mar. 16, 1989, Ser. No. 324,500

Claims priority, application Australia, Sep. 7, 1987, P14400; Oct. 22, 1987, P15018

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

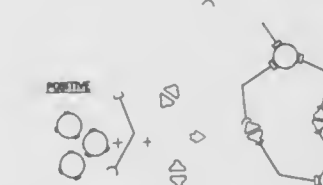
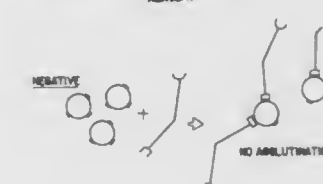
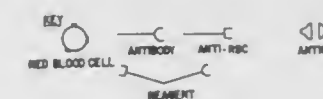
Int. Cl.⁵ G01N 33/541

U.S. Cl. 436—540

52 Claims

1. An agglutination reagent which comprises a conjugate comprising at least one erythrocyte binding molecule conjugated with at least one analyte binding molecule, said conjugate agglutinating erythrocytes essentially only in the presence of the analyte, wherein such conjugate does not substantially alter the binding characteristics of said erythrocyte binding molecule and said analyte binding molecule or lyse said erythrocytes; and wherein said erythrocyte binding molecule is a

(1) non-univalent anti-erythrocyte antibody or a non-univalent



anti-erythrocyte antibody fragment which essentially does not auto agglutinate erythrocytes.

5,086,003

METHOD FOR APPLYING AN ORGANIC INSULATOR TO A SOLAR ARRAY

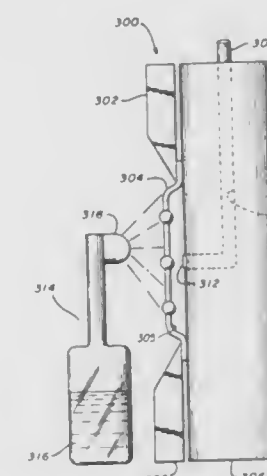
Milfred D. Hammerbacher, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1989, Ser. No. 387,929

Int. Cl.⁵ H01L 31/18, 31/048

U.S. Cl. 437—2

16 Claims



1. A method for applying a dielectric material to a solar array having an edge, a light gathering side and a backside, said method comprising the steps of:

- providing a solar array having an edge, a light gathering side and a backside;
- sealing said array in the region of said edge;
- providing a gas pressure differential between said light gathering side and said backside which pressure is greater on said light gathering side than on said backside; and
- applying said dielectric material to said backside of said array;
- said gas pressure differential being sufficient to substantially prevent said dielectric material from leaking from said backside to said light gathering side.

5,086,004

ISOLATION OF LAYERED P-N JUNCTIONS BY DIFFUSION TO SEMI-INSULATING SUBSTRATE AND IMPLANTATION OF TOP LAYER

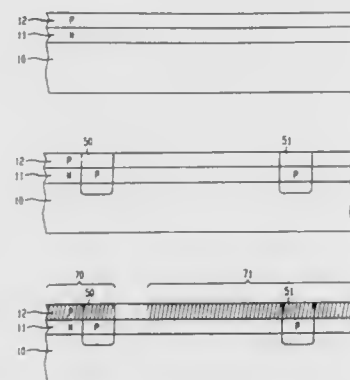
Victor E. Quintana, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 167,780, Mar. 14, 1988, Pat. No. 4,956,683. This application Jun. 1, 1990, Ser. No. 534,654

Int. Cl.⁵ H01L 21/76, 21/265

U.S. Cl. 437-22

1 Claim



1. A method of forming an isolation structure for isolating regions of a non-localized p-n junction which is contained in a structure comprising a semi-insulating substrate and a plurality of stacked layers overlying each other with the innermost layer thereof overlying said semi-insulating substrate and doped with an impurity of a first conductivity type and an outermost layer doped with an impurity of a second conductivity type opposite to said first conductivity type so as to define said p-n junction between said innermost and outermost layers, which method comprises the steps of:

- patterning a diffusion mask on the structure to delineate at least one first predetermined region;
- diffusing an impurity having the same conductivity type as that of the outermost layer of the plurality of stacked layers to a depth that at least reaches the semi-insulating substrate;
- patterning an ion implant mask onto the structure to delineate at least one second predetermined region, the second predetermined region comprising a portion of the first predetermined region; and
- ion implanting a substantially non-conductive impurity to a depth which includes the top layer of the p-n junction to render the second predetermined region substantially non-conductive.

5,086,005

BIPOLAR TRANSISTOR AND METHOD FOR MANUFACTURING THE SAME

Keoiji Hirakawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 5, 1990, Ser. No. 533,519

Claims priority, application Japan, Jun. 6, 1989, 1-143830

Int. Cl.⁵ H01L 21/266, 27/06, 27/10

U.S. Cl. 437-32

1 Claim

1. A method for manufacturing a bipolar transistor, comprising the steps of:

- forming a first insulation film on a semiconductor substrate;
- exposing a predetermined surface portion of the semiconductor substrate by selectively removing the first insulation film;
- forming a first polycrystalline semiconductor layer on the resultant semiconductor structure;
- forming a first photoresist film having a predetermined pattern on the first polycrystalline semiconductor layer;
- ion-implanting first impurities, which are of a first conductivity type, into the first polycrystalline semiconductor layer, using the first photoresist film as a mask;
- removing the first photoresist film;
- ion-implanting second impurities, which are of a second conductivity type and have a larger diffusion coefficient than that of the first impurities, into the first polycrystalline semiconductor layer through the entire surface thereof;
- forming a second insulation film on the first polycrystalline semiconductor layer;
- forming a second photoresist film having a predetermined pattern on the second insulation film;
- forming an opening to expose a predetermined surface portion of the semiconductor substrate by selectively removing the second insulation film and the first polycrystalline semiconductor layer, using the second photoresist film as a mask, such that the first polycrystalline semiconductor layer is divided into: a second polycrystalline semiconductor layer containing both impurities of the first conductivity type and impurities of the second conductivity type; and a third polycrystalline semiconductor layer containing only impurities of the second conductivity type;
- removing the second photoresist film;
- forming a third insulation film on the resultant semiconductor structure;
- exposing the predetermined surface portion of the semiconductor substrate once again, by selectively removing the

third insulation film such that the third insulation film remains on side walls of the opening;

heat-treating the resultant semiconductor structure, so as both to form a fourth insulation film on the exposed surface portion of the semiconductor substrate and to activate the first and second impurities such that the semiconductor substrate contains: a first impurity-diffusion layer which is of the second conductivity type; a second impurity-diffusion layer which is of the first conductivity and is in contact with the first impurity-diffusion layer; and a third impurity-diffusion layer of the second conductivity;

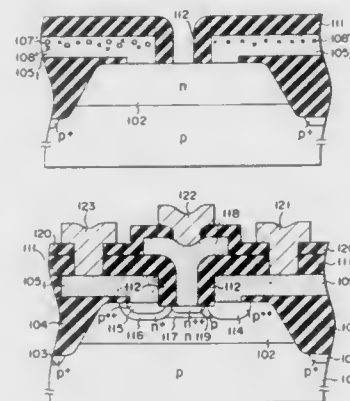
ion-implanting third impurities of the first conductivity type into the fourth insulation film;

forming a fourth impurity-diffusion layer, which is of the first conductivity type and is in contact with both the second and third impurity-diffusion layers, by activating the third impurities implanted into the fourth insulation film;

exposing the predetermined surface portion of the semiconductor substrate once again, by removing the fourth insulation film;

forming a fourth polycrystalline semiconductor layer, which contains fourth impurities of the second conductivity, on the entire surface of the resultant semiconductor structure; and

forming a fifth impurity-diffusion layer, which is of the first conductivity type, is located inside the fourth impurity-diffusion layer, and is contact with the second impurity-



third insulation film such that the third insulation film remains on side walls of the opening;

heat-treating the resultant semiconductor structure, so as both to form a fourth insulation film on the exposed surface portion of the semiconductor substrate and to activate the first and second impurities such that the semiconductor substrate contains: a first impurity-diffusion layer which is of the second conductivity type; a second impurity-diffusion layer which is of the first conductivity and is in contact with the first impurity-diffusion layer; and a third impurity-diffusion layer of the second conductivity;

ion-implanting third impurities of the first conductivity type into the fourth insulation film;

forming a fourth impurity-diffusion layer, which is of the first conductivity type and is in contact with both the second and third impurity-diffusion layers, by activating the third impurities implanted into the fourth insulation film;

exposing the predetermined surface portion of the semiconductor substrate once again, by removing the fourth insulation film;

forming a fourth polycrystalline semiconductor layer, which contains fourth impurities of the second conductivity, on the entire surface of the resultant semiconductor structure; and

forming a fifth impurity-diffusion layer, which is of the first conductivity type, is located inside the fourth impurity-diffusion layer, and is contact with the second impurity-

diffusion layer, by activating the fourth impurities to diffuse from the fourth polycrystalline semiconductor layer into the fourth impurity-diffusion layer.

5,086,006

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCTION

Michio Asahina, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

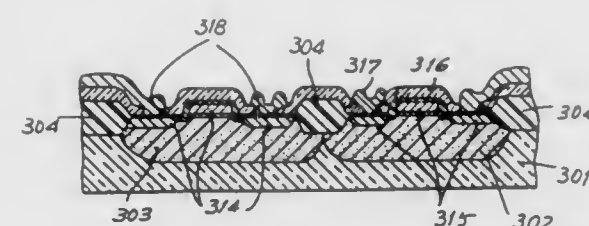
Division of Ser. No. 553,281, Jul. 17, 1990, abandoned, which is a division of Ser. No. 75,245, Jul. 16, 1987, Pat. No. 4,985,746, which is a continuation of Ser. No. 807,408, Dec. 10, 1985, abandoned. This application May 10, 1991, Ser. No. 698,048

Claims priority, application Japan, Dec. 11, 1984, 59-261251

Int. Cl.⁵ H01L 21/265

U.S. Cl. 437-34

2 Claims



1. A method for making a semiconductor device comprising: forming a substrate of a first conductivity type;

forming a well region of a second conductivity type in the substrate;

forming an insulating film over the well region and the substrate;

photoetching the insulating film to expose a portion of the substrate and a portion of the well region;

forming a polysilicon layer of the second conductivity type on the exposed portion of the substrate and the insulating film which is over the substrate;

forming a polysilicon layer of the first conductivity type on the exposed portion of the well region and the insulating film which is over the well region, such that a junction is formed where the polysilicon layer of the first conductivity type is directly connected to the polysilicon layer of the second conductivity type;

heating the polysilicon layers such that the polysilicon layer of the second conductivity type is thermally diffused into the exposed portion of the substrate thereby forming a first diffusion region, and the polysilicon layer of the first conductivity type is thermally diffused into the exposed portion of the well region thereby forming a second diffusion region, and the first and second diffusion regions are separated by that portion of the insulating film which is directly below the junction of the polysilicon layers;

forming a metal silicide film by sputtering over the surface; photoetching the metal silicide film, the polysilicon layer of the second conductivity type, the polysilicon layer of the first conductivity type, and the remaining insulating layer to form a first gate over the substrate, a second gate over the well region, and a wiring which includes the junction of the polysilicon layers and the first and second diffusion regions, and thereby exposing the substrate on both sides of the first gate and exposing the well region on both sides of the second gate; and

injecting a high concentration of ions of the first conductivity type into the exposed areas of the substrate to form a first source and drain region in the substrate on either side of the first gate, and injecting a high concentration of ions of the second conductivity type into the exposed areas of the well region to form a second source and drain region in the well region on either side of the second gate.

5,086,007 METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR

Katunori Ueno, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Japan

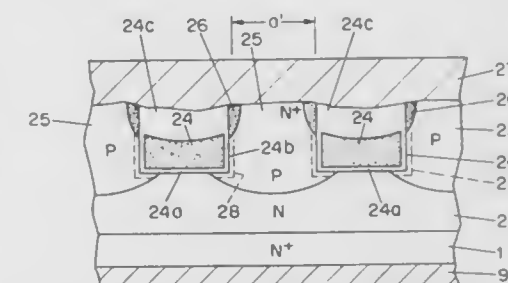
Filed May 8, 1990, Ser. No. 521,230

Claims priority, application Japan, May 24, 1989, 1-131085

Int. Cl.⁵ H01L 21/225, 21/336

U.S. Cl. 437-41

7 Claims



7. A single mask method utilizing self alignment of source regions for manufacturing insulated gate field effect transistors with reduced spacing comprising the steps of:

- (a) forming indentations in an n-type semiconductor substrate, each such indentation representing a transistor location;
- (b) oxidizing surfaces of said indentations by thermal oxidation so as to form a silicon oxide film on the surfaces of said indentations;
- (c) depositing a polysilicon gate material in said indentations;
- (d) forming a p-type base region by diffusing impurities into the region between adjacent indentations;
- (e) depositing a phosphorus glass insulating material into said indentations, so as to encase said gate material;
- (f) removing said phosphorus glass insulating material from portions of said substrate adjacent to said indentations;
- (g) laterally diffusing impurities from said phosphorus glass insulating material in said indentations into said adjacent base region to form n-type source regions;
- (h) forming source electrodes on the surface of the resulting structure, in contact with one or more of said source regions and base regions; and
- (i) forming a drain electrode on a surface of said substrate opposite said indentations;

whereby transistors may be manufactured reliably in closely spaced relationship with no need for registration steps, outside of electrode formation, through use of self alignment to provide transistors with large current capacity resulting from reduced channel resistance and high density integration.

5,086,008

PROCESS FOR OBTAINING HIGH-VOLTAGE N CHANNEL TRANSISTORS PARTICULARLY FOR EEPROM MEMORIES WITH CMOS TECHNOLOGY

Carlo Riva, Monza, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

Continuation of Ser. No. 309,889, Feb. 14, 1989, abandoned.

This application Oct. 29, 1990, Ser. No. 604,995

Claims priority, application Italy, Feb. 29, 1988, 19580 A/88

Int. Cl.⁵ H01L 21/70

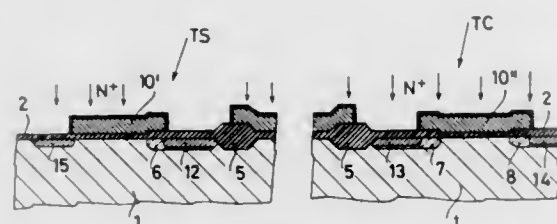
U.S. Cl. 437-41

3 Claims

1. Process for obtaining a high-voltage N-channel transistor, particularly for an EEPROM memory with CMOS technology, comprising in succession the steps of:

- a) N⁻ doping at least a first portion of a P-type semiconductor substrate surface which has been covered with an oxide layer,
- b) oxidizing the doped first portion of the substrate surface to form a gate oxide layer which is thicker than gate oxide layer thicknesses on any other portion of the substrate surface as a result of the N⁻ doping,

- c) deposit and definition of an N⁺ doped polysilicon layer on a part of said doped first portion and on an adjacent portion of the substrate surface to form a gate strip,
d) oxidizing the gate strip,



- e) N⁺ doping the remaining part of said doped first portion of the substrate surface which does not have the N⁺ doped polysilicon layer deposited and defined thereon, and simultaneously N⁺ doping another portion of the substrate surface at a side of the gate strip opposite to that of said doped first portion to form drain and source areas.

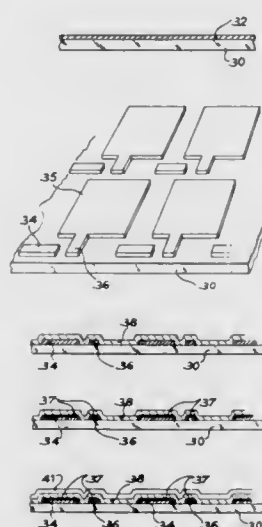
5,086,009

METHOD FOR EMBODYING AN ACTIVE MATRIX FLAT SCREEN AND A RAM MEMORY USING MIM COMPONENTS

Patrick Sangouard, Villiers Sur Marne, France, assignor to
Chambre de Commerce et d'Industrie de Paris, Paris, France
Filed Dec. 21, 1989, Ser. No. 454,758

Claims priority, application France, Dec. 27, 1988, 88 17246
Int. Cl.⁵ H01L 21/44, 21/84, 29/00
U.S. Cl. 437—48

10 Claims



1. A method for embodying a display screen comprising the steps of:

depositing onto a transparent insulating plate a first film made of a conductive metal oxide;
etching said first film so as to form a matrix of electrodes with a piece joined on and a matrix of first connection patterns at the location of future addressing columns;
depositing a second film made of a conductive oxidizable material;
heating said substrate with said etched first film and said second film to a temperature between 200° and 700° C. for forming a third film between said first and second films, said third film being made of an oxide of said oxidizable material;
etching said second and third films for forming addressing columns overlapping said first connection patterns so as to form a matrix of second connection patterns overlapping

said first connection patterns and said pieces joined on said electrodes; and,
bringing back the temperature to ambient temperature.

3. Method for embodying a dynamic random access memory comprising the steps of:

doping a semiconductive substrate so as to form a set of addressing lines;
depositing onto said substrate a first film made of an insulating material;
etching said first film for forming insulating columns;
depositing a second film made of a conductive oxidizable material;
etching said second film to leave addressing columns on said insulating columns;
depositing a third film made of a conductive metal oxide;
etching said third film for forming a matrix of patterns overlapping said addressing lines with a piece joined on overlapping said addressing columns;
heating the substrate with said first, second and third etched films to a temperature between 200° and 700° C. for forming a fourth film between said second and third films, said fourth film being made of an oxide of said oxidizable material; and,
bringing back the temperature to ambient temperature.

5,086,010

METHOD FOR MANUFACTURING SOLID STATE IMAGE SENSING DEVICE FORMED OF CHARGE COUPLED DEVICES ON SIDE SURFACES OF TRENCHES

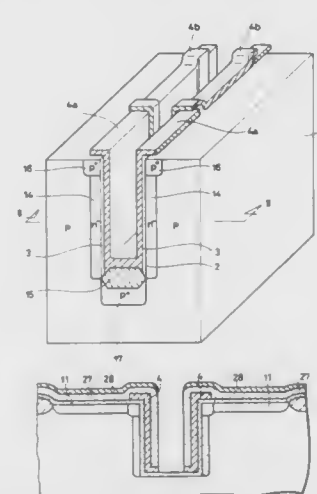
Mikihiko Kimura, Hyogo, Japan, assignor to Mitsubishi Denki
Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 446,261, Dec. 5, 1989, Pat. No. 5,029,321.
This application Apr. 16, 1991, Ser. No. 685,802

Claims priority, application Japan, Dec. 19, 1988, 63-321564
Int. Cl.⁵ H01L 21/76

U.S. Cl. 437—53

3 Claims



1. A method for manufacturing a solid state image sensing device, comprising the steps of:

selectively forming an insulation film for isolating elements on a surface of a semiconductor substrate having a first conductivity type;
forming a first impurity region of a second conductivity type on the surface of said semiconductor substrate;
forming a trench on a prescribed region of the surface of said semiconductor substrate;
forming second impurity regions of the second conductivity type on both side surfaces of said trench;
forming a first insulating film on the main surface of said semiconductor substrate and in said trench;
forming a polycrystalline silicon layer on the surface of said

first insulating film and patterning the same into a prescribed pattern;
forming a second insulating film on said first insulating film and on the surface of said polycrystalline silicon layer;
applying a resist on the surface of said polycrystalline silicon layer and patterning the same to expose the surface of said second insulating film formed in said trench;
anisotropically etching said second insulating film by using said resist as a mask to expose the surface of said polycrystalline silicon layer formed on the bottom surface of said trench; and
etching said polycrystalline silicon layer by using said resist and said second insulating film as masks.

5,086,011

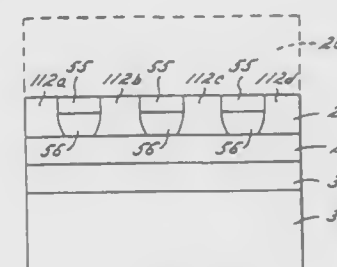
PROCESS FOR PRODUCING THIN SINGLE CRYSTAL SILICON ISLANDS ON INSULATOR

Philip S. Shiota, Saratoga, Calif., assignor to Advanced Micro
Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 7,312, Jan. 27, 1987,
abandoned. This application Jan. 25, 1988, Ser. No. 147,892
Int. Cl.⁵ H01L 21/302

U.S. Cl. 437—61

31 Claims



1. A method for fabricating dielectrically isolated single crystal semiconductor regions utilizing a first and a second substrate, and having first and second surfaces, comprising the steps of:

forming a layer of epitaxial semiconductor on said first surface of said first substrate;
forming a masking layer on said layer of epitaxial semiconductor to expose selected portions of said layer of epitaxial semiconductor where isolation regions are to be formed;
forming isolation regions in said selected substrate where exposed by said masking layer;
subsequent to said step of forming isolation regions, forming a dielectric layer on said first surface of said second substrate and/or the surface of said layer of epitaxial semiconductor;
joining said layer of epitaxial semiconductor and said first surface of said second substrates together; and
removing a selected one of said first and second substrates, leaving said epitaxial layer, using a plasma etch wherein RF energy is introduced into the one of said first and second substrates other than that selected for removal.

5,086,012

METHOD FOR FORMING A FIELD OXIDE LAYER

Son Kwang Sik, Seoul, Rep. of Korea, assignor to Hyundai
Electronics Industries Co., Ltd., Rep. of Korea

Filed Mar. 5, 1991, Ser. No. 664,660
Claims priority, application Rep. of Korea, Mar. 6, 1990,
90-2898

Int. Cl.⁵ H01L 21/302

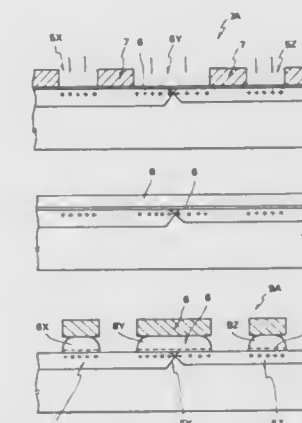
U.S. Cl. 437—70

20 Claims

1. A method for forming a field oxide layer in an integrated semiconductor device comprises:

providing a silicon substrate;
sequentially depositing a first oxide layer and a first photoresist layer on the silicon substrate;
forming a first separation mask pattern by removing a por-

tion of the first photoresist layer to expose a portion of the first oxide layer, thereby defining a plurality of separation regions at the silicon substrate, with each separation region being spaced apart relative to each other;
performing an ion-implantation process through the exposed first oxide layer into a portion of the silicon substrate positioned at the defined separation regions utilizing the first separation mask pattern;
removing the first photoresist layer remaining on the first oxide layer to thereby expose the entire surface of the first oxide layer;
sequentially depositing a second oxide layer and a second photoresist layer on the entire surface of the first oxide layer;



forming a second separation mask pattern by removing the second photoresist layer except for those portions of the second photoresist layer positioned above the defined separation regions, to thereby expose a portion of the second oxide layer;
forming a plurality of field oxide layers at the defined separation regions by sequentially removing the exposed portion of the second oxide layer and the first oxide layer thereunder utilizing the second separation mask pattern; and
removing the remaining second photoresist layer so positioned to expose the plurality of field oxide layer thereunder.

5,086,013

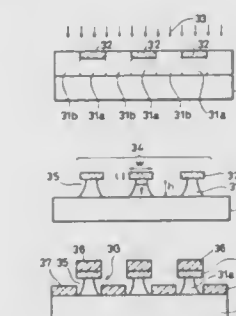
METHOD FOR FINE PATTERNING

Ryu Shimizu, and Shun-ichi Kobayashi, both of Ibaraki, Japan,
assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 2, 1989, Ser. No. 388,595
Claims priority, application Japan, Aug. 10, 1988, 63-200553

Int. Cl.⁵ H01L 21/283, 21/312, 21/3205
U.S. Cl. 437—80

11 Claims



1. A method for fine patterning, comprising in sequence the steps of:

applying a photoresist layer to a substrate, the photoresist

layer having a surface layer and a lower layer beneath the surface layer;
implanting ions into predetermined regions in said surface layer of said photoresist layer and leaving other regions in the surface layer free of the implanting of ions, said lower layer thereby being constituted by a first lower portion beneath the predetermined regions and a second lower portion beneath the other regions;
irradiating at least some of the other regions of said surface layer of said photoresist layer with ultraviolet from above;
forming a resist pattern for lift-off by developing said photoresist layer to remove a portion of said photoresist layer, a rate of the developing of said first lower portion being less than a rate of developing of said second lower portion because of differences in an extent of exposure of the first and second lower portions to the ultraviolet from above, said differences being dependent upon a level of concentration of the ions implanted into the predetermined regions;
depositing a material to be patterned onto said resist pattern and said substrate from above said resist pattern; and
removing said resist pattern, thereby lifting off said material which is on said resist pattern, whereby
a fine pattern of said material is left on said substrate.

5,086,014

SCHOTTKY DIODE MANUFACTURING PROCESS EMPLOYING THE SYNTHESIS OF A POLYCRYSTALLINE DIAMOND THIN FILM

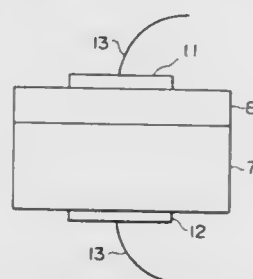
Koichi Miyata, Raleigh, N.C.; Kazuo Kumagai, Kobe, Japan; Koji Kobashi, Nishinomiya, Japan; Yuichi Matsui, Kobe, Japan, and Akimitsu Nakae, Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 18, 1990, Ser. No. 584,110

Claims priority, application Japan, Sep. 19, 1989, 1-244399
Int. Cl.⁵ H01L 21/20

U.S. Cl. 437-103

5 Claims



1. A Schottky diode manufacturing process employing the synthesis of a polycrystalline diamond film, comprising: a deposition of a B-doped p-type polycrystalline diamond film on a low-resistance p-type Si substrate by using a source gas consisting of CH₄, H₂ and B₂H₆ and having boron/carbon concentration ratio greater than 0.01 ppm and less than 20 ppm; forming an ohmic contact on the back of the p-type Si substrate; and forming a metal electrode on the B-doped p-type polycrystalline diamond thin film.

5,086,015

METHOD OF ETCHING A SEMICONDUCTOR DEVICE BY AN ION BEAM

Fumikazu Itoh, Fujisawa; Akira Shimase; Satoshi Haraichi, both of Yokohama; Takahiko Takahashi, Iruma, and Mikio Hongo, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 394,364

Claims priority, application Japan, Aug. 24, 1988, 63-208374
Int. Cl.⁵ H01L 21/26

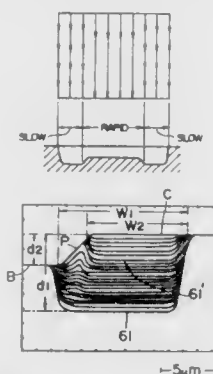
U.S. Cl. 437-173

10 Claims

1. A method of etching a semiconductor device having a multi-layered wiring including an upper wiring conductor

having an undulation, a lower wiring conductor and an insulating film between said upper and lower wiring conductors, by an ion beam, comprising the steps of:

extracting a high-intensity ion beam from a high-intensity ion source to obtain an extracted ion beam;
focusing the extracted ion beam by an ion optical system;
determining target shape data representing a target shape for a first hole to be formed with a curved bottom corresponding to the undulation of said upper wiring conductor in the semiconductor device;
calculating scan control data relating to forming of said first hole having the target shape comprising first scanning by a first scanning process including a whole area scanning by which the focused ion beam scans a whole area substantially corresponding to the first hole and a local area scanning by which the focused ion beam scans partially said whole area, wherein the scan control data is based on



said target shape data, an ion incident angle effect on ion beam sputtering rate, a redeposition effect on sputtering hole profile and focused ion beam characteristics;
repeating said first scanning process according to said calculated scan control data so as to form said first hole having the target shape with a depth capable of reaching the insulating film formed between said upper and lower wiring conductors and the curved bottom of the first hole comprised only by said insulating film and having a configuration substantially corresponding to the undulation of said upper wiring conductor; and,
second scanning a portion of the bottom of said first hole with a second scanning process with said focused ion beam to form a second hole having a narrow width in comparison with said first hole in the insulating film with a depth capable of cutting the lower wiring conductor whereby said upper and lower wiring conductors are prevented from being electrically connected.

5,086,016

METHOD OF MAKING SEMICONDUCTOR DEVICE CONTACT INCLUDING TRANSITION METAL-COMPOUND DOPANT SOURCE

Stephen B. Brodsky, Millwood; Rajiv V. Joshi, Yorktown Heights; John S. Lechaton, Wappingers Falls, all of N.Y.; James G. Ryan, Essex Junction, Vt., and Dominic J. Schepis, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1990, Ser. No. 606,632

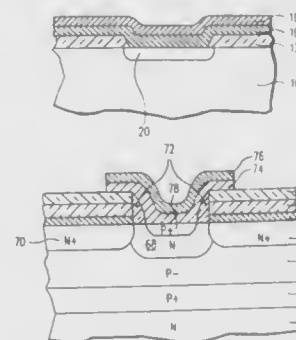
Int. Cl.⁵ H01L 21/225, 21/283

U.S. Cl. 437-190

5 Claims

1. A method of forming a self-aligned contact to a doped region on a semiconductor substrate, comprising the steps of:
providing a substrate of semiconductor material;
forming a first layer of a transition metal-boride compound over at least one selected portion of said substrate;
forming a second layer of a transition metal-nitride compound over said first layer;

heating to drive dopant from said first layer into said substrate; and



removing portions of said first and second layers to leave overlying portions of said first and second layers as a contact to the doped region.

5,086,017

SELF ALIGNED SILICIDE PROCESS FOR GATE/RUNNER WITHOUT EXTRA MASKING

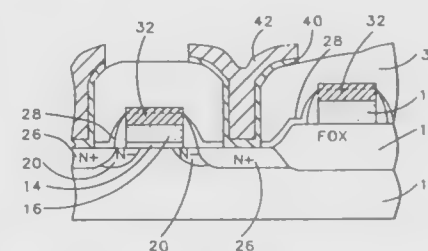
Chih-Yuan Lu, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Hsincho, Taiwan

Filed Mar. 21, 1991, Ser. No. 672,916

Int. Cl.⁵ H01L 21/28

U.S. Cl. 437-200

14 Claims



1. A method of forming a metal silicide contacts to polycrystalline silicon regions and contacts which are not metal silicides to monocrystalline silicon regions of an integrated circuit device comprising:

forming and patterning said polycrystalline silicon regions;
providing openings to said monocrystalline silicon regions;
forming a masking layer over said polycrystalline and monocrystalline silicon regions;
covering the surfaces of said masking layer and filling the irregularities of the said surfaces with an organic material to thereby planarize the surfaces;
blanket etching the said organic material until the said masking layer which covers the said polycrystalline silicon regions is exposed and allowing the said masking layer which covers the said monocrystalline silicon regions to remain covered with said organic material;
removing the exposed said masking layer from the polycrystalline regions;
removing the remaining said organic material;
forming said metal silicide contacts to said polycrystalline regions;
forming an insulating layer over the surface of the structure;
making openings in said insulating layer to said monocrystalline regions and the top of said polycrystalline silicon regions; and
forming contacts which are not metal silicides to said monocrystalline and polycrystalline regions.

5,086,018 METHOD OF MAKING A PLANARIZED THIN FILM COVERED WIRE BONDED SEMICONDUCTOR PACKAGE

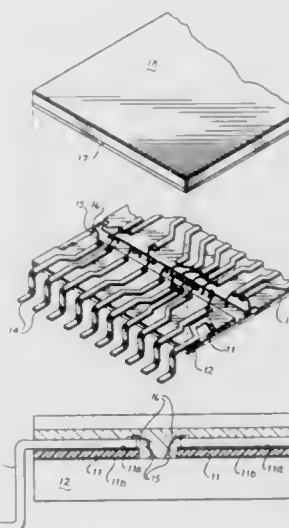
H. Ward Conru, Essex Junction; Gary H. Irish, Jericho; Francis J. Pakulski, Shelburne; William J. Slattery; Stephen G. Starr, both of Essex Junction, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1991, Ser. No. 694,719

Int. Cl.⁵ H01L 21/56, 21/58, 21/603

U.S. Cl. 437-207

11 Claims



1. A method of forming a semiconductor package comprising the steps of:

providing a semiconductor chip having first and second major surfaces with input and output bonding pads on the first major surface,
providing a lead frame having a plurality of leads adjacent said chip,
electrically connecting respective ones of the leads to respective ones of the bonding pads on the chip by conductive bonding wires therebetween,
placing an insulating film having a thermosetting plastic adhesive coating on a surface thereof over the lead frame, the first major surface of the chip and the wires, with the coated surface abutting the lead frame and the wires,
applying a force on the insulating film sufficient to force the wires against the respective pads and the respective leads to which they are bonded and sufficient to force the thermosetting plastic adhesive coating between the leads, and
heating the film to cure the thermosetting plastic adhesive coating.

5,086,019

RESERVOIR FEED METHOD OF MAKING CERAMIC COMPOSITE STRUCTURES AND STRUCTURES MADE THEREBY

Jerry G. Weinstein; Robert C. Kantner, and Marc S. Newkirk, all of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 168,358, Mar. 15, 1988, Pat. No. 4,918,034, which is a continuation-in-part of Ser. No. 908,067, Sep. 16, 1986, Pat. No. 4,900,699. This application Feb. 12, 1990, Ser. No. 478,845

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.⁵ C04B 35/02

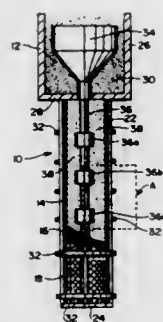
U.S. Cl. 501-94

5 Claims

1. A method for producing a self-supporting ceramic composite structure comprising a ceramic matrix obtained by an

oxidation reaction of a parent metal with an oxidant to form a polycrystalline material which comprises an oxidation reaction product of said parent metal and said oxidant and a filler infiltrated by said matrix, the method comprising:

- orienting a first source of metal comprising a parent metal and a permeable mass of filler relative to each other so that formation of an oxidation reaction product will occur in a direction towards and into said mass of filler, wherein the quantity of said first source of metal provided is insufficient to embed substantially completely with permeable mass;
- communicating a reservoir comprising a second metal with said first source of metal, said second metal having a chemical composition which is different from said first source of metal;
- heating said first source of metal to a temperature above the melting point of said first source of metal, but below the melting point of said oxidation reaction product of said first source of metal to form a source of molten parent



metal and reacting said parent metal with an oxidant to form said oxidation reaction product which contains a first metallic constituent therein;

- maintaining at least a portion of said oxidation reaction product in contact with and extending between said first source of molten parent metal and said oxidant to progressively draw molten parent metal through the oxidation reaction product towards the oxidant and into said mass of filler so that fresh oxidation reaction product continues to form within said mass of filler at an interface between said oxidant and previously formed oxidation reaction product;
- replenishing said first source of metal with said second metal in said reservoir such that (1) said second metal modifies at least a portion of said first metallic constituent, and (2) said oxidation reaction continues such that said permeable mass is substantially completely embedded; and
- recovering said self-supporting ceramic composite structure.

5,086,020

HIGH ZIRCONIA FUSED CAST REFRACTORY

Toshihiro Ishino, Yokohama; Kouzou Sakai, Kawasaki, and Nobuyuki Kido, Kobe, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 23, 1990, Ser. No. 617,178

Claims priority, application Japan, Nov. 28, 1989, 1-306455

Int. Cl.⁵ C04B 35/48

U.S. Cl. 501—105

4 Claims

1. A high zirconia fused cast refractory which comprises, as chemical components of the refractory, from 90 to 95% by weight of ZrO₂, from 3.5 to 7% by weight of SiO₂ and from 1.3 to 3% by weight of Al₂O₃ and at most 0.02% by weight contain any one of P₂O₅, B₂O₃ and CuO.

5,086,021

DIELECTRIC COMPOSITION

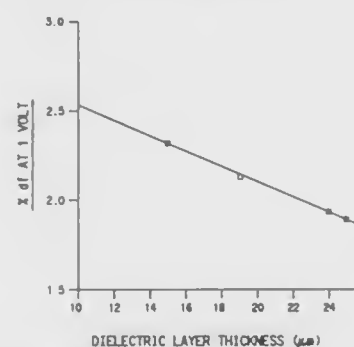
Kyoichi Sasaki, Tokyo, Japan, and Donald K. Swanson, Wilmington, Del., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 28, 1990, Ser. No. 545,249

Int. Cl.⁵ C04B 35/46

U.S. Cl. 501—137

6 Claims



1. A composition for forming a multilayer ceramic device having a thin dielectric layer with lower porosity and having a dissipation factor of 2.5% of less, an insulation resistance of 1000 ohm-Farads or more at 25° C. and 100 ohm-Farads or more at 125° C. and a temperature coefficient of capacitance of ±15% deviation or less within a temperature range of -55° C. to +125° C. and consisting essentially of an admixture of:

- 97 to 99 wt % of a major component ceramic powder particle; and
- 1 to 3 wt % of minor component additives selected from the group consisting essentially of the oxides of cerium, neodymium, samarium, lanthanum, niobium, tantalum, manganese, cobalt, nickel, magnesium or mixtures thereof, provided that, a primary cation ratio, CR, equals A/B and ranges from more than 0 to about 0.30 wherein A is a sum of atom % for a cation selected from Ce, Nd, Sm, La or mixtures thereof; and B is a sum of atom % for a cation selected from Nb, Ta, Mn, Co, Ni, Mg or mixtures thereof and, further provided, a secondary cation ratio, BR, equals B1/(B2+0.5 Mn) and ranges from 1.8 to 2.2 wherein B1 is a sum of atom % of an electron donor selected from Nb, Ta or mixtures thereof; and B2 is a sum of atom % for an electron acceptor selected from Co, Ni, Mg or mixtures thereof Mn is atom % of manganese.

5,086,022

REACTION MEDIUM IMPROVING THE CHARACTERISTICS OF ABSORPTION AND OF DESORPTION OF A GAS

Alain Roca, Perpignan; Sylvain Mauran, Rivesaltes, and Bernard Spinner, Elne, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

PCT No. PCT/FR89/00024, § 371 Date Oct. 30, 1989, § 102(e) Date Oct. 30, 1989, PCT Pub. No. WO89/07009, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 26, 1989, Ser. No. 423,440

Claims priority, application France, Jan. 29, 1988, 88 01029

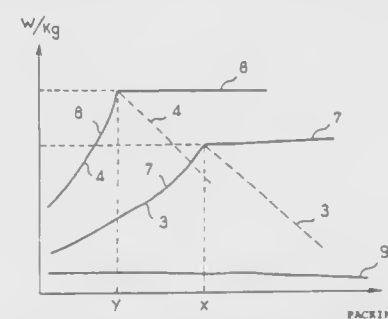
Int. Cl.⁵ B01J 20/18, 20/20, 20/04; C09K 5/00

U.S. Cl. 502—60

15 Claims

1. In an improved packed reaction medium for use in a gas-solid reaction heat pump; said reaction medium comprising an absorptive reactive salt in pulverulent form and a porous product mixed with said salt; said porous product being expanded graphite; and said porous product being present in a positive amount up to and including 60 mass percent of the reaction medium; said salt being a metal halide capable of swelling when reacted in said gas-solid reaction heat pump;

wherein the improvement comprises: an improved porous product in the reaction medium; said porous product comprising expanded graphite in combination with a second expanded product of rigid structure and high permeability which is



obtained from an exfoliated hydrated lamellar mineral; said second expanded product being present in an effective amount so that absorption or desorption of a gas by the reaction medium is substantially independent of the packing of the reaction medium.

5,086,023

CATALYST FOR EPDM POLYMERIZATION

Gregory M. Smith, Danbury, Conn., assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 13, 1991, Ser. No. 714,399

Int. Cl.⁵ C08F 4/68

U.S. Cl. 502—103

10 Claims

1. A catalyst for the preparation of an ethylene-propylene-diene polymer which comprises a Group I to Group III organometallic compound and a vanadium imido complex.

5,086,024

CATALYST SYSTEM FOR POLYMERIZATION OF OLEFINS

Clark C. Crapo, Houston, and Dennis B. Malpass, LaPorte, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Division of Ser. No. 279,377, Dec. 2, 1988, Pat. No. 4,960,878.

This application Aug. 1, 1990, Ser. No. 560,953

Int. Cl.⁵ C08F 4/642, 4/68, 4/69

U.S. Cl. 502—117

15 Claims

1. A catalyst system for the polymerization of olefins which comprises a metallocene component and a methylaluminoxane which, when hydrolyzed, evolves hydrolysis products comprising methane and C₂ or higher alkanes.

5,086,025

METHOD FOR PREPARING A SILICA GEL SUPPORTED METALLOCENE-ALUMOXANE CATALYST

Main Chang, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 174,668, Mar. 29, 1988, Pat. No. 5,008,228.

This application Aug. 14, 1990, Ser. No. 567,489

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁵ C08F 4/656, 4, 68

U.S. Cl. 502—117

10 Claims

1. A supported metallocene alumoxane catalyst for polymerization of olefins made by the process comprising the steps of: (a) adding a water-impregnated catalyst support to a stirred solution of an aluminum trialkyl in an amount sufficient to provide a mole ratio of aluminum trialkyl to water of from about 10:1 to about 1:1 and allowing the mixture to react; and (b) adding a metallocene to the reacted mixture in an amount sufficient to provide a mole ratio of aluminum to transition metal of from about 1000:1 to about 1:1.

5,086,026

REDUCTION CATALYST WITH MODIFIED RHODIUM STRUCTURE

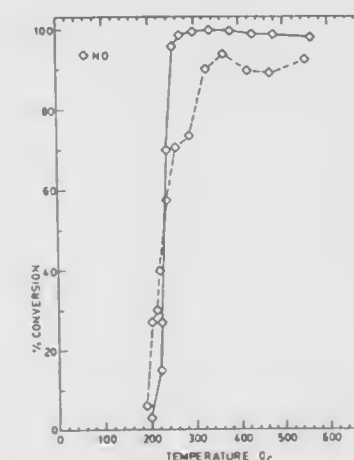
Mohinder S. Chattha, Northville, Mich., and William L. H. Watkins, Toledo, Ohio, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 8, 1990, Ser. No. 461,947

Int. Cl.⁵ B01J 31/00

U.S. Cl. 502—159

12 Claims



1. A method of enhancing the catalytic effectiveness of rhodium to reduce nitric oxides by sacrificial use of polymers, comprising:

- preparing an adhesive polymer modifier by controllably reacting amine with epoxy resin to form a soluble adduct and adding to the adduct a solvent to form a homogeneous amino polymer solution, said amine being a secondary or primary amine selected from 2-hydroxy alkyl mono or diamine, said epoxy resin being a soluble copolymer having two or more epoxide groups per molecule;
- coating an alumina support material with a rhodium compound; and
- adding the amino polymer modifier solution to the support material either prior to or subsequent to step (b) and heating such mixture of polymer solution, support material, and rhodium compound to evaporate the solvent and decompose and eliminate the polymer modifier, leaving the coated support material with rhodium in a morphologically changed condition devoid of the polymer modifier with enhanced catalytic effectiveness for promoting reduction of nitric oxides.

5,086,027

NOVEL NOBLE METAL SUPPORTED HYDROTREATING CATALYSTS

Gopal H. Singhal; William E. Winter; Kenneth L. Riley, and Kenneth L. Trachte, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 18, 1990, Ser. No. 631,303

Int. Cl.⁵ B01J 31/12

U.S. Cl. 502—166

8 Claims

1. A catalyst composition comprised of: about 0.005 to 5.0 wt. % noble metal, about 0.5 to 5 wt. % of at least one other Group VIII metal selected from the group consisting of nickel, iron, and cobalt, and about 3 to 18 wt. % of a Group VI metal, and a refractory support, wherein the noble metal is incorporated into the refractory support by use of a precursor represented by ML₂ when the noble metal is Pt or Pd, and ML₃, when the noble metal is Rh or Ir, where M is the noble metal and L is a ligand selected from the dithiocarbonates, dithiophosphates, dithiophosphinates, xanthates, thioxanthates, and further wherein L has organo groups having a sufficient num-

ber of carbon atoms to render the noble metal complex soluble in oil.

5,086,028 SELECTIVE CATALYTIC PROCESS FOR PREPARING N-HALOTHIOSULFONAMIDE MODIFIED TERPOLYMERS AND CATALYSTS THEREFOR

Donald A. White, Edison, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 403,630, Sep. 6, 1989, Pat. No. 5,017,662, which is a continuation-in-part of Ser. No. 244,743, Sep. 15, 1988, Pat. No. 4,956,420. This application Sep. 26, 1990, Ser. No. 588,677

Int. Cl.⁵ B01J 31/04

U.S. Cl. 502—170

6 Claims

1. A catalyst comprising:

(a) A first salt of an acid being represented by the formula MA_n , wherein A is an anion or mixture of anions of an acid, said acid has a pKa greater than about 4.0 at 25° C., and M is a metal selected from the group consisting of zinc, iron and mixtures thereof; and (b) an effective amount of a second salt of an acid, said second salt being represented by the formula TA_n , wherein T is a metal selected from the group consisting of nickel, chromium, a Group IIA metal of the Periodic Table of Elements and mixtures thereof; said acid having a pKa greater than about 4.0 at 25° C., and wherein A is an anion or mixture of anions which is the same or different from the anion of said first metal salt and wherein n in said first metal salt is a number corresponding to the respective oxidative state of M or T divided by the valence of said anion; and wherein the molar ratio of said second metal salt to said first metal salt ranges from about 0.2:1 to 20:1.

5,086,029 VANADIUM SPINEL MATERIALS IN THE V_2O_3 — MnO — SiO_2 SYSTEM

Arnulf Muan, Lacey Spring, Va., and Mitri S. Najjar, Wappingers Fall, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,761

Int. Cl.⁵ B01J 21/08, 23/22, 23/34

U.S. Cl. 502—241

11 Claims

1. A method of preparing a vanadium spinel material that is crystallized from a liquid with which said vanadium spinel is in equilibrium on the liquidus surface and wherein said liquid has a composition that falls within a polygon shaped shaded area ABCDE as shown in the disclosed FIGURE for a ternary composition diagram of V_2O_3 , MnO and SiO_2 comprising the steps of:

- (1) heating V_2O_5 powder having a particle size of less than about 50 microns in an atmosphere in which the partial pressure of oxygen is in the range of 10^{-5} to 10^{-10} atmospheres while gradually increasing the temperature over a temperature range of about 600° C. to 1300° C. and holding the final temperature for a period to ensure complete reduction of all vanadium to V^{3+} ;
- (2) heating MnO powder having a particle size of less than about 50 microns for a period of about 10 to 14 hrs. at a temperature in the range of about 1200° C. to 1400° C.;
- (3) heating SiO_2 powder having a particle size of less than about 50 microns for a period of about 10 to 14 hours at a temperature in the range of about 1000° C. to 1200° C.;
- (4) thoroughly grinding together an amount of V_2O_3 from (1) in the range of about 25 to about 98 wt.%, with an amount of MnO from (2) in the range of more than 0 to about 55 wt.%, and with an amount of SiO_2 from (3) in the range of about more than 0 to about 40 wt.% to produce a mixture having a grain size of less than about 50 microns;
- (5) pelletizing the mixture from (4) at a pressure of about 5,000 psi;
- (6) heating the pellets from (5) at a temperature in the range of about 1200° C. to 1600° C. for a period in the range of about 12 to 48 hrs. in an atmosphere in which the partial

pressure of oxygen is in the range of 10^{-10} to 10^{-5} atmosphere to produce a melt; and

(7) cooling the material from (6) and crystallizing out said vanadium spinel material, and separating said vanadium spinel material from the rest of the melt.

11. An oxidation catalyst comprising a vanadium spinel material that is crystallized from a liquid with which said vanadium spinel is in equilibrium on the liquidus surface, and wherein said liquid has a composition that falls within a polygon shaped shaded area ABCDE as shown in the disclosed FIGURE for a ternary composition diagram of V_2O_3 , MnO and SiO_2 , and wherein the amounts of V_2O_3 , MnO and SiO_2 are characterized as shown in the table below:

Vertices	Coordinates (wt %)		
	V_2O_3	MnO	SiO_2
A	44	55	1
B	25	55	20
C	25	35	40
D	59	1	40
E	98	1	1

5,086,030 GAMMA-BUTYROLACTONE PRODUCTION CATALYST

Geir Bjornson, and Joel J. Stark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 389,350, Aug. 3, 1989, Pat. No. 4,968,818.

This application Aug. 14, 1990, Ser. No. 566,987

Int. Cl.⁵ B01J 21/08, 23/36, 23/84

U.S. Cl. 502—241

12 Claims

1. A catalyst comprised of transition metals, their oxides and mixtures thereof selected from the group consisting of nickel, cobalt, nickel oxide, cobalt oxide, cobalt rhenium oxide and nickel rhenium oxide supported on silica gel having a surface area in the range of from about 50 m^2/g to about 500 m^2/g and a pore volume in the range of from about 0.25 cc/g to about 2.5 cc/g, said transition metals, their oxides or mixtures thereof being present on said silica gel in an amount in the range of from about 0.1% to about 10% by weight of said catalyst and said nickel not exceeding about 4.8% by weight of said catalyst.

3. A method of preparing a catalyst comprised of transition metals, their oxides and mixtures thereof selected from the group consisting of nickel, cobalt, nickel oxide, cobalt oxide, cobalt rhenium oxide and nickel rhenium oxide supported on silica gel, said silica gel having a surface area in the range of from about 50 m^2/g to about 500 m^2/g and a pore volume in the range of from about 0.25 cc/g to about 2.5 cc/g comprising the steps of:

- (a) calcining said silica gel at a temperature and for a time period sufficient to remove hydroxyl groups therefrom;
- (b) impregnating said calcined silica gel with an alcohol solution of transition metal salts which are thermally decomposable to said transition metals, their oxides and mixtures thereof, said transition metal salts being impregnated in said silica gel in an amount such that upon decomposition, the resulting metals and oxides formed are present on said catalyst in an amount less than about 10% by weight of said catalyst;
- (c) evaporating said alcohol from the resulting impregnated silica gel in air;
- (d) after step (c), heating said impregnated silica gel in an inert gas atmosphere at a temperature and for a time period sufficient to decompose said transition metal salts to said transition metals, their oxides or mixtures thereof; and
- (e) after step (d), heating said impregnated silica gel in a hydrogen atmosphere at a temperature in the range of from about 75° C. to about 300° C. for a time period in the range of from about 12 hours to about 24 hours to thereby activate said catalyst.

5,086,031 PRESSED PARTS BASED ON PYROGENICALLY PRODUCED SILICON DIOXIDE, METHOD OF THEIR PRODUCTION AND THEIR USE

Klaus Deller, Hainburg; Martin Förster, Bidingen, and Helmfried Krause, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 10, 1990, Ser. No. 507,040

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912504

Int. Cl.⁵ B01J 21/14, 21/00

U.S. Cl. 502—251

3 Claims

3. A method for producing pressed parts based on pyrogenically produced silicon dioxide said pressed parts having the following physico-chemical characteristics:

Outer diameter	2 to 15 mm
BET surface	50 to 400 m^2/g
Pore volume	0.6 to 1.3 ml/g
Breaking strength	50–150 N
Pore distribution	no pores <5 nm diameter only meso and macropores >99% by weight SiO_2
Composition	
Abrasion	<1.0%
Bulk weight:	400–500 g/l

said method comprising homogenizing pyrogenically produced silicon dioxide with (1) at least one member of the group consisting of urea, methyl cellulose and magnesium stearate, (2) graphite and (3) aluminum stearate with the addition of water, drying the homogenizate at a temperature of 80° to 120° C, comminuting the dried homogenizate to a powder, pressing the powder to pressed parts and tempering the pressed parts for a period of 0.5 to 8 hours at a temperature of 400° to 1200° C.

5,086,032 CATALYST FOR OXIDATIVE DEHYDROGENATION OF PROPANE

Carlo Mazzocchi, Ezio Tempesti, and Chafic Aboumrad, all of Milan, Italy, assignors to Norsolor, France

Continuation of Ser. No. 465,785, Jan. 18, 1990, abandoned. This application Feb. 5, 1991, Ser. No. 652,210

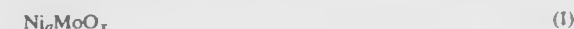
Claims priority, application France, Jan. 18, 1989, 89 00552

Int. Cl.⁵ B01J 23/84

U.S. Cl. 502—315

7 Claims

1. A catalyst for the oxidative dehydrogenation of propane, of the following formula:



in which:

a is a number from 0.6 to 1.3, and

x is a number determined by the valency requirements of nickel and of molybdenum, wherein the catalyst further comprises an inert solid diluent in a mixture.

5,086,033 USE OF HELIUM AND ARGON DILUENT GASES IN MODIFICATION OF CARBON MOLECULAR SIEVES

John N. Armor, Orefield; Thomas A. Braymer, Allentown; Thomas S. Farris, Bethlehem, and Thomas R. Gaffney, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 575,474, Aug. 30, 1990. This application Jan. 3, 1991, Ser. No. 638,477

Int. Cl.⁵ C01B 31/00, 31/10; B01J 20/20

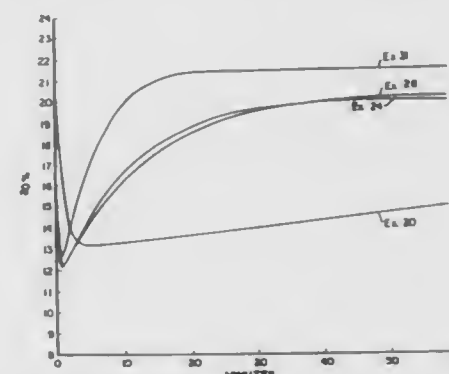
U.S. Cl. 502—432

10 Claims

1. A process for modifying a carbon molecular sieve in order to alter its gas separation characteristics which comprises contacting said sieve under pyrolysis conditions with a volatile carbon-containing organic compound in a gaseous state ad-

mixed with diluent gas comprising helium for a time sufficient to affect said characteristics.

9. A process for modifying a carbon molecular sieve by oxidative treatment with carbon dioxide which comprises



contacting said sieve at elevated temperature with carbon dioxide admixed with a diluent gas comprising helium or argon for a time sufficient to widen and open pores in said sieve available to contacting gases.

5,086,034 CALCINATION AND SOLID STATE REACTION OF CERAMIC-FORMING COMPONENTS TO PROVIDE SINGLE-PHASE SUPERCONDUCTING MATERIALS HAVING FINE PARTICLE SIZE

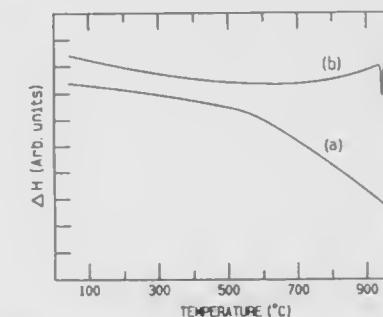
Uthamalingam Balachandran, Hinsdale; Roger B. Poeppel, Glen Ellyn; James E. Emerson, Plainfield, and Stanley A. Johnson, Countryside, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1990, Ser. No. 589,562

Int. Cl.⁵ H01L 39/12; C01F 17/00

U.S. Cl. 505—1

8 Claims



1. An improved method of preparing copper oxide superconducting materials having one of the following formulas, $YBa_2Cu_3O_x$, $YBa_2Cu_4O_8$, $Bi_2Sr_2CaCu_2O_x$ and $Bi_{1-x}Pb_xSr_{2-x}Ca_2Cu_3O_x$, wherein said material is prepared by the calcination and reaction of a precursor powder mixture containing at least one alkali earth carbonate comprising:

preparing a stoichiometric precursor mixture containing at least one alkali earth carbonate,

calcining and reacting the mixture by the following steps:

- (a) heating the mixture in a furnace to a first temperature, said first temperature being a temperature at about which CO_2 will begin to evolve from the precursor mixture,
- (b) simultaneously with step (a) establishing a partial vacuum in the furnace of from about 213 to 2×10^4 Pa,
- (c) simultaneously with steps (a) and (b) providing flowing oxygen at a pressure from about 266 to 1330 Pa to the furnace,
- (d) heating the mixture to at least 750° C. at which temperature CO_2 evolution and reaction of the mixture will go to completion,

- (e) simultaneously with step (d), controlling the rate of evolution of CO₂ from the mixture as the mixture is heated so that the partial pressure of CO₂ in the furnace is no greater than about 2.66 Pa,
- (f) maintaining the mixture at 750° C. for a period of time sufficient for CO₂ evolution to cease and for the reaction of the mixture to go to completion forming a ceramic material,
- (g) cooling the ceramic material to a third temperature, the third temperature being a temperature below which the ceramic will not decompose, and
- (h) increasing the pressure of the oxygen in the furnace to about ambient and soaking the ceramic in the oxygen for a period of time sufficient for the superconducting material to form, thereby forming the copper oxide superconducting material.

5,086,035

ELECTRICALLY CONDUCTIVE ARTICLE (1)

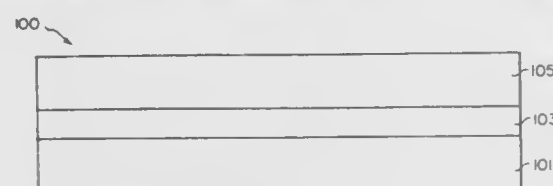
Liang-Sun Hung, Webster, and Dilip K. Chatterjee, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,527

Int. Cl.⁵ B32B 9/00

U.S. Cl. 505—1

13 Claims



1. An article comprised of a support, a barrier and an electrically conductive crystalline 2-2-1-2 or 2-2-2-3 heavy pnictide mixed alkaline earth copper oxide coating, wherein said coating has a thickness of less than 10 μm, characterized in that the support is comprised of an austenitic alloy of chromium and one or more group VIII period 4 metals and the barrier is comprised of a high density hafnia layer, having a density at least 90 percent of the theoretical density of hafnia and a thickness in the range of from 1 to 3 μm.

5,086,036

Patent Not Issued For This Number

5,086,037

CERAMIC SUPERCONDUCTING MEMBER

Hajime Hitotsuyanagi; Kazuo Sawada; Satoshi Takano, and Shinji Inazawa, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 12, 1988, Ser. No. 180,495

Claims priority, application Japan, Apr. 14, 1987, 62-91722

Int. Cl.⁵ B32B 9/00

U.S. Cl. 505—1

2 Claims



1. A ceramic superconducting member, comprising: a base material having a main surface and comprising a ceramic superconductive material; and a continuous protective layer formed at least over said main surface of said base material and encapsulating said ce-

ramic superconducting material; said protective layer comprising a ceramic material having a coefficient of thermal expansion about the same as said ceramic superconducting material and resistant to moisture, wherein said ceramic superconductive material is of a composition generally expressed by the formula AaBbCc, where a, b, and c represent numbers showing the composition ratio of A, B and C, respectively, where the composition ratio of a:b:c=3:3:7-x (0<x<7), where A contains yttrium and barium B contains copper and C contains oxygen, and wherein said ceramic material of said continuous protective layer is selected from nitrides, oxides, and oxynitrides of at least one element selected from groups IIa, IIIa, IIIb, IVa and IVb of the periodic table.

5,086,038

AROMATIC ALDEHYDES, THEIR DERIVATIVES AND THEIR UTILIZATION AS PERFUMING INGREDIENTS

Ferdinand Naef; François Delay, both of Carouge, Switzerland, and Arnoldus Uijtewaai, St-Genis/Pouilly, France, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 503,339, Apr. 2, 1990. This application Mar. 18, 1991, Ser. No. 670,653

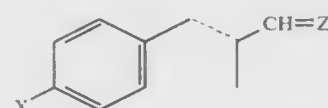
Claims priority, application Switzerland, Apr. 12, 1989, 1379/89

Int. Cl.⁵ A61K 7/46

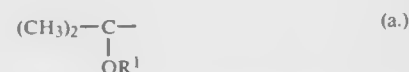
13 Claims

U.S. Cl. 512—21

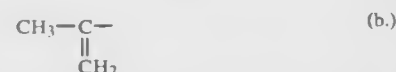
1. A method for preparing perfume compositions and perfumed articles which comprises adding thereto an odor-effective concentration of an aromatic aldehyde or derivative thereof having the general formula



possessing a single or a double bond in the position indicated by the dotted line, wherein X represents a monovalent radical of formula



or, when the dotted line represents a single bond, of formula



and wherein Z stands for an oxygen atom or for two R²O radicals, R¹ and R² representing an alkyl radical having from 1 to 3 carbon atoms.

5,086,039

PHARMACEUTICAL COMPOSITIONS AND USE THEREOF IN TREATING INFLAMMATION

Geoffrey L. Hammond, Lambeth, Canada, assignor to Allelix Biopharmaceuticals, Inc., Mississauga, Canada

Division of Ser. No. 204,356, Jun. 9, 1988, Pat. No. 4,997,814.

This application Mar. 4, 1991, Ser. No. 664,114

The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.

Int. Cl.⁵ A61K 37/04

U.S. Cl. 514—8

24 Claims

1. A pharmaceutical composition useful in treating a mammal suffering from inflammation, said composition comprising human CBG, an anti-inflammatory agent which binds there-

with, and a pharmaceutically acceptable carrier, wherein the said anti-inflammatory agent has an affinity constant for CBG within the range from 0.1 to 10 nanomolar at about 4° C. and physiological pH.

5,086,040

NOVEL DERMATOLOGICAL COMPOSITION AND METHOD

Armelle Bonfils, Conflans Sainte Honorine; Pierre Smets, Villennes sur Seine, and René Zalisz, Menucourt, all of France, assignors to Roussel Uclaf, Romainville, France

Filed Oct. 16, 1990, Ser. No. 598,553

Claims priority, application France, Oct. 17, 1989, 89-13543

Int. Cl.⁵ A61K 7/06

U.S. Cl. 514—8

2 Claims

1. A method for stimulating hair growth of a warm-blooded animal in need thereof comprising applying to the hair of a warm-blooded animal a composition containing 0.01 to 0.05% by weight of an effective hair growth stimulating amount of a glycoprotein extract of gram negative bacteria selected from the group consisting of Klebsiella pneumoniae, Hafnia, Enterobacter cloacae, Escherichia coli, Klebsiella Ozoenae, Pseudomonas aeruginosa and Proteus.

5,086,041

METHODS OF USING PROLONGED RELEASE SOMATOTROPIN COMPOSITIONS

James W. Mitchell, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 414,503, Sep. 29, 1989, Pat. No. 5,013,713, which is a continuation of Ser. No. 787,873, Oct. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 657,713, Oct. 4, 1984, abandoned. This application Aug. 16, 1990, Ser. No. 567,996

Claims priority, application Spain, Oct. 2, 1985, 547,489

Int. Cl.⁵ A61K 37/02, 37/36

U.S. Cl. 514—12

25 Claims

1. A method for achieving prolonged release of a biologically active somatotropin into the circulatory system of an animal which comprises parenteral administration to the animal by subcutaneous or intramuscular injection of a substantially non-aqueous composition comprising at least about 10% by weight of a biologically active somatotropin, an antihydration agent in an amount effective to retard hydration of the composition and, as a continuous phase of the composition, a biocompatible oil.

5,086,042

PEPTIDES WITH SULFATE ESTER GROUPS

James D. Rosamond, Rochester, N.Y., assignor to Fisons Corporation, Bedford, Mass.

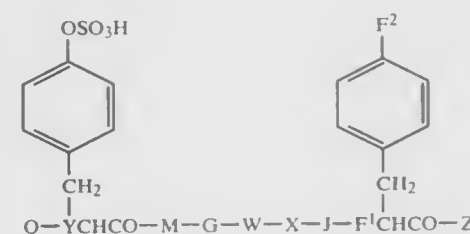
Continuation-in-part of Ser. No. 54,554, May 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 932,119, Nov. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 810,948, Dec. 19, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 303,425

Int. Cl.⁵ A61K 37/02; C07K 7/06

U.S. Cl. 514—16

74 Claims

1. A peptide of the formula



wherein

Q is H, H-Asp, H-βAsp, H-DAsp, H-MeAsp, For, Ac, Suc, desQ, or R¹R²CHOCO;

Y is H, (S)-NH or (R)-R³N, or (S)-R³N;

M is Met, DMet, MeMet, MetO, Ahx, DAhx, MeAhx, Leu, MeLeu, Pro, Ile, Melle, or Lys;

G is Gly, Pro or Sar,

W is Trp, MeTrp or Nal,

X is Met, MeMet, MetO, Ahx, MeAhx, Leu, MeLeu, Ile, Melle, Pro, or Lys,

J is Asp, DAsp, MeAsp, or Asn,

F¹ is (S)-NH, (S)-R⁴N, or (R)-R⁴N,

F² is H, Cl, I, Br, F, NO, NH₂, R⁵, or OR⁶,

Z is NH₂, NHR⁷ or NR⁷R⁸,

R¹ and R² are independently H or lower alkyl,

R³, R⁴, and R⁵ are lower alkyl,

R⁶ is H or lower alkyl, and

R⁷ and R⁸ are lower alkyl,

and pharmaceutically acceptable salts thereof, provided that

(1) Q is desQ when Y is H,

(2) F² is not H if, in the same peptide, Q is H-Asp or Ac, Y is (S)-NH, M is either Met, MetO, Ahx or Leu, X is either Met, MetO, Ahx or Leu, G is Gly, DAhx or Pro, W is Trp, J is Asp, F is (S)-NH, and Z is NH₂,

(3) F² is not H if, in the same peptide, Q is H, H-βAsp or For, Y is (S)-NH, M is Met, Ahx or Leu, G is Gly, W is Trp, X is Met, Ahx or Leu, J is Asp, F¹ is (S)-NH, and Z is NH₂,

(4) F² is not H if, in the same peptide, Y is H, M is Met, X is Met, G is Gly, W is Trp, J is Asp, F¹ is (S)-NH, and Z is NH₂, and

(5) F² is not H if, in the same peptide, Q is Suc, Y is (S)-NH, M is Met, X is Met, G is Gly or DAhx, W is Trp, J is Asp, F¹ is (S)-NH or (S)-R⁴N, and Z is NH₂.

5,086,043

PRODUCTION OF SAPONINS OF LITCHI

Yaguang Liu, 67-08 168th St., Flushing, N.Y. 11365

Division of Ser. No. 394,558, Aug. 16, 1989, Pat. No. 4,985,248, which is a continuation of Ser. No. 63,978, Jun. 18, 1987, abandoned. This application Oct. 31, 1990, Ser. No. 606,195

Int. Cl.⁵ A61K 31/70, 35/78

U.S. Cl. 514—25

2 Claims

1. A process for producing saponins of Litchi comprising:

a, extracting dried and powdered seeds or fruits of *Litchi chinensis* Sonn with 95% ethanol;

b, separating the extracts from the powdered residue to yield a filtrate;

c, distilling the filtrate under vacuum to yield a residue;

d, dissolving the residue of step c in water;

e, removing contained lipids from the aqueous solution of step d by extracting with ether;

f, separating the ether extract from the raffinate;

g, adding an equal volume of water-saturated butanol to the raffinate,

h, distilling under vacuum the solution of step g to yield a powder product;

i, dissolving the powder product in ethanol; and

j, precipitating saponins of Litchi from the ethanol solution by adding acetone and recovering the same.

5,086,044

TREATMENT OF HUMAN VIRAL INFECTIONS

Janet L. Rideout, Raleigh; David W. Barry, Chapel Hill; Sandra N. Lehrman, Durham; Martha H. St. Clair, Durham, and Phillip A. Furman, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 140,967, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 877,796, Jun. 23, 1986, abandoned.

This application Apr. 18, 1990, Ser. No. 510,590

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.⁵ A61K 31/70

U.S. Cl. 514—51

3 Claims

1. A method of treating a human being diagnosed as having Kaposi's sarcoma comprising administering to said human being a non-toxic, effective amount of 3'-azido-3'-deoxythymidine or its 5'-mono-, 5'-di-, or 5'-triphosphate, or a pharmaceutically acceptable salt thereof.

5,086,045

ANTITUMOR ANTIBIOTIC

Jerzy Golik, Southington, Conn.; John Beutler, Braddock Heights, Md.; Pat Clark, Frederick, Md.; John Ross, Myersville, Md.; John Roach; Gary Muschik, both of Frederick, Md., and William B. Leber, III, Woodboro, Md., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Division of Ser. No. 323,648, Mar. 15, 1989, Pat. No. 5,028,536.

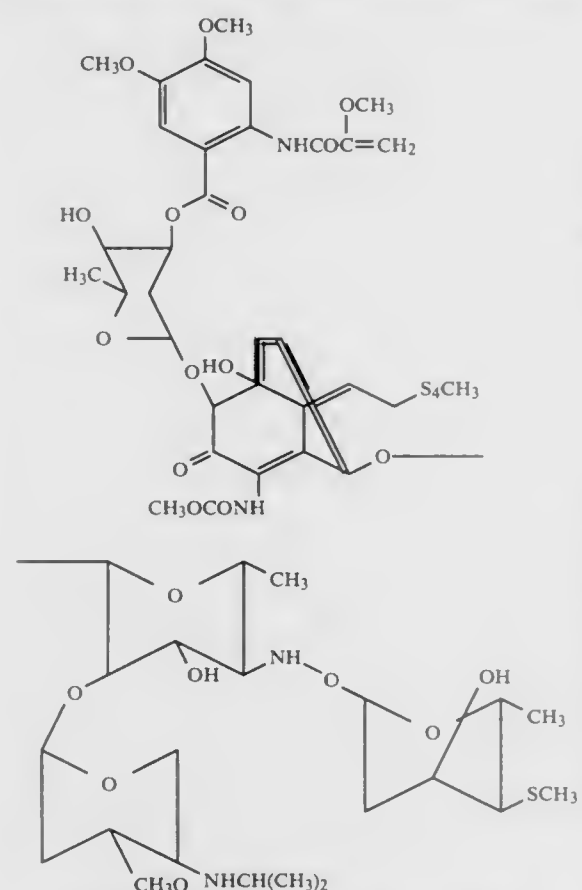
This application Aug. 24, 1990, Ser. No. 572,062

Int. Cl.⁵ A61K 31/715, 31/70; C07G 11/00, 3/00

U.S. Cl. 514—61

3 Claims

1. The antitumor antibiotic BMY-41339 having the formula



3. A method for therapeutically treating an animal host affected by a bacterial infection, which comprises administering to said host an effective antibacterial dose of BMY-41339.

5,086,046

Patent Not Issued For This Number

5,086,047

NOVEL STEROIDS

Jean-Francois Gourvest, Joinville le Pont, and Dominique Le-suisse, Paris, both of France, assignors to Roussel Uclaf, Department des Brevets, Romainville, France

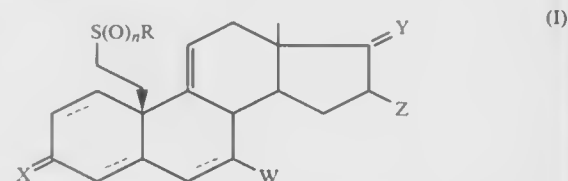
Filed Dec. 24, 1990, Ser. No. 633,291

Claims priority, application France, Dec. 22, 1989, 89 17047 Int. Cl.⁵ A61K 31/56; C07J 17/00, 1/00, 9/00, 7/00, 31/00, 4/00, 11/00

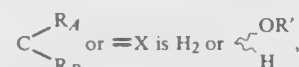
U.S. Cl. 514—177

12 Claims

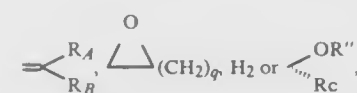
1. A compound selected from the group consisting of a compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl, alkylthio and haloalkyl of 1 to 6 carbon atoms, alkenyl and alkynyl of 2 to 6 carbon atoms, arylthio of 6 to 10 carbon atoms, optionally substituted with at least one amino or nitro, hydrocarbyl aryl of 6 to 12 carbon atoms, acyl of an organic carboxylic acid of 1 to 12 carbon atoms, —CN, cycloalkyl of 3 to 6 carbon atoms and —(CH₂)_m—Re, m is an integer from 1 to 3, Re is —OH or —SH or —SAlk, Alk is alkyl of 1 to 6 carbon atoms, X is selected from the group consisting of O, N—OR₁,

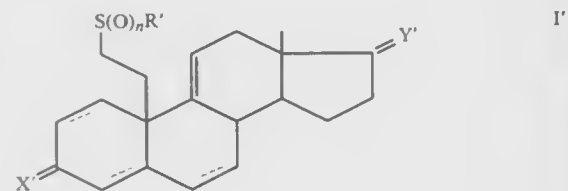


R₄ and R₅ are individually selected from the group consisting of hydrogen, halogen and alkyl of 1 to 6 carbon atoms, R₁ is hydrogen or alkyl of 1 to 6 carbon atoms, R' is hydrogen or acyl of an aliphatic carboxylic acid of 1 to 12 carbon atoms, the wavy lines indicate α- or β-position, Y is selected from the group consisting of O, NOR₁, or —Y is



q is an integer from 1 to 3, R_c is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and alkenyl and alkynyl of 2 to 6 carbon atoms, R'' is hydrogen or acyl of an aliphatic carboxylic acid of 1 to 12 carbon atoms, W is selected from the group consisting of hydrogen, optionally substituted alkyl and alkylthio of 1 to 6 carbon atoms arylthio of 6 to 10 carbon atoms optionally substituted with at least one amino or nitro, Z is hydrogen or alkyl of 1 to 10 carbon atoms, n is an integer from 0 to 2, the dotted lines in 1(2)-, 4(5)- and 6(7)-position indicate an optional double bond between the carbon atoms and their non-toxic, pharmaceutically acceptable salts.

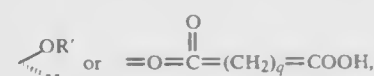
10. A method of claim 1 wherein the active compound has the formula



wherein R' is selected from the group consisting of alkyl, alkylthio and haloalkyl of 1 to 4 carbon atoms, alkenyl and alkynyl of 2 to 4 carbon atoms, —CN and acyl of an aliphatic carboxylic acid of 1 to 4 carbon atoms, X' is selected from the group consisting of O, CH₂, NOR₁ or —X' is



R₁ is hydrogen or alkyl of 1 to 4 carbon atoms, Y' is O or —Y' is



R' is hydrogen or acyl of an alkanic acid of 1 to 12 carbon atoms and n, q and the dotted lines have the definition of claim 1.

5,086,048

MIXTURE OF FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Helmut Kaspers, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinplug, Leverkusen, and Wolfgang Krämer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 398,113, Aug. 24, 1989, Pat. No. 4,990,528, which is a division of Ser. No. 22,454, Mar. 6, 1987, Pat. No. 4,888,349, which is a continuation of Ser. No. 649,463, Sep. 11, 1984, abandoned, which is a division of Ser. No. 468,729, Feb. 22, 1983, Pat. No. 4,514,402. This application Oct. 30, 1990, Ser. No. 606,011

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208142

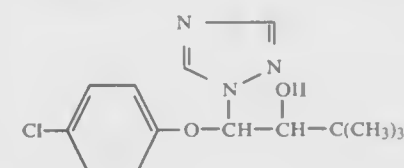
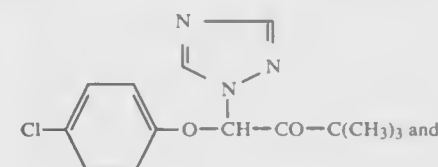
Int. Cl.⁵ A01N 43/64, 55/02

U.S. Cl. 514—187

2 Claims

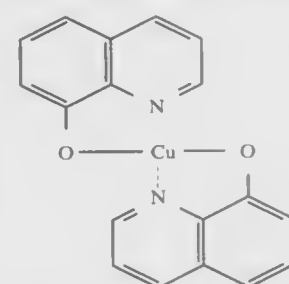
1. A fungicidal composition comprising a synergistic fungicidally effective amount of a mixture of

(A) a 1,2,4-triazole derivative of a phenoxyether-ketone or phenoxyether-alkanol selected from the group consisting of



and

(B) a copper complex salt of the formula



(VII)

wherein the synergistic weight ratio of (A) to (B) is from about 1:1 to 1:50.

5,086,049

7[4-(5 METHYL-2-OXO-1,3-DIOXALEN-4-YL)METHYL-1-PIPERZINYL]-4-OXO-4H-[1,3]THIAZETO[3,2-A]QUINOLINE-3-CARBOXYLIC ACIDS

Masahiro Kise; Masahiko Kitano, both of Kyoto; Masakuni Ozaki, Joyo; Kenji Kazuno, Rittcho; Masahito Matsuda, Otsu; Ichiro Shirahase, and Jun Segawa, both of Kyoto, all of Japan, assignors to Nipponshinyaku Co., Ltd., Japan

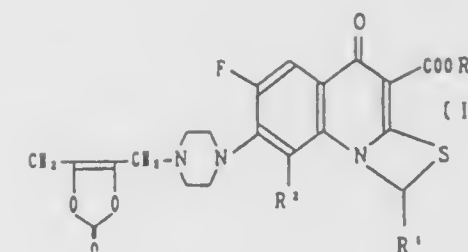
Continuation of Ser. No. 267,940, Nov. 7, 1988, abandoned. This application Apr. 8, 1991, Ser. No. 682,434

Claims priority, application Japan, Nov. 7, 1987, 62-281550 Int. Cl.⁵ A61K 31/47; C07D 513/04

U.S. Cl. 514—210

24 Claims

1. A compound of the formula (I)



or a pharmaceutically acceptable salt thereof wherein R¹ is hydrogen, straight or branch chain lower alkyl or phenyl unsubstituted or substituted by one or two halo moieties; R² is hydrogen or straight or branch chain lower alkyl; and R³ is hydrogen, halo or straight or branch chain lower alkoxy.

5,086,050

METHOD OF TREATING INFLAMMATORY DISORDERS AND PSORIASIS WITH SALTS OF AZELASTINE

Helmut Hettche, Dietzenbach; Reinhard Muckenschnabel, Frankfurt; Gerhard Scheffler, Bruchköbel; Ilona Fleischbauer, Offenbach, and Wolfgang Morick, Frankfurt, all of Fed. Rep. of Germany, assignors to Asta Pharma AG, Fed. Rep. of Germany

Division of Ser. No. 519,172, May 4, 1990. This application Feb. 8, 1991, Ser. No. 652,986

Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914859

Int. Cl.⁵ A61K 31/55

U.S. Cl. 514—212

8 Claims

1. A method of treating inflammatory and psoriasis disorders, said method comprising administering to a host suffering from an inflammatory or psoriasis disorder an effective dose of a salt selected from the group consisting of azelastine acetate, azelastine gluconate, azelastine lactate and azelastine malate.

5,086,051

1H, 3H-PYRROLO[1,2-C]THIAZOLE-7-CARBOXAMIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Claude James; Daniel Lave, and Francoise Soler, all of Paris, France, assignors to Rhone-Poulenc Sante, Antony Cedex, France

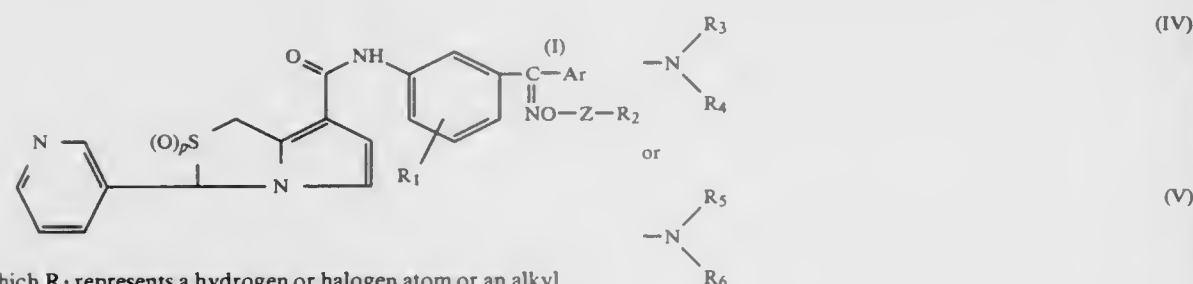
Filed Mar. 14, 1990, Ser. No. 493,439

Claims priority, application France, Mar. 17, 1989, 8903510 Int. Cl.⁵ C07D 513/04, 417/04; A61K 31/425

U.S. Cl. 514—228.2

2 Claims

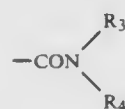
1. A new 1H,3H-pyrrolo[1,2-c]thiazole-7-carboxamide derivative, which is of the general formula:



in which R_1 represents a hydrogen or halogen atom or an alkyl, alkyloxy, trifluoromethyl, amino, alkylamino, dialkylamino, hydroxy, cyano, phenyl or phenoxy radical, Ar represents a phenyl, naphthyl, pyridyl, quinolyl, isoquinolyl, thienyl, thieno[2,3-b]thien-2-yl or thieno[3,2-b]thien-2-yl, it being possible for these radicals optionally to bear one or more substituents selected from halogen atoms or alkyl, alkyloxy, trifluoromethyl, amino, alkylamino, dialkylamino, hydroxy or cyano radicals, p represents an integer equal to zero, one or two, and A—either Z represents a valency bond and R_2 represents a hydrogen atom,

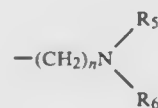
B—or Z represents a valency bond and R_2 represents a 2- or 4-pyridyl, 3-quinolidinyl, 3-pyrrolidinyl or 3- or 4-piperidyl radical, it being possible for the latter two radicals to be optionally substituted on the nitrogen atom with an alkyl, hydroxyalkyl, phenyl or phenylalkyl radical,

C—or Z represents an alkylene radical containing 1 to 4 carbon atoms and R_2 represents a 2-, 3- or 4-pyridyl, 3-quinolidinyl, 2- or 3-pyrrolidinyl or 2-, 3- or 4-piperidyl radical, it being possible for the latter two radicals to be substituted on the nitrogen atom with an alkyl, hydroxyalkyl, phenyl or phenylalkyl radical, or alternatively R_2 represents a radical of general formula:



in which:

- a) either R_3 and R_4 , together with the nitrogen atom to which they are attached, form a piperazine ring optionally substituted on the second nitrogen atom with an alkyl, hydroxyalkyl, pyridyl, phenyl or phenylalkyl radical, b) or R_3 represents a hydrogen atom or an alkyl, phenyl or phenylalkyl radical or a radical of general formula:



in which n represents an integer between 1 and 4 and R_5 and R_6 , which may be identical or different, represent a hydrogen atom or an alkyl, phenyl or phenylalkyl radical, or alternatively R_3 and R_2 , together with the nitrogen atom to which they are attached, form a morpholine, thiomorpholine, pyrrolidine, piperidine or piperazine ring in which the second nitrogen atom can be optionally substituted with an alkyl, hydroxyalkyl, pyridyl, phenyl, phenylalkyl or phenylcarbonyl radical, and R_4 represents a radical of general formula (III) defined as above, on the understanding that the definitions of n, R_5 and R_6 in the symbols R_3 and R_4 can be identical or different,

D—or Z represents an alkylene radical containing 1 to 4 carbon atoms and R_2 represents a radical of general formula:

in which R_3 , R_4 , R_5 and R_6 are defined as above in C b), on the understanding that the alkyl radicals and alkyl portions contain 1 to 4 carbon atoms in a straight or branched chain and that the invention relates to the racemic products, the enantiomers due to the presence of an asymmetric carbon at the 3-position of the pyrrolothiazole ring, the mixtures of these enantiomers, the diastereoisomers, pure or mixed, due to the possible presence of another chiral centre, and the E and Z (also known as syn and anti) isomers and mixtures thereof originating from the presence of the oxime group $C=NO-Z-R_2$, as well as to the pharmaceutically acceptable salts of the products of formula (I) thus defined.

5,086,052

SUBSTITUTED

1,4,5,6-TETRAHYDRO-2H-PYRIDAZIN-3-ONE
AND-3-THIONE COMPOUNDS HAVING
LIPOXYGENASE INHIBITORY ACTIVITY

Dee W. Brooks, Libertyville; George W. Carter, Mundelein; Anwer Basha, Lake Forest; Bruce P. Gunn, Island Lake, all of Ill., and Richard D. Dyer, Ann Arbor, Mich., assignors to Abbott Laboratories, Abbott Park, Ill.

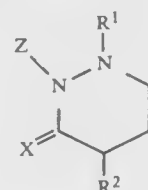
(II) Division of Ser. No. 210,806, Jun. 28, 1988, Pat. No. 4,970,210, which is a continuation-in-part of Ser. No. 75,015, Jul. 17, 1987, abandoned. This application Jun. 28, 1990, Ser. No. 546,337

Int. Cl.⁵ A61K 31/535, 31/50; C07D 237/02, 265/30

U.S. Cl. 514—231.5

5 Claims

1. A compound of the formula

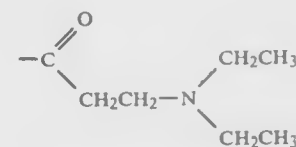


wherein X is oxygen or sulfur;

R^1 is selected from the group consisting of

benzofuranyl,
2-benzoxazolyl;
dibenzofuranyl,
dibenzopyrrolyl, optionally substituted with alkyl of from one to four carbon atoms,
fluorenyl,
indanyl,
N-morpholinyl,
tetrahydronaphthyl,
2-, 3- or 4-pyridyl, optionally substituted by alkyl of from one to four carbon atoms and nitro,
pyrimidyl;
quinolyl;
thianaphthyl,
phenyl; and
phenyl substituted by
alkyl of from one to twelve carbon atoms,
alkoxy of from one to twelve carbon atoms,

alkoxycarbonyl of from two to six carbon atoms,
benzyl,
cyano,
halogen,
hydroxymethyl,
methylsulfonyl,
methylthio,
phenoxy,
trifluoromethyl, and



R^2 is selected from the group consisting of
hydrogen,

alkyl of from one to twelve carbon atoms, optionally substituted with
hydroxy,
alkoxy of from one to four carbon atoms,
benzoyl,
alkylthio of from one to four carbon atoms,
phenylthio,
alkanoyl of from two to four carbon atoms, or
dialkylamino,
alkylenyl of from two to four carbon atoms,
alkanoyl of from one to four carbon atoms,
benzoyl,
alkoxy of from one to twelve carbon atoms,
cyano,
phenyl,
benzyl, and
thienyl; and

Z is selected from the group consisting of
hydrogen,
a pharmaceutically acceptable cation, and
a metabolically cleavable group selected from
acetyl,
methoxycarbonyl,
benzoyl,
—COR,
—COOR,
—CH₂COOR,
—C(O)NRR,
—CH₂C(O)NRR,
—CH₂OR, and
—CH₂SR,
where R is selected at each occurrence from alkyl of from one to twelve carbon atoms, phenyl, and phenyl substituted with halogen, alkyl of from one to twelve carbon atoms, or alkoxy of from one to twelve carbon atoms.

5,086,053

DERIVATIVES OF 1,3,4-THIAZIAZOLE, A METHOD OF
OBTAINING THEM AND PHARMACEUTICAL
COMPOSITIONS CONTAINING THEM

Roger Brodin; Dominique Olliero, both of Montpellier, and Paul Worms, St. Gely Du Fesc, all of France, assignors to Sanofi, Paris, France

Filed Aug. 16, 1989, Ser. No. 394,321

Claims priority, application France, Aug. 25, 1988, 88 11226
Int. Cl.⁵ C07D 285/135, 417/12; A61K 31/41

U.S. Cl. 514—236.2

14 Claims

1. A thiaziazole derivative having the formula

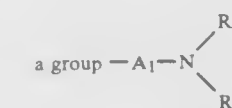


in which:

R_1 represents a phenyl group, non-substituted or substituted 1 to 3 times by any one of a halogen atom, a C_1 - C_4 alkyl group, a C_1 - C_4 alkoxy group, a hydroxy group or a trifluoromethyl group; or a phenyl group substituted simultaneously by 1 to 3 halogen atoms and by 1 or 2 methyl groups;

R_2 represents hydrogen or a C_1 - C_4 alkyl group,

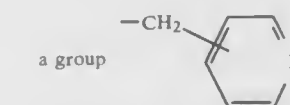
R_3 represents:



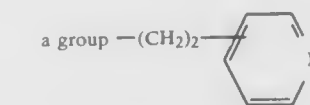
in which

A_1 denotes a straight chain C_3 - C_4 alkyl group,

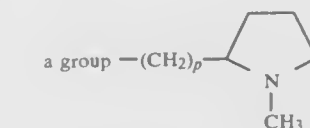
R_4 and R_5 considered independently represent hydrogen or a C_1 - C_4 alkyl group, or R_4 or R_5 considered with the nitrogen atom bonded thereto constitute a 5- or 6-membered heterocyclic ring system containing one or two heteroatoms; or



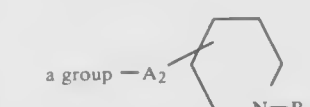
where the methylene group substitutes the pyridine ring in portions 3 or 4;



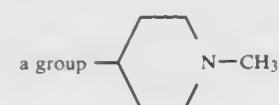
where the ethylene group substitutes the pyridine ring in position 2 or 3;



with p = 2 or 3;



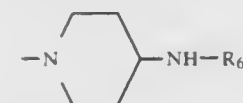
where R_6 denotes a methyl or ethyl group and A_2 denotes a $(CH_2)_m$ group where m = 1 or 2, the A_2 group being in position 3 or 4 of the piperidine ring when m = 1 and in position 2 or 3 thereof when m = 2, or



or alternatively the substituent



represents a group



where R₆ is as indicated hereinbefore, or an addition salt thereof with a mineral or organic acid.

5,086,054

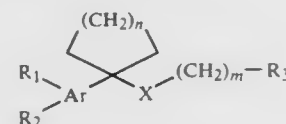
NOVEL ARYL-CYCLOALKANEPOLYALKYLAMINES
Daniel W. Parish, Sunnyvale, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jul. 31, 1990, Ser. No. 560,446

Int. Cl.⁵ A61K 31/445, 31/33; C07D 265/30, 295/22, 211/06
U.S. Cl. 514—239.2

20 Claims

1. A compound of the formula (I)



and its pharmaceutically acceptable salts, wherein

Ar is aryl;

R₁ and R₂ are independently selected from the group consisting of hydrogen, hydroxy, lower alkyl, cycloalkyl, alkoxy, nitro, thio or halo;

R₃ is morpholine;

X is zero, ester, ether, ketone, amide, thioether, thioamide, thioether or thioester;

n is 2, 3, 4 or 5; and

m is zero, 1, 2, 3, 4 or 5.

5,086,055

SERIES OF 5-[(4-ARYL-1-PIPERAZINYL)ALKYL]-2-OXAZOLIDINONE DERIVATIVES USEFUL IN THE TREATMENT OF ALLERGIC CONDITIONS

David A. Walsh, Richmond, Va., and John M. Yanni, Fort Worth, Tex., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

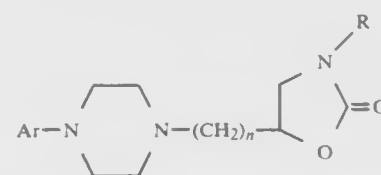
Filed Dec. 24, 1990, Ser. No. 633,030

Int. Cl.⁵ A61K 31/50

U.S. Cl. 514—252

12 Claims

1. A method of treating allergies in warm-blooded animals by administering thereto a therapeutically effective amount of an antiallergy compound having the formula



where R is hydrogen, loweralkyl, phenyl, substituted phenyl, phenyl-loweralkyl, or cycloalkyl; n is 1-4, and Ar is pyridinyl, phenyl or phenyl substituted by 1 to 3 substituents selected from halogen, loweralkyl, loweralkoxy, trifluoromethyl, nitro, acetyl, amino, loweralkylamino, diloweralkylamino, acetyl-amino, cyano, aminocarbonyl, or carboxylate, the stereoisomers, and pharmaceutically acceptable salts thereof.

5,086,056

2-(HETEROCYCLYLALKYL)IMIDAZOPYRIDINES

Frans E. Janssens, Bonheiden; François M. Sommen, Wortel; Joseph L. G. Torremans, Beerse, and Gaston S. M. Diels, Ravels, all of Belgium, assignors to Janssen Pharmaceutica N.V., Belgium

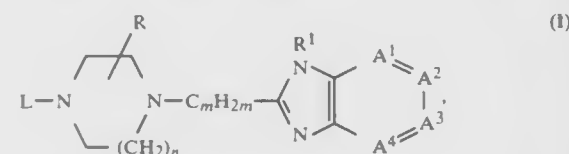
Division of Ser. No. 561,833, Aug. 2, 1990, Pat. No. 5,011,842, which is a continuation of Ser. No. 211,652, Jun. 27, 1988, Pat. No. 4,946,843. This application Feb. 8, 1991, Ser. No. 652,828

Claims priority, application United Kingdom, Jul. 10, 1987, 8716313

Int. Cl.⁵ A61K 31/495, 31/505, 31/52; C07D 473/00, 403/14
U.S. Cl. 514—253

24 Claims

1. A method of treating allergic diseases in warm-blooded animals suffering from the same, which method comprises the systemic administration to warm blooded animals of an effective anti-allergic amount of a compound of the formula:



a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

—A¹—A²—A³—A⁴— represents a bivalent radical of the formula:

—N=CH—N=CH— (a-5) or;

—CH=N—CH=N— (a-6),

wherein one or two hydrogen atoms in said radicals (a-5) and (a-6) may, each independently from each other, be replaced by halo, C₁-alkyl, C₁-alkyloxy, trifluoromethyl, or hydroxy;

R represents hydrogen or C₁-alkyl;

R¹ represents hydrogen, C₁-alkyl, C₃-cycloalkyl, Ar¹, C₁-alkyl substituted with one or two Ar¹ radicals, or a radical of the formula —Alk—G—R², wherein:

Ar¹ represents phenyl; phenyl substituted with 1, 2 or 3 substituents each independently selected from halo, hydroxy, nitro, cyano, trifluoromethyl, C₁-alkyl, C₁-alkyloxy, C₁-alkylthio, mercapto, amino, mono- and di(C₁-alkyl)amino, carboxyl, C₁-alkyloxycarbonyl, and C₁-alkylcarbonyl; thienyl; halothienyl; furanyl; C₁-alkyl substituted furanyl; pyridinyl; pyrimidinyl; pyrazinyl; thiazolyl; imidazolyl; or imidazolyl substituted with C₁-alkyl;

Alk represents C₁-alkanediyl;

G represents O, S, or NR³, wherein R³ represents hydrogen, C₁-alkyl, C₁-alkylcarbonyl, C₁-alkyloxycarbonyl, or Ar²—C₁-alkyl;

Ar² represents phenyl or phenyl substituted with 1, 2, or 3 substituents each independently selected from halo, hydroxy, nitro, cyano, trifluoromethyl, C₁-alkyl, C₁-alkyloxy, C₁-alkylthio, mercapto, amino, mono- and di(C₁-alkyl)amino, carboxyl, C₁-alkyloxycarbonyl, and C₁-alkylcarbonyl; and

R² represents hydrogen; C₂-alkenyl; C₂-alkenyl substituted with Ar²; C₃-alkynyl; Ar¹; C₁-alkyl; or C₁-alkyl substituted with Ar¹, hydroxy, C₁-alkyloxy, carboxyl, C₁-alkyloxycarbonyl, Ar²-oxycarbonyl, or Ar²—C₁-alkyloxycarbonyl, wherein Ar¹ and Ar² are as defined above;

m represents a number having a value of from 1 to 4;

n represents a number having a value of from 1 to 2; and

L represents hydrogen, C₁-alkylcarbonyl, C₁-alkylsulfonyl, C₁-alkyloxycarbonyl, Ar²—C₁-alkyloxycarbonyl, Ar²-carbonyl, Ar²-sulfonyl, C₃-cycloalkyl, C₂-alkenyl, C₂-alkenyl substituted with Ar², C₁-alkyl, wherein Ar² is as defined above, or L represents a radical of the formula:

—Alk—R⁴ (b-1);

—Alk—Y—R⁵ (b-2); or

—Alk—Z¹—(C=X)—Z²—R⁶ (b-3)

p1

wherein:

Alk is as defined above;

Y represents O, S, NR⁸, wherein R⁸ represents hydrogen, C₁-alkyl, C₁-alkylcarbonyl, or Ar¹-carbonyl, wherein Ar¹ is as defined above;

Z¹ and Z² each independently represent O, S, NR⁹, or a direct bond, wherein R⁹ represents hydrogen or C₁-alkyl;

X represents O, S, or NR¹⁰, wherein R¹⁰ represents hydrogen, C₁-alkyl, or cyano;

R⁴ represents Het, Ar², cyano, isocyanato, isothiocyanato, Ar²-sulfonyl, or halo, wherein Ar² is as defined above;

R⁵ represents hydrogen, Het, Ar², C₁-alkyl, or C₁-alkyl substituted with halo or Ar², wherein Ar² is as defined above; and

R⁶ represents hydrogen, Het, Ar², C₁-alkyl, or C₁-alkyl substituted with halo or Ar², wherein Ar² is as defined above; wherein Het represents:

(i) an optionally substituted five- or six-membered heterocyclic ring containing 1, 2, 3, or 4 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, provided that no more than two oxygens or sulfurs are present; or

(ii) an optionally substituted five- or six-membered heterocyclic ring containing 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, being fused with an optionally substituted five- or six-membered ring through two ring carbon atoms or one ring carbon and one ring nitrogen atom, containing in the remainder of the fused ring only carbon atoms; or

(iii) an optionally substituted five- or six-membered heterocyclic ring containing 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, being fused with an optionally substituted five- or six-membered heterocyclic ring through two ring carbon atoms or one ring carbon and one ring nitrogen atom, containing in the remainder of the fused ring 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur and nitrogen; wherein:

Het may optionally be substituted with up to 4 substituents when Het is a monocyclic ring system, and wherein Het may optionally be substituted with up to 5 substituents when Het is a bicyclic ring system, said substituents of Het being selected from the group consisting of a bivalent radical =X; halo; isocyanato; isothiocyanato; nitro; cyano; trifluoromethyl; a radi-

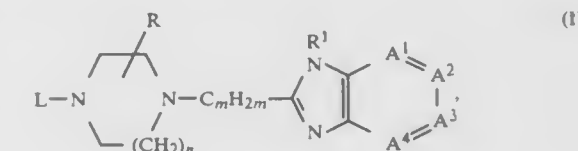
cal of formula —A; a radical of formula —Y—A; or a radical of formula —Z¹—C(=X)—Z²—A; wherein =X is as defined above;

A represents hydrogen, Ar², or C₁-alkyl being optionally substituted with Ar², C₁-alkyloxy, Ar²—O, hydroxy, or C₁-alkyloxycarbonyl; and

Y, Z¹, and Z² each have the meaning as defined above;

provided that when in the radical —Z¹—C(=X)—Z²—A, A is hydrogen and Z¹ is NR⁹, O, or X, then Z² is other than O or S.

8. A compound of the formula:



a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

—A¹—A²—A³—A⁴— represents a bivalent radical of the formula:

—N=CH—N=CH— (a-5) or;

—CH=N—CH=N— (a-6),

wherein one or two hydrogen atoms in said radicals (a-5) and (a-6) may, each independently from each other, be replaced by halo, C₁-alkyl, C₁-alkyloxy, trifluoromethyl, or hydroxy;

R represents hydrogen or C₁-alkyl;

R¹ represents hydrogen, C₁-alkyl, C₃-cycloalkyl, Ar¹, C₁-alkyl substituted with one or two Ar¹ radicals, or a radical of the formula —Alk—G—R², wherein:

Ar¹ represents phenyl; phenyl substituted with 1, 2, or 3 substituents each independently selected from halo, hydroxy, nitro, cyano, trifluoromethyl, C₁-alkyl, C₁-alkyloxy, C₁-alkylthio, mercapto, amino, mono- and di(C₁-alkyl)amino, carboxyl, C₁-alkyloxycarbonyl, and C₁-alkylcarbonyl; thienyl; halothienyl; furanyl; C₁-alkyl substituted furanyl; pyridinyl; pyrimidinyl; pyrazinyl; thiazolyl; imidazolyl; or imidazolyl substituted with C₁-alkyl;

Alk represents C₁-alkanediyl;

G represents O, S, or NR³, wherein R³ represents hydrogen, C₁-alkyl, C₁-alkylcarbonyl, C₁-alkyloxycarbonyl, or Ar²—C₁-alkyl;

Ar² represents phenyl or phenyl substituted with 1, 2, or 3 substituents each independently selected from halo, hydroxy, nitro, cyano, trifluoromethyl, C₁-alkyl, C₁-alkyloxy, C₁-alkylthio, mercapto, amino, mono- and di(C₁-alkyl)amino, carboxyl, C₁-alkyloxycarbonyl, and C₁-alkylcarbonyl; and

R² represents hydrogen; C₂-alkenyl; C₂-alkenyl substituted with Ar²; C₃-alkynyl; Ar¹; C₁-alkyl; or C₁-alkyl substituted with Ar¹, hydroxy, C₁-alkyloxy, carboxyl, C₁-alkyloxycarbonyl, Ar²-oxycarbonyl, or Ar²—C₁-alkyloxycarbonyl, wherein Ar¹ and Ar² are as defined above;

m represents a number having a value of from 1 to 4;

n represents a number having a value of from 1 to 2; and

L represents hydrogen, C₁-alkylcarbonyl, C₁-alkylsulfonyl, C₁-alkyloxycarbonyl, Ar²—C₁-alkyloxycarbonyl, Ar²-carbonyl, Ar²-sulfonyl, C₃-cycloalkyl, C₂-alkenyl, C₂-alkenyl substituted with Ar², C₁-alkyl, wherein Ar² is as defined above, or L represents a radical of the formula:

—Alk—R⁴ (b-1)

—Alk—Y—R⁵ (b-2); or



(b-3)

wherein:

Alk is as defined above;

Y represents O, S, NR⁸, wherein R⁸ represents hydrogen, C₁₋₆alkyl, C₁₋₆alkylcarbonyl, or Ar¹-carbonyl, wherein Ar¹ is as defined above;Z¹ and Z² each independently represent O, S, NR⁹, or a direct bond, wherein R⁹ represents hydrogen or C₁₋₆alkyl;X represents O, S, or NR¹⁰, wherein R¹⁰ represents hydrogen, C₁₋₆alkyl, or cyano;R⁴ represents Het, Ar², cyano, isocyanato, isothiocyanato, Ar²-sulfonyl, or halo, wherein Ar² is as defined above; R⁵ represents hydrogen, Het, Ar², C₁₋₆alkyl, or C₁₋₆alkyl substituted with halo or Ar², wherein Ar² is as defined above; andR⁶ represents hydrogen, Het, Ar², C₁₋₆alkyl, or C₁₋₆alkyl substituted with halo or Ar², wherein Ar² is as defined above; wherein Het represents:

(i) an optionally substituted five- or six-membered heterocyclic ring containing 1, 2, 3, or 4 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, provided that no more than two oxygens or sulfurs are present; or

(ii) an optionally substituted five- or six-membered heterocyclic ring containing 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, being fused with an optionally substituted five- or six-membered ring through two ring carbon atoms or one ring carbon and one ring nitrogen atom, containing in the remainder of the fused ring only carbon atoms; or

(iii) an optionally substituted five- or six-membered heterocyclic ring containing 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, being fused with an optionally substituted five- or six-membered heterocyclic ring through two ring carbon atoms or one ring carbon and one ring nitrogen atom, containing in the remainder of the fused ring 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur and nitrogen; wherein:

Het may optionally be substituted with up to 4 substituents when Het is a monocyclic ring system, and wherein Het may optionally be substituted with up to 5 substituents when Het is a bicyclic ring system, said substituents of Het being selected from the group consisting of a bivalent radical =X; halo; isocyanato; isothiocyanato; nitro; cyano; trifluoromethyl; a radical of formula -A; a radical of formula -Y-A; or a radical of formula -Z¹-C(=X)-Z²-A; wherein =X is as defined above;A represents hydrogen, Ar², or C₁₋₆alkyl being optionally substituted with Ar², C₁₋₆alkyloxy, Ar²-O, hydroxy, or C₁₋₆alkyloxycarbonyl; and Y, Z¹, and Z² each have the meaning as defined above;provided that (i) when in the radical -Z¹-C(=X)-Z²-A, A is hydrogen and Z¹ is NR⁹, O, or S, then Z² is other than O or S, and further provided that (ii) when L is C₁₋₂alkyl, R¹ is other than hydrogen, 2-methylphenyl, benzyl, 4-chlorobenzyl, or methoxybenzyl.

5,086,057
METHOD OF TREATING CACHEXIA AND CERTAIN NEW COMPOUNDS FOR USE IN THIS METHOD
 Kazubiko Sasagawa, Yo Takiguchi, Jun Ohsumi, Yasuo Shimoji, all of Tokyo, Japan, assignor to Sankyo Company Limited, Tokyo, Japan
 Division of Ser. No. 365,851, Jun. 14, 1989. This application Apr. 25, 1991, Ser. No. 691,542

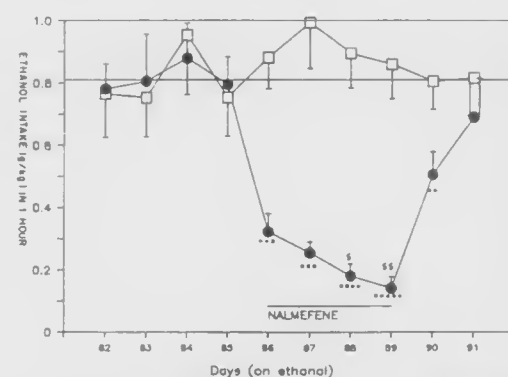
Claims priority, application Japan, Jun. 16, 1988, 63-149137
 Int. Cl.⁵ A01N 43/54, 43/647; A61K 31/505; C07D 239/70
 U.S. Cl. 514-267 8 Claims

3. The method of claim 1, in which:
 R¹ represents a hydrogen atom or a phenyl group;
 R² represents a hydrogen, bromine or chlorine atom;
 R³ represents a methyl group;
 R⁴ represents a hydrogen atom;
 R⁵ represents a hydrogen atom, or, but only when the dotted line represents a double bond, a bromine atom; and
 R⁶ represents a C₂₋₄ alkyl group, a cycloheptyl group or a phenylalkyl group in which the alkyl part is C₁₋₃ and is unsubstituted and the phenyl part is unsubstituted or has at least one substituent selected from the group consisting of methyl groups and methoxy groups.

5,086,058
METHOD FOR TREATING ALCOHOLISM WITH NALMEFENE

John D. Sinclair, Espoo; Harry Scheinin, Piispanristi, and Risto Lammintausta, Turku, all of Finland, assignors to Alko Ltd., Helsinki and Orion-Yhtymä Oy, Espoo, both of, Finland
 Filed Jun. 4, 1990, Ser. No. 532,424

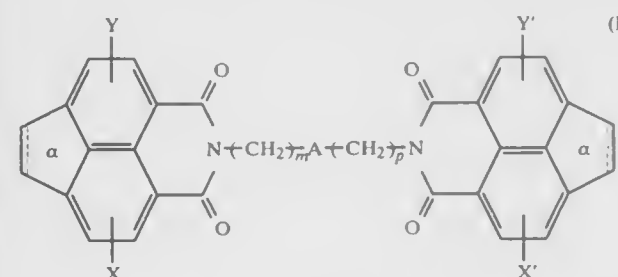
Int. Cl.⁵ A61K 31/44
 U.S. Cl. 514-282 4 Claims



1. A method for treating alcoholism by extinguishing the alcohol-drinking response, comprising the steps of: repeatedly administering nalmefene to a subject suffering from alcoholism; while the amount of nalmefene in the subject's body is sufficient to block the stimulatory effect of alcohol, having the subject drink an alcoholic beverage; and continuing the steps of administering nalmefene and drinking an alcoholic beverage until the alcohol-drinking response is extinguished.

5,086,059
BIS-NAPHTHALIMIDES AS ANTICANCER AGENTS
 Robert J. Ardecky, Landenberg, Pa.; Arthur D. Patten, Bear, and Jung-Hui Sun, Hockessin, both of Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.
 Filed Jun. 7, 1990, Ser. No. 539,115
 Int. Cl.⁵ C07D 221/18; A61K 31/435
 U.S. Cl. 514-284 36 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

A is RN(CH₂)_nNR' or NR¹ (n=2-10);

R, R' and R¹ independently are H, C₁₋₆ alkyl, benzyl optionally substituted with 1 or more substituents independently selected from the group consisting of:

H, C₁₋₆ alkyl, halogen, CF₃, NO₂, OH, N(R²)₂, OR³, CO₂R⁴, CONR⁵, NHCOR⁶, SO₂NR⁷ or S(O)₂R⁸, (t is 0, 1 or 2);

R², R⁵ and R⁷ independently are H, C₁₋₃ alkyl including cyclopropyl;

R³ and R⁴ independently are H or C₁₋₆ alkyl;

R⁶ and R⁸ independently are C₁₋₆ alkyl;

X, X', Y and Y' independently are selected from the group consisting of:

H, NO₂, N(R⁹)₂, halogen or OR¹⁰;

R⁹ and R¹⁰ independently are H or C₁₋₆ alkyl;

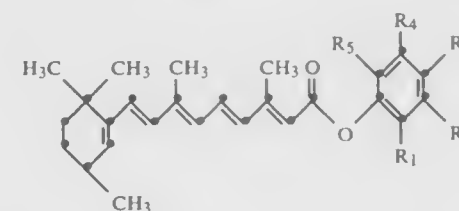
each α is independently a single or a double bond; and m and p independently are 2-10.

5,086,060
COMPOUND AND METHOD FOR TREATING SKIN FOR ACNE OR PSORIASIS

Neil F. Haley, Fairport; Xina Nair, East Amherst, both of N.Y.; Gerard J. Gendimenico, Hillsborough, N.J.; F. Christopher Zusi, Tonawanda, and R. Thomas Swann, Buffalo, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 384,948, Jul. 25, 1989, abandoned. This application Jul. 16, 1990, Ser. No. 552,726
 Int. Cl.⁵ A61K 31/21, 31/24; C07D 455/06, 277/62; C07F 7/04
 U.S. Cl. 514-294 16 Claims

1. A method of treating acne or psoriasis comprising administering a compound having the structure:



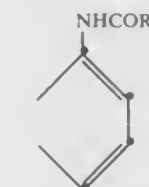
wherein

any three of R₁, R₂, R₃, R₄ and R₅ are independently selected from the group consisting of H, Cl, straight or branched alkyl of 1 to 10 carbon atoms, NO₂, COOR₆, CN, OR₆, NR₆R₇, NR₆C(=S)NR₇R₈, NR₆COR₇, SO₂NR₆R₇, CH(CH₃)COOH, CONR₆R₇, COR₆, OCONR₆R₇, NR₆COONR₇, R₉OR₆, NR₆SO₂R₇, Si(CH₃)₃, and NR₆CONR₇R₈.

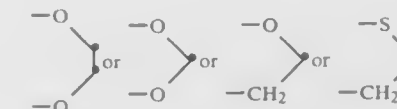
R₃ together with R₄ forms a benzo ring or taken together with R₂ forms a benzo or tetrahydrobenzo ring or together with R₂ and R₁ forms a:



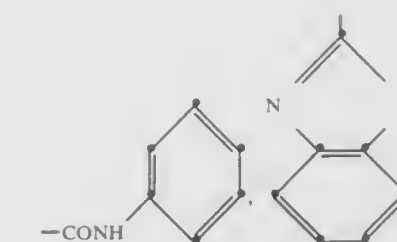
moiety or together with R₂ forms a



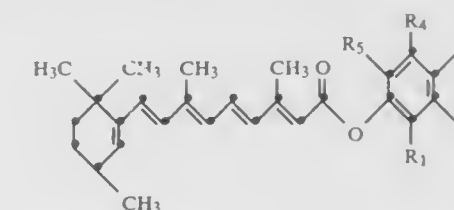
moiety or R₂ together with R₁ forms a benzo ring.



or
 R₁ is independently selected from the group consisting of



10. A method of treating acne or psoriasis comprising administering a compound having the structure:



wherein R³ is NHCOR⁶ and R₁, R₂ and R₄ are H.

5,086,061

USE OF BETA BLOCKERS FOR THE TREATMENT OF THE PROGRESSION OF INFANTILE AXIAL MYOPIA
Heinfried Tiburtius, Berlin, Fed. Rep. of Germany, assignor to Dr. Gerhard Mann Chem.-Pharm. Fabrik GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 315,096, Feb. 24, 1989, Pat. No. 4,942,161. This application Apr. 9, 1990, Ser. No. 505,432
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805882

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.⁵ A61K 31/47, 31/34, 31/135

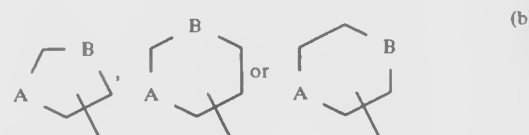
U.S. Cl. 514—309

3 Claims

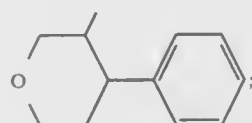
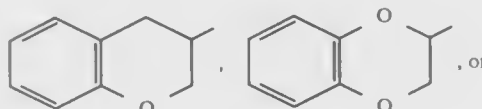
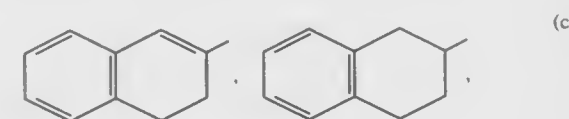
1. A method for the prevention or treatment of progressive infantile axial myopia in the presence of normal internal eye pressure comprising the step of administering to the eye of patient an effective amount of an aqueous solution of an ophthalmology acceptable beta blocker selected from the group consisting of levobunolol, carteolol, befunolol and betaxolol in amounts such that on repeated administration essentially no side effects of a systemic nature are observed.



wherein R₂ and R₃ are each, independently, H, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio or halo, X is methylene which is unsubstituted or substituted with one methyl group, nitrogen which is unsubstituted or substituted with a protecting group, oxygen, sulfur, sulfoxide or sulfone, and the dotted line between the 2- and 4- positions represents an optional bond between positions 2 and 3 or positions 3 and 4;



wherein A and B are each, independently, O or S;



5,086,062

ANTIALLERGY AND ANTIINFLAMMATORY BENZOXAZOLINONES

Kazuo Ando; Nobuko Asai; Fumitaka Ito, all of Chita; Takashi Mano, Handa; Masami Nakane, Nagoya; Kunio Satake, Handa, and Kaoru Shimada, Okazaki, all of Japan, assignors to Pfizer Inc., New York, N.Y.

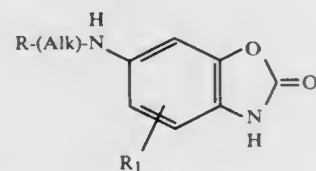
Continuation-in-part of Ser. No. 483,612, Feb. 12, 1990, abandoned. This application May 29, 1990, Ser. No. 529,971
Claims priority, application Japan, Feb. 28, 1989, 1-47429

Int. Cl.⁵ A61K 31/42; C07D 263/58

U.S. Cl. 514—321

22 Claims

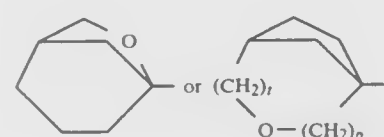
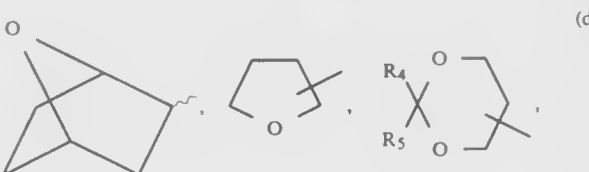
1. A compound of the formula:



or a pharmaceutically-acceptable acid addition salt thereof, wherein Alk is a C_n straight or branched chain divalent alkyl group; n is 1, 2, 3, 4, or 5;

R₁ is (C₁-C₃)alkyl, (C₁-C₃)alkoxy, (C₁-C₃)alkylthio, hydrogen, halo, phenoxy, phenylthio or trifluoromethyl; and

R is selected from the group consisting of:



wherein R₄ and R₅ are each, independently, H or (C₁-C₄)alkyl, p is 0, 1 or 2 and t is 0, 1 or 2 provided that the sum of p plus t equals 1 or 2; and the wavy line indicates that the moiety containing such wavy line can be endo- or exo-7-oxabicyclo[2.2.1]heptan-1-yl; and

(e) CH₃-(CH₂)_m-Y—

wherein m is an integer from 1 to 3 and Y is oxygen, sulfur, sulfoxide or sulfone.

5,086,063

4-ARYL-4-PIPERIDINE (OR PYRROLIDINE OR HEXAHYDROAZEPINE) CARBINOLS AND HETEROCYCLIC ANALOGS THEREOF

Engelbert Ciganek, Kennett Square, Pa., and Leonard Cook, Newark, Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

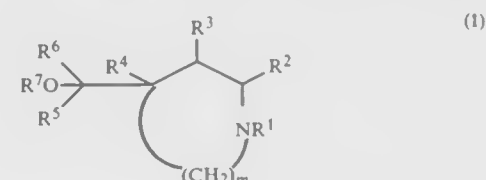
Division of Ser. No. 174,356, Mar. 28, 1988, abandoned. This application Aug. 28, 1989, Ser. No. 398,996

Int. Cl.⁵ A61K 31/445, 31/44, 31/47

U.S. Cl. 514—326

16 Claims

1. A method of treating pain in a mammal which comprises administering to said mammal an analgesic effective amount of a compound of the formula:



wherein

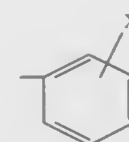
m is 2;

R¹ is CH₃, C₂H₅, n-C₃H₇, or allyl;

R² and R³ independently are H or alkyl of 1-4 carbon atoms; or R¹ and R² taken together is a branched or unbranched alkylene bridge wherein the bridge is of 3 or 4 carbon atoms; or R² and R³ taken together is a branched or unbranched alkylene bridge wherein the bridge is of 3 to 6 carbon atoms;

R⁴ is:

(a) phenyl or



where X is one or two substituents, the same or different, selected from F, Cl, Br, perfluoroalkyl, alkyl, alkyl- or dialkylamino, alkylthio, alkoxy or phenoxy, said alkyl in the alkyl-containing groups being of 1 to 12 carbon atoms;

(b) 2-, 3-, or 4-biphenyl or 2-, 3-, or 4-biphenyl where either or both aromatic groups are substituted with 1 or 2 substituents, the same or different, selected from F, Cl, alkyl, perfluoroalkyl, alkoxy, aryloxy, alkylthio, perfluoroalkoxy, arylthio, perfluoroalkylthio and dialkylamino, said alkyl and alkoxy groups being of 1-12 carbon atoms and said aryl groups being of 6-12 carbon atoms;

(c) 1- or 2-naphthyl optionally having one or two X substituents as defined in (a) above;

(d) 2-, 3-, or 4-pyridyl, or 2-, or 3-pyrrolyl optionally substituted with one to three alkyl groups of 1-4 carbon atoms;

(e) 2- or 3-thienyl optionally substituted with one substituent selected from Cl, Br, or alkyl of 1-4 carbon atoms; or

(f) 2- or 3-benzothieryl or benzofuryl optionally substituted on the aromatic ring with Cl, Br, or CF₃;

R⁵ is alkyl of 1-4 carbon atoms, or is taken together with R⁶ to form a branched or unbranched alkylene bridge of 3-11 carbon atoms;

R⁶ is H, alkyl of 1-4 carbon atoms, or is taken together with R⁵ to form a branched or unbranched alkylene bridge of 3-11 carbon atoms; and

R⁷ is H, alkyl of 1-4 carbon atoms, alkanoyl of 1-4 carbon atoms, or —CH₂ phenyl; or

a pharmaceutically salt or N-oxide thereof, provided that when

- 1) R¹, R⁵ and R⁶ are methyl, and R² and R³ are H, then R⁴ is not 3,4-F₂C₆H₃, 3,4-Cl₂C₆H₃, p-t-butylphenyl, 2,3-(MeO)₂C₆H₃, 2,5-(MeO)₂C₆H₃, or 3-pyridyl;
- 2) R¹ is methyl and R⁵ and R⁶ are taken together as —(CH₂)₇, then R⁴ is not 3-MeOC₆H₄; and
- 3) R¹ and R⁵ are methyl, and R², R³ and R⁶ are H, then R⁴ is not 2-FC₆H₄, 4-BrC₆H₄, 2-CH₃C₆H₄, 4-CH₃OC₆H₄, or 4-CF₃C₆H₄.

5,086,064

3,5-DI-TERTIARY-BUTYL-4-HYDROXYPHENYL THIAZOLYL, OXAZOLYL, AND IMIDAZOLYL METHANONES AND RELATED COMPOUNDS AS ANTIINFLAMMATORY AGENTS

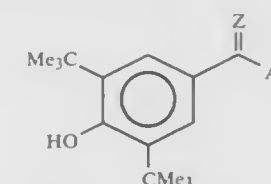
Thomas Capiris, Plymouth; David T. Connor, and Jagadish C. Sircar, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 500,175, Mar. 27, 1990, abandoned. This application Jan. 31, 1991, Ser. No. 646,411
Int. Cl.⁵ C07D 277/24, 275/02; A61K 31/425

U.S. Cl. 514—365

11 Claims

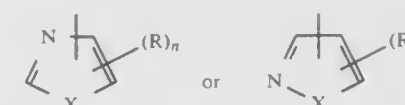
1. A compound of the formula



and a pharmaceutically acceptable base or acid addition salt thereof; wherein

Z is O, NOH, or NOCH₃;

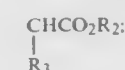
Ar is



wherein

X is S;

R is hydrogen, lower alkyl, halogen, CO₂R₂ or



wherein

R₁ is hydrogen or lower alkyl; and

R₂ and R₃ are independently hydrogen or lower alkyl; and n is an integer of one or two with the proviso that when n is two then R cannot be CO₂R₂ or



5,086,065

PHENYLALKAN(ENO)IC ACID

Mitoshi Konno; Takahiko Nakae, and Nobuyuki Hamanaka, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

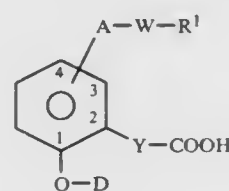
Filed May 17, 1990, Ser. No. 524,521

Claims priority, application Japan, Jun. 27, 1989, 1-164213; Dec. 1, 1989, 1-310545; Jan. 9, 1990, 2-1799

Int. Cl.⁵ A61K 31/425; C07D 275/03

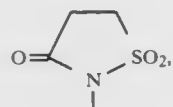
U.S. Cl. 514—372

1. A phenylkan(en)ic acid of the formula:



wherein

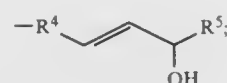
A, taken together with W and R¹, is
i)



Y is ethylene or vinylene;

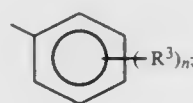
D is

i) —Z—B or
ii)



Z is C3-11 alkylene or alkenylene

B is



or

Z, taken together with B, is C3-22 alkyl;
R³ is

i) hydrogen,
ii) halogen,
iii) C1-8 alkyl, alkoxy or alkylthio or
iv) C2-8 alkenyl, alkenyloxy or alkenylthio;

n is 1-3;

R⁴ is C1-7 alkylene;

R⁵ is

i) C1-12 alkyl,
ii) C2-12 alkenyl,
iii) C5-7 cycloalkyl or
iv) phenethyl or phenethyl wherein the ring is substituted by one C1-4 alkoxy;

with the proviso that —A—W—R¹ should bind to 3- or 4-carbon in benzene ring and non-toxic salts thereof.

5,086,066

METHOD OF PROVIDING ANXIOLYTIC AND ANTIPSYCHOTIC TREATMENT WITH SUBSTITUTED BENZAMIDES

Jacques Acher, Itteville; Jean-Claude Monier, Lardy; Jean-Paul Schmitt, Arpajon; Renee Gardais-Luthereau, Cachan, all of France; Robert Naylor, and Brenda Costall, both of Addingham, United Kingdom, assignors to Laboratoires Delagrangre Societe D'Applications Pharmacodynamiques, Paris, France

Filed Dec. 20, 1989, Ser. No. 454,015

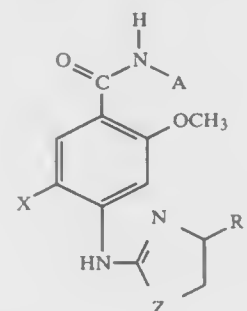
Claims priority, application France, Dec. 20, 1988, 88 16764

Int. Cl.⁵ A61K 31/42, 31/415

U.S. Cl. 514—377

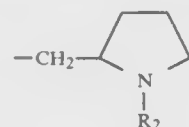
16 Claims

(I) 1. A method of treating anxiety of psychotic disorders which comprises administering to a psychotic patient exhibiting anxiety, a therapeutically effective amount of a compound of the general formula (I):



in which:

A is diethylaminoethyl or a group of formula II:



where R₂ is ethyl or allyl;

R₁ is hydrogen or methyl;

X is chlorine or bromine, and

Z is —NH—OR—O—

with the following condition:

when Z is —NH— and X is chlorine, R₁ is methyl and their pharmacologically acceptable salts.

5,086,067

LTB₄ SYNTHESIS INHIBITORS

Stevan W. Djuric, Glenview; Richard A. Haack, and Julie M. Miyashiro, both of Chicago, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

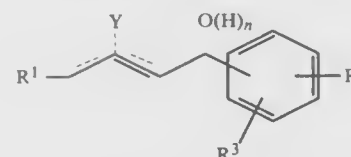
Filed Dec. 18, 1989, Ser. No. 452,138

Int. Cl.⁵ C07C 65/32

U.S. Cl. 514—381

20 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein Y when present is hydrogen or halogen; wherein R¹ is alkyl of 1 to 20 carbon atoms, alkenyl or alkynyl of 2 to 20 carbon atoms; wherein n is either 0 or 1;

wherein R is —CO₂R², tetrazole, methylsulfonamide or benzenesulfonamide;
wherein R² is hydrogen, alkyl or 1 to 6 carbon atoms or a pharmaceutically acceptable cation; and
wherein R³ is hydroxyl or halogen.

5,086,068

IMMUNOCHEMICAL DETECTION OF HYPOXIA IN NORMAL AND TUMOR TISSUE

James A. Raleigh; Gerald G. Miller; Allan J. Franko, and J. D. Chapman, all of Edmonton, Canada, assignors to Alberta Cancer Board, Edmonton, Canada

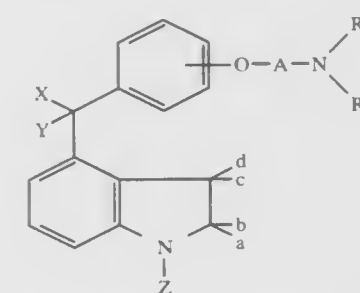
Filed Feb. 26, 1988, Ser. No. 161,034

Int. Cl.⁵ A61K 31/415, 37/00, 31/70, 31/20

U.S. Cl. 514—398

15 Claims

1. A process for preparing an immunogenic conjugate of a nitroaromatic compound covalently bonded to an immune response inducing carrier, said process comprising covalently bonding a nitroaromatic compound selected from the group consisting of nitrobenzenes, nitrofurans, nitrothiazoles, nitropropanes, nitrodiazoles and nitrotriazoles, each of said nitroaromatic compounds having a side chain including an —NO₂ group, to said carrier in an essentially oxygen-free atmosphere and isolating said conjugate.



wherein R₁ and R are individually selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, aralkyl of 7 to 12 carbon atoms, all optionally substituted with at least one member of the group consisting of halogen, alkyl and alkoxy of 1 to 5 carbon atoms, —OH, —CF₃, CH₃S—, —NO₂, —NH₂ and mono and dialkylamino of 1 to 4 alkyl carbon atoms, A is

5,086,069

ANTI-THROMBOTIC PEPTIDE AND PSEUDOPEPTIDE DERIVATIVES

Scott I. Klein, Audubon, and Bruce F. Molino, Hatfield, both of Pa., assignors to Rorer Pharmaceutical Corporation, Ft. Washington, Pa.

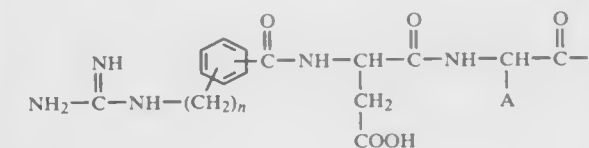
Filed Feb. 5, 1990, Ser. No. 475,043

Int. Cl.⁵ A01K 31/195, 31/415, 31/405; C07C 279/00

U.S. Cl. 514—399

11 Claims

1. A compound of the formula



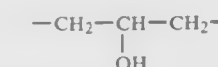
wherein:

A is hydrogen, methyl, isopropyl, benzyl, n-but-2-yl, 2-methylprop-1-yl, hydroxymethyl, 4-hydroxybenzyl, indol-3-ylmethyl, mercaptomethyl, methylthioethyl, carboxymethyl, carbamoylmethyl, 2-carboxyethyl, 2-carbamoylthioethyl, imidazol-3-ylmethyl, 3-guanidinopropyl, or 4-aminobutyl;

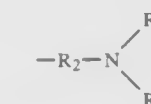
B is —OH or —NH₂; and

n is 0 to about 6;

or a pharmaceutically acceptable salt thereof.



or —(CH₂)_n—, n is 2, 3, 4 or 5, X and Y are both hydrogen or one is hydrogen and the other is selected from the group consisting of —OH, alkoxy and alkyl of 1 to 4 carbon atoms, or X and Y together form a member of the group consisting of =O, alkylidene or 1 to 4 carbon atoms and =N—OR₅, R₅ is hydrogen or alkyl of 1 to 4 carbon atoms, a, b, c and d are all hydrogen or a and b form =O and c and d are hydrogen or one of a and b with one of c and d form a carbon-carbon bond and the others are both hydrogen, Z is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl and alkynyl of 2 to 5 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms and aralkyl of 7 to 14 carbon atoms, all optionally substituted and



R₂ is alkylene of 2 to 5 carbon atoms, R₃ and R₄ are individually selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms and aralkyl of 7 to 12 carbon atoms, all optionally substituted with at least one member of the group consisting of alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, phenyl, naphthyl and aralkyl and diaralkyl of 7 to 14 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

18. A method of inducing antiarrhythmic activity in warm-blooded animals comprising administering to warm-blooded animals an antiarrhythmically effective amount of at least one compound of claim 1.

5,086,070

4-BENZYL-1H-INDOLES AND ANTI-ARRHYTHMIC USE THEREOF

Francois Clemence; Jacques Guillaume, both of Paris, and Gilles Hamon, Le Raincy, all of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 26, 1990, Ser. No. 514,692

Claims priority, application France, Apr. 28, 1989, 89 05650

Int. Cl.⁵ C07D 209/34, 209/12, 209/14; A61K 31/40

U.S. Cl. 514—418

25 Claims

1. A compound selected from the group consisting of all possible racemic or diastereoisomer forms of a 4-benzyl-1H-indole compound of the formula

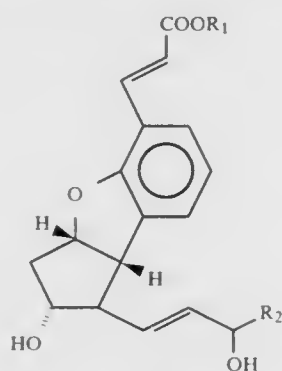
5,086,071
2,5,6,7-TETRANOR-4,8-INTER-M-PHENYLENE PG₁₂
DERIVATIVES

Kiyotaka Ohno, Fujisawa; Atsushi Ohtake, Kamakura; Takashi Endoh, Chigasaki; Shigeki Itou, and Kazuhiro Hoshi, both of Kamakura, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 493,109

Claims priority, application Japan, Mar. 14, 1989, 1-63241
Int. Cl.⁵ A61K 31/34; C07D 307/93

U.S. Cl. 514—468 24 Claims
1. A 2,5,6,7-tetranor-4,8-inter-m-phenylene PG₁₂ derivative having the following formula:



wherein R₁ is hydrogen, a pharmacologically acceptable cation, or an ester residue;

R₂ is

- (i) normal alkyl group having 1 to 12 carbon atoms or branched alkyl group having 3 to 14 carbon atoms;
- (ii) —Z—Ar wherein Z is a valence bond or normal or branched alkylene group having the formula: C_tH_{2t}, t is an integer of 1 to 6, and Ar is phenyl group unsubstituted or substituted by 1 to 4 substituents selected from alkyl, methoxy, chloro, bromo, fluoro, iodo, trifluoromethyl, nitro, cyano, phenyl and phenoxy;
- (iii) —Z—R₃ wherein Z is as defined above, R₃ is cycloalkyl group having 3 to 12 carbon atoms or cycloalkyl group having 3 to 12 carbon atoms substituted by 1 to 4 normal alkyl substituents containing 1 to 4 carbon atoms;
- (iv) —C₇H₂₇—C≡C—R₄ wherein C₇H₂₇ is as defined above, R₄ is normal alkyl group having 1 to 6 carbon atoms;
- (v) —C₇H₂₇—O—R₅ wherein C₇H₂₇ is as defined above, R₅ is (1) normal alkyl group having 1 to 6 carbon atoms or branched alkyl group having 3 to 6 carbon atoms, (2) cyclopentyl or cyclohexyl group unsubstituted or substituted by 1 to 4 normal alkyl substituents containing 1 to 4 carbon atoms, or (3) Ar wherein Ar is as defined above.

5,086,072
TREATMENT OF MOOD DISORDERS WITH
FUNCTIONAL ANTAGONISTS OF THE
GLYCINE/NMDA RECEPTOR COMPLEX

Ramon Trullas, Bethesda, and Phil Skolnick, Potomac, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 18, 1990, Ser. No. 541,032

Int. Cl.⁵ A61K 31/215, 31/19

U.S. Cl. 514—531 10 Claims
1. A method for treating mood disorders selected from the group consisting of major depression, bipolar disorder, dysphemia, and seasonal affective disorder in a patient, which comprises:

administering to a patient in need thereof, an effective amount of a compound possessing functional antagonist

properties for the N-Methyl-D-Aspartate (NMDA) receptor complex.

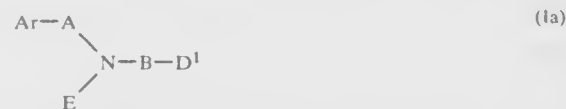
5,086,073
COMPOSITION FOR TREATING DEPRESSION WITH
ARALKYL AMINES

John F. White, Wokingham; Michael C. Warren, Oxford, and Christine Ennis, Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England
Filed May 30, 1990, Ser. No. 530,758

Claims priority, application United Kingdom, Jun. 2, 1989, 8912784.9; Nov. 30, 1989, 8927087.0

Int. Cl.⁵ A61K 31/13, 31/18, 31/135, 31/445

U.S. Cl. 514—602 30 Claims
1. A method of treating depression or cerebral insufficiency disorders or dementias in a mammal so afflicted, which comprises administering to said mammal an amount effective to alleviate depression or cerebral insufficiency or dementias of a compound having the formula



or a pharmaceutically acceptable salt thereof, wherein E represents hydrogen, lower alkyl or a group Ar¹—A¹—; Ar and Ar¹ are, independently, mono- or bi-cyclic aryl groups of 6 to 10 carbon atoms which are optionally substituted by one to three substituents independently selected from lower alkyl, lower alkoxy, halogen, halo-loweralkyl, haloloweralkoxy, cyano, amino, mono- or di-loweralkyl amino and nitro;

A and A¹ are, independently, —(CH₂)_m—, where m is 1 or 2, optionally substituted by a lower alkyl group or an Ar² group, wherein Ar² is the same or different as Ar defined above, or by one of each such group;

B is an alkylene group of 3 or 4 carbon atoms, which may be substituted by lower alkyl; and

D¹ represents halogen, —CH₃, —CR¹R²NH₂, —SO₃H or —SO₂NR⁶R⁷, where R¹ and R² are independently hydrogen or lower alkyl and R⁶ and R⁷ are each hydrogen, lower alkyl or aralkyl of 7 to 12 carbon atoms or R⁶ and R⁷ together with the nitrogen atom to which they are attached represent a 5 or 6 membered ring.

5,086,074
1-AMINOMETHYL-1,2,3,4-TETRAHYDRO-NAPHTHA-
LENES

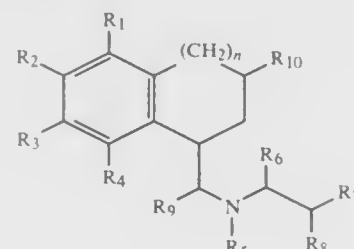
John F. DeBernardis, Lindenhurst; Robert E. Zelle, Grayslake, and Fatima Z. Basha, Lake Forest, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 470,210, Jan. 25, 1990, which is a continuation-in-part of Ser. No. 140, Jan. 13, 1989, which is a continuation-in-part of Ser. No. 144,364, Jan. 15, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 499,232

Int. Cl.⁵ A61K 31/135

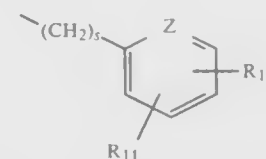
U.S. Cl. 514—649

1. A compound of the formula



wherein n is 1;

R₁, R₃, and R₄ are hydrogen and R₂ is hydroxy or loweralkyl;
R₅ is loweralkyl;
R₆ and R₈ are hydrogen;
R₇ is



wherein s is 0; Z is C; and R₁₁ and R₁₂ are independently selected from the group consisting of hydrogen, halo, hydroxy, methoxy and loweralkyl;

R₉ is hydrogen; and

R₁₀ is hydrogen;

or a pharmaceutically acceptable salt thereof.

5,086,075
THERAPEUTIC COMPOSITIONS CONTAINING
BENZOYL PEROXIDE

Richard L. De Villez, San Antonio, Tex., assignor to Board of Regents, the University of Texas System, Austin, Tex.

Continuation of Ser. No. 862,808, May 13, 1986, Pat. No. 4,923,900, which is a continuation-in-part of Ser. No. 694,226, Jan. 24, 1985, abandoned. This application Apr. 2, 1990, Ser. No. 503,433

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.⁵ A61K 3/075

U.S. Cl. 514—714

15 Claims
1. The composition for application to skin in the alleviation of the cutaneous condition acne, seborrhea, dermatophyte infection, reaction to irritative plant contactants or body odor, the composition comprising:

benzoyl peroxide particles in a quantity between about 1% by weight and about 20% by weight of the composition; water in a quantity between about 30% by weight and about 94% by weight of the composition; dimethylisobutyl sorbate in a quantity between about 5% by weight and about 50% by weight of the composition; and an alkyl alcohol in a quantity sufficient to control viscosity of the composition

said composition being a lotion, cream, salve or foam readily applied to skin and said benzoyl peroxide particles being at least substantially insoluble when water is between about 30% by weight and 90% by weight of the composition.

5,086,076
ANTIVIRAL PHARMACEUTICAL COMPOSITIONS
COMPRISING A TERPENE OZONIDE

Stephen Herman, 9341 Hazel Cir., Villa Park, Calif. 92667
Division of Ser. No. 363,628, Jun. 8, 1989, Pat. No. 4,983,637, which is a continuation-in-part of Ser. No. 211,378, Jun. 24, 1988, abandoned. This application Oct. 19, 1990, Ser. No. 600,316

Int. Cl.⁵ A01N 31/00, 31/04; A61K 31/045, 31/07

U.S. Cl. 514—724

14 Claims
1. An antiviral pharmaceutical composition comprising a pharmaceutically acceptable systemic carrier and a pharmacologically antiviral amount of an ozonide of a terpene, wherein said terpene is selected from the group consisting of: limonene, citronella, alpha-carotene, beta-carotene, Vitamin A, linalool, linalyl acetate, and squalene.

5,086,077
ENDERMIC MEDICAMENT WITH A GEL BASE
Sakae Obara; Hiroaki Muto; Sumiko Mizuno; Tohru Chiba, all of Niigata; Izumi Saitoh, Hyogo, and Kaori Ikeda, Osaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1990, Ser. No. 604,921

Claims priority, application Japan, Nov. 7, 1989, 1-289241
Int. Cl.⁵ A61K 47/00

U.S. Cl. 514—781

7 Claims
1. An endermic medicament having a consistency of a gel which comprises, as a blend:

- (a) a non-ionic water-soluble cellulose ether modified by reaction with a modification agent containing, in the molecule, an alkyl group having 6 to 26 carbon atoms and a functional group having reactivity with the hydroxyl group in the cellulose ether as a base; and
- (b) a therapeutic effective amount of a therapeutically active ingredient.

5,086,078
PROCESS FOR MAKING EXPANDED POLYMERIC
PRODUCT WITH LOW LEVEL OF EMISSION OF
BLOWING AGENT

William H. Harclerode, Ewing; Eugene K. Zimmermann, Hamilton Square; Barry J. Pekich, Bridgeton; John C. Knutsen, Highland Park; John V. Wiman, Morristown, and John C. Voss, Trenton, all of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Nov. 26, 1990, Ser. No. 618,342

Int. Cl.⁵ C08J 9/22, 9/232, 9/24

U.S. Cl. 521—58

37 Claims
1. A process for making an expanded polymeric product while emitting only a small amount of a volatile organic blowing agent, the process comprising expanding unexpanded polymer beads in an expander, in from 2 to 5 expansion steps, the unexpanded polymer beads being comprised of:

A. a blowing agent in an amount of from about 2 to about 4.4 weight percent, wherein the blowing agent is at least one member selected from the group consisting of:

pentane, cyclopentane, methylcyclopentane, neopentane, isopentane, pentane petroleum distillate fractions, propane, butane, isobutane, hexane, isomers of hexane, 2-methyl pentane, 3-methyl pentane, 2,2-dimethylbutane, 2,3-dimethylbutane, cyclohexane, methylcyclohexane, heptane, propylene, 1-butylene, 2-butylene, isobutylene, mixtures of one or more aliphatic hydrocarbons having a molecular weight of at least 42 and a boiling point not higher than 95° C. at 760 millimeters absolute pressure, water, carbon dioxide, ammonium carbonate, and azo compounds that are decomposable to form a gas at a heat-plastifying temperature to which the polymer is brought, and

B. a polymer produced from at least one monomer, wherein the monomer is at least one member selected from the group consisting of:

styrene, derivatives of styrene, vinyltoluene, mono- and polyhalogenated vinyltoluenes which form linear polymers, phenyl ether, acrylonitrile, and methyl methacrylate,

the polymer being present in the beads in an amount of from about 93 weight percent to about 98 weight percent based on the weight of the beads, the polymer exhibiting:

- (a) a polydispersity of from about 1 to less than 2.5,
- (b) a weight average molecular weight of greater than about 180,000 to about 300,000 and
- (c) an Mz:Mn of from about 2 to about 4.5, and wherein the polymer is branched to from 0 to less than 5 weight percent, and

wherein the total amount of blowing agent emitted in the expansion and intermediate aging steps is only from about 0.3 to about 1.5 weight percent based on the total weight of the beads, and wherein the expansion steps are carried out in an

expander and at substantially atmospheric pressure, and wherein the expansion steps are carried out so that finally-expanded beads are produced, the expansion steps being carried out so that the finally-expanded beads have a density of from about 0.8 pounds per cubic foot to about 2 pounds per cubic foot.

5,086,079

PROCESS FOR PRODUCING STYRENE POLYMERS WITH NARROW PARTICLE SIZE DISTRIBUTION

Dirk Reese, Horst Leithoenser, both of Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 207,194, Jun. 16, 1988, abandoned.

This application Jan. 10, 1991, Ser. No. 638,157

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1987, 3728044

Int. Cl.⁵ C08J 9/18; C08F 12/08

U.S. Cl. 521—56 12 Claims

1. A process for producing styrene-containing polymers having a narrow particle size distribution, comprising the steps:

- (i) preparing a polymerization mixture, said mixture comprising
 - a) an organic phase comprising at least 50 wt.% styrene and a monomer-soluble polymerization initiator, and
 - b) an aqueous phase comprising water, a water soluble organic protective colloid and a substantially water insoluble inorganic suspension stabilizer;
- (ii) adding to said polymerization mixture 100–300 ppm of a metal carbonate, bicarbonate or mixtures thereof based on said aqueous phase; and
- (iii) polymerizing said polymer mixture to produce said styrene-containing polymer particles.

5,086,080

PROCESS FOR THE PREPARATION OF EXPANDABLE BEADS

Francesco Anfuso, Mantova; Andrea Mattiussi, Milan; Savino Matarrese, Verona, and Italo Borghi, Ferrara, all of Italy, assignors to Montedipe S. R. L., Milan, Italy

Filed Jun. 13, 1990, Ser. No. 538,080

Claims priority, application Italy, Jul. 5, 1989, 21092 A/89

Int. Cl.⁵ C08J 9/20

U.S. Cl. 521—59 13 Claims

1. Process for the preparation of expandable beads constituted by blends of poly(phenylene-ether) and a vinyl aromatic polymer and containing an expanding agent, which process consists essentially of:

- dissolving a poly(phenylene-ether) in a vinyl aromatic monomer;
- prepolymerizing the vinyl aromatic monomer, at a temperature between 100° C. and 130° C., optionally in the presence of a peroxide initiator, to obtain a conversion of 10–45% by weight of polymerized vinyl aromatic monomer;
- suspending this prepolymerized mass in water;
- adding the expanding agent; and
- completing the polymerization in the aqueous suspension.

5,086,081

AMINE-BORON ADDUCTS AS REDUCED ODOR CATALYST COMPOSITIONS FOR THE PRODUCTION OF POLYURETHANES

Ann C. L. Savoca, Sinking Springs, and Michael Louie, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 20, 1991, Ser. No. 763,107

Int. Cl.⁵ C08J 9/00

U.S. Cl. 521—103 6 Claims

1. In a method for preparing a polyurethane foam which comprises reacting an organic polyisocyanate and a polyol in the presence of a blowing agent, a cell stabilizer and a catalyst, the improvement which comprises employing as the catalyst a

composition consisting essentially of the addition product of triethylenediamine and a boron compound having the formula



where

n=0 or 1, and

R=C₁–C₈ alkyl, C₅–C₈ cycloalkyl or C₆–C₁₀ aryl.

5,086,082

IGNITION RESISTANT POLYURETHANE FOAMS WITH MELAMINE

Herman Stone, Hazleton, Pa., assignor to PMC, Inc., Sun Valley, Calif.

Filed Sep. 27, 1989, Ser. No. 413,271

Int. Cl.⁵ C08G 68/14; C08J 9/00

U.S. Cl. 521—107 10 Claims

1. An improved ignition resistant, flexible, open-celled polyurethane foam produced in situ from the reaction, in the presence of a catalyst, of an isocyanate, a blowing agent, a foam stabilizer, a polyether polyol, melamine, and a blend of about 80 to 85% pentabromodiphenyl oxide in an aromatic phosphate plasticizer, wherein the melamine is present in an amount of from about 30 to about 40 parts by weight per 100 parts by weight of polyol, and wherein the blend of about 80 to 85% pentabromodiphenyl oxide in an aromatic phosphate plasticizer is present in an amount of from about 15 to about 25 parts by weight per 100 parts by weight of polyol, the polyurethane foam being sufficiently ignition resistant to pass the California Technical Bulletin No. 117, Underwriters Laboratories UL-94, and British Standard 5852 Pt. 2 Source 5 flammability tests.

5,086,083

DIALKYL DICARBONATES AS BLOWING AGENTS FOR POLYMERS

Ralph Franklin, Danbury, Conn.; William J. Parr, Hopwell Junction, N.Y.; Gerald Fesman, Teaneck, N.J., and Barry Jacobs, Matthews, N.C., assignors to Akzo NV, Arnhem, Netherlands

Continuation-in-part of Ser. No. 622,034, Dec. 4, 1990, Pat. No. 5,030,664, which is a division of Ser. No. 353,852, May 18, 1989, Pat. No. 4,983,320. This application Jul. 2, 1991, Ser. No. 724,687

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.⁵ C08J 9/08

U.S. Cl. 521—129 29 Claims

1. A method of producing polymeric foams wherein at least one of the blowing agents used is a catalyzed blowing agent capable of generating carbon dioxide gas at about room temperature, said method comprising the steps of:

- (a) providing a crosslinking polymer system which can be changed from a fluid to a foamed form and incorporating at least one blowing agent comprising a dicarbonate having alkyl substituent end groups;
- (b) combining said dicarbonate compound with at least one dicarbonate decomposition catalyst comprising a tertiary amine having at least one sterically accessible nitrogen which exhibits nucleophilicity; and
- (c) using the combination of said blowing agent and said decomposition catalyst to initiate the generation of carbon dioxide gas at about room temperature to produce said foam.

5,086,084

POLYVINYL CHLORIDE/POLYURETHANE HYBRID FOAMS

William Michaelson, Cerritos, Calif., assignor to Lee H. Ambrose, Aspen, Colo.

Continuation of Ser. No. 399,851, Aug. 29, 1989, abandoned, which is a continuation of Ser. No. 300,787, Jan. 23, 1989, abandoned. This application Apr. 18, 1990, Ser. No. 512,064

Int. Cl.⁵ C08L 75/00

U.S. Cl. 521—137 21 Claims

1. A foamed rigid polymeric material comprising a continuous phase of polyurethane defining a multiplicity of microcells no greater than about 1 millimeter in diameter, said continuous phase containing integral, substantially uniformly dispersed solid polyvinyl chloride particles having surface features effective to provide a multiplicity of seed bubble sites and serving to stabilize and reinforce said microcellular structure of said foamed polymeric material to produce a rigid structure approximating the mechanical properties of woods.

5,086,085

MELAMINE-FORMALDEHYDE AEROGELS

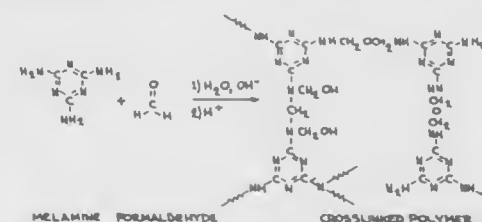
Richard Walter Pekala, Pleasant Hill, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Division of Ser. No. 684,051, Apr. 11, 1991. This application

Jun. 19, 1991, Ser. No. 717,581

Int. Cl.⁵ C08G 12/00; C08J 9/28

U.S. Cl. 521—187 8 Claims



1. A composition of matter comprising a low density, melamineformaldehyde (MF) aerogel which is transparent and essentially colorless, wherein the cell/pore sizes of the aerogel are less than or equal to 500 angstroms (Å) and the density of the aerogel is from about 0.1 to 0.8 g/cc.

5,086,086

ENERGY-INDUCED CURABLE COMPOSITIONS

Katherine A. Brown-Wensley, Lake Elmo; Robert J. DeVoe, and Michael C. Palazzotto, both of St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 90,791, Aug. 28, 1987, Pat. No. 4,952,612, and a division of 90,791, Aug. 28, 1987. This application May 2, 1990, Ser. No. 518,089

Int. Cl.⁵ C08F 4/80, 20/18, 20/56, 18/14

U.S. Cl. 522—25 21 Claims

1. A polymerizable composition consisting essentially of a least one ethylenically-unsaturated monomer selected from the group consisting of

- a) acrylates and methacrylates free of epoxy functionality,
- b) acrylamides and methacrylamides, and
- c) vinyl azlactones and divinyl compounds selected from the group consisting of diallyl phthalate, divinyl succinate, divinyl adipate, and divinyl phthalate, and

a curing agent comprising an organometallic compound and an onium salt selected from the group consisting of halonium compounds and cationic compounds of hypervalent Group VIA elements, said organometallic compound having the formula,



wherein

L¹ represents none, or 1 to 12 ligands contributing pi-electrons that can be the same or different ligand selected from substituted and unsubstituted acyclic and cyclic unsaturated compounds and groups and substituted and unsubstituted carbocyclic aromatic and heterocyclic aromatic compounds, each capable of contributing 2 to 24 pi-electrons to the valence shell of M;

L² represents none, or 1 to 24 ligands that can be the same or different contributing an even number of sigma-electrons selected from mono-, di-, and tri-dentate ligands, each donating 2, 4, or 6 sigma-electrons to the valence shell of M;

L³ represents none, or 1 to 12 ligands that can be the same or different, each contributing no more than one sigma-electron each to the valence shell of each M;

Ligands L¹, L², and L³ can be bridging or non-bridging ligands;

M represents 1 to 4 of the same or different transition metal atom selected from the elements of Periodic Groups IVB, VB, VIB, VIIB, and VIIIB;

with the proviso that said organometallic compound contains at least one of a metal-metal sigma bond and L³; and with the proviso that L¹, L², L³, and M are chosen so as to achieve a stable configuration.

5,086,087

COMPOSITION CONTAINING UV CURABLE UNSATURATED MONOMERS AND/OR OLIGOMERS, A PHOTOINITIATOR AND COLLOIDAL SILICA WITH AN ORAGNOSILANE COMPOUND, AND THE APPLICATION OF THIS COMPOSITION IN COATINGS

Tosko A. Misev, Zwolle, Netherlands, assignor to Stamcarbon B.V., Geleen, Netherlands

Filed Mar. 24, 1989, Ser. No. 328,562

Claims priority, application Netherlands, Mar. 25, 1988, 8800748

Int. Cl.⁵ C08J 3/28

U.S. Cl. 522—84 8 Claims

1. Composition comprising UV curable unsaturated monomers and/or oligomers, a photoinitiator and colloidal silica with a polyalkoxysilane and an acid catalyst.

5,086,088

EPOXY-ACRYLATE BLEND PRESSURE-SENSITIVE THERMOSETTING ADHESIVES

Shuichi Kitano, Sagami, Kiyoshi Ogata, Hashimoto, and Shinobu Sato, Tokyo, all of Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 321,571, Mar. 9, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 632,029

Int. Cl.⁵ C08F 2/46

U.S. Cl. 522—170 20 Claims

1. A pressure-sensitive thermosetting adhesive which is the photopolymerization reaction product of a blend consisting essentially of:

- (a) from about 30% to about 80% by weight of a photopolymerizable monomeric or prepolymeric syrup containing an acrylic acid ester of a nontertiary alcohol, and a moderately polar copolymerizable monomer;
- (b) from about 20% to about 60% by weight of an epoxy resin or a mixture of epoxy resins containing no photopolymerizable groups;
- (c) from about 0.5% to about 10% by weight of a heat-activatable hardener for the epoxy resin;
- (d) from about 0.01% to about 5% of a photoinitiator; and
- (e) from 0% to about 5% of a photocrosslinking agent.

5,086,089

PROGRAMMED GELATION OF POLYMERS USING MELAMINE RESINS

Paul Shu, West Windsor, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 431,419, Nov. 3, 1989, Pat. No. 4,964,461.

This application Aug. 10, 1990, Ser. No. 565,595

Int. Cl.⁵ C09K 7/00; C08C 19/22; C08F 8/32; C08G 8/30
U.S. Cl. 523—130 10 Claims

1. A process for the programmed gelation of a polymer which is crosslinkable by reaction with an amino resin, which comprises the following steps:

- determining a period of time within which full gelation of the polymer is to be achieved;
- preparing a gel-forming aqueous-based mixture comprising the polymer, a rapid amino resin crosslinking agent and a delayed amino resin crosslinking agent, said gel-forming aqueous-based mixture capable of complete gelation within the period of time determined in step (a);
- partially gelling the aqueous-based mixture by reacting the polymer with the rapid amino resin crosslinking agent which is effective to complete the partial gelation by crosslinking the polymer within four hours; and
- fully gelling the aqueous-based mixture by reacting the polymer with the delayed amino resin crosslinking agent which is effective to complete the full gelation by crosslinking the polymer within the period of time determined in step (a).

5,086,090

PROCESS FOR THE PREPARATION OF BINDER DISPERSIONS CAPABLE OF BEING CATHODICALLY DEPOSITED USING CROSSLINKING AGENTS BASED ON POLYISOCYANATES BLOCKED BY HYDROXYL GROUPS

Michael Geist, Ludwigshafen, Fed. Rep. of Germany; Klaus Cibura, Southfield, Mich.; Walter Jouck, Münster; Gunther Ott, Münster; Jürgen Sadłowski, Münster; Manfred Dangschafft, Drensteinfurt, and Manfred Reimann, Münster, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Münster-Hiltrup, Fed. Rep. of Germany

PCT No. PCT/EP88/00998, § 371 Date Jun. 13, 1990, § 102(e) Date Jun. 13, 1990, PCT Pub. No. WO89/04353, PCT Pub. Date May 18, 1989

PCT Filed Nov. 3, 1988, Ser. No. 466,437

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738219

Int. Cl.⁵ C08G 59/40; C09D 5/44

U.S. Cl. 523—414 27 Claims

1. A process for making an aqueous dispersion of a cathodically electrodepositable binder which is heat-curable upon baking at a temperature below 160° C. for a time of 30 minutes or less, comprising:

- reacting a polyepoxide and a compound containing one or more hydroxyl groups attached to an aromatic or (cyclo)aliphatic fragment in the presence of a catalyst at an elevated temperature to produce an epoxy-group containing intermediate;
- adding a solvent with external cooling to form a resin solution;
- boiling the resin solution at reflux until the solution temperature drops to 20° C. to 95° C.,
- adding an amine to the solution to form an epoxy-amine adduct,
- dispersing the epoxy-amine adduct in a water/acid mixture, and
- adding a crosslinking agent which is blocked by hydroxyl groups to the water acid mixture to form the aqueous dispersion.

5,086,091

CATHODIC WATER-DILUTABLE BINDERS, WATER-DILUTABLE COATING COMPOSITIONS AND PROCESSES FOR THE PREPARATION OF CATHODIC WATER-DILUTABLE BINDERS BASED ON MERCAPTO-KETIMINE-MODIFIED EPOXY RESINS

Michael Geist, Munster, Fed. Rep. of Germany; Klaus Cibura, Southfield, Mich.; Helmut Fobbe, and Gunther Ott, both of Munster, Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Münster-Hiltrup, Fed. Rep. of Germany

PCT No. PCT/EP87/00713, § 371 Date Nov. 20, 1989, § 102(e) Date Nov. 20, 1989, PCT Pub. No. WO88/03941, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 16, 1987, Ser. No. 368,316

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639488

Int. Cl.⁵ C09D 5/44; C08G 59/66

U.S. Cl. 523—415 16 Claims

1. A cathodic water-dilutable binder containing primary amino groups and neutralized with acid comprised of the reaction product of:

- An epoxy group containing resin, and
- A compound having a mercapto group which is reactive with epoxy groups and at least one ketimine group, and wherein the reaction product is neutralized with acid.

5,086,092

HEAT-CURABLE AQUEOUS COATING AGENT FOR CATHODIC ELECTROCOATING CONTAINING MONOMERIC CHELATING AGENT

Hans Schupp, Worms; Thomas Schwerzel, Ludwigshafen; Dirk Lawrenz, Hassloch; Hans-Josef Oslowski, and Ulrich Heilmann, both of Muenster, all of Fed. Rep. of Germany, assignors to BASF Lacke + Farben Aktiengesellschaft, Muenster, Fed. Rep. of Germany

Continuation of Ser. No. 556,853, Jul. 24, 1990, abandoned, which is a continuation of Ser. No. 278,578, Dec. 1, 1988, abandoned. This application Apr. 12, 1991, Ser. No. 684,150

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741161

Int. Cl.⁵ C09D 5/44

U.S. Cl. 523—414 5 Claims

1. A heat-curable aqueous coating agent for cathodic electrocoating comprising:

- An amino-containing polymerization, polycondensation or poly addition product as binder which becomes water-dilutable on protonation with an acid,
- A crosslinking agent, and
- From 0.05 to 10% by weight, based on components (A) and (B), of a monomeric organic complexing compound having at least two identical or different heteroatoms chosen from the group consisting of N, O or S atoms and containing an aromatic heterocyclic ring having N, O or S atoms with not more than two heteroatoms being present in said heterocyclic ring.

5,086,093

AQUEOUS ORGANIC COMPOSITIONS AS CERAMIC BINDERS FOR CASTING AND MOLDING

Lawrence T. Miller, Vienna, W. Va., assignor to Allied-Signal Inc., Morris Township, N.J.

Filed Apr. 2, 1990, Ser. No. 503,356

Int. Cl.⁵ C08L 5/04

U.S. Cl. 524—28 20 Claims

1. A mixture of a ceramic material and an aqueous organic composition wherein the aqueous organic composition comprises an aqueous dispersion of an ethylene copolymer.

5,086,094

ORGANIC SOLVENT SOLUTIONS OF PHOSPHATE ESTERS OF EPOXY RESINS

John L. Massingill, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 241,517, Sep. 7, 1988, abandoned. This application May 29, 1990, Ser. No. 530,126

Int. Cl.⁵ C08G 59/50

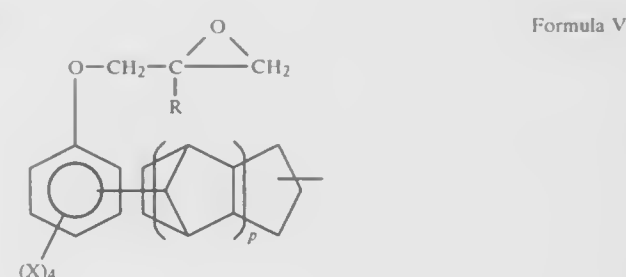
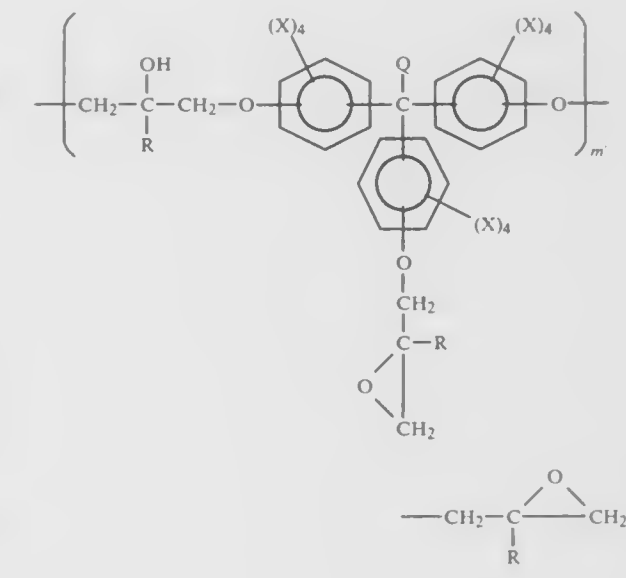
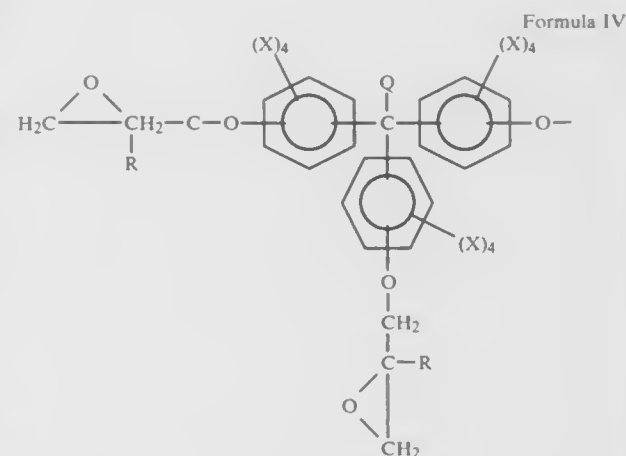
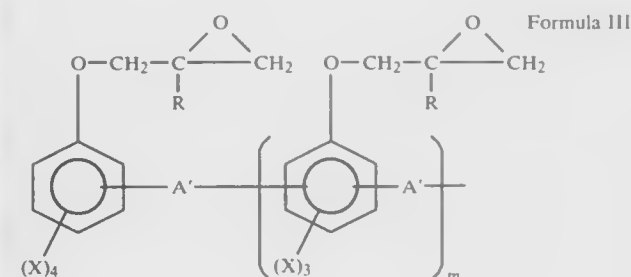
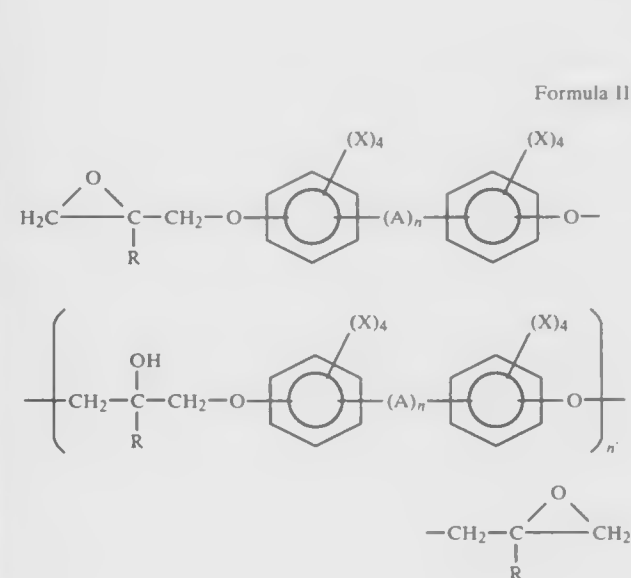
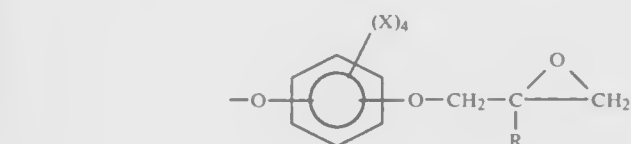
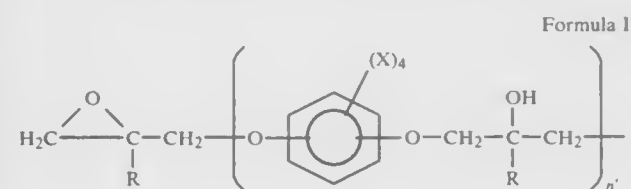
U.S. Cl. 523—414 32 Claims

1. A curable composition which is (a) essentially water free and (b) polymer of ethylenically unsaturated monomer free; which comprises a mixture of

(A) a product which is free of methylol or alkoxymethyl substituent groups resulting from reacting under phosphorylating conditions

(1) at least one compound containing an average of more than one vicinal epoxide group per molecule selected from the group consisting of those epoxy resins represented by the following formulas I, II, III, IV or V

-continued



5,086,095

WEATHER-RESISTANT POLYACETAL RESIN COMPOSITIONS AND MOLDED ARTICLES THEREOF
Toru Katsumata, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Oct. 15, 1990, Ser. No. 597,169

Claims priority, application Japan, Oct. 2, 1989, 1-257240

Int. Cl.⁵ C07K 5/34

U.S. Cl. 524—91

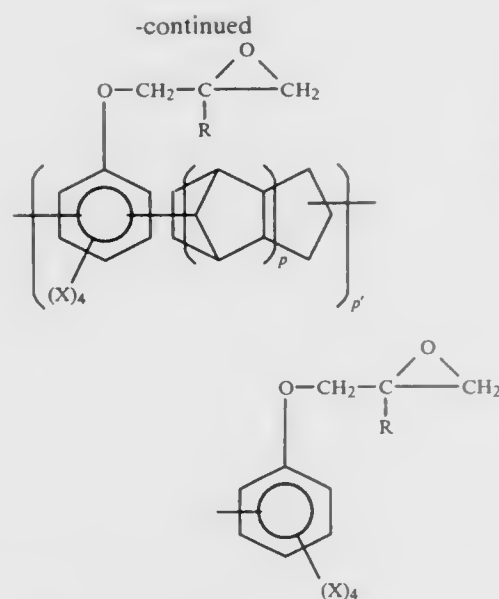
9 Claims

1. A weather-resistance molded article formed of a polyacetal resin composition which comprises, based on the total weight of the compositions, a melt-blend of:

- (A) a polyacetal base resin;
(B) between 0.01 to 5% by weight of a weather stabilizer which is at least one selected from the group consisting of benzotriazoles, benzophenones, aromatic benzoates, cyanoacrylates, oxalanilides and hindered amines;
(C) between 1 to 40% by weight of an acrylic resin which is at least one resin selected from the group consisting of methyl methacrylate homopolymers or methyl methacrylate copolymers mainly comprised of methyl methacrylate; and

(D) a fluoroacetal resin which is one or more polymers selected from the group consisting of polytetrafluoroethylene, polyvinyl fluoride, polyvinylidene fluoride tetrafluoroethylene/hexafluoropropylene copolymer and tetrafluoroethylene/ethylene copolymer, and wherein

said fluoroacetal resin being present in an effective amount of between 1 to 20% by weight to enhance the acrylic resin's fluidity within said polyacetal base resin such that said acrylic resin is present in a localized region near a surface of the molded article, whereby weather-resistance of the molded article is improved.



wherein each A is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms; each A' is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each Q is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; each X is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 12 carbon atoms or a halogen atom; m has a value from about 0.01 to about 8; n has a value of zero or 1; n' has an average value from about 0 to about 200; each p suitably has a value from zero to about 10; and each p' suitably has a value from zero to about 8; with

- (2) at least one member selected from the group consisting of
(a) phosphoric acid;
(b) super phosphoric acid; and
(c) a combination of (a) and (b); and
(3) optionally water; wherein component (2) is employed in an amount which provides a ratio of moles of component (2) to component (1) of from about 0.02:1 to about 5:1; and component (3) is employed in an amount which provides a ratio of moles of component (3) to moles of component (1) of from zero:1 to an amount sufficient to totally hydrolyze all of the epoxide groups in component (1), said amount of water including any amount of water contained in component (2) and subsequently removing any residual quantities of water remaining after any hydrolysis of the epoxide-containing compound of component (1); and

(B) at least one organic solvent for component (A); and wherein component (A) is employed in an amount of from about 100 to about 10 percent by weight based upon the combined weight of components (A) and (B); and component (B) is employed in an amount of from about 0 to about 90 percent by weight based upon the combined weight of components (A) and (B); and

(C) a curing quantity of at least one curing agent for component (A) which curing agent cures through the aliphatic hydroxyl groups contained in the phosphorylated and optionally totally or partially hydrolyzed epoxy resin.

5,086,096

POLYACETAL COMPOSITIONS STABILIZED WITH MICROCRYSTALLINE OR FIBROUS CELLULOSE
Leonard E. R. Kosinski, Washington, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 483,603, Feb. 22, 1990,

abandoned. This application Jun. 11, 1990, Ser. No. 536,369

Int. Cl.⁵ C08L 1/08, 59/00

U.S. Cl. 524—36

18 Claims

1. A thermoplastic polyacetal composition consisting essentially of

(a) 0.05 to 5 weight percent of a stabilizer selected from the group consisting of microcrystalline cellulose and fibrous cellulose, and

(b) 95 to 99.95 weight percent of polyacetal, provided that the above-stated percentages are based on the total amount of components (a) and (b) only and wherein the average particle size of the microcrystalline cellulose is 100 microns or less.

5,086,097

ULTRAVIOLET STABILIZER FOR POLYCARBONATE COMPOSITIONS
Steven A. Jorissen, Mars, and Sivaram Krishnan, Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

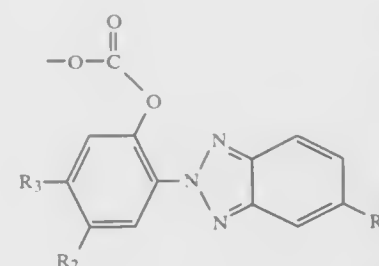
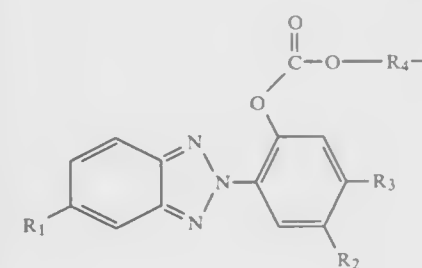
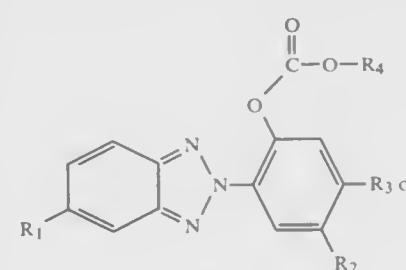
Filed Jan. 7, 1991, Ser. No. 638,462

Int. Cl.⁵ C08K 5/27

U.S. Cl. 524—91

13 Claims

1. A thermoplastic molding composition comprising (i) an aromatic polycarbonate resin and (ii) an effective amount of a UV stabilizer conforming to



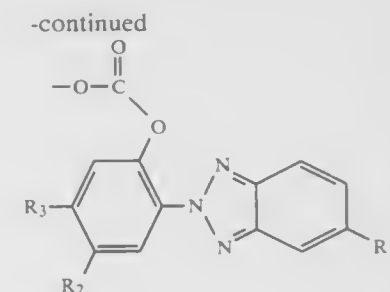
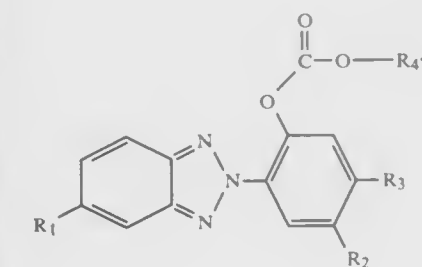
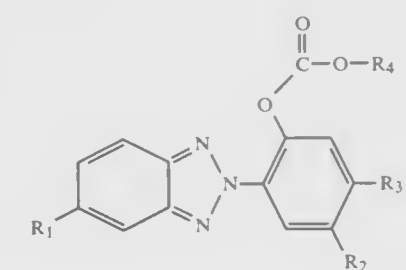
wherein

R₁ denotes a hydrogen or a halogen atom or a C₁₋₄ alkyl or alkoxy group,

R₂ and R₃ independently represent a hydrogen atom, a C₁₋₁₂ alkyl, a C₁₋₄ alkoxy group, a phenyl or a phenoxy radical, and

R₄ denotes a C₁₋₁₂ alkylene radical or a C₆₋₃₀ arylene group.

9. A thermoplastic molding composition having initial optical properties which include a yellowness index of less than 3.30%, a haze value of less than 0.5% and total light transmission greater than 89.0% comprising (i) an aromatic polycarbonate resin and (ii) an effective amount of a UV stabilizer conforming to



(II) wherein

R₁ denotes a hydrogen or a halogen atom or a C₁₋₄ alkyl or alkoxy group,

R₂ and R₃ independently represent a hydrogen atom, a C₁₋₁₂ alkyl, a C₁₋₄ alkoxy group, a phenyl or a phenoxy radical, and

R₄ denotes a C₁₋₁₂ alkylene or a C₆₋₃₀ arylene group.

5,086,098

POLYHALOAROMATIC ESTER FLAME RETARDANTS FOR POLYOLEFIN RESINS

Joseph M. Bohen, King of Prussia, Pa., and Gerald H. Reifenberg, East Windsor, N.J., assignors to Atochem North America, Inc., Philadelphia, Pa.

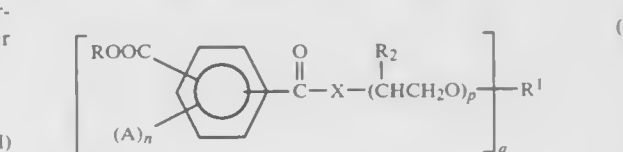
Continuation of Ser. No. 322,035, Mar. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 3,839, Oct. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 115,211, Oct. 30, 1987, Pat. No. 4,762,861, and Ser. No. 115,688, Oct. 30, 1987, Pat. No. 4,938,894, and Ser. No. 173,344, Mar. 25, 1988, Pat. No. 4,912,158, and Ser. No. 173,691, Mar. 25, 1988, Pat. No. 4,923,917, and Ser. No. 173,343, Mar. 25, 1988, Pat. No. 4,954,542, which is a continuation-in-part of Ser. No. 244,421, Sep. 16, 1988, Pat. No. 5,049,697. This application Dec. 3, 1990, Ser. No. 622,122

Int. Cl.⁵ C08K 5/20, 5/12

U.S. Cl. 524—94

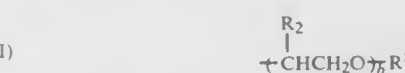
20 Claims

1. A flame retardant composition comprising a uniform blend of a polyolefin resin and an amount of an ester of a polyhaloaromatic acid of the following general formula to increase the flame retardancy in said resin:



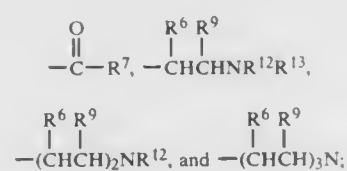
wherein

- (a) the ring can have all possible isomeric arrangements;
(b) R is selected from the group consisting of alkyl or substituted alkyl or 1 to 30 carbons with the proviso that said alkyl is not substituted with a hydroxy group or a halogen, and



wherein R⁸ is an alkyl or substituted alkyl of 1 to 18 carbons, and b is 1 to 50 with the proviso that said alkyl is not substituted with a hydroxy group or a halogen;

(c) R¹ is selected from the group consisting of alkyl or substituted alkyl or 1 to 30 carbons, alkenyl or substituted alkenyl of 2 to 22 carbons with the proviso that said alkyl and alkenyl are not substituted with a hydroxy group or a halogen,



- with the proviso that the valence of R^1 is equal to q ;
- (d) R^2 is independently selected from the group consisting of H and CH_3 ;
- (e) R^6 , R^9 , R^{12} and R^{13} are independently hydrogen or alkyl of 1 or 22 carbons, R^7 is an alkyl of 1 to 18 carbons;
- (f) p is an integer of 0 to 50;
- (g) q is an integer of 1 to 6;
- (h) A is halogen;
- (i) X is O or NH; and
- (j) $n=1$ to 4.

5,086,099

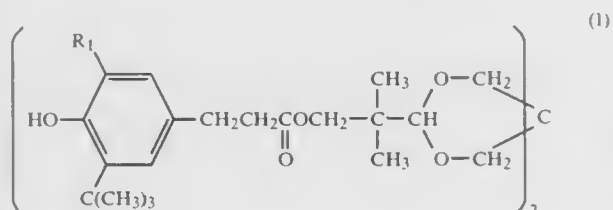
INORGANIC FILLER CONTAINING POLYOLEFIN COMPOSITION

Yoshiharu Fukui, and Kazuhisa Kuroda, both of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan
Division of Ser. No. 348,418, May 8, 1989, Pat. No. 4,985,480.
This application Oct. 31, 1990, Ser. No. 606,940
Claims priority, application Japan, May 9, 1988, 63-113390
Int. Cl.⁵ C08K 5/15

U.S. Cl. 524-108

5 Claims

1. An inorganic filler-containing polyolefin composition which comprises
- (a) 100 parts by weight of a polyolefin,
- (b) 1-100 parts by weight of an inorganic filler,
- (c) 0.01-1.0 part by weight of a phenolic antioxidant represented by general formula (I) shown below:



wherein R_1 represents an alkyl group of 1-3 carbon atoms, and

- (d) at least one compound selected from the group consisting of the compounds represented by general formula



wherein R_3 represents an alkyl group or an alkenyl group of 5-21 carbon atoms.

5,086,100

INORGANIC FILLER CONTAINING POLYOLEFIN COMPOSITION

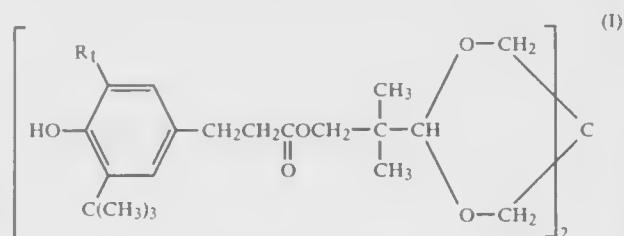
Yoshiharu Fukui, and Kazuhisa Kuroda, both of Ichihara, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan
Division of Ser. No. 348,418, May 8, 1989, Pat. No. 4,985,480.
This application Oct. 31, 1990, Ser. No. 606,936
Claims priority, application Japan, May 9, 1988, 63-113390
Int. Cl.⁵ C08K 5/15

U.S. Cl. 524-108

4 Claims

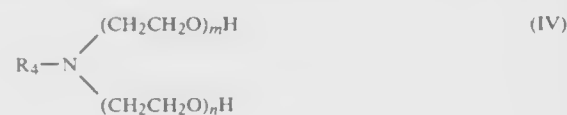
1. An inorganic filler-containing polyolefin composition which comprises
- (a) 100 parts by weight of a polyolefin,
- (b) 1-100 parts by weight of an inorganic filler,

- (c) 0.01-1.0 part by weight of a phenolic antioxidant represented by general formula (I) shown below:

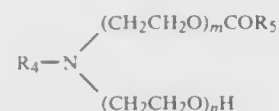


wherein R_1 represents an alkyl group of 1-3 carbon atoms, and

- (d) at least one compound selected from the group consisting of the compounds represented by general formula



or



wherein R_4 represents an alkyl group, an alkenyl group or an acyl group ($\text{R}'-\text{CO}$) of 8-18 carbon atoms, m and n are integers which meet $m+n=2$ to 10, R' represents an aliphatic carbon chain which may be saturated or unsaturated, and R_5 represents an alkyl group or an alkenyl group of 7-17 carbon atoms.

5,086,101

GLASS SIZE COMPOSITIONS AND GLASS FIBERS COATED THEREWITH

David W. Garrett, Marietta, Ga., and Robert A. Schweizer, Granville, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jul. 13, 1990, Ser. No. 552,050

Int. Cl.⁵ C08J 5/10; C08K 5/15, 5/24; B32B 9/00

U.S. Cl. 524-188

15 Claims

1. An glass aqueous size composition comprising a water dispersible phenoxy resin modified with an acid, a di- or tri-functional cyanurate or isocyanurate, and an organosilane coupling agent.

5,086,102

MIXTURES OF POLY(ARYLENE SULPHIDES), MALEAMIDIC ACIDS AND GLASS FIBRES

Harald Pielartzik; Burkhard Köhler, both of Krefeld, Fed. Rep. of Germany; Hans-Joachim Traenckner, Merksem, Belgium; Wolfgang Jakob, Moers, and William C. Bushong, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jul. 5, 1990, Ser. No. 548,601

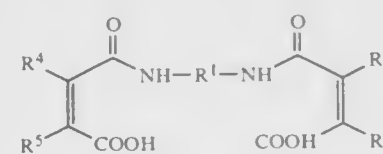
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1989, 3923658

Int. Cl.⁵ C08K 5/54

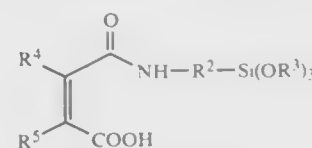
U.S. Cl. 524-188

7 Claims

1. Mixture containing
- A) 99.9 to 20 wt. % poly(arylene sulphides) and
- B) 0.1 to 40 wt. % of an amidic acid of formula (I) or (II) or both,



(I)



(II)

where

R^1 is a divalent radical selected from the group consisting of 1 to 38 aliphatic radicals, one or more cycloaliphatic rings having a total of up to 38 carbon atoms in the rings, one or more aromatic rings having a total of from 6 to 24 carbon atoms and where 2 or more aromatic groups are present, they can be linked by a chemical bond, an oxygen atom, a sulphur atom, a carbonyl group or a sulphone group,

R^2 is C_1 - C_{10} alkylene group or a phenylene group,

R^3 is a C_1 - C_6 alkyl group or a C_6 - C_{14} aryl group and R^4 and R^5 is each the same or different and represents hydrogen, C_1 - C_{22} alkyl, or C_6 - C_{14} aryl.

5,086,103

PRESSURE-SENSITIVE COMPOSITION CONTAINING AN AMINOXYSILICON COMPOUND

John D. Blizzard, and Terence J. Swihart, both of Bay County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 303,783, Jan. 30, 1989, abandoned. This application Apr. 24, 1990, Ser. No. 513,727

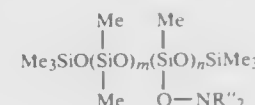
Int. Cl.⁵ C08K 5/54; C09J 11/06, 11/08

U.S. Cl. 524-188

4 Claims

1. A composition consisting essentially of:

- (I) a pressure-sensitive adhesive selected from those based on acrylic, styrene-butadiene, acrylonitrile-butadiene, polyisobutylene, isoprene, isoprene-isobutylene, chloroprene, polyvinylether, chlorinated or polyurethane rubber; and
- (II) an aminoxy silicon compound having the structure



wherein Me denotes a methyl radical, R'' is independently selected from the group consisting of methyl and ethyl radicals, m is 1 to about 5,000 and n is 2 to about 50, said aminoxy silicon compound constituting from about 1 to 20 percent of the total weight of said ingredients (I) and (II).

5,086,104

POLYESTER RESIN COMPOSITIONS EXHIBITING LONG-TERM TEMPERATURE RESISTANCE, AND MOLDED ARTICLES FORMED OF THE SAME

Mitsuo Wada, and Koichi Kato, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jan. 31, 1991, Ser. No. 647,632

Claims priority, application Japan, Feb. 2, 1990, 2-24187

Int. Cl.⁵ C08K 5/37, 5/20

U.S. Cl. 524-217

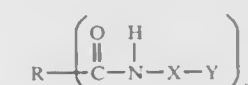
9 Claims

1. A polyester resin composition comprising:

- (A) between 60 to 99 parts by weight of a crystalline thermoplastic polyester resin,
- (B) between 1 to 40 parts by weight of a polyester elastomer,

wherein the total amount of components (A) and (B) is 100 parts by weight, and

(C) between 0.005 to 10 parts by weight of an amide compound of the general formula (I):



wherein R represents an n-valent organic group, X represents an alkylene group having 2 to 10 carbon atoms or a substituted derivative thereof, Y represents $-\text{COOH}$, $-\text{OH}$, $-\text{SH}$ or $-\text{NH}_2$ and n represents an integer from 2 to 4, inclusive.

5,086,105

THERMOPLASTIC RESIN COMPOSITION

Hiroomi Abe; Taichi Nishio, and Kaoru Kitadono, all of Chiba, Japan, assignors to Sumitomo Chemical Co. Ltd., Osaka, Japan

Filed Dec. 11, 1989, Ser. No. 448,338

Claims priority, application Japan, Dec. 15, 1988, 63-317020

Int. Cl.⁵ C08L 83/07; C08K 3/36

U.S. Cl. 524-492

27 Claims

1. A thermoplastic resin composition which comprises (I) 100 parts by weight of a resin comprising 5-95% by weight of a polyphenylene ether resin, a mixture of a polyphenylene ether resin and a styrene resin or a graft polymer of a polyphenylene ether resin and styrene and 95-5% by weight of polyamide resin, (II) 0-50 parts by weight of a rubber-like material, (III) 2.0-50 parts by weight of an inorganic filler having an average particle size of 5.0μ or less and (IV) 0.01-10 parts by weight of at least one compatibilizing agent which improves compatibility between the polyphenylene ether resin and the polyamide resin.

5,086,106

METHACRYLIC RESIN CAST PLATE HAVING EXCELLENT ANTISTATIC PROPERTY

Kiyotaka Azegami, Machida; Suehiro Tayama, Otake; Naoki Yamamoto, Sueki; Akira Yanagase, and Hiroki Hatakeyama, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Continuation of Ser. No. 92,586, Sep. 3, 1987, abandoned. This application Oct. 17, 1989, Ser. No. 423,596

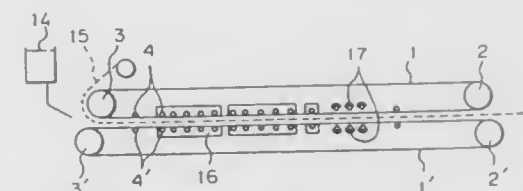
Claims priority, application Japan, Sep. 8, 1986, 61-211158; Sep. 9, 1986, 61-211890

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.⁵ C08K 5/10, 5/06; C08L 33/12

U.S. Cl. 524-300

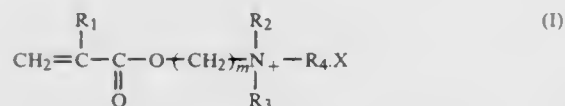
4 Claims



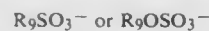
1. A methacrylic resin case plate having an excellent antistatic property, which is obtained by polymerizing a mixture comprising:

- (A) 100 parts by weight of methyl methacrylate, a monomer mixture comprising at least 50% by weight of methyl methacrylate and up to 50% by weight of at least one monomer copolymerizable therewith or a partial polymerization product thereof,
- (B) 0.1 to 20 parts by weight of a polymer comprising:
- (a) 20 to 100% by weight of units derived from a monomer

having a quaternary ammonium base, which is represented by the following general formula (I):

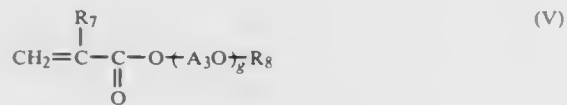


wherein R₁ represents a hydrogen atom or a methyl group, R₂ through R₄ represent an alkyl group having 1 to 9 carbon atoms, m is a number of from 1 to 10 and X is an anion represented by the following general formula:



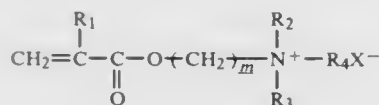
wherein R₉ represents a hydrogen atom or an alkyl group having 1 to 20 carbon atoms, which may have a phenyl group, and

(b) 0 to 80% by weight of units derived from at least one monomer which is copolymerizable with the monomer of the formula (I) and represented by the following general formula (V):

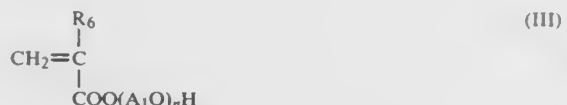


wherein R₇ represents a hydrogen atom or a methyl group, R₈ represents a hydrogen atom or an alkyl, allyl, aryl or aralkyl group having 1 to 10 carbon atoms, A₃ represents an alkylene group having 2 to 4 carbon atoms, and g is an integer of from 0 to 500, and

(C) 0.1 to 20 parts by weight of at least one compound selected from the group consisting of fatty acids represented by the following general formula (II):



wherein R₅ represents a hydrogen atom or an aliphatic hydrocarbon residue having 1 to 11 carbon atoms, compounds of the formula (III):



wherein R₆ represents a hydrogen atom or a methyl group, A₁ represents an alkylene group having 2 to 6 carbon atoms and n is 0 or 1, and alkylene glycols represented by the following general formula (IV):



wherein A₂ represents an alkylene group having 2 to 4 carbon atoms and p 1 or 2; said polymerization being effected in the absence of a liquid polymerization medium and within a casting mold.

5,086,107

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Masatoshi Arai; Tsuneo Kimura, and Yoshio Inoue, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1990, Ser. No. 634,998

Claims priority, application Japan, Dec. 28, 1989, 1-343431 Int. Cl.⁵ C08K 3/26

U.S. Cl. 524-424

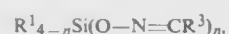
7 Claims

1. A room temperature-curable organopolysiloxane composition which comprises, as a blend:

- 100 parts by weight of a diorganopolysiloxane having a viscosity in the range from 25 to 500,000 centistokes at 25° C., of which the molecular chain ends are blocked with silanolic hydroxy groups;
- from 1 to 50 parts by weight of an iminoxysilane compound represented by the general formula



or



in which R¹ is an unsubstituted or substituted monovalent hydrocarbon group, R² is a hydrogen atom or an unsubstituted or substituted monovalent hydrocarbon group, R³ is an unsubstituted or substituted divalent hydrocarbon group forming a cyclic structure together with the carbon atom bonded to the nitrogen atom and the subscript n is 3 or 4, or a partial hydrolysis product thereof; (c) from 0.01 to 10 parts by weight of an organotin compound; and (d) from 1 to 500 parts by weight of a combination of zinc carbonate and zinc hydroxide in a powdery form of which the content of zinc hydroxide is in the range from 5 to 50% by weight.

5,086,108

FIBRIDS LOADED WITH ELECTROMAGNETIC-WAVE OBSCURANTS

James C. Hornsby, Hendersonville, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1989, Ser. No. 331,385

Int. Cl.⁵ C08J 5/12; C08K 3/08; C08L 1/12

U.S. Cl. 524-440

5 Claims

1. Polymeric fibrids, particularly suited for use as air-borne electromagnetic wave obscurants, said fibrids being of cellulose acetate polymer or of poly(m-phenylene isophthalamide) polymer, the polymer being loaded with an obscurant powder amounting to between 30 and 70% of the total weight of the fibrids, said fibrids being of a size that passes through a 20-mesh screen but does not pass through a 100-mesh screen and said fibrids having a settling rate of no greater than 2 meters per minute.

5,086,109

POLYPROPYLENE RESIN COMPOSITION

Kohhei Ueno; Tomohiko Akagawa, both of Sakai; Saburo Hinenoya, Izumisano, and Toshio Morimoto, Sakai, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 28, 1990, Ser. No. 618,899

Claims priority, application Japan, Dec. 1, 1989, 1-310568

Int. Cl.⁵ C08R 3/40

U.S. Cl. 524-496

7 Claims

1. A polypropylene resin composition comprising: (A) 50 to 90% by weight of a crystalline ethylene-propylene block copolymer having an ethylene content of 4 to 10% by weight, an insolubility, in boiling n-heptane, of a polypropylene component of 97% by weight or more, an inherent viscosity in decalin at 135° C., of p-xylene soluble at room temperature of 3 to 7, a melt flow index of 3 to 30, and a flexural modulus of 15,000 kg/cm² or more;

(B) 5 to 20% by weight of a hydrogenated block copolymer composed of both end blocks of an aromatic vinyl compound and an intermediate block of a conjugated diene polymer, the content of both end blocks being 10 to 40% by weight of the copolymer, 10% or less of both end blocks and 90% or more of the intermediate block being in a hydrogenated state;

(C) 0 to 15% by weight of an amorphous ethylene propylene copolymer having an inherent viscosity, in decalin at 135° C., of 1.8 to 3.5 and a Mooney viscosity ML₁₊₄ (100° C.) of 40 to 100;

(D) 0 to 5% by weight of a high density polyethylene having a melt flow index of 1 to 10; and

(E) 5 to 30% by weight of a particulate or flaky inorganic filler having an average particle diameter of 3 μm or less, wherein the blending ratio (B)/(C) (by weight) of the hydrogenated block copolymer component (B) to the amorphous ethylene-propylene copolymer component (C) is 100/0 to 20/80.

5,086,110

AQUEOUS POLYURETHANE DISPERSIONS

Han X. Xiao, Farmington Hill, and Shi Yang, Ferndale, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1989, Ser. No. 418,405

Int. Cl.⁵ C08G 18/10

U.S. Cl. 524-840

2 Claims

1. A prepolymer made by reaction of (A) 1 equivalent of 1,12-dodecanediisocyanate with (B) total 0.6-0.8 equivalent of the following active hydrogen compounds:

- alpha, alpha-dimethylolacetic acid or a homologue thereof,
- a polymeric glycol selected from poly(oxyalkylene)-glycols and polyester glycols having a weight average molecular weight of about 400-3000, and the amount of component (a) being about 0.08-0.25 hydroxyl equivalent per 100 g of total weight of all the reactants A and B.

5,086,111

AMINE FUNCTIONAL POLYMERS CONTAINING ACETAL GROUPS

Robert K. Pinschmidt, Jr., Allentown, Pa., and Ta-Wang Lai, Taipei, Taiwan, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 17, 1990, Ser. No. 525,377

Int. Cl.⁵ C08F 8/00

U.S. Cl. 525-61

9 Claims

1. An amine functional polyvinylacetal which is the reaction product of monoaldehyde and poly(vinylamine).

5,086,112

SOLVENT-RESISTANT POLYPHENYLENE ETHER RESIN COMPOSITION

Shizuo Togo, Ichikawa; Akikazu Amagai, Tokyo; Yoshinori Kondo, Tokyo, and Toshiaki Yamada, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 122,235, Nov. 17, 1987, Pat. No. 4,914,153. This application Nov. 16, 1989, Ser. No. 437,441

Claims priority, application Japan, Nov. 19, 1986, 63-273958

Int. Cl.⁵ C08L 51/06, 71/12

U.S. Cl. 525-68

4 Claims

1. A solvent-resistant polyphenylene ether resin composition comprising

- a modified polyphenylene ether obtained by modifying a polyphenylene ether with a modifier selected from the group consisting of maleic anhydride, glycidyl methacrylate and glycidyl acrylate in the absence of a radical initiator, and
- a modified polyolefin obtained by modifying a polyolefin with styrene and a modifier selected from the group con-

sisting of maleic anhydride, glycidyl methacrylate and glycidyl acrylate in the presence of a radical initiator.

5,086,113

THERMOPLASTIC BLENDS OF ABS CONTAINING ETHYLENE TERPOLYMERS

Kathryn A. Kamins, Hockessin, Del., and Robert J. Statz, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 236,441, Aug. 25, 1988, Pat. No. 4,985,497. This application Nov. 28, 1990, Ser. No. 618,503

The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.⁵ C08L 55/02, 101/06

U.S. Cl. 525-84

4 Claims

1. A toughened multi-phase thermoplastic blend comprising:

- 90-96 weight percent based on total blend of acrylonitrile/butadiene/styrene resin; and
- 4-10 weight percent based on total blend of a terpolymer comprising 40-79 weight percent of polymer repeat units of ethylene, about 15-40 weight percent of polymer repeat units of ethyl acrylate, and 6-20 weight percent of polymer repeat units of carbon monoxide having a melt flow index of 0.1-100 g/10 minutes, the blend having a flex modulus of at least 1700 MPa.

5,086,114

METHOD OF PRODUCING IMIDE BOND-CONTAINING RESINS

Akira Taniuchi; Hirohito Komori, and Koichi Niwa, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

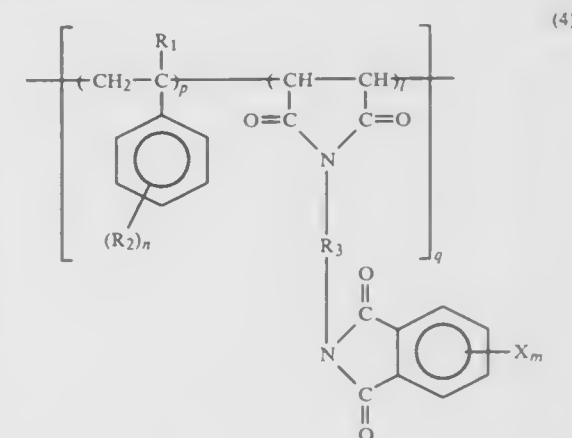
Filed May 21, 1990, Ser. No. 526,931

Claims priority, application Japan, Jun. 2, 1989, 1-141450 Int. Cl.⁵ C08F 8/30

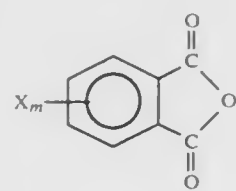
U.S. Cl. 525-123

8 Claims

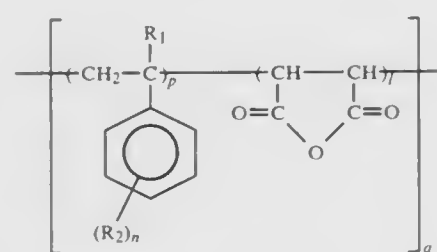
1. A method of producing imide bond-containing resins of the general formula (4)



wherein R₁ is H or CH₃, R₂ is H, Cl, Br, F or CH₃, R₃ is an aliphatic, aromatic or alicyclic hydrocarbon group, X is Br, Cl or F, l is equal to 1, m is an integer of 1 to 4, n is an integer of 1 to 5, p is an integer of 1 to 4 and q is a number equal to 1 to 100, which comprises reacting a halogenated phthalic anhydride of the general formula (1)



wherein X and m are as defined above, a copolymer of the general formula (2)



wherein R₁, R₂, p, n, l and q are as defined above, and a diisocyanate compound of the general formula (3)



wherein R₃ is as defined above, in an inert solvent in the presence of a quaternary phosphonium compound as a catalyst.

5,086,115

PROCESS FOR PRODUCTION OF OXIDIZED POLYISOBUTENES, THEIR USE IN THE PRODUCTION OF ADDITIVES AND USE OF THE ADDITIVES

Michael J. Clarke, Hull, England, assignor to BP Chemicals (Additives) Limited, London, England
Division of Ser. No. 216,634, Jun. 24, 1988. This application Apr. 26, 1991, Ser. No. 692,226

Claims priority, application United Kingdom, Nov. 27, 1986, 8628339

Int. Cl.⁵ C08F 8/32

U.S. Cl. 525—164

14 Claims

1. A process for the production of a product suitable for use as a lubricating oil additive which process comprises passing through a column of polyisobutene maintained at a temperature in the range from 140° to 200° C. and at atmospheric or elevated pressure a molecular oxygen-containing gaseous oxidant at a gas flow rate greater than 10 liters cm⁻²h⁻¹ measured at the operating pressure to obtain an oxidized polyisobutene and then reacting the oxidized polyisobutene with an aliphatic polyamine employing a mole ratio of polyamine to oxidized polyisobutene of from about 0.2 to about 2.5 moles of polyamine per mole of the oxidized polyisobutylene.

5,086,116

METHOD FOR PRODUCING THERMOPLASTIC RESIN COMPOSITION

Tadayuki Ohmae; Yoshiaki Toyoshima; Kentaro Mashita, and Jinsho Nambu, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 492,471, Mar. 12, 1990, which is a continuation of Ser. No. 157,262, Feb. 18, 1990, abandoned. This application Apr. 24, 1990, Ser. No. 513,940

Claims priority, application Japan, Mar. 31, 1987, 62-80786
Int. Cl.⁵ C08L 67/02

U.S. Cl. 525—166

1 Claim

1. A method for producing a thermoplastic resin composition which comprises:
melt-kneading (A) 60-97 parts by weight of polybutylene terephthalate and (B) 40-3 parts by weight of an epoxy

(1)

group-containing ethylene copolymer consisting essentially of:

- (a) 30-99% by weight of ethylene units,
- (b) 20-1% by weight of α,β -unsaturated carboxylic acid glycidyl ester units, and
- (c) 70-0% by weight of ester units selected from carboxylic acid vinyl ester unit and α,β -unsaturated carboxylic acid alkyl ester unit,

wherein (B) is prepared by copolymerizing (a), (b) and (c) at 100°-300° C. under 500-4000 atm in the presence of a radical forming agent, and then melt-kneading the resulting composition with (c) 0.01-20 parts by weight of an ethylene copolymer comprising ethylene and acrylic acid to carry out a partial crosslinking reaction.

5,086,117

METHOD FOR PRODUCING THERMOPLASTIC RESIN COMPOSITION

Tadayuki Ohmae; Yoshiaki Toyoshima; Kentaro Mashita, and Jinsho Nambu, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 385,438, Jul. 27, 1989, abandoned, which is a division of Ser. No. 157,262, Feb. 18, 1988, abandoned.

This application Feb. 8, 1991, Ser. No. 652,477

Claims priority, application Japan, Mar. 31, 1987, 62-80786
Int. Cl.⁵ C08L 67/02

U.S. Cl. 525—166

1 Claim

1. A method for producing a thermoplastic resin composition which comprises:

melt-kneading (A) 60-97 parts by weight of polybutylene terephthalate and (B) 40-3 parts by weight of an epoxy group-containing ethylene copolymer consisting essentially of

- (a) 30-99% by weight of ethylene units,
- (b) 20-1% by weight of α,β -unsaturated carboxylic acid glycidyl ester units, and
- (c) 70-0 by weight of ester unit selected from carboxylic acid vinyl ester unit and α,β -unsaturated carboxylic acid alkyl ester unit,

wherein (B) is prepared by copolymerizing (a), (b) and (c) at 100°-300° C. under 500-4000 atm in the presence of a radical forming agent, and then melt-kneading the resulting composition with (C) 0.01-20 parts by weight of an ethylene copolymer comprising ethylene units, α,β -unsaturated carboxylic acid alkyl ester units and maleic anhydride units to carry out a partial crosslinking reaction.

5,086,118

METHOD FOR PRODUCING THERMOPLASTIC RESIN COMPOSITION

Tadayuki Ohmae; Yoshiaki Toyoshima; Kentaro Mashita, and Jinsho Nambu, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 385,320, Jul. 27, 1989, abandoned, which is a division of Ser. No. 157,262, Feb. 18, 1988, abandoned.

This application Jan. 22, 1991, Ser. No. 643,167

Claims priority, application Japan, Mar. 31, 1987, 62-80786
Int. Cl.⁵ C08L 67/02

U.S. Cl. 525—176

1 Claim

1. A method for producing a thermoplastic resin composition which comprise:

melt-kneading (A) 60-97 parts by weight of polybutylene terephthalate and (B) 40-3 parts by weight of an epoxy group-containing ethylene copolymer consisting essentially of:

- (a) 30-99% by weight of ethylene units,
- (b) 20-1% by weight of α,β -unsaturated carboxylic acid glycidyl ester units, and
- (c) 80-0% by weight of ester unit selected from carboxylic

acid vinyl ester unit and α,β -unsaturated carboxylic acid alkyl ester unit,
wherein (B) is prepared by copolymerizing (a), (b) and (c) at 100°-300° C. under 500-4000 atm in the presence of a radical forming agent, and then melt-kneading the resulting composition with (C) 0.01-20 parts by weight of an aliphatic diaminecarbamate to carry out a partial crosslinking reaction.

5,086,119

METHOD FOR PRODUCING THERMOPLASTIC RESIN COMPOSITION

Tadayuki Ohmae; Yoshiaki Toyoshima; Kentaro Mashita, and Jinsho Nambu, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 492,471, Mar. 12, 1990, which is a continuation of Ser. No. 157,262, Feb. 18, 1990, abandoned. This application Apr. 24, 1990, Ser. No. 513,937

Claims priority, application Japan, Mar. 31, 1987, 62-80786
Int. Cl.⁵ C08L 67/02

U.S. Cl. 525—176

1 Claim

1. A method for producing a thermoplastic resin composition which comprises:

melt-kneading (A) 60-97 parts by weight of polybutylene terephthalate and (B) 40-3 parts by weight of an epoxy group-containing ethylene copolymer consisting essentially of:

- (a) 30-99% by weight of ethylene units,
- (b) 20-1% by weight of α,β -unsaturated carboxylic acid glycidyl ester units, and
- (c) 70-0% by weight of ester unit selected from carboxylic acid vinyl ester unit and α,β -unsaturated carboxylic acid alkyl ester unit,

wherein (B) is prepared by copolymerizing (a), (b) and (c) at 100°-300° C. under 500-4000 atm in the presence of a radical forming agent, and then melt-kneading the resulting composition with (C) 0.01-20 parts by weight of at least one of terephthalic acid, isophthalic acid, adipic acid, sebacic acid and dodecanoic acid to carry out a partial crosslinking reaction.

5,086,120

IONICALLY BLENDED MOLECULAR COMPOSITES

Loon-Seng Tan, and Fred E. Arnold, both of Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 8, 1991, Ser. No. 652,728

Int. Cl.⁵ C08G 75/32; C08L 81/00

U.S. Cl. 525—183

5 Claims

1. A molecular composite system consisting essentially of a para-oriented benzobisazole polymer and poly(2-acrylamido-2-methylpropanesulfonic acid).

5,086,121

DYNAMICALLY CURED THERMOPLASTIC OLEFIN POLYMERS

Donald R. Hazelton, Chatham; Robert C. Puydak, Cranbury, both of N.J., and D. A. Booth, Overijse, Belgium, assignors to Advanced Elastomer Systems, L. P., St. Louis, Mo.

Division of Ser. No. 368,783, Jun. 20, 1989, Pat. No. 4,960,830, which is a division of Ser. No. 874,702, Jun. 16, 1986, Pat. No. 4,845,145, which is a division of Ser. No. 629,635, Jul. 11, 1984, Pat. No. 4,607,074. This application Jul. 20, 1990, Ser. No. 556,610

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.⁵ C08L 15/02, 23/26, 23/16

U.S. Cl. 525—197

4 Claims

1. A process for preparing a thermoplastic composition comprising a polyolefin resin, which is a blend of polypropylene with EVA or an ethylene-methacrylate copolymer, and at least two rubbers, at least one of said rubbers being vulcanized by a vulcanizing agent which will vulcanize at least one of said

rubbers leaving at least one of said rubbers in an unvulcanized state which comprises:

- (a) intimately mixing the polyolefin resin with at least one first rubber at a temperature above the softening point of the polyolefin resin;
- (b) adding to the intimate mixture of resin and rubber a vulcanizing agent for at least one first rubber;
- (c) vulcanizing the rubber by dynamic vulcanization for a time sufficient to fully vulcanize the rubber; and
- (d) blending into the dynamically vulcanized rubber-polyolefin resin composition at least one second rubber at a temperature above the softening point of the polyolefin resin.

5,086,122

CROSSLINKED CHLORINATED POLYVINYL CHLORIDE RESIN COMPOSITIONS

Dennis L. Lawson, Brunswick, and Robert E. Detterman, Elyria, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 197,730, May 23, 1988, Pat. No. 4,983,687. This application Jan. 4, 1991, Ser. No. 637,394

Int. Cl.⁵ C08F 8/22

U.S. Cl. 525—235

16 Claims

1. A crosslinked chlorinated polyvinyl chloride resin composition, comprising:

a crosslinked chlorinated polyvinyl chloride resin, said crosslinked chlorinated polyvinyl chloride resin containing from about 58 percent to about 70 percent by weight of chlorine therein, said crosslinked chlorinated polyvinyl chloride resin made from a vinyl chloride monomer and a crosslinking agent, said crosslinking agent containing two or more polymerizable CH₂=C< groups per molecule, the composition containing from about 0 percent to about 85 percent by weight of a non-crosslinked chlorinated polyvinyl chloride resin based upon the total weight of said non-crosslinked chlorinated polyvinyl chloride resin and said crosslinked chlorinated polyvinyl resin, and containing from about 0 parts to about 40 parts by weight of a non-crosslinked polyvinyl chloride resin per 100 parts by weight of said non-crosslinked chlorinated polyvinyl chloride resin and said crosslinked chlorinated polyvinyl chloride resin, the amount of said crosslinking agent being from about 0.025 parts to about 5.0 parts by weight for every 100 parts by weight of said vinyl chloride monomer.

5,086,123

FLUOROELASTOMER COMPOSITIONS CONTAINING FLUOROALIPHATIC SULFONAMIDES AS CURING AGENTS

Richard A. Guenther, Birchwood, and Robert E. Kolb, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 376,886, Jul. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 654,191, Sep. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 583,762, Feb. 27, 1984, abandoned. This application Nov. 28, 1990, Ser. No. 619,669

Int. Cl.⁵ C08F 8/34

U.S. Cl. 525—276

11 Claims

1. A composition comprising at least one fluorocarbon elastomer gum, at least one polyhydroxy compound or derivative thereof as a curing agent therefor, at least one fluoroaliphatic sulfonamide as a curing agent for the fluorocarbon elastomer gum, and at least one organo-onium accelerator, the amount of said fluoroaliphatic sulfonamide curing agent being present in said composition in the range of about 0.002 to about 0.006 mole per hundred grams of said gum, the amounts of said curing agents being sufficient to bring about cross-linking of said fluorocarbon elastomer gum, said fluoroaliphatic sulfonamide curing agent being represented by the general formula:



or



wherein

R_f represents a monovalent fluoroaliphatic radical having from 1 to 20 carbon atoms.

R_f represents a divalent fluoroaliphatic radical having from 1 to 20 carbon atoms;

A represents an organic linkage selected from the group consisting of $-CR^1R^2$, $-CR^1R^2CR^3R^4-$, and $-CR^1=CR^2-$, wherein R^1 , R^2 , R^3 , and R^4 are selected from the group consisting of hydrogen atom, fluorine atom, chlorine atom, and lower alkyl group.

Z is zero or one,

R represents hydrogen atom or alkyl radical having from 1 to 20 carbon atoms, and

M represents hydrogen atom or salt forming cation with valence x, which is 1, 2, or 3.

5,086,124

HIGH HEAT DISTORTION TEMPERATURE EPOXY SILOXANE/ORGANIC EPOXY COMPOSITIONS

James M. Fukuyama, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 5, 1990, Ser. No. 548,156

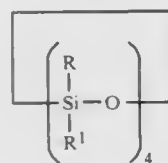
Int. Cl.⁵ C08L 71/02

U.S. Cl. 525—403

15 Claims

1. A heat curable cyclic epoxy siloxane/organic epoxy resin blend which will polymerize to form a composition having a high heat distortion temperature, the blend comprising:

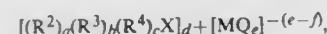
(A) a cyclic epoxy functional siloxane monomer having the general formula



wherein each R group is, independently, a monovalent substituted or unsubstituted C_{1-12} alkyl, C_{1-12} cycloalkyl, or phenyl radical; each R' group is, independently, R, or a monovalent epoxy functional group having 2-10 carbon atoms with the proviso that at least one of the R' groups is epoxy functional;

(B) an organic epoxy resin, the ratio of parts of (A) to parts (B) being from about 10:1 to about 1:1;

(C) from about 2.5 to about 3.0 weight percent, based on the combined weight of (A) and (B), of a cationic onium salt catalyst having the formula:



wherein R^2 is a monovalent aromatic organic radical, R^3 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R^4 is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, X is a Group VIa element selected from sulfur, selenium and tellurium, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 or 1 where the sum of $a+b+c$ is a value equal to 3 or the valence of X, $d=e-f$, f is valence of M and is an integer equal to from 2 to 7 inclusive, e is greater than f and is an integer having a value up to 8; and

(D) from about 0.25 to about 0.30 weight percent, based on the combined weight of (A) and (B), of a copper salt

cocatalyst selected from Cu(I) halide, Cu(II) benzoate, Cu(II) acetate, Cu(II) stearate, Cu(II) gluconate, Cu(II) citrate, Cu(II) formate, Cu(II) oleate, or Cu(II) carbonate.

5,086,125

POLYIMIDE RESIN COMPOSITION

Masahiro Ohta, Yokohama; Saburo Kawashima, Yokosuka; Katsuaki Iiyama, Odawara; Shoji Tamai; Hideaki Oikawa, both of Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 199,702, May 27, 1988, abandoned.

This application Aug. 24, 1990, Ser. No. 574,502

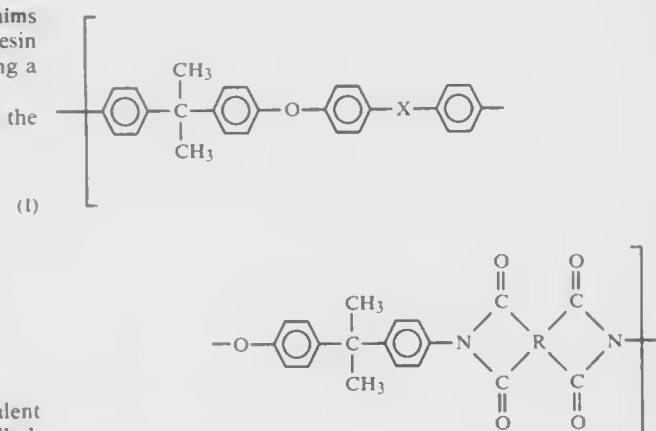
Claims priority, application Japan, Jun. 2, 1987, 62-137756; Jun. 2, 1987, 62-137757; Dec. 17, 1987, 62-317451

Int. Cl.⁵ C08L 79/08, 81/06; C08G 69/48

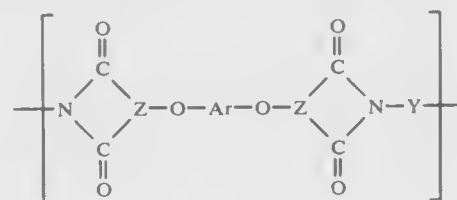
U.S. Cl. 525—432

5 Claims

1. A polyimide resin composition comprised of 99.9 to 50% weight of a polyimide which has recurring units of the formula:



wherein X is a sulfonyl radical or carbonyl radical and R is a tetra-valent radical selected from the group consisting of aliphatic radical having 2 or more carbon atoms, alicyclic radical, monoaromatic radical, condensed polyaromatic radical, or non-condensed polyaromatic radical wherein aromatic radicals are linked to one another directly or via bridge member, and 0.1 to 50% by weight of a high temperature engineering polymer selected from the group consisting of polyphenylene sulfide, aromatic polysulfone and polyetherimide substantially composed of recurring units of the following formula:



wherein Z is a trivalent aromatic radical and Ar and Y are respectively a divalent monoaromatic radical and a divalent non-condensed polyaromatic radical connected with a bridge member.

5,086,126

METHOD FOR PRODUCING FUNCTIONAL SILAZANE POLYMERS

Louis G. Mahone, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 24, 1990, Ser. No. 632,833

Int. Cl.⁵ C08G 77/26

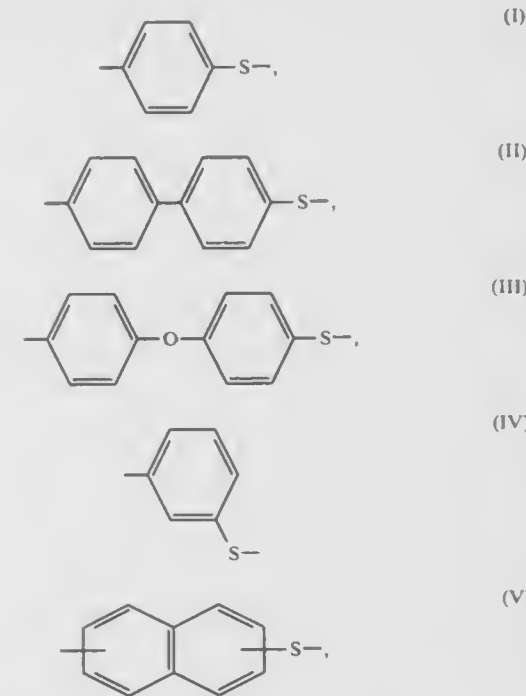
U.S. Cl. 525—474

11 Claims

1. A method of adding silicon functional groups on a silazane polymer containing N-H bonds comprising:

treating the silazane polymer containing the N-H bonds with an alkylolithium to form a silazane polymer containing Li-N bonds; and

reacting the silazane polymer containing Li-N bonds with a chlorosilane to form a silazane polymer with silicon functional groups.



5,086,127

SILICONE UV ABSORBERS CONTAINING SILANE UNITS

Kunio Itoh, Annaka; Mitsuo Umemura, Gunma, and Eiichi Tabei, Kawasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1990, Ser. No. 472,110

Claims priority, application Japan, Feb. 2, 1989, 1-24246

Int. Cl.⁵ C08G 77/04, 77/20; C08F 283/12; C08L 83/00

U.S. Cl. 525—474

11 Claims

1. A UV absorber comprising an organic silicon compound containing in its molecule

at least one polysilane structural unit of the formula:



wherein R^1 is a substituted or unsubstituted alkyl radical having 1 to 10 carbon atoms, R^2 is a radical selected from the group consisting of substituted or unsubstituted alkyl radicals having 3 to 10 carbon atoms, cycloalkyl radicals having 5 to 10 carbon atoms, and aryl radicals having 6 to 10 carbon atoms, and letter n is an integer of 5 to 50, and at least one structural unit of the formula:



wherein R^3 is a radical selected from the group consisting of a hydrogen atom, a hydroxyl radical, a substituted or unsubstituted monovalent hydrocarbon radical having 1 to 10 carbon atoms, and OR^4 wherein R^4 is a substituted or unsubstituted monovalent hydrocarbon radical having 1 to 4 carbon atoms, and letter a is a positive number in the range of $0 < a \leq 4$.

5,086,128

HIGH MOLECULAR WEIGHT ARYLENE SULPHIDE POLYMER MELT MIXED WITH AROMATIC NITRO COMPOUND

Hans-Detlef Heinz; Burkhard Köhler; Rolf-Volker Meyer, all of Krefeld; Klaus Reinking, Wermelskirchen, and Alexa Sommer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 358,450, May 30, 1989, abandoned.

This application Sep. 18, 1990, Ser. No. 585,282

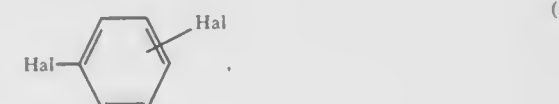
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819478

Int. Cl.⁵ C08G 75/16

U.S. Cl. 525—537

12 Claims

1. High molecular weight polymer obtained by melt mixing of 80-99.9% by weight, of arylene sulphide polymer containing at least one of the formulae (I)-(V):



with 0.1 to 20% by weight of one or both of a high boiling aromatic polynitro compound or mononitro compound containing at least one additional substituent reactable with the arylene sulphide polymer, optionally followed by a solid phase after-treatment at elevated temperature, the boiling points of which nitro compounds is at least 250° C., and in the mononitro compounds when the additional substituent capable of reacting with the arylene sulphide polymer is an SO_3 group, the mononitro compound is the sodium salt of 3-nitrobenzene sulphonic acid, the potassium salt of 3-nitrobenzene sulphonic acid, the calcium salts of 3-nitrobenzene sulphonic acid, the magnesium salts of 3-nitrobenzene sulphonic acid, the potassium salt of 2-nitrobenzene sulphonic acid, the sodium or potassium salt of 2-methyl-5-nitrobenzene sulphonic acid, the sodium or potassium salt of 4-methyl-3-nitrobenzene sulphonic acid or the sodium, potassium, or ammonium salt of 5-nitro-2-naphthalene sulphonic acid.

5,086,129

POLYARYLENE SULPHIDE MODIFIED WITH ARYL SULFONIC ACID CONTAINING AMINO OR HYDROXYL GROUP

Burkhard Köhler; Hans-Detlef Heinz, both of Krefeld-Uerdingen, and Klaus Reinking, Bayerwerk, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 570,858

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 39291717

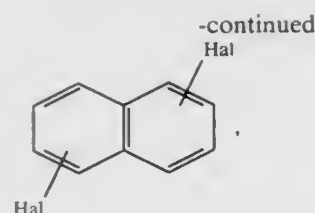
Int. Cl.⁵ C08G 75/16

U.S. Cl. 525—537

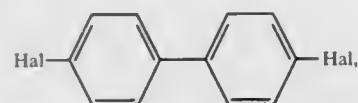
1 Claim

1. Reaction product of polyarylene sulphide prepared by the reaction of

a) one or more dihalogenated aromatic compounds corresponding to formula selected from the group consisting of (I), (II) and (III)



(II)



(III)

wherein Hal represents fluorine, chlorine or bromine, b) from 0-5 mol-%, based on a), of a tri- or tetra-halogenated aromatic compound corresponding to formula (IV)



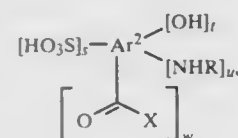
(IV)

wherein Ar¹ represents an aromatic C₆-C₁₄ group and Hal represents fluorine, chlorine or bromine and c) one or more sulphur donors corresponding to formula (V)



(V)

wherein M represents sodium or potassium and the ratio of (a+b):c is in the range of from 0.75:1 to 1.15:1 d) in an organic solvent, optionally with the addition of a catalyst or the alkali metal salts of 6-amino or 6-methylamino caproic acid, the molar ratio of c:d being in the range of from 1:2 to 1:15, with from 0.1 to 20% by weight of at least one aromatic compound containing OH or NH₂ and corresponding to formula (VI)



(VI)

wherein

R represents hydrogen, C₁-C₂₂-alkyl which is unsubstituted or substituted by OH or NH₂ groups, C₁-C₂₂-acyl or C₆-C₁₄-aryl which is unsubstituted or substituted by OH or NH₂, Ar² represents an aromatic C₆-C₂₂ which is unsubstituted or substituted by C₁-C₂₂-alkyl, nitro, nitroso or halogen, s represents the number 1, 2 or 3, t, u and w represent 0, 1 or 2, and the sum of (s+t+u+w) is less than 6 and the sum of (t+u) is greater than or equal to 1 and X represents OR or NHR, wherein R is defined above.

5,086,130

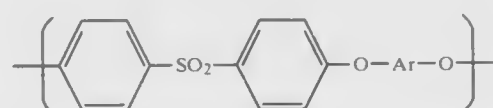
POLY(ARYL ETHER SULFONE) COMPOSITIONS COMPRISING POLY(PHENYLENE ETHER SULFONE)
Barry L. Dickinson, Whitehouse Station; M. J. El-Hibri, Highland Park, and Marvin E. Sauers, Belle Mead, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 163,781, Mar. 3, 1988, abandoned. This application Apr. 6, 1990, Ser. No. 505,827
Int. Cl.⁵ C06H 283/00; C02G 15/00; C02L 21/00

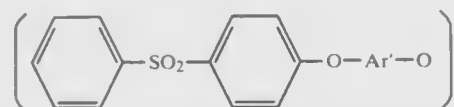
U.S. Cl. 525-537

5 Claims

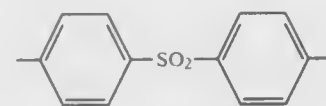
1. A composition comprising (a) poly (biphenyl ether sulfone) consisting essentially of the repeating unit:



and (b) a second poly(aryl ether sulfone) consisting essentially of the repeating unit:



wherein Ar is a divalent group comprising at least 50 mole percent p-biphenylene and Ar' is a divalent group comprising at least 50 mole percent



and the weight of (a) to (b) is from about 70 to 99 to 30 to 1.

5,086,131

PROCESS FOR PRODUCTION OF POLYETHYLENE
Yukimasa Miwa, Nagoya; Takeo Shimada, Yokkaichi; Shigekazu Hayashi, Yokkaichi; Yoshio Kobayashi, Yokkaichi, and Yoshiteru Kageyama, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 840,545, Mar. 17, 1986, Pat. No. 4,719,270, which is a continuation of Ser. No. 506,588, Jun. 22, 1983, abandoned. This application Jun. 22, 1987, Ser. No. 64,707
Claims priority, application Japan, Jun. 24, 1982, 57-108970
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.⁵ C08F 6/02, 10/02

U.S. Cl. 526-68

6 Claims

1. A process for the high pressure production of copolymers of ethylene, which comprises:

- introducing a feed material comprising ethylene and a comonomer copolymerizable therewith in a non-batchwise manner into a polymerization zone which does not contain a dispersant, which is maintained at a pressure of at least 200 atmospheres and at a temperature of 150°-320° C. and which contains a catalyst comprised of a titanium compound and an organoaluminum derivative combined in such amounts that the atomic ratio Al/Ti ranges from 6-20;
- polymerizing the monomer reactants in a nonbatchwise manner;
- withdrawing polymerized material at a temperature of 150°-250° C. from said polymerization zone and adding from 0.08-0.20 mole of t-butylperoxypivalate per gram atom of the sum of the gram atoms of aluminum and titanium in said catalyst, to said withdrawn polymerization material in order to deactivate the catalyst therein;
- separating the polymer product component of the withdrawn material from any unreacted monomer under superatmospheric pressure, thereby affecting polymer product recovery; and
- recycling the separated unreacted monomer of step (d) to said polymerization zone.

5,086,132

REDUCTION OF AGGLOMERATION

William H. Joyce, New Town, Conn., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 10, 1990, Ser. No. 625,938

Int. Cl.⁵ C08F 2/00

U.S. Cl. 526-74

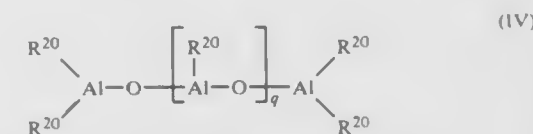
6 Claims

1. A process for the polymerization of a liquid alpha-olefin or a solution of two or more alpha-olefins and, optionally, one or more diolefins

wherein the sole process medium is one or more of the said olefins in liquid form comprising:

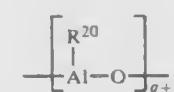
- admixing the liquid alpha-olefin or the solution with an inert particulate material having a mean particle size in the range of about 0.01 to about 10 microns in an amount of at least about 0.005 percent by weight of particulate material based on the total weight of the resin and particulate material in the final product; and
- contacting the mixture formed in step (a) with a catalyst system adapted to polymerize the olefin(s) in the mixture at a temperature and pressure sufficient to (i) provide polymerization conditions; (ii) maintain the olefin(s) in the liquid phase throughout the polymerization; and (iii) maintain the polymer product in its sticky phase.

about 10.3 mol % of propylene units, relative to the entire polymer, by polymerization of ethylene and a 1-olefin comprising propylene in a suspending agent, at a temperature of -60° to 90° C., at a pressure of 0.5 to 150 bar, in the presence of a catalyst comprising a metallocene and an aluminoxane of the formula IV



(IV)

in the case of the linear type and/or of the formula V

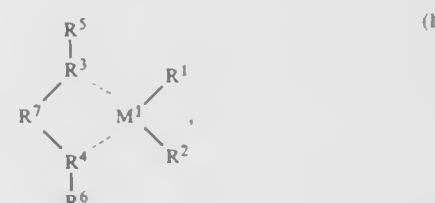


(V)

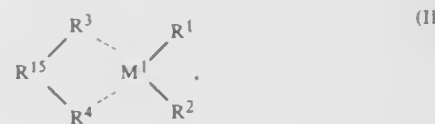
in the case of the cyclic type, in which in formulae IV and V R²⁰ is a C₁-C₆-alkyl group and q is an integer from 2 to 50, which comprises carrying out the polymerization in liquid propylene as suspending agent, in which the ratio of the partial pressure P_{C2} of ethylene in the gas phase to the partial pressure P_{C3} of propylene in the gas phase

$$\frac{P_{C2}}{P_{C3}} \text{ is greater than } 0.6$$

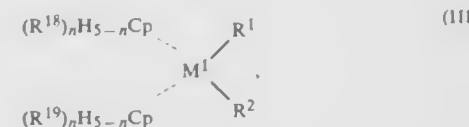
and the metallocene is a compound of the formula I, II or III



(I)



(II)



(III)

in which in formulae I, II and III

M¹ is a metal from group IVb, Vb and VIb of the periodic table, R¹ and R² are identical or different and are a hydrogen atom, a C₁-C₁₀-alkyl group, a C₁-C₁₀-alkoxy group, a C₆-C₁₀-aryl group, a C₆-C₁₀-aryloxy group, a C₂-C₁₀-alkenyl group, a C₇-C₁₀-aryalkenyl group or a halogen atom, R³ and R⁴ are identical or different and are an indenyl or tetrahydroindenyl radical in which the five-membered rings of the radicals R³ and R⁴ form a sandwich structure with the central atom M¹, R⁵ and R⁶ are identical or different, and are substituents in the 3-position of R³ and R⁴ or are radicals of the formulae

5,086,133 PROCESS FOR PRODUCING HIGHLY WATER ABSORPTIVE POLYMER

Kiichi Itoh; Takeshi Shibano, and Kenji Yoshinaga, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 428,631, Oct. 30, 1989, abandoned, which is a continuation of Ser. No. 160,278, Feb. 25, 1988, abandoned. This application May 17, 1991, Ser. No. 703,047
Claims priority, application Japan, Feb. 27, 1987, 62-44580
Int. Cl.⁵ C08F 30/04

U.S. Cl. 526-93

21 Claims

1. A process for producing a highly water absorptive polymer, which comprises:

- preparing a mixture (A) comprising an aqueous solution of (a) a partially neutralized product of acrylic acid with 20% or more of carboxylic groups being neutralized to an alkali metal salt or ammonium salt, (b) a crosslinking agent having two or more copolymerizable vinyl groups in one molecule, (c) a basic vinyl monomer in a quantity of 20 mol % or less based on said partially neutralized product of acrylic acid, (d) a nonionic surfactant with HLB of 7 or more and (e) an oxidative radical polymerization initiator, said mixture (A) being maintained at a temperature of 50° C. or lower, and a mixture (B) comprising an amine or a reducing agent dissolved in water or in said mixture (A) from which at least the component (e) is removed; and mixing both the mixtures and conducting polymerization at a temperature of 30° to 50° C.

5,086,134

PROCESS FOR THE PREPARATION OF AN ETHYLENE/PROPYLENE COPOLYMER

Martin Antberg, Hofheim am Taunus; Walter Spaleck; Jürgen Rohrmann, both of Liederbach; Hartmut Lüker, Hofheim am Taunus, and Andreas Winter, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 19, 1989, Ser. No. 424,116

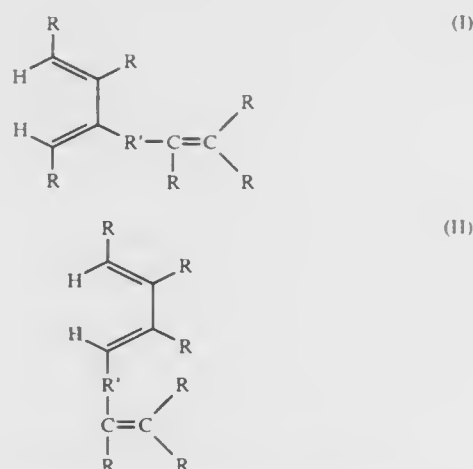
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1988, 3836059

Int. Cl.⁵ C08F 2/02, 4/602, 210/16

U.S. Cl. 526-126

11 Claims

1. A process for the preparation of a predominantly crystalline ethylene/propylene copolymer containing no more than



in which each R is selected independently from the group consisting of hydrogen and C₁₋₃ alkyl, R' is a divalent linking group, and the isolated double bond adjoins at least one hydrogen-bearing carbon atom.

5,086,140
OPTICAL MATERIAL FORMED BY CASTING
POLYMERIZATION OF A PHENYL PHOSPHINE
MONOMER

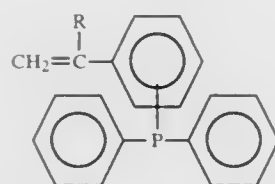
Hideaki Dui, Matsudo, and Teruo Sakagami, Nerima, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 277,980, Nov. 30, 1988, abandoned.

This application Nov. 13, 1990, Ser. No. 611,464

Claims priority, application Japan, Dec. 28, 1987, 62-330175
Int. Cl.⁵ C08F 230/02; C08G 67/02

U.S. Cl. 526—274 3 Claims
1. An optical material of a high refractive index comprising a copolymer obtained by polymerizing about 10 to about 90 weight percent of a phenyl phosphine monomer of the formula



wherein R is a hydrogen atom or a methyl group and about 90 to about 10 weight percent of a copolymerizable monomer selected from the group consisting of an aromatic monomer containing one or more halogen groups and a polyfunctional monomer containing plural ethylenically-unsaturated polymerizable bonds.

5,086,141
POLYSILOXANE CROSSLINKED
STYRENE/BUTADIENE COPOLYMERS

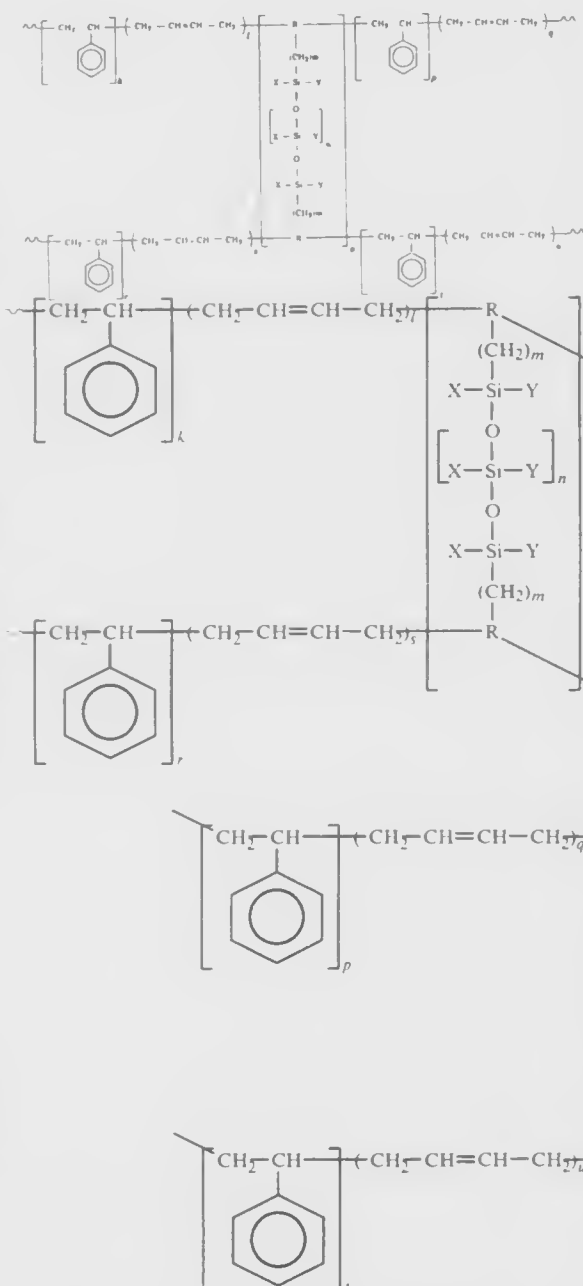
Michael K. Georges, Guelph, Canada, assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 325,715, Mar. 20, 1989, Pat. No. 4,954,408.

This application Apr. 30, 1990, Ser. No. 516,571

Int. Cl.⁵ C08F 30/08

U.S. Cl. 526—279 11 Claims
1. A crosslinked polysiloxane styrene/butadiene copolymer represented by the following formula



wherein m is a number of from about 2 to about 10; n is a number of from about 10 to about 1,000; k, l, o, p, q, r, s, t, u are weight fraction numbers totaling one with the sum of k+p+r+t being from about 0.35 to about 0.94; the sum of l+q+s+u being from about 0.05 to about 0.2 and o is from about 0.02 to about 0.5; R is CH₂C(R') or alkylene-CR''C(O)O, where R' is an aromatic or a substituted aromatic substituent and R'' is hydrogen or an alkyl substituent, and X is aryl, substituted aryl or alkyl, and Y is aryl, substituted aryl or alkyl.

5,086,142
COPOLYMER ACTING AS THICKENING AGENT FOR
AQUEOUS PREPARATIONS HAVING A PH ABOVE 5.5,
A METHOD FOR ITS PREPARATION AND ITS USE AS A
THICKENING AGENT

Jürgen Fock, Düsseldorf, and Eberhard Esselborn, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

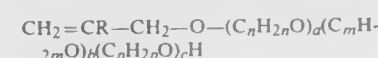
Continuation-in-part of Ser. No. 544,335, Jun. 27, 1990, abandoned. This application Jan. 31, 1991, Ser. No. 648,571
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1989, 3925220

Int. Cl.⁵ C08F 20/06, 26/08, 116/12

U.S. Cl. 526—318 4 Claims

1. A copolymer obtainable by emulsion polymerization in an aqueous medium, at a pH of 2.5 to 5, in the presence of an initiator forming free radicals, at a temperature of 60° to 95° C. of

10 to 50% by weight of acrylic or methacrylic acid
5 to 75% by weight of a nonionic vinyl monomer and
2 to 50% by weight of a macromonomer of the formula



wherein

R is H or CH₃

n and p are the same or different and in each case are 2 or 3, with the proviso that n and p have a value of not more than 2.3 in the average molecule,

m = a whole number from 12 to 18

a = 10 to 100,

b = 2 to 10,

c = 0 to 10, and

wherein the sum of the monomers amounts to 100% by weight.

5,086,143
COPOLYMERS CONTAINING POLYOXYALKYLENE
SIDE CHAINS

Richard C. Sutton, and Marsha B. Oenick, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1990, Ser. No. 557,338

Int. Cl.⁵ C08F 220/26, 228/02, 12/08, 12/16, 220/18

U.S. Cl. 526—320 15 Claims

1. A water-insoluble, nonporous particulate copolymer having recurring units derived from:

(a) from about 0.5 to about 20 mole % of one or more ethylenically unsaturated polymerizable monomers having reactive groups which are, directly, or indirectly, capable of reaction with amino or sulfhydryl groups of biologically active substances,

(b) from about 0.1 to about 20 mole % of one or more ethylenically unsaturated polymerizable monomers having polyoxyalkylene side chains, each of which side chains has a molecular weight of at least about 88, and

(c) from about 60 to about 99.4 mole % of one or more ethylenically unsaturated polymerizable vinyl aromatic monomers which provide hydrophobicity to said copolymer.

5,086,144
ACID-FUNCTIONAL POLYMERS DERIVED FROM
CELLULOSE ACETATE BUTYRATE UNSATURATED
ALCOHOL COPOLYMERS AND COATINGS PREPARED
FROM SAME

Mohamad D. Shalati, Richton Park; James A. Marquart, Chicago Heights; John R. Babjak, Tinley Park, and Rodney M. Harris, Chicago, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 121,265, Nov. 16, 1987, Pat. No. 4,859,758.

This application Aug. 14, 1989, Ser. No. 393,194

Int. Cl.⁵ C08F 251/02

U.S. Cl. 527—313 44 Claims

1. A curable composition which comprises:

(a) an acid-functional polymer having an average of at least two carboxylic acid groups per molecule wherein the acid-functional polymer comprises the reaction products obtained by reacting:

(i) a hydroxy-functional polymer having an average of at least two hydroxyl groups per molecule; and

(ii) a monomeric aliphatic or aromatic cyclic anhydride having one anhydride group per molecule under reaction conditions to produce acid groups and ester groups; and

wherein the hydroxy-functional polymer is obtained by the copolymerization of:

(A) 1-95 weight percent of a cellulose ester; and

(B) 5-99 weight percent of at least one ethylenically unsaturated alcohol copolymerizable with the cellulose ester; and

(C) 0-94 weight percent of at least one other ethylenically unsaturated monomer copolymerizable with the cellulose ester and the ethylenically unsaturated alcohol; and

(b) an epoxy-functional compound.

5,086,145
METHOD OF MANUFACTURING SOLVENT-SOLUBLE
POLYORGANOSILSESQUIOXANES

Takashi Morimoto, and Hiroshi Yoshioka, both of Tokyo, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

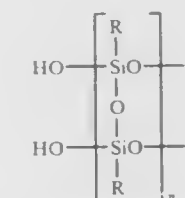
Filed Jun. 18, 1990, Ser. No. 539,486

Claims priority, application Japan, Jun. 16, 1989, 1-153885

Int. Cl.⁵ C08G 77/06

U.S. Cl. 528—14 16 Claims

1. A method of manufacturing solvent-soluble polyorganosilsesquioxanes having the following general formula:



wherein each R is a substituted or unsubstituted hydrocarbon group selected from the group consisting of univalent alkyl groups, alkenyl groups and halogen-substituted alkyl groups of 1-5 carbon atoms, and univalent substituted or unsubstituted phenyl groups of 6-10 carbon atoms, and n lies in the range 2-10,000; which comprises reacting an organotriacetoxysilane with a stoichiometric quantity of an alcohol and/or water in an organic solvent to obtain a diacetoxymonoalkoxysilane, which is condensation polymerized in the presence of sodium hydrogencarbonate to obtain a prepolymer, and this prepolymer is then condensation polymerized by heat in the presence of at least one type of catalyst chosen from alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal fluorides, alkaline earth metal fluorides, and triethylamine.

5,086,146
METHYLALKOXY-METHYLALKYL CYCLOSILOXANE COPOLYMER

Donald T. Liles, Midland, and Renee A. Klein, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 578,715, Sep. 7, 1990. This application Apr. 8, 1991, Ser. No. 681,262
Int. Cl.⁵ C08G 77/06

U.S. Cl. 528—15 3 Claims
1. A methylalkoxy-methylalkyl cyclosiloxane copolymer having the formula



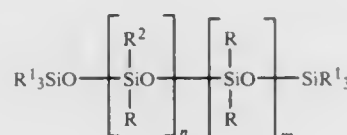
where R is an alkyl radical having one to three carbon atoms; R' is the alkyl radical (CH₂)_cR; c is an integer having a value of from one to seventeen; d is an integer having a value of from 3 to 10; and e is an integer having a value of from one to seven.

5,086,147
ORGANOPOLYSILOXANE COMPOSITION

Masayuki Ikeno, and Hironao Fujiki, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jul. 25, 1990, Ser. No. 556,723

Claims priority, application Japan, Jul. 25, 1989, 1-192370
Int. Cl.⁵ C08G 77/06

U.S. Cl. 528—15 14 Claims
1. An organopolysiloxane composition which comprises (A) 100 parts by weight of an organopolysiloxane represented by the formula



wherein R represents a substituted or unsubstituted monovalent hydrocarbon residue other than an aliphatic unsaturated group; R¹ represents a substituted or unsubstituted monovalent hydrocarbon residue; R² represents an alkenyl group; and n and m each represents a positive integer; (B) an organohydrogenpolysiloxane represented by the general formula,



wherein R has the same meaning as R in the component (A); R³ is selected from among alkenyl groups and hydrogen atom, with the proviso that the statistical average of alkenyl groups and hydrogen atoms per molecule each is one; and l represents a positive integer; in an amount such that the ratio of the hydrogen atoms thereof attached to the silicon atoms to the alkenyl groups attached to silicon atoms in the component (A) is from 0.1 to 4.0; and (C) a catalytic amount of an addition reaction catalyst.

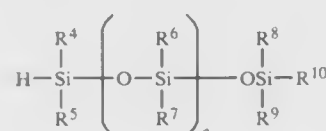
5,086,148
POLYETHER-IMPRESSION MATERIAL AND METHOD FOR ITS PREPARATION AND USE

Peter Jochum; Oswald Gasser, both of Seefeld; Wolf-Dietrich Zahler, Seefeld-Hechendorf; Gunther Lechner, Frieding; Rainer Guggenberger, Hechendorf, and Klaus Ellrich, Worthsee, all of Fed. Rep. of Germany, assignors to ESPE Stiftung & Co., Produktions- und Vertriebs KG, Seefeld, Fed. Rep. of Germany

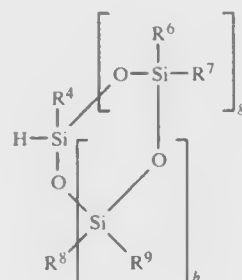
Filed Nov. 14, 1989, Ser. No. 435,994
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1988, 3838587

Int. Cl.⁵ C08G 77/06 12 Claims
U.S. Cl. 528—15
1. A polyether-impression material comprising (a) a polyether, which has at least two, substituted or non-substituted vinyl- and/or allyl end groups, (b) a SiH component and (c) a platinum catalyst

characterized in that the SiH component (b) is obtained by the reaction in the presence of a platinum catalyst of at least a bifunctional, or polyfunctional hydrocarbon compound, the hydrocarbon radical of which, without taking account of the allyl or vinyl groups and the optionally present alkylene ether groups has 6–30 carbon atoms and contains at least one aromatically unsaturated, heterocyclic, or cycloaliphatic ring, with at least one mole per vinyl- or allyl group of at least a bifunctional, or polyfunctional SiH-compound of the formulae



or



in which
e=0 to 8,
g=0 to 8,
h=0 to 4 and

R⁴ to R¹⁰, are the same or different, and are each H, methyl or ethyl, with the proviso that at least 1 and at most 5 of R⁴ to R¹⁰ are H, wherein g and h cannot simultaneously be 0, and wherein at least the components (b) and (c) are spatially separated from each other.

5,086,149
LOW ENERGY CURED COMPOSITE REPAIR SYSTEM BASED ON EPOXY RESIN WITH IMIDAZOLE BLOCKED NAPHTHYL DIISOCYANATE CATALYST HAVING EXTENDED SHELF LIFE

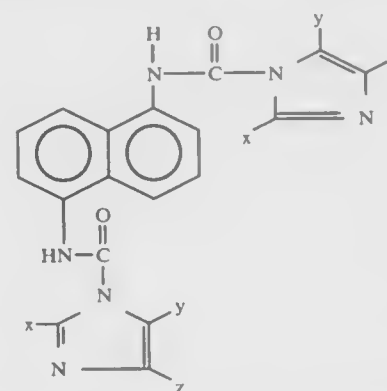
Kenneth S. Baron, San Ramon; Susan M. Brinkerhoff, San Lorenzo; Frank W. Lee, San Ramon, and Stella M. McKinney, Livermore, all of Calif., assignors to Hexcel Corporation, Dublin, Calif.

Filed Jul. 7, 1989, Ser. No. 377,087
Int. Cl.⁵ C08G 18/28, 18/81

U.S. Cl. 528—45 3 Claims
1. An uncured resin system having a shelf life at ambient

temperature in excess of one year and a cure temperature of not more than 212° F., comprising:

at least one epoxy resin and a catalyst of the formula I:



wherein X, Y and Z may be the same or different and each is hydrogen, lower alkyl or aryl of C1–C12, halo or nitro, said resin system being sealed in a waterproof enclosure from which water has been rigidly excluded said catalyst present in amounts of 5–15 pph.

5,086,150
PROCESS FOR THE PRODUCTION OF PUH ELASTOMER THREADS AND FILMS RESISTANT TO LIGHT AND EXHAUST GASES AND ELASTOMER THREADS HAVING THE REQUIRED COMPOSITION

Beatrix Frauendorf, Leverkusen; Carlhans Süling, Odenthal; Hans Rudolph, Krefeld, and Siegfried Korte, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Sep. 21, 1990, Ser. No. 585,959
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1989, 3932958

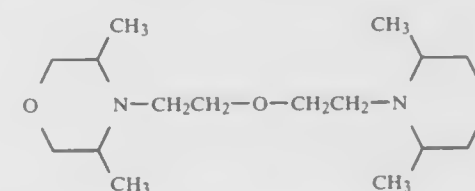
Int. Cl.⁵ C08G 18/30 16 Claims
U.S. Cl. 528—49
1. Process for the production of segmented polyurethane urea elastomers based on relatively high molecular weight dihydroxy compounds, aliphatic and/or cycloaliphatic diisocyanates and diamines and chain terminators optionally carried out in the presence of solubilizing agents, and their shaping into threads and films by conventional processes wherein for a first stage,

- a relatively high molecular weight dihydroxy compound having molecular weights of from 1000 to 8000,
- with the addition of 0–15 mol %, based on a), of low molecular weight dihydroxy compounds having molecular weights of from 62 to 399, and
- a mixture of diisocyanates in molar quantity of from 1.4 to 2.5 times the molar quantity of (a+b) comprising (c1) from 30 to 85 mole %, based on the diisocyanates put into the process, of trans-1,4-cyclo-hexylene diisocyanate and (c2) from 70 to 15 mol % of other aliphatic or cycloaliphatic diisocyanates, are reacted
- in the presence of 0.002 to 0.5% by weight, based on a) of catalyst selected from the group consisting of tin catalysts and diazabicyclo octane,
- either solvent free or in solvents which are dichlorobenzene or highly polar amide solvents comprising dimethyl formamide, dimethyl acetamide, dimethyl sulfoxide or N-methyl pyrrolidone, to produce an isocyanate prepolymer having an NCO content, based on the solid content, of from 1.5 to 3.5% by weight and this isocyanate prepolymer is reacted in a second stage with or without further dilution with said highly polar solvents, with solutions of (f-g) in said highly polar solvents, of

- (f) at least 50 mol % of other aliphatic and/or cycloaliphatic diamines and
- (g) from 0 to 5 mol % of monofunctional chain terminators (h) in the presence of from 0.1 to 10% by weight of solubilizing agents in the form of salts based on the polyurethane urea solids content,

5,086,151
MOISTURE-CURING SEALANT COMPOSITION
Masahiro Ito, Osaka, and Yukio Hayashi, Kyoto, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan
Filed May 25, 1990, Ser. No. 528,616
Claims priority, application Japan, May 25, 1989, 1-131831
Int. Cl.⁵ C08G 18/16

U.S. Cl. 528—53 5 Claims
1. A moisture-curing sealant composition which comprises a urethane prepolymer containing free NCO group as a main component and di[2-(3,5-dimethylmorpholino)ethyl] ether of the formula:



as a curing catalyst, said curing catalyst being incorporated in an amount of 0.2 to 2% by weight based on the whole amount of the moisture-curing sealant composition.

5,086,152
HEAT-CURING TYPE RESINOUS COMPOSITION AND HEAT-RESISTING MOLDED ARTICLE PREPARED THEREFROM

Norikazu Iwamoto, Hyogo, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 27, 1990, Ser. No. 559,282
Claims priority, application Japan, Aug. 8, 1989, 1-205298
Int. Cl.⁵ C08G 18/00

U.S. Cl. 528—55 4 Claims
1. Three-component-heat-curing type resinous composition consisting of (a) a polyisocyanate component comprising at least one bi-to hexa-functional polyisocyanate compound, (b) a polyepoxide component comprising at least one bi-to hexafunctional polyepoxide compound, and (c) a catalyst component comprising at least one catalyst selected from the group consisting of complex of organo antimony halide and organo tin halide, and complex of organo antimony halide and zinc halide.

5,086,153
PROCESS FOR PRODUCING POLYUREA RESIN
Yoshiji Oyaizu, Shizuoka, Japan, assignor to Ihara Chemical Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 465,601, Jan. 18, 1990, Pat. No. 5,039,775, which is a continuation of Ser. No. 155,293, Feb. 12, 1988, abandoned. This application Apr. 16, 1991, Ser. No. 685,923
Claims priority, application Japan, Feb. 18, 1987, 62-34848
Int. Cl.⁵ C08G 18/32, 18/60

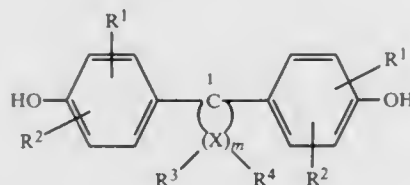
U.S. Cl. 528—68 11 Claims
1. A process for producing polyurea resin, which comprises reacting a first aromatic amine compound having the formula:

h 1. A thermoplastic molding composition comprising an aromatic copolycarbonate resin having a weight average mo-

molecular weight of at least 8000 prepared by reacting a member selected from the group consisting of phosgene and carbonyl halide with (i) at least one first diphenol corresponding to



wherein Z denotes an aromatic group having 6 to 30 carbon atoms, and from (ii) at least one dihydroxy diphenyl cycloalkane corresponding to



wherein

R¹ and R² independently of one another denote a member selected from the group consisting of a hydrogen atom, a halogen atom, C₁-C₈ alkyl, C₅-C₆ cycloalkyl, C₆-C₁₀ aryl and C₇-C₁₂ aralkyl radicals, and

m denotes an integer from 4 to 7, and

R³ and R⁴ are individually selected for each X and independently of one another denote a hydrogen atom or a C₁-C₆ alkyl radical, and

X denotes carbon, wherein on at least one X atom, both R³ and R⁴ denote an alkyl radical and wherein said dihydroxy diphenyl cycloalkane is present in an amount of 0.01 to 1.99% relative to the total molar amount of said first diphenol and said dihydroxy diphenyl cycloalkane, wherein said Z contains no cycloaliphatic groups of said (ii).

5,086,160

THERMOTROPIC COPOLYESTER, PROCESS FOR PREPARING IT AND ITS USE

Ugo Pedretti, Milan; Bruno Bresci, Livorno; Cesarina Bonfanti, Milan; Pier L. Magagnini, Riggione; Francesco P. La Mantia, Palermo, and Arnaldo Roggero, San Donato Milanese, all of Italy, assignors to Eniricerche S.p.A., Milan, Italy
Division of Ser. No. 358,145, May 30, 1989, Pat. No. 4,970,285.
This application Jun. 1, 1990, Ser. No. 531,756

Claims priority, application Italy, Jun. 23, 1988, 21079 A/88
Int. Cl.⁵ C08G 63/00, 63/02, 63/18, 67/00

U.S. Cl. 528-291 4 Claims

1. Process for preparing a thermotropic copolyester having a mesophase of nematic type, and temperatures of transition from the crystal phase to the mesophase of from about 140° C. up to about 320° C., comprising:

polymerizing in the molten phase at increasing temperatures of from about 190° C. up to about 320° C. for from 3 to 10 hours a mixture of the following monomers (a), (b), (c) and (d) in the presence of from 0.01 to 1 part by weight per each 100 parts by weight of the monomers of a catalyst selected from the group consisting of the carboxylates of sodium, potassium, calcium and magnesium, the oxides of these metals and oxides of titanium, antimony and tin, with removal of carboxy acid:

(a) a saturated α , ω -dicarboxy aliphatic acid:



wherein:

n is a number of from 3 to 8;

(b) 4,4'-di-acyloxy-diphenyl;

(c) p-acyloxybenzoic acid; and

(d) a substituted p-acyloxy-benzoic acid

wherein the substituted substituent is a halogen atom, or a linear or branched alkyl radical containing from 1 to 4

carbon atoms with the following mutual ratios of the monomers to one another:

$$(a)/(b) = 1;$$

$$[(c) + (d)]/(a) = 1-7;$$

$$(d)/[(c) + (d)] = 0.1-1.$$

5,086,161

NOVEL METHINE COMPOUNDS, POLYMERS CONTAINING THEM AND FORMED ARTICLES THEREFROM

Max A. Weaver; Wayne P. Pruett, both of Kingsport, and Samuel D. Hilbert, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

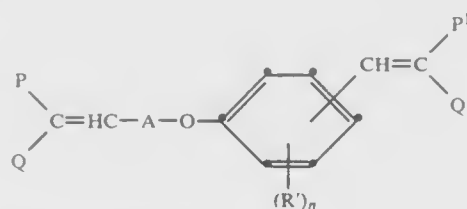
Division of Ser. No. 454,087, Dec. 20, 1989, which is a division of Ser. No. 182,633, Apr. 18, 1988, Pat. No. 4,958,043. This application May 6, 1991, Ser. No. 701,401

Int. Cl.⁵ C08G 63/20

U.S. Cl. 528-288

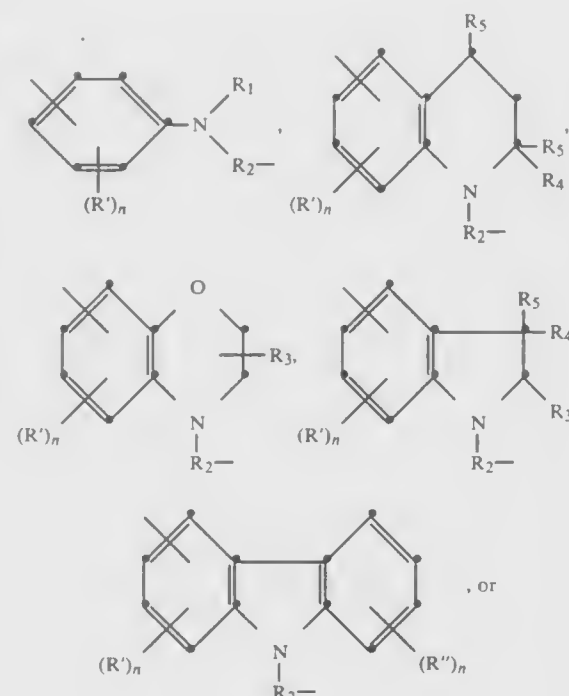
6 Claims

1. A polymeric composition comprising a molding or fiber grade condensation polymer having in the range of about 1.0 up to 100,000 ppm of the reactant residue moieties of one or more bis- and tris-methine compounds having the structural formula

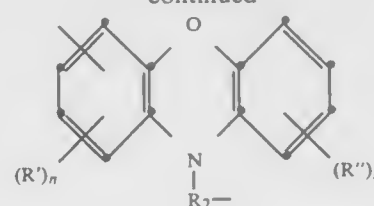


wherein

A is selected from the radicals



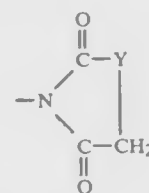
-continued



wherein

R' and R'' are each selected from chlorine, bromine, fluorine, alkyl, alkoxy, phenyl, phenoxy, and phenylthio; n is 0, 1, or 2;

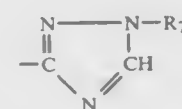
R₁ is selected from cycloalkyl; cycloalkyl substituted with one or two or alkyl, —OH, alkoxy, halogen, or hydroxy substituted alkyl; phenyl; phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, carboxy, cyano, or alkoxycarbonyl; straight or branched lower alkenyl; straight or branched alkyl of 1-8 carbons and such alkyl substituted with the following: hydroxy; halogen; cyano; succinimido; hydroxysuccinimido; acyloxysuccinimido; glutarimido; phenylcarbamoyloxy; phthalimido; 4-carboxyphthalimido; phthalimidino; 2-pyrrolidono; cyclohexyl; phenyl; phenyl substituted with alkyl, alkoxy, halogen, hydroxy alkanoylamino, carboxy, cyano, or alkoxycarbonyl; alkylsulfonyl; vinylsulfonyl; acrylamido; sulfamyl; benzoylsulfonamido; alkylsulfonamido; phenylsulfonamido; alkoxy-carbonylamino; alkylcarbamoyloxy; groups of the formula



wherein Y is —NH—,



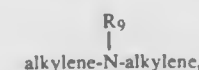
—O—, —S—, or —CH₂O—; —S—R₆; SO₂CH₂CH₂SR₆; wherein R₆ is alkyl, phenyl, phenyl substituted with halogen, alkyl, alkoxy, alkanoylamino, cyano, or alkoxycarbonyl; pyridyl; pyrimidinyl; benzoxazolyl; benzimidazolyl; benzothiazolyl; radicals of the formula



—OXR₈; —NHXR₈; —X—R₈; —CONR₇R₇; and —SO₂NR₇R₇; wherein R₇ is selected from H, aryl, alkyl, and alkyl substituted with halogen, —OH, phenoxy, aryl, —CN, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, or alkoxy; X is —CO—, —COO—, or —SO₂—; R₈ is selected from alkyl and alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, and alkoxy; and when X is —CO—, R₈ also can be hydrogen, amino, alkenyl, alkylamino, dialkylamino, arylamino, aryl, or furyl; alkoxy; alkoxy substituted with hydroxy, cyano, alkanoyloxy, or alkoxy, phenoxy; phenoxy substituted with one or more of alkyl, carboxy, alkoxy, carbalkoxy, or halogen; R₁ can also be —R₂Z—B—CH=C(P)Q wherein Z is O or S, and B is arylene;

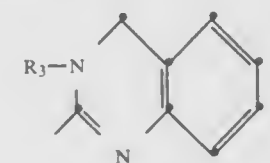
R₂ is alkylene; alkylene substituted with alkoxy, aryl, aryl-

oxy, halogen, hydroxy, acyloxy, cyano, and —R₂—Z—B—CH=C(P)Q; arylene, aralkylene, alkylene-O-alkylene; alkylene-O-arylene-O-alkylene; alkylene-arylene-alkylene; alkylene-C₆H₁₀-alkylene; alkylene-S-alkylene; alkylene-SO₂-alkylene;



wherein R₉ is alkyl, aryl, alkanoyl, alkylsulfonyl, aroyl, or arylsulfonyl;

R₃, R₄, and R₅ are each selected from hydrogen and alkyl; P and Q and P¹ and Q¹ are selected from cyano, carbalkoxy, carbaryloxy, carbalkoxyloxy, carbalkenyloxy, carbamyl, carboxy, acyl, aroyl, N-alkylcarbamyl, N-alkyl-N-arylcarbamyl, N,N-dialkylcarbamyl, N-arylcarbamyl, N-cyclohexylcarbamyl, aryl, 2-benzoxazolyl, 2-benzothiazolyl, 2-benzimidazolyl, 1,3,4-thiadiazol-2-yl, 1,3,4-oxadiazol-2-yl, SO₂ alkyl, SO₂ aryl, pyridyl, pyrrolyl, quinolyl, pyrimidyl and



wherein:

in the above definitions, each alkyl, alkoxy, aryl, or cycloalkyl moiety or portion of a group or radical may be substituted where appropriate with hydroxyl, acyloxy, alkyl, cyano, alkoxy-carbonyl, halogen, alkoxy, aryl, aryloxy, or cycloalkyl;

each methine compound, preferably at least one of A, P, Q, P¹ or Q¹ thereof, bears a group capable of reacting under polymerization conditions, to incorporate the multichromophoric compound into the polymer, including the following: carboxy, carbalkoxy, carbaryloxy, N-alkylcarbamoyloxy, acyloxy, chlorocarbonyl, carbamoyloxy, N-alkylcarbamoyloxy, amino, alkylamino, hydroxyl, N-phenylcarbamoyloxy, cyclohexanoyloxy, and carbocyclohexyloxy, wherein the alkyl and/or aryl groups may contain common substituents such as hydroxyl, cyano, acyloxy, carbalkoxy, phenyl, and halogen which do not interfere with the condensation reaction, and

in all of the above definitions the alkyl or alkylene moieties or portions of the various groups contain 1-8 carbon atoms, straight or branched chain.

5,086,162

POLYETHER AMIDE FROM POLYALKYLENE GLYCOL DIAMINE AND DIACID MIXTURE

George P. Speranza, and Wei-Yang Su, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Apr. 10, 1990, Ser. No. 506,990

Int. Cl.⁵ C08G 69/26

U.S. Cl. 528-339

17 Claims

1. A polyether amide produced by reacting at least one polyalkylene glycol diamine with at least two different dicarboxylic acids or esters thereof, where the polyethylene glycol diamine has the formula NH₂—(CH₂CH₂O)_x—CH₂CH₂—NH₂, where x ranges from 2 to 6, and where at least one of the dicarboxylic acids is an aromatic dicarboxylic acid.

5,086,163

AROMATIC SULFIDE/SULFONE POLYMER PRODUCTION

Lacey E. Scoggins, Bartlesville; Kenneth C. Hoover, Tulsa, and Wei-Teh W. Shangi, Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 401,595, Aug. 31, 1989, Pat. No. 5,015,725, which is a division of Ser. No. 102,462, Sep. 29, 1987, abandoned.
This application Mar. 22, 1991, Ser. No. 674,812
Int. Cl.⁵ C08G 75/16

U.S. Cl. 528—388 8 Claims

1. A process for the production of aromatic sulfide/sulfone polymer which comprises the steps:

- I. contacting
 - (a) at least one alkali metal aminoalkanoate,
 - (b) at least one organic amide and
 - (c) at least one alkali metal hydrosulfide under reaction conditions of time and temperature sufficient to produce a mixture containing a complex which comprises (a) and (c) and
- II. contacting said mixture produced in step I with
 - (d) water, and
 - (e) at least one dihalo aromatic sulfone under polymerization conditions for a period of time sufficient to form an aromatic sulfide/sulfone polymer.

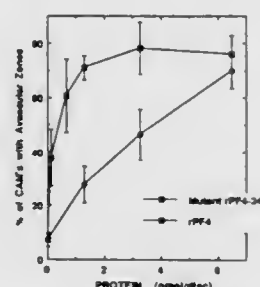
5,086,164

NOVEL METHODS AND COMPOSITIONS FOR TREATMENT OF ANGIOGENIC DISEASES

Theodore Maione, Wakefield, and Richard J. Sharpe, Newton, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 295,955, Jan. 10, 1989, abandoned. This application Dec. 27, 1989, Ser. No. 451,021
Int. Cl.⁵ A61K 37/02; C07K 7/10, 7/08

U.S. Cl. 530—324 13 Claims



1. An essentially pure polypeptide, wherein said polypeptide inhibits angiogenesis, but does not bind heparin under physiological conditions, and wherein said polypeptide consists essentially of the amino acid residues 1-60 of Platelet Factor 4 and the 10 amino acid sequence designated



wherein

- a₆₁ is selected from the group Lys, Gly, Glu, Gln, Asp, Asn, Met, Ala, Leu, or Ile;
a₆₂ is selected from the group Lys, Glu, Gln, Asp, Asn, Met, Ala, Leu, or Ile;
a₆₃ is selected from the group Glu, Gln, Met, Ala, Leu, Ile, Val, Pro, Phe, Trp, or Tyr;
a₆₄ is selected from the group Glu, Met, Ala, Leu, Ile, Val, pro, Phe, Trp, or Tyr;
a₆₅ is selected from the group Lys, Gly, Glu, Gln, Asp, Asn, Met, Ala, Leu, or Ile;
a₆₆ is selected from the group Lys, Glu, Gln, Asp, Asn, Met, Ala, Leu, or Ile;
a₆₇ is selected from the group Lys, Glu, Met, Ala, Leu, Ile, Val, Pro, Phe, Trp, or Tyr; and

a₆₈ is selected from the group Gln, Met, Ala, Leu, Ile, Val, Pro, Phe, Trp, or Tyr.

5,086,165

INHIBITORS OF RETROVIRAL PROTEASE WITH A KETOMETHYLENE ISOSTERIC REPLACED AMIDE BOND

Garland R. Marshall, Clayton, and Mihaly V. Toth, Kirkwood, both of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 320,742, Mar. 8, 1989. This application Feb. 7, 1991, Ser. No. 652,163
Int. Cl.⁵ A61K 37/02; C07K 7/06

U.S. Cl. 530—329 1 Claim

1. An inhibitor of HIV protease selected from the group consisting of
Abz-Thr-Ile-NleΨ(K)Nle-Gln-Arg-NH₂,
Abz-Thr-Ile-Nle-Ψ(K)2-Nal-Gln-Arg-NH₂,
Abz-Thr-Ile-PheΨ(K)Ala-Gln-Arg-NH₂,
Qua-Thr-Ile-NleΨ(K)2-Nal-Gln-Arg-NH₂,
Qua-Ile-NleΨ(K)2-Nal-Gln-Arg-NH₂,
Qua-NleΨ(K)2-Nal-Gln-Arg-NH₂,
Qui-Thr-Ile-NleΨ(K)Nle-Gln-Arg-NH₂,
Qui-Ile-NleΨ(K)Nle-Gln-Arg-NH₂,
Qui-NleΨ(K)Nle-Gln-Arg-NH₂,
Qui-Thr-Ile-NleΨ(K)2-Nal-Gln-Arg-NH₂,
Qui-Ile-NleΨ(K)2-Nal-Gln-Arg-NH₂,
Qui-NleΨ(K)2-Nal-Gln-Arg-NH₂,
Qui-Thr-Ile-NleΨ(K)2-Nal-Gln-NH₂,
Qui-Ile-NleΨ(K)2-Nal-Gln-NH₂, and
Qui-NleΨ(K)2-Nal-Gln-NH₂
and wherein K is COCH₂.

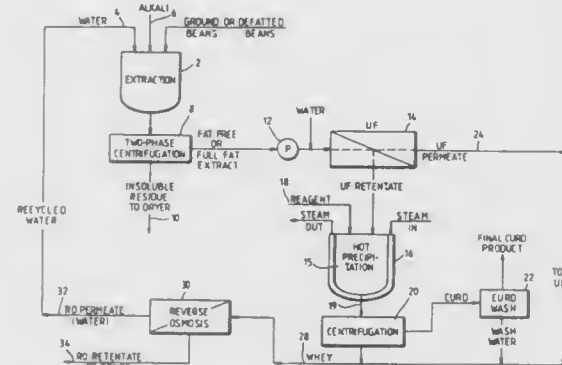
5,086,166

PROTEIN FOODS AND FOOD INGREDIENTS AND PROCESSES FOR PRODUCING THEM FROM DEFATTED AND UNDEFATTED OILSEEDS

James T. Lawhon, and Khee C. Rhee, both of College Station, Tex., assignors to The Texas A&M University System, College Station, Tex.

Continuation of Ser. No. 14,725, Feb. 13, 1987, abandoned. This application Dec. 26, 1989, Ser. No. 453,206
Int. Cl.⁵ A23J 1/14, 3/16; C07K 3/02, 3/26

U.S. Cl. 530—378 21 Claims



1. A method of producing a true soybean protein curd, comprising the steps of:

- (a) extracting proteins from protein-containing soybean material, wherein inherent enzymes contained in said material have been inactivated, by mixing said material in water at a water/material weight ratio of about 10/1 to about 40/1 and at a pH and a temperature in the range of about 60° C. to about 85° C. which are sufficient to solubilize said proteins;
- (b) separating said solubilized proteins from any insoluble

components to yield protein extract and an insoluble residue;

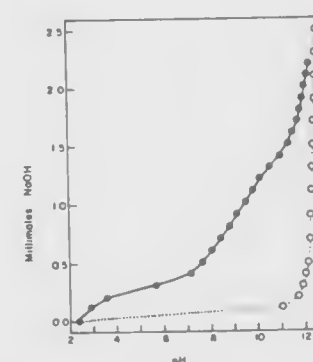
- (c) ultrafiltering said extract through an ultrafiltration membrane with a molecular weight cut-off value that is at least about 50,000 and is sufficient to pass odor-, color-, and taste-forming compounds as a permeate and to retain as a retentate proteins having molecular weights greater than said compounds;
- (d) heating said retentate to a temperature between about 80° C. and about 100° C. which is sufficient, and for a time sufficient, to coagulate said proteins in said retentate as a true curd which does not disintegrate in boiling water; and
- (e) separating said true curd from the remainder of said retentate.

5,086,167

METHOD OF SEPARATING PROTEINS

William M. Awad, Jr., Miami, Fla., assignor to University of Miami, Miami, Fla.
Filed Nov. 28, 1988, Ser. No. 276,924
Int. Cl.⁵ C07K 3/22

U.S. Cl. 530—416 16 Claims



1. A method of separating proteins comprising contacting said proteins to be separated with a ligand that is anionic, which ligand is attached to a matrix, under conditions that permit pi-electron and electrostatic charge interaction of said ligand with specific amino acid residues of said proteins; and effecting said separation based on said interaction.

5,086,168

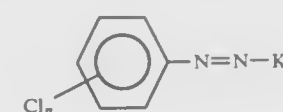
MONOAZO PIGMENTS DERIVED FROM DIAZOTIZED DI- OR TRICHLOROANILINES, PREPARATION THEREOF AND THERE USE

Wolfgang Rieper, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 474,982, Feb. 6, 1990, abandoned, which is a continuation of Ser. No. 278,199, Nov. 30, 1988, abandoned. This application Sep. 5, 1990, Ser. No. 578,014
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740622

Int. Cl.⁵ C09B 29/20, 29/32, 41/00; D06P 1/44
U.S. Cl. 534—579 16 Claims

1. A monoazo pigment of the formula



where K is the residue of the coupling component H-K which remains after azo coupling of the coupling component with a diazo component derived from a di- or trichloroaniline, H-K being substituted or unsubstituted naphthol or substituted or

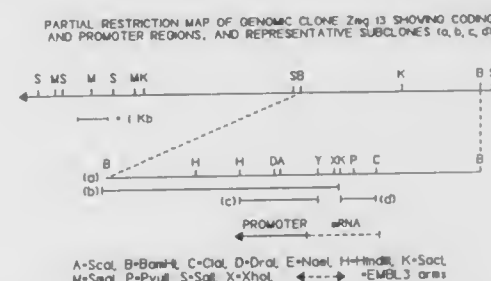
unsubstituted acetoacetylamine, and n is 2 or 3, which pigment contains not more than 25 μg of a PCB, i.e. a polychlorinated biphenyl having at least 4 chlorine atoms, per g of pigment, determined by first dissolving the pigment in concentrated sulfuric acid, then transferring the PCB portions dissolved therein into an apolar organic solvent, and quantitatively analyzing therein for PCB.

5,086,169

ISOLATED POLLEN-SPECIFIC PROMOTER OF CORN

Joseph P. Mascarenhas, Delmar, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.
Continuation-in-part of Ser. No. 341,151, Apr. 20, 1989, abandoned. This application Oct. 31, 1989, Ser. No. 429,822
Int. Cl.⁵ C12N 15/11, 15/82

U.S. Cl. 536—27 1 Claim



1. A purified isolated DNA sequence consisting essentially of the promoter region derived from a pollen-specific gene of inbred corn line W-22 having substantially the sequence illustrated in FIG. 2 and any base substitutions, additions, deletions, mutations and other changes thereof in which the promoter function is preserved.

5,086,170

PROCESS FOR THE PREPARATION OF AZABICYCLO COMPOUNDS

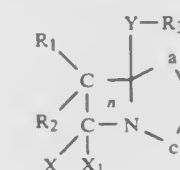
Abdul B. N. Luheshi, Hull; Robert K. Smalley, Urmston; Peter D. Kennewell, Okus, and Robert Westwood, Kingston Bagpuize, all of Great Britain, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 465,031, Jan. 16, 1990. This application Dec. 24, 1990, Ser. No. 633,289

Claims priority, application United Kingdom, Jan. 16, 1989, 8900863

Int. Cl.⁵ C07D 487/04 5 Claims

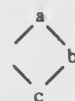
U.S. Cl. 540—303 1. A process for the preparation of a compound selected from the group consisting of a compound of the formula



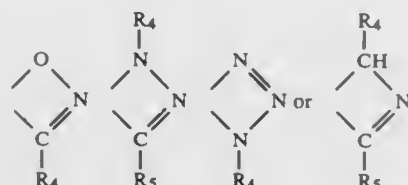
wherein R₁ and R₂ are individually selected from the group consisting of hydrogen, alkyl and hydroxyalkyl of 1 to 5 carbon atoms and amino, n is an integer from 1 to 3, X and X₁ are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms or taken together with the carbon atom to which they are attached are



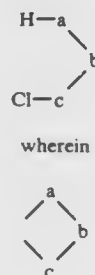
Y is —O— or —S—, R₃ is alkyl of 1 to 3 carbon atoms or aryl of 6 to 8 carbon atoms,



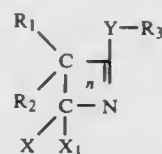
is selected from the group consisting of



R₄ and R₅ are individually aryl unsubstituted or substituted with at least one member of the group consisting of halogen, —NO₂ and alkyl and alkoxy of 1 to 3 carbon atoms and non-toxic, pharmaceutically acceptable salts thereof with acids and bases comprising effecting a cyclo addition reaction between a compound of the formula

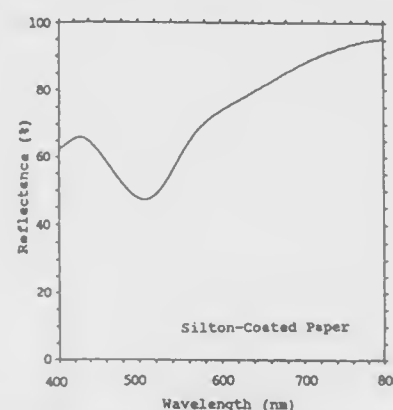


is as defined above and a compound of the formula

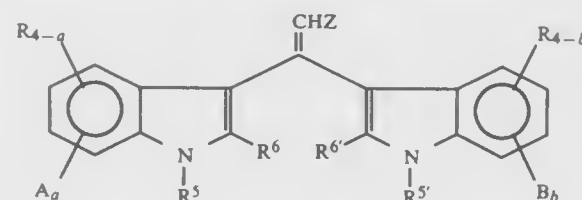


wherein R₁, R₂, n, X, X₁, Y and R₃ are as defined above to obtain the compound of formula I.

5,086,171
BIS-(INDOLYL)ETHYLENES
Ponnampalam Mathiaparanam, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.
Continuation-in-part of Ser. No. 320,642, Mar. 8, 1987, Pat. No. 4,996,328. This application Nov. 19, 1990, Ser. No. 615,730
Int. Cl.⁵ C07D 413/00
U.S. Cl. 544—144 10 Claims

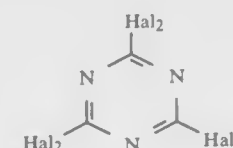


1. Chromogenic bis-(indolyl)ethylene of the formula



wherein a is 1 or 2,
wherein b is 1 or 2,
wherein each A is selected from the group consisting of a dialkylamino, dialkoxyalkylamino, diaroxyalkylamino, diarylam, alkylaryl amino, dicycloalkylamino, alkylcycloalkylamino, arylcycloalkylamino, pyrrolidino, piperidino, and morpholino radical,
wherein each B is selected from the group consisting of A, alkoxy, alkoxyalkyl and aryloxy radical,
wherein each R is selected from the group consisting of hydrogen, halogen, alkyl, and alkoxy,
wherein each of R⁵, R^{5'}, R⁶, R^{6'} are selected from the group consisting of hydrogen, alkyl (C₁–C₈), alkoxyalkyl, aryloxyalkyl, cycloalkyl (C₃–C₆), phenyl, and phenyl substituted by alkyl (C₁–C₈) or alkoxy (C₁–C₈),
wherein Z is selected from the group consisting of hydrogen, alkyl (C₁–C₈), alkoxyalkyl, aryloxyalkyl, halogen, phenyl, and phenyl substituted by alkyl or alkoxy,
the alkyl moieties referred to herein being of one to eight carbons, the cycloalkyl moieties referred to herein being of three to six carbons.

5,086,172
PREPARATION OF 2,4,6-TRICYANO-1,3,5-TRIAZINE
Gunther Beck, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jan. 3, 1991, Ser. No. 637,386
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000480
Int. Cl.⁵ C07D 251/24
U.S. Cl. 544—180 7 Claims
1. A process for the preparation of 2,4,6-tricyano-1,3,5-triazine, comprising reacting a 2,4,6-trihalogeno-1,3,5-triazine of the formula



in which

Hal₁ and Hal₂ independently of one another represent chlorine or fluorine, with an alkali metal cyanide or an alkaline earth metal cyanide.

5,086,173
PROCESS FOR THE PREPARATION OF
ALKYLHYDROXYANILINOTHIOTRIAZINE
DERIVATIVES

Wolfgang Tritschler, Binzen, Fed. Rep. of Germany; Heinz Steiner, Münchenstein, Switzerland; Helmut Prestel, Bruchsal, and Rudolf Maul, Lorsch/Hessen, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 13, 1991, Ser. No. 699,067

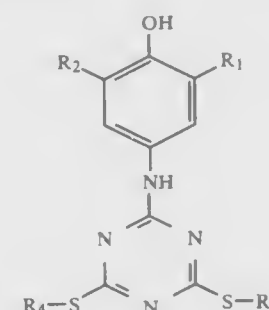
Claims priority, application Switzerland, May 18, 1990, 1701/90

Int. Cl.⁵ C07D 251/46

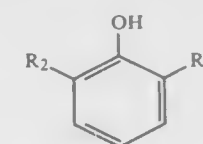
U.S. Cl. 544—211

13 Claims

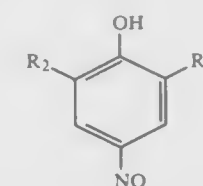
1. A process for the preparation of an alkylhydroxyanilinothiotriazine derivative of formula I



wherein R₁ and R₂ are each independently of the other hydrogen, C₁–C₁₂alkyl, C₅–C₆cycloalkyl or phenyl, and R₃ and R₄ are each independently of the other C₁–C₁₈alkyl, C₅–C₆cycloalkyl, phenyl, phenyl which is substituted by C₁–C₆alkyl and/or hydroxy, or phenyl-C₁–C₄alkyl, which process comprises reacting a compound of formula III



with a nitrite, in aqueous or aqueous/organic medium, to a compound of formula II



extracting said compound of formula II from the reaction solution with a solvent, hydrogenating said compound, without isolation, in the cited solvent and in the presence of a palladium catalyst, to the corresponding p-aminophenol, and

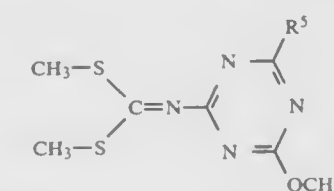
reacting said aminophenol, without isolation, with cyanuric chloride and a compound of formula HSR₃ or HSR₄ or a mixture of compounds of formulae HSR₃ and HSR₄.

5,086,174
PREPARATION OF SULFONYLSISOTHIOUREAS
Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 395,228, Aug. 17, 1989, Pat. No. 4,968,796.
This application Jun. 6, 1990, Ser. No. 534,389
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829469
Int. Cl.⁵ C07D 251/42, 251/46

U.S. Cl. 544—213

2 Claims

1. An N-(s-triazin-2-yl)-iminodithiocarbonic acid S,S-dimethyl ester of the formula



(I) in which
R⁵ is CH₃ or OCH₃.

5,086,175
POLYISOCYANATES, THEIR PRODUCTION AND USES
Ichiro Minato, Kobe; Fumiaki Hirata, Sakai, and Tatsuya Nakashima, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Dec. 18, 1989, Ser. No. 451,746
Claims priority, application Japan, Dec. 28, 1988, 63-330979
Int. Cl.⁵ C07D 251/34; C08K 5/34

U.S. Cl. 544—221

27 Claims

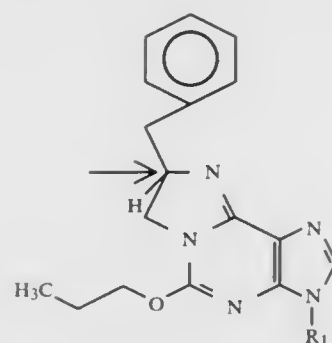
1. A polyisocyanate having an isocyanurate ring which can be diluted with a nonpolar solvent to a concentration of 75% or less and remains a clear homogeneous liquid without showing turbidity at 5° C. and which is obtained by reacting a diisocyanate compound selected from the group consisting of alkylene, cycloalkylene and aralkylene diisocyanates with a monoalcohol of 10- to 50 carbon atoms in the presence of an isocyanuration catalyst, and removing the unreacted diisocyanate compound from the reaction mixture.

(II)

5,086,176
TRICYCLIC FUSED ADENINE DERIVATIVES
Norton P. Peet, Cincinnati, and Nelsen L. Lentz, West Chester, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio
Division of Ser. No. 544,811, Jun. 27, 1990, which is a continuation of Ser. No. 330,400, Mar. 29, 1989, abandoned.
This application Jun. 4, 1991, Ser. No. 709,957
Int. Cl.⁵ C07D 473/00, 487/12; A61K 31/645
U.S. Cl. 544—251

1 Claim

1. A compound according to the formula:



wherein R₁ is phenyl and the (R) and (S) enantiomers thereof, wherein the chiral carbon atom is designated by the arrow, that is (R)-7,8-dihydro-3-phenyl-8-(phenylmethyl)-5-propoxy-3H-diimidazo[1,2-c:4',5'-e]pyrimidine and (S)-7,8-dihydro-3-phenyl-8-(phenylmethyl)-5-propoxy-3H-diimidazo[1,2-c:4',5'-e]pyrimidine.

5,086,177

PREPARATION OF OXYGUANIDINES

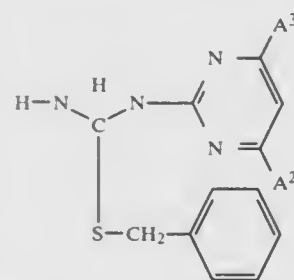
Hans-Jochem Riebel, Wuppertal, and Klaus-Helmut Müller, Duesseldorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 400,916, Aug. 30, 1989, Pat. No. 4,980,469.
This application May 24, 1990, Ser. No. 517,985

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3829957

Int. Cl.⁵ C07D 239/42, 239/47

U.S. Cl. 544—320

1. An isothiourea of the formula



in which

A² represents fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-halogenoalkyl, C₁-C₂-alkoxy-C₁-C₂-alkyl, C₁-C₄-alkoxy, C₁-C₄-halogenoalkoxy, C₁-C₄-alkylthio, C₁-C₄-halogenoalkylthio, C₁-C₄-alkylamino, dimethylamino or diethylamino, and

A³ represents hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-halogenoalkyl, C₁-C₄-alkoxy, C₁-C₄-halogenoalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylamino, dimethylamino or diethylamino,

or a hydrogen chloride, bromide or iodide thereof.

5,086,178

FLUORINATED DIAZABICYCLOALKANE DERIVATIVES

Ronald E. Banks, Stockport, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

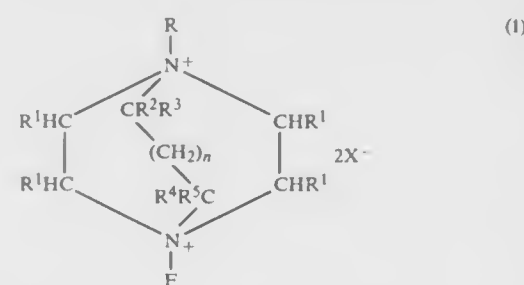
Filed Sep. 20, 1990, Ser. No. 585,765

Int. Cl.⁵ C07D 487/08, 519/00; C07B 39/00

U.S. Cl. 544—351

19 Claims

1. An N-fluorinated diazabicycloalkane compound having the following Formula I:



wherein n represents 0, 1, or 2; R represents a quaternizing organic group selected from the group consisting of aliphatic unsubstituted linear or branched C₁-C₁₆ alkyl groups, benzyl, benzyl substituted by one to three C₁-C₄ alkyl groups, C₁-C₁₀ perfluoroalkyl groups, C₁-C₁₆ partially halogenated alkyl groups, and 3-(4-fluoro-1,4-diazoniabicyclo(2,2,2)oct-1-yl)propyl; each R¹, R², R³, R⁴ and R⁵ independently is selected from the group consisting of hydrogen, C₁-C₆ alkyl, aryl, C₁-C₆ alkyl-substituted aryl or aryl-substituted C₁-C₆ alkyl and each X⁻ independently is a counterion or 2X⁻ represents a single divalent counterion, either of which are capable of forming a strable salt with the dication portion of the compound.

5,086,179

PROCESS FOR THE PREPARATION OF OPTICALLY PURE AMIDES

Matthew R. Powers, Barto, Pa.; Raymond D. Youssefeyeh, Princeton Junction, N.J.; William L. Studt, Harleysville, and Frederick A. Golec, Merion, both of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Ft. Washington, Pa.

Continuation-in-part of Ser. No. 351,625, May 15, 1989, Pat. No. 4,959,485, which is a division of Ser. No. 186,824, Apr. 27, 1988, Pat. No. 4,863,921. This application Sep. 24, 1990, Ser. No. 586,669

Int. Cl.⁵ C07D 453/02; C07B 53/00; C07C 231/08
U.S. Cl. 546—133

19 Claims

1. A process for the preparation of a substantially optically pure secondary amide containing at least one acid sensitive chiral center in the acyl portion of the amide and an N-chiral group, comprising removing an N acid-removable-chiral group from a substantially optically pure N-chiral, N-chiral disubstituted amide compound under acid conditions which do not isomerize said acid sensitive chiral center, wherein said acid removable N-chiral group is capable of forming a stabilized carbonium ion and comprises a chiral alkyl group substituted with aryl or heteroaryl.

5,086,180

SULPHAMOYLTHIOPHENES, A PROCESS THEIR PREPARATION

Dieter Binder, Vienna; Franz Rovenszky, Bruck an der Leitha; Norman Brunner, Hagenbrunn, and Hubert P. Ferber, Ansfelden, all of Austria, assignors to Chemisch Pharmazeutische Forschungsgesellschaft m.b.H., Linz, Austria

Filed Jun. 15, 1990, Ser. No. 544,113

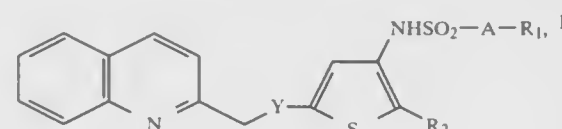
Claims priority, application Austria, Jul. 5, 1989, 1639/89

Int. Cl.⁵ C07D 239/74

U.S. Cl. 546—172

2 Claims

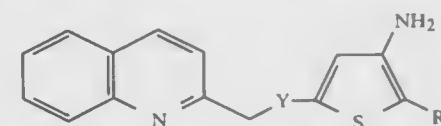
1. A process for producing a compound of the formula



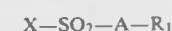
in which

Y denotes O or S,

A denotes a single bond or a straight-chain or branched alkylene group having 1-5 carbon atoms,
R₁ denotes methyl or trifluoromethyl and
R₂ denotes COOR₃, in which
R₃ denotes (C₁-C₄)-alkyl,
which comprises reacting a compound of the formula:



in which Y and R₂ have the above meaning with a compound of the formula



in which A and R₁ have the above meaning and X represents chlorine or a group —O—SO₂—A—R₁, where A and R₁ have the above meaning, in an inert organic solvent and in the presence of at least 2 equivalents of an inorganic or organic base.

5,086,182

INTERMEDIATES FOR THE PRODUCTION OF EPIPODOPHYLLOTOXIN AND RELATED COMPOUNDS AND PROCESSES FOR THE PREPARATION AND USE THEREOF

Dolatrai M. Vyas, Madison, Conn., and Paul M. Skonezny, Clay, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

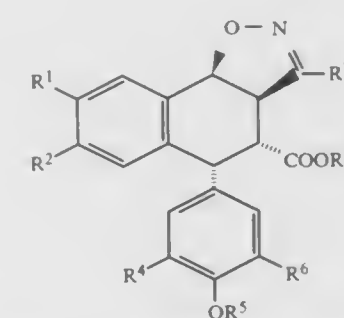
II Division of Ser. No. 379,747, Jul. 14, 1989, Pat. No. 5,011,948, which is a division of Ser. No. 245,108, Sep. 16, 1988, Pat. No. 4,866,189, which is a division of Ser. No. 76,513, Jul. 27, 1987, Pat. No. 4,795,819, which is a division of Ser. No. 707,422, Sep. 19, 1986, Pat. No. 4,728,740, which is a division of Ser. No. 722,932, Apr. 12, 1985, Pat. No. 4,644,072. This application Feb. 13, 1991, Ser. No. 654,466

Int. Cl.⁵ C07D 261/20

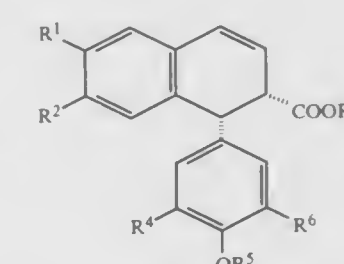
U.S. Cl. 548—110

1 Claim

III 1. A process for the preparation of a compound of the formula



wherein R¹ and R² each are independently hydrogen or (lower)-alkoxy, or R¹ and R², taken together, is methylenedioxy; R³ is hydrogen or a carboxyl-protecting group; R⁴ and R⁶ each are independently hydrogen or (lower)alkoxy; R⁵ is hydrogen or a phenol-protecting group; and R⁷ is hydrogen, halogen, (lower)-alkoxycarbonyl, carboxyl, cyano, trimethylsilyl, phenylsulfonyl or phenoxy carbonyl in which the phenyl ring of R⁷ may contain one or two substituents independently selected from (lower)alkyl, halogen, (lower)alkoxy and trifluoromethyl, comprising the step of reacting a cis-olefin of the formula



wherein R¹, R², R³, R⁴, R⁵ and R⁶ are as defined above, with a nitrile oxide of the formula



wherein R⁷ is as defined above, in an inert aqueous or organic, or mixed aqueous-organic solvent at about —20° C. to refluxing temperature of the solvent to stereoselectively produce said compound of the Formula X, and optionally and selectively deblocking said compound of Formula X wherein R³ is a carboxyl-protecting group to produce a compound of the formula

5,086,181

4-BROMO-6-CHLORO-5-AMINO-2-SUBSTITUTED PYRIDYL COMPOUNDS

Hans Lindel, Leverkusen; Werner Hallenbach, Langenfeld; Friedrich Berschauer, Wuppertal; Gernot Klotz, Leichlingen, and Heinrich A. Greife, Langenfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 340,936, Apr. 20, 1989, Pat. No. 4,988,694.

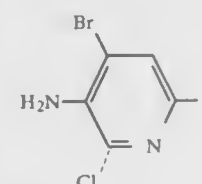
This application Sep. 13, 1990, Ser. No. 581,815

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1989, 3813839

Int. Cl.⁵ C07D 213/61

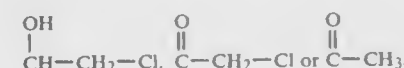
U.S. Cl. 546—310

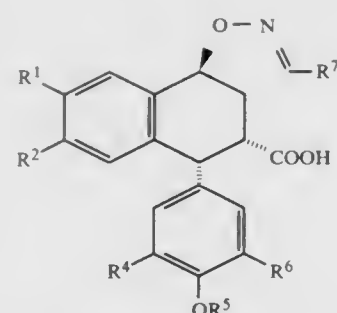
1. A pyridine derivative of the formula



in which

A stands for





wherein R^1 , R^2 , R^4 , R^5 , R^6 and R^7 are as defined above.

5,086,183

SUBSTITUTED PYRAZOLINE DERIVATIVES

Rainer Fuchs, Wuppertal; Ulrike Wachendorff-Neumann, Monheim, both of Fed. Rep. of Germany; Benedikt Becker, Apiano, Italy; Christoph Erdelen, Leichlingen, and Wilhelm Stendel, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 641,417, Jan. 15, 1991. This application Jun. 19, 1991, Ser. No. 717,560

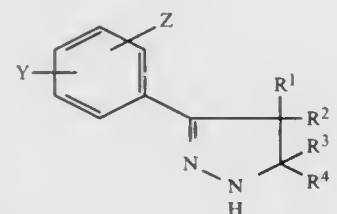
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1990, 4001931; Oct. 10, 1990, 4032089

Int. Cl.⁵ C07D 403/04; C07F 7/10

U.S. Cl. 548—110

1 Claim

1. Substituted pyrazoline derivatives of the general formula



(II)

in which

R^1 represents an unsaturated five-membered heterocycle which contains 1 to 4 nitrogen atoms, which is optionally substituted and which is optionally benzo-fused and which is attached by way of a ring nitrogen,

R^2 represents hydrogen, alkyl, optionally substituted cycloalkyl, halogenoalkyl, halogenoalkylthio, alkoxy, carbonyl or trialkylsilyl,

R^3 represents hydrogen or alkyl,

R^4 represents hydrogen or alkyl, and Y and Z can be identical or different and represent hydrogen, alkyl, halogen, halogenoalkyl, alkoxy, alkylthio, halogenoalkoxy, halogenoalkylthio, alkoxy, carbonyl, optionally substituted aryl, alkenyl, alkenylthio, alkenyloxy, alkenyl, alkenylthio, alkylsulfonyl, halogenoalkylthionyl, halogenoalkylsulfonyl, amino, nitro or cyano, or where Y and Z together represent optionally halogen-substituted 3,4-methylenedioxy or 3,4-ethylenedioxy.

5,086,184

N-HETEROCYCLIC BENZAMIDES

Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Dow Chemical Company, Indianapolis, Ind.

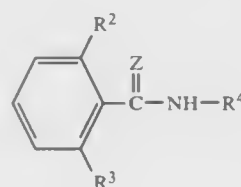
Division of Ser. No. 270,907, Nov. 14, 1988, Pat. No. 4,943,634, which is a division of Ser. No. 805,020, Dec. 5, 1985, Pat. No. 4,801,718, which is a division of Ser. No. 685,922, Dec. 24, 1984, Pat. No. 4,636,243, which is a division of Ser. No. 510,699, Jul. 5, 1983, Pat. No. 4,515,625, which is a division of Ser. No. 302,323, Sep. 14, 1981, Pat. No. 4,416,683, which is a continuation-in-part of Ser. No. 187,675, Sep. 16, 1980, abandoned. This application May 7, 1990, Ser. No. 520,008

Int. Cl.⁵ C07D 261/14; A01N 43/80

U.S. Cl. 548—246

26 Claims

1. An N-aryl benzamide of the formula



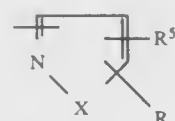
wherein:

Z is oxygen or sulfur;

R^2 is C_1 - C_4 alkylthio or C_1 - C_4 alkoxy;

R^3 is C_1 - C_4 alkylthio or C_1 - C_4 alkoxy;

R^4 is an aryl group selected from

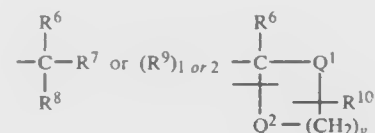


in which:

R is hydrogen or C_1 - C_4 alkyl;

X is O;

R^5 is

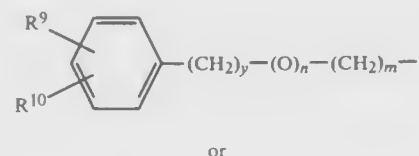


wherein:

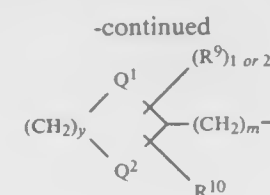
R^6 is hydrogen, C_1 - C_4 alkyl, C_2 - C_4 alkenyl, C_2 - C_4 alkynyl, C_1 - C_6 alkoxy, or C_1 - C_6 alkylthio;

y is an integer from 0 to 5;

R^7 and R^8 independently are hydrogen, C_1 - C_{13} alkyl, halo- C_1 - C_{13} alkyl, C_2 - C_{13} alkenyl, C_2 - C_{13} alkynyl, C_1 - C_6 alkoxy, C_1 - C_6 alkylthio, C_1 - C_4 alkoxy- C_1 - C_6 alkyl, C_1 - C_4 alkylthio- C_1 - C_6 alkyl, C_2 - C_4 alkanoyloxy- C_1 - C_6 alkyl.



or



wherein:

m is an integer from 0 to 4;

n is zero or 1;

R^9 and R^{10} independently are hydrogen, halogen, C_1 - C_4 alkyl, or C_2 - C_4 alkenyl; Q^1 and Q^2 independently are CH_2 ; or the agronomically acceptable salts thereof.

5,086,185

PROCESS FOR PRODUCING 1,3-SUBSTITUTED TETRAHYDRO-1H-THIENO-[3,4-D]-IMIDAZOL-2(3H)-ON-4-YLIDENE PENTANOIC ACID ESTER

Martin Eyer, Glis, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Continuation of Ser. No. 491,589, Mar. 12, 1990. This application Jul. 23, 1990, Ser. No. 556,187

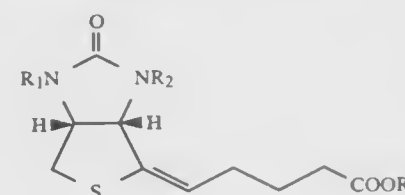
Claims priority, application Switzerland, Mar. 15, 1989, 953/89

Int. Cl.⁵ C07D 473/00

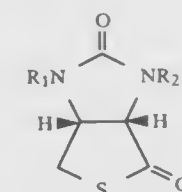
U.S. Cl. 548—303

8 Claims

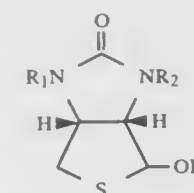
1. Process for producing a 1,3-substituted tetrahydro-1H-thieno-[3,4-d]-imidazol-2(3H)-on-4-ylidene pentanoic acid ester of the formula:



wherein R is a C_1 - C_6 alkyl group which is a straight-chain or branched, or a phenyl or benzyl group which is unsubstituted or substituted with at least one halogen atom or with a lower alkyl group and R_1 is an (R)- or (S)-1-phenyl lower alkyl group and R_2 is hydrogen, a lower alkanoyl group, a benzoyl group, a benzyl group which is unsubstituted or substituted with halogen or lower alkyl, a lower alkoxy, carbonyl group, a lower alkoxy, lower alkyl group, consisting essentially of reducing a 1,3-substituted tetrahydro-1H-thieno-[3,4-d]-imidazole-2,4-dione of the formula:



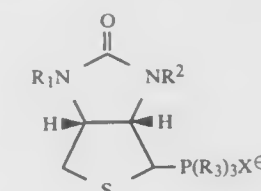
wherein R_1 and R_2 have the above meanings, with a reducing agent selected from the group consisting of diisobutyl aluminum hydride, sodium borohydride, a borane complex or a complex aluminum hydride, to the corresponding hydroxy compound of the formula:



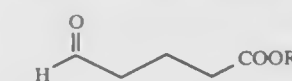
reacting the corresponding hydroxy compound with a phosphonium salt of the formula:



wherein R_3 is an alkyl group with 1 to 20 C atoms, a phenyl group or benzyl group and X is a halogen atom, BF_4^- , ClO_4^- , I_3^- or PF_6^- , to provide a phosphonium compound of the formula:



wherein R_1 , R_2 , R_3 and X have the above meanings, and converting the phosphonium compound of formula IV into the end product in the presence of a strong base with a 5-oxo-valeric acid ester of the formula:



wherein R has the meaning above.

5,086,186

N-TRICHLOROACETYL-2-OXINDOLE-1-CARBOXAMIDES

Sarah E. Kelly, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

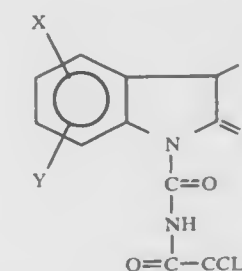
Division of Ser. No. 357,138, May 25, 1989, Pat. No. 4,952,703. This application May 31, 1990, Ser. No. 531,952

Int. Cl.⁵ C07D 403/06, 491/048, 491/056, 495/04

U.S. Cl. 548—468

9 Claims

1. A compound of the formula (II)



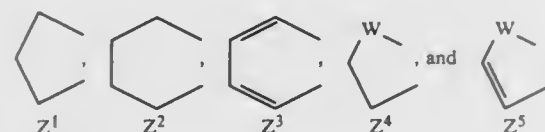
wherein

X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in

each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;

or X and Y when taken together are a 4,5-, 5,6- or 6,7-methylenedioxy group or a 4,5-, 5,6- or 6,7-ethylenedioxy group;

or X and Y when taken together and when attached to adjacent carbon atoms, form a divalent radical Z, wherein Z is selected from the group consisting of



wherein
W is oxygen or sulfur;
R is



wherein R¹ is $-(CH_2)_n-Q-R^0$; wherein n is zero, 1 or 2; Q is a divalent radical derived from a compound selected from the group consisting of furan, thiophene, pyrrole, tetrahydrofuran, tetrahydrothiophene, tetrahydropyran, tetrahydrothiopyran, benzofuran and benzothiophene; and R⁰ is hydrogen or alkyl having 1 to 3 carbons.

5,086,187

HERBICIDAL PYRONES

Janet E. Anderson-McKay, Newtown, and Andris J. Liepa, Wheelers Hill, both of Australia, assignors to Dunluna Pty. Limited, North Sydney, Australia

Division of Ser. No. 188,800, Apr. 13, 1988, Pat. No. 4,939,278.

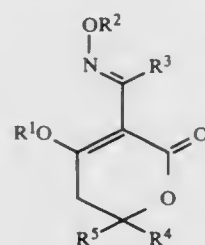
This application May 31, 1990, Ser. No. 531,325

Int. Cl.⁵ C07D 337/02, 311/96

U.S. Cl. 549—9

11 Claims

1. A compound of the following general formula, including isomers and tautomers thereof:



wherein:

R¹ is selected from the group consisting of hydrogen; optionally substituted C₁-C₆ alkyl; C₂-6 alkenyl; C₂-6 alkynyl; optionally substituted C₃-6 cycloalkyl; C₅-6 cycloalkenyl wherein the said substituted alkyl or cycloalkyl group is substituted with a substituent selected from the group consisting of alkoxy, alkylthio and optionally substituted phenyl; optionally substituted phenyl; alkyl sulfonyl; optionally substituted benzene sulfonyl; C₂-6 acyl group; and an inorganic or organic cation;

R² is selected from the group consisting of optionally substituted C₁-6 alkyl; C₂-6 alkenyl; optionally substituted C₃-6 cycloalkyl; C₅-6 cycloalkenyl; C₂-6 haloalkenyl; C₂-6 alkynyl; C₂-6 haloalkynyl wherein the said substituted alkyl or cycloalkyl is substituted with a substituent selected from the group consisting of halogen, alkoxy, alkyl-

thio and optionally substituted phenyl; and optionally substituted phenyl;

R³ is selected from the group consisting of C₁-6 alkyl; C₁-6 haloalkyl; C₂-6 alkenyl; C₃-6 cycloalkyl; C₅-6 cycloalkenyl; C₂-6 alkynyl; and optionally substituted phenyl; wherein any carbon-containing substituents on an R¹ and R³ alkyl contains up to 6 carbon atoms; and

R⁴ and R⁵ together with the carbon to which they are attached form a substituted or unsubstituted saturated or partially saturated sulfur-containing ring containing 3 to 10 ring atoms, which ring can be bridged or fused and can contain substituents selected from the group consisting of hydrogen; C₁-6 alkyl; C₂-6 alkenyl; C₂-6 alkynyl; substituted C₁-6 alkyl wherein the alkyl group is substituted with a substituent selected from the group consisting of alkoxy, alkylthio and optionally substituted phenyl; optionally substituted phenyl; oxo; C₂-6 acyl; C₁-6 alkoxy; C₁-6 alkylthio; C₂-6 alkoxycarbonyl; C₃-6 (alkoxyimino) alkyl; C₁-6 ketal; and C₁-6 carboxylic acid.

5,086,188

PREPARATION OF 3,5-DICHLOROPHTHALIC ACID AND 3,5-DICHLOROPHTHALIC ANHYDRIDE

Lawrence B. Fertel, Buffalo; Neil J. O'Reilly, and Henry C. Lin, both of Grand Island, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

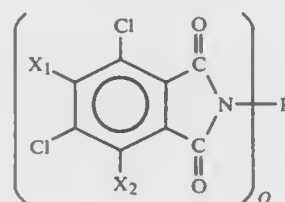
Filed Jan. 16, 1991, Ser. No. 641,961

Int. Cl.⁵ C07D 307/77; C07C 51/06

U.S. Cl. 549—246

19 Claims

1. A process for the preparation of salts of 3,5-dichlorophthalic acid which comprises reacting the polychlorophthalimide represented by the following formula



wherein X₁ and X₂ may be chlorine or hydrogen provided that both X₁ and X₂ may not be hydrogen, Q may be 1 or 2, and the R group may be a monovalent or divalent organic group selected from the group consisting of C₁ to C₈ straight or branched alkyl, C₃ to C₈ cycloalkyl, and C₆ to C₁₂ aryl; with metallic zinc in the presence of a base, whereby a reaction mixture containing a salt of 3,5-dichlorophthalic acid is formed.

5,086,189

PROCESS FOR THE MANUFACTURE OF EPOXIDES

André Lecloux, Meise; Claude Declerck, Brussels, and Franz Legrand, Quaregnon, all of Belgium, assignors to Interlox (Société Anonyme), Brussels, Belgium

Continuation of Ser. No. 649,959, Sep. 11, 1984, abandoned, which is a continuation of Ser. No. 517,387, Jul. 27, 1983, abandoned, which is a continuation of Ser. No. 391,407, Jun. 23, 1982, abandoned. This application Feb. 2, 1990, Ser. No. 474,226

Claims priority, application France, Jun. 26, 1981, 81 12797

Int. Cl.⁵ C07D 301/12

U.S. Cl. 549—531

21 Claims

1. A process for the manufacture of epoxides, comprising: reacting hydrogen peroxide with a compound containing an ethylenic double bond, in a homogenous liquid reaction mixture in which the concentration of water is kept below 10% by weight, containing a catalyst consisting essentially of a compound selected from the group consisting of selenium dioxide and selenous acid, and a base which is a member of the group consisting of pyridine, halogeno-

substituted pyridine, amino-substituted pyridine, alkoxy-substituted pyridine, alkyl-substituted pyridine, quinoline, and isoquinoline.

5,086,190

METHOD OF FLUORINATING BY USING N-FLUOROPYRIDINIUM PYRIDINE HEPTAFLUORODIBORATE

Michael Van Der Puy, Cheektowaga; David Nalewajek, West Seneca; George A. Shia, North Tonawanda, and William J. Wagner, Hamburg, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

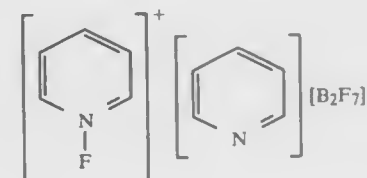
Continuation-in-part of Ser. No. 497,382, Mar. 21, 1990, abandoned, which is a division of Ser. No. 406,659, Sep. 13, 1989, Pat. No. 4,935,519, which is a continuation-in-part of Ser. No. 351,115, May 12, 1989, abandoned. This application Jan. 29, 1991, Ser. No. 647,101

Int. Cl.⁵ C07J 75/00

U.S. Cl. 552—521

7 Claims

1. A method of fluorinating an organic selected from the group consisting of 3,17β-diacetoxy-3,5-androstadiene, 3,17β-bis(trimethylsiloxy)-3,5-androstadiene, and 3β-acetoxy-17-acetamino-5,16-androstadiene compound by reacting a compound represented as



with said organic compound in a solvent at a temperature sufficient to effect said fluorination.

5,086,191

INTERMEDIATES FOR THE SYNTHESIS OF 19-NOR VITAMIN D COMPOUNDS

Hector F. DeLuca, Deerfield; Heinrich K. Schnoes, and Kato L. Perlman, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

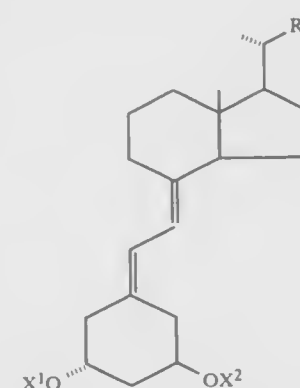
Filed May 28, 1991, Ser. No. 705,932

Int. Cl.⁵ C07C 3/00

U.S. Cl. 552—653

1 Claim

1. A compound of the formula



where X¹ and X², which may be the same or different, represent hydrogen or a hydroxy-protecting group, and where R¹ is selected from the group consisting of hydroxy-methyl, hydroxy-protected hydroxymethyl, carboxaldehyde (—CHO), and carboxyalkyl (—COOalkyl).

5,086,192

PHOTOPOLYMERIZABLE COMPOSITIONS AND PHOTOINITIATORS THEREFOR

Carl R. Kessel, St. Paul, and Tracy R. Woodward, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 14, 1990, Ser. No. 627,498

Int. Cl.⁵ C07F 7/18, 13/00; C08F 22/250; C08G 59/30

U.S. Cl. 556—9

7 Claims

1. A diatomic iodonium salt comprising: (a) a diatomic iodonium cation wherein one of the aromatic groups is substituted with a siloxanyl group; and (b) a halogen-containing complex anion.

5,086,193

AROMATIC ALKYLATION PROCESS

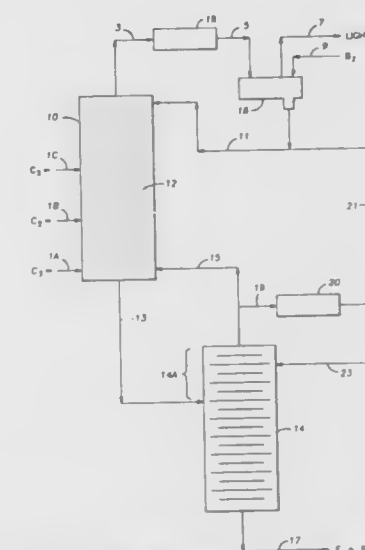
Angel Sy, Katy, Tex., assignor to Chemical Research & Licensing Company and ABB Lummus Crest, Inc., both of Houston, Tex., a part interest

Filed Nov. 9, 1990, Ser. No. 611,105

Int. Cl.⁵ C07C 2/64

U.S. Cl. 585—446

4 Claims



4. A process for the alkylation of organic aromatic compounds with olefins, comprising the steps of:

- dividing a first stream containing olefins into a second and third streams of the same composition and feeding said second and third streams to a distillation column reactor at different heights in a distillation reaction zone and feeding a fourth stream containing organic aromatic compounds to said distillation column reactor near the top of said distillation reaction zone;
- contacting said olefins and said organic aromatic compounds together with a particulate acidic catalytic distillation structure in said distillation reaction zone thereby reacting substantially all of said olefins with a portion of said organic aromatic compounds to form a reaction mixture containing alkylated aromatic product and unreacted organic aromatic compounds while distilling a portion of said unreacted organic aromatic compounds overhead of said distillation column reactor and distilling said alkylated aromatic product and the remainder of said unreacted organic aromatic compounds downward out of said distillation reaction zone;
- separating said alkylated product from said remainder of unreacted organic aromatic compounds by fractional distillation in a separate distillation zone having distillation structure above the point where said alkylated product and said remainder of unreacted organic aromatic compounds are fed to said distillation zone to provide an

enrichment section and enhanced separation of said remainder of unreacted organic aromatic compounds from said alkylated product, said remainder of unreacted organic aromatic compounds being recovered as overheads from said distillation zone and said alkylated product being recovered as bottoms from said distillation zone; (d) reducing the volume of vapors from said distillation zone by condensing a portion of said overheads from said distil-

lation zone and refluxing a portion of said condensed overheads;

- (e) combining the remainder of said condensed portion of said overheads with said fourth stream as feed to said distillation column reactor; and
(f) returning the uncondensed portion of said overheads from said distillation zone to a point near the bottom of said distillation reaction zone.

ELECTRICAL

5,086,194

TRUNKING ASSEMBLY

Robert F. W. Bruinsma, 9463 Ta-Eext-NI, Netherlands, assignor to Electrak International Ltd., Surrey, England and BIS BV, Hoogezaand, Netherlands

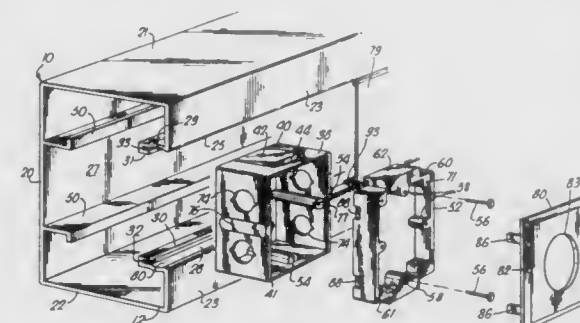
Filed Apr. 3, 1990, Ser. No. 503,774

Claims priority, application United Kingdom, Apr. 7, 1989, 8907896

Int. Cl.⁵ H05K 5/00

U.S. Cl. 174—48

15 Claims



1. A trunking assembly for accommodating electrical wiring and accessories, comprising a housing having a base and side walls defining a longitudinally extending channel having an opening therein; a pair of mounting rails extending longitudinally within the channel; a backing box freely longitudinally movable along said housing for accepting an electrical accessory; clamping means adapted to hook over said mounting rails; and fastening means for attaching said clamping means to said backing box with said mounting rails disposed therebetween so as to clamp the backing box to said mounting rails to longitudinally fix it in position within the housing; the said mounting rails extending adjacent to the opening whereby relative deformation of said walls is substantially prevented on clamping of the backing box in position.

5,086,195

PROFILE WITH TWO FITTINGLY ENGAGEABLE PARTS, IN PARTICULAR A DUCT HAVING A BODY AND A COVER

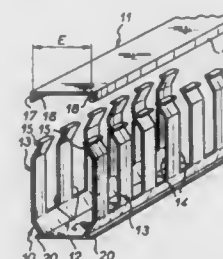
Jean-Jacques Claisse, Crepy En Valois, France, assignor to Planet Wattohm, Senlis, France

Filed May 10, 1990, Ser. No. 521,385

Int. Cl.⁵ H02G 3/04

U.S. Cl. 174—101

4 Claims



1. A profiled trunking member comprising a generally U-shaped body member and a cover part, said body member including a baseplate, two lateral flanges projecting from opposed sides of said baseplate, an opening defined between free ends of said lateral flanges remote from said baseplate, first and second snap-fastening means being provided proximate said baseplate and said free ends of the lateral flanges respectively, said first snap-fastening means being defined by extensions of said baseplate extending beyond junctions with the respective lateral flanges, the extensions and said baseplate lying in a common plane, said cover part having cooperable snap-fastening means selectively detentingly engageable with said first and second snap-fastening means, said cooperable snap-fast-

ing means comprising two inwardly directed hook-shaped members projecting from an underside of said cover part, the distance between the extension on said baseplate and the hook-shaped members being equal, said cover part having a first or packing position in which said cooperable snap-fastening means are in engagement with said first snap-fastening means and said cover part at least partially overlies said baseplate while leaving the lateral flanges substantially entirely uncovered, said cover part having a second or service position in which said cooperable snap-fastening means are in engagement with said second snap-fastening means for closing off said opening, each of said lateral flanges comprising a planar central panel and marginal panels to each side thereof, the marginal panels of each lateral flange being inclined away from the plane of the respective central panel and towards the other lateral flange so as to define substantially bowed lateral flanges.

5,086,196

ELECTRO-MECHANICAL CABLE FOR CABLE DEPLOYED PUMPING SYSTEMS

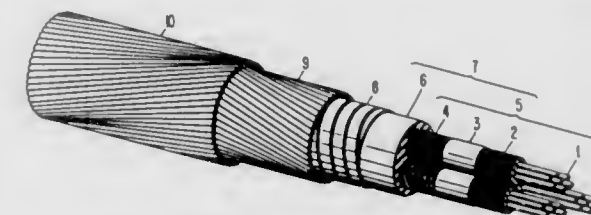
Earl B. Brookbank, Bartlesville, Okla., and Walter Dinkins, Lawrence, Kans., assignors to Camco, Incorporated, Houston, Tex.

Filed Aug. 9, 1990, Ser. No. 564,834

Int. Cl.⁵ H01B 7/18

U.S. Cl. 174—106 R

14 Claims



1. An electro-mechanical cable for use in a cable deployed pumping system and the like, comprising a cable core including insulated conductor means extending longitudinally of the cable and a core jacket surrounding the insulated conductor means, a pressure containment layer surrounding the cable core, and armor means surrounding the pressure containment layer, the pressure containment layer having means for restraining outward radial expansion of the cable core while permitting longitudinal expansion, whereby gas embolism and kinking of the cable due to outward radial expansion of the cable core are alleviated, wherein said insulated conductor means includes a plurality of wires with integral insulation surrounded by tape means for permitting longitudinal movement of the insulated wires relative to the core jacket when the cable is bent, and wherein said core jacket is formed of an elastomer that embeds the insulated conductor means therein to form said cable core as a unit to which the pressure containment layer is applied.

5,086,197

OPTICAL ENCODING METHOD AND DEVICE

Kwang-Wan Liou, 2F, No. 7, Lane 76, Pao An Street, Hsin Tien City, Taiwan

Filed Sep. 17, 1990, Ser. No. 583,608

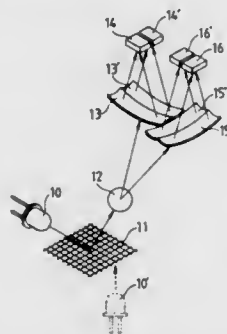
Int. Cl.⁵ G08C 21/00; G01V 9/04

U.S. Cl. 178—18

35 Claims

1. An optical encoding device for providing an operator interface with a machine, comprising:
a reflective Grid Pad having a plurality of coordinate lines arranged along an x-axis and y-axis;
imaging means for providing information indicative of a relative displacement of said imaging means with respect to said Grid Pad, said imaging means further comprising, a light source for forming an image of said coordinate lines

when light from said light source is reflected from the Grid Pad,
an imaging lens for magnifying said image,
a plurality of light-sensors each for providing a threshold measure of illumination, and



a plurality of axially aligned condensers each for condensing a fragment of said image onto one of said light-sensors, and
an encoder connected to said light-sensors for encoding said measures of illumination into information indicative of a relative displacement of said imaging means with respect to said Grid Pad.

5,086,198

ELECTRIC SWITCH

Motoi Arakawa, Shimane, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

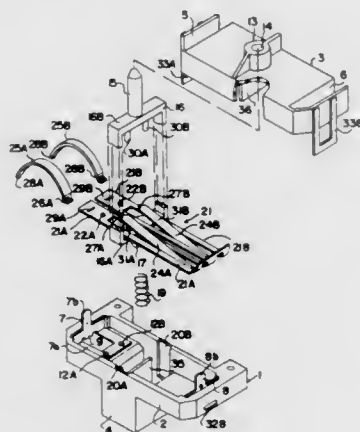
Continuation of Ser. No. 293,453, Jan. 4, 1989, abandoned. This application Jul. 23, 1990, Ser. No. 555,790

Claims priority, application Japan, Jan. 6, 1988, 63-517; Jan. 6, 1988, 63-518

Int. Cl.⁵ H01H 5/18

U.S. Cl. 200—456

6 Claims



1. An electric switch, comprising:

- 1) a casing;
- 2) at least one actuating member pivotally attached to said casing and pivotable between a first and a second position;
- 3) at least one moveable contact piece pivotally attached to said casing at a base end and pivotable between a third and a fourth position;
- 4) at least one moveable contact attached to said at least one moveable contact piece;
- 5) at least one U-shaped spring member, a pair of legs corresponding to each spring member, wherein:
 - a) one leg of said pair of legs being engaged with a free end of said moveable contact piece at an engagement point, and
 - b) an other leg of said pair of legs being engaged with a free end of said actuating member; wherein:

said at least one U-shaped spring urges said at least one

moveable contact piece into said third position when said at least one actuating member is in said first position; said at least one U-shaped spring urges said at least one moveable contact piece into said fourth position when said at least one actuating member is in said second position; and
the distance from a base end of said moveable contact piece to said moveable contact is less than the distance from said base end of said moveable contact piece to said engagement point.

5,086,199

LEVER SWITCH

Tsunesuke Takano, Tokyo, Japan, assignor to Daiichi Denso Babin Co., Ltd., Tokyo, Japan

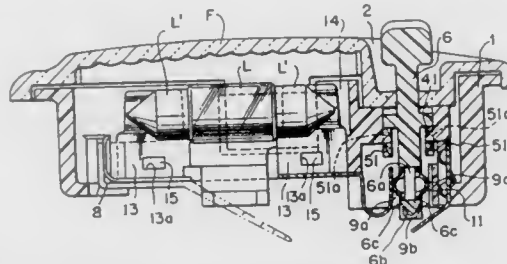
Filed May 10, 1990, Ser. No. 521,430

Claims priority, application Japan, May 15, 1989, 1-55678; May 25, 1989, 1-60729

Int. Cl.⁵ H01H 15/02, 9/00

U.S. Cl. 200—563

3 Claims



1. A lever switch device comprising:

an insulating base formed of a plastics material which defines an upper and lower switch operation spaces, a pair of confronting hinge bosses interposed between said upper and lower switch operating spaces, and a lamp-mounting space;

an operation lever having upper and lower ends and being pivotally coupled to said hinge bosses such that said upper end extends into said upper switch operation space and a lower end extends into said lower switch operating space, whereby said operation lever may be pivotally moved between first and second states; wherein

said lower end of said operation lever includes a bridge portion having a hole therein; and wherein

said operation lever further includes a substantially U-shaped movable contact having terminal ends which establish an opposed pair of resilient contact members, said U-shaped contact being mounted to said bridge portion of said lower end of said operation lever such that said opposed pair of resilient contact members are disposed adjacent to said hole through said lower end of said operation lever so as to be resiliently displaceable therewithin;

said lever switch further including;

a lamp-holding connector mounted to said base for holding a lamp within said lamp-mounting space; and
first and second fixed contacts forming an electrical circuit through the lamp held by said lamp-holding connector and disposed within said lower switch operating space such that said resilient contact members of said U-shaped movable contact makes electrical contact with said first and second fixed contacts when said operation lever is in said first state, and breaks electrical contact between said first and second fixed contacts when said operation lever is in said second state, whereby an electrical circuit is made and broken to turn said lamp held by said lamp-holding connector on and off, respectively.

5,086,200

MOLDED PRINTED CIRCUIT FOR ROTARY SWITCHES

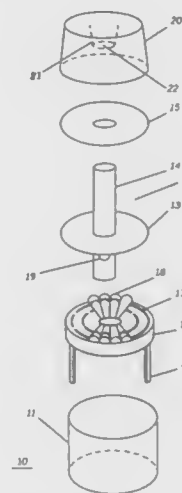
Charles E. Kline, Sunrise; Dale W. Dorinski, Coral Springs, and William M. Bradford, Davie, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 4, 1990, Ser. No. 532,784

Int. Cl.⁵ H01H 19/20, 9/00

U.S. Cl. 200—571

14 Claims



1. A rotary switch, having a plurality of operating positions, comprising:

a molded base comprising a printed electric circuit, having a plurality of conductive paths, deposited on at least one surface of the base, for providing at least a first electrical contact;

a rotating contact member comprising at least a second electrical contact thereon for providing at least one connection between at least two of the conductive paths in the printed electric circuit, as the rotating contact member rotates;

detent means for providing the operating positions for the rotary switch, the detent means comprising first and second portions, the first portion and the base being molded as a one piece unit and the second portion and the rotating contact member being molded as a one piece unit; and
attachment means for rotatably attaching the rotating contact member to the base.

5,086,201

METHOD AND DEVICES FOR THE EXTRACTION OF A CLOSURE PLUG FROM A STEAM GENERATOR TUBE

Daniel Grypczynski, Lyons; Paul Jacquier, Tassin la Demi-Lune, and André Guglielmo, Villeurbanne, all of France, assignors to Framatome, Courbevoie, France

Filed Apr. 3, 1990, Ser. No. 503,701

Claims priority, application France, Apr. 4, 1989, 89 04418

Int. Cl.⁵ B23H 1/00, 7/26, 9/00

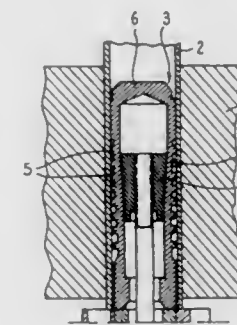
U.S. Cl. 219—69.17

17 Claims

1. Method for the extraction of a closure plug (3) from a steam generator tube (2), said plug comprising a tubular plug body (4) closed at one end by an end wall (6), and a clamp block (7) adapted to be inserted into said plug body (4) in such a manner as to effect diametrical expansion of said plug body (4) inside said tube (2) and its leaktight application against an inner wall of said tube, while said clamp block (7) remains in place in said plug body (4) in operating position, said method comprising the steps of

- (a) re-boring said plug body (4), in a direction of said end wall, at least as far as an expansion zone of said plug where anchoring means are provided, and drilling said clamp block (7) by electric machining over a substantial part of a length of said clamp block;
- (b) relieving a wall of said plug body (4) of stress with the aid

of a welding torch introduced into a bore re-bored in said plug body by electric machining; and



(c) introducing a gripping tool into said bore in order to extract from said tube said plug body relieved of stress.

5,086,202

WIRE GUIDES FOR TRAVELING WIRE TYPE APPARATUS

Takeshi Iwasaki, and Hisashi Yamada, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

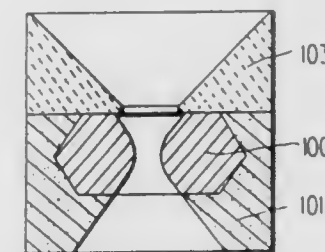
Filed Jul. 30, 1990, Ser. No. 559,800

Claims priority, application Japan, Oct. 23, 1989, 1-275176

Int. Cl.⁵ B23H 7/10

U.S. Cl. 219—69.12

12 Claims



12. A guide for traveling wire, comprising:

a die guide having a hole for insertion of the wire; and
a support member surrounding said die guide; and
at least one collar having a generally conical interior contour and a hole for passage of said wire, and made of a corrosion resistant electrical insulating material, said at least one collar being located at least on an inlet side of said die guide as an aid in the insertion of said wire and having its smaller diameter end facing said die guide, wherein an inner wall area of that portion of the wire inlet-side collar adjacent said die guide is cylindrical, such that said inner wall area is coaxial with respect to said wire.

5,086,203

WIRE ELECTRIC DISCHARGE MACHINING APPARATUS

Kazuo Kobayashi, Sagami, Hitoshi Miyahara, Yokohama; Hidemaru Nishikizawa, Hadano; Hironori Shimomoto, and Osamu Maruyama, both of Ebina, all of Japan, assignors to Hitachi, Seiko, Ltd., Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 360,131

Claims priority, application Japan, Jun. 3, 1988, 63-135531

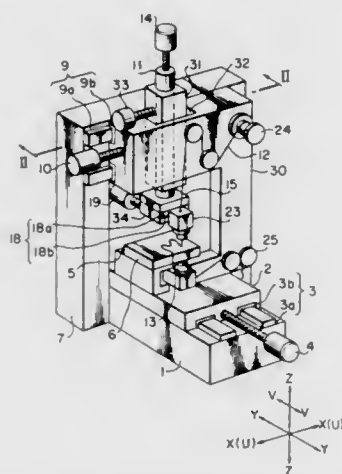
Int. Cl.⁵ B23H 7/02, 7/26

U.S. Cl. 219—69.12

9 Claims

1. In a wire electric discharge machining apparatus in which a workpiece and a wire supported by a pair of guides are moved relative to each other in an X-axis direction and a Y-axis direction, one of said guides being moved relative to the

other guide in two directions in a horizontal plane, the improvement comprising said pair of guides, a frame movable in the X-axis direction on a column, a table for mounting the workpiece and moving in the Y-axis direction on a base, rails



mounted on the column, a U-axis moving means and a V-axis moving means in parallel with said Y-axis, and said frame and said U-axis moving means are arranged in alignment on the same rails.

5,086,204

METHOD OF PRODUCING A PLUG-TYPE HEAT FLUX GAUGE

Curt H. Liebert, Middleburg Hts., and John Koch, Jr., Medina, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

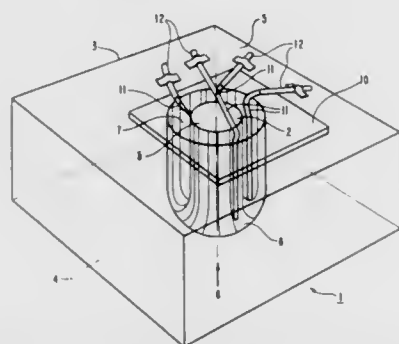
Division of Ser. No. 531,433, May 31, 1990, Pat. No. 5,048,973.

This application Apr. 8, 1991, Ser. No. 685,062

Int. Cl.⁵ B23H 9/00

U.S. Cl. 219—69.17

5 Claims



1. A method of producing a plug-type heat flux gauge with a thermoplug integrally formed in a member having a first surface exposed to an energy source which heats said member and a second surface oppositely disposed from said first surface away from said energy source, said method comprising the steps of

removing material from said second surface of said member in a circular groove thereby forming an annulus, forming a floor in said annulus at a predetermined finite distance from said first surface thereby forming said thermoplug from the material of said member which extends from said first surface to said second surface with no seam between said thermoplug and said member and said annulus encircling said thermoplug from said floor to said second surface, securing a plurality of thermocouple wires to said thermo-

plug at various predetermined distances from said first surface, and covering said annulus and thermocouple wires.

5,086,205

APPARATUS EMPLOYING A WELDING POWER SUPPLY FOR POWERING A PLASMA CUTTING TORCH

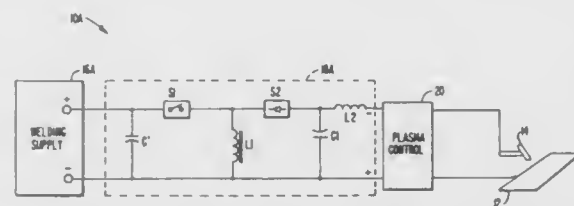
James M. Thommes, Escondido, Calif., assignor to Powcon, Inc., San Diego, Calif.

Filed Mar. 26, 1990, Ser. No. 499,020

Int. Cl.⁵ B23K 9/00

U.S. Cl. 219—121.54

28 Claims



1. A device for use with a DC welding power supply for supplying power to a plasma cutting torch for cutting a workpiece, said device comprising:

a first stage including an inductor for storing power supplied by the welding power supply at an input voltage; and a second stage including a capacitor for storing power stored in the first stage and for supplying power at an output voltage to a plasma cutting torch for cutting the workpiece, wherein the two stages cause the output voltage to be higher than the input voltage; and

wherein said first stage includes a first switch and the second stage includes a second switch, and wherein when the first switch is closed, the inductor is charged by energy from the welding power supply, and when the second switch is closed, the first switch is open, and energy stored in the inductor charges the capacitor to a voltage suitable for powering the plasma cutting torch.

5,086,206

SUPPORT ARM

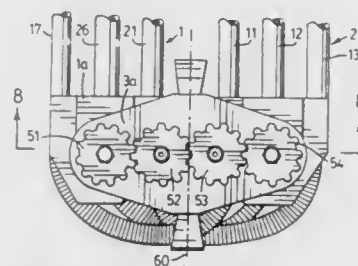
Henning Hansen, 1470 Highbush Trail, Pickering, Ontario, Canada L1V 1N5.

Continuation-in-part of Ser. No. 530,357, May 30, 1990, Pat. No. 5,025,126. This application Apr. 12, 1991, Ser. No. 684,554

Int. Cl.⁵ B23K 9/32

U.S. Cl. 219—125.1

21 Claims



1. A support arm comprising: an inner boom having a longitudinal axis; mounting means, pivotally connected to the inner end of the boom, for pivotally mounting the boom to a stationary supporting structure; an outer jib having a longitudinal axis; a knuckle having an inner end pivotally connected to the outer end of the boom and having an outer end pivotally connected to the inner end of the jib said knuckle having a longitudinal median axis; support means, connected to the outer end of the jib for supporting a suspended load;

said boom and said jib each constructed of rigid open-ended tube means for providing an at least partially encased access channel between the suspended load and the inner end of the boom;

flexible tube means adjacent the knuckle, the flexible tube means spanning between the rigid tube means of the boom and the rigid tube means of the jib; and a drive connecting said boom, knuckle and jib and pivoting each one of said boom and jib relative to the median axis of the knuckle through an angular displacement equal to the angular displacement of the other of said boom and jib relative to said median axis when said other is pivoted relative to said median axis.

11. An arm according to claim 1 comprising: utility outlet means, mounted to the support means at the outer end of the jib, for allowing connection to at least one utility at a distance from an associated utility source; and utility supply conduit means, engaging the interior of the rigid longitudinal tube means of the boom and jib, and spanning between the rigid tube means of the boom and jib adjacent the knuckle, for communicating between an associated utility outlet means and the associated utility source.

12. An arm according to claim 11 comprising: a welding wire feeder connected to the support means; first welding control means, connected to the support means, for controlling a welding process and for controlling the wire feeder; a welding gun coacting with the wire feeder and first welding control means; a spool of welding wire rotatably mounted to the arm and passing through the wire feeder and welding gun; and a welding supply conductor connected the first welding control means and associated welding supply source, the welding supply conductor passing through the rigid tube means of the boom and jib adjacent the knuckle; whereby welding and control of the welding process may be carried out at a distance from the power supply and whereby the welding supply conductors are partially encased and supported at an elevation within the rigid tube means.

5,086,207

MONITORING OF ARC WELDING BY ANALYZING MODULATION OF RADIATION FROM CARRIER SIGNALS SUPERIMPOSED ON WELD CURRENT

Rowan T. Deam, 11 South Street, Hythe, Southampton SO4 6EA, United Kingdom

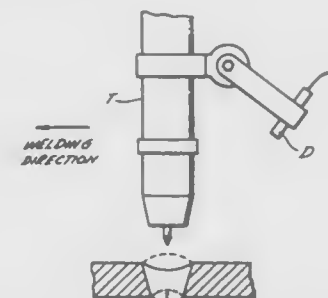
Continuation-in-part of Ser. No. 329,545, Mar. 28, 1989, abandoned. This application May 23, 1990, Ser. No. 527,443

Claims priority, application United Kingdom, Jan. 13, 1989, 8900738

Int. Cl.⁵ B23K 9/095

U.S. Cl. 219—130.01

15 Claims



1. A method of arc welding comprising the steps of forming an arc to produce a weldpool; positively superimposing a carrier signal on the arc current; causing the weldpool to vibrate so as to modulate the superimposed carrier signal; detecting radiation emitted by the arc; and analyzing the mod-

ulation of the detected radiation to obtain details of parameters of the weldpool.

5,086,208

HAND HELD ELECTRIC ARC WELDER

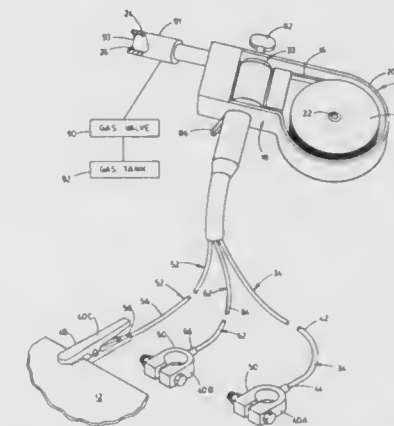
Joseph P. Habermann, Hartland, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Nov. 2, 1990, Ser. No. 608,199

Int. Cl.⁵ B23K 9/133

U.S. Cl. 219—130.1

14 Claims



11. An electric arc welder for performing welding on a work object, and adapted to be used with a spool of welding wire, said electric arc welder comprising:

a hand holdable body including means for supporting the spool of welding wire; a welding tip supported by said hand holdable body and including an aperture adapted to have welding wire fed therethrough; drive means for feeding welding wire through said aperture in said welding tip, said drive means comprising a 24 volt dc motor having first and second terminals; a 24 volt dc battery comprising a first and second 12 volt dc car battery, and means electrically serially connecting said first and second 12 volt dc batteries, said 24 volt dc battery having first and second terminals of opposite polarities; first motor to battery connecting means electrically connecting said welding tip and said first terminal of said motor to said first terminal of said 24 volt dc battery; second motor to battery connecting means electrically connecting said second terminal of said motor to said second terminal of said 24 volt dc battery; means for connecting the work object to said second terminal of said 24 volt dc battery; means for causing said motor to operate in a direction for feeding welding wire to said welding tip when said first terminal of said 24 volt dc battery has a positive polarity and for causing said motor to operate in a direction for feeding welding wire to said welding tip when said first terminal of said 24 volt dc battery has a negative polarity, said means for causing said motor to operate in a direction for feeding comprising a diode bridge connecting said first and second terminals of said motor to said first and said second motor to battery connecting means; means for directing shielding gas to a location proximate said welding tip; a gas valve in fluid communication with said directing means; and means electrically connected between said first and said second motor to battery connecting means and for controlling the speed of said motor by selectively reducing the voltage between said first and said second motor to battery connecting means and supplying the reduced voltage across said first and second terminals of said motor, said speed controlling means comprising a variable

resistor supported by said body and electrically connected between one of said first and second terminals of said motor and a corresponding one of said first and second motor to battery connecting means.

5,086,209

HOT AIR APPARATUS FOR GLOSSING SHEETS

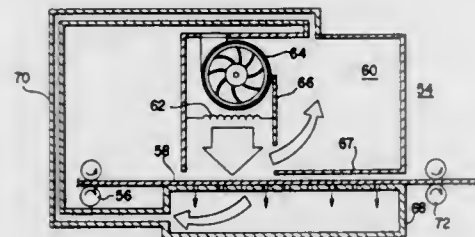
Karl A. Kintz, Kettering; Russell K. Messer, II, Franklin; Carl W. McCrary, Jr., West Carrollton, and Erik K. Nelson, Centerville, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 16, 1988, Ser. No. 155,795

Int. Cl.⁵ G03G 15/20

U.S. Cl. 219—216

4 Claims



1. An apparatus for glossing a sheet having a thermoplastic resin on the surface thereof, said thermoplastic resin being capable of forming a film which imparts gloss upon the application of heat, comprising:

- sheet supporting means;
- sheet feeding means for feeding said sheet onto said supporting means, passing said sheet along said supporting means, and removing said sheet from said supporting means, thereby defining a sheet feeding path, wherein the resin side of said sheet is away from said sheet supporting means;
- a housing mounted above said supporting means;
- a heating element mounted within said housing;
- a blower mounted for blowing air through said heating element to generate hot air which is blown onto said sheet;
- said housing defining an open lower end adjacent said supporting means;
- a first baffle mounted within said housing for directing air flow from said blower through said heating element and toward said open end;
- a second baffle mounted at a lower portion of said housing to extend over and parallel to said feeding path, said second baffle closing a portion of said open end and terminating so as to define an opening at a lower portion of said housing;
- said first baffle further terminating at a lower end remote from said second baffle, whereby said first baffle further defines a recirculation path from said opening to said blower, and said second baffle provides a shield for a sheet moved by said feeding means past said opening.

5,086,210

MO₅Si₃C CERAMIC MATERIAL AND GLOW PLUG HEATING ELEMENT MADE OF THE SAME

Naohika Nunogaki, Kariya; Tetuo Toyama, Anjo, and Nobuei Ito, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of Japan

Filed Mar. 28, 1989, Ser. No. 329,616

Claims priority, application Japan, Mar. 29, 1988, 63-75551

Int. Cl.⁵ C04B 35/58; H05B 3/10; F02P 19/02

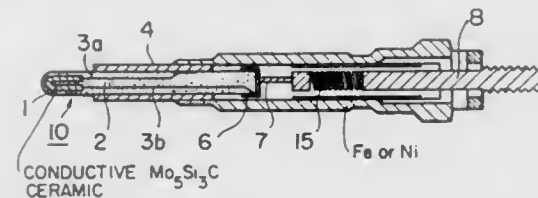
U.S. Cl. 219—270

13 Claims

1. An electrically conductive ceramic material containing at least 20% Mo₅Si₃C by weight and having a resistance-temperature coefficient no greater than 5×10^{-4} deg⁻¹.

6. A self-controlling type glow plug having a heating element and a resistor for controlling a current flow through said heating element, said heating element being connected in series

to said resistor and comprising an electrically conductive ceramic material containing at least 8.5 vol % of Mo₅Si₃C based on a total volume of said material, and said resistor having a



higher resistance-temperature coefficient than that of said heating element, said resistance-temperature coefficient of said heating element being no greater than 5×10^{-4} deg⁻¹.

5,086,211

ELECTRIC HOTPLATE

Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

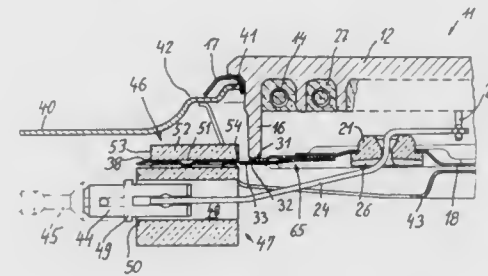
Filed Mar. 19, 1991, Ser. No. 671,527

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1990, 4008830

Int. Cl.⁵ H05B 3/70

U.S. Cl. 219—451

16 Claims



1. An electric hotplate having a cooking surface defining a cooking surface plane, connecting leads leading from the hotplate to insulator means, the insulator means being fixed by a connecting element to the hotplate, wherein quick connecting means are provided between the insulator means and the connecting element, said connecting element being a sheet metal plate fixed to a lower hotplate cover, said plate defining a plate plane substantially parallel to the cooking surface plane, said plate projecting past an outer circumference of said hotplate.

5,086,212

TEMPERATURE CONTROLLER HAVING A CONTROLLER BREAKAGE DETECTOR

Haruo Itakura, and Susumu Kurihara, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,840

Claims priority, application Japan, Jul. 10, 1989, 1-179782

Int. Cl.⁵ H05B 1/02

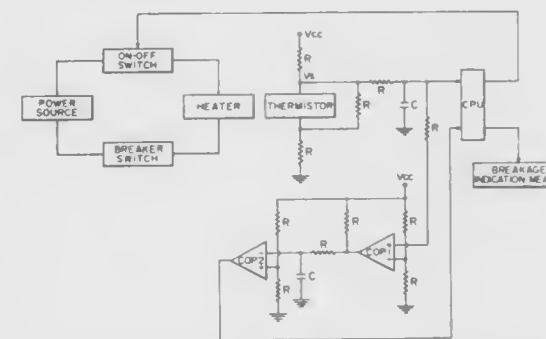
U.S. Cl. 219—505

2 Claims

1. An apparatus for controlling the temperature of a member by energizing or deenergizing a heater in response to the temperature of the member, the apparatus comprising:

- a thermistor for sensing the temperature of the member, the resistance of the thermistor being inversely proportional to the temperature of the member, the apparatus determining the temperature of the member by detecting a voltage which changes depending on the resistance of the thermistor;
- means for detecting whether said thermistor is broken, said means including first means for comparing said detected voltage to a first predetermined voltage and outputting a selected one of two possible values, a second means for

comparing the output from said first comparing means to a second predetermined voltage and outputting a selected



one of two possible values, and means for delaying the output of said first comparing means from reaching the second comparing means.

5,086,213

DEVICE FOR DETECTING, DURING WELDING, VARIATION IN THE PHYSICAL STATE OF THE PLASTIC MATERIAL IN A COUPLING PIECE OF JOINING PIPES

Max Nussbaum, Eaubonne, and Eric Federspiel, Saint Gratien, both of France, assignors to Gaz de France, Paris, France

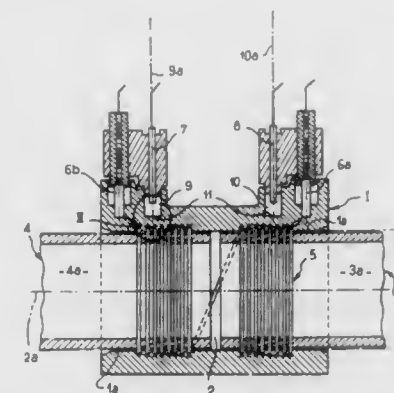
Filed Dec. 15, 1989, Ser. No. 450,944

Claims priority, application France, Dec. 29, 1988, 88 17420

Int. Cl.⁵ H05B 3/48, 3/58

U.S. Cl. 219—535

9 Claims



1. A device for detecting changes in the physical state of a thermoplastic material forming a weld between piping pieces, comprising:

- an external thermoplastic coupling member including an aperture for receiving first and second lengths of internal piping pieces along a common axis, a cavity disposed in said coupling member extending along a radial dimension of said coupling member, said cavity having a bottom wall adjacent an inner surface of said coupling member, said bottom wall having an axial dimension d in the direction parallel to said common axis;
- an electrical heating resistor embedded in said thermoplastic coupling member between said cavity and an inner surface of said coupling member at a minimum radial depth h₁ from said bottom wall of said cavity, said heating resistor being connected to a source of electrical current for melting said thermoplastic material to a predetermined melted radial depth for welding said coupling member to said first and second pieces;
- said axial dimension d of said cavity and said depth h₁ each being selected to be less than or equal to the predetermined melted radial depth e measured from said resistor toward the external surface of said coupling member for melting the thermoplastic material surrounding the bot-

tom of said cavity beyond the bottom wall thereof and filling said cavity with said melted material to a radial depth e-h₁, before an expansion pressure induced by the melting causes the melted material to expand into the cavity; and,

sensor means disposed in said cavity for detecting when said melted material has expanded into said cavity beyond said predetermined melted depth and interrupting said electrical current in response to said detection.

5,086,214

Patent Not Issued For This Number

5,086,215

METHOD AND APPARATUS FOR DISCRIMINATING OR LOCATING BAR CODES FOR AN OPTICAL MARK READER

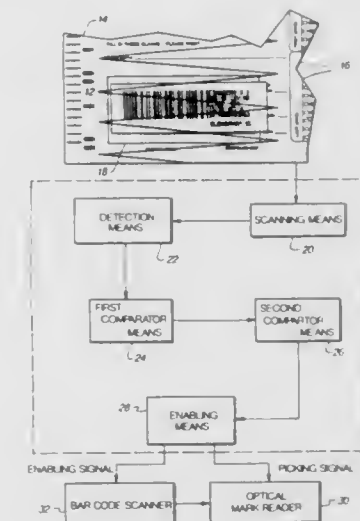
George E. Carsner, and John V. McMillin, both of Iowa City, Iowa, assignors to National Computer Systems, Inc., Eden Prairie, Minn.

Filed Oct. 26, 1988, Ser. No. 262,869

Int. Cl.⁵ G06K 7/10

U.S. Cl. 235—462

7 Claims



1. An apparatus for discriminating the presence of a bar code on a scannable form to be scanned by an optical mark reader and scanning the bar code if present on the scannable form, comprising:

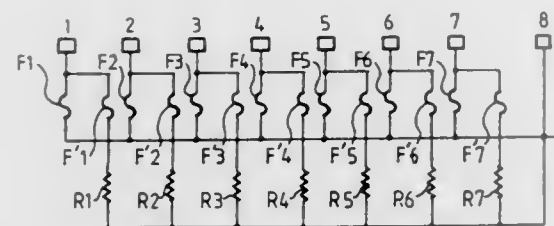
- scanning means for scanning a target area on the scannable form and producing a signal in response to the intensity of indications in the target area;
- detection means responsive to the scanning means for detecting indications having a width within a specified range of widths;
- first comparator means responsive to the detection means for comparing the number of detected indications to a specified range of valid numbers of detected indications and producing an output signal indicating when the number of detected indications falls within the specified range;
- second comparator means responsive to the first comparator means for storing the output of the first comparator means and comparing the output of the first comparator means for two consecutive sweeps and producing an enabling signal when the output of the first comparator means is valid for two consecutive sweeps; and
- bar code scanning means responsive to the enabling signal for rescanning the bar code and decoding the bar code data obtained during the rescan of the bar code.

5,086,216
MEMORY CARD WITH FUSES AND A SYSTEM FOR HANDLING SUCH MEMORY CARDS
 Jean P. Mollet, La Celle Saint Cloud, and René Rose, Voisin le Bretonneux, both of France, assignors to Schlumberger Industries, Montrouge, France

Filed Jun. 27, 1989, Ser. No. 371,768
 Claims priority, application France, Jun. 28, 1988, 8808640
 Int. Cl.⁵ G06K 19/00, 19/067

U.S. Cl. 235—492

3 Claims



1. A data medium comprising:

a card body having a plane main face, said main face having the same dimensions as those of a main face of a standard electronic memory card, and a plurality of external electrical contact tabs including n external electrical contact tabs in said main face having the same position and the same dimensions as corresponding tabs of a standard electronic memory card, so that the external appearance of said plane main face is the same as that of the main face of a standard electronic memory card,

a plurality of discrete electrical components including $n-1$ discrete electrical components, each of said $n-1$ electrical components having two electrical connectors, with one connector from all of said $n-1$ electrical components being coupled, respectively, to $n-1$ of said n external electrical contact tabs, the other connector of all of said $n-1$ electrical components being coupled to the remaining one external electrical contact tab of said n external electrical contact tabs, each said $n-1$ electrical components forming a memory cell,

said electrical components and said conducting portions being embedded in the card body, with each electrical component having an initial electrical conduction state and at least one second irreversible electrical conduction state, said electrical components being such that upon application of a predetermined electrical write signal between the respective $n-1$ external electrical contact tabs associated with said respective electrical components and said remaining one of said n external electrical contact tabs produces said second conduction state; and

wherein said plurality of discrete electrical components includes $k(n-1)$ discrete electrical components organized in k series of discrete electrical components each of which is constituted by a fuse, with each fuse in any one series being mounted in series with a corresponding resistance, and with each fuse and resistance series connection being connected between said remaining one of the external tabs and a respective one of said $n-1$ external tabs, with the value of the resistances associated with each series of fuses being specific to that series, and wherein $K \geq 2$.

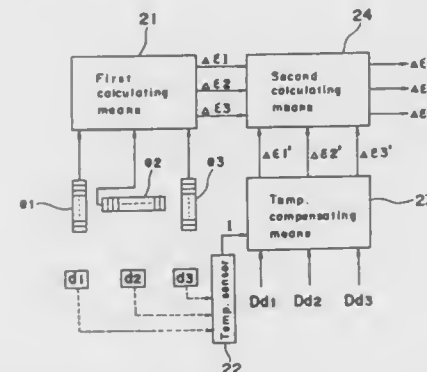
5,086,217
AUTOMATIC FOCUS CONTROL DEVICE
 Tokuji Ishida, Toshio Norita, and Hiroshi Ootsuka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 457,898, Dec. 27, 1981, Pat. No. 5,049,731, which is a continuation of Ser. No. 141,845, Jan. 11, 1988, Pat. No. 4,904,854. This application Apr. 25, 1991, Ser. No. 691,486

Int. Cl.⁵ G01J 1/20

U.S. Cl. 250—201.8

6 Claims



1. An automatic focus control device of a camera comprising:

photo-sensor means for receiving, through a photo-taking lens of said camera, light coming from a plurality of regions different from each other in a photographic field to be photographed;

means for discriminating that proper focus detection is impossible with respect to all of said plurality of regions to produce a discriminating signal;

means for detection that luminance of at least one of said plurality of regions is lower than a predetermined level to produce a detecting signal; and

means, in response to both of said discriminating signal and said detecting signal, for controlling a predetermined operation of the camera.

5,086,218
PHOTO SENSOR AND ITS MANUFACTURING METHOD AND AN IMAGE READING APPARATUS HAVING THIS PHOTO SENSOR

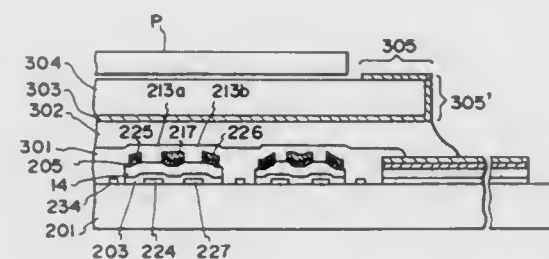
Mineto Yagyu, Sagami, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 607,047, Oct. 31, 1990, abandoned, which is a division of Ser. No. 204,520, Jun. 9, 1988, abandoned. This application May 13, 1991, Ser. No. 700,898

Claims priority, application Japan, Jun. 12, 1987, 62-146374; Nov. 13, 1987, 62-285617

Int. Cl.⁵ H01J 40/14

U.S. Cl. 250—208.1

9 Claims



1. A method of manufacturing a photo sensor having an electrostatic shielding layer comprising the steps of:

- forming photoelectric converting elements on a substrate;
- forming a protective layer on said photoelectric converting elements;
- preparing a sheet member and forming a conductive layer on a first surface of said sheet member, a part of a second surface on the side opposite to said first surface, at least one edge surface which continues to said first and second surfaces; and
- adhering on said protective layer said first surface on which said conductive layer is formed.

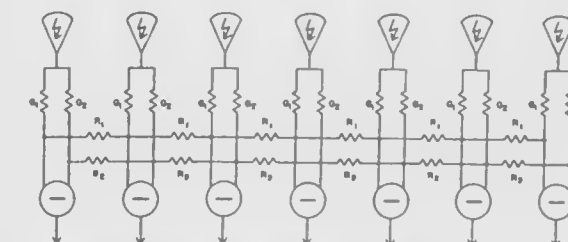
5,086,219
CIRCUIT FOR DETECTING DISCONTINUITIES IN LIGHT INTENSITY INCLUDING TWO INDEPENDENT RESISTIVE NETWORKS

Christof Koch, and Wyeth Bair, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.
 Filed Nov. 30, 1990, Ser. No. 620,493

Int. Cl.⁵ H01J 40/14

U.S. Cl. 250—208.2

20 Claims



1. An edge-detection circuit comprising:

a plurality of substantially adjacent photoreceptors;

a first resistive network having a plurality of nodes, a respective such node being connected to each respective photoreceptor;

a second resistive network having a plurality of nodes, a respective such node being connected to each respective photoreceptor;

said first and second resistive networks having different space constants;

means for generating a signal proportional to the difference in voltage between the nodes corresponding to each photoreceptor; and

means for indicating relative to said photoreceptors where said signal passes through a zero magnitude.

5,086,220
RADIATION IMAGING FIBER OPTIC TEMPERATURE DISTRIBUTION MONITOR

John W. Berthold, Salem; Cevdet G. Koksai, and Larry A. Jeffers, both of Alliance, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 5, 1991, Ser. No. 650,504

Int. Cl.⁵ B21B 37/10; G01J 5/00

U.S. Cl. 250—227.20

12 Claims

1. A temperature distribution monitor for monitoring the temperature distribution of a product, comprising:

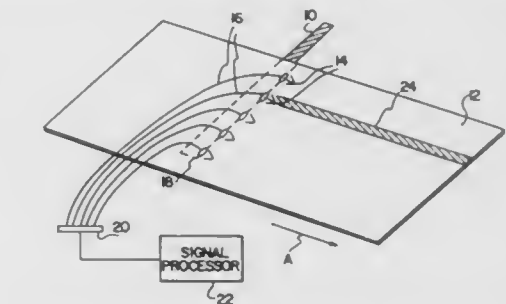
an array containing a plurality of lenses extending across the product, each of said lenses collecting radiation from an area of the product;

an optical fiber for each lens receiving radiation intensity therefrom;

at least one photo detector array optically coupled to the optical fibers for receiving the radiation intensity transmitted therethrough and establishing signals indicative of the radiation intensity transmitted therethrough; and

a signal processor connected to the at least one photo detector array for receiving and measuring said signals from each lens which correspond to radiation picked up by the

tor array for receiving and measuring said signals from each lens which correspond to radiation picked up by the



lenses to monitor the temperature distribution of the product.

5,086,221
ROTARY ENCODER HAVING STATIONARY CENTRAL SUPPORT SHAFT

Yukihiro Ishihara, Kaizuka; Tamotsu Yamamoto, Ashiya, and Hiroshi Matsui, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
 PCT No. PCT/JP89/01093, § 371 Date Jun. 21, 1990, § 102(e) Date Jun. 21, 1990, PCT Pub. No. WO90/04755, PCT Pub. Date May 3, 1990

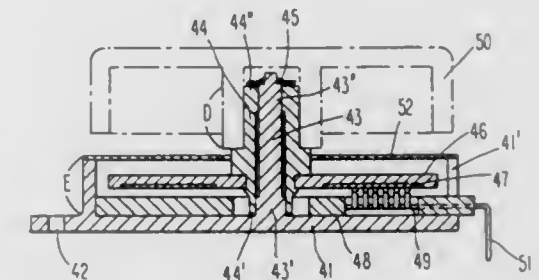
PCT Filed Oct. 25, 1989, Ser. No. 499,437

Claims priority, application Japan, Oct. 25, 1988, 63-268462; Oct. 25, 1988, 63-268464

Int. Cl.⁵ G01D 5/30

U.S. Cl. 250—231.13

7 Claims



1. A rotary encoder comprising: a base member having an outer flange; attachment means such as notches or holes in the outer flange or on the outside of the bottom surface of the base member and a cylindrical support shaft extending up from the center of the base member; a cylindrical operating shaft which is rotatably supported by said cylindrical support shaft on at least the bottom and top portions and has an attachment portion to a control knob on the outer circumference; a rotary plate attached to the lower end of said cylindrical operating shaft; and a substrate which is disposed on the bottom of the base member and has external connection terminals and a means for generating a pulse signal by engaging with said rotary plate.

5,086,222
SCANNING TYPE MICROSCOPE WITH PHASE MEMBER

Masato Shibuya, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 410,658, Sep. 21, 1989, abandoned. This application Jan. 25, 1991, Ser. No. 646,461

Claims priority, application Japan, Sep. 26, 1988, 63-240182

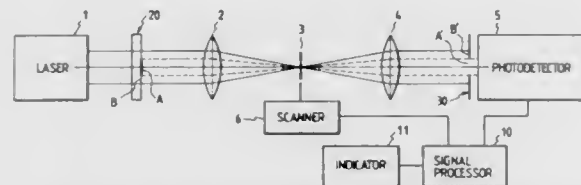
Int. Cl.⁵ H01J 3/14; G02B 21/06

U.S. Cl. 250—234

25 Claims

1. A scanning type microscope, comprising:
 a coherent light source;

condenser means for condensing rays of light supplied from said coherent light source on an object;
a phase member disposed between said coherent light source and said condenser means, said phase member having first and second phase areas providing a predetermined phase difference on a wave front of rays of said light reaching said object;
objective means for guiding rays of said light coming from said object;
light separating means for separating rays of guided light



coming from said objective means in a first optical path area corresponding to said first phase area of said phase member from rays of guided light coming from said objective means in a second optical path area corresponding to said second phase area of said phase member;
photodetector means for receiving the separated rays of light in said first optical path area; and
scanning means for relatively moving said object and a position at which the rays of light supplied from said coherent light source are condensed by said condenser means.

5,086,223

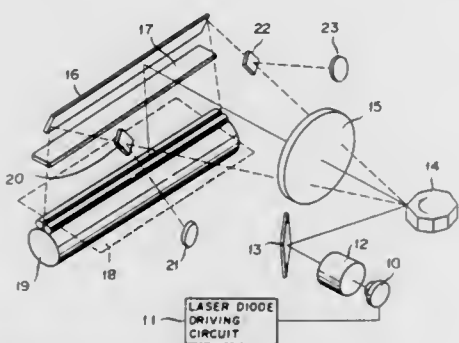
IMAGE FORMING APPARATUS AND METHOD FOR REMOVAL OF HIGH FREQUENCY IMAGE JITTER
Shinobu Hidaka, Sagami, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 20, 1990, Ser. No. 557,724

Claims priority, application Japan, Jul. 21, 1989, 1-187321
Int. Cl.⁵ H01J 3/14

U.S. Cl. 250-235

32 Claims



1. A light scanning device, comprising:
light emitting means for emitting a light beam;
image signal output means for providing an image signal for modulating said light beam;
scanning means provided with a rotary polygonal-prism mirror possessing a plurality of reflecting surfaces;
driving means for rotating said rotary polygonal-prism mirror at a prescribed speed and adapted to reflect said light beam and cause the reflected light beam to scan a target plane;
detecting means, including first and second light receiving means for receiving the light beam, for detecting the arrival of said light beam at prescribed positions at the opposite ends of the target plane;
arithmetic means for determining a scanning time on said target plane with respect to said plurality of reflecting surfaces based on outputs of said detecting means, whereby the arithmetic means determines a time period

between reception of light by the first light receiving means and the second light receiving means and determines a reference scanning time necessary for scanning one line on each of said reflecting surfaces;
memory means for memorizing a reference scanning time on said target plane and a reference delay time intervening between the time said first light receiving means receives light and the time the issuance of said image signal is started, and
control means for controlling the timing of the issuance of an image signal from said image signal output means based on the result of the arithmetic operation with said arithmetic means, wherein said control means sets a longer time period for intervention between the time said first light receiving means receives light and the time the issuance of said image signal is started than said reference delay time when the scanning time on said target plane is longer than said reference scanning time, or sets a shorter time period for intervention between the time said first light receiving means receives light and the time the issuance of said image signal is started when the scanning time on said target plane is shorter than said reference scanning time, so as to control the timing for starting the issuance of said image signal from said image signal output means.

5,086,224

ANALYSIS OF NUCLEAR DATA FOR DETERMINING CHARACTERISTICS OF EARTH FORMATIONS TRAVERSED BY A BOREHOLE

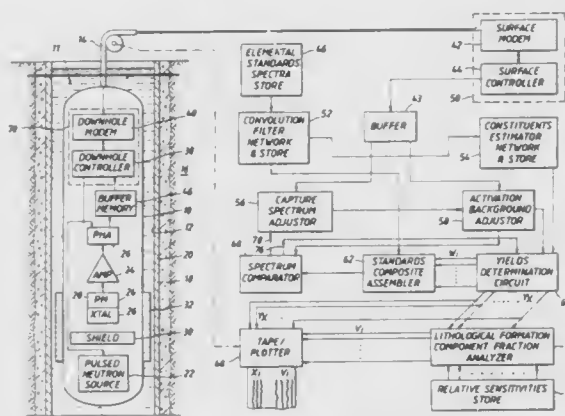
Bradley A. Roscoe, Pasadena, and Michael L. Evans, Missouri City, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 13, 1990, Ser. No. 612,345

Int. Cl.⁵ G01V 5/10

U.S. Cl. 250-269

17 Claims



1. A method for the determination of petrophysical characteristics of earth formation surrounding a borehole, comprising:
detecting nuclear particles representative of said formations and forming therefrom a set of detected data;
expressing said set of detected data "U" as a function of said unknown characteristics "Y", and of a set of response data "S", representative of the conditions under which said detecting step is performed; and
expressing said unknown characteristics "Y" as $\tau = Y \cdot R$, where "Y" represents prior information independent from said detected data and obtained from other sources, and "R" indicates a set of relationships between at least part of said unknown characteristics.

5,086,225

THERMAL CYCLE RECIRCULATING PUMP FOR ISOTOPE PURIFIER

David A. Hill, Tarzana, Calif., assignor to KPG Associates, Inc., Tarzana, Canada

PCT No. PCT/US87/03465, § 371 Date Jun. 27, 1989, § 102(e) Date Jun. 27, 1989, PCT Pub. No. WO88/05210, PCT Pub. Date Jul. 14, 1988

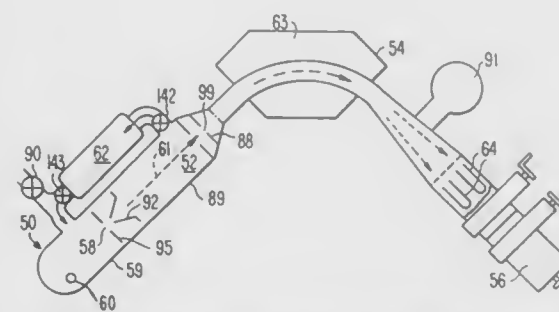
PCT Filed Dec. 29, 1987, Ser. No. 382,674

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.⁵ B01D 59/44; H01J 49/00

U.S. Cl. 250-288

6 Claims



1. A system for the separation and purification of a selected isotope from a polyisotopic mixture which comprises in combination:

- an ion source having a discharge region containing means to bombard the polyisotopic mixture to produce a mixture of ionized and uncharged isotopes;
- a first aperture from said discharge region positioned to allow the ionized and uncharged isotopes to enter a vacuum chamber;
- said vacuum chamber having a plurality of walls maintained at an elevated temperature such that said uncharged isotopes are prevented from devaporizing;
- a thermal cycle recirculating pump connecting said vacuum chamber and said discharge region and having a selectively operable intake valve and a selectively operable exhaust valve and selectively operable heating means and selectively operable cooling means;
- said intake valve being open and said exhaust valve being closed during a first intake phase and being reversed during a second exhaust phase;
- said cooling means operable during said first phase and said heating means operable during said second phase;
- said thermal cycle recirculating pump having said uncharged isotopes devaporize and attach on the interior wall of the thermal cycle recirculating pump during the first phase;
- said thermal cycle recirculating pump having said uncharged isotopes revaporize and return to the discharge region during the second phase;
- an extraction electrode means adjacent said first aperture to accelerate and direct said ionized isotopes toward a second aperture as a collimated ion beam;
- a mass analyzer to receive the collimated ion beam of ionized isotopes and having a means to separate the selected ionized isotope from the other ionized isotopes in the polyisotopic mixture; and
- a plurality of collectors to receive the isotopes, one of said collectors positioned to receive said selected isotope and the other collectors positioned to receive the other isotopes; wherein the selected isotope is separated and purified at a high recovery rate of the selected isotope from the polyisotopic mixture.

5,086,226

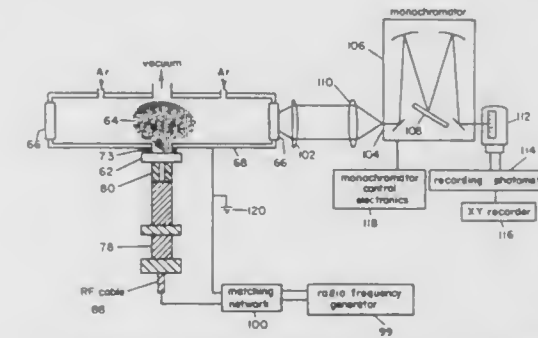
DEVICE FOR RADIO FREQUENCY POWERED GLOW DISCHARGE SPECTROMETRY WITH EXTERNAL SAMPLE MOUNT GEOMETRY

R. Kenneth Marcus, Clemson, S.C., assignor to Clemson University, Clemson, S.C.

Continuation-in-part of Ser. No. 359,157, May 31, 1989, Pat. No. 5,006,706. This application Oct. 1, 1990, Ser. No. 591,544 Int. Cl.⁵ H01J 49/04

U.S. Cl. 250-288

35 Claims



1. An apparatus for using radio frequency electromagnetic energy to sustain a glow discharge atomization/excitation source in the presence of a solid sample, whether the sample is electrically conducting or nonconducting, the glow discharge atomization/excitation source being suitable for atomic emission analyses, or atomic absorption analyses, or atomic mass spectrometry analyses, the apparatus comprising:

- an enclosure,
 - said enclosure defining a vacuum chamber,
 - said enclosure defining a vacuum port connectable to means for evacuating said vacuum chamber,
 - said enclosure defining at least one gas inlet port connectable to means for supplying gas into said vacuum chamber,
 - said enclosure defining an output port connectable to means for analyzing the contents of said vacuum chamber,
 - said enclosure defining an external mount for receiving a solid sample external to said vacuum chamber,
 - said external mount defining a sample opening for communicating between said vacuum chamber and the sample to be received by said external mount,
 - said enclosure defining an electrode having a surface exposed to the interior of said vacuum chamber, and
 - said electrode being electrically connected to said external mount so as to be maintained at the same electrical potential as said external mount;
- means for securing the sample to said external mount wherein at least a portion of the sample forms a vacuum seal around said sample opening; and
- means for applying a radio frequency electromagnetic potential between said electrode and the sample to be received by said external mount.

5,086,227

SECONDARY ION MASS ANALYZING APPARATUS
Hiroshi Toita, Hiroshi Hirose, both of Katsuta, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Chiyoda and Hitachi Instrument Eng. Co., Ltd., Ibaraki, both of Japan

Filed Oct. 18, 1990, Ser. No. 599,407

Claims priority, application Japan, Oct. 23, 1989, 1-273802

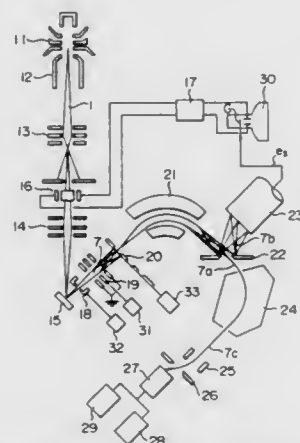
Int. Cl.⁵ G01N 23/225; H01J 37/256

U.S. Cl. 250-309

9 Claims

1. A secondary ion mass analyzing apparatus in which a primary ion beam is scanned on a specimen to perform a mass analysis of secondary ions emitted from the specimen, comprising:

means for forming an image with said secondary ions; an aperture disposed on a position in which the secondary ion image is formed;



secondary ion converting means for detecting the secondary ions which have passed through the aperture and for converting the detected ions into electrical signals; and means for displaying an image of said aperture based on said electrical signals.

5,086,228

METHOD FOR ELIMINATING NONUNIFORMITY IN SENSITIVITY IN IMAGE READ-OUT APPARATUSES
Tetsuya Kojima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

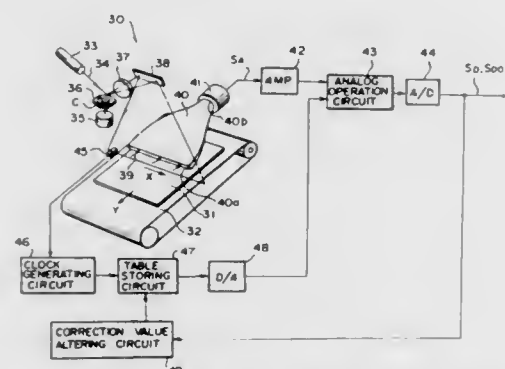
Filed Nov. 14, 1990, Ser. No. 612,385

Claims priority, application Japan, Nov. 14, 1989, 1-295626

Int. Cl.⁵ G01N 23/04

U.S. Cl. 250—327.2

11 Claims



1. A method for eliminating nonuniformity in sensitivity in an image read-out apparatus which is provided with:

- a light beam producing means which produces a light beam,
 - a main scanning means provided with a rotating polygon mirror, which has a plurality of reflecting surfaces and which reflects and deflects the light beam such that it scans a recording medium, on which an image has been recorded, in a main scanning direction,
 - a sub-scanning means, which moves the recording medium with respect to the light beam in a sub-scanning direction approximately normal to the main scanning direction, and
 - a photoelectric conversion means for detecting light, which is radiated out of the recording medium during the scanning with the light beam and which represents the image, and generating an image signal representing the image,
- the method for automatically compensating for any

change in nonuniformity in sensitivity in an image read-out apparatus comprising the steps of:

- storing the information about the characteristics of the shading based upon the surface inclination of said rotating polygon mirror and differences in reflectivity among reflecting surfaces of said polygonal mirror along the main scanning direction in a storage means,
- in the course of obtaining said image signal, finding correction values, each of which is used to correct said characteristics of the shading with respect to each of said reflecting surfaces of said rotating polygon mirror, from said image signal, and
- correcting said image signal in accordance with said characteristics of the shading and said correction values.

5,086,229

NON-INVASIVE MEASUREMENT OF BLOOD GLUCOSE
Robert D. Rosenthal, Gaithersburg; Lynn N. Paynter, Elkridge, and Linda H. Mackie, Rockville, all of Md., assignors to Futrex, Inc., Gaithersburg, Md.

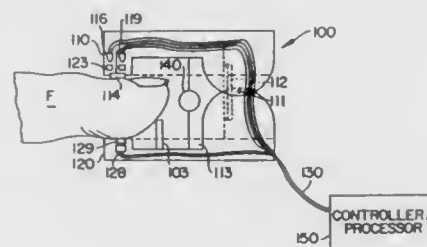
Continuation-in-part of Ser. No. 298,904, Jan. 19, 1989. This application Jun. 27, 1990, Ser. No. 544,580

The portion of the term of this patent subsequent to Jul. 2, 1991, has been disclaimed.

Int. Cl.⁵ G01N 33/50, /21/59

U.S. Cl. 250—341

43 Claims



1. A near-infrared quantitative analysis instrument for non-invasive measurement of blood glucose in blood present in a body part of a subject, comprising:

- introducing means including a near infrared energy source for introducing near-infrared energy into blood present in a body part of a subject wherein said introducing means introduces near-infrared energy of between about 600 and 1100 nanometers;
- detecting means for detecting near-infrared energy emerging from the body part;
- positioning means for positioning both the near-infrared introducing means and the detecting means closely adjacent to the body part; and
- processing means for processing a first electrical signal produced by the detector means into a second signal indicative of the quantity of glucose present in the blood of the subject.

5,086,230

APPARATUS FOR FORMING, CORRECTING PATTERN
Tatsuya Adachi, and Masabiro Yamamoto, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Japan

Continuation of Ser. No. 855,167, Apr. 23, 1986, abandoned.

This application Sep. 14, 1988, Ser. No. 244,128

Claims priority, application Japan, Apr. 23, 1985, 60-87275; Apr. 23, 1985, 60-87276

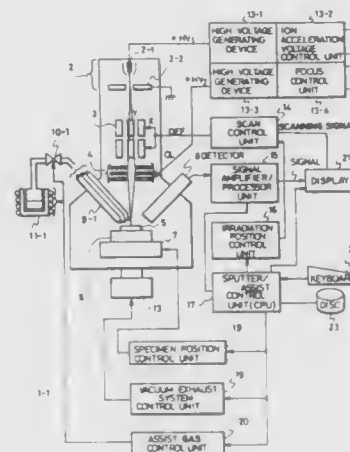
Int. Cl.⁵ H01J 37/317

U.S. Cl. 250—492.2

6 Claims

1. Apparatus for forming laminated conductive and insulative films on a specimen, comprising: means defining a specimen chamber for receiving a specimen; irradiating means for irradiating the specimen in the specimen chamber with a focused ion beam; scanning means selectively operable in a first mode to scan the focused ion beam over the surface of the

specimen to cause the specimen to emit charged particles characteristic of a property of the specimen surface and selectively operable in a second mode to repeatedly scan the focused ion beam over a designated treatment area of the surface of the specimen; detecting means for detecting the charged particles emitted by the irradiated specimen and producing output signals representative of a characteristic of the specimen surface; imaging means responsive to the output signals for producing a visible image representative of the surface of the specimen to thereby enable an operator to view the image and select designated treatment areas on the specimen surface; means for producing a first compound vapor containing depositable conductive material which, when irradiated with the focused ion beam at the surface of the specimen, will deposit on the specimen surface as a conductive film; means for producing a second compound vapor containing depositable insu-



lative material which, when irradiated with the focused ion beam at the surface of the specimen, will deposit on the specimen surface as an insulative film; first directing means selectively operable to direct the first compound vapor in the form of a vapor stream onto a designated treatment area of the specimen surface to form a conductive film at the said designated treatment area while the same is being irradiated with the focused ion beam; second directing means selectively operable to direct the second compound vapor in the form of a vapor stream onto a designated treatment area of the specimen surface to form an insulative film at the said designated treatment area while the same is being irradiated with the focused ion beam; and control means for selectively operating the scanning means in the first and second modes and for selectively operating the first and second directing means to effect the formation of laminated conductive and insulative films on the specimen surface.

5,086,231

MICROFILM RETRIEVAL SYSTEM FOR RETRIEVING A DESIGNATED IMAGE FRAME

Izumi Watanabe; Tetsuya Takamori; Kenji Yokota, and Takashi Yamaguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1990, Ser. No. 509,436

Claims priority, application Japan, Apr. 19, 1989, 1-99612

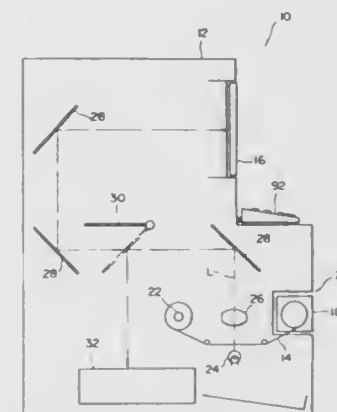
Int. Cl.⁵ G06K 7/015

U.S. Cl. 250—557

20 Claims

1. A microfilm retrieval system for retrieving a designated image frame by counting the number of blip marks on an elongated microfilm in correspondence with each of a plurality of image frames recorded on said microfilm from a set initial value in a set unit of count in accordance with a kind of said blip mark, said microfilm retrieval system comprising: specific mark detecting means for detecting at least one specific kind of blip mark which is provided at a predeter-

mined position of said microfilm and is used for determining at least one of said initial value and said unit of count; means for detecting a combination of specific kinds of blip marks in cases where two or more specific kinds of blip marks are provided; and



means for setting said initial value and said unit of count corresponding to the combination of specific blip marks detected by said means for detecting a combination of specific kinds of blip marks.

5,086,232

METHODS OF AND APPARATUS FOR INSPECTING SURFACES FOR DEFECTS

Sean P. J. Maguire, Barwell; Kandiah Sivayoganathan, Beeston, and Velupillai Balendran, Moseley, all of United Kingdom, assignors to Jaguar Cars Limited, England

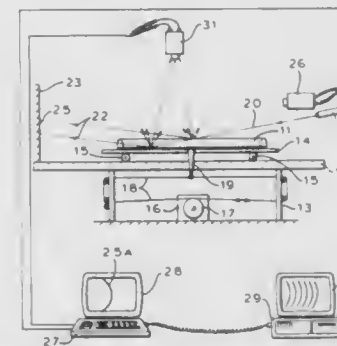
Filed Jun. 29, 1990, Ser. No. 547,467

Claims priority, application United Kingdom, Jun. 30, 1989, 8915093; Sep. 8, 1989, 8920358

Int. Cl.⁵ G01N 21/88

U.S. Cl. 250—572

8 Claims



1. A method of inspecting a surface of a member including the steps of setting up the member at an inspection site, directing light on to the surface at a high angle of incidence so as to form a transverse trace there across and to reflect light from the surface with a low angle of deflection to form an image of the trace on a detection screen, producing a record of the shape of the image, viewing and producing a record of the shape of the trace of light on the surface from a position substantially perpendicular thereto, analyzing the record of the image and the record of the trace together to give an indication of the nature of the surface at said trace, scanning the light in relation to the member to form further transverse traces across the member and repeating the viewing, recording and analysis steps for the new traces.

5,086,233

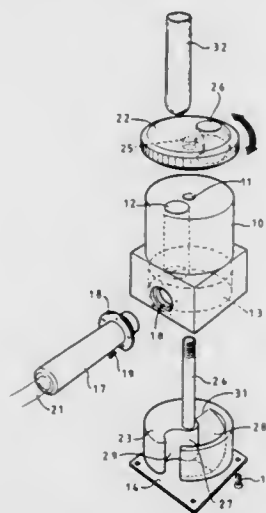
LUMINOMETERS WITH SAMPLE CONTAINER DISPLACEMENT CONTROLLED BY RAMPED ABUTMENT

David A. Stafford, Cardiff; Ian R. Johnson, Mid Glamorgan, and Clive Goodfield, Pootypridd, all of United Kingdom, assignors to Dynatech Corporation, Chantilly, Va.

Filed Jan. 22, 1991, Ser. No. 643,493
Int. Cl.⁵ G01N 15/06

U.S. Cl. 250—576

12 Claims



1. A luminometer comprising a body formed with a bore having at one end an entry aperture through which a sample container may be introduced into the bore, a photo-multiplier device remote from said entry aperture, control means for effecting displacement of the sample container along the bore to and from a test position where it is exposed to the photo-multiplier device, and a movable cap which is so coupled to the control means that operation of the control means to displace the sample container to the test position is accompanied by movement of the cap to cover said entry aperture in a light-tight manner.

5,086,234

METHOD AND APPARATUS FOR COMBINED-CLOSED-CYCLE

MAGNETOHYDRODYNAMIC GENERATION

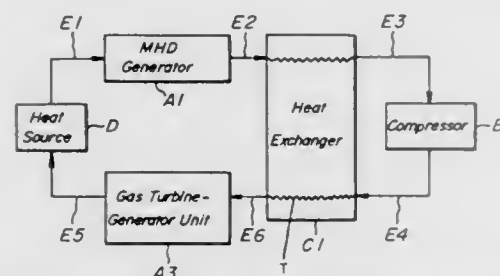
Susumu Shiota, Yokohama, and Kunio Yoshikawa, Sagami-hara, both of Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 554,441

Claims priority, application Japan, Jul. 31, 1989, 1-196888
Int. Cl.⁵ F02C 6/20

U.S. Cl. 290—52

6 Claims



1. A method for electric power generation by a combined-closed-cycle including a magnetohydrodynamic (MHD) generator and a gas turbine-generator unit, comprising the steps of heating an operative fluid at a heater, introducing the heated operative fluid into an MHD generator so as to convert energy of the heated operative fluid into electric power, passing the

operative fluid outflowing from said MHD generator through a first portion of a heat exchanger, introducing the operative fluid outflowing from the first portion of said heat exchanger into a compressor so as to compress the operative fluid, passing the compressed operative fluid from said compressor through a second portion of said heat exchanger so as to recover heat energy of the operative fluid between the first and second portion of said heat exchanger, introducing the operative fluid outflowing from the second portion of said heat exchanger into a turbine-generator unit so as to convert energy of the compressed operative fluid into electric power, and returning the operative fluid outflowing from said turbine-generator unit into said heater so as to complete a combined-closed-cycle of the operative fluid.

5,086,235

POWER SUPPLY SWITCHOVER DEVICE FOR ELECTRICAL APPARATUS AND TELEACTION TERMINAL EQUIPPED THEREWITH

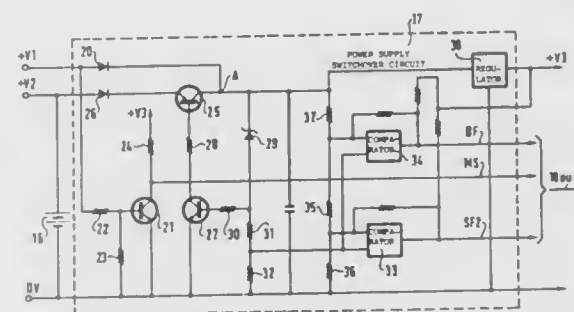
Alain Marquet, Lardy, and Jacques Tanguy, Antony, both of France, assignors to Alcatel Cit, Paris, France

Filed Dec. 26, 1989, Ser. No. 457,071

Claims priority, application France, Dec. 26, 1988, 88 17183
Int. Cl.⁵ H02J 9/00

U.S. Cl. 307—64

6 Claims



1. A power supply switchover device for an electrical apparatus including a first source of electrical power and a battery both connected to a common supply terminal of said apparatus (A) and to a common reference terminal (0 V) of said apparatus, said switchover device including first and second switching means for putting the battery into and out of service, each of said first and second switching means having first and second terminals and controlling conduction therebetween, said first switching means (26) having its first terminal connected to a supply terminal of said battery and having its second terminal connected to said first terminal of said second switching means (25) and being conducting when the voltage at the first terminal of said second switching means is smaller than the voltage at the supply terminal of the battery, said second switching means having its second terminal connected to said common supply terminal (A) of said apparatus and being operated by control means (27) responsive to voltage at said common supply terminal of said apparatus for operating said first and second switching means to connect said supply terminal of said battery to said common supply terminal of said apparatus only once after each cutoff of said first source and to maintain connection of said battery supply terminal to said common supply terminal of said apparatus as long as the battery voltage is above a threshold level, said control means being driven through a biasing bridge for fixing said threshold level, said biasing bridge including a resistive link (31, 32) and a Zener diode (29), wherein the biasing bridge is connected between said common reference terminal and said common supply terminal of said apparatus and is directly connected to said second terminal of said second switching means.

5,086,236

SYNCHRONIZING CIRCUIT OF TWO CLOCK SIGNALS

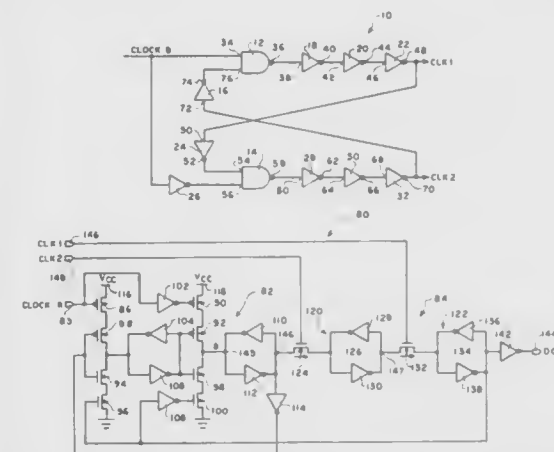
Ryan E. Feemster, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 27, 1990, Ser. No. 572,716

Int. Cl.⁵ H03K 5/13, 19/096

U.S. Cl. 307—269

22 Claims



18. A synchronizing circuit for synchronizing a first clock signal to a second clock signal for providing a synchronized signal, said first and second clock signals and said synchronized signal including leading and trailing edges, said synchronizing circuit comprising:

- an input for receiving said first clock signal;
- an output for providing said synchronized signal;
- an edge-triggered set-reset latch coupled to said input for being set by said first clock signal leading edge to a first state and coupled to said output for being reset by said synchronized signal leading edge to a second state;
- subclock signal generator means including first and second outputs and responsive to said second signal for generating first and second subclock signals at said first and second outputs respectively, said first and second subclock signals including leading and trailing edges, the leading edges of said first subclock signal corresponding to said leading edges of said second clock signal; and
- conveying means comprising serially coupled first and second stages coupled between said edge-triggered set-reset latch and said circuit output, said second stage being coupled immediately adjacent said circuit output and said first stage being coupled between said edge-triggered set-reset latch and said second stage, said first stage being coupled to said subclock signal generator means second output and said second stage being coupled to said subclock signal generator means first output, said first and second stages being responsive to said first and second subclock signals for conveying said first and second states to said circuit output.

5,086,237

RE-TRIGGERABLE MONOSTABLE MULTIVIBRATOR CAPABLE OF GENERATING A PREDETERMINED WIDTH OF PULSE WITH ADDITIONAL LOGIC GATE AND D FLIP-FLOP WITH RESET

Kouji Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 7, 1989, Ser. No. 390,592

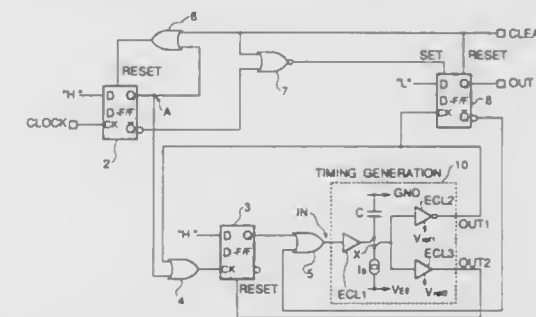
Claims priority, application Japan, Aug. 6, 1988, 63-196476
Int. Cl.⁵ H03K 3/284

U.S. Cl. 307—273

6 Claims

1. A monostable multivibrator comprising an input circuit receiving a trigger signal for generating an instantaneous pulse, a timing generation circuit receiving the instantaneous pulse for generating a timing defining signal after a predetermined time, and an output circuit receiving the instantaneous pulse

and the timing defining signal for generating an output pulse in response to the instantaneous pulse and terminating at the timing defining signal, the timing generation circuit including a time constant circuit including at least a capacitor, an OR gate having a first input connected to receive the output signal of the output circuit, a first logic circuit having an input connected to an output of the OR gate and operating to discharge the capacitor of the time constant circuit when the output of the OR gate is in a first level and to charge the capacitor of the time constant circuit when the output of the OR gate is in a second level opposite to the first level, a second logic circuit connected to receive a potential of the capacitor for generating the timing defining signal when the potential of the capacitor reaches a first predetermined reference voltage, a third logic



5,086,238

SEMICONDUCTOR SUPPLY INCORPORATING INTERNAL POWER SUPPLY FOR COMPENSATING FOR DEVIATION IN OPERATING CONDITION AND FABRICATION PROCESS CONDITIONS

Takao Watanabe, Kokubunji; Ryoichi Hori; Goro Kitsukawa, both of Tokyo; Yoshiki Kawajiri, Hachioji; Takayuki Kawahara, Kokubunji, and Kiyoo Itoh, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 196,743, May 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,485, Nov. 30, 1987, Pat. No. 4,873,673, and Ser. No. 130,640, Dec. 9, 1987, Pat. No. 4,837,462, which is a division of Ser. No. 886,816, Jul. 18, 1986, Pat. No. 4,730,132. This application Nov. 5, 1990, Ser. No. 608,640

Claims priority, application Japan, May 22, 1987, 62-123797; Sep. 9, 1987, 62-223921; Nov. 27, 1987, 62-297546
Int. Cl.⁵ H03K 17/14

U.S. Cl. 307—296.6

14 Claims

1. A semiconductor circuit device comprising a load and an internal power supply circuit, said internal power supply circuit comprising:

- a reference voltage generator generating a first reference voltage from an external voltage; and
- means, provided between said reference voltage generator and the load, for converting said first reference voltage into an internal supply voltage, for supplying the internal

- (a) a ring of ferromagnetic material having a plurality of radially inwardly extending integral teeth;
- (b) said teeth each having a radially inwardmost surface, with side end terminations;
- (c) said side end terminations of adjacent teeth inwardmost surfaces being spaced from each other to define a first set of slots having a first width; and
- (d) means defining a radially outwardly extending slot in each of said radially inwardmost surfaces between said side end terminations thereof, to define a second set of slots, and having initially straight sides extending generally perpendicularly to said radially inwardmost surface, said initially straight sides spaced approximately said first width, and having a V-shape portion after said initially straight sides, said V-shape portion having a radial length greater than the length of an initially straight side.

5,086,246
SALIENT POLE ROTOR FOR A DYNAMOELECTRIC MACHINE

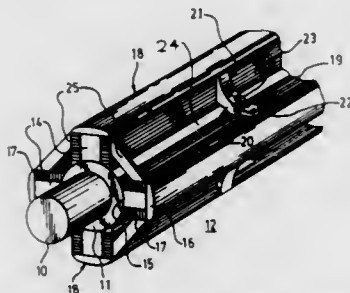
James H. Dymond, Peterborough; Nick N. Saidi, Ajax, and John M. Young, Omeme, all of Canada, assignors to General Electric Canada Inc., Mississauga, Canada

Filed Feb. 5, 1991, Ser. No. 650,540

Claims priority, application Canada, Feb. 22, 1990, 2010670
Int. Cl.⁵ H02K 1/24

U.S. Cl. 310—269

6 Claims



1. A dynamoelectric machine having a salient pole rotor with an axially extending shaft mounted for rotation within a stator, the rotor having no fan associated therewith, the rotor and stator defining therebetween an air gap, the stator having a stator core with stator windings thereon, and a plurality of spaced apart ventilation ducts located between axially opposing ends of the stator and extending radially from the air gap to an exhaust region, said dynamoelectric machine being cooled by a cooling gas circulated through said rotor and said stator, said rotor comprising

- a plurality of axially extending, spaced apart poles, mounted on said shaft, each pole having a base where it mounts to said shaft and a pole tip radially outward of said base and defining a periphery of rotation,
- a winding on each said pole, each said pole and respective winding thereon forming a pole member, adjacent pole members defining therebetween an interpolar space,
- at least one coil bracket in each interpolar space, each said coil bracket having a central portion with extending arm portions,
- means for fastening each said coil bracket to said shaft at the central portion of said bracket, respective arm portions of said coil bracket engaging adjacent surfaces of the windings of adjacent pole members for aiding in securing said windings,
- a baffle at each end of each said interpolar space, each of said baffles being in a substantially radial plane and extending between adjacent ones of said pole members, each said baffle having a radially outward edge adjacent said periphery of rotation and an inward edge spaced outwardly from said bases of adjacent ones of said pole members,
- with rotation of said rotor said baffles tending to increase at each end of said rotor static pressure of said cooling gas within said machine in said air gap adjacent the ends of

said stator, thereby improving flow of said cooling gas radially outwards through said air gap and said ventilation ducts adjacent the ends of said stator.

5,086,247
ARMATURE

Akira Morishita, and Keiichi Konishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 172,527, Mar. 24, 1988, abandoned.

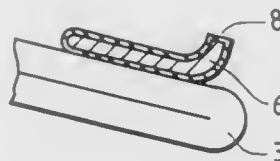
This application Nov. 1, 1989, Ser. No. 432,303

Claims priority, application Japan, Apr. 10, 1987, 62-54988

Int. Cl.⁵ H02K 3/46

U.S. Cl. 310—270

2 Claims



1. An electric motor armature including a core (2) and a coil (3) wound thereon with axially outwardly extending opposite end turns, comprising: a pair of pre-insulated steel reinforcing rings (6) individually fitted around said opposite end turns of the coil for preventing said coil from being radially outwardly scattered by centrifugal force applied thereto during rotation of said armature, said steel reinforcing rings being completely surrounded and enclosed by a coating of insulating material (8) applied thereto before fitting of said rings around said coil such that said fitting is simplified.

5,086,248

MICROCHANNEL ELECTRON MULTIPLIERS

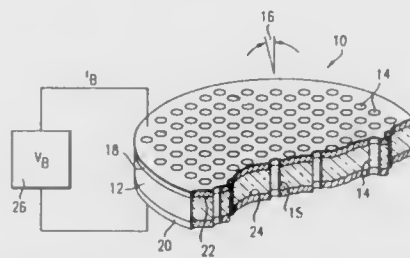
Jerry R. Horton, Cape Elizabeth, Me., and G. William Tasker, West Brookfield, Mass., assignors to Galileo Electro-Optics Corporation, Sturbridge, Mass.

Filed Aug. 18, 1989, Ser. No. 395,586

Int. Cl.⁵ H01J 43/04

U.S. Cl. 313—103 CM

37 Claims



1. A microchannel plate comprising a monolithic body in the form of a wafer of etchable material having opposite faces and a plurality of uniform microchannels extending through the wafer from one face to the other, the microchannels with wall surface portions being formed in the wafer by a selectively applied direction specific flux of reactive particles directed against at least one face of the wafer for anisotropically etching the microchannels therein, said microchannels having a major transverse dimension on the order of $<10\ \mu\text{m}$, being closely spaced on the order of $<2\ \mu\text{m}$ in pitch and having substantially straight, parallel wall portions for receiving a thin film of thickness on the order of about 10 nm–1000 nm said dimension, pitch and thickness being selected so as to result in an operative device; and

a continuous thin film dynode to provide electron multiplication formed on the wall portions of the microchannels, said dynode formed by at least one of low pressure chemical vapor deposition, liquid phase deposition and by native

growth of a film by an oxidizing reaction with a reactive species above ambient temperature.

5,086,249
COMPACT DISCHARGE LAMP UNIT AND METHOD FOR MANUFACTURING SAME

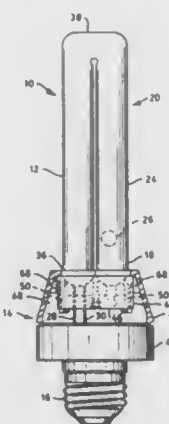
Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Mar. 4, 1991, Ser. No. 664,250

Int. Cl.⁵ H01J 61/30, 9/34

U.S. Cl. 313—318

7 Claims



1. A discharge lamp unit comprising:
a discharge tube having a base shell secured to one end thereof, said base shell including a collar having a rim,
a housing defining a cavity and comprising a first portion having a standardized base electrically coupled to said discharge tube and a second portion having an aperture formed therein for receiving said discharge tube; and
means within said cavity of said housing for securing said base shell of said discharge tube to said second portion of said housing, said securing means comprising a plurality of flexible fingers secured to or formed from said second portion of said housing.

5,086,250

COLOR CATHODE RAY TUBE HAVING SHADOW MASK WITH SOME LONG, NARROW APERTURES

Jan Van Der Waal, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

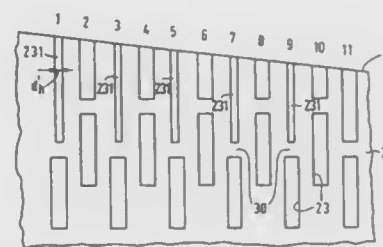
Filed Mar. 25, 1988, Ser. No. 172,877

Claims priority, application United Kingdom, Apr. 10, 1987, 8708574

Int. Cl.⁵ H01J 29/81

U.S. Cl. 313—403

5 Claims



1. A colour cathode ray tube comprising an envelope including a faceplate, a cathodoluminescent screen provided on an internal surface of the faceplate, the screen comprising triplets of materials which luminesce in different colours, and a shadow mask disposed adjacent to, but spaced from the screen, the shadow mask comprising a metal sheet having therein columns of elongate apertures separated by bridges, wherein

the top and bottom edges of the mask are curvilinear and the apertures at the ends of the columns terminate at one or other of said edges, and characterised in that at least some of the apertures terminating at said top and bottom edges are narrower than, and longer than, adjacent apertures in the same column and others of said apertures terminating at said top and bottom edges each have substantially the same width as the horizontal width of, and a length less than that of, the adjacent aperture in the same column.

5,086,251

TENSION MASK CRT FRONT ASSEMBLY WITH REDUCED STRAIN-INDUCED DEFECTS

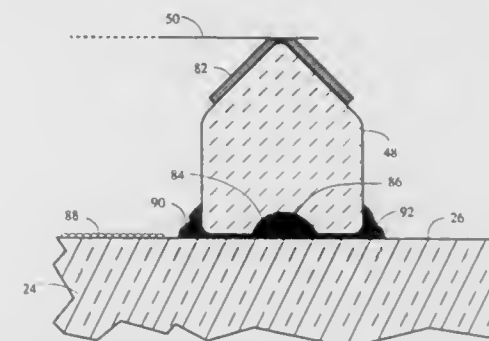
Raymond G. Capek, Elmhurst; Siegfried M. Greiner, Crystal Lake, and Robert F. Hutton, Buffalo Grove, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 28, 1989, Ser. No. 458,129

Int. Cl.⁵ H01J 29/81, 29/07

U.S. Cl. 313—407

13 Claims



10. A flat tension mask color cathode ray tube having a front assembly comprising:

a faceplate having an inner surface with a target area for receiving a cathodoluminescent screen, said faceplate being composed of a glass having a predetermined thermal contraction coefficient; and

mask support means secured by a devitrifiable solder glass cement on opposed sides of said target area for receiving and retaining a foil shadow mask in tension at a predetermined distance from said inner surface, said mask support means comprising a laminate with a ceramic first element between the faceplate glass and a second element, said ceramic first element having a contraction coefficient no less than three points lower than that of the faceplate glass, or the tensile strain in said interface glass no less than 2000 psi, and said second element having a contraction coefficient higher than that of said faceplate glass, said mask support means having a net thermal contraction coefficient which is lower than said predetermined glass coefficient such that after devitrification of said cement at an elevated temperature to affix said mask support means to said faceplate, and subsequent cool-down, faceplate glass at the interface with said mask support means is placed under significant tensile strain to thereby place faceplate glass surfaces adjacent to said interface under compressive strain to increase the resistance of said faceplate to defects attributable to thermal gradients in the region of said mask support means, the contraction coefficient of said cement being intermediate that of said faceplate glass and said first element to provide a buffering effect to the thermal expansion differential between said ceramic first element and said glass faceplate, said ceramic first element having a lengthwise groove at its interface with said faceplate inner surface to accommodate a greater amount of said cement at said interface and thereby improve said buffering effect without increasing the cement-caused separation of said ceramic first element from said faceplate inner surface.

5,086,252

THIN FILM ELECTROLUMINESCENCE DEVICE

Fusayoshi Kido, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

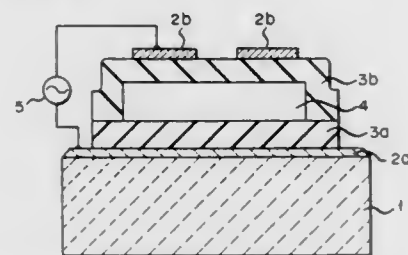
Filed Dec. 18, 1989, Ser. No. 451,874

Claims priority, application Japan, Dec. 27, 1988, 63-327558

Int. Cl.⁵ H01J 1/62; C09K 11/08

U.S. Cl. 313-503

6 Claims



1. A thin film electroluminescence device comprising: an emitting layer composed of a host material and lanthanide element ions added as a luminescence center in the host material, said host material being a fluoride compound of an alkaline earth metal selected from the group consisting of CaF_2 , SrF_2 and BaF_2 , the emitting layer having first and second opposite surfaces; a dielectric layer formed on each surface, or one surface, of the emitting layer; one electrode provided on an emitting layer surface or on said dielectric layer; and another electrode provided on the opposite emitting layer surface or the opposite dielectric layer.

5,086,253

AUTOMATIC HEADLIGHT DIMMER APPARATUS

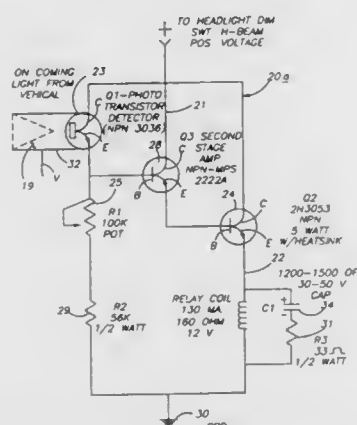
Louis N. Lawler, 29156 Cahilan St., Barstow, Calif. 92311

Filed Oct. 15, 1990, Ser. No. 597,502

Int. Cl.⁵ B60Q 1/14

U.S. Cl. 315-83

1 Claim



1. An automatic headlight dimmer switch comprising, in combination, a light directional tube mounted to a vehicle, the directional tube including a beveled left side to permit light into the directional tube from an oncoming vehicle, and the directional tube including a photo-sensitive transistor mounted within the tube, the photo-sensitive transistor arranged in a first circuit loop parallel to a second circuit loop, the second circuit loop including a first adjustable potentiometer resistor in series with a relay coil, and a first junction transistor coupled between the first circuit loop and the second circuit loop, and a high beam voltage input line coupled to at least one high beam lamp mounted within the vehicle, and operative to direct voltage to the high beam lamp upon absence of light

directed into the light directional tube upon actuation of the relay coil, and a third circuit loop arranged parallel to the first and second circuit loop, with the third circuit loop including a second junction transistor at a junction between the first, second, and third circuit loops, and a second resistor in series with the first adjustable resistor, and a third resistor in parallel with the relay coil, and a capacitor in series with the third resistor to effect a time delay in actuation of the relay coil to permit complete passage of the oncoming vehicle.

5,086,254

MICROWAVE EXCITED HELIUM PLASMA PHOTOIONIZATION DETECTOR

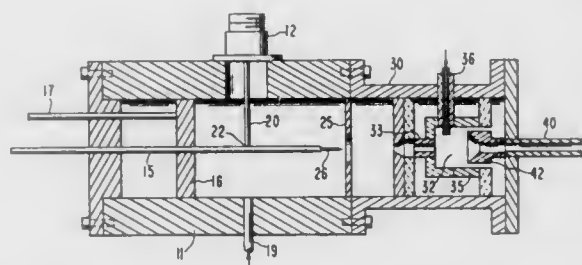
Gregory J. Wells, Suisun, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 672,646, Nov. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 522,081, Aug. 11, 1983, abandoned, which is a continuation of Ser. No. 733,854, May 13, 1985, Pat. No. 4,684,807. This application Mar. 17, 1987, Ser. No. 26,934

Int. Cl.⁵ H01J 7/24

U.S. Cl. 315-111.21

12 Claims



1. A photoionization detector operating at substantially atmospheric pressure comprising, a photon source comprising a microwave-powered plasma generating means, said plasma comprising Helium, said photon source having a first windowless aperture through which photons propagate, a photoionization cell comprising a collector electrode, inlet means for receiving a flow of sample gas, outlet means for allowing said sample gas to exit and a second windowless aperture through which photons emitted from said photon source enter said photoionization cell, said photoionization cell and said photon source being adjacent and abutting each other and said first and second windowless apertures being aligned and in registration, and means for continuously flowing said Helium into said photon source, whereby a slight overpressure of Helium develops within said photon source and whereby the slight overpressure causes Helium to flow through said first windowless aperture into said photoionization cell.

5,086,255

MICROWAVE INDUCED PLASMA SOURCE

Yukio Okamoto, Sagami, Japan; Makoto Yasuda, Kodaira, and Masataka Koga, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1990, Ser. No. 473,430

Claims priority, application Japan, Feb. 15, 1989, 1-033579

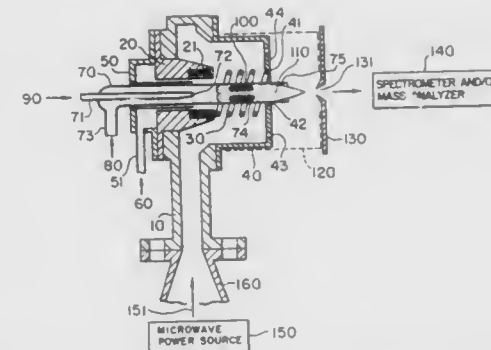
Int. Cl.⁵ H01J 7/24

U.S. Cl. 315-111.21

6 Claims

1. A microwave induced plasma source comprising: a coaxial waveguide formed of a cylindrical outer conductor and an inner conductor, the inner conductor being formed of a helical coil; a discharge tube having a double tube structure and being inserted into the helical coil in an axial direction thereof,

the double tube structure being formed of an inner tube for introducing a sample and an outer tube for introducing a plasma gas;



- discharge-tube cooling means for causing a cooling gas to flow along an outer periphery of the discharge tube in directions parallel to an axis thereof; and means for supplying microwave power to the coaxial waveguide.

5,086,256

EXTERNAL RESONANCE CIRCUIT TYPE RADIO FREQUENCY QUADRUPOLE ACCELERATOR

Katsumi Tokiguchi, Hitachi; Kensuke Amemiya, Katsuta; Noriyuki Sakudo, and Takayoshi Seki, both of Hitachi, all of Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

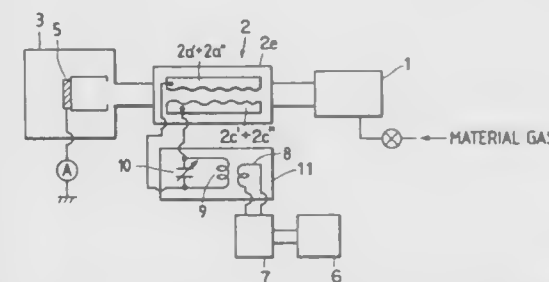
Filed Nov. 20, 1989, Ser. No. 438,018

Claims priority, application Japan, Nov. 24, 1988, 63-294775

Int. Cl.⁵ H01J 25/10

U.S. Cl. 315-111.81

8 Claims



1. In an external resonance circuit type RFQ accelerator comprising undulated quadrupole electrodes and a separate radio frequency resonance circuit for generating a radio frequency high voltage to be supplied to said electrodes, the improvement wherein said undulated quadrupole electrodes and at least a part of metallic supports for supporting said electrodes and voltage supplying lines are provided with a surface coating of silicon or silicon doped with boron, phosphorus, or arsenic.

5,086,257

PLASMA PANEL WITH INCREASED ADDRESSABILITY
Michel Gay, Le Fontanil; Jacques Deschamps, Grenoble, and Serge Salavio, St. Egreve, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Aug. 28, 1989, Ser. No. 399,082

Claims priority, application France, Aug. 30, 1988, 8811355

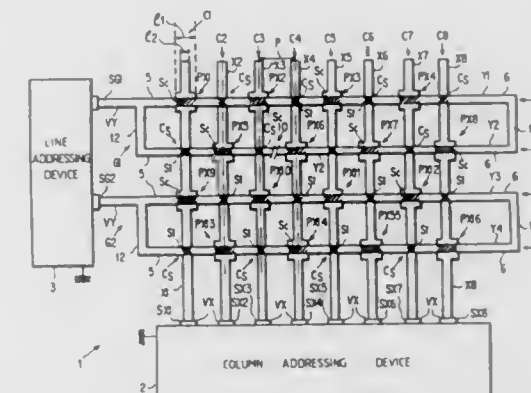
Int. Cl.⁵ G09G 3/10

U.S. Cl. 315-169.4

21 Claims

3. A plasma panel comprising pixels arranged in rows of pixels and columns of pixels, column electrodes crossing or intersecting row electrodes and defining a plurality of crossings or intersections, a column control and addressing device

to which the column electrodes are connected, a row control and addressing device to which the row electrodes are connected, each crossing having a crossing surface formed by the facing surfaces of the corresponding column electrode and row electrode, wherein the crossings comprise, firstly, simple crossings and comprise, secondly, widened crossings having a greater crossing surface than the crossing surface of the simple crossings, and wherein each pixel is defined substantially at a widened crossing, said panel of the coplanar sustaining AC



- type, pairs of sustaining electrodes intersecting with solely addressing electrodes, each pair of electrodes being formed by an addressing-sustaining electrode and a solely sustaining electrode, the addressing-sustaining electrodes and the solely sustaining electrodes having projecting surfaces which, between the two electrodes of the same pair, are oriented towards each other and enable the definition, at the intersection with a purely addressing electrode, of a widened surface where a pixel is formed.

5,086,258

DISCHARGE TUBE ARRANGEMENT

Stuart A. Mucklejohn, Leicester, and David O. Wharmby, Loughborough, both of England, assignors to Thorn EM1 plc, London, England

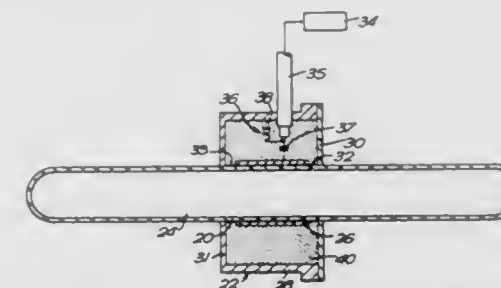
Filed Oct. 4, 1990, Ser. No. 592,491

Claims priority, application United Kingdom, Oct. 11, 1989, 8922862

Int. Cl.⁵ H05B 41/16

U.S. Cl. 315-248

7 Claims



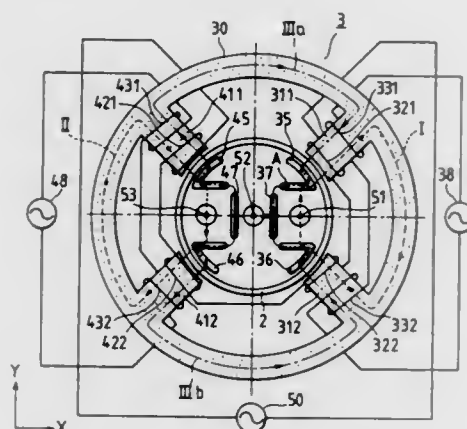
1. A discharge tube arrangement comprising an electrodeless discharge tube and means for supplying r.f. power to the discharge tube, said discharged tube containing a fill which comprises a metal carbonyl complex.

5,086,259

SYSTEM FOR CONVERGING A PLURALITY OF ELECTRON BEAMS IN CATHODE RAY TUBE

Soichi Sakurai, Yokohama; Masaki Nakahara, Chigasaki; Takahisa Mizuta; Nobutaka Okuyama, both of Yokohama; Michitaka Ohsawa, Fujisawa, and Ichiro Niitsu, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 14, 1990, Ser. No. 493,356

Claims priority, application Japan, Mar. 17, 1989, 1-63516; Jun. 12, 1989, 1-146833
Int. Cl.³ G09G 1/04; H01J 29/70; H01H 1/00
U.S. Cl. 315—368.25 10 Claims

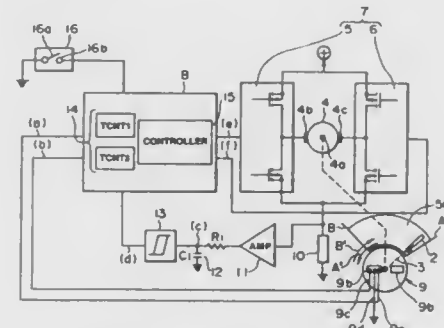


1. A system for generating magnetic fields to converge a plurality of electron beams in a cathode-ray tube comprising: magnetic pole pieces disposed on both sides of a center electron beam opposing each other for forming magnetic paths inside the neck part of said cathode-ray tube; a first convergence yoke disposed on the outside of the neck part of said cathode-ray tube for forming magnetic paths together with said magnetic pole pieces; a first coil wound on said first convergence yoke for generating a magnetic field for correcting horizontal misconvergence between said center electron beam and a side electron beam located on a side of said center electron beam, and a driving circuit for supplying an exciting current to the first coil; a second coil wound on said first convergence yoke for generating a magnetic field for correcting horizontal misconvergence between said center electron beam and a side electron beam located on the other side of said center electron beam, and a driving circuit for supplying an exciting current to the second coil; a third coil wound on said first convergence yoke for generating a magnetic field for correcting vertical misconvergence between said center electron beam and said both side electron beams, and a driving circuit for supplying an exciting current to the third coil; a second convergence yoke disposed in a different position from said first convergence yoke on the neck part of said cathode-ray tube; and a fourth coil wound on said second convergence yoke for generating a magnetic field for correcting vertical misconvergence between said both side electron beams, and a driving circuit for supplying an exciting current to the fourth coil; wherein said first convergence yoke comprises a core having a ring shaped outer periphery and four magnetic poles on its inner periphery, said first coil is wound on two adjacent magnetic poles out of said four magnetic poles, said second coil is wound on the remaining two adjacent magnetic poles out of said four magnetic poles, and said third coil is wound on said four magnetic poles.

5,086,260

WIPER APPARATUS WITH REVERSING MOTOR PROTECTED FROM OVERLOAD

Takeshi Ito, Yokohama, Japan, assignor to Jidosha Denki Kogyo K.K., Kanagawa, Japan
Filed Feb. 15, 1991, Ser. No. 655,588
Claims priority, application Japan, Feb. 16, 1990, 2-35955
Int. Cl.³ H02P 3/00 2 Claims



1. A wiper apparatus comprising: a wiper motor for driving a wiper blade; an overcurrent detection means for detecting an overcurrent flowing in said wiper motor; a timer means actuated according to a signal output from the overcurrent detection means when the overcurrent is detected by said overcurrent detection means; and a control means for actuating the wiper blade reciprocatingly by rotating the wiper motor in the reverse direction every time the wiper blade arrives at a predetermined position, and for rotating said wiper motor in the reverse direction when the overcurrent detection means continues to detect the overcurrent flowing in the wiper motor for a period predetermined by said timer means; said timer means comprising a first timer means actuated according to a signal output from the overcurrent detection means when said overcurrent detection means detects the overcurrent flowing in the wiper motor, and a second timer means actuated according to a signal output from the overcurrent detection means when said overcurrent detection means detects the overcurrent again after reversing the wiper motor by detecting the overcurrent continuing for a period predetermined by said first timer means.

5,086,261

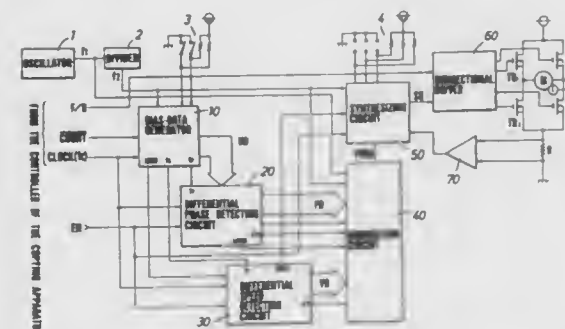
MOTOR SPEED CONTROL DEVICE FOR USE IN AN IMAGE FORMING APPARATUS

Satoshi Sakata; Kazuo Sato; Yuichi Gotoh; Mitsuo Azumai, and Ikuya Hotta, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 606,627

Claims priority, application Japan, Oct. 31, 1989, 1-283822; Dec. 26, 1989, 1-335105
Int. Cl.³ H02P 1/00 4 Claims

1. A motor speed control device for use in an image forming apparatus comprising: a bias-data generating circuit for generating a bias data on a clock signal having a given frequency corresponding to a predetermined speed of a motor; a differential phase detecting circuit for outputting a differential phase data by biasing a first counted value with said bias data, wherein said first counted value is the result of counting the differential phase between said clock signal and a motor-rotating pulse signal having a frequency proportional to an actual speed of said motor, and wherein said first counted value is counted in terms of a first refer-

- ence clock pulse having a higher frequency than that of said clock signal; a differential speed detecting circuit for outputting a differential speed data by digitally operating a second and a third counted values, wherein said second and third counted values are respectively the result of counting the length of one-cycle of said clock signal and the length of



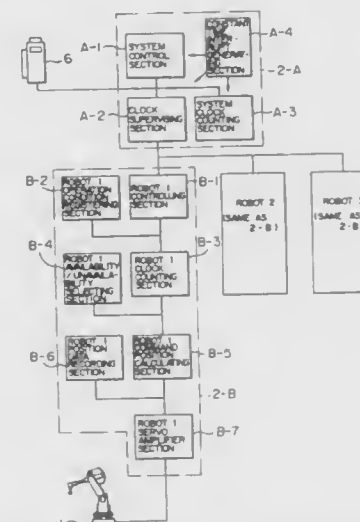
- one-cycle of said motor-rotating pulse signal in terms of a second reference clock pulse having a higher frequency than that of said clock signal; and a modulation circuit for digitally operating said differential phase data and said differential speed data and outputting a pulse width modulation signal obtained by counting the result of operation, whereby to control the speed of said motor.

5,086,262

INDUSTRIAL ROBOT SYSTEM

Kazuo Hariki; Tatsuya Koizumi; Kazuya Ishiguro, and Kiyoshi Kanitani, all of Toyama, Japan, assignors to Nachi-Fujikoshi Corp., Toyama, Japan
Filed Jul. 25, 1990, Ser. No. 557,071

Claims priority, application Japan, Jul. 27, 1989, 1-192648
Int. Cl.³ G05B 11/32 7 Claims



1. A method for controlling an industrial robot system including a plurality of robots arranged for conducting a job in cooperation with each other, comprising the following steps of: a) setting a system clock and a clock for each robot so that a predetermined increment value is added to each clock in every constant basic time period, each clock reaching a predetermined saturated value just within a cycle time of

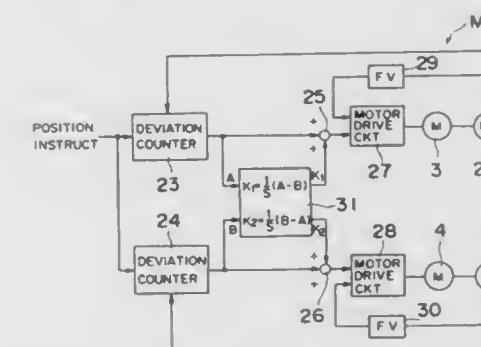
- the system, and then each clock again starting to count from zero; b) setting, for each of the robots, an original point clock value which is a waiting position for starting an operation, and setting respective positions of each robot during operation of that robot in accordance with clock values of the clock associated with that robot; and c) advancing the system clock by adding thereto the predetermined increment value every constant basic time period during drive of the system, and advancing the clock of each robot by adding thereto the predetermined increment value whenever a robot corresponding to that clock is enabled.

5,086,263

BI-AXIAL SYNCHRONOUS DRIVING APPARATUS

Saburo Kubota, Katano; Hirotsuka Mega, Kadoma, and Yasuhiro Kametani, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 27, 1990, Ser. No. 634,552

Claims priority, application Japan, Dec. 29, 1989, 1-341535
Int. Cl.³ G05B 11/00 3 Claims



1. A bi-axial synchronous driving apparatus which comprises: a set of motors for respectively driving two axes; a rotation detecting means for detecting rotational positions of the respective motors; a set of deviation counters for receiving a common position instruction signal and detection signals of the respective rotation detecting means; a correcting means for receiving deviation signals outputted from the respective deviation counters, to thereby form correction signals with respect to the respective deviation signals based on an integration of a difference between each one of the deviation signals and the other corresponding deviation signal; a set of adding means for adding the deviation signals outputted from the respective deviation counters to the correction signals thereof; and a set of driving means for driving the respective motors based on control signals outputted from said respective adding means.

5,086,264

MOTOR TOQUE COMPENSATION OF AN INDUCTION ELECTRIC MOTOR BY ADJUSTING A SLIP COMMAND DURING PERIODS OF SUPPOSED CHANGE IN MOTOR TEMPERATURE

William L. Kelleles, Brighton, and Don K. St. John, Livonia, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio
Filed Jun. 22, 1990, Ser. No. 542,266

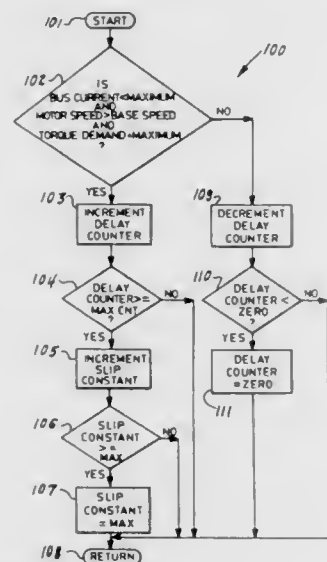
Int. Cl.³ H02P 5/41 13 Claims

1. An electric motor control system comprising: a direct current power supply; an alternating current induction electric motor; a motor speed detector coupled to said alternating current induction electric motor for generating a signal representing the speed of said alternating current induction electric motor;

an inverter coupled to said direct current power supply via a direct current power bus and coupled to said alternating current induction electric motor and said motor speed detector for supplying a modulated power output from said direct current bus to said alternating current induction electric motor at a selectable frequency equal to the sum of the speed of said alternating current induction electric motor and a slip command and a selectable voltage modulation for control of the rate of speed and the torque produced by said alternating current induction electric motor; and

a control circuit connected to said inverter, said direct current power bus and said motor speed detector operative to monitor the current delivered through said direct current power bus, the speed of said alternating current induction motor and the torque demanded of said alternating current induction motor,

supply a slip command to said inverter, and periodically adjust said slip command supplied to said inverter during periods of supposed change in motor temperature corresponding to said monitored current delivered through said direct current power bus, the speed of said alternating current induction motor and the torque demanded of said alternating current induction motor to compensate for torque changes because of changes in motor temperature.



6. An electric motor control system comprising:
a direct current power supply;
an alternating current induction electric motor;
a motor speed detector coupled to said alternating current induction electric motor for generating a signal representing the speed of said alternating current induction electric motor;

an inverter coupled to said direct current power supply via a direct current power bus and coupled to said alternating current induction electric motor and said motor speed detector for supplying a modulated power output from said direct current bus to said alternating current induction electric motor at a selectable frequency equal to the sum of the speed of said alternating current induction electric motor and a slip command and a selectable voltage modulation for control of the rate of speed and the torque produced by said alternating current induction electric motor; and

a control circuit connected to said inverter, said direct current power bus and said motor speed detector operative to monitor the bus current, the speed of said alternating current induction electric motor and the torque demanded of said alternating current induction electric motor,

supply a slip command to said inverter, increase said slip command if said bus current is less than a maximum bus current, the speed of said alternating current induction electric motor is greater than a predetermined base speed and the torque demanded is equal to a maximum torque demand for longer than a predetermined period of time, and

decrease said slip command if said bus current is greater than said maximum bus current, the speed of alternating current induction electric motor is greater than said predetermined base speed and the torque demanded is equal to said maximum torque demand for longer than said predetermined period of time.

5,086,265

ELECTRICAL CIRCUIT FOR A CENTRIFUGE

Rüdiger Uhlendorf, Niemetal-Lowenhausen, Fed. Rep. of Germany, assignor to Heraeus Sepatech GmbH, Osterode am Harz, Fed. Rep. of Germany

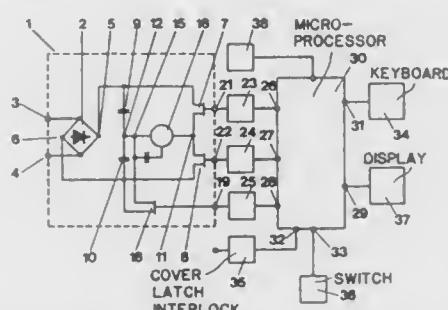
Filed May 6, 1991, Ser. No. 696,034

Claims priority, application Fed. Rep. of Germany, May 5, 1990, 4014448

Int. Cl.⁵ H02P 3/24, 7/63

U.S. Cl. 318—817.

10 Claims



1. A system for preselecting the speed of a capacitor electric motor of a centrifuge, comprising:

a source of direct current
a first series circuit including two series connected field effect transistors, each having a control input for switching the corresponding transistor to an on and off condition, the transistors having a common connection for connecting to one terminal of the motor;
a second series circuit including at least two series connected capacitors having a common connection for connecting to a second terminal of the motor;
the first and second series circuit being connected in parallel across the direct current source; and
a pulse generator having an output connected to the control input of both field effect transistors for applying spaced control pulses alternately to the two transistors.

5,086,266

AUTOMOBILE AC GENERATOR SYSTEM

Naomichi Shiga; Hisatoshi Tsuchiya, both of Numazu; Yasuyuki Sakakibara, Fuji, and Katsumi Kibe, Atami, all of Japan, assignors to Toyo Densan Co., Ltd., Numazu, Japan

Continuation-in-part of Ser. No. 260,918, Oct. 21, 1988, Pat. No. 4,973,896. This application Sep. 19, 1990, Ser. No. 584,635

Claims priority, application Japan, Sep. 19, 1989, 1-240780

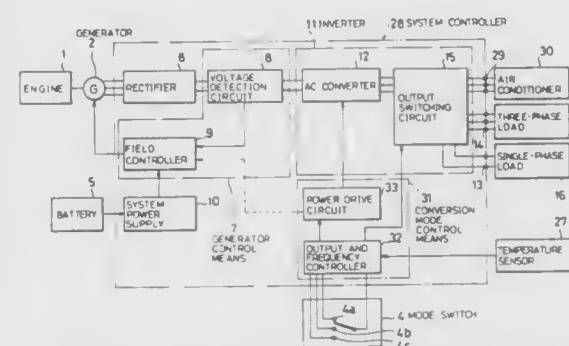
Int. Cl.⁵ H02J 7/14

U.S. Cl. 322—28

10 Claims

1. An automobile ac generator system comprising:
a generator driven by the engine of an automobile;
a system controller for controlling the voltage and converting the frequency of ac power generated by the generator, said system controller comprising rectification means for converting the ac power generated by the generator into dc power, generator control means for detecting the volt-

age of the dc power rectified by the rectification means and controlling the voltage of the ac power generated by the generator on the basis of the detected voltage, an inverter for converting the dc power from the rectification means into single-phase ac power of commercial line frequency and three-phase ac power of commercial line



frequency, and conversion mode control means for controlling the conversion operation of the inverter; control operation selection means for selecting among conversion modes of the inverter controlled by the conversion mode control means of the systems controller; and a battery for supplying electric power to the system controller.

5,086,267

CONTROL CIRCUIT FOR A SOLAR-POWERED RECHARGEABLE POWER SOURCE AND LOAD

Rudolph W. Janda, Spring Grove; Jerald L. Douglas, Antioch, and Edward F. Condon, Jr., Northbrook, all of Ill., assignors to Intermatic Incorporated, Spring Grove, Ill.

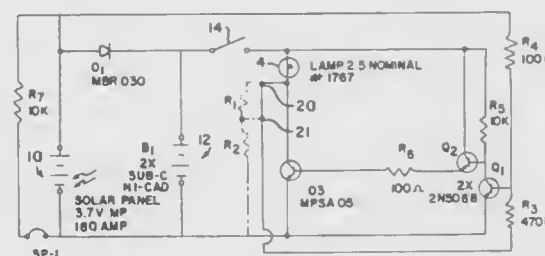
Continuation of Ser. No. 387,682, Jul. 31, 1989. This application Jan. 4, 1991, Ser. No. 641,878

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.⁵ G05F 1/67

U.S. Cl. 325—350

16 Claims



1. A circuit for controlling the recharging of a rechargeable power source with a photovoltaic panel and for controlling the discharge of the rechargeable power source into a load, comprising:

a rechargeable power source;
a photovoltaic panel operably, connected to the rechargeable power source for supplying a charging current to the rechargeable power source whenever the voltage across the photovoltaic panel is greater than the voltage across the rechargeable power source by a predetermined amount;
means for substantially blocking current flow from the rechargeable power source to the photovoltaic panel;
a load; and
switching means responsive to the voltage across the photovoltaic panel:
for connecting the load across the rechargeable power

5,086,268

MEASURING MOUNT FOR MICROWAVE COMPONENTS

Walter Zimmermann, Dorfen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

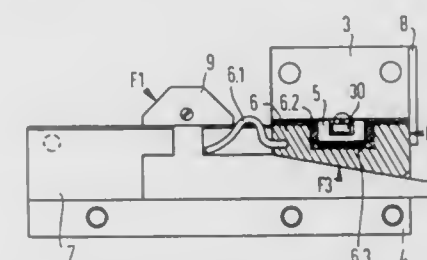
Filed Mar. 8, 1990, Ser. No. 490,409

Claims priority, application European Pat. Off., Mar. 20, 1989, 89104951

Int. Cl.⁵ G01R 1/00, 1/02

U.S. Cl. 324—158 F

3 Claims



1. A measuring mount for microwave components, comprising a base structure, a slide means (6-9) on which a component (30) which is to be measured is mounted and can be moved longitudinally relative to said base structure into the measuring mount so as to position and make contact between said component and (30) a measuring contact (12), comprising a recess formed in a tapered slide part (6) of said slide means so as to allow the component (30) being measured to be inserted into said measuring contact wherein said base structure includes two side members (1, 2) which are guide members for the slide part (6), wherein said slide means comprises a first portion formed with an inclined plane and said slide part moveably mounted on the inclined plane of said first portion, wherein said slide part (6) is mounted to move on said inclined plane relative to said slide means, including a stop on said base structure which engages said slide part (6) for positioning said component (30) being measured and wherein said component being measured makes contact with said slide part (6), and including an elastic cushion (6.3) mounted in said slide means so as to elastically cushion the component (30) being measured and wherein said slide means and said slide part initially move together longitudinally on said base structure until said slide part (6) engages said stop after which said slide part (6) moves upwardly as said slide means continues to move longitudinally relative to said base structure.

5,086,269

BURN-IN PROCESS AND APPARATUS

Laszlo Nobi, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 8, 1991, Ser. No. 667,620

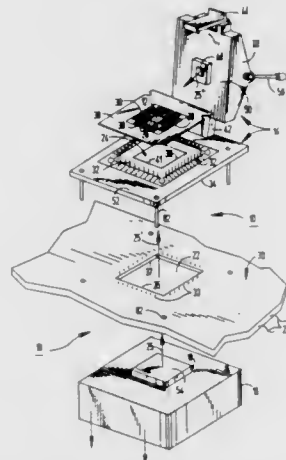
Int. Cl.⁵ G01R 31/02, 1/06

U.S. Cl. 324—158 F

17 Claims

1. A method for performing a burn-in screening procedure upon an integrated circuit chip, said method comprising:
(1) temporarily associating the chip with a chip connector having electrical connections suitable for electrically interconnecting a chip being screened with a PC test board having: (a) electrical connections and test equipment means for sending electrical signals to and receiving electrical signals from a chip subjected to burn-in screening, (b) means for electrically and physically attaching the chip connector to the PC test board and (c) an opening through which a raised head portion of a plenum projects

- and is thereby positioned in heat-transfer-proximity with the chip being screened;
- (2) employing the chip connector to place the chip in heat-transfer-proximity with the plenum;
 - (3) heating the plenum by circulating a heat transfer fluid through a fluid chamber in said plenum;



- (4) electrically testing the chip after it attains a predetermined heated state sufficient to burn-in screen said chip; and
- (5) disassociating the chip from the heat provided by the heated fluid after the chip is burn-in screened.

5,086,270

PROBE APPARATUS

Wataru Karasawa, Yokohama; Taketoshi Itoyama, Tokorozawa; Itaru Takao, Yamanashi; Tadashi Obikane, Kofu, and Hisashi Koike, Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

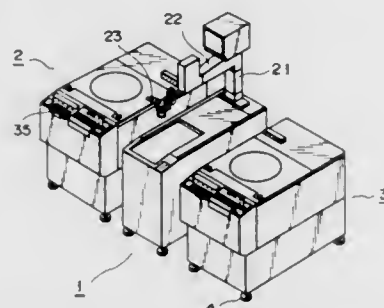
Continuation of Ser. No. 359,579, Jun. 1, 1989, abandoned. This application Dec. 31, 1990, Ser. No. 634,814

Claims priority, application Japan, Jul. 8, 1988, 63-171570

Int. Cl.⁵ G01R 31/26

U.S. Cl. 324—158 P

8 Claims



1. A probing test apparatus for highly integrated IC chips formed on a semiconductor wafer, in which each of the pads of said IC chips is in contact with a probe in 1:1 relationship, and while the electrical characteristics of each IC chip are being tested in a first testing section, loading/unloading of another wafer is carried out between a second testing section and a loader section, said apparatus comprising:

- at least said first and second testing sections each having a first system for electrically testing wafers and an independent member for supporting said system;
- said loader section having a second system for carrying the wafers to the testing sections and a supporting member for supporting said second system;
- means provided in at least one of the independent members

and serving to store those results of electrically testing the wafers at each of the testing sections; and

marking means arranged on at least one of the independent members and made independent of the testing sections; wherein said at least first and second testing sections and said loader section are arranged independent of each other such that they are physically separate, not mechanically linked, spaced apart from each other, and vibration is not transmitted from any one section to any other section.

5,086,271

DRIVER SYSTEM AND DISTRIBUTED TRANSMISSION LINE NETWORK FOR DRIVING DEVICES UNDER TEST

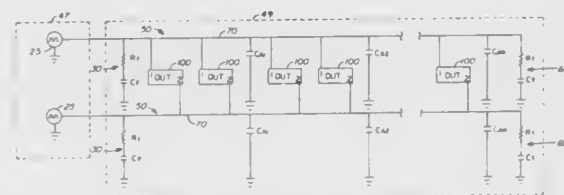
Harry K. Haill, Houston; James R. Birchak, Spring, and Wai-Leung Hon, Sugarland, all of Tex., assignors to Reliability Incorporated, Houston, Tex.

Filed Jan. 12, 1990, Ser. No. 464,404

Int. Cl.⁵ G01R 31/00, 31/02, 1/00

U.S. Cl. 324—158 R

37 Claims



21. A distributed transmission line network for providing test signals to devices under test, comprising:
- a driver for generating a test signal;
- an input RC network, connected to the output of the driver;
- a transmission line, with distributed capacitance, said transmission line connected to said input RC network;
- an output RC network, connected to said transmission line; and
- wherein said driver has an internal resistance which is less than approximately ten percent of the impedance of the transmission line.

5,086,272

APPARATUS FOR DISTINGUISHING BETWEEN OPPOSED DIRECTIONS OF RELATIVE MOTION OF A PART HAVING MAGNETIC VARIATIONS

Uwe Hinrichsen, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagen AG, Fed. Rep. of Germany

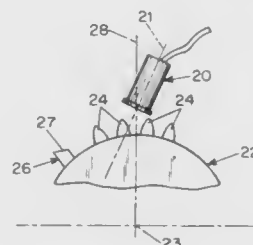
Filed Jun. 12, 1990, Ser. No. 537,045

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1989, 3919993

Int. Cl.⁵ G01B 7/14; G08B 21/00

U.S. Cl. 324—207.13

7 Claims



1. Apparatus for distinguishing between opposed directions of relative motion of a part having magnetic variations comprising magnetic sensor means disposed adjacent to the path of the magnetic variations of the part and having different magnetic couplings with the magnetic variations in the part in the direction of relative motion of the part with respect to the sensor means, wherein the sensor means includes armature means having portions spaced at different distances from the

magnetic variations and wherein the portions of the armature means have different dimensions in a direction transverse to the direction of motion of the magnetic variations.

5,086,273

A.C. ELECTROMAGNETIC SYSTEM FOR DETERMINING POSITION OF AN ENCASED MOVABLE ELECTRICALLY CONDUCTIVE ELEMENT

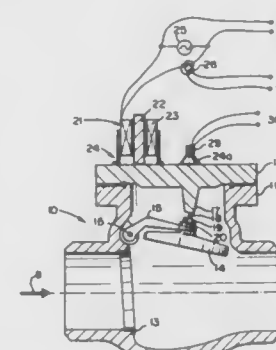
Robert L. Leon, Maple Glen, Pa., assignor to Liberty Technology Center, Inc., Conshohocken, Pa.

Filed Apr. 20, 1990, Ser. No. 511,657

Int. Cl.⁵ G01B 7/14; F16K 37/00

U.S. Cl. 324—207.17

23 Claims



1. A system for detecting from outside a housing the position of an electrically conductive element movably enclosed in the housing, the system comprising:

A.C. electromagnet means connected to an A.C. voltage source and positioned proximal to the housing for generating a magnetic field penetrating the housing and the element, the A.C. electromagnet means including a coil and a core means at least partially within the coil for intensifying and focusing magnetic lines of force generated by the A.C. electromagnet means so as to penetrate the housing and the electrically conductive element from outside the housing;

sensor means for sensing the instantaneous A.C. current flowing through the electromagnet means; and

amplitude demodulation means for amplitude demodulating the sensed A.C. current and generating a trace of sensed A.C. current amplitude, an instantaneous value of the sensed A.C. current amplitude trace being related to an instantaneous position of the element in the housing.

5,086,274

VARIABLE FREQUENCY MAGNETIC FIELD DEVICE EMPLOYING MULTIPLE ANTENNAE FOR MEASURING THE SURFACE IMPEDANCE OF A MATERIAL

Vincent Gobin, Chatenay Malabry; Gérard Labaune, Palaiseau, and Francois Issac, Nanterre, all of France, assignors to Office National d'Etudes et de Recherches Aérospatiales, Chatillon and Avions Marcel Dassault-Breguet Aviation (AMD/BA), Vaucresson, both of France, a part interest

Filed Jun. 11, 1990, Ser. No. 535,498

Claims priority, application France, Jun. 12, 1989, 89 07726

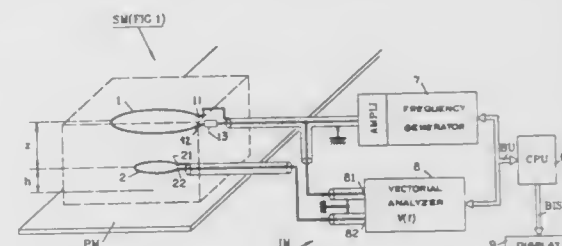
Int. Cl.⁵ G01R 33/12; G01N 27/72

U.S. Cl. 324—239

11 Claims

1. A device for measuring the surface impedance of a material to be tested, said device comprising:
- a first antenna and a second antenna, said first and second antennae being superposed by an intermediary of a dielectric material to constitute a compact probe;
- means for deriving a first electrical voltage wobbled in frequency to be supplied to said first antenna whereby said first wobbled voltage produces a magnetic field emitted by said first antenna and crossing said second antenna;
- voltage measuring means for measuring second and third

wobbled voltages supplied successively by said second antenna, said second wobbled voltage being induced in said second antenna responsive to said magnetic field when said probe is moved away from said material to be tested so that said material does not perturb said magnetic field, and said third wobbled voltage being induced in said second antenna responsive to said magnetic field when said probe is substantially placed on said material to be tested so that said material perturbs said magnetic field;



means for calculating the variation of a ratio between said second and third wobbled voltages as a function of the frequency of said first wobbled voltage; and

means for comparing said ratio variation with low-pass type functions respectively depending on predetermined surface impedances thereby selecting one of said low-pass type functions nearest said ratio variation to determine the surface impedance of said material to be tested.

5,086,275

TIME DOMAIN FILTERING FOR NMR PHASED ARRAY IMAGING

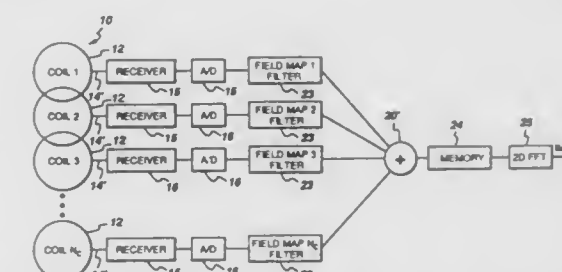
Peter B. Roemer, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 20, 1990, Ser. No. 570,247

Int. Cl.⁵ G01R 33/20

U.S. Cl. 324—309

11 Claims



1. A method for combining NMR response data of a sample from a plurality of RF receiver coils of an NMR phased array in the time domain to form a composite NMR image, comprising the steps of:

- (a) receiving at each of the RF receiver coils a different one of a plurality of NMR response signals, each of the signals being evoked from a portion of the sample within a field of view of a respective one of the receiver coils;
- (b) conditioning each of the response signals develop a plurality of data point signals corresponding to the magnitude of each of the respective response signals from each of the receiver coils at successive time intervals;
- (c) convolving each of the data point signals by a time domain representation of a field map of the respective one of the receiver coils generating the corresponding one of the response signals; and
- (d) combining the signals obtained by the step of convolving on a time domain point-by-point basis to produce a time domain representation of the composite NMR image of the sample.

5,086,276

METHOD OF DETERMINING CONDENSATE LOCATION IN AN HID LAMP

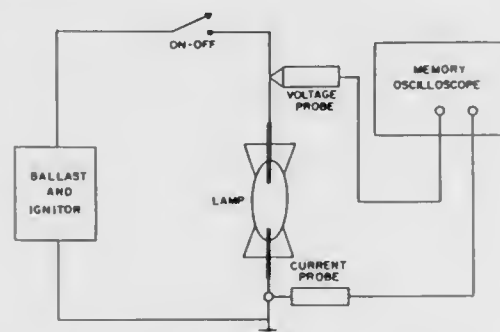
Yan M. Li, Cambridge; A. Bowman Budinger, Westford; Wojciech W. Byszewski, Concord; Philip Gregor, Acton, and William M. Keefe, Rockport, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 7, 1991, Ser. No. 696,659

Int. Cl.⁵ G01R 31/24

U.S. Cl. 324—414

4 Claims



1. A method of determining condensate location within an HID lamp comprising: measuring a first current and a first voltage waveform during the glow phase of lamp starting when the lamp electrodes are free of condensate; measuring a second current and a second voltage waveform during the glow phase of lamp starting and comparing the first current waveform with the second current waveform and the first voltage waveform with the second voltage waveform to determine the condensate location.

5,086,277

APPARATUS AND METHOD FOR PERFORMING DIAGNOSTIC TESTS ON THE ELECTRICAL SYSTEMS OF RECREATIONAL VEHICLES AND THE LIKE

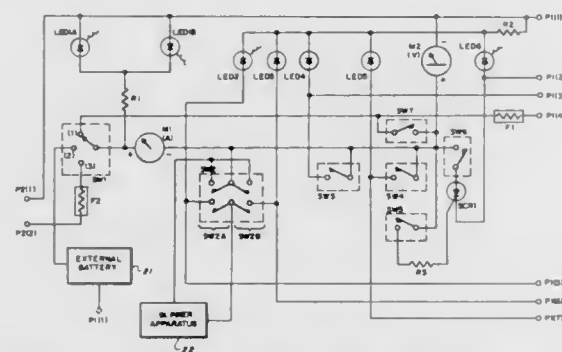
Robert C. Hamnerly, Prescott Valley, Ark. 86314

Filed Mar. 15, 1990, Ser. No. 493,788

Int. Cl.⁵ G01R 31/00

U.S. Cl. 324—504

20 Claims



1. Apparatus for testing the electrical components of a trailer vehicle and the like, the apparatus comprising: a voltmeter having one terminal coupled to a ground potential of said trailer vehicle electrical system; a selector switch for selecting one of a plurality of batteries to energize a common terminal of said selector switch; a plug for coupling to said trailer vehicle electrical components, said plug containing a plurality of terminals, each of said plurality of plug terminals coupled to a first terminal of a trailer vehicle electrical component, wherein second terminals of said electrical components are coupled to said ground potential;

an ammeter having a first terminal coupled to said common terminal of said selector switch; a plurality of activation switches, each activation switch having a first terminal coupled to a common terminal of said ammeter and having a second terminal coupled to a one of said plug terminals; and an illumination device coupled between said common potential and each of said plug terminals, wherein changing a state to an activation switch coupled to said plug terminal applies battery voltage to a coupled electrical component, wherein said voltmeter can determine a status of said applied battery voltage, said illumination device and said ammeter determining when said electrical component having voltage applied thereto is operative, a value provided by said ammeter determining when said electrical component is operating in an expected operational state.

5,086,278

CIRCUIT ELEMENT MEASURING METHOD AND APPARATUS

Hideki Wakamatsu, and Shinya Goto, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

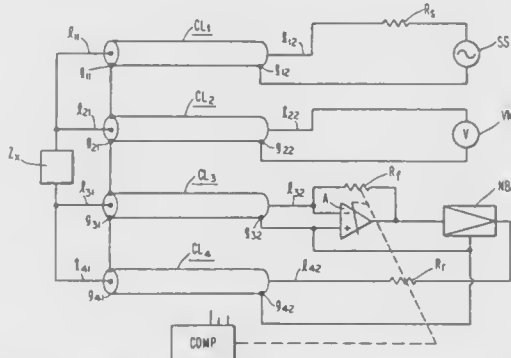
Filed Feb. 22, 1991, Ser. No. 659,853

Claims priority, application Japan, Feb. 27, 1990, 2-49052

Int. Cl.⁵ G01R 27/00

U.S. Cl. 324—605

13 Claims



8. A circuit element measuring apparatus for a device under test having one terminal and another terminal, said apparatus comprising: means for applying a measurement voltage to one terminal of said device; means for detecting the measurement voltage applied to said one terminal of said device; zero detection amplifier means coupled to the other terminal of said device for detecting the voltage at said other terminal; a voltage controlled current source for drawing an electric current through said element in accordance with the output of said zero detection amplifier to drop the voltage of said other terminal to zero; shielded line means coupling said device to said means for applying a measurement voltage, said means for detecting the measurement voltage, said zero detection amplifier, and said voltage-controlled current source; and means for changing the operation point of said zero detection amplifier in response to a measuring condition of said apparatus.

5,086,279

METHOD OF AND APPARATUS FOR MEASURING THE MOISTURE CONTENT OF FIBROUS MATERIALS

Waldemar Wochowski, Hamburg-Meindorf, and Heiko Niehues, Hamburg, both of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

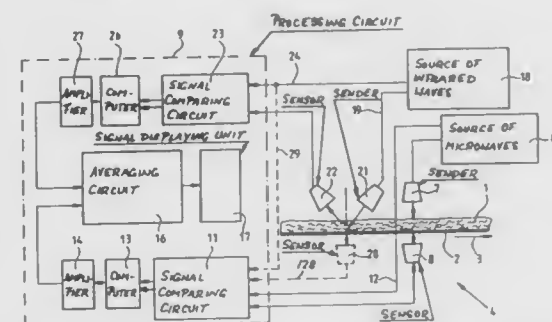
Filed Feb. 23, 1990, Ser. No. 484,934

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905658

Int. Cl.⁵ G01R 27/04; G01N 22/04

U.S. Cl. 324—637

39 Claims



1. A method of measuring the moisture content of a commodity, comprising the steps of exposing the commodity to oscillating electrical energy the oscillations of which are influenced by moisture so that the influencing of the oscillations of energy that penetrates the commodity is indicative of the moisture content of the commodity; monitoring the energy that has penetrated the commodity and generating first signals denoting the extent of oscillations of monitored energy, said first signals being indicative of the extent of damping of oscillations of the energy as a result of penetration into the commodity; exposing the commodity to electromagnetic waves which are reflected by the commodity and the oscillations of which are damped by moisture in the commodity; generating second signals denoting the extent of damping of reflected waves; averaging each first signal with a second signal; and utilizing the thus obtained averaged signals for the generation of moisture signals.

5,086,280

CONTINUOUSLY VARIABLE PULSEWIDTH WAVEFORM FORMATION DEVICE EMPLOYING TWO MEMORIES

Ryuji Ohmura, and Naomi Higashino, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,958

Claims priority, application Japan, Mar. 12, 1990, 2-61573

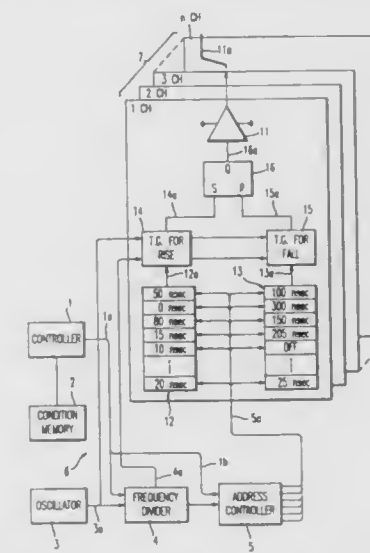
Int. Cl.⁵ H03K 3/037, 5/05

U.S. Cl. 328—61

5 Claims

1. A continuously variable pulse width waveform formation device, comprising: a first memory storing a plurality of rise time data related to an output waveform in order of address; a second memory storing a plurality of fall time data related to said output waveform in order of address; control means for sequentially reading said rise time data and said fall time data in pairs in order of address from said first and second memories in a specified cycle; a first timing generator for outputting a plurality of set signal pulses at a timing related to said rise time data on the basis of said rise time data which is read from said first memory by said control means; a second timing generator for outputting a plurality of reset signal pulses at a timing related to said fall time data on the basis of said fall time data which is read from said second memory by said control means; and a flip flop circuit for generating an output signal rising in

response to said set signal pulses and falling in response to said reset signal pulses, whereby a continuously variable



pulsewidth waveform is generated as a function of said data read from said first and second memories.

5,086,281

OPTICAL CONTROL CIRCUIT FOR A MICROWAVE MONOLITHIC INTEGRATED CIRCUIT

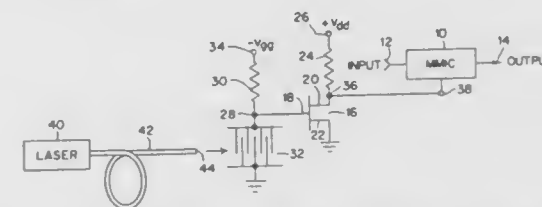
Arthur Paoletta, Howell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 4, 1991, Ser. No. 664,237

Int. Cl.⁵ H03G 3/30

U.S. Cl. 330—279

8 Claims



1. An optical control circuit for controlling a microwave monolithic integrated circuit, comprising: a light source generating an optical control signal; an interdigitated photoconductive detector responsive to said optical control signal and having an internal gain to generate an electrical control signal from said optical control signal; optical energy conductor means coupled to said light source for directing said optical control signal to said detector; field effect transistor means having a predetermined transconductance between an input electrode and an output electrode; circuit means coupled to said input electrode for controlling the current between said input electrode and said output electrode of the field effect transistor as a function of the electrical control signal generated by said detector; and circuit means coupling said output electrode to the microwave monolithic integrated circuit, whereby the internal gain of the interdigitated photoconductive detector and the transconductance of the field effect transistor operate to generate an output signal for controlling the microwave monolithic integrated circuit.

5,086,282

FIELD EFFECT TRANSISTOR-BIPOLAR TRANSISTOR DARLINGTON PAIR

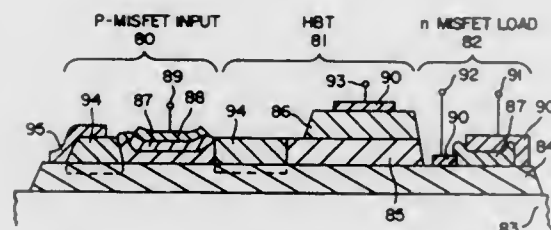
Olaleye A. Aina, Columbia, Md., and Eric A. Martin, Nahant, Mass., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 5, 1990, Ser. No. 593,459

Int. Cl.⁵ H03F 3/16

U.S. Cl. 330—300

8 Claims



1. A high frequency amplifying device comprising: field effect transistor means; bipolar transistor means driven by said field effect transistor means, wherein said field effect transistor means and said bipolar transistor means are cascaded together to provide high input impedance and high transconductance; and, n-channel MISFET means connected as an active load for said bipolar transistor.

5,086,283

DIPOLE TRANSDUCER ARRAY FOR BULK ACOUSTIC WAVE DELAY DEVICE

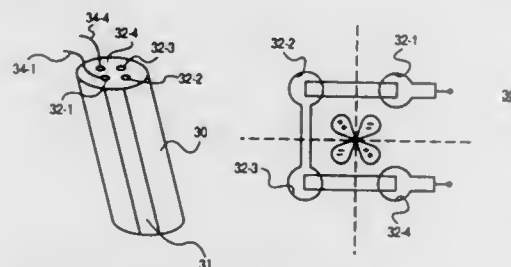
Sheng-Hann Lee, Cupertino, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 22, 1989, Ser. No. 455,202

Int. Cl.⁵ H03H 9/125, 9/30

U.S. Cl. 333—149

7 Claims



1. A delay line device comprising: an acoustic substrate having two opposing surfaces; and an even number of series-connected circular transducers formed on one of said two opposing surfaces of the acoustic substrate and arranged at approximately equal distances from a central point on the surface.

5,086,284

CONNECTOR HAVING A SWITCHING DEVICE

Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 8, 1990, Ser. No. 461,821

Claims priority, application Netherlands, Jan. 16, 1989, 8900092

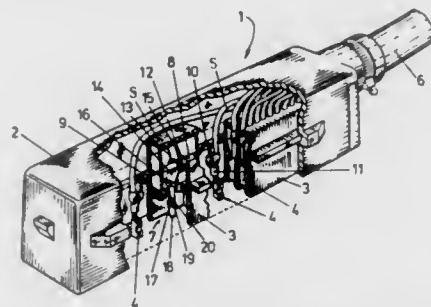
Int. Cl.⁵ H01H 36/00

U.S. Cl. 335—205

12 Claims

1. An electrical connector comprising: a housing of electrically insulating material enclosing a carrier body of electrically insulating material, said carrier body containing a plurality of contact elements of electrically conducting material, one end of each contact ele-

ment adapted for detachable mating with other contact means at one side of the housing; at least one magnetically actuatable elongated reed relay switch electrically connectible to at least two of said contact elements; a permanent magnet disposed in said carrier body in the



form of a ring with a central opening, the reed relay switch being disposed in the central opening of the magnet ring; and a tracer finger supported by said carrier body and being biased by a spring means to move said permanent magnet relative to said reed relay switch during mating or disconnection of said contact elements.

5,086,285

TIME-CURRENT CHARACTERISTICS VARIABLE CHIP FUSE

Hiroo Arikawa, Tokyo, and Yasutada Yuza, Kanagawa, both of Japan, assignors to SOC Corporation, Tokyo, Japan

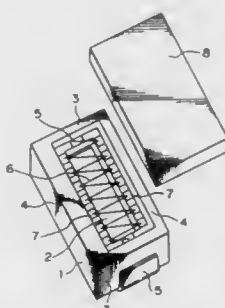
Filed Apr. 8, 1991, Ser. No. 682,112

Claims priority, application Japan, May 10, 1990, 2-48196[U]

Int. Cl.⁵ H01H 85/143, 85/02

U.S. Cl. 337—231

4 Claims



1. A time-current characteristics variable chip fuse comprising: a main body having a wall and a cavity defined by said wall in said main body; a pair of main terminals provided on said wall in such a manner that said pair of main terminals penetrate through said wall, and are opposed to each other, said pair of main terminals having end portions for electrical connection to an external circuit at an outer side of said wall; a plurality of subsidiary terminals located in said cavity to each side of a line extending from one of the main terminals of said pair to the other of the main terminals of said pair; and a fusible element having end portions which are respectively secured and electrically connected to said pair of main terminals, said fusible element being provided in said cavity, said fusible element extending between one of the main terminals of said pair via some or all of said plurality subsidiary terminals and the other of the main terminals of said pair in a zigzag fashion, and said fusible element being

5,086,286

GAS-SENSITIVE DEVICE

Yoshikazu Yasukawa, and Norihiro Inagaki, both of Hamamatsu, Japan, assignors to Kurabe Industrial Co., Ltd., Shizuoka, Japan

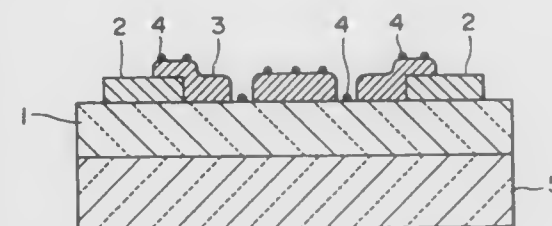
Filed Jul. 26, 1990, Ser. No. 563,321

Claims priority, application Japan, Jul. 28, 1989, 1-196131

Int. Cl.⁵ H01C 7/00

U.S. Cl. 338—34

16 Claims



1. A thin film gas-sensitive device comprising: an insulating substrate having a pair of electrodes disposed thereon; a gas-sensitive layer, having a gas sensitive substance, deposited on the insulating substrate and electrodes; and a catalytic layer deposited on the gas-sensitive layer and insulating substrate as a non-continuous layer; wherein the insulating substrate is partly uncovered because the electrodes, the gas-sensitive layer containing the gas-sensitive substance and the catalytic layer do not thoroughly cover the substrate.

5,086,287

DISPLAY SURFACE FOR TACTILE INFORMATION

Wolfgang Nützel, Geroldshausen, Fed. Rep. of Germany, assignor to KTS Kommunikationstechnik Stolper GmbH, Horb-Nordstetten, Fed. Rep. of Germany

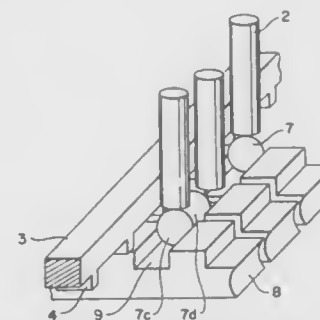
Filed Dec. 11, 1989, Ser. No. 445,592

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3812028

Int. Cl.⁵ G09B 21/00

U.S. Cl. 340—407

22 Claims



mechanically connected to said some or all of said plurality of subsidiary terminals.

associated with each lifting element to shift the latter in the direction of the column.

5,086,288

VATS INTERROGATOR ACCESSORY

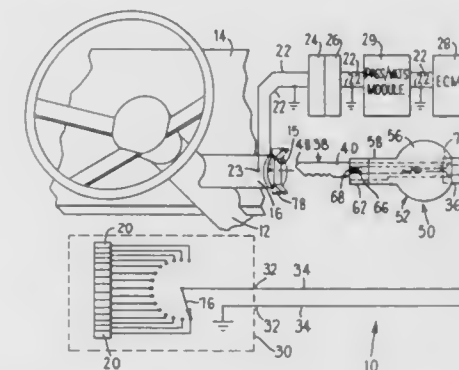
Carl Stramer, Sterling Heights, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Filed May 18, 1990, Ser. No. 525,770

Int. Cl.⁵ B60R 25/10; E05B 45/06

U.S. Cl. 340—426

20 Claims



1. An accessory for use with a vehicle anti-theft system, the vehicle including vehicle wiring harness means and starting means for facilitating through the wiring harness means a starting of a vehicle engine, said starting means including a vehicle ignition lock cylinder mechanism and an electronic means electrically connected to the vehicle ignition lock cylinder mechanism for facilitating a starting of the vehicle engine, said electronic means being responsive to a predetermined electronically detectable key identification code in order to effect the starting of the vehicle engine, the lack of which key identification code preventing a starting of the vehicle engine, even when an ignition key successfully mechanically operates the vehicle ignition lock cylinder mechanism, said accessory comprising:

conductor means separate from and external to the vehicle wiring harness means for conducting electric current; and adaptor means adapted to be received in the vehicle ignition lock cylinder mechanism for effecting within the vehicle ignition lock cylinder mechanism an electrical connection between said conductor means and the vehicle anti-theft system and for thereby obtaining electrical access to the vehicle anti-theft system through said adaptor means and said conductor means for facilitating an experimental determining of a key identification code encoded in the vehicle anti-theft system.

5,086,289

U-TURN SIGNAL DEVICE

Maureen A. Sullivan, 26732 Crown Valley Pkwy., No. 111, Mission Viejo, Calif. 92691, and Elizabeth A. Himelson, 24953 Paseo de Valencia, No. 8C, Laguna Hills, Calif. 92653

Filed Mar. 19, 1990, Ser. No. 495,498

Int. Cl.⁵ B60Q 1/34

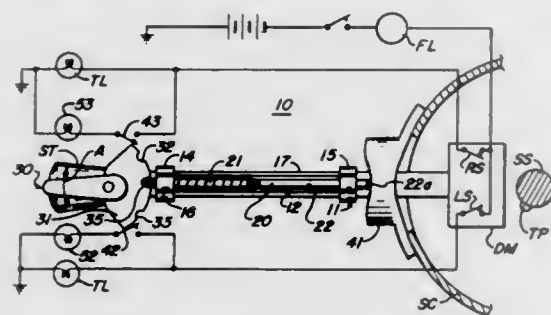
U.S. Cl. 340—475

5 Claims

1. In a turn signaling mechanism of a motor vehicle characterized by a steering column, a turn signal stalk extending from said column for pivotal displacement, turn switching means operatively connected to said stalk for exciting turn signal lamps in response to said pivotal displacement thereof, the improvement comprising:

a frame attachable to said stalk; a pushrod mounted for sliding advancement along said frame, said pushrod being defined by an inner and an outer end;

a symmetrical cam surface secured to said column to oppose said inner end of said pushrod;
a lever pivotally attached to said frame and including a cam edge aligned to oppose said outer end of said pushrod;



U-turn switching means connected to said lever for providing electrical continuity therethrough in response to the pivotal displacement of said lever relative said frame; and U-turn indication means connected to said U-turn switching means to be rendered operative upon the completion of the circuit continuity in said switching means.

5,086,290

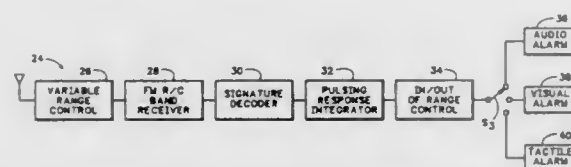
MOBILE PERIMETER MONITORING SYSTEM

Shawn G. Murray, 1543 NE, 52nd Ave., Portland, Ore. 97213, and Mark A. Hawes, 3314 SW, 125th Ave., Beaverton, Ore. 97005

Filed Mar. 8, 1990, Ser. No. 490,282
Int. Cl.⁵ G08B 1/08; H04Q 7/00

U.S. Cl. 340—539

6 Claims



1. A mobile perimeter monitoring system comprising:
 - (a) a mobile transmitter having a predetermined transmitting range for transmitting a data signal;
 - (b) a receiver including an alarm circuit for providing an alarm signal; and
 - (c) mode switch means associated with said receiver for placing said receiver in a monitoring mode wherein an alarm signal will be provided only whenever said mobile transmitter moves beyond said predetermined range, and in a tracking mode wherein an alarm signal will be provided only when said mobile transmitter moves within said predetermined range.

5,086,291

SENSING MAT, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Henry J. Schwab, Jr., 429 Rittenhouse Cir., Havertown, Pa. 19083

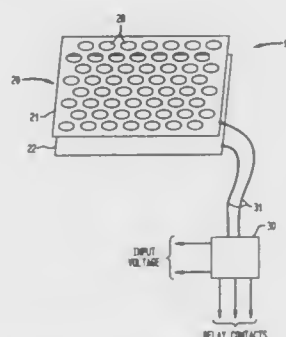
Filed Nov. 1, 1989, Ser. No. 430,146
Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—604

10 Claims

1. A warning device for the prevention of damage to electrical equipment by liquids, comprising:
 - a thin, flexible mat which is adaptable to various situations by changing the size to meet the required conditions on site including conductive and nonconductive portions;
 - a monitoring means for sensing changes in the electrical properties of said mat;

means to electrically connect said mat to said monitoring means;
upon sensing a change in the electrical properties of said mat, a warning device is activated by said monitoring means;



said monitoring means deactivates said electrical equipment; and said mat may be cut to change the size and shape.

5,086,292

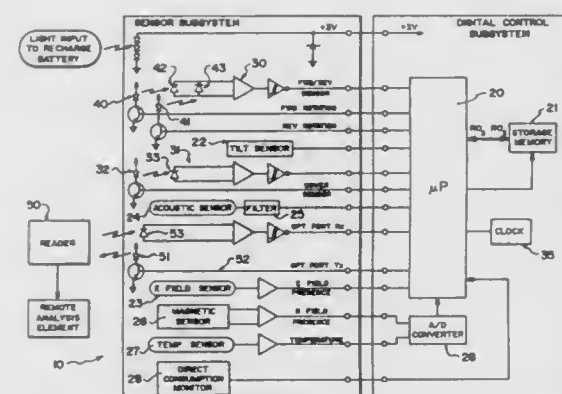
TAMPER DETECTION DEVICE FOR UTILITY METER

Dennis F. Johnson, and Michael Wiebe, both of Winnipeg Manitoba, Canada, assignors to Iris Systems Inc., Winnipeg Manitoba, Canada

Filed Oct. 31, 1989, Ser. No. 429,458
Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—637

14 Claims



1. A method or detection of unauthorized tampering with the operation of a utility meter and for estimation of the difference between measured utility consumption and an actual utility consumption comprising mounting a unit in a utility meter of a type having a moving element, the unit being separate from the meter and removable therefrom, generating a plurality of sequential time periods of predetermined length, detecting during each respective time period a summation of the movement of the moving element and recording, in association with the respective time period, said summation in a memory as information stored in the memory, in each of said time periods, detecting one or more events associated with possible tampering attempts and recording, in association with the respective timer period, the existence of such event in the memory as information stored in the memory, reading from the unit the information stored in the memory, analyzing the information stored in relation to the time and day of the respective time period recorded and in relation to any tampering event recorded in the respective time period to thus obtain a pattern during said sequential time periods of actual consumption, and estimating from said pattern the actual consumption during those time periods a tampering event has been recorded.

5,086,293

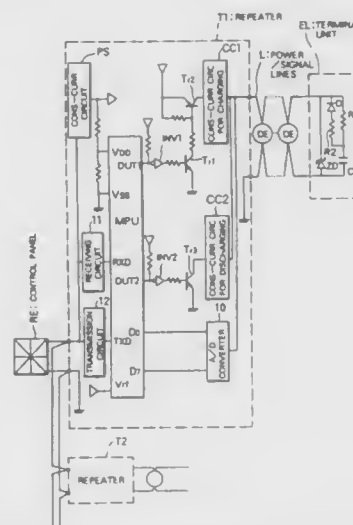
LINE INTERRUPTION SUPERVISORY DEVICE FOR A FIRE ALARM SYSTEM

Kaoru Takahashi, Akio Tsumnji, and Ryuji Shutoku, all of Tokyo, Japan, assignors to Nohmi Bosai Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1990, Ser. No. 542,050
Claims priority, application Japan, Jun. 29, 1989, 1-168164
Int. Cl.⁵ G08B 29/00

U.S. Cl. 340—506

9 Claims



1. A line interruption supervisory device for a fire alarm system, comprising:
 - a terminating capacitor connected across a terminal of a pair of power/signal lines to which fire detectors are connected;
 - a cut-off means for cutting off a power supply to the power/signal lines;
 - a discharge means for causing the terminating capacitor to discharge upon interruption of the power supply to the power/signal lines;
 - a memory means for storing a first voltage available on the power/signal lines immediately before interruption of the power supply; and
 - a line interruption discriminating means for determining, according to any difference between a second voltage available on the power/signal lines after a lapse of a predetermined time from the interruption of the power supply and the first voltage stored in said memory means, whether there is an open power/signal line.

5,086,294

INDICATOR CIRCUIT FOR PROTECTING LIGHT EMITTING DIODE

Hiroshi Kasegi, Shimane, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 503,106, Apr. 2, 1990, abandoned, which is a continuation of Ser. No. 346,730, May 3, 1989, abandoned. This application Apr. 16, 1991, Ser. No. 685,667
Claims priority, application Japan, May 10, 1988, 63-61886[U]

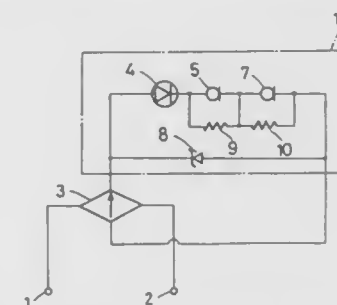
Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—644

8 Claims

1. An indicator circuit, comprising:
 - a first input terminal;
 - a second input terminal;
 - a constant current device having one end connected to said first input terminal, said constant current device comprising a first constant current circuit connected in parallel with a first resistor, a second constant current circuit connected in parallel with a second resistor, said first constant current circuit and said first resistor connected in

series with said second constant current circuit and said second resistor;
an indicator device having one end connected to another end of said constant current device and another end connected to said second input terminal; and



a voltage surge protection circuit having one end connected to said first input terminal and another end connected to said second input terminal.

5,086,295

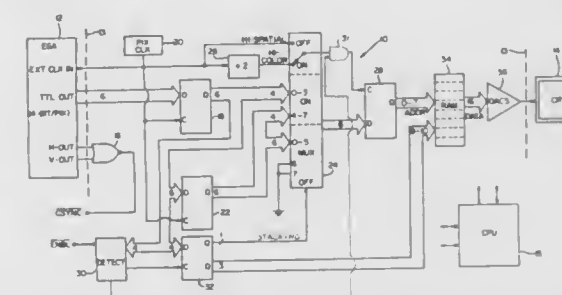
APPARATUS FOR INCREASING COLOR AND SPATIAL RESOLUTIONS OF A RASTER GRAPHICS SYSTEM

Eric R. Boettcher, 366 W. Olive #5, Sunnyvale, Calif. 94086, and David R. Barker, 400 E. Remington Dr. #236, Sunnyvale, Calif. 94087

Filed Jan. 12, 1988, Ser. No. 143,740
Int. Cl.⁵ G09G 5/04

U.S. Cl. 340—701

25 Claims



1. In a raster graphics system employing a display device and a graphics adapter for generating an adapter output that provides a bit related number of displayable colors, an apparatus for controlling the color and spatial resolutions of the display device, comprising:

means for reformatting an original output of the graphics adapter into a reformatted adapter output having a different number of bits, one of the original and reformatted adapter outputs having a greater number of bits for providing greater color resolution and the other adapter output having a fewer number of bits for providing greater spatial resolution;
clocking means for providing two clock rates, a faster clock rate for association with the adapter output having the fewer number of bits and a slower clock rate for association with the adapter output having the greater number of bits;
multiplexing means for selecting either the adapter output with the greater number of bits and its associated slower clock rate or the adapter output with the fewer number of bits and its associated faster clock rate; and
detecting means responsive to switch commands insertable within the original adapter output for controlling the selection of the multiplexing means, whereby the selected adapter output and clock rate control the color and spatial resolution of the display device.

5,086,296

SIGNAL GENERATING DEVICE

David G. Clark, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

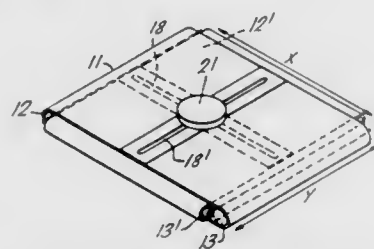
Filed Dec. 2, 1988, Ser. No. 279,389

Claims priority, application United Kingdom, Dec. 2, 1987, 8728141

Int. Cl.⁵ G05G 9/04

U.S. Cl. 340—709

8 Claims



1. A manually operable signal generating device for use as an interface device for generating control signals which can be used to control movement of at least one discrete image portion in a display which is produced on a display device, said signal generating device comprising:

mounting means comprising a first pair of parallel guide surface which are spaced apart from each other and a second pair of parallel guide surfaces which are also spaced apart from each other and are disposed orthogonally with respect to said first pair,

a continuous first loop member defining a first linear slot, at least parts of said first loop member being flexible and located about said first pair of guide surfaces to mount said first loop member on the mounting means,

a continuous second loop member defining a second linear slot which is disposed orthogonally with respect to the first slot, at least parts of said second loop member being flexible and located about said second pair of guide surfaces to mount said second loop member on the mounting means, one of said first and second loop member being positioned inside the other,

means defining a substantially planar window, an actuating part which is located in both said first and second slots and thereby coupled to both said first and second loop members, said actuating part being movable to any position within said planar window area and such movement thereof causing composite movement of the first and second loop members in mutually orthogonal direction normal to their respective pairs of guide surfaces, and

signal means responsive to movement of the loop members to generate said control signals.

5,086,297

PLASMA DISPLAY PANEL AND METHOD OF FORMING FLUORESCENT SCREEN THEREOF

Toru Miyake; Naoshige Higuchi; Yoshiki Kudo, and Hisao Tanabe, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Jun. 12, 1989, Ser. No. 364,119

Claims priority, application Japan, Jun. 14, 1988, 63-146374; Jun. 14, 1988, 63-146375; Dec. 7, 1988, 63-309419

Int. Cl.⁵ G09G 3/04; H01J 17/49; B05D 1/36

U.S. Cl. 340—759

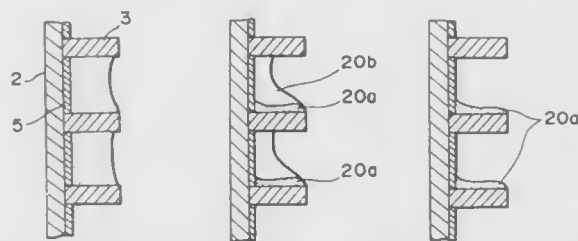
9 Claims

1. A method of forming a fluorescent screen for a plasma display panel provided with a front plate and a rear plate disposed parallel to each other and a cell barrier mounted on the front or rear plate and constituting a plurality of cells as display elements, comprising the steps of:

filling a slurry solution containing a phosphor in a portion of the plasma display panel defined by a cell wall of the cell barrier on the plate;

inclining the plate on which the cell barrier is mounted

immediately after the filling step at an inclination of about 90 or more degrees with respect to a horizontal plane so that the phosphor-containing slurry solution covers the cell wall and not the plate;



settling the plate in the inclined state until the phosphor in slurry solution is precipitated on the cell wall of the cell barrier; and drying and hardening the cell wall after the precipitating step to form a fluorescent screen on the cell wall only.

5,086,298

REMOTE CONTROL SIGNAL PROCESSING DEVICE

Toshiyuki Katsu; Hidenori Hidaka, and Fusako Inotsume, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 197,249, May 23, 1988, abandoned.

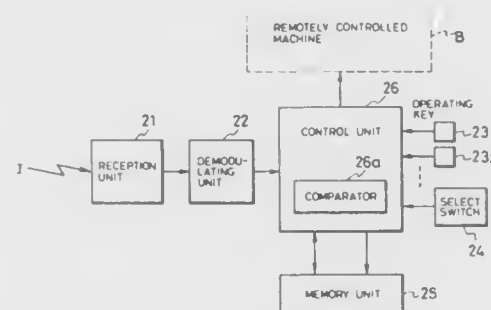
This application Apr. 20, 1990, Ser. No. 511,886

Claims priority, application Japan, May 22, 1987, 62-123932; Jun. 30, 1987, 62-99458[U]

Int. Cl.⁵ G08C 19/00

U.S. Cl. 340—825,69

5 Claims



1. In a remote control signal processing device for a machine that performs various operations in response to preset control signals, the device being of the type comprising:

a signal receiving unit for receiving a remote control signal from an external remote control apparatus;

demodulating means for generating and outputting signal data corresponding to the format and code of the received remote control signal;

a memory unit for storing the signal data of the received remote control signal, said memory unit including storage areas which are associated with said preset control signals; operating keys, associated with said storage areas in said memory unit, for selecting said storage areas; and

a select switch for selectively setting a recording mode or an operating mode of the device; the improvement comprising:

a control unit which, when said select switch is set into said recording mode, writes the signal data of the received remote control signal into one of said storage areas associated with a manipulated one of said operating keys, said control unit including comparator means, and said control unit operable, when said select switch is set into said operating mode, for sequentially reading out the written signal data from said memory unit, and said comparator means operable for comparing the sequentially read out

written signal data with the signal data of the received remote control signal, said control unit supplying said machine with the preset control signal associated with the storage area where the signal data, which has been found to match the received signal data by the comparison performed by said comparator means, has been written.

5,086,299

HIGH SPEED ANALOG-TO-DIGITAL CONVERTER HAVING A PLURALITY OF COMPARISON CELLS WHICH IN SUCCESSIVE STEPS DETERMINE THE FOUR MOST SIGNIFICANT BITS OF THE CONVERSION AND THEN THE FOUR LEAST SIGNIFICANT BITS

Giulio Frigerio, Cavenago Brianza, and Alessandro Cremonesi, S. Angelo Lodigiano, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

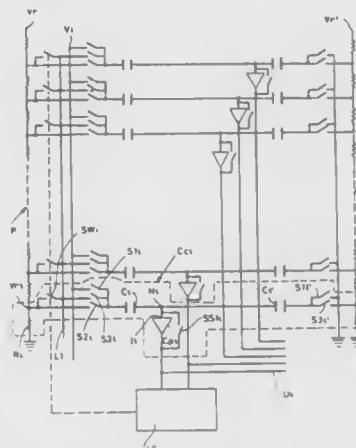
Filed May 9, 1990, Ser. No. 520,724

Claims priority, application Italy, May 17, 1989, 20537 A/89

Int. Cl.⁵ H03M 1/14

U.S. Cl. 341—156

2 Claims



1. High speed analog-to-digital converter, characterized in that it comprises a plurality of comparison cells which in successive steps determine the four most significant bits of the conversion and then the four least significant bits after the more significant bits have been reconverted to analog and their subsequent subtraction from the input signal where each of said comparison cells is constituted by a comparator with input connected to an intermediate branch point between two condensers in series, one of which is supplied in a first step with an input signal, in a second step with a first reference voltage different for each cell and in a third step with a selected reference voltage equal to that of said first reference voltages which approximates said input signal downward with the highest accuracy, and by a second condenser which is grounded during said first and second step, while in the third step it is connected to one respective of a plurality of second reference voltages submultiples of said first reference voltage.

5,086,300

METHOD AND SYSTEM FOR PASSIVE DETECTION OF ELECTROMAGNETIC EVENTS ASSOCIATED WITH DESTRUCTIVE DEVICES

George A. Ashmore, 1725 Millmar Cir., Dallas, Tex. 75228-3749

Filed May 29, 1990, Ser. No. 529,422

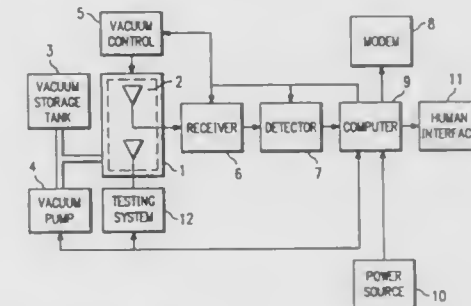
Int. Cl.⁵ H04K 3/00

U.S. Cl. 342—20

17 Claims

1. A passive detector system for detecting low intensity radio frequency emissions from an apparatus that may include a fusing portion of an explosive train, comprising: antenna means positioned to receive low intensity radio frequency energy originating from the apparatus in a specified area, wherein the specified area includes an

automatic material handling means for transferring materials into the specific area for evaluation; receiver means connected to said antenna means for selecting predetermined frequency ranges for reception and amplifying any low intensity radio frequency energy received in said ranges;



detector means connected to said receiver means for quantifying the received low intensity radio frequency energy; and computer means connected to said detector means for evaluating and characterizing the detected radio frequency energy.

5,086,301

POLARIZATION CONVERTER APPLICATION FOR ACCESSING LINEARLY POLARIZED SATELLITES WITH SINGLE- OR DUAL-CIRCULARLY POLARIZED EARTH STATION ANTENNAS

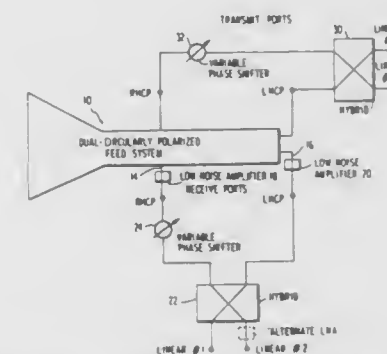
William J. English, Derwood, and Hans H. Viskum, Rockville, both of Md., assignors to Intelsat, Washington, D.C.

Filed Jan. 10, 1990, Ser. No. 463,057

Int. Cl.⁵ H01Q 21/24

U.S. Cl. 342—188

11 Claims

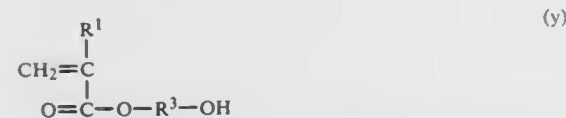
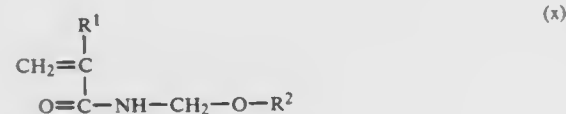


1. An apparatus responsive to an input signal for transmitting corresponding linearly polarized signals, said apparatus comprising:

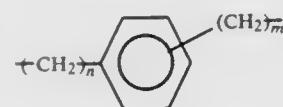
a dual-circularly polarized feed system having a left-hand circular polarization (LHCP) transmit port and a right-hand circular polarization (RHCP) transmit port; and polarization conversion means coupled to said LHCP and RHCP transmit ports and responsive to said input signal for providing a converted signal to said LHCP and RHCP transmit ports for causing said feed system to transmit signals linearly polarized in at least one direction.

(A) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight

average molecular weight of 50,000 or less which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of alkyl methacrylates, acrylonitrile and styrene and has graft chains having structural units derived from at least one monomer selected from the group consisting of the monomers represented by the following formula x and other monomers presented by the formula y:



(wherein R^1 is hydrogen or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is hydrogen or an alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, alkylether group represented by the formula: $-(CH_2)_nO-(CH_2)_m$ (wherein $2 \leq m+n \leq 6$, $n \neq 0$ and $m \neq 0$), or a phenylalkyl group represented by the formula:



(wherein $2 \leq m+n \leq 4$, or the case where $n=0$ or $m=0$ is contained), added to said trunk chain;

(B) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60°C . or more which comprises structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl acrylate, tricyclodecanecarboxylate, tricyclodecane methacrylate, acrylonitrile, isobornyl methacrylate, isobornyl methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate and other structural units derived from at least one monomer selected from the group consisting of the monomers represented by said formula (x) and the monomers represented by said formula (y);

(C) a resin esterified at part of epoxy groups present in an epoxy resin containing at least one compound having two or more epoxy groups in one molecule with an unsaturated carboxylic acid; and

(D) a polymerization initiator capable of generating a Lewis acid with irradiation of an active energy ray.

5,086,308 PIEZOELECTRIC INK JET PRINT HEAD INCLUDING COMMON LAMINAR PIEZOELECTRIC ELEMENT FOR TWO OR MORE INK JETTING DEVICES

Yoshikazu Takahashi, Kasugai; Masahiko Suzuki, Nagoya, and Makoto Takeuchi, Okazaki, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 16, 1990, Ser. No. 552,537

Claims priority, application Japan, Jul. 19, 1989, 1-186232

Int. Cl.⁵ B41J 2/045; H01L 41/08

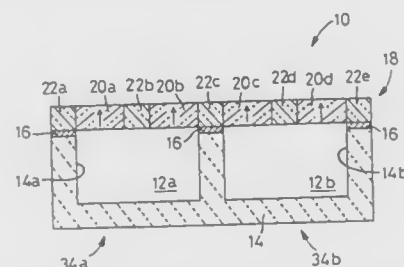
U.S. Cl. 346—140 R 6 Claims

1. A piezoelectric ink jet print head including a plurality of ink jetting devices each having an ink chamber whose volume

is changed by a piezoelectric transducer to eject a droplet of ink, wherein the improvement comprises:

a piezoelectric transducer consisting of a common laminar piezoelectric element disposed for activating a plurality of ink jetting devices, said common laminar piezoelectric element partially defining each said ink chamber of said plurality of ink jetting devices, said laminar piezoelectric element consisting of a plurality of piezoelectric ceramic layers and a plurality of electrode layers which are alternately laminated on each other;

each of said plurality of piezoelectric ceramic layers being polarized in a polarizing direction perpendicular to a direction in which said piezoelectric ceramic layers and said electrode layers are laminated;



voltage applying means for applying a voltage selectively to said plurality of electrode layers for displacing at least one of said plurality of piezoelectric ceramic layers in said polarizing direction, due to a piezoelectric shear effect, so as to change a volume of the ink chamber of a selected one of said plurality of ink jetting devices which corresponds to said at least one of the piezoelectric ceramic layers; and said electrode layers being formed of a thermistor which has a Curie point lower than that of said piezoelectric ceramic layers and which has a positive temperature coefficient of resistance so that said thermistor is an electrically insulating material at a temperature above the Curie point thereof.

5,086,309

IMAGE FORMING APPARATUS

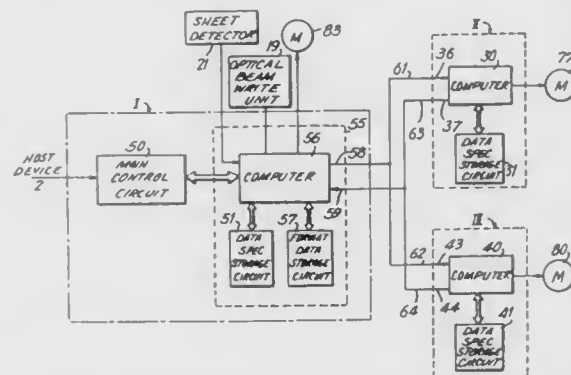
Kazuhiko Iida, and Masahiro Koiwai, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 547,351

Claims priority, application Japan, Jul. 3, 1989, 1-172684

Int. Cl.⁵ G01D 15/14; G03G 21/00; H04N 1/23

U.S. Cl. 346—160 40 Claims



1. An image forming apparatus in combination with at least one optical device and an external device, comprising: recording means for recording images on pages of recording medium based on recording data; first control means for storing at least two pages of recording data and associated format data from the external

device and for inspecting specifications of said at least one optional device; and

second control means for controlling operation of said recording means and said at least one optional device based on said associated format data and specifications of said at least one optional device, said second control means including first storage means for storing format data associated with at least two pages of recording data provided by said first control means and second storage means for storing specifications of said at least one optional device.

5,086,310

PRINT CONTROL APPARATUS FOR EFFECTIVE MULTIPLE PRINTING OF IMAGES ONTO A COMMON PRINTING FRAME

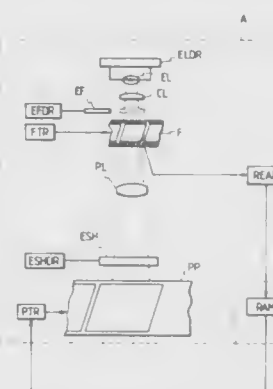
Tomonori Iwashita, Yokohama; Akira Egawa, Machida, and Yoshiaki Sugiyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 455,784, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 349,528, May 5, 1989, abandoned. This application Apr. 4, 1991, Ser. No. 681,637 Claims priority, application Japan, May 9, 1988, 63-113275; Jun. 27, 1988, 63-159781; Jun. 27, 1988, 63-159782; Sep. 16, 1988, 63-231937

Int. Cl.⁵ G03B 17/24, 27/52

U.S. Cl. 354—75

1 Claim



1. A print control system for a camera including: a camera provided with setting means for setting multiple printing information, and recording means for recording the multiple printing information set by said setting means; and a printing apparatus provided with reading means for reading the multiple printing information recorded by said recording means and control means for effecting multiple printing on a common printing frame in conformity with the multiple printing information read by said reading means.

5,086,311

PANORAMIC CAMERA

Yoji Naka, Tokyo, and Akio Ohmiya, Saitama, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 18, 1990, Ser. No. 629,631

Claims priority, application Japan, Dec. 18, 1989, 1-145772[U]; Dec. 18, 1989, 1-145773[U]; Dec. 18, 1989, 1-145774[U]; Dec. 18, 1989, 1-145775[U]; Dec. 19, 1989, 1-146258[U]; Dec. 19, 1989, 1-146259[U]; Dec. 19, 1989, 1-146260[U]; Dec. 19, 1989, 1-146261[U]; Jun. 8, 1990, 2-60780[U]

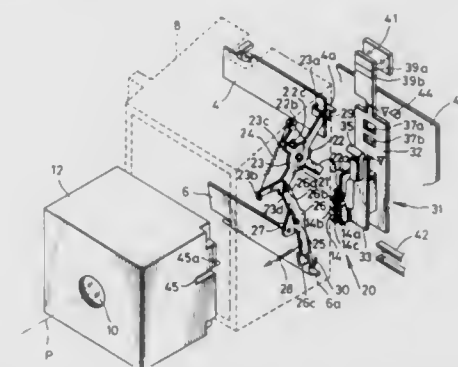
Int. Cl.⁵ G03B 3/00

U.S. Cl. 354—195.1

31 Claims

1. A photographic camera comprising: a rectangular exposure aperture for forming a picture frame of full size; masking means for selectively partly masking said exposure aperture so as to form a picture frame of a panoramic size which is vertically reduced from said full size when said

masking means is set in a panoramic position and for opening the whole said exposure aperture when said masking means is set in a full size position;



actuating means for setting said masking means selectively in either said full size position or said panoramic position; and manual operating means for operating said actuating means.

5,086,312

VARIABLE FOCAL LENGTH CAMERA WITH FOCUS ADJUSTING DEVICE

Yasuhiko Tanaka; Takao Koda, both of Saitama; Yoshihiro Ide, Tokyo; Akio Ohmiya, Saitama; Masanoshin Komori, Saitama; Masaya Nozawa, Saitama; Shiro Hashimoto, Saitama, and Tetuo Nishizawa, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

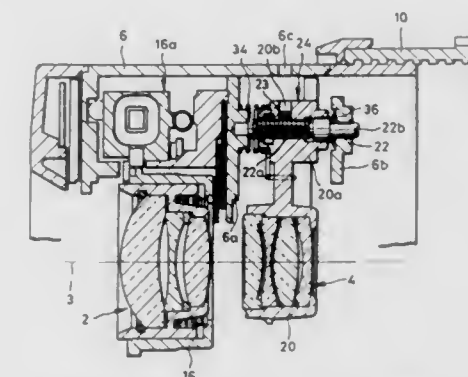
Filed Aug. 31, 1990, Ser. No. 576,027

Claims priority, application Japan, Aug. 31, 1989, 1-102226; Aug. 31, 1989, 1-102227; Sep. 8, 1989, 1-105663

Int. Cl.⁵ G03B 1/18

U.S. Cl. 354—195.12

24 Claims



1. A variable focal length camera that changes the focal length of a taking lens by inserting or withdrawing an auxiliary lens system into or from a photo-taking optical axis along which a main lens system is disposed, comprising:

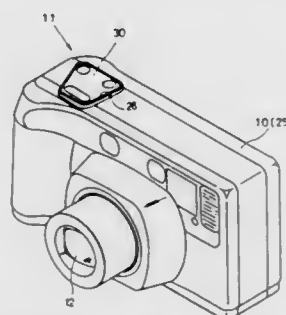
a shaft extending substantially in parallel with said photo-taking optical axis, said shaft being mounted on said camera for rotation relative to said camera but being fixed against movement relative to said camera in the direction of said photo-taking optical axis; a lens holder for supporting said auxiliary lens system, a base portion of said lens holder being formed with a female thread; a male thread formed on an intermediate portion of said shaft and meshing with said female thread of said lens holder rotation of said shaft serving to move said lens holder relative to said taking lens in the direction of said photo-taking optical axis for focus adjustment; and means for fixing said lens holder to said shaft after said focus

adjustment so as to prevent the position of said lens holder relative to said shaft from being changed, said shaft and lens holder thereafter turning in unison about the axis of said shaft for changing said focal length.

5,086,313

OPERATION SWITCH UNIT FOR A CAMERA

Masayuki Misawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 301,124, Jan. 25, 1989, abandoned. This application Jun. 22, 1990, Ser. No. 541,474
Claims priority, application Japan, Jan. 28, 1988, 63-17608
Int. Cl.⁵ G03B 17/38; H01H 3/00, 9/00
U.S. Cl. 200—5 R 23 Claims



1. An operation switch unit for actuating more than two switches located at the apexes of an imaginary polygon, each said switch comprising at least one actuatable member, the number of sides of the polygon corresponding to the number of the switches, and a single operating member moveably positioned and having a plurality of actuating portions, said operating member being pivotable about discrete fulcrum positioned intermediate the apexes of the imaginary polygon and spaced from the center of the imaginary polygon to bring a selected one of said actuating portions into contact with a said actuatable member of one of said switches.

11. An operation switch unit in accordance with claim 1, wherein said operation unit comprises means for operating an electrically drive zoom lens camera including a zoom lens system, a zoom lens motor, two switches for controlling said zoom lens motor and a further electromagnetic release switch, said two zoom switches and said release switch comprising said more than two switches.

5,086,314

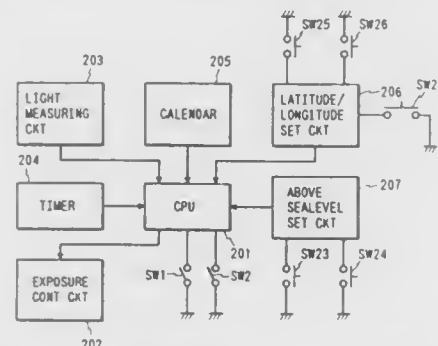
EXPOSURE CONTROL APPARATUS FOR CAMERA

Hitoshi Aoki, Tokyo; Hiroshi Wakabayashi, Yokohama; Daiki Tsukahara, Hiratsuka, and Hidenori Miyamoto, Urayasu, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 525,832, May 21, 1990. This application Jan. 22, 1991, Ser. No. 644,232
Int. Cl.⁵ G03B 7/00 69 Claims

U.S. Cl. 354—412

9. An exposure control apparatus for a camera, comprising: luminance information generating means for generating electrical luminance information corresponding to a luminance of an object;
season information supplying means for supplying electrical

season information corresponding to information of a season; and



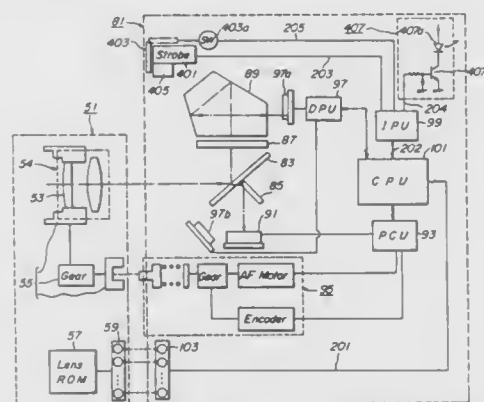
exposure value determining means for determining exposure value for an object on the basis of said luminance information and said season information.

5,086,315

CAMERA WITH STROBE AND LENS FOR USE THEREWITH

Takao Nishida, and Osamu Satoh, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 148,999, Jan. 27, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 412,556
Claims priority, application Japan, Feb. 4, 1987, 62-22451
Int. Cl.⁵ G03B 15/05 18 Claims

U.S. Cl. 354—413



1. A photographic lens that is detachably mountable on a single-lens reflex camera, said photographic lens comprising a photographic lens system and a memory for storing in said photographic lens information that warns a photographer of an unsuitability of using a strobe when said photographic lens mounted on said camera body reduces a quantity of light emitted from said strobe to a value less than a quantity of light incident to an object to be photographed.

5,086,316

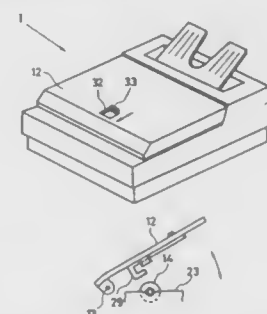
LIFTING THE PHOTSENSITIVE BODY IN AN IMAGE FORMING APPARATUS

Hideo Aoki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 10, 1989, Ser. No. 377,901
Claims priority, application Japan, Jul. 14, 1988, 63-173748
Int. Cl.⁵ G03G 15/00 11 Claims

U.S. Cl. 355—200

1. A xerographic image forming apparatus for transferring an image on a paper by exposing a photosensitive body to the image to produce a toner image and by transferring the toner image to the paper while passing the paper at an upper side of the photosensitive body, comprising:

a top cover lid member provided above the photosensitive body so as to be opened and closed;
movable supporting means provided on said top cover lid member so as to be movable between a first position and a second position relative to the top cover lid member, said movable supporting means being adapted for engagement with the photosensitive body and selectively assuming a



first position in which the movable supporting means does not engage with the photosensitive body and a second position in which the movable supporting means engages with the photosensitive body responsive to opening of the top cover lid member; and

fixed supporting means provided on a body of the xerographic image forming apparatus for supporting the photosensitive body.

5,086,317

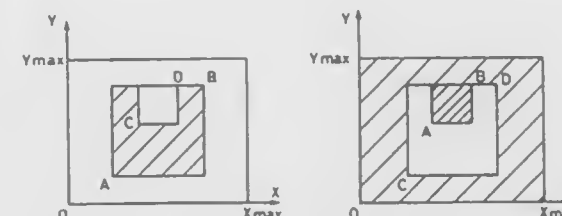
EDITING AREA SETTING METHOD AND EDITING AREA SETTING APPARATUS IN AN IMAGE FORMING APPARATUS

Yoshio Sugishima, and Masashi Matsumoto, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 126,371, Nov. 30, 1987, Pat. No. 4,914,475. This application Sep. 25, 1989, Ser. No. 411,998
Claims priority, application Japan, Nov. 28, 1986, 61-285543
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.⁵ G03G 21/00, 27/58

U.S. Cl. 355—218

4 Claims



1. An editing area setting method in an image forming apparatus, comprising:

sequentially inputting co-ordinates corresponding to diagonal points of different-sized rectangular areas with the largest area including at least two areas which do not partially overlap each other; and

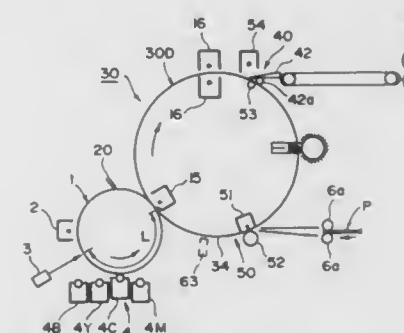
setting an area inside or outside of said largest area including said at least two areas which do not overlap each other as an image forming area and another area as a non-image forming area.

5,086,318

IMAGE FORMING APPARATUS HAVING TRANSFER MATERIAL CARRYING DEVICE

Atsushi Takeda, Kawasaki, and Takashi Hasegawa, Matsudo, both of Japan, assignors to Cannon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 622,143, Dec. 4, 1990, abandoned, which is a continuation of Ser. No. 333,044, Apr. 4, 1989, abandoned. This application Jun. 14, 1991, Ser. No. 714,989
Claims priority, application Japan, Apr. 5, 1988, 63-83381
Int. Cl.⁵ G03G 15/14, 21/00 74 Claims

U.S. Cl. 355—271



1. An image forming apparatus, comprising:

a movable image bearing member;
means for forming an image on said image bearing member;
transfer means for electrostatically transferring the image from said image bearing member to a transfer material;
transfer material carrying means for carrying the transfer material to an image transfer position where the image is transferred from said image bearing member onto the transfer material said transfer material carrying means being repeatedly movable to the image transfer position; and

transfer material attracting means for electrostatically attracting the transfer material onto the transfer material carrying means, said transfer material carrying means being capable of attracting and supporting a plurality of the transfer materials simultaneously thereon at different positions thereon,

wherein the plural transfer materials carried on said transfer material carrying means are presented plural times to the image transfer position to be subjected to plural image transfer operations by said transfer means, wherein one of the transfer materials is subjected to the transfer operation at a time.

5,086,319

MULTIPLE SERVO SYSTEM FOR COMPENSATION OF DOCUMENT MIS-REGISTRATION

Kevin M. Carolan, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1989, Ser. No. 437,708

Int. Cl.⁵ G03G 21/00

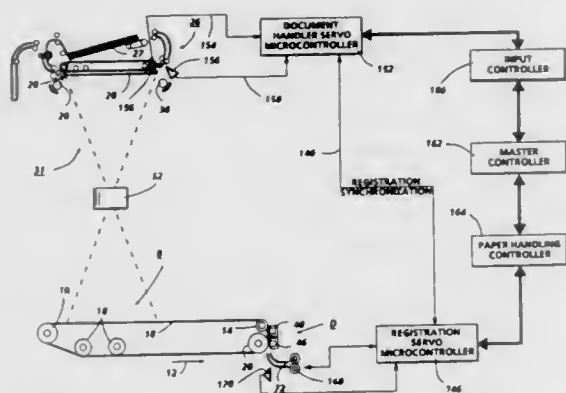
U.S. Cl. 355—317

8 Claims

4. A system for compensating for the mispositioning of a stationary document, by a document drive, on a platen, the document being imaged onto a photosensitive member and the image being transferred to a copy sheet, comprising:

sensing means, disposed near the platen, for sensing the position of the document on the platen,
means, responsive to said sensing means, for determining the variance in the position of the document from a registration position,
a source of copy sheets,
a copy sheet drive disposed near the source of copy sheets to convey a copy sheet from the source of copy sheets to the photosensitive member in a continuous motion for transfer of the image to the copy sheet, and

means, responsive to the variance of the actual document position from the registration position, for adjusting the



copy sheet drive to compensate for said variance while conveying the copy sheet to the photosensitive member.

5,086,320

PAPER CONVEYING MECHANISM IN IMAGE FORMING APPARATUS

Tadao Koike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

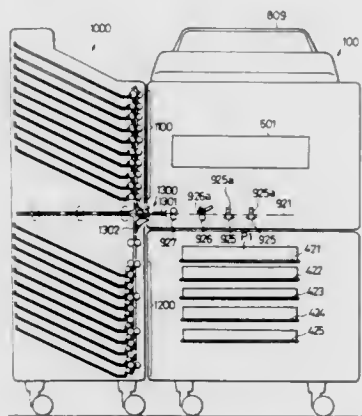
Filed Sep. 13, 1990, Ser. No. 582,375

Claims priority, application Japan, Sep. 14, 1989, 1-238567; Nov. 17, 1989, 1-299189; Nov. 17, 1989, 1-299190; Nov. 17, 1989, 1-299191; Jun. 29, 1990, 2-171827

Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—318

12 Claims



5. A paper conveying mechanism in an image forming apparatus, comprising:

- an image forming body section of a front operating type provided with a forward conveying path for conveying a discharged sheet of recording paper toward a direction of front and rear sides of the image forming apparatus at a predetermined feed speed, said sheet of recording paper having an image thereon formed at a predetermined image forming process speed;
- after-treatment means for after-treating the sheet of recording paper and arranged in parallel to a side portion of the image forming body section;
- a perpendicular conveying path connected with the forward conveying path for conveying the sheet of recording paper discharged from said forward conveying path toward a direction approximately perpendicular to the forward conveying path in a horizontal face of the sheet of recording paper, thereby to feed the sheet of recording paper to said after-treatment means;
- first feeding means for feeding the sheet of recording paper in said forward conveying path;
- means for selecting either a paper conveying speed V_1 equal

to said image forming process speed or a paper-conveying speed V_2 set to be higher than said image forming process speed by providing a constant relation therebetween, said selecting means being disposed in the first feeding means in the forward conveying path; and

means for setting the paper conveying speed by using, as a reference, the sheet of recording paper having a largest value with respect to a difference ($h-i$) between a width h of the sheet of recording paper with respect to a conveying direction thereof and a distance i between sheets of recording paper, said setting means being disposed in the first feeding means in the forward conveying path.

5,086,321

UNPINNED OXIDE-COMPOUND SEMICONDUCTOR STRUCTURES AND METHOD OF FORMING SAME

John Batey, Danbury, Conn.; Sandip Tiwari, Ossining, and Steven L. Wright, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

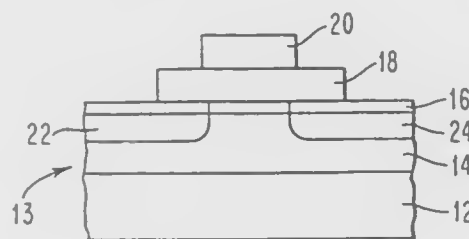
Division of Ser. No. 207,700, Jun. 15, 1988, Pat. No. 4,987,095.

This application Oct. 4, 1990, Ser. No. 592,611

Int. Cl.⁵ H01L 29/20, 29/161, 29/34

U.S. Cl. 357—23.2

30 Claims



1. A semiconductor structure comprising:
 - an epitaxially grown compound semiconductor layer having a forbidden energy gap and an interface Fermi level, said compound semiconductor layer having a density of states which permits the interface Fermi level to be moved through the entire forbidden energy gap in the presence of an electric field;
 - a layer of insulator material of low electrical leakage overlying said compound semiconductor layer having a thickness sufficient to act, as a gate insulator in a field effect transistor environment; and
 - an epitaxial, single crystal, continuous layer of elemental semiconductor disposed between said compound semiconductor layer and said layer of insulating material.

5,086,322

INPUT PROTECTION CIRCUIT AND OUTPUT DRIVER CIRCUIT COMPRISING MIS SEMICONDUCTOR DEVICE

Tatsuya Ishii, and Takashi Miyakawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,556

Claims priority, application Japan, Oct. 19, 1988, 63-264657; Apr. 27, 1989, 1-109705

Int. Cl.⁵ H01L 29/10, 29/78, 29/68, 29/04

U.S. Cl. 357—23.3

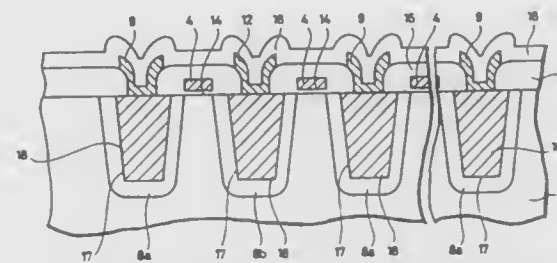
11 Claims

1. An MIS semiconductor device comprising:
 - a semiconductor substrate of a first conductivity type having a first surface, a second surface approximately parallel to the first surface and separated perpendicularly and upwardly from the first surface, and first and second sidewall surfaces opposed to each other with the second surface provided therebetween and connecting said second sidewall surface and said first sidewall surface,

an insulating layer formed on said second surface of said semiconductor substrate,

a gate electrode formed on said insulating layer, and

a source region and a drain region of a second conductivity type formed substantially along said first and second sidewall surfaces in said semiconductor substrate, respectively,



wherein said source and drain regions have a configuration corresponding to a surface configuration of said first and second sidewall surfaces, and the configuration of said first and second sidewall surfaces provides a current path area for punch through current between said source and drain regions that extends along substantially the entire length of the source and drain regions on said first and second sidewall surfaces opposed to each other.

5,086,323

CONDUCTIVITY MODULATED MOSFET

Akio Nakagawa, Hiratsuka; Hiromichi Ohashi, Yokohama; Yoshihiro Yamaguchi, Urawa; Kiminori Watanabe, Kawasaki, and Thuneo Thukakoshi, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

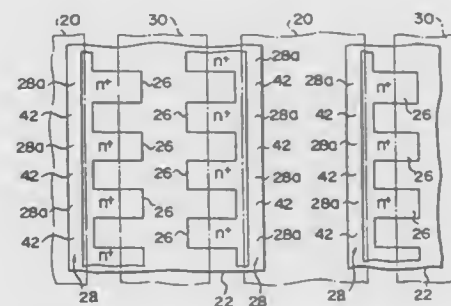
Continuation-in-part of Ser. No. 532,366, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 249,822, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 116,357, Nov. 4, 1987, Pat. No. 4,881,120, which is a continuation of Ser. No. 19,337, Feb. 26, 1987, Pat. No. 4,782,372, which is a continuation of Ser. No. 738,188, May 28, 1985, Pat. No. 4,672,407. This application Jun. 10, 1991, Ser. No. 712,997

Claims priority, application Japan, May 30, 1984, 59-110244; Sep. 29, 1984, 59-204427; Nov. 20, 1984, 59-244811

Int. Cl.⁵ H01L 29/10, 29/78

U.S. Cl. 357—23.4

11 Claims



1. A conductivity modulated metal oxide semiconductor field effect transistor, comprising:
 - a first conductivity type region having a first surface;
 - a high resistance semiconductor region of a second conductivity type having a second surface;
 - a second conductivity type region provided between said first conductivity type region and said high resistance semiconductor region and having an impurity concentration higher than that of said high resistance semiconductor region;
 - a base region of the first conductivity type which is formed in the second surface of said high resistance semiconductor region;

a source region of the second conductivity type which is formed in said base region;

a gate electrode formed at least on a gate insulating film which is formed on a channel region formed in said base region between said high resistance semiconductor region and said source region;

a source electrode ohmic-contacting said source and base regions; and

a drain electrode formed on said first surface of the first conductivity type region,

wherein said source region comprises a plurality of separated sections in a contact area between said source electrode and said base and source regions to set a specific drain current of said transistor at a value lower than a latch-up current of the transistor, the specific drain current being defined as a drain current when 10^2 -d(V) is applied to said gate electrode and 100 V is applied to said drain electrode, wherein when a 100-V constant voltage source is directly connected between said source and drain electrodes of said conductivity modulated metal oxide semiconductor field effect transistor turned on, said transistor is turned on for 10 μ sec, and thereafter the gate voltage is decreased from 10^2 -d(V) to 0 (V) within 200 nsec, said conductivity modulated metal oxide semiconductor field effect transistor is not latched up but turned off at a temperature at 25° C., wherein d is the thickness (μ m) of the gate insulating film.

5,086,324

INSULATED GATE BIPOLAR TRANSISTOR

Hiroyasu Hagino, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

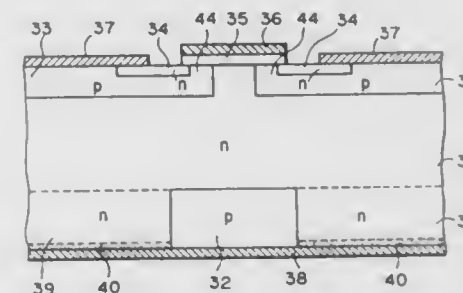
Filed Apr. 21, 1989, Ser. No. 341,630

Claims priority, application Japan, Jul. 11, 1988, 63-280608

Int. Cl.⁵ H01L 29/68, 29/78, 29/06

U.S. Cl. 357—23.5

10 Claims



1. An insulated gate bipolar transistor comprising:
 - a first conductivity type semiconductor substrate;
 - a first region of a second conductivity type partially formed on a first major surface of said semiconductor substrate;
 - a second region of the second conductivity type partially formed on a second major surface of said semiconductor substrate;
 - a third region of the first conductivity type partially formed on a surface of said second region;
 - an insulation film formed on the surface of said second region and extending between the surfaces of said semiconductor substrate and said third region, said insulation film virtually locationally corresponding to said first region;
 - a control electrode formed on said insulation film;
 - a first electrode formed on said second major surface extending over said third region and said second region;
 - a second electrode formed on said first major surface extending over said first region and a region adjacent to said first region of said semiconductor substrate; and
 - a barrier layer formed at a region except for said first region

within said first major surface of said semiconductor substrate for restricting movement of a carrier which moves toward said second electrode from said semiconductor substrate.

5,086,325

NARROW WIDTH EEPROM WITH SINGLE DIFFUSION ELECTRODE FORMATION

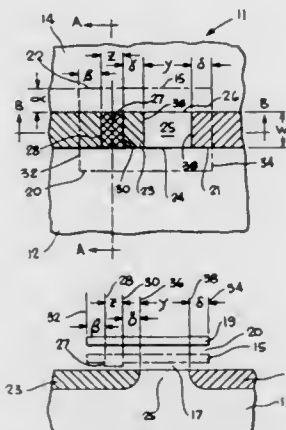
Steven J. Schumann, Sunnyvale, and James C. Hu, Saratoga, both of Calif., assignors to Atmel Corporation, San Jose, Calif.

Filed Nov. 21, 1990, Ser. No. 616,460

Int. Cl.⁵ H01L 29/68, 29/34; G11C 11/34

U.S. Cl. 357—23.5

3 Claims



1. An MOS EEPROM transistor cell comprising, field oxide having spaced apart, opposed barrier walls defining the width limits of the active transistor memory cell and at least partially disposed into a wafer substrate of a first conductivity type,
 - a first electrode stripe diffused into said substrate and extending across the cell in the widthwise direction from one field oxide barrier wall to an opposed field oxide barrier wall, said first stripe having opposed ends in abutment with said opposed field oxide barrier walls,
 - a second electrode stripe diffused into said substrate parallel to and spaced apart from the first electrode stripe and defining a channel stripe with opposed edges therebetween, said second stripe having opposed ends in abutment with said opposed field oxide barrier walls, the first and second electrodes being of a second conductivity type opposite to the first conductivity type, said first and second electrode stripes having the same depth,
 - a thin oxide stripe, surrounded by thicker oxide layers on two opposite sides and said field walls on two other opposite sides and overlying and within the first electrode stripe, the thin oxide serving as a tunneling region for electrical charge, the thin oxide having the same width as the first and second electrode stripes,
 - a floating gate electrode stripe disposed over the channel stripe and insulated from said electrode stripes by said thicker oxide and covering said thin oxide region and overlapping said opposed barrier walls, thin oxide, and channel, whereby electrical charge can be communicated through the thin oxide to the floating gate, and
 - a control electrode stripe disposed over the floating gate electrode stripe in insulated relation therewith.

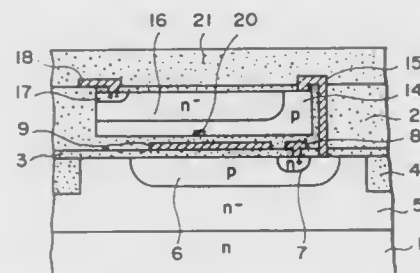
5,086,326

PHOTOELECTRIC CONVERSION DEVICE

Mahito Shinohara, Tokyo, and Takao Yonehara, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 357,948, May 30, 1989, abandoned, which is a continuation of Ser. No. 68,194, Jun. 30, 1987, abandoned. This application Feb. 22, 1991, Ser. No. 662,320
Claims priority, application Japan, Jul. 11, 1986, 61-162127
Int. Cl.⁵ H01L 31/10, 29/72

U.S. Cl. 357—30

30 Claims



1. A photoelectric conversion device comprising: a photoconversion section, wherein incident light generates electric carriers in said photoconversion section, the carriers being stored to allow generation of an output signal in accordance with the quantity of stored carriers; a transistor, having a control region of a first conductivity type and a main region of a second conductivity type opposite to the first; and switch means coupled to said control region for controlling the potential of said control region, wherein said device has a multilayer structure in which said switch means is provided below said photoconversion section, and wherein said switch means controls a potential of said control region by connecting said control region to a reference potential source.

5,086,327

CAPACITIVE DETECTOR OF ELECTROMAGNETIC WAVES

Emmanuel Rosencher, Bagnaux; Borge Vinter, Paris, and Paul Bois, Echirrolles, all of France, assignors to Thomson-CSF, Puteaux, France

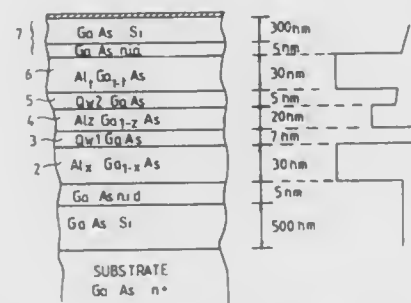
Filed Oct. 9, 1990, Ser. No. 593,992

Claims priority, application France, Oct. 12, 1989, 89 13326

Int. Cl.⁵ H01L 27/14

U.S. Cl. 357—30

8 Claims



1. A capacitive detector for electromagnetic waves, comprising:
 - a) a semiconductor structure having at least one stack of first, second, third, fourth, fifth, sixth and seventh layers forming an asymmetrical quantum well, respective widths of forbidden gaps of the first to seventh layers providing the following profile of potential energies corresponding to a bottom of a conduction band for an electron; a lowest energy for the third layer;

intermediate energies for the fourth and fifth layers with a greater energy for the fourth as compared with the fifth layer, the fourth layer forming an internal barrier; energies of the second and sixth layers having values that are greater than the energies of the third, fourth and fifth layers, the second and sixth layers forming barriers of the asymmetrical quantum well; said structure being such that:

- a) an energy corresponding to a first permitted electron level is smaller than the potential energy at the bottom of the conduction band of the material of the fourth layer; an energy corresponding to a second permitted electron level is between the potential energy at the bottom of the conduction band of the material of the fourth layer and the potential energies at the bottom of the conduction band of the materials of the second and sixth layers; an energy corresponding to a third permitted electron level is between the potential energy at the bottom of the conduction band of the material of the fourth layer and the potential energy at the bottom of the conduction band of the material of the fifth layer, the energy of this third permitted electron level being greater than that of the first permitted electron level;
- and the potential energy at the bottom of the conduction band of the material of the fourth layer and a thickness of this fourth layer prevent a strong electron coupling between the first permitted electron level and the third permitted electron level;
- b) means for populating the first permitted electron level with electrons, the means for populating the first permitted electron level with electrons comprising n type doping of at least one of the second to sixth layers which provides a majority of electrons localized at the third layer; and
- c) means for detecting an electrical field, in the semiconductor structure, created by the transfer of charges to the third permitted electron level due to radiation of the detector with photon energy, the means for detecting being connected solely to the first and seventh layers.

5,086,328

PHOTO-ANODIC OXIDE SURFACE PASSIVATION FOR SEMICONDUCTORS

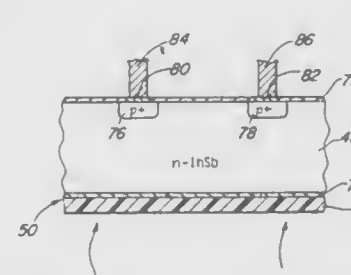
Ichiro Kasai, Santa Barbara; Richard M. Wallach, Guerneville; Bonnie A. Baumgratz, Goleta, and Michael E. Boyd, Isla Vista, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 153,387, Feb. 8, 1988, abandoned. This application Feb. 2, 1990, Ser. No. 474,700

Int. Cl.⁵ A01L 27/14

U.S. Cl. 357—30

12 Claims



1. A method of forming an indium-antimonide (InSb) infrared detector for the 3-5 micron range having substantially zero flatband voltage characteristics without requiring gated structures, said method comprising:
 - placing an indium-antimonide substrate in a container filled with an aqueous solution;
 - applying a positive electrical potential to the substrate; and
 - illuminating the substrate with light having a wavelength of 4000-8000 Å and a preselected intensity for a sufficient period of time to grow an anodization layer thereon of desired thickness;

forming a plurality of p-n junctions in the substrate so that said anodization layer covers and passivates the junctions; said anodization layer providing such improved passivation characteristics that gated structures are not required.

5,086,329

PLANAR GALLIUM ARSENIDE NPNP MICROWAVE SWITCH

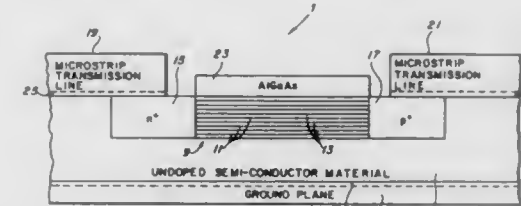
Harvey S. Newman, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1990, Ser. No. 558,540

Int. Cl.⁵ H01L 29/00, 29/161, 33/00, 31/00

U.S. Cl. 357—37

22 Claims



1. A microwave switch for controlling the transmission of microwave energy in a microstrip structure, said microwave switch comprising:
 - a planar electrically conducting ground plane;
 - an undoped semiconducting material in contact with said ground plane;
 - a plurality of epitaxially grown layers of a semiconducting material disposed on said undoped semiconducting material, said plurality of epitaxially grown layers being alternately doped with different dopants to form interleaved p- and n-type layers, the thickness of said grown layers and the amount of dopants contained in said grown layers being balanced to provide a superlattice which is fully compensated and is fully depleted of free-charge carriers; p- and n-regions formed integral with said superlattice so that said superlattice electrically connects said p- and n-regions; and
 - first and second microstrip transmission lines electrically connected to said p- and n-regions, respectively.

5,086,330

BIPOLAR SEMICONDUCTOR SWITCHING DEVICE

Tadaharu Minato, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 205,364, Jun. 10, 1988, abandoned.

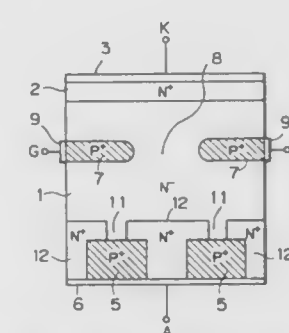
This application Dec. 6, 1989, Ser. No. 445,163

Claims priority, application Japan, Feb. 26, 1988, 63-45115

Int. Cl.⁵ H01L 29/74, 29/78

U.S. Cl. 357—38

5 Claims



1. A bipolar semiconductor switching device, comprising:
 - a first conductivity type semiconductor substrate having a first and a second major surface;

- a first main electrode region of a first conductivity type formed in said first major surface of said semiconductor substrate;
- a first conductivity type buffer region having relatively high impurity concentration formed in said second major surface of said second substrate, said buffer region having an opening portion of a predetermined width and a predetermined depth;
- a second main electrode region of second conductivity type formed in direct contact with said semiconductor substrate through said opening portion of said buffer region, wherein said buffer region includes a covering portion which covers a portion of said second main electrode region, wherein said portion of said second main electrode region is substantially parallel to said second major surface;
- a connecting region for electrically connecting said buffer region and said second main electrode region with each other; and
- a control region for controlling current flowing between said first and second main electrode regions.

5,086,331

INTEGRATED CIRCUIT COMPRISING A PROGRAMMABLE CELL

Cornelis D. Hartgring, Dublin, Ireland, and Roger Cuppens, Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 332,635, Mar. 31, 1989, abandoned.

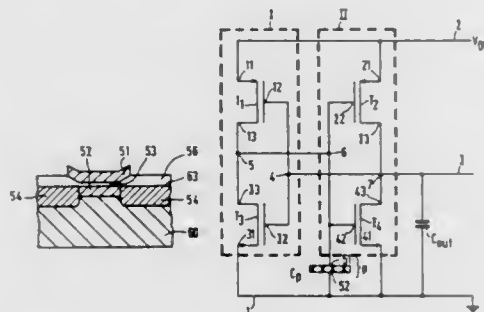
This application Jan. 18, 1991, Ser. No. 643,687

Claims priority, application Netherlands, Apr. 5, 1988, 8800846

Int. Cl.⁵ H01L 27/02

U.S. Cl. 357—51

9 Claims



1. An integrated circuit comprising a programmable cell provided with a programmable element having a first conductive layer, a second conductive layer and a dielectric layer arranged between them, the cell being programmed by producing an electric breakdown in the dielectric layer, as a result of which the programmable element passes permanently from the electrically non-conducting capacitive state to an electrically conducting state, the programmable cell comprising an asymmetrical bistable trigger circuit, capacitance means for initially setting said trigger circuit to a first state in operation and comprising said programmable element being in said non-conducting capacitance state, and conductive means for subsequently permanently setting said trigger circuit to a second state in operation and comprising said programmable element being in the permanent electrically conducting state.

5,086,332 PLANAR SEMICONDUCTOR DEVICE HAVING HIGH BREAKDOWN VOLTAGE

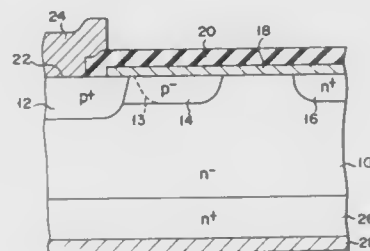
Akio Nakagawa, Hiratsuka; Kiminori Watanabe, Kawasaki; Yutaka Koshino, Yokohama; Yoshihiro Yamaguchi, Urawa, and Yoshiro Baba, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 135,230, Dec. 21, 1987, abandoned. This application Sep. 27, 1989, Ser. No. 415,400 Claims priority, application Japan, Dec. 26, 1986, 61-315301; Aug. 18, 1987, 62-203392

Int. Cl.⁵ H01L 27/02

U.S. Cl. 357—51

4 Claims



1. A planar semiconductor device having a breakdown voltage, comprising:
- a semiconductor layer of a first conductivity type;
 - a first semiconductor region of a second conductivity type selectively formed in the surface of said semiconductor layer to form a pn junction together with said semiconductor layer, said first semiconductor region having an impurity concentration higher than that of said semiconductor layer; and therefore a resistivity lower than that of said semiconductor layer;
 - a second semiconductor region of the second conductivity type formed surrounding said first semiconductor region, said second semiconductor region forming a pn junction together with said semiconductor layer and having an impurity concentration lower than that of said first semiconductor region;
 - a high resistance film having a resistivity in the range of 10^7 to $10^{12} \Omega$ per cm, formed at least over said first semiconductor region and said second semiconductor region, said high resistance film being formed directly on said first and second semiconductor regions and that portion of said semiconductor layer which surrounds said second semiconductor region; and
 - means for applying a voltage across said high resistance film to create a uniform electric field in said high resistance film.

5,086,333

SUBSTRATE FOR SEMICONDUCTOR APPARATUS HAVING A COMPOSITE MATERIAL

Mituo Osada; Yoshinari Amano; Nobuo Ogasa, and Akira Ohtsuka, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 90,392, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 831,124, Feb. 21, 1986, abandoned, which is a continuation of Ser. No. 515,890, Jul. 21, 1983, abandoned. This application Jul. 13, 1989, Ser. No. 382,056

Claims priority, application Japan, Jul. 26, 1982, 57-131026 Int. Cl.⁵ H01L 29/62

U.S. Cl. 357—67

8 Claims

1. A substrate for a semiconductor apparatus for loading a semiconductor chip, consisting essentially of a material containing copper and at least one of tungsten and molybdenum, said material being produced by pressing and sintering at least one of tungsten and molybdenum powders to form a sintered compact, said sintered compact being infiltrated with molten copper at 10-30 weight percent, the thermal expansion coefficient

of said substrate being in the range of 5.2 to $9.7 \times 10^{-6}/^\circ\text{C}$. and the thermal conductivity being at least 0.35 cal/cm. sec. $^\circ\text{C}$.

5,086,334

CHIP CARRIER

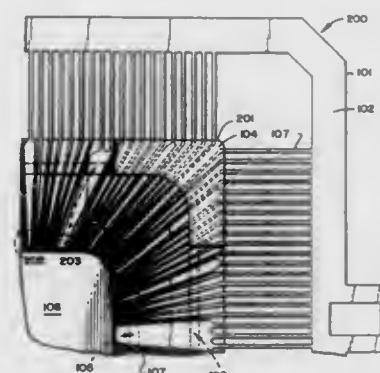
Delvin D. Eberlein, Altoona, Wis., assignor to Cray Research Inc., Egan, Minn.

Continuation of Ser. No. 447,651, Dec. 8, 1989, abandoned. This application Apr. 25, 1991, Ser. No. 692,814

Int. Cl.⁵ H01L 23/48

U.S. Cl. 357—70

22 Claims



1. A chip carrier, comprising:
- a substrate having a top surface with a cavity and a first channel surrounding said cavity;
 - a plurality of conductive leads adjacent said substrate top surface, said conductive leads extending from the periphery of said substrate over said first channel; and
 - adhesive means substantially confined to said first channel, said adhesive means of a sufficient thickness to contact said conductive leads so that said adhesive means attaches said plurality of conductive leads to said substrate and the amount of said adhesive means in contact with said conductive leads is controlled.

5,086,335

TAPE AUTOMATED BONDING SYSTEM WHICH FACILITATE REPAIR

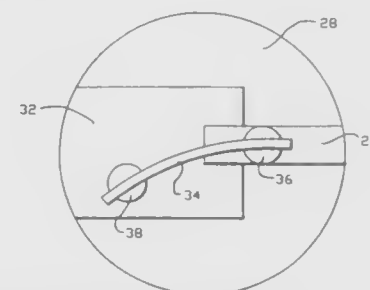
Jacques Leibovitz, San Jose; Kenneth D. Scholz, Palo Alto; V. K. Nagesh, Cupertino, and Clinton C. Chao, Redwood City, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 31, 1990, Ser. No. 560,511

Int. Cl.⁵ H01L 23/12, 23/48

U.S. Cl. 357—70

2 Claims



1. An electronic assembly comprising:
- a semiconductor device having a first pattern of chip pads;
 - a lead frame having a plurality of unitary conductive fingers having inner lead portions disposed in a second pattern in alignment with the first pattern, the inner lead portions

attached to the chip pads, the unitary conductive fingers having outer lead portions arranged in a third pattern;

a substrate having a fourth pattern of substrate connection sites in alignment with the third pattern of outer lead portions;

a plurality of conductive wires, each attached at a first end to one of said outer lead portions and attached at a second end to one of the substrate connection sites; and the outer lead portions are in frictional contact with a portion of said substrate connection sites.

5,086,336

SEMICONDUCTOR DEVICE CARD

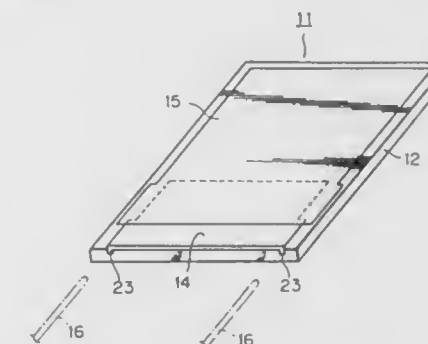
Yasuhiro Murasawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 27, 1990, Ser. No. 516,127

Int. Cl.⁵ H01L 23/02, 23/12, 23/16; G06K 19/06

U.S. Cl. 357—74

3 Claims



1. A semiconductor device card comprising:
- a four sided frame defining an area and in which a semiconductor module board may be mounted, the frame including first and second opposed sides and third and fourth opposed sides, the first and second sides each including a first groove and a second groove offset from the first groove; and
 - a metal protection panel fixedly adhered to the frame, said metal protection panel having opposed first and second longitudinal edges, each edge including a first and second flange, the first and second flanges being offset from each other, wherein the first and second flanges at the first longitudinal edge of the metal protection panel are respectively inserted into the first and second grooves in the first side of the frame and the first and second flanges at the second longitudinal edge of the metal protection panel are respectively inserted into the first and second grooves in the second side of the frame and the flanges are adhered to the frame in the grooves with the protection panel covering the area.

5,086,337

CONNECTING STRUCTURE OF ELECTRONIC PART AND ELECTRONIC DEVICE USING THE STRUCTURE

Takanobu Noro; Kunio Matsumoto; Muneco Oshima; Naoya Kanda; Suguru Sakaguchi, all of Yokohama, and Akira Murata, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 143,200, Jan. 13, 1988, Pat. No. 4,893,172. This application Sep. 13, 1988, Ser. No. 243,796

Claims priority, application Japan, Jan. 19, 1987, 62-8004; Mar. 14, 1987, 63-58260; Oct. 28, 1987, 62-270125

Int. Cl.⁵ H01L 23/36, 23/48, 21/603

U.S. Cl. 357—79

41 Claims

1. A connecting structure for an electronic part, comprising:
- conductor means for electrically connecting said electronic part;
 - a substrate having an electrical conductor to be electrically

1. An image sensor forming an optical shutter, comprising a first input light (8) facing semiconductor layer (9a) having a p-conductivity, a second semiconductor layer (9b) having an conductivity on said first layer opposite a light facing surface of said first layer, an avalanche diode (10) between said first and second semiconductor layers for amplifying a photocurrent produced in response to a light input, a further semiconductor layer (9c) of p-conductivity on said second layer (9b),

control means (6) including control electrode means for applying a control signal (CV) to said first and second layers for controlling a charge carrier transport, read-out means (5a, 5b) on said third layer, said read-out means and said further semiconductor layer forming a charge coupled device positioned for cooperating with said avalanche diode (10), wherein said control signal (CV) opens and closes said shutter electronically by permitting and interrupting a charge transport in said charge coupled device.

5,086,343

METHOD AND APPARATUS FOR COMPENSATING FOR SENSITIVITY VARIATIONS IN THE OUTPUT OF A SOLID STATE IMAGE SENSOR

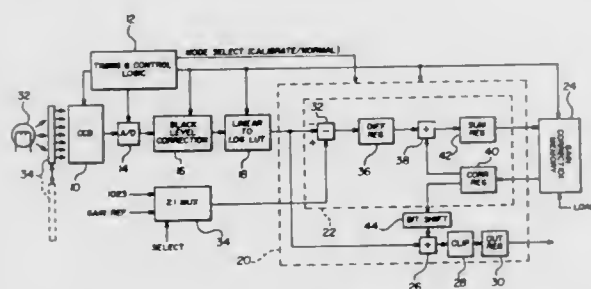
William A. Cook; Kenneth A. Parulski, and Lionel J. D'Luna, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1990, Ser. No. 522,334

Int. Cl.⁵ H04N 3/14, 5/335

U.S. Cl. 358—213.15

5 Claims



1. A correction circuit for generating correction values to compensate for variations appearing in image values derived from an image sensor having a plurality of discrete photosites, said sensor operable in a calibration mode to produce a plurality of calibration values from each photosite while the sensor images a gain calibration object, said circuit comprising: means for converting the calibration values to logarithmic calibration signals; means for subtracting each log calibration signal from a reference value corresponding to a maximum expected signal value to generate positive log calibration signals; means for generating a logarithmic correction value for each photosite from the average of the plurality of positive logarithmic calibration signals corresponding to each photosite; means for storing said logarithmic correction values; and means for applying said stored correction values to the alteration of the image values whereby each correction value pertains to the photosite producing the image value.

5,086,344

DIGITAL CORRELATED DOUBLE SAMPLING CIRCUIT FOR SAMPLING THE OUTPUT OF AN IMAGE SENSOR

Lionel J. D'Luna; William A. Cook, and Kenneth A. Parulski, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1990, Ser. No. 522,030

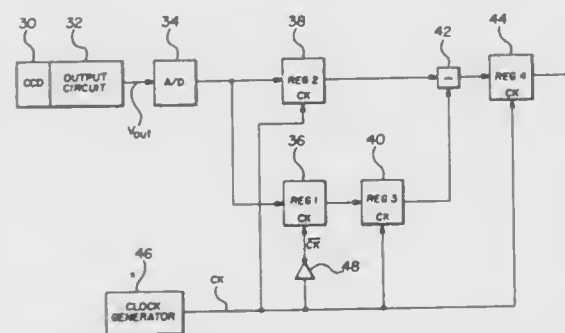
Int. Cl.⁵ H04N 5/14, 5/335, 5/213

U.S. Cl. 358—213.15

7 Claims

1. A digital circuit for sampling an image-bearing signal from the output circuit of a charge transfer device in order to develop a noise-free difference signal, the output circuit converting the image-bearing charge from pixels of the charge transfer device to an image voltage signal and establishing a reset reference voltage a sequence of at least two intervals recurring at the pixel rate, a first interval during which the reset reference voltage is present and a second interval during which the image voltage signal is present, said digital circuit comprising:

means for digitizing the image-bearing signal from the output circuit of the charge transfer device; means for generating a clock signal having a frequency equivalent to the pixel processing rate; first and second registers commonly connected to receive the digitized signal from said digitizing means and a third register connected to receive the output of said first register, said first register responding to first polarity transitions of said clock signal to store the reset reference voltage



age present during the first interval of the digitized signal, said second and third registers responding to second polarity transitions of the clock signal opposite to said first transitions to store, respectively, the image voltage signal present during the second interval of the digitized signal and the signal output from said register; and subtracting means having inputs coupled to the outputs of said second and third registers for developing a noise-free difference signal from the difference between the input signals.

5,086,345

METHOD OF OPERATION IN A STILL VIDEO CAMERA SYSTEM FOR TRANSFERRING TRACK INFORMATION FROM A PLAYBACK DEVICE TO THE STILL VIDEO CAMERA

Yoshio Nakane; Kiyotaka Kaneko; Izumi Miyake; Yutaka Maeda, and Hiroshi Shimaya, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

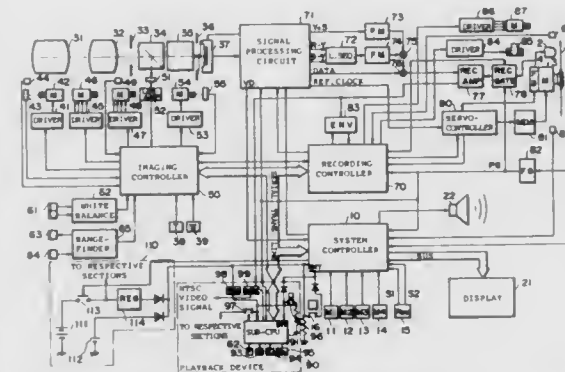
Filed Apr. 7, 1989, Ser. No. 334,564

Claims priority, application Japan, Apr. 7, 1988, 63-84082; Apr. 7, 1988, 63-84083

Int. Cl.⁵ H04N 5/76, 5/225

U.S. Cl. 358—335

6 Claims



6. A still video camera system comprising: a still video camera for producing a still video signal representing an objective image by a solid-state imaging element and recording said still video signal on a predetermined track or in two predetermined tracks of a rotating magnetic recording medium having a plurality of tracks; a playback device capable of being detachably connected to

said still video camera for reproducing a signal read from said predetermined track or said two predetermined tracks of said magnetic recording medium; a still video camera memory for storing track information used by a recording operation in said still video camera; transferring means for transferring said track information stored in said still video camera memory from said still video camera to said playback device when said playback device is connected to said still video camera and a mode thereof is changed over to a playback mode; and a playback memory of said playback device for storing said track information transferred by said transferring means.

5,086,346

IMAGE PROCESSING APPARATUS HAVING AREA DESIGNATION FUNCTION

Tetsuo Fujisawa, Urawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

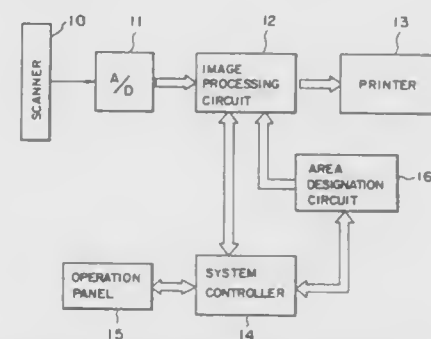
Filed Feb. 5, 1990, Ser. No. 475,378

Claims priority, application Japan, Feb. 8, 1989, 1-29392; Feb. 27, 1989, 1-45950

Int. Cl.⁵ G06K 9/20

U.S. Cl. 358—453

12 Claims



1. An image processing apparatus comprising: designating means for designating a plurality of areas on an original document and for outputting coordinate data representing a designated areas, a process being assigned to each area; dividing means, coupled to said designating means, for dividing the original document into a plurality of blocks based on the coordinate data output from said designating means, said dividing means outputting number information for each block; area information generating means for generating area information for each of blocks obtained by said dividing means, said area information including an area number representing the process assigned to a designated area to which each block belongs and border information representing a border of each block; memory means for storing the area information; information write means, coupled to said dividing means and said memory means, for writing the area information for each block at an address in said memory means, the address being specified by the number information output for each corresponding block from said dividing means; original scan means for optically scanning the original document and for outputting image data for each pixel; information read means, coupled to said memory means, for reading out the area information for each block from the address in said memory means while said original scan means scans the original document, the address being specified by the number information of each corresponding block which is scanned by said original scan means; and processing means, coupled to said information read means, for carrying out the process for image data output for each pixel from said original scan means until a position at which the original scan means scans the original document reaches a position corresponding to the border infor-

mation of the area information for each corresponding block, a content of the process being specified by the area number of the area information for each corresponding block, the area information being supplied from said information reading means.

5,086,347

LIQUID CRYSTAL DISPLAY DEVICE HAVING METALLIC BUS REPAIR LAYER

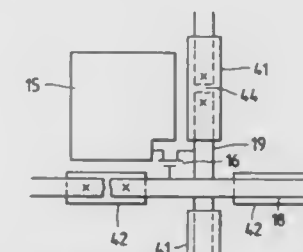
Yasuhiko Ukai; Tomihisa Sunata, and Teizo Yukawa, all of Kobe, Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Dec. 6, 1989, Ser. No. 446,849

Claims priority, application Japan, Dec. 12, 1988, 63-314468 Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—87

12 Claims



1. A liquid crystal display device in which a plurality of parallel buses and a plurality of parallel gate buses perpendicular thereto are formed in different planes, respectively, on one surface of a transparent base plate, thin film transistors are provided at intersections of said source and gate buses, and a picture element area of liquid crystal opposite each of a plurality of display electrodes formed in a matrix array in the plane in which said source buses are provided is driven by ON-OFF control of said thin film transistors;

an insulating layer formed at one side of each of said source buses in direct contact therewith; and a metallic source bus repair conductive layer formed opposite said each source bus across said insulating layer in direct contact therewith and extending along at least each sectional portion of the source bus defined between two adjacent ones of said gate buses.

5,086,348

SYSTEM FOR CONNECTING OPTICAL LINES TO A WIDEBAND TELECOMMUNICATIONS EXCHANGE

Guy Le Roy, Lannion, France, assignor to Alcatel Cit, Paris, France

Filed Dec. 1, 1989, Ser. No. 444,356

Claims priority, application France, Dec. 6, 1988, 88 15968 Int. Cl.⁵ H04J 14/00

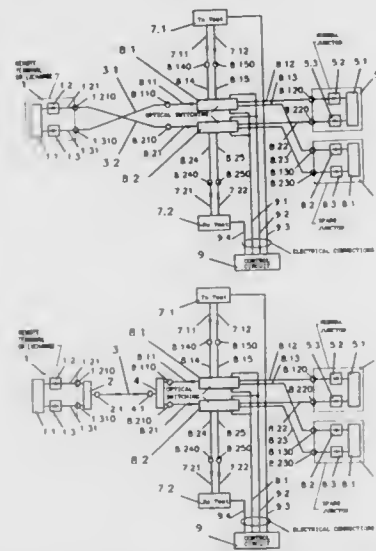
U.S. Cl. 358—117

10 Claims

1. A system for connecting a local exchange to optical subscriber lines and to optical junction lines in a wideband multiservice telecommunications network, each of said optical subscriber lines being connected firstly to a transmission circuit and a reception circuit in a subscriber terminal located on subscriber premises and secondly to a transmission circuit and a reception circuit in a junctor of said local exchange, each optical junction line being connected to a transmission circuit and a reception circuit in a junctor of a distant exchange and to a transmission circuit and a reception circuit of a junctor in the local exchange, said local exchange also including spare junctors, wherein:

the optical subscriber and optical junction lines are connected to the junctors of the local exchange and to its spare junctors via at least one connection assembly including at least one connection module having a connection capacity of N optical lines;

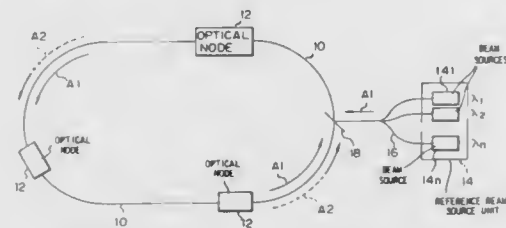
a connection module comprises first, second, and third optical switch assemblies; and in the connection module, the first optical switch assembly is connected to the optical subscriber and optical junction lines, the second optical switch assembly is connected



both to the first optical switch assembly and to the junctions in said local exchange and to the spare junctions associated with the N optical lines, and the third optical switch assembly is connected both to the first optical switch assembly and to at least one test circuit via a test line optical fiber and via a junction test optical fiber.

5,086,349
OPTICAL SWITCHING SYSTEM WHICH EMPLOYS REFERENCE BEAMS WITH DIFFERENT WAVELENGTHS

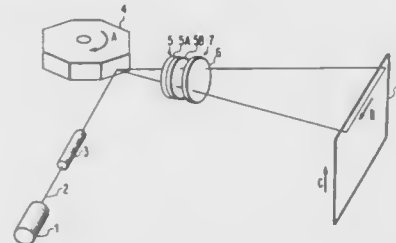
Hideaki Okayama, and Toshimasa Ishida, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 24, 1990, Ser. No. 557,630
Claims priority, application Japan, Jul. 26, 1989, 1-93215
Int. Cl.⁵ H04J 1/00
U.S. Cl. 359-124 14 Claims



1. An optical switching system, comprising: an optical transmission path; a plurality of optical node means, each interconnected to the optical transmission path, for generating and receiving signal beams that have a first polarization direction and that propagate along the optical transmission path; and a reference beam source means, interconnected to the optical transmission path, for generating reference beams that have a second polarization direction and that propagate along the optical transmission path, each of the reference beams having a different wavelength, wherein each of the optical node means includes means for generating a plurality of signal beams, each signal beam generated by the means for generating being tuned to the wavelength of a respective one of the reference beams, and wherein the optical transmission path preserves the direc-

tions of polarization of the reference beams and the signal beams.

5,086,350
Fθ LENS
Sumihiro Nishihata, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 28, 1990, Ser. No. 573,763
Claims priority, application Japan, Aug. 29, 1989, 1-222698
Int. Cl.⁵ G02B 26/08, 9/00
U.S. Cl. 359-206 2 Claims



1. An $f\theta$ lens located between a light deflector, which deflects a light beam approximately at uniform angular velocity, and a surface, which is to be scanned, the $f\theta$ lens converges the light beam onto the surface and causes the converged light beam to scan the surface approximately at uniform velocity, the $f\theta$ lens comprising: a first lens set having a positive or negative refracting power and a second lens set having a positive refracting power, said first lens set and second lens set being located in that order from the side of said light deflector, wherein said first lens set is composed of a first lens and a second lens, which are cemented together, said second lens set is composed of a single lens, and said first lens set and said second lens set satisfy the conditions

$$0.2 \leq \Psi G2 / \Psi \leq 1.5$$

$$r1, r2 < 0$$

$$0.3 \leq r3 / r1 \leq 1.7$$

$$vd1 > vd2$$

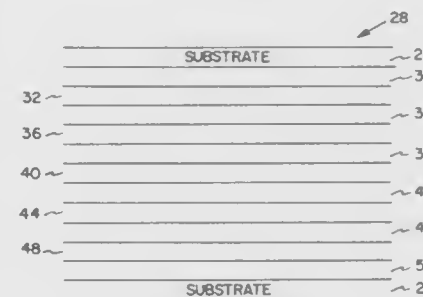
where Ψ denotes the reciprocal of the focal length of the whole $f\theta$ lens; $\Omega G2$ denotes the reciprocal of the focal length of the second lens set; $r1$, $r2$ and $r3$ denote radii of curvature of first, second, and third surfaces of said first and second lenses, each radius taking a positive value when the corresponding lens surface is convex as viewed from the side of the light deflector; $vd1$ denotes the Abbe's dispersion number of said first lens of said first lens set; and $vd2$ denotes the Abbe's dispersion number of said second lens of said first lens set.

5,086,351
ELECTROCHROMIC ELEMENTS, MATERIALS FOR USE IN SUCH ELEMENT, PROCESSES FOR MAKING SUCH ELEMENTS AND SUCH MATERIALS AND USE OF SUCH ELEMENT IN AN ELECTROCHROMIC GLASS DEVICE

Jean Paul Couput, Bizanos, and Guy Campet, Canejan, both of France, assignors to M&T Chemicals, Inc., Somerville, N.J. and Societe Nationale Elf Aquitaine, Paris, France
Filed Jul. 13, 1989, Ser. No. 379,225
Int. Cl.⁵ G02F 1/01; C23C 14/00; B05D 5/12; H01M 6/16
U.S. Cl. 359-265 36 Claims

1. An electrochromic element comprising a pair of conductive electrodes at least one of which is transparent, first and second inorganic electrochromic layers interposed between said pair of conductive electrodes and an ion conducting layer

of an electrolyte interposed between said first and second inorganic electrochromic layers, wherein said first and second inorganic electrochromic layers are different and are capable of exhibiting electrochromic properties upon the incorporation of an alkali metal or Ag ion, wherein the electrochromic properties of said first and second inorganic electrochromic layers are complementary, and wherein said second inorganic electrochromic layer comprises the composition



wherein T^{II} and T^{III} are divalent and trivalent forms of a transition metal T; M is selected from the group consisting of an alkali metal, Ag, a mixture of alkali metals, a mixture of at least one alkali metal and Ag, a mixture of Ag and hydrogen, a mixture of at least one alkali metal and hydrogen and a mixture of at least one alkali metal with Ag and hydrogen; x is a first mole fraction of M^+ ions and y is a second mole fraction of M^+ ions incorporated into said second inorganic electrochromic layer such as $0 < x \leq 1.0$, $-x \leq y \leq +x$ and $y \geq 2x - 1$; and wherein the composition undergoes a maximum transmissivity change when y varies between $-x$ and $+x$.

5,086,352
OPTICAL MEMBERS AND BLANKS OR SYNTHETIC SILICA GLASS AND METHOD FOR THEIR PRODUCTION

Shigeru Yamagata; Kyoichi Inaki; Toshikatu Matsuya, all of Kohriyama, Japan; Ralf Takke, Hanau, Fed. Rep. of Germany; Thomas Stephan, Grosskrotzenburg, Fed. Rep. of Germany, and Heinz Fabian, Hanau, Fed. Rep. of Germany, assignors to Shin-Etsu Quartz Products Co., Ltd. and Heraeus Quarzglas GmbH, both of Hanau, Fed. Rep. of Germany
Filed Jun. 8, 1990, Ser. No. 535,205
Claims priority, application Japan, Jun. 9, 1989, 1-145226; Jun. 14, 1989, 1-149466; Jun. 19, 1989, 1-154620; Jun. 19, 1989, 1-154621; Sep. 11, 1989, 1-232983
Int. Cl.⁵ G02B 1/00, 37/00
U.S. Cl. 359-350 39 Claims

BLANKS (80 mm dia. x 20 mm thick)				LAYER DATA			
NO	PICTURE	TEMPERATURE	NO	PICTURE	TEMPERATURE	NO	PICTURE
11		1000°C	12		1000°C	13	
14		1000°C	15		1000°C	16	
17		1000°C	18		1000°C	19	
20		1000°C	21		1000°C	22	
23		1000°C	24		1000°C	25	
26		1000°C	27		1000°C	28	
29		1000°C	30		1000°C	31	
32		1000°C	33		1000°C	34	
35		1000°C	36		1000°C	37	
38		1000°C	39		1000°C	40	

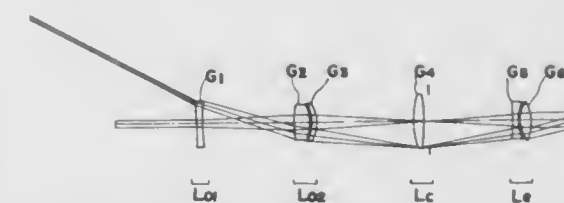
○ Excellent
△ Average
× Poor

1. A synthetic silica glass optical member for use with a high-power ultraviolet laser beam having a wavelength shorter

than 250 nm, wherein said optical member is made of high-purity synthetic silica glass material which is free from striae in at least one direction corresponding to the incident light, and said member has an OH group concentration of at least about 100 wt. ppm, and a doped hydrogen molecule concentration of at least about 5×10^{16} molecules/cm³ sufficient to inhibit decreases in light transmittance over time due to exposure to light from said laser beam.

5,086,353
VARIABLE MAGNIFICATION VIEWFINDER OPTICAL SYSTEM

Hiromu Mukai; Kagumi Kojiya; Kohtaro Hayashi, all of Osaka, Japan, and Taro Shihuya, Monrovia, Liberia, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 333,701, Apr. 4, 1989, abandoned. This application Nov. 20, 1990, Ser. No. 616,698
Claims priority, application Japan, Apr. 7, 1988, 63-86958
Int. Cl.⁵ G02B 25/00, 23/14, 15/15; G03B 13/02
U.S. Cl. 359-432 18 Claims



1. Variable magnification viewfinder optical system, comprising from the object side: an objective lens group of a positive refractive power, including a first lens unit of a negative refractive power and a second lens unit of a positive refractive power, said first and second lens units being shiftable along the optical axis of the optical system for changing the magnification of the optical system; a condenser lens group of a positive refractive power; and an eyepiece lens group of a positive refractive power; wherein the objective lens group forms a real image of an object and the real image can be observed through the eyepiece lens group; and wherein the optical system fulfills the following conditions;

$$-0.09/\text{mm} < 1/f_1 < -0.03/\text{mm}$$

$$0.04/\text{mm} < 1/f_2 < 0.11/\text{mm}$$

$$-0.1/\text{mm} < f_e/(f_1 \cdot f_2) < -0.035/\text{mm}$$

wherein:

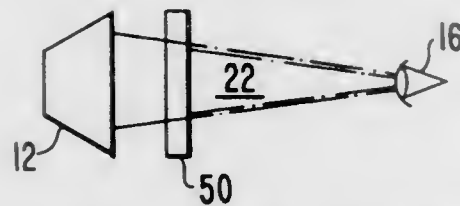
f_1 represents the focal length of the first lens unit of the objective lens group in millimeters;
 f_2 represents the focal length of the second lens unit of the objective lens group in millimeters; and
 f_e represents the focal length of the eyepiece lens group in millimeters.

5,086,354
THREE DIMENSIONAL OPTICAL VIEWING SYSTEM
Robert E. Bass, and John S. Bass, both of 2832 NE. 35th St., Ft. Lauderdale, Fla. 33306

Filed Feb. 27, 1989, Ser. No. 316,019
Int. Cl.⁵ G02B 27/22

U.S. Cl. 359-465 12 Claims
1. An optical viewing system for producing a simulated three dimensional image comprising: first means for generating and displaying a two dimensional image on a display means;

second means for generating and displaying a two dimensional image on a transparent display means; wherein each of said display means are located at different,



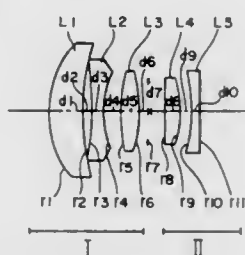
predetermined locations on an optical viewing path and further wherein the image displayed by said first means for displaying is projected through said second means for displaying.

5,086,355

FOCAL LENGTH CHANGEABLE LENS SYSTEM

Yoshinobu Kudo, and Kazuo Kimura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan Division of Ser. No. 137,518, Dec. 22, 1987, Pat. No. 4,983,026. This application Jun. 11, 1990, Ser. No. 536,186

Claims priority, application Japan, Dec. 27, 1986, 61-311448 Int. Cl.⁵ G02B 15/08, 9/60 U.S. Cl. 359-675 2 Claims



1. A lens system including lens elements made of synthetic resin material comprising from the object side to the image side:

a front positive lens group consisting of a first positive lens element made of glass, a second negative lens element made of a synthetic resin material, and a third positive lens element made of a synthetic resin material, wherein a compound refractive power of the second and the third lens elements is negative, and

a rear negative lens group consisting of a fourth positive lens element made of a synthetic resin material and a fifth negative lens element made of glass.

5,086,356

COMPACT ZOOM LENS SYSTEM

Ayako Kojima, and Hisayuki Masumoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan Continuation of Ser. No. 456,073, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 294,276, Jan. 6, 1989, abandoned. This application Oct. 1, 1990, Ser. No. 593,476 Claims priority, application Japan, Jan. 1, 1988, 63-3316; Jan. 8, 1988, 63-1937; Mar. 31, 1988, 63-80147

Int. Cl.⁵ G02B 15/14, 13/18

U.S. Cl. 359-686 28 Claims

1. A compact zoom lens system comprising from object side to image side:

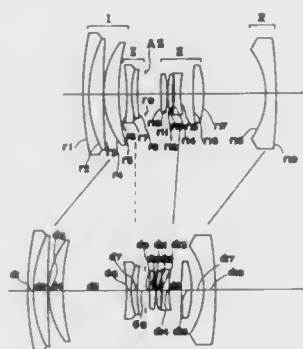
a first lens unit of a positive refractive power;

a second lens unit of a negative refractive power with a first variable air space formed between the first and second lens units;

a third lens unit of a positive refractive power; and

a fourth lens unit of a negative refractive power with a

second variable air space formed between the third lens unit and fourth lens unit; wherein the back focal length of the whole lens system for the shortest focal length is less than half of the diagonal length of the image plane; wherein the first lens unit, the fourth lens unit and at least



one of the second and third lens units are shiftable from the image side to the object side so that the first variable air space increases and the second variable air space decreases in the zooming operation from the shortest focal length to the longest focal length; and wherein the third lens unit includes at least an aspherical surface and fulfills the following condition:

$$\frac{|X| - |X_0|}{C_0 (N' - N)} < 0$$

wherein, X represents the distance along the optical axis measured from an intersection of the basic (paraxial) spherical surface and the optical axis and is expressed as the following equation:

$$X = X_0 + \sum A_{2i} Y^{2i}$$

X₀ represents the distance along the optical axis measured from the intersection and is expressed as the following equation: $X_0 = C_0 Y^2 / \{1 + (1 - C_0^2 Y^2)\}$, Y represents the distance from the optical axis, C₀ represents the radius of curvature of the basic spherical surface of the aspherical surface, N represents the refractive index of the material existing at the object side of the aspherical surface, and N' represents the refractive index of the material existing at the image side of the aspherical surface.

5,086,357

EXTERNAL MIRROR FOR A MOTOR VEHICLE

Bernhard Mittelhäuser, Am Krähenberg, 3002 Wedemark 2, Fed. Rep. of Germany, and Jan Schubert, Wedemark, Fed. Rep. of Germany, assignors to Bernhard Mittelhäuser, Wedemark, Fed. Rep. of Germany

Filed Oct. 4, 1990, Ser. No. 592,610

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1989, 3933641

Int. Cl.⁵ G02B 7/18

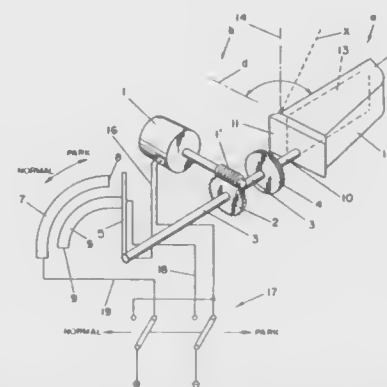
U.S. Cl. 359-841 4 Claims

1. An external rear view or side view mirror for a motor vehicle, comprising:

a housing that is pivotable to a limited extent between two end positions and accommodates a mirror panel;

an electric motor that serves to pivot said housing about an approximately vertical axis, with said electric motor being selectively rotatably in either of two opposite directions to pivot said housing between a park position that forms one of said end positions and is essentially parallel to a longitudinal direction of said vehicle, and a normal operating position that forms the other of said end positions and is transverse to said longitudinal direction of said vehicle;

a slip coupling that is interposed between said electric motor and said housing; and conducting means for supplying power to said electric motor, with said conducting means including contact strip



5,086,358

RECORDING AND REPRODUCING APPARATUS

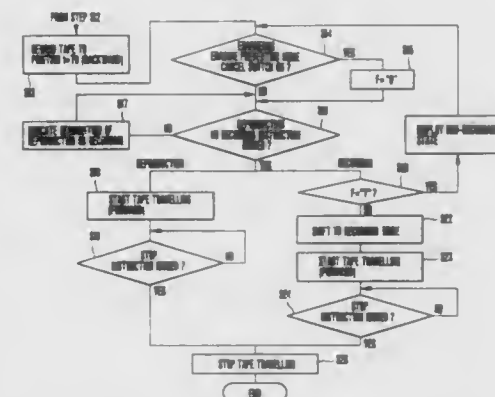
Masahiro Takei, Kanagawa; Motokazu Kashida, Tokyo; Koji Takahashi, Kanagawa; Kenichi Nagasawa, Kanagawa; Toshitake Masui, Kanagawa, and Tsutomu Fukatsu, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,971

Claims priority, application Japan, Jun. 25, 1985, 60-136994 Int. Cl.⁵ G11B 15/04, 15/48

U.S. Cl. 360-60

11 Claims



1. A recording and reproducing apparatus, comprising:

(a) recording means for recording an information signal on a tape-shaped recording medium;

(b) reproducing means for reproducing signals recorded on said recording medium;

(c) means for providing a signal indicative of a preselected length of the tape-shaped recording medium on which said information signal is to be recorded;

(d) discriminating means for receipt of such signals reproduced by said reproducing means and such preselected length indicative signal for discriminating whether or not said information signal has been recorded on at least a part of a portion of said tape-shaped recording medium having a length corresponding to said preselected length and providing an output signal indicative of such discrimination; and

(e) prohibiting means responsive to said discriminating

means output signal for selectively prohibiting recording of said information signal by said recording means.

5,086,359

CASSETTE TAPE SLACK-PREVENTING APPARATUS FOR USE IN MAGNETIC RECORDING/REPRODUCING APPARATUS

Yuzo Tsuchiya, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

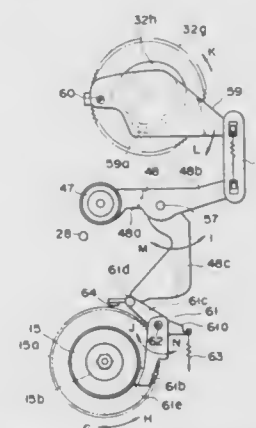
Filed Jan. 30, 1990, Ser. No. 472,189

Claims priority, application Japan, Jan. 31, 1989, 1-19652

Int. Cl.⁵ G11B 15/18, 17/00, 19/02

U.S. Cl. 360-71

7 Claims



1. A cassette tape slack-preventing apparatus for preventing slack of a cassette tape used in a magnetic recording/reproducing apparatus which comprises: a capstan motor; supply and take-up reel bases having reel shafts adapted for engagement with reel-engaging holes of a tape cassette; a front loading mechanism for transporting the tape cassette and engaging the reel-engaging holes of the tape cassette with the reel shafts of the reel bases, and for disengaging the tape cassette from the reel shafts of the reel bases and transporting the tape cassette back to an original position; a clutch mechanism for selectively transmitting torque of the capstan motor to the front loading mechanism; and a tape-driving mechanism for selectively transmitting the torque of the capstan motor to one of the supply or take-up reel bases, the tape-driving mechanism transmitting the torque to the one reel base when the front loading mechanism is operated, said cassette tape slack-preventing apparatus comprising:

detection means for detecting whether or not the front loading mechanism is operated by the capstan motor through the clutch mechanism; and

a braking mechanism for braking at least one of the supply and take-up reel bases transmitting the torque of the capstan motor by the tape-driving mechanism during the operating of the front loading mechanism when the detection means detects the condition that the front loading mechanism is operated, whereby the cassette tape is prevented from slackening in both first and second states, the first state being a state immediately after the reel-engaging holes of the tape cassette are brought into engagement with the reel shafts of the reel bases, while the second state being a state where the reel-engaging holes are disengaged from the reel shafts.

5,086,360

CONSTANT FLYING HEIGHT SLIDER

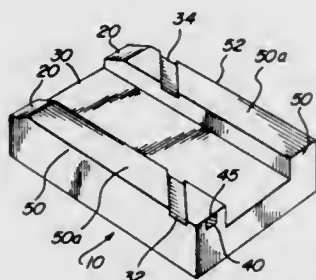
Paul W. Smith, Agoura Hills, Calif.; Raymond S. Abbott, Elkhorn, Nebr.; Peter C. Lorince, Bellevue, Nebr.; Robert K. Wood, Elkhorn, Nebr.; Robert R. Lichtenberg, Elkhorn, Nebr., and John J. Gaukel, Omaha, Nebr., assignors to Applied Magnetics Corporation, Goleta, Calif.

Filed Sep. 6, 1990, Ser. No. 579,058

Int. Cl.⁵ G11B 5/60

U.S. Cl. 360—103

7 Claims



1. A device for positioning a transducer in an airstream near a magnetic recording medium moving with a primary direction of motion, said device comprising: a generally rectangular slider housing said transducer, said slider having four sides arranged at approximately 90 degree angles such that a first pair of said sides are located opposite each other and a second pair of said sides are located opposite each other, a longitudinal axis intersecting said first pair of sides, and a transverse axis intersecting said second pair of sides, one of said first pair of sides intersected by said longitudinal axis being a leading edge, said leading edge arranged to contact said airstream first, and the other said first pair of sides intersected by said longitudinal axis being a trailing edge; a rail running along each side edge from said leading edge to said trailing edge, each rail having an air bearing surface which faces the magnetic recording medium, said longitudinal axis being located midway between said air bearing surfaces, each air bearing surface having a sloped ramp at said leading edge, said ramp defining a sloped portion of said air bearing surface and a non-sloped portion of said air bearing surface, said non-sloped portion of said air bearing surface being generally flat relative to a plane defined by said side edges, said transverse axis being located midway along said non-sloped portion of said air bearing surfaces; and a slot in each air bearing surface, said slots being cut along a single straight line at an identical acute angle from said longitudinal axis whereby the pressure under said air bearing surfaces is reduced and said slider flies at approximately constant height over said magnetic recording medium, whereby pressure is relieved from a location in one of said air bearing surfaces but is not relieved from a symmetrical location in the other of said air bearing surfaces.

5,086,361

ROTARY HEAD DRUM FOR VIDEO TAPE RECORDER

Hideaki Kawada; Yoshiaki Sugiyama, and Masahiro Kanaguchi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1990, Ser. No. 507,736

Claims priority, application Japan, Apr. 21, 1989, 1-103238

Int. Cl.⁵ G11B 5/52, 21/04

U.S. Cl. 360—107

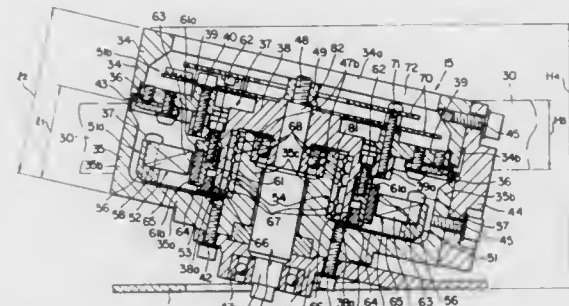
20 Claims

1. A rotary magnetic head drum for guiding a magnetic tape in a helical-type video tape recorder during the recording or reproducing of signals on the tape, said rotary magnetic head drum comprising:

a stationary lower drum member having a base portion and inner and outer cylindrical portions extending generally

upwardly from said base portion for defining an internal cavity therebetween;

a rotary assembly rotatably mounted on a rotor shaft coaxial with said lower drum member and having at least one rotary magnetic head mounted thereto for recording signals on and reproducing signals from the magnetic tape; driving means for driving said at least one rotary head and being mounted in said internal cavity of said lower drum member;



means for transferring signals to and from said at least one rotary head and also being disposed within said internal cavity in radially spaced, and axially overlapped relation to said driving means to thereby reduce the axial height of the video tape recorder; and means for detecting rotation of said driving means and being also disposed within said internal cavity at least partly in radially spaced, and axially overlapped relation to said driving means to thereby reduce the axial height of the video tape recorder.

5,086,362

MULTIPLE-TRACK MAGNETIC RECORDING HEAD HAVING A MATRIX OF MAGNETIC MICROHEADS

Francois Maurice, Verrieres le Buisson, France, assignor to Thomson-CSF, Puteaux, France

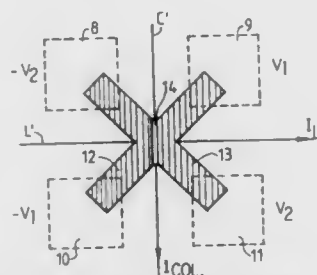
Filed Jul. 13, 1990, Ser. No. 552,088

Claims priority, application France, Jul. 21, 1989, 89 09887

Int. Cl.⁵ G11B 5/147

U.S. Cl. 360—121

11 Claims



1. A multiple-track magnetic recording head, including means for generating and sensing magnetic fields, comprising: a compact matrix structure of magnetic microheads, controlled by inhibition, formed in a Cartesian matrix of pads made of magnetic material projecting out of a supporting substrate made of magnetic material, and electrical conductors being intersectingly arranged in inter-pad spaces, wherein each microhead has a magnetic circuit formed by four neighboring pads, a part of the substrate that joins said four neighboring pads, and two poles made of magnetic material, each pole magnetically connecting two of said four neighboring pads, these two poles near each having a gap defined therebetween at an intersection of

electrical conductors associated with said four neighboring pads.

5,086,363

MAGNETIC TAPE CASSETTE CASING

Shingo Katagiri, and Shigeru Nishiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

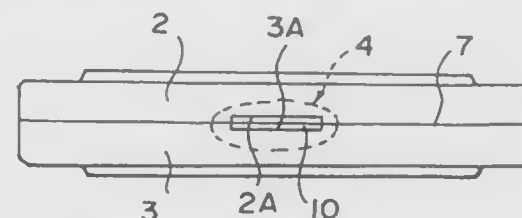
Filed Oct. 3, 1990, Ser. No. 592,390

Claims priority, application Japan, Oct. 4, 1989, 1-116964[U]

Int. Cl.⁵ G11B 23/023

U.S. Cl. 360—132

3 Claims



1. A magnetic tape cassette casing formed of upper and lower cassette halves each of which has a rear wall portion extending in the direction of thickness of the casing and which are mated together with the top surfaces of the rear wall portions thereof abutting against each other, characterized by having a hole defined by a recess formed in the top surface of the rear wall portion of each or one of the cassette halves substantially at the center between the left and right side ends, the hole being 0.04 to 1.0mm in width and 2 to 20mm in length.

5,086,364

CIRCUITRY FOR DETECTING A SHORT CIRCUIT OF A LOAD IN SERIES WITH AN FET

Ludwig Leipold; Rainald Sander; Jenö Tihanyi, and Roland Weber, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

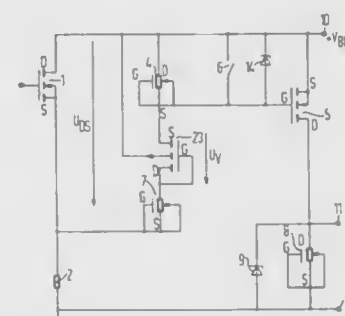
Continuation of Ser. No. 382,524, Jul. 20, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 657,291

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825514

Int. Cl.⁵ H02H 3/20

U.S. Cl. 361—18

10 Claims



1. Short circuit detection apparatus, comprising: a power MOSFET of a predetermined channel type having a source terminal, a drain terminal, and a gate terminal; a load in series with the power MOSFET; a voltage comparator having one end coupled to the source terminal of the power MOSFET and another end coupled to the drain terminal, the voltage comparator providing an output signal when the voltage between the source and drain terminals is higher than a predetermined voltage representing a short circuit in the load, the voltage comparator comprising: (a) a first means for providing a Zener characteristic in series with a first current source, the first Zener characteristic

providing means and the first current source being responsive to the source and drain terminals of the power MOSFET;

(b) a second MOSFET of a channel type opposite to that of the power MOSFET, the second MOSFET having a source terminal, a drain terminal, and a gate terminal, the source terminal of the second MOSFET and the drain terminal of the power MOSFET being coupled to one end of the first current source, and the gate terminal of the second MOSFET being coupled to another end of the first current source;

(c) a second load in series with the second MOSFET; and (d) a first output terminal coupled to one end of the second load and a second output terminal coupled to another end of the second load.

5,086,365

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT

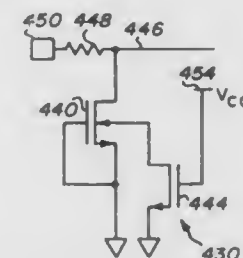
Cheun-Der Lien, Mountain View, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed May 8, 1990, Ser. No. 521,148

Int. Cl.⁵ H02H 3/24

U.S. Cl. 361—58

9 Claims



1. An electrostatic-discharge-protection circuit (430) for protecting an integrated circuit, the protection circuit comprising in combination:

an integrated circuit pad (450);

an integrated circuit power supply line (454);

a first N-channel-type metal-oxide-semiconductor transistor (440) having a transistor gate connected to circuit ground, a transistor well, and a transistor channel coupled between circuit ground and said pad (450); and

a second N-channel-type metal-oxide-semiconductor transistor (444) having a transistor gate connected to said line (454) and a transistor channel connected between circuit ground and said first transistor (440) well.

5,086,366

PREALARM CIRCUIT BREAKER

Kazuhiro Ishii; Kouji Hirotsune; Ichiro Arinobu, and Kazushi Sato, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,459

Claims priority, application Japan, Mar. 16, 1990, 2-64138

Int. Cl.⁵ H02H 3/08

U.S. Cl. 361—94

2 Claims

1. A prealarm circuit breaker, which has an overcurrent trip apparatus and a prealarm apparatus for issuing a prealarm signal before occurrence of trip, comprising:

a pair-transistor having a pair of transistors;

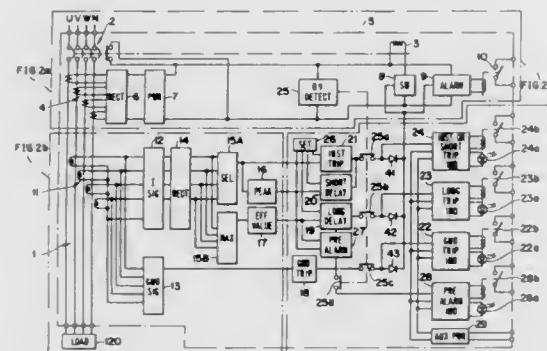
current detection means for making a detection voltage responding to a current flowing through said prealarm circuit breaker;

voltage applying means for operating said pair-transistor in response to said detection voltage;

a pair of resistors which are connected in series to said transistors, respectively;

trip signal generation means connected in series to one of said transistors, said trip signal generation means issuing a trip signal with a predetermined delay time when said

detection voltage exceeds a predetermined pickup voltage for trip; and
prealarm signal generation means connected in series to the



other one of said transistors, said signal generation means issuing the prealarm signal with a predetermined delay time when said detection voltage exceeds a predetermined pickup voltage for prealarm.

5,086,367

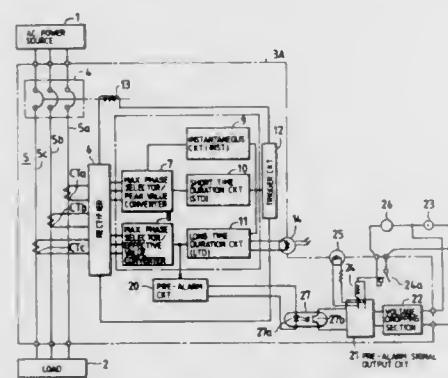
CIRCUIT BREAKER

Kazuhiro Ishii, and Hideaki Moriwaki, both of Hiroshima, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Continuation of Ser. No. 376,462, Jul. 7, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 620,445

Claims priority, application Japan, Jul. 8, 1988, 63-168996
Int. Cl.⁵ H02H 3/093

U.S. Cl. 361-94

3 Claims



1. A circuit breaker operative to detect an overcurrent flowing through a main circuit between an AC source and a load, and to perform an overcurrent tripping function, said circuit breaker further comprising:

- a pre-alarm circuit with such a pre-alarming function as to generate an alarm output signal before a current flowing through a main circuit exceeds an overcurrent;
- a pre-alarm signal output circuit driven by said alarm output signal from the pre-alarm circuit and being operative to generate at least one of an audio and visual alarm; and
- a photo-coupler coupled between said pre-alarm circuit and said pre-alarm signal output circuit and being operative in such a direction as to block the transmission of a signal from the pre-alarm signal output circuit to the pre-alarm circuit.

5,086,368
CONNECTOR BANK WITH VOLTAGE SURGE PROTECTION

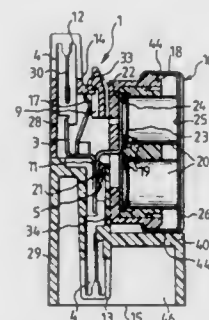
Dieter Gerke; Lutz Biederstedt, and Manfred Müller, all of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Berlin, Fed. Rep. of Germany
Filed Apr. 23, 1990, Ser. No. 512,808

Claims priority, application Fed. Rep. of Germany, May 23, 1989, 3917270

Int. Cl.⁵ H02H 9/04

U.S. Cl. 361-118

20 Claims



1. A connector bank particularly for telecommunication and data systems, comprising: a connector bank body defining a plurality of connector bank sides; two rows of insulation displacement contacts, each of said rows being provided on a different side of said connector bank body; said connector bank body defining an arrester magazine receiving chamber disposed laterally of a first of said two rows of insulation displacement contacts; a plurality of connecting elements, each connecting element being connected to a displacement contact of each of said two rows of displacement contacts, said connecting elements each being positioned adjacent said arrester magazine receiving chamber; and, an arrester magazine inserted in said arrester magazine receiving chamber and connectable to said connecting elements.

5,086,369

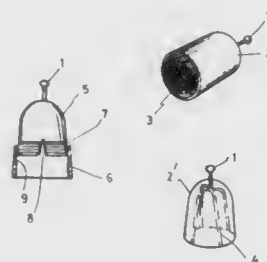
STATIC DISCHARGING DEVICE

Spencer B. Lin, 3311 Shelby St., Ontario, Calif. 91764
Filed May 9, 1990, Ser. No. 521,240

Int. Cl.⁵ H05F 3/00

U.S. Cl. 361-220

8 Claims



1. A static discharging device comprising a conductive antenna and a conductive retainer connected to each other, said retainer being worn on a finger, said antenna having a longitudinal axis extending in a direction of the finger and having a length in said direction extending past a digital end of the finger, so that said antenna extends over a digital end of the finger, wherein said retainer comprises a cap made of a plastic material and a conductive member embedded in said cap and exposed at inner side, said conductive member connected to said retainer.

5,086,370

INTEGRATED CIRCUIT CHIP FORMED WITH A CAPACITOR HAVING A LOW VOLTAGE COEFFICIENT, AND METHOD OF MAKING SUCH CAPACITOR

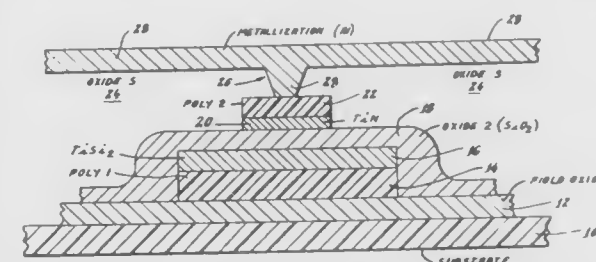
John A. Yasaitis, Lexington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Aug. 24, 1990, Ser. No. 572,751

Int. Cl.⁵ H01G 1/015, 4/10, 7/00

U.S. Cl. 361-313

27 Claims



1. An integrated-circuit (IC) chip incorporating a capacitor as part of the integrated circuitry, said chip comprising: a substrate having an upper surface; a first layer of polysilicon above said substrate upper surface; a layer of a silicide above and in contact with said first layer of polysilicon to serve as the lower plate of the capacitor; dielectric material above and in contact with said silicide layer; a layer of an electrically-conductive refractory material in contact with the upper surface of said dielectric and serving as the upper plate of said capacitor; and a layer of conductively-doped polysilicon above and in contact with said refractory layer.

5,086,371

PRINTED CIRCUIT BOARD ASSEMBLY HANDLE/STIFFENER

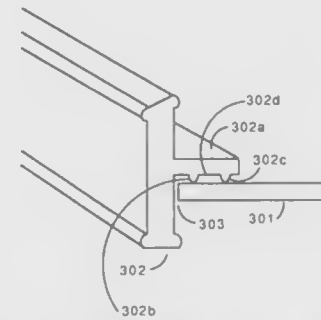
James J. Grammas, Westchester; James M. Maronn, Naperville, and James R. Weston, Palos Park, all of Ill., assignors to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Jan. 7, 1991, Ser. No. 637,835

Int. Cl.⁵ H05K 7/00; B23K 37/04

U.S. Cl. 361-397

5 Claims



1. A printed circuit board handle for attachment to a printed circuit board, said printed circuit board handle comprising: a flange having first and second ribs protruding therefrom; said ribs having substantially the same length and being positioned substantially parallel and in close proximity to, but spaced apart from, each other, with the midpoint of each rib located in a plane perpendicular to the longitudinal axes of said ribs; said flange being attachable to said printed circuit board in such a manner that said ribs cause said flange to be spaced apart from said printed circuit board.

5,086,372

CARD EDGE POWER DISTRIBUTION SYSTEM

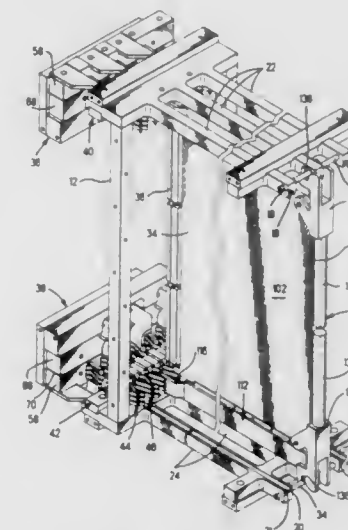
Glenn E. Bennett; John E. Lucius; Roger N. Polk; Frederick H. Rider, and David S. Szczesny, all of Glendale, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 29, 1990, Ser. No. 546,335

Int. Cl.⁵ H05K 7/14

U.S. Cl. 361-415

13 Claims



1. A system for distributing electrical power to daughter cards of a card cage, the card cage having a framework, a backplane, and a card-receiving region forwardly of the backplane including upper and lower card guides at each card location extending from the entrance to the card-receiving region to the backplane at the inwardmost portion of the region, and including electrical connectors on the backplane at each card location mateable with corresponding card edge connectors on the rearward edge of a daughter card upon full insertion of the card into the card cage along the card guides, each daughter card including thereon electrical and electronic components requiring electrical power and signal and power circuit means extending from at least one card edge to at least some of the components, comprising:

- a card cage having a card-receiving region defined by framework and having a backplane disposed at an inwardmost portion of said region, and at least one daughter card receivable into said card-receiving region of said card cage at one of a plurality of card locations;
- means for bussing power to said card locations in said card cage proximate said inwardmost portion of said card-receiving region thereof and defining source and return power paths of said cage;
- contact means mounted to said card cage framework at each said card location at said inwardmost portion and electrically connected thereat to said bussing means, said contact means including contact sections exposed along said inwardmost portion of the card-receiving region for distributing power to a said daughter card inserted into said card cage at a said card location; and
- power bus means mounted on each said daughter card and electrically connected to contact areas of power circuit means of said card, said power bus means including bus contact sections mateable with said contact sections of said card cage contact means to establish electrical connections between said card and said card cage bussing means; each said power bus means being at least two bus members defining source and return power paths respectively of said card, each said bus member being mounted along one of an upper and a lower edge of said daughter card, each said bus member including a said bus contact section extending rearward of said rearward card cage and said card edge connectors mounted therealong to become

mated with corresponding said contact means of said card cage connected to an appropriate one of said source and return power paths of said cage power bussing means, and each said bus member including a plurality of card-engaging terminals for transmitting power to said card contact means proximate said respective card edge; each said power bus means including an insulating means thereover defining a rail cooperable with a channel of a respective guide of said card cage framework at each said card location for guiding said daughter card therealong in cooperation with another rail along the other of said upper and lower card edges in the opposed guide, for at least substantially aligning said corresponding connectors on said rearward card edge with said electrical connectors on said backplane to be mated upon full card insertion; and said contact means of said card cage being mounted therein in a manner permitting incremental positional adjustment upon initial engagement by a respective said bus member contact means which may not be precisely aligned where-with, and in a manner permitting incremental positional adjustment after contact mating upon said daughter card being incrementally repositioned upon positional adjustment during mating of said card edge connector means with said backplane connector means, without generating substantial resistance to said daughter card positional adjustment.

5,086,373

ELECTRIC DOUBLE LAYER CAPACITOR

Ken Kurabayashi, Chigasaki; Yoshibu Tsuchiya, Fujisawa; Akio Yoshida, Kamakura; Hitoshi Koizumi, Hiratsuka, and Yoriaki Niida, Yamato, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

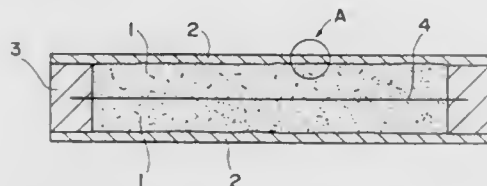
Filed Aug. 28, 1990, Ser. No. 573,694

Claims priority, application Japan, Sep. 7, 1989, 1-232243

Int. Cl.⁵ H01G 9/02

U.S. Cl. 361—502

5 Claims



1. An electric double layer capacitor having an electric double layer, comprising:
 - two polarized electrodes each comprising a porous sintered body, said polarized electrodes having first surfaces disposed out of contact with each other in confronting relationship, and said polarized electrodes having second surfaces having pores;
 - two current collectors each made of an electrically conductive material including a base and electrically conductive fine particles mixed in said base, said current collectors contacting said second surfaces of said polarized electrodes and entering said pores of said second surfaces of said polarized electrodes; and
 - a gasket disposed between said current collectors and surrounding said polarized electrodes, said gasket being joined to peripheral edges of said current collectors.

5,086,374

APROTIC ELECTROLYTE CAPACITORS AND METHODS OF MAKING THE SAME

Douglas R. Mac Farlane; Arthur K. Philpott, and John R. Tetaz, all of Victoria, Australia, assignors to Specialised Conductive Pty. Limited, Victoria, Australia

Filed May 21, 1990, Ser. No. 526,465

Int. Cl.⁵ H01G 9/02

U.S. Cl. 361—525

17 Claims

1. An electrolyte comprising a solution of (a) at least one salt selected from the group consisting of alkali metal salts, transition metal salts, ammonium and ammonium derivative salts, zinc salts, cadmium salts, mercury salts, lead salts, bismuth salts and thallium salts of (b) at least one acid selected from the group consisting of monobasic, dibasic and tribasic acids (c) in an aprotic solvent substantially free of protic impurities, said aprotic solvent having polar groups which impart high solvation power to said solvent and wherein said polar groups are free of labile hydrogen atoms.

5,086,375

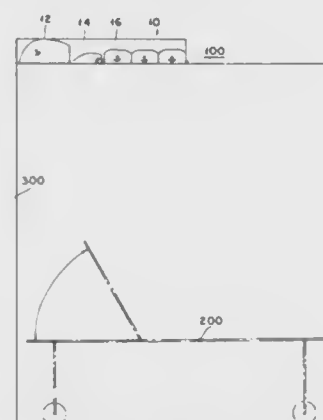
MODULAR MEDICAL LIGHT SYSTEM

William C. Fabbri, Billerica, and Roy B. Crane, Wilmington, both of Mass., assignors to Keene Corporation, Union, N.J. Continuation-in-part of Ser. No. 629,436, Dec. 18, 1990, Pat. No. 5,038,254. This application Apr. 30, 1991, Ser. No. 693,696

Int. Cl.⁵ F21V 13/00

U.S. Cl. 362—33

44 Claims



1. A medical lighting system comprising:
 - a first light fixture module oriented to direct light downwardly to a selected reading area under the medical lighting system, said first light fixture including a first reflector with an inclined axis, a first bulb generally under said first reflector, a forward wall blocking at least a portion of light reflected from said first bulb by said first reflector, and a first shield under said first bulb aligned with said first reflector and with a lower section of said forward wall to prevent non-reflected light from emanating directly from said first bulb outwardly from said first light fixture module;
 - a second light fixture module oriented to direct light downwardly and outwardly to a vertical wall surface outwardly adjacent from the medical lighting system whereby light is reflected back to a broad area under the medical lighting system, said second light fixture module including a second reflector, a second bulb forwardly disposed generally under said second reflector, a wall forward of said second reflector, and a horizontal section joining a lower portion of said wall forward of said second reflector, wherein said wall forward of said second reflector and said horizontal section are positioned with respect to said second bulb to directly illuminate uppermost portions of the vertical wall surface from said second bulb and indirectly illuminate intermediate portions of the

vertical wall surface by light reflected from said second bulb by said second reflector; and a third light fixture module oriented to direct light downwardly under the medical lighting system to a selected patient examination area under the medical lighting system, said third light fixture module including at least one optical system, each of said optical systems including a third reflector including two substantially ellipsoidal contours forming an apex therebetween, a third bulb directly below said apex, vertical risers at outermost edges of said optical system intersecting with outermost edges of said contours, and a second shield under said third bulb aligned with lower ends of said vertical risers to prevent non-reflected light to emanate directly from said third bulb outwardly from said third light fixture module.

5,086,376

MOTOR VEHICLE HEADLIGHT HAVING A REFLECTOR OF COMPLEX SURFACE SHAPE WITH MODIFIED INTERMEDIATE ZONES

Eric Blusseau, Les Pavillons Sous Bois, France, assignor to Valeo Vision, Bobigny Cedex, France

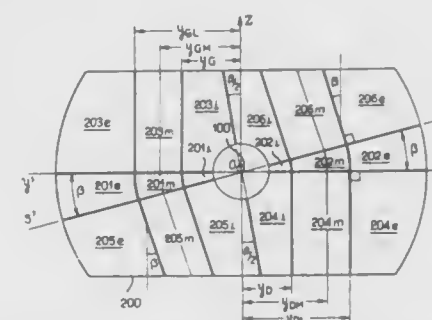
Filed Dec. 5, 1989, Ser. No. 446,117

Claims priority, application France, Dec. 7, 1988, 88 16061

Int. Cl.⁵ B60Q 1/04

U.S. Cl. 362—61

8 Claims



1. A motor vehicle headlight of the type comprising a lamp having a filament, a reflector defining an optical axis, and a closure glass, the filament emitting light freely in all radial directions thereabout and the reflector having a smooth and essentially continuous reflecting surface which reflects the rays emitted by the filament in such a manner as to cause the majority of them to be situated beneath a cut-off constituted by two half-planes of given height and slope, wherein the reflecting surface comprises a central zone which reflects rays from the filament so that they propagate in planes which are essentially vertical, two intermediate zones situated on either side of the central zone and connected thereto with continuity, which intermediate zones reflect the light rays from the filament by imparting a substantial deflection thereto in planes essentially parallel to the cut-off half-plane to the definition of which the rays participate, and at least one peripheral zone situated beyond at least one intermediate zone and being connected thereto with continuity, the peripheral zone reflecting the rays from the filament so that they propagate in planes which are essentially vertical and parallel to the optical axis.

5,086,377

PERSONAL ACCESSORY AND DEFENSE BATON

Bert Roberts, 7053 N. Oracle Rd., Tucson, Ariz. 85704

Filed May 31, 1991, Ser. No. 708,237

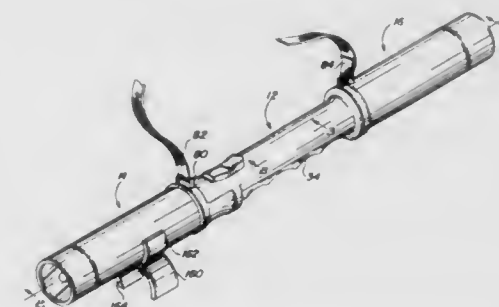
Int. Cl.⁵ A63B 15/02

U.S. Cl. 362—102

17 Claims

1. A non-lethal self-defense baton comprising:
 - (a) a handle having a defined grip, a discharge nozzle and an actuator movable to an on-position which when manually grasped will normally orient the discharge nozzle away for the user; and
 - (b) first and second elongate housing members oppositely

extending from said grip, said first housing member defining first compartment for removably receiving a defense



spray container having a valve therein positioned to be opened when said actuator is moved to an on-position causing spray to be discharged at said discharge nozzle.

5,086,378

FIBER OPTIC FINGER LIGHT

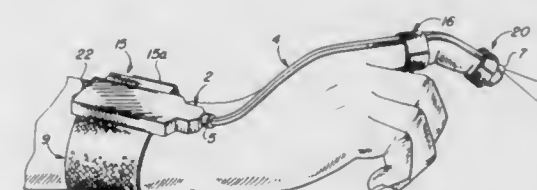
Mark W. Prince, 906 S. Farmerville, Ruston, La. 71270

Filed Aug. 20, 1990, Ser. No. 569,715

Int. Cl.⁵ F21L 15/12; F21V 8/00

U.S. Cl. 362—103

20 Claims



1. A fiber optic finger light for mounting on the wrist and finger of a user, comprising a housing; wrist strap means attached to said housing for removably securing said housing on the wrist; at least one light-emitting diode provided in said housing; at least one lens positioned in said housing in light-receiving relationship with respect to said light-emitting diode; fiber optic cable means extending from said housing for receiving and transmitting light from said light-emitting diode through said lens; finger attachment means carried by said fiber optic cable means for securing said fiber optic cable means to the finger; and switch means electrically connected to a source of electric current and said light-emitting diode, whereby said light-emitting diode is selectively energized to emit light through said lens and said fiber optic cable means responsive to manipulation of said switch means.

5,086,379

LOW VOLTAGE OUTDOOR FLOODLIGHT HAVING ADJUSTABLE BEAM PATTERN, BALL AND SOCKET MOUNTING, AND NOVEL CABLE HANDLING

John F. Denison, Lake Villa; John A. Czerlanis, Solon Mills, both of Ill., and Ronald L. Sitzema, Ellsworth, Mich., assignors to Intermatic Incorporated, Spring Grove, Ill.

Filed Jul. 31, 1989, Ser. No. 387,473

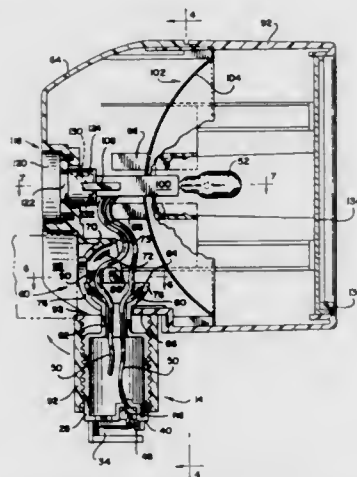
Int. Cl.⁵ F21S 1/02

U.S. Cl. 362—145

16 Claims

1. In combination:
 - a base and a housing joined together along a first axis at a ball and socket coupling so that the housing is above the base, the coupling comprising
 - a first member having a concave surface in the form of a spherical segment and being mounted for movement together with the housing, said first member having a downward-facing opening in the concave surface, the coupling further comprising

a stem portion connected at a first end thereof to the base and extending upward through and movable along the downward-facing opening,
 a second member having a convex surface in the form of a spherical segment, the second member connected to a second end of the stem portion, the convex surface being opposed to said concave surface and being mounted for limited rotational movement about said first axis and limited rotational movement about a second axis orthogonal to said first axis,



a first stop member connected to the concave surface of the first member and extending in a direction toward the second member;
 a second stop member connected to the convex surface of the second member, the second stop member positioned and adapted to interfere with the first stop member whereby rotation of the second member and the first member about said first axis is limited by the interference between the first stop member and the second stop member.

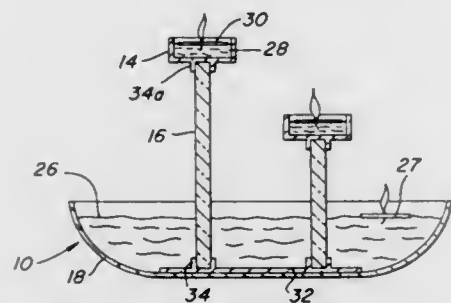
5,086,380

DECORATIVE APPARATUS

Carleton R. Hedner, Jr., 489 Creek Rd., Doylestown, Pa. 18901
 Filed Aug. 6, 1990, Ser. No. 564,532
 Int. Cl.⁵ F21L 19/00

U.S. Cl. 362—161

14 Claims



1. A decorative apparatus comprising:
 (a) an oblong container means for retaining and displaying a liquid medium;
 (b) an insert means located within said container means,
 (c) said insert means comprising a base having a plurality of retention means;
 (d) a plurality of means extending above said liquid medium and maintained in an upright position by being respectively inserted in one said retention means;
 (e) a bowl means located upon the top of said plurality of means extending above said liquid medium;

(f) candle means located within said bowl means,
 (g) whereby the burning of said candle means causes a reflection of light upon said liquid medium, bowls means and extending means to provide atmosphere to a location where said container means is located.

5,086,381

DC-DC CONVERTER

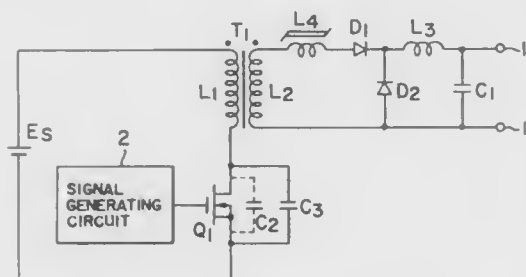
Shigeru Kameyama; Koji Arakawa, both of Tsurugashima; Kazu-shi Watanabe, Nagaoka; Hitoshi Yoshioka, Kawasaki, and Isami Norio, Inagi, all of Japan, assignors to Toko Kabushiki Kaisha; Nemic Lambda Kabushiki Kaisha, both of Tokyo; Yutaka Electric Mfg. Co., Ltd., Kanagawa and Densetsu Corp., Tokyo, all of Japan

Filed Oct. 9, 1990, Ser. No. 594,030

Claims priority, application Japan, Oct. 14, 1989, 1-266616
 Int. Cl.⁵ H02M 3/335

U.S. Cl. 363—16

2 Claims



1. A DC-DC converter comprising:
 a transformer having a primary winding and a secondary winding, said primary winding being adapted to be connected in series with a DC power source;
 a rectifier and smoothing circuit;
 a switching means, adapted to be connected in series with said DC power source, for connecting said rectifier and smoothing circuit to said secondary winding of said transformer during a time when said switching means is in an on-state;
 a capacitor connected in parallel with said switching means; and
 a saturable reactor connected between said secondary winding of said transformer and said rectifier.

5,086,382

CIRCUIT CONFIGURATION FOR A CONTROLLED BLOCKING OSCILLATOR CONVERTER SWITCHING POWER SUPPLY

Martin Feldtkeller, München, and Rainer Dangschat, Landsham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
 Filed Oct. 1, 1990, Ser. No. 591,146

Claims priority, application European Pat. Off., Sep. 29, 1989, 89118086.1

Int. Cl.⁵ H02M 3/335

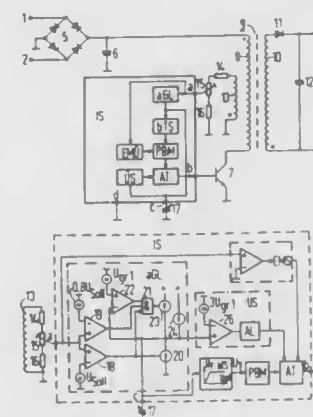
U.S. Cl. 363—21

31 Claims

1. Circuit configuration for a controlled blocking oscillator converter switching power supply, comprising:
 (A) an electric switch having a duty cycle;
 (B) a transformer having
 (a) a primary winding connected in series with said electric switch in the loop of a direct voltage source for alternately turning on said switch in a first operating phase and turning off said switch in a second operating phase, and
 (b) a secondary winding outputting an alternating voltage from which a direct voltage is obtained;
 (C) a variable capacitor having a voltage;
 (D) an integratable trigger circuit connected to said switch

for pulse width modulated switching of said switch, said integratable trigger circuit having

(a) a controller for receiving an input voltage being at least approximately proportional to the alternating voltage, for comparing the input voltage with a set-point voltage, and for deriving a further voltage from the difference between the input and set-point voltages, said further voltage being the voltage of said variable capacitor, said controller including a controlling recti-



fier for charging said variable capacitor when the input voltage is less than the set-point voltage and discharging said variable capacitor when the input voltage is greater than the set-point voltage during the second operating phase, and

(b) a pulse width modulator connected between said controlling rectifier and said variable capacitor for determining the duty cycle of said switch as a function of the further voltage.

5,086,383

STEP-UP POWER SUPPLYING CIRCUIT

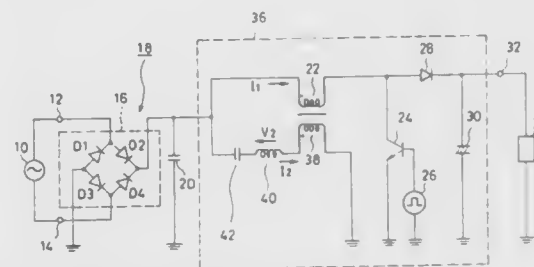
Seiji Oda, Toyama, Japan, assignor to Elco Co., Ltd., Toyama, Japan

Filed Apr. 30, 1991, Ser. No. 693,594

Int. Cl.⁵ H02M 1/12

U.S. Cl. 363—44

5 Claims



1. A step-up power supplying circuit for rectifying an AC voltage and, thereafter, for stepping up and generating a step-up voltage, comprising:
 rectifying means for rectifying the AC voltage;
 smoothing means for smoothing a rectified output of said rectifying means;
 chopper means for transferring a DC voltage which is generated from said smoothing means to a choke coil, for rectifying and smoothing an intermittent energy which is generated by on/off driving operations of said choke coil by switching means, and thereby for generating a step-up DC voltage;
 another winding which is magnetically coupled to said choke coil so as to have a same polarity and whose one

end is connected to a ground and whose the other end is connected to an input side of the choke coil; and
 an inductance which is connected serially with said another winding and adjusts a current flowing in said another winding.

5,086,384

MASTER-SLAVE-TYPE CONTROL SYSTEM WITH STAND-BY SUSPENDING CONTROL STATION

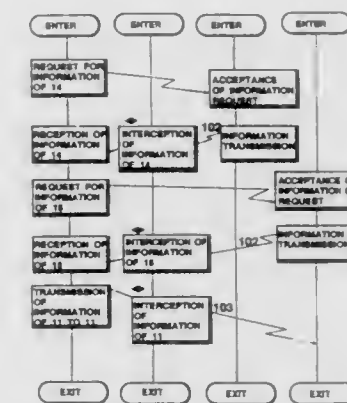
Akio Fukada, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 7, 1989, Ser. No. 403,286

Claims priority, application Japan, Sep. 7, 1988, 63-222487
 Int. Cl.⁵ G06F 11/20

U.S. Cl. 364—187

9 Claims



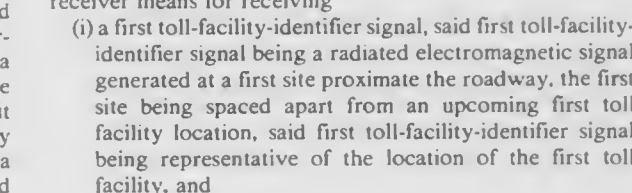
6. A method of controlling a master-slave-type control system including a common transmission passage for transmitting various data, at least one control terminal device connected to said transmission passage, a normal supervisory control station, connected to said transmission passage for supervising operations of said control terminal device, and a stand-by supervisory control station connected with said control terminal device and said normal supervisory control station only through said transmission passage for supervising operations of said control terminal device in case said normal supervisory control station is disabled, the method comprising the steps of:

transmitting first data concerning information to be communicated between said control terminal device and a currently operative one of said normal supervisory control station and said stand-by supervisory control station which is currently supervising operation of said control terminal device, through said common transmission passage between said normal supervisory control station and said control terminal device;
 intercepting said first data transmitted on said common transmission passage at said stand-by supervisory control station;
 transmitting second data, concerning information about an internal state of said normal supervisory control station, from said normal supervisory control station through said common transmission passage to an imaginary station having a non-existent address;
 intercepting said second data transmitted on said common transmission passage at said stand-by supervisory control station;
 detecting an abnormality of said normal supervisory control station by said stand-by supervisory control station in accordance with said second data obtained by intercepting said second data sent to said imaginary station; and
 switching from control by said normal supervisory control station to control by said stand-by supervisory control station when said abnormality of said normal supervisory

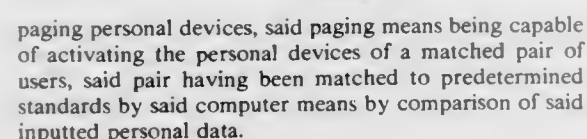
20 Claims



16 Claims



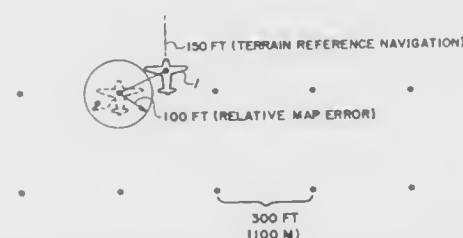
the microcomputer being programmed to provide voltage pulses for setting the flip-flop to generate a positive voltage at the positive voltage output of the noninverting power amplifier, and a control voltage to the inverting power amplifier to generate a negative voltage at the negative voltage output of the inverting power amplifier; the electromagnetic control element being held in the first control state when a predetermined voltage is present at the positive voltage output of the noninverting power amplifier and at the negative voltage output of the inverting power amplifier, and being held in the second control state when the predetermined voltage decreases below a predetermined voltage value at at least one of the outputs.



9. The method of assisting navigation of an aircraft on a mission, said method comprising the steps of:

- by means of navigational equipment, identifying an approximate position of said aircraft relative to a terrain map, said terrain map having at least digitized terrain elevations stored as a functions of global coordinates;
- comparing terrain profiles determined by measurements of a distance of said aircraft from terrain over which said aircraft is flying with terrain map profiles to determine a position of said aircraft relative to said terrain map;
- displaying a presentation of a local region of said terrain map with an icon of said aircraft positioned on said presentation in said position of said aircraft relative to said terrain map; and
- implementing said presentation to provide a visual indication of terrain map features which currently provide a threat to aircraft security.

U.S. Cl. 364—454 20 Claims



9. The method of assisting navigation of an aircraft on a mission, said method comprising the steps of:

- by means of navigational equipment, identifying an approximate position of said aircraft relative to a terrain map, said terrain map having at least digitized terrain elevations stored as a functions of global coordinates;
- comparing terrain profiles determined by measurements of a distance of said aircraft from terrain over which said aircraft is flying with terrain map profiles to determine a position of said aircraft relative to said terrain map;
- displaying a presentation of a local region of said terrain map with an icon of said aircraft positioned on said presentation in said position of said aircraft relative to said terrain map; and
- implementing said presentation to provide a visual indication of terrain map features which currently provide a threat to aircraft security.

7 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

RECEIVING BIN
PULL AND FIX
FIRST ASSEMBLY STATION
SECOND ASSEMBLY STATION
NTH ASSEMBLY STATION
SOLDER
TEST IN CIRCUIT
SYSTEM ASSEMBLY
FUNCTION TEST
SYSTEM TEST
PACKING AND SHIPPING
REMOTE CONTROL STATION

SCREEN
LIGHTENER
KEYBOARD
BUS
PRINTER
PROGRAM DATA MEMORY
PROGRAM PROCESSOR
ON-LINE HARD DISK
TYPICAL INSPECTION STATION

OUTPUT

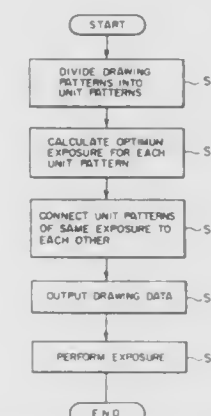
comprising:

- (a) at least one inspection station having data input terminal means for use by an inspector to input data relating to manufacturing or component defects as observed after component installation along the assembly line wherein the defects are coded with defect specific codes, and the defects are converted by said terminal means into defect codes;
- (b) output means for forming an indication in real time from data input upon entry of a defect at said terminal means during inspection, said output means forming an output indicative of the defect; and
- (c) a CPU connected between said terminal and said output means, said CPU correlating the output of said output means with the coded defect input from said terminal means and forming a coded indication that the defect has occurred in real time and further forming an indication regarding the significance of the defect.

1. A method for controlling exposure by an electron beam of a pattern, the pattern including at least one large-area drawing pattern and at least one small-area drawing pattern, the method comprising:

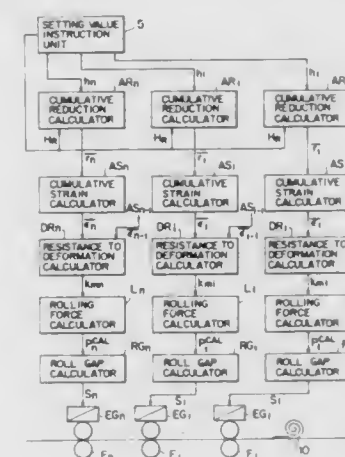
comprising:

- specifying a pattern including at least one large-area drawing pattern and at least one small-area drawing pattern;
- dividing at least one of the large-area drawing patterns into a plurality of unit patterns;
- calculating electron beam exposure for each unit pattern and each small-area drawing pattern including a proximity effect correction for each unit pattern and each small-area drawing pattern;



merged larger patterns formed from unit patterns, for the unit patterns not merged with other unit patterns, and for the small-area drawing patterns; and exposing the pattern to an electron beam controlled by the drawing data.

U.S. Cl. 364—508 4 Claims



1. A method of setting roll gaps of a rolling mill including a plurality (n) of tandem-arranged mill stands F_1, F_2, \dots, F_n , comprising
 - a first step of calculating a cumulative reduction r_i at each said stand F_i ($i = 1, 2, \dots, n$) from a transfer bar thickness H_R at an entrance side of said rolling mill and a setting thickness h_i at an exit side of each said stand,
 - a second step of calculating a cumulative strain ϵ_i of a workpiece in said stand F_i from said cumulative reduction r_i ,
 - a third step of calculating resistance to deformation k_{mi} of said material in said stand from said cumulative strain ϵ_i ,
 - a fourth step of calculating a rolling force P_i^{CAL} of said stand F_i from said resistance to deformation k_{mi} ,

a fifth step of calculating an objective roll gap S_i of said stand F_i from said rolling force P_i^{CAL} , and
a sixth step of setting a roll gap such that an actual roll gap of said stand F_i coincides with said objective roll gap S_i .

5,086,400

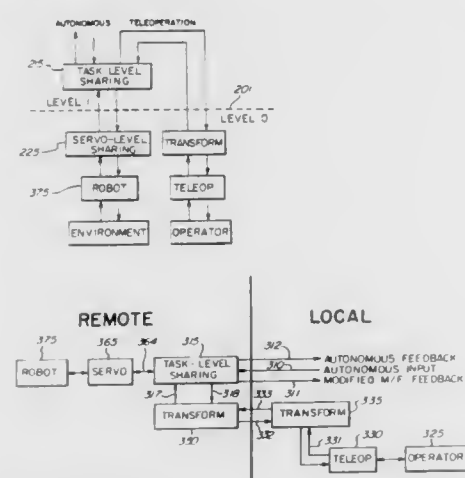
BILEVEL SHARED CONTROL FOR TELEOPERATORS
Samad A. Hayati, Altadena, and Subramanian T. Venkataraman, Cerritos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 11, 1990, Ser. No. 522,949

Int. Cl.⁵ G06F 15/00

U.S. Cl. 395—95

58 Claims



1. A hierarchical robotic control system for controlling a robot located at a remote site which is remotely located from a point of command over said robot at a local site, which robotic control system experiences communication time delays between said local and remote sites and shares autonomous and teleoperator hand-controller ("teleoperator") commands including motion and force, a task trajectory for performing a given task, and a teleoperator trajectory as directed by a teleoperator for remotely performing said given task, all expressed as individual command signals applied to and fed back from said control system, with said commands being implemented in said control system in a task level and in an execution level, said robotic control system comprising:

a task level including means for controlling said robot in motion and force, task trajectories, and/or teleoperator trajectories in said task level to control tasks being performed by said robot;

an execution level including means at said local site for transforming teleoperator command signals which are subjected to said communication time delays from a local coordinate system at said local site to the coordinates being used as task level commands at said robot's remote site; and

a combined command signal selection and signal mixing means at the remote site for varying the effectiveness in autonomous control over said robot by said communication time delayed teleoperator command signals in accordance with the length of communication time delays said teleoperator command signals experience in travelling between said local and said remote sites.

5,086,401
IMAGE-DIRECTED ROBOTIC SYSTEM FOR PRECISE ROBOTIC SURGERY INCLUDING REDUNDANT CONSISTENCY CHECKING

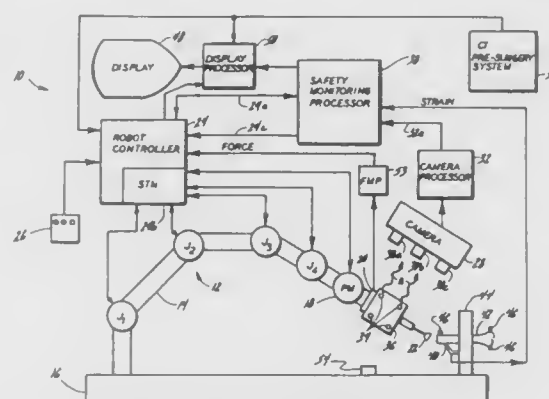
Edward Glassman, New York, N.Y.; William A. Hanson, Mountain View, Calif.; Peter Kazanzides, Davis, Calif.; Brent D. Mittelstadt, Placerville, Calif.; Bela L. Musits, Hopewell Junction, N.Y.; Howard A. Paul, Loomis, Calif., and Russell H. Taylor, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 11, 1990, Ser. No. 523,611

Int. Cl.⁵ A61B 17/56

U.S. Cl. 395—94

23 Claims



1. A robotic surgical system comprising:
multiple degree of freedom of manipulator arm means including a surgical tool, the manipulator arm means being coupled to means for controllably positioning the surgical tool during the operation thereof within a three dimensional coordinate system;

means for determining a position of the surgical tool in the three dimensional coordinate system relative to a volumetric model that corresponds at least in part to a volume of tissue to be operated on by the surgical tool, the determining means including redundant means for detecting a position of the surgical tool within the three dimensional coordinate system during the operation of the surgical tool, the detecting means having an output coupled to means for processing the volumetric model for determining the position of the surgical tool relative to the volumetric model, the processing means having an output coupled to a first input of the positioning means for causing the positioning means to suspend a motion of the surgical tool if the position of the surgical tool is detected to lie outside of the volumetric model; and

means for measuring a magnitude of a force applied to the surgical tool during the operation of the surgical tool, the force measuring means having an output coupled to a second input of the positioning means for causing the positioning means to suspend a motion of the surgical tool if a force greater than a predetermined force is measured.

5,086,402
METHOD FOR HIGH SPEED DATA TRANSFER
Edward W. Sterling, II, Bolton, Mass., assignor to Simware, Inc., Nepean, Canada

Continuation-in-part of Ser. No. 377,634, Jul. 10, 1989, abandoned. This application May 30, 1990, Ser. No. 528,339

Int. Cl.⁵ G06K 15/00; H04L 11/00

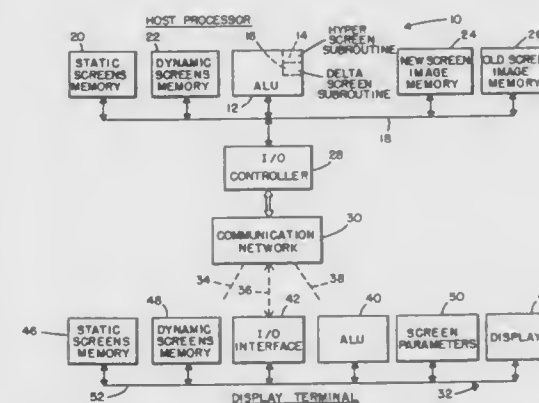
U.S. Cl. 364—514

31 Claims

1. An efficient method for transfer of information over a communication link between first and second processors, said processors employing blocks of data on a repetitive basis, each said processor including storage means for storing copies of used blocks of data, a block of data currently used in said second processor termed an old data block and a block of data

to be transmitted from said first processor to said second processor termed a new data block, the method comprising:

- storing identical copies of used data blocks and said old data block in said storage means of said first and second processors;
- comparing in said first processor, said new data block to said stored copies of said used data blocks and said old data block to determine if said new data block exhibits a



preestablished level of similarity with any said stored data block copy, and selecting from among said copies of stored data blocks, a data block which exhibits said preestablished level of similarity; and
(c) transmitting to said second processor, information regarding the difference between said new data block and said selected stored data block, and the identity of said selected stored data block.

5,086,403
LIQUID LEAK TEST PROBE WITH COMPENSATION FOR GAS IN LINE

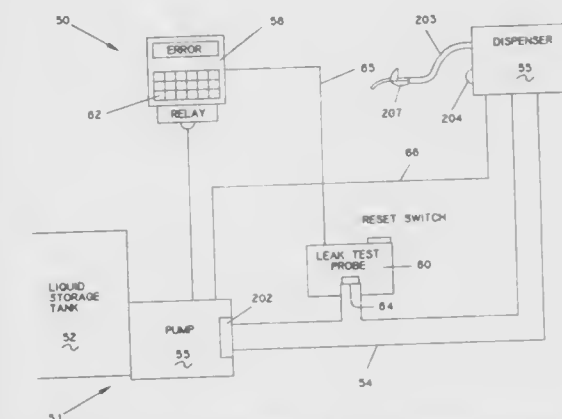
Laurence S. Slocum, and Michael T. Clouser, both of Indianapolis, Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 9, 1990, Ser. No. 491,224

Int. Cl.⁵ G01L 27/00

U.S. Cl. 364—558

10 Claims



8. A leak test probe for use in a liquid storage and dispensing system, said leak test probe comprising:
pressure transducer means for providing a pressure signal representative of the pressure in a liquid conduit;
timing means for providing a timing signal;
leak test means responsive to said pressure signal and said timing signal for providing a leak signal; and
said leak test means comprising:
rate means for measuring the time rate of change of said pressure;
means responsive to said rate means for providing said leak

signal if the time rate of change of said pressure indicates that said system is leaking;
parameter measuring means for measuring a parameter of said system; and
sliding time scale means for adjusting a sliding window time scale of said rate means depending on said measured parameter.

5,086,404
DEVICE FOR SIMULTANEOUS CONTINUOUS AND SEPARATE RECORDING AND MEASUREMENT OF HEAD AND BODY MOVEMENTS DURING STANDING, WALKING AND STEPPING

Claus-Frenz Claussen, Kurhausstrasse 12, D-8730 Bad Kissingen, Fed. Rep. of Germany

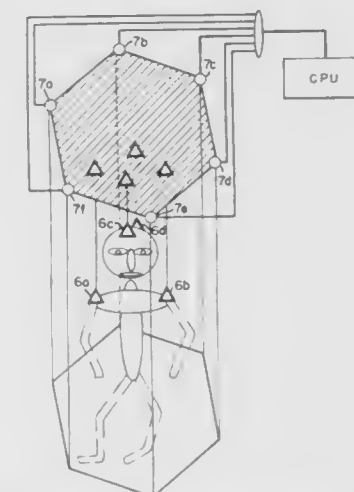
Continuation of Ser. No. 486,128, Feb. 28, 1990, abandoned.

This application Mar. 27, 1991, Ser. No. 677,372

Int. Cl.⁵ G06G 7/48; G09G 3/02; G01B 11/26

U.S. Cl. 364—559

15 Claims



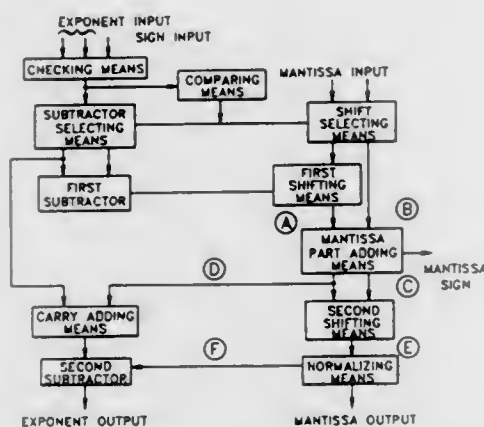
10. An apparatus for continuous and separate recording and measurement of movements of a test object, comprising:
optical markers attached to the test object, which markers output optical signals;
means for continuously receiving and recording the optical signals from the optical markers, said receiving and recording means being stationarily fixed above the test object, said receiving and recording means including at least three photoelectric cells arranged in a polygon so that to project a cylindrical vertical projection upon the test object, and so as to measure light intensity of the optical signals and put out corresponding signals; and
central processing means for successively comparing and computing different light intensities of the photoelectric cells against each other for generating virtual data points, measurements from the cells being successively called into the central processing means by a data flow, and thereafter, if necessary for resolution, followed by at least one successive generation of virtual data points from the light intensity comparisons previously computed, which again are successively and pair wise compared and computed with respect to the virtual data points having coordinates inside the polygon, until the points are projected and displayed with a set precision into a data bank from which the points are transferably into a projection frame.

5,086,405
FLOATING POINT ADDER CIRCUIT USING NEURAL NETWORK

Ho-sun Chung, and Seung-yeob Paek, both of Taegu, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Jul. 10, 1990, Ser. No. 550,450
Claims priority, application Rep. of Korea, Apr. 3, 1990, 90-4517

Int. Cl.⁵ G06F 7/50
U.S. Cl. 364-748 7 Claims



1. A floating point adder circuit using neural network which adds two binary numbers of $K(M+N)$ bit that consist of an M-bit exponent part and an N-bit mantissa part comprising:

a comparator for comparing the exponent magnitude of said two binary numbers by comprising first input synapses for connecting a first power supply voltage to a line as the connecting strength of the weight of each bit according to a first exponent value of said M-bit; second input synapses for connecting a second power supply voltage to said line as the connecting strength of the weight of each bit according to a second exponent value of said M-bit; and a neuron which is stimulated or restrained according to the difference of the connecting strength between said first power supply voltage and said second power supply voltage that are connected to said line;

an adder which add the mantissa parts of said two binary numbers by comprising input synapses for respectively connecting said second power supply voltage to a first line of $N+1$ numbers as the connecting strength of the weight of each bit according to a first mantissa value of said N-bit, a second mantissa value of said N-bit and a carry input of one-bit; first bias synapses for connecting said first power supply voltage to each first line as the connecting strength of a multiple of said input connecting strength sum; feedback synapses for connecting said second power supply voltage to a second line of $N+1$ numbers of each lower output bit as the connecting strength of the weight of upper output bit; second bias synapses for connecting said first power supply voltage to the least significant bit line among said second lines as the connecting strength which subtracts 0.5 from the connecting strength of said first bias synapse and to the other lines as the connecting strength which subtracts the weight of the bit from the connecting strength of each lower bit line, in order to bias said each second line connected to said feedback synapses; neurons which are stimulated or restrained by comparing the difference of the connecting strength of said first power supply voltage and said second power supply voltage which are respectively connected to said first line and said second line; and inverters for inverting the output of each of said neurons; and

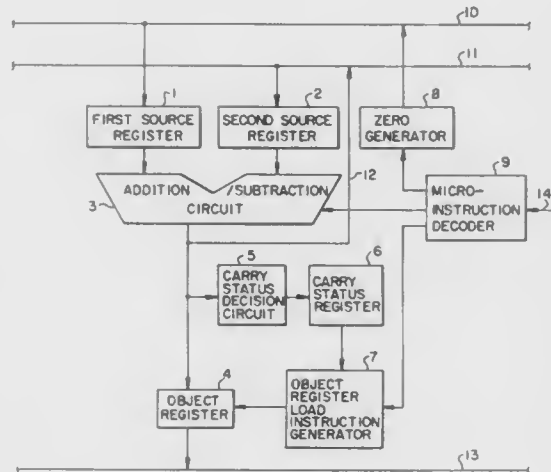
a subtractor comprising said adder and inverters for inverting some mantissa value of said N-bit and said carry input.

5,086,406
CIRCUIT ARRANGEMENT FOR DECIMAL ARITHMETIC

Shinichi Okugawa, Tokyo, and Shigenobu Sugimoto, Gunma, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 28, 1990, Ser. No. 544,863
Claims priority, application Japan, Jun. 28, 1989, 1-163679

Int. Cl.⁵ G06F 7/50
U.S. Cl. 364-781 2 Claims



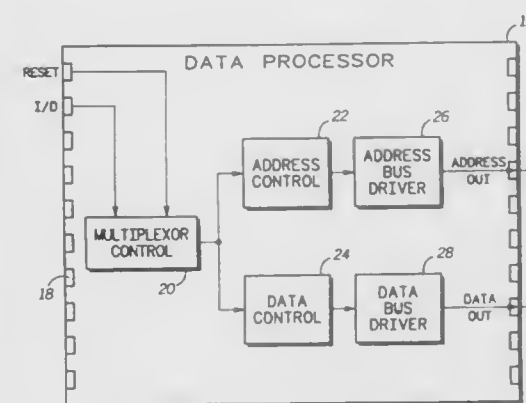
1. A circuit for decimal arithmetic comprising:
- a first register for storing a minuend in Binary Coded Decimal (BCD) representation,
 - a second register for storing a subtrahend in BCD representation,
 - a third register,
 - a carry status decision means for producing a first signal as a carry status when the subtrahend is larger than the minuend and a second signal as the carry status when the subtrahend is less than the minuend in a first subtraction,
 - a carry status register connected to the carry status decision means for holding the carry status sent from the carry status decision means,
 - a zero generation means for generating a zero in BCD representation;
 - a binary coded decimal subtraction means for receiving the minuend from the first register and the subtrahend from the second register, performing the first subtraction and after the first subtraction of the subtrahend from the minuend, storing a result of the first subtraction in the second register and in the third register, and subsequently storing the zero in the first register, and for subtracting the result of the first subtraction from the zero in the first register, and
 - an inhibition means for preventing the third register from storing the result of the second subtraction when the carry status register holds the second signal, the inhibition means further assigning a positive sign to the result in the third register if the preventing takes place and a negative sign to the result in the third register if no preventing occurs.

5,086,407
DATA PROCESSOR INTEGRATED CIRCUIT WITH SELECTABLE MULTIPLEXED/NON-MULTIPLEXED ADDRESS AND DATA MODES OF OPERATION

Ralph C. McGarity, 3813 Kandy Dr., Austin, Tex. 78749; William B. Ledbetter, Jr., 11802 Knollpark Dr., Austin, Tex. 78758; Steven C. McMahan, 8405 Manuai Dr., Austin, Tex. 78749; Michael G. Gallup, 1102 Radan Cir., Austin, Tex. 78745; Russell Stanphill, 8405 Bent Tree #2823, Austin, Tex. 78759, and James G. Gay, 301 Oat Meadow Dr., Pflugerville, Tex. 78660

Filed Jun. 5, 1989, Ser. No. 361,539
Int. Cl.⁵ G06F 13/38

U.S. Cl. 395-800 9 Claims



1. A data processor integrated circuit having first and second terminals for respectively being coupled to an address communication bus and a data communication bus, said first and second terminals of the data processor integrated circuit being externally controlled for either time division multiplexed or non-multiplexed operation, said data processor integrated circuit providing data and address timing control signals, said data processor integrated circuit having multiplex bus mode circuitry comprising:

control means having an input for receiving a bus mode signal, said bus mode signal being controlled from external to the data processor integrated circuit to place the data processor integrated circuit in either a multiplexed or non-multiplexed bus operation, said control means selectively providing a data drive signal at a first output and an address drive signal at a second output;

address bus drive means having an input coupled to the second output of the control means and an output coupled to the first terminal of the data processor integrated circuit for providing address bits at the first terminal of the data processor integrated circuit in response to the address drive signal; and

data bus drive means having an input coupled to the first input of the control means and an output coupled to the second terminal of the data processor integrated circuit for providing data bits at the second terminal of the data processor integrated circuit in response to the data drive signal;

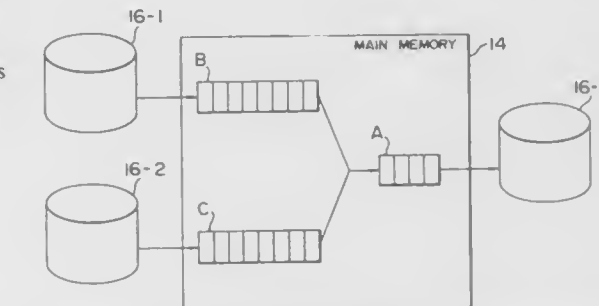
said data processor integrated circuit implementing time division multiplexed operation of address and data bits in response to the bus mode signal when the first and second terminals are directly connected and without requiring additional circuitry external to the data processor integrated circuit, said data processor integrated circuit not implementing time division multiplexing of data and address bits in response to the bus mode signal, the first and second terminals not being directly connected when time division multiplexing is not implemented.

5,086,408
METHOD AND APPARATUS FOR MERGING

Akiharu Sakata, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1988, Ser. No. 192,134
Claims priority, application Japan, May 13, 1987, 62-114600

Int. Cl.⁵ G06F 7/14
U.S. Cl. 395-600 17 Claims



1. A three-way merging apparatus for connection to a first storage, in which three input data strings are stored, and a second storage, and operative to merge said three input data strings and store the result in said second storage, said apparatus comprising:

work areas in memory including a first area for storing a first of said three input data strings sequentially, a second area for storing a second of said three input data strings sequentially, a third area for storing a third of said three input data strings sequentially, a fourth area for storing a result of merging between data stored in said first and second areas, and a fifth area for storing a result of merging between data stored in said fourth area and third area, said fourth area having a size at least equal to the size of said fifth area, said first, second and third areas each having a size at least twice the size of said fourth area;

two-way merging means for executing a two-way merging; and

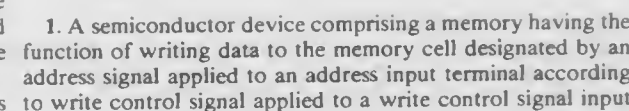
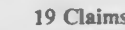
means for controlling said first and second storages and said two-way merging means to cause storing of a result of merging from said fifth area unit into said second storage, said controlling means including:

(a) means responsive to a vacant area in one of said first, second and third areas becoming available for a number of data, which are stored in said fifth area as a result of execution of said two-way merging, for loading a part of a data string which is to be loaded in said one of said first, second and third areas to said vacant area;

(b) means for setting a number of data, which can be stored in said fifth area, as a first number of data to be merged by said merging means; and

(c) means for comparing a number of data stored in said fourth area with said first number of data, and (i) if said number of data stored in said fourth area is greater than or equal to said first number of data, for causing a merging between data in said fourth and third areas and a storing of the result obtained into said fifth area for storage into said second storage, or (ii) if said number of data stored in said fourth area is smaller than said first number of data, for setting a number of data, which can be stored in a vacant area of said fourth area, as a second number of data, and causing a first merging for said second number of data between data in said first and second areas, a second merging for said first number of data between data in said fourth area, where the result of merging is stored, and data in said third area, and a delivering of the result of the second merging to said fifth area for storage into said second storage.

27 Claims

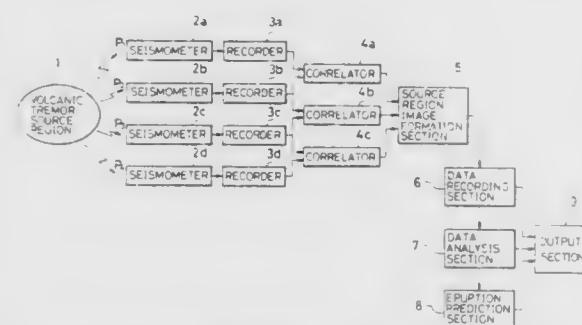


terminal and data supplied to a data input terminal, wherein a plurality of stages of latch circuits are provided in a signal path from the write control signal input terminal or data input terminal up to the memory cell, wherein the latch circuits of at least two stages are coupled in such a manner that the output signal of the latch circuit at the preceding stage is fed to the latch circuit at the following stage directly or indirectly via another circuit, and wherein the latch circuits at the preceding and the following stages have an inverse operating relationship in which control is effected by a pair of complementary clock signals in which one is the logic invert of the other or by a single clock signal so that with respect to each consecutive pair of latch circuits coupled one is placed in a hold-state and the other in a through-state.

5,086,415
METHOD FOR DETERMINING SOURCE REGION OF VOLCANIC TREMOR

Kozo Takahashi, 7-14-7 Takiyama, Higashi-Kurume-shi, Tokyo, and Yukio Fujinawa, 6-5-1 Nakamura Minami, Tsuchiura-shi, Ibaraki-ken, both of Japan

Filed Jan. 4, 1991, Ser. No. 637,531
Claims priority, application Japan, Jan. 6, 1990, 2-889
Int. Cl.⁵ G01V 1/00; G01S 3/80, 3/808
U.S. Cl. 367-125 2 Claims

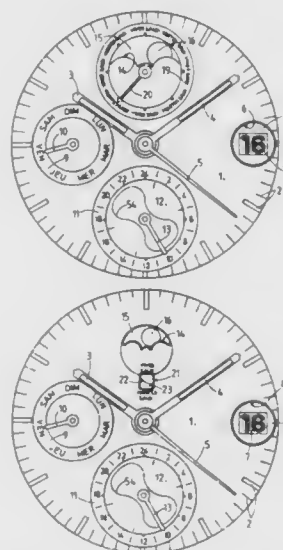


1. A method for determining a source region of a volcanic tremor, comprising the steps of:
detecting a volcanic tremor with seismometers at at least four observation points at the same time and recording the detected tremor from each seismometer in the form of a signal;
obtaining at least three cross-correlation functions among pairs of the recorded signals of the tremors detected at the observation points;
calculating at least three observation time lags at which the respective correlation functions become maximal; and
determining the source region of the volcanic tremor from the maxima of the at least three cross-correlation functions which directly correspond to the at least three observation time lags.

5,086,416
DISPLAY MODULE FOR WATCH MOVEMENT
Gerald Dubois, and Francois Berthoud, both of Le Lieu, Switzerland, assignors to Dubois & Depraz S.A., Le Lieu, Switzerland
Filed Apr. 10, 1990, Ser. No. 507,188
Claims priority, application Switzerland, Apr. 14, 1989, 1432/89
Int. Cl.⁵ G04B 19/26 15 Claims

1. Analogic display module comprising a dial provided with an hour graduation cooperating with hands intended to be driven by a movement on which the module can be fixed, said dial comprising further a circular graduation of twenty-four hours having a hand adapted to be driven in rotation by a said movement at a speed of one revolution per twenty-four hours and circumscribing a tides disc adapted to be driven in rotation by a said movement at a speed of one revolution for each moon

cycle, said module further comprising a base plate carrying said dial and a sleeve adapted to be driven by a said movement at a speed of one turn per twelve hours, said sleeve having a pinion meshing with a movable member having a slot in which

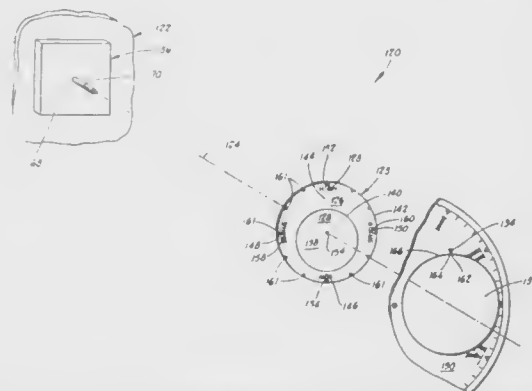


a pin is located, said pin being secured to a disc pivoted concentrically on said movable member, the last-named disc comprising at least one finger engaging with a toothing carried by the tides disc, and said movable member meshing also with a secondary movable member secured to said hand.

5,086,417
NAUTICAL MOON AND TIDE CLOCK APPARATUS
Breene M. Kerr, 1200 Davinbrook, Oklahoma City, Okla. 73118
Continuation of Ser. No. 422,991, Oct. 16, 1989. This application Oct. 9, 1990, Ser. No. 594,650

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.⁵ G04B 19/26 14 Claims

U.S. Cl. 368-19



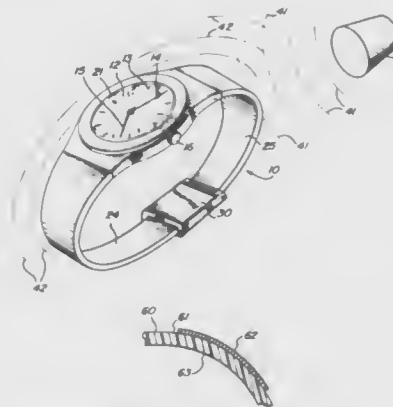
1. A tide clock for indicating a state of the tide comprising:
a base;
a tide disk attached to said base and rotatable about a central axis perpendicularly extending therefrom, said tide disk including:
a front surface; and
tide representation means for representing a high tide, said tide representation means comprising a flat circular member eccentrically disposed on said front surface in a fixed position such that the periphery of said circular member is contained within the periphery of said tide

disk whereby the greatest distance on said front surface between the periphery of said circular member and the periphery of said tide disk visually represents said high tide;

a clock face having an opening disposed therethrough fixedly attached to said base in a position adjacent to said tide disk such that said tide disk is visible through said opening, said opening including a top portion positioned above said tide representation means;
marker means fixedly attached to said clock face adjacent to and above said top portion of said opening of said clock face for marking a position of said tide representation means with respect to said base and clock face that indicates the time of said high tide; and
drive means attached to said base for rotating said tide disk about said axis at a rate of approximately one revolution every 12 hours and 25 minutes.

5,086,418
LUMINESCENT FEATURED WATCH
Mark W. Marcus, 20671 De La Guerra, Woodland Hills, Calif. 91364

Filed Mar. 28, 1991, Ser. No. 676,856
Int. Cl.⁵ G04B 19/32, 37/00 8 Claims
U.S. Cl. 368-226



1. A luminescent featured watch comprising:
a case formed of a luminescent material for supporting a time-piece mechanism;
a watchband joined to said case and formed of a luminescent material; and
a time indicia bearing face supported by said case.

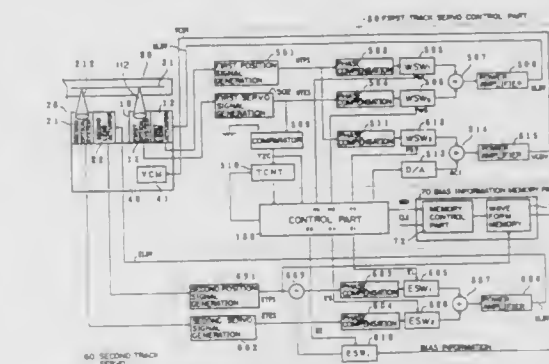
5,086,419
OPTICAL DISK APPARATUS FOR CONTROLLING SECOND OPTICAL BEAM BASED ON BIAS INFORMATION

Shigenori Yanagi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1990, Ser. No. 575,847
Claims priority, application Japan, Aug. 31, 1989, 1-222936
Int. Cl.⁵ G11B 7/00 14 Claims

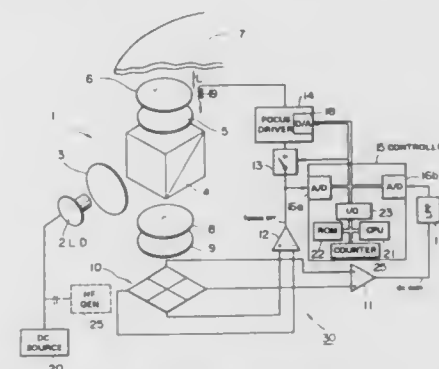
1. An optical disk apparatus having a first optical head equipped with a first lens actuator for movement control of a first light beam projected to a location on a track of an optical disk and a second optical head equipped with a second lens actuator for controlling the movement of a second light beam projected to another location of an optical disk different from the location projected to by said first light beam, comprising:
a first track servo control part means for performing control so that the first light beam is projected to a track and for generating a control signal;
a second track servo control part means for performing

control so that the second light beam is projected to a track;
a positioner means for controlling the movement of the first and second optical heads in response to the control signal; and
a bias information memory part means for storing bias information including information pertaining to a position of the second optical head relative to said first optical head obtained when said first and second track servo control



part means control the light beams of both said first and second optical heads to properly track on the same track; and
means for enabling said second track servo control part means to control the position of the second optical head according to the bias information stored in said bias information memory part means when the first light beam is projected on a target track.

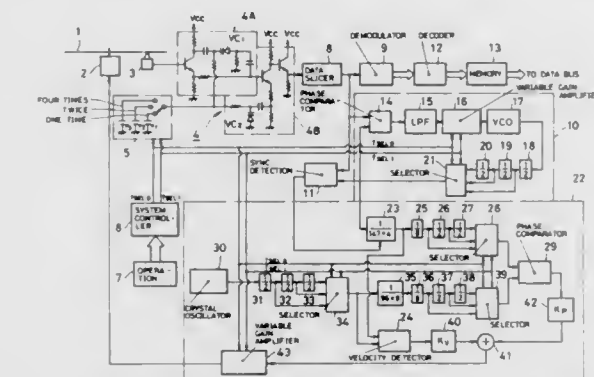
5,086,420
FOCUS CONTROL APPARATUS FOR USE WITH AN OPTICAL DISK FOR DETERMINING WHETHER A FOCUSED STATE HAS BEEN OBTAINED
Masanori Doi, Oume, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 178,941, Apr. 7, 1988, abandoned. This application Aug. 6, 1990, Ser. No. 563,733
Claims priority, application Japan, Apr. 7, 1987, 62-85529
Int. Cl.⁵ G11B 7/00 10 Claims
U.S. Cl. 369-44.25



1. An optical disk apparatus comprising:
optical beam generating means for outputting an optical beam;
an objective lens condensing said optical beam;
an optical recording medium onto which a condensed optical beam is irradiated;
a lens actuator moving said objective lens in a direction perpendicular to a surface of said recording medium by a signal applied thereto;
focus error signal outputting means for detecting light returning from said recording medium and therein generating a focus error signal which corresponds to a relative

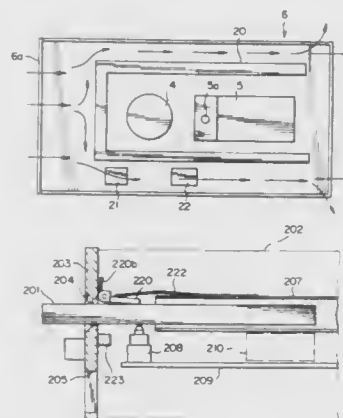
distance between said objective lens and said recording medium;
 added signal generating means for detecting the light returning from said recording medium and for outputting a signal representing a total amount of said light;
 means for outputting a lens moving signal to said lens actuator to move said objective lens;
 means for setting first and second predetermined standard levels, said first standard level representing a desired value of said focus error signal and said second level representing a desired value of said signal representing the total amount of said light;
 a first judging means for comparing said generated focus error signal with said first predetermined standard level while said lens moving signal is being output;
 means for controlling a focusing pull timing of applying said focus error signal to said lens actuator by a judging signal from said first judging means; and
 a second judging means for determining whether or not a focused state has been obtained by comparing said signal representing the total amount of light to said second predetermined standard level after the focusing pull has been completed.

5,086,421
DISK PLAYING APPARATUS HAVING A COMPENSATION CHARACTERISTIC VARIABLE WITH VELOCITY INFORMATION
 Kiyoshi Tateishi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
 Filed Sep. 21, 1990, Ser. No. 585,916
 Claims priority, application Japan, Dec. 22, 1989, 1-334280
 Int. Cl.⁵ G11B 7/00
 U.S. Cl. 369—50 3 Claims



1. A disk playing apparatus for playing a disk on which a digital signal treated by a predetermined modulation process is recorded, comprising:
 reading means for reading information recorded on said disk;
 velocity information outputting means for outputting velocity information indicating the speed of reading information from said disk by said reading means; and
 compensating means for compensating phase and frequency characteristics of a read signal obtained by said reading means, said compensating means having a compensation characteristic variable with said velocity information.

5,086,422
OPTICAL DISK APPARATUS
 Toshimichi Hagiya, Hadano; Junichi Watanabe, Yokohama; Tetsuo Kanno, Ebina; Hideo Inuzuka, Yokohama; Makoto Yamahata, Fukuoka; Masaaki Sofue, Hadano, and Yoshiaki Aota, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
 Filed May 25, 1990, Ser. No. 529,235
 Claims priority, application Japan, Jun. 19, 1989, 1-154463; Jun. 20, 1989, 1-155764; Aug. 9, 1989, 1-204596; Oct. 17, 1989, 1-120593
 Int. Cl.⁵ G11B 33/02, 3/58, 5/012
 U.S. Cl. 369—75.1 11 Claims

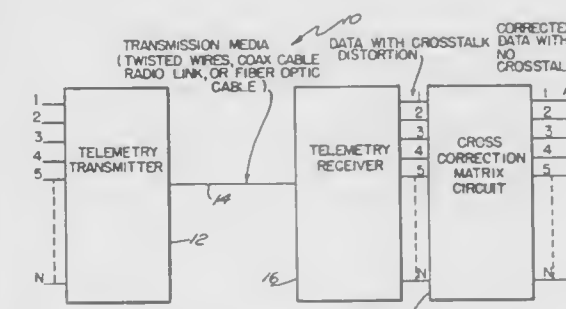


1. An optical disk apparatus for an optical disk enclosed in a disk cartridge which is to be detachably inserted thereto, comprising:
 a casing for accommodating the cartridge through a cassette insertion aperture formed therein;
 a disk drive motor for rotating the optical disk in the cartridge about the center thereof within the casing;
 a loading assembly for detachably loading the cartridge on the disk drive motor within the casing;
 an optical pickup device for recording data on and/or reproducing data from the optical disk; and
 an U-shaped deflecting means disposed behind the cassette insertion aperture and extending to an air outlet positioned on a back of the casing, said U-shaped deflecting means partially surrounding the optical pick up device and the disk drive motor and guides the air flowing into the casing along outer edges of said U-shaped deflecting means for protecting the optical pick up device and the disk drive motor from dust contained in the air flow.

5,086,423
CROSSTALK CORRECTION SCHEME
 Roy L. Streit, New London, and Foster L. Striffler, East Lyme, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
 Filed Jul. 5, 1989, Ser. No. 376,270
 Int. Cl.⁵ H04J 1/12, 3/10
 U.S. Cl. 370—6 4 Claims

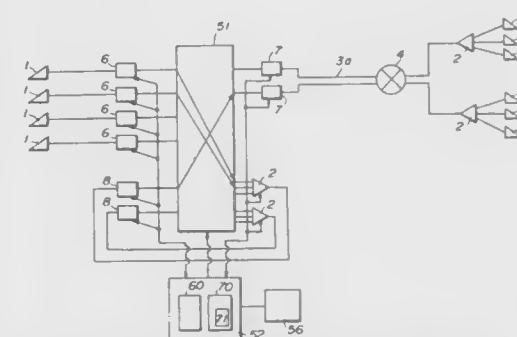
1. A method for reducing crosstalk contamination of signals in a multi-channel data transmission system using $N \times N$ -electronic circuits and N -summers with N -electronic circuits corresponding to each of said N -channels and one each of said N -summers corresponding to each of said N -channels wherein said method comprises the steps of:
 measuring crosstalk error between each possible pair of said N -channel data transmission system taking crosstalk contamination of each one of said N -channels with itself to be unity;
 formulating an $N \times N$ crosstalk correction matrix having diagonal terms thereof to be unity and the off-diagonal terms representing the crosstalk contamination in a partic-

ular channel with the remaining channels of said N -channels;
 computing an $N \times N$ inverse matrix of said crosstalk correction matrix with the diagonal terms thereof to be unity and the off-diagonal terms to be functions of frequency;
 synthesizing $N \times N$ electronic circuits, each member thereof corresponding to a corresponding element of said inverse matrix, each of said $N \times N$ electronic circuits corresponding to a respective element of said $N \times N$ inverse matrix;



summing the outputs of said synthesized electronic circuits for every channel of said N channels with the input of the members of said $N \times N$ electronic circuits for said selected channel so as to cancel the crosstalk contribution from each of said channels; and
 obtaining crosstalk free output for every channel of said N -channel data transmission system.

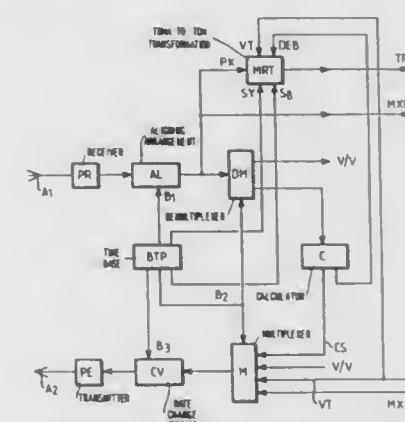
5,086,424
COMMUNICATION TERMINAL CONNECTION SYSTEM
 Kazutoshi Motohashi, Tokyo; Takeshi Uehara, Tama, and Takashi Matsumoto, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
 Filed Feb. 9, 1990, Ser. No. 477,496
 Claims priority, application Japan, Feb. 9, 1989, 1-30858
 Int. Cl.⁵ H04R 11/04
 U.S. Cl. 370—58.1 22 Claims



1. A communication terminal connection system for coupling at least one of first communication terminals, each providing request-to-use information and a respective destination identification number to a second communication terminal having a respective one of the destination identification numbers via a line, comprising:
 a plurality of multiplexers each having an identification number;
 channel switch means for operatively connecting said first communication terminals to at least one of said multiplexers and
 control means operatively coupled to said channel switch means, for switching and controlling a connection of said channel switch means, said control means including
 first detection means for detecting request-to-use informa-

tion from one of said first communication terminals and for requesting use of said one of said multiplexers;
 second detection means, operatively coupled to said first detection means, for detecting an identification number of said one of said multiplexer that is coupled via the line when said first detection means detects the request-to-use information; and
 connection means for detecting the destination identification number of said second communication terminal and for controlling said channel switch means to couple said one of said first communication terminals to said one of said multiplexers when the destination identification number matches the identification number detected by said second means, so as to couple said one of said first communication terminals to said second communication terminal via the line.

5,086,425
ARRANGEMENT FOR TRANSFORMING DATA PACKETS INTO A REGULAR MULTIPLEX FOR A TRANSMISSION SYSTEM UTILIZING THE TDMA PRINCIPLE
 Yves H. M. Le Goffic, and Roland Y. J. M. Soulabail, both of Lannion, France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France
 Continuation of Ser. No. 280,419, Dec. 6, 1988, abandoned. This application Feb. 4, 1991, Ser. No. 651,056
 Claims priority, application France, Dec. 18, 1987, 87 17711
 Int. Cl.⁵ H04J 3/02, 3/26
 U.S. Cl. 370—84 3 Claims



1. A system for transforming a sequence of data packets including at least some packets containing data generated at one or more predetermined low-speed data rates, organized in time slots of successive time-division multiple-access frames, into a standard time-division multiplex frame format, said system comprising a data memory into which the sequence of data packets is entered, characterized by further comprising:
 means for assigning address locations in said data memory, at which locations data are to be written, in a regular pattern based on the data rate at which said data were generated;
 means for defining a plurality of different address patterns for reading out data from said data memory, each pattern corresponding to a respective predetermined data rate; and
 addressing means for writing a sequence of data having a given data rate into said data memory at locations corresponding to said regular pattern, and for reading out the data according to the one of said different address patterns corresponding to said given data rate, said different address patterns minimizing delay between writing and reading out of a data packet.

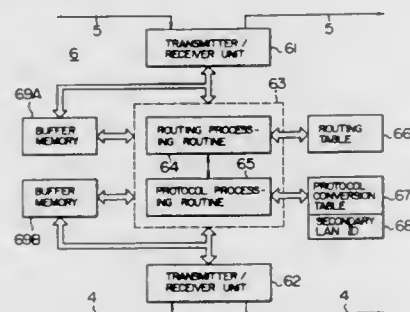
5,086,426

COMMUNICATION NETWORK SYSTEM HAVING A PLURALITY OF DIFFERENT POTOCAL LON'S CONNECTED THROUGH A BRIDGE

Masato Tsukakoshi, Yokohama; Yasuhiro Takahashi, Fujisawa; Matsuaki Terada, Machida, and Kenji Kusaka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 20, 1988, Ser. No. 286,847
Int. Cl.⁵ H04J 3/02, 3/26

U.S. Cl. 370—85.13

13 Claims



1. A communication network system having a primary local area network (LAN), a plurality of secondary LAN's each connected with a plurality of terminals, and a plurality of bridge means, each provided in association with a respective one of said secondary LAN's, for connecting the secondary LAN's to said primary LAN, said plurality of secondary LAN's each belonging to either of at least two groups having different types of protocol, a secondary LAN communication frame transmitted from a source terminal belonging to one of said secondary LAN's and addressed to a destination terminal belonging to another secondary LAN being relayed to said another secondary LAN through a bridge means connected with said one secondary LAN, said primary LAN and another bridge means connected with said another secondary LAN, each of said plurality of bridge means comprising:

- first means for storing a secondary LAN identifier representative of the type of protocol required by an associated secondary LAN connected with said bridge means;
- second means for converting a secondary LAN communication frame received from an associated secondary LAN into a primary LAN communication frame by combining said secondary LAN communication frame with said stored secondary LAN identifier read out from said first means and for relaying the converted frame to said primary LAN; and
- third means for comparing a secondary LAN identifier contained in a primary LAN communication frame received from said primary LAN with said stored secondary LAN identifier read out from said first means and for converting said received primary LAN communication frame into a secondary LAN communication frame adapted to the protocol of said associated secondary LAN through a predetermined protocol conversion procedure in accordance with a result of said comparison to relay the converted secondary LAN communication frame to said associated secondary LAN.

5,086,427

CLOCKED LOGIC CIRCUITRY PREVENTING DOUBLE DRIVING ON SHARED DATA BUS

Bruce E. Whittaker, Mission Viejo; Saul Barajas, Capistrano Beach, and Leland E. Watson, Mission Viejo, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 9, 1990, Ser. No. 506,392

Int. Cl.⁵ H04J 3/02

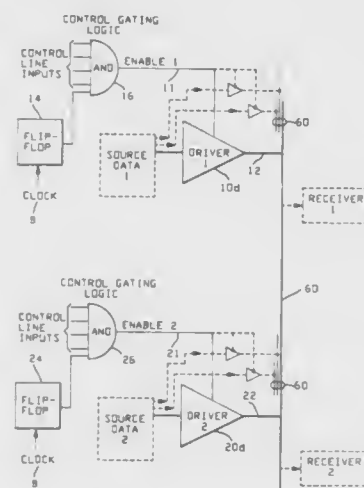
U.S. Cl. 370—85.1

2 Claims

2. In a digital computer network using a plurality of data source for transmitting data over a shared system bus to a

selected one of a plurality of receiver units, a bus access and double drive prevention system comprising:

- (a) a plurality of data source modules connected to said system bus wherein each of said modules includes:
 - (a1) a digital data source unit for holding digital data to be transmitted;
 - (a2) a set of driver units for moving digital data from one of said data source modules onto said system bus, said set of driver units providing one driver unit for each bit line of said bus;
 - (a3) gating logic means for enabling one of said data source modules to transmit data onto said system bus one clock cycle after all other data source modules have been dis-



abled from transmitting data onto said system bus, said gating logic means including:

- (a3a) a control logic unit connected to enable/disable said set of driver units wherein said control logic unit includes:
 - (a3ai) flip-flop circuit means for clocking an associated AND gate at a clock rate determined by a clocking means;
 - (a3aii) said clocking means connected to drive a clock signal to each one of said flip-flop circuit means;
 - (a3aiii) said associated AND gate including input instruction signals for enabling/disabling its associated set of driver units to permit/inhibit data transmission onto said system bus.

5,086,428

RELIABLE BROADCAST OF INFORMATION IN A WIDE AREA NETWORK

Radia J. Perlman, Acton; George Varghese, Bradford, and Anthony G. Lauck, Wellesley, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 9, 1989, Ser. No. 364,470

Int. Cl.⁵ H04J 3/24

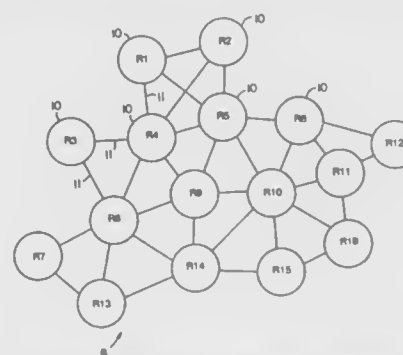
U.S. Cl. 370—94.1

21 Claims

1. A method for aging and purging from storage in each node of a distributed system of nodes, packets which expire over time, each said packet comprising a sequence number in a linear space, data identifying its originating node, and data indicating the time remaining until said packet expires, the method comprising

causing each node to regularly modify the data in each said packet stored therein to indicate that less time remains before each said packet expires than the time that remained before said data was modified, and

causing each node, when a given packet has expired, to wait a purge time approximately equal to the time necessary for



a packet to propagate through said distributed system, and then erase said given packet.

5,086,429

FAULT-TOLERANT DIGITAL COMPUTING SYSTEM WITH REDUCED MEMORY REDUNDANCY

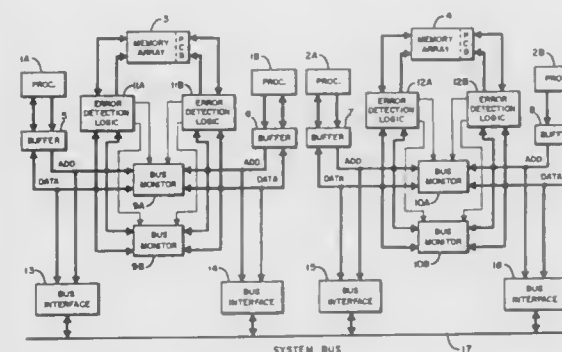
Scott L. Gray, Glendale, and Steven R. Thompson, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 10, 1990, Ser. No. 506,714

Int. Cl.⁵ G06F 11/00

U.S. Cl. 371—9.1

2 Claims



1. A fail-operative, fail-pressure, fault-tolerant digital computer system comprising:

- (a) first and second pairs of substantially identical processor means with one pair being designated the active pair and the other designated the hot standby pair, each processor in each pair having an address bus and a data bus and each simultaneously clocked by a common mast clock and each programmed to simultaneously execute the same sequence of instructions in lock-step operation;
- (b) bus monitor means individually associated with each of said pair of processor means and operatively coupled to each address bus and said data bus for the processor means of each pair for detecting any discrepancies between the information being carried on said address buses and data buses of the individual processor means in said first and second pairs;
- (c) first and second shared memory means, each operatively coupled individually to said first and second pairs of processor means and each simultaneously accessed by said respective pairs of processor means such that said first and second shared memory means are identical;
- (d) first and second error detection means individually coupled intermediate said shared memory means and said address bus and said data bus of both processor means of each of said first pair and second pair of processor means for delivering a "fail" signal to said bus monitor means in the event a memory fault in said first and second shared memory means is detected by said error detection means;
- (e) system bus means coupled to said address bus and data

bus for both the pair of processor means designated the active pair and said pair of processor means designated the hot standby pair; and

- (f) means coupling said bus monitor means to said system bus means for reversing the role of said active pair of processor means to a standby status and said pair of processor means designated the hot standby pair to an active status upon detection of said "fail" signal.

5,086,430

PHASE-LOCKED ARRAY OF REFLECTIVITY-MODULATED SURFACE-EMITTING LASERS

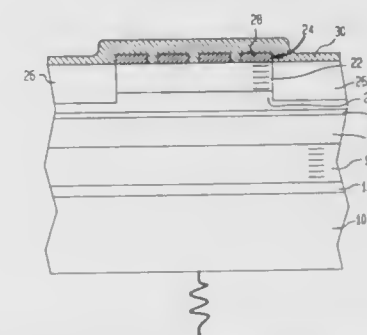
Elyahou Kapon, and Meir Orenstein, both of Old Bridge, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 14, 1990, Ser. No. 628,571

Int. Cl.⁵ H01S 3/19

U.S. Cl. 372—50

12 Claims



1. In an array of lasers, an optical structure comprising: a crystalline substrate;

- a lower interference mirror epitaxially formed on said substrate and comprising a plurality of pairs of layers of differing refractive indices and of optical thickness $\lambda/4$;
- an active layer epitaxially formed over said lower mirror and emitting at a wavelength equal to λ ;
- an upper interference mirror formed over said active layer and comprising a plurality of pairs of layers of differing refractive indices and of optical thickness $\lambda/4$, a optical distance between said upper and lower interference mirrors having a predetermined relationship to λ ; and
- a laterally arranged array of reflectively differing portions, comprising first portions of higher reflectivity and second portions of lower reflectivity, formed on said upper interference mirror with said second portions of lesser reflectivity electrically coupling said first portions of higher reflectivity.

5,086,431

INCREASED INTENSITY LASER DIODE SOURCE CONFIGURATION

Arthur H. Hardy, Jr., and William C. Schubert, both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 21, 1990, Ser. No. 631,589

Int. Cl.⁵ H01S 3/19

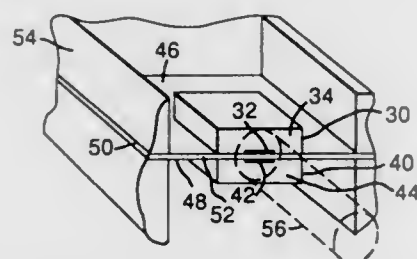
U.S. Cl. 372—50

9 Claims

1. A small, high-intensity source of semiconductor laser radiation comprising:

- a sheet of thermally conductive material having first and second sides and an edge therebetween;
- a first semiconductor laser chip mounted in thermal contact with the first side of said sheet, said first semiconductor laser chip having an emitting facet with at least one lasing junction, said chip mounted with said facet proximate to

said edge such that a lasing junction on said chip is located to emit laser radiation along a line proximate to said edge; a second semiconductor laser chip mounted in thermal contact with the second side of said sheet opposite said first chip, said second semiconductor laser chip having an emitting facet with at least one lasing junction, said chip mounted with said facet proximate to said edge such that a lasing junction on said chip is located to emit laser radiation proximate to said edge opposite said first chip, said thin sheet having a thickness between said first and second sides thereof at said edge so that said first and second semiconductor lasers have lasing junctions that are separated by a distance comparable to the line along which said junctions emit laser radiation or less; heat sink means coupled to said sheet for removing heat from said sheet conducted thereto from said first and second chips.

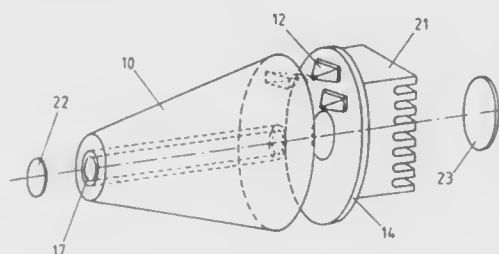


1. A structure of illumination of a laser rod, notably for the pumping of the rod by means of at least one set of coherent optical sources, wherein the optical sources of at least one set of optical sources are placed on one and the same delocalized support, and wherein said structure comprises reflecting means for the transmission, towards the rod, of the illumination beam from said set of delocalized optical sources, and includes means for driving at least some of the constituent elements of said structure in rotation around an axis of symmetry.

5,086,433
STRUCTURE OF ILLUMINATION OF A LASER ROD WITH DELOCALIZED OPTICAL SOURCES
Jean-Paul Pocholle, Arpaion/la Norville; Michel Papuchon, Massy, and Claude Puech, Ballainvilliers Longjumeau, all of France, assignors to Thomson-CSF, Puteaux, France
Filed Jun. 12, 1990, Ser. No. 536,523
Claims priority, application France, Jun. 23, 1989, 89 08384
Int. Cl.⁵ H01S 3/093

U.S. Cl. 372—72

23 Claims

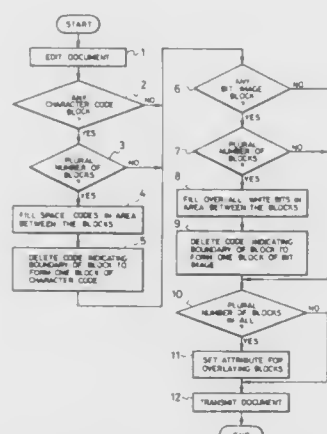


1. A structure of illumination of a laser rod, notably for the pumping of the rod by means of at least one set of coherent optical sources, wherein the optical sources of at least one set of optical sources are placed on one and the same delocalized support, and wherein said structure comprises reflecting means for the transmission, towards the rod, of the illumination beam from said set of delocalized optical sources, and includes means for driving at least some of the constituent elements of said structure in rotation around an axis of symmetry.

5,086,434
DATA COMMUNICATION PROCESS AND APPARATUS FOR DATA TRANSMISSION IN BLOCKS WHICH MAY INCLUDE MIXED DATA TYPES
Shintaro Abe, Fujisawa; Muneo Adachi, Yokohama; Naoyuki Okada, Yokohama, and Yasuhito Shimamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 26, 1986, Ser. No. 911,779
Claims priority, application Japan, Sep. 30, 1985, 60-217233; Sep. 30, 1985, 60-217234; May 19, 1986, 61-114017; Sep. 11, 1986, 61-215315
Int. Cl.⁵ H04B 1/38; H04L 5/16

U.S. Cl. 375—7

13 Claims

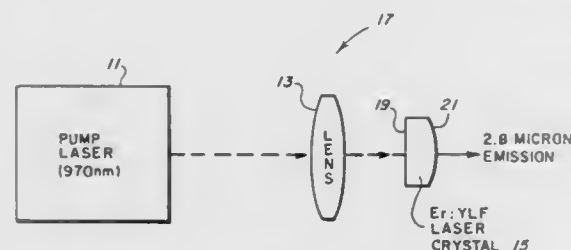


1. A data communication process, comprising the steps of; generating mixed data including data of a first type and data of a second type in at least one page, said mixed data being divided into a plurality of blocks in accordance with respective data type; detecting the existence of plural blocks of data of the first type or the existence of plural blocks of data of the second type in one page of the mixed data; and

5,086,432
RESONANTLY PUMPED, ERBIUM-DOPED, 2.8 MICRON SOLID STATE LASER WITH HIGH SLOPE EFFICIENCY
Leon Esterowitz, Springfield, and Robert C. Stoneman, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 23, 1991, Ser. No. 705,048
Int. Cl.⁵ H01S 3/091, 3/092

U.S. Cl. 372—71

21 Claims



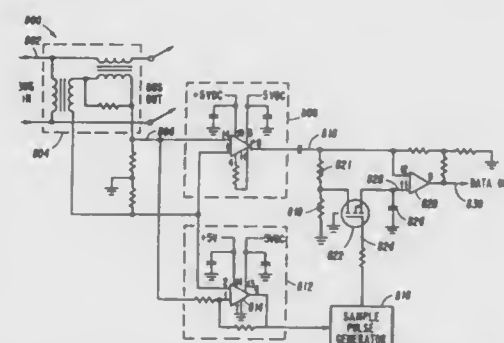
1. A laser system comprising: a crystal having a host material doped with erbium; a laser cavity defined by first and second reflective elements at opposing ends of said crystal to form a reflective path therebetween; and resonant pumping means for directly pumping the $^{4}I_{11/2}$ upper laser state of said erbium with a pump beam at a preselected wavelength to cause the erbium-doped crystal to produce a laser emission corresponding to the $^{4}I_{11/2} \rightarrow ^{4}I_{13/2}$ laser transition having a wavelength of substantially 2.8 microns; one of the first and second reflective elements outputting a portion of said laser emission at substantially 2.8 microns.

converting the data of one page into one block of data of the first type and one block of data of the second type when plural blocks of data of the first type or plural blocks of data of the second type are detected in the detecting step.

5,086,435
METHOD AND APPARATUS FOR DETECTING SIGNALS ON DIGITAL DATA SYSTEMS
Fred J. Studenberg, West Melbourne, Fla., assignor to Rockwell International Corporation, El Segundo, Calif.
Continuation-in-part of Ser. No. 258,923, Oct. 17, 1988, Pat. No. 4,952,070. This application Oct. 17, 1989, Ser. No. 422,713
Int. Cl.⁵ H04L 7/02

U.S. Cl. 375—20

5 Claims



5. An apparatus for detecting digital data signals on a digital data system bus, the apparatus comprising: a passive coupler coupled with the system bus for coupling off a received signal from the system bus; a receiver bus coupled with said passive coupler for carrying said received signal; a signal amplifier coupled with said receiver bus for amplifying said received signal and generating an amplified signal; comparator means for recovering clock information embedded in said received signal and originating from an earlier transmission, said comparator means for recovering clock information also generating a recovered clock signal; means for generating a sample pulse in response to said recovered clock signal; a MOSFET coupled with said means for generating a sample signal and with said signal amplifier; a comparator for comparing said amplified signal with said sample pulse and coupled with said signal amplifier and said MOSFET.

5,086,436
CODED TRANSMISSION SYSTEM WITH INITIALIZING CODE

Koji Tezuka, Kawasaki; Shigeo Amemiya, Yokohama; Tomohiro Shinomiya, Kawasaki; Kazuo Iguchi, Yokohama, and Tetsuo Soejima, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1990, Ser. No. 529,326

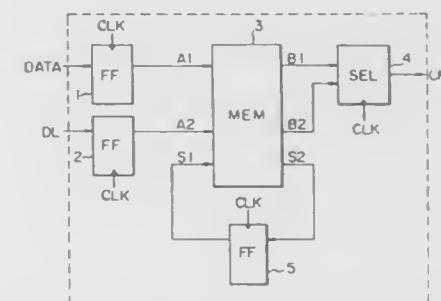
Claims priority, application Japan, May 27, 1989, 1-133599
Int. Cl.⁵ H04L 1/00, 25/32

U.S. Cl. 375—25

18 Claims

1. A coded transmission system for transmitting data including a resetting bit and a message, wherein each bit of transmitted data, having a logical value, is coded depending on a coded result of a bit most recently transmitted before said each bit, said coded transmission system comprising: sending-side apparatus including at least first preceding code memorizing means for memorizing a first stored code representing a code of a bit last transmitted to code a bit to be transmitted next, and for resetting the first stored code to an initial code which indicates a start of a message in response to the resetting bit; coding means for receiving the resetting bit and the mes-

sage, for coding each bit of the message in accordance with a predetermined coding rule and the first stored code to produce a coded result, and for coding the resetting bit to a predetermined resetting code, the predetermined resetting code is different from the codes used in the coding of the message; and transmitting means for transmitting the predetermined resetting code and for transmitting the coded result of the message after the transmission of the resetting code; receiver-side apparatus including at least second preceding code memorizing means for memorizing a second stored code representing a code of a bit last received to decode a code of a bit received next;



receiving means for receiving the predetermined resetting code, and the coded result of the message; resetting means for resetting the second stored code to the initial code in response to the predetermined resetting code; and decoding means for decoding the coded result received corresponding to the message in accordance with the predetermined coding rule and the code memorized by said second preceding code memorizing means; and transmission line means for connecting said sender-side apparatus with said receiver-side apparatus.

5,086,437
AGC DEVICE FOR PRODUCING A GAIN CONTROLLED AND D.C. OFFSET REMOVED SIGNAL
Hideho Tomita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 537,994

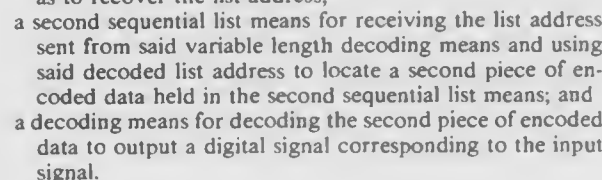
Claims priority, application Japan, Jun. 13, 1989, 1-151652
Int. Cl.⁵ H04L 27/06

U.S. Cl. 375—98

2 Claims

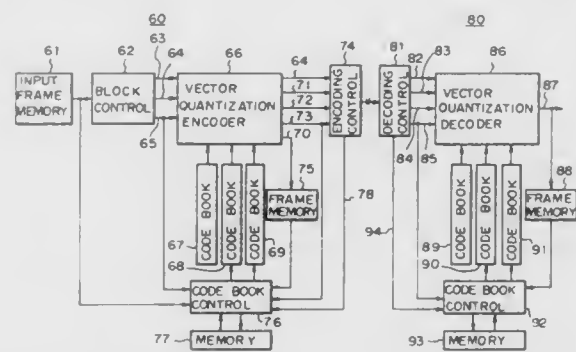
1. An automatic gain control device supplied with a received baseband signal to produce a gain controlled signal in a receiver comprising a receiving circuit for receiving a receiver input signal comprising bursts in predetermined time slots to produce said received baseband signal and an output circuit supplied with said gain controlled signal to produce a timing signal indicative of said predetermined time slots, said automatic gain control device including an amplifier circuit for amplifying said received baseband signal into an amplified signal with a gain controlled by a gain control signal, a direct-current blocking circuit for blocking a direct-current component of said amplified signal to produce a variable level signal, and a level detector circuit for detecting level values of said variable level signal to produce a level value signal representative of said level values of said variable level signal, wherein the improvement comprises a timing controller supplied with said timing signal for producing a first control signal during each of said predetermined time slots and a second control signal in an interval between two consecutive ones of said predetermined time slots; supply means controlled by said first control signal for supplying said level value signal to said amplifier circuit as said gain control signal; and removing

ond reference register means, deriving a feedback signal at its said output having a value corresponding to the difference between said first and second charges, and feedback controlling an input bias on said first reference register means to said given fraction of said first maximum charge amount, thereby feedback controlling the input bias on said signal register means to substantially the same charge level as that on said first reference register means.

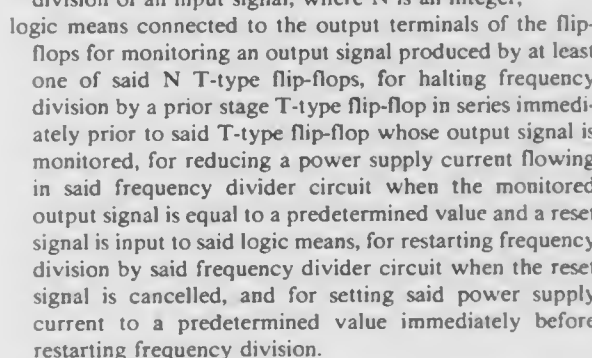


Int. Cl.⁵ G11C 19/28, 27/04; H01L 29/78
U.S. Cl. 377-60 17 Claims

U.S. Cl. 377-60 17 Claims



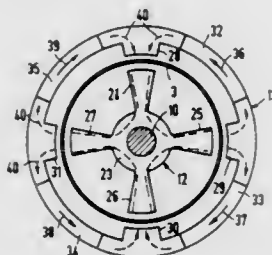
an information signal source connected to said first signal input of said signal register; and
a feedback circuit means, having its output connected to said second and said fourth signal inputs, for comparing a first charge transferred through said first reference register means and a second charge transferred through said second



U.S. Cl. 378—132 Int. Cl.⁵ H01J 35/10 15 Claims

1. In a magnetic coupling for a device disposed in a vacuum bulb of a tube which has shafts rotatably mounted to enable rotation of the tube, said coupling comprising an inner ferromagnetic part mounted for rotation in the vacuum bulb and an outer ferromagnetic part, the improvements comprising the outer part comprising a magnetic arrangement having a plural

ity of pole pieces and the inner part being a ferromagnetic yoke being connected to said device, said ferromagnetic yoke hav-



ing poles allocated to the pole pieces of the magnetic arrangement.

5,086,443 BACKGROUND-REDUCING X-RAY MULTILAYER MIRROR

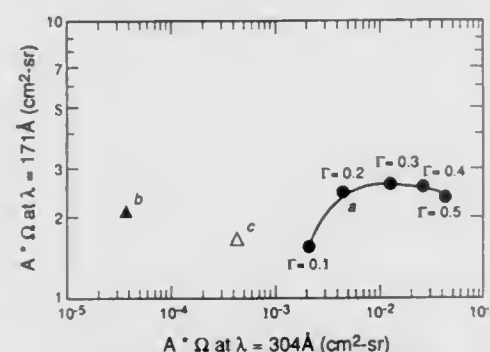
Jeffrey J. Bloch; Diane Roussel-Dupre', and Barham W. Smith, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 3, 1990, Ser. No. 562,297

Int. Cl.⁵ G21K 1/06

U.S. Cl. 378—145

8 Claims



1. A multiplayer mirror having significant reflectivity at a single chosen shorter wavelength of incident x-radiation, while suppressing the reflectivity at a single chosen longer incident wavelength, comprising in combination:

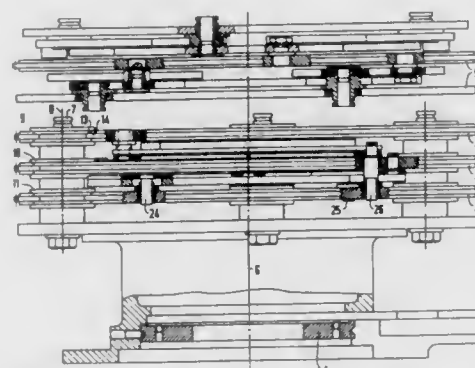
- a plurality of layers of a first high-Z material, each of said first high-Z material layers having a first thickness and being spaced apart from each other;
- a plurality of layers of a first low-Z material, each of said first low-Z material layers having a second thickness, said low-Z material layers and said high-Z material layers being disposed such that a low-Z material material layer, such that the plurality of first high-Z material layers and the plurality of interspersed first low-Z material layers efficiently reflect the chosen wavelength of incident x-radiation;
- at least one second high-Z material layer having a third thickness and disposed such that said at least one second high-Z material layer receives the incident x-radiation; and
- at least one second low-Z material layer having a fourth thickness, said at least one second low-Z material layer disposed between said at least one second high-Z material layer and the one of said first high-Z material layers which is the first to receive the incident x-radiation, forming thereby at least one pair of anti-reflection layers such that said at least one layer pair is a wavetap for the chosen wavelength of incident longer-wavelength radiation for which the reflectivity thereof is to be suppressed.

5,086,444
PRIMARY RADIATION DIAPHRAGM
Guenter Bartmann, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jan. 30, 1991, Ser. No. 647,980
Claims priority, application European Pat. Off., Feb. 16, 1990, 90103049.4

Int. Cl.⁵ G21K 1/04

U.S. Cl. 378—152

8 Claims



1. A primary radiation diaphragm for a medical radiation application apparatus, said primary radiation diaphragm comprising:

- first and second diaphragm plates; and actuator means in mechanical connection with said first and second diaphragm plates and having first and second different ranges of adjustment for respectively differently adjusting said first and second diaphragm plates in succession with said first diaphragm plate being adjusted by initially moving said actuator means within said first range of adjustment and said second diaphragm plate being adjusted by subsequently moving said actuator means within said second range of adjustment, wherein said actuator means is a control disc rotatable around a central axis through said first and second ranges of adjustment in succession so that as said control disc is rotated around said central axis said first diaphragm plate is adjusted in said first range of adjustment and as said control disc is further rotated around said central axis the position of said first diaphragm plate remains constant and said second diaphragm plate is adjusted in said second range of adjustment.

5,086,445
METHOD AND APPARATUS FOR REFERENCING A CASSETTE AND/OR AN INTENSIFYING SCREEN ON A RADIOGRAPH

Edwin W. Fisher, Elkton, Md.; Christopher Schreiber, Ridley Park, Pa., and Douglas R. Walker, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 13, 1990, Ser. No. 581,998

Int. Cl.⁵ G03B 42/04

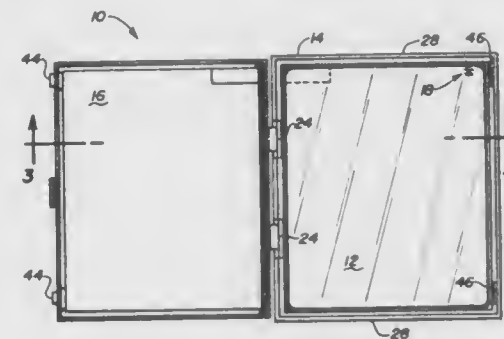
U.S. Cl. 378—165

6 Claims

1. An apparatus for producing a visible image on an X-ray film identifying an intensifying screen used to aid in the exposure of the X-ray film, the apparatus comprising:

- at least one intensifying screen adapted to fluoresce when exposed to X-ray radiation; means for identifying the intensifying screen on a radiograph exposed to X-ray radiation adjacent the screen, the identifying means comprising a label attached to the intensifying screen, the label being at least partially opaque to light and uniquely identifying the intensifying screen to which the label is attached; a light tight X-ray cassette housing for enclosing the screen adjacent the X-ray film; and a mark or label on an exterior of the cassette housing, the

mark or label corresponding to the identity established by the label on the intensifying screen in the cassette and on



any developed film which was exposed within the cassette.

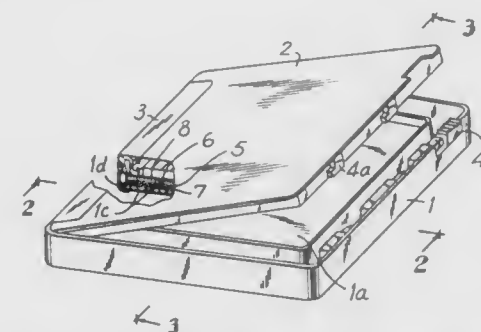
5,086,446
X-RAY SHEET FILM CASSETTE
Walter Bauer, Munich; Ernst Widemann, Dachau, and Manfred Schmidt, Kirchheim, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Aug. 17, 1990, Ser. No. 571,295

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 8910348

Int. Cl.⁵ G03B 42/04

U.S. Cl. 378—188

4 Claims



1. In an X-ray film sheet cassette including a base part having a bottom provided with a frame and a supporting plate connected to and held by the frame, a top part hinged to the base part for closing the same, and a film within the cassette being exposable to radiation transmitted through the supporting plate, the improvement wherein the supporting plate includes two face plates (1c) of thermoplastically bonded carbon fibers and a comparatively thicker intermediate plate (1d) of hard foam rubber sandwiched between and glued to the two face plates (1c).

5,086,447
OVERHEAD X-RAY APPARATUS FOR IMAGING IN BI-PLANE CONFIGURATION

Aldona A. Siczek, and Bernard W. Siczek, both of 1252 Chinook Way, Boulder, Colo. 80303-1411

Filed Jun. 4, 1990, Ser. No. 533,155

Int. Cl.⁵ H05G 1/02

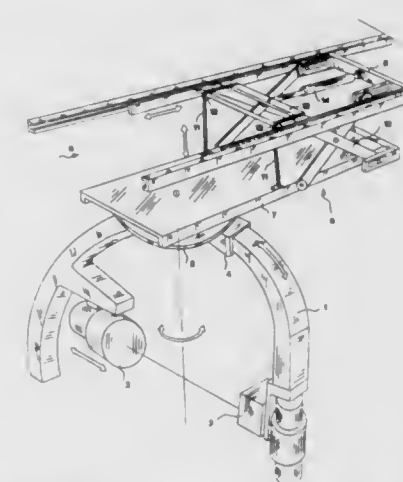
U.S. Cl. 378—197

2 Claims

1. An X-ray imaging apparatus for medical examinations comprising:

- a support member for an X-ray tube and an X-ray image receptor mounted on a carriage assembly in a rotatable arrangement about a virtual vertical axis, wherein said carriage assembly is mounted on overhead rails and includes a means for providing vertical displacement of said

support member relative to said overhead rails which means comprises a scissor mechanism disposed in an offset



arrangement to the axis of rotation of said support member.

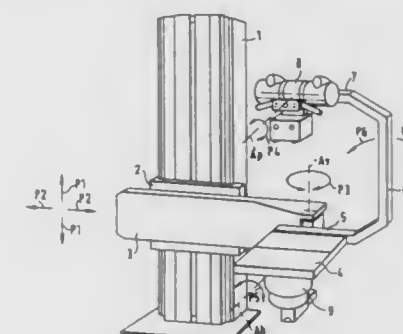
5,086,448
X-RAY EXAMINATION UNIT
Karl-Dieter Muthmann, Siegfriedstrasse 5, D 5810 Witten, 10 Witten

Filed Dec. 22, 1989, Ser. No. 455,297

Int. Cl.⁵ H05G 1/02

U.S. Cl. 378—197

3 Claims



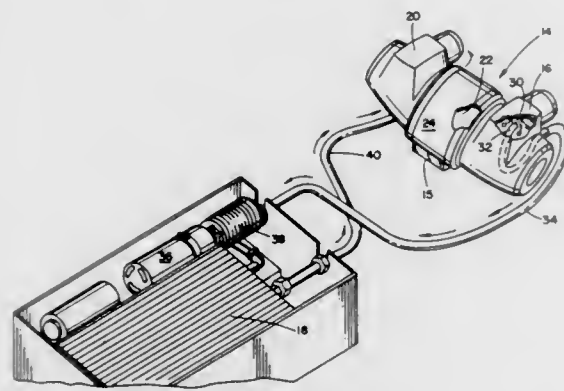
1. An X-ray examination unit comprising: a stand, a bracket vertically and horizontally movable on said stand, moving grid means pivotally mounted about a vertical axis at one of the lateral ends of said bracket such that said moving grid means is pivotable at least between a front position in front of said bracket and a lateral position beside said bracket removed therefrom by a pivot angle of about 90°, an X-ray tube held on one end of a substantially C-shaped support arm, the other end of said support arm being arranged on said moving grid means in such a way that said X-ray tube is located in a photographing position with respect to said moving grid means and is pivotable together with said moving grid means about said vertical axis, and means mounting said moving grid means and said other end of said support arm for rotary movement with respect to said bracket about a horizontal axis, either jointly as a unit or singly and independently of one another.

5,086,449
DEBUBBLER SYSTEM FOR X-RAY TUBES
 Avery D. Furbee, Elmhurst, and James E. Burke, Villa Park, both of Ill., assignors to Picker International, Inc., Highland Hts., Ohio

Filed Aug. 8, 1990, Ser. No. 564,325
 Int. Cl.⁵ H01J 35/10

U.S. Cl. 378—200

16 Claims



14. An x-ray tube assembly comprising:
 a central x-ray tube portion having a window for transmitting generated x-rays and a cooling fluid conducting path therethrough;
 anode and cathode termination assemblies to which anode and cathode power supplies are connected, the anode and cathode termination assemblies being disposed adjacent the central x-ray tube portion;
 at least one enlarged portion connected with the central portion surrounding one of the anode and cathode termination assemblies and defining a cooling fluid receiving reservoir therein, the cooling fluid receiving reservoir being in fluid communication with the cooling fluid path through the central portion;
 a heat exchanger suction tube having an inlet aperture disposed in one of the cooling fluid receiving reservoir and the cooling fluid conducting path in a location which favors removal of bubbles from the x-ray tube;
 a bubble trap for holding bubbles removed from the x-ray tube by the suction tube, which bubbles do not readily dissolve in the cooling fluid.

5,086,450
EMERGENCY INTERCOMMUNICATION SYSTEM FOR ELEVATOR

Shigeo Kitagawa, Kenzo Tachino, Yasuhiro Nagata, Tomoichiro Yamamoto, Shigemi Iwata, Terumi Hirabayashi, and Junichi Tanino, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

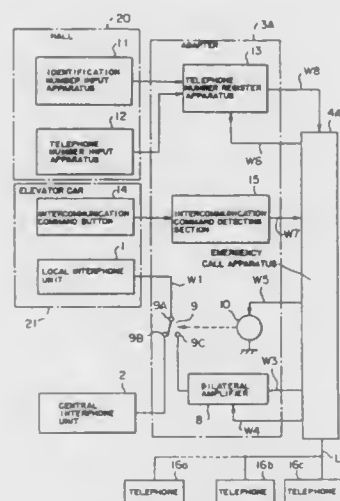
Filed Aug. 17, 1990, Ser. No. 568,884
 Claims priority, application Japan, Aug. 23, 1989, 1-214904
 Int. Cl.⁵ H04M 11/04

U.S. Cl. 379—40

6 Claims

1. An emergency intercommunication system for an elevator comprising:
 a telephone number input means provided in an elevator hall for inputting the desired telephone number;
 a register means for storing the telephone number input through said telephone number input means;
 an interphone unit and an intercommunication command switch both provided in an elevator car;
 an intercommunication command detecting means for detecting the actuation of said intercommunication command switch; and
 an emergency call means for, upon the detection of the actuation of said intercommunication command switch by

said intercommunication command detecting means, automatically dialing the telephone number stored in said



register means to connect said interphone unit with a telephone having the telephone number.

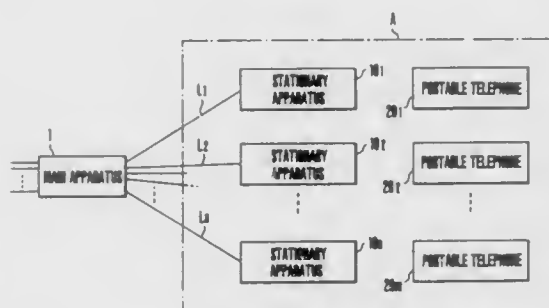
5,086,451
METHOD FOR CONTROLLING A PLURALITY OF STATIONARY APPARATUSES IN A CORDLESS TELEPHONE SYSTEM

Noboru Saegusa, Yukihiro Shimura, both of Tokyo; Hideki Toyama, Kanagawa; Yuji Ohta, Osaka; Shoji Fuse, and Koji Ono, both of Tokyo all of Japan, assignors to NEC Corporation; Nippon Telegraph & Telephone Corporation, both of Tokyo and K.K. Toshiba, Kanagawa, all of Japan

Filed Jul. 17, 1989, Ser. No. 380,359
 Claims priority, application Japan, Jul. 15, 1988, 63-175212
 Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—58

5 Claims



1. A control method for a system having a main apparatus connected to a telephone line and having a line control function, a plurality of stationary apparatuses connected to said main apparatus and each having a radio transmitter/receiver, and a portable telephone capable of communicating with said stationary apparatuses through a radio channel, said method comprising the steps of:
 designating, using said main apparatus, each of said stationary apparatuses in a main or sub state to control communication with said portable telephone;
 monitoring a state signal including information of the main or sub state transmitted from each of said stationary apparatuses; and
 when the state signal from a given stationary apparatus does not coincide with a state of the given stationary apparatus designated by said main apparatus, transmitting a state

designation signal to the given stationary apparatus to coincide with the state designated by said main apparatus.

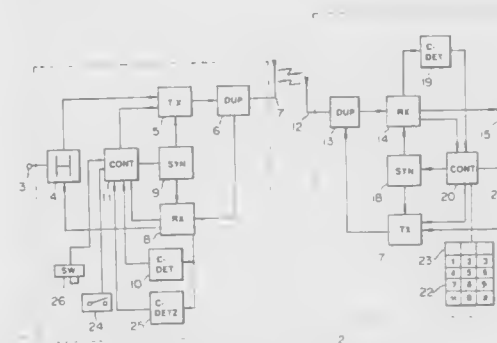
5,086,452
RADIO TELEPHONE SYSTEM AND ITS CONTROL METHOD

Koichi Ito, Tokyo, and Masanori Toba, Nagano, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 9, 1989, Ser. No. 363,974
 Claims priority, application Japan, Jun. 13, 1988, 63-145499
 Int. Cl.⁵ H04Q 7/04

U.S. Cl. 379—58

5 Claims



2. A radio telephone system, comprising:
 a base unit connected to a wired line;
 a radio telephone set connected through a spatial radio circuit to said base unit;
 detecting means for detecting whether or not said radio telephone set is mounted on a telephone-set receiving part provided in said base unit;
 selection means for determining that on-hook and off-hook operations of said radio telephone set are carried out by a hook switch of said radio telephone set or by an output of said detecting means;
 means for controlling connection and disconnection between said wired line and said radio telephone set through said spatial radio circuit on the basis of on/off signals of said hook switch when said selection means is set to select the on-hook and off-hook operations by said hook switch of said radio telephone set, and for controlling the connection and disconnection between said wired line and said radio telephone set through said spatial radio circuit on the basis of the output of said detecting means when said selection means is set to select the on-hook and off-hook operations by the output of said detecting means; and
 wherein said detecting means comprises switching means which is turned ON and OFF when said radio telephone set is mounted on and dismounted from said telephone-set receiving part of said base unit, respectively.

5,086,453
APPARATUS FOR COMMUNICATING DATA VIA A TELEPHONE

Seiiti Senoo, Nara, and Tadamasa Maekawa, Yamatokouriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

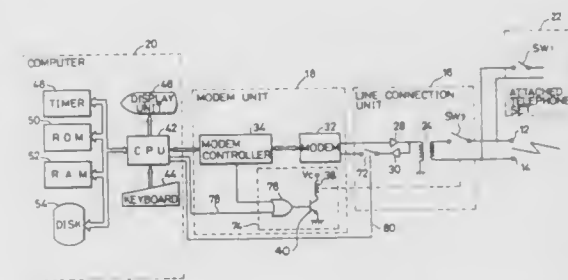
Filed May 30, 1990, Ser. No. 530,745
 Claims priority, application Japan, May 30, 1989, 1-137740
 Int. Cl.⁵ H04 11/00

U.S. Cl. 379—93

8 Claims

1. A data communication apparatus comprising:
 data communication means, adapted to be connected, in parallel with a telephone set, to a public telephone line, for communicating data by transmission or reception, with other station through connection to the telephone line, with said another station;
 termination command generating means for generating a termination command, upon being activated, to terminate said data communication by said data communication

means under predetermined conditions, in other words remove the brackets;
 detection means for detecting said termination command and generating a detection signal;
 delay means for delaying said detection signal by a predetermined time to delay telephone line connection termination



to provide a period of time to switch to audible communication, subsequent to said data communication prior to telephone line connection termination; and
 line connection terminating means responsive to said delayed detection signal for terminating said telephone line connection upon expiration of said predetermined time, without switching to audible communication.

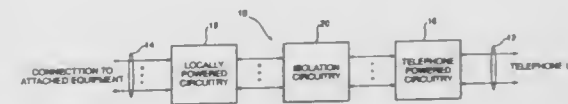
5,086,454
DIRECT CONNECT MODEM DERIVING POWER FROM TELEPHONE LINE

Frederic J. Hirzel, Cupertino, Calif., assignor to Vocal Technologies, Ltd., Santa Clara, Calif.

Filed Nov. 17, 1989, Ser. No. 438,553
 Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—98

2 Claims



1. An apparatus to generate negative and positive voltages from either negative voltages, positive voltages or a combination of positive and negative voltages using a CMOS voltage inverter which comprises:
 a first bi-directional switch;
 a second bi-directional switch;
 a third bi-directional switch;
 a fourth bi-directional switch;
 a switch controller for switching said first switch and said second switch in synchronism and for switching said third switch and said fourth switch in synchronism and in non-overlapping closed states with said first switch and said second switch;
 said first switch having a first node in common with said third switch, said second switch having a second node in common with said third switch, and said fourth switch having a third node in common with said second switch, said first switch having a fifth node and said fourth switch having a seventh node, the apparatus comprising:
 a first capacitor;
 a second capacitor;
 a third capacitor;
 a first diode;
 a second diode; and
 wherein said second node is coupled to a first terminal of said first capacitor and to a first terminal of said second capacitor at a common ground reference;
 wherein said third capacitor is coupled between said first node and said third node;

wherein said first diode is coupled from a first voltage source to a second terminal of said first capacitor and to said fifth node and which is disposed to pass current when forward biased by said first voltage source; and wherein said second diode is coupled from said first voltage source to a second terminal of said second capacitor and to said seventh node and which is disposed to block current when the said first diode is forward biased by said first voltage source and to pass current when said first diode is reverse biased in order to charge said first capacitor and said second capacitor from positive voltage, from negative voltage or from both positive and negative voltage upon alternate switching by said switch control means to cause current to flow in either direction through said switches.

5,086,455

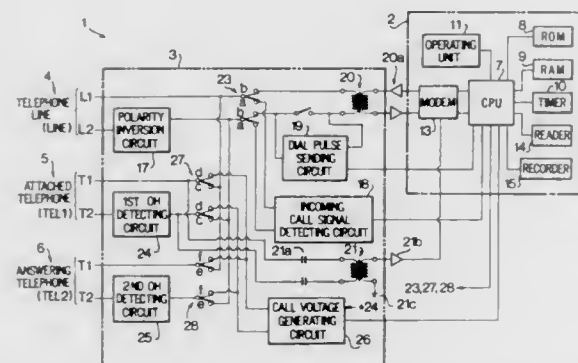
FACSIMILE ARRANGEMENT HAVING AUTOMATIC ANSWERING TELEPHONE SET AND FACSIMILE SET AND SWITCHING PROCESS THEREFOR

Mitsuo Satomi; Akio Nomura, both of Kyoto; Kazuaki Oshita, Hirakata, and Tetsuya Kuwahara, Takashima, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Mar. 13, 1990, Ser. No. 492,730

Claims priority, application Japan, Mar. 16, 1989, 1-65266
Int. Cl.⁵ H04N 1/32; H04M 11/00

U.S. Cl. 379-100

8 Claims



1. A process for controlling a telephone system having an automatic answering unit and a facsimile unit, comprising the steps of:

- detecting an incoming signal,
- determining whether the incoming signal is a facsimile signal, the step of determining whether the incoming signal is a facsimile signal comprising the steps of;
- determining whether the incoming signal includes a speech signal and determining whether the incoming signal includes a CNG signal, whereby the incoming signal is determined to be a facsimile signal when the incoming signal does not include a speech signal and the incoming signal includes a CNG signal, and

connecting a telephone line to the automatic answering unit upon detection of the incoming signal regardless of whether the incoming signal is a speech signal or a facsimile signal,

detecting whether the automatic answering unit is in an on-hook state of an off-hook state and, before a predetermined time has elapsed after the step of detecting an incoming signal, disconnecting the telephone line from the automatic answering unit and connecting the telephone line with the facsimile unit when the automatic answering unit is in an on-hook state.

5,086,456 DIAL UNIT DETACHABLY MOUNTED ON PUBLIC TELEPHONE FOR EQUAL ACCESS

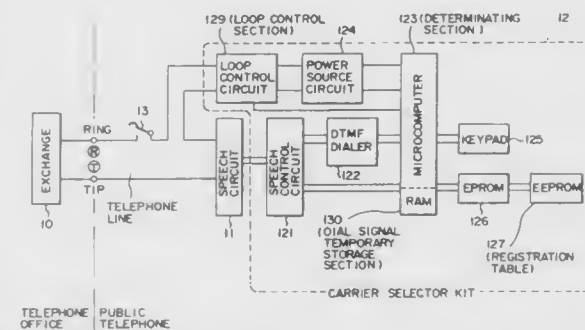
Masahiro Shizawa; Katsuhiko Taka, and Hiroshi Ogihara, all of Atsugi, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Apr. 16, 1990, Ser. No. 509,861

Claims priority, application Japan, Apr. 24, 1989, 1-103776
Int. Cl.⁵ H04M 3/42

U.S. Cl. 379-132

5 Claims



1. A dial unit adapted to be detachably mounted on a public telephone for equal access, said dial unit comprising:

- keypad means for key-inputting dial digits;
- memory means in which area codes corresponding to specific destinations to be handled as a long-distance call, and a carrier code corresponding to a specific carrier line having a right of a carrier to each specific destination, are stored in advance;

determination processing means comprising:

- (a) dial digit determination means for identifying either one of a "1" or a "0" as a first digit of dial digits key-input by said keypad means, or a digit other than a "1" or a "0" as said first digit;
- (b) dial digit storage means for temporally storing all of the dial digits key-input by said keypad means, when one of "1" and "0" as the first digit is identified by said dial digit determining means;
- (c) equal access determining means for determining either a coincidence or a non-coincidence of an area code part of the dial digits temporarily stored in said dial digit storage means, with one of the area codes corresponding to a specific destination stored in said memory means in advance; and

- (d) carrier code adding means for adding a carrier code stored in said memory means in advance and corresponding to a specific carrier line, to a front portion of said dial digits temporarily stored in said dial digit storage means, when a coincidence is determined by said equal access determining means; and

transmitting means comprising:

- (a) first converting means for converting the dial digits, when other than a "1" or a "0" is identified by said dial digit determination means, into corresponding DTMF signals in synchronism with key input by said keypad means;
- (b) first speech control means for sequentially transmitting the DTMF signal converted by first converting means to a telephone line connected to the public telephone;
- (c) second converting means for converting the dial digits, which are temporarily stored in said dial digit storage means when a non-coincidence is determined by said equal access determining means, or the dial digits with the carrier code added by said carrier code adding means, into corresponding DTMF signals, and
- (d) second speech control means for sequentially transmitting the DTMF signals converted by said second converting means to the telephone line in a correct dialing

sequence after a key input operation by said keypad means is completed.

5,086,457

PREPAYMENT DATA TRANSMISSION SYSTEM

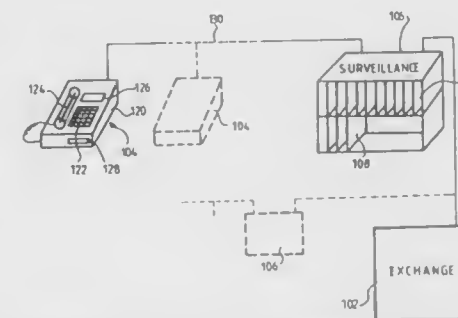
Claude Barraud, Brussels, Belgium; Jean-Loup Poilleux, Vanves, and Christian Guion, Verrieres-le-Buisson, both of France, assignors to Schlumberger Industries, Montrouge, France

Continuation of Ser. No. 553,733, Jul. 13, 1990, which is a continuation of Ser. No. 327,474, Mar. 22, 1989, abandoned.

This application Jan. 15, 1991, Ser. No. 649,680
Claims priority, application France, Mar. 28, 1988, 88 04015
Int. Cl.⁵ H04M 15/10, 17/02

U.S. Cl. 379-144

9 Claims



1. A prepayment information transmission system comprising:

- a terminal connected to a line for transmitting said information;
- means for emitting charging signals determining instants at which payment is required;
- payment verification means for emitting a receipt signal whose state depends on whether or not payment has been performed in response to a charging signal;
- a verification module connected to said transmission line and associated with said terminal; and
- means for applying synchronizing signals to said terminal and said module;

each of said module and said terminal including means for implementing a common algorithm ALG on the appearance of each synchronizing signal in order to generate respective authentication information K_i and K'_i depending, in each case, at least on the preceding authentication information K_{i-1} ;

said terminal further including means for emitting said authentication information to said module and said module including means for emitting initial authentication information K_0 to said terminal and means for comparing authentication information K_i generated by the module with authentication information K'_i received from said terminal; and

said system further including means for inhibiting said information transmission in response to said comparison and in response to the state of said receipt signals.

5,086,458

TELEPHONE ANSWERING SYSTEM AND APPARATUS FOR DIRECT CALLER SELECTION OF A PARTY LINE EXTENSION

James H. Bowen, Catharpin, Va., assignor to Product Engineering & Manufacturing, Inc., Catharpin, Va.

Filed Oct. 2, 1989, Ser. No. 415,852

Int. Cl.⁵ H04M 1/72, 13/00

U.S. Cl. 379-180

7 Claims

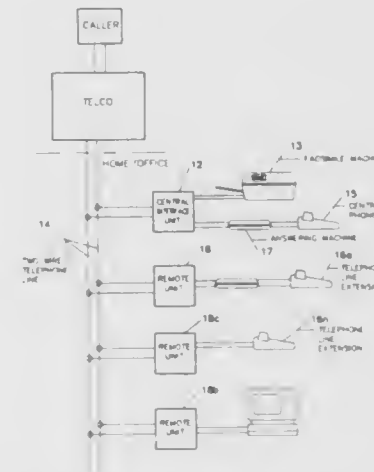
1. A remote unit for an automated telephone answering system for use with telephone extensions connected in parallel on a line, comprising in combination;

means for coupling said remote unit to said line;

means for coupling a telephone extension to said remote unit;

means to detect a plurality of different caller generated tones;

means to select at least one of said generated tones for response by said remote unit;



means for generating a ring signal; and means to couple said ring signal to said telephone extension coupling means in response to detection of a tone selected by said selection means.

5,086,459

TIMING CIRCUIT AND A SECURE TELEPHONE JACK UTILIZING THIS CIRCUIT

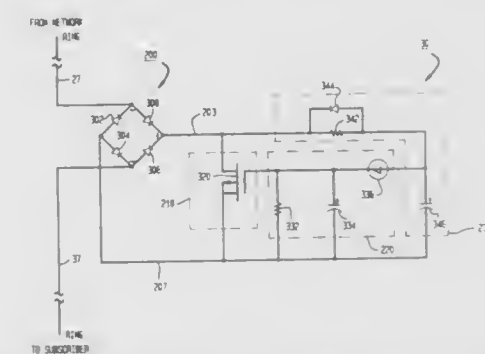
Steven B. Perry, Perrineville, N.J., assignor to Keptel, Inc., Tinton Falls, N.J.

Filed Feb. 23, 1990, Ser. No. 483,875

Int. Cl.⁵ H04M 1/66

U.S. Cl. 379-200

3 Claims



1. Apparatus for connection in series between a voltage source and a load for supplying current on a timed repetitive basis from the voltage source to the load, said apparatus comprising:

switch means, having a load current carrying path there-through for connection between said load and said voltage source and a control terminal and being operative in response to a control signal applied to said control terminal, for interrupting said load current flowing through said path;

first means for timing an on-time period during which said load current is to be applied by said switch means to said load, said first means having a series combination of a first resistor and a first capacitor connected in parallel across said load current carrying path of the switch means; and second means, responsive to said first means, for timing an off-time period during which the load current is to be interrupted and for producing said control signal so as to

cause said switch means to conduct load current during said on-time period and to interrupt load current during said off-time period, said second means having:

- a voltage breakover device; and
- a parallel combination of a second resistor and a second capacitor, wherein said voltage breakover device is connected in series between a junction of said first capacitor and said first resistor and a junction of said second resistor and said second capacitor, and said second resistor and said second capacitor are connected in parallel between the control terminal of said switch means and one terminal of said load current carrying path of said switch means.

5,086,460

COMMUNICATIONS SYSTEM INGRESS AND EGRESS ARRANGEMENT

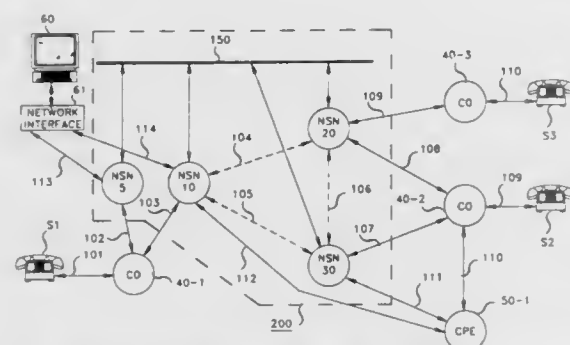
Gerald R. Ash, West Long Branch; Jin-Shi Chen, Holmdel, both of N.J., and Robert A. Gerritsen, Batavia, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 2, 1990, Ser. No. 503,014

Int. Cl.⁵ H04M 7/06

U.S. Cl. 379—221

31 Claims



1. An arrangement for routing traffic through a network, said network comprising a plurality of network nodes and a plurality of communications links interconnecting individual ones of said plurality of network nodes, said arrangement comprising:

- a plurality of other communications links, individual ones of said other communications links respectively connecting at least one switching office external to said network to at least two of said plurality of network nodes so that telecommunications calls may be routed to said external switching office, and
- means, contained in at least another one of said nodes and operative responsive to receipt of a telecommunications call identifying a telecommunications station served by said external switching office, for routing said call to one of said at least two nodes based on a predetermined percentage of the total number of telecommunications calls that said other node sends to said external switching office via said at least two nodes within a predetermined period of time.

5,086,461

APPARATUS AND METHOD FOR PROVIDING EXISTING 1ESS AND 1AESS TELEPHONE SWITCHING EQUIPMENT WITH THE CAPABILITY OF USING THE SS7 PROTOCOL

David W. Thorn, Richardson; Rajendra Patel, Plano, and Gordon Sohl, Richardson, all of Tex., assignors to Network Access Corporation, Richardson, Tex.

Filed Jan. 23, 1990, Ser. No. 469,093

Int. Cl.⁵ H04M 3/42, 7/06, 7/12

U.S. Cl. 379—230

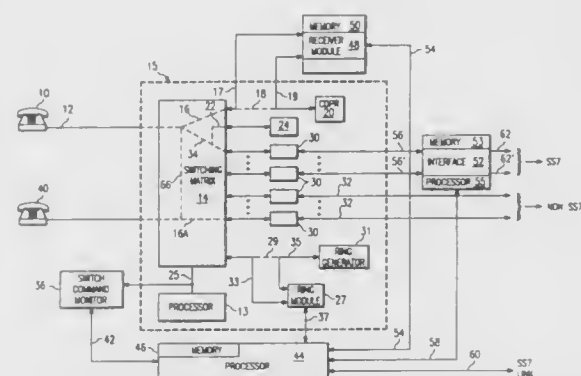
24 Claims

20. A receiver module for use in upgrading existing telephone switching equipment, the receiver module collecting

called number digits and analyzing such called number digits for enhanced subscriber services, comprising:

- receiver interface means for providing either a connection of a subscriber via a switching matrix to a customer dial pulse receiver or splitting a connection between the switching matrix and the dial pulse receiver;

- for the split connection, the receiver interface means further providing a dial tone to the subscriber and collecting digits from the subscriber; the receiver interface means also receiving dial tones from the customer dial pulse



receiver and sending the called number digits to the customer dial pulse receiver; and

- an input/output controller responding to subscriber identifying information from a processor as a part of the switching equipment to generate commands to said receiver interface means to provide the dial tone to a subscriber, to receive and analyze the called number digits and generate a command to out pulse the received called number digits or modified called number digits to the customer dial pulse receiver.

5,086,462

TERMINAL REPEATER HAVING A FUNCTION FOR REPEATING DC LOOP SIGNAL

Tosho Oka, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

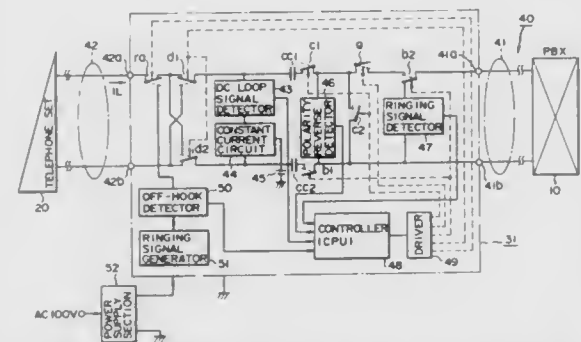
Continuation of Ser. No. 610,326, Nov. 8, 1990, abandoned, which is a continuation of Ser. No. 358,306, May 30, 1989, abandoned. This application Jun. 4, 1991, Ser. No. 711,268

Claims priority, application Japan, May 30, 1988, 63-132320

Int. Cl.⁵ H04M 1/00

U.S. Cl. 379—340

12 Claims



1. A terminal repeater placed in at least one communication line connecting an exchange with at least one terminal device, said terminal device having means for generating a first DC loop signal in response to the connecting condition of a DC loop formed on the communication line, and for supplying said first DC loop signal to said exchange, the terminal repeater comprising:

DC cut-off means for passing AC signals flowing through said communication line and cutting off DC signals flowing through said communication line;

- DC power supply means, provided between said DC cut-off means and said terminal device, for supplying a DC power to said terminal device through said communication line between said DC cut-off means and said terminal device, said DC power corresponding to a DC power supplied through said communication line from said exchange;

- DC loop signal detecting means for comparing a threshold level with a level of said first DC loop signal transmitted from said terminal device to said exchange, and for generating a DC loop detecting signal corresponding to said first DC loop signal;

- DC loop signal transmitting means for generating a second DC loop signal analogous to said first DC loop signal transmitted from said terminal device in response to said DC loop detecting signal derived from said DC loop signal detecting means through the communication line between said DC cut-off means and said exchange, and transmitting said second DC loop signal to said exchange;

- DC level detecting means, provided between said DC cut-off means and said terminal device, for detecting a DC level of said communication line connected to said terminal device and for producing a DC level detecting signal; and

- threshold control means for setting said threshold level to a value lower by a predetermined value than the DC level of said communication line, in accordance with each DC level detecting signal produced by said DC level detecting means.

5,086,463

VANDAL-RESISTANT COMMUNICATIONS STATION

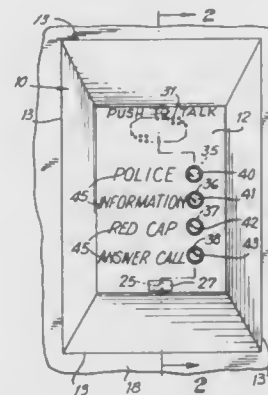
Kevin T. Vesely, 100 Edinburgh Rd., Middletown, N.Y. 10940, and John J. McMonagle, Jr., 1369 E. 84th St., Brooklyn, N.Y. 11236

Filed Oct. 2, 1989, Ser. No. 415,782

Int. Cl.⁵ H04M 1/04; H01H 13/04

U.S. Cl. 379—388

19 Claims



6. A vandal-resistant communications station comprising, in combination:

- a one-piece face plate enclosure having a speaker aperture and plurality of additional apertures therein;

- a call push-button assembly and an answer push-button assembly, each of said call push-button assembly and said answer push-button assembly including a corresponding body portion disposed in a respective one of said additional apertures and a respective plunger carried in an opening in the corresponding body portion and being moveable between an operative position and an inoperative position;

- means for resiliently sealing each of said plungers against the opening in its corresponding body portion to prevent the

insertion of foreign matter between each plunger and its respective opening;

- spring means for biasing said plungers to their inoperative positions;

- first and second switching devices each in position to be actuated by a plunger of a respective one of said call push-button assembly and said answer push-button assembly upon movement of the respective plunger to its operative position;

- circuit means mounted within the face plate enclosure in electrical circuit relationship with said switching devices, the circuit means including an automatic signaling unit associated with said call push-button assembly for producing an output signal at a remote location in response to actuation of the first switching device when the plunger of the call push-button assembly is moved to its operative position, the circuit means additionally including means for establishing communication from said remote location to said station in response to actuation of the second switching device when the plunger of the answer push-button assembly is moved to its operative position; and

- a signal unit within the faceplate enclosure for alerting the communications station of an incoming call.

5,086,464

TELEPHONE HEADSET FOR THE HEARING IMPAIRED

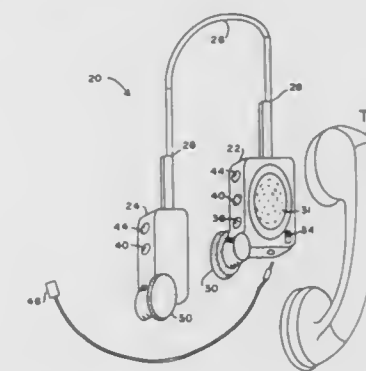
Alvin F. Groppe, Germantown, Tenn., assignor to Artic Elements, Inc., Germantown, Tenn.

Filed Mar. 5, 1990, Ser. No. 487,846

Int. Cl.⁵ H04M 1/00, 11/00; H04R 25/00; A42B 00/00

U.S. Cl. 379—430

6 Claims



1. A telephone amplification headset for wearing on the head of a hearing impaired user for use with a telephone receiver, comprising:

- (a) a left and a right ear piece, each ear piece including speaker means for transmittal of an amplified telephone conversation to each respective ear of the user;

- (b) input means contained in one of the ear pieces for receipt of an unamplified telephone conversation when the telephone receiver is placed adjacent the input means, said input means comprising a microphone;

- (c) an amplifier connected between the input means and the speaker means for amplification of a signal from the input means and for excitation of the speaker means;

- (d) a left and a right volume control means for independent control of the volume of the amplified conversation to each respective speaker means; and,

- (e) remote microphone means for connection to the amplifier to amplify audio sounds to the user's ears.

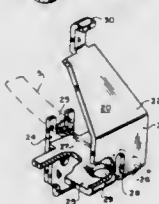
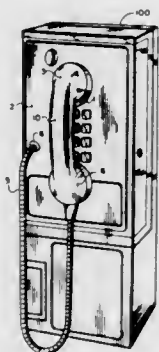
5,086,465

ARMORED TELEPHONE CORD RETENTION BRACKET
Charles J. Bass, New Hope, Ala., assignor to Quadrum Telecommunications, Inc., Arab, Ala.

Filed Jan. 4, 1991, Ser. No. 637,448

Int. Cl.⁵ H04M 17/00, 1/00; H01R 13/58; H02G 3/18
U.S. Cl. 379—438

8 Claims



1. A bracket for mounting within a telephone paystation to retain a telephone handset armored cable of the type including a central cable terminated at at least a first end in a stop secured to said cable, and with an armored sheath encircling said cable, said bracket comprising:

a first vertical section positioned in a first plane, including a first opening therein adapted to receive and grasp said armored cable sheath within said telephone paystation; said first vertical section further including a second opening for receiving a fastener for securing said bracket within said telephone paystation; said bracket further including a first horizontal section extending at right angles from said first vertical section and including a third opening therein having a dimension greater than the width of said stop secured to said cable; a second vertical section extending upward at right angles from said horizontal section and including a fourth opening communicating with said third opening; said fourth opening being smaller in width than said stop affixed to said cable and greater in width than the diameter of said cable; an angularly inclined section extending upward from said second vertical section in a direction towards the plane of said first vertical section and including a hook-like section on a distant end thereof adapted to engage a portion of said telephone paystation.

5,086,466

TELEPHONE BASE STRUCTURES FOR STABILIZING UPON SUPPORT SURFACES
Beverley W. Gumb, and Edward J. R. Foster, both of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 22, 1990, Ser. No. 504,210

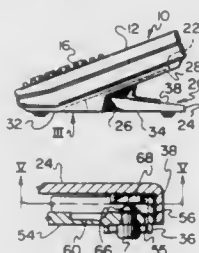
Int. Cl.⁵ H04M 1/00

U.S. Cl. 379—440

7 Claims

1. A telephone base structure having an underwall formed with a plurality of spaced apart resilient cantilever beams, the cantilever beams being resiliently flexible in an upward direction and having free end regions and support feet carried by each free end region, each support foot extending downwardly from the underwall, the base structure also having a further wall which overlies and is spaced above the underwall, the

further wall providing a stop disposed above the free end region of each cantilever beam so that the free end region



moves towards the stop during upward resilient flexing movement of the beam to limit the amount of the upward movement.

5,086,467

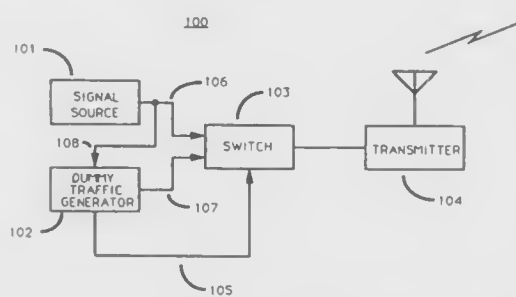
DUMMY TRAFFIC GENERATION
Charles J. Malek, Crystal Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1989, Ser. No. 359,317

Int. Cl.⁵ H04K 1/02, 1/04, 1/10

U.S. Cl. 380—6

15 Claims



1. In a transmitter that transmits first message signals provided by a first signal source, an improvement comprising: second signal source means for providing second message signals to the transmitter for at least part of the time when the first message signals are absent, wherein duration of transmissions and time between transmissions of the second message signals are derived from said second message signals.

5,086,468

TEXT MODIFIER

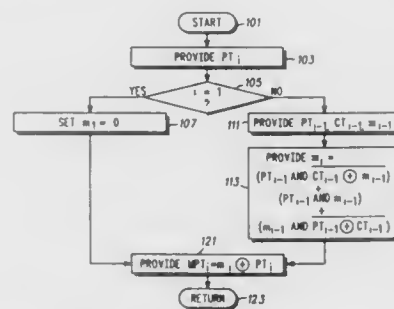
Michael D. Kotzin, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 376,776, Jul. 7, 1989. This application
Nov. 19, 1990, Ser. No. 615,108

Int. Cl.⁵ H04L 9/02

U.S. Cl. 380—28

5 Claims



1. A method for forming a "z" bit stream having bits designated z_i , based on an "x" bit stream having bits designated x_i , each x_i of successively increasing order, the least significant bit

5,086,470

SCRAMBLING IN DIGITAL COMMUNICATIONS NETWORK USING A SCRAMBLED SYNCHRONIZATION SIGNAL

John W. Ballance, Woodbridge, England, assignor to British Telecommunications Public Limited Company, United Kingdom
PCT No. PCT/GB88/01038, § 371 Date May 21, 1990, § 102(e)
Date May 21, 1990, PCT Pub. No. WO89/05077, PCT Pub. Date Jun. 1, 1989

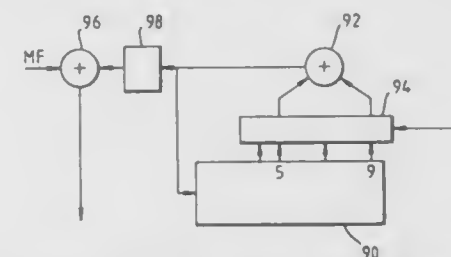
PCT Filed Nov. 28, 1988, Ser. No. 488,045

Claims priority, application United Kingdom, Nov. 27, 1987, 8727846

Int. Cl.⁵ H04L 9/02

U.S. Cl. 380—48

10 Claims



5,086,469
ENCRYPTION WITH SELECTIVE DISCLOSURE OF PROTOCOL IDENTIFIERS

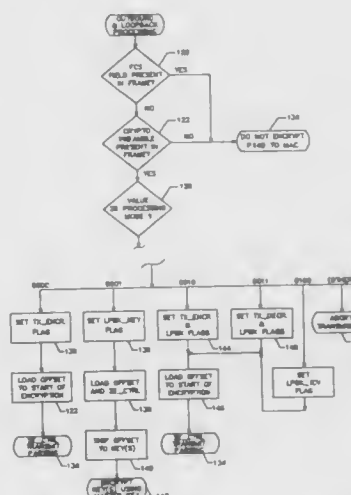
Amar Gupta; Charles W. Kaufman, both of Northboro; Mark F. Kempf, Stow, all of Mass., and G. Paul Koning, Brookline, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,615

Int. Cl.⁵ H04L 9/00

U.S. Cl. 380—48

6 Claims



1. A method for encryption of information packets for transmission over a communication network, the method comprising:

determining whether or not to encrypt an information packet prior to transmittal over a communication network; if an information packet is to be encrypted, deciding whether or not to conceal the identity of an underlying network protocol by means of which the information packet was generated; if the underlying network protocol is to be concealed, using a special protocol identifier in a plaintext portion of a header in the information packet, to indicate that the underlying network protocol is to remain anonymous; and subsequently identifying the underlying network protocol within an encrypted portion of a header in the information packet, whereby monitoring of encrypted network traffic will not be distorted by the use of incorrect protocol identifiers.

5,086,471

GAIN-SHAPE VECTOR QUANTIZATION APPARATUS
Yoshinori Tanaka, Kawasaki; Tomohiko Taniguchi, Yokohama; Fumio Amano, Tokyo; Yasuji Ohta, Yokohama, and Shigeyuki Unagami, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

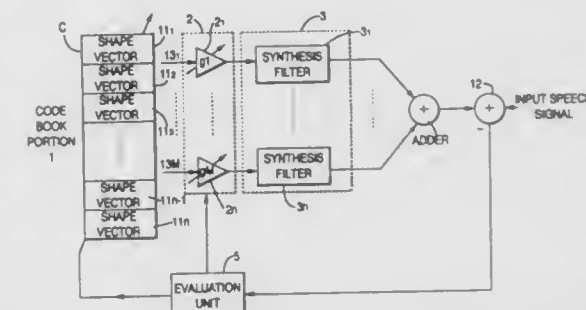
Filed Jun. 29, 1990, Ser. No. 545,609

Claims priority, application Japan, Jun. 29, 1989, 1-167397

Int. Cl.⁵ G10L 5/00

U.S. Cl. 381—36

4 Claims



1. A gain-shape vector quantization apparatus for an input speech signal, said apparatus comprising: a code book portion containing a plurality of shape vectors and selecting among the shape vectors upon receipt of an index signal; a gain circuit portion including a plurality of variable gain circuits coupled in parallel to said code book portion to

impart predetermined gains to the shape vectors selected by said code book portion;

- a synthesis filter portion including a plurality of synthesis filters coupled in parallel to said gain circuit portion to reproduce signals from the shape vectors as output by said variable gain circuits in said gain circuit portion;
- a first adder portion coupled to said synthesis filter portion to add the signals reproduced by said synthesis filters in said synthesis filter portion and to produce an output;
- a second adder portion coupled to said first adder portion to add the output of said first adder portion and the input speech signal to determine an error; and
- an evaluation unit coupled to said second adder and said code book portion to determine the index signal used in the selection of the shape vectors stored in said code book portion to minimize the error between the output of said first adder portion and the input speech signal produced by said second adder portion, and supplied to said code book portion.

5,086,472

CONTINUOUS SPEECH RECOGNITION APPARATUS
Kazunaga Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

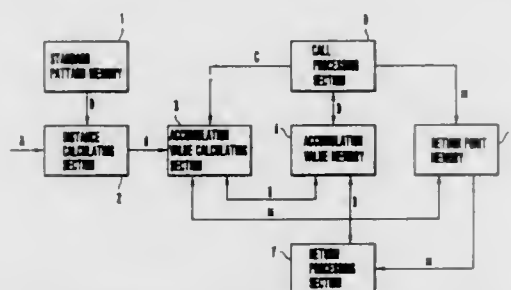
Filed Jan. 12, 1990, Ser. No. 464,084

Claims priority, application Japan, Jan. 12, 1989, 1-6185

Int. Cl.⁵ G10L 5/00

U.S. Cl. 381-43

6 Claims



1. A continuous speech recognition apparatus for recognizing continuous speech by coupling standard patterns in units of predetermined recognition units in accordance with a predetermined network which includes subnetworks inserted between predetermined call and return points in said network, said apparatus comprising:

- a standard pattern memory for storing the standard patterns;
- a distance calculating section for calculating distances between frames of an input speech pattern and the standard patterns;
- an accumulation value calculating section for calculating a plurality of accumulation values of distances on matching paths which cause frames of the speech pattern and the standard patterns to correspond to each other;
- an accumulation value memory for storing said calculated accumulation values;
- a return point memory for storing a plurality of addresses of return points of the subnetwork that correspond to respective ones of said calculated accumulation values in said accumulation value memory;
- a call processing section for writing a minimum value of said accumulation values at a plurality of call points for the subnetwork as an initial value of the accumulation value for the subnetwork in said accumulation value memory and writing an address of a return point corresponding to the call point yielding the minimum value in said return point memory as an initial value; and
- a return processing section for writing an accumulation value at a terminal point of the subnetwork in said accumulation value memory addressed by the return point address stored in said return point memory corresponding to the terminal point of the subnetwork.

5,086,473 **FEEDBACK SYSTEM FOR A SUB-WOOFER LOUDSPEAKER**

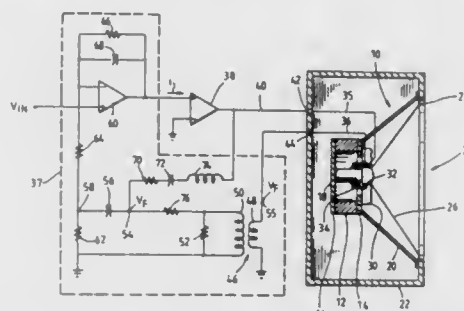
Louis W. Erath, P.O. Box 177, Abbeville, La. 70511-0177, assignor to Louis W. Erath, Abbeville, La.

Filed Nov. 27, 1989, Ser. No. 442,518

Int. Cl.⁵ H04R 3/00

U.S. Cl. 381-96

28 Claims



1. An apparatus for enhancing the low frequency response of a loudspeaker, said loudspeaker comprising an acoustic wave producing member, and a drive coil having a first and a second terminal, said drive coil being adapted to produce movement of said member, and said loudspeaker being adapted to be powered by an audio amplifier having an output connected to the first terminal of said drive coil, and having an input adapted to receive an audio input signal, the output of said audio amplifier being adapted to deliver a current signal correlative to the audio input signal, said apparatus comprising:

- a feedback circuit being operably connected to said audio amplifier and being tuned to substantially match the impedance of said loudspeaker within a predetermined frequency range; and
- a transformer having a primary winding and a secondary winding, said primary winding being adapted to connect to the second terminal of said drive coil, and said secondary winding being connected to said feedback circuit, said feedback circuit delivering a feedback signal which alters said audio input signal in response to a voltage induced on said secondary winding b said primary winding.

5,086,474

AMPLIFIER HAVING MAXIMUM SUMMED POWER OUTPUT FROM A PLURALITY OF DEVICES HAVING LIMITED CURRENT SINKING CAPABILITY

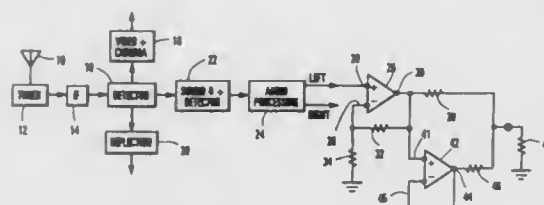
Mark F. Rumreich, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Mar. 28, 1990, Ser. No. 501,089

Int. Cl.⁵ H03F 21/00

U.S. Cl. 381-120

4 Claims



1. An amplifier comprising:

- a first operational amplifier having a first non-inverting input terminal coupled to receive an input signal, a first output terminal, and a first inverting input terminal coupled to the first output terminal through a resistive voltage divider of a first and a second resistors providing negative feedback between the first inverting input terminal and the first output terminal without any intervening elements,
- a second operational amplifier having a second non-inverting input terminal coupled to said first output terminal, a

second output terminal, and a second inverting input coupled to said second output in a unity gain configuration, and

third and fourth resistors coupled between respective output terminals of said first and second operational amplifiers and a common load, said third and fourth resistors being exclusive of the resistive voltage divider.

5,086,475

APPARATUS FOR GENERATING, RECORDING OR REPRODUCING SOUND SOURCE DATA

Ken Kutaragi, Makoto Furubashi, both of Kanagawa; Masakazu Suzuki, Tokyo, and Koji Kageyama, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

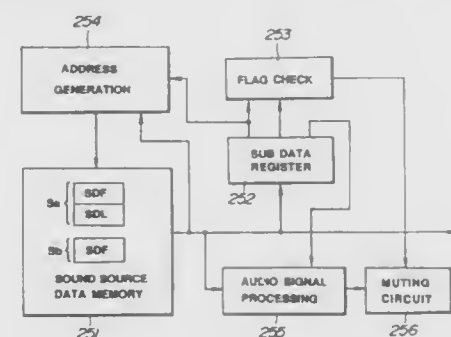
Filed Nov. 14, 1989, Ser. No. 436,423

Claims priority, application Japan, Nov. 19, 1988, 63-292931; Nov. 19, 1988, 63-292933; Nov. 19, 1988, 63-292934; Nov. 19, 1988, 63-292935; Nov. 29, 1988, 63-301544; Feb. 3, 1989, 1-025564

Int. Cl.⁵ G10L 9/14; G10H 17/00

U.S. Cl. 381-36

6 Claims



5. A sound source device comprising:

- a sound source data memory for selectively storing sound source data, wherein the sound source data includes first samples representing a looping domain which is repetitively reproduced, and second samples which do not represent the looping domain, and an end sample,
- a flag check circuit for detecting discriminating flags indicating the presence or absence of the looping domain and the presence or absence of the end sample,
- means for repeatedly reading out said first samples from the sound source data memory and for reading out said second samples from said sound source data memory to reproduce analog or digital audio signals, and
- means for asserting a muting signal when the flag check circuit detects a discriminating flag which indicates the absence of the looping domain and the end of the sound source data.

5,086,476

METHOD AND APPARATUS FOR DETERMINING A PROLIFERATION INDEX OF A CELL SAMPLE

James W. Bacus, Hinsdale, Ill., assignor to Cell Analysis Systems, Inc., Lombard, Ill.

Continuation-in-part of Ser. No. 121,674, Nov. 17, 1987, Pat. No. 5,016,283, and a continuation-in-part of Ser. No. 106,717, Oct. 6, 1987, Pat. No. 5,008,185, and a continuation-in-part of Ser. No. 927,285, Nov. 4, 1986, Pat. No. 5,018,209, which is a continuation-in-part of Ser. No. 794,937, Nov. 4, 1985, Pat. No. 4,741,043, said Ser. No. 121,674, is a continuation-in-part of Ser. No. 927,285. This application Feb. 24, 1989, Ser. No. 315,289

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-6

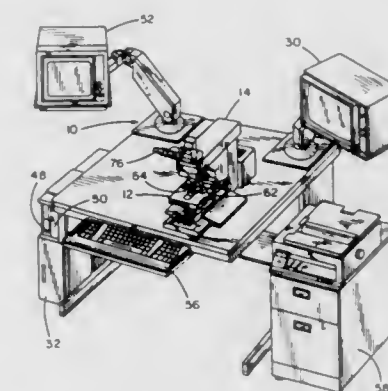
7 Claims

1. An apparatus for determining a proliferation index of a cell sample, comprising:

- first means for optically sensing portions of a cell sample having a proliferation optically enhanced substance thereon and producing a proliferation substance signal corresponding thereto wherein the first means further

comprises an image enhancing optical filter allowing transmission of light for an optical absorbing region of a chromogen associated with the optically-enhanced proliferation substance at a reduced optical absorbing transmission region of a stain optically marking the cell nuclei;

second means for optically sensing portions of a cell sample having optically marked cell nuclei and producing a cell nuclei signal corresponding thereto wherein the second means further comprises an optical filter allowing transmission of light at an optical absorbing region of a stain, which is optically marking the cell nuclei, and at an optical absorbing region of a chromogen associated with the optically-enhanced proliferation substance;



first determining means coupled to the first sensing means for determining an amount of the proliferation substance and producing a proliferation substance amount signal corresponding thereto;

second determining means coupled to the second sensing means for determining an amount of optically marked cell nuclei and producing a cell nuclei amount signal corresponding thereto; and

proliferation index determining means coupled to the first determining means and receiving the proliferation substance amount signal and coupled to the second determining means and receiving the cell nuclei amount signal therefrom, for determining a proliferation index from the proliferation substance amount signal and the cell nuclei amount signal.

5,086,477

AUTOMATED SYSTEM FOR EXTRACTING DESIGN AND LAYOUT INFORMATION FROM AN INTEGRATED CIRCUIT

Kenneth K. Yu, Beaverton, and C. Neil Berglund, Oregon City, both of Oreg., assignors to Northwest Technology Corp., Beaverton, Oreg.

Filed Aug. 7, 1990, Ser. No. 564,175

Int. Cl.⁵ G06K 9/00

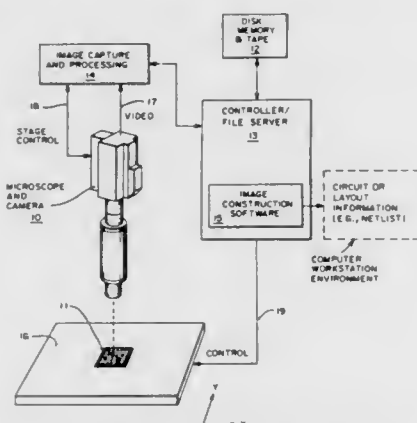
U.S. Cl. 382-8

35 Claims

1. A system for extracting design information from a semiconductor integrated circuit (IC) comprising:

- means for capturing the image of a section of said IC in the form of a video signal;
- table means for placing said IC in position for image capture of said section by said capture means, said table means being responsive to a control signal to enable said IC to be repositioned relative to said capture means such that a composite image of said IC can be obtained by successive capture of partially contiguous or overlapping images covering all of the different sections of said IC;
- image processing means for receiving said video signal and for generating an abstract representation of said images, said abstract representation including lists of identifying features of each of said sections and the relative locations of said identifying features;

memory means for storing said images, said abstract representations and a reference library of circuit elements; computer means coupled to said image processing and memory means for combining said abstract representations of said images to obtain said composite image, and for recog-



nizing individual circuit cells by matching the abstract representation of a portion of said composite image with a corresponding entry in said reference library; once all of said circuit cells on said IC have been recognized, said computer means generating a schematic representation of said IC in the form of a netlist.

5,086,478

FINDING FIDUCIALS ON PRINTED CIRCUIT BOARDS TO SUB PIXEL ACCURACY

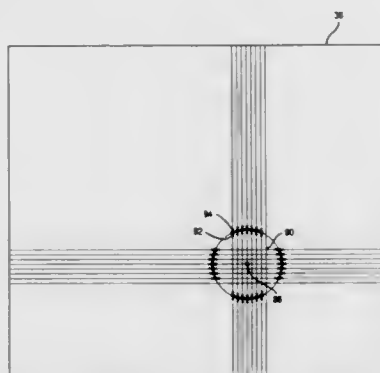
William L. Kelly-Mahaffey, Austin, and James M. Stafford, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1990, Ser. No. 634,642

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382—8

7 Claims



1. A method for locating a circular or symmetrical convex polygonal fiducial of known dimensions on a circuitized substrate comprising the steps of:

- determining fiducial presence by;
 - acquiring a two dimensional digitized image array;
 - selecting a subarray representing a predetermined area within which a fiducial is expected;
 - calculating summation profiles of rows and columns in said selected subarray;
 - constructing a first difference profile corresponding to each calculated summation profile; and
 - screening said first difference profiles for choosing presumptive leading and trailing edges of the fiducial;
- finding approximate fiducial center by taking midpoints between presumptive leading edges and trailing edges; and
- calculating fiducial center to sub pixel accuracy by selecting from said two dimensional array of digitized image data, four two dimensional subarrays located a

predetermined distance on either side of the X and Y coordinates found in said finding step; determining first differences for each of said four subarrays; choosing maximum and minimum values for X from said first differences from subarrays located on either side of the X value found in said finding step; choosing maximum and minimum values for Y first differences from said subarrays on either side of the Y value found in said finding step; and averaging chosen values for X and Y, respectively, to find exact X and Y values.

5,086,479

INFORMATION PROCESSING SYSTEM USING NEURAL NETWORK LEARNING FUNCTION

Hiroshi Takenaga, Ibaraki; Yoshiyuki Okuyama, Hitachi; Masao Takatoo, Katsuta; Kazuyoshi Asada, Hitachi; Norio Tanaka, Hitachi; Tadaaki Kitamura, Hitachi, and Kuniyuki Kikuchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

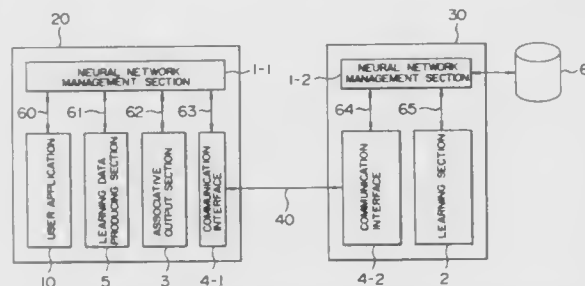
Filed Jun. 28, 1990, Ser. No. 544,870

Claims priority, application Japan, Jun. 30, 1989, 1-166675; Feb. 21, 1990, 2-038376

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382—14

17 Claims



1. An information processing system using a neural network learning function, comprising:

- first operating means including learning data producing means for producing learning data for a neural network and associative output means having a first neural network for producing, after having been reconstructed on the basis of the learning data, output data responsive to given input data;
- communication medium means; and
- second operating means coupled to said first operating means by said communication medium means and including learning means supplied by said communication means with the learning data produced by said learning data producing means and having a second neural network for executing learning with the learning data to generate connection weight data to be supplied, via said communication medium means, from said second operating means to said first operating means so that reconstruction of said first neural network is effected with supplied connection weight data.

5,086,480

VIDEO IMAGE PROCESSING

Graham G. Sexton, Felixstowe, England, assignor to British Telecommunications public limited company, London, England

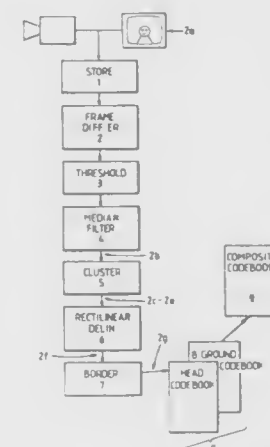
Continuation of Ser. No. 295,214, Jan. 5, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 594,670

Claims priority, application United Kingdom, May 6, 1988 [GB] United Kingdom PCT/GB88 00357

Int. Cl.⁵ G06K 9/46

U.S. Cl. 382—18

21 Claims



1. A method of identifying an object against a background within an image array, comprising the steps of:

- a) comparing, using vector comparison, each of a plurality of identically shaped, two-dimensional sub-arrays into which the image array is notionally divided as to object and background, with a plurality of vectors from a set, each said set including a subset comprising a plurality of members of said set associated with the object, and
- b) in the event of substantial similarity, labeling that sub-array as corresponding to the object, wherein said plurality of vectors are taken from a codebook which includes a second subset of vectors associated with said object within an image array and a subset of vectors associated with the background with an image array, wherein each vector of each subset has an associated flag indicating which of the object or the background that vector is associated with, so that each sub-array may be labelled as corresponding to the object or to the background by the flag.

5,086,481

APPARATUS FOR CONVERTING OUTLINE DATA INTO DOT DATA, HAVING MEANS FOR ASSURING CONTINUITY OF VISIBLE REPRESENTATIONS REPRODUCED BY THE DOT DATA

Hitoshi Yoshida, Kohnan; Takahiro Kanegae, Nagoya, and Naoyuki Kawamoto, Toki, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 28, 1990, Ser. No. 486,605

Claims priority, application Japan, Mar. 4, 1989, 1-52523

Int. Cl.⁵ G06K 9/48

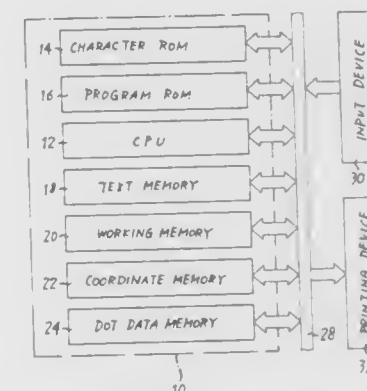
U.S. Cl. 382—22

22 Claims

1. A data converting apparatus comprising:

- dot data preparing means for converting, according to a predetermined rule, a batch of outline data stored in a memory and representative of an outline of a visible representation such as a letter, a symbol and a graphical representation to be formed by a series of strokes, into a batch of dot data comprising dot-forming bits indicative of image dots to be formed at positions of respective picture elements which correspond to each stroke of the visible representation;
- discontinuity detecting means for detecting a discontinuous portion of said each stroke as defined by said image dots to

be formed according to said dot-forming bits by checking said dot-forming bits to determine whether said image dots represented by said dot-forming bits are discontinuous along the outline of said each stroke; and discontinuity eliminating means responsive to said disconti-



nity detecting means, for processing said outline data before said outline data are converted into said dot data, such that said dot data prepared by said dot data preparing means include dot-forming bits indicative of image dots to be formed at positions of respective picture elements which correspond to said discontinuous portion.

5,086,482

IMAGE PROCESSING METHOD

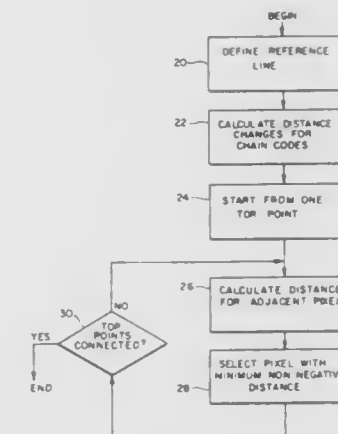
Ryohei Kumagai, Tokyo, Japan, assignor to Ezel, Inc., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,350

Int. Cl.⁵ G06F 3/14

U.S. Cl. 382—25

7 Claims



1. An image processing method for generating a portion of a convex hull of a configuration comprising the steps of: selecting two adjacent top points in a configuration in an image; defining a reference line connecting the two top points; selecting one top point as a starting point; selecting a series of pixels, each being as near to the reference line as possible while being positioned between the reference line and a contour of the configuration, the selected pixels extending continuously from the start point to the other top point.

5,086,483

OPTICAL PROCESSOR INCLUDING ELECTRONIC PROCESSING ARRAY

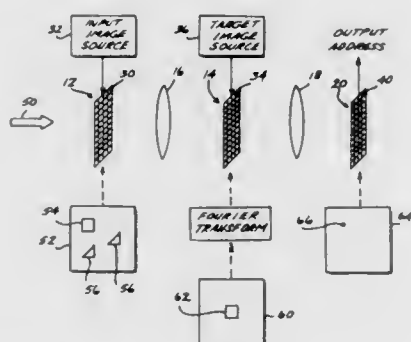
C. David Capps, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 31, 1989, Ser. No. 402,121

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-31

18 Claims



1. A system for determining the presence of a feature of interest in an input image, the system comprising:
 - an optical processor for convolving the input image with a target image representing the feature of interest, to produce an output image;
 - an electrical processing array for determining the presence of a convolution peak in the output image, the electronic processing array comprising a two dimensional array of processing cells, each processing cell comprising:
 - a photodetector for producing an electronic detection signal corresponding to the intensity of illumination at the processing cell;
 - means for transmitting the detection signal to one or more adjacent processing cells;
 - means for receiving detection signals produced by one or more adjacent processing cells; and
 - detection means separate from the photodetector for producing an output signal if the detection signals satisfy a predetermined criteria.

5,086,484

IMAGE PROCESSING APPARATUS WITH FIXED OR VARIABLE THRESHOLD

Akibiro Katayama, Kawasaki, and Hidefumi Oosawa, Kawaguchi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

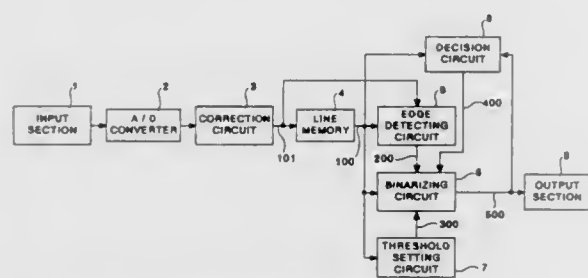
Filed Aug. 21, 1989, Ser. No. 396,339

Claims priority, application Japan, Aug. 24, 1988, 63-208274; Aug. 29, 1988, 63-212386; Aug. 29, 1988, 63-212387; Nov. 8, 1988, 63-280484

Int. Cl.⁵ G06K 9/38

U.S. Cl. 382-50

25 Claims



1. An image processing apparatus comprising:
 - inputting means for inputting pixel data;
 - variable-threshold generating means for generating a thresh-

old corresponding to the pixel data input by said inputting means;

fixed-threshold generating means for generating a fixed threshold;

decision means for making a decision as to whether or not an input object pixel is located in the vicinity of an edge portion of an image;

selecting means for selection a threshold generated by said variable-threshold generating means or a threshold generated by said fixed-threshold generating means on the basis of the result of the decision made by said decision means; and

quantizing means for quantizing the input object pixel on the basis of a threshold selected by said selecting means.

5,086,485

METHOD AND APPARATUS FOR DYNAMICALLY SETTING A BACKGROUND LEVEL

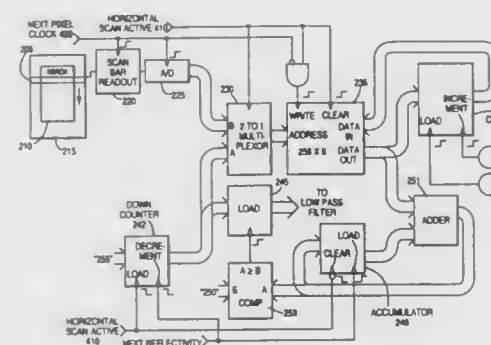
Ying-wei Lin, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 19, 1990, Ser. No. 599,831

Int. Cl.⁵ G06K 9/38, 9/34; H04N 1/40

U.S. Cl. 382-51

9 Claims



6. In an image scanning system for producing a digital image from an analog image, an apparatus for producing a value useful for dynamically adjusting a background level, comprising:
 - means for scanning a reflectivity of a plurality of pixels across a line of the analog image;
 - quantizing means, coupled to the scanning means, for quantizing the reflectivity of each pixel to produce one of a finite set of digital reflectivity values;
 - multiplexor means having a first data input coupled to the quantizing means, a second data input, a control input, and an output;
 - incrementing means for incrementing a digital value by one, having an input port and an output port;
 - histogram storing means having an address input coupled to the output of the multiplexor means, a data output coupled to the input of the incrementing means, and a data input coupled to the output of the incrementing means;
 - means, coupled to the histogram storing means, for summing the number of pixels having each reflectivity value, starting with the highest value including
 - means, coupled to the second data input of the multiplexor means, for counting down,
 - accumulator means having an input and an output, and
 - adder means having a first input coupled to the output of the histogram storing means, a second input coupled to the output of the accumulator, and an output coupled to the input of the accumulator;
 - comparator means, coupled to the adder means, for comparing the output of the adder means to a predetermined fraction of the number of pixels in a scan line and for generating an output signal when the output of the adder means exceeds the predetermined fraction of the number of pixels in the scan line; and
 - latch means for latching the value useful for dynamically

5,086,487

METHOD AND APPARATUS FOR IMAGE ENCODING IN WHICH REFERENCE PIXELS FOR PREDICTIVE ENCODING CAN BE SELECTED BASED ON IMAGE SIZE

Akibiro Katayama, Kawasaki; Tadashi Yoshida, Ichikawa; Yasuji Hirabayashi, Tokyo, and Mitsuru Maeda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

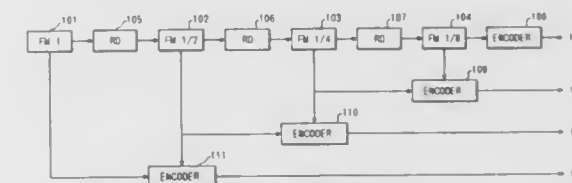
Filed Nov. 2, 1989, Ser. No. 438,082

Claims priority, application Japan, Nov. 24, 1988, 63-297512; Dec. 8, 1988, 63-311694

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-56

25 Claims



1. A method of encoding an image, comprising the steps of:
 - inputting a size of a whole image to be encoded;
 - determining reference pixel positions or the number of reference pixels in accordance with the input image size;
 - predicting a status of a noticed pixel by using reference pixels of the determined pixel positions or the determined number; and
 - encoding the noticed pixel by means of comprising an actual status of the noticed pixel with the predicted status of the noticed pixel.

5,086,486

APPARATUS FOR READING A DOCUMENT AND PROCESSING THE IMAGE

Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

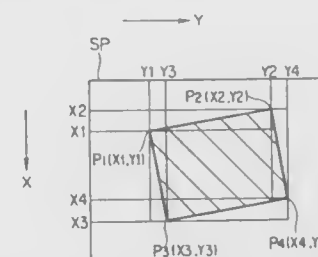
Continuation of Ser. No. 570,971, Aug. 22, 1990, abandoned, which is a continuation of Ser. No. 205,575, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 775,013, Sep. 11, 1985, abandoned. This application May 10, 1991, Ser. No. 700,993

Claims priority, application Japan, Sep. 19, 1984, 59-196171; Sep. 19, 1984, 59-196172

Int. Cl.⁵ G06K 9/38

U.S. Cl. 382-53

21 Claims



1. An image processing apparatus comprising:
 - means for reading an original document to produce digital image signals;
 - recognizing means for discriminating between a first area readable by said reading means, where the original document is present, and a second area readable by said reading means, where the document is not present, on the basis of the digital image signals from said reading means;
 - detecting means for detecting an image density level, solely in the first area, in a first time period on the basis of the digital image signals from said reading means; and
 - conversion process means for converting digital image signals from said reading means into reproduction signals, wherein said reading means again reads the original document to produce digital image signals in a second time period after the end of detection of an image density level by said detecting means in the first time period, wherein said conversion process means converts the digital image signals produced in the second time period into reproduction signals on the basis of the image density level signals detected in the first time period, and wherein the digital image signals used for recognition by said recognizing means and the digital image signals to be converted by said conversion process means in the second time period are produced from the same reading means.

5,086,488

TRANSFORM CODING APPARATUS

Yoshiaki Kato, and Tokumichi Murakami, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

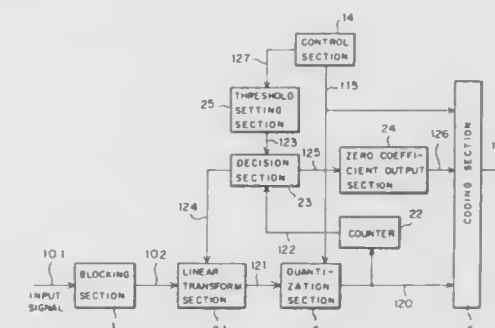
Filed Aug. 9, 1990, Ser. No. 564,824

Claims priority, application Japan, Aug. 19, 1989, 1-213622; Dec. 13, 1989, 1-324527; Jan. 19, 1990, 2-11500; Feb. 15, 1990, 2-34658

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-56

10 Claims



1. A transform coding apparatus wherein a linear transform operation is performed on an input signal series, and transform coefficients are quantized and coded in sequence from the lower frequency components to the higher frequency components in the transform region, said transform coding apparatus comprising:
 - blocking means for blocking said input signal series;
 - linear transform means for performing a linear transform operation on the blocked signals and for obtaining a series of transform coefficients in sequence from the lower frequency components to the higher frequency components;
 - quantizing means for quantizing in sequence each of said

transform coefficients in said series of transform coefficients outputted from said linear transform means;
counting means for counting the number of consecutive zero quantized levels in the quantized transform coefficients quantized by said quantization means and for outputting the count values thereof;
threshold determining means for determining the threshold value of the number of consecutive zero quantized levels to be transmitted;
zero quantized level output means for outputting zero quantized levels when activated;
decision means for obtaining at least one additional transform coefficient from said linear transform means when the count value of consecutive zero quantized levels is less than the threshold value and for activating said zero quantized level output means for subsequent transform coefficients when said count value equals said threshold value; and
coding means for coding the outputs of said quantization means.

5,086,489

METHOD FOR COMPRESSING IMAGE SIGNALS

Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 511,359, Apr. 19, 1990, abandoned.

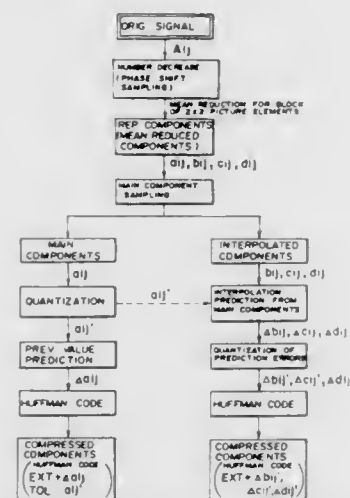
This application Jul. 3, 1991, Ser. No. 726,133

Claims priority, application Japan, Apr. 20, 1989, 1-101341

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382—56

7 Claims



1. A method for compressing an image signal, which comprises the steps of:

- i) subjecting an original image signal made up of a series of image signal components representing an image to a component number decreasing process which comprises the steps of:
 - a) electronically superimposing a plurality of block lines in parallel on an image, each block comprising a plurality of picture elements in said image, wherein each said picture element is associated with an image signal component, arranging said blocks continuously or at predetermined intervals, shifting said blocks such that the phases of the blocks located along a block line are shifted by at least a distance equal to a length of a single picture element from the phases of the blocks located along a neighboring block line such that said neighboring block lines are out of phase, and
 - b) combining said image signal components that are associated with said plurality of picture elements within each said block through a predetermined process thereby determining a representative image signal component for each said block, said representative image

signal component being indicative of all image signal components in each said block,

- ii) classifying said representative image signal components, which have been determined from said component number decreasing processing, into main components, which have been sampled at appropriate sampling intervals, and interpolated components other than said main components, and
- iii) subjecting said interpolated components to interpolation prediction encoding processing based on said main components.

5,086,490

OPTICAL PATTERN EXTRACTING APPARATUS

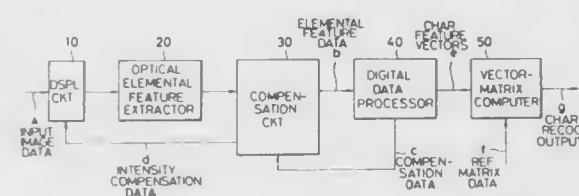
Norman A. Peppers, Belmont; Gregory K. Myers, San Francisco; James R. Young, Palo Alto, all of Calif., and Kazuo Katsuki, Tokyo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Feb. 7, 1990, Ser. No. 474,585

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382—65

32 Claims



1. An optical pattern extracting apparatus comprising: display means consisting of arrays of radiant pixels for forming a radiant image of a pattern to be recognized in accordance with input image data;
a large number of strip-like photosensor means, located at focusing positions of the microimages, for decomposing the pattern to be recognized into constituent elements and detecting the constituent elements, wherein
each of said strip-like photosensor means comprises groups of elements oriented in horizontal, vertical and diagonal direction,
said elements in each group comprise a large number of photodetection elements offset in the horizontal and vertical directions in units of pixels to cover an entire area of pixel array, and
said photodetection elements are distributed in the large number of microimages to prevent light-receiving areas of said photodetection elements from overlapping each other.

5,086,491

ELECTRONIC CONTROL CIRCUIT FOR A/C MOTORS

Giuseppe L. Cuneo, Bergamo, Italy, assignor to Black & Decker, Inc., Newark, Del.

Filed Nov. 21, 1990, Ser. No. 616,532

Claims priority, application Italy, Nov. 24, 1989, 22510 A/89

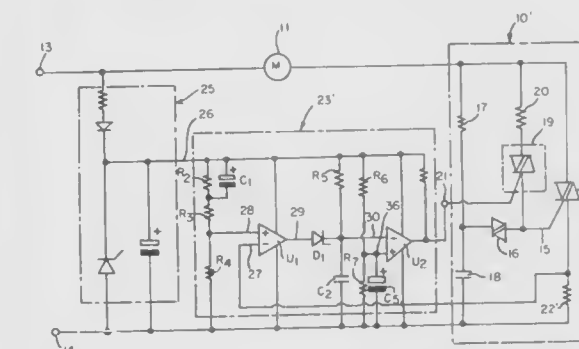
Int. Cl.⁵ H02P 5/16

U.S. Cl. 388—811

9 Claims

1. An automatic control device, comprising: an electronic control circuit for alternately supplying an electric motor, on command by a switching signal, with partial or full power in alternating current;
said electronic control circuit comprising a first TRIAC connected in series to the motor for connecting the motor, in operation, to a source of power with a substantially sinusoidal wave;
said TRIAC having a control terminal connected to an actuating device controlling operation of said TRIAC, in each wave period of the power supply, for an interval of time shorter than the duration of such period, in order to achieve said partial power;

the control terminal of said TRIAC also being connected to a switching device which is closed on command by said switching signal to connect said TRIAC to a source of bias current to effect continuous operation of said TRIAC and achieve said full power;
means for measuring the current flowing through the motor and for producing a current signal that is a function of that current at an output of said measuring means;
comparing means, having an input connected to said measuring means output, for comparing said current signal with a preestablished threshold value;
said switching signal being generated when said current signal passes through said pre-established threshold value;
said measuring means comprising a measuring resistance connected to pass the current flowing through the motor, and a conversion circuit which converts any drop in voltage across said measuring resistance into a continuous electrical quantity which is a function thereof;



duct portion being connected to and drawing heated air from said heat storage brick portion and delivering the heated air into said first outlet duct portion to mix with and increase the temperature of the air from the heat pump supplied to said first outlet duct portion.

5,086,494

LEAK PROOF HUMIDIFIER

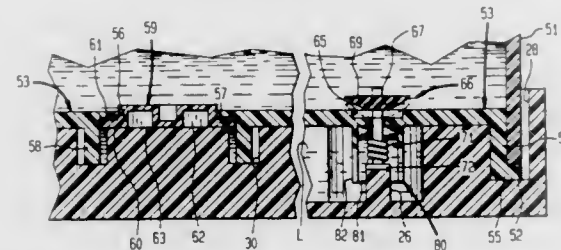
Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.

Filed Dec. 10, 1990, Ser. No. 624,850

Int. Cl.⁵ F22B 1/28

U.S. Cl. 392—405

26 Claims



1. A humidifier comprising:
 - base means defining a reservoir adapted to retain water to be dispersed and a cavity adapted to receive leakage;
 - humidifier means for inducing dispersal of water retained by said reservoir;
 - tank means removably supported by said base means and having a bottom wall defining a discharge opening communicating with said reservoir and an inlet opening communicating with said cavity; and
 - wall means surrounding said inlet opening and extending from said tank means into said cavity.

5,086,495

SOLID MODELLING SYSTEM WITH LOGIC TO DISCARD REDUNDANT PRIMITIVES

Michael A. Gray, Alan R. Halbert, and Stephen J. Todd, all of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

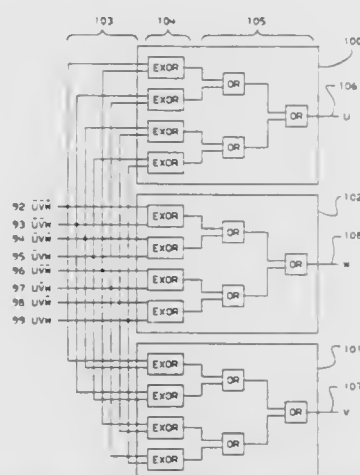
Filed Dec. 16, 1988, Ser. No. 285,850

Claims priority, application United Kingdom, Dec. 18, 1987, 8729630

Int. Cl.⁵ G06F 15/72

U.S. Cl. 395—120

10 Claims



1. A solid modelling system for generating a spatial representation of an object defined in terms of solid geometric primi-

tives combined by a logical expression including one or more combinatorial logical operators, comprising:

- object definition means including a structure comprising a plurality of linked nodes for said primitives and for said operators;
- first logic means for traversing at least certain of the nodes generating a table comprising a bitmap representing the logical expression or the part thereof defined at the operator nodes encountered during the traversal; and
- second logic means for testing the bitmap for logical redundancies indicative of redundant geometric primitives.

5,086,496

METHOD FOR HIDDEN LINE AND SURFACE REMOVAL IN A THREE DIMENSIONAL DISPLAY

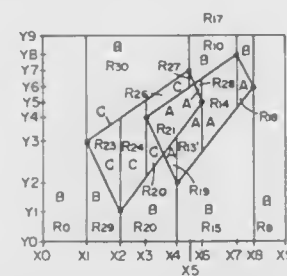
Ketan D. Mulmuley, Chicago, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Continuation of Ser. No. 189,320, May 2, 1988, abandoned. This application Jul. 12, 1991, Ser. No. 730,036

Int. Cl.⁵ G06F 15/72

U.S. Cl. 395—121

12 Claims



1. In a computer graphics system for displaying a multiface image, each face comprising a plurality of vertices connected by line segments, the method comprising:

- (a) establishing a scene partition comprising a series of stripped regions, each region having at least one boundary which intersects an image vertex;
- (b) selecting a face of said image;
- (c) inserting into said scene partition, line segments of said selected face and modifying each region in which a line segment appears by contracting a portion of the boundary thereof which extends from a side of said line segment and does not intersect an image vertex; and
- (d) determining visibility of said modified regions by assigning a temporary visibility value to each said modified region, said value indicating that said region is visible to a viewer in a view plane, and when a new image face is inserted into said scene partition, comparing depth positions of modified regions within said new image face with a set of regions indicated as visible in image faces in said scene partition, and for modified regions which are obscured by said new image face, revising said temporary visibility values to reflect the visibility value of said new image face.

5,086,497

IMAGE OUTPUT COMMAND METHOD FOR IMAGE PROCESSING SYSTEM

Hiroshi Horikawa, Akira Watanabe, Hiroo Koyama, and Ikuro Mori, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 301,553, Jan. 26, 1989, abandoned. This application Oct. 22, 1990, Ser. No. 600,280

Claims priority, application Japan, Jan. 27, 1988, 63-16049; Jan. 27, 1988, 63-16050

Int. Cl.⁵ G06F 3/00

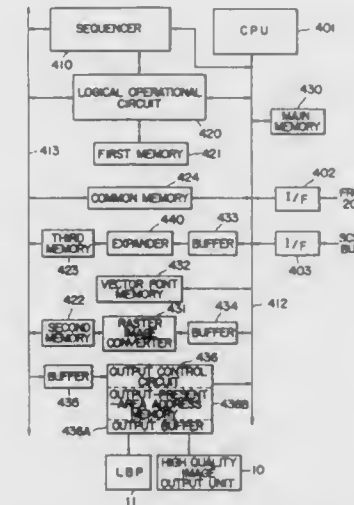
U.S. Cl. 395—147

9 Claims

1. An image generating apparatus to lay-out and output to a display and a printer, scanned in a main direction and an auxiliary direction, character images via code data and bit map

images formed by either one of compressed data or non-compressed data, which comprises:

- a first memory for storing bit mapped image data, addressable in block form, for outputting to said display and said printer,
- a raster image converter for converting said code data into bit map data,
- a second memory for temporarily storing bit map data which was converted by said raster image converter,
- an expander for converting said compressed data into bit map data by expanding said compressed data,
- a third memory for temporarily storing bit map data which was converted by said expander,
- a fourth memory for temporarily storing non-compressed bit map data,



- a transferring means for transferring bit map data in parallel from said second, third and fourth memories to a designated area of said first memory, said designated area containing displayable information and printer information in block form;
- a logical operational means for performing selectable ones of a plurality of logical operations for each bit of said transferred data and correspondingly located bits of said stored data of said first memory, as said data is transferred to said first memory said operations comprising at least one of overlapping bit map data and synthesizing bit map data, and
- a sequencer for controlling said transferring means and logical operational means to operate in a predetermined order.

5,086,498

PARALLEL COMPUTER WITH ASYNCHRONOUS COMMUNICATION FACILITY

Teruo Tanaka, Hachioji; Naoki Hamaoka; Junji Nakagoshi, both of Tokyo; Koichiro Omoda, Sagami-hara, and Shigeo Nagashima, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1988, Ser. No. 145,614

Claims priority, application Japan, Jan. 23, 1987, 62-12358; Jan. 23, 1987, 62-12359

Int. Cl.⁵ G06F 13/00

U.S. Cl. 395—200

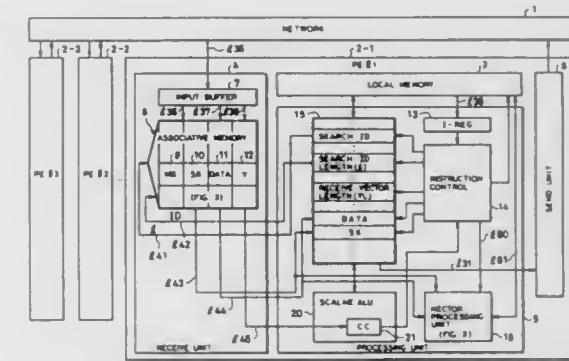
20 Claims

1. A parallel computer for asynchronous transmission of messages among processors, having:

- (a) a plurality of processors, and
- (b) a network for data transfer between said plurality of processors,
- (c) each processor having:
 - (c1) first means for sending to said network a message comprising data to be sent to another processor and data ID, the data ID comprising a main ID for identifying

ing a data group to which said data belong and a sub ID for discriminating said data from other data in said data group.

- (c2) second means for receiving from the network and holding a plurality of messages supplied to the processor from said network, and outputting data and sub ID contained in one communication data having a main ID contained in one communication data having a main ID



- coincident with a search main ID, among said plurality of held communication data in response to supply of said search main ID to said second means, and,
- (c3) third means for executing a plurality of instructions, said third means supplying said second means with a search main ID specified by an instruction requesting reading of data out of said second means among the instructions, in response to said instruction.

5,086,499

COMPUTER NETWORK FOR REAL TIME CONTROL WITH AUTOMATIC FAULT IDENTIFICATION AND BY-PASS

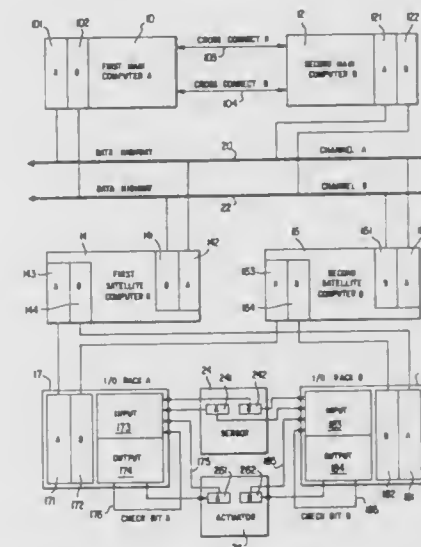
Gioacchino A. Mutone, Pittsburgh, Pa., assignor to AEG Westinghouse Transportation Systems, Inc., Pittsburgh, Pa.

Filed May 23, 1989, Ser. No. 356,546

Int. Cl.⁵ G06F 11/00

U.S. Cl. 364—200

11 Claims



1. A computer system comprising:
 - first and second main computers, each computer having a primary data interface and a secondary data interface each

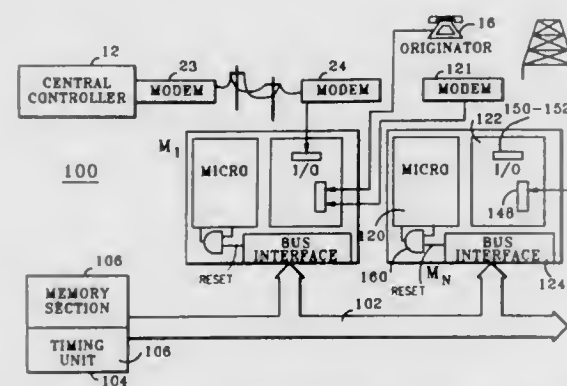
5,086,505 SELECTIVE INDIVIDUAL RESET APPARATUS AND METHOD

Steven J. Goldberg, Coral Springs, and Gary S. Lobel, Boynton Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1989, Ser. No. 374,011
Int. Cl.⁵ G06F 13/00

U.S. Cl. 395—775

10 Claims



1. In an electronic system including a plurality of resettable circuits, a method of providing selective resetting of individual ones of the resettable circuits, comprising the steps of: assigning each of the plurality of resettable circuits a time slot in a time frame, the time frame being at least equivalent to the total of all the time slots; controlling each of the plurality of resettable circuits so that each of the plurality of resettable circuits can be reset only during the time slot assigned thereto; providing a reset signal during the time slot of a predetermined one of the plurality of resettable circuits to be reset; and supplying the provided reset signal to the predetermined one of the plurality of resettable circuits.

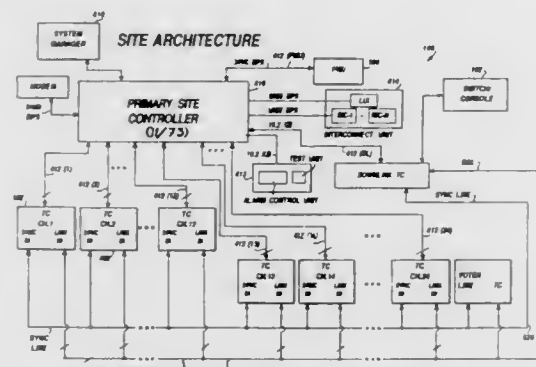
5,086,506 RADIO TRUNKING FAULT DETECTION SYSTEM WITH POWER OUTPUT MONITORING AND ON-AIR MONITORING

Nancy L. Hall, and David L. Hattey, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va. Division of Ser. No. 85,663, Aug. 14, 1987, Pat. No. 4,903,321. This application Nov. 28, 1989, Ser. No. 442,319

Int. Cl.⁵ H04B 3/36

U.S. Cl. 455—8

19 Claims



1. A radio frequency repeater system including: a plurality of radio frequency repeater stations each capable of transmitting RF signals; site controller means coupled to said repeater stations for controlling said stations, and for periodically polling said

stations and receiving poll responses generated by said stations in response to said polling; RF output power monitor means coupled to said site controller means and said plurality of radio frequency repeater stations for monitoring the RF power output level of active ones of said stations and for indicating to said site controller if any said monitored power level falls below a predetermined level; and testing means connected to said site controller means for monitoring RF digital signalling produced by active repeater stations and for notifying said site controller means of errors detected in said signalling, wherein said site controller means automatically removes a repeater station from operation without human intervention whenever the station (a) fails to respond to polls, (b) has low RF power output level as detected by said RF output power monitor means, or (c) produces erroneous signalling as detected by said testing means, and restores removed repeater stations from service only when all three of said failure conditions (a), (b) and (c) are not present.

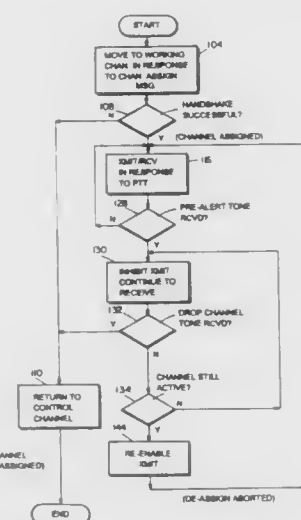
5,086,507 DROP CHANNEL PRE-ALERT FOR TRUNKED RADIO COMMUNICATIONS SYSTEM

Samuel S. Mela, Lynchburg, Va., assignor to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed May 25, 1989, Ser. No. 356,353
Int. Cl.⁵ H04Q 7/00, 9/00

U.S. Cl. 455—34

6 Claims



1. In a trunked radio communications system, a method of operating plural radio frequency transceivers presently assigned for use of a radio frequency communications channel, said method comprising the following steps:

- monitoring said assigned channel for a period of non-use by said assigned transceivers and in response to the detection of said period of non-use;
- transmitting a pre-alert signal on said assigned channel;
- receiving said pre-alert signal present on said assigned radio frequency communications channel at each of said transceivers;
- inhibiting further transmission of RF signals over said assigned communications channel by each of said transceivers but with each said transceiver continuing to monitor said assigned channel in response to receipt of said pre-alert signal;
- subsequent to said receiving step (c), receiving a drop channel signal present on said assigned channel; and
- each said transceiver ceasing to monitor said assigned channel in response to receipt of said drop channel signal.

5,086,508 RADIO TRANSCEIVER WITH TRANSMISSION LEVEL CONTROL

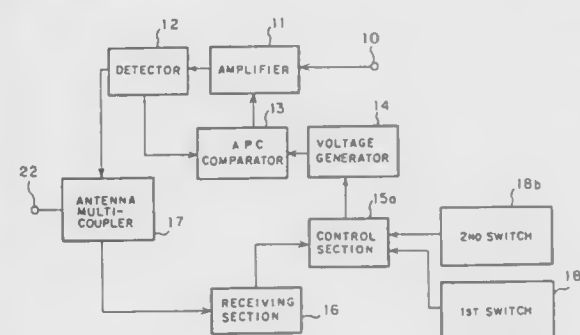
Kenichi Furuno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,862

Claims priority, application Japan, Apr. 10, 1989, 1-88105
Int. Cl.⁵ H04B 7/00

U.S. Cl. 455—69

15 Claims



1. A radio transceiver comprising: an amplifier for amplifying a transmitting signal at a variable transmitting output power level; transmitting power detecting means for detecting the transmitting output power level of said amplified transmitting signal; receiver means including means for receiving and for outputting transmitting output power level information contained in a received signal, which designates a specified transmitting output power level within a prescribed tolerance range; level conversion means for outputting a conversion signal designating a transmitting output power level modified from said specified transmitting output power level but within said prescribed tolerance range; control means responsive to said transmitting output power level information and said conversion signal for outputting a transmitting output power selection signal corresponding to said specified transmitting output power level designated by said level information as modified by said level conversion signal; and transmitting power control means responsive to said transmitting output power selection signal and said detected transmitting output power level for setting the amplification factor of said amplifier to control the transmitting output power of said transceiver at the power level specified by said transmitting output power selection signal outputted by said control means.

5,086,509 THERMALLY ADAPTIVE HOUSING FOR HAND HELD RADIO TELEPHONE DEVICE

Toshiya Inubushi, Atsushi Musha, and Manabu Hasegawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1989, Ser. No. 459,290

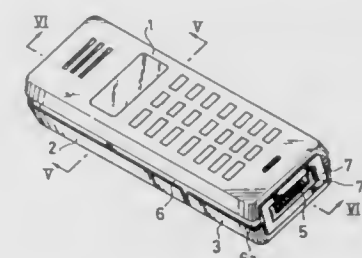
Claims priority, application Japan, Apr. 3, 1989, 1-84384
Int. Cl.⁵ H04B 1/38; H05K 7/20

U.S. Cl. 455—89

15 Claims

1. A housing for a portable hand held radio telephone device comprising an upper cover and a lower cover having outer surfaces, said upper cover and said lower cover being made of heat insulating material; and a metal chassis having a good thermal conductivity held between said upper cover and said lower cover, said chassis having a surface part thereof exposed to the outer surface of said device, said exposed surface part

being recessed inwardly from the outer surfaces of said upper cover and said lower cover such that direct contact between



the hand by which said device is held and said surface part is prevented when the device is held by hand.

5,086,510 MULTI-CHOICE INFORMATION SYSTEM FOR A MOTOR VEHICLE

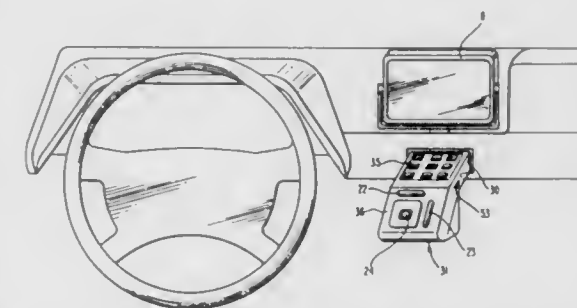
Clemens Guenther, Sexau; Ralf Eck, Frankfurt/M; Christa Heiland-Franzen, Eggenstein-Leo; Peter Knoll, Ettlingen; Winfried Koenig, Pfingsttal-Berghausen; Georg Geiser, Karlsruhe; Rudolf Haller, Karlsruhe; Udo Brunke, Dieckholzen, and Rudolph Vollmer, Barienrode, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 452,606

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842413; Dec. 16, 1988, 3842414; Dec. 16, 1988, 3842417
Int. Cl.⁵ H01Q 7/04

U.S. Cl. 455—90

5 Claims



1. An input subsystem for an information system of a motor vehicle including an input device comprising a voice transmitter (38) and a voice receiver (37) at opposite ends of a hand-grippable elongate casing, said device having an input keyboard on the side of said casing opposite said transmitter and receiver, said keyboard being composed of a first input field (34) equipped with an alphanumeric keyboard and a second input field (35) implemented by a keyboard portion for designating any of a plurality of selectable auxiliary equipments in said vehicle for activation or operation, said input device also having wireless data transmission and reception means (52, 51) for data and voice communication with a corresponding transmission and reception means (62, 61; 72, 71) installed in said vehicle,

said input subsystem including a close fitting holding sheath mounted in fixed position in said vehicle for insertion of the casing of said input device therein, holding said casing in a predetermined position therein or removal of said casing and said input device therefrom, said sheath being of a configuration such that when said casing is held therein, at least one (36) of said fields of said keyboard is exposed and usable.

5,086,511

MOBILE RECEIVER

Akikazu Kobayashi, Yokohama, and Hideo Shiozawa, Sagami-hara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

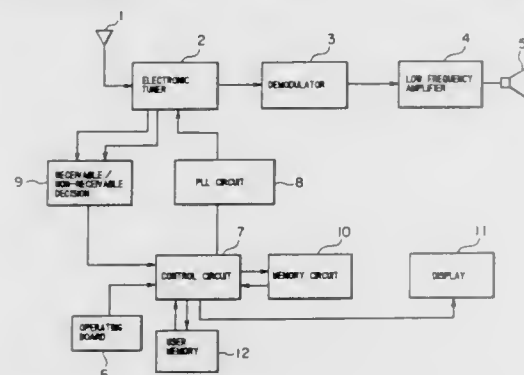
Filed Mar. 8, 1990, Ser. No. 490,419

Claims priority, application Japan, Mar. 13, 1989, 1-059930; Mar. 13, 1989, 1-059931

Int. Cl.⁵ H04B 11/16

U.S. Cl. 455—156

6 Claims



1. A mobile receiver comprising:
 an operating means having an input for inputting a travel direction of the receiver;
 memory means for storing therein receive frequency data and broadcasting station name data associated therewith with respect to respective geographic areas;
 read out means for reading out from said memory means receive frequency data relating to a designated area corresponding to said travel direction of the receiver designated by said operating means and broadcasting station name data associated therewith;
 receivable/non-receivable decision means for determining broadcasting frequencies receivable at a current position of the receiver; and
 means for (a) comparing receive frequency data determined as receivable by said receivable/non-receivable decision means with said receive frequency data of said designated area read out from said memory means, (b) retrieving from said memory means receive broadcasting station name data corresponding to one broadcasting station in said designated area and (c) providing an output identifying said one broadcasting station.

5,086,512

COMPENSATION SYSTEM FOR DYNAMICALLY TRACKING AND NULLING LOCAL OSCILLATOR FEEDTHROUGH

Manfred U. Bartz, Snohomish, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 183,856, Apr. 20, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 455,209

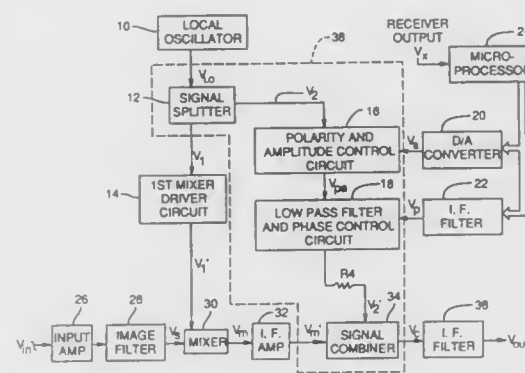
Int. Cl.⁵ H04B 1/26

U.S. Cl. 455—186

15 Claims

1. In a method of nulling local oscillator feedthrough in a superheterodyne receiver, the receiver including a mixer driven by RF input and local oscillator signals, the receiver producing a receiver signal which includes an undesirable local oscillator component, the method including summing the receiver signal with a nulling signal derived from the local oscillator signal, said nulling signal having substantially the same amplitude and opposite phase as the undesired local oscillator component, an improvement comprising the steps:
 (a) providing an automatic control circuit;
 (b) producing from the automatic control circuit a first electrical control signal on which the nulling signal depends;
 (c) setting the first control signal to a first value;

- (d) incrementing the first control signal, and thereby changing the nulling signal;
 (e) determining whether the undesired local oscillator component is diminished by the aforesaid incrementing of the first control signal and, if so, storing a datum indicative of the value of the first control signal in an electrical memory element;



- (f) repeating steps (d) and (e) until the first control signal reaches a second value;
 (g) recalling the stored datum from the electrical memory element; and
 (h) setting the first control signal to the value indicated by said stored datum.

5,086,513

DIGITAL RADIO TRANSCEIVER PROGRAMMER WITH ADVANCED USER INTERFACE

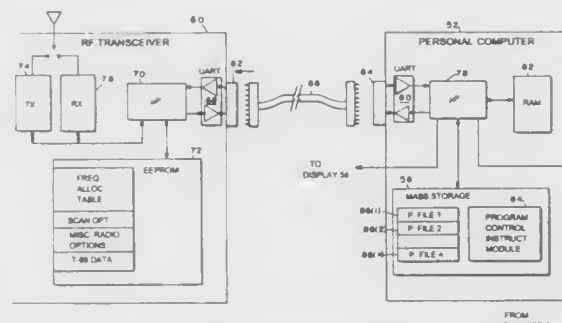
Douglas P. Lawrence, and Jeffrey S. Childress, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Apr. 12, 1989, Ser. No. 337,202

Int. Cl.⁵ H04B 1/38

U.S. Cl. 455—186

23 Claims



15. A digital radio transceiver programming apparatus of the type for loading personality defining information into an internal non-volatile memory of a digital radio transceiver, said apparatus comprising:
 connector means for operatively connecting to said digital radio transceiver non-volatile memory;
 user operable input means for inputting user selections, said input means including a set of user depressible keys;
 processor means connected to said connector means and to said input means for generating digital signals specifying operating parameters of said digital radio transceiver in response to inputted user selections and for loading said digital signals into said digital radio transceiver non-volatile memory via said connector means;
 storage means connected to said processor for storing further digital signals representing plural display formats organized in a hierarchical tree structure, at least one of said display formats comprising plural input fields; and

- display means connected to said processor means for selectively displaying said display formats in response to inputted user selections,
 said processing means including means responsive to said input means for superimposing said cursor symbol over a user selected one of said input fields, and means for gener-

ating a prompt line responsive to the displayed position of said cursor and for controlling said display to display said generated prompt line at a lower portion within said work section.

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DESIGN PATENTS

GRANTED FEB. 4, 1992

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CLASS

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See
PATENT NO.

323,726

VOL
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DESIGNS

FEBRUARY 4, 1992

323,575

SKI BOOT UPPER

Renzo Balbinot, Vittorio Veneto, and Michele Minesso, Ponte Longo, both of Italy, assignors to Skis Rossignol S.A., Voiron, France

Filed Nov. 16, 1988, Ser. No. 272,689

Claims priority, application Hague, May 18, 1988, DM010970
Term of patent 14 years

U.S. Cl. D2—276



323,576

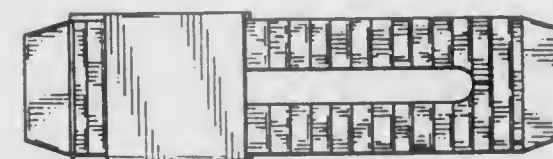
LATCH FOR CLOSING SHOE BY PULLING EYELETS TOGETHER

David A. Laks, 916 Dawson Ave., Long Beach, Calif. 90804

Filed Nov. 15, 1989, Ser. No. 436,679

Term of patent 14 years

U.S. Cl. D2—314



323,577

SHOE SOLE

Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan

Filed Mar. 14, 1990, Ser. No. 493,280

Claims priority, application Japan, Sep. 29, 1989, 1-35798
Term of patent 14 years

U.S. Cl. D2—320



323,578

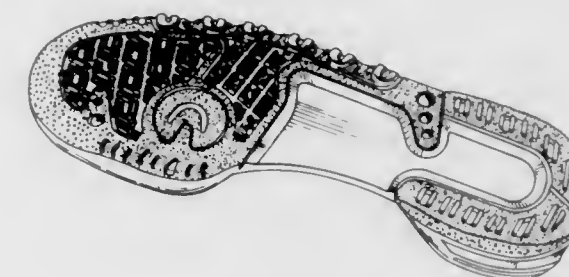
SHOE SOLE

Toshiaki Kawasaki, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan

Filed Apr. 18, 1990, Ser. No. 510,424

Claims priority, application Japan, Oct. 20, 1989, 1-38458
Term of patent 14 years

U.S. Cl. D2—320



323,579

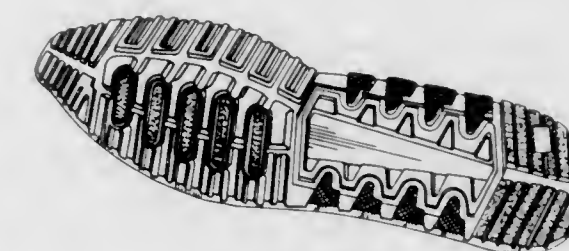
SHOE SOLE

Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan

Filed Apr. 18, 1990, Ser. No. 510,795

Claims priority, application Japan, Oct. 20, 1989, 1-38453
Term of patent 14 years

U.S. Cl. D2—320



323,580

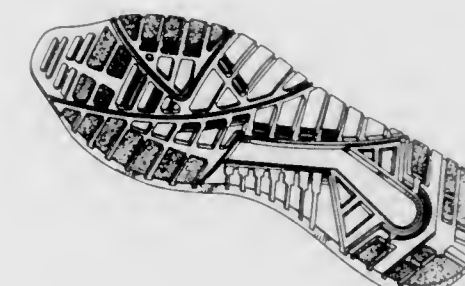
SHOE SOLE

Michihito Hoshimi, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan

Filed May 22, 1990, Ser. No. 526,936

Claims priority, application Japan, Nov. 27, 1989, 1-43257
Term of patent 14 years

U.S. Cl. D2—320



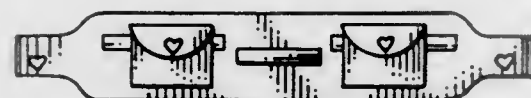
323,581

INFORMATION BELT OR THE LIKE

Kathy L. Grivjack, 3870 NW. 21 St., Coconut Creek, Fla. 33066,
and Connie Dares, 4165 NW. 34 Ter., Lauderdale Lakes, Fla.
33309

Filed Aug. 11, 1988, Ser. No. 231,045
Term of patent 14 years

U.S. Cl. D2—630



323,582

PORTABLE PERSONAL SUN SHADE

Yanon Volcani, 305 Bird Rock Ave., La Jolla, Calif. 92037
Filed Aug. 28, 1989, Ser. No. 399,272

Term of patent 14 years

U.S. Cl. D3—5



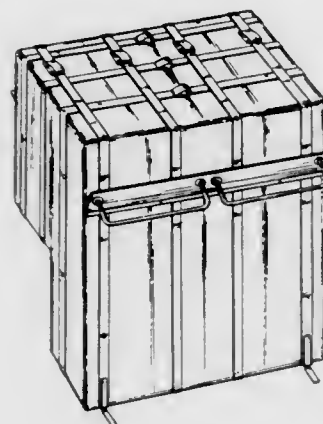
323,583

AIRPLANE SEAT ATTACHABLE BAG

John R. Bennetts, 54 Solomon Street, Palmyra, Western Australia,
Australia 6157

Filed Sep. 13, 1988, Ser. No. 243,763
Term of patent 14 years

U.S. Cl. D3—78



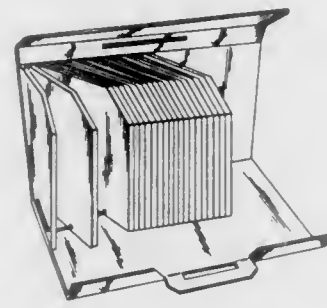
323,584

FLEXIBLE DOCUMENT CASE

Jonothan M. W. McIntyre, 6732 Hinds Ave., North Hollywood,
Calif. 91606

Filed Oct. 20, 1989, Ser. No. 424,575
Term of patent 14 years

U.S. Cl. D3—78



323,585

COMBINED SKI AND SKI POLE CARRIER

June S. Rader, and Joseph P. Rader, both of Boulder, Colo.,
assignors to Camas Corporation, Boulder, Colo.

Filed Jan. 4, 1990, Ser. No. 461,087
Term of patent 14 years

U.S. Cl. D3—104



323,586

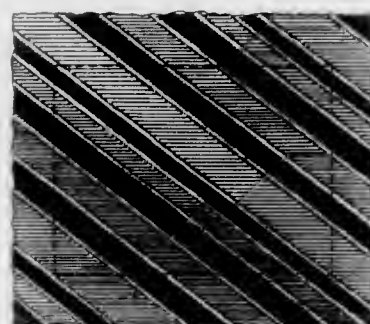
TEXTILE FABRIC

Rudolf Cerny, Steinfurt, Fed. Rep. of Germany, assignor to
Arnold Kock GmbH u. Co. KG, Steinfurt, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,333
Claims priority, application Fed. Rep. of Germany, Feb. 25,
1988, 8MRBD.5B1.660

Term of patent 14 years

U.S. Cl. D5—60



323,587

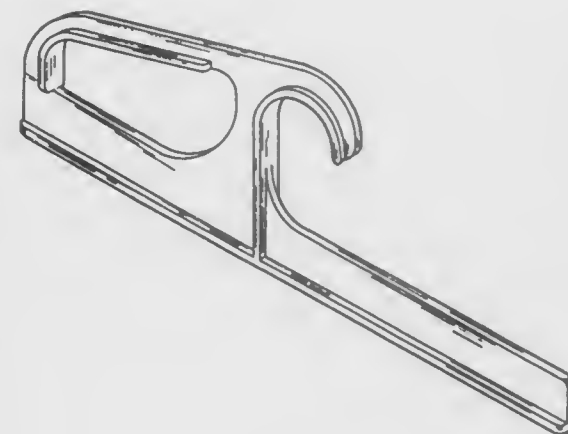
HANGING SUPPORT

Mario Primeau, St-Leonard, Canada, assignor to 2549-1622
Quebec Inc., Longueuil, Canada

Filed Jan. 30, 1989, Ser. No. 303,679

Claims priority, application Canada, Jul. 28, 1988, 2807883
Term of patent 14 years

U.S. Cl. D6—327



323,589

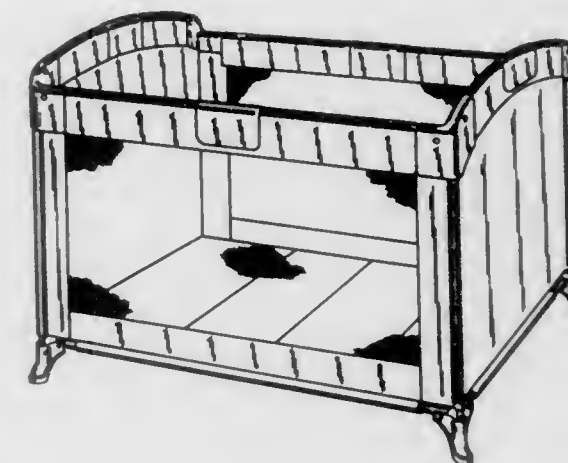
FOLDABLE PLAYPEN OR SIMILAR ARTICLE

John V. Mariol, Cincinnati, Ohio, assignor to Lisco, Inc.,
Tampa, Fla.

Filed Sep. 8, 1989, Ser. No. 404,974

Term of patent 14 years

U.S. Cl. D6—331



323,588

CUSHIONED HANGER CLIP OR SIMILAR ARTICLE

Raymond P. Pelosi, P.O. Box 1713, Rutherford, N.J. 07070
Continuation of Ser. No. 23,291, Mar. 9, 1991, Pat. No. Des.
303,590. This application May 15, 1989, Ser. No. 352,172

Term of patent 14 years

U.S. Cl. D6—328



323,590

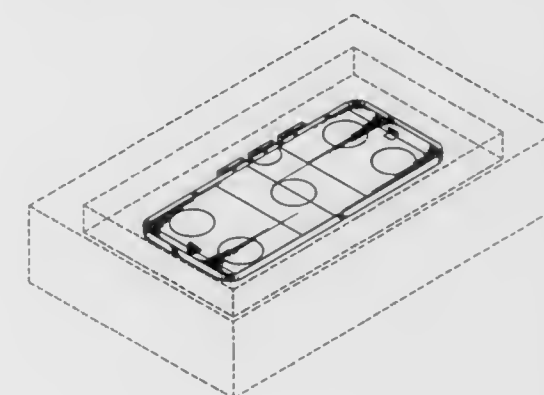
ICE HOCKEY RINK INSERT FOR A TABLE

Jesse Barfield, 4208 Canterwood Dr., Houston, Tex. 77068

Filed Aug. 17, 1989, Ser. No. 395,404

Term of patent 14 years

U.S. Cl. D6—450

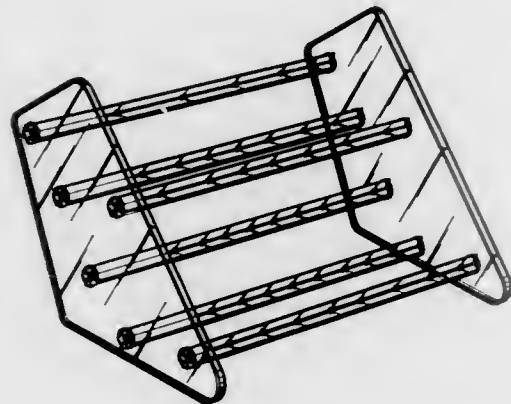


323,591
MULTI-TIER RACK

David M. Stravitz, 16 Park Ave., Ste. 14A, New York, N.Y. 10016

Filed Oct. 5, 1990, Ser. No. 593,128
Term of patent 14 years

U.S. Cl. D6—437

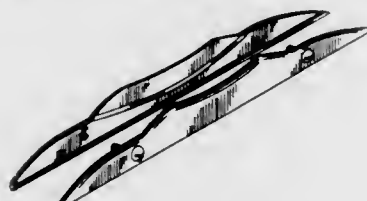


323,592
SUPPORT FOOT FOR A WINE RACK

David P. Masacek, 2925 Locust St., San Diego, Calif. 92106

Filed Dec. 5, 1988, Ser. No. 280,203
Term of patent 14 years

U.S. Cl. D6—495

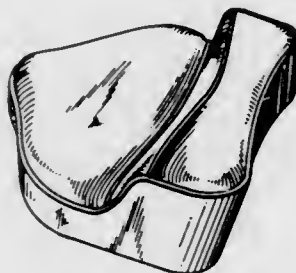


323,593
BOAT SEAT

Ronnie C. Messer, 2956 Landmark Dr., Conyers, Ga. 30208

Filed Mar. 31, 1989, Ser. No. 331,543
Term of patent 14 years

U.S. Cl. D6—502

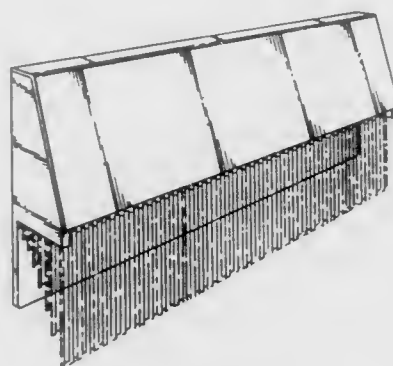


323,594
TWIST-TIE CLOSURE DISPENSER

James R. Helseth, Minnetonka, Minn., assignor to Twist-Ease Inc., Minneapolis, Minn.

Filed Aug. 11, 1989, Ser. No. 392,845
Term of patent 14 years

U.S. Cl. D6—515

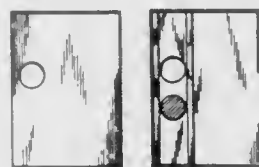
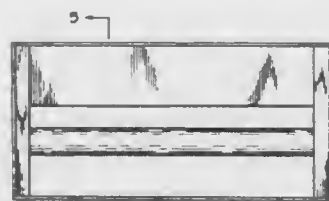


323,595
COMBINATION HOLDER AND DISPENSER FOR PAPER ROLLS

H. Hayes Alexander, and Ben L. Alexander, both of 16387 60.30 Rd., Montrose, Colo. 81401

Filed Jun. 12, 1989, Ser. No. 364,634
Term of patent 14 years

U.S. Cl. D6—518

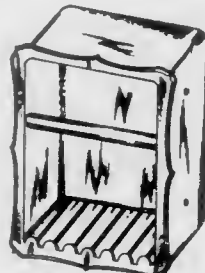


323,596
COMBINATION SOAP DISH AND GRAB BAR

Paul H. Kim, 6830 Third St., Lanham, Md. 20706

Filed Jan. 31, 1990, Ser. No. 473,193
Term of patent 14 years

U.S. Cl. D6—533



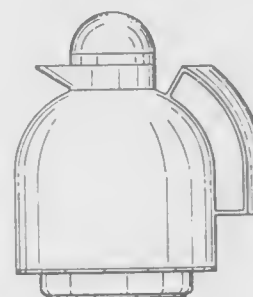
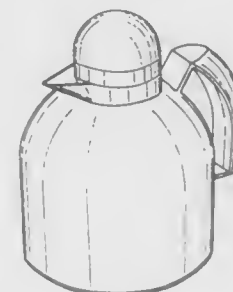
323,597
CARAFE

Furio Minuti, Macerata, Italy, assignor to Fratelli Guzzini S.p.A., Macerata, Italy

Filed Jun. 23, 1989, Ser. No. 371,596

Claims priority, application Italy, Jan. 5, 1989, 20414/89[U] Term of patent 14 years

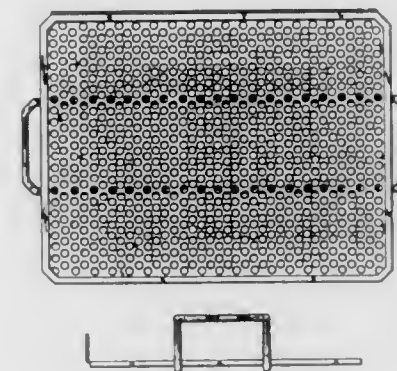
U.S. Cl. D7—317



323,599
BARBECUE GRATE

John D. Griffard, 301 Oak St., Quincy, Ill. 62301

Filed May 1, 1989, Ser. No. 346,151
Term of patent 14 years



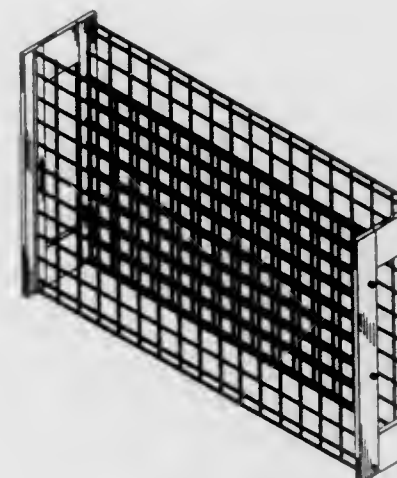
323,600

BOTTLE RACK OR SIMILAR ARTICLE

Bruce D. Patke, 19010 White Candle, Spring, Tex. 77388

Filed Apr. 13, 1989, Ser. No. 337,445
Term of patent 14 years

U.S. Cl. D7—618



323,598

BEVERAGE INFUSING POT OR SIMILAR ARTICLE

Flavio Sambinelli, Gussago, Italy, assignor to Carlo Giannini S.p.A., Brescia, Italy

Filed Aug. 4, 1989, Ser. No. 389,785

Claims priority, application Italy, Feb. 22, 1989, 6931/89[U] Term of patent 14 years

U.S. Cl. D7—317



323,601

BEVERAGE CONTAINER

Jonathan D. Katz, 321 Huntington Rd., Kansas City, Mo. 64113

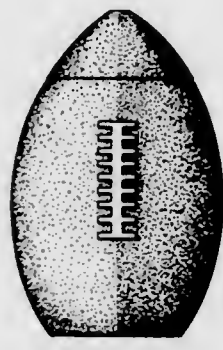
Filed Feb. 26, 1990, Ser. No. 484,629
Term of patent 14 years

U.S. Cl. D7—619



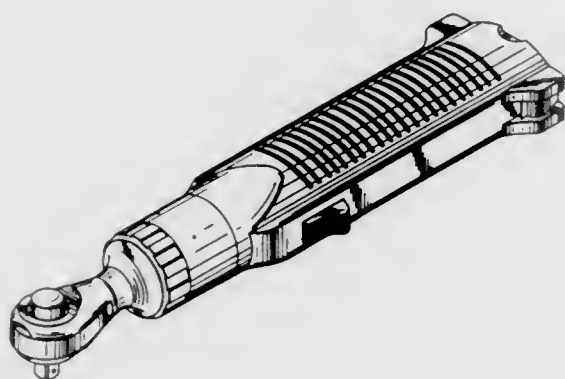
323,602
BEVERAGE CONTAINER

Jonathan D. Katz, 321 Huntington Rd., Kansas City, Mo. 64113
Filed Feb. 26, 1990, Ser. No. 484,631
Term of patent 14 years
U.S. Cl. D7—619



323,603
ELECTRIC RATCHET WRENCH OR SIMILAR ARTICLE

Pao-Chu Fu, No. 10, Kung Yeh 10 Rd., Kung Yeh Chu, Tai-chung, Taiwan
Filed Jun. 19, 1989, Ser. No. 368,208
Term of patent 14 years
U.S. Cl. D8—61



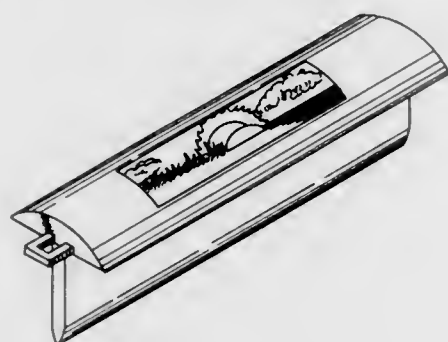
323,605
BRAKE BLEEDING WRENCH

Timothy L. Frane, Beavercreek, Oreg., assignor to Intracut Enterprises, Beavercreek, Oreg.
Filed Jul. 13, 1989, Ser. No. 379,169
Term of patent 14 years
U.S. Cl. D8—21



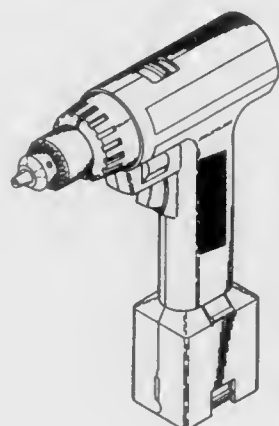
323,604
LAWN BORDER

James Deschryver, 411 Timberline Dr., Fayetteville, N.C. 28311
Filed May 4, 1990, Ser. No. 518,856
Term of patent 14 years
U.S. Cl. D8—1



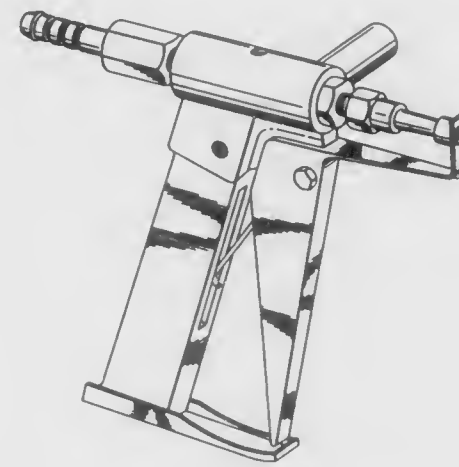
323,606
ELECTRIC DRILL

Jung C. Chang, No. 127, Shangping Li Chutung, Hsinchu Shien, Taiwan
Filed May 9, 1989, Ser. No. 349,798
Term of patent 14 years
U.S. Cl. D8—68



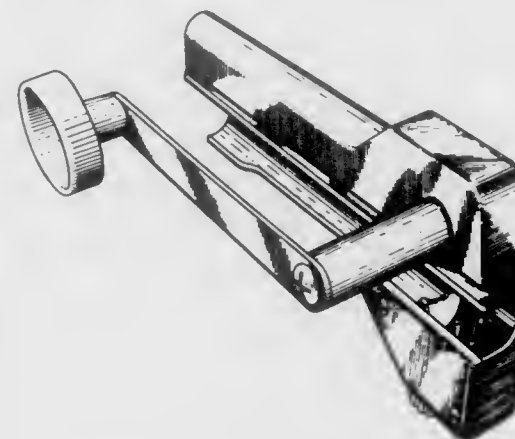
323,607
SANDBLASTING GUN

Fred Zwicker, Canfield, Ohio, assignor to Truman's Inc., Canfield, Ohio
Filed Jul. 3, 1989, Ser. No. 375,287
Term of patent 14 years
U.S. Cl. D8—68



323,608
CABLE SHIELDING CUTTER

Thomas Boese, Rockford, Ill., and Orville Larsen, Lake Geneva, Wis., assignors to Greenlee Trextron Inc., Rockford, Ill.
Filed Nov. 4, 1988, Ser. No. 267,520
Term of patent 14 years
U.S. Cl. D8—98



323,609
COMBINED KNIFE AND SPIRIT LEVEL

Charles McEvily, Harrison, N.Y., assignor to Gutmann Cutlery, Inc., Mount Vernon, N.Y.
Filed Feb. 1, 1989, Ser. No. 304,830
Term of patent 14 years
U.S. Cl. D8—99



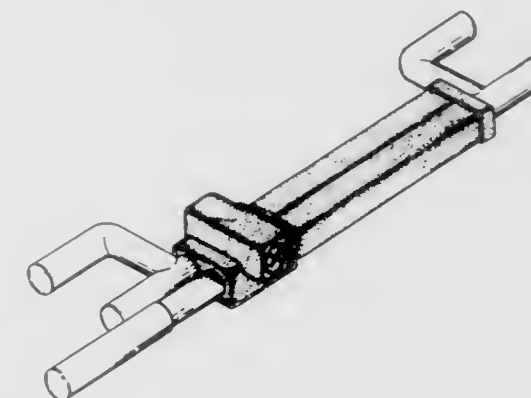
323,610
LEVER HANDLE

Alan P. Tye, Tring; David R. Perrett, and Simon D. E. Mills, both of Aylesbury, all of England, assignors to G. & S. Allgood (Holdings) Limited, London, England
Filed Oct. 27, 1989, Ser. No. 428,047
Claims priority, application United Kingdom, May 5, 1989, 1059244
Term of patent 14 years
U.S. Cl. D8—308



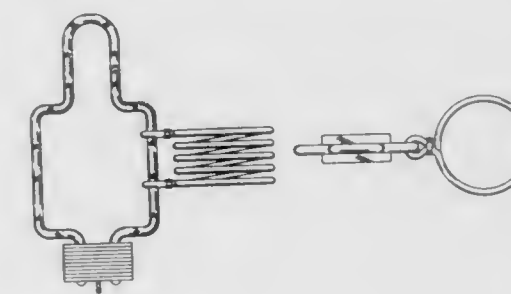
323,611
AUTOMOBILE STEERING WHEEL LOCK

Shwv M. Jan, No. 7-2, Alley 13, Lane 54, Sec. 2, Hsing Nan Road, Chung Heh Shih, Taipei Hsien, and Hsien P. Chen, No. 76, Lane 274, Chung Cheng South Road, Yung Kang Hsiang, Tainan Hsien, both of Taiwan
Filed Oct. 1, 1990, Ser. No. 592,318
Term of patent 14 years
U.S. Cl. D8—331



323,612
COMBINED SNOW SKI AND POLE LOCK ASSEMBLY

Peter B. Rau, 4011 Wilson Rd., Kenosha, Wis. 53142
Filed Jul. 27, 1990, Ser. No. 559,560
Term of patent 14 years
U.S. Cl. D8—333

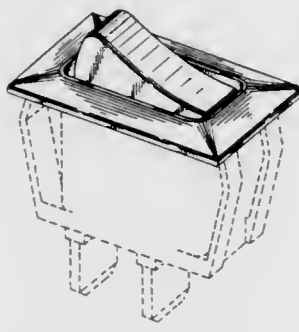


323,613

COMBINED ROCKER BUTTON AND BEZEL

Leonard D. Cummins, Cedarville, and Gary L. Turner, Polo, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 13, 1989, Ser. No. 311,028
Term of patent 14 years

U.S. Cl. D8—353

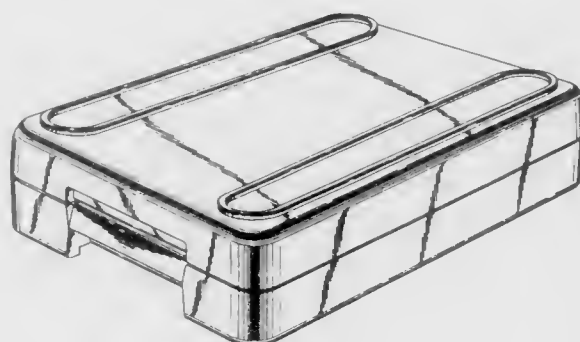


323,616

COMBINED FOOD STORAGE AND SERVING TRAY WITH COVER

Jonathan H. Mueller, Hermitage, Tenn., assignor to Aladdin Synergetics, Inc., Nashville, Tenn.
Filed Jun. 1, 1989, Ser. No. 359,933
Term of patent 14 years

U.S. Cl. D9—341

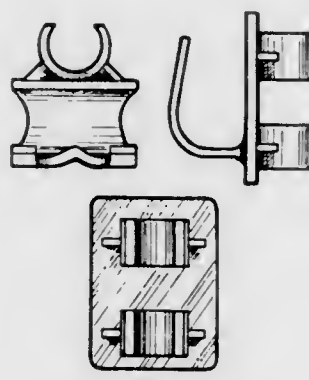


323,614

HANGER FOR HOSES AND ATTACHMENTS

Robert J. Bell, 1900 Smith Grade Rd., Santa Cruz, Calif. 95060
Filed Apr. 10, 1990, Ser. No. 507,587
Term of patent 14 years

U.S. Cl. D8—373



323,617

COMBINED BOTTLE AND CAP

Alan N. Miller, New City, N.Y., assignor to Coltene/Whaledent, Inc., New York, N.Y.
Filed Aug. 30, 1989, Ser. No. 400,560
Term of patent 14 years

U.S. Cl. D9—411

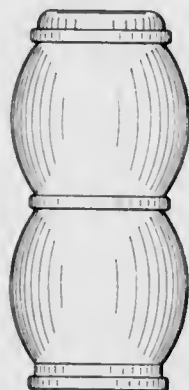


323,615

FOOD STORAGE JAR

Scott B. Carlstrom, 7511 Dean St. West, Tacoma, Wash. 98467
Filed Apr. 26, 1989, Ser. No. 343,244
Term of patent 14 years

U.S. Cl. D9—341

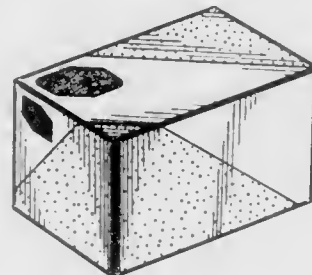


323,618

BOX FOR A ROLL OF FILM

Takuya Arai, Kanagawa, Japan, and Glenn Tutssel, London, England, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 5, 1989, Ser. No. 375,463
Claims priority, application Japan, Jan. 11, 1989, 1-602; Jan. 11, 1989, 1-603; Jan. 11, 1989, 1-604; Jan. 11, 1989, 1-605
Term of patent 14 years

U.S. Cl. D9—432

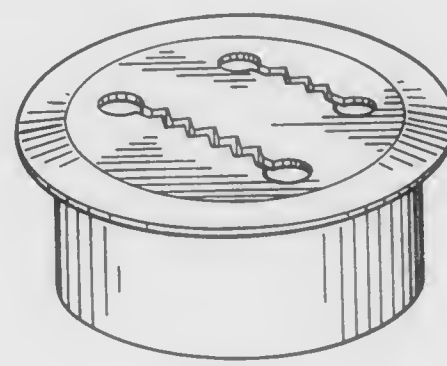


323,619

NOZZLE FOR A PLASTIC BAG DISPENSER

Harry B. Wilfong, Jr., and Edwin W. Haenl, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.
Filed Apr. 3, 1989, Ser. No. 332,220
The portion of the term of this patent subsequent to May 1, 2004, has been disclaimed.
Term of patent 14 years

U.S. Cl. D9—447

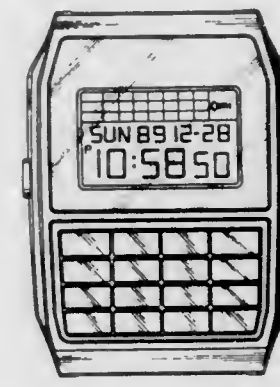


323,622

WRIST WATCH

Takashi Morishima, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 6, 1989, Ser. No. 403,725
Term of patent 14 years

U.S. Cl. D10—31



323,623

WRIST WATCH

Masamichi Wakamatsu, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Aug. 11, 1989, Ser. No. 392,400
Term of patent 14 years

U.S. Cl. D10—38

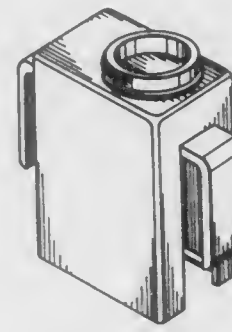


323,620

COMBINED HOLDER AND DISPENSER FOR PACKAGED FLUIDS

Keith D. Patterson, 224 Fifth St., Providence, R.I. 02906
Filed Feb. 13, 1989, Ser. No. 309,627
Term of patent 14 years

U.S. Cl. D9—455



323,621

TRAVEL ALARM CLOCK

Mitsuo Wada, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Oct. 25, 1989, Ser. No. 427,310
Term of patent 14 years

U.S. Cl. D10—15

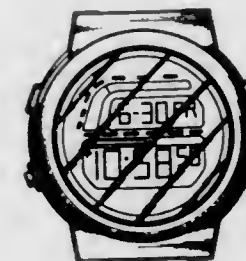


323,624

WRIST WATCH

Ryusuke Moriai, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Aug. 11, 1989, Ser. No. 392,521
Term of patent 14 years

U.S. Cl. D10—38

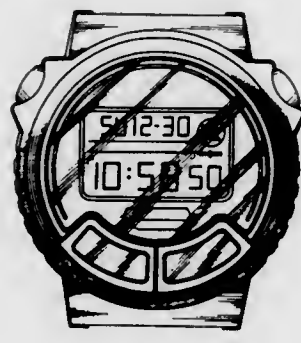


323,625
WRIST WATCH

Ynki Murakami, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1989, Ser. No. 403,718
Term of patent 14 years

U.S. Cl. D10—38

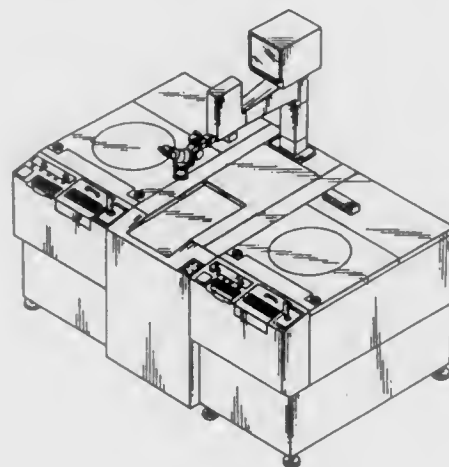


323,628
SEMICONDUCTOR WAFER MEASURING
INSTRUMENT

Itaru Takao, Yamanashi, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Apr. 25, 1989, Ser. No. 343,124
Term of patent 14 years

U.S. Cl. D10—46

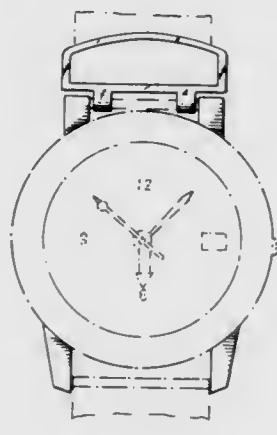


323,626
STRAP CONNECTOR FOR WRISTWATCH

Oreste Tomasini, 7 Largo De Dominici, 00159 Rome, Italy

Filed Sep. 26, 1988, Ser. No. 249,087
Term of patent 14 years

U.S. Cl. D10—39

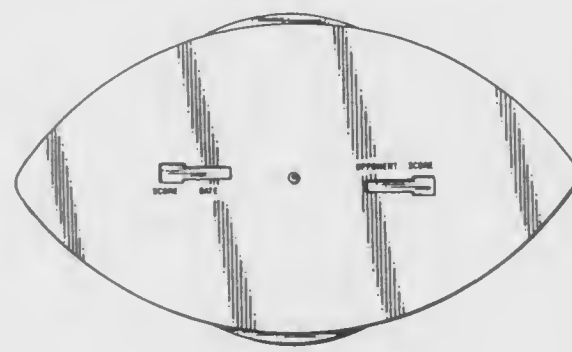


323,629
FOOTBALL SCORE KEEPER

Timothy J. Murphy, Cedar, Minn., assignor to Season Keeper Inc., Minneapolis, Minn.

Filed May 24, 1989, Ser. No. 356,395
Term of patent 14 years

U.S. Cl. D10—46.1



323,627
WATCH

Ira Krieger, 407 Lincoln Road, Suite 10-B, Miami Beach, Fla. 33139

Filed Apr. 17, 1989, Ser. No. 338,960
Term of patent 14 years

U.S. Cl. D10—39



323,630
INTERVAL LOCATOR GAUGE

Brian A. Johnson, 519 Green St., Perry, Mich. 48872

Filed Oct. 13, 1989, Ser. No. 421,007
Term of patent 14 years

U.S. Cl. D10—64

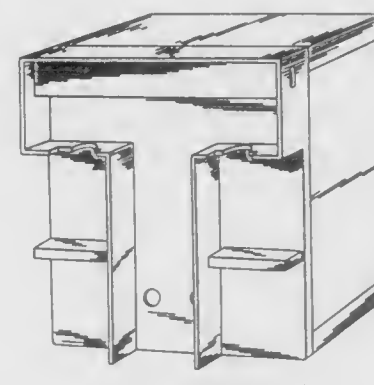


323,631
CABINET FOR DUAL PARTICLE AND CELL ANALYSIS
OR SIMILAR ARTICLE

Lawrence R. Berg, Conroe, Tex., assignor to Particle Data, Inc., Elmhurst, Ill.

Filed Nov. 13, 1989, Ser. No. 435,357
Term of patent 14 years

U.S. Cl. D10—74



323,634
ARTIFICIAL TREE

Stephen B. Green, State Rd., R.D. 1, Box 141-B, Covington, Pa. 16917

Filed Nov. 23, 1988, Ser. No. 275,736
Term of patent 14 years

U.S. Cl. D11—118



323,632
BRACELET

Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari SpA, Rome, Italy

Filed Nov. 13, 1989, Ser. No. 436,015

Claims priority, application Int'l Pat. Institute, May 23, 1989, DM/013.637

Term of patent 14 years

U.S. Cl. D11—9



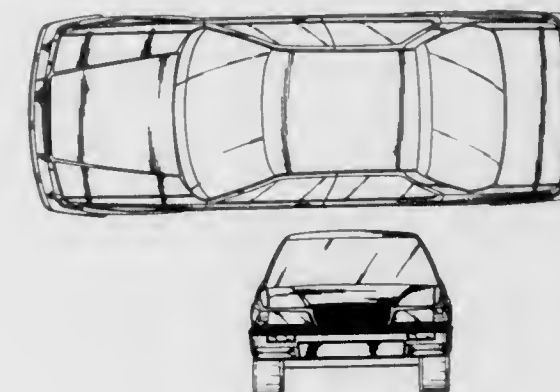
323,635
AUTOMOBILE

Akio Koike, Tokyo; Tamotsu Okamoto, and Fumihito Takayama, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 385,263

Term of patent 14 years

U.S. Cl. D12—92



323,633
BRACELET

Edward J. Mastoloni, Greenwich, Conn., assignor to Frank Mastoloni & Sons, Inc., New York, N.Y.

Filed Jun. 16, 1989, Ser. No. 367,112

Term of patent 14 years

U.S. Cl. D11—3



323,636

PATIENT TRANSPORTER

Ernst Walser, Istighofen, Switzerland, and Kurt Barkhausen, Oberursel, Fed. Rep. of Germany, assignors to Samarit Medizintechnik Aktiengesellschaft, Switzerland
 Filed Apr. 10, 1989, Ser. No. 335,519
 Claims priority, application Switzerland, Oct. 10, 1988, DM/011933

Term of patent 14 years

U.S. Cl. D12-128

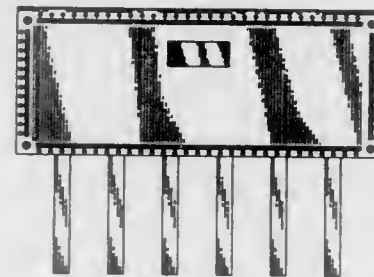


323,639

TAILGATE PROTECTIVE COVER

Troy W. Creamer, P.O. Box 4712, Oceanside, Calif. 92052
 Filed Jul. 27, 1990, Ser. No. 558,385
 Term of patent 14 years

U.S. Cl. D12-155



323,640

STEERING WHEEL

David R. Holm, Oconomowoc; David A. Westmayer, Horicon, both of Wis.; William E. Crookes, Waldwick, N.J., and Daniel R. Nickles, Monroe, N.Y., assignors to Deere & Company, Moline, Ill.

Filed Jul. 3, 1990, Ser. No. 548,054

Term of patent 14 years

U.S. Cl. D12-176



323,637

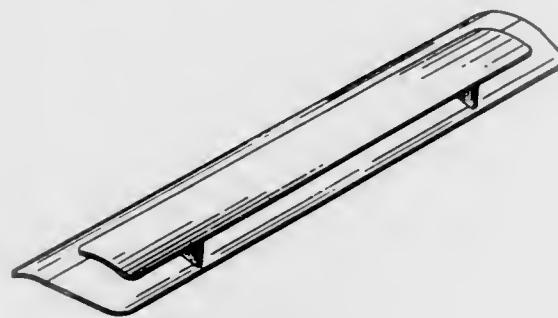
AERODYNAMIC WING ATTACHMENT FOR WINDSHIELD WIPER ARM

Stephen G. Dipple, P.O. Box 881, 71 Nelson Street, Waterdown, Ontario, Canada L0R 2H0

Filed Jul. 11, 1989, Ser. No. 378,511

Term of patent 14 years

U.S. Cl. D12-155



323,638

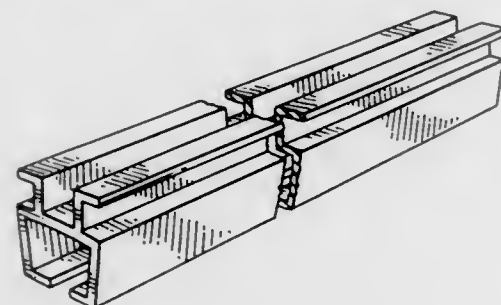
WINDSHIELD WIPER REFILL BACKING STRIP

Franz Buechele, Burlington, Canada, assignor to Tridon Limited, Ontario, Canada

Filed Jul. 5, 1990, Ser. No. 548,641

Term of patent 14 years

U.S. Cl. D12-155



323,641

VEHICLE EXTERNAL REAR VIEW MIRROR

Antonio Ferreirado P. Espirito Santo, Amirante Tamandaré Street, 85 in Sao Bernardo do Campo, Sao Paulo, Brazil

Filed Jul. 10, 1989, Ser. No. 377,707

Claims priority, application Brazil, Jan. 9, 1989, 4900053

Term of patent 14 years

U.S. Cl. D12-187



323,642

BATTERY PACK

Joe Liao, Taichung, Taiwan, assignor to Regitar Power Tools Co., Ltd., Taya Taichung, Taiwan
 Filed Jun. 6, 1989, Ser. No. 363,107
 Term of patent 14 years

U.S. Cl. D13-119



323,645

HOUSING FOR AN ELECTRICAL CONNECTOR

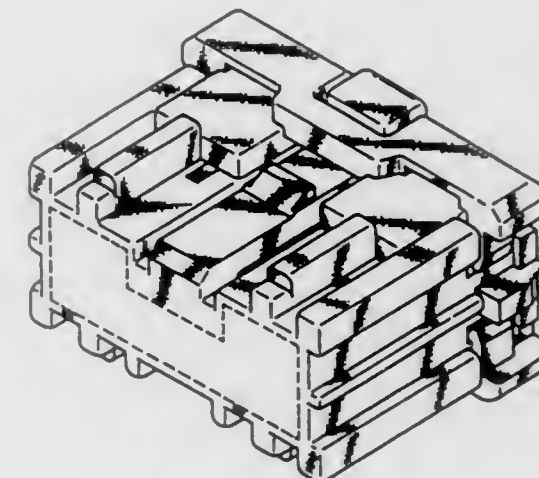
Masaji Suzuki, Tsu; Shoichi Sugata, Suzuka, and Kiyofumi Ichida, Ichishi, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Sep. 28, 1989, Ser. No. 414,074

Claims priority, application Japan, Jun. 9, 1989, 1-21409

Term of patent 14 years

U.S. Cl. D13-147



323,643

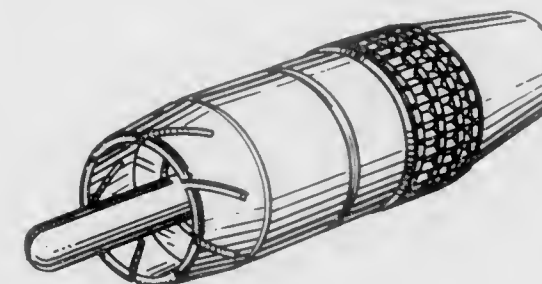
CONNECTOR

Noel Lee, Daly City, Calif., assignor to Monster Cable Products, Inc., South San Francisco, Calif.

Filed Nov. 14, 1989, Ser. No. 436,444

Term of patent 14 years

U.S. Cl. D13-133



323,644

HOUSING FOR AN ELECTRICAL CONNECTOR

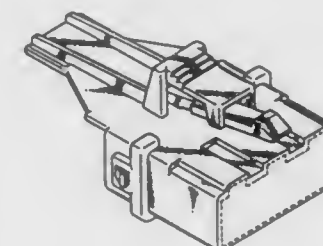
Kiyofumi Ichida, Utsunomiya, and Sadao Kubo, Kanuma, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Nov. 22, 1989, Ser. No. 441,400

Claims priority, application Japan, Jun. 14, 1989, 1-21933

Term of patent 14 years

U.S. Cl. D13-146



323,646

HOUSING FOR AN ELECTRICAL CONNECTOR

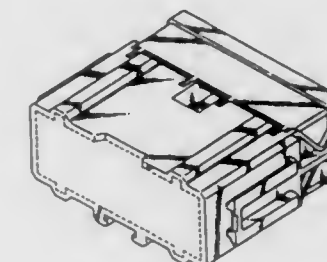
Masaji Suzuki, Tsu; Shoichi Sugata, Suzuka, and Kiyofumi Ichida, Utsunomiya, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Nov. 22, 1989, Ser. No. 441,395

Claims priority, application Japan, Jun. 9, 1989, 1-21414

Term of patent 14 years

U.S. Cl. D13-147

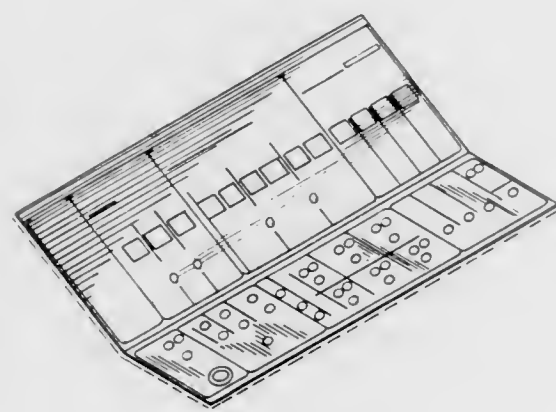


323,647
CONTROL PANEL FOR MACHINERY OPERATION
CONSOLE

Alfred Schott, Radebeul; Roland Reichenberger, Coswig; Volker Eichler, Weinboehla, and Horst Schulz, Dresden, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Walter Lamberz" Leipzig, Fed. Rep. of Germany
Continuation of Ser. No. 412,864, Sep. 26, 1989, Pat. No. Des. 314,370, which is a division of Ser. No. 905,669, Sep. 8, 1986, Pat. No. Des. 310,659. This application Sep. 27, 1990, Ser. No. 589,484

Term of patent 14 years

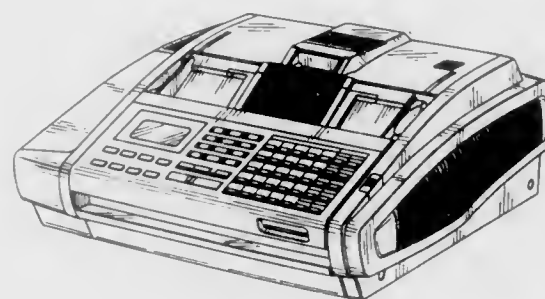
U.S. Cl. D13—162



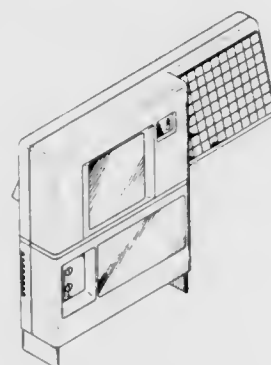
323,649
FACSIMILE TRANSCIVER
Shin-ichi Hiroki, Tokyo, and Kunio Hara, Ichihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 2, 1990, Ser. No. 502,661
Claims priority, application Japan, Oct. 2, 1989, 54-35643
Term of patent 14 years

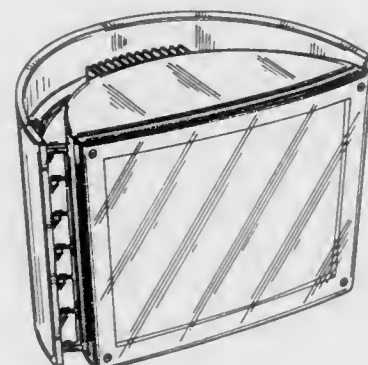
U.S. Cl. D14—118



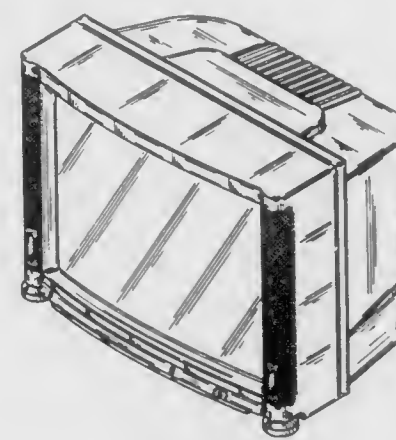
323,648
MARK READER FOR CASH REGISTER
Yoshiro Yamamoto, Chiba, Japan, assignor to Tokyo Electric Company, Ltd., Tokyo, Japan
Filed Aug. 14, 1989, Ser. No. 394,175
Claims priority, application Japan, Feb. 13, 1989, 1-4992
Term of patent 14 years
U.S. Cl. D14—105



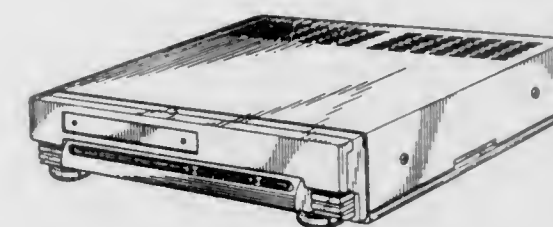
323,650
TELEVISION SET
Hiroshi Kajimoto, and Yasuo Matsudaira, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 27, 1989, Ser. No. 428,755
Claims priority, application Japan, Apr. 27, 1989, 1-16285
Term of patent 14 years
U.S. Cl. D14—126



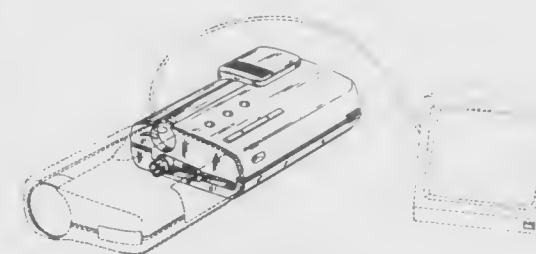
323,651
TELEVISION SET
Taisuke Saeki; Yoshito Fujii; Osamu Shimizu, and Tohru Oh-tani, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 10, 1990, Ser. No. 551,252
Term of patent 14 years
U.S. Cl. D14—126



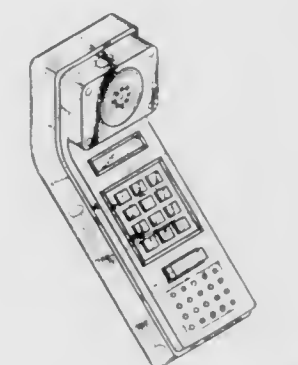
323,654
VIDEO CASSETTE RECORDER
Jae J. Shim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 25, 1990, Ser. No. 543,181
Claims priority, application Rep. of Korea, Dec. 29, 1989, 17852/1989
Term of patent 14 years
U.S. Cl. D14—135



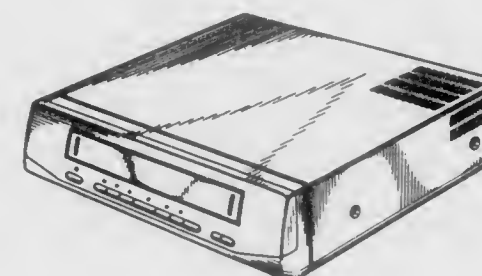
323,652
VIDEO PROCESSOR FOR A STILL VIDEO CAMERA
Hiroshi Imai, and Shosaku Kawashima, both of Hachioji, Japan, assignors to Olympus Optical Company, Ltd., Japan
Filed Sep. 19, 1988, Ser. No. 246,492
Claims priority, application Japan, Mar. 4, 1988, 63-009037
Term of patent 14 years
U.S. Cl. D14—135



323,655
COMBINED HANDSET TELEPHONE AND CLOCK
Gloria S. Bethea, and James H. Bethea, both of 613 S. Blount St., Raleigh, N.C. 27601
Filed Oct. 23, 1990, Ser. No. 601,566
Term of patent 14 years
U.S. Cl. D14—144



323,653
VIDEO CASSETTE PLAYER
Seung G. Bang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed May 15, 1990, Ser. No. 523,733
Claims priority, application Rep. of Korea, Nov. 30, 1989, 16292/1989
Term of patent 14 years
U.S. Cl. D14—135



323,656

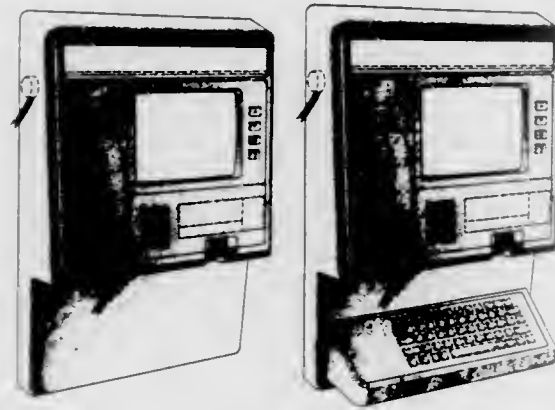
WALL-MOUNTED, COINLESS PUBLIC TELEPHONE

John N. McGarvey, Drexel Hill, Pa.; Frederick A. Rosebrock, Greenfield, Ind., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 26, 1990, Ser. No. 634,267

Term of patent 14 years

U.S. Cl. D14—146



323,658

TELEPHONE SET

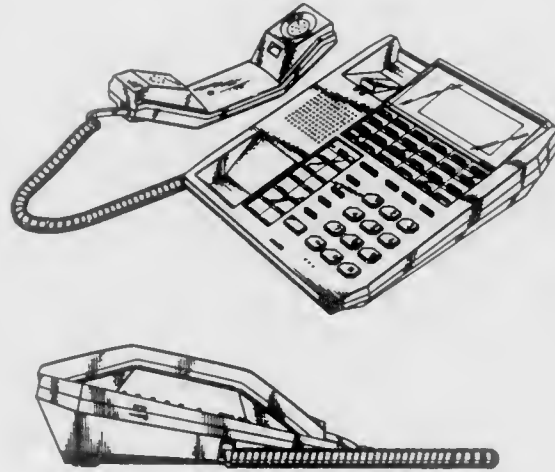
Yoshio Sasaki; Hiroshi Yamagishi, both of Kawasaki, and Youichirou Yashiro, Tokyo, all of Japan, assignors to Nitsuko Corp. and Nippon Telegraph and Telephone Corporation, both of Japan

Filed Jul. 5, 1990, Ser. No. 548,734

Claims priority, application Japan, Jan. 8, 1990, 2-35

Term of patent 14 years

U.S. Cl. D14—241



323,657

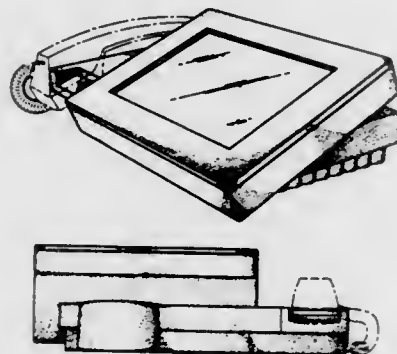
TELEPHONE STATION HAVING A TOUCH-SCREEN DISPLAY

David C. Danielson, New Canaan, Conn.; Michael G. Grisham, New York, N.Y.; James J. Hartmann, Indianapolis, Ind., and David C. Stowers, Nutley, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 8, 1991, Ser. No. 682,119

Term of patent 14 years

U.S. Cl. D14—151



323,659

CAB FOR A LOADER

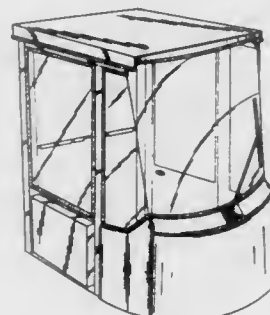
Leif Jacobsson, Eskilstuna, Sweden, assignor to VME Industries Sweden AB, Eskilstuna, Sweden

Filed Oct. 19, 1989, Ser. No. 424,321

Claims priority, application Sweden, Apr. 20, 1989, 89-1009

Term of patent 14 years

U.S. Cl. D15—30



323,660

EXCAVATOR BLADE

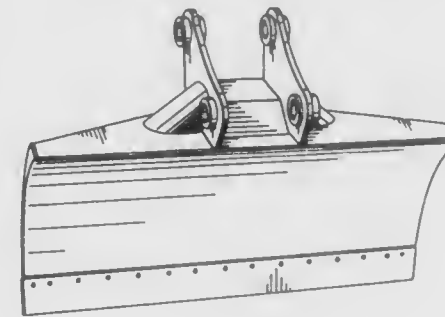
Elizabeth Bolduc, and Sheldon Bolduc, both of Box 118, R.R. #1, Cardiff Echoes, Morinville, Alberta T0G 1P0, Canada

Filed Apr. 9, 1990, Ser. No. 506,382

Claims priority, application Canada, Feb. 6, 1990, 06-02-90-9

Term of patent 14 years

U.S. Cl. D15—32



323,661

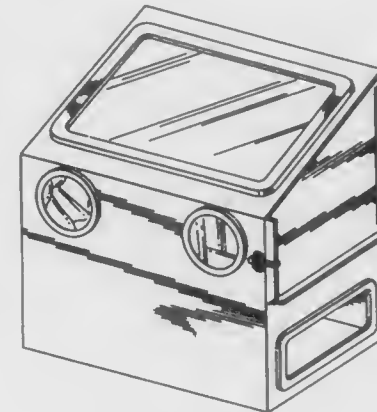
SANDBLASTING CABINET

Fred Zwicker, Canfield, Ohio, assignor to Skat Blast, Canfield, Ohio

Filed Aug. 14, 1989, Ser. No. 393,759

Term of patent 14 years

U.S. Cl. D15—124



323,662

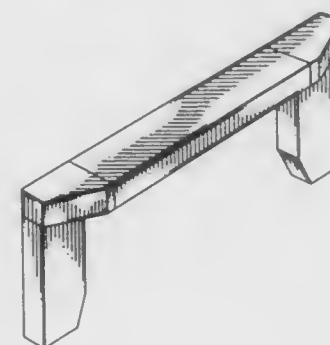
AIR DRYER FOR A CAR WASH

John W. A. Sapp, 6517 Banner Lake Cir., Orlando, Fla. 32821

Filed Jul. 31, 1989, Ser. No. 386,686

Term of patent 14 years

U.S. Cl. D15—199



323,663

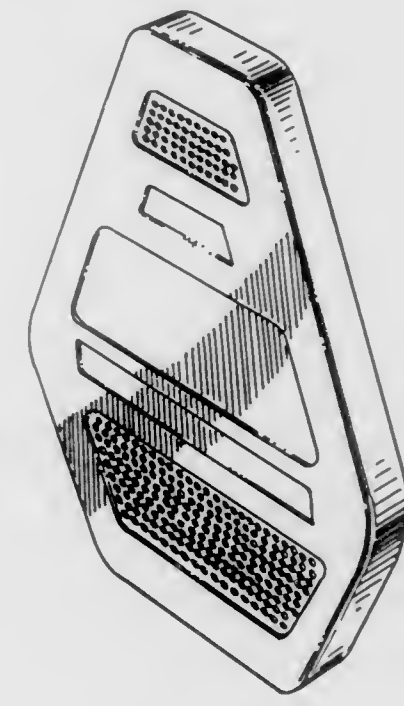
TRANSMISSION COVER

Stephen L. Markle, Rochester; David J. Engel, Springwater, and William F. Hutchings, Fairport, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed May 25, 1989, Ser. No. 356,487

Term of patent 14 years

U.S. Cl. D15—149



323,664

SUNGLASSES

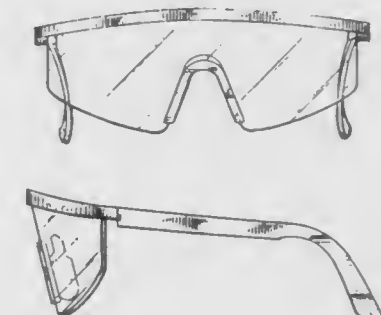
Ronald W. Longsdorf, 1123 N. Flores, West Hollywood, Calif. 90069

Filed Jan. 2, 1990, Ser. No. 459,672

The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D16—102



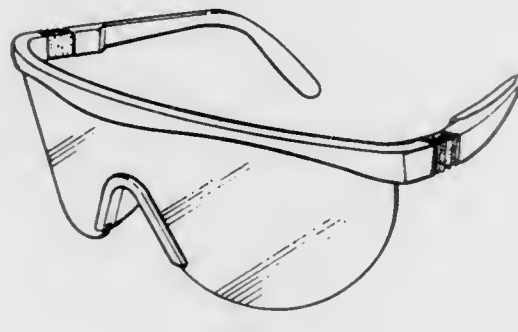
323,665
SUN GLASSES

Luciano Simioni, Montebelluna, Italy, assignor to Moda Solaris S.p.A., Pederobba, Italy

Filed Jun. 14, 1990, Ser. No. 537,729

Claims priority, application Italy, Mar. 21, 1990, 59329/90[U]
Term of patent 14 years

U.S. Cl. D16—102



323,666
CAMERA

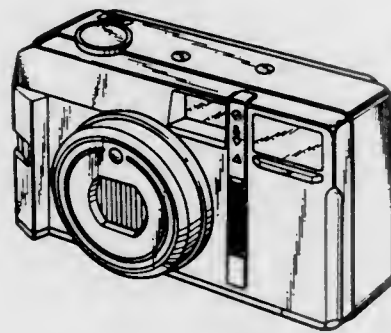
Jae G. Yu, Inchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 9, 1989, Ser. No. 364,191

Claims priority, application Rep. of Korea, Dec. 23, 1988, 17446/1988

Term of patent 14 years

U.S. Cl. D16—200



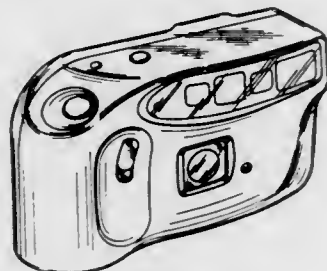
323,667
CAMERA

Hitomi Ito, Kawasaki, Japan, and Cho C. Jung, Taichung, Taiwan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 449,743

Claims priority, application Japan, Jun. 16, 1989, 1-22261
Term of patent 14 years

U.S. Cl. D16—209



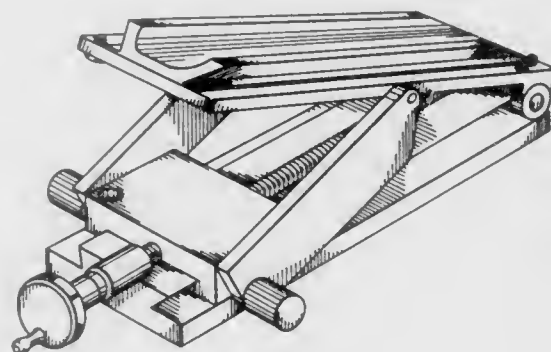
323,668
CAMERA SUPPORT

Noah Schwartz, and Brian Heller, both of 200 Olney St., Providence, R.I. 02906

Filed Feb. 2, 1990, Ser. No. 474,599

Term of patent 14 years

U.S. Cl. D16—242



323,669

ELECTRIC GUITAR

Claudio Pagelli, Chur, Switzerland, assignor to Dronge & Rapaport, Tenafly, N.J.

Filed Sep. 18, 1989, Ser. No. 408,325

Term of patent 14 years

U.S. Cl. D17—14



323,670
COMBINED POCKET CALCULATOR AND TELEPHONE
DIRECTORY

Richard Peersmann, Scheveningen, Netherlands, assignor to Pollyflame International BV, Netherlands

Filed Jan. 2, 1990, Ser. No. 460,257

Term of patent 14 years

U.S. Cl. D18—2



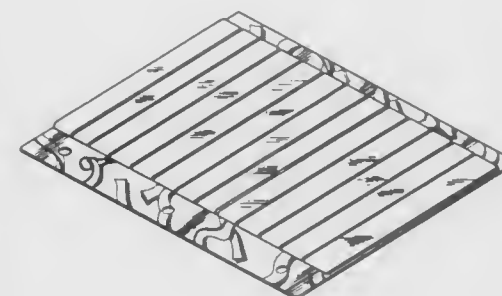
323,671
POCKETED LEAF FOR VIDEO INDEX TABS OR
SIMILAR ARTICLE

Viola M. Pflanzner, 2022 Sylved La., Cincinnati, Ohio 45238

Filed Jan. 26, 1990, Ser. No. 470,534

Term of patent 14 years

U.S. Cl. D19—33



323,673
PEN

Francine Gomez, Rueil-Malmaison, France, assignor to Waterman S.A., Paris, France

Filed Jan. 6, 1989, Ser. No. 294,491

Claims priority, application France, Aug. 12, 1988, 88 5170

Term of patent 14 years

U.S. Cl. D19—49



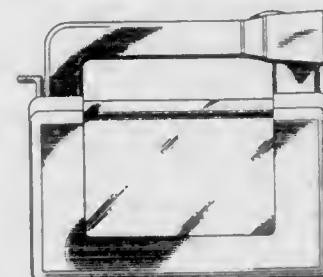
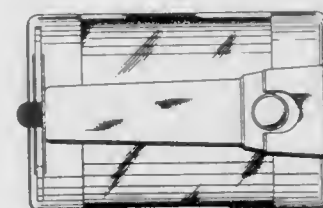
323,674
COMBINED FLASHLIGHT AND INSECT VIEWING
CONTAINER

David L. Winslow, Cincinnati, Ohio, assignor to James F. Mariol, Cincinnati, Ohio

Filed Feb. 7, 1989, Ser. No. 307,885

Term of patent 14 years

U.S. Cl. D19—62



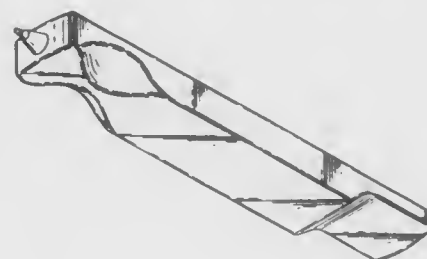
323,672
PEN

Douglas C. Schwarzwaelder, 1128 Thackary Ct., Voorhees, N.J. 08043

Filed Apr. 12, 1989, Ser. No. 337,035

Term of patent 14 years

U.S. Cl. D19—41

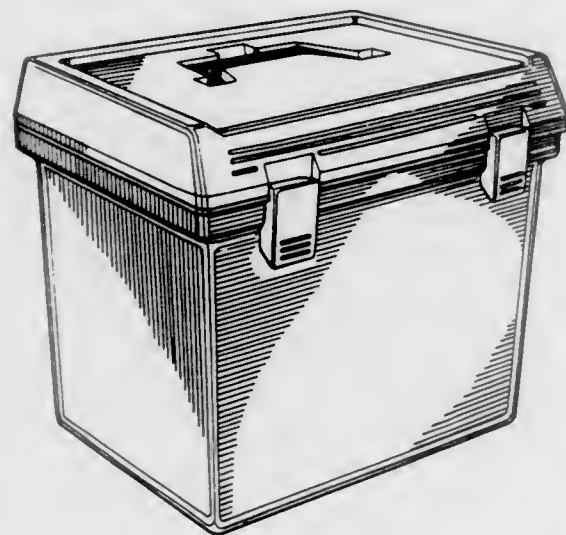


323,675
FILE BOX

Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.

Filed Mar. 1, 1989, Ser. No. 317,337
Term of patent 14 years

U.S. Cl. D19—75

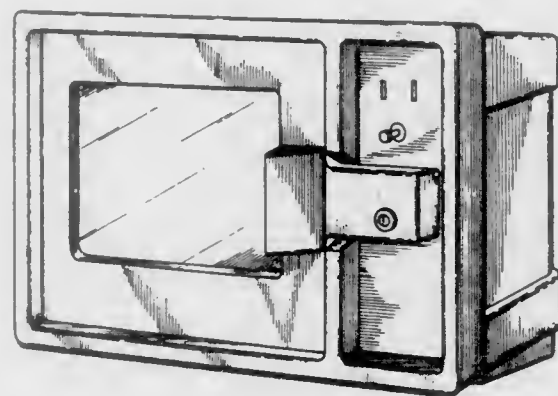


323,678
VENDING MACHINE FOR NEWSPAPERS AND THE LIKE

John B. Olson, Waukesha; Richard L. Jeanson, Watertown, and John D. Sinchok, Oconomowoc, all of Wis., assignors to Fortec, Inc., Waukesha, Wis.

Division of Ser. No. 212,727, Jun. 28, 1988, Pat. No. Des. 317,468. This application Jan. 29, 1991, Ser. No. 647,001
Term of patent 14 years

U.S. Cl. D20—6



323,676

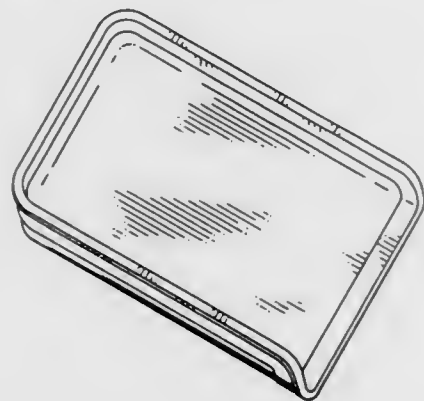
Patent Not Issued For This Number

323,677
MEMO HOLDER

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Oct. 24, 1989, Ser. No. 425,983
Term of patent 14 years

U.S. Cl. D19—92



323,679
FOOD AND BEVERAGE MENU HOLDER FOR RESTAURANT TABLES OR THE LIKE

Karen E. Burgess, Branford, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.

Filed May 18, 1990, Ser. No. 526,320
Term of patent 14 years

U.S. Cl. D20—40

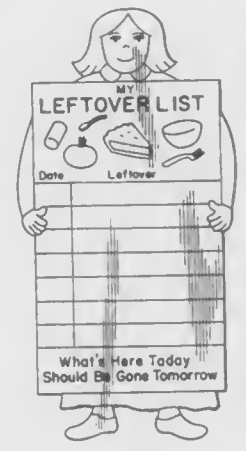


323,680
COMBINED DISPLAY BOARD AND MAGNETIC NOTE HOLDER

Henry Fankhauser, 1306 Dilston Pl., Silver Spring, Md. 20903
Filed Nov. 20, 1989, Ser. No. 438,159

Term of patent 14 years

U.S. Cl. D20—42

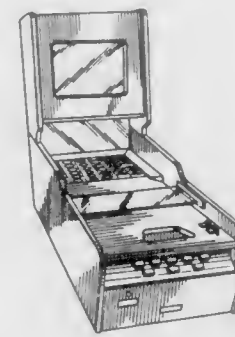


323,681
POKER ROLL GAME HOUSING

Salvatore Mirando, Holmdel, N.J., assignor to SMS Manufacturing Corporation, Lakewood, N.J.

Filed Jul. 13, 1989, Ser. No. 381,152
Term of patent 14 years

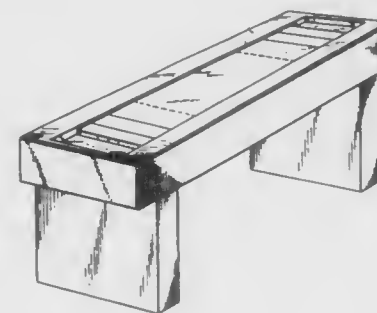
U.S. Cl. D21—7



323,682
GAME TABLE
Marcel MacDermott, 729 Paul-Emile Borduas Street, P.Q., St-Hilaire, Québec, Canada

Filed Apr. 5, 1990, Ser. No. 505,647
Claims priority, application Canada, Feb. 2, 1990, 02-02-90-10
Term of patent 14 years

U.S. Cl. D21—14

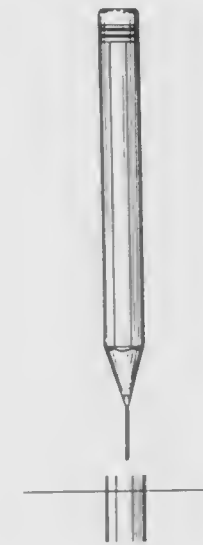


323,683
PENCIL BALLOON
Michael S. Isaacs, Brooklyn, N.Y., assignor to U.S. Balloon Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Mar. 1, 1989, Ser. No. 317,359

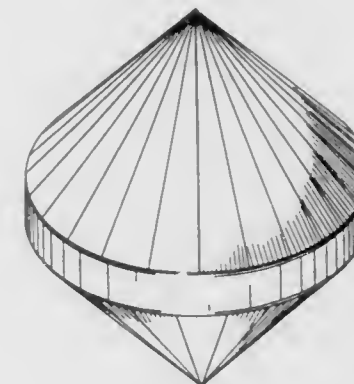
Term of patent 14 years

U.S. Cl. D21—84



323,684
FIFTY SIDED DIE
Kasey B. Thompson, 1536 Mainsail Dr., Naples, Fla. 33961
Filed Jul. 19, 1988, Ser. No. 221,441
Term of patent 14 years

U.S. Cl. D21—41



323,685
TOY TRAILER
Wayne W. LaFlamme, 160 State Ave., P.O. Box 52, Rogers, Conn. 06263

Filed Oct. 4, 1990, Ser. No. 592,879
Term of patent 14 years

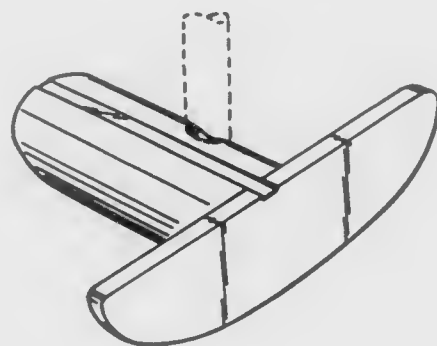
U.S. Cl. D21—135



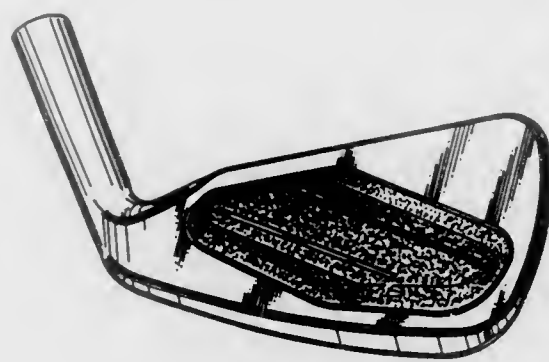
323,686
INDIAN DOLL
Ann Carlson, Maple Lake, Minn., assignor to Carlson Dolls Co.,
Maple Lake, Minn.
Filed Jan. 9, 1990, Ser. No. 462,432
Term of patent 14 years
U.S. Cl. D21—182



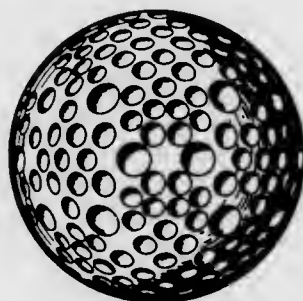
323,688
GOLF PUTTER HEAD
Denzil E. Whitney, 931 Lincoln Ave., Napa, Calif. 94558
Filed Jul. 7, 1989, Ser. No. 377,013
Term of patent 14 years
U.S. Cl. D21—219



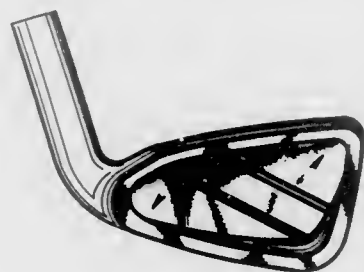
323,689
GOLF CLUB HEAD
Thomas F. Hardman, Palm Beach Gardens, Fla.; Carl E. Schele,
Libertyville, and Robert A. Mendralla, Bloomington, both of
Ill., assignors to Wilson Sporting Goods Co., River Grove, Ill.
Filed Aug. 8, 1989, Ser. No. 390,919
Term of patent 14 years
U.S. Cl. D21—220



323,687
GOLF BALL
Gary T. Mackey, Argyle, Tex., assignor to American Ball Manu-
facturing Corporation, Carrollton, Tex.
Filed Jun. 15, 1988, Ser. No. 207,129
Term of patent 14 years
U.S. Cl. D21—205



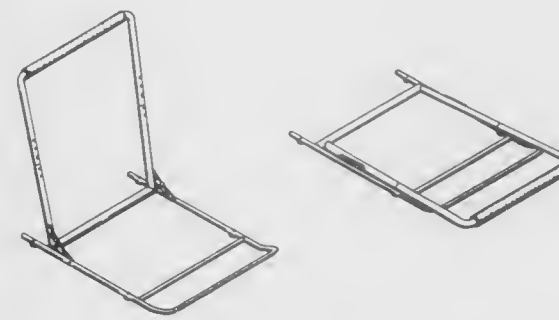
323,690
GOLF CLUB HEAD
Edward A. Hlinka, Glendale Heights, Ill., assignor to Wilson
Sporting Goods Co., River Grove, Ill.
Filed Aug. 8, 1989, Ser. No. 390,920
Term of patent 14 years
U.S. Cl. D21—220



323,691
SKI BOARD
James D. Olson, 560 Canyon Ct., Patterson, Calif. 95363
Filed Jan. 26, 1990, Ser. No. 470,550
Term of patent 14 years
U.S. Cl. D21—228



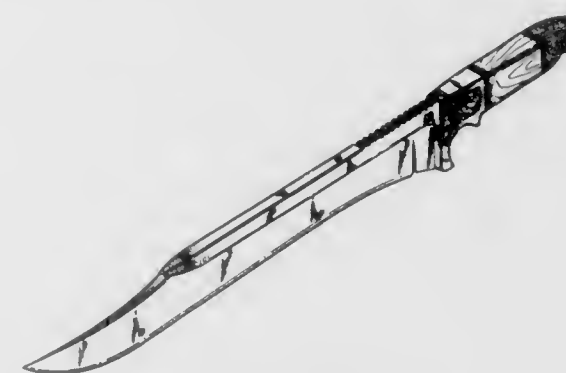
323,692
SKATING AID
Raymond A. Lukowski, Kapuskasing, Canada, assignor to
P.R.L. Associates, Canada
Filed Mar. 3, 1989, Ser. No. 318,367
Claims priority, application Canada, Sep. 12, 1988, 12-09-88-2
Term of patent 14 years
U.S. Cl. D21—230



323,693
TENT
Robert R. Cantwell, and Deborah M. Zumsteg, both of New
Haven, Mo., assignors to American Recreation Products, Inc.,
St. Louis, Mo.
Filed Nov. 30, 1989, Ser. No. 443,963
Term of patent 14 years
U.S. Cl. D21—253



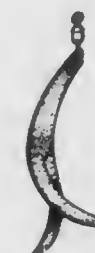
323,694
KNIFE
Kevin G. Pipes, Sevierville, Tenn., assignor to Lucasfilm, Ltd.,
Nicasio, Calif.
Filed Sep. 21, 1989, Ser. No. 410,232
Term of patent 14 years
U.S. Cl. D22—118



323,695
INSECT REPELLENT STICK
Kurt D. Nelson, Township of Mt. Pleasant, County of Racine;
Edward J. Lazzeroni, Sr., Township of Caldeonia, County of
Racine, and Timothy E. Zollers, Franklin, all of Wis., assign-
ors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 11, 1989, Ser. No. 419,987
Term of patent 14 years
U.S. Cl. D22—122

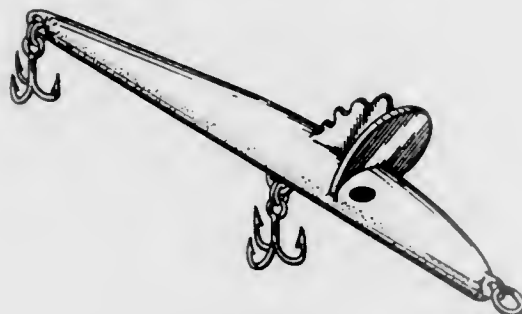


323,696
SPINNER FISHING LURE
Don Gentry, Williamson County, Ill., assignor to Lunker Lure
Products, Inc., Caterville, Ill.
Filed Dec. 4, 1989, Ser. No. 445,016
Term of patent 14 years
U.S. Cl. D22—129



323,697
FISH LURE

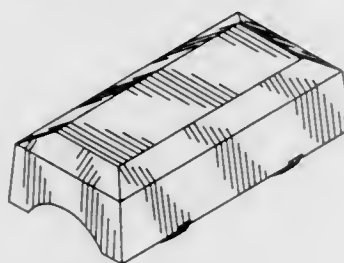
Francis L. Balkcom, Jr., Rte. 4, Box 280, Macon, Ga. 31201
Filed Sep. 11, 1989, Ser. No. 405,846
Term of patent 14 years
U.S. Cl. D22—133

323,698
FLOATING FISH CONTAINER

Daniel E. Nelson, and Mickey C. Nelson, both of 10662 Hummingbird St. NW., Coon Rapids, Minn. 55435
Filed Feb. 3, 1989, Ser. No. 306,037
Term of patent 14 years
U.S. Cl. D22—136

323,699
MAGNETIC WATER SOFTENER

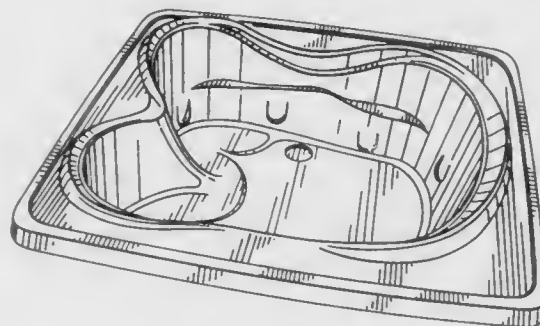
Randy Ambrose, Costa Mesa, Calif., assignor to H.K. Research & Development, Inc., Philadelphia, Pa.
Filed Feb. 21, 1989, Ser. No. 313,537
Term of patent 14 years
U.S. Cl. D23—207

323,700
FAUCET

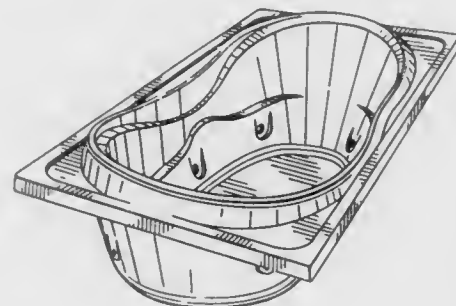
Alex Wilde, Nyborg, Denmark, assignor to Damixa A/S, Odense No., Denmark
Filed Aug. 10, 1989, Ser. No. 391,846
Claims priority, application Denmark, Feb. 10, 1989, 163/1989; Feb. 10, 1989, 164/1989
Term of patent 14 years
U.S. Cl. D23—241

323,701
BATH TUBE

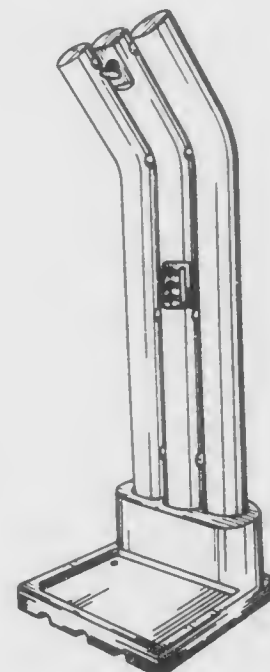
Joseph Primucci, Vello Hubel, and Alexander M. Gardiner, all of Toronto, Canada, assignors to Mirolin Industries Inc., Toronto, Canada
Filed May 31, 1989, Ser. No. 359,435
Claims priority, application Canada, May 3, 1989, 0305891
Term of patent 14 years
U.S. Cl. D23—277

323,702
BATH TUB

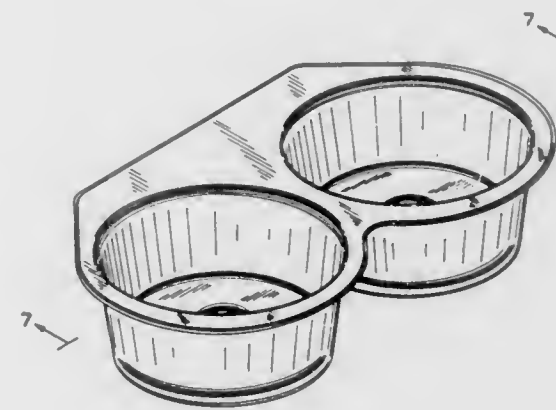
Joseph Primucci, Vello Hubel, and Alexander M. Gardiner, all of Toronto, Canada, assignors to Mirolin Industries Inc., Toronto, Canada
Filed May 31, 1989, Ser. No. 359,436
Claims priority, application Canada, Mar. 28, 1989, 2803896
Term of patent 14 years
U.S. Cl. D23—277

323,703
SOLAR ENERGY SHOWER

Paolo Bianco, Turin, Italy, assignor to Wam S.r.l., Turin, Italy
Filed Jan. 6, 1989, Ser. No. 294,025
Term of patent 14 years
U.S. Cl. D23—283

323,705
KITCHEN SINK OR THE LIKE

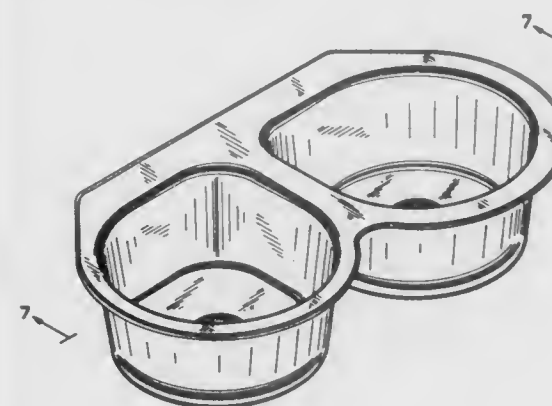
Henry M. Stairs, Jr., Ligonier, Pa., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 13, 1989, Ser. No. 322,253
The portion of the term of this patent subsequent to Feb. 4, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—290

323,706
CHEMICAL MEDIUM FILTER CARTRIDGE

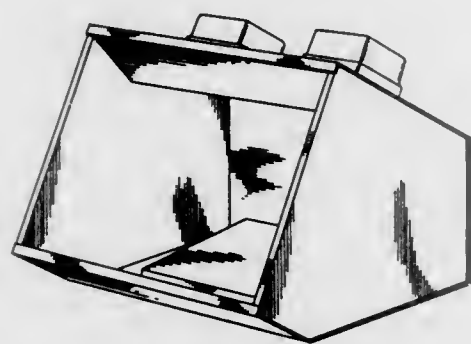
John M. Sexton, Pleasant Garden, N.C., assignor to Pressure Systems, Inc., Pleasant Garden, N.C.
Filed Sep. 23, 1988, Ser. No. 248,029
Term of patent 14 years
U.S. Cl. D23—365

323,704
KITCHEN SINK OR THE LIKE

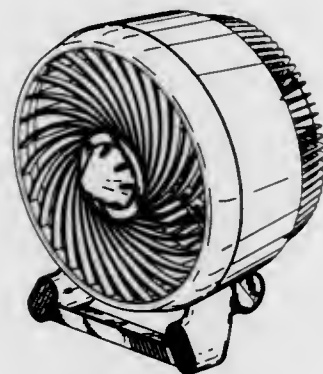
Henry M. Stairs, Jr., Ligonier, Pa., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 13, 1989, Ser. No. 322,011
The portion of the term of this patent subsequent to Feb. 4, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—290



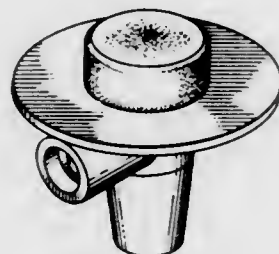
323,707
DUAL FAN FILTERED PORTABLE SPRAY BOOTH FOR USE BY GRAPHIC ARTISTS
 Joseph Fay, San Rafael, Calif., assignor to Safety Island Products Inc., San Rafael, Calif.
 Filed Oct. 19, 1989, Ser. No. 423,868
 Term of patent 14 years
 U.S. Cl. D23—371



323,708
PORTABLE ELECTRICAL FAN
 Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.
 Filed Nov. 23, 1990, Ser. No. 617,717
 Term of patent 14 years
 U.S. Cl. D23—382



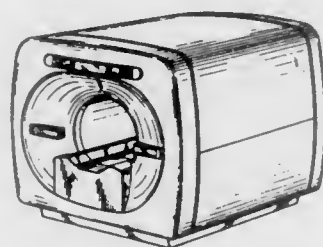
323,709
COMBINED GUARD AND INJECTION SITE FOR INTRAVENOUS INFUSION OR THE LIKE
 Philip Wyatt, Glendale, and Michael R. Pescovitz, Saugus, both of Calif., assignors to Migada, Inc., Burbank, Calif.
 Filed Mar. 21, 1988, Ser. No. 171,523
 The portion of the term of this patent subsequent to Feb. 11, 2006, has been disclaimed.
 Term of patent 14 years
 U.S. Cl. D24—129



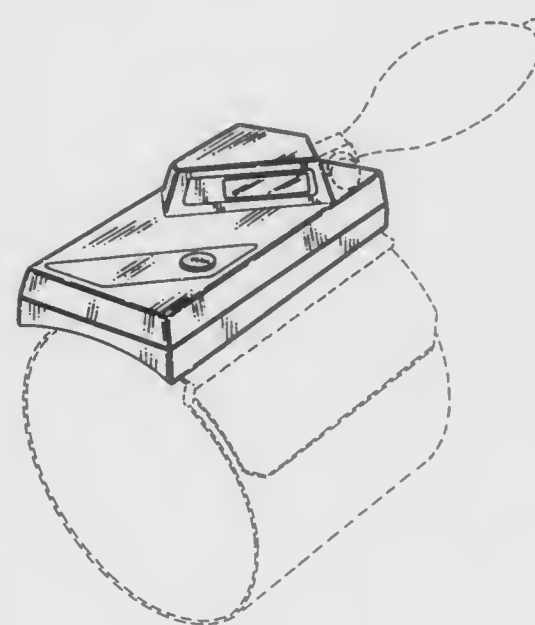
323,710
BLOOD COLLECTING TUBE HOLDER
 Masaaki Kasai; Sakae Yamazaki, both of Yamanashi, and Kazuhisa Senshu, Fuji, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
 Filed Jun. 29, 1988, Ser. No. 213,976
 Term of patent 14 years
 U.S. Cl. D24—130



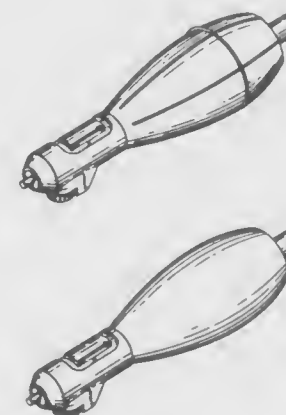
323,711
MAGNETIC RESONANCE IMAGING SCANNER
 Isamu Takekoshi, Tokyo; Tsuyoshi Syudo, Katsuta, and Minoru Saito, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
 Filed Aug. 23, 1989, Ser. No. 397,301
 Claims priority, application Japan, Aug. 14, 1989, 1-29532
 Term of patent 14 years
 U.S. Cl. D24—159



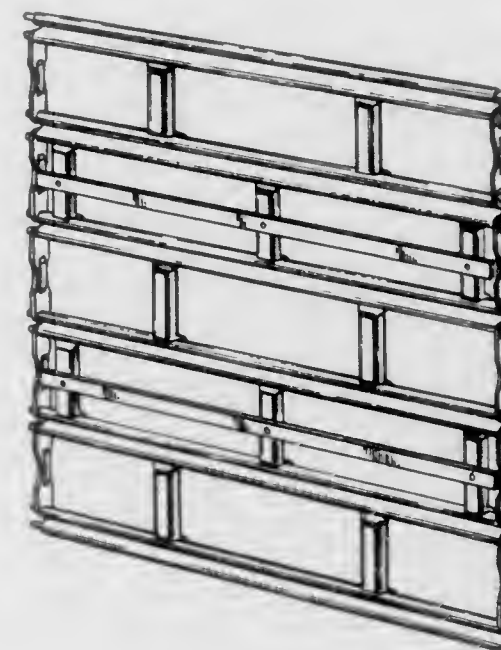
323,712
ELECTRONIC SPHYGMOMANOMETER
 Werner R. Foster, Jr., Mesquite; Ulrich A. Gienger, and Charles D. Ray, both of Dallas, all of Tex., assignors to Sunbeam Corporation, Downers Grove, Ill.
 Filed Oct. 5, 1989, Ser. No. 417,390
 Term of patent 14 years
 U.S. Cl. D24—165



323,713
BULB FOR SPHYGMOMANOMETER
 Tetsuya Arioka, Tokyo, and Hideo Hata, Fujimi, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
 Filed Dec. 8, 1989, Ser. No. 448,151
 Claims priority, application Japan, Jun. 13, 1989, 1-21591; Jun. 19, 1989, 1-26441
 Term of patent 14 years
 U.S. Cl. D24—165



323,714
ROLLING GATE GRILLE
 Vincent Greco, 65 Rockledge Drive, Pelham Manor, N.Y. 10803
 Filed Dec. 15, 1989, Ser. No. 451,359
 Term of patent 14 years
 U.S. Cl. D25—50



323,715
MERCHANDISING DISPLAY WALL STANDARD
 Constance C. Bodurow, Canton; Larry D. Murphy, New Philadelphia, both of Ohio, and Gordon R. Perry, New York, N.Y., assignors to Commercial and Architectural Products Company, Inc., Dover, Ohio
 Filed Jun. 1, 1987, Ser. No. 56,838
 Term of patent 14 years
 U.S. Cl. D25—119



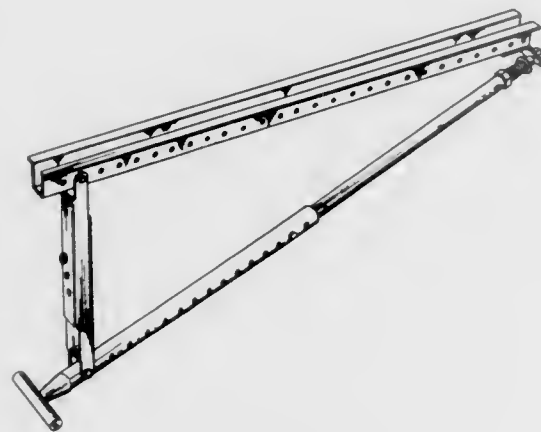
323,716

BRIDGE OVERHANG SUPPORT BRACKET

Hal C. Shook, Kensington, Ga., and John F. Gourley, Chattanooga, Tenn., assignors to Symons Corporation, Des Plaines, Ill.

Filed Jan. 13, 1989, Ser. No. 296,587
Term of patent 14 years

U.S. Cl. D25—127



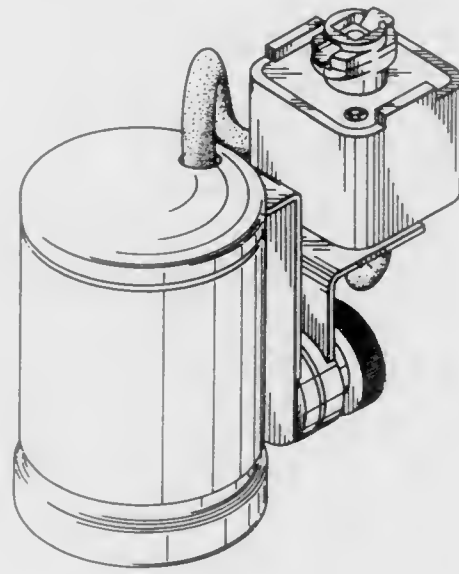
323,718

TRACK LIGHTING FIXTURE

Bruce N. Layne, Wheaton, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 23, 1989, Ser. No. 371,964
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

U.S. Cl. D26—63



323,719

ADJUSTABLE SLOTTED STRAP PENDANT LAMP HOLDER FOR TRACK LIGHTING FIXTURE

Gary P. Wereley, Wheaton, Ill., assignor to Juno Lighting, Inc., Des Plaines, Ill.

Filed Oct. 29, 1990, Ser. No. 604,417
Term of patent 14 years

U.S. Cl. D26—140



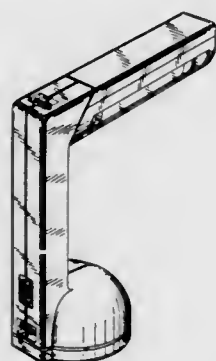
323,717

COMBINED FLUORESCENT LANTERN AND FLASHLIGHT

Shiu P. Fung, Tuen Mun, Hong Kong, assignor to Fatia Industrial Co., Ltd., Kowloon, Hong Kong

Filed Oct. 31, 1989, Ser. No. 429,340
Term of patent 14 years

U.S. Cl. D26—44



323,720

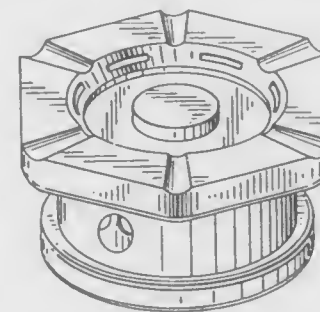
ASHTRAY

Ka L. Leung, Shatin, Hong Kong, assignor to Happy Town Ind. Ltd., Shatin, Hong Kong

Filed Aug. 10, 1990, Ser. No. 565,614
Claims priority, application United Kingdom, Apr. 2, 1990, 2005836

Term of patent 14 years

U.S. Cl. D27—102



323,721

DENTAL FLOSSER

Todd E. Bushberger, S72 W13839 Woods Rd., Muskego, Wis. 53150

Filed Jun. 22, 1990, Ser. No. 543,565
Term of patent 14 years

U.S. Cl. D28—64



323,722

DENTAL FLOSSER

Melanie Lott, 908 Warren Way, Dallas, Tex. 75080

Filed Sep. 5, 1990, Ser. No. 577,627
Term of patent 14 years

U.S. Cl. D28—64



323,723

DISPOSABLE DENTAL FLOSSER

Wu-Chang Chung, No. 185, Alley 3, Lane 219, Sec. 7, Chung Shan N. Rd., Taipei, Taiwan

Filed Oct. 12, 1990, Ser. No. 596,904
Term of patent 14 years

U.S. Cl. D28—64



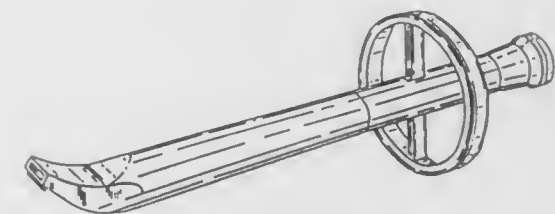
323,724

PORTABLE BLOWER

Martin P. Gierke; Robert B. Straub, both of Baltimore, and Jonathan L. Miner, Timonium, all of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 13, 1987, Ser. No. 119,996
Term of patent 14 years

U.S. Cl. D32—15



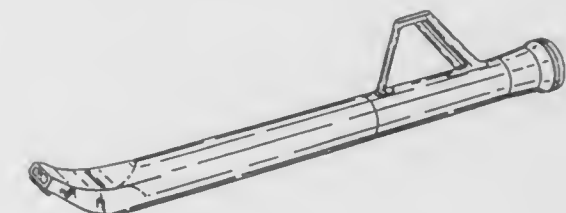
323,725

PORTABLE BLOWER

Martin P. Gierke; Robert P. Straub, both of Baltimore, and Jonathan L. Miner, Timonium, all of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 13, 1987, Ser. No. 119,999
Term of patent 14 years

U.S. Cl. D32—15



323,726

TEXTURED SURFACE PANEL

Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 24, 1984, Ser. No. 685,352

Term of patent 14 years

U.S. Cl. D5—53



323,728

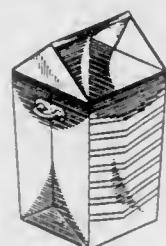
REFUSE CONTAINER OR THE LIKE

Robert McNamara, 1 Simmons La., Staten Island, N.Y. 10314

Filed Feb. 10, 1989, Ser. No. 308,753

Term of patent 14 years

U.S. Cl. D34—1



323,729

WASTE RECEPTACLE

Martha M. Weiland, 3611 52nd St., Sacramento, Calif. 95820

Filed Dec. 20, 1990, Ser. No. 630,941

Term of patent 14 years

U.S. Cl. D34—9



323,730

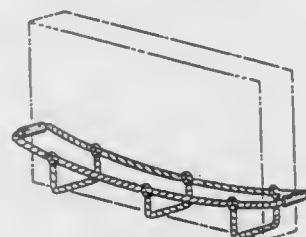
CARRIER FOR MATTRESS OR BOX SPRINGS

William C. Burney, 1263 Tyler, Topeka, Kans. 66612

Filed Dec. 12, 1988, Ser. No. 283,874

Term of patent 14 years

U.S. Cl. D34—28



323,731

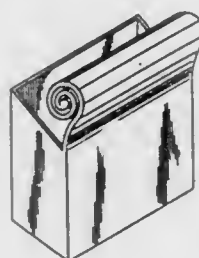
DOOR-MOUNTED MAILBOX

Kevin L. Blake, 625 Pickford Pl., NE., Washington, D.C. 20002-5334

Filed May 2, 1989, Ser. No. 346,610

Term of patent 14 years

U.S. Cl. D99—33



323,727

FLOOR CLEANING DEVICE

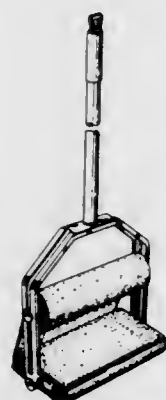
Giovanni Re, Rho, Italy, assignor to Fratelli Re S.p.A., Milan, Italy

Filed Nov. 3, 1989, Ser. No. 431,628

Claims priority, application Italy, May 9, 1989, 21045/89[U]

Term of patent 14 years

U.S. Cl. D32—51



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF FEBRUARY, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. H. Robins Company, Incorporated: See—
Walsh, David A.; and Yanni, John M., 5,086,055, Cl. 514-252.000.
- A/S Niro Atomizer: See—
Rasmussen, Stig; Rasmussen, Bjarne; and Felsvang, Karsten S., 5,085,843, Cl. 423-242.000.
- Aaron, David A.; and Domanski, Piotr A., to United States of America, Commerce. Bi-flow expansion device. 5,085,058, Cl. 62-324.600.
- AB Volvo Penta: See—
Mansson, Kjell, 5,085,396, Cl. 248-678.000.
- ABB Air Preheater, Inc.: See—
Counterterm, Wayne S.; and Mergler, Thomas G., 5,085,270, Cl. 165-95.000.
- ABB Lummus Crest, Inc.: See—
Sy, Angel, 5,086,193, Cl. 585-446.000.
- Abbott Laboratories: See—
Brooks, Dee W.; Carter, George W.; Basha, Anwer; Gunn, Bruce P.; and Dyer, Richard D., 5,086,052, Cl. 514-231.500.
- Cannon, John B.; Hsu, Chung-Chiang; Papp, Karen J.; and Williams, N. Adeyinka, 5,085,864, Cl. 424-450.000.
- DeBernardis, John F.; Zelle, Robert E.; and Basha, Fatima Z., 5,086,074, Cl. 514-649.000.
- Garleb, Keith A.; Chmura, James N.; Anloague, Paul S.; Cunningham, Mary B.; and Sertl, David C., 5,085,883, Cl. 426-590.000.
- Larkin, Mark E.; Ogden, John E.; and Moeller, Dale V., 5,085,643, Cl. 604-152.000.
- Abbott, Raymond S.: See—
Smith, Paul W.; Abbott, Raymond S.; Lorince, Peter C.; Wood, Robert K.; Lichtenberg, Robert R.; and Gaukel, John J., 5,086,360, Cl. 360-103.000.
- Abe, Hiroaki: See—
Osugi, Yukihisa; Abe, Hiroaki; and Kozuka, Yoshinari, 5,085,503, Cl. 359-246.000.
- Abe, Hiroaki; Nishio, Taichi; and Kitadono, Kaoru, to Sumitomo Chemical Co., Ltd. Thermoplastic resin composition. 5,086,105, Cl. 524-492.000.
- Abe, Shintaro; Adachi, Muneco; Okada, Naoyuki; and Shimamura, Yasuhito, to Canon Kabushiki Kaisha. Data communication process and apparatus for data transmission in blocks which may include mixed data types. 5,086,434, Cl. 375-7.000.
- Aboumradi, Chafic: See—
Mazzocchi, Carlo; Tempesti, Ezio; and Aboumradi, Chafic, 5,086,032, Cl. 502-315.000.
- Abrams, Ray K.: See—
Remington, Mark A.; and Abrams, Ray K., 5,084,971, Cl. 30-123.000.
- Absil, Robert P. L.; Bowes, Emmerson; Green, Gary J.; Marler, David O.; Shihabi, David S.; and Socha, Richard F., to Mobil Oil Corporation. Catalytic cracking of hydrocarbons. 5,085,762, Cl. 208-120.000.
- Abt, Norman E.: See—
Jaffe, James M.; and Abt, Norman E., 5,086,412, Cl. 365-145.000.
- Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardiax-Luthereau, Renee; Naylor, Robert; and Costall, Brenda, to Laboratoires Delagrangue Societe d'Applications Pharmacodynamiques. Method of providing anxiolytic and antipsychotic treatment with substituted benzamides. 5,086,066, Cl. 514-377.000.
- Adachi, Chihaya: See—
Saito, Shogo; Tsutsumi, Tetsuo; and Adachi, Chihaya, 5,085,946, Cl. 428-690.000.
- Saito, Shogo; Tsutsumi, Tetsuo; and Adachi, Chihaya, 5,085,947, Cl. 428-690.000.
- Adachi, Keiichi: See—
Kameoka, Kimitaka; Kuwabara, Ken-ichi; Takahashi, Toshiro; Moriuchi, Shigenori; Yagihara, Morio; Inagaki, Yoshio; and Adachi, Keiichi, 5,085,970, Cl. 430-264.000.
- Adachi, Muneco: See—
Abe, Shintaro; Adachi, Muneco; Okada, Naoyuki; and Shimamura, Yasuhito, 5,086,434, Cl. 375-7.000.
- Adachi, Tatsuya; and Yamamoto, Masahiro, to Seiko Instruments & Electronics Ltd. Apparatus for forming, correcting pattern. 5,086,230, Cl. 250-492.200.
- Adams, David V.; and Anderson, Roger N., to Applied Materials, Inc. Wafer reactor vessel window with pressure-thermal compensation. 5,085,887, Cl. 427-55.000.
- Adamson, Phil A.; and Yeiser, Andrew J. Electronic coin detector. 5,085,309, Cl. 194-317.000.
- Adamson, William L.: See—
Hickey, James J.; and Adamson, William L., 5,085,831, Cl. 422-62.000.
- Adcock, David F., to Du Pont de Nemours, E. I., and Company. Process for improving the surface of liquid crystal polymers. 5,085,015, Cl. 51-319.000.
- Aderans Co., Ltd.: See—
Motoori, Nobumoto; and Mochizuki, Kousuke, 5,085,233, Cl. 132-54.000.
- Adler, Robert: See—
Kaplan, Sam; and Adler, Robert, 5,085,606, Cl. 445-30.000.
- Advanced Elastomer Systems, L. P.: See—
Hazelton, Donald R.; Puydak, Robert C.; and Booth, D. A., 5,086,121, Cl. 525-197.000.
- Advanced Micro Devices, Inc.: See—
Feemster, Ryan E., 5,086,236, Cl. 307-269.000.
- Shiota, Philip S., 5,086,011, Cl. 437-61.000.
- AEG Westinghouse Transportation Systems, Inc.: See—
Mutone, Gioacchino A., 5,086,499, Cl. 364-200.000.
- AG Communication Systems Corporation: See—
Grammas, James J.; Maronn, James M.; and Weston, James R., 5,086,371, Cl. 361-397.000.
- Agfa-Gevaert AG: See—
Bauer, Walter; Widemann, Ernst; and Schmidt, Manfred, 5,086,446, Cl. 378-188.000.
- Agfa-Gevaert Aktiengesellschaft: See—
Himmelman, Wolfgang; Lalvani, Prem; Buschmann, Hans-Theo; and Helling, Gunter, 5,085,981, Cl. 430-536.000.
- Scholtysik, Bernd; and Birkmann, Josef, 5,085,110, Cl. 83-34.000.
- Ahrweiler, Karl-Heinz; and Heimes, Bernd, to Eduard Kusters Maschinenfabrik GmbH & Co. KG. Method of and plant for the manufacture of wood chipboards and similar board materials. 5,085,812, Cl. 264-37.000.
- Aida, Shunichi: See—
Yamagami, Hiroyuki; and Aida, Shunichi, 5,085,979, Cl. 430-505.000.
- Aime, Michael, to Inventio AG. Apparatus for automatically sealing the space between an elevator shaft and an elevator car. 5,085,293, Cl. 187-1.00R.
- Aina, Olaleye A.; and Martin, Eric A., to Allied-Signal Inc. Field effect transistor-bipolar transistor Darlington pair. 5,086,282, Cl. 330-300.000.
- Ainsworth Nominees Pty., Ltd.: See—
Bennett, Nicholas L., 5,085,436, Cl. 273-143.00R.
- Aipronk Promotie & Ontwilling B.V.: See—
van Herpen, Frederik C., 5,085,019, Cl. 52-127.100.
- Air Products and Chemicals, Inc.: See—
Armor, John N.; Braymer, Thomas A.; Farris, Thomas S.; and Gaffney, Thomas R., 5,086,033, Cl. 502-432.000.
- Banks, Ronald E., 5,086,178, Cl. 544-351.000.
- Norman, John A. T.; and Muratore, Beth A., 5,085,731, Cl. 156-646.000.
- Pinschmidt, Robert K., Jr.; Vijayendran, Bheema R.; and Lai, Ta-Wang, 5,085,787, Cl. 252-8.551.
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- Savoca, Ann C. L.; and Louie, Michael, 5,086,081, Cl. 521-103.000.
- Airline Industrial Machinery, Inc.: See—
Thomas, Joseph R., Jr., 5,084,936, Cl. 14-71.500.
- Aisan Kogyo Kabushiki Kaisha: See—
Aoki, Tsuneaki; Makimura, Toshiro; and Imamura, Kaneo, 5,085,369, Cl. 239-5.000.
- Iwata, Kouichi; and Fukaya, Katsuyoshi, 5,085,248, Cl. 137-625.480.
- Aisin AW Co., Ltd.: See—
Ando, Masahiko; Ozaki, Kazuhisa; and Niki, Hiroshi, 5,085,103, Cl. 74-868.000.
- Aisin Seiki Kabushiki Kaisha: See—
Hashiride, Tadaaki; Nakai, Toshiyuki; and Goto, Hisaharu, 5,085,160, Cl. 112-300.000.
- Iwase, Yoshinobu; Sonoda, Shiro; Watanabe, Kazuaki; Minemoto, Isamu; and Akashi, Teruo, 5,085,102, Cl. 74-867.000.
- Katsuda, Hiroyuki; Mizuno, Tomokimi; and Watanabe, Tetsumi, 5,085,054, Cl. 60-517.000.
- Matsubara, Osamu; Kaneko, Kenichi; and Kawai, Shinji, 5,084,917, Cl. 4-237.000.
- Akagawa, Tomohiko: See—
Ueno, Kohhei; Akagawa, Tomohiko; Hinenoya, Saburo; and Morimoto, Toshio, 5,086,109, Cl. 524-496.000.

Akano, Hirofumi: See—
Okada, Gentaro; Akano, Hirofumi; Sato, Takeshi; Okumura, Hajime; and Kawamura, Yoshiya, 5,085,851, Cl. 424-50.000.
Akasaka, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nukada, Katsumi; and Marumo, Teruomi, to Fuji Xerox Co., Ltd. Electrophotographic photosensitive member and image forming process, 5,085,960, Cl. 430-58.000.
Akashi, Teruo: See—
Iwase, Yoshinobu; Sonoda, Shiro; Watanabe, Kazuaki; Minemoto, Tsamu; and Akashi, Teruo, 5,085,102, Cl. 74-867.000.
Akatsu, Yohsuke: See—
Sato, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, 5,085,459, Cl. 280-707.000.
Aker, David; Philpott, Arthur K.; and Tetaz, John R., to Specialised Conductives Pty. Limited. Aprotic electrolyte capacitors and methods of making the same, 5,086,374, Cl. 361-525.000.
Akkerboom, Piet J.: See—
Olthoff, Margaretha; Dijkgraaf, Bernardus L. J.; and Akkerboom, Piet J., 5,085,869, Cl. 424-499.000.
Akridge, James R.; and Jones, Steven D., to Eveready Battery Company, Inc. Vitreous compositions based on Li_2PO_4 and LiPO_3 as network formers and network modifiers, 5,085,953, Cl. 429-193.000.
Aktiebolaget Bofors: See—
Rossel, Ulf; Karlsson, Mats; and Ternsjo, Johan, 5,085,123, Cl. 89-4.200.
Akutsu, Takashi: See—
Morokuma, Hiroshi; Matsuyama, Shigeru; and Akutsu, Takashi, 5,085,117, Cl. 84-615.000.
Akzo NV: See—
Franklin, Ralph; Parr, William J.; Fesman, Gerald; and Jacobs, Barry, 5,086,083, Cl. 521-129.000.
Smith, Gregory M., 5,086,023, Cl. 502-103.000.
Albert Handtmann Maschinenfabrik GmbH & Co., KG: See—
Muller, Gerhard; and Hermann, Albert, 5,085,612, Cl. 452-51.000.
Alberta Cancer Board: See—
Raleigh, James A.; Miller, Gerald G.; Franko, Allan J.; and Chapman, J. D., 5,086,068, Cl. 514-398.000.
Albright & Wilson Limited: See—
Lowe, Edward J.; and Holmes, William S., 5,085,846, Cl. 423-316.000.
Alcatel Cit: See—
Le Roy, Guy, 5,086,348, Cl. 358-117.000.
Marquet, Alain; and Tanguy, Jacques, 5,086,235, Cl. 307-64.000.
Alexander, Michael, to ASC Incorporated. Convertible top latching mechanism, 5,085,483, Cl. 296-121.000.
Algieri, Louis. Wear resistant floor covering, 5,085,912, Cl. 428-67.000.
Alko Ltd.: See—
Penttila, Liisa; and Vaara, Timo, 5,085,875, Cl. 426-62.000.
Sinclair, John D.; Scheinin, Harry; and Lammintausta, Risto, 5,086,058, Cl. 514-282.000.
Allelix Biopharmaceuticals, Inc.: See—
Hammond, Geoffrey L., 5,086,039, Cl. 514-8.000.
Allied-Signal Inc.: See—
Aina, Olaleye A.; and Martin, Eric A., 5,086,282, Cl. 330-300.000.
Carr, Clyde E.; Holcomb, Orla L., Jr.; and Rodino, Louis S., 5,085,296, Cl. 188-79.550.
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Emo, Stephen M.; and Kinney, Terrance R., 5,085,125, Cl. 91-459.000.
Gasparri, James A.; Borgia, Joseph A.; Randall, Paul C.; Cote, Edmond H., Jr.; and Caronia, Anthony J., 5,085,188, Cl. 123-196.000.
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Miller, George M., 5,086,302, Cl. 342-373.000.
Miller, Lawrence T., 5,086,093, Cl. 524-28.000.
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Alperine, Serge: See—
Josso, Pierre; Alperine, Serge; Steinmetz, Pierre; and Constantini-Friant, Anne, 5,085,693, Cl. 106-1.280.
Alps Electric Co., Ltd.: See—
Torii, Katsuhiko, 5,085,394, Cl. 248-455.000.
Alstom International S.A.: See—
Frey, Guy, 5,085,626, Cl. 600-13.000.
Althaus, Wolfgang, to Wilkinson Sword Gesellschaft mit beschränkter Haftung. Razor head of a wet razor, 5,084,969, Cl. 30-79.000.
Aluminum Company of America: See—
Yun, David I.; Fang, Que-Tsang; and Wei-Berk, Caroline, 5,085,945, Cl. 428-614.000.
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Amberger, Werner: See—
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Sanderson, Robert A.; Sakai, Katsunori; Kuwabara, Takeshi; and Amemiya, Takashi, 5,085,949, Cl. 429-23.000.
American Bank Note Holographics, Inc.: See—
Mallik, Donald W.; and D'Amato, Salvatore F., 5,085,514, Cl. 359-2.000.
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Engelmann, Lester B., 5,085,076, Cl. 73-197.000.
Amin, Nurul; Bortins, John; Keel, Beat G.; and Yan, Ying D., to Seagate Technology, Inc. Method for aligning thin film head pole tips, 5,084,957, Cl. 29-603.000.
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Dickinson, Barry L.; El-Hibri, M. J.; and Sauers, Marvin E., 5,086,130, Cl. 525-537.000.
Puri, Rajen; and Yee, Dan, 5,085,274, Cl. 166-252.000.
Richards, Robert L., 5,085,443, Cl. 277-53.000.
Amos, Warren E.; and Chupka, Michael. Portable loadmake/loadbreak switch and live-line eyebolt terminal clamp, 5,085,583, Cl. 439-479.000.
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Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,086,372, Cl. 361-415.000.
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Galloway, Michael D., 5,085,590, Cl. 439-95.000.
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Yeomans, Michael A., 5,084,960, Cl. 29-753.000.
Analog Devices, Incorporated: See—
Yasaitis, John A., 5,086,370, Cl. 361-313.000.
Anchor Hocking Corporation: See—
Hayes, Thomas H.; and LoMaglio, Lewis C., 5,085,347, Cl. 222-153.000.
Anchor Tech, Inc.: See—
Oldfield, Thomas A., 5,085,101, Cl. 74-730.100.
Andersen, Erik F.: See—
Jensen, Svend V.; and Andersen, Erik F., 5,085,317, Cl. 206-229.000.
Anderson, Everett B.: See—
Reddy, N. R. K.; Vilambi; Anderson, Everett B.; and Taylor, Earl J., 5,085,743, Cl. 205-105.000.
Anderson-McKay, Janet E.; and Liepa, Andris J., to Dunlana Pty. Limited. Herbicidal pyrones, 5,086,187, Cl. 549-9.000.
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Adams, David V.; and Anderson, Roger N., 5,085,887, Cl. 427-55.000.
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Andis Company: See—
Sukow, Daniel L.; Quella, Daniel C.; and Andis, Matthew L., 5,084,974, Cl. 30-201.000.
Andis, Matthew L.: See—
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Ando, Masahiko; Ozaki, Kazuhisa; and Niki, Hiroshi, to Aisin AW Co., Ltd. Hydraulic control apparatus for automatic transmissions, 5,085,103, Cl. 74-868.000.
Ando, Tateo; and Kabeshita, Akira, to Matsushita Electric Industrial Co., Ltd. Chip mounting apparatus, 5,084,959, Cl. 29-740.000.
Anfuso, Francesco; Mattiussi, Andrea; Matarrese, Savino; and Borghi, Italo, to Montedipe S.r.l. Process for the preparation of expandable beads, 5,086,080, Cl. 521-59.000.
Anloague, Paul S.: See—
Garleb, Keith A.; Chmura, James N.; Anloague, Paul S.; Cunningham, Mary B.; and Sertl, David C., 5,085,883, Cl. 426-590.000.
Annemarie Schlogl GmbH & Co. KG: See—
Polaschegg, Hans-Dietrich, 5,085,656, Cl. 604-891.100.
Anritsu Corporation: See—
Shizawa, Masahiro; Taka, Katsuhiko; and Ogihara, Hiroshi, 5,086,456, Cl. 379-132.000.
Sugata, Fujio; Ohtake, Masatoshi; and Fujiwara, Hidefumi, 5,086,438, Cl. 375-114.000.
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preparation of an ethylene/propylene copolymer, 5,086,134, Cl. 526-126.000.
Antonini, Piero: See—
Lancini, Giancarlo; Borghi, Angelo; Antonini, Piero; and Palumbo, Raffaele, 5,085,990, Cl. 435-71.300.
Antropov, Gennady M.: See—
Fedorov, Svyatoslav; Linnik, Leonid F.; Antropov, Gennady M.; Arnautov, Leonid N.; Ippolitov, Vladimir V.; Streltsov, Valentin F.; Stromakov, Alexandr P.; and Shigina, Nina A., 5,085,627, Cl. 600-14.000.
Aoki, Hideo, to Ricoh Company, Ltd. Lifting the photosensitive body in an image forming apparatus, 5,086,316, Cl. 355-200.000.
Aoki, Hitoshi; Wakabayashi, Hiroshi; Tsukahara, Daiki; and Miyamoto, Hidenori, to Nikon Corporation. Exposure control apparatus for camera, 5,086,314, Cl. 354-412.000.
Aoki, Takayoshi: See—
Suzuki, Chiaki; Kumashiro, Koichi; Torigoe, Tetsu; Kimura, Takachi; and Aoki, Takayoshi, 5,085,963, Cl. 430-106.600.
Aoki, Tsuneaki; Makimura, Toshiro; and Imamura, Kaneo, to Aisan Kogyo Kabushiki Kaisha. Fuel injector, 5,085,369, Cl. 239-5.000.
Aoki, Yorikazu, to Sanden Corporation. Hydraulically driven heating and air conditioning system for vehicles such as mobile cranes, 5,085,269, Cl. 165-43.000.
Aono, Toshiaki; Nakamura, Koichi; and Shibata, Takeshi, to Fuji Photo Film Co., Ltd. Photographic element containing water-absorbing compound, 5,085,980, Cl. 430-531.000.
Aonuma, Hidekazu: See—
Akasaka, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nukada, Katsumi; and Marumo, Teruomi, 5,085,960, Cl. 430-58.000.
Aota, Yoshiaki: See—
Hagiya, Toshimichi; Watanabe, Junichi; Kanno, Tetsuo; Inuzuka, Hideo; Yamahata, Makoto; Sofue, Masaaki; and Aota, Yoshiaki, 5,086,422, Cl. 369-75.100.
Aoyama, Susumu: See—
Nakaki, Masao; and Aoyama, Susumu, 5,085,723, Cl. 156-250.000.
Appleton Papers Inc.: See—
Mathiaparanam, Ponnampalam, 5,086,171, Cl. 544-144.000.
Applied Magnetics Corporation: See—
Smith, Paul W.; Abbott, Raymond S.; Lorince, Peter C.; Wood, Robert K.; Lichtenberg, Robert R.; and Gaukel, John J., 5,086,360, Cl. 360-103.000.
Applied Materials, Inc.: See—
Adams, David V.; and Anderson, Roger N., 5,085,887, Cl. 427-55.000.
Steger, Robert J., 5,085,727, Cl. 156-345.000.
Arai, Masatoshi; Kimura, Tsuneo; and Inoue, Yoshio, to Shin-Etsu Chemical Co., Ltd. Room temperature-curable organopolysiloxane composition, 5,086,107, Cl. 524-424.000.
Arai, Shigeyoshi: See—
Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
Arakawa, Koji: See—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshio, Hitoshi; and Nongoe, Isami, 5,086,381, Cl. 363-16.000.
Arakawa, Motoi, to Omron Tateisi Electronics Co. Electric switch, 5,086,198, Cl. 200-456.000.
Araya, Shinichi: See—
Takahashi, Kuniaki; Kudo, Koji; Araya, Shinichi; and Nakayama, Hitoshi, 5,084,962, Cl. 29-833.000.
Arbisi, Thomas E.: See—
Fluharty, William J.; and Arbisi, Thomas E., 5,085,481, Cl. 296-37.800.
Arch Development Corporation: See—
Mumuley, Ketan D., 5,086,496, Cl. 395-121.000.
Ardecky, Robert J.; Patten, Arthur D.; and Sun, Jung-Hui, to Du Pont Merck Pharmaceutical Company. Bis-naphthalimides as anticancer agents, 5,086,059, Cl. 514-284.000.
Arikawa, Hiroo; and Yuza, Yasutada, to SOC Corporation. Time-current characteristics variable chip fuse, 5,086,285, Cl. 337-231.000.
Arikawa, Jun: See—
Fujita, Noboru; Orisaka, Toru; Haneda, Akira; Miyokawa, Yuuki-chi; and Arikawa, Jun, 5,085,932, Cl. 428-331.000.
Arimoto, Shoji: See—
Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Jooraku, Fumio, 5,085,806, Cl. 252-518.000.
Arinobu, Ichiro: See—
Ishii, Kazuhiko; Hirotsume, Kouji; Arinobu, Ichiro; and Sato, Kazushi, 5,086,366, Cl. 361-94.000.
Arita, Kinya: See—
Tsutsui, Osamu; Haraga, Hisato; Arita, Kinya; Makita, Atsuo; Takeuchi, Hirofumi; and Tsukada, Ryoichi, 5,085,399, Cl. 251-30.030.
Armament Systems & Procedures, Inc.: See—
Parsons, Kevin L., 5,085,433, Cl. 273-84.000.
Armor, John N.; Braymer, Thomas A.; Farris, Thomas S.; and Gaffney, Thomas R., to Air Products and Chemicals, Inc. Use of helium and argon diluent gases in modification of carbon molecular sieves, 5,086,033, Cl. 502-432.000.
Arnautov, Leonid N.: See—
Fedorov, Svyatoslav; Linnik, Leonid F.; Antropov, Gennady M.; Arnautov, Leonid N.; Ippolitov, Vladimir V.; Streltsov, Valentin

F.; Stromakov, Alexandr P.; and Shigina, Nina A., 5,085,627, Cl. 600-14.000.
Arnold, Fred E.: See—
Tan, Loon-Seng; and Arnold, Fred E., 5,086,120, Cl. 525-183.000.
Arold, Klaus; and Koukal, Heinz, to Mercedes-Benz AG. Motor vehicle filter in the inlet stream of a heating system or air-conditioning system of a motor vehicle, 5,085,266, Cl. 165-1.000.
Arroyo, Ronald X.; and Hanna, James T., to International Business Machines Corporation. Multi-frequency clock generation with low state coincidence upon latching, 5,086,387, Cl. 395-550.000.
Art, Jack; and Levad, Douglas J., to Atmel Corporation. Gravity-held alignment member for manufacture of a leadless chip carrier, 5,085,362, Cl. 228-49.100.
Arthur, Samuel D., to Du Pont de Nemours, E. I., and Company. Reverse osmosis membranes of polyamideurethane, 5,085,777, Cl. 210-500.380.
Artic Elements, Inc.: See—
Groppe, Alvin F., 5,086,464, Cl. 379-430.000.
Arudi, Ravindra L.: See—
Wenz, Robert P.; Weber, Michael F.; and Arudi, Ravindra L., 5,085,939, Cl. 428-411.100.
Asada, Kazuyoshi: See—
Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.
Asahi Glass Company Ltd.: See—
Ishino, Toshihiro; Sakai, Kouzou; and Kido, Nobuyuki, 5,086,020, Cl. 501-105.000.
Morimoto, Takeshi; and Sanada, Yasuhiro, 5,085,888, Cl. 427-108.000.
Asahi Kasei Kogyo Kabushiki Kaisha: See—
Sagami, Hiroshi; and Wakamatsu, Hisashi, 5,085,754, Cl. 204-296.000.
Asahi Kogaku Kogyo K.K.: See—
Sugawara, Saburo; Takahashi, Toshiharu; Yuda, Hideaki; and Shirayanagi, Moriyasu, 5,085,977, Cl. 430-321.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: See—
Misawa, Masayuki, 5,086,313, Cl. 200-5.000.
Nishida, Takao; and Satoh, Osamu, 5,086,315, Cl. 354-413.000.
Tsuru, Sumiaki; Yokoo, Akihiko; Ichitsuka, Takeshi; and Hiraide, Tsuneo, 5,085,781, Cl. 210-692.000.
Asahi, Masahiko: See—
Fukuda, Morinobu; Kamata, Yoshitsugu; and Asahi, Masahiko, 5,085,854, Cl. 424-63.000.
Asahina, Michio, to Seiko Epson Corporation. Semiconductor device and method of production, 5,086,006, Cl. 437-34.000.
Asai, Kohtaro; Murakami, Tokumichi; and Hasegawa, Yuri, to Mitsubishi Denki Kabushiki Kaisha. Encoding/decoding system utilizing local properties, 5,086,439, Cl. 375-122.000.
Asai, Nobuko: See—
Ando, Kazuo; Asai, Nobuko; Ito, Fumitaka; Mano, Takashi; Nakane, Masami; Satake, Kunio; and Shimada, Kaoru, 5,086,062, Cl. 514-321.000.
Asami, Eiichi: See—
Sakuma, Kazuhiro; Ohno, Aritaka; Asami, Eiichi; and Kaku, Ryoji, 5,085,501, Cl. 356-350.000.
Asami, Kouichiro: See—
Okuda, Masaharu; Asami, Kouichiro; and Nagasaki, Heishiro, 5,085,374, Cl. 239-751.000.
Asanuma, Tadashi; Yamamoto, Kazuhiko; Ohnaka, Junko; and Tokura, Yoshiko, to Mitsui Toatsu Chemicals, Inc. Polyolefin resin composition, 5,085,895, Cl. 427-393.500.
ASC Incorporated: See—
Alexander, Michael, 5,085,483, Cl. 296-121.000.
Ascosi, Vito S.; and Breece, Robert O. Contact lens orientation method and apparatus, 5,085,013, Cl. 51-277.000.
Asea Brown Boveri: See—
Keller, Jakob; and Haumann, Jürgen, 5,085,575, Cl. 431-8.000.
Ash, Gerald R.; Chen, Jin-Shi; and Gerritsen, Robert A., to AT&T Bell Laboratories. Communications system ingress and egress arrangement, 5,086,460, Cl. 379-221.000.
Ashmore, George A. Method and system for passive detection of electromagnetic events associated with destructive devices, 5,086,300, Cl. 342-20.000.
Aslam, Muhammad; and Farnand, Thomas J., to Eastman Kodak Company. Method and apparatus for reducing relief in toner images, 5,085,962, Cl. 430-99.000.
Ast, Hans-Peter; Paech, Eberhard; and Amberger, Werner, to Zweckform Etikettentechnik GmbH. Adhesive label for adhering to a container and containers made therewith, 5,085,906, Cl. 428-36.920.
Asta Pharma AG: See—
Hettche, Helmut; Muckenschnabel, Reinhard; Scheffler, Gerhard; Fleischhauer, Ilona; and Morick, Wolfgang, 5,086,050, Cl. 514-212.000.
Astec International, Ltd.: See—
Sawtell, Carl K.; Dagan, Marc E.; and Bandy, Frederic S., 5,085,526, Cl. 374-101.000.
Astra Lakemedel Aktiebolag: See—
Mattsson, Kjell J.; Nicklasson, Alf G. M.; and Sjoovist, Rolf, 5,085,868, Cl. 424-490.000.
AT&T Bell Laboratories: See—
Ash, Gerald R.; Chen, Jin-Shi; and Gerritsen, Robert A., 5,086,460, Cl. 379-221.000.
Miller, Gabriel L.; and Wagner, Eric R., 5,085,070, Cl. 73-105.000.
Wong, Ching-Ping, 5,085,913, Cl. 428-76.000.

Atcher, Robert W.; and Hines, John J., to United States of America, Energy. Method of treating inflammatory diseases using a radiolabeled ferric hydroxide colloid. 5,085,848, Cl. 424-1.100.

Atmel Corporation: See—
Art, Jack; and Levad, Douglas J., 5,085,362, Cl. 228-49.100.
Schumann, Steven J.; and Hu, James C., 5,086,325, Cl. 357-23.500.

Atochem: See—
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Atochem North America, Inc.: See—
Bohen, Joseph M.; and Reifenberg, Gerald H., 5,086,098, Cl. 524-94.000.
Muller, Frank A.; and Zaelke, Arnold E., 5,085,696, Cl. 106-14.160.

Atsugi Unisia Corp.: See—
Nakamura, Makoto; Sakuragi, Shigeru; Matayoshi, Yutaka; Maekawa, Keichi; Hara, Seinosuke; and Morita, Shoji, 5,085,182, Cl. 123-90.160.

Auburn University: See—
Baginski, Thomas A., 5,085,146, Cl. 102-202.500.

Audibert, Jacques J. Folding furniture structure. 5,085,447, Cl. 280-30.000.

Aulick, Larry O.; Stafford, Donald W.; and Suthar, Ajay K., to Lexmark International, Inc. Compliant doctor blade. 5,085,171, Cl. 118-653.000.

Aura Systems, Inc.: See—
Um, Gregory; and Szilagyi, Andrei, 5,085,497, Cl. 359-848.000.

Aurand, William C.: See—
Ingebrigtsen, Kjell A.; and Aurand, William C., 5,085,221, Cl. 128-660.100.

Aurik, Erik A.: See—
Borgman, Fokko P.; Aurik, Erik A.; and Dessing, Jacobus P., 5,085,172, Cl. 119-14.090.

Aurora Optics, Inc.: See—
Wesson, Laurence N.; and Cabato, Nellie L., 5,085,494, Cl. 385-98.000.

Ausco Products, Inc.: See—
Schmaltz, Gary E., 5,085,406, Cl. 254-103.000.

Aust, Steven D.: See—
Lebron, Carmen A.; Karr, Leslie A.; Fernando, Tudor; and Aust, Steven D., 5,085,998, Cl. 435-262.000.

Austin, Joseph R. Necktie assembly. 5,084,916, Cl. 2-149.000.

Austin, Marlin; Cain, Michael; and Haack, Paul J., to Von Duprin, Inc. Exit-delaying mechanism, for a panic exit device. 5,085,475, Cl. 292-92.000.

Automotive Products (USA) Inc.: See—
Bubnash, Terry L., 5,085,106, Cl. 74-866.000.

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Behr, Leonard W.; and White, Craig W., 5,085,464, Cl. 280-735.000.

Autronic Plastics, Inc.: See—
Lax, Michael, 5,085,322, Cl. 206-387.000.

Avalon, Gary A.: See—
Mann, Roger H.; Joseph, Karl; and Avalon, Gary A., 5,085,655, Cl. 604-389.000.

Avery Dennison Corporation: See—
Mann, Roger H.; Joseph, Karl; and Avalon, Gary A., 5,085,655, Cl. 604-389.000.

Avions Marcel Dassault-Breguet Aviation (AMD/BA): See—
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AVM Auto-Equipamentos, Ltda.: See—
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Awad, William M., Jr., to University of Miami. Method of separating proteins. 5,086,167, Cl. 530-416.000.

Axelsson, Robert: See—
Svenson, Jan A.; and Axelsson, Robert, 5,085,646, Cl. 604-175.000.

Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, to Mitsubishi Rayon Company Ltd. Methacrylic resin cast plate having excellent antistatic property. 5,086,106, Cl. 524-300.000.

Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: See—
Sogliani, Claudio; and Corniani, Carlo, 5,085,354, Cl. 222-504.000.

Azumai, Mitsuo: See—
Sakata, Satoshi; Sato, Kazuo; Gotoh, Yuichi; Azumai, Mitsuo; and Hotta, Ikuya, 5,086,261, Cl. 318-268.000.

B. F. Goodrich Company, The: See—
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Baba, Seigo: See—
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, 5,085,822, Cl. 264-528.000.

Baba, Yoshiro: See—
Nakagawa, Akio; Watanabe, Kiminori; Koshino, Yutaka; Yamaguchi, Yoshihiro; and Baba, Yoshiro, 5,086,332, Cl. 357-51.000.

Babcock & Wilcox Company, The: See—
Berthold, John W.; Koksall, Cevdet G.; and Jeffers, Larry A., 5,086,220, Cl. 250-227.200.

Cantor, Barry I.; Flora, John H.; and Latimer, Paul J., 5,085,082, Cl. 73-622.000.

Babczinski, Peter: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., 5,085,684, Cl. 71-92.000.

Babjak, John R.: See—
Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., 5,086,144, Cl. 527-313.000.

Baccou, Jean-Claude; Bessiere, Jean-Marie; Boisseau, Patrick; Augeras, Pierre; Jouy, Nicholas; Peyrot, Elysabette; and Sauvage, Yves, to Commissariat a l'Energie Atomique; and Universite des Sciences et Techniques du Languedoc. Process for the accelerated ageing and treatment of iris rhizomes. 5,085,994, Cl. 435-148.000.

Bacus, James W., to Cell Analysis Systems, Inc. Method and apparatus for determining a proliferation index of a cell sample. 5,086,476, Cl. 382-6.000.

Baginski, Thomas A., to Auburn University. Electroexplosive device. 5,085,146, Cl. 102-202.500.

Bailey, Rouse R., Jr.: See—
Lessig, William R., III; Bailey, Rouse R., Jr.; and Cochran, John R., 5,084,934, Cl. 15-325.000.

Bair, Wyeth: See—
Koch, Christof; and Bair, Wyeth, 5,086,219, Cl. 250-208.200.

Baker, Ronald D. Device simulating a running bird. 5,085,075, Cl. 73-188.000.

Balachandran, Uthamalingam; Poepel, Roger B.; Emerson, James E.; and Johnson, Stanley A., to United States of America, Energy. Calcination and solid state reaction of ceramic-forming components to provide single-phase superconducting materials having fine particle size. 5,086,034, Cl. 505-1.000.

Baldwin, Ronald S., to Branson Ultrasonics Corporation. Vapor degreasing apparatus. 5,085,238, Cl. 134-105.000.

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Maguire, Sean P. J.; Sivayoganathan, Kandiah; and Balendran, Velupillai, 5,086,232, Cl. 250-572.000.

Ballance, John W., to British Telecommunications public limited company. Scrambling in digital communications network using a scrambled synchronization signal. 5,086,470, Cl. 380-48.000.

Ballard, Donald M. Shelf assembly. 5,085,155, Cl. 108-111.000.

Bandy, Frederic S.: See—
Sawtell, Carl K.; Dagan, Marc E.; and Bandy, Frederic S., 5,085,526, Cl. 374-101.000.

Banks, Ronald E., to Air Products and Chemicals, Inc. Fluorinated diazabicycloalkane derivatives. 5,086,178, Cl. 544-351.000.

Banks, Todd J., to Procter & Gamble Company, The. Antimicrobial oral compositions. 5,085,852, Cl. 424-53.000.

Barajas, Saul: See—
Whittaker, Bruce E.; Barajas, Saul; and Watson, Leland E., 5,086,427, Cl. 370-85.100.

Barito, Thomas R., to Carrier Corporation. Axially compliant scroll with rotating pressure chambers. 5,085,565, Cl. 418-55.400.

Barker, David R.: See—
Boettcher, Eric R.; and Barker, David R., 5,086,295, Cl. 340-701.000.

Baron, Kenneth S.; Brinkerhoff, Susan M.; Lee, Frank W.; and McKinney, Stella M., to Hexcel Corporation. Low energy cured composite repair system based on epoxy resin with imidazole blocked naphthyl diisocyanate catalyst having extended shelf life. 5,086,149, Cl. 528-45.000.

Barraud, Claude; Poilleux, Jean-Loup; and Guion, Christian, to Schlumberger Industries. Prepayment data transmission system. 5,086,457, Cl. 379-144.000.

Barrett, Brian F.; and Firek, Frank H., to Prime Tube, Inc. Hydraulic cylinder for automotive steering systems and the like. 5,085,131, Cl. 92-169.100.

Barrett, Haentjens & Co.: See—
Stirling, Thomas E., 5,085,809, Cl. 261-77.000.

Barrett, Patrick J., to Twenty-First Century Products, Incorporated. Inflatable cushion for supporting an extremity. 5,085,214, Cl. 128-845.000.

Barroso, Elton, to AVM Auto-Equipamentos, Ltda. Automatic free-wheeling hub assembly. 5,085,304, Cl. 192-67.00R.

Barry, David W.: See—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 5,086,044, Cl. 514-51.000.

Bart, Anthony J.: See—
Gibson, Joseph W., Jr.; Bart, Anthony J.; Verblar, Robert J.; and Sebastian, S. Andries R. D., 5,085,976, Cl. 430-306.000.

Bartlett, Peter J.; and Bradford, Peter F., to Lucas Industries Public Limited Company. Low pressure fuel supply system for a fuel injection pump. 5,085,198, Cl. 123-510.000.

Bartmann, Guenter, to Siemens Aktiengesellschaft. Primary radiation diaphragm. 5,086,444, Cl. 378-152.000.

Barton, Arthur E. M., to British Aerospace Public Limited Company. Projectile guidance. 5,085,380, Cl. 244-3.210.

Bartosik, George; Paris, Sam; Kresch, Jeffrey M.; Danley, William J.; Kalley, Eugene F.; and Goldberg, Arthur E., to Square D Company. Scanning infrared temperature sensor with sighting apparatus. 5,085,525, Cl. 374-124.000.

Bartz, Manfred U., to Hewlett-Packard Company. Compensation system for dynamically tracking and nulling local oscillator feed-through. 5,086,512, Cl. 455-186.000.

BASF Aktiengesellschaft: See—
Ebenhoch, Franz L.; and Schlegel, Reinhold, 5,085,690, Cl. 75-362.000.

Kast, Juergen; Meyer, Norbert; Misslitz, Ulf; Schubert, Juergen; Jung, Johann; Rademacher, Wilhelm; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,085,689, Cl. 71-105.000.

Platz, Horst; Engelhardt, Peter; Sommermann, Friedrich; Kohl, Albert; Klausmann, Juergen; Baur, Reinhold; Heilmann, Peter; and Roller, Hermann, 5,085,889, Cl. 427-128.000.

Rheinheimer, Joachim; Eicken, Karl; Vogelbacher, Uwe J.; Rohr, Wolfgang; Kuekenhoechner, Thomas; Westphalen, Karl O.; and Wuerzer, Bruno, 5,085,685, Cl. 71-92.000.

Vogelbacher, Uwe J.; Eicken, Karl; Rheinheimer, Joachim; Goetz, Norbert; Harreus, Albrecht; Paul, Gerhard; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,085,686, Cl. 71-92.000.

BASF Corporation: See—
Harcloode, William H.; Zimmermann, Eugene K.; Pekich, Barry J.; Knutsen, John C.; Wiman, John V.; and Voss, John C., 5,086,078, Cl. 521-58.000.

BASF Lacke & Farben AG: See—
Geist, Michael; Cibura, Klaus; Jouck, Walter; Ott, Gunther; Sadlowski, Jurgen; Dangschaft, Manfred; and Reimann, Manfred, 5,086,090, Cl. 523-414.000.

Geist, Michael; Cibura, Klaus; Fobbe, Helmut; and Ott, Gunther, 5,086,091, Cl. 523-415.000.

BASF Lacke + Farben Aktiengesellschaft: See—
Schupp, Hans; Schwerzel, Thomas; Lawrenz, Dirk; Osowski, Hans-Josef; and Heimann, Ulrich, 5,086,092, Cl. 523-414.000.

Basha, Anwer: See—
Brooks, Dee W.; Carter, George W.; Basha, Anwer; Gunn, Bruce P.; and Dyer, Richard D., 5,086,052, Cl. 514-231.500.

Basha, Fatima Z.: See—
DeBernardis, John F.; Zelle, Robert E.; and Basha, Fatima Z., 5,086,074, Cl. 514-649.000.

Bass, Charles J., to Quadrum Telecommunications, Inc. Armored telephone cord retention bracket. 5,086,465, Cl. 379-438.000.

Bass, John S.: See—
Bass, Robert E.; and Bass, John S., 5,086,354, Cl. 359-465.000.

Bass, Robert E.; and Bass, John S. Three dimensional optical viewing system. 5,086,354, Cl. 359-465.000.

Basu, Rajat S.: See—
Stachura, Leonard M.; Logsdon, Peter B.; Swan, Ellen L.; and Basu, Rajat S., 5,085,796, Cl. 252-171.000.

Swan, Ellen L.; and Basu, Rajat S., 5,085,797, Cl. 252-171.000.

Swan, Ellen L.; Basu, Rajat S.; and Hollister, Richard M., 5,085,798, Cl. 252-171.000.

Batey, John; Tiwari, Sandip; and Wright, Steven L., to International Business Machines Corporation. Unninned oxide-compound semiconductor structures and method of forming same. 5,086,321, Cl. 357-23.200.

Battaglia, James M.: See—
Launey, Reuel O.; Grendler, Peter A.; Packham, Donald L.; Battaglia, James M.; and Levine, Howard E., 5,086,385, Cl. 364-188.000.

Battelle Memorial Institute: See—
Griffin, Jeffrey W.; and Olsen, Khrist B., 5,085,499, Cl. 356-311.000.

Bauer, Hans J.: See—
Bauer, Hans-Peter; Bauer, Hans J.; and Stadelmann, Ludwig, 5,085,297, Cl. 188-129.000.

Bauer, Hans-Peter; Bauer, Hans J.; and Stadelmann, Ludwig. Frictional damper. 5,085,297, Cl. 188-129.000.

Bauer, Walter; Widemann, Ernst; and Schmidt, Manfred, to Agfa-Gevaert AG. X-ray sheet film cassette. 5,086,446, Cl. 378-188.000.

Bauman, Ralph E.; and Seymour, Horace W., III, to Sanders Associates, Inc. Electrical circuit board mounting apparatus and method. 5,085,602, Cl. 439-874.000.

Baumgratz, Bonnie A.: See—
Kasai, Ichiro; Wallach, Richard M.; Baumgratz, Bonnie A.; and Boyd, Michael E., 5,086,328, Cl. 357-30.000.

Baur, Reinhold: See—
Platz, Horst; Engelhardt, Peter; Sommermann, Friedrich; Kohl, Albert; Klausmann, Juergen; Baur, Reinhold; Heilmann, Peter; and Roller, Hermann, 5,085,889, Cl. 427-128.000.

Baux, Christian; and Salau, Thierry, to Jaeger. Device for measuring fuel level in a motor vehicle tank. 5,085,078, Cl. 73-313.000.

Baxter International, Inc.: See—
Leissing, Nancy C.; and Oskroba, Diana, 5,086,001, Cl. 436-171.000.

Bayer Aktiengesellschaft: See—
Beck, Gunther, 5,086,172, Cl. 544-180.000.

Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinplugg, Hans; and Kramer, Wolfgang, 5,086,048, Cl. 514-187.000.

Fraundorf, Beatrix; Suling, Carl Hans; Rudolph, Hans; and Korte, Siegfried, 5,086,150, Cl. 528-49.000.

Fritsch, Karl-Herbert; Westeppe, Uwe; Nouvertne, Werner; and Freitag, Dieter, 5,086,159, Cl. 528-204.000.

Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,086,183, Cl. 548-110.000.

Heinz, Hans-Detlef; Kohler, Burkhard; Meyer, Rolf-Volker; Reinking, Klaus; and Sommer, Alexa, 5,086,128, Cl. 525-537.000.

Held, Wolfgang; Konig, Axel; and Puppe, Lothar, 5,085,840, Cl. 423-212.000.

Kohler, Burkhard; Heinz, Hans-Detlef; and Reinking, Klaus, 5,086,129, Cl. 525-537.000.

Kuske, Peter; and Buxbaum, Gunter, 5,085,706, Cl. 106-456.000.

Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Klotz, Gernot; and Greife, Heinrich A., 5,086,181, Cl. 546-310.000.

Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., 5,085,684, Cl. 71-92.000.

Pielartzik, Harald; Kohler, Burkhard; Traenckner, Hans-Joachim; Jakob, Wolfgang; and Bushong, William C., 5,086,102, Cl. 524-188.000.

Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 5,086,157, Cl. 528-171.000.

Riebel, Hans-Jochem, 5,086,174, Cl. 544-213.000.

Riebel, Hans-Jochem; and Muller, Klaus-Helmut, 5,086,177, Cl. 544-320.000.

Bayerische Motoren Werke AG: See—
Watson, Stephen H.; Watson, Stephen H.; Sivesind, Jerome M.; and Heyl, Gerrit, 5,084,918, Cl. 2-424.000.

Beaudoin, Arthur W. Fishing jigging apparatus. 5,084,995, Cl. 43-26.100.

Beauprez, Gregory M., to United Technologies Motor Systems, Inc. Window lift mechanism. 5,085,004, Cl. 49-138.000.

Becher, Hubert: See—
Rutz, Andreas; Langer, Rudolf; Becher, Hubert; Buttenbender, Klaus; and Zeller, Heinz, 5,084,949, Cl. 26-72.000.

Beck, Gunther, to Bayer Aktiengesellschaft. Preparation of 2,4,6-tricyano-1,3,5-triazine. 5,086,172, Cl. 544-180.000.

Beck, Harold D., to Dayco Products, Inc. Adhesion of elastomers to brass plated wire. 5,085,905, Cl. 428-35.900.

Becker, Benedikt: See—
Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,086,183, Cl. 548-110.000.

Becker, Johann A.: See—
Zell, Werner; Becker, Johann A.; and Romahn, Ulrich, 5,085,493, Cl. 385-96.000.

Becker, Willi, to Heidelberger Druckmaschinen AG. Sheet-size multiple-adjustment drive for a sheet-fed rotary printing machine. 5,085,143, Cl. 101-183.000.

Beckman, John B.; and Blickstein, Martin. System for controlling poultry house window closures. 5,085,368, Cl. 236-49.300.

Becton Dickinson & Co.: See—
Maino, Vernon C.; and Janszen, Marina E., 5,085,985, Cl. 435-7.240.

Purdy, Edmund R.; Crawford, Mark A.; Erskine, Timothy J.; and Peterson, Gerald H., 5,085,645, Cl. 604-167.000.

Purdy, Edmund R.; Peterson, Gerald H.; and Erskine, Timothy J., 5,085,648, Cl. 604-198.000.

Beers, John A. Swimming pool skimming apparatus. 5,085,767, Cl. 210-169.000.

Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, to Behr Industrieanlagen GmbH & Co. Apparatus for coating workpieces electrostatically. 5,085,373, Cl. 239-690.000.

Behr Industrieanlagen GmbH & Co.: See—
Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 5,085,373, Cl. 239-690.000.

Behr, Leonard W.; and White, Craig W., to Automotive Systems Laboratory, Inc. Air bag firing circuit. 5,085,464, Cl. 280-735.000.

Behrens, William L., to Chrysler Corporation. Gearshift park interlock system. 5,085,096, Cl. 74-475.000.

Beigang, Wolfgang, to GKN Automotive AG. Releasable coupling for shaft elements. 5,085,306, Cl. 192-79.000.

Belchos, Michael S.: See—
Hickling, Paul D.; and Belchos, Michael S., 5,085,133, Cl. 454-63.000.

Bell Communications Research, Inc.: See—
Kapon, Elyahou; and Orenstein, Meir, 5,086,430, Cl. 372-50.000.

Bell, Conrad J., to Xerox Corporation. Paper feeder insert tray. 5,085,419, Cl. 271-9.000.

Bell Helicopter Textron Inc.: See—
Duello, Charles L., 5,085,100, Cl. 74-606.00R.

Bellafore, Francis V.: See—
Farber, Scott A.; and Bellafore, Francis V., 5,085,745, Cl. 204-129.350.

Ben-Simhon, Haim. Electrosurgical instrument. 5,085,657, Cl. 606-42.000.

Bender, John E.; and Frank, Robert G., to PPG Industries, Inc. Deformable side seal for furnaces and method for using. 5,085,680, Cl. 65-118.000.

Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczeny, David S., to AMP Incorporated. Card edge power distribution system. 5,086,372, Cl. 361-415.000.

Bennett, Nicholas L., to Ainsworth Nominees Pty., Ltd. Slot machine with long and short pseudo reel strip. 5,085,436, Cl. 273-143.00R.

Bennett, Simon J.: See—
McMurtry, David R.; Jarman, Thomas B.; and Bennett, Simon J., 5,084,981, Cl. 33-556.000.

Benson, Mark A.: See—
Sinykin, William B.; Benson, Mark A.; and Hales, Scott J., 5,084,992, Cl. 37-222.000.

Bentley, Bill F.; Jett, James H.; Martin, John C.; and Saunders, George C., to United States of America, Energy. Compact air scrubber. 5,085,673, Cl. 55-10.000.

Berard, Jean-Daniel M.; Finck, Bernard E.; Doriath, Gerard; and Perut, Christian M. Autopyrolyzable composition for aerobic propulsion, the oxidizing agent of which is an explosive. 5,085,717, Cl. 149-19.900.

Berberich, Joseph P.: See—
Bundy, Wayne M.; Manasso, John A.; and Berberich, Joseph P., 5,085,707, Cl. 106-486.000.

Berg, Lloyd; and Yang, Zuyin, to Berg, Lloyd. Separation of the propyl alcohols from water by azeotropic or extractive distillation. 5,085,739, Cl. 203-18.000.

- Bergemont, Albert M., to National Semiconductor Corporation. Non-erasable EPROM cell for redundancy circuit. 5,086,410, Cl. 365-53.000.
- Berger, Barbara J.: See—
Berger, Irvin A.; Berger, Barbara J.; Schneider, Neil C.; and Schneider, Karen J., 5,085,391, Cl. 248-311.200.
- Berger, Christoph, to Puma AG Rudolf Dassler Sport. Shoe, especially a children's shoe with a transparent sole area. 5,084,988, Cl. 36-112.000.
- Berger, Irvin A.; Berger, Barbara J.; Schneider, Neil C.; and Schneider, Karen J. Plate and glass holder. 5,085,391, Cl. 248-311.200.
- Berglund, C. Neil: See—
Yu, Kenneth K.; and Berglund, C. Neil, 5,086,477, Cl. 382-8.000.
- Berlam, Gary R.; Bissonnette, Laurent C.; Bitsakis, Nicholas; Bodycoat, Peter R.; and Duarte, George M., to United States of America, Navy. Firing assembly for stored energy launcher. 5,085,122, Cl. 89-1.810.
- Berschauer, Friedrich: See—
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Klotz, Gernot; and Greife, Heinrich A., 5,086,181, Cl. 546-310.000.
- Berthold, John W.; Koksall, Cevdet G.; and Jeffers, Larry A., to Babcock & Wilcox Company, The. Radiation imaging fiber optic temperature distribution monitor. 5,086,220, Cl. 250-227.200.
- Berthoud, Francois: See—
Dubois, Gerald; and Berthoud, Francois, 5,086,416, Cl. 368-18.000.
- Bertil, Hok: See—
Lars, Tenerz; Bertil, Hok; Roman, Lonic; Ola, Hammarstrom; and Tomas, Engstrom, 5,085,223, Cl. 128-675.000.
- Bertram, Albert R. J.: See—
Bouwens, Henricus J. J.; and Bertram, Albert R. J., 5,085,553, Cl. 414-331.000.
- Bertrand, Gerard; Imbert, Gerard; and Narduzzo, Gabriel, to Societe Generale pour les Techniques Nouvelles SGN. Process for determining and monitoring the shape of the edges of a curved object and apparatus therefor. 5,085,516, Cl. 356-394.000.
- Bessiere, Jean-Marie: See—
Baccou, Jean-Claude; Bessiere, Jean-Marie; Boisseau, Patrick; Faugeras, Pierre; Jouy, Nicholas; Peyrot, Elysabette; and Sauvage, Yves, 5,085,994, Cl. 435-148.000.
- Beth Israel Hospital Association, The: See—
Gerhart, Tobin N.; and Hayes, Wilson C., 5,085,861, Cl. 424-78.170.
- Betts, John E.: See—
Toledo, George F.; and Betts, John E., 5,085,474, Cl. 292-92.000.
- Betts, Norman L.: See—
Jones, Clarence S.; Coolidge, Arthur W.; Cavin, Dennis, deceased; Betts, Norman L.; Moser, Jeffrey M.; and McGarvey, Kenneth J., 5,085,325, Cl. 209-580.000.
- Beutler, John: See—
Golik, Jerzy; Beutler, John; Clark, Pat; Ross, John; Roach, John; Muschik, Gary; and Leberer, William B., III, 5,086,045, Cl. 514-61.000.
- Bexten, Ludger: See—
Weber, Jürgen; Bexten, Ludger; Kupies, Dieter; Lappe, Peter; and Springer, Helmut, 5,085,835, Cl. 423-22.000.
- IIHS-Voith Getriebetechnik GmbH: See—
Heidrich, Günther, 5,085,093, Cl. 74-411.000.
- DHT Holdings Limited: See—
Danova, Cesare M., 5,084,930, Cl. 5-502.000.
- Niederstedt, Lutz: See—
Gerke, Dieter; Biederstedt, Lutz; and Müller, Manfred, 5,086,368, Cl. 361-118.000.
- Ilenert, Horst: See—
Kohlpaintner, Georg; and Bienert, Horst, 5,085,622, Cl. 296-222.000.
- Bildner, Heinz H., to Implementors Overseas Limited. Automatically releasable ski binding unit. 5,085,453, Cl. 280-612.000.
- Billotte, Keith. Vehicle storage tank headboard. 5,085,468, Cl. 280-831.000.
- Binder, Dieter; Rovenszky, Franz; Brunner, Norman; and Ferber, Hubert P., to Chemisch Pharmazeutische Forschungsgesellschaft m.b.H. Sulphamoylthiophenes, a process for their preparation. 5,086,180, Cl. 546-172.000.
- Bio Serax Laboratoires S.A.: See—
Degre, Michel, 5,085,873, Cl. 426-8.000.
- Birchak, James R.: See—
Hail, Harry K.; Birchak, James R.; and Hon, Wai-Leung, 5,086,271, Cl. 324-158.000.
- Birk, Manfred; Fenchel, Reinhard; Müller, Norbert; and Wessel, Wolf, to Robert Bosch GmbH. Error-corrected automatic control system. 5,085,190, Cl. 123-357.000.
- Birkhofer, Herbert, to Windmoller & Holscher. Apparatus for stacking flat articles. 5,085,111, Cl. 83-91.000.
- Birkmann, Josef: See—
Scholtysik, Bernd; and Birkmann, Josef, 5,085,110, Cl. 83-34.000.
- BIS BV: See—
Bruinsma, Robert F. W., 5,086,194, Cl. 174-48.000.
- Bissonnette, Laurent C.: See—
Berlam, Gary R.; Bissonnette, Laurent C.; Bitsakis, Nicholas; Bodycoat, Peter R.; and Duarte, George M., 5,085,122, Cl. 89-1.810.
- Bitsakis, Nicholas: See—
Berlam, Gary R.; Bissonnette, Laurent C.; Bitsakis, Nicholas; Bodycoat, Peter R.; and Duarte, George M., 5,085,122, Cl. 89-1.810.
- Bittel, John A., Sr. Swimming pool ladder guard. 5,084,919, Cl. 4-496.000.
- Bjorkquist, David W., to Procter & Gamble Company, The. Temporary wet strength resins and paper products containing same. 5,085,736, Cl. 162-168.200.
- Bjornson, Geir; and Stark, Joel J., to Phillips Petroleum Company. Gamma-butyrolactone production catalyst. 5,086,030, Cl. 502-241.000.
- Black & Decker, Inc.: See—
Cuneo, Giuseppe L., 5,086,491, Cl. 388-811.000.
- Hess, Kristoffer A.; Dyke, Colin; and Shaver, David M., 5,085,043, Cl. 56-10.500.
- Lessig, William R., III; Bailey, Rouse R., Jr.; and Cochran, John R., 5,084,934, Cl. 15-325.000.
- Black, Gregg T., to Chrysler Corporation. Integral engine oil pump and pressure regulator. 5,085,187, Cl. 123-196.000.
- Blaisdell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Compact discharge lamp unit and method for manufacturing same. 5,086,249, Cl. 313-318.000.
- Blake, Mott J.: See—
Hinze, Jay W.; Lawson, Richard D.; and Blake, Mott J., 5,085,679, Cl. 65-1.000.
- Blanton, John C.: See—
Kutschenreuter, Paul H., Jr.; and Blanton, John C., 5,085,048, Cl. 60-270.100.
- Blazej, Daniel C.: See—
Zupancic, Joseph J.; Blazej, Daniel C.; and Fraenkel, Howard A., 5,085,886, Cl. 427-43.100.
- Blesener, James L., to TSI Incorporated. Non-imaging laser particle counter. 5,085,500, Cl. 356-338.000.
- Blickstein, Martin: See—
Beckman, John B.; and Blickstein, Martin, 5,085,368, Cl. 236-49.300.
- Bliven, A. Bruce: See—
Russell, Michael T.; and Bliven, A. Bruce, 5,085,326, Cl. 211-4.000.
- Blizzard, John D.; and Swihart, Terence J., to Dow Corning Corporation. Pressure-sensitive composition containing an aminoxysilicon compound. 5,086,103, Cl. 524-188.000.
- Bloch, Jeffrey J.; Roussel-Dupre, Diane; and Smith, Barham W., to United States of America, Energy. Background-reducing X-ray multilayer mirror. 5,086,443, Cl. 378-145.000.
- Bloom, Leonard: See—
Cohen, Todd J., 5,085,213, Cl. 128-419.000.
- Blume, Ingo; Peinemann, Klaus-Viktor; Pinnau, Ingo; and Wijmans, Johannes G., to Membrane Technology & Research, Inc. Composite membranes for fluid separations. 5,085,776, Cl. 210-500.270.
- Blusseau, Eric, to Valeo Vision. Motor vehicle headlight having a reflector of complex surface shape with modified intermediate zones. 5,086,376, Cl. 362-61.000.
- Blytas, George C.: See—
Hale, Arthur H.; and Blytas, George C., 5,085,282, Cl. 175-40.000.
- Board of Regents, The University of Texas System: See—
De Villez, Richard L., 5,086,075, Cl. 514-714.000.
- Board of Regents, University of Nebraska: See—
Clements, Luther D., Jr.; and Holmes, Carlton S., 5,085,175, Cl. 119-171.000.
- Board of Trustees operating Michigan State University: See—
Safir, Gene R.; Nair, Muraliedharan G.; and Siqueira, Jose O., 5,085,682, Cl. 71-88.000.
- Bodycoat, Peter R.: See—
Berlam, Gary R.; Bissonnette, Laurent C.; Bitsakis, Nicholas; Bodycoat, Peter R.; and Duarte, George M., 5,085,122, Cl. 89-1.810.
- Boeing Company, The: See—
Capps, C. David, 5,086,483, Cl. 382-31.000.
- Jayarajan, Jay A., 5,085,921, Cl. 428-204.000.
- Boettcher, Eric R.; and Barker, David R. Apparatus for increasing color and spatial resolutions of a raster graphics system. 5,086,295, Cl. 340-701.000.
- Bogner, Martin; and Peyre, Henri, to Look S.A. Sporting board with two boot bindings. 5,085,455, Cl. 280-618.000.
- Bohen, Joseph M.; and Reifenberg, Gerald H., to Atochem North America, Inc. Polyhaloaromatic ester flame retardants for polyolefin resins. 5,086,098, Cl. 524-94.000.
- Bois, Paul: See—
Rosencher, Emmanuel; Vinter, Borge; and Bois, Paul, 5,086,327, Cl. 357-30.000.
- Boisseau, Patrick: See—
Baccou, Jean-Claude; Bessiere, Jean-Marie; Boisseau, Patrick; Faugeras, Pierre; Jouy, Nicholas; Peyrot, Elysabette; and Sauvage, Yves, 5,085,994, Cl. 435-148.000.
- Bond, Alan: See—
Scott-Scott, John L.; and Bond, Alan, 5,085,041, Cl. 60-244.000.
- Bonfanti, Cesarina: See—
Pedretti, Ugo; Bresci, Bruno; Bonfanti, Cesarina; Magagnini, Pier L.; La Mantia, Francesco P.; and Roggero, Arnaldo, 5,086,160, Cl. 528-291.000.
- Bonfils, Armelle; Smets, Pierre; and Zalisz, Rene, to Uclaf, Roussel. Novel dermatological composition and method. 5,086,040, Cl. 514-8.000.
- Bonne, Ulrich; Tate, George J.; and Schwarz, Edward, to Honeywell Inc. Apparatus and method for detecting leaks in a system for delivering gaseous fuel. 5,085,576, Cl. 431-22.000.
- Bonnes, David R.: See—
Seifert, Charles A.; and Bonnes, David R., 5,085,478, Cl. 294-60.000.
- Bonomi, Giovanni B.; and Oldani, Battistino, to IMTA. Multi-axis tool positioner. 5,084,951, Cl. 29-26.00A.

- Booker, Barbara T., to Du Pont de Nemours, E. I., and Company. Process for desilvering silver halide processing fluids. 5,085,836, Cl. 423-34.000.
- Booth, D. A.: See—
Hazelton, Donald R.; Puydak, Robert C.; and Booth, D. A., 5,086,121, Cl. 525-197.000.
- Borchers, Eric J.: See—
Boyer, Charles E., III; Borchers, Eric J.; Kuo, Richard J.; and Hoyle, Charles D., 5,085,931, Cl. 428-328.000.
- Borden, Inc.: See—
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- Border, Delvin K.: See—
Durgin, Ronald A.; Matheson, Derek S.; Border, Delvin K.; Kenner, Carlton L.; and Hammett, Daniel E., 5,085,366, Cl. 229-1.50B.
- Borghi, Angelo: See—
Lancini, Giancarlo; Borghi, Angelo; Antonini, Piero; and Palumbo, Raffaele, 5,085,990, Cl. 435-71.300.
- Borghi, Italo: See—
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- Borgia, Joseph A.: See—
Gasparri, James A.; Borgia, Joseph A.; Randall, Paul C.; Cote, Edmond H., Jr.; and Caronia, Anthony J., 5,085,188, Cl. 123-196.000.
- Borgman, Fokko P.; Aurik, Erik A.; and Dessing, Jacobus P., to Multinorm B.V. Discharge system for milk and an automatic milking system provided with such a discharge system. 5,085,172, Cl. 119-14.090.
- Boriani, Silvano; and Gamberini, Antonio, to G. D. Societa per Azioni. Machine for wrapping substantially parallelepiped commodities. 5,085,028, Cl. 53-234.000.
- Borland, James E.: See—
Corona, Raymond J.; Borland, James E.; and Smith, Kim R., 5,085,892, Cl. 427-365.000.
- Born, Rainer, to ME/BO/CO Verfahrenstechnik GmbH & Co. KG. Filter for cleaning fluids. 5,085,766, Cl. 210-150.000.
- Borroughs Tool & Equipment Corporation: See—
Stramer, Carl, 5,086,288, Cl. 340-426.000.
- Bortins, John: See—
Amin, Nurul; Bortins, John; Keel, Beat G.; and Yan, Ying D., 5,084,957, Cl. 29-603.000.
- Bortoluzzi, Guido, to Molteni & C. S.p.A. Longitudinally sliding accordion door. 5,085,261, Cl. 160-199.000.
- Bosse, Frank; Lage, Karl-Heinz; and Klose, Rainer, to Windmoller & Holscher. Apparatus for manufacturing oriented multi-ply tapes. 5,085,566, Cl. 425-66.000.
- Boston, Russell E.: See—
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,085,903, Cl. 428-34.600.
- Boston University, Trustees of: See—
DeLuca, Carlo J.; and Roy, Serge H., 5,085,225, Cl. 128-733.000.
- DeLuca, Carlo J.; and Gilmore, L. Donald, 5,085,226, Cl. 128-733.000.
- Bothe, Lothar: See—
Wilhelm, Thomas; Schloegl, Gunter; Bothe, Lothar; and Crass, Gunther, 5,085,916, Cl. 428-156.000.
- Bottger, Dieter: See—
Deussen, Josef; and Bottger, Dieter, 5,085,263, Cl. 164-436.000.
- Botting, Robert J.; and Ledeen, Howard L., to H. L. Ledeen Associates. Low power valve actuator. 5,085,401, Cl. 251-129.110.
- Boukidis, Nicholas A. Fertilizer materials based on metallurgical slags and methods of making the same. 5,085,681, Cl. 71-29.000.
- Bourret, Jean A., to Societe de Construction L.B. Tenderizing device especially for butchery meat. 5,085,614, Cl. 452-141.000.
- Bouwens, Henricus J. J.; and Bertram, Albert R. J., to U.S. Philips Corporation. Device for the transport of carriers from and to a positioning device and selection device for use in such a device. 5,085,553, Cl. 414-331.000.
- Boux, Heather A.: See—
Klein, Michel H.; Boux, Heather A.; Cockle, Stephen A.; Loosmore, Sheena M.; and Zealey, Gavin R., 5,085,862, Cl. 424-92.000.
- Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., to Molex Incorporated. Shielded electrical connector. 5,085,596, Cl. 439-497.000.
- Bowen, James H., to Product Engineering & Manufacturing, Inc. Telephone answering system and apparatus for direct caller selection of a party line extension. 5,086,458, Cl. 379-180.000.
- Bowen, Joanna; Bowers, Roderick J. W.; Purbrick, Malcolm D.; and Wagner, Hans M., to Eastman Kodak Company. Polymerizable composition. 5,086,138, Cl. 526-245.000.
- Bowers-Irons, Gail L. A.; Tran, Quynh K.; and Pryor, Robert J., to Technical Research, Inc. Method, apparatus, and reactant for removal of paint and epoxies from metallic beverage containers using microorganisms. 5,085,999, Cl. 435-264.000.
- Bowers, Roderick J. W.: See—
Bowen, Joanna; Bowers, Roderick J. W.; Purbrick, Malcolm D.; and Wagner, Hans M., 5,086,138, Cl. 526-245.000.
- Bowes, Emmerson: See—
Abisil, Robert P. L.; Bowes, Emmerson; Green, Gary J.; Marler, David O.; Shihabi, David S.; and Socha, Richard F., 5,085,762, Cl. 208-120.000.
- Boyd, James P. Intraoral discluser device and method. 5,085,584, Cl. 433-6.000.
- Boyd, Michael E.: See—
Kasai, Ichiro; Wallach, Richard M.; Baumgratz, Bonnie A.; and Boyd, Michael E., 5,086,328, Cl. 357-30.000.
- Boyden, Willis G. Skate cushioning device. 5,085,445, Cl. 280-11.220.
- Boyer, Bradley P.: See—
Mauck, John C.; and Boyer, Bradley P., 5,085,986, Cl. 435-7.360.
- Boyer, Charles E., III; Borchers, Eric J.; Kuo, Richard J.; and Hoyle, Charles D., to Minnesota Mining and Manufacturing Company. Microwave absorber employing acicular magnetic metallic filaments. 5,085,931, Cl. 428-328.000.
- Boyle, Michael D. P.; and Reis, Kathleen J., to University of Florida Research Foundation, Inc. Novel type VI bacterial Fc receptors. 5,085,984, Cl. 435-7.200.
- Bozzo, Luigi. Disobstructor dilator device for urinary pathology. 5,085,664, Cl. 606-191.000.
- BP Chemicals (Additives) Limited: See—
Clarke, Michael J., 5,086,115, Cl. 525-164.000.
- Bradford, Peter F.: See—
Bartlett, Peter J.; and Bradford, Peter F., 5,085,198, Cl. 123-510.000.
- Bradford, William M.: See—
Kline, Charles E.; Dorinski, Dale W.; and Bradford, William M., 5,086,200, Cl. 200-571.000.
- Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflog, Hans; and Kramer, Wolfgang, to Bayer Aktiengesellschaft. Mixture of fungicidal agents. 5,086,048, Cl. 514-187.000.
- Branson Ultrasonics Corporation: See—
Baldwin, Ronald S., 5,085,238, Cl. 134-105.000.
- Brasch, William R., to LeaRonald, Inc. Electroplated gold-copper-zinc alloys. 5,085,744, Cl. 205-148.000.
- Braymer, Thomas A.: See—
Armor, John N.; Braymer, Thomas A.; Farris, Thomas S.; and Gaffney, Thomas R., 5,086,033, Cl. 502-432.000.
- Breece, Robert O.: See—
Ascoli, Vito S.; and Breece, Robert O., 5,085,013, Cl. 51-277.000.
- Breitenstein, George T. Bag holder. 5,085,385, Cl. 248-99.000.
- Bresci, Bruno: See—
Pedretti, Ugo; Bresci, Bruno; Bonfanti, Cesarina; Magagnini, Pier L.; La Mantia, Francesco P.; and Roggero, Arnaldo, 5,086,160, Cl. 528-291.000.
- Brewer, Earl G.: See—
Fuerst, Carlton D.; and Brewer, Earl G., 5,085,716, Cl. 148-301.000.
- Bridgestone Corporation: See—
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 5,085,721, Cl. 156-108.000.
- Briece, Serge: See—
Duchoud, Christian; and Briece, Serge, 5,084,984, Cl. 34-48.000.
- Brinkerhoff, Susan M.: See—
Baron, Kenneth S.; Brinkerhoff, Susan M.; Lee, Frank W.; and McKinney, Stella M., 5,086,149, Cl. 528-45.000.
- Brinkley, William J., III. Method of and apparatus for generating and injecting hydrogen into an engine. 5,085,176, Cl. 123-3.000.
- Brinson, Edward P.: See—
Evans, Alfred J.; Whittlesey, Thomas; May, Dennis J.; Chen, Grant K.; and Brinson, Edward P., 5,085,036, Cl. 53-550.000.
- Briscoe, Terry L., to ESCO Corporation. Dragline bucket and method of operating the same. 5,084,990, Cl. 37-116.000.
- Bristol-Myers Company: See—
Vyas, Dolatrai M.; and Skonezny, Paul M., 5,086,182, Cl. 548-110.000.
- Bristol-Myers Squibb Company: See—
Golik, Jerzy; Beutler, John; Clark, Pat; Ross, John; Roach, John; Muschik, Gary; and Leberer, William B., III, 5,086,045, Cl. 514-61.000.
- British Aerospace Public Limited Company: See—
Barton, Arthur E. M., 5,085,380, Cl. 244-3.210.
- British Nuclear Fuels plc: See—
Higson, Alan, 5,085,314, Cl. 198-755.000.
- British Petroleum Company, p.l.c.: See—
Hopper, Hans P., 5,085,277, Cl. 166-341.000.
- British Telecommunications public limited company: See—
Ballance, John W., 5,086,470, Cl. 380-48.000.
- Sexton, Graham G., 5,086,480, Cl. 382-18.000.
- Brockmanns, Karl-Josef; Bruns, Siegfried; and Lembeck, Theo, to W. Schlafhorst AG & Co. Sliver divider having a positionable blade and guide walls. 5,084,941, Cl. 19-151.000.
- Brod, Daniel: See—
Pearce, Scott C.; Perkins, William H.; Brod, Daniel; and Brod, Stan, 5,085,316, Cl. 206-223.000.
- Brod, Stan: See—
Pearce, Scott C.; Perkins, William H.; Brod, Daniel; and Brod, Stan, 5,085,316, Cl. 206-223.000.
- Brodin, Roger; Olliero, Dominique; and Worms, Paul, to Sanofi. Derivatives of 1,3,4-thiadiazole, a method of obtaining them and pharmaceutical compositions containing them. 5,086,053, Cl. 514-236.200.
- Brodsky, Stephen B.; Joshi, Rajiv V.; Lechaton, John S.; Ryan, James G.; and Schepis, Dominic J., to International Business Machines Corporation. Method of making semiconductor device contact including transition metal-compound dopant source. 5,086,016, Cl. 437-190.000.
- Brognyani, Edgar; Stummer, Giseler; Kittel, Franz P.; and Schick, Roland, to Maschinenfabrik Andritz Aktiengesellschaft. Apparatus for the dewatering of a web of cellulosic matter or a web of material for the pasteboard or cardboard production. 5,085,737, Cl. 162-359.000.

Brookbank, Earl B.; and Dinkins, Walter, to Camco, Incorporated. Electro-mechanical cable for cable deployed pumping systems. 5,086,196, Cl. 174-106.00R.

Brooks, Dee W.; Carter, George W.; Basha, Anwer; Gunn, Bruce P.; and Dyer, Richard D., to Abbott Laboratories. Substituted 1,4,5,6-tetrahydro-2H-pyridazin-3-one and -3-thione compounds having lipoxigenase inhibitory activity. 5,086,052, Cl. 514-231.500.

Brosher, Paul L.; LeBeau, David R.; and Shuck, Dallas, to Dana Corporation. Front axle toe-in process and apparatus. 5,084,979, Cl. 33-193.000.

Brother Kogyo Kabushiki Kaisha: See—
Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, 5,086,308, Cl. 346-140.00R.
Yoshida, Hitoshi; Kanegae, Takahiro; and Kawamoto, Naoyuki, 5,086,481, Cl. 382-22.000.

Brothers, Budd R.: See—
Hileman, John, 5,084,944, Cl. 24-453.000.

Brown, Helen G.: See—
Snyder, Harry E.; Wiese, Kurt L.; Sheu, Gueyha; Brown, Helen G.; Nieh, Ciping; and Clark, Patricia K., 5,085,808, Cl. 260-412.400.

Brown, Ronald E.; Rouse, Anthony L.; and Lee, Fu-Ming, to Phillips Petroleum Company. Extractive distillation of low boiling alkene/alkane mixtures. 5,085,741, Cl. 203-53.000.

Brown, Ronald E.: See—
Lee, Fu-Ming; and Brown, Ronald E., 5,085,740, Cl. 203-51.000.

Brown-Wensley, Katherine A.; DeVoe, Robert J.; and Palazzotto, Michael C., to Minnesota Mining and Manufacturing Company. Energy-induced curable compositions. 5,086,086, Cl. 522-25.000.

Bruce, R.; and Mitakidis, Dimitrios, to Domtar Inc. Gypsum board. 5,085,929, Cl. 428-309.900.

Bruinsma, Robert F. W., to Electrak International Ltd.; and BIS BV. Trunking assembly. 5,086,194, Cl. 174-48.000.

Brunke, Udo: See—
Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.

Brunner, Norman: See—
Binder, Dieter; Rovenszky, Franz; Brunner, Norman; and Ferber, Hubert P., 5,086,180, Cl. 546-172.000.

Bruns, Siegfried: See—
Brockmanns, Karl-Josef; Bruns, Siegfried; and Lembeck, Theo, 5,084,941, Cl. 19-151.000.

Brunswick Corporation: See—
Haluzak, William, 5,085,603, Cl. 440-51.000.

Bryer, Jack: See—
Lindstrom, Jan C. R.; Bryer, Jack; and Talarico, Robert J., 5,085,144, Cl. 101-363.000.

BTL Specialty Resins Corp.: See—
Widmann, Marcel; and Hickey, James H., 5,085,930, Cl. 428-323.000.

Bubnash, Terry L., to Automotive Products (USA) Inc. Electric shift apparatus with removable control module. 5,085,106, Cl. 74-866.000.

Buchter, Randolph L.; and Simmons, Randy G., to AMP Incorporated. Reduced insertion force electrical connector. 5,085,601, Cl. 439-660.000.

Buckley, Larry J. Steering wheel cover having a prayer counter mechanism thereon. 5,085,098, Cl. 74-558.000.

Budinger, A. Bowman: See—
Li, Yan M.; Budinger, A. Bowman; Byszewski, Wojciech W.; Gregor, Philip; and Keffe, William M., 5,086,276, Cl. 324-414.000.

Buechele, Franz. Adaptor for windshield wiper arms. 5,084,933, Cl. 15-250.320.

Buell, Kenneth B., to Procter & Gamble Company. The Disposable garment with breathable leg cuffs. 5,085,654, Cl. 604-370.000.

Bugaut, Andre; and Junino, Alex, to L'Oreal. Nitroanilines and hair-dyeing compositions in which they are present. 5,085,666, Cl. 8-408.000.

Buhler, Beat: See—
Schelb, Heinz; Buhler, Beat; and Schneider, Ulf, 5,084,942, Cl. 19-200.000.

Bull S.A.: See—
Neu, Georges, 5,086,240, Cl. 307-465.000.

Bulyanda, Alexandr A.: See—
Nakonechny, Anatoly Y.; Tolymbekov, Manat Z.; Ponomarenko, Alexandr G.; Radchenko, Vladimir N.; Bulyanda, Alexandr A.; Mizin, Vladimir G.; Gizatuln, Gennady Z.; and Vyatkin, Jury F., 5,085,691, Cl. 75-546.000.

Bundberg, Robert D.: See—
Emert, Jacob; and Bundberg, Robert D., 5,085,788, Cl. 252-951.50A.

Bundesen, Peter G.: See—
Hillyard, Carmel J.; Rylatt, Dennis B.; Kemp, Bruce E.; and Bundesen, Peter G., 5,086,002, Cl. 436-540.000.

Bundy, Wayne M.; Manasso, John A.; and Berberich, Joseph P., to Georgia Kaolin Company, Inc. Defined and delaminated kaolin product. 5,085,707, Cl. 106-486.000.

Burke, James E.: See—
Furbee, Avery D.; and Burke, James E., 5,086,449, Cl. 378-200.000.

Burlington Industries, Inc.: See—
Jenkins, William G., 5,085,667, Cl. 8-539.000.

Burndy Corporation: See—
Murray, Thomas C.; and Flynn, Kevin J., 5,084,963, Cl. 29-863.000.

Burns, Jeffrey M., to Texaco Chemical Company. Corrosion-inhibited antifreeze/coolant composition containing cyclohexane acid(s). 5,085,791, Cl. 252-79.000.

Burns, Jeffrey M.; Sanderson, John R.; Larkin, John M.; and McCoy, David R., to Texaco Chemical Company. Corrosion-inhibited antifreeze/coolant composition. 5,085,793, Cl. 252-79.000.

Burns, Matthew M., to SciMed Life Systems, Inc. Balloon catheter with inflation-deflation valve. 5,085,636, Cl. 604-99.000.

Burrow, Kenneth W., Jr., to DowElanco. N-heterocyclic benzamides. 5,086,184, Cl. 548-246.000.

Burroughs Wellcome Co.: See—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 5,086,044, Cl. 514-51.000.

Burrows, Bruce D., to Ebtech, Inc. Water carbonator system. 5,085,810, Cl. 261-140.100.

Busch, Francis R.; and Faulstich, David L., to General Electric Company. Nuclear refueling platform drive system. 5,085,824, Cl. 376-268.000.

Busch-Sorensen, Thomas, to Eskofot A/S. Filter for filtration of fluids. 5,085,772, Cl. 210-388.000.

Buschmann, Hans-Theo: See—
Himmelmann, Wolfgang; Lalvani, Prem; Buschmann, Hans-Theo; and Helling, Gunter, 5,085,981, Cl. 430-536.000.

Bushong, William C.: See—
Pielartzik, Harald; Kohler, Burkhard; Traenckner, Hans-Joachim; Jakob, Wolfgang; and Bushong, William C., 5,086,102, Cl. 524-188.000.

Buttenbender, Klaus: See—
Rutz, Andreas; Langer, Rudolf; Becher, Hubert; Buttenbender, Klaus; and Zeller, Heinz, 5,084,949, Cl. 26-72.000.

Buxbaum, Gunter: See—
Kuske, Peter; and Buxbaum, Gunter, 5,085,706, Cl. 106-456.000.

Buzawa, David M.: See—
Kelsoe, Wayne E.; and Buzawa, David M., 5,085,492, Cl. 385-60.000.

Byszewski, Wojciech W.: See—
Li, Yan M.; Budinger, A. Bowman; Byszewski, Wojciech W.; Gregor, Philip; and Keffe, William M., 5,086,276, Cl. 324-414.000.

C. Itoh Feed Mills: See—
Horikawa, Hiroshi; Fukazawa, Akira; and Hori, Tetsuya, 5,085,871, Cl. 426-2.000.

Cabato, Nellie L.: See—
Wesson, Laurence N.; and Cabato, Nellie L., 5,085,494, Cl. 385-98.000.

Cain, Michael: See—
Austin, Marlin; Cain, Michael; and Haack, Paul J., 5,085,475, Cl. 292-92.000.

California Institute of Technology: See—
Koch, Christof; and Bair, Wyeth, 5,086,219, Cl. 250-208.200.

Callison, Douglas A.: See—
Thieleke, Douglas L.; and Callison, Douglas A., 5,085,404, Cl. 254-28.000.

Camberlin, Yves; and Michaud, Philippe, to Rhone-Poulenc Chimie. Linear aromatic poly(amideimide)s having latent maleimide end-groups. 5,086,154, Cl. 528-73.000.

Camco, Incorporated: See—
Brookbank, Earl B.; and Dinkins, Walter, 5,086,196, Cl. 174-106.00R.

Campbell, Colin G. Petroleum containment barrier for recovering floating petroleum. 5,085,538, Cl. 405-66.000.

Campbell, Timothy J.: See—
Thompson, Christopher M.; Campbell, Timothy J.; Farfaglia, Leonard T.; deceased; Gipson, Billy P.; and Matambo, Thompson, 5,085,057, Cl. 62-262.000.

Campet, Guy: See—
Couput, Jean Paul; and Campet, Guy, 5,086,351, Cl. 359-265.000.

Cangelosi, Philip J.: See—
Hong, Sung W.; and Cangelosi, Philip J., 5,085,942, Cl. 428-492.000.

Cannon, John B.; Hsu, Chung-Chiang; Papp, Karen J.; and Williams, N. Adeyinka, to Abbott Laboratories. Injectable formulation for lipophilic drugs. 5,085,864, Cl. 424-450.000.

Canon Kabushiki Kaisha: See—
Abe, Shintaro; Adachi, Muneco; Okada, Naoyuki; and Shimamura, Yasuhito, 5,086,434, Cl. 375-7.000.
Hiraoka, Mizuho; and Imataki, Hiroyuki, 5,085,925, Cl. 428-215.000.
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,086,310, Cl. 354-75.000.

Katayama, Akihiro; and Oosawa, Hidefumi, 5,086,484, Cl. 382-50.000.

Katayama, Akihiro; Yoshida, Tadashi; Hirabayashi, Yasuji; and Maeda, Mitsuru, 5,086,487, Cl. 382-56.000.

Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, 5,085,423, Cl. 271-266.000.

Noguchi, Hiromichi; Inamoto, Tadayoshi; and Saito, Megumi, 5,086,307, Cl. 346-140.00R.

Oda, Hitoshi; Ono, Takeo; Yoneda, Kou; Sasaki, Toyoshige; and Miyawaki, Mamoru, 5,086,409, Cl. 365-10.000.

Sagara, Seiji, 5,085,422, Cl. 271-162.000.

Saito, Hideo; Kimura, Tadashi; and Kondo, Hiroatsu, 5,085,530, Cl. 400-171.000.

Sata, Junichi, 5,085,420, Cl. 271-114.000.

Shinohara, Mahito; and Yonehara, Takao, 5,086,326, Cl. 357-30.000.

Takeda, Atsushi; and Hasegawa, Takashi, 5,086,318, Cl. 355-271.000.

Takei, Masahiro; Kashida, Motokazu; Takahashi, Koji; Nagasawa, Kenichi; Masui, Toshiyuki; and Fukatsu, Tsutomu, 5,086,358, Cl. 360-60.000.

Terasawa, Koji, 5,086,305, Cl. 346-1.100.

Usui, Fumiaki, 5,086,338, Cl. 358-41.000.

Yagyu, Mineto, 5,086,218, Cl. 250-208.100.

Yamada, Masanori, 5,086,486, Cl. 382-53.000.

Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 5,085,355, Cl. 222-564.000.

Cantor, Barry I.; Flora, John H.; and Latimer, Paul J., to Babcock & Wilcox Company. The Apparatus and method of discriminating flaw depths in the inspection of tubular products. 5,085,082, Cl. 73-622.000.

Capdevila, Juan, to Capdevila, Juan. Keys and related magnetic locks to control accesses. 5,085,062, Cl. 70-276.000.

Capek, Raymond G.; Greiner, Siegfried M.; and Hutton, Robert F., to Zenith Electronics Corporation. Tension mask CRT front assembly with reduced strain-induced defects. 5,086,251, Cl. 313-407.000.

Capisir, Thomas; Connor, David T.; and Sircar, Jagadish C., to Warner-Lambert Company. 3,5-di-tertiary-butyl-4-hydroxyphenyl thiazolyl, oxazolyl, and imidazolyl methanones and related compounds as antiinflammatory agents. 5,086,064, Cl. 514-365.000.

Capps, C. David, to Boeing Company. The Optical processor including electronic processing array. 5,086,483, Cl. 382-31.000.

Capscan Sales Incorporated: See—
Stapleton, Charles E.; and Numata, Jerald T., 5,085,077, Cl. 73-290.00V.

Carbaugh, Donna. Drinking cup apparatus. 5,085,335, Cl. 220-709.000.

Carbone Industries: See—
Wautelet, Yves P.; and Manin, Charles, 5,085,295, Cl. 188-73.200.

Cardiac Pacemakers, Inc.: See—
Heil, Ronald W., Jr.; Wickham, Robert W., Jr.; and Kubitschek, Edward D., 5,085,218, Cl. 128-642.000.

Carl Freudenberg, Firma: See—
Freudenberg, Tillman; and Freudenberg, Ulrich, 5,085,413, Cl. 267-140.10A.

Carlblom, Leland H.: See—
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,085,903, Cl. 428-34.600.

Carlisle, George, deceased: See—
Larkin, John; and Carlisle, George, deceased, 5,085,383, Cl. 244-121.000.

Carlisle, Ida Maude, legal representative: See—
Larkin, John; and Carlisle, George, deceased, 5,085,383, Cl. 244-121.000.

Carolan, Kevin M., to Xerox Corporation. Multiple servo system for compensation of document mis-registration. 5,086,319, Cl. 355-317.000.

Caronia, Anthony J.: See—
Gasparri, James A.; Borgia, Joseph A.; Randall, Paul C.; Cote, Edmond H., Jr.; and Caronia, Anthony J., 5,085,188, Cl. 123-196.00R.

Carpenter, Michael W.: See—
Martin, Lawrence L.; Storer, Jonathan; and Carpenter, Michael W., 5,085,671, Cl. 51-293.000.

Carr, Clyde E.; Holcomb, Orla L., Jr.; and Rodino, Louis S., to Allied-Signal Inc. Mechanically actuated brake with automatic adjustment. 5,085,296, Cl. 188-79.550.

Carrier Corporation: See—
Barito, Thomas R., 5,085,565, Cl. 418-55.400.

Carsner, George E.; and McMillin, John V., to National Computer Systems, Inc. Method and apparatus for discriminating or locating bar codes for an optical mark reader. 5,086,215, Cl. 235-462.000.

Carstens, Ronald. Corrugated cardboard boxes with increased compression strength. 5,085,367, Cl. 229-3.50R.

Carter, Charles G.; Lee, David L.; Michael, William J.; and Kraatz, Gary W., to ICI Americas Inc. Certain 2-(2-chloro-3-alkoxy-4-substituted benzoyl)-5-methyl-5-1,3-cyclohexanediones as herbicides. 5,085,688, Cl. 71-103.000.

Carter, George W.: See—
Brooks, Dee W.; Carter, George W.; Basha, Anwer; Gunn, Bruce P.; and Dyer, Richard D., 5,086,052, Cl. 514-231.500.

Case Corporation: See—
Matousek, Robert A.; and Ricketts, Jon E., 5,085,616, Cl. 460-10.000.

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- Clark, Pat: See—
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- Courtesy Enterprises, Incorporated: See—
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- Cragg, Andrew H. Valved-tip angiographic catheter. 5,085,635, Cl. 604-96.000.
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- Dahlheimer, Mary L. Worksheet and support frame apparatus. 5,084,993, Cl. 40-547.000.
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- Dambach, Philip J.: See—
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,085,596, Cl. 439-497.000.
- Damron, Matthew S. Automotive blade-to-ferrule fuse adapter. 5,085,600, Cl. 439-621.000.
- Dana Corporation: See—
Brosher, Paul L.; LeBeau, David R.; and Shuck, Dallas, 5,084,979, Cl. 33-193.000.
- Danfoss A/S: See—
Klausen, Jorm H.; and Froslev, Peter, 5,085,769, Cl. 210-232.000.
- Petersen, Hans C., 5,085,400, Cl. 251-129.060.
- Dangschaft, Manfred: See—
Geist, Michael; Cibura, Klaus; Jouck, Walter; Ott, Gunther; Sadlowski, Jurgen; Dangschaft, Manfred; and Reimann, Manfred, 5,086,090, Cl. 523-414.000.
- Dangschat, Rainer: See—
Feldtkeller, Martin; and Dangschat, Rainer, 5,086,382, Cl. 363-21.000.
- Daniel Industries, Inc.: See—
Kendrick, Ray, 5,085,250, Cl. 138-44.000.
- Danley, William J.: See—
Bartosiak, George; Paris, Sam; Kresch, Jeffrey M.; Danley, William J.; Kalley, Eugene F.; and Goldberg, Arthur E., 5,085,525, Cl. 374-124.000.
- Danova, Cesare M., to BHT Holdings Limited. Combined soft sculpture and blanket. 5,084,930, Cl. 5-502.000.

Danowski, Daniel R., to Allied-Signal Inc. Anti-static fuel filter. 5,085,773, Cl. 210-446.000.

Danzaki, Tsutomu; Iwaka, Toshio; Yamaguchi, Yuichi; and Tsukahara, Akihiko, to Jidosha Denki Kogyo K.K. Car-speed control system. 5,085,286, Cl. 180-179.000.

Dauphin, Yves, to Solvay & Cie (Societe Anonyme). Device for recovering, by melting, the metal constituting a fusible core. 5,085,569, Cl. 425-174.80R.

Davidson Texttron Inc.: See—
Turgeon, Michael; and Kielinen, Jeffrey, 5,085,568, Cl. 425-125.000.

Davis-Lynch, Inc.: See—
Coone, Malcolm G., 5,085,273, Cl. 166-242.000.

Dayco Products, Inc.: See—
Beck, Harold D., 5,085,905, Cl. 428-35.900.

Deak, Gedeon I.; and Jackson, Scott C., to Du Pont de Nemours, E. I., and Company. Barrier materials useful for packaging. 5,085,904, Cl. 428-35.700.

Deam, Rowan T. Monitoring of arc welding by analyzing modulation of radiation from carrier signals superimposed on weld current. 5,086,207, Cl. 219-130.010.

DeBernardis, John F.; Zelle, Robert E.; and Basha, Fatima Z., to Abbott Laboratories. 1-aminomethyl-1,2,3,4-tetrahydronaphthalenes. 5,086,074, Cl. 514-649.000.

DeCanio, Paul J. Flat file hooded gas lighter fastening device. 5,084,943, Cl. 24-3.00L.

Declerck, Claude: See—
Lecloux, Andre; Declerck, Claude; and Legrand, Franz, 5,086,189, Cl. 549-531.000.

DeCosta, Sandra D. Portable solar tanning box. 5,085,212, Cl. 128-372.000.

Deere & Company: See—
Koltoski, Sarkis A., 5,085,557, Cl. 414-778.000.

Degre, Michel, to Bio Serac Laboratoires S.A. Process for the treatment of a non-liquid food product for assuring its microbial decontamination. 5,085,873, Cl. 426-8.000.

Degussa Aktiengesellschaft: See—
Deller, Klaus; Forster, Martin; and Krause, Helmfried, 5,086,031, Cl. 502-251.000.

DeHart, Larry, Sr., to Dometic Corporation, The. Step stall prevention for vehicle steps. 5,085,450, Cl. 280-166.000.

Dehnen, Bengt L. A., to Trelleborg, AB. Screen for processing conveyed gases. 5,085,324, Cl. 209-399.000.

Delaware Capital Formation, Inc.: See—
Evans, Alfred J.; Whittlesey, Thomas; May, Dennis J.; Chen, Grant K.; and Brinson, Edward P., 5,085,036, Cl. 53-550.000.

Delay, Francois: See—
Naef, Ferdinand; Delay, Francois; and Uijtewaal, Arnoldus, 5,086,038, Cl. 512-21.000.

Deller, Klaus; Forster, Martin; and Krause, Helmfried, to Degussa Aktiengesellschaft. Pressed parts based on pyrogenically produced silicon dioxide, method of their production and their use. 5,086,031, Cl. 502-251.000.

DeLuca, Carlo J.; and Roy, Serge H., to Boston University, Trustees of. Electrode matrix for monitoring back muscles. 5,085,225, Cl. 128-733.000.

DeLuca, Carlo J.; and Gilmore, L. Donald, to Boston University, Trustees of. Force monitoring apparatus for back muscles. 5,085,226, Cl. 128-733.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., to Wisconsin Alumni Research Foundation. Intermediates for the synthesis of 19-nor vitamin D compounds. 5,086,191, Cl. 552-653.000.

DeLuca, Michael J.; and Rivas, Mario A., to Motorola, Inc. Computing system with selective operating voltage and bus speed. 5,086,501, Cl. 395-550.000.

Den Norske Stats Oljeselskap A.S.: See—
Gausland, Ingebrigt, 5,086,339, Cl. 358-81.000.

Denison, John F.; Czerlanis, John A.; and Sitzema, Ronald L., to Intermatic Incorporated. Low voltage outdoor floodlight having adjustable beam pattern, ball and socket mounting, and novel cable handling. 5,086,379, Cl. 362-145.000.

Densetsu Corp.: See—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshio, Hitoshi; and Norigoe, Isami, 5,086,381, Cl. 363-16.000.

DeRoss, Robert W.; Dudek, Ronald; and Stanhbel, Dennis, to Molex Incorporated. Method for facilitating removal of insulation from wires. 5,085,114, Cl. 83-861.000.

Deschamps, Jacques: See—
Gay, Michel; Deschamps, Jacques; and Salavin, Serge, 5,086,257, Cl. 315-169.400.

DesForges, Paul; and Prutz, Michael, to Scantron Corporation. Scannable form and system. 5,085,587, Cl. 434-355.000.

Dessing, Jacobus P.: See—
Borgman, Fokko P.; Aurik, Erik A.; and Dessing, Jacobus P., 5,085,172, Cl. 119-14.090.

Detterman, Robert E.: See—
Lawson, Dennis L.; and Detterman, Robert E., 5,086,122, Cl. 525-235.000.

Deussen, Josef; and Bottger, Dieter, to SMS Schloemann-Siemag Aktiengesellschaft. Continuous casting mold. 5,085,263, Cl. 164-436.000.

Deutsch Automobilgesellschaft: See—
Imhof, Otwin; and Kistrup, Holger, 5,085,956, Cl. 429-211.000.

Deutsche Airbus Gesellschaft mit beschränkter Haftung: See—
Finkenbeiner, Robert, 5,085,382, Cl. 244-118.100.

Deutsche Airbus GmbH: See—
Hararat-Tehrani, Mohammad, 5,085,017, Cl. 52-1.000.

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Imhof, Otwin, 5,085,254, Cl. 141-1.100.

Devic, Michel, to Atochem. Process for the preparation of bleached vegetable pulps. 5,085,880, Cl. 426-253.000.

De Villez, Richard L., to Board of Regents, The University of Texas System. Therapeutic compositions containing benzoyl peroxide. 5,086,075, Cl. 514-714.000.

DeVoe, Robert J.: See—
Brown-Wensley, Katherine A.; DeVoe, Robert J.; and Palazzotto, Michael C., 5,086,086, Cl. 522-25.000.

Dewar, John U.: See—
Elsby, John; Dewar, John U.; Greathead, Andrew; and Sanfead, Brian T., 5,085,285, Cl. 175-325.000.

DewEze Manufacturing, Inc.: See—
Lansdowne, David L., 5,085,042, Cl. 56-6.000.

Dhein, Rolf: See—
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; Dhein, Rolf; Meier, Erich; and Muller, Gerold, 5,086,157, Cl. 528-171.000.

Dial, Darrel D. Apparatus for lubricating railroad vehicle wheel flanges. 5,085,292, Cl. 184-3.200.

Diamant Boart Stratabit: See—
Skopec, Robert A.; Jeffers, Douglas E.; and Hagins, Freddy W., 5,084,980, Cl. 33-286.000.

Dick, Ronald E.: See—
Radocy, Robert; and Dick, Ronald E., 5,085,665, Cl. 623-57.000.

Dickinson, Barry L.; El-Hibri, M. J.; and Sauer, Marvin E., to Amoco Corporation. Poly(aryl ether sulfone) compositions comprising poly(phenylene ether sulfone). 5,086,130, Cl. 525-537.000.

Didier-Werke AG: See—
Hintzen, Ullrich, 5,085,344, Cl. 222-590.000.

Diels, Gaston S. M.: See—
Janssens, Frans E.; Sommen, Francois M.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 5,086,056, Cl. 514-253.000.

Dierikx, Petrus A., to R.M.I. Holland B.V. Gate valves. 5,085,403, Cl. 251-327.000.

Diesel Equipment Limited: See—
Hickling, Paul D.; and Belchos, Michael S., 5,085,133, Cl. 454-63.000.

Diesel Kiki Co., Ltd.: See—
Yoshizu, Fumitsugu, 5,085,195, Cl. 123-502.000.

Digital Equipment Corporation: See—
Gupta, Amar; Kaufman, Charles W.; Kempf, Mark F.; and Koning, G. Paul, 5,086,469, Cl. 380-48.000.

Mallory, Michael L., 5,085,935, Cl. 428-336.000.

Perlman, Radia J.; Varghese, George; and Lauck, Anthony G., 5,086,428, Cl. 370-94.100.

Dijkgraaf, Bernardus L. J.: See—
Olthoff, Margaretha; Dijkgraaf, Bernardus L. J.; and Akkerboom, Piet J., 5,085,869, Cl. 424-499.000.

Dills, Steven S.: See—
Pan, Pauline H.; Dills, Steven S.; Lynch, Donald M.; and Kumar, Lori D., 5,085,850, Cl. 424-49.000.

Dinkins, Walter: See—
Brookbank, Earl B.; and Dinkins, Walter, 5,086,196, Cl. 174-106.00R.

Dion, Andrew, to Ralph Wilson Plastics Co. Decorative laminate having core sheet impregnated with vinyl ester resin. 5,085,940, Cl. 428-413.000.

DiPaola, Frank A. Fishing lure and method. 5,084,997, Cl. 43-42.530.

Discko, John J., Jr.: See—
Dragan, William B.; and Discko, John J., Jr., 5,085,249, Cl. 137-879.000.

Dixon, William T. Fishhook with coating of low-friction material. 5,084,998, Cl. 43-43.160.

Djuric, Stevan W.; Haack, Richard A.; and Miyashiro, Julie M., to G. D. Searle & Co. LTB₄ synthesis inhibitors. 5,086,067, Cl. 514-381.000.

D'Luna, Lionel J.; Cook, William A.; and Parulski, Kenneth A., to Eastman Kodak Company. Digital correlated double sampling circuit for sampling the output of an image sensor. 5,086,344, Cl. 358-213.150.

D'Luna, Lionel J.: See—
Cook, William A.; Parulski, Kenneth A.; and D'Luna, Lionel J., 5,086,343, Cl. 358-213.150.

Dr. Gerhard Mann Chem.-Pharm. Fabrik GmbH: See—
Tiburtius, Heinfried, 5,086,061, Cl. 514-309.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: See—
Wurl, Willi, 5,085,485, Cl. 296-204.000.

Dohrer, Gregory L., to Paragon Films, Inc. Stretch film cling enhancement by addition of elastomers. 5,085,927, Cl. 428-220.000.

Doi, Hideaki; and Sakagami, Teruo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Optical material formed by casting polymerization of a phenyl phosphine monomer. 5,086,140, Cl. 526-274.000.

Doi, Masanori, to Olympus Optical Co., Ltd. Focus control apparatus for use with an optical disk for determining whether a focused state has been obtained. 5,086,420, Cl. 369-44.250.

Dolco Packaging Corporation: See—
Congleton, Wayne, 5,085,571, Cl. 425-292.000.

Dollard, Walter J.; Folser, George R.; Pal, Uday B.; and Singhal, Subhash C., to Westinghouse Electric Corp. Solid oxide electrochemical cell fabrication process. 5,085,742, Cl. 205-188.000.

Doman, Michael. Apparatus for the moving of liquid, pasty and/or pourable media. 5,085,512, Cl. 366-219.000.

Domanski, Piotr A.: See—
Aaron, David A.; and Domanski, Piotr A., 5,085,058, Cl. 62-324.600.

Dometic Corporation, The: See—
DeHart, Larry, Sr., 5,085,450, Cl. 280-166.000.

Domtar Inc.: See—
Bruce, R.; and Mitakidis, Dimitrios, 5,085,929, Cl. 428-309.900.

Donnohue, James R.: See—
Harris, Windel L.; and Donnohue, James R., 5,085,738, Cl. 201-11.000.

Doriath, Gerard: See—
Berard, Jean-Daniel M.; Finck, Bernard E.; Doriath, Gerard; and Perut, Christian M., 5,085,717, Cl. 149-19.900.

Dorinski, Dale W.: See—
Kline, Charles E.; Dorinski, Dale W.; and Bradford, William M., 5,086,200, Cl. 200-571.000.

Doss, George: See—
Chen, Shieh-Shung T.; and Doss, George, 5,085,992, Cl. 435-119.000.

Double Containment Systems: See—
Ziu, Christopher G., 5,085,471, Cl. 285-133.100.

Dougherty, John D., to Timken Company, The. Bearing assembly with speed sensor and process for assembling the same. 5,085,519, Cl. 384-448.000.

Douglas, Bruce M.: See—
Holcomb, Grove R.; and Douglas, Bruce M., 5,085,398, Cl. 249-24.000.

Douglas, Jerald L.: See—
Janda, Rudolph W.; Douglas, Jerald L.; and Condon, Edward F., Jr., 5,086,267, Cl. 325-350.000.

Doutrelaigne, Pierre: See—
Lemaire, Marc; Guy, Alain; Foos, Jacques; Chomel, Rodolphe; Doutrelaigne, Pierre; Moutarde, Thierry; Guyon, Vincent; and Le Roy, Henri, 5,085,834, Cl. 423-8.000.

Dow Chemical Company, The: See—
Cipriano, Robert A., 5,085,955, Cl. 429-197.000.

Massingill, John L., Jr., 5,086,094, Cl. 523-414.000.

Quencer, Lisa B., 5,085,670, Cl. 23-302.00R.

Dow Corning Corporation: See—
Blizzard, John D.; and Swihart, Terence J., 5,086,103, Cl. 524-188.000.

Cifuentes, Martin E., 5,085,694, Cl. 106-3.000.

Halloran, Daniel J.; and Vincent, Judith M., 5,085,858, Cl. 424-71.000.

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Mahone, Louis G., 5,086,126, Cl. 525-474.000.

Weiss, Keith D.; and Frye, Cecil L., 5,085,893, Cl. 427-387.000.

Dow Corning S.A.: See—
Pascucci, Carlo; and Wolf, Andreas T. F., 5,085,894, Cl. 427-387.000.

Dow Corning Toray Silicone Company, Ltd.: See—
Wakita, Haruki; Shimizu, Koji; and Hamada, Mitsuo, 5,085,803, Cl. 525-511.000.

DowElanco: See—
Burrow, Kenneth W., Jr., 5,086,184, Cl. 548-246.000.

Doxey, Andre G.; and Hradisky, John L., to Rubbermaid Incorporated. System for locking a waste receptacle. 5,085,340, Cl. 220-298.000.

Drackett Company, The: See—
Pearce, Scott C.; Perkins, William H.; Brod, Daniel; and Brod, Stan, 5,085,316, Cl. 206-223.000.

Dragan, William B.; and Discko, John J., Jr., to Centrix, Inc. Valve for a vascular dilating device. 5,085,249, Cl. 137-879.000.

DrM, Dr. Muller AG: See—
Muller, Hans, 5,085,997, Cl. 435-261.000.

Druliner, Joe D.; and Fryd, Michael, to Du Pont de Nemours, E. I., and Company. Polymerization of selected vinyl monomers. 5,086,137, Cl. 526-208.000.

Drutel, Yves; and Ranc, Denis, to Renault Vehicules Industriels. Detection process and device for an electronic injection system of a multi-cylinder engine. 5,085,072, Cl. 73-119.00A.

Du Pont Merck Pharmaceutical Company: See—
Ardecky, Robert J.; Patten, Arthur D.; and Sun, Jung-Hui, 5,086,059, Cl. 514-284.000.

Ciganek, Engelbert; and Cook, Leonard, 5,086,063, Cl. 514-326.000.

Duarte, George M.: See—
Berlam, Gary R.; Bissonnette, Laurent C.; Bitsakis, Nicholas; Bodycoat, Peter R.; and Duarte, George M., 5,085,122, Cl. 89-1.810.

Dubois & Depraz S.A.: See—
Dubois, Gerald; and Berthoud, Francois, 5,086,416, Cl. 368-18.000.

Dubois, Gerald; and Berthoud, Francois, to Dubois & Depraz S.A. Display module for watch movement. 5,086,416, Cl. 368-18.000.

Duchoud, Christian; and Brice, Serge, to Yves Saint Laurent Parfums. Nail-dryer. 5,084,984, Cl. 34-48.000.

Dudek, Ronald: See—
DeRoss, Robert W.; Dudek, Ronald; and Stanhbel, Dennis, 5,085,114, Cl. 83-861.000.

Duello, Charles L., to Bell Helicopter Textron Inc. Gear shrouding system. 5,085,100, Cl. 74-606.00R.

Duffy, Clifford D. Insulation supporting means for metal buildings. 5,085,023, Cl. 52-410.000.

Dufresne, Pierre; Kessler, Henri; and Guth, Jean-Louis, to Institut Francais du Pétrole. Catalyst and its use for a catalytic dewaxing process. 5,085,763, Cl. 208-120.000.

Dugan, Larry M., to Golden Technologies Company, Inc. Joint system. 5,085,129, Cl. 92-84.000.

Duncan Instrument Company: See—
Harker, Alan R., 5,085,759, Cl. 204-408.000.

Dunlana Pty. Limited: See—
Anderson-McKay, Janet E.; and Liepa, Andris J., 5,086,187, Cl. 549-9.000.

Dunn, Richard L.: See—
Cowsar, Donald R.; Dunn, Richard L.; and Laughlin, Thomas J., 5,085,866, Cl. 424-481.000.

Dunphy, Patrick J.; Meyers, Alan J.; and Rigg, Richard T., to Elizabeth Arden Co., division of Conopco, Inc. Cosmetic water-in-oil emulsion lipstick comprising a phospholipid and glycerol fatty acid esters emulsifying system. 5,085,856, Cl. 424-64.000.

Du Pont de Nemours, E. I., and Company: See—
Adcock, David F., 5,085,015, Cl. 51-319.000.

Arthur, Samuel D., 5,085,777, Cl. 210-500.380.

Booker, Barbara T., 5,085,836, Cl. 423-34.000.

Chao, Tze; and Senkler, George H., Jr., 5,085,837, Cl. 423-82.000.

Deak, Gedeon I.; and Jackson, Scott C., 5,085,904, Cl. 428-35.700.

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Ekiner, Okan M.; Hayes, Richard A.; and Manos, Phillip, 5,085,676, Cl. 55-158.000.

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Fisher, Edwin W.; Schreiber, Christopher; and Walker, Douglas R., 5,086,445, Cl. 378-165.000.

Gibson, Joseph W., Jr.; Bart, Anthony J.; Verblar, Robert J.; and Sebastian, S. Andries R. D., 5,085,976, Cl. 430-306.000.

Hornsby, James C., 5,086,108, Cl. 524-440.000.

Jones, David C.; and Lee, Chi-Chang, 5,085,817, Cl. 264-175.000.

Kamins, Kathryn A.; and Statz, Robert J., 5,086,113, Cl. 525-84.000.

Kosinski, Leonard E. R., 5,086,096, Cl. 524-36.000.

Krueger, William H., 5,085,928, Cl. 428-287.000.

Ma, Sheau-Hwa; Matrick, Howard; Shor, Arthur C.; and Spinelli, Harry J., 5,085,698, Cl. 106-20.000.

McCord, Elizabeth F., 5,085,816, Cl. 264-171.000.

Mikeska, Kurt R.; Schaefer, Daniel T.; and Jensen, Richard H., 5,085,720, Cl. 156-89.000.

Mouissie, Bob, 5,086,284, Cl. 335-205.000.

Sasaki, Kyoichi; and Swanson, Donald K., 5,086,021, Cl. 501-137.000.

Wang, Ying, 5,086,239, Cl. 359-328.000.

Xiao, Han X.; and Yang, Shi, 5,086,110, Cl. 524-840.000.

Duracraft Corporation: See—
Wang, Jui-Shang, 5,086,494, Cl. 392-405.000.

Durgin, Ronald A.; Matheson, Derek S.; Border, Delvin K.; Kennet, Carlton L.; and Hammett, Daniel E., to Sweetheart Cup Company. High gloss paper cup. 5,085,366, Cl. 229-1.50B.

Durkopp Adler A.G.: See—
Goldbeck, Heinz; and Meyer, Werner, 5,085,158, Cl. 112-114.000.

Duroda, Shigetaka; Igarashi, Hisashi; Kano, Hidekazu; and Suzuki, Takeshi, to Honda Giken Kogyo K.K. Method of detecting abnormality in an evaporative fuel-purging system for internal combustion engines. 5,085,194, Cl. 123-479.000.

Dutt, Herbert V.; Mengue, Gary L.; and Royal, Stephen F., to Continental Plastics, Inc. Tamper evident container overcap molded in straight draw mold. 5,085,333, Cl. 215-250.000.

Duurk Opp Adler Aktiengesellschaft: See—
Jung, Detlef; Riss, Gerhard; and Niehaus, Heinz, 5,085,157, Cl. 112-68.000.

Dyer, Richard D.: See—
Brooks, Dee W.; Carter, George W.; Basha, Anwer; Gunn, Bruce P.; and Dyer, Richard D., 5,086,052, Cl. 514-231.500.

Dyke, Colin: See—
Hess, Kristoffer A.; Dyke, Colin; and Shaver, David M., 5,085,043, Cl. 56-10.500.

Dykema, Owen W., to TransAlta Resources Investment Corporation. Combustion process. 5,085,156, Cl. 110-347.000.

Dymond, James H.; Saidi, Nick N.; and Young, John M., to General Electric Canada Inc. Salient pole rotor for a dynamoelectric machine. 5,086,246, Cl. 310-269.000.

Dynatech Corporation: See—
Stafford, David A.; Johnson, Ian R.; and Goodfield, Clive, 5,086,233, Cl. 250-576.000.

Dynic Corporation: See—
Fujita, Noboru; Orisaka, Toru; Haneda, Akira; Miyokawa, Yuuki; and Arikawa, Jun, 5,085,932, Cl. 428-331.000.

E. B. Thomas: See—
Rose, James L., 5,085,016, Cl. 51-129.000.

E.G.O. Elektro-Geräte Blanc u. Fischer: See—
Schreder, Felix, 5,086,211, Cl. 219-451.000.

E. R. Squibb & Sons: See—
Johnsen, Kenneth A.; and Freeman, Frank, 5,085,652, Cl. 604-333.000.

Eastman Kodak Company: See—
Aslam, Muhammad; and Farnand, Thomas J., 5,085,962, Cl. 430-99.000.

Bowen, Joanna; Bowers, Roderick J. W.; Purbrick, Malcolm D.; and Wagner, Hans M., 5,086,138, Cl. 526-245.000.

Cook, William A.; Parulski, Kenneth A.; and D'Luna, Lionel J., 5,086,343, Cl. 358-213.150.

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- Hung, Liang-Sun; and Chatterjee, Dilip K., 5,086,035, Cl. 505-1.000.
- Mauck, John C.; and Boyer, Bradley P., 5,085,986, Cl. 435-7.360.
- Rapkin, Alan E.; and Cockayne, John E., 5,085,418, Cl. 271-3.100.
- Shaw, James D.; and Want, Nicholas, 5,085,832, Cl. 422-63.000.
- Smith, Thomas M., 5,085,907, Cl. 428-40.000.
- Sutton, Richard C.; and Oenick, Marsha B., 5,086,143, Cl. 526-320.000.
- Weaver, Max A.; Pruett, Wayne P.; and Hilbert, Samuel D., 5,086,161, Cl. 528-288.000.
- Womack, Kenneth H.; Kwarta, Brian J.; Outterson, David H.; and Reda, James R., 5,085,502, Cl. 356-376.000.
- Eaton Corporation: See—
- Edler, James P., 5,085,582, Cl. 432-156.000.
- Kelldes, William L.; and St. John, Don K., 5,086,264, Cl. 318-798.000.
- Stretch, Dale A., 5,085,617, Cl. 464-27.000.
- Torrence, Robert J., 5,085,267, Cl. 165-2.000.
- Ebato, Kazuo; and Tamura, Keiji, to Nippon Yakin Kogyo Co., Ltd. Rare earth metal-series alloys for storage of hydrogen, 5,085,944, Cl. 428-570.000.
- Ebenhoech, Franz L.; and Schlegel, Reinhold, to BASF Aktiengesellschaft. Preparation of iron whiskers, 5,085,690, Cl. 75-362.000.
- Eberhardt, H. Alfred. Oil separator, 5,085,770, Cl. 210-242.300.
- Eberlein, Delvin D., to Cray Research Inc. Chip carrier, 5,086,334, Cl. 357-70.000.
- Ebisuya, Noritsugu: See—
- Minayoshi, Shiro; Saitoh, Naofumi; Higashi, Toshio; and Ebisuya, Noritsugu, 5,085,800, Cl. 525-309.000.
- Ebtech, Inc.: See—
- Burrows, Bruce D., 5,085,810, Cl. 261-140.100.
- Eck, David A., to Xerox Corporation. Variable rate welding of thermoplastic belts, 5,085,719, Cl. 156-73.400.
- Eck, Ralf: See—
- Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.
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 Gaffard, Jean-Paul; Ravelet, Robert; Chabassier, Genevieve; and Griffaton, Jacques, 5,085,509, Cl. 356-153.000.
 Grypczynski, Daniel; Jacquier, Paul; and Guglielmo, Andre, 5,086,201, Cl. 219-69.170.
 Francis, M. Triffaux, to Saint-Gobain Vitrage International. Device for the drive of driving rollers of a calender for laminated glazings and calender equipped with this device. 5,085,141, Cl. 100-155.000.
 Franck, Gerhard; and Rumpf, Guenter, to Hartmann & Braun AG. Sampling corrosive fluid. 5,085,087, Cl. 73-864.730.
 Frank, Robert G.: See—
 Bender, John E.; and Frank, Robert G., 5,085,680, Cl. 65-118.000.
 Franke, Joseph W.: See—
 Engel, Robert W.; Franke, Joseph W.; Piyevsky, Alex R.; and Unalp, Enis J., 5,085,610, Cl. 446-175.000.
 Franklin, Ralph; Parr, William J.; Fesman, Gerald; and Jacobs, Barry, to Akzo NV. Dialkyl dicarbonates as blowing agents for polymers. 5,086,083, Cl. 521-129.000.
 Franko, Allan J.: See—
 Raleigh, James A.; Miller, Gerald G.; Franko, Allan J.; and Chapman, J. D., 5,086,068, Cl. 514-398.000.
 Frantz, Ronald L.: See—
 Marks, Allen P.; and Frantz, Ronald L., 5,085,896, Cl. 427-412.100.
 Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: See—
 Theurer, Josef; and Worgotter, Herbert, 5,084,989, Cl. 37-104.000.
 Frass, Werner; Mohr, Dieter; and Rode, Klaus, to Hoechst Aktiengesellschaft. Photopolymerizable mixture, and a recording material produced therefrom. 5,085,974, Cl. 430-284.000.
 Frater, Wayne K.; and Spitzer, Joseph C., to Mardesich Enterprises, Inc. Equipment security apparatus and kit. 5,085,395, Cl. 248-552.000.
 Frauendorf, Beatrix; Suling, Carlhans; Rudolph, Hans; and Korte, Siegfried, to Bayer Aktiengesellschaft. Process for the production of PUH elastomer threads and films resistant to light and exhaust gases and elastomer threads having the required composition. 5,086,150, Cl. 528-49.000.
 Frazer, Glenn D.: See—
 Osterholm, Jewell L.; and Frazer, Glenn D., 5,085,630, Cl. 604-28.000.
 Fredrickson, John: See—
 Engebretson, A. Maynard; and Fredrickson, John, 5,085,628, Cl. 600-25.000.
 Freeman, Frank: See—
 Johnsen, Kenneth A.; and Freeman, Frank, 5,085,652, Cl. 604-333.000.
 Freier, Edward, Jr.; Hays, Gary A.; Jacque, John F.; and Klas, Kenneth H., to Simplicity Manufacturing, Inc. Two-blade mower deck with infinite height adjustment. 5,085,044, Cl. 56-13.500.
 Freitag, Dieter: See—
 Fritsch, Karl-Herbert; Westeppe, Uwe; Nouvertne, Werner; and Freitag, Dieter, 5,086,159, Cl. 528-204.000.
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 Freudenberg, Tillman; and Freudenberg, Ulrich, to Carl Freudenberg, Firma. Rubber mounting. 5,085,413, Cl. 267-140.10A.
 Freudenberg, Ulrich: See—
 Freudenberg, Tillman; and Freudenberg, Ulrich, 5,085,413, Cl. 267-140.10A.
 Frey, Guy, to Alstom International S.A. Physiotherapeutic apparatus provided for producing a magnetic field to be used as a therapeutic means. 5,085,626, Cl. 600-13.000.
 Friedrich, Bruce A.: See—
 Peterson, Leslie D.; and Friedrich, Bruce A., 5,085,412, Cl. 267-64.260.
 Frigerio, Giulio; and Cremonesi, Alessandro, to SGS-Thomson Microelectronics s.r.l. High speed analog-to-digital converter having a plurality of comparison cells which in successive steps determine the four most significant bits of the conversion and then the four least significant bits. 5,086,299, Cl. 341-156.000.
 Fritsch, Karl-Herbert; Westeppe, Uwe; Nouvertne, Werner; and Freitag, Dieter, to Bayer Aktiengesellschaft. Stabilized copolycarbonate from dihydroxy diphenyl cycloalkane. 5,086,159, Cl. 528-204.000.
 Fritzsche, Hans-J.: See—
 Kriebel, Manfred; Grunewald, Gerhard; and Fritzsche, Hans-J., 5,085,675, Cl. 55-44.000.
 Frommelt, Hans-Dieter; and Wierze, Hartmut, to Hoechst Aktiengesellschaft. Process for stabilizing a leuco-dye solution by means of a piperidine derivative. 5,085,669, Cl. 8-568.000.
 Froslev, Peter: See—
 Klausen, Jörn H.; and Froslev, Peter, 5,085,769, Cl. 210-232.000.

Frost, Barry L., to New Venture Gear, Inc. Drag-free strut-type synchronizer. 5,085,303, Cl. 192-53.00F.
 Fryd, Michael: See—
 Drulliner, Joe D.; and Fryd, Michael, 5,086,137, Cl. 526-208.000.
 Frye, Cecil L.: See—
 Weiss, Keith D.; and Frye, Cecil L., 5,085,893, Cl. 427-387.000.
 Fu, Chuen-Cheng, to Ingersoll-Rand Co. Hybrid pneumatic percussion rock drill. 5,085,284, Cl. 175-296.000.
 Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Substituted pyrazoline derivatives. 5,086,183, Cl. 548-110.000.
 Fuehrer, Charles, to Stoffel Seals Corporation. Drum ring seal. 5,085,476, Cl. 292-307.00R.
 Fuerst, Carlton D.; and Brewer, Earl G., to General Motors Corporation. Hot worked rare earth-iron-carbon magnets. 5,085,716, Cl. 148-301.000.
 Fujan, Steven J., to Terex Corporation. Nose cone bearing arrangement. 5,085,520, Cl. 384-203.000.
 Fuji Electric Co., Ltd.: See—
 Kazuyuki, Urabe, 5,085,959, Cl. 430-58.000.
 Saito, Shigemasa; and Fujitaka, Hisashi, 5,084,956, Cl. 29-602.100.
 Ueno, Katunori, 5,086,007, Cl. 437-41.000.
 Fuji Jukogyo Kabushiki Kaisha: See—
 Morikawa, Koji, 5,085,193, Cl. 123-458.000.
 Wako, Kanji; Fukui, Tetsujiro; and Tanaka, Yusuke, 5,085,151, Cl. 105-206.100.
 Fuji Photo Film Co., Ltd.: See—
 Aono, Toshiaki; Nakamura, Koichi; and Shibata, Takeshi, 5,085,980, Cl. 430-531.000.
 Horikawa, Hiroshi; Watanabe, Akira; Koyama, Hiroo; and Mori, Ikuo, 5,086,497, Cl. 395-147.000.
 Kameoka, Kimitaka; Kuwabara, Ken-ichi; Takahashi, Toshiro; Moriuchi, Shigenori; Yagihara, Morio; Inagaki, Yoshio; and Adachi, Keiichi, 5,085,970, Cl. 430-264.000.
 Katagiri, Shingo; and Nishiyama, Shigeru, 5,086,363, Cl. 360-132.000.
 Kato, Mikihiko; Endo, Yasushi; and Kawamata, Toshio, 5,085,911, Cl. 428-65.000.
 Katoh, Kazunobu; and Yagihara, Morio, 5,085,971, Cl. 430-264.000.
 Kojima, Tetsuya, 5,086,228, Cl. 250-327.200.
 Naka, Yoji; and Ohmiya, Akio, 5,086,311, Cl. 354-195.100.
 Nakajima, Nobuyoshi, 5,086,392, Cl. 364-413.220.
 Nakane, Yoshio; Kaneko, Kiyotaka; Miyake, Izumi; Maeda, Yutaka; and Shimaya, Hiroshi, 5,086,345, Cl. 358-335.000.
 Namiki, Tomizo; Suzuki, Tamotsu; and Shinozaki, Fumiaki, 5,085,969, Cl. 430-260.000.
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 Shimura, Kazuo, 5,086,489, Cl. 382-56.000.
 Suzuki, Nobuo; Sakasai, Yutaka; and Kato, Eiichi, 5,085,966, Cl. 430-115.000.
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 Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.
 Usui, Tetuo; Suzuki, Nobuo; Sakasai, Yutaka; and Oh-Ishi, Hisao, 5,085,967, Cl. 430-126.000.
 Watanabe, Izumi; Takamori, Tetsuya; Yokota, Kenji; and Yamaguchi, Takashi, 5,086,231, Cl. 250-557.000.
 Yamagami, Hiroyuki; and Aida, Shunichi, 5,085,979, Cl. 430-505.000.
 Fuji Spinning Co., Ltd.: See—
 Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiro; and Kimura, Tsuguji, 5,085,009, Cl. 51-131.100.
 Fuji Xerox Co., Ltd.: See—
 Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nakada, Kazumi; and Marumo, Terumi, 5,085,960, Cl. 430-58.000.
 Nakamura, Mitsuhide; and Kimura, Shiro, 5,085,732, Cl. 156-656.000.
 Suzuki, Chiaki; Kumashiro, Koichi; Torigoe, Tetsu; Kimura, Takachi; and Aoki, Takayoshi, 5,085,963, Cl. 430-106.600.
 Fujieda, Nobuhiko: See—
 Iwanaga, Naruyuki; Yamaguti, Tosiaki; Fujieda, Nobuhiko; and Tsuzikawa, Yoshihiro, 5,085,752, Cl. 204-243.00R.
 Fujii, Toshihiro: See—
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 Fujiki, Hironao: See—
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 Fujimura, Itaru: See—
 Sato, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, 5,085,459, Cl. 280-707.000.
 Fujinawa, Yukio: See—
 Takahashi, Kozo; and Fujinawa, Yukio, 5,086,415, Cl. 367-125.000.
 Fujioka, Yuji: See—
 Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
 Fujisawa, Tetsuo, to Ricoh Company, Ltd. Image processing apparatus having area designation function. 5,086,346, Cl. 358-453.000.
 Fujita, Noboru; Orisaka, Toru; Haneda, Akira; Miyokawa, Yuukichi; and Arikawa, Jun, to Dynic Corporation. Transparent plastic printing film. 5,085,932, Cl. 428-331.000.

Fujitaka, Hisashi: See—
 Saito, Shigemasa; and Fujitaka, Hisashi, 5,084,956, Cl. 29-602.100.
 Fujitsu Limited: See—
 Motohashi, Kazutoshi; Uehara, Takeshi; and Matsumoto, Takashi, 5,086,424, Cl. 370-58.100.
 Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Shigeyuki, 5,086,471, Cl. 381-36.000.
 Tezuka, Koji; Amemiya, Shigeo; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 5,086,436, Cl. 375-25.000.
 Yanagi, Shigenori, 5,086,419, Cl. 369-32.000.
 Fujiwara, Akiko; and Hoshino, Tatsuo, to Hoffmann-La Roche Inc. Coenzyme-independent L-sorbose dehydrogenase from *Pseudomonas putida*. 5,085,993, Cl. 435-138.000.
 Fujiwara, Hidefumi: See—
 Sugata, Fujio; Ohtake, Masatoshi; and Fujiwara, Hidefumi, 5,086,438, Cl. 375-114.000.
 Fukada, Akio, to Kabushiki Kaisha Toshiba. Master-slave-type control system with stand-by suspending control station. 5,086,384, Cl. 364-187.000.
 Fukatsu, Tsutomu: See—
 Takei, Masahiro; Kashida, Motokazu; Takahashi, Koji; Nagasawa, Kenichi; Masui, Toshiyuki; and Fukatsu, Tsutomu, 5,086,358, Cl. 360-60.000.
 Fukaya, Katsuyoshi: See—
 Iwata, Kouichi; and Fukaya, Katsuyoshi, 5,085,248, Cl. 137-625.480.
 Fukazawa, Akira: See—
 Horikawa, Hiroshi; Fukazawa, Akira; and Hori, Tetsuya, 5,085,871, Cl. 426-2.000.
 Fukuda Denshi Co., Ltd.: See—
 Shimizu, Chuji, 5,085,217, Cl. 128-640.000.
 Fukuda, Makoto: See—
 Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.
 Fukuda, Morinobu; Kamata, Yoshitsugu; and Asahi, Masahiko, to Kao Corporation. Translucent cosmetic emulsion. 5,085,854, Cl. 424-63.000.
 Fukui, Tetsujiro: See—
 Wako, Kanji; Fukui, Tetsujiro; and Tanaka, Yusuke, 5,085,151, Cl. 105-206.100.
 Fukui, Yoshiharu; and Kuroda, Kazuhisa, to Sumitomo Chemical Co., Ltd. Inorganic filler containing polyolefin composition. 5,086,099, Cl. 524-108.000.
 Fukui, Yoshiharu; and Kuroda, Kazuhisa, to Sumitomo Chemical Co., Ltd. Inorganic filler containing polyolefin composition. 5,086,100, Cl. 524-108.000.
 Fukunaga, Yukio: See—
 Sato, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, 5,085,459, Cl. 280-707.000.
 Fukushima, Naoto: See—
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 Fukushima, Toshihiko: See—
 Yanadori, Michio; Fukushima, Toshihiko; and Kunugi, Yoshifumi, 5,085,271, Cl. 165-104.120.
 Fukuyama, James M.; and Lee, Julia L., to General Electric Company. High heat distortion temperature epoxy siloxane/organic epoxy compositions. 5,086,124, Cl. 525-403.000.
 Fukuyama, Kensuke: See—
 Sato, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, 5,085,459, Cl. 280-707.000.
 Fulfillment Systems Inc.: See—
 Peach, John A.; Korba, Paul H.; and Rapp, Kenneth M., 5,085,470, Cl. 283-58.000.
 Funahashi, Norio: See—
 Tsuboi, Toshihide; and Funahashi, Norio, 5,086,413, Cl. 365-230.010.
 Funato, Masatomi: See—
 Kawata, Hideaki; Funato, Masatomi; Umeda, Kiminori; Kawano, Nobuaki; and Honda, Koji, 5,085,964, Cl. 430-106.600.
 Funk, Douglas H. Assembly for cleaning a drain conduit. 5,085,244, Cl. 137-240.000.
 Furbee, Avery D.; and Burke, James E., to Picker International, Inc. Debubbler system for X-ray tubes. 5,086,449, Cl. 378-200.000.
 Furman, Phillip A.: See—
 Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 5,086,044, Cl. 514-51.000.
 Furuhashi, Makoto: See—
 Kutaragi, Ken; Furuhashi, Makoto; Suzuki, Masakazu; and Kageyama, Koji, 5,086,475, Cl. 381-36.000.
 Furukawa Electric Co., Ltd., The: See—
 Murase, Takashi, 5,084,966, Cl. 29-890.043.
 Furukawa, Kenji: See—
 Shimizu, Itsuo; Furukawa, Kenji; and Tanaka, Masami, 5,085,799, Cl. 252-299.660.
 Furuki, Masahiro: See—
 Onoue, Akihiro; Saitoh, Hideki; and Furuki, Masahiro, 5,085,604, Cl. 440-61.000.
 Furuno, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Radio transceiver with transmission level control. 5,086,508, Cl. 455-69.000.

Fuse, Shoji: See—
Saegusa, Noboru; Shimura, Yukihiko; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, 5,086,451, Cl. 379-58.000.

Futrex, Inc.: See—
Rosenthal, Robert D.; Paynter, Lynn N.; and Mackie, Linda H., 5,086,229, Cl. 250-341.000.

G. D. Searle & Co.: See—
Djuric, Stevan W.; Haack, Richard A.; and Miyashiro, Julie M., 5,086,067, Cl. 514-381.000.

G. D. Societa per Azioni: See—
Boriani, Silvano; and Gamberini, Antonio, 5,085,028, Cl. 53-234.000.

Gaddis, Donald L., to Courtesy Enterprises, Incorporated. Extruded truck frame structure. 5,085,025, Cl. 52-732.000.

Gaffard, Jean-Paul; Ravelet, Robert; Chabassier, Genevieve; and Grifaton, Jacques, to Framatome. Apparatus and method for aligning an optical beam. 5,085,509, Cl. 356-153.000.

Gaffney, Thomas R.: See—
Armor, John N.; Braymer, Thomas A.; Farris, Thomas S.; and Gaffney, Thomas R., 5,086,033, Cl. 502-432.000.

Gagnon, Paul L. Water bottle neck clamp. 5,085,477, Cl. 294-28.000.

Galen, Peter M.; Hart, Susan R.; and Saltzstein, William E., to Hewlett-Packard Company. Portable signalling unit for an EKG. 5,085,224, Cl. 128-696.000.

Galileo Electro-Optics Corporation: See—
Horton, Jerry R.; and Tasker, G. William, 5,086,248, Cl. 313-103.0CM.

Galloway, Michael D., to AMP Incorporated. Shielded stackable connector assembly. 5,085,590, Cl. 439-95.000.

Gallup, Darrell L.; and Obando, Manuel E., to Union Oil Company of California. Process for controlling the pH of a brine. 5,085,782, Cl. 210-696.000.

Gallup, Michael G.: See—
McGarity, Ralph C.; Ledbetter, William B., Jr.; McMahan, Steven C.; Gallup, Michael G.; Stanphill, Russell; and Gay, James G., 5,086,407, Cl. 395-800.000.

Gamberini, Antonio: See—
Boriani, Silvano; and Gamberini, Antonio, 5,085,028, Cl. 53-234.000.

Gani, Matthew J.: See—
Nappholz, Tibor A.; Swift, Scott; Hamilton, John R.; and Gani, Matthew J., 5,085,215, Cl. 128-419.0PG.

Gantzer, Charles J., to Sundstrand Corporation. Cavitation resistant hydraulic cylinder block porting faces. 5,085,127, Cl. 91-499.000.

Garanhel, Manuel A. Tube cutter. 5,084,970, Cl. 30-92.000.

Garcia, Felix, Jr.: See—
Williams, Rodney D.; and Garcia, Felix, Jr., 5,085,507, Cl. 356-152.000.

Garcia, Pedro F., to Highland Supply Corporation. Plant cover/wrap system. 5,085,003, Cl. 47-72.000.

Gardaix-Luthereau, Renee: See—
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Naylor, Robert; and Costall, Brenda, 5,086,066, Cl. 514-377.000.

Garland, Charles: See—
Cuneo, Joseph; Garland, Charles; Goldbach, Richard A.; Goldbach, Robert D.; McConnell, Frank E.; and Tornay, Edmund G., 5,085,161, Cl. 114-65.00R.

Garleb, Keith A.; Chmura, James N.; Anloague, Paul S.; Cunningham, Mary B.; and Sertl, David C., to Abbott Laboratories. Blend of dietary fiber for nutritional products. 5,085,883, Cl. 426-590.000.

Garman, Ronald H., to Caterpillar Inc. Door dampening assembly. 5,084,939, Cl. 16-84.000.

Garrett, David W.; and Schweizer, Robert A., to Owens-Corning Fiberglass Corporation. Glass size compositions and glass fibers coated therewith. 5,086,101, Cl. 524-188.000.

Garro, Gene. In-line accumulator with zero backline pressure. 5,085,311, Cl. 198-460.000.

Garza, Cesar M.; Jackson, Ricky A.; and Priebe, Ryan E., to Texas Instruments Incorporated. Uniformity using stagnant silylation. 5,085,729, Cl. 156-628.000.

Gasparri, James A.; Borgia, Joseph A.; Randall, Paul C.; Cote, Edmond H., Jr.; and Caronia, Anthony J., to Allied-Signal Inc. Modular lubrication/filter system. 5,085,188, Cl. 123-196.00R.

Gasser, Oswald: See—
Jochum, Peter; Gasser, Oswald; Zahler, Wolf-Dietrich; Lechner, Gunther; Guggenberger, Rainer; and Ellrich, Klaus, 5,086,148, Cl. 528-15.000.

Gaukel, John J.: See—
Smith, Paul W.; Abbott, Raymond S.; Lorince, Peter C.; Wood, Robert K.; Lichtenberg, Robert R.; and Gaukel, John J., 5,086,360, Cl. 360-103.000.

Gausland, Ingebet, to Den Norske Stats Oljeselskap A.S. Videosystem for determining position of colored areas. 5,086,339, Cl. 358-81.000.

Gay, James G.: See—
McGarity, Ralph C.; Ledbetter, William B., Jr.; McMahan, Steven C.; Gallup, Michael G.; Stanphill, Russell; and Gay, James G., 5,086,407, Cl. 395-800.000.

Gay, Michel; Deschamps, Jacques; and Salavin, Serge, to Thomson-CSF. Plasma panel with increased addressability. 5,086,257, Cl. 315-169.400.

Gaz de France: See—
Nussbaum, Max; and Federspiel, Eric, 5,086,213, Cl. 219-535.000.

Gazzani, Giovanni: See—
Farolfi, Giancarlo; Gazzani, Giovanni; Niada, Riccardo; and Mantovani, Marisa, 5,085,867, Cl. 424-485.000.

Geary, Frederick J., to Robertshaw Controls Company. Hot surface ignition system for a gas furnace, control device therefor and methods of making the same. 5,085,573, Cl. 431-6.000.

Gebhardt, Juergen: See—
Muller, Michael; Pennewiss, Horst; and Gebhardt, Juergen, 5,085,701, Cl. 106-273.100.

Geer, Frederick J. Adjustable spacer for hair clippers. 5,084,973, Cl. 30-133.000.

Geiser, Georg: See—
Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.

Geist, Michael; Cibura, Klaus; Jock, Walter; Ott, Gunther; Sadlowski, Jurgen; Dangschaft, Manfred; and Reimann, Manfred, to BASF Lacke & Farben AG. Process for the preparation of binder dispersions capable of being cathodically deposited using crosslinking agents based on polyisocyanates blocked by hydroxyl groups. 5,086,090, Cl. 523-414.000.

Geist, Michael; Cibura, Klaus; Fobbe, Helmut; and Ott, Gunther, to BASF Lacke & Farben AG. Cathodic water-dilutable binders, water-dilutable coating compositions and processes for the preparation of cathodic water-dilutable binders based on mercapto-ketimine-modified epoxy resins. 5,086,091, Cl. 523-415.000.

Gem Industries Inc.: See—
Guillot, Edmund P., 5,084,923, Cl. 5-93.100.

Gemmel, Edwin; Rohmfeld, Josef; and Hock, Stefan, to Siemens Aktiengesellschaft. Magnetic coupling for a rotating X-ray tube. 5,086,442, Cl. 378-132.000.

Gendimenico, Gerard J.: See—
Haley, Neil F.; Nair, Xina; Gendimenico, Gerard J.; Zusi, F. Christopher; and Swann, R. Thomas, 5,086,060, Cl. 514-294.000.

General Devices Co., Inc.: See—
Hobbs, James D., 5,085,523, Cl. 384-21.000.

General Electric Canada Inc.: See—
Dymond, James H.; Saidi, Nick N.; and Young, John M., 5,086,246, Cl. 310-269.000.

General Electric Company: See—
Busch, Francis R.; and Faulstich, David L., 5,085,824, Cl. 376-268.000.

Eckberg, Richard P., 5,085,924, Cl. 428-207.000.

Fukuyama, James M.; and Lee, Julia L., 5,086,124, Cl. 525-403.000.

Gibo, Edward Y., 5,085,823, Cl. 376-232.000.

Gluntz, Douglas M.; and Caviglione, Mauro, 5,085,825, Cl. 376-282.000.

Hall, Nancy L.; and Hattey, David L., 5,086,506, Cl. 455-8.000.

Johansson, Eric B.; Latter, Gerald M.; and Curulla, Michael V., 5,085,827, Cl. 376-444.000.

Kutschenreuter, Paul H., Jr.; and Blanton, John C., 5,085,048, Cl. 60-270.100.

Lawrence, Douglas P.; and Childress, Jeffrey S., 5,086,513, Cl. 455-186.000.

Oosterkamp, Willem J., 5,085,826, Cl. 376-371.000.

Roemer, Peter B., 5,086,275, Cl. 324-309.000.

Singh, Anant P., 5,085,521, Cl. 384-99.000.

Yerman, Alexander J.; and Ngo, Khai D., 5,084,958, Cl. 29-606.000.

General Motors Corporation: See—
Fuerst, Carlton D.; and Brewer, Earl G., 5,085,716, Cl. 148-301.000.

Shain, Jon C.; and Herchenroeder, James W., 5,085,828, Cl. 419-66.000.

Georges, Michael K., to Xerox Corporation. Polysiloxane crosslinked styrene/butadiene copolymers. 5,086,141, Cl. 526-279.000.

Georgia Kaolin Company, Inc.: See—
Bundy, Wayne M.; Manasso, John A.; and Berberich, Joseph P., 5,085,707, Cl. 106-486.000.

Gerhard, Anton, to Toge-Dubel A. Gerhard GmbH. Expanding plug and a method to manufacture same. 5,085,544, Cl. 411-33.000.

Gerhart, Tobin N.; and Hayes, Wilson C., to Beth Israel Hospital Association, The. Bioerodable implant composition comprising cross-linked biodegradable polyesters. 5,085,861, Cl. 424-78.170.

Gerke, Dieter; Biederstedt, Lutz; and Muller, Manfred, to Krone Aktiengesellschaft. Connector bank with voltage surge protection. 5,086,368, Cl. 361-118.000.

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Giglio, Frank A. Gynecological urethral suppository. 5,085,650, Cl. 604-288.000.

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Trotta, Robert A., 5,084,968, Cl. 30-47.000.

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Gilmore, L. Donald: See—
DeLuca, Carlo J.; and Gilmore, L. Donald, 5,085,226, Cl. 128-733.000.

Gipson, Billy P.: See—
Thompson, Christopher M.; Campbell, Timothy J.; Farfaglia, Leonard T.; deceased; Gipson, Billy P.; and Matambo, Thompson, 5,085,057, Cl. 62-262.000.

Gist-Brocades N.V.: See—
Olthoff, Margaretha; Dijkgraaf, Bernardus L. J.; and Akkerboom, Piet J., 5,085,869, Cl. 424-499.000.

Gizatulin, Gennady Z.: See—
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GKN Automotive AG: See—
Beigang, Wolfgang, 5,085,306, Cl. 192-79.000.

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Glasstech, Inc.: See—
Reunamaki, Pauli T., 5,085,580, Cl. 432-59.000.

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Clawson, Charles W.; and Stottsberry, James W., 5,085,094, Cl. 74-424.600.

Gobin, Vincent; Labaune, Gerard; and Issac, Francois, to Office National d'Etudes et de Recherches Aerospatiales; and Avions Marcel Dassault-Breguet Aviation (AMD/BA), a part interest. Variable frequency magnetic field device employing multiple antennae for measuring the surface impedance of a material. 5,086,274, Cl. 324-239.000.

Goergen, Rene ; and Kummer, Pierre, to Goodyear Tire & Rubber Company, The. Tire tread. 5,085,259, Cl. 152-209.00R.

Goetz, Norbert: See—
Vogelbacher, Uwe J.; Eicken, Karl; Rheinheimer, Joachim; Goetz, Norbert; Harreus, Albrecht; Paul, Gerhard; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,085,686, Cl. 71-92.000.

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Goldbach, Richard A.: See—
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Goldbeck, Heinz; and Meyer, Werner, to Durkopp Adler A.G. Sewing machine with piping strip cutting and transfer device. 5,085,158, Cl. 112-114.000.

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Goldberg, Jay; and Sinclair, Richard, to Medical Engineering Corporation. Biodegradable stent. 5,085,629, Cl. 604-8.000.

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Dugan, Larry M., 5,085,129, Cl. 92-84.000.

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Powers, Matthew R.; Youssef, Raymond D.; Studt, William L.; and Golec, Frederick A., 5,086,179, Cl. 546-133.000.

Golik, Jerzy; Beutler, John; Clark, Pat; Ross, John; Roach, John; Muschik, Gary; and Lebherz, William B., III, to Bristol-Myers Squibb Company. Antitumor antibiotic. 5,086,045, Cl. 514-61.000.

Gondouin, Michel, to S-Cal Research Corporation. Process for conserving steam quality in deep steam injection wells. 5,085,275, Cl. 166-303.000.

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Goss, Michael L., to Nalco Chemical Company. Method of using an aqueous chemical system to recover hydrocarbon and minimize wastes from sludge deposits in oil storage tanks. 5,085,710, Cl. 134-22.140.

Goto, Hisaharu: See—
Hashiride, Tadaaki; Nakai, Toshiyuki; and Goto, Hisaharu, 5,085,160, Cl. 112-300.000.

Goto, Shinya: See—
Wakamatsu, Hideki; and Goto, Shinya, 5,086,278, Cl. 324-605.000.

Goto, Takashi: See—
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Gotoh, Yasuharu: See—
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Gotoh, Yuichi: See—
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North, John M., 5,085,952, Cl. 429-192.000.

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Gowda, Padmanab L., to Westinghouse Air Brake Company. Hydraulic isolation valve for railway vehicle. 5,085,243, Cl. 137-118.000.

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Fortune, Christopher S.; and Severson, Ervin L., 5,085,360, Cl. 224-42.130.

Grabow, Glen M., to Cencorp, Inc. Method and apparatus for increasing a substrate processing area without increasing the length of a manufacturing line. 5,084,952, Cl. 29-33.00P.

Gradecki, Raymond J.: See—
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Graham, Dean M., to D. M. Graham Laboratories, Inc. Process for preparing a solid encapsulated medicament. 5,085,033, Cl. 53-436.000.

Graillat, Gerard: See—
Provence, Marc; and Graillat, Gerard, 5,085,454, Cl. 280-615.000.

Grammas, James J.; Maronn, James M.; and Weston, James R., to AG Communication Systems Corporation. Printed circuit board assembly handle/stiffener. 5,086,371, Cl. 361-397.000.

Grandstand International Corp.: See—
Wood, Sidney B., Jr., 5,085,424, Cl. 272-3.000.

Grau, Rainer, to Hans Weber Maschinenfabrik GmbH. Contact roll for belt grinding machines. 5,085,010, Cl. 51-141.000.

Graves Spray Supply, Incorporated: See—
Smith, James E., 5,085,370, Cl. 239-71.000.

Gray, Michael A.; Halbert, Alan R.; and Todd, Stephen J., to International Business Machines Corporation. Solid modelling system with logic to discard redundant primitives. 5,086,495, Cl. 395-120.000.

Gray, Scott L.; and Thompson, Steven R., to Honeywell Inc. Fault-tolerant digital computing system with reduced memory redundancy. 5,086,429, Cl. 371-9.100.

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Ripley, Ian; and Needham, Anthony H., 5,085,242, Cl. 137-13.000.

Greathead, Andrew: See—
Elsby, John; Dewar, John U.; Greathead, Andrew; and Sanfead, Brian T., 5,085,285, Cl. 175-325.000.

Green, Gary J.: See—
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Greene, John D.: See—
Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; and Fein, Michael E., 5,085,517, Cl. 356-394.000.

Greer, Stephen J.: See—
Nemeth-Johannes, Jay J.; and Greer, Stephen J., 5,086,504, Cl. 395-700.000.

Gregor, Philip: See—
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Gregory, Peter; and White, Raymond, to Imperial Chemical Industries plc. Multilayer organic photoconductor. 5,085,961, Cl. 430-59.000.

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Greiner, Siegfried M.: See—
Capek, Raymond G.; Greiner, Siegfried M.; and Hutton, Robert F., 5,086,251, Cl. 313-407.000.

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Kahn, Frederic J.; Kendrick, Paul N.; Leff, Jerry; Livoni, Linden J.; Loucks, Bryan E.; Stepper, David E.; and Witte, Kenneth G., 5,085,506, Cl. 353-122.000.

Griffaton, Jacques: See—
Gaffard, Jean-Paul; Ravelet, Robert; Chabassier, Genevieve; and Griffaton, Jacques, 5,085,509, Cl. 356-153.000.

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- Griggs, Bruce F., to Union Camp Patent Holding, Inc. Methods of high consistency oxygen delignification using a low consistency alkali pretreatment. 5,085,734, Cl. 162-19.000.
- Grigoli, Franco; and Trabacchi, Franco, to Sidam S.r.l. Machine for making stick ices, water ices, and the like. 5,085,059, Cl. 62-345.000.
- Grimke, Ralph E. Plural-rate surge-suppressing valve. 5,085,246, Cl. 137-504.000.
- Grimshaw, Paul E.; Grodzinsky, Alan J.; and Yarmush, Martin L., to Massachusetts Institute of Technology. Dynamically controlled membrane. 5,085,749, Cl. 204-182.100.
- Grisel, Howard L. Loaded shotgun shell testing apparatus used to visually inspect, via transmitted light images, the internal arrangement of the powder, wad, and shot. 5,085,511, Cl. 356-239.000.
- Grodzinsky, Alan J.: See—
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- Groppe, Alvin F., to Artic Elements, Inc. Telephone headset for the hearing impaired. 5,086,464, Cl. 379-430.000.
- Grove, Lee A., to Remote Controls, Inc. Flow control valve cartridge. 5,085,245, Cl. 137-454.500.
- Groya, Robert J.; and Hofmann, Richard W., to Magenta Corporation. Spooning closure. 5,085,331, Cl. 215-245.000.
- Grumman Aerospace Corporation: See—
Pagliaccio, Joseph A., 5,085,540, Cl. 407-11.000.
- Grunewald, Gerhard: See—
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- Gruppo Lepetit S.p.A.: See—
Lancini, Giancarlo; Borghi, Angelo; Antonini, Piero; and Palumbo, Raffaele, 5,085,990, Cl. 435-71.300.
- Grypczynski, Daniel; Jacquier, Paul; and Guglielmo, Andre, to Framatome. Method and devices for the extraction of a closure plug from a steam generator tube. 5,086,201, Cl. 219-69.170.
- GTE Laboratories Incorporated: See—
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- GTE Products Corporation: See—
Blaisdell, Ronald G.; and Hough, Harold L., 5,086,249, Cl. 313-318.000.
- Guadagno, Philip A.; and McNeely, Terry L., to Helena Laboratories Corporation. Container for electrophoretic gel. 5,085,758, Cl. 204-299.00R.
- Gualtier, Quentin E. Airbag and vehicle horn switch assembly. 5,085,462, Cl. 280-731.000.
- Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, to Robert Bosch GmbH. Multi-choice information system for a motor vehicle. 5,086,510, Cl. 455-90.000.
- Guenther, Richard A.; and Kolb, Robert E., to Minnesota Mining and Manufacturing Company. Fluoroelastomer compositions containing fluoroaliphatic sulfonamides as curing agents. 5,086,123, Cl. 525-276.000.
- Guest, Timothy S., to John Guest Engineering Limited. Tube coupling sleeves. 5,085,472, Cl. 285-158.000.
- Gueyne, Jean: See—
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- Guglielmo, Andre: See—
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- Guilford Mills, Inc.: See—
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- Guillaume, Jacques: See—
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- Guillot, Edmund P., to Gem Industries Inc. Crib with stabilizer bar and hidden connector for stabilizer bar. 5,084,923, Cl. 5-93.100.
- Guion, Christian: See—
Barraud, Claude; Poilleux, Jean-Loup; and Guion, Christian, 5,086,457, Cl. 379-144.000.
- Guiringer, Edward C. Foldaway stool mounted to inside of cabinet door. 5,085,290, Cl. 182-77.000.
- Gulden, Walter: See—
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- Gumb, Beverley W.; and Foster, Edward J. R., to Northern Telecom Limited. Telephone base structures for stabilizing upon support surfaces. 5,086,466, Cl. 379-440.000.
- Gundlach, Larry C.; Gould, Paul F.; and Skaar, Gary R., to Oscar Mayer Foods Corporation. Reducing the development of pale, soft and exudative pork. 5,085,615, Cl. 452-198.000.
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- Gunn, Bruce P.: See—
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- Guttler, Hermann, to Zinser Textilmaschinen GmbH. System for preparing roving bobbins. 5,085,378, Cl. 242-172.000.
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- Gyenes, Russell E.; and Kleinert, Raymond J., III, to Motorola, Inc. Vented battery. 5,085,951, Cl. 429-86.000.
- Gyori, Matthias: See—
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- H. L. Ledeen Associates: See—
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- Haas, Richard G., to Hillside Plastics Inc. Method of preparing a blow molded maple syrup jug. 5,085,034, Cl. 53-452.000.
- Haberle, Walter. Puppet theater with sound track and cued lights. 5,085,609, Cl. 446-83.000.
- Habermann, Joseph P., to Hein-Werner Corporation. Hand held electric arc welder. 5,086,208, Cl. 219-130.100.
- Habing, Theodore G., to Pacific Fitness Corporation. Multiple station exercise apparatus. 5,085,430, Cl. 272-117.000.
- Haack, Paul J.: See—
Austin, Marlin; Cain, Michael; and Haack, Paul J., 5,085,475, Cl. 292-92.000.
- Hagino, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Insulated gate bipolar transistor. 5,086,324, Cl. 357-23.500.
- Hagins, Freddy W.: See—
Skopec, Robert A.; Jeffers, Douglas E.; and Hagins, Freddy W., 5,084,980, Cl. 33-286.000.
- Hagiya, Toshimichi; Watanabe, Junichi; Kanno, Tetsuo; Inuzuka, Hideo; Yamahata, Makoto; Sofue, Masaaki; and Aota, Yoshiaki, to Ricoh Company, Ltd. Optical disk apparatus. 5,086,422, Cl. 369-75.100.
- Hague, Ekramul. Eraser crumb cleaner. 5,084,937, Cl. 15-3.530.
- Hail, Harry K.; Birchak, James R.; and Hon, Wai-Leung, to Reliability Incorporated. Driver system and distributed transmission line network for driving devices under test. 5,086,271, Cl. 324-158.00R.
- Hain, Josef, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 5,085,196, Cl. 123-502.000.
- Halbert, Alan R.: See—
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- Haldor Topsoe A/S: See—
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- Haley, Neil F.; Nair, Xina; Gendimenico, Gerard J.; Zusi, F. Christopher; and Swann, R. Thomas, to Eastman Kodak Company. Compound and method for treating skin for acne or psoriasis. 5,086,060, Cl. 514-294.000.
- Hall, Jacob H.; and Powell, Timothy E., to Rheem Manufacturing Company. Fuel-fired water heated with combination drainage pan and combustion air flow control apparatus. 5,085,205, Cl. 126-363.000.
- Hall, Nancy L.; and Hattey, David L., to General Electric Company. Radio trunking fault detection system with power output monitoring and on-air monitoring. 5,086,506, Cl. 455-8.000.
- Hallenbach, Werner: See—
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- Haller, Rudolf: See—
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- Halloran, Daniel J.; and Varaprath, Padmakumari J., to Dow Corning Corporation. Thioglycolamide-functional siloxanes. 5,085,858, Cl. 424-71.000.
- Halloran, Daniel J.; and Vincent, Judith M., to Dow Corning Corporation. Hair fixatives. 5,085,859, Cl. 424-71.000.
- Haluzak, William, to Brunswick Corporation. Marine drive with steering torque compensation. 5,085,603, Cl. 440-51.000.
- Hamada, Mitsuo: See—
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- Hamanaka, Naoki: See—
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- Hamanaka, Nobuyuki: See—
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- Hamer, James D., to Minnesota Mining and Manufacturing Company. Method of reducing surface defects in a positive dental model. 5,085,811, Cl. 264-16.000.
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- Hamilton Standard Controls, Inc.: See—
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- Hamlett, Bob D. Artificial palm tree. 5,085,900, Cl. 428-18.000.
- Hamlyn, Maxwell C.; Luck, Thomas H.; and Nelson, Charles J., to Allied-Signal Inc. Process for dimensionally stable polyester yarn. 5,085,818, Cl. 264-210.600.
- Hammerbacher, Milfred D., to Texas Instruments Incorporated. Method for applying an organic insulator to a solar array. 5,086,003, Cl. 437-2.000.
- Hammerly, Robert C. Apparatus and method for performing diagnostic tests on the electrical systems of recreational vehicles and the like. 5,086,277, Cl. 324-504.000.
- Hammett, Daniel E.: See—
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- Hammond, Geoffrey L., to Allelix Biopharmaceuticals, Inc. Pharmaceutical compositions and use thereof in treating inflammation. 5,086,039, Cl. 514-8.000.
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- Haneda, Akira: See—
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- Haniff, Paul H.; and Harrel, Donald R., to Sage Products, Inc. Method of forming suction swab. 5,085,633, Cl. 604-35.000.
- Hanna, James T.: See—
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- Hans Weber Maschinenfabrik GmbH: See—
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- Hansen, Henning. Support arm. 5,086,206, Cl. 219-125.100.
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- Hara, Seinosuke: See—
Nakamura, Makoto; Sakuragi, Shigeru; Matayoshi, Yutaka; Maekawa, Keichi; Hara, Seinosuke; and Morita, Shoji, 5,085,182, Cl. 123-90.160.
- Harada, Akihiro: See—
Yamasaki, Akinori; Harada, Akihiro; and Miyamoto, Teruo, 5,084,955, Cl. 29-599.000.
- Harada, Tatsumi: See—
Murakami, Sadatoshi; Yamasaki, Satoru; and Harada, Tatsumi, 5,085,768, Cl. 210-222.000.
- Haraga, Hisato: See—
Tsutsui, Osamu; Haraga, Hisato; Arita, Kinya; Makita, Atsuo; Takeuchi, Hirofumi; and Tsukada, Ryoichi, 5,085,399, Cl. 251-30.030.
- Haraichi, Satoshi: See—
Itoh, Fumikazu; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Hongo, Mikio, 5,086,015, Cl. 437-173.000.
- Hararat-Tehrani, Mohammad, to Deutsche Airbus GmbH. Decompression panel for a separation device in an aircraft. 5,085,017, Cl. 52-1.000.
- Harata, Mitsuru; and Yasuda, Hiroshi, to Toyota Gosei Co., Ltd. Steering wheel core. 5,085,097, Cl. 74-552.000.
- Harbison, James C.: See—
Marano, Gerald A.; Evans, Donald; Lomas, Edwin D.; and Harbison, James C., 5,085,035, Cl. 53-510.000.
- Harclerode, William H.; Zimmermann, Eugene K.; Pekich, Barry J.; Knutsen, John C.; Wiman, John V.; and Voss, John C., to BASF Corporation. Process for making expanded polymeric product with low level of emission of blowing agent. 5,086,078, Cl. 521-58.000.
- Hardy, Arthur H., Jr.; and Schubert, William C., to Santa Barbara Research Center. Increased intensity laser diode source configuration. 5,086,431, Cl. 372-50.000.
- Hariki, Kazuo; Koizumi, Tatsuya; Ishiguro, Kazuya; and Kanitani, Kiyoshi, to Nachi-Fujikoshi Corp. Industrial robot system. 5,086,262, Cl. 318-568.100.
- Harker, Alan R., to Duncan Instrument Company. Apparatus for rapid biological oxidation demand of liquids. 5,085,759, Cl. 204-408.000.
- Harrel, Donald R.: See—
Haniff, Paul H.; and Harrel, Donald R., 5,085,633, Cl. 604-35.000.
- Harreus, Albrecht: See—
Vogelbacher, Uwe J.; Eicken, Karl; Rheinheimer, Joachim; Goetz, Norbert; Harreus, Albrecht; Paul, Gerhard; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,085,686, Cl. 71-92.000.
- Harris Corporation: See—
Heilman, Randy T.; and Prentice, John S., 5,086,242, Cl. 307-631.000.
- Salatino, Matthew M., 5,085,084, Cl. 73-827.000.
- Harris, Rodney M.: See—
Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., 5,086,144, Cl. 527-313.000.
- Harris, Windel L.; and Donnohue, James R. Method and apparatus for thermal conversion of organic matter. 5,085,738, Cl. 201-11.000.
- Harrison, John M.: See—
Hassett, John J.; and Harrison, John M., 5,086,389, Cl. 364-401.000.
- Hart, Susan R.: See—
Galen, Peter M.; Hart, Susan R.; and Saltzstein, William E., 5,085,224, Cl. 128-696.000.
- Hart, Walter D.: See—
Meyers, Robert A.; Hart, Walter D.; and McClanathan, Loren C., 5,085,764, Cl. 208-404.000.
- Hartgring, Cornelis D.; and Cuppens, Roger, to U.S. Philips Corp. Integrated circuit comprising a programmable cell. 5,086,331, Cl. 357-51.000.
- Hartmann & Braun AG: See—
Franck, Gerhard; and Rumpf, Guenter, 5,085,087, Cl. 73-864.730.
- Harvey, John B.: See—
Solberg, Joseph R.; and Harvey, John B., 5,085,535, Cl. 403-24.000.
- Hasegawa, Manabu: See—
Inubushi, Toshiya; Musha, Atsushi; and Hasegawa, Manabu, 5,086,509, Cl. 455-89.000.
- Hasegawa, Takashi: See—
Takeda, Atsushi; and Hasegawa, Takashi, 5,086,318, Cl. 355-271.000.
- Hasegawa, Yuri: See—
Asai, Kohtaro; Murakami, Tokumichi; and Hasegawa, Yuri, 5,086,439, Cl. 375-122.000.
- Hashimoto, Shiro: See—
Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.
- Hashimoto, Shunichi: See—
Kitamura, Mitsuru; and Hashimoto, Shunichi, 5,085,714, Cl. 148-16.500.
- Hashiride, Tadaaki; Nakai, Toshiyuki; and Goto, Hisaharu, to Aisin Seiki Kabushiki Kaisha. Thread cutting device for use in a sewing machine. 5,085,160, Cl. 112-300.000.
- Hassett, John J.; and Harrison, John M. Automatic toll processing apparatus. 5,086,389, Cl. 364-401.000.
- Hatakeyama, Hidetoshi; and Kashiba, Takashi, to Mitsubishi Gas Chemical Company. Deoxidizer package. 5,085,878, Cl. 426-107.000.
- Hatakeyama, Hiroki: See—
Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 5,086,106, Cl. 524-300.000.
- Hathey, David L.: See—
Hall, Nancy L.; and Hattey, David L., 5,086,506, Cl. 455-8.000.
- Hattori, Iwakazu: See—
Takashima, Akio; Hattori, Iwakazu; and Imamura, Takashi, 5,086,136, Cl. 526-177.000.
- Hattori, Masaru; and Tsukada, Toru, to NSK Ltd. Return guide fixing structure for a linear guide apparatus. 5,085,522, Cl. 384-45.000.
- Hattori, Toshihiko: See—
Hitomi, Mitsuo; and Hattori, Toshihiko, 5,085,178, Cl. 123-52.00M.
- Hattori, Yuji: See—
Kouno, Katsumi; Hattori, Yuji; and Morisawa, Kunio, 5,085,104, Cl. 74-866.000.
- Haumann, Jurgen: See—
Keller, Jakob; and Haumann, Jurgen, 5,085,575, Cl. 431-8.000.
- Hawes, Mark A.: See—
Murray, Shawn G.; and Hawes, Mark A., 5,086,290, Cl. 340-539.000.
- Hawkinson, Dan, to Pittway Corporation. Beam alignment apparatus and method usable with projected beam smoke detector systems. 5,085,508, Cl. 356-153.000.
- Haworth, Edward M., to Cotter & Company. Leaf mulcher. 5,085,375, Cl. 241-55.000.
- Hayakawa Rubber Co., Ltd.: See—
Kimura, Tetsuya; Fujii, Toshihiro; and Nii, Hiroki, 5,085,697, Cl. 106-20.000.
- Hayakawa, Takashi; Narikawa, Shiro; and Ohashi, Kunio, to Sharp Kabushiki Kaisha. Amorphous, layered, photosensitive member for electrophotography and ECR process. 5,085,968, Cl. 430-128.000.
- Hayashi, Keizo; Shigeki, Kiyoshi; and Ogawa, Kazuo, to Toyota Gosei Co., Ltd. Weather strip for motor vehicle. 5,085,006, Cl. 49-482.000.
- Hayashi, Kohtaro: See—
Mukai, Hiromu; Kojiya, Kagumi; Hayashi, Kohtaro; and Shibuya, Taro, 5,086,353, Cl. 359-432.000.
- Hayashi, Noriyuki; Kageyama, Yukihiko; and Hijikata, Kenji, to Polyplastics Co., Ltd. Polyester resin exhibiting anisotropy in a molten state and resin composition. 5,086,158, Cl. 528-193.000.
- Hayashi, Shigekazu: See—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, 5,086,131, Cl. 526-68.000.
- Hayashi, Shoichi; Ishihara, Hidetoshi; and Ueda, Atsushi, to Mitsubishi Jukogyo Kabushiki Kaisha. Drum type washing and dehydrating machine. 5,085,064, Cl. 68-23.001.
- Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atsuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, to Honda Giken Kogyo Kabushiki

Kaisha. Swashplate assembly for a swashplate type hydraulic pressure device. 5,085,053, Cl. 60-488.000.

Hayashi, Yukio: See—
Ito, Masahiro; and Hayashi, Yukio, 5,086,151, Cl. 528-53.000.

Hayati, Samad A.; and Venkataraman, Subramanian T., to United States of America, National Aeronautics and Space Administration. Bilevel shared control for teleoperators. 5,086,400, Cl. 395-95.000.

Hayes, Richard A.: See—
Ekiner, Okan M.; Hayes, Richard A.; and Manos, Phillip, 5,085,676, Cl. 55-158.000.

Hayes, Thomas H.; and LoMaglio, Lewis C., to Anchor Hocking Corporation. Pressurized dispenser package. 5,085,347, Cl. 222-153.000.

Hayes, Wilson C.: See—
Gerhart, Tobin N.; and Hayes, Wilson C., 5,085,861, Cl. 424-78.170.

Hays, Gary A.: See—
Freier, Edward, Jr.; Hays, Gary A.; Jacque, John F.; and Klas, Kenneth H., 5,085,044, Cl. 56-13.500.

Hazelton, Donald R.; Puydak, Robert C.; and Booth, D. A., to Advanced Elastomer Systems, L. P. Dynamically cured thermoplastic olefin polymers. 5,086,121, Cl. 525-197.000.

Heath, D. Michele: See—
Heyman, Joseph S.; Heath, D. Michele; Welch, Christopher S.; Winfree, William P.; and Miller, William E., 5,085,073, Cl. 73-147.000.

Hebels, Albert, to Pagendam GmbH. Apparatus for applying coating material to a substrate. 5,085,167, Cl. 118-65.000.

Hedlund Manufacturing Co., Inc.: See—
Martin, Mervin G., 5,085,372, Cl. 239-675.000.

Hedner, Carleton R., Jr. Decorative apparatus. 5,086,380, Cl. 362-161.000.

Heidelberger Druckmaschinen AG: See—
Becker, Willi, 5,085,143, Cl. 101-183.000.

Heidrich, Gunther, to BHS-Voith Getriebetechnik GmbH. Power splitting transmission. 5,085,093, Cl. 74-411.000.

Heil, Ronald W., Jr.; Wickham, Robert W., Jr.; and Kubitschek, Edward D., to Cardiac Pacemakers, Inc. Bipolar myocardial positive fixation lead with improved sensing capability. 5,085,218, Cl. 128-642.000.

Heiland-Franzen, Christa: See—
Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.

Heilman, Randy T.; and Prentice, John S., to Harris Corporation. Fast turn-off of thyristor structure. 5,086,242, Cl. 307-631.000.

Heilmann, Peter: See—
Platz, Horst; Engelhardt, Peter; Sommermann, Friedrich; Kohl, Albert; Klausmann, Juergen; Baur, Reinhold; Heilmann, Peter; and Roller, Hermann, 5,085,889, Cl. 427-128.000.

Heimann, Ulrich: See—
Schupp, Hans; Schwerzel, Thomas; Lawrenz, Dirk; Osowski, Hans-Josef; and Heimann, Ulrich, 5,086,092, Cl. 523-414.000.

Heimes, Bernd: See—
Ahrweiler, Karl-Heinz; and Heimes, Bernd, 5,085,812, Cl. 264-37.000.

Hein-Werner Corporation: See—
Habermann, Joseph P., 5,086,208, Cl. 219-130.100.

Heinz, Hans-Detlef; Kohler, Burkhard; Meyer, Rolf-Volker; Reinking, Klaus; and Sommer, Alexa, to Bayer Aktiengesellschaft. High molecular weight arylene sulphide polymer melt mixed with aromatic nitro compound. 5,086,128, Cl. 525-537.000.

Heinz, Hans-Detlef: See—
Kohler, Burkhard; Heinz, Hans-Detlef; and Reinking, Klaus, 5,086,129, Cl. 525-537.000.

Held, Wolfgang; Konig, Axel; and Puppe, Lothar, to Bayer Aktiengesellschaft. Process for the reduction of nitrogen oxides contained in exhaust gases. 5,085,840, Cl. 423-212.000.

Helena Laboratories Corporation: See—
Guadagno, Philip A.; and McNeely, Terry L., 5,085,758, Cl. 204-299.000.

Helling, Gunter: See—
Himmelmann, Wolfgang; Lalvani, Prem; Buschmann, Hans-Theo; and Helling, Gunter, 5,085,981, Cl. 430-536.000.

Henderson, William D.; and Crouse, Roger L., to Sherwood Medical Company. Rigid needle cover with needle sealing plug and method of manufacture thereof. 5,085,647, Cl. 604-192.000.

Hendry, James D.: See—
Stampa, Juergen P.; Honda, Ronald T.; and Hendry, James D., 5,085,091, Cl. 74-206.000.

Henkel, Daniel L. Stackable support apparatus. 5,085,397, Cl. 248-688.000.

Henley, Robert L., Jr.; and Weber, Richard W., Jr. Nasogastric/nasointestinal enteral feeding tube and method for avoiding tracheobronchial misplacement. 5,085,216, Cl. 128-636.000.

Henry, Harold F. Fish hook remover. 5,084,999, Cl. 43-53.500.

Heraeus Quarzglas GmbH: See—
Yamagata, Shigeru; Inaki, Kyoichi; Matsuya, Toshikatu; Takke, Ralf; Thomas, Stephan; and Fabian, Heinz, 5,086,352, Cl. 359-350.000.

Heraeus Sepatech GmbH: See—
Uhlenhoff, Rudiger, 5,086,265, Cl. 318-817.000.

Herauf, Leroy J., to Minnesota Mining and Manufacturing Company. Particulate monitoring tape. 5,085,937, Cl. 428-343.000.

Herchenroeder, James W.: See—
Shain, Jon C.; and Herchenroeder, James W., 5,085,828, Cl. 419-66.000.

Herdman, Peter T., to Wiggins Teape Group Limited, The. Watermarked paper sheet for use in xerographic imaging processes. 5,085,936, Cl. 428-337.000.

Herman Miller, Inc.: See—
McClung, Duane G.; and Mueller, Thomas C., 5,085,027, Cl. 52-811.000.

Herman, Stephen. Antiviral pharmaceutical compositions comprising a terpene ozonide. 5,086,076, Cl. 514-724.000.

Hermann, Albert: See—
Muller, Gerhard; and Hermann, Albert, 5,085,612, Cl. 452-51.000.

Hesch, Mary. Invalid garment. 5,084,914, Cl. 2-79.000.

Heshmat, Hooshang, to Mechanical Technology, Incorporated. Powder-lubricant piston ring for diesel engines. 5,085,185, Cl. 123-193.000.

Hess, Kristoffer A.; Dyke, Colin; and Shaver, David M., to Black & Decker Inc. Electro-mechanical interlock and module system for lawn mower or other electrical device. 5,085,043, Cl. 56-10.500.

Hettche, Helmut; Muckenschnebel, Reinhard; Scheffler, Gerhard; Fleischhauer, Ilona; and Morick, Wolfgang, to Asta Pharma AG. Method of treating inflammatory disorders and psoriasis with salts of azelastine. 5,086,050, Cl. 514-212.000.

Hewlett-Packard Company: See—
Bartz, Manfred U., 5,086,512, Cl. 455-186.000.

Galen, Peter M.; Hart, Susan R.; and Saltzstein, William E., 5,085,224, Cl. 128-696.000.

Leibovitz, Jacques; Scholz, Kenneth D.; Nagesh, V. K.; and Chao, Clinton C., 5,086,335, Cl. 357-70.000.

Nemeth-Johannes, Jay J.; and Greer, Stephen J., 5,086,504, Cl. 395-700.000.

Nobi, Laszlo, 5,086,269, Cl. 324-158.000.

Swedberg, Sally A., 5,085,756, Cl. 204-299.000.

Wakamatsu, Hideki; and Goto, Shinya, 5,086,278, Cl. 324-605.000.

Hexcel Corporation: See—
Baron, Kenneth S.; Brinkerhoff, Susan M.; Lee, Frank W.; and McKinney, Stella M., 5,086,149, Cl. 528-45.000.

Heyl, Gerrit: See—
Watson, Stephen H.; Watson, Stephen H.; Sivesind, Jerome M.; and Heyl, Gerrit, 5,084,918, Cl. 2-424.000.

Heyman, Joseph S.; Heath, D. Michele; Welch, Christopher S.; Winfree, William P.; and Miller, William E., to United States of America, National Aeronautics and Space Administration. Thermal remote anemometer system. 5,085,073, Cl. 73-147.000.

Heyn, William M.: See—
Roth, Donald J.; Heyn, William M.; and Sauer, Donald G., 5,085,339, Cl. 220-269.000.

Hickey, James H.: See—
Widmann, Marcel; and Hickey, James H., 5,085,930, Cl. 428-323.000.

Hickey, James J.; and Adamson, William L., to Nalco Chemical Company. Apparatus for continually and automatically measuring the level of a water treatment product in boiler feedwater. 5,085,831, Cl. 422-62.000.

Hickling, Paul D.; and Belchos, Michael S., to Diesel Equipment Limited. Exhaust extraction system for welding site. 5,085,133, Cl. 454-63.000.

Hicks, George W., Jr. Supine patient lift and transfer apparatus. 5,084,921, Cl. 5-81.000.

Hicks, Thomas W.; and Hodgins, Ron, to Hicks, Thomas W. Paintbrush holder. 5,085,386, Cl. 248-110.000.

Hidaka, Hidenori: See—
Katsu, Toshiyuki; Hidaka, Hidenori; and Inotsume, Fusako, 5,086,298, Cl. 340-825.690.

Hidaka, Shinobu, to Minolta Camera Kabushiki Kaisha. Image forming apparatus and method for removal of high frequency image jitter. 5,086,223, Cl. 250-235.000.

Hidehiko, Miyake; and Kazuhiro, Kajitani, to Takisawa Machine Tool Co., Ltd. Machine tool for processing work piece into non-circular cross-sectional configuration. 5,085,109, Cl. 82-118.000.

Hieahim, Isao, to Mazda Motor Corporation. Air bag structure for an automotive vehicle. 5,085,465, Cl. 280-738.000.

Higashi, Izumi, to Fanuc Ltd. Machining fluid supply device for a wire cut electric discharge machine. 5,085,247, Cl. 137-601.000.

Higashi, Toshio: See—
Minayoshi, Shiro; Saitoh, Naofumi; Higashi, Toshio; and Ebisuya, Noritsugu, 5,085,800, Cl. 252-309.000.

Higashino, Naomi: See—
Ohmura, Ryuuji; and Higashino, Naomi, 5,086,280, Cl. 328-61.000.

Highland Supply Corporation: See—
Garcia, Pedro F., 5,085,003, Cl. 47-72.000.

Higson, Alan, to British Nuclear Fuels plc. Transfer apparatus. 5,085,314, Cl. 198-755.000.

Higuchi, Naoshige: See—
Miyake, Toru; Higuchi, Naoshige; Kudo, Yoshiki; and Tanabe, Hisao, 5,086,297, Cl. 340-759.000.

Hijikata, Kenji: See—
Hayashi, Noriyuki; Kageyama, Yukihiko; and Hijikata, Kenji, 5,086,158, Cl. 528-193.000.

Hikiguchi, Shozo: See—
Kasuda, Takashi; Nishimura, Yukihiko; Hikiguchi, Shozo; Nakano, Minoru; Yasuda, Eiji; and Noguchi, Kazuo, 5,085,159, Cl. 112-246.000.

Hilbert, Samuel D.: See—
Weaver, Max A.; Pruett, Wayne P.; and Hilbert, Samuel D., 5,086,161, Cl. 528-288.000.

Hileman, John, to Brothers, Budd R. Universal material clip. 5,084,944, Cl. 24-453.000.

Hill, David A., to KPG Associates, Inc. Thermal cycle recirculating pump for isotope purifier. 5,086,225, Cl. 250-288.000.

Hillside Plastics Inc.: See—
Haas, Richard G., 5,085,034, Cl. 53-452.000.

Hillyard, Carmel J.; Rylatt, Dennis B.; Kemp, Bruce E.; and Bundesen, Peter G., to Agen Biomedical, Ltd. Erythrocyte agglutination assay. 5,086,002, Cl. 436-540.000.

Himelston, Elizabeth A.: See—
Sullivan, Maureen A.; and Himelston, Elizabeth A., 5,086,289, Cl. 340-475.000.

Himmelmann, Wolfgang; Lalvani, Prem; Buschmann, Hans-Theo; and Helling, Gunter, to Agfa-Gevaert Aktiengesellschaft. Photographic silver halide element with protective layer. 5,085,981, Cl. 430-536.000.

Hinenoya, Saburo: See—
Ueno, Kohhei; Akagawa, Tomohiko; Hinenoya, Saburo; and Morimoto, Toshio, 5,086,109, Cl. 524-496.000.

Hines, John J.: See—
Atcher, Robert W.; and Hines, John J., 5,085,848, Cl. 424-1.100.

Hinrichsen, Uwe, to Volkswagen AG. Apparatus for distinguishing between opposed directions of relative motion of a part having magnetic variations. 5,086,272, Cl. 324-207.130.

Hintzen, Ulrich, to Didier-Werke AG. Apparatus for closing and/or regulating the discharge or tapping of molten metal. 5,085,344, Cl. 222-590.000.

Hinze, Jay W.; Lawson, Richard D.; and Blake, Mott J., to Owens-Corning Fiberglass Corporation. Glass spinner manufacture. 5,085,679, Cl. 65-1.000.

Hirabayashi, Terumi: See—
Kitagawa, Shigeo; Tachino, Kenzo; Nagata, Yasuhiro; Yamamoto, Tomochiro; Iwata, Shigemitsu; Hirabayashi, Terumi; and Tanino, Junichi, 5,086,450, Cl. 379-40.000.

Hirabayashi, Yasuji: See—
Katayama, Akihiko; Yoshida, Tadashi; Hirabayashi, Yasuji; and Maeda, Mitsuru, 5,086,487, Cl. 382-56.000.

Hiraide, Tsuneo: See—
Tsuru, Sumiaki; Yokoo, Akihiko; Ichitsuka, Takeshi; and Hiraide, Tsuneo, 5,085,781, Cl. 210-692.000.

Hirakata, Takashi: See—
Nakata, Takuya; Makita, Hitoshi; Hirakata, Takashi; and Kawasaki, Shingo, 5,085,116, Cl. 84-609.000.

Hirakawa, Kenji, to Kabushiki Kaisha Toshiba. Bipolar transistor and method for manufacturing the same. 5,086,005, Cl. 437-32.000.

Hiramoto, Seigo: See—
Oka, Kazuhiro; Morita, Takeshi; Hiramoto, Seigo; and Kagawa, Toshio, 5,085,166, Cl. 118-50.100.

Hiraoka, Mizuho; and Imataki, Hiroyuki, to Canon Kabushiki Kaisha. Optical recording medium. 5,085,925, Cl. 428-215.000.

Hirashima, Isao: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, 5,085,466, Cl. 280-775.000.

Hirata, Fumiaki: See—
Minato, Ichiro; Hirata, Fumiaki; and Nakashima, Tatsuya, 5,086,175, Cl. 544-221.000.

Hirata, Toichi, to Hitachi Construction Machinery Co., Ltd. Displacement of variable displacement pump controlled by load sensing device having two settings for low and high speed operation of an actuator. 5,085,051, Cl. 60-368.000.

Hirose, Hiroshi: See—
Toita, Hiroshi; Hirose, Hiroshi; and Tamura, Hifumi, 5,086,227, Cl. 250-309.000.

Hirotaki Manufacturing Co., Ltd.: See—
Kimura, Takashi, 5,085,124, Cl. 91-433.000.

Hirosune, Kouji: See—
Ishii, Kazuhiro; Hirosune, Kouji; Arinobu, Ichiro; and Sato, Kazu-shi, 5,086,366, Cl. 361-94.000.

Hirzel, Frederic J., to Vocal Technologies, Ltd. Direct connect modem deriving power from telephone line. 5,086,454, Cl. 379-98.000.

Hisao, Nakagawa; Yasunaka, Shinsaku; and Morita, Masato, to Matsushita Electric Works, Ltd. Dry shaver with a trimmer. 5,084,967, Cl. 30-34.100.

Hishinuma, Titaru: See—
Komami, Yuji; Kan, Megumi; Tamai, Toshiyuki; and Hishinuma, Titaru, 5,085,066, Cl. 72-13.000.

Hitachi Construction Machinery Co., Ltd.: See—
Hirata, Toichi, 5,085,051, Cl. 60-368.000.

Nakamura, Shigetaka; Gotoh, Yasuharu; and Izumi, Eiki, 5,085,128, Cl. 91-504.000.

Hitachi Device Engineering Co., Ltd.: See—
Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.

Hitachi Instrument Eng. Co., Ltd.: See—
Toita, Hiroshi; Hirose, Hiroshi; and Tamura, Hifumi, 5,086,227, Cl. 250-309.000.

Hitachi, Ltd.: See—
Itoh, Fumikazu; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Hongo, Mikio, 5,086,015, Cl. 437-173.000.

Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiko, 5,085,495, Cl. 359-455.000.

Nakagawa, Hiroaki; and Takehana, Yoichi, 5,085,899, Cl. 428-14.000.

Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.

Noro, Takanobu; Matsumoto, Kunio; Oshima, Muneo; Kanda, Naoya; Sakaguchi, Suguru; and Murata, Akira, 5,086,337, Cl. 357-79.000.

Okamoto, Yukio; Yasuda, Makoto; and Koga, Masataka, 5,086,255, Cl. 315-111.210.

Sakata, Akiharu, 5,086,408, Cl. 395-600.000.

Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, 5,086,259, Cl. 315-368.250.

Setoyama, Eiji; Kamei, Mitsuhiro; and Ohno, Yasunori, 5,085,755, Cl. 204-298.160.

Soraoka, Minolu; Kawasaki, Yoshinao; Kudo, Katsuyoshi; and Tsubone, Tsunehiko, 5,085,750, Cl. 204-192.320.

Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.

Tanaka, Teruo; Hamanaka, Naoki; Nakagoshi, Junji; Omoda, Koichiro; and Nagashima, Shigeo, 5,086,498, Cl. 395-200.000.

Toita, Hiroshi; Hirose, Hiroshi; and Tamura, Hifumi, 5,086,227, Cl. 250-309.000.

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Tsukamoto, Moriaki; and Inoue, Hisamichi, 5,085,948, Cl. 429-11.000.

Watanabe, Takao; Hori, Ryoichi; Kitsukawa, Goro; Kawajiri, Yoshiki; Kawahara, Takayuki; and Itoh, Kiyoo, 5,086,238, Cl. 307-296.600.

Yanadori, Michio; Fukushima, Toshihiko; and Kunugi, Yoshifumi, 5,085,271, Cl. 165-104.120.

Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Jooraku, Fumio, 5,085,806, Cl. 252-518.000.

Hitachi Maxell, Ltd.: See—
Kita, Fusaji; Kawakami, Akira; and Kajita, Kozo, 5,085,954, Cl. 429-194.000.

Matoba, Mikio; Sugawara, Ken; and Sakairi, Shigeru, 5,086,388, Cl. 395-425.000.

Matsushima, Seiichi; Yagi, Masahide; Suzuki, Masahiro; and Mori, Yasuyuki, 5,085,910, Cl. 428-64.000.

Hitachi Metals, Ltd.: See—
Tokunaga, Masatoshi; Nozawa, Yasuto; and Iwasaki, Katsunori, 5,085,715, Cl. 148-101.000.

Hitachi Seiko, Ltd.: See—
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 5,086,203, Cl. 219-69.120.

Hitachi Setsubi Engineering Co., Ltd.: See—
Nakaki, Masao; and Aoyama, Susumu, 5,085,723, Cl. 156-250.000.

Hitomi, Mitsuo; and Hattori, Toshihiko, to Mazda Motor Corporation. Intake piping structure for multi-cylinder engine. 5,085,178, Cl. 123-52.000.

Hitotsuyanagi, Hajime; Sawada, Kazuo; Takano, Satoshi; and Inazawa, Shinji, to Sumitomo Electric Industries, Ltd. Ceramic superconducting member. 5,086,037, Cl. 505-1.000.

Hobbs, James D., to General Devices Co., Inc. Slide release mechanism. 5,085,523, Cl. 384-21.000.

Hock, Stefan: See—
Gammel, Edwin; Rohmfeld, Josef; and Hock, Stefan, 5,086,442, Cl. 378-132.000.

Hodge, Allan M. Trash bin system. 5,085,341, Cl. 220-331.000.

Hodgins, Ron: See—
Hicks, Thomas W.; and Hodgins, Ron, 5,085,380, Cl. 248-110.000.

Hodnett, William P., III, to Thor Radiation Research, Inc. Fabric having ravel resistant selvages and method for imparting the same. 5,085,917, Cl. 428-173.000.

Hoechst AG: See—
Pelster, Gerhard; and Schidlo, Wolfram, 5,085,668, Cl. 8-549.000.

Hoechst Aktiengesellschaft: See—
Antberg, Martin; Spaleck, Walter; Rohrmann, Jurgen; Luker, Hartmut; and Winter, Andreas, 5,086,134, Cl. 526-126.000.

Frass, Werner; Mohr, Dieter; and Rode, Klaus, 5,085,974, Cl. 430-284.000.

Frommold, Hans-Dieter; and Wiezer, Hartmut, 5,085,669, Cl. 8-568.000.

Mueller, Werner H., 5,085,975, Cl. 430-285.000.

Porz, Christoph; Christensen, Bernd; Kyaw-Naing, Elena; Guelden, Walter; and Paulus, Erich F., 5,085,842, Cl. 423-226.000.

Rieper, Wolfgang, 5,086,168, Cl. 534-579.000.

Weber, Jurgen; Bexten, Ludger; Kupies, Dieter; Lappe, Peter; and Springer, Helmut, 5,085,835, Cl. 423-22.000.

Wilhelm, Thomas; Schloegl, Gunter; Bothe, Lothar; and Crass, Guenther, 5,085,916, Cl. 428-156.000.

Hoffman, Larry D. Portable sportsman seating apparatus. 5,085,446, Cl. 280-19.100.

Hoffmann-La Roche Inc.: See—
Fujiwara, Akiko; and Hoshino, Tatsuo, 5,085,993, Cl. 435-138.000.

Hofmann, Eberhard; to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Opening roll for an open-end spinning device. 5,085,047, Cl. 57-408.000.

Hofmann, Manfred, to Siemens Aktiengesellschaft. Rotation detector for a commutator motor excited by pole units. 5,086,243, Cl. 310-68.000.

Hofmann, Richard W.: See—
Groya, Robert J.; and Hofmann, Richard W., 5,085,331, Cl. 215-245.000.

Hofstra, Joseph S.; Karaskiewicz, Ronald J.; and Fischer, Mark R. Smoker's booth. 5,085,134, Cl. 454-67.000.

Hojo, Atuo: See—

Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.

Holcomb, Grove R.; and Douglas, Bruce M. Adjustable form brace. 5,085,398, Cl. 249-24.000.

Holcomb, Orla L., Jr.: See—

Carr, Clyde E.; Holcomb, Orla L., Jr.; and Rodino, Louis S., 5,085,296, Cl. 188-79.550.

Holdren, Frederick V.; and Novack, Mitchell J., to Sundstrand Data Control, Inc. Accelerometer with mounting/coupling structure for an electronics assembly. 5,085,079, Cl. 73-517.00B.

Hollister, Richard M.: See—

Swan, Ellen L.; Basu, Rajat S.; and Hollister, Richard M., 5,085,798, Cl. 252-171.000.

Holmes, Carlton S.: See—

Clements, Luther D., Jr.; and Holmes, Carlton S., 5,085,175, Cl. 119-171.000.

Holmes, William S.: See—

Lowe, Edward J.; and Holmes, William S., 5,085,846, Cl. 423-316.000.

Homma, Noriyuki: See—

Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.

Hon, Wai-Leung: See—

Hall, Harry K.; Birchak, James R.; and Hon, Wai-Leung, 5,086,271, Cl. 324-158.00R.

Honda Giken Kogyo K.K.: See—

Duroda, Shigetaka; Igarashi, Hisashi; Kano, Hidekazu; and Suzuki, Takeshi, 5,085,194, Cl. 123-479.000.

Honda Giken Kogyo Kabushiki Kaisha: See—

Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.

Shiraiishi, Shuji; Nishihara, Takashi; Kiryu, Hironobu; and Omomo, Naoki, 5,085,288, Cl. 180-197.000.

Yamada, Yoshikazu; and Nakano, Hiroyuki, 5,085,184, Cl. 123-182.100.

Honda, Koji: See—

Kawata, Hideaki; Funato, Masatomi; Umeda, Kiminori; Kawano, Nobuaki; and Honda, Koji, 5,085,964, Cl. 430-106.600.

Honda, Ronald T.: See—

Stampa, Juergen P.; Honda, Ronald T.; and Hendry, James D., 5,085,091, Cl. 74-206.000.

Honda, Toshio: See—

Tanuma, Tsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 5,085,721, Cl. 156-108.000.

Honeywell Inc.: See—

Bonne, Ulrich; Tate, George J.; and Schwarz, Edward, 5,085,576, Cl. 431-22.000.

Gray, Scott L.; and Thompson, Steven R., 5,086,429, Cl. 371-9.100.

Waruszewski, Harry L., Jr., 5,086,396, Cl. 364-454.000.

Hong, Rong-Fang: See—

Huang, Hui-Huay; and Hong, Rong-Fang, 5,085,189, Cl. 123-275.000.

Hong, Sung W.; and Cangelosi, Philip J., to Uniroyal Goodrich Tire Company, The. Sealant product, laminate thereof, and pneumatic tire constructed therewith. 5,085,942, Cl. 428-492.000.

Hongo, Kazuya: See—

Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nakada, Katsumi; and Marumo, Teruomi, 5,085,960, Cl. 430-58.000.

Hongo, Mikio: See—

Itoh, Fumikazu; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Hongo, Mikio, 5,086,015, Cl. 437-173.000.

Hoover, Kenneth C.: See—

Scoggins, Lacey E.; Hoover, Kenneth C.; and Shang, Wei-Teh W., 5,086,163, Cl. 528-388.000.

Hopper, Hans P., to British Petroleum Company, p.l.c., The. Sub-sea well injection system. 5,085,277, Cl. 166-341.000.

Hori, Ryoichi: See—

Watanabe, Takao; Hori, Ryoichi; Kitsukawa, Goro; Kawajiri, Yoshiki; Kawahara, Takayuki; and Itoh, Kiyoo, 5,086,238, Cl. 307-296.600.

Hori, Tetsuya: See—

Horikawa, Hiroshi; Fukazawa, Akira; and Hori, Tetsuya, 5,085,871, Cl. 426-2.000.

Horikawa, Hiroshi; Fukazawa, Akira; and Hori, Tetsuya, to C. Itoh Feed Mills; and Meiji Seika Kaisha, Ltd. Feed composition for fowls. 5,085,871, Cl. 426-2.000.

Horikawa, Hiroshi; Watanabe, Akira; Koyama, Hiroo; and Mori, Ikuro, to Fuji Photo Film Co., Ltd. Image output command method for image processing system. 5,086,497, Cl. 395-147.000.

Horiya, Yoshiharu: See—

Yamasaki, Makoto; Horiya, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.

Hormansdorfer, Gerd. Phase change materials and use thereof. 5,085,790, Cl. 252-70.000.

Horn, Hans, to Skis Rossignol S.A. Release binding with plate. 5,085,456, Cl. 280-618.000.

Hornsby, James C., to Du Pont de Nemours, E. I., and Company. Fibrils loaded with electromagnetic-wave obscurants. 5,086,108, Cl. 524-440.000.

Horton-Corcoran, Bernard; and Rowlandson, Nicholas, to Horton Manufacturing Company Inc. Self-actuating, dry-fire prevention safety device for a crossbow. 5,085,200, Cl. 124-25.000.

Horton, Jerry R.; and Tasker, G. William, to Galileo Electro-Optics Corporation. Microchannel electron multipliers. 5,086,248, Cl. 313-103.0CM.

Horton Manufacturing Company Inc.: See—

Horton-Corcoran, Bernard; and Rowlandson, Nicholas, 5,085,200, Cl. 124-25.000.

Hoshi, Kazuhiro: See—

Ohno, Kiyotaka; Ohtake, Atsushi; Endoh, Takashi; Ito, Shigeki; and Hoshi, Kazuhiro, 5,086,071, Cl. 514-468.000.

Hoshino, Tatsuo: See—

Fujiwara, Akiko; and Hoshino, Tatsuo, 5,085,993, Cl. 435-138.000.

Hosiden Corporation: See—

Sekiguchi, Shigemi, 5,085,592, Cl. 439-188.000.

Hosiden Electronics Co., Ltd.: See—

Ukai, Yasuhiro; Sunata, Tomihisa; and Yukawa, Teizo, 5,086,347, Cl. 359-87.000.

Hosono, Kunihiro, to Mitsubishi Denki Kabushiki Kaisha. Method of repairing a mask. 5,085,957, Cl. 430-5.000.

Hotta, Ikuya: See—

Sakata, Satoshi; Sato, Kazuo; Gotoh, Yuichi; Azumai, Mitsuo; and Hotta, Ikuya, 5,086,261, Cl. 318-268.000.

Hotta, Yoshihiko; Maruyama, Syoji; and Kawaguchi, Makoto, to Ricoh Company, Ltd. Reversible thermosensitive recording material. 5,085,934, Cl. 428-335.000.

Hough, Harold L.: See—

Blaisdell, Ronald G.; and Hough, Harold L., 5,086,249, Cl. 313-318.000.

Houston Area Research Center: See—

Huson, Frederick R., 5,085,149, Cl. 104-281.000.

Hovey, Verl: See—

Peterson, Brent; and Hovey, Verl, 5,085,387, Cl. 248-154.000.

Howard, Ronald A., to UCAR Carbon Technology Corporation. High purity, high temperature pipe thread sealant paste. 5,085,700, Cl. 106-33.000.

Howlett, Ian C. Method of constructing tubular spars. 5,085,820, Cl. 264-255.000.

Hoyle, Charles D.: See—

Boyer, Charles E., III; Borchers, Eric J.; Kuo, Richard J.; and Hoyle, Charles D., 5,085,931, Cl. 428-328.000.

Hradisky, John L.: See—

Doxey, Andre G.; and Hradisky, John L., 5,085,340, Cl. 220-298.000.

Hsu, Chung-Chiang: See—

Cannon, John B.; Hsu, Chung-Chiang; Papp, Karen J.; and Williams, N. Adeyinka, 5,085,864, Cl. 424-450.000.

Hu, James C.: See—

Schumann, Steven J.; and Hu, James C., 5,086,325, Cl. 357-23.500.

Huang, Hui-Huay; and Hong, Rong-Fang, to Industrial Technology Research Institute. Air-assisted fuel injection applied in the two-stroke engine of flame-jet ignition type. 5,085,189, Cl. 123-275.000.

Huang, Tien-Hung. Centrifugal filter casing. 5,085,771, Cl. 210-332.000.

Hudson, William. Cutter having a single blade for a safety belt. 5,085,449, Cl. 280-801.000.

Huels Aktiengesellschaft: See—

Reese, Dirk, 5,086,079, Cl. 521-56.000.

Huerlimann, Peter; and Van Meir, Eugene, to Nestec S.A. Reclosable container having a pouring spout. 5,085,348, Cl. 222-153.000.

Hughes Aircraft Company: See—

Turner, Raymond L., 5,085,365, Cl. 228-223.000.

Hughes, Robert W. Cam lobe having orientating means. 5,085,099, Cl. 74-567.000.

Humphries, William H.: See—

Story, Martha F.; Ragland, Glen W.; Humphries, William H.; Koht, Lowell; and Uken, William D., 5,085,597, Cl. 439-521.000.

Hung, Liang-Sun; and Chatterjee, Dilip K., to Eastman Kodak Company. Electrically conductive article (I). 5,086,035, Cl. 505-1.000.

Hunter, Robert M. Child-resistant lighter with gas and spark control. 5,085,578, Cl. 431-277.000.

Husky Corporation: See—

Fink, Arthur C., Jr.; and Mitchell, Thomas O., 5,085,258, Cl. 141-207.000.

Huson, Frederick R., to Houston Area Research Center. Ground vehicle suspension and guidance and electromagnetic system thereof with multiple surface arcuate reaction rails. 5,085,149, Cl. 104-281.000.

Hutchins, Donald H., to Hutchins Manufacturing Company. Reciprocating abrading or polishing tool with improved suction system. 5,085,012, Cl. 51-273.000.

Hutchins Manufacturing Company: See—

Hutchins, Donald H., 5,085,012, Cl. 51-273.000.

Hutter, G. Frederick, to Westvaco Corporation. Amniopolyester resins as dilution extenders for zinc-containing metal resinates inks. 5,085,699, Cl. 106-30.000.

Huttlin, Herbert. Fluidized bed apparatus, in particular for granulation of pulverulent substance. 5,085,170, Cl. 118-303.000.

Hutton, Robert F.: See—

Capek, Raymond G.; Greiner, Siegfried M.; and Hutton, Robert F., 5,086,251, Cl. 313-407.000.

Hydac Technology GmbH: See—

Kasubke, Volker, 5,085,384, Cl. 248-62.000.

Hyundai Electronics Industries Co., Ltd.: See—

Son, Kwang Sik, 5,086,012, Cl. 437-70.000.

Ichikawa, Yasunori: See—

Okamoto, Masaru; Ichikawa, Yasunori; Inoue, Toshihide; and Yamanaka, Toru, 5,085,807, Cl. 252-609.000.

Ichikawa, Yukio: See—

Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.

Ichioaka, Tetsumi: See—

Ikeda, Kazutoshi; Kuriyama, Hiroshi; Ichioaka, Tetsumi; and Matsuoka, Ryouji, 5,085,132, Cl. 98-2.110.

Ichitsuka, Takeshi: See—

Tsuru, Sumiaki; Yokoo, Akihiko; Ichitsuka, Takeshi; and Hiraide, Tsuneo, 5,085,781, Cl. 210-692.000.

ICI Americas Inc.: See—

Carter, Charles G.; Lee, David L.; Michaely, William J.; and Kraatz, Gary W., 5,085,688, Cl. 71-103.000.

Ide, Yoshihiro: See—

Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.

Idei, Youji: See—

Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.

Iff, Ronald H.: See—

Perdelwitz, Lee E., Jr.; Pfeiffer, Gustav O.; Neogi, Amar N.; Iff, Ronald H.; and Mehta, Haresh R., 5,085,914, Cl. 428-137.000.

Igaki, Masahiko: See—

Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, 5,085,423, Cl. 271-266.000.

Igarashi, Hisashi: See—

Duroda, Shigetaka; Igarashi, Hisashi; Kano, Hidekazu; and Suzuki, Takeshi, 5,085,194, Cl. 123-479.000.

Iguchi, Kazuo: See—

Tezuka, Koji; Amemiya, Shigeo; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 5,086,436, Cl. 375-25.000.

Iguchi, Seiya: See—

Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Kuwamoto, Hideharu, 5,085,991, Cl. 435-108.000.

Ihara Chemical Industry Co., Ltd.: See—

Oyaizu, Yoshihiro, 5,086,153, Cl. 528-68.000.

Iida, Kazuhiko; and Koizumi, Masahiro, to Seiko Epson Corporation. Image forming apparatus. 5,086,309, Cl. 346-160.000.

Iida, Yasunobu; Nakamura, Masato; Takeuchi, Nobuyuki; and Onishi, Keiji, to Central Glass Company, Limited. Neat reflecting glass with multilayer coating. 5,085,926, Cl. 428-216.000.

Iiyama, Katsuaki: See—

Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,086,125, Cl. 525-432.000.

Iizuka, Yo: See—

Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.

Ikada, Yoshito; Okada, Toshiyuki; Kawai, Tatsuya; and Yoshimoto, Michiaki, to Japan Medical Supply Co., Ltd. Catheter and method for the manufacture thereof. 5,085,632, Cl. 604-29.000.

Ikeda, Kaori: See—

Obara, Sakae; Muto, Hiroaki; Mizuno, Sumiko; Chiba, Tohru; Saitoh, Izumi; and Ikeda, Kaori, 5,086,077, Cl. 514-781.000.

Ikeda, Kazushige: See—

Ueyoko, Kiyoshi; Mizukoshi, Yasuyoshi; Ikeda, Kazushige; and Yamada, Munemitsu, 5,085,260, Cl. 152-554.000.

Ikeda, Kazutoshi; Kuriyama, Hiroshi; Ichioaka, Tetsumi; and Matsuoka, Ryouji, to Toyota Gosei Co., Ltd. Ventilating apparatus. 5,085,132, Cl. 98-2.110.

Ikeda, Kouji: See—

Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, 5,085,814, Cl. 264-126.000.

Ikeno, Masayuki; and Fujiki, Hironao, to Shin-Etsu Chemical Co., Ltd. Organopolysiloxane composition. 5,086,147, Cl. 528-15.000.

Imaizumi, Tomio: See—

Kato, Tetsuo; and Imaizumi, Tomio, 5,085,300, Cl. 188-322.150.

Imamura, Hiroyuki; Kurata, Takafumi; Yokota, Hiroaki; and Noguchi, Naoyuki, to Mazda Motor Corporation; and Jatco Corporation. Lockup control device of a fluid transmission. 5,085,301, Cl. 192-0.076.

Imamura, Kaneco: See—

Aoki, Tsuneaki; Makimura, Toshiro; and Imamura, Kaneco, 5,085,369, Cl. 239-5.000.

Imamura, Takashi: See—

Takashima, Akio; Hattori, Iwakazu; and Imamura, Takashi, 5,086,136, Cl. 526-177.000.

Imataki, Hiroyuki: See—

Hiraoka, Mizuho; and Imataki, Hiroyuki, 5,085,925, Cl. 428-215.000.

Imbert, Gerard: See—

Bertrand, Gerard; Imbert, Gerard; and Narduzzo, Gabriel, 5,085,516, Cl. 556-394.000.

Imhof, Otwin, to Deutsche Automobilgesellschaft mbh. Process and device for the continuous filling of fiber structure electrode frames provided with current discharge use. 5,085,254, Cl. 141-1.100.

Imhof, Otwin; and Kistrup, Holger, to Deutsch Automobilgesellschaft. Fiber-structure electrode support with welded-on current discharge lug and production method therefor. 5,085,956, Cl. 429-211.000.

Imperial Chemical Industries plc: See—

Gregory, Peter; and White, Raymond, 5,085,961, Cl. 430-59.000.

Implementors Overseas Limited: See—

Bildner, Heinz H., 5,085,453, Cl. 280-612.000.

Impresa Costruzioni Soc. Fra. S.a.r.l.: See—

Salabe, Mario; and Rossi, Adelio, 5,085,765, Cl. 209-2.000.

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Inaba, Hiroo: See—

Taga, Kazuaki; Tsuda, Takeshi; Inaba, Hiroo; and Ogawa, Hiroshi, 5,085,915, Cl. 428-141.000.

Inagaki, Hiroshi: See—

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Inagaki, Jitsuo. Method of treating medical wastes and containers to be used for the treatment method. 5,085,338, Cl. 220-254.000.

- Janda, Rudolph W.; Douglas, Jerald L.; and Condon, Edward F., Jr., 5,086,267, Cl. 325-350.000.
- International Business Machines Corporation: See—
- Arroyo, Ronald X.; and Hanna, James T., 5,086,387, Cl. 395-550.000.
- Batey, John; Tiwari, Sandip; and Wright, Steven L., 5,086,321, Cl. 357-23.200.
- Brodsky, Stephen B.; Joshi, Rajiv V.; Lechaton, John S.; Ryan, James G.; and Schepis, Dominic J., 5,086,016, Cl. 437-190.000.
- Chung, Connie Y.; Keen, Robert G.; Raymond, Ozella; Snyder, Jan W.; and Tohlen, Dennis A., 5,086,503, Cl. 395-700.000.
- Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,086,018, Cl. 437-207.000.
- Glassman, Edward; Hanson, William A.; Kazanides, Peter; Mittelstadt, Brent D.; Musits, Bela L.; Paul, Howard A.; and Taylor, Russell H., 5,086,401, Cl. 395-94.000.
- Gray, Michael A.; Halbert, Alan R.; and Todd, Stephen J., 5,086,495, Cl. 395-120.000.
- Kelly-Mahaffey, William L.; and Stafford, James M., 5,086,478, Cl. 382-8.000.
- Kerr, Randal H.; and Mesnard, Robert M., 5,086,393, Cl. 364-419.000.
- International Integrated Communications, Ltd.: See—
- Castro, Peter D., 5,085,469, Cl. 283-94.000.
- International Paper Company: See—
- Marano, Gerald A.; Evans, Donald; Lomax, Edwin D.; and Harbison, James C., 5,085,035, Cl. 53-510.000.
- Interox (Societe Anonyme): See—
- Lecloux, Andre; Declerck, Claude; and Legrand, Franz, 5,086,189, Cl. 549-531.000.
- Intersec, Inc.: See—
- Ingebrigtsen, Kjell A.; and Aurand, William C., 5,085,221, Cl. 128-660.100.
- Inubushi, Toshiya; Musha, Atsushi; and Hasegawa, Manabu, to Mitsubishi Denki Kabushiki Kaisha. Thermally adaptive housing for hand held radio telephone device. 5,086,509, Cl. 455-89.000.
- Inui, Ryoosuke; and Matsubara, Susumu, to Takasago Perfumery Co., Ltd.; and Kabushiki Kaisha Tatsumi Kogyo. Actuator for liquid ejection. 5,085,353, Cl. 222-402.130.
- Inuzuka, Hideo: See—
- Hagiya, Toshimichi; Watanabe, Junichi; Kanno, Tetsuo; Inuzuka, Hideo; Yamahata, Makoto; Sofue, Masaaki; and Aota, Yoshiaki, 5,086,422, Cl. 369-75.100.
- Inventio AG: See—
- Aime, Michael, 5,085,293, Cl. 187-1.00R.
- Ippolito, Vladimir V.: See—
- Fedorov, Svyatoslav; Linnik, Leonid F.; Antropov, Gennady M.; Arnaudov, Leonid N.; Ippolito, Vladimir V.; Streltsov, Valentin F.; Stromakov, Alexander P.; and Shigina, Nina A., 5,085,627, Cl. 600-14.000.
- Iris Medical Instruments, Inc.: See—
- Kelsoe, Wayne E.; and Buzawa, David M., 5,085,492, Cl. 385-60.000.
- Iris Systems Inc.: See—
- Johnson, Dennis F.; and Wiebe, Michael, 5,086,292, Cl. 340-637.000.
- Irish, Gary H.: See—
- Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,086,018, Cl. 437-207.000.
- Irsid: See—
- Jolivet, Jean-Marc; and Sosin, Laurent, 5,085,264, Cl. 164-455.000.
- Ishida, Hiroichi: See—
- Maemura, Kousei; and Ishida, Hiroichi, 5,086,441, Cl. 377-107.000.
- Ishida, Tokuji; Norita, Toshio; and Ootsuka, Hiroshi, to Minolta Camera Kabushiki Kaisha. Automatic focus control device. 5,086,217, Cl. 250-201.800.
- Ishida, Toshimasa: See—
- Okayama, Hideaki; and Ishida, Toshimasa, 5,086,349, Cl. 359-124.000.
- Ishiguro, Kazuya: See—
- Hariki, Kazuo; Koizumi, Tatsuya; Ishiguro, Kazuya; and Kanitani, Kiyoshi, 5,086,262, Cl. 318-568.100.
- Ishiguro, Shiro, to Casio Computer Co., Ltd. Electronic stringed musical instrument with parameter selecting function. 5,085,120, Cl. 84-737.000.
- Ishihara, Hidetoshi: See—
- Hayashi, Shoichi; Ishihara, Hidetoshi; and Ueda, Atsushi, 5,085,064, Cl. 68-23.001.
- Ishihara, Yukihiro; Yamamoto, Tamotsu; and Matsui, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Rotary encoder having stationary central support shaft. 5,086,221, Cl. 250-231.130.
- Ishii, Kazuhide; and Kawasaki, Tatsuo, to Kawasaki Steel Corporation. Oxidation resistant Fe-Cr-Al steel. 5,085,829, Cl. 420-79.000.
- Ishii, Kazuhiro; Hirotsune, Kouji; Arinobu, Ichiro; and Sato, Kazushi, to Mitsubishi Denki Kabushiki Kaisha. Prealarm circuit breaker. 5,086,366, Cl. 361-94.000.
- Ishii, Kazuhiro; and Moriawaki, Hideaki, to Mitsubishi Denki K.K. Circuit breaker. 5,086,367, Cl. 361-94.000.
- Ishii, Shigeru: See—
- Wakahara, Tatsuo; Iwanaga, Kazuyoshi; and Ishii, Shigeru, 5,085,105, Cl. 74-866.000.
- Ishii, Tatsuya; and Miyakawa, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Input protection circuit and output driver circuit comprising MIS semiconductor device. 5,086,322, Cl. 357-23.300.
- Ishikawa, Mitsuo; and Watarai, Shigeaki, to Senju Metal Industry Co., Ltd.; and Nihon Junyaku Co., Ltd. Pressure-sensitive adhesive for temporarily securing electronic devices. 5,085,364, Cl. 228-139.000.
- Ishimaru, Junzo: See—
- Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyoji, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.
- Ishino, Toshihiro; Sakai, Kouzou; and Kido, Nobuyuki, to Asahi Glass Company Ltd. High zirconia fused cast refractory. 5,086,020, Cl. 501-105.000.
- Ishizaki, Hiroshi: See—
- Itoh, Hajime; Ito, Atsuo; Inoue, Yoshihiro; and Ishizaki, Hiroshi, 5,085,515, Cl. 356-398.000.
- Islam, Nayeem, to Sun Microsystems, Inc. Method and apparatus for benchmarking the working set of window-based computer systems. 5,086,386, Cl. 395-600.000.
- Isomura, Syohei: See—
- Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
- Isozumi, Shuzoo, to Mitsubishi Denki K.K. Starter including an electric motor. 5,086,244, Cl. 310-89.000.
- ISP Investments Inc.: See—
- Narayanan, Kolazi S.; and Taylor, Paul D., 5,085,795, Cl. 252-162.000.
- Issac, Francois: See—
- Gobin, Vincent; Labaune, Gerard; and Issac, Francois, 5,086,274, Cl. 324-239.000.
- Isuzu Motors Limited: See—
- Koga, Hidetaka, 5,085,092, Cl. 74-333.000.
- Kurabayashi, Ken; Tsuchiya, Yoshinobu; Yoshida, Akio; Koizumi, Hitoshi; and Niida, Yoriaki, 5,086,373, Cl. 361-502.000.
- Itakura, Haruo; and Kurihara, Susumu, to Konica Corporation. Temperature controller having a controller breakage detector. 5,086,212, Cl. 219-505.000.
- Itami, Takaharu; Nikaido, Masaru; and Yamaguchi, Hideki, to Kabushiki Kaisha Toshiba. Method of encapsulating an AC power type EL panel. 5,085,605, Cl. 445-25.000.
- Ito, Fumitaka: See—
- Ando, Kazuo; Asai, Nobuko; Ito, Fumitaka; Mano, Takashi; Nakane, Masami; Satake, Kunio; and Shimada, Kaoru, 5,086,062, Cl. 514-321.000.
- Ito, Hidenori: See—
- Sugasawa, Isamu; and Ito, Hidenori, 5,085,090, Cl. 74-202.000.
- Ito, Koichi; and Toba, Masanori, to Kabushiki Kaisha Toshiba. Radio telephone system and its control method. 5,086,452, Cl. 379-58.000.
- Ito, Masahiro; and Hayashi, Yukio, to Sunstar Giken Kabushiki Kaisha. Moisture-curing sealant composition. 5,086,151, Cl. 528-53.000.
- Ito, Nobue: See—
- Nunogaki, Naohika; Toyama, Tetuo; and Ito, Nobue, 5,086,210, Cl. 219-270.000.
- Ito, Susumu: See—
- Torii, Nobutoshi; Ito, Susumu; and Terada, Akihiro, 5,085,619, Cl. 474-138.000.
- Ito, Takeshi, to Jidosha Denki Kogyo K.K. Wiper apparatus with reversing motor protected from overload. 5,086,260, Cl. 318-266.000.
- Ito, Toshifumi: See—
- Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atsuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.
- Ito, Yukiyo: See—
- Satoh, Tsutomu; Shimizu, Ikuo; and Ito, Yukiyo, 5,085,909, Cl. 428-64.000.
- Itoh, Fumikazu; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Hongo, Mikio, to Hitachi, Ltd. Method of etching a semiconductor device by an ion beam. 5,086,015, Cl. 437-173.000.
- Itoh, Hajime; Ito, Atsuo; Inoue, Yoshihiro; and Ishizaki, Hiroshi, to Mitsubishi Metal Corporation. Method and apparatus for inspecting quality of manufactured articles. 5,085,515, Cl. 356-398.000.
- Itoh, Kuchi; Shibano, Takeshi; and Yoshinaga, Kenji, to Mitsubishi Petrochemical Company Limited. Process for producing highly water absorptive polymer. 5,086,133, Cl. 526-93.000.
- Itoh, Kiyoo: See—
- Watanabe, Takao; Hori, Ryoichi; Kitsukawa, Goro; Kawajiri, Yoshiki; Kawahara, Takayuki; and Itoh, Kiyoo, 5,086,238, Cl. 307-296.600.
- Itoh, Kunio; Umemura, Mitsuo; and Tabei, Eiichi, to Shin-Etsu Chemical Co., Ltd. Silicone UV absorbers containing silane units. 5,086,127, Cl. 525-474.000.
- Ito, Shigeki: See—
- Ohno, Kiyotaka; Ohtake, Atsushi; Endoh, Takashi; Ito, Shigeki; and Hoshi, Kazuhiro, 5,086,071, Cl. 514-468.000.
- Ito, Atsuo: See—
- Itoh, Hajime; Ito, Atsuo; Inoue, Yoshihiro; and Ishizaki, Hiroshi, 5,085,515, Cl. 356-398.000.
- Itoyama, Takatoshi: See—
- Karasawa, Wataru; Itoyama, Takatoshi; Takao, Itaru; Obikane, Tadashi; and Koike, Hisashi, 5,086,270, Cl. 324-158.00P.
- ITT Corporation: See—
- Klinger, Gary, 5,084,954, Cl. 29-237.000.
- Ivarson, Nemo. Arrangement for mixing powder with liquid. 5,085,513, Cl. 366-155.000.
- Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiro, to Hitachi, Ltd. Multi-screen projector. 5,085,495, Cl. 359-455.000.

- Iwamoto, Masayuki; Minami, Koji; and Watanabe, Kaneo, to Sanyo Electric Co., Ltd. Photovoltaic device. 5,085,711, Cl. 136-258.000.
- Iwamoto, Norikazu, to Nippon Paint Co., Ltd. Heat-curing type resinous composition and heat-resisting molded article prepared therefrom. 5,086,152, Cl. 528-55.000.
- Iwanaga, Kazuyoshi: See—
- Wakahara, Tatsuo; Iwanaga, Kazuyoshi; and Ishii, Shigeru, 5,085,105, Cl. 74-866.000.
- Iwanaga, Naruyuki; Yamaguti, Tosiaki; Fujieda, Nobuhiko; and Tsuzikawa, Yoshihiro, to Mitsui Toatsu Chemicals, Inc. Electrolytic cell. 5,085,752, Cl. 204-243.00R.
- Iwaoka, Toshio: See—
- Danzaki, Tsutomu; Iwaoka, Toshio; Yamaguchi, Yuichi; and Tsukahara, Akihiko, 5,085,286, Cl. 180-179.000.
- Iwasa, Tadanobu: See—
- Yasukawa, Takemasa; Iwasa, Tadanobu; and Midooka, Masanori, 5,085,005, Cl. 49-377.000.
- Iwasaki, Katsunori: See—
- Tokunaga, Masatoshi; Nozawa, Yasuto; and Iwasaki, Katsunori, 5,085,715, Cl. 148-101.000.
- Iwasaki, Takeshi; and Yamada, Hisashi, to Mitsubishi Denki K.K. Wire guides for traveling wire type apparatus. 5,086,202, Cl. 219-69.120.
- Iwase, Yoshinobu; Sonoda, Shiro; Watanabe, Kazuaki; Minemoto, Isamu; and Akashi, Teruo, to Aisin Seiki Kabushiki Kaisha. Hydraulic control apparatus for automatic transmissions. 5,085,102, Cl. 74-867.000.
- Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, to Canon Kabushiki Kaisha. Print control apparatus for effective multiple printing of images onto a common printing frame. 5,086,310, Cl. 354-75.000.
- Iwata, Kouichi; and Fukaya, Katsuyoshi, to Aisan Kogyo Kabushiki Kaisha. Flow control device. 5,085,248, Cl. 137-625.480.
- Iwata, Shigemitsu, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 5,085,294, Cl. 187-134.000.
- Iwata, Shigemi: See—
- Kitagawa, Shigeo; Tachino, Kenzo; Nagata, Yasuhiro; Yamamoto, Tomochiro; Iwata, Shigemi; Hirabayashi, Terumi; and Tanino, Junichi, 5,086,450, Cl. 379-40.000.
- Izumi, Eiki: See—
- Nakamura, Shigetaka; Gotoh, Yasuhiro; and Izumi, Eiki, 5,085,128, Cl. 91-504.000.
- J. M. Huber Corporation: See—
- Withiam, Michael C., 5,085,705, Cl. 106-287.170.
- J. M. Voith GmbH: See—
- Sollinger, Hans-Peter, 5,085,168, Cl. 118-126.000.
- J. T. Baker, Inc.: See—
- Crane, Laura J.; and Kakodkar, Sunil V., 5,085,779, Cl. 210-635.000.
- Jackson, Donald T. Cam operated workpiece engaging apparatus. 5,085,480, Cl. 294-116.000.
- Jackson, Ricky A.: See—
- Garza, Cesar M.; Jackson, Ricky A.; and Priebe, Ryan E., 5,085,729, Cl. 156-628.000.
- Jackson, Scott C.: See—
- Deak, Gedeon I.; and Jackson, Scott C., 5,085,904, Cl. 428-35.700.
- Jacobs, Barry: See—
- Franklin, Ralph; Parr, William J.; Fesman, Gerald; and Jacobs, Barry, 5,086,083, Cl. 521-129.000.
- Jacque, John F.: See—
- Freier, Edward Jr.; Hays, Gary A.; Jacque, John F.; and Klas, Kenneth H., 5,085,044, Cl. 56-13.500.
- Jacquier, Paul: See—
- Grypczynski, Daniel; Jacquier, Paul; and Guglielmo, Andre, 5,086,201, Cl. 219-69.170.
- Jaeger: See—
- Baux, Christian; and Salaun, Thierry, 5,085,078, Cl. 73-313.000.
- Jaffe, James M.; and Abt, Norman E., to National Semiconductor Corporation. Sense amplifier and method for ferroelectric memory. 5,086,412, Cl. 365-145.000.
- Jaguar Cars Limited: See—
- Maguire, Sean P. J.; Sivayoganathan, Kandiah; and Balendran, Velupillai, 5,086,232, Cl. 250-572.000.
- Jakob, Wolfgang: See—
- Pielartzik, Harald; Kohler, Burkhard; Traenckner, Hans-Joachim; Jakob, Wolfgang; and Bushong, William C., 5,086,102, Cl. 524-188.000.
- Jalinski, Thomas J., to Oscar Mayer Foods Corporation. Time temperature indicator with distinct end point. 5,085,802, Cl. 252-408.100.
- James, Claude; Lave, Daniel; and Soler, Francoise, to Rhone-Poulenc Sante. 1H, 3H-pyrrolo[2,2-c]thiazole-7-carboxamide derivatives and pharmaceutical compositions containing them. 5,086,051, Cl. 514-228.200.
- James River Corporation of Virginia: See—
- Kuchenbecker, Morris W.; and Maroszek, Raymond V., 5,085,323, Cl. 229-207.000.
- James, Simon A.: See—
- Todman, Michael T.; James, Simon A.; and Parker, Michael L., 5,085,038, Cl. 60-39.370.
- Janda, Rudolph W.; Douglas, Jerald L.; and Condon, Edward F., Jr., to Intermatic Incorporated. Control circuit for a solar-powered rechargeable power source and load. 5,086,267, Cl. 325-350.000.
- Janeiro, Joseph J. Interchangeable towing ball assembly. 5,085,452, Cl. 280-511.000.
- Janssen Pharmaceutica N.V.: See—
- Janssens, Frans E.; Sommen, Francois M.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 5,086,056, Cl. 514-253.000.
- Janssens, Frans E.; Sommen, Francois M.; Torremans, Joseph L. G.; and Diels, Gaston S. M., to Janssen Pharmaceutica N.V. 2-(heterocyclalkyl)imidazopyridines. 5,086,056, Cl. 514-253.000.
- Janszen, Marina E.: See—
- Maino, Vernon C.; and Janszen, Marina E., 5,085,985, Cl. 435-7.240.
- Japan Aircraft Mfg. Co., Ltd.: See—
- Kitamura, Takayuki; and Yamashiro, Koichi, 5,085,018, Cl. 52-108.000.
- Japan Aviation Electronics Industry Limited: See—
- Sakuma, Kazuhiro; Ohno, Aritaka; Asami, Eiichi; and Kaku, Ryoji, 5,085,501, Cl. 356-350.000.
- Japan Medical Supply Co., Ltd.: See—
- Ikada, Yoshito; Okada, Toshiyuki; Kawai, Tatsuya; and Yoshimoto, Michiaki, 5,085,632, Cl. 604-29.000.
- Japan Synthetic Rubber Co., Ltd.: See—
- Takashima, Akio; Hattori, Iwakazu; and Imamura, Takashi, 5,086,136, Cl. 526-177.000.
- Jarman, Thomas B.: See—
- McMurtry, David R.; Jarman, Thomas B.; and Bennett, Simon J., 5,084,981, Cl. 33-556.000.
- Jatco Corporation: See—
- Imamura, Hiroyuki; Kurata, Takafumi; Yokota, Hiroaki; and Noguchi, Naovuki, 5,085,301, Cl. 192-0.076.
- Jayarajan, Jay A., to Boeing Company. The. Decorative laminates with heat release reducing and ink discoloration preventive protective layer. 5,085,921, Cl. 428-204.000.
- Jeffers, Douglas E.: See—
- Skopec, Robert A.; Jeffers, Douglas E.; and Hagins, Freddy W., 5,084,980, Cl. 33-286.000.
- Jeffers, Larry A.: See—
- Berthold, John W.; Koksai, Cevdet G.; and Jeffers, Larry A., 5,086,220, Cl. 250-227.200.
- Jenkins, William G., to Burlington Industries, Inc. Stain resistance of nylon carpet: cationic-dyeable nylon fibers dyed with acid dye. 5,085,667, Cl. 8-539.000.
- Jennings, Gilbert M.; Gledhill, Scott; Stock, Norman R.; and Powell, Arthur T., to Versicut, Ltd. Apparatus and method for cutting and grinding masonry units. 5,085,008, Cl. 51-74.00R.
- Jensen, Benita Berg: See—
- Jensen, Kaj B., 5,085,504, Cl. 359-843.000.
- Jensen, Kaj B., to Jensen, Kaj-Berg; Jensen, Benita Berg; Pedersen, Bent; and Pedersen, Inge. Control system for adjusting the rear view mirror of a vehicle in response to the position of the steering gear. 5,085,504, Cl. 359-843.000.
- Jensen, Kaj-Berg: See—
- Jensen, Kaj B., 5,085,504, Cl. 359-843.000.
- Jensen, Richard H.: See—
- Mikeska, Kurt R.; Schaefer, Daniel T.; and Jensen, Richard H., 5,085,720, Cl. 156-89.000.
- Jensen, Svend V.; and Andersen, Erik F., to Flugger A/S. Liquid-containing container. 5,085,317, Cl. 206-229.000.
- Jeong, Su-Min, to Samsung Electron Devices Co., Ltd. Manufacturing method of phosphor film of cathode ray tube. 5,085,958, Cl. 430-25.000.
- Jersey Nuclear-Avco Isotopes, Inc.: See—
- Ficnh, Lester M., 5,085,410, Cl. 266-44.000.
- Jett, James H.: See—
- Bentley, Bill F.; Jett, James H.; Martin, John C.; and Saunders, George C., 5,085,673, Cl. 55-10.000.
- Jette, Claude. Movable grill for a barbecue. 5,085,203, Cl. 126-41.00R.
- Jidosha Denki Kogyo K.K.: See—
- Danzaki, Tsutomu; Iwaoka, Toshio; Yamaguchi, Yuichi; and Tsukahara, Akihiko, 5,085,286, Cl. 180-179.000.
- Ito, Takeshi, 5,086,260, Cl. 318-266.000.
- Jochum, Peter; Gasser, Oswald; Zahler, Wolf-Dietrich; Lechner, Gunther; Guggenberger, Rainer; and Ellrich, Klaus, to ESPE Stiftung & Co., Produktions- und Vertriebs KG. Polyether-impression material and method for its preparation and use. 5,086,148, Cl. 528-15.000.
- Johansson, Eric B.; Latter, Gerald M.; and Curulla, Michael V., to General Electric Company. Nuclear fuel assembly spacer and loop spring with enhanced flexibility. 5,085,827, Cl. 376-444.000.
- John Guest Engineering Limited: See—
- Guest, Timothy S., 5,085,472, Cl. 285-158.000.
- John Wyeth & Brother Limited: See—
- White, John F.; Warren, Michael C.; and Ennis, Christine, 5,086,073, Cl. 514-602.000.
- Johnsen, Kenneth A.; and Freeman, Frank, to E. R. Squibb & Sons. Pouch with mounting member for removable adhesive filter. 5,085,652, Cl. 604-333.000.
- Johnson, Arlie; and Johnson, Barbara E. Artificial Christmas tree. 5,085,901, Cl. 428-19.000.
- Johnson, Barbara E.: See—
- Johnson, Arlie; and Johnson, Barbara E., 5,085,901, Cl. 428-19.000.
- Johnson, Dennis F.; and Wiebe, Michael, to Iris Systems Inc. Tamper detection device for utility meter. 5,086,292, Cl. 340-637.000.
- Johnson, Donald A.: See—
- Kneller, James F.; Narutis, Vyatas; Fair, Barbara F.; and Johnson, Donald A., 5,085,794, Cl. 252-82.000.
- Johnson, Ian R.: See—
- Stafford, David A.; Johnson, Ian R.; and Goodfield, Clive, 5,086,233, Cl. 250-576.000.
- Johnson, Julius T.; and Johnson, Robert R. On-line liquid samplers. 5,085,086, Cl. 73-863.860.

- Johnson, Robert R.: See—
Johnson, Julius T.; and Johnson, Robert R., 5,085,086, Cl. 73-863.860.
- Johnson, Ronald A. Hat-like apparatus for directing air flow. 5,085,231, Cl. 131-329.000.
- Johnson, Stanley A.: See—
Balachandran, Uthamalingam; Poeppel, Roger B.; Emerson, James E.; and Johnson, Stanley A., 5,086,034, Cl. 505-1.000.
- Johnson, Todd L. Table and rocking apparatus. 5,085,486, Cl. 297-3.000.
- Johnson, William B. Method and apparatus for installing a post in a tooth having an existing endodontic obturator therein. 5,085,586, Cl. 433-224.000.
- Jolivet, Jean-Marc; and Sosin, Laurent, to Irsid. Process for adjusting the secondary cooling of a machine for continuous casting of metal products. 5,085,264, Cl. 164-455.000.
- Jones, Clarence S.; Coolidge, Arthur W.; Cavin, Dennis, deceased (by Cavin, Nan Hai, legal representative); Betts, Norman L.; Moser, Jeffrey M.; and McGarvey, Kenneth J., to Simco/Ramic Corporation. Color sorting system and method. 5,085,325, Cl. 209-580.000.
- Jones, David C.; and Lee, Chi-Chang, to Du Pont de Nemours, E. I., and Company. Process for preparing a metallized polyethylene plex-filamentary film-fibril sheet. 5,085,817, Cl. 264-175.000.
- Jones, Steven D.: See—
Akridge, James R.; and Jones, Steven D., 5,085,953, Cl. 429-193.000.
- Jooraku, Fumio: See—
Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Anmoto, Shoji; and Jooraku, Fumio, 5,085,806, Cl. 252-518.000.
- Jorissen, Steven A.; and Krishnan, Sivaram, to Mobay Corporation. Ultraviolet stabilizer for polycarbonate compositions. 5,086,097, Cl. 524-91.000.
- Jos. Hunkeler, Ltd.: See—
Felix, Willi, 5,085,624, Cl. 493-413.000.
- Joseph, Karl: See—
Mann, Roger H.; Joseph, Karl; and Avalon, Gary A., 5,085,655, Cl. 604-389.000.
- Joshi, Rajiv V.: See—
Brodsky, Stephen B.; Joshi, Rajiv V.; Lechaton, John S.; Ryan, James G.; and Schepis, Dominic J., 5,086,016, Cl. 437-190.000.
- Josso, Pierre; Alperine, Serge; Steinmetz, Pierre; and Constantini-Friant, Anne, to Office National d'Etudes et de Recherches Aérospatiales. Hydrazine bath for chemical deposition of platinum and/or palladium, and method of manufacturing such a bath. 5,085,693, Cl. 106-1.280.
- Jouck, Walter: See—
Geist, Michael; Cibura, Klaus; Jouck, Walter; Ott, Gunther; Sadlowski, Jürgen; Dangschaft, Manfred; and Reimann, Manfred, 5,086,090, Cl. 523-414.000.
- Jouy, Nicholas: See—
Baccout, Jean-Claude; Bessiere, Jean-Marie; Boisseau, Patrick; Faugeras, Pierre; Jouy, Nicholas; Peyrot, Elysabette; and Sauvage, Yves, 5,085,994, Cl. 435-148.000.
- Jova, Fernando J. Method of playing a board game. 5,085,441, Cl. 273-248.000.
- Joyce, William H., to Union Carbide Chemicals & Plastics Technology Corporation. Reduction of agglomeration. 5,086,132, Cl. 526-74.000.
- JRCO, Inc.: See—
Schweigert, James R., 5,085,451, Cl. 280-460.100.
- JSP Corporation: See—
Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, 5,085,814, Cl. 264-126.000.
- Ju, Shiao T.: See—
Yeh, Richard C.; and Ju, Shiao T., 5,085,815, Cl. 264-142.000.
- Jung, Detlef; Riss, Gerhard; and Niehaus, Heinz, to Duurk Opp Adler Aktiengesellschaft. Sewing machine with an adjustable cutting device. 5,085,157, Cl. 112-68.000.
- Jung, Johann: See—
Kast, Juergen; Meyer, Norbert; Misslitz, Ulf; Schubert, Juergen; Jung, Johann; Rademacher, Wilhelm; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,085,689, Cl. 71-105.000.
- Jungvid, Hans, to Hans Jungvid Aktiebolag. Feeding-stuff. 5,085,874, Cl. 426-41.000.
- Junino, Alex; and Malle, Gerard, to L'Oreal. Reducing composition for the permanent deformation of hair containing as a reducing agent, an amino mercaptoalkylamide or a salt thereof. 5,085,860, Cl. 424-72.000.
- Junino, Alex: See—
Bugaut, Andree; and Junino, Alex, 5,085,666, Cl. 8-408.000.
- Junkosha Co., Ltd.: See—
Goshiki, Keigo, 5,085,863, Cl. 424-423.000.
- Kabeshita, Akira: See—
Ando, Tateo; and Kabeshita, Akira, 5,084,959, Cl. 29-740.000.
- Kabushi Kaisha Tokyo Kikai Seisakusho: See—
Ohta, Hideo; Matsumoto, Yasuhiro; and Kurihara, Masaru, 5,085,145, Cl. 101-363.000.
- Kabushiki Kaisha Ishikawa Seisakusho Ltd.: See—
Takeuchi, Yukio; Nakahashi, Akio; and Kubota, Shingo, 5,085,045, Cl. 57-58.650.
- Kabushiki Kaisha Kawai Gakki Seisakusho: See—
Sekizuka, Makoto, 5,085,118, Cl. 84-635.000.
- Kabushiki Kaisha Kobe Seiko Sho: See—
Kitamura, Mitsuru; and Hashimoto, Shunichi, 5,085,714, Cl. 148-16.500.
- Miyata, Koichi; Kumagai, Kazuo; Kobashi, Koji; Matsui, Yuichi; and Nakaue, Akimitsu, 5,086,014, Cl. 437-103.000.
- Kabushiki Kaisha Meidensha: See—
Mizushima, Fumio; Goto, Takashi; and Nawa, Michio, 5,085,071, Cl. 73-118.100.
- Kabushiki Kaisha Tamiya Mokei: See—
Mochizuki, Takashi, 5,085,618, Cl. 464-185.000.
- Kabushiki Kaisha Tatsumi Kogyo: See—
Inui, Ryosuke; and Matsubara, Susumu, 5,085,353, Cl. 222-402.130.
- Kabushiki Kaisha Top: See—
Sugita, Koichi, 5,085,350, Cl. 222-260.000.
- Kabushiki Kaisha Toshiba: See—
Fukada, Akio, 5,086,384, Cl. 364-187.000.
- Hirakawa, Kenji, 5,086,005, Cl. 437-32.000.
- Itani, Takaharu; Nikaido, Masaru; and Yamaguchi, Hideki, 5,085,605, Cl. 445-25.000.
- Ito, Koichi; and Toba, Masanori, 5,086,452, Cl. 379-58.000.
- Kido, Fusayoshi, 5,086,252, Cl. 313-503.000.
- Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 5,086,323, Cl. 357-23.400.
- Nakagawa, Akio; Watanabe, Kiminori; Koshino, Yutaka; Yamaguchi, Yoshihiro; and Baba, Yoshiro, 5,086,332, Cl. 357-51.000.
- Oka, Toshio, 5,086,462, Cl. 379-340.000.
- Sanderson, Robert A.; Sakai, Katsunori; Kuwabara, Takeshi; and Amemiya, Takashi, 5,085,949, Cl. 429-23.000.
- Tsuchiya, Yuzo, 5,086,359, Cl. 360-71.000.
- Tsugeno, Masashi; and Miyashita, Makoto, 5,086,399, Cl. 364-508.000.
- K.K. Toshiba: See—
Saegusa, Noboru; Shimura, Yukihiko; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, 5,086,451, Cl. 379-58.000.
- Kaelin, Ruedi. Solder-free plug-cable connection system. 5,085,594, Cl. 439-427.000.
- Kaes, Guenter: See—
Steinhauser, Walter; Kaes, Guenter; Maisch, Wolfgang; and Stegmaier, Alwin, 5,085,490, Cl. 303-113.0TR.
- Kaetsu, Hayato: See—
Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
- Kagawa, Toshio: See—
Oka, Kazuhiro; Morita, Takeshi; Hiramoto, Seigo; and Kagawa, Toshio, 5,085,166, Cl. 118-50.100.
- Kageyama, Koji: See—
Kutaragi, Ken; Furuhashi, Makoto; Suzuoki, Masakazu; and Kageyama, Koji, 5,086,475, Cl. 381-36.000.
- Kageyama, Yoshiteru: See—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, 5,086,131, Cl. 526-68.000.
- Kageyama, Yukihiko: See—
Hayashi, Noriyuki; Kageyama, Yukihiko; and Hijikata, Kenji, 5,086,158, Cl. 528-193.000.
- Kahn, Frederic J.; Kendrck, Paul N.; Leff, Jerry; Livoni, Linden J.; Loucks, Bryan E.; Stepper, David E.; and Witte, Kenneth G., to Greyhawk Systems, Inc. Apparatus and method of forming and projecting high precision optical images. 5,085,506, Cl. 353-122.000.
- Kajita, Kozo: See—
Kita, Fusaji; Kawakami, Akira; and Kajita, Kozo, 5,085,954, Cl. 429-194.000.
- Kajiura, Makoto; Nishijima, Toyoki; and Chino, Shigeo, to Konica Corporation. Method for processing light-sensitive silver halide photographic material. 5,085,978, Cl. 430-374.000.
- Kakimoto, Toshihiko: See—
Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyo, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.
- Kakodkar, Sunil V.: See—
Crane, Laura J.; and Kakodkar, Sunil V., 5,085,779, Cl. 210-635.000.
- Kaku, Ryoji: See—
Sakuma, Kazuhiro; Ohno, Arataka; Asami, Eiichi; and Kaku, Ryoji, 5,085,501, Cl. 356-350.000.
- Kali-Chemie AG: See—
Moeller, Hans G., 5,085,881, Cl. 426-491.000.
- Kalley, Eugene F.: See—
Bartosiak, George; Paris, Sam; Kresch, Jeffrey M.; Danley, William J.; Kalley, Eugene F.; and Goldberg, Arthur E., 5,085,525, Cl. 374-124.000.
- Kalthoff, Ferdinand, to Orbis-Werk Groten GmbH & Co. KG. Multiple-purpose wire shaping and cutting tool. 5,084,935, Cl. 7-132.000.
- Kamata, Yoshitsugu: See—
Fukuda, Morinobu; Kamata, Yoshitsugu; and Asahi, Masahiko, 5,085,854, Cl. 424-63.000.
- Kameda, Masanao: See—
Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyo, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.
- Kamei, Mitsuhiro: See—
Setoyama, Eiji; Kamei, Mitsuhiro; and Ohno, Yasunori, 5,085,755, Cl. 204-298.160.
- Kameoka, Kimitaka; Kuwabara, Ken-ichi; Takahashi, Toshiro; Moriuchi, Shigenori; Yagihara, Morio; Inagaki, Yoshio; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Image forming method. 5,085,970, Cl. 430-264.000.

- Kametani, Yasuhiro: See—
Kubota, Saburo; Mega, Hirotsuka; and Kametani, Yasuhiro, 5,086,263, Cl. 318-568.110.
- Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norio, Isami, to Toko Kabushiki Kaisha; Nemic Lambda Kabushiki Kaisha; Yutaka Electric Mfg. Co., Ltd.; and Densetsu Corp. DC-DC converter. 5,086,381, Cl. 363-16.000.
- Kamins, Kathryn A.; and Statz, Robert J., to Du Pont de Nemours, E. I., and Company. Thermoplastic blends of ABS containing ethylene terpolymers. 5,086,113, Cl. 525-84.000.
- Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, to JSP Corporation. Production process of expansion-molded article. 5,085,814, Cl. 264-126.000.
- Kamyr AB: See—
Nilsson, Bengt, 5,085,735, Cl. 162-26.000.
- Kan, Ko-Chien, to Foxconn International, Inc. Grounding boardlock for connector. 5,085,589, Cl. 439-92.000.
- Kan, Megumi: See—
Komami, Yuji; Kan, Megumi; Tamai, Toshiyuki; and Hishinuma, Tsuru, 5,085,066, Cl. 72-13.000.
- Kanaguchi, Masahiro: See—
Kawada, Hideaki; Sugiyama, Yoshiaki; and Kanaguchi, Masahiro, 5,086,361, Cl. 360-107.000.
- Kanda, Naoya: See—
Noro, Takanobu; Matsumoto, Kunio; Oshima, Muneo; Kanda, Naoya; Sakaguchi, Suguru; and Murata, Akira, 5,086,337, Cl. 357-79.000.
- Kanegae, Takahiro: See—
Yoshida, Hitoshi; Kanegae, Takahiro; and Kawamoto, Naoyuki, 5,086,481, Cl. 382-22.000.
- Kaneko, Kenichi: See—
Matsubara, Osamu; Kaneko, Kenichi; and Kawa, Shinji, 5,084,917, Cl. 4-237.000.
- Kaneko, Kiyotaka: See—
Nakane, Yoshio; Kaneko, Kiyotaka; Miyake, Izumi; Maeda, Yutaka; and Shimaya, Hiroshi, 5,086,345, Cl. 358-335.000.
- Kaneko, Kunishige: See—
Watanabe, Kunio; Nishimura, Satoshi; and Kaneko, Kunishige, 5,085,712, Cl. 148-2.000.
- Kaneko, Takashi: See—
Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Izuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.
- Kanetani, Kazuo: See—
Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Ettoh, Jun, 5,086,414, Cl. 365-230.080.
- Kanitani, Kiyoshi: See—
Hariki, Kazuo; Koizumi, Tatsuya; Ishiguro, Kazuya; and Kanitani, Kiyoshi, 5,086,262, Cl. 318-568.100.
- Kanno, Tetsuo: See—
Hagiya, Toshimichi; Watanabe, Junichi; Kanno, Tetsuo; Inuzuka, Hideo; Yamahata, Makoto; Sofue, Masaaki; and Aota, Yoshiaki, 5,086,422, Cl. 369-75.100.
- Kano, Hidekazu: See—
Duroda, Shigetaka; Igarashi, Hisashi; Kano, Hidekazu; and Suzuki, Takeshi, 5,085,194, Cl. 123-479.000.
- Kantner, Robert C.: See—
Weinstein, Jerry G.; and Kantner, Robert C., 5,086,019, Cl. 501-94.000.
- Kao Corporation: See—
Fukuda, Morinobu; Kamata, Yoshitsugu; and Asahi, Masahiko, 5,085,854, Cl. 424-63.000.
- Kaplan, Sam; and Adler, Robert, to Zenith Electronics Corporation. Method of manufacture for post-mask deflection type tension mask color cathode ray tube. 5,085,606, Cl. 445-30.000.
- Kapon, Elyahou; and Orenstein, Meir, to Bell Communications Research, Inc. Phase-locked array of reflectivity-modulated surface-emitting lasers. 5,086,430, Cl. 372-50.000.
- Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., to PPG Industries, Inc. Coatings for the protection of products in light-transmitting containers. 5,085,903, Cl. 428-34.600.
- Karasawa, Wataru; Itoyama, Taketoshi; Takao, Itaru; Obikane, Tadashi; and Koike, Hisashi, to Tokyo Electron Limited. Probe apparatus. 5,086,270, Cl. 324-158.00P.
- Karaskiewicz, Ronald J.: See—
Hofstra, Joseph S.; Karaskiewicz, Ronald J.; and Fischer, Mark R., 5,085,134, Cl. 454-67.000.
- Karger, Barry L.; and Nelson, Robert J., to Northeastern University. Integrated temperature control/alignment system for high performance capillary electrophoretic apparatus. 5,085,757, Cl. 204-299.00R.
- Karl Lautenschlager GmbH & Co. KG: See—
Lautenschlager, Karl, 5,085,491, Cl. 312-329.000.
- Karlsson, Mats: See—
Rossel, Ulf; Karlsson, Mats; and Ternsjo, Johan, 5,085,123, Cl. 89-4.200.
- Karr, Leslie A.: See—
Lebron, Carmen A.; Karr, Leslie A.; Fernando, Tudor; and Aust, Steven D., 5,085,998, Cl. 435-262.000.
- Kasai, Ichiro; Wallach, Richard M.; Baumgratz, Bonnie A.; and Boyd, Michael E., to Santa Barbara Research Center. Photo-anodic oxide surface passivation for semiconductors. 5,086,328, Cl. 357-30.000.
- Kasegi, Hiroshi, to Omron Tateisi Electronics Co. Indicator circuit for protecting light emitting diode. 5,086,294, Cl. 340-644.000.
- Kashiba, Takashi: See—
Hatakeyama, Hidetoshi; and Kashiba, Takashi, 5,085,878, Cl. 426-107.000.
- Kashida, Motokazu: See—
Takei, Masahiro; Kashida, Motokazu; Takahashi, Koji; Nagasawa, Kenichi; Masui, Toshiyuki; and Fukatsu, Tsutomu, 5,086,358, Cl. 360-60.000.
- Kaspers, Helmut: See—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinplugg, Hans; and Kramer, Wolfgang, 5,086,048, Cl. 514-187.000.
- Kast, Juergen; Meyer, Norbert; Misslitz, Ulf; Schubert, Juergen; Jung, Johann; Rademacher, Wilhelm; Westphalen, Karl-Otto; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Cyclohexenone compounds and their use as herbicides or plant growth regulators. 5,085,689, Cl. 71-105.000.
- Kasubke, Volker, to Hydac Technology GmbH. Power line attachment system. 5,085,384, Cl. 248-62.000.
- Kasuda, Takashi; Nishimura, Yukihiko; Hikiguchi, Shozo; Nakano, Minoru; Yasuda, Eiji; and Noguchi, Kazuo, to Pegasus Sewing Machine Mfg. Co., Ltd. Needle thread feed regulating device for oversewing sewing machine. 5,085,159, Cl. 112-246.000.
- Katada, Kunio: See—
Kii, Katsuya; Katada, Kunio; Okuyama, Yuji; and Yonezawa, Takashi, 5,085,458, Cl. 280-707.000.
- Katagiri, Shingo; and Nishiyama, Shigeru, to Fuji Photo Film Co., Ltd. Magnetic tape cassette casing. 5,086,363, Cl. 360-132.000.
- Katahira, Kiyoshi: See—
Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.
- Katano, Mitsunori; Yamazaki, Fumio; and Yamakita, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Flat panel display device. 5,085,334, Cl. 220-2.200.
- Kataoka, Kenichi: See—
Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, 5,085,423, Cl. 271-266.000.
- Katayama, Akihiro; and Oosawa, Hideo, to Canon Kabushiki Kaisha. Image processing apparatus with fixed or variable threshold. 5,086,484, Cl. 382-50.000.
- Katayama, Akihiro; Yoshida, Tadashi; Hirabayashi, Yasuji; and Maeda, Mitsuru, to Canon Kabushiki Kaisha. Method and apparatus for image encoding in which reference pixels for predictive encoding can be selected based on image size. 5,086,487, Cl. 382-56.000.
- Katayama, Kazuyori: See—
Utsumi, Yoshiyuki; and Katayama, Kazuyori, 5,085,287, Cl. 180-179.000.
- Kato, Eiichi: See—
Suzuki, Nobuo; Sakasai, Yutaka; and Kato, Eiichi, 5,085,966, Cl. 430-115.000.
- Kato, Koichi: See—
Wada, Mitsuo; and Kato, Koichi, 5,086,104, Cl. 524-217.000.
- Kato, Mikihiro; Endo, Yasushi; and Kawamata, Toshio, to Fuji Photo Film Co., Ltd. Flexible magnetic disc with a two layer protective coating which top layer is a ultra violet radiation cured compound with specified elasticity modulus. 5,085,911, Cl. 428-65.000.
- Kato, Naoki: See—
Yamamoto, Shuhei; and Kato, Naoki, 5,085,498, Cl. 359-70.000.
- Kato, Tetsuo; and Imaizumi, Tomio, to Tokico Ltd. Hydraulic damper. 5,085,300, Cl. 188-322.150.
- Kato, Yoshiaki; and Murakami, Tokumichi, to Mitsubishi Denki Kabushiki Kaisha. Transform coding apparatus. 5,086,488, Cl. 382-56.000.
- Katoh, Kazunobu; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 5,085,971, Cl. 430-264.000.
- Katoh, Kenji, to Toyota Jidosha Kabushiki Kaisha. Exhaust gas purification system for an internal combustion engine using alcohol blended gasoline for fuel. 5,085,050, Cl. 60-288.000.
- Katoh, Kotaro; Tomita, Hiroshi; and Saitoh, Kazuyoshi, to Teijin Limited. Film for use as thermosensitive stencil printing cardboard sheet. 5,085,933, Cl. 428-332.000.
- Katsu, Toshiyuki; Hidaka, Hidenori; and Inotsume, Fusako, to Pioneer Electronic Corporation. Remote control signal processing device. 5,086,298, Cl. 340-825.690.
- Katsuda, Hiroyuki; Mizuno, Tomokimi; and Watanabe, Tetsumi, to Aisin Seiki Kabushiki Kaisha. Sealing mechanism in Stirling engine. 5,085,054, Cl. 60-517.000.
- Katsuji Takeno: See—
Takeno, Katsuji, 5,085,438, Cl. 273-212.000.
- Katsuki, Kazuo: See—
Peppers, Norman A.; Myers, Gregory K.; Young, James R.; and Katsuki, Kazuo, 5,086,490, Cl. 382-65.000.
- Katsumata, Toru, to Polyplastics Co., Ltd. Weather-resistant polyacetal resin compositions and molded articles thereof. 5,086,095, Cl. 524-91.000.
- Katto, Takayuki: See—
Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Izuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.
- Kaufman, Charles W.: See—
Gupta, Amar; Kaufman, Charles W.; Kempf, Mark F.; and Koning, G. Paul, 5,086,469, Cl. 380-48.000.

Kawada, Hideaki; Sugiyama, Yoshiaki; and Kanaguchi, Masahiro, to Sony Corporation. Rotary head drum for video tape recorder. 5,086,361, Cl. 360-107.000.

Kawaguchi, Makoto: See—
Hotta, Yoshihiko; Maruyama, Syoji; and Kawaguchi, Makoto, 5,085,934, Cl. 428-335.000.

Kawahara, Takayuki: See—
Watanabe, Takao; Hori, Ryoichi; Kitsukawa, Goro; Kawajiri, Yoshiaki; Kawahara, Takayuki; and Itoh, Kiyoo, 5,086,238, Cl. 307-296.600.

Kawai, Shinji: See—
Matsubara, Osamu; Kaneko, Kenichi; and Kawai, Shinji, 5,084,917, Cl. 4-237.000.

Kawai, Tatsuya: See—
Ikada, Yoshito; Okada, Toshiyuki; Kawai, Tatsuya; and Yoshimoto, Michiaki, 5,085,632, Cl. 604-29.000.

Kawajiri, Yoshiaki: See—
Watanabe, Takao; Hori, Ryoichi; Kitsukawa, Goro; Kawajiri, Yoshiaki; Kawahara, Takayuki; and Itoh, Kiyoo, 5,086,238, Cl. 307-296.600.

Kawakami, Akira: See—
Kita, Fusaji; Kawakami, Akira; and Kajita, Kozo, 5,085,954, Cl. 429-194.000.

Kawamata, Toshio: See—
Kato, Mikihiro; Endo, Yasushi; and Kawamata, Toshio, 5,085,911, Cl. 428-65.000.

Kawamoto, Naoyuki: See—
Yoshida, Hitoshi; Kanegae, Takahiro; and Kawamoto, Naoyuki, 5,086,481, Cl. 382-22.000.

Kawamura, Yoshiya: See—
Okada, Gentaro; Akano, Hirofumi; Sato, Takeshi; Okumura, Hajime; and Kawamura, Yoshiya, 5,085,851, Cl. 424-50.000.

Kawanaka, Masanobu; Kondo, Youichi; Tabata, Junichi; and Onda, Kimimasa, to Shin Caterpillar Mitsubishi Ltd. Operating speed change-over device. 5,085,052, Cl. 60-445.000.

Kawano, Nobuaki: See—
Kawata, Hideaki; Funato, Masatomi; Umeda, Kiminori; Kawano, Nobuaki; and Honda, Koji, 5,085,964, Cl. 430-106.600.

Kawasaki, Shingo: See—
Nakata, Takuya; Makita, Hitoshi; Hirakata, Takashi; and Kawasaki, Shingo, 5,085,116, Cl. 84-609.000.

Kawasaki Steel Corporation: See—
Ishii, Kazuhide; and Kawasaki, Tatsuo, 5,085,829, Cl. 420-79.000.

Komami, Yuji; Kan, Megumi; Tamai, Toshiyuki; and Hishinuma, Ttaro, 5,085,066, Cl. 72-13.000.

Kawasaki, Tatsuo: See—
Ishii, Kazuhide; and Kawasaki, Tatsuo, 5,085,829, Cl. 420-79.000.

Kawasaki, Yoshinao: See—
Soraoka, Minoru; Kawasaki, Yoshinao; Kudo, Katsuyoshi; and Tsubone, Tsunehiko, 5,085,750, Cl. 204-192.320.

Kawase, Hiromitsu: See—
Nanya, Toshiaki; Yamaguchi, Kimitoshi; Tsubuko, Kazuo; Takahashi, Toshihiko; Kawase, Hiromitsu; and Ookawara, Makoto, 5,085,965, Cl. 430-109.000.

Kawashima, Masao: See—
Otsuka, Masako; Saimoto, Hiroshi; Murata, Yumiko; and Kawashima, Masao, 5,085,995, Cl. 435-240.450.

Kawashima, Mitsunobu: See—
Omura, Ikuo; Yamauchi, Junichi; and Kawashima, Mitsunobu, 5,085,726, Cl. 156-307.300.

Kawashima, Saburo: See—
Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,086,125, Cl. 525-432.000.

Kawata, Hideaki; Funato, Masatomi; Umeda, Kiminori; Kawano, Nobuaki; and Honda, Koji, to Mita Industrial Co., Ltd. Carrier for developer. 5,085,964, Cl. 430-106.600.

Kazantzides, Peter: See—
Glassman, Edward; Hanson, William A.; Kazantzides, Peter; Mittelstadt, Brent D.; Musits, Bela L.; Paul, Howard A.; and Taylor, Russell H., 5,086,401, Cl. 395-94.000.

Kazuhiro, Kajitani: See—
Hidehiko, Miyake; and Kazuhiro, Kajitani, 5,085,109, Cl. 82-118.000.

Kazuno, Kenji: See—
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Matsuda, Masahito; Shirahase, Ichiro; and Segawa, Jun, 5,086,049, Cl. 514-210.000.

Kazuyuk, Urabe, to Fuji Electric Co., Ltd. Se or Se alloy electrophotographic photoreceptor. 5,085,959, Cl. 430-58.000.

Keefe, William M.: See—
Li, Yan M.; Budinger, A. Bowman; Byszewski, Wojciech W.; Gregor, Philip; and Keefe, William M., 5,086,276, Cl. 324-414.000.

Keel, Beat G.: See—
Amin, Nurul; Bortins, John; Keel, Beat G.; and Yan, Ying D., 5,084,957, Cl. 29-603.000.

Keen, Robert G.: See—
Chung, Connie Y.; Keen, Robert G.; Raymond, Ozella; Snyder, Jan W.; and Tohlen, Dennis A., 5,086,503, Cl. 395-700.000.

Keene Corporation: See—
Fabbri, William C.; and Crane, Roy B., 5,086,375, Cl. 362-33.000.

Keeper Co., Ltd.: See—
Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyoi, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.

Keith, Douglas H., to City of Hope. Method of detecting specific substances by selective growth of living cells. 5,085,982, Cl. 435-5.000.

Kelless, William L.; and St. John, Don K., to Eaton Corporation. Motor torque compensation of an induction electric motor by adjusting a slip command during periods of supposed change in motor temperature. 5,086,264, Cl. 318-798.000.

Keller, Jakob; and Haumann, Jurgen, to Asea Brown Boveri. Method for premixed combustion of a liquid fuel. 5,085,575, Cl. 431-8.000.

Kellerman, Jeffrey L.: See—
Crowell, John W.; and Kellerman, Jeffrey L., 5,085,329, Cl. 211-195.000.

Kelly-Mahaffey, William L.; and Stafford, James M., to International Business Machines Corporation. Finding fiducials on printed circuit boards to sub pixel accuracy. 5,086,478, Cl. 382-8.000.

Kelly, Sarah E., to Pfizer Inc. N-trichloroacetyl-2-oxindole-1-carboxamides. 5,086,186, Cl. 548-468.000.

Kelsoe, Wayne E.; and Buzawa, David M., to Iris Medical Instruments, Inc. Optical fiber with electrical encoding. 5,085,492, Cl. 385-60.000.

Keltner, Loren L., to T. D. F. Partnership. Foam proportioning inductor apparatus. 5,085,278, Cl. 169-15.000.

Kemp, Bruce E.: See—
Hillyard, Carmel J.; Rylatt, Dennis B.; Kemp, Bruce E.; and Bundesen, Peter G., 5,086,002, Cl. 436-540.000.

Kempf, Mark F.: See—
Gupta, Amar; Kaufman, Charles W.; Kempf, Mark F.; and Koning, G. Paul, 5,086,469, Cl. 380-48.000.

Kendrick, Paul N.: See—
Kahn, Frederic J.; Kendrick, Paul N.; Leff, Jerry; Livoni, Linden J.; Loucks, Bryan E.; Stepper, David E.; and Witte, Kenneth G., 5,085,506, Cl. 353-122.000.

Kendrick, Ray, to Daniel Industries, Inc. Orifice system. 5,085,250, Cl. 138-44.000.

Kendrick, Thomas J. Locking nut assembly. 5,085,550, Cl. 411-432.000.

Kenichi, Kamakura; Murasawa, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, to Pentel Kabushiki Kaisha. Mechanical pencil lead protection pipe with protuberance. 5,085,534, Cl. 401-65.000.

Kenner, Carlton L.: See—
Durgin, Ronald A.; Matheson, Derek S.; Border, Delvin K.; Kenner, Carlton L.; and Hammett, Daniel E., 5,085,366, Cl. 229-1.50B.

Kennewell, Peter D.: See—
Luheshi, Abdul B. N.; Smalley, Robert K.; Kennewell, Peter D.; and Westwood, Robert, 5,086,170, Cl. 540-303.000.

Kent, David L., to Motorola, Inc. Switching current regulator for motor control. 5,086,492, Cl. 388-815.000.

Keptel, Inc.: See—
Perry, Steven B., 5,086,459, Cl. 379-200.000.

Kerr, Breene M. Nautical moon and tide clock apparatus. 5,086,417, Cl. 368-19.000.

Kerr, Randal H.; and Mesnard, Robert M., to International Business Machines Corp. System for testing human factors and performance of a system program. 5,086,393, Cl. 364-419.000.

Kessel, Carl R.; and Woodward, Tracy R., to Minnesota Mining and Manufacturing Company. Photopolymerizable compositions and photoinitiators therefor. 5,086,192, Cl. 556-9.000.

Kessler, Henri: See—
Dufresne, Pierre; Kessler, Henri; and Guth, Jean-Louis, 5,085,763, Cl. 208-120.000.

Kester, Jeffrey J.: See—
Young, Jerry D.; Kester, Jeffrey J.; Wehmeier, Thomas J.; Fox, Mary M.; and Letton, James C., 5,085,884, Cl. 426-611.000.

Ketels, Dieter, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Apparatus for gaining single organs from the belly cavity of fish. 5,085,613, Cl. 452-110.000.

Kibe, Katsumi: See—
Shiga, Naomichi; Tsuchiya, Hisatoshi; Sakakibara, Yasuyuki; and Kibe, Katsumi, 5,086,266, Cl. 322-28.000.

Kido, Fusayoshi, to Kabushiki Kaisha Toshiba. Thin film electroluminescence device. 5,086,252, Cl. 313-503.000.

Kido, Nobuyuki: See—
Ishino, Toshihiro; Sakai, Kouzou; and Kido, Nobuyuki, 5,086,020, Cl. 501-105.000.

Kielinen, Jeffrey: See—
Turgeon, Michael; and Kielinen, Jeffrey, 5,085,568, Cl. 425-125.000.

Kii, Katsuya; Katada, Kunio; Okuyama, Yuji; and Yonezawa, Takashi, to Nissan Motor Company, Limited. Attitude change suppression control system for active suspension system with high sensitivity of vehicular attitude change. 5,085,458, Cl. 280-707.000.

Kikuchi, Kuniyuki: See—
Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.

Kimball, James L. Water recycling system. 5,084,920, Cl. 4-665.000.

Kimberly-Clark Corporation: See—
Nohr, Ronald S.; and MacDonald, J. Gavin, 5,085,920, Cl. 428-198.000.

Kimura, Atsushi: See—
Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, 5,085,423, Cl. 271-266.000.

Kimura, Hiroshi: See—
Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Kuwamoto, Hideharu, 5,085,991, Cl. 435-108.000.

Kimura, Kazuo: See—
Kudo, Yoshinobu; and Kimura, Kazuo, 5,086,355, Cl. 359-675.000.

Kimura, Mikihiro, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing solid state image sensing device formed of charge coupled devices on side surfaces of trenches. 5,086,010, Cl. 437-53.000.

Kimura, Shiro: See—
Nakamura, Mitsuhide; and Kimura, Shiro, 5,085,732, Cl. 156-656.000.

Kimura, Tadashi: See—
Saito, Hideo; Kimura, Tadashi; and Kondo, Hiroatsu, 5,085,530, Cl. 400-171.000.

Kimura, Takaichi: See—
Suzuki, Chiaki; Kumashiro, Koichi; Torigoe, Tetsu; Kimura, Takaichi; and Aoki, Takayoshi, 5,085,963, Cl. 430-106.600.

Kimura, Takashi, to Hiroaki Manufacturing Co., Ltd. Directional control valve for pneumatic cylinder. 5,085,124, Cl. 91-433.000.

Kimura, Tetsuya; Fujii, Toshihiro; and Nii, Hiroki, to Hayakawa Rubber Co., Ltd. Method of forming a tentative surface protective coating. 5,085,697, Cl. 106-20.000.

Kimura, Tsugui: See—
Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiko; and Kimura, Tsugui, 5,085,009, Cl. 51-131.100.

Kimura, Tsuneo: See—
Arai, Masatoshi; Kimura, Tsuneo; and Inoue, Yoshio, 5,086,107, Cl. 524-424.000.

Kinney, Terrance R.: See—
Emo, Stephen M.; and Kinney, Terrance R., 5,085,125, Cl. 91-459.000.

Kinoshita, Yoshiji, to AMP Incorporated. Double locking type electrical connector. 5,085,598, Cl. 439-595.000.

Kintz, Karl A.; Messer, Russell K., II; McCrary, Carl W., Jr.; and Nelson, Erik K., to Mead Corporation, The. Hot air apparatus for glossing sheets. 5,086,209, Cl. 219-216.000.

Kinugawa Rubber Ind. Co., Ltd.: See—
Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyoi, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.

Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiko; and Kimura, Tsugui, to Sekisui Kagaku Kogyo Kabushiki Kaisha; Okabe Mica Co., Ltd.; and Fuji Spinning Co., Ltd. Carrier for supporting workpiece to be polished. 5,085,009, Cl. 51-131.100.

Kircher, Joseph J.; Zeisloft, Jane M.; and Martucci, James, to Clintec Nutrition Co. Drift stabilization check. 5,085,256, Cl. 141-083.000.

Kirchoff, Johannes; and Klossek, Hans. Garbage truck. 5,085,554, Cl. 414-346.000.

Kircos, Louis T.: See—
Ortendahl, Douglas A.; Nichols, Brenda G.; Zepeda, Ernesto; Gyor, Matthias; and Kircos, Louis T., 5,085,219, Cl. 128-653.500.

Kirstein, Gerhard, to Renk Aktiengesellschaft. Safety device of an electric control or regulating system for a gearshift mechanism, which contains at least one electromagnetic control element. 5,086,395, Cl. 364-424.100.

Kirsten, Rolf: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Kiryu, Hironobu: See—
Shiraishi, Shuji; Nishihara, Takashi; Kiryu, Hironobu; and Omomo, Naoki, 5,085,288, Cl. 180-197.000.

Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Matsuda, Masahito; Shirahase, Ichiro; and Segawa, Jun, to Nippon-shinyaku Co., Ltd. 7[4-(5-methyl-2-oxo-1,3-dioxalen-4-yl)methyl]-1-piperzinyll-4-oxo-4H-[1,3]thiazolo[3,2-a]quinoline-3-carboxylic acids. 5,086,049, Cl. 514-210.000.

Kishbaugh, Dennis L.: See—
Mottur, George P.; Kishbaugh, Dennis L.; Cope, Hilbert J., Jr.; and Cooper, Edward W., 5,085,137, Cl. 99-404.000.

Kissin, Yury V., to Mobil Oil Corporation. Zirconium-based catalyst composition for polymerizing olefins and polymerization therewith. 5,086,135, Cl. 526-151.000.

Kistrup, Holger: See—
Imhof, Otwin; and Kistrup, Holger, 5,085,956, Cl. 429-211.000.

Kita, Fusaji; Kawakami, Akira; and Kajita, Kozo, to Hitachi Maxell, Ltd. Organic electrolyte solution type cell. 5,085,954, Cl. 429-194.000.

Kitada, Akiharu: See—
Yano, Hisashi; Yabumoto, Junsuke; and Kitada, Akiharu, 5,085,561, Cl. 417-313.000.

Kitadono, Kaoru: See—
Abe, Hiromichi; Nishio, Taichi; and Kitadono, Kaoru, 5,086,105, Cl. 524-492.000.

Kitagawa, Shigeo; Tachino, Kenzo; Nagata, Yasuhiro; Yamamoto, Tomochiro; Iwata, Shigemichi; Hirabayashi, Terumi; and Tanino, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Emergency intercommunication system for elevator. 5,086,450, Cl. 379-40.000.

Kitahara, Satoshi; Sugimoto, Kazuaki; Yamamoto, Akio; and Sugiura, Ikuro, to Tokyo Electric Co., Ltd. Thermal printer. 5,085,533, Cl. 400-652.000.

Kitamura, Mitsuru; and Hashimoto, Shunichi, to Kabushiki Kaisha Kobe Seiko Sho. Method of manufacturing a steel sheet. 5,085,714, Cl. 148-16.500.

Kitamura, Tadaaki: See—
Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.

Kitamura, Takayuki; and Yamashiro, Koichi, to Japan Aircraft Mfg., Co., Ltd. Extendable mast. 5,085,018, Cl. 52-108.000.

Kitano, Masahiko: See—
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Matsuda, Masahito; Shirahase, Ichiro; and Segawa, Jun, 5,086,049, Cl. 514-210.000.

Kitano, Shuichi; Ogata, Kiyoshi; and Sato, Shinobu, to Minnesota Mining and Manufacturing Company. Epoxy-acrylate blend pressure-sensitive thermosetting adhesives. 5,086,088, Cl. 522-170.000.

Kito, Tsutomu: See—
Shibahashi, Yutaka; Kito, Tsutomu; Nakasugi, Norikazu; and Inagaki, Hiroshi, 5,085,607, Cl. 446-14.000.

Kitsukawa, Goro: See—
Watanabe, Takao; Hori, Ryoichi; Kitsukawa, Goro; Kawajiri, Yoshiaki; Kawahara, Takayuki; and Itoh, Kiyoo, 5,086,238, Cl. 307-296.600.

Kittel, Franz P.: See—
Brogyanyi, Edgar; Stummer, Giseler; Kittel, Franz P.; and Schick, Roland, 5,085,737, Cl. 162-359.000.

Klas, Kenneth H.: See—
Freier, Edward, Jr.; Hays, Gary A.; Jacque, John F.; and Klas, Kenneth H., 5,085,044, Cl. 56-13.500.

Klausen, Jorn H.; and Froslev, Peter, to Danfos A/S. Fuel filter assembly for an oil burner pump. 5,085,769, Cl. 210-232.000.

Klausmann, Juergen: See—
Platz, Horst; Engelhardt, Peter; Sommermann, Friedrich; Kohl, Albert; Klausmann, Juergen; Baur, Reinhold; Heilmann, Peter; and Roller, Hermann, 5,085,889, Cl. 427-128.000.

Klein, Michel H.; Bous, Heather A.; Cockle, Stephen A.; Loosmore, Sheena M.; and Zealey, Gavin R., to Connaught Laboratories Limited. Genetic detoxification of pertussis toxin. 5,085,862, Cl. 424-92.000.

Klein, Renee A.: See—
Liles, Donald T.; and Klein, Renee A., 5,086,146, Cl. 528-15.000.

Klein, Scott I.; and Molino, Bruce F., to Rorer Pharmaceutical Corporation. Anti-thrombotic peptide and pseudopeptide derivatives. 5,086,069, Cl. 514-399.000.

Kleinert, Raymond J., III: See—
Gyenes, Russell E.; and Kleinert, Raymond J., III, 5,085,951, Cl. 429-86.000.

Kline, Charles E.; Dorinski, Dale W.; and Bradford, William M., to Motorola, Inc. Molded printed circuit for rotary switches. 5,086,200, Cl. 200-571.000.

Klinger, Gary, to ITT Corporation. Quick connector universal release tool. 5,084,954, Cl. 29-237.000.

Klose, Rainer: See—
Bosse, Frank; Lage, Karl-Heinz; and Klose, Rainer, 5,085,566, Cl. 425-66.000.

Klossek, Hans: See—
Kirchoff, Johannes; and Klossek, Hans, 5,085,554, Cl. 414-346.000.

Klotz, Gernot: See—
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Klotz, Gernot; and Greife, Heinrich A., 5,086,181, Cl. 546-310.000.

Kluth, Joachim: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Kneller, James F.; Narutis, Vytas; Fair, Barbara F.; and Johnson, Donald A., to Nalco Chemical Company. Oligomer containing phosphinate compositions and their method of manufacture. 5,085,794, Cl. 252-82.000.

Knestele, Leopold. Apparatus for cleaning floor coverings. 5,084,938, Cl. 15-98.000.

Knoll, Peter: See—
Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.

Knutsen, John C.: See—
Harclerode, William H.; Zimmermann, Eugene K.; Pekich, Barry J.; Knutsen, John C.; Wiman, John V.; and Voss, John C., 5,086,078, Cl. 521-58.000.

Kobashi, Koji: See—
Miyata, Koichi; Kumagai, Kazuo; Kobashi, Koji; Matsui, Yuichi; and Nakaue, Akimitsu, 5,086,014, Cl. 437-103.000.

Kobayashi, Aikazu; and Shiozawa, Hideo, to Matsushita Electric Industrial Co., Ltd. Mobile receiver. 5,086,511, Cl. 455-156.000.

Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, to Hitachi Seiko, Ltd. Wire electric discharge machining apparatus. 5,086,203, Cl. 219-69.120.

Kobayashi, Kesanao: See—
Shimizu, Tokihiko; and Kobayashi, Kesanao, 5,085,973, Cl. 430-271.000.

Kobayashi, Manabu, to Yamaha Hatsudoki Kabushiki Kaisha. Crankshaft and journal arrangement for engine. 5,085,186, Cl. 123-195.00R.

Kobayashi, Shun-ichi: See—
Shimizu, Ryu; and Kobayashi, Shun-ichi, 5,086,013, Cl. 437-80.000.

Kobayashi, Yoshio: See—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, 5,086,131, Cl. 526-68.000.

Kobayashi, Yukihiko: See—
Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiko, 5,085,495, Cl. 359-455.000.

Kobayashi, Yutaka: See—
Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.

Koch, Christof; and Bair, Wyeth, to California Institute of Technology. Circuit for detecting discontinuities in light intensity including two independent resistive networks. 5,086,219, Cl. 250-208.200.

Koch, John, Jr.: See—
Liebert, Curt H.; and Koch, John, Jr., 5,086,204, Cl. 219-69.170.

Koda, Takao: See—
Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.

Koegel, Keith S.; and Weber, Ronald M., to AMP Incorporated. Side entry cable assembly. 5,085,595, Cl. 439-494.000.

Koenig, Winfried: See—
Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.

Koga, Hidetaka, to Isuzu Motors Limited. Gear transmission for vehicle. 5,085,092, Cl. 74-333.000.

Koga, Horitaka: See—
Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.

Koga, Masataka: See—
Okamoto, Yukio; Yasuda, Makoto; and Koga, Masataka, 5,086,255, Cl. 315-111.210.

Kohl, Albert: See—
Platz, Horst; Engelhardt, Peter; Sommermann, Friedrich; Kohl, Albert; Klausmann, Juergen; Baur, Reinhold; Heilmann, Peter; and Roller, Hermann, 5,085,889, Cl. 427-128.000.

Kohler, Burkhard; Heinz, Hans-Detlef; and Reinking, Klaus, to Bayer Aktiengesellschaft. Polyarylene sulphide modified with aryl sulfonic acid containing amino or hydroxyl group. 5,086,129, Cl. 525-537.000.

Kohler, Burkhard: See—
Heinz, Hans-Detlef; Kohler, Burkhard; Meyer, Rolf-Volker; Reinking, Klaus; and Sommer, Alex, 5,086,128, Cl. 525-537.000.

Pielartzik, Harald; Kohler, Burkhard; Traenckner, Hans-Joachim; Jakob, Wolfgang; and Bushong, William C., 5,086,102, Cl. 524-188.000.

Kohlpaintner, Georg; and Bienert, Horst, to Webasto AG Fahrzeugtechnik. Sliding roof and/or sliding-lifting roof for motor vehicles. 5,085,622, Cl. 296-222.000.

Kohn, Shigefumi: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohn, Shigefumi, 5,085,466, Cl. 280-775.000.

Koht, Lowell: See—
Story, Martha F.; Ragland, Glen W.; Humphries, William H.; Koht, Lowell; and Uken, William D., 5,085,597, Cl. 439-521.000.

Koike, Hisashi: See—
Karasawa, Wataru; Itoyama, Taketoshi; Takao, Itaru; Obikane, Tadashi; and Koike, Hisashi, 5,086,270, Cl. 324-158.00P.

Koike, Tadao, to Ricoh Company, Ltd. Paper conveying mechanism in image forming apparatus. 5,086,320, Cl. 355-318.000.

Koiwai, Masahiro: See—
Iida, Kazuhiko; and Koiwai, Masahiro, 5,086,309, Cl. 346-160.000.

Koizumi, Hitoshi: See—
Kurabayashi, Ken; Tsuchiya, Yoshinobu; Yoshida, Akio; Koizumi, Hitoshi; and Niida, Yoriaki, 5,086,373, Cl. 361-502.000.

Koizumi, Tatsuya: See—
Hanki, Kazuo; Koizumi, Tatsuya; Ishiguro, Kazuya; and Kanitani, Kiyoshi, 5,086,262, Cl. 318-568.100.

Kojima, Ayako; and Masumoto, Hisayuki, to Minolta Camera Kabushiki Kaisha. Compact zoom lens system. 5,086,356, Cl. 359-686.000.

Kojima, Noriyuki, to Komori Corporation. Chopper fold device for a folder. 5,085,625, Cl. 493-444.000.

Kojima, Tetsuya, to Fuji Photo Film Co., Ltd. Method for eliminating nonuniformity in sensitivity in image read-out apparatuses. 5,086,228, Cl. 250-327.200.

Kojiya, Kagumi: See—
Mukai, Hiromu; Kojiya, Kagumi; Hayashi, Kohtaro; and Shibuya, Taro, 5,086,353, Cl. 359-432.000.

Koksal, Cevdet G.: See—
Berthold, John W.; Koksal, Cevdet G.; and Jeffers, Larry A., 5,086,220, Cl. 250-227.200.

Kolb, Robert E.: See—
Guenther, Richard A.; and Kolb, Robert E., 5,086,123, Cl. 525-276.000.

Kolbenschmidt Aktiengesellschaft: See—
Kreuzer, Martin, 5,085,463, Cl. 280-731.000.

Kolbus GmbH & Co. KG: See—
Erdorries, Ulrich; and Schuler, Robert C., 5,085,551, Cl. 412-6.000.

Koltoukian, Sarkis A., to Deere & Company. Large part rollover device. 5,085,557, Cl. 414-778.000.

Komami, Yuji; Kan, Megumi; Tamai, Toshiyuki; and Hishinuma, Tataru, to Kawasaki Steel Corporation. Method for suppressing fluctuation of width in hot rolled strip. 5,085,066, Cl. 72-13.000.

Komatsu, Yasuji: See—
Narihiko, Yoshimura; Tamizawa, Hirotaka; and Komatsu, Yasuji, 5,085,792, Cl. 252-79.000.

Komori Corporation: See—
Kojima, Noriyuki, 5,085,625, Cl. 493-444.000.

Komori, Hirohito: See—
Taniuchi, Akira; Komori, Hirohito; and Niwa, Koichi, 5,086,114, Cl. 525-123.000.

Komori, Masanoshin: See—
Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.

Kondo, Hiroatsu: See—
Saito, Hideo; Kimura, Tadashi; and Kondo, Hiroatsu, 5,085,530, Cl. 400-171.000.

Kondo, Tetsuya: See—
Narabu, Tadakuni; Kondo, Tetsuya; Maki, Yasuhito; and Noguchi, Katsunori, 5,086,440, Cl. 377-60.000.

Kondo, Yoshinori: See—
Togo, Shizuo; Amagai, Akikazu; Kondo, Yoshinori; and Yamada, Toshiaki, 5,086,112, Cl. 525-68.000.

Kondo, Youichi: See—
Kawanaka, Masanobu; Kondo, Youichi; Tabata, Junichi; and Onda, Kimimasa, 5,085,052, Cl. 60-445.000.

Konica Corporation: See—
Itakura, Haruo; and Kurihara, Susumu, 5,086,212, Cl. 219-505.000.

Kajiwara, Makoto; Nishijima, Toyoki; and Chino, Shigeo, 5,085,978, Cl. 430-374.000.

Sakata, Satoshi; Sato, Kazuo; Gotoh, Yuichi; Azumai, Mitsuo; and Hotta, Ikuya, 5,086,261, Cl. 318-268.000.

Konig, Axel: See—
Held, Wolfgang; Konig, Axel; and Puppe, Lothar, 5,085,840, Cl. 423-212.000.

Konig, Klaus: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Koning, G. Paul: See—
Gupta, Amar; Kaufman, Charles W.; Kempf, Mark F.; and Koning, G. Paul, 5,086,469, Cl. 380-48.000.

Konishi, Keiichi: See—
Morishita, Akira; and Konishi, Keiichi, 5,085,713, Cl. 148-12.100.

Morishita, Akira; and Konishi, Keiichi, 5,086,247, Cl. 310-270.000.

Konno, Mitoshi; Nakae, Takahiko; and Hamaoka, Nobuyuki, to Ono Pharmaceutical Co., Ltd. Phenylalkanoic acid. 5,086,065, Cl. 514-372.000.

Konno, Sunao, to Tomy Company, Ltd. Toy with remote control track switching. 5,085,148, Cl. 104-130.000.

Kono, Takumi: See—
Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioaka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.

Korba, Paul H.: See—
Peach, John A.; Korba, Paul H.; and Rapp, Kenneth M., 5,085,470, Cl. 283-58.000.

Korber AG: See—
Wochnowski, Waldemar; and Niehues, Heiko, 5,086,279, Cl. 324-637.000.

Koretomo, Katsuhiko: See—
Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiko; and Kimura, Tsuguji, 5,085,009, Cl. 51-131.100.

Korte, Siegfried: See—
Frauendorf, Beatrix; Suling, Carlhans; Rudolph, Hans; and Korte, Siegfried, 5,086,150, Cl. 528-49.000.

Kos, Chester M., to Rubbermaid Commercial Products Inc. Shock resistant gasketing system for liquid containers. 5,085,337, Cl. 220-204.000.

Koshino, Yutaka: See—
Nakagawa, Akio; Watanabe, Kiminori; Koshino, Yutaka; Yamaguchi, Yoshihiro; and Baba, Yoshiro, 5,086,332, Cl. 357-51.000.

Kosinski, Leonard E. R., to Du Pont de Nemours, E. I., and Company. Polyacetal compositions stabilized with microcrystalline or fibrous cellulose. 5,086,096, Cl. 524-36.000.

Kotzin, Michael D., to Motorola, Inc. Text modifier. 5,086,468, Cl. 380-28.000.

Koukal, Heinz: See—
Arold, Klaus; and Koukal, Heinz, 5,085,266, Cl. 165-1.000.

Kouno, Katsumi; Hattori, Yuji; and Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control apparatus for vehicle power transmitting system. 5,085,104, Cl. 74-866.000.

Koyama, Hiroo: See—
Horikawa, Hiroshi; Watanabe, Akira; Koyama, Hiroo; and Mori, Ikuro, 5,086,497, Cl. 395-147.000.

Kozma, Jess A.: See—
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,085,903, Cl. 428-34.600.

Kozono, Seiji: See—
Maejima, Toshiro; Sakurai, Kazuaki; Kozono, Seiji; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,085,599, Cl. 439-595.000.

Kozuka, Yoshinari: See—
Osugi, Yukihiisa; Abe, Hiroaki; and Kozuka, Yoshinari, 5,085,503, Cl. 359-246.000.

KPG Associates, Inc.: See—
Hill, David A., 5,086,225, Cl. 250-288.000.

Kraatz, Gary W.: See—
Carter, Charles G.; Lee, David L.; Michaely, William J.; and Kraatz, Gary W., 5,085,688, Cl. 71-103.000.

Kramer, Wolfgang: See—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinplugg, Hans; and Kramer, Wolfgang, 5,086,048, Cl. 514-187.000.

Kraus, Charles E., to Excelsomatic Inc. Infinitely variable traction roller transmission. 5,085,089, Cl. 74-200.000.

Krause, Helmfried: See—
Deller, Klaus; Forster, Martin; and Krause, Helmfried, 5,086,031, Cl. 502-251.000.

Kresch, Jeffrey M.: See—
Bartosiak, George; Paris, Sam; Kresch, Jeffrey M.; Danley, William J.; Kalley, Eugene F.; and Goldberg, Arthur E., 5,085,525, Cl. 374-124.000.

Kreuzer, Martin, to Kolbenschmidt Aktiengesellschaft. Gas bag apparatus for protection against impact. 5,085,463, Cl. 280-731.000.

Kriebel, Manfred; Grunewald, Gerhard; and Fritzsche, Hans-J., to Metallgesellschaft Aktiengesellschaft. Process of regenerating a high-boiling scrubbing solution which contains CO₂ and H₂S. 5,085,675, Cl. 55-44.000.

Kriesels, Peter C., to Falk Corporation, The. Marine reverse reduction gearbox. 5,085,302, Cl. 192-51.000.

Krishnan, Sivaram: See—
Jorissen, Steven A.; and Krishnan, Sivaram, 5,086,097, Cl. 524-91.000.

Kritz, Albert M.: See—
Surya, Ronald V.; and Kritz, Albert M., 5,085,532, Cl. 400-234.000.

Krone Aktiengesellschaft: See—
Gerke, Dieter; Biederstedt, Lutz; and Muller, Manfred, 5,086,368, Cl. 361-118.000.

Krueger, William H., to Du Pont de Nemours, E. I., and Company. Fiber reinforced composites comprising uni-directional fiber layers and aramid spunlaced fabric layers. 5,085,928, Cl. 428-287.000.

KTS Kommunikationstechnik Stolper GmbH: See—
Nutzell, Wolfgang, 5,086,287, Cl. 340-407.000.

Kubitschek, Edward D.: See—
Heil, Ronald W., Jr.; Wickham, Robert W., Jr.; and Kubitschek, Edward D., 5,085,218, Cl. 128-642.000.

Kubota, Saburo; Mega, Hirotaka; and Kametani, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Bi-axial synchronous driving apparatus. 5,086,263, Cl. 318-568.110.

Kubota, Shingo: See—
Takeuchi, Yukio; Nakahashi, Akio; and Kubota, Shingo, 5,085,045, Cl. 57-58.650.

Kuchenbecker, Morris W., and Maroszek, Raymond V., to James River Corporation of Virginia. Carton having a perforation cut score opening and a carton blank for forming the same. 5,085,323, Cl. 229-207.000.

Kudo, Katsuyoshi: See—
Soraoka, Minoru; Kawasaki, Yoshinobu; Kudo, Katsuyoshi; and Tsubone, Tsunehiko, 5,085,750, Cl. 204-192.320.

Kudo, Koji: See—
Takahashi, Kuniaki; Kudo, Koji; Araya, Shinichi; and Nakayama, Hitoshi, 5,084,962, Cl. 29-833.000.

Kudo, Toshiharu: See—
Maejima, Toshiro; Sakurai, Kazuaki; Kozono, Seiji; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,085,599, Cl. 439-595.000.

Kudo, Yoshiki: See—
Miyake, Toru; Higuchi, Naoshige; Kudo, Yoshiki; and Tanabe, Hisao, 5,086,297, Cl. 340-759.000.

Kudo, Yoshinobu; and Kimura, Kazuo, to Minolta Camera Kabushiki Kaisha. Focal length changeable lens system. 5,086,355, Cl. 359-675.000.

Kuekenhoeher, Thomas: See—
Rheinheimer, Joachim; Eicken, Karl; Vogelbacher, Uwe J.; Rohr, Wolfgang; Kuekenhoeher, Thomas; Westphalen, Karl O.; and Wuerzer, Bruno, 5,085,685, Cl. 71-92.000.

Kuhleke, Reiner J. Paint brush with replaceable applicator. 5,084,931, Cl. 15-244.100.

Kumagai, Kazuo: See—
Miyata, Koichi; Kumagai, Kazuo; Kobashi, Koji; Matsui, Yuichi; and Nakae, Akimitsu, 5,086,014, Cl. 437-103.000.

Kumagai, Ryohei, to Ezel, Inc. Image processing method. 5,086,482, Cl. 382-25.000.

Kumar, Lori D.: See—
Pan, Pauline H.; Dills, Steven S.; Lynch, Donald M.; and Kumar, Lori D., 5,085,850, Cl. 424-49.000.

Kumar, Mridul: See—
Rivas, Luis F.; Reis, John; and Kumar, Mridul, 5,085,276, Cl. 166-303.000.

Kumashiro, Koichi: See—
Suzuki, Chiaki; Kumashiro, Koichi; Torigoe, Tetsu; Kimura, Takachi; and Aoki, Takayoshi, 5,085,963, Cl. 430-106.600.

Kummer, Pierre: See—
Goergen, Rene; and Kummer, Pierre, 5,085,259, Cl. 152-209.00R.

Kunert, Heinz, to Saint-Gobain Vitrage. Automobile glass pane having elastic sealing profile. 5,085,021, Cl. 52-208.000.

Kunig, Helmut, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Presser belt separating apparatus. 5,085,140, Cl. 100-121.000.

Kunugi, Yoshifumi: See—
Yanadori, Michio; Fukushima, Toshihiko; and Kunugi, Yoshifumi, 5,085,271, Cl. 165-104.120.

Kuo, Richard J.: See—
Boyer, Charles E., III; Borchers, Eric J.; Kuo, Richard J.; and Hoyle, Charles D., 5,085,931, Cl. 428-328.000.

Kupies, Dieter: See—
Weber, Jurgen; Bexten, Ludger; Kupies, Dieter; Lappe, Peter; and Springer, Helmut, 5,085,835, Cl. 423-22.000.

Kurabayashi, Ken; Tsuchiya, Yoshinobu; Yoshida, Akio; Koizumi, Hitoshi; and Niida, Yoriaki, to Isuzu Motors Limited. Electric double layer capacitor. 5,086,373, Cl. 361-502.000.

Kurabe Industrial Co., Ltd.: See—
Yasukawa, Yoshikazu; and Inagaki, Norihiro, 5,086,286, Cl. 338-34.000.

Kuraray Co., Ltd.: See—
Omura, Ikuro; Yamauchi, Junichi; and Kawashima, Mitsunobu, 5,085,726, Cl. 156-307.300.

Kurata, Takafumi: See—
Imamura, Hiroyuki; Kurata, Takafumi; Yokota, Hiroaki; and Noguchi, Naovuki, 5,085,301, Cl. 192-0.076.

Kurata, Yukio: See—
Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569.000.

Kureha Kabaku Kogyo K.K.: See—
Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: See—
Doi, Hideaki; and Sakagami, Teruo, 5,086,140, Cl. 526-274.000.

Kurihara, Masaru: See—
Ohta, Hideo; Matsumoto, Yasuhiro; and Kurihara, Masaru, 5,085,145, Cl. 101-363.000.

Kurihara, Susumu: See—
Itakura, Haruo; and Kurihara, Susumu, 5,086,212, Cl. 219-505.000.

Kuriyama, Hiroshi: See—
Ikeda, Kazutoshi; Kuriyama, Hiroshi; Ichioaka, Tetsumi; and Matsuo, Ryouji, 5,085,132, Cl. 98-2.110.

Kuroda, Kazuhisa: See—
Fukui, Yoshiharu; and Kuroda, Kazuhisa, 5,086,099, Cl. 524-108.000.

Fukui, Yoshiharu; and Kuroda, Kazuhisa, 5,086,100, Cl. 524-108.000.

Kuroda, Shoji: See—
Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiko, 5,085,495, Cl. 359-455.000.

Kurtz, William L.: See—
Shaffer, John H.; and Kurtz, William L., 5,085,847, Cl. 423-474.000.

Kusaka, Kenji: See—
Tsukakoshi, Masato; Takahashi, Yasuhiro; Terada, Matsuaki; and Kusaka, Kenji, 5,086,426, Cl. 370-85.130.

Kuske, Peter; and Buxbaum, Gunter, to Bayer Aktiengesellschaft. Synthetic pigment having the color of natural uncalcined umber and its use. 5,085,706, Cl. 106-456.000.

Kutaragi, Ken; Furuhashi, Makoto; Suzuoki, Masakazu; and Kageyama, Koji, to Sony Corporation. Apparatus for generating, recording or reproducing sound source data. 5,086,475, Cl. 381-36.000.

Kuischenreuter, Paul H., Jr.; and Blanton, John C., to General Electric Company. Scramjet including integrated inlet and combustor. 5,085,048, Cl. 60-270.100.

Kuwabara, Ken-ichi: See—
Kameoka, Kimitaka; Kuwabara, Ken-ichi; Takahashi, Toshiro; Moriuchi, Shigenori; Yagihara, Morio; Inagaki, Yoshio; and Adachi, Keiichi, 5,085,970, Cl. 430-264.000.

Kuwabara, Takeshi: See—
Sanderson, Robert A.; Sakai, Katsunori; Kuwabara, Takeshi; and Amemiya, Takashi, 5,085,949, Cl. 429-23.000.

Kuwahara, Tetsuya: See—
Satomi, Mitsuo; Nomura, Akio; Oshita, Kazuaki; and Kuwahara, Tetsuya, 5,086,455, Cl. 379-100.000.

Kuwamoto, Hideharu: See—
Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Kuwamoto, Hideharu, 5,085,991, Cl. 435-108.000.

Kuwano, Tatsuhiko: See—
Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiko; and Kimura, Tsuguji, 5,085,009, Cl. 51-131.100.

Kvistgaard, Jens P. Lifter for potatoes and other subterranean vegetation products. 5,085,279, Cl. 171-4.000.

Kwarta, Brian J.: See—
Womack, Kenneth H.; Kwarta, Brian J.; Outtersen, David H.; and Reda, James R., 5,085,502, Cl. 356-376.000.

Kyaw-Naing, Elena: See—
Porz, Christoph; Christensen, Bernd; Kyaw-Naing, Elena; Gulden, Walter; and Paulus, Erich F., 5,085,842, Cl. 423-226.000.

Kyoi, Yuji: See—
Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyoi, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.

Kyowa Hako Kogyo Co., Ltd.: See—
Sato, Tsutomu; Shimizu, Ikuro; and Ito, Yukiyo, 5,085,909, Cl. 428-64.000.

Labauze, Gerard: See—
Gobin, Vincent; Labauze, Gerard; and Issac, Francois, 5,086,274, Cl. 324-239.000.

Laboratoires Delagrangre Societe d'Applications Pharmacodynamiques: See—
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Naylor, Robert; and Costall, Brenda, 5,086,066, Cl. 514-377.000.

Lackney, Albert M. Medicament and support. 5,085,634, Cl. 604-77.000.
 Lacruche, Bernard: See—
 Mestas, Jean-Louis; Lacruche, Bernard; and Cathignol, Dominique, 5,085,206, Cl. 128-24.0EL.
 Ladies Houshoku Company Ltd.: See—
 Matsushita, Koji, 5,085,060, Cl. 63-2.000.
 Laditka, Alexander. Methods and apparatus for dispensing, mixing, and applying coating constituents to traffic surfaces. 5,085,537, Cl. 404-75.000.
 Lage, Karl-Heinz: See—
 Bosse, Frank; Lage, Karl-Heinz; and Klose, Rainer, 5,085,566, Cl. 425-66.000.
 Lai, Ta-Wang: See—
 Pinschmidt, Robert K., Jr.; Vijayendran, Bheema R.; and Lai, Ta-Wang, 5,085,787, Cl. 252-8.551.
 Pinschmidt, Robert K., Jr.; and Lai, Ta-Wang, 5,086,111, Cl. 525-61.000.
 Lalvani, Prem: See—
 Himmelmann, Wolfgang; Lalvani, Prem; Buschmann, Hans-Theo; and Helling, Gunter, 5,085,981, Cl. 430-536.000.
 Lam, Peter Ar-Fu. Adjustable clothes hanger. 5,085,358, Cl. 223-94.000.
 La Mantia, Francesco P.: See—
 Pedretti, Ugo; Bresci, Bruno; Bonfanti, Cesarina; Magagnini, Pier L.; La Mantia, Francesco P.; and Roggero, Arnaldo, 5,086,160, Cl. 528-291.000.
 Lammintausta, Risto: See—
 Sinclair, John D.; Scheinin, Harry; and Lammintausta, Risto, 5,086,058, Cl. 514-282.000.
 Lancini, Giancarlo; Borghi, Angelo; Antonini, Piero; and Palumbo, Raffaele, to Gruppo Lepetit S.p.A. Teicoplanin-like derivatives. 5,085,990, Cl. 435-71.300.
 Langer, Rudolf: See—
 Rutz, Andreas; Langer, Rudolf; Becher, Hubert; Buttenbender, Klaus; and Zeller, Heinz, 5,084,949, Cl. 26-72.000.
 Langouet, Luc, to Vilter Manufacturing Corporation. Bearing and seal assembly. 5,085,518, Cl. 384-477.000.
 Lansdowne, David L., to DewEze Manufacturing, Inc. Slope mower with rear drive assembly. 5,085,042, Cl. 56-6.000.
 Lanxide Technology Company, LP: See—
 Weinstein, Jerry G.; and Kantner, Robert C., 5,086,019, Cl. 501-94.000.
 Lappe, Peter: See—
 Weber, Jürgen; Bexten, Ludger; Kupies, Dieter; Lappe, Peter; and Springer, Helmut, 5,085,835, Cl. 423-22.000.
 Larkin, John; and Carlisle, George, deceased (by Carlisle, Ida Maude, legal representative), to Short Brothers PLC. Canopy assembly. 5,085,383, Cl. 244-121.000.
 Larkin, John M.: See—
 Burns, Jeffrey M.; Sanderson, John R.; Larkin, John M.; and McCoy, David R., 5,085,793, Cl. 252-79.000.
 Larkin, Mark E.; Ogden, John E.; and Moeller, Dale V., to Abbott Laboratories. Syringe, adaptor, and check valve combination for parenteral infuser. 5,085,643, Cl. 604-152.000.
 Lars, Tenez; Bertil, Hok; Roman, Lenc; Ola, Hammarstrom; and Tomas, Engstrom, to Radi Medical Systems AB. Miniaturized pressure sensor having means for protection of diaphragm. 5,085,223, Cl. 128-675.000.
 Lasoen, Jean J., to Massey-Ferguson Services N.V. Gearbox selector mechanism. 5,085,095, Cl. 74-473.00R.
 Latimer, Paul J.: See—
 Cantor, Barry I.; Flora, John H.; and Latimer, Paul J., 5,085,082, Cl. 73-622.000.
 Latter, Gerald M.: See—
 Johansson, Eric B.; Latter, Gerald M.; and Curulla, Michael V., 5,085,827, Cl. 376-444.000.
 Lauck, Anthony G.: See—
 Perlman, Radia J.; Varghese, George; and Lauck, Anthony G., 5,086,428, Cl. 370-94.100.
 Lauenstein, Michael: See—
 Tallier, Bernard; and Lauenstein, Michael, 5,085,229, Cl. 131-84.400.
 Laughlin, Thomas J.: See—
 Cowser, Donald R.; Dunn, Richard L.; and Laughlin, Thomas J., 5,085,866, Cl. 424-481.000.
 Launey, Reuel O.; Grendler, Peter A.; Packham, Donald L.; Battaglia, James M.; and Levine, Howard E., to Custom Command Systems. Expandable home automation system. 5,086,385, Cl. 364-188.000.
 Lautenschlager, Karl, to Karl Lautenschlager GmbH & Co. KG. Mounting plate assembly for cabinet hinges. 5,085,491, Cl. 312-329.000.
 Lave, Daniel: See—
 James, Claude; Lave, Daniel; and Soler, Francoise, 5,086,051, Cl. 514-228.200.
 Lawarre Precision Technologies Inc.: See—
 LaWarre, Robert W., Sr.; and LaWarre, Robert W., Jr., 5,085,255, Cl. 141-39.000.
 LaWarre, Robert W., Jr.: See—
 LaWarre, Robert W., Sr.; and LaWarre, Robert W., Jr., 5,085,255, Cl. 141-39.000.
 LaWarre, Robert W., Sr.; and LaWarre, Robert W., Jr., to Lawarre Precision Technologies Inc. Filling valve apparatus. 5,085,255, Cl. 141-39.000.
 Lawhon, James T.; and Rhee, Khee C., to Texas A&M University System, The. Protein foods and food ingredients and processes for producing them from defatted and undefatted oilseeds. 5,086,166, Cl. 530-378.000.

Lawler, Louis N. Automatic headlight dimmer apparatus. 5,086,253, Cl. 315-83.000.
 Lawrence, Douglas P.; and Childress, Jeffrey S., to General Electric Company. Digital radio transceiver programmer with advanced user interface. 5,086,513, Cl. 455-186.000.
 Lawrenz, Dirk: See—
 Schupp, Hans; Scherz, Thomas; Lawrenz, Dirk; Oslowski, Hans-Josef; and Heimann, Ulrich, 5,086,092, Cl. 523-414.000.
 Lawson, Dennis L.; and Dettmerman, Robert E., to B. F. Goodrich Company, The. Crosslinked chlorinated polyvinyl chloride resin compositions. 5,086,122, Cl. 525-235.000.
 Lawson, Richard D.: See—
 Hinze, Jay W.; Lawson, Richard D.; and Blake, Mott J., 5,085,679, Cl. 65-1.000.
 Lax, Michael, to Autronic Plastics, Inc. Bottom-load video cassette container. 5,085,322, Cl. 206-387.000.
 LeaRonai, Inc.: See—
 Brasch, William R., 5,085,744, Cl. 205-148.000.
 Leavitt, Frederick W., to Union Carbide Industrial Gases Technology Corporation. Duplex adsorption process. 5,085,674, Cl. 55-26.000.
 LeBeau, David R.: See—
 Brosher, Paul L.; LeBeau, David R.; and Shuck, Dallas, 5,084,979, Cl. 33-193.000.
 Leberherz, William B., III: See—
 Golik, Jerzy; Beutler, John; Clark, Pat; Ross, John; Roach, John; Muschik, Gary; and Leberherz, William B., III, 5,086,045, Cl. 514-61.000.
 Lebron, Carmen A.; Karr, Leslie A.; Fernando, Tudor; and Aust, Steven D., to United States of America, Navy. Biodegradation of 2,4,6-trinitrotoluene by white-rot fungus. 5,085,998, Cl. 435-262.000.
 Lechaton, John S.: See—
 Brodsky, Stephen B.; Joshi, Rajiv V.; Lechaton, John S.; Ryan, James G.; and Schepis, Dominic J., 5,086,016, Cl. 437-190.000.
 Lechner, Gunther: See—
 Jochum, Peter; Gasser, Oswald; Zahler, Wolf-Dietrich; Lechner, Gunther; Guggenberger, Rainer; and Ellrich, Klaus, 5,086,148, Cl. 528-15.000.
 Lecloux, Andre; Declerck, Claude; and Legrand, Franz, to Interox (Societe Anonyme). Process for the manufacture of epoxides. 5,086,189, Cl. 549-531.000.
 Ledbetter, William B., Jr.: See—
 McGarity, Ralph C.; Ledbetter, William B., Jr.; McMahan, Steven C.; Gallup, Michael G.; Stanphill, Russell; and Gay, James G., 5,086,407, Cl. 395-800.000.
 Ledeen, Howard L.: See—
 Botting, Robert J.; and Ledeen, Howard L., 5,085,401, Cl. 251-129.110.
 Lee, Chi-Chang: See—
 Jones, David C.; and Lee, Chi-Chang, 5,085,817, Cl. 264-175.000.
 Lee Company, The: See—
 O'Dell, Gerald W., 5,085,402, Cl. 251-129.210.
 Lee, David J., to Indiana Mills & Manufacturing, Inc. Quick disconnect connector. 5,084,946, Cl. 24-625.000.
 Lee, David L.: See—
 Carter, Charles G.; Lee, David L.; Michael, William J.; and Kraatz, Gary W., 5,085,688, Cl. 71-103.000.
 Lee, Frank W.: See—
 Baron, Kenneth S.; Brinkerhoff, Susan M.; Lee, Frank W.; and McKinney, Stella M., 5,086,149, Cl. 528-45.000.
 Lee, Fu-Ming; and Brown, Ronald E., to Phillips Petroleum Company. Separation of alkenes from alkanes. 5,085,740, Cl. 203-51.000.
 Lee, Fu-Ming: See—
 Brown, Ronald E.; Rouse, Anthony L.; and Lee, Fu-Ming, 5,085,741, Cl. 203-53.000.
 Lee, Jer-Shyang J.; and Lee, Shin Y. Portable art object wall decoration. 5,085,002, Cl. 47-41.120.
 Lee, Julia L.: See—
 Fukuyama, James M.; and Lee, Julia L., 5,086,124, Cl. 525-403.000.
 Lee, Miryoung, to Many Amazing Ideas. Articles of play for use in the game of catch. 5,085,442, Cl. 273-346.000.
 Lee, Sheng-Hann, to Teledyne Industries, Inc. Dipole transducer array for bulk acoustic wave delay device. 5,086,283, Cl. 333-149.000.
 Lee, Shin Y.: See—
 Lee, Jer-Shyang J.; and Lee, Shin Y., 5,085,002, Cl. 47-41.120.
 Leff, Jerry: See—
 Kahn, Frederic J.; Kendrick, Paul N.; Leff, Jerry; Livoni, Linden J.; Loucks, Bryan E.; Stepper, David E.; and Witte, Kenneth G., 5,085,506, Cl. 353-122.000.
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 Gold, Robert J.; Leffel, Wesley C.; and Myka, Albert G., 5,085,147, Cl. 102-486.000.
 Le Goffic, Yves H. M.; and Soulabail, Roland Y. J. M., to Telecommunications Radioelectriques et Telephoniques. Arrangement for transforming data packets into a regular multiplex for a transmission system utilizing the TDMA principle. 5,086,425, Cl. 370-84.000.
 Legrand, Franz: See—
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 Lehmann, Ernst: See—
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 Lehrman, Sandra N.: See—
 Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 5,086,044, Cl. 514-51.000.
 Leibovitz, Jacques; Scholz, Kenneth D.; Nagesh, V. K.; and Chao, Clinton C., to Hewlett-Packard Company. Tape automated bonding system which facilitate repair. 5,086,335, Cl. 357-70.000.

Leighton, Barbara, to Thomas Jefferson University. Method and kit for administering spinal subarachnoid anesthesia. 5,085,631, Cl. 604-28.000.
 Leinweber, Johann, to Leinweber Maschinen Gesellschaft m.b.H. & Co. KG. Press for forming bodies. 5,085,570, Cl. 425-195.000.
 Leinweber Maschinen Gesellschaft m.b.H. & Co. KG: See—
 Leinweber, Johann, 5,085,570, Cl. 425-195.000.
 Leopold, Ludwig; Sander, Rainald; Tihanyi, Jenoe; and Weber, Roland, to Siemens Aktiengesellschaft. Circuitry for detecting a short circuit of a load in series with an FET. 5,086,364, Cl. 361-18.000.
 Leissing, Nancy C.; and Oskroba, Diana, to Baxter International, Inc. Automated test method for evaluating the physical compatibility of intravenous drugs in solutions. 5,086,001, Cl. 436-171.000.
 Leitao, Joseph F. Chipping and putting practice device. 5,085,437, Cl. 273-183.00B.
 Lemaire, Marc; Guy, Alain; Foos, Jacques; Chomel, Rodolphe; Douteigne, Pierre; Moutarde, Thierry; Guyon, Vincent; and Le Roy, Henri, to Cogema-Compagnie Generale des Matieres Nucleaires. Method for separating by using crown compounds plutonium from uranium and from fission products in the initial stages for the reprocessing of irradiated nuclear fuels. 5,085,834, Cl. 423-8.000.
 Lembeck, Theo: See—
 Brockmanns, Karl-Josef; Bruns, Siegfried; and Lembeck, Theo, 5,084,941, Cl. 19-151.000.
 Le Moigne, Jacques: See—
 Thierry, Annette; and Le Moigne, Jacques, 5,085,801, Cl. 252-408.100.
 Lenington, John W.: See—
 McDougal, John A.; and Lenington, John W., 5,085,192, Cl. 123-416.000.
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 Lentz, Nelsen L.: See—
 Peet, Norton P.; and Lentz, Nelsen L., 5,086,176, Cl. 544-251.000.
 Leon, Robert L., to Liberty Technology Center, Inc. A.C. electromagnetic system for determining position of an encased movable electrically conductive element. 5,086,273, Cl. 324-207.170.
 Le Roy, Guy, to Alcatel Cit. System for connecting optical lines to a wideband telecommunications exchange. 5,086,348, Cl. 358-117.000.
 Le Roy, Henri: See—
 Lemaire, Marc; Guy, Alain; Foos, Jacques; Chomel, Rodolphe; Douteigne, Pierre; Moutarde, Thierry; Guyon, Vincent; and Le Roy, Henri, 5,085,834, Cl. 423-8.000.
 Lessig, William R., III; Bailey, Rouse R., Jr.; and Cochran, John R., to Black & Decker Inc. Vacuum cleaners. 5,084,934, Cl. 15-325.000.
 Lesuisse, Dominique: See—
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 Letton, James C.: See—
 Young, Jerry D.; Kester, Jeffrey J.; Wehmeier, Thomas J.; Fox, Mary M.; and Letton, James C., 5,085,884, Cl. 426-611.000.
 Levad, Douglas J.: See—
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 Leverenz, David, to Fast Heat Element Manufacturing Co., Inc. Multiple tip torpedo heater. 5,085,572, Cl. 425-549.000.
 Leverick, Kathy L. Secured disc folder. 5,085,318, Cl. 206-312.000.
 Levesque, Joseph M. Building stud support. 5,085,389, Cl. 248-300.000.
 Levine, Howard E.: See—
 Launey, Reuel O.; Grendler, Peter A.; Packham, Donald L.; Battaglia, James M.; and Levine, Howard E., 5,086,385, Cl. 364-188.000.
 Levy, Harry. Durable and reusable incontinent underpads. 5,085,653, Cl. 604-358.000.
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- Matsumoto, Kouji, to NEC Corporation. Re-triggerable monostable multivibrator capable of generating a predetermined width of pulse with additional logic gate and D flip-flop with reset. 5,086,237, Cl. 307-273.000.
- Matsumoto, Kunio: See—
Noro, Takanobu; Matsumoto, Kunio; Oshima, Muneo; Kanda, Naoya; Sakaguchi, Suguru; and Murata, Akira, 5,086,337, Cl. 357-79.000.
- Matsumoto, Masashi: See—
Sugishima, Yoshio; and Matsumoto, Masashi, 5,086,317, Cl. 355-218.000.
- Matsumoto, Takashi: See—
Motohashi, Kazutoshi; Uehara, Takeshi; and Matsumoto, Takashi, 5,086,424, Cl. 370-58.100.
- Matsumoto, Yasuhiro: See—
Ohta, Hideo; Matsumoto, Yasuhiro; and Kurihara, Masaru, 5,085,145, Cl. 101-363.000.
- Matsumura, Chitoshi: See—
Yamamoto, Hironori; Matsumura, Chitoshi; and Mori, Kentaro, 5,085,265, Cl. 164-468.000.
- Matsuoka, Ryouji: See—
Ikeda, Kazutoshi; Kuriyama, Hiroshi; Ichioka, Tetsumi; and Matsuoka, Ryouji, 5,085,132, Cl. 98-2.110.
- Matsushima, Seichi; Yagi, Masahide; Suzuki, Masahiro; and Mori, Yasuyuki, to Hitachi Maxell, Ltd. Optical data recording medium and method of manufacturing the same. 5,085,910, Cl. 428-64.000.
- Matsushita Electric Industrial Co., Ltd.: See—
Ando, Tateo; and Kabeshita, Akira, 5,084,959, Cl. 29-740.000.
- Ishihara, Yukihiko; Yamamoto, Tamotsu; and Matsui, Hiroshi, 5,086,221, Cl. 250-231.130.
- Katano, Mitsunori; Yamazaki, Fumio; and Yamakita, Hiroyuki, 5,085,334, Cl. 220-2.200.
- Kobayashi, Akikazu; and Shiozawa, Hideo, 5,086,511, Cl. 455-156.000.
- Kubota, Saburo; Mega, Hirotaka; and Kametani, Yasuhiro, 5,086,263, Cl. 318-568.110.
- Shimizu, Tokihiko; and Kobayashi, Kesanao, 5,085,973, Cl. 430-271.000.
- Matsushita Electric Works, Ltd.: See—
Hisao, Nakagawa; Yasunaka, Shinsaku; and Morita, Masato, 5,084,967, Cl. 30-34.100.
- Matsushita, Koji, to Ladies Houshoku Company Ltd. Clip ring type ornamental clasp. 5,085,060, Cl. 63-2.000.
- Matsuya, Toshikazu: See—
Yamagata, Shigeru; Inaki, Kyoichi; Matsuya, Toshikazu; Takke, Ralf; Thomas, Stephan; and Fabian, Heinz, 5,086,352, Cl. 359-350.000.
- Matsuyama, Shigeru: See—
Morokuma, Hiroshi; Matsuyama, Shigeru; and Akutsu, Takashi, 5,085,117, Cl. 84-615.000.

- Mattel, Inc.: See—
Engel, Robert W.; Franke, Joseph W.; Piyevsky, Alex R.; and Unalp, Enis J., 5,085,610, Cl. 446-175.000.
- Matthews, Gordon H.: System for monitoring play of a golfer. 5,086,390, Cl. 364-410.000.
- Mattiussi, Andrea: See—
Anfuso, Francesco; Mattiussi, Andrea; Matarrese, Savino; and Borghi, Italo, 5,086,080, Cl. 521-59.000.
- Mattsson, Kjell J.; Nicklasson, Alf G. M.; and Sjoovist, Rolf, to Astra Lakemedel Aktiebolag: Liquid dosage form for all oral administration of a pharmaceutically active substance. 5,085,868, Cl. 424-490.000.
- Mauck, John C.; and Boyer, Bradley P., to Eastman Kodak Company: Diagnostic test kit and method for determination of chlamydial antigen using a membrane having surface hydroxy groups. 5,085,986, Cl. 435-7.360.
- Maudsley, Michael J.: Anti-theft device for motor vehicles. 5,085,061, Cl. 70-225.000.
- Mauk, Paul: See—
Onderka, Bernd; Engel, Georg; Mauk, Paul; and Feldmann, Hugo, 5,085,065, Cl. 72-8.000.
- Maul, Rudolf: See—
Tritschler, Wolfgang; Steiner, Heinz; Prestel, Helmut; and Maul, Rudolf, 5,086,173, Cl. 544-211.000.
- Mauran, Sylvain: See—
Roca, Alain; Mauran, Sylvain; and Spinner, Bernard, 5,086,022, Cl. 502-60.000.
- Maurice, Francois, to Thomson-CSF: Multiple-track magnetic recording head having a matrix of magnetic microheads. 5,086,362, Cl. 360-121.000.
- May, Dennis J.: See—
Evans, Alfred J.; Whittlesey, Thomas; May, Dennis J.; Chen, Grant K.; and Brinson, Edward P., 5,085,036, Cl. 53-550.000.
- Mazda Motor Corporation: See—
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Hitomi, Mitsuo; and Hattori, Toshihiko, 5,085,178, Cl. 123-52.00M.
Imamura, Hiroyuki; Kurata, Takafumi; Yokota, Hiroaki; and Noguchi, Naovuki, 5,085,301, Cl. 192-0.076.
Sado, Osamu; and Masuda, Shunji, 5,085,199, Cl. 123-559.100.
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- Mazda Motor Corporation: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, 5,085,466, Cl. 280-775.000.
- Mazzocchi, Carlo; Tempesti, Ezio; and Aboumrach, Chafic, to Norsolor: Catalyst for oxidative dehydrogenation of propane. 5,086,032, Cl. 502-315.000.
- McClanathan, Loren C.: See—
Meyers, Robert A.; Hart, Walter D.; and McClanathan, Loren C., 5,085,764, Cl. 208-404.000.
- McClung, Duane G.; and Mueller, Thomas C., to Herman Miller, Inc.: Panel edge construction. 5,085,027, Cl. 52-811.000.
- McConnell, Frank E.: See—
Cuneo, Joseph; Garland, Charles; Goldbach, Richard A.; Goldbach, Robert D.; McConnell, Frank E.; and Tornay, Edmund G., 5,085,161, Cl. 114-65.00R.
- McCord, Elizabeth F., to Du Pont de Nemours, E. I., and Company: Process for preparing laminar articles from a mixture of a polyolefin and ethylene/vinyl alcohol copolymers. 5,085,816, Cl. 264-171.000.
- McCoy, David R.: See—
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- McCrary, Carl W., Jr.: See—
Kintz, Karl A.; Messer, Russell K., II; McCrary, Carl W., Jr.; and Nelson, Erik K., 5,086,209, Cl. 219-216.000.
- McCune, Brent A.: See—
Celaya, Phillip; McCune, Brent A.; Scott, David E.; and Wellborn, Tom A., 5,085,839, Cl. 423-210.000.
- McDonald, Daniel P., to Zip-Pak Incorporated: Transverse zipper application for horizontal form, fill and seal machine. 5,085,031, Cl. 53-412.000.
- McDougal, John A.; and Lenington, John W., to McDougal, John A.: Internal combustion engine ignition system and cleaning device. 5,085,192, Cl. 123-416.000.
- McGarity, Ralph C.; Ledbetter, William B., Jr.; McMahan, Steven C.; Gallup, Michael G.; Stanphill, Russell; and Gay, James G.: Data processor integrated circuit with selectable multiplexed/non-multiplexed address and data modes of operation. 5,086,407, Cl. 395-800.000.
- McGarvey, Kenneth J.: See—
Jones, Clarence S.; Coolidge, Arthur W.; Cavin, Dennis, deceased; Betts, Norman L.; Moser, Jeffrey M.; and McGarvey, Kenneth J., 5,085,325, Cl. 209-580.000.
- McGill, Scott A.; and McGill, Sterling A.: Conical seismic anchor and drill bit for use with unreinforced masonry structures. 5,085,026, Cl. 52-741.000.
- McGill, Sterling A.: See—
McGill, Scott A.; and McGill, Sterling A., 5,085,026, Cl. 52-741.000.
- McGourty, Lawrence F.: See—
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- McGourty, Thomas K.; and McGourty, Lawrence F., to Insignia Systems, Inc.: Thermal printing system with encoded sheet set. 5,085,529, Cl. 400-120.000.
- McGrath, James E.; and Gungor, Atilla, to Virginia Tech Intellectual Properties, Inc.: Novel phosphorus containing epoxy networks based on trihydrocarbyl phosphine oxides having active substituents. 5,086,156, Cl. 528-108.000.
- McGuire, Robert M.: Golf tee and placement tool. 5,085,431, Cl. 273-33.000.
- McKee, Carl B.: Desk structure. 5,085,153, Cl. 108-44.000.
- McKinley, Mildred L.: See—
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,085,903, Cl. 428-34.600.
- McKinney, Bob W., Jr.: See—
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- McKinney, Stella M.: See—
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- McMahan, Steven C.: See—
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- McMillin, John V.: See—
Carsner, George E.; and McMillin, John V., 5,086,215, Cl. 235-462.000.
- McMonagle, John J., Jr.: See—
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- McMurtry, David R.; Jarman, Thomas B.; and Bennett, Simon J., to Renshaw plc: Probe head. 5,084,981, Cl. 33-556.000.
- McNeely, Terry L.: See—
Guadagno, Philip A.; and McNeely, Terry L., 5,085,758, Cl. 204-299.00R.
- McReynolds, William D.: Dental saw and abrasive tool. 5,084,978, Cl. 30-517.000.
- ME/BO/CO Verfahrenstechnik GmbH & Co. KG: See—
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- Mead Corporation, The: See—
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- Mechanical Technology, Incorporated: See—
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- Medical Engineering Corporation: See—
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- Medkeff, Arthur T.: See—
Nye, Norman H.; and Medkeff, Arthur T., 5,084,953, Cl. 29-235.000.
- Mega, Hirotaka: See—
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- Mehta, Haresh R.: See—
Perdelwitz, Lee E., Jr.; Pfeiffer, Gustav O.; Neogi, Amar N.; Iff, Ronald H.; and Mehta, Haresh R., 5,085,914, Cl. 428-137.000.
- Meier, Erich: See—
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- Meiji Seika Kaisha, Ltd.: See—
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- Meixner, Hans: See—
Mader, Gerhard; Meixner, Hans; and Schreiber, Hans, 5,085,197, Cl. 123-520.000.
- MEKU Metallverarbeitung GmbH: See—
Muller, Rudolf, 5,085,577, Cl. 431-265.000.
- Mela, Samuel S., to Ericsson GE Mobile Communications Inc.: Drop channel pre-alert for trunked radio communication system. 5,086,507, Cl. 455-34.000.
- Melter, Craig H., to Fiskars Oy AB: Extendable pruner. 5,084,975, Cl. 30-249.000.
- Membrane Technology & Research, Inc.: See—
Blume, Ingo; Peinemann, Klaus-Viktor; Pinnau, Ingo; and Wijmans, Johannes G., 5,085,776, Cl. 210-500.270.
- Mendenhall, Robert L.: Method and apparatus for removing volatile hydrocarbons from particulate soils. 5,085,581, Cl. 432-103.000.
- Mengeu, Gary L.: See—
Dutt, Herbert V.; Mengeu, Gary L.; and Royal, Stephen F., 5,085,333, Cl. 215-250.000.
- Mercedes-Benz AG: See—
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- Mercer, Alan S., Jr.; and Mercer, Alan S., Sr.: Sports equipment organizer. 5,085,327, Cl. 211-13.000.
- Mercer, Alan S., Sr.: See—
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- Merck & Co., Inc.: See—
Chen, Shieh-Shung T.; and Doss, George, 5,085,992, Cl. 435-119.000.
- Merck Patent Gesellschaft mit beschränkter Haftung: See—
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- Mergler, Thomas G.: See—
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- Merl, Milton, to Marlboro Marketing, Inc.: Expandable tray assembly. 5,085,154, Cl. 108-90.000.
- Merrell Dow Pharmaceuticals Inc.: See—
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- Mesnard, Robert M.: See—
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- Messer, Russell K., II: See—
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- Messerschmitt-Boelkow-Blohm GmbH: See—
Spies, Hans; Woehrl, Alfons; and Spies, Martin, 5,086,342, Cl. 358-213.130.
- Mestas, Jean-Louis; Lacruche, Bernard; and Cathignol, Dominique, to Technomed International; and INSERM: System for initializing positions of target locating arm and device for firing focused shots. 5,085,206, Cl. 128-24.0EL.
- Metallgesellschaft Aktiengesellschaft: See—
Kriebel, Manfred; Grunewald, Gerhard; and Fritzsche, Hans-J., 5,085,675, Cl. 55-44.000.
- Metro Machine Corporation: See—
Cuneo, Joseph; Garland, Charles; Goldbach, Richard A.; Goldbach, Robert D.; McConnell, Frank E.; and Tornay, Edmund G., 5,085,161, Cl. 114-65.00R.
- Meyer, Norbert: See—
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- Meyer, Rolf-Volker: See—
Heinz, Hans-Detlef; Kohler, Burkhard; Meyer, Rolf-Volker; Reinking, Klaus; and Sommer, Alexa, 5,086,128, Cl. 525-537.000.
- Meyer, Werner: See—
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- Meyer, William F., to Percutaneous Technologies: Neurosurgical pathological tissue removing device. 5,085,658, Cl. 606-46.000.
- Meyers, Alan J.: See—
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- Meyers, Robert A.; Hart, Walter D.; and McClanathan, Loren C., to TRW Inc.: Process for upgrading coal. 5,085,764, Cl. 208-404.000.
- Mezhotsraslevoi Nauchno-Tekhnichesky Komplex "Mikrokhirurgia Glaza": See—
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- Michaelson, William, to Ambrose, Lee H.: Polyvinyl chloride/polyurethane hybrid foams. 5,086,084, Cl. 521-137.000.
- Michaely, William J.: See—
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- Michaud, Philippe: See—
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- Micro Gijutsu Kenkyujo Co., Ltd.: See—
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- Microfits & Methods Pte. Ltd.: See—
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- Micon Technology, Inc.: See—
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- Mid-West Conveyor Company, Inc.: See—
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- Midooka, Masanori: See—
Yasukawa, Takemasa; Iwasa, Tadanobu; and Midooka, Masanori, 5,085,005, Cl. 49-377.000.
- Mieth, Hans O.: Process for controlling a leakage cavity of a valve and an apparatus therefor. 5,085,241, Cl. 137-1.000.
- Mikeska, Kurt R.; Schaefer, Daniel T.; and Jensen, Richard H., to Du Pont de Nemours, E. I., and Company: Method for reducing shrinkage during firing of green ceramic bodies. 5,085,720, Cl. 156-89.000.
- Miller, Gabriel L.; and Wagner, Eric R., to AT&T Bell Laboratories: Capacitive force-balance system for measuring small forces and pressures. 5,085,070, Cl. 73-105.000.
- Miller, George M., to Allied-Signal Inc.: Fault isolation in a Butler matrix fed circular phased array antenna. 5,086,302, Cl. 342-373.000.
- Miller, Gerald G.: See—
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- Miller Hoff, Inc.: See—
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- Miller, Lawrence T., to Allied-Signal Inc.: Aqueous organic compositions as ceramic binders for casting and molding. 5,086,093, Cl. 524-28.000.
- Miller, William E.: See—
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- Milligan, Charles J.: Asbestos removal equipment. 5,085,237, Cl. 134-104.200.
- Minami, Koji: See—
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- Minato, Ichiro; Hirata, Fumiaki; and Nakashima, Tatsuya, to Takeda Chemical Industries, Ltd.: Polysocyanates, their production and uses. 5,086,175, Cl. 544-221.000.
- Minato, Tadaharu, to Mitsubishi Denki Kabushiki Kaisha: Bipolar semiconductor switching device. 5,086,330, Cl. 357-38.000.
- Minayoshi, Shiro; Saitoh, Naofumi; Higashi, Toshio; and Ebisuya, Noritsugu, to Maruo Calcium Company, Limited: Glycol dispersion of precipitated calcium carbonate. 5,085,800, Cl. 252-309.000.
- Minemoto, Isamu: See—
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- Minnesota Mining and Manufacturing Company: See—
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Guenther, Richard A.; and Kolb, Robert E., 5,086,123, Cl. 525-276.000.
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Randen, Neil A.; and Patel, Vinu, 5,085,695, Cl. 106-8.000.
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- Minolta Camera Kabushiki Kaisha: See—
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- Misawa, Masayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha: Operation switch unit for a camera. 5,086,313, Cl. 200-5.00R.
- Misev, Tosko A., to Stamicarbon B.V.: Composition containing UV curable unsaturated monomers and/or oligomers, a photoinitiator and colloidal silica with an oragnosilane compound, and the application of this composition in coatings. 5,086,087, Cl. 522-84.000.
- Misslitz, Ulf: See—
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- Mita Industrial Co., Ltd.: See—
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- Mitakidis, Dimitrios: See—
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- Mitamura, Nobuaki, to Nippon Seiko Kabushiki Kaisha: Rolling steel bearing. 5,085,733, Cl. 148-319.000.
- Mitchard, John M., to Union Camp Corporation: Bar scoring apparatus. 5,085,623, Cl. 493-400.000.
- Mitchell, James W., to Monsanto Company: Methods of using prolonged release somatotropin compositions. 5,086,041, Cl. 514-12.000.
- Mitchell, Thomas O.: See—
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- Mitchell, William H., to Pfizer Inc.: Pharmaceutical tablet vision inspection system. 5,085,510, Cl. 356-237.000.
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Ishii, Tatsuya; and Miyakawa, Takashi, 5,086,322, Cl. 357-23.300.
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- Yamasaki, Akinori; Harada, Akihiro; and Miyamoto, Teruo, 5,084,955, Cl. 29-599,000.
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- Mitsubishi Gas Chemical Company, Inc.: See—
Togo, Shizuo; Amagai, Akikazu; Kondo, Yoshinori; and Yamada, Toshiaki, 5,086,112, Cl. 525-68,000.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—
Hayashi, Shoichi; Ishihara, Hidetoshi; and Ueda, Atsushi, 5,085,064, Cl. 68-23,001.
- Mitsubishi Materials Corporation: See—
Nakayama, Masaaki; and Okawa, Masayuki, 5,085,542, Cl. 407-114,000.
- Mitsubishi Metal Corporation: See—
Itoh, Hajime; Itow, Atsuo; Inoue, Yoshihiro; and Ishizaki, Hiroshi, 5,085,515, Cl. 356-398,000.
- Mitsubishi Oil Co., Ltd.: See—
Yano, Hisashi; Yabumoto, Junsuke; and Kitada, Akiharu, 5,085,561, Cl. 417-313,000.
- Mitsubishi Petrochemical Company Limited: See—
Itoh, Kichiro; Shibano, Takeshi; and Yoshinaga, Kenji, 5,086,133, Cl. 526-93,000.
- Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, 5,086,131, Cl. 526-68,000.
- Mitsubishi Rayon Company Ltd.: See—
Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 5,086,106, Cl. 524-300,000.
- Mitsubishi, Yukio, to Tosoh Corporation. Liquid drain trap device, 5,085,833, Cl. 422-99,000.
- Mitsui Petrochemical Industries, Ltd.: See—
Nakagawa, Hiroaki; and Takehana, Yoichi, 5,085,899, Cl. 428-14,000.
- Mitsui Toatsu Chemicals, Inc.: See—
Asanuma, Tadashi; Yamamoto, Kazuhiko; Ohnaka, Junko; and Tokura, Yoshiko, 5,085,895, Cl. 427-393,500.
- Iwanaga, Naruyuki; Yamaguti, Tosiaki; Fujieda, Nobuhiko; and Tsuzikawa, Yoshihiro, 5,085,752, Cl. 204-243,000.
- Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Kuwamoto, Hideharu, 5,085,991, Cl. 435-108,000.
- Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Okawa, Hideaki; and Yamaguchi, Akihiro, 5,086,125, Cl. 525-432,000.
- Mittelhauser, Bernhard; and Schubert, Jan, to Mittelhauser, Bernhard. External mirror for a motor vehicle, 5,086,357, Cl. 359-841,000.
- Mittelstadt, Brent D.: See—
Glassman, Edward; Hanson, William A.; Kazantzides, Peter; Mittelstadt, Brent D.; Musits, Bela L.; Paul, Howard A.; and Taylor, Russell H., 5,086,401, Cl. 395-94,000.
- Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, to Mitsubishi Petrochemical Company Limited. Process for production of polyethylene, 5,086,131, Cl. 526-68,000.
- Miyahara, Hitoshi: See—
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 5,086,203, Cl. 219-69,120.
- Miyahara, Yuichi: See—
Kenichi, Kamakura; Murasawa, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, 5,085,534, Cl. 401-65,000.
- Miyakawa, Takashi: See—
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- Miyake, Izumi: See—
Nakane, Yoshio; Kaneko, Kiyotaka; Miyake, Izumi; Maeda, Yutaka; and Shimaya, Hiroshi, 5,086,345, Cl. 358-335,000.
- Miyake, Masaya: See—
Yamakawa, Akira; Miyake, Masaya; Sakanoue, Hitoyuki; Takeuchi, Hisao; Sogabe, Koichi; and Sasame, Akira, 5,085,923, Cl. 428-209,000.
- Miyake, Takahiro: See—
Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569,000.
- Miyake, Teruyoshi; and Yamamoto, Tatuo, to Chyugoku Paalu Distributing Corporation; Shinanen New Ceramic Corporation; and Shinagawa Fuel Co., Ltd. Sterilized food cutting board, 5,085,416, Cl. 269-289,000.
- Miyake, Toru; Higuchi, Naoshige; Kudo, Yoshiki; and Tanabe, Hisao, to Dai Nippon Insatsu Kabushiki Kaisha. Plasma display panel and method of forming fluorescent screen thereof, 5,086,297, Cl. 340-759,000.
- Miyamoto, Hidenori: See—
Aoki, Hitoshi; Wakabayashi, Hiroshi; Tsukahara, Daiki; and Miyamoto, Hidenori, 5,086,314, Cl. 354-412,000.
- Miyamoto, Teruo: See—
Yamasaki, Akinori; Harada, Akihiro; and Miyamoto, Teruo, 5,084,955, Cl. 29-599,000.
- Miyashiro, Julie M.: See—
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- Miyashita, Makoto: See—
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- Miyata, Koichi; Kumagai, Kazuo; Kobashi, Koji; Matsui, Yuichi; and Nakae, Akimitsu, to Kabushiki Kaisha Kobe Seiko Sho. Schottky diode manufacturing process employing the synthesis of a polycrystalline diamond thin film, 5,086,014, Cl. 437-103,000.
- Miyawaki, Mamoru: See—
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- Miyazawa, Shinkichi: See—
Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488,000.
- Miyokawa, Yuukichi: See—
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- Miyoshi, Tadahiko: See—
Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Jooraku, Fumio, 5,085,806, Cl. 252-518,000.
- Mizin, Vladimir G.: See—
Nakonechny, Anatoly Y.; Tolybekov, Manat Z.; Ponomarenko, Alexandr G.; Radchenko, Vladimir N.; Bulyanda, Alexandr A.; Mizin, Vladimir G.; Gizatulin, Gennady Z.; and Vyatkin, Jury F., 5,085,691, Cl. 75-546,000.
- Mizukoshi, Yasuyoshi: See—
Ueyoko, Kiyoshi; Mizukoshi, Yasuyoshi; Ikeda, Kazushige; and Yamada, Munemitsu, 5,085,260, Cl. 152-554,000.
- Mizuno, Sumiko: See—
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- Mizuno, Tomokimi: See—
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- Mizushima, Fumio; Goto, Takashi; and Nawa, Michio, to Kabushiki Kaisha Meidensha. Driving power source unit for automotive power transmission testing apparatus employing motor, 5,085,071, Cl. 73-118,100.
- Mizuta, Takahisa: See—
Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, 5,086,259, Cl. 315-368,250.
- Mobay Corporation: See—
Corbett, Terry L., 5,085,813, Cl. 264-117,000.
- Jorissen, Steven A.; and Krishnan, Sivaram, 5,086,097, Cl. 524-91,000.
- Mobil Oil Corporation: See—
Absil, Robert P. L.; Bowes, Emmerson; Green, Gary J.; Marler, David O.; Shihabi, David S.; and Socha, Richard F., 5,085,762, Cl. 208-120,000.
- Kissin, Yuri V., 5,086,135, Cl. 526-151,000.
- Morris, Richard L.; and Paul, James M., 5,085,709, Cl. 134-3,000.
- Shu, Paul, 5,086,089, Cl. 523-130,000.
- Mobil Solar Energy Corporation: See—
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- Mochizuki, Kousuke: See—
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- Mochizuki, Takashi, to Kabushiki Kaisha Tamiya Mokei. Steering device for use in a toy car, 5,085,618, Cl. 464-185,000.
- Moehlman, Philip M.; and Shahab, Syed A., to Ford Motor Company. Seat back mount, 5,085,482, Cl. 296-63,000.
- Moeller, Dale V.: See—
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- Moeller, Hans G., to Kali-Chemie AG. Process for fractionating dried milk products, 5,085,881, Cl. 426-491,000.
- Moghaddassi, Majid: See—
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- Mohamed, Mansour H.; and Zhang, Zhong-Huai, to North Carolina State University. Method of forming variable cross-sectional shaped three-dimensional fabrics, 5,085,252, Cl. 139-22,000.
- Mohr, Dieter: See—
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- Molex Incorporated: See—
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- DeRoss, Robert W.; Dudek, Ronald; and Stanhbel, Dennis, 5,085,114, Cl. 83-861,000.
- Molino, Bruce F.: See—
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- Mollet, Jean P.; and Rose, Rene, to Schlumberger Industries. Memory card with fuses and a system for handling such memory cards, 5,086,216, Cl. 235-492,000.
- Molteni & C. S.p.A.: See—
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- Monier, Jean-Claude: See—
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Naylor, Robert; and Costall, Brenda, 5,086,066, Cl. 514-377,000.
- Mono Pumps Limited: See—
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- Monsanto Company: See—
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- Montedipe S.r.l.: See—
Anfuso, Francesco; Mattiussi, Andrea; Matarrese, Savino; and Borghi, Italo, 5,086,080, Cl. 521-59,000.

- Mooney, Neil T.; Liddle, Judith M.; Wright, Wayne C.; and Smith, Geoffrey, to National Starch and Chemical Investment Holding Corporation. Starch based natural adhesives used in cigarette manufacture, 5,085,228, Cl. 131-37,000.
- Moore, Archie S.; and Teske, Robert J., to Mid-West Conveyor Company, Inc. Trolley body with embedded inserts for axles having a peripheral groove cast into body, 5,085,150, Cl. 105-150,000.
- Moore, Henry J., Jr.; and Gidanian, Bijan, to Mor-Flo Industries, Inc. Powered chamber combustion system and burner therefor, 5,085,579, Cl. 431-326,000.
- Mor-Flo Industries, Inc.: See—
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- Mori, Ikuo: See—
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- Mori, Kentaro: See—
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- Mori, Takeo, to Toyota Jidosha Kabushiki Kaisha. Vehicle underframe structure for reducing torsional deformation thereof, 5,085,484, Cl. 296-204,000.
- Mori, Yasuyuki: See—
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- Morick, Wolfgang: See—
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- Morizumi, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Electron beam exposure method, 5,086,398, Cl. 364-490,000.
- Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for a two-cycle engine, 5,085,193, Cl. 123-458,000.
- Morimoto, Takashi; and Yoshioka, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Method of manufacturing solvent-soluble polyorganosiloxanes, 5,086,145, Cl. 528-14,000.
- Morimoto, Takeshi; and Sanada, Yasuhiro, to Asahi Glass Company Ltd. Method for forming thin MgF₂ film and low-reflection film, 5,085,888, Cl. 427-108,000.
- Morimoto, Toshio: See—
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- Morisawa, Kunio: See—
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- Morishita, Akira; and Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Method of forming a partially carburized starter output shaft, 5,085,713, Cl. 148-12,100.
- Morishita, Akira; and Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Armature, 5,086,247, Cl. 310-270,000.
- Morita, Masato: See—
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- Morita, Shoji: See—
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- Morita, Takeshi: See—
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- Moriuchi, Shigenori: See—
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- Moriwaki, Hideaki: See—
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- Moriya, Yoshitaka; Nomachi, Hiroshi; Takada, Makoto; Takatsu, Yukihide; and Umezawa, Kenichi, to Sandoz Ltd. Lignosulfonates, oxycarboxylates, polycarboxylates, and polyoxalkene, alkylaryl and alkyl ethers admixtures for ultra-dry mix concrete, 5,085,708, Cl. 106-819,000.
- Morley, Christopher R.: See—
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- Morokuma, Hiroshi; Matsuyama, Shigeru; and Akutsu, Takashi, to Casio Computer Co., Ltd. Electronic musical instrument with any key play mode, 5,085,117, Cl. 84-615,000.
- Morris, David K.: See—
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- Morris, Richard L.; and Paul, James M., to Mobil Oil Corporation. Method for treating natural gas equipment, 5,085,709, Cl. 134-3,000.
- Morrison, Jerry D.: See—
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- Moseneder, Johann: See—
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- Moser, Jeffrey M.: See—
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- Moss, Gerald. Surgical fastener implantation device, 5,085,661, Cl. 606-139,000.
- Motohashi, Kazutoshi; Uehara, Takeshi; and Matsumoto, Takashi, to Fujitsu Limited. Communication terminal connection system, 5,086,424, Cl. 370-58,100.
- Motoori, Nobumoto; and Mochizuki, Kousuke, to Aderans Co., Ltd. Wig having colorless camouflage root portions, 5,085,233, Cl. 132-54,000.
- Motorola, Inc.: See—
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- Goldberg, Steven J.; and Lobel, Gary S., 5,086,505, Cl. 395-775,000.
- Gyenes, Russell E.; and Kleinert, Raymond J., III, 5,085,951, Cl. 429-86,000.
- Kent, David L., 5,086,492, Cl. 388-815,000.
- Kline, Charles E.; Dorinski, Dale W.; and Bradford, William M., 5,086,200, Cl. 200-571,000.
- Kotzin, Michael D., 5,086,468, Cl. 380-28,000.
- Malek, Charles J., 5,086,467, Cl. 380-6,000.
- Motta, Carmelo. Leno weaving with stationary warp threads and shifting cross threads, 5,085,253, Cl. 139-50,000.
- Motter Printing Press Co.: See—
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- Mottur, George P.; Kishbaugh, Dennis L.; Cope, Hilbert J., Jr.; and Cooper, Edward W., to Borden, Inc. Equipment for the preparation of potato chips, 5,085,137, Cl. 99-404,000.
- Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Connector having a switching device, 5,086,284, Cl. 335-205,000.
- Moutarde, Thierry: See—
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- Moyer, James D. Mounting of door gasket, 5,085,204, Cl. 126-190,000.
- Moyle, Mervyn W., to United States of America. Navy Nut and snap ring position locking device, 5,085,548, Cl. 411-316,000.
- MPA-Meccanizzazione Postale e Automazione S.p.A.: See—
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- MTU Motoren und Turbinen-Union Munchen GmbH: See—
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- Muan, Arnulf; and Najjar, Mitri S., to Texaco Inc. Vanadium spinel materials in the V₂O₃-MnO-SiO₂ system, 5,086,029, Cl. 502-241,000.
- Muckenschabel, Reinhard: See—
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- Mucklejohn, Stuart A.; and Wharmby, David O., to Thorn EMI plc. Discharge tube arrangement, 5,086,258, Cl. 315-248,000.
- Mueller, Thomas C.: See—
McClung, Duane G.; and Mueller, Thomas C., 5,085,027, Cl. 52-811,000.
- Mueller, Werner H., to Hoechst Aktiengesellschaft. Radiation sensitive composition utilizing ethylenically unsaturated perfluoroalkyl group-containing compounds and reproduction layers produced therefrom, 5,085,975, Cl. 430-285,000.
- Mukai, Hiromu; Kojiya, Kagumi; Hayashi, Kohtaro; and Shibuya, Taro, to Minolta Camera Kabushiki Kaisha. Variable magnification viewfinder optical system, 5,086,353, Cl. 359-432,000.
- Mukoyama, Kenji, to Makita Electric Works, Ltd. Pneumatic percussion tool with relatively movable head valves, 5,085,126, Cl. 91-426,000.
- Muller, Frank A.; and Zaelke, Arnold E., to Atochem North America, Inc. Methods and compositions for treating metals by means of water-borne polymeric films, 5,085,696, Cl. 106-14,160.
- Muller, Gerhard; and Hermann, Albert, to Albert Handtmann Maschinenfabrik GmbH & Co., KG. Apparatus for transporting sausages filled in a continuous sausage casing, 5,085,612, Cl. 452-51,000.
- Muller, Gerold: See—
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- Muller, Hans, to DrM, Dr. Muller AG. Method of separating yeasts from fermentation liquors, 5,085,997, Cl. 435-261,000.
- Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal substituted 4-sulphonylamino-2-aziny-1,2,4-triazol-3-ones, 5,085,687, Cl. 71-93,000.
- Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal sulphonylamino-carbonyl triazolinones having substituents which are bonded via sulphur, 5,085,684, Cl. 71-92,000.
- Muller, Klaus-Helmut: See—
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- Muller, Manfred: See—
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- Muller, Michael; Pennewiss, Horst; and Gebhardt, Juergen, to Rohm GmbH Chemische Fabrik. Polymer-modified bitumen (PMB), 5,085,701, Cl. 106-273,100.
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Reid, Evan S.; and Murray, Andrew M., 5,085,857, Cl. 424-70.000.

Murray, Shawn G.; and Hawes, Mark A. Mobile perimeter monitoring system. 5,086,290, Cl. 340-539.000.

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Musha, Atsushi: See—
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Musits, Bela L.: See—
Glassman, Edward; Hanson, William A.; Kazantzides, Peter; Mittelstadt, Brent D.; Musits, Bela L.; Paul, Howard A.; and Taylor, Russell H., 5,086,401, Cl. 395-94.000.

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Usui, Akio, 5,084,986, Cl. 36-2.600.

Myers, Gregory K.: See—
Peppers, Norman A.; Myers, Gregory K.; Young, James R.; and Katsuki, Kazuo, 5,086,490, Cl. 382-65.000.

Myka, Albert G.: See—
Gold, Robert J.; L., Wesley C.; and Myka, Albert G., 5,085,147, Cl. 102-486.000.

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Haniki, Kazuo; Koizumi, Tatsuya; Ishiguro, Kazuya; and Kanitani, Kiyoshi, 5,086,262, Cl. 318-568.100.

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Kenichi, Kamakura; Murasawa, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, 5,085,534, Cl. 401-65.000.

Nagaki, Takeshi: See—
Sasaki, Toshiyuki; and Nagaki, Takeshi, 5,085,352, Cl. 222-327.000.

Nagano, Masashi, to Shimano Corporation. Multi-gear cluster for bicycle. 5,085,620, Cl. 474-152.000.

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Nagasaki, Heishiro: See—
Okuda, Masaharu; Asami, Kouichiro; and Nagasaki, Heishiro, 5,085,374, Cl. 239-751.000.

Nagasawa, Kenichi: See—
Takei, Masahiro; Kashida, Motokazu; Takahashi, Koji; Nagasawa, Kenichi; Masui, Toshiyuki; and Fukatsu, Tsutomu, 5,086,358, Cl. 360-60.000.

Nagase, Hiroshi: See—
Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Jooraku, Fumio, 5,085,806, Cl. 252-518.000.

Nagashima, Shigeo: See—
Tanaka, Teruo; Hamanaka, Naoki; Nakagoshi, Junji; Omoda, Koichiro; and Nagashima, Shigeo, 5,086,498, Cl. 395-200.000.

Nagata, Tsuyoshi: See—
Okuda, Shinji; Maeda, Hiroshi; and Nagata, Tsuyoshi, 5,085,169, Cl. 118-205.000.

Nagata, Yasuhiro: See—
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Nagesh, V. K.: See—
Leibovitz, Jacques; Scholz, Kenneth D.; Nagesh, V. K.; and Chao, Clinton C., 5,086,335, Cl. 357-70.000.

Nair, Muralaeddharan G.: See—
Safir, Gene R.; Nair, Muralaeddharan G.; and Siqueira, Jose O., 5,085,682, Cl. 71-88.000.

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Haley, Neil F.; Nair, Xina; Geidimenico, Gerard J.; Zusi, F. Christopher; and Swann, R. Thomas, 5,086,060, Cl. 514-294.000.

Najjar, Mitri S.: See—
Muan, Arnulf; and Najjar, Mitri S., 5,086,029, Cl. 502-241.000.

Naka, Yoji; and Ohmiya, Akio, to Fuji Photo Film Co., Ltd. Panoramic camera. 5,086,311, Cl. 354-195.100.

Nakada, Shigeo: See—
Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, 5,085,814, Cl. 264-126.000.

Nakae, Takahiko: See—
Konno, Mitoshi; Nakae, Takahiko; and Hamanaka, Nobuyuki, 5,086,065, Cl. 514-372.000.

Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, to Kabushiki Kaisha Toshiba. Conductivity modulated MOSFET. 5,086,323, Cl. 357-23.400.

Nakagawa, Akio; Watanabe, Kiminori; Koshino, Yutaka; Yamaguchi, Yoshihiro; and Baba, Yoshiro, to Kabushiki Kaisha Toshiba. Planar semiconductor device having high breakdown voltage. 5,086,332, Cl. 357-51.000.

Nakagawa, Hiroaki; and Takehana, Yoichi, to Mitsui Petrochemical Industries, Ltd.; and Hitachi, Ltd. Dust-proof film. 5,085,899, Cl. 428-14.000.

Nakagoshi, Junji: See—
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Nakahara, Masaki: See—
Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, 5,086,259, Cl. 315-368.250.

Nakahashi, Akio: See—
Takeuchi, Yukio; Nakahashi, Akio; and Kubota, Shingo, 5,085,045, Cl. 57-58.650.

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Hashiride, Tadaaki; Nakai, Toshiyuki; and Goto, Hisaharu, 5,085,160, Cl. 112-300.000.

Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Radiation image diagnostic apparatus. 5,086,392, Cl. 364-413.220.

Nakajima, Yoshihiro: See—
Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.

Nakaki, Masao; and Aoyama, Susumu, to Hitachi Setsubi Engineering Co., Ltd. Process and apparatus for producing magnetic diskette. 5,085,723, Cl. 156-250.000.

Nakamichi Corporation: See—
Uchikoshi, Gohji; and Sano, Keiji, 5,085,379, Cl. 242-186.000.

Nakamura, Koichi: See—
Aono, Toshiaki; Nakamura, Koichi; and Shibata, Takeshi, 5,085,980, Cl. 430-531.000.

Nakamura, Makoto; Sakuragi, Shigeru; Matayoshi, Yutaka; Maekawa, Keichi; Hara, Seinosuke; and Morita, Shoji, to Nissan Motor Co., Ltd.; and Atsugi Unisia Corp. Variable valve timing rocker arm arrangement for internal combustion engine. 5,085,182, Cl. 123-90.160.

Nakamura, Masato: See—
Iida, Yasunobu; Nakamura, Masato; Takeuchi, Nobuyuki; and Onishi, Keiji, 5,085,926, Cl. 428-216.000.

Nakamura, Mitsuhide; and Kimura, Shiro, to Fuji Xerox Co., Ltd. Method for removing a selenium-containing layer from an electrophotographic photoreceptor. 5,085,732, Cl. 156-656.000.

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Nakane, Masami: See—
Ando, Kazuo; Asai, Nobuko; Ito, Fumitaka; Mano, Takashi; Nakane, Masami; Satake, Kunio; and Shimada, Kaoru, 5,086,062, Cl. 514-321.000.

Nakane, Yasuaki: See—
Tamada, Sakuya; and Nakane, Yasuaki, 5,086,341, Cl. 358-201.000.

Nakane, Yoshio; Kaneko, Kiyotaka; Miyake, Izumi; Maeda, Yutaka; and Shimaya, Hiroshi, to Fuji Photo Film Co., Ltd. Method of operation in a still video camera system for transferring track information from a playback device to the still video camera. 5,086,345, Cl. 358-335.000.

Nakano, Hiroyuki: See—
Yamada, Yoshikazu; and Nakano, Hiroyuki, 5,085,184, Cl. 123-182.100.

Nakano, Minoru: See—
Kasuda, Takashi; Nishimura, Yukihiro; Hikiguchi, Shozo; Nakano, Minoru; Yasuda, Eiji; and Noguchi, Kazuo, 5,085,159, Cl. 112-246.000.

Nakano Vinegar Co., Ltd.: See—
Okada, Gentaro; Akano, Hirofumi; Sato, Takeshi; Okumura, Hajime; and Kawamura, Yoshiya, 5,085,851, Cl. 424-50.000.

Nakashima, Tatsuya: See—
Minato, Ichiro; Hirata, Fumiaki; and Nakashima, Tatsuya, 5,086,175, Cl. 544-221.000.

Nakasui, Norikazu: See—
Shibahashi, Yutaka; Kito, Tsutomu; Nakasui, Norikazu; and Inagaki, Hiroshi, 5,085,607, Cl. 446-14.000.

Nakata, Takuya; Makita, Hitoshi; Hirakata, Takashi; and Kawasaki, Shingo, to Yamaha Corporation. Automatic performance apparatus. 5,085,116, Cl. 84-609.000.

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Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569.000.

Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, to Mazda Motor Corporation. Automobile steering system equipped with an air bag. 5,085,466, Cl. 280-775.000.

Nakaue, Akimitsu: See—
Miyata, Koichi; Kumagai, Kazuo; Kobashi, Koji; Matsui, Yuichi; and Nakaue, Akimitsu, 5,086,014, Cl. 437-103.000.

Nakayama, Hitoshi: See—
Takahashi, Kuniaki; Kudo, Koji; Araya, Shinichi; and Nakayama, Hitoshi, 5,084,962, Cl. 29-833.000.

Nakayama, Isao, to NEC Corporation. Costas loop carrier wave reproducing circuit. 5,086,241, Cl. 307-494.000.

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Kenichi, Kamakura; Murasawa, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, 5,085,534, Cl. 401-65.000.

Nakonechyn, Anatoly Y.; Tolymbekov, Manat Z.; Ponomarenko, Alexandr G.; Radchenko, Vladimir N.; Bulyanda, Alexandr A.; Mizin, Vladimir G.; Gizatulin, Gennady Z.; and Vyatkin, Jury F. Method of producing general-purpose steel. 5,085,691, Cl. 75-546.000.

Nalco Chemical Company: See—
Goss, Michael L., 5,085,710, Cl. 134-22.140.

Hickey, James J.; and Adamson, William L., 5,085,831, Cl. 422-62.000.

Kneller, James F.; Narutis, Vytas; Fair, Barbara F.; and Johnson, Donald A., 5,085,794, Cl. 252-82.000.

Nalewajek, David: See—
Van Der Puy, Michael; Nalewajek, David; Shia, George A.; and Wagner, William J., 5,086,190, Cl. 552-521.000.

Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, to Hitachi, Ltd.; and Hitachi Device Engineering Co., Ltd. Semiconductor device having latch means. 5,086,414, Cl. 365-230.080.

Nambu, Jinsho: See—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,086,116, Cl. 525-166.000.

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Namiki, Tomizo; Suzuki, Tamotsu; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Photopolymerizable image-receiving sheet material and process for the formation of a transferred image. 5,085,969, Cl. 430-260.000.

Nanya, Toshiaki; Yamaguchi, Kimitoshi; Tsubuko, Kazuo; Takahashi, Toshihiko; Kawase, Hiromitsu; and Ookawara, Makoto, to Ricoh Company, Ltd. Negative toner for developing latent electrostatic images. 5,085,965, Cl. 430-109.000.

Nappholz, Tibor A.; Swift, Scott; Hamilton, John R.; and Gani, Matthew J., to Teletronics Pacing Systems, Inc. Metabolic demand driven rate-responsive pacemaker. 5,085,215, Cl. 128-419.0PG.

Narabu, Tadakuni; Kondo, Tetsuya; Maki, Yasuhito; and Noguchi, Katsunori, to Sony Corporation. Charge coupled device with enhanced input structure. 5,086,440, Cl. 377-60.000.

Narayanan, Kolazi S.; and Taylor, Paul D., to ISP Investments Inc. Water-based compositions for removing stains from fabrics. 5,085,795, Cl. 252-162.000.

Narduzzo, Gabriel: See—
Bertrand, Gerard; Imbert, Gerard; and Narduzzo, Gabriel, 5,085,516, Cl. 356-394.000.

Narihiko, Yoshimura; Tamizawa, Hirohiko; and Komatsu, Yasuji, to Toa Nenryo Kogyo, K.K. Synthetic traction fluid. 5,085,792, Cl. 252-79.000.

Narikawa, Shiro: See—
Hayakawa, Takashi; Narikawa, Shiro; and Ohashi, Kunio, 5,085,968, Cl. 430-128.000.

Narramore, Daniel O. Safety ladder. 5,085,291, Cl. 182-106.000.

Narutis, Vytas: See—
Kneller, James F.; Narutis, Vytas; Fair, Barbara F.; and Johnson, Donald A., 5,085,794, Cl. 252-82.000.

National Computer Systems, Inc.: See—
Carsner, George E.; and McMillin, John V., 5,086,215, Cl. 235-462.000.

National Research Development Corporation: See—
Wattie, James A.; and Wattie, Joanne M., 5,084,926, Cl. 5-636.000.

National Semiconductor Corporation: See—
Bergemont, Albert M., 5,086,410, Cl. 365-53.000.

Jaffe, James M.; and Abt, Norman E., 5,086,412, Cl. 365-145.000.

National Starch and Chemical Investment Holding Corporation: See—
Mooney, Neil T.; Liddle, Judith M.; Wright, Wayne C.; and Smith, Geoffrey, 5,085,228, Cl. 131-37.000.

Naumec, John R.; and Faucher, Joseph E., to United Technologies Corporation. Seal assembly. 5,085,313, Cl. 198-659.000.

Nawa, Michio: See—
Mizushima, Fumio; Goto, Takashi; and Nawa, Michio, 5,085,071, Cl. 73-118.100.

Nayak, Ammune S., to Warner-Lambert Company. Sustained release pharmaceutical preparations containing an analgesic and a decongestant. 5,085,865, Cl. 424-472.000.

Naylor, Robert: See—
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaux, Luthereau, Renee; Naylor, Robert; and Costall, Brenda, 5,086,066, Cl. 514-377.000.

Naylor, Roger L.; and Morris, David K., to Mono Pumps Limited. Flexible drive shaft. 5,085,564, Cl. 418-48.000.

NCM International, Inc.: See—
Sorensen, Gerald R.; Gradecki, Raymond J.; and Finkiewicz, Daniel J. E., 5,085,611, Cl. 446-216.000.

NEC Corporation: See—
Matsumoto, Kouji, 5,086,237, Cl. 307-273.000.

Nakayama, Isao, 5,086,241, Cl. 307-494.000.

Okugawa, Shinichi; and Sugimoto, Shigenobu, 5,086,406, Cl. 364-781.000.

Saegusa, Noboru; Shimura, Yukihiro; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, 5,086,451, Cl. 379-58.000.

Tomita, Hideho, 5,086,437, Cl. 375-98.000.

Tsuboi, Toshihide; and Funahashi, Norio, 5,086,413, Cl. 365-230.010.

Yoshida, Kazunaga, 5,086,472, Cl. 381-43.000.

Needham, Anthony H.: See—
Ripley, Ian; and Needham, Anthony H., 5,085,242, Cl. 137-13.000.

Nelligan, Joseph W., Jr.: See—
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,085,596, Cl. 439-497.000.

Nelson, Charles J.: See—
Hamlyn, Maxwell C.; Luck, Thomas H.; and Nelson, Charles J., 5,085,818, Cl. 264-210.600.

Nelson, Erik K.: See—
Kintz, Karl A.; Messer, Russell K., II; McCrary, Carl W., Jr.; and Nelson, Erik K., 5,086,209, Cl. 219-216.000.

Nelson, Robert J.: See—
Karger, Barry L.; and Nelson, Robert J., 5,085,757, Cl. 204-299.00R.

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Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshio, Hitoshi; and Norigoe, Isami, 5,086,381, Cl. 363-16.000.

Neogi, Amar N.: See—
Perdelwitz, Lee E., Jr.; Pfeiffer, Gustav O.; Neogi, Amar N., Iff, Ronald H.; and Mehta, Hareesh R., 5,085,914, Cl. 428-137.000.

Nestec S.A.: See—
Huerlimann, Peter; and Van Meir, Eugene, 5,085,348, Cl. 222-153.000.

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Thorn, David W.; Patel, Rajendra; and Sohl, Gordon, 5,086,461, Cl. 379-230.000.

Neu, Georges, to Bull S.A. Programmable integrated logic network having bipolar and MOS transistors. 5,086,240, Cl. 307-465.000.

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New Venture Gear, Inc.: See—
Frost, Barry L., 5,085,303, Cl. 192-53.00F.

- Newman, Harvey S., to United States of America, Navy. Planar gallium arsenide NPN microwave switch. 5,086,329, Cl. 357-37.000.
- NGK Insulators, Ltd.: See—
Osugi, Yukihisa; Abe, Hiroaki; and Kozuka, Yoshinari, 5,085,503, Cl. 359-246.000.
- Ngo, Khai D.: See—
Yerman, Alexander J.; and Ngo, Khai D., 5,084,958, Cl. 29-606.000.
- Niada, Riccardo: See—
Farolfi, Giancarlo; Gazzani, Giovanni; Niada, Riccardo; and Mantovani, Marisa, 5,085,867, Cl. 424-485.000.
- Niara, Vitas; Oxley, Jeffery A.; and Tarika, Elio E., to Viskase Corporation. Method for preparing indicia-containing article. 5,085,890, Cl. 427-149.000.
- Nichols, Brenda G.: See—
Ortendahl, Douglas A.; Nichols, Brenda G.; Zepeda, Ernesto; Gyor, Matthias; and Kircos, Louis T., 5,085,219, Cl. 128-653.500.
- Nicklasson, Alf G. M.: See—
Mattsson, Kjell J.; Nicklasson, Alf G. M.; and Sjoovist, Rolf, 5,085,868, Cl. 424-490.000.
- Nieh, Ciping: See—
Snyder, Harry E.; Wiese, Kurt L.; Sheu, Gueyhw; Brown, Helen G.; Nieh, Ciping; and Clark, Patricia K., 5,085,808, Cl. 260-412.400.
- Niehaus, Heinz: See—
Jung, Detlef; Riss, Gerhard; and Niehaus, Heinz, 5,085,157, Cl. 112-68.000.
- Niehues, Heiko: See—
Wochnowski, Waldemar; and Niehues, Heiko, 5,086,279, Cl. 324-637.000.
- Nielsen, Arne; and Moghaddassi, Majid, to Guilford Mills, Inc. Textile napping machine. 5,084,948, Cl. 26-32.000.
- Nifco Inc.: See—
Takahashi, Atsushi, 5,085,545, Cl. 411-45.000.
- Nihon Junyaku Co., Ltd.: See—
Ishikawa, Mitsuo; and Watarai, Shigeaki, 5,085,364, Cl. 228-139.000.
- Nii, Hiroki: See—
Kimura, Tetsuya; Fujii, Toshihiro; and Nii, Hiroki, 5,085,697, Cl. 106-20.000.
- Niida, Yoriaki: See—
Kurabayashi, Ken; Tsuchiya, Yoshinobu; Yoshida, Akio; Koizumi, Hitoshi; and Niida, Yoriaki, 5,086,373, Cl. 361-502.000.
- Niitsu, Ichiro: See—
Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, 5,086,259, Cl. 315-368.250.
- Nikaido, Masaru: See—
Itani, Takaharu; Nikaido, Masaru; and Yamaguchi, Hideki, 5,085,605, Cl. 445-25.000.
- Nikano, Akio. Ultrasonic machining method. 5,085,747, Cl. 204-129.460.
- Niki, Hiroshi: See—
Ando, Masahiko; Ozaki, Kazuhisa; and Niki, Hiroshi, 5,085,103, Cl. 74-868.000.
- Nikon Corporation: See—
Aoki, Hitoshi; Wakabayashi, Hiroshi; Tsukahara, Daiki; and Miyamoto, Hidenori, 5,086,314, Cl. 354-412.000.
- Shibuya, Masato, 5,086,222, Cl. 250-234.000.
- Nilsson, Bengt, to Kamyr AB. Method of refining cellulosic fibrous material with successive expansions before impacts, and expansions, to achieve increased fiber flexibility. 5,085,735, Cl. 162-26.000.
- Nilsson, Sven M. Heat transmission roll and a method and an apparatus for manufacturing such a roll. 5,085,268, Cl. 165-8.000.
- Nipox Kabushiki Kaisha: See—
Tsuchida, Michiro, 5,085,505, Cl. 353-98.000.
- Nippon Paint Co., Ltd.: See—
Iwamoto, Norikazu, 5,086,152, Cl. 528-55.000.
- Nippon Seiko Kabushiki Kaisha: See—
Mitamura, Nobuaki, 5,085,733, Cl. 148-319.000.
- Yokouchi, Atsushi; and Yabe, Toshikazu, 5,085,789, Cl. 252-62.520.
- Nippon Sheet Glass Co., Ltd.: See—
Peppers, Norman A.; Myers, Gregory K.; Young, James R.; and Katsuki, Kazuo, 5,086,490, Cl. 382-65.000.
- Segawa, Toyoo; Syono, Sinkichi; and Suzue, Syuichi, 5,085,030, Cl. 53-399.000.
- Nippon Soken, Inc.: See—
Nunogaki, Naohika; Toyama, Tetuo; and Ito, Nobuei, 5,086,210, Cl. 219-270.000.
- Nippon Steel Chemical Co., Ltd.: See—
Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
- Nippon Steel Corporation: See—
Tanaka, Yoshinao; Ohsawa, Takaaki; and Tanabe, Akira, 5,085,411, Cl. 266-102.000.
- Watanabe, Kunio; Nishimura, Satoshi; and Kaneko, Kunishige, 5,085,712, Cl. 148-2.000.
- Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
- Nippon Telegraph & Telephone Corporation: See—
Saegusa, Noboru; Shimura, Yukihiko; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, 5,086,451, Cl. 379-58.000.
- Nippon Yakin Kogyo Co., Ltd.: See—
Ebato, Kazuo; and Tamura, Keiji, 5,085,944, Cl. 428-570.000.
- Nippondenso Co., Ltd.: See—
Nunogaki, Naohika; Toyama, Tetuo; and Ito, Nobuei, 5,086,210, Cl. 219-270.000.
- Nipponshinyaku Co., Ltd.: See—
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Matsuda, Masahito; Shirahase, Ichiro; and Segawa, Jun, 5,086,049, Cl. 514-210.000.
- Nishida, Takao; and Satoh, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with strobe and lens for use therewith. 5,086,315, Cl. 354-413.000.
- Nishihara, Takashi: See—
Shiraishi, Shuji; Nishihara, Takashi; Kiryu, Hironobu; and Omomo, Naoki, 5,085,288, Cl. 180-197.000.
- Nishihata, Sumihiko, to Fuji Photo Film Co., Ltd. F θ lens. 5,086,350, Cl. 359-206.000.
- Nishijima, Toyoki: See—
Kajiwara, Makoto; Nishijima, Toyoki; and Chino, Shigeo, 5,085,978, Cl. 430-374.000.
- Nishikizawa, Hidemaru: See—
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 5,086,203, Cl. 219-69.120.
- Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, to Canon Kabushiki Kaisha. Sheet feeding device. 5,085,423, Cl. 271-266.000.
- Nishimura, Satoshi: See—
Watanabe, Kunio; Nishimura, Satoshi; and Kaneko, Kunishige, 5,085,712, Cl. 148-2.000.
- Nishimura, Yukihiko: See—
Kasuda, Takashi; Nishimura, Yukihiko; Hikiguchi, Shozo; Nakano, Minoru; Yasuda, Eiji; and Noguchi, Kazuo, 5,085,159, Cl. 112-246.000.
- Nishio, Taichi: See—
Abe, Hiroomi; Nishio, Taichi; and Kitadono, Kaoru, 5,086,105, Cl. 524-492.000.
- Nishiyama, Shigeru: See—
Katagiri, Shingo; and Nishiyama, Shigeru, 5,086,363, Cl. 360-132.000.
- Nishizawa, Tetuo: See—
Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.
- Nissan Motor Company, Limited: See—
Kii, Katsuya; Katada, Kunio; Okuyama, Yuji; and Yonezawa, Takashi, 5,085,458, Cl. 280-707.000.
- Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyo, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.
- Nakamura, Makoto; Sakuragi, Shigeru; Matayoshi, Yutaka; Makawa, Keiichi; Hara, Seinosuke; and Morita, Shoji, 5,085,182, Cl. 123-90.160.
- Sato, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, 5,085,459, Cl. 280-707.000.
- Takahashi, Kenro, 5,085,460, Cl. 280-707.000.
- Wakahara, Tatsuo; Iwanaga, Kazuyoshi; and Ishii, Shigeru, 5,085,105, Cl. 74-866.000.
- Nissei ASB Machine Co., Ltd.: See—
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, 5,085,822, Cl. 264-528.000.
- Niwa, Koichi: See—
Taniuchi, Akira; Komori, Hirohito; and Niwa, Koichi, 5,086,114, Cl. 525-123.000.
- NKK Corporation: See—
Yamamoto, Hironori; Matsumura, Chitoshi; and Mori, Kentaro, 5,085,265, Cl. 164-468.000.
- Nobi, Laszlo, to Hewlett-Packard Company. Burn-in process and apparatus. 5,086,269, Cl. 324-158.00F.
- Noguchi, Hiromichi; Inamoto, Tadayoshi; and Saito, Megumi, to Canon Kabushiki Kaisha. Liquid jet recording head. 5,086,307, Cl. 346-140.00R.
- Noguchi, Katsunori: See—
Narabu, Tadakuni; Kondo, Tetsuya; Maki, Yasuhito; and Noguchi, Katsunori, 5,086,440, Cl. 377-60.000.
- Noguchi, Kazuo: See—
Kasuda, Takashi; Nishimura, Yukihiko; Hikiguchi, Shozo; Nakano, Minoru; Yasuda, Eiji; and Noguchi, Kazuo, 5,085,159, Cl. 112-246.000.
- Noguchi, Naovuki: See—
Imamura, Hiroyuki; Kurata, Takafumi; Yokota, Hiroaki; and Noguchi, Naovuki, 5,085,301, Cl. 192-0.076.
- Nohara, Shigezo, to Toyo Seikan Kaisha, Ltd. Preparation of multi-layer drawn polyester bottles. 5,085,821, Cl. 264-515.000.
- Nohmi Bosai Kabushiki Kaisha: See—
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,086,293, Cl. 340-506.000.
- Nohr, Ronald S.; and MacDonald, J. Gavin, to Kimberly-Clark Corporation. Nonwoven wipe having improved grease release. 5,085,920, Cl. 428-198.000.
- Nolte, Roger; Rohrig, Herbert; and Roth, Franz-Josef, to Madaus AG. Test device for determining adhesive strength of lacquer on a tube. 5,085,074, Cl. 73-150.00A.

- Nomachi, Hiroshi: See—
Moriya, Yoshitaka; Nomachi, Hiroshi; Takada, Makoto; Takatsu, Yukihide; and Umezawa, Kenichi, 5,085,708, Cl. 106-819.000.
- Nomura, Akio: See—
Satomi, Mitsuo; Nomura, Akio; Oshita, Kazuaki; and Kuwahara, Tetsuya, 5,086,455, Cl. 379-100.000.
- Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: See—
Ketels, Dieter, 5,085,613, Cl. 452-110.000.
- Kunig, Helmut, 5,085,140, Cl. 100-121.000.
- Nordson Corporation: See—
Evans, Ronald F., 5,085,891, Cl. 427-277.000.
- Norigoe, Isami: See—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshio, Hitoshi; and Norigoe, Isami, 5,086,381, Cl. 363-16.000.
- Norita, Toshio: See—
Ishida, Tokuji; Norita, Toshio; and Ootsuka, Hiroshi, 5,086,217, Cl. 250-201.800.
- Norman, John A. T.; and Muratore, Beth A., to Air Products and Chemicals, Inc. Volatile liquid precursors for the chemical vapor deposition of copper. 5,085,731, Cl. 156-646.000.
- Noro, Takano; Matsumoto, Kunio; Oshima, Munee; Kanda, Naoya; Sakaguchi, Suguru; and Murata, Akira, to Hitachi, Ltd. Connecting structure of electronic part and electronic device using the structure. 5,086,337, Cl. 357-79.000.
- Norsolor: See—
Mazzocchi, Carlo; Tempesti, Ezio; and Aboumradi, Chafic, 5,086,032, Cl. 502-315.000.
- North Carolina State University: See—
Mohamed, Mansour H.; and Zhang, Zhong-Huai, 5,085,252, Cl. 139-22.000.
- Musselman, Inga H.; and Russell, Phillip E., 5,085,746, Cl. 204-129.400.
- North, John M., to Gould Inc. Solid state cell electrolyte. 5,085,952, Cl. 429-192.000.
- Northeastern University: See—
Karger, Barry L.; and Nelson, Robert J., 5,085,757, Cl. 204-299.00R.
- Northern Telecom Limited: See—
Gumb, Beverley W.; and Foster, Edward J. R., 5,086,466, Cl. 379-440.000.
- Northwest Technology Corp.: See—
Yu, Kenneth K.; and Berglund, C. Neil, 5,086,477, Cl. 382-8.000.
- Norton Company: See—
Washburn, Malcolm E., 5,085,804, Cl. 252-516.000.
- Norton, Ronald L.; and Turner, James R. Trailer connecting guide. 5,085,408, Cl. 254-325.000.
- Nouvetne, Werner: See—
Fritsch, Karl-Herbert; Westeppe, Uwe; Nouvetne, Werner; and Freitag, Dieter, 5,086,159, Cl. 528-204.000.
- Novack, Mitchell J.: See—
Holdren, Frederick V.; and Novack, Mitchell J., 5,085,079, Cl. 73-517.000.
- Nowack, Gerhard P., to Phillips Petroleum Company. Sorption of trialkyl arsines. 5,085,844, Cl. 423-245.100.
- Nozawa, Masaya: See—
Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.
- Nozawa, Yasuto: See—
Tokunaga, Masatoshi; Nozawa, Yasuto; and Iwasaki, Katsunori, 5,085,715, Cl. 148-101.000.
- NSK Ltd.: See—
Hattori, Masaru; and Tsukada, Toru, 5,085,522, Cl. 384-45.000.
- Nudell, Bruce M.; Entekin, Robert R.; Skidmore, Robert; and Luckman, Nicholas P., to Spacelabs, Inc. Doppler flow sensing device and method for its use. 5,085,220, Cl. 128-661.090.
- Nukada, Katsumi: See—
Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nukada, Katsumi; and Marumo, Teruumi, 5,085,960, Cl. 430-58.000.
- Numata, Jerald T.: See—
Stapleton, Charles E.; and Numata, Jerald T., 5,085,077, Cl. 73-290.00V.
- Nunogaki, Naohika; Toyama, Tetuo; and Ito, Nobuei, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. MoS₃/SiC ceramic material and glow plug heating element made of the same. 5,086,210, Cl. 219-270.000.
- Nussbaum, Max; and Federspiel, Eric, to Gaz de France. Device for detecting, during welding, variation in the physical state of the plastic material in a coupling piece of joining pipes. 5,086,213, Cl. 219-535.000.
- NutraSweet Company, The: See—
Tsau, Josef H. K., 5,085,876, Cl. 426-92.000.
- Nutzel, Wolfgang, to KTS Kommunikationstechnik Stolper GmbH. Display surface for tactile information. 5,086,287, Cl. 340-407.000.
- Nye, Norman H.; and Medkoff, Arthur T. Container assembly machine. 5,084,953, Cl. 29-235.000.
- Obando, Manuel E.: See—
Gallup, Darrell L.; and Obando, Manuel E., 5,085,782, Cl. 210-696.000.
- Obara, Sakae; Muto, Hiroaki; Mizuno, Sumiko; Chiba, Tohru; Saitoh, Izumi; and Ikeda, Kaori, to Shin-Etsu Chemical Co., Ltd. Endermic medicament with a gel base. 5,086,077, Cl. 514-781.000.
- Obikane, Tadashi: See—
Karasawa, Wataru; Itoyama, Taketoshi; Takao, Itaru; Obikane, Tadashi; and Koike, Hisashi, 5,086,270, Cl. 324-158.00P.
- Occidental Chemical Corporation: See—
Fertel, Lawrence B.; O'Reilly, Neil J.; and Lin, Henry C., 5,086,188, Cl. 549-246.000.
- Ochshorn, Miriam: See—
Farbstein, David; and Ochshorn, Miriam, 5,085,638, Cl. 604-110.000.
- Oda, Hitoshi; Ono, Takeo; Yoneda, Kou; Sasaki, Toyoshige; and Miyawaki, Mamoru, to Canon Kabushiki Kaisha. Recording and/or reproducing method of Bloch line memory. 5,086,409, Cl. 365-10.000.
- Oda, Seiji, to Elco Co., Ltd. Step-up power supplying circuit. 5,086,383, Cl. 363-44.000.
- O'Dell, Gerald W., to Lee Company. The. High speed solenoid valve actuator. 5,085,402, Cl. 251-129.210.
- Odneal, Billie L.; and Seidel, Charles S. Dental floss machine. 5,085,236, Cl. 132-325.000.
- Oenick, Marsha B.: See—
Sutton, Richard C.; and Oenick, Marsha B., 5,086,143, Cl. 526-320.000.
- Office National d'Etudes et de Recherches Aérospatiales: See—
Gobin, Vincent; Labaune, Gerard; and Issac, Francois, 5,086,274, Cl. 324-239.000.
- Josso, Pierre; Alperine, Serge; Steinmetz, Pierre; and Constantini-Friant, Anne, 5,085,693, Cl. 106-1.280.
- Ogasa, Nobuo: See—
Osada, Mituo; Amano, Yoshinari; Ogasa, Nobuo; and Ohtsuka, Akira, 5,086,333, Cl. 357-67.000.
- Ogata, Kiyoshi: See—
Kitano, Shuichi; Ogata, Kiyoshi; and Sato, Shinobu, 5,086,088, Cl. 522-170.000.
- Ogata, Nobuo: See—
Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569.000.
- Ogawa, Hiroshi: See—
Taga, Kazuaki; Tsuda, Takeshi; Inaba, Hiroo; and Ogawa, Hiroshi, 5,085,915, Cl. 428-141.000.
- Ogawa, Kazuhisa: See—
Usui, Ikuro; Ohgi, Hirokazu; and Ogawa, Kazuhisa, 5,086,303, Cl. 343-756.000.
- Ogawa, Kazuo: See—
Hayashi, Keizo; Shigeki, Kiyoshi; and Ogawa, Kazuo, 5,085,006, Cl. 49-482.000.
- Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Kuwamoto, Hideharu, to Mitsui Toatsu Chemicals, Inc. Process of preparing purified aqueous indole solution. 5,085,991, Cl. 435-108.000.
- Ogden, John E.: See—
Larkin, Mark E.; Ogden, John E.; and Moeller, Dale V., 5,085,643, Cl. 604-152.000.
- Ogihara, Hiroshi: See—
Shizawa, Masahiro; Taka, Katsuhiko; and Ogihara, Hiroshi, 5,086,456, Cl. 379-132.000.
- Ogino, Masanori: See—
Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiko, 5,085,495, Cl. 359-455.000.
- Oh-Ishi, Hisao: See—
Usui, Tetuo; Suzuki, Nobuo; Sakasai, Yutaka; and Oh-Ishi, Hisao, 5,085,967, Cl. 430-126.000.
- Ohashi, Hiromichi: See—
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 5,086,323, Cl. 357-23.400.
- Ohashi, Kunio: See—
Hayakawa, Takashi; Narikawa, Shiro; and Ohashi, Kunio, 5,085,968, Cl. 430-128.000.
- Ohgi, Hirokazu: See—
Usui, Ikuro; Ohgi, Hirokazu; and Ogawa, Kazuhisa, 5,086,303, Cl. 343-756.000.
- Ohhata, Kenichi: See—
Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.
- Ohkubo, Takatoshi, to Minnesota Mining and Manufacturing Company. Magnetic recording medium with hydroxy functional, sulfonated binder system. 5,085,941, Cl. 428-424.600.
- Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, to Sumitomo Chemical Co., Ltd. Method for producing thermoplastic resin composition. 5,086,116, Cl. 525-166.000.
- Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, to Sumitomo Chemical Co., Ltd. Method for producing thermoplastic resin composition. 5,086,117, Cl. 525-166.000.
- Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, to Sumitomo Chemical Co., Ltd. Method for producing thermoplastic resin composition. 5,086,118, Cl. 525-176.000.
- Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, to Sumitomo Chemical Co., Ltd. Method for producing thermoplastic resin composition. 5,086,119, Cl. 525-176.000.
- Ohmiya, Akio: See—
Naka, Yoji; and Ohmiya, Akio, 5,086,311, Cl. 354-195.100.
- Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, 5,086,312, Cl. 354-195.120.
- Ohmura, Ryuuji; and Higashino, Naomi, to Mitsubishi Denki Kabushiki Kaisha. Continuously variable pulsewidth waveform formation device employing two memories. 5,086,280, Cl. 328-61.000.

- Ohnaka, Junko: *See—*
Asanuma, Tadashi; Yamamoto, Kazuhiko; Ohnaka, Junko; and Tokura, Yoshiko, 5,085,895, Cl. 427-393.500.
- Ohno, Aritaka: *See—*
Sakuma, Kazuhiro; Ohno, Aritaka; Asami, Eiichi; and Kaku, Ryoji, 5,085,501, Cl. 356-350.000.
- Ohno, Kiyotaka; Ohtake, Atsushi; Endoh, Takashi; Itou, Shigeki; and Hoshi, Kazuhiro, to Toray Industries, Inc. 2,5,6,7-tetranor-4,8-inter-m-phenylene PG₁₂ derivatives, 5,086,071, Cl. 514-468.000.
- Ohno, Masahiro, to Olympus Optical Co., Ltd. Ultrasonic imaging apparatus without phase distortion, 5,085,081, Cl. 73-620.000.
- Ohno, Yasunori: *See—*
Setoyama, Eiji; Kamei, Mitsuhiro; and Ohno, Yasunori, 5,085,755, Cl. 204-298.160.
- Ohsawa, Michitaka: *See—*
Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, 5,086,259, Cl. 315-368.250.
- Ohsawa, Takaaki: *See—*
Tanaka, Yoshinori; Ohsawa, Takaaki; and Tanabe, Akira, 5,085,411, Cl. 266-102.000.
- Ohta, Hideo; Matsumoto, Yasuhiro; and Kurihara, Masaru, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Remote control device for ink groove width, 5,085,145, Cl. 101-363.000.
- Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Polyimide resin composition, 5,086,125, Cl. 525-432.000.
- Ohta, Masutomi: *See—*
Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiro, 5,085,495, Cl. 359-455.000.
- Ohta, Yasuji: *See—*
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Shigeyuki, 5,086,471, Cl. 381-36.000.
- Ohta, Yuji: *See—*
Saegusa, Noboru; Shimura, Yukihiro; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, 5,086,451, Cl. 379-58.000.
- Ohtake, Atsushi: *See—*
Ohno, Kiyotaka; Ohtake, Atsushi; Endoh, Takashi; Itou, Shigeki; and Hoshi, Kazuhiro, 5,086,071, Cl. 514-468.000.
- Ohtake, Masatoshi: *See—*
Sugata, Fujio; Ohtake, Masatoshi; and Fujiwara, Hidefumi, 5,086,438, Cl. 375-114.000.
- Ohtomi, Sadayuki, to Mitsubishi Denki K.K. Industrial robot apparatus, 5,085,556, Cl. 414-744.300.
- Ohtsuka, Akira: *See—*
Osada, Mituo; Amano, Yoshinari; Ogasa, Nobuo; and Ohtsuka, Akira, 5,086,333, Cl. 357-67.000.
- Oikawa, Hideaki: *See—*
Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,086,125, Cl. 525-432.000.
- Oka, Kazuhiro; Morita, Takeshi; Hiramoto, Seigo; and Kagawa, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Laser vapor deposition apparatus, 5,085,166, Cl. 118-50.100.
- Oka, Toshio, to Kabushiki Kaisha Toshiba. Terminal repeater having a function for repeating DC loop signal, 5,086,462, Cl. 379-340.000.
- Okabayashi, Hiroaki: *See—*
Kenichi, Kamakura; Muraoka, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, 5,085,534, Cl. 401-65.000.
- Okabe Mica Co., Ltd.: *See—*
Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiko; and Kimura, Tsuguyuki, 5,085,009, Cl. 51-131.100.
- Okada, Gentaro; Akano, Hirofumi; Sato, Takeshi; Okumura, Hajime; and Kawamura, Yoshiya, to Nakano Vinegar Co., Ltd. Dental plaque-degrading compositions, 5,085,851, Cl. 424-50.000.
- Okada, Naoyuki: *See—*
Abe, Shintaro; Adachi, Muneco; Okada, Naoyuki; and Shimamura, Yasuhito, 5,086,434, Cl. 375-7.000.
- Okada, Toshiyuki: *See—*
Ikada, Yoshito; Okada, Toshiyuki; Kawai, Tatsuya; and Yoshimoto, Michiaki, 5,085,632, Cl. 604-29.000.
- Okamoto, Masaru; Ichikawa, Yasunori; Inoue, Toshihide; and Yamanaka, Toru, to Toray Industries, Inc. Flame-retardant liquid crystal polyester composition, process for preparation thereof and injection-molded article composed thereof, 5,085,807, Cl. 252-609.000.
- Okamoto, Yukio; Yasuda, Makoto; and Koga, Masataka, to Hitachi, Ltd. Microwave induced plasma source, 5,086,255, Cl. 315-111.210.
- Okawa, Masayuki: *See—*
Nakayama, Masaaki; and Okawa, Masayuki, 5,085,542, Cl. 407-114.000.
- Okayama, Hideaki; and Ishida, Toshimasa, to Oki Electric Industry Co., Ltd. Optical switching system which employs reference beams with different wavelengths, 5,086,349, Cl. 359-124.000.
- Oki Electric Industry Co., Ltd.: *See—*
Okayama, Hideaki; and Ishida, Toshimasa, 5,086,349, Cl. 359-124.000.
- Okuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Tachometer signal generating device, 5,085,191, Cl. 123-414.000.
- Okuda, Masaharu; Asami, Kouichiro; and Nagasaki, Heishiro, to Taikisha, Ltd. Spray painting apparatus arm support, 5,085,374, Cl. 239-751.000.
- Okuda, Shinji; Maeda, Hiroshi; and Nagata, Tsuyoshi, to Sunstar Engineering Inc. Method of and apparatus for applying a paint, 5,085,169, Cl. 118-205.000.
- Okuda, Tetsuo, to CKD Corporation. Thread drawing-in head with clamp for drawing device, 5,084,950, Cl. 28-205.000.
- Okugawa, Shinichi; and Sugimoto, Shigenobu, to NEC Corporation. Circuit arrangement for decimal arithmetic, 5,086,406, Cl. 364-781.000.
- Okumura, Hajime: *See—*
Okada, Gentaro; Akano, Hirofumi; Sato, Takeshi; Okumura, Hajime; and Kawamura, Yoshiya, 5,085,851, Cl. 424-50.000.
- Okuyama, Nobutaka: *See—*
Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, 5,086,259, Cl. 315-368.250.
- Okuyama, Yoshiyuki: *See—*
Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.
- Okuyama, Yuji: *See—*
Kii, Katsuya; Katada, Kunio; Okuyama, Yuji; and Yonezawa, Takashi, 5,085,458, Cl. 280-707.000.
- Ola, Hammarstrom: *See—*
Lars, Tenerz; Bertil, Hok; Roman, Lonc; Ola, Hammarstrom; and Tomas, Engstrom, 5,085,223, Cl. 128-675.000.
- Oldani, Battistino: *See—*
Bonomi, Giovanni B.; and Oldani, Battistino, 5,084,951, Cl. 29-26.00A.
- Oldfield, Thomas A., to Anchor Tech, Inc. Apparatus for exerting a braking torque upon a rotating shaft, 5,085,101, Cl. 74-730.100.
- Olin Corporation: *See—*
Shaffer, John H.; and Kurtz, William L., 5,085,847, Cl. 423-474.000.
- Olliero, Dominique: *See—*
Brodin, Roger; Olliero, Dominique; and Worms, Paul, 5,086,053, Cl. 514-236.200.
- Olsen, Khris B.: *See—*
Griffin, Jeffrey W.; and Olsen, Khris B., 5,085,499, Cl. 356-311.000.
- Olson, John D., to Syntex (U.S.A.) Inc. Immunoseparating strip, 5,085,987, Cl. 435-7.910.
- Olson, John D., to Syntex (U.S.A.) Inc. Immunoseparating strip, 5,085,988, Cl. 435-7.910.
- Olthoff, Margaretha; Dijkgraaf, Bernardus L. J.; and Akkerboom, Piet J., to Gist-Brocades N.V. Pharmaceutical granulate, 5,085,869, Cl. 424-499.000.
- Olympus Optical Co., Ltd.: *See—*
Doi, Masanori, 5,086,420, Cl. 369-44.250.
- Ohno, Masahiro, 5,085,081, Cl. 73-620.000.
- Omoda, Koichiro: *See—*
Tanaka, Teruo; Hamanaka, Naoki; Nakagoshi, Junji; Omoda, Koichiro; and Nagashima, Shigeo, 5,086,498, Cl. 395-200.000.
- Omomo, Naoki: *See—*
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- Young, Jonathan, 5,085,457, Cl. 280-693.000.
- Pacific Fitness Corporation: *See—*
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- Pagliaccio, Joseph A., to Grumman Aerospace Corporation. Endmill with notched shank, 5,085,540, Cl. 407-11.000.
- Paige, Clive R., to Shop-Vac Corporation. Foam creating nozzle system, 5,085,371, Cl. 239-343.000.
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- Papuchon, Michel: *See—*
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- Par-Way Group: *See—*
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- Paragon Films, Inc.: *See—*
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- Parish, Daniel W., to SRI International. Novel arylcycloalkane polycyclic amines, 5,086,054, Cl. 514-239.200.
- Parker, Michael L.: *See—*
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- Parkevich, Gayle, to Tan Sense Medical Corp. Method for protecting a surface from contaminants, 5,084,927, Cl. 5-484.000.
- Parr, William J.: *See—*
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- Parsons, Kevin L., to Armament Systems & Procedures, Inc. Auxiliary folding handle, 5,085,433, Cl. 273-84.00R.
- Parulski, Kenneth A.: *See—*
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- Pascucci, Carlo; and Wolf, Andreas T. F., to Dow Corning S.A. Method of bonding silicone elastomer to a substrate, 5,085,894, Cl. 427-387.000.
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- Patel, Rajendra: *See—*
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- Paul, Gerhard: *See—*
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- Paul, Howard A.: See—
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- Paul, James M.: See—
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- Paulin, Kenneth R. Drinking bottle attachment. 5,085,330, Cl. 215-6.000.
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- Peach, John A.; Korba, Paul H.; and Rapp, Kenneth M., to Fulfillment Systems Inc. Combined post card and check. 5,085,470, Cl. 283-58.000.
- Pearce, Scott C.; Perkins, William H.; Brod, Daniel; and Brod, Stan, to Drackett Company, The. Blank for package and assembled package for display. 5,085,316, Cl. 206-223.000.
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- Pedersen, Inge: See—
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- Peet, Norton P.; and Lentz, Nelsen L., to Merrell Dow Pharmaceuticals Inc. Tricyclic fused adenine derivatives. 5,086,176, Cl. 544-251.000.
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- Peinemann, Klaus-Viktor: See—
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- Pekala, Richard Walter, to United States of America, Energy. Melamine-formaldehyde aerogels. 5,086,085, Cl. 521-187.000.
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- Pelton, John F., to Union Carbide Industrial Gases Technology Corp. Strengthened graphite-metal threaded connection. 5,085,536, Cl. 403-343.000.
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- Perdelwitz, Lee E., Jr.; Pfeiffer, Gustav O.; Neogi, Amar N.; Iff, Ronald H.; and Mehta, Hareesh R., to Weyerhaeuser Company. Thermoplastic material containing towel. 5,085,914, Cl. 428-137.000.
- Perkins, Douglas W.: See—
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- Perkins, Robert E. Saw guide apparatus. 5,084,977, Cl. 30-374.000.
- Perkins, William H.: See—
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- Perlman, Radia J.; Varghese, George; and Lauck, Anthony G., to Digital Equipment Corporation. Reliable broadcast of information in a wide area network. 5,086,428, Cl. 370-94.100.
- Perna, Anthony M. Mounting apparatus for securing an electrical appliance to a suspended ceiling structure. 5,085,392, Cl. 248-343.000.
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- Persson, Erland: See—
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- Perut, Christian M.: See—
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- Peterson, Brent; and Hovey, Verl, to Quake Safe Corporation. Water heater support system. 5,085,387, Cl. 248-154.000.
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- Peyre, Henri: See—
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- Peyrot, Elysabette: See—
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- Pfizer Inc.: See—
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- Kelly, Sarah E., 5,086,186, Cl. 548-468.000.
- Mitchell, William H., 5,085,510, Cl. 356-237.000.
- Pharis, Richard P.; Looney, Norman E.; and Mander, Lewis N. Promotion of flowering of fruit trees. 5,085,683, Cl. 71-89.000.
- Phillips Petroleum Company: See—
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- Philpott, Arthur K.: See—
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- Physical Sciences, Inc.: See—
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- Picker International, Inc.: See—
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Pedretti, Ugo; Bresci, Bruno; Bonfanti, Cesarina; Magagnini, Pier L.; La Mantia, Francesco P.; and Roggero, Arnaldo, 5,086,160, Cl. 528-291.000.
- Rohm GmbH Chemische Fabrik: See—
Muller, Michael; Pennewiss, Horst; and Gebhardt, Juergen, 5,085,701, Cl. 106-273.100.
- Rohm and Haas Company: See—
Marks, Allen P.; and Frantz, Ronald L., 5,085,896, Cl. 427-412.100.
- Rohmfeld, Josef: See—
Gammel, Edwin; Rohmfeld, Josef; and Hock, Stefan, 5,086,442, Cl. 378-132.000.
- Rohr, Wolfgang: See—
Rheinheimer, Joachim; Eicken, Karl; Vogelbacher, Uwe J.; Rohr, Wolfgang; Kuekenhoechner, Thomas; Westphalen, Karl O.; and Wuerzer, Bruno, 5,085,685, Cl. 71-92.000.
- Rohrer, Jean; and Lehmann, Ernst, to Maschinenfabrik WIFAG. Process for feeding paper rolls to web-fed rotary presses and device for carrying out the process. 5,085,377, Cl. 242-58.600.
- Rohrig, Herbert: See—
Nolte, Roger; Rohrig, Herbert; and Roth, Franz-Josef, 5,085,074, Cl. 73-150.00A.
- Rohrmann, Jurgen: See—
Antberg, Martin; Spaleck, Walter; Rohrmann, Jurgen; Luker, Hartmut; and Winter, Andreas, 5,086,134, Cl. 526-126.000.
- Roller, Hermann: See—
Platz, Horst; Engelhardt, Peter; Sommermann, Friedrich; Kohl, Albert; Klausmann, Juergen; Baur, Reinhold; Heilmann, Peter; and Roller, Hermann, 5,085,889, Cl. 427-128.000.
- Rolls-Royce plc: See—
Scott-Scott, John L., 5,085,037, Cl. 60-39.093.
- Scott-Scott, John L.; and Bond, Alan, 5,085,041, Cl. 60-244.000.
- Todman, Michael T.; James, Simon A.; and Parker, Michael L., 5,085,038, Cl. 60-39.370.
- Romahn, Ulrich: See—
Zell, Werner; Becker, Johann A.; and Romahn, Ulrich, 5,085,493, Cl. 385-96.000.
- Roman, Bernard J. Smoker's appliance. 5,085,230, Cl. 131-235.100.
- Roman, Lonc: See—
Lars, Tenerz; Bertil, Hok; Roman, Lonc; Ola, Hammarstrom; and Tomas, Engstrom, 5,085,223, Cl. 128-675.000.
- Rorer Pharmaceutical Corporation: See—
Klein, Scott I.; and Molino, Bruce F., 5,086,069, Cl. 514-399.000.
- Rosamond, James D., to Fisons Corporation. Peptides with sulfate ester groups. 5,086,042, Cl. 514-16.000.
- Roscoe, Bradley A.; and Evans, Michael L., to Schlumberger Technology Corporation. Analysis of nuclear data for determining characteristics of earth formations traversed by a borehole. 5,086,224, Cl. 250-269.000.
- Rose, James L., to E. B. Thomas. Method and apparatus for cleaning pipe. 5,085,016, Cl. 51-129.000.
- Rose, Rene: See—
Mollet, Jean P.; and Rose, Rene, 5,086,216, Cl. 235-492.000.
- Rosencher, Emmanuel; Vinter, Borge; and Bois, Paul, to Thomson-CSF. Capacitive detector of electromagnetic waves. 5,086,327, Cl. 357-30.000.
- Rosenthal, Robert D.; Paynter, Lynn N.; and Mackie, Linda H., to Futrex, Inc. Non-invasive measurement of blood glucose. 5,086,229, Cl. 250-341.000.
- Ross, Dale R. Boning knife. 5,084,976, Cl. 30-276.000.
- Ross, John: See—
Golik, Jerzy; Beutler, John; Clark, Pat; Ross, John; Roach, John; Muschik, Gary; and Lebherz, William B., III, 5,086,045, Cl. 514-61.000.
- Rossel, Ulf; Karlsson, Mats; and Ternsjo, Johan, to Aktiebolaget Bofors. Large-caliber guns. 5,085,123, Cl. 89-4.200.
- Rossi, Adelio: See—
Salabe, Mario; and Rossi, Adelio, 5,085,765, Cl. 209-2.000.
- Rossides, Michael T. Method of using a random number supplier for the purpose of reducing currency handling. 5,085,435, Cl. 273-138.00A.
- Rossmo, William. Reflexology nail stimulator. 5,085,235, Cl. 132-75.800.
- Roth, Donald J.; Heyn, William M.; and Sauer, Donald G., to Polystar Packaging, Incorporated. Reclosable container closure. 5,085,339, Cl. 220-269.000.
- Roth, Franz-Josef: See—
Nolte, Roger; Rohrig, Herbert; and Roth, Franz-Josef, 5,085,074, Cl. 73-150.00A.
- Rouse, Anthony L.: See—
Brown, Ronald E.; Rouse, Anthony L.; and Lee, Fu-Ming, 5,085,741, Cl. 203-53.000.
- Roussel-Dupre', Diane: See—
Bloch, Jeffrey J.; Roussel-Dupre', Diane; and Smith, Barham W., 5,086,443, Cl. 378-145.000.
- Roussel Uclaf: See—
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 5,086,070, Cl. 514-418.000.
- Luheshi, Abdul B. N.; Smalley, Robert K.; Kennewell, Peter D.; and Westwood, Robert, 5,086,170, Cl. 540-303.000.
- Roussel Uclaf, Departement des Brevets: See—
Gourvest, Jean-Francois; and Lesuisse, Dominique, 5,086,047, Cl. 514-177.000.
- Rovensky, Franz: See—
Binder, Dieter; Rovensky, Franz; Brunner, Norman; and Ferber, Hubert P., 5,086,180, Cl. 546-172.000.
- Rowlandson, Nicholas: See—
Horton-Corcoran, Bernard; and Rowlandson, Nicholas, 5,085,200, Cl. 124-25.000.
- Roy, Serge H.: See—
DeLuca, Carlo J.; and Roy, Serge H., 5,085,225, Cl. 128-733.000.
- Royal Canadian Mint: See—
Pickles, Christopher A.; Toguri, James M.; Truong, Hieu; and Clark, Janet G., 5,085,692, Cl. 75-634.000.
- Royal, Stephen F.: See—
Dutt, Herbert V.; Meneau, Gary L.; and Royal, Stephen F., 5,085,333, Cl. 215-250.000.
- Rubbermaid Commercial Products Inc.: See—
Kos, Chester M., 5,085,337, Cl. 220-204.000.
- Rubbermaid Incorporated: See—
Doxey, Andre G.; and Hradisky, John L., 5,085,340, Cl. 220-298.000.
- Rudolph, Hans: See—
Frauendorf, Beatrix; Suling, Carlhans; Rudolph, Hans; and Korte, Siegfried, 5,086,150, Cl. 528-49.000.
- Ruf, Erich, to Th. Goldschmidt AG. Electrically conducting, IR reflecting, fluorine-doped tin oxide organic compound. 5,085,805, Cl. 252-518.000.
- Rumpf, Guenter: See—
Franck, Gerhard; and Rumpf, Guenter, 5,085,087, Cl. 73-864.730.
- Rumreich, Mark F., to Thomson Consumer Electronics, Inc. Amplifier having maximum summed power output from a plurality of devices having limited current sinking capability. 5,086,474, Cl. 381-120.000.
- Russell, Michael T.; and Bliven, A. Bruce, to Paccar Inc. Load lock holder. 5,085,326, Cl. 211-4.000.

- Russell, Phillip E.: See—
Musselman, Inga H.; and Russell, Phillip E., 5,085,746, Cl. 204-129.400.
- Rutz, Andreas; Langer, Rudolf; Becher, Hubert; Buttenbender, Klaus; and Zeller, Heinz, to Lindauer Dornier GmbH. Tenting chain with a continuously adjustable chain pitch for treating film webs simultaneously in two axial directions. 5,084,949, Cl. 26-72.000.
- Ryan, Dana W., to Ryan Medical, Inc. Safety winged needle medical devices. 5,085,639, Cl. 604-110.000.
- Ryan, James G.: See—
Brodsky, Stephen B.; Joshi, Rajiv V.; Lechaton, John S.; Ryan, James G.; and Schepis, Dominic J., 5,086,016, Cl. 437-190.000.
- Ryan Medical, Inc.: See—
Ryan, Dana W., 5,085,639, Cl. 604-110.000.
- Ryan, Patrick V. Hanger assembly method and apparatus. 5,085,393, Cl. 248-343.000.
- Rydel, Mark A., to Everest Medical Corporation. Biopsy device with bipolar coagulation capability. 5,085,659, Cl. 606-47.000.
- Rylatt, Dennis B.: See—
Hillyard, Carmel J.; Rylatt, Dennis B.; Kemp, Bruce E.; and Bundesen, Peter G., 5,086,002, Cl. 436-540.000.
- Ryles, Christine W.: See—
Williams, David R.; and Ryles, Christine W., 5,085,853, Cl. 424-53.000.
- S-Cal Research Corporation: See—
Gondouin, Michel, 5,085,275, Cl. 166-303.000.
- Sadlowski, Jürgen: See—
Geist, Michael; Cibura, Klaus; Jock, Walter; Ott, Gunther; Sadlowski, Jürgen; Dangschaft, Manfred; and Reimann, Manfred, 5,086,090, Cl. 523-414.000.
- Sado, Osamu; and Masuda, Shunji, to Mazda Motor Corporation. V-type engine equipped with a supercharging device. 5,085,199, Cl. 123-559.100.
- Saegusa, Noboru; Shimura, Yukihiko; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, to NEC Corporation; Nippon Telegraph & Telephone Corporation; and K.K. Toshiba. Method for controlling a plurality of stationary apparatuses in a cordless telephone system. 5,086,451, Cl. 379-58.000.
- Safir, Gene R.; Nair, Muralidharan G.; and Siqueira, Jose O., to Board of Trustees operating Michigan State University. Method and compositions for stimulating vestibular-arcular mycorrhizal fungi using isoflavonoids. 5,085,682, Cl. 71-88.000.
- Sagami, Hiroshi; and Wakamatsu, Hisashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane having high durability with diffusion coating on marginal areas of the membrane. 5,085,754, Cl. 204-296.000.
- Sagara, Seiji, to Canon Kabushiki Kaisha. Image forming apparatus. 5,085,422, Cl. 271-162.000.
- Sage Products, Inc.: See—
Haniff, Paul H.; and Harrel, Donald R., 5,085,633, Cl. 604-35.000.
- Saidi, Nick N.: See—
Dymond, James H.; Saidi, Nick N.; and Young, John M., 5,086,246, Cl. 310-269.000.
- Saimoto, Hiroshi: See—
Otsuka, Masako; Saimoto, Hiroshi; Murata, Yumiko; and Kawashima, Masao, 5,085,995, Cl. 435-240.450.
- St. Clair, Martha H.: See—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 5,086,044, Cl. 514-51.000.
- Saint-Gobain Vitreage: See—
Kunert, Heinz, 5,085,021, Cl. 52-208.000.
- Saint-Gobain Vitreage International: See—
Francis, M. Triffaux, 5,085,141, Cl. 100-155.00G.
- St. John, Don K.: See—
Kelleher, William L.; and St. John, Don K., 5,086,264, Cl. 318-798.000.
- Saito, Hideo; Kimura, Tadashi; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Single motor moving ribbon and exchanging character holding member, all on print carrier. 5,085,530, Cl. 400-171.000.
- Saito, Megumi: See—
Noguchi, Hiromichi; Inamoto, Tadayoshi; and Saito, Megumi, 5,086,307, Cl. 346-140.00R.
- Saito, Mitsuru: See—
Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.
- Saito, Shigemasa; and Fujitaka, Hisashi, to Fuji Electric Co., Ltd. Method of making an oil dashpot in an electromagnetic tripping apparatus. 5,084,956, Cl. 29-602.100.
- Saito, Shogo; Tsutsui, Tetsuo; and Adachi, Chihaya, to Ricoh Company, Ltd. Electroluminescence device. 5,085,946, Cl. 428-690.000.
- Saito, Shogo; Tsutsui, Tetsuo; and Adachi, Chihaya, to Ricoh Company, Ltd. Electroluminescence device. 5,085,947, Cl. 428-690.000.
- Saitoh, Hideki: See—
Onoue, Akihiro; Saitoh, Hideki; and Furuki, Masahiro, 5,085,604, Cl. 440-61.000.
- Saitoh, Izumi: See—
Obara, Sakae; Muto, Hiroaki; Mizuno, Sumiko; Chiba, Tohru; Saitoh, Izumi; and Ikeda, Kaori, 5,086,077, Cl. 514-781.000.
- Saitoh, Kazuyoshi: See—
Katoh, Kotaro; Tomita, Hiroshi; and Saitoh, Kazuyoshi, 5,085,933, Cl. 428-332.000.
- Saitoh, Naofumi: See—
Minayoshi, Shiro; Saitoh, Naofumi; Higashi, Toshio; and Ebisuya, Noritsugu, 5,085,800, Cl. 252-309.000.
- Sakagami, Teruo: See—
Doi, Hideaki; and Sakagami, Teruo, 5,086,140, Cl. 526-274.000.
- Sakaguchi, Suguru: See—
Noro, Takano; Matsumoto, Kunio; Oshima, Muneo; Kanda, Naoya; Sakaguchi, Suguru; and Murata, Akira, 5,086,337, Cl. 357-79.000.
- Sakaguchi, Yasuo: See—
Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.
- Sakai, Katsunori: See—
Sanderson, Robert A.; Sakai, Katsunori; Kuwabara, Takeshi; and Amemiya, Takashi, 5,085,949, Cl. 429-23.000.
- Sakai, Kouzou: See—
Ishino, Toshihiro; Sakai, Kouzou; and Kido, Nobuyuki, 5,086,020, Cl. 501-105.000.
- Sakairi, Shigeru: See—
Matoba, Mikio; Sugawara, Ken; and Sakairi, Shigeru, 5,086,388, Cl. 395-425.000.
- Sakakibara, Yasuyuki: See—
Shiga, Naomichi; Tsuchiya, Hisatoshi; Sakakibara, Yasuyuki; and Kibe, Katsumi, 5,086,266, Cl. 322-28.000.
- Sakanoue, Hitoyuki: See—
Yamakawa, Akira; Miyake, Masaya; Sakanoue, Hitoyuki; Takeuchi, Hisao; Sogabe, Koichi; and Sasame, Akira, 5,085,923, Cl. 428-209.000.
- Sakasai, Yutaka: See—
Suzuki, Nobuo; Sakasai, Yutaka; and Kato, Eiichi, 5,085,966, Cl. 430-115.000.
- Usui, Tetuo; Suzuki, Nobuo; Sakasai, Yutaka; and Oh-Ishi, Hisao, 5,085,967, Cl. 430-126.000.
- Sakata, Akihiro, to Hitachi, Ltd. Method and apparatus for merging. 5,086,408, Cl. 395-600.000.
- Sakata, Satoshi; Sato, Kazuo; Gotoh, Yuichi; Azumai, Mitsuo; and Hotta, Ikuya, to Konica Corporation. Motor speed control device for use in an image forming apparatus. 5,086,261, Cl. 318-268.000.
- Sakudo, Noriyuki: See—
Tokiguchi, Katsumi; Amemiya, Kensuke; Sakudo, Noriyuki; and Seki, Takayoshi, 5,086,256, Cl. 315-111.810.
- Sakuma, Kazuhiro; Ohno, Aritaka; Asami, Eiichi; and Kaku, Ryoji, to Japan Aviation Electronics Industry Limited. Fiber optic gyroscope using optical waveguide couplers. 5,085,501, Cl. 356-350.000.
- Sakuragi, Shigeru: See—
Nakamura, Makoto; Sakuragi, Shigeru; Matayoshi, Yutaka; Makawa, Keiichi; Hara, Seinosuke; and Morita, Shoji, 5,085,182, Cl. 123-90.160.
- Sakurai, Kazuaki: See—
Maehira, Toshiro; Sakurai, Kazuaki; Kozono, Seiji; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,085,599, Cl. 439-595.000.
- Sakurai, Soichi; Nakahara, Masaki; Mizuta, Takahisa; Okuyama, Nobutaka; Ohsawa, Michitaka; and Niitsu, Ichiro, to Hitachi, Ltd. System for converging a plurality of electron beams in cathode ray tube. 5,086,259, Cl. 315-368.250.
- Sakurai, Yoshiaki: See—
Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.
- Salabe, Mario; and Rossi, Adelio, to Impresa Costruzioni Soc. Fra. S.a.r.l. Conveying and separation unit for ballistic projectile arresters. 5,085,765, Cl. 209-2.000.
- Salatino, Matthew M., to Harris Corporation. Method and apparatus for testing lead bonds and detecting failure. 5,085,084, Cl. 73-827.000.
- Salaun, Thierry: See—
Baux, Christian; and Salaun, Thierry, 5,085,078, Cl. 73-313.000.
- Salavin, Serge: See—
Gay, Michel; Deschamps, Jacques; and Salavin, Serge, 5,086,257, Cl. 315-169.400.
- Salomon S.A.: See—
Provence, Marc; and Graillat, Gerard, 5,085,454, Cl. 280-615.000.
- Saltzstein, William E.: See—
Galen, Peter M.; Hart, Susan R.; and Saltzstein, William E., 5,085,224, Cl. 128-696.000.
- Sambell, Kenneth W. Wide-range blade pitch control for a folding rotor. 5,085,315, Cl. 244-7.00R.
- Sampson, Dennis; and Smith, Robert M., to Par-Way Group. d-Limonene containing space or room aerosol deodorant. 5,085,849, Cl. 424-45.000.
- Samsung Electron Devices Co., Ltd.: See—
Jeong, Su-Min, 5,085,958, Cl. 430-25.000.
- Samsung Electronics Co., Ltd.: See—
Chung, Ho-sun; and Paek, Seung-yeob, 5,086,405, Cl. 364-748.000.
- Sanada, Yasuhiro: See—
Morimoto, Takeshi; and Sanada, Yasuhiro, 5,085,888, Cl. 427-108.000.
- Sanden Corporation: See—
Aoki, Yoriakazu, 5,085,269, Cl. 165-43.000.
- Sander, Rainald: See—
Leipold, Ludwig; Sander, Rainald; Tihanyi, Jenoe; and Weber, Roland, 5,086,364, Cl. 361-18.000.
- Sanders Associates, Inc.: See—
Bauman, Ralph E.; and Seymour, Horace W., III, 5,085,602, Cl. 439-874.000.
- Sanderson, John R.: See—
Burns, Jeffrey M.; Sanderson, John R.; Larkin, John M.; and McCoy, David R., 5,085,793, Cl. 252-79.000.

- Sanderson, Robert A.; Sakai, Katsunori; Kuwabara, Takeshi; and Amemiya, Takashi, to Kabushiki Kaisha Toshiba. Fuel cell generation system. 5,085,949, Cl. 429-23.000.
- Sandhof, Gerhard, to Maschinenfabrik Gehring GmbH & Co. Honing tool and method for the surface machining of bore walls. 5,085,014, Cl. 51-290.000.
- Sandoz Ltd.: See—
Moriya, Yoshitaka; Nomachi, Hiroshi; Takada, Makoto; Takatsu, Yukihide; and Umezawa, Kenichi, 5,085,708, Cl. 106-819.000.
- Sanfead, Brian T.: See—
Elsby, John; Dewar, John U.; Greathead, Andrew; and Sanfead, Brian T., 5,085,285, Cl. 175-325.000.
- Sanguard, Patrick, to Chambre de Commerce et d'Industrie de Paris. Method for embodying an active matrix flat screen and a RAM memory using MIM components. 5,086,009, Cl. 437-48.000.
- Sankyo Company Limited: See—
Sasagawa, Kazuhiko, 5,086,057, Cl. 514-267.000.
- Sano, Keiji: See—
Uchikoshi, Gohji; and Sano, Keiji, 5,085,379, Cl. 242-186.000.
- Sano, Shinichi; Shimokawahara, Hisashi; and Maruyama, Hiroshi, to Somar Corporation. Lightsafe masking film. 5,085,908, Cl. 428-40.000.
- Sanofi: See—
Brodin, Roger; Olliero, Dominique; and Worms, Paul, 5,086,053, Cl. 514-236.200.
- Sanshin Kogyo Kabushiki Kaisha: See—
Onoue, Akihiro; Saitoh, Hideki; and Furuki, Masahiro, 5,085,604, Cl. 440-61.000.
- Torigai, Katsumi, 5,085,180, Cl. 123-73.00A.
- Santa Barbara Research Center: See—
Hardy, Arthur H., Jr.; and Schubert, William C., 5,086,431, Cl. 372-50.000.
- Kasai, Ichiro; Wallach, Richard M.; Baumgratz, Bonnie A.; and Boyd, Michael E., 5,086,328, Cl. 357-30.000.
- Santel, Hans-Joachim: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.
- Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., 5,085,684, Cl. 71-92.000.
- Sanyo Electric Co., Ltd.: See—
Iwamoto, Masayuki; Minami, Koji; and Watanabe, Kaneko, 5,085,711, Cl. 136-258.000.
- Shimizu, Ryu; and Kobayashi, Shun-ichi, 5,086,013, Cl. 437-80.000.
- Sarkisian, Paul H.: See—
Popelka, Andrew; and Sarkisian, Paul H., 5,085,251, Cl. 138-119.000.
- Sarnoff, Stanley J.; Lopez, Claudio; and Dalling, N. Lawrence, to Survival Technology, Inc. Conveniently carried frequent use autoinjector with improved cap structure. 5,085,641, Cl. 604-134.000.
- Sarnoff, Stanley J.; and Lopez, Claudio, to Survival Technology, Inc. Conveniently carried frequent use autoinjector. 5,085,642, Cl. 604-134.000.
- Sasagawa, Kazuhiko, to Sankyo Company Limited. Method of treating cachexia and certain new compounds for use in this method. 5,086,057, Cl. 514-267.000.
- Sasaki, Eiichi, to Ricoh Company, Ltd. Line head driving apparatus. 5,086,306, Cl. 346-76.0PH.
- Sasaki, Kazutoshi: See—
Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, 5,085,814, Cl. 264-126.000.
- Sasaki, Kyochi; and Swanson, Donald K., to Du Pont de Nemours, E. I., and Company. Dielectric composition. 5,086,021, Cl. 501-137.00G.
- Sasaki, Toshiyuki; and Nagaki, Takeshi, to Pentel Kabushiki Kaisha. Dispenser for discharging material and having relatively rotatable male and female screws. 5,085,352, Cl. 222-327.000.
- Sasaki, Toyoshige: See—
Oda, Hitoshi; Ono, Takeo; Yoneda, Kou; Sasaki, Toyoshige; and Miyawaki, Mamoru, 5,086,409, Cl. 365-10.000.
- Sasaki, Tsukasa: See—
Kenichi, Kamakura; Murasawa, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, 5,085,534, Cl. 401-65.000.
- Sasame, Akira: See—
Yamakawa, Akira; Miyake, Masaya; Sakanoue, Hitoyuki; Takeuchi, Hisao; Sogabe, Koichi; and Sasame, Akira, 5,085,923, Cl. 428-209.000.
- Sata, Junichi, to Canon Kabushiki Kaisha. Sheet feeding apparatus. 5,085,420, Cl. 271-114.000.
- Satake, Kunio: See—
Ando, Kazuo; Asai, Nobuko; Ito, Fumitaka; Mano, Takashi; Nakane, Masami; Satake, Kunio; and Shimada, Kaoru, 5,086,062, Cl. 514-321.000.
- Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, to Kureha Kabaku Kogyo K.K. Heat-resistant resin compositions, and heat-resistant molded or formed articles and production process thereof. 5,085,819, Cl. 264-235.000.
- Sato, Hideaki: See—
Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569.000.
- Sato, Katsuhiro: See—
Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiro; Nukada, Katsumi; and Marumo, Teruomi, 5,085,960, Cl. 430-58.000.
- Sato, Kazuo: See—
Sakata, Satoshi; Sato, Kazuo; Gotoh, Yuichi; Azumai, Mitsuo; and Hotta, Ikuya, 5,086,261, Cl. 318-268.000.
- Sato, Kazushi: See—
Ishii, Kazuhiro; Hirotsune, Kouji; Arinobu, Ichiro; and Sato, Kazushi, 5,086,366, Cl. 361-94.000.
- Sato, Maki: See—
Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, 5,085,748, Cl. 204-157.200.
- Sato, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, to Nissan Motor Company, Limited. Pressure supply network for active suspension system and control therefor. 5,085,459, Cl. 280-707.000.
- Sato, Shinobu: See—
Kitano, Shuichi; Ogata, Kiyoshi; and Sato, Shinobu, 5,086,088, Cl. 522-170.000.
- Sato, Takeshi: See—
Okada, Gentaro; Akano, Hirofumi; Sato, Takeshi; Okumura, Hajime; and Kawamura, Yoshiya, 5,085,851, Cl. 424-50.000.
- Satoh, Osamu: See—
Nishida, Takao; and Satoh, Osamu, 5,086,315, Cl. 354-413.000.
- Satoh, Tsutomu; Shimizu, Ikuo; and Ito, Yukiyo, to Ricoh Company, Ltd.; and Kyowa Hakko Kogyo Co., Ltd. Squaryl compounds and optical information recording medium using the same. 5,085,909, Cl. 428-64.000.
- Satomi, Mitsuo; Nomura, Akio; Oshita, Kazuaki; and Kuwahara, Tetsuya, to Murata Kikai Kabushiki Kaisha. Facsimile arrangement having automatic answering telephone set and facsimile set and switching process therefor. 5,086,455, Cl. 379-100.000.
- Satou, Kouichi: See—
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, 5,085,822, Cl. 264-528.000.
- Sauer, Donald G.: See—
Roth, Donald J.; Heyn, William M.; and Sauer, Donald G., 5,085,339, Cl. 220-269.000.
- Sauers, Marvin E.: See—
Dickinson, Barry L.; El-Hibri, M. J.; and Sauers, Marvin E., 5,086,130, Cl. 525-537.000.
- Saunders, George C.: See—
Bentley, Bill F.; Jett, James H.; Martin, John C.; and Saunders, George C., 5,085,673, Cl. 55-10.000.
- Sauvage, Yves: See—
Baccou, Jean-Claude; Bessiere, Jean-Marie; Boisseau, Patrick; Faugeras, Pierre; Jouy, Nicholas; Peyrot, Elysabette; and Sauvage, Yves, 5,085,994, Cl. 435-148.000.
- Savoca, Ann C. L.; and Louie, Michael, to Air Products and Chemicals, Inc. Amine-boron adducts as reduced odor catalyst compositions for the production of polyurethanes. 5,086,081, Cl. 521-103.000.
- Sawada, Kazuo: See—
Hitotsuyanagi, Hajime; Sawada, Kazuo; Takano, Satoshi; and Inazawa, Shinji, 5,086,037, Cl. 505-1.000.
- Sawtell, Carl K.; Dagan, Marc E.; and Bandy, Frederic S., to Astec International, Ltd. Compact programmable temperature detector apparatus. 5,085,526, Cl. 374-101.000.
- Sayles, David C., to United States of America, Army. Method of chemical bonding of solid propellant grains to the internal insulation of an interceptor motor. 5,085,725, Cl. 156-281.000.
- Scanlon, Kevin J., to City of Hope. Detection of human tumor progression and drug resistance. 5,085,983, Cl. 435-6.000.
- Scantron Corporation: See—
DesForges, Paul; and Prutz, Michael, 5,085,587, Cl. 434-355.000.
- Scarr, Antony B., to Martin Marietta Corporation. Nested tank construction. 5,085,343, Cl. 220-445.000.
- Scata, Mario; and Passero, Adolfo, to MPA-Meccanizzazione Postale e Automazione S.p.A. Sorting unit for belt conveyor plants. 5,085,310, Cl. 198-369.000.
- Schaefer, Daniel T.: See—
Mikeska, Kurt R.; Schaefer, Daniel T.; and Jensen, Richard H., 5,085,720, Cl. 156-89.000.
- Schaumstoffwerk Greiner Gesellschaft mbH: See—
Weingartner, Rudolf; Moseneder, Johann; and Eder, Bernhard, 5,085,487, Cl. 257-452.000.
- Scheer, Erich, to Fichtel & Sachs AG. Clutch disc. 5,085,307, Cl. 192-107.00C.
- Scheffler, Gerhard: See—
Hettche, Helmut; Muckenschnabel, Reinhard; Scheffler, Gerhard; Fleischhauer, Ilona; and Morick, Wolfgang, 5,086,050, Cl. 514-212.000.
- Scheinin, Harry: See—
Sinclair, John D.; Scheinin, Harry; and Lammintausta, Risto, 5,086,058, Cl. 514-282.000.
- Scheinpflug, Hans: See—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 5,086,048, Cl. 514-187.000.
- Schell, Heinz; Buhler, Beat; and Schneider, Ulf, to Rieter Machine Works, Ltd. Device and method for the fine cleaning of textile fibers having positionable blades and guides. 5,084,942, Cl. 19-200.000.
- Schepis, Dominic J.: See—
Brodsky, Stephen B.; Joshi, Rajiv V.; Lechaton, John S.; Ryan, James G.; and Schepis, Dominic J., 5,086,016, Cl. 437-190.000.

Schick, Roland: See—
Brogyanyi, Edgar; Stummer, Gisela; Kittel, Franz P.; and Schick, Roland, 5,085,737, Cl. 162-359.000.

Schidlo, Wolfram: See—
Pelster, Gerhard; and Schidlo, Wolfram, 5,085,668, Cl. 8-549.000.

Schilling, Peter; and Schreuders, Hans G., to Westvaco Corporation. Accelerators for cationic aqueous bituminous emulsion-aggregate slurries. 5,085,702, Cl. 106-277.000.

Schilling, Peter; and Schreuders, Hans G., to Westvaco Corporation. Accelerators for cationic aqueous bituminous emulsion-aggregate slurries. 5,085,704, Cl. 106-277.000.

Schlegel, Reinhold: See—
Ebenhoeh, Franz L.; and Schlegel, Reinhold, 5,085,690, Cl. 75-362.000.

Schlink, Robert. Electric guitar/violin. 5,085,115, Cl. 84-310.000.

Schloegl, Gunter: See—
Wilhelm, Thomas; Schloegl, Gunter; Bothe, Lothar; and Crass, Guenther, 5,085,916, Cl. 428-156.000.

Schlumberger Industries: See—
Barraud, Claude; Poilleux, Jean-Loup; and Guion, Christian, 5,086,457, Cl. 379-144.000.

Mollet, Jean P.; and Rose, Rene, 5,086,216, Cl. 235-492.000.

Schlumberger Technology Corporation: See—
Roscoe, Bradley A.; and Evans, Michael L., 5,086,224, Cl. 250-269.000.

Schmalz, Gary E., to Ausco Products, Inc. Thumb wheel for a jack. 5,085,406, Cl. 254-103.000.

Schmalz, Walter: See—
Reismann, Hans-Jurgen; Porcembka, Burkhardt; and Schmalz, Walter, 5,085,067, Cl. 72-20.000.

Schmidt, Manfred: See—
Bauer, Walter; Widemann, Ernst; and Schmidt, Manfred, 5,086,446, Cl. 378-188.000.

Schmidt, Robert R.: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., 5,085,684, Cl. 71-92.000.

Schmitt, Jean-Paul: See—
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardais-Luthereau, Rene; Naylor, Robert; and Costall, Brenda, 5,086,066, Cl. 514-377.000.

Schneider, Karen J.: See—
Berger, Irvin A.; Berger, Barbara J.; Schneider, Neil C.; and Schneider, Karen J., 5,085,391, Cl. 248-311.200.

Schneider, Neil C.: See—
Berger, Irvin A.; Berger, Barbara J.; Schneider, Neil C.; and Schneider, Karen J., 5,085,391, Cl. 248-311.200.

Schneider, Rolf: See—
Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 5,085,373, Cl. 239-690.000.

Schneider, Ulf: See—
Schelb, Heinz; Buhler, Beat; and Schneider, Ulf, 5,084,942, Cl. 19-200.000.

Schnoes, Heinrich K.: See—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,086,191, Cl. 552-653.000.

Scholtysik, Bernd; and Birkmann, Josef, to Agfa-Gevaert Aktiengesellschaft. Cutting device for the longitudinal cutting of foil lengths. 5,085,110, Cl. 83-34.000.

Scholz, Kenneth D.: See—
Leibovitz, Jacques; Scholz, Kenneth D.; Nagesh, V. K.; and Chao, Clinton C., 5,086,335, Cl. 357-70.000.

Schreder, Felix, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate. 5,086,211, Cl. 219-451.000.

Schreiber, Christopher: See—
Fisher, Edwin W.; Schreiber, Christopher; and Walker, Douglas R., 5,086,445, Cl. 378-165.000.

Schreiber, Hans: See—
Mader, Gerhard; Meixner, Hans; and Schreiber, Hans, 5,085,197, Cl. 123-520.000.

Schreuders, Hans G.: See—
Schilling, Peter; and Schreuders, Hans G., 5,085,702, Cl. 106-277.000.

Schilling, Peter; and Schreuders, Hans G., 5,085,704, Cl. 106-277.000.

Schubert, Jan: See—
Mittelhauser, Bernhard; and Schubert, Jan, 5,086,357, Cl. 359-841.000.

Schubert, Juergen: See—
Kast, Juergen; Meyer, Norbert; Misslitz, Ulf; Schubert, Juergen; Jung, Johann; Rademacher, Wilhelm; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,085,689, Cl. 71-105.000.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: See—
Hofmann, Eberhard, 5,085,047, Cl. 57-408.000.

Schubert, William C.: See—
Hardy, Arthur H., Jr.; and Schubert, William C., 5,086,431, Cl. 372-50.000.

Schuler, Robert C.: See—
Erdorries, Ulrich; and Schuler, Robert C., 5,085,551, Cl. 412-6.000.

Schumann, Steven J.; and Hu, James C., to Atmel Corporation. Narrow width EEPROM with single diffusion electrode formation. 5,086,325, Cl. 357-23.500.

Schupp, Hans; Schwerzel, Thomas; Lawrenz, Dirk; Oslowski, Hans-Josef; and Heimann, Ulrich, to BASF Lacke + Farben Aktiengesell-

schaft. Heat-curable aqueous coating agent for cathodic electrocoat-ing containing monomeric chelating agent. 5,086,092, Cl. 523-414.000.

Schuster, Pamela K.; Strong, James W.; and Conrad, Marvin C. Method and apparatus for data collection of testing and inspection of products made on a production assembly line. 5,086,397, Cl. 364-468.000.

Schwab, Henry J., Jr. Sensing mat, and methods of constructing and utilizing same. 5,086,291, Cl. 340-604.000.

Schwarz, Edward: See—
Bonne, Ulrich; Tate, George J.; and Schwarz, Edward, 5,085,576, Cl. 431-22.000.

Schweigert, James R., to JRCO, Inc. Universal Mounting hitch. 5,085,451, Cl. 280-460.100.

Schweizer, Robert A.: See—
Garrett, David W.; and Schweizer, Robert A., 5,086,101, Cl. 524-188.000.

Schwerzel, Thomas: See—
Schupp, Hans; Schwerzel, Thomas; Lawrenz, Dirk; Oslowski, Hans-Josef; and Heimann, Ulrich, 5,086,092, Cl. 523-414.000.

SciMed Life Systems, Inc.: See—
Burns, Matthew M., 5,085,636, Cl. 604-99.000.

Willard, Lloyd K., 5,085,662, Cl. 606-159.000.

Scoggins, Lacey E.; Hoover, Kenneth C.; and Shangi, Wei-Teh W., to Phillips Petroleum Company. Aromatic sulfide/sulfone polymer production. 5,086,163, Cl. 528-388.000.

Scott, David E.: See—
Celaya, Phillip; McCune, Brent A.; Scott, David E.; and Wellborn, Tom A., 5,085,839, Cl. 423-210.000.

Scott, Gregory D., to SGS International. Bag for carrying a game ball. 5,085,320, Cl. 206-315.900.

Scott-Scott, John L., to Rolls-Royce plc. Minimizing the effects of icing in the intakes of aerospace propulsors. 5,085,037, Cl. 60-39.093.

Scott-Scott, John L.; and Bond, Alan, to Rolls-Royce plc. Dual mode engine having a continuously operated oxidizer pump. 5,085,041, Cl. 60-244.000.

Sea Quest, Inc.: See—
VanTassel, Charles E.; and Seligman, Scott P., 5,085,163, Cl. 114-315.000.

Seabourn, Ed O.; and Erickson, William R. Method and tool string for curving a vertical borehole horizontally. 5,085,283, Cl. 175-61.000.

Seagate Technology, Inc.: See—
Amin, Nurul; Bortins, John; Keel, Beat G.; and Yan, Ying D., 5,084,957, Cl. 29-603.000.

SEB S.A.: See—
Eisenberg, Roger, 5,085,136, Cl. 99-391.000.

Sebastian, S. Andries R. D.: See—
Gibson, Joseph W., Jr.; Bart, Anthony J.; Verblar, Robert J.; and Sebastian, S. Andries R. D., 5,085,976, Cl. 430-306.000.

Segawa, Jun: See—
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Matsuda, Masahito; Shirahase, Ichiro; and Segawa, Jun, 5,086,049, Cl. 514-210.000.

Segawa, Masashi: See—
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 5,085,721, Cl. 156-108.000.

Segawa, Toyoo; Syono, Sinkichi; and Suzue, Syuichi, to Nippon Sheet Glass Co., Ltd. Method of transferring and storing glass sheets and tray used in method. 5,085,030, Cl. 53-399.000.

Seguin, Marie-Christine; and Gueyne, Jean. Silanol-based product for care of the superficial lymphatic vessels. 5,085,870, Cl. 424-547.000.

Seidel, Charles S.: See—
Odneal, Billie L.; and Seidel, Charles S., 5,085,236, Cl. 132-325.000.

Seifert, Charles A.; and Bonnes, David R., to Union Fork & Hoe Company, The. Cushioning step for a shovel and the like. 5,085,478, Cl. 294-60.000.

Seiko Epson Corporation: See—
Asahina, Michio, 5,086,006, Cl. 437-34.000.

Iida, Kazuhiko; and Koiwai, Masahiro, 5,086,309, Cl. 346-160.000.

Seiko Instruments & Electronics Ltd.: See—
Adachi, Tatsuya; and Yamamoto, Masahiro, 5,086,230, Cl. 250-492.200.

Seiko Instruments Inc.: See—
Yamamoto, Shuhei; and Kato, Naoki, 5,085,498, Cl. 359-70.000.

Seikosha Co., Ltd.: See—
Sugino, Koichi, 5,085,528, Cl. 400-61.000.

Seki, Hiroyuki: See—
Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, 5,085,423, Cl. 271-266.000.

Seki, Takayoshi: See—
Tokiguchi, Katsumi; Amemiya, Kensuke; Sakudo, Noriyuki; and Seki, Takayoshi, 5,086,256, Cl. 315-111.810.

Sekiguchi, Shigemi, to Hosiden Corporation. Connector with short circuit and connector assembly. 5,085,592, Cl. 439-188.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: See—
Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiro; and Kimura, Tsugui, 5,085,009, Cl. 51-131.100.

Sekizuka, Makoto, to Kabushiki Kaisha Kawai Gakki Seisakusho. Auto-accompaniment apparatus with auto-chord progression of accompaniment tones. 5,085,118, Cl. 84-635.000.

Seligman, Scott P.: See—
VanTassel, Charles E.; and Seligman, Scott P., 5,085,163, Cl. 114-315.000.

Sellers, Charles, to Compaq Computer Corporation. Dual bin paper feed tray for an image reproduction machine such as a printer or copier. 5,085,421, Cl. 271-155.000.

Selly, Patrick H. Slide hammer apparatus. 5,085,281, Cl. 173-91.000.

Semitoal, Inc.: See—
Thompson, Raymon F.; and Owczarz, Aleksander, 5,085,560, Cl. 417-53.000.

Sengupta, Sourav K.: See—
Foley, Henry C.; Varrin, Robert D., Jr.; and Sengupta, Sourav K., 5,085,885, Cl. 477-38.000.

Senju Metal Industry Co., Ltd.: See—
Ishikawa, Mitsuo; and Watarai, Shigeaki, 5,085,364, Cl. 228-139.000.

Senkler, George H., Jr.: See—
Chao, Tze; and Senkler, George H., Jr., 5,085,837, Cl. 423-82.000.

Senoo, Seiti; and Maekawa, Tadamasu, to Sharp Kabushiki Kaisha. Apparatus for communicating data via a telephone. 5,086,453, Cl. 379-93.000.

Serfl, David C.: See—
Garleb, Keith A.; Chmura, James N.; Anloague, Paul S.; Cunningham, Mary B.; and Serfl, David C., 5,085,883, Cl. 426-590.000.

Setoyama, Eiji; Kamei, Mitsuhiro; and Ohno, Yasunori, to Hitachi, Ltd. Sputtering apparatus for forming thin films. 5,085,755, Cl. 204-298.160.

Severson, Ervin L.: See—
Fortune, Christopher S.; and Severson, Ervin L., 5,085,360, Cl. 224-42.130.

Sexton, Graham G., to British Telecommunications public limited company. Video image processing. 5,086,480, Cl. 382-18.000.

Seymour, Horace W., III: See—
Bauman, Ralph E.; and Seymour, Horace W., III, 5,085,602, Cl. 439-874.000.

SGS International: See—
Scott, Gregory D., 5,085,320, Cl. 206-315.900.

SGS-Thomson Microelectronics s.r.l.: See—
Frigerio, Giulio; and Cremonesi, Alessandro, 5,086,299, Cl. 341-156.000.

Riva, Carlo, 5,086,008, Cl. 437-41.000.

Shaffer, John H.; and Kurtz, William L., to Olin Corporation. Apparatus for producing a fast dissolving granular product. 5,085,847, Cl. 423-474.000.

Shah, Atulbhai S.: See—
Razaq, Mohammed; Shah, Atulbhai S.; and Pust, Harold W., 5,085,760, Cl. 204-431.000.

Shahab, Syed A.: See—
Moehlman, Philip M.; and Shahab, Syed A., 5,085,482, Cl. 296-63.000.

Shain, Jon C.; and Herchenroeder, James W., to General Motors Corporation. Cold press die lubrication method. 5,085,828, Cl. 419-66.000.

Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., to Sherwin-Williams Company, The. Acid-functional polymers derived from cellulose acetate butyrate unsaturated alcohol copolymers and coatings prepared from same. 5,086,144, Cl. 527-313.000.

Shangi, Wei-Teh W.: See—
Scoggins, Lacey E.; Hoover, Kenneth C.; and Shangi, Wei-Teh W., 5,086,163, Cl. 528-388.000.

Shapira, Shmuel. Introduction system for locating compatible persons. 5,086,394, Cl. 364-419.000.

Sharp Kabushiki Kaisha: See—
Hayakawa, Takashi; Narikawa, Shiro; and Ohashi, Kunio, 5,085,968, Cl. 430-128.000.

Senoo, Seiti; and Maekawa, Tadamasu, 5,086,453, Cl. 379-93.000.

Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569.000.

Sharpe, Richard J.: See—
Maione, Theodore; and Sharpe, Richard J., 5,086,164, Cl. 530-324.000.

Shaver, Craig A. Windshield installation tool. 5,085,415, Cl. 269-69.000.

Shaver, David M.: See—
Hess, Kristoffer A.; Dyke, Colin; and Shaver, David M., 5,085,043, Cl. 56-10.500.

Shaw, James D.; and Want, Nicholas, to Eastman Kodak Company. Dispensing mechanism. 5,085,832, Cl. 422-63.000.

Shekleton, Jack R., to Sundstrand Corporation. Coanda phenomena combustor for a turbine engine. 5,085,039, Cl. 60-39.360.

Shell Oil Company: See—
Corley, Larry S., 5,086,139, Cl. 526-262.000.

Hale, Arthur H.; and Blytas, George C., 5,085,282, Cl. 175-40.000.

Sherman, Mark, to Floatron, Inc. Water purifier. 5,085,753, Cl. 204-267.000.

Sherwin-Williams Company, The: See—
Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., 5,086,144, Cl. 527-313.000.

Sherwood Medical Company: See—
Henderson, William D.; and Crouse, Roger L., 5,085,647, Cl. 604-192.000.

Sheu, Guey-hwa: See—
Snyder, Harry E.; Wiese, Kurt L.; Sheu, Guey-hwa; Brown, Helen G.; Nieh, Ciping; and Clark, Patricia K., 5,085,808, Cl. 260-412.400.

Shia, George A.: See—
Van Der Puy, Michael; Nalewajek, David; Shia, George A.; and Wagner, William J., 5,086,190, Cl. 552-521.000.

Shibahashi, Yutaka; Kito, Tsutomu; Nakasugi, Norikazu; and Inagaki, Hiroshi, to Pilot Ink Co., Ltd., The. Toy that stably exhibits different

colors with indicator for proper temperature application. 5,085,607, Cl. 446-14.000.

Shibano, Takeshi: See—
Itoh, Kiichi; Shibano, Takeshi; and Yoshinaga, Kenji, 5,086,133, Cl. 526-93.000.

Shibata, Keiichiro, to Mazda Motor Corporation. Air bag mount device for steering wheel including control switches. 5,085,461, Cl. 280-731.000.

Shibata, Takeshi: See—
Aono, Toshiaki; Nakamura, Koichi; and Shibata, Takeshi, 5,085,980, Cl. 430-531.000.

Shibuya, Masato, to Nikon Corporation. Scanning type microscope with phase member. 5,086,222, Cl. 250-234.000.

Shibuya, Taro: See—
Mukai, Hiromu; Kojiya, Kagumi; Hayashi, Kohtaro; and Shibuya, Taro, 5,086,353, Cl. 359-432.000.

Shiga, Naomichi; Tsuchiya, Hisatoshi; Sakakibara, Yasuyuki; and Kibe, Katsumi, to Toyo Densan Co., Ltd. Automobile ac generator system. 5,086,266, Cl. 322-28.000.

Shigeki, Kiyoshi: See—
Hayashi, Keizu; Shigeki, Kiyoshi; and Ogawa, Kazuo, 5,085,006, Cl. 49-482.000.

Shigihara, Takae: See—
Ushizawa, Koji; and Shigihara, Takae, 5,085,989, Cl. 435-26.000.

Shigina, Nina A.: See—
Fedorov, Svyatoslav; Linnik, Leonid F.; Antropov, Gennady M.; Arnautov, Leonid N.; Ippolitov, Vladimir V.; Streltsov, Valentin F.; Stromakov, Alexandr P.; and Shigina, Nina A., 5,085,627, Cl. 600-14.000.

Shihabi, David S.: See—
Absil, Robert P. L.; Bowes, Emmerson; Green, Gary J.; Marler, David Q.; Shihabi, David S.; and Socha, Richard F., 5,085,762, Cl. 208-120.000.

Shiiki, Zenya: See—
Satake, Yoshikatsu; Kaneko, Takashi; Kobayashi, Yutaka; Ichikawa, Yukio; Iizuka, Yo; Fukuda, Makoto; Enoki, Toshio; Katto, Takayuki; Sakaguchi, Yasuo; and Shiiki, Zenya, 5,085,819, Cl. 264-235.000.

Shiia, Kazuo: See—
Yada, Yukihiko; and Shiia, Kazuo, 5,085,902, Cl. 428-31.000.

Shimada, Kaoru: See—
Ando, Kazuo; Asai, Nobuko; Ito, Fumitaka; Mano, Takashi; Nakane, Masami; Satake, Kunio; and Shimada, Kaoru, 5,086,062, Cl. 514-321.000.

Shimada, Takeo: See—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Kobayashi, Yoshio; and Kageyama, Yoshiteru, 5,086,131, Cl. 526-68.000.

Shimamura, Yasuhito: See—
Abe, Shintaro; Adachi, Muneko; Okada, Naoyuki; and Shimamura, Yasuhito, 5,086,434, Cl. 375-7.000.

Shimano Corporation: See—
Nagano, Masashi, 5,085,620, Cl. 474-152.000.

Nagano, Masashi, 5,085,621, Cl. 474-160.000.

Shimase, Akira: See—
Itoh, Fumikazu; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Hongo, Mikio, 5,086,015, Cl. 437-173.000.

Shimaya, Hiroshi: See—
Nakane, Yoshio; Kaneko, Kiyotaka; Miyake, Izumi; Maeda, Yutaka; and Shimaya, Hiroshi, 5,086,345, Cl. 358-335.000.

Shimizu, Chujii, to Fukuda Denshi Co., Ltd. Pad for the living body stimulus electrode. 5,085,217, Cl. 128-640.000.

Shimizu, Ikko: See—
Satoh, Tsutomu; Shimizu, Ikko; and Ito, Yukiyoshi, 5,085,909, Cl. 428-64.000.

Shimizu, Itsuo; Furukawa, Kenji; and Tanaka, Masami, to Chisso Corporation. Liquid crystal composition. 5,085,799, Cl. 252-299.660.

Shimizu, Koji: See—
Wakita, Haruki; Shimizu, Koji; and Hamada, Mitsuo, 5,085,803, Cl. 252-511.000.

Shimizu, Ryu; and Kobayashi, Shun-ichi, to Sanyo Electric Co., Ltd. Method for fine patterning. 5,086,013, Cl. 437-80.000.

Shimizu, Tokihiko; and Kobayashi, Kesanoo, to Matsushita Electric Industrial Co., Ltd. Colored filter element containing layers of polymerizable composition. 5,085,973, Cl. 430-271.000.

Shimokawahara, Hisashi: See—
Sano, Shinichi; Shimokawahara, Hisashi; and Maruyama, Hiroshi, 5,085,908, Cl. 428-40.000.

Shimomoto, Hironori: See—
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 5,086,203, Cl. 219-69.120.

Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Method for compressing image signals. 5,086,489, Cl. 382-56.000.

Shimura, Yukihiro: See—
Saegusa, Noboru; Shimura, Yukihiro; Toyama, Hideki; Ohta, Yuji; Fuse, Shoji; and Ono, Koji, 5,086,451, Cl. 379-58.000.

Shin Caterpillar Mitsubishi Ltd.: See—
Kawanaka, Masanobu; Kondo, Youichi; Tabata, Junichi; and Onda, Kimimasa, 5,085,052, Cl. 60-445.000.

Shin-Etsu Chemical Co., Ltd.: See—
Arai, Masatoshi; Kimura, Tsuneo; and Inoue, Yoshio, 5,086,107, Cl. 524-424.000.

Ikeno, Masayuki; and Fujiki, Hironao, 5,086,147, Cl. 528-15.000.

Itoh, Kunio; Umemura, Mitsuo; and Tabei, Eiichi, 5,086,127, Cl. 525-474.000.

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- Shinanen New Ceramic Corporation: See—
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- Shiota, Susumu; and Yoshikawa, Kunio, to Tokyo Institute of Technology. Method and apparatus for combined-closed-cycle magnetohydrodynamic generation. 5,086,234, Cl. 290-52.000.
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- Shook, Larry E.: See—
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- Shop-Vac Corporation: See—
Paige, Clive R., 5,085,371, Cl. 239-343.000.
- Shor, Arthur C.: See—
Ma, Sheau-Hwa; Matrick, Howard; Shor, Arthur C.; and Spinelli, Harry J., 5,085,698, Cl. 106-20.000.
- Shore, Kathleen M., to Mary Kay Cosmetics, Inc. Silicone based cosmetic product. 5,085,855, Cl. 424-64.000.
- Short Brothers PLC: See—
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- Shotwell, James M.; and Stellabotte, Fred W. Method of displaying information. 5,084,915, Cl. 2-115.000.
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- Shubin, Don B. Stackable containers. 5,085,448, Cl. 280-33.998.
- Shuck, Dallas: See—
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Grigoli, Franco; and Trabacchi, Franco, 5,085,059, Cl. 62-345.000.
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Bartmann, Guenter, 5,086,444, Cl. 378-152.000.
- Feldtkeller, Martin; and Dangschat, Rainer, 5,086,382, Cl. 363-21.000.
- Gemmel, Edwin; Rohmfeld, Josef; and Hock, Stefan, 5,086,442, Cl. 378-132.000.
- Hofmann, Manfred, 5,086,243, Cl. 310-68.00B.
- Leipold, Ludwig; Sander, Rainald; Tihanyi, Jenoe; and Weber, Roland, 5,086,364, Cl. 361-18.000.
- Mader, Gerhard; Meixner, Hans; and Schreiber, Hans, 5,085,197, Cl. 123-520.000.
- Zimmermann, Walter, 5,086,268, Cl. 324-158.00F.
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- Silverman, Gloria. Fingernail shielding method. 5,085,234, Cl. 132-73.000.
- Simco/Ramic Corporation: See—
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- Simmons, Randy G.: See—
Bucher, Randolph L.; and Simmons, Randy G., 5,085,601, Cl. 439-660.000.
- Simplicity Manufacturing, Inc.: See—
Freier, Edward, Jr.; Hays, Gary A.; Jacque, John F.; and Klas, Kenneth H., 5,085,044, Cl. 56-13.500.
- Simpson, Vandell E., III, to Manchester Tool Company. Metal-cutting insert. 5,085,541, Cl. 407-110.000.
- Sims, John A., to Westinghouse Electric Corp. Method of weld repairing of a section of a metallic cylindrical member. 5,085,363, Cl. 228-119.000.
- Simula, Inc.: See—
Peterson, Leslie D.; and Friedrich, Bruce A., 5,085,412, Cl. 267-64.260.
- Simware, Inc.: See—
Sterling, Edward W., II, 5,086,402, Cl. 364-514.000.
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- Sinclair, Richard: See—
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- Singh, Anant P., to General Electric Company. Squeeze film damper seal. 5,085,521, Cl. 384-99.000.
- Singhal, Gopal H.; Winter, William E.; Riley, Kenneth L.; and Trachte, Kenneth L., to Exxon Research and Engineering Company. Novel noble metal supported hydrotreating catalysts. 5,086,027, Cl. 502-166.000.
- Singhal, Subhash C.: See—
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- Sinykin, William B.; Benson, Mark A.; and Hales, Scott J., to Logan Manufacturing Company. Snow tiller with compactor pan. 5,084,992, Cl. 37-222.000.
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Safir, Gene R.; Nair, Muralaetharan G.; and Siqueira, Jose O., 5,085,682, Cl. 71-88.000.
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Capiris, Thomas; Connor, David T.; and Sircar, Jagadish C., 5,086,064, Cl. 514-365.000.
- Sitzema, Ronald L.: See—
Denison, John F.; Czerlanis, John A.; and Sitzema, Ronald L., 5,086,379, Cl. 362-145.000.
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Maguire, Sean P. J.; Sivayoganathan, Kandiah; and Balendran, Velupillai, 5,086,232, Cl. 250-572.000.
- Sivesind, Jerome M.: See—
Watson, Stephen H.; Watson, Stephen H.; Sivesind, Jerome M.; and Heyl, Gerrit, 5,084,918, Cl. 2-424.000.
- Sjoovist, Rolf: See—
Mattsson, Kjell J.; Nicklasson, Alf G. M.; and Sjoovist, Rolf, 5,085,868, Cl. 424-490.000.
- Skaar, Gary R.: See—
Gundlach, Larry C.; Gould, Paul F.; and Skaar, Gary R., 5,085,615, Cl. 452-198.000.
- Skidmore, Robert: See—
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- Skolnick, Phil: See—
Trullas, Ramon; and Skolnick, Phil, 5,086,072, Cl. 514-531.000.
- Skonezny, Paul M.: See—
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- Skopec, Robert A.; Jeffers, Douglas E.; and Hagins, Freddy W., to Oryx Energy Co.; and Diamant Boart Stratabit. Laser alignment system for well equipment. 5,084,980, Cl. 33-286.000.
- Slattery, William J.: See—
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- Slocum, Laurence S.; and Clouser, Michael T., to Emerson Electric Co. Liquid leak test probe with compensation for gas in line. 5,086,403, Cl. 364-558.000.
- Smalley, Robert K.: See—
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- Smets, Pierre: See—
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- Smith, Barham W.: See—
Bloch, Jeffrey J.; Roussel-Dupre, Diane; and Smith, Barham W., 5,086,443, Cl. 378-145.000.
- Smith, C. R. Method and apparatus for mounting and faceting gemstones. 5,085,011, Cl. 51-216.0LP.

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- Smith, Gregory M., to Akzo N.V. Catalyst for EPDM polymerization. 5,086,023, Cl. 502-103.000.
- Smith, James E., to Graves Spray Supply, Incorporated. Compact spray gun. 5,085,370, Cl. 239-71.000.
- Smith, Kim R.: See—
Corona, Raynold J.; Borland, James E.; and Smith, Kim R., 5,085,892, Cl. 427-365.000.
- Smith, Kirby, III. Sleeve for maintaining position of orthopedic knee brace. 5,085,210, Cl. 602-26.000.
- Smith, Maurice D. Dampening fluid evaporator. 5,085,142, Cl. 101-148.000.
- Smith, Paul W.; Abbott, Raymond S.; Lorince, Peter C.; Wood, Robert K.; Lichtenberg, Robert R.; and Gaukel, John J., to Applied Magnetics Corporation. Constant flying height slider. 5,086,360, Cl. 360-103.000.
- Smith, Philip E. Sump cover containment assembly. 5,085,257, Cl. 141-86.000.
- Smith, Robert M.: See—
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- Smith, Thomas M., to Eastman Kodak Company. Abrasion-resistant protective laminates. 5,085,907, Cl. 428-40.000.
- SMS Schloemann-Siemag Aktiengesellschaft: See—
Deussen, Josef; and Bottger, Dieter, 5,085,263, Cl. 164-436.000.
- Onderka, Bernd; Engel, Georg; Mauk, Paul; and Feldmann, Hugo, 5,085,065, Cl. 72-8.000.
- Reismann, Hans-Jurgen; Porembka, Burkhardt; and Schmalz, Walter, 5,085,067, Cl. 72-20.000.
- Snyder, Harry E.; Wiese, Kurt L.; Sheu, Gueyhu; Brown, Helen G.; Nieh, Ciping; and Clark, Patricia K., to University of Arkansas, The Board of Trustees of the Process for efficiently extracting high quality oil from soybeans and other oil bearing seeds. 5,085,808, Cl. 260-412.400.
- Snyder, Jan W.: See—
Chung, Connie Y.; Keen, Robert G.; Raymond, Ozella; Snyder, Jan W.; and Tohlen, Dennis A., 5,086,503, Cl. 395-700.000.
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- SOC Corporation: See—
Arikawa, Hiroo; and Yuza, Yasutada, 5,086,285, Cl. 337-231.000.
- Socha, Richard F.: See—
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- S.A. Compagnie Internationale des Pieux Armes Frankignou: See—
Massarsch, Karl R., 5,085,539, Cl. 405-229.000.
- Societe Anonyme Dite Hispano-Suiza: See—
Ville, Daniel; and Vives, Jean-Paul, 5,085,677, Cl. 55-205.000.
- Societe de Construction L.B.: See—
Bourret, Jean A., 5,085,614, Cl. 452-141.000.
- Societe Generale pour les Techniques Nouvelles SGN: See—
Bertrand, Gerard; Imbert, Gerard; and Narduzzo, Gabriel, 5,085,516, Cl. 356-394.000.
- Societe Louit SA: See—
Louit, Claude, 5,084,922, Cl. 5-81.100.
- Societe Nationale Elf Aquitaine: See—
Coupot, Jean Paul; and Campet, Guy, 5,086,351, Cl. 359-265.000.
- Roca, Alain; Mauran, Sylvain; and Spinner, Bernard, 5,086,022, Cl. 502-60.000.
- Soejima, Tetsuo: See—
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- Sofue, Masaki: See—
Hagiya, Toshimichi; Watanabe, Junichi; Kanno, Tetsuo; Inuzuka, Hideo; Yamahata, Makoto; Sofue, Masaki; and Aota, Yoshiaki, 5,086,422, Cl. 369-75.100.
- Sogabe, Koichi: See—
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- Sogliani, Claudio; and Corniani, Carlo, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Dispenser device for liquid substances. 5,085,354, Cl. 222-504.000.
- Sohl, Gordon: See—
Thorn, David W.; Patel, Rajendra; and Sohl, Gordon, 5,086,461, Cl. 379-230.000.
- Sokolis, Beverly L.: See—
Etkin, Norm, 5,085,174, Cl. 119-169.000.
- Solberg, Joseph R.; and Harvey, John B. Locating mechanism. 5,085,535, Cl. 403-24.000.
- Soler, Françoise: See—
James, Claude; Lave, Daniel; and Soler, Françoise, 5,086,051, Cl. 514-228.200.
- Sollami, Phillip A. Pressure compensating relief and refill system. 5,085,298, Cl. 188-314.000.
- Sollinger, Hans-Peter, to J. M. Voith GmbH. Device for coating web material. 5,085,168, Cl. 118-126.000.
- Solovieff, Paul G.: See—
Loffler, James M.; and Solovieff, Paul G., 5,084,940, Cl. 16-110.00R.
- Solvay & Cie (Societe Anonyme): See—
Dauphin, Yves, 5,085,569, Cl. 425-174.80R.
- Somar Corporation: See—
Otsuka, Masako; Saimoto, Hiroshi; Murata, Yumiko; and Kawashima, Masao, 5,085,995, Cl. 435-240.450.
- Sano, Shinichi; Shimokawahara, Hisashi; and Maruyama, Hiroshi, 5,085,908, Cl. 428-40.000.
- Sommen, Francois M.: See—
Janssens, Frans E.; Sommen, Francois M.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 5,086,056, Cl. 514-253.000.
- Sommer, Alexa: See—
Heinz, Hans-Detlef; Kohler, Burkhard; Meyer, Rolf-Volker; Reinking, Klaus; and Sommer, Alexa, 5,086,128, Cl. 525-537.000.
- Sommermann, Friedrich: See—
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- Son, Kwang Sik, to Hyundai Electronics Industries Co., Ltd. Method for forming a field oxide layer. 5,086,012, Cl. 437-70.000.
- Sonoda, Shiro: See—
Iwase, Yoshinobu; Sonoda, Shiro; Watanabe, Kazuaki; Minemoto, Isamu; and Akashi, Teruo, 5,085,102, Cl. 74-867.000.
- Sony Corporation: See—
Kawada, Hideaki; Sugiyama, Yoshiaki; and Kanaguchi, Masahiro, 5,086,361, Cl. 360-107.000.
- Kutragi, Ken; Furuhashi, Makoto; Suzuoki, Masakazu; and Kageyama, Koji, 5,086,475, Cl. 381-36.000.
- Narabu, Tadakuni; Kondo, Tetsuya; Maki, Yasuhiro; and Noguchi, Katsunori, 5,086,440, Cl. 377-60.000.
- Tamada, Sakuya; and Nakane, Yasuaki, 5,086,341, Cl. 358-201.000.
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- Sorensen, Gerald R.; Gradecki, Raymond J.; and Finkiewicz, Daniel J. E., to NCM International, Inc. Amusement device for a wheel. 5,085,611, Cl. 446-216.000.
- Sosin, Laurent: See—
Jollivet, Jean-Marc; and Sosin, Laurent, 5,085,264, Cl. 164-455.000.
- Soto, Luis A., II. Magnetic indicator device. 5,085,434, Cl. 273-138.00A.
- Soulabail, Roland Y. J. M.: See—
Le Goffic, Yves H. M.; and Soulabail, Roland Y. J. M., 5,086,425, Cl. 370-84.000.
- Southern Research Institute: See—
Cowser, Donald R.; Dunn, Richard L.; and Laughlin, Thomas J., 5,085,866, Cl. 424-481.000.
- SpaceLabs, Inc.: See—
Nudell, Bruce M.; Entekin, Robert R.; Skidmore, Robert; and Luckman, Nicholas P., 5,085,220, Cl. 128-661.090.
- Spaleck, Walter: See—
Antberg, Martin; Spaleck, Walter; Rohrmann, Jurgen; Luker, Hartmut; and Winter, Andreas, 5,086,134, Cl. 526-126.000.
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Aker, David; Philpot, Arthur K.; and Tetaz, John R., 5,086,374, Cl. 361-525.000.
- Spector, George: See—
Robinson, Antonio; and Spector, George, 5,085,088, Cl. 74-64.000.
- Speranza, George P.; and Su, Wei-Yang, to Texaco Chemical Company. Polyether amide from polyalkylene glycol diamine and diacid mixture. 5,086,162, Cl. 528-339.000.
- Speranza, George P.: See—
Waddill, Harold G.; Su, Wei-Yang; and Speranza, George P., 5,086,155, Cl. 528-94.000.
- Spies, Hans; Woehrl, Alfons; and Spies, Martin, to Messerschmitt-Boelkow-Blohm GmbH. Image sensor with an avalanche diode forming an optical shutter. 5,086,342, Cl. 358-213.130.
- Spies, Martin: See—
Spies, Hans; Woehrl, Alfons; and Spies, Martin, 5,086,342, Cl. 358-213.130.
- Spies, Ewald; and Tischer, Michael, to Robert Bosch GmbH. Shock absorber with two seat valve. 5,085,299, Cl. 188-319.000.
- Spinelli, Harry J.: See—
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- Spinner, Bernard: See—
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- Spiroff, Carl M.; Long, Lawrence J.; Winkelmann, Ward F.; and Steinmetz, Harold F., to United States of America, Air Force. Deployable aerodynamic aerosurface. 5,085,381, Cl. 244-3.240.
- Spitz, Melvin P. Mounting apparatus for wall beds with safety jamming feature. 5,084,924, Cl. 5-136.000.
- Spitzer, Joseph C.: See—
Frater, Wayne K.; and Spitzer, Joseph C., 5,085,395, Cl. 248-552.000.
- Springer, Helmut: See—
Weber, Jurgen; Bexten, Ludger; Kupies, Dieter; Lappe, Peter; and Springer, Helmut, 5,085,835, Cl. 423-22.000.
- Square D Company: See—
Bartosik, George; Paris, Sam; Kresch, Jeffrey M.; Danley, William J.; Kalley, Eugene F.; and Goldberg, Arthur E., 5,085,525, Cl. 374-124.000.
- SRI International: See—
Parish, Daniel W., 5,086,054, Cl. 514-239.200.
- Stachura, Leonard M.; Logsdon, Peter B.; Swan, Ellen L.; and Basu, Rajat S., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, dichlorotrifluoroethane, ethanol and a mono- or di-chlorinated C2 or C3 alkane. 5,085,796, Cl. 252-171.000.

Stadelmann, Ludwig: See—
Bauer, Hans-Peter; Bauer, Hans J.; and Stadelmann, Ludwig, 5,085,297, Cl. 188-129.000.

Stafford, David A.; Johnson, Ian R.; and Goodfield, Clive, to Dynatech Corporation. Luminometers with sample container displacement controlled by ramped abutment. 5,086,233, Cl. 250-576.000.

Stafford, Donald W.: See—
Aulick, Larry O.; Stafford, Donald W.; and Suthar, Ajay K., 5,085,171, Cl. 118-653.000.

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Kelly-Mahaffey, William L.; and Stafford, James M., 5,086,478, Cl. 382-8.000.

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Misev, Tosko A., 5,086,087, Cl. 522-84.000.

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Standard Products Company, The: See—
Emmons, Ronnie; and Vaughan, Robert A., 5,085,024, Cl. 52-717.100.

Stanhilbel, Dennis: See—
DeRoss, Robert W.; Dudek, Ronald; and Stanhilbel, Dennis, 5,085,114, Cl. 83-861.000.

Stanphill, Russell: See—
McGarity, Ralph C.; Ledbetter, William B., Jr.; McMahan, Steven C.; Gallup, Michael G.; Stanphill, Russell; and Gay, James G., 5,086,407, Cl. 395-800.000.

Stapleton, Charles E.; and Numata, Jerauld T., to Capscan Sales Incorporated. Ultrasonic liquid measuring device for use in storage tanks containing liquids having a non-uniform vapor density. 5,085,077, Cl. 73-290.00V.

Stark, Joel J.: See—
Bjornson, Geir; and Stark, Joel J., 5,086,030, Cl. 502-241.000.

Starr, Stephen G.: See—
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,086,018, Cl. 437-207.000.

Statz, Robert J.: See—
Kamins, Kathryn A.; and Statz, Robert J., 5,086,113, Cl. 525-84.000.

Staudinger, Luana A. Bed sheet sleeping enclosure. 5,084,929, Cl. 5-494.000.

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Walters, James C., Jr., 5,085,069, Cl. 72-237.000.

Steffes, Paul J. Electric thermal storage boosted heat pump air heating apparatus. 5,086,493, Cl. 392-307.000.

Steger, Robert J., to Applied Materials, Inc. Plasma etch apparatus with conductive coating on inner metal surfaces of chamber to provide protection from chemical corrosion. 5,085,727, Cl. 156-345.000.

Stegmaier, Alwin: See—
Steinhauser, Walter; Kaes, Guenter; Maisch, Wolfgang; and Stegmaier, Alwin, 5,085,490, Cl. 303-113.0TR.

Steiner, Heinz: See—
Tritschler, Wolfgang; Steiner, Heinz; Prestel, Helmut; and Maul, Rudolf, 5,086,173, Cl. 544-211.000.

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Steinmetz, Harold F.: See—
Sproff, Carl M.; Long, Lawrence J.; Winkelmann, Ward F.; and Steinmetz, Harold F., 5,085,381, Cl. 244-3.240.

Steinmetz, Pierre: See—
Josso, Pierre; Alperine, Serge; Steinmetz, Pierre; and Constantini-Friant, Anne, 5,085,693, Cl. 106-1.280.

Stellabotte, Fred W.: See—
Shotwell, James M.; and Stellabotte, Fred W., 5,084,915, Cl. 2-115.000.

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Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,086,183, Cl. 548-110.000.

Stepner, David E.: See—
Kahn, Frederic J.; Kendrick, Paul N.; Leff, Jerry; Livoni, Linden J.; Loucks, Bryan E.; Stepner, David E.; and Witte, Kenneth G., 5,085,506, Cl. 353-122.000.

Sterling, Edward W., II, to Simware, Inc. Method for high speed data transfer. 5,086,402, Cl. 364-514.000.

Stern, Richard M.: See—
Aim, Roger R.; and Stern, Richard M., 5,085,786, Cl. 252-8.050.

Stirling, Thomas E., to Barrett, Haentjens & Co. Apparatus for gas absorption in a liquid. 5,085,809, Cl. 261-77.000.

Stock, Norman R.: See—
Jennings, Gilbert M.; Gledhill, Scott; Stock, Norman R.; and Powell, Arthur T., 5,085,008, Cl. 51-74.00R.

Stoffel, Charles: See—
Fuehrer, Charles, 5,085,476, Cl. 292-307.00R.

Stoffler, Lewis J.; and MacGee, Andrew, to United States of America, Air Force. Composite vane. 5,085,559, Cl. 416-95.000.

Stone, Herman, to PMC, Inc. Ignition resistant polyurethane foams with melamine. 5,086,082, Cl. 521-107.000.

Stoneman, Robert C.: See—
Esterowitz, Leon; and Stoneman, Robert C., 5,086,432, Cl. 372-71.000.

Stopinc Aktiengesellschaft: See—
Waltenspuhl, Rolf, 5,085,356, Cl. 222-598.000.

Storer, Jonathan: See—
Martin, Lawrence L.; Storer, Jonathan; and Carpenter, Michael W., 5,085,671, Cl. 51-293.000.

Story, Martha F.; Ragland, Glen W.; Humphries, William H.; Koht, Lowell; and Uken, William D., to Raychem Corporation. Corrosion protection apparatus. 5,085,597, Cl. 439-521.000.

Storz Instrument Company: See—
Engelbreton, A. Maynard; and Fredrickson, John, 5,085,628, Cl. 600-25.000.

Stottsberry, James W.: See—
Clawson, Charles W.; and Stottsberry, James W., 5,085,094, Cl. 74-424.600.

Stramer, Carl, to Borroughs Tool & Equipment Corporation. VATS interrogator accessory. 5,086,288, Cl. 340-426.000.

Strang, Harry: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,085,687, Cl. 71-93.000.

Strawder, Glenn G. Bag support for trash cans. 5,085,342, Cl. 220-404.000.

Streit, Roy L.; and Striffler, Foster L., to United States of America, Navy. Crosstalk correction scheme. 5,086,423, Cl. 370-6.000.

Streltsov, Valentin F.: See—
Fedorov, Svyatoslav; Linnik, Leonid F.; Antropov, Gennady M.; Arnavtsov, Leonid N.; Ippolitov, Vladimir V.; Streltsov, Valentin F.; Stromakov, Alexandr P.; and Shigina, Nina A., 5,085,627, Cl. 600-14.000.

Stretch, Dale A., to Eaton Corporation. Vane damper assembly for a torque converter. 5,085,617, Cl. 464-27.000.

Striffler, Foster L.: See—
Streit, Roy L.; and Striffler, Foster L., 5,086,423, Cl. 370-6.000.

Stromakov, Alexandr P.: See—
Fedorov, Svyatoslav; Linnik, Leonid F.; Antropov, Gennady M.; Arnavtsov, Leonid N.; Ippolitov, Vladimir V.; Streltsov, Valentin F.; Stromakov, Alexandr P.; and Shigina, Nina A., 5,085,627, Cl. 600-14.000.

Strong, James W.: See—
Schuster, Pamela K.; Strong, James W.; and Conrad, Marvin C., 5,086,397, Cl. 364-468.000.

Studenberg, Fred J., to Rockwell International Corporation. Method and apparatus for detecting signals on digital data systems. 5,086,435, Cl. 375-20.000.

Studt, William L.: See—
Powers, Matthew R.; Youssefeh, Raymond D.; Studt, William L.; and Golec, Frederick A., 5,086,179, Cl. 546-133.000.

Stummer, Giseler: See—
Brogyanyi, Edgar; Stummer, Giseler; Kittel, Franz P.; and Schick, Roland, 5,085,737, Cl. 162-359.000.

Su, Wei-Yang: See—
Speranza, George P.; and Su, Wei-Yang, 5,086,162, Cl. 528-339.000.

Waddill, Harold G.; Su, Wei-Yang; and Speranza, George P., 5,086,155, Cl. 528-94.000.

Sugasawa, Isamu; and Ito, Hidenori, to Ricoh Company, Ltd. Rotation transmitting mechanism. 5,085,090, Cl. 74-202.000.

Sugata, Fujio; Ohtake, Masatoshi; and Fujiwara, Hidefumi, to Anritsu Corporation. Signal generating and receiving apparatuses based on synchronous transfer mode. 5,086,438, Cl. 375-114.000.

Sugawara, Ken: See—
Matoba, Mikio; Sugawara, Ken; and Sakairi, Shigeru, 5,086,388, Cl. 395-425.000.

Sugawara, Saburo; Takahashi, Toshiharu; Yuda, Hideaki; and Shirayanagi, Moriyasu, to Asahi Kogaku Kogyo K.K. Focusing screen and a method of forming a microstructure array for use with a focusing screen. 5,085,977, Cl. 430-321.000.

Sugimoto, Kazuaki: See—
Kitahara, Satoshi; Sugimoto, Kazuaki; Yamamoto, Akio; and Sugimura, Ikuzo, 5,085,533, Cl. 400-652.000.

Sugimoto, Naruto: See—
Nishimoto, Yoshifumi; Igaki, Masahiko; Kataoka, Kenichi; Sugimoto, Naruto; Seki, Hiroyuki; and Kimura, Atsushi, 5,085,423, Cl. 271-266.000.

Sugimoto, Shigenobu: See—
Okugawa, Shinichi; and Sugimoto, Shigenobu, 5,086,406, Cl. 364-781.000.

Sugino, Koichi, to Seikosha Co., Ltd. Data card and serial printer using same. 5,085,528, Cl. 400-61.000.

Sugishima, Yoshio; and Matsumoto, Masashi, to Mita Industrial Co., Ltd. Editing area setting method and editing area setting apparatus in an image forming apparatus. 5,086,317, Cl. 355-218.000.

Sugita, Koichi, to Kabushiki Kaisha Top. Pump assembly with container for storing liquid in isolation from ambient air. 5,085,350, Cl. 222-260.000.

Sugiyama, Ikuzo: See—
Kitahara, Satoshi; Sugimoto, Kazuaki; Yamamoto, Akio; and Sugimura, Ikuzo, 5,085,533, Cl. 400-652.000.

Sugiyama, Tetsuya: See—
Kenichi, Kamakura; Murasawa, Nobuo; Sasaki, Tsukasa; Miyahara, Yuichi; Okabayashi, Hiroaki; Sugiyama, Tetsuya; Nagahama, Masamitsu; and Nakayama, Tsuruo, 5,085,534, Cl. 401-65.000.

Sugiyama, Yoshiaki: See—
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,086,310, Cl. 354-75.000.

Kawada, Hideaki; Sugiyama, Yoshiaki; and Kanaguchi, Masahiro, 5,086,361, Cl. 360-107.000.

Suita, Tomoe: See—
Ueda, Shiunkichi; Suita, Tomoe; Murakami, Masahiko; and Tsubako, Mitsutomo, 5,085,845, Cl. 423-308.000.

Sukow, Daniel L.; Quella, Daniel C.; and Andis, Matthew L., to Andis Company. Clipper with lever actuated adjustable comb. 5,084,974, Cl. 30-201.000.

Suling, Carlhans: See—
Frauendorf, Beatrix; Suling, Carlhans; Rudolph, Hans; and Korte, Siegfried, 5,086,150, Cl. 528-49.000.

Sullivan, Maureen A.; and Himelston, Elizabeth A. U-turn signal device. 5,086,289, Cl. 340-475.000.

Sumitomo Chemical Co., Ltd.: See—
Abe, Hiroomi; Nishio, Taichi; and Kitadono, Kaoru, 5,086,105, Cl. 524-492.000.

Fukui, Yoshiharu; and Kuroda, Kazuhisa, 5,086,099, Cl. 524-108.000.

Fukui, Yoshiharu; and Kuroda, Kazuhisa, 5,086,100, Cl. 524-108.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,086,116, Cl. 525-166.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,086,117, Cl. 525-166.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,086,118, Cl. 525-166.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,086,119, Cl. 525-166.000.

Sumitomo Electric Industries, Ltd.: See—
Hitotsuyanagi, Hajime; Sawada, Kazuo; Takano, Satoshi; and Inazawa, Shinji, 5,086,037, Cl. 505-1.000.

Osada, Mituo; Amano, Yoshinari; Ogasa, Nobuo; and Ohtsuka, Akira, 5,086,333, Cl. 357-67.000.

Yamakawa, Akira; Miyake, Masaya; Sakanoue, Hitoyuki; Takeuchi, Hisao; Sogabe, Koichi; and Sasame, Akira, 5,085,923, Cl. 428-209.000.

Sumitomo Rubber Industries, Ltd.: See—
Ueyoko, Kiyoshi; Mizukoshi, Yasuyoshi; Ikeda, Kazushige; and Yamada, Munemitsu, 5,085,260, Cl. 152-554.000.

Sun, Jung-Hui: See—
Ardecky, Robert J.; Patten, Arthur D.; and Sun, Jung-Hui, 5,086,059, Cl. 514-284.000.

Sun Microsystems, Inc.: See—
Islam, Nayeem, 5,086,386, Cl. 395-600.000.

Sunata, Tomihisa: See—
Ukai, Yasuhiro; Sunata, Tomihisa; and Yukawa, Teizo, 5,086,347, Cl. 359-87.000.

Sundstrand Corporation: See—
Gantzer, Charles J., 5,085,127, Cl. 91-499.000.

Shekleton, Jack R., 5,085,039, Cl. 60-39.360.

Sundstrand Data Control, Inc.: See—
Holdren, Frederick V.; and Novack, Mitchell J., 5,085,079, Cl. 73-517.00B.

Sunstar Engineering Inc.: See—
Okuda, Shinji; Maeda, Hiroshi; and Nagata, Tsuyoshi, 5,085,169, Cl. 118-205.000.

Sunstar Giken Kabushiki Kaisha: See—
Ito, Masahiro; and Hayashi, Yukio, 5,086,151, Cl. 528-53.000.

Survival Technology, Inc.: See—
Sarnoff, Stanley J.; Lopez, Claudio; and Dalling, N. Lawrence, 5,085,641, Cl. 604-134.000.

Sarnoff, Stanley J.; and Lopez, Claudio, 5,085,642, Cl. 604-134.000.

Surya, Ronald V.; and Krutz, Albert M., to Pierce Companies, Inc. Multiple ribbon mandril for multiple print head printers. 5,085,532, Cl. 400-234.000.

Suthar, Ajay K.: See—
Aulick, Larry O.; Stafford, Donald W.; and Suthar, Ajay K., 5,085,171, Cl. 118-653.000.

Sutton, Richard C.; and Oenick, Marsha B., to Eastman Kodak Company. Copolymers containing polyoxyalkylene side chains. 5,086,143, Cl. 526-320.000.

Suzuki, Syuichi: See—
Segawa, Toyoo; Syono, Sinkichi; and Suzue, Syuichi, 5,085,030, Cl. 53-399.000.

Suzuki, Chiaki; Kumashiro, Koichi; Torigoe, Tetsu; Kimura, Takaichi; and Aoki, Takayoshi, to Fuji Xerox Co., Ltd. Dry developer with polyethylene powder. 5,085,963, Cl. 430-106.600.

Suzuki, Masahiko: See—
Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, 5,086,308, Cl. 346-140.00R.

Suzuki, Masahiro: See—
Matsushima, Seiichi; Yagi, Masahide; Suzuki, Masahiro; and Mori, Yasuyuki, 5,085,910, Cl. 428-64.000.

Suzuki, Nobuo; Sakasai, Yutaka; and Kato, Eiichi, to Fuji Photo Film Co., Ltd. Non-aqueous dispersing agent and liquid developing agent for electrostatic photography. 5,085,966, Cl. 430-115.000.

Suzuki, Nobuo: See—
Usui, Tetsuo; Suzuki, Nobuo; Sakasai, Yutaka; and Oh-Ishi, Hisao, 5,085,967, Cl. 430-126.000.

Suzuki, Takeshi: See—
Duroda, Shigetaka; Igarashi, Hisashi; Kano, Hidekazu; and Suzuki, Takeshi, 5,085,194, Cl. 123-479.000.

Suzuki, Tamotsu: See—
Namiki, Tomizo; Suzuki, Tamotsu; and Shinozaki, Fumiaki, 5,085,969, Cl. 430-260.000.

Suzuki, Tetsuo: See—
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 5,085,355, Cl. 222-564.000.

Suzuoki, Masakazu: See—
Kutaragi, Ken; Furuhashi, Makoto; Suzuoki, Masakazu; and Kageyama, Koji, 5,086,475, Cl. 381-36.000.

Svenson, Jan A.; and Axelsson, Robert. Implant passageway. 5,085,646, Cl. 604-175.000.

SVG Lithography Systems, Inc.: See—
Engelbrecht, Orest, 5,085,558, Cl. 414-786.000.

Swamikannu, A. Xavier, to Allied-Signal Inc. Thin film composite ultrafiltration membrane. 5,085,775, Cl. 210-500.270.

Swan, Ellen L.; and Basu, Rajat S., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, a monochlorinated C3 alkane and optionally an alcohol. 5,085,797, Cl. 252-171.000.

Swan, Ellen L.; Basu, Rajat S.; and Hollister, Richard M., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, cyclopentane and optionally an alcohol. 5,085,798, Cl. 252-171.000.

Swan, Ellen L.: See—
Stachura, Leonard M.; Logsdon, Peter B.; Swan, Ellen L.; and Basu, Rajat S., 5,085,796, Cl. 252-171.000.

Swann, R. Thomas: See—
Haley, Neil F.; Nair, Xina; Gendimenico, Gerard J.; Zusi, F. Christopher; and Swann, R. Thomas, 5,086,060, Cl. 514-294.000.

Swanson, Donald K.: See—
Sasaki, Kyoichi; and Swanson, Donald K., 5,086,021, Cl. 501-137.000.

Swedberg, Sally A., to Hewlett-Packard Company. Column separation system for electrophoresis with sample pretreatment. 5,085,756, Cl. 204-299.00R.

Sweetheart Cup Company: See—
Durgin, Ronald A.; Matheson, Derek S.; Border, Delvin K.; Kennet, Carlton L.; and Hammett, Daniel E., 5,085,366, Cl. 229-1.50B.

Swift, Scott: See—
Nappholz, Tibor A.; Swift, Scott; Hamilton, John R.; and Gani, Matthew J., 5,085,215, Cl. 128-419.0PG.

Swihart, Terence J.: See—
Blizzard, John D.; and Swihart, Terence J., 5,086,103, Cl. 524-188.000.

Sy, Angel, to Chemical Research & Licensing Company; and ABB Lummus Crest, Inc., a part interest. Aromatic alkylation process. 5,086,193, Cl. 585-446.000.

Syme, Blair G. W.: See—
Crighton, Allan J.; and Syme, Blair G. W., 5,085,943, Cl. 428-500.000.

Syntex (U.S.A.) Inc.: See—
Olson, John D., 5,085,987, Cl. 435-7.910.

Olson, John D., 5,085,988, Cl. 435-7.910.

Syono, Sinkichi: See—
Segawa, Toyoo; Syono, Sinkichi; and Suzue, Syuichi, 5,085,030, Cl. 53-399.000.

Szczesny, David S.: See—
Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,086,372, Cl. 361-415.000.

Szilagy, Andrei: See—
Um, Gregory; and Szilagy, Andrei, 5,085,497, Cl. 359-848.000.

Szypura, Claus R.: See—
Welteke, Uwe; Szypura, Claus R.; Welteke, Reinhard; Erb, Gottfried; Szypura, Claus R.; Welteke, Reinhard; and Erb, Gottfried, 5,085,898, Cl. 428-2.000.

Welteke, Uwe; Szypura, Claus R.; Welteke, Reinhard; Erb, Gottfried; Szypura, Claus R.; Welteke, Reinhard; and Erb, Gottfried, 5,085,898, Cl. 428-2.000.

SI Montevideo Technology, Inc.: See—
Sieja, Alan E.; and Persson, Erland, 5,086,245, Cl. 310-216.000.

T. D. F. Partnership: See—
Keltner, Loren L., 5,085,278, Cl. 169-15.000.

Tabata, Junichi: See—
Kawanaka, Masanobu; Kondo, Youichi; Tabata, Junichi; and Onda, Kimimasa, 5,085,052, Cl. 60-445.000.

Tabei, Eiichi: See—
Itoh, Kunio; Umemura, Mitsuo; and Tabei, Eiichi, 5,086,127, Cl. 525-474.000.

Tachino, Kenzo: See—
Kitagawa, Shigeo; Tachino, Kenzo; Nagata, Yasuhiro; Yamamoto, Tomochiro; Iwata, Shigemi; Hirabayashi, Terumi; and Tanino, Junichi, 5,086,450, Cl. 379-40.000.

Taga, Kazuaki; Tsuda, Takeshi; Inaba, Hiroo; and Ogawa, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,085,915, Cl. 428-141.000.

Taishia, Ltd.: See—
Okuda, Masaharu; Asami, Kouichiro; and Nagasaki, Heishiro, 5,085,374, Cl. 239-751.000.

Taka, Katsuhiro: See—
Shizawa, Masahiro; Taka, Katsuhiro; and Oghara, Hiroshi, 5,086,456, Cl. 379-132.000.

Takada, Makoto: See—
Moriya, Yoshitaka; Nomachi, Hiroshi; Takada, Makoto; Takatsu, Yukihide; and Umezawa, Kenichi, 5,085,708, Cl. 106-819.000.

Takahashi, Atsushi, to Nifco Inc. Expandable rivet for securing together overlapped panels. 5,085,545, Cl. 411-45.000.

Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, to Nohmi Bosai Kabushiki Kaisha. Line interruption supervisory device for a fire alarm system. 5,086,293, Cl. 340-506.000.

Takahashi, Kenro, to Nissan Motor Company, Limited. Working fluid circuit for automotive active suspension system with enhanced take-up characteristics upon initiation of operation. 5,085,460, Cl. 280-707.000.

- Takahashi, Koji: See—
Takei, Masahiro; Kashida, Motokazu; Takahashi, Koji; Nagasawa, Kenichi; Masui, Toshiyuki; and Fukatsu, Tsutomu, 5,086,358, Cl. 360-60.000.
- Takahashi, Kozo; and Fujinawa, Yukio. Method for determining source region of volcanic tremor. 5,086,415, Cl. 367-125.000.
- Takahashi, Kuniaki; Kudo, Koji; Araya, Shinichi; and Nakayama, Hitoshi, to TDK Corporation. Apparatus for and method of automatically mounting electronic component on printed circuit board. 5,084,962, Cl. 29-833.000.
- Takahashi, Takahiko: See—
Itoh, Fumikazu; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Hongo, Mikio, 5,086,015, Cl. 437-173.000.
- Takahashi, Toshiharu: See—
Sugawara, Saburo; Takahashi, Toshiharu; Yuda, Hideaki; and Shirayanagi, Moriyasu, 5,085,977, Cl. 430-321.000.
- Takahashi, Toshihiko: See—
Nanya, Toshiaki; Yamaguchi, Kimitoshi; Tsubuko, Kazuo; Takahashi, Toshihiko; Kawase, Hiromitsu; and Oookawara, Makoto, 5,085,965, Cl. 430-109.000.
- Takahashi, Toshiro: See—
Kameoka, Kimitaka; Kuwabara, Ken-ichi; Takahashi, Toshiro; Moriuchi, Shigenori; Yagihara, Morio; Inagaki, Yoshio; and Adachi, Keiichi, 5,085,970, Cl. 430-264.000.
- Takahashi, Yasuhiro: See—
Tsukakoshi, Masato; Takahashi, Yasuhiro; Terada, Matsuaki; and Kusaka, Kenji, 5,086,426, Cl. 370-85.130.
- Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, to Brother Kogyo Kabushiki Kaisha. Piezoelectric ink jet print head including common laminar piezoelectric element for two or more ink jetting devices. 5,086,308, Cl. 346-140.00R.
- Takamori, Tetsuya: See—
Watanabe, Izumi; Takamori, Tetsuya; Yokota, Kenji; and Yamaguchi, Takashi, 5,086,231, Cl. 250-557.000.
- Takano, Satoshi: See—
Hitotsuyanagi, Hajime; Sawada, Kazuo; Takano, Satoshi; and Inazawa, Shinji, 5,086,037, Cl. 505-1.000.
- Takano, Tsunesuke, to Daiichi Denso Buhin Co., Ltd. Lever switch. 5,086,199, Cl. 200-563.000.
- Takao, Itaru: See—
Karasawa, Wataru; Itoyama, Taketoshi; Takao, Itaru; Obikane, Tadashi; and Koike, Hisashi, 5,086,270, Cl. 324-158.00P.
- Takasago Perfumery Co., Ltd.: See—
Inui, Ryosuke; and Matsubara, Susumu, 5,085,353, Cl. 222-402.130.
- Takashima, Akio; Hattori, Iwakazu; and Imamura, Takashi, to Japan Synthetic Rubber Co., Ltd. Process for producing high trans low vinyl conjugated diene (co)polymer. 5,086,136, Cl. 526-177.000.
- Takatoo, Masao: See—
Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.
- Takatsu, Yukihide: See—
Moriya, Yoshitaka; Nomachi, Hiroshi; Takada, Makoto; Takatsu, Yukihide; and Umezawa, Kenichi, 5,085,708, Cl. 106-819.000.
- Takayama, Masatoshi: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, 5,085,466, Cl. 280-775.000.
- Takeda, Atsushi; and Hasegawa, Takashi, to Canon Kabushiki Kaisha. Image forming apparatus having transfer material carrying device. 5,086,318, Cl. 355-271.000.
- Takeda Chemical Industries, Ltd.: See—
Minato, Ichiro; Hirata, Fumiaki; and Nakashima, Tatsuya, 5,086,175, Cl. 544-221.000.
- Takehana, Yoichi: See—
Nakagawa, Hiroaki; and Takehana, Yoichi, 5,085,899, Cl. 428-14.000.
- Takei, Masahiro; Kashida, Motokazu; Takahashi, Koji; Nagasawa, Kenichi; Masui, Toshiyuki; and Fukatsu, Tsutomu, to Canon Kabushiki Kaisha. Recording and reproducing apparatus. 5,086,358, Cl. 360-60.000.
- Takeichi, Hideo: See—
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 5,085,721, Cl. 156-108.000.
- Takemura, Makoto: See—
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 5,085,355, Cl. 222-564.000.
- Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, to Hitachi, Ltd. Information processing system using neural network learning function. 5,086,479, Cl. 382-14.000.
- Takeno, Katsuji, to Takeno, Katsuji. Golf tee manufacturing method. 5,085,432, Cl. 273-33.000.
- Takeno, Katsuji, to Katsuji Takeno. Golf tee. 5,085,438, Cl. 273-212.000.
- Takeuchi, Hirofumi: See—
Tsutsui, Osamu; Haraga, Hisato; Arita, Kinya; Makita, Atsuo; Takeuchi, Hirofumi; and Tsukada, Ryoichi, 5,085,399, Cl. 251-30.030.
- Takeuchi, Hisao: See—
Yamakawa, Akira; Miyake, Masaya; Sakanoue, Hitoyuki; Takeuchi, Hisao; Sogabe, Koichi; and Sasame, Akira, 5,085,923, Cl. 428-209.000.
- Takeuchi, Makoto: See—
Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, 5,086,308, Cl. 346-140.00R.
- Takeuchi, Nobuyuki: See—
Iida, Yasunobu; Nakamura, Masato; Takeuchi, Nobuyuki; and Onishi, Keiji, 5,085,926, Cl. 428-216.000.
- Takeuchi, Yukio; Nakahashi, Akio; and Kubota, Shingo, to Kabushiki Kaisha Ishikawa Seisakusho Ltd. Double twist spindle apparatus. 5,085,045, Cl. 57-58.650.
- Takisawa Machine Tool Co., Ltd.: See—
Hidehiko, Miyake; and Kazuhiro, Kajitani, 5,085,109, Cl. 82-118.000.
- Takke, Ralf: See—
Yamagata, Shigeru; Inaki, Kyoichi; Matsuya, Toshikatu; Takke, Ralf; Thomas, Stephan; and Fabian, Heinz, 5,086,352, Cl. 359-350.000.
- Talarico, Robert J.: See—
Lindstrom, Jan C. R.; Bryer, Jack; and Talarico, Robert J., 5,085,144, Cl. 101-363.000.
- Tallier, Bernard; and Lauenstein, Michael, to Fabriques de Tabac Reunies, S.A. Method and apparatus for forming continuous cigarette rods. 5,085,229, Cl. 131-84.400.
- Tamada, Sakuya; and Nakane, Yasuaki, to Sony Corporation. Laser scanning apparatus having two, parallel, acoustic optic deflectors for the horizontal scan. 5,086,341, Cl. 358-201.000.
- Tamai, Shoji: See—
Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,086,125, Cl. 525-432.000.
- Tamai, Toshiyuki: See—
Komami, Yuji; Kan, Megumi; Tamai, Toshiyuki; and Hishinuma, Taro, 5,085,066, Cl. 72-13.000.
- Tamizawa, Hirotaka: See—
Narihiko, Yoshimura; Tamizawa, Hirotaka; and Komatsu, Yasuji, 5,085,792, Cl. 252-79.000.
- Tamura, Hifumi: See—
Toita, Hiroshi; Hirose, Hiroshi; and Tamura, Hifumi, 5,086,227, Cl. 250-309.000.
- Tamura, Keiji: See—
Ebato, Kazuo; and Tamura, Keiji, 5,085,944, Cl. 428-570.000.
- Tamura, Nobuyuki: See—
Murakami, Takuya; Kakimoto, Toshihiko; Dake, Shigeki; Ishimaru, Junzo; Kyo, Yuji; Kameda, Masanao; and Tamura, Nobuyuki, 5,085,444, Cl. 277-154.000.
- Tamura, Yuzo: See—
Iwahara, Yoshiaki; Ogino, Masanori; Ohta, Masutomi; Kuroda, Shoji; Tamura, Yuzo; and Kobayashi, Yukihiko, 5,085,495, Cl. 359-455.000.
- Tan, Loon-Seng; and Arnold, Fred E., to United States of America, Air Force. Ionically blended molecular composites. 5,086,120, Cl. 525-183.000.
- Tan Sense Medical Corp.: See—
Parkevich, Gayle, 5,084,927, Cl. 5-484.000.
- Tanabe, Akira: See—
Tanaka, Yoshinao; Ohsawa, Takaaki; and Tanabe, Akira, 5,085,411, Cl. 266-102.000.
- Tanabe, Hisao: See—
Miyake, Toru; Higuchi, Naohige; Kudo, Yoshiki; and Tanabe, Hisao, 5,086,297, Cl. 340-759.000.
- Tanaka, Masami: See—
Shimizu, Itsuo; Furukawa, Kenji; and Tanaka, Masami, 5,085,799, Cl. 252-299.660.
- Tanaka, Norio: See—
Takenaga, Hiroshi; Okuyama, Yoshiyuki; Takatoo, Masao; Asada, Kazuyoshi; Tanaka, Norio; Kitamura, Tadaaki; and Kikuchi, Kuniyuki, 5,086,479, Cl. 382-14.000.
- Tanaka, Teruo; Hamanaka, Naoki; Nakagoshi, Junji; Omoda, Koichiro; and Nagashima, Shigeo, to Hitachi, Ltd. Parallel computer with asynchronous communication facility. 5,086,498, Cl. 395-200.000.
- Tanaka, Yasuhiko; Koda, Takao; Ide, Yoshihiro; Ohmiya, Akio; Komori, Masanoshin; Nozawa, Masaya; Hashimoto, Shiro; and Nishizawa, Tetuo, to Fuji Photo Film Co., Ltd. Variable focal length camera with focus adjusting device. 5,086,312, Cl. 354-195.120.
- Tanaka, Yoshinao; Ohsawa, Takaaki; and Tanabe, Akira, to Nippon Steel Corporation. Apparatus for processing grain-oriented electrical steel strip. 5,085,411, Cl. 266-102.000.
- Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Shigeyuki, to Fujitsu Limited. Gain-shape vector quantization apparatus. 5,086,471, Cl. 381-36.000.
- Tanaka, Yusuke: See—
Wako, Kanji; Fukui, Tetsujiro; and Tanaka, Yusuke, 5,085,151, Cl. 105-206.100.
- Tanguy, Jacques: See—
Marquet, Alain; and Tanguy, Jacques, 5,086,235, Cl. 307-64.000.
- Taniguchi, Tomohiko: See—
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- Tanino, Junichi: See—
Kitagawa, Shigeo; Tachino, Kenzo; Nagata, Yasuhiro; Yamamoto, Tomoichiro; Iwata, Shigemitsu; Hirabayashi, Terumi; and Tanino, Junichi, 5,086,450, Cl. 379-40.000.
- Taniuchi, Akira; Komori, Hirohito; and Niwa, Koichi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Method of producing imide bond-containing resins. 5,086,114, Cl. 525-123.000.
- Tanno, Kiyohiko: See—
Yasutomi, Yoshiyuki; Miyoshi, Tadachiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Joeraku, Fumio, 5,085,806, Cl. 252-518.000.

- Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, to Bridgestone Corporation. Method of fitting an impact-resisting anti-lacerative window unit. 5,085,721, Cl. 156-108.000.
- Tarika, Elio E.: See—
Niaura, Vitas; Oxlley, Jeffery A.; and Tarika, Elio E., 5,085,890, Cl. 427-149.000.
- Tarr, Bernard. Surgical knife with angular cut control and method of using the same. 5,085,663, Cl. 606-172.000.
- Tasker, G. William: See—
Horton, Jerry R.; and Tasker, G. William, 5,086,248, Cl. 313-103.0CM.
- Tatara, Yuda; to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling hydraulically operated continuously variable vehicle transmission, having means for changing power transmitting capacity with input torque. 5,085,107, Cl. 74-866.000.
- Tate, George J.: See—
Bonne, Ulrich; Tate, George J.; and Schwarz, Edward, 5,085,576, Cl. 431-22.000.
- Tateishi, Kiyoshi, to Pioneer Electronic Corporation. Disk playing apparatus having a compensation characteristic variable with velocity information. 5,086,421, Cl. 369-50.000.
- Tayama, Suehiro: See—
Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 5,086,106, Cl. 524-300.000.
- Tayca Corporation: See—
Ueda, Shiunkichi; Suita, Tomoe; Murakami, Masahiko; and Tshako, Mitsutomo, 5,085,845, Cl. 423-308.000.
- Taylor, Earl J.: See—
Reddy, N. R. K. Vilambi; Anderson, Everett B.; and Taylor, Earl J., 5,085,743, Cl. 205-105.000.
- Taylor, Paul D.: See—
Narayanan, Kolazi S.; and Taylor, Paul D., 5,085,795, Cl. 252-162.000.
- Taylor, Russell H.: See—
Glassman, Edward; Hanson, William A.; Kazanzides, Peter; Mittelstadt, Brent D.; Musits, Bela L.; Paul, Howard A.; and Taylor, Russell H., 5,086,401, Cl. 395-94.000.
- Taylor, William T. Vertically manipulated ratchet fishing tool. 5,085,477, Cl. 294-86.170.
- TDK Corporation: See—
Takahashi, Kuniaki; Kudo, Koji; Araya, Shinichi; and Nakayama, Hitoshi, 5,084,962, Cl. 29-833.000.
- Technical Research, Inc.: See—
Bowers-Irons, Gail L. A.; Tran, Quynh K.; and Pryor, Robert J., 5,085,999, Cl. 435-264.000.
- Technomed International: See—
Mestas, Jean-Louis; Lacruche, Bernard; and Cathignol, Dominique, 5,085,206, Cl. 128-24.0EL.
- Teixeira, Franklin W. Wire holding cap for post. 5,085,409, Cl. 256-48.000.
- Tejin Limited: See—
Katoh, Kotaro; Tomita, Hiroshi; and Saitoh, Kazuyoshi, 5,085,933, Cl. 428-332.000.
- Tektronix, Inc.: See—
Greub, Hans-Jurg, 5,086,500, Cl. 395-550.000.
- Telecommunications Radioelectriques et Telephoniques: See—
Le Goffic, Yves H. M.; and Soulbail, Roland Y. J. M., 5,086,425, Cl. 370-84.000.
- Teletronics Pacing Systems, Inc.: See—
Nappholz, Tibor A.; Swift, Scott; Hamilton, John R.; and Gani, Matthew J., 5,085,215, Cl. 128-419.0PG.
- Teledyne Industries, Inc.: See—
Lee, Sheng-Hann, 5,086,283, Cl. 333-149.000.
- Razaq, Mohammed; Shah, Atulbhai S.; and Pust, Harold W., 5,085,760, Cl. 204-431.000.
- Tempesti, Ezio: See—
Mazzocchia, Carlo; Tempesti, Ezio; and Aboumrar, Chafic, 5,086,032, Cl. 502-315.000.
- Teng, Chin-Hung; Zon, Lin-chang; and Yu, Frank. Structure of safety umbrella. 5,085,239, Cl. 135-25.330.
- Tepper, John E.; and Tepper, Timothy T. Arrow rest for archery bows. 5,085,201, Cl. 124-44.500.
- Tepper, Timothy T.: See—
Tepper, John E.; and Tepper, Timothy T., 5,085,201, Cl. 124-44.500.
- Terada, Akihiro: See—
Torii, Nobutoshi; Ito, Susumu; and Terada, Akihiro, 5,085,619, Cl. 474-138.000.
- Terada, Matsuaki: See—
Tsukakoshi, Masato; Takahashi, Yasuhiro; Terada, Matsuaki; and Kusaka, Kenji, 5,086,426, Cl. 370-85.130.
- Terasawa, Koji, to Canon Kabushiki Kaisha. Liquid injection recording apparatus and suction recovery device using capping means integrally provided with a plurality of caps. 5,086,305, Cl. 346-1.100.
- Terex Corporation: See—
Fujan, Steven J., 5,085,520, Cl. 384-203.000.
- Ternsjo, Johan: See—
Rosell, Ulf; Karlsson, Mats; and Ternsjo, Johan, 5,085,123, Cl. 89-4.200.
- Teske, Robert J.: See—
Moore, Archie S.; and Teske, Robert J., 5,085,150, Cl. 105-150.000.
- Tetaz, John R.: See—
Aker, David; Philpott, Arthur K.; and Tetaz, John R., 5,086,374, Cl. 361-525.000.
- Tetra Pak Holdings S.A.: See—
Rausing, Hans, 5,085,882, Cl. 426-524.000.
- Texaco Chemical Company: See—
Burns, Jeffrey M., 5,085,791, Cl. 252-79.000.
- Burns, Jeffrey M.; Sanderson, John R.; Larkin, John M.; and McCoy, David R., 5,085,793, Cl. 252-79.000.
- Speranza, George P.; and Su, Wei-Yang, 5,086,162, Cl. 528-339.000.
- Waddill, Harold G.; Su, Wei-Yang; and Speranza, George P., 5,086,155, Cl. 528-94.000.
- Texaco Inc.: See—
Muan, Arnulf; and Najjar, Mitri S., 5,086,029, Cl. 502-241.000.
- Reale, John, Jr., 5,085,778, Cl. 210-500.390.
- Texas A&M University System, The: See—
Lawhon, James T.; and Rhee, Khee C., 5,086,166, Cl. 530-378.000.
- Texas Alkyls, Inc.: See—
Crapo, Clark C.; and Malpass, Dennis B., 5,086,024, Cl. 502-117.000.
- Texas Instruments Incorporated: See—
Garza, Cesar M.; Jackson, Ricky A.; and Priebe, Ryan E., 5,085,729, Cl. 156-628.000.
- Hammerbacher, Milfred D., 5,086,003, Cl. 437-2.000.
- Williams, Rodney D.; and Garcia, Felix, Jr., 5,085,507, Cl. 356-152.000.
- Tezuka, Koji; Amemiya, Shigeo; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, to Fujitsu Limited. Coded transmission system with initializing code. 5,086,436, Cl. 375-25.000.
- Th. Goldschmidt AG: See—
Fock, Jürgen; and Esselborn, Eberhard, 5,086,142, Cl. 526-318.000.
- Ruf, Erich, 5,085,805, Cl. 252-518.000.
- Therm-All, Inc.: See—
Paliwoda, Kenneth J., 5,085,022, Cl. 52-309.800.
- Theurer, Josef; and Worgotter, Herbert, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast plow. 5,084,989, Cl. 37-104.000.
- Thieleke, Douglas L.; and Callison, Douglas A., to D.L.T. Mfg. Corp. Staple removing device. 5,085,404, Cl. 254-28.000.
- Thierry, Annette; and Le Moigne, Jacques, to Centre National de la Recherche Scientifique. Temperature indicators based on polydiacetylene compounds. 5,085,801, Cl. 252-408.100.
- Thomas, Carmen J. Garment accessory device to remove pants with constricted cuffs. 5,085,359, Cl. 223-111.000.
- Thomas Industries Inc.: See—
Toledo, George F.; and Betts, John E., 5,085,474, Cl. 292-92.000.
- Thomas Jefferson University: See—
Leighton, Barbara, 5,085,631, Cl. 604-28.000.
- Osterholm, Jewell L.; and Frazer, Glenn D., 5,085,630, Cl. 604-28.000.
- Thomas, Joseph R., Jr., to Airline Industrial Machinery, Inc. Apparatus for raising and lowering a rotatable platform. 5,084,936, Cl. 14-71.500.
- Thomas, Stephan: See—
Yamagata, Shigeru; Inaki, Kyoichi; Matsuya, Toshikatu; Takke, Ralf; Thomas, Stephan; and Fabian, Heinz, 5,086,352, Cl. 359-350.000.
- Thommes, James M., to Powcon, Inc. Apparatus employing a welding power supply for powering a plasma cutting torch. 5,086,205, Cl. 219-121.540.
- Thompson, Christopher M.; Campbell, Timothy J.; Farfaglia, Leonard T.; deceased (by Farfaglia, Mary, heir); Gipson, Billy P.; and Matambo, Thompson, to Whirlpool Corporation. Dual side discharge room air conditioner with foamed insulation air passage walls. 5,085,057, Cl. 62-262.000.
- Thompson, Raymon F.; and Owczarz, Aleksander, to Semitool, Inc. Low contamination blending and metering systems for semiconductor processing. 5,085,560, Cl. 417-53.000.
- Thompson, Steven R.: See—
Gray, Scott L.; and Thompson, Steven R., 5,086,429, Cl. 371-9.100.
- Thomson Consumer Electronics, Inc.: See—
Rumreich, Mark F., 5,086,474, Cl. 381-120.000.
- Thomson-CSF: See—
Gay, Michel; Deschamps, Jacques; and Salavin, Serge, 5,086,257, Cl. 315-169.400.
- Maurice, Francois, 5,086,362, Cl. 360-121.000.
- Pocholle, Jean-Paul; Papuchon, Michel; and Puech, Claude, 5,086,433, Cl. 372-72.000.
- Rosencher, Emmanuel; Vinter, Borge; and Bois, Paul, 5,086,327, Cl. 357-30.000.
- Thor Radiation Research, Inc.: See—
Hodnett, William P. III, 5,085,917, Cl. 428-173.000.
- Thorn, David W.; Patel, Rajendra; and Sohl, Gordon, to Network Access Corporation. Apparatus and method for providing existing IESS and IAESS telephone switching equipment with the capability of using the SS7 protocol. 5,086,461, Cl. 379-230.000.
- Thorn EMI plc: See—
Mucklejohn, Stuart A.; and Wharmby, David O., 5,086,258, Cl. 315-248.000.
- Thukakoshi, Thuneo: See—
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 5,086,323, Cl. 357-23.400.
- Tiburtius, Heinfried, to Dr. Gerhard Mann Chem.-Pharm. Fabrik GmbH. Use of beta blockers for the treatment of the progression of infantile axial myopia. 5,086,061, Cl. 514-309.000.
- Tihanyi, Jenoe: See—
Leipold, Ludwig; Sander, Rainald; Tihanyi, Jenoe; and Weber, Roland, 5,086,364, Cl. 361-18.000.
- Tilston, John R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Torch igniters. 5,085,040, Cl. 60-39.827.

Timken Company, The: See—
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Tischer, Michael: See—
Spiess, Ewald; and Tischer, Michael, 5,085,299, Cl. 188-319.000.
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Toa Nenryo Kogyo, K.K.: See—
Narihiko, Yoshimura; Tamizawa, Hirotsuka; and Komatsu, Yasuji, 5,085,792, Cl. 252-79.000.
Toba, Masanori: See—
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Todd, Stephen J.: See—
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Toldman, Michael T.; James, Simon A.; and Parker, Michael L., to Rolls-Royce plc. Gas turbine engine, 5,085,038, Cl. 60-39.370.
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Togo, Shizuo; Amagai, Akikazu; Kondo, Yoshinori; and Yamada, Toshiaki, to Mitsubishi Gas Chemical Company, Inc. Solvent-resistant polyphenylene ether resin composition, 5,086,112, Cl. 525-68.000.
Toguri, James M.: See—
Pickles, Christopher A.; Toguri, James M.; Truong, Hieu; and Clark, Janet G., 5,085,692, Cl. 75-634.000.
Tohlen, Dennis A.: See—
Chung, Connie Y.; Keen, Robert G.; Raymond, Ozella; Snyder, Jan W.; and Tohlen, Dennis A., 5,086,503, Cl. 395-700.000.
Toita, Hiroshi; Hirose, Hiroshi; and Tamura, Hifumi, to Hitachi, Ltd.; and Hitachi Instrument Eng. Co., Ltd. Secondary ion mass analyzing apparatus, 5,086,227, Cl. 250-309.000.
Tokai Kogyo Kabushiki Kaisha: See—
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Tokico Ltd.: See—
Kato, Tetsuo; and Imaizumi, Tomio, 5,085,300, Cl. 188-322.150.
Tokiguchi, Katsumi; Amemiya, Kensuke; Sakudo, Noriyuki; and Seki, Takayoshi, to Agency of Industrial Science and Technology, The. External resonance circuit type radio frequency quadrupole accelerator, 5,086,256, Cl. 315-111.810.
Toko Kabushiki Kaisha: See—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshio, Hitoshi; and Norio, Isami, 5,086,381, Cl. 363-16.000.
Tokunaga, Masatoshi; Nozawa, Yasuto; and Iwasaki, Katsunori, to Hitachi Metals, Ltd. Magnetically anisotropic bond magnet, magnetic powder for the magnet and manufacturing method of the powder, 5,085,715, Cl. 148-101.000.
Tokura, Yoshiko: See—
Asanuma, Tadashi; Yamamoto, Kazuhiko; Ohnaka, Junko; and Tokura, Yoshiko, 5,085,895, Cl. 427-393.500.
Tokyo Electric Co., Ltd.: See—
Kitahara, Satoshi; Sugimoto, Kazuaki; Yamamoto, Akio; and Sugura, Ikuzo, 5,085,533, Cl. 400-652.000.
Tokyo Electron Limited: See—
Karasawa, Wataru; Itoyama, Taketoshi; Takao, Itaru; Obikane, Tadashi; and Koike, Hisashi, 5,086,270, Cl. 324-158.00P.
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Tolt, Thomas L.: See—
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Tolymbekov, Manat Z.: See—
Nakonechny, Anatoly Y.; Tolymbekov, Manat Z.; Ponomarenko, Alexandr G.; Radchenko, Vladimir N.; Bulyanda, Alexandr A.; Mizin, Vladimir G.; Gizatulin, Gennady Z.; and Vyatkin, Jury F., 5,085,691, Cl. 75-546.000.
Tomas, Engstrom: See—
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Okamoto, Masaru; Ichikawa, Yasunori; Inoue, Toshihide; and Yamanaka, Toru, 5,085,807, Cl. 252-609.000.
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Torigoe, Tetsu: See—
Suzuki, Chiaki; Kumashiro, Koichi; Torigoe, Tetsu; Kimura, Takachi; and Aoki, Takayoshi, 5,085,963, Cl. 430-106.600.
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Torii, Nobutoshi; Ito, Susumu; and Terada, Akihiro, to Fanuc Ltd. Dual pinion anti-backlash tensioner for a robot, 5,085,619, Cl. 474-138.000.

Tornay, Edmund G.: See—
Cuneo, Joseph; Garland, Charles; Goldbach, Richard A.; Goldbach, Robert D.; McConnell, Frank E.; and Tornay, Edmund G., 5,085,161, Cl. 114-65.00R.
Torremans, Joseph L. G.: See—
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Tsutsui, Osamu; Haraga, Hisato; Arita, Kinya; Makita, Atsuo; Takeuchi, Hirofumi; and Tsukada, Ryoichi, 5,085,399, Cl. 251-30.030.
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Shiga, Naomichi; Tsuchiya, Hisatoshi; Sakakibara, Yasuyuki; and Kibe, Katsumi, 5,086,266, Cl. 322-28.000.
Toyo Seikan Kaisha, Ltd.: See—
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Toyoda Gosei Co., Ltd.: See—
Harata, Mitsuru; and Yasuda, Hiroshi, 5,085,097, Cl. 74-552.000.
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Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; and Nambu, Jinsho, 5,086,117, Cl. 525-166.000.
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Pielartzik, Harald; Kohler, Burkhard; Traenckner, Hans-Joachim; Jakob, Wolfgang; and Bushong, William C., 5,086,102, Cl. 524-188.000.
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Triner, Irvin R.: See—
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,085,596, Cl. 439-497.000.
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Tylisz, Eugene R.; and Przybylinski, Phillip G., 5,085,152, Cl. 105-419.000.
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Trota, Robert A., to Gillette Company, The. Razor blade assembly, 5,084,968, Cl. 30-47.000.
Trullas, Ramon; and Skolnick, Phil, to United States of America, Health and Human Services. Treatment of mood disorders with functional antagonists of the glycine/NMDA receptor complex, 5,086,072, Cl. 514-531.000.
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Petrich, John P., 5,085,162, Cl. 114-85.000.
TRW Inc.: See—
Meyers, Robert A.; Hart, Walter D.; and McClanathan, Loren C., 5,085,764, Cl. 208-404.000.

Tsau, Josef H. K., to NutraSweet Company, The. Fast dissolving sweetening agent including caramel, 5,085,876, Cl. 426-92.000.
TSI Incorporated: See—
Blesener, James L., 5,085,500, Cl. 356-338.000.
Tsuboi, Toshihide; and Funahashi, Norio, to NEC Corporation. Non-volatile semiconductor memory device having an improved testing mode of operation and method of forming checkerwise test pattern in memory cell array, 5,086,413, Cl. 365-230.010.
Tsubone, Tsunehiko: See—
Soraoka, Minoru; Kawasaki, Yoshinao; Kudo, Katsuyoshi; and Tsubone, Tsunehiko, 5,085,750, Cl. 204-192.320.
Tsubuko, Kazuo: See—
Nanya, Toshiaki; Yamaguchi, Kimitoshi; Tsubuko, Kazuo; Takahashi, Toshihiko; Kawase, Hiromitsu; and Oikawara, Makoto, 5,085,965, Cl. 430-109.000.
Tsuchida, Michio, to Nipox Kabushiki Kaisha. Overhead projector, 5,085,505, Cl. 353-98.000.
Tsuchiya, Hisatoshi: See—
Shiga, Naomichi; Tsuchiya, Hisatoshi; Sakakibara, Yasuyuki; and Kibe, Katsumi, 5,086,266, Cl. 322-28.000.
Tsuchiya, Yoshinobu: See—
Kurabayashi, Ken; Tsuchiya, Yoshinobu; Yoshida, Akio; Koizumi, Hitoshi; and Niida, Yoriaki, 5,086,373, Cl. 361-502.000.
Tsuchiya, Yuzo, to Kabushiki Kaisha Toshiba. Cassette tape slack-preventing apparatus for use in magnetic recording/reproducing apparatus, 5,086,359, Cl. 360-71.000.
Tsuda, Takeshi: See—
Taga, Kazuaki; Tsuda, Takeshi; Inaba, Hiroo; and Ogawa, Hiroshi, 5,085,915, Cl. 428-141.000.
Tsugen, Masashi; and Miyashita, Makoto, to Kabushiki Kaisha Toshiba. Method and apparatus for setting-up rolling mill roll gaps, 5,086,399, Cl. 364-508.000.
Tsuha, Mitsutomo: See—
Ueda, Shiunkichi; Suita, Tomoe; Murakami, Masahiko; and Tsuhako, Mitsutomo, 5,085,845, Cl. 423-308.000.
Tsukada, Ryoichi: See—
Tsutsui, Osamu; Haraga, Hisato; Arita, Kinya; Makita, Atsuo; Takeuchi, Hirofumi; and Tsukada, Ryoichi, 5,085,399, Cl. 251-30.030.
Tsukada, Toru: See—
Hattori, Masaru; and Tsukada, Toru, 5,085,522, Cl. 384-45.000.
Tsukahara, Akihiko: See—
Danzaki, Tsutomu; Iwaoka, Toshio; Yamaguchi, Yuichi; and Tsukahara, Akihiko, 5,085,286, Cl. 180-179.000.
Tsukahara, Daiki: See—
Aoki, Hitoshi; Wakabayashi, Hiroshi; Tsukahara, Daiki; and Miyamoto, Hidenori, 5,086,314, Cl. 354-412.000.
Tsukakoshi, Masato; Takahashi, Yasuhiro; Terada, Matsuaki; and Kusaka, Kenji, to Hitachi, Ltd. Communication network system having a plurality of different protocol LAN's connected through a bridge, 5,086,426, Cl. 370-85.130.
Tsukamoto, Moriaki; and Inoue, Hisamichi, to Hitachi, Ltd. Alkali metal thermoelectric power generator, 5,085,948, Cl. 429-11.000.
Tsumuji, Akio: See—
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,086,293, Cl. 340-506.000.
Tsuru, Sumiaki; Yokoo, Akihiko; Ichitsuka, Takeshi; and Hiraide, Tsuneo, to Asahi Kogyo Kogyo Kabushiki Kaisha. Separating agent, separator and method of separating cell or virus, 5,085,781, Cl. 210-692.000.
Tsutsui, Osamu; Haraga, Hisato; Arita, Kinya; Makita, Atsuo; Takeuchi, Hirofumi; and Tsukada, Ryoichi, to Toto Ltd. Automatically operating valve for regulating water flow and faucet provided with said valve, 5,085,399, Cl. 251-30.030.
Tsutsui, Tetsuo: See—
Saito, Shogo; Tsutsui, Tetsuo; and Adachi, Chihaya, 5,085,946, Cl. 428-690.000.
Tsutui, Tetsuo: See—
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Tsuzikawa, Yoshihiro: See—
Iwanaga, Naruyuki; Yamaguchi, Tosiaki; Fujieda, Nobuhiko; and Tsuzikawa, Yoshihiro, 5,085,752, Cl. 204-243.00R.
Tuan, Kenny, to Elasticity-enhanced contact element of electrical connector, 5,085,593, Cl. 439-326.000.
Tucker, Francis D., III: See—
Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; and Fein, Michael E., 5,085,517, Cl. 356-394.000.
Turgeon, Michael; and Kielinen, Jeffrey, to Davidson Textron Inc. Pour head seal assembly for a mold for forming composite articles, 5,085,568, Cl. 425-125.000.
Turner, De Maris C. Collapsible desk with dollhouse, 5,085,608, Cl. 446-75.000.
Turner, James R.: See—
Norton, Ronald L.; and Turner, James R., 5,085,408, Cl. 254-325.000.
Turner, Raymond L., to Hughes Aircraft Company. Water-soluble soldering flux, 5,085,365, Cl. 228-223.000.
Tusinski, Joseph, to Coburn Optical Industries. Toric lens fining apparatus, 5,085,007, Cl. 51-55.000.
Tutikawa, Yoshiji, to Daiyusu Kinzoku Co., Ltd. Device for supporting folding doors, 5,085,262, Cl. 160-199.000.
Twenty-First Century Products, Incorporated: See—
Barrett, Patrick J., 5,085,214, Cl. 128-845.000.
Tylisz, Eugene R.; and Przybylinski, Phillip G., to Trinity Industries. Well car crossbearer side connection, 5,085,152, Cl. 105-419.000.

Ube Industries, Ltd.: See—
Ueno, Kohhei; Akagawa, Tomohiko; Hinenoya, Saburo; and Morimoto, Toshio, 5,086,109, Cl. 524-496.000.
UCAR Carbon Technology Corporation: See—
Howard, Ronald A., 5,085,700, Cl. 106-33.000.
Uchikoshi, Gohji; and Sano, Keiji, to Nakamichi Corporation. Method of controlling reel drive, 5,085,379, Cl. 242-186.000.
Uclaf, Roussel: See—
Bonfils, Armelle; Smets, Pierre; and Zalisz, Rene, 5,086,040, Cl. 514-8.000.
Ueda, Atsushi: See—
Hayashi, Shoichi; Ishihara, Hidetoshi; and Ueda, Atsushi, 5,085,064, Cl. 68-23.001.
Ueda, Shiunkichi; Suita, Tomoe; Murakami, Masahiko; and Tsuhako, Mitsutomo, to Tayca Corporation. Production and use of crystalline hydrogen-phosphate compounds having layer structure, 5,085,845, Cl. 423-308.000.
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, to Nissei ASB Machine Co., Ltd. Method for stretch blow molding and uniformly cooling a hollow heat-resistant, 5,085,822, Cl. 264-528.000.
Uehara, Takeshi: See—
Motomashi, Kazutoshi; Uehara, Takeshi; and Matsumoto, Takashi, 5,086,424, Cl. 370-58.100.
Ueno, Katunori, to Fuji Electric Co., Ltd. Method of manufacturing an insulated gate field effect transistor, 5,086,007, Cl. 437-41.000.
Ueno, Kohhei; Akagawa, Tomohiko; Hinenoya, Saburo; and Morimoto, Toshio, to Ube Industries, Ltd. Polypropylene resin composition, 5,086,109, Cl. 524-496.000.
Ueyama, Tetsuo: See—
Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, 5,085,496, Cl. 359-569.000.
Ueyoko, Kiyoshi; Mizukoshi, Yasuyoshi; Ikeda, Kazushige; and Yamada, Munemitsu, to Sumitomo Rubber Industries, Ltd. Heavy duty radial tire with a carcass turnup portion having specific dimensions, 5,085,260, Cl. 152-554.000.
Uhlendorf, Rudiger, to Heraeus Sepatech GmbH. Electrical circuit for a centrifuge, 5,086,265, Cl. 318-817.000.
Uijtewaall, Arnoldus: See—
Naef, Ferdinand; Delay, Francois; and Uijtewaall, Arnoldus, 5,086,038, Cl. 512-21.000.
Ukai, Yasuhiro; Sunata, Tomihisa; and Yukawa, Teizo, to Hosiden Electronics Co., Ltd. Liquid crystal display device having metallic bus repair layer, 5,086,347, Cl. 359-87.000.
Uken, William D.: See—
Story, Martha F.; Ragland, Glen W.; Humphries, William H.; Kohl, Lowell; and Uken, William D., 5,085,597, Cl. 439-521.000.
Um, Gregory; and Szilagyi, Andrei, to Aura Systems, Inc. Method for fabricating mirror array for optical projection system, 5,085,497, Cl. 359-848.000.
Umeda, Kiminori: See—
Kawata, Hideaki; Funato, Masatomi; Umeda, Kiminori; Kawano, Nobuaki; and Honda, Koji, 5,085,964, Cl. 430-106.600.
Umemura, Mitsuo: See—
Itoh, Kunio; Umemura, Mitsuo; and Tabei, Eiichi, 5,086,127, Cl. 525-474.000.
Umezawa, Kenichi: See—
Moriya, Yoshitaka; Nomachi, Hiroshi; Takada, Makoto; Takatsu, Yukihide; and Umezawa, Kenichi, 5,085,708, Cl. 106-819.000.
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Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Shigeyuki, 5,086,471, Cl. 381-36.000.
Unalp, Enis J.: See—
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Union Camp Corporation: See—
Mitchard, John M., 5,085,623, Cl. 493-400.000.
Union Camp Patent Holding, Inc.: See—
Griggs, Bruce F., 5,085,734, Cl. 162-19.000.
Union Carbide Chemicals & Plastics Technology Corporation: See—
Joyce, William H., 5,086,132, Cl. 526-74.000.
Union Carbide Industrial Gases Technology Corporation: See—
Leavitt, Frederick W., 5,085,674, Cl. 55-26.000.
Pelton, John F., 5,085,536, Cl. 403-343.000.
Union Fork & Hoe Company, The: See—
Seifert, Charles A.; and Bonnes, David R., 5,085,478, Cl. 294-60.000.
Union Oil Company of California: See—
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Uniroyal Goodrich Tire Company, The: See—
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Unisearch Limited: See—
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Unisys Corporation: See—
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—
Tilston, John R., 5,085,040, Cl. 60-39.827.
United States of America: See—
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Spiroff, Carl M.; Long, Lawrence J.; Winkelmann, Ward F.; and Steinmetz, Harold F., 5,085,381, Cl. 244-3.240.

- Stoffer, Lewis J.; and MacGee, Andrew, 5,085,559, Cl. 416-95.000.
- Tan, Loon-Seng; and Arnold, Fred E., 5,086,120, Cl. 525-183.000.
- Army: See—
- Gilbert, Paul A., 5,085,527, Cl. 374-14.000.
- Paoletta, Arthur, 5,086,281, Cl. 330-279.000.
- Sayles, David C., 5,085,725, Cl. 156-281.000.
- Commerce: See—
- Aaron, David A.; and Domanski, Piotr A., 5,085,058, Cl. 62-324.600.
- Energy: See—
- Atcher, Robert W.; and Hines, John J., 5,085,848, Cl. 424-1.100.
- Balachandran, Uthamalingam; Poeppel, Roger B.; Emerson, James E.; and Johnson, Stanley A., 5,086,034, Cl. 505-1.000.
- Bentley, Bill F.; Jett, James H.; Martin, John C.; and Saunders, George C., 5,085,673, Cl. 55-10.000.
- Bloch, Jeffrey J.; Roussel-Dupre, Diane; and Smith, Barham W., 5,086,443, Cl. 378-145.000.
- Pekala, Richard Walter, 5,086,085, Cl. 521-187.000.
- Health and Human Services: See—
- Trullas, Ramon; and Skolnick, Phil, 5,086,072, Cl. 514-531.000.
- National Aeronautics and Space Administration: See—
- Hayati, Samad A.; and Venkataraman, Subramanian T., 5,086,400, Cl. 395-95.000.
- Heyman, Joseph S.; Heath, D. Michele; Welch, Christopher S.; Winfree, William P.; and Miller, William E., 5,085,073, Cl. 73-147.000.
- Liebert, Curt H.; and Koch, John, Jr., 5,086,204, Cl. 219-69.170.
- Navy: See—
- Berlam, Gary R.; Bissonnette, Laurent C.; Bitsakis, Nicholas; Bodycoat, Peter R.; and Duarte, George M., 5,085,122, Cl. 89-1.810.
- Esterowitz, Leon; and Stoneman, Robert C., 5,086,432, Cl. 372-71.000.
- Lebron, Carmen A.; Karr, Leslie A.; Fernando, Tudor; and Aust, Steven D., 5,085,998, Cl. 435-262.000.
- Moyles, Mervyn W., 5,085,548, Cl. 411-316.000.
- Newman, Harvey S., 5,086,329, Cl. 357-37.000.
- Streit, Roy L.; and Striffler, Foster L., 5,086,423, Cl. 370-6.000.
- U.S. Philips Corporation: See—
- Bouwens, Henricus J. J.; and Bertram, Albert R. J., 5,085,553, Cl. 414-331.000.
- Clark, David G., 5,086,296, Cl. 340-709.000.
- Hartgring, Cornelis D.; and Cuppens, Roger, 5,086,331, Cl. 357-51.000.
- Van Der Waal, Jan, 5,086,250, Cl. 313-403.000.
- Zell, Werner; Becker, Johann A.; and Romahn, Ulrich, 5,085,493, Cl. 385-96.000.
- United Technologies Corporation: See—
- Naumec, John R.; and Faucher, Joseph E., 5,085,313, Cl. 198-659.000.
- United Technologies Motor Systems, Inc.: See—
- Beauprez, Gregory M., 5,085,004, Cl. 49-138.000.
- Universite des Sciences et Techniques du Languedoc: See—
- Baccou, Jean-Claude; Bessiere, Jean-Marie; Boisseau, Patrick; Faugetas, Pierre; Jouy, Nicholas; Peyrot, Elysabette; and Sauvage, Yves, 5,085,994, Cl. 435-148.000.
- University of Alabama/Research Foundation, The: See—
- Urry, Dan W., 5,085,055, Cl. 60-527.000.
- University of Arkansas, The Board of Trustees of the: See—
- Snyder, Harry E.; Wiese, Kurt L.; Sheu, Gueyhw; Brown, Helen G.; Nieh, Ciping; and Clark, Patricia K., 5,085,808, Cl. 260-412.400.
- University of California, The Regents of the: See—
- Ortendahl, Douglas A.; Nichols, Brenda G.; Zepeda, Ernesto; Gyon, Matthias; and Kircos, Louis T., 5,085,219, Cl. 128-653.500.
- University of Delaware: See—
- Foley, Henry C.; Varrin, Robert D., Jr.; and Sengupta, Sourav K., 5,085,885, Cl. 477-38.000.
- University of Florida Research Foundation, Inc.: See—
- Boyle, Michael D. P.; and Reis, Kathleen J., 5,085,984, Cl. 435-7.200.
- University of Miami: See—
- Awad, William M., Jr., 5,086,167, Cl. 530-416.000.
- Urry, Dan W., to University of Alabama/Research Foundation, The. Reversible mechanochemical engines comprised of bioelastomers capable of modulating inverse temperature transitions for the interconversion of chemical and mechanical work. 5,085,055, Cl. 60-527.000.
- Ushizawa, Koji; and Shigihara, Takao, to Daiichi Pure Chemicals Co., Ltd. Method and reagent for quantitative analysis of 3-oxo- β -steroid. 5,085,989, Cl. 435-26.000.
- Usui, Akio, to Mycoal Warmers Company Limited. Disposable warmer holder. 5,084,986, Cl. 36-2.600.
- Usui, Fumiaki, to Canon Kabushiki Kaisha. Color television camera optical system adjusting for chromatic aberration. 5,086,338, Cl. 358-41.000.
- Usui, Hiroshi: See—
- Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, 5,085,814, Cl. 264-126.000.
- Usui, Ikuro; Ohgi, Hirokazu; and Ogawa, Kazuhisa, to Agency of Industrial Science and Technology, The. Primary feed with central conductor defining a discharge path. 5,086,303, Cl. 343-756.000.
- Usui, Tetuo; Suzuki, Nobuo; Sakasai, Yutaka; and Oh-Ishi, Hisao, to Fuji Photo Film Co., Ltd. Wet-type electrostatic photographic transferring method. 5,085,967, Cl. 430-126.000.
- Utsumi, Yoshiyuki; and Katayama, Kazuyori, to Mitsubishi Denki Kabushiki Kaisha. Cruise control apparatus for a vehicle. 5,085,287, Cl. 180-179.000.
- Vaara, Timo: See—
- Penttila, Liisa; and Vaara, Timo, 5,085,875, Cl. 426-62.000.
- Valeo Vision: See—
- Blusseau, Eric, 5,086,376, Cl. 362-61.000.
- Van Dam, Ivan. Board game device. 5,085,440, Cl. 273-241.000.
- Van Der Hoeven, Martin A. Musculature exercising method. 5,085,429, Cl. 272-93.000.
- Van Der Puy, Michael; Nalewajek, David; Shia, George A.; and Wagner, William J., to Allied-Signal Inc. Method of fluorinating by using N-fluoropyridinium pyridine heptafluorodiborate. 5,086,190, Cl. 552-521.000.
- Van Der Waal, Jan, to U.S. Philips Corporation. Color cathode ray tube having shadow mask with some long, narrow apertures. 5,086,250, Cl. 313-403.000.
- Van Dyke, Laroy J.; and Cluff, Kenneth, to Innovative Bicycle Products, Inc. Bicycle handlebar lock. 5,085,063, Cl. 70-218.000.
- Van Herpen, Frederik C., to Aipron Promotic & Ontwilleling B.V. Door, window or panel section. 5,085,019, Cl. 52-127.100.
- van Lintel, Harald, to Westonbridge International Limited. Micropump having a constant output. 5,085,562, Cl. 417-413.000.
- Van Meir, Eugene: See—
- Huerlimann, Peter; and Van Meir, Eugene, 5,085,348, Cl. 222-153.000.
- Vanotti, Gerard L., to Etablissements Vape S.A. Screw fixing device for a concrete construction element. 5,085,547, Cl. 411-72.000.
- Van Tassel, Charles E.; and Seligman, Scott P., to Sea Quest, Inc. Weight release system. 5,085,163, Cl. 114-315.000.
- Varapath, Padmakumari J.: See—
- Halloran, Daniel J.; and Varapath, Padmakumari J., 5,085,858, Cl. 424-71.000.
- Varghese, George: See—
- Perlman, Radia J.; Varghese, George; and Lauck, Anthony G., 5,086,428, Cl. 370-94.100.
- Varian Associates, Inc.: See—
- Wells, Gregory J., 5,086,254, Cl. 315-111.210.
- Varrin, Robert D., Jr.: See—
- Foley, Henry C.; Varrin, Robert D., Jr.; and Sengupta, Sourav K., 5,085,885, Cl. 477-38.000.
- Vartanian, Roger. Spring biased vehicle access ramp. 5,085,555, Cl. 414-537.000.
- Vassilatos, George: See—
- Ekner, Okan M.; and Vassilatos, George, 5,085,774, Cl. 210-500.230.
- Vaughan, Robert A.: See—
- Emmons, Ronnie; and Vaughan, Robert A., 5,085,024, Cl. 52-717.100.
- Venables, Herbert J., IV, to Venables Machine and Tool Company, The. Spine fin heat exchanger and method and apparatus for producing same. 5,085,272, Cl. 165-184.000.
- Venables Machine and Tool Company, The: See—
- Venables, Herbert J., IV, 5,085,272, Cl. 165-184.000.
- Venkataraman, Subramanian T.: See—
- Hayati, Samad A.; and Venkataraman, Subramanian T., 5,086,400, Cl. 395-95.000.
- Ventola, Jouko, to Oy Tampella AB. Drying section in a paper or board machine and method for guiding a web therein. 5,084,985, Cl. 34-115.000.
- Verblar, Robert J.: See—
- Gibson, Joseph W., Jr.; Bart, Anthony J.; Verblar, Robert J.; and Sebastian, S. Andries R. D., 5,085,976, Cl. 430-306.000.
- Versicut, Ltd.: See—
- Jennings, Gilbert M.; Gledhill, Scott; Stock, Norman R.; and Powell, Arthur T., 5,085,008, Cl. 51-74.00R.
- Vesely, Kevin T.; and McMonagle, John J., Jr. Vandal-resistant communications station. 5,086,463, Cl. 379-388.000.
- Vetter, Kurt: See—
- Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 5,085,373, Cl. 239-690.000.
- Vetter, Manfred. Hoisting cushion with two reinforced walls. 5,085,405, Cl. 254-93.0HP.
- Vijayendran, Bheema R.: See—
- Pinschmidt, Robert K., Jr.; Vijayendran, Bheema R.; and Lai, Ta-Wang, 5,085,787, Cl. 252-8.551.
- Ville, Daniel; and Vives, Jean-Paul, to Societe Anonyme Dite Hispano-Suiza. Oil deaerator device. 5,085,677, Cl. 55-205.000.
- Vilter Manufacturing Corporation: See—
- Langouet, Luc, 5,085,518, Cl. 384-477.000.
- Vincent, Judith M.: See—
- Halloran, Daniel J.; and Vincent, Judith M., 5,085,859, Cl. 424-71.000.
- Vingmed Sound A/S: See—
- Ingebrigtsen, Kjell A.; and Aurand, William C., 5,085,221, Cl. 128-660.100.
- Vinter, Borge: See—
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- Virginia Tech Intellectual Properties, Inc.: See—
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- Viskase Corporation: See—
- Niaura, Vitas; Oxley, Jeffery A.; and Tarika, Elio E., 5,085,890, Cl. 427-149.000.
- Viskum, Hans H.: See—
- English, William J.; and Viskum, Hans H., 5,086,301, Cl. 342-188.000.
- Vives, Jean-Paul: See—
- Ville, Daniel; and Vives, Jean-Paul, 5,085,677, Cl. 55-205.000.
- Vocal Technologies, Ltd.: See—
- Hirzel, Frederic J., 5,086,454, Cl. 379-98.000.
- Vogel, Dennis E., to Minnesota Mining and Manufacturing Company. Alkoxyalkyl ester solubility inhibitors for phenolic resins. 5,085,972, Cl. 430-270.000.
- Vogelbacher, Uwe J.; Eicken, Karl; Rheinheimer, Joachim; Goetz, Norbert; Harreus, Albrecht; Paul, Gerhard; Westphalen, Karl-Otto; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Salicylaldehyde derivatives and salicylic acid derivatives and their sulfur analogs and their use as herbicides. 5,085,686, Cl. 71-92.000.
- Vogelbacher, Uwe J.: See—
- Rheinheimer, Joachim; Eicken, Karl; Vogelbacher, Uwe J.; Rohr, Wolfgang; Kuekenhoechner, Thomas; Westphalen, Karl O.; and Wuerzer, Bruno, 5,085,685, Cl. 71-92.000.
- Volkswagen AG: See—
- Hinrichsen, Uwe, 5,086,272, Cl. 324-207.130.
- Vollmer, Rudolph: See—
- Guenther, Clemens; Eck, Ralf; Heiland-Franzen, Christa; Knoll, Peter; Koenig, Winfried; Geiser, Georg; Haller, Rudolf; Brunke, Udo; and Vollmer, Rudolph, 5,086,510, Cl. 455-90.000.
- Von Duprin, Inc.: See—
- Austin, Marlin; Cain, Michael; and Haeck, Paul J., 5,085,475, Cl. 292-92.000.
- Voss, John C.: See—
- Harcloede, William H.; Zimmermann, Eugene K.; Pekich, Barry J.; Knutsen, John C.; Wiman, John V.; and Voss, John C., 5,086,078, Cl. 521-58.000.
- Vyas, Dolatrai M.; and Skonezny, Paul M., to Bristol-Myers Company. Intermediates for the production of epipodophyllotoxin and related compounds and processes for the preparation and use thereof. 5,086,182, Cl. 548-110.000.
- Vyatkin, Jury F.: See—
- Nakonechny, Anatoly Y.; Tolymbekov, Manat Z.; Ponomarenko, Alexandr G.; Radchenko, Vladimir N.; Bulyanda, Alexandr A.; Mizin, Vladimir G.; Gizatulin, Gennady Z.; and Vyatkin, Jury F., 5,085,691, Cl. 75-546.000.
- W. Schlafhorst AG & Co.: See—
- Brockmanns, Karl-Josef; Bruns, Siegfried; and Lembeck, Theo, 5,084,941, Cl. 19-151.000.
- Wachendorf-Neumann, Ulrike: See—
- Fuchs, Rainer; Wachendorf-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,086,183, Cl. 548-110.000.
- Wada, Mitsuo; and Kato, Koichi, to Polyplastics Co., Ltd. Polyester resin compositions exhibiting long-term temperature resistance, and molded articles formed of the same. 5,086,104, Cl. 524-217.000.
- Waddill, Harold G.; Su, Wei-Yang; and Speranza, George P., to Texaco Chemical Company. 1-isopropyl-2-tolylimidazole as an epoxy resin curative. 5,086,155, Cl. 528-94.000.
- Wagner, Barry K. Burglar bar breaking tool. 5,085,361, Cl. 225-102.000.
- Wagner, Eric R.: See—
- Miller, Gabriel L.; and Wagner, Eric R., 5,085,070, Cl. 73-105.000.
- Wagner, Hans M.: See—
- Bowen, Joanna; Bowers, Roderick J. W.; Purbrick, Malcolm D.; and Wagner, Hans M., 5,086,138, Cl. 526-245.000.
- Wagner Spray Tech Corporation: See—
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- Wagner, William J.: See—
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Kameoka, Kimitaka; Kuwabara, Ken-ichi; Takahashi, Toshiro; Moriuchi, Shigenori; Yagihara, Morio; Inagaki, Yoshio; and Adachi, Keiichi, 5,085,970, Cl. 430-264.000.
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Yagyu, Mineto, to Canon Kabushiki Kaisha. Photo sensor and its manufacturing method and an image reading apparatus having this photo sensor. 5,086,218, Cl. 250-208.100.
Yamada, Hisashi: See—
Iwasaki, Takeshi; and Yamada, Hisashi, 5,086,202, Cl. 219-69.120.
Yamada, Masanori, to Canon Kabushiki Kaisha. Apparatus for reading a document and processing the image. 5,086,486, Cl. 382-53.000.
Yamada, Munemitsu: See—
Ueyoko, Kiyoshi; Mizukoshi, Yasuyoshi; Ikeda, Kazushige; and Yamada, Munemitsu, 5,085,260, Cl. 152-554.000.
Yamada, Toshiaki: See—
Togo, Shizuo; Amagai, Akikazu; Kondo, Yoshinori; and Yamada, Toshiaki, 5,086,112, Cl. 525-68.000.
Yamada, Yoshikazu; and Nakano, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Device for reducing starting load on internal combustion engine. 5,085,184, Cl. 123-182.100.
Yamagami, Hiroyuki; and Aida, Shunichi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials and processing method. 5,085,979, Cl. 430-505.000.
Yamagata, Shigeru; Inaki, Kyoichi; Matsuya, Toshikazu; Takke, Ralf; Thomas, Stephan; and Fabian, Heinz, to Shin-Etsu Quartz Products Co., Ltd.; and Heraeus Quarzglas GmbH. Optical members and blanks or synthetic silica glass and method for their production. 5,086,352, Cl. 359-350.000.
Yamaguchi, Akihiro: See—
Ohta, Masahiro; Kawashima, Saburo; Iiyama, Katsuaki; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,086,125, Cl. 525-432.000.
Yamaguchi, Hideki: See—
Itani, Takaharu; Nikaido, Masaru; and Yamaguchi, Hideki, 5,085,605, Cl. 445-25.000.
Yamaguchi, Kimitoshi: See—
Nanya, Toshiki; Yamaguchi, Kimitoshi; Tsubuko, Kazuo; Takahashi, Toshihiko; Kawase, Hiromitsu; and Oikawa, Makoto, 5,085,965, Cl. 430-109.000.
Yamaguchi, Kunihiko: See—
Nambu, Hiroaki; Homma, Noriyuki; Yamaguchi, Kunihiko; Kanetani, Kazuo; Idei, Youji; Ohhata, Kenichi; Sakurai, Yoshiaki; and Etoh, Jun, 5,086,414, Cl. 365-230.080.
Yamaguchi, Takashi: See—
Watanabe, Izumi; Takamori, Tetsuya; Yokota, Kenji; and Yamaguchi, Takashi, 5,086,231, Cl. 250-557.000.
Yamaguchi, Yoshihiro: See—
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 5,086,323, Cl. 357-23.400.
Nakagawa, Akio; Watanabe, Kiminori; Koshino, Yutaka; Yamaguchi, Yoshihiro; and Baba, Yoshiro, 5,086,332, Cl. 357-51.000.

Yamaguchi, Yuichi: See—
Danzaki, Tsutomu; Iwaoka, Toshio; Yamaguchi, Yuichi; and Tsukahara, Akihiko, 5,085,286, Cl. 180-179.000.

Yamaguti, Tosiaki: See—
Iwanaga, Naruyuki; Yamaguti, Tosiaki; Fujieda, Nobuhiko; and Tsuzikawa, Yoshihiro, 5,085,752, Cl. 204-243.00R.

Yamaha Corporation: See—
Nakata, Takuya; Makita, Hitoshi; Hirakata, Takashi; and Kawasaki, Shingo, 5,085,116, Cl. 84-609.000.

Yamaha Hatsudoki Kabushiki Kaisha: See—
Kobayashi, Manabu, 5,085,186, Cl. 123-195.00R.

Yamahata, Makoto: See—
Hagiya, Toshimichi; Watanabe, Junichi; Kanno, Tetsuo; Inuzuka, Hideo; Yamahata, Makoto; Sofue, Masaaki; and Aota, Yoshiaki, 5,086,422, Cl. 369-75.100.

Yamakawa, Akira; Miyake, Masaya; Sakanoue, Hitoyuki; Takuchi, Hisao; Sogabe, Koichi; and Sasame, Akira, to Sumitomo Electric Industries, Ltd. Heat-conductive aluminum nitride sintered body and method of manufacturing the same, 5,085,923, Cl. 428-209.000.

Yamakita, Hiroyuki: See—
Katano, Mitsunori; Yamazaki, Fumio; and Yamakita, Hiroyuki, 5,085,334, Cl. 220-2.200.

Yamamoto, Akio: See—
Kitahara, Satoshi; Sugimoto, Kazuaki; Yamamoto, Akio; and Sugura, Ikuzo, 5,085,533, Cl. 400-652.000.

Yamamoto, Hironori; Matsumura, Chitoshi; and Mori, Kentaro, to NKK Corporation. Method for continuous casting of molten steel and apparatus therefor, 5,085,265, Cl. 164-468.000.

Yamamoto, Hiroshi: See—
Kamiyama, Makoto; Nakada, Shigeo; Ikeda, Kouji; Usui, Hiroshi; Sasaki, Kazutoshi; and Yamamoto, Hiroshi, 5,085,814, Cl. 264-126.000.

Yamamoto, Kazuhiko: See—
Asanuma, Tadashi; Yamamoto, Kazuhiko; Ohnaka, Junko; and Tokura, Yoshiko, 5,085,895, Cl. 427-393.500.

Yamamoto, Masahiro: See—
Adachi, Tatsuya; and Yamamoto, Masahiro, 5,086,230, Cl. 250-492.200.

Yamamoto, Naoki: See—
Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 5,086,106, Cl. 524-300.000.

Yamamoto, Shuhei; and Kato, Naoki, to Seiko Instruments Inc. Optically switching ferroelectric liquid crystal light valve, 5,085,498, Cl. 359-70.000.

Yamamoto, Tamotsu: See—
Ishihara, Yukihiko; Yamamoto, Tamotsu; and Matsui, Hiroshi, 5,086,221, Cl. 250-231.130.

Yamamoto, Tatuo: See—
Miyake, Teruyoshi; and Yamamoto, Tatuo, 5,085,416, Cl. 269-289.00R.

Yamamoto, Tomoichiro: See—
Kitagawa, Shigeo; Tachino, Kenzo; Nagata, Yasuhiro; Yamamoto, Tomoichiro; Iwata, Shigemitsu; Hirabayashi, Terumi; and Tanino, Junichi, 5,086,450, Cl. 379-40.000.

Yamanaka, Toru: See—
Okamoto, Masaru; Ichikawa, Yasunori; Inoue, Toshihide; and Yamanaka, Toru, 5,085,807, Cl. 252-609.000.

Yamasaki, Akinori; Harada, Akihiro; and Miyamoto, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing a superconducting magnet, 5,084,955, Cl. 29-599.000.

Yamasaki, Makoto; Horita, Yoshiharu; Otsubo, Takashi; Kono, Takumi; Murata, Tomozumi; Fujioka, Yuji; Chiba, Koichi; Sato, Maki; Hamada, Naoya; Arai, Shigeyoshi; Isomura, Syohei; and Kaetsu, Hayato, to Nippon Steel Chemical Co., Ltd.; Nippon Steel Corporation; and Rikagaku Kenkyusho. Process for enriching carbon 13, 5,085,748, Cl. 204-157.200.

Yamasaki, Satoru: See—
Murakami, Sadatoshi; Yamasaki, Satoru; and Harada, Tatsumi, 5,085,768, Cl. 210-222.000.

Yamashiro, Koichi: See—
Kitamura, Takayuki; and Yamashiro, Koichi, 5,085,018, Cl. 52-108.000.

Yamashita, Nobuyuki: See—
Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Jooraku, Fumio, 5,085,806, Cl. 252-518.000.

Yamate, Masato. Method for printing textile products and textile products obtained thereby, 5,085,919, Cl. 428-196.000.

Yamauchi, Junichi: See—
Omura, Ikuo; Yamauchi, Junichi; and Kawashima, Mitsunobu, 5,085,726, Cl. 156-307.300.

Yamazaki, Fumio: See—
Katano, Mitsunori; Yamazaki, Fumio; and Yamakita, Hiroyuki, 5,085,334, Cl. 220-2.200.

Yamazaki, Keiichi. Portable, assemblable-disassemblable staircase, 5,085,020, Cl. 52-183.000.

Yan, Ying D.: See—
Amin, Nurul; Bortins, John; Keel, Beat G.; and Yan, Ying D., 5,084,957, Cl. 29-603.000.

Yanadori, Michio; Fukushima, Toshihiko; and Kunugi, Yoshifumi, to Hitachi, Ltd. Heat accumulation system and method of operating the same, 5,085,271, Cl. 165-104.120.

Yanagase, Akira: See—
Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 5,086,106, Cl. 524-300.000.

Yanagi, Shigenori, to Fujitsu Limited. Optical disk apparatus for controlling second optical beam based on bias information, 5,086,419, Cl. 369-32.000.

Yang, De Q., to Yang, Yuhe. Air actuated car curtain device, 5,085,473, Cl. 296-141.000.

Yang, Shi: See—
Xiao, Han X.; and Yang, Shi, 5,086,110, Cl. 524-840.000.

Yang, Yuhe: See—
Yang, De Q., 5,085,473, Cl. 296-141.000.

Yang, Zuyin: See—
Berg, Lloyd; and Yang, Zuyin, 5,085,739, Cl. 203-18.000.

Yanni, John M.: See—
Walsh, David A.; and Yanni, John M., 5,086,055, Cl. 514-252.000.

Yano, Hisashi; Yabumoto, Junsuke; and Kitada, Akihiko, to Mitsubishi Oil Co., Ltd. Gas removal pump for liquid, 5,085,561, Cl. 417-313.000.

Yarmush, Martin L.: See—
Grimshaw, Paul E.; Grodzinsky, Alan J.; and Yarmush, Martin L., 5,085,749, Cl. 204-182.100.

Yasaitis, John A., to Analog Devices, Incorporated. Integrated circuit chip formed with a capacitor having a low voltage coefficient, and method of making such capacitor, 5,086,370, Cl. 361-313.000.

Yasuda, Eiji: See—
Kasuda, Takashi; Nishimura, Yukihiko; Hikiguchi, Shozo; Nakano, Minoru; Yasuda, Eiji; and Noguchi, Kazuo, 5,085,159, Cl. 112-246.000.

Yasuda, Hiroshi: See—
Harata, Mitsuru; and Yasuda, Hiroshi, 5,085,097, Cl. 74-552.000.

Yasuda, Makoto: See—
Okamoto, Yukio; Yasuda, Makoto; and Koga, Masataka, 5,086,255, Cl. 315-111.210.

Yasukawa, Takemasa; Iwasa, Tadanobu; and Midooka, Masanori, to Toyoda Gosei Co., Ltd. Weather strip for motor vehicle, 5,085,005, Cl. 49-377.000.

Yasukawa, Yoshikazu; and Inagaki, Norihiro, to Kurabe Industrial Co., Ltd. Gas-sensitive device, 5,086,286, Cl. 338-34.000.

Yasunaka, Shinsaku: See—
Hisao, Nakagawa; Yasunaka, Shinsaku; and Morita, Masato, 5,084,967, Cl. 30-34.100.

Yasutomi, Yoshiyuki; Miyoshi, Tadahiko; Sobue, Masahisa; Yamashita, Nobuyuki; Nagase, Hiroshi; Tanno, Kiyohiko; Arimoto, Shoji; and Jooraku, Fumio, to Hitachi, Ltd. Conductive material and process for preparing the same, 5,085,806, Cl. 252-518.000.

Yazaki Corporation: See—
Maejima, Toshiro; Sakurai, Kazuaki; Kozono, Seiji; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,085,599, Cl. 439-595.000.

Yee, Dan: See—
Puri, Rajen; and Yee, Dan, 5,085,274, Cl. 166-252.000.

Yeh, Richard C.; and Ju, Shiao T., to Exxon Chemical Patents Inc. Process of recovering and conveying shaped polymer extrudate, 5,085,815, Cl. 264-142.000.

Yeiser, Andrew J.: See—
Adamson, Phil A.; and Yeiser, Andrew J., 5,085,309, Cl. 194-317.000.

Yeomans, Michael A., to AMP Incorporated. Apparatus for terminating wires to terminals, 5,084,960, Cl. 29-753.000.

Yerman, Alexander J.; and Ngo, Khai D., to General Electric Company. Method of making conductive film magnetic components, 5,084,958, Cl. 29-606.000.

Yokoo, Akihiko: See—
Tsuru, Sumiaki; Yokoo, Akihiko; Ichitsuka, Takeshi; and Hiraide, Tsuneo, 5,085,781, Cl. 210-692.000.

Yokota, Hiroaki: See—
Imamura, Hiroyuki; Kurata, Takafumi; Yokota, Hiroaki; and Noguchi, Naovuki, 5,085,301, Cl. 192-0.076.

Yokota, Kenji: See—
Watanabe, Izumi; Takamori, Tetsuya; Yokota, Kenji; and Yamaguchi, Takashi, 5,086,231, Cl. 250-557.000.

Yokouchi, Atsushi; and Yabe, Toshikazu, to Nippon Seiko Kabushiki Kaisha. Ferrofluid compositions, 5,085,789, Cl. 252-62.520.

Yoneda, Kou: See—
Oda, Hitoshi; Ono, Takeo; Yoneda, Kou; Sasaki, Toyoshige; and Miyawaki, Mamoru, 5,086,409, Cl. 365-10.000.

Yonehara, Takao: See—
Shinohara, Mahito; and Yonehara, Takao, 5,086,326, Cl. 357-30.000.

Yonezawa, Takashi: See—
Kii, Katsuya; Katada, Kunio; Okuyama, Yuji; and Yonezawa, Takashi, 5,085,458, Cl. 280-707.000.

Yoshida, Akio: See—
Kurabayashi, Ken; Tsuchiya, Yoshinobu; Yoshida, Akio; Koizumi, Hitoshi; and Niida, Yoriaki, 5,086,373, Cl. 361-502.000.

Yoshida, Hitoshi; Kanegae, Takahiro; and Kawamoto, Naoyuki, to Brother Kogyo Kabushiki Kaisha. Apparatus for converting outline data into dot data, having means for assuring continuity of visible representations reproduced by the dot data, 5,086,481, Cl. 382-22.000.

Yoshida, Kazunaga, to NEC Corporation. Continuous speech recognition apparatus, 5,086,472, Cl. 381-43.000.

Yoshida, Tadashi: See—
Katayama, Akihiro; Yoshida, Tadashi; Hirabayashi, Yasuji; and Maeda, Mitsuru, 5,086,487, Cl. 382-56.000.

Yoshida, Yoshihiro: See—
Hayashi, Tsutomu; Koga, Horitaka; Katahira, Kiyoshi; Hojo, Atuo; Ito, Toshifumi; Saito, Mitsuru; Nakajima, Yoshihiro; Miyazawa, Shinkichi; and Yoshida, Yoshihiro, 5,085,053, Cl. 60-488.000.

Yoshida, Yoshio; Miyake, Takahiro; Nakata, Yasuo; Kurata, Yukio; Ogata, Nobuo; Ueyama, Tetsuo; and Sato, Hideaki, to Sharp Kabushiki Kaisha. Optical element and optical pickup device comprising it, 5,085,496, Cl. 359-569.000.

Yoshikawa, Kunio: See—
Shiota, Susumu; and Yoshikawa, Kunio, 5,086,234, Cl. 290-52.000.

Yoshikawa, Minoru, to Micro Gijutsu Kenkyujo Co., Ltd. Method of mounting circuit on substrate and circuit substrate for use in the method, 5,084,961, Cl. 29-840.000.

Yoshimoto, Michiaki: See—
Ikada, Yoshito; Okada, Toshiyuki; Kawai, Tatsuya; and Yoshimoto, Michiaki, 5,085,632, Cl. 604-29.000.

Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, to Canon Kabushiki Kaisha. Liquid storage container preventing liquid backflow, 5,085,355, Cl. 222-564.000.

Yoshinaga, Kenji: See—
Itoh, Kiichi; Shibano, Takeshi; and Yoshinaga, Kenji, 5,086,133, Cl. 526-93.000.

Yoshioka, Hiroshi: See—
Morimoto, Takashi; and Yoshioka, Hiroshi, 5,086,145, Cl. 528-14.000.

Yoshioka, Hitoshi: See—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,086,381, Cl. 363-16.000.

Yoshizu, Fumitsugu, to Diesel Kiki Co., Ltd. Injection timing control device for distributor-type fuel injection pumps, 5,085,195, Cl. 123-502.000.

Youcheff, Gary G.; Wodke, Stephen M.; and Perkins, Douglas W., to Mars, Incorporated. Composition and method for improving adherence of fat-based coatings to frozen fat-based confections, 5,085,877, Cl. 426-100.000.

Young, James R.: See—
Peppers, Norman A.; Myers, Gregory K.; Young, James R.; and Katsuki, Kazuo, 5,086,490, Cl. 382-65.000.

Young, Jerry D.; Kester, Jeffrey J.; Wehmeier, Thomas J.; Fox, Mary M.; and Letton, James C., to Procter & Gamble Company, The. Reduced calorie potato chips and other low moisture fat-containing foods having less waxiness and improved flavor display, 5,085,884, Cl. 426-611.000.

Young, John M.: See—
Dymond, James H.; Saidi, Nick N.; and Young, John M., 5,086,246, Cl. 310-269.000.

Young, Jonathan, to Paccar Inc. Independent front air suspension apparatus and method, 5,085,457, Cl. 280-693.000.

Youssefeh, Raymond D.: See—
Powers, Matthew R.; Youssefeh, Raymond D.; Studt, William L.; and Golec, Frederick A., 5,086,179, Cl. 546-133.000.

Yu, Chang, to Micron Technology, Inc. Temperature and pressure measuring technique using the photoacoustic effect and mechanical resonance, 5,085,080, Cl. 73-579.000.

Yu, Frank: See—
Teng, Chin-Hung; Zon, Lin-chang; and Yu, Frank, 5,085,239, Cl. 135-25.330.

Yu, Kenneth K.; and Berglund, C. Neil, to Northwest Technology Corp. Automated system for extracting design and layout information from an integrated circuit, 5,086,477, Cl. 382-8.000.

Yuda, Hideaki: See—
Sugawara, Saburo; Takahashi, Toshiharu; Yuda, Hideaki; and Shirayanagi, Moriyasu, 5,085,977, Cl. 430-321.000.

Yukawa, Teizo: See—
Ukai, Yasuhiro; Sunata, Tomihisa; and Yukawa, Teizo, 5,086,347, Cl. 359-87.000.

Yun, David I.; Fang, Que-Tsang; and Wei-Berk, Caroline, to Aluminum Company of America. Production of metal matrix composites reinforced with polymer fibers, 5,085,945, Cl. 428-614.000.

Yura, Shuichi: See—
Kinumura, Akira; Koretomo, Katsuhiko; Yura, Shuichi; Kuwano, Tatsuhiko; and Kimura, Tsuguyuki, 5,085,009, Cl. 51-131.100.

Yutaka Electric Mfg. Co., Ltd.: See—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,086,381, Cl. 363-16.000.

Yuza, Yasutada: See—
Arikawa, Hiroo; and Yuza, Yasutada, 5,086,285, Cl. 337-231.000.

Yves Saint Laurent Parfums: See—
Duchoud, Christian; and Briece, Serge, 5,084,984, Cl. 34-48.000.

Zaelke, Arnold E.: See—
Muller, Frank A.; and Zaelke, Arnold E., 5,085,696, Cl. 106-14.160.

Zahler, Wolf-Dietrich: See—
Jochum, Peter; Gasser, Oswald; Zahler, Wolf-Dietrich; Lechner, Gunther; Guggenberger, Rainer; and Ellrich, Klaus, 5,086,148, Cl. 528-15.000.

Zalisz, Rene: See—
Bonfils, Armelle; Smets, Pierre; and Zalisz, Rene, 5,086,040, Cl. 514-8.000.

Zanchi, Dale E. Drip collar for a paint brush, 5,084,932, Cl. 15-248.00R.

Zavaskin, Linda; and Reid, Philip L., to Zavaskin, Linda. Plaster cast mold and liner, 5,085,211, Cl. 600-8.000.

Zealey, Gavin R.: See—
Klein, Michel H.; Boux, Heather A.; Cockle, Stephen A.; Loosmore, Sheena M.; and Zealey, Gavin R., 5,085,862, Cl. 424-92.000.

Zeisloft, Jane M.: See—
Kircher, Joseph J.; Zeisloft, Jane M.; and Martucci, James, 5,085,256, Cl. 141-083.000.

Zell, Werner; Becker, Johann A.; and Romahn, Ulrich, to U.S. Philips Corporation. Method of simultaneously splicing by fusion welding several pairs of optical wave guides, 5,085,493, Cl. 385-96.000.

Zelle, Robert E.: See—
DeBernardis, John F.; Zelle, Robert E.; and Basha, Fatima Z., 5,086,074, Cl. 514-649.000.

Zeller, Heinz: See—
Rutz, Andreas; Langer, Rudolf; Becher, Hubert; Buttenbender, Klaus; and Zeller, Heinz, 5,084,949, Cl. 26-72.000.

Zenith Electronics Corporation: See—
Capek, Raymond G.; Greiner, Siegfried M.; and Hutton, Robert F., 5,086,251, Cl. 313-407.000.

Citta, Richard W.; and Eilers, Carl G., 5,086,340, Cl. 358-141.000.

Kaplan, Sam; and Adler, Robert, 5,085,606, Cl. 445-30.000.

Zepeda, Ernesto: See—
Ortendahl, Douglas A.; Nichols, Brenda G.; Zepeda, Ernesto; Gyor, Matthias; and Kircos, Louis T., 5,085,219, Cl. 128-653.500.

Zhang, Zhong-Huai: See—
Mohamed, Mansour H.; and Zhang, Zhong-Huai, 5,085,252, Cl. 139-22.000.

Zimble, Alan W. Dental medicament applicator and method of use, 5,085,585, Cl. 433-80.000.

Zimmermann, Eugene K.: See—
Harclerode, William H.; Zimmermann, Eugene K.; Pekich, Barry J.; Knutsen, John C.; Wiman, John V.; and Voss, John C., 5,086,078, Cl. 521-58.000.

Zimmermann, Walter, to Siemens Aktiengesellschaft. Measuring mount for microwave components, 5,086,268, Cl. 324-158.00F.

Zimmern, Bernard. Process to cut hour glass screws, 5,084,965, Cl. 29-889.230.

Zinser Textilmaschinen GmbH: See—
Guttler, Hermann, 5,085,378, Cl. 242-172.000.

Zip-Pak Incorporated: See—
McDonald, Daniel P., 5,085,031, Cl. 53-412.000.

Ziu, Christopher G., to Double Containment Systems. Double containment pipe joint assembly, 5,085,471, Cl. 285-133.100.

Zon, Lin-chang: See—
Teng, Chin-Hung; Zon, Lin-chang; and Yu, Frank, 5,085,239, Cl. 135-25.330.

Zupancic, Joseph J.; Blazej, Daniel C.; and Fraenkel, Howard A., to Allied-Signal Inc. Photodefinable interlevel dielectrics, 5,085,886, Cl. 427-43.100.

Zusi, F. Christopher: See—
Haley, Neil F.; Nair, Xina; Gendimenico, Gerard J.; Zusi, F. Christopher; and Swann, R. Thomas, 5,086,060, Cl. 514-294.000.

Zweckform Etikettiertechnik GmbH: See—
Ast, Hans-Peter; Paech, Eberhard; and Amberger, Werner, 5,085,906, Cl. 428-36.920.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF FEBRUARY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bradley, Robert O.; Knighton, Heywood J., deceased (by Steitz, William R., legal representative); and Naveaux, Robert J., to Toledo Engineering Co., Inc. Manifold inputs and outputs for furnace regenerators. Re. 33,814, Cl. 432-181.000.
- Gonda, Michihiro: See—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, Re. 33,815, Cl. 503-214.000.
- Harry Major Machine & Tool Co.: See—
Miller, Jack E., Re. 33,811, Cl. 198-803.200.
- Hodogaya Chemical Co., Ltd.: See—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, Re. 33,815, Cl. 503-214.000.
- Kanasugi, Mikiko: See—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, Re. 33,815, Cl. 503-214.000.
- Knighton, Heywood J., deceased: See—
Bradley, Robert O.; Knighton, Heywood J., deceased; and Naveaux, Robert J., Re. 33,814, Cl. 432-181.000.
- Korner, Ernst-Moritz: See—
von der Heide, Johann; Muller, Rolf; and Korner, Ernst-Moritz, Re. 33,813, Cl. 310-51.000.
- Miller, Jack E., to Harry Major Machine & Tool Co. Accumulating conveyor. Re. 33,811, Cl. 198-803.200.
- Muller, Rolf: See—
von der Heide, Johann; Muller, Rolf; and Korner, Ernst-Moritz, Re. 33,813, Cl. 310-51.000.
- Naveaux, Robert J.: See—
Bradley, Robert O.; Knighton, Heywood J., deceased; and Naveaux, Robert J., Re. 33,814, Cl. 432-181.000.
- Papst-Motoren GmbH & Co. KG: See—
von der Heide, Johann; Muller, Rolf; and Korner, Ernst-Moritz, Re. 33,813, Cl. 310-51.000.
- Satoh, Yutaka: See—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, Re. 33,815, Cl. 503-214.000.
- Schneider, Norbert. Diffuser for aeration basin. Re. 33,812, Cl. 261-62.000.
- Steitz, William R., legal representative: See—
Bradley, Robert O.; Knighton, Heywood J., deceased; and Naveaux, Robert J., Re. 33,814, Cl. 432-181.000.
- Strieter, Jerome F. Portable isolation enclosure for use in cleaning contaminated environments. Re. 33,810, Cl. 134-99.000.
- Toledo Engineering Co., Inc.: See—
Bradley, Robert O.; Knighton, Heywood J., deceased; and Naveaux, Robert J., Re. 33,814, Cl. 432-181.000.
- von der Heide, Johann; Muller, Rolf; and Korner, Ernst-Moritz, to Papst-Motoren GmbH & Co. KG. Electric motor, particularly a brushless direct current motor. Re. 33,813, Cl. 310-51.000.
- Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, to Hodogaya Chemical Co., Ltd. Heat sensitive record sheet. Re. 33,815, Cl. 503-214.000.

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- ESPE Stiftung & Co. Produktions- und Vertriebs KG: See—
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- Guggenberger, Rainer: See—
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- Hennenfent, Douglas J.; and Holmstrand, Allan L. Magnetic transducer head core manufacturing method. B1 3,982,318, 2-4-92, Cl. 29-603.000.
- Holmstrand, Allan L.: See—
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- Purmann, Robert; Guggenberger, Rainer; and Pieper, Gunter, to ESPE Stiftung & Co. Produktions- und Vertriebs KG. Shapable material and shaped articles obtainable therefrom. B1 4,927,866, 2-4-92, Cl. 523-115.000.

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- Alexander, Ben L.: See—
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- Alexander, H. Hayes; and Alexander, Ben L. Combination holder and dispenser for paper rolls. 323,595, 2-4-92, Cl. D6-518.000.
- Ambrose, Randy, to H.K. Research & Development, Inc. Magnetic water softener. 323,699, 2-4-92, Cl. D23-207.000.
- American Ball Manufacturing Corporation: See—
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- American Recreation Products, Inc.: See—
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- Arai, Takuya; and Tutssel, Glenn, to Fuji Photo Film Co., Ltd. Box for a roll of film. 323,618, 2-4-92, Cl. D9-432.000.
- Arioka, Tetsuya, and Hata, Hideo, to Terumo Kabushiki Kaisha. Bulb for sphygmomanometer. 323,713, 2-4-92, Cl. D24-165.000.
- Arnold Kock GmbH u. Co. KG: See—
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- Berg, Lawrence R., to Particle Data, Inc. Cabinet for dual particle and cell analysis or similar article. 323,631, 2-4-92, Cl. D10-74.000.
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- Blake, Keven L. Door-mounted mailbox. 323,731, 2-4-92, Cl. D99-33.000.
- Bodurow, Constance C.; Murphy, Larry D.; and Perry, Gordon R., to Commercial and Architectural Products Company, Inc. Merchandising display wall standard. 323,715, 2-4-92, Cl. D25-119.000.
- Boese, Thomas; and Larsen, Orville, to Greenlee Trextron Inc. Cable shielding cutter. 323,608, 2-4-92, Cl. D8-98.000.
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- Burney, William C. Carrier for mattress or box springs. 323,730, 2-4-92, Cl. D34-28.000.
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Primucci, Joseph; Hubel, Vello; and Gardiner, Alexander M., 323,702, Cl. D23-277.000.
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- Suzuki, Masaji; Sugata, Shoichi; and Ichida, Kiyofumi, to Sumitomo Wiring Systems, Ltd. Housing for an electrical connector. 323,646, 2-4-92, Cl. D13-147.000.
- Symons Corporation: *See—*
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- Wada, Mitsuo, to Seikosha Co., Ltd. Travel alarm clock. 323,621, 2-4-92, Cl. D10-15.000.
- Wakamatsu, Masamichi, to Casio Computer Co., Ltd. Wrist watch. 323,623, 2-4-92, Cl. D10-38.000.
- Walser, Ernst; and Barkhausen, Kurt, to Samarit Medizintechnik Aktiengesellschaft. Patient transporter. 323,636, 2-4-92, Cl. D12-128.000.
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- Wang, Jui-Shang, to Duracraft Corporation. Portable electrical fan. 323,708, 2-4-92, Cl. D23-382.000.
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- Weiland, Martha M. Waste receptacle. 323,729, 2-4-92, Cl. D34-9.000.
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- Whitney, Denzil E. Golf putter head. 323,688, 2-4-92, Cl. D21-219.000.
- Wilde, Alex, to Damixa A/S. Faucet. 323,700, 2-4-92, Cl. D23-241.000.
- Wilfong, Harry B., Jr.; and Haenni, Edwin W., to Sonoco Products Company. Nozzle for a plastic bag dispenser. 323,619, 2-4-92, Cl. D9-447.000.
- Wilson Sporting Goods Co.: *See—*
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- Hlinka, Edward A., 323,690, Cl. D21-220.000.
- Winslow, David L., to Mariol, James F. Combined flashlight and insect viewing container. 323,674, 2-4-92, Cl. D19-62.000.
- Wyatt, Philip; and Pescovitz, Michael R., to Migada, Inc. Combined guard and injection site for intravenous infusion or the like. 323,709, 2-4-92, Cl. D24-129.000.
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- Yamamoto, Yoshiro, to Tokyo Electric Company, Ltd. Mark reader for cash register. 323,648, 2-4-92, Cl. D14-105.000.
- Yamazaki, Sakae: *See—*
Kasai, Masaaki; Yamazaki, Sakae; and Senshu, Kazuhisa, 323,710, Cl. D24-130.000.
- Yashiro, Youichirou: *See—*
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- Yu, Jae G., to Gold Star Co., Ltd. Camera. 323,666, 2-4-92, Cl. D16-200.000.
- Zollers, Timothy E.: *See—*
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- Zwicker, Fred, to Truman's Inc. Sandblasting gun. 323,607, 2-4-92, Cl. D8-68.000.
- Zwicker, Fred, to Skat Blast. Sandblasting cabinet. 323,661, 2-4-92, Cl. D15-124.000.
- 2549-1622 Quebec Inc.: *See—*
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LIST OF PLANT PATENTEEES

- DeCoster, Paul. Philodendron plant named Splendor. 7,782, 2-4-92, Cl. 88.000.
- Holtkamp, Reinhold, Sr. African violet plant named Emilie. 7,780, 2-4-92, Cl. 69.000.
- Royal Sluis: *See—*
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- Van Staaveren B.V.: *See—*
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- van Andel, Jacob, to Van Staaveren B.V. Carnation named Stacorpi. 7,781, 2-4-92, Cl. 71.000.
- Wilms, His J., to Royal Sluis. Dahlia plant named Linda. 7,779, 2-4-92, Cl. 68.000.

LIST OF
STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE
4TH DAY OF FEBRUARY, 1992

- Briggs, Donald D.: *See—*
Holden, Geoffrey; Briggs, Donald D.; and Donaho, Charles R., H1022, Cl. 524-474.000.
- Donaho, Charles R.: *See—*
Holden, Geoffrey; Briggs, Donald D.; and Donaho, Charles R., H1022, Cl. 524-474.000.
- Feldman, Lyudmila; and Kiser, T. Kay, to Mead Corporation, The. Method for forming images on plain paper. H1019, 2-4-92, Cl. 430-138.000.
- Gergen, William P.: *See—*
Machado, Joseph M.; and Gergen, William P., H1021, Cl. 524-494.000.
- Holden, Geoffrey; Briggs, Donald D.; and Donaho, Charles R., to Shell Oil Company. Soft paintable polymer composition. H1022, 2-4-92, Cl. 524-474.000.
- Kiser, T. Kay: *See—*
Feldman, Lyudmila; and Kiser, T. Kay, H1019, Cl. 430-138.000.
- Konica Corporation: *See—*
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- Machado, Joseph M.; and Gergen, William P., to Shell Oil Company. Reinforced polymer blends. H1021, 2-4-92, Cl. 524-494.000.
- Mead Corporation, The: *See—*
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- Nishio, Syoji; and Yoshida, Kazuhiro, to Konica Corporation. Developing solution for light-sensitive silver halide photographic material and method of forming photographic image making use of it. H1020, 2-4-92, Cl. 430-440.000.
- Shell Oil Company: *See—*
Holden, Geoffrey; Briggs, Donald D.; and Donaho, Charles R., H1022, Cl. 524-474.000.
- Machado, Joseph M.; and Gergen, William P., H1021, Cl. 524-494.000.
- Yoshida, Kazuhiro: *See—*
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NOTE.—First number, class; second number, subclass; third number, patent number

79	CLASS 2	133	5,084,973	227	5,085,678	475	5,085,096	30	5,085,697	661.09	5,085,220
115	5,084,914	201	5,084,974	CLASS 56	552	5,085,097	20	5,085,698	675	5,085,223	
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568	5,085,669	508,995	591	345	5,085,053	609	65	5,085,167	258	5,085,248	
		CLASS 14	71.5	2	5,085,060	615	65	5,085,168		5,085,249	
		508,996		CLASS 65	635	5,085,111	126	5,085,169	CLASS 136	5,085,250	
3.53	5,084,937	508,997		1	5,085,679	724	205	5,085,170	CLASS 137	5,085,251	
98	5,084,938	508,998		118	5,085,680	737	303	5,085,171	1	5,085,252	
244.1	5,084,939	508,999		CLASS 68	23.001	5,085,121	653	5,085,172	13	5,085,253	
248 R	5,084,940	508,1000		CLASS 70	218	5,085,122		5,085,173	118	5,085,254	
250.32	5,084,941	508,1001		225	5,085,123	1.8	14.09	5,085,174	240	5,085,255	
325	5,084,934	508,1002		276	5,085,124	4.2	53.5	5,085,175	454.5	5,085,256	
385	B1 4,178,654	508,1003		225	5,085,125	CLASS 91	169	5,085,176	504	5,085,257	
		508,1004		226	5,085,126	CLASS 92	171	5,085,177	601	5,085,258	
84	CLASS 16	508,939		227	5,085,127	CLASS 93		5,085,178	625.48	5,085,259	
110 R	5,084,940	508,940		228	5,085,128	CLASS 94		5,085,179	879	5,085,260	
		508,941		229	5,085,129	CLASS 95		5,085,180		5,085,261	
151	5,084,941	508,942		230	5,085,130	CLASS 96		5,085,181	CLASS 138	5,085,262	
200	5,084,942	508,943		231	5,085,131	CLASS 97		5,085,182	44	5,085,263	
		508,944		232	5,085,132	CLASS 98		5,085,183	119	5,085,264	
302 R	5,085,670	508,945		233	5,085,133	CLASS 99		5,085,184		5,085,265	
		508,946		234	5,085,134	CLASS 100		5,085,185	CLASS 139	5,085,266	
		508,947		235	5,085,135	CLASS 101		5,085,186	22	5,085,267	
3 L	5,084,943	508,948		236	5,085,136	CLASS 102		5,085,187	50	5,085,268	
453	5,084,944	508,949		237	5,085,137	CLASS 103		5,085,188		5,085,269	
530	5,084,945	508,950		238	5,085,138	CLASS 104		5,085,189	1	5,085,270	
625	5,084,946	508,951		239	5,085,139	CLASS 105		5,085,190	39	5,085,271	
658	5,084,947	508,952		240	5,085,140	CLASS 106		5,085,191	86	5,085,272	
		508,953		241	5,085,141	CLASS 107		5,085,192	2083	5,085,273	
		508,954		242	5,085,142	CLASS 108		5,085,193	207	5,085,274	
		508,955		243	5,085,143	CLASS 109		5,085,194		5,085,275	
		508,956		244	5,085,144	CLASS 110		5,085,195	CLASS 140	5,085,276	
		508,957		245	5,085,145	CLASS 111		5,085,196	19.9	5,085,277	
		508,958		246	5,085,146	CLASS 112		5,085,197		5,085,278	
		508,959		247	5,085,147	CLASS 113		5,085,198	CLASS 141	5,085,279	
		508,960		248	5,085,148	CLASS 114		5,085,199	209 R	5,085,280	
		508,961		249	5,085,149	CLASS 115		5,085,200	554	5,085,281	
		508,962		250	5,085,150	CLASS 116		5,085,201		5,085,282	
		508,963		251	5,085,151	CLASS 117		5,085,202	CLASS 142	5,085,283	
		508,964		252	5,085,152	CLASS 118		5,085,203		5,085,284	
		508,965		253	5,085,153	CLASS 119		5,085,204	CLASS 143	5,085,285	
		508,966		254	5,085,154	CLASS 120		5,085,205	209 R	5,085,286	
		508,967		255	5,085,155	CLASS 121		5,085,206	554	5,085,287	
		508,968		256	5,085,156	CLASS 122		5,085,207		5,085,288	
		508,969		257	5,085,157	CLASS 123		5,085,208	CLASS 144	5,085,289	
		508,970		258	5,085,158	CLASS 124		5,085,209		5,085,290	
		508,971		259	5,085,159	CLASS 125		5,085,210	CLASS 145	5,085,291	
		508,972		260	5,085,160	CLASS 126		5,085,211		5,085,292	
		508,973		261	5,085,161	CLASS 127		5,085,212	CLASS 146	5,085,293	
		508,974		262	5,085,162	CLASS 128		5,085,213		5,085,294	
		508,975		263	5,085,163	CLASS 129		5,085,214	CLASS 147	5,085,295	
		508,976		264	5,085,164	CLASS 130		5,085,215		5,085,296	
		508,977		265	5,085,165	CLASS 131		5,085,216	CLASS 148	5,085,297	
		508,978		266	5,085,166	CLASS 132		5,085,217		5,085,298	
		508,979		267	5,085,167	CLASS 133		5,085,218	CLASS 149	5,085,299	
		508,980		268	5,085,168	CLASS 134		5,085,219		5,085,300	
		508,981		269	5,085,169	CLASS 135		5,085,220	CLASS 150	5,085,301	
		508,982		270	5,085,170	CLASS 136		5,085,221		5,085,302	
		508,983		271	5,085,171	CLASS 137		5,085,222	CLASS 151	5,085,303	
		508,984		272	5,085,172	CLASS 138		5,085,223		5,085,304	
		508,985		273	5,085,173	CLASS 139		5,085,224	CLASS 152	5,085,305	
		508,986		274	5,085,174	CLASS 140		5,085,225		5,085,306	
		508,987		275	5,085,175	CLASS 141		5,085,226	CLASS 153	5,085,307	
		508,988		276	5,085,176	CLASS 142		5,085,227		5,085,308	
		508,989		277	5,085,177	CLASS 143		5,085,228	CLASS 154	5,085,309	
		508,990		278	5,085,178	CLASS 144		5,085,229		5,085,310	
		508,991		279	5,085,179	CLASS 145		5,085,230	CLASS 155	5,085,311	
		508,992		280	5,085,180	CLASS 146		5,085,231		5,085,312	
		508,993		281	5,085,181	CLASS 147		5,085,232	CLASS 156	5,085,313	
		508,994		282	5,085,182	CLASS 148		5,085,233		5,085,314	
		508,995		283	5,085,183	CLASS 149		5,085,234	CLASS 157	5,085,315	
		508,996		284	5,085,184	CLASS 150		5,085,235		5,085,316	
		508,997		285	5,085,185	CLASS 151		5,085,236	CLASS 158	5,085,317	
		508,998		286	5,085,186	CLASS 152		5,085,237		5,085,318	
		508,999		287	5,085,187	CLASS 153		5,085,238	CLASS 159	5,085,319	
		509,000		288	5,085,188	CLASS 154		5,085,239		5,085,320	
		509,001		289	5,085,189	CLASS 155		5,085,240	CLASS 160	5,085,321	
		509,002		290	5,085,190	CLASS 156		5,085,241		5,085,322	
		509,003		291	5,085,191	CLASS 157		5,085,242	CLASS 161	5,085,323	
		509,004		292	5,085,192	CLASS 158		5,085,243		5,085,324	
		509,005		293	5,085,193	CLASS 159		5,085,244	CLASS 162	5,085,325	
		509,006		294	5,085,194	CLASS 160		5,085,245		5,085,326	
		509,007		295	5,085,195	CLASS 161		5,085,246	CLASS 163	5,085,327	
		509,008		296	5,085,196	CLASS 162		5,085,247		5,085,328	
		509,009		297	5,085,197	CLASS 163		5,085,248	CLASS 164	5,085,329	
		509,010		298	5,085,198	CLASS 164		5,085,249		5,085,330	
		509,011		299	5,085,199	CLASS 165		5,085,250	CLASS 165	5,085,331	
		509,012		300	5,085,200	CLASS 166		5,085,251		5,085,332	
		509,013		301	5,085,201	CLASS 167		5,085,252	CLASS 166	5,085,333	
		509,014		302	5,085,202	CLASS 168		5,085,253		5,085,334	
		509,015		303	5,085,203	CLASS 169		5,085,254	CLASS 167	5,085,335	
		509,016		304	5,085,204	CLASS 170		5,085,255		5,085,336	
		509,017		305	5,085,205	CLASS 171		5,085,256	CLASS 168	5,085,337	
		509,018		306	5,085,206	CLASS 172		5,08			

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CLASS 464			12	5,086,040	CLASS 522			474	5,086,126	416	5,086,167	13	5,085,626				
27	5,085,617	16	5,086,041	25	5,086,086	CLASS 523			537	5,086,127	CLASS 534			14	5,085,627		
185	5,085,618	25	5,086,042	84	5,086,087	B1 4,927,866				5,086,128	579	5,086,168	25	5,085,628			
CLASS 474			51	5,086,044	170	5,086,088	CLASS 526				5,086,130	CLASS 536			41	5,085,209	
138	5,085,619	61	5,086,045	CLASS 524			68	5,086,131	CLASS 540			CLASS 602				5,085,210	
152	5,085,620	177	5,086,047	115	5,086,093	130	5,086,089	74	5,086,132	27	5,086,169	26	5,085,629	CLASS 604			
160	5,085,621	187	5,086,048	414	5,086,090	414	5,086,092	93	5,086,133	303	5,086,170	8	5,085,630	5,085,632			
CLASS 477			212	5,086,050	5,086,094			126	5,086,134			28	5,085,631	5,085,633			
38	5,085,885	228.2	5,086,051	415	5,086,091	5,086,091			151	5,086,135	CLASS 544			5,085,634			
CLASS 493			231.5	5,086,052	CLASS 524			177	5,086,136	144	5,086,171	29	5,085,635	5,085,636			
400	5,085,623	239.2	5,086,054	5,086,093			208	5,086,137	180	5,086,172	35	5,085,637	5,085,638				
413	5,085,624	252	5,086,055	28	5,086,096	5,086,096			245	5,086,138	211	5,086,173	5,085,639				
444	5,085,625	253	5,086,056	36	5,086,095	5,086,097			262	5,086,139	213	5,086,174	5,085,640				
CLASS 501			267	5,086,057	91	5,086,098	5,086,098			274	5,086,140	221	5,086,175	5,085,641			
94	5,086,019	282	5,086,058	94	5,086,099	5,086,099			279	5,086,141	251	5,086,176	5,085,642				
105	5,086,020	294	5,086,059	108	5,086,100	5,086,100			318	5,086,142	320	5,086,177	5,085,643				
137	5,086,021	309	5,086,060	188	5,086,101	5,086,101			320	5,086,143	351	5,086,178	5,085,644				
CLASS 502			321	5,086,062	5,086,102			313	5,086,144	CLASS 546			134	5,085,645			
60	5,086,022	326	5,086,063	5,086,103			CLASS 527			133	5,086,179	152	5,085,646	5,085,647			
103	5,086,023	365	5,086,064	5,086,104			CLASS 528			172	5,086,180	153	5,085,648	5,085,649			
117	5,086,024	372	5,086,065	217	5,086,105	5,086,105			14	5,086,145	310	5,086,181	167	5,085,650	5,085,651		
159	5,086,025	377	5,086,066	300	5,086,106	5,086,106			15	5,086,146	CLASS 548			175	5,085,652		
166	5,086,026	381	5,086,067	424	5,086,107	5,086,107				5,086,147	110	5,086,182	192	5,085,653	5,085,654		
170	5,086,027	398	5,086,068	440	5,086,108	5,086,108				5,086,148	246	5,086,183	198	5,085,655	5,085,656		
241	5,086,028	399	5,086,069	492	5,086,109	5,086,109			45	5,086,149	303	5,086,184	282	5,085,657	5,085,658		
	5,086,029	418	5,086,070	496	5,086,110	5,086,110			49	5,086,150	468	5,086,185	298	5,085,659	5,085,659		
	5,086,030	468	5,086,071	840	5,086,111	CLASS 525			53	5,086,151	CLASS 549			333	5,085,660		
251	5,086,031	531	5,086,072	61	5,086,112	5,086,112			55	5,086,152	9	5,086,187	370	5,085,661	5,085,661		
315	5,086,032	602	5,086,073	68	5,086,113	5,086,113			68	5,086,153	246	5,086,188	358	5,085,662	5,085,662		
432	5,086,033	649	5,086,074	84	5,086,114	5,086,114			73	5,086,154	531	5,086,189	389	5,085,663	5,085,663		
CLASS 503			714	5,086,075	123	5,086,115	5,086,115			108	5,086,155	CLASS 552			CLASS 606		
214	Re.33,815	781	5,086,076	164	5,086,116	5,086,116			171	5,086,156	521	5,086,190	42	5,085,664	5,085,664		
CLASS 505			166	5,086,077	193	5,086,117	5,086,117			193	5,086,157	653	5,086,191	46	5,085,665	5,085,665	
1	5,086,034	56	5,086,078	176	5,086,118	5,086,118			204	5,086,158			47	5,085,666	5,085,666		
	5,086,035	58	5,086,079	183	5,086,119	5,086,119			288	5,086,159	9	5,086,192	139	5,085,667	5,085,667		
	5,086,037	59	5,086,080	197	5,086,120	5,086,120			339	5,086,160			159	5,085,668	5,085,668		
CLASS 512			103	5,086,081	235	5,086,121	5,086,121			388	5,086,161	CLASS 585			172	5,085,669	
21	5,086,038	107	5,086,082	276	5,086,122	5,086,122				5,086,162	446	5,086,193	191	5,085,670	5,085,670		
CLASS 514			129	5,086,083	324	5,086,123	5,086,123			324	5,086,163	CLASS 600			CLASS 623		
8	5,086,039	137	5,086,084	329	5,086,124	5,086,124			378	5,086,164	8	5,085,211	57	5,085,671	5,085,671		
		187	5,086,085	388	5,086,125	5,086,125				5,086,165							

CLASSIFICATION OF DESIGNS

D2—	276	323,575	618	323,600	39	323,626	135	323,652	40	323,679		323,705
	314	323,576	619	323,601		323,627		323,653	42	323,680	365	323,706
	320	323,577		323,602	46	323,628		323,654	7	323,681	371	323,707
		323,578	D8—	323,603	46.1	323,629		323,655	14	323,682	382	323,708
		323,579		323,604	64	323,630		323,656	41	323,683	129	323,709
		323,580		323,605	74	323,631		323,657	84	323,684	130	323,710
	630	323,581		323,606	241	323,632		323,658	135	323,685	159	323,711
D3—	5	323,582		323,607	30	323,633		323,659	182	323,686	165	323,712
	78	323,583		323,608	32	323,634		323,660	205	323,687		323,713
		323,584		323,609	124	323,635		323,661	219	323,688	50	323,714
	104	323,585		323,610	149	323,636		323,662	220	323,689	119	323,715
D5—	53	323,586		323,611	199	323,637		323,663		323,690	127	323,716
	60	323,587		323,612	102	323,638		323,664		323,691	44	323,717
D6—	327	323,588		323,613	D12—	323,639		323,665	228	323,692	63	323,718
	328	323,589		323,614		323,640		323,666	230	323,693	140	323,719
	331	323,590		323,615		323,641		323,667	253	323,694		323,720
	437	323,591		323,616	D13—	323,642		323,668	118	323,695	102	323,721
	450	323,592		323,617		323,643		323,669	122	323,696	64	323,722
	495	323,593		323,618		323,644		323,670	133	323,697		323,723
	502	323,594		323,619		323,645		323,671	136	323,698	15	323,724
	515	323,595		323,620		323,646		323,672	207	323,699		323,725
	518	323,596		323,621		323,647		323,673	241	323,700	51	323,726
	533	323,597		323,622		323,648		323,674	277	323,701	1	323,727
D7—	317	323,598		323,623		323,649		323,675		323,702	9	323,728
	408	323,599		323,624		323,650		323,676	283	323,703	28	323,729
				323,625		323,651		323,677	290	323,704	33	323,730
												323,731

CLASSIFICATION OF PLANTS

P—	68	7,779	69	7,780	71	7,781	88	7,782
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STATUTORY INVENTION REGISTRATIONS

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PATENTS

01 :	5,085,035	5,085,365	5,085,985	5,085,780	13 :	5,086,505	5,086,144
	5,085,055	5,085,390	5,085,987	5,085,784		5,085,987	5,086,251
	5,085,146	5,085,391	5,085,988	5,085,853		5,084,945	5,086,267
	5,085,205	5,085,395	5,085,998	5,085,942		5,085,003	5,086,340
	5,085,725	5,085,401	5,086,011	5,085,949		5,085,011	5,086,371
	5,085,866	5,085,409	5,086,054	5,086,023		5,085,210	5,086,379
	5,086,465	5,085,429	5,086,076	5,086,045		5,085,368	5,086,449
02 :	5,085,320	5,085,430	5,086,084	5,086,083		5,085,597	5,086,467
04 :	5,085,075	5,085,431	5,086,085	5,086,132		5,085,920	5,086,468
	5,085,216	5,085,442	5,086,149	5,086,186		5,086,101	5,086,476
	5,085,291	5,085,445	5,086,205	5,086,321	16 :	5,085,000	5,086,496
	5,085,315	5,085,448	5,086,219	5,086,423		5,085,080	5,086,927
	5,085,412	5,085,449	5,086,225	5,085,015		5,085,410	5,086,946
	5,086,277	5,085,450	5,086,253	5,085,585	17 :	5,084,947	5,086,952
	5,086,372	5,085,457	5,086,254	5,085,676		5,084,972	5,086,972
	5,086,377	5,085,474	5,086,283	5,085,720		5,084,951	5,086,977
	5,086,429	5,085,477	5,086,289	5,085,774		5,085,031	5,086,982
	5,085,164	5,085,492	5,086,295	5,085,777		5,085,114	5,086,986
	5,085,808	5,085,497	5,086,325	5,085,816		5,085,127	5,086,990
05 :	5,084,915	5,085,506	5,086,328	5,085,837		5,085,256	5,086,994
	5,084,918	5,085,506	5,086,328	5,085,885		5,085,267	5,086,997
	5,084,924	5,085,517	5,086,335	5,085,904		5,085,298	5

25	5085,342	5085,281	5086,430	5084,944	5085,680	5086,003
	5085,366	5085,415	5086,459	5084,953	5085,699	5086,024
	5085,641	5085,417	5086,460	5084,979	5085,731	5086,025
	5085,642	5085,440	5085,085	5085,004	5085,742	5086,075
	5085,705	5085,451	5085,134	5085,022	5085,770	5086,094
	5086,072	5085,470	5085,283	5085,048	5085,787	5086,139
	5086,229	5085,486	5085,673	5085,094	5085,809	5086,155
	5086,282	5085,500	5086,396	5085,230	5085,877	5086,162
	5086,301	5085,576	5086,443	5085,272	5085,896	5086,166
	5086,302	5085,636	5084,919	5085,290	5085,903	5086,193
	5086,445	5085,659	5084,943	5085,316	5085,938	5086,224
	5084,968	5085,662	5084,958	5085,336	5085,945	5086,236
	5085,034	5085,671	5084,993	5085,340	5086,033	5086,271
	5085,179	5085,695	5085,033	5085,347	5086,059	5086,330
	5085,225	5085,786	5085,088	5085,446	5086,063	5086,387
	5085,226	5085,811	5085,134	5085,478	5086,069	5086,390
	5085,251	5085,918	5085,161	5085,519	5086,081	5086,397
	5085,471	5085,931	5085,185	5085,521	5086,082	5086,407
	5085,728	5085,939	5085,270	5085,537	5086,097	5086,461
	5085,749	5085,972	5085,303	5085,541	5086,098	5086,478
	5085,757	5085,996	5085,322	5085,559	5086,111	5086,503
	5085,804	5086,086	5085,418	5085,634	5086,179	5086,522
	5085,841	5086,123	5085,419	5085,654	5086,273	5086,592
	5085,861	5086,192	5085,424	5085,679	5086,291	5086,598
	5085,935	5086,245	5085,427	5085,700	5086,380	5086,645
	5086,004	3,982,318	5085,469	5085,736	5086,499	5086,649
	5086,164	5085,176	5085,476	5085,783	5085,115	5086,699
	5086,249	5085,527	5085,502	5085,785	5085,122	5086,703
	5086,276	5084,998	5085,514	5085,852	5085,188	5086,708
	5086,375	5085,150	5085,536	5085,883	5085,207	5086,718
	5086,389	5085,214	5085,540	5085,884	5085,212	5086,733
	5086,402	5085,237	5085,543	5085,901	5085,773	5086,738
	5086,428	5085,258	5085,565	5085,953	5085,975	5086,748
	5086,469	5085,278	5085,653	5086,120	5084,973	5086,753
	Re-33,811	5085,280	5085,660	5086,122	5085,173	5086,758
	5084,954	5085,628	5085,661	5086,176	5085,211	5086,763
	5084,997	5085,738	5085,674	5086,204	5085,243	5086,768
	5085,027	5085,753	5085,744	5086,209	5085,699	5086,773
	5085,029	5085,813	5085,778	5086,220	5085,704	5086,778
	5085,049	5085,849	5085,788	5084,921	5085,836	5086,783
	5085,096	5085,905	5085,796	5084,996	5086,226	5086,788
	5085,098	5086,041	5085,797	5085,007	5086,244	5086,793
	5085,099	5086,165	5085,798	5085,274	5084,933	5086,798
	5085,106	5085,560	5085,832	5085,520	5084,983	5086,803
	5085,131	5085,578	5085,907	5085,586	5085,002	5086,808
	5085,153	5085,739	5085,912	5085,608	5085,057	5086,813
	5085,187	5085,175	5085,924	5085,719	5085,639	5086,818

DESIGN PATENTS

06 :	323,576		323,595	323,613		323,602	39 :	323,589	47 :	323,616
	323,582	09 :	323,633	323,690		323,693		323,607		323,694
	323,584		323,657	323,696	34	323,588		323,661	48 :	323,590
	323,592		323,679	323,718		323,672		323,671		323,600
	323,614		323,685	323,719		323,681		323,674		323,631
	323,639	11 :	323,731	323,730	36	323,591		323,715		323,687
	323,643	12 :	323,581	323,596		323,609		323,726		323,712
	323,664		323,627	323,680		323,617		323,605		323,722
	323,677		323,662	323,724		323,663	41 :	323,634	53 :	323,615
	323,688		323,684	323,725		323,683	42 :	323,656	55 :	323,612
	323,691		323,689	323,630		323,714		323,704		323,640
	323,699	13 :	323,593	323,594		323,728		323,705		323,675
	323,707		323,697	323,629	37	323,604		323,620		323,678
	323,709		323,716	323,686		323,655	44 :	323,668		323,695
	323,729	17 :	323,599	323,698		323,706		323,619		323,721
08 :	323,585		323,608	323,601			45 :			

STATUTORY INVENTION REGISTRATIONS

39	H1019	48	H1021	H1022			
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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 11, 1992

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O.G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00	
Search Fee		
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)		
—No corresponding prior U.S. national application filed	600.00	
—Corresponding prior U.S. national application filed	400.00	
—Supplemental search fee, per additional invention	160.00	
European Patent Office as ISA	1320.00	
Preliminary examination fee		
USPTO as International Preliminary Examining Authority (IPEA)		
—Search fee paid to USPTO as ISA	440.00	
—Additional examination fee, per additional invention	140.00	
—ISA not the USPTO	650.00	
—Additional examination fee, per additional invention	220.00	
International fees		
Basic fee	525.00	
Basic Supplemental fee (for each page over 30)	10.00	
Designation fee per country or region for the first 10 national or regional offices	127.00	
Designation fee for 11th and subsequent designations	No Charge	
Handling fee	161.00	

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00

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USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 7, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,802,242 through 4,803,739
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 5, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,497,069 through 4,498,198
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 29, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(c)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees	4,418,500	06/292,283	12/06/83
	4,418,502	06/281,211	12/06/83
(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,418,503	06/215,682	12/06/83
	4,418,509	06/327,198	12/06/83
	4,418,510	06/255,222	12/06/83
	4,418,512	06/247,253	12/06/83
	4,418,523	06/291,128	12/06/83
By a small entity (\$1.9f)	4,418,525	06/361,573	12/06/83
By other than a small entity	4,418,526	06/348,459	12/06/83
	4,418,532	06/348,557	12/06/83
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,418,534	06/242,261	12/06/83
	4,418,542	06/321,537	12/06/83
	4,418,544	06/392,652	12/06/83
	4,418,546	06/322,257	12/06/83
	4,418,549	06/425,356	12/06/83
By a small entity (\$1.9f)	4,418,552	06/279,590	12/06/83
By other than a small entity	4,418,564	06/332,410	12/06/83
	4,418,570	06/328,562	12/06/83
(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:	4,418,575	06/264,131	12/06/83
	4,418,576	06/505,125	12/06/83
	4,418,594	06/320,867	12/06/83
	4,418,595	06/384,330	12/06/83
	4,418,596	06/250,260	12/06/83
By a small entity (\$1.9f)	4,418,598	06/335,985	12/06/83
By other than a small entity	4,418,599	06/366,541	12/06/83
	4,418,604	06/396,414	12/06/83
The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:	4,418,613	06/323,625	12/06/83
	4,418,620	06/366,239	12/06/83
	4,418,623	06/281,879	12/06/83
	4,418,624	06/288,475	12/06/83
	4,418,629	06/234,756	12/06/83
(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980	4,418,633	06/250,486	12/06/83
	4,418,642	06/302,200	12/06/83
	4,418,653	06/385,747	12/06/83
	4,418,654	06/382,640	12/06/83
	4,418,658	06/420,015	12/06/83
	4,418,663	06/332,539	12/06/83
By a small entity (\$1.9f)	4,418,672	06/241,332	12/06/83
By other than a small entity	4,418,673	06/318,867	12/06/83
	4,418,678	06/321,741	12/06/83
(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable	4,418,680	06/261,049	12/06/83
	4,418,685	06/281,471	12/06/83
	4,418,688	06/280,247	12/06/83
	4,418,690	06/289,380	12/06/83
	4,418,709	06/323,001	12/06/83
	4,418,711	06/246,966	12/06/83
	4,418,722	06/259,211	12/06/83
	4,418,725	06/318,073	12/06/83
	4,418,727	06/279,321	12/06/83
	4,418,728	06/319,807	12/06/83
	4,418,729	06/326,568	12/06/83
	4,418,736	06/339,905	12/06/83
	4,418,738	06/253,219	12/06/83
	4,418,748	06/343,246	12/06/83
	4,418,749	06/316,877	12/06/83
	4,418,750	06/310,823	12/06/83
	4,418,751	06/364,116	12/06/83
	4,418,755	06/293,746	12/06/83
	4,418,761	06/304,584	12/06/83
	4,418,762	06/285,141	12/06/83
	4,418,769	06/243,076	12/06/83
	4,418,783	06/370,068	12/06/83
	4,418,784	06/342,820	12/06/83
	4,418,790	06/322,561	12/06/83
	4,418,793	06/253,201	12/06/83
	4,418,798	06/433,576	12/06/83
	4,418,802	06/285,049	12/06/83
	4,418,805	06/281,591	12/06/83
	4,418,808	06/265,808	12/06/83
	4,418,829	06/322,054	12/06/83
	4,418,836	06/286,336	12/06/83
	4,418,838	06/281,052	12/06/83
	4,418,847	06/394,517	12/06/83
	4,418,851	06/325,478	12/06/83
	4,418,853	06/412,582	12/06/83
	4,418,854	06/325,091	12/06/83
	4,418,858	06/227,806	12/06/83
	4,418,860	06/278,488	12/06/83
	4,418,864	06/423,470	12/06/83

Notice of Expiration of Patents
Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 8, 1991
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,078	07/195,493	10/03/89
(4,711,577)	(07/049,005)	(12/08/87)
4,418,432	06/296,293	12/06/83
4,418,433	06/290,935	12/06/83
4,418,440	06/395,145	12/06/83
4,418,455	06/259,997	12/06/83
4,418,457	06/341,048	12/06/83
4,418,463	06/228,581	12/06/83
4,418,465	06/469,664	12/06/83
4,418,475	06/366,654	12/06/83
4,418,480	06/367,187	12/06/83
4,418,483	06/249,451	12/06/83
4,418,488	06/307,741	12/06/83
4,418,495	06/345,475	12/06/83
4,418,498	06/342,832	12/06/83

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Patent Number	Serial Number	Issue Date	4,419,235	06/462,100	12/06/83
4,418,865	06/290,318	12/06/83	4,419,239	06/368,166	12/06/83
4,418,874	06/302,872	12/06/83	4,419,242	06/350,078	12/06/83
4,418,875	06/306,470	12/06/83	4,419,251	06/419,107	12/06/83
4,418,876	06/259,689	12/06/83	4,419,252	06/436,157	12/06/83
4,418,883	06/311,419	12/06/83	4,419,253	06/318,974	12/06/83
4,418,887	06/315,023	12/06/83	4,419,255	06/344,321	12/06/83
4,418,896	06/403,868	12/06/83	4,419,259	06/313,874	12/06/83
4,418,897	06/244,652	12/06/83	4,419,262	06/396,998	12/06/83
4,418,899	06/304,283	12/06/83	4,419,263	06/337,805	12/06/83
4,418,901	06/256,258	12/06/83	4,419,266	06/352,295	12/06/83
4,418,902	06/329,583	12/06/83	4,419,269	06/447,385	12/06/83
4,418,913	06/371,787	12/06/83	4,419,278	06/259,941	12/06/83
4,418,914	06/338,722	12/06/83	4,419,283	06/284,622	12/06/83
4,418,915	06/387,384	12/06/83	4,419,285	06/350,494	12/06/83
4,418,917	06/220,623	12/06/83	4,419,292	06/339,230	12/06/83
4,418,918	06/475,239	12/06/83	4,419,293	06/282,206	12/06/83
4,418,936	06/383,240	12/06/83	4,419,296	06/353,986	12/06/83
4,418,939	06/345,081	12/06/83	4,419,321	06/341,866	12/06/83
4,418,951	06/283,951	12/06/83	4,419,322	06/424,116	12/06/83
4,418,953	06/231,380	12/06/83	4,419,324	06/316,681	12/06/83
4,418,955	06/279,465	12/06/83	4,419,337	06/275,201	12/06/83
4,418,957	06/292,700	12/06/83	4,419,341	06/472,085	12/06/83
4,418,959	06/350,547	12/06/83	4,419,342	06/458,244	12/06/83
4,418,961	06/382,747	12/06/83	4,419,346	06/407,987	12/06/83
4,418,964	06/316,632	12/06/83	4,419,247	06/366,635	12/06/83
4,418,975	06/294,212	12/06/83	4,419,355	06/283,971	12/06/83
4,418,978	06/384,615	12/06/83	4,419,356	06/285,845	12/06/83
4,418,980	06/269,558	12/06/83	4,419,362	06/351,836	12/06/83
4,418,982	06/235,235	12/06/83	4,419,366	06/398,849	12/06/83
4,418,988	06/235,786	12/06/83	4,419,369	06/414,085	12/06/83
4,418,989	06/343,802	12/06/83	4,419,370	06/326,357	12/06/83
4,418,995	06/295,718	12/06/83	4,419,371	06/357,507	12/06/83
4,418,998	06/379,152	12/06/83	4,419,374	06/414,401	12/06/83
4,419,000	06/312,569	12/06/83	4,419,378	06/320,397	12/06/83
4,419,001	06/381,717	12/06/83	4,419,379	06/369,401	12/06/83
4,419,002	06/388,303	12/06/83	4,419,382	06/330,098	12/06/83
4,419,004	06/317,446	12/06/83	4,419,383	06/483,668	12/06/83
4,419,005	06/317,448	12/06/83	4,419,384	06/423,664	12/06/83
4,419,016	06/394,579	12/06/83	4,419,385	06/305,009	12/06/83
4,419,031	06/316,410	12/06/83	4,419,388	06/312,459	12/06/83
4,419,032	06/231,469	12/06/83	4,419,389	06/413,126	12/06/83
4,419,039	06/240,296	12/06/83	4,419,392	06/385,152	12/06/83
4,419,044	06/318,851	12/06/83	4,419,400	06/315,097	12/06/83
4,419,049	06/312,884	12/06/83	4,419,401	06/404,915	12/06/83
4,419,053	06/323,178	12/06/83	4,419,415	06/339,931	12/06/83
4,419,059	06/291,791	12/06/83	4,419,419	06/371,120	12/06/83
4,419,060	06/474,780	12/06/83	4,419,422	06/360,850	12/06/83
4,419,063	06/356,220	12/06/83	4,419,424	06/286,571	12/06/83
4,419,091	06/233,899	12/06/83	4,419,434	06/451,320	12/06/83
4,419,105	06/359,454	12/06/83	4,419,443	06/320,045	12/06/83
4,419,108	06/351,126	12/06/83	4,419,445	06/360,723	12/06/83
4,419,132	06/337,220	12/06/83	4,419,450	06/370,431	12/06/83
4,419,141	06/365,121	12/06/83	4,419,462	06/485,877	12/06/83
4,419,143	06/321,882	12/06/83	4,419,463	06/358,552	12/06/83
4,419,146	06/283,409	12/06/83	4,419,464	06/402,830	12/06/83
4,419,147	06/251,147	12/06/83	4,419,468	06/446,127	12/06/83
4,419,152	06/388,715	12/06/83	4,419,475	06/289,611	12/06/83
4,419,153	06/377,888	12/06/83	4,419,479	06/458,029	12/06/83
4,419,157	06/300,263	12/06/83	4,419,483	06/381,033	12/06/83
4,419,162	06/299,814	12/06/83	4,419,484	06/341,929	12/06/83
4,419,169	06/360,947	12/06/83	4,419,490	06/273,068	12/06/83
4,419,171	06/372,650	12/06/83	4,419,504	06/366,445	12/06/83
4,419,176	06/418,323	12/06/83	4,419,505	06/398,423	12/06/83
4,419,178	06/275,321	12/06/83	4,419,506	06/359,511	12/06/83
4,419,182	06/239,066	12/06/83	4,419,520	06/278,369	12/06/83
4,419,187	06/354,711	12/06/83	4,419,523	06/262,576	12/06/83
4,419,188	06/350,592	12/06/83	4,419,529	06/354,308	12/06/83
4,419,196	06/247,328	12/06/83	4,419,545	06/282,620	12/06/83
4,419,197	06/260,481	12/06/83	4,419,546	06/342,030	12/06/83
4,419,202	06/331,881	12/06/83	4,419,548	06/415,132	12/06/83
4,419,209	06/285,196	12/06/83	4,419,549	06/375,728	12/06/83
4,419,211	06/354,905	12/06/83	4,419,555	06/383,811	12/06/83
4,419,212	06/343,194	12/06/83	4,419,556	06/344,036	12/06/83
4,419,214	06/314,050	12/06/83	4,419,557	06/337,056	12/06/83
4,419,217	06/467,415	12/06/83	4,419,571	06/368,206	12/06/83
4,419,218	06/281,450	12/06/83	4,419,576	06/303,136	12/06/83
4,419,219	06/305,267	12/06/83	4,419,578	06/281,255	12/06/83
			4,419,579	06/237,254	12/06/83

Patent Number	Serial Number	Issue Date	4,711,184	06/803,759	12/08/87
			4,711,190	06/899,051	12/08/87
4,419,581	06/338,622	12/06/83	4,711,192	06/857,247	12/08/87
4,419,583	06/266,968	12/06/83	4,711,196	06/934,845	12/08/87
4,419,593	06/278,775	12/06/83	4,711,198	06/866,947	12/08/87
4,419,605	06/221,257	12/06/83	4,711,201	06/828,856	12/08/87
4,419,609	06/413,811	12/06/83	4,711,208	06/851,881	12/08/87
4,419,615	06/319,268	12/06/83	4,711,210	06/946,815	12/08/87
4,419,621	06/265,459	12/06/83	4,711,220	06/794,539	12/08/87
4,419,623	06/327,925	12/06/83	4,711,222	06/853,425	12/08/87
4,419,627	06/222,139	12/06/83	4,711,224	06/902,663	12/08/87
4,419,635	06/305,231	12/06/83	4,711,235	06/896,316	12/08/87
4,419,637	06/343,752	12/06/83	4,711,236	06/698,162	12/08/87
4,419,639	06/301,659	12/06/83	4,711,239	06/915,248	12/08/87
4,419,644	06/457,881	12/06/83	4,711,243	06/890,027	12/08/87
4,419,646	06/425,013	12/06/83	4,711,253	06/864,713	12/08/87
4,419,647	06/247,813	12/06/83	4,711,254	06/839,640	12/08/87
4,419,652	06/309,877	12/06/83	4,711,258	06/882,405	12/08/87
4,419,653	06/311,394	12/06/83	4,711,259	06/678,268	12/08/87
4,419,654	06/284,571	12/06/83	4,711,260	06/866,784	12/08/87
4,419,658	06/249,929	12/06/83	4,711,266	06/415,613	12/08/87
4,419,673	06/308,019	12/06/83	4,711,268	06/830,830	12/08/87
4,419,692	06/336,088	12/06/83	4,711,270	06/948,416	12/08/87
4,419,704	06/257,482	12/06/83	4,711,271	06/942,003	12/08/87
4,419,713	06/281,010	12/06/83	4,711,276	06/854,974	12/08/87
4,419,717	06/307,803	12/06/83	4,711,281	06/836,476	12/08/87
4,419,719	06/264,264	12/06/83	4,711,291	06/901,487	12/08/87
4,419,720	06/304,982	12/06/83	4,711,296	06/668,604	12/08/87
4,419,722	06/375,912	12/06/83	4,711,302	06/900,466	12/08/87
4,419,738	06/318,815	12/06/83	4,711,304	06/941,671	12/08/87
4,419,741	06/299,343	12/06/83	4,711,307	07/015,528	12/08/87
4,419,743	06/282,266	12/06/83	4,711,308	06/873,971	12/08/87
4,419,749	06/274,507	12/06/83	4,711,309	06/879,525	12/08/87
4,419,758	06/235,277	12/06/83	4,711,310	06/794,017	12/08/87
4,419,763	06/269,423	12/06/83	4,711,321	06/882,882	12/08/87
4,419,767	06/324,705	12/06/83	4,711,325	06/874,528	12/08/87
4,710,980	07/025,728	12/08/87	4,711,327	06/895,201	12/08/87
4,710,983	07/030,343	12/08/87	4,711,328	06/937,836	12/08/87
4,710,985	06/356,901	12/08/87	4,711,330	06/903,786	12/08/87
4,710,986	06/855,340	12/08/87	4,711,331	06/880,890	12/08/87
4,710,992	07/045,447	12/08/87	4,711,332	06/866,566	12/08/87
4,710,997	06/636,153	12/08/87	4,711,342	06/685,594	12/08/87
4,711,000	06/864,505	12/08/87	4,711,343	06/915,241	12/08/87
4,711,002	07/003,372	12/08/87	4,711,344	06/817,407	12/08/87
4,711,003	06/842,325	12/08/87	4,711,357	06/810,885	12/08/87
4,711,005	06/884,991	12/08/87	4,711,358	06/832,411	12/08/87
4,711,012	06/303,510	12/08/87	4,711,359	06/599,414	12/08/87
4,711,031	06/886,228	12/08/87	4,711,366	06/890,167	12/08/87
4,711,033	06/947,902	12/08/87	4,711,367	06/793,848	12/08/87
4,711,036	06/821,892	12/08/87	4,711,368	06/883,245	12/08/87
4,711,042	06/778,204	12/08/87	4,711,369	06/829,367	12/08/87
4,711,043	06/913,932	12/08/87	4,711,370	06/882,201	12/08/87
4,711,045	06/885,149	12/08/87	4,711,378	06/842,969	12/08/87
4,711,051	06/926,743	12/08/87	4,711,381	06/884,727	12/08/87
4,711,058	06/864,999	12/08/87	4,711,383	06/929,794	12/08/87
4,711,061	06/799,431	12/08/87	4,711,388	06/736,169	12/08/87
4,711,068	06/938,044	12/08/87	4,711,389	06/906,585	12/08/87
4,711,072	06/819,852	12/08/87	4,711,394	07/019,417	12/08/87
4,711,074	06/828,640	12/08/87	4,711,396	06/861,483	12/08/87
4,711,078	06/783,876	12/08/87	4,711,398	06/828,297	12/08/87
4,711,092	06/893,623	12/08/87	4,711,404	07/006,672	12/08/87
4,711,094	06/929,422	12/08/87	4,711,407	07/011,262	12/08/87
4,711,097	06/922,887	12/08/87	4,711,413	06/939,539	12/08/87
4,711,099	06/902,242	12/08/87	4,711,415	06/696,604	12/08/87
4,711,114	06/861,084	12/08/87	4,711,417	06/780,532	12/08/87
4,711,115	06/814,310	12/08/87	4,711,419	06/917,038	12/08/87
4,711,120	06/915,382	12/08/87	4,711,420	06/731,876	12/08/87
4,711,126	06/838,675	12/08/87	4,711,422	06/901,637	12/08/87
4,711,130	06/880,006	12/08/87	4,711,432	06/877,971	12/08/87
4,711,139	06/873,593	12/08/87	4,711,449	06/816,625	12/08/87
4,711,150	06/677,989	12/08/87	4,711,453	06/284,926	12/08/87
4,711,161	06/318,683	12/08/87	4,711,457	06/871,110	12/08/87
4,711,164	06/834,400	12/08/87	4,711,460	06/863,710	12/08/87
4,711,169	06/802,340	12/08/87	4,711,461	06/853,187	12/08/87
4,711,171	06/927,736	12/08/87	4,711,464	06/927,962	12/08/87
4,711,177	06/893,846	12/08/87	4,711,468	06/874,646	12/08/87
4,711,178	06/855,078	12/08/87	4,711,475	06/761,979	12/08/87
4,711,179	06/916,970	12/08/87	4,711,476	06/933,153	12/08/87
4,711,180	06/915,566	12/08/87	4,711,482	07/017,994	12/08/87

Patent Number	Serial Number	Issue Date	4,711,826	06/822,973	12/08/87
4,711,486	06/939,223	12/08/87	4,711,937	06/769,903	12/08/87
4,711,488	06/899,233	12/08/87	4,711,844	06/473,820	12/08/87
4,711,490	06/922,251	12/08/87	4,711,847	06/638,789	12/08/87
4,711,495	06/920,909	12/08/87	4,711,857	06/901,114	12/08/87
4,711,496	06/888,714	12/08/87	4,711,860	06/838,806	12/08/87
4,711,499	06/737,423	12/08/87	4,711,863	06/838,298	12/08/87
4,711,500	06/933,392	12/08/87	4,711,877	06/777,385	12/08/87
4,711,502	06/754,214	12/08/87	4,711,879	06/928,493	12/08/87
4,711,503	06/901,269	12/08/87	4,711,890	06/564,322	12/08/87
4,711,504	06/901,287	12/08/87	4,711,892	06/851,113	12/08/87
4,711,514	06/690,792	12/08/87	4,711,893	06/907,909	12/08/87
4,711,519	06/948,468	12/08/87	4,711,899	06/862,715	12/08/87
4,711,527	06/802,311	12/08/87	4,711,902	06/662,469	12/08/87
4,711,531	06/770,938	12/08/87	4,711,907	06/705,718	12/08/87
4,711,532	06/942,638	12/08/87	4,711,932	06/855,879	12/08/87
4,711,538	06/912,987	12/08/87	4,711,937	06/942,829	12/08/87
4,711,563	07/013,439	12/08/87	4,711,940	06/925,843	12/08/87
4,711,582	06/928,058	12/08/87	4,711,944	06/765,692	12/08/87
4,711,583	06/932,546	12/08/87	4,711,952	06/875,230	12/08/87
4,711,587	06/887,275	12/08/87	4,711,962	06/782,676	12/08/87
4,711,589	06/846,106	12/08/87	4,711,967	06/856,505	12/08/87
4,711,592	06/871,469	12/08/87	4,711,971	06/805,507	12/08/87
4,711,594	07/017,455	12/08/87	4,711,980	06/829,989	12/08/87
4,711,595	06/873,828	12/08/87	4,711,991	07/001,222	12/08/87
4,711,598	06/912,752	12/08/87	4,711,998	06/804,720	12/08/87
4,711,602	06/886,459	12/08/87	4,712,005	06/810,605	12/08/87
4,711,604	06/915,318	12/08/87	4,712,010	06/824,350	12/08/87
4,711,613	06/602,734	12/08/87	4,712,026	06/926,498	12/08/87
4,711,620	06/738,266	12/08/87	4,712,032	06/939,500	12/08/87
4,711,624	06/837,533	12/08/87	4,712,033	06/945,153	12/08/87
4,711,625	06/844,933	12/08/87	4,712,051	06/869,564	12/08/87
4,711,635	06/774,487	12/08/87	4,712,054	06/863,068	12/08/87
4,711,638	06/861,707	12/08/87	4,712,062	06/684,767	12/08/87
4,711,640	06/878,106	12/08/87	4,712,063	06/614,506	12/08/87
4,711,643	06/331,444	12/08/87	4,712,064	06/852,629	12/08/87
4,711,649	06/902,492	12/08/87	4,712,065	06/831,263	12/08/87
4,711,656	06/891,939	12/08/87	4,712,066	06/894,247	12/08/87
4,711,657	06/684,973	12/08/87	4,712,067	06/684,199	12/08/87
4,711,658	06/934,047	12/08/87	4,712,069	06/841,132	12/08/87
4,711,665	06/759,547	12/08/87	4,712,074	06/801,881	12/08/87
4,711,670	06/799,400	12/08/87	4,712,078	06/716,729	12/08/87
4,711,672	06/853,925	12/08/87	4,712,083	06/812,170	12/08/87
4,711,682	06/929,000	12/08/87	4,712,087	07/012,752	12/08/87
4,711,697	06/800,194	12/08/87	4,712,096	06/732,875	12/08/87
4,711,705	07/004,374	12/08/87	4,712,098	06/890,493	12/08/87
4,711,706	06/870,170	12/08/87	4,712,104	06/724,998	12/08/87
4,711,708	06/917,333	12/08/87	4,712,107	06/697,839	12/08/87
4,711,715	06/823,887	12/08/87	4,712,113	06/886,488	12/08/87
4,711,716	06/939,008	12/08/87	4,712,120	06/840,500	12/08/87
4,711,718	07/005,215	12/08/87	4,712,126	06/839,954	12/08/87
4,711,723	06/867,480	12/08/87	4,712,157	07/026,321	12/08/87
4,711,745	07/001,419	12/08/87	4,712,165	06/903,599	12/08/87
4,711,751	06/690,680	12/08/87	4,712,166	06/832,140	12/08/87
4,711,764	06/790,861	12/08/87	4,712,170	06/826,942	12/08/87
4,711,767	06/846,909	12/08/87	4,712,177	06/609,873	12/08/87
4,711,771	06/590,301	12/08/87	4,712,180	06/649,218	12/08/87
4,711,772	06/909,057	12/08/87	4,712,202	06/680,733	12/08/87
4,711,785	06/794,229	12/08/87	4,712,210	06/648,061	12/08/87
4,711,786	06/756,400	12/08/87	4,712,222	06/745,814	12/08/87
4,711,792	06/892,517	12/08/87	4,712,226	06/886,081	12/08/87
4,711,804	06/881,543	12/08/87	4,712,246	06/681,894	12/08/87
4,711,808	06/830,803	12/08/87	4,712,247	06/716,774	12/08/87
4,711,824	06/929,939	12/08/87	4,712,249	06/828,057	12/08/87
4,711,825	06/849,989	12/08/87	4,712,250	06/764,786	12/08/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41(e); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,603,767	06/649,289	8/05/86	9/11/84	11/13/91
4,640,756	06/736,164	2/03/87	5/20/85	11/15/91

Patent Number	Serial Number	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,641,692	06/743,568	2/10/87	6/11/85	10/25/91
4,669,599	06/704,652	6/02/87	2/22/85	8/07/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,448,548, Re. S.N. 07/813,371, Filed Dec. 24, 1991, Cl. 374/160, STEAM STERILIZATION INDICATOR, Theodore A. Foley, Owner of Record: *PY MAH Corp., Sommersville, N.J.*, Attorney or Agent: Robert Hardy Falk, Ex. Gp.: 246

4,638,426, Re. S.N. 07/812,837, Filed Dec. 20, 1991, Cl. 364, VIRTUAL MEMORY ADDRESS TRANSLATION MECHANISM WITH CONTROLLED DATA PERSISTENCE, Albert Chang, et. al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: David J. Cushing, Ex. Gp.: 232

4,671,151, Re. S.N. 07/815,053, Filed Dec. 24, 1991, Cl. 83/150, PAPER TAIL CUTTER, Sidney Crawford Rooney, Owner of Record: *Fibron Machine Corp., British Columbia, Canada*, Attorney or Agent: Kenneth S. Klarguist, Ex. Gp.: 324

4,769,786, Re. S.N. 07/606,809, Filed Oct. 30, 1991, Cl. 365/182, TWO SQUARE MEMORY CELLS, Richard R. Granache, et. al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Mark F. Chadurjian, Ex. Gp.: 233

4,805,525, Re. S.N. 07/813,970, Filed Dec. 24, 1991, Cl. 99/408, APPARATUS FOR FILTERING LIQUIDS, Thomas H. Bivens, Owner of Record: *Inventor*, Attorney or Agent: Neal J. Mosely, Ex. Gp.: 242

4,847,526, Re. S.N. 07/716,310, Filed June 17, 1991, Cl. 310/11, VARIANT-POLE ELECTRIC MOTOR, Akira Yamamura, et. al., Owner of Record: *Nippon Ferrofluidics, Tokyo, Japan*, Attorney or Agent: David S. Woronoff, Ex. Gp.: 212

4,850,359, Re. S.N. 07/779,145, Filed Oct. 21, 1991, Cl. 128/642, ELECTRICAL BRAIN-CONTACT DEVICES, David A. Putz, Owner of Record: *Ad-Tech Medical Instrument Corp., Racine, Wis.*, Attorney or Agent: Peter N. Jansson, Ex. Gp.: 335

4,890,573, Re. S.N. 07/816,028, Filed Dec. 30, 1991, Cl. 118/667, SYSTEM FOR APPLYING THERMAL CURE MATERIALS, Robert J. Zaber, Owner of Record: *Technadyne Engineering Corp., Detroit, Mich.*, Attorney or Agent: Robert C. Collins, Ex. Gp.: 139

4,891,066, Re. S.N. 07/815,762, Filed Jan. 2, 1992, Cl. 420/417, HIGHLY PURE TITANIUM, Kazumi Shimotori, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan*, Attorney or Agent: Richard L. Schwaab, Ex. Gp.: 111

4,891,105, Re. S.N. 07/812,453, Filed Dec. 23, 1991, Cl. 205/138, METHOD AND APPARATUS FOR ELECTROLYTIC REFINING OF COPPER AND PRODUCTION OF COPPER WIRES FOR ELECTRICAL PURPOSES, Carlos E. Roggero Sein, Owner of Record: *Inventor*, Attorney or Agent: John J. Tomaszewski, Ex. Gp.: 112

4,972,872, Re. S.N. 07/809,983, Filed Dec. 18, 1991, Cl. 137/487.5, RELIEF VALVE, Kevin F. Hunt, Owner of Record: *Inventor*, Attorney or Agent: Jennings B. Thompson, Ex. Gp.: 347

4,994,237, Re. S.N. 07/814,710, Filed Dec. 30, 1991, Cl. 427/4, MICROWAVE PRESERVATION OF BIOPROS THESES, Gary R. Login, et. al., Owner of Record: *The Beth Israel Hospital*

Association, Boston, Mass., Attorney or Agent: Anthony M. Lorusso, Ex. Gp.: 139

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,384,436, Reexam. No. 90/002,611, Requested Jan. 2, 1992, Cl. 052/202, COMBINATION HURRICANE SHUTTER AND SECURITY GRILL, Michael A. Green, Owner of Record: *Michael A. Green, North Miami Beach, Fla.*, Attorney or Agent: John Oltman, Oltman & Flynn, Ft. Lauderdale, Fla., Ex. Gp.: 354, Requester: The Rich Co. Inc., North Miami, Fla.

4,894,240, Reexam. No. 90/002,612, Requested Jan. 6, 1992, Cl. 424/497, CONTROLLED ABSORPTION DILTIAZEM FORMULATION FOR ONCE-DAILY ADMINISTRATION, Edward J. Geoghegan, et. al., Owner of Record: *Elan Corp., PLC, Monksland, Athlone County, Westmeath, Ireland*, Attorney or Agent: Hubbard, Thurman, Turner & Tucker, Dallas, Tex., Ex. Gp.: 152, Requester: Owner

4,912,800, Reexam. No. 90/002,613, Requested Jan. 6, 1992, Cl. 015/114, CLEANING DEVICE FOR GOLFERS AND CONSTRUCTION METHOD THEREFOR, Barry Zeltner, Owner of Record: *Recreative Technologies Corp., Wheatridge, Colo.*, Attorney or Agent: Timothy J. Martin, Lakewood, Colo., Ex. Gp.: 242, Requester: Preferred Response Marketing, Ltd., Lakewood, Colo.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 911188-1288]
RIN: 0651-AA53

Patent Interference Practice

Agency: Patent and Trademark Office, Commerce.

Action: Notice of Proposed Rulemaking

Summary: The Patent and Trademark Office proposes to amend the rules of practice in patent cases, Part 1 of Title 37, Code of Federal Regulations, relating to patent interference proceedings. The proposed changes generally consist of clarifying and house-keeping amendments with respect to patent interference practice, particularly preliminary motions under 37 CFR 1.633.

Dates: Comments must be submitted on or before March 23, 1992. A public hearing will not be held.

Addresses: Address written comments to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Saul I. Serota.

For Further Information Contact: Saul I. Serota by telephone at 703-557-4072 or Ian A. Calvert at 703-557-4000, or by mail to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C.

Supplementary Information: Several of the proposed changes are based upon suggestions submitted by the American Intellectual Property Law Association.

(1) Access to Interference Files

Under §1.11(e) it was intended that, once an interference had terminated or an award of priority or judgment had been entered as to all parties and all counts, the file of the interference would then be available to the public if the file of *at least one* of the cases involved in the interference was open to the public. However, although §1.11(b) provides that the file of a reissue application is open to the public, interferences involving reissue applications were inadvertently not specifically included in §1.11(e). The proposed amendment to §1.11(e) more clearly expresses the practice under current §1.11(e).

(2) Patentability of an Interference Count

As presently written, §1.601(f) states that "A phantom count is not patentable to any party." This language may be construed as meaning that the count need not be patentable over prior art, which is incorrect; as provided in §1.601(i), the parties must be claiming the same *patentable* invention. The proposed amendment to §1.601(f) would make it clear, consistent with *Case v. CPC International, Inc.*, 730 F.2d 745, 221 USPQ 196 (Fed. Cir.), *cert. denied*, 469 U.S. 872 (1984), that a phantom count is unpatentable to all parties because no party complies with 35 U.S.C. 112 for that count.

(3) Preliminaries to Interference with a Patent

(A) 35 U.S.C. 135(b) provides:

A claim which is the same as, or for the same or substantially the same subject matter as, a claim of an issued patent may not be made in any application unless such a claim is made prior to one year from the date on which the patent was granted.

Under 35 U.S.C. 135(b), an interference should not be instigated with a patent unless the applicant claims the same or substantially the same subject matter as claimed in the patent within one year after the patent issues. See *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980), and *Parks v. Fine*, 773 F.2d 1577, 227 USPQ 432 (Fed. Cir. 1985), *modified*, 783 F.2d 1036, 228 USPQ 677 (1986). However, it has been found that there is a tendency to overlook the requirement of 35 U.S.C. 135(b). The proposed amendment to §1.607(a) would reverse this trend by requiring the applicant to explain how the requirements of 35 U.S.C. 135(b) are met whenever the applicant seeks to have an interference declared between the application and a patent and the claim presented or identified by the applicant under §1.607(a)(4) was not present in the application until more than one year after the issue date of the patent. For example, if an applicant filed an amendment presenting a claim corresponding to a claim of a patent more than one year after the patent issued, the applicant would have to explain in the amendment how one or more of the claims which were in the application prior to expiration of the one-year period was drawn to "substantially the same subject matter" as a claim of the patent.

(B) It is proposed to change present §1.608(a) in two respects. The first change would specify that the effective filing date of the patent is the effective filing date under 35 U.S.C. 120, i.e., in determining whether the patent should be accorded the benefit of a prior application, only a prior United States application, and not a prior foreign application (35 U.S.C. 119), would be considered. This change is desirable to conform the language of paragraph (a) to that of paragraph (b), since the same considerations are applicable to both paragraphs, namely, that under *In re Hilmer*, 359 F.2d 859, 149 USPQ 480 (CCPA 1966), a patent's foreign priority date under 35 U.S.C. 119 does not constitute its effective filing date for reference purposes.

The second proposed change in §1.608(a) would relax the requirement that an affidavit be filed by the applicant, and instead permit the filing of a statement by either the applicant or the applicant's attorney or agent of record. This proposed change would bring the rule into conformity with §1.621(a), which allows an attorney or agent of record to sign a preliminary statement.

(4) Notice of Intent to Arouse Abandonment, Suppression or Concealment

Present §1.632 provides that a notice of intent to argue abandonment, suppression or concealment is timely when filed "within ten (10) days of the close of the testimony-in-chief of the opponent." Section 1.632 may be interpreted as requiring that the notice be filed either ten days before or ten days after the close of the testimony. The proposed change would make clear that the ten-day period runs for ten days after the opponent's testimony-in-chief closes.

(5) Preliminary Motions

(A) It is proposed to amend §1.633(a) to incorporate the substance of the Notice of August 10, 1990, by the Chairman of the Board of Patent Appeals and Interferences entitled "Interferences - Preliminary Motions for Judgment", and published at 1118 Off. Gaz. Pat. Off. 19 (September 11, 1990). The Notice deals with the procedure to be followed when a party to an interference files a motion for judgment on the ground of unpatentability over prior art and the dates of the cited prior art, relative to the effective filing dates of the applications and/or patents involved in the interference, are such that the prior art would appear to apply to the moving party. In such a case, if the motion does not contain an explanation as to why the prior art would not be applicable to the movant, the Notice provides that the examiner-in-chief will send a letter to the moving party (a) informing the movant that the prior art appears to be applicable against him/her, (b) setting a time period for the movant to provide an explanation as to why the prior art does not apply to him/her, and (c) stating that unless a sufficient explanation (and evidence if appropriate) is filed within the time set, the movant will not be permitted to rely on any such explanation (and evidence) in response to or in any subsequent action in the interference.

The purpose of the proposed amendment to §1.633(a) is to eliminate the necessity for the examiner-in-chief to send a letter to the moving party, and the resulting delay. Under proposed §1.633(a), the burden would be placed on the moving party to include with the motion itself a sufficient explanation of why the prior art would not be applicable to him/her. If no explanation was provided, or the explanation was insufficient, the moving party would be placed in the same position as a moving party who, under current practice as specified in the Notice, provides no explanation or an insufficient explanation in response to the examiner-in-chief's letter, i.e., the moving party would not be permitted to rely on any later-submitted explanation, or evidence, in response to or in any subsequent action in the interference.

The following examples illustrate the operation of the proposed rule:

Example 1. Party A files a motion for judgment against Party B on the basis of a reference which antedates Party A's own effective filing date, and does not include with the motion an explanation of why the reference does not apply to Party A. If the examiner-in-chief grants the motion and finds that the claims of the parties corresponding to the count are unpatentable, he/she will issue an order to show cause under §1.640 against Parties A and B. Any showing or motion for a testimony period under §1.651(c)(4) which Party A files in response to the order to show cause may not be based on reasons which could have been, but were not, given with the motion in explanation of why the reference would not apply to Party A.

Example 2. Party A files a motion for judgment against Party B based on a reference which antedates Party A's effective filing date by less than a year, and which is antedated by the date of first actual reduction to practice alleged in Party A's preliminary statement (§1.623). Party A explains in the motion that the reference does not apply to him/her in view of the dates alleged in Party A's preliminary statement. If the examiner-in-chief finds that the claims of the parties corresponding to the count are unpatentable over the reference and grants the motion, he/she will issue an order to show cause under §1.640 against Parties A and B. In response to the order to show cause, Party A could file a motion to take testimony in accordance with the allegations in its preliminary statement in order to antedate the reference, as well as to prove priority of invention.

(B) Section 1.633(e), if amended as proposed, would permit a party to file a preliminary motion to declare an additional interference between a patent owned by a party but not involved in the interference and an opponent's application involved in the interference. This would permit a party to seek an additional interference directly between a patent commonly owned by the party and an opponent's application, rather than having to file a reissue application in order to be able to bring the motion under the present rule.

(C) Section 1.633(i), if amended as proposed, would provide a party-patentee opposing a motion for judgment (§1.633(a) or (b)) or a motion attacking the party's benefit (§1.633(g)) the option of moving under §1.633(h) to add to the interference an application or reissue of the party's involved patent. This would give the patentee an option similar to that afforded a party-applicant in the same situation, i.e., the patentee could attempt to change the patent claims by way of reissue in order to avoid the grounds on which the motion under §1.633(a), (b) or (g) is based.

(D) The proposed changes in §1.637(c)(2)(ii) and (iii) would clarify the language of these two paragraphs and are self-explanatory.

(E) When a party files a preliminary motion to add or substitute a count under §1.633(c)(1), to substitute a different application under §1.633(d), or to declare an additional interference under §1.633(e), the moving party must also file a motion under §1.633(f) for benefit of the filing date of a prior application if the party wishes to be accorded such benefit. See §§1.637(c)(1)(vi), (d)(4), (e)(1)(viii) and (e)(2)(vii). However, if the party's opposition was accorded benefit of a prior application in the notice of declaration of the interference (§1.611(c)(5)), confusion has arisen as to whether the opponent will automatically be accorded benefit if the motion under §1.633(c)(1), (d) or (e) is granted, or whether the opponent must file a motion under §1.633(f) in order to be accorded such benefit. In the latter case, filing of the motion for benefit by the opponent tends to cause further delay in resolution of the interference.

The proposed amendment of §1.637, by adding paragraphs (c)(1)(vii), (d)(5), (e)(1)(ix) and (e)(2)(viii), would address this problem by providing, in substance, that for motions under §1.633(c)(1), (d) or (e), an opponent who has been accorded the benefit of the filing date of an earlier application in the notice of declaration of the interference would be presumed to be entitled to such benefit if the motion is granted unless the moving party shows why the opponent should not be so entitled.

(F) It is proposed that paragraphs (c)(2)(iv) and (c)(3)(iii) of §1.637 be deleted. These paragraphs require that a preliminary motion to amend or add an application claim (§1.633(c)(2)), or to designate an application or patent claim to correspond to a count (§1.633(c)(3)), be accompanied by a motion under §1.633(f) requesting the benefit of a prior application. This requirement is, however, unnecessary in the case of motions under §1.633(c)(2) or (3), because the question of whether a party should be accorded benefit of a prior application for priority purposes is determined by reference to whether the prior application supports an embodiment within the count. *Weil v. Fritz*, 572 F.2d 856, 865-66 n.16, 196 USPQ 600, 608 n.16 (CCPA 1978). Motions under §1.633(c)(2) or (3), which concern only the claims and do not affect the count, would have no effect on a party's entitlement to benefit of a prior application even if they were granted.

(6) Content of the Record

Paragraph (c)(5) of §1.653 currently requires that the record filed by each party include each notice, official record, and publication relied upon by the party and filed under §1.682(a). This requirement is considered unnecessary, since such notices, official records and printed publications are in the nature of exhibits, which are not included in the record under §1.653(c). Their inclusion in the record merely increases the size of the record without serving any useful purpose. It is therefore proposed that §1.653(c)(5) be deleted, and paragraphs (c)(6) and (c)(7) be renumbered as (c)(5) and (c)(6), respectively.

(7) Failure of the Junior Party to Timely File an Opening Brief

Under the provisions of §1.656(i), if a junior party fails to timely file an opening brief for final hearing, an order may be issued by the examiner-in-chief requiring the junior party to

show cause why the failure to file the brief should not be treated as a concession of priority. Currently, §1.656(i) further states that judgment may be entered against the junior party if the junior party "fails to respond" within a time period set in the order. The expression "fails to respond" has been interpreted by some junior parties as meaning that the mere filing of a response of any kind to the order to show cause should be sufficient to avoid the entry of judgment. Such an interpretation was not intended, and if adopted would effectively negate §1.656(i). In order to make clear that a junior party's failure to file a timely opening brief will not be excused unless sufficient cause is shown to explain or justify the failure, it is proposed to amend §1.656(i) by changing "respond" to "show good cause." The language of the rule will then be consistent with other interference rules dealing with orders to show cause, e.g., §§1.640(e) and 1.652.

Other Considerations:

The proposed rule changes will not have a significant impact on the quality of the human environment or conservation of energy resources. The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because they are primarily intended to simplify by clarification and amplification certain rules governing the conduct of an interference.

The Patent and Trademark Office has determined that these proposed rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., however, they do involve a paperwork burden currently approved by the Office of Management and Budget under control number 0651-0011.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below. Deletions are indicated by brackets and additions by arrows.

PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.11 is proposed to be amended by revising paragraph (e) to read as follows:

§1.11 Files open to the public.

(e) The file of any interference involving a patent, a statutory invention registration, ► a reissue application, ◀ or an application on which a patent has been issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if: (1) the interference has terminated, or (2) an

award of priority or judgment has been entered as to all parties and all counts.

3. Section 1.601(f) is proposed to be amended by revising interdoctr text.
(F) revised to read as follows:

§1.601 Scope of rules, definitions.

This subpart governs the procedure in patent interferences in the Patent and Trademark Office. This subpart shall be construed to secure the just, speedy, and inexpensive determination of every interference. For the meaning of terms in the Federal Rules of Evidence as applied to interferences, see §1.671(c). Unless otherwise clear from the context, the following definitions apply to this subpart:

(f) A "count" defines the interfering subject matter between (1) two or more applications or (2) one or more applications and one or more patents. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent which corresponds to a count is a claim involved in the interference within the meaning of 35 U.S.C. 135(a). A claim of a patent or application which is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application which is not identical to a count, but which defines the same patentable invention as the count, is said to "correspond substantially" to the count. When a count is broader in scope than all claims which correspond to the count, the count is a "phantom count." A phantom count is [not patentable to any party] ▶unpatentable to all parties under 35 U.S.C. 112.◀

4. Section 1.607 is proposed to be amended by adding new paragraph (a)(6) as follows:

§1.607 Request by applicant for interference with patent.

(a) ***

(6) Explaining how the requirements of 35 U.S.C. 135(b) ▶are met, if the claim presented or identified under paragraph (a)(4) of this section was not present in the application until more than one year after the issue date of the patent.◀

5. Section 1.608 is proposed to be amended by revising paragraph (a) to read as follows:

§1.608 Interference between an application and a patent; prima facie showing by applicant.

(a) When the earlier of the filing date or effective filing date of an application is three months or less after the earlier of the filing date or effective filing date ▶under 35 U.S.C. 120◀ of a patent, [the applicant,] before an interference will be declared, ▶either the applicant or the applicant's attorney or agent of record◀ shall file [an affidavit] ▶a statement◀ alleging that there is a basis upon which ▶the◀ applicant is entitled to a judgment relative to the patentee.

6. Section 1.632 is proposed to be revised to read as follows:

§1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.

A notice shall be filed by party who intends to argue that an opponent has abandoned, suppressed ▶,◀ or concealed an actual reduction to practice (35 U.S.C. 102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an examiner-in-chief, a notice is timely when filed within ten (10) days ▶after◀ [of] the close of the testimony-in-chief of the opponent.

7. Section 1.633 is proposed to be amended by revising paragraphs (a), (c) and (i) to read as follows:

§1.633 Preliminary motions.

A party may file the following preliminary motions:

(a) A motion for judgment on the ground that an opponent's claim corresponding to a count is not patentable to the opponent. In determining a motion filed under this paragraph, a claim may be construed by reference to the prior art of record. A motion under this paragraph shall not be based on: (1) Priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. See §1.637(a). ▶If a party files a motion for judgment under this paragraph on the ground of unpatentability over prior art, and the dates of the cited prior art are such that it would appear to be applicable to the moving party, it will be presumed, without regard to the dates alleged in the preliminary statement of the moving party, that the cited prior art is applicable to the moving party unless there is included with the motion a sufficient explanation, and evidence if appropriate, as to why the prior art would not apply to the movant. If no such explanation, or an insufficient explanation, is provided with the motion, the movant will not be permitted to rely on any such explanation, or evidence, in response to or in any subsequent action in the interference.◀

(e) A motion to declare a additional interference (1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference ▶(2) between a patent not involved in the interference and owned by a party and an opponent's application involved in the interference, ▶or (2)▶▶3◀ when an interference involves three or more parties, between less than all applications and any patent involved in the interference. See §1.637(a) and (e).

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an opponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section [or] ▶,◀ a motion to substitute a different application under paragraph (d) of this section ▶,◀ or a motion to add a reissue application to the interference under paragraph (h) of this section.◀

8. Section 1.637 is proposed to be amended by revising paragraphs (c)(2)(ii) and (iii); adding paragraphs (c)(1) ▶vii), (d)(5), (e)(1)(ix) and (e)(2)(viii); and deleting paragraphs (c)(2)(iv) and (c)(3)(iii), as follows:◀

§1.637 Content of motions.

(c) ***

(1) ***

▶vii) If an opponent is accorded the benefit of the filing date of an earlier application in the notice of declaration of the interference, show why the opponent is not entitled to its benefit. Otherwise, the opponent will be presumed to continue to be entitled to the benefit of the earlier application with respect to the proposed count.◀

(2) ***

(ii) Show that the ▶claim◀ proposed ▶to be amended◀ or added [claim] defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each ▶claim proposed to be◀ amended or [added] ▶each◀ claim ▶proposed to be added,◀ and apply the terms of the ▶claim proposed to be◀ amended or [added] claim ▶proposed to be

added◀ to the disclosure of the application; when necessary a moving party applicant shall file with the motion [an] ▶a proposed◀ amendment [making the amended] ▶to the application amending the claim corresponding to the count◀ or [added] ▶adding the proposed additional◀ claim to the application.

[(iv) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.]

(3) ***

[(iii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.]

(d) ***

▶(5) If an opponent is accorded the benefit of the filing date of an earlier application in the notice of declaration of the interference, show why the opponent is not entitled to its benefit. Otherwise, the opponent will be presumed to continue to be entitled to the benefit of the earlier application.◀

(e) ***

(1) ***

▶(ix) If an opponent is accorded the benefit of the filing date of an earlier application in the notice of declaration of the interference, show why the opponent is not entitled to its benefit. Otherwise, the opponent will be presumed to continue to be entitled to the benefit of the earlier application with respect to the proposed count.◀

(2) ***

▶(viii) If an opponent is accorded the benefit of the filing date of an earlier application in the notice of declaration of the interference, show why the opponent is not entitled to its benefit. Otherwise, the opponent will be presumed to continue to be entitled to the benefit of the earlier application with respect to the proposed count.◀

9. Section 1.653 is proposed to be amended by deleting paragraphs (c)(5) and renumbering paragraphs (c)(6) and (c)(7), as follows:

§1.653 Record and exhibits.

(c) ***

[(5) Each notice, official record, and publication relied upon by the party and filed under §1.682(a).]

▶(5)◀ [(6)] Any evidence from another interference, proceeding, or action relied upon by the party under §1.683.

▶(6)◀ [(7)] Each request for an admission and the admission and each written interrogatory and the answer upon which a party intends to rely under §1.688.

10. Section 1.656 is proposed to be amended by revising paragraph (i) as follows:

§1.656 Briefs for final hearing.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to [respond] ▶show good cause◀

within a time period set in the order, judgment may be entered against the junior party.

Jan. 14, 1992

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Tool Stores, Inc., Canoga Park, Calif., Reg. No. 1,409,806 for the mark "TOOL SHACK", Canc. No. 19805.
Gaston Johnston Corp., Long Island City, N.Y., Reg. No. 1,035,406 for the mark "SURF BUM", Canc. No. 19,851
Congress Sportswear Co. Inc., Boston, Mass., Reg. No. 630,493, for the mark "CANADIAN NORTHWEST", Canc. No. 19,985.
Chocoline, Inc., Lakewood, N.J., Reg. No. 1,411,561 for the mark "ANGEL KISS AND DESIGN", Canc. No. 19,794.

JEAN BROWN
Administrator, Trademark Trial
and Appeal Board
for JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Patents Available for License or Sale

4,998,920 PROTECTIVE ASSEMBLY FOR HYPODERMIC SYRINGE DEVICES, Delores Johnson, 6920 Summerfield Drive, Indianapolis, Ind. 46214

4,932,574 CONVERTIBLE COAT AND CARRYING MEANS AND METHOD, Jyoti J. Doshi, 222 Washington St., Brookline, Mass. 02146

5,073,937 HYDRODYNAMICALLY PRESSURE RELATED LOUDSPEAKER SYSTEMS, Lee W. Almasy, 339 Long Road, Pittsburgh, Pa. 15235

Clarification of Office Policy Regarding Actions by Assignee of Trademark Applications and Registrations and Issuance of Certificates of Registrations in Name of Assignee

Trademark Rule 2.186, 37 C.F.R. §2.186, permits an assignee to take action regarding a trademark application or registration, provided that: (1) the assignment has been recorded with the Assignment Division of the Patent and Trademark Office, or (2) proof of assignment has been submitted.

Where a trademark application has been assigned, the certificate of registration will issue in the name of the assignee only if: (1) the applicant expressly requests in the application record that the registration issue in the name of the assignee, and (2) an appropriate document is of record in the Assignment Search Room. To ensure that the registration issues in the name of the new owner, the assignee/applicant bears the burden of both recording the document(s) with the Assignment Division and notifying the Examining Attorney of the recordation of the assignment.

While a party taking an action under Section 8 or 9 of the Trademark Act may establish its ownership without recording the appropriate documents with the Assignment Division, there are certain benefits gained from recordation. Specifically, only

when the necessary documents have been duly recorded in the Assignment Division will a certified copy of a registered mark, with title and/or status, reflect the true owner of the registration. In addition, recordation is required for the renewal certificate and the Section 8 acceptance notice to be issued in the name of the current owner.

Jan. 8, 1992

JEFFREY M. SAMUELS
*Assistant Commissioner
for Trademarks*

**Receipt of a Filing Date Under Section 44
of the Trademark Act -
Claim of a Bona Fide Intention
to Use the Mark in Commerce Required**

For purposes of receiving a filing date, applications filed in the United States based on prior registrations in an applicant's country of origin under Section 44(e) of the Trademark Act, 15 U.S.C. §1126(e), and applications claiming the benefit of a priority filing date in the United States based on prior application in a Paris Convention country under Section 44(d) of the Act, 15 U.S.C. §1126(d), must include a statement "that the applicant has a bona fide intention to use the mark in commerce." 15 U.S.C. 1126(d) and (e); Trademark Rules 2.21(a) (5) (ii) and (iii); 37 C.F.R. §2.21(a) (5) (ii) and (iii).

The claim of a bona fide intention to use the mark in commerce is expressly required by the statute and cannot be waived by the Commissioner for any reason. The claim is required in all applications filed under Section 44, even if the applicant has commenced use of the mark in commerce, and even if the applicant is also filing on the basis of use in commerce under Section 1(a) of the Act.

Where a Section 44 applicant has used the mark in commerce, it may choose to submit for the record an additional statement regarding actual use. For example, an applicant could state that it "has a bona fide intention to use the mark in commerce, as evidenced by the fact that actual use in commerce with the United States has commenced." In this way, the application will contain the statutorily required language of a "bona fide intention to use the mark in commerce," as well as the additional clarifying language that, in this particular instance, the mark is actually in use in commerce.

Jan. 8, 1992

JEFFREY M. SAMUELS
*Assistant Commissioner
for Trademarks*

Typed Drawings in Trademark Applications

Trademark Rule 2.51(e), 37 C.F.R. §2.51(e), permits submission of certain drawings in typed form. However, typefaces

currently available on typewriters and word processors may give the appearance of special form. Therefore, in order to avoid confusion as to whether or not a drawing is intended to show special form, all typed drawings should be depicted in a standard type which does not give the appearance of special form.

A special form drawing must be submitted if the mark contains any special character, feature or form which cannot be represented by means of typing in pica or elite type. Typing is inappropriate if the mark contains numeric exponents, foreign characters or punctuation marks other than those listed below:

. ? " - ; (% \$ @ + , ! ' : /) & # * =

Diacritical marks such as the German umlaut, the Spanish tilde and the French accents are permitted if they can be typed in pica or elite type.

Jan. 8, 1992

JEFFREY M. SAMUELS
*Assistant Commissioner
for Trademarks*

**Filing of Facsimile Transmissions of Certain Trademark
Papers**

On February 12, 1991, the Trademark Examining Groups (TMEG) and the Office of the Assistant Commissioner for Trademarks implemented a pilot program to study the feasibility of accepting certain trademark documents by facsimile transmission (fax). (See the *Trademark Official Gazette* notice at 1123 TMOG 18 (Feb. 12, 1991) regarding documents which may now be filed by fax transmission, documents which are excluded from fax transmission and the requirements for filing by fax in connection with this program. See also the *Trademark Official Gazette* notice at 1127 TMOG 36 (June 11, 1991) regarding new fax numbers for filing documents by facsimile transmission.)

Although certain documents are excluded from fax transmission, facsimile copies, like any other copies, which are mailed, hand-delivered or deposited with the Office pursuant to Rule 1.6(c), 37 C.F.R. §1.6(c), may be filed in place of original documents. In such cases, the Office will not require submission of the original document and, in fact, discourages such practice. Facsimile copies of papers required to be certified or those requiring an original signature will not be accepted.

Jan. 8, 1992

JEFFREY M. SAMUELS
*Assistant Commissioner
for Trademarks*

PATENT NOTICES

Certificates of Correction For Week of February 11, 1992

4,404,040	4,888,743	4,927,077	4,951,416
D. 311,575	4,890,860	4,929,293	4,951,653
Re. 33,299	4,893,545	4,931,151	4,951,764
4,081,313	4,894,843	4,931,498	4,952,229
4,606,572	4,894,935	4,932,026	4,952,426
4,616,510	4,895,149	4,932,258	4,952,689
4,623,407	4,898,147	4,935,525	4,952,925
4,680,700	4,898,799	4,936,861	4,953,976
4,708,494	4,899,110	4,937,874	4,954,095
4,711,730	4,900,987	4,938,031	4,954,241
4,737,188	4,902,207	4,938,732	4,954,752
4,750,106	4,902,713	4,938,841	4,954,816
4,775,411	4,902,777	4,939,454	4,954,900
4,785,880	4,903,709	4,939,459	4,954,982
4,805,536	4,906,467	4,941,406	4,955,379
4,818,614	4,906,509	4,941,559	4,955,712
4,821,731	4,907,526	4,941,930	4,955,907
4,822,887	4,908,802	4,941,944	4,956,346
4,830,712	4,911,684	4,942,254	4,957,014
4,831,691	4,912,719	4,943,142	4,957,211
4,833,243	4,913,256	4,943,816	4,957,613
4,834,885	4,913,827	4,943,854	4,958,620
4,841,097	4,917,427	4,944,916	4,959,318
4,849,774	4,918,380	4,945,073	4,960,009
4,849,906	4,918,639	4,946,112	4,960,039
4,852,684	4,918,641	4,946,403	4,960,836
4,853,732	4,919,334	4,946,748	4,962,616
4,862,850	4,919,500	4,946,766	4,962,694
4,867,496	4,920,116	4,946,934	4,964,248
4,871,480	4,920,631	4,947,680	4,982,845
4,871,789	4,921,802	4,947,717	4,985,634
4,875,696	4,924,353	4,947,719	5,014,856
4,876,003	4,924,856	4,947,864	5,031,784
4,876,293	4,924,862	4,947,874	5,033,096
4,878,866	4,925,159	4,948,842	5,054,727
4,883,100	4,925,401	4,949,561	5,055,251
4,885,475	4,926,132	4,950,082	
4,887,134	4,926,155	4,950,383	
4,888,731	4,926,548	4,950,714	

1135 OG 43

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box	Commissioner of Patents and Trademarks Washington, D.C. 20231
Box 3	Mail for the Office of personnel for NFC
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor <i>except</i> communications relating to <i>pending litigation</i> ; papers relating to pending litigation shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents except: trademark registrations and assignments.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Invoices directed to the Office of Finance.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee. All intent to use documents, excluding the initial application and amendments to allege use. Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box ITU	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box M. Fee	Mail for the Office of Enrollment and Discipline
Box Non-Fee- Amendment	
Box OED	
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for <i>original</i> request papers <i>only</i> .
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications <i>prior</i> to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Purdue University Libraries	(317) 494-2873
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Big Rapids: Abigail S. Timme Library, Ferris State University	Not Yet Operational
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331

Reference Collections of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

State	Name of Library	Telephone Contact
Rhode Island South Carolina Tennessee	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
	Providence Public Library	(401) 455-8027
	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
West Virginia	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Madison	(608) 262-6845
Wisconsin	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	10/27/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	4/26/90
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — DONALD CZAJA, Acting Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/6/90
BIOTECHNOLOGY, GROUP 180 — BARRY S. RICHMAN, Acting Director	308-0196	6/30/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	6/12/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	6/12/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	10/12/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS, GROUP 240 — CARLTON CROYLE, Director	308-0771	12/24/90
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	12/15/90
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	7/07/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	4/18/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	3/04/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	2/12/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	11/26/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	2/05/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	11/28/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during January 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents	Numbers 3,858,241 to 3,863,270 inclusive
Plant Patents	3,674 to 3,677

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REISSUES

FEBRUARY 11, 1992

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,816

PULSE COMPRESSION APPARATUS FOR ULTRASONIC IMAGE PROCESSING

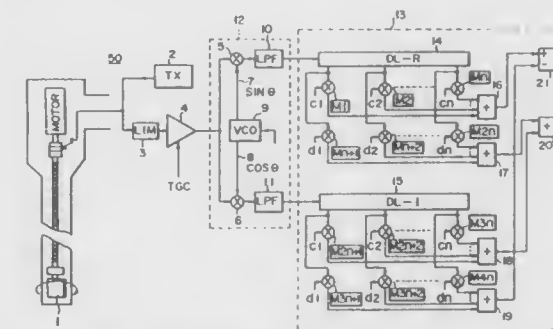
Tatsuo Nagasaki, Yokohama; Koji Taguchi, Hachioji; Shinichi Imade, Iruma; Eishi Ikuta, Sagami-hara, and Kazunori Shionoya, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Original No. 4,788,981, dated Dec. 6, 1988, Ser. No. 107,497, Oct. 9, 1987. Application for reissue Dec. 6, 1990, Ser. No. 623,191

Claims priority, application Japan, Oct. 16, 1986, 61-245777
Int. Cl.⁵ A61B 10/00

U.S. Cl. 128—660.07

22 Claims



1. A pulse compression apparatus for ultrasonic image processing, comprising:
quadrature detection means for converting an echo signal obtained from an ultrasonic transducer means into a complex signal;
reference output means for producing a reference wave signal; and
correlation means for deriving a correlation between said complex signal and said reference wave signal to compress said echo signal.

16. A pulse compression apparatus according to claim 1, which further includes at least one of first and second memory means provided in an endoscope, said first memory means storing a first signal defining a transmission signal and a second signal defining frequencies of continuous wave signals output from said quadrature detection means, and said second memory means storing a third signal defining a frequency of said reference signal in said correlation means.

Re. 33,817

APPARATUS FOR FOLDING AN OUTBOARD BOOM ON A LIQUID SPRAYING IMPLEMENT

Loren E. Tyler, Loomington, Ill., assignor to Lor-al, Inc., Benson, Minn.

Original No. 4,449,667, dated May 22, 1984, Ser. No. 371,817, Apr. 26, 1982. Application for reissue Jul. 13, 1989, Ser. No. 381,589

Int. Cl.⁵ B05B 1/20

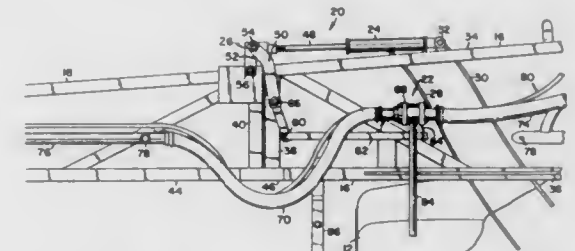
U.S. Cl. 239—167

4 Claims

1. Apparatus for folding an outboard portion of a boom and controlling substance flow to ejection devices supported thereon, said boom having also an inboard portion, said apparatus comprising:

hinge means for pivotably connecting the inboard and outboard portions of said boom;
a valve connected between a source container in fluid communication with said ejection devices and said ejection devices on the outboard portion of said boom, said valve having an actuating member;
means for moving the outboard portion of said boom about

the pivoted axis of said hinge means and simultaneously moving said valve actuating member, said moving means being attached [directly] to [one of] said inboard [and outboard portions] portion;
linkage means for connecting said moving means, said valve and [the other of said inboard and] said outboard [por-



tions] portion, said linkage means forming a common axis with a first element connected to [said other of] said [inboard and] outboard [portions] portion and a second element connected to said valve, said moving means moving said outboard portion and said valve actuating member simultaneously by moving said common axis.

Re. 33,818

AXIALLY SHAPED CHANNEL AND INTEGRAL FLOW TRIPPERS

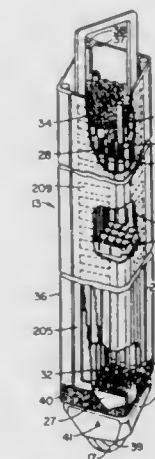
Russell L. Crowther, Jr. deceased, late of Saratoga by Cosette M. Crowther, Russell L. Crowther, III, Eric J. Crowther, heirs; Eric B. Johansson, and Bruce Matzner, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Original No. 4,749,543, dated Jun. 7, 1988, Ser. No. 29,508, Mar. 24, 1987. Application for reissue Jun. 6, 1990, Ser. No. 534,812

Int. Cl.⁵ G21C 3/34

U.S. Cl. 376—443

14 Claims



1. A fuel assembly comprising a plurality of fuel rods posi-

tioned in spaced array by upper and lower tie-plates, an open ended flow channel surrounding said array for conducting coolant upward between a lower support plate having coolant communicated thereto to an upper support grid having a steam/water outlet communicated thereto, said flow channel surrounding said array for conducting coolant about said fuel rods; said open ended channel having a polygon shaped cross section with said channel constituting a closed conduit with flat side sections connected at corners to form said enclosed conduit; means separate from said channel for connecting said upper and lower tie-plates together and maintaining said fuel rods in spaced array independent of said flow channel, the improvement in said flow channel comprising tapered side walls, said tapered side walls extending from an average thick cross section adjacent said lower support plate to an average thin cross section adjacent said upper core grid whereby said channel is reduced in thickness adjacent said upper core grid to correspond with the reduced pressure adjacent said upper core grid.

Re. 33,819

MAGENTA DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

William H. Moore; Max A. Weaver, both of Kingsport, Tenn., and Kin K. Lum, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,698,651, dated Oct. 6, 1987, Ser. No. 923,444, Oct. 27, 1986. Continuation-in-part of Ser. No. 813,208, Dec. 24, 1985, abandoned. Application for reissue Mar. 17, 1989, Ser. No. 325,173

Int. Cl.⁵ B41M 5/035, 5/26

U.S. Cl. 503—227

31 Claims

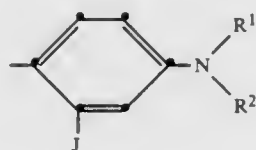
18. A thermal transfer printing sheet comprising a support having thereon a dye layer comprising a magenta azo dye dispersed in a polymeric binder, said magenta azo dye having the formula:



wherein:

A is isothiazol-5-yl substituted in the 3-position by hydrogen, substituted or unsubstituted alkyl of from 1 to about 6 carbon atoms, substituted or unsubstituted aryl of from about 5 to about 10 carbon atoms, alkylthio or halogen, and substituted in the 4-position by cyano, thiocyanato, alkylthio or alkoxy-carbonyl; and

E is a group of the formula:



wherein

J may be substituted or unsubstituted alkyl of from 1 to about 6 carbon atoms, substituted or unsubstituted aryl of from about 5 to about 10 carbon atoms or NHA, where A is an acyl or sulfonyl radical; and

R¹ and R² may each independently be hydrogen; substituted or unsubstituted alkyl or allyl of from 1 to about 6 carbon atoms; substituted or unsubstituted cycloalkyl of from about 5 to about 7 carbon atoms, substituted or unsubstituted aryl of from about 5 to about 10 carbon atoms; or R¹ and R² may be taken together to form a ring; or a 5- or 6-membered heterocyclic ring may be formed with R¹ or R², the nitrogen to which R¹ or R² is attached, and either carbon atom ortho to the carbon attached to said nitrogen atom.

Re. 33,820

PREPARATION OF ALKOXY MALEIC ANHYDRIDES

Rainer Becker, Bad Dürkheim, and Wolfgang Rohr, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Original No. 4,877,887, dated Oct. 31, 1989, Ser. No. 189,297, May 2, 1988. Application for reissue Oct. 4, 1990, Ser. No. 592,847

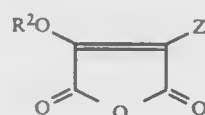
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715344

Int. Cl.⁵ C07D 307/56, 307/62

U.S. Cl. 549—253

2 Claims

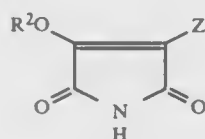
1. A process for the preparation of a maleic anhydride



II

where R² is C₁-C₄-alkyl, C₂-C₄-alkenyl, C₁-C₄-haloalkyl or C₂-C₄-haloalkenyl and Z is hydrogen, halogen or a radical OR³, where R³ is C₁-C₄-alkyl, C₂-C₄-alkenyl, C₁-C₄-haloalkyl or C₂-C₄-haloalkenyl, which comprises:

subjecting a maleimide



Ia

to alkaline hydrolysis at 0° to 100° C. and cyclizing the resulting maleic acid dianion in the presence of an acid to give the anhydride II; and isolating said anhydride II which has been formed in the reaction mixture.

Re. 33,821

SYRINGE HYPODERMIC NEEDLE

Gilbert H. Banks, Logan Valley, Australia, assignor to Transbrook Pty. Limited, Sydney, Australia

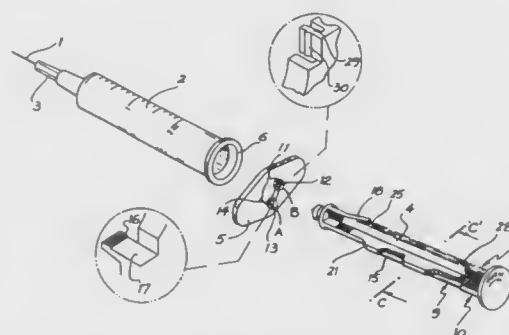
Original No. 4,840,616, dated Jun. 20, 1989, Ser. No. 161,574, Feb. 29, 1988. Application for reissue Feb. 8, 1991, Ser. No. 652,703

Claims priority, application Australia, Feb. 29, 1988, 161574

Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—110

9 Claims



1. A single use disposable medical syringe comprising a syringe body adapted at one end to receive a hypodermic needle, a plunger located within said syringe body and passing through an end plate attached to other end of said syringe body and characterised in that:

said plunger includes a plunger head forming at any time a seal with an interior surface of said syringe body, and a plunger shaft including at least a first and second longitu-

dinally extending spline, said first spline including teeth adapted to co-act with a first pawl and said second spline including teeth adapted to co-act with a second pawl, said splines further including circumjacent and corresponding first and second recesses;

said end plate having an aperture to locate said plunger shaft, said aperture having three or more channels each adapted to receive one or other said splines and two of said chan-

nels being provided respectively with said first and second pawls;

said recesses allowing free rotation of said plunger within said end plate aperture such that when said first pawl allows withdrawal only of said plunger whereupon predetermined free rotation of said plunger engages said second pawl which allows insertion only of said plunger.

PLANT PATENTS

GRANTED FEBRUARY 11, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,783

ROSE PLANT—MEIPITAC VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Sep. 10, 1990, Ser. No. 580,190

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—1

1 Claim

1. A new and distinct variety of rose plant of the Shrub Class characterized by the following combination of characteristics:

- (a) abundantly and continuously forms attractive long lasting double bicolored blossoms which are China Rose on the upper surface and Cream White widely suffused with Pale Pink on the under surface,
- (b) forms blossoms having very consistent petals,
- (c) exhibits a very rapid reflowering cycle,
- (d) forms vigorous vegetation,
- (e) assumes a well-balanced configuration,
- (f) forms bright dark green foliage, and
- (g) is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

7,784

ROSE PLANT—MEICIJAS VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Sep. 10, 1990, Ser. No. 580,252

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—15

1 Claim

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

- (a) from the physical point of view the plant has an upright growth habit, forms dark green adult wood and has characteristics very similar to its parent Meijason variety (U.S. Plant Pat. No. 5,622) with the exception that its very double long lasting flowers while having the same shape and form have a distinctive light lemon yellow coloration instead of the very light cream yellow edged with luminous pink coloration of its parent, and
- (b) from the biological point of view the plant forms vigorous vegetation and is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

7,785

ROSE PLANT—MEIKIJI VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Sep. 10, 1990, Ser. No. 580,253

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—22

1 Claim

1. A new and distinct variety of Floribunda rose plant characterized by the following combination of characteristics:

- (a) forms abundantly and continuously attractive long-lasting bicolored double blossoms which are French Rose edged and suffused with Rose Bengal,

- (b) forms medium green adult wood,
- (c) forms vigorous vegetation,
- (d) is particularly well suited for the decoration of parks and gardens, and
- (e) is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

7,786

ASTER PLANT NAMED DARK PINK STAR

Micha Danziger, Post Beit Dagan, P.O.B. 24, Moshav Mishmar Hashiva 50 297, Israel

Filed Oct. 29, 1990, Ser. No. 604,224

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct Aster plant named Dark Pink Star, as described and illustrated.

7,787

IMPATIENS PLANT NAMED CHARADE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 31, 1990, Ser. No. 606,841

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of Impatiens plant named Charade, as illustrated and described.

7,788

IMPATIENS PLANT NAMED AMBROSIA

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 31, 1990, Ser. No. 607,022

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of Impatiens plant named Ambrosia, as illustrated and described.

7,789

IMPATIENS PLANT NAMED INNOCENCE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 31, 1990, Ser. No. 607,021

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of Impatiens plant named Innocence, as illustrated and described.

7,790

CHRYSANTHEMUM PLANT NAMED CREAM FROLIC

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 18, 1990, Ser. No. 599,348

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—78

1 Claim

1. A new and distinct Chrysanthemum plant named Cream Frolic, as described and illustrated.

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PATENTS

GRANTED Feb. 11, 1992

ERRATA

For CLASS	See PATENT NO.
211-041	5,086,544
454-187	5,086,692
110-234	5,086,720
602-017	5,086,757
602-019	5,086,758
602-019	5,086,759
602-027	5,086,760
602-026	5,086,761
602-004	5,086,762
602-042	5,086,763
602-042	5,086,764
152-251	5,086,815
229-217	5,086,928
224-042	5,086,958
462-008	5,087,079
385-027	5,087,108
385-110	5,087,110
359-479	5,087,111
359-800	5,087,112
359-059	5,087,113
359-081	5,087,114
359-719	5,085,115
359-851	5,087,116
493-023	5,087,140
106-021	5,087,283
106-038	5,087,285
106-287	5,087,286
106-677	5,087,287
136-225	5,087,312
205-075	5,087,330
205-118	5,087,331
205-135	5,087,332
205-138	5,087,333
395-325	5,088,022
395-425	5,088,023
395-725	5,088,024
395-275	5,088,025
395-425	5,088,026
395-575	5,088,027
395-325	5,088,028
395-275	5,088,029
395-400	5,088,031
395-200	5,088,032

ERRATA—Continued

395-500	5,088,033
395-700	5,088,034
395-375	5,088,035
395-425	5,088,036
395-011	5,088,048
395-023	5,088,049
395-142	5,088,050
395-117	5,088,051
395-158	5,088,052
395-166	5,088,053
395-121	5,088,054

PATENTS

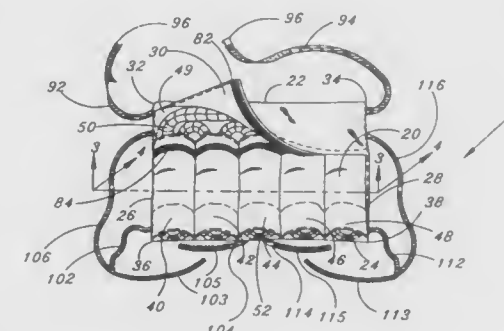
GRANTED FEBRUARY 11, 1992

GENERAL AND MECHANICAL

5,086,514
INFLATABLE PROTECTIVE CUSHION TO BE WORN BY PEOPLE IN HIGH SPEED AND HIGH IMPACT SPORTS
 Gary Ross, 140 Oxnard Ave., Oxnard, Calif. 93035
 Filed Jun. 5, 1991, Ser. No. 710,465
 Int. Cl.⁵ A41D 13/00

U.S. Cl. 2—2

25 Claims



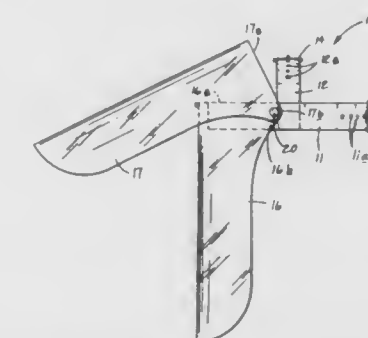
1. An inflatable protective cushion comprising:
 - a. a generally rectangular shaped pouch made of flexible, non-stretchable and abrasion resistant fabric material, the generally rectangular shaped pouch having an upper edge, a lower edge and two side edges;
 - b. said generally rectangular shaped pouch also having two upper corners and two lower corners;
 - c. said generally rectangular shaped pouch further having five vertical generally tubular shaped constricted compartments, the five vertical generally tubular shaped constricted compartments being arranged next to one another and parallel to said two side edges of said generally rectangular shaped pouch, and each vertical generally tubular shaped constricted compartment having an upper opening;
 - d. a generally rectangular shaped cover made of flexible, non-stretchable and abrasion resistant fiber material, the generally rectangular shaped cover extending from said upper edge of said generally rectangular shaped pouch and folding down to cover said upper openings of said five vertical generally tubular shaped constricted compartments and forming a horizontal constricted compartment which interconnects said five vertical generally tubular shaped constricted compartments;
 - e. an elongated generally tubular shaped inflatable membrane made of flexible impervious rubber material, the elongated generally tubular shaped inflatable membrane being woven into said five vertical generally tubular shaped constricted compartments through their respective upper openings, such that each vertical generally tubular shaped constricted compartment contains two folded portions of the elongated generally tubular shaped inflatable membrane, and said horizontal constricted compartment contains a straight portion of the elongated generally tubular shaped inflatable membrane;
 - f. said elongated generally tubular shaped inflatable membrane further having valve means for inflating said elongated generally tubular shaped inflatable membrane and maintaining a desired air pressure therein;
 - g. lock means for closing said generally rectangular shaped cover to said rectangular shaped pouch;
 - h. belt means for attaching said generally rectangular shaped pouch to the waist of the wearer, such that the waist region of the wearer's body is overlapped by said horizontal constricted compartment, and the two opposite hip regions of the wearer's body are overlapped by a portion

- of said five vertical generally tubular shaped constricted compartments; and
- i. strap means for attaching said rectangular shaped pouch to the two legs of the wearer, such that each of the two hip regions of the wearer's body is overlapped by a respective pair of said five vertical generally tubular shaped constricted compartments;
- j. whereby said inflatable protective cushion can be worn by people in high speed and high impact sports such as snowboarding for cushioning the blow when falling on their rear, or for sitting on as a seat when working on their boot bindings.

5,086,515
WELDING SHIELD APPARATUS
 Samuel S. Giuliano, 258 Walzford Rd., Rochester, N.Y. 14622
 Filed Dec. 5, 1990, Ser. No. 622,629
 Int. Cl.⁵ A61F 9/06

U.S. Cl. 2—8

1 Claim



1. A welding shield apparatus including a support, wherein the support is arranged for defining an open cavity, the support including a horizontal adjustable cylindrical mounting band, including a first adjustment member to provide annular adjustment of the horizontal mounting band, and
 - a vertical semi-cylindrical mounting band orthogonally mounted to the horizontal mounting band by first mounting means, with the vertical mounting band including a second adjustment member to effect adjustment of the second mounting band, and
 - a first clear shield mounted to the horizontal cylindrical mounting band forwardly of the vertical semi-cylindrical mounting band, with the first adjustment member mounted rearwardly of the vertical semi-cylindrical band on the horizontal cylindrical mounting band, and
 - an opaque shield mounted coextensively with and overlying the clear shield, the clear shield and the opaque shield pivotally mounted to the horizontal cylindrical mounting band forwardly of the vertical semi-cylindrical mounting band, and
 - wherein the clear shield includes a first upper arcuate edge, with a plurality of first ears extending rearwardly of the clear shield along the first upper arcuate edge, and the opaque shield including a second upper arcuate edge, with the opaque shield including a plurality of second ears, wherein the second ears extend rearwardly of the opaque shield along the second upper arcuate edge, and the first upper arcuate edge and the second upper arcuate edge are aligned relative to one another in a lowered position and aligned with an upper edge of the horizontal cylindrical mounting band in the lowered position, wherein the clear shield and opaque shield are arranged orthogonally relative to the horizontal cylindrical mounting band in the lowered position, and

wherein the first ears and the second ears each include respective second apertures and third apertures, wherein the second apertures and third apertures are coaxially aligned relative to one another, and the horizontal cylindrical mounting band includes a first aperture aligned with each of the second apertures and third apertures, and a fastener member directed through each of the first, second, and third apertures, and

wherein the fastener member includes a threaded shank extending through the first, second, and third apertures, and the threaded shank including a planar head member positioned interiorly of the horizontal cylindrical mounting band, and a first washer mounted between the planar head and the horizontal cylindrical mounting band, and a manual rotatably cylindrical handle mounted to the threaded shank exteriorly of the opaque shield, and the cylindrical handle including a threaded bore, wherein the threaded bore complementarily receives the threaded shank therewithin, and a further washer member interposed between the horizontal cylindrical mounting band and the clear shield, and a spring member mounted in surrounding relationship relative to the further washer and the horizontal cylindrical mounting band and the clear shield, and

including a fluid absorbent band member mounted interiorly of the horizontal cylindrical mounting band by second mounting means, and

including an arcuate attachment plate selectively securable to an exterior surface of the horizontal cylindrical mounting band, and the arcuate attachment plate includes a plurality of positioning studs, wherein the positioning studs complementarily receive a plurality of additional shield members in alignment thereon, and the attachment plate further includes a plurality of snap fasteners, wherein the snap fasteners are selectively securable to snap fastener receiving bores directed through the horizontal cylindrical mounting band, and the arcuate attachment plate further includes a plurality of flexible "U" shaped tabs each receiving the arcuate attachment plate and the horizontal mounting band therewithin to assist in providing securement of the attachment plate to the horizontal cylindrical mounting band.

5,086,516

COAT JACKET WITH DETACHABLE DECLARATIONS OF ALLEGIANCE

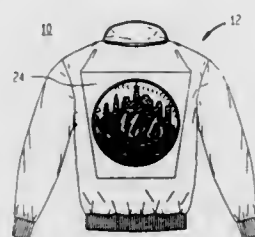
La Varr Baxter, and Roy Baxter, both of 1916 Baags Ave., Neptune, N.J. 07753

Filed Sep. 10, 1990, Ser. No. 579,731

Int. Cl.⁵ A41D 1/02

U.S. Cl. 2—108

3 Claims



1. The combination comprising:
a coat jacket having an outwardly facing back portion;
a first plurality of adhesively securing fabric strips affixed to said back portion to form an outwardly facing frame;
means providing on a first side thereof one of a pictorial representation, logo and insignia according to a wearer's preference;
and a second plurality of adhesively securing fabric strips affixed to a second side of said providing means;

with said second plurality of strips removably attaching said providing means to said jacket via said frame;
wherein said back portion of said coat jacket includes a shoulder section and a waist section, and wherein said first plurality of adhesively securing fabric strips extends both across said sections and between said sections;
wherein said first plurality of strips are of a given width and are affixed to said back portion of said coat jacket by fabric guide and then by a sewing thereto;
wherein said providing means includes a plurality of side edges and wherein said second plurality of adhesively securing fabric strips are of a narrower width than said first plurality of strips and are affixed to said second side of said providing means between said side edges thereof, by a sewing thereto.

5,086,517

SURROGATE NURSING BIB

Stacy C. Jones, 456 S. Harvard Blvd., Los Angeles, Calif. 90020

Continuation-in-part of Ser. No. 378,374, Jul. 11, 1989. This

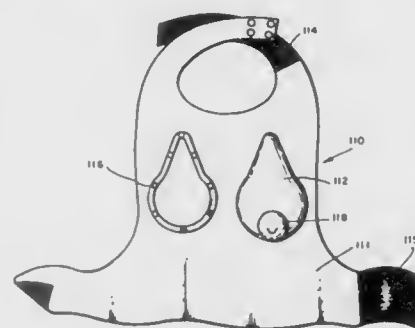
application Oct. 30, 1990, Ser. No. 605,794

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.⁵ A41D 1/20

U.S. Cl. 2—104

1 Claim



1. A surrogate nursing bib for use by a wearer in promoting bonding with child, said surrogate nursing bib comprising:
a. a bib which is formed out of terry cloth;
b. a pouch which is formed out of a latex material in order to provide a natural-looking background and which has an inner side and an outer side and at least one opening;
c. a first set of fastening straps which are mechanically coupled to said bib in order to secure said bib to the neck of the wearer;
d. a second set of fastening straps which are mechanically coupled to said bib in order to secure said bib to the waist of the wearer; and
e. pouch coupling means for coupling said pouch to said bib; and
f. a container which has a nipple on which an infant may suckle, said container being disposed in said pouch so that said nipple protrudes through said opening in said pouch.

5,086,518

METHOD FOR MAKING A VENTED SOCK

William L. Staley, 10265 Gandy Blvd., Apt. 1214, St. Petersburg, Fla. 33702

Continuation of Ser. No. 475,340, Feb. 5, 1990, abandoned. This application Apr. 30, 1991, Ser. No. 696,264

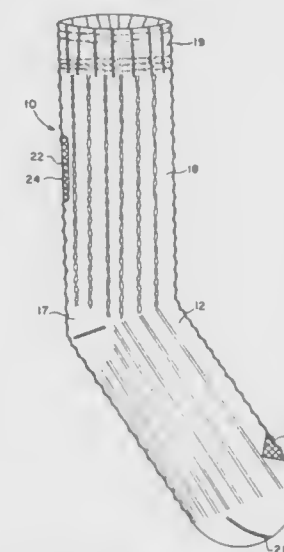
Int. Cl.⁵ A41B 11/00

U.S. Cl. 2—239

8 Claims

1. A method for making a sock including a main portion and a vent panel of lighter weight than said main portion, the vent panel being located on the top of the sock near its toe end, comprising the steps of:
circularly knitting a tubular blank using a doubled yarn

comprising a first yarn and a second yarn, the blank having a pair of open ends;



selectively omitting the second yarn during knitting of the blank to form a vent panel proximate one end of the blank, which vent panel is made of the first yarn only; and sewing said one end of the blank closed to form said sock.

5,086,519

INTERACTIVE LINGERIE UNDERGARMENT

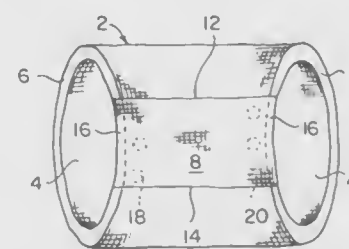
Fred J. Rokasky, 316 Academy St., Carnegie, Pa. 15106

Filed Feb. 7, 1991, Ser. No. 651,944

Int. Cl.⁵ A41B 9/04

U.S. Cl. 2—408

7 Claims



1. A female lingerie undergarment for enhancing sexual arousal, comprising
(a) a panty containing leg openings and including an elastic band surrounding each leg opening;
(b) an overlay flap connected with front and rear portions of said panty and having side edges arranged adjacent to said panty leg openings, said flap including elastic bands connected with said side edges; and
(c) stimulation means connected with said panty in a crotch area adjacent one of said leg openings and with said flap side edge in a crotch area adjacent the other of said leg openings, whereby a crotch opening is defined by pulling said panty and said flap edges having said stimulation means connected therewith toward the opposite leg openings, respectively, and further whereby when a penis is inserted into said opening and said edges are released, said elastic bands of said panty and said flap bias said stimulation means toward the male and female genitalia to enhance sexual arousal.

5,086,520

VENTILATING DEVICE FOR HELMET

Michio Arai, 1-164, Horinouchi, Obmiya-sbi, Saitama-ken, Japan

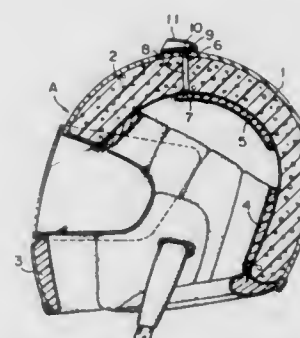
Filed Oct. 22, 1990, Ser. No. 602,200

Claims priority, application Japan, Nov. 7, 1989, 1-130478[U]

Int. Cl.⁵ A42B 1/08

U.S. Cl. 2—424

4 Claims



1. A ventilating device for a helmet, comprising:
a ventilating passage extending through a cap member of a helmet body and further through a shock absorbing member from an outer surface of said cap member in a position near the head top and opening to the interior of said helmet body;
a base plate having a communication hole for communication with said ventilation passage and fixed to the outer surface of said cap member;
an induction duct attached to said base plate;
a rectilinear portion permitting a rectilinear sliding of said duct along said base plate, a circular portion permitting a horizontal rotation of the duct about the base plate in one side of said rectilinear portion, and the rectilinear portion and the circular portion being formed continuously and being connected with the induction duct; and
a through-hole formed in a bottom portion of said induction duct in a central position of said circular portion in conformity and communication with said communication hole of said base plate,
wherein said communication hole can be opened and closed by sliding said induction duct in a longitudinal direction in a mounted state of said base plate and the induction duct, and the supply of air into the interior of said helmet body and the discharge of air therefrom can be changed over from one to the other by rotating said induction duct.

5,086,521

PADDED TOILET SEAT LID

John M. Stewart, River Drive Park, Canada, assignor to Sanitation Equipment Limited, Concord, Canada

Division of Ser. No. 476,233, Feb. 2, 1990, Pat. No. 5,022,946.

This application Feb. 6, 1991, Ser. No. 651,071

Claims priority, application Canada, Nov. 16, 1989, 2003103

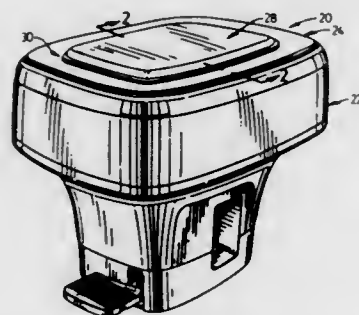
Int. Cl.⁵ A47K 13/00, 13/14

U.S. Cl. 4—234

7 Claims

1. A padded toilet seat lid comprising:
a lid having an upper surface portion made of a thermoplastic material;
a cushion having a peripheral margin; and
a frame having inner and outer parts overlying respectively

said peripheral margin of the cushion and a surrounding part of said lid surface portion, said outer part of the frame



being fused to said lid surface portion in a fused area having magnetically excitable particles dispersed therein.

5,086,522

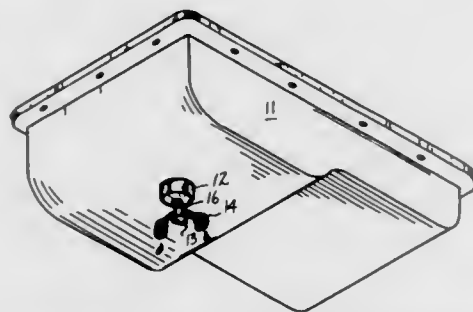
DRAIN PLUG APPARATUS

George D. Stofko, Sr., Box 186, R.D. #1, Pittston, Pa. 18640
Filed Jun. 21, 1990, Ser. No. 541,325

Int. Cl.⁵ A47K 1/14; F16K 31/44

U.S. Cl. 4—295

3 Claims



1. A drain plug apparatus in combination with a fluid reservoir, the fluid reservoir including a bottom surface, and an internally threaded pressure nut fixedly mounted to the bottom surface, the internally threaded pressure nut defined by a coaxially aligned internally threaded conduit, and

an externally threaded discharge screw threadedly received within the conduit, and the discharge screw including an elongate longitudinally aligned shank, the shank including a shank conduit coextensive with and directed through the shank, and the discharge screw further including a conical member, the head member including a head conduit through-extending the head in fluid communication with the shank conduit, and

wherein the shank conduit is orthogonally oriented relative to the head conduit, and wherein the pressure nut includes a boss member extending beyond the pressure nut and integrally formed thereto, the boss member coaxially aligned with the pressure nut and the conduit, and wherein the boss member includes a conical recess coaxially aligned with the conduit formed within a forward end of the boss member of a complementary configuration defined by that of the conical head of the discharge screw, and

wherein the head conduit is seated within the conical cavity in a first position and spaced from the conical cavity in a second position to expose the head conduit, and wherein the conical head of the discharge screw includes a diametrically aligned slot oriented to receive a blade member for removal of the discharge screw from the pressure nut.

5,086,523
SANITARY ATTACHMENT MEANS FOR A TOILET SEAT WHICH FEATURES A REPLACEABLE DEODORIZER AND SERVES AS A HANDLE TO LIFT AND LOWER SEAT

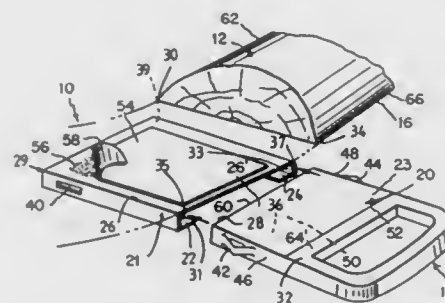
Corinne De Mott, 1937 Wilhelmina Rise, Honolulu, Hi. 96816, and Ghary D. Won, 1717 Ala Wai Blvd., #1406, Honolulu, Hi. 96815

Filed Aug. 8, 1990, Ser. No. 564,355

Int. Cl.⁵ A47K 13/10

U.S. Cl. 4—251

13 Claims



1. A sanitary attachment adapted to be mounted to an under-surface of a toilet seat of a toilet, comprising:

- a substantially rectangular, planar handle portion having a through opening in a first end portion thereof and a cavity in a second end portion thereof, said cavity having a replaceable solid deodorant therein; and
- a bracket portion slidably receiving said handle portion, said bracket portion having a substantially rectangular, planar top member including means for attachment to the undersurface of the toilet seat, said top member having a pair of depending "L"-shaped flanges on opposing edges thereof defining therewith "U"-shaped channels being sized to slidably receive opposing sides of said second end portion therewithin, said bracket portion being oriented such that said first end portion extends laterally of the toilet seat to be grasped by a user when said second end portion is received in said channels.

5,086,524

DOUBLE-ACTING WATER CLOSET METERING DEVICE
Charles F. Stevens, 20192 Rockville Ct., Yorba Linda, Calif. 92686

Division of Ser. No. 519,430, May 4, 1990, Pat. No. 5,040,247, which is a division of Ser. No. 189,152, May 2, 1988, Pat. No. 4,937,895, which is a continuation-in-part of Ser. No. 51,297, May 15, 1987, Pat. No. 4,748,699. This application Mar. 25, 1991, Ser. No. 674,595

Int. Cl.⁵ E03D 1/00

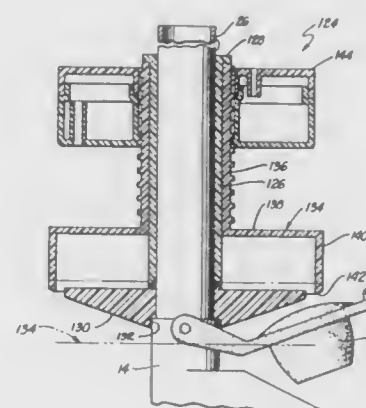
U.S. Cl. 4—415

12 Claims

1. A water closet metering device from which position said float will drop with a receding water level comprising:

- an actuator flange;
- an actuator tube attached to said actuator flange and extending upwardly therefrom, said actuator tube having an open interior for sliding embrace on the overflow tube of a toilet tank, said actuator flange having a downwardly directed face for engaging against the flapper valve adjacent the overflow tube for thrusting the flapper valve towards the closed position;
- a sleeve engaged on and slidable with respect to said actuator tube, an actuator surface mounted on said sleeve and positioned to move below said actuator flange;
- a float mounted on said sleeve, a stop on said actuator tube to be engaged by said sleeve to limit upward motion of said sleeve on said actuator tube to a raised position where

said actuator surface is not below said actuator flange from which position said float will drop with a receding



water level to a position where said actuator surface is below said actuator flange.

5,086,525

MOISTURE-PROOF SPA COVER AND METHOD OF CONSTRUCTION

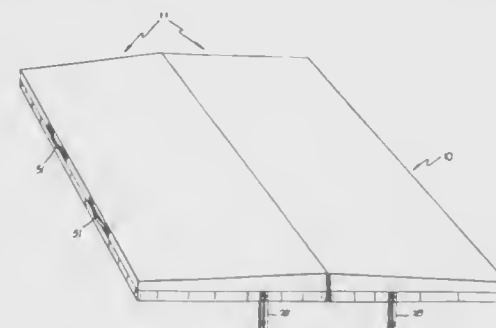
Larry D. Christopher, 1364 S. Kendall Ct., Lakewood, Colo. 80226

Filed Apr. 13, 1990, Ser. No. 509,372

Int. Cl.⁵ E04H 4/00; A47K 3/02

U.S. Cl. 4—498

18 Claims



1. An apparatus to protect a spa, comprising a first cover with:

- a one-piece insulating insert having a top surface and bottom surface;
- a substantially unitary flexible top panel sheet made of a durable weather resistant and water proof material and having an inner side surface, an outer side surface and a periphery, said top panel covering said insert, with said top panel inner side surface in direct contact with said insert top surface and said top panel outer side surface being exposed;
- a substantially unitary flexible bottom panel sheet made of a durable weather resistant and water proof material and having an inner side surface, an outer side surface and a periphery, said bottom panel covering said insert, with said bottom panel inner side surface in direct contact with said insert bottom surface and said bottom panel outer side surface being exposed, and substantially all of said bottom panel periphery being attached to substantially all of said top panel periphery so that said insert is protected from moisture.

5,086,526

BODY HEAT RESPONSIVE CONTROL APPARATUS
Karel C. Van Marcke, Kruishoutem, Belgium, assignor to International Sanitary Ware Manufacturing Co., S.A., Kruishoutem, Belgium

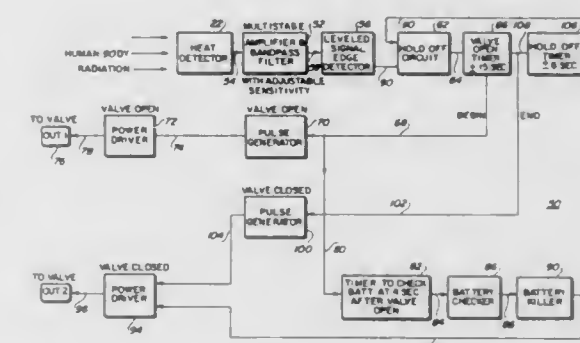
Continuation-in-part of Ser. No. 419,315, Oct. 10, 1989, Pat. No. 4,941,219. This application Jul. 6, 1990, Ser. No. 549,220

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.⁵ E03C 1/05

U.S. Cl. 4—623

24 Claims



1. A passive apparatus for controlling the operation of a fluid flow control valve in response to the presence of a human body part, said apparatus comprising in combination:

- a sensor for detecting heat radiating from a human body part within a predetermined detection field and for producing an output signal in response to such detection;
- means for opening the valve to permit fluid flow there-through;
- means for closing the valve;
- a low voltage power source for energizing said apparatus;
- means for determining the voltage of said power source;
- means responsive to the output signal for comparing the determined voltage with at least one predetermined voltage and for generating a control signal responsive to the difference between the determined voltage and the predetermined voltage;
- means for enabling said opening means in response to a control signal generated and reflective of a determined voltage greater than the predetermined voltage; and
- means for providing a signal to enable said closing means.

5,086,527

FOLDING BABY BED

Takehiko Takahashi, Tokyo; Takahiro Sato, and Yuji Shimizu, both of Aichi, all of Japan, assignors to Toyota Gosei Co., Ltd., Aichi and Combi Corporation, Tokyo, both of Japan

Filed Aug. 16, 1990, Ser. No. 567,515

Claims priority, application Japan, Oct. 12, 1989, 1-119519[U]
Int. Cl.⁵ A47C 17/40; A47D 7/00

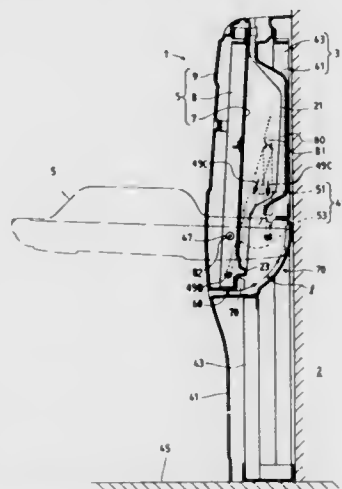
U.S. Cl. 5—136

8 Claims

1. A folding baby bed comprising:

- a body portion including side and cross frame members and having a cavity portion formed in a front upper half portion thereof;
- a bed portion pivotally attached to at least one of said side frame members through pivotal shafts projected from said bed portion at opposite end portions thereof and in a vicinity of a lower end portion thereof, so that said bed portion is able to be vertically folded and horizontally extended, said bed portion having a base end portion which abuts on at least one of said cross frame members so that said bed portion is maintained in a horizontal state when said bed portion is horizontally extended, said bed portion being housed in said cavity portion formed in said body portion when said bed portion is in a vertically folded state, said bed portion being provided with upper

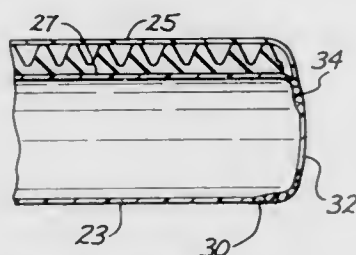
and lower plates having flanges vertically projected from the circumferential edges of said plates respectively, said flanges of said lower plate being located at the outside of said flanges of said upper plate, or vice versa, so as to be lapped over each other with a trim of a soft material interposed between said lapped-over flanges; and



posture maintaining urging means provided between said body portion and said bed portion for maintaining said bed portion in at least one of said vertically folded and horizontally extended state.

5,086,528
WATER MATTRESS AND METHOD FOR MAKING SAME
Craig S. Miller, 6092 Ohio St., Yorba Linda, Calif. 92686
Filed Sep. 18, 1990, Ser. No. 584,765
Int. Cl.⁵ A47C 27/08
U.S. Cl. 5—451

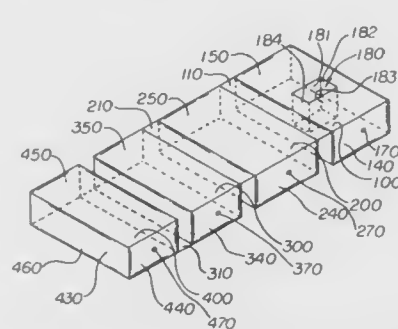
7 Claims



1. A water mattress, comprising:
a first sheet of heat sealable material forming a bottom of the mattress;
a second sheet of heat sealable material forming a top of the mattress;
a third sheet of heat sealable material disposed between the first sheet and the second sheet, the third sheet being sealed around its periphery to at least one of the first sheet and the second sheet;
the third sheet forming with the first sheet a bladder for receiving the water and forming with the second sheet a particular cavity isolated from the water in the bladder; foam disposed in the particular cavity and having a state of optimum resiliency in air; and
means for introducing air into the second cavity for maintaining the foam in the state of optimum resiliency.

5,086,529
SEGMENTED SUPPORT ARTICLE
Linda J. DeGroot, 18204 W. Spring Lake Dr, SE, Renton, Wash. 98058
Filed Jul. 25, 1990, Ser. No. 557,097
Int. Cl.⁵ A47C 27/10
U.S. Cl. 5—465

8 Claims



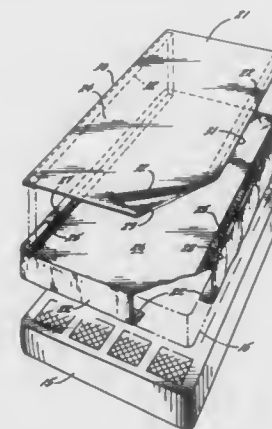
1. A segmented support article, which comprises four segments, head, second, third and fourth attached successively one to another in a linear arrangement, with three flexion hinges attached between segments, the first between the head and the second segments, the second between the second second and third segments, and the third between the third and fourth segments wherein
the four segments are substantially the same length;
the segments are each independently adapted for adding and removing a fluid through a valve;
the first and second flexion hinges are positioned on one side of the article, and the third flexion hinge is positioned on a side opposite the position of the first and second flexion hinges, and
the head segment has an opening for positioning an individual's head therein supported by its face, the individual being in a prone position and the opening being such that the individual can breathe while so positioned,
such that the article can accommodate individual bodily characteristics and can support the individual's entire body, to include its head and neck, shoulders, upper thorax, lower thorax and hips, to include an unborn baby carried by a pregnant mother, upper legs, lower legs, ankles and feet, as supported in supine or prone positions, through use of the independent valves for each segment, which allow for adjustments in contained fluid to suit overall weight of the individual and to suit the weight of the individual and to suit the weight of particular body parts, allowing for relaxation of separate body parts, which can assist in relaxing the entire body.

5,086,530
QUICK-CHANGE SHEET
Bonnie C. Blake, 2781 Collins Rd., Fort Mill, S.C. 29715
Continuation of Ser. No. 134,995, Dec. 18, 1987, abandoned.
This application Sep. 13, 1990, Ser. No. 581,671
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.⁵ A47G 9/04
U.S. Cl. 5—484

2 Claims

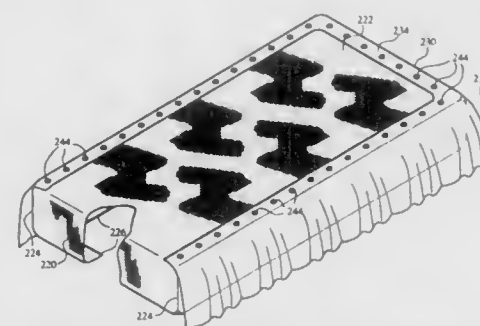
1. A combination mattress protector and quick-change bed sheet for use by babies and incontinent persons who frequently soil bed sheets and an underlying mattress, the combination mattress protector and quick-change bed sheet consisting of a bottom panel, a reusable top panel, and reusable means for releasably attaching the reusable top panel to the bottom panel for repeated removal and reattachment of the top panel to the bottom panel without disturbing the bottom panel or the mattress, said bottom panel including means for being anchored to a mattress in use, said top panel comprising a moisture-proof layer and an absorbent layer overlying and moisture-proof

layer and integrated with the moisture-proof layer to define the top panel, said absorbent layer consisting of a single-ply layer of absorbent material, whereby the user of the sheet rests on the absorbent layer of the top panel and the moisture-proof



5,086,531
DUST RUFFLE WITH SEPARABLE FASTENER
Mary L. Carlos, 4500 Roland Ave., Dallas, Tex. 75219
Continuation-in-part of Ser. No. 611,673, Nov. 13, 1990. This application May 20, 1991, Ser. No. 702,308
Int. Cl.⁵ A47G 9/02
U.S. Cl. 5—493

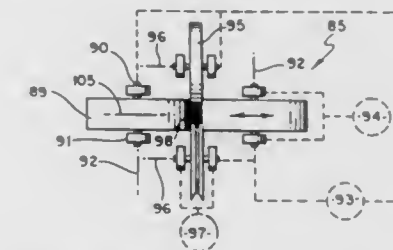
10 Claims



1. A unitary dust ruffle adapted to be positioned on a box spring which supports a mattress comprising:
a section of support fabric with dimensions slightly larger than the box spring, said support fabric covering the horizontal top surface and vertical sides of the box spring and having peripheral edges extending beneath the bottom of the box spring;
elastic means attached to the peripheral edges of the section of support fabric to enable the section of support fabric to substantially conform to the shape of the box spring;
a first section of decorative fabric secured to a second section of decorative fabric, and descending vertically towards the floor above which the box spring is supported;
the second section of decorative fabric being comprised of a U-shaped strip superimposed on and attached to the first section of fabric along a line spaced inwardly towards the center of the box spring, this line corresponding to the width of the strip; and
releasable fastening means secured to the second section of decorative fabric and the section of support fabric for releasably connecting same.

5,086,532
METHODS AND APPARATUS FOR FORMING FASTENERS AND THREADED CONNECTIONS
William P. Green, Pasadena, Calif., assignor to Mark Hattan, Orange, Calif., a part interest
Continuation-in-part of Ser. No. 318,859, Mar. 6, 1989, Pat. No. 4,956,888, which is a division of Ser. No. 738,256, May 28, 1985, Pat. No. 4,842,464. This application Feb. 26, 1991, Ser. No. 488,669
Int. Cl.⁵ B21D 53/20
U.S. Cl. 10—86 A

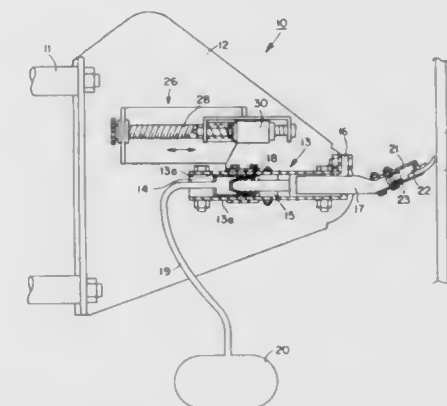
17 Claims



1. The method that comprises:
forming on a fastener body, by relative rotary and axial movement of thread forming tool means and said body, a thread having a pitch which changes progressively through a plurality of turns; and
shaping said thread during its formation to have an axial sectional profile and axial thickness both of which are uniform through said plurality of turns, but with a groove between successive turns of the thread progressively changing in width in correspondence with said change in pitch.

5,086,533
DEVICE FOR CLEANING A WINDOW GLASS
Genichi Kitahara, Tokyo, Japan, assignor to Nihon Biso Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 380,818, Jul. 17, 1989, abandoned. This application May 7, 1991, Ser. No. 700,345
Claims priority, application Japan, Jul. 19, 1988, 63-95433[U]
Int. Cl.⁵ A47L 1/04
U.S. Cl. 15—103

3 Claims



1. A device for cleaning a window glass having a moving unit which is moved along a window of a building comprising:
a first moving member having a size corresponding to the width of a window glass and being mounted on the moving unit in such a manner that the position of fixing the first moving member to the moving unit can be adjusted so that the first moving member can be located closer to or further away, from the window glass;
a second moving member mounted on the first moving

member in such a manner that the second moving member can be moved toward and away from the window glass; a gas bag containing pressurized gas of a predetermined pressure and connected to the second moving member to supply a moving force to the second moving member; a third moving member comprising a plurality of squeegee holders arranged in a row in the direction of the width of cleaning, each of the plural squeegee holders being mounted movably on the second moving member and being elongated in the direction of the width of cleaning; spring means provided between the second moving member and each of the squeegee holders to urge each of the squeegee holders toward the window glass with a uniform force over the entire length of the squeegee holders and to enable each of the squeegee holders to move toward or away from the window glass independently from the second moving member and also independently from the other squeegee holders; and a squeegee secured commonly to said plural squeegee holders.

5,086,534
WINDSHIELD WIPER INCORPORATING A DEFLECTOR

Maurice Journee, Chaumont-en-Vexin, France, assignor to Paul Journee S.A., Colombes, France

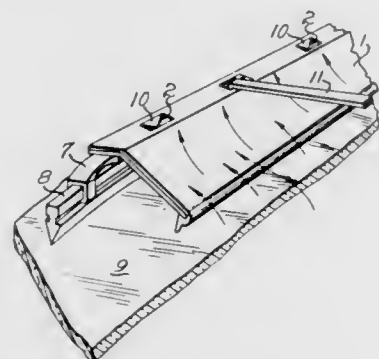
Filed Feb. 5, 1990, Ser. No. 475,313

Claims priority, application France, Feb. 8, 1989, 89 01626

Int. Cl.⁵ B60S 1/04

U.S. Cl. 15—250.2

5 Claims



1. A windshield wiper for an automotive vehicle, wherein the wiper incorporates a deflector having a front face facing away from a windshield including a glass surface and a rear face facing the windshield and having a free edge to lie adjacent to the windshield glass surface to be swept by the wiper, said deflector comprising a rigid, flat, profiled core element covered on at least one surface by a soft flexible material to form at least one of said deflector faces, said core element having a terminal edge adjacent said free edge, said flexible material extending over and covering said terminal edge and extending beyond and downwardly thereby defining said free edge facing said windshield glass to prevent abrasion of the glass.

5,086,535
MACHINE AND METHOD USING GRAPHIC DATA FOR TREATING A SURFACE

Mark Grossmeyer, Cedarburg, and Geoffrey B. Rench, Racine, both of Wis., assignors to Racine Industries, Inc., Racine, Wis.

Filed Oct. 22, 1990, Ser. No. 600,848

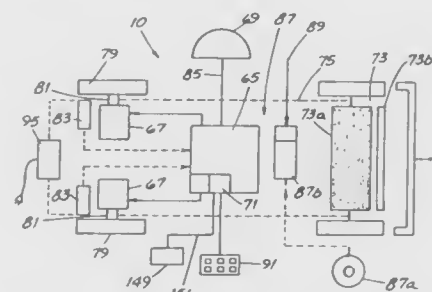
Int. Cl.⁵ A47L 9/28

U.S. Cl. 15—319

24 Claims

1. A machine for treating a surface area within a boundary perimeter and including:

a steerable self-propelled chassis having a surface treating device mounted thereon;
a computing section mounted on the chassis;
a plurality of powered wheels mounted on the chassis each having a motor module for receiving command signals from the computing section;
a position sensor coupled to the computing section for generating a feedback signal representing the actual position of the machine;



a data file storing graphic data developed from a graphic depiction representing the surface area to be treated;
a data loading device for transferring graphic data from the data file to the computing section;
the computing section processing the feedback signal and the graphic data and responsively generating command signals directed to the motor modules, thereby propelling the machine for steered travel over the surface area for treatment thereof.

5,086,536
CONVERTIBLE VACUUM CLEANER

John R. Lackner, North Ridgeville; Stanley E. Grzywina, Elyria; Ralph A. Weber, Richmond Heights, all of Ohio, and Thomas E. Baird, Springfield, Ill., assignors to The Scott Fetzer Company, Westlake, Ohio

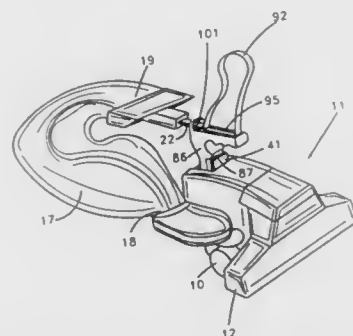
Division of Ser. No. 534,192, Jun. 6, 1989, Pat. No. 5,007,133.

This application Jan. 25, 1991, Ser. No. 647,676

Int. Cl.⁵ A47L 9/32

U.S. Cl. 15—328

3 Claims



1. A convertible vacuum cleaner comprising:
a) a power unit including a motor driven fan;
b) an upright handle releasably mountable on said power unit for facilitating operation of said vacuum cleaner as an upright carpet cleaner;
c) a portable cleaner handle removably mountable on said power unit for facilitating operation of said vacuum cleaner as a portable cleaner;
d) a reel journaled on said portable handle;
e) a shoulder strap connected between said portable handle and said reel, wherein rotation of said reel in one direction takes up said shoulder strap within said portable handle, and rotation of said reel in the other direction pays out said shoulder strap;

f) apparatus for locking said reel against rotation at a plurality of positions of shoulder strap payout.

5,086,537
COMPACT EXTRACTOR

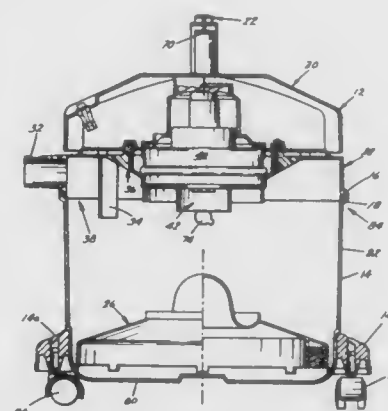
David E. McDowell, Grand Rapids, and Robert A. Yonkers, Grandville, both of Mich., assignors to Bissell, Inc., Grand Rapids, Mich.

Filed Dec. 4, 1990, Ser. No. 621,889

Int. Cl.⁵ A47L 7/00

U.S. Cl. 15—353

32 Claims



1. A surface cleaning liquid extractor for vacuum extraction of liquid and debris from a surface comprising:
a recovery tank including an upwardly extending sidewall for receiving debris and liquid which are vacuumed from a surface;
a housing removably positioned upon said tank;
a vacuum hose connection means in fluid communication with said tank so that debris and liquid which are drawn in through said connection means are deposited into said tank;
suction means positioned in said housing for drawing debris and liquid through said vacuum hose connection means and into said tank;
an opening in the bottom of said housing whereby said suction means is in fluid communication with said tank; and
a floating splash damper positioned within said recovery tank, said splash damper being free to float upon liquid collected in said tank as the liquid level rises in said tank, said splash damper defining a generally continuous surface over the majority of the upper surface of liquid collected in said tank whereby said splash damper minimizes the tendency for liquid in said tank to splash into said suction means in said housing, yet said splash damper having a perimeter spaced inwardly from said upwardly extending sidewall of said tank whereby liquid being drawn into said recovery tank can flow around said splash damper and collect below said splash damper.

5,086,538
INCREMENTAL FOOT OPERATED HEIGHT ADJUSTER FOR UPRIGHT VACUUM CLEANER

Terry L. Zahuranec, Hudson, Ohio, assignor to Royal Appliance Mfg. Co., Cleveland, Ohio

Filed Jun. 22, 1990, Ser. No. 542,450

Int. Cl.⁵ A47L 5/34

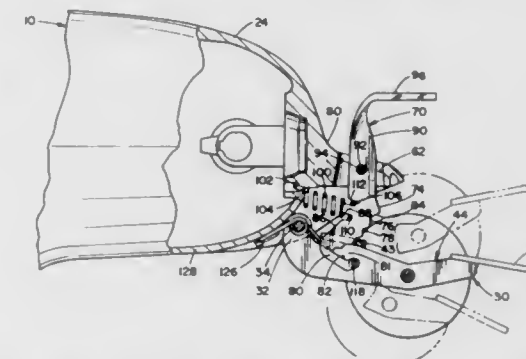
U.S. Cl. 15—354

20 Claims

1. A foot operated nozzle height adjusting mechanism for a vacuum cleaner of the type characterized by a housing having a front floor cleaning nozzle that is pivotable about a pair of front wheels through the change in height of a rear end of the housing, the rear end including a pair of rear wheels that are

secured in a wheel fork mounted by a first pivot on the housing, comprising:

a first pedal secured to said wheel fork;
a second pedal including an adjustment lever extending in a direction substantially normal to said wheel fork, said adjustment lever including a plurality of spaced teeth;



a second pivot for pivotally securing said second pedal to said housing such that said second pivot is spaced from said first pivot;
a locking plate secured to said wheel fork, wherein said spaced teeth of said adjustment lever are adapted to selectively engage said locking plate; and
a means for biasing said adjustment lever teeth against said locking plate.

5,086,539
CARPET CLEANING MACHINE WITH PATTERN-ORIENTED VACUUM NOZZLE

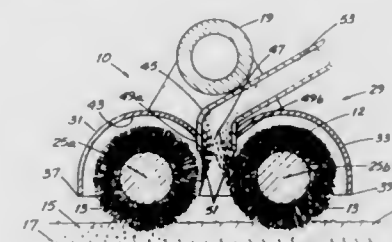
Geoffrey B. Rench, Racine, Wis., assignor to Racine Industries, Inc., Racine, Wis.

Filed Oct. 31, 1990, Ser. No. 607,363

Int. Cl.⁵ A47L 5/30

U.S. Cl. 15—384

8 Claims



1. An improved machine for cleaning a carpet using substantially-dry cleaning granules, the machine including:
a pair of spaced, long-bristled counter-revolving cylindrical brushes supporting the machine and stroking the granules into and across the carpet fibers;
a shroud disposed above the brushes and having a bottom surface spaced from the brushes for air flow therebetween;
a first vacuum nozzle powered by a separated vacuum motor and having an inlet adjacent to the bottom surface of the shroud receiving granules removed from the carpet; the counter-revolving brushes simultaneously and continuously casting the granules toward the bottom surface of the shroud for vacuum collection through the inlet; whereby the machine strokes cleaning granules into a carpet and more efficiently removes such granules therefrom.

5,086,540

SUPPORT MECHANISM FOR ROOM DIVIDERS

Markus Schumacher, Hamburg, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

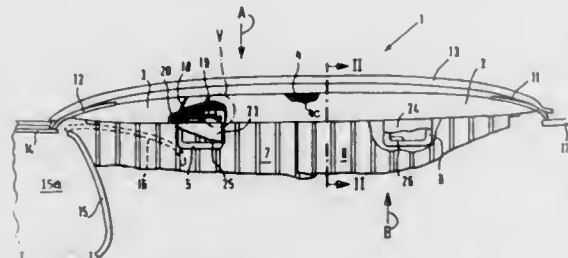
Filed Jul. 2, 1990, Ser. No. 547,977

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1989, 3922580

Int. Cl.⁵ A47H 1/00, 15/00

U.S. Cl. 16—87.4 R

18 Claims



1. A support mechanism for dividing an aircraft cabin into different sections by a curtain (7, 8), comprising a carrier cross-beam including two beam elements, hinge means of interconnecting said beam elements with each other to permit a vertical scissors motion of said two beam elements relative to each other, means for locking said beam elements against journaling movements when said beam elements extend substantially in parallel to each other in an installed state, each beam element having a mounting foot for engagement with a supporting wall structure of said aircraft cabin, each beam element further having an extension opposite said mounting foot, said hinge means being arranged between said extension and said mounting foot, operating means operatively arranged for cooperation with said locking means for unlocking said locking means to remove said support mechanism out of an installed position and to push said mechanism into an installed portion, and curtain rod means (9, 10) carried by said carrier crossbeam for suspending said curtain from said curtain rod means.

5,086,541

SELF-MOTORIZED ANTIFRICTION JOINT AND AN ARTICULATED ASSEMBLY, SUCH AS A SATELLITE SOLAR PANEL, EQUIPPED WITH SUCH JOINTS

Jacques Auternaud, Mougins; Jean Bartevean, Cannes la Bocca; Philippe Bertheux, Les Adrets; Eric Blanc, Le Cannet; Thierry de Mollerat du Jeu, Villeneuve Loubet; Jean Foucras, Mougins; Michel Louis, Nice; Georges Marelllo, Mandelieu; Pierre Poveda, Le Cannet Rocheville, and Christian Roux, Mandelieu, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

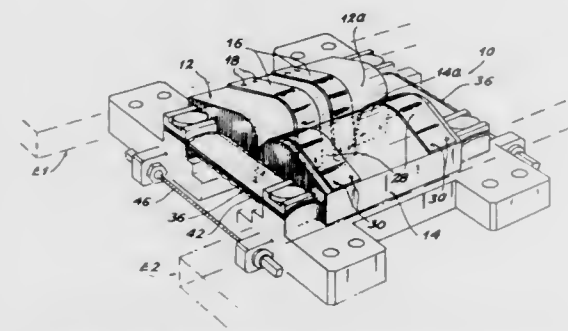
Filed Jul. 31, 1989, Ser. No. 387,956

Claims priority, application France, Aug. 8, 1988, 88 10695

Int. Cl.⁵ E05D 1/06

U.S. Cl. 16—227

22 Claims



1. Antifriction joint designed to be mounted between two

adjacent elements and comprising at least one preformed elastic band having a circular arc-shaped cross section and having two ends of which one is secured to each of said elements, said joint also comprising two braces suitable for being rendered integral with each of the elements and on which secured are the respective ends of each elastic band, said braces comprising convex cylindrical surfaces suitable for rolling onto each other under the action of at least two flexible members, the two ends of each of these members being respectively secured to each of the braces so that these members pass by crossing between said cylindrical surfaces, a tensioning device being provided for exerting a tractive prestressing on each of said members, said elastic band including two superimposed spring rods rendered integral at their middle by a mechanical linking device.

5,086,542

ELECTRONIC STOP MOTION FOR TEXTILE DRAW FRAME

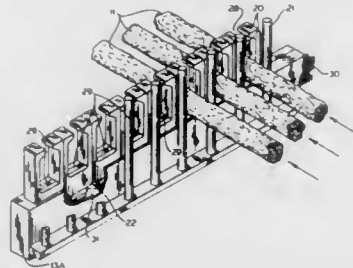
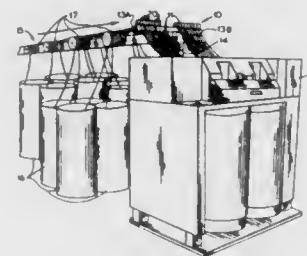
James R. Franklin, P.O. Box 82, Bessemer City, N.C., and Larry R. Wright, Rte. 3, Box 40, Kings Mountain, N.C.

Filed Nov. 30, 1990, Ser. No. 621,051

Int. Cl.⁵ D01G 31/00; D01H 13/16

U.S. Cl. 19—0.25

13 Claims



1. In combination with a creel and a draw frame, the draw frame having a power supply and a plurality of drafting rolls defining a drafting zone for drafting strands of textile sliver fed thereto from the creel, a stop motion for sensing a parting of the sliver prior to being fed into the drafting zone, said stop motion comprising:

- a. at least one elongate arm mounted on the creel and upstream of the drafting zone;
- a plurality of sliver guides supported by said arm in side-by-side relation thereon, said sliver guides having a low coefficient of friction to reduce accumulation of textile lint thereon, each of said sliver guides being substantially U-shaped in cross-section and having intumed upper end portions defining a restricted opening;
- sliver sensing means carried by each of said U-shaped sliver guides and being positioned in a bight portion thereof and each having an exposed upper surface substantially flush with the surrounding bight portion of the sliver guide;
- a series of sliver separator means supported by said elongate arm and positioned to separate strands of sliver passing through adjacent sliver guides, said separator means having a low coefficient of friction to reduce accumulation of textile lint thereon;
- capacitive detecting means cooperating with said sliver sensing means for identifying the absence of any parted strand of sliver in said sliver guides and for also identifying

ing an absence of movement of any strand of sliver in said sliver guides as when sliver is parted immediately upstream of the drafting zone; and control means responsive to said capacitive detecting means for interrupting the power supply and stopping the drafting rolls of the draw frame when the sliver is parted and responsive to means for visually identifying the particular sliver guide in the path of the parted sliver.

5,086,543

WRAPPING DEVICE

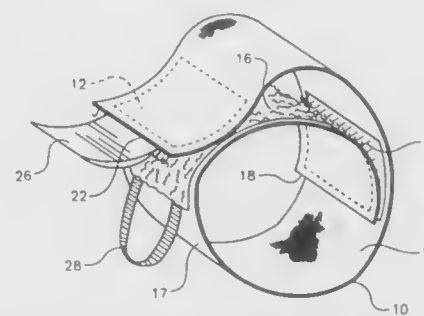
Jacob T. Mitchell, 3615 147th Pl. NE #C1, Bellevue, Wash. 98007

Filed Sep. 10, 1990, Ser. No. 512,303

Int. Cl.⁵ B65D 63/00

U.S. Cl. 24—16 PB

4 Claims



1. A wrapping device for encircling a pair of spaced, independent articles and for securely gripping the articles to permit them to be carried together in spaced relationship, said wrapping device comprising:

- a. a continuous, unitary, elongated elastic band having a length sufficient to encircle a pair of separate and distinct articles when the articles are positioned in closely spaced relationship, the band having an upper face and a lower face and having a first end and a second end;
- b. a first elongated area of hook and loop fastening material secured to the upper face of the band and extending along the band from the first end to a first termination point substantially intermediate the ends of the band;
- c. second and third area of hook and loop fastening material each adapted to securely and releasably engage with the first area of hook and loop fastening material, the second and third area of fastening material secured to the lower face of the band, the second area of fastening material positioned adjacent the second end of the band and defining a first connection surface, the third area of fastening material positioned adjacent the second area and spaced therefrom to permit longitudinal extension of the band between the second and third area of fastening material, the elasticity of the band between the second and third area permitting adjustment capability for accommodating articles of different size, the third area of fastening material terminating at a second termination point spaced from the first termination point;
- d. the band is adapted to pass completely around a first article with the lower face of the band in contact with the first article and with the first and third fastening material areas engaged so that the band securely grips the first article, the space between the second and third fastening material area overlying a part of a second article spaced from the first article by at least the thickness of the band and of the first fastening material, the first and second fastening material area engage so that the band securely and releasably grips the second article.

5,086,544

CUTLERY BASKET FOR DISH-WASHING MACHINE

Wilfried Huttemann; Hettenhausen, Ulrich, both of Bielefeld, and Horst Moller, Werther, all of Fed. Rep. of Germany, assignors to Miele & Cie, GmbH & Co., D-4830 Gutersloh 1, Fed. Rep. of Germany

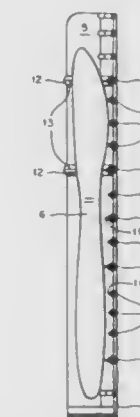
Filed Feb. 27, 1989, Ser. No. 347,805

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721689

Int. Cl.⁵ A47L 15/50

U.S. Cl. 211—41

5 Claims



1. In a cutlery-holding basket for a dish-washing machine, in which the items of cutlery which are to be washed and dried can be individually laid down lengthwise alongside one another in cutlery holders at small distances apart, where the cutlery holders are constructed to hold separate items of cutlery as well as providing supports with appropriate bearing surfaces for the items of cutlery,

- the improvement which comprises the separate cutlery supports for the knives, forks and spoons resting on their sides are provided with differently profiled support surfaces and/or different support surfaces;
- wherein the cutlery supports are arranged in the cutlery-holding basket so that they form groups;
- wherein the separate cutlery supports are arranged in alternating sequence in the cutlery-holding basket so that one or several similar cutlery supports can form one group of cutlery supports; and
- wherein the cutlery supports of the one cutlery support of a first group have a sawtooth-shaped bearing surface and the cutlery supports of a second group are smooth profiled strips with blade-shaped bearing edges for the knives, forks and spoons, in which case the blade-shaped smooth supports of the second group have the greater height than the cutlery support of the first group.

5,086,545

ONE-ACTION PAPER CLIP

Takatoshi Suzuki, Abiko, Japan, assignor to Obto Kabushiki Kaisha, Tokyo, Japan, a part interest

Filed Dec. 27, 1990, Ser. No. 634,729

Claims priority, application Japan, Jan. 20, 1990, 2-11201; Sep. 28, 1990, 2-259883

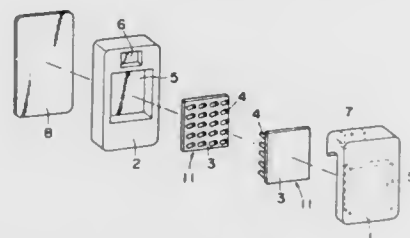
Int. Cl.⁵ A44B 13/00

U.S. Cl. 24—67 R

6 Claims

- 1. A paper clip comprising:
 - a first plate,
 - a second plate extending parallel to said first plate and connected at an end thereof to an end of said first plate to thereby form a substantially U-shaped structure,
 - a first group of hairs implanted to an inner surface of said first plate and projecting at an acute angle towards said second plate,

a second group of hairs implanted to an inner surface of said second plate and projecting at an acute angle towards said first plate,
a first recess on an inner surface of said first plate,
a second recess on an inner surface of said second plate,



a first brush plate including said first group of hairs,
a second brush plate including said second group of hairs,
wherein said first brush plate is fitted to said first recess and said second brush plate is fitted to said second recess.

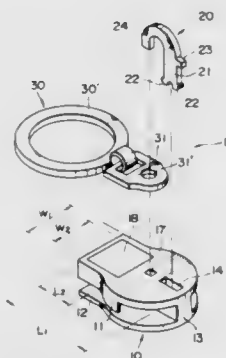
5,086,546 SLIDE FASTENERS SLIDER

Tsunetaka Aoki, Toyama, and Susumu Ishii, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Filed Jun. 11, 1990, Ser. No. 535,585

Claims priority, application Japan, Jun. 12, 1989, 1-68384[U]
Int. Cl.⁵ A44B 19/26

U.S. Cl. 24—429

8 Claims



1. A slide fastener including a slider body and a pull tab pivotally connected thereto;
the slider body comprising a pair of upper and lower wings connected at their respective front ends by a diamond having a through hole formed longitudinally thereof, the upper wing having a recess in its upper surface close to the through hole;
a holder post including a holder body and a crook portion bent rearwardly from the holder body, the holder body being fit through the through hole and the crook portion having its lower end fit into the recess, thus defining with the upper surface of the upper wing an opening through which to pivotally join the pull tab to the slider body;
means for clinching the holder body to the slider body through the through hole, the means for clinching comprising a cross beam formed across the through hole adjacent to its lower end and a pair of legs provided at the lower end of the holder body and bent inwardly into embracing engagement with the cross beam; and
a decorative pattern provided on the upper surface of the upper wing rearwardly of the recess.

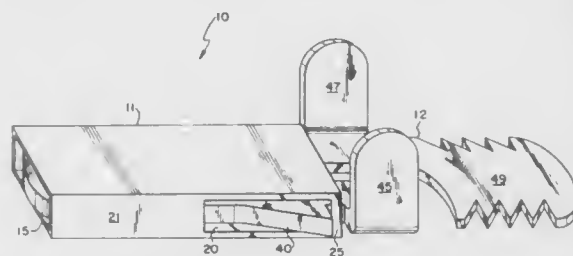
5,086,547 BOX AND CATCH ASSEMBLY FOR BRACELETS, NECKLACES, ETC.

Herbert Ziemelis, Wallingford, Conn., assignor to The Napier Company, Meriden, Conn.

Filed May 29, 1990, Ser. No. 529,331
Int. Cl.⁵ A44B 17/00

U.S. Cl. 24—615

1 Claim



1. A clasp for joining first and second selectively separable ends of a piece of jewelry or the like, comprising:
a catch box secured to the first end of the jewelry, said box having a locking aperture in a side wall member of said catch box;
a catch secured to the second end of the jewelry, said catch being insertable in said catch box to a locked position releasably joining said catch and catch box, said catch having a pair of opposed segments joined at one end, at least one of said segments being resiliently deformable toward the other segment for releasably engaging with the catch box in said locked position with deformation being limited to spacing between the segments;
an interlocking projection member formed on said one resiliently deformable catch segment, said catch segment interlocking projection cooperating with said locking member to project into the aperture on said catch box to maintain said catch and catch box in said locked position; and
a pair of opposed upstanding tabs integrally formed on said catch segments, said tabs extending generally perpendicular to the direction of catch insertion and removal for manual engagement by the user to compress one segment towards the other for disengaging said interlocking projection from the aperture in said locking member for unlocking said catch and said catch box.

5,086,548 BUCKLE DEVICE FOR SEATBELT SYSTEM

Kohbun Tanaka, and Hiroshi Tsuge, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Sep. 6, 1990, Ser. No. 578,285

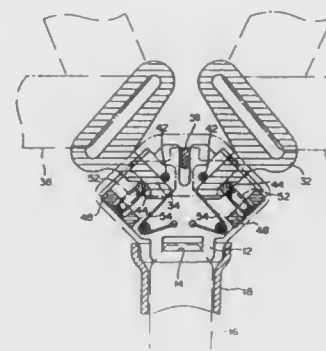
Claims priority, application Japan, Sep. 11, 1989, 1-106301[U]
Int. Cl.⁵ A44B 11/25

U.S. Cl. 24—632

21 Claims

1. A buckle device in which a plurality of tongue plates are inserted and engaged therein, comprising:
a buckle body supported to a vehicle body;
lock members being reciprocally movable between an engagement position and a disengagement position for the corresponding tongue plate in a plane defined by the insertion directions of the tongue plates and being supported in the buckle body which come into engagement with the corresponding tongue plates;
an urging means for urging the lock members to the engagement position; and
a release button movable relative with respect to the buckle body, and being able to contact and to operate transversely with the lock members to bring the lock members out of engagement with the corresponding tongue plates, the relative movement of the release button being con-

fined in the plane defined by the insertion directions of the tongue plates,



whereby the lock members can be released through a sliding operation of the release button by an occupant.

5,086,549 METHOD OF PREPARING A LUMBERED QUARTZ BAR FOR SWEEPING AND THEN SWEEPING SAID LUMBERED QUARTZ BAR

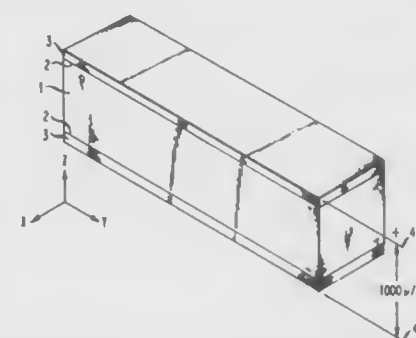
John G. Gualtieri, Oceanport, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 1, 1990, Ser. No. 591,317

Int. Cl.⁵ H04R 17/00

U.S. Cl. 29—23.35

6 Claims



1. Method of preparing a lumbered bar of quartz for sweeping and then sweeping said lumbered quartz bar, said method including the steps of:

- (A) mechanically lapping and polishing the Z surfaces of the lumbered bar until at least the bulk of the surface damage caused by the lumbering process is removed,
- (B) chemically etching using $\text{NH}_4\text{F}:\text{HF}=1:1$ at 75°C . for 10 minutes to remove all traces of remaining surface damage,
- (C) cleaning all surfaces using ultrasonic cleaning steps followed by cleaning in an oxygen plasma for about two minutes,
- (D) growing electrically conducting sputtered oxide electrode films that are amorphous and subject to easy diffusion of hydrogen on the Z-surfaces of the quartz bar by magnetron sputtering from a single stoichiometric electrically conducting oxide target at room temperature in flowing argon,
- (E) applying a full DC voltage at the start of sweeping and maintaining that voltage throughout the sweeping process while the bar temperature is increased from room temperature to not more than 500°C . at a rate of 20°C./hr , the temperature then being held constant at the maximum for a period of at least 24 hours, and long enough to insure that the current density is steady, then decreasing the bar temperature at 20°C./hr to room temperature.

5,086,550 METHOD OF ASSEMBLING AN INFLATOR FOR A VEHICLE OCCUPANT RESTRAINT

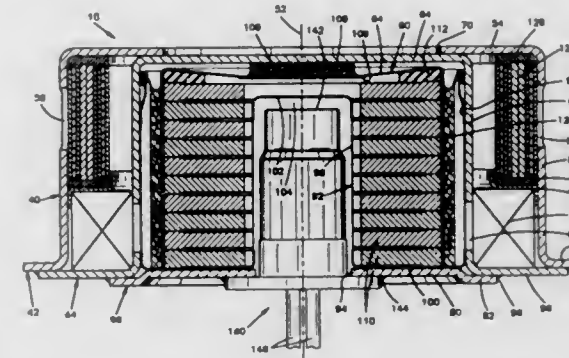
John P. O'Loughlin, and Conrad M. Novak, both of Mesa, Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Dec. 18, 1990, Ser. No. 629,482

Int. Cl.⁵ B23P 15/16

U.S. Cl. 29—163.8

17 Claims



1. A method of assembling an inflator for a vehicle occupant restraint which inflator comprises a housing providing a gas flow path, a filter comprising a plurality of successive filter layers extending across the gas flow path, and a seal between the housing and the filter, said method comprising the steps of: preassembling said seal and filter by embedding a part of the filter into the material of the seal to provide a sealing relationship between the seal and the filter; and thereafter, positioning the preassembled filter and seal in the housing.

5,086,551 RIVET SETTING TOOL

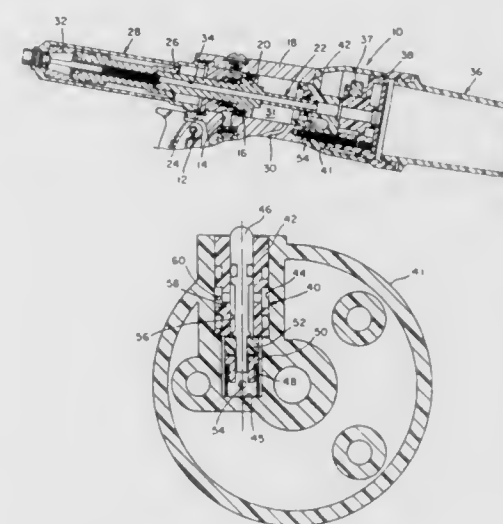
Thomas P. Shamaly, Shelton, and Sidney D. Schwartz, Hamden, both of Conn., assignors to Emhart Inc., Towson, Md.

Filed Sep. 5, 1990, Ser. No. 577,956

Int. Cl.⁵ B21J 15/20

U.S. Cl. 29—243.523

3 Claims



1. A rivet setting tool comprising
a pulling head adaptor assembly having a forward and rearward end including a tool nose at the forward end thereof and a piston at the rearward end thereof, said piston having a front and rear for receiving fluid pressure,

housing means for supporting said assembly for displacement between start and finish locations, means for supplying liquid under pressure to the front of said piston to operate said assembly by displacing said piston from said start position to said finish position, means for supplying line air pressure to the rear of said piston for returning the piston to said start position, vacuum transducer means located in the rearward end of said pulling head adapter assembly and rearwardly of said piston including

a vacuum transducer and

a body for housing said vacuum transducer, and valve means located in the rearward end of said pulling head adapter assembly and rearwardly of said piston and intermediate said piston and said vacuum transducer including on/off valve means displaceable between an "on" position and an "off" position for selectively connecting the line air pressure at the rear of said piston to said vacuum transducer.

5,086,552

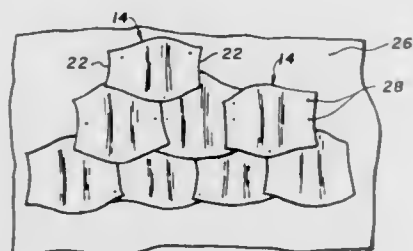
METHOD OF RECYCLING VEHICLE TIRES

Richard A. Moore, P.O. Box 1459, Squamish, British Columbia, Canada V0N 3G0

Filed Oct. 2, 1990, Ser. No. 591,695

Int. Cl.⁵ E04D 1/22

U.S. Cl. 29—403.1



1. A method of recycling a vehicle tire having a road engaging tread portion and two opposed sidewall portions each of which terminates in a peripheral bead portion, comprising the steps of: cutting the vehicle tire into a plurality of separate pieces by performing radial cuts on the vehicle tire, each piece comprising two bead portions, to opposed sidewall portions and a tread portion; bending the opposed sidewall portions of each of the cut tire pieces relative to its tread portion, thereby forming the tire pieces into a partially flattened condition; and securing the thus-cut tire pieces in their partially flattened condition in mutually overlapping relationship as shingles on a building, thereby forming a rain-proof covering, wherein the road-engaging tread portions of the tire pieces face inwardly of the building and the bead portions of each piece are disposed substantially in a desired direction of rain drainage.

5,086,553

METHOD OF PRODUCING A FLY-TYPE COMPOSITE MAGNETIC HEAD WITH APPROPRIATE BONDING GLASSES

Ryo Goto; Tadafumi Tomitani, both of Mouka; Fumio Nitanda, Fukaya; Masanobu Yamazaki; Manabu Toyoda, both of Mouka, and Makoto Ushijima, Tokyo, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Division of Ser. No. 330,216, Mar. 29, 1989, Pat. No. 5,016,129.

This application Oct. 31, 1990, Ser. No. 606,473

Claims priority, application Japan, Mar. 29, 1988, 63-75259; Apr. 7, 1988, 63-85718

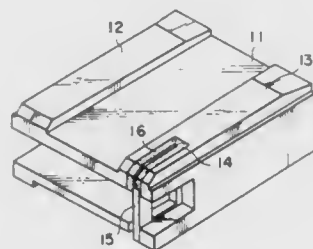
Int. Cl.⁵ G11B 5/42

U.S. Cl. 29—603

17 Claims

1. A method of producing a flying-type composite magnetic head comprising (a) a magnetic core constituted by a pair of core pieces bonded together by a first glass portion, at least one of opposing surfaces of said core pieces being formed with a

thin magnetic metal layer; (b) a non-magnetic slider having a slit for receiving said magnetic core; and (c) a second glass portion for fixing said magnetic core in said slit; wherein a step of forming said first glass portion has a first bonding temperature T_1 ($^{\circ}$ C) satisfying the following relation:



$$T_1 \leq aW + b,$$

wherein W is thickness (μ m) of said thin magnetic metal layer, a is between -25 and -15 and b is between 720 and 770, and wherein a step of forming said second glass portion has a second bonding temperature T_2 of 530° C. or lower.

5,086,554

METHOD OF MANUFACTURING A MAGNETIC CORE Shinichi Murata; Yoshiyuki Yamauchi; Takao Kusaka; Takao Sawa, and Noriaki Yagi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 429,067, Oct. 25, 1989, Pat. No. 4,983,943.

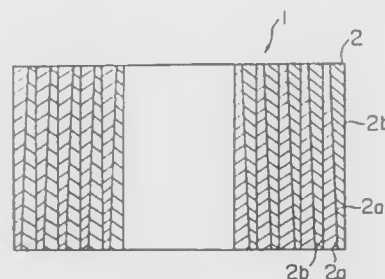
This application Sep. 20, 1990, Ser. No. 585,638

Claims priority, application Japan, Nov. 2, 1988, 63-278388

Int. Cl.⁵ H01F 7/06

U.S. Cl. 29—605

18 Claims



1. A method of manufacturing a magnetic core comprising the steps of: forming a thin metal tape having a rolled face and a free face; superimposing at least one of said free face of said metal tape to form at least a two-layer tape and said rolled face of said metal tape to form at least a two-layer tape, in a free-to-free or in a rolled-to-rolled relation; and winding and laminating said two-layer tape into a given shape.

5,086,555

POWER DRIVEN VALVE ASSEMBLING APPARATUS John M. Broadway, Paragould; Martin L. Koschmann, Jonesboro, and William D. Mullikin, Paragould, all of Ark., assignors to Arkla Products Company, Paragould, Ark.

Filed Sep. 21, 1990, Ser. No. 586,436

Int. Cl.⁵ B23P 21/00

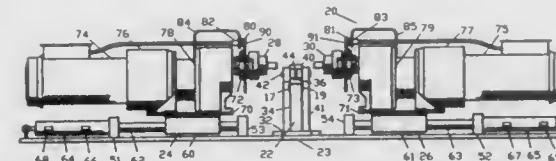
U.S. Cl. 29—714

5 Claims

1. Power driven apparatus for assembling first and second threading engageable workpiece members to a predetermined axial coupling position and predetermined rotational orientation, said apparatus comprising: a stationary clamping unit for retention of said first workpiece member, said stationary clamping unit including a

cradling member for supporting said first workpiece member and a cooperating pivotally supported yoke member clampingly engageable with a cradled first workpiece member,

first power means for pivotally actuating said pivotable yoke member towards and away from said cradling member for clamping and releasing of a first workpiece member, a rotatable yoke member arranged to retain and rotate a second workpiece member and being longitudinally movable toward and away from said stationary clamping unit, said rotatable yoke member including an integral position indicator, rotatable power means for driving said rotatable yoke member,



a proximity switch mounted adjacent said rotatable yoke member for detecting said position indicator in order to determine the relative rotational orientation of said workpieces,

a position limit switch mounted on said stationary clamping unit for detecting a portion of said second workpiece in order to determine the axial position of said second workpiece with respect to said first workpiece, the rotation speed of said rotatable power means being automatically lowered in response to said detection of said second workpiece, and

second power means for providing longitudinal movement of said rotatable yoke means towards and away from the stationary clamping unit.

5,086,556

ELECTRONIC COMPONENT MOUNTING APPARATUS Hiroshi Toi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

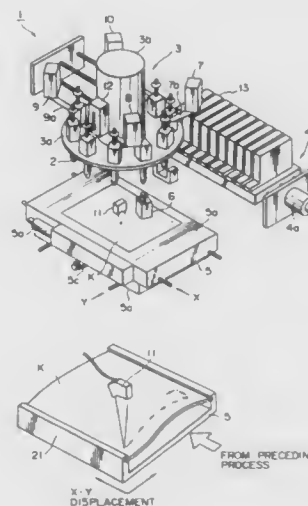
Filed Jun. 10, 1991, Ser. No. 712,670

Claims priority, application Japan, Jun. 14, 1990, 2-153927

Int. Cl.⁵ B23P 19/00

U.S. Cl. 29—740

2 Claims



1. An electronic component mounting apparatus comprising: means for holding electronic components supplied from a component feeder and mounting the same sequentially on a substrate;

a means for positioning the substrate;

a measuring means disposed facing the positioned substrate for measuring the unflatness values of the substrate at predetermined surface points thereof in a non-contact manner and producing output data representative of the measured unflatness values; and

a means for adding the unflatness values of the substrate as correction values to the descent strokes of said component holding means.

5,086,557

METHOD OF ASSEMBLING ELECTRONIC COMPONENT SYSTEMS

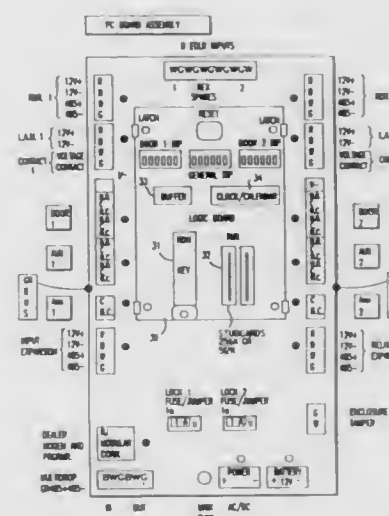
Richard G. Hyatt, Jr., Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Filed Sep. 11, 1990, Ser. No. 580,460

Int. Cl.⁵ H05K 3/30

U.S. Cl. 29—832

7 Claims



1. A method of assembling an electronic component system comprising the steps of:

temporarily mounting a first template having installation instructions printed thereon onto a circuit board containing at least one wire conductor terminal;

interconnecting components of the circuit board with the remainder of the electronic system through said at least one wire conductor terminal according to the installation instructions printed on said template; and

removing said template from said circuit board.

5,086,558

DIRECT ATTACHMENT OF SEMICONDUCTOR CHIPS TO A SUBSTRATE WITH A SUBSTRATE WITH A THERMOPLASTIC INTERPOSER

Gary W. Grube, Washingtonville, and Igor Y. Khandros, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 13, 1990, Ser. No. 581,854

Int. Cl.⁵ H05K 3/34

U.S. Cl. 29—832

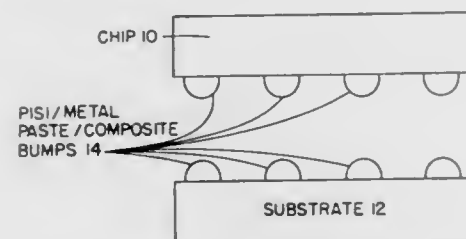
19 Claims

1. A method of direct attachment of at least one semiconductor chip to a substrate or module, comprising:

a. fabricating a thermoplastic and dielectric interposer, which is to be positioned between a chip and the substrate, with a via pattern matching the contact pattern of the chip;

b. placing the chip on the interposer with the contact pattern of the chip being positioned on the matching via pattern, and attaching the chip to the interposer;

- c. filling the vias of the interposer with a conductive attachment material; and



- d. directly attaching the chip with attached interposer to a substrate or module, with the interposer therebetween, with the interposer providing a controlled join height and providing encapsulated joints.

5,086,559

ELECTRICAL COMPONENT PLACING APPARATUS AND METHOD OF PLACING ELECTRICAL COMPONENT

Kazuyuki Akatsuchi, 19-17, Aobadai 4-chome, Dazaifu-shi, Fukuoka, Japan

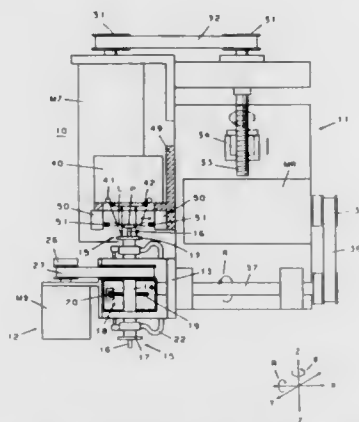
Filed Oct. 17, 1990, Ser. No. 597,664

Claims priority, application Japan, Oct. 17, 1989, 1-269352

Int. Cl.⁵ H05K 3/00; B23P 19/00

U.S. Cl. 29—834

10 Claims



1. An electrical component placing apparatus, comprising: an XY-axis table comprising means for moving said table in the X and Y axis directions between an electrical component delivery unit and a printed circuit board; and a pick and place head mounted to said XY-axis table for movement therewith, said pick and place head comprising: a pick and place head body unit, a nozzle shaft rotatably mounted on said pick and place head body unit for rotation about an axis extending in a vertical plane, said nozzle shaft having vacuum nozzles on opposite ends thereof for picking and placing electrical components, a motor operationally connected to said nozzle shaft for rotating said nozzle about said axis, a rotating means for rotating said nozzle shaft in said vertical plane about a horizontal axis perpendicular to said vertical plane, and a recognition means for externally recognizing an electrical component after the electrical component has been picked up by a said vacuum nozzle and said nozzle shaft has been rotated by said rotating means.
10. A method of placing an electrical component, comprising the steps of: providing an XY-axis table comprising means for moving said table in the X and Y axis directions between an electrical

component delivery unit and a printed circuit board and a pick and place head mounted to said XY-axis table for movement therewith, said pick and place head comprising a pick and place head body unit, a nozzle shaft rotatably mounted on said pick and place head body unit for rotation about an axis extending in a vertical plane, said nozzle shaft having a vacuum nozzle on a lower end thereof, a motor operationally connected to said nozzle shaft for rotating said nozzle shaft about said axis, a rotating means for rotating said nozzle shaft in said vertical plane about a horizontal axis perpendicular to said vertical plane, and a recognition unit;

- picking up an electrical component from a delivery unit with said vacuum nozzle;
- rotating said nozzle shaft with said rotating means to move the electrical component to a recognition position of axis having a vacuum nozzle at a lower end thereof,
- a motor for rotating said nozzle shaft about its axis on said pick and place head body unit having a transmission means for transmitting rotation produced by said motor to said shaft, and
- an encoder means connected to said nozzle shaft for directly detecting the amount of rotation of said nozzle shaft, producing an output signal controlling the amount of rotation of said motor in response to said output signal.

5,086,560

METHOD OF ASSEMBLING PRESTRESSED FRICTIONLESS BEARINGS

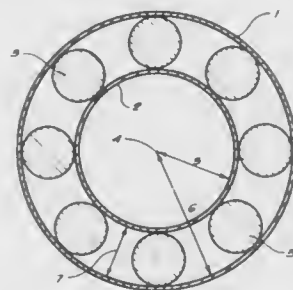
Stephen C. Glazier, 211 E. 35th St., Ste. 8B, New York, N.Y. 10016

Filed Jan. 24, 1990, Ser. No. 469,400

Int. Cl.⁵ B21D 53/00

U.S. Cl. 29—898,061

4 Claims



1. A method for assembling a pre-stressed radial thrust frictionless bearing device, said device having an annular inner race, an annular outer race, and a plurality of bearings, said method comprising the steps of: assembling all of said plurality of bearings around said inner race; heating said outer race so as to expand said outer race; assembling the expanded outer race over the assembled inner race without pre-stressing the plurality of bearings around said inner race; and contracting said outer race to its original size by cooling said outer race to its original temperature so as to pre-stress said plurality of bearings.

5,086,561

SAFETY KNIFE AND PROTECTION GARMENT FOR PROCESSING OPERATIONS

Daniel M. Nathan, 593 Barkworth Rd., Clemmons, N.C. 27012

Continuation of Ser. No. 528,437, May 25, 1990, abandoned.

This application Jul. 17, 1991, Ser. No. 733,067

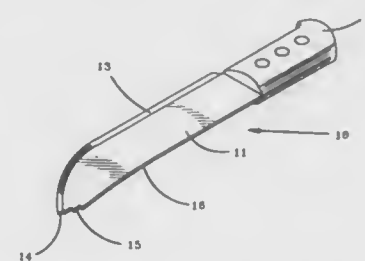
Int. Cl.⁵ B26B 3/02, 3/00, 9/00, 3/06

U.S. Cl. 30—1

15 Claims

1. A safety knife for cutting meat, fish and poultry including a handle and a blade, said blade having a non-cutting edge and

a sharpened cutting edge terminating in a pointed end; a plurality of serrations formed on the non-cutting edge originating immediately adjacent the pointed end and extending in an upwardly stepped relationship from and above the pointed end



toward the handle with said serrations being inclined toward the pointed end, to snag a protective garment worn by a user of the knife to prevent the pointed end from deep penetration through the garment and into the body of the user.

5,086,562

UTILITY KNIFE

Daniel Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.

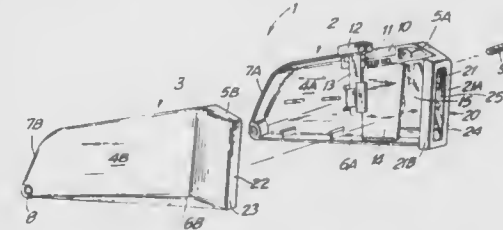
Continuation-in-part of Ser. No. 519,782, May 7, 1990, Pat. No. 5,031,322, which is a continuation-in-part of Ser. No. 337,479, Apr. 13, 1987, Pat. No. 4,930,218. This application Apr. 12, 1991, Ser. No. 684,186

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.⁵ B26B 3/08, 1/04, 1/00

U.S. Cl. 30—162

7 Claims



1. A utility knife for holding a blade comprising a main body formed from a pair of body halves assembled together, said main body having an opening at the front to accommodate a blade and locking means on one of said body halves adapted to cooperate with the other of said body halves to removably hold the two body halves together, said front opening comprising a mouth having a pair of side walls extending at right angles from one of said body portions, the said side walls having upper and lower ends, and means within said mouth to restrict the space within the mouth, said restricting means comprises at least one rib extending from one side wall of the mouth toward the other, and located intermediate the upper and lower ends of said wall to form finger-receiving space, interlocking means to prevent the body halves at the front from spreading apart, said interlocking means comprises at least one lock finger on one of said body halves extending into the said finger-receiving space in the said open mouth of the other body half and abutting one of the side walls of said mouth of the other body half.

5,086,563

SCISSORS WITH REPLACEABLE CUTTING BLADES

Shuji Sakuma, Tokyo; Seigo Kanematsu, Seki, and Yasuo Hiramatsu, Tokyo, all of Japan, assignors to Kabushiki Kaisha Sangi, Tokyo; Kanematsu Koguo Kabushiki Kaisha, Gifu and Yugen Kaisha Works, Tokyo, all of Japan

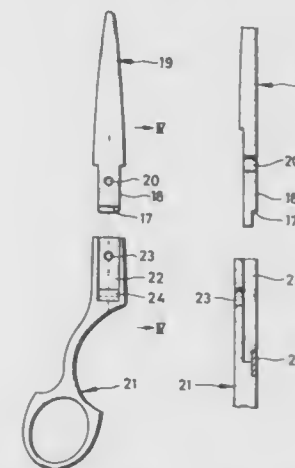
Filed Mar. 12, 1991, Ser. No. 668,056

Claims priority, application Japan, May 29, 1990, 2-56379[U]

Int. Cl.⁵ B26B 13/00

U.S. Cl. 30—260

1 Claim



1. Scissors comprising a pair of blades adapted to pivotally cooperate with each other, each blade comprising a cutting portion having a cutting edge at one end and a longitudinally extending shank at a base end thereof with a through hole in said shank, a handle portion having a longitudinally extending groove in one end thereof for receiving in a recessed manner the shank of the cutting portion, said handle having a through hole therein that aligns with the through hole in the shank of the cutting portion when the shank is inserted into said groove and a retaining plate covering a portion of the groove therein for holding said shank of said cutting portion in said groove, said retaining plate being located across a bottom end of said groove, said shank of said cutting portion having a step on its base end that engages under said retaining plate, the exposed surface of said shank being flush with the surface of said handle portion adjacent said groove, and screw means adapted to pass through said pairs of aligned holes to pivotally connect said pair of blades together.

5,086,564

DEVICE AND METHOD FOR ACTIVE VIBRATION DAMPING

Karl-Josef Scholz, Weilburg, Fed. Rep. of Germany, assignor to Wild Leitz GmbH, Wetzlar, Fed. Rep. of Germany

Filed Apr. 9, 1990, Ser. No. 506,344

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911341

Int. Cl.⁵ G01B 5/03

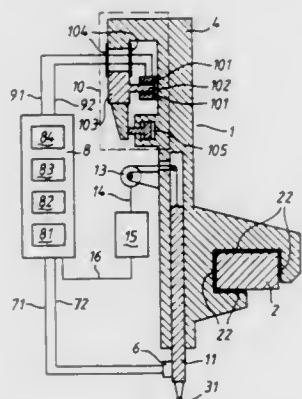
U.S. Cl. 33—1 M

20 Claims

1. A device for active vibration damping of an object, said object comprising a beam firmly attached to a support member at a clamping point and having first and second free ends extending in opposite directions from said clamping point, said active vibration damping device comprising:

- (a) a vibration sensor which is attached to said beam near said first free end and which generates input signals;
- (b) an actuator which is attached to said beam near said second free end and which, when activated, actively damps vibrations in said beam, said actuator comprising a vibration generator and a viscous damper; and
- (c) an electronic control circuit which is connected to said vibration sensor and an output connected to said actuator,

said control circuit receiving said input signals emitted from said vibration sensor and transmitting electronic



control signals to said actuator to activate said actuator to actively damp vibrations in said beam.

5,086,565

TECHNICAL DRAWING APPARATUS

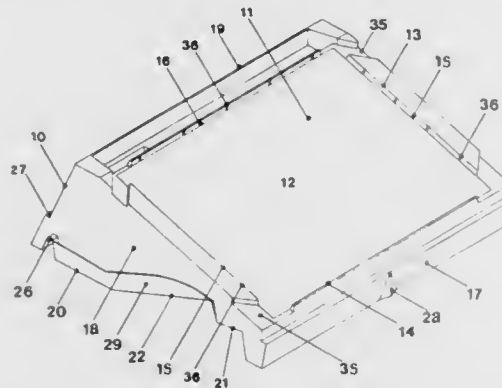
Philip A. Cartwright, Wry Cottage, The Street, Ridlington, North Walsham, Norfolk NR28 9NS, England

Filed Mar. 13, 1990, Ser. No. 492,676

Int. Cl.⁵ B43L 5/00

U.S. Cl. 33—1 AA

10 Claims



1. Drawing apparatus comprising means defining a substantially-flat generally-rectangular drawing surface having a front edge, a pair of side edges and a rear edge, and further comprising a pair of side walls depending downwardly from the opposed side edges of the drawing surface means, which said pair of side walls flare outwardly from said side edges of the drawing surface means whereby a plurality of like drawing apparatuses may be nested one partially within another, and the lower edge of each said side wall being shaped to define at least one shoulder stepped back closer to the drawing surface means than the lower edge of each side wall adjacent the front edge of the drawing surface means, the lower edges of each said side walls being shaped from a location adjacent the rear edge of the drawing surface means to a location adjacent said shoulder to permit the apparatus to be placed on a support surface in one of a first disposition where the lower edges of said pair of side walls adjacent both said front and rear edges of the drawing surface means bear on the support surface, and in a second disposition where the shoulder and also the lower edges of said pair of side walls nearer the rear edge bear on the support surface.

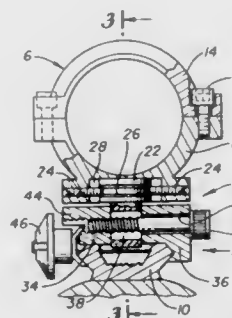
5,086,566
ADJUSTABLE TELESCOPIC SIGHT MOUNT
Harry R. Klumpp, Southgate, Calif., assignor to Fontaine Industries, Long Beach, Calif.

Filed Nov. 9, 1990, Ser. No. 611,927

Int. Cl.⁵ F41G 1/38

U.S. Cl. 33—247

3 Claims



1. A telescopic sight mount which includes a mounting base, said base including means to mount said mounting base upon linear rail means attached to a weapon; said mount further including front and rear ring mounts, at least one of said ring mounts including a clevis, said clevis further including a lateral bore in one jaw of said clevis and threaded bore in the opposing jaw of said clevis, said bore and said threaded portion being aligned with one another and perpendicular to said rail means, said base further including means to laterally adjust at least one of said rings by means of set screws operative on a portion of said rings; and

ring mount adjusting means, including a vertical blade designed to be received in the jaws of said clevis, said blade further including a slot operative to allow vertical adjustment of said ring within said clevis, said blade being retained in said clevis by fastening means extending through a first jaw of said clevis and engaging the threaded portion of a second jaw of said clevis.

5,086,567
ARCHERY BOW SIGHT RETICLE WITH MULTIPLE FIXED AIMING POINTS

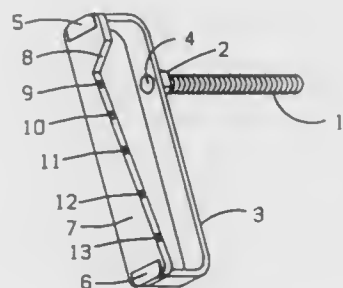
Jerald H. Tutsch, 110 S. Midvale Blvd., Madison, Wis. 53705

Filed Apr. 2, 1991, Ser. No. 679,645

Int. Cl.⁵ F41G 1/46

U.S. Cl. 33—265

11 Claims



1. An archery bow sight reticle comprising:
a flat elongated aiming point support member of substantially rectangular cross section with a plurality of fixed aiming points located along a narrow edge, said aiming points to be oriented facing the archer when in use and to be used by the archer to align the arrow with the target when shooting at various distances corresponding to the fixed aiming points, and
a frame substantially C-shaped having its opposite ends attached to the ends of said aiming point support member

and used to hold said aiming point support member in the proper orientation relative to the archer while shooting.

5,086,568

GEOLOGICAL GYROCOMPASS

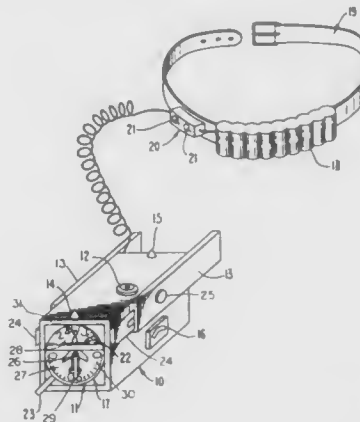
Mark H. McKeown, Golden, and Steven C. Beason, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 231,017, Aug. 11, 1988, abandoned. This application Oct. 24, 1990, Ser. No. 602,598

Int. Cl.⁵ G01C 19/38, 1/02

U.S. Cl. 33—275 G

5 Claims



1. A hand held geologic mapping and surveying instrument for providing accurate, dependable, and portable measurement of attitudes of planar surfaces in situations where magnetic compasses will not work, the invention comprising:

support means,
gyrocompass means enclosed in a protective case and shock mounted within said support means, said gyrocompass means having numerical readout means for determining direction, and power means adapted to provide power for spinning said gyrocompass means,
sighting means, comprising at least one strike reference bar and a pair of sights, affixed to said support means for aligning said instrument along a plane of a structure to be measured,
inclination measuring means affixed to said support means for measuring angles from horizontal, and
leveling means affixed to said support means for horizontally leveling said instrument to a reference direction.

5,086,569

APPARATUS FOR CHECKING DIMENSIONS OF WORKPIECES

Mario Possati, and Guido Golinelli, both of Bologna, Italy, assignors to Marposs Societa' Per Azioni, S. Marino di Benivoglio, Italy

PCT No. PCT/IT88/00078, § 371 Date Jun. 16, 1989, § 102(e) Date Jun. 16, 1989, PCT Pub. No. WO89/04456, PCT Pub. Date May 18, 1989

PCT Filed Nov. 3, 1988, Ser. No. 381,647

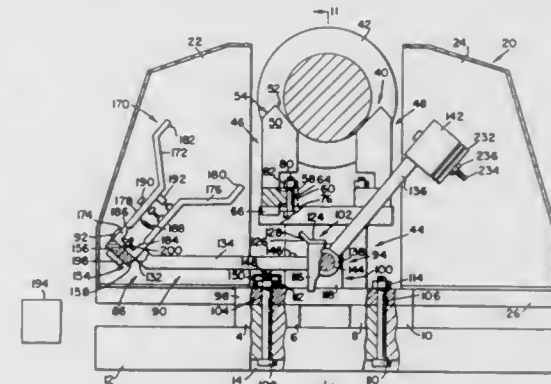
Claims priority, application Italy, Nov. 9, 1987, 3683 A/87 Int. Cl.⁵ G01B 5/20

U.S. Cl. 33—549

21 Claims

1. An apparatus for checking features of workpieces with rotational symmetry, comprising sensing means including a plurality of first gauges (170); support and protection means with a base (2; 2') defining first longitudinal guides (16, 18), rest devices (40; 410; 440) adjustably fixed to the first guides for defining a first horizontal geometrical axis along which the workpiece to be checked is to be mounted and a movable support structure (88) including a first frame (154) defining a

second longitudinal guide for supporting the first gauges (170) in independently adjustable positions, each of the first gauges being coupled to the first frame substantially in a single limited zone, the support structure (88) being rotatable about a second geometrical horizontal axis arranged below the first horizontal axis, in correspondence to a vertical geometrical plane passing



through the first axis, to allow said first gauges (170) to be moved in and out of measuring position simultaneously in a direction essentially horizontally tangential to the workpiece, the support structure being counterbalanced; and control means (232; 300; 320; 476) for controlling the displacement of said support structure (88).

5,086,570

DRYING APPARATUS FOR SCREEN PROCESS PRINTING AND COATING

Frank J. Matheus, Mission Viejo, Calif., assignor to Screen Printing Enterprises, Inc., Huntington Beach, Calif.

Filed Sep. 28, 1990, Ser. No. 589,976

Int. Cl.⁵ F26B 3/34

U.S. Cl. 34—1 L

6 Claims



1. An improved drying apparatus for use in drying water-based inks and coatings in screen process printing and coating applications; the improvement comprising:
a forced heated air dryer; and
a radio frequency (RF) power dryer;
said air dryer and said RF power dryer being serially arranged along a common path for receiving a sequential plurality of printed or coated materials from a screen process apparatus;
said RF power dryer comprising a conveyor belt for transporting said materials and a plurality of grid elements arranged in a selected array adjacent said conveyor belt for generating RF energy to cure said inks and coatings.

5,086,571

DEVICE IN THE DRYING SECTION OF A PAPER MACHINE

Pekka Hietanen, Kyröskoski, Finland, assignor to Oy Tampella Ab, Tampere, Finland

Filed Aug. 30, 1990, Ser. No. 574,680

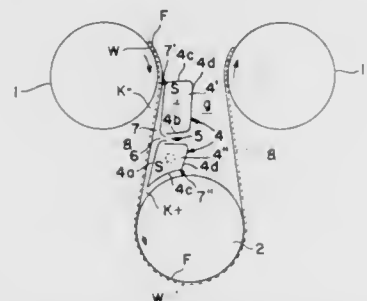
Claims priority, application Finland, Sep. 1, 1989, 894145 Int. Cl.⁵ D06F 58/00

U.S. Cl. 34—117

13 Claims

1. A device provided in the drying section of a paper machine having a first cylinder, a second cylinder and a support

fabric supporting a web to be dried, said fabric along with the web being passed from the first cylinder to the second cylinder, said device being provided at the height of the free run portion of the web and the support fabric between the cylinders on the side of the support fabric, said device comprising: a chamber connected to a source of pressurized medium and a nozzle slot provided in the chamber wall for effecting a flow having an influence on positive and negative pressures induced in wedge-like spaces formed between the cylinders and the web with the support fabric for stabiliz-



ing the run of the web, said nozzle slot being directed at an angle with respect to the free run of the web and away from the web and the support fabric towards an area, which is outside the wedge-like space defined by the circumferential surface of the cylinder and said free run, said device further including an ejector operatively connected with the nozzle slot, said ejector being adapted for ejecting air from a free space situated between said free run and said ejector, the ejecting of said air being induced by the flow path of said nozzle slot adjacent to the flow path of said ejector.

5,086,572

SELF-VENTILATING SHOE

Kuyn C. Lee, Taepyeongyang Apt. 6-405, 1774-1 Daeyun 6-Dong, Nam-Ku, Pusan, Rep. of Korea

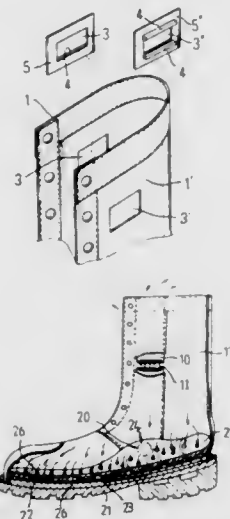
Filed Aug. 29, 1990, Ser. No. 574,102

Claims priority, application Rep. of Korea, Sep. 12, 1989, 89-13599

Int. Cl.⁵ A43B 7/06

U.S. Cl. 36—3 R

5 Claims



1. A ventilating system for a shoe, which comprises: an upper of the shoe, said upper including an air inlet and an air outlet disposed in the upper portion thereof, said air inlet and said outlet being provided with a pair of raised portions disposed in parallel for freely passing a shoelace

between the pair of raised portions so as to close the inlet and the outlet, respectively,

an one-way air flowing member disposed in the lower portion of said upper, said one-way air flowing member including a hollow body with a plurality of air flowing apertures, a spring with an air valve, and a cover with a hole whereby the air valve is slidably moved forwardly and backwardly between the hollow body and the cover so as to control the discharge and stop of ambient air from the interior of the shoe,

an air inlet vertical plate member attached to the inner surface of said upper, said air inlet vertical plate member including air inlet flowing means for communicating the air inlet with the interior of the shoe, said air inlet flowing means including a plurality of inlet channels, a plurality of inlet cross channels, a plurality of inlet radial channels, and a plurality of inlet apertures of the air inlet vertical plate member,

an air outlet vertical plate member attached to the inner surface of said upper, said air outlet vertical plate member including air outlet flowing means for communicating the air outlet with the interior of the shoe through the one-way air flowing member, said air outlet flowing means including a plurality of outlet channels, a plurality of outlet cross channels, a plurality of outlet radial channels, and said one-way air flowing member, and

an insole having a plurality of insole apertures and an arch extended portion for mating with the one-way air flowing member and a plurality of air discharging channels disposed in the bottom thereof, whereby when pressure is applied to the insole, air is expelled from the interior of the shoe through the air valve into the air outlet through the air outlet flowing means and when the pressure is released from the insole, air is drawn in the interior of the shoe and the air valve to close in order to introduce fresh air from the air inlet through the air inlet flowing means.

5,086,573

WEARING APPAREL HAVING AN ENERGY CONSUMING DEVICE

Michel Mabboux, Seynod, and Jean-Louis DeMarchi, Duingt, both of France, assignors to Salomon S.A., Annecy Cedex, France

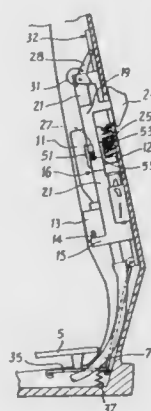
Continuation-in-part of Ser. No. 409,457, Sep. 19, 1989. This application Nov. 7, 1989, Ser. No. 432,893

Claims priority, application France, Sep. 19, 1988, 88 12197; Nov. 8, 1988, 88 14549

Int. Cl.⁵ A43B 7/02, 5/04

U.S. Cl. 362—2.6

31 Claims



1. A ski boot having an energy source for supplying an energy consuming device and a device for controlling opening and closing of a supply element for supplying said energy consuming device connected between said energy source and said energy consuming means, wherein said boot comprises

means for detecting the presence of a foot within said boot for allowing the opening of said element for supplying energy only when the foot is inserted into said boot and for automatically closing said supply element in response to the removal of the foot from said boot.

5,086,574

IMPACT DAMPING SYSTEM APPLICABLE TO SPORT SHOES

Alberto Bacchiocchi, Sao Paulo, Brazil, assignor to Sao Paulo Alpargatas, S.A., Sao Paulo SP, Brazil

Continuation of Ser. No. 429,802, Oct. 30, 1990, abandoned.

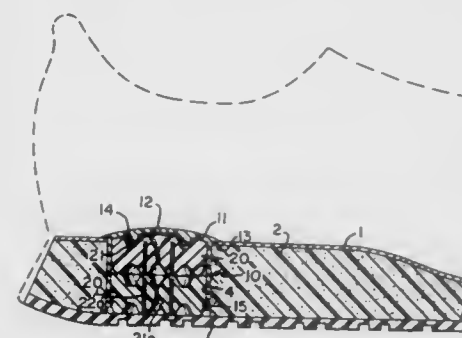
This application Apr. 26, 1991, Ser. No. 692,773

Claims priority, application Brazil, Nov. 25, 1988, 8806281

Int. Cl.⁵ A43B 13/12, 21/26

U.S. Cl. 36—35 R

20 Claims



1. An impact damping system for sport shoes of the type having an insole and a sole, a cavity formed in said insole and extending down to the upper face of the sole within the shoe, a hollow housing of resilient material shaped to fit in said cavity and to be removable therefrom, the bottom end of the housing extending toward said upper face of the sole, said housing having an integral cover at its upper end, the upper face of the cover mating with the upper face of the insole, the bottom of the housing having an inward peripheral extension leaving an opening, and at least one damping disc of resilient material in said housing extending between the inner face of said cover and the housing inward extension and toward the upper face of the sole, said at least one disc being insertable into said housing through the opening in the housing bottom by deforming the housing bottom.

5,086,575

ALPINE SKI BOOT WITH SHOCK ABSORBING SOLE

Laurent Bonaventure, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France

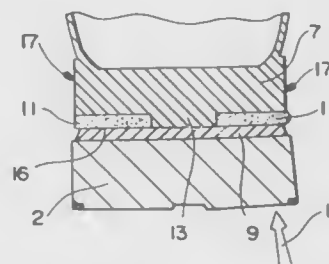
Division of Ser. No. 150,202, Jan. 29, 1988, Pat. No. 4,937,955. This application Feb. 15, 1990, Ser. No. 480,597

Claims priority, application France, Feb. 12, 1987, 87 02175

Int. Cl.⁵ A43B 5/04

U.S. Cl. 36—117

12 Claims



1. Ski boot comprising a shell base covering a rigid sole

comprising at least one zone which cooperates with at least one support plate of a binding, wherein at least in said zone, said sole comprises at least one shock absorption apparatus located within the thickness of said sole and including:

(a) at least one rigid rib having a width dimension less than that of the width of the sole, at least a portion of said at least one rigid rib being in said zone; and
(b) at least one elastically deformable insert positioned in a corresponding cut-out in the sole adjacent to the rib, wherein said at least one elastically deformable insert comprises a compressible element in the cut-out in said sole, wherein said sole includes a walking surface, and wherein a surface of said compressible element and a surface of said at least one rigid rib are substantially coextensive with said walking surface;

whereby said compressible element absorbs shocks encountered during skiing when said sole pivots about said at least one rigid rib, while said at least one zone remains rigid in cooperation with the at least one support plate of the binding under all conditions encountered during skiing.

5,086,576

BICYCLE SHOE

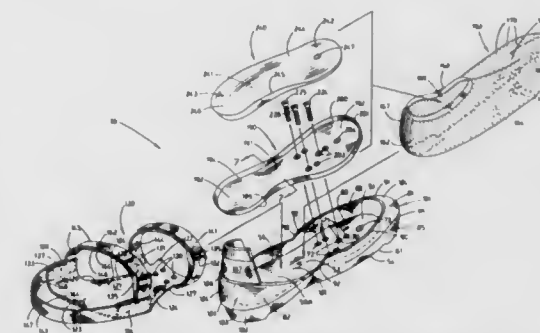
Donald W. Lamson, 29155 Hook Creek Rd., Cedar Glen, Calif. 92320

Filed May 29, 1990, Ser. No. 529,934

Int. Cl.⁵ A43B 5/14

U.S. Cl. 36—131

16 Claims



16. A shoe for use by an athlete in the sport of bicycling comprising:

a sole portion having a bottom panel which includes forwardly and rearwardly disposed sidewalls, and wherein the forwardly disposed sidewall partially encloses the forward portion of the athlete's foot, and the rearwardly disposed sidewall encloses the athlete's heel, and wherein the bottom panel, and the forwardly and rearwardly disposed sidewalls, respectively, have interior and exterior facing surfaces, and wherein the exterior surface of the rearwardly disposed sidewall has a channel formed therein, and wherein an aperture is formed in the bottom panel;

envelope for enclosing the athlete's foot and which is fixed on the interior facing surfaces of the bottom panel and the forwardly disposed sidewall, respectively;

a harness having a base portion and first and second adjustable straps, and wherein the base portion is fixed on the bottom panel, and the first and second straps are fixed on the base portion, and wherein the first strap extends substantially transversely relative to the major axis of the shoe and is disposed in covering relation relative to the envelope, and wherein the second strap is received in the channel and is operable to substantially secure the athlete's heel in the shoe;

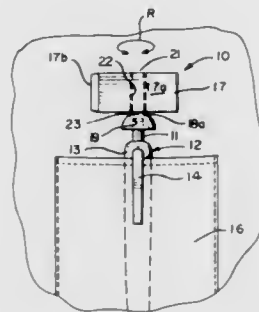
a rigid insole operable for mating receipt in the envelope, the rigid insole having an aperture which is disposed in substantially coaxial alignment relative to the aperture formed in the bottom panel;

a fastener received in the coaxial aligned apertures; and

a cushioned insole received in the envelope and disposed in rested receipt on the rigid insole and wherein the cushioned insole supports the athlete's foot.

5,086,577
WRITING INSTRUMENT ADVERTISING DEVICE
Robert R. Abernethy, 6541 Brookhill Dr., Garfield Hts., Ohio 44125

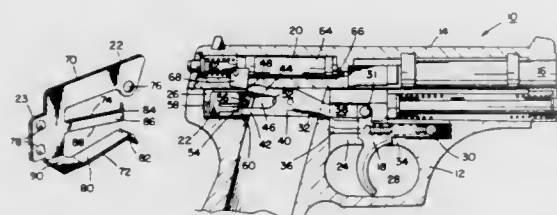
Filed Jan. 31, 1989, Ser. No. 304,204
Int. Cl.⁵ G09F 3/00
U.S. Cl. 40—334 10 Claims



1. In a writing instrument of the type including a barrel having a lower end provided with a retractable writing tip and an upper pushbutton end and means for actuating the movement of said writing tip between a retracted position and an extended position, an improvement which comprises an advertising device affixed to a sleeve, said advertising device being provided with advertising indicia viewable by an observer, means for permanent mounting of said sleeve on said upper pushbutton end and allowing movement of said tip, without removing said device with said advertising device extending upwardly for viewing of said indicia by an observer.

5,086,578
SEAR POSITIONING SPRING FOR A FIREARM
Bryant L. Lishness, Bristol, and Paul A. Scirica, East Hampton, both of Conn., assignors to Colt's Manufacturing Company, Inc., West Hartford, Conn.

Filed Dec. 14, 1990, Ser. No. 628,345
Int. Cl.⁵ F41A 19/12
U.S. Cl. 42—69.02 16 Claims



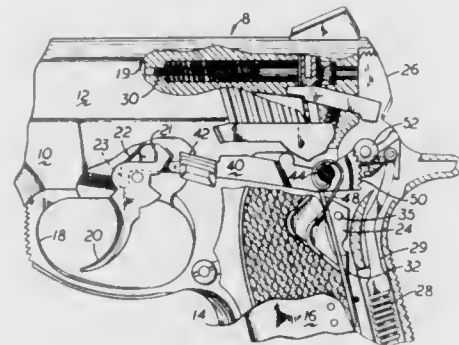
1. A sear locating spring for use with a firearm, the firearm having a sear movable in two directions, the spring comprising:

- a first section adapted to be fixedly connected to a frame of the firearm;
- a second section connected to said first section and adapted to exert a biasing force against the sear in a first direction; and
- a third section connected to said first section and adapted to move in a second direction relatively perpendicular to said first direction.

5,086,579
DECOCKING MECHANISM FOR A SEMI-AUTOMATIC FIREARM

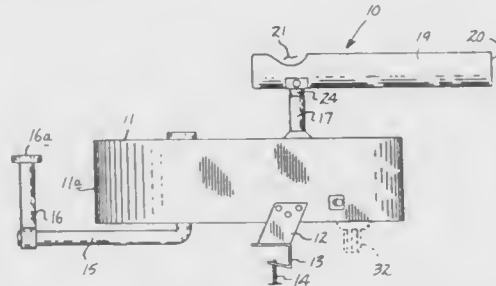
Stephen L. Flatley, West Springfield, Mass., and Donald B. Mears, Jr., Enfield, Conn., assignors to Smith & Wesson Corp., Springfield, Mass.

Filed Dec. 17, 1990, Ser. No. 628,444
Int. Cl.⁵ F41A 17/74
U.S. Cl. 42—70.08 4 Claims



1. In a semi-automatic handgun having a pivotable hammer urged toward a firing position by a main spring, the hammer including a full-cocked notch and a half-cocked notch, a pivotable sear urged by a sear spring toward a position of selective engagement with the hammer notches, and a trigger actuated drawbar adapted to pivot the sear to release the hammer for firing the handgun, an improved decocking mechanism comprising a pivotable lever disposed on at least one side of the handgun, a pawl disposed adjacent the hammer, said pawl being rotatable in response to pivotable movement of the decocking lever, said pawl including means to disengage the sear from the full-cocked notch of the hammer for decocking the hammer and means to move the drawbar to clear the sear should the trigger actuate the drawbar, said hammer including means for resetting the pawl to enable the sear spring to urge the sear toward engagement with the half-cocked hammer notch.

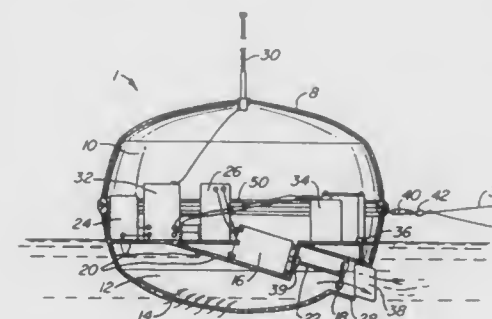
5,086,580
FISH JIGGING APPARATUS
Ronald M. Redding, 555 Pacific St., Coalinga, Calif. 93210
Filed Jan. 14, 1991, Ser. No. 640,614
Int. Cl.⁵ A01K 97/10, 87/00
U.S. Cl. 43—21.2 4 Claims



1. A fish jigging apparatus in combination with a boat, with the apparatus mounted to a side wall of the boat, wherein the apparatus comprises, a housing, the housing including a housing top wall spaced from and parallel a housing bottom wall, and including an arcuate housing rear wall defining a first arc, and the housing mounted overlying the boat side wall, and an "L" shaped housing handle leg, including a handle leg

interior leg member orthogonally and rotatably mounted between the top and bottom wall of the housing, and a horizontal leg member of the "L" shaped handle leg extending rearwardly of the housing arranged generally parallel to the bottom wall of the housing and extending beyond the housing arcuate rear wall, and a vertical handle leg orthogonally mounted to a rear terminal end of the horizontal leg member, with the vertical handle leg arranged for oscillation relative to the housing arcuate rear wall defining a second arc, wherein the second arc and first arc are spaced apart a predetermined spacing and defined by respective first and second concentric circles, and a fishing pole support tube mounted above the housing top wall and extending forwardly of the housing, and drive means mounted within the housing for oscillation of the fishing pole support tube upon oscillation of the vertical handle leg.

5,086,581
ELECTRONIC FISHING BOBBER
Charles L. Barra, P.O. Box 196, and William M. Neese, 401 School Way, both of Redwood Valley, Calif. 95470
Continuation-in-part of Ser. No. 383,824, Jul. 21, 1989, abandoned. This application Jan. 16, 1991, Ser. No. 642,702
Int. Cl.⁵ A01K 97/00
U.S. Cl. 43—26.1 17 Claims

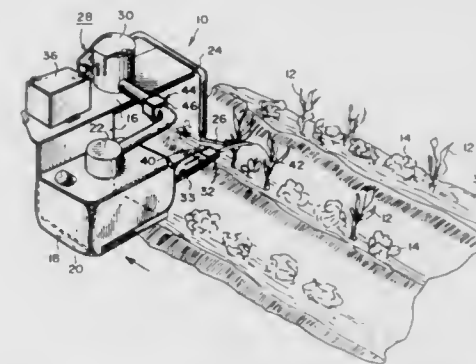


1. An electronic fishing bobber comprising:
a) a generally spherical body enclosing an upper portion and a lower portion, the upper portion being water-tight and the lower portion having a plurality of sieve-like holes for filtering water entering the lower portion, wherein the lower portion includes a rearward jet port surrounding the impeller so that the impeller is recessed therein and a forward volume for receiving water through the sieve-like holes, wherein the lower portion is generally hemispherical and the forward volume is much larger than the rearward jet port whereby water enters the forward volume through the sieve-like holes before contacting the impeller in the jet port as the body moves forward;
b) means for moving the body through the water by jet force, the moving means including a motor within the upper portion of the body and an impeller within the lower portion of the body;
c) means for directing movement of the body in the water; and
d) means for detachably mounting the body to a fishing line.

5,086,582
SPOT SPRAYER FOR TALL WEEDS
Robert E. Hamilton, 14023 S. Red Top Rd., El Nido, Calif. 95317

Filed Dec. 13, 1990, Ser. No. 626,697
Int. Cl.⁵ B05B 12/00
U.S. Cl. 47—1.7 6 Claims
1. A self contained spot sprayer for tall weeds in short crops, comprising:

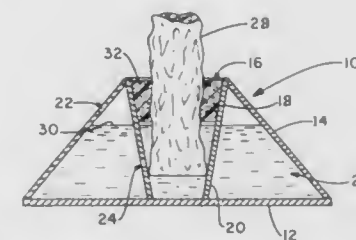
a) a housing affixed to a mechanized sprayer;
b) a tank containing a liquid herbicide therein carried on said housing;
c) a pump connected to said tank;
d) a discharge tube extending from said pump;
e) a spray nozzle at the distal end of said discharge tube; and
f) a means, carried on said housing, for sensing the tall weeds in the short crops, so as to allow said pump to transfer a predetermined amount of the liquid herbicide from said tank through said discharge tube and exit said spray nozzle to spray the tall weeds and kill them, said sensing means including a solenoid in said discharge tube and carried on said housing and a first sensor carried on said housing and proximate to said spray nozzle and a second sensor carried on said housing and spaced away from said



first sensor and a battery electrically connected between said solenoid, said first sensor and said second sensor so that when the mechanized spray rig moves along and above the ground said first sensor will make contact with a tall weed and activate said solenoid to allow the liquid herbicide to pass through said discharge tube and exit said spray nozzle, said second sensor will make contact with the tall weed and deactivate said solenoid to stop the liquid herbicide from passing through said discharge tube, said first sensor and said second sensor each including a microswitch having an actuating arm, whereby said microswitch is electrically connected between said solenoid and said battery and an activating lever on a bearing extending outwardly therefrom proximate the actuating arm to make contact with the tall weed, so as to press in the actuating arm and operate said microswitch.

5,086,583
METHOD AND APPARATUS FOR HOLDING CUT TREES
William C. Breen, 126 S. Portage Path Apt. 5, Akron, Ohio 44303

Filed Jul. 18, 1990, Ser. No. 555,090
Int. Cl.⁵ A47G 7/02
U.S. Cl. 47—40.5 8 Claims



1. A stand for receiving and securing a cut tree comprising: a base plate;
a first side wall extending upwardly from said base plate to an aperture at a top end thereof;

a receptacle formed by a second side wall depending from said aperture for receiving a trunk of a cut tree; securing means interposed between said trunk and second side wall for holding said trunk in a fixed position within said receptacle; and wherein said first side wall defines a cavity, said first side wall having an opening therein for receiving water into said cavity.

5,086,584

METHOD AND APPARATUS FOR APPLYING HERBICIDE AND THE LIKE TO TREES

Hans A. K. Merving, Torshälla, Sweden, assignor to Forestry Injection Company FIC AB, Eskilstuna, Sweden
Filed Oct. 12, 1989, Ser. No. 420,258
Int. Cl.³ A01G 29/00

U.S. Cl. 47—57.5

7 Claims

6. A method of forming a hole in a tree comprising the steps of:
providing a punch hammer having a hollow cylinder affixed thereto;
driving a portion of said hollow cylinder into a trunk of a tree so that a core of wood from the tree is forced into the hollow cylinder portion;
twisting said punch hammer so as to twist said cylinder and said core of wood relative to the tree; and
withdrawing said cylinder from the tree to remove said core of wood, thereby forming said hole.

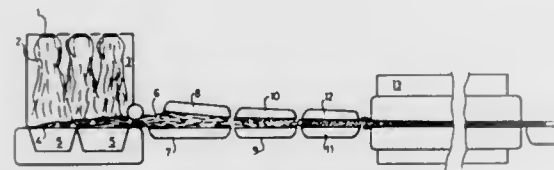
5,086,585

SUBSTRATE FOR OUT-OF-GROUND CULTIVATION AND METHOD FOR THE PRODUCTION THEREOF

Bernard Kafka, Rantigny, France, assignor to Isover Saint-Gobain, Courbevoie, France
Filed Mar. 15, 1990, Ser. No. 493,804
Claims priority, application France, Mar. 15, 1989, 89 03372
Int. Cl.³ A01G 31/00

U.S. Cl. 47—64

6 Claims



1. Method for manufacturing substrate for out-of-ground plant cultivation, comprising the steps of:
continuously longitudinally compressing, by a ratio of between 1.5 and 15, a sheet of mineral fibers having a resinous binder, said fibers being generally arranged in layers parallel to faces of the sheet;
heat treating the compressed sheet to crosslink the binder; and
causing plant roots to grow in said substrate.

5,086,586

VEHICLE SIDE DOOR FLUSH GLASS SYSTEM

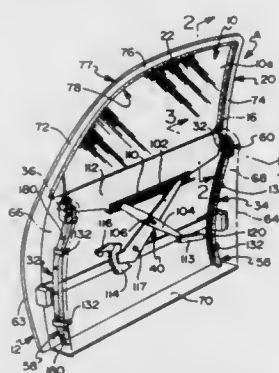
David G. Hlavaty, Allen Park; Juozas Doveinis, Sterling Heights, and Bela Gergoe, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 23, 1991, Ser. No. 689,438
Int. Cl.³ E05F 11/52

U.S. Cl. 49—211

8 Claims

1. A framed vehicle door assembly comprising a lower body structure having spaced inner and outer panels and a pair of spaced end walls which together define a compartment having a top opening extending longitudinally of the door assembly, an upper door frame having fore and aft side portions and a top

portion which together with the lower body structure defines a window opening,
said frame including a portion which is generally U-shaped in cross-section to define spaced inner and outer flanges, a window supported by the lower body structure for movement through the top opening between open and closed positions,
first seal means carried by said portion of said frame and sealingly engageable with said window along its sides on its interior surface and biasing said window outwardly toward engagement with said exterior flange,
spaced guide channel means including stationary guide tracks supported by said lower body structure and located within said compartment,
a pair of guides secured to said window at its opposite sides and adjacent its lower end, said guides being slidably received within said guide channel means,
window regulator means carried by said lower body structure for effecting movement of said window between its open and closed positions,



second seal means carried by said lower body structure adjacent said top opening thereof for engagement with said window when in its closed position, and
said guide channel means including second guide tracks for effecting outward movement of said window as it approaches its closed position so that said window will be substantially flush with said outer flange of said portion of said frame and be substantially flush with the outer panel of said lower door structure when in its closed position, the improvement being that said second guide tracks comprises curved track sections forming a continuation of said stationary guide tracks and which are supported for limited movement relative to said stationary guide tracks so that the window will be fully moved outwardly when moved to its closed position so as to be substantially flush with the outer flange and outer flange of said frame and said lower body structure, respectively, irrespective of build tolerance variations in the height of the window and the frame.

5,086,587

BALANCED BEAM LATCHING APPARATUS

Zenas B. Andrews, P.O. Box 2536, Pascagoula, Miss. 39567
Filed Jan. 30, 1991, Ser. No. 647,987
Int. Cl.³ E05C 9/00

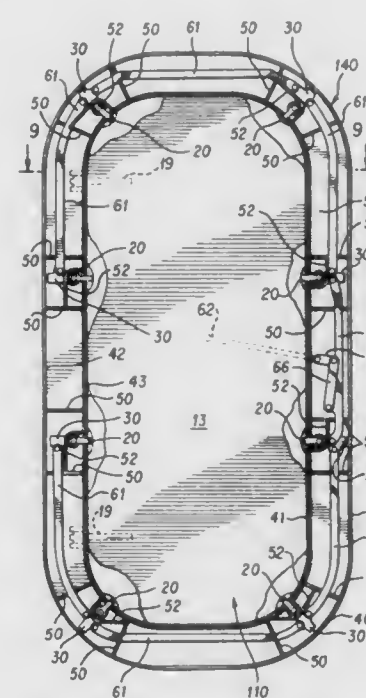
U.S. Cl. 49—395

21 Claims

1. A latching apparatus for a fluid tight door, for mounting in an aperture in a bulkhead, which comprises:
a) a substantially enclosed box frame having a bulkhead side, an inside, an outside, and a door side; the bulkhead side of the box frame sized to be secured about the aperture in the bulkhead, the box frame having a plurality of latching apertures extending in spaced relation about the door side of the box frame;
b) a fluid tight door having an inside, an outside, a door hinge side and a door opening side, the fluid tight door positioned to be closely received within the door side of

the box frame, and pivotally secured to the box frame by a suitable door hinge;

- c) a plurality of rotating dogs, each pivotally secured in alignment with a selected latching aperture located in the door side of the box frame, the rotating dogs each positioned to retract within the box frame when in a retracted position, and to extend beyond the profile of the box frame to engage the outside of the fluid tight door when in an extended position;
- d) a plurality of balanced beam linkage members secured by a slotted shaft to the rotating dogs within the box frame;
- e) a plurality of connecting rods rotatably secured on opposite ends to adjacent balanced beam linkage members within the box frame, with a central connecting rod disposed within the box frame;
- f) an operating link pivotally secured at one end to the central connecting rod;
- g) an operating crank arm pivotally secured at one end to the opposite end of the operating link;
- h) the opposite end of the operating crank arm pivotally secured to a shaft extending through an aperture in the



door frame to inside and outside operating handles, the inside and outside operating handles rotatably positioned to extend beyond the profile of the fluid tight door adjacent to the box frame in the opened position, and rotatably positioned to extend within the profile of the fluid tight door in the closed position;

- i) an annular gasket secured to the inside of the fluid tight door;
- j) an annular door stop secured in proximity to the door side of the box frame, the door stop having an annular narrow gasket engaging edge positioned to abut the annular gasket on the fluid tight door when the fluid tight door is in a closed position; and
- k) a dog spindle threadably positioned within the box frame to provide axial alignment of the dog spindle towards the inside and outside of the box frame by rotation of the dog spindle from an external location selected from the inside and outside of the box frame, wherein the torque from rotation of the slotted shaft is transmitted to the rotating dogs, independently of the axial alignment of the dog spindle within the slotted sleeve.

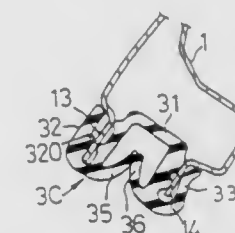
5,086,588

GLASS RUN FOR MOTOR VEHICLE

Shuji Nakano, and Hisayuki Kisanuki, both of Inazawa, Japan, assignors to Toyoda Gosei Co. Ltd., Japan
Filed Apr. 29, 1991, Ser. No. 692,555
Int. Cl.³ E06B 7/16

U.S. Cl. 49—441

2 Claims



1. A glass run to be attached to flanges of a door frame of a motor vehicle, which is composed of extruded parts and at least one molded part connecting the extruded parts to each other and forming a corner portion of the glass run, comprising:

- a main portion having a U-shaped cross-section;
 - seal lips extending from both ends of said main portion in such directions as to face each other for sandwiching a periphery of a door glass when being raised to its closed position; and
 - outer lips extending from both ends of said main portion outwardly, turning upwardly and extending along an outer surfaces of both side walls of said main portion for holding the flanges of the door frame;
- one of said outer lips provided in the molded part of the glass run, which is to be located outside the door frame, having a projecting portion at a root portion thereof, said projecting portion projecting toward a facing outer surface of one of said side walls of said main portion so that the thickness of said root portion of said one of said outer lips is greater than that of a corresponding outer lip provided in the extruded part of the glass run whereby said projecting portion and the facing outer surface of said side wall of said main portion define a narrow slit to which an outer flange of the door frame is to be inserted.

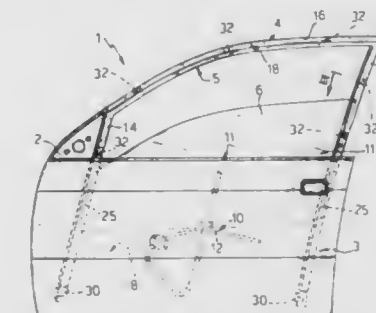
5,086,589

DOOR FOR VEHICLES AND METHOD FOR THE MAKING OF SAID DOOR

Giuseppe dibenedetto, Pogliano Milanese, Italy, assignor to Fiat Auto S.p.A., Turin, Italy
Filed Dec. 14, 1990, Ser. No. 627,721
Claims priority, application Italy, Dec. 15, 1989, 68101 A/89
Int. Cl.³ B60J 5/04

U.S. Cl. 49—502

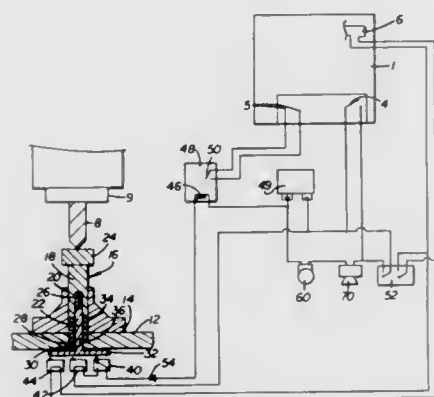
10 Claims



1. A vehicle door of the type comprising a window opening defined by a frame having a pair of posts and a cross-member, an accessory opening in said door underlying said frame, and a window glass for said window opening selectively movable between said window opening and said underlying accessory

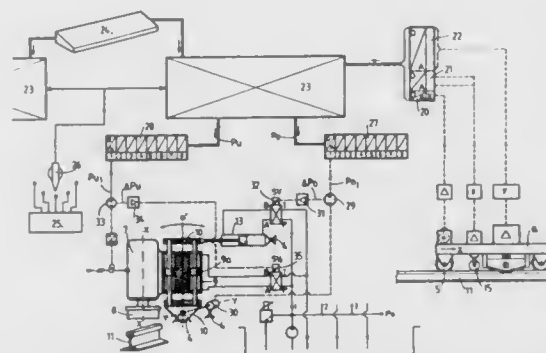
opening, characterized in that said frame presents an outer front surface provided with a channel-shaped cavity and in that said window glass is slidably mounted on a profiled supporting element the shape of which mates with that of said frame and constitutes, together with said window glass, a self-supporting unit, said profiled supporting element being housed within said channel-shaped cavity of said frame and being fastened to said frame by snap-hooking means.

5,086,590
TOOL CHECKING DEVICE FOR USE WITH NUMERICALLY CONTROLLED MACHINES
George Athanasiou, 3110 Spring St., Redwood City, Calif. 94063
Filed Jun. 16, 1989, Ser. No. 367,421
Int. Cl.⁵ B24B 49/00
U.S. Cl. 51—165.71 7 Claims



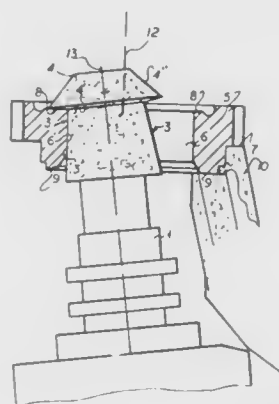
1. For use with a numerically controlled machine of the type which is programmable to carry out a succession of machining operations on a workpiece, and including means for supporting a workpiece, tool holder means for releasably securing a worktool and for moving the axially distal portion of said tool against the workpiece to remove material therefrom; programmable control means responsive to a sequence of programmed instructions for successively positioning the tool holder means with respect to the workpiece and controllably moving the tool against the workpiece during each of a succession of machining operations, first and second sets of operator-accessible terminal means positioned on the numerically controlled machine for connection to external equipment, and instruction-responsive means responsive to programmed instructions for producing an operator-accessible signal at the first set of operator-accessible terminal means, and for interrupting the programmed sequence until receipt of an enabling signal, the second set of operator-accessible terminal means coupling the enabling signal to the instruction-responsive means to initiate the next instruction in said succession; a retrofit sensor assembly for detecting unacceptable tool length and comprising: first switch means coupled to the first set of terminal means to selectively apply the enabling signal to the second set of terminal means, the first switch means being mounted with respect to the numerical control machine to selectively apply said enabling signal to said second set of terminal means only if the axial length of the tool is greater than a minimally acceptable length.

5,086,591
REPROFILING METHOD OF THE RAILS OF A RAILROAD TRACK AND RAILROAD VEHICLE FOR PERFORMING THE SAME
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S. A., Geneva, Switzerland
Filed Jul. 30, 1990, Ser. No. 560,584
Claims priority, application Switzerland, Aug. 28, 1989, 3116/89
Int. Cl.⁵ B24B 49/00
U.S. Cl. 51—165.71 13 Claims



1. A profiling or reprofiling method of the rails of a railroad track comprising the steps of measuring for each line of rails at least its transversal real profile; establishing for at least one type of rails one transversal base reference profile and at least another transversal reference profile; selecting one pair of reference profiles; attributing to each of the lines of rails one of the reference profiles of the pair selected; comparing the real transversal profile of each line of rails with the reference transversal profile which is assigned to it, and selecting a particular tool configuration for each line of rails in function of said comparison datas.

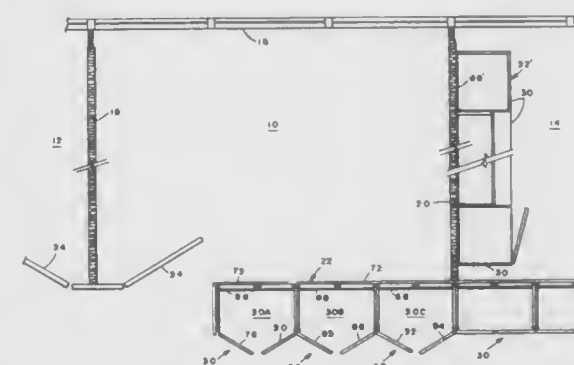
5,086,592
GRINDING TOOL AND METHOD OF USING SAME
Jürgen Schreiber, Wetzlar, Fed. Rep. of Germany, assignor to Buderus Schleiftechnik GmbH, Ehringshausen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 415,406, Sep. 29, 1989, abandoned, which is a continuation of Ser. No. 249,703, Sep. 27, 1988, abandoned. This application Dec. 4, 1990, Ser. No. 624,211
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733308
Int. Cl.⁵ B24B 1/00
U.S. Cl. 51—291 1 Claim



1. A grinding process using a grinding tool, centered on an axis, adapted to be mounted on an end of an arbor, and unitarily formed with: a head having

a frustoconical front end face centered on the axis, turned away from the arbor, and tapering away from the arbor, and
a frustoconical back face centered on the axis, turned toward the arbor, meeting the front face at an outer circular edge centered on the axis, tapering toward the arbor, and forming with the front face an acute angle; and
a foot having
a frustoconical outer surface centered on the axis, facing radially away from the axis, meeting the back face at a front inner circular edge centered on the axis, tapering toward the front edge, and forming a right angle with the back face;
the process comprising the steps of:
rotating the tool about its axis;
rotating relative to the rotating tool about a workpiece axis offset from the tool axis an annular workpiece having an end face turned away from the arbor and perpendicular to the workpiece axis and a passage having a cylindrical passage surface centered on the workpiece axis;
engaging the outer foot surface at a line of contact with the passage surface of the workpiece;
maintaining the tool axis and workpiece axis at an acute angle to each other with the workpiece axis parallel to the line of contact where the foot outer surface engages the passage surface; and
engaging the frustoconical back face of the grinding tool axially backward against the end face of the workpiece.

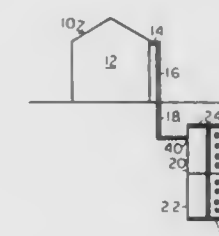
5,086,593
MODULAR BUILT-IN STORAGE WALL SYSTEM
Ellis B. Walentine, Coopersburg, Pa., assignor to J. G. Furniture Systems Inc., Quakertown, Pa.
Filed Feb. 6, 1990, Ser. No. 475,958
Int. Cl.⁵ E04H 1/06
U.S. Cl. 52—36 25 Claims



1. An integrated office furniture system including at least one modular storage wall comprising:
a plurality of prefabricated modular base components arranged adjacent one another, each having width, depth and height dimensions, the depth and height dimensions of said plurality of base components being substantially uniform; each base component including a plurality of support legs and a supporting surface for supporting a storage component thereon, said support legs arranged to provide openings along the depth dimensions of said components to thereby permit passage of cables therethrough along the width dimensions of said base components;
a plurality of prefabricated modular storage components mounted on respective ones of said base components, each storage component having width, depth and height dimension, the depth and height dimensions of said plurality of storage components being substantially uniform, and the depth and width dimensions of said storage components being substantially identical to the depth and width

dimensions of associated ones of said modular base components; and
means for permitting any one of said storage components to be removed from a respective one of said base components without disturbing any other of said storage components or any of said base components.

5,086,594
COMPOSITE DRYWELL, DRYWELL SYSTEM AND METHOD
Thomas Florence, Centerville, Mass., assignor to Owl 1990 Trust, Hyannis, Mass.
Continuation-in-part of Ser. No. 407,361, Sep. 14, 1989, Pat. No. 4,982,533, which is a continuation-in-part of Ser. No. 394,635, Aug. 16, 1989, Pat. No. 4,983,069. This application Nov. 28, 1990, Ser. No. 619,115
Int. Cl.⁵ E02B 11/00; E03F 5/02
U.S. Cl. 52—169.5 20 Claims



1. A drywell for use in a drywell drainage system for the collection and distribution of surface water to a drain field, which drywell comprises:

a cylindrical drywell having a top and bottom cover section the cylindrical drywell composed of a plurality of separate, edge-interlocked, arcuate sections to form cylindrical wall of the drywell with the arcuate section having a top, a bottom and a one and the other side edges with a side wall, one side edge of each arcuate section having a side edge opening extending substantially the length of the one side edge, while the other side edge of each arcuate section having a generally beaded side edge extending substantially the length of the side edge, the arcuate openings and beading adapted to fit in an interlocking, receiving relationship adjacent one and the other side edges of adjacent arcuate sections so as to provide for a plurality of the arcuate sections to form said wall of the composite drywell wherein the arcuate sections making of the composite drywell are selected from a group of arcuate sections having a solid side wall, a solid side wall with at least one large diameter port opening in the upper section of the side wall, a side wall having a plurality of small diameter distribution ports having a weakened mechanical section therein which may be removed, a side wall having a plurality of small diameter distribution ports with plugs therein which plugs may be removed, a side wall having a plurality of smaller diameter distribution ports in the side wall and having at least one large diameter port opening in the upper section thereof and a wall section having a plurality of generally uniformly distributed, smaller diameter, open distribution ports or any combination thereof, at least one of such arcuate sections forming the cylindrical side wall containing a plurality of water distribution ports therein so as to provide for the discharge of water from such distribution ports and the drywell including an opening for the introduction of surface water into the interior of the drywell so that the selection of the number of openings of the distribution ports and the nature of the arcuate sections making up the composite drywell the direction, level and distribution pattern of the flow of surface water discharge from the drywell may be controlled.

5,086,595

STAIR SUPPORT SYSTEM

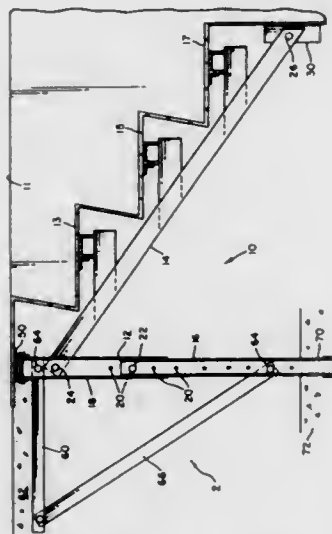
John V. Maiuccoro, Albany, and John Gardenier, Gunderland, both of N.Y., assignors to Saratoga Spa & Bath, Latham, N.Y.
Filed Feb. 14, 1990, Ser. No. 479,652

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.⁵ E04F 11/00

U.S. Cl. 52—183

15 Claims



1. A stair support system for use with and supporting a prefabricated stair module comprising a molded plurality of staggered stair treads and risers, said system comprising: an outer leg having a bottom end and a top end, said bottom end including securing means for securing it to a foundation means and said top end including fastening means for attaching said top end to an underside of a stair tread support means which traverses essentially the underside of a tread; a singular stringer having a top end removably connected to said outer leg proximate and under said top end, said stringer underlying at least two of said steps and having fastening means at a bottom end for attachment to the module at the rear, lower portion of its lowest stair riser; and a plurality of straight stair support members, each member having one end connected to said stringer and a free end underlying and supporting a separate stair tread support means which underlies each of said steps in slidably detached fashion.

5,086,596

WEEP AND SEALING WINDOW SYSTEM

Omer T. Schlyper, and Daniel E. Stokes, both of Bend, Oreg., assignors to Bend Millwork Systems, Inc., Bend, Oreg.
Filed Jul. 18, 1990, Ser. No. 553,595

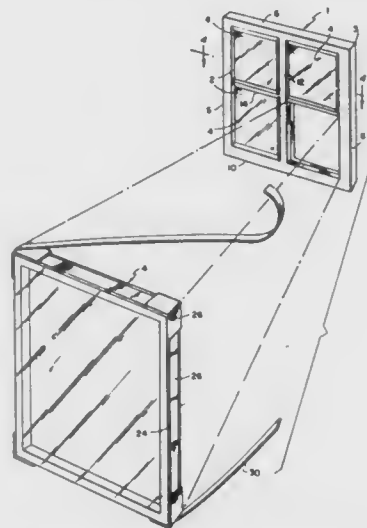
Int. Cl.⁵ E06B 1/34

U.S. Cl. 52—204

15 Claims

1. A divided light weep and sealing system, comprising: a window frame unit including a top rail and a bottom rail connected at their end portions by a pair of vertically extending stiles to form an outer frame, and at least one set of horizontal mull bars and a vertical center bar affixed to an interior surface of said outer frame to define a plurality of light openings, an interior surface of said top rail being formed substantially along its entire length with a horizontal groove, respective interior surfaces of said pair of stiles and said vertical center bar being formed substantially along their entire lengths with respective vertical grooves,

said vertical grooves opening at a bottom portion of said window frame unit;
a plurality of insulated window units, one for each of said light openings, each window unit having at least an interior window pane and an exterior window pane separated at their perimeters by a continuous spacer;
a strip of tape wrapped around a perimeter surface of each



said spaced and being disposed substantially opposite to the grooves in said window frame unit;
an interior bead of glazing material disposed around each said light opening at an interior window pane side of the grooves in said window frame unit; and
an exterior bead of glazing material disposed around each said light opening at an exterior window pane side of the grooves in said window frame unit.

5,086,597

WORK SPACE MANAGEMENT SYSTEM HALLWAY WALL ARRANGEMENT

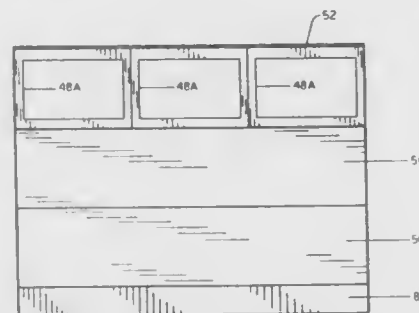
James O. Kelley, Spring Lake, Mich., and William E. Stumpf, Minneapolis, Minn., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Feb. 20, 1990, Ser. No. 481,167

Int. Cl.⁵ E04H 1/00

U.S. Cl. 52—239

13 Claims



1. A work space management system for dividing a building space into a work space and a hallway, said system comprising a rigid framework formed of rigid rectangular frames rigidly joined together at edges thereof, said rigid framework defining at least one work area wall portion and one hallway wall portion, a plurality of wall-defining primary tiles removably mounted to the faces of said framework in the work area wall portion, said primary tiles having a common height and a width substantially equal to the width of the frames on which

they are mounted and are interchangeable one with another, a plurality of wall-forming extended tiles mounted to the frames on the hallway wall portion, said extended tiles having a related height and a length which spans at least two of said frames on which they are mounted.

5,086,598

WALL BOARD JOINT REINFORCING SYSTEM

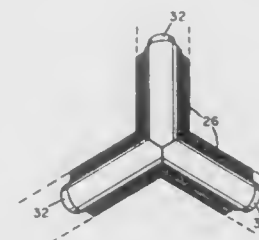
Derrell J. Weldy, 1316 Dewey Pl., Campo, Calif. 92006, assignor to Derrell J. Weldy, Santee, Calif.

Continuation of Ser. No. 328,759, Mar. 23, 1989, abandoned, which is a continuation of Ser. No. 205,424, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 7,570, Jan. 28, 1987, abandoned. This application Nov. 17, 1989, Ser. No. 438,942

Int. Cl.⁵ E04F 19/04, 13/06; E04B 1/38

U.S. Cl. 52—288

12 Claims



1. A wall edging system for reinforcing building wall intersections, comprising: an elongate, resilient strip formed from a single piece of plastic; the strip comprising a central arcuate portion extending along the length of the strip and a planar side flange projecting outwardly from each side edge of the arcuate portion; each flange having a plurality of linear striations on a face comprising evenly spaced, straight grooves and ridges, the striations extending along the length of the strip 3 the striations terminate short of the junction between the flange and adjacent edge of the arcuate portion on one side and extending up to the outer peripheral edge of the respective flange.

5,086,599

BUILDING PANEL AND METHOD

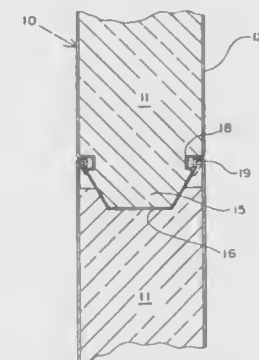
Steven C. Meyerson, Clearwater, Fla., assignor to Structural Panels, Inc., Oldsmar, Fla.

Continuation-in-part of Ser. No. 481,607, Feb. 15, 1990. This application Apr. 24, 1990, Ser. No. 513,922

Int. Cl.⁵ E04B 1/80; E04C 1/14

U.S. Cl. 52—309.9

13 Claims



1. A building panel comprising, in combination, a core portion having insulating and structural properties, a skin secured to the core portion having formed lateral

edges which extend beyond the core on one lateral edge of the panel,
a nose formed in the core material portion of one lateral edge of the panel,
and a nose mating member formed on the opposite lateral edges of said panel,
a sealant pockets formed on the skin edges provided on the lateral portions of the nose edge and mating member terminating in a nose core engaging ramp for receiving an opposed yieldable member,
and opposed means formed with skin which extends from the core and formed defining a sealant locking press provided adjacent the pockets which is formed to define a press for entering into the opposed pocket and terminating with a further folded centering stabilizer portion which is proportioned to ride on the opposed nose engaging ramp, said locking press being proportioned for a nesting fit within the sealant pocket but providing sufficient clearance to permit sealant material to extrude between the opposed faces of the sealant press and the sealant pocket as the sealant press yieldably moves into the sealant pocket to lockingly engage the two opposed members and their respective adjacent panels.

5,086,600

BLOCK FOR CONCRETE WALL FORM CONSTRUCTION

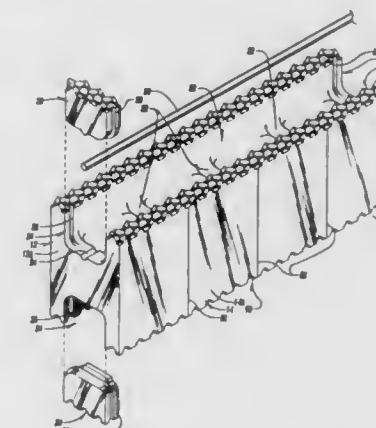
Geary C. Holland, and Charles E. Allison, both of St. Petersburg, Fla., assignors to Revelation Builders, Inc., St. Petersburg, Fla.

Filed Apr. 26, 1990, Ser. No. 514,734

Int. Cl.⁵ E04C 3/22

U.S. Cl. 52—594

12 Claims



1. A block means to be used with block means of similar character to create a form for a concrete wall, comprising, a block of substantially rectangular shape having opposite ends, opposite sides, an upper interlocking surface, a lower interlocking surface, a substantially hollow interior compartment, opposite end walls, and opposite side walls, said upper interlocking surface comprising an elongated longitudinal first rib on each of the upper surfaces of said side walls, and extending along the length of said side walls;
said ribs having a width less than that of side walls, a substantially horizontal ledge adjacent at least one side of each of said ribs,
spaced apart laterally extending interlocking surface means comprising intersecting ribs extending completely across the upper surfaces of said side walls and intersecting said ledges and said first ribs,
said lower interlocking surface comprising a mirror image of said upper interlocking surface,
said first ribs and said intersecting ribs have an upper surface comprised of an inverted V-shaped,

a plurality of cylindrical plugs extending upwardly at the intersection of said first ribs and said intersecting ribs.

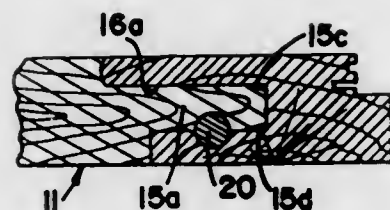
5,086,601 JOINT STRUCTURE

Dennis A. Galowitz, Stillwater, Minn., and Harold H. Evans, Hudson, Wis., assignors to Andersen Corporation, Bayport, Minn.

Continuation of Ser. No. 301,173, Jan. 24, 1989, abandoned. This application Jun. 27, 1990, Ser. No. 545,113
Int. Cl.⁵ E04C 2/38

U.S. Cl. 52—656

8 Claims



1. A joint structure for interconnecting first and second portions of a frame for a door or window, comprising:
 - (a) a tenon cooperatively connected to a first portion of the frame;
 - (b) a mortise formed in a second portion of the frame, the mortise position being sized to receive the tenon;
 - (c) a first groove formed in the tenon, the first groove being transverse to the tenon;
 - (d) a second groove formed in the second portion, wherein when the tenon is inserted in the mortise, the second groove is aligned with the first groove to form a dowel cavity; and
 - (e) a locking dowel pin for insertion into the dowel cavity, wherein when inserted in the dowel cavity the pin further secures the tenon in the mortise and provides a resistance to a shear force along substantially the length of the pin.

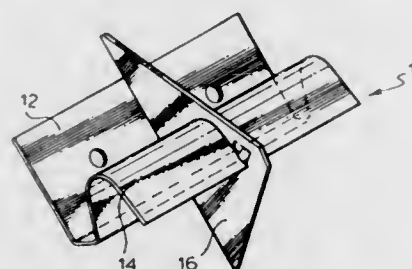
5,086,602 INSULATION CLIP

Paul Pukas, Salmon Arm, Canada, assignor to Tech-Crete Processors Ltd., Salmon Arm, Canada

Filed Mar. 27, 1991, Ser. No. 675,827
Int. Cl.⁵ E04F 13/00

U.S. Cl. 52—713

6 Claims



1. A clip for retaining an insulation panel to a planar surface, said insulation panel having an inner face for presenting to said planar surface, a tongue and groove formation on opposite edge surfaces thereof, respectively, for interlocking with adjacent like panels and a cut extending across from each of the opposite edge surfaces to said face, said clip comprising
 - a rigid sheet base adapted to lie flush on the planar surface upon which the insulation panel is to be mounted and adapted to be secured to the planar surface and
 - an interlock member extending substantially perpendicular from said base and adapted to the contour of the tongue and groove formation and terminating within the thickness of the insulation panel, said interlock member having

a fin slot extending substantially perpendicular to said base for receiving a fin means,
said fin means having means for engaging said interlock member and adapted for engagement with said cuts of said insulation panels whereby said fin means restricts relative sliding movement between the clip and the insulation panel when at least two like clips retain said insulation panel to the wall surface from said opposite edge surfaces.

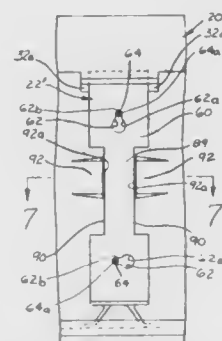
5,086,603 BODY SIDE MOLDING ASSEMBLY THAT COMPENSATES FOR THERMAL EXPANSION

Edward J. Graf, Oxford; Robert Hancz, Troy, both of Mich., and Zinovy Tytes, Tecumseh, Canada, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1991, Ser. No. 651,873
Int. Cl.⁵ E04F 19/02

U.S. Cl. 52—718.1

4 Claims



1. A molding assembly for attachment to a vehicle body panel comprising:
 - a plurality of fastener clips including first and second end clips and an intermediate clip which are adapted to be mounted to the body panel at spaced longitudinal locations thereon, each of said clips having a body portion, a projection at one end of the body portion and a projecting flexible leg at the opposite end of the body portion,
 - an elongated plastic molding having a front surface, a rear surface and means integral with the rear surface which define a pair of spaced channels facing toward each other, one of said channels receiving said flexible legs of said clips when the molding is being attached to said clips, the other of said channels receiving said projections at said one end of said clips when the molding is moved in a direction to deflect said flexible legs and then moved to cause said means defining said other channel to be snap fitted over said projections to retain the molding on said clips, and first and second cooperable means integral with said intermediate clip and said rear side of said elongated molding adjacent its longitudinal midpoint, respectively for positioning said molding relative to said panel and for preventing longitudinal movement of said elongated molding relative to said intermediate clip, said first cooperable means on said intermediate clip defining a pair of oppositely facing side surfaces, said second cooperable means on said molding comprising a pair of raised portions defining a recess whose side surfaces face toward each other, said side surfaces of said first cooperable means being received within said recess between said raised portions when the molding is attached to said intermediate clip whereby engagement between the side surfaces of said first and second cooperable means prevents longitudinal movement of said molding relative to said intermediate clip,
 - said end clips permitting longitudinal sliding movement of said molding relative thereto whereby linear thermal expansion and contraction of said molding takes place evenly from said midpoint of said molding.

5,086,604 MOUNTING FOR STORM WINDOWS

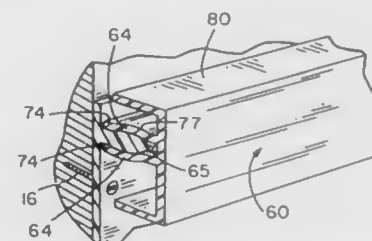
Robert W. Orth, 1073 Burns St., St. Paul, Minn. 55106

Filed Sep. 24, 1990, Ser. No. 611,486

Int. Cl.⁵ E06B 3/26

U.S. Cl. 52—741

1 Claim



1. A method for mounting a storm window and a decorative cover frame to a window casing so that storm window and the decorative cover frame can be interchanged comprising the steps of:

placing an extruded male retainer means around a window casing, the extruder male retainer means having an enlarged bulb with a convex outer surface, the extruded male retainer means having a ridge extending its entire length, the ridge having a relatively narrow neck adjacent the enlarged bulb to allow the enlarged bulb to flex with respect to the retainer means, the retainer means having an outwardly projecting integral strip projecting sufficiently beyond the enlarged bulb for receiving permanent attachment means for attaching the retainer means to the window casing;

inserting a channel of a storm window frame member in a pivoting relationship on the male retainer means by forcing the channel having engagement means for engaging only the enlarged bulb with a convex outer surface, onto the convex outer surface of the enlarged bulb to thereby permit the storm window frame member to pivot and flex to a limited extent with respect to the retainer means to facilitate application of the storm window frame member and the retainer means as an assembled unit to the window casing while the retainer means remains engaged with the storm window frame member;

permanently affixing the outwardly projecting integral strip to the window casing while the storm window frame member is pivotally mounted to the convex outer surface of the enlarged bulb of the retainer means by nailing the outwardly projecting integral strip to the window casing to thereby provide a permanent retainer means affixed around the window casing;

pulling the storm window frame member away from the enlarged bulb after the integral strip is affixed to the window casing to leave the retainer means secured to the casing with the enlarged bulb and the ridge exposed to view; and

then applying a decorative cover frame to the enlarged bulb, the decorative cover frame having a first face with flanges projecting outward from a channel on the decorative cover frame, the decorative cover frame having no means for supporting a storm window to the retainer means but having means for engaging only the enlarged bulb of the retainer means around the convex outer surface of the enlarged bulb until the enlarged bulb and the ridge are completely hidden from view by the flanges projecting outward from the decorative cover frame to thereby form a pivotally and locking engagement between the enlarged bulb and the channel in the decorative cover frame so that the decorative cover frame provides a decorative cover frame for completely hiding from view the enlarged bulb when the storm window frame member is not present so that the decorative cover frame adds a

finished look to the male retainer means and protects the enlarged bulb and the ridge from exposure to the sunlight when the storm window frame member is not in place on the male retainer means.

5,086,605 METHOD OF MOUNTING FLOORS IN A SHELL WHOSE CONCRETE WALL IS ERECTED BY A CONTINUOUS SELF-CLIMBING SHUTTERING INSTALLATION

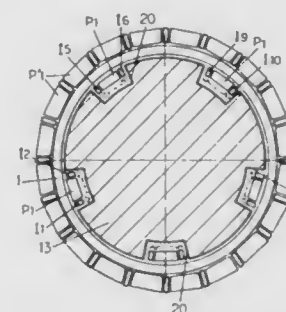
Alexandre J. Tzincoca, Paris, France, assignor to Enterprise Generale Industrielle, France

Filed Mar. 16, 1990, Ser. No. 495,036

Claims priority, application France, Mar. 16, 1989, 89 03481
Int. Cl.⁵ B28B 1/00, 17/00; E04B 1/16; E04G 11/20

U.S. Cl. 52—745

5 Claims



1. Method of mounting a floor in a shell having a periphery whose concrete wall is erected by a continuous self-climbing shuttering installation, said concrete wall being formed by successive lifts made along said periphery of said shell until a desired height is reached, said installation comprising essentially, on both an internal and an external face of said wall, means for momentarily fixing working walkways on an underlying portion of said wall already cast and hardened, means for shuttering a next lift on said underlying portion and climbing means for self-raising of said walkways, in which installation said fixing means comprise series of uprights (M₁ to M₅) extending substantially in vertical planes, lower uprights of which are anchored in said hardened concrete of said wall, said series being evenly spaced apart along said periphery of said wall (1), said uprights serving both as elements for holding shuttering in position and as means for guiding and engaging self-lifting mobile brackets (2, 2') supporting said walkways, which method comprises:

providing a floor (13) having a periphery and a series of evenly spaced apart clearances (20) at said periphery;

providing multiple assemblies for both said internal face and said external face of said wall, each assembly comprising said brackets (2) which are engaged on two adjacent series of uprights, and said walkways (P₁, P₂, P₃) supported by said brackets, and wherein on said internal face of said wall there are provided first assemblies (I₁-I₂), second assemblies (I₂-I₃), and third assemblies (I₃-I₄) which are adjacent to each other;

erecting said concrete wall of said shell by performing shuttering and concreting operations on both said internal face and said external face of said wall with said multiple assemblies;

interrupting said shuttering and concreting operations on said internal face of said wall; laying said walkways (P₁, P₂, P₃) of each of said second assemblies (I₂-I₃) on said walkways of one of said adjacent assemblies;

lowering said third assemblies (I₃-I₄) to a lower level than a level of said first assemblies (I₁-I₂);

laterally transferring said third assemblies (I₃-I₄) under said first assemblies (I₁-I₂);

laying said floor (13) in said shell by positioning said floor such that said clearances (20) of said floor pass said first

assemblies (I₁-I₂) and said third assemblies (I₃-I₄) which have been superimposed.
laterally transferring said first assemblies (I₁-I₂) to respective positions occupied previously by said third assemblies (I₃-I₄);
mounting said third assemblies (I₃-I₄) to respective positions previously occupied by said first assemblies (I₁-I₂);
repositioning said walkways of said second assemblies (I₄-I₁); and
continuing said shuttering and concreting operations until another floor (13) is to be laid on until said desired height of said concrete wall is reached.

5,086,606

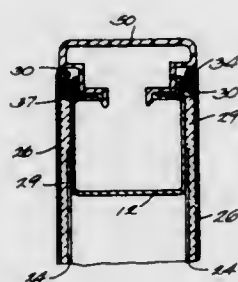
OFFICE PANEL PARTITION AND FRAME THEREFORE
Gregory R. Finses, Green Bay, Wis., assignor to Krueger International, Inc., Green Bay, Wis.

Filed Feb. 20, 1991, Ser. No. 658,060

Int. Cl.⁵ A47G 5/00

U.S. Cl. 52-794

14 Claims



I. A frame for an acoustical divider panel comprising: top and bottom frame members of equal length, opposed side frame members of equal length joined at their ends by a miter joint to the ends of said top and bottom members to form a rectangular frame, each of said four members being formed of a U-shaped channel opening outwardly from said frame, said channel having outer edges formed into the shape of outwardly facing grooves extending along the length thereof for receiving the edges of a sheet of fabric, the interiors of said grooves containing an undercut portion adapted to secure the edge of said fabric therein, each of said frame members being formed from a single sheet of metal bent into the form of said U-shaped channel, the outer edges on each side of each of said channels being formed by a series of folds into the shape of said grooves.

5,086,607

WRAPPING PAPER FEEDING APPARATUS FOR COIN WRAPPING MACHINE

Masamichi Ozeki, Ashikaga, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 664,844

Claims priority, application Japan, Mar. 14, 1990, 2-25660; Feb. 27, 1991, 3-31233

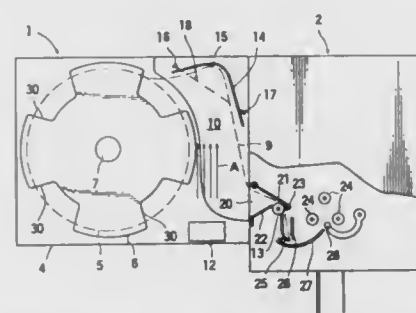
Int. Cl.⁵ B65B 11/04

U.S. Cl. 53-64

16 Claims

1. A wrapping paper feeding apparatus for a coin wrapping machine in which a wrapping paper is withdrawn by feed roller means and stacked coins are wrapped by winding the wrapping paper therearound by use of wrapping roller means, said wrapping paper feeding apparatus comprising said feed roller means for withdrawing the wrapping paper from a wrapping paper roll and feeding the same to the wrapping roller means, supporting means for holding said wrapping paper roll thereon, said supporting means being rotatable in substantially the horizontal plane, drive means for rotating said supporting means, blower means disposed between said supporting means and said feed roller means for blowing gas toward the wrapping paper fed out from said wrapping paper

roll so as to form the wrapping paper with a loop, sensor means for detecting said loop of the wrapping paper, and control means for causing said drive means to stop rotation of said



supporting means when said sensor means detects said loop of the wrapping paper and causing said drive means to rotate said supporting means when said sensor means does not detect said loop of the wrapping paper.

5,086,608

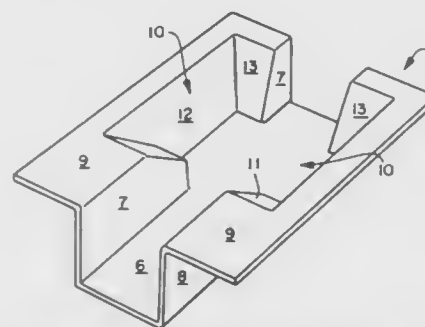
ERGONOMIC HAND LOADING CARTONER BUCKET
Emory E. Leubke, and Keith R. Haen, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 15, 1990, Ser. No. 539,103

Int. Cl.⁵ B65B 35/30

U.S. Cl. 53-443

9 Claims



1. A hand-loading cartoner infeed bucket comprising an open top, a bottom and at least one open end for sliding product into an open carton, said bucket further comprising two sidewalls, at least one of said sidewalls having an open indentation sufficiently large to accept a hand and which provides a discontinuity in the mating surface between the bottom and the sidewall, wherein the length of the discontinuity is less than the length of the product to be placed in the bucket.

5,086,609

METHOD AND AN APPARATUS FOR PRODUCING, FILLING AND SEALING BAGS

Konrad Tetenborg, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 30, 1991, Ser. No. 647,018

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1990, 4002652; May 30, 1990, 4017452

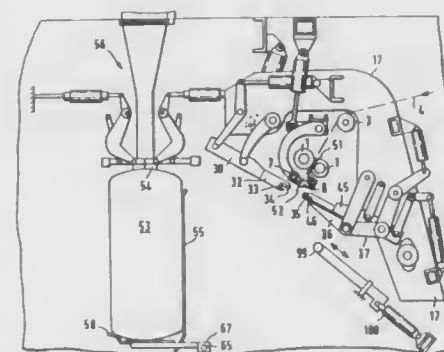
Int. Cl.⁵ B65B 43/04, 9/13, 7/06, 43/26

U.S. Cl. 53-452

19 Claims

1. A method for manufacturing, filling and sealing a bag using a flat web of tubular foil which comprises providing a leading end of the web with a terminal transverse weld seam at a position in a welding station, severing a section of the web in the form of an open bag including said seam at one end thereof from the remainder of the web, filling the bag, drawing the open end of the bag taut, and closing the bag by means of a further transverse weld,

the method including after formation of the terminal transverse weld by welding jaws at the welding station, the steps of feeding the tubular web through the welding jaws by a length suitable for forming a bag, gripping the web laterally by a pair of grippers and, at a higher level than the grippers, severing the bag from the remainder of the web by a transverse cut, thereby forming the bag with an open end, holding the bag by the grippers on two sides



adjacent the open end, conveying the bag with the grippers into a filling station, moving the grippers towards each other to open the bag, filling the bag at the filling station, moving the grippers apart to pull the open end of the bag taut after filling, using at least the grippers to return the bag into said position in the welding station and in the welding station sealing the open end of the bag by said further transverse weld.

5,086,610

DEVICE ASSEMBLY

Jari Maki-Rahkola, Kauhajoki; Mauri Kononen, and Jorma Surakka, both of Hyvinkaa, all of Finland, assignors to Insinööri Oy Pesmel Oy, Kauhajoki, Finland

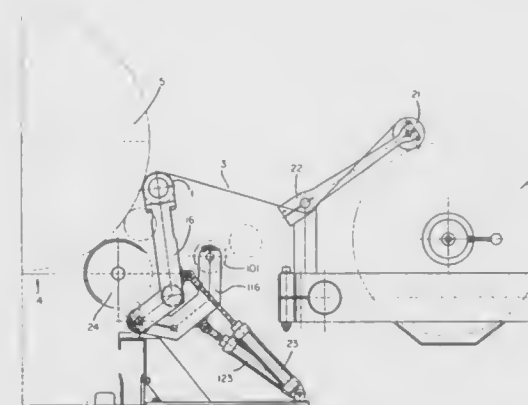
Division of Ser. No. 441,910, Nov. 28, 1989. This application Apr. 23, 1991, Ser. No. 690,810

Claims priority, application Finland, Nov. 30, 1988, 885573

Int. Cl.⁵ B65B 41/12

U.S. Cl. 53-587

11 Claims



1. A device assembly for wrapping a heat sealing plastic film around an article at a packing station, the device assembly comprising:

a first longitudinal member having a longitudinal axis movable with respect to the packing station, wherein said first longitudinal member is rotatable about said axis thereof and comprises a first curved external surface adapted to engage the plastic film, and heating means mounted adjacent the first curved external surface for heating the plastic film sufficiently to allow heat bonding of the plastic

film to a previously wrapped layer of plastic on the surface of the article; and

a second longitudinal member having a longitudinal axis movable with respect to the packing station and said first longitudinal member and adapted to bring the plastic film in contact with the surface of the article at the packing station, wherein said second longitudinal member is rotatable about said axis thereof and includes a second external surface, cutting means for cutting the plastic film, and retaining means provided adjacent the second external surface of said second longitudinal member for retaining the cut off end of the plastic film on the second external surface.

5,086,611

ANIMAL HALTER

Howard A. Purdy, 12777 Quaker St., Lawtons, N.Y. 14091

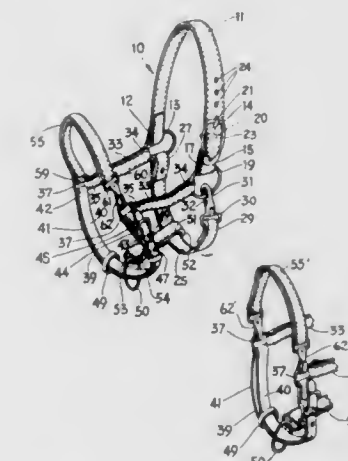
Continuation of Ser. No. 450,444, Dec. 14, 1989, abandoned.

This application Jan. 24, 1991, Ser. No. 647,174

Int. Cl.⁵ B68B 1/02

U.S. Cl. 54-24

4 Claims



1. An animal halter comprising a leather crown strap having opposite ends, first loops at said opposite ends of said leather crown strap, said first loops effectively constituting leather ends of said leather crown strap, first adjustable buckle means on said leather crown strap and spaced from said first loops for adjusting the length of said leather crown strap, first straps mounted within said first loops at said opposite ends of said leather crown strap, a pair of cheek straps having first ends, second loops on said said first ends of said cheek straps mounted on said first rings, second ends on said cheek straps, third loops on said second ends of said cheek straps, second rings mounted in said third loops on said second ends of said cheek straps, a chin strap having first and second opposite ends, a return bend on said first end of said chin strap mounted on one of said second rings, a fourth loop on said second end of said chin strap mounted on the other of said second rings, second adjustable buckle means on said chin strap between said second rings for adjusting the length of said chin strap, a nose strap having first and second opposite ends, means mounting said first and second opposite ends of said nose strap on said second rings including first and second latch means for detachably securing said first and second opposite ends, respectively, of said nose strap to said second rings whereby said first and second opposite ends of said nose strap can substantially move toward and away from said first ends of said cheek straps, a throat latch strap having fifth loops at its opposite ends with one of said fifth loops mounted on one of said first rings, and a snap latch mounted on the other of said fifth loops and having a detachable portion for selective mounting on the other of said first rings.

5,086,612

TAIL LENGTHENER ASSEMBLY AND METHOD OF USE

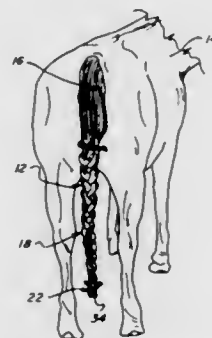
Heather E. Anderson, Lone Eagle Ranch, Rte. 5, Hutchinson, Kans. 67502

Filed Feb. 11, 1991, Ser. No. 654,286

Int. Cl.⁵ B68B 7/00

U.S. Cl. 54—78

19 Claims



1. A tail lengthener assembly adapted to be connected to an animal's tail, comprising:

- a tail enclosure assembly having a plurality of tail tube members, each operable to receive a portion of the animal's tail therein;
- each tail tube member having a main tube body to receive and enclose a portion of the animal's tail and a connector member at an upper end of said main tube body for attachment to an upper portion of the animal's tail;
- a tail hook member operable to be extended through respective ones of said tail tube members to grasp a portion of the animal's tail and pull same through the length of respective ones of said tail tube member; and
- a bias means to be mounted about a lower portion of the animal's tail and adjacent ones of said tail tube members.

5,086,613

CHECK-RELIEF VALVE FOR A HYDRAULIC CIRCUIT

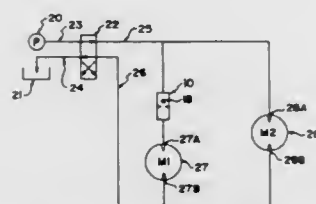
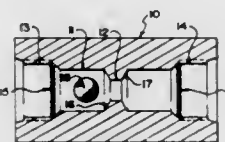
Thomas R. Fox, and Bruce R. Kidd, both of Manitoba, Canada, assignors to MacDon Industries Ltd., Winnipeg, Canada

Filed Jan. 30, 1991, Ser. No. 647,796

Int. Cl.⁵ A01D 47/00

U.S. Cl. 56—10.9

9 Claims



5. A header for a swather comprising a frame, a first draper mounted on the frame having support roller means, hydraulic drive means for driving said roller means and an endless draper canvas wrapped around said roller means for movement of an upper run of the canvas longitudinally of the frame, support means mounting the first draper on the frame for movement of the first draper including the roller means and canvas thereof longitudinally of the frame, from a first position of the first draper in which a space is provided at one end of the first

draper for deposit of crop material therethrough to a second position of the first draper in which a space is provided at an opposed end of the first draper for discharge at an opposed end of the first draper, the hydraulic drive means of the first draper being arranged to drive the first draper alternatively in clockwise and counterclockwise directions, hydraulic actuator means for moving said support means and said first draper alternatively in one direction from the first position to the second position and in the opposed direction from the second position to the first position, single valve means operable manually to cause both actuation of said hydraulic actuator means and said hydraulic drive means to cause movement of said support means and said first draper in a required direction and rotation of the first draper in a required direction and a hydraulic circuit controlled by said single valve means for supplying fluid to said hydraulic drive means and to said hydraulic actuator means, said hydraulic circuit comprising a source of pressurized hydraulic fluid, a fluid return sump, a first fluid and a second fluid line, said single valve means being constituted by a flow control valve operable to move from a first condition in which the source is connected to the first line and the sump is connected to the second line to a second condition in which the source is connected to the second line and the sump is connected to the first line, the hydraulic actuator means having a first fluid port and a second fluid port and responsive to fluid flow from the first fluid port to the second fluid port to cause driving of said support means and said first draper in said one direction and to fluid flow from the second port to the first port to cause driving of said support means and said first draper in the opposed direction, said hydraulic drive means having a first fluid port and a second fluid port and responsive to fluid flow from the first fluid port to the second fluid port to cause rotation of the first draper in a first direction and to fluid flow from the second fluid port to the first fluid port to cause rotation of the first draper in an opposed direction, said first fluid line being connected to said first port of said hydraulic actuator means and to said first port of said hydraulic drive means, said second fluid line being connected to said second port of the hydraulic actuator means and to the second port of the hydraulic drive means, and a check-relief valve mounted so as to act upon fluid flow through the hydraulic drive means, and first and second stop means for halting movement of said support means and said first draper on reaching said first and second positions respectively, said check-relief valve comprising a valve body defining a channel through which fluid can pass in either direction between a first end and a second end of the channel, means connecting said first line through said check-relief valve, means defining an annular restriction member within the channel through which the fluid can pass and dividing the channel into a first portion and a second portion, a first valve seat defined on the restriction member on a side of the restriction member facing said first portion and said first end, a second valve seat defined on the restriction member on a side of the restriction member facing said second portion and said second end, a valve member mounted within and movable within the channel and shaped to cooperate with the first valve seat to halt flow of fluid in a direction from the first end toward the second end and alternatively with the second valve seat to halt flow of fluid in a direction from the second end toward the first end, means at the first and second ends respectively shaped such that, when engaged by the valve member, fluid can bypass the valve member to escape from the first and second end respectively, at least one of the restriction member and the valve member being formed from a material which is deformable under pressure from the fluid such that upon an increase in the fluid pressure in the first portion above a predetermined pressure, the valve member is forced from the first valve seat through the restriction member into the second portion and on an increase in fluid pressure in the second portion above a predetermined pressure the valve member is forced from the second valve seat through the restriction member into the first portion, whereby the valve operates symmetrically to check flow of the fluid through the hydraulic

drive means until the support means and the first draper are moved to one of said stop means and then to release the flow to allow driving of the first draper in a required direction.

5,086,614

ENGINE POWERED SAFETY MOWER WITH SELF CLEANING DECK

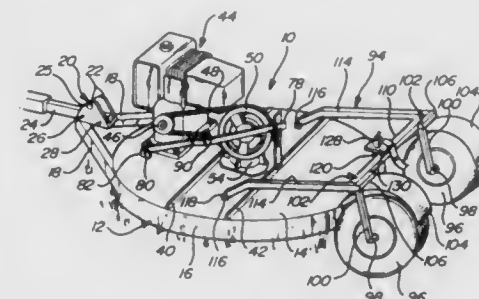
Thomas J. Pestka, Ontonagon, Mich., assignor to Mobil Oil Corporation

Filed Dec. 20, 1990, Ser. No. 630,528

Int. Cl.⁵ A01D 34/74

U.S. Cl. 56—17.2

8 Claims



4. A mower for cutting vegetation growing from the earth comprising in combination, a support deck having an upper surface plate and having a skirt of a predetermined height extending downward with respect to the upper surface plate, blade means for cutting vegetation operatively mounted beneath said deck, support means for maintaining the deck and said blade means at a predetermined distance above the upper surface of the earth, a drive motor having an output mounted for operation on said upper plate, transmission means operatively connected to the output of said drive motor to said blade means, clutch means for connecting and disconnecting said transmission means with respect to said blade means, said clutch means including an endless drive, and manual means for positioning said endless drive so that power is selectively interrupted to said blade means, a carriage assembly secured to said deck having trailing rear wheel means affixed thereto for supporting the rear of said deck during mowing operation, front tongue means affixed to a forward portion of said deck, said tongue means including adjustment means for inclining said deck so that the forward portion of said deck tilts upward with respect to the rear portion thereof to facilitate entry of vegetation from growing areas forward of said deck to the cutting area beneath said deck.

5,086,615

COATED SPINNING RINGS AND TRAVELERS

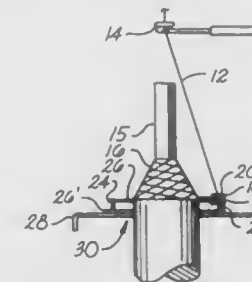
Michael L. Bodnar, Gastonia, N.C., assignor to A. B. Carter, Inc., Gastonia, N.C.

Filed Feb. 15, 1990, Ser. No. 480,679

Int. Cl.⁵ D01H 7/52, 7/62

U.S. Cl. 57—120

7 Claims



1. A self-lubricating traveler for use on a ring in textile applications requiring winding of yarn onto rotating spindle, said ring defining at least one flange for receiving said traveler,

said traveler having an intermediate portion and intumed horns defining a gap therebetween for slidably mounting on one of said flanges of said ring, and for sliding around said flange, said ring fixedly mounted to a ring rail and concentrically disposed about a rotating spindle having a bobbin mounted thereon for reciprocating vertically thereabout, with a yarn fed from drafting rolls for threading through said traveler and winding onto said bobbin, the improvement comprising:

a coating on the surface of said traveler, said coating being chemically deposited thereon and being uniform in thickness about the surface thereof and having a thickness of from about 0.1 mil to about 0.5 mil, said coating including from about 15% to about 30% by volume of a particulate polytetrafluoroethylene uniformly dispersed in a metallic matrix including a nickel-phosphorus alloy, each fluorocarbon particle being of a size on the order of from about 0.002 mil to about 0.02 mil.

5,086,616

TRANSPORT SYSTEM FOR PRODUCTION OF TEXTILE FILAMENT

Siegfried Günkinger, Heiningen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

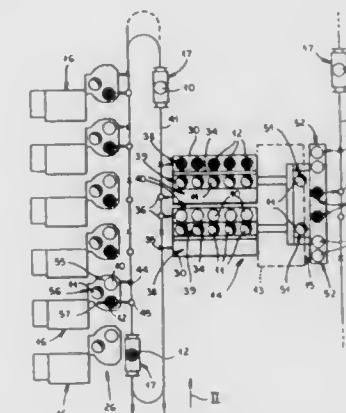
Filed Jul. 23, 1990, Ser. No. 557,215

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1989, 3924274

Int. Cl.⁵ D01H 9/18

U.S. Cl. 57—264

6 Claims



1. A method of moving empty and full containers from and to a spinning apparatus having an input side having a waiting station for a full container, a working station for a container from which filament is withdrawn, and a takeoff station for an emptied container and an output side having a waiting station for an empty container, a working station where a container is filled with spun filament, and a takeoff station for full containers awaiting transport away, the spinning apparatus having at each side a system for moving the respective containers from the respective waiting station through the respective working station to the respective takeoff station, the method comprising the steps of: periodically transporting containers away from the takeoff stations; monitoring the fullness of the container at the input-side working station and generating an input-side working-station priority signal when the respective container is nearly empty; monitoring the fullness of the container at the output-side working station and generating an output-side working-sta-

tion priority signal when the respective container is nearly full;

determining the presence of containers at the input-side waiting station and output-side takeoff station and generating respective input-side waiting-station and output-side takeoff-station priority signals when there is no container at the respective station;

interrupting periodic transport of containers away from the takeoff stations and immediately supplying a full container to the input-side waiting station on generation of both input-side priority signals; and

interrupting periodic transport of containers away from the takeoff stations and immediately supplying an empty container to the output-side waiting station on generation of both output-side priority signals.

5,086,617

GAS TURBINE ENGINE FUEL CONTROL SYSTEM, AND METERING VALVE

Trevor S. Smith, Birmingham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

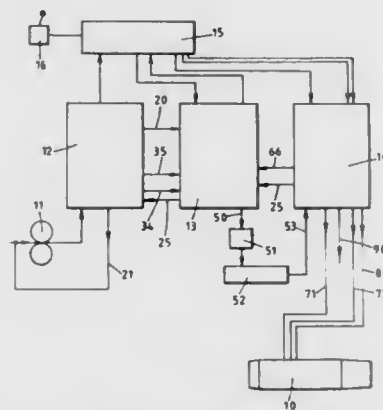
Filed Mar. 9, 1990, Ser. No. 491,097

Claims priority, application United Kingdom, Mar. 16, 1989, 8906060

Int. Cl.⁵ F02C 9/28

U.S. Cl. 60—39.281

9 Claims



1. A fuel control system for a gas turbine engine, comprising: a metering valve for regulating fuel flow to the engine; a shut-off valve in series with said metering valve; means for actuating said shut-off valve in response to a first servo pressure;
- a spill valve for spilling fuel to a low pressure from a location upstream of said metering valve;
- means for actuating said spill valve in response to a second servo pressure; and
- a first electrically energizable valve which is operable to control said first and second servo pressures, independently of control of said metering valve.

5,086,618

TORQUE GENERATING DEVICE USING SHAPE MEMORY ALLOY

Makoto Tanaka, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Feb. 13, 1991, Ser. No. 654,780

Claims priority, application Japan, Feb. 16, 1990, 2-36766

Int. Cl.⁵ F03G 7/06

U.S. Cl. 60—527

4 Claims

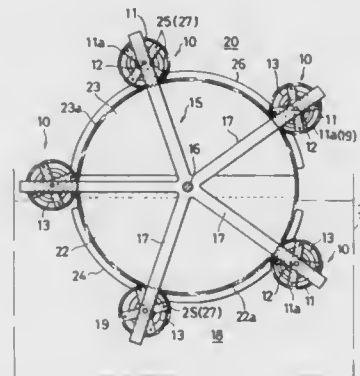
1. A torque generating device using shape memory alloy, comprising: multiple torque generating units each comprised of a cylindrical casing, a shaft rotatably supported in the casing, and a coil of shape memory alloy housed in the casing with the

inner end of the coil attached to the shaft and the outer end attached to the casing;

a rotatable wheel which has a central shaft and supports the multiple torque generating units at an equidistant spacing around the periphery of the wheel and can be turned by rotation of the shafts of the units;

a fixed wheel having substantially the same shape as the rotatable wheel and which is provided adjacent to the rotatable wheel;

a high temperature region which heats part of the rotatable wheel to a temperature higher than the transformation temperature of the shape memory alloy in the casing;



- a low temperature region which cools part of the rotatable wheel to a temperature lower than the transformation temperature of the shape memory alloy;
- means provided in the high temperature region for using the reversion force of the deformed shape memory alloy to rotate the casing on the fixed wheel and thereby cause the rotatable wheel to rotate; and
- means provided in the low temperature region for deforming the shape memory alloy in the casing by turning the shaft supported in the casing.

5,086,619

FILLER APPARATUS FOR PROVIDING CRYOGENIC LIQUID COOLANT TO DEWARs SUCH AS THOSE USED IN RADIATION DETECTORS

Yuchi Huang, Madison; Charles Talbot, Belleville, and Jeffrey R. Henderson, Madison, all of Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Jun. 15, 1990, Ser. No. 538,995

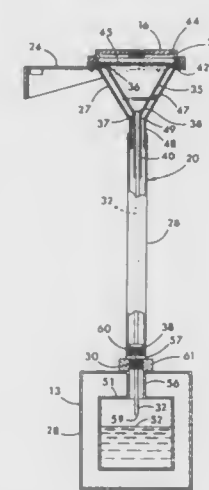
Int. Cl.⁵ F17C 7/02

U.S. Cl. 62—50.1

26 Claims

19. Radiation detection apparatus for an FTIR spectrometer which is capable of receiving liquid coolant, comprising: (a) a detector having inner and outer vessels connected together to define a dewar, the inner vessel adapted to contain liquid coolant, the detector having a fill port extending from an outer surface of the detector to the interior of the inner vessel by which liquid coolant can be introduced into the inner vessel;
- (b) a liquid coolant inlet port including a funnel having a top opening and extending to a bottom;
- (c) a gas discharge port including a funnel co-axial with, surrounding and spaced outwardly from the funnel of the liquid inlet port and extending from a top opening at substantially the same level as the top opening of the inlet port funnel to a bottom;
- (d) a liquid delivery tube extending from the bottom of the inlet port funnel and into the inner vessel of the detector to deliver liquid coolant from the inlet port funnel to the interior of the inner vessel of the detector;
- (e) a gas discharge tube co-axial with and spaced outwardly from the delivery tube and extending from connection

with the detector at the fill port of the detector to the bottom of the gas outlet port funnel to direct gas resulting



from evaporation of the liquid coolant in the inner vessel to the gas outlet port.

5,086,620

METHOD OF MICROENCAPSULATION OF HYPERBARIC GAS

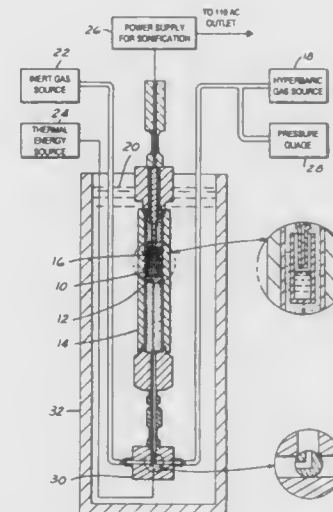
James R. Spears, Bloomfield Hills, Mich., assignor to Wayne State University, Detroit, Mich.

Filed Feb. 14, 1991, Ser. No. 655,078

Int. Cl.⁵ F25B 19/00

U.S. Cl. 62—51.1

38 Claims



1. A method of encapsulating a hyperbaric gas, comprising the steps of: supporting within a reaction vessel a receptacle containing an encapsulating material;
- inserting an ultrasonic probe into the reaction vessel so that a portion of the ultrasonic probe is juxtaposed to the encapsulating material;
- sealing the reaction vessel so that the receptacle and the ultrasonic probe are entrapped therewithin;
- communicating a source of the hyperbaric gas with the reaction vessel so that a space between the encapsulating material and the ultrasonic probe is permeated thereby;
- immersing the reaction vessel at least partially within a cooling fluid so that the hyperbaric gas condenses within

the reaction vessel upon exposure to a cold environment created by the cooling fluid;

applying thermal energy to the receptacle so that the encapsulating material is heated thereby;

delivering ultrasound energy to the ultrasonic probe so that the probe is vibrated, thereby distributing hyperbaric gas within the heated encapsulating material; and

allowing the cooling fluid to chill the mixture of hyperbaric gas and the encapsulating material so that the hyperbaric gas is entrapped within the encapsulating material, thereby forming a hyperbaric gas-enriched encapsulating material.

5,086,621

OIL RECOVERY SYSTEM FOR LOW CAPACITY OPERATION OF REFRIGERATION SYSTEMS

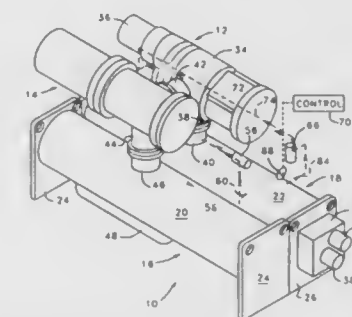
Keith E. Starner, and Robert A. Cromis, both of York, Pa., assignors to York International Corporation, York, Pa.

Filed Dec. 27, 1990, Ser. No. 634,526

Int. Cl.⁵ F25B 43/02

U.S. Cl. 62—84

12 Claims



5. In a refrigeration apparatus having an oil lubricated compressor with a suction inlet opening to the top of an evaporator including a suction trough to control distribution of refrigerant gas passing from the evaporator to the suction inlet of the compressor, and a compressed refrigerant by-pass loop including a first eductor for returning liquid refrigerant and oil from the evaporator to the compressor, the improvement comprising:

means for removing oil dropping into said trough during low capacity operation of said compressor, said means for removing oil dropping into said trough including a second eductor and means for directing compressed refrigerant through said second eductor; and

means for returning the removed oil directly to the compressor.

5,086,622

ENVIRONMENTAL CONTROL SYSTEM CONDENSING CYCLE

John L. Warner, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 17, 1990, Ser. No. 570,100

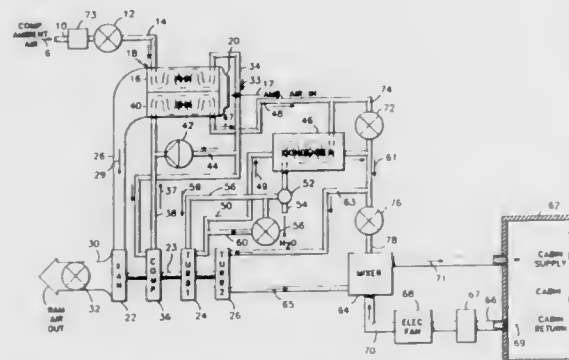
Int. Cl.⁵ F25B 9/06

U.S. Cl. 62—88

18 Claims

1. A method for conditioning water-vapor bearing compressed air for supply as conditioned air to an enclosure, comprising the steps of: condensing and removing water vapor from said water-vapor bearing compressed air thereby dehumidifying said air;
- expanding said dehumidified air in said condensing step in a first turbine;
- passing said dehumidified air expanded in said first turbine in heat exchange relationship with said water-vapor bearing compressed air as coolant in said condensing step;

expanding said dehumidified air warmed in said condensing step in a second turbine; and



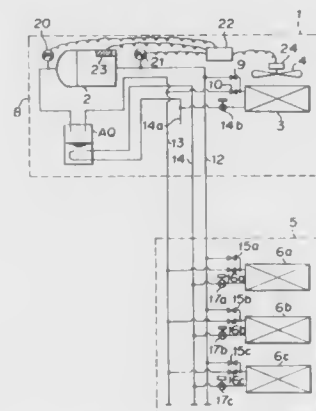
supplying said conditioned air expanded in said second turbine to the enclosure.

5,086,624
COOLING AND HEATING CONCURRENT OPERATION TYPE OF MULTIPLE REFRIGERATION CYCLE
Fumio Matsuoka; Jiro Okajima; Keiko Okuma, all of Kama-kura; Ken Tomita, Nagasaki; Yasuo Shibuya, Nagasaki; Mutsumi Nakamura, Nagasaki, and Hajime Kitauchi, Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1990, Ser. No. 608,277
Claims priority, application Japan, Mar. 7, 1990, 2-56238
Int. Cl.⁵ F25B 13/00

U.S. Cl. 62—160

1 Claim



1. A cooling and heating concurrent type of multiple refrigeration cycle comprising:
an outdoor portion containing an outdoor heat exchanger and a variable delivery type of compressor having an intake and output;
a plurality of indoor units having indoor exchangers;
triple connection pipes comprising a high pressure gas pipe, a high pressure liquid pipe and a low pressure gas pipe, said triple for connecting said outdoor unit and said indoor units;
pressure detecting means located in said outdoor portion and at the output and input to said variable delivery type of compressor for detecting the input and output pressure of said variable delivery type compressor; and
calculation and control means for comparing the detected input and output pressure of said variable delivery type compressor at the intake and output therefrom with two predetermined set values and making a calculation to obtain a respective deviation value between the respective detected values and said predetermined capability of said compressor and the heat exchange capability of said outdoor heat exchanger based upon the deviation produced by said calculation.

5,086,625
AIR-CYCLE AIR CONDITIONING SYSTEM
Yutaka Momose; Shigeyoshi Tabata, both of Anjo, and Katsuhiko Mori, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Sep. 19, 1990, Ser. No. 584,738
Claims priority, application Japan, Sep. 21, 1989, 1-245988
Int. Cl.⁵ F25B 9/06

U.S. Cl. 62—172

2 Claims

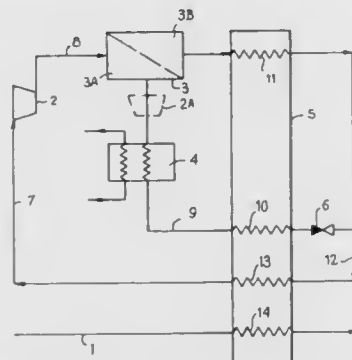
1. An air-cycle air conditioning system comprising the combination of:
a first turbine disposed in an exhaust passage of an internal combustion engine and driven by energy of exhaust gases from said internal combustion engine;
a first compressor placed in coaxial relation to said first turbine and rotatable in response to operation of said first turbine so as to intake and compress air;
a second turbine coupled to an outlet end of said first com-

5,086,623
REFRIGERATING PROCESS AND APPARATUS UTILIZING A REFRIGERATING MIXTURE
Pierre Gauthier, Fresnes, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

Filed Oct. 1, 1990, Ser. No. 591,076
Claims priority, application France, Oct. 9, 1989, 89 13158
Int. Cl.⁵ E25B 1/00

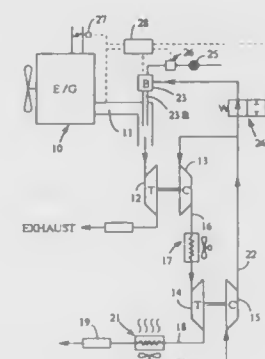
U.S. Cl. 62—114

14 Claims



7. A refrigeration process utilizing a gas mixture of at least one relatively light component and a relatively heavy fraction, comprising the cycle of compressing the gas mixture to a relatively high pressure; separating at least a portion of the at least one relatively light component from the compressed gas mixture by permeation to provide a residue and a permeate; condensing by cooling only said residue; expanding only said residue; adding said permeate to the expanded residue to form a mixture; and vaporizing said mixture to provide said gas mixture.

pressor through a first line and rotatable by energy of compressed air from said first compressor so as to expand and cool the compressed air;
a first heat exchanger disposed in the first line and effecting heat exchange between the compressed air and outside air;
a second heat exchanger connected to said second turbine through a second line and effecting heat exchange between air supplied from said second turbine and an air supplied from a fan;
a second compressor placed in coaxial relation to said second turbine and rotatable in response to operation of said



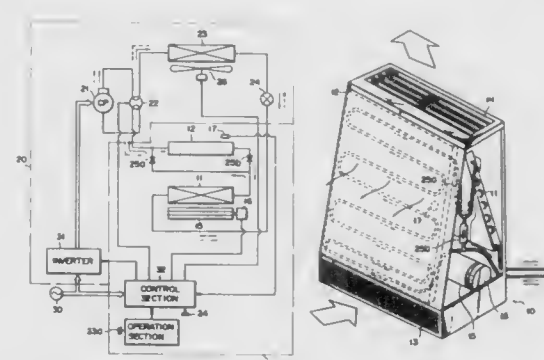
- second turbine so as to intake and compress air received therein;
auxiliary burner means for burning the air supplied from said second compressor and feeding resultant exhaust gases to said first turbine;
load sensor means for detecting load condition of the internal combustion engine; and
control means for controlling said auxiliary burner to feed the resultant exhaust gases to said first turbine when said load sensor means detects that the internal combustion engine is operating on low load.

5,086,626
AIR CONDITIONER WITH FUNCTION FOR TEMPERATURE CONTROL OF RADIANT HEAT EXCHANGER

Tadasato Iida, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 23, 1988, Ser. No. 288,959
Claims priority, application Japan, Jan. 13, 1988, 63-5104
Int. Cl.⁵ F25B 13/00, 5/00

U.S. Cl. 62—184

18 Claims



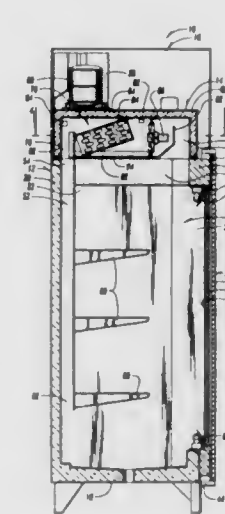
1. An air-conditioner, comprising: a refrigeration cycle including:
a compressor for compressing a refrigerant,
an outdoor heat exchanger including means to operate as an evaporator, said compressor and said outdoor heat exchanger being arranged outside a room to be air-conditioned,
an indoor heat exchanger including means for exchanging,

primarily by convection of air, heat from the refrigerant to the air in the room to be air-conditioned, and
a radiant heat exchanger including means for primarily radiating heat into the room to be air-conditioned, said indoor heat exchanger and said radiant heat exchanger being arranged inside the room to be air-conditioned and including means to operate as condensers;
said refrigeration cycle including means, operable in a heating mode, to interconnect said compressor, said outdoor heat exchanger and said indoor and radiant heat exchangers to allow circulation of refrigerant therebetween;
fan means for supplying air to at least said indoor heat exchanger, said fan means having a variable-speed motor for driving said fan means with a variable speed;
detecting means for detecting the temperature of said radiant heat exchanger; and
control means for controlling the speed of said variable-speed motor of said fan means, so as to control the temperature of said radiant heat exchanger in accordance with a temperature detection signal from said detecting means, said control means including means for controlling temperature in different manners in accordance with levels of the temperature detecting signal; said control means including:
a positive voltage source;
sensing circuit means, connected to said detecting means and said positive voltage source, for sensing a temperature of a radiant panel of said radiant heat exchanger;
a series circuit of resistors connected to said positive voltage source;
a plurality of comparators having one input from said sensing circuit and one input from said series circuit;
a plurality of logic gates having inputs being outputs of said plurality of comparators;
an adder/subtractor circuit having inputs being outputs of said plurality of logic gates;
a phase trigger output down counter connected to said adder/subtractor circuit; and
a driver circuit for driving said fan connected to said phase trigger output down counter.

5,086,627
REMOVABLE COOLING UNIT FOR DISPLAY CASE AND METHOD FOR USING SAME
Arden L. Borgen, Des Moines, Iowa, assignor to Margaret Platt Borgen, Des Moines, Iowa
Filed Nov. 19, 1990, Ser. No. 615,038
Int. Cl.⁵ F25D 19/00

U.S. Cl. 62—229

4 Claims



1. A cooled display case comprising:

a case housing comprising a back wall, a bottom wall, side walls, and a front wall forming a display compartment, each of said back wall, front wall, and side walls having upper edges;

a top frame attached to said upper edges of said back wall, said front wall, and said side walls of said case housing, said top frame forming a top opening above said compartment of said case housing;

a door opening in said front wall;

a door hinged to said housing and covering said door opening;

a cooling unit housing having a top wall, a rear wall, a front wall, side walls, and a bottom wall forming a cooling chamber therein, said side walls of said cooling unit housing being formed in a shape which conforms to the shape of said top frame and resting in registered alignment above said top frame;

cooling means within said cooling chamber of said cooling unit for cooling air passing therethrough;

said bottom wall of said cooling unit housing having an air inlet duct and an air outlet duct providing communication through said top opening between said display compartment and said cooling chamber;

said cooling unit housing having a vertical baffle within said cooling chamber between said cooling means and said outlet duct and adjacent and forming a part of said outlet duct;

fan means within said cooling unit for drawing air into said inlet duct from said display compartment and for forcing said air through said cooling chamber, around said cooling means, around said vertical baffle, and through said outlet duct into said display compartment, whereby said cooling means cools said air as it passes through said cooling chamber;

a vertical duct having an open lower end within said display compartment adjacent said bottom wall of said case housing and having an upper open end registered with and closely adjacent said inlet duct of said cooling unit housing, whereby actuation of said fan causes air to be drawn into said lower end of said vertical duct and upwardly through said vertical duct into said inlet duct of said cooling unit;

a first thermostat positioned within said cooling chamber for sensing the temperature of the air within said cooling chamber;

a compressor mounted to said cooling unit housing and connected to said cooling means for causing said cooling means to be cooled;

said first thermostat being connected to said compressor for causing actuation of said compressor whenever the air temperature sensed by said thermostat is above a first predetermined level.

5,086,628

AUTOMOTIVE AIR TEMPERING APPARATUS

Kazunobu Hashimoto, New Castle Upon Tyne, United Kingdom, assignor to Nissan Motor Company, Ltd., Japan
Filed Oct. 18, 1990, Ser. No. 598,410
Claims priority, application Japan, Oct. 24, 1989, 1-274803
Int. Cl.⁵ F24F 3/00

U.S. Cl. 62—244

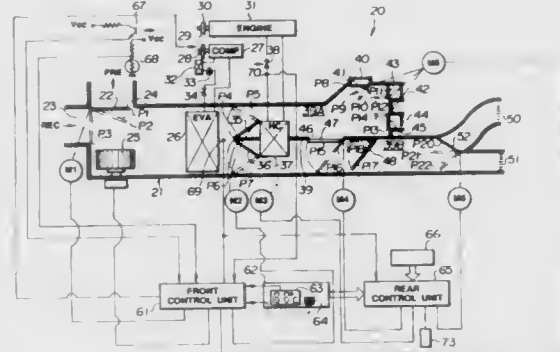
6 Claims

1. An air tempering apparatus for use in an automotive vehicle, including an ignition switch, a passenger compartment, and front and rear seats installed in the passenger compartment, the passenger compartment having a front compartment portion in front of the front seats and a rear compartment portion in rear of the front seats, the air tempering apparatus comprising:

a duct through which tempered air flows, the duct having a first passage for directing flow of the tempered air into the front compartment portion and a second passage for directing flow of the tempered air into the rear compartment portion;

a single blower operable at variable speeds for producing a forced flow of air through the duct;

command means provided for manual operation in the rear compartment portion to generate a command signal; and



control means in response to the command signal fed thereto from the command means for decreasing the amount of tempered air discharged into the front compartment portion to increase the amount of tempered air discharged through the second passage into the rear compartment portion.

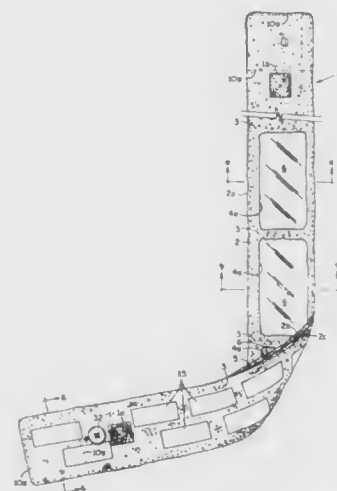
5,086,629

SCARF FOR TRANSFERRING HEAT FROM OR TO BODY AREAS OF THE WEARER

Carroll M. Dibrell, San Antonio, Tex., assignor to Exer Icer Towels, Inc., San Antonio, Tex.
Continuation-in-part of Ser. No. 565,786, Aug. 13, 1990. This application Jun. 28, 1991, Ser. No. 723,119
Int. Cl.⁵ F25D 23/12

U.S. Cl. 62—259.3

11 Claims



10. A scarf for absorbing heat from or transmitting heat to a body area of the wearer comprising:

an elongated band of flexible fabric material wrappable around the body area of a wearer;

a pocket secured to a medial portion of said fabric band; said pocket being formed by folding a sheet of moisture impervious, breathable plastic material to provide an outer flat face abutable with said fabric band and an inner face abutable with said body area of the wearer;

said pocket having an opening permitting the insertion of a mass of heat absorbing or heat transmitting material to selectively cool or heat said body area.

5,086,630

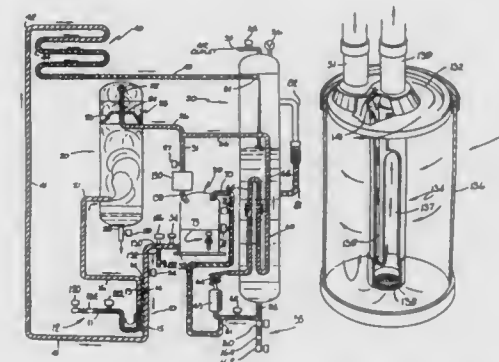
REFRIGERANT RECLAIM APPARATUS

Leon R. Van Steenburgh, Jr., 1900 S. Quince, Denver, Colo. 80231

Division of Ser. No. 309,421, Feb. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 109,958, Oct. 19, 1987, abandoned. This application Mar. 27, 1991, Ser. No. 677,607
Int. Cl.⁵ F25B 43/04

U.S. Cl. 62—475

11 Claims



1. An apparatus for reclaiming refrigerant comprising, in combination, cleaning means for removing gaseous or liquid refrigerant from a container, vaporizing all of said liquid refrigerant and separating oil from the gaseous refrigerant, a compressor for receiving and compressing said gaseous refrigerant from said container, a condenser for receiving and condensing said gaseous refrigerant from said compressor, storing means for receiving and storing said liquid refrigerant from said condenser, removal means for removing condensed refrigerant out from said storing means, and evacuations means for evacuating high pressure gaseous refrigerant from the entire apparatus after all of said condensed refrigerant has been removed said storing means; said evacuation means comprised of the three-way solenoid valve and an operator activated switch functionally associated with said solenoid valve wherein the activation of said switch causes said evacuation of high pressure gaseous refrigerant; and said evacuation means located adjacent to and in fluid communication with the exit of said compressor.

5,086,631

DISC CYLINDER LOCK

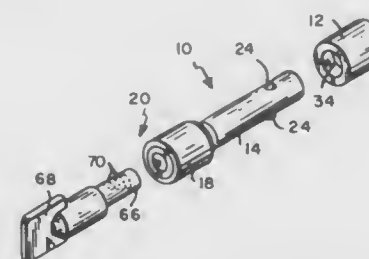
Anthony J. Agbay, Auburn, Mass., assignor to Olson Manufacturing Co., Holden, Mass.

Filed Jul. 9, 1990, Ser. No. 550,325

Int. Cl.⁵ E05B 15/14

U.S. Cl. 70—366

3 Claims



1. A disc cylinder lock and key combination comprising:

(a) a tubular barrel having an internal groove extending longitudinally in parallel relationship to the lock axis;

(b) a cylinder received in said barrel for rotation about said axis, said cylinder having a slot extending in parallel relationship to said axis;

(c) a locking bar located in said slot;

(d) disc means for radially shifting said locking bar between an outer position partially extending from said slot into said groove to prevent rotation of said cylinder relative to

said barrel about said axis, and an inner position recessed within said slot and clear of said groove to permit said rotation, said disc means including a plurality of independently rotatable discs arranged along said axis within said cylinder, said discs having coaxially aligned central apertures and outer peripheral edges interrupted by notches, said discs being rotatably adjustable between;

(i) a first setting at which at least some of said discs are arranged with their notches angularly misaligned with respect to said slot, and with their peripheral edges bearing against and holding said locking bar in said outer position; and

(ii) a second setting at which the notches of all of said discs are aligned longitudinally with each other as well as radially with said slot to thereby accommodate shifting of said locking bar from said outer position to said inner position; and

a key having a longitudinally extending shank receivable in said cylinder in a fully inserted position extending through the coaxially aligned central apertures of said discs, said shank having a plurality of longitudinally offset spiral external camming surfaces, each of said external camming surfaces being located in a plane of a respective one of said discs when said key is in said fully inserted position, each external camming surface being arranged to mate with a substantially identical spiral internal camming surface bordering the central aperture of the respective one of said discs and to coact therewith in response to rotation of said key to rotate said discs between said first and second settings.

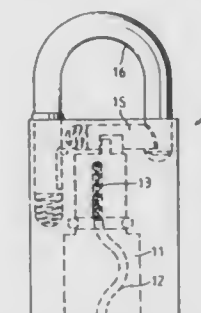
5,086,632

FLEXIBLE KEY AND LOCK ASSEMBLY

Yun-Tung Hsu, No. 9, Floor 2, Alley 2, Lane 437, Nei-Hu Rd., Sec. 1, Nei-Hu Dist., Taipei, Taiwan
Filed May 8, 1990, Ser. No. 520,579
Int. Cl.⁵ E05B 19/08

U.S. Cl. 70—375

19 Claims



1. A key for use with a lock assembly comprising a lock body having tumbler members and a keyway curved along its longitudinal extent said key being flexible to be received in said keyway and useful for actuating said tumbler members, wherein said key has:

an inner end;

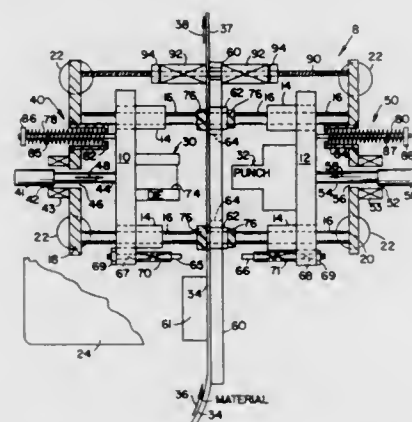
an outer end; and

a plurality of one piece knuckles being hinged to one another between said inner and said outer ends, with adjacent knuckles being turnable relative to one another about individual axes, said individual axes being parallel to each other, some of said knuckles incorporating key bit projections for actuating said tumbler members.

5,086,633

**OPPOSED MOTION, MOMENTUM
BALANCED-AT-IMPACT PUNCH PRESS**

George M. Meyerle, 17 Lakeview Dr., Brookfield, Conn. 06804
 Filed Jul. 5, 1990, Ser. No. 548,001
 Int. Cl.⁵ B21J 7/46, 7/30; B26D 5/00; B30B 5/00
 U.S. Cl. 72—24 35 Claims



16. The method of operating a punch press comprising the steps of:

positioning material to be formed between first and second forming tools each initially spaced substantially the same distance away from respective opposite sides of the material

providing substantially identical first and second electromagnetic thrust motors coupled to said first and second forming tools, respectively,

substantially equalizing the moving masses operatively associated with said first and second forming tools,

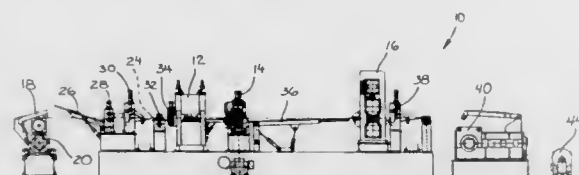
simultaneously initiating delivery of substantially equal electrical power to said first and second electromagnetic thrust motors for applying substantially equal thrusts to said first and second forming tools for substantially simultaneously equally accelerating said first and second forming tools with substantially equal velocities in opposite directions toward the material between them for substantially simultaneously impacting said tools against opposite sides of the material for forming the material,

movably supporting said material to be formed between said first and second forming tools for enabling motion of the material in either of said opposite directions.

5,086,634

COIL-TO-COIL STEEL SLITTING PROCESS

Lawrence J. Richards, Naperville, Ill., assignor to Braner, Inc., Schiller Park, Ill.
 Filed Nov. 26, 1990, Ser. No. 618,074
 Int. Cl.⁵ B21B 15/00 1 Claim
 U.S. Cl. 72—161



1. A single line process for slitting uncoiled steel and then recoiling slit steel into uniform thickness coils comprising the steps of:

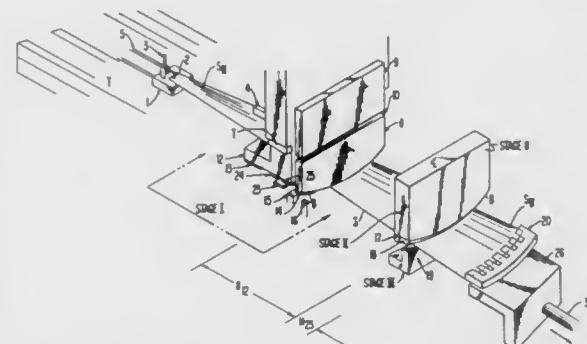
a) uncoiling a single sheet of steel of varying thickness from edge to edge; then

- b) passing said steel sheet through a machine which elongates said sheet of steel at its thickest point; then
- c) passing said steel sheet through a machine which slits the steel sheet into multiple strands; then
- d) passing said multiple strands of steel through a machine which rolls the multiple strands to a desired finish thickness; then
- e) recoiling said steel into a multiplicity of individual uniform thickness coils on a single recoiler.

5,086,635

**METHOD OF AND MACHINE FOR FORMING
COMPOUND CURVATURES IN METAL SHEETS BY
DRAWING**

Charles Creaser, Lady Lake, Fla., and Ray C. Johnson, Webster, N.Y., assignors to Chu Associates, Inc., Littleton, Mass.
 Filed Dec. 10, 1990, Ser. No. 624,982
 Int. Cl.⁵ B21D 5/06 10 Claims
 U.S. Cl. 72—176



1. In a method of drawing sheet metal to form compound curvature sheets in which the drawing is effected by longitudinally drawing the sheet through a first stage having a slot bounded by sheet-restraining transversely extending bead means, longitudinally passing the sheet to a second stage providing a transverse slot and having work-engaging forming elements in longitudinally stepped relation which engage a side of the sheet, and longitudinally passing the sheet over a third stage surface engaging a side of the sheet opposite that engaged by the second stage forming elements,

an improvement which obviates wrinkling and rippling of the sheet, comprising the steps of

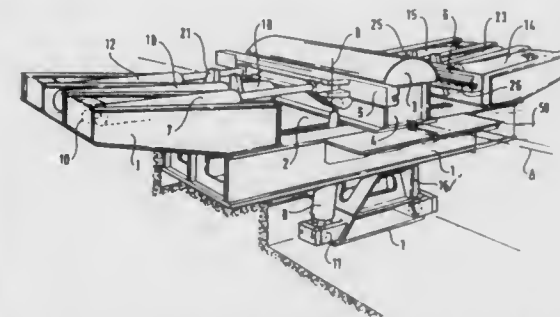
- (a) adjusting the first stage slot so that the portion of the sheet bent around the first stage bead means is above the level of the portion of the sheet received in the second stage slot and drawn over its said forming elements, with the sheet portion there-between inclining downwardly between the first and second stages;
- (b) clamping a tail end of the sheet with a clamp, prior to said drawing; and
- (c) sliding the clamp toward the first stage as the sheet is longitudinally drawn successively through the first, second and third stages; and
- (d) releasing the clamping just before the tail end reaches the first stage;

and in which a head end of the sheet is transversely gripped to enable the said drawing, with the gripping being adjusted to slip slightly as a motor controlling the drawing runs up to speed and with shock absorption effected during the slipping to enable a positive draw force.

5,086,636

STRETCH-FORMING MACHINE

Jean-Paul Huet, Nantes, France, assignor to ACB, Paris, France
 Filed Dec. 17, 1990, Ser. No. 628,027
 Int. Cl.⁵ B21D 11/02 7 Claims
 U.S. Cl. 72—296

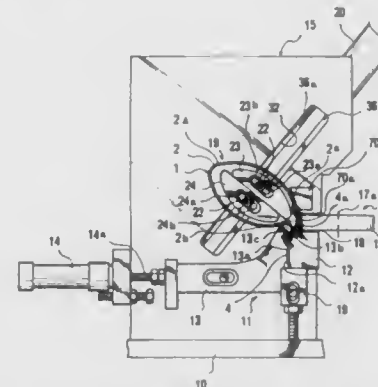


1. A stretch-forming machine for forming a sheet about an elongated forming die, said machine comprising: a pair of jaws extending respectively longitudinally along opposite sides of said die for grasping a respective opposite edge of the sheet, said machine including a base having a fixed frame, drive means having one end connected to said fixed frame and a second end connected to each jaw for causing the end of the jaw proximate to said forming die to move substantially in a plane perpendicular to a longitudinal axis of the jaw in its rest position and to move said jaw in any direction within said plane, said die being fixed to said base and connected to a table on said fixed frame, said table being situated at ground level, and said die being mounted on said table and having a longitudinal axis extending horizontally, and said machine further including vertical guide means on said fixed frame operatively coupled to the longitudinal center of the jaws for limiting movement of the jaws vertically and perpendicular to the axis of said die, and wherein said means for connecting said jaws to respective drive means comprises means for preventing rotation of said jaws relative to said drive means about a longitudinal axis parallel to the longitudinal axis of the forming die.

5,086,637

**APPARATUS FOR FORMING METALLIC BINDING
BANDS**

Atsuo Yamazaki, Tamagawa Chino, Japan, assignor to Kabushiki Kaisha Mihama Seisakusho, Nagano, Japan
 Filed Jul. 31, 1990, Ser. No. 560,686
 Claims priority, application Japan, Apr. 24, 1990, 2-108252
 Int. Cl.⁵ B21D 7/04, 53/36 4 Claims
 U.S. Cl. 72—302



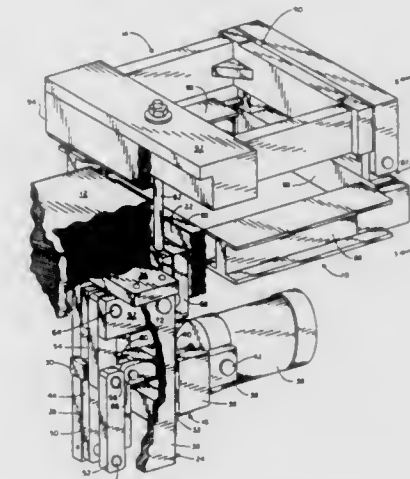
1. An apparatus for forming a truly circular metallic binding band from a starting piece comprising a band-like binding section whose ends have been overlapped to form a flattened loop section and wherein one end of a lever has been overlapped on the overlapped ends to form an overlapped section, the apparatus comprising a pair of holding pieces gripping both sides of the overlapped section, a front end of the one of the holding pieces, which engages the side of the overlapped section opposite the side on which the lever is overlapped, having an arc-shaped bending section for bending a part of the binding section adjacent to the overlapped section to form an acute angle with respect to the overlapped section, a pair of forming pieces provided adjacent the front end of the one of the holding pieces having the bending section, the forming pieces being located in the loop section of the starting piece gripped by the holding pieces, the forming pieces being mutually movable toward and away from each other in a direction substantially parallel to the overlapped section of the starting piece gripped by the holding pieces, outer circumferential faces of the forming pieces except mutually opposed faces thereof being arc-shaped, one of the forming pieces, which is movable away from the holding pieces, being offset a prescribed distance nearer to the overlapped section than the other, driving means for simultaneously moving the forming pieces away from each other, and a delivering unit for delivering said starting pieces to said holding pieces and said forming pieces, said delivering unit being movable toward and away from said holding pieces and said forming pieces, and said delivering unit having a gripping section for gripping the overlapped section and the lever of said starting piece, and an engagement section for contacting the inner face of the loop section of said starting piece gripped by the delivering unit gripping section so as to engage the loop section and bend the loop section toward the side of the overlapped section opposite the side to which the lever is overlapped, about a right angle with respect to the overlapped section.

lapped on the overlapped ends to form an overlapped section, the apparatus comprising a pair of holding pieces gripping both sides of the overlapped section, a front end of the one of the holding pieces, which engages the side of the overlapped section opposite the side on which the lever is overlapped, having an arc-shaped bending section for bending a part of the binding section adjacent to the overlapped section to form an acute angle with respect to the overlapped section, a pair of forming pieces provided adjacent the front end of the one of the holding pieces having the bending section, the forming pieces being located in the loop section of the starting piece gripped by the holding pieces, the forming pieces being mutually movable toward and away from each other in a direction substantially parallel to the overlapped section of the starting piece gripped by the holding pieces, outer circumferential faces of the forming pieces except mutually opposed faces thereof being arc-shaped, one of the forming pieces, which is movable away from the holding pieces, being offset a prescribed distance nearer to the overlapped section than the other, driving means for simultaneously moving the forming pieces away from each other, and a delivering unit for delivering said starting pieces to said holding pieces and said forming pieces, said delivering unit being movable toward and away from said holding pieces and said forming pieces, and said delivering unit having a gripping section for gripping the overlapped section and the lever of said starting piece, and an engagement section for contacting the inner face of the loop section of said starting piece gripped by the delivering unit gripping section so as to engage the loop section and bend the loop section toward the side of the overlapped section opposite the side to which the lever is overlapped, about a right angle with respect to the overlapped section.

5,086,638

DRIVE MECHANISM FOR A HEMMING APPARATUS

Michael W. David, Sparta, Mich., assignor to Link Special Machinery, Inc., Comstock Park, Mich.
 Filed Apr. 9, 1991, Ser. No. 682,724
 Int. Cl.⁵ B21J 9/18 20 Claims
 U.S. Cl. 72—451



1. A drive mechanism for a hemming apparatus having a bed adapted to receive a workpiece comprising at least two superposed sheet materials to be hemmed, and a tool mounted to a movable member adapted to move toward and away from an operative position, the tool being disposed to engage the workpiece when the movable member is in the operative position, the drive mechanism comprising:

- a frame fixedly mounted to the bed;
- a pneumatic cylinder pivotally mounted to the frame, the

cylinder having a shaft extending therefrom for reciprocating movement;

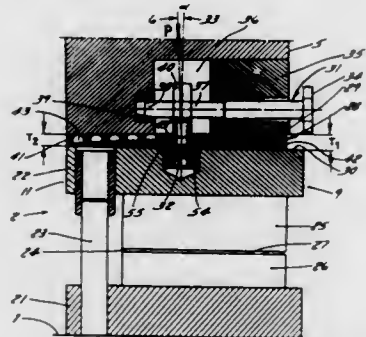
a toggle joint having first and second arms and a knee, the knee being pivotally connected to the shaft and the first arm being pivotally mounted to a lower portion of the frame;

a lever having first and second ends, said lever being pivotally mounted at a point intermediate the first and second ends to an upper portion of the frame, the first end of the lever being pivotally connected to the second arm;

and a draw rod having one end pivotally connected to the second end of the lever, the draw rod having another portion thereof connected to the movable member;

whereby when the pneumatic cylinder is energized, the shaft, the toggle joint, the lever, and the draw rod will cooperate to urge the movable member toward the operative position.

5,086,639
ARRANGEMENT FOR CARRYING OUT PRESSING IN ECCENTRIC PRESSES
 Lennert K. O. Wallman, Harstenagatan 2, S-582 73 Linköping, Sweden
 PCT No. PCT/SE90/00440, § 371 Date Jan. 31, 1991, § 102(e) Date Jan. 31, 1991, PCT Pub. No. WO91/00174, PCT Pub. Date Jan. 10, 1991
 PCT Filed Jun. 20, 1990, Ser. No. 640,317
 Claims priority, application Sweden, Jul. 5, 1989, 8902435
 Int. Cl. B21D 37/00
 U.S. Cl. 74—455 7 Claims

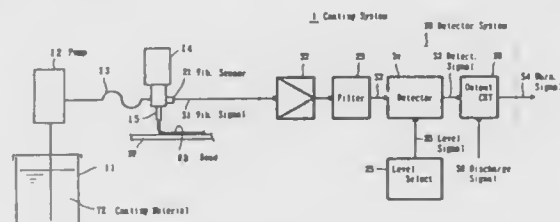


1. In an arrangement for press forming a workpiece placed between upper and lower separable tool parts mounted in a press of the type having a C-shaped frame (4), first and second opposite sides (9,11), a press table (1) on said frame, and a slide (5) reciprocally mounted on said frame for movement downward toward and upward from said press table along a central plane (6), said downward movement of said slide at impact on the workpiece generating a force (P) which, as a result of the resiliency in said frame, causes said frame to deflect and create an angle of inclination (α) of said slide relative to said central plane so that the effective movement of said slide at said first side (9) is shorter than the effective movement of said slide at said second side (11), the improvement comprising:

a plate-shaped unequally compressible body (28) mounted in a transverse plane below said slide and having a plurality of surface units located between said first and said second sides;

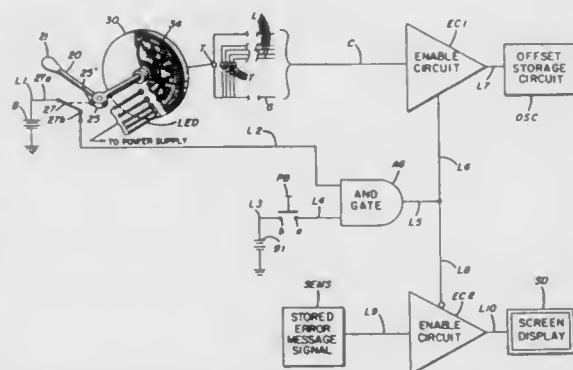
said unequally compressible body having a resistance to compression per surface unit that is greater at said first side than at said second side so that the compression of said body created by the force (P) at impact is less at said first side than at said second side to compensate for said angle of inclination (α) caused by frame deflection whereby the slide movement that is transmitted to the tool at the impact is substantially identical at both of said first and second sides during tool impact on the workpiece.

5,086,640
METHOD OF DETECTING BREAKAGE OF A BEAD OF FLUID MATERIAL
 Tsuyoshi Nagata, Osaka, and Shinji Okuda, Hyogo, both of Japan, assignors to Sunstar Engineering Inc., Osaka, Japan
 Filed Nov. 30, 1990, Ser. No. 620,005
 Claims priority, application Japan, Nov. 30, 1989, 1-312298
 Int. Cl. B05D 1/26; G08D 21/00
 U.S. Cl. 73—661 2 Claims



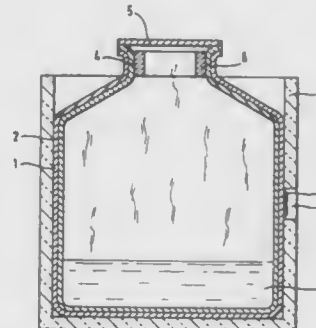
1. A method of detecting a breakage of a bead of fluid material emerging from a nozzle, which comprises the steps of: providing the nozzle with a vibration sensor; using the vibration sensor to detect and provide an electric vibration responsive to vibrations occurring in the nozzle; and detecting a change in level of the vibration signal to provide an indication of an occurrence of the breakage of the bead.

5,086,641
ARRANGEMENT FOR DYNAMIC CALIBRATING AN ABSOLUTE POSITION ENCODER
 Leonard Roselli, Verona, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
 Filed Apr. 30, 1990, Ser. No. 516,603
 Int. Cl. G01D 18/00
 U.S. Cl. 73—1 D 20 Claims



1. A calibration arrangement comprising, handle means for controlling braking of a railway vehicle, encoder means for monitoring the position of said handle means, means for ascertaining when said handle means is in a release position, and means for activating an enable means for reading said encoder means and for storing and for employing said reading as an offset value for subsequent readings of other positions of said handle means.

5,086,642
TEST VESSEL DEVICE FOR TESTING AN APPARATUS FOR MEASURING OR DETECTING A GAS
 Wolfgang Jessel, Reinfeld, and Kurt Masurat, Hamburg, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany
 Filed Dec. 19, 1989, Ser. No. 452,415
 Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843920
 Int. Cl. G01D 18/00
 U.S. Cl. 73—1 G 16 Claims



1. The combination of an apparatus for measuring or detecting a gas and a test vessel device for testing the apparatus, the apparatus having a sensing head and the combination comprising:

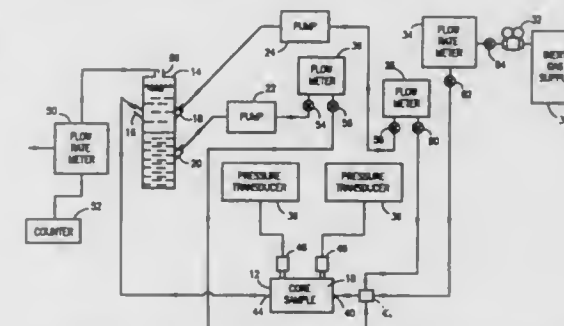
- a vessel having an interior and having an upper portion defining an opening through which the sensing head of the apparatus is insertable;
- a liquid disposed in said interior, said liquid being a solution composed of a solvent and a test substance of a quantity and concentration so as to cause a vapor to be present in said interior which is saturated with said test substance to provide an operationally ready test substance atmosphere for detection by the sensing head;
- a penetrable seal for closing off said interior with respect to the ambient in a gastight manner until the sensing head is inserted into said opening for communicating directly with said test substance atmosphere;
- said seal having a lower surface facing toward the interior of said vessel; and,
- said interior of said vessel being unobstructed up to said lower surface of said seal.

5,086,643
SYSTEM AND METHOD FOR DETERMINING MULTI-PHASE RELATIVE PERMEABILITY OF A SUBTERRANEAN RESERVOIR
 Benjamin F. Marek, Coppell, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.
 Filed Sep. 18, 1990, Ser. No. 584,222
 Int. Cl. G01N 15/08
 U.S. Cl. 73—38 20 Claims

1. A system for use in determining multi-phase fluid saturation in a porous media comprising:
- (a) means for containing the porous media, said porous media containing means having a fluid inlet positioned at a first end thereof and a fluid outlet positioned at a second end thereof;
 - (b) a fluid separatory vessel for separating the multi-phase fluid into at least a first fluid phase and a second fluid phase, said vessel having an inlet in fluid communication with said fluid outlet of said media containing means and at least a first outlet and a second outlet, wherein said first outlet and said second outlet of said vessel are positioned to permit withdrawal of the separated first fluid phase and the separated second fluid phase, respectively;
 - (c) means for measuring pressure across said porous media;
 - (d) a first pumping means in fluid communication with said first outlet of said fluid separatory vessel for withdrawing

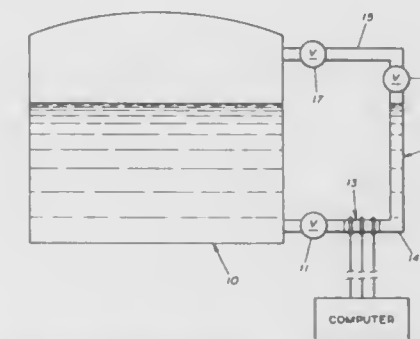
the separated first fluid phase therefrom for transfer to said fluid inlet of said media containing means;

(e) a second pumping means in fluid communication with said second outlet of said fluid separatory vessel for withdrawing the separated second fluid phase therefrom for transfer to said fluid inlet of said media containing means;



- (f) means for measuring fluid flow of the separated first fluid phase in transfer from said first outlet of said fluid separatory vessel to said fluid inlet of said media containing means; and
- (g) means for measuring fluid flow of the separated second fluid phase in transfer from said second outlet of said fluid separatory vessel to said fluid inlet of said media containing means.

5,086,644
ULTRA SENSITIVE LEAK DETECTION
 Robert E. Schendel, Kingwood, Tex., assignor to Environmental Protection Technology, Inc., Kingwood, Tex.
 Filed Nov. 1, 1990, Ser. No. 607,820
 Int. Cl. G01M 3/26
 U.S. Cl. 73—49.2 11 Claims



1. An apparatus for measuring very small flows into and out of relatively large tanks comprising:
- a. a reference vessel positioned substantially vertical and proximate to said tank for which measurements are to be taken;
 - b. a means for connecting said tank in fluid communication with said reference vessel at any point on said tank below the fluid level in said tank to be measured;
 - c. a means having a predetermined cross sectional area there-through connected in fluid communication between said means for connecting said tank in fluid communication with said reference vessel and said reference vessel below the surface of the fluid in said reference vessel for converting the mass of fluid flow therethrough to an electrical signal readable into equivalent volume change in the tank; and
 - d. a means for reading said electrical signal for recording and indicating the accrued data.

5,086,645
MULTIPLE CALIPER ARMS CAPABLE OF
INDEPENDENT MOVEMENT

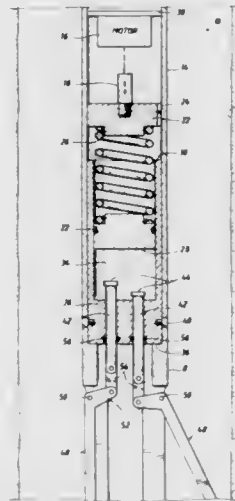
John G. Deaton, Houston, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Apr. 10, 1990, Ser. No. 507,285

Int. Cl.⁵ G01V 1/00

U.S. Cl. 73—151

18 Claims



1. A multiple arm caliper tool system for use in a well borehole, comprising:

- (a) an elongate tool body that adapted to be lowered and retrieved along a well borehole;
- (b) at least a pair of caliper arms, each of said arms being
 - (1) pivotally mounted,
 - (2) for radial extension radially outwardly from the tool body to extend arm tips outwardly for tip engagement with the surrounding well borehole wall,
 - (3) wherein the arm moves radially outwardly on extension to make measurement of the wall borehole by contact of the caliper arm tip,
 - (4) connecting with a push rod for each caliper arm, and
 - (5) wherein said push rods collectively extend into a closed chamber;
- (c) a piston isolating said chamber; and
- (d) means for compressing the hydraulic fluid within said chamber so that hydraulic fluid in said chamber is brought to a specified pressure wherein the hydraulic fluid acts on all of the push rods extending into said chamber.

5,086,646
APPARATUS AND METHOD FOR ANALYZING WELL
FLUID SAG

Dale E. Jamison, 19911 Rustlewood Dr., Humble, Tex. 77338, and William R. Clements, 16407 Southampton Dr., Spring, Tex. 77379

Filed Sep. 12, 1989, Ser. No. 405,899

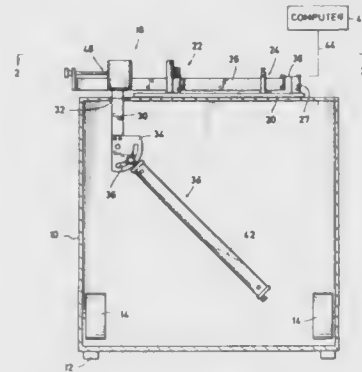
Int. Cl.⁵ G01L 1/12; G01N 15/04

U.S. Cl. 73—65

52 Claims

12. A method of analyzing sag phenomena in well fluids, comprising the steps of:
- mounting an elongate container containing a sample of a fluid to be tested on a force responsive device which provides a measurable, variable indication of the center of mass of the container, at an angle with respect to vertical; holding said angle generally constant, but for small move-

ments corresponding to changes in the center of mass of the container due to sagging of the contents of said sam-



ple, for a period of time sufficient for such sagging to occur; and measuring said indication.

5,086,647
POWER TESTING APPARATUS

Ryoji Kamata, and Saburo Ozawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Japan

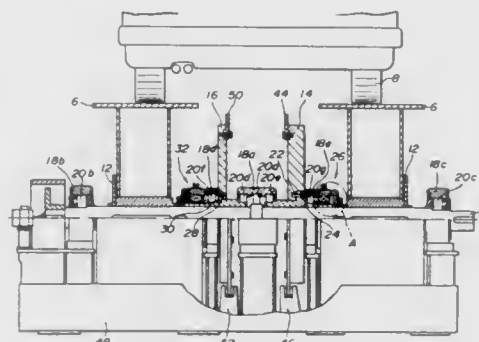
Filed May 4, 1990, Ser. No. 518,878

Claims priority, application Japan, May 8, 1989, 1-52390

Int. Cl.⁵ G01M 15/00; G01L 3/16

U.S. Cl. 73—117

12 Claims



1. A power testing apparatus comprising:
- a dynamometer;
 - rotation shaft means, connected to said dynamometer and an object to be tested, for transmitting power therebetween;
 - flywheel means supported on said rotation shaft for rotation therewith, for forming an inertial load to be applied to said tested object through said rotation shaft means;
 - clutch means, associated with said rotation shaft means and said flywheel means, for controlling transmission of said inertial load from said flywheel means to said tested object through said rotation shaft means; and
 - brake means, associated with said flywheel means, for braking said flywheel means at a required timing.

5,086,648
SIMULATION SYSTEM FOR AUTOMOTIVE PRIME
MOVER

Kaoru Sano; Fumio Mizushima; Takashi Goto, and Toshimitsu Maruki, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

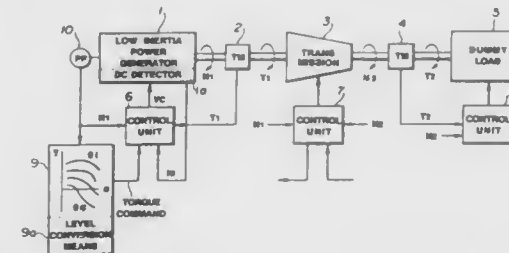
Filed Nov. 29, 1990, Ser. No. 619,407

Claims priority, application Japan, Nov. 30, 1989, 1-310883

Int. Cl.⁵ G01M 19/00

U.S. Cl. 73—118.1

11 Claims



1. A simulation system for an automotive internal combustion engine, comprising:

- a low inertia power generator including power generating means having relatively high inertia and inertia reducing means for reducing the inertia of said power generating means;
- an engine characteristic generator receiving predetermined engine operation parameter simulated data for deriving a first signal indicative of a first output torque to be derived as an output of said low inertia power generator according to a preset engine output torque variation characteristic which is set in terms of said engine operation parameter simulated data;
- first means for deriving a first correction value indicative of a first compensation torque to be compensated at the output of said low inertia power generator in view of a set engine inertia;
- second means for deriving a second correction value indicative of a second compensation torque to be compensated at the output of said low inertia power generator in view of a set inertia of said low inertia power generator;
- third means for deriving a third correction value based on said first and second correction values, said third correction value indicative of a third compensation torque to be compensated at the output of said low inertia power generator, said third compensation torque compensating a differential in inertia between the engine and the low inertia power generator;
- fourth means for deriving a control signal based on said first signal and said third correction value, said control signal fed to said low inertia power generator for controlling operation of said relatively high inertia power generating means so as to provide a second output torque as the output of said low inertia power generator, said second output torque being equivalent to said first output torque.

5,086,649
MOUNTING STRUCTURE FOR LOAD SENSOR IN
AUTOMOTIVE SUSPENSION SYSTEM

Fumiynki Yamaoka, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Jan. 22, 1991, Ser. No. 643,503

Claims priority, application Japan, Jan. 24, 1990, 2-5970[U]

Int. Cl.⁵ G01M 19/00

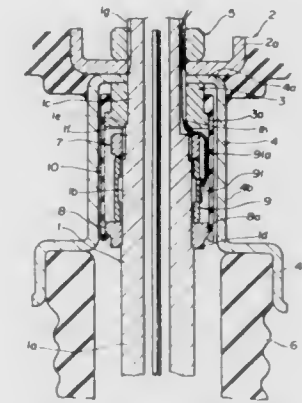
U.S. Cl. 73—118.1

8 Claims

1. A mounting structure for a load sensor in an automotive suspension comprising:

- a suspension component forming a part of a suspension system disposed between a sprung mass and an unsprung mass, said suspension component being disposed in a route

of transmission of a load between said sprung mass and said unsprung mass; and a load sensor mounted on said suspension component at an



orientation axially offset from the position of said suspension component at which said suspension component is interconnected to said sprung mass, and secured in place by means of a threaded means.

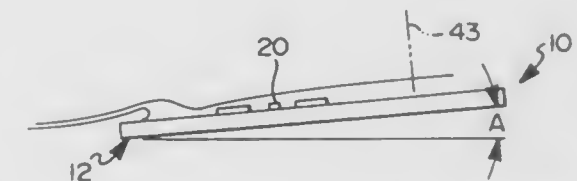
5,086,650
LOW NOISE FLUID FLOW SENSOR MOUNTING
Charles R. Harrington, Troy, and Stephen P. Sanders, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1991, Ser. No. 637,724

Int. Cl.⁵ G01F 1/68

U.S. Cl. 73—204.21

13 Claims



1. Apparatus for the measurement of fluid flow comprising:
- a flow passage having walls for guiding fluid in a flow path,
 - a flow sensing chip having a thin flat substrate and sensing elements mounted on one side of the substrate,
 - mounting means for holding the flow sensing chip in the passage and spaced from the passage walls, the substrate of the flow sensing chip having a leading edge extending upstream of the mounting means, and
 - the flow sensing chip being mounted at a tilt to the flow path with the said one side of the substrate inclined toward the fluid flow, the chip being tilted sufficiently to be substantially free of turbulence in the region of the sensing elements.

5,086,651
STRAIN MONITORING APPARATUS AND METHODS
FOR USE IN MECHANICAL STRUCTURES SUBJECTED
TO STRESS

Bruce Westermo, 5151 Longbranch Ave., San Diego, Calif. 92107, and Larry D. Thompson, 795 Lingel Dr., El Cajon, Calif. 92019

Filed Sep. 19, 1990, Ser. No. 584,734

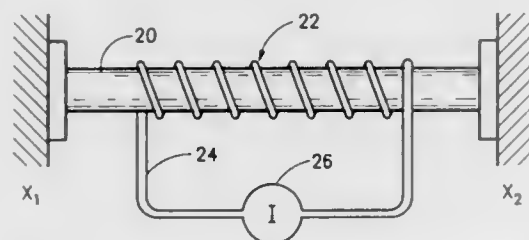
Int. Cl.⁵ G01B 7/16

U.S. Cl. 73—763

49 Claims

1. A device for measuring mechanical strain on a structural member, comprising:

- (a) a piece of material formed out of a substance that changes phase in response to strain;
 (b) means for securing said piece of material to said structural element whereby stress on the structural member causes stain on said piece of material; and
 (c) means for measuring change in the phase of said piece of material.



tural element whereby stress on the structural member causes stain on said piece of material; and
 (c) means for measuring change in the phase of said piece of material.

5,086,652

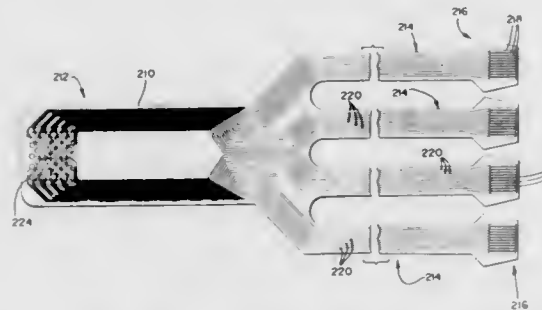
MULTIPLE PAD CONTACT SENSOR AND METHOD FOR MEASURING CONTACT FORCES AT A PLURALITY OF SEPARATE LOCATIONS

Harry C. Kropp, Chicago, Ill., assignor to Fel-Pro Incorporated, Skokie, Ill.

Filed Feb. 25, 1991, Ser. No. 660,703
 Int. Cl.⁵ G01B 7/18

U.S. Cl. 73-767

5 Claims



1. A contact sensor comprising a pair of thin flexible insulating sheets secured to each other in a confronting relationship and including a single terminal, a plurality of elongate flexible leads extending from said terminal, each said lead being separately flexible, and a sensing pad at the remote end of each lead,

each of said sensing pads having a first set of electrodes on one of said sheets and a second set of electrodes on the other of said sheets in a crossing relationship to said first set of electrodes, and pressure-sensitive resistive material disposed between said sets of electrodes in the zones of their crossing relationships, said sets of electrodes defining plural intersections in each of said sensing pads, said terminal having a plurality of contacts and adapted to be received in a single connector having complementary contactors for receiving signals from said plurality of contacts, and conductors extending from each of said electrodes along said leads to said terminal.

and each of said sensing pads being separately positionable via said separately flexible leads in separate selected locations between a pair of confronting surfaces to sense the loads applied at each said selected location.

5,086,653

CAN END TESTING

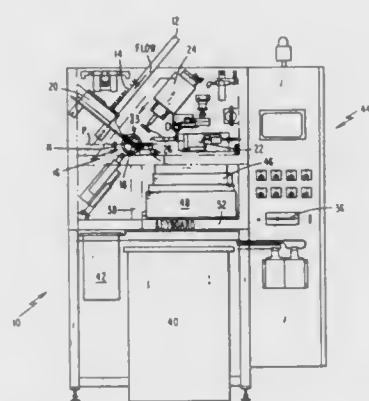
Alan C. Bagwell, Chesterfield, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 22, 1991, Ser. No. 673,715

Int. Cl.⁵ G01N 3/08

U.S. Cl. 73-835

17 Claims



1. In a can end testing apparatus performing a predetermined test on a can end manufactured in a can end forming machine to determine whether the can end satisfies a particular production parameter, said apparatus including a feed chute into which a set of sample can ends to be tested is inserted as a stack; a part feeder means for removing a next in-line can end to be tested from the stack; means, receiving the end from the part feeder means, for holding the end while said predetermined test is being performed on it; testing means for applying said predetermined test to said end in the holding means; means for storing data representative of the results of said predetermined test; host computer means for retrieving data from said data storing means and for coordinating said test data with production data indicative of at least the machine manufacturing said end; and means for discharging said can end from the testing apparatus; the improvement comprising sensing means, located downstream from the feed chute, for sensing the presence of a physical characteristic of a material object positioned in the stack which physical characteristic signifies the completion of testing of a particular sample set, and means for signaling the host computer means of said completion to thereby enable precise correlation of said test data with the production data.

5,086,654

VARIABLE AREA FLOWMETER

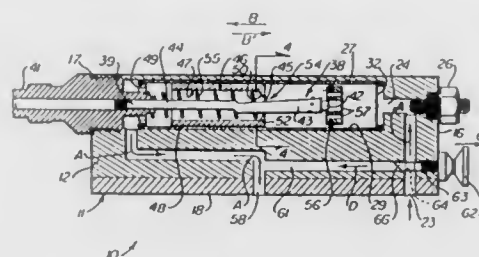
Kari Malminen, Lithonia, Ga., assignor to Th-Flow, Inc., Lithonia, Ga.

Filed Sep. 17, 1990, Ser. No. 583,726

Int. Cl.⁵ G01F 1/22

U.S. Cl. 73-861.58

11 Claims



1. In a variable area flowmeter for measuring the rate of flow of a medium and which includes a housing, a flow tube having an inner wall, first and second ends and a scale printed thereon mounted within the housing and through which the medium flows, an inlet means for delivering the medium flow to the

flow tube, and an outlet means for enabling the medium flow to flow out of the flow tube, the improvement therein comprising:

- a movable float mounted within the flow tube in frictional contact with the inner wall of the flow tube and movable along the length of the flow tube between the first and second ends thereof;
- an adjustable metering member having a fixed end and a distal end with said fixed end attached to the housing adjacent the first end of the flow tube said member extending along the length of the flow tube toward the second end thereof and with said distal end positioned intermediate the first and second ends of the flow tube, said metering member supporting said float as said float moves between the first and second ends of the flow tube;
- a flow indicator ring for indicating the rate of flow of the medium positioned within the flow tube between said distal end of said metering member and the second end of the flow tube, said flow indicator ring being freely movable between said distal end of said metering member and the second end of the flow tube; and
- a means for biasing said float along the length of the flow tube toward the second end, positioned between said float and the first end of the flow tube.

5,086,655

ORIFICE MEASURING DEVICE

George E. Fredericks, and Alfred Jaschek, both of Graz, Austria, assignors to AVL Gesellschaft fuer Verbrennungskraftmaschinen und Messtechnik mbH, Graz, Austria

Continuation of Ser. No. 376,182, Jul. 5, 1989, abandoned, which is a continuation of Ser. No. 918,367, Oct. 14, 1986, abandoned.

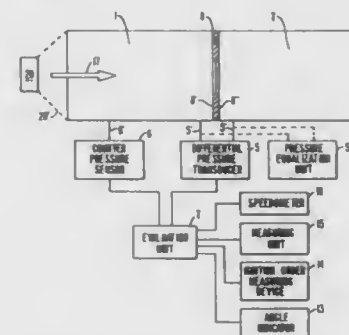
This application Oct. 12, 1990, Ser. No. 597,298

Claims priority, application Austria, Oct. 15, 1985, 2977/85

Int. Cl.⁵ G01F 1/42

U.S. Cl. 73-861.61

41 Claims



1. A measuring device for the flow metering of fluid streams comprising at least one orifice plate disposed within a pipe and having an orifice defined by a sharp, radially inwardly directed edge, said fluid being guided through said orifice, said plate being of a substantially rigid material, at least partially defined by opposite, substantially parallel sides facing flow directions through the pipe, said measuring device further including a differential pressure measuring device comprising at least two pressure sensors, one of said pressure sensors being disposed upstream and one pressure sensor being disposed downstream of said orifice, said differential pressure measuring device including means for producing output signals dependent upon the differential pressure forming a measuring signal for the fluid flow rate through said orifice, a plane passing through the sharp edge of the orifice of the plate, said sharp edge being formed by first and second, in cross-section straight surfaces which converge at an angle of no more than about 110°, the surfaces being symmetrical about said plane and forming a flank angle α of the sharp edge of at most 110° at the flow orifice.

5,086,656

METHOD AND APPARATUS FOR CALCULATING THE AXLE LOAD OF A VEHICLE

Bernhard Schwendemann, Schorndorf, and Werner Stumpe, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

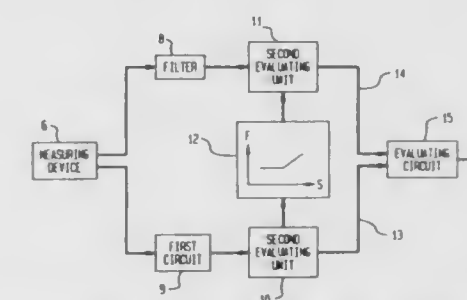
Filed Apr. 4, 1990, Ser. No. 504,292

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 3912144

Int. Cl.⁵ G01L 5/00; G01G 19/08

U.S. Cl. 73-862.54

20 Claims



rotate therewith and a second clutch member connected to said pinion, said second clutch member having a portion thereof disposed within said first clutch member, at least one weight member connected to said first clutch member by means which permits said weight member to move radially inwardly toward or radially outwardly away from said portion of said second clutch member, and a spring for urging said weight member radially inwardly into clutching engagement with said portion of said second clutch member, the force of said spring being such as to maintain said weight member in clutching engagement with said portion of said second clutch member when said engine is being cranked by said cranking motor at cranking speed, said weight member being moved radially outwardly by centrifugal force against the force of said spring to a position where it does not engage said portion of said second clutch member when said engine starts and drives said first clutch member at a speed that is higher than the speed that it is driven during engine cranking.

5,086,658

COAXIAL ENGINE STARTER

Shuzou Iozumi, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

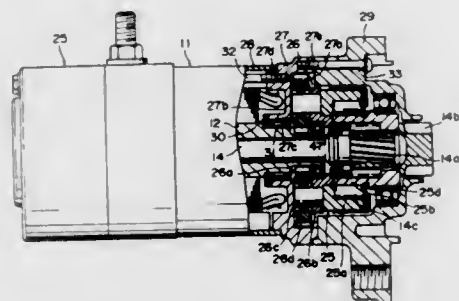
Filed Sep. 24, 1990, Ser. No. 586,646

Claims priority, application Japan, Sep. 26, 1989, 1-249621; Nov. 9, 1989, 1-131421

Int. Cl.⁵ F02N 11/00; F16H 57/02

U.S. Cl. 74—7 E

12 Claims



8. A coaxial engine starter comprising:
a d.c. electric motor including a motor yoke and generating a rotational force for starting an engine;
a front machine frame disposed on a front end of said electric motor and having a drive force transmission mechanism disposed therein;
a planetary speed reduction gear unit including an inner gear member having inner gear teeth in an inner circumference thereof and disposed between said motor yoke and said front machine frame;
a plurality of first through bolts axially extending within said motor yoke of said electric motor from a rear end thereof toward a front end thereof to thread engage with an end face of said inner gear member at a yoke side end face thereof, thereby to fasten said motor yoke and said inner gear member; and
a plurality of second through bolts thread engaged with an opposite end face of said inner gear member to fasten said front machine frame and said inner gear member.

5,086,659

UPSHIFT BRAKE

Leonard Earp, Radcliffe, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 4, 1991, Ser. No. 663,355

Claims priority, application United Kingdom, Apr. 17, 1990, 9008482

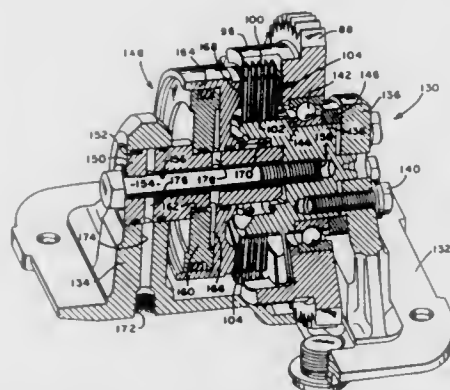
Int. Cl.⁵ F16H 57/10; F16D 55/00, 55/36

U.S. Cl. 74—411.5

5 Claims

1. An upshift brake (130) for a mechanical change gear transmission (10) having input gearing (18, 22, 36, 38, 40, 42

and 44) and a housing (H), said upshift brake comprising a brake housing (132) defining a pair of generally parallel axially spaced end walls (134, 136) cantilever mounted to and extending from a base portion, a gear member (68) rotatably supported by one of said end walls and constantly meshed with one of the gears of the input gearing of said transmission, a stator member (138) rotationally and axially fixed to one of said end walls, said stator member axially fixed to and rotationally supporting said gear member, a friction brake disc pack (104) comprising at least one first disc (100) fixed to said gear and one second disc member (102) rotationally fixed to said stator, and a fluid cylinder/piston assembly (148) having a first axially



contracted position corresponding to disengagement of said brake and a second axially expanded position corresponding to engagement of said brake, said piston/cylinder assembly including a reaction member (160) axially fixed relative to said brake housing, said upshift brake characterized by:

said cylinder/piston assembly additionally comprises a support member (150) axially movable relative to said housing and axially fixed relative to said reaction member, said support member being generally coaxial with said stator member, and means (154) for axially clamping said stator member to said axially fixed reaction member.

5,086,660

GEARWHEEL ATTACHED TO AN EXPANDED TUBE

Helmut Swars, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Continuation of Ser. No. 315,527, Feb. 24, 1989, abandoned.

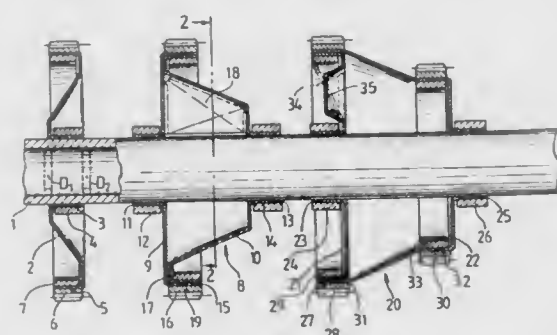
This application Feb. 21, 1991, Ser. No. 660,158

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805777

Int. Cl.⁵ F16H 55/12

U.S. Cl. 74—446

13 Claims



1. A gearwheel attached to an expanded tube portion in a force-locking way, comprising:
at least one plate metal disc member having an outer peripheral edge and a cylindrical hub portion in contact with the tube portion;

eral edge and a cylindrical hub portion in contact with the tube portion;
a supporting ring slid upon the hub portion so that said hub portion is held between said supporting ring and said tube portion, said supporting ring having a yield strength higher than that of the tube portion; and
at least one gear ring attached to the outer peripheral edge of the disc member.

5,086,661

VEHICLE STEERING COLUMN

Michael T. Hancock, Warwickshire, England, assignor to The Torrington Company, Torrington, Conn.

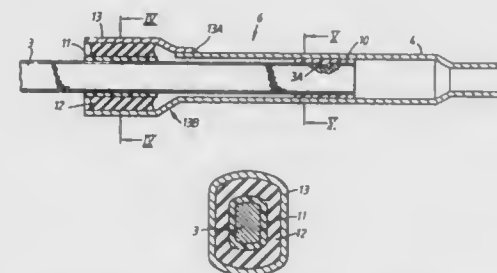
Filed Aug. 24, 1990, Ser. No. 571,711

Claims priority, application United Kingdom, Sep. 21, 1989, 8921321

Int. Cl.⁵ B62D 1/18

U.S. Cl. 74—493

12 Claims



1. A vehicle steering column having a coupling between two portions of the steering column comprising:

means for providing preloaded torque resistance to inhibit transmission of rotational backlash through the steering column, said means for providing preloaded torque resistance being a resilient member comprising an outer sleeve and a coaxial inner sleeve; and

a resilient material fixed between the two, the resilient material in the unstressed state having an asymmetric non-uniform thickness around the inner sleeve and the inner sleeve being rotationally offset relative to the outer sleeve, so that, when the two portions of the steering column are aligned with one another with the coupling in place, the resilient material provides a resilient bias in one direction to inhibit transmission of rotational backlash between the two portions.

5,086,662

REACTION BRAKE SYSTEM INCLUDING CLIP ADJUSTING MEANS

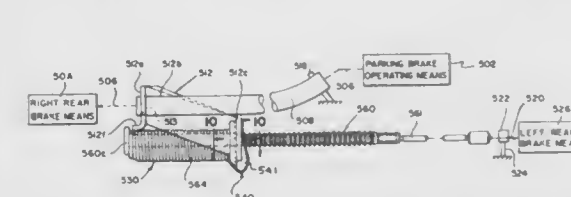
Jeffrey E. Tayon; Vernon E. Stewart, both of Moberly, and Tave E. Hass, Columbia, all of Mo., assignors to Orscheln Co., Moberly, Mo.

Continuation-in-part of Ser. No. 466,963, Jan. 18, 1990, abandoned. This application Sep. 19, 1990, Ser. No. 584,636

Int. Cl.⁵ F16C 1/22

U.S. Cl. 74—501.5 R

10 Claims



1. A parking brake operating system for a vehicle or the like including an operating member movably connected with a vehicle chassis, and a pair of brake operating means, comprising:

(a) a floating reaction bracket housing (512) including a unitary generally U-shaped first housing portion defining

a base portions (512b), and first and second arm portions (512a, 512c) connected with the ends of said base portion, said arm portions being generally parallel and relatively laterally offset, said arm portions containing first (513) and second (515) openings, respectively;

(b) a reaction cable assembly, including:

(1) a first outer tubular conduit (508) connected at one end with said reaction housing first opening, said first conduit being adapted for connection at its other end with the vehicle chassis;

(2) a first inner strand member (506) mounted for relative longitudinal movement within said first conduit, said first strand member extending through said first housing opening and being adapted for connection at opposite ends with the operating member and with one of the wheel brake operating means, respectively;

(c) second cable means including a second inner strand member (520) adapted for connection at one end with the other of the wheel brake operating means; and

(d) quick-release cable slack adjusting means (530) for connecting the other end of said second inner strand member with said second housing opening, said cable slack adjusting means including:

(1) a rod (560) extending through said second housing opening, one end of said rod being connected with said second inner strand member and the other end of said rod having an enlarged end portion (560c), said rod including between its ends an intermediate portion containing on its periphery a plurality of longitudinally-spaced annular locking grooves (560b);

(2) a helical compression spring (564) arranged concentrically about said rod between said rod enlarged end portion and said second housing arm portion for biasing said rod longitudinally in one direction relative to said housing; and

(3) clip means for preventing longitudinal displacement of said rod relative to said housing, said clip means including a clip member arranged for orthogonal displacement relative to said rod between locked and released positions relative to at least one of said grooves,

(a) said clip member being generally U-shaped and including a pair of leg portions (540a, 540b) resiliently biased together toward engagement with opposite sides of second housing arm portion;

(b) a first leg portion (540a) of said clip member containing a locking slot (540d) having a relatively wide portion (540d') for freely receiving said rod intermediate portion when said clip member is in the released position, said slot including a restricted portion (540d'') adapted for insertion within one of said grooves when said clip member is in said locked position.

5,086,663

ADJUSTABLE PEDAL

Yasushi Asano, and Yoshimasa Kataumi, both of Shizuoka, Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

Filed Jul. 27, 1990, Ser. No. 558,510

Claims priority, application Japan, Jul. 28, 1989, 1-88788[U]; Jul. 28, 1989, 1-88789[U]

Int. Cl.⁵ G05G 1/14

U.S. Cl. 74—512

6 Claims

1. A position adjustable pedal assembly for a vehicle comprising:

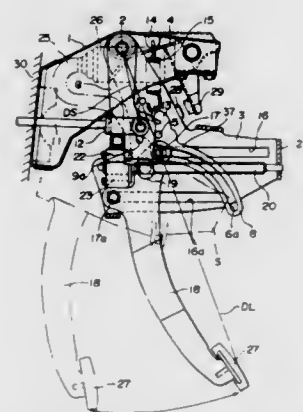
a bracket fixed to a stationary portion of the vehicle;
a holder attached to said bracket for a pivotal movement relative to said bracket with respect to a first pivotal axis, said holder including first and second linear paths of travel which extend in a longitudinal direction of the vehicle with a given interval therebetween;

a pedal arm with a pedal pad at its lower end, said pedal arm being engaged with the first and second paths of travel of

said holder via first and second connecting members respectively for allowing linear movement along the first and second paths of travel, pivotally and longitudinally moving along with said holder in response to a depression force applied to the pedal pad;

pedal position adjusting means including a drive member and a driven member, the drive member adapted to be activated by a vehicle driver, said driven member mounted on said pedal arm to be selectively driven by said drive member to move said pedal arm along the first and second paths of travel of said holder for adjusting a position of the pedal pad in the longitudinal direction;

an adjusting lever provided on said holder for pivotal movement relative to said holder with respect to a second pivotal axis, said adjusting lever including a curved path of travel which engages with the first connecting member to allow the first connecting member to move along the curved path of travel with linear movement along the first



path to travel of said holder for providing pivotal movement to said adjusting lever relative to said holder; an operating member connected to said adjusting lever through a second pivotal axis for pivotal movement relative to said adjusting lever so that a distance between the first pivotal axis and the second pivotal axis varies according to variation in a distance between the first pivotal axis and the pedal pad in response to the linear movement of said pedal arm along the first and second linear paths of travel at a constant ratio, said operating member receiving the depression force applied to the pedal pad through said adjusting lever to output same; and a movable lever, connected to said bracket through the first pivotal axis, including a path of travel for receiving the second pivotal axis connecting between said adjusting member and said operating member for allowing pivotal movement of said adjusting lever relative to said holder within a range defined by said path of travel.

5,086,664

ENERGY STORAGE FLYWHEELS USING FLUID TRANSFER TO VARY MOMENTS OF INERTIA

John T. Wagner, 510 Wide Ave., Drexel Hill, Pa. 19026
Continuation-in-part of Ser. No. 857,839, Apr. 30, 1986,
abandoned. This application Oct. 23, 1989, Ser. No. 425,660
Int. Cl.⁵ F16F 15/30, 15/10

U.S. Cl. 74—572

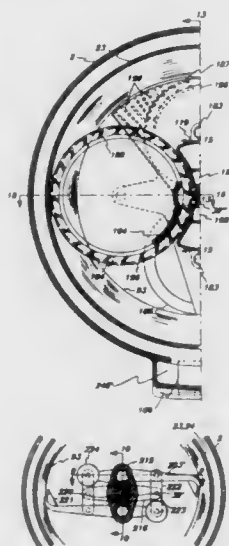
17 Claims

1. A variable inertia flywheel comprising:

a liquid retaining rotor drum mounted for rotation about a central axis; and

liquid control means for controllably varying an amount of liquid in the rotor drum during rotation of the rotor drum, the liquid control means including feed means for selectively feeding liquid into the rotor drum while the rotor drum rotates and drain means for selectively removing liquid from the rotor drum while the rotor drum rotates, whereby the moment of inertia of the flywheel is selec-

tively and controllably variable regardless of rotational speed of the rotor drum;



at least one of the drain means and the feed means comprising bucket wheel means rotating within the rotor drum between an outer circumferential wall of the rotor drum and the central axis.

5,086,665

ADAPTIVE SHIFT PRESSURE CHARACTERIZATION OF AN ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

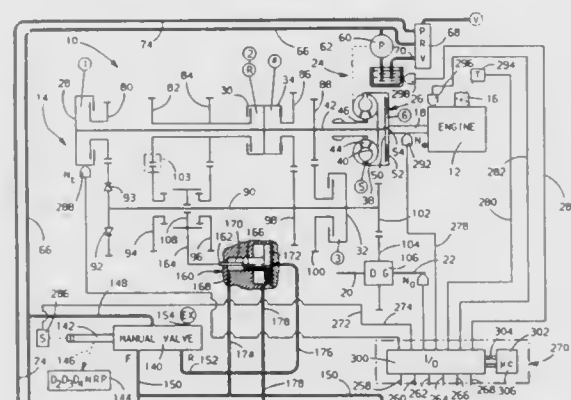
Rimas S. Milunas, Royal Oak, and Larry T. Nitz, Troy, both of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Jun. 27, 1991, Ser. No. 722,756

Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—856

5 Claims



4. In a multiple speed ratio motor vehicle transmission including a fluid operated friction device and predetermined pressure schedule for each of at least two of such speed ratios and a common electro-hydraulic actuator, where shifting between speed ratios involves energizing said actuator to supply fluid pressure to a respective friction device in accordance with a pressure command determined in relation to a respective predetermined pressure schedule, the friction device exhibiting variability with age and wear, and the actuator exhibiting a variable error characteristic for scheduled pressures in excess of a minimum pressure value, a method of operation comprising the steps of:

determining an adaptive correction amount for the predetermined pressure schedule of a respective friction device, said correction amount being designed to compensate for

both actuator error and variability of the respective oncoming clutch;

comparing the adaptive correction amounts for each of said friction devices to identify an actuator-related correction component which compensates for the variability of said actuator alone; and

adjusting said predetermined schedule in accordance with the difference between the determined correction amount and said actuator-related correction component during operating conditions for which said scheduled pressure is in proximity to said minimum pressure value to form said pressure command, thereby limiting the adjustment of the predetermined schedule to an amount which compensates for the variability of said respective friction device.

5,086,666

SHIFT CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Daisaku Moriki, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

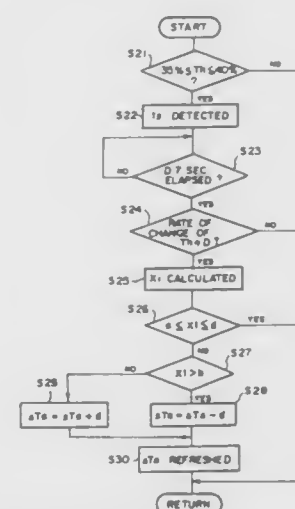
Filed Jun. 27, 1990, Ser. No. 544,540

Claims priority, application Japan, Jun. 30, 1989, 1-170655

Int. Cl.⁵ B60K 41/08

U.S. Cl. 74—857

7 Claims



1. A shift control system for an automatic transmission of a vehicle which controls the output of the engine according to the running condition of the vehicle when a gear-shifting operation detecting means detects gear-shifting operation of the automatic transmission, comprising:

a shifting condition output means which outputs a shifting condition signal representing an actual value of the running condition during a gear-shifting operation, said shifting condition signal being detected after a predetermined time has passed from a commencement of the gear-shifting operation, a length of said predetermined time being set substantially equal to a time lapse which is required for completion of the gear-shifting operation so that delay or advance of mechanical response in the automatic transmission can be accurately detected.

a reference signal output means which outputs a reference value signal representing a reference value of the running condition during the gear-shifting operation,

a correction signal output means which compares the shifting condition signal with the reference value signal and outputs a correction signal on the basis of the result of the comparison, and

an engine output power correcting means which corrects the controlled variable of the engine output power on the basis of the correction signal, whereby torque shocks and slipping in the automatic transmission can be suppressed in

accordance with the actual value of the running condition during the gear-shifting operation.

5,086,667

INTAKE SYSTEM FOR AUTOMOBILE ENGINE

Kenji Katayama, Hiroshima; Hiroshi Hirano, Hatsukaichi; Toshio Takeda, Hiroshima, and Seiji Yashiki, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

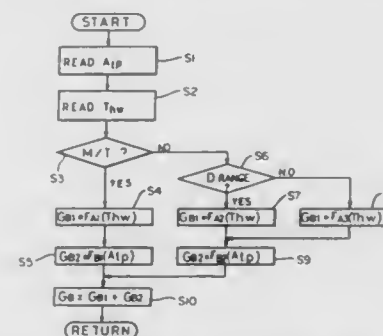
Filed Apr. 10, 1990, Ser. No. 506,611

Claims priority, application Japan, Apr. 10, 1989, 1-43123

Int. Cl.⁵ B60K 41/06; F02B 75/18

U.S. Cl. 74—860

6 Claims



1. An intake system for an automobile engine with a manual transmission or an automatic transmission, said intake system comprising:

a throttle valve disposed in an intake passage of said intake system for distributing air into cylinders of said automobile engine;

supplementary air distribution means for distributing supplementary air into said intake passage between said throttle valve and automobile engine;

control means for controlling said supplementary air distribution means to distribute different amounts of said supplementary air according to operating conditions of said automobile engine; and

a control unit for recognizing whether the transmission is a manual transmission or an automatic transmission, and controlling said control means so as to make corrections in an amount of said supplementary air distributed by said supplementary air distribution means into said intake passage according to atmospheric pressure and so as to distribute a larger amount of said supplementary air into said intake passage when an automatic transmission is recognized by said control unit than when a manual transmission is recognized by said control unit at a given atmospheric pressure.

5,086,668

LINE PRESSURE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Takuji Fujiwara; Kozo Ishii, and Hiroshi Yoshimura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 27, 1989, Ser. No. 427,700

Claims priority, application Japan, Oct. 29, 1988, 63-274261

Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—866

8 Claims

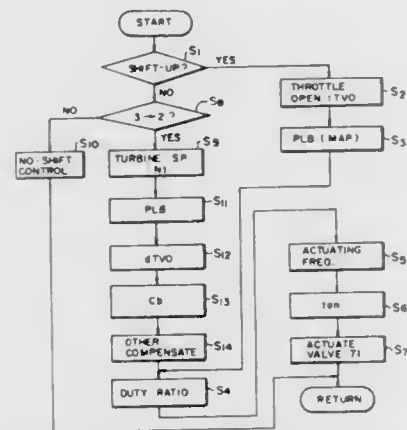
1. A hydraulic pressure control system for an automatic transmission comprising:

a torque converter,

a transmission gear mechanism having a plurality of gear stages and frictional elements for switching power transmitting paths in the transmission gear mechanism,

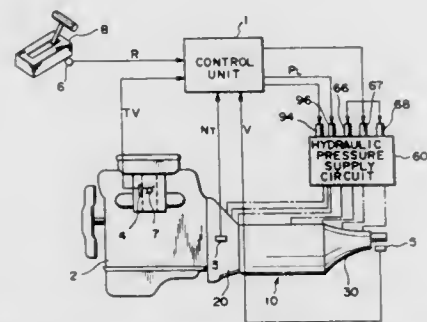
a hydraulic control mechanism for controlling engagement and disengagement of the frictional elements to establish one of said gear stages,

line pressure control means for controlling line pressure of said hydraulic control mechanism in accordance with vehicle operating condition,
an engine torque detecting device for detecting an engine output torque,
turbine speed detecting means for detecting a turbine speed of the torque converter,



shift condition detecting means for detecting a shift-up operation and a shift-down operation in the transmission, said line pressure control means controlling the line pressure in accordance with the engine torque after the shift condition detecting means detects a shift-up operation and with the turbine speed after the shift condition detecting means detects a shift-down operation.

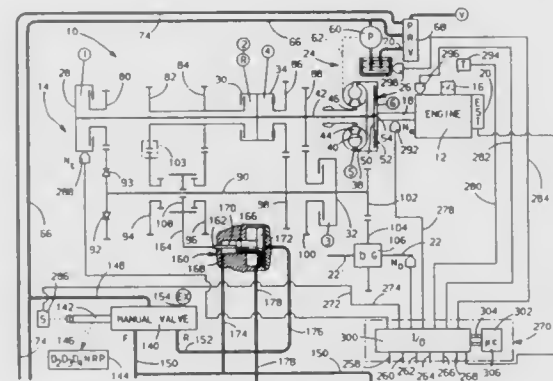
5,086,669
LINE PRESSURE CONTROLLER FOR AUTOMATIC TRANSMISSION
Takuji Fujiwara, and Kohzo Ishii, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jun. 29, 1990, Ser. No. 545,629
Claims priority, application Japan, Jun. 30, 1989, 1-170656
Int. Cl.⁵ B60K 41/06
U.S. Cl. 74-866
6 Claims



1. A line pressure controller for an automatic transmission having a hydraulic pressure supply circuit for supplying line pressure to frictional engaging elements which are arranged to be engaged/disengaged so as to change the speed; and regulation means for regulating said line pressure, said controller comprising:
load detection means for detecting the engine load;
start detection means for detecting the start of the speed change operation performed in said automatic transmission;
completion detection means for detecting the substantial completion of said speed change operation performed by said automatic transmission;
time supervisory means which receives the output from said completion detection means for supervising a predeter-

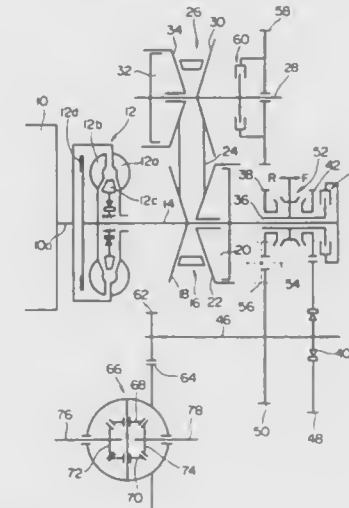
mined lapse of time period after said substantial completion of said speed change operation has been detected; and first and second control means for compensating/controlling said line pressure, wherein said first control means receives the output from said completion detection means and from said time supervisory means so as to control said regulation means in such a manner that said line pressure is lowered after said predetermined lapse of time period from the start of the operation for changing the engaging state of said frictional engagement elements to said substantial completion of said speed change operation; and said second control means receives the output from said completion detection means, from said time supervisory means and from said load detection means so as to control said regulation means in such a manner that said line pressure lowering control performed by said first control means is cancelled and said line pressure is raised if said engine load has been enlarged by a predetermined value after said predetermined lapse of time after said substantial completion of said speed change operation.

5,086,670
ADAPTIVE TRANSMISSION SHIFT PRESSURE CONTROL WITH CLOSED-LOOP COMPENSATION
Larry T. Nitz, Troy, and Rimas S. Milunas, Royal Oak, both of Mich., assignors to Saturn Corporation, Troy, Mich.
Filed Jul. 31, 1991, Ser. No. 722,770
Int. Cl.⁵ B60K 41/06
U.S. Cl. 74-866
3 Claims



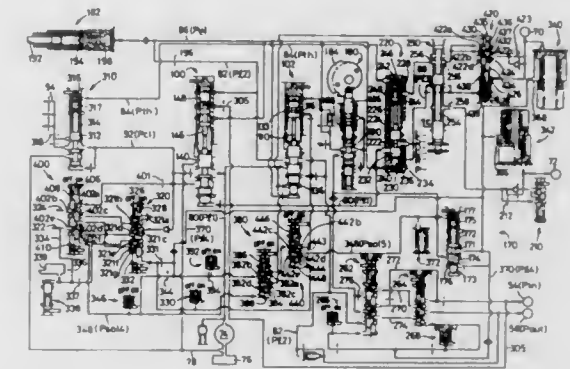
2. In a motor vehicle having an engine connected to supply torque to a multiple speed ratio transmission, the transmission being upshifted from a first speed ratio to a second speed ratio by supplying fluid pressure to an on-coming torque transmitting device in accordance with a predetermined pressure schedule based on an estimation of the torque supplied to said transmission by said engine upon initiation of said upshift, said predetermined schedule being adaptively adjusted based on a measured interval of speed ratio progression during said shift, a method of operation comprising the steps of:
measuring a rate of change of speed ratio progression during said upshift;
establishing a target rate of change of speed ratio progression based on the rate of change of speed ratio progression measured during a first portion of said upshift, such target rate being dependent on the torque transmitted by said on-coming torque transmitting device;
determining a rate error based on the amount by which said target rate exceeds the rate of change of speed ratio progression measured during a second portion of said upshift; and
increasing the fluid pressure supplied to said on-coming torque transmitting device during said second portion of said upshift in relation to said rate error.

5,086,671
QUICK DOWNSHIFT CONTROL IN HYBRID CONTINUOUSLY VARIABLE TRANSMISSION
Toshikazu Oshidari, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 3, 1990, Ser. No. 562,575
Claims priority, application Japan, Aug. 10, 1989, 1-205634
Int. Cl.⁵ F16H 11/02
U.S. Cl. 74-867
7 Claims



1. In a hybrid transmission:
a gearing mechanism;
a continuously variable transmission mechanism combined with said gearing mechanism, a continuously variable transmission mechanism including a driver pulley, a follower pulley and a V-Belt drivingly interconnecting said driver and follower pulleys;
means including a high clutch for causing said continuously variable transmission to take over a drive in the hybrid transmission when said high clutch is engaged, but causing said gearing mechanism to take over a drive in the hybrid transmission upon releasing said high clutch to effect a downshift in reduction ratio in the hybrid transmission;
means for controlling a speed ratio between said driver and follower pulleys to control a reduction ratio in the hybrid transmission, said speed ratio controlling means including a shift command valve which assumes a predetermined position when said gearing mechanism takes over a drive in the hybrid transmission, and a shift control valve means operatively connected to said shift command valve for controlling supply of hydraulic fluid to and discharge thereof from said driver pulley, but discharging hydraulic fluid from said driver pulley upon said shift command valve assuming said predetermined position;
means hydraulically interconnecting said high clutch and said shift control valve for establishing a fluid communication between said high clutch and said shift control valve, but blocking said fluid communication and draining said high clutch upon said shift command valve assuming said predetermined position; and
wherein said speed ratio controlling means includes a manual valve having a forward drive position, and said fluid communication establishing means includes a neutral valve means fluidly disposed between said high clutch and said shift control valve means for establishing said fluid communication upon said manual valve assuming said forward drive position, but blocking said fluid communication and draining said high clutch upon said shift command valve assuming said predetermined position.

5,086,672
HYDRAULIC CONTROL APPARATUS FOR VEHICLE TRANSMISSION SYSTEM, INCORPORATING VALVES FOR REVERSE INHIBIT VALVE
Nobuyuki Kato, Toyota; Ryoji Hahuchi, Miyoshi; Kunio Morisawa, and Hiroshi Itoh, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 2, 1990, Ser. No. 562,113
Claims priority, application Japan, Aug. 9, 1989, 1-206086; Aug. 9, 1989, 1-206087
Int. Cl.⁵ B60K 41/12
U.S. Cl. 74-868
19 Claims

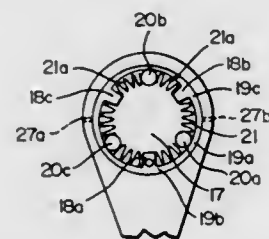


1. A hydraulic control apparatus for controlling a hydraulically operated power transmitting system for a motor vehicle, wherein power is transmitted from an engine of the vehicle to a drive wheel of the vehicle through a reversing gear mechanism having a reverse position which is established by a hydraulic actuator in response to an operation of a shift lever to a reverse position, by applying a hydraulic pressure to the actuator, said hydraulic control apparatus comprising:
a reverse inhibit valve disposed in a hydraulic line leading to said hydraulic actuator, and having a reverse inhibit position for inhibiting said reversing gear mechanism from being placed in the reverse position and a non-inhibit position for permitting said mechanism to be placed in the reverse position;
first pilot pressure generating means including a solenoid operated valve which is turned on and off for producing a first pilot pressure in one of on and off states thereof;
second pilot pressure generating means including a solenoid-operated valve which is turned on and off for producing a second pilot pressure in one of on and off states thereof; and
a relay valve for applying a first hydraulic signal to said reverse inhibit valve for placing the reverse inhibit valve in said reverse inhibit position, when one of four combinations of on-off operating states of said solenoid-operated valves of said first and second pilot pressure generating means is established, and for applying a second hydraulic signal to said reverse inhibit valve for placing the reverse inhibit valve in said non-inhibit position, when any one of the other of said four combinations of on-off operating states is established.

5,086,673
RATCHET WRENCH WITH POSITIVE LOCKING CAPABILITY
David Korty, R.D. 1, Forest City, Pa. 18421
Filed Apr. 22, 1991, Ser. No. 688,812
Int. Cl.⁵ B25B 13/00
U.S. Cl. 81-59.1
10 Claims

1. A ratchet type tool drive, comprising:
handle means having a predetermined length and cross sectional configuration with one end formed to function as a tool drive;

means on said tool drive end of said handle means to define a cavity with substantially smooth inner walls and terminating in a surface with an opening;
spindle means bearing against said surface and with a tool engaging end fitted through said opening;
a predetermined number of partitions extending into said cavity from said inner walls and terminating contiguous with said spindle means to define channel means which narrows approximately 30 thousandths of an inch from the center in each direction toward an adjacent partition;



roller means within said channel means and having a diameter for fitting readily in said channel means at said center and being pinched between said spindle means and said narrowing channel means at a distance from said center approximately equal to said diameter of said roller means; spring means located on each side of said roller means within said channel means; and
retainer cover means fitted over said means to define a cavity and including means to engage said spring means for urging said roller means in a preselected direction; so that said roller means is pinched in a positive locking action that resists any tendency to slip.

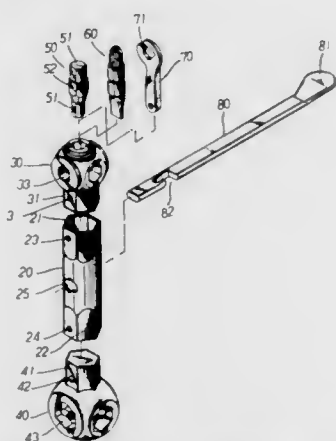
5,086,674

MULTI-PURPOSE HAND TOOL

Jern-Shong Her, Changhua City, Taiwan, assignor to Yu Chou Enterprise Co., Ltd., Changhua City, Taiwan
Filed Apr. 30, 1991, Ser. No. 693,468
Int. Cl.⁵ B25B 13/00

U.S. Cl. 81—124.4

4 Claims



1. A multi-purpose hand tool, comprising:
a tubular body, having a pair of joints formed integrally on both ends, an opening defined on tubular wall of said tubular body;
a pair of connecting blocks, each connected to said joints of said tubular body at one side, having a plurality of openings of different sizes defined on said connecting blocks in a way that allows engagement with various sizes of screw heads, thereby to fasten or unfasten the screws;
a plurality of tool members, each having one end being engageable to said opening of said connecting blocks;
a spoon-shaped member, of a slim bar-like member having a

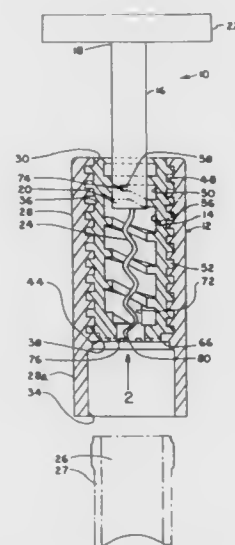
flat, extended spoon head formed integrally at one end provided with a connecting slot formed on the other end of said spoon-shaped member functioning as a stop to facilitate the operation of adjusting the spokes of a bicycle.

5,086,675
CORKSCREW

Tai L. Leung, 7A Oxford Court, 26 Braemar Hill Road, North Point, and Tai T. Leung, Flat D, 3/F., 3 Cheung Sha Wan Rd., Kowloon, both of Hong Kong
Filed Aug. 16, 1990, Ser. No. 568,176
Int. Cl.⁵ B67B 7/04

U.S. Cl. 81—3.29

12 Claims



1. A corkscrew comprising a housing having means for locating the housing over the mouth of a corked bottle, a screw member having a handle outside the housing and a screw within the housing, whereby rotation of the member in a first direction drives the screw into the cork in the bottle and the member axially into the housing, and first limiting means limiting said axial movement whereby continued rotation of the member in said first direction drives the cork into the housing and out of the bottle, wherein a barrel is screw-engaged in the housing and the limiting means is between the barrel and the member so that the cork is driven into the housing by axial movement of the barrel relative to the housing, means is provided in the housing for engaging the end of the cork, whereby rotation of the member in a second direction, opposite to the first direction, releases, or almost releases, the screw from the cork with axial movement of the member relative to the barrel and the housing, and second limiting means between the barrel and the member whereby continued rotation of the member in said second direction effects return axial movement of the barrel relative to the housing.

5,086,676

METHOD AND APPARATUS FOR MACHINING A DIFFERENTIAL CARRIER

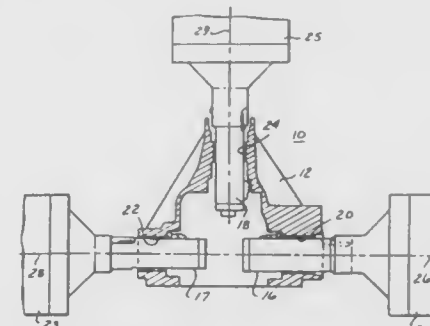
David A. Gifford, Roseville, and John L. Taylor, Troy, both of Mich., assignors to J. P. Tool, Inc., Warren, Mich.
Filed Jul. 11, 1990, Ser. No. 551,568
Int. Cl.⁵ B23B 1/00, 3/26

U.S. Cl. 82—1.11

17 Claims

1. A machine tool for machining a differential carrier having three bores each of which requires a back boring operation having a first diameter and a radial face generated at an inner end of the back bore, said machine tool comprising, first, second and third tool means adapted to be mounted on a respec-

tive spindle for rotation coaxially with a rotational axis of its spindle and axially shiftable of its spindle axis to machine a respective bore, each of said tool means comprising a tool body extending in a direction along its spindle axis, first and second slide means spaced axially along said body and carried on body transverse to its spindle axis, said first slide means being adapted to carry an insert to back bore said first diameter and generate said radial face on said carrier, said second slide means being adapted to carry another insert to bore a second diameter, said first slide being located on said body to extend and retract said first insert at a first predetermined location



circumferential of said body, said second slide being located on said body to extend and retract said second insert at a second predetermined location circumferential of said body, and actuating means carried on said body and operatively interengaged with said first slide means and said second slide means to extend and retract said first insert at said first circumferential location and extend and project said second insert at said second location, and wherein said first and second slide means are arranged on said body and constructed so that movement of one of said slides that would cause unbalance of said body is offset by movement of the other slide to maintain said tool in balance.

5,086,677

TUBE TRUNCATION APPARATUS AND METHOD

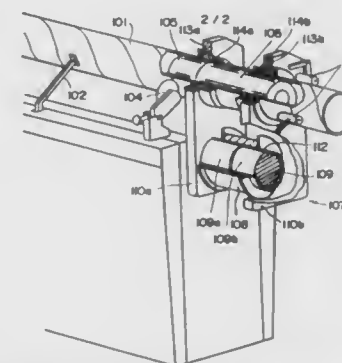
Jean P. Languillat, Vallieres par Thorigny-sur-Oreuse, France, assignor to Lhomme S.A., Pont-sur-Yonne, France
Continuation-in-part of Ser. No. 924,443, Oct. 29, 1986, Pat. No. 4,889,023. This application Apr. 25, 1989, Ser. No. 342,886
Claims priority, application France, Apr. 25, 1988, 88 05434; Oct. 7, 1988, 88 13157

The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.

Int. Cl.⁵ B23B 3/04

U.S. Cl. 82—92

13 Claims



1. An apparatus for truncating tubes, comprising at least one knife adapted to cooperate at the end of the cutting with a counter-knife positioned in the interior of a tube to be truncated, said counter-knife being connected mechanically to a core of strong magnetic permeability, a winding wound in a framework around the tube to be truncated to create a mag-

netic field in said core through the tube to be truncated as to act magnetically on the longitudinal position of said core and thus on the longitudinal position of the counter-knife, wherein said framework is annular and includes a central cylindrical part comprising a material having weak magnetic permeability, the ends of said framework comprising end elements made of material having strong magnetic permeability to direct and form the lines of induction, and comprising at least one pair of tubular sleeves which are fitted at each end of the framework and which are formed by a material of strong magnetic permeability, the exterior and interior diameters respectively of each sleeve being adapted to the respective interior diameter of said end elements of the framework, and the exterior diameter of the tube to be truncated.

5,086,678

WORKPIECE CONVEYING METHOD AND DEVICE FOR A CUTTING MACHINE

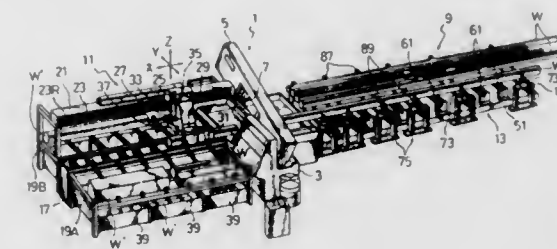
Minoru Aoyagi, and Takayoshi Hasegawa, both of Hadano, Japan, assignors to Amada Company, Limited, Japan
Filed Nov. 22, 1989, Ser. No. 440,313

Claims priority, application Japan, Nov. 22, 1988, 63-293576; Feb. 9, 1989, 1-28690

Int. Cl.⁵ B65G 47/74

U.S. Cl. 83—13

12 Claims



1. A method for conveying long workpieces to a cutting machine comprising the steps of:
disposing the workpieces laterally in contact with each other on a cross conveyor extending in a direction normal to a path line of the cutting machine;
conveying the workpieces to a feed conveyor positioned in parallel with the path line of the cutting machine by the cross conveyor;
stopping the cross conveyor when a selected workpiece reaches a regulating member provided above the cross conveyor and in a line parallel to the path line of the cutting machine;
moving the position of the feed conveyor in the direction normal to the path line of the cutting machine in response to the width of the selected workpiece so that a side end of the feed conveyor is aligned with one side of the selected workpiece;
moving at least one of the feed conveyor and a part of the cross conveyor in the vertical direction so that the selected workpiece is loaded on the feed conveyor; and
conveying the selected workpiece to the cutting machine by the feed conveyor.

5,086,679

PROCESS FOR APPARATUS FOR COLLECTING CONTINUOUS SUPPLIED YARN TO WASTE

Grant M. Fletcher, Arnprior, Canada, assignor to BASF Fibres Inc., Arnprior, Canada

Continuation of Ser. No. 253,281, Oct. 3, 1988. This application Aug. 6, 1990, Ser. No. 563,376

Int. Cl.⁵ B65H 29/24

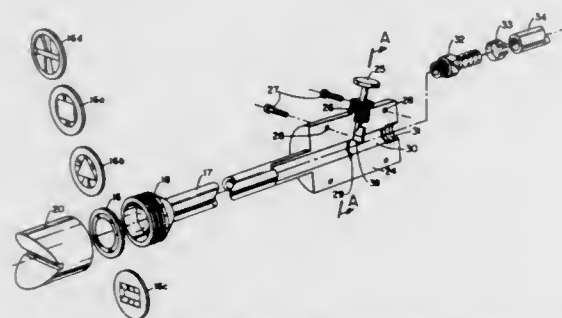
U.S. Cl. 83—24

5 Claims

1. A process for aspirating a continuously supplied yarn to waste, comprising:
(a) moving the yarn adjacent an aspirating device having an

entrance for receiving yarn, said device having a stationary inner annular cutting edge substantially surrounding the entrance;

- (b) aspirating a loop of the yarn into the entrance of the device and tensioning the loop across the inner annular cutting edge to cut the yarn;



- (c) continuing to aspirate the cut continuously supplied yarn to waste; and
(d) simultaneously cutting the yarn downstream of said annular cutting edge and blocking the action of the aspirating device, thereby releasing the yarn for further processing.

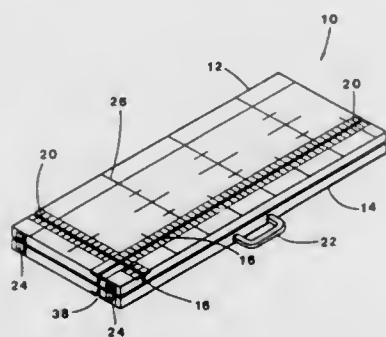
5,086,680

APPARATUS FOR JOB-SITE CUTTING OF INSULATION
Gary E. Johnson, N6402 County Trunk G, Scandania, Wis. 54977

Filed Feb. 16, 1990, Ser. No. 480,792
Int. Cl.⁵ B26D 7/18, 7/20

U.S. Cl. 83—167

20 Claims



1. A fiberglass insulation cutting apparatus for job-site use comprising:

a workboard having an upwardly-facing groove thereacross and including a substantially continuous lower member forming the bottom of said groove and two upper members which are above the lower member and spaced from the lower member to form a void extending laterally from the groove between the lower member and the upper members, the upper members having opposed inner edges spaced from one another to form the sides of the groove; the two upper members each being formed of a pair of submembers having submember inner edges, the submembers of both upper members being coplanar and positioned and arranged such that their inner edges form a second groove intersecting and substantially perpendicular to the first-mentioned groove, said flat lower member being of sufficient dimension to form the bottom of said second groove;
means insertable in the groove and movable therealong to cut fiberglass insulation; and
a free handle supporting the cutting means and grippable by

a worker to move the cutting means in the groove across the workboard;
whereby fiberglass insulation placed on the workboard may readily be divided at the groove and fiberglass leavings from cutting operations can move laterally away from the groove into the void.

5,086,681

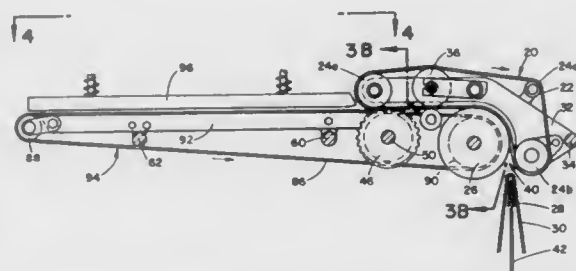
BOOK FEEDING AND TRIMMING APPARATUS
Rudolph H. Ruetschle, Avon Lake, and Philip A. Yakovac, Euclid, both of Ohio, assignors to K. S. Macey Machine Company, Inc., Cleveland, Ohio

Filed Dec. 19, 1989, Ser. No. 458,762

Int. Cl.⁵ B26D 5/20; B65G 47/31

U.S. Cl. 83—277

12 Claims



1. A trimming apparatus for edge trimming assembled signatures or books comprising:

a housing;
a trimmer knife assembly mounted in said housing for edge trimming assembled signatures or books conveyed thereto;
a conveying apparatus for conveying assembled signatures or books along a path of movement into aligned relationship with the trimmer knife assembly, said conveying apparatus including a pair of horizontally extending endless conveyor chains positioned in parallel on adjacent sides of the path of movement and including outwardly extending pusher members for engaging longitudinal edges of the assembled signatures or books and driving them forwardly along the path of movement so that the forwardly driven assembled signatures or books are moved solely by said conveyor chains, a pair of vertically extending guide members positioned laterally outwardly of the endless chains for engaging the ends of the assembled signatures and moving them into proper lateral alignment with the path of movement, an endless conveyor belt is associated with the endless conveyor chains for frictionally engaging an exterior face of said assembled signatures or books; and, drive means for simultaneously driving said conveyor chains and said endless conveyor belt in the same direction with said conveyor belt being driven at a velocity slightly less than the velocity at which said conveyor chains are driven to thereby produce a frictional force acting to continuously impel said assembled signatures or books rearwardly of the direction of movement and toward said pusher members to maintain said assembled signatures or books properly oriented relative to said path and in engagement with said pusher members.

5,086,682

BAND CUTTING APPARATUS

Eric W. Strub, 235 Rockhill Rd., Vista, Calif. 92084, and Kenneth M. Strub, 25670 Jesmond Dene, Escondido, Calif. 92026

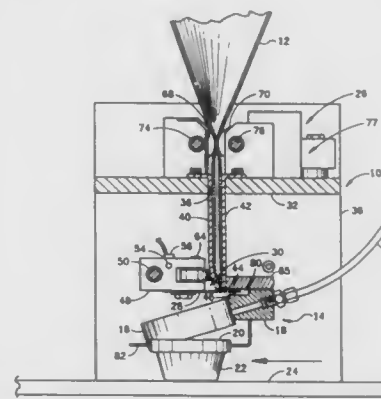
Filed Apr. 5, 1990, Ser. No. 505,241

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.⁵ B26D 5/08; B65B 9/10

U.S. Cl. 83—382

9 Claims



3. A band cutting apparatus for cutting banding material to form separate bands of predetermined height for placing around container necks, the apparatus comprising:

guide means for guiding banding material in a flattened condition along a predetermined path from an inlet towards a cutting station, the guide means having an elongate inlet slot defining the inlet end of said guide path, and a pair of opposed parallel guide plates extending from said inlet slot towards said cutting station;
pinch means at said cutting station for pinching opposite sides of the flattened banding material together in a region to be cut;
at least one of said guide plates comprising a resilient plate and said pinch means comprising means for biasing an end of said resilient plate remote from said inlet slot towards an end of the other guide plate to pinch material between the ends of the two guide plates;
a single cutter blade mounted for movement in a transverse cutting path across the pinched and flattened banding material at the cutting station to cut a band of predetermined length from the material; and
transport means for transporting said blade back and forth along said cutting path.

5,086,683

APPARATUS FOR CUTTING AND METHOD

Donald J. Steidinger, Barrington, Ill., assignor to Tamarack Products, Inc., Barrington, Ill.

Filed Dec. 13, 1990, Ser. No. 627,214

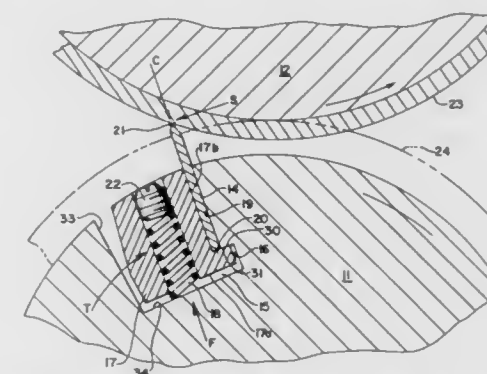
Int. Cl.⁵ B26D 1/62

U.S. Cl. 83—674

7 Claims

1. Apparatus for cutting web material comprising a frame, a blade roll rotatably mounted on said frame, an impression roll rotatably mounted on said frame adjacent said blade roll, said blade roll being equipped with an axially-extending slot having a radially inward generally circumferentially-extending bottom wall and spaced generally radially-extending side walls,
a blade-supporting bar mounted in said slot having a bottom wall adjacent said slot bottom wall, said bar being equipped with generally circumferentially-extending integral ledge means adjacent said bar bottom wall,
a blade mounted on said ledge means and interposed between said bar and one side wall of said slot, and
spring means operatively associated with said blade roll bearing against said bar for exerting both generally radi-

ally outward and circumferential forces against said bar to clamp said blade while providing a radially resistant mounting for said blade to permit generally radially in-



ward movement of said bar during cutting, said spring means, during said radially inward movement of said bar, exerting an increasing circumferentially extending force clamping said bar and blade to said one side wall.

5,086,684

TRANSPORTABLE WORK MACHINE HAVING A STABILIZER LEG WITH SELECTIVELY OPERABLE AUXILIARY SAW MEANS

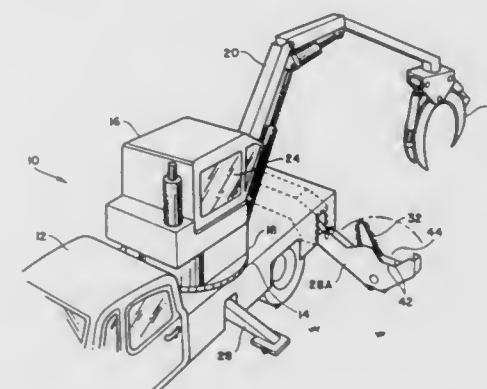
Calvin S. Johnson, Union Grove, N.C., assignor to CTR Manufacturing, Inc., Union Grove, N.C.

Filed Nov. 5, 1990, Ser. No. 609,418

Int. Cl.⁵ A01G 23/08

U.S. Cl. 83—795

8 Claims



8. In a transportable apparatus of the type having selectively operable stabilizer legs movable into and out of ground engagement to fix said apparatus in a stationary work position, the improvement comprising a chain saw assembly pivotally mounted directly to one said stabilizer leg for selective operative cutting movement when said one stabilizer leg is in its ground-engaging stationary work position.

5,086,685

MUSICAL TONE GENERATING APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Hohtaro Hanzawa, Kunihiko Sugita, and Hiroyuki Sasaki, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

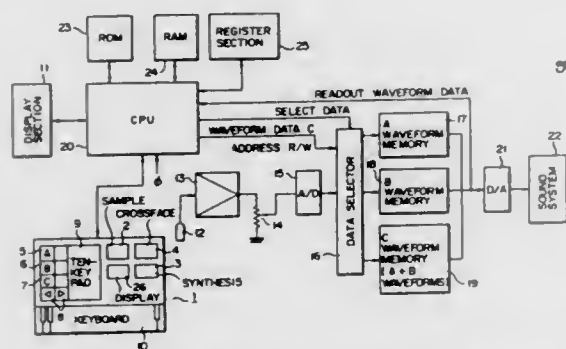
Continuation of Ser. No. 118,448, Nov. 6, 1987, abandoned. This application Mar. 9, 1990, Ser. No. 492,245

Claims priority, application Japan, Nov. 10, 1986, 61-172304[U]; Dec. 9, 1986, 61-293650; Jul. 6, 1987, 62-167069; Jul. 6, 1987, 62-167070; Jul. 6, 1987, 62-167071

Int. Cl.⁵ G10H 7/00

U.S. Cl. 84—605

23 Claims



1. A musical tone generating apparatus for an electronic musical instrument comprising sampling means for sampling external sounds, storage means for storing digital waveform data of the external sounds sampled by said sampling means, reading means for reading out the digital waveform data stored in said storage means, and musical tone generating means for generating a musical tone corresponding to the digital waveform data read out by said reading means, comprising:

reading control means for reading out at least one of external sound digital waveform data stored in said storage means with an output frequency different from an input frequency of a corresponding external sound waveform which is stored in said storage means;

synthesizing means for synthesizing a plurality of digital waveform data read out under the control of said reading control means;

synthesized waveform storage means for storing synthesized digital waveform data synthesized by said synthesizing means; and

writing means for writing said synthesized digital waveform data into said synthesized waveform storage means.

5,086,686

KEYBOARD INSTRUMENT

Yoichi Misawa, and Toshiyuki Suzuki, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan Division of Ser. No. 366,748, Jun. 15, 1989. This application Dec. 27, 1990, Ser. No. 634,712

Claims priority, application Japan, Jun. 21, 1988, 63-151289; Jun. 21, 1988, 63-151290; Jun. 21, 1988, 63-151291; Jun. 22, 1988, 63-155763

Int. Cl.⁵ G10H 1/00; H05K 5/00

U.S. Cl. 84—718

1 Claim

1. A keyboard instrument comprising:

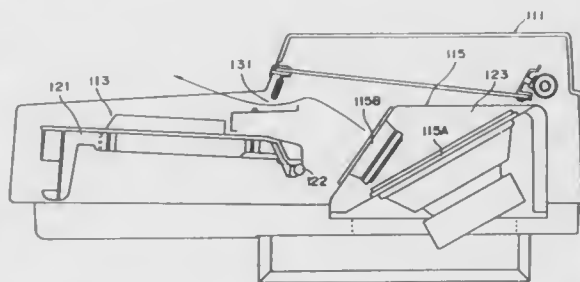
a box-like main body case;

a keyboard arranged on a front side of said main body case;

a slit formed in said main body case so as to be open to the front side; and

a speaker unit arranged upright in said main body case on a

rear side of said keyboard and having a diaphragm whose axis is directed to said tone escape, wherein



said speaker unit includes large- and small-diameter speakers, an inclination of said large-diameter speaker being smaller than that of said small-diameter speaker.

5,086,687

ROTARY SLIDE VALVE FOR HYDRAULIC AUXILIARY POWER STEERING

Dieter Elser, Essingen; Helmut Hetzel, Schwäbisch Gmünd, and Walter Kogel, Abtsgmünd, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

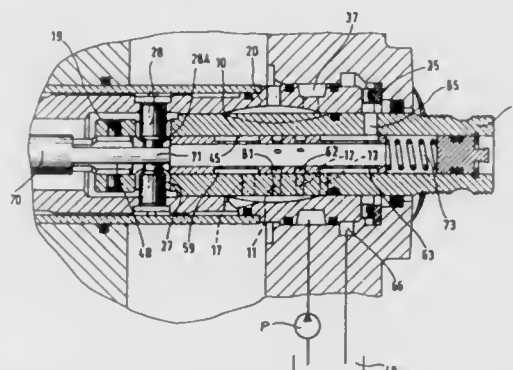
PCT No. PCT/EP87/00524, § 371 Date Jan. 31, 1989, § 102(e) Date Jan. 31, 1989, PCT Pub. No. WO88/01959, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 16, 1987, Ser. No. 328,036

Claims priority, application Luxembourg, Sep. 19, 1986, 00543 Int. Cl.⁵ F15B 9/10; B62D 5/06

U.S. Cl. 91—375 A

8 Claims



1. A rotary slide valve for hydraulic auxiliary power steering mechanisms for motor vehicles includes a fixed cylindrical valve sleeve (20), a rotary slide member (10) arranged within the valve sleeve and flexibly connected therewith via a torsion bar (4), the valve sleeve containing a plurality of longitudinal grooves (21, 22, 23, 24, 25, 26) in the inner surface thereof and the rotary member containing a plurality of longitudinal grooves (6, 7, 8) in the outer surface thereof, the grooves cooperating to control the pressure of hydraulic fluid guided therethrough for a power cylinder of the steering mechanism, the rotary member containing a plurality of radial bores (11, 12, 13, 14, 15, 16) connected with a tank for the return flow of hydraulic fluid from the valve, the improvement which comprises

(a) the bores being arranged in two radially spaced longitudinal rows (9, 9A), the bores of each row being spaced longitudinally;

(b) each row of bores corresponding to one of the grooves in the valve sleeve;

(c) a piston valve (60) arranged within the rotary member for selectively closing the bores; and

(d) adjustment means (67) connected with said piston valve for adjusting the position thereof as a function of a vari-

able of the motor vehicle, whereby said piston valve is displaced to selectively open and close the bores, thereby providing variable hydraulic pressure to the power cylinder of the steering mechanism in accordance with the variable of the motor vehicle.

5,086,688

HYDRAULIC BOOSTER DEVICE WITH VALVE MEANS FOR DAMPING OF INPUT ROD

Gilbert Kervagoret, Drancy, France, assignor to Bendix Europe Services Techniques, Drancy, France

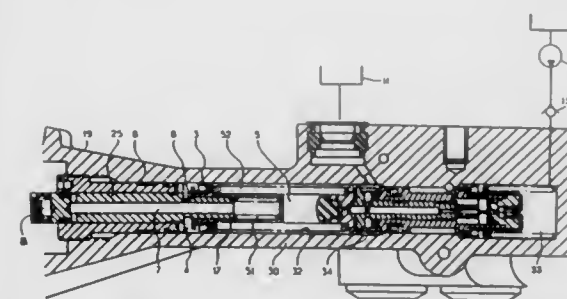
Filed Jan. 11, 1991, Ser. No. 639,844

Claims priority, application France, Jan. 31, 1990, 90 01118

Int. Cl.⁵ F15B 11/08, 13/04; B60T 15/04

U.S. Cl. 91—440

8 Claims



1. A hydraulic booster device for a brake circuit, comprising a body having a bore in which slide coaxially a pusher controlled by a brake pedal and piston means located between first and second chambers containing brake fluid, the first chamber receiving at least one spring which loads the pusher and the piston means away from one another, the first and second chambers bring connected respectively to sources of fluid under low pressure and under high pressure by valve means, and an auxiliary chamber of a volume variable as a function of the position of the pusher and located in said bore, the auxiliary chamber communicating with said first chamber permanently by means of a restriction and by auxiliary valve means for allowing communication during an increase in the volume of the auxiliary chamber and preventing communication during a reduction of volume of the auxiliary chamber.

5,086,689

AXIAL PISTON MACHINE

Kenji Masuda, Settsu, Japan, assignor to Daikin Industries Ltd., Osaka, Japan

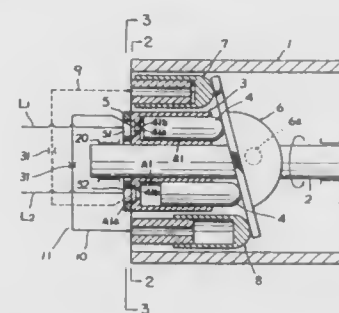
Filed Feb. 7, 1991, Ser. No. 651,974

Claims priority, application Japan, Feb. 15, 1990, 2-34990

Int. Cl.⁵ F01B 31/04

U.S. Cl. 91—499

6 Claims



1. An improvement in an axial piston machine provided with a housing, an even number of piston cylinder chambers rotatably supported to said housing and disposed concentrically with respect to the axis of rotation, a cylinder block provided with an even number of pistons housed in said piston cylinder

chambers in relation of being movable in reciprocation respectively, a driving shaft for driving said cylinder block, a swash plate for controlling a stroke of reciprocal movement of each of said pistons, and a valve member having the suction port and a discharge port communicating with said piston cylinder chambers respectively, comprising:

(a) first and second compensating pistons located opposite to said swash plate and disposed on said housing at the positions radially outward of said cylinder block and at the symmetrical positions in the vicinity of the upper dead point inclusive where said piston cylinder chamber transfers from said discharge port to said suction port and in the vicinity of the lower dead point inclusive where said piston cylinder chamber transfers from said suction port to discharge port; and

(b) control means for introducing control pressure to said first and second compensating piston, said control means being provided with a first control passage connected to the rear side of said first compensating piston and a second control pressure passage connected to the rear side of said second compensating piston, so that, when said piston cylinder chamber is positioned in the vicinity of said upper dead point, control pressure at the pressurized side is introduced to said second compensating piston through said second control pressure passage and, when said piston cylinder chamber is positioned in the vicinity of said lower dead point, control pressure at the pressure-reduction side is introduced to said first compensating piston through said first control pressure passage.

5,086,690

BOOSTER INTERLOCK DIVIDER AND DIAPHRAGM CONCEPT

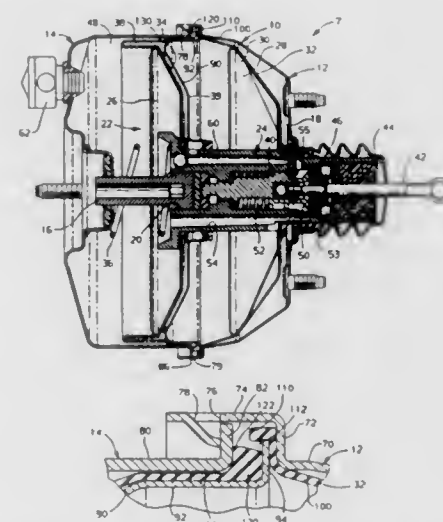
Donald M. Flory, Arcanum; Clark D. Moore, West Carrollton; Craig A. Osterday, Dayton, and Edward J. De Hoff, Huber Heights, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1991, Ser. No. 692,888

Int. Cl.⁵ F01B 19/00

U.S. Cl. 92—48

6 Claims



1. An interlock peripheral union for a vehicle vacuum actuated tandem dual diaphragm brake booster, the union in combination comprising:

a rigid first housing member providing a first pressure boundary having a first generally axially extending portion with a second radial flange portion joined thereto and a third generally axially extending portion joined to the second portion extending in a direction opposite the first axially extending portion, the third axially extending portion

tion having a series of slots allowing a portion of the third portion to be deformed radially inwardly forming tabs;

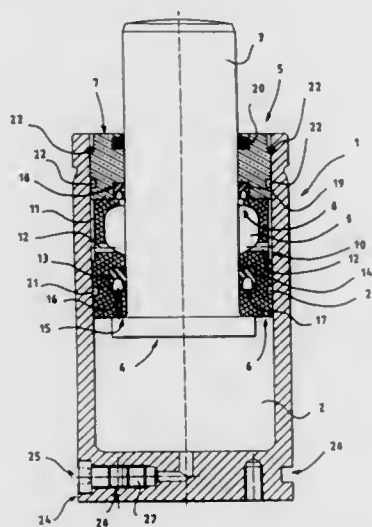
a rigid second housing member providing a pressure boundary, the second housing member having a generally axially extending first portion and a second radial flange portion joined to the first portion, the second portion providing a surface for contact with the first housing member third portion tabs;

a rigid divider providing a pressure boundary between the first and second housing members, the divider having a first portion extending generally axially and a second portion joined to the first portion extending generally radially outward being captured between the second portions of the first and second housing members;

a flexible first diaphragm providing a pressure boundary forming a peripherally sealed first control volume with an adjacent first or second housing member and a second peripherally sealed control volume with the divider, the first diaphragm having a bead head joined to a generally thin section, the thin section being adjacent to the second portion of the adjacent first or second housing member with the bead head overlapping the generally radial portion of the divider, and the first diaphragm sealing on both of the second portion of the adjacent housing member and against the second portion of the rigid divider member; and

a second flexible diaphragm providing a pressure boundary forming a peripherally sealed third controlled volume with the divider and a fourth peripherally sealed controlled volume with an adjacent first or second housing member, the second diaphragm having a bead head joined to a generally thin section, the second diaphragm bead head sealing against the second portion of the other of the housing members that the thin portion of the first diaphragm seals against and the second diaphragm bead head seals against the generally radial portion of the divider.

5,086,691
GAS COMPRESSION DEVICE HAVING ISOLATED COMPRESSION AND LUBRICATION CHAMBERS
 Didier von Hatten, Strasbourg, France, assignor to Societe des Usines Quiri & Cie, Schiltigheim, France
 Filed Oct. 19, 1990, Ser. No. 599,938
 Claims priority, application France, Oct. 19, 1989, 89 13897
 Int. Cl.⁵ F15B 21/04
 U.S. Cl. 92—83 12 Claims



1. A gas-compression device, comprising in combination:
 a substantially cylindrical body;
 a chamber formed within said cylindrical body for gas storage under pressure;

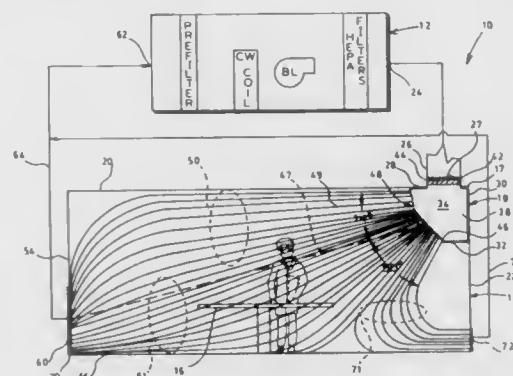
a piston partially projecting into said gas-storage chamber; upper and lower piston guiding sleeves surrounding said piston;

a principal lubrication chamber being formed within one of said guiding sleeves and being adapted to hold a lubricating fluid, separate and distinct from said gas stored under pressure within said chamber, for lubricating said guiding sleeves;

a pair of annular sealing joints accommodated within said guiding sleeves, at least one of said annular sealing joints being formed with an annular groove in communication with said gas-storage chamber, thereby exposing said one of said sealing joints to a pressure prevailing within said gas-storage chamber, the other one of said sealing joints being exposed to a constant pressure from the lubricating fluid, said at least one of said pair of annular sealing joints isolating said principal lubrication chamber from said gas-storage chamber; and

a subsidiary annular lubrication chamber defining communication between said principal lubrication chamber and said cylindrical body for facilitating heat dissipation from the lubricating fluid disposed within said principal lubrication chamber.

5,086,692
AIR HANDLING SYSTEM AND METHOD FOR AN OPERATING ROOM
 Henry W. Welch, 5332 Riverbriar, Knoxville, Tenn. 37919, and Theodore G. Bloomfield, 1140 Buxton Dr., Knoxville, Tenn. 37922
 Continuation-in-part of Ser. No. 508,860, Apr. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 280,600, Dec. 6, 1988, abandoned. This application Dec. 14, 1990, Ser. No. 627,598
 Int. Cl.⁵ E24F 7/007
 U.S. Cl. 454—187 10 Claims



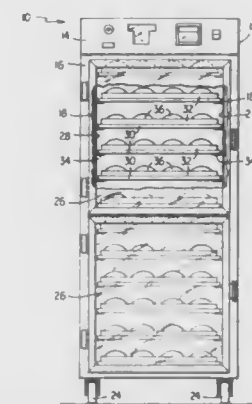
1. An air handling system for supplying filtered air to an operating room having an operating region where surgical procedures are performed so as to reduce airborne contaminants and improve comfort within said operating region, said operating region being provided with an operating table, said operating room including a first wall, an opposite wall, and having a ceiling and a floor, said operating room also having an upper corner defined by the intersection of said ceiling and said first wall, said air handling system being used in conjunction with an air supply unit provided with an air outlet and an air return inlet, said air handling system comprising:
 a plenum mounted at said upper corner of said operating room, said plenum defining an air chamber therein connected in fluid communication to said air outlet of said air supply unit whereby air, under pressure, is supplied to said air chamber, said plenum further defining at least one diffuser opening accessing said chamber to said operating room;
 at least one air diffuser for communicating said air within

said air chamber to said operating room, said air diffuser being closely received in said diffuser opening and disposed therein so as to depend downwardly from a point proximate said ceiling and converge with said first wall, said diffuser including an upper section and a lower section, said upper section being disposed at a first preselected angle for directing air flow emanating from said upper section in a first stream diagonally through said operating region above said operating table, said lower section being disposed at a second preselected angle for directing air flow emanating from said lower section in a second stream diagonally through said operating region toward said operating table;

at least one air return connected in fluid communication with said air return inlet of said air supply unit for removing a major portion of air from said operating room, said air return being disposed in said opposite wall proximate said floor of said operating room; and

at least one further air return connected in fluid communication with said air return inlet of said air supply unit for removing a minor portion of air from said operating room, said further air return disposed in said first wall proximate said floor of said operating room.

5,086,693
APPARATUS FOR HEATING AND COOLING FOOD ARTICLES
 Vincent P. Tippmann, 8605 N. River Rd., New Haven, Ind. 46774, and Joseph R. Tippmann, HRC-33, Box 8419, Rapid City, S. Dak. 57701
 Continuation of Ser. No. 542,600, Jun. 25, 1990, abandoned.
 This application Jul. 23, 1991, Ser. No. 735,178
 Int. Cl.⁵ A23L 1/00
 U.S. Cl. 99—333 10 Claims



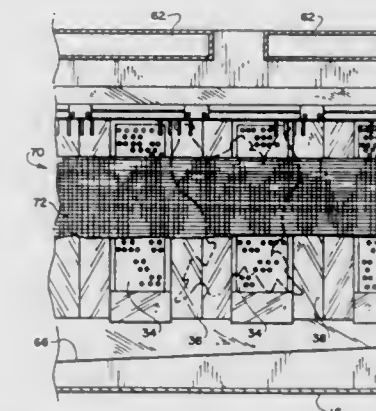
1. An apparatus for transferring heat to food articles contained within a chamber comprising:
 a) a chamber having at least two vertically upstanding, spaced-apart side walls and adjacent top and bottom walls, and at least one closure member permitting access to said chamber;
 b) a plurality of pans for holding said food articles within said chamber;
 c) a plurality of vertically spaced-apart support means between said walls, each of said support means being made of heat conductive material and supporting one of said pans, said support means including a plurality of spaced-apart tubular members, each tubular member having one end thereof connected to a first plenum and the other end thereof connected to a second plenum, said first and second plenums and each of said tubular members engaging said respective pan in heat conductive relationship;
 d) supply header means connecting said first plenums of each of said support means and return header means con-

necting said second plenums of each of said support means;

e) means for circulating a heated transfer fluid through said supply and return header means and said support means; and

f) means projecting into each of said tubular members from at least one of said first or second plenums, said means having an orifice sized to equilibrate the flow of said transfer fluid through said tubular members of each of said support means to ensure even heating of said food articles on each said pans.

5,086,694
APPARATUS FOR COOKING FOOD PRODUCTS, ESPECIALLY FOR BROILING WHOLE CHICKENS, WITH MEANS FOR CONTROLLING INTERNAL AIR TEMPERATURE
 Robert M. Stuck, 1 Thornwood Rd., Clover, S.C. 29710, and Samuel H. Maw, Jr., 1824 Santiago Dr., Newport Beach, Calif. 92660
 Filed Aug. 1, 1990, Ser. No. 561,056
 Int. Cl.⁵ A47J 37/04; A23L 1/025
 U.S. Cl. 99—443 C 6 Claims



1. Apparatus for cooking food products comprising a substantially enclosed housing, means within said housing for generating infrared cooking energy, said generating means including a first plurality of gas-burning heaters arranged in generally co-planar alignment with one another collectively forming a first energy-emitting face and a second plurality of gas-burning heaters arranged in generally co-planar alignment with one another collectively forming a second energy-emitting face, said first and second pluralities of heaters being spaced from one another in upright laterally-opposed facing relation for defining therebetween a cooking area, said first and second pluralities of heaters being arranged in a staggered relation to one another along said cooking path, reflector means arranged intermediate each pair of adjacent heaters of each said plurality for reflecting cooking energy emitted from the other said plurality of heaters, endless conveyor means for transporting food products along a cooking path through said cooking area between said energy-emitting faces, and hood means disposed above said cooking area for exhausting from said cooking area through said hood means smoke and other airborne effluent released from food products during cooking, said generating means, said reflectors means, and said exhaust means being cooperative to maintain the temperature of ambient air within said cooking area generally constant without regard to the frequency at which food products are transported by said conveyor means through said cooking area.

5,086,695
COMPOSITION FOR THE FOUR-COLOR ENAMELLING
BY SERIGRAPHY OF GLASS OBJECTS

Stephane Czczota, Saintes, France, assignor to Societe Nouvelle d'Applications Serigraphiques, Saintes, France
Continuation of Ser. No. 304,195, Jan. 31, 1989, abandoned. This application Dec. 31, 1990, Ser. No. 633,208

Claims priority, application France, Feb. 5, 1989, 88 01389
Int. Cl.³ B41F 15/00; C03C 17/34

U.S. Cl. 101—129 10 Claims

1. A method for serigraphically printing a multicolor design with enamel pigments on a glass object which comprises providing four color separation of the multicolor design, reproducing each color separation design on a printing screen such that only the screen openings corresponding to the particular color are left open for passage therethrough of a molten enamel coloring composition, depositing an enamel coloring composition for one of the primary colors magenta, yellow, cyan and black on each respective printing screen for the corresponding color separation, said enamel coloring composition for magenta comprising a red enamel and a cadmiferous lead borosilicate frit as a transparentizing agent, said enamel coloring composition for yellow comprising an enamel and a cadmiferous lead borosilicate frit transparentizing agent, said enamel coloring composition for cyan comprising a blue enamel and a cadmiferous lead borosilicate frit transparentizing agent, and said enamel coloring composition for black comprising a black enamel and a cadmiferous lead borosilicate transparentizing frit, successively applying each of said transparentizable enamel color compositions magenta, yellow, cyan and black via a serigraphy machine to the glass object by thermally melting the respective compositions whereby the compositions pass through the printing screen onto the glass object, and heating the covered glass object to thereby form said multicolor design on the glass object.

5,086,696
WETTING/INKING MECHANISM FOR OFFSET
PRINTING PRESSES

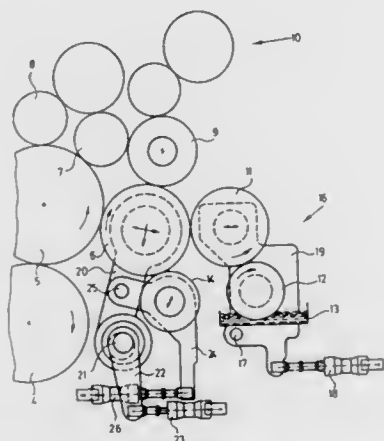
Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 288,790, Dec. 22, 1988, Pat. No. 4,922,818. This application Mar. 22, 1990, Ser. No. 497,443
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 8904197[U]

Int. Cl.³ B41F 7/26, 7/36

U.S. Cl. 101—148

15 Claims



1. A printing press for printing a document comprising: first plate cylinder means; first ink applicator roller means for being in contact with

said first plate cylinder means and for applying an ink to said plate cylinder means; wetting application roller means for being in contact with said first plate cylinder means and for applying a wetting agent to said plate cylinder means; and first roller means for being in contact with at least one of said first ink applicator roller means and said wetting medium application roller means; said first roller means for distributing at least one of said wetting agent and said ink; said first roller means defining an exterior surface having a generally uniform roughness over generally all portions of the entire exterior surface of said first roller means; said generally uniform roughness being in the range of fifteen micrometers to twenty micrometers, whereby at least one of ghosting and scumming is reduced.

5,086,697
INKED RIBBON CARTRIDGE FOR MONEY ORDER
IMPRINTER

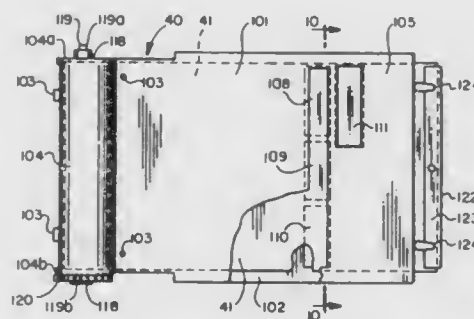
Robert P. Koper, Bensenville, and Howard R. Konieczka, Chicago, both of Ill., assignors to The Paymaster Corporation, Chicago, Ill.

Division of Ser. No. 418,670, Oct. 10, 1989, Pat. No. 4,995,315. This application Dec. 6, 1990, Ser. No. 622,928

Int. Cl.³ B41F 1/04; B41J 1/58

U.S. Cl. 101—336

8 Claims



1. An inked ribbon cartridge for use with an apparatus for imprinting an instrument, comprising:

- a ribbon,
- a spool
- and a housing including a first housing member and a second housing member constructed and arranged to be assembled together enclosing said ribbon and said spool therein,
- said first and second housing members when assembled together defining a spool receiving chamber,
- a ribbon guide portion
- and a throat portion communicating said chamber with said ribbon guide portion,
- said first housing member having a first flat panel portion and said second housing member having a second flat panel portion overlying said first panel portion to provide said ribbon guide portion,
- said ribbon being adapted for advancement bidirectionally through said ribbon guide portion between said first and second panel portions thereof, said first panel portion having first and second windows therethrough and said second panel portion having first and second windows therethrough and aligned with said first and second windows in said first panel portion exposing therethrough first and second portions of said ribbon as said ribbon is advanced through said ribbon guide portion.

5,086,698
DEVICE FOR SMOOTHING A SHEET ON AN
IMPRESSION CYLINDER OF A SHEET-FED ROTARY
PRINTING MACHINE

Arno Wirz, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

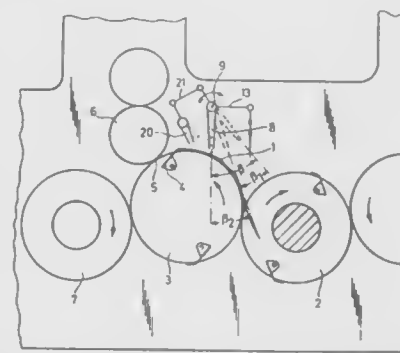
Filed Jun. 22, 1990, Ser. No. 542,425

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1989, 3920730

Int. Cl.³ B41F 1/30

U.S. Cl. 101—409

6 Claims



1. Device for smoothly applying a sheet for printing onto an impression cylinder upstream of a printing gap of a sheet-fed rotary offset printing machine in travel direction of the sheet through the printing machine and including at least one jet nozzle capable of being directed towards the circumference of the impression cylinder for pressing the sheet by blowing air force against the circumference, comprising drive means for swingingly reciprocating the jet nozzle in travel direction of the sheet during an operating cycle of the printing machine, the jet nozzle being mounted at a spaced distance and upstream from a printing gap and being swingable in a pendular manner about a pendulum axis extending parallel to an axis of the impression cylinder, the jet nozzle being coupleable having a nozzle opening extending over a major part of the width of the impression cylinder.

5,086,699
COMBINATION ROLL COVERING AND SPECIALLY
CONFIGURED PRINTING PLATE SECUREMENT
APPARATUS

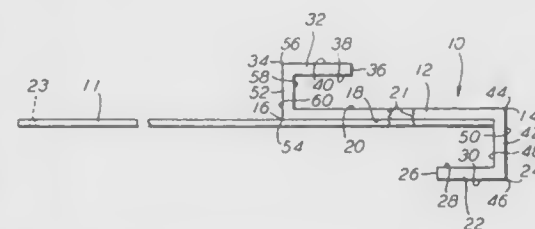
Ivan N. Philpot, Irving, Tex., assignor to Matthews International Inc., Pittsburgh, Pa.

Filed Mar. 27, 1991, Ser. No. 675,744

Int. Cl.³ B41F 27/00

U.S. Cl. 101—415.1

20 Claims



1. A combination flexible roll covering member and specially configured printing plate securement apparatus for use both in securing at least one printing plate disposed on an upper surface of a print plate carrier sheet to at least a predetermined portion of a working surface of at least one printing plate cylinder having a groove-like portion and disposed in at least one print station of a printing arrangement and in achieving a relatively rapid alignment of such flexible roll covering

member and such printing plate in a predetermined position on such working surface of such printing plate cylinder, said combination flexible roll covering member and specially configured printing plate securement apparatus comprising:

- (a) a first elongated and substantially flat strip-like portion having each of axially opposed outer edges and axially opposed surfaces, said first flat strip-like portion further having a first predetermined length and a first predetermined width and a first predetermined thickness;
- (b) a generally flexible and substantially rectangular-shape sheet-like member having axially opposed surfaces and a pair of axially opposed outer edges, said sheet-like member having a predetermined length and a predetermined width and a predetermined thickness, a narrow portion of an upper surface of said sheet-like member being engaged with at least a substantial portion of a first surface of said axially opposed surfaces of said first flat strip-like portion adjacent a first outer edge of a first of said pair of axially opposed outer edges of said sheet-like member, said first outer edge of said first of said pair of axially opposed outer edges of said sheet-like member being located along said predetermined width of said sheet-like member and said at least a substantial portion of said first surface of said axially opposed surfaces of said first flat strip-like portion being located along said first predetermined length of said first flat strip-like portion;
- (c) a securing means engageable with said first flat strip-like portion and said sheet-like member for securing said narrow portion of said sheet-like member to said substantial portion of said first surface of said axially opposed surfaces of said first flat strip-like portion;
- (d) a second elongated and substantially flat strip-like portion having each of axially opposed outer edges and axially opposed surfaces, said second flat strip-like portion further having a second predetermined length and a second predetermined width, which is less than said first predetermined width of said first flat strip-like portion, and a second predetermined thickness, a first surface of said axially opposed surfaces of said second flat strip-like portion facing a first surface of said axially opposed surfaces of said first flat strip-like portion and a bottom surface of said axially opposed surfaces of said sheet-like member;
- (e) a third elongated and substantially flat strip-like portion having each of axially opposed outer edges and axially opposed surfaces, said third flat strip-like portion further having a third predetermined length and a third predetermined width, which is less than said first predetermined width of said first flat strip-like portion, and a third predetermined thickness, a first surface of said axially opposed surfaces of said third flat strip-like portion facing a second surface of said axially opposed surfaces of said first flat strip-like portion;
- (f) a first elongated connecting strip-like portion having axially opposed outer edges and axially opposed surfaces, said first connecting strip-like portion further having a fourth predetermined length and a fourth predetermined width and a fourth predetermined thickness; a first outer edge of said axially opposed outer edges of said first connecting strip-like portion being connected to a first outer edge of said axially opposed outer edges of said first flat strip-like portion along said first predetermined length of said first flat strip-like portion and said fourth predetermined length of said first connecting strip-like portion and a second outer edge of said axially opposed outer edges of said first connecting strip-like portion being connected to a first outer edge of said axially opposed outer edges of said second flat strip-like portion along said second predetermined length of said second flat strip-like portion and said fourth predetermined length of said first connecting strip-like portion, a second outer edge of said axially opposed outer edges of said second flat strip-like portion being engageable in such groove-like portion formed adjacent a working surface of such printing plate cylinder

and substantially parallel to a longitudinal axis thereof; and

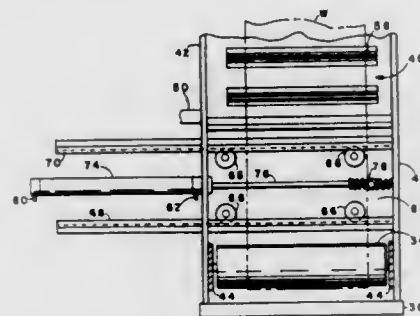
- (g) a second elongated connecting strip-like portion having axially opposed outer edges and axially opposed surfaces, said second connecting strip-like portion further having a fifth predetermined length and a fifth predetermined width, which is equal to or less than said fourth predetermined width of said first connecting strip-like portion, and a fifth predetermined thickness, a first outer edge of said axially opposed outer edges of said second connecting strip-like portion being connected to a second outer edge of said axially opposed outer edges of said first flat strip-like portion along said first predetermined length of said first flat strip-like portion and said fifth predetermined length of said second connecting strip-like portion and a second outer edge of said axially opposed outer edges of said second connecting strip-like portion being connected along said fifth predetermined length thereof to a first outer edge of said axially opposed outer edges of said third flat strip-like portion along said third predetermined length thereof, thereby forming a specially configured S-shaped printing plate securement apparatus.

5,086,700

DRYING/CURING APPARATUS FOR PRINTING PRESSES

Eduard Van Den Berg, 990 St. Paul Dr., Cincinnati, Ohio 45206
 Filed Sep. 10, 1990, Ser. No. 579,471
 Int. Cl.⁵ B41F 35/00
 U.S. Cl. 101—424.1

1 Claim



1. A print module comprising a pair of vertical side frame plates, a printing head for imprinting ink on a web of printable material moving therepast, and drying/curing apparatus disposed downstream of the printing head and comprising a hot air dryer, mounted on the side frame plates, for directing hot air against the printed surface of the web as it moves therepast, and a radiation unit, mounted on the side frame plates, for directing ultra violet radiation against the web as it moves therepast through a given length of travel, means defining a downward, vertical path of travel of the web past the hot air dryer and radiation unit, and shutter means for blocking radiation from the web when movement of the web is halted, characterized in that the shutter means comprise a shutter plate disposed in a plane generally parallel to the path of travel of the web past the radiation unit, and having a height at least as great as the length of travel to which the web is exposed to radiation from the radiation unit, and an air motor for displacing said shutter plate between a "print" position permitting the web to be exposed to radiation and a blocking position in which the shutter plate is disposed between the web and the radiation unit and blocks radiation from the web, one of the side frame plates having an opening through

which the shutter plate passes in being displaced between said "print" and blocking positions, said "print" position of the shutter plate being laterally to one side of the path of travel of the web, means for guiding said shutter plate in a rectilinear path of travel between said "print" position and said blocking position, said means guiding the shutter plate for rectilinear movement comprising a pair of grooved rails disposed adjacent the top and bottom of said shutter plate and extending between said side frame plates and outwardly of the side frame plate in which said opening is formed, and rollers, mounted on said shutter plate and riding in said grooved rails, said air motor comprising a cylinder mounted on and extending outwardly from the side frame plate in which said opening is formed, and a rod projecting through said side frame plate and connected to the shutter plate at a point between the side frame plates, said rod displacing the shutter plate in an extended position thereof and displacing the shutter plate to its "print" position in a retracted position thereof, and the air motor rod connection with the shutter plate is disposed adjacent the other of said side frame plates in the blocking position of the shutter plate and is disposed adjacent said one side frame plate in the "print" position of the shutter plate, further characterized by first shock absorbing means mounted on said connection and engageable with said other side frame plate when the rod is displaced to its extended position, and second shock absorbing means mounted on said connection for minimizing shock when the rod is displaced to its retracted position.

5,086,701

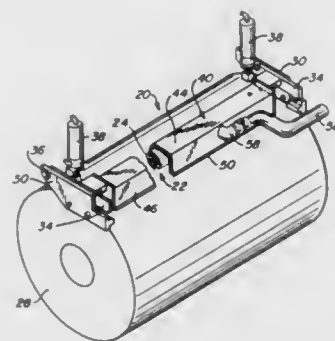
PRINTING PRESS BLANKET CLEANER

Charles R. Gasparrini, Rye, N.Y., and Carl Arnolds, Stamford, Conn., assignors to Baldwin Technology Corp., Stamford, Conn.

Filed Nov. 17, 1988, Ser. No. 272,635
 The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.
 Int. Cl.⁵ B41F 35/02

U.S. Cl. 101—425

10 Claims



1. A dry mechanical cleaning system for removing dirt and lint from a blanket cylinder of an offset printing press having at least one blanket cylinder, said cleaning system comprising: (a) a blanket cleaner mounting frame attached to a press frame adjacent the blanket cylinder; (b) arm means movably connecting said mounting frame and said press frame; (c) brush housing means attached to said movable arm means and adapted to extend along the length of the blanket cylinder; (d) said housing means being adapted to enclose a portion of the surface of said blanket cylinder;

- (e) means for moving said arm means to and from a first position away from said blanket cylinder and to and from a second position adjacent said blanket cylinder; (f) rotatable brush means mounted within and enclosed by said housing means and adapted to engage said blanket cylinder when said rotatable brush means is in said second position; (g) means for rotating said rotatable brush means; (h) vacuum flow means in cooperative relationship with said housing to establish a flow path within said housing at predetermined times whereby said brush means will loosen dirt and lint without the use of liquid from said rotating blanket cylinder permitting said vacuum flow means and housing to remove such dirt and lint; and (i) said housing means includes sealing means extending from said housing into contact with said blanket cylinder to provide a sealing surface between said blanket cylinder and said housing when said cleaner is in said second position adjacent said blanket cylinder.

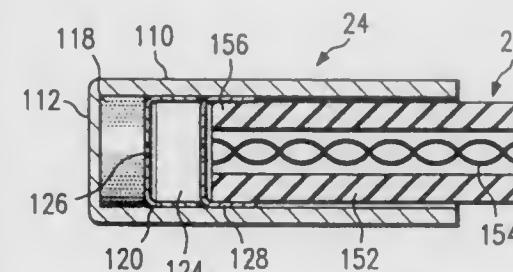
5,086,702

MODULAR BLASTING SYSTEM

Merritt Jacob, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Division of Ser. No. 507,739, Apr. 12, 1990. This application
 Feb. 20, 1991, Ser. No. 657,997
 Int. Cl.⁵ C06C 5/04; F42B 3/10; F42C 19/10
 U.S. Cl. 102—275.5

17 Claims



1. A cap used in blasting for a modular blasting system comprising: (a) a wall defining a volume closed at the first end and open at the second end; (b) an explosive element at the first end of said wall defining a volume; (c) a blow-back preventing chamber comprising a cup with a closed bottom end and open top end, said bottom end in close proximity to said explosive element, said closed bottom end penetrated by a detonation transmission passageway, permitting a detonation signal to be transmitted to said explosive charge received from said second end, but preventing the transmission of a detonation signal resulting from accidental discharge of said explosive element from being transferred to said second end of the wall defining said volume, and (d) a receiving cup adjacent to said blow-back preventing chamber.

5,086,703

UNIVERSAL PROJECTILE AMMUNITION

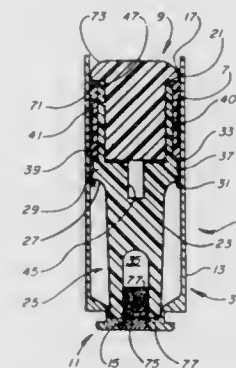
John M. Klein, 5100 Wah-Ta-Wah, Clarkston, Mich. 48016

Filed Feb. 5, 1991, Ser. No. 651,290
 Int. Cl.⁵ F42B 8/02
 U.S. Cl. 102—439

16 Claims

1. A universal projectile ammunition comprising: (a) a projectile body, removably emplaceably within a shell casing; the body having a first leg and a hollow, cylindrical second leg, the second leg having a central cavity

provided therein, the second leg having at least one longitudinally extending ridge formed thereon;



- (b) a sleeve mountable onto the second leg, the sleeve having at least one longitudinally extending cavity formed therein, the cavity receiving the ridge therewithin; and, (c) a closure member for sealing the central cavity.

5,086,704

MOTOR VEHICLE TURNTABLE

Wieland R. Mueller, Aliquippa, Pa., assignor to Michael E. Mueller, Richmond, Canada

Filed Sep. 17, 1990, Ser. No. 583,465
 Int. Cl.⁵ B60S 13/02
 U.S. Cl. 104—44

12 Claims



1. A motor vehicle turntable comprising: a circular vehicle receiving platform supported by a polygonal support frame; a recessed cylindrical pit receiving said platform and said frame so that the upper surface of said platform is level with the surrounding terrain into which said pit is formed; bearing means to rotatably support said platform and said support frame for rotation about the axis of said circular vehicle receiving platform; a drive chain directly frictionally engaging the perimeter of said polygonal support frame to rotate said receiving platform when said chain is moved; a drive sprocket engaging said drive chain and being rotated by a drive motor upon selective rotation of said motor whereby said chain is moved to rotate said platform; spring means to maintain said chain in direct frictional engagement with said polygonal support frame when said motor operates to rotate said platform and to release the frictional engagement between said chain and said polygonal support frame when said platform is rotated manually in the same direction;

said spring biasing means operating to relieve tension on said chain automatically whereby said platform has a manually operated mode when said motor is not operating and said platform is moved manually in the same direction as it normally operates by manually moving said polygonal support frame relative to said chain.

5,086,705

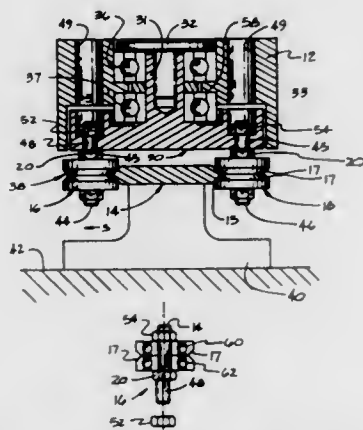
LINEAR POSITIONING SYSTEM

Bernard Jarvis, 209 W. 23rd St., Hutchinson, Kans. 67501, Edward L. Dobkins, 2500 E. 40th, Hutchinson, Kans. 67502, and Filed Feb. 26, 1990, Ser. No. 485,090

Int. Cl.⁵ B61B 13/04

U.S. Cl. 105—30

8 Claims



1. A carriage and rail positioning system providing precise linear and arcuate movement of a workpiece comprising:
 - a longitudinally extending fixed rail of uniform width and thickness including linear and arcuate sections, the rail having two opposed running surfaces on the sides thereof;
 - a carriage means for transporting a workpiece along said rail including a base;
 - a pair of bogies each connected to the base by a rotatable journal positioned on an axis parallel to the other bogie axis of rotation;
 - a pair of ball bearing assemblies rigidly mounted on each bogie on axes parallel to the bogie axes of rotation and spaced apart a fixed distance for retention and contact of the ball bearing assemblies with said opposing rail running surfaces; and
 - a mounting shaft rotatably journaling each ball bearing assembly to its respective bogie, including an eccentric journal for lateral shifting of the ball bearing assembly to preload the ball bearing assembly on the rail.

5,086,706

HINGED BOGEY FOR RAIL VEHICLES

Gilbert Boivin, Saint Pierre de Varennes, France, assignor to GEC Alsthom SA, Paris, France

Filed Jul. 13, 1990, Ser. No. 552,035

Claims priority, application France, Jul. 18, 1989, 89 09619

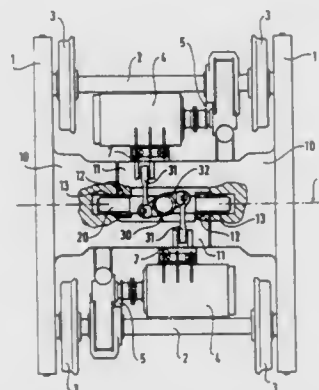
Int. Cl.⁵ B61F 5/02

U.S. Cl. 105—168

6 Claims

1. A hinged bogey for rail vehicles, the bogey comprising two longitudinal members, two cross-members each fixed respectively to one of the longitudinal members, and a hinge device enabling each longitudinal member to pitch about a central transverse axis, wherein the hinge device comprises a shaft disposed along the transverse axis which is central to the bogey and four bearings supporting the shaft, with the cross-members being mounted head-to-tail, each end of the shaft being supported by bearings, one of which belongs to one of

the cross-members and the other of which belongs to the other cross member, and wherein one of the two bearings at each end



of the of the shaft is a resilient hinge and wherein the other bearing is a spherical hinge acting as an axial abutment.

5,086,707

SELF ADJUSTING CONSTANT CONTACT SIDE BEARING FOR RAILCARS

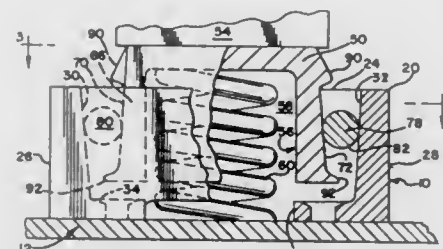
Charles P. Spencer, Staunton, Ill., and Terry L. Pitchford, Florissant, Mo., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 15, 1991, Ser. No. 685,044

Int. Cl.⁵ F16F 1/36

U.S. Cl. 105—199.3

20 Claims



13. An improved railcar truck side bearing, said side bearing comprising:
 - a base member of boxlike shape having two upstanding side walls, two upstanding end walls and a bottom part for attachment to a truck bolster;
 - a cap member mounted within said side walls and end walls of said base member, said cap member having a depending skirt with two end portions in spaced opposition to said end walls of said base member;
 - sloped outer surfaces on each of said end portions of said cap members;
 - sloped inner surfaces on each of said end walls of said base member, said sloped inner and outer surfaces being inclined to converge inwardly toward said bottom part of said base member;
 - spacing means for maintaining each of said sloped outer surfaces separated from an opposing said sloped inner surface, said spacing means being positioned between each said end portion of said cap member and said end wall of said base member;
 - and a biasing member under said cap member to urge said cap member upwardly of said base member.

5,086,708

RAILCAR TRUCK BOLSTER WITH IMMOBILIZED FRICTION SHOES

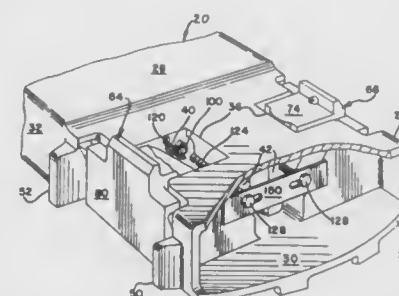
Franklin S. McKeown, Jr., St. Louis, Mo.; Charles Moehling, Arlington Heights, and Charles P. Spencer, Staunton, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Nov. 1, 1990, Ser. No. 607,828

Int. Cl.⁵ B61F 5/40

U.S. Cl. 105—207

4 Claims



1. In a combination of a friction shoe and a railcar truck pocket for spring biased reception of the shoe wherein opposite pocket walls and a portion of the shoe each have apertures that may be aligned to receive an immobilizing means when the shoe is compressed within the pocket, the improvement comprising:

guiding means within said pocket concentric with one of said apertures on a pocket wall directing said immobilizing means into said one aperture, said immobilizing means comprising a threaded pin having one pointed end and an enlarged opposite end, said pointed end being extended through said one aperture and said guiding means, and wherein said friction shoe is immobilized in a pocket at an end of a truck bolster, and further including a spacer strap between said enlarged opposite end of said pin and an outer surface of an outboard pocket wall to space said enlarged end from said outboard pocket wall.

5,086,709

SLIDING GATE STRUCTURE WITH DUAL LINKAGE PER SINGLE ACTUATOR ARRANGEMENT

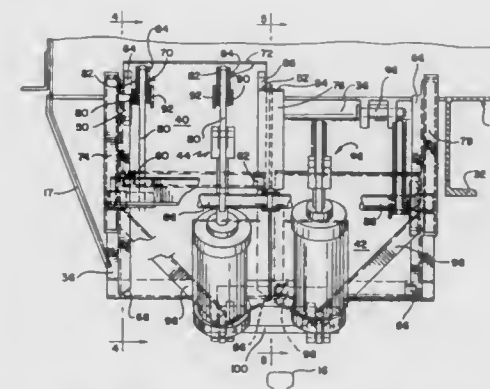
Robert T. Fischer, Homewood, and Guadalupe L. Galvan, DeKalb, both of Ill., assignors to Miner Enterprises, Inc., Geneva, Ill.

Filed Jan. 25, 1990, Ser. No. 469,990

Int. Cl.⁵ B61D 7/20

U.S. Cl. 105—282.1

1 Claim



1. A sliding gate structure for a railroad hopper car, said hopper car having a housing with sidewalls and an opening defined by said housing between said sidewalls and through which material is discharged from said car, said opening being

provided at a lower end of a slanted chute defined by said housing, said sliding gate structure comprising:

first and second sliding gates arranged side-by-side beneath said opening to regulate the discharge of material there-through, each gate being mounted for movement along a predetermined linear path within guide tracks connected to said housing;

each of said gates defines a generally planar surface which is moved relative to said opening, said planar surface being inclined relative to said predetermined path of movement to reduce the effort required to open said gate; and

operative means for independently moving each sliding gate between closed and open positions, said operative means including a pair of linkage assemblies connected to each sliding gate, each linkage assembly being connected at a first end to opposite sides of one of said sliding gates and at a second end to said housing to inhibit the gate from skewing relative to said guide tracks during its movement, wherein each linkage assembly includes a first lever connected at a first end to said gate and a second end, and a second lever with a first end connected to said housing and a second end, and wherein the second end of each lever is rotatably joined to each other; a fluid operating cylinder operable in combination with each pair of said linkage assemblies for slidably moving the respective gates between closed and open positions, said cylinder being secured to said housing and to said second lever of only one of said linkage assemblies whereby about a 2:1 ratio between gate movement and cylinder distention is achieved when said gate is moved into either an open position or a closed position, and said cylinder provides an opening push force which is directed substantially perpendicular to said second lever; and

control means arranged proximate a side of the hopper car for regulating fluid flow from a source of pressurized fluid to said cylinder to control movement of said gates.

5,086,710

TABLE WITH SUPPORT FRAME AND TABLETOP AND CONTROL DEVICE FOR VARYING THE HEIGHT AND INCLINATION OF THE TABLETOP

Daniel Korb, Stuttgart, Fed. Rep. of Germany, assignor to Dyes GmbH, Fed. Rep. of Germany

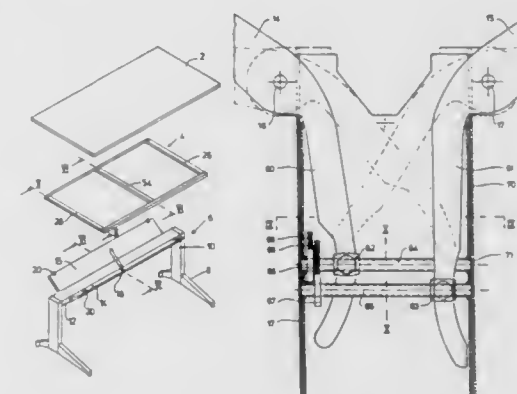
Filed Oct. 18, 1989, Ser. No. 423,148

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1988, 38 35 591

Int. Cl.⁵ A47F 5/12

U.S. Cl. 108—4

27 Claims

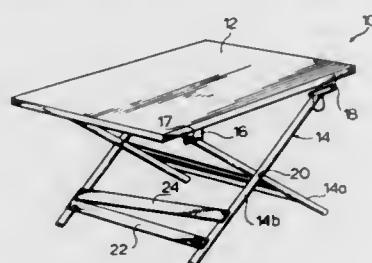


1. A table having a table frame (4), a tabletop (2) and a control device (11) for adjusting height and inclination of the table, the control device (11) comprising: two support devices (14, 15) pivotally attached to an upper region of a transverse middle of a support frame (6) about transversely extending frame pivot shafts (16, 17);

at least one guide arm (18) pivotally connected to an under-

side of the tabletop (2) and pivotally supported on the support frame (6) near a rear end of a skirt (12); the support devices (14, 15) on the underside of the tabletop (2) supported on the tabletop (2) about transversely extending tabletop pivot shafts (30, 31), and the support devices (14, 15) are guided adjustably by means in a depth of the tabletop (2); and the control device (11) selectively raises at least one of the support devices (14, 15) in an upward direction toward the tabletop (2), the control device (11) selectively lowers at least one of the support devices (14, 15) in a downward direction toward the support frame (6), and the tabletop pivot shafts (30, 31) of the support devices (14, 15) are movable relative to one another.

5,086,711
COLLAPSIBLE TABLE
Ernest Matthews, 143A, Belmont Circular Road, Belmont, Trinidad and Tobago
Filed May 7, 1990, Ser. No. 519,215
Claims priority, application Trinidad and Tobago, May 5, 1989, 40/1989
Int. Cl.⁵ A47B 3/02
U.S. Cl. 108—119 3 Claims

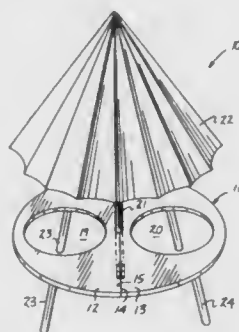


1. A collapsible table comprising a table top, and at least a first and a second leg having a scissors action connection to one another, said first leg being pivotally secured at a first location to said table top, said second leg being pivotally and removably secured by attaching means at a second location to said table top spaced from said first location, said second leg having a hole provided therethrough in the portion removably secured by said attaching means; said attaching means comprising a bracket attached to the table top at said second location, said bracket being provided with at least one hole therethrough, said hole in said second leg and at least one said hole in said bracket aligning when said second leg is placed at said second location in said bracket; securing pin means for placement in said aligned holes to secure said leg to said bracket, said securing pin means having an enlarged head; and releasable locking means is a locking lever pivotally secured to said bracket having a securing pin means receiving means for releasably securing said securing pin means when said securing pin means is placed in said aligned holes, said securing pin means receiving means being provided by a depression in said locking means of a size to releasably catch and harbor said enlarged head of said securing pin means.

5,086,712
PORTABLE COASTER KIT
Dale A. Clark, 2065 Pagan Pl., Louisville, Ky. 40218
Filed Mar. 4, 1991, Ser. No. 663,684
Int. Cl.⁵ A47B 35/00
U.S. Cl. 108—50 5 Claims

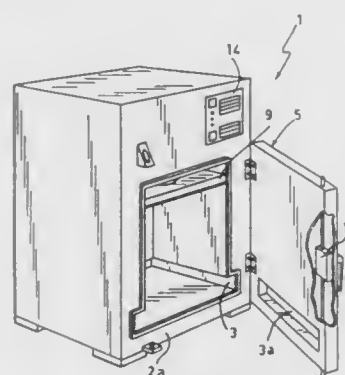
1. A portable coaster kit comprising, combination, a support table, the support table including a first and second support plate, wherein each support plate includes a re-

spective first and second hinge line, wherein each hinge line is coextensively and contiguously arranged in communication relative to one another, and a plurality of hinges spanning the first and second hinge line hingedly mounting the first and second support plates together, and the respective first and second hinge line including a respective first and second semi-cylindrical opening mounted medially of the respective first and second hinge line, wherein the first and second semi-cylindrical openings are



in contiguous communication to define a cylindrical opening when the first and second support plates are in planar alignment relative to one another, and an umbrella shaft slidably and removably mounted within the first and second semi-cylindrical openings when the first and second support plates are in planar alignment, with the umbrella shaft including an umbrella canopy at an upper terminal end thereof, and a first leg pair hingedly mounted to a bottom surface of the first support plate, and a second leg pair hingedly mounted to a bottom surface of the second support plate.

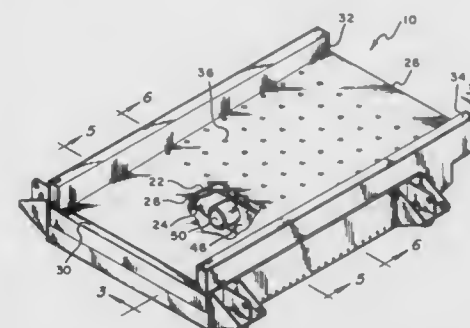
5,086,713
REFUSE-TREATING UNIT
Antonietta Dessi, Vaduz, Liechtenstein, assignor to Biogen Ltd., Liechtenstein
Filed Oct. 29, 1990, Ser. No. 605,572
Claims priority, application Switzerland, Nov. 1, 1989, 3954/89
Int. Cl.⁵ F23G 5/00, 5/10
U.S. Cl. 110—250 9 Claims



1. A refuse-treating unit comprising: a treatment chamber containing a predetermined amount of refuse and having a tight-closure access door and a safety locking device which prevent said door from opening while said treating unit is in operation; a suction and filtering apparatus which removes and filters air and gases produced within said treatment chamber; an inlet air valve that admits cooling air in said treatment chamber; means forming a sterilization apparatus disposed within said

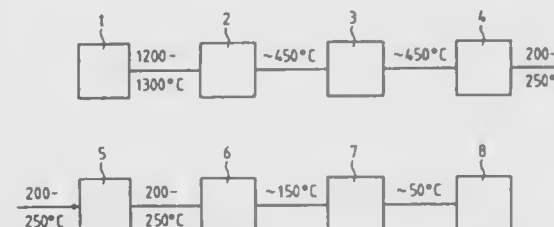
treatment chamber and including resistors which heat said refuse amount until the refuse amount is reduced, at least partly, to a pasty state, and a compacting device having a fluid-operated cylinder which includes a work plate that presses and converts said refuse amount, which was previously heated to a pasty state, into a compact block.

5,086,714
VIBRATORY HEARTH
Kenneth W. Hladun, 1137 N. Woodbine Ave., Narberth, Pa. 19072
Filed Apr. 16, 1990, Ser. No. 509,085
Int. Cl.⁵ F23H 7/00, 13/02; F23J 1/02; F23G 5/12
U.S. Cl. 110—281 13 Claims



1. In a vibratory hearth having a substantially planar upper surface and a plurality of openings therein for passing combustion air upwardly therethrough from beneath said surface, the improvement comprising an ash bin located beneath said openings for catching ashes that fall downwardly through the same, said ash bin being in the form of a substantially closed plenum having an input at one end adapted to be connected to an air supply source and an output adjacent the other end thereof for removing the ash within said ash bin; said openings having tops and bottoms which are smaller in diameter at the tops than at the bottoms.

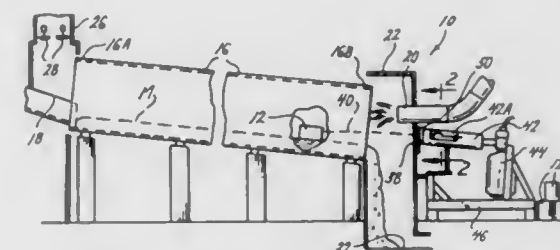
5,086,715
PROCESS FOR INCINERATING HETEROGENEOUS COMBUSTIBLE MATERIAL
Markus E. Bürgin, Berikon, and Martin R. Zweifel, Wetztingen, both of Switzerland, assignors to W&E Umwelttechnik AG, Zurich, Switzerland
Filed Jun. 27, 1990, Ser. No. 545,237
Claims priority, application Switzerland, Jun. 29, 1989, 2427/89
Int. Cl.⁵ F23B 7/00
U.S. Cl. 110—342 10 Claims



2. A process for incinerating heterogeneous combustible material, especially refuse, in an incinerator furnace, the flue gases formed in the incineration of the refuse being discharged from the combustion chamber of the furnace and being cooled, dedusted and purified, which comprises at least the steps of: cooling the flue gases in a first cooling stage, in particular

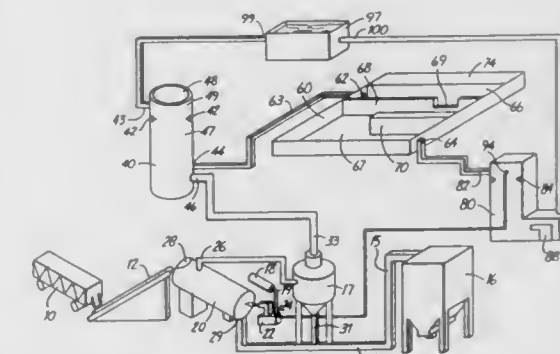
with heat recovery from the flue gases, from their exit temperature from the combustion chamber of 1000°-1200° C. to a temperature of about 450° C., rapidly cooling the flue gases by shock-cooling means to a temperature of 200°-250° C. to avoid substantially the formation of toxic dioxins and furans in the flue gases.

5,086,716
SYSTEM, APPARATUS AND METHOD FOR DISPOSING OF SOLID WASTE
Fred A. Lafser, Jr., University City, Mo., assignor to Industrial Waste Management, Inc., St. Louis, Mo.
Filed Apr. 30, 1990, Ser. No. 516,210
Int. Cl.⁵ F23G 7/04
U.S. Cl. 110—345 6 Claims



1. A method for disposing of solid waste in a rotary kiln of the type which produces cement, the kiln comprising a rotating, generally cylindrical vessel having first and second longitudinally opposite ends and means for heating gases in the interior of the vessel to progressively greater temperatures from one end to the other end for processing material in the vessel, the interior of the kiln including at least two zones, a calcining zone wherein the temperature ranges from approximately 950° C. to 1200° C. and a clinkering zone wherein the temperature ranges from above 1200° C. to approximately 1925° C., the method comprising the step of delivering pre-packaged sealed containers of solid waste to the clinkering zone inside the vessel.

5,086,717
SOIL REMEDIATION METHOD AND APPARATUS
Charles McCrossan, Box 1240, 7865 Jefferson Hwy., Maple Grove, Minn. 55369
Filed Jan. 23, 1991, Ser. No. 644,335
Int. Cl.⁵ F23G 5/02
U.S. Cl. 110—346 11 Claims



1. A method for removing volatile organic compounds (VOC's) from soil comprising: heating the soil in a burner-heated drum to vaporize at least a substantial portion of the VOC's, some of which may be combusted;

ducting the vaporized VOC's to an air scrubber and absorbing a substantial portion of the vaporized VOC's into the scrubber water;
conducting the VOC-laden scrubber water to a settling basin to permit any soil particulates to settle out of the water; withdrawing the VOC-laden water which is substantially free of soil particulates from the basin and removing the VOC's from such water by vaporizing them in an air stripper;
conducting the vaporized VOC's to the burner and burning them to help heat the drum; and
returning the water from which the VOC's have been stripped to the air scrubber for use in absorbing VOC's coming from the drum.

5,086,718

SEWING MACHINE WITH AUTOMATIC THREAD TAKE-UP AND THREADING

Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

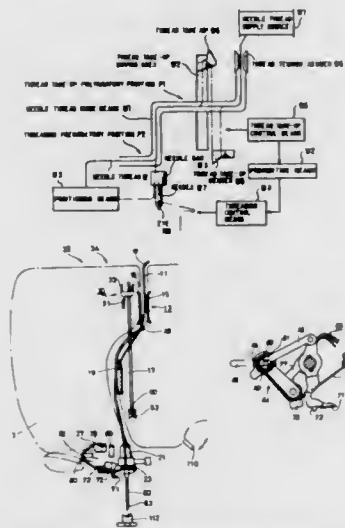
Filed Oct. 4, 1990, Ser. No. 592,831

Claims priority, application Japan, Oct. 9, 1989, 1-263609

Int. Cl.⁵ D05B 87/02

U.S. Cl. 112—225

17 Claims



1. Apparatus included in a sewing machine to provide automatic thread take-up and threading comprising:

- needle thread guide means for guiding a needle thread from a needle thread supply source to a threading preparatory position in the vicinity of a needle bar via a thread take-up preparatory position intersecting a thread take-up moving area;
- thread take-up means for extracting said needle thread at said thread take-up preparatory position along said thread take-up moving area, said thread take-up means including a thread take-up member for catching a loop of needle thread;
- threading means for pulling a loop of said needle thread at said threading preparatory position through an eye of a needle provided at a lower end of said needle bar;
- signal generating means provided in association with the sewing machine for generating signals when operated by a human operator; and,
- thread take-up and threading control means for controlling said threading means and said thread take-up means in combination in a pre-established timing relationship in response to signals from said signal generating means whereby said threading means pulls a loop of said needle thread through said eye of said needle and said thread take-up member takes up a separate loop of needle thread, said thread take-up and threading control means including

prohibiting means for prohibiting a threading operation until a thread take-up operation is completed.

5,086,719

SEWING MACHINE PROVIDED WITH A THREADING DEVICE AND A NEEDLE BAR RAISING DEVICE

Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

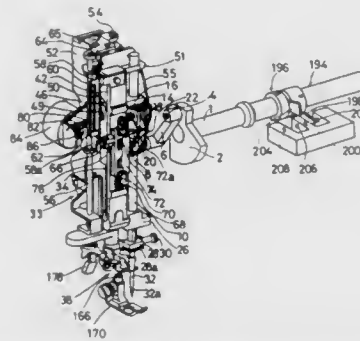
Filed Sep. 17, 1990, Ser. No. 583,315

Claims priority, application Japan, Oct. 31, 1989, 1-285197

Int. Cl.⁵ D05B 87/02, 55/14

U.S. Cl. 112—225

21 Claims



1. A raising and threading apparatus for raising a needle bar and threading a needle of a sewing machine, wherein the needle bar is movably mounted on a frame of the sewing machine, the needle is attached to one end of the needle bar, and the sewing machine further comprises a sewing transmission driven by a main drive means for moving the needle bar, the raising and threading apparatus comprising:

- needle-bar raising means for raising the needle bar to a preparatory position prior to a threading operation;
- threading means for threading the needle when the needle bar is raised to the preparatory position;
- reversible drive means operatively connected to the threading means for moving the threading means toward and away from the needle;
- detecting means for detecting a position of the threading means; and
- control means for controlling a drive direction of the reversible drive means; wherein the needle-bar raising means raises the needle bar to the preparatory position independently from the rotation of the main drive means and sewing transmission during a sewing operation.

5,086,720

FURNACE FOR CONTROLLABLE COMBUSTION OF THERMITE

Kahlil Gibran, 160 W. Canton St., Boston, Mass. 02118

Filed Jan. 25, 1991, Ser. No. 645,639

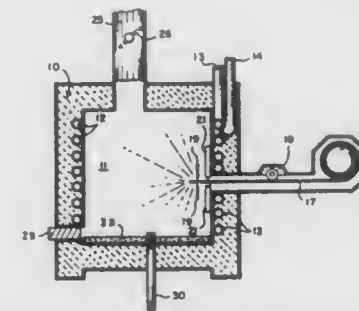
Int. Cl.⁵ F23B 7/00

U.S. Cl. 110—234

23 Claims

20. A furnace for initiating and controlling the combustion of thermite, comprising:
- a furnace housing having a combustion chamber and insulation for retaining the heat product of combustion;
 - thermite encapsulated in self-extinguishing material;
 - a means for introducing said thermite into said combustion chamber;
 - an electric arc located within said furnace housing for igniting into combustion the encapsulated thermite fed into said chamber;
 - coil means disposed within said further housing, within said housing insulation, and around said combustion chamber, said coil means operative to circulate fluid within said housing around said combustion chamber and for drawing

off the heat energy of thermite combustion beyond said housing for utilization; and
said encapsulated thermite being shaped in a solid elongated



form sufficient to enable said thermite to be continuously introduced into said combustion chamber and positioned within said combustion chamber at a point whereat it is ignited by said electric arc.

5,086,721

LIGHTWEIGHT TRANSPORTABLE WATERCRAFT

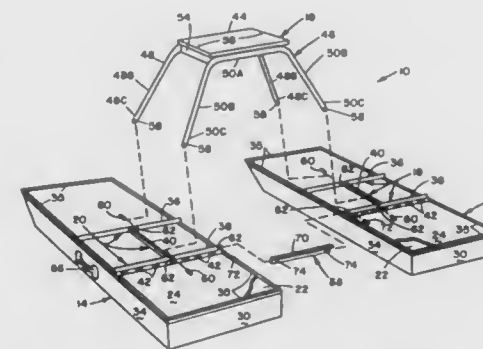
David A. Burkard, P.O. Box 263, Hillsboro, Ohio 45133

Filed Nov. 29, 1990, Ser. No. 621,272

Int. Cl.⁵ B63B 1/14

U.S. Cl. 114—61

20 Claims



1. A lightweight transportable watercraft, comprising:
- a pair of elongated pontoons having respective longitudinal centerlines and being disposed in spaced side-by-side relation to one another;
 - a stool straddling said pontoons and extending over a middle space between respective middle locations on said pontoons spaced from front and rear ends of said pontoons, said stool including an upper seat and a lower frame straddling and extending over said middle space between said middle locations on said pontoons, said lower frame also having opposite end portions extending laterally from opposite sides of said upper seat and being inclined outwardly and downwardly in opposite directions from said upper middle portion of said lower frame and in transverse relation to said longitudinal centerlines of said pontoons; and
 - separate means attached on each one of said middle locations on said respective pontoons and generally aligned with said stool for pivotally mounting said opposite end portions of said lower frame of said stool to said pontoons such that said pontoons can float on water and concurrently pivot relative to said stool and relative to one another and such that remaining front and rear spaces between said pontoons extending forwardly and rearwardly from said stool contiguous with front and rear

locations on said pontoons which correspondingly extend from said middle locations to said front and rear ends thereof are unobstructed so as to permit a user of said watercraft to disembark therefrom into the water between said pontoons in order to transport said watercraft, said separate means further for releasably attaching said opposite end portions of said lower frame of said stool to said pontoons such that said stool can be assembled and disassembled respectively to and from said pontoons in order to respectively put said watercraft together for use on water and to take said watercraft apart for transport and storage.

5,086,722

TRANSIENT DAMAGE STRATEGY

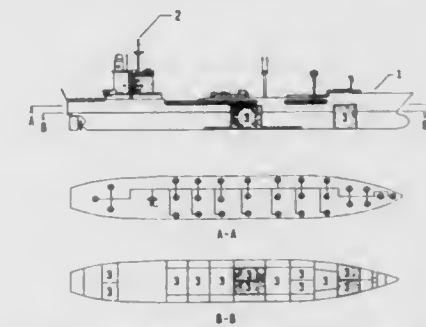
Charles E. Sloope, 4657 Morris Rd., and John H. Kurtz, 4649 Morris Rd., both of Jacksonville, Fla. 32225

Continuation-in-part of Ser. No. 556,380, Jul. 23, 1990, abandoned. This application May 22, 1991, Ser. No. 704,225

Int. Cl.⁵ B63B 25/08

U.S. Cl. 114—74 R

17 Claims



1. A TDS ventlock system which provides a vacuum to minimize leakage from a liquid carrying vessel including a tank, a tank vent, and a main tank valve located in the tank vent, said main valve including an operator controlled diaphragm, a diaphragm chamber and a spring such that during normal ship transit and during loading and unloading of the tank the main valve is held in an open position, in opposition to spring pressure from said spring by application of air pressure to the diaphragm chamber from the vessel's low pressure air system, whereupon tank damage the main valve reverts to a closed position via spring pressure upon loss or diversion of air pressure from the diaphragm chamber, or due to diaphragm failure, such that static vacuum will form in the top of the damaged tank to restrict leakage from the tank, thereby providing a fail safe system.

5,086,723

DOUBLE-HULLED VESSEL CONSTRUCTION HAVING VERTICAL DOUBLE-WALLED LONGITUDINAL BULKHEAD

Robert D. Goldbach, Milford, Pa., and Joseph Cuneo, Hastings on the Hudson, N.Y., assignors to Metro Machine Corporation, Norfolk, Va. and Marinex International, Inc., Hoboken, N.J.

Filed Jun. 12, 1991, Ser. No. 713,990

Int. Cl.⁵ B63B 3/68

U.S. Cl. 114—78

34 Claims

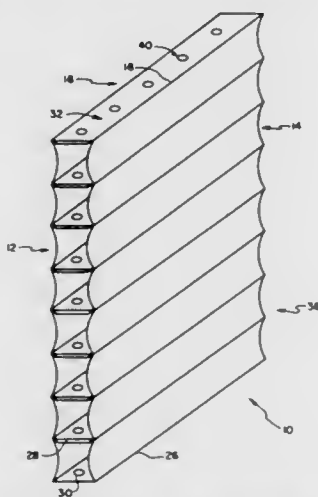
1. A vessel construction having a double-walled longitudinal bulkhead element, comprising:
- a plurality of flat plate panels, each being elongated rectangular in outer perimetrical shape so as to have two opposite side edges, two opposite end edges, and two opposite flat faces;
 - a longitudinally extending series of transversally extending stiffener plates mounted on one said face of each said flat plate panel, so as to provide a corresponding plurality of stiffened flat plate panels;

a first plurality of face plate panels, each being elongated rectangular in outer perimetrical shape, so as to have two opposite side edges, two opposite end edges, and two opposite faces, namely an inner face and an outer face;

a second plurality of face plate panels, each being elongated rectangular in outer perimetrical shape, so as to have two opposite side edges, two opposite end edges, and two opposite faces, namely an inner face and an outer face;

said first plurality of face plate panels being arranged in a first series, in which individual ones of these panels spacedly adjoin one another, side edge to side edge, with respective gaps between them, in a first single layer;

said second plurality of face plate panels being arranged in a second series, in which individual ones of these panels spacedly adjoin one another, side edge to side edge, with respective gaps between them, in a second single layer, so that gaps between panels in said first layer are substantially in registry with gaps between panels in said second



layer, thicknesswise of said longitudinal bulkhead element;

said stiffened flat plate panels being arranged in a series, in which one side edge of each stiffened flat plate panel adjoins a respective gap in said first layer and an opposite edge thereof adjoins a respective gap in said second layer;

a plurality of welded joints, each filling respective ones of said gaps and thereby uniting respective ones of said panels into a double walled element having a plurality of longitudinally extending cells of generally rectangular transverse cross-sectional shape and two laterally opposite ends where side edges of respective terminal ones of said face plate panels in both of said layers are available for connection, respectively to a vessel deck element and a vessel bottom element for providing a vessel with a longitudinal bulkhead in which said cells are arranged in a vertically extending stack and each extends longitudinally of the vessel.

5,086,724

ANCHOR APPARATUS

Ralph E. Schreiber, 9318 W. Missouri, Glendale, Ariz. 85305
Filed Oct. 22, 1990, Ser. No. 601,509
Int. Cl.⁵ B63B 21/34

U.S. Cl. 114—301

17 Claims

1. Anchor apparatus for anchoring a vessel to a sea bottom, comprising, in combination:

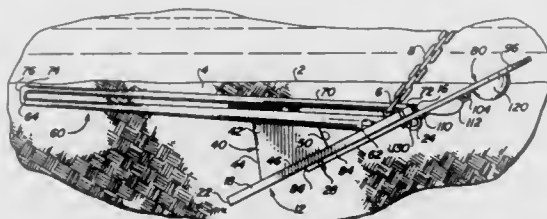
fluke means for penetrating into a sea bottom;

shank means secured to the fluke means and extending over the fluke means for securing the anchor apparatus to the vessel;

wedge means extending between the fluke means and the

shank means for securing the fluke means to the shank means; and

burying plate means secured to the fluke means for providing additional surface area for the fluke means and for



extending into the sea bottom with the fluke means, including float means for helping the anchor apparatus to maintain a predetermined orientation as the anchor apparatus moves downwardly towards and into the sea bottom.

5,086,725

UNITIZED RECREATIONAL BOAT CONSTRUCTION

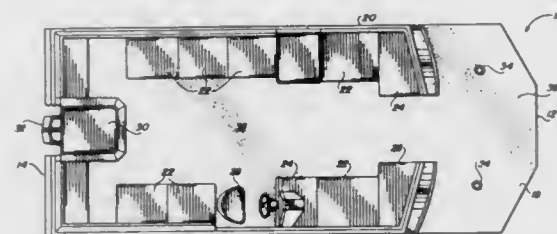
Paul D. Garrett, Merritt Island; Michael R. Meyer, Cocoa, and Danny T. York, Rockledge, all of Fla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jun. 5, 1990, Ser. No. 533,509

Int. Cl.⁵ B63B 3/09

U.S. Cl. 114—356

1 Claim



1. A construction for a recreational pontoon boat, comprising:

a pair of pontoons formed of a thin gauge metal;

a deck across the pontoons;

a vertical superstructure formed of plural members, each superstructure member molded from a plastic resin into a unitary panel;

means for rigidly fastening each unitary molded panel to the metal pontoons and the deck to form a rigid construction; and wherein

the pontoons include an upper extremity extending to the upper level of the deck and which upper extremity overlaps the outer periphery of the deck, and wherein each superstructure panel includes a longitudinal indentation defining a lower flange which abuts the upper extremity of the pontoons.

5,086,726

WHISTLE

Michael C. Sharp, Solihull, England, assignor to J. Hudson & Co. (Whistles) Ltd., England
Filed Aug. 24, 1990, Ser. No. 571,927
Int. Cl.⁵ G01K 5/00

U.S. Cl. 116—137 R

15 Claims

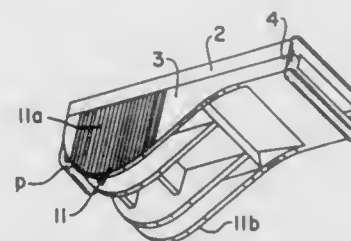
1. A pealess whistle comprising:

a neck portion having a longitudinal axis and first and second longitudinal ends, said neck portion having a first part extending from said second longitudinal end along at least a portion of the length of said neck portion;

a mouthpiece defined at said first longitudinal end of said neck portion;

at least one curved depending wall, said wall extending from said first part of said neck portion on one side of said longitudinal axis of said neck portion;

at least three whistle chamber elements extending side by side in a common plane along at least a portion of the length of said neck portion from a mouthpiece opening of each said chamber element adjacent said first longitudinal end of said neck portion toward said second longitudinal end; and



exhaust port means defined through a surface of said neck portion between said first and second longitudinal ends and on a second side of said longitudinal axis of said neck portion opposite to said one side, for exhausting air blown into the mouthpiece,

whereby said neck portion and said said at least one wall together define a generally mandolin shape.

5,086,727

THIN FILM FORMING APPARATUS HAVING ADJUSTABLE GUIDE

Mikio Sekiguchi; Mizuho Imai; Nobuyasu Shiba, and Hideyo Iida, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

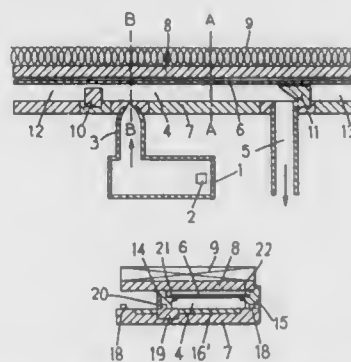
Filed Aug. 24, 1990, Ser. No. 573,240

Claims priority, application Japan, Aug. 31, 1989, 1-224980

Int. Cl.⁵ B05B 1/34; B05C 5/00

U.S. Cl. 118—324

8 Claims



1. A thin film forming apparatus for forming a thin film on a surface of a substrate, comprising:

an atomizer for atomizing a source solution;

a film forming chamber provided above said atomizer, said film forming chamber having a first end and a second end;

a nozzle provided on an upper portion of said atomizer, said nozzle being connected to and opening into said first end of said film forming chamber so as to be able to introduce atomized source solution therein;

an exhaust duct connected to said second end of said film forming chamber for removing said atomized source solution therefrom;

substrate feeding means for feeding said substrate into said film forming chamber in such a manner that said surface of said substrate forms the ceiling in said film forming chamber;

heating means for heating the substrate; and

a pair of adjustable guide members provided opposite to

each other at opposite sides of the film forming chambers so as to be able to support and guide opposite lateral edges of said substrate during the feeding of said substrate into said film forming chamber, at least one of said guide members being adjustable in the lateral direction of said substrate.

5,086,728

DEVELOPING APPARATUS

Masahide Kinoshita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

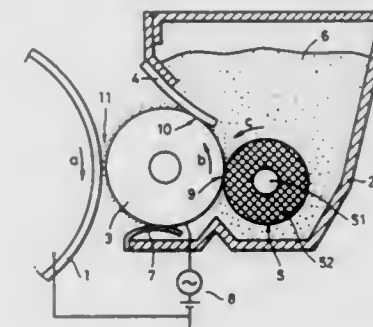
Filed Jun. 7, 1991, Ser. No. 711,875

Claims priority, application Japan, Aug. 30, 1990, 2-228919

Int. Cl.⁵ G03G 15/08

U.S. Cl. 118—653

15 Claims



1. A developing apparatus for developing an electrostatic latent image formed on an image bearing member, said apparatus comprising:

a developer container for receiving a one-component nonmagnetic developer;

a rotatable developer carrying member for carrying the one-component nonmagnetic developer and for conveying the one-component nonmagnetic developer from said developer container to a developing area for developing the electrostatic latent image;

a developer regulating member for regulating the thickness of a layer of the one-component nonmagnetic developer conveyed to the developing area by said rotatable developer carrying member; and

an elastic rotatable member disposed within said developer container for forming a nip portion with said rotatable developer carrying member at a position upstream from said developer regulating member with respect to the direction of rotation of said developer carrying member, said elastic rotatable member comprising a surface having projections and recesses thereon, and said elastic rotatable member rotating in the same direction as said developer carrying member,

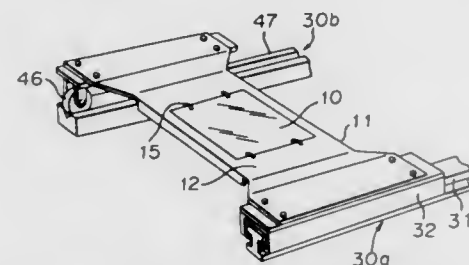
wherein a circumferential speed V_1 (mm/sec) of said rotatable developer carrying member, a circumferential speed V_2 (mm/sec) of said elastic rotatable member, a width d (mm) of the nip portion between said rotatable developer carrying member and said elastic rotatable member, and a number N (/mm) per unit length of the projections on the surface of said elastic rotatable member in the direction of rotation of said elastic rotatable member are set so as to satisfy the relationship:

$$V_2 \geq V_1/4,$$

and

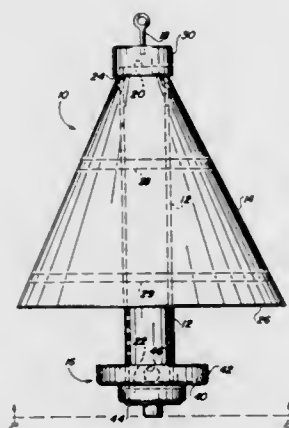
$$6 \leq N \times d \times (V_1 + V_2) / V_1 \leq 40.$$

5,086,729
VACUUM PROCESSING APPARATUS AND TRANSPORTATION SYSTEM THEREOF
 Yoshitaka Katagiri, Yokohama, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan
 Filed Jun. 13, 1989, Ser. No. 365,677
 Claims priority, application Japan, Jun. 13, 1988, 63-143685; Jun. 13, 1988, 63-143686
 Int. Cl.⁵ B05C 3/09; B60L 13/04, 13/10
 U.S. Cl. 118.729 14 Claims



1. A transportation system for a vacuum processing apparatus which comprises a supporting means for supporting a material to be processed and a transportation means for transporting said supporting means in a vacuum processing apparatus wherein said transportation means comprises a magnetically floating type linear motor transportation means comprising a stationary member and a movable member movable with respect to said stationary member in a non-contacting state, wherein said transportation means comprises a pair of magnetically floating type linear motor transportation means at least one of which has a driving force generating section, and said supporting means comprises at least two side surfaces, said supporting means comprising supporting members at each of said side surfaces to support said material to be processed.

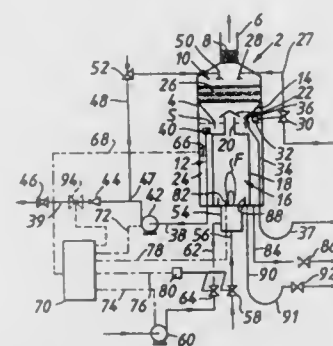
5,086,730
BIRD FEEDER
 Robert S. Figley, B-2 C.C. Village, Lake Wales, Fla. 33853
 Filed Dec. 3, 1990, Ser. No. 620,751
 Int. Cl.⁵ A01K 31/00
 U.S. Cl. 119—52.3 9 Claims



1. A bird feeder for foiling rodents comprising:
 a silo having a front end and a second end with an opening to permit seed to flow there through;
 means for supporting said feeder;
 means disposed adjacent said silo second end and having an outside diameter for holding seed after flowing through said opening;
 a conically shaped cover attached adjacent said silo first end, said cover having a narrow portion and a wide portion, said cover extending away from said narrow portion in a substantially straight line toward said wide portion, said

substantially straight line terminating said cover in said wide portion, said wide portion having a diameter greater than the outside diameter of said housing means, said diameter of the outside perimeter of the wide portion having a ratio with respect to the diameter of the outside perimeter of the holding means of about 2:1 or more; and means for preventing the cover from deforming when the feeder is disturbed by a rodent, said preventing means having a plurality of baffles extending perpendicularly away from said silo and connecting to said cover, said baffles being disposed at predetermined intervals along said silo.

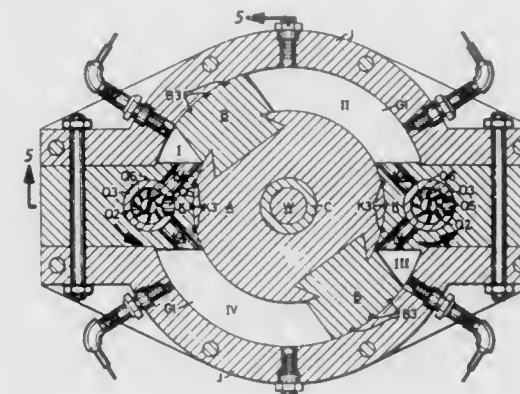
5,086,731
WATER HEATER
 John F. Lockett, Cheswick Green, and Aik B. Lua, Halesowen, both of England, assignors to British Gas plc, London, England
 Continuation of Ser. No. 470,315, Jan. 25, 1990, abandoned. This application Nov. 5, 1990, Ser. No. 608,617
 Claims priority, application United Kingdom, Mar. 15, 1989, 8905969
 Int. Cl.⁵ F22B 1/02; F24H 1/10
 U.S. Cl. 122—31.1 13 Claims



1. A gas fired direct contact water heater comprising gas burner means, wall means defining a flow path for hot products of combustion from said burner means, water supply means for supplying water for flowing along said flow path in an opposite direction to the simultaneous flow of said products of combustion therealong and wherein heat from said products of combustion becomes transferred to the water which becomes heated thereby, first conduit means for conveying said heated water subsequent to travelling along said flow path, said first conduit means having an output portion permitting a user to take heated water from said first conduit means, pump means included in the first conduit means for pumping heated water therealong to said output portion, second conduit means having first and second opposite ends, said second conduit means being in communication with the first conduit means at said first end intermediate the pump means and the output portion, valve means included in said second conduit means for allowing passage of water through said valve means to the said second end of said second conduit means from which the water returns to said flow path, said valve means comprising pressure release valve means for opening automatically when subjected to water at at least a pre-determined pressure engendered in said second conduit means by the pump means to allow passage of the water through the valve means to said second end of said second conduit means for return of the water to said flow path, the water supply means and second conduit means being wholly separate from each other and being arranged such that any water returned from said second conduit means to said flow path is returned independently of said water from said water supply means, said heater further comprising control means, switchable between an operating condition and a non-operating condition, for controlling operation of the pump means and for controlling supply of gas to said burner means

such that, in the non-operating condition, said control means causes said supply of gas to be stopped and the pump means to be stopped, and, in the operating condition, said control means causes the pump means to operate continuously.

5,086,732
FOUR STROKE CONCENTRIC OSCILLATING ROTARY VANE INTERNAL COMBUSTION ENGINE
 Cornelio L. Seo, 10718 Nathanson Ave., Cupertino, Calif. 95014
 Filed Sep. 7, 1990, Ser. No. 578,674
 Int. Cl.⁵ F02B 53/00
 U.S. Cl. 123—18 R 1 Claim



1. A four stroke concentric oscillating rotary vane internal combustion engine made up of a pair of cranking mechanisms, a pair of forced porting mechanisms, an output shaft mechanism, a stator, a rotor, four arcuate combustion chambers and longitudinal and transverse grooves for lubrication and dynamic sealing, in which:

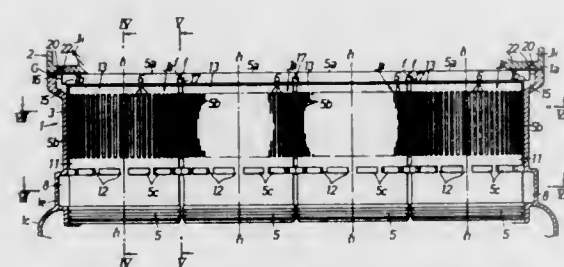
- said pair of cranking mechanisms control the oscillating rotary motion of the rotor, each cranking mechanism comprising:
 - a pair of parallel and coaxial cylindrical discs,
 - an eccentric pin connecting rigidly said pair of discs with each other,
 - a gear coaxially and integrally connected to the front disc,
 - a pair of axially opposed journals coaxially and outwardly projecting from the rear disc and said gear, and
 - a connecting rod pivotally connected to said disc pin at one end;
- said pair of forced porting mechanisms control the forced porting of air into and combustion byproducts from the combustion chambers, each forced porting mechanism comprising:
 - a hollow tube divided by a transverse wall into an air duct in front and an exhaust duct in the rear,
 - an exhaust inlet adjacent said transverse dividing wall and in said exhaust duct measuring 45 degrees from edge to edge of the inlet on the outer circumference of said exhaust duct,
 - an air outlet adjacent said transverse dividing wall and in said air duct measuring 45 degrees from edge to edge of the outlet and lagging behind by 45 degrees in the direction of rotation of the hollow tube from said exhaust inlet from edge to edge as reckoned on the outer circumference of said air duct,
 - a gear integrally connected with said hollow tube,
 - an axial flow fan connected to the front end of the air duct and supplying slightly pressurized air into the combustion chambers, and
 - a radial flow exhaust fan connected to the rear end of said exhaust duct and extracting combustion byproducts from the combustion chambers;
- said output shaft mechanism orchestrating and coordinating the synchronized iterative operations of said cranking

mechanisms, said forced porting mechanisms, a fuel injection system and a spark ignition system, comprising:

- a main shaft providing brake power output in the front and rear of the engine,
 - a big gear keyed to said main shaft and enmeshed with said cranking gears and porting gears at gear ratios of 2:1 and 1:1, respectively,
 - a pair of auxiliary shafts driving the fuel injection and spark ignition systems,
 - a pair of gears coaxially and integrally connected to said auxiliary shafts,
 - a pair of journals coaxially projecting from said gears of the auxiliary shafts, and
 - a small gear keyed to said main shaft and enmeshed with said gears of the auxiliary shafts at a gear ratio of 1:1;
- d. said stator having three compartments, namely, a working chamber in the middle, a crankcase in the front and a gear box in the rear,
- said working chamber comprises:
 - a shell with a right circular cylindrical internal surface,
 - a pair of diametrically opposed stator vanes with concave axial edges coaxially and inwardly projecting from said shell,
 - front and rear transverse end plates,
 - a pair of longitudinal cylindrical holes for journalling the two hollow tubes of the forced porting mechanisms in said stator vanes,
 - a pair of diagonal air inlets, one in each stator vane, with identical diameter and relative axial location as those of the air outlets of said forced porting mechanisms, and
 - a pair of diagonal exhaust outlets, one in each stator vane, with identical dimensions and relative transverse location as those of said air inlets of the stator vanes, as well as with identical diameter and relative axial location as those of said exhaust inlets of the forced porting mechanisms;
 - said crankcase comprises:
 - a crank case body which is recessed to accommodate the cranking mechanisms, the big gear of the main shaft, the porting gears and lubricating oil,
 - a central longitudinal bore with gas seal and anti-friction bearing in said crankcase body,
 - a pair of longitudinal blind holes with anti-friction bearings in said crankcase body for journalling the rear journals of the cranking mechanisms,
 - a crank case cover plate,
 - a pair of longitudinal blind holes with anti-friction bearings in the crankcase cover plate for journalling the front journals of the cranking mechanisms, and
 - three longitudinal holes with anti-friction bearings and oil seals in said crank case cover plate for journalling the hollow tubes and the main shaft;
 - said gear box comprises:
 - a gear box body which is recessed to accommodate the small gear of the main shaft, the gears of the auxiliary shafts and lubricating oil,
 - a central longitudinal bore with gas seal and anti-friction bearing in said gear box body,
 - a pair of longitudinal blind holes with anti-friction bearings in said gear box body for journalling the gears of the auxiliary shafts,
 - a gear box cover plate,
 - a pair of longitudinal holes with anti-friction-bearings and oil seals in the gear box cover plate for journalling the auxiliary shafts, and
 - three longitudinal holes with anti-friction bearings and oil seals in the gear box cover plate for journalling the hollow tubes and the main shaft;
- e. a rotor coaxially and rotatably mounted in said working chamber of said stator having

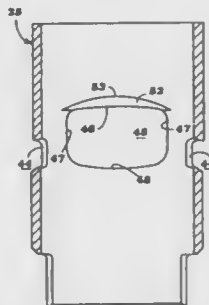
- i. a right circular cylinder journaled for rotation between the concave axial edges of the stator vanes,
- ii. a pair of diametrically opposed rotor vanes with convex axial edges outwardly projecting from said rotor cylinder and journaled for axial rotation in the shell cylinder,
- iii. a pair of axially opposed journals coaxially and outwardly projecting from said rotor cylinder as well as journaled for axial rotation in said central longitudinal bores of the crankcase body and gear box body,
- iv. a central axial hole with sleeve bearing for journaled the main shaft, and
- v. a pair of diametrically opposed axial pins which are equidistant from the axis and axially projecting from transverse face of the front rotor journal, each pin being journaled in the other end of the connecting rod of the cranking mechanism;
- f. said four arcuate combustion chambers are each bounded by:
 - i. the right circular cylindrical internal surface of the shell, the rotor cylinder and the transverse end plates functioning as engine cylinder,
 - ii. the two stator vanes serving as cylinder heads, and
 - iii. the two adjacent rotor vanes corresponding to pistons; and
- g. longitudinal grooves in the concave axial edges of the stator vanes and convex axial edges of the rotor vanes as well as transverse grooves in plane radial edges of the rotor vanes containing hot air and gases serving as lubricant and dynamic seals.

5,086,733
COOLING SYSTEM FOR MULTI-CYLINDER ENGINE
 Kazuo Inoue; Noriyuki Kishi; Hiroo Shimada; Masakatsu Miyao; Katsunori Nakamura; Tsuneo Konno, and Harumi Taketomi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
 Filed Aug. 23, 1989, Ser. No. 398,006
 Claims priority, application Japan, Aug. 23, 1988, 63-209279; Sep. 20, 1988, 63-235486; Nov. 1, 1988, 63-277097
 Int. Cl.⁵ F02F 1/10
 U.S. Cl. 123—41.84 21 Claims



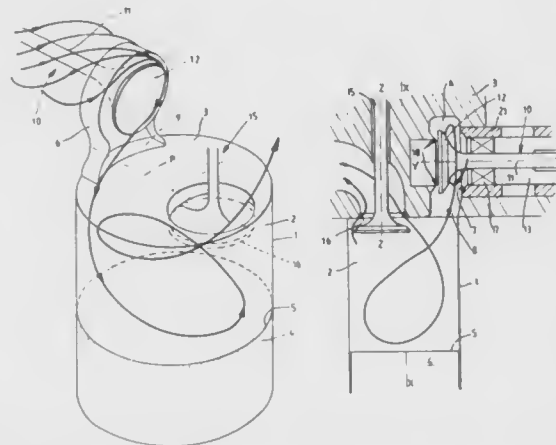
1. A cooling system for a multi-cylinder engine, comprising: a block-side coolant jacket positioned around a plurality of in-line cylinder bores in a cylinder block; an endless main channel extending around the cylinder bores upstream of said block-side coolant jacket; and an upstream coolant channel between said block-side coolant jacket and said main coolant channel surrounding the cylinder bores, said upstream coolant channel and said main coolant channel connected through a plurality of orifice passages provided around each of the cylinder bores, and said upstream coolant channel connected with an upstream end of said block-side coolant jacket.

5,086,734
CYLINDER SLEEVE FOR TWO-CYCLE ENGINE
 Hiroshi Nakai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
 Filed Aug. 30, 1990, Ser. No. 575,356
 Claims priority, application Japan, Aug. 30, 1989, 1-221630
 Int. Cl.⁵ F02B 75/02
 U.S. Cl. 123—65 P 9 Claims



1. A porting arrangement for a reciprocating machine having a cylinder having a wall thickness, a port opening extending through said cylinder and defined by a top edge, side edges and a bottom edge, and a chamfered area on the inner surface on said cylinder extending along a substantial width of said top edge and providing an edge having greater curvature than said top edge for reducing piston ring sticking without affecting the port timing of said port.

5,086,735
RECIPROCATING INTERNAL COMBUSTION ENGINES OF THE TWO-STROKE TYPE
 Jean Melchior; Thierry Andre, both of Paris, and Henri B. Edelmann, Sevres, all of France, assignors to S.N.C. Melchior Technologie, France
 Filed May 7, 1991, Ser. No. 696,745
 Claims priority, application France, May 31, 1990, 90 06781
 Int. Cl.⁵ F02B 25/18
 U.S. Cl. 123—65 VD 25 Claims



1. In a two-stroke internal combustion engine which comprises: at least one cylinder having an axis and an inner wall and devoid of lateral ports; a cylinder head having a ceiling and fixed relative to said cylinder and a piston disposed inside said cylinder for undergoing reciprocating motion inside said cylinder, a combustion chamber being defined in said cylinder by said cylinder head and said piston; a combustion and scavenging prechamber provided in said cylinder head, an intake valve seat provided in said prechamber, a transfer passage putting said prechamber

chamber in communication with said chamber through an outlet at which outlet said transfer passage opens into said combustion chamber, said outlet having a cross-section perpendicular to said axis of said cylinder which is an oblong surface internally substantially tangent to said inner wall of said cylinder;

an intake valve comprising a head and a stem and having an axis which is at least substantially orthogonal to said axis of said cylinder and so disposed that said stem of said intake valve is spaced further away from said axis of said cylinder than said head of said intake valve and said head is movable inside said prechamber for the purpose of moving away and toward said intake valve seat;

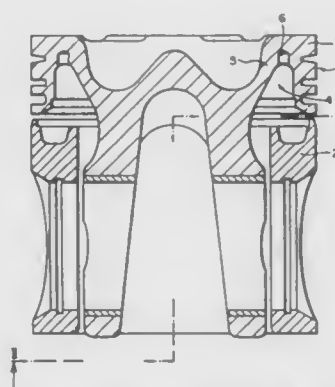
an intake pipe which leads directly to an upstream side of said first intake valve seat; and

at least one exhaust valve seat provided in said ceiling of said cylinder head opposite said transfer passage, at least one exhaust valve which has an axis and is so disposed relative to said cylinder that said axis of said at least one exhaust valve is at least substantially parallel to said axis of said cylinder and is capable of cooperating, while allowing passage of exhaust gases on at least a major part of the periphery of said at least one exhaust valve, with said at least one exhaust valve seat;

the improvement wherein said prechamber has, apart from the connection thereof with said transfer passage, substantially a shape of revolution about an axis parallel to said axis of said intake valve;

deflecting means are disposed inside an end part of said intake pipe as directly as possible on an upstream side of said intake valve seat and are so arranged as to produce a deflection in a single direction about said axis of said intake valve, of the mass of air which arrives through said passage when said intake valve is open; and said transfer passage has such shape that the deflection thus produced in said prechamber by said deflecting means during a scavenging stage produces a substantially helical swirling in said cylinder and, when said piston rises in said cylinder, said substantially helical swirling in turn produces in said prechamber a swirling in the same direction.

5,086,736
PISTON HEAD WITH BORES
 Lothar Wiemann, Weinstadt, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany
 Filed May 1, 1991, Ser. No. 694,414
 Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014703
 Int. Cl.⁵ F02F 3/22
 U.S. Cl. 123—193.6 7 Claims



1. In an improved piston for an internal combustion engine with a separate head and skirt which are joined by a piston pin, a ring belt extends downward from the head and terminates above the pin, the ring belt defines an outer border of a cooling oil ring space, a section of the head extending from the piston base defines the inner border of the space, a bottom free end of

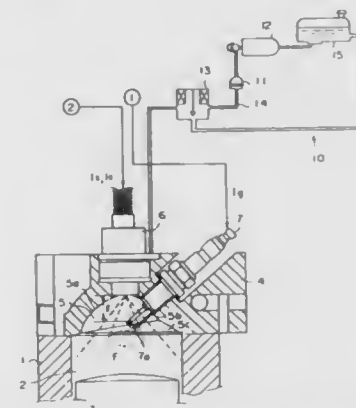
the ring belt is detached from the head, a depression is formed in the head and is partly defined by the section, the improvement comprising:

the head is provided with bores which extend essentially vertically upward from the cooling oil ring space toward the top of the head.

5,086,737
FUEL INJECTION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A DIRECT FUEL INJECTION SYSTEM

Hideo Watanabe, Tokyo, and Koji Morikawa, Musashino, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1990, Ser. No. 534,717
 Claims priority, application Japan, Jun. 29, 1989, 1-168937; Jun. 29, 1989, 1-168940
 Int. Cl.⁵ F02D 41/34
 U.S. Cl. 123—295 5 Claims



1. In a fuel injection control system for an internal combustion engine having a cylinder, a piston reciprocating in said cylinder, a fuel injector provided at a top of said cylinder for injecting fuel directly into said cylinder, and a spark plug provided below said fuel injector for igniting said fuel, said spark plug forming a gap, the improvement in the system which comprises:

injection timing determining means for setting a fuel injection finishing timing at an advance angle corresponding to an arrival time of said fuel at said gap;

said injection timing determining means further for setting a fuel injection starting timing in dependency on said fuel injection finishing timing in accordance with a quantity of said fuel;

said injector injects said fuel in said cylinder in a form of a cone; and

wherein said arrival time is determined as a function of distance between said injector and said spark plug and speed of said fuel injected into said cylinder in accordance with operating conditions of said engine so as to form a stratified charge.

5,086,738

MOTOR BRAKE FOR AIR-COMPRESSING INTERNAL COMBUSTION ENGINES

Heribert Kubis, and Dieter Wittmann, both of Nuremberg, Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft, Munich, Fed. Rep. of Germany

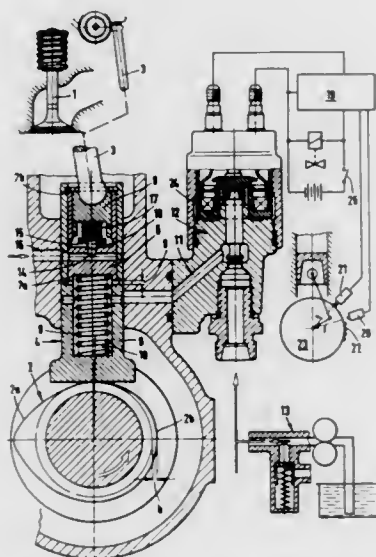
Filed Mar. 8, 1991, Ser. No. 667,050

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1990, 4007287

Int. Cl.⁵ F01L 13/06; F02D 9/06, 13/04

U.S. Cl. 123—322

4 Claims



1. A motor brake for an air-compressing internal combustion engine, comprising:

a hydraulic linkage system disposed between a cam and an exhaust valve;

an external regulating mechanism in the form of a high-speed solenoid valve that has a solenoid, with said linkage system communicating via a connecting line with said solenoid valve and a leakage oil compensation means of an engine lubricating-oil circuit;

a control valve means that is disposed in an exhaust manifold of said engine and that upon actuation of said motor brake partially closes off said exhaust manifold together with activation of said solenoid valve;

at least one sensor for activation of said solenoid valve; and

a control unit, with signals of said at least one sensor, via the interposition of said control unit, being conveyed to said solenoid of said solenoid valve in such a way that, upon actuation of said motor brake during a specific time interval during lifting of a valve tappet of said linkage system

via a secondary projection of said cam in a compression phase of said engine, said solenoid valve is closed, with said time interval being derived via a processing, in said control unit, of signals of said at least one sensor formed from a cam position and a camshaft speed, whereby said cam is divided into six sectors, with a first sector having a first angular range serving, via a primary projection of said cam, for the opening of said exhaust valve in an exhaust phase, a second sector having a second angular range serving for the filling of a cylinder space of said valve tappet, a third sector having a third angular range initiating closure of said solenoid valve, a fourth sector having a fourth angular range being provided with said secondary projection of said cam, a fifth sector having a fifth angular range serving for the reopening of said solenoid valve, and a sixth sector having a sixth angular range serving for the emptying of said cylinder space of said valve tappet.

UMI

5,086,739

ELECTRONIC SPEED GOVERNOR FOR AN AIR-COMPRESSION INTERNAL-COMBUSTION ENGINE

Gerhard Fränkle, Remshalden, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

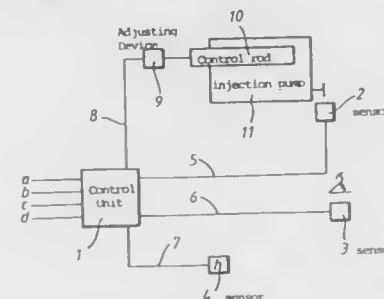
Filed Apr. 6, 1990, Ser. No. 505,691

Claims Priority, Application [DE] Fed. Rep. Germany, Apr. 6, 1989, 39111458

Int. Cl.⁵ F02M 37/00

U.S. Cl. 123—357

3 Claims



1. An electronic speed governor for an air-compression internal-combustion engine, comprising:

means for sensing operating values of the internal-combustion engine;

means for measuring an absolute pressure to determine air mass for the internal-combustion engine;

a control unit having stored smoke-limit curves, said smoke-limit curves graphically providing engine operating parameters which produce a blackening value of the smoke emission, and said control unit being coupled to the means for sensing and the means for measuring, and receiving as inputs the operating values and the determined air mass and controlling a fuel mass as a function of the operating values, the air mass and the stored smoke-limit curves, said control unit using shifted smoke-limit curves in response to decreasing atmospheric pressure so that the blackening value of the smoke emission per unit volume of the internal-combustion engine remains constant, and correcting a fuel mass according to the shifted smoke-limit curves.

5,086,740

ENGINE ELECTRONIC THROTTLE CONTROL WITH CRUISE CONTROL FEATURE

Kregg S. Wiggins, Clarkston, Mich., and Danny O. Wright, Newport News, Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Nov. 2, 1990, Ser. No. 608,500

Int. Cl.⁵ B60K 31/04; F02D 11/10

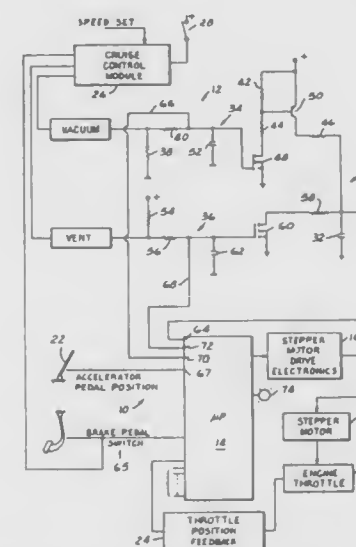
U.S. Cl. 123—361

9 Claims

1. An automotive vehicle internal combustion engine electronic throttle control system that controls the positioning of an engine throttle and comprises a microprocessor that receives both accelerator pedal position and throttle position signals and that operates to command an electric motor to secure correspondence of throttle position to accelerator pedal position, characterized in that a cruise control sub-system is cooperatively associated with the microprocessor, and in a cruise control mode of operation the cruise control sub-system provides a cruise control signal representing a desired cruise speed for the vehicle and the microprocessor operates to command said electric motor to secure correspondence of throttle position to the cruise control signal, wherein said cruise control sub-system comprises a cruise control module that issues respective charge and discharge signals that cause respective charge and discharge of a capacitor, and the voltage across said capacitor constitutes said cruise control signal and is delivered to one particular port of the microprocessor.

9. An automotive vehicle internal combustion engine electronic throttle control system that controls the positioning of

an engine throttle and comprises a microprocessor that receives both accelerator pedal position and throttle position signals and that operates to command an electric motor to secure correspondence of throttle position to accelerator pedal position, characterized in that a cruise control sub-system is cooperatively associated with the microprocessor, and in a cruise control mode of operation the cruise control sub-system provides a cruise control signal representing a desired cruise



speed for the vehicle and the microprocessor operates to command said electric motor to secure correspondence of throttle position to the cruise control signal, and characterized further in that said microprocessor comprises means for performing a test on said cruise control sub-system by applying test signals to the cruise control sub-system, for detecting potential fault in said cruise control sub-system by monitoring the response of the cruise control sub-system to said test signals, and for causing an indication of the detection of potential fault to be given.

5,086,741

METHOD AND APPARATUS FOR DETECTING AND CONTROLLING COMBUSTION CONDITION IN AN INTERNAL COMBUSTION ENGINE

Kenichi Nakamura, Katsuta; Yoza Nakamura, Ibaraki; Yuji Maeda; Masami Nagano, both of Katsuta, and Yuzo Kadomukai, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

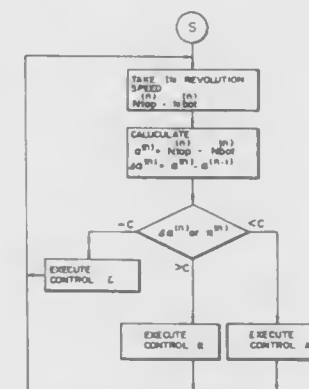
Filed Aug. 16, 1990, Ser. No. 568,086

Claims priority, application Japan, Aug. 25, 1989, 1-217364

Int. Cl.⁵ F02P 5/15; F02D 41/04

U.S. Cl. 123—419

17 Claims



1. A method of detecting the condition of combustion in

each cylinder of an internal combustion engine while monitoring a variation in rotation of the crankshaft of said engine for each cylinder, in which a rotational angular acceleration within one combustion period of each cylinder is detected to judge that a predetermined cylinder is in a condition of irregular combustion when the quantity of variation in the rotational angular acceleration between adjacent cylinders exceeds a predetermined value, in which the rotational angular acceleration is obtained by dividing a difference between the values of revolution speed obtained at two points within a combustion period by the period of said one combustion period.

5,086,742

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Hans-Jörg Vogtmann, Markgroningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

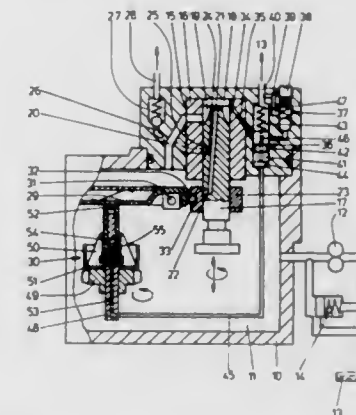
Continuation of Ser. No. 147,481, Jan. 25, 1988, abandoned. This application Jun. 21, 1991, Ser. No. 726,112

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704580

Int. Cl.⁵ F02M 41/00

U.S. Cl. 123—449

8 Claims



1. A fuel injection pump for internal combustion engines, comprising a housing, a piston bore in said housing, a piston operative in said piston bore, a pump work chamber defined in said housing, by said pump piston, at least one pressure line leading from said work chamber to at least one injection nozzle, a relief conduit (34) extending from said work chamber for diverting a partial fuel quantity during a compression stroke of said pump piston in order to lengthen injection duration, a throttle (35) in said relief conduit, a control slide (36) disposed in said relief conduit for blocking off said relief conduit at upper partial load and at full load, an adjustable pressure maintenance valve (37) in said relief conduit for closing off said relief conduit, and means for adjusting an opening pressure of said adjustable pressure maintenance valve (37) in accordance with the opening pressure of said at least one injection nozzle.

5,086,743

INTEGRALLY FORMED AND TUNED FUEL RAIL/INJECTORS

John C. Hickey, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1990, Ser. No. 630,913

Int. Cl.⁵ F02M 55/02, 51/00

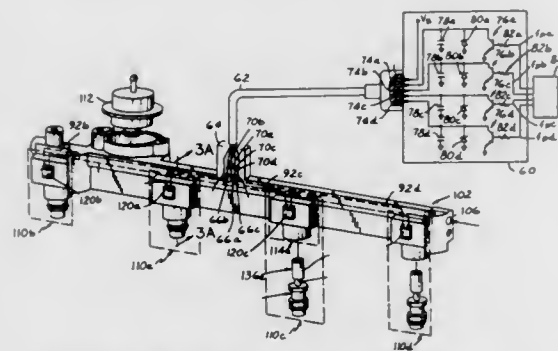
U.S. Cl. 123—468

10 Claims

1. A fuel rail assembly coupled to a source of fuel, comprising:

a plurality of fuel injectors each coupled to a single fuel rail, each of said fuel injectors including an electrically coil assembly and valve means mechanically responsive to

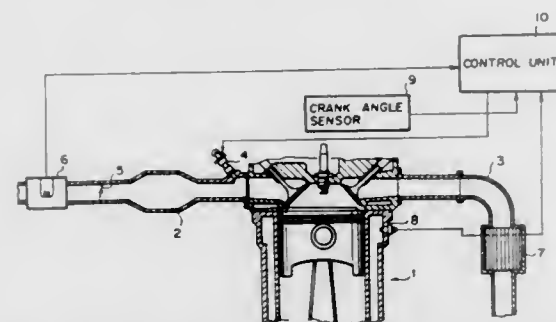
application of electrical power to said coil assembly for controlling fuel flow through said fuel injector;
 a plurality of electronic drivers each coupled to a corresponding one of said electric coil assemblies for applying said electrical power; and
 a plurality of adjusting means each including a separate resistor coupled in series between one of said electrical



drivers and one of said electric coils, each of said resistors of said adjusting means having a preselected resistance value determined by operating characteristics of said fuel injector to which said resistor is coupled and for fuel flow variations within said fuel rail for maintaining substantially equivalent fuel flow through each of said fuel injectors coupled to said fuel rail.

5,086,744 FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

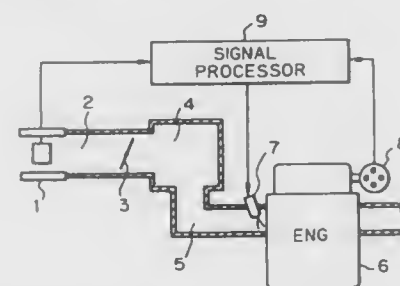
Toshihiro Ishibara; Tetsushi Hosokai; Tetsuro Takaba, and Hideki Kobayashi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
 Filed Jan. 10, 1991, Ser. No. 639,263
 Claims priority, application Japan, Jan. 12, 1990, 2-5911; Jan. 16, 1990, 2-7934
 Int. Cl.⁵ F02M 51/00; F02D 41/30
 U.S. Cl. 123—480 9 Claims



2. A fuel control system for an engine having a fuel injection means which injects fuel into an intake passage communicating with a combustion chamber, in which the quantity of a direct delivery part of the fuel injected from the fuel injection means which is directly fed to the combustion chamber is estimated, the quantity of a drawn part of fuel which has been on a wall surface of the intake passage and is vaporized and fed to the combustion chamber together with the direct delivery part is estimated, and the quantity of fuel to be injected from the fuel injection means is determined on the basis of the estimated quantities of the direct delivery part and the drawn part so that the sum of them provides a desired quantity of fuel to be fed to the combustion chamber comprising:
 a vaporizing condition detecting means which detects at least one of factors which govern the degree of evaporation of the fuel on the wall surface, and
 a changing means which increase the estimated quantity of

at least one of the direct delivery part and the drawn part as the factor changes in such a direction as to promote evaporation of the fuel on the wall surface;
 wherein said factor is the temperature of the fuel and the changing means increases both the estimated quantities of the direct delivery part and the drawn part as the temperature of the fuel increases, said changing means selecting correction values corresponding to the temperature of the fuel, and obtaining a product of the estimated quantity of the direct delivery part and a correction value, and a product of the estimated quantity of the drawn part and a correction value, with the product forming changed estimated quantities of the direct delivery part and the drawn part.

5,086,745
METHOD AND APPARATUS FOR PROCESSING A THERMAL FLOW-RATE SENSOR SIGNAL
 Yukinobu Nishimura; Setsuhiro Shimomura; Nobutake Taniguchi, and Kouji Tanimoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
 Filed Jul. 10, 1990, Ser. No. 550,765
 Claims priority, application Japan, Jul. 11, 1989, 1-178427
 Int. Cl.⁵ F02M 51/00 6 Claims



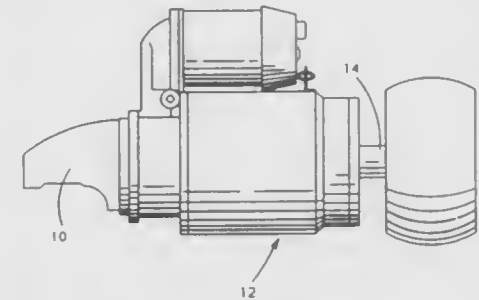
1. A method of processing a signal of a thermal flow-rate sensor, including a temperature-dependent resistor having a resistance value which fluctuates depending on temperature, and a substrate support member for supporting said temperature-dependent resistor, said thermal flow-rate sensor detecting a flow rate of a fluid on the basis of an output signal formed via said temperature-dependent resistor, comprising the steps of:

providing a temperature monitor for monitoring a temperature at a representative point of said support member; obtaining a temperature at the representative point corresponding to the flow rate of said fluid by use of said temperature monitor; and
 correcting an output of said flow-rate sensor in accordance with a value corresponding to the temperature obtained by use of said temperature monitor and a value corresponding to the temperature at the representative point when the flow rate is in a steady state.

5,086,746
COMPRESSED AIR SUPPLY
 William C. Albertson, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
 Filed Mar. 29, 1991, Ser. No. 677,194
 Int. Cl.⁵ F02B 13/08 2 Claims

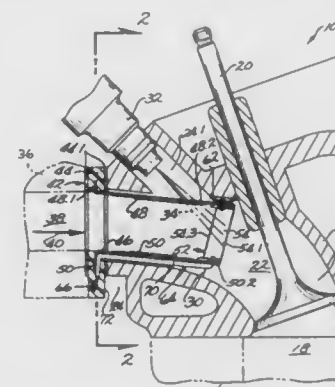
1. The method of supplying air to an air-assisted fuel injection system for a combustion engine which includes the steps of supplying air from a principal air compressor to the fuel injection system during normal engine operation, driving a

supplementary air compressor from an engine cranking motor while the cranking motor cranks the engine, and supplying air



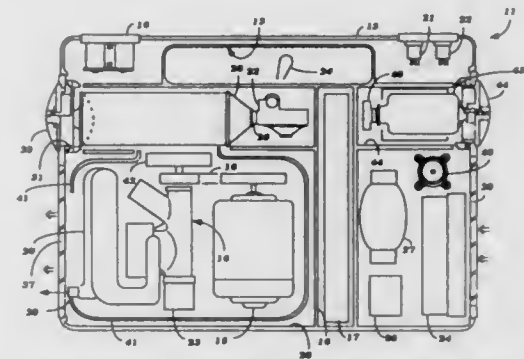
from the supplementary air compressor to the fuel injection system to facilitate prompt starting of the engine.

5,086,747
INTERNAL COMBUSTION ENGINE WITH FUEL HEATER
 Jeffrey A. Curhan, Medway, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
 Filed Aug. 22, 1990, Ser. No. 571,384
 Int. Cl.⁵ F02M 31/00 24 Claims



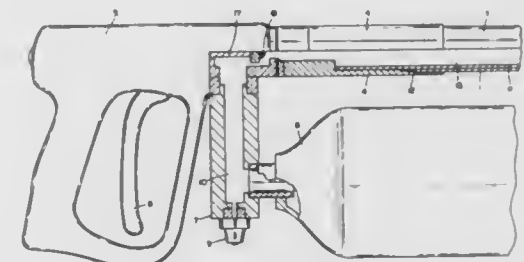
1. An internal combustion engine comprising a channel member having an inlet for receiving air and fuel to form an air-fuel mixture and two outlets for furnishing the mixture to respective engine cylinder means, and a heating device mounted on the member, the heating device having a V-shaped heat-exchange surface having a single pair of surface sections extending in angular relation to each other from a common edge between the surface sections and having a self-regulating electrical resistance heater element of positive temperature coefficient of resistivity disposed in heat-transfer relation to each of the respective surface sections, the device being arranged with said surface sections each in facing relation to the inlet to intercept air and fuel directed into the inlet directly on said two surface sections for heating the fuel to substantially fully vaporize the fuel in forming the air-fuel mixture and for simultaneously dividing the mixture between the outlets for furnishing to the respective engine cylinder means.

5,086,748
FUEL SUPPLYING SYSTEM FOR GAS ENGINE
 Yoshiharu Yokoyama, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
 Continuation of Ser. No. 337,481, Jul. 10, 1989, abandoned. This application Dec. 6, 1990, Ser. No. 633,151
 Claims priority, application Japan, Jul. 9, 1988, 63-171292
 Int. Cl.⁵ F02M 31/00 15 Claims



1. In a fuel supply system for operating an internal combustion engine from a separate container filled with a pressurized gaseous fuel, said separate container being insertable as a separate unit insertable into a supply system for said engine, means for sensing the pressure in said container when installed in said system, and means for heating said fuel when the pressure is below a predetermined value.

5,086,749
ARROW GUN
 Glen Ekstrom, 167 Cherry St., Ste. 286, Milford, Conn. 06460
 Continuation-in-part of Ser. No. 194,847, May 17, 1988, Pat. No. 4,890,597. This application Nov. 17, 1989, Ser. No. 438,686
 Int. Cl.⁵ F41B 11/06, 11/08, 11/10; A01K 81/06
 U.S. Cl. 124—74 13 Claims



1. An arrow gun for propelling an arrow, harpoon or the like, comprising
 a handle including a trigger;
 an elongated hollow barrel extending at a first end from said handle having an opening at a second end remote from said handle;
 collar means for securing said barrel to said handle, said collar means being fixedly secured at a first end to said handle and circumferentially engaged about said barrel; means positioned on said first end of said barrel for frictionally engaging said arrow about said barrel;
 a compressed gas source; and
 connection means including an air passageway for linking said compressed gas source to said barrel for releasing said compressed gas under pressure from said barrel into said hollow arrow at said second end of said barrel remote from said handle to propel said arrow;
 whereby said arrow is hollow and sealed at one end forming a tip, said arrow having an inner diameter slightly larger

than an outer diameter of said barrel such that said arrow maintains contact with said barrel along its length and is frictionally disposed over said barrel prior to being propelled, said arrow being secured over said barrel at said first end by said frictional engagement means of said barrel, said arrow being fired under pressure upon actuation of said trigger.

6. A method of propelling a payload attached to an arrow head of a hollow arrow, said payload and arrow being fired from a gun, comprising
attaching said payload to said arrow head;
sliding said arrow over an elongated discharge barrel of said gun, said arrow having an inner diameter slightly larger than an outer diameter of said barrel, said gun including a handle and trigger assembly, said barrel being hollow and connected to said handle at one end of said barrel and having a discharge opening at a second end;
engaging by means of friction an end of said arrow opposite said arrow head at said handle end of said barrel to restrict its movement by sliding said arrow over a series of gripping means positioned in grooves in said barrel adjacent said handle; and
activating a compressed gas source to energize said barrel of said gun to discharge gas from said second end of said hollow barrel remote from said handle;
whereby said arrow maintains frictional contact with said barrel along its length and is instantaneously propelled from said gun upon activation of said gas source by sliding off said barrel under high pressure.

5,086,750

SKID PLATE FOR CONCRETE SAW

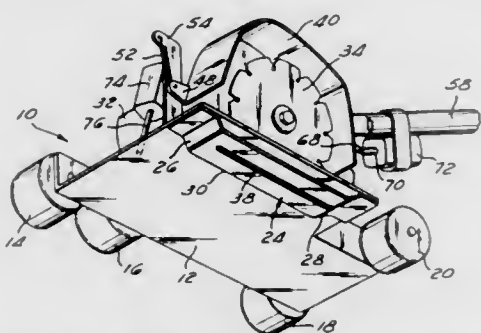
Edward Chiuminatta, and Alan R. Chiuminatta, both of 6677 Columbus, Riverside, Calif. 92504

Continuation of Ser. No. 539,783, Jun. 18, 1990, which is a continuation of Ser. No. 386,814, Jul. 27, 1989, Pat. No. 4,938,201, which is a division of Ser. No. 185,055, Apr. 22, 1988, Pat. No. 4,889,675, which is a continuation of Ser. No. 843,779, Mar. 25, 1986, Pat. No. 4,769,201. This application Nov. 2, 1990, Ser. No. 608,331

Int. Cl.⁵ B28D 1/04

U.S. Cl. 125—13.01

30 Claims



1. A depending skid plate for use with a wheeled saw having an upcutting rotating cutting blade for cutting concrete, and having a base rollably supported on wheels a predetermined distance above the surface of the concrete, comprising:
two mounting portions configured to secure the skid plate to the base so that the skid plate does not move relative to the saw during use;
a support plate having a flat portion with a longitudinal slot therein, said slot positioned relative to the mounting portions so that the cutting blade extends through the slot to permit cutting of the concrete surface, the support plate being so dimensioned that it depends from the two mounting portions a distance sufficient to place substantially all of the flat portion of the support plate in contact with the concrete surface when the skid plate is mounted on the saw so that the flat portion of the skid plate is substantially parallel to the concrete surface being cut, with the slot

being so dimensioned as to inhibit chipping, spalling, and cracking of the concrete during cutting, the slot and the support plate having corresponding leading and trailing ends, with the leading end of the support plate curving toward the adjacent mounting portion, and with the leading end of the slot ending in the flat portion of the support plate.

5,086,751

SAW CABLE WITH SPACERS BETWEEN ADJACENT CUTTING BEADS

Johann Pfister, Hart, and Karl Daum, Kolsass, both of Austria, assignors to Tyrolit Schleifmittelwerke Swarovski K.G., Schwaz, Austria

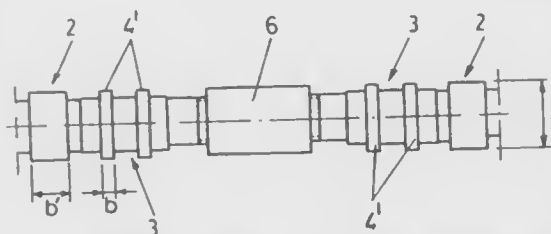
Filed Apr. 2, 1991, Ser. No. 678,154

Claims priority, application Austria, Apr. 3, 1990, 768/90

Int. Cl.⁵ B28D 1/08

U.S. Cl. 125—21

13 Claims



1. A saw cable for a cable saw, for cutting natural stone or rock, masonry or the like, said saw cable comprising:
a cable;
a plurality of cutting beads provided on and spaced along said cable with intervals between adjacent pairs of said cutting beads, said cutting beads having an abrasive cutting grain;
a plurality of non-abrasive spacer sleeves provided on said cable, with each said spacer sleeve being positioned in a respective said interval between a respective adjacent pair of said cutting beads and in abutment therewith; and
each said spacer sleeve including a main body having a diameter less than an outer diameter of said cutting beads and at least one annular land extending outwardly from said main body and having an outer diameter at least approximately the same as said diameter of said cutting beads.

5,086,752

OUTDOOR COOKING UNIT WITH A PEDESTAL STAND

Paul W. Hait, Sun River, Oreg., assignor to Pyromid, Inc., Redmond, Oreg.

Filed Sep. 28, 1990, Ser. No. 589,382

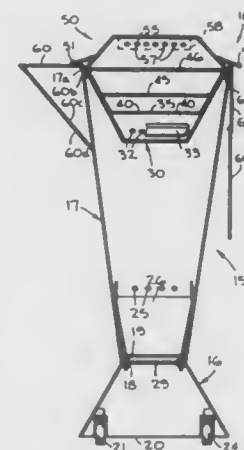
Int. Cl.⁵ F24C 1/16

U.S. Cl. 126—9 R

28 Claims

1. An outdoor cooking unit comprising:
(a) a hollow firebox;
(b) a fire grate disposed in said firebox on which fire grate fuel is supported;
(c) a cooking grill disposed above said fire grate on which cooking grill food is supported; and
(d) a pedestal stand elongated in the upright direction for supporting said firebox above the ground at a convenient height for an operator, said pedestal stand including an upstanding elongated hollow member having an inverted, truncated pyramidal configuration and a quadrilateral upper perimeter,
(e) said firebox having an inverted truncated pyramidal configuration and a quadrilateral upper perimeter, said firebox being disposed generally entirely within said upstanding hollow member of said pedestal stand, said fire-

box being configured and dimensioned for the upper perimeter of said firebox to be supported by said upstanding



5,086,753

PORTABLE GRILL WITH PEDESTAL MOUNT

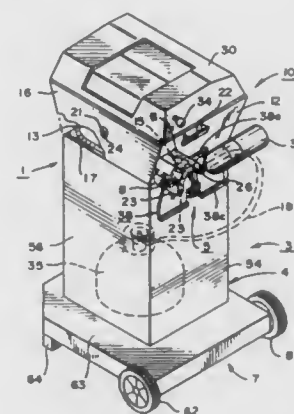
Bernard B. Berger, Aiken, S.C., assignor to The Ducane Company, Inc., Columbia, S.C.

Filed Feb. 26, 1991, Ser. No. 660,863

Int. Cl.⁵ F24C 3/00

U.S. Cl. 126—41 R

20 Claims



1. An outdoor grill comprising:
head means for supporting heating means in spaced relation beneath food support means so as to cook food supported on the food support means;
leg means mounted on said head means for directly engaging a support surface to support said head means at a first distance above the support surface;
pedestal means for supporting said head means at a second distance above the support surface, said second distance being substantially greater than said first distance, and said pedestal means comprising a vertically extending pedestal and foot means at a lower end portion of said pedestal for cooperating with the support surface to support said pedestal in an upright position; and,
fastening means for releasably attaching said leg means to said pedestal means such that said head means may be selectively connected to and disconnected from an upper end portion of said pedestal.

5,086,754

FUEL BURNING FURNACE

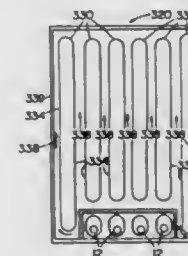
Rajendra Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056, assignor to Rajendra K. Narang, Macedonia, Ohio

Division of Ser. No. 494,589, Mar. 16, 1990, Pat. No. 4,987,881, which is a division of Ser. No. 366,262, Jun. 12, 1989, Pat. No. 4,922,890, which is a continuation of Ser. No. 428,542, Sep. 30, 1982, abandoned. This application Oct. 9, 1990, Ser. No. 595,251

Int. Cl.⁵ F24H 3/02

U.S. Cl. 126—110 R

12 Claims



1. A furnace comprising a plurality of burners for use in burning fuel to form hot combustion gases which rise upwardly, a plurality of heat exchange enclosures having upwardly extending heating chambers for holding air to be warmed, a housing having side walls at least partially enclosing said plurality of burners, said plurality of heat exchange enclosures, and space for receiving combustion gases from said burners, an upright exhaust duct connected in fluid communication with the space in said housing which receives hot combustion gases from said burners, said upright exhaust duct extending upwardly from an upper end portion of said housing to conduct hot combustion gases upwardly from the space in said housing, and an upright intake duct connected in fluid communication with said plurality of burners for conducting a flow of air downwardly along said upright exhaust duct toward said housing to heat the air with heat transferred from hot combustion gases flowing upwardly in said exhaust duct, for conducting a flow of air around the outside of said housing after the air has been heated by heat transferred during a downward flow of air along said exhaust duct, and for then conducting the air to said plurality of burners so that the air is preheated before being conducted to said burners, one of said upright intake and exhaust ducts surrounding at least a portion of the other of said upright intake and exhaust ducts at a location above said housing to heat a downward flow of air conducted through said upright intake duct toward said housing with an upward flow of hot combustion gases in said upright exhaust duct before the air is conducted around the outside of said housing and before the air is conducted to said plurality of burners.

5,086,755

THERAPEUTIC CHAISE LONGUE

Helmut Schmid-Ellber, Ölbronn-Dürrn, Fed. Rep. of Germany, assignor to GfPE-Gesellschaft für Persönlichkeitsentwicklung GmbH, Ölbronn-Dürrn, Fed. Rep. of Germany

Filed Jul. 24, 1989, Ser. No. 383,595

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825454

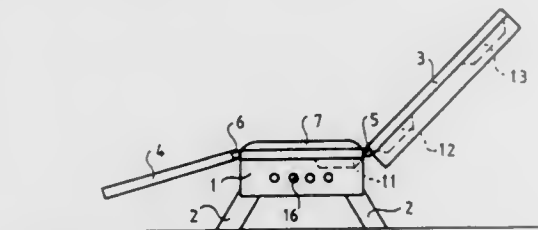
Int. Cl.⁵ A61H 1/00

U.S. Cl. 128—33

6 Claims

1. A chaise longue for the administration of therapeutic treatment adapted to facilitate total relaxation of a patient, said chaise longue including a first support section for the support of the back and the head of the patient, a second support section for the support of the lower back and a third support section for the shanks of the patient, said first and second support sections having openings formed therein in spaced relationship along the longitudinal centerline of the chaise longue and electroacoustic transducers mounted below said first and second sections and arranged so as to radiate up-

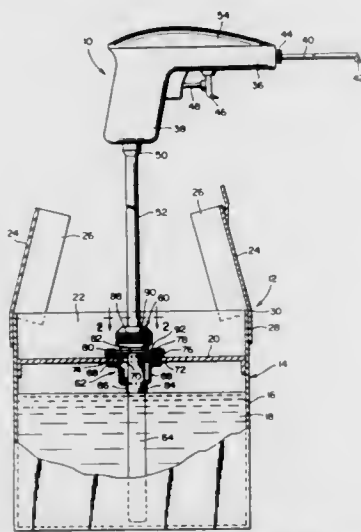
wardly through said openings onto a patient resting on said chaise longue, said first section having wide band speakers arranged at opposite sides of said centerline so as to be adjacent the head of a patient resting on said chaise longue for transmitting music to said patient wherein alternating current in the sound frequency range of the music is supplied to the wide-



band speakers to be listened to by the patient on the chaise longue and means are provided for sensing the first of the repetitive beats of the beat pattern of the music and a signal generator is provided to supply to said electroacoustic transducers a signal based on the repetitive beat pattern sensed by said sensing means, said signal having an adjustable frequency below the audible range.

5,086,756
HAND OPERATED ORAL IRRIGATION DEVICE FOR PACKAGED LIQUIDS
James R. Powell, 480 Roe Ave., Elmira, N.Y. 14901
Filed Jan. 3, 1991, Ser. No. 637,142
Int. Cl.⁵ A61H 7/00
U.S. Cl. 128—66

11 Claims

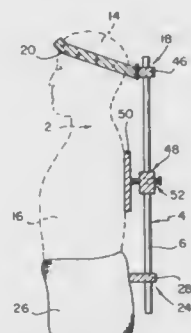


1. An oral irrigation device comprising the combination of a packaged liquid and a pump unit, said packaged liquid including a container having a quantity of liquid therein formulated to treat surfaces within an oral cavity, said container including a top wall having a female connecting module therein, said pump unit including discharge nozzle means to discharge liquid onto surfaces of the oral cavity, an inlet tube communicated with the pump unit, said inlet tube including a male connecting module for separable, sealing connection with the female connecting module on the container to communicate the inlet tube with the interior of the container thereby enabling discharge of the liquid directly from the container onto the surfaces of the oral cavity without coming into contact with ambient air, said female connecting module including a tubular housing having an opening extending therethrough, said tubular housing extending through the top wall of the

container and including a rotatable disk mounted therein, said disk including an opening therethrough having a non-circular configuration, said male connecting module including a tubular inlet member extending below the male connecting module and forming a continuation of the inlet tube with the inlet member including a transverse configuration identical to the opening in the disk to enable insertion of the tubular member but excluding insertion of tubular members of different shape.

5,086,757
THREE-POINT CERVICAL FIXATION DEVICE
William F. Lestini, 3531 39th St., NW., Condo B500, Washington, D.C. 20016
Filed Nov. 30, 1990, Ser. No. 620,074
Int. Cl.⁵ A61F 5/08, 5/02, 5/04
U.S. Cl. 602—17

8 Claims



1. A three-point cervical fixation device for a human patient, comprising:
(a) vertical support means extending substantially parallel to the patient's spine, said support means having upper and lower ends adjacent the head and torso of a patient, respectively;
(b) first means for connecting said support means upper end with the patient's head;
(c) second means for connecting a lower portion of said support means adjacent the sacral region of the patient's spine; and
(d) force-applying means connected with said support means or applying a force to the apex of the thoracic region of the patient's spine intermediate said first and second connecting means in a horizontal direction generally away from said support means, thereby to stabilize the cervical region of the patient's spine.

5,086,758
BELT SUPPORT DEVICE WITH ADJUSTABLE HOOK AND LOOP-TYPE FASTENER
James W. Schiek, Sr., 513 B Saratoga Ave., Fond du Lac, Wis. 54935, and James M. Schiek, 1031 S. Webster, Omro, Wis. 54963
Filed Mar. 7, 1991, Ser. No. 665,990
Int. Cl.⁵ A61F 5/02, 5/37; A63B 21/072; A41F 3/02
U.S. Cl. 602—19

9 Claims



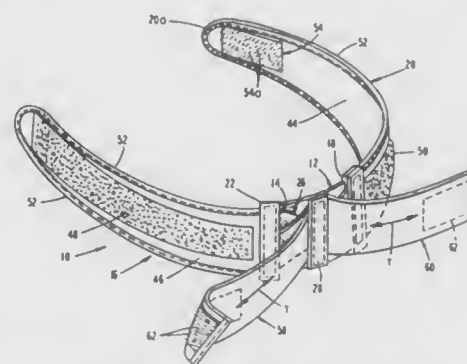
1. In a support device of the type including a belt for adjustably encircling the human body about the waist, the device having a pair of straps extending laterally outward from the opposite sides thereof and having outer ends spaced outwardly therefrom, and improved means for securing the outer ends of

said straps to one another and for adjusting the position of the straps relative to one another when the belt is first placed about the waist of a wearer, the improvement comprising:

- a first pad permanently secured to the outer end of one of said straps and including a hooked surface;
- a second pad permanently secured to the outer end of the other of said straps and including a looped surface, wherein the first and second pads may be secured to one another by placing the pads in mated juxtaposition, with the hooked and looped surfaces in contact with one another and by applying pressure to said pads; and
- a removable shield secured to the belt and removably placed over the surface of one of said pads for preventing inadvertent, premature engagement of the hooked and looped surfaces to one another, said shield being selectively removable from the pad surface when the belt is in use and replaceable over the pad surface during storage or for adjustment of the belt when first placed to encircle the waist of a wearer.

5,086,759
CHIROPRACTIC BELT
C. Curtis Buddingh, 22114 Ventura Blvd., Woodland Hills, Calif. 91364
Filed Apr. 10, 1990, Ser. No. 507,373
Int. Cl.⁵ A61F 5/02, 5/24
U.S. Cl. 602—19

7 Claims



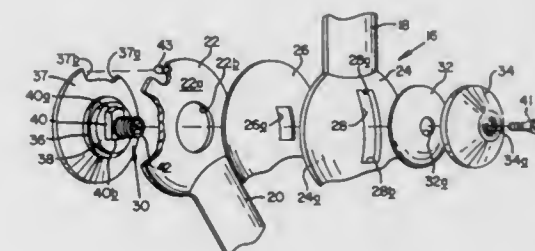
1. A chiropractic belt comprising
a first, flexible elastic member having opposed ends,
a pair of flexible belt segments, each belt segment having a free end and another end attached to one of the opposed ends of the elastic member,
fastener means on the belt segments which allow the free ends of the belt segments to be connected and disconnected,
second and third flexible elastic members overlying the first elastic member and criss-crossing each other to intersect near the mid-section of the first elastic member,
means for securing the second and third elastic members to each other and means for securing the first elastic member at the intersection of said second and third elastic members,
fourth and fifth elastic members, each having one end secured at the intersection of the second and third elastic members, and each having a free end, each of said fourth and fifth elastic members extending outwardly from the intersection and being adapted to be aligned in parallel, overlying relationship with an adjacent belt segment, and means which allow the fourth and fifth elastic members to be connected and disconnected to their respective adjacent belt segments.

5,086,760
ARTICULATED ORTHOTIC BRACE FOR AN ANATOMICAL JOINT

Holm W. Neumann, 803 NW. Tyler, Corvallis, Ore. 97330, and Thomas J. Maddock, 45937 McKenzie Hwy., Vida, Ore. 97488
Continuation of Ser. No. 338,737, Apr. 14, 1989, abandoned.
This application Jun. 17, 1991, Ser. No. 715,735
Int. Cl.⁵ A61F 5/00

U.S. Cl. 602—27

18 Claims



6. An articulated, orthotic brace for promoting rehabilitation of an injured ankle comprising:
first support means for detachably engaging the lower leg adjacent the injured ankle;
second support means for detachably engaging the foot adjacent the injured ankle;
articulated means interconnecting the first and second support means adjacent one of the ankle's malleoli including first and second articular members and mounting means mounting the second articular member on the first articular member for relative rotation about an axis which extends outwardly to one side of said articulated means and this axis occupying a neutral position, the mounting means including a pin extending from one articular member to the other articular member along the axis and including a slot in one articular member through which the pin extends to permit relative displacement of the articular members, the slot defining a guide path along which the pin moves when the articular members are displaced relative to one another, and wherein the displacement of the second articular member relative to the first articular member swings said axis to a position inclined to the position of the axis with the axis in said neutral position;
first adjustment means associated with the articulated means for selectively predetermining extent of relative rotation of the first and second articular members; and
second adjustment means associated with the articulated means for selectively predetermining the extent of relative displacement of the second articular member with respect to the first articular member by selectively predetermining the dimensions of the slot.

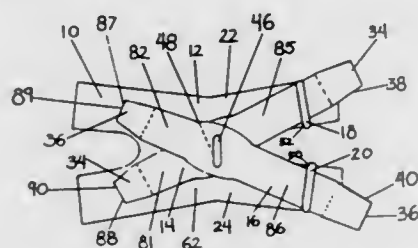
5,086,761
MULTI-ADJUSTABLE KNEE BRACE
Patrick T. Ingram, 9800 Sheridan St. #205, Pembroke Pines, Fla. 33024
Filed Mar. 26, 1990, Ser. No. 498,909
Int. Cl.⁵ A61F 5/00

U.S. Cl. 602—26

8 Claims

1. A knee brace or wrap for use during athletic or other activity to prevent or reduce knee damage, said knee brace comprising:
sleeve means for snugly embracing the knee joint region of a user's leg and adjacent sections of the upper limb and lower limb extending therefrom, said sleeve means containing an opening positionable directly over the front of the kneecap;
first and second strap means, said strap means criss-crossing one another and intersecting directly over the front of the kneecap; each strap means having an aperture positionable

directly over the front of the kneecap for providing tension that encompasses the kneecap; said strap means each being anchored above and below said sleeve means opening to said sleeve means at points above and below the aperture of each strap respectively; and



adjustment means for adjusting the tension of said first and second strap means across the kneecap and sides of the knee and to the back of the knee.

5,086,762

TYPING BRACE

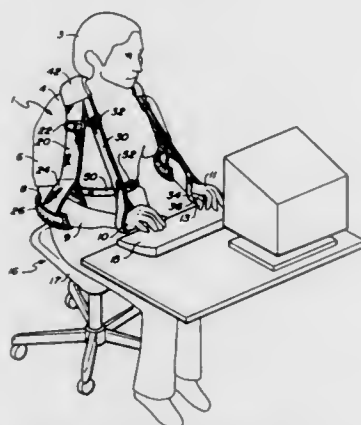
Edward K. Chee, 220 Bush St., Ste. 348, San Francisco, Calif. 94104

Filed Mar. 15, 1991, Ser. No. 669,970

Int. Cl.⁵ A61F 5/40, 5/37

U.S. Cl. 602—4

19 Claims



1. Typing brace apparatus including:
 - a rigid yoke having an upper pair of yoke arms, each yoke arm having a free forward end and a rear end connected to the rear end of the other yoke arm;
 - a leg of the yoke depending downwardly from the connected rear ends of the yoke arms;
 - at least one strap depending downwardly from the forward end of each yoke arm, the at least one strap having human arm cradling means at a distal end thereof; and
 - attachment means operably connected to the yoke leg for stabilizing the yoke leg with respect to the at least one strap.

5,086,763

PROTECTIVE RECLOSABLE WOUND DRESSING

Johnnie L. Hathman, 1310 Summertime La., Culver City, Calif. 90230

Filed Aug. 6, 1990, Ser. No. 562,831

Int. Cl.⁵ A61F 13/00, 15/00; A61L 15/00

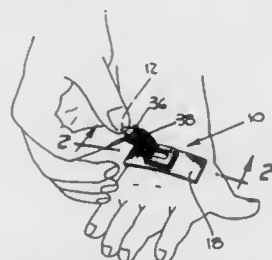
U.S. Cl. 602—42

3 Claims

1. A disposable, protective, reclosable wound dressing bandage providing access to a wound, comprising:
 - an adhesive tape for adhering said bandage to a body part, said tape having an opening such that the wound is circumscribed therewithin;
 - a soft pad frame affixed to said adhesive tape and said soft

pad frame having an opening in registry with said opening in said adhesive tape, said soft pad frame providing an outward offset from said adhesive tape;

- a pad frame secured to said soft pad frame, said pad frame having an opening in registry with said openings in said adhesive tape and in said soft pad frame, respectively, said pad frame being fabricated from a fabric used to adhere to a micro hook material;



- a gauze pad having dimensions such that said gauze pad fits within said openings in registry with said adhesive tape, said soft pad frame and said pad frame;
- a removable inspection, medication covering flap having micro hook material on a substantial portion of a side thereof for detachably securing said flap to said pad frame and to said gauze pad, said flap having a tab for use by a care provider so as to open, close and remove said flap.

5,086,764

ABSORBENT DRESSING

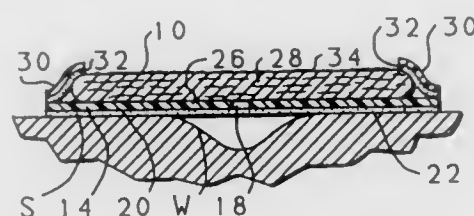
Thomas Gilman, 6 Jacob Dr., Mansfield, Mass. 02048

Filed Apr. 13, 1989, Ser. No. 337,240

Int. Cl.⁵ A61F 13/00, 15/00

U.S. Cl. 602—42

5 Claims



1. A dressing for a wound of a patient, comprising:
 - a base sheet for placement on the skin of the patient surrounding the wound, said base sheet having an opening extending therethrough located over the wound, said base sheet having an adhesive on a front surface thereof for securing the base sheet to the skin surrounding the wound;
 - an absorbent layer separate from the base sheet and located on a back surface of the base sheet, said layer covering the opening to permit replacement of the absorbent layer without removal of the base sheet from the patient's skin, with said layer having dimensions larger than said opening, said absorbent layer having a back surface comprising a hydrophobic coating in order to provide a barrier for the absorbent layer and make the dressing resistant to contamination; and
 - means for securing the absorbent layer in place over the base sheet.

5,086,765

NEBULIZER

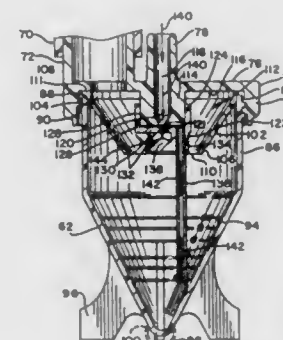
Walter Levine, 6948 N. Keating, Lincolnwood, Ill. 60646

Filed Aug. 29, 1990, Ser. No. 575,146

Int. Cl.⁵ A61M 11/02

U.S. Cl. 128—200.21

18 Claims



1. A nebulizer for administering medicine to a patient, comprising:
 - a tubular body having an inspiratory end portion, an opposing air inlet end portion and a central portion disposed between said inspiratory and said inlet end portions;
 - a cap connected to said central portion and having a gas inlet nipple;
 - one-way valve means for controlling the flow of fluid through said central portion from said inspiratory and said inlet end portions;
 - a vial configured for connection to said cap and being in fluid communication with said central portion, said vial adapted to retain a supply of medicine therein;
 - nebulizing means for creating an aerosol of the medicine, said nebulizing means including a plurality of baffle members and being disposed on said tubular body so as to be in fluid communication with said vial and said central portion;
 - said nebulizing means further including a female jet member having an upper end with a vertically projecting annular ring defining a socket, said socket sealingly engaging a depending boss of said cap to define a mixing chamber having a jet orifice in a bottom surface thereof; a siphon port depending from said bottom surface and being in fluid communication with said mixing chamber; a primary baffle member integrally joined to said siphon port; a siphon tube engaged in said siphon port for drawing medicine from the vial; said mixing chamber adapted to receive gas from said inlet nipple and to mix the gas with medicine drawn through said siphon tube and to emit the mixture through said orifice; and
 - said primary baffle disposed coaxially with said orifice and disposed in spaced relationship below said orifice to fragment droplets of the mixture emitted therefrom.

5,086,766

MEDICAL BREATHING APPARATUS

Allan Beacham, Andover, United Kingdom, assignor to Virotherm Laboratories Ltd., United Kingdom

PCT No. PCT/GB89/00357, § 371 Date Oct. 15, 1990, § 102(e)

Date Oct. 15, 1990, PCT Pub. No. WO89/09632, PCT Pub. Date Oct. 19, 1989

PCT Filed Apr. 6, 1989, Ser. No. 585,068

Claims priority, application United Kingdom, Apr. 16, 1988, 8809039

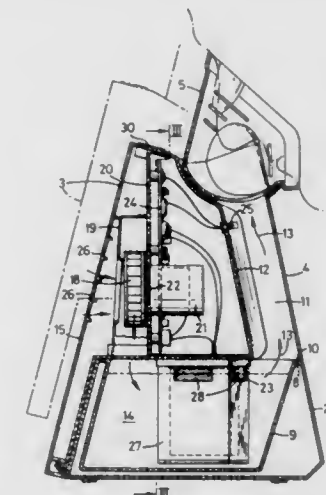
Int. Cl.⁵ A61M 16/00

U.S. Cl. 128—203.27

6 Claims

1. A breathing apparatus of the kind having a water chamber in which a heating element is immersed in water, the temperature of the water being controlled by the heating element so that air drawn over the heated water is maintained at an outlet of the apparatus at or close to a desired humidity and temperature, the volume of the air passing through the apparatus being

substantially greater than that required for breathing and being directed into a face mask, connected to the outlet, which is formed with vents through which excess moist heated air together with air exhaled by the user can pass to atmosphere, wherein an exterior casing of the apparatus is formed from a base and a mating removable housing carrying electrical components including the heating element, the base comprises a water tank and at least a substantial portion of a duct extending therefrom which defines an air path for the



moist heated air to travel from the water tank to the face mask connected to a distal end of the duct, the heating element being carried by the removable housing so that, once the removable housing is matingly engaged with the base, the heating element is at least partly immersed in the water, when water is contained in the water tank, and the base, the at least substantial portion of the duct and the face mask remaining connected to one another as a single unit upon disengagement of the removable housing from the base.

5,086,767

VENTILATOR FOR ASSISTING THE BREATHING OF A PATIENT

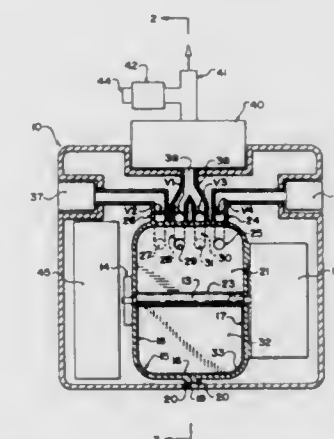
Jules O. Legal, Manitoba, Canada, assignor to Canadian Aging & Rehabilitation Product Development Corporation, Winnipeg, Canada

Filed Sep. 26, 1990, Ser. No. 588,275

Int. Cl.⁵ A62B 00/00

U.S. Cl. 128—205.18

1 Claim



1. A ventilator for assisting the breathing of a patient com-

prising a pump for generating an air flow, inlet means for drawing air from an exterior supply into the pump, said inlet means including valve means for preventing expulsion of air through said inlet means from said pump, outlet means for communicating pumped air from the pump, a supply line for supplying air exiting from the pump through the outlet means to the patient, valve means connected to the supply line operable to control the supply of air from the pump to the patient in an inhaling action and to allow release of air from the patient to the exterior in an exhaling action, a drive motor for the pump, the pump comprising a drive shaft, a housing defining a chamber having a chamber surface formed by a surface of revolution about a longitudinal axis of the drive shaft, a dividing member lying in an axial plane of the chamber and extending from the shaft to the peripheral wall, the dividing member being wedge-shaped in cross section with an apex at the drive shaft and increasing in width to a base at the chamber surface, the ports being formed in side faces of the dividing member so as to face angularly around the chamber, the inlet means including a first and a second inlet duct communicating with the chamber at the dividing member with the first inlet duct having a port on one side of the dividing member and the second inlet duct having a port on an opposed side of the dividing member, the outlet means including a first and a second outlet duct communicating with the chamber at the dividing member with the first outlet duct having a port on said one side of the dividing member and the second outlet duct having a port on said opposed side of the dividing member, a vane carried by the drive shaft and extending therefrom in a substantially axial plane, sealing means for sealing an edge of the vane relative to the chamber surface such that rotation of the drive shaft in a first angular direction through an angle less than 360° causes the vane to sweep around a portion of the chamber to draw air through the first inlet duct into the chamber and to expel air from the chamber into said second outlet duct and rotation in the opposed angular direction causes the vane to sweep around a volume of the chamber to expel air through the first outlet duct to the patient, the dividing member being permanently fixed inside said chamber and said valve means comprising four valve members each mounted in a respective one of said first inlet duct, said first outlet duct, said second inlet duct and said second outlet duct at a position therein exteriorly of the dividing member.

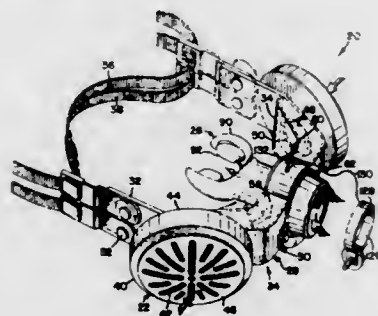
5,086,768

RESPIRATORY PROTECTIVE DEVICE

Trenton A. Niemeyer, St. Paul, Minn., assignor to Filcon Corporation, St. Paul, Minn.
Continuation of Ser. No. 18,154, Feb. 24, 1987, abandoned. This application Sep. 15, 1989, Ser. No. 433,381
Int. Cl. A62B 9/02

U.S. Cl. 128—205.24

13 Claims



1. A respiratory protective device for a person, comprising: a mouthpiece having an opening means for centering with respect to the person's mouth, said mouthpiece having a centerline extending centrally through the opening means; means for holding said mouthpiece with respect to the person's head; a plurality of filter assemblies for filtering air; means, attached to said holding means, for directing the

filtered air from said filter assemblies to said mouthpiece, and supporting said filter assemblies and said mouthpiece, said directing means including first and second chambers; said first chamber containing said second chamber, said mouthpiece being connected to said second chamber, said directing means also including a plurality of passageways, each passageway connected between a different one of the filter assemblies and said first chamber wherein each of said passageways is in fluid communication with said first chamber and a different one of said filter assemblies; and said directing means further including means for selectively passing filtered air and exhalation air, and defining with the remainder of said directing means said first and second chambers, said passing means including first valve means, positioned between the first and second chambers, for admitting filtered air from said first chamber to said second chamber to flow to said mouthpiece and second valve means positioned between the second chamber and the atmosphere opposite the mouthpiece and adjacent to said first valve means, for minimizing dead air space, and directly outletting exhalation air from said mouthpiece and said second chamber to ambient.

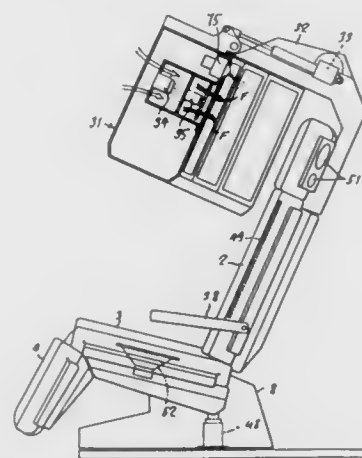
5,086,769

TANNING CHAIR

Daniele Vianello, Milan; Hiromitsu Kawai; Antonio Ubezio, both of Novara, and Orlando Jemma, Genoa, all of Italy, assignors to Whitesun S.p.A., Italy
Filed Sep. 28, 1989, Ser. No. 414,029
Claims priority, application Italy, Sep. 28, 1988, 12558 A/88
Int. Cl. A61N 5/06; A61H 15/02

U.S. Cl. 128—377

7 Claims



1. A chair for supporting a user undergoing ultraviolet light treatment for inducing body tanning comprising: conversion means for reclining said chair into a couch-like support; a body tanning apparatus mounted on a side of the chair, said body tanning apparatus including a base frame; an overlying case hingedly mounted on said side of the chair; front and side ultraviolet lamps, said lamps being housed in said overlying case.

5,086,770

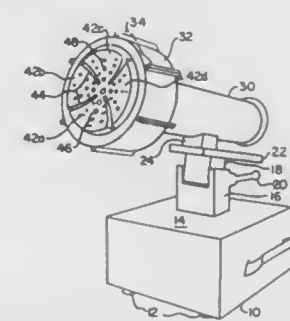
THERAPEUTIC APPARATUS WITH JEWELS

Gordon N. Prangley, 4 Church Street, Abbey Green, Bath, Avon, United Kingdom
Continuation of Ser. No. 935,075, Nov. 24, 1986, abandoned, which is a continuation of Ser. No. 530,590, Jul. 11, 1983, abandoned. This application Feb. 19, 1991, Ser. No. 657,373
Claims priority, application United Kingdom, Nov. 11, 1981, 8134029

Int. Cl. A61B 17/36

U.S. Cl. 128—395

10 Claims



1. Therapeutic apparatus for producing a beam of therapeutic radiation, comprising: a source of at least one of thermal and optical radiation, a shield interposed in a path of radiation from the source, said shield including a plate having a plurality of apertures defined therein, in which a plurality of jewels are mounted, said jewels being of a plurality of types including at least some emeralds, topazes, garnets, sapphires, rubies, diamonds, peridots and amethysts, whereby radiation from the source is transmissible through the shield via at least some of the jewels.

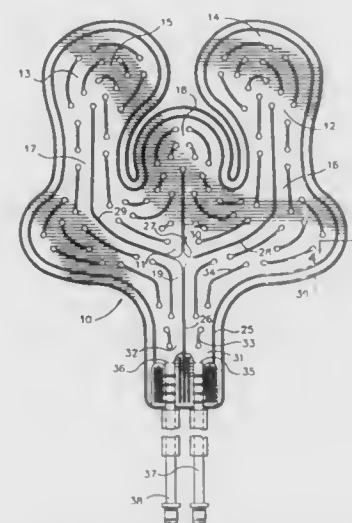
5,086,771

CONFIGURED PAD FOR THERAPEUTIC COOLING EFFECT

Michael C. Molloy, Cincinnati, Ohio, assignor to Cincinnati Sub-Zero Products, Inc., Cincinnati, Ohio
Filed Sep. 5, 1991, Ser. No. 755,550
Int. Cl. A61F 7/00

U.S. Cl. 128—400

14 Claims



1. A configured pad for placement on a body part of a patient so as to conform thereto for the purpose of effectively cooling the body part, said configured pad comprising:
(a) a substantially flattened member having a main section, a first generally oblong-shaped branch extending forwardly from a side area thereof, a generally circular-shaped

branch extending forwardly from an upper center area thereof and a second generally oblong-shaped branch extending forwardly from another side area thereof, wherein said substantially flattened member is divided into a lower cooling zone portion and an overlying insulating zone portion, said lower cooling zone portion having formed therewithin an internal flow channel extending generally from a lower center area of the main section along divided halves of the first generally oblong-shaped branch, the generally circular-shaped branch and the second generally oblong-shaped branch back to the lower center area of the main section; and

(b) inlet and outlet port tubes located in the lower center area of the main section in communication with the internal flow channel such that cooling water which enters the inlet port tube flows through the internal flow channel to provide a cooling effect to the body part adjacent the configured pad and ultimately flows out the outlet port tube.

5,086,772

ARRHYTHMIA CONTROL SYSTEM EMPLOYING ARRHYTHMIA RECOGNITION ALGORITHM

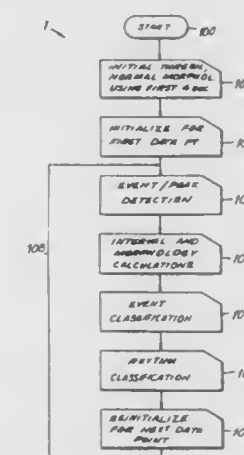
Donald J. Larnard, Davie, and Andre G. Routh, West Melbourne, both of Fla., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Jul. 30, 1990, Ser. No. 559,295

Int. Cl. A61N 1/39

U.S. Cl. 128—419 D

31 Claims



1. A cardioverting device for reverting tachycardia in a patient's heart, said device including means for sensing the ventricular waveform of the heart, means for storing data corresponding to said waveform, and means for delivering cardioversion shock therapy to the heart, said device further comprising:

means for detecting event peaks in said waveform and establishing event data windows extending for predetermined time periods relative to each of said event peaks;
means responsive to the detection of an event peak in said waveform for determining the morphology of that portion of said waveform which occurs within said event data window;
means for classifying each of said events based on said morphology, said means outputting in real time at least one of a plurality of different values corresponding to at least one of a plurality of different heart rate categories, including at least a normal rate, a tachycardia rate and a ventricular fibrillation rate;
means for summing the output of said event classifying means during a predetermined number of events, said means outputting in real time at least one of a plurality of different rhythm signals based on said summing and corre-

sponding at least to a non-pathological rhythm, a pathological ventricular tachycardia rhythm and a pathological ventricular fibrillation rhythm; and,
means responsive to said output summing means for delivering appropriate therapy to the heart when said rhythm signal corresponds to one of said pathological rhythms.

5,086,773

TOOL-LESS PACEMAKER LEAD ASSEMBLY

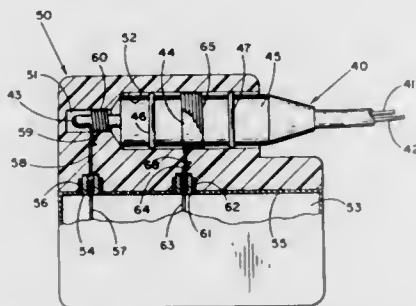
Lyle A. Ware, Albuquerque, N. Mex., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Sep. 10, 1990, Ser. No. 580,169

Int. Cl.⁵ A61N 1/05

U.S. Cl. 128—419 P

7 Claims



1. A lead connection assembly for an implantable device forming a subcutaneous electrical and mechanical connection with an electrical lead without tools comprising:

- an electrically insulative housing having a biocompatible exterior surface;
- a longitudinal bore in the housing for receiving an electrically conductive terminal tip portion of a generally cylindrical electrical lead;
- a connector means in the form of a resilient conductive spring retaining connector means in the shape of a generally cylindrical helix disposed in the bore, the spring retaining connector means further being adapted to be electrically connected to the internal circuitry of the implantable device, the helix of the retaining connector means further being adapted to receive the pin portion of the lead making electrical contact to the conductive pin terminal thereof, the connector means operating in a manner such that when the lead is rotated a partial revolution within the helix in a first direction which would tend to unwind the helix, the lead is freed to move longitudinally in and out of the helix coil and when the lead is rotated a partial revolution within the helix in a second direction which tends to tighten the helix winding, the coil permanently seizes the lead such that it cannot be withdrawn without first being rotated in the first direction; and
- wherein the insertion of the lead further provides a biocompatible seal accomplishing electrical and fluid isolation of the connector means from bodily fluids proximate the exterior surface of the implantable device.

5,086,774

SYSTEM AND METHOD FOR AUTOMATICALLY COMPENSATING FOR LATENCY CONDUCTION TIME IN A PROGRAMMABLE PACEMAKER

James L. Duncan, Alpharetta, Ga., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Apr. 2, 1990, Ser. No. 503,209

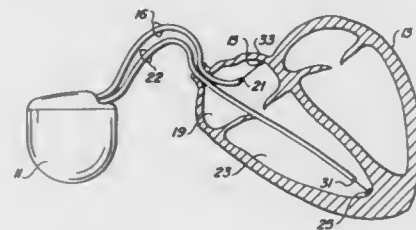
Int. Cl.⁵ A61W 1/00

U.S. Cl. 128—419 PG

16 Claims

1. A system for automatically compensating for latency conduction time in a programmable implantable pacemaker, the latency conduction time being the time interval between a stimulus to the heart and the responsive evoked potential, the system comprising:

means for generating a first stimulus in the absence of intrinsic activity;
means for sensing an evoked potential evidencing depolarization of one of the ventricles or the atrium of the heart, the sensed depolarization resulting from either the application of the first stimulus or intrinsic activity;
timer means for generating a prescribed pacing interval, the prescribed pacing interval commencing with the application of a trigger signal to the timer means;
means for generating the trigger signal of the timer means upon generating the first stimulus and upon sensing the evoked potential, so that in the presence of intrinsic activity the timer means commences its prescribed pacing



interval upon sensing the intrinsic activity, and so that in the absence of intrinsic activity the timer means commences its prescribed pacing interval upon generating the first stimulus and restarts the prescribed pacing interval upon sensing the evoked potential resulting from application of the first stimulus; and

means for generating a second stimulus at the conclusion of the prescribed pacing interval;

whereby the time interval between the generation of the first and second stimulus is equal to the sum of the prescribed pacing interval and the interval between the first stimulus and the resulting evoked potential in the absence of intrinsic activity.

5,086,775

METHOD AND APPARATUS FOR USING DOPPLER MODULATION PARAMETERS FOR ESTIMATION OF VIBRATION AMPLITUDE

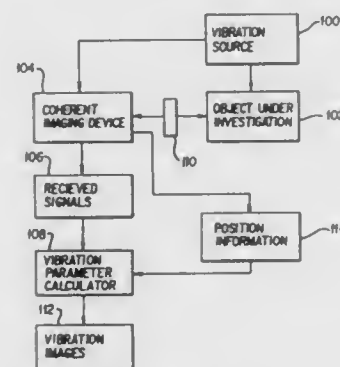
Kevin J. Parker, Robert M. Lerner, and Sung-Rung Huang, all of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Nov. 2, 1990, Ser. No. 608,389

Int. Cl.⁵ A61B 8/00

U.S. Cl. 128—660.01

38 Claims



1. The system using Doppler modulation parameters in real-time for determining the vibration amplitude of an object, comprising:

- means for causing said object to vibrate;
- means for generating one of pulsed electromagnetic and acoustic radiation and for impinging said pulsed radiation onto said object;

means for receiving pulsed radiation Doppler shifted signals reflected by said object after impingement of said pulsed radiation on said object; and
means for analyzing said Doppler shifted signals to derive the vibration amplitude of said object.

5,086,776

APPARATUS AND METHOD FOR SENSING CARDIAC PERFORMANCE

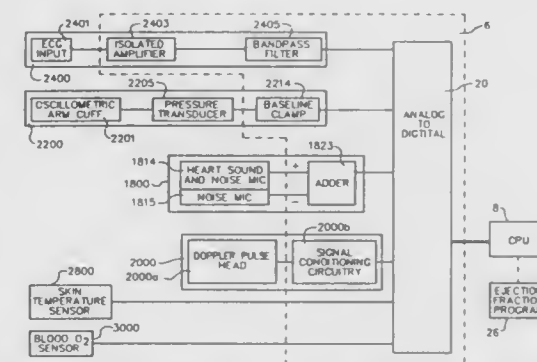
Franklin S. Fowler, Jr., and Russell P. Jurgensen, both of Camano Island, Wash., assignors to Precision Diagnostics, Inc., Stanwood, Wash.

Filed Mar. 6, 1990, Ser. No. 490,044

Int. Cl.⁵ A61B 8/02

U.S. Cl. 128—661.09

39 Claims



1. An apparatus for sensing cardiac performance comprising: a plurality of noninvasive sensors adapted to be attached to a patient for producing electrical analog sensor signals representing cardiac wave initiation points, high-frequency components of second heart sounds, arterial pulse wave initiation points, and arterial pulse wave diastolic notches;

means for processing said electrical analog signals to produce a signal representing systolic time intervals as a responsive function of said electrical analog sensor signals; and

means for producing an electrical signal representing ejection fractions as a responsive function of said signal representing systolic time intervals.

5,086,777

SMALL-SIZED DISPOSABLE PRESSURE TRANSDUCER APPARATUS WITH A TEMPERATURE COMPENSATING CIRCUIT DISPOSED ADJACENT A PASSAGEWAY COUPLED WITH A CATHETER

Toshiyasu Hishii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 2, 1990, Ser. No. 517,882

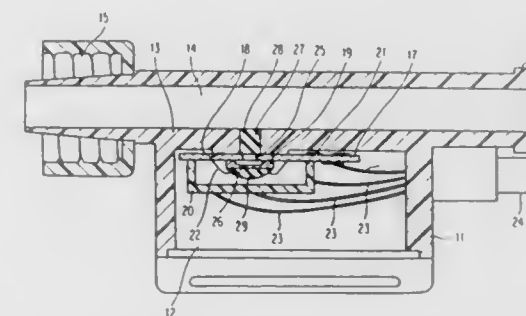
Int. Cl.⁵ A61B 5/02

U.S. Cl. 128—675

4 Claims

1. In a disposable pressure transducer apparatus for use in blood pressure measurement, said apparatus comprising a housing having an interior and a wall portion in which a passageway is formed to be coupled with a catheter, said passageway being for introduction of a fluid through said catheter inserted into a blood vessel, a dielectric substrate having a first surface and an opposite second surface, said substrate being fixedly mounted in said interior of the housing with said second surface being onto an inner surface of said wall portion, a semiconductor pressure sensor mounted on said first surface of said substrate and hydraulically coupled with said passageway, and an electric circuit including a temperature compensating circuit and being mounted on said substrate, said electric circuit being electrically connected to said semiconductor pressure sensor and to electric conductive means for electrically connecting said electric circuit with a monitoring device, the

improvement wherein said first surface of said substrate has a first specific area on which said semiconductor pressure sensor is mounted and the remaining area as a first particular area, said second surface has a second specific area corresponding to said first specific area and the remaining area has a second particular area, said temperature compensating circuit is formed on



said second particular area, said wall portion is provided with an abutment slightly projecting from said inner surface, and said substrate is fixed at said second specific area onto said abutment so that said temperature compensating circuit on said second particular area is positioned to face said inner surface of said wall portion with a small gap.

5,086,778

METHOD AND SYSTEM FOR EVALUATING DATA PICKED-UP BY MEANS OF LONG TERM ECG DEVICES

Peter Mueller, and Oscar Sebastiani, both of Munich, Fed. Rep. of Germany, assignors to Mueller & Sebastiani Elektronik GmbH, Munich, Fed. Rep. of Germany

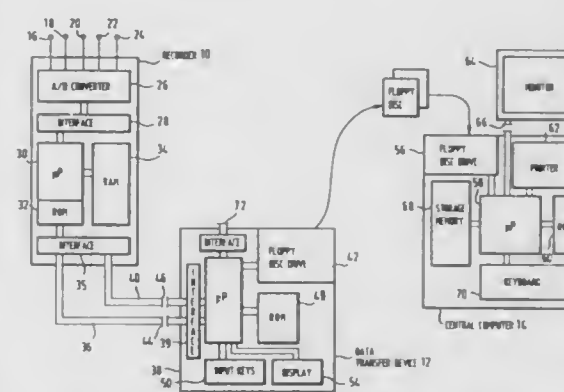
Filed Jul. 20, 1990, Ser. No. 556,084

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1989, 3924214

Int. Cl.⁵ A61B 5/0402

U.S. Cl. 128—696

9 Claims



1. A method of evaluating data picked-up by means of a long term ECG device and stored in a permanent memory, characterized in that, in a first step, a transfer is effected of the data of the permanent memory onto a data carrier independent from the long term ECG device, with a brief evaluation of the data being simultaneously carried out; and in that, in a second step, the data transferred to the independent data carrier is subjected to detailed evaluation at an evaluation center.

5,086,779

BACK ANALYSIS SYSTEM

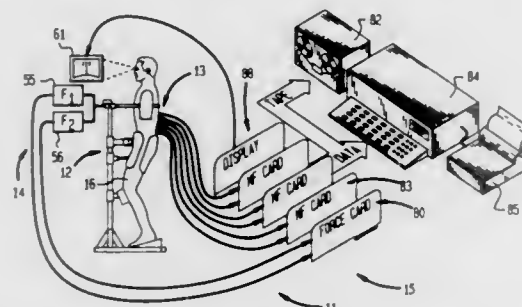
Carlo J. DeLuca; L. Donald Gilmore, both of Wellesley, and Serge H. Roy, Duxbury, all of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed May 30, 1990, Ser. No. 530,302

Int. Cl.⁵ A61B 5/0488

U.S. Cl. 128—733

22 Claims



1. A muscle function analysis system comprising: base means; restraint means supported by said base means and shaped and arranged to receive and immobilize one portion of a human body, said one portion retaining a muscle group concurrently activatable to produce a body function and said restraint means comprising mold means shaped to conform to said one portion; support means supported by said base means and shaped and arranged to support other portions of the body, said support means adapted to substantially isolate activity in said muscle group from muscle activity in said other portions of the body; electrode means adapted for coupling to said muscle group so as to receive myoelectric signals generated by muscle activity therein; and processing means coupled to said electrode means and adapted to process said myoelectric signals.

5,086,780

BLOOD COLLECTION DEVICE

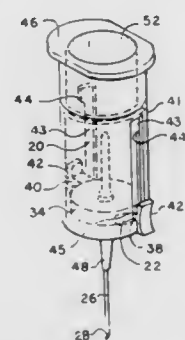
Robert J. Schmitt, Kenosha, Wis., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed May 21, 1990, Ser. No. 526,859

Int. Cl.⁵ A61B 5/00

U.S. Cl. 128—763

16 Claims



1. A blood collection device, for use with a double-ended needle, comprising: a tube having forward and rear ends and at least one longitudinal external slot having a first transverse slot extension in said tube at a forward end portion and a second transverse slot extension in said tube at a rear end portion, said tube rear end terminating with an open tube bore; a needle sheath, axially aligned with the axis of the double-ended needle, at said tube forward end; a support member slideably positioned in said tube bore for

movement along said tube bore between said forward end portion of said tube and said rear end portion of said tube, wherein the double-ended needle is mounted centrally and perpendicularly through said member; an arm means secured to said support member, wherein said arm means projects through said longitudinal external slot and is movable in a slideable and rotatable manner from one transverse slot extension to another transverse slot extension to secure said support member in a selected forward end position or rear end position; a tube rear end cap means to close said tube rear end; a needle sheath cap means to cover said needle sheath; and a flexible connector means joining said rear end cap and said sheath cap.

5,086,781

BIOELECTRIC APPARATUS FOR MONITORING BODY FLUID COMPARTMENTS

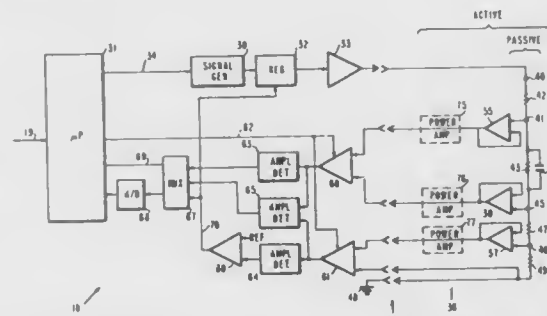
Mark A. Bookspan, 1328 de la Guerra Rd., Santa Barbara, Calif. 93103

Filed Nov. 14, 1989, Ser. No. 436,476

Int. Cl.⁵ A61B 5/05

U.S. Cl. 128—734

21 Claims



1. Apparatus for measuring the body water compartmentalization of a human subject, having potassium ion and sodium ion concentrations which can be used to form a sum, comprising:

means for generating alternating constant current signals at a plurality of predetermined frequencies, and for coupling the alternating constant current signals to a human subject between two selected physical locations thereon; measuring means coupled to two selected different locations on the subject for determining resistance, phase angle and impedance data associated with the subject at each of the plurality of predetermined frequencies; data generation means for generating a plurality of signals comprising electrolytic concentration and anthropometric data associated with the subject; and processor means connected to the data generation means and measuring means for processing the resistance, phase angle, electrolytic concentration and anthropometric data, and for computing intracellular, extracellular and total water volumes of the subject as a function thereof in accordance with predefined equations having a form $V_e = b_0 + b_1[H^2/(R_e M)]$, $V_i = b_0 + b_1(C_i H^2)/M + b_2 H^2/(R_i M)$, and $V_t = b_0 + b_1[H^2/(R_e M)] + b_2(C_i H^2)/M + b_3 H^2/(R_i M)$ for intracellular, extracellular and total body water volumes, respectively, and where H is the subject's height, M is the sum of the concentration of the subject's sodium and potassium ions, and b_0 , b_1 , b_2 , and b_3 are predetermined multivariate linear regression coefficients.

5,086,782

SYRINGE FOR WITHDRAWAL OF FLUIDS

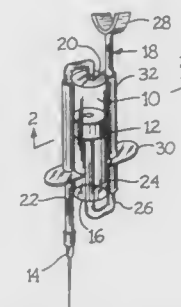
Jerry Zucker, 16 Buckingham Dr., Charleston, S.C. 29407

Filed Dec. 5, 1990, Ser. No. 622,552

Int. Cl.⁵ A61B 5/00

U.S. Cl. 128—765

4 Claims



1. A syringe for the withdrawal of fluids, said syringe comprising a cylinder, said cylinder having first and second ends, a hollow needle extending away from said first end of said cylinder, a piston slideable in said cylinder from said second end toward said first end thereof and toward said needle, a passage connecting said needle to the second end of the cylinder in fluid tight relation, and a plunger, said plunger comprising a first portion connected to said piston and extending in said cylinder toward said first end, and a second portion connected with said first portion and extending exteriorly of said cylinder toward said second end.

5,086,783

BLOOD SAMPLING DEVICE

Paul P. M. G. J. Macors, Liege, Belgium; Henricus F. Paulussen, Eindhoven, and Jellard Vos, Hasselt, both of Netherlands, assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 31, 1990, Ser. No. 607,410

Int. Cl.⁵ A61B 5/00

U.S. Cl. 128—765

26 Claims



1. A blood sampling kit for obtaining a blood sample from a patient, said kit comprising: a syringe assembly having first outer diameter, an elongate barrel section with a reduced diameter distal end and a piston member movably positioned in said barrel section to form a sample chamber between said distal end of said barrel section and said piston member; a stopper assembly having distal and proximal ends and a second outer diameter, said stopper assembly further including a needle pierceable diaphragm member operatively associated therewith; an elongate and generally cylindrical blood collection tube holder having distal and proximal ends and an inner diameter, said blood collection tube holder further including a

needle with distal and proximal needle points thereon wherein said needle is operatively associated with said distal end of said blood collection tube holder; and said stopper assembly is sized to be completely received in said blood collection tube holder and said second outer diameter of said stopper assembly is intermediate said first outer diameter of said syringe assembly and said inner diameter of said blood collection tube holder.

5,086,784

CENTRIFUGED MATERIAL LAYER MEASUREMENTS TAKEN IN AN EVACUATED TUBE

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 191 North Cove Rd., Old Saybrook, Conn. 06475

Continuation of Ser. No. 356,077, May 24, 1989, abandoned.

This application Sep. 5, 1990, Ser. No. 579,274

Int. Cl.⁵ A61B 5/14

U.S. Cl. 128—771

9 Claims



1. A blood sampling assembly for performing tests on a centrifuged sample of blood contained in the assembly without exposing one performing the test to the blood being sampled, said assembly comprising: a transparent tube for holding the sample of blood, said tube having an integral end wall closing one end thereof; an elongated float member disposed in said tube, said float member being operable to settle into the red blood cell layer of the centrifuged blood sample and being sized to extend through the blood sample buffy coat and into the plasma layer and to provide an annular free space of about 125 microns between the tube bore and float and to physically expand the white cell and platelet layers in the buffy coat by about ten fold sufficiently to obtain white cell and platelet layer counts; testing reagents disposed in said tube for reacting with the blood cells to enhance results of the tests; an elastomeric stopper sealing the end of said tube opposite said integral end wall; and the interior of said tube having a subatmospheric pressure whereby the blood will be automatically drawn into said tube when said stopper is pierced by a blood sampling needle.

5,086,785

ANGULAR DISPLACEMENT SENSORS

Christopher T. Gentile, New York, N.Y.; Michael Wallace, Beaverton; Timothy D. Avalon, Portland, both of Oreg.; Scott Goodman, Hermosa Beach, Calif.; Richard Fuller, Sherman Oaks, and Tracy Hall, Cupertino, Calif., assignors to Abrams/Gentile Entertainment Inc., New York, N.Y.

Filed Aug. 10, 1989, Ser. No. 392,127

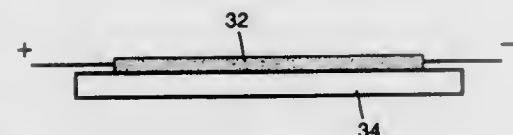
Int. Cl.⁵ A61B 5/11

U.S. Cl. 128—782

3 Claims

1. A sensor for detecting angular displacement of an object comprising:

a substrate for attachment to the object whose angular displacement is to be sensed; sensing means attached to the substrate and connectable into an electric circuit, the sensing means comprising a material having an electrical resistance which changes as a



function of the angular displacement, said material comprising an electrically conductive ink deposited on said substrate, said conductive ink comprising carbon particles in a binder and further comprising a solution of a first stretchable ink and a second brittle ink.

5,086,786

ELECTRODE DEVICE FOR HEATING TUMOR IN ENDOTRACHAL ORGAN

Akira Sogawa, Tokyo; Kiyoshi Kitagawa, Chiba; Chikau Onodera, Tokyo, and Tadashi Onuma, Kikizaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

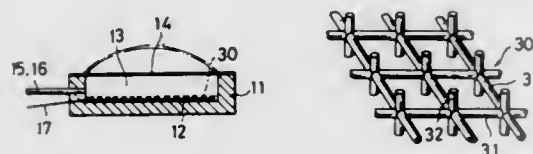
Continuation-in-part of Ser. No. 337,138, Apr. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 64,574, Jun. 22, 1987, abandoned. This application Mar. 14, 1990, Ser. No. 493,429

Claims priority, application Japan, Jun. 27, 1986, 61-98429; Jun. 27, 1986, 61-98430

Int. Cl.⁵ A61N 1/00

U.S. Cl. 128—783

15 Claims



1. An electrode device for heating a tumor of an endotracheal organ by high frequency current, said electrode device being deformable and insertable into said organ and comprising:

- a container made of a flexible polymeric material, formed by a thick side wall and a thick bottom wall which is connected to one end of the side wall, and having an opening defined by the other end of said side wall;
- a deformable electrode member disposed near an inner surface of said thick bottom wall for flowing said electric current into a living body in association with another electrode member which is located on an outer surface of said living body;
- a cable fluid-tightly piercing said side wall, and connected to said electrode member at one end thereof to supply a high frequency current to said electrode member;
- a flexible polymeric film fluid-tightly attached to said thick side wall to close said opening;
- means connected to said container for supplying and discharging a coolant into and out of a space defined by said thick side wall, said thick bottom wall and said flexible polymeric film; and
- a mesh-like member of a flexible polymeric material disposed between said electrode member and said flexible polymeric film, and having a plurality of first passages leading to a top surface thereof and a bottom surface thereof, and a plurality of second passages each communicating said first passages with each other.

5,086,787

STERIOD ELUTING INTRAMUSCULAR LEAD

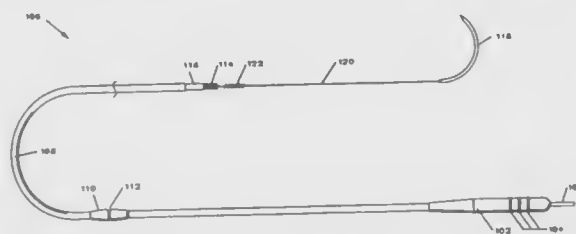
Pierre-Andre Grandjean, Bassenge; Ivan Bourgeois, Verliers, both of Belgium, and Philip H. J. Lee, Woodbury, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 446,594, Dec. 6, 1989, Pat. No. 5,009,229. This application Feb. 28, 1991, Ser. No. 662,526

Int. Cl.⁵ A61N 1/05

U.S. Cl. 128—786

7 Claims



1. An implantable lead for stimulation of a skeletal muscle comprising:

- A. terminal connector means;
- B. conductor means electrically coupled to said terminal connector means, and insulated from the bodily fluids and tissues;
- C. electrode means electrically coupled to said electrical conductor means for transferring electrical energy to the body tissue;
- D. spacer means for storing drug and for allowing it to be gradually eluted; and
- E. said electrode means forming a coil, and said spacer means also forming a coil, wherein at least one turn of said spacer means is interleaved with the turns of said electrode means.

5,086,788

HAND-HELD PHYSIOLOGICAL STIMULATION APPLICATOR

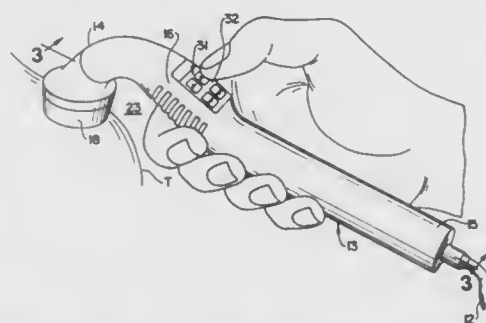
John C. Castel, and Alexander Bally, both of c/o Physio Technology, Inc., 1925 W. 6th St., Topeka, Kans. 66606

Filed Jun. 13, 1988, Ser. No. 206,440

Int. Cl.⁵ A61N 1/00

U.S. Cl. 128—800

29 Claims



1. Manually operable apparatus for controlled physiological stimulation of tissue, comprising:

- an elongated housing having a first end defining an axis, an opposite second end, and a housing grasping portion intermediate said ends;
- an electrically operable transducer;
- mounting means for mounting said transducer to said first housing end comprising means for directing said transducer at an angle to said axis selectively at any one of a plurality of positions circumferentially about said axis; and
- means for energizing said transducer including a power source spaced from said housing, manually operable controls at said housing grasping portion, and electrical conductors for interconnecting said power source, controls,

and transducer to permit concurrent controlled energization and physical positioning of said transducer by a user's hand embracing said housing grasping portion.

(e) means for imparting motion to the cigarette pack and cigarettes contained therein; and

5,086,789

WIND DEFLECTOR FOR THE EAR

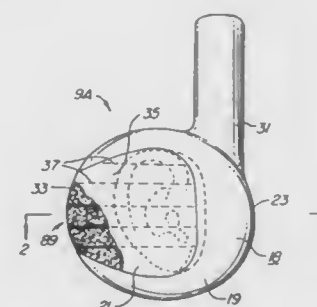
James B. Tichy, P.O. Box 1308, Sausalito, Calif. 94966

Continuation-in-part of Ser. No. 406,685, Sep. 13, 1989, abandoned. This application Jun. 1, 1990, Ser. No. 531,965

Int. Cl.⁵ A41D 21/00

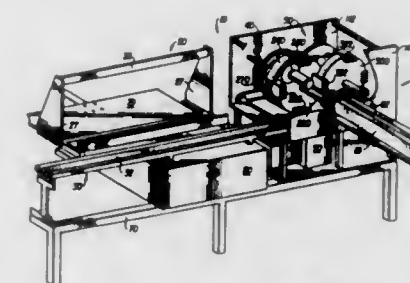
U.S. Cl. 128—866

26 Claims



1. An apparatus for reducing wind noise with respect to a user's ear, the ear having an upper edge, an ear lobe, and a front part, the apparatus comprising:

- a wind deflector including,
 - an outer portion configured to at least partially surround at least the upper edge of the ear, the ear lobe and the front part of the ear, said outer portion having a smooth outer surface shaped such that wind flows smoothly over said outer surface;
 - a sound-permeable inner portion attached to the outer portion and located alongside the user's ear, said inner portion having a smooth outer surface flush with the smooth outer surface of the outer portion; and
 - means for creating an air flow ventilation path between the user's head and the inner portion; and
 - securing means, located on the outer portion, for securing said wind deflector to the user's head.



(f) means for stopping the moving cigarette pack, to separate the cigarettes from the pack.

5,086,791

PROCESS FOR THE PRODUCTION OF A COSMETIC PRODUCT WITH POWDERS OF SEVERAL COLORS OR DIFFERENT CHARACTERISTICS

Dario Ferrari, Milan, Italy, assignor to Intercos Italia S.p.A., Milan, Italy

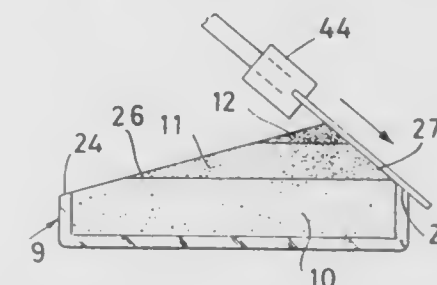
Filed Jun. 4, 1990, Ser. No. 532,605

Claims priority, application Italy, Nov. 15, 1989, 22394 A/89

Int. Cl.⁵ A45D 24/00

U.S. Cl. 132—200

4 Claims



1. A process for the production of a cosmetic product having powders of several different characteristics, said process comprising the steps of:

- introducing a first cosmetic powder into a container and compressing said first cosmetic powder;
- introducing at least one additional cosmetic powder having a different characteristic than said first cosmetic powder into said container on top of said first cosmetic powder and compressing said at least one additional cosmetic powder to form a vertical pile having layers of said first cosmetic powder and said at least one additional cosmetic powder; and
- excavating said pile to form at least one visible surface having adjacent portions of said layers.

5,086,790

METHOD OF AND APPARATUS FOR RECLAIMING CIGARETTES FROM CIGARETTE PACKAGES

Carl C. Greene, Jr., Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 23, 1990, Ser. No. 512,693

Int. Cl.⁵ A24C 5/36

U.S. Cl. 131—96

29 Claims

1. Apparatus for opening cigarette packs and removing the cigarettes therefrom, each of said packs having two side panels, a front and back panel and two end panels, the apparatus comprising:

- (a) means for receiving the cigarette pack;
- (b) means for penetrating the cigarette pack, said penetrating means engaging the cigarette pack so as to be fixedly attached to said receiving means;
- (c) means, communicating with said penetrating means, for expanding the cigarette pack;
- (d) means for cutting of a cigarette pack end panel, thereby exposing a pack edge;

5,086,792

DENTAL FLOSS LOOP DEVICES, AND METHODS OF MANUFACTURE AND PACKAGING SAME

Ingram S. Chodorow, Upper Saddle River, N.J., assignor to Placcontrol Corp., Montvale, N.J.

Continuation of Ser. No. 312,341, Feb. 16, 1991, abandoned, which is a continuation of Ser. No. 820,100, Jan. 21, 1986, abandoned. This application Jun. 4, 1990, Ser. No. 533,937. The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁵ A61C 15/00

U.S. Cl. 132—323

10 Claims



1. A dental floss loop device comprising a pair of injection molded plastic gripping elements and a pair of separate dental floss strands extending between said pair of elements with opposite ends of each floss strand secured respectively in the two elements of said pair, the two strands of said pair are equal in length and the two gripping elements of each pair are generally similar, the two ends of floss within each element defining along their entire length within the element a pair of generally parallel lines, each gripping element is generally U-shaped with said floss strands extending axially through the legs of the U, and the base of the U extending transversely of said floss.

5,086,793

ADJUSTABLE MASCARA APPLICATOR

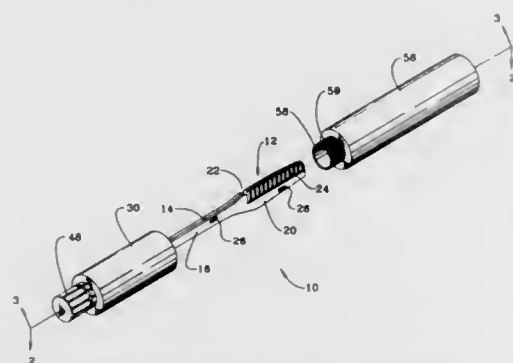
Ted I. Kingsford, Sarasota, Fla., assignor to Maybe Holding Co., Wilmington, Del.

Filed Nov. 13, 1990, Ser. No. 611,649

Int. Cl.⁵ A45D 40/26

U.S. Cl. 132—218

36 Claims



1. An adjustable mascara applicator comprising: comb means for applying mascara to eyelashes, said comb means having a proximal end, a distal end and a plurality of teeth at said distal end for holding mascara therebetween, said comb means extending in a longitudinal direction between said proximal end and said distal end, said teeth being arranged in at least one row along the longitudinal axis of said comb means; handle means connected with said comb means for grasping said adjustable mascara applicator during use; adjustment means for moving some of said teeth in said longitudinal direction relative to the remaining teeth, so as to vary the spacing between adjacent ones of said teeth in said longitudinal direction; and mascara container means for containing mascara, said container means including an opening for receiving said distal end of said comb means.

5,086,794

PLANT FOR TREATING MECHANICAL PIECES IN A WASHING TANK

Daniel Guerinat, 6, Rue St. Paul, Paris (F), France; Giuseppe Marolda, V. Biancamano 2, Monza (MI) I, and Ettore Alagna, V. Delle Ande 5, Milano (I), both of Italy

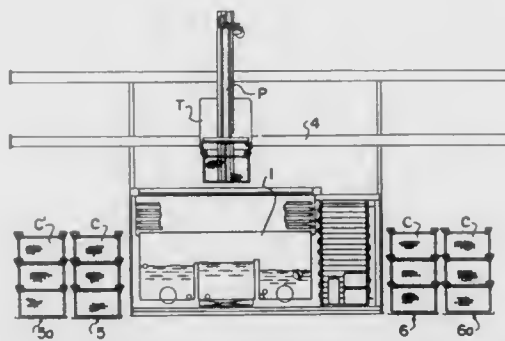
Filed Jun. 21, 1990, Ser. No. 541,498

Claims priority, application Italy, Jun. 21, 1989, 20939 A/89

Int. Cl.⁵ B08B 3/04

U.S. Cl. 134—56 R

18 Claims



1. In a plant for treating mechanical pieces in a washing tank, of the type comprising at least one stationary washing tank, a horizontal rail positioned above said tank, a conveying unit movable along said rail and above the tank, suspension means associated with said conveying unit and adapted to be lowered into said tank and to be lifted out thereof, and a plurality of baskets to contain said pieces to be treated, adapted to be hooked to said suspension means; the improvement wherein it comprises at least two fixed stationing areas positioned on opposite sides of the tank, in alignment with said rail, one for stacking at least one pile of baskets containing pieces to be treated, and the other for stacking at least one pile of baskets containing already treated pieces; said baskets have means for stacking them into a pile, associated with their upper and/or lower edge; with said suspension means there are associated height detection means cooperating with the top of the baskets, to supply a signal indicating the height of said pile of baskets; and a processing unit responsive to said height signal to control the motion of the baskets and the forming of the piles.

5,086,795

REMOVABLE FLUSHING SYSTEM FOR MACHINE TOOL COOLANT RETURN SYSTEM FLUMES

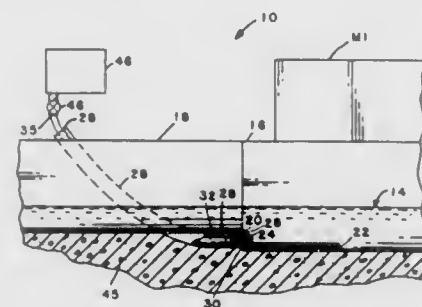
Eugene H. Harms, Perrysburg, Ohio, assignor to Henry Filters, Inc., Bowling Green, Ohio

Filed Apr. 4, 1989, Ser. No. 333,302

Int. Cl.⁵ B08B 3/02

U.S. Cl. 134—166 R

19 Claims



1. In a coolant return system for transporting machine tool coolant, a removable flushing system comprising: a flume for transporting the machine tool coolant;

5,086,797

UMBRELLA FRAME

John M. Earnshaw, Crowedge, and Michael H. Bly, New Mill, both of United Kingdom, assignors to Holyand Fox Limited, England

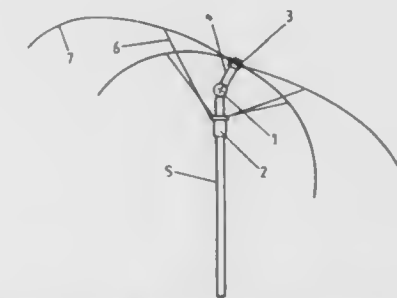
Filed Nov. 6, 1989, Ser. No. 431,830

Claims priority, application United Kingdom, Nov. 9, 1988, 8826209; Jan. 18, 1989, 8901086

Int. Cl.⁵ A45B 11/00

U.S. Cl. 135—20.1

10 Claims



1. A frame for an umbrella, having a shaft, ribs pivotally attached to the top of the shaft to extend radially from the top of the shaft, a location body on the shaft, stretchers pivotally attached to the location body and to attachment points on the ribs to extend from the location body to the attachment points on the ribs, and means for locating the location body at a set position on the shaft, opening the ribs to hold open an umbrella cover attached to the ribs, the shaft comprising first and second parts and tilting means connecting the first and second parts, to allow the axis of one part of the shaft to be set in a position inclined with respect to the axis of the other part of the shaft, wherein the tilting means is located at a position between the top of the shaft and the set position of the location body.

5,086,796

PAINT ROLLER COVER CLEANING APPARATUS

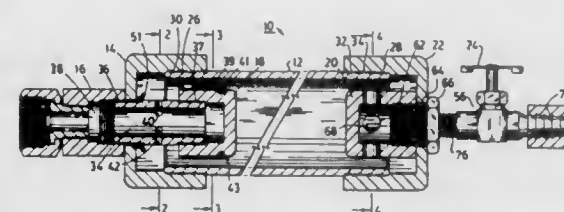
Warn Bailey, 17 Bradford St., Perry, N.Y. 14530

Filed Jul. 25, 1991, Ser. No. 736,000

Int. Cl.⁵ B08B 3/04

U.S. Cl. 134—182

14 Claims



1. A paint roller cover applicator cleaning apparatus for cleaning a hollow, cylindrical paint roller cover applicator of the type having a hollow body member supporting a paint absorbing layer, comprising:

- (a) a cylindrical sleeve housing having an inside diameter slightly smaller than the outside diameter of a paint roller cover applicator to be cleaned by the apparatus;
- (b) a first end cap having a first central opening therein, wherein said first end cap is connected to a first end of said sleeve;
- (c) coupling means for coupling a liquid supply to said cleaning apparatus, wherein said coupling means is connected to said first end cap;
- (d) means for spraying liquid within said cylindrical sleeve housing, wherein said means for spraying liquid is connected to said coupling means and is disposed within said first central opening;
- (e) a first, substantially cylindrical plug adapted to impede the flow of liquid which is disposed within said cylindrical sleeve;
- (f) a second, substantially cylindrical plug adapted to impede the flow of liquid which is disposed within said cylindrical sleeve;
- (g) an outlet through which liquid may exit from said cleaning apparatus;
- (h) means for varying the rate at which liquid which flows into said cleaning apparatus exits such apparatus; and
- (i) a second end cap with a second central opening therein, wherein liquid exists said cylindrical sleeve housing through said second central opening.

5,086,798

VERSATILE KNEE REST WALKER

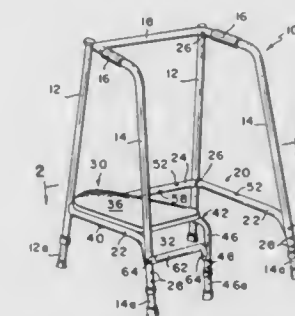
Glen Motts, 10195 Lisbon St., Louisville, Ohio 44641

Filed Dec. 26, 1990, Ser. No. 634,012

Int. Cl.⁵ A61H 3/00

U.S. Cl. 135—67

11 Claims



1. A versatile knee rest invalid walker comprising, a pair of spaced-apart rear legs and spaced-apart front legs in front of said rear legs defining together opposite sides between which a user may stand, and means for a user to grip the walker in use, a rest for a knee or the like, means removably securing said knee rest to said walker between the said sides thereof and adjacent the selected side thereof corresponding to the leg of the user requiring the rest, and, depending leg means for supporting the rear portion of said rest, said leg means being secured to said rest in spaced relation to the adjacent rear leg of the selected side of the walker.

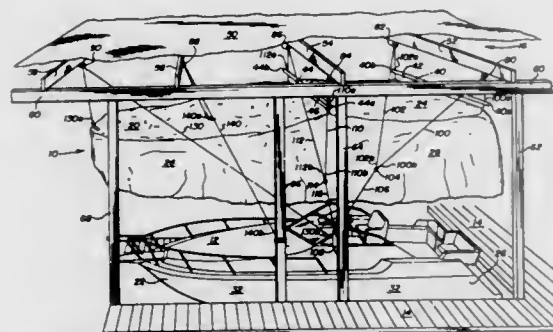
5,086,799

VEHICLE COVER

John J. Lumbleau, 14208 Hughes La., Dallas, Tex. 75240
Filed Jul. 9, 1990, Ser. No. 549,809
Int. Cl.⁵ E04H 15/04

U.S. Cl. 135—90

17 Claims



1. A cover and apparatus for raising and lowering the cover suspended from an overhead structure for selectively covering a vehicle parked thereunder, comprising:

- a cover having a front, a back and sides;
- a first bar having first and second ends and extending between said sides of said cover and integrally connected to said cover;
- first and second pulleys attached to the overhead structure and generally disposed above said first bar first and second ends, respectively;
- a first cable having first and second ends, and extending through said first and second pulleys, said first end thereof connected to said first end of said bar and said second end thereof connected to said second end of said bar;
- a second cable having first and second ends, said first end thereof connected to said first cable between said first and second ends, such that by pulling on or releasing said second end of said second cable, said bar raises and lowers said cover, respectively with respect to the vehicle in the area of said first bar;
- a second bar having first and second ends extending between said sides of said cover and spaced apart from said first bar, and integrally connected to said cover;
- third and fourth pulleys attached to the overhead structure and generally disposed above said second bar first and second ends, respectively;
- a third cable having first and second ends, said first end thereof connected to said second bar first end and for passing through said third pulley;
- a fourth cable having first and second ends, said first end thereof connected to said second bar second end and for passing through said fourth pulley; and
- such that by pulling on or releasing said second ends of said third and fourth cables, said second bar raises or lowers said cover, respectively with respect to the vehicle in the area of said second bar.

5,086,800

MULTI-TANK LIQUID VARIABLE CONTAINER STORAGE SYSTEM

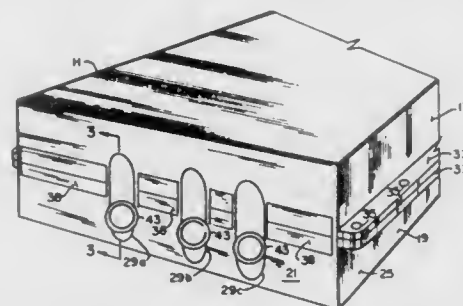
Wallace Dunn, 3520 Cinnamon Pl., Springfield, Mo. 65809
Filed Mar. 4, 1991, Ser. No. 663,477
Int. Cl.⁵ E05B 7/07

U.S. Cl. 137—1

5 Claims

1. A system for storing and transporting liquids comprising a hard-sided tank of a desired volume containing a first soft-sided tank for holding one liquid, and second soft-sided tank for holding a second liquid, said first and second soft-sided tanks both having a capacity equal to said desired volume, wherein said first soft-sided tank communicates with an inlet for injecting a liquid into said first soft-sided tank, whereby said liquid may be transported to a distant location for dispensing, and said second soft-sided tank having an inlet for inject-

ing a second liquid therein for transport to a distant location for dispensing, both said first and second soft-sided tanks having outlets to accommodate their separate dispensing, whereby said first soft-sided tank is initially filled to some capacity,



transported, and unloaded, when said second soft-sided tank is then filled to some capacity, as with another and different liquid, with the two liquids capable of being independently dispensed at separate locations after transport.

5,086,801

VACUUM PROCESSING SYSTEM AND METHOD

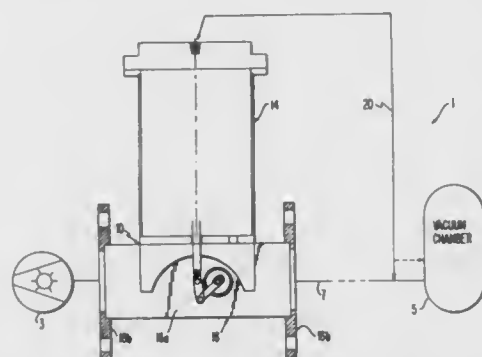
Roy N. Peacock, Lafayette, and Lee E. Vestman, Lakewood, both of Colo., assignors to MKS Instruments, Inc., Andover, Mass.

Continuation of Ser. No. 431,825, Nov. 6, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 674,433

Int. Cl.⁵ G05D 16/06

U.S. Cl. 137—12

20 Claims



7. Vacuum processing method comprising the steps of:

- A) turning on a vacuum pump which has a low pressure side connected to a vacuum processing chamber via a vacuum line having a valve member of a vacuum responsive flow controlling valve disposed therein between the pump and said chamber;
- B) allowing gases to be evacuated by said pump from said vacuum processing chamber while said valve member is in a maximally closed position via a leakage path communicating said vacuum line at an upstream side of the valve member with the vacuum line at a downstream side of the valve member;
- C) communicating a pressure which at least closely corresponds to the pressure in said vacuum processing chamber with a vacuum responsive actuator means of the controlling valve for shifting the position of the valve member; and
- D) progressively opening said vacuum line by shifting the valve member in response to decreases in the pressure communicated to said vacuum responsive actuator means, whereby initial pumpdown of said vacuum processing chamber is restricted for reducing turbulence within the vacuum processing chamber.

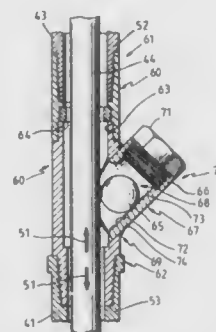
5,086,802

SAFETY CHECK VALVE

Harry L. Spears, 11246 TimberTech, Tomball, Tex. 77375
Filed Oct. 22, 1990, Ser. No. 600,671
Int. Cl.⁵ E21B 17/00, 33/06

U.S. Cl. 137—68.1

4 Claims



1. A safety check valve, for use with a pumping unit for petroleum fluids, the pumping unit including a polished rod and a stuffing box, comprising:

- a valve housing having upper and lower ends and a central bore extending between the upper and lower ends and adapted to have the polished rod pass through the central bore;
- a ball seating surface associated with the central bore;
- a non-spring biased ball;
- a ball housing for the ball and associated with the valve housing; and
- means for moving the ball from the ball housing into the central bore upon the polished rod not being disposed in the central bore, including a ball receiving cavity associated with the ball housing, the ball housing having first and second ends, the first end of the ball housing being in communication with the central bore of the valve housing, the second end being closed; the ball receiving cavity having a ball support surface upon which the ball may rest, when the ball is disposed in the ball receiving cavity, the ball support surface sloping downwardly toward the first end of the ball housing, whereby if the polished rod is not disposed within the central bore of the valve housing, the ball moves down the ball support surface, under the force of gravity, from the ball receiving cavity into the central bore and seats on the ball seating surface.

5,086,803

SOLENOID VALVE AND MANIFOLD ASSEMBLY

Hiromi Nakajima, Chiba, Japan, assignor to Taiyo Ltd., Osaka, Japan

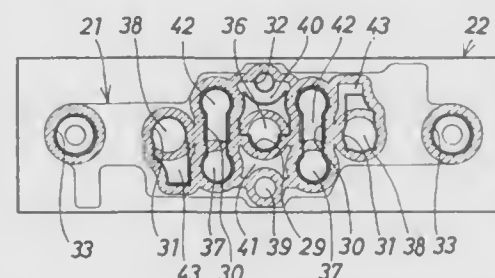
Filed Oct. 31, 1990, Ser. No. 606,962

Claims priority, application Japan, Dec. 20, 1989, 1-328379

Int. Cl.⁵ F15B 13/43

U.S. Cl. 137—270

4 Claims



1. A solenoid valve and manifold assembly, comprising a manifold body, a solenoid pilot change-over valve placed on said manifold body and including a change-over valve having a valve body and a solenoid pilot valve provided on said valve

body for controlling said change-over valve, said manifold body having at least a supply path and an external pilot path formed therein, said valve body having formed therein at least an inlet port and a pilot port which is communicated with said solenoid pilot valve, and a gasket capable of being disposed between said manifold body and said valve body alternatively in first orientation or in second orientation reverse to the first orientation and having at least a supply hole, an internal pilot hole and an external pilot hole formed therein such that an exit of said supply path of said manifold body is communicated with said inlet port of said valve body by way of said supply hole whether said gasket is disposed between said manifold body and said valve body in the first orientation or in the second orientation; said exit of said supply path is communicated with said pilot port by way of said internal pilot hole when said gasket is disposed in the first orientation, but when said gasket is disposed in the second orientation, said internal pilot hole is displaced from said exit of said supply path and said pilot port; and said external pilot hole is displaced from said pilot port and an exit of said external pilot path when said gasket is disposed in the first orientation, but when said gasket is disposed in the second orientation, said exit of said external pilot path is communicated with said pilot port by way of said external pilot hole.

5,086,804

EMERGENCY SECURITY DEVICE FOR HEAD OF A LEAKING GAS CYLINDER

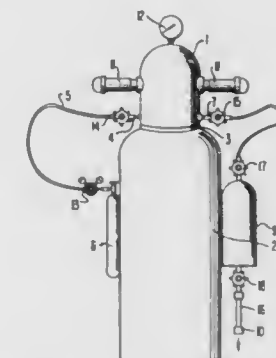
Eugene Y. Ngai, Whitehouse Station, N.J., assignor to Solka-tronic Chemicals, Inc., Fairfield, N.J.

Filed Jan. 23, 1991, Ser. No. 644,550

Int. Cl.⁵ F16K 37/00

U.S. Cl. 137—312

9 Claims



1. An emergency security device adapted to be used on a head of a leaking gas cylinder containing toxic and/or corrosive gases comprising a cap equipped with an internal threaded collar adapted to be tightly engaged onto a screw thread provided on the head of said cylinder, a sealing ring disposed in said cap and adapted to be tightly compressed between said cap and said cylinder by the engagement of said threaded collar, and inlet port in said cap connected by a first tubing to a cylinder containing a purging inert gas and an outlet port in said cap connected by a second tubing to a dry scrubbing assembly having an exit port and filled with a dry scrubbing material irreversibly reacting with the leaked gas carried away from the cap by the purging inert gas, said purging inert gas escaping through said exit port.

5,086,805

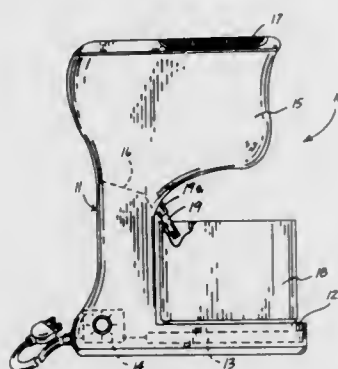
SELF-FILLING POTPOURRI APPARATUS

Richard L. DeForest, III, 1100 N. Plum Grove Rd. #108,
Schaumburg, Ill. 60173

Filed Jan. 14, 1991, Ser. No. 640,619

Int. Cl.⁵ A01K 7/00

U.S. Cl. 137—341



1. A self-filling potpourri apparatus comprising, a unitary housing arranged for convenience of positioning and transport, wherein the housing includes an underlying horizontal planar selectively heated support platform, the support platform overlying an elongate heating member, the heating member operated through a thermostat to maintain a preselected temperature within the heating member and the overlying support platform, and
- a fluid reservoir positioned above and integrally mounted relative to the support platform, with the fluid reservoir including a fill tube in fluid communication with the fill reservoir, with the fill tube projecting exteriorly of the fluid reservoir overlying the support platform, and
- a container selectively positionable upon the support platform and arranged to receive the fill tube therewithin, and
- wherein the fill tube is flexible to permit positioning within the container, and wherein the fill tube is mounted to a rigid fill tube conduit, with the fill tube conduit in fluid communication interiorly of the fluid reservoir, and the fluid reservoir including a concave floor to enhance directing of fluid into the fill tube and container, and
- including a vertical positioning wall between the reservoir and the support platform to align and position the container relative to the reservoir and support platform, and
- wherein the predetermined temperature is maintained between 100 and 180 degrees F., and
- wherein the flexible fill tube includes a fill tube floor including at least a single aperture directed therethrough, with a check ball mounted within the fill tube overlying the aperture, and the check ball defined by a predetermined internal diameter, wherein the predetermined diameter is less than the predetermined internal diameter to permit seepage of fluid about the check ball and through the aperture into the container to provide metered filling of the container, and
- wherein the container includes a container floor and an upper container opening overlying the floor, and the container includes an internal annular ribbed wall, the internal ribbed wall including a series of equally spaced parallel ribs projecting interiorly of the container to recirculate convection currents formed within the container to

promote thorough heating of components contained within the container.

5,086,806

AUTOMATIC FLOW CONTROL SYSTEM AND FLOOD PROTECTOR

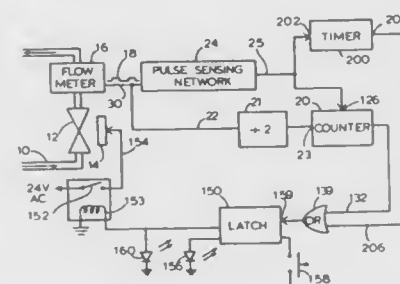
Christopher J. Engler, Portland, and Michael W. Johnson, St. Helens, both of Oreg., assignors to Boyd Coffee Company, Portland, Oreg.

Filed Apr. 5, 1991, Ser. No. 680,838

Int. Cl.⁵ F16K 17/00

U.S. Cl. 137—486

18 Claims



1. A fluid-flow control system for shutting off the flow in a conduit under selected conditions comprising:
 - a flow monitor operatively connected to such a conduit for producing a first signal containing information about the volume of fluid flow in the conduit,
 - a signal-controlled valve operatively connected to the conduit,
 - a signal detector operatively connected to said flow monitor for analyzing said first signal and for distinguishing periods of substantial fluid flow from periods of no-flow through the flow monitor, and
 - a flow quantity measuring device operatively connected to said flow monitor, said signal detector and said valve for measuring the approximate quantity of fluid passing through the flow monitor during each period of substantial fluid flow and for outputting a valve closure signal to said valve to close the valve when a predetermined flow quantity has passed through said flow monitor during a period of uninterrupted fluid flow.

5,086,807

PRESSURE REDUCER

Didier Lasnier, Cergy, France; Bruno Beaco, Verona, Italy, and Daniel Sakreiter, Montgeroult par Boissy l'Aillerie, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

Filed Feb. 5, 1991, Ser. No. 651,011

Claims priority, application France, Feb. 22, 1990, 90 02199

Int. Cl.⁵ G05D 16/06

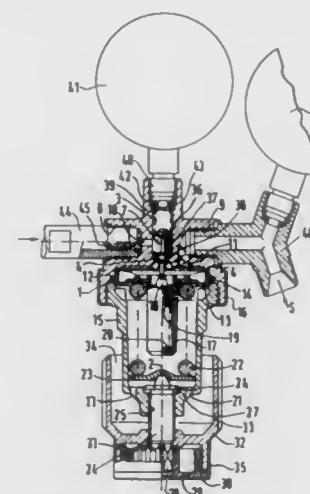
U.S. Cl. 137—505.11

10 Claims

1. A pressure regulating valve comprising a valve body having an axis and defining internally a high-pressure chamber and a low-pressure chamber separated by a valve seat coaxial with said axis, a valve member displaceable along said axis for engagement with the valve seat, the valve member being biased by a valve spring toward the valve seat and operatively coupled to a piston means movable in the low-pressure chamber along said axis, a manually adjustable spring biasing means biasing said piston means in a direction opposite the biasing direction of the valve spring, the valve body including inlet passage means communicating with the high-pressure chamber, outlet passage means communicating with the low-pressure chamber and a first bore coaxial with said axis within

which is slidably received said valve member, said first bore opening outwardly and having an outer end portion adapted to

means to thereby expose a portion of said pressure balancing ports to obtain a desired flow rate.



receive mounting means for mounting a high-pressure manometer on the valve body and forming a rest for said valve spring.

5,086,808

BALANCED SLEEVE CONTROL CHOKE

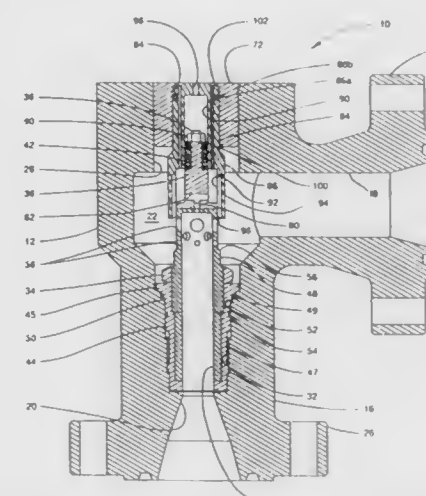
Ronald G. Pettus, Houston, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 7, 1990, Ser. No. 625,303

Int. Cl.⁵ F16K 47/14, 39/02

U.S. Cl. 137—625.3

16 Claims



1. A pressure balanced control choke, comprising:
 - a pressure containing member having an internal flow chamber with an inlet flow passage thereto and an outlet flow passage therefrom,
 - a flow controlling means reciprocable to control flow between said inlet flow passage and said outlet flow passage,
 - a means for positioning said flow controlling means,
 - a pressure balancing means cooperating with said flow controlling means to eliminate pressure induced loading of said positioning means,
 - said flow controlling means including:
 - a flow cage sealably secured within said flow chamber,
 - said flow cage having a closed end with a seal neck extending therefrom and having pressure balancing ports therethrough,
 - an external flow sleeve disposed about said seal neck and said flow cage, and
 - said external flow sleeve reciprocable by said positioning

5,086,809

PIPE COUPLING AND SEALING DEVICE

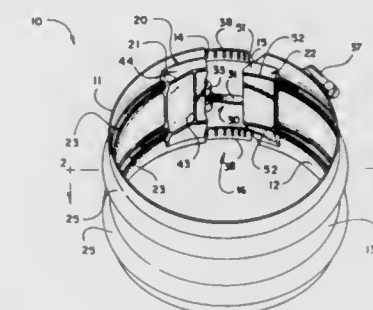
Donald Y. Bridges, 3014 Creek Ct., Roswell, Ga. 30075

Filed Jun. 12, 1990, Ser. No. 536,695

Int. Cl.⁵ F16L 19/12

U.S. Cl. 138—99

39 Claims



32. An apparatus for sealing a leak location in a pipe, comprising:
 - a cylindrical member having an inner surface and an outer surface, and including an axial joint defined by a first axial edge and a second axial edge;
 - sealing means for preventing passage of fluid to said outer surface of said cylindrical member, comprising:
 - an axial gasket adhered to said cylindrical member adjacent to said second axial edge, a portion of said axial gasket extending beyond said second axial edge to a position spaced outwardly from said second axial edge; and
 - a pair of spaced apart arcuate gaskets extending along said inner surface of said cylindrical member between said axial gasket and said first axial edge;
 - means for positioning said first axial edge adjacent to said outer surface of said cylindrical member such that said second axial edge is positioned adjacent to said inner surface of said cylindrical member, and said arcuate gaskets are on opposite sides of said leak location; and
 - said axial gasket and said arcuate gaskets being shaped so that when said second axial edge is positioned adjacent to said inner surface of said cylindrical member said axial gasket and said arcuate gaskets overlap to form a combined thickness equal to the thickness of said arcuate gaskets.

5,086,810

ULTRA-SONIC REED CLEANING SYSTEM

Patrick R. Carroll, Greenwood, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 791,792, Oct. 28, 1985, abandoned. This

application Nov. 24, 1986, Ser. No. 933,876

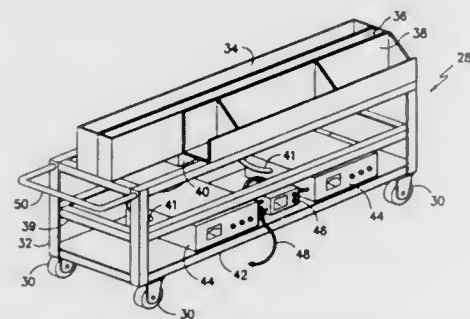
Int. Cl.⁵ D03J 1/02; B08B 3/12; B01F 11/02

U.S. Cl. 139—1 C

4 Claims

1. A moveable ultrasonic apparatus for servicing loom reeds at the loom with the warp yarns remaining in the reeds comprising: an elongated wheeled cart; a first elongated tank for containing a cleaning liquid carried by said cart accommodating a loom reed for cleaning; a second elongated tank for containing a rinsing liquid carried by said cart adjacent and in alignment with said first elongated tank accommodating a loom reed for rinsing; transducer means carried by said cart

beneath said first and second tanks for driving said cleaning liquid for ultrasonic cleaning of said loom reed and said rinsing



liquid for rinsing said loom reed; and generator means supplying power to said transducer means carried by said cart.

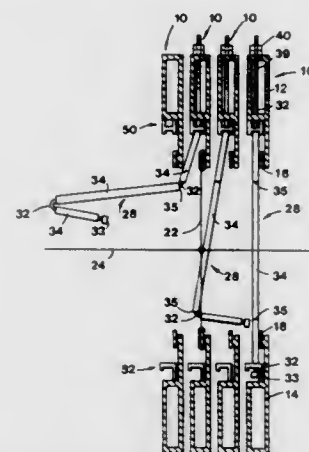
5,086,811

FLEXIBLE CABLE INTERMEDIATE SUPPORT WITH RIGID HOLLOW TUBE FOR A HEDDLE FRAME

Robert N. Suhr, 431 Chowning Pl., Marietta, Ga. 30064
Filed Jul. 26, 1990, Ser. No. 558,230
Int. Cl.⁵ D03C 9/06

U.S. Cl. 139-91

8 Claims



1. In a weaving heddle frame having upper and lower frame staves, the combination with said frame staves of an intermediate support having:

- (a) a flexible cable connected to the upper frame stave;
- (b) a rigid hollow member surrounding a portion of the cable and extending generally from the upper edge of the lower frame stave to the lower edge of the upper frame stave;
- (c) means for detachably mounting the lower end of the cable on the lower frame stave; and
- (d) means disposed at the upper end of the cable for tensioning the cable, the tensioning means transmitting tensile force in the cable to urge the lower frame stave upward into contact with the lower end of the hollow member and the upper frame stave downward into contact with the upper end of the hollow member while the rigid hollow member exerts compressive force simultaneously upon the upper and lower staves to hold them in a spaced apart relationship.

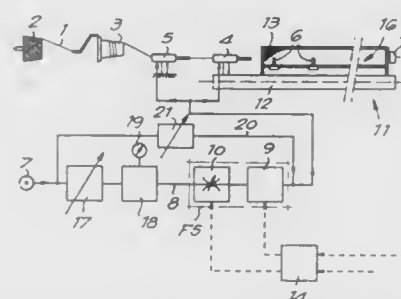
5,086,812

WEFT THREAD SUPPLYING DEVICE WITH ROTARY THROTTLE VALVE IN AIRJET WEAVING MACHINES

Philippe Van Bogaert, Schaerbeek; Jean-Marie Bamelis; Jozef Peeters, both of Ieper, and Hugo Markey, Langemark, all of Belgium, assignors to Picanol N.V., naamloze vennootschap, Belgium
Filed Feb. 14, 1991, Ser. No. 655,156
Claims priority, application Belgium, Feb. 15, 1990, 09000169
Int. Cl.⁵ D03D 47/30

U.S. Cl. 139-435.2

16 Claims



1. A device for supplying weft thread in airjet weaving machines, comprising at least one nozzle connected to a compressed air source; a buffer tank; a cutoff valve situated in a funnel between the compressed air source and the nozzle, said funnel comprising an inlet funnel and an outlet funnel connected to the inlet funnel; and a controlled throttling device mounted adjacent the cutoff valve and downstream of the buffer tank in respect to a direction of air supplied from the compressed air source through said funnel to said nozzle, said throttling device comprising said inlet funnel, said outlet funnel, a rotary throttling element situated in said inlet funnel, and means including a motor for rotating the throttling element to throttle said air supplied to said nozzle.

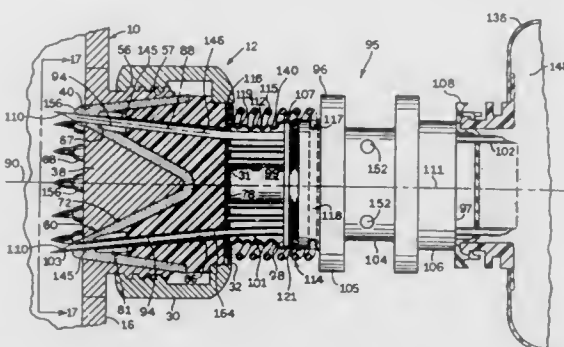
5,086,813

ASEPTIC FLUID TRANSFER METHODS

Edwin J. Galloway, 6741 Firelane 5, Menasha, Wis. 54952
Division of Ser. No. 261,020, Oct. 20, 1988, Pat. No. 4,941,517.
This application Jun. 7, 1990, Ser. No. 534,747
Int. Cl.⁵ G01N 1/12; B65D 41/20

U.S. Cl. 141-1

9 Claims



1. A method of transferring a material between enclosures, said method comprising the steps of:

- (a) connecting a first enclosure to a first end of a needle bundle comprising a needle holder having needles extending between first and second ends of said needle holder, by driving first ends of said needles into said first enclosure, thereby establishing fluid communication through said needles with the interior of said first enclosure;
- (b) driving second ends of said needles through a fluid receiver fitting, said fitting comprising a plurality of chan-

nels extending toward the interior of said second enclosure, and pierceable, self-closing seal means at the ends of said plurality of channels, said second ends of said needles being passed through said plurality of channels, and into a second enclosure, thereby connecting said second end of said needle bundle to said second enclosure, and establishing communicative passages between said first and second enclosures, through said needles; and

(c) urging said material from one of said enclosures toward the other of said enclosures with sufficient force to effect the transfer of said material through said communicative passages in said needles.

5,086,814

DEVICE FOR RELEASING REMAINING GAS IN PRESSURE CAN CONTAINERS AND STORAGE CAP OF THE DEGASSING DEVICE

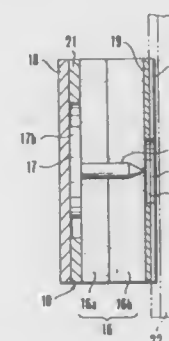
Motohisa Sato, and Ichiro Matuda, both of Osaka, Japan, assignors to Taito Co., Ltd., Osaka, Japan
Filed Dec. 17, 1990, Ser. No. 627,938

Claims priority, application Japan, Jun. 7, 1990, 2-60503

Int. Cl.⁵ B67B 7/24

U.S. Cl. 141-65

3 Claims



1. A remaining gas releasing device for releasing gas remaining in pressurized can containers, comprising:

- an open-cell, compressible and flexible sponge plate having a predetermined thickness and shape and opposite surfaces;
- a push pin member having a head plate portion with opposite surfaces and a pin portion extending from one surface thereof into the center of one of the surfaces of said sponge plate;
- a center hole rigid sheet member positioned around the outer periphery of said head plate portion of said push pin member with one surface thereof on said one of the surfaces of said sponge plate, and having the same thickness as that of said head plate portion;
- a gas-impermeable rigid sheet plate adhered to the other surface of said center hole rigid plate member and said head plate portion and covering said center hole rigid plate member and said head plate portion;
- an adhesive sheet plate bonded to the other surface of said sponge plate and having a small hole at its center; and
- a release sheet plate peelably adhered to said adhesive sheet plate.

5,086,815

AIR LESS TIRE WITH CIRCUMFERENTIAL BAND REINFORCEMENT

Vincent F. Panaroni, 7 Whatney, Irvine, Calif. 92718, and Richard Steinke, 2180 Three Kings Crt., Park City, Utah 84060
Filed Jun. 4, 1990, Ser. No. 533,025

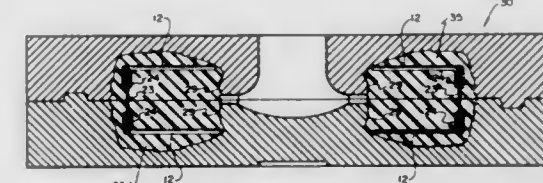
Int. Cl.⁵ B60C 7/00, 7/14

U.S. Cl. 152-251

6 Claims

1. An airless tire comprising, a foamed polyurethane material formed into an airless tire; at least one band of reinforcement material for arrangement within said airless tire formed into a ring; means for adjusting the circumference of said ring; and a plurality of stand-off support means arranged for cou-

pling at spaced intervals along said band and including leg means for projecting therefrom to either the radially outermost



or radially innermost surface of the foamed polyurethane material.

5,086,816

ASSEMBLY FOR THE TRANSFER, MASS DETERMINATION AND MASS SEPARATION OF FLUENT MATERIAL, PARTICULARLY FOR BEVERAGES SUCH AS MILK OR BEER

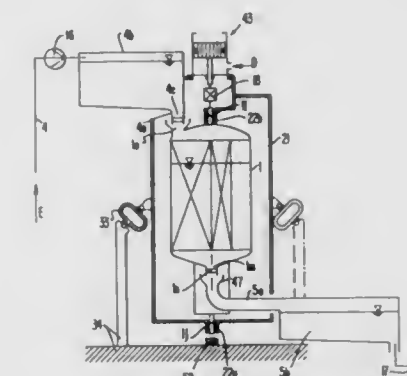
Hans O. Mieth, Schnakenbek, Fed. Rep. of Germany, assignor to Otto Tuchenhausen GmbH & Co. KG, Büchen, Fed. Rep. of Germany
Continuation of Ser. No. 302,597, filed as PCT/EP88/00521, Jun. 11, 1988, abandoned. This application Aug. 3, 1990, Ser. No. 563,665

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719775

Int. Cl.⁵ G01G 17/04

U.S. Cl. 141-83

12 Claims

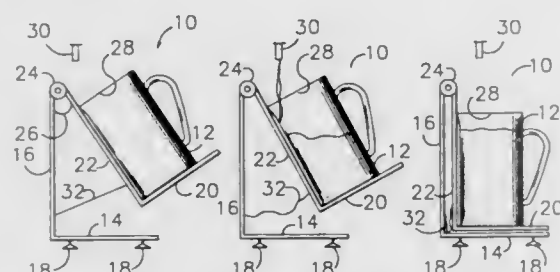


1. An assembly for the transfer, mass determination and separate handling of masses of fluent material, comprising:

- a first vessel, a metering vessel, and a second vessel arranged in series, each said vessel comprising a vessel designed to hold liquid;
- first means for connecting said first vessel and said metering vessel for a flow of fluent material therebetween, and
- second means for connecting said metering vessel and said second vessel for a flow of fluent material therebetween, whereby said metering vessel can be filled with fluent material from said first vessel and can discharge fluent material to said second vessel;
- forces metering means for measuring the weight force component of the metering vessel and any fluent material therein while taking into account any inclination angle with respect to the vertical, the weight force component being equal to the weight when the weight force component is vertical and being different from the weight when the weight force component is in a direction forming an inclination angle with the vertical; and
- support means for guiding said metering vessel for displacement in the direction of the weight force component of said metering vessel and for preventing movement of said metering vessel in any other direction, said metering vessel being supported by said forces metering means during weighing operation.

5,086,817
FOAM-SUPPRESSING APPARATUS FOR FILLING BEER PITCHER
 David J. Murphy, 200 Bayside Blvd., #107, Clearwater, Fla. 34619

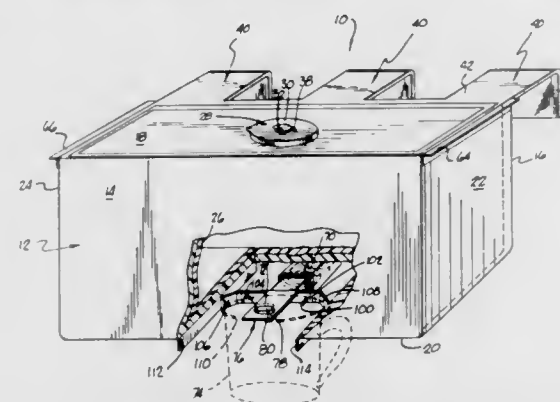
Filed Oct. 1, 1990, Ser. No. 591,150
 Int. Cl.⁵ B67C 3/22
 U.S. Cl. 141—271 19 Claims



1. A device having utility in connection with the charging of a beverage into a pitcher, comprising:
 - a base,
 - a first back wall fixedly secured to a rearward end of said base in orthogonal relation thereto,
 - said base and said first back wall collectively forming a base means,
 - a platform for supporting a pitcher,
 - a second back wall fixedly secured to a rearward end of said platform in orthogonal relation thereto,
 - said platform and said second back wall collectively forming a platform means,
 - said base means and said platform means being pivotally secured to one another along a pivot axis,
 - a bias means disposed in interconnecting relation to said base means and said platform means,
 - said bias means being operative to urge said platform means to pivot away from said base means.

5,086,818
BEVERAGE STORAGE AND DISPENSING DEVICE
 Larry A. Bendt, 6584 Rustic Dr., Parker, Colo. 80134
 Continuation-in-part of Ser. No. 315,325, Feb. 24, 1989. This application Aug. 27, 1990, Ser. No. 574,463
 Int. Cl.⁵ B65B 3/04

U.S. Cl. 141—358 26 Claims

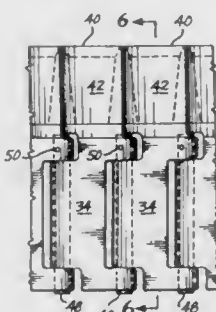


1. A beverage storage and dispensing device comprising:
 - a housing having top, bottom, front and rear surfaces which define width, depth and height dimensions;
 - liquid storage means disposed within said housing for storing a beverage including insulation means for maintaining the temperature of the beverage within said storage means;
 - inlet means for introducing the beverage into said storage means;

means for mounting said housing in an upright position; and means for selectively dispensing beverage from said storage means into a liquid receiver device including an orifice defined in the bottom surface of said housing and extending into said storage means, a closure plate mounted to the exterior of the bottom surface of said housing for slidingly moving along said bottom surface between a first position wherein said orifice is covered and a second position wherein said orifice is uncovered to permit selective passage of beverage by gravity flow therethrough, a detent projecting from the surface of said plate sized and shaped to fit within said orifice for sealing said orifice to prevent leakage when said closure plate is in said first position, bias means exterior to said main housing for urging said closure plate toward said first position, and trigger means projecting below said plate for selectively operating said closure plate in opposition to said bias means to permit flow of beverage through said orifice in said second position.

5,086,819
CURVED PRUNER BLADES
 John S. Selby, 2910 91st Ave. E., Puyallup, Wash. 98371
 Filed May 11, 1990, Ser. No. 522,761
 Int. Cl.⁵ A01G 23/08; B27L 1/00

U.S. Cl. 144—2 Z 2 Claims



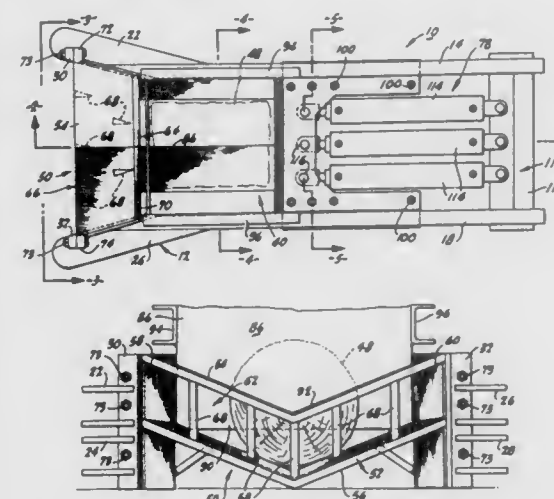
1. A mechanized tree pruner of the type having bell-type knife blades for encircling a tree to be delimbed, having the improvement comprising:
 - a plurality of members connected together at pinned points to form a continuous articulatable belt-type knife blade with the blade members having a top knife section with a concave front face and sharp concave top knife edges and further having the side edges of the knife sections substantially in line with the respective pinned points.

5,086,820
WOOD SPLITTING APPARATUS
 Ian V. Gelder, P.O. Box 988, Minden, Nev. 89423
 Filed Sep. 28, 1990, Ser. No. 589,427
 Int. Cl.⁵ B27L 7/00

U.S. Cl. 144—193 A 7 Claims

1. An apparatus for dividing a wood piece utilizing a motor, the improvement comprising:
 - a support for a wood piece said support possessing a substantially V-shape surface;
 - a splitting head, said splitting head including a frame member and a plurality of splitting knives supported therefrom, said head lying adjacent said support, said frame member providing an open chamber and said plurality of splitting knives being supported within said chamber, said splitting head chamber having a top, bottom, and a pair of sides therebetween, and further includes an entrance and an exit thereto, said top of said splitting head being substantially V-shaped;
 - means for driving the wood piece along said support and through said splitting head in one direction utilizing the motor to effect splitting of at least one portion of the wood

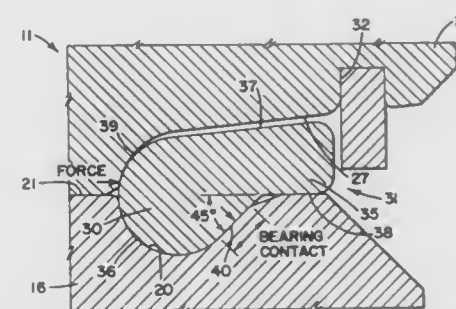
piece, said means for driving the wood piece along said support and through said splitting head including a first plate and said means for returning the wood piece including a spaced second plate, said second plate having a V-shaped edge portion conforming to said V-shaped top of splitting head; and



- d. means for returning at least another unsplit portion of the wood piece to said support in conjunction with the motor and subsequent to said splitting of said one portion of the wood piece.

5,086,821
AIRCRAFT WHEEL
 Donald L. Russell, New Carlisle, and Michael P. Kahrs, Troy, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 23, 1990, Ser. No. 468,511
 Int. Cl.⁵ B60B 25/18
 U.S. Cl. 152—410 25 Claims

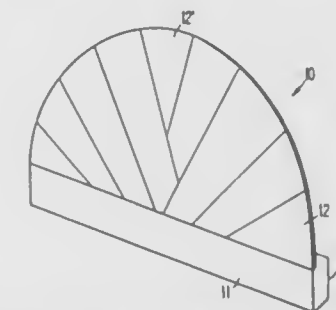


1. An annular locking ring for an aircraft wheel assembly with an axial center line, said locking ring having an annular lobe section and an annular leg section, said sections merge into each other to form an integral unitary structure, the cross sectional shape of said leg section has a pair of spaced linear portions that define an outer linear portion and an inner linear portion relative to said center line, the cross sectional shape of said lobe section has a curvilinear portion and a linearly extending portion, said curvilinear portion has one end merging with one end of said outer linear portion, the other end of said curvilinear portion merges with one end of said linearly extending portion of said lobe section, the other end of said linearly extending portion of said lobe section intersects one end of said inner linear portion of said leg section, and said lobe section having a diameter that is greater in

dimension than the distance between said pair of spaced linear portions of said leg section.

5,086,822
ARCH TREATMENT
 Howard V. Keighler, 1675 Glencove Ave., N.W., Palm Bay, Fla. 32907

Filed Aug. 17, 1990, Ser. No. 570,130
 Int. Cl.⁵ E04F 10/00
 U.S. Cl. 160—38 17 Claims

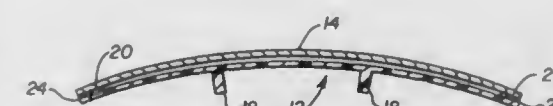


1. An above-window arch treatment comprising at least one valence adapted to fit a window, and a plurality of approximately rectangular slats fixedly joined to each other and to the at least one valence to form an arcuate portion of a circle, wherein one of the slats farthest from the at least one valence is arranged perpendicular to the at least one valence, and wherein the remaining slats between the at least one valence and the perpendicularly arranged slat extend in an alternating manner toward a right-hand side and a left-hand side in relation to the perpendicularly arranged slat.

5,086,823
ONE-PIECE LOUVER FOR A LOUVERED COVERING SYSTEM

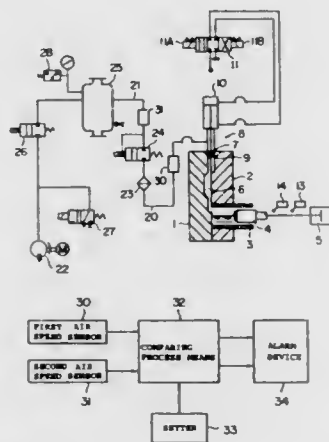
James E. Danchulis, Pittsburgh, and Robert A. Walde, Allison Park, both of Pa., assignors to Allied Extrusions, Deerfield Beach, Fla.

Continuation-in-part of Ser. No. 380,291, Jul. 17, 1989, abandoned. This application Jun. 19, 1990, Ser. No. 540,228
 Int. Cl.⁵ E06B 9/00
 U.S. Cl. 160—236 2 Claims



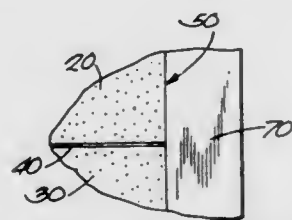
1. A novel elongated louver made of a material selected from the group consisting of a plastic material, aluminum and wood having a flat or substantially arcuate cross-section defining thereof first and second longitudinal edges, there being no other structure depending from said first and said second longitudinal edges, suitable for use in a louvered covering system, carrying on at least one face thereof along the vertical edges thereof an adhesive carrying a removable protective covering, said louver being provided with at least one elongated, contiguous protrusion extending outwardly from a surface of said louver.

5,086,824
**METHOD AND SYSTEM OF SENSING
 ABNORMALITIES IN A DEGASSING FLOW PATH OF A
 VACUUM DIE CASTING MACHINE**
 Akihiko Tsuda, and Norihiro Iwamoto, both of Zama, Japan,
 assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan
 Filed Jun. 16, 1989, Ser. No. 366,921
 Claims priority, application Japan, Jun. 27, 1988, 63-158286
 Int. Cl.⁵ B22D 17/32
 U.S. Cl. 164—4.1 10 Claims



1. A method of sensing an abnormality in a degassing flow path of a vacuum die casting machine, the degassing flow path communicating a vacuum system with a mold cavity, the vacuum system for degassing a gas from the mold cavity, comprising the steps of:
 sensing an air speed and a change pattern in air speed through the degassing flow path with at least one air speed sensor;
 comparing the sensed air speed and air speed change pattern with a predetermined air speed and air speed change pattern;
 issuing a predetermined abnormality signal if the sensed air speed and air speed change pattern are not within predetermined tolerance limits for the predetermined air speed and air speed change pattern.

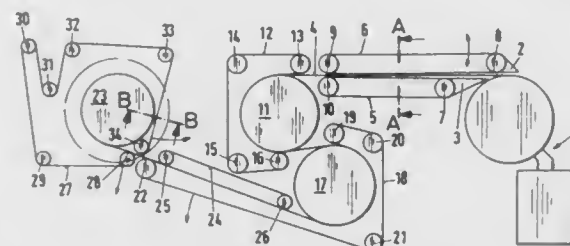
5,086,825
**METHOD FOR MANUFACTURING FOAM PATTERN
 ASSEMBLIES**
 Russell J. VanRens, Milwaukee, Wis., and Michael A. Proffitt, Burnsville, N.C., assignors to Outboard Marine Corporation, Waukegan, Ill.
 Filed May 10, 1990, Ser. No. 521,590
 Int. Cl.⁵ B22C 7/02
 U.S. Cl. 164—4.1 10 Claims



1. A method for manufacturing a casting from a foam pattern assembly in a lost foam casting process, said method comprising the steps of providing a foam pattern assembly including a parting line, and a surface which is intersected by said parting line and which includes a first surface portion and a second surface portion offset from said first surface portion at said parting line, leveling said surface so that said first surface portion is not offset from said second surface portion, using

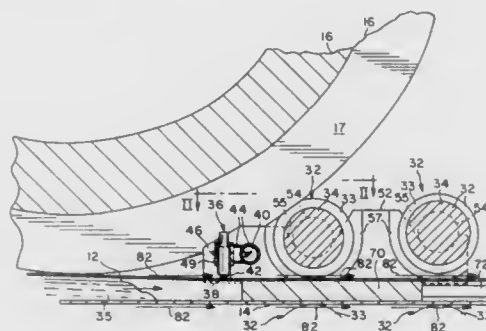
said foam pattern assembly in a lost foam casting process to form a casting including a surface corresponding to said surface of said foam pattern assembly, and leak testing said casting by using a leak test fixture including a sealing member, and placing said sealing member against said surface of said casting.

5,086,826
**APPARATUS FOR THE AFTER-COOLING AND
 COILING OF CAST METAL STRIPS**
 Armin Frauenkron, Dortmund, and Herbert Gellenbeck, Hemer, both of Fed. Rep. of Germany, assignors to Sundwiger Eisen-
 hutte Maschinenfabrik GmbH & Co., Hemer-Sundwig, Fed. Rep. of Germany
 Filed May 10, 1991, Ser. No. 698,716
 Claims priority, application Fed. Rep. of Germany, May 14, 1990, 4015438
 Int. Cl.⁵ B22D 11/24, 11/28
 U.S. Cl. 164—417 1 Claim



1. An apparatus for the after-cooling and coiling of metal strips (4) produced by a strip casting machine, comprising at least one cooling roller (11, 17) and one coiler (23) and also guiding and deflecting elements (5, 6, 12, 18, 24, 27) characterized in that the guiding and deflecting elements comprise groups of wire cables (5, 6, 12, 18, 24, 27) which are disposed one beside the other distributed over the width of the strip and which are driven in the direction in which the strip runs and which, together with similar groups or the cooling roller (11, 17) and the coiler (23) guide the metal strip (4) between themselves.

5,086,827
**METHOD AND APPARATUS FOR SENSING THE
 CONDITION OF CASTING BELT AND BELT COATING
 IN A CONTINUOUS METAL CASTING MACHINE**
 Thomas S. Graham, Shelburne, and Norman J. Bergeron, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.
 Filed Dec. 6, 1990, Ser. No. 623,024
 Int. Cl.⁵ B22D 11/06, 11/08, 11/16
 U.S. Cl. 164—452 31 Claims



1. In the continuous casting of metal product from molten metal employing a moving mold including at least one revolving, tensed, flexible, electrically-conductive metallic casting belt having a front face defining a portion of the moving mold

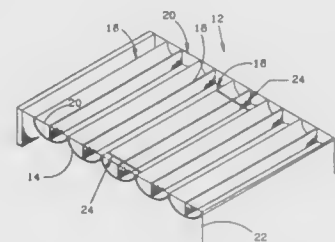
and having a predetermined desired "pass line" position, and said casting belt having a back face cooled by aqueous coolant applied to said back face in the vicinity of said moving mold, the method of monitoring status of the front face of the revolving casting belt during continuous casting comprising the steps of:

positioning a proximity sensor in predetermined spaced relationship relative to said back face of the revolving casting belt during continuous casting, said proximity sensor being positioned in a region opposite to said portion of the moving mold,
 said proximity sensor being positioned at a predetermined distance from said desired "pass line" position of the front face of the revolving casting belt,
 using the proximity sensor for sensing the spacing between the back face of the revolving casting belt and said proximity sensor, and
 from the sensed spacing between the back face of the revolving casting belt and said proximity sensor determining deviation of the front face of the revolving casting belt relative to said predetermined "pass line".

22. In a twin-belt continuous casting machine wherein two tensed, flexible, electrically conductive casting belts are simultaneously revolved, and each of said casting belts has a front face and a back face, and said front faces are used for defining a moving mold between them as said casting belts are simultaneously revolving, and each of said belts is desired to follow a predetermined "pass line" during continuous casting, apparatus for monitoring characteristics of the front face of at least one of said casting belts as said one belt is revolving during continuous casting, said apparatus comprising:

an eddy-current type of proximity sensor,
 mounting means holding said proximity sensor in predetermined spaced relationship relative to the back face of said one belt as it is revolving during casting,
 said mounting means holding said proximity sensor in a region where said one belt is desired to move along said "pass line",
 energizing means for energizing said proximity sensor with an alternating current, and
 means for determining variations in the spacing between said proximity sensor and said back face of the revolving casting belt for determining deviations of the revolving casting belt from said "pass line".

5,086,828
LUNAR RADIATOR SHADE
 Michael K. Ewert, Seabrook, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
 Filed Sep. 25, 1991, Ser. No. 765,273
 Int. Cl.⁵ F28D 15/00; F28F 13/18, 5/00
 U.S. Cl. 165—1 9 Claims



8. A method of heat dissipation for a lunar environment at

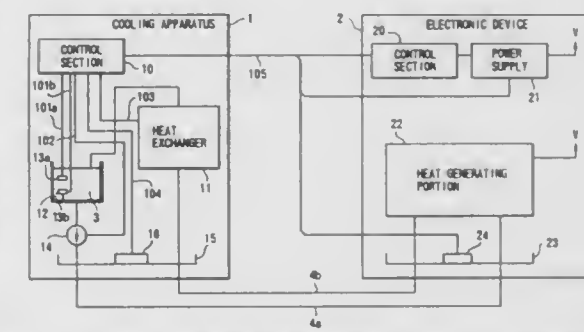
the vicinity of the lunar equator with a radiator shade array movable between a collapsed relationship and an extended relationship where the radiator shade is a flexible strip of material with a reflective surface and a non-reflective surface and is attached to lengthwise extending horizontal members which are longitudinally spaced from one another and radiator elements are disposed between adjacent horizontal members;

moving the horizontal members to horizontal spaced apart locations relative to a horizontal ground surface and supporting said horizontal members above the ground surface so that the strip of material between adjacent horizontal members has its reflective surface defining a catenary trough with a focus at a focal line above the horizontal members;

fixing the radiator elements in vertical planes relative to said horizontal members; and

aligning the radiator elements parallel to the lunar equator and at an angle of incidence relative to solar radiation to minimize direct incidence of sunlight on the radiator elements.

5,086,829
**LIQUID COOLING APPARATUS WITH IMPROVED
 LEAKAGE DETECTION FOR ELECTRONIC DEVICES**
 Kyoichi Asakawa, Yamanashi, Japan, assignor to NEC Corporation, Japan
 Filed Jul. 5, 1991, Ser. No. 726,323
 Claims priority, application Japan, Jul. 12, 1990, 2-184720
 Int. Cl.⁵ G05D 23/00; F28F 27/00
 U.S. Cl. 165—12 9 Claims



1. A liquid cooling apparatus characterized by comprising:
 a heat exchanger for cooling a coolant to be supplied to a heat generating portion in an electronic device;
 a tank for temporarily storing the coolant cooled by said heat exchanger before the coolant is supplied to the electronic device;
 leakage detecting means for detecting leakage of the coolant in a circulation path for repeatedly performing cooling and heat absorbing operations;
 coolant detecting means for detecting a decrease in amount of the coolant in said tank;
 timer counter means for counting a time interval between an instant at which a leakage detection output is output from said leakage detecting means and an instant at which a coolant decrease detection output is output from said coolant detecting means; and
 control means for stopping an operation of the electronic device when a value of said timer counter means is not more than a predetermined value.

5,086,830

AIR-CONDITIONING SYSTEM FOR MOTOR VEHICLES

Dieter Heinle, Plüderhausen, and Wolfgang Volz, Magstadt, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

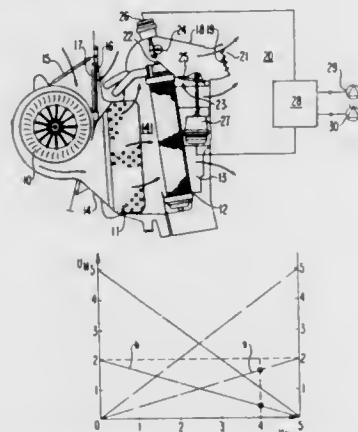
Filed Aug. 31, 1990, Ser. No. 575,665

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928944

Int. Cl.⁵ B60H 1/00, 1/32

U.S. Cl. 165—16

2 Claims



1. Air conditioning system for a motor vehicle for controlling the temperature of air flowing through said air conditioner into said motor vehicle comprising:

an evaporator and a heat exchanger, arranged one downstream from the other relative to the direction of air flow; first and second air chambers disposed upstream and downstream, respectively, from said heat exchanger relative to the direction of air flow;

an air duct having an air outlet opening for a central jet, said central jet having no air flap for controlling the flow of air therethrough, said air duct being connected via a cold air opening with said first air chamber, and connected via a hot air opening to said second air chamber, each of said hot and cold air openings having a bypass flap for regulating the flow of air therethrough, and each of said bypass flaps being coupled with an actuator for controlling the position thereof; and

control means responsive to preselected air quantity and air temperature values for controlling said actuators, said control means having stored therein characteristics which indicate the correlation between quantity and temperature of said air flow and the position of said bypass flaps, and said control means having further means for causing said actuators to effect a setting of said bypass flaps which corresponds to said preselected air quantity and temperature values.

5,086,831

ARRANGEMENT FOR THE CATALYTIC OXIDATION OF THE HARMFUL COMPONENTS IN A COOLED CARRIER GAS OF A TECHNICAL PROCESS

Paul Paikert, Witten; Werner Rudowski, and Clemens Ruff, both of Bochum, all of Fed. Rep. of Germany, assignors to GEA Luftkühler GmbH

Filed Apr. 30, 1991, Ser. No. 693,699

Claims priority, application Fed. Rep. of Germany, May 4, 1990, 4014415

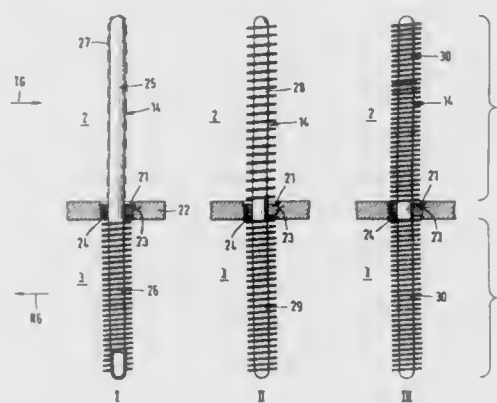
Int. Cl.⁵ F28D 15/02; F28F 13/14

U.S. Cl. 165—47

15 Claims

1. In an arrangement for catalytic oxidation of environmentally harmful components in a cooled carrier gas from a technical process, wherein purified gas to be transferred to the atmosphere is in heat-exchanging contact downstream of the catalyst with the carrier gas upstream of the catalyst through a

multi-pass heat exchanger, the improvement comprising a gas duct for conducting the carrier gas and a gas duct for conducting the purified gas, the gas ducts extending parallel to each other, a thermal energy return unit for connecting the gas ducts to each other, the thermal energy return unit having at least two stages and including heat tubes, the exchanger stages each having a heating part in the flow duct for the carrier gas



and a cooling part in the flow duct for the purified gas, wherein a size ratio of heat-exchanging surface areas of heating part relative to cooling part of each exchanger stage decreases in flow direction of the carrier gas from exchanger stage to exchanger stage, and wherein the catalyst is mounted immediately downstream of the heating part of the last exchanger stage.

5,086,832

MECHANICALLY INTERLOCKED MULTI TUBE HEAT EXCHANGER CORE

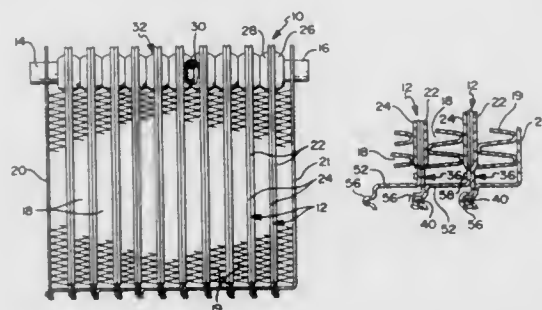
Prasad S. Kadle, Getzville, and Douglas L. Sattelberg, North Tonawanda, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 588,397, Sep. 26, 1990, abandoned. This application May 28, 1991, Ser. No. 706,531

Int. Cl.⁵ F28D 1/03

U.S. Cl. 165—76

3 Claims



1. A heat exchanger core having a series of flattened fluid flow tubes operatively interconnected with one another to transmit pressurized fluid therethrough from an intake to a discharge respectively operatively connected to the first and last of said tubes, each of said tubes having a tank portion at one end thereof, each said tank portion having an inlet and an outlet, each of said tubes having a main body portion defining an fluid flow path from said inlet to the outlet thereof, the improvement comprising first and second spacing and locking means on one end of each said tubes to releasably interlock with one another so that said tubes are spaced and supported at a predetermined distance from one another to prevent core damage by compressive forces applied to said tubes and to prevent said core from being pulled apart.

5,086,833

CLEANING SYSTEM FOR CLEANING FLUID-CONDUCTING TUBING

Chaim Ben-Dosa, Herzlia, Israel, assignor to Balls-Technique Ltd., Herzlia, Israel

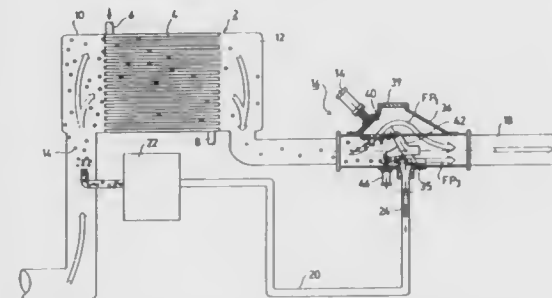
Filed Apr. 17, 1991, Ser. No. 686,359

Claims priority, application Israel, May 4, 1990, 94289

Int. Cl.⁵ F28G 1/12

U.S. Cl. 165—95

17 Claims



1. A cleaning system for cleaning fluid-conducting tubing comprising:

a plurality of balls circulated with the fluid through the tubing from an upstream side to a downstream side of the tubing;

recirculating means having an inlet at a negative fluid pressure at the downstream side of the tubing, and an outlet at a positive fluid pressure at the upstream side of the tubing for recirculating the balls through the tubing;

and separator means for separating the balls from the fluid before recirculated by said recirculating means; said separator means comprising:

a conduit having an inlet connected to the downstream side of the tubing, a ball outlet connected to the inlet of the recirculating means, and a fluid outlet connected to an outlet fluid line;

a grid structure within said conduit having an upstream face facing said conduit inlet and ball outlet, and a downstream face facing said fluid outlet, for separating the balls from the fluid and for directing the separated balls to said recirculating means;

and ball freeing means comprises first and second blocking devices cooperable with separate parts of said grid structure and effective, during a ball freeing operation, to shift the bulk of the fluid flow through the grid structure towards the ball outlet of said separator conduit to thereby move balls tending to accumulate on the upstream face of said grid structure towards said ball outlet where they may be more effectively drawn into said recirculating means by the negative pressure at the inlet of the recirculating means.

5,086,834

APPARATUS FOR STORING AND HEATING FOOD PRODUCTS

René Grandi, Loudon Ruy, Bourgoin-Jallieu 38300, France

PCT No. PCT/FR89/00461, § 371 Date Mar. 11, 1991, § 102(e)

Date Mar. 11, 1991, PCT Pub. No. WO90/02509, PCT Pub.

Date Mar. 22, 1990

PCT Filed Sep. 13, 1989, Ser. No. 656,190

Claims priority, application France, Sep. 14, 1988, 88/12073

Int. Cl.⁵ A47J 39/02

U.S. Cl. 165—135

20 Claims

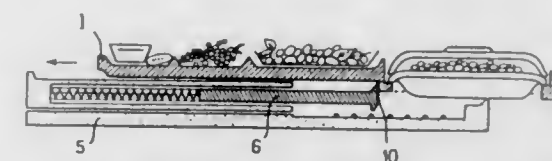
1. Apparatus for storing and reheating food products in a refrigerated housing, comprising:

at least one heating support;

at least one electrical resistance element within said at least one heating support;

a substantially horizontal and movable insulating heat barrier associated with each of said at least one heating support

port, with said heat barrier being retractable from a first position over said at least one electrical resistance element



within the heating support to a second, retracted position at another portion of the heating support when subjected to a push by introduction of a tray.

5,086,835

HEAT EXCHANGER

Toshiharu Shimura, Iseaki, Japan, assignor to Sanden Corporation, Gunma, Japan

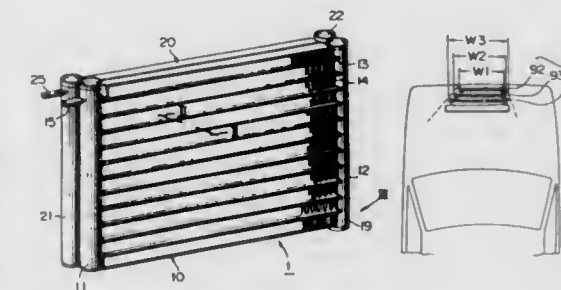
Filed Apr. 24, 1990, Ser. No. 513,623

Claims priority, application Japan, Apr. 24, 1989, 1-46793[U]

Int. Cl.⁵ F28F 9/26

U.S. Cl. 165—144

12 Claims



1. A heat exchanger comprising:

a plurality of heat exchanger cores each having a pair of header pipes extending in parallel relation to each other, a plurality of flat heat transfer tubes disposed between each pair of header pipes in parallel relation to one another and connected to and communicating with said pair of header pipes at their end portions, and a plurality of fins provided on the sides of said heat transfer tubes, said plurality of heat exchanger cores being integrally assembled in parallel relation to one another;

an inlet tube and an outlet tube for conveying fluid to and from said heat exchanger cores; and

means for connecting and communicating between one of said pair of header pipes of a heat exchanger core of said plurality of heat exchanger cores and one of said pair of header pipes of another heat exchanger core of said plurality of heat exchanger cores, said connecting and communicating means including a header block connected to said inlet tube to distribute said heat medium introduced through said inlet tube to at least two of said heat exchanger cores, and said heat exchanger further comprising another said connecting and communicating means including a header block connected to said outlet tube to join said medium passed through said plurality of heat exchanger cores and directs that heat medium to said outlet tube.

5,086,836

RETARDING HEAT TRACING SYSTEM AND METHOD OF MAKING SAME

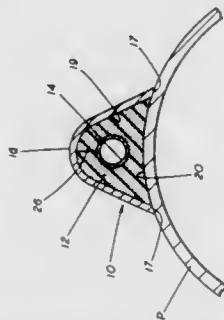
Roy E. Barth, San Marcos; Joseph M. Venable, New Braunfels; Atlee E. Fritz, Seguin, and Arthur McDonald, New Braunfels, all of Tex., assignors to Thermon Manufacturing Company, San Marcos, Tex.

Filed Nov. 2, 1990, Ser. No. 608,576

Int. Cl.⁵ F16L 53/00

U.S. Cl. 165—164

22 Claims



1. A retarding heat tracing system adapted to externally heat a process pipe which is to be maintained at a temperature within a specific temperature range, comprising:

a channel member having a pair of longitudinally extending edges and a longitudinal recess formed therebetween, said longitudinally extending edges abutting the process pipe; a heat transfer element extending longitudinally within said longitudinal recess, said heat transfer element being at a temperature substantially higher than the specified temperature range of the process pipe;

a retarding heat transfer strip disposed between said pipe and said heat transfer element, said retarding heat transfer strip having an external shape substantially conforming to said longitudinal recess of said channel member and positioned in said longitudinal recess between said channel member and process pipe, wherein said retarding heat transfer strip maintain said heat transfer element out of direct contact with the process pipe;

means for attaching said channel member to the process pipe; and

wherein said retarding heat transfer strip is made of a retarding heat transfer material for optimizing the heat transfer between said heat transfer element and the process pipe, said retarding heat transfer material having a thermal conductivity no greater than 1.5 BTU-In/HR-Ft²-°F. such that the heat transferred from said heat transfer element to the process pipe maintains the process pipe at a temperature within the specific temperature range.

5,086,837

HEAT EXCHANGER FORMED FROM SUPERIMPOSED TRAYS

Klaus Hagemeister, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed May 4, 1990, Ser. No. 520,038

Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914774

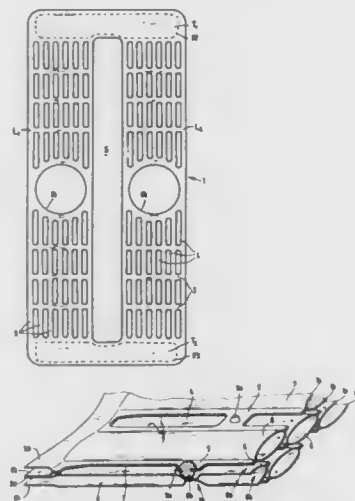
Int. Cl.⁵ F28D 1/03

U.S. Cl. 165—170

16 Claims

1. A heat exchanger comprising two parallel manifold ducts, and a matrix of rows of heat exchange tubes connecting the ducts to one another, the ducts and matrix being constituted by a plurality of stacked sheet metal trays, each sheet metal tray comprising two complementary tray members joined together in juxtaposed relation to form one row of said tubes extending longitudinally and intermediate webs between adjacent tubes, said webs being provided with longitudinal slots, each tray member being deformed as a trough between the slots so that when the two complementary tray members are juxtaposed on

one another, the troughs form said tubes, the tubes of each row being laterally staggered with respect to the adjacent rows so that the tubes of one row face the longitudinal slots in the adjacent rows, and means projecting away from each web on



5,086,838

TAPERED CUTTING TOOL FOR REAMING TUBULAR MEMBERS IN WELL BORE

Terry E. Cassel, and Gerald D. Lynde, both of Bossier City, La., assignors to Baker Hughes Incorporated

Continuation-in-part of Ser. No. 290,575, Dec. 27, 1988, Pat. No. 5,038,859, which is a continuation-in-part of Ser. No. 181,812,

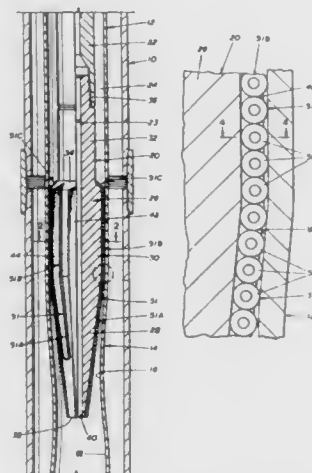
Apr. 15, 1988, Pat. No. 4,978,260, which is a

continuation-in-part of Ser. No. 816,287, Jan. 6, 1986, Pat. No. 4,796,709. This application Mar. 21, 1991, Ser. No. 673,186

Int. Cl.⁵ E21B 29/00

U.S. Cl. 166—55.6

19 Claims



1. In a cutting tool adapted to be positioned within a tubular metal member downhole in a well bore for reaming the inner peripheral surface of the tubular member to a uniform inner diameter and adapted for attachment at its upper end to a drill string for receiving drilling fluid therefrom; said cutting tool comprising:

a tool body having a generally cylindrical intermediate body

portion and an integral frusto-conical lower end portion defining the lower end of said tool, said tool body having a central bore therethrough for the discharge of drilling fluid received from said drill string from said lower end; a plurality of planar mounting surfaces spaced about the outer periphery of said tool body and extending along said generally cylindrical tool body portion and said frusto-conical lower end portion, each mounting surface having on the leading side thereof a channel to permit the upward flow of drilling fluid and entrained metal scrap material; and

a single continuous column of cutting elements of a similar shape and size on each of said mounting surfaces arranged generally in an end to end relation, each of said cutting elements having an exposed front cutting face forming a cutting surface, a rear face secured to the associated mounting surface, a peripheral surface extending between said faces, and a relatively sharp edge formed at the juncture of the front face and peripheral surface.

5,086,839

WELL PACKER

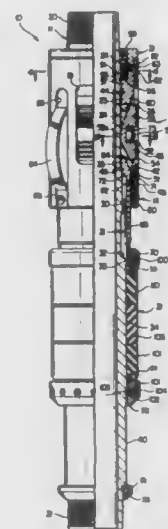
John R. Setterberg, Jr., Dallas, and Pat M. White, Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 8, 1990, Ser. No. 611,188

Int. Cl.⁵ E21B 33/128, 33/129

U.S. Cl. 166—138

19 Claims



1. A well packer comprising:

a tubular mandrel having a central longitudinal flow passage;

an annular packer element assembly on said mandrel for sealing around said mandrel with a well bore wall;

a drag spring and slip carrier assembly movably mounted on said mandrel;

a slip assembly in said drag spring and slip carrier assembly including a slip housing movable within and relative to said drag spring and slip carrier assembly;

an interlock assembly associated with said drag spring and slip carrier assembly for selectively coupling said mandrel with said slip assembly and said drag spring and slip carrier assembly to set and release said packer in a well bore, said interlock assembly including arcuate running segments for holding said packer in a release mode and arcuate locking segments for setting and releasing said packer in a well bore;

said running segments and said tubular mandrel having coacting means for limiting movement of said running segments away from said annular packing element assembly to release positions of said running segments on said mandrel at which slack remains in said drag spring and slip

carrier assembly when torque is applied to said mandrel in a direction opposite to the direction of torque required for setting said packer; and

means in said interlock assembly coacting with said locking segments for biasing lower end portions of said locking segments radially inwardly for maximum seating of said segments along said packer mandrel.

5,086,840

DELAYED RIGID FOAM SYSTEMS AND APPLICATIONS IN PARTICULAR FOR PLUGGING SELECTIVE TREATMENTS IN THE OIL INDUSTRY

Arthur Soucemarianadin, Saint-Perey, France, and Keng S. Chan, Calgary, Canada, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

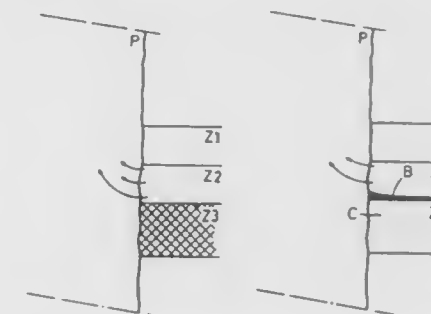
Filed Jan. 26, 1990, Ser. No. 471,199

Claims priority, application France, Jan. 27, 1989, 89 01147

Int. Cl.⁵ E21B 33/138, 43/27

U.S. Cl. 166—294

9 Claims



1. A method for selectively plugging a subterranean formation comprising the steps of:

(a) providing a controlled gelation or solidification system comprising an aluminum salt selected from a group consisting of aluminum chloride and aluminum hydroxychloride and a weak base selected from a group consisting of urea and hexamethylenetetramine;

(b) combining the controlled gelation or solidification system with a gas and a foaming surfactant to form a foam;

(c) injecting the foam into the formation to be plugged, and

(d) shutting in the well for a period of time to allow solidification or gelation of the foamed controlled gelation or solidification system within the formation.

5,086,841

METHOD OF REDUCING CIRCULATION FLUID LOSS USING WATER ABSORBING POLYMER

Ansell L. Reid, Spring, and Henry A. Grichuk, Rosenberg, both of Tex., assignors to Nalco Chemical Company

Division of Ser. No. 367,798, Jun. 16, 1989, Pat. No. 5,034,139. This application Feb. 19, 1991, Ser. No. 656,437

Int. Cl.⁵ E21B 33/138

U.S. Cl. 166—295

9 Claims

1. In the process of reducing loss of circulation fluid during the drilling of a borehole penetrating a subterranean formation by injecting into the borehole a slug of hydrocarbon containing a polymer capable of substantially expanding on contact with water, subsequently injecting into the borehole a discrete slug of water and forcing the water slug and the polymer slug into a lost circulation zone within the formation whereby the water absorbent polymer absorbs water to expand and close off the lost circulation zone, the improvement which comprises providing the hydrocarbon polymer mixture as a thixotropic hydrocarbon gel of a crosslinked polymer, the mixture being gelled by the presence of phosphorus-containing hydrocarbon gelling agents.

5,086,842

DEVICE AND INSTALLATION FOR THE CLEANING OF DRAINS, PARTICULARLY IN A PETROLEUM PRODUCTION WELL

Henri Cholet, Le Pecq, France, assignor to Institut Français Du Pétrole, Rueil Malmaison, France

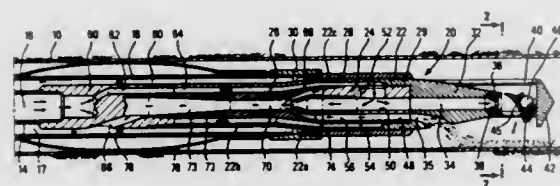
Filed Sep. 7, 1990, Ser. No. 578,452

Claims priority, application France, Sep. 7, 1989, 8911693

Int. Cl.³ E21B 37/00

U.S. Cl. 166—312

15 Claims



1. Device for cleaning a horizontal or slightly sloping drain adapted to be disposed in the drain at the downstream extremity of two concentric pipe columns delimiting two pipes, also concentric, said device including a body which is provided at its extremity with at least one nozzle for projecting fluid and which delimits firstly a cleaning fluid feeding passage and secondly a return passage for the fluid loaded with solid particles of sand and other sediments, said two passages being adapted to be respectively connected to the two pipes delimited by the pipe columns, wherein said device further comprises deflector means for directing a fluid jet projecting out of the at least one nozzle in a direction toward a wall of the drain on which the solid particles of sand and other sediments accumulate.

5,086,843

OIL TOOL RELEASE JOINT

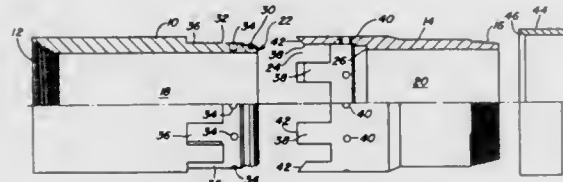
Michael G. Mims, Bakersfield; Mark D. Mueller, Santa Maria, both of Calif.; Frank L. Jones, Balikpapan, Indonesia, and Michael J. Bunyak, Santa Maria, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 27, 1990, Ser. No. 589,321

Int. Cl.³ E21B 17/05, 19/16, 23/02

U.S. Cl. 166—380

49 Claims



1. A release tool for coupling pipe string segments comprising:

- (a) a top sub for coupling to a first pipe string segment, the top sub having a longitudinal axis and a bore substantially along the axis;
- (b) a bottom sub for coupling to a second pipe string segment, the bottom sub having a longitudinal axis and a bore substantially along the longitudinal axis, the bottom sub being connectable to the top sub so that the top and bottom subs are substantially aligned and said bores are capable of containing a fluid pressure;
- (c) a plurality of splines extending from one of the subs substantially parallel to the sub's longitudinal axis;
- (d) a plurality of slots on the other one of the subs extending substantially parallel to the other sub's axis, the slots receiving the splines when the subs are connected to trans-

mit rotational motion about the longitudinal axis between the subs; and

- (e) means for preventing axial movement between the subs to retain the subs in connection with each other, the means capable of releasing to allow the subs to move axially away and disconnect from each other in the absence of rotational motion and an absence of an increase in fluid pressure in said subs.

5,086,844

HYDRAULIC RELEASE OIL TOOL

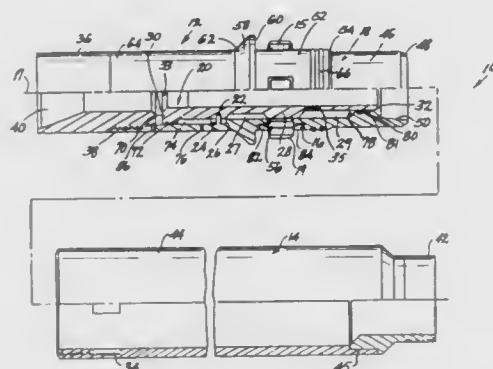
Michael G. Mims, Bakersfield; Mark D. Mueller, Santa Maria, both of Calif., and Jeffrey C. Ehlinger, Houston, Tex., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 10, 1989, Ser. No. 418,510

Int. Cl.³ E21B 23/04

U.S. Cl. 166—383

69 Claims



1. A hydraulic release tool comprising:

- (a) a setting assembly including:
 - (i) a body having a longitudinal axis and a longitudinal bore along the axis;
 - (ii) a piston translatable in the bore of the body between a setting position and a release position, the piston also having a longitudinal bore and differential areas to effect a net force on the piston in response to hydraulic pressure in the bore of the body that tends to move the piston from the setting position to the release position;
 - (iii) a plurality of dogs in the body extendable radially of the axis between a retracted position close to the axis and an extended position further from the axis and outwardly of the body;
 - (iv) biasing means for biasing the dogs toward the axis and into the body;
 - (v) means on the piston engaging the base of the dogs to extend the dogs outside the body when the piston is in the setting position;
 - (vi) means on the piston to disengage the base of the dogs so that the dogs move to their retracted position in response to the dog biasing means when the piston moves into its release position; and
 - (vii) means between the piston and the body to hold the piston in the setting position until a predetermined hydraulic pressure exists in the body bore and to release the piston when the hydraulic pressure exceeds the predetermined pressure so that the piston moves to its release position;
- (b) a coupling member for coupling to drill string or petroleum production components, the coupling member having a plurality of sockets for receiving the dogs in their extended position and attaching the coupling member to the setting assembly; whereby the setting assembly couples to the coupling member by engagement of the dogs in the sockets and releases from and disengages the coupling member upon movement of the piston from its setting to its release position in response to a pressure in the body in excess of the predetermined pressure; and

5,086,846

FOAM-DISPENSING APPARATUS

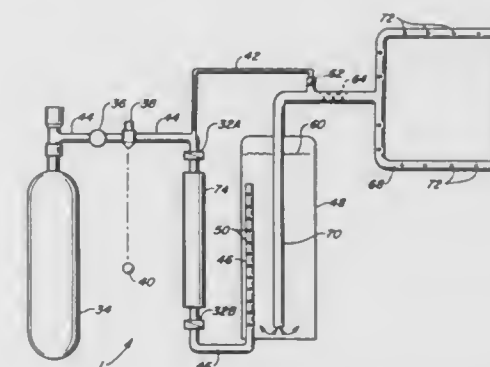
Richard F. Carlson, 357 Palos Verdes Dr. West, Palos Verdes Estate, Calif.

Continuation-in-part of Ser. No. 442,617, Nov. 29, 1989. This application May 2, 1990, Ser. No. 518,026

Int. Cl.³ A62C 3/00, 35/58

U.S. Cl. 169—15

10 Claims



1. A new and improved surfactant dispensing apparatus, comprising:
 means for storing a supply of surfactant;
 separate means, connected to said surfactant storage means, for storing a supply of water such that said surfactant flows into said water supply when it is necessary to dispense surfactant from said apparatus;
 a stationary mixing device disposed downstream of said water supply;
 a metered supply of pressurized air having valve means for operatively connecting said air supply to said surfactant storage means and further to said mixing device by means of a first air conduit such that when said valve is in the open position pressurized air from said air supply forces surfactant from said foam storage means and into said water supply where said surfactant and water combine and are further forced by said pressurized air downstream towards and through said mixing device where said water and surfactant are further mixed by said mixing device in such a manner that substantial foaming results from the surfactant and water mixture as a substantial amount of bubbles are produced from said mixture thereby producing a high quality of surfactant to be dispensed over a desired area.

5,086,845

LINER HANGER ASSEMBLY

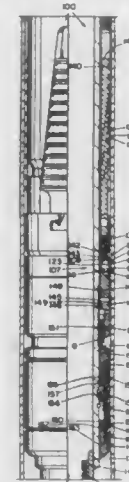
J. Lindley Baugh, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 29, 1990, Ser. No. 545,612

Int. Cl.³ E21B 23/00

U.S. Cl. 166—382

13 Claims



1. A hanger assembly securable to a workstring for carrying a liner conduit in a subterranean well and settable within a casing string, comprising:

- (1) an elongated tubular housing;
- (2) a series of circumferentially extending slip elements carried exteriorly around and by said housing and axially movable relative to a slip seat from a radially retracted position to a radially expanded position for gripping engagement with the casing string; and
- (3) each of said slip elements having circumferentially subtended exteriorly protruding non-buttress teeth defined thereon, said teeth being symmetrical to both push and pull forces applied through the assembly by either the workstring or the liner conduit subsequent to setting within said casing string;
- (4) wherein said assembly is moved to a set position relative to said casing string by application of hydraulic pressure in a first predetermined amount to transmit and apply a setting load to said slip elements;
- (5) and further comprising compressive biasing means movable to a compressed condition by mechanical manipulation of said workstring subsequent to movement of said assembly to said set position to transmit a second load to said slip elements in excess of the setting load; and
- (6) locking means for locking the setting and second loads into said slip assembly,

5,086,847

HEIGHT ADJUSTMENT MECHANISM FOR FARM IMPLEMENTS

Elmo R. Meiners, P.O. Box 126, Anchor, Ill. 61720

Filed Nov. 2, 1990, Ser. No. 609,190

Int. Cl.³ A01B 63/22

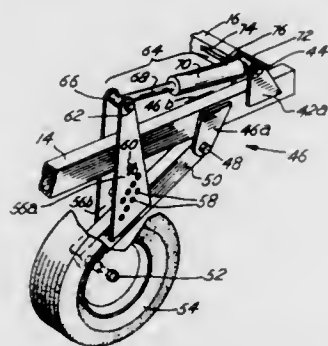
U.S. Cl. 172—466

2 Claims

1. A towable farm implement platform and an improved height adjustment mechanism comprising, in combination:
 a frame having a forward end and rearward end, said frame comprising longitudinal structural members and lateral cross-members, said members having means for securing farm implements thereto, said frame being movable longitudinally over the ground;
 means for attaching said frame to a prime mover, said means for attaching connected to the forward end of said frame; at least one wheel mounting member with a wheel mounted at one end of the wheel mounting member, said wheel mounting member having a pivotal attachment at its opposite end to said a longitudinal structural member, said wheel mounting member being pivotally attached to the longitudinal structural member of the frame for pivotal movement about an axis generally transverse to the direction of platform travel, said wheel mounting member

lying and moveable substantially in the same vertical plane as the longitudinal structural member to which it is pivotally attached;

a height adjustment arm comprising first and second planer, parallel guide plates attached to and extending vertically upward from said wheel mounting member and spaced from the pivotal attachment of the arm to the structural member, said guide plates spaced from the pivotal attachment of said wheel mounting member to said longitudinal structural member, said guide plates positioned on opposite sides of the longitudinal structural member and having a plurality of pairs of aligned support openings, said guide



plates extending above the longitudinal structural member to define a pivot connection;
means for height adjustment pivotally connected to said guide plates at said pivot connection, said height adjustment means having a second end pivotally connected to said longitudinal structural member;
adjustable means for controlling the length of the means for height adjustment to thereby raise and lower the wheel and;
a frame support pin positioned in one pair of aligned support openings to thereby limit upward pivotal movement of the wheel mounting member.

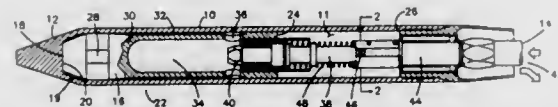
5,086,848

REVERSIBLE IMPACT HOLE DRILLER AND METHOD OF REVERSING

Donald M. Hudak, 5454 Coronada Dr., Mentor, Ohio 44060
Filed Oct. 19, 1990, Ser. No. 600,431
Int. Cl.⁵ E21B 11/02

U.S. Cl. 173—1

9 Claims



8. A method of reversing the operational direction of a pneumatic impact hole drilling tool having a longitudinally and rotationally spring biased, tubular, valve mechanism having a keyed portion, said mechanism coacting with a valve guide, said guide having a channel portion to receive said keyed portion of said valve mechanism, the method comprising:

- operatively connecting a pneumatic supply to said valve mechanism;
- applying a counter rotational biasing force to said valve mechanism to align the keyed portion of said mechanism with said channel portion from an otherwise non-aligned position thereby allowing said pneumatic supply to overcome said longitudinal spring bias to shift said mechanism from a forward tool advancing range to a rearward tool retraction range; and,
- interrupting said pneumatic supply to allow said longitudi-

nal spring bias force to shift said valve into said forward tool advancing range.

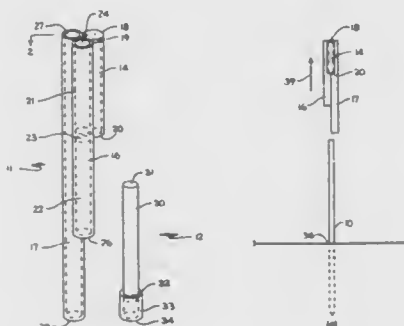
5,086,849

APPARATUS USEFUL IN DRIVING ELECTRICAL GROUND RODS

Robert R. Dahl, Rte. 1, Box 45, Walkerville, Mich. 49459
Filed May 13, 1991, Ser. No. 699,367
Int. Cl.⁵ E02D 7/04

U.S. Cl. 173—126

8 Claims



1. Apparatus for manually driving an electrical ground rod, said electrical ground rod typically having a circular cross section of an accepted standard diameter and a length of approximately 305 centimeters said apparatus comprising:

a first tubular element, formed of a length of a rigid, durable, right circular cylindrical annular stock having an inner cylindrical diameter and an outer cylindrical diameter, said inner cylindrical diameter being adapted to freely receive said electrical ground rod axially therethrough, said length being defined by a first end thereof and a second end thereof, both said first end and said second end being formed to be substantially orthogonally transverse to a longitudinal axis of said first tubular element, said length being constrained to be approximately thirty centimeters;

a cap element, formed of a segment of a right circular solid cylindrical stock having a diameter substantially equal to the outer diameter of said first tubular element, said cap element being formed from a high tensile strength material, with a longitudinally directed thickness sufficient to withstand repeated longitudinally directed impacts upon an upper end of said electrical ground rod; said cap element being rigidly coaxially affixed to said first end of said first tubular element so as to fully close said first end;

a second tubular element, fabricated as a rigid coaxial assembly of a first tubular segment and a second tubular segment separated by, and rigidly affixed to a plug element, said first tubular segment and said second tubular segment each being substantially physically and dimensionally equal to said first tubular element, and said plug element being substantially physically and dimensionally equal to said cap element, said second tubular element having a first open end thereof and a second open end thereof; said second tubular element having an assembled overall length constrained to be approximately sixty centimeters plus the axial thickness of said plug element;

a third tubular element, fabricated as a further length of right circular cylindrical annular stock substantially physically and dimensionally equivalent to the stock used to fabricate said first tubular element, except as to length, said third tubular element having a first end thereof and a second end thereof separated by a length sufficient to enable a user to reasonably hold said third tubular element vertically upwardly such that said first end thereof is at an elevation of at least three and one-half meters above a surface supporting a standing user;

said first tubular element, said second tubular element, and said third tubular element being assembled into a rigid and

durable unit wherein longitudinal axes of said first, second and third tubular elements are arranged to be mutually parallel, and wherein a planar surface of said cap element obverse to that affixed to said first end of said first tubular element, said first end of said second tubular element, and said first end of said third tubular element are substantially coplanar, with respective second ends of said first, second, and third tubular elements being respectively separated from said plane in a mutually common direction; and

an extension element, formed as a coaxially aligned rigid assembly comprised of a length of right circular cylindrical solid stock, of substantially the same cross-sectional dimensions as said electrical ground rod, having a first end thereof and a second end thereof, said length being constrained to exceed the inner axial length of a segment of said second tubular element, extending from a first end of said second tubular element to said plug element, by approximately two centimeters, and a segment of tubular stock, a first end of which is rigidly attached to said second end of said length of solid cylindrical stock, said tubular segment having substantially the same physical and cross-sectional dimensional properties as said first, second, and third tubular elements, said tubular segment having an internal axial length sufficient to axially slidably engage upon an upper end of said electrical ground rod but not exceeding fifteen centimeters.

5,086,850

WELL BORE DRILLING DIRECTION CHANGING METHOD

Kirk L. Harris, and Clyde Cook, Jr., both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Continuation-in-part of Ser. No. 638,878, Jan. 8, 1991. This application Apr. 2, 1991, Ser. No. 679,373
Int. Cl.⁵ E21B 7/06, 33/13

U.S. Cl. 175—61

20 Claims

1. A method of changing the direction of drilling a well bore comprising the steps of:

placing a slurry of hydraulic cement in water in said well bore at a location therein where said direction of drilling is to be changed and in an amount sufficient to form a plug therein;

allowing said slurry to set into a rigid plug in said well bore; drilling a pilot hole in said cement plug in the desired new direction of drilling;

continuing the drilling of said well bore by way of said pilot hole in said cement plug; and

wherein said slurry is comprised of a mixture of water and said hydraulic cement in the ratio of from about 0.5 to about 5.0 pounds of water per pound of cement, the particle size of said hydraulic cement is no greater than about 30 microns, and the Blaine Fineness of said hydraulic cement is no less than about 6,000 square centimeters per gram.

5,086,851

COMBINATION THRUST AND RADIAL BEARING FOR USE IN DOWN-HOLE DRILLING TOOLS

Thomas R. Beasley, Katy, Tex., assignor to Dailey Petroleum Service Corp., Houston, Tex.

Filed Oct. 26, 1990, Ser. No. 604,784

Int. Cl.⁵ E21B 4/02; F16C 19/02, 19/18

U.S. Cl. 175—101

10 Claims

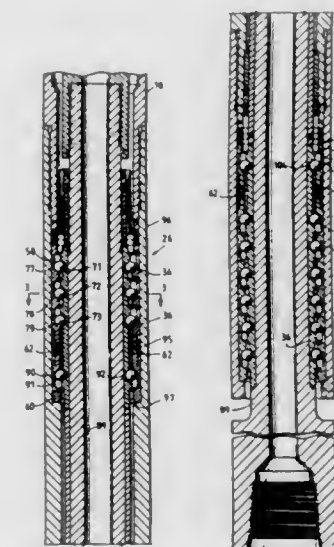
1. A bearing, comprising

a generally cylindrical inner race having a first plurality of longitudinally spaced circumferential raised portions forming first and second outward-facing grooves on an outer surface thereof;

a generally cylindrical outer race coaxially arranged about said inner race, said outer race having a second plurality of longitudinally spaced raised portions forming a third and fourth forward-facing circumferential groove therebetween in an inner surface thereof, said third and fourth

grooves each having a second preselected longitudinal width substantially greater than said first longitudinal width, said third and fourth plurality of grooves being spaced a preselected distance apart and alignable with said first and second grooves;

a plurality of ball bearings, each having a diameter substantially similar to the width of said first plurality of grooves, a first portion of said ball bearings being positioned within



said first and third grooves, substantially captured between one of said first and second plurality of raised portions and adapted for receiving a longitudinal thrust load in a first direction only, and a second portion of said ball bearings being positioned within said second and fourth grooves, substantially captured between one of said first and second plurality of raised portions and adapted for receiving a longitudinal thrust load in a second, opposite direction only.

5,086,852

FLUID FLOW CONTROL SYSTEM FOR OPERATING A DOWN-HOLE TOOL

W. Jeffrey van Buskirk, Hobbs, N. Mex., assignor to WADA Ventures, Hobbs, N. Mex.

Filed Aug. 27, 1990, Ser. No. 572,455

Int. Cl.⁵ E21B 7/28

U.S. Cl. 175—269

32 Claims

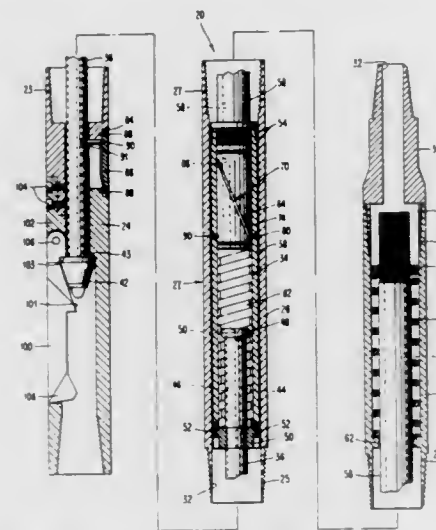
1. A hydraulically operated down-hole tool for use in well bores comprising:

a body having a longitudinal bore that extends therethrough; a plurality of cutter arms mounted on a lower end of the body for movement between a retracted position and an extended position;

an axially movable wedge column positioned in the bore of the body, said wedge column having a longitudinal jet flow passage extending from one end of the wedge column to an opposite end and a flow through passage extending from the one end of the wedge column to the opposite end, said flow through passage and said jet flow passage being radially offset with respect to a longitudinal axis of the wedge column, said flow through passage being larger in size than said jet flow passage, said wedge column having engaging means for engaging the cutter arms upon downward movement of the wedge column to cause the cutter arms to pivot outwardly to the extended position, said engaging means being located at the bottom end of the wedge column; and

rotationally and axially movable valve means positioned within the bore of the body and above the wedge column for alternately supplying fluid to the flow through passage

and the jet flow passage and for translating hydraulic-back pressure which results when the valve means supplies



fluid to the jet flow passage into downward axial movement of the wedge column to cause the cutter arms to pivot outwardly to the extended position.

5,086,853

LARGE BORE HYDRAULIC DRILLING JAR

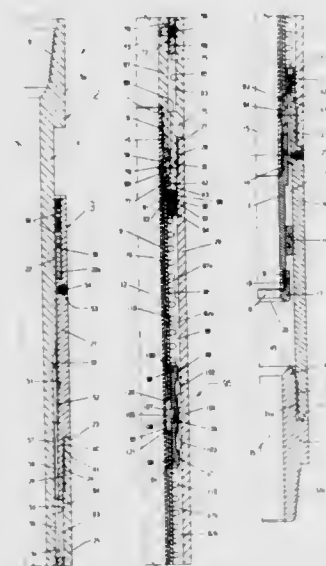
Robert W. Evans, 12986 Wood Harbor, Montgomery, Tex. 77356

Filed Mar. 15, 1991, Ser. No. 670,249

Int. Cl.⁵ E21B 31/113

U.S. Cl. 175—297

9 Claims



1. A hydraulic tripping valve for use in a double acting drilling jar consisting of a tubular mandrel arranged for telescoping movement within a tubular housing, comprising:

- a first flange coupled to an interior surface of said tubular housing and extending a preselected distance therein to form first and second actuating surfaces on opposed surfaces of said first flange;
- a first annular valve member positioned diametrically between the mandrel and housing of said drilling jar and longitudinally displaced from said first flange, said first annular valve member having a second flange extending a preselected radial distance therefrom toward said housing in overlapping relation with said first actuating surface on

said first flange, said first annular valve member having a diametrically interior surface having a recess formed therein to expose a third actuating surface;

- a second annular valve member positioned diametrically between the mandrel and housing of said drilling jar and longitudinally adjacent and in sealing relationship with said first annular valve member, said second annular valve member having a third flange extending a preselected radial distance therefrom toward said housing in overlapping relation with said second actuating surface on said first flange, said second annular valve member having a diametrically interior surface having a recess formed therein to expose a fourth actuating surface, said first and second annular valve member recesses being formed adjacent and open to one another; and

an actuating mechanism coupled to and movable with said mandrel, said actuating mechanism being positioned diametrically interior to said tripping valve and having a fourth flange extending a preselected distance therefrom into said first and second annular valve member recesses to form fifth and sixth actuating surfaces on opposed surfaces of said fourth flange, said fifth and sixth actuating surfaces being positioned in diametrically overlapping relation with said third and fourth actuating surfaces of said first and second annular members.

5,086,854

DRILL PIPES FOR ROTARY-VIBRATORY DRILLS

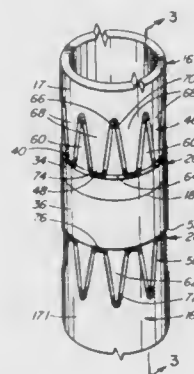
Raymond J. Roussy, 10241 - 148th Street, Surrey, B.C., Canada V3R 6S4

Filed Oct. 31, 1990, Ser. No. 606,710

Int. Cl.⁵ E21B 17/00; F16L 13/02

U.S. Cl. 175—320

3 Claims



1. In combination:

- a rotary-vibratory drill and a drill string connected thereto, the drill string comprising a plurality of drill pipes and joints for connecting the drill pipes together, each of the joints including a female threaded connector, first means for connecting the female threaded connector to a first said drill pipe, a male threaded connector which threadedly engages the female threaded connector, and second means for connecting the male threaded connector to a second said drill pipe, each of the connectors having an outer portion and an inner portion, the outer portions and the pipes having equal outside diameters, the pipes having outer portions fitting over the inner portions of the connectors, the means for connecting each comprising circumferentially alternating slots and finger-like projections on the outer portions of the pipes which are elongated and aligned generally axially with the pipes and welds connected to the connectors and the pipes along edges of the slots.

5,086,855
WEIGHING AND LABELING APPARATUS AND METHOD

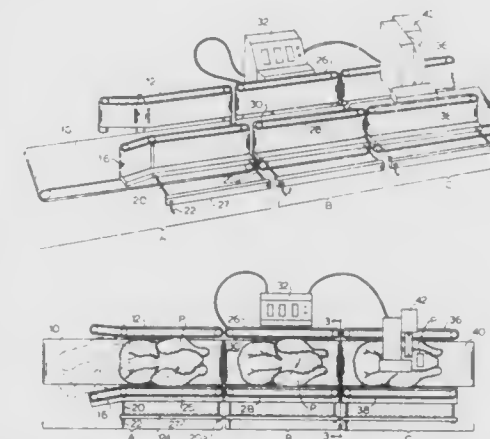
Sidney S. Tolson, Scotland Neck, N.C., assignor to Ossid Corporation, Rocky Mount, N.C.

Filed Nov. 13, 1990, Ser. No. 615,810

Int. Cl.⁵ G01G 23/38, 19/00; B65G 15/14

U.S. Cl. 177—5

10 Claims



1. An apparatus for the weighing and labeling of products with non-flat bottoms in a high speed processing environment, comprising:

- (a) first conveyor means including a first horizontal conveyor to support and transport said products into operating position and including a first pair of vertical control belts mounted primarily in a pair of parallel planes perpendicular to said first horizontal conveyor and operative in a direction parallel to the direction of said first horizontal conveyor at a synchronous speed therewith, said first pair of vertical control belts being separated by a space such that said products are gripped securely therebetween;
- (b) second conveyor means aligned with and mounted adjacent said first conveyor means, including a second horizontal conveyor to support and transport said products during a weighing operation and including a second pair of vertical control belts mounted in a pair of parallel planes perpendicular to said second horizontal conveyor and operative in a direction parallel to the direction of said second horizontal conveyor at a synchronous speed therewith, said second pair of vertical control belts being separated by a space such that said products are gripped securely therebetween;
- (c) said second conveyor means being mounted on a weighing device capable of registering the weight thereof including the weight of any product carried thereby to produce individual product weight information and transmitting said product weight information as a signal to a signal processing device;
- (d) third conveyor means mounted adjacent said second conveyor means including a third horizontal conveyor aligned with and mounted adjacent said second conveyor means to support and transport said products during a labeling operation and including a third pair of vertical control belts mounted in a pair of parallel planes perpendicular to said third horizontal conveyor and operative in a direction parallel to the direction of said third horizontal conveyor at a synchronous speed therewith, said third vertical control belts being separated by a space such that said products are gripped securely therebetween; and
- (e) labeling means mounted adjacent said third conveyor means and connected to said signal processing device, said labeling means being capable in response to said signal of imprinting and transferring a label onto each of said products in sequence prior to each of said products being expelled from the said weighing/labeling apparatus and

while each said product is in continuous motion on said third horizontal conveyor.

5,086,856

METHOD AND APPARATUS FOR WEIGHING A WHEEL SUPPORTED LOAD

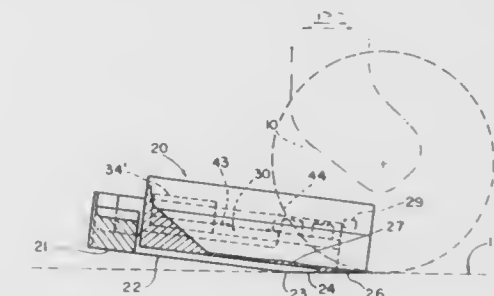
Rolf P. Haggstrom, East Walpole, Mass., assignor to Flintab AB, Västerås, Sweden

Filed Nov. 20, 1990, Ser. No. 616,073

Int. Cl.⁵ G01G 23/00

U.S. Cl. 177—161

14 Claims



6. A weighing device for a wheel supported load, comprising:

- (a) a base having a bottom surface adapted to rest movably on a floor, and a front edge on said bottom surface;
- (b) means, supported by said base, for sensing force; and
- (c) track means for supporting the wheel, said track means being substantially flat in a direction of travel of said wheel and fixedly mounted on said means for sensing force in substantially parallel alignment above said bottom surface and having a first end extending beyond said front edge of said bottom surface, whereby the first end of the track means can be wedged under the wheel when the base is tilted about said front edge.

5,086,857

ROLLER DRIVE UNIT

Gerald H. Dale, Okanagan, Gristhorpe, Filey, England YO14 9PH

PCT No. PCT/GB88/00593, § 371 Date Feb. 12, 1990, § 102(e) Date Feb. 12, 1990, PCT Pub. No. WO89/00514, PCT Pub. Date Jan. 26, 1989

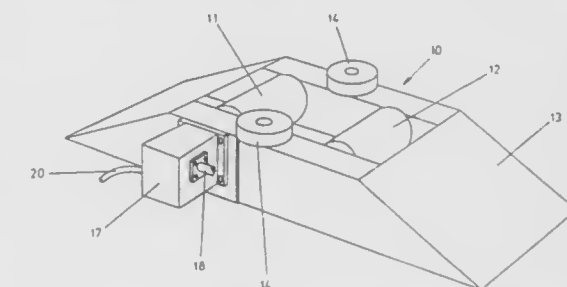
PCT Filed Jul. 21, 1988, Ser. No. 460,176

Claims priority, application United Kingdom, Jul. 22, 1987, 8717310

Int. Cl.⁵ B60K 17/28, 25/00

U.S. Cl. 180—53.4

12 Claims



1. A roller drive unit for providing regulated output power, in which the unit comprises:

- an input drive roller assembly;
- a guide path to the drive roller assembly for an engine-powered wheeled vehicle, the roller assembly being arranged relative to the guide path so as to be engageable drivingly by one or more driven wheels of the vehicle;

a hydraulic pump arranged to be driven by said roller assembly and to deliver a pressurised output fluid to a load; a fluid reservoir communicating with the pump; and flow regulator means for controlling the pressurised output fluid of the pump to a predetermined flow rate by allowing only a predetermined rate of fluid flow to the load and by dumping any excess fluid to the reservoir, the regulator means being connected to the load and to the reservoir.

5,086,858

AIR INTAKE SYSTEM FOR UTILITY VEHICLE

Fumio Mizuta, Akashi; Takashi Arai, Kakogawa; Yoshiharu Matsuda, Akashi, and Itsuo Takegami, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

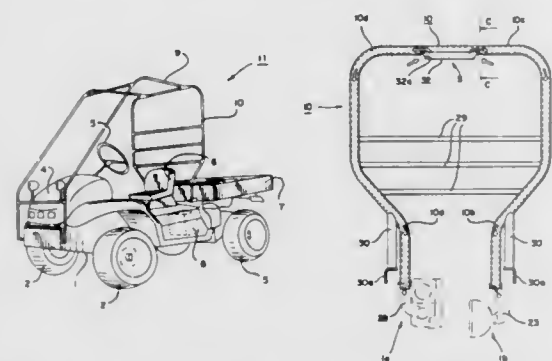
Filed Dec. 3, 1990, Ser. No. 621,635

Claims priority, application Japan, Aug. 17, 1990, 2-86585[U]

Int. Cl.⁵ B60K 13/02, 13/06, 11/06

U.S. Cl. 180—68.3

5 Claims



1. An air intake system for a utility vehicle including an engine, a driver's seat, at least one wheel, and a belt converter all being mounted on said vehicle, said engine being located near said driver's seat and powering said wheels via said belt converter, said engine having a combustion air intake and said converter having a cooling air intake, said air intake system comprising a hollow open ended and generally rectangular frame disposed vertically behind said seat, said frame having first and second lower ends, said first lower end being connected to said combustion air intake of said engine and said second lower end being connected to said cooling air intake of said belt converter, said frame further being provided with an upper air intake, a first air passage connected between said upper air intake and said first lower end, and a second air passage connected between said upper air intake and said second lower end.

5,086,859

METHOD AND SYSTEM FOR CONTROLLING ELECTRIC POWER STEERING

Tsutomu Takahashi, Seiichi Oshita, and Toyohiko Mouri, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 324,144, Mar. 9, 1989, abandoned. This application Jul. 20, 1990, Ser. No. 555,818

Claims priority, application Japan, Mar. 15, 1988, 63-61251

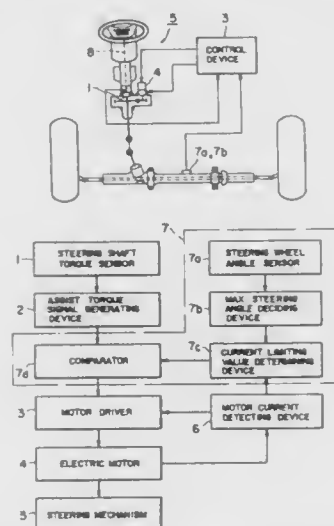
Int. Cl.⁵ B62D 5/04

U.S. Cl. 180—79.1

8 Claims

1. A controlling system for controlling an electric power steering device mounted on a vehicle, having a steering wheel operatively connected to wheels to be steered through a steering shaft, an electric motor for assisting the rotation of the steering wheel, torsion torque sensing means for producing a torsion torque signal indicative of torsion torque on the steering shaft, assist torque signal generating means responsive to said torsion torque signal for generating a desired motor current command signal, and motor signal, and motor driver means responsive to current command signal, and motor driver

means responsive to said desired motor current command signal for operating said electric motor, the system comprising: motor current detecting means for detecting an actual motor current flowing to the electric motor and for producing an actual motor current signal indicative thereof; steering wheel angle detecting means for detecting a turning angle of the steering wheel and for producing a steering angle signal indicative thereof; maximum steering angle deciding means responsive to said steering angle signal for deciding a condition when said steering angle becomes equal to or over a first predeter-



mined value and for generating an output indicative thereof; current limiting value determining means for storing said actual motor current signal as a motor current limiting value when said condition is satisfied and for producing a motor current limiting signal indicative thereof; and comparator means for comparing said motor current limiting signal and said desired motor current command signal to operate the electric motor by said motor current limiting value when said desired current signal is greater than said current limiting signal, so as to prevent overheating of various element of said electric power steering device.

5,086,860

VEHICULAR BATTERY RETAINER AND SHIELD

Laurie A. Francis, Bloomfield Hills, and Richard H. Krentz, Farmington Hills, both of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Jun. 4, 1990, Ser. No. 532,769

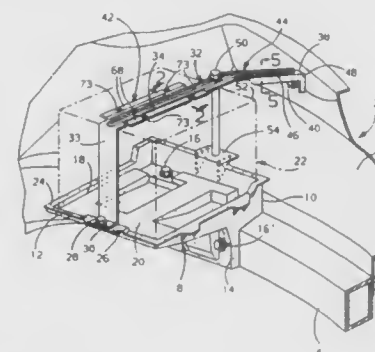
Int. Cl.⁵ B60R 16/04

U.S. Cl. 180—68.5

9 Claims

1. In a motor vehicle including a body member in part defining an engine compartment and a tray secured to, and cantilevered from, said body member for supporting an electric storage battery in said compartment wherein said tray has a mounting end engaging said body member at a first site and a distal end opposite said mounting end which is susceptible to vertical oscillations different from said body member when the vehicle is in motion, the improvement comprising a combined damper and retention means overlying said battery for reducing the amplitude of said distal end's oscillations and for retaining said battery in said tray, said damper and retention means comprising a rigid bracket having a first end secured to said distal end of said tray, a second end rigidly secured to said body member at a second site above said first site and a retainer section intermediate said first and second ends, said retainer section being rigidly coupled to said second end such as to suppress vertical movement of said first end of said bracket relative to

said second end and contiguously overlying said battery for holding said battery securely in said tray, and means for secur-



ing said retainer section to said tray so as to compress said battery between said tray and said section.

5,086,861

ELECTRIC REAR WHEEL STEERING ACTUATOR

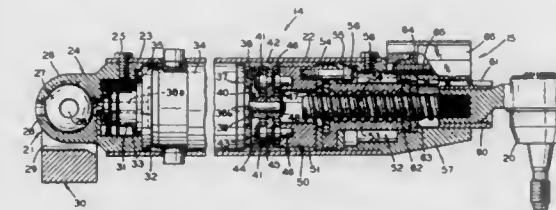
Donald W. Peterson, 11509 Farmhill, Fenton, Mich. 48430

Filed Apr. 6, 1990, Ser. No. 505,715

Int. Cl.⁵ B62D 5/04

U.S. Cl. 180—79.1

8 Claims



1. An electrically powered actuator for moving an object along a linear path comprising: a generally tubular housing; an electric motor enclosed in said housing and having a rotatable output shaft, said output shaft having first and second ends; a first planetary gear set enclosed in said housing and having an input attached to said first end of said output shaft and an output; a first ball screw assembly enclosed in said housing and having a rotatable nut attached to said first planetary gear set output and a screw driven along a linear path of movement by said nut and adapted to be attached to an object to be moved, said output shaft, said first planetary gear set and said first ball screw assembly sharing a common longitudinal axis with said housing; a second planetary gear set enclosed in said housing and having an input attached to said second end of said output shaft and an output; a second ball screw assembly enclosed in said housing and having a rotatable nut attached to said second planetary gear set output and a screw driven along a linear path of movement by said nut and adapted to be attached to an object to be moved, said output shaft, said second planetary gear set and said second ball screw assembly sharing a common longitudinal axis with said housing; and brake means attached to said output shaft whereby when said electric motor is actuated, said output shaft rotates said planetary gear sets and said nuts to move said screws along said path of movement and when said first ball screw assembly screw reaches a predetermined position along said path, said brake means is actuated to stop the rotation of said output shaft.

5,086,862

APPARATUS FOR STABILIZING POWER STEERING FOR TEMPERATURE EFFECTS

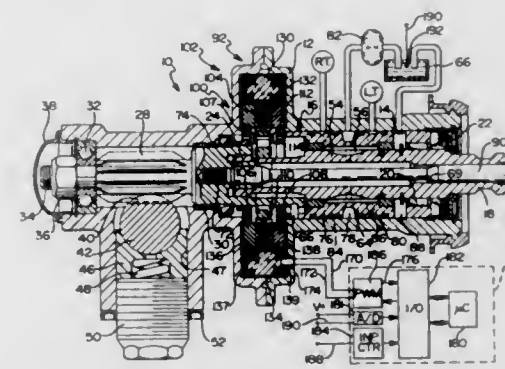
David W. Graber, Millington; Dennis C. Eckhardt, Saginaw, and Andrzej M. Pawlak, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1990, Ser. No. 580,976

Int. Cl.⁵ B02D 5/04

U.S. Cl. 180—132

6 Claims



1. In a vehicular power assist steering system having a pair of relatively rotatable hydraulic elements connected between a driver manipulated steering shaft and a steering gear, the hydraulic elements being adapted to generate hydraulic flow for producing power assist steering force in relation to their relative rotation, the level of power assist being subject to temperature effects in the system, apparatus for compensating for temperature effects comprising:

first and second rotary magnetic means connected respectively to the pair of rotatable hydraulic elements, the first and second magnetic means being coupled together magnetically for effecting relative rotational force on the said hydraulic elements, an excitation coil magnetically coupled to the first and second rotary magnetic means for controlling the amount of rotational force on the hydraulic elements and thus the amount of power assist as a function of the energization current, applied to the coil, and control means for sensing system parameters indicative of said temperature effects, and for said adjusting the energization current by a value which compensates said level of power assist for said temperature effects.

5,086,863

ALL-WHEEL STEERING SYSTEM FOR MOTOR VEHICLES

Werner Tischer, Heubach-Lautern, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP89/00653, § 371 Date Nov. 2, 1990, § 102(e) Date Nov. 2, 1990, PCT Pub. No. WO89/12568, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 10, 1989, Ser. No. 613,500

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1988, 3820354

Int. Cl.⁵ B62D 5/06

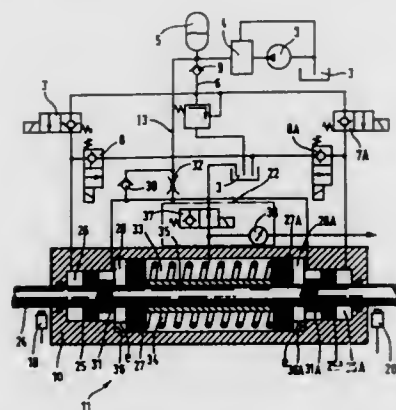
U.S. Cl. 180—140

7 Claims

1. An all-wheel steering system for motor vehicles including a steering wheel for activating a first steering system (1) for steering front wheels of the vehicle, a second steering system (11) for steering rear wheels of the vehicle, the second steering system including an adjusting motor (10) activated by a control device (22) as a function of the steering of the front wheels, the adjusting motor including working pistons (25, 25A) mounted on a piston rod (24) for providing steering movement to the vehicle rear wheels, the adjusting motor further including two steering pistons (27, 27A) positioned on the piston rod and defining a pressure chamber (33) therebetween having a vari-

able volume in accordance with the position of the steering pistons, the pressure chamber being connected with the control device, the adjusting motor further including stops (36, 36A) for bracing the steering pistons and a spring mechanism (34, 40) for biasing the steering pistons, the improvement wherein,

(a) the adjusting motor includes control chambers (28, 28A) defined by the steering pistons on opposite sides of the pressure chamber, the working pistons being arranged in said control chambers;



(b) the working pistons are supported by the steering pistons when the steering pistons abut against the stops; and
(c) the control device includes

- (1) a 2/2-way valve (37) having a through flow position for relieving the pressure chamber and a blocking position for retaining pressure in the pressure chamber; and
- (2) a pressure monitor (38) connecting with an electronic switching device for monitoring pressure increases in the pressure chamber.

5,086,864

HYDRAULIC AUXILIARY-POWER STEERING DEVICE
Dieter Elser, Essingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP89/00081, § 371 Date Jun. 20, 1990, § 102(e) Date Jun. 20, 1990, PCT Pub. No. WO89/07064, PCT Pub. Date Aug. 10, 1989

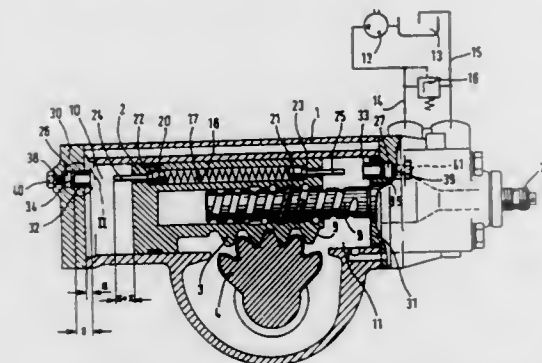
PCT Filed Feb. 1, 1989, Ser. No. 499,399

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803206

Int. Cl.³ B62D 5/12; F15B 9/10

U.S. Cl. 180—147

5 Claims



1. In a hydraulic auxiliary-power steering mechanism for motor vehicles including a housing (1) having walls and containing a threaded spindle upon which a drive piston (4) is movable, a steering valve for supplying pressurized oil to working chambers (10, 11) of the housing on opposite sides of the drive piston, steering limiting bypass valves (20, 21) ar-

ranged within an axial bore of the drive piston, the bypass valves each including a push rod (24, 25) which projects from opposite ends of the drive piston, the bypass valves being activated when the push rods engage the walls of the housing and being automatically adjusted to limit the travel of the drive piston during assembly of the mechanism as a result of rotation of the motor vehicle steering wheel from limit stop to limit stop, the improvement wherein

said housing walls contain openings aligned with the push rods of said bypass valves, and further comprising self-adjusting bushings arranged within said openings, an insertion position (a) of said bushings being set by the drive piston upon movement of the drive piston between its terminal positions defined by rotation of the steering wheel from limit stop to limit stop.

5,086,865

REGENERATIVE BRAKING SYSTEM FOR CAR

Koji Tanaka, and Takashi Shima, both of Tokyo, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

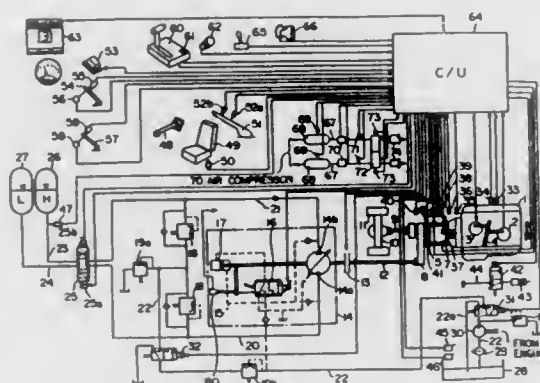
Filed Oct. 20, 1989, Ser. No. 424,727

Claims priority, application Japan, Oct. 26, 1988, 63-270268; Oct. 27, 1988, 63-271527

Int. Cl.³ B60K 9/00

U.S. Cl. 180—165

12 Claims



1. A regenerative braking system for a car having a transmission, an exhaust brake, an engine and a power take-off unit, comprising:

- a hydraulic oil circuit formed of:
 - a high pressure accumulator;
 - a pump/motor having a pumping capacity and including means for varying the pumping capacity of said pump/motor;
 - a circuit valve coupled to said pump/motor and said high pressure accumulator; and
 - a low pressure accumulator coupled to said circuit valve;
- an electromagnetic clutch, coupled to said pump/motor for connecting or disconnecting said pump/motor to or from the power take-off unit;
- manual operating means for actuating the exhaust brake;
- means for sensing the gear position of the transmission;
- means for sensing car speed;
- means for sensing the inner pressure of said hydraulic oil circuit; and
- control means for determining an exhaust brake equivalent torque corresponding to a predetermined relationship between the sensed car speed and the sensed gear position when the sensed car speed exceeds a predetermined speed and said manual operating means is actuated, and for determining the pumping capacity of said pump/motor in response to the inner pressure of said hydraulic oil circuit and the determined exhaust brake equivalent torque, said control means then decoupling the engine of the car from the power take-off unit, closing said hydraulic oil circuit to operate said pump/motor, providing a capacity control

signal to said means for varying the pumping capacity so that the pumping capacity is caused to be the determined pumping capacity, and actuating said electromagnetic clutch to connect said pump/motor to the power take-off unit, whereby the deceleration energy of the car is accumulated into said high pressure accumulator.

5,086,866

MOTORCYCLE HAVING BODY HEIGHT ADJUSTOR

Tetsuya Banjo; Eiji Iida; Katsubiko Tokunaga, and Satoshi Kiyota, all of Shizuoka, Japan, assignors to Suzuki Kabushiki Kaisha, Kamimura, Japan

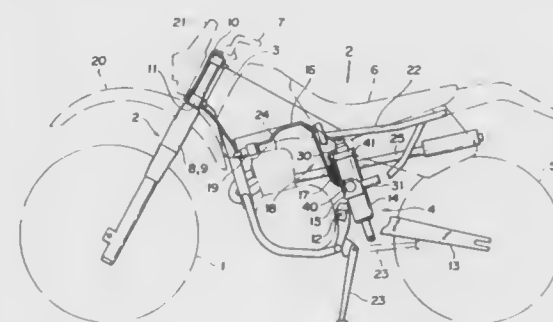
Filed Oct. 25, 1990, Ser. No. 603,120

Claims priority, application Japan, Oct. 26, 1989, 1-277154; Oct. 27, 1989, 1-125101[U]; Oct. 30, 1989, 1-279960; Nov. 1, 1989, 1-127128[U]; Nov. 9, 1989, 1-130102[U]; Jun. 12, 1990, 2-61277[U]

Int. Cl.³ B60G 17/00; B62J 39/00; B62K 11/00

U.S. Cl. 180—219

20 Claims



1. A motorcycle having a body being adjustable in height, comprising:

- a front fork supported axially and rotatably on a body frame, said front fork supporting a front wheel in a shock absorbing manner by a pair of front suspensions;
- a rear cushion unit supported on said body frame, said rear cushion unit supporting a rear wheel in a shock absorbing manner;
- an engine mounted on said body frame to drive and rotate said rear wheel; and
- a body height adjustor capable of adjusting the body height of the motorcycle by changing the lengths of said front suspensions and said rear cushion unit, said body height adjustor including:
 - a first hydraulic jack provided on said rear cushion unit to enable body height adjustment;
 - second hydraulic jacks provided on said front suspensions to enable body height adjustment; and
 - a body height adjusting unit capable of transmitting a hydraulic pressure of a pressure fluid in said rear cushion unit to said first and second hydraulic jacks through hydraulic hoses, said body height adjusting unit having an adjusting operation member for simultaneously transmitting the hydraulic pressure of the pressure fluid to said first and second hydraulic jacks.

5,086,867

POWER TRANSMISSION APPARATUS

Isao Hirota; Masao Teraoka; Sakuo Kurihara, and Mitsuru Hasegawa, all of Tochigi, Japan, assignors to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan

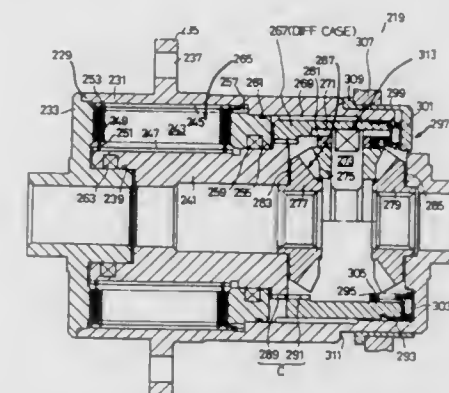
Filed Jul. 6, 1989, Ser. No. 376,393

Claims priority, application Japan, Jul. 8, 1988, 63-168856; Jul. 12, 1988, 63-171910; Jul. 12, 1988, 63-171912; Jul. 28, 1988, 63-186991; Sep. 27, 1988, 63-125134[U]; Oct. 31, 1988, 63-141182[U]; Dec. 26, 1988, 63-326074; Jan. 31, 1989, 1-19535; Jan. 31, 1989, 1-19540; Apr. 28, 1989, 1-49703[U]

Int. Cl.³ B60K 17/43, 20/04; F16D 35/02

U.S. Cl. 180—248

1 Claim



1. A power transmission apparatus comprising:

- (a) a housing rotatably supported and adapted to be driven by an external force;
- (b) an inner hub rotatably supported within said housing;
- (c) a viscous coupling device disposed between an inner circumference of said housing and an outer circumference of said inner hub on one side of and within said housing, for viscously restricting relative rotational motion between said housing and said inner hub;
- (d) a differential case disposed on the other side of and within said housing, said differential case being axially shiftable into and out of engagement with said inner hub; and
- (e) a differential gear assembly disposed within said differential case and connected to a first shaft and a second shaft, the engagement of said differential case with said inner hub resulting in the external force applied to said housing being transmitted via said viscous coupling device, said inner hub and said differential case to said differential gear assembly for differential distribution to the first and second shafts, and the disengagement of said differential case from said inner hub allowing the first and second shafts to rotate free of the influence of said external drive force.

5,086,868

AUTOMOTIVE PROTECTION SYSTEM WITH A TELESOPING PROTECTIVE SLEEVE BETWEEN BRAKE PEDAL AND BRAKE ACTUATOR

William G. Fontaine, 2676 SW. 15th St., Deerfield Beach, Fla. 33442, and Vernon D. Beard, Lauderhill, Fla., assignors to William G. Fontaine, Deerfield Beach, Fla.

Filed Aug. 23, 1988, Ser. No. 235,228

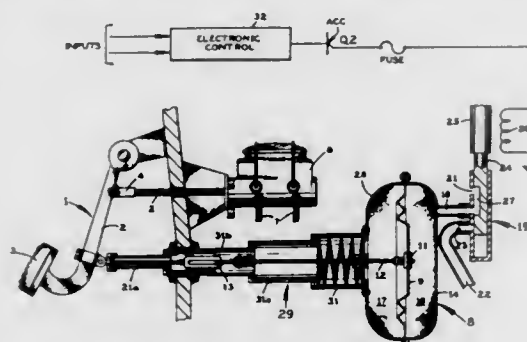
Int. Cl.³ B60R 25/08

U.S. Cl. 180—287

12 Claims

1. Automotive protective system comprising a brake actuator being responsive to at least one brake-activating signal and at least one brake-deactivating signal; a brake having a brake

pedal; coupling means for coupling the brake actuator to the brake pedal; and intrusion-protection sleeve means enveloping



said coupling means for preventing unauthorized disabling of the coupling means.

5,086,870

ROTATABLE OPERATOR CONTROL STATION

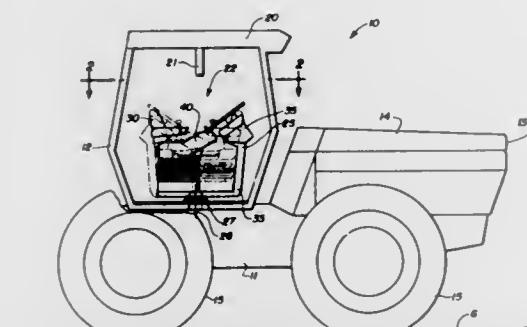
Brian L. Newbery, Kel W. Loewen, and Grant H. Adolph, all of Winnipeg, Canada, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Aug. 14, 1990, Ser. No. 567,439

Int. Cl.⁵ B60K 26/00

U.S. Cl. 180—329

1 Claim



1. In a vehicle having a frame supported above the ground by ground engaging wheels to mobile support said vehicle over the ground; and operator controls supported by said frame to control operative functions of said vehicle, said operator controls including a pivotable console selectively rotatable about a pivot mechanism defining a generally vertically pivot axis about which said console is rotatable for selectively orienting an operator positioned on said console in one of at least two opposing directions, said console including a seat, a steering mechanism for controlling the directional movement of said vehicle over the ground, and a housing supporting said steering mechanism for rotative movement with said seat about said pivot axis, said operator controls further including a control panel having a plurality of control devices mounted thereon for controlling corresponding operational functions of said vehicle, the improvement comprising:

mounting said control panel on said console for pivotal movement thereof with said seat about said pivot axis; said seat including fore-and-aft adjustment means for selectively positioning said seat relative to said steering mechanism in a direction toward and away from said steering mechanism; said seat further having a pan member supporting a seat cushion for receiving said operator and being moveable with said seat, said control panel being affixed to said pan member for movement with said seat, thereby maintaining the positional relationship between the control panel and the operator sitting on said seat cushion during movement of said seat toward and away from said steering mechanism, said seat further including height adjustment means for

effecting a vertical adjustment movement of said seat cushion relative to said steering mechanism, said height adjustment means being positioned above said pivot mechanism to effect vertical movement of said pan member without causing vertical movement of said steering mechanism such that the positional relationship of said control panel relative to an operator sitting on said seat cushion is maintained during vertical adjustment movement of said seat relative to said steering mechanism.

5,086,870

JOYSTICK-OPERATED DRIVING SYSTEM

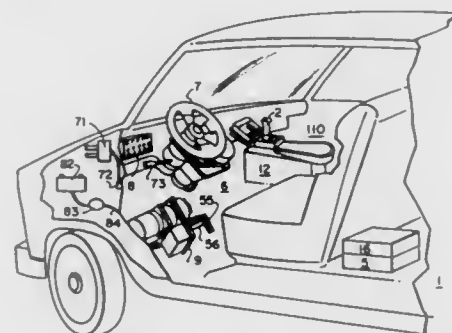
Scott Bolduc, Dunkirk, Md., assignor to Division Driving Systems, Inc., Capitol Heights, Md.

Filed Oct. 31, 1990, Ser. No. 606,560

Int. Cl.⁵ B60K 26/00

U.S. Cl. 180—333

23 Claims



1. A control system for a vehicle of the type having: (i) a rotary steering shaft; (ii) an accelerator pedal; and (iii) a brake pedal, wherein said control system comprises:

- a remote manipulator, wherein said manipulator has two axes of movement, wherein one axis of movement directs the rotation of said steering shaft and a second axis of movement directs the displacement of said accelerator pedal and said brake pedal;
- first electronic means connected to said remote manipulator, wherein said first electronic means translates mechanical movement of said remote manipulator into a first electronic steering signal and a first electronic acceleration signal;
- command means connected to said first electronic means, wherein said command means receives and processes said first electronic steering signal and said first electronic acceleration signal and wherein said command means transmits a second electronic steering signal related to the rotation of said steering shaft and a second electronic acceleration signal related to the displacement of said accelerator pedal and said brake pedal;
- a steering drive controller and an acceleration drive controller, wherein both of said controllers are connected to said command means, wherein said steering drive controller receives said second electronic steering signal and said acceleration drive controller receives said second electronic acceleration signal, wherein said steering drive controller transmits a steering movement signal and said acceleration drive controller transmits an acceleration signal;
- a steering motor connected to said steering drive controller, wherein said steering motor receives said steering movement signal and translates said steering movement signal into mechanical motion, wherein said steering motor is connected to said rotary steering shaft and wherein said steering motor rotates said steering shaft as directed by said steering controller;
- an acceleration motor connected to said acceleration drive controller, wherein said acceleration motor receives said

acceleration signal and translates said acceleration signal into mechanical motion; and
g. a disc assembly connected to said acceleration motor, wherein said disc assembly operates to displace said accelerator pedal and said brake pedal.

5,086,871

OMNIDIRECTIONAL ELECTRO-ACCOUSTICAL CHAMBER

Alain Barbe, 17, rue Faidherbe, 33110 Le Bouscat, France

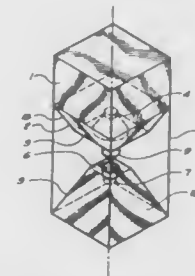
Filed Sep. 29, 1989, Ser. No. 414,924

Claims priority, application France, Sep. 29, 1988, 88 12930

Int. Cl.⁵ H05K 5/00

U.S. Cl. 181—145

4 Claims



1. An omnidirectional electro-acoustical chamber comprising a first tone transducer and a second tone transducer, said first tone transducer being disposed coaxially with respect to said second tone transducer, said first tone transducer having a membrane positioned so as to face a membrane of said second tone transducer said first tone transducer being disposed in a first compartment, said second tone transducer being disposed in a second compartment, said first compartment having a general shape of a truncated pyramid having a first end surface and a second end surface, said first end surface of said first compartment having a smaller area than said second end surface of said first compartment, said second compartment having a general shape of a truncated pyramid having a first end surface and a second end surface, said first end surface of said second compartment having a smaller area than said second end surface of said second compartment, said first tone transducer positioned in said first end surface of said first compartment, said second tone transducer positioned in said first end surface of said second compartment, said second end surface of said first compartment positioned opposite said first end surface from said second compartment, said second end surface of said second compartment positioned opposite said first end surface from said first compartment, and a generally pear-shaped diffuser disposed coaxially between said first tone transducer and said second tone transducer, said diffuser having a convex surface of revolution confronting said first tone transducer and a pointed surface of revolution confronting said second tone transducer.

5,086,872

FOLDABLE LADDER

Fan-Nan Lin, Taipei, Taiwan, assignor to Alfa Metal Corp., Taipei, Taiwan

Filed May 24, 1991, Ser. No. 705,434

Int. Cl.⁵ E06C 1/397, 5/34

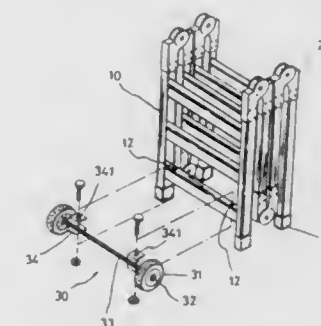
U.S. Cl. 182—18

2 Claims

1. A foldable ladder provided with a pair of wheels removably attached to the bottom thereof so that said ladder can be easily converted into different types of push cart, which is mainly comprised of:

a foldable ladder having a plurality of sections each made up of a pair of vertical rods and three horizontal rungs fixedly disposed between said pair of vertical rods, each section of said ladder being joined by a pair of adjustable knuckles; a pair of wheels provided with bearings rotatably mounted to a shaft on which a pair of C-shaped fixture elements are

secured so that a pair of bolts and nuts which are disposed through said C-shaped fixture elements and a pair of spaced holes disposed on the lowest rung of said ladder



with said nuts screwed tightly against the bottom of said bolts so that said wheels can be removably attached to the bottom of said ladder.

5,086,873

TREE STEP

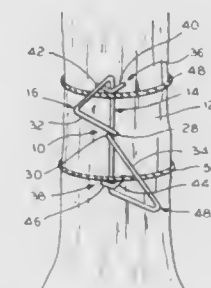
Peter R. George, 130 Ch Castle Bar, Kingsey Falls, Quebec, Canada J0A 1B0

Filed Jan. 28, 1991, Ser. No. 646,403

Int. Cl.⁵ A63B 27/00

U.S. Cl. 182—92

9 Claims



1. A tree step comprising: an elongated steel rod bent into a pair of right triangular shaped portions meeting at a vertex of each right triangular shaped portion, said right triangular shaped portions lying in perpendicular planes with one leg of each right triangular shaped portion that forms the right angle of each respective right triangular shaped portion lying on a line of intersection between the planes of the two triangular shaped portions, a second leg of each right triangular shaped portion that forms the right angle of each respective right triangular shaped portion lying in parallel spaced apart planes perpendicular to the planes of the pair of right triangular shaped portions; and rope means for securing said one leg of said right triangular portions to the tree.

5,086,874

TREE CLIMBING APPARATUS

Bill Treants, 5329 South Skyline Dr., New Berlin, Wis. 53151

Filed Sep. 10, 1990, Ser. No. 579,649

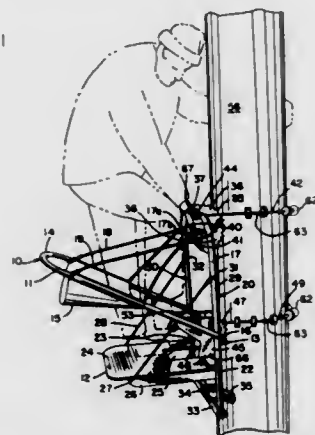
Int. Cl.⁵ A01M 31/02; A63B 27/00

U.S. Cl. 182—136

15 Claims

1. A tree or the like climbing apparatus comprising: a platform member adapted to be raised or lowered over a tree trunk or the like, said platform including a seat portion and a single footed foot support portion;

an independent foot climber member locatable in the same plane or above said platform member; and



tree trunk engaging means operatively associated with said platform member and said foot climber to releasably engage said tree trunk.

5,086,875

FOLDING SCAFFOLD

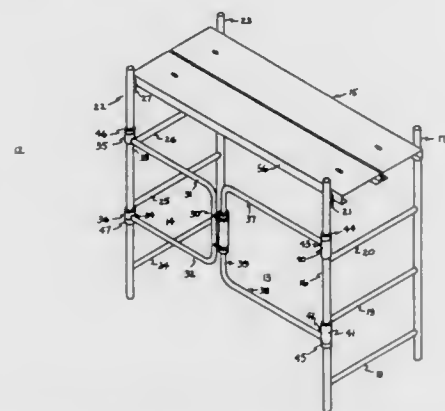
Arthur L. Shreve, III, P. O. Box 25, Butler, Md. 21023

Filed Oct. 31, 1990, Ser. No. 606,434

Int. Cl.⁵ E04G 1/34

U.S. Cl. 182—152

3 Claims



1. An improved folding scaffold device of the type which comprises:

- a first ladder frame consisting essentially of a front vertical post and a rear vertical post and a plurality of horizontal rungs interconnecting said posts;
- a second ladder frame consisting essentially of a front vertical post and a rear vertical post and a plurality of horizontal rungs interconnecting said posts;
- a plurality of flat board shaped members positionable atop one of the rungs of the first ladder frame and atop one of the rungs of the second ladder frame and providing a supporting surface thereon;
- the flat board shaped members including a transverse notch at each end to fittingly engage opposing horizontal rungs of the first ladder frame and the second ladder frame to rigidly maintain the ladder frames in a parallel relation to each other;
- a first support frame including a first pair of aligned sleeve shaped proximal ends pivotally connected to the rear vertical post of the first ladder frame, said first support frame also including a first vertically extending distal end

with the first support frame converging from the first proximal ends to the distal end;

a second support frame including a second pair of aligned sleeve shaped proximal ends pivotally connected to the rear vertical post of the second ladder frame, the second support frame also including a second vertically extending distal end positioned adjacent to the distal end of the first support frame, with the second support frame converging from the second pair of proximal ends to the distal end of the second support frame;

hinge means to pivotally connect together the distal end of the first support frame and the distal end of the second support frame for pivotal movement of the first support frame and the second support frame from a fully-extended position in which the support frames are in substantial end to end alignment and perpendicular to the first and second ladder frames, to a folded position, the pivotal movement of the first and second support frames producing relative lateral movement of the first and second ladder frames from a parallel spaced apart relation, one toward the other, to contiguous positions wherein the improvements comprise:

- a. a second support frame smaller than the first support frame such that the smaller support frame fits within the plane of the first support frame when the scaffold is in the folded position and wherein the hinge means to pivotally connect the proximal ends of the support frames includes a pair of spacer members fixedly attached to a sleeve rotatably connected to the distal end of the second support frame a spaced distance therefrom and fixedly attached to the distal end of the first support frame to form a handle; to position the sleeve and the distal end of the second support frame equidistant from the first and second ladder frames when fully extended; and to position the front vertical posts of the ladder frames in close opposite relation to each other when the first and second ladder frames and the first and second support frames are in the folded position;
- b. a fastening means for removably attaching the board shaped members to the rungs of the first and second ladder frames when the scaffold is in the folded position;
- c. a first retaining means fixedly connected to the distal end of the first support frame limiting the vertical movement of the sleeve on the distal end of the first support frame;
- d. a second retaining means connected to the front and rear vertical posts of the first and second ladder frames limiting the vertical movement of the sleeve shaped proximal ends of the first and second support frames;
- e. a third retaining means removably attached to the front vertical posts of the first and second ladder frames to secure the first and second ladder frames in the folded position.

5,086,876

FOOT ACTUATED LADDER BRACE

Gary E. Severson, 1903 - First Avenue SW., Rochester, Minn. 55902

Filed Apr. 26, 1991, Ser. No. 691,467

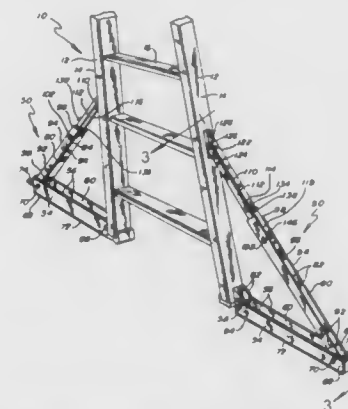
Int. Cl.⁵ E06C 5/36, 7/42

U.S. Cl. 182—172

15 Claims

- 1. A foot actuated ladder brace for stabilizing ladders with side rails by increasing the ladder base width, comprising:
 - (a) a channel-shaped foot link with inner and outer ends, the inner end being pivotally connected to the bottom of one of the side rails as to fold up along the side rail and to swing downwardly to extend along and to increase the ladder base.
 - (b) a smaller channel-shaped intermediate link adapted to nest within the foot link having a foot end pivotally connected to the outer end of the foot link and an inward end;
 - (c) a smallest channel-shaped ladder link adapted to nest

within the intermediate link having a ladder end pivotally connected to the one side rail above the bottom and an outer end pivotally connected to the intermediate link adjacent to the inward end of the intermediate link; and



(d) a foot actuated extending, locking and folding means for extending the foot link from its folded position to its extended position along the ladder base, for rigidly interlocking the links together, for releasing the interlocked links and for nesting and folding the links upwardly along the side rail.

5,086,877

LUBRICANT SUPPLY LIMITING DEVICE

Dieter Synatschke, Mannheim; Paul Sattelberger, Reilingen, and Werner Saam, Oberhausen-Rheinhausen, all of Fed. Rep. of Germany, assignors to 501 Joseph vögele AG, Mannheim, Fed. Rep. of Germany

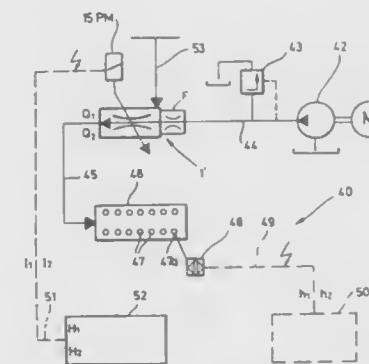
Filed Feb. 26, 1990, Ser. No. 484,842

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906683

Int. Cl.⁵ F16N 27/00

U.S. Cl. 184—7.4

16 Claims



1. A lubricant supply limiting device for a lubricant distribution system comprising a pressurized lubricant supply path, at least one fixed throttle and a servo pressure controller having variable throttle means, both said fixed throttle and said variable throttle means being disposed in the lubricant path, said controller being downstream of and responsive to variations in the pressure drop over the fixed throttle, said variable throttle means including an adjustment member for controlling the flow of lubricant through the controller and a proportional solenoid for adjusting the position of the adjustment member, wherein said proportional solenoid acts directly on said adjustment member of said variable throttle means through a push rod, and wherein said proportional solenoid has a stroke (S₁) and said adjustment member has a stroke (S), and wherein said stroke (S₁) is greater than said stroke (S) of said adjustment

member between a position where the variable throttle is in a barely closed position and a fully opened position.

5,086,878

TOOL AND WORKPLACE LUBRICATION SYSTEM HAVING A MODIFIED AIR LINE LUBRICATOR TO CREATE AND TO START THE DELIVERY OF A UNIFORMLY FLOWING PRESSURIZED AIR FLOW WITH OIL, TO DELIVER THE OIL CONTINUOUSLY AND UNIFORMLY WHERE A METAL PART IS BEING FORMED

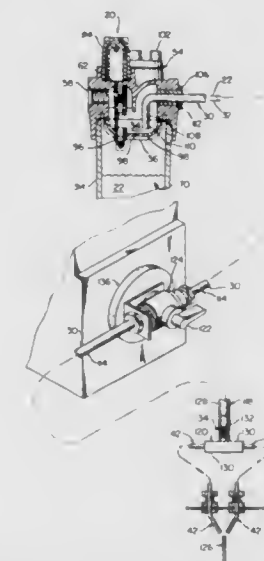
Steven M. Swift, 17822 Driftwood Dr., Sumner, Wash. 98390

Filed May 23, 1990, Ser. No. 527,758

Int. Cl.⁵ F16N 7/30

U.S. Cl. 184—55.2

20 Claims



1. A lubrication system to lubricate tools and workpieces to eliminate most of the friction during the forming of metal parts, so little heat is generated and coolants are not required, wherein an air line lubricator, originally designed for internally lubricating compressed airflow driven pneumatic tools, is modified to create and to start the delivery of a pressurized airflow with oil, so the oil becomes the lubricant at a location where metal parts are being formed, comprising:

- a) an air line lubricator, before modification, including the entire assembly thereof comprising: a housing; a compressed overall airflow entry thereof; a venturi portion thereof to receive, at low airflow rates, the majority airflow of this overall airflow along one path of the overall airflow; a throat section thereof where a pressure drop is created upon passage of this majority airflow; a pre-departure mixing basin thereof to receive the majority airflow; a compressed air exit thereof to receive and to pass the majority airflow out of this housing; an air receiving portion thereof to receive, at low airflow rates, the minority airflow of this overall airflow along another path of the overall airflow; a restrictor disc thereof which slightly deflects to allow this minority airflow to enter the pre-departure mixing basin and to continue on through the compressed air exit; an oil reservoir bowl thereof having an oil pickup tube and a check ball; an oil metering block thereof having a rotatable metering screw; inner and outer sight domes thereof having a clearance between them to view flowing oil, having an entry to receive oil from the metering block and an oil discharge exit by the throat section forming oil drops which drip into the throat section; an oil receiving entry thereof having a removable cap, for filling the oil reservoir bowl; a drain for the oil reservoir bowl; and a check ball subassembly thereof to seal off the oil reservoir bowl from the pressure of the

compressed airflow through the housing, when the oil receiving entry is opened;

whereby this air line lubricator, before modification, is ready to receive oil in the oil reservoir bowl and when oil is so filled and the cap is replaced, and compressed air, at a low airflow rate, is directed into the overall airflow entry, the compressed air follows the two airflow paths, with the majority airflow meeting and carrying the oil drops at the throat section and then meeting the minority airflow in the pre-departure mixing basin, and thereafter the overall airflow with the oil leaves the air line lubricator; and

b) an added modification structure installed in the housing of this air line lubricator to direct the compressed overall airflow and the oil carried within this overall airflow from the pre-departure mixing basin through the compressed air exit in a controlled delivery of the compressed airflow and oil in a continuous operation, which insures a continuity of this controlled delivery even through a tilting of the housing might occur, otherwise causing a tipping of the pre-departure basin, which otherwise would cause an over abundance of oil passing through the compressed air exit of the housing, or alternately no oil passing through this compressed air exit of the housing, and which insures a continuity of this controlled delivery even through an unwanted short delivery time of more overall compressed airflow might occur, comprising:

an oil and overall airflow pick up passageway structure arranged within the housing of the air line lubricator and having a continuous uniform diameter to direct the oil and overall airflow from near the bottom of the pre-departure mixing basin, up to the compressed air exit of the housing, and then through this compressed air exit of this then modified air line lubricator.

5,086,879

SCALE CALIBRATION/ZEROING IN DATA GATHERING SYSTEM

David L. Latimer; Howard H. Nojiri, both of Eugene, Oreg.; James F. Million, Powell; Steven R. Grimm, Dublin, and David S. Platt, Worthington, all of Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif. and Toledo Scale Corporation, Worthington, Ohio

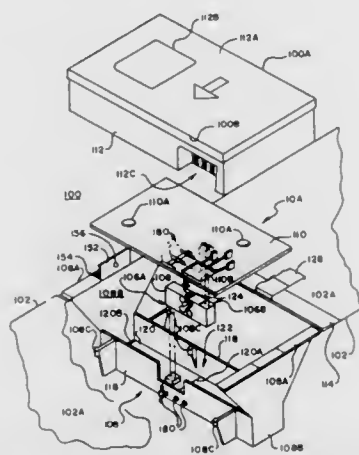
Continuation of Ser. No. 328,188, Mar. 24, 1989, abandoned.

This application Sep. 4, 1990, Ser. No. 579,243

Int. Cl.⁵ A47F 9/02; G06K 7/10

U.S. Cl. 186—61

19 Claims



1. A data gathering system adapted to be installed within a checkout counter for determining information about products presented for purchase at the counter including the weight of products placed upon a weighing portion of an upper surface of the system which is substantially aligned with an upper surface of said counter, said data gathering system comprising: support means for supporting said data gathering system within said checkout counter, said support means defining

a portion of the upper surface of said data gathering system;

scale means secured to said support means and coupled to said weighing portion of the upper surface of said system for determining weights of products placed thereon; and

scale adjusting means for calibrating and zeroing said scale means, said scale adjusting means comprising a scale zeroing switch connected to said scale means and being incorporated into said support means to be accessible to an operator of said data gathering system through the upper surface thereof and a scale calibration switch connected to said scale means and accessible to scale service personnel but inaccessible to an operator of said data gathering system whereby said scale means can be periodically zeroed and calibrated as necessary to maintain the accuracy of said scale means without removal of the data gathering system from said counter.

5,086,880

ELEVATOR TRAVELING CABLE GRIP

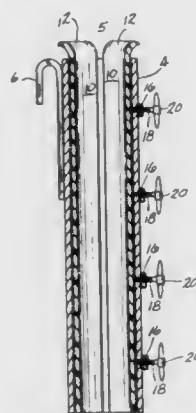
Leonard Pearce, Wanneroo, Australia, assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 10, 1990, Ser. No. 595,075

Int. Cl.⁵ B66B 9/00

U.S. Cl. 187—1 R

6 Claims



1. An elevator traveling cable grip comprising:

- a. a sleeve;
- b. a liner disposed in said sleeve and extending for substantially the entire length of said sleeve, said liner being formed from a pliant material which will not damage the traveling cable and segmented axially; said liner being operable to encircle the traveling cable; and
- c. variable clamping means mounted on said sleeve and engageable with said liner whereby the liner can be tightened on and loosened from the traveling cable.

5,086,881

ELEVATOR DRIVEN BY A FLAT LINEAR MOTOR

Ernest P. Gagnon, Manchester; Jerome F. Jaminet, Glastonbury, and Eric G. Olsen, Woodbury, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 15, 1991, Ser. No. 670,132

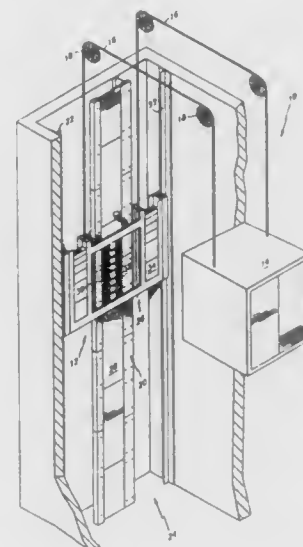
Int. Cl.⁵ B66B 11/04

U.S. Cl. 187—17

10 Claims

6. A motor for providing motive force to an elevator disposed within a hoistway, said motor comprising:
 - a secondary assembly having:
 - a support attaching to said hoistway and extending therefrom, and
 - a flat secondary element supported by an edge thereof from said support, said secondary element having a first side and a second side, and
 - a primary assembly having:

- a first primary element disposed adjacent said first side, and being separated from said first side by an air gap, and
- a second primary element disposed adjacent said second side, and being separated from said first side by an air gap



- a frame having first leg for supporting said first primary element adjacent said first side, and a second leg for supporting said second primary element adjacent said second side, and
- guide means attaching to said frame beyond opposite edges of said flat secondary element for guiding said primary assembly upwardly and downwardly in said hoistway.

5,086,882

ELEVATOR APPARATUS PROVIDED WITH GUIDING DEVICE USED FOR PREVENTING PASSENGER CAGE VIBRATION

Jun Sugahara; Hideaki Takahashi, and Toshihiko Nara, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

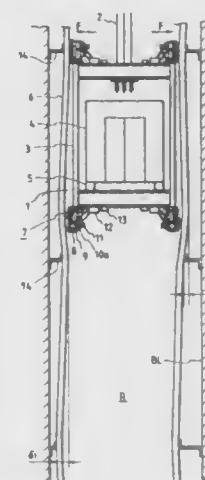
Filed Aug. 29, 1990, Ser. No. 574,093

Claims priority, application Japan, Aug. 30, 1989, 1-221487

Int. Cl.⁵ B66B 7/04

U.S. Cl. 187—95

16 Claims



1. An elevator apparatus having guide rails erected in an elevator shaft of a building and a passenger cage provided with

guiding devices in contact with said guide rails and moving upwardly and downwardly along said guide rails, wherein at least two guiding devices are provided on and under said passenger cage, each of said guiding devices being provided with an actuator for applying a pressure between said guide rails and the guiding device, an actuator controller for controlling the actuator, a sensor for detecting a pressure caused by the actuator and an elastic member, provided in parallel with the actuator for absorbing a pressure applied from said guide rail to said guiding device, and wherein the pressure applied to each of said guiding devices is kept constant by said actuator in correspondence with an output of said sensor.

5,086,883

GROUP CONTROL FOR ELEVATORS WITH DOUBLE CARS WITH IMMEDIATE ALLOCATION OF TARGET CALLS

Joris Schroder, deceased, late of Luzern, Switzerland by Margrit Meyer, executor, assignor to Inventio AG, Switzerland

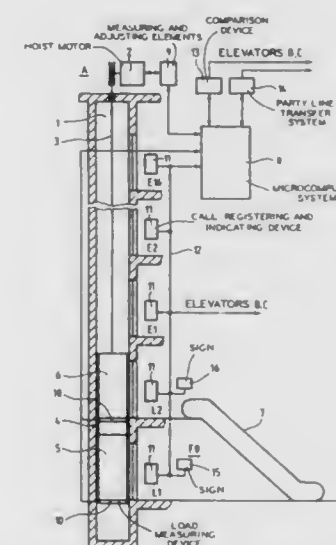
Filed May 31, 1991, Ser. No. 708,445

Claims priority, application Switzerland, Jun. 1, 1990, 01863/90

Int. Cl.⁵ B66B 1/18

U.S. Cl. 187—127

10 Claims



1. A group control for elevators with the immediate allocation of target calls to double cars having two cars which are arranged in a common car frame and can be boarded selectively at a main stopping floor, call registering devices which are located at the floors and have a keyboard for the entry of calls for desired target floors, call memories which are associated with the elevators and connected with the call registering devices wherein a call identifying the input floor and a call identifying the target floor are stored on the entry of a call, load measuring devices which are provided in the lower car and in the upper car of the double car and are connected with load memories, selectors for designating the floor of a possible stop, and a call allocation device for allocating the entered calls to the elevators, wherein the call allocation device for each elevator has a computer which computes operating costs corresponding to the waiting times of passengers from data specific to the elevator, an operating costs register connected to the computer wherein the operating costs registers of all of the elevators are connected to a comparison device which compares the operating costs of the elevators one with the other such that the entered call is allocated to that elevator which displays the lowest operating costs, comprising:

a call memory for each car of a double car in an elevator group serving a plurality of floors, each said call memory having first memory locations for storing a call represent-

ing a call input floor and second memory locations for storing a call representing a call target floor in response to an entered call;

a switching circuit having an input connected to said second memory locations such that the double car to which said entered call is allocated is scheduled in dependence on said allocated call for stopping at floor pairs numbered odd-even or even-odd;

a switching device connected for actuation to an output of said switching circuit and connected between an operating costs register and a comparison device so that either the double cars stopping at floor pairs numbered even-odd or the double cars stopping at floor pairs numbered odd-even can not participate in a comparison and allocation process for the allocation of a subsequently entered call; and

call registering and indicating devices located at floors served by the double cars of the elevator group for entering a target call upon actuation and for indicating the car to which said target call is allocated and the position of the car on an indicating field of the actuated one of said call registering and indicating devices.

5,086,884

DISC BRAKE CALIPER ASSEMBLY

Ralph A. Gordon, Centerville; Victor A. Ferguson, Kettering, both of Ohio; Bernard Fouilleux, Champigny Sur Marne, France; Eric Schonenberger, Bois Colombes, France, and Gabriel Gregoire, Luzarches, France, assignors to General Motors Corporation, Detroit, Mich. and General Motors France, Gennevilliers, France

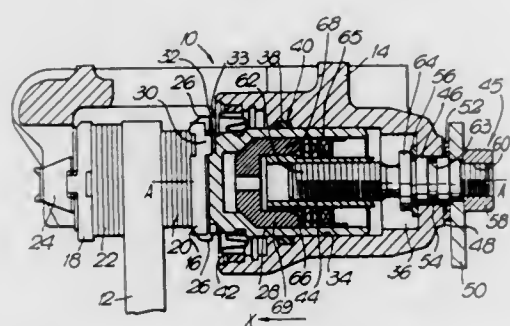
Filed Mar. 7, 1990, Ser. No. 489,052

Claims priority, application United Kingdom, Apr. 25, 1989, 8909442

Int. Cl.⁵ F16D 65/56

U.S. Cl. 188—71.9

15 Claims



1. A disc brake caliper assembly for a rotary disc brake of a vehicle comprising first and second brake shoes having integral brake pads of friction lining material for frictionally engaging opposite sides of the rotary disc brake; a caliper housing having a cavity therein defining an expansion chamber for hydraulic fluid; an inlet port opening into the expansion chamber for passage of the hydraulic fluid; a piston sealingly slidably mounted in the cavity in the caliper housing and projecting from one end of the cavity, the first brake shoe being secured to the piston at one end thereof outside the cavity with means to key the first brake shoe and the piston together to prevent the piston rotating relative to the caliper housing, the piston having an internal bore having a longitudinal axis and having an open end opening into the expansion chamber; a thrust washer secured in the internal bore of the piston; an actuator nut positioned in the internal bore with a first smaller diameter and a second larger diameter, and with a functional gap between a circumferential edge portion of the actuator nut between the first smaller and the second larger diameters and the thrust washer, the actuator nut having a longitudinal axis; and an actuator screw mounted in the cavity in the caliper housing and projecting from the other end of the cavity, the actuator screw having a longitudinal axis, the longitudinal axes

of the actuator screw, the actuator nut, and the internal bore being aligned, the actuator screw extending into the internal bore and threadingly engaging the actuator nut; and actuator means positioned in the internal bore of the piston and engaging the actuator nut along the larger diameter portion, the actuator means having a friction clutch surface normally resiliently biased by resilient means into engagement with a corresponding friction clutch surface in the internal bore of the piston and directed towards the open end thereof, being rotatable relative to the piston on disengagement of the friction clutch surfaces, and being rotatably fixed relative to the actuator nut but axially movable relative thereto; hydraulic actuation of the disc brake caliper assembly being actuated by pressurising the hydraulic fluid in the expansion chamber to move the piston relative to the caliper housing in an axial direction such that the brake pads frictionally engage the rotary disc brake and such that the friction clutch surfaces become disengaged, the distance moved by the piston being greater than the functional gap between the actuator nut and the thrust washer if wear of the brake pads has occurred such that the thrust washer engages the actuator nut circumferential edge portion to rotate the actuator nut and the actuator means about the actuator screw relative to the caliper housing and to move the actuator nut relative to the caliper housing in the same axial direction as the piston, reverse rotation of the actuator nut and the actuator means being prevented by reengagement of the friction clutch surfaces on release of the hydraulic fluid pressure thereby restricting reverse axial movement of the piston to a wear adjusted position relative to the caliper housing.

5,086,885

VEHICLE BRAKES

Glynne T. Bowsher, Birmingham, England, assignor to Sab Wabco (Holdings) B.V., Broomborough, England

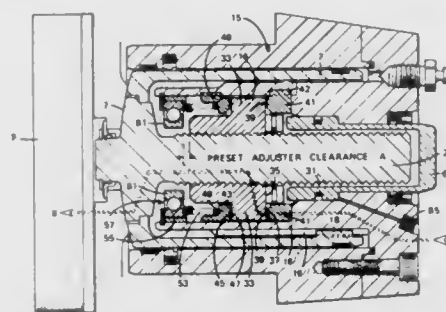
Filed Feb. 4, 1991, Ser. No. 650,555

Claims priority, application United Kingdom, Feb. 7, 1990, 9002686

Int. Cl.⁵ F16D 55/02, 56/38

U.S. Cl. 188—71.9

5 Claims



1. A disc brake comprising a clamp member which is slidably connected to a torque taking member, a hydraulic actuator mechanism and an adjuster mechanism being located within the clamp member and a spring being arranged to act on the clamp member and adjuster mechanism to provide a parking brake facility, hydraulic pressure being used to release the parking brake facility so that normal brake application and release can occur via the hydraulic actuator mechanism, the adjuster mechanism comprising an adjuster nut which is threadedly engaged on an axially movable actuator shaft which acts on a friction pad, the adjuster nut having an annular series of detent teeth formed on two axially and oppositely directed faces, the teeth on one face being engageable with complementary detent teeth provided on a part of the adjuster mechanism on which said spring acts, and the teeth on the other oppositely directed face of the adjuster nut being engageable with complementary detent teeth provided on an axially movable though non-rotatable, detent collar which is spring biased against the adjuster nut, the detent teeth being arranged such

that when the teeth on said one face of the adjuster nut are fully meshed with the teeth on said part of the adjuster mechanism, the teeth on said detent collar are engaged with but offset from the teeth on the other face of the adjuster nut, the adjuster nut engaging an abutment during normal hydraulic operation of the brake only after the adjuster nut has moved a predetermined axial distance, the adjuster nut being caused to rotate on the actuator shaft only when the adjuster nut has to travel a distance greater than said predetermined distance to apply the brake, the detent teeth on the said faces of the adjuster nut then moving over the mated teeth on the detent collar and said part of the adjuster mechanism, the spring biased detent collar causing the adjuster nut to rotate when the brake is released, to a position where the teeth on said other face of the adjuster nut are further meshed with the teeth on the detent collar, subsequent parking brake operation causing the adjuster nut to rotate to a position where the teeth on said one face of the adjuster nut are fully meshed with the teeth on said one part of the adjuster mechanism.

5,086,886

DISC BRAKE AND CAP SEAL THEREFOR

Gabriel Gregoire, Luzarches, and Lucien Trubert, Ezanville, both of France, assignors to General Motors France, Gennevilliers, France

Division of Ser. No. 464,518, Jan. 16, 1990, Pat. No. 5,040,642.

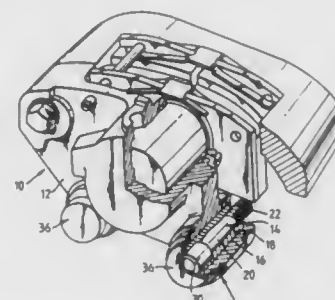
This application Jun. 14, 1991, Ser. No. 715,210

Claims priority, application United Kingdom, Jan. 28, 1989, 8901916

Int. Cl.⁵ F16D 65/18; F16J 15/32

U.S. Cl. 188—73.44

3 Claims



1. A disc brake for a motor vehicle comprising a stationary support for mounting on the motor vehicle;

a caliper slidably mounted on the stationary support;

at least one pin fixed at one end to either the stationary support or the caliper and slidably positioned in an axial bore in the other for slidably mounting the caliper, with the other end of the pin being positioned adjacent one end of the axial bore wherein the said other of the stationary support or the caliper has an annularly extending ledge formed therein around the said one end of the axial bore with a radially outward surrounding flat;

a cap seal sealing the said one end of the axial bore, the cap seal comprising a base with a continuous wall upstanding from the periphery thereof which is of substantially rigid material and which is securable to the said other of the stationary support or the caliper and wherein the continuous wall of the cap seal has a radially outward projecting free edge and wherein the continuous wall is resilient and makes an external push fit with the annularly extending ledge to secure the cap seal; and

an elastomeric seal secured to the free edge of the continuous wall for making a seal with the said other of the stationary support or the caliper around the said one end of the axial bore the elastomeric seal being captured between the free edge of the continuous wall and by the flat radially outward from the ledge and the elastomeric seal being isolated from the axial bore and the pin by the ledge.

5,086,887

ANCHOR PIN FOR BRAKE BAND

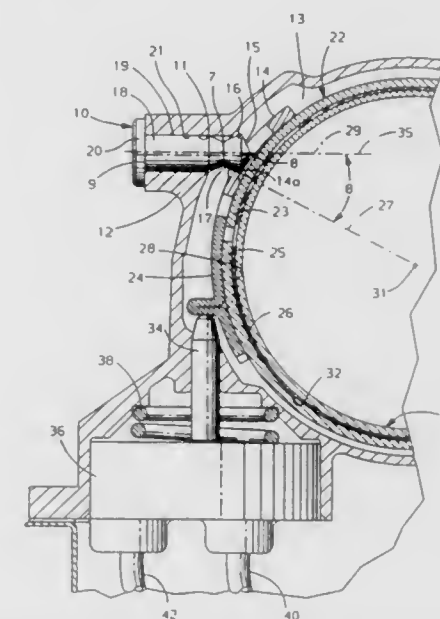
Keith D. Van Maanen, Berkley, and Jeffrey K. Baran, West Bloomfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 451,046, Dec. 15, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 576,546

Int. Cl.⁵ F16D 49/08

U.S. Cl. 188—77 R

24 Claims



1. An anchor pin for an automatic transmission brake band, the pin having a distal end, a proximate end, and a centerline passing through both the distal end and the proximate end, the pin installed in a transmission case by displacing it so that its centerline follows an axis passing through a side of the transmission case into a cavity within the transmission case in a direction parallel to a casting core pull of the transmission case for that same side, the proximate end of the pin being the first part of the pin to pass through the case on installation and reposing inside of the cavity upon completion of assembly, the distal end of the pin reposing at least in part within the case upon completion of assembly, the proximate end of the pin engaging the brake band through an anchor bracket which is fixed to the brake band, the anchor bracket providing the interface between the anchor pin and the brake band, the precise location of the interface on the bracket being an anchor bracket contact surface, the brake band wrapped around a brake drum, the brake drum mounted on an axis of rotation of the automatic transmission and located within the case cavity, the pin comprising:

a shank element with an outside diameter having a constant axially extending portion, sized to provide a piloting relationship between the shank and a corresponding aperture in said transmission case, thereby locating said pin;

an anchor pin reaction surface on said shank for said brake band anchor bracket contact surface, the anchor pin reaction surface of the pin being at an angle to said centerline of said pin, the angle defined by a tangential plane, wherein the plane is defined by said axis of rotation and a desired point of contact between said brake band and said pin;

an end shape on said proximate end of said pin to facilitate insertion of said anchor pin into said transmission case, the end shape tapering in the distal direction from a diameter less than an inside diameter of said corresponding aperture in said transmission case to a larger diameter.

5,086,888

FOLDING SUITCASE WITH HARD CASING

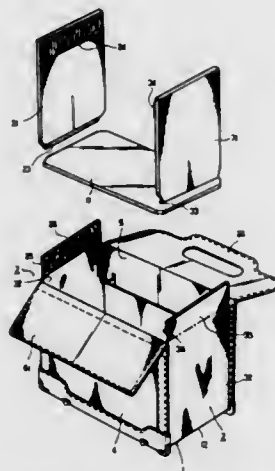
Chung-Nan Chu, No. 7, Alley 10, Lane 172, Chung Hsing St.,
Chungho City, Taipei Hsiang, Taiwan

Filed Sep. 7, 1990, Ser. No. 579,078

Int. Cl.⁵ A45C 7/00

U.S. Cl. 190—107

4 Claims



1. A folding suitcase having a hard casing consisting of at least six hard plate including hard bottom, left and right side plate bodies; soft surface materials associated with each of said bottom, left and right plate bodies, said plate bodies being movable but associated plate bodies substantially abutting against each other when the suitcase is assembled and can be engaged with the corresponding soft surface materials, respectively; and assembling devices for maintaining associated ones of said plate bodies in abutment when the suitcase is assembled, whereby disassembly of said plate bodies only requires said assembling devices to release said left and right plate bodies so that all said plate bodies can be removed and the soft surface materials on the bottom, left and right sides of the suitcase become foldable, and the suitcase as a whole can be folded into a flat shape with its front and rear sides overlapping each other.

5,086,889

SLIP CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION WITH LOCK-UP CLUTCH

Hidetoshi Nobumoto, Higashi-Hiroshima, and Minzi Sakaki,
Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 19, 1990, Ser. No. 554,470

Claims priority, application Japan, Jul. 20, 1989, 1-190017

Int. Cl.⁵ F16H 45/02; B60K 41/02

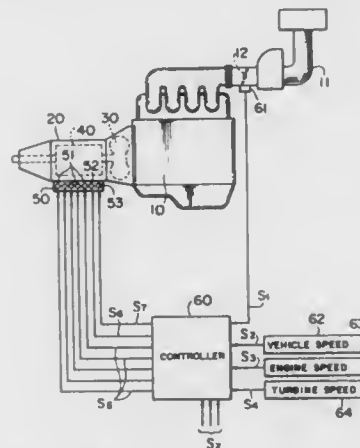
U.S. Cl. 192—0.076

5 Claims

1. A slip control system for a lock-up clutch of an automatic transmission comprising:

- a torque converter having an input member connected to an engine output shaft so that engine output torque is transmitted, and an output member driven by virtue of a rotation of the input member through a hydraulic fluid,
- a hydraulic fluid circuit for controlling an engaging force of the lock-up clutch to carry out a slip control so that an amount of slippage in the lock-up clutch is controlled to a target value corresponding to a target speed difference between the input and output members,
- an acceleration detecting sensor for detecting an accelerating condition of a vehicle and producing a first output signal,
- an engine speed sensor for detecting rotation speed of said engine output shaft and producing a second output signal,
- a turbine speed sensor for detecting rotation speed of said output member and producing a third output signal, and
- a controller for (1) determining if there is a request for abrupt acceleration, based on the first output signal, (2)

determining if the vehicle is in a normal operation condition when there is no request for abrupt acceleration, (3) performing a feedback control, by calculating a difference between the amount of slippage in the lock-up clutch and the target value, based on said second and third output signals, calculating a modification coefficient, based on said difference, obtaining a compensating value based on said modification coefficient, increasing said engaging



force, based on said compensating value, to reduce the amount of slippage when said difference is greater than the target value, and decreasing said engaging force, based on said compensating value, to increase the amount of slippage when said difference is less than the target value, when the vehicle is in the normal operating condition, and (4) performing a feedforward control, by reducing said engaging force sufficiently to release the lock-up clutch entirely, when there is a request for abrupt acceleration.

5,086,890

ENGINE BRAKING SYSTEM

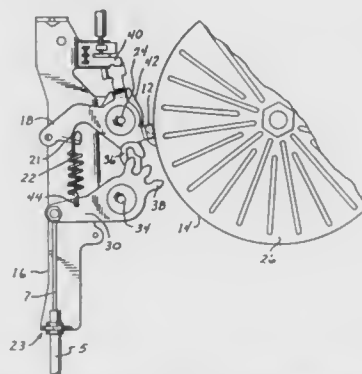
James F. Turczyn, Waukesha; Gary J. Gracyalny, Brown Deer,
both of Wis., and David W. Baylor, New Albany, Ind., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation-in-part of Ser. No. 493,338, Mar. 14, 1990, Pat. No. 5,040,644. This application Dec. 21, 1990, Ser. No. 631,630

Int. Cl.⁵ B60K 41/20; F16D 49/00

U.S. Cl. 192—1.44

4 Claims



1. Apparatus for slowing a rotating member of an internal combustion engine, the apparatus having at least one cable and a brake surface, comprising:
a bracket attached to the engine;
a first arm in pivotal engagement with said bracket at a first pivot point and attached to said at least one cable;
a second arm in pivotal engagement with said bracket at a second pivot point;

- a brake pad attached to either said first arm or said second arm that engages said brake surface;
- a spring having a first end and a second end, said first end being attached to said first arm and said second end being attached to said second arm; and
- a first engagement means interconnected with said first arm and a second engagement means interconnected with said second arm, said first and second engagement means for engaging each other in response to movement by said cable.

3. The apparatus of claim 1, wherein the internal combustion engine also has an ignition ground switch that is attached to said bracket, and wherein said first or said second arm actuates said ignition ground switch.

5,086,891

SINGLE PEDAL VEHICLE BRAKING AND ACCELERATION CONTROL SYSTEM

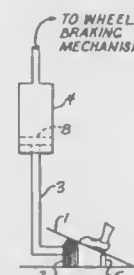
Herbert R. Rinder, 525 W. Stratford, Apt. 374, Chicago, Ill. 60657

Filed Aug. 29, 1990, Ser. No. 582,657

Int. Cl.⁵ F02D 9/06

U.S. Cl. 192—1.56

2 Claims



1. A single pedal vehicle braking and acceleration control system, comprising:

- a fluid-driven friction brake system having a brake actuator,
- an acceleration system having an acceleration actuator,
- a pivotable single pedal arranged and constructed to simultaneously contact and directly act upon said brake actuator and said acceleration actuator,
- a resilient means opposing downward movement of said single pedal, said resilient means arranged and constructed to automatically apply force to said brake actuator to engage the braking system, whereby, upon downward movement of said single pedal, the acceleration system is engaged while the braking system is simultaneously disengaged, and upon release of said single pedal, the acceleration system is disengaged while the braking system is simultaneously engaged.

5,086,892

HYDRODYNAMIC TORQUE CONVERTER

Bernhard Schierling, Kürnberg, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 16, 1990, Ser. No. 614,507

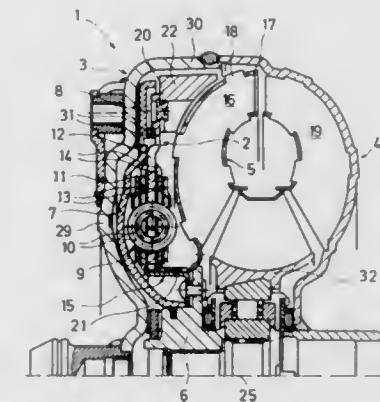
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1989, 3938724

Int. Cl.⁵ F16D 33/00

U.S. Cl. 192—3.29

12 Claims

1. A hydrodynamic torque converter, comprising an approximately pot-shaped housing part (3) rotatably driven about an axis of rotation (25) and comprising a bottom wall (29) and a side wall (30), a pump wheel (4) connected to the side wall (30) of the housing part (3) and masking the housing part (3), a turbine wheel (5) rotatable about the axis of rotation (25) in relation to the pump wheel (4) and disposed axially between the bottom wall (29) and the pump wheel (4), with a hub (6) coupled to an output shaft, a bridging coupling (2) disposed axially between the bottom wall (29) and the turbine wheel (5) with an axially movable piston (7) frictionally applied to the



arrangement (90), the torsion spring arrangement (9) has disposed in a circle springs (10) which couple the output part (11) in rotationally elastic fashion to the input part (13), and wherein the additional gyrating mass (22, 23, 24) is disposed relative to the axis of rotation (25) substantially radially outside the circle of disposition of the springs (10).

5,086,893

VISCOUS COUPLING BY-PASS ELEMENT FOR A TORQUE CONVERTER AND IMPROVED BUSHING DESIGN

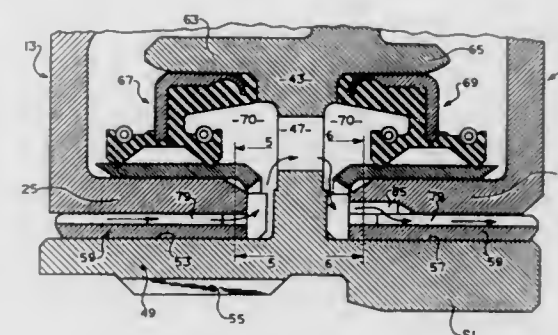
Edward J. Bojas, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 28, 1991, Ser. No. 705,849

Int. Cl.⁵ F16H 45/02; F16D 13/72, 47/02

U.S. Cl. 192—3.29

8 Claims



1. A viscous coupling for use as a bypass element with a torque converter including a torque converter housing and an output shaft; said viscous coupling being of the type including an annular housing assembly adapted to be positioned within the torque converter housing and having first and second axially spaced, radially-extending, annular side wall members defining an annular viscous chamber therebetween adapted to contain viscous fluid; said annular housing assembly defining a radially-extending annular clutching surface adapted for clutching co-action with a confronting surface of the torque converter housing; an annular clutch assembly disposed within said viscous chamber and including an annular, radially-extending clutch portion adapted for viscous clutching co-action with one of said side wall members, and first and second axially-extending clutch hub portions, one of said hub portions being adapted to be drivingly associated with the output shaft of the torque converter; said first and second side wall members defining first and second annular, axially-extending side

wall hub portions, respectively, defined at a radially inner extent of said side wall members, said first and second side wall hub portions being journaled on said first and second clutch hub portions, respectively, by first and second bushing members, respectively; characterized by:

- said first and second bushing members being substantially identical, and each comprising a generally cylindrical member defining an axially-extending fluid passage including a restricted cross-section flow area;
- said first bushing member cooperating with one of said first clutch hub portion and said first side wall hub portion to define a relatively restricted cross-section flow area; and
- said second bushing member cooperating with one of said second clutch hub portion and said second side wall hub portion to define a relatively unrestricted cross-section flow area in parallel with said restricted cross-section flow area defined by said second bushing member.

5,086,894

LOCK-UP CLUTCH CONTROL SYSTEM FOR AUTOMATIC POWER TRANSMISSION

Nanori Iizuka, and Takafumi Kurata, both of Shizuoka, Japan, assignors to Jatco Corporation, Shizuoka, Japan

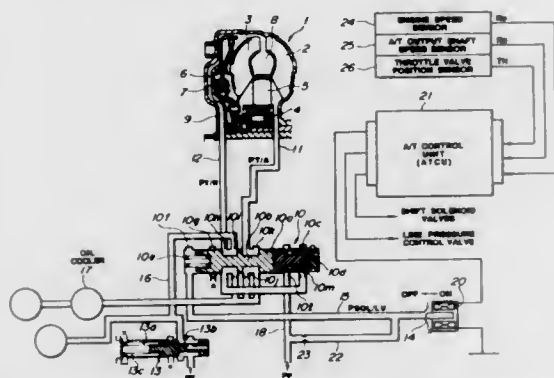
Filed Sep. 6, 1990, Ser. No. 578,197

Claims priority, application Japan, Sep. 9, 1989, 1-234425

Int. Cl.⁵ F16D 33/00

U.S. Cl. 192—3.29

20 Claims



1. A lock-up clutch control system for an automatic power transmission for an automotive vehicle, comprising:

- an input element;
- an output element in hydraulic drive connection with said input element;
- a lock-up clutch operatively arranged between said input element and said output element, said lock-up clutch being shiftable to operation in one of first, second and third modes, said lock-up clutch being applied to mechanically connect said input element with said output element during operation in said first mode and being released to mechanically disconnect said input element from said output element during operation in said second mode, said lock-up clutch being applied to establish a slippage mechanical connection of said input element with said output element during operation in said third mode such that a relative rotation is allowed between said input and output elements;
- means for detecting a power demand on the automotive vehicle and generating a power demand indicative signal indicative of said power demand detected;
- a control unit operatively connected with said lock-up clutch, said control unit including,
- first means for selecting one of said first, second and third modes based on preselected vehicular operating condition indicative parameters;
- second means for deriving a speed of variation in said power demand indicative signal and generating an acceleration

demand magnitude when said third mode is selected by said first means, said acceleration demand magnitude being indicative of said speed of variation of said power demand indicative signal; and

third means for executing said second mode in place of said third mode when said acceleration demand magnitude is not less than a predetermined value.

5,086,895

BRAKE-ACTUATING MECHANISM FOR VEHICLE PARKING BRAKES

Shusuke Nemoto, Yao, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

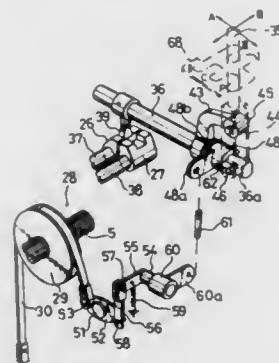
Filed Oct. 5, 1990, Ser. No. 593,064

Claims priority, application Japan, Nov. 17, 1989, 1-133720[U]

Int. Cl.⁵ B60K 41/26

U.S. Cl. 192—4 A

3 Claims



1. In a vehicle which includes a gear-shifting mechanism and a parking brake, said gear-shifting mechanism comprising a control shaft which is mounted for sliding movement along its longitudinal axis and for rotational movement about said axis, a change lever which is operable to provide one of said sliding and rotational movements selectively to said control shaft, and shifter forks each of which is supported slidably for gear-shifting operation, said control shaft fixedly carrying a shifter pin (39) through which one of said shifter forks is engaged selectively with the control shaft by a sliding movement of said control shaft and through which each of said shifter forks is slidably displaced by a rotational movement of said control shaft at an engaged condition of said each shifter fork with the control shaft, a brake-actuating mechanism which comprises:

- a brake-operating member (46; 46A) fixedly carried by said control shaft (36) and having an operative position to which said operating member is displaced selectively by a sliding movement of said control shaft, said operating member being disposed relative to said shifter pin (39) such that said shifter forks (26, 27) are released from engagement with said control shaft at said operative position of the operating member; and
- a rotatable brake-actuating member (48) mounted on said control shaft (36) such that the control shaft is slidable and rotatable relative to said actuating member, said actuating member being disposed such that the said member is engaged non-rotatably with said control shaft through said operating member (46; 46A) at said operative position of said operating member so as to be rotationally moved by a rotational movement of said control shaft and to thereby actuate said parking brake (28).

5,086,896

JAW CLUTCH COUPLING MECHANISM AND SHIFT LEVER LINK MECHANISM

Yoshiaki Murakami; Takahisa Murakami, and Akira Kikuchi, all of Ehime, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

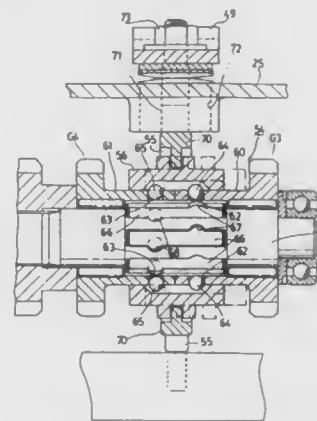
Filed Sep. 25, 1990, Ser. No. 587,865

Claims priority, application Japan, Nov. 30, 1989, 1-311614; Dec. 18, 1989, 1-327727

Int. Cl.⁵ F16D 21/04, 11/12

U.S. Cl. 192—48.91

4 Claims



1. A jaw clutch coupling mechanism employing steel balls to be disengageably engaged with ball drop-in portions on a driven shaft by sliding movement of a slider fitted on the drive shaft, said jaw clutch coupling mechanism comprising:

- a gear case;
- a pair of driven shafts disposed within the gear case independently of and in parallel relation with each other to serve as FR switching shafts;
- forward and reverse gears freely and rotatably mounted on each of said FR switching shafts; and
- spline grooves formed axially on the circumferential surface of each FR switching shaft to serve as ball drop-in portions, wherein each of said spline grooves is provided with a semi-spherical ball support recess on a side wall portion to be engaged with a steel ball of said forward gear in forward rotation.

5,086,897

PRE-ENERGIZER PINS FOR A SYNCHRONIZER

Joseph D. Reynolds, Climax, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 24, 1990, Ser. No. 632,883

Int. Cl.⁵ F16D 23/06

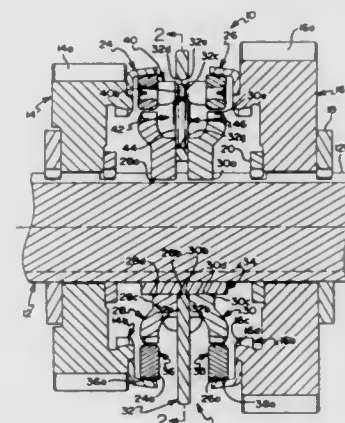
U.S. Cl. 192—53 E

18 Claims

1. A pin-type synchronizer mechanism comprising an annular shift flange extending radially about a shaft having an axis, the flange for moving first jaw and first friction means respectively into engagement with second jaw and second friction means for respectively synchronizing and positive clutching a gear to the shaft, the first friction means including a rigid ring having a plurality of circumferentially spaced apart pins rigidly extending therefrom and into openings in the flange, each pin having a reduced diameter portion allowing limited relative rotation between the flange and the pin, and each pin having a blocker shoulder surface engagable with a blocker shoulder surface defined about the associated flange opening; pre-energizer means including a plurality of plungers each having a head portion resiliently biased against a pre-energizer surface for resiliently engaging the friction means with an engaging force in response to initial axial movement of the flange by a shift force from a neutral position toward the gear for engaging the blocker shoulder surfaces in response to engagement of the friction means producing an initial synchronizing torque trans-

mitted to the flange via the pins and for transmitting the shift force to the first friction means via the blocker shoulders to increase the engaging force of the friction means; characterized by:

each pin including an axis parallel to the shaft axis, the blocker shoulder extending radially outward from the



reduced diameter portion and axially toward the rigid ring at a predetermined angle relative to the pin axis, each pin also including said pre-energizer surface, each pre-energizer surface being independent of the blocker shoulder and reacting against the associated plunger head portion during the neutral position of the flange and during at least initial axial movement of the flange.

5,086,898

ROTARY SLIP CLUTCH

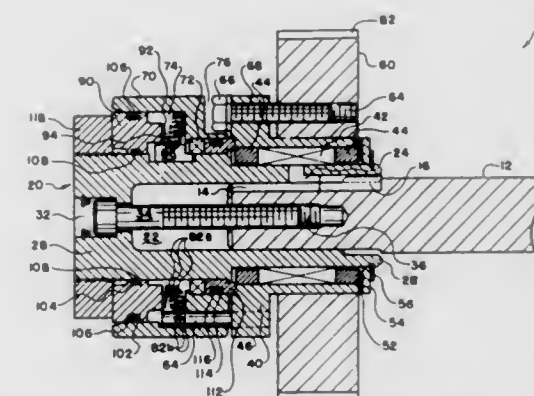
Robert J. Patton, Lakewood, and Adam G. Bay, Chesterland, both of Ohio, assignors to Gould Inc., Eastalek, Ohio

Filed Oct. 30, 1990, Ser. No. 605,676

Int. Cl.⁵ F16D 13/22, 11/04

U.S. Cl. 192—70.12

12 Claims



1. An adjustable rotary slip clutch comprising:

- a shaft;
- a first rotary member rotatably mounted relative to said shaft concentric with said shaft;
- a second rotary member mounted to said shaft for rotation therewith;
- sleeve means rotatably mounted concentrically relative to said shaft defining an annular cavity;
- friction clutch means within said annular cavity including a plurality of hardened, elastically deformable metal elements, each of said metal elements having a generally conical shape wherein the surface on one side of said element is generally parallel to the surface on the other side of said element, at least one of said metal elements being connected to said first rotary member for rotation

therewith and at least one of said metal elements being mounted to said second rotary member for rotation therewith wherein a portion of said element connected to said first rotary member overlaps a portion of said element connected to said second rotary member for continuous engagement therewith;

selectively positionable adjustment means operable to increase or decrease incrementally the axial force acting on said metal elements;

lubrication means in said annular cavity surrounding said metal elements; and,

means for sealing said annular cavity to retain said lubrication means therein.

5,086,899

COUPLING ASSEMBLY COMPONENT

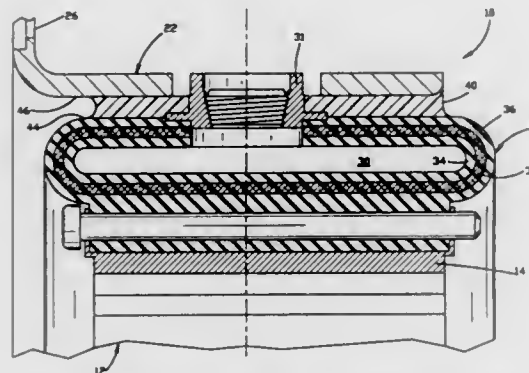
James M. Latsko, North Royalton, Ohio, assignor to Eaton Corporation, North Royalton, Ohio

Filed Jul. 17, 1991, Ser. No. 731,493

Int. Cl.⁵ F16D 25/04

U.S. Cl. 192—88 B

17 Claims



1. A coupling assembly component for damping the transmission of vibration between first and second elements while transmitting force between the first and second elements, said coupling assembly component comprising an annular base adapted to be connected with the first element, a first annular friction surface which is coaxial with said base and is movable into engagement with a second annular friction surface connected with the second element, annular fluid extensible tube means which is coaxial with said base and is radially extensible under the influence of fluid pressure in said tube means to move said first friction surface into engagement with the second friction surface, said annular fluid extensible tube means including a reinforcing layer and a cover layer, said cover layer being formed of an elastomeric material and extending around said reinforcing layer, and an annular layer of vibration damping material disposed between and connected with said tube means and said base, said annular layer of vibration damping material being formed of an elastomeric material having vibration damping characteristics which are different than the vibration damping characteristics of the elastomeric material forming said cover layer.

5,086,900

POWER CONVERTING MECHANISM

Tomoyuki Kikuta, and Chikara Kawaguchi, both of Kosai, Japan, assignors to ASMO Co., Ltd., Kosai, Japan

Continuation-in-part of Ser. No. 176,148, Mar. 31, 1988, Pat. No. 4,903,535. This application Jun. 6, 1990, Ser. No. 533,756

Int. Cl.⁵ F16D 23/10, 11/04; F16H 27/02; F16C 1/00

U.S. Cl. 192—142 R

5 Claims

1. An electric actuator provided with a power converting mechanism, said power converting mechanism comprising: a motor provided with an output shaft,

gear means coupled to the output shaft of said motor to

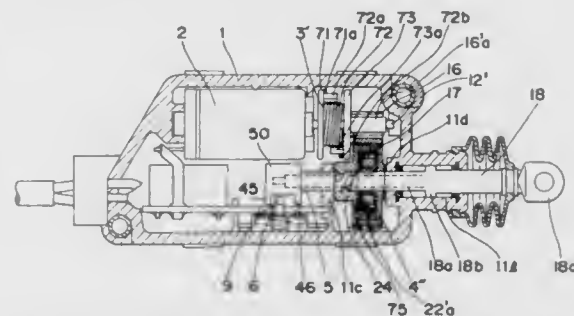
transmit the rotation thereof, and including a coupling apparatus

a plate member fixedly mounted on the output shaft of said motor and provided with a pair of projections having a gap therebetween,

a gear member slidably mounted on the output shaft of said motor and provided with a gear at one side and a fitting strip at the other side,

spring means having a pair of fitting ends one of which is fitted with the fitting strip of said gear member and the other of which is fitted with the pair of projections of said plate member,

a final drive gear meshing with said gear means,



a drum member being concentric with said final drive gear and provided with a boss portion having an internal thread formed in an inner peripheral surface of a central axial opening,

centrifugally actuated clutch means provided between the final drive gear and the drum member, and

a screw member passing through the central axial opening of said boss portion and having an external thread formed on the outer peripheral surface and threadably engaged with said internal thread of said drum member, and a connecting portion formed on one end and connected to a driven member to be driven,

whereby rotational movement of said motor is converted into linear movement of said driven member.

5,086,901

ROBOT OVERLOAD DETECTION DEVICE

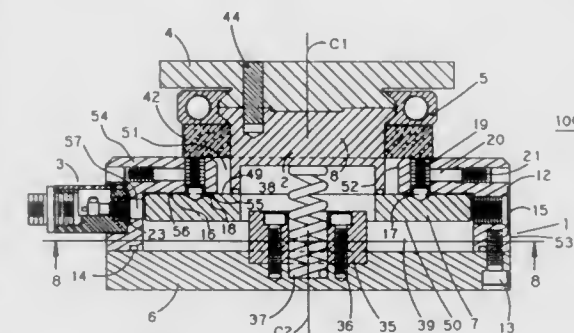
Thomas J. Petronis, Clifton Park, and Clifford C. Annis, Schenectady, both of N.Y., assignors to Applied Robotics, Inc., Schenectady, N.Y.

Filed Feb. 14, 1991, Ser. No. 655,550

Int. Cl.⁵ B25J 19/06, 19/02; F16D 43/28

U.S. Cl. 192—150

23 Claims



1. An overload detection device adapted to be positioned intermediate tooling and an end of a robot arm for detecting excessive loading and protecting the tooling and robot arm against damage resulting therefrom, comprising:

a pressurized fluid chamber assembly including a housing having a central bore concentric with a central axis of the chamber assembly, a cover plate closing one end of said

bore, and an annular end plate overlying an opposite end of said bore, the annular end plate having a central opening therethrough concentric with the central axis, said opening having a radial extent less than that of the bore;

a stemmed plate having a central axis, the stemmed plate comprising a plate member located within the bore, said plate member having a radial extent intermediate that of the opening in the annular end plate and the bore of the housing, the plate member having a stem extending axially beyond a first face of the plate member such that the stem protrudes out of the chamber assembly through the opening in the annular end plate, said first face of the plate member and an inner face of the annular end plate comprising opposing faces;

means for relatively positioning the chamber assembly and stemmed plate into engaging registration with their central axes coincident and with a predetermined unique rotational angular relationship therebetween;

a non-compressive annular bearing member fixed to one of said opposing faces, said bearing member having a raised surface configured to fit flush against a portion of the other of said opposing faces to create a fluid tight seal therebetween only when the chamber assembly and stemmed plate are in engaging registration;

means for controllably applying fluid pressure to the plate member to maintain the chamber assembly and stemmed plate in engaging registration with a force designed to maintain a rigid coupling therebetween under normal operating loads; and

sensor means for sensing a loss of said engaging registration and providing an output signal indicative thereof, whereby a load in excess of said normal operating loads will force the chamber assembly and stemmed plate out of engaging registration allowing fluid to escape between the opposed faces and the coupling to become compliant, and causing the sensor means to provide said output signal.

5,086,902

LADDER FOR FRAGILE PARTICULATE COMMODITIES

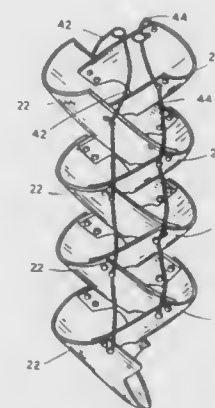
Theodore J. Dunnigan, Hwy. 32 N., P.O. Box 67, Walhalla, N. Dak. 58282

Filed Nov. 28, 1990, Ser. No. 619,083

Int. Cl.⁵ B65G 11/00

U.S. Cl. 193—25 C

3 Claims



1. An apparatus for lowering fragile, particulate commodities into a commodity storage facility, comprising: a vertically disposed ladder means having upper and lower ends;

means for supporting said ladder means within the storage facility so that the lower end thereof is positioned adjacent the lower end of the storage facility;

the upper end of said ladder means being in communication with a source of commodities;

said ladder means comprising a plurality of resilient, flexible

planar sheets bent upon themselves to define a substantially U-shaped chute member having upper and lower ends;

said chute members being formed of a material which will resiliently deform and return to its original shape, whereby said chute members will cushion the fall of the said particulate commodities;

the lower ends of each chute member, except the lower most member, being secured to the upper ends of the chute members positioned therebelow, said chute members defining a zigzag pattern, whereby the particulate commodities will flow downward through said chute members passing from one chute member to the next chute member positioned therebelow;

adjacent chute members defining an opening at the connection therebetween whereby the particulate commodities may exit the ladder therethrough once the level of commodity within the storage facility has reached the level; and

means for selectively, adjustably securing the lower ends of the chute members to the upper ends of the chute members positioned therebelow, so as to selectively and individually adjust the slope of each chute member in the zigzag pattern, whereby the speed at which a commodity passes through said ladder means may be adjusted.

5,086,903

TANDEM BRAKE ROLLER SYSTEM

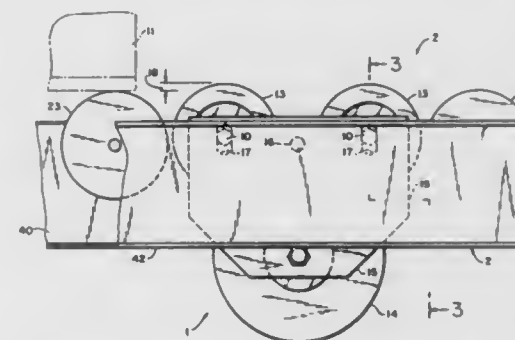
Charles Agnoff, Wilmington, N.C., assignor to Interroll Holding AG, San Antonio, Switzerland

Filed Apr. 8, 1991, Ser. No. 682,580

Int. Cl.⁵ B65G 13/00

U.S. Cl. 193—35 A

10 Claims



1. A tandem braking system for controlling the speed of loads conveyed by gravity along a roller conveyor, comprising:

(a) a gravity-type roller conveyor including at least one longitudinally-extending support rail and a plurality of longitudinally-spaced apart rollers rotatably mounted on said support rail and arranged generally in a row, said rollers each having a top circumferential surface defining a tangential point of contact which cooperatively define a support surface plane for a load to be conveyed therealong; and

(b) a tandem brake assembly including:

(i) support means for mounting said brake assembly on said support rail generally between two adjacent rollers,

(ii) a braking roller rotatably mounted in a fixed position on said support means generally beneath said support surface plane, and

(iii) a pair of spaced-apart, freely rotatable traction rollers mounted on said support means in a generally vertically-displaceable manner so as to be disposed generally above and in rotatable engagement with said braking roller so that said braking roller may exert a braking force thereon, said traction rollers also being disposed

so as to be generally aligned with said conveyor rollers and so as to normally extend slightly above said support surface plane in a non-loaded state, said traction rollers being compressible when transversed by a load being conveyed.

5,086,904

PART SUPPLY ARRANGEMENT

Masanori Yasutake, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

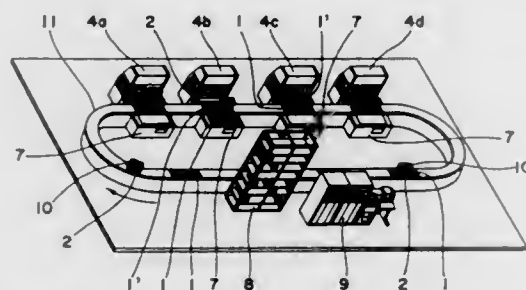
Filed Oct. 22, 1990, Ser. No. 600,805

Claims priority, application Japan, Oct. 20, 1989, 1-274099

Int. Cl.⁵ B65G 37/00

U.S. Cl. 198—346.1

2 Claims



1. A part supply arrangement comprising:
 - a transport path having stationary parts of a D.C. brushless motor therealong and having at least one part feeding station therealong;
 - carrier means having a part carrier unit thereon and being constituted by a movable part of a D.C. brushless motor and movable along said transport path by the interaction with said stationary parts;
 - one of said stationary parts being positioned at said part feeding station and being shaped for movement laterally of said transport path into an automatic part mounting apparatus as a part feeding table thereof, said one of said stationary parts being movable laterally out of said transport path into an automatic part mounting apparatus;
 - a transporting table means constituting a transport path replacement part and being constituted by a stationary part of a D.C. brushless motor and being positioned in spaced parallel relation to said one of said stationary parts; and
 - changeover means connected to said one of said stationary parts and said transporting table means for, upon arrival of a carrier unit with a part carrier unit thereon at said one of said stationary parts, simultaneously moving said one of said stationary parts into an automatic part mounting apparatus and moving said transporting table means into said transport path to replace said one of said stationary parts and to function to drive other carrier units past said part feeding station in place of said one of said stationary parts.

5,086,905

TIPPING-CONVEYOR ELEMENT FOR A PACKAGE CONVEYOR

Ludger Pölling, Wadersloh Diestedde, Fed. Rep. of Germany, assignor to Bernhard Beumer Maschinenfabrik KG, Beckum, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 494,411

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1989, 3908632

Int. Cl.⁵ B65G 47/46

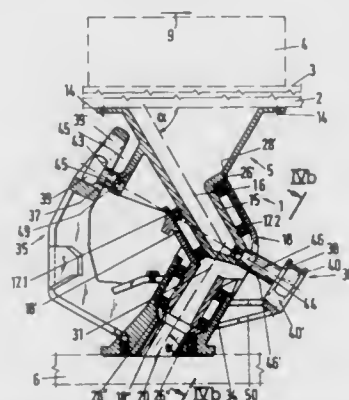
U.S. Cl. 198—365

22 Claims

1. A tipping-conveyor element for a package conveyor whose driven conveyor line has a multiplicity of conveyor

elements flexibly connected to one another, wherein at least one of said elements comprises:

- a carrying surface, essentially horizontal in a conveying state, upon which is respectively positioned a package which, by tipping of the carrying surface, is delivered, laterally to the conveying direction, selectively to one of a plurality of delivery stations provided along the conveyor line;
- a carrying element having the carrying surface positioned thereon, said carrying element including a support device positioned on a support part that is movable along a guide-way, wherein the carrying element includes a pivoted journal placed stationarily on an underside portion thereof, oriented downward at an inclined angle, and pivotable around the lengthwise axis of the journal during tipping; and



- a support element which projects upward from the support part; and
- a tipping element wherein the journal is supported on the support element and the tipping element is mounted on the support element wherein the support element has a lengthwise axis which runs at an angle to the lengthwise axis of the journal and includes means for being tilted in a controlled manner relative to the support element during tipping of the carrying element wherein end sections of journal and support element face each other and are connected to one another only by the tipping element; and
- axially spaced first and second bearing elements wherein an end section of the journal is supported against an upper leg of the tipping element by the first and second axially spaced bearings.

5,086,906

DIVERTER FOR ROLLER CONVEYORS

Arnold Ludke, Oakland, N.J., assignor to AL Industries, Fairfield, N.J.

Filed Feb. 20, 1991, Ser. No. 658,186

Int. Cl.⁵ B65G 47/46

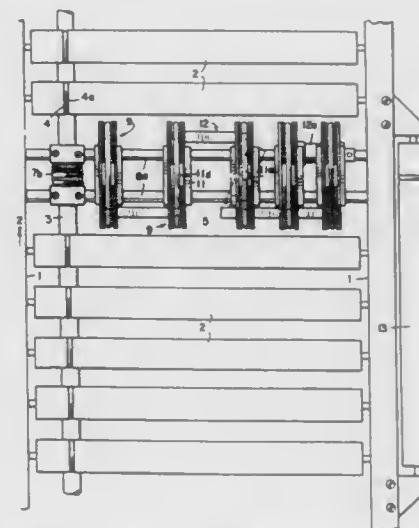
U.S. Cl. 198—372

7 Claims

1. A conveyor diverter comprising a row of assemblies each comprising two radially aligned and horizontally interspaced sheaves and a belt reeved over the sheaves and forming a

horizontal span therebetween positioned to receive and carry objects conveyed by the conveyor, and means for mounting

a controller controlling the cooperable operation of said elevator and catcher mechanism.



5,086,907

GLASS SHEET TRANSFERRING DEVICE

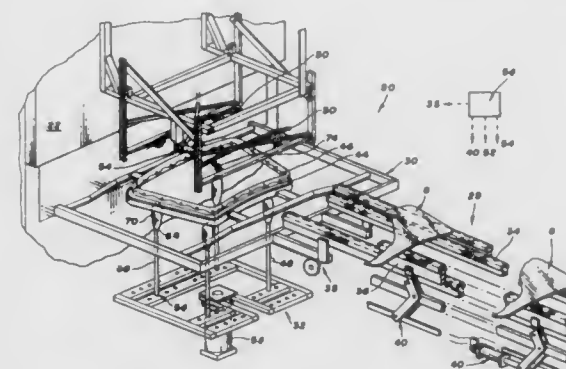
David B. Nitschke, and Christopher Hersch, both of Perrysburg, Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Oct. 17, 1990, Ser. No. 600,304

Int. Cl.⁵ B65G 15/58

U.S. Cl. 198—468.6

17 Claims



1. A glass sheet transferring device for transferring a formed glass sheet from a glass sheet forming station, the device comprising:

- a movable frame having a support ring mounted thereon for receiving the glass sheet;
- said frame including a drive for moving said frame;
- an elevator mechanism mounted below the frame and defining in part a glass sheet lifting mechanism for raising the formed glass sheet upwardly off the support ring;
- a glass sheet catcher mechanism in cooperable operation with said elevator mechanism and completing the definition of the glass sheet lifting mechanism for receiving the raised glass sheet from said elevator mechanism and for supporting the glass sheet as said elevator mechanism is lowered;
- an elevator actuator for actuating the vertical movement of said elevator mechanism;
- a catcher actuator for actuating the operation of said catcher mechanism; and

5,086,908
APPARATUS FOR MOVING BINS SIMULTANEOUSLY IN ARCUATE AND LINEAR PATHS

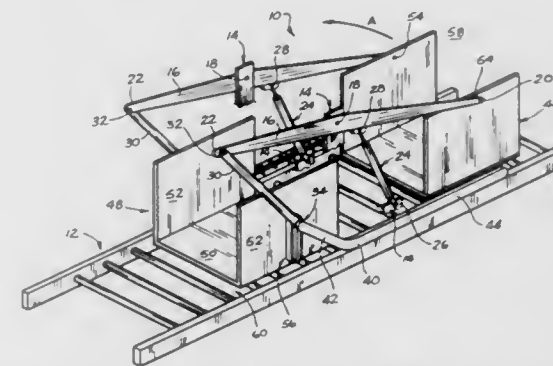
Herbert E. Gladish, Ottawa, and Christopher L. Raikums, Etobicoke, both of Canada, assignors to E.B. Eddy Forest Products Ltd., Ontario, Canada

Filed Dec. 27, 1990, Ser. No. 634,480

Int. Cl.⁵ B65G 15/58; B65B 21/02

U.S. Cl. 198—468.6

4 Claims



1. Apparatus for selectively moving first and second bin members between their respective loading stations and a common unloading station, comprising:

- a) conveyor means extending between the loading station of at least one of said bins and said common unloading station, said second bin member being adapted for reciprocal movement thereon between its loading station and said unloading station;
- b) frame means on each side of said conveyor means;
- c) a pair of elongated first lever arms pivotally mounted between the ends thereof in said frame means with said first bin member being pivotally connected to said first lever arms at a distal end thereof;
- d) a pair of elongated second lever arms, each being pivotally connected at one end thereof to the proximal end of a respective first lever arm;
- e) a pair of first cam tracks, one on each side of said conveyor means and each including a first straight portion extending substantially parallel to said conveyors means and a second portion disposed at an angle relative to said first straight portion;
- f) a pair of second cam tracks, each extending vertically on a respective side of said second bin member;
- g) a cam follower at the other end of each said second lever arm and constrained to simultaneously engage the corresponding first and second cam tracks; and
- h) drive means connected between said frame means and each of said first lever arms for pivoting said first lever arms;
- i) whereby, with said second bin member at its loading station and said first bin member at the common unloading station said drive means are in a first condition and each said cam follower is at the upper extremity of the respective first and second cam tracks, subsequent operation of said drive means to a second condition thereof serving to pivot said first lever arms to lift and move said first bin member from the common unloading station to its loading station, such pivoting movement of said first lever arms serving to move said second lever arms and said cam followers along a path defined by said first cam tracks, said cam followers simultaneously moving, through engagement with said second cam tracks, said second bin member from its loading station, along said conveyor means, to the common unloading station.

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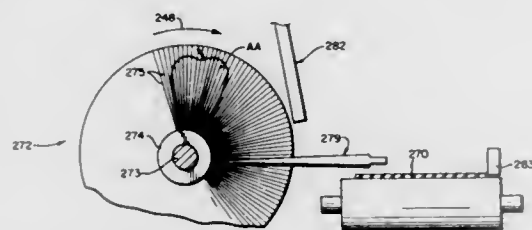
GENTLE HANDLING OF FRUIT DURING WEIGHT SIZING AND OTHER OPERATIONS

Harry C. Powell, Jr., Faber, Va., assignor to Powell Machinery, Inc., Faber, Va.

Continuation-in-part of Ser. No. 248,199, Sep. 23, 1988, Pat. No. 4,957,619. This application Jul. 3, 1989, Ser. No. 374,827
Int. Cl.⁵ B65G 47/19

U.S. Cl. 198—534

17 Claims



1. A bruisable discrete element transfer mechanism comprising:

- a first transporting means for transporting the bruisable element in a first direction at a first level;
- a second transporting means for transporting the bruisable element in a second direction and second level, different than said first direction and first level;
- a brush having a shaft rotatable about a substantially horizontal axis, and adjacent said first transporting means, and having bristles extending from said shaft positioned adjacent said first level;
- means for rotating said shaft so that said brush bristles have a tangential direction of movement adjacent said first level in said first direction;
- the bruisable element being moved from the first transporting means to the brush so that the bruisable element is substantially engulfed by said brush bristles and moves through said bristles toward said shaft so that said brush transfers the bruisable element from said first transporting means to said second transporting means; and
- said second level disposed below said first level by a distance approximately equal to the radius of said brush.

5,086,910

ZONE CONTROLLED CONVEYANCE SYSTEM

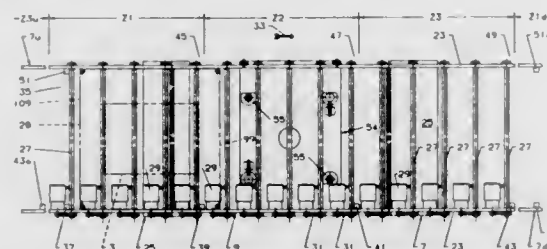
Paul D. Terpstra, Janesville, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Aug. 13, 1990, Ser. No. 565,726

Int. Cl.⁵ B65G 43/08

U.S. Cl. 198—572

19 Claims



1. A zone controlled conveyance system for propelling a workpiece comprising a plurality of sections arranged end-to-end to define a path along which the workpiece is propelled in a downstream direction to a selected section from an adjacent upstream section and from the selected section to an adjacent downstream section, each section comprising a frame, a plurality of rollers rotatably mounted in the frame for supporting the workpiece thereon, and a plurality of motors fastened to the frame, each motor individually driving a separate roller, wherein:

- a. the motors and associated rollers of each section are grouped into a predetermined number of zones, there

being a sufficient number of rollers in each zone to completely support a selected workpiece thereon, each section having an upstream zone and a downstream zone and each zone having an upstream end and a downstream end; and

b. each section further comprises controller means for controlling the energization of the motors of each zone independently of the energization of the motors of the other zones,

so that energization of selected motors causes the associated rollers to rotate and propel a workpiece supported on the rotating rollers in the downstream direction and a different workpiece can be supported by the rollers of the respective zones and the propulsion of a selected workpiece can be independent of the propulsion of all other workpieces.

5,086,911

FOLDABLE FRAMEWORK FOR BELT CONVEYORS

Patrick J. Douglas, Santon, Great Britain, assignor to Extex Screens and Crushers Limited, Sheffield, United Kingdom

PCT No. PCT/GB90/00104, § 371 Date Oct. 1, 1990, § 102(e)

Date Oct. 1, 1990, PCT Pub. No. WO90/08720, PCT Pub.

Date Aug. 9, 1990

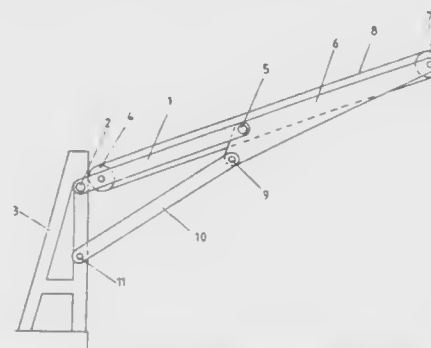
PCT Filed Jan. 25, 1990, Ser. No. 576,474

Claims priority, application United Kingdom, Feb. 1, 1989, 8902152

Int. Cl.⁵ B65G 21/10

U.S. Cl. 198—632

5 Claims



1. An endless conveyor having a foldable framework and which comprises:

- a supporting structure;
- a tail conveyor framework which is hinged to one end to the supporting structure;
- a head conveyor framework hinged to the other end of the tail conveyor framework;
- tail and head conveyor drums mounted on the tail and head conveyor frameworks respectively, and around which an endless belt is taken; and
- at least one supporting link hinged to one end to the supporting structure and at its other end to the head conveyor framework at a point adjacent to the hinged connection of the tail conveyor framework to the head conveyor framework;

in which the supporting structure, the tail conveyor framework, the head conveyor framework and the supporting link form a four-bar type linkage having proportions arranged so that when the two conveyor frameworks are aligned end to end, they are constrained to slope upwardly; and an actuator is coupled with the linkage and is operable to alter the angular relationships between adjacent members of the linkage in order to adjust the foldable structure between an operative condition of the endless conveyor and a folded inoperative position suitable for transport of the endless conveyor form an adjustable 4-bar type linkage having proportions arranged to enable the two conveyor frameworks to be adjusted between an operative position of alignment end to end in which the

frameworks are constrained to slope upwardly, and a folded inoperative position suitable for transport of the endless conveyor.

5,086,912

AMBULATOR FOR CARPET ROLLS OR THE LIKE

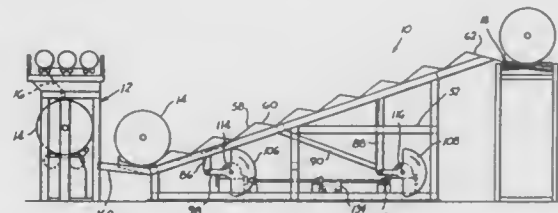
Dwight E. Howden, Jr., 2029 Brookview Dr., Dalton, Ga. 30720

Filed Nov. 13, 1990, Ser. No. 614,073

Int. Cl.⁵ B65G 25/02

U.S. Cl. 198—776

6 Claims



1. A method for conveying a substantially cylindrical roll of carpet having an axis about which the roll is elongated from a receiving station at a first elevation to a discharge station at a second elevation, said method comprising:

- (a) disposing said roll on a first pair of spaced apart fixed steps at said first elevation of a respective pair of laterally spaced apart fixed frame members having a multiplicity of fixed steps undulating from said first elevation to said second elevation, said roll being disposed with said axis extending laterally;
- (b) disposing a movable frame having a multiplicity of pairs of laterally spaced apart movable steps intermediate said fixed frame members;
- (c) entering beneath said roll while supported on said first pair of spaced apart fixed steps with a pair of spaced apart movable steps of said movable frame;
- (d) lifting said movable frame to engage and cradle said roll by said pair of spaced apart movable steps and thereafter lifting said roll by said pair of spaced apart movable steps;
- (e) moving said movable frame in a direction extending from said first elevation toward said second elevation such that said pair of movable steps are disposed vertically above a second pair of spaced apart fixed steps closer to said second elevation; and
- (f) lowering said movable frame to dispose said pair of movable steps vertically beneath said second pair of fixed steps while depositing said roll on said second pair of spaced apart fixed steps, said method including continuously driving said movable frame and all said movable steps in an orbital path to move said roll at substantially the same speed in seriatim from said first elevation to said second elevation.

5,086,913

CONTACT LENS CASE

Thomas Camm, 966 Ponus Ridge Rd., New Canaan, Conn. 06840, and Louise Wollman, White Plains, N.Y., assignors to Thomas Camm, New Canaan, Conn.

Continuation-in-part of Ser. No. 478,207, Feb. 9, 1990, abandoned. This application Mar. 15, 1991, Ser. No. 670,078

Int. Cl.⁵ A45C 11/04

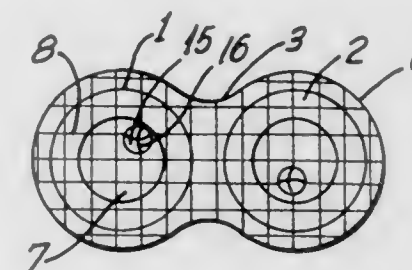
U.S. Cl. 206—5.1

13 Claims

1. A contact lens storage case incorporating an aid for the visual location of a contact lens stored within fluid in the case, comprising:

- at least one housing member of a first color, said housing member having an open top, side walls and a closed bottom defining a storage chamber;
- a cover member associated with said housing member and adapted to cover said open top, and indicia on said housing member, said indicia of a second color contrasting and different from said housing member and being distinguish-

able from the housing member to provide an image which can be intercepted by a lens stored in the housing and thereby refracted or otherwise distorted by the lens to



visually indicate the lens location within said housing wherein said indicia is viewable through said open top of said housing member.

5,086,914

SUTURE PACKAGE

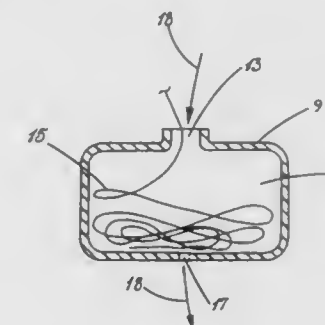
Stanley L. Mish, and James D. Silverman, both of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed May 14, 1990, Ser. No. 523,438

Int. Cl.⁵ A61B 17/06

U.S. Cl. 206—63.3

22 Claims



1. A suture package comprising:

- a housing defining at least one enclosed cavity;
- a port in said housing configured to permit lengthwise insertion of suture material into said cavity; and
- venting means in said housing distributed about a substantial part of said cavity for venting gas from said cavity and being operative during the insertion of suture material through said port.

5,086,915

WRAPPING BODY FOR MEDICAL CONTAINER

Kenichi Yashima, Tokyo; Norisuke Kira, and Yoshinori Minagawa, both of Fujinomiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 499,458

Claims priority, application PCT Int'l Appl., Dec. 19, 1987, PCT/JP87/00998

Int. Cl.⁵ B65D 81/26; F17G 11/00

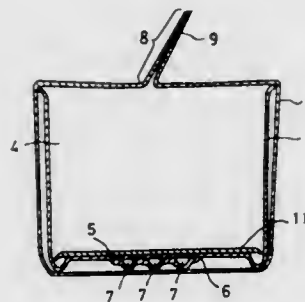
U.S. Cl. 206—204

20 Claims

1. A wrapping body for a medical container, comprising:

- a tray having an opened upper portion;
- a plastic medical container which is contained in said tray together with a deoxidizer and which contains an infusion solution;
- a flexible bag enclosing said tray and having a retarded permeability to a gas and steam, said bag being sized and

disposed so that the bag can be contacted with said medical container at the opened upper portion of said tray; and



means sealing said bag while said bag entirely covers said tray.

5,086,916
COMBINATION TOOTHBRUSH STERILIZATION
CONTAINER AND MOUNTING BRACKET

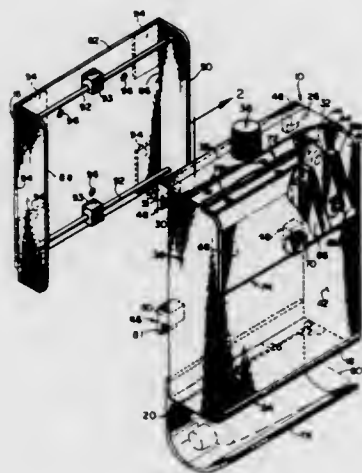
Ruben L. Gray, 5853 Cedar Ave., Philadelphia, Pa. 19143

Filed Dec. 21, 1990, Ser. No. 633,656

Int. Cl.³ B65D 81/24; A45D 44/18

U.S. Cl. 206—209.1

7 Claims



1. A toothbrush sterilization container for receiving a sterilization agent and at least one toothbrush, said container comprising:

- a bottom wall having a first edge, a second edge, a third edge, and a fourth edge;
- a top wall having a first edge, a second edge, a third edge, and a fourth edge; said top wall being positioned generally parallel to and spaced from said bottom wall; said top wall having a first access opening for adding and removing said sterilization agent from said container;
- a first side wall extending between and attached to said first edges of said top and bottom walls such that said first side wall extends generally perpendicularly from said top and bottom walls;
- a second side wall extending between and attached to said second edges of said top and bottom walls such that said second side wall extends generally perpendicularly from said top and bottom walls;
- a front wall extending from said third edge of said bottom wall such that a second access opening for adding and removing toothbrushes from said container is formed between said front and top walls and said front wall extends generally perpendicularly from said bottom wall;
- a rear wall extending between and attached to said fourth

edges of said top and bottom walls such that said rear wall extends generally perpendicularly from said top and bottom walls, said rear wall having a bracket means for attaching said container to a mounting bracket;

- a first partition positioned between and spaced from said top and bottom walls and in complementary engagement with said front wall, said rear wall, said first side wall and said second side wall such that a reservoir is formed between said bottom wall, said first partition, said first side wall, said front wall, said second side wall, and said rear wall, said first partition including openings therethrough for permitting said sterilization agent to pass to and from said reservoir;
- a second partition positioned between and spaced from said front and rear walls and in complementary engagement with said first partition, said top wall, said first side wall and said second side wall such that a sterilization agent compartment is formed between said second partition, said rear wall, said first partition, said top wall, said first side wall, and said second side wall and a toothbrush holder compartment is formed between said second partition, said first partition, said front wall, said first side wall, and said second side wall;
- divider means positioned within said toothbrush holder compartment for dividing said toothbrush holder compartment into individual toothbrush receiver compartments and interior portions thereof;
- a lid member for being pivotally mounted to said top wall;
- a hinge means interconnected between said lid member and said top wall for allowing said lid member to pivot with respect to said top wall between a first position wherein said lid member is positioned proximate said second access opening and a second position wherein said lid member is positioned away from said second access opening; and
- a shelf member extending from said bottom wall for receiving a toothpaste tube, whereby said sterilization agent deposited within said sterilization agent compartment through said first access opening flows through a portion of said openings in said first partition into said reservoir and upon said reservoir being filled with said sterilization agent, said sterilization agent flows through another portion of said openings in said first partition into said toothbrush receiver compartment to thereby sterilize any toothbrushes therein.

5,086,917
UTILITY CADDY FOR USE WITH OR WITHOUT A
BUCKET

Mark Dziarski, Simsbury, Conn.; Melissa Rader, Mendon, N.Y.; A. Stanley Tucker, Pleasanthope, Mo., and Walter Wilsford, Shreve, Ohio, assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 22, 1991, Ser. No. 673,739

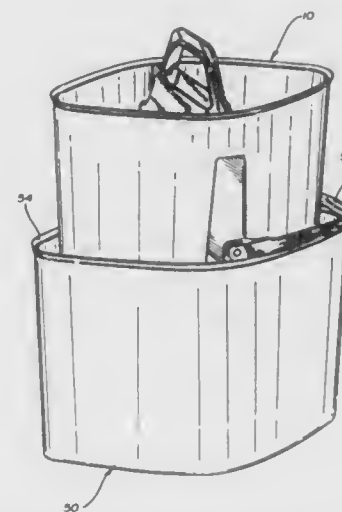
Int. Cl.³ B65D 25/28, 77/00, 1/36

U.S. Cl. 206—216

19 Claims

- 1. A utility caddy comprising:
 - a receptacle including two pairs of opposing walls having upper edges defining a rim;
 - partition means extending across said receptacle and dividing said receptacle into a pair of generally triangular compartments of substantially the same size, each com-

partment being bounded by an adjoining pair of said walls, said partition means, an a bottom wall; and



a handle formed integrally with said partition means and extending above the rim of said receptacle.

5,086,918
CIGARETTE CASING HAVING A BUTTON-ACTUATED
LEVER EJECTOR

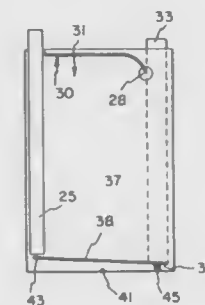
Michael P. D'Antonio, 45 Farmstead Rd., New Windsor, N.Y. 12553-7611

Filed Jul. 22, 1991, Ser. No. 733,877

Int. Cl.³ B65D 85/10

U.S. Cl. 206—250

6 Claims



1. A cigarette casing comprising:

- a) a housing having an internal chamber receiving a plurality of cigarettes;
- b) said housing having a top wall having (1) an opening sized to receive a cigarette therethrough and (2) an actuator button protruding therefrom, said housing having a cover movable from a first position closing said opening to a second position exposing said opening; and
- c) an actuator for causing dispensing of a cigarette from said chamber comprising:
 - i) a lever pivotable on a fulcrum, one end of said lever being aligned below said opening and another end of said lever being aligned below said button; and
 - ii) a linkage operatively connected between said another end of said lever and said button and cover whereby with a cigarette supported on said one end of said lever, depression of said button results in simultaneous movement of said cover to said second position thereof and reciprocation of said cigarette through said opening.

5,086,919
MULTIPLE PACKAGING FOR MAGNETIC TAPES
WOUND ON CORES

Jose Toral; Hermann Brandstetter; Hartmut Thiele; August Liepold, all of Munich, and Leo Gruber, Pentenried, all of Fed. Rep. of Germany, assignors to BASF Magnetics GmbH, Mannheim, Fed. Rep. of Germany

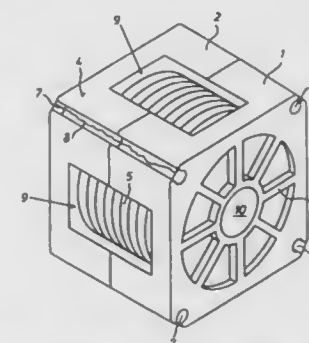
Filed Oct. 12, 1990, Ser. No. 596,475

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 8912747[U]; Oct. 27, 1989, 8912749[U]

Int. Cl.³ B65D 85/671

U.S. Cl. 206—303

7 Claims



- 1. A package of tape-wound reel cores comprising:
 - a plurality of recording media consisting of tape-wound reel cores, each having a core with an internal bore and a reel of tape wound about the core
 - pallets positioned around said recording media to contain the recording media,
 - a shrink film sealed over the pallets and by shrinkage of the film so that the pallets are drawn together,
 - groove-like notches at the edges of the pallets,
 - a weld seam in the shrink film positioned at one of the notches, closing the film over the pallets and recording media,
 - and a face on the interior of the pallet providing a support for a core having a tape wound about it and a support surface on the interior of the pallet for supporting the reel of tape.

5,086,920
SHIPPING CONTAINER HAVING CURVED DIVIDER
PANELS

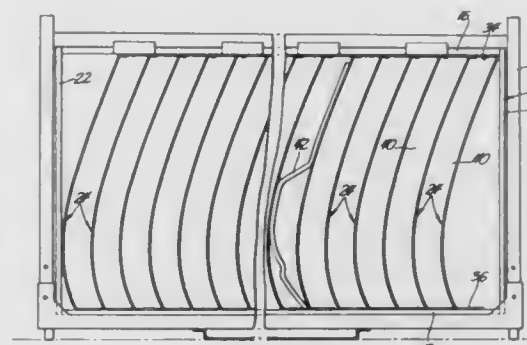
Robert Binienda, Northville, Mich., assignor to Erb Lumber Co., Birmingham, Mich.

Filed Jan. 24, 1991, Ser. No. 645,216

Int. Cl.³ B65D 85/68

U.S. Cl. 206—335

5 Claims



- 1. A shipping container comprising a rectangular frame (14) having at least one open side, a plurality of divider panels (24) mounted within said frame in generally equally spaced relationship with each other whereby adjacent panels form a

pocket (40) for receiving a part to be shipped within the container in non-contacting relationship to other parts, said rectangular frame including vertically spaced top and bottom walls (16, 18) joined at their respective ends by longitudinally spaced and normally disposed end walls (20, 22), each panel having a rectangular shape and being formed of a flexible material, the vertical dimension of each panel being greater than the interior height of the frame as defined by the distance between the vertically spaced top and bottom walls, each panel having top and bottom edges respectively secured to the top and bottom walls of said frame so as to impart a curvature to the panel, the curvature of each panel being substantially identical so as to provide a plurality of substantially identical shaped pockets.

2. A shipping container comprising a rectangular frame (14) having at least one open side, a plurality of divider panels (24) mounted within said frame in generally equally spaced relationship with each other whereby adjacent panels form a pocket for receiving a part to be shipped within the container in non-contacting relationship to other parts, said frame including vertically spaced planar top and bottom frame walls (16, 18) joined at their respective ends by longitudinally spaced and normally exposed end walls (20, 22), each panel having a rectangular shape and being formed of a flexible material, the vertical dimension of each panel being greater than the interior height of the frame as defined by the distance between the top and bottom walls, each panel having top and bottom edges, an upper transverse groove (26) formed in each panel parallel to and proximately vertically spaced from said top edge so as to define an upper planar flap (34), a lower transverse groove (28) formed in each panel parallel and proximately vertically spaced from said bottom edge so as to define a lower planar flap (36), each groove being sufficiently deep to form a thin panel wall section (30 or 32) to enable each flap to bend about its respective thin panel wall section, said flaps being respectively secured to the top and bottom frame walls so as to impart a curvature to each panel.

5,086,921

STORING ELEMENT FOR RING TRAVELLERS FOR SPINNING OR TWISTING MACHINES

Andreas Neff, Pfäffikon, Switzerland, assignor to Braecker AG, Switzerland

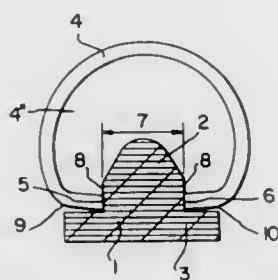
Continuation of Ser. No. 267,090, Nov. 4, 1988, abandoned, which is a continuation of Ser. No. 448,704, Dec. 10, 1982, abandoned. This application Dec. 5, 1989, Ser. No. 449,514

Claims priority, application Switzerland, Aug. 5, 1982, 4707/82-4

Int. Cl.³ B65D 85/24

U.S. Cl. 206-338

8 Claims



1. A ring traveller supply device comprising an elongate flexible storing element in combination with a plurality of aligned ring travellers intended to be used in ring spinning or ring twisting machines carried thereon, said elongate flexible storing element comprising a self-supporting elongate profiled strip of flexible material

said profiled strip having a first portion integrally interconnected with a second portion;

said first portion defining retaining means having a maximum width which is only slightly greater than the width of an opening in each of said ring travellers;

said retaining means being positioned within an internal

space of the ring travelers and serving for clamping leg portions of said ring travellers at said region of engagement of said retaining means and thus independently supporting each one of a series of said ring travellers on said elongate profiled strip; and

said second portion defining a back member positioned externally of said ring travellers and arranged to contactingly engage the leg portions of said ring travellers, said back member having a width substantially greater than said maximum width.

5,086,922

DISPOSAL FOR NEEDLES AND SYRINGES

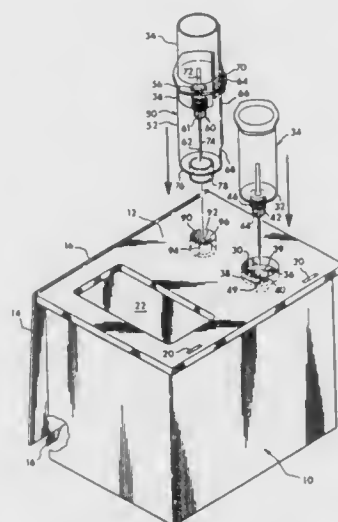
William E. Sagstetter, Denver, and John E. Cooke, Lakewood, both of Colo., assignors to Medical Safety Products, Inc., Denver, Colo.

Filed Jun. 12, 1990, Ser. No. 536,708

Int. Cl.³ B65D 85/24, 83/10; A61M 5/32

U.S. Cl. 206-366

45 Claims



1. A disposal for receiving double ended needles being in engagement with a blood collection tube holder and aligned with the longitudinal axis of the holder, said disposal comprising in combination:

a) a receptacle for housing the needles;

b) means disposed in said receptacle for receiving the anterior end of the holder and for accommodating rotation of the holder about its longitudinal axis, which holder includes a boss for engaging a hub disposed upon the double ended needle, said receiving means including means for supporting at least a part of the anterior end of the holder;

c) a post disposed within said receiving means for engaging the hub to prevent rotation of the hub about the longitudinal axis of the holder;

d) means for interferingly aligning the hub with said post upon axial movement of the holder along its longitudinal axis to engage the hub with said post and for preventing lateral displacement of the holder from its longitudinal axis; and

e) an aperture disposed in said receiving means for accommodating passage of the needle upon disengagement of the double ended needle from the holder resulting from rotation of the holder relative to the hub and withdrawal of the holder from said receiving means.

5,086,923

ENCLOSURE FOR OPTICAL DISK OR THE LIKE

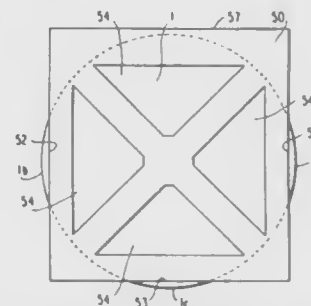
Richard W. King, Bloomington, Ind., and Timothy P. Wilsey, Pittsfield, Mass., assignors to Lakewood Industries, Inc., Pittsfield, Mass.

Continuation of Ser. No. 428,433, Oct. 31, 1989, abandoned, which is a continuation of Ser. No. 261,329, Oct. 24, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 602,377

Int. Cl.³ B65D 85/30, 85/57

U.S. Cl. 206-444

10 Claims



1. An enclosure for an optical disk or the like comprising:
 - (a) a pair of elongated, spaced apart substantially parallel side walls having substantially planar, spaced apart inner surfaces facing each other and forming an elongated, substantially flat space therebetween;
 - (b) an access opening formed in said side walls for permitting the gripping of the disk to facilitate the insertion and removal thereof into and from said enclosure;
 - (c) edge walls extending between opposed lateral edges of said side walls to enclose the lateral edges of said elongated space;
 - (d) an end wall extending between said side walls at one end thereof to enclose said one end of said elongated space and to form with said side walls and said edge walls a partially enclosed elongated and substantially flat cavity between said spaced apart, inner facing surfaces of said side walls, the other end of said cavity remaining open to form means for inserting and removing a disk into and from said cavity;
 - (e) positioning means permanently located within said cavity and supported on said edge walls and said end wall, said positioning means including means for engaging the outer edges of the disk at a plurality of spaced apart locations around the perimeter thereof to position the disk with the active face surfaces thereof positioned and held in spaced apart relation to said inner facing surfaces of said side walls and including grip means supported on said end wall for releasably gripping at least one edge of the disk; and
 - (f) said enclosure consisting of a one-piece unitary structure; where said grip means comprises a pair of opposed, resilient grip elements spaced apart a sufficient distance for snugly receiving an edge of the disk therebetween.

5,086,924

PERFORATED COOK-IN SHRINK BAG

Timothy T. Oberle, Duncan, S.C., assignor to W. R. Grace & Co., Conn., Duncan, S.C.

Division of Ser. No. 399,685, Aug. 25, 1989, Pat. No. 5,002,782, which is a division of Ser. No. 183,116, Apr. 19, 1988, Pat. No. 4,879,124, which is a continuation of Ser. No. 785,419, Oct. 8, 1985, abandoned. This application Jul. 25, 1990, Ser. No. 558,274

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.³ B65D 81/34, 30/08, 30/02

U.S. Cl. 206-497

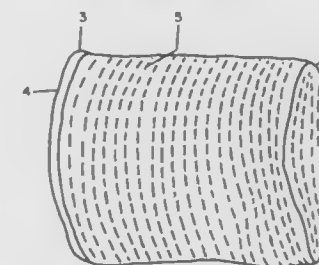
1 Claim

1. A perforated heat shrinkable bag capable of having meat products cooked therein, comprising:

(a) a seamless, biaxially oriented heat-shrinkable tube of thermoplastic film forming the body of the bag;

(b) a transverse heat seal closing one end of the tube, said closed end defining the bottom of the bag, the other end defining the mouth of the bag, said heat shrinkable thermoplastic film shrinking with predominantly transverse shrink tension;

(c) an array of spaced apart perforations in the body of said bag, said perforations being arranged and spaced apart relative to each other in both the transverse and longitudinal direction of the bag, each perforation being an elongated



gated slit aligned to extend in the transverse direction of the bag and the slits are dimensioned both in length and the space between slits sufficient such that when the bag is heat shrunk during cook-in with a meat product enclosed therein splitting of the tube film is reduced during cook-in, as compared to a needle perforated tube and

(d) wherein the film is a multi-layer film having a sealing layer comprising a polymer selected from the group consisting of EAA, EMAA, ionomers and blends of an ionomer, EAA or EMAA with polyolefin; and, at least one other layer comprising a blend of ethylene-vinyl acetate copolymer and linear low density polyethylene.

5,086,925

PACKAGING MADE OF CARD OR SIMILAR MATERIAL FOR PACKING A PLURALITY OF OBJECTS, A BLANK FOR MAKING SUCH PACKAGING BY FOLDING, AND A METHOD OF MANUFACTURING THE BLANK

Guy Coaller, Noce, and Jean-Claude Serre, Dijon, both of France, assignors to Otor, Paris, France

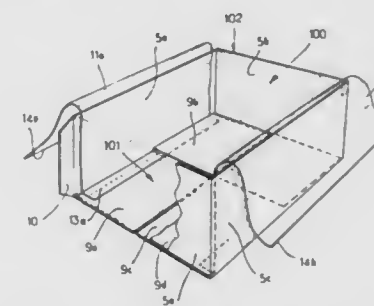
Filed Mar. 12, 1991, Ser. No. 668,129

Claims priority, application France, Mar. 12, 1990, 90 03118

Int. Cl.³ B65D 65/00

U.S. Cl. 206-497

19 Claims



1. Packaging made of card or similar material for packing a plurality of objects, the packaging comprising a body having a ring of sides and a bottom, thereby defining a volume for receiving said objects, and at least one sheet of shrinkable synthetic material fixed to said body for covering said plurality of objects and for holding the objects in place in said volume by said sheet being shrunk, said bottom being constituted by a plurality of flaps each of which is connected via a corresponding fold line to the bottom longitudinal edge of said ring of sides, said sheet being fixed to at least one of said bottom flaps which is covered, at least in part, by at least one other one of

said bottom flaps in such a manner as to clamp said sheet between said flaps.

5,086,926

DUAL THERMOS

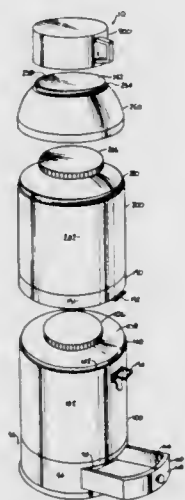
Lawrence E. Paige, 507 N. Lincoln, and Edward L. Nicholas,
131 N. Buchanan, both of Olathe, Kans. 66061

Filed Aug. 6, 1990, Ser. No. 563,065

Int. Cl.⁵ B65D 21/02

U.S. Cl. 206—542

19 Claims



1. In a thermal container for edibles having at least a first thermos, the improvement comprising:
storage means underlying said first thermos comprising:
a base for contact with an underlying support surface;
a housing extending from said base;
a slot in said housing;
a drawer slidable within and out of said slot for storage of articles therein; and
means for maintaining said drawer within said slot;
means for joining said housing to said at least first thermos;
a second thermos;
means for joining said second thermos to said first thermos comprising:
an annular shoulder about the top of said first thermos;
spacer means comprising a rim having a configuration complementary to said annular shoulder so as to engage said shoulder in a nesting relationship therebetween and further comprising:
a lug atop said rim;
means located in said second thermos for a nesting relationship with said lug;
thread means along a top of said rim;
thread means along a bottom of said second thermos, said second thermos thread means functionally engaging said rim thread means to present said first and second thermoses in a longitudinally-aligned relationship with said nesting relationship enhancing the stability therebetween.
7. A thermal container for edibles having a single thermos or dual thermos capability, said container comprising:
a support base;
thread means on said support base;
complementary thread means on a first thermos for functional engagement with said support base thread means;
a spacer;
a shoulder about said first thermos for nesting engagement with said spacer element;
thread means about said spacer element;
complementary thread means about a second thermos, said second thermos thread means functionally engageable with said spacer thread means or said support base thread means, said complementary thermos thread means pres-

enting either a dual thermos capability upon engagement of said second thermos thread means with said spacer thread means or a single thermos capability upon engagement of said thread means on said first or second thermoses with said thread means on said base;
at least one liquid vessel for edibles;
means about said vessel for engagement with either said second thermos during said dual thermos capability or with said spacer thread means during said single thermos capability, said means comprising:
a thread about said vessel for engagement with said spacer thread means or said thread means about said second thermos.

9. In a thermal container for edibles having at least a first thermos, the improvement comprising:
storage means underlying said first thermos comprising:
a base for contact with an underlying support surface;
a housing extending from said base;
a slot in said housing;
a drawer slidable within and out of said slot for storage of articles therein; and
means for maintaining said drawer within said slot;
means for joining said housing to said at least first thermos;
a second thermos;
means for joining said second thermos to said first thermos comprising:
an annular shoulder about the top of said first thermos;
spacer means comprising a rim having a configuration complementary to said annular shoulder so as to engage said shoulder in a nesting relationship therebetween;
thread means along a top of said rim;
thread means along a bottom of said second thermos, said second thermos thread means functionally engaging said rim thread means to present said first and second thermoses in a longitudinally-aligned relationship therebetween;
a liquid vessel for separate storage of the edibles;
means for user-selectably joining said liquid vessel to said first or second thermoses;
a second liquid vessel for storage of edibles in said other container therein;
means for joining said second vessel to said first vessel for transport.

14. In a thermal container for edibles having at least a first thermos, the improvement comprising:
storage means underlying said first thermos comprising:
a base for contact with an underlying support surface;
a housing extending from said base;
a slot in said housing;
a drawer slidable within and out of said slot for storage of articles therein; and
means for maintaining said drawer within said slot;
means for joining said housing to said at least first thermos whereby to present a thermal container for transport of edibles and articles;
a second thermos;
means for joining said second thermos to said first thermos in a longitudinally-aligned relationship therebetween comprising:
an annular shoulder about the top of said first thermos;
spacer means comprising a rim having a configuration complementary to said annular shoulder so as to engage said shoulder in a nesting relationship therebetween;
thread means along a top of said rim;
thread means along a bottom of said second thermos, said second thermos thread means functionally engaging said rim thread means to present said first and second thermoses in a longitudinally-aligned relationship therebetween;
a first clamping means on said first thermos;
a complementary clamping means on said rim of said spacer means, said clamping means engageable to secure relationship between said rim and said first thermos.

5,086,927

PALLET FOR HEAVY LOADS

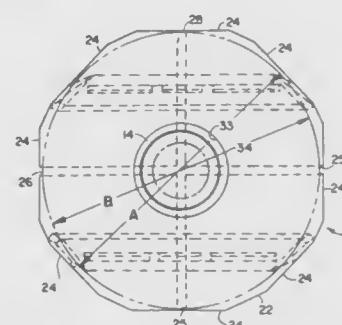
Gary M. Bach; Carl R. Baehman, both of Appleton, Wis.;
Frederick M. Holt, Jr., Midlothian, Va., and Terry T. Highfield, Sheffield, Ala., assignors to Reynolds Consumer Products, Inc., Appleton, Wis.

Filed Dec. 6, 1990, Ser. No. 624,734

Int. Cl.⁵ B65D 85/66

U.S. Cl. 206—597

10 Claims



1. A molded pallet for securely holding coiled materials, comprising:
a platform having eight sides and a generally octagonal shape configured to securely hold a coiled material having coils which extend into close proximity to each side, respective legs extending from a lower surface of said platform and disposed lengthwise in parallel arrangement, a first groove recessed in said lower surface of said platform and disposed parallel to said legs,
a second groove recessed in said lower surface and disposed perpendicular to said legs wherein said first and second grooves function to hold tie straps which secure said coiled material to said pallet, and
respective apertures in communication with said second groove and extending through said legs whereby a tie strap can be inserted through said legs and remain within said second groove.
5. A molded one piece pallet supporting a heavy metal coiled stock having a predetermined diameter, said pallet comprising:
a generally octagonal platform having a top surface and a bottom surface, each pair of opposing sides of said platform having an inside diameter therebetween being substantially equal to the outside diameter of the coiled stock, and
a pair of legs molded on the bottom of said platform for supporting the platform.

5,086,928

FLAT TOP END CLOSURE FOR LIQUID CONTAINERS

Robert E. Lisiecki, W. Bloomfield, Mich., assignor to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Dec. 7, 1990, Ser. No. 623,789

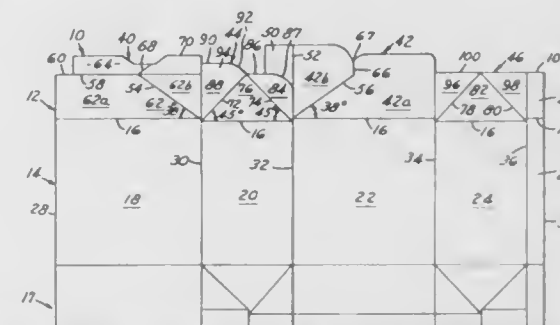
Int. Cl.⁵ B65D 5/74

U.S. Cl. 229—217

7 Claims

1. In a flat top end closure for a liquid carrying, thermoplastic-coated paperboard container having a tubular body and including two oppositely disposed infolded panels and two oppositely disposed outer closure panels, one of said infolded panels adapted to serve as a pouring spout, said infolded panels each including a substantially triangular panel portion defined by converging diagonal score lines and being integrally connected to said tubular body, and a first pair of fold-back panels integrally connected to and folded between each of said substantially triangular panel portions and the respective adjacent outer closure panels, said two oppositely disposed outer closure panels including one shorter and one longer panel, with the edge portion of said longer panel overlapping the edge portion of said shorter panel and each having a diagonal opening-assist score line formed thereon to form a second pair of fold-back panels between said respective diagonal opening-

assist score lines and said first pair of fold-back panels, a first lift tab formed on a side edge of said longer panel for lifting the portion of said overlying longer panel adjacent its diagonal opening-assist score line and the integrally connected underlying fold-back panel of said pouring spout, and a second lift tab formed on the other of said fold-back panels of said pouring spout for lifting said other fold-back panel and the portion of



said overlying shorter closure panel adjacent its diagonal opening assist score line to enhance the opening of the infolded panel bearing said second lift tab into said pouring spout, characterized by said opening-assist score lines being formed so as to be at a constant angle with respect to said respective underlying converging diagonal score lines and spaced apart therefrom in a predetermined rearward orientation with respect to said pouring spout.

5,086,929

SORTING APPARATUS AND METHOD

Robert A. Richter, Deerfield; Maurice C. Rochman, Plantation, and Stephen M. Gordon, Hallandale, all of Fla., assignors to G B Instruments, Inc., Hollywood, Fla.

Filed Feb. 20, 1990, Ser. No. 482,182

Int. Cl.⁵ B07C 1/00, 5/36

U.S. Cl. 209—698

40 Claims



1. Apparatus for sorting articles into a selected one of a multiplicity of article-receiving receptacles, said apparatus comprising a plurality of carriers, means for conveying said carriers together with said articles received therein along a path, a loading station along said path at which articles to be sorted are loaded into said carriers, a plurality of unloading stations along said path, each said unloading station having at least a first article-receiving receptacle on one side of said path and a second article-receiving receptacle on the other side of said path, means for supporting each of said carriers on said conveying means as said carrier is conveyed along said path in a generally vertical loading position, in a first inclined position in which an article unloaded from said carrier at a selected one of said unloading stations is delivered to said first article receiving receptacle, or in a second inclined position in which an

article unloaded from said carrier at said selected one of said unloading stations is delivered to said second receptacle, means for prepositioning a selected one of said carriers in one of its said inclined positions as said selected one carrier moves along said path to said selected one unloading station, and means at said selected one unloading station for effecting the unloading of said article from said selected one carrier thereby to deliver said article carried by said selected one carrier to a predetermined article receiving receptacle at said selected one unloading station.

5,086,930

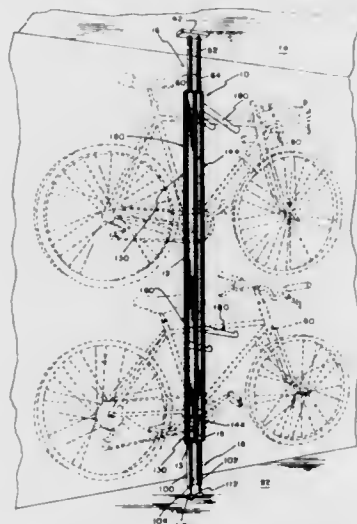
STORAGE SYSTEM FOR HOLDING ATHLETIC EQUIPMENT AND A METHOD

Ford Saeks, P.O. Box 16577, Wichita, Kans. 67216-0577
Filed Mar. 21, 1990, Ser. No. 496,960

Int. Cl.⁵ A47F 5/00

U.S. Cl. 211-17

2 Claims



1. A storage system for holding athletic equipment comprising:

- a body member having a structure defining an internal channel means for slidably receiving an upper height adjustment member and a lower height adjustment member, said body member additionally having a structure defining an opening communicating with the internal channel means;
- an upper height adjustment member slidably disposed within the internal channel means;
- a lower height adjustment member slidably disposed within the internal channel means; and said internal channel means comprises a first internal channel and a pair of opposed second internal channels positioned on opposite sides of said first internal channel with said first internal channel and said pair of opposed second internal channels communicating with said opening.

5,086,931

DEVICE FOR HOLDING STACKED CAPS

Denis Cobb, 11529 S. Norlain Ave., Downey, Calif. 90241

Continuation-in-part of Ser. No. 508,006, Apr. 10, 1990, abandoned. This application Aug. 30, 1990, Ser. No. 575,557

Int. Cl.⁵ A47F 7/00

U.S. Cl. 211-32

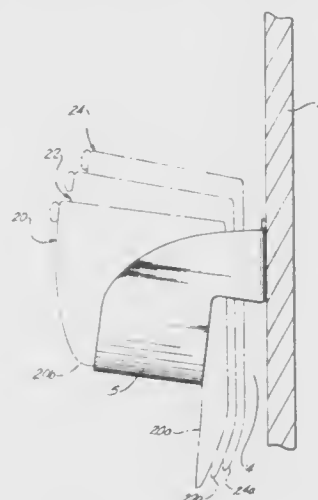
16 Claims

1. A device mountable to a wall for supporting a plurality of stacked caps, comprising:

- a concave portion for vertically supporting a crown of a lowermost one of the stacked caps;
- two end portions connected to the concave portion for mounting the device to the wall, the concave portion being so shaped and disposed as to define a gap between it and the wall for receiving visors of the stacked caps,

wherein the lowermost cap is supported so as to be adapted for supporting a crown of a next one of the stacked caps;

wherein the concave portion has a width in a direction



perpendicular to the wall for contacting and supporting substantially all of the front of the crown of the lowermost one of the stacked caps; and wherein the width of the concave portion is inclined upwardly away from the wall.

5,086,932

RACK PACKAGE

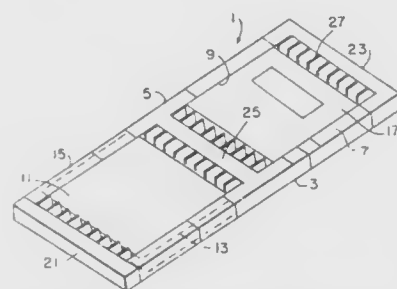
Paul J. Gelardi, P.O. Box 127, Cape Porpoise, Me. 04014, and John A. Gelardi, Cape Porpoise, Me., assignors to Paul J. Gelardi, Kennebunkport, Me.

Continuation of Ser. No. 417,633, Oct. 5, 1989, abandoned. This application Nov. 26, 1990, Ser. No. 617,384

Int. Cl.⁵ A47F 7/00

U.S. Cl. 211-40

27 Claims



1. Rack apparatus formed entirely as a single piece for disc record media storage cases and comprising a one-piece elongated frame having longitudinally extending parallel side walls, transverse end walls extending parallel to each other and fixedly connected between ends of the side walls and a transverse central wall extending parallel to the end walls and fixedly connected between centers of the side walls, the end walls having similar regularly spaced short, oppositely extending dividers extending toward the end walls parallel to the side walls, bases extending near the bottom of the short dividers, and forming with the dividers, the transverse walls and the side walls, a compact disc storage case rack for holding plural compact disc storage cases generally upright between the dividers parallel to the side walls; and lips fixedly connected to and extending inward from the entire length of the upper edges of the side walls and keepers integrally formed in the dividers extending inward near the bases and beyond the reach of the dividers for holding a disc record media storage case between

the side walls, the dividers, the lips and the keepers in a generally horizontal orientation.

5,086,933

PRINTED WIRING BOARD MOUNTING ASSEMBLY

David G. Sykes, and Alan Jordan, both of Coventry, England, assignors to GEC Plessey Telecommunications Limited, Coventry, England

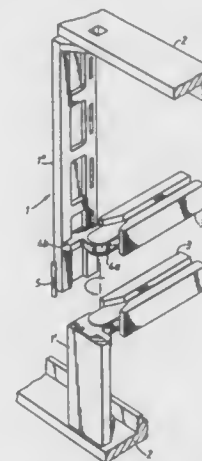
Filed Jun. 27, 1990, Ser. No. 544,424

Claims priority, application United Kingdom, Aug. 31, 1989, 8919725

Int. Cl.⁵ A47B 63/00

U.S. Cl. 211-41

8 Claims



1. A printed wiring board mounting arrangement comprising:

- a pair of substantially parallel cross-members, at least one vertical support structure extending between said cross-members and pivotally mounted, at respective ends of the vertical support structure, on said cross-members,
- at least two printed wiring board guides arranged substantially parallel to each other and to said cross-members and in a vertical plane,
- a first knuckle arrangement interconnecting a first end of each guide to said vertical support structure so that the vertical support structure is rotatable between first and second positions, relative to said guides,
- means at a second end of each guide for securing the guide to a backplane, the vertical support structure being rotatable to said first position, permitting access to the guides, and to said second position, preventing access to the guides, and
- a second knuckle arrangement interconnecting each of the upper and lower ends of said vertical support structure to one of the cross-members, each second knuckle arrangement forming a locking mechanism so that said vertical support structure is held in a locked condition when it is in both the first position and the second position.

5,086,934

RADIOGRAPHIC FILE HOLDER

John K. Kelly, 2293 Rio de Janeiro Ave., Punta Gorda, Fla. 33983

Filed Dec. 10, 1990, Ser. No. 624,573

Int. Cl.⁵ A47F 5/00

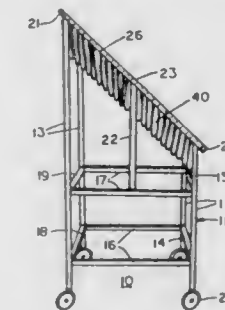
U.S. Cl. 211-45

4 Claims

1. A new and improved portable, radiographic film record holder comprising:

- a wheel-bearing supporting base having, front corner posts, rear corner posts and side vertical posts, said rear corner

and vertical posts being longer than said front corner posts, a pair of hanging bars supported on the top edges of said front, rear and vertical posts and forming an inclined plane extending upwardly from said front corner posts to said rear corner posts, said hanging bars having a plurality of equally spaced apart holes formed therein, and means supported by said hanging bars for removably supporting a plurality of said records in a stepped relation-



ship, said means comprising a continuous flexible strip having: a plurality of equally spaced apart pockets formed across the width of said flexible strip and along the entire length of said flexible strip, and a plurality of bar means inserted into said pockets and fixedly mated with said holes in said hanging bars and forming a series of downwardly hanging, equally spaced, stepped, flexible, film record holder slots.

5,086,935

DISPENSING RACK WITH MOVABLY POSITIONABLE HANGERS

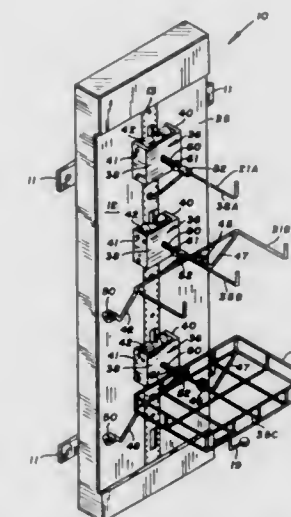
David Gallagher, 10858 Cedar Bend, Minnetonka, Minn. 55343

Filed Oct. 26, 1990, Ser. No. 603,893

Int. Cl.⁵ A47F 5/00

U.S. Cl. 211-103

3 Claims



1. In a merchandise storing and dispensing rack means comprising frame supporting means, shroud means, and an endless merchandise display supporting belt trained about toothed drive and idler rollers, each of which is journaled for rotation about generally parallel spaced-apart axes, and with drive means for powering said drive roller, and merchandise loading and carrying means coupled to said endless display supporting belt, said merchandise display rack means being characterized in that;

- (a) said shroud means having an outwardly facing panel with a slotted belt receiving channel formed therein, said endless display supporting belt disposed for running movement within said shroud channel and having a plurality of axially spaced-apart roller receiving slots and drive bracket receiving bores formed therein;
- (b) merchandise loading and carrying means having a merchandise load receiving rod means including a centrally disposed support rod extending rearwardly of said merchandise loading and carrying means and arranged to be releasably coupled to said belt and further comprising an elongated generally "U"-shaped roller supported channel means with an outer rod receiving plate with a rod receiving guide bore formed therein, and a pair of laterally disposed roller supported legs extending from said rod receiving plate;
- (c) a pair of spaced apart channel supporting rollers journaledly supported across said roller supported legs and disposed to contact the surface of said shroud laterally of said belt receiving channel;
- (d) a drive bracket slidably secured to the shank of said centrally disposed rod at its proximal end and having its distal end received within one of said drive bracket receiving bores; and
- (e) an additional roller journaledly secured to the distal end of said centrally disposed rod adapted to be operably disposed parallel to said channel supporting rollers, and having a length and diameter which is less than the length and diameter of said roller receiving slot so as to enable passage of said roller through said slot, and resilient biasing means arranged radially outwardly of said centrally disposed rod and normally biasing said third roller into contact with the surface of said shroud means opposed to said belt receiving channel.

5,086,936

CABINET STACKING BASKET ORGANIZER

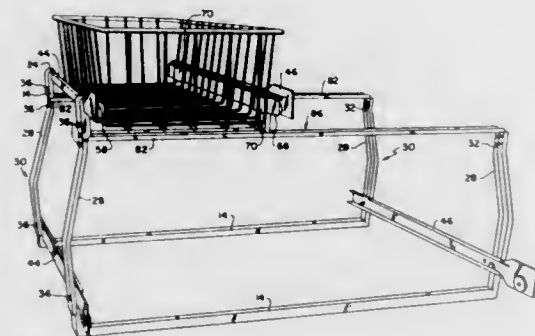
Lee Remmers, Ocala, Fla., assignor to Clairson International, Fla.

Filed Apr. 9, 1990, Ser. No. 506,207

Int. Cl.⁵ A47F 3/14

U.S. Cl. 211—126

4 Claims



1. An assembly comprising:

- a first base frame, said first base frame including first and second base frame members, each said base frame member having a longitudinal axis, and means for interconnecting longitudinal ends of said base frame members so that said base frame members are disposed in parallel spaced apart relation;
- a second base frame, said second base frame including first and second base frame members, each said base frame member having a longitudinal axis, and means for interconnecting longitudinal ends of said base frame members so that said base frame members are disposed in parallel spaced apart relation;
- means for mounting said second base frame vertically above and spaced from said first base frame, said means for mounting including a plurality of upright elements, each said upright element having a longitudinal axis and first

and second ends, said upright elements being mounted to said first base frame at said first end thereof so as to extend vertically upwardly from said first base frame, and means for mounting said second base frame to said second end of said upright elements;

a first storage element slidably mounted to said means for interconnecting longitudinal ends of said base frame members of said first base frame; and

a second storage element slidably mounted to said means for interconnecting longitudinal ends of said base frame members of said second base frame,

said means for mounting said second base frame to said upright elements includes at least first and second storage element mounting brackets coupled to and extending between first and second opposed pairs of upright elements so that said storage element mounting brackets are disposed in parallel, spaced relation and are spaced apart a distance corresponding to a spacing of said base frame members of said second base frame, said base frame members of said second base frame being slidably mounted to said storage element mounting brackets so as to be slidable along longitudinal axes thereof and transversely with respect to a longitudinal axis of said second storage element.

5,086,937

LIGHTWEIGHT PLASTIC BOTTLE AND METHOD AND APPARATUS FOR FORMING

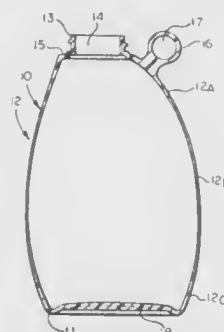
Gerald R. Robinson, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Oct. 9, 1990, Ser. No. 594,807

Int. Cl.⁵ B65D 1/02, 1/40, 23/10

U.S. Cl. 215—100 A

24 Claims



1. A plastic bottle comprising:

- (a) a base including a bottom intended to rest upon a supporting surface, said base having a predetermined average thickness providing sufficient strength and rigidity to maintain its shape as molded;
- (b) an integral body portion extending upwardly from said base, said body portion including a shoulder portion at its upper end, a central area and a lower area adjacent said base, said shoulder portion having a predetermined average thickness providing sufficient strength and rigidity to maintain its shape as molded;
- (c) dispensing means extending upwardly from said shoulder portion;
- (d) an integral handle extending from said shoulder portion, said integral handle being solid; said body portion central area having an average thickness less than said base predetermined average thickness, said central area average thickness being insufficient to permit said body portion to maintain its shape as molded during handling without supplementary supporting means and the thickness of said handle at its juncture with said shoulder portion does not exceed 0.045 inch.

5,086,938

PILFER-PROOF CLOSURE FOR CONTAINERS AND INJECTION MOULD FOR PRODUCING THE CLOSURE

Dietmar F. Aichinger, Alteselweg 287, CH-4497 Rüthenberg, Switzerland

PCT No. PCT/AT89/00011, § 371 Date Jul. 26, 1990, § 102(e)

Date Jul. 26, 1990, PCT Pub. No. WO89/07557, PCT Pub.

Date Aug. 24, 1989

PCT Filed Feb. 7, 1989, Ser. No. 474,823

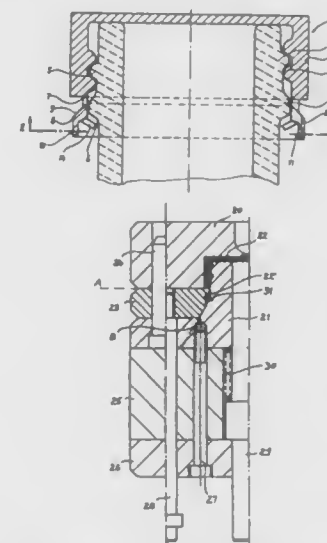
Claims priority, application Austria, Feb. 16, 1988, A356/88;

Nov. 14, 1988, A2783/88

Int. Cl.⁵ B65D 41/34; B29D 1/00

U.S. Cl. 215—252

14 Claims



1. A pilfer-proof closure for containers, such as bottles and the like, having

- a closure cap (1) of plastic designed as a screw cap, the shell (2) of which is connected in the region of the inner circumference of the shell, via tear-off webs (7) to a pilfer-proof strip (8), the outside of which has a wall section (9) running obliquely outwardly and downwardly adjoining the webs and which on its inside bears at least one retention member (14) which extends into the inner space bounded by the pilfer-proof strip and, when the closure cap has been screwed onto the container orifice, engages beneath an annular snap-on projection (6) of the container arranged below the screw thread (5) of the container,

the pilfer-proof strip having on its inside, in the region of the retention member, a circumferential recess (11) which is open towards the lower end of the pilfer-proof strip, which runs essentially axially and defines an upper wall section (12) and from the upper section (12) of which the retention member (14) extends,

characterized in that in axial section, the retention member (14) has inner and outer faces and

in that the radial depth (z) of the circumferential recess (11) is at least equal to the maximum width (x) of the retention member (14) in axial section.

9. An injection mould for producing a pilfer-proof closure as claimed in claim 1,

- having
- a cavity plate (20) and a mould core (21) which together delimit a first mould cavity (22) for the closure cap (1) and can be moved relative to one another in axial direction upon release of the mould,
- an axially movable stripper plate (23) which, together with the mould core (21), delimits a second mould cavity (22') for the pilfer-proof strip communicating with said first cavity; and
- an ejector mechanism (29) for the closure cap, a first mould parting line (A) being formed between the

cavity plate (20) and the stripper plate (23), said first parting line starting from the lower edge of the closure cap,

characterized in that the stripper plate (23) and the mould core (21) adjoin one another along a second common mould parting line (B) which second parting line runs obliquely outwardly from the lower inside edge of the second mould cavity (22') for the pilfer-proof strip,

in that the mould core (21) has at least one recess (31) for the formation of the retention member (14), said recess (31) communicating with the second mould cavity (22') for the pilfer-proof strip above the second oblique mould parting line (B), starting from a shoulder of the mould core and, in axial section, having sides which extend downwardly; and

in that guide means (24, 28) are provided, guiding relative movement of said stripper plate (23) and said mould core (21) in axial direction to permit said retention members (14), when formed, to resiliently escape into the recesses (11) of the pilfer-proof strip (8).

5,086,939

POTS

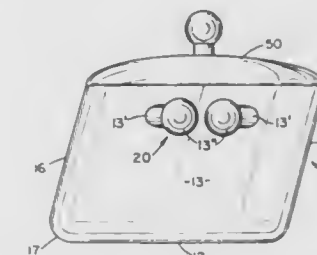
Keith Foulkes, Jr., 5520 E. Edgerton, Brecksville, Ohio 44141

Filed Dec. 17, 1990, Ser. No. 628,392

Int. Cl.⁵ B65D 25/28

U.S. Cl. 220—94 A

3 Claims



1. A pot comprising a flat bottom portion, parallel rear and front sides extending upwardly from the bottom portion, said rear and front sides being disposed rearwardly in the same direction at an inclined angle to the bottom portion, lateral sides connecting the rear and front sides disposed at an angle of approximately 90 degrees to the bottom portion.

5,086,940

CONTAINER FOR NEWSPAPERS

Donna M. Parker, 180 Queen Mary Road, Apt. 405, Kingston, Ontario, K7M 2A8, and John Madden, Apt. 11, 15 Manitou Crescent W, Amherstview, Ontario, K7N 1C1, both of Canada

Filed Aug. 5, 1991, Ser. No. 740,112

Int. Cl.⁵ B65D 53/00

U.S. Cl. 220—214

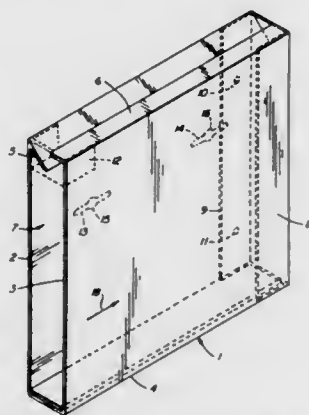
3 Claims

1. A tamper proof container for receiving and temporarily storing newspapers and the like and mountable on a door comprising:

a substantially rectangular container having slot means in one side thereof adapted for insertion of a newspaper therethrough and including means to preclude withdrawal of said newspaper therethrough;

said container having an open side located, when said container is mounted in operative position on said door, closely adjacent to a door jamb thereof such that when said door is closed access to said open side is precluded

and when said door is open access to said open side is facilitated for removal of said newspaper;



and tamper proof means between a rear face of said container and a face of said door for securing said container to said face to said door in said operative position.

5,086,941

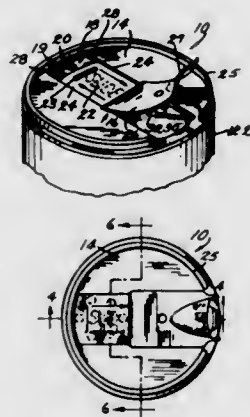
DISPENSER CLOSURE ASSEMBLY

Brent W. English, Eau Claire; Robert W. Manthey, and Kevin Gottwalt, both of Menomonie, all of Wis., assignors to Board of Regents of the University of Wisconsin System on Behalf of University of Wisconsin - Stout, Menomonie, Wis.
Filed Jan. 25, 1990, Ser. No. 470,346

Int. Cl.⁵ B65D 51/18

U.S. Cl. 220—254

20 Claims



1. An end closure assembly for a container comprising: an end wall member secured within and closing one end of a container, said end wall having at least one flow-through aperture for allowing dispensing of the container contents, said end wall having means defining elongated pathway means extending across the end wall, and a closure member having first and second portions hingably connected together in an end-to-end relationship, the first portion slidably operable to cover and uncover the flow-through aperture, the second portion pivotally operable to lock the closure means in a fixed position; and hinge means integral with the end wall member and the closure member which prohibits movement of the closure member with respect to the end wall member while the hinge means is intact.

5,086,942

COVER WITH LOCKING DEVICE

Johann Merz, Schwäbisch Gmünd; Josef Schmid, Mutlangen, and Eckard Kelcher, Neuenstadt, all of Fed. Rep. of Germany, assignors to Zahndradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP88/00852, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO89/02857, PCT Pub. Date Apr. 6, 1989

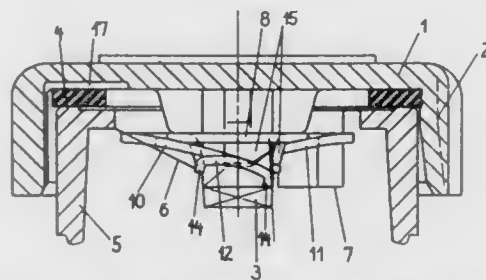
PCT Filed Dec. 17, 1988, Ser. No. 460,918

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731798

Int. Cl.⁵ B65D 41/06

U.S. Cl. 220—302

9 Claims



1. A cover (1) and locking device for a tank (5) opening, said locking device comprising a bed plate (8) having an aperture (9) for receiving a cover pin (3) carried by the cover for securement of the locking device to the cover; said bed plate carrying diametrically opposed locking elements (14) for coaction with a bayonet track ridge inside the tank;

the improvement wherein:

said bed plate has flexible curved arms (10, 11) carrying said locking elements (14) and said flexible arms extending from said bed plate (8); said bed plate having said aperture (9) and flexible prongs (15) extending outward from the edge of said aperture for gripping said cover pin to secure said locking device to said cover, wherein said bed plate, flexible arms, and flexible prongs are formed integrally of a spring material.

5,086,943

SEALING CAP ASSEMBLY FOR AN ACCESS APERTURE

Fredrick R. Poskie, Plymouth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 3, 1991, Ser. No. 709,464

Int. Cl.⁵ B65D 51/16

U.S. Cl. 220—374

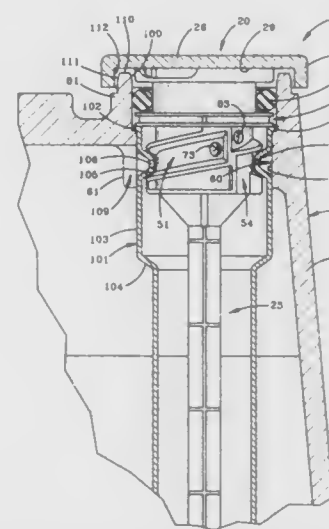
10 Claims

1. A sealing cap assembly comprising: a body portion having a radially outermost extent; thread path means extending along, and being recessed inwardly with respect to, the radially outermost extent of said body portion; at least one hollow chamber provided interiorly of said body portion; port means penetrating said body portion in the location of said thread path means recess, to provide communication between said thread path means and said hollow chamber; a cap portion attached to said body portion, and being disposed in spaced relation with respect thereto in order to provide communication between said hollow chamber and the environment to which said cap portion is exposed.

8. A sealing cap assembly in combination with an access aperture for a housing: a boss circumscribing the access aperture; said boss having an upper surface, a flared inner surface and a cylindrical outer surface; a stop ledge presented from the interior of said boss; engaging protuberances extending inwardly with respect to said boss; the sealing cap assembly having a body portion and a cap portion; said body portion having radially outermost extent; thread path means extending along, and being recessed inwardly with respect to, the radially outermost extent of said body portion to interact with said engaging protuberances; at least one hollow cubicle provided

interiorly of said body portion; port means penetrating said body portion in the location of said thread path means recess to provide communication between said threaded path means and said hollow cubicle; sealing means presented from the exterior of said body portion to interact with the flared surface of said access aperture; flange means also being presented from said body portion to interact with said stop ledge; a cap portion; said cap portion having a circular plate circumscribed by an annular skirt; spacing means; said spacing means extending between said plate and said body portion to define a spaced

and wherein the curl is generally oval in cross-sectional configuration having a height, generally parallel to the axis of the pail



relation therebetween in order to provide a portion of a maze-like passageway interposed between said body portion and said cap portion; said spacing means and the interaction between said flange means and said stop ledge combining to effect that portion of a maze-like passageway extending radially between the upper surface on said boss and the plate of said cap portion; and, said skirt being disposed radially outwardly from the outer surface of said boss to effect that portion of a maze-like passageway extending axially between the outer surface on said boss and the skirt of said cap portion.

5,086,944

DRUM OR PAIL CLOSURE

Douglas C. Duffy, West Ryde, and Richard D. Temby, Woodville West, both of Australia, assignors to Rheem Australia Ltd., Australia

Division of Ser. No. 893,790, Aug. 6, 1986, Pat. No. 4,938,051.

This application Aug. 22, 1988, Ser. No. 235,107

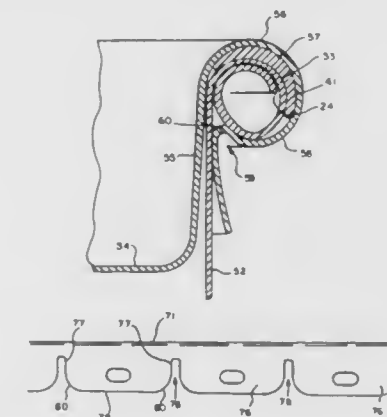
Claims priority, application Australia, Dec. 7, 1984, PG8469; Sep. 30, 1985, PH2676

Int. Cl.⁵ B65D 41/10

U.S. Cl. 220—658

19 Claims

1. A cylindrical open head sheet metal pail or drum having a top rim formed as an outwardly rolled curl wherein the upper peripheral edge of the sheet metal has been curled or rolled outwardly, wherein the curl comprises two components, namely primary curl adjacent the peripheral edge and a secondary curl of larger cross-sectional diameter extending from the primary curl to the cylindrical wall of the pail or drum, the primary curl being curled through at least 180 degrees and the secondary curl through at least 270 degrees, wherein the primary curl touches and follows along the curve of the inside of the uppermost portion of the secondary curl



or drum, greater than the width, generally along the diameter of the pail.

5,086,945

TABLET SELECTOR AND PACKAGING SYSTEM USING SAME

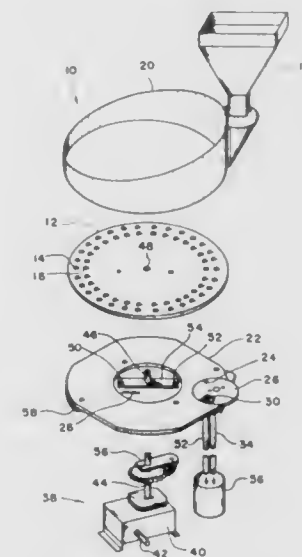
Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602

Filed Mar. 9, 1990, Ser. No. 491,169

Int. Cl.⁵ B65G 59/00

U.S. Cl. 221—13

15 Claims



9. A tablet selector comprising: a rotatable disk having an upper surface and a plurality of pairs of first and second openings disposed radially at a peripheral region of the disk; a bin disposed around the disk for collecting tablets on the upper surface of the disk; a stationary support plate disposed under the rotatable disk and having a cut-out region formed in a peripheral region thereof for passing tablets discharged from the plurality of pairs of first and second openings to a form, fill and seal packaging station; and means disposed in the cut-out region of the stationary support plate for selectively blocking either one or both of the first and second openings of the rotatable disk.

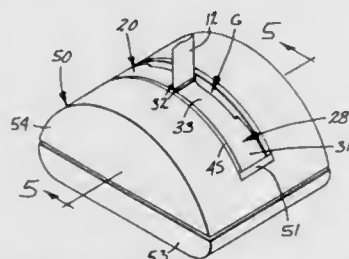
5,086,946

SHEET STACK AND DISPENSER PACKAGE THEREFOR
Elmer Blackwell, Woodbury; Bruce E. Samuelson, Stillwater;
John J. Emmel, Blaine, all of Minn., and Harry A. Loder,
Paradise, Calif., assignors to Minnesota Mining and Manu-
facturing Company, St. Paul, Minn.

Filed Dec. 10, 1990, Ser. No. 625,311
Int. Cl.⁵ B65H 1/00

U.S. Cl. 221-45

26 Claims



1. A dispenser for flexible sheets from a stack of pre-cut sheets disposed one on top of another, each sheet comprising a backing having first and second opposite major side surfaces and first and second opposite ends with the first end of each sheet being in alignment with the second end of an adjacent sheet in said stack, and a layer of adhesive permanently adhered to the first side surface of said sheet backing, the layer of adhesive of each sheet being releasably adhered along the second surface of the adjacent sheet in said stack, said sheets comprising release means for providing a first adhesion level along a first end portion of each of said sheets adjacent said first end of said backing between said layer of adhesive and the second side surface of the adjacent sheet in the stack to which said layer of adhesive is releasably adhered, which first adhesion level provides a sufficiently low release force between said adhesive coating and the adjacent sheet to which the adhesive is releasably adhered to afford sliding movement between the side surfaces of the adjacent sheets along said first end portion, and attachment means for providing a second adhesion level along a second end portion of each of said sheets adjacent said second end of said backing between said layer of adhesive and the second side surface of the adjacent sheet in the stack to which said layer of adhesive is releasably adhered, which second adhesion level provides a release force that is higher than said low release force along said first end portion and firmly adheres the sheet to the adjacent sheet in the stack during sliding movement of the sheet relative to the adjacent sheet along said first end portion while affording peeling away of the sheet along said second end portion, the dispenser comprising:

walls having surfaces defining a cavity adapted to receive the stack, said walls including
a bottom abutment wall defining a bottom surface,
end walls defining end surfaces at opposite ends of said bottom surface and having generally parallel outer ends,
arcuate wall portions generally opposite said bottom abutment wall extending generally toward each other from said outer ends and having spaced distal ends, said arcuate wall portions defining arcuate friction surface portions, opposed outlet surfaces at said distal ends defining an opening through said walls,
said arcuate friction surface portions and said bottom surface being shaped to afford reciprocating movement of the stack of sheets within the cavity in response to forces applied to the stack to sequentially remove sheets from the stack through said opening, and to position the uppermost sheets of the stack adjacent the arcuate friction surface portions with the second end portion of the uppermost sheet in the stack projecting through the opening so that by grasping that second end portion, the uppermost sheet in the stack can be manually pulled through the opening and will carry with it the second end portion of the sheet beneath it in the stack to which the uppermost sheet is adhered by the adhesive coating, placing that second end

portion in a position where it also may be grasped and pulled to withdraw that sheet from the stack,
said arcuate friction surface portions being shaped to provide means for affording sliding movement of the adhesively joined first end portion of the uppermost sheet and the second end portion of the sheet beneath the uppermost sheet between the second side surface of a subsequent sheet in the stack and the adjacent arcuate friction surface portion, and for making sufficient frictional engagement with the second side surface of the sheet beneath the uppermost sheet to restrict the movement of the sheet beneath the uppermost sheet between the rest of the stack and the adjacent arcuate friction surface portion to thereby afford peeling separation between the uppermost sheet and the sheet beneath it after the uppermost sheet is withdrawn from the dispenser.

5,086,947

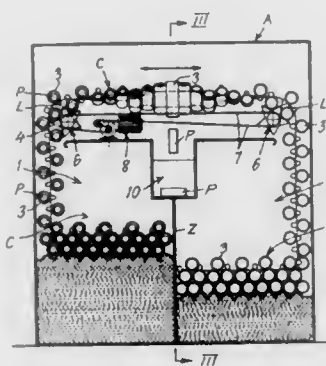
AUTOMATIC BELT-TYPE DISPENSER, WITH TUBULAR CONTAINERS FOR THE ARTICLES

Giorgio Bragaglia, Via Pablo Neruda 5, Bologna, Italy
Filed Apr. 19, 1991, Ser. No. 687,947

Claims priority, application Italy, Apr. 24, 1990, 3460 A/90
Int. Cl.⁵ B65H 5/28

U.S. Cl. 221-72

13 Claims



1. An automatic dispenser for dispensing any article, comprising:
at least one feed belt, including at least one belt or other flexible element, having secured thereon transversely-arranged and equally spaced apart tubes open at both ends, capable of receiving therein the article to be dispensed;
a first magazine in which said feed belt, with its tubes filled with articles which are held inside said tubes, the ends of which are closed by the sidewalls of the said first magazine, is stacked in a plurality of layers;
a second magazine arranged in any manner with respect to the preceding one, in which the feed belt with empty tubes, after having articles dispensed therefrom, is gathered and stacked in a plurality of superimposed layers;
means for positively driving and guiding the feed belt for transfer from said first magazine to said second magazine and for submitting the belt of said feed belt to a limited torsion about its longitudinal axis, first in one direction and then in the other direction, so that in a region between said two magazines one end of said tubes will be directed downwards, for example in a vertical position, and the lower end thereof will be aligned with a lower opening through which the article is discharged to fall onto a discharge chute;
means controlling the step-by-step advance of the feed belt and resulting dispensation of the article on condition that payment is introduced into payment processing means.

5,086,948

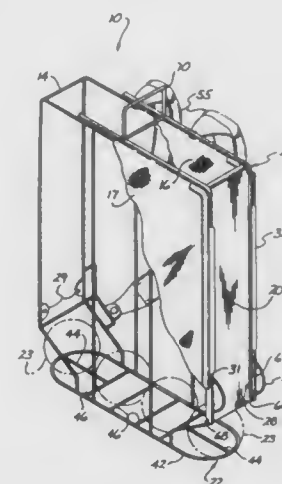
TENNIS BALL PACK DISPENSING AND RETRIEVING APPARATUS

Bennet A. Slusarz, 645 10th St., Hermosa Beach, Calif. 90254
Filed Dec. 4, 1990, Ser. No. 621,982

Int. Cl.⁵ A47F 1/08

U.S. Cl. 221-185

12 Claims



1. Ball pack apparatus for dispensing and retrieving tennis balls comprising,
an elongated housing for storing tennis balls while positioned on a player's back including a first pair of spaced walls having a relatively narrow spacing which is at least the diameter of a tennis ball, and a second pair of spaced walls having a spacing larger than said relatively narrow spacing;
said housing having an oblong shaped bottom for supporting tennis balls including a plurality of flexible connected rod members, at least some of said rod members being sufficiently displaceable upon flexing thereof enabling balls to be forcibly inserted therebetween;
said second pair of walls extending for a predetermined length which is less than said first pair to define at least one opening adjacent to the bottom at the ends thereof enabling balls to be dispensed through the opening in seriatim by gripping a ball and imparting a predetermined force against the bottom; and
a U-shaped frame extending across the top of said housing and downwardly in close proximity with said second pair of walls, said U-shaped frame being slidable in engagement with said second pair of walls from a first position adjacent to the housing when operating in a ball dispensing mode while on the player's back to a second position extended from the housing when operating in a ball retrieving mode upon removal of the housing from said player's back.

5,086,949

CHEMICAL FLOW STREAM SEPARATOR

Anthony C. Vulpitta, Lansing, Ill.; William P. Dwyer, Meriden, and Thomas P. Patrosch, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Sep. 25, 1990, Ser. No. 588,111

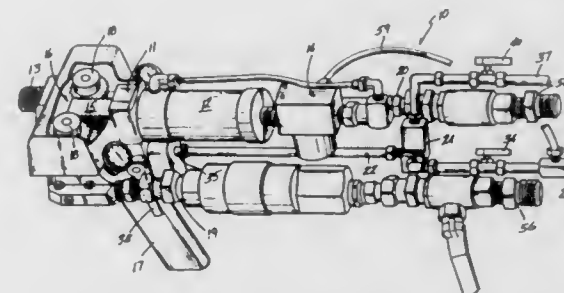
Int. Cl.⁵ B67D 5/00

U.S. Cl. 222-1

16 Claims

1. In a plural component dispensing apparatus for the dispensing of a substance formed from the mixing and reaction of plural components that are selectively fed via flow control means into a dispensing gun block in a plurality of separate plural component flow passageways at a first end and exit the dispensing gun block at an opposing second end, comprising:
(a) a flow stream separator inserted within the gun block connected to the plurality of plural component flow passageways adapted to receive the separate flow of plural

components and keep them separate in separator passages, the separator passages feeding the plural components to a point of mixing where they are impingement mixed and exit through an exit passageway from the separator, the separator further having a plurality of separate liquid cleaning medium passageways selectively controlled via second flow control means for the selective flow of cleaning medium therethrough to remove any plural compo-



nents or reacted plural components for the plurality of plural component flow passageways and the point of mixing and exit passageway of the separator;
(b) a gas feed line connected to the plurality of separate liquid cleaning medium flow passageways effective via third flow control means to selectively dry the liquid cleaning medium flow passageways after cleaning; and
(c) liquid cleaning medium feed means to deliver cleaning medium to the liquid cleaning medium passageways.

5,086,950

LIQUID DISPENSING APPARATUS

Garry W. Crossdale, Deryshire; Paul A. Johnson, Chesterfield, and Kenneth J. H. Bird, Nottingham, all of England, assignors to Diversey Corporation, Ontario, Canada

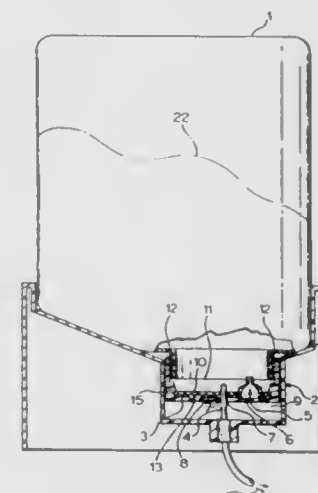
Filed Nov. 13, 1989, Ser. No. 435,808

Claims priority, application United Kingdom, Nov. 14, 1988, 8826627

Int. Cl.⁵ B67D 5/00

U.S. Cl. 222-88

6 Claims



1. An apparatus for dispensing liquid or slurried products comprising:
(a) a container for a liquid or slurried product said container having an outlet which is covered by a self sealing septum said septum having slits therein;
(b) a receptacle for receiving said container with the said septum lowermost, said receptacle having a blunt hollow

penetrating device for forcing part said slit, the septum around said slit sealing around said penetrating device to prevent leakage;

(c) means connected to said penetrating device for dispensing liquid or slurried products from said container;

(d) said container having means for allowing ingress air as produce is dispensed from the container; and

(e) wherein the slit eliminates the need for piercing the septum with said hollow penetrating device and said septum is self sealing before penetration and after the penetrating device is removed.

5,086,951

PORTABLE POST-MIX BEVERAGE DISPENSER UNIT
Shunichi Nakayama, Takasaki; Yasushi Takayanagi, Akabori, and Yasuyuki Arai, Sakai, all of Japan, assignors to Sanden Corporation, Gunma, Japan

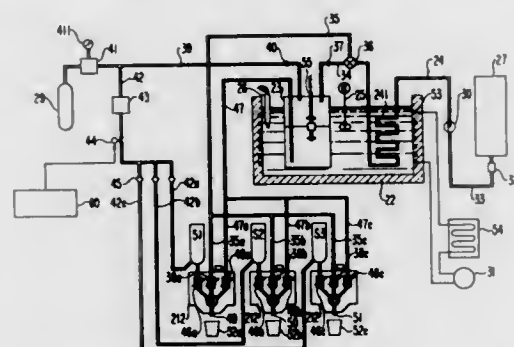
Filed Oct. 11, 1989, Ser. No. 421,587

Claims priority, application Japan, Oct. 11, 1988, 63-131731[U]

Int. Cl.⁵ B67D 1/00

U.S. Cl. 222-129.1

29 Claims



1. A post-mix dispensing system including a cabinet housing having a first access panel and a second access panel adjacent thereto, portable tank means for storing potable water, said portable tank means being detachable from said cabinet housing, carbonator means for producing carbonated water by mixing cooled water from said portable tank means with CO₂, cooling reservoir means for cooling potable water supplied from said portable tank means to said carbonator means, CO₂ tank means for supplying CO₂ to said carbonator means, syrup package means for dispensing a selected syrup, first pipe means partially disposed in said cooling reservoir means for linking said portable tank means with said carbonator means, second pipe means for linking said CO₂ tank means with said carbonator means, valve means for controlling the flow of carbonated water from said carbonator means, third pipe means linking said carbonator means with said valve means, and fourth pipe means linking said second pipe means to said syrup package means for supplying CO₂ from said CO₂ tank means to said syrup package means to supply syrup from said syrup package means to said valve means, wherein the improvement comprises:

detecting means for detecting relative open and closed positions of said first and second access panels; and control valve means disposed on said fourth pipe means for opening and closing the communication between said CO₂ tank means and said syrup package means in accordance with at least one signal from said detecting means.

5,086,952

DETERGENT CONTAINER

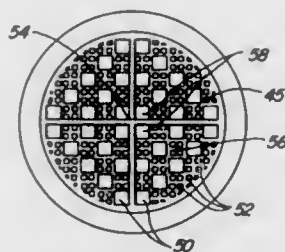
Lewis R. Kryk, Windsor, Canada, assignor to Diversey Corporation, Wyandotte, Mich.

Filed Sep. 12, 1988, Ser. No. 242,914

Int. Cl.⁵ B67D 5/58

U.S. Cl. 222-189

37 Claims



1. A detergent delivery system whereby a detergent solution is formed from dissolving a detergent material with a liquid, the system comprising:

a container for holding the detergent material, the container having a hollow body portion, a passageway, and a base portion, the base portion having rotatable means for grasping the container when the container is disposed in an inverted position; and

a lid fitting retentively and securely within the passageway of the hollow body portion, the lid having an integral grid, the grid being divided into quadrants, each quadrant of the grid having a plurality of first apertures and a plurality of second apertures, the size of the second apertures being different from the size of the first apertures, the first apertures and the second apertures cooperating to form a pattern in each quadrant, the pattern in each quadrant being substantially identical to the pattern in each of the other quadrants, the first apertures and the second apertures enabling a detergent solvent solution to pass therethrough and dissolve the detergent material into a detergent solution.

5,086,953

SELF METERING COUNTERSINK SEALANT TIP

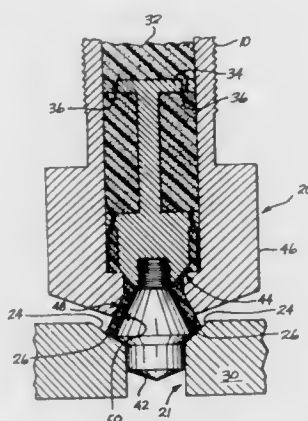
Shane K. Twede, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 9, 1990, Ser. No. 506,725

Int. Cl.⁵ B65D 88/54; G01F 11/28

U.S. Cl. 222-322

1 Claim



1. A self metering countersink sealant tip assembly comprising in combination:

a plunger having central axis and a plurality of metering orifices;

a housing circumferentially disposed about said plunger;

a pilot portion coaxially disposed with respect to the central

axis of said plunger an integral shoulder attached to said pilot coaxially disposed with respect to the central axis of said pilot said integral shoulder having an upward taper; said housing having first and second seat portions for providing first and second check valves;

said first and second check valves controlling the flow of sealant from said self metering countersink sealant assembly.

5,086,954

SPRAY CAN ACTUATION DEVICE WITH IMPROVED CAN RETENTION

Harvey Brody, Costa Mesa, Calif., assignor to Delshar Industries, Inc., Santa Ana, Calif.

Filed Apr. 4, 1991, Ser. No. 680,818

Int. Cl.⁵ B65D 83/14

U.S. Cl. 222-402.11

13 Claims



1. An actuation device for holding a pressurized container and actuating a push button valve in the top of the container to dispense the pressurized contents thereof, the container having an annular channel around the valve, the device having a body including a forward portion adapted for removable attachment to the container, an actuation member in the forward portion of the body, engageable with the push button valve for actuation of the valve, and trigger means, operatively connected to the actuation member, and operable to bring the actuation member into operable engagement with the valve, wherein the improvement comprises:

attachment means, on the forward portion of the body, for removably attaching the forward portion to the container, the attachment means comprising:

a substantially annular rim dimensioned to be received in the channel surrounding the valve, the rim being divided into first and second substantially semicircular halves joined at front and back junctures forming front and back rim portions, respectively, each of the rim halves having a side wall portion with flexure means for allowing the side wall to flex resiliently in response to forces applied to the front portion when the rim is inserted into the channel, front portion first; and

interlocking means for joining the first and second rim halves at the front portion of the rim so as to limit substantial relative movement between the rim halves as the rim is inserted into the channel.

5,086,955

LOG MARKING APPARATUS

Connie I. Anglen, 520720 Sagebrush Ln., Prineville, Oreg. 97754

Filed Mar. 4, 1991, Ser. No. 663,682

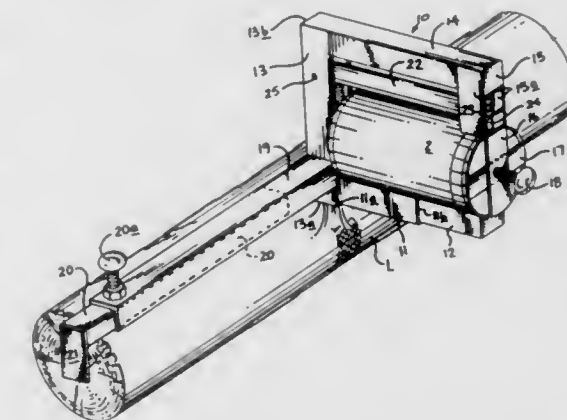
Int. Cl.⁵ B65D 83/14

U.S. Cl. 222-402.150

6 Claims

1. A log marking apparatus comprising, in combination, an elongate support rod, the support rod telescopically

mounting an extension rod, and the extension rod including an extension rod rear plate, and the support rod including a forward terminal end remote from the extension rod rear plate, with a mounting tube integrally and orthogonally mounted to the elongate support rod at the forward end, and clamp means mounted to the extension rod rear plate to secure an aerosol container between the extension rod rear plate and the mounting tube, and



the mounting tube including a mounting tube lower terminal end and a mounting tube upper terminal end, the mounting tube upper terminal end including a further support rod integrally and orthogonally mounted thereto overlying the support rod, and

actuator means mounted to the further support rod for permitting depressing of an aerosol container nozzle mounted to the aerosol container, with the aerosol container nozzle positioned within the mounting tube for directing of spray from the aerosol container exteriorly of the mounting tube.

5,086,956

EASY-OPENING LEAK-RESISTANT LIQUID STORAGE AND DISPENSING CONTAINER

Marlan H. Polhemus, Chicago, Ill., assignor to Mobil Oil Corporation, Fairfax, Va.

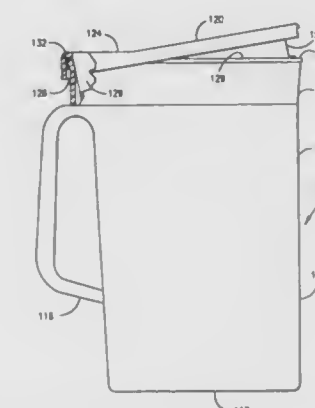
Continuation-in-part of Ser. No. 464,516, Jan. 12, 1990, Pat. No. 4,993,603. This application Dec. 31, 1990, Ser. No. 636,519

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.⁵ B65D 43/02, 43/06

U.S. Cl. 222-472

20 Claims



11. An easy-opening, leak-resistant liquid storage container, comprising:

(a) a thermoplastic container body having substantially up-

- right walls, said walls having an upper rim portion and a bottom portion, said upper rim portion having an inner surface and an outer surface; and
- (b) a removable thermoplastic lid having pour-accommodating means, said lid including:
- a cover section having an upper surface and a lower surface;
 - a plug section integral to said lower surface of said cover section, said plug section having an outer peripheral surface adapted to substantially conform to the inner surface of said upper rim portion of said container body walls for providing a close conforming fit when said lid is installed on said container body;
 - a lip integral to said cover section, said lip spaced apart from said outer peripheral surface of said plug section, wherein said lip combines with said lower surface of said cover section and said outer peripheral surface of said plug section to form a track, said track having a pair of rocker points; and
 - a pour orifice located in a portion of said plug section of said lid, said pour orifice positioned so as to be exposed when said lid is in a fully open position;
- whereby said rocker points are effective to release said lid from a closed position when a downward force is exerted upon the upper surface of said cover section of said lid.

5,086,957

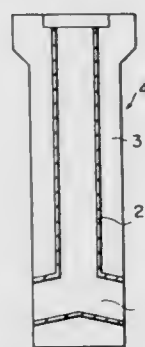
MOLTEN STEEL POURING NOZZLE

Hidekichi Ozeki, and Takafumi Aoki, both of Gifu, Japan, assignors to Akechi Ceramics Co., Ltd., Gifu, Japan
Filed Nov. 28, 1990, Ser. No. 619,292

Claims priority, application Japan, Jan. 23, 1990, 2-14218
Int. Cl.⁵ B22D 41/08

U.S. Cl. 222—607

14 Claims



1. A molten steel pouring nozzle having, along the axis thereof, a bore through which molten steel flows, wherein: at least part of an inner portion of said molten steel pouring nozzle, which inner portion forms said bore, is formed of a refractory consisting essentially of:
- 40 to 89 weight % zirconia clinker comprising calcium zirconate
- where, a content of calcium oxide in said zirconia clinker being within a range of from 8 to 35 weight parts relative to 100 weight parts of said zirconia clinker;
- from 10 to 35 weight % of graphite; and from 1 to 25 weight % of calcium silicate
- where, a content of calcium oxide in said calcium silicate being within a range of from 40 to 54 weight parts relative to 100 weight parts of said calcium silicate.

5,086,958

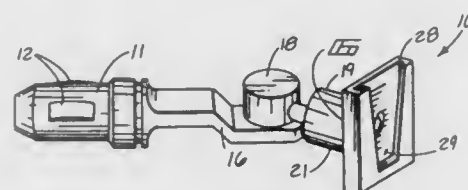
VEHICULAR ACCESSORY MOUNTING ORGANIZATION

Giselle Nagy, 7556 Hesperia Ave., Reseda, Calif. 91335
Continuation-in-part of Ser. No. 371,841, Jun. 27, 1989, Pat. No. 5,048,733. This application Sep. 7, 1990, Ser. No. 578,686

Int. Cl.⁵ B60R 7/00

U.S. Cl. 224—42,42

9 Claims



1. A vehicular accessory mounting organization for securement within an automotive cigarette lighter socket within a vehicular dashboard, wherein the socket is defined by a socket bore of a predetermined internal configuration, and wherein the apparatus comprises,
- an elongate support cylinder defined by an external predetermined configuration substantially equal to the predetermined internal configuration of the socket, and
- a plurality of spring clip members extending exteriorly of the exterior surface defined by the support cylinder, and
- a link member mounted to the support cylinder, and
- the forward leg including a series of first radial teeth mounted thereon, the first radial teeth cooperative with second radial teeth, the second radial teeth integrally mounted to a first mounting head, the first mounting head rotatably positionable relative to the forward leg and including a fastener member directed through the forward leg and receivable within the first mounting head to selectively secure the first mounting head relative to the forward leg, and
- a second mounting head fixedly mounted to the first mounting head, wherein the second mounting head includes a second mounting head axis and the first mounting head is defined by a first mounting head axis, wherein the second mounting head axis is obliquely arranged relative to the first mounting head axis, wherein the second mounting head includes second radial teeth formed thereon, and
- including a third mounting head, the third mounting head including third mounting head radial teeth, wherein the third mounting head radial teeth are cooperatively securable to the second mounting head radial teeth to rotatably align the second mounting head relative to the third mounting head, and
- a further fastener directed through the third mounting head to selectively secure the third mounting head relative to the second mounting head, and
- a support plate integrally mounted to the third mounting head, wherein the support plate includes a support plate cavity and the support plate cavity including a perimeter slot formed about a perimeter of the cavity, and
- the slot arranged to receive one of a plurality of wedge shaped plates to secure selectively one of said wedge shaped plates within the perimeter slot.

5,086,959

BOOT JACK

George J. Jerry, 2602 Manila La., Houston, Tex. 77043, and Albert B. Fay, Jr., 5719 Indian Trail, Houston, Tex. 77057
Filed Aug. 17, 1990, Ser. No. 569,352

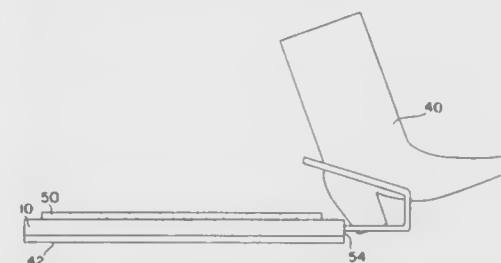
Int. Cl.⁵ A47G 25/84, 25/80

U.S. Cl. 223—114

14 Claims

2. An apparatus for removing a boot with a heel, comprising:
- a base having two bores in one end;
- a rod-like member forming a V-shaped notch with vertically and horizontally extending portions with respect to said

base, said bores receiving said horizontally extending portions for attaching said rod-like member to said base; said notch having an apex and an open mouth for receiving the boot, said apex being angled upwardly and positioned rearwardly above said mouth; and



said vertically and horizontally extending portions positioning said mouth such that said mouth receives and holds the heel of the boot above and in front of said base.

5,086,960

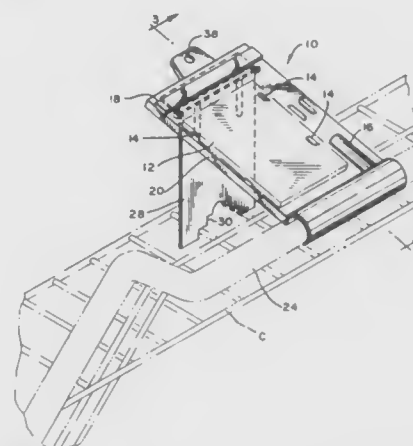
GROCERY CART ATTACHMENT

Janet Schwietzer, 16456 Marbro Dr., Encino, Calif. 91436
Filed Dec. 31, 1990, Ser. No. 640,283

Int. Cl.⁵ B60R 7/00

U.S. Cl. 224—277

9 Claims



1. A display holder for a grocery cart having a transverse, cylindrical handle and transverse support structure; said display holder comprising:
- a substantially rectangular panel having an upper side defining a writing surface and an underside;
- a semi-cylindrical clamp attached to a lower edge of said rectangular panel, said clamp being resilient and structured to grip said cylindrical handle for mounting the holder on the cart; and
- a planar stand support means having a hinge pivotally attaching the planar stand support means to the underside of said rectangular panel; said planar stand support means including a plurality of notches to accommodate engagement of the transverse members of a variety of sizes of grocery carts.

5,086,961

PIPE SEVERING METHOD AND APPARATUS

James A. Angel, Antioch; Gilbert G. Hagar, Brentwood, and Michael H. Clement, Antioch, all of Calif., assignors to Kwik Snap Corporation, Pittsburgh, Calif.

Filed Oct. 31, 1990, Ser. No. 607,121

Int. Cl.⁵ B26F 3/00

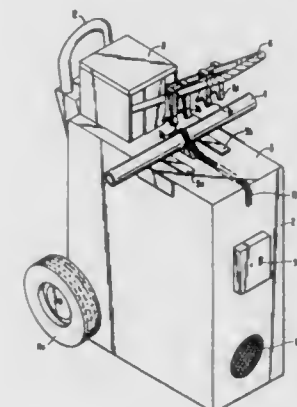
U.S. Cl. 225—1

17 Claims

1. A method of safely and quickly severing brittle pipe mate-

rials including cast iron, vitreous clay, cement, and asbestos comprising:

- placing a pipe on a substantially horizontal surface of a mobile frame;
- arranging a chain around the circumference of said pipe, said chain having a plurality of stress inducing wheels and a plurality of links having laterally protruding pins, said chain further having retaining spring means to bias said chain in a substantially circular position around said pipe;
- connecting one end link of said chain to a cam actuated by a power unit and at least one other link of said chain to a chain cleat thereby tightly wrapping said pipe with said



chain, said wheels touching said pipe at preselected locations;

- pivoting an actuating handle about a pivot point, said handle having first and second holddown members attached thereto and positioned to frictionally engage the pipe on both sides of said chain, said actuating handle having a limit switch so that when said holddown members come into contact with the pipe to be severed, said limit switch actuates said hydraulic power unit, causing said chain to tighten about the pipe and induce stress concentration points around the circumference of said pipe at said selected locations and sever the pipe.

5,086,962

DEVICE FOR BREAKING OPEN PACKAGED ROLLS OF COINS

Gerard M. Costello, Haynes Rd., Wilmington, Vt. 05363

Filed May 29, 1990, Ser. No. 529,626

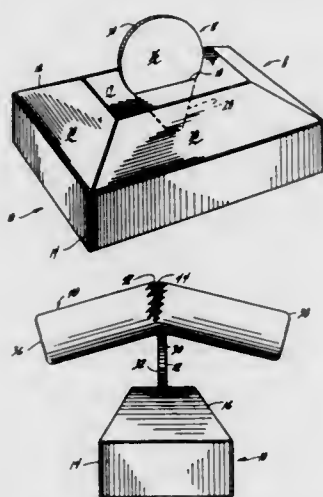
Int. Cl.⁵ B26F 3/00

U.S. Cl. 225—93

5 Claims

1. A device for opening rolls of coins packaged in a wrapper comprising a base, an integral anvil extending vertically from side base and having a lower end portion securely anchored into said base, said anvil including an outer edge portion of a generally blunt and convex configuration disposed diametrically opposite the end portion anchored into said base, the outer portion of the convex edge being disposed a sufficient vertical distance above said base and providing equal clearance on both sides of said anvil such that when a coil roll is struck against the outer edge portion of said anvil, in a downward

direction, while hand held, the anvil will cause the roll to bend relative to said blunt edge and to rupture the wrapper, without



the hand striking the base or anvil, to thereby open the roll of coins.

5,086,963

WEB GUIDANCE AND TRACKING MECHANISM FOR A CONTINUOUS BELT FILTER

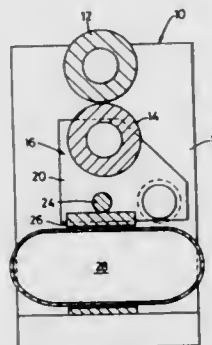
Henri G. W. Pierson, Canary Island, Spain, assignor to D & C Limited, Monrovia, Liberia

Filed Jan. 3, 1990, Ser. No. 460,556

Claims priority, application United Kingdom, Jan. 6, 1989, 8900285

Int. Cl.⁵ B65H 23/02

U.S. Cl. 226—17



1. A web guidance mechanism comprising a first tracker unit arranged at one side of a web path and comprising a first pair of rollers defining a nip for passage therethrough of a first respective edge margin of a web and a first actuator which serves to adjust the position of one roller of the first pair of rollers relative to the other thereby opening or closing the associated nip, a second tracker unit arranged at one side of said web path in opposition to said first tracker unit and comprising a second pair of rollers defining a nip for passage therethrough of a second respective edge margin of said web and a second actuator which serves to adjust the position of one roller of the second pair of rollers, relative to the other thereby opening or closing the associated nip, sensor means located at or adjacent to a desired path for at least one edge of said web for detecting the presence or absence of said edge on said desired path, said sensor means being connected through control means too said first and second tracker units such that the control means is operative to cause alternate operation of one or the other of the first or second actuator in response to the

presence or absence of said web edge, to open the nip of one roller pair and to at substantially the same time close the nip of the other roller pair thereby to grip a respective edge margin of said web, tension said web and cause the web to shift towards said closed roller pair, only one of said roller pairs being effectively engaged with said web at one time.

5,086,964

DUAL DRIVE WEB FEED APPARATUS AND METHOD

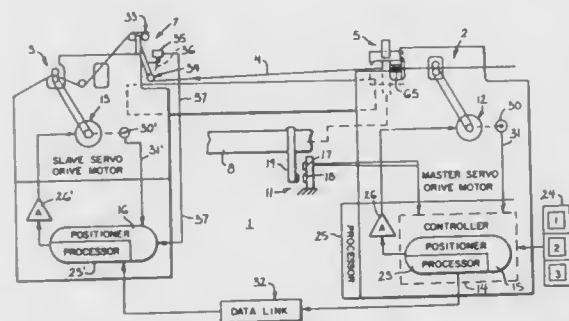
Giles R. Blaser, Green Bay, Wis., assignor to Amplas, Inc., Green Bay, Wis.

Continuation-in-part of Ser. No. 226,398, Jul. 29, 1988, abandoned. This application Feb. 24, 1989, Ser. No. 314,905

Int. Cl.⁵ B65H 20/00

U.S. Cl. 226—108

17 Claims



1. A multiple drive apparatus for transport of successive predetermined lengths of a web, comprising a first and second drive units coupled to the web in longitudinally spaced relation for moving said web, separate control units for establishing a timed drive profile of the drive units including an acceleration and deceleration period to sequentially and cyclically move said web within a selected web moving period, a web length monitor unit coupled to said web between said first and second drive units to sense any change in the length of said web between said drive units, said monitor unit establishing an output signal proportional to the direction of the change and to the length of said change, at least one of said control units including a drive modifying unit connected to said monitor unit and responsive to said output signal to change the drive profile of the connected control unit for a subsequent succeeding web feed to compensate for the change in web length and move the web in accordance with the modified drive profile.

5,086,965

FASTENER PRESS WITH WORKPIECE PROTECTION SYSTEM

K. Edward Marsteller, Willow Grove, and Patrick McGlone, Bethlehem, both of Pa., assignors to Penn Engineering & Manufacturing Corp., Danboro, Pa.

Filed Nov. 13, 1990, Ser. No. 611,502

Int. Cl.⁵ B21J 15/28

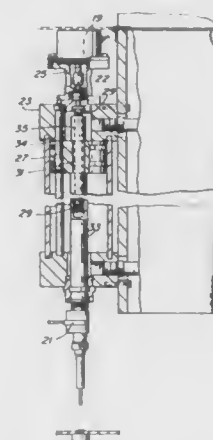
U.S. Cl. 227—8

1 Claim

1. A press for assembling fasteners into a workpiece having a frame with a base, comprising:
(a) an anvil secured to said base;
(b) a ram assembly including a punch attached to the frame above the anvil;
(c) a main actuating cylinder connected to said ram assembly and punch for moving said punch along a path between a retracted home position and a position of contact with said fastener or said workpiece located on said anvil;
(d) sensing means for sensing when said punch contacts the workpiece, said contact sensing means connected to said ram assembly;
(e) sensing means for continuously sensing the position of

said punch relative to said anvil, said position sensing means connected to said ram assembly;

- (f) a controller for limiting the operation of said press, said controller connected to and continuously signalled by both the contact sensing means and said punch position sensing means; and
- (g) three operational zones established by said controller, each zone representing a linear portion of the ram's descent, wherein said zones are distinct and contiguous



between the fully retracted home position of the punch and the point at which the punch makes contact with the anvil, wherein said zones include an upper operator safety window, a lower set window and a stop widow located between said safety and lower set windows wherein unwanted punch contact within either the operator safety window or the set window causes the punch to retract to home position, and unwanted punch contact within the stop widow causes the punch to be halted and to remain stationary.

5,086,967

SOLDER CONNECTION DEVICE

Jacques Delalle, 36 rue du General Gallieni, 78510-Triel Sur Siene; Mahrez Ouamich, 19 rue du Commerce, 95610 Eragny; Michele Lamothe, 16 Villa Cheuvreuse, 92140 Clamart; Frederic Passa, 8 les Dix Arpents Ogres, 95610 Eragny, and Philippe Roucaute, 100 rue Henri Barbusse, 60230 Chambly, all of France

PCT No. PCT/GB88/00335, § 371 Date Jan. 2, 1990, § 102(e) Date Jan. 2, 1990, PCT Pub. No. WO88/09068, PCT Pub. Date Nov. 17, 1988

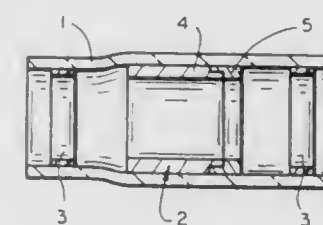
Continuation of Ser. No. 435,381, Jan. 2, 1990, abandoned. This PCT application Apr. 29, 1988, Ser. No. 610,730

Claims priority, application United Kingdom, May 2, 1987, 8710489

Int. Cl.⁵ H01R 4/72; B23K 3/00

U.S. Cl. 228—56.3

14 Claims



1. A device for forming a solder connection between a plurality of elongate bodies, which comprises a dimensionally recoverable article into which part of the bodies can be inverted, the article containing a composite solder strip which comprises a plurality of strips of solder, at least one such strip being formed from a relatively low melting point solder for forming a solder joint between the bodies, and at least one other such strip being formed from a relatively high melting point solder which, when the device is heated in use, will not melt until after the relatively low melting point solder has melted and flowed.

5,086,968

WELD REPAIRABLE COMBUSTOR

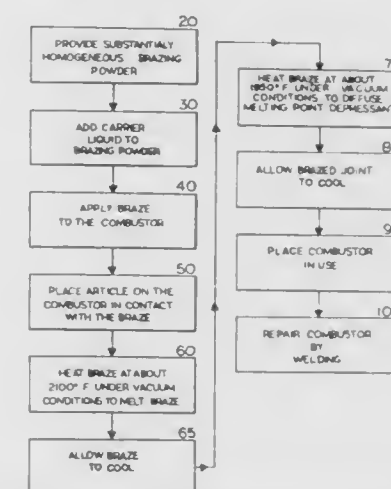
Robert W. Fawley, R. G. Keetley, both of San Diego, and William D. Treece, LaMesa, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 26, 1990, Ser. No. 470,885

Int. Cl.⁵ B23K 1/19, 31/02

U.S. Cl. 228—119

12 Claims



1. A process for the formation of a weld repairable combustor having at least one brazed joint, comprising:
providing a substantially homogenous brazing powder mix

5,086,966

PALLADIUM-COATED SOLDER BALL

Cynthia M. Melton, Bolingbrook; Carl J. Raleigh, Cary; Steven Scheifers, Hoffman Estates, and William Beckenbaugh, Barrington, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 5, 1990, Ser. No. 608,872

Int. Cl.⁵ B23K 31/02

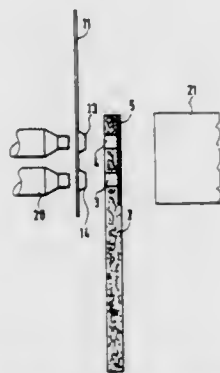
U.S. Cl. 228—208

5 Claims

1. In a method for soldering onto a metallic substrate, said method comprising contacting the substrate with a solder body composed of a lead-tin alloy and heating at a temperature and for a time sufficient to reflow the solder alloy onto the substrate, whereby upon cooling the reflowed alloy bonds to the metal substrate, the improvement comprising depositing palladium onto the solder body surface prior to heating the solder alloy in contact with the substrate to enhance wetting of the substrate by the solder alloy during reflow and thereby improve bonding of the solder to the substrate.

comprising a metal powder compatible with the metals of said combustor and an article to be brazed to said combustor, and a melting point depressant in powder form, between said combustor and said article where the brazed joint is to be formed;
heating said brazing powder mix to a first temperature sufficient to cause said brazing powder mix to become molten; solidifying said molten brazing powder mix; then heating said brazing powder mix at a second temperature for a sufficient time to cause said melting point depressant to substantially diffuse away from said brazed area; and welding near or on said brazed area.

5,086,969
METHOD OF BONDING A METAL CONNECTION TO AN ELECTRODE HAVING A FOAM TYPE SUBSTRATE FOR AN ELECTROCHEMICAL CELL, AND AN ELECTRODE OBTAINED BY THE METHOD
Jean-Marc Guerinault, Leognan, and Joël Brunarie, Bordeaux, both of France, assignors to SAFT, Romainville, France
Filed Dec. 18, 1990, Ser. No. 638,864
Claims priority, application France, Dec. 13, 1990, 90 15607
Int. Cl.⁵ B23K 31/02
U.S. Cl. 228—189 8 Claims

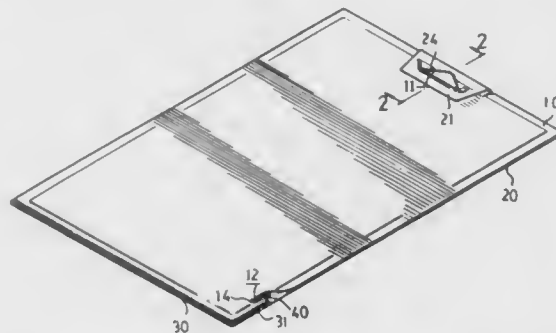


1. In a bonding method for bonding a metal connection to an electrode for an electrochemical cell, the electrode having a foam type substrate with mass per unit area lying in the range of 2 g/dm² to 8 g/dm², said substrate being filled with active material then compressed, the improvement comprising the steps of:
forming at least one hole through said electrode;
compressing a metal tongue against said at least one hole and the surrounding zone, and causing said tongue to penetrate superficially into a first face of the electrode; and
welding said connection to said metal tongue through said at least one hole in the electrode.

5,086,970
ENVELOPE FOR SAFELY PROTECTING DOCUMENTS
Ken J. Su, No. 102, Lane 52, Fu-Te Rd., Shu Wang Tsun, Ta-Li Shiang, Taichung Shien, Taiwan
Filed Jan. 29, 1991, Ser. No. 647,076
Int. Cl.⁵ B65D 27/22
U.S. Cl. 229—84 1 Claim

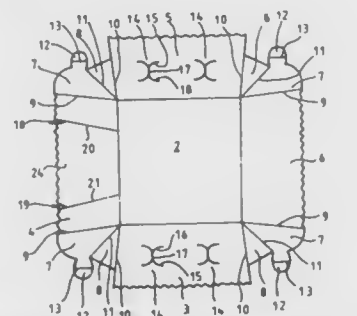
1. An envelope comprising a face and a base having a side edge integrally formed together and having a bottom edge welded together, a slot being formed in upper edge portion of said face, a flap being integrally formed on an upper edge portion of said base, an ear being formed in said flap and being insertable through said slot of said face when said flap is folded and superposed upon said face so that said upper edge portion of said face and said upper edge portion of said base can be clamped together, a weld extension being formed on another side edge of said envelope opposite to said integrally formed side edge and connected to said welded bottom edge, said weld extension ending with a nick which is formed in a lower and

side corner area of either said face or said base so that said weld extension is prevented from being torn when said envelope is



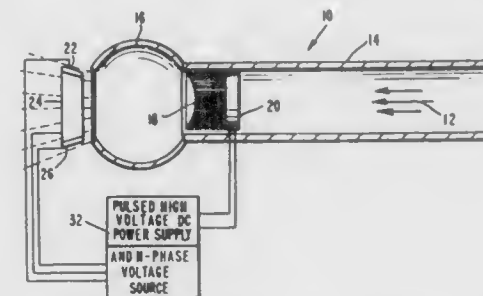
opened, and so that papers disposed within said envelope can be safely and stably retained in place.

5,086,971
FOLDED CONTAINER
Josef Detzel; Walter Schraegle, both of Kempten, and Rudolf Kraus, Osterreinen, all of Fed. Rep. of Germany, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
PCT No. PCT/EP89/00278, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989
PCT Filed Mar. 16, 1989, Ser. No. 442,357
Int. Cl.⁵ B65D 5/24
U.S. Cl. 229—188 2 Claims



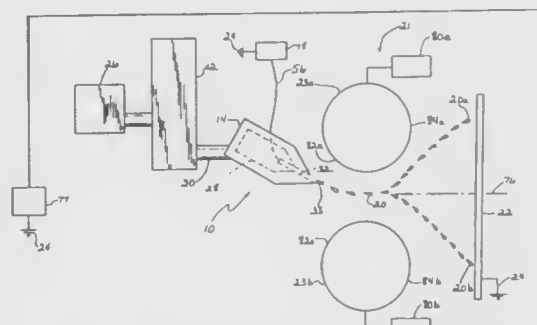
1. Folded container made from a single-piece board blank wherein said container comprises
(1) a base;
(2) four side panels (3, 4, 5, 6) hinged to said base; and
(3) a pair of gusset sections (7, 8) connecting each adjacent side panel; wherein one section of each pair of gusset sections is provided with a tab (12) and wherein two of the said panels (3, 5) comprise areas for engaging each tab; each of said areas for engaging each tab being defined by two back-to-back C-shaped cuts, wherein the back-to-back C-shaped cuts are in turn defined by cut lines (15, 16) representing the upper and lower section of the C-shape and by a middle section 17 where the back-to-back C-shapes meet; wherein a middle section of the tab (12) is somewhat wider than end sections of the tab and is the only part of the tab in the interior of the folded container.

5,086,972
ENHANCED ELECTROSTATIC PAINT DEPOSITION METHOD AND APPARATUS
David B. Chang, Tustin, and James E. Drummond, Oceanside, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 1, 1990, Ser. No. 561,118
Int. Cl.⁵ B05B 5/025, 5/053
U.S. Cl. 239—3 17 Claims



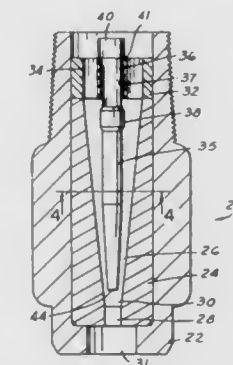
1. An enhanced electrostatic paint deposition apparatus comprising:
a nozzle;
a conduit coupled to said nozzle for supplying paint thereto; and
a plurality of electrically conductive whiskers formed in a three-dimensional curved array for applying an electrostatic charge to the paint and for focussing the paint.

5,086,973
NOZZLE MODULATORS
Eduardo C. Escallon; Theodore Parker, both of Elwood, and Steven Y. Walters, Anderson, all of Ind., assignors to Terronics Development Corp., Elwood, Ind.
Filed Apr. 11, 1990, Ser. No. 507,488
Int. Cl.⁵ B05B 5/04
U.S. Cl. 239—3 55 Claims



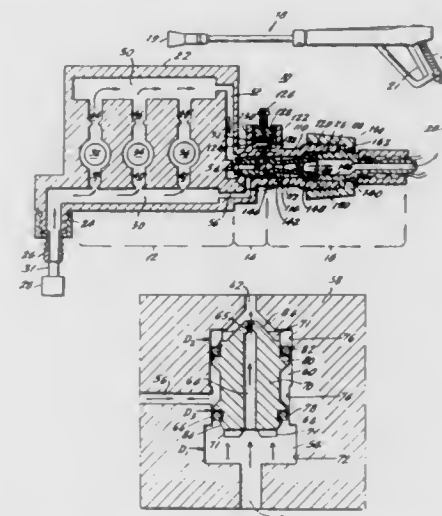
1. A nozzle modulator comprising at least one conductor arranged in spaced relation to a charged flow path of droplets from an electrostatic nozzle, a voltage source connected to said conductor, said conductor alternately being charged forming a homogeneous fog from said flow path comprising uniformly disbursed droplets of generally uniform size and charge moving in a wide variety of directions.

5,086,974
CAVITATING JET NOZZLE
Terry L. Henshaw, Battle Creek, Mich., assignor to NLB Corp., Wixom, Mich.
Filed Dec. 18, 1990, Ser. No. 629,214
Int. Cl.⁵ E21B 7/18
U.S. Cl. 239—101 19 Claims



1. A cavitating nozzle comprising:
a throat having a first bore centered about an axis, said axis extending in said first bore from an inlet to an outlet, said inlet defining a greater cross-sectional area in a plane drawn perpendicular to said axis than said outlet; and
a pin extending axially between two end portions and received in said first bore, a first end portion being retained within said bore adjacent said inlet, a second end portion extending from said first end portion toward said outlet, said pin being free-floating relative to said throat throughout its axial length such that said pin may be self-centering on said axis throughout its axial length.

5,086,975
PRESSURE WASHER WITH SPRING-LESS OUTLET TO INLET BYPASS
Clive R. Paige, Winkfield, England, assignor to Shop Vac Corporation, Williamsport, Pa.
Continuation of Ser. No. 462,733, Jan. 19, 1990, abandoned, Continuation-in-part of Ser. No. 297,620, Jan. 17, 1989, abandoned. This application Dec. 26, 1990, Ser. No. 634,063
Int. Cl.⁵ F04B 17/00
U.S. Cl. 239—124 25 Claims



1. A pressure washer for delivering liquid under pressure, the pressure washer comprising:
a spray nozzle for spraying liquid;

an outlet conduit connected for delivering liquid to the spray nozzle; an inlet conduit for receiving liquid from a liquid supply; a pump connected between the inlet conduit and the outlet conduit and effective for pumping liquid from the inlet conduit to the outlet conduit;

actuation means connected with the spray nozzle for selectively permitting or blocking exit from the spray nozzle of liquid pumped by the pump;

a bypass conduit connected between the inlet conduit and the outlet conduit and in parallel with the pump; and a liquid bypass system associated with the bypass conduit for selectively closing and opening the bypass conduit to flow of liquid through the bypass conduit, the bypass system including:

a bypass chamber in liquid communication with the bypass conduit, the bypass chamber having a chamber inlet in fluid communication with the outlet conduit for receiving liquid from the outlet conduit and having a chamber outlet for delivering liquid to the outlet conduit;

a shuttle so shaped and so movable in the bypass chamber between a first position in which the shuttle blocks fluid communication between the bypass chamber and the bypass conduit and a second position which permits fluid communication between the bypass chamber and the bypass conduit;

the shuttle having a first surface area in the bypass chamber which is exposed to liquid pressure at the chamber inlet and having a second surface area in the bypass chamber which is exposed to liquid pressure in the chamber outlet;

a liquid passage which extends through the shuttle from the first to the second surface areas of the shuttle; the liquid passage being narrowed in cross-section sufficiently for producing a pressure drop in the bypass chamber across the shuttle from the first to the second surface areas when liquid is passing through the liquid passage; the first and second surface areas of the shuttle are so constructed and dimensioned and the liquid passage is of sufficiently narrowed cross-section for producing a sufficient pressure drop that the shuttle becomes disposed in the first position when liquid is exiting from the spray nozzle while liquid is passing through the liquid passage for causing the liquid pressure at the chamber inlet to be greater than the liquid pressure at the chamber outlet by a predetermined amount, and otherwise the shuttle is moved, by the liquid pressures at the chamber inlet and the chamber outlet, toward the second position.

22. A pressure washer for delivering liquid under pressure, the pressure washer comprising:

a spray nozzle for spraying liquid;

an outlet conduit connected for delivering liquid to the spray nozzle; an inlet conduit for receiving liquid from a liquid supply; a pump means connected between the inlet conduit and the outlet conduit and effective for pumping liquid from the inlet conduit to the outlet conduit;

actuation means connected with the spray nozzle for selectively permitting or blocking exit from the spray nozzle of liquid pumped by the pump;

a bypass conduit connected between the inlet conduit and the outlet conduit and in parallel with the pump;

a cylinder and a piston reciprocable within the cylinder, the piston having a peripheral wall and a cross-sectional size which is smaller than the cross-section of the cylinder providing a clearance between the cylinder and the piston;

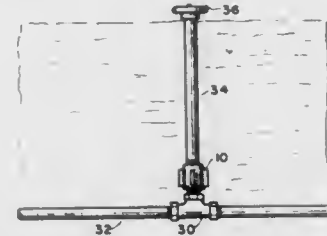
an annularly extending notch in the cylinder;

a first piston seal in the notch and a second piston seal extending between the first piston seal and the peripheral wall of the piston, the second piston seal being partially disposed in the notch, the first and second piston seals being effective to enable the piston to wobble relative to an axis of the cylinder while maintaining a liquid seal between the first and second piston seals and between the second piston seals and the wall of the piston.

5,086,976
SPRINKLER PIPE FLOW LIMITER
 James R. Sessions, 127 Thayer Way, Vallejo, Calif. 94589
 Filed Nov. 26, 1990, Ser. No. 617,666
 Int. Cl.⁵ B05B 15/06; F15D 1/02

U.S. Cl. 239—200

4 Claims



1. A flow control fixture for mounting in series with a water pipe between a supply main and an irrigation dispensing head having a first flow discharge rate at a first pressure and for limiting the flow of water through said pipe whenever said irrigation dispensing head has been removed from said pipe, said flow control fixture comprising:

a housing having a water pipe inlet and a water pipe outlet;

a plurality of fins radially attached to an exterior surface of said housing and aligned substantially parallel with the longitudinal axis of said housing;

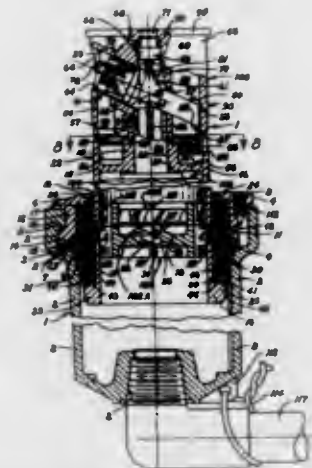
a wall within said housing separating said inlet and said outlet, said wall forming an inlet reservoir and an outlet reservoir in said housing; and

a passage formed at an angle through said wall permitting a controlled flow of water between said inlet and said outlet, said angle directing said controlled flow of water against a side wall of said outlet reservoir, said controlled flow being approximately 130% of the first flow rate and the first pressure of said irrigation dispensing head.

5,086,977
SPRINKLER DEVICE
 Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408
 Division of Ser. No. 37,704, Apr. 13, 1987, Pat. No. 4,867,378.
 This application Sep. 6, 1989, Ser. No. 403,758
 Int. Cl.⁵ B05B 15/10

U.S. Cl. 239—205

46 Claims



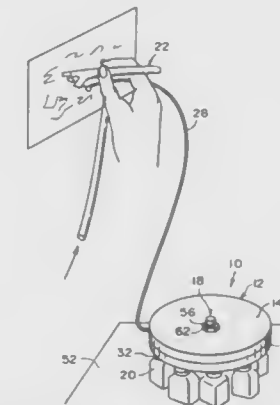
1. A sprinkler having a cylindrical housing, a cover member thereon having an opening, a riser means mounted for axial movement in said cylindrical housing between an extended and retracted position, said riser means extending through said opening in said cover member, a resilient cylindrical sealing means fixed relative to said cover member having a long cylin-

drical member around said riser means, the inside of said long cylindrical member contacting said riser means for sealing, means for directing water to said cylindrical housing, the outside of said long cylindrical member being open to the inside of said cylindrical housing to sense water pressure thereon when water is directed to said cylindrical housing to move said riser means to its extended position, a flange means extends from said riser means, a coiled spring means is located around said long cylindrical member between said cover member and flange means on said riser means to bias said riser means to its retracted position, said coiled spring means being compressed when said riser means is in its extended position, said long cylindrical member extending downwardly to just below the bottom of the fully compressed coiled spring means to seal with said flange means.

5,086,978
MULTIPLE JAR TURRET AIR BRUSH
 Douglas B. Fertig, 54 Oak St., Deer Park, N.Y. 11729
 Filed Dec. 31, 1990, Ser. No. 635,976
 Int. Cl.⁵ B05B 7/30

U.S. Cl. 239—305

3 Claims



1. A multiple jar turret air brush comprising:

a) a turret having a top, stationary member and a bottom, rotating member rotatively coupled to said top stationary member;

b) a hand-held air brush assembly having flow control means thereon fluidly connected to said top stationary member of said turret by an elongated siphon hose extending between said air brush assembly and a passageway in said top stationary member providing remote control of the fluid flow; and

c) a plurality of paint jar caps secured in a radial distribution onto the underside of the bottom member with threaded necks of paint jars threaded onto said caps to depend therefrom;

d) a plurality of siphon tubes, extending through said bottom rotating member and respective ones of said paint jar caps;

e) a plurality of O-rings, secured about the respective tops of said siphon tubes on said bottom rotating member so that said bottom rotating member can be turned to different rotary positions to bring any one of said siphon tubes into alignment with the passageway in said top stationary member with its respective O-ring sealing the fluid connection so that any one of said paint jars can be fluidly connected to said air brush assembly and the liquid in said respective paint jar be utilized by said air brush assembly; and

f) means for retaining said bottom rotating member in any one of said rotary positions.

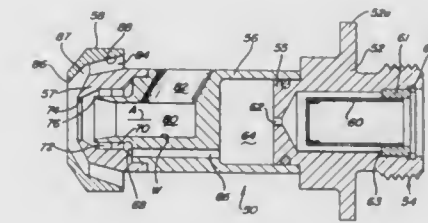
5,086,979
SMALL AIRBLAST FUEL NOZZLE WITH HIGH EFFICIENCY INNER AIR SWIRLER
 Theodore R. Koblish, Birmingham, and Leonard D. Bell, Ferndale, both of Mich., assignors to Fuel Systems Textron Inc., Zeeland, Mich.

Filed Jul. 7, 1989, Ser. No. 376,751

Int. Cl.⁵ B05B 7/10

U.S. Cl. 239—404

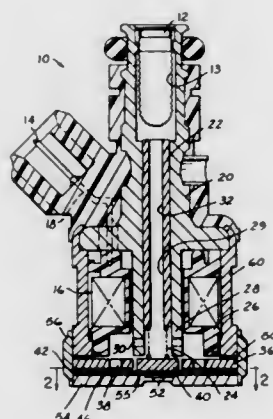
21 Claims



1. An airblast fuel nozzle for a gas turbine engine comprising a nozzle body having a longitudinal inner air swirl chamber with a downstream discharge orifice, means for discharging fuel from the nozzle body and a plurality of air inlet passages circumferentially spaced apart around the nozzle body upstream of the fuel discharge orifice and extending from the inner air swirl chamber to the exterior of the nozzle body for receiving air flow, each air inlet passage having an inner section converging toward and intersecting with the inner air swirl chamber and an outer section converging toward and intersecting with the inner section, said inner section having an outlet communicating with said inner air swirl chamber and an inlet communicating with said outer section, said outer section having an outlet communicating with the inlet of said inner section and an inlet on the exterior of said nozzle body for receiving said air flow, the convergence of said outer section and inner section being selected to provide an effective air flow area through said outer section greater than the effective air

flow area through said inner section, said inner section and outer section of each air inlet passage being relatively canted in the same circumferential direction and oriented relative to said air swirl chamber to, in effect, provide a distance "X" between centerlines of said air swirl chamber and said inner section that increases the air swirl strength achievable in said air swirl chamber at a given air pressure value at the inlet of said outer section.

5,086,980
FUEL INJECTOR FOR AN INTERNAL COMBUSTION ENGINE
 John C. Hickey, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
 Filed Oct. 9, 1990, Ser. No. 594,752
 Int. Cl.⁵ F02M 51/00; F16K 31/02
 U.S. Cl. 239—585

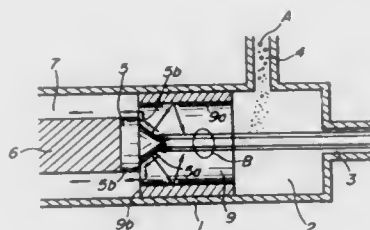


1. A fuel injector for an internal combustion engine, comprising:
 - a housing adapted for receiving liquid fuel therein and having a terminal provision for connecting said injector to an engine control computer;
 - a solenoid coil operatively connected with said terminal provision;
 - an orifice plate containing at least one orifice for discharging fuel from said injector;
 - a valve element positioned to cooperate with said orifice plate to control the flow of fuel from said orifice, with said valve element comprising a generally planar valve body comprising a reed spring having a first segment immovable with respect to said housing and a second segment movably cantilevered from said first segment, and an armature attached to the second segment so that fuel is allowed to flow when said coil is excited; and
 - elastic means for urging said second segment into contact with said orifice so that said injector is normally in a closed position.

5,086,981

Patent Not Issued For This Number

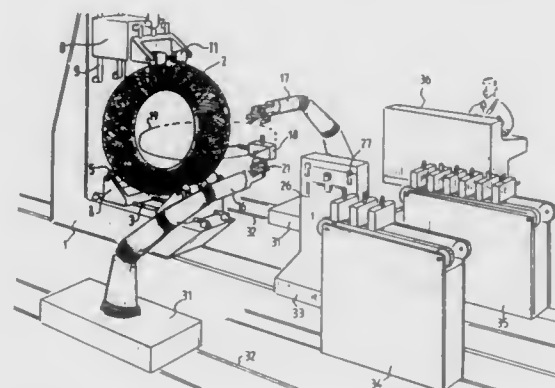
5,086,982
PULVERIZER
 Hideo Hirano, Yokosuka, and Takuo Kaneko, Joetsu, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
 Filed Mar. 9, 1990, Ser. No. 491,257
 Int. Cl.⁵ B02C 19/06
 U.S. Cl. 241—40



1. A pulverizer having a decreased back pressure comprising:
 - a pulverization chamber;
 - an injection nozzle provided at said pulverization chamber to inject a jet traveling in a first direction through said pulverization chamber;
 - a supply port arranged at said pulverization chamber to introduce a material to be pulverized into said pulverization chamber;
 - a collision member arranged in said pulverization chamber opposite to said injection nozzle having a pulverization surface on which said material to be pulverized impinges together with said jet;
 - said pulverization surface of said collision member including a first collision surface inclined with respect to the direction of injection of said jet and a second collision surface contiguous to said first collision surface, whereby said material is subjected to impinge upon said first collision surface together with said jet for traveling close to said first collision surface contour and strike against said second collision surface for pulverization;
 - a passage means downstream of said first and second collision surfaces for permitting said jet to continue in substantially said first direction; and
 - a cylindrical collision ring lined with an inner peripheral surface of said pulverization chamber, said cylindrical collision ring being larger in diameter than said collision member and arranged along a path of said jet in said pulverization chamber in concentric relationship with said collision member, said passage means including a discharge passage passing between said cylindrical collision ring and said collision member;
- whereby back pressure of the jet upstream of said pulverization surface is reduced.

10 Claims

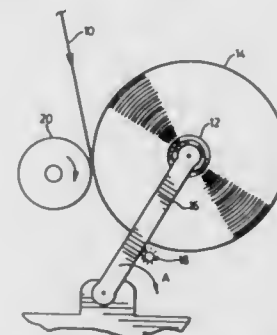
5,086,983
DEVICE FOR APPLYING A FILAMENT WINDING TO A SUPPORT OF ANY SHAPE AND A UNIVERSAL WINDING MACHINE COMPRISING AN APPLICATION THEREOF
 Jean-Louis Darrieux, Merignac, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France
 Continuation of Ser. No. 342,204, Apr. 24, 1989, abandoned.
 This application Nov. 28, 1990, Ser. No. 619,828
 Claims priority, application France, Apr. 25, 1988, 88 04539
 Int. Cl.⁵ H01F 41/08; B65H 81/02
 U.S. Cl. 242—4 R



1. A winding apparatus for applying a filament to a mandrel of any shape, comprising:
 - mandrel support means for movably supporting said mandrel;
 - at least one dispensing cassette for dispensing a filament to be wound around said mandrel;
 - first and second robot arms;
 - first and second cassette support means connected respectively to ends of said first and second robot arms for releasably supporting said dispensing cassette;
 - control means for controlling movement of said robot arms over a winding path and for actuating each of said cassette support means such that the end of said first robot arm travels over a part of said winding path while said first support means supports said dispensing cassette a predetermined distance away from said mandrel, said first and second cassette support means are actuated to transfer said dispensing cassette from said first cassette support means to said second support means, and the end of said second robot arm travels over the remaining part of said winding path while said second support means supports said dispensing cassette a predetermined distance away from said mandrel;
 - wherein said second robot arm returns said dispensing cassette to the end of said first robot arm, and said first and second cassette support means are actuated to transfer said cassette from said second support means to said first support means;
 - wherein said first and second support means alternately support said dispensing cassette a predetermined distance away from said mandrel as the ends of said first and second robot arms travel the entire distance of said winding path; and
 - wherein only said filament and said mandrel support means contact said mandrel while said filament is wound around said mandrel;
- said cassette support means at said ends of said first and second robot arms include pincer means and said dispensing cassette comprises two gripping spindles, wherein said control means further controls said pincer means to open and close so as to release and seize said gripping spindles; said ends of said robot arms further include a rotating sleeve connecting said pincer means to said robot arms, said pincer means comprising a rotating support and two semi-

circular portions movable toward and away from each other.

5,086,984
METHOD OF PREDICTING YARN PACKAGE DIAMETER
 Douglas E. Turek, Clayton North, Australia, and Mark A. Sibley, Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada
 Filed Aug. 20, 1990, Ser. No. 570,307
 Claims priority, application Canada, Aug. 30, 1989, 609839
 Int. Cl.⁵ B65H 54/00, 61/00
 U.S. Cl. 242—18 R

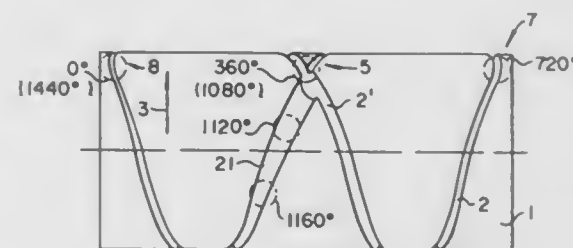


1. A method of predicting final yarn package diameter (D) during winding of yarn onto said package, said yarn to be wound onto said package for a known period of time (TD) to obtain said final yarn package diameter, said method comprising the steps of:
 - measuring the time (TS) for the package to grow to a predetermined diameter (DS);
 - predicting yarn package size using the correlation:

$$D = \text{square root}[k_1 + k_2(TD/TS)]$$

wherein k_1 and k_2 are empirically determined constants derived from varying TD and measuring TS and the final yarn package diameter.

5,086,985
YARN GUIDE DRUM
 Claus-Dieter Landolt, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst AG & Co., Mönchengladbach, Fed. Rep. of Germany
 Filed Apr. 1, 1991, Ser. No. 678,593
 Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010470
 Int. Cl.⁵ B65H 54/28, 54/48
 U.S. Cl. 242—43.2



1. A yarn guide drum of a bobbin winder, comprising a one-piece metal drum body having a jacket surface, a yarn-guiding reversing thread groove being cut into said jacket surface, said reversing thread groove having intersections and being divided into given groove portions in the vicinity of said intersections and other groove portions, said reversing thread

groove having a club-like cross-sectional shape in said other groove portions, said reversing thread groove having a rounded groove bottom, a variable depth at least at said intersections, a variable width, a relatively flatter portion, and a relatively deeper portion interrupting said relatively flatter portion defining a groove portion of relatively lesser depth and relatively lesser width through which the yarn initially passes, being followed by a collector pocket groove portion of relatively greater width which decreases in width as said groove continues, and said collector pocket groove portions having lateral reversing thread groove surfaces beginning at said intersections with a concave cross section and a steepness increasing toward said jacket surface and gradually merging with said club-like cross-sectional shape with increasing distance from said intersections.

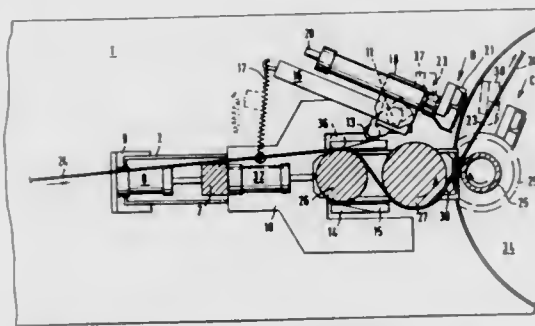
5,086,986
APPARATUS FOR SEVERING A WEB AT A REVERSING WINDER

Manfred Twente, Tecklenburg, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany
Filed Jun. 27, 1990, Ser. No. 543,883

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1989, 3922253

Int. Cl.⁵ B65H 19/20
U.S. Cl. 242—56 R

8 Claims

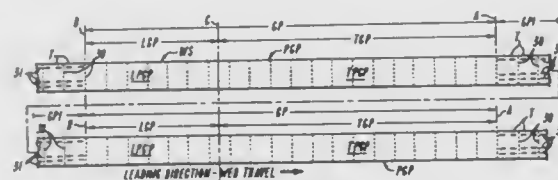


1. An apparatus for severing a web at a reversing winder, comprising:

- a cutter bar provided with a cutter blade;
- pressure-applying means engageable with an empty core tube in the winder;
- a traversing frame on which the cutter bar provided with the cutter blade and the pressure-applying means are mounted, said traversing frame being movable relative to the core tube so that the position of the cutter bar and of the pressure-applying means relative to the core tube is adjustable by a movement of the traversing frame;
- a piston-cylinder unit for moving the cutter bar into engagement with the web;
- pins connected to said cutter bar, the pins being mounted rotatably in bearing plates of the traversing frame;
- levers non-rotatably connected to ends of the pins;
- cam followers carried at free ends of said levers, which, in dependence on the position of the traversing frame, are moved on oblique camming surfaces of tracks fixed to a main frame, so that a pivotal movement of said levers and pins is imparted to the cutter bar to an extent which depends on the position of the traversing frame to position the cutter bar in accordance with the diameter of the core tube.

5,086,987
METHOD OF MAKING ROLLS OF RECORD MEMBERS
Roung-Min Shieh, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Apr. 24, 1989, Ser. No. 342,279
Int. Cl.⁵ B32B 3/16; B65H 75, 19/00
U.S. Cl. 242—56 R

35 Claims

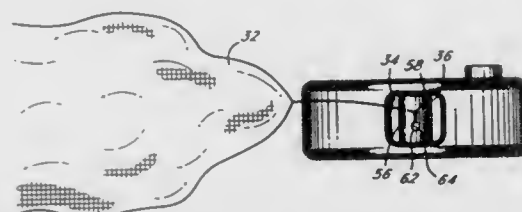


1. Method of making wound rolls of record members for use in a printer, comprising the steps of: providing a longitudinally extending web of printable record material, printing machine-readable marks on the web with the marks being arranged in longitudinally spaced groups with intervening mark gap portions between the groups and with the marks within each occurring at equally spaced apart intervals, advancing the web in a leading direction, completely severing the web transversely at selected longitudinal positions only within each mark gap portion to provide web sections each having a leading mark gap portion and a trailing mark gap portion, wherein the step of printing the machine-readable marks occurs before the step of completely severing the web transversely, providing a core for each web section, wherein the transverse severing makes the leading mark gap portions of substantially equal length with each leading mark gap portions of substantially equal length with each leading mark gap portion being at least slightly longer than a circumference of the respective core and makes the trailing mark gap portions of substantially equal length with each trailing mark gap portion being at least slightly longer than a circumference of the wound roll, adhesively securing the leading mark gap portion of each web section to its respective core, winding the remainder of each web section onto the respective core, each trailing mark gap portion forming an outer loop of the respective wound roll, and adhesively securing each trailing mark gap portion in loop form about the remainder of the respective web section.

5,086,988
CAR COVER DEPLOYMENT AND STORAGE SYSTEM
David A. LaPoint, 11 Cintilar, Irvine, Calif. 92720; James P. LaPoint, 48 Country La., and J. Philip LaPoint, 17 Coral Tree La., both of Rolling Hills Estates, Calif. 90274
Filed Mar. 1, 1990, Ser. No. 486,956

Int. Cl.⁵ B65H 75/40
U.S. Cl. 242—96

5 Claims



1. A car cover deployment and storage system, comprising: a car cover having a cord along its periphery for securing said cover around the body of a car;

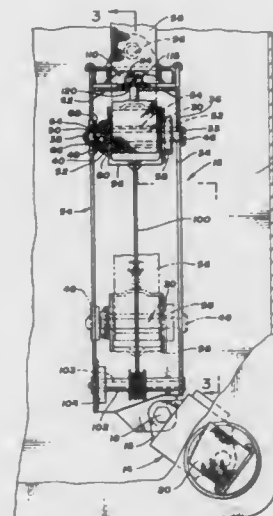
- a plastic container having a top, a bottom and a side wall connecting said top and said bottom, a portion of said side wall defining an opening, wherein said top defines an outer annular ridge and a recessed disk-shaped central portion defining an aperture at its center;
- a raised pivot secured within said container to the bottom of said container;

a rotating assembly including a plastic circular plate, a setting device and a plastic cylindrical axle having a pair of ends extending from said bottom of said container through said aperture in said top of said container, one of said pair of ends being rotatably secured to said pivot, another of said pair of ends of said axle extending through said aperture, said circular plate being affixed to said another of said pair of ends and positioned within said recessed disk-shaped central portion and said setting device secured to said axle within said container and adjacent to said top of said container to secure said axle within said container, yet permit said axle to rotate about an axis;

- a holder for securing a portion of said cord to said axle;
- a handle secured to said circular plate displaced from said axis, wherein the rotation of said handle about said axis results in a portion of said car cover being gathered by said portion of said side wall defining said opening, being drawn through said opening and being wound around said axle, said opening sized and shaped so that the gathered portion of said car cover drawn through said opening has a height roughly equal to the height of the axle, thereby providing for the compact and even winding of said car cover about said axle within said container; and,
- a raised curved lip surrounding the periphery of said opening to facilitate the smooth gathering of said car cover by said portion of said side walls surrounding said opening and to prevent sharp edges from damaging the car cover as it is drawn through the opening.

5,086,989
DUAL EFFORT LINEAR RETRACTOR
Harley L. Kapanka, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 28, 1990, Ser. No. 618,804
Int. Cl.⁵ B60R 22/38, 22/44
U.S. Cl. 242—107

4 Claims



1. A seat belt retractor for restraining an occupant in a vehicle, comprising:

- a length of belt;
- a reel rotatably mounted on a reel frame and having the belt attached thereto;
- a track mounted on the vehicle body and having the reel frame mounted thereon for translation along the track from a retracted position to an extended position;
- a high effort spring acting between the reel frame and the track to provide high effort retraction of the reel frame and the reel to the retracted position;
- a low effort spring acting between the reel frame and the reel to provide low effort retraction of the belt toward a

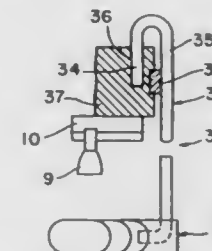
wound condition on the reel and permit extension of the belt therefrom;

latch means acting between the reel frame and the track to latch the reel frame at the extended position in response to the full unwinding of the belt from the reel against the low effort of the low effort spring and full travel of the reel frame along the track to the extended position against the effort of the high effort spring so that the belt is subsequently urged to a taut restraining position about the occupant by only the effort of the low effort spring;

and release means releasing the latch means in response to a subsequent full unwinding of the belt from the reel and consequent further movement of the reel frame toward the extended position to thereby permit the return of the belt to a fully retracted position by the retraction of the reel frame along the track and winding of the belt upon the reel.

5,086,990
ROVING GUIDE
Kurt Wetter, Hagenbuch, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Nov. 19, 1990, Ser. No. 615,385
Claims priority, application Switzerland, Nov. 20, 1989, 4158/89
Int. Cl.⁵ B65H 57/02, 57/16, 57/26
U.S. Cl. 242—157 R

8 Claims



1. In a textile machine, the combination of

- a carrier beam extending in parallel to a predetermined plane;
- a roving guide mounted on said beam for guiding a plurality of rovings relative to said plane, said guide including a deflector for deflecting a plurality of rovings thereabout and a retaining rod secured at one end to said deflector, said rod having one arm extending from said deflector and a free arm extending from said one arm into said beam; and
- a resilient member between and in contact with said beam and said one arm of said guide.

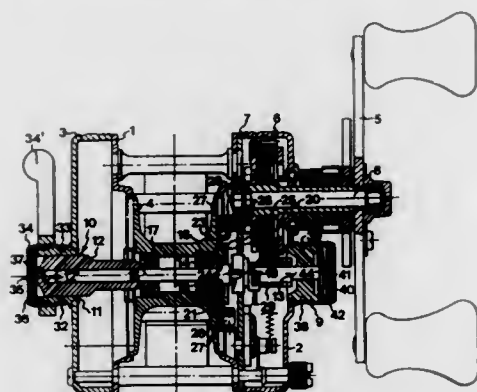
5,086,991
FISHING REEL OF THE MULTIPLIER TYPE
Arne Johansson, Mörrum, Sweden, assignor to ABU Garcia Produktion AB, Svangsta, Sweden
Filed Oct. 29, 1990, Ser. No. 604,288
Int. Cl.⁵ A01K 89/015
U.S. Cl. 242—321

2 Claims

1. A fishing reel of the multiplier type, comprising

- a frame having a first side plate and a second side plate;
- a first support bearing element on said first side plate;
- a second support bearing element on said second side plate;
- a line spool shaft extending through said frame and having two ends which are supported by said support bearing elements;
- a first ball bearing and a second ball bearing axially displaceably mounted on said line spool shaft and each having an outer ring and an inner ring;
- a line spool rotatably mounted on said line spool shaft by means of said ball bearings and having a first inner shoulder facing said first side plate, and a second inner shoulder facing said second side plate, the outer ring of said first

ball bearing engaging said first shoulder and the outer ring of said second ball bearing engaging said second shoulder; a spindle parallel to said line spool shaft and extending out through said first side plate; a handle mounted on said spindle outside said first side plate and adapted to rotate the line spool for retrieving a fishing line attached thereto; and a retaining shoulder formed on the line spool shaft and engaging the inner ring of said first ball bearing to maintain the outer ring thereof in engagement with said first shoulder; said second support bearing element comprising a sleeve, having an external thread, and a bearing body axially



displaceably mounted in said sleeve and having a bore in which one end of said line spool shaft is mounted, said bearing body engaging with one end of the inner ring of said second ball bearing to maintain the outer ring thereof in engagement with said second shoulder; manually operable adjusting means, comprising a bearing cap having an internal thread and being screwed on said sleeve, being provided for axially displacing said bearing body to urge said one end thereof against the inner ring of said second ball bearing with an adjustable force to adjust the resistance to rotation of the line spool, the other end of said bearing body engaging the bottom of said bearing cap by the intermediary of resilient means provided in the bearing cap.

5,086,992

AEROPLANE OR MODEL AEROPLANE

Martinus C. Gosen, Lorentzstraat 18, 5707 EW Helmond, and Andreas P. Bergmans, Kastanjelaan 1, Valkenswaard, both of Netherlands

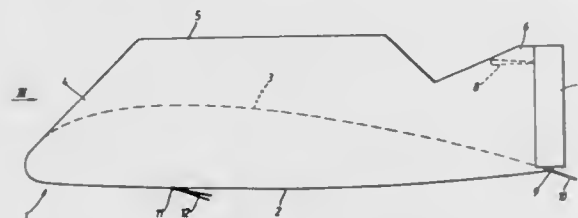
Filed Feb. 3, 1988, Ser. No. 151,920

Claims priority, application Netherlands, Feb. 12, 1987, 8700341

Int. Cl.⁵ B64C 21/00

U.S. Cl. 244—36

13 Claims



1. An airplane comprised of:
a fuselage for carrying passengers, said fuselage being wing-shaped in longitudinal cross-section and thereby having a front end, a tail end located opposite said front end, sides connecting said front end and said tail end, a generally flat base and a rounded top;
a first wing mounted on one of said sides near said front end

and a second wing mounted oppositely of said first wing on the other of said sides, said wings extending vertically above said rounded top to define upper-most ends, said upper-most ends curving away from said passenger body; and powering means associated with said wings.

5,086,993

AIRPLANE WITH VARIABLE-INCIDENCE WING

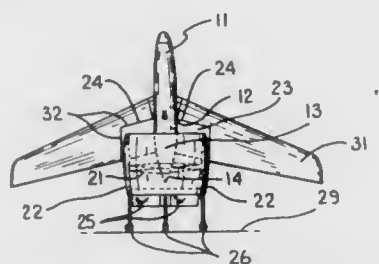
Barnaby Wainfan, Long Beach, Calif., assignor to ACA Industries, Rancho Palos Verdes, Calif.

Filed Feb. 9, 1989, Ser. No. 308,655

Int. Cl.⁵ B64C 3/38

U.S. Cl. 244—48

26 Claims



1. An aircraft for hovering flight, generally vertical takeoff and landing, and substantially horizontal forward flight, comprising:
a fuselage having a generally longitudinal axis;
support means for standing the aircraft for vertical takeoff and landing, with the fuselage axis substantially vertical, on a landing surface;
ducted-fan means, supported from the fuselage aft, for propelling the aircraft in both (a) hovering and vertical flight and (b) substantially horizontal forward flight; and
at each side of the fuselage, floating-wing means, supported from the fuselage for passive rotation about a generally spanwise axis, for providing lift in forward flight; wherein the fuselage-axis attitude varies between substantially vertical in hovering and vertical flight, and generally horizontal in forward flight.

5,086,994

OSCILLATING AND CONTINUOUS MOTION GEAR DRIVE ASSEMBLY

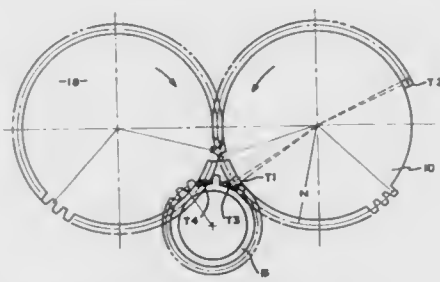
John J. Donnelly, Fort Worth, Tex., and Bruno J. Germano, Centereach, N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 3, 1990, Ser. No. 592,255

Int. Cl.⁵ B64C 25/50; F16H 55/17

U.S. Cl. 244—50

14 Claims



1. A gear drive assembly comprising:
a drive gear having a first segment including gear teeth extending about a first predetermined arcuate length of the drive gear perimeter and a second segment without gear teeth on its perimeter adjacent the first segment;
a backdrive gear coaxially mounted to rotate in unison with said drive gear, said backdrive gear having a first segment including gear teeth extending about a second predeter-

mined arcuate length of the backdrive gear perimeter, and a second segment without gear teeth on its perimeter adjacent the first backdrive gear segment;
a driven gear having gear teeth extending about its perimeter;
a first intermediate backdrive gear having gear teeth in constant mesh with the gear teeth of said driven gear; and
a second intermediate backdrive gear having gear teeth extending about at least a portion of its perimeter, said second intermediate backdrive gear being coaxially mounted to rotate in unison with said first intermediate backdrive gear with the gear teeth of said second intermediate backdrive gear being arranged to mesh with the gear teeth of said backdrive gear;
said gear drive assembly being arranged such that continuous rotation of said drive gear through 360° results in oscillation of said driven gear, with the gear teeth of the first segment of said drive gear directly meshing with the gear teeth of said driven gear to directly drive said driven gear when the drive gear is rotated in one direction over an arcuate length corresponding to said first predetermined arcuate length of said first segment of said drive gear and, upon continued rotation of said drive gear in said one direction, to drive said driven gear in an opposite direction through the gear teeth of the first segment of said backdrive gear directly meshing with the gear teeth of said second intermediate backdrive gear to produce said opposite rotation.

5,086,995

AFT CANTILEVERED WING LANDING GEAR FOR HEAVY AIRPLANE WITH AFT CENTER OF GRAVITY

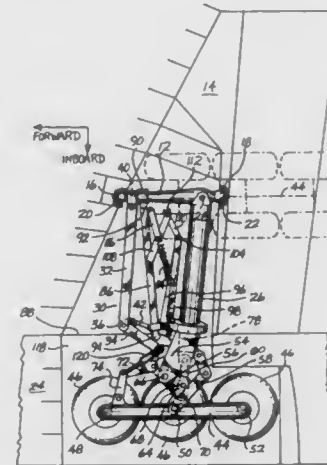
David T. Large, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 9, 1990, Ser. No. 507,112

Int. Cl.⁵ B64C 25/12

U.S. Cl. 244—102 R

8 Claims



1. In an aircraft having a body and a wing, a retractable wing-mounted landing gear, comprising:
a trunnion operably mounted to said wing for pivotal movement about a substantially forward and aft axis of rotation, said trunnion rotatable to cause substantially lateral movement of said gear between in-use and stowed positions;
a strut member having upper and lower ends, said upper end being pivotally connected to said trunnion for relative forward and aft movement thereto, said pivotal connection having an axis of rotation substantially perpendicular to that of said trunnion;
a ground-contacting wheel assembly operably connected to said lower end of said strut member;
a folding drag brace extending between said lower end of said strut member and a location on said aircraft spaced forwardly from said strut member, said folding drag brace

being movable between an in-use stabilizing position and a stowed position in which said drag brace folds to permit relative forward and aft movement of said strut member; and
said strut member being cantilevered aftly relative to said trunnion which said gear is in said in-use position and said strut member pivoting relatively forwardly for lateral inboard retraction of said gear to said stowed position, wherein said strut member includes a shock-absorbing means having a longitudinally reciprocating portion, and wherein the connection between said wheel assembly and said strut member includes a bell crank member having first and second lever portions and a pivot point therebetween, said pivot point being at a pivotal connection between said bell crank member and said strut member, said first lever portion operably connected to said wheel assembly and said second lever portion operably connected to transfer vertical force from said wheel assembly to said longitudinally reciprocating portion of said shock-absorbing means.

5,086,996

HIGH-CAPACITY FUSELAGE FOR AIRCRAFT

Jean Roeder, and Leslie J. Geering, both of Cornebarrieu, France, assignors to Airbus Industrie, Blagnac, France

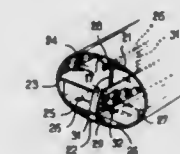
Filed Jul. 9, 1990, Ser. No. 549,970

Claims priority, application France, Jul. 12, 1989, 89 09397

Int. Cl.⁵ B64C 1/00

U.S. Cl. 244—119

27 Claims

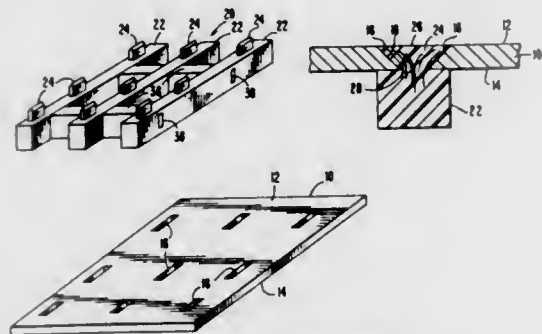


1. An aircraft fuselage having a forward end section, a rear end section, and a central section that constitutes a major part of the length of the fuselage, the central section being formed by first and second elongated lobes placed side by side such that the lobes intersect along a top longitudinal junction line and a bottom longitudinal junction line to form a bilobed fuselage shell, wherein the fuselage comprises:

a top stiffening longeron extending along the top junction line of the two lobes, the top stiffening longeron being located above the top junction line;
a bottom stiffening longeron extending along the bottom junction line of the two lobes;
a first floor dividing the central section into an upper internal space adapted to serve as a passenger cabin and a lower internal space adapted to serve as a freight and baggage hold;
means for supporting the first floor and for connecting the first floor to a lower portion of the fuselage;
a plurality of longitudinally-spaced transverse rows of seats arranged in the upper internal space; and
a plurality of longitudinally-spaced upright connecting means disposed at intervals in the rows of seats for connecting the top longeron to structural members located in the lower internal space.

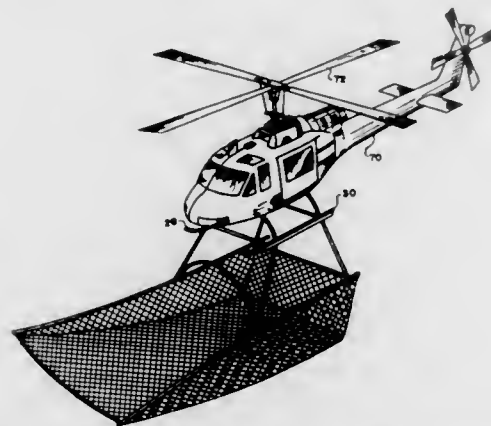
5,086,997
STRUCTURAL JOINT AND A METHOD FOR JOINING
IN REINFORCED THERMOPLASTIC FABRICATION
 Billy M. Glass, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 2, 1990, Ser. No. 502,671
 Int. Cl.⁵ B64C 3/26
 U.S. Cl. 244—123



1. An aerodynamic structure comprising:
 a skin having inner and outer opposed surfaces and a plurality of spaced, rectangular holes therethrough, each said hole having a truncated triangular shape in one transverse cross section, the truncated apex thereof being at said inner surface; and
 a support structure including a fiber-reinforced thermoplastic spar in abutting relation to said inner surface, said spar including a plurality of spaced, one-piece, integrally-formed, fiber-reinforced, thermoplastic tabs, each said tab extending from said spar into a respective one of said holes and being shaped to fill said respective hole and to define a surface generally co-planar with said outer surface.

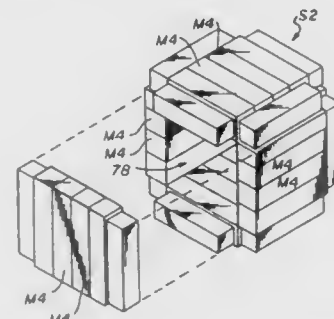
5,086,998
AIR/SEA RESCUE DEVICE
 Larry Pelas, P.O. Box 802, Venice, La. 70091
 Filed Feb. 26, 1990, Ser. No. 484,420
 Int. Cl.⁵ B64C 1/08
 U.S. Cl. 244—137.2



1. A rescue device for retrieval of persons or objects from water for use with a helicopter, the device comprising:
 an upper rigid attachment frame means for attaching the device to skids of the helicopter, said upper frame means attachable in substantially co-planar relationship to the helicopter skids;
 a space support means extending downwardly from said upper attachment frame means and fixedly attached to said upper attachment frame means;
 a lower rigid net frame means fixedly attached to a lower portion of said space support means; and
 a deformable net means having an open front end and open

top carried along its upper peripheral edge by said lower net frame means in a fixed relationship to said lower net frame means.

5,086,999
MODULAR SPACE STRUCTURE
 Charles F. Mullen, 204 Yacht Club La., Seabrook, Tex. 77586
 Continuation-in-part of Ser. No. 194,042, May 13, 1988, Pat. No. 4,878,637, which is a continuation-in-part of Ser. No. 900,094, Aug. 25, 1986, Pat. No. 4,744,533. This application Nov. 6, 1989, Ser. No. 432,365
 Int. Cl.⁵ B64G 1/00
 U.S. Cl. 244—159

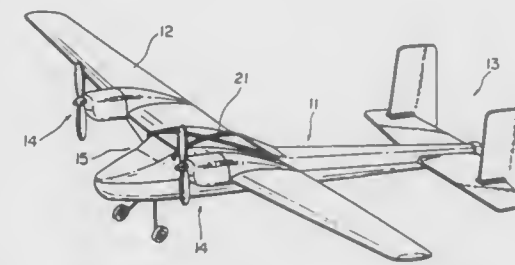


1. A space structure assembled in outer space comprising:
 slidably connected hollow modules transported into outer space in a telescopically nested condition by rocket and extended outwardly relative to one another to form a complete enclosure about a common interior volume, said modules forming the walls of the common enclosure, two or more of said modules being telescopically nested one within the other in generally parallel relation and extendible relative to one another with the outermost said modules having an end wall forming the end walls of the common enclosure and said modules having a side wall forming the exterior wall of the common enclosure to create a single space structure unit having a central area within said walls,
 said modules in the extended condition forming a single space structure unit having a central area within the extended modules the volume of which exceeds the volume of said modules in the nested condition, and
 the exterior of said single space structure unit configured to be joined with like units whereby a plurality of said single space structure units can be joined together in a predetermined pattern to form a complete enclosure about a common interior volume to create a further larger space structure unit having a plurality of enclosed central interior volumes.

5,087,000
TOY AIRPLANE
 Shohei Suto, Tokyo, Japan, assignor to Taiyo Kogyo Co., Ltd., Tokyo, Japan
 Filed Mar. 7, 1991, Ser. No. 665,804
 Claims priority, application Japan, Apr. 20, 1990, 2-41561[U]; Oct. 17, 1990, 2-108035[U]
 Int. Cl.⁵ B64C 13/20
 U.S. Cl. 244—189

1. A toy airplane, comprising:
 an airframe provided with a fixed vertical tail plane and a fixed horizontal tail plane;
 two propellers rotatably mounted on opposite sides of the airframe;
 rotating means for independently drivably rotating the two propellers;

power output means for controlling the combined total rotational output of the two propellers;
 power balance means for adjustably proportioning the distribution of said combined total rotational output between the two propellers;
 a radio control system incorporating said power output means and said power balance means for remote control of flight of the airframe;
 said rotating means comprising two electric motors, one for each of said propellers;
 a battery mounted in said airframe and connected through said radio control system to power said motors;
 said radio control system comprising a radio receiver circuit mounted in said airframe, and a transmitter circuit for use remote from said airframe;

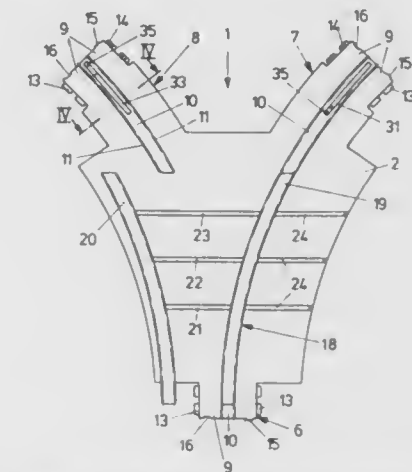


said transmitter circuit including a control stick for manually controlling said power output means and a separate control stick for manually controlling said power balance means;
 said receiver circuit including a receiver antenna feeding a high-frequency amplifier circuit connected to a mixing circuit also input from a local oscillation circuit, an output from said mixing circuit being fed via an intermediate-frequency amplifier circuit and then an amplitude demodulation circuit to a decoder circuit which outputs in parallel a power control signal and a separate power balance signal; and
 said power control signal and said power balance signal being received by a further mixing circuit which in turn produces from these signals two control signals for separately driving said two motors.

5,087,001
ACTUATING DEVICE IN A TOY TRACK ASSEMBLY
 Peter Bolli, Steinhausen; Philippe Kunz, Baar; Heinz Looser, Baar, and Werner Tanner, Baar, all of Switzerland, assignors to Interlego A.G., Baar, Switzerland
 Continuation of Ser. No. 286,635, Dec. 19, 1988, abandoned.
 This application Nov. 21, 1990, Ser. No. 617,412
 Claims priority, application Switzerland, Dec. 31, 1987, 5127/87
 Int. Cl.⁵ A63H 18/02, 19/32
 U.S. Cl. 246—327

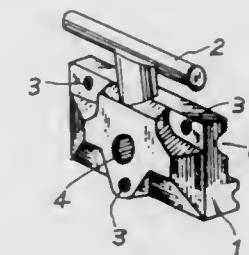
30 Claims
 1. An actuating device for a toy-track assembly for the mechanical shifting of a track shifting device by a vehicle travelling on a track section in a defined travelling direction, said track section having at least three end segments of track, characterized in that at least two of the end segments of said track section are each provided with an actuating element which protrudes beyond the respective track, said actuating elements being displaceably mounted in a longitudinal direction of the respective end segment, and being connected by means of coupling elements with said shifting device each said actuating element being mounted in a respective guide extending in the longitudinal direction of said respective end segment, whose limit defines the level of said actuating element above said respective track and being disposed deeper in a down-

stream area of the defined direction of track than in an upstream area, whereby said actuating elements as a result of said



vehicle travelling in said defined direction are lowered at least to the level of said respective track.

5,087,002
ANCHORING APPARATUS FOR TELEPHONE WIRE
 Masahiko Okura, 11-7, 4-chome, Shiroganedai, Minatoku, Tokyo, Japan
 Filed Jan. 14, 1991, Ser. No. 640,686
 Int. Cl.⁵ F16L 3/08
 U.S. Cl. 248—65

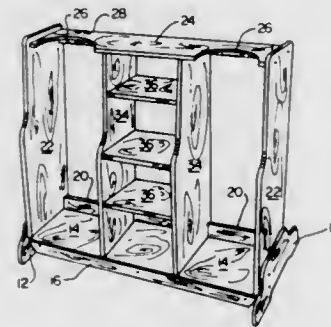


1. An anchoring apparatus for telephone wire comprising a thickish plate-like base body and a T-shaped suspending rod member set on the upper side of the base body to be protruded upwardly and forwardly, the front side of said base body having apertures of three bores perforating the body in a front and rear direction for guiding set screws of the base body and an aperture of a bore perforating the body in a front and rear direction for guiding a set bolt of the base body, while the rear side of said body has a laterally elongated groove of a circular arc shape in section and a dent surface of circular arc shape in section along the longitudinal axis of said body.

5,087,003
GOLF BAG STAND
 Bonnie Montgomery, Rte. 2, 2101 Chelsea Ct., Jamestown, N.C. 27282
 Continuation of Ser. No. 419,197, Oct. 10, 1989, abandoned.
 This application Mar. 4, 1991, Ser. No. 664,462
 Int. Cl.⁵ A47B 53/00
 U.S. Cl. 248—96

1. A free standing stand of the type which is positioned against a vertical wall for storing a pair of bags containing golf clubs, or the like, therein off the floor and in an upright position, comprising:
 (a) a base for supporting the bottom of the bags, said base being tilted backward to balance and to support the clubs and bags and prevent the bags from falling over;

- (b) a backstop attached to said base to limit the rearward position of the bags on said base;
- (c) a pair of feet attached to opposite sides of said base for supporting said base;
- (d) a pair of slanted side wall supports attached at one end to said base adjacent to each of said pair of feet;
- (e) an upper bags support, said upper bags support including a planar member attached to the opposite end of said pair of said wall supports, said planar member being aligned substantially parallel to said base for supporting the bottoms of the bags, planar member includes a pair of cutout portions which partially surrounds and supports the bags at their collar, permitting the golf clubs to be supported



without pressure on the shafts, thereby preventing the golf club shafts from being bent or warped, wherein said base and said cutout portions of said upper bags support form an included angle, said included angle is less than 90 degrees, thereby wedging the bottoms of the bags between the upper surface of said base and said backstop, wherein said pair of feet extend rearward further than said pair of side wall supports, thereby allowing said stand to be positioned against said vertical wall without the upper portion of said stand hitting said wall and, at the same time, also permitting individual golf clubs to be withdrawn from the bags without striking said wall; and an upstanding cabinet located between said cutout portions having a plurality of shelved portions for storing shoes or the like.

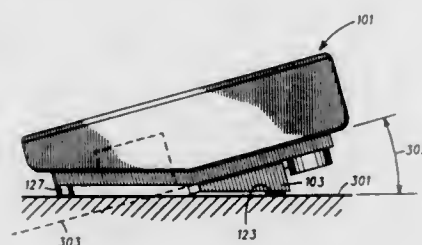
5,087,004 CONVERTIBLE MOUNTING APPARATUS

Louis J. Lundell, Buffalo Grove, and Kenneth W. Carlson, Hawthorn Woods, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1990, Ser. No. 590,208
Int. Cl.⁵ H04M 1/11

U.S. Cl. 248—126

7 Claims



1. A convertible mounting apparatus for mounting a communication device in one of at least a first plane and a second plane, the convertible mounting apparatus comprising:
- a platform with at least a first and a second surface said first and second surfaces intersecting at a vertex thereby defining an acute angle;
- an installation interface having a first and second surface each in non-parallel planes, said first and second surfaces intersecting at an edge, and having a first interface angle disposed between said first surface and an imaginary ex-

tension of said second surface, and a second interface angle disposed between said second surface and an imaginary extension of said first surface, said first interface angle, said second interface angle and said acute angle having essentially the same magnitude;

means for connecting said vertex of said platform to said edge of said installation interface; and

means for retaining said platform in each of a said first and second position such that said acute angle is disposed within corresponding said first and second interface angles to produce an essentially planar surface for mounting the communication device in the first and second planes, respectively.

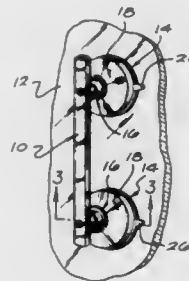
5,087,005 TWIST-CAM SUCTION CUP ASSEMBLY

Richard S. Holoff, 3024 Daphney Ct., Simi Valley, Calif. 93063, and J. David Riggins, 8544 Noble Ave., Sepulveda, Calif. 91343

Filed Feb. 12, 1991, Ser. No. 654,276
Int. Cl.⁵ A45D 42/14

U.S. Cl. 248—205.8

19 Claims



1. A twist cam suction cup assembly comprising:
- a suction cup which has a central attachment portion;
- a core member secured to said suction cup, said core member having a generally cylindrical outer surface and an upper cylindrical portion and a lower cylindrical portion delimiting a lower chamber;
- a cone member having an outer periphery generally co-extensive with the outer portion of said suction cup, said cone member having a generally cylindrical inner opening closely enclosing the cylindrical outer surface of said core member;
- said cone member and said core member constituting a pair of mating members;
- a utilization device having a bearing surface and being mounted on one of said two mating members;
- a cam member having generally cylindrical camming surfaces, said camming surfaces comprising a generally cylindrically contoured camming edge for bearing against the bearing surface of the utilization device;
- said cam member being mounted onto and closely engaging the upper cylindrical portion of the core member;
- anti-rotation means, comprising a mating combination of ribs and keyway slots on the cone member and core member, respectively, for preventing relative rotation of said two mating members while permitting relative axial movement thereof, to prevent undesired rotation of said utilization device and said suction cup;
- securing means for connecting the suction cup to the utilization device;
- said core member having an internal wall perpendicular to the outer surface, said internal wall delimiting the lower chamber and said lower chamber being provided for entrapping the attachment portion of the suction cup when the securing means is inserted into the attachment portion;
- said cam member and its associated camming surfaces serving to axially shift the core member outward with respect to said cone member to increase the suction of the suction

cup by pulling the center thereof away from a surface to which the suction cup may be adhered, to shift the assembly to a tightened position as the cam member is rotated; and

snap-lock means, comprising a groove on the utilization device and mating tabs on the camming surfaces of the cam member, for releasably locking the cam member into the tightened position.

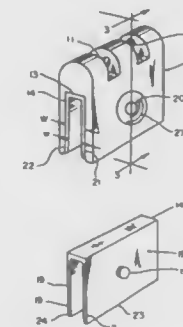
5,087,006 APPARATUS FOR ADJUSTMENT OF EFFECTIVE SLOT WIDTH

Robert A. Wrench, 8542 32nd Ave. NW., Seattle, Wash. 98117
Filed Apr. 5, 1990, Ser. No. 505,136

Int. Cl.⁵ A47B 96/06

U.S. Cl. 248—214

1 Claim



1. In combination, a holder and apparatus for adjusting the effective width of a slot,
- said slot being in said holder and having two opposed faces and at least one hole in each of said two faces,
- said apparatus comprising a liner shaped to fit into said slot and having exterior surfaces which fit against said two faces and projections on said surfaces, said projections engaging said at least one hole in each of said two faces, whereby the engagement of said projections in said holes retains said liner in said slot,
- and further, whereby without said apparatus for adjusting in place in said holder said slot has a first effective width and with said apparatus for adjusting in place in said holder said slot has a second effective width,
- said holder having two outside surface, each of which is parallel to one of said two opposed faces and each of said holes in each of said two faces extends through said outside surface which is parallel to said face,
- whereby, said projections are accessible to be pressed out of said holes to enable removal of said apparatus for adjusting from said slot,
- said liner being resilient and having two sides, said sides being flared away from each other, whereby when said liner is installed in said slot said sides are flexed to be essentially parallel and said flexing causes restoring forces tending to hold said projections in said holes.

5,087,007 COMBINATION SHOWER ENCLOSURE CADDY AND GARMENT HANGER

Franklin Gaderick, 106 Greenwich Hills Dr., Greenwich, Conn. 06831

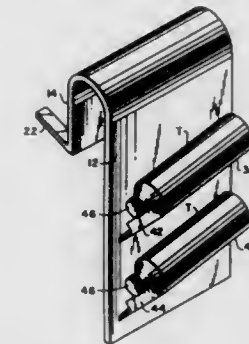
Continuation-in-part of Ser. No. 553,221, Jul. 16, 1990, abandoned. This application May 13, 1991, Ser. No. 701,685
Int. Cl.⁵ A47B 96/06

U.S. Cl. 248—215

2 Claims

1. A one piece device for use in a shower area and positioned over a shower door, adjacent fixed panel for said shower door, or a support rod for a shower curtain comprising: an inverted U-shaped body adapted to fit over the shower door or the support rod like and provided with one depending leg on the inside of the shower area and another depending spaced leg

located on the outside of the shower area, at least one elongated shelf slantedly positioned on said leg on the inside of the shower area and having an upstanding flange at a lower end of said shelf slanted for holding a tube of personal care substance



having a cap within the shower area and ensuring that the viscous substance in the tube remains in the bottom side of the tube adjacent to the cap, and one pair of horizontally spaced hooks on said other leg for suspending towels and clothing articles and the like in the area outside of said shower.

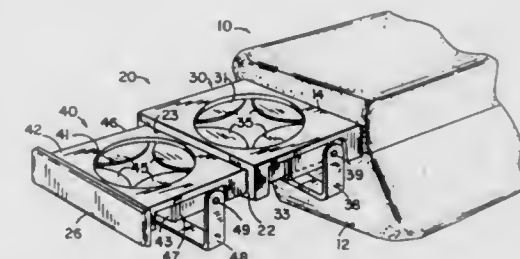
5,087,008 MULTIPLE CONTAINER HOLDER

Gordon Miller; Ronald Dykstra; David Spykerman, and Joseph Buonodono, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 379,816, Jul. 14, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 627,554
Int. Cl.⁵ A47C 7/62

U.S. Cl. 248—311.2

22 Claims



8. A selectable one or two container holder for a vehicle comprising:
- a base member mounted to a vehicle;
- a first and a second container support movably mounted to said base member and to each other, each container support individually defining at least a portion of a container supporting aperture, said first and second supports each movable between a first position for concealed storage of said container holder in said base member, to a first extended use position where a single container can be supported by said first and second container supports and to a second extended use position in which two containers can be supported therein and wherein said second container support is telescopically fitted into said first container support and wherein each of said container supports includes an aperture extending therethrough and wherein said apertures are coaxially aligned when said second container support is fitted within said first container support in said first storage position and in said first extended use position.

5,087,009

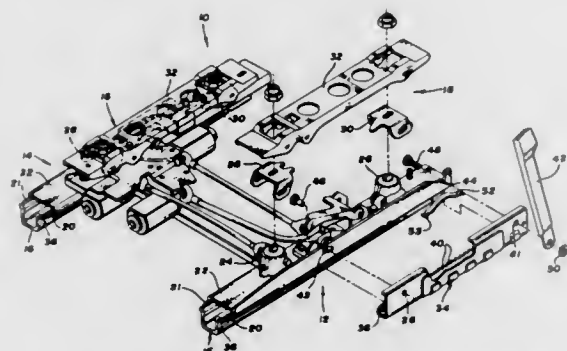
POWER SEAT ADJUSTER WITH INTEGRAL HORIZONTAL INTERLOCK SYSTEM

Hans J. Borlinghaus, Mt. Clemens, and James H. Klein, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1990, Ser. No. 618,803
Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—429

9 Claims



1. A seat adjuster for a vehicle seat adjustable fore and aft with an occupant restraint belt system connected to the seat adjuster, the seat adjuster in combination comprising:
a lower channel fixedly attached to the vehicle;
the lower channel having a lower channel flange portion;
an upper channel fixedly supporting the vehicle seat;
the upper channel slidably carried by the lower channel;
a lock arm connected at one end to the occupant restraint belt system;
the lock arm slidably connected to the upper channel such that a force on the lock arm from the occupant restraint belt system will produce a motion of the lock arm relative to the upper channel that has a vertical component;
the lock arm having a lock arm flange portion;
the lock arm flange portion of the lock arm having teeth;
the teeth being constructed from a material which is harder than the material of the lower channel flange portion of the lower channel;
the teeth being positioned adjacent the lower flange so that when the occupant restraint belt system produces the aforementioned motion of the lock arm the teeth of the lock arm flange portion will engage and dig into the lower channel flange portion so that the lock arm is fixedly attached to the lower channel and no vertical or horizontal movement can occur relative to one another; and
a spring element interposed between the upper channel and the lock arm which exerts a spring force so that the teeth of the lock arm flange portion of the lock arm and the lower channel flange portion of the lower channel do not engage each other until the force on the lock arm from the occupant restraint belt system exceeds the spring force.

5,087,010

SPEAKER'S PROMPTING PODIUM

Gregory M. Walters, 1706 Winding Ridge Trail, Knoxville, Tenn. 37922

Filed Oct. 26, 1990, Ser. No. 603,927
Int. Cl.⁵ A47G 1/24

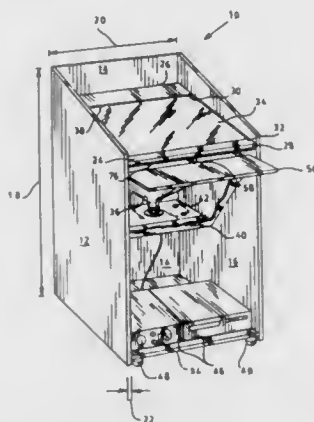
U.S. Cl. 248—455

18 Claims

1. An improved speaker's podium including at least one upright support member and at least one bracing means for bracing said upright support member, said improved speaker's podium for supporting a video display monitor mounted therein, said improvement comprising:

at least one supplementary support member, supported by said upright support member, said supplementary support member for containing and supporting said video display monitor, having a viewscreen of said monitor positioned

at a selectable angle such that said viewscreen is substantially perpendicular to a line of sight of a user facing said viewscreen, said user being positioned proximate to said improved speaker's podium such that said viewscreen is substantially exclusively visible to said user and substantially invisible to an audience to which said user is speaking; and



framing means for forming a work surface proximate said monitor view screen which provides a user with a surface upon which to place papers, speech notes, or the like, and allows said user to view at least a portion of said view screen while positioned proximate said podium.

5,087,011

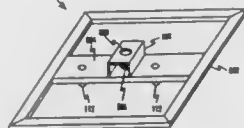
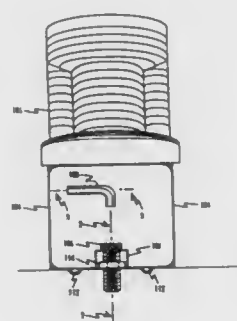
DETACHABLE LOCKDOWN DEVICE FOR ARENA CHAIR

Thomas J. Turner, 1602 Ruxton Crt., Ruxton, Md. 21204, and David Ankers, New Freedom, Pa., assignors to Thomas J. Turner, Ruxton, Md.

Filed Feb. 20, 1991, Ser. No. 659,634
Int. Cl.⁵ A47B 97/00

U.S. Cl. 248—501

9 Claims



1. Apparatus for removably mounting a chair assembly to a rigid support surface, comprising
a base member having a base member opening therethrough;
seat support members attached to and extending generally at angles greater than 0 degrees to the plane of said base member for mounting thereon a seat member;
a plurality of alignment members attached to and extending from said base member on substantially opposite sides of said opening, said alignment members being adapted to be received into openings in the rigid support surface;

removable securing means adapted to extend through said opening for securing said base member in engagement with the rigid support surface; and
unlocking means engagable with said securing means for disengaging said securing means from engagement with the rigid surface.

5,087,012

TABLE FLAG HOLDER

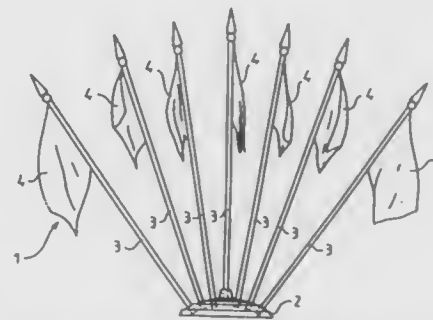
Luc Doublet, Seclin, France, assignor to Ets. Doublet S.A., Avelin, France

Filed Jun. 26, 1990, Ser. No. 543,365

Claims priority, application France, Sep. 12, 1989, 89 12212
Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—512

7 Claims



1. A table flag holder for flags which include a pole and a banner supported by the pole, said table flag holder comprising:

a base;

a plurality of inclined planar surfaces on said base, said plurality of inclined surfaces being constructed and arranged in concentric crowns, with inclination of the surfaces of the concentric crowns increasing outwardly so that viewing of a banner and adjacent banners is not obstructed, and each of said plurality of inclined planar surfaces having a series of holes capable of supporting a pole within each hole, said concentric crowns having diameters of 22 mm, 47 mm and 68 mm, and inclinations thereof being 9°, 19° and 35°, respectively; and
means for radially orienting each of the poles with respect to said base so as to avoid rotation of the pole with respect to the base.

5,087,013

FOLDABLE STAND FOR THREADING MACHINE

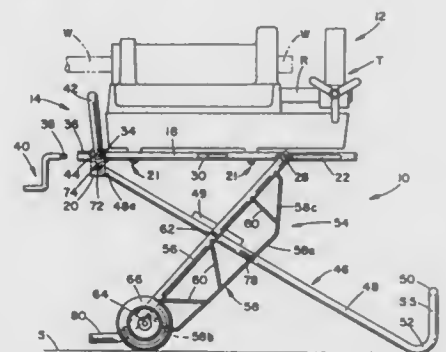
Paul W. Gress, and John H. Jansen, both of Bay Village, Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 150,394, Jan. 29, 1988, abandoned. This application Jan. 12, 1989, Ser. No. 296,883

Int. Cl.⁵ B62B 3/02

U.S. Cl. 248—676

19 Claims



1. A folding stand for supporting and transporting a power driven threading machine relative to an underlying surface

comprising, first support means for supporting said machine, said first support means having longitudinally opposite ends, second support means, means interconnecting said first and second support means for relative displacement between unfolded and folded positions in which said first support means is respectively elevated and lowered relative to said underlying surface, said second support means including wheel means, handle means and skid means, said wheel means and handle means respectively being adjacent one and the other of said opposite ends of said first support means when said second support means is in said folded position, said skid means including planar skid portions extending in the direction between said opposite ends when said second support means is in said folded position, said stand in said folded position of said second support means being pivotal about the axis of said wheel means to an inclined position in which said stand is supported by said wheel means for rolling movement along said underlying surface, said planar skid portions in said inclined position of said stand being inclined to facilitate sliding displacement of said stand upwardly and downwardly relative to a horizontal edge elevated above said underlying support surface, said wheel means in said unfolded position of said second support means engaging said underlying surface below said one of said opposite ends of said first support means, and said second support means including projection means extending outwardly relative to said one end beyond said wheel means and generally parallel to said underlying surface when said second support means is in said unfolded position to restrain pivoting of said stand about said wheel means in the direction outwardly of said one end.

5,087,014

CLIP FOR HOLDING A TOOL ON A CONTAINER IN TWO POSITIONS

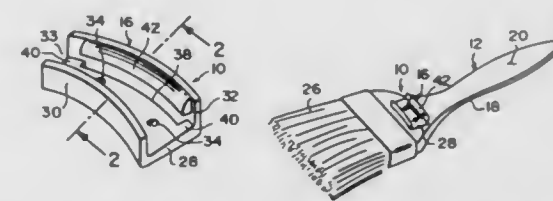
Warren Desjardin, 34 Bonita Rd., East Quogue, N.Y. 11942

Filed Jul. 25, 1990, Ser. No. 557,687

Int. Cl.⁵ A46B 17/00

U.S. Cl. 248—692

7 Claims



1. A clip for securing a tool with a working head and an elongate handle extending therefrom on an open mouthed container in two, different positions, said clip comprising:

a) an integral bracket of channel-section formed by an arcuate base portion and arcuate inner and arcuate outer wall portions upstanding from the base portion defining a longitudinally arcuate channel therebetween, a hook forming protrusion extending from the outer wall portion inwardly of the channel over the base;

b) means for mounting said bracket on the tool with the channel extending transversely thereof and axes of generation of the wall portions extending perpendicularly to the longitudinal axes of the handle so that the wall portions present concave surfaces to the working head,

whereby, in a first of the positions, the channel receives the rim of the open mouth container with the inner and outer wall portions engaging between the inner and outer lip portions of the rim thereby securing the tool to the container extending cantilever fashion with the working head substantially horizontal over the open mouth and, in a second position, in which the working head depends substantially vertically into the container by engagement of the hook forming portion with the rim.

5,087,015

ADJUSTABLE CONTACT LENS MOLD

Geoffrey H. Galley, Red Lodge, The Close, Totteridge, London, United Kingdom N20 8PJ

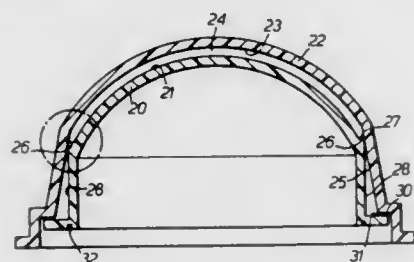
Filed Jan. 8, 1990, Ser. No. 462,166

Claims priority, application United Kingdom, Jan. 12, 1989, 8900616

Int. Cl.⁵ B29D 11/00

U.S. Cl. 249—82

10 Claims



1. A plastics material mold for casting a contact lens from curable material which shrinks during curing, said mold comprising:

- a male mold member;
- a female mold member;
- said male and female mold members being adapted to fit together to define a mold cavity;
- said male and female mold members each presenting a curved surface for molding a respective desired optical surface of a contact lens;
- said male mold member having a shoulder adjacent and circumferentially surrounding said curved surface of the male mold member, said shoulder presenting a substantially right-angled external corner in any cross-section around its circumference;
- said female mold member presenting a generally cylindrical surface adjacent and circumferentially surrounding said curved surface of the female mold member;
- said male and female mold members being provided with a means of initially limiting the motion of each towards the other during assembly of said mold members and subsequently permitting such movement during the curing of said curable material; and
- said external corner of said shoulder having a circumferentially continuous slidable fit with said generally cylindrical surface when the mold members are assembled to permit the mold members to move slidably directly towards one another during curing and consequent shrinkage of said curable material introduced into the mold cavity to cast a lens, said cast lens thereby having a circumferential edge formed between said external corner of said shoulder and said generally cylindrical surface.

5,087,016

ELECTROMAGNETIC VALVE IN PARTICULAR FOR INJECTION PUMP

Pierre Advenier, Paris, and Marcel Regneault, Sartrouville, both of France, assignors to Automobiles Peugeot et al., France

Filed Nov. 7, 1990, Ser. No. 610,396

Claims priority, application France, Nov. 7, 1989, 8914594

Int. Cl.⁵ F16K 31/06

U.S. Cl. 251—129.15

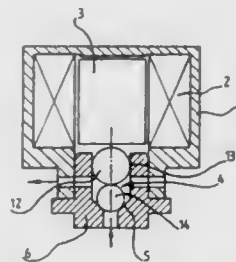
2 Claims

1. An electromagnetic valve comprising:
- a body;
 - an electric coil mounted in said body;
 - a plunger core disposed within said coil and adapted to move slidably therein upon energization of said coil;
 - a valve member body portion connected immovably to said body and comprising a seat portion and an orifice opening into said seat portion;
 - a valve member mounted within said valve member body

portion and comprising two balls having different diameters directly fastened to each other;

said two balls comprising:

- a first ball of a first diameter which is slidably mounted in guided relationship within the valve member body portion and which is directly operated by said plunger core; and



a second ball having a second diameter less than the first diameter adapted to bear upon said seat portion and to close said orifice in response to actuation of said first ball by the plunger core bearing upon said first ball.

5,087,017

VALVE BODY FOR NON-SLIDING TYPE GATE VALVE

Toshio Sawa, Sayama; Norikimi Irie, Tokyo, and Yuzo Hayashi, Kawagoe, all of Japan, assignors to Irie Koken Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP90/00020, § 371 Date Jun. 12, 1990, § 102(e)

Date Jun. 12, 1990, PCT Pub. No. WO90/08275, PCT Pub.

Date Jul. 26, 1990

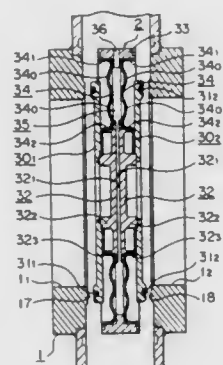
PCT Filed Jan. 10, 1990, Ser. No. 499,336

Claims priority, application Japan, Jan. 10, 1989, 1-1940

Int. Cl.⁵ F16K 31/16

U.S. Cl. 251—175

2 Claims



1. In a non-sliding gate valve for high vacuum use comprising a valve housing having a valve seat and a counter plate receiving seat surrounding a valve opening formed in said valve housing, and a valve body to close or open said valve seat and said counter plate receiving seat, an improvement wherein said valve body comprises a paired valve plate and a counter plate, said valve and counter plates each made of a circular thin metal plate having an outer diameter sufficient to close said valve seat and counter plate receiving seat respectively formed in said valve housing and each having its center line arranged in line with a center line of said valve opening and in parallel with said valve seat and said counter plate receiving seat as well as each other with gaps being left between said said valve plate and valve seat, between said valve and counter plates, and between said counter plate and said counter plate receiving seat, and a pair of inner support members arranged within said gap between said valve plate and said counter plate so as to be concentric with them and in parallel with each other, each of said inner support members having an outer diameter smaller than the outer diameter of said valve and counter plates, and an annular outer support member

arranged radially outside said inner support member and made of an annular metal body having an inner diameter larger than the outer diameter of said valve and counter plates with a width substantially equal to the combined thicknesses of said inner support members, and a pair of diaphragm-like annular elastic connecting sheets arranged between the outer peripheries of said inner support members and the inner periphery of said outer support member, each annular elastic connecting sheet being made of a thin metal sheet, said valve and counter plates being sealingly connected to said inner support members, respectively, to confront them, the outer peripheries of said inner support members and the inner periphery of said outer support member being sealingly secured to said annular elastic connecting sheets at the inner and outer peripheries of said annular elastic connecting sheets, respectively, each of said annular elastic connecting sheets being formed with at least one concentric corrugation on the surface thereof and perpendicular thereto, a sealed space being formed between said inner support members, said annular elastic connecting sheets and said outer support member.

5,087,018

FLUID FLOW CONTROL VALVE

Michael R. Blase; Henry J. Rosendall, and Gordon W. Goodrich, all of Grand Rapids, Mich., assignors to Bissell Inc., Grand Rapids, Mich.

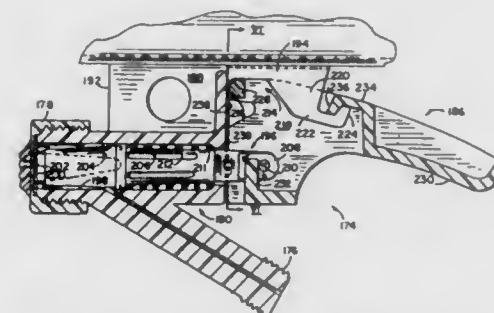
Continuation of Ser. No. 179,857, Apr. 11, 1988, which is a division of Ser. No. 28,613, Mar. 20, 1987. This application Jul.

31, 1989, Ser. No. 388,063

Int. Cl.⁵ F16K 31/60

U.S. Cl. 251—245

8 Claims



1. A fluid flow control means comprising:

- a base, a valve member, a trigger member and attachment means for attaching said trigger member to said valve member;
- said base comprising a first portion rigidly attached to said valve member and a second portion adjacent said first portion, said second portion having surface means defining a generally horizontal throat extending in a first direction away from said first portion to an open mouth located away from said first portion, said surface means having a first upwardly extending latching flange;
- said valve member comprising a housing and a stem longitudinally movable in said housing between a first position and a second position, means biasing said stem toward said first position in a direction generally opposite said first direction, said biasing means being operably connected to said attachment means to bias said trigger into position toward said first portion of said base; and establishing means associated with said stem for establishing no liquid flow when said stem is in said first position and for establishing maximum liquid flow when said stem is in said position; and
- said trigger member comprising a laterally extending pin loosely disposed in a portion of said throat defined by said surface means, a second latching flange on said trigger member having a generally downwardly facing surface overlapping said upwardly extending latching flange on said surface means to maintain said pin in said throat portion defined by said surface means when said trigger

5,087,019

SPREADER APPARATUS

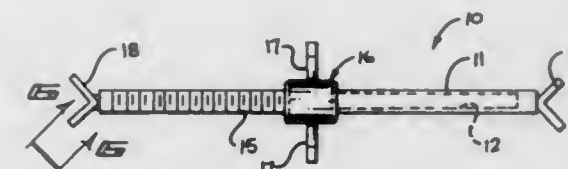
Dennis J. Peabody, 1751 Bush Ave., St. Paul, Minn. 55106, and James J. Borowske, 2587 E. 12th Ave., N. St. Paul, Minn. 55109-2435

Filed Dec. 31, 1990, Ser. No. 636,290

Int. Cl.⁵ B66F 3/36

U.S. Cl. 254—100

1 Claim



1. A spreader apparatus comprising, in combination, an elongate tube defined by a predetermined length and a predetermined first diameter, including a tube forward end and a tube rear end, the tube forward end fixedly mounting a first "V" shaped jaw thereon, and the tube including a rod receiving bore directed there-through, and an externally threaded rod defined by a rod length less than the predetermined length slidably receivable within the tube, the rod defined by a rod forward end and a rod rear end, the rod forward end directed within the tube, and the rod rear end fixedly and orthogonally mounting a second "V" shaped jaw thereon, and sleeve means rotatably mounted on the tube rear end for adjustably directing the threaded rod coaxially relative to the tube, and wherein the sleeve means includes a cylindrical sleeve, the cylindrical sleeve including a cylindrical socket recess directed through a first end of the sleeve, wherein the socket is defined by a socket diameter substantially equal to the predetermined first diameter of the tube, and the socket including a communicating internally threaded bore directed from the socket to a remote second side of the sleeve, wherein the internally threaded bore is coaxially aligned with the socket and is in threaded communication with the externally threaded rod, and wherein the cylindrical sleeve includes an annular array of bores directed about an exterior surface of the sleeve, and a removable peg member selectively receivable within one of said bores to enhance rotation of the cylindrical sleeve relative to the threaded rod, and wherein the first and second "V" shaped jaws each include confronting planar surfaces, and each planar surface includes a first medial row of conical teeth, and a second row of pyramidal teeth directed along a first edge of each planar jaw surface parallel to the conical teeth, and a third row of pyramidal teeth directed along a second edge of the planar jaw surface parallel to the conical teeth to enhance engagement of each of the first and second "V" shaped jaws to a rib cage to enhance spreading of the rib cage subsequent to a hunting event.

5,087,020

CUSHION BEARING FOR MOTOR VEHICLES

Otto Weber, Volkmar Keck, both of Wolfsburg; Siegfried Grohnert, Cremlingen, and Manfred Thesenvitz, Braunschweig, all of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

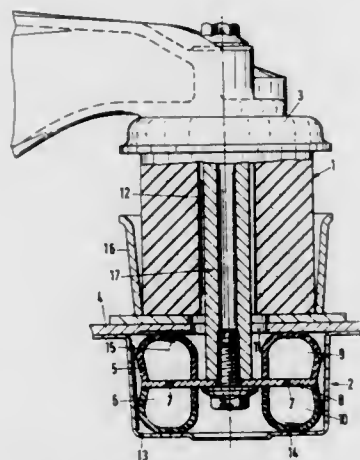
Filed Nov. 16, 1990, Ser. No. 614,274

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1989, 3938048

Int. Cl.⁵ B60G 11/62

U.S. Cl. 267—35

5 Claims



1. A cushion bearing comprising two rigid bearing seats, a bearing block of resilient material and a double-acting gas spring acting in parallel with respect to the two rigid bearing seats, the gas spring comprising a resilient bellows encompassing a gas chamber, a rigid throttling member dynamically connected with one of the bearing seats and arranged to divide the gas chamber into two compartments whose volumes vary in opposite directions in response to relative motions of the bearing seats, means forming a rigid housing, which is separate from and encloses the resilient bellows, dynamically connected to the other bearing seat and acting on the bellows, and at least one intake valve for the bellows permitting entry of ambient air therein during relative movement between the bearing seats.

5,087,021

FLUID-FILLED CYLINDRICAL ELASTIC MOUNT HAVING ANNULAR FLUID CHAMBER AND ANNULAR MOVABLE MEMBER TO PROVIDE RESTRICTED RESONANCE PORTION

Hiroaki Tanahashi, Komaki, and Takanobu Nanno, Kasugai, both of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Aug. 15, 1990, Ser. No. 567,619

Claims priority, application Japan, Aug. 23, 1989, 1-98554

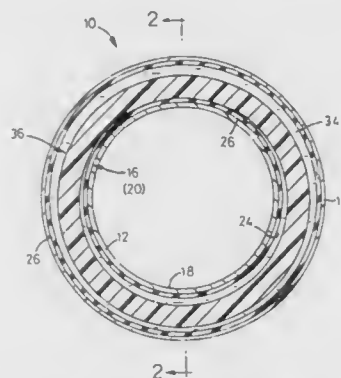
Int. Cl.⁵ F16F 13/00

U.S. Cl. 267—140.1 C

9 Claims

1. A fluid-filled cylindrical elastic mount for flexibly connecting two members, comprising:
an inner sleeve attached to one of said two members;
an outer sleeve attached to the other of said two members, and disposed radially outwardly of said inner sleeve with a predetermined radial spacing therebetween;
generally annular elastic body interposed between said inner and outer sleeves for elastic connection therebetween, said elastic body at least partially defining an annular fluid chamber formed between the inner and outer sleeves and extending over an entire circumference of the mount, said fluid chamber having a substantially constant cross sectional area over the entire circumference of the mount, and being filled with a non-compressible fluid having a kinematic viscosity of not higher than 100 centistokes; and
a rigid annular movable member having a generally rectan-

gular cross sectional shape and a radial wall thickness, said annular movable member being accommodated in said fluid chamber such that said movable member can be radially displaced within the fluid chamber relative to said inner and outer sleeves, said movable member and said fluid in said fluid chamber cooperating to provide a restricted resonance portion, said annular movable member having a radially inner circumferential space having axial dimension larger than said radial wall thickness thereof, and being dimensioned such that said resonance portion comprises a pair of axially spaced-apart sections spaced



apart from each other by said movable member in an axial direction of the mount, and a radially inner section and a radially outer section which are spaced apart from each other by said movable member in a radial direction of the mount, said non-compressible fluid being forced to flow with a resistance in said radial direction through said axially spaced-apart sections, and in a circumferential direction of the mount through said axially spaced-apart sections and said radially inner and outer sections, upon application of a vibrational load between the inner and outer sleeves.

5,087,022

MEANS CONNECTING A COMMERCIAL VEHICLE AXLE WITH THE CHASSIS

Gerhard Rieck; Ingo Scholly, and Armin Mertens, all of München, Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, München, Fed. Rep. of Germany

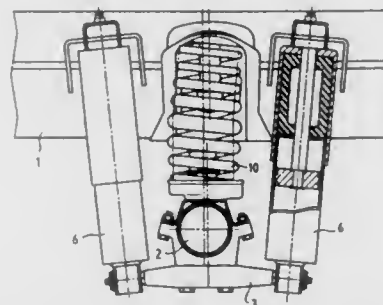
Filed Mar. 31, 1989, Ser. No. 332,296

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811630

Int. Cl.⁵ B60G 13/08, 15/04

U.S. Cl. 267—219

6 Claims



1. Elastic coupling means between an axle and a chassis of a motor vehicle, comprising spring means connected between the axle and the chassis of the motor vehicle, and a combination spring and shock absorber unit extending between the axle and the chassis to act in combination with the spring means to resist relative displacement of the axle and the chassis towards one another, said spring and shock absorber unit including a spring member and a shock absorber in axial alignment, said

5,087,024

SHEET-REMOVAL DEVICE

Gunter Sachs, Ostfildern, and Bernd Mirlieb, Fellbach, both of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP88/00420, § 371 Date Oct. 16, 1989, § 102(e) Date Oct. 16, 1989, PCT Pub. No. WO88/09523, PCT Pub. Date Dec. 1, 1988

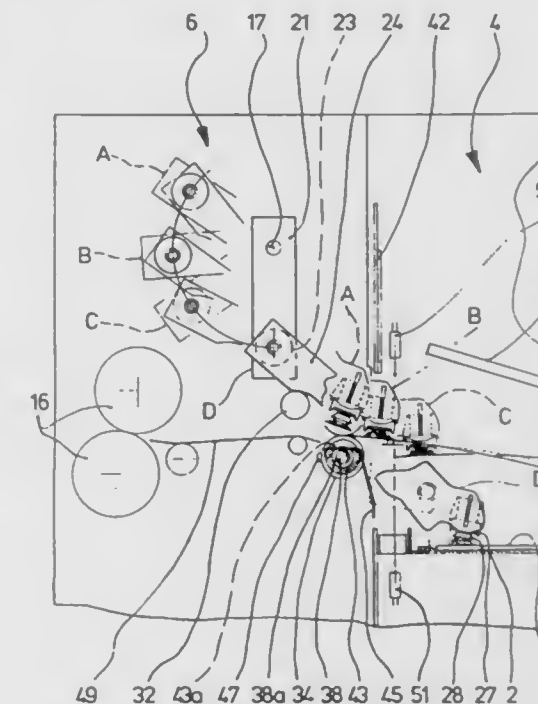
PCT Filed May 16, 1988, Ser. No. 427,135

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716904

Int. Cl.⁵ B65H 5/08

U.S. Cl. 271—11

2 Claims



1. In a device for removing a sheet from a container by means of suction means that engages the sheet to bend off a portion of the sheet, the improvement comprising:
crank means having spaced arms,
an elongated member extending between and carried by said spaced arms,
suction means carried by said elongated member,
slot and guide web means carried by said spaced arms and comprising straight slot means in end portions of said spaced arms and guide web means in the ends of said elongated member, which guide web means engage said slot means to provide limited, free, rectilinear movement of said elongated member and suction means with respect to said spaced arms, and
means for moving said crank means to move said spaced arms in an arcuate path in a first direction to move said suction means toward said sheet to a position in which said suction means is proximate said sheet, at which position said straight slot means is positioned at an acute angle to the sheet and said suction means engages the sheet at an acute angle, and in a second direction to lift the engaged sheet,
said slot and guide web means providing for rectilinear compensating movement of said suction means in one rectilinear direction relative to said spaced arms as said suction means engages the sheet, and rectilinear movement in a direction opposite to one direction when said spaced arms move in said second direction to lift the sheet.

combination spring and shock absorber unit comprising a two part housing, one part of said two part housing comprising a first cylindrical part and the other part of said two part housing comprising a second cylindrical part having an open end in which said first cylindrical part is slidably fitted coaxially of said second cylindrical part, said spring member comprising a hollow cylinder of cellular polyurethane fitted between the two parts of the housing to resist displacement therebetween, said shock absorber comprising a piston slidable in said first cylindrical part of the housing and secured to the second cylindrical part of the housing, said piston including a rod extending through the hollow cylinder, said hollow cylinder of cellular polyurethane being fitted in said second cylindrical part of the housing and having an outer cylindrical surface in contact with said second cylindrical part of the housing, said hollow cylinder of cellular polyurethane further having a first end bearing against an end of said second cylindrical part of the housing and a second opposite end bearing against an end of said first cylindrical part of the housing, said outer cylindrical surface of said cylinder of cellular polyurethane being in contact over its entire axial length with said second cylindrical part of the housing to be effective during the entire translation of the piston in said first cylindrical part of the housing in resisting relative displacement between the axle and the chassis after a specific spring load is resisted by said spring means.

5,087,023

APPARATUS AND METHOD FOR FOLDING SEPARATED FORMS IN A STACK

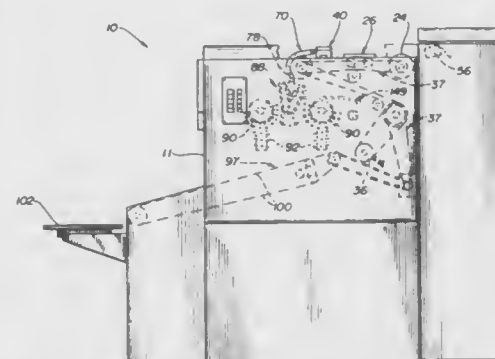
L. Eldean Gilbert, West Milton; Watson L. Gullett, Spring Valley, and W. Edwin Thornburg, Troy, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Aug. 23, 1990, Ser. No. 572,041

Int. Cl.⁵ B41L 1/32

U.S. Cl. 270—39

58 Claims



1. A form handling device for advancing and folding a continuous web and forms of two or more pages, said form handling device comprising:
means for advancing a continuous web and forms in a direction of web movement;
means for folding said web and forms comprising:
a swing chute adapted to swing through an arc defining a swing angle, said swing chute including means for positively conveying said web and forms therethrough, said means for positively conveying disposed in said swing chute and operable to positively convey said web and forms at a speed substantially related to the advance of said web and forms in said direction of web movement, said speed substantially unrelated to the position of said swing chute as it swings through said arc;
means for receiving said web and forms from said swing chute whereon said web and forms are folded; and
means for operating said means for folding in timed relation with said means for advancing; and
frame means for supporting said means for advancing, means for folding and means for operating.

5,087,025

SHEET DELIVERY MECHANISM HAVING A SUCTION FEEDER INCLUDING A MOVABLE ROLLER PAIR
Shingo Hamada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 325,407, Mar. 17, 1989, abandoned.

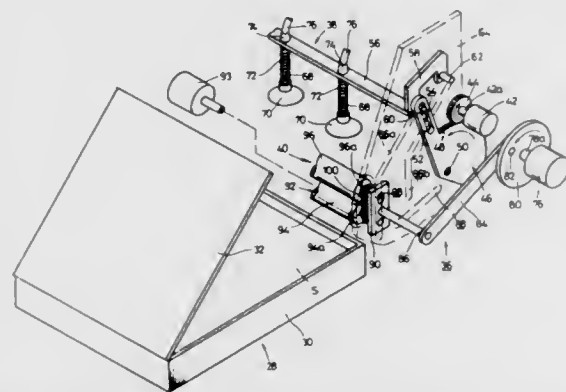
This application Jan. 10, 1991, Ser. No. 639,402

Claims priority, application Japan, Mar. 18, 1988, 63-65061

Int. Cl.⁵ B65H 5/10

U.S. Cl. 271-14

8 Claims



1. A sheet delivery mechanism for delivering a sheet from a sheet storage unit to a sheet feed system, comprising: suction means movable toward and away from the sheet stored in the sheet storage unit for removing an end of the sheet from the sheet storage unit; and feed means movably disposed between said suction means and the sheet feed system, said feed means being movable toward said suction means for holding the end of the sheet removed from said sheet storage unit, and then operable to feed the sheet to said sheet feed system, said feed means being displaceable between said suction means and said sheet feed system while holding said end of said removed sheet, wherein said suction means comprises at least one suction cup connected to a vacuum generator, an arm supporting said suction cup, first and second guide pins mounted on said arm, means defining guide grooves in which said first and second guide pins are movably fitted respectively, a guide plate engaging said first guide pin, and a first actuator for rotating said guide plate.

5,087,026

SHEET CONVEYING APPARATUS FOR CONVEYING VARIABLE LENGTH SHEETS TO A STACK HAVING A SELECTIVELY POSITIONABLE TRANSPORT ROLLER
Andrew F. Wyer, Comberton, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

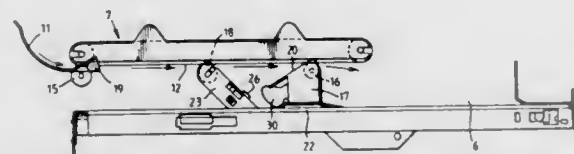
Filed May 31, 1991, Ser. No. 708,941

Claims priority, application United Kingdom, Jun. 28, 1990, 9014447

Int. Cl.⁵ B65H 29/70

U.S. Cl. 271-188

11 Claims



1. Sheet feeding apparatus having an input and an output ends thereof and a sheet feed path, comprising: a belt for conveying sheets through the apparatus; an input roll and an output roll which co-operate with said belt at said input and said output ends of said apparatus, respectively, said output roll

being movable lengthwise of said belt to vary the length of said sheet feed path through said apparatus; an intermediate roll which is movable between an operative position in which it co-operates with said belt at a point intermediate the ends thereof and an inoperative position in which it does not co-operate with said belt; and latch means operable to hold said intermediate roll in said inoperative position, said output roll being co-operable with said intermediate roll whereby: movement of said output roll from a position on one side of said intermediate roll, remote from said input roll, to a position on the other side of said intermediate roll moves said intermediate roll into said inoperative position and operates said latch means; and the reverse movement of said output roll releases said latch means and allows said intermediate roll to return to said operative position.

5,087,027

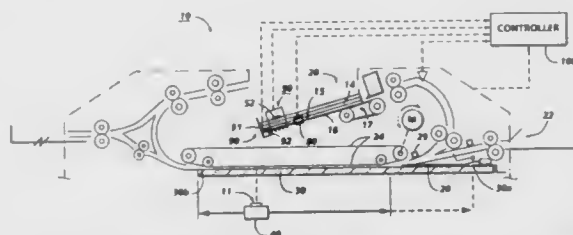
DOCUMENT HANDLER STAPLE DETECTOR
Thomas Acquaviva, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1990, Ser. No. 548,458

Int. Cl.⁵ B65H 7/02

U.S. Cl. 271-258

2 Claims



1. In a document feeder for an imaging system for sequentially feeding document sheets from an open, coverless document tray with a document set stack supporting surface onto which a set of document sheets are stacked for separation and sequential bottom sheet feeding; the improvement comprising non-contact metal staple or paper clip detection means including electrical field generating means underlying only a minor, limited, pre-selected portion of said document tray in which staples or clips are most likely to be found in a set of documents stacked onto said tray, said staple detecting means being responsive to the presence of a staple or clip in the set of documents within a limited distance above said document set stack supporting surface of said document tray; document loading detection means for detecting and indicating the stacking of document sheets into said document tray, and control means for inhibiting interrogation of said staple detection means until after a time delay after said document loading detection means has detected said stacking of documents sheets into said document tray so that said staple detection means is only actuated after the set of document sheets has been stacked into said tray, and prior to said feeding of said document sheets, to prevent feeding of stapled document sheets by said document feeder by said staple detection means being interrogated in time periods in which it is unlikely that metal objects other than a staple or clip will be present within said document tray to actuate said staple detection means; said staple detecting means generating a limited effective distance metal detection electrical field in a limited area above said stack supporting surface of said document tray for detecting a staple or clip within said document stack adjacent to said set stack supporting surface of said document tray in said limited area, and providing a control signal for inhibiting feeding of document sheets from said stack in response to said metal detection.

5,087,028

ALIGNING TABLE

Eckhard Fröhlich, Steinheim, Fed. Rep. of Germany, assignor to Stahl GmbH & Co. Maschinenfabrik, Fed. Rep. of Germany

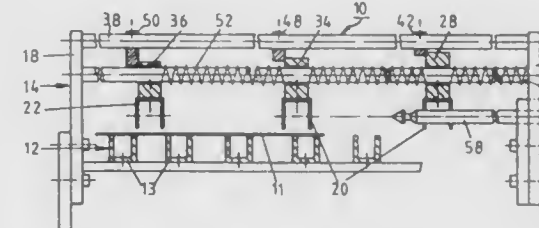
Filed Sep. 1, 1989, Ser. No. 401,956

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1989, 8902453[U]

Int. Cl.⁵ B65H 5/00

U.S. Cl. 271-273

11 Claims



1. Aligning table comprising a lower sheet guide and an upper sheet guide defined by two side walls extending in a conveying direction, a plurality of holding-down elements between said side walls aligned in the conveying direction, and at least one guide bar connecting said side walls together, said guide bar extending perpendicularly to said side walls, said holding-down elements being slidable when mounted on said guide bar.

5,087,030

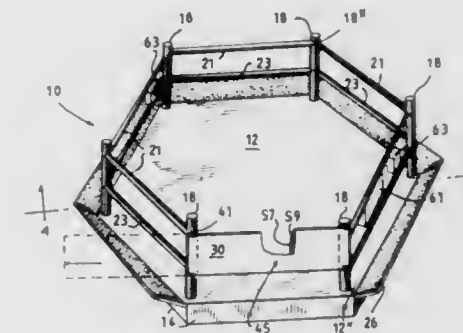
ROLLER SKATING RINK

Kirk Jones, 3304 Great Neck Rd., Copiague, N.Y. 11726

Filed Jun. 18, 1990, Ser. No. 539,690

Int. Cl.⁵ A63C 10/10

12 Claims



1. A roller skating ring for children comprising: a substantially flat floor made from a solid piece having a plurality of lateral edges and corners, which is of a size which can fit in a yard or basement of a single-family home; a barrier means attached to said floor adjacent said lateral edges to prevent skaters from skating off said floor and to prevent those who are not said skaters from entering and interfering with said skaters; and entrance means in said barrier means for ingress and egress of said skaters.

5,087,031

ARM EXERCISER

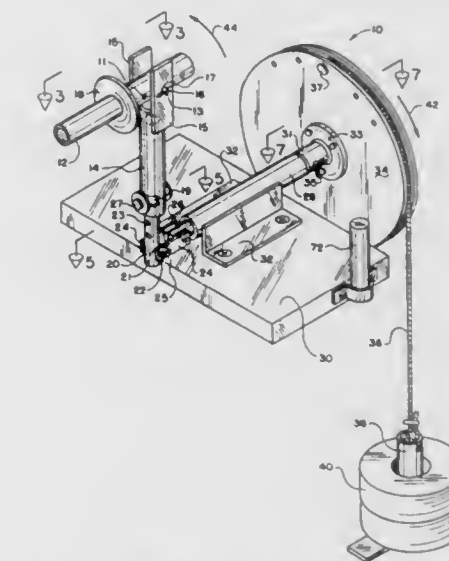
Ross W. Hoff, 448 N. Pleasant St., Norwalk, Ohio 44857

Filed Apr. 8, 1991, Ser. No. 681,921

Int. Cl.⁵ A63B 23/00

U.S. Cl. 272-67

2 Claims



1. An arm exercising apparatus comprising: an elongated handle member including a hand guard and a plurality of apertures along the longitudinal axis thereof at one end thereof; a first elongated sleeve member including an opening throughout its longitudinal axis, said first elongated sleeve member terminating at one end with connecting means, said connecting means including a pair of apertures in opposite relationship and in axial alignment with respect

5,087,029

SORTER HAVING NOISE-ELIMINATING MEMBER
Yoshio Sugishima, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 365,799, Jun. 14, 1989, abandoned.

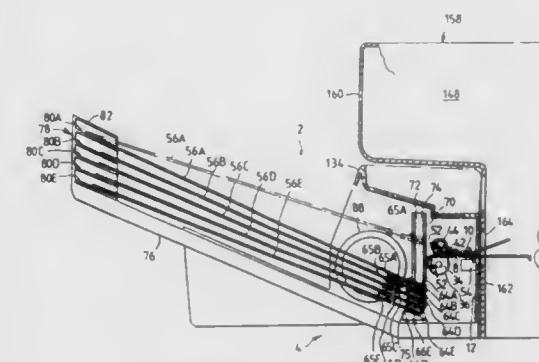
This application Feb. 13, 1991, Ser. No. 655,188

Claims priority, application Japan, Jun. 17, 1988, 63-80747[U]; Jul. 2, 1988, 63-65239[U]

Int. Cl.⁵ B65H 39/11

U.S. Cl. 271-293

15 Claims



1. A sorter comprising a plurality of movable bin trays vertically arranged, shifting means for moving said bin trays upwardly or downwardly one after another, and noise eliminating means for eliminating noise between a first contacting portion and second contacting portion said noise eliminating being provided in at least one portion of said first contacting portion of said shifting means which contacts said bin trays and said second contacting portion of each of said bin trays which contacts said shifting means.

to each other, said first elongated sleeve member further including at the end opposite said connecting means an elongated slot, said slot being perpendicular to the longitudinal axis of said first sleeve member;

means for pivotally connecting said handle to said first sleeve member at a point defined by the alignment of apertures of said handle member and said apertures located on said connecting means;

a first rod member telescopically inserted into said first elongated sleeve member, said first rod member including a plurality of apertures therethrough along the longitudinal axis thereof;

said first sleeve member rotatably connected to said first rod member by means of a locking pin through said apertures located on said first rod member and through said elongated slot located on said first sleeve member;

a second elongated rod member terminating at one end thereof in a U-shaped configuration, said U-shaped terminating end including a pair of apertures oppositely disposed and in axial alignment with respect to each other; means for pivotally connecting said second elongated rod member to said first rod member at a point such that the apertures located on said first rod member are in alignment with apertures located on said U-shaped configuration;

an elongated bearing member adapted to rotatably receive said second elongated rod member;

a pulley member;

means for connecting said pulley member to said elongated rod member; and,

means for attaching a load to said pulley member.

5,087,032

GRIP EXERCISER USED WITH WEIGHT ASSEMBLY

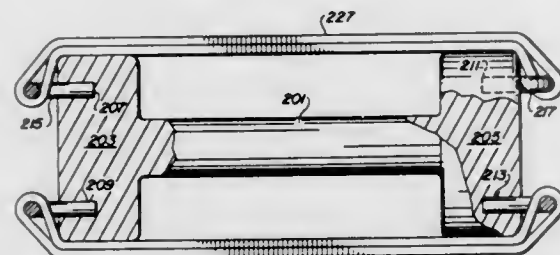
Peter Gresh, 437 Lark Ave., Miami Springs, Fla. 33166

Filed Apr. 27, 1990, Ser. No. 515,579

Int. Cl.⁵ A63B 21/072

U.S. Cl. 272-68

9 Claims



1. In combination, a dumbbell structure and a grip exerciser device for concurrently exercising the grip while lifting the dumbbell, said combination comprising:

said dumbbell structure including a weight supporting bar and two weight structures each attached adjacently to an opposite end of said weight support bar in spaced apart relation,

said grip exerciser device comprising spaced apart gripping portions structured to resist movement of said gripping portions towards one another,

said grip exerciser device secured to said dumbbell such that said gripping portion is defined between said weight structures,

said grip exerciser device being disposed to position said gripping portions outwardly in spaced relation to said weight support bar,

said grip exerciser device including a biasing means removably attached to said dumbbell and disposed and structured to resist movement of said gripping portions towards said weight support bar,

said biasing means including a pair of flexible, resilient non-metallic bands being sufficiently taught to resist movement thereof, and being disposed on opposite sides of said

weight support bar in spaced relation thereto, such that a hand or foot may be inserted therebetween, and attachment means for securing said biasing means to said dumbbell.

5,087,033

JOGGING GENERATOR

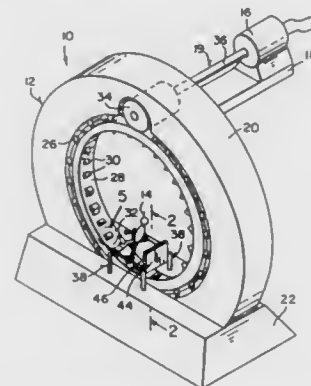
Lee Tagney, 1626 N. Wilcox Ave. Box 220, Los Angeles, Calif. 90028, and George Spector, 233 Broadway RM 3815, New York City, N.Y. 10007

Filed May 9, 1990, Ser. No. 521,842

Int. Cl.⁵ A63B 22/02

U.S. Cl. 272-69

4 Claims



1. A jogging-generator for use by a person to jog therein and generate an electrical current during a jogging activity, said jogging-generator comprising:

a) support means,

b) a drum shaped exercise unit housing supported by said support means and sized so that a jogger can run therein;

c) bearing means associated within said drum shaped exercise unit housing;

d) rotatable ring member operatively supported by said bearing means for rotation within said drum shaped exercise unit housing;

e) an electrical generator;

f) means connected to said drum shaped exercise unit housing for operating said generator during the running of the jogger within said drum shaped exercise unit housing so as to produce electrical current from said generator; and

g) a foot receiving section on said rotatable ring member to receive and provide a comfortable position for the feet of the jogger, said foot receiving section being spaced around the entire circumference of said rotatable ring member.

5,087,034

ILLUMINATED JUMP ROPE

Kenneth M. Solis, 4700 W. Grange Ave., Greenfield, Wis. 53220

Filed Jan. 24, 1991, Ser. No. 645,105

Int. Cl.⁵ A63B 5/20

U.S. Cl. 272-75

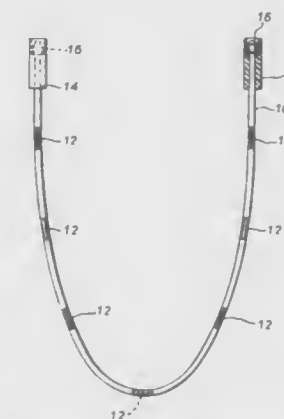
11 Claims

1. A jump rope, comprising:

a. a hollow, elongated, flexible, translucent tube of sufficient length to be used for jumping, said tube having an outer wall and an inner wall and open outer ends;

b. a plurality of discrete light emitting elements of a predetermined length and having opposite outer ends and an outer periphery which is slightly larger than the inner diameter of the tube, the light emitting elements inserted in the tube and spaced along its length, and held in place by friction between the inner wall of the tube and the periphery of the light emitting element, the tube further including through slits communicating the outer wall of

the tube of the hollow interior, each of said slits of approximately the same length as one of the light emitting elements,



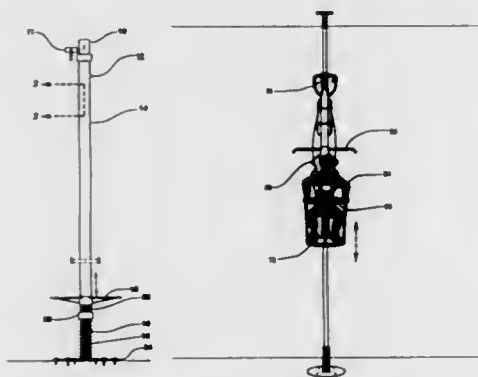
ments, whereby light emitting element may be inserted in and removed from the tube through the slits; and

c. handles, one each attached to the outer ends of the tube.

5,087,035

RECREATIONAL APPARATUS FOR PROPELLING A PERSON ABOUT A FIXED POINT

chamber within said cavity, said plunger member being slidably and sealingly movable inwardly and outwardly of said cavity, the axial position of said plunger member in relation to said barrel being responsive to the force or pressure exerted on the resulting column of air from without, and to the volume of air within said air chamber, wherein said barrel has a bore diameter in the approximate range of 5 to 10 centimeters and barrel length equal to at least the approximate height of a predetermined operator; (c) air exchange valve means for selectively increasing and decreasing the volume of air confined in said air chamber,



thus affecting the amount of extension and retraction, respectively, of said plunger member relative to said barrel, wherein said valve means includes check valve means, positioned so as to allow air into said air chamber when air pressure on inlet side of said check valve exceeds the air pressure within said chamber, thus achieving extension of said gas spring and the consequent elevation of said operator; and (d) footrest means on the lower outside portion of said barrel, whereby said gas spring is made suitable for use as a pogo stick with variable height control.

5,087,038

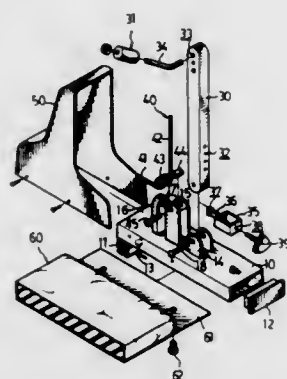
EXERCISING APPARATUS FOR ARMS

Kuo-Hua Hao, No. 19, Anshun Pei Erh St., Taichung, and Jui-Fang Hwang, No. Shanghsin 27, Shanghsin Li, Tsolan Chen, Miaoli Hsien, both of Taiwan

Filed Mar. 7, 1991, Ser. No. 667,492
Int. Cl.⁵ A63B 21/00

U.S. Cl. 272-135

6 Claims



1. An exercising apparatus comprising a base, a post and a first pair of lugs and a second pair of lugs integrally formed on said base, a first hole formed in said post, a beam having a lower end pivotally supported on said base, a handle portion being provided to an upper portion of said beam, a lower end of said beam being pivotally coupled to said first pair of lugs by a pivot axle, a loop engaged on said beam and an extension integrally formed thereon, a second hole being formed in a free end of said extension, and a spring biased between said beam

and said base, said spring having two legs coupled together by a middle portion which is supported on said second pair of lugs, a first leg of said spring extending through said first hole of said post and a second leg of said spring extending through said second hole of said extension so that said spring can be biased between said beam and said extension of said loop, whereby a user may hold said handle portion and actuate said beam to rotate said spring so that said user can practice training muscle groups of his arm.

5,087,039

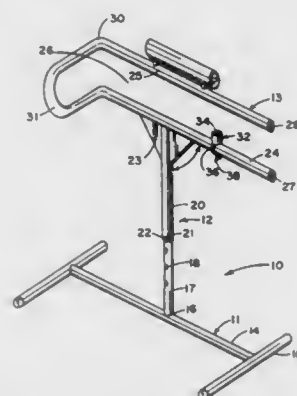
BASEBALL BAT SWING TRAINING DEVICE

Erik A. Laseke, 213 Whitman Rd., Winter Haven, Fla. 33884
Filed Mar. 26, 1991, Ser. No. 674,893

Int. Cl.⁵ A63B 69/40

U.S. Cl. 273-26 R

9 Claims



1. A baseball bat swing guide training apparatus comprising:
A support base;
A vertically extending support post having its lower end attached to said support base,
first and second guide arms, each having first and second end, said first guide arm being attached intermediate its ends to the upper end of said post,
said second arm being vertically spaced above said first arm a predetermined distance and having its first end attached to said first end of said first arm, said guide arms being generally L-shaped and parallel to each other, said arms being attached to each other such that a straight portion thereof extend substantially horizontal and the remaining portion and said first end of each arm extend at a predetermined downward angle of between 50 and 80 degrees relative to said support post, whereby a batter can swing a bat between said arms at said second end and along said straight portion without being obstructed.

5,087,040

GOLF CART WHEEL FRAME MOUNTING STRUCTURE

Ching-Chang Wu, No. 35-1, Jih Hsin Street, Tu Cheng Hsiang, Taipei Hsien, Taiwan

Filed Aug. 23, 1991, Ser. No. 749,360

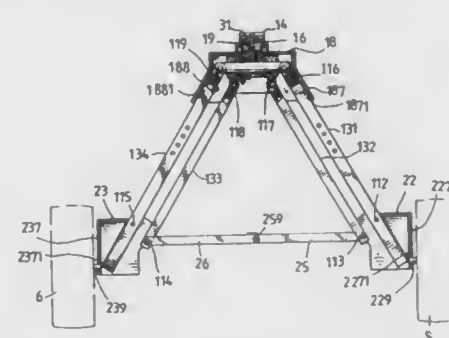
Int. Cl.⁵ A63B 55/08; B62B 1/04

U.S. Cl. 273-32 E

1 Claim

1. A golf cart wheel frame mounting structure, the improvement comprising:
a wheel frame holder made from a trapezoidal casing, two hook-shaped projecting strips upstanding from the top surface thereof at two opposite locations, two elongated parallel rails on the top surface thereof within said two hook-shaped projecting strips, two opposite side walls obliquely extending downwards outwards at two opposite ends, a front side wall vertically extending downwards at the front and respectively connected to said two opposite side walls at two opposite ends, and an opening opposite to said front side wall;

a mounting plate mounted on a golf cart's main frame to secure said wheel frame holder thereto, said mounting plate being made from a channel iron having two hooked edges on the two opposite ends thereof respectively engaged with said two hook-shaped projecting strips through hook joint;
a pressure plate having a flat bottom edge stopped at said two elongated parallel rails and a groove on the top edge thereof attached to said main frame at the bottom;
a lock screw inserted through a bolt hole on said wheel frame holder and a bolt hole on said pressure plate to tightly press said main frame against said mounting plate;
a shaft fastened in said wheel frame holder at the bottom in longitudinal direction by a clamp, said clamp being secured to said wheel frame holder by screws;
a first left-hand wheel frame having a top end pivoted to said shaft at one end;
a first right-hand wheel frame having a top end pivoted to said shaft at an opposite end;
a first connector mounted on said shaft through sleeve joint and retained between said first left-hand wheel frame and said clamp;
a second connector mounted on said shaft through sleeve joint and retained between said first right-hand wheel frame and said clamp;
a second left-hand wheel frame having a top end pivoted to said first connector;
a second right-hand wheel frame having a top end pivoted to said second connector;



a left-hand wheel holder made from a hollow frame having a left-hand vertical wall at one end, a wheel axle transversely extending outwards from said left-hand vertical wall for holding a left-hand wheel, and a right-hand U-shaped support transversely extending from the top edge thereof at an opposite end, said right-hand U-shaped support having a first pair of pin holes for connecting the opposite end of said first left-hand wheel frame by a pin and a second pair of pin holes for connecting the opposite end of said second left-hand wheel frame by a pin;
a right-hand wheel holder made from a hollow frame having a right-hand vertical wall at one end, a wheel axle transversely extending outwards from said right-hand vertical wall for holding a right-hand wheel, and a left-hand U-shaped support transversely extending from the top edge thereof at an opposite end, said left-hand U-shaped support having a first pair of pin holes for connecting the opposite end of said first right-hand wheel frame by a pin and a second pair of pin holes for connecting the opposite end of said second right-hand wheel frame by a pin;
a foldable frame comprised of two connecting rods pivoted at one end, said foldable frame having two opposite ends respectively pivotally connected to said second left-hand wheel frame and said second right-hand wheel frame;
wherein said foldable frame can be folded up to close said first and second left-hand wheel frames, said first and second right-hand wheel frames, said left-hand and right-hand wheel holders and said left-hand and right-hand wheels together; said shaft being rotated through 90° angle causing said first and second left-hand wheel frames

and said first and second right-hand wheel frames to be collapsed and closely attached to said main frame.

5,087,041

COVER PANEL FOR PIN SETTER BOWLING MACHINE

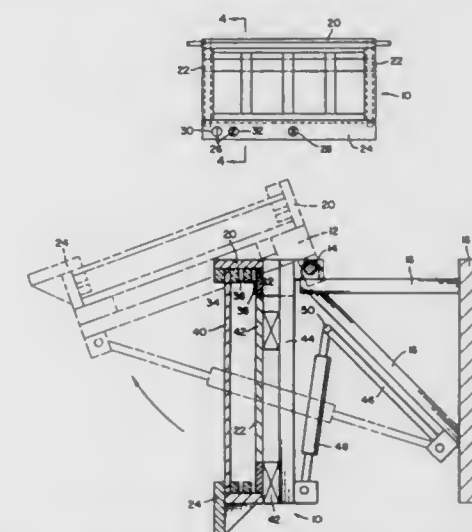
Joseph L. Gagnon, 296 Swaggertown Rd., Scotia, N.Y. 12302

Filed Apr. 5, 1991, Ser. No. 681,574

Int. Cl.⁵ A63D 5/00

U.S. Cl. 273-54 R

6 Claims



1. A cover panel mechanism for adjacent bowling alley pin setter machines comprising:

a plurality of frame members each adapted to receive a cover panel, each of said frame members pivotally secured to a pin setter machine framework for movement between a closed position where the cover panel is in a vertical position in front of the pin setter, thereby blocking the view of the pin setter from a bowling alley user, a plurality of said cover panels in the closed position forming a series of adjacent cover panels lying in substantially the same plane, and an open position where the cover panel is pivoted toward the horizontal to an angled position where said open cover panel lies in a plane which is completely separate and distinct and does not intersect or bisect adjacent cover panels when said adjacent panels are in the closed position; and means for locking the frame in said angled position.

5,087,042

GOLF CLUB GRIP

Karsten Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 573,326, Aug. 27, 1990, abandoned. This application Feb. 11, 1991, Ser. No. 653,646

Int. Cl.⁵ A63B 53/14

U.S. Cl. 273-81 B

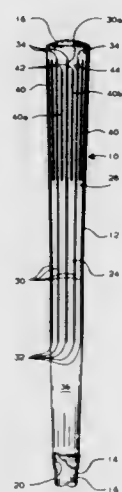
24 Claims

1. A grip for mounting on the extending end of a shaft of a golf club, said grip comprising:

a) a tubular body of elongated frusto-conical configuration with a closed end of relatively large diameter and a smaller diameter open end for slidably and coaxially receiving the extending end of the shaft of the golf club; and
b) said body having a groove array means formed in the peripheral surface thereof for maximizing the static friction exerting capability of said grip to resist rotation of the golf club in a golfer's hands about the longitudinal axis of the shaft of the golf club, said groove array means including:
I. a first plurality of grooves formed in said body in spaced radial increments so as to circumscribe said body, said

first plurality of grooves extending longitudinally from proximate the closed end of said body for a distance which is more than half the length of said body,

II. a second plurality of grooves formed in said body in spaced radial increments so as to circumscribe said body, said second plurality of grooves being in alternating interspersed relationship with the grooves of said first plurality of grooves and extending longitudinally



from proximate the closed end of said body for a distance which is less than the extending distance of said first plurality of grooves, whereby the distances which the first and second plurality of grooves extend are such that the static friction exertion capability is maximized for the golfer's hand proximate the closed end of the grip and is lessened for the hand proximate the opened end of the grip.

5,087,043

INTERACTIVE AUDIO-VISUAL PUZZLE

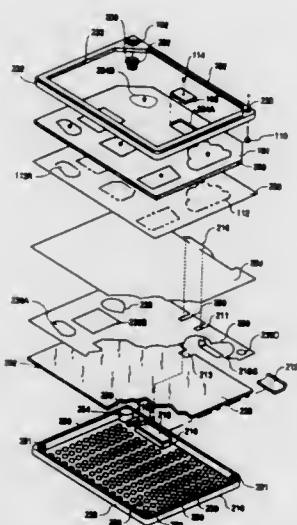
Zeb Billings, Hartland, Wis.; Harold D. Pierce, Woodland Hills, Calif.; Conrad W. Kish, Brookfield, and Patrick E. Kusina, Greenfield, both of Wis., assignors to Sight and Sound Inc., New Berlin, Wis.

Filed Feb. 9, 1990, Ser. No. 478,086

Int. Cl.⁵ A63F 9/10; G09B 7/06

U.S. Cl. 273—157 R

8 Claims



1. An audio-visual interactive puzzle comprising:

a rigid puzzle form defining an upper surface, including a predetermined number of form cutouts;
an upper graphic disposed on said upper surface of said form;
a plurality of respective removable puzzle pieces, each having a peripheral configuration conforming to that of an associated form cutout and bearing a piece graphic;
a flexible membrane having an underside and bearing, on said underside thereof, a plurality of conductors in predetermined relative disposition;
a plurality of respective lower graphics disposed to overlie said flexible membrane and to underlie said form cutouts;
a spacer including respective spacer cutouts generally corresponding to and disposed to underlie said form cutouts;
a conductive ground plane disposed to underlie said spacer cutouts;
means for maintaining said form, said lower graphics, said flexible membrane, said spacer and said ground plane in predetermined relative dispositions; and
an electronic sound generator, responsive to input signals applied thereto, for generating respective predetermined associated sounds in response to the input signals;
said flexible membrane conductors, said spacer and said ground plane corresponding to form a touchpad including a touchpoint corresponding to each of said lower graphics electrically connected to said electronic sound generator, to selectively effect generation of said the input signals to said electronic sound generator.

5,087,044

MARKING MEMBER STORAGE DEVICE FOR GOLF CLUB

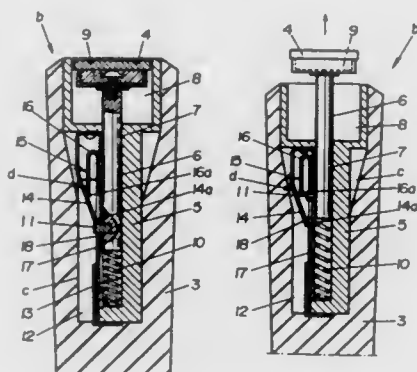
Kaoru Okushima, 1-21-17 Andou, Shizuoka, 420, Japan

Filed Dec. 26, 1990, Ser. No. 633,942

Int. Cl.⁵ A63B 57/00, 53/14

U.S. Cl. 273—162 D

7 Claims



1. A device for storing a marking member in a golf club, comprising:

a grip for a golf club;
a main member mounted in a mounting hole formed in the end of said grip, said main member being provided with a recess formed in the outer end thereof;
a movable member received in said main member so as to be movable outward to project from the bottom of said recess and be pushed inward into said main member;
a marking member holder provided on an end of said movable member and adapted to detachably hold said marking member;
fixing means for fixing said marking member holder in such a state that said marking member is releasably held in said recess; and
releasing means for releasing the fixing operation of said fixing means so as to allow said movable member and marking member holder to project outward from said recess.

5,087,045

PUTTING GREEN WITH ADJUSTABLE TOPOGRAPHY AND MULTI-BALL RETURN

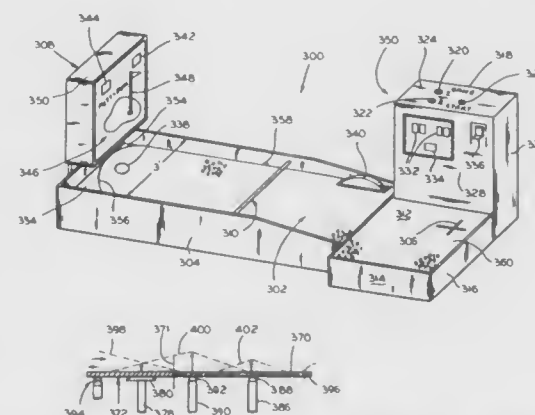
Samuel Kim, 3820 Charlemagne Dr., Hoffman Estates, Ill. 60195

Filed Feb. 26, 1990, Ser. No. 485,296

Int. Cl.⁵ A63B 67/02

U.S. Cl. 273—176 H

4 Claims



1. A putting green assembly, said assembly comprising a playing mat, a target hole in said playing mat, a means for adjusting the topography of said mat and for returning any balls on said mat to a predetermined location on said assembly, said means being adapted to elevate a predetermined segment of said playing mat and thereby adjust said topography of said mat by creating an incline therein, said incline also causing any balls on said predetermined segment to move away from said incline of said playing mat, control means for automatically operating said topography adjusting and ball return means, and detector means responsive to the presence of a ball on either said predetermined segment of said playing mat or in said target hole for signalling said control means to operate said topography adjusting and to operate said ball return means.

5,087,046

NOVELTY GOLF GAME

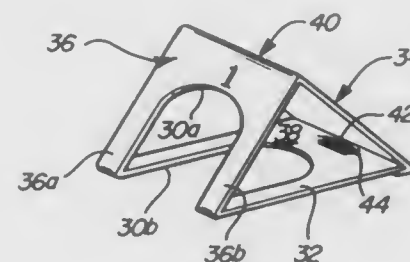
Carolyn S. Mauch, 19163 Surrey La., Northville, Mich. 48167

Filed Jan. 17, 1991, Ser. No. 642,440

Int. Cl.⁵ A63B 69/36

U.S. Cl. 273—178 R

2 Claims



1. A novelty golf game comprising:
a pair of putters and a pair of golf balls;
a putting target including a first inclined planar surface portion thereon adapted to be imprinted with instructional text and said target further including a base portion with a first hole segment with an open entrance and a closed exit and including a second inclined planar surface portion thereon having spaced side segments forming a second hole segment located above and rearwardly of the entrance to said first hole segment and located above and forwardly of the exit of said first hole segment for defining

a target hole through which a golf ball can be stroked and captured.

5,087,047

GOLF TRAINING METHOD AND APPARATUS

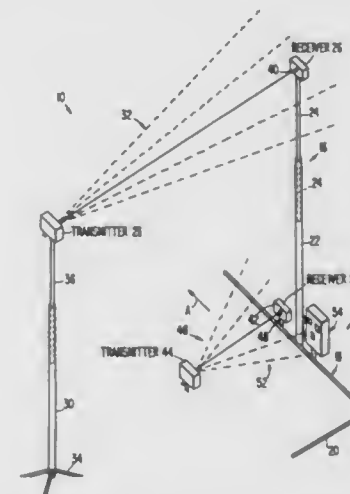
John P. McConnell, 2283 Hogback Rd., Sunbury, Ohio 43074

Filed Mar. 12, 1991, Ser. No. 668,052

Int. Cl.⁵ A63B 69/36; G08B 13/14

U.S. Cl. 273—183 B

16 Claims



1. A golf training system for detecting unwanted golfer's head displacement during a golf swing, said system comprising:

a support assembly having a vertically adjustable assembly; first motion detecting means being operable for detecting golfer's head displacement and for generating a signal indicative of such displacement, said first detecting means being an electromagnetic motion detecting means; second motion detecting means being operable for detecting a golf club head travelling in a preselected zone which zone is inclusive of where a golf ball would be during a swing and for generating a signal indicative of a golf club travelling in said zone and impacting a ball; means responsive to said signals of said first and second motion detecting means for indicating unwanted golfer's head displacement prior to a golf club head travelling in said zone; and, said indicating means is operable for indicating when a golf club head travels in said zone prior to golfer's head displacement for indicating unwanted golfer's head displacement.

5,087,048

GOLF BALL

Donald J. C. Sun, and Charles S. C. Su, both of 4521 Ocean Valley La., San Diego, Calif. 92130

Filed Jul. 13, 1990, Ser. No. 552,089

Int. Cl.⁵ A63B 37/14

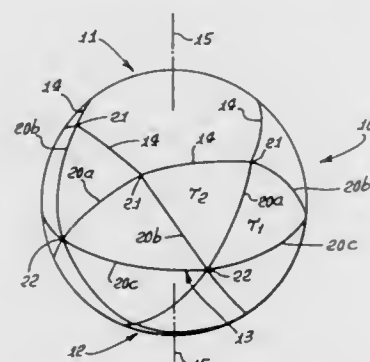
U.S. Cl. 273—232

10 Claims

1. In a golf ball characterized by enhanced flight distance and enhanced aerodynamic symmetry, the ball having a generally spherical surface with dimple patterns thereon, the improvement comprising:

a) between about 75% and 85% of the ball spherical surface occupied by the dimples,
b) there being smaller and larger dimples, all of which have diameters within the range of 0.110 to 0.160 inches,
c) there being dimple-free multiple great circle arcs on the ball surface, which define n-sided spherical surface polygons associated with axially opposite polar zones,

- d) there being $n^2 - 2n$ of the smaller dimples within each polygon,
e) the ball also having an equator, and great circle arcs also



- defining multiple spherical surface triangles with legs on said equator,
f) and there being $n^2 + 2n$ of the smaller dimples within said triangles on each side of the ball equator.

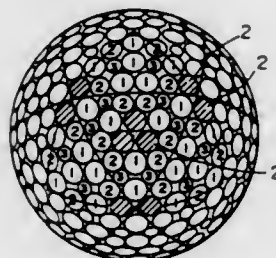
5,087,049 GOLF BALL

Hisashi Yamagishi, Yokohama, and Seisuke Tomita, Tokorozawa, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 555,011
Claims priority, application Japan, Jul. 25, 1989, 1-193670
Int. Cl.⁵ A63B 37/12

U.S. Cl. 273-232

10 Claims



1. A golf ball having groups of dimples on the surface thereof, wherein

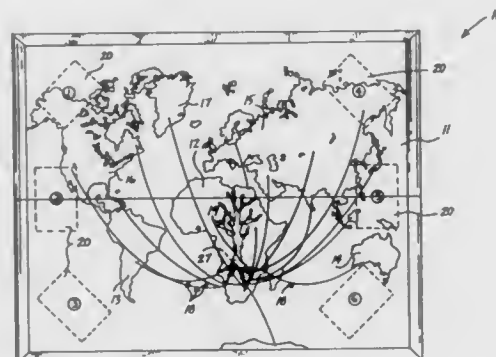
provided that the ball has a phantom spherical surface (11), three first phantom orthogonal great circles (12) are drawn on the spherical surface (11) to define eight equal spherical regular triangles (13), each spherical regular triangle (13) being delimited by three sides (17) and having a center and middle points (18) on the three sides (17), and four second phantom great circles (19) are drawn on the spherical surface (11), each second phantom great circle (19) connecting the middle points (18) on two of the three sides (17) delimiting the spherical regular triangle (13), each spherical regular triangle (13) having three segments of the second phantom great circles (19);

a group of three dimples (14) having the same shape and an equal diameter and an equal depth is distributed about the center of each spherical regular triangle (13) such that three line segments connecting the centers of the three dimples (14) define a regular triangle (15) and the length of each line segment (D_{D1}) of one side of the regular triangle (15) does not exceed twice the diameter (D_m) of the dimples, and not other dimples are located within the regular triangle (15) associated with the three dimples (14),

a group of two dimples (16) having the same diameter as the three dimples (14) is distributed on each side of the spherical regular triangle (13) in symmetry with respect to its

middle point such that the distance (D_{D2}) between the centers of the two dimples (16) does not exceed twice the diameter (D_m) of the dimples (16), and none of the dimples intersect the second phantom great circles 19.

5,087,050
HISTORY GAME APPARATUS UTILIZING FIBER OPTIC CABLE SEGMENTS
Thomas D. Donovan, 3637 Morrell Cir., Philadelphia, Pa. 19114
Filed May 2, 1991, Ser. No. 694,684
Int. Cl.⁵ A63F 3/04, 9/18
U.S. Cl. 273-237 2 Claims



1. A history game apparatus, comprising in combination, a game board, the game board including a geographic continent designation, with the geographic continent designation including an origin base therewithin, and the game board further including a plurality of further geographical designations in surrounding relationship relative to the central origin base, and at least one migratory path directed from the central origin base to each further geographical designation, and each of the migratory paths merging at the central origin base, and a predetermined number of card deck spaces positioned on the game board in surrounding relationship relative to the origin base, and

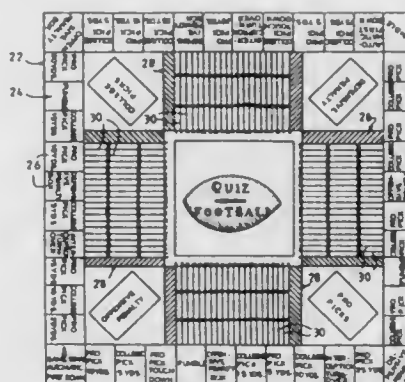
a predetermined number of card decks, each of the card decks formed of a plurality of cards, with each of the plurality of cards including questions relating to distinct historical data, with a card deck of the plurality of card decks mounted on each of said predetermined number of card deck spaces, and

each of the card deck spaces, and each of the card decks including a coated designation, and

a spinner assembly, the spinner assembly including a plurality of spinner target spaces positioned in relation to the spinner assembly, wherein each of the spinner target spaces designates a coated card deck of the plurality of card decks, and said game board includes a fiber optic cable housing mounted to a bottom surface of the game board below the origin base, and the fiber optic cable housing defined by a predetermined height, and including a plurality of table support legs mounted to the bottom surface of the game board, wherein each leg is defined by the predetermined height, and each of the migratory paths is defined by a fiber optic cable, and each fiber optic cable merging into a fiber optic cable sheath, wherein the fiber optic cable sheath is directed through the game board into the fiber optic cable housing, the fiber optic cable housing including an illumination bulb and switch means for ef-

fecting selective illumination of the illumination bulb to direct illumination through each fiber optic cable, and each fiber optic cable includes a plurality of fiber optic cable segments removably mounted relative to the game board.

5,087,051
QUIZ FOOTBALL BOARD GAME
Salvatore LoBue, 879 Bohemia Pky., Bohemia, N.Y. 11716
Filed Jun. 21, 1991, Ser. No. 718,799
Int. Cl.⁵ A63F 3/00, 9/18
U.S. Cl. 273-247 12 Claims



1. A quiz football board game which comprises:
a) a game board having a continuous path around its perimeter divided into consecutive playing spaces bearing instructions and a plurality of simulated football playing fields with yardage markings thereon;
b) a plurality of playing pieces one for each of the game players, each said playing piece representing a football team and being of a size to fit within the playing spaces;
c) a chance means operable by the players in sequence for determining the number of playing spaces to be traversed per turn by each said playing piece;
d) a plurality of football markers, each said football marker for indicating the position and advancement of a football along one of the simulated football playing fields;
e) a down marker to indicate the correct down for each player;
f) a plurality of professional football questions and answer cards;
g) a plurality of college football question and answer cards;
h) a plurality of offensive penalty cards; and
i) a plurality of defensive penalty cards; and said plurality of playing spaced including question card selection spaces each having first indicia thereon corresponding to the selection of a question and answer card, said question card selection spaces each also having second indicia representing yardage distance corresponding to said yardage markings on said football fields.

5,087,052
GAME WITH VARIABLY CONFIGURED BOARD
Richard M. Simon, 250 Yard Dr., Locust Valley, N.Y. 11560
Filed Sep. 28, 1990, Ser. No. 589,983
Int. Cl.⁵ A63F 3/00

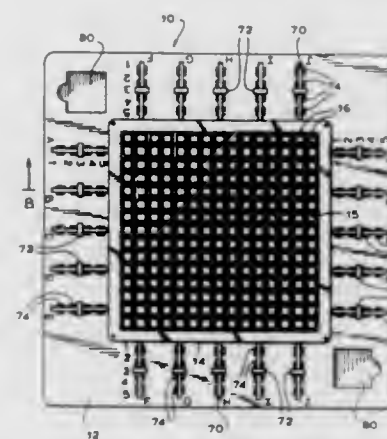
U.S. Cl. 273-284

23 Claims

1. Apparatus for a game played on a game board having an operative configuration of a plurality of squares which is adapted to be changed by the players of the game, comprising:

(A) a frame;
(B) a grid disposed in said frame for releasably receiving game pieces placed thereon and restraining the game pieces against unintended horizontal and vertical displacement;
(C) a plurality of planar slides operatively disposed for slid-

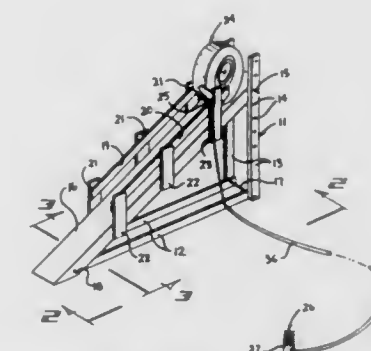
ing movement in said frame in at least two planes below said grid and defining a plurality of squares;
said slides together defining at least a portion of the operative configuration of the game board, each of said slides being mounted in said frame for independent movement



5,087,053
ARCHERY TARGET APPARATUS
Robert H. Head, Rd. 1, Box 261, Callicoon, N.Y. 12723
Filed Jun. 24, 1991, Ser. No. 719,622
Int. Cl.⁵ F41J 9/02

U.S. Cl. 273-359

4 Claims



1. An archery target apparatus, comprising, a support rack, the support rack including a plurality of horizontal base legs, each base leg including a rear base leg end and a forward base leg end, and each base leg mounting a rear mounting post orthogonally relative to each base leg rear terminal end at a rear mounting post lower terminal end, each rear mounting post arranged in a parallel relationship relative to one another, and each mounting post including a plurality of spaced apertures, with apertures of the plurality of spaced apertures of each mounting post arranged in a coaxial relationship relative to one another, and a ramp member, with the ramp member adjustably mounted relative to and between the rear mounting post, including a first pin connector directed through coaxially aligned apertures of the rear mounting posts for selective and

adjustable securement of an upper portion of the ramp member between the rear mounting posts, and a ramp member lower end portion including a further pin connector directed through base leg forward terminal ends and a lower portion of the ramp member to secure the ramp member to the base legs, and a right rail mounted to and in a spaced relationship relative to the ramp member on a right side thereof, and a left rail mounted to the ramp member coextensive with the right rail in a spaced parallel relationship relative to the right rail, with the left rail mounted to a left side of the ramp member, and the left rail including a top left support post positioned adjacent the right member upper portion, and the top left support post including a latch mechanism, a release member in operative association with the latch mechanism to effect selective release of the latch mechanism, with a cylindrical tire member mounted rotatably relative to a top surface of the ramp member above the latch mechanism, whereupon selective actuation of the release member and release of the latch mechanism effects release of the tire member for rotation along a top surface of the ramp member.

5,087,054

AMUSEMENT DUNKING APPARATUS

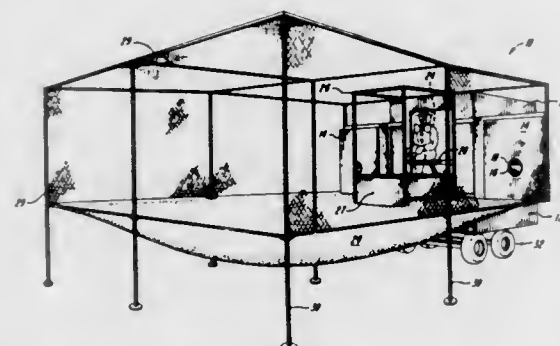
T. Scott O'Neil, Merrimac, Mass., assignor to Dunk The Clown, Inc., Merrimac, Mass.

Filed Mar. 14, 1991, Ser. No. 669,044

Int. Cl.⁵ A63B 63/00

U.S. Cl. 273—384

15 Claims



1. A release mechanism for an amusement apparatus adapted to release a load upon the occurrence of a predetermined event, comprising

- a load-supporting platform having load-supporting and load-releasing conditions;
- an elongate support rod adapted to maintain the platform in the load supporting condition, a first end of said support rod being pivotally connected to a bottom surface of the load supporting platform;
- a control apparatus comprising a horizontally disposed member rotatable about its longitudinal axis;
- a locking mechanism secured to the control apparatus and adapted to receive and retain a second end of the support rod to facilitate the load-supporting condition of the platform, said locking mechanism moveable between load-supporting and load-releasing conditions upon rotational movement of the control apparatus; and
- impact responsive release activation means for imparting rotational movement to the control apparatus to facilitate movement of the locking mechanism from a load-supporting condition engaging the support rod to a load-releasing condition for releasing the support rod.

5,087,055

STEEL OIL RING ASSEMBLY

Sumio Ono; Hitoshi Hattori, and Hatsutaro Mizuno, all of Kashiwazaki, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

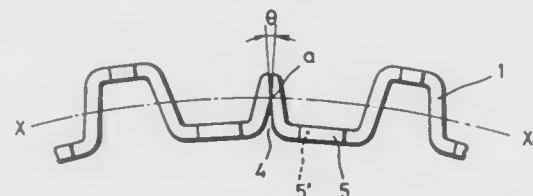
Filed Aug. 22, 1990, Ser. No. 570,772

Claims priority, application Japan, Aug. 31, 1989, 1-102151; Aug. 31, 1989, 1-102152

Int. Cl.⁵ F16J 9/06

U.S. Cl. 277—139

4 Claims



1. A steel oil ring assembly comprising an upper rail, a lower rail and an annular spacer-expander having axially extending corrugations for supporting from above and below said upper and lower rails, said spacer being split at one circumferential location to form end portions, each terminating in a free end, said end portions being in pressured contact with each other at a point remote from said free ends that is located in a plane extending in radial direction that passes substantially through the centers of said corrugations in the axial direction, the free ends of said end portions diverging in an axial direction away from said point at an angle of from 1° to 19°.

5,087,056

STATIC SEALING SYSTEM BETWEEN TWO FLAT-FACED CASINGS

Richard Baglin, Rueil-Malmaison, France, assignor to Societe Jaeger, Levallois-Perret, France

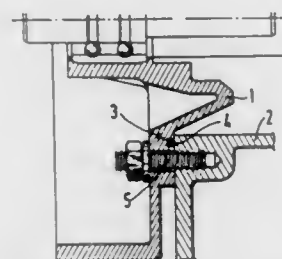
Filed Jul. 5, 1990, Ser. No. 547,080

Claims priority, application France, Jul. 6, 1989, 89 09124

Int. Cl.⁵ F16J 15/00

U.S. Cl. 277—180

8 Claims



1. A static sealing system suitable for sealing between two generally flat-faced casings, in which a semi-plastic synthetic material seal is housed in a groove formed in the flat face of only one of the casings and is disposed in the vicinity of fixing points at which the casings are fixed together by fixing means, wherein the groove and the seal each have a variable cross-section with respect to the radial thickness of the seal, each said cross section respectively varying as a function of position with respect to said fixing points.

5,087,057

HELICAL CUT SEAL

Ronald C. Kurkowski, 22487 Bell Ct., Farmington Hills, Mich. 48024

Filed Jan. 19, 1990, Ser. No. 467,448

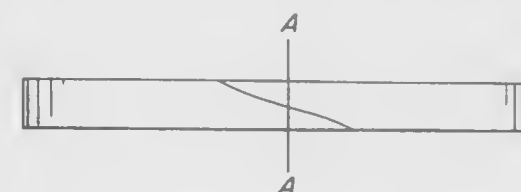
Int. Cl.⁵ F16J 9/12, 9/00, 9/28

U.S. Cl. 277—222

1 Claim

1. A ring seal having an axis, an inner diameter about said axis, an outer diameter about said axis, a thickness between said

inner and outer diameter, and a depth extending parallel to said axis, said ring seal comprising mating surfaces extending between said diameters and across said depth, said surfaces each



being a helicoid characterized by a radial generatrix that is constantly perpendicular to said axis over a sector of said seal between said inner and outer diameters.

5,087,058

METAL GASKET FOR MANIFOLD

Masahiko Miura, Kawachinagano; Shigeru Kawaguchi, Daito; Kunitoshi Inoue, Higashiosaka; Hideo Yamamoto, Miura, and Ken Obkura, Yokohama, all of Japan, assignors to Nippon Gasket Co., Ltd., Osaka, Japan

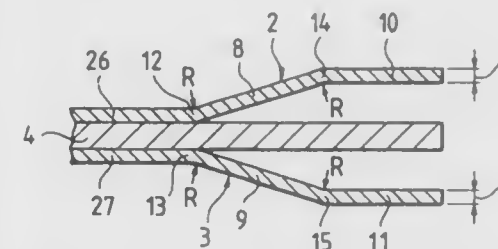
Filed May 31, 1991, Ser. No. 708,574

Claims priority, application Japan, Aug. 13, 1990, 2-211692

Int. Cl.⁵ F16J 15/12; F02F 11/00

U.S. Cl. 277—235 B

8 Claims



1. A metal gasket for a manifold disposed between a cylinder head equipped with exhaust ports and an exhaust manifold fixed to said cylinder head and equipped with inlets corresponding to said exhaust ports, comprising:

- a plurality of metal bead plates having a plurality of holes formed and positioned in such a manner as to correspond to said exhaust ports of said cylinder head;
- said bead plates having flat portions each having a flat surface, taper portions bent at first boundary portions thereof with said flat portions at a predetermined radius of curvature R and extending in a departing direction with respect to the other of said bead plates and bead portions bent at second boundary portions thereof with said taper portions at said predetermined radius of curvature R, extending in parallel and in spaced-apart relation with the other of said bead plates and positioned around said holes formed in said bead plates; and
- having a ratio R/t of said radius of curvature R to the thickness t of said bead plates being set to within the range of 7 to 15.

5,087,059

TOOL FOR INSTALLING OR REMOVING A COLLET HEAD

Donald N. Terwilliger, Millerton, Pa., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jun. 21, 1990, Ser. No. 541,793

Int. Cl.⁵ B23B 31/06

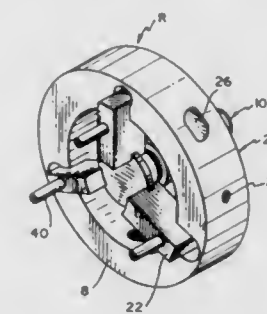
U.S. Cl. 279—1 ME

25 Claims

1. A tool for installing or removing a collet head, which has

a plurality of spring loaded collet segments, from a collet body, said tool comprising:

- a) a body having an axis;
- b) said body including a base and a skirt extending from said base;
- c) a member operably secured to said body and axially movable relative thereto;
- d) a plurality of arms;
- e) said skirt including a plurality of recesses;
- f) one end of each of said arms being disposed within a respective one of said recesses and pivotally secured



therein and the other end being movably secured to one end of said member such that when said member moves axially, the other end of each of said arms move with said member while the one end of each of said arms pivots in said recess; and

- g) means operably associated with said arms for securing said arms to the collet head such that when said member moves axially relative to said body, the resulting pivoting motion of said arms causes the collet head to be compressed or relaxed, whereby the collet head is engaged or disengaged from the collet body.

5,087,060

ROW N SLED

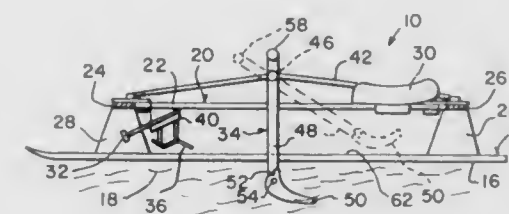
Joseph Rogalski, 29 Congress St. Apt. 5, Nashua, N.H. 03062, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Jan. 16, 1991, Ser. No. 642,058

Int. Cl.⁵ B62B 13/06

U.S. Cl. 280—12.11

3 Claims



- 1. A snow rowing sled comprising:
 - a) a pair of parallel spaced apart skis;
 - b) a plurality of blade-type cleats rearwardly facing along the bottom surface of each of said skis, which will dig into snow during a rearward movement of said skis;
 - c) an H-shaped frame having a long center member and front and rear short end members affixed between and elevated above said skis;
 - d) a seat mounted rearwardly on said long center member of said frame so that a person being the operator of said sled can sit thereupon;
 - e) a foot rest mounted forwardly below said front short end member on said frame to support the feet of the operator; and
 - f) a pair of drive mechanisms, each drive mechanism includes a pair of thrust levers mounted to a pivot rod

having a fixed pivot axis for pivotal movement relative to the skis, each pair of thrust levers straddling a respective one of said pair of skis between said short end members and having upper and lower ends, a handle affixed to and extending between the upper ends of each pair of thrust levers, and a pair of hook spurs pivotally mounted to respective lower ends of each pair of thrust levers, each hook spur being mounted to face rearwardly and having a stop member for preventing pivotal movement of said hook spur relative to said thrust lever when said handles are pushed forwardly by the operator for propelling the sled in a forward direction.

5,087,061

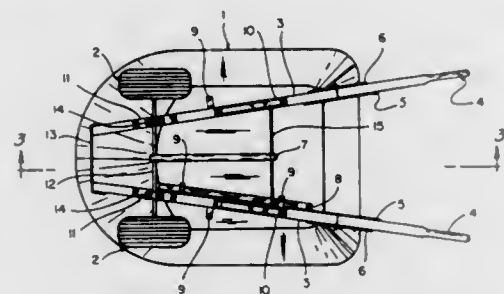
WHEELBARROW-TRAILER IMPLEMENT

Astor J. Wallace, 1301 W. Robinson St., Harrisburg, Ill. 62946
Filed Dec. 3, 1990, Ser. No. 624,714

Int. Cl.⁵ B62B 1/04

U.S. Cl. 280—30

5 Claims



1. A wheelbarrow/trailer device having a dumping end and a workman's end, comprising:

- (a) a fixed upper pan supported by a pair of lower wedges connected to said pan;
- (b) a pair of lower base rails, converging toward the dumping end of said device, connected to and underneath said wedges, wherein each base rail has a permanently but hingedly attached extension rail;
- (c) a pair of opposed wheels connected by an axle, said axle being attached to the bottom of the base rails by a pair of corresponding plates which separate said rails from said axle;
- (d) a central tow bar member fixedly attached to said wheelbarrow/trailer device;
- (e) a wheelbarrow/trailer base plate connecting the converging ends of said base rails;
- (f) a separate tow bar extender detachably connected to said tow bar member; and
- (g) a tow bar securing means for detachably securing said separate tow bar extender underneath said pan to one base rail;

wherein in a first wheelbarrow configuration the base rails and extension rails are in an extended position and said tow bar extender is secured to said one base rail underneath the wheelbarrow pan, and in a second alternative trailer position said extension rails are folded back about hinges and said tow bar extender is attached to said tow bar member.

5,087,062
KNOCK-DOWN WHEELBARROW AND FASTENING DEVICES THEREFOR

Calvin T. Chappell, 16581 Timberlakes Dr. SW., Unit 203, Ft. Meyers, Fla. 33908, and Randy T. Chappell, 5262 Hillsboro La., Las Vegas, Nev. 89120

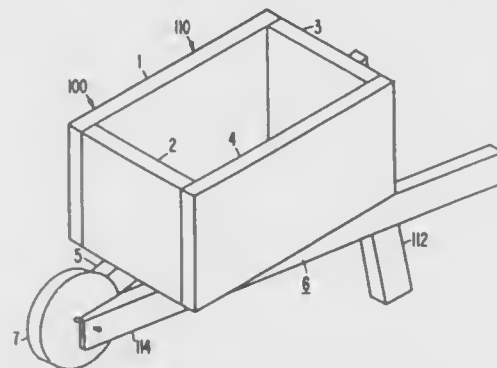
Continuation of Ser. No. 369,947, Jun. 22, 1989, abandoned.

This application Aug. 27, 1991, Ser. No. 758,275

Int. Cl.⁵ B62B 1/20

U.S. Cl. 280—47.31

7 Claims



1. A knock-down wheelbarrow comprising:

- four side units and a bottom unit that are generally planar, each said side unit and bottom unit having a plurality of smooth partial bores on interfacing surface portions, a respective interfacing surface portion on a corresponding unit being adjacent another respective interfacing surface portion defined when said four side units and said bottom unit are configured as an open topped box structure;
- a pair of support beams each having:
 - at least one smooth partial bore in a top surface thereof;
 - a smooth partial bore in a bottom surface thereof; and,
 - a lateral through bore at a fore end thereof, said through bore extending parallel to said top and bottom surfaces of the respective beams;

the wheelbarrow further including:

- a pair of legs each having a top end interfacing surface with a smooth partial bore therein;
- a wheel with an axial through passage;
- a plurality of fastener pins equal to at least one-half of the number of smooth partial bores, each pin having radially circumferential protruding serrations, each end length of each pin having oppositely disposed serrations such that radially protruding edges of commonly disposed serrations are remote from a corresponding pin end; each said pin adapted to be inserted into a pair of smooth partial bores by hand pressure thereby locking said pins in said pair of smooth partial bores and locking interfacing surfaces together;

an insertable and lockable one piece integral axle, said axle having opposing ends which further include axial end slots defining opposing split axle ends, said split axle ends being resilient such that corresponding split axle ends are capable of being compressed when inserted through both said lateral through bores and said axial passage of said wheel and such that said corresponding split axle ends resiliently expand when said corresponding ends protrude beyond said wheel when said wheel is intermediate said support beams, said axle rotatably retaining said wheel; said side units, said bottom unit, said support beams, said legs, and said wheel being sized to collectively fit within a compact rectilinear, solid geometric space delineated by the total thickness of three side units, the length of said support beams and the width of the bottom unit before said wheelbarrow is assembled.

5,087,063

RETRACTABLE TRAILER TONGUE SUPPORT JACK

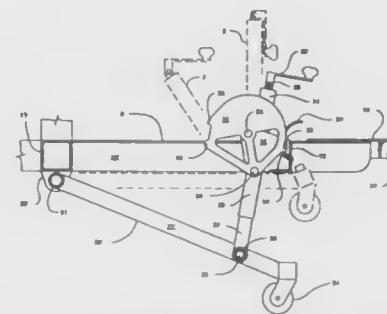
Kenneth T. Merrill, Jr., 1002 Myers Rd., Celina, Ohio 45822

Filed Mar. 14, 1990, Ser. No. 493,242

Int. Cl.⁵ B60S 9/18

U.S. Cl. 280—475

4 Claims



1. A retractable jacking and support apparatus mounted on a trailer tongue comprising:

- a support frame comprised of two elongate members having front and rear ends, each of said elongate members pivotally connected at said rear end to said trailer tongue and rigidly connected to each other at said front end, said pivotal connections widely spaced along a common axis and said front ends forming an apex in a triangular shape;
- a first means for lifting and lowering said support frame from a jacking position in which said apex is adjacent to a ground surface to a support position in which said apex is forced downward contacting said ground surface and thereby elevating said trailer tongue, said first means comprised of a jack pivotally connected adjacent said apex of said support frame and vertically interposed between said support frame and said trailer tongue such that said jack extends upward from said pivotal connection with said support frame;
- a second means for lifting and lowering said support frame in combination with said jack from a retracted position in which said support frame is closely approximated and parallel to said trailer tongue to said jacking position, said second means comprised of at least one pivoting link having a stationary pivotal connection to said trailer tongue and a dynamic pivotal connection to said jack, said dynamic pivotal connection describes a circular arc having a vertical orientation and traversing at least 180 degrees about said stationary pivotal connection thereby effecting said second means for lifting and lowering of said support frame.

5,087,064

ANTI-THEFT AND SAFETY DEVICE FOR A BALL AND SOCKET TRAILER HITCH

Kjall G. Gublin, 11727 Sheridan, Houston, Tex. 77050

Filed Jul. 27, 1990, Ser. No. 560,855

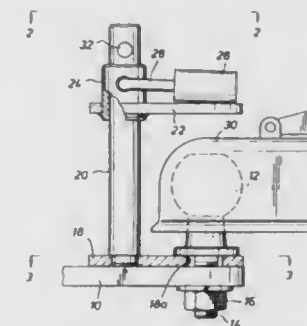
Int. Cl.⁵ B60D 1/28

U.S. Cl. 280—507

1 Claim

1. An attachment for use with a trailer hitch of the type which includes a tow bar mounted on the towing vehicle, a ball including a threaded shaft connected to the ball mounted on the tow bar, a trailer having a tongue, a socket mounted on the tongue that engages the ball and connects the trailer to the towing vehicle, said attachment comprising a base plate including an opening through which the threaded shaft extends to clamp the base plate to the tow bar by the ball to allow the base plate to be clamped to the tow bar at an angle to the tow bar as required by the width of the tow bar, a post having one end attached to the base plate and extending vertically adjacent the ball and socket, an upper plate having an opening through which the post extends and allows the upper plate to move vertically and rotate relative to the post, a bushing connected to the upper plate having an opening in register with the opening in the upper plate, both the post and the bushing having

transverse openings that when aligned will receive the bolt of a lock that will hold the upper plate in position over the socket



5,087,065

BINDING FOR CONNECTING A SHOE OR BOOT TO A SKI

Marc Provence, Thorens Les Glires; Didier Rousset, Lescheraines, and Josiane Dunand, Cran Gevrier, all of France, assigns to Salomon S.A., Annecy Cedex, France

Filed Jul. 11, 1989, Ser. No. 378,329

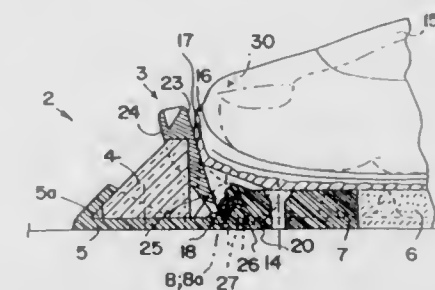
Claims priority, application France, Jul. 13, 1988, 88 09985; Jul. 21, 1988, 88 10157; Jul. 21, 1988, 88 10158

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.⁵ A63C 9/086

U.S. Cl. 280—615

28 Claims



1. Apparatus for releasably attaching a toe member of a boot to a binding member on the upper surface of a ski having a longitudinal median plane comprising:

- a) complementary latching means on said toe member and said binding member;
- b) said toe member and said binding member being relatively movable in a longitudinal direction to an operative position at which the latch means complementarily engage each other;
- c) a base for mounting on the upper surface of said ski;
- d) an abutment element movably mounted on said base;
- e) said abutment element adapted to engage said toe member when said toe member and said binding member are in operative position;
- f) resilient means acting on said abutment element for resiliently maintaining said toe member and said binding member in operative position;
- g) said abutment element being pivotally mounted on said base about an axis that is parallel to the upper surface of the ski and perpendicular to said median plane; and
- h) wherein said abutment element is U-shaped having a pair of spaced arms connected by a bar, each of said arms being journaled on said base for defining a boot pivot axis.

5,087,066

FOLDABLE BABY STROLLER

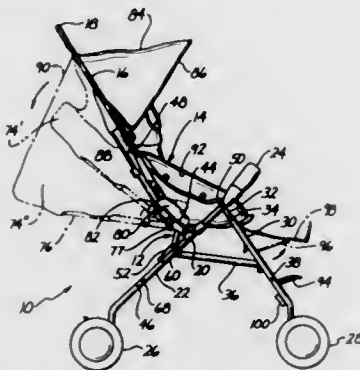
Chai Mong-Hsing, Walnut, Calif., assignor to Baby Trend, Inc., Industry, Calif.

Filed Feb. 16, 1989, Ser. No. 311,492

Int. Cl.⁵ B62B 7/06

U.S. Cl. 280—644

13 Claims



1. A foldable baby stroller comprising: a frame and an infant seat suspended from the frame; said frame having: a first frame member of inverted U-shaped having two lower ends; a second frame member of inverted U-shape having leg portions carrying at their lower extremities a set of rear wheels; said first and second frame members each having a transverse intermediate portion which in said first frame member serves as a pushing bar and in said second frame member serves as a child restraint bar; a U-shaped third frame member having a forward transverse intermediate portion and two rearwardly extending side portions having rearward ends connected to said first frame member, said leg portions of said second frame member being pivoted to said side portions of said third frame member at a point intermediate the ends of said side portions; forward leg means pivoted to said side portions of said third frame member at a location forwardly of said intermediate point and carrying a set of forward wheels; and linkage means interconnecting said leg means and said first and second frame members such that said frame is foldable between an unfolded condition wherein said first, second and third frame members are generally transverse to each other, and a folded condition wherein said first, second and third frame members are generally parallel to each other.

5,087,067

INFLATABLE BAG ASSEMBLY FOR PROTECTING A VEHICLE OCCUPANT

Kazuhiro Seki; Yukihiro Yamaguchi; Minoru Kanda, and Satoshi Takizawa, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1990, Ser. No. 525,014

Claims priority, application Japan, May 19, 1989, 1-124140; May 19, 1989, 1-124141

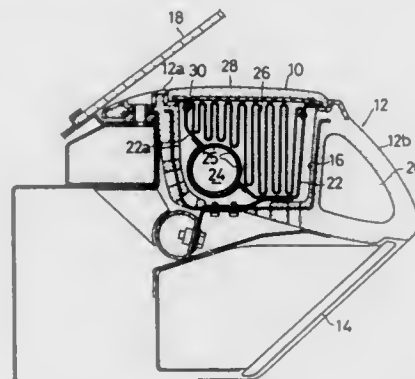
Int. Cl.⁵ B60R 21/22

U.S. Cl. 280—732

5 Claims

1. An inflatable bag assembly for protecting an occupant of a vehicle comprising: a retainer case mounted on an instrument panel of the vehicle, said retainer case is open at an upper end of said instrument panel, said retainer case having a front wall extending rearward and downward so that an internal space thereof sequentially increases toward a rear side of said retainer case with respect to a front-and-rear direction of a body of the vehicle; an inflatable bag accommodated in said retainer case in a

folded position, said bag is distributed less to a front side of said retainer case than to said rear side thereof; and



a gas generator for expelling a gas into said bag to inflate said bag, said gas generator has a gas outlet which is located in and at the front side of said retainer case.

5,087,068

ANTI-ROLLING CONTROL FOR ACTIVELY CONTROLLED AUTOMOBILE SUSPENSION SYSTEM WITH ENHANCED ROLLING DETECTING ABILITY

Yukio Fukunaga; Naoto Fukushima; Yohsuke Akatsu; Itaru Fujimura, and Masaharu Satoh, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

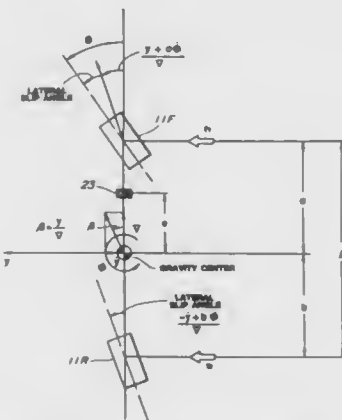
Filed Jun. 12, 1989, Ser. No. 364,477

Claims priority, application Japan, Jun. 10, 1988, 63-142865

Int. Cl.⁵ B60G 17/01

U.S. Cl. 280—707

9 Claims



1. An actively controlled suspension system for an automotive vehicle, comprising: a hydraulic cylinder disposed between a vehicle body and a suspension member which rotatably supports a road wheel, said cylinder defining a variable pressure working chamber filled with a pressure medium for generating a damping force resisting relative displacement between said vehicle body and said suspension member, a pressure of said pressure medium being variable between a predetermined maximum value and a predetermined minimum value across a predetermined neutral value, said cylinder being provided for each of the suspension systems respectively associated with said front and rear wheels; a pressure source circuit means connected to said working chamber for supplying pressure medium and including a pressure source feeding pressurized medium through said circuit; a pressure control valve disposed between said pressure source and said working chamber and having a valve with

5,087,070

METHOD OF ASSEMBLING AN INFLATOR FOR A VEHICLE OCCUPANT RESTRAINT

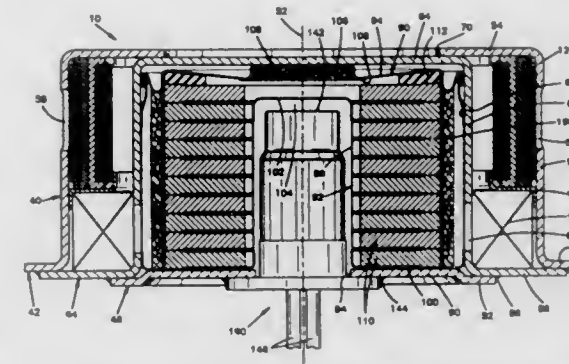
John P. O'Loughlin, and Conrad M. Novak, both of Mesa, Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Dec. 18, 1990, Ser. No. 629,412

Int. Cl.⁵ B60R 21/28

U.S. Cl. 280—740

14 Claims



1. An inflator for generating gas to inflate a vehicle occupant restraint, said inflator comprising: a housing, said housing having a chamber for gas generating material and gas outlet openings through which gas flows from said housing into said restraint; and a filter in said housing providing a gas flow path to said gas outlet openings, said filter filtering and cooling the gas as it flows in the gas flow path, said filter comprising a plurality of filter layers, at least one of said filter layers having a higher resistance to gas flow than at least one other of the filter layers, said at least one of said filter layers having a portion engaging said housing and extending between said housing and said at least one other of the filter layers to provide a gas flow sealing zone adjacent said housing having a resistance to gas flow higher than the resistance to gas flow of said gas flow path.

5,087,069

RESTRAINT SYSTEM MOUNTING

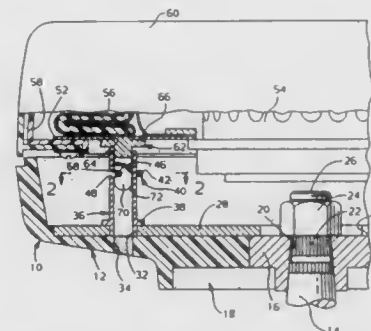
Thomas J. Corbett, Sterling Heights; Michele A. Smith, Davisburg, both of Mich., and Barry C. Worrell, Miamisburg, Ohio, assignors to General Motors Corporation, Detroit and Saturn Corporation, Troy, both of, Mich.

Filed Dec. 20, 1990, Ser. No. 630,624

Int. Cl.⁵ B60R 21/22

U.S. Cl. 280—731

13 Claims



1. In combination with a vehicle steering wheel having a hub portion, a restraint system mounting comprising, a plurality of annular hollow support members mounted to the hub portion of the steering wheel in a predetermined pattern and opening outwardly of the hub portion through openings therethrough, driver restraint system including a plurality of mounting members arranged in the same pattern as the annular support members and interfitting therewith in respective pairs, resilient means mounted on one of the annular members of each pair and receivable within aligned recesses of both members of such pair to releasably secure the pairs of support and mounting members to each other, and means insertable into the members of each pair through the hub portion openings and engageable with the resilient means to displace the resilient means from the recesses of such members to permit their disengagement.

5,087,071

VEHICLE AIR BAG STRUCTURE AND METHOD OF FORMING

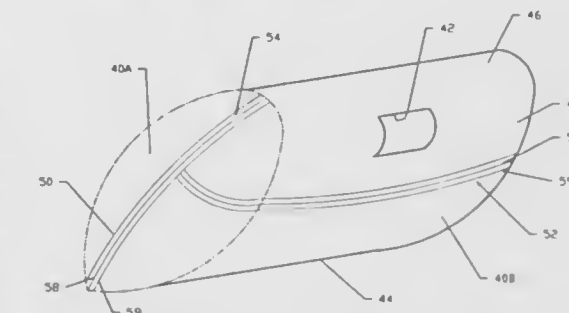
John P. Wallner, Romeo, and Ken B. Taggart, St. Clair Shores, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Aug. 1, 1990, Ser. No. 561,039

Int. Cl.⁵ B60R 21/20

U.S. Cl. 280—743

23 Claims



1. A method of forming an air bag, comprising the steps of: (a) providing a length of fabric; (b) folding the length of fabric at predetermined locations to form a central portion intermediate and immediately adjacent to two end portions with each end portion at least partially overlapping the central portion, one end portion

at least partially overlapping and immediately adjacent to the other end portion, and edges of the end portions disposed generally in alignment with corresponding edges of the central portion;

- (c) fastening the partially overlapping end portions to each other without reforming the folded configuration of the length of fabric; and
- (d) fastening the aligned edges of the central portion and the partially overlapping end portions to each other without reforming the folded configuration of the length of fabric to form an inflatable air bag, the inflatable air bag being adapted to have a predetermined configuration when inflated with gas.

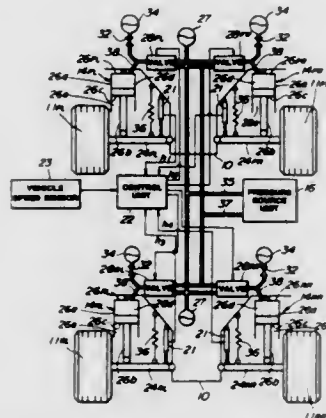
5,087,072
ATTITUDE CHANGE SUPPRESSIVE CONTROL SYSTEM FOR ACTIVE SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLE

Yoshihiro Kawarasaki, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jul. 30, 1990, Ser. No. 559,859
Claims priority, application Japan, Jul. 31, 1989, 1-199115
Int. Cl.⁵ B62D 9/02

U.S. Cl. 280—772

8 Claims



1. An active suspension system for a vehicular body, comprising:

- a plurality of fluid pressure operated actuators each having a working chamber and disposed between the vehicular body and front and rear, left and right, road wheels at respective suspension systems provided thereat;
- vehicular height monitoring means for monitoring a vehicular height at respective ones of the suspension systems, for providing vehicular height indicative data;
- means for performing height regulation, in which a single front height adjustment command for both of the front-left and front-right suspension systems is derived on the basis of a difference between a predetermined target vehicle height and an average height data at the two front suspension systems, and a single rear height adjustment command for both of rear-left and rear-right suspension systems is derived on the basis of a difference between the target vehicle height and an average height data at the two rear suspension systems, so as to adjust the vehicle height through a group control with said single front and rear height adjustment commands output to the respective actuators associated with said front and rear suspension systems;
- means for performing anti-roll control by deriving a vehicular rolling magnitude on the basis of said vehicular height indicative data of the front and back right and the front and back left suspension systems and deriving anti-rolling control commands in such a manner as to be applied in opposite phases to each other to said front and back right and front and back left suspension systems so as to reduce said rolling magnitude through an independent control

with said anti-rolling control commands having opposite signs to each other with regard to said actuators associated with said front and back right and front and back left suspension systems; and

means for outputting final control commands to each of said actuators so as to achieve said height regulation and said anti-roll control in response to vehicle driving conditions, said outputting means deriving said final control commands by adding or subtracting said anti-rolling control command to or from the respective of said front and rear height adjustment commands.

5,087,073
ANTI-ROLL SYSTEM WITH TILT LIMITATIONS

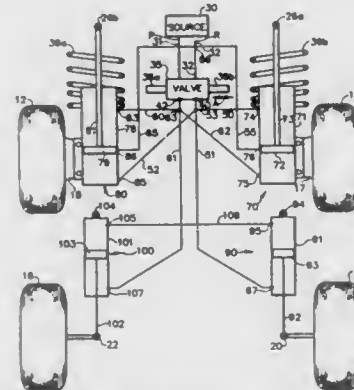
Mark A. Lund, 766 E. Mission, Apt. H., Escondido, Calif. 92025

Continuation of Ser. No. 563,048, Aug. 6, 1990, Pat. No. 5,040,823, which is a continuation-in-part of Ser. No. 397,723, Aug. 23, 1989, Pat. No. 4,966,390. This application Jun. 6, 1991, Ser. No. 711,644

Int. Cl.⁵ B62D 9/02

U.S. Cl. 280—772

21 Claims



1. A cylinder and piston assembly comprising:
- a cylinder with upper and lower ports, each of the ports opening into the interior of the cylinder;
- a piston means slideably contained within said cylinder for reciprocal, hydraulically-actuated movement within said cylinder between said ports;
- a first piston port opening between each end of said piston means, a first port cover attached to a first end of said piston means and biased against said first end of said piston means to cover one end of said first port, a second piston port opening between each end of said piston means, and a second port cover attached to said second end and biased against said second end to cover one end of said second port;
- a floating piston assembly sealing said cylinder beneath said lower port, said floating piston assembly being contained in the interior of said cylinder and attached to said cylinder for reciprocal movement therein.

5,087,074
VEHICLE SUSPENSION MOUNTING STRUCTURE

Nobuhiro Komatsu, Yokohama; Mitsuru Fujinaka, Higashihiroshima; Masayoshi Sannomiya, Hiroshima; Toshiro Kondo, Hatsukaichi, and Atsushi Nishiyama, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 9, 1990, Ser. No. 550,173
Claims priority, application Japan, Jul. 7, 1989, 1-174275; Jul. 20, 1989, 1-84494[U]; Apr. 27, 1990, 2-44539[U]

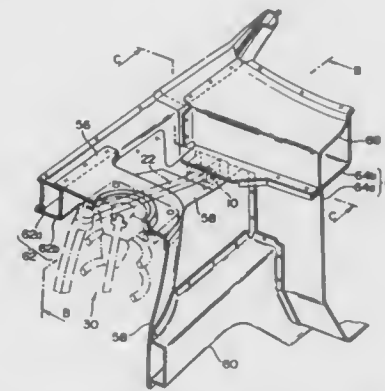
Int. Cl.⁵ B62D 21/00

U.S. Cl. 280—788

15 Claims

1. A vehicle suspension mounting structure for mounting a suspension device to a vehicle body, at least an upper arm of said suspension device being constituted by two link members

disposed to be spaced apart by a predetermined distance in a vertical direction of said vehicle body with respect to a vehicle wheel support member,



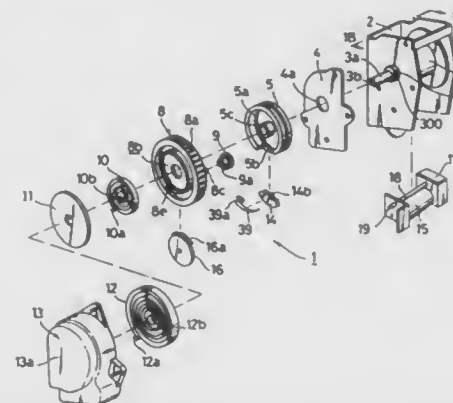
said suspension mounting structure comprising:
mounting means for mounting a rear end of said upper link member to a dash panel.

5,087,075
SEAT BELT SYSTEM
Tetsuya Hamaue, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Oct. 30, 1990, Ser. No. 605,322
Claims priority, application Japan, Nov. 13, 1989, 1-294278
Int. Cl.⁵ B60R 22/34

U.S. Cl. 280—806

2 Claims



1. A seat belt system for protecting an occupant inside a vehicle by a seat belt, comprising:

- an emergency locking seat belt retractor for selectively setting a tensile force giving mode to provide tensile force to the seat belt and a tensile force cancel mode to cancel the tensile force, and
- seat detection means for detecting at least one of sliding of a seat, changing of a reclining angle and changing of posture of the occupant, said seat belt retractor, based on a signal from the seat detection means, providing for a time the tensile force giving mode and after predetermined time, changing to the tensile force cancel mode to provide a predetermined slack of the seat belt,
- said seat belt retractor including:
- a retractor body,
- a reel shaft for winding the seat belt and rotationally situated in the retractor body, said reel shaft having a side portion protruding from the retractor body,
- a gear plate fixed to the reel shaft and having internal teeth and an external circumference,
- a disk-shaped gear hold having a central hole, external teeth at an external circumference thereof, and a support axis at

- a side face thereof, said central hole being rotationally situated over the reel shaft,
- a cover attached to the retractor body to cover the gear plate and the gear hold,
- a spiral return spring connected between the cover and the reel shaft for biasing the reel shaft to rotate in a belt-winding direction,
- a spiral memory spring connected between the gear hold and the reel shaft to urge the reel shaft to rotate in the belt-winding direction relative to the gear hold,
- an idle gear rotatably supported by the support axis of the gear hold, said idle gear having teeth and a protruding portion both formed at an external circumference thereof, said teeth engaging the internal teeth of the gear plate,
- a hook having a base end side and a tip side, said base end side being rotatably supported at a peripheral portion of the gear plate and said tip side being able to protrude outwardly and to retreat inwardly from the external circumference of the gear plate, said hook being able to engage with the protruding portion of the idle gear, said tip side, when the hook is engaged with the protruding portion, protruding over the external circumference of the gear plate,
- a hook spring for urging the tip side of the hook inwardly from the external circumference of the gear plate,
- a protruding portion formed at the gear hold, said protruding portion engaging the tip side of the hook when the tip side of the hook protrudes over the external circumference of the gear plate, said protruding portion and the hook being arranged such that the gear hold may rotate freely in the belt-winding direction and the protruding portion may contact with the hook when the gear hold rotates in a belt-unwinding direction,
- a partial teeth gear having partial teeth at an external circumference thereof, said partial teeth engaging the external teeth of the gear hold, and
- drive means for operating the partial teeth gear, said drive means having a stop position for locking the gear hold by force transmitted from the partial teeth gear,
- wherein when the partial teeth gear rotate such that the teeth of the partial teeth gear and the external teeth of the gear hold shift from a non-engagement state to an engagement state, the gear hold is rotated in the belt-unwinding direction for a predetermined small angle and the gear plate together with the reel shaft is rotated in the direction of unwinding the seat belt for a predetermined small angle to thereby allow the seat belt to extend outwardly for a predetermined amount,
- when the partial teeth gear stops in the non-engagement state, the gear hold is locked by the drive means, and the gear plate and the reel shaft are prevented from rotating in the belt-winding direction to provide a tensile force cancel mode, and
- in the tensile force cancel mode, when the partial teeth gear is rotated in the non-engagement state, the gear hold becomes to rotate freely, and the reel shaft is urged by the return spring to rotate in the belt-winding direction to provide the tensile force giving mode.

5,087,076
SKI POLE

Jacques Fagot, Saint Jean De Molrans, and Claude Gobis, Voiron, both of France, assignors to Skis Rossignol SA, France
Filed Apr. 15, 1991, Ser. No. 685,143

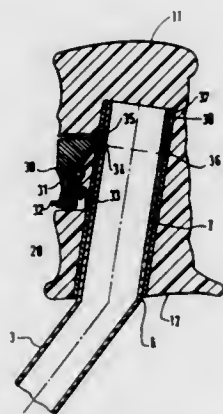
Claims priority, application France, Apr. 20, 1990, 90 05297
Int. Cl.⁵ A63C 11/22

U.S. Cl. 280—819

9 Claims

1. A ski pole comprising:
- a bent rod member comprising a first substantially straight portion and a second substantially straight portion, an axis of the first portion forming an angle β with respect to an axis of the second portion;
- a handle member comprising:

a cavity formed therein, said cavity being inclined at an angle α with respect to a longitudinal axis of said handle member, and said cavity housing at least a portion of the first portion of said rod member,



means for providing free rotation of said rod member relative to said handle member, and means for lockign said rod member in a selected rotational position.

5,087,077

STAPLE BASED BINDING SYSTEM

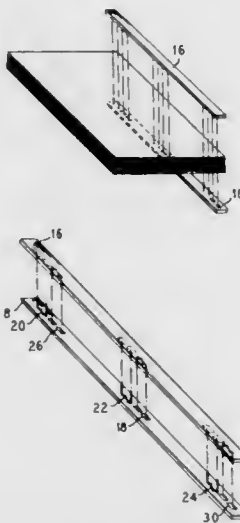
Alfredo J. Vercillo, Harwood Heights, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Feb. 15, 1991, Ser. No. 656,227

Int. Cl.⁵ B42B 4/00

U.S. Cl. 281—28

10 Claims

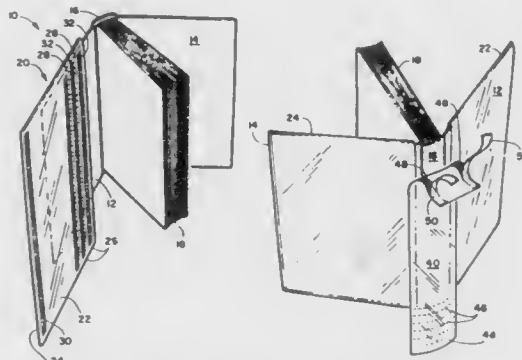


1. A strip-type binding system for securing together a plurality of stacked sheets along an edge and in a booklet form using a pair of strips between which a plurality of sheets are bound, wherein at least one strip is an elongated member having a plurality of fastener receiving and deforming depressions in a surface thereof and a plurality of upstanding staple-like fastener members supportingly embedded therein.

5,087,078
PROTECTIVE BOOK COVER
Geoff Phillips, 6726 Cavite Ct., San Diego, Calif. 92120
Filed Dec. 13, 1990, Ser. No. 626,941
Int. Cl.⁵ B42D 3/00, 3/18

U.S. Cl. 281—31

11 Claims



1. A protective book cover system comprising: cover sleeves adapted to fit over book covers, each cover sleeve consisting of two overlying sheets bonded together along three edges; each cover sleeve having a plurality of narrow tearaway strips along the open end of said sleeve; each of said strips bearing a line of pressure sensitive adhesive overlayed with a removable protective facing; a line of pressure sensitive adhesive along the closed end opposite said strips, on the same side of said sleeve as said adhesive on said strips; an elongated narrow spine piece adapted to engage a book spine having a plurality of tearaway strips on at least one narrow end of said spine piece; lines of pressure sensitive adhesive along the long edges of said spine piece on the same side of said spine piece; and easily removable protective facings on each of said spine piece adhesive lines.

5,087,079

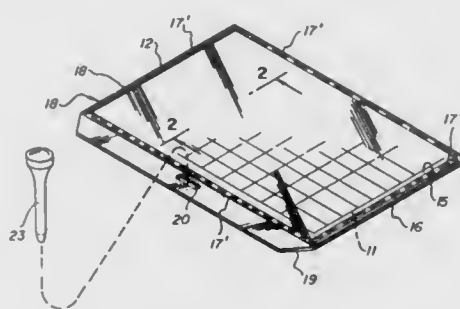
WATERTIGHT NOTE CARD ASSEMBLY

Daniel R. Morris, Jr., 5737 Northton Ct., Dale City, Va. 22193
Filed Aug. 29, 1990, Ser. No. 574,115

Int. Cl.⁵ B41L 1/20

U.S. Cl. 462—8

20 Claims



1. A watertight note card assembly comprising an envelope, said envelope having a front panel and a back panel a watertight seal sealing the edge portions of said front and back panel so as to define an interior pocket, an opening in said seal so as to permit access into said pocket, and a means for sealing said opening with a watertight seal, wherein at least a portion of at least one of said front and back panels is transparent; a card having appropriate dimension and shape so as to be

slidably insertable into said pocket through said opening, said card having a portion thereof for recording indicia; and means for making a visible mark on said card when a corresponding mark is made on said transparent panel.

5,087,080

ARTHROSCOPIC SHEATH WITH QUICK COUPLING SOCKET

George V. Shutt, Glendora, Calif., assignor to Zimmer Inc., Warsaw, Ind.

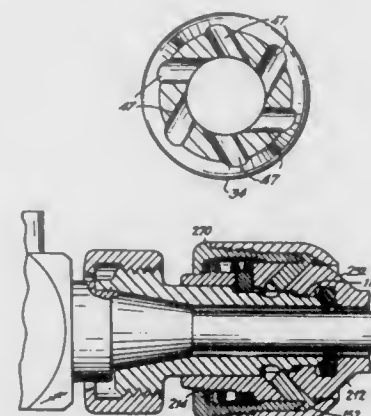
Division of Ser. No. 305,887, Feb. 2, 1989, Pat. No. 4,951,977.

This application May 18, 1990, Ser. No. 524,945

Int. Cl.⁵ F16L 55/00

U.S. Cl. 285—5

1 Claim



1. In an arthroscopic sheath having an elongated hollow tube for receiving an elongated arthroscopic tool therein, a fluid irrigation portion for receiving a fluid and guiding it into a cylindrical space between the tool and the hollow tube, said fluid irrigation portion comprising a plurality of circumferentially spaced fluid inlet bores to impart an axial flow to said fluid, the improvement comprising:

each of said fluid inlet bores being inclined a predetermined amount in the same arcuate direction for imparting to said fluid a spiral path within said cylindrical space, the amount of inclination being sufficient to assure that the axes of said bores do not intersect said axis of said sheath.

5,087,081

WATER SUPPLY HOSE CONNECTING DEVICE FOR WASHING MACHINE

Eui-Chang Yoon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon City, Rep. of Korea

Filed Jul. 31, 1990, Ser. No. 561,523

Claims priority, application Rep. of Korea, Aug. 1, 1989, 89-11459

Int. Cl.⁵ E03C 1/00

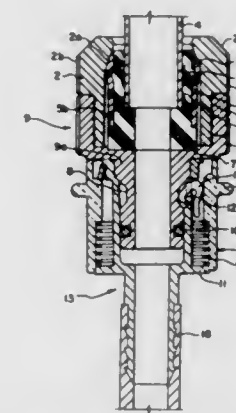
U.S. Cl. 285—8

3 Claims

1. A water supply hose connecting device for connecting a washing machine water supply hose with a water tap, comprising:

an upper connecting member comprising: a first assembly of parts having a first longitudinal throughbore, means for coupling one end of said throughbore to a water tap in a watertight manner, and a band of external threading; an intermediate connecting member comprising: a second assembly of parts having a second longitudinal throughbore, means providing an internally threaded socket at an upper end of said second longitudinal throughbore, and means providing a lower piping portion extending axially downwards around said second throughbore from said socket, said lower piping portion having a radially outer sidewall surface provided intermediate said socket and an

open lower end of said second throughbore with a radially outwardly opening circumferentially extending recess; said band of external threading threadedly connecting said upper connecting member with said internally threaded socket of said intermediate member so that said second longitudinal throughbore effectively forms a longitudinal continuation of said first longitudinal throughbore; a lower connecting member comprising: a third assembly of parts having a third longitudinal throughbore, an upper tubular portion shaped and sized to axially slidably telescopically receive said lower piping portion of said intermediate connecting member so that said third longitudinal throughbore forms a longitudinal continuation of said second longitudinal throughbore and said radially outwardly opening circumferentially extending recess is radially surrounded by wall means of said upper tubular portion, a lower tubular portion extending longitudinally from said upper tubular portion and including means for securely connecting with a water supply hose for causing said third longitudinal throughbore to form a longitudinal continuation of said water supply hose, radially movable



click means releasably engageable in said recess, through said wall means, for releasably locking said upper tubular portion of said lower connecting member in telescoped relation with said lower piping portion of said intermediate connecting member, axially movable control means changeably surrounding said click means for, in a first, upper position forcing said click means to protrude radially inwardly for locking said click means engaged in said recess and a second, lower position in which said click means are free to withdraw radially outwardly from said recess, and resilient means acting between said upper tubular portion and said axially movable control means for tending to maintain said axially movable means in said first, upper position;

an O-ring seal; and surface means on said lower piping portion and said upper tubular portion mounting said O-ring seal and sealed therewith when said intermediate connecting member is locked in telescoped relation with said lower connecting member for providing an effectively sealed joint between said second and third longitudinal throughbores.

5,087,082

ROTARY JOINT

Niels A. Anthonsen, West Vancouver, Canada, assignor to Indu-Tech Enterprises Ltd., British Columbia, Canada

Filed Dec. 13, 1989, Ser. No. 450,196

Claims priority, application Canada, Dec. 13, 1988, 585,823

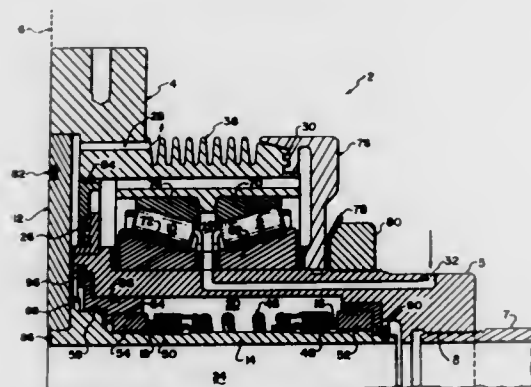
Int. Cl.⁵ F16L 27/00

U.S. Cl. 285—94

17 Claims

17. A rotary joint for connecting a stationary object to a rotating object comprising:

- (a) bearing housing means adapted to be joined to either the stationary or the rotating object;
- (b) seal housing means adapted to be joined to either the stationary or rotating object that is not joined to the bearing housing means and adapted to rotate independently of the bearing housing means;
- (c) seal tube means adapted to cooperate with the bearing housing means, and positioned radially to the interior of the bearing housing means and the seal housing means;
- (d) rotatable sealing means positioned between the seal housing means and the seal tube means and adapted to enable the seal housing means and the seal tube means to rotate independently;
- (e) first cavity means enclosing the rotatable sealing means and being adapted to have circulated therethrough a first fluid, at least a part of the radially interior wall thereof being formed by the seal tube means;



- (f) rotatable bearing means positioned radially exterior to the first cavity means and in association with the bearing housing means and seal housing means, and being adapted to enable the bearing housing means and the seal housing means to rotate independently of one another and;
- (g) a second cavity means enclosing the rotatable bearing means, the second cavity being independent of the first cavity means and being adapted to have circulated therethrough a lubricating means different from the first fluid, wherein the bearing housing means and the seal housing means forms in part a radially exterior wall of the first cavity and at least a part of the interior radial wall of the second cavity, and wherein the rotatable bearing means are located between the seal housing means and the bearing housing means and are isolated from the rotatable sealing means and the seal tube means, the seal housing means and the bearing housing means creating opposite wall of the second cavity means.

5,087,083

CONNECTOR FOR CONNECTING SMALL DIAMETER PIPE

Masayoshi Usui, Numazu, and Katsushi Washizu, Nagasawa, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Japan

Continuation of Ser. No. 346,551, May 2, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 617,406

Claims priority, application Japan, May 28, 1988, 63-131278 Int. Cl.⁵ F16L 13/02

U.S. Cl. 285—286

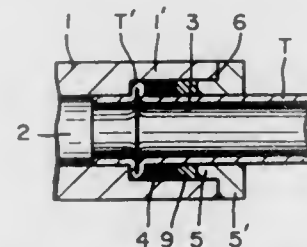
8 Claims

1. A connector for connecting a small diameter pipe, comprising:

- a resinous connector body having a rear axial end, a cylindrical wall extending forwardly from the rear axial end and defining an enlarged diameter chamber of substantially uniform cylindrical shape extending into the rear axial end and communicating with a communication bore defined in the connector body spaced from the rear axial end, the

communication bore defining a smaller diameter than the enlarged diameter chamber, a stepped portion defined in the enlarged diameter chamber adjacent the communication bore;

- a metal pipe having a top end, an annular collar wall formed in proximity to the top end, said top end and said annular collar wall being disposed in the connector body, said annular collar wall including opposed front and rear surfaces, said front surface engaging with said stepped portion of said enlarged diameter chamber;
- an elastic sealing member fitted to the rear surface of said annular collar wall and in said enlarged diameter chamber;
- a heat resistant ring fitting in the enlarged diameter meter chamber and adjacent to the elastic sealing member;
- a resinous sleeve member having a top end with substantially uniformly cylindrical inner and outer surfaces, the inner surface of the top end being fitted over the pipe and the



outer surface of the top end being fitted in said enlarged diameter chamber, said sleeve member further having a rear end defining an outwardly extending collar wall having a top face disposed in abutting face-to-face contact with the rear axial end of the resinous connector body, said top end of said resinous sleeve member having a length such that said sealing member is pressed by said heat resistant ring when said top face of said collar wall is in face-to-face contact with the rear axial end of the connector body; and

- a welding portion defining an integral resinous connector between the top face of the collar wall of the resinous sleeve and the rear axial end of the resinous connector body for sealing the pipe to the connector body, whereby heat generated by welding the resinous connector body to the resinous sleeve member is sufficiently low to avoid damage to the pipe.

5,087,084

FITTING FOR EXTERNALLY GROOVED END PORTIONS OF TUBULAR BODIES

Peter Gehring, Simonswald-Griesbach, Fed. Rep. of Germany, assignor to Anton Hummel GmbH Metallwarenfabrik, Waldkirch, Fed. Rep. of Germany

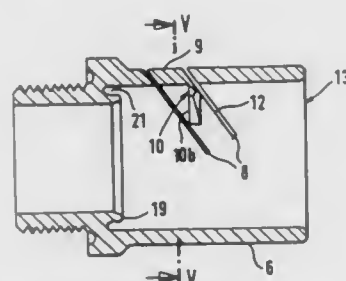
Filed Feb. 2, 1990, Ser. No. 474,277

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903355

Int. Cl.⁵ F16L 39/02

U.S. Cl. 285—319

39 Claims



1. A fitting for attachment to an end portion of a tube having circumferentially extending external ribs alternating with cir-

cumferentially extending external grooves, comprising a sleeve including a tubular section having a tube-receiving end arranged to receive the end portion of a tube; and a substantially circumferentially extending elastic prong having a first end integral with said section and a free second end, said section having a slot surrounding said prong and said prong having an inner side provided with a protuberance arranged to enter a groove of the end portion which is introduced into said section, said section further having an internal surface, an external surface and lateral surfaces bounding a portion of said slot and extending substantially circumferentially of said section, one of said lateral surfaces being disposed between said tube-receiving end and the other of said lateral surfaces and being inclined from said external surface toward said internal surface in a direction toward said tube-receiving end, said prong having a lateral surface adjacent and complementary to the one lateral surface of said section.

5,087,085

SEALING SYSTEM FOR CONNECTING BEADED AND FLAT COUPLING HARDWARE

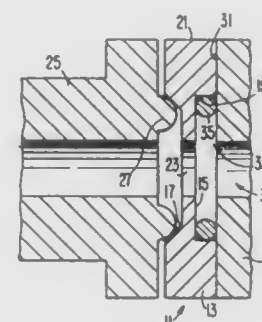
Raymond McGarvey, Bethesda, Md., assignor to General Components, Inc., Rockville, Md.

Filed Oct. 17, 1990, Ser. No. 599,069

Int. Cl.⁵ F16L 19/00

U.S. Cl. 285—328

15 Claims



1. A gasket comprising a radially outer section and a radially inner section of a smaller axial dimension than said radially outer section and located axially between axial ends of said radially outer section, a conical surface on one side of said gasket extending between said radially outer section and said radially inner section and forming a junction with said radially outer section, the other side of said gasket comprising a flat radial outer surface and a flat radial inner surface axially opposite said conical surface and connected to said flat radial outer surface by a shoulder extending inwardly from said flat radially outer surface to said flat radial inner surface in substantial axial alignment with the junction between said conical surface and said radially outer surface, and wherein said shoulder comprises a cylindrical surface.

5,087,086

QUICK CONNECT COUPLING WITH PRESSURE RELIEF

Clarke R. Snedeker, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 13, 1991, Ser. No. 699,121

Int. Cl.⁵ F16L 21/02

U.S. Cl. 285—361

4 Claims

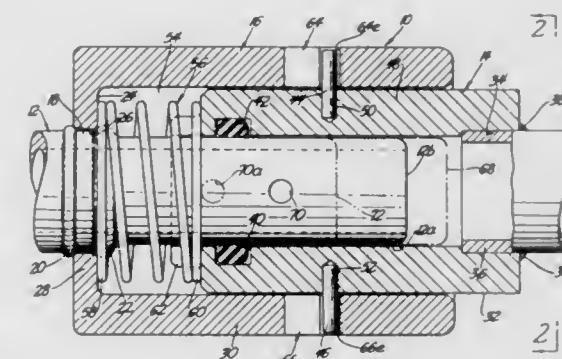
1. A tube coupling having a first tube and a second tube joined together by axial insertion into one another and relative rotation therebetween characterized by:

- said first tube having an outer surface and relief port in the end thereof communicating the interior of said first tube with said outer surface;
- a control collar having a flange portion thereon secured to said first tube and a hollow cylindrical portion telescopically receivable on said second tube and further having

cam surface means thereon including a lock portion and a pressure relief portion;

cam follower means on said second tube selectively engageable with said cam surface means at said pressure relief portion and said lock portion when said second tube is inserted into said control collar and rotated with respect to said control collar to axially position said first tube in blow-off and lock positions;

means located within said control collar for applying an outwardly directed biasing force on said second tube



when it is inserted into said control collar to hold said cam follower means against said lock portion to prevent separation of said first and second tubes;

said second tube having an annular groove and an O-ring seal supported in said annular groove adapted to engage and seal the outer surface of said first tube for preventing escape of fluid through said relief port when said first tube is in its lock position; said O-ring seal positioned outboard of said relief port when said first tube is in its blow-off position to relieve pressure from said first and second tubes before they are fully separated.

5,087,087

SASH LOCK

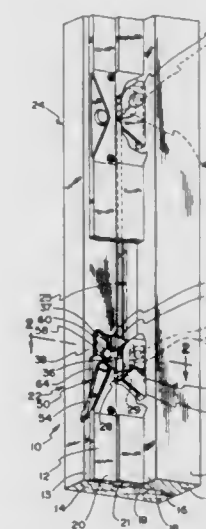
Gregory J. Vetter, Owatonna, and Daniel G. Tucker, Waseca, both of Minn., assignors to Truth Division of SPX Corporation, Owatonna, Minn.

Filed Mar. 14, 1991, Ser. No. 669,530

Int. Cl.⁵ E05C 3/08

U.S. Cl. 292—48

14 Claims



1. In a lock including a keeper on a window sash and a catch

reciprocally mounted to a face of a window frame for grasping and releasing the keeper, an improved structure for operating said catch comprising:

- a housing for mounting against the frame face, said housing including an opening therethrough with a portion substantially cylindrical about an axis substantially perpendicular to the frame face; and an operator including
- a cylindrical pivotal portion secured by the housing cylindrical portion for pivoting within said cylindrical portion about said axis,
- a handle portion secured at one end to the operator pivotal portion, and
- an actuator portion having a button at one end for engaging the catch to control movement thereof, said actuator portion being secured at the other end to the operator pivotal portion, whereby a part of said actuator portion is trapped between said housing and said frame face to prevent removal of said operator from the mounted housing.

5,087,088

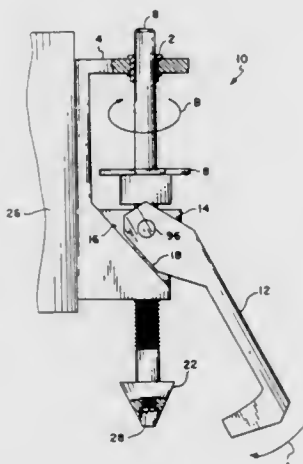
J-HOOK LATCHING DEVICE

Malcolm B. Milam, Laurel, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 13, 1991, Ser. No. 654,454
Int. Cl.⁵ E05C 5/02

U.S. Cl. 292—110

14 Claims



1. A latching device for latching a first and second item together comprising:

- a housing affixed to said first item having a shaft mounted thereon such that rotation of said shaft causes said shaft to move longitudinally;
- said shaft having at least one end extending beyond said housing and having a first alignment means attached to this end for engaging a second alignment means on said second item;
- a latch mounted to said shaft by a mounting means providing a pivot point for said latch such that rotation of said shaft causes said pivot point of said latch to translate along the longitudinal axis of said shaft; and
- means for rotating said latch such that said latch will engage said second alignment means on said second item thereby latching said first and second items together.

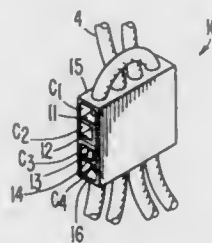
5,087,089
BAG SECURITY SEAL AND METHOD OF MANUFACTURING SAME

Leon L. M. Lee, 15/F., Caltex House, 258 Hennessey Rd., Wanchai, Hong Kong

Filed Jun. 27, 1991, Ser. No. 722,154
Int. Cl.⁵ B65D 33/34

U.S. Cl. 292—308

7 Claims



1. A tamperproof security seal for a container comprising a seal member including a plurality of partition walls disposed in parallel to one another and in parallel to end wall sections so as to define a plurality of channels extending across a width of the seal member, a plurality of aligned holes provided in each of said partition walls and said end wall sections, said holes extending through said partition walls and said end wall sections in a direction perpendicular to a longitudinal center axis of the respective channels, said holes in said partition walls and said end wall sections being disposed in alignment so as to enable a drawstring to be threaded therethrough in such a manner that a loop portion is formed on one side of the seal member and is adapted to be placed around the container, with free ends of the drawstring being disposed on an opposite side of the seal member, and wherein, upon a crimping of said seal member, said partition walls and said end wall sections are deformed whereby said openings form individual anchoring points on the drawstring so as to prevent a withdrawal of the drawstring from the seal member and prevent unauthorized access to the container.

5,087,090

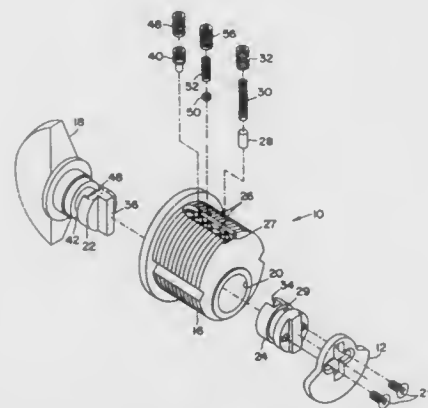
COMBINATION LOCKOUT/HOLDBACK APPARATUS

Edward F. Humphrey, Waterbury; Nelson J. De Angelo, and David W. Florian, both of Southington, all of Conn., assignors to International Security Products, Inc., Southington, Conn.

Filed May 17, 1991, Ser. No. 702,784
Int. Cl.⁵ E05C 1/04

U.S. Cl. 292—359

9 Claims



1. In a locking system, the locking system including a reciprocally movable bolt and a spring which biases the bolt toward an extended position, an improved operator comprising: shaft means, said shaft means comprising a rotatable telescopic shaft including at least a pair of coaxial members

which are rotatably coupled together at first ends thereof, said members being relatively movable in the axial direction;

handle means for imparting rotation to said shaft means, said handle means being affixed to a second end of a first of said members;

means for transmitting rotational movement of said shaft means to the bolt, said movement transmitting means being coupled to the second end of the other of said members;

cylinder means for defining a housing for said shaft means, said cylinder means having a bore therethrough, said bore having an axis, said shaft means extending through said bore and being coaxial therewith;

guide means for coupling said other of said shaft means members to said cylinder means, said guide means permitting rotational movement of said other member while preventing axial movement thereof whereby said other of said members will be permanently coupled to the bolt via said coupling means when the operator is in the installed condition; and

mode selector means for coupling said cylinder means to said shaft means first member, said selector means permitting limited axial movement of said first member relative to said second member between first and second positions, the permitted axial movement being insufficient to interrupt the coupling between said shaft means members, said selector means also permitting rotation of said first member when in the first axial position and preventing rotation of said first member when in the second axial position whereby said shaft means may selectively be capable of rotation by said handle means or may be secured against rotation, reciprocal movement of the bolt being prevented by the securing of said shaft means first member against rotation.

5,087,091

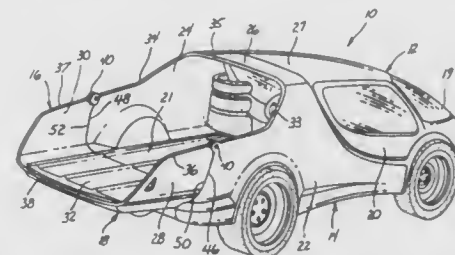
MULTIPLE PURPOSE VEHICLE

Kent W. Madill, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1991, Ser. No. 684,723
Int. Cl.⁵ B62D 33/04; B60P 7/02

U.S. Cl. 296—26

8 Claims



1. A vehicle convertible from a first configuration having an open cargo bed of increased longitudinal length, the vehicle comprising:

- a body section having a roof and side walls;
- an enclosure member connected to the body section for movement between a closed position wherein the vehicle has the first configuration and an open position wherein the vehicle has the second configuration;
- said enclosure member being a continuation of said body section whereby said enclosure member meets substantially flush with said roof and side walls of said body section and is supported by said body section in both the open position and the closed position;
- access means connected to the rear of the body section for movement between a raised position and a lowered position; and
- means located at the rear of said body section for pivotally connecting said enclosure member to said body section whereby movement of said enclosure member from the

closed position to the open position results in the enclosure member serving as a cargo carrying member and increasing the longitudinal length of the cargo bed.

5,087,092

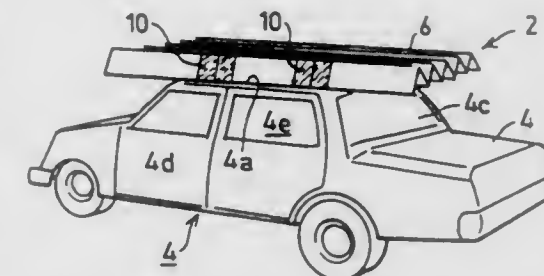
COVER FOR MOTOR VEHICLES

Eliahu Antopolsky, 4 Harav Kook St., 49315 Petach Tikva, and Efraim Ramon, Talei Menashe 553, 70392 Beer Yaacov, both of Israel

Filed Sep. 5, 1990, Ser. No. 577,665
Claims priority, application Israel, Sep. 8, 1989, 91566
Int. Cl.⁵ B60J 1/20

U.S. Cl. 296—95.1

7 Claims



1. A cover for a motor vehicle, comprising:

a panel of stiff sheet material having a width sufficient at least to cover the vehicle roof;

said panel being formed with a plurality of longitudinal fold lines to extend longitudinally of the vehicle and to permit folding the panel in accordian fashion and thereby to adjust its width to the width of the vehicle roof to which it is applied;

said panel being of a length greater than that of the vehicle roof so as to extend forwardly of the vehicle windshield and rearwardly of the vehicle rear window and thereby to at least partially shield the windshield and rear window from the sun when the panel is applied to the vehicle roof;

said panel including at least two sections, each constituted of a sheet of stiff material formed with said longitudinal fold lines and joined together by a transversely-extending flexible strip defining said transverse fold line;

and a plurality of anchoring members extending from opposite sides of the panel for anchoring it to the vehicle roof when applied thereover;

said anchoring members being constituted of said transversely-extending flexible strips.

5,087,093

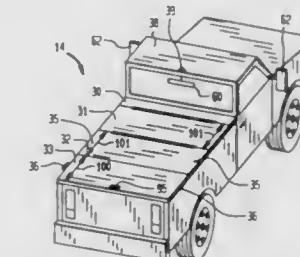
HINGED COVER FOR PICK-UP TRUCKS

Thomas A. Repetti, 2219 Ave. C, Bradenton Beach, Fla. 34217

Filed May 16, 1991, Ser. No. 701,055
Int. Cl.⁵ B60P 7/02

U.S. Cl. 296—100

7 Claims



1. Apparatus for detachably covering the bed of a pick-up truck, comprising:

first, second and third sections individually extending across a first dimension of said bed, with said first section being

permanently affixed to said bed, with said second section being releasably secured to said bed, and with said third section being positioned between said first and second sections;

a first pair of facing edges on said first and third sections;

a second pair of facing edges on said second and third edges;

a first hinge coupled to the top surfaces of said first and third sections along said first pair of facing edges;

a second hinge coupled to the underside surfaces of said second and third sections along said second pair of facing edges;

securement means at a top portion of the cab of said pick-up truck;

and means coupling an underside surface of said third section to said securement means for detachably securing said second and third sections in position when folded onto said first section through rotation of said second and third sections about said first and second hinges.

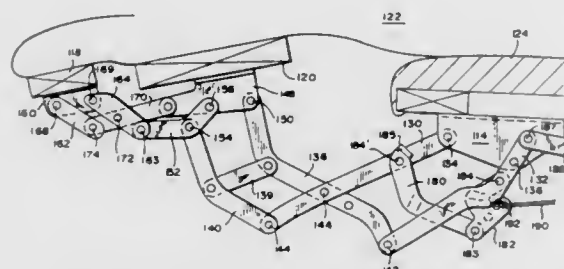
5,087,094

RECLINER CHAIR

Walter C. Rogers, Jr., P.O. Box 728, Denton, N.C. 27239-0728
Continuation-in-part of Ser. No. 463,461, Jan. 11, 1990, which is a continuation-in-part of Ser. No. 361,309, Jun. 5, 1989, Pat. No. 4,915,444. This application Jul. 9, 1990, Ser. No. 549,972
Int. Cl.⁵ A47C 1/02

U.S. Cl. 297—68

11 Claims



1. A recliner chair comprising in combination a basic support, a seat and backrest, a linkage system mounting the seat and backrest on the basic support, a footrest linkage mounted at the front of the chair for movement between retracted and extended positions, a footrest including a first frame connected to the footrest linkage to move between a retracted position located below the seat and inwardly of the front end of the seat and an extended position projecting forwardly from the front end of the seat, a second footrest frame connected to the footrest linkage between the first frame and the seat, a first layer of upholstery overlying and connected to the seat and extending and connected to the second frame to provide a leg and foot support surface when the footrest is in extended position and extending about the front end of the seat and below the seat when the footrest is in retracted position, and a second layer of upholstery connected to said first frame, and wherein said linkage when moved into retracted position pulls the first layer downwardly to remove slack in the first layer.

5,087,095

RECREATIONAL CHAIR

Richard A. McFate, 537 Winthrop Rd., Collegeville, Pa. 19426
Filed Jul. 19, 1990, Ser. No. 554,440
Int. Cl.⁵ A47C 5/10; A45F 4/02

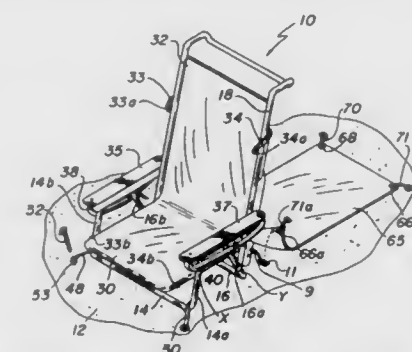
U.S. Cl. 297—129

22 Claims

1. A recreational chair comprising:

(a) a lightweight foldable framing means which provides a support for a seat, backrest, arm supports and legs for said chair, said framing means being covered with a material along said seat and backrest to allow for comfortable seating in said chair;

- (b) said framing means being foldable into a relatively flat profile for transporting and storage purposes;
- (c) a flat means positioned on respective arm supports for placement of an occupant's arms and elbows when using said chair;
- (d) means fastened to each end of said respective flat means and support to allow for easy carrying of said chair upon



the back and across the shoulders of the user when said chair is folded in the flat profile condition; and

(e) said carrying means being adjustable to fit the shoulder and width dimensions of the carrier; whereby said carrying means frees the hands of the user for carrying additional items associated with the recreational use of said chair.

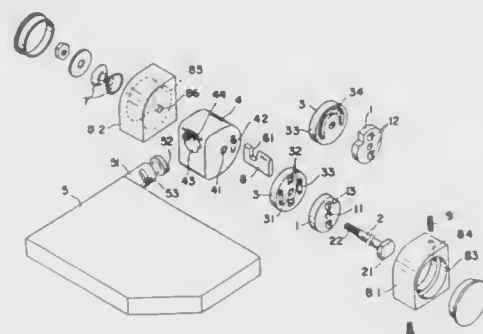
5,087,096

APPARATUS FOR DISPLACING EXTENSIBLE/CONTRACTIBLE BOARD FOR CHAIR IN CASE OF EMERGENCY

Ryokichi Yamazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Kotobuki, Tokyo, Japan
Filed Apr. 18, 1990, Ser. No. 510,525
Claims priority, application Japan, Apr. 28, 1989, 1-110676
Int. Cl.⁵ A47C 39/00

U.S. Cl. 297—145

9 Claims



1. An apparatus for displacing an extensible/contractible board for a chair having an elbow rest in case of an occurrence of emergency, comprising:

a board support for turnably supporting said board, said board support being formed with a bearing hole for rotatably receiving a board shaft made integral with said board, an arcuate recess for turnably receiving an arcuate projection on said board shaft, said arcuate recess being located above said bearing hole, a shaft hole extending at a right angle relative to the board shaft and being located below said bearing hole, and a slide hole for slidably receiving an engagement piece, said slide hole being located at a position behind the shaft hole relative to the board,

an engagement piece slidably received in the slide hole of the base support, said engagement piece having an engagement recess formed thereon so as to allow an eccentric

projection on the board shaft to be engaged with said engagement recess,

a turn guide plate disposed adjacent to the board support to guide turning movement of the board and the board support, said turn guide plate being formed with a shaft hole at the central part thereof, an engagement aperture located in alignment with the slide hole of the board support so that a foremost end of the engagement piece is inserted therethrough when the engagement piece is projected outwardly of the board support by turning movement of the board via operative engagement of the eccentric projection of the board shaft with the engagement recess of the engagement piece, an opposing pair of engagement recesses, one of said engagement recesses being located above the shaft hole and the other one being located below the shaft hole, and an arcuate guide groove for allowing the foremost end of the engagement piece to slidably move therealong when the board is turned from a horizontal attitude and thereby the engagement piece is retracted from a projected state via said operative engagement of the eccentric projection of the board shaft with the engagement recess of the engagement piece,

a stationary guide plate having an opposing pair of first engagement projections adapted to be engaged with the engagement recesses of said turn guide plate and an opposing pair of second engagement projections adapted to receive a flange portion of a thrust shaft, said second engagement projections being located opposite to said first engagement projections,

a thrust shaft extending through the shaft hole of said stationary guide plate, the shaft at hole of said turn guide plate, the shaft hole of said board support and a shaft hole of one base member at a right angle relative to the board shaft, said thrust shaft including a flange portion held between the second engagement projections of said stationary guide plate to immovably hold the stationary guide plate, and a male-threaded portion at the fore end thereof,

an opposing pair of base members firmly secured to the front surface of the foremost end of said elbow rest of the chair with the board support rotatably interposed therebetween, one of said base members being located adjacent to the board support to receive the turn guide plate and the stationary guide plate in a hole formed therein and the other one being likewise located adjacent to the board support with a spring receiving hole formed therein, and engagement assuring means for firmly holding said board support, said turn guide plate and said stationary guide plate in an operative engagement relationship under the effect of resilient force derived from said engagement assuring means.

5,087,097

HIGH CHAIR TRAY ATTACHMENT

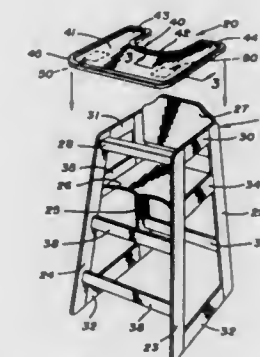
Bruce A. Hehn, 9570 Pondera St., NW., Massillon, Ohio 44646
Filed Nov. 14, 1990, Ser. No. 612,627
Int. Cl.⁵ A47B 83/02

U.S. Cl. 297—153

16 Claims

1. Detachable tray apparatus for a high chair having a pair of spaced arm rails comprising, means providing a substantially planar surface spanning the distance between the pair of spaced arm rails and a pair of spaced attachment means affixed to said means providing a substantially planar surface and selectively engaging the arm rails, said attachment means having pivotally mounted gripper means movable from an open position into engagement with a portion of the periphery of an arm rail for maintaining the tray in a locked position, said gripper means

having projecting ends for encasing a plurality of sides of an arm rail and having an intermediate leg joining said projecting



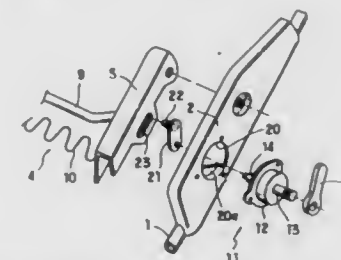
5,087,098

LUMBAR SUPPORT DEVICE

Takanori Ishizuka, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Sep. 25, 1990, Ser. No. 587,690
Int. Cl.⁵ A47C 3/00, 25/00

U.S. Cl. 297—284 C

2 Claims



1. A lumbar support device, comprising:

a seat back frame having a pair of lateral frame sections;

a pair of side brackets each fixedly provided on the respective said lateral frame sections;

a pair of arms each pivotally connected to the respective said two side brackets, such that said arms are disposed inwardly of said side brackets and their respective rotation centers are located at their upper end parts relative to the corresponding said two side brackets, so that said two arms are free to rotate about said rotation centers in a fore-and-aft direction with respect to said seat back frame;

a lumbar support means extending between said arms, so that said lumbar support means is free to rotate forwardly and backwardly relative to said seat back frame as said arms rotate;

a connecting rod extending between said arms;

a brake means provided fixedly on one of said two lateral frame sections on said seat back frame, said brake means being adapted for restricting rotation of a drive shaft in order that said drive shaft is only permitted to rotate through operation of an operation spindle; and

a link means fixed on said driven shaft of said brake means, said link means being at its free end part in an operative engagement with said lumbar support means, said link means including an engagement pin provided at its end part, wherein said engagement pin is in an slidable engagement with an elongated hole which is formed in one of said arms,

whereby rotation of said drive shaft causes a lumbar support action of said lumbar support means via said link means.

5,087,099

LONG RANGE MULTIPLE POINT WIRELESS CONTROL AND MONITORING SYSTEM

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

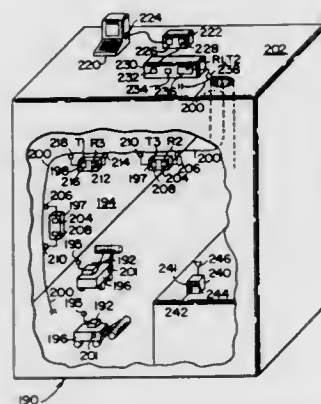
Division of Ser. No. 239,771, Sep. 2, 1988, Pat. No. 4,968,978.

This application Aug. 16, 1990, Ser. No. 557,907

Int. Cl.⁵ H04B 13/02

U.S. Cl. 299—1

6 Claims



4. A method of mine wide data transmission which comprises:

- inductively coupling a plurality of first repeaters to an electrical conductor running from a surface area to a mine;
- inductively coupling a plurality of second repeaters to said electrical conductor;
- transmitting a data signal from a base station at a frequency F_2 to one of the first repeaters;
- retransmitting the data signal from one of the first repeaters at a frequency F_3 to one of the second repeaters;
- retransmitting the data signal from one of the second repeaters at a frequency F_1 to a remote monitoring and control unit;
- inputting an input signal into an input circuit of the remote monitoring and control unit;
- transmitting the input signal to one of the first repeaters at the frequency F_2 ;
- retransmitting the input signal from one of the first repeaters at the frequency F_3 to one of the second repeaters; and
- retransmitting the input signal from one of the second repeaters at the frequency F_1 to the base station.

5,087,100

METHOD OF FRACTURING ROCK OR SIMILAR MATERIAL AND APPARATUS THEREFORE

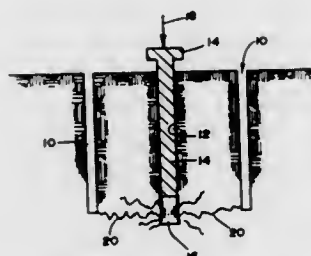
Howard D. Bruce, 1129 Commodore St., Clearwater, Fla. 34615

Filed Oct. 17, 1990, Ser. No. 599,022

Int. Cl.⁵ E21C 37/06

U.S. Cl. 299—15

22 Claims



1. A method of fracturing a hard compact material such as rock or concrete which has a hole pre-drilled in the area to be fractured, comprising:

- inserting a slug of solid material into said hole, to a bottom thereof; and
- impacting said slug with a force sufficiently large to cause

said slug to transfer the impact by hydraulic action to the sides and the bottom of said hole so as to fracture material surrounding said hole.

5,087,101

POWER SPIRAL CONVEYOR SECTION AND METHOD

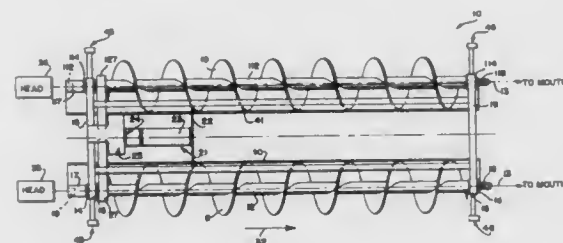
James C. Justice, and Frank Delli-Gatti, Jr., both of Beckley, W. Va., assignors to Coaltex, Inc., Beckley, W. Va.

Filed Dec. 11, 1990, Ser. No. 625,440

Int. Cl.⁵ E21C 35/20; B65G 33/32

U.S. Cl. 299—18

20 Claims



11. A method of mining a mine having a mine mouth, using a mining head with a spiral conveyor including a spiral conveyor screw rotatable with a shaft about an axis of rotation, comprising the steps of:

- inserting the mining head into the mine through the mine mouth, and advancing the head into the mine mouth;
- continuously conveying mined material from the mine toward the mine mouth using the spiral conveyor;
- adding incremental lengths to the spiral conveyor screw as the distance from the mining head to the mouth increases; and
- periodically providing power assists for effecting powered rotation of the spiral conveyor about its axis of rotation along the length of the spiral conveyor in the mine as the incremental lengths are added.

5,087,102

CONTINUOUS MINING MACHINE

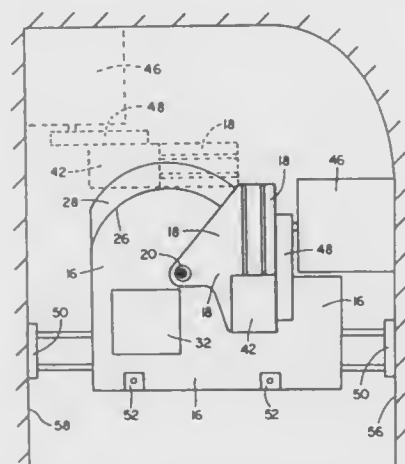
Heinz E. Kiefer, 10332 S. 535 East, Sandy, Utah 84070

Filed Jul. 18, 1990, Ser. No. 554,273

Int. Cl.⁵ E21C 29/26, 31/04

U.S. Cl. 299—72

23 Claims



1. A continuous mining machine for excavating a longitudinal shaft or tunnel underneath the surface of the earth, said mining machine comprising

- transport means for moving the machine over a floor of the shaft or tunnel that is being excavated;
- a working platform having forward and trailing ends and

opposite sides, said working platform being mounted on the transport means;

- a cutter platform mounted to said working platform;
- means for moving the cutter platform about a pivot point on said working platform, such that said cutter platform moves in a reciprocating, arcuate movement around the forward end of said working platform between the opposite sides of said working platform;
- a cutter mounting module connected to said cutter platform;
- means for moving the cutter mounting module in a reciprocating, linear motion on the cutter platform, with the linear motion being in a direction that is perpendicular to a radial line extending from the pivot axis of the arcuate movement of said cutter platform;
- a cutter member; and
- means for mounting the cutter member to said cutter mounting module to extend outwardly from said cutter mounting module and said working platform,

whereby when the cutter platform and the cutter mounting module are positioned at a terminal position in the arcuate movement of said cutter platform, the cutter mounting module can move in said reciprocating, linear motion so that said cutter member cuts an advancing, substantially straight rib cut at the side of the excavation, and when the cutter platform moves in its arcuate movement, the cutter member cuts an advancing, arcuate cut into the face of the excavation at the forward end of said working platform.

5,087,103

AUXILIARY WHEEL TO BE PAIRED TEMPORARILY WITH A VEHICLE WHEEL AND TRAVELING DEVICE THUS OBTAINED

Jean-Pierre Pomplé, Volvic, France, assignor to Compagnie Generale Des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand, France

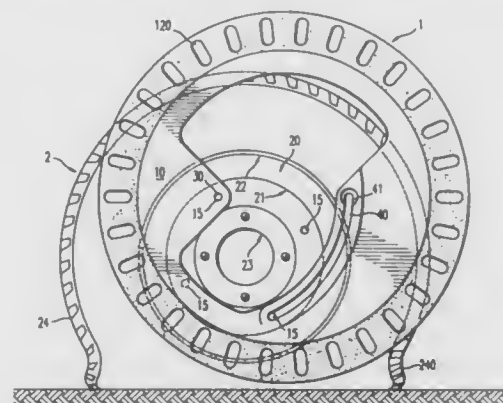
Filed May 23, 1990, Ser. No. 527,368

Claims priority, application France, May 1, 1989, 89 07495

Int. Cl.⁵ B60C 17/04; B60B 15/00

U.S. Cl. 301—39 R

16 Claims



1. An auxiliary wheel to be paired with a main wheel of a vehicle, comprising:

- a disk having a wheel rim;
- at least one circular tire mounted on said wheel rim;
- pivot means formed on said disk at a position eccentric to a center of said tire for pivoting said auxiliary wheel relative to said main wheel; and
- guide means formed on said disk and comprising at least one guide surface formed along an arc of a circle centered on said pivot means for guiding said pivoting of said auxiliary wheel during pairing of said auxiliary wheel with a main wheel.

5,087,104

CLOSURE FOR A THREE-PART CONTROL CABINET
Roger Fursier, Cornwall, Great Britain, and Claus-Dieter Bovermann, Breltenbach-Niederdielen, Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

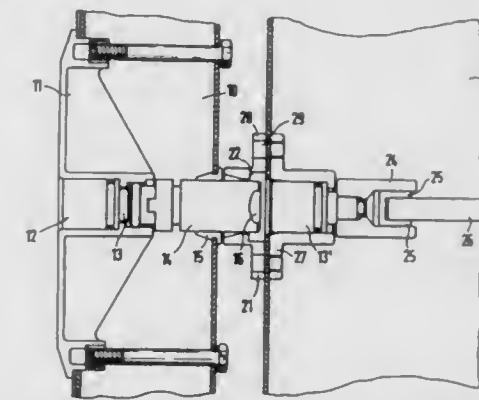
Filed Oct. 8, 1990, Ser. No. 600,773

Claims priority, application European Pat. Off., Oct. 6, 1989, 89118547

Int. Cl.⁵ A47B 47/00

U.S. Cl. 312—100

20 Claims



5,087,105

EARRING RACK

James M. White, Rte. 8, Box 260AA, Fairmont, W. Va. 26554-8613

Filed Oct. 1, 1990, Ser. No. 590,922

Int. Cl.⁵ A47B 67/02

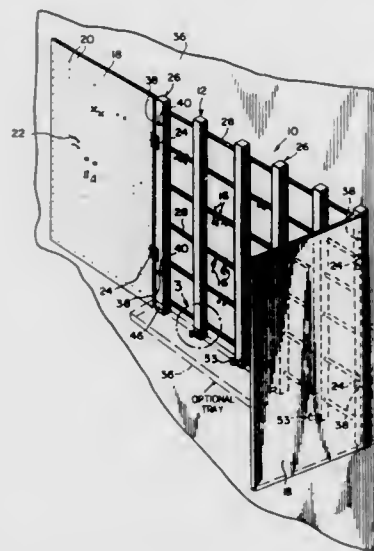
U.S. Cl. 312—245

7 Claims

1. An improved supportless earring rack, comprising:

- a grid frame having holes in the vertical members and cylindrical shaped horizontal members and a center for removably holding the hook of earrings thereon in a neat organized fashion, said horizontal members are cylindrically shaped and pass through said vertical members, said grid frame including a plurality of vertical stanchions and

- a plurality of cylindrically shaped horizontal rungs which transversely pass through said stanchions so that the hook earrings can be removably held thereto;
- b) two shutters, each having a plurality of small holes for removably holding the posts earrings with their respective friction nuts therein in a neat organized fashion, said shutters meeting in said center of said frame.
- c) means for securing one edge of each said shutter to one



- side of said grid frame so that said shutters can be swung centerwards for the post earrings to be removed easily;
- d) means for mounting said grid frame in a stationary vertical position to prevent said rack from falling over when the earrings are being removed therefrom; and
- e) a mirror and means for removably attaching said mirror to one of said horizontal rungs of said grid frame, said removably attaching means is an inverted U-shaped clip affixed to the back of said mirror.

5,087,106

FURNITURE WITH FASTENING DEVICE

David R. Betts, Tenterden, England, assignor to Kentinental Engineering Limited, Kent, England

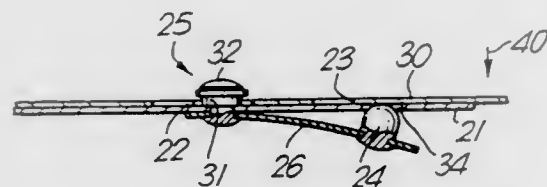
Filed Jul. 31, 1990, Ser. No. 560,708

Claims priority, application United Kingdom, Aug. 1, 1989, 89177540

Int. Cl.⁵ A47B 88/00

U.S. Cl. 312-263

8 Claims



1. Knockdown quick assembly furniture parts incorporating fastening means for releasably securing a first furniture part and a second furniture part together, the fastening means comprising a first substantially planar member on one of said furniture parts defining a slot having a relatively wide portion having an effective center and a relatively narrow portion having an effective center, and defining a secondary aperture having an effective center, the effective center of the narrow portion of the slot spaced from the effective center of the wide portion by a predetermined distance, the second of the furniture parts defining a second fastening member including a planar portion and a stud having a head and a body mounted to

the planar portion, the head being dimensioned to pass through the wide portion but not through the narrow portion of the slot on the first furniture part and the body being dimensioned for transverse movement from the wide portion to the narrow portion, an opening spaced a predetermined distance from the stud, and a substantially planar strip of resilient material mounted to the planar portion of the second furniture part on the side opposite the first furniture part, a peg dimensioned to be received in the aperture on the first furniture part mounted on the resilient strip and passing through the opening in the second furniture part whereby the peg can move with the stud when displaced parallel to the plane of the strip and away from the plane of the first member by flexing the strip, the arrangement being such that when the head is inserted through the wide portion of the slot, the peg is displaced rearwardly away from the first furniture part by contact with the first furniture part so as to bend the strip, and when the stud is displaced transversely through said distance with the body traversing the narrow portion of the slot the peg will enter the aperture under the bias of the strip so that the engagement of the peg in the aperture prevents reverse transverse movement until the peg is depressed.

5,087,107

DEVICE AND PROCESS FOR PROTECTING AND HANDLING BANK NOTES AND VALUABLES

Giuseppe E. Fumanelli, Milan, Italy, assignor to M.I.B. Elettronica S.R.L., Peschiera Borromeo, Italy

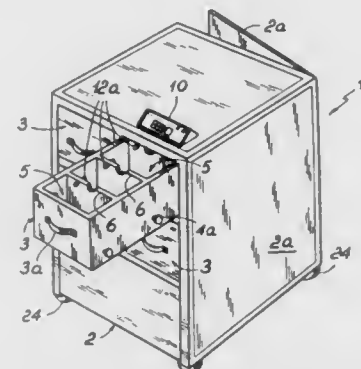
Filed Jan. 17, 1990, Ser. No. 466,524

Claims priority, application Italy, Jan. 19, 1989, 19122 A/89; Feb. 6, 1989, 19324 A/89; Mar. 13, 1989, 19744 A/89; May 19, 1989, 20562 A/89

Int. Cl.⁵ A47B 88/00

U.S. Cl. 312-319

13 Claims



1. A device for protecting and handling bank notes and valuables comprising
- a housing;
- a protection housing forming external walls of said housing;
- at least one mobile element supported for movement in said housing including a drawer movable in a direction for extraction of said drawer out of said protection housing;
- safety compartments within said drawer having safety bulkheads forming walls of said safety compartments, said safety compartments being of a size substantially dimensioned for holding a measured quantity of the bank notes;
- at least two of said safety compartments being consecutive with each other in said drawer in said extraction direction of said drawer;
- said extraction direction of said drawer allowing access to said safety compartments from outside of said protection housing;
- mobile element locking means attachable to said mobile element at a plurality of stop positions in movement of said mobile element along said extraction direction;
- a control device connected to drive said locking means at

- said plurality of stop positions for access to said safety compartments;
- said control device including
- quantity sensors connected to operate said mobile element locking means and having means to detect the presence of the bank notes and valuables in said safety compartments.

5,087,108

DOUBLE-CORE ACTIVE-FIBER OPTICAL AMPLIFIER HAVING A WIDE-BAND SIGNAL WAVELENGTH

Giorgio Grasso, Monza, Italy; Paul L. Scrivener, Southampton Hampshire, Great Britain, and Andrew P. Appleyard, Monza, Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

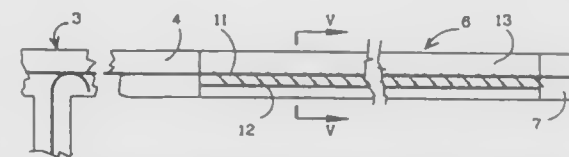
Filed Jul. 13, 1990, Ser. No. 553,246

Claims priority, application United Kingdom, Aug. 11, 1989, 8918377; Italy, Feb. 12, 1990, 19340 A/90

Int. Cl.⁵ G02B 6/26

U.S. Cl. 385-27

25 Claims



1. An optical amplifier having a wide signal band, in particular for optical fiber telecommunication lines (1) operating with a transmission signal in a predetermined wavelength band, comprising a dichroic coupler adapted to multiplex a transmission signal and luminous pumping energy in a sole outgoing fiber and an active optical fiber containing a fluorescent doping substance, connected to the fiber coming out of the dichroic coupler and to a telecommunication line fiber adapted to receive and transmit an amplified signal, characterized in that the active optical fiber (6) is completely formed by two cores (11 and 12, 101 and 102) in a common cladding (13, 103), where the former core (11, 101) is an active or amplifying core containing a fluorescent laser emission dopant in a wavelength range including the wavelength band of the transmission signal and is optically connected at one end to said fiber coming out of the dichroic coupler and, at the other end, to said telecommunication, whereas the other core (12, 102) of the active optical fiber is an attenuating core and contains a substance adapted to absorb luminous energy and is cut at the ends, the two cores being optically coupled to each other in a wavelength band comprised in the range of the laser emission wavelengths of the first core and different from the transmission signal band.

5,087,109

METHOD FOR COUPLING SEMICONDUCTOR LASER WITH OPTICAL FIBER

Satoshi Ishizuka, Hirakata; Kazuro Toda, Katano, and Osamu Kato, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1987, Ser. No. 105,131

Claims priority, application Japan, Oct. 9, 1986, 61-240331; Jul. 22, 1987, 62-182513

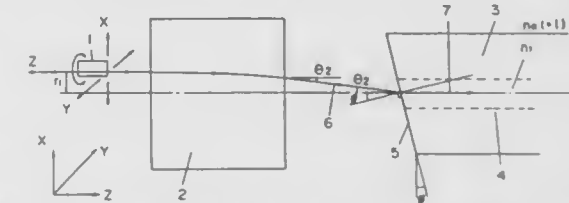
Int. Cl.⁵ G02B 6/42

U.S. Cl. 385-34

14 Claims

1. A semiconductor laser module, comprising: a semiconductor laser for outputting a laser beam; an optical fiber having an input inclined end face thereof inclined to a plane perpendicular to a center axis of the optical fiber;
- a coupling lens disposed between said semiconductor laser and optical fiber for passing said laser beam outputted from said semiconductor laser therethrough and for focusing said laser beam onto the input inclined end face of the optical fiber;
- wherein, said laser beam outputted from said semiconductor laser passes through said coupling lens, and is inputted

into said optical fiber and transferred through said optical fiber as a transferring light, and wherein said semiconductor laser is positioned at a position away from the center



axis of said coupling lens in such manner that an optical axis of said transferring light transferring in said optical fiber is coincident with the center axis of the optical fiber, thereby maximizing a coupling efficiency of said semiconductor laser, coupling lens and optical fiber.

5,087,110

OPTICAL FIBER CABLE AND MANUFACTURE OF OPTICAL FIBER CABLE

Shinya Inagaki, Shinjuku; Sakae Yoshizawa, Setagaya, and Kazuya Sasaki, Mitaka, all of Japan, assignors to Fujitsu Ltd., Kanagawa, Japan

PCT No. PCT/JP89/00130, § 371 Date Jul. 6, 1989, § 102(e) Date Jul. 6, 1989, PCT Pub. No. WO89/07779, PCT Pub. Date Aug. 24, 1989

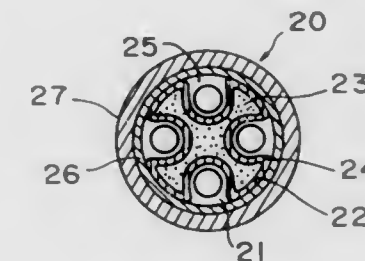
PCT filed Feb. 9, 1990, Ser. No. 381,397

Claims priority, application Japan, Feb. 10, 1988, 63-029259; Mar. 1, 1988, 63-047952

Int. Cl.⁵ G02B 6/44

U.S. Cl. 385-110

17 Claims



1. An optical fiber cable comprising:
- a core loading material (22) which includes a bundled material (23) of high tensile strength synthetic resin fibers and having a plurality of spiraling optical fiber accommodating spiral grooves (25) formed in an outer circumferential surface thereof and a synthetic resin covering layer (24) covering the outer circumferential surface of said bundled material and a surface of said optical fiber accommodating spiral grooves (25);
- at least one optical fiber (21) housed in one of said spiral grooves; and
- an outer sheath (27) covering the core loading material housing said at least one optical fiber in one of the spiral grooves.

5,087,111

MAT SELECTION DEVICE

Gerald Wessler, 18 Kimball Dr., Gulfport, Miss. 39507

Filed May 2, 1989, Ser. No. 346,553

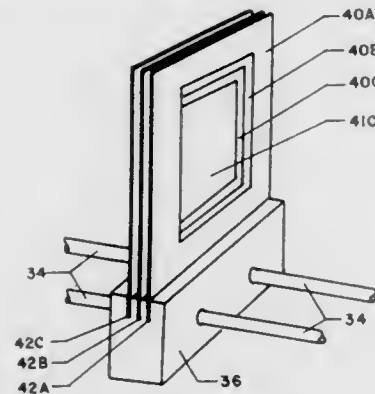
Int. Cl.⁵ G02B 27/02

U.S. Cl. 359-479

18 Claims

1. A viewing device for visual mat selection comprising:
- a. a frame whose vertical posterior section supports an eyepiece which traverses said vertical posterior section so that its optical axis is at right angles to the vertical section;
- b. a horizontal base section which supports a plurality of elongate, parallel horizontal runners extending outward to

a transverse end piece from said horizontal base section in line with the optical axis of said eyepiece; and
c. a mat carrier slidably mounted on the runners in a direction perpendicular thereto, wherein the carrier has on its upper surface parallel slots in said direction to hold mats of different colors and aperture sizes facing the optical axis



of said eyepiece, whereby the eyepiece is used to restrict a field of view to said mats supported by the carrier which may be moved proximally and distally so as to fill a periphery of the visual field, and with said viewing device manually held or physically placed to be aimed at a subject to be matted so that the illusion of a mat surrounding the subject is created and preserved.

5,087,112 OPTICAL MAGNIFIER APPARATUS

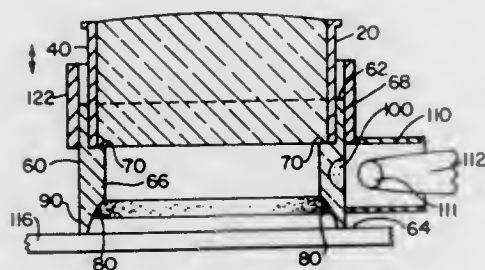
Richard E. Feinbloom, New York, N.Y., assignor to Designs For Vision, Inc., Ronkonkoma, N.Y.

Filed Jul. 19, 1990, Ser. No. 554,472

Int. Cl.⁵ G02B 27/02, 7/02

U.S. Cl. 359—800

11 Claims



7. An optical magnifier apparatus comprising:
a support adapted to support a magnifier glass over a document to be read,
said support comprising a tubular member having a sidewall with open upper and open lower ends,
a thickened wall portion comprising a portion of said sidewall and disposed between said open upper end and said open lower end of said support,
an annular horizontal flat surface at an upper end of said thickened wall portion and spaced from said open upper end,
an annular slanted surface at a lower end of said thickened wall portion and spaced above said open lower end of said sidewall, said slanted surface facing toward said open lower end of said sidewall and thus adapted to face the surface of a document on which said support is placed, said slanted surface being roughened to reflect light in different directions when light impinges on said roughened surface, and
a depression in said thickened wall portion of said sidewall but not extending through said thickened wall portion, said depression being adapted to receive a source of light

such that light from said source can enter into said thickened wall portion and exit said thickened wall portion through said slanted surface to uniformly illuminate the surface of a document to be read.

5,087,113

LIQUID CRYSTAL DISPLAY DEVICE

Ikuo Sakono, Osaka; Motokazu Inui, Kawachinagano, and Hiroaki Kato, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

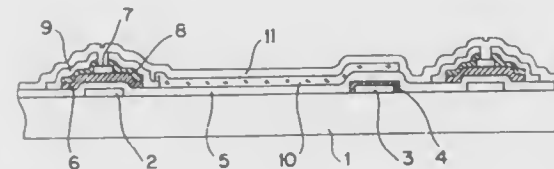
Continuation of Ser. No. 241,351, Sep. 7, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 480,947

Claims priority, application Japan, Feb. 25, 1988, 63-43553

Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—59

14 Claims



1. A thin film transistor array for a liquid crystal display device comprising:
an insulating substrate;
a plurality of gate electrodes formed on the insulating substrate;
a plurality of additional capacity electrodes formed on the insulating substrate on substantially the same plane as that of the gate electrodes, and made of tantalum, the same material as the gate electrodes, to provide a low resistance and to allow for formation of a plurality of additional capacity electrodes small in thickness and width;
an insulating film covering at least the gate electrodes and the additional capacity electrodes;
a plurality of picture element electrodes formed on the insulating film in a matrix form; and
a plurality of thin film transistors formed on the insulating film and connected to said gate electrodes, said thin film transistors being coupled to the picture element electrodes respectively, for switching the voltage to be applied to the corresponding picture element electrodes.

5,087,114

LIQUID CRYSTAL DEVICE WHEREIN THE MOST OPTIMUM RATIO OF SPACING BETWEEN SUBSTRATES IN WHICH THE LIQUID CRYSTAL IS DISPOSED AND BEFORE DISPOSING OF THE LIQUID CRYSTAL IS 0.77-0.87

Takeshi Fukui, and Toshio Watanabe, both of Atsugi, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Dec. 11, 1989, Ser. No. 448,315

Claims priority, application Japan, Dec. 12, 1988, 63-313222

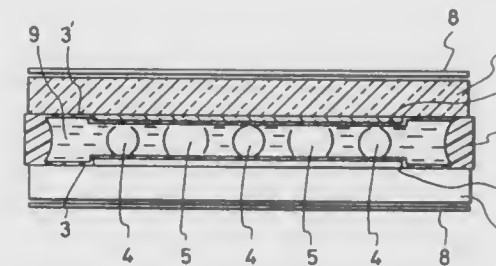
Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—81

5 Claims

1. A liquid crystal device comprising:
a pair of substrates;
an electrode arrangement formed on the inside surfaces of the pair of substrates;
a ferroelectric liquid crystal layer disposed between said substrates;
a plurality of spacers distributed between said substrates in order to more uniformly maintain the distance between said substrates, said spacers comprising non-fusible spacers and fusible resilient spacers;
wherein the distribution density of said fusible resilient spacers

ers is selected from 2 to 200 particles per square millimeter such that the distance between the mated substrates before



the liquid crystal is disposed is 0.77-0.87 of that after the liquid crystal is disposed.

5,087,115

ASPHERICAL GLASS LENS ELEMENT SUITABLE FOR AN OBJECT LENS ELEMENT OF A DISK DEVICE

Isao Ishibai; Hitonobu Otsu, and Yutaka Kawai, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

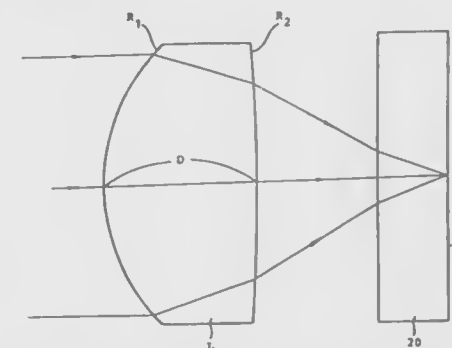
Filed Mar. 9, 1990, Ser. No. 491,223

Claims priority, application Japan, Mar. 10, 1989, 1-56206

Int. Cl.⁵ B29D 11/00; G02B 13/18

U.S. Cl. 359—719

8 Claims



1. An aspherical glass lens element having an optical axis, a focal length f , a thickness D along said optical axis, and first and second aspherical convex surfaces, said first and said second aspherical convex surfaces having first and second apexes through which said optical axis passes, first and second radii of curvature r_1 and r_2 at said first and said second apexes, and first and second conical coefficients k_1 and k_2 , respectively, and being determined by first and second predetermined formulae represented as functions of said first and said second radii r_1 and r_2 and said first and said second conical coefficients k_1 and k_2 , said aspherical glass lens element being defined by the following formulae:

$$1.68 < f/D < 1.75,$$

$$-0.18 < (r_1/r_2)D < -0.10, \text{ and}$$

$$-0.08 < k_1/k_2 < 0.04,$$

where an absolute value of said second coefficient k_2 is smaller than 1,000.

5,087,116

REFLECTIVE IMAGE DISPLAY INCLUDING A FIRST MIRROR AND A FRESNEL MIRROR

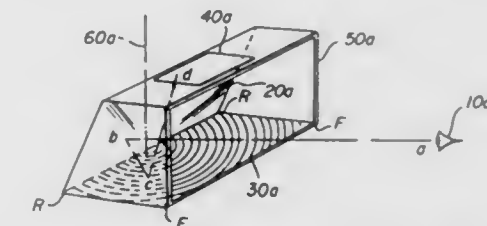
Roy Y. Taylor, II, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1990, Ser. No. 559,026

Int. Cl.⁵ G02B 17/06, 27/02, 5/10

U.S. Cl. 359—851

16 Claims



1. A reflective image display for forming a viewable, virtual, right reading image of a planar object positioned at an object position, said display comprising:
a first mirror; and
a second, Fresnel mirror, said second mirror having converging power, an optical axis, and opposite edges, one of said edges being nearer the first mirror than the other edge and said optical axis being adjacent to said one edge, said first and second mirrors being positioned to receive light from the object, positioned at said object position, without having any intervening lens elements located therebetween, wherein said light is reflected off one mirror to the other mirror and then into the eye of a viewer to provide an erect magnified virtual image of said object to said viewer.

5,087,117

SIDE-MEMBER FOR SPECTACLE FRAMES

Peter Steinwachs, Margarethenstr. 8, D-6080 Gross-Gerau, Fed. Rep. of Germany

PCT No. PCT/EP88/01085, § 371 Date May 7, 1990, § 102(e) Date May 7, 1990, PCT Pub. No. WO89/05469, PCT Pub. Date Jun. 15, 1989

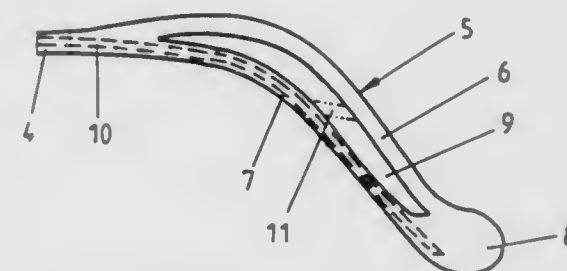
PCT Filed Nov. 29, 1988, Ser. No. 466,323

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1987, 8716445[U]

Int. Cl.⁵ G02C 5/18

U.S. Cl. 351—117

14 Claims



1. A side member for a spectacle frame comprising an elongated rod and an ear part extending rearwardly from said rod, said ear part being wider than said elongated rod, and comprising at least two narrow elongated spars formed of an essentially rigid material, said spars being spaced apart to form an elongated opening therebetween and being interconnected at their rear ends, a metal insert extending through at least a lower one of said spars.

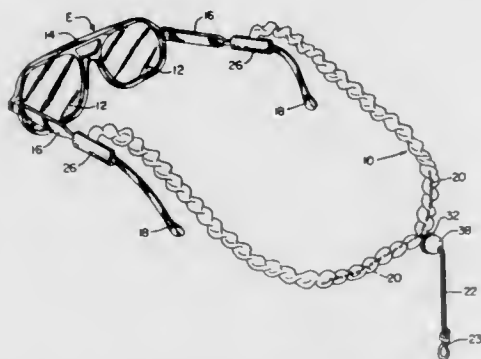
5,087,118

ARTICLE HOLDER

Vicki L. Gill, 5022 Syndt Rd., Evergreen, Colo. 80439
Continuation-in-part of Ser. No. 351,526, May 15, 1989, Pat.
No. 4,974,956. This application Jun. 11, 1990, Ser. No. 535,658
Int. Cl.⁵ G02C 3/00

U.S. Cl. 351—156

5 Claims



1. A retainer for a pair of eyeglasses comprising in combination an elongated flexible elastic cord having opposite end portions, releasable connecting means at said opposite end portions for releasably connecting said cord to each temple bar of said pair of eyeglasses, said cord being of a length to extend around the head or neck of a wearer, a sleeve in surrounding relation to said cord and of a length to cover substantially the length of said cord, first adjustable slide means engageable with said cord for adjusting the effective length of said cord between a position fitting snugly around the head of a wearer and a position in which said pair of eyeglasses are loosely suspended from the neck of the wearer, said releasable connecting means defined by a generally loop-shaped member sized to receive one of said temple bars, said loop-shaped member having end portions attached to one of said opposite end portions of said cord, and slidable cinching means in surrounding relation to said ends of said loop-shaped member, said slidable cinching means being manually engageable for advancement along said loop-shaped member toward said temple bar for adjustably tightening said loop-shaped member around each of said temple bars.

5,087,119

DISTANCE MEASURING APPARATUS

Yoshiyuki Kaneko, Kawasaki, and Ryoichi Suzuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 382,041, Jul. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 300,220, Jan. 24, 1989, abandoned, which is a continuation of Ser. No. 19,790, Feb. 27, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 483,293

Claims priority, application Japan, Jan. 23, 1987, 62-013470; Feb. 28, 1988, 61-044551

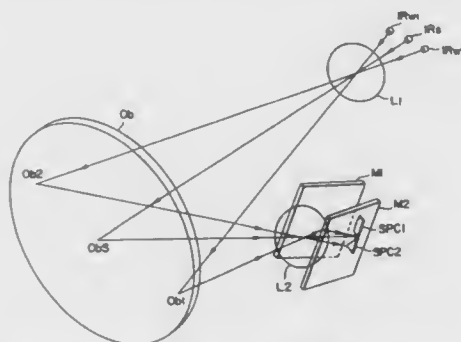
Int. Cl.⁵ G01C 3/00, 5/00; G03B 3/00

U.S. Cl. 356—1

60 Claims

1. A distance measuring apparatus for measuring a distance of an object, having a position within a measurable range in a field of view, the field of view having first and second areas, said apparatus comprising:
projecting means for projecting an incident signal on said object within said measurable range, said incident signal being projected toward one of said first and second areas of the field of view;
receiving means for receiving a reflected signal resulting from reflection of said incident signal off said object;
timer means for timing a predetermined time period;
detecting means for detecting whether said received reflected signal reached a predetermined level within said predetermined time period; and
switching means for switching said incident signal from one

of said first and second area to the other of said first and second areas, in response to said detecting means detect-



ing that said received reflected signal did not reach said predetermined level within said predetermined period.

5,087,120

SYSTEM FOR CAPTURING, PRESSING AND ANALYZING ENTRAINED SOLIDS SUCH AS COTTON

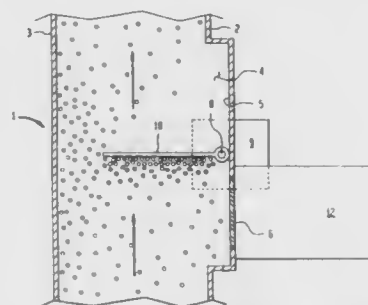
William S. Anthony, Greenville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 16, 1991, Ser. No. 641,837

Int. Cl.⁵ G01N 1/20, 21/47

U.S. Cl. 356—36

30 Claims



1. Apparatus for analyzing flowable solids comprising
a. means to move said solids through a conduit;
b. means connected to said conduit to abruptly halt part of said solids moving through said conduit, and thereafter to press said halted solids against an interior surface of said conduit;
c. analyzing means adjacent said interior surface whereat said solids are pressed, to analyze said pressed solids; and
d. means to remove pressure from said pressed solids after analysis thereof, and to permit said latter solids to resume movement through said conduit.

5,087,121

DEPTH/HEIGHT MEASURING DEVICE

Osamu Kakuebi, Kawasaki, and Mikichi Ban, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 277,544, Nov. 29, 1988, abandoned.
This application Oct. 1, 1990, Ser. No. 593,253

Claims priority, application Japan, Dec. 1, 1987, 62-304078; Dec. 1, 1987, 62-304079; Dec. 1, 1987, 62-304080

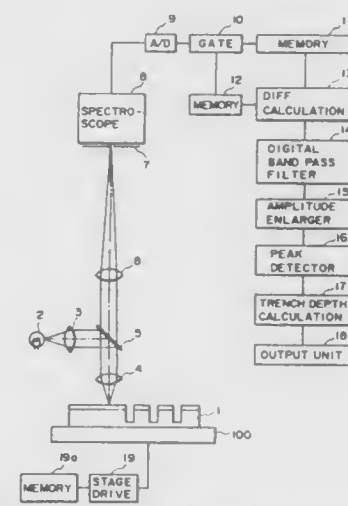
Int. Cl.⁵ G01B 11/06, 11/22

U.S. Cl. 356—73

37 Claims

1. A method of measuring the depth of a trench formed on an article having a surface layer, said method comprising the steps of:
irradiating with light a first portion of the article without a trench;

analyzing light from the irradiated first portion with respect to wavelength to produce first information related to the first portion;
irradiating with light a second portion of the article with the trench, different from the first portion;



analyzing light from the irradiated second portion with respect to wavelength to produce second information related to the second portion; and
determining the depth of the trench on the basis of the first and second information.

5,087,122

ADJUSTABLE ATTENUATOR FOR OPTICAL TRANSMISSION SYSTEM

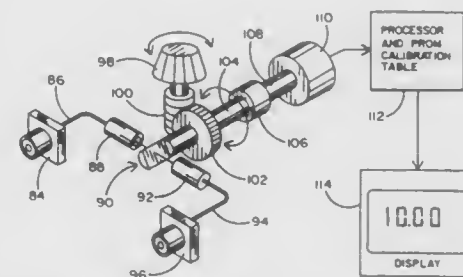
Frederick M. Ostrander, Oriskany, and Hosain Hakimi, Utica, both of N.Y., assignors to Laser Precision Corporation, Utica, N.Y.

Filed Aug. 13, 1990, Ser. No. 565,804

Int. Cl.⁵ G01N 21/84; G05D 25/00

U.S. Cl. 356—73.1

16 Claims



1. A variable optical attenuator comprising:
an optical signal input means;
an optical signal output means;
a first lens which converts the optical signal from the input means into a collimated beam;
a second lens which receives the collimated beam and causes it to focus into the output means; and
a mechanical blocker which is gradually moved into the collimated beam in such a way that its outer edge travels along a substantially arcuate path as the blocker gradually attenuates the beam;
said mechanical blocker (a) having a substantially non-variable opaqueness to the beam, and (b) causing variable attenuation of the beam solely by the extent to which it reduces the area of the beam.

5,087,123

ATOMIC EMISSION SPECTROMETER WITH BACKGROUND COMPENSATION

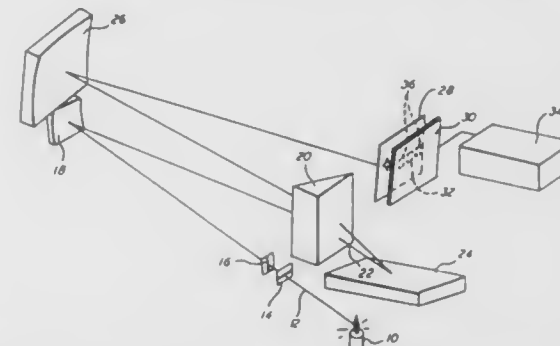
Edgar Gerlach, Konstanz; Carl G. Dencks, Owingen; Uwe Gunther, Owingen, and Gunther Rodel, Owingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin Elmer GmbH, Überlingen, Fed. Rep. of Germany
Continuation of Ser. No. 335,065, Apr. 7, 1989, abandoned. This application May 17, 1990, Ser. No. 526,779

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811923

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.
Int. Cl.⁵ G01J 3/36, 3/28

U.S. Cl. 356—307

18 Claims



1. An atomic emission spectrometer for multi-element measurement of elements in a sample comprising
means for atomizing a sample and for exciting atoms to emit light with characteristic spectral lines of elements contained in the sample,
dispersing means for generating a spectrum of characteristic spectral lines of the emitted light in a focal plane,
first photodetector means for simultaneously sensing spectral lines of multiple elements in the sample for processing to determine concentration,
second photodetector means for sensing background emission outside the spectral lines sensed by said first detector means for processing to determine background emission correction,
measuring range circuit means, associated with said first photodetector means, for determining whether said first photodetector means senses spectral lines within a measuring range of said first photodetector means and selecting for processing only spectral lines sensed by said first photodetector means within the measuring range without changing the intensity of any of the spectral lines at said first photodetector means, and
processing circuit means for determining concentration of the multiple elements in the sample with correction for background emission.

5,087,124

INTERFEROMETRIC PRESSURE SENSOR CAPABLE OF HIGH TEMPERATURE OPERATION AND METHOD OF FABRICATION

Rosemary L. Smith, and Scott D. Collins, both of 3311 Oyster Bay Ave., Davis, Calif. 95616

Filed May 9, 1989, Ser. No. 349,231

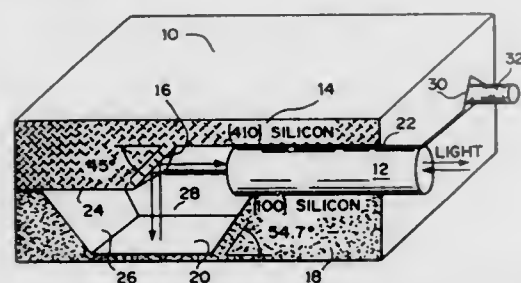
Int. Cl.⁵ G01B 9/02

U.S. Cl. 356—358

14 Claims

1. An interferometric pressure microtransducer comprising two layers of silicon of different crystal orientations and an optical waveguide formed between the two silicon layers, wherein one silicon layer includes a pressure-responsive,

light-reflective membrane and the second silicon layer includes a light reflective surface oriented at an angle with



respect to the membrane to convey light reflected by the light-reflective surface to the optical waveguide.

5,087,125 EQUIPMENT FOR MEASURING A DIFFERENCE IN ELEVATION

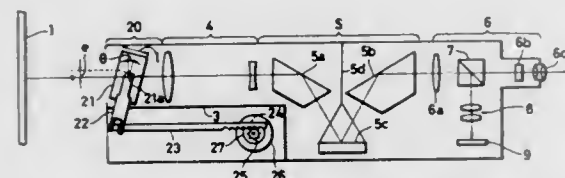
Yoshinori Narutaki, Tokyo, Japan, assignor to Optec Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 177,237, Apr. 4, 1988, abandoned. This application Sep. 12, 1990, Ser. No. 581,355

Claims priority, application Japan, Apr. 8, 1987, 62-86525
Int. Cl.⁵ G01C 5/00, 3/22

U.S. Cl. 356—375

9 Claims



1. A level for use in combination with a leveling pole to be set up at a measuring point, said pole displaying divisions consisting of coded marks each digitally height of mark from an end of said pole at a unit interval, said interval comprising:

- (i) a telescope optical system having an optical axis;
- (ii) leveling means for making the telescope level;
- (iii) an image sensor on which an image is focused by the optical system, said sensor having a linear image pickup device arranged to provide a signal responsive to an image of one of said coded marks; said linear image pickup device comprising:

a light-receiving element array extending parallel to the width of the image of said coded marks, having sufficient resolution for reading the image of said coded marks at a maximum distance of a measurable range between said level and said leveling pole, and wherein the length of said light-receiving element array is sufficient to allow said image sensor to read the image of said coded marks at a minimum distance of the measurable range;

- (iv) a micro optical system provided in front of an object lens of said telescope optical system for vertical compensation of the optical axis thereof, said micro optical system comprising a plate glass having parallel planes facing said object lens and tilting means for inclining said plate glass about a horizontal axis normal to the optical axis of said telescope;

- (v) decoder means coupled to the output of said image sensor for decoding the signal responsive to the image of the coded mark to provide a digital height signal; and

- (vi) interpolation means comprising:

(a) means for detecting the inclination angle of said plate glass, comprising:
a pulse motor coupled to said tilting means so as to incline said plate glass and means for counting drive

pulses of said pulse motor to generate data indicative of said inclination angle;

- (b) detecting means for detecting alignment of the optical axis of the telescope with one of said coded marks in response to the signal provided by said image sensor, as said plate glass is tilted by said tilting means; and

- (c) interpolator means for calculating an interpolated height value in accordance with the signal from said decoder means and with angle data from said means for detecting the inclination angle.

5,087,126 METHOD OF ESTIMATING COLORS FOR COLOR IMAGE CORRECTION

Hung Pochieh, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

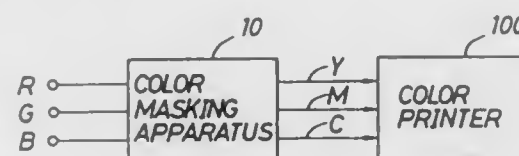
Filed Feb. 27, 1990, Ser. No. 485,555

Claims priority, application Japan, Feb. 28, 1989, 1-46830

Int. Cl.⁵ G01J 3/46; G01B 27/46; H04N 11/20

U.S. Cl. 356—402

4 Claims



1. A method of estimating colors, comprising the steps of: performing colorimetry of a plurality of colors obtained by combining n fundamental colors, where n is an integer of not less than 2;

converting values obtained by the colorimetry into values in a predetermined colorimetric system; and calculating a combination of fundamental colors, which corresponds to a target color in the colorimetric system, by using a combination of n+1 values in the colorimetric system which surround the target value in the colorimetric system and fundamental colors corresponding to the n+1 values in the colorimetric system.

5,087,127 REMOVAL OF CONCENTRATE FROM A CENTRIFUGAL SEPARATOR

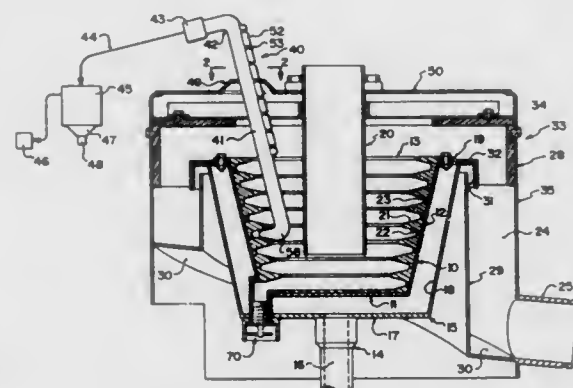
Benjamin Knelson, 20313-8th Avenue, R.R. #1, Langley, British Columbia, Canada V3A 6Y3

Filed Jul. 5, 1990, Ser. No. 547,078

Int. Cl.⁵ B04B 11/00

U.S. Cl. 366—27

4 Claims



1. A method of centrifugally separating intermixed materials of different specific gravities comprising providing a centrifuge bowl having a base and a peripheral wall surrounding an

axis passing through the base and generally upstanding from the base to an open mouth, defining on the bowl a plurality of axially spaced inwardly projecting peripherally extending ring members defined on an inner surface of the peripheral wall so as to provide a plurality of peripherally extending recesses each between one ring member and a next adjacent ring member, the recesses being arranged as a series of the recesses in axially spaced location including an uppermost recess, a plurality of intermediate recesses and a lowermost recess, rotating the bowl about the axis, feeding materials into the bowl such that during rotation of the bowl the materials flow over the peripheral wall with discarded materials discharging from the open mouth and retained material being collected on the peripheral wall within each of the recesses as a concentrate, fluidizing the material in the recesses by injection of fluid through the peripheral wall into each recess, providing a probe member, supporting the probe member on a support element extending into the bowl from a location exteriorly of the bowl, actuating the support element so as to move the probe member in a substantially radial direction of the bowl to a position temporarily inserted into each recess in turn to a location therein spaced from the peripheral wall so as to cause a part only of the material within said each recess to be extracted from said each recess, collecting the extracted material, actuating the support element so as to move the probe member in a substantially radial direction out of said each recess, the support element being held so as to prevent movement of said probe member in said substantially radial direction except when the probe member is radially aligned with said each recess in turn, said support element being moved such that the probe member enters each recess in turn from the uppermost recess through the plurality of intermediate recesses to the lowermost recess.

5,087,128 METHOD AND APPARATUS FOR INTEGRATING NUTRITIONAL SUPPLEMENTS FOR SUBSEQUENT MIXING WITH LIVESTOCK FEED GRAIN

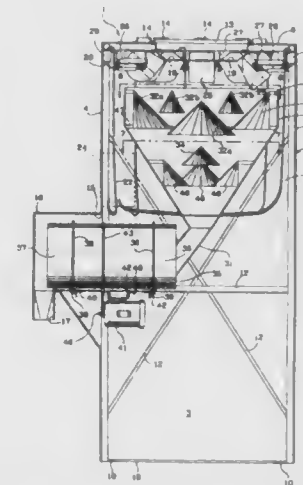
James S. Matthews, Circleville; Robert K. Matthews, Canton, both of Ohio, and Myron M. Martin, Lebanon, Pa., assignors to Robert J. Matthews Co., Canton, Ohio

Filed Apr. 6, 1990, Ser. No. 505,574

Int. Cl.⁵ B01F 15/04

U.S. Cl. 366—141

18 Claims



1. An apparatus adapted for automatically and simultaneously weighing and integrating at least two different nutritional supplements for subsequent blending with a livestock feed grain, said apparatus including:

- a) a housing formed with at least one inlet opening and an outlet opening located below said inlet opening;
- b) weighing means mounted within the housing adjacent to the housing inlet opening for receiving, weighing, and

releasing the nutritional supplements, said weighing means including at least a pair of weigh hoppers, each pivotally mounted on an electronic load cell adjacently below and in alignment with the housing inlet opening;

- c) metering means for depositing the nutritional supplements into the weighing means through the inlet opening of the housing;

- d) means mounted within the housing below the weighing means for integrating and guiding the weighed and released supplements downwardly and out of the housing outlet opening; and

- e) computer means interfaced with the weighing means and metering means for controlling and coordinating the receipt, weighing and release of the nutritional supplements.

5,087,129 APPARATUS FOR PRODUCING A HYDROSTATIC THRUST BEARING

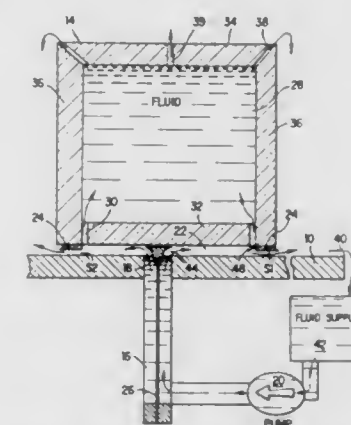
Klaus O. Schneider, 9200 Cotharin Rd., Malibu, Calif. 90265

Filed Nov. 16, 1990, Ser. No. 614,204

Int. Cl.⁵ F16C 32/06

U.S. Cl. 384—12

12 Claims



1. An apparatus for producing a hydrostatic thrust bearing comprising:

- a base;
- a load disposed on the base; and
- means for applying fluid at the load with respect to the base such that the load exhibits self-amplified chaotic motion from only the fluid applied to the load but the load cannot fall off of the base.

5,087,130 UNDER SEAL DEVICE OF LINEAR MOVEMENT GUIDE BEARING

Toru Tsukada, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 672,338

Claims priority, application Japan, Mar. 20, 1990, 2-28403[U]; Mar. 23, 1990, 2-30321[U]

Int. Cl.⁵ F16C 29/06, 33/72

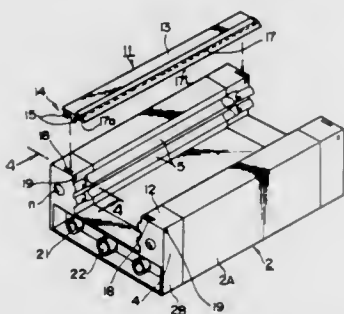
U.S. Cl. 384—15

11 Claims

1. An under seal device of a linear movement guide bearing having a guide rail extending in an axial direction and rolling body rolling grooves respectively formed in side surfaces thereof, a slider movably fitted on the guide rail and having rolling body rolling grooves respectively formed in inner surfaces of side walls thereof so that the rolling body rolling grooves of the slider respectively oppose the rolling body rolling grooves of the guide rail, the guide rail and the slider being relatively movable in the axial direction through a plurality of balls inserted in the opposing rolling body rolling grooves, the under seal device comprising:

- a pair of under seals mounted to lower surfaces of the slider

respectively in the vicinity of lower side edges of the slider so that inner edges of the under seals are slidably in contact with the side surfaces of the guide rail; elastic projection portions respectively formed at axial opposite ends of each of the pair of under seals; and fitting apertures formed in the lower surfaces of the slider at positions corresponding to the elastic projection portions

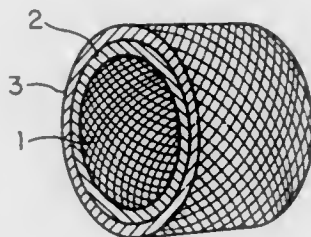


of the pair of under seals so that each of the elastic projection portions is fitted into a corresponding one of the fitting apertures; wherein the elastic projection portions protrude axially from each under seal, the slider includes a pair of side seals respectively attached to axial opposite ends of the slider, and the fitting apertures are formed in lower portions of the pair of side seals.

5,087,132
BEARING HAVING BEARING SURFACE OF CLOTH
Kouji Tanaka; Masaaki Ikeda; Yasumasa Tsubakimoto, all of Osaka; Takashi Koizumi, Nara; Takerou Nakagawa, and Makato Kanehira, both of Osaka, all of Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan
Continuation of Ser. No. 292,948, Jan. 3, 1989, abandoned. This application Jan. 4, 1991, Ser. No. 636,019
Int. Cl.⁵ F16C 33/20, 33/02

U.S. Cl. 384—276

18 Claims



1. A bearing surface of a deaerated cloth impregnated with deaerated resin with both such cloth and such resin being aerated prior to impregnation with the resin.

8. In a bearing having a hardened impregnated cloth bearing surface the improvement of the resin and cloth being individually deaerated under a negative pressure prior to impregnation and hardening.

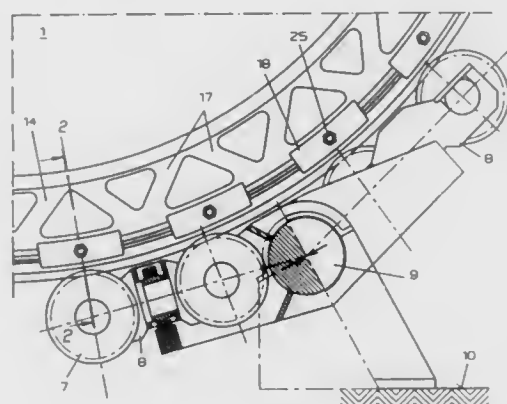
5,087,133
ARRANGEMENT FOR ATTACHING RUNNING RINGS TO A ROTARY DRUM

Werner Jacob, Frankfurt, and Martin Schepp, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany
Filed Jan. 30, 1991, Ser. No. 647,840
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1990, 4003616

Int. Cl.⁵ F16C 23/06

U.S. Cl. 384—549

11 Claims



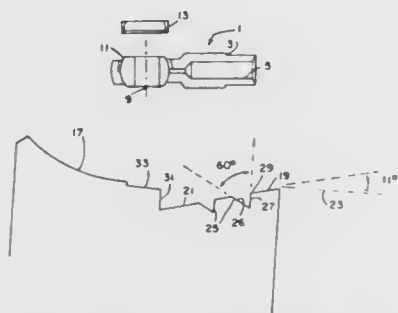
1. In an arrangement for mounting a running ring to a drum adapted to rotate about a predetermined axis wherein a bore surface of the running ring is held to a supporting surface means carried by the drum by circumferentially spaced straps mounted laterally on at least one side of the ring, the straps having radially outer projections that extend axially toward the ring and have support surfaces that are directed radially inwardly toward an engagement surface on one side of the ring, the improvement wherein

at least one of the engagement surface of the ring and the support surfaces of the straps that engage the engagement surface extend, in the direction axially outward of said one

5,087,131
THREE PIECE ROD END
Peter D'Andrea, Fairfield, Conn., assignor to Imo Industries Inc., Lawrenceville, N.J.
Filed Oct. 29, 1990, Ser. No. 604,878
Int. Cl.⁵ F16C 25/04

U.S. Cl. 384—208

12 Claims



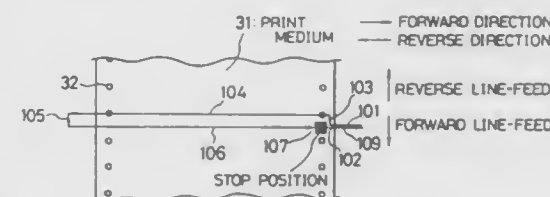
1. A spherical bearing having an outer race body, an enlarged head on the race body, an opening in the head for receiving a ball, the opening having a first portion with a curved side for contacting and holding one side of a ball, and having a second sloped portion with an enlarged bore for receiving an insert for holding the ball, a deformable insert having a generally cylindrical shape with an outer surface and an inner surface, the outer surface deforming against the second sloped portion of the opening in the head and the inner surface deforming against the ball, the improvement comprising internal grooves in a wall of the second portion of the opening in the head for digging into the insert as the insert is expanded by pressure of a ball into the second portion of the opening.

side of the ring, toward the axis of rotation, and comprising means for axially adjusting the support surface of each strap with respect to the engagement surface, the bore surface of the ring pressing locally against a supporting surface of said supporting surface means.

5,087,134
METHOD OF AND DEVICE FOR PRINTER CONTROL
Jiro Tanuma; Hideaki Ishimizu; Tadashi Kasai, and Chihiro Komori, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Apr. 3, 1990, Ser. No. 504,140
Claims priority, application Japan, Apr. 7, 1989, 1-87093
Int. Cl.⁵ B41J 29/387

U.S. Cl. 400—54

7 Claims



1. A printer control device for a printer in which a spacing operation of a print head and a line-feed operation of a print medium are performed, comprising:

- (a) line-feed means for performing the line-feed operation of the print medium;
- (b) spacing means for performing the spacing operation of the print head;
- (c) means for detecting the position of the print head in a spacing direction;
- (d) means for detecting a stoppage of the print head during the spacing operation;
- (e) stop position memory means for storing the stop position of the print head in the spacing direction when stoppage of the print head is detected; and
- (f) control means for causing the line-feed means to perform a line-feed operation in a reverse direction by a first amount when the stoppage of the print head is detected, then causing the spacing means to perform a spacing operation in a first direction which is the same as a direction of the spacing operation before the stoppage of the print head was detected, then causing the line-feed means to perform a line-feed operation in a forward direction by said first amount, and then causing the spacing means to perform a spacing operation in a second direction which is opposite the first direction;
- (g) said stoppage detecting means for detecting a stoppage of the print head during the spacing operation in the second direction as well; and
- (h) said control means, responsive to said stoppage detecting means, for performing an error indication when stoppage of the print head is detected at the stop position stored in said stop position memory means during the spacing operation in the second direction, and continuing the spacing operation if stoppage of the print head is not detected at the stop position.

5,087,135
PRINTER PAPER THICKNESS DETECTOR
Nicholas H. Tew, Newbury Park, and Lyudmila M. Preys, Granada Hills, both of Calif., assignors to DataProducts Corporation, Woodland Hills, Calif.
Filed Apr. 14, 1988, Ser. No. 181,537
Int. Cl.⁵ B41J 11/20, 25/308

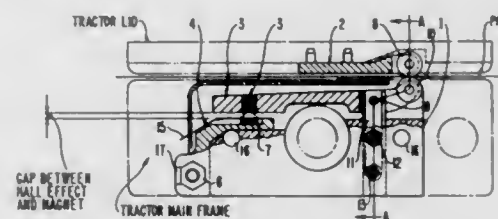
U.S. Cl. 400—56

7 Claims

1. In a printer having a printing mechanism for placing printed matter on a substrate, the printing mechanism includ-

ing character printing elements and an electrically driven hammer unit which is connected to receive an actuating current and is operative for causing the printing elements to print characters on the substrate by impacting against the elements with an impact force dependent on the magnitude of the actuating current, the improvement comprising:

substrate thickness monitoring means disposed in the printer for monitoring the thickness of a substrate disposed to be printed upon by the mechanism and for producing an electrical output signal indicative of the substrate thickness; and



actuating current control means connected to receive the output signal from said monitoring means and to control the actuating current in a manner to reduce the impact force when the substrate thickness is less than a selected value;

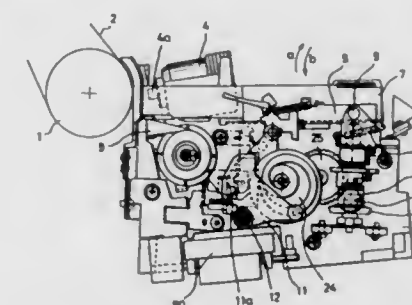
wherein said actuating current control means comprise a timer for timing a predetermined time period following the introduction of a new substrate into the printer and circuit means for detecting the electrical output signal during the predetermined time period.

5,087,136
PRINTING MECHANISM WITH A CAM AND GROOVE ARRANGEMENT

Hiroharu Nakajima, Kodaira; Naohisa Suzuki, Yokohama, and Michihisa Kumamoto, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 634,825, Jan. 2, 1991, Pat. No. 5,048,988, which is a continuation of Ser. No. 535,296, Jun. 8, 1990, abandoned, which is a continuation of Ser. No. 185,345, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 815,057, Dec. 31, 1985, abandoned. This application Jun. 27, 1991, Ser. No. 722,518
Claims priority, application Japan, Jan. 7, 1985, 60-000665
Int. Cl.⁵ B41J 35/22

U.S. Cl. 400—214

3 Claims



1. A printing mechanism for printing on a recording medium, comprising

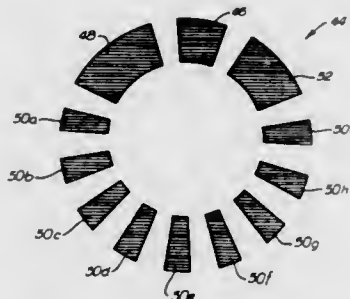
cam means for moving an ink ribbon between an effecting position to act on the recording medium and an initial position for not acting on the recording medium, said cam means including a cam plate having a cam groove and a cam tracing pin guided in said cam groove, with said cam tracing pin travelling a first course in said cam groove for moving the ink ribbon between the initial position and the

effecting position and a second course in said cam groove for holding the ink ribbon in the effecting position; drive means for imparting rotary motion to said cam means in two directions about a rotary axis, wherein the first course in said cam groove is eccentric with respect to the rotary axis and the second course is substantially concentric with respect to the rotary axis, wherein in a first stage of rotary motion said cam tracing pin is guided from the first course to the second course, in a second stage of rotary motion said cam tracing pin is guided in a predetermined direction in the second course and in a third stage of rotary motion said cam tracing pin is guided in the second course in a direction opposite to the predetermined direction; and prohibiting means formed in said cam groove for prohibiting said cam tracing pin from travelling off-course.

5,087,137
RIBBON ASSEMBLY INCLUDING INDICIA TO IDENTIFY OPERATING PARAMETERS AND RIBBON DEPLETION
 Jonathan J. Burnard, Brookline, and Brendan Fee, Litchfield, both of N.H., assignors to Datamax Corporation, Orlando, Fla.

Filed Jul. 19, 1988, Ser. No. 221,319
 Int. Cl.⁵ B41J 33/32
 U.S. Cl. 400—249

8 Claims



1. A method of indicating a low ribbon condition of a printer operable according to printer operating parameters and having a ribbon supply spool, a ribbon take-up spool and a machine readable coded indicia having X indicia elements, the X indicia elements including Y indicia elements, the X indicia elements being carried by at least one of the ribbon supply spool and the ribbon take-up spool, wherein Y is a number at least as great as 0, the method comprising the steps of: providing means for reading the coded indicia and determining the number Y; determining the operating parameters dependent on the number Y; rotating the ribbon supply spool and ribbon take-up spool; determining the speed of rotation of at least one of the ribbon supply spool and the ribbon take-up spool by reading the X indicia elements; and indicating a low ribbon condition based on the speed of rotation of at least one of the ribbon supply spool and the ribbon take-up spool.

5,087,138
SUNTAN OIL APPLICATOR
 Rosemarie Terbrusch, RD 4 Blueberry Ln., South Salem, N.Y. 10590, and George Spector, 233 Broadway #3815, New York City, N.Y. 10007

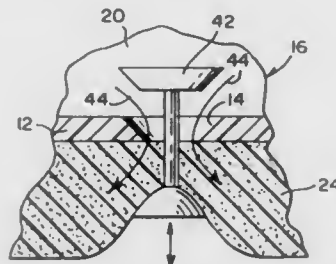
Filed Nov. 2, 1989, Ser. No. 431,433
 Int. Cl.⁵ A45D 34/00

U.S. Cl. 401—206

1 Claim

1. A suntan lotion applicator comprising:
 a) a flat head having a central aperture therein;
 b) an elongated hollow handle having a proximate end and a distal end, the distal end connected to said head over the

central aperture while the proximate end having an open entry for addition of suntan lotion into said handle and through the central aperture in said head;
 c) a resilient absorbent pad affixed to underside of said head and presenting a surface area for rubbing the suntan lotion on the skin of a person;
 d) a removable cover on said head for isolating said pad during periods of non-use;
 e) a cap detachably connected to the proximate end of said handle so as to protect the suntan lotion disposed within said handle; wherein the distal end of said handle is angularly cut and is connected to said head over the central aperture at a preferred angle so that application of the suntan lotion can be properly applied to the skin of a person, wherein said cap further includes:



f) a top portion having an off center aperture therethrough;
 g) a disc having an off center hole therethrough whereby said disc is carried on said top portion;
 h) a pivot pin extending through center of said disc and said top portion so that said disc can be rotated in which the hole in said disc can line up with the aperture in said top portion allowing the suntan lotion to freely run into said pad; further including a suntan lotion release valve assembly mounted on said pad having a head external to said pad engaging the center of said pad and a stem extending through said pad and said head aperture including a valve at an inner end of said stem in combination with a seat surrounding said head aperture coacting with said valve, wherein external pressure on said head causes pad compression and inward opening movement of said valve.

5,087,139
DEVICE FOR APPLYING MAKE-UP, INCORPORATING REPLACEABLE RESERVOIR

Maurice Pinoteau, Maisons Alfort, and Bernard Mallet, Le Chesnay, both of France, assignors to Parfums Christian Dior, Paris, France

PCT No. PCT/FR87/00234, § 371 Date Dec. 6, 1988, § 102(e) Date Dec. 6, 1988, PCT Pub. No. WO87/07821, PCT Pub. Date Dec. 30, 1987

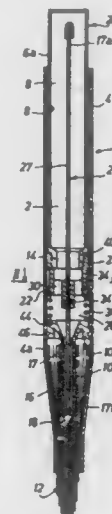
PCT Filed Jun. 19, 1987, Ser. No. 297,857
 Claims priority, application France, Jun. 20, 1986, 86 08968
 Int. Cl.⁵ A45D 33/02

U.S. Cl. 401—206

12 Claims

1. A device for applying a powdery material, comprising:
 (a) a hollow case provided at one end with a closure element supporting a tuft or bundle of hairs of filaments;
 (b) a dismountable and replaceable reservoir received in the case, defining a cavity for the powdery material and having an opening proximate to the closure element, said reservoir and said case having mutually cooperating dismounting means allowing said reservoir to be dismounted relative to said case;
 (c) a valve for establishing at least temporary communication between the cavity and the tuft, the valve being defined by the closure element and comprising:
 (i) an obturation element for opening and closing the valve, the obturation element being mounted within the closure element, extending into the cavity defined by

the reservoir, and comprising a rod of sufficient length that its end remote from the valve protrudes relative to said case and is therefore accessible from outside the device when the reservoir is dismounted therefrom; and
 (d) the reservoir being of a length sufficient to define a

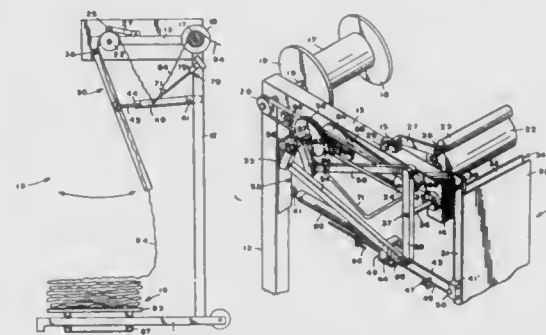


5,087,140
FESTOONING MACHINE FOR CLOTH STRIPS
 J. Herbert Keeton, and David A. Keeton, both of 747 Meader St., Campbellsville, Ky. 42718

Filed Dec. 14, 1989, Ser. No. 450,537
 Int. Cl.⁵ B31B 1/54

U.S. Cl. 493—23

14 Claims

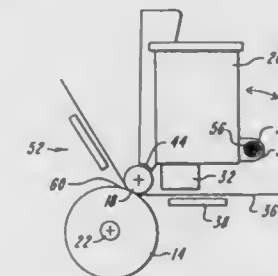


1. A festooning machine for web material comprising:
 a frame;
 spreader means, mounted on said frame, for engaging the web to guide it during festooning;
 means mounted on said frame for directing web material to be festooned to said spreader means; and
 an automatic variable speed fully pneumatic drive means mounted between said frame and said spreader means for effecting movement of said spreader means with respect to said frame so that said web is festooned;
 said variable speed pneumatic drive comprising a pneumatic cylinder with a piston reciprocal therein, and having first and second faces with a piston rod extending from said first face; means for supplying compressed air to either said first or said second face; means for exhausting air from adjacent the face to which air is not supplied; and

means responsive to the speed of movement of said web adjacent said web directing means for controlling the exhaust flow from said exhausting means, and thereby the speed of movement of said piston rod.

5,087,141
COMBINATION PINCH ROLLER AND CARRIAGE GUIDE FOR PRINTER
 Kieran B. Kelly, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.
 Filed Dec. 19, 1989, Ser. No. 452,908
 Int. Cl.⁵ B41J 25/304
 U.S. Cl. 400—352

30 Claims



1. Apparatus for printing on a printing medium comprising:
 a frame;
 a printhead carriage having a printhead for printing on a printing medium in a printing area;
 drive roller means journaled in said frame;
 means for guiding movement of said printhead carriage in the printing area;
 an elongated roller, having a direction of elongation, said elongated roller being rotatably disposed in said frame and being rotatable along an axis generally parallel to the direction of elongation, said elongated roller being disposed generally parallel to said drive roller means, said printhead carriage resting on and riding along said elongated roller in a non-fixed relationship, said elongated roller cooperating with said drive roller means to provide the printing medium to the printing area for printing thereon, said elongated roller also cooperating with said guiding means to guide movement of said printhead carriage in the printing area; and
 means for moving said printhead carriage along said guiding means and said elongated roller for positioning said printhead in a desired location in the printing area.

5,087,142
SHEET FEEDER FOR PRINTERS INCLUDING MEANS TO CONTROL AND DETECT THE SHEET
 Hiroshi Suzuki; Eiji Arakawa; Kazuhiko Takagi, all of Nagoya, and Hiroshi Watanabe, Kaizu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
 Filed Feb. 8, 1990, Ser. No. 476,705

Claims priority, application Japan, Feb. 8, 1989, 1-29454; Mar. 3, 1989, 1-52574; Mar. 8, 1989, 1-55393
 Int. Cl.⁵ B41J 11/50

U.S. Cl. 400—616

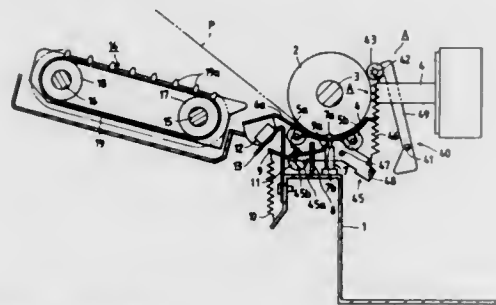
17 Claims

1. A sheet feeder for a printer comprising:
 a frame;
 a printing mechanism including a platen rotatably supported on said frame and a print head reciprocally movable along said platen, said print mechanism carrying out printing on a sheet loaded in said printing mechanism;
 a drive source;
 continuous sheet feed means connected to said drive source for feeding a continuous sheet;
 cut sheet feed means connected to said drive source for feeding a cut sheet;
 switching means for connecting said drive source to selec-

tive one of said continuous sheet feed means and said cut sheet feed means, said switching means being movable between a first position and second position wherein said cut sheet feed means is selectively driven when said switching means is in the first position and said continuous sheet feed means is selectively driven when said switching means is in the second position;

position detecting means for detecting the position of said switching means and indicating the position thus detected;

sheet detecting means for detecting the sheet loaded in said printing mechanism;



indicator means; and

control means for actuating said indicator means when said position detecting means indicates that the position of said switching means is moved from the first position to the second position while said sheet detecting means is detecting the cut sheet loaded in said printing mechanism and also actuating said indicator means when said position detecting means indicates that the position of said switching means is moved from the second position to the first position while said sheet detecting means is detecting the continuous sheet loaded in said printing mechanism.

5,087,143 FILLING TOOTHBRUSH

Michael Hertrampf, Schaferweg 7, 3007 Gehrden 1, Fed. Rep. of Germany

Filed Jul. 12, 1990, Ser. No. 551,895

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922850

Int. Cl.⁵ A46B 11/02

U.S. Cl. 401—146

4 Claims



1. In a filling toothbrush having a hollow handle providing space for a supply of toothpaste, said hollow handle terminating in a support with bristles, a discharge aperture in the area of the bristles, a tube within the handle connecting the inner end of said supply space to said aperture, a pump disposed within said handle at said inner end, a check valve between said supply space and said tube which closes upon activation of said pump and causes toothpaste to flow through said tube to said aperture, and opens upon deactivation of said pump to permit toothpaste to flow from said supply space to said pump, the improvement in which said supply space comprises

- a first cylinder within said handle surrounding said tube,
- a first annular piston within said first cylinder which slides on said tube,
- a second cylinder of larger diameter than said first cylinder adjoining said first cylinder,
- a second piston for said second cylinder in the form of a ring

disposed between the outer diameter of said first cylinder and the inner diameter of said second cylinder, and an inwardly projecting flange on said second ring piston against which said first piston abuts as it moves toward said second cylinder, said first and second cylinders moving in unison to expel toothpaste from said second cylinder.

5,087,144 TEMPORARY INK STORAGE MEMBER AND WRITING INSTRUMENT USING THE SAME

Yoshihiro Wada, Yashio; Kazunori Suzuki, Kasukabe; Tadashi Kono, and Katsuo Asano, both of Ishioka, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/00767, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990, PCT Pub. No. WO90/01423, PCT Pub. Date Feb. 22, 1990

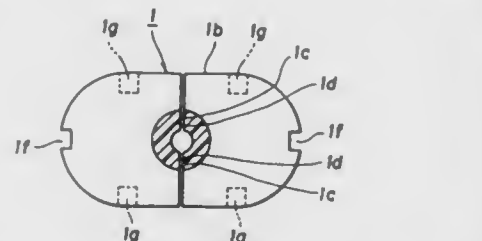
PCT Filed Jul. 27, 1989, Ser. No. 465,254

Claims priority, application Japan, Jul. 30, 1988, 63-101602[U]

Int. Cl.⁵ B43K 8/04, 7/08, 5/18

U.S. Cl. 401—199

19 Claims



1. A temporary ink storage member for temporarily storing ink in response to pressure changes in an ink tank, including:

- an elongated core portion having a through-hole formed along a length thereof;
- a reduced thickness portion extending radially outwardly from said core portion and having a longitudinal section of comb-tooth shape with a plurality of teeth separated by gaps, and a cross section with opposing long portions and opposing short portions shorter than said long portions;
- a slit-shaped ink groove formed longitudinally of said elongated core portion and in communication with said through-hole, said slit-shaped ink groove being formed in one of said opposing short portions; and

wherein a temporary ink storage portion is defined by said gaps, is in communication with said slit-shaped ink groove, and has deep portions defined by ones of said gaps in said short portions and shallow portions defined by ones of said gaps in said long portions, said temporary ink storage portion being disposed about substantially an entire periphery of said core portion as viewed in cross section.

5,087,145 TRADING CARD HOLDER

Gregory S. Cooley, 16041 Beatrice, Allen Park, Mich. 48101

Filed Apr. 5, 1991, Ser. No. 681,219

Int. Cl.⁵ B42F 13/00

U.S. Cl. 402—79

19 Claims

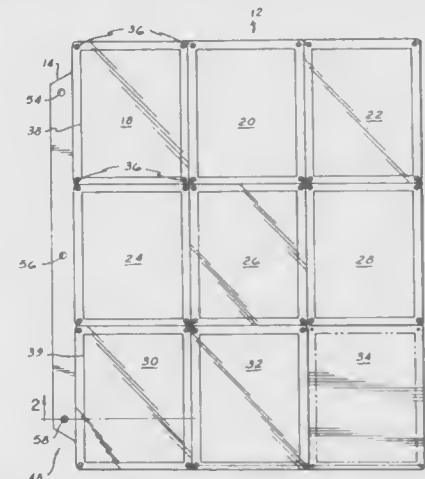
1. A trading card display holder for displaying a plurality of trading cards, each trading card of the type having first and second opposing planar surfaces, wherein at least one of said surfaces includes visible indicia thereon, said trading card display holder comprising:

- a back plate having a relatively flat card engaging surface, said surface having sufficient area to engage one of said planar surfaces of at least two of said display cards,
- a plurality of trading card covers, each one of said card covers respectively associated with one of said trading

cards, each said card cover having a relatively flat card engaging surface adapted to engage one of the planar surfaces of its respectively associated trading card, and wherein each of said covers includes back plate engaging means for engaging one of said card covers to said back plate, and

wherein at least one of said back plate and said card covers is transparent for allowing the visible indicia on at least one of said planar surfaces on each of said trading cards to be viewed therethrough, and

wherein at least one of said back plate and said card covers



is rigid for preventing any substantial flexing movement between said cards, their respective card covers and said back plate,

whereby when each said trading card is sandwiched between the card engaging surface of its respectively associated card cover and said back plate and secured thereto by said engaging means associated with its respectively associated trading card cover, said cards are immovably retained between their respective card covers and said back plate thereby allowing the visible indicia placed thereon to be viewed while preventing said trading cards from bending.

5,087,146 ASSEMBLY FOR THE POSITIONING OF TWO STRUCTURAL ELEMENTS IN RELATION TO EACH OTHER

Josef Motzet; Harald Sprehe, both of Ingolstadt, and Xaver Stemmer, Reichertshofen, all of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany

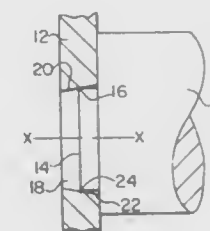
Filed Mar. 4, 1991, Ser. No. 664,314

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1990, 4006477

Int. Cl.⁵ B25G 3/00

U.S. Cl. 403—13

10 Claims



1. An assembly comprising:

- a first structural member having a polygonal and slightly conical recess along a longitudinal centerline thereof, said recess having a planar contact surface disposed in spaced relation from said centerline and a surface diametrically

opposed to said planar contact surface having at least a contact point; and

- a second structural member having a projecting portion along a longitudinal centerline thereof, insertable in said recess to align said members along this longitudinal centerline, said opposite surface of said recess being dimensioned such that said projecting portion overlaps said opposite surface, said projecting portion being cylindrical with a flattened surface thereon, said flattened surface being engageable with the planar contact surface of said first structural member, and said projecting portion having a contact point engageable with the contact point of said first structural member when said projecting member is received within said recess whereby upon insertion of said projecting portion into said recess said members will be prevented from displacing angularly relative to each other about said aligned centerlines.

5,087,147 ASSEMBLY OF SHAFT AND HUB MEMBER

Miloslav Petrzek, Much-Kraunüchel, and Werner Hoffmann, Siegburg, both of Fed. Rep. of Germany, assignors to GKN Automotive AG, Siegburg, Fed. Rep. of Germany

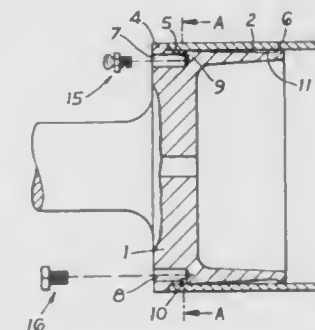
Filed Dec. 2, 1988, Ser. No. 278,839

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740908

Int. Cl.⁵ F16B 11/00

U.S. Cl. 403—268

16 Claims



1. An assembly comprising:

- a tubular shaft member;
- a hub member fitting within the shaft member;
- the hub member having spaced formations engaging the internal surface of the shaft member, and further having a surface between said formations so as to define an annular space between the shaft member and hub member;
- an adhesive in said space;
- means for providing said annular space, from one end of the assembly to the other, with an increasing resistance to flow of said adhesive in a liquid condition within said space; and
- two diametrically opposed passage means communicating with the end of said space of greater flow resistance, for introduction of adhesive to the space and venting of air therefrom.

5,087,148 SURFACE MARKER STRIP AND METHODS FOR PROVIDING IMPROVED INTEGRITY AND ADHESION TO ROADWAYS AND THE LIKE

Charles W. Wyckoff, Needham, Mass., assignor to Brite Line Corporation, Roxbury, Mass.

Continuation of Ser. No. 309,312, Feb. 10, 1989, abandoned.

This application Nov. 13, 1990, Ser. No. 611,315

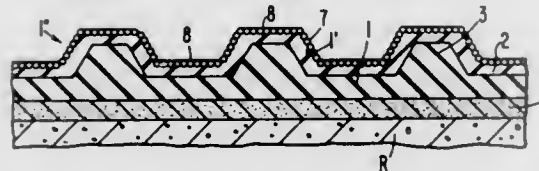
Int. Cl.⁵ E01F 9/06, 9/08

U.S. Cl. 404—12

7 Claims

1. A roadway marker strip for adhesive attachment along a

bottom surface of the strip to a roadway, comprising a rubber-like sheet having a bottom layer and surface which possess cold-flow substantially memory-free characteristics and an upper layer and surface deformed into successive protuberances such as ridges and wedges from which incident light



from a vehicle traveling along the roadway may be reflected or retro-reflected to indicate a roadway direction, said deformed upper layer and surface including said protuberances being cross-link-vulcanized so as to possess substantial memory enabling restoration of depression of the protuberances caused by vehicle

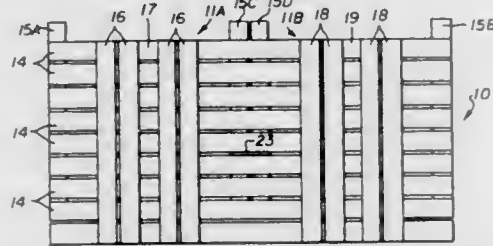
5,087,149

INTERLOCKING WOODEN MAT ROADWAY

A. J. Waller, Jr., P.O. Box 1591, Nederland, Tex. 77627
Filed Apr. 14, 1989, Ser. No. 337,880
Int. Cl.⁵ E01C 5/14, 9/08

U.S. Cl. 404—35

18 Claims



1. A laminated wooden mat section of at least three ply construction adapted to be secured in interlocking relation to other like mat sections for constructing roadways in underdeveloped areas to be driven upon by the wheels of a motor vehicle,

said mat section being of rectangular shape with a shorter side and a longer side at least 50% longer than said shorter side and comprising

an intermediate layer of closely spaced planks of predetermined width and of substantially equal length extending parallel to each other for the length of the longer side of said rectangular shape from one edge to the other thereof,

a bottom layer of substantially parallel wooden planks of predetermined width and of substantially equal length corresponding to the length of the shorter side of said rectangular shape, secured to said intermediate layer of planks at right angles thereto by nailing, with the ends thereof secured to the outermost planks of said intermediate layer to define said rectangular shape,

at least one plank of said bottom layer being longitudinally offset to provide a male extension at only one end and a female recess only at the other end of said bottom layer,

a top layer of substantially parallel wooden planks of predetermined width and of substantially equal length corresponding to the length of the shorter side of said rectangular shape, secured to said intermediate layer of planks at right angles thereto by nailing,

said top layer comprising two groups of closely spaced planks, each group of planks being of sufficient width and spaced one group from the other a sufficient distance to provide parallel tracks for the wheels of a motor vehicle when said mat sections are assembled into a roadway, at least one of said top layer groups of planks having an

internal longitudinal space of substantially the width of one of said planks, said layers being securely attached together at common overlapping intersections, and said bottom layer male extensions being adapted to fit and be removably secured in said female recess on an adjacent mat by being lowered into position for assembly along the longer edge of said rectangular shape with the edges and ends, respectively, of adjacent mats being in a straight line and said groups of top layer planks being aligned to define said parallel vehicle tracks, said mat sections being substantially lighter in weight than mats having closely spaced planks on each of the layers thereof and being constructed to permit a vehicle to move along a previously laid mat while laying the next mat in the roadway being assembled.

5,087,150

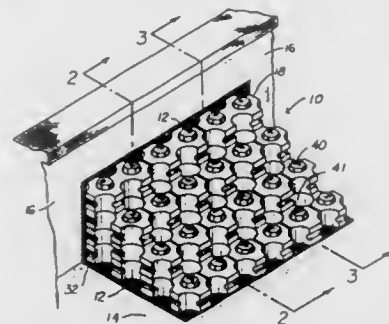
METHOD OF CONSTRUCTING A SEAWALL REINFORCEMENT OR JETTY STRUCTURE

Donald R. McCreary, 240 Brightwaters Blvd., NE., St. Petersburg, Fla. 33704

Continuation-in-part of Ser. No. 420,299, Oct. 12, 1989, abandoned. This application Apr. 4, 1990, Ser. No. 504,295
Int. Cl.⁵ E02B 3/04, 3/06; E04C 1/10

U.S. Cl. 405—31

20 Claims



1. A method of constructing a wave barrier structure comprising

applying a weighted water permeable fabric over a bottom sediment,

applying to the fabric located over the bottom sediment a first layer of concrete blocks, the blocks having a pair of vertical bores,

the first layer of concrete blocks being applied to abut each other in adjacent horizontally rows with one edge of each block in a first row being applied to abut a solid vertical structure,

a second vertical layer of blocks being applied to abut over the first horizontal layer of blocks, an edge of each block in a first row in the second layer being applied to abut the solid vertical structure and a bore in the blocks of the second layer being aligned with a bore in a first layer of blocks,

successive vertical layers of blocks being aligned to a next lower layer in the same manner as the layer of blocks directly beneath the next lower layer, with each higher layer of blocks having at least one less horizontal row and placing a concrete piling through the bores of multiple vertical continuous layers of blocks.

13. A concrete block structure for use in seawall reinforcement comprising a rectangular shape having an integral pair of four sided star-like configurations with a vertical bore centrally located within each star from a top to a bottom surface and a latitudinal groove along each exterior side surface of the block to form a channel for passage of water when abutted against a like surface of an identical concrete block structure, the latitudinal groove being parallel to the top and bottom surfaces, each corner of the block having a quarter round circle

and the mid-portion of each long side of the block having a semi-circle along an exterior surface.

5,087,151

DRAINAGE SYSTEM

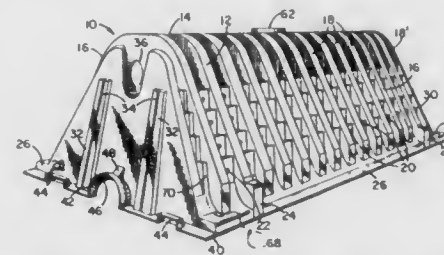
Robert J. DiTullio, 38 Hidden Brook Dr., Brookfield, Conn. 06804

Continuation of Ser. No. 304,329, Jan. 30, 1989, abandoned. This application Apr. 23, 1990, Ser. No. 513,031

Int. Cl.⁵ E02B 13/00

U.S. Cl. 405—43

16 Claims



1. A drain field gallery for guiding liquid through a drain field and allowing liquid to seep into adjoining ground comprising:

A. an elongated main body portion having an arch-shaped configuration thereby creating an enlarged enclosure;

B. at least one end wall covering one end of said elongated main body portion, said at least one end wall having an opening therethrough dimensionally sized to accept a perforated drainpipe for transporting the liquid to said gallery; and

C. a latching system associated with said at least one end wall for attaching said gallery to an adjoining gallery in an end-to-end relationship, said latching system including a flange on said at least one end wall, said flange being dimensionally sized to mate with an associated flange on an end wall of an adjoining gallery, and said flange is located at the lower terminal edge of said at least one end wall.

5,087,152

BOOM FOR CONTAINING OIL SPILLS AND METHODS OF DEPLOYING AND RETRIEVING SAME

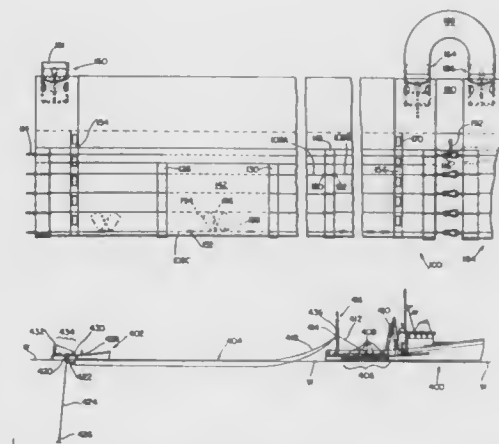
Malcolm B. Whidden, P.O. Box 280, South Harpswell, Me. 04079

Filed Aug. 23, 1990, Ser. No. 571,148

Int. Cl.⁵ E02B 15/06

U.S. Cl. 405—68

10 Claims



1. A method of deploying a boom for containing a spill of oil

or other substance on the surface of water, comprising the steps of:

partially unrolling a portion of a first boom section from a first reel aboard a carrier vessel;

attaching a first end of the boom section to a tender vessel; causing relative motion of the tender vessel and the carrier vessel to further unroll the first boom section;

partially inflating one or more inflatable chambers within the first boom section through one or more corresponding valve assemblies disposed near the first end of the boom section as the boom section is deployed through relative motion of the carrier vessel and the tender vessel;

substantially stopping relative motion of the tender vessel and the carrier vessel as the unwinding of the second end of the first boom section approaches;

partially unwinding a second boom section from a second reel aboard the carrier;

attaching the second end of the first boom section to a first end of the second boom section; and

completing the inflation of inflatable chambers of the first boom section.

5,087,153

INTERNALLY SPIRALED DUCT AND METHOD OF INSTALLATION

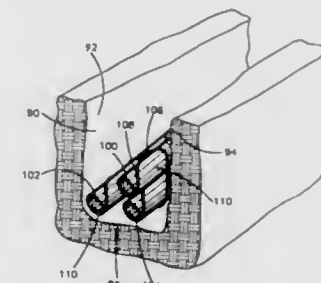
Robert B. Washburn, Cleveland, Ohio, assignor to Arco Corporation, Elyria, Ohio

Filed Aug. 23, 1989, Ser. No. 397,740

Int. Cl.⁵ F32L 51/00

U.S. Cl. 405—154

33 Claims



1. A duct for longitudinal transmission of fiber optic and other cable comprising:

a polymeric tubing having an inner wall and an outer wall; spiral ribs having peaks with tops and valleys between the peaks along the inner wall, the valleys adapted to receive lubrication, the tops of the peaks forming substantially the only surface that contacts the cable as it passes longitudinally therethrough, the tops of the peaks forming an opening large enough so that the cable passing through it cannot touch the tops of the peaks at two points 180° apart at a given distance along the length of the duct, the tops of the peaks having low friction and a small surface area relative to the surface area of the valleys over which the cable may travel longitudinally at reduced friction and with reduced damage to the cable, whereby the cable is able to be pulled through the duct in long expanses without damage.

5,087,154

COATINGS AND PROCESS AFFORDING CORROSION PROTECTION FOR MARINE STRUCTURES

David W. Crawford, Houston, Tex., assignor to MPT Services, Inc., Houston, Tex.

Filed Sep. 17, 1990, Ser. No. 583,282

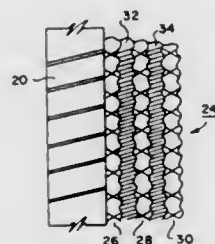
Int. Cl.⁵ E02D 5/60, 31/06

U.S. Cl. 405—216

21 Claims

1. A protective coating on a corrosion susceptible item adapted for use in a marine environment comprising at least two uninterrupted encapsulating and superposed layers of a

marine resistant epoxy composition applied onto a select surface portion of the item and a thin layer of reinforcing composition extendign contiguously intervening between the superposed of said epoxy layers.



sition extendign contiguously intervening between the superposed of said epoxy layers.

5,087,155

APPARATUS FOR INTRODUCING BULK MATERIALS INTO PNEUMATIC CONVEYING LINE

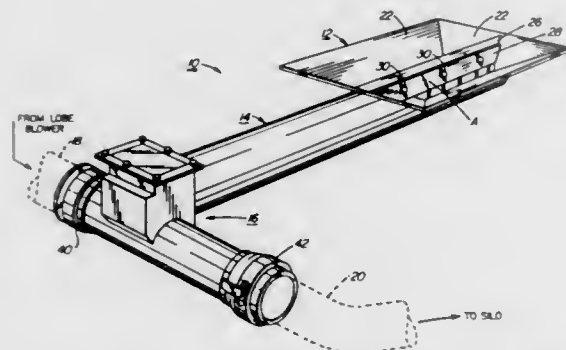
Alvin Herman; Rubien Herman, and Ken Bokor, all of Saskatchewan, Canada, assignors to Blowhard Pneumatic Services Inc., Saskatchewan, Canada

Filed Apr. 25, 1990, Ser. No. 514,757

Int. Cl.⁵ B65G 53/08

U.S. Cl. 406—61

23 Claims



1. Apparatus for introducing fluent bulk material into a pneumatic conveying line, comprising:

- a fluidizing chamber having an air line inlet and an air line outlet for connection to incoming and outgoing air lines respectively;
- a feed tube connected to said fluidizing chamber and having an outlet end disposed within said fluidizing chamber;
- an assembly for effecting movement of the bulk material through said feed tube from a source of supply into the interior of said fluidizing chamber so that the bulk material may, during use, be fluidized by an air flow passing through said fluidizing chamber from said air line to and through said air line outlet and carried therewith out through said air line outlet;
- a gate located at said outlet end of said feed tube within said fluidizing chamber and exposed, in use, to the air flow passing from the air line inlet to and through the air line outlet and responsive to opposing forces exerted thereon by the bulk material moving through said feed tube and the pressure of the air within said fluidizing chamber for permitting flow of the bulk material into said fluidizing chamber through said feed tube and at the same time preventing blow back of air from said fluidizing chamber through said feed tube;
- said air line inlet and said air line outlet being located in substantial alignment with one another along a first axis and wherein said feed tube defines a further axis which is laterally arranged relative to the first axis and is displaced therefrom in such a manner that, during use, bulk material exiting the outlet end of said feed tube falls downwardly

under the influence of gravity and passes into and is fluidized by the air flow passing through said fluidizing chamber along the first axis from said air line inlet to said air line outlet;

- said gate being hinged adjacent its upper edge for movement from a closed position in close contacting relation to the outlet end of the feed tube to and through a range of partially open positions, and wherein
- said fluidizing chamber comprises a gate chamber and an air duct section, said air duct section comprising a tubular section having said air line inlet and said air line outlet disposed at opposing ends thereof, and said gate chamber being secured to said air duct section and having a lower end portion opening into and freely communicating with the interior of the air duct section such that the bulk material falling downwardly by gravity from the end of said feed tube pass into a central region of maximum air flow velocity within said air duct section to effect the fluidization of the bulk material.

5,087,156

PRINTED CIRCUIT BOARD BORING MACHINE

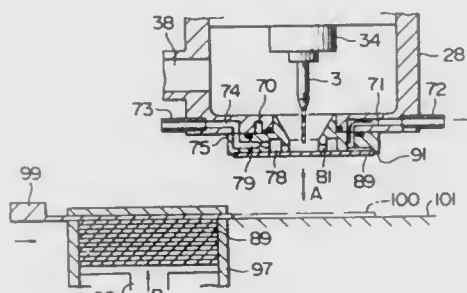
Yasubiko Kanaya, Machida; Tamio Otani, Hadano, and Kunio Arai, Atsugi, all of Japan, assignors to Hitachi Seiko Ltd., Japan

Filed Nov. 30, 1990, Ser. No. 620,020

Int. Cl.⁵ B23B 35/00

U.S. Cl. 408—1 R

11 Claims



1. A printed circuit board boring method, comprising the steps of:

- stacking printed circuit boards on a table;
- pressing the printed circuit boards with a pressure foot;
- supplying a plurality of pieces one by one for detachably mounting a piece on a tip end portion of the pressure foot, which piece is used for depressing the printed circuit boards in place;
- boring the printed circuit boards with a drill; and
- disposing of each used piece removed from the tip end portions of the pressure foot.

5,087,157

ELECTROMAGNETIC BASE DRILL WITH INTERMITTENT FEED

Michihiro Sboji, and Osamu Asano, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,525

Claims priority, application Japan, Jan. 26, 1990, 2-16328

Int. Cl.⁵ B23Q 15/013

U.S. Cl. 408—9

6 Claims

- A drill device comprising: a drill motor for driving a drill; a feed motor for feeding said drill motor and said drill towards a workpiece; an electromagnetic base including an electromagnet for attaching said drill device to said workpiece; an oscillator for repeatedly generating outputs of "H" and "L" in a preset period; energization controlling means for intermittently energizing

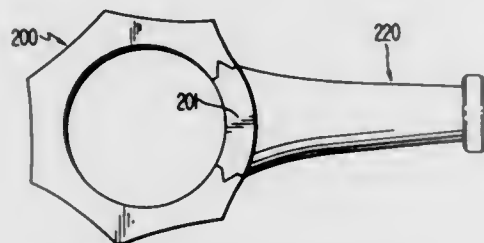
5,087,161

SPACED ELASTIC RING PRODUCT

Dennis R. Gunn, Tashiro-so east 1st Floor rm. 1 Kamiokichai
2-9-2, Shinjuku-ku Tokyo 161, JapanContinuation of Ser. No. 92,146, Sep. 1, 1987, abandoned. This
application May 20, 1991, Ser. No. 704,735Claims priority, application Japan, Sep. 17, 1986, 61-
141471[U]Int. Cl.³ F16B 37/10

U.S. Cl. 411—433

23 Claims



1. A spaced elastic ring product comprising:
a removable spacer;
a handle formed on said removable spacer for facilitating manual removal of said spacer without rotation thereof; and
an elastic ring means, comprising a gap at a portion thereof for said spacer, for defining a hole of a second larger diameter while said spacer is disposed in said gap and elastically returning toward a condition wherein said hole is of a first smaller diameter when said removable spacer is removed from said gap.

5,087,162

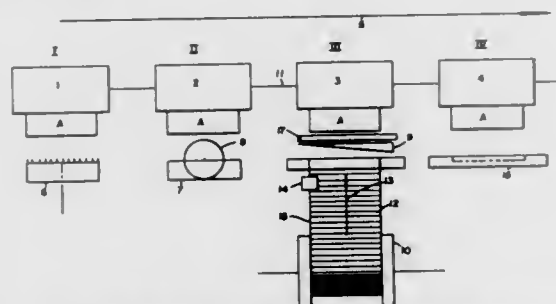
PROCESS FOR BINDING PAMPHLETS AND THE LIKE
Guenter Basler, Darmstadt, Fed. Rep. of Germany, assignor to
Hollmann GmbH, Fed. Rep. of Germany

Filed Jan. 17, 1989, Ser. No. 297,566

Int. Cl.³ B42C 11/00

U.S. Cl. 412—4

18 Claims



1. A process for binding folded sheets using an adhesive binding apparatus which comprises the steps of:
gathering said sheets into a block having a top face, a bottom face and edges forming at least a front face and back face;
placing covers on said top face and said bottom face;
coating the back face of said block and adjacent portions of said top cover and said bottom cover with an adhesive;
taking a pre-printed spine fold exhibiting optically readable control markings from a magazine;
cutting said spine fold;
transporting said spine fold to a bonding station; and
combining said spine fold with said adhesive coated back face, folding said spine fold around said adjacent adhesive coated portions of said covers, and pressing said spine fold onto said adhesive coated back face and said adhesive coated cover portions; said steps of cutting, transporting and combining of said spine fold being performed in ac-

cordance with said pre-printed optically readable control marking.

5,087,163

STITCHING PRESS FOR BOOK BLOCKS

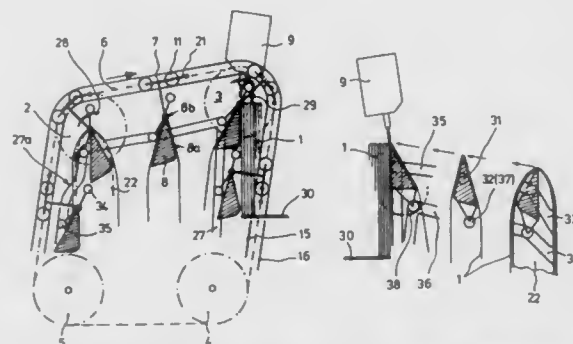
Ulrich Erdberies, Rahden; Gerhard Grannemann, Petershagen, and Horst Rathert, Minden, all of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Filed Oct. 24, 1990, Ser. No. 602,741

Int. Cl.³ B42B 2/02

U.S. Cl. 412—35

20 Claims



1. In apparatus for stitching book block sections together to form book blocks, said apparatus including a book block section feed station and a stitching station, a sewing head being located at the stitching station, the improvement comprising: conveyor means for receiving book block sections at the feed station and transporting said book block sections to the stitching station, said conveyor means comprising an endless conveyor which defines a transport path, said transport path changing direction in the vicinity of the feed station and the stitching station;
plural carriage means coupled to said conveyor means at spaced fixed locations thereof, motion being imparted to said carriage means by said conveyor means to cause said carriage means to move along said transport path;
a saddle means pivotally connected to each of said carriage means, said saddle means receiving book block sections and transporting said book block sections between the feed station and the stitching station, said saddle means each including a book block section engaging saddle;
guide means for controlling the position of said carriages in a pair of mutually orthogonal directions along at least portions of the path of motion thereof as said carrier means is moved by said conveyor means; and
swing control means for controlling the angular position of said saddles relative to said carriage means, said swing control means causing said saddles to swing to a first pivotal position for intercepting a book block section at the feed station and to swing to a second pivotal position for stitching of the book block section at the sewing station.

5,087,164

APPARATUS FOR STORING ROLL MATERIALS

Kenichi Mukaimoto, Fukui, Japan, assignor to Maeda Kogyo Kabushiki Kaisha, Japan

Filed Mar. 20, 1990, Ser. No. 495,986

Claims priority, application Japan, Mar. 20, 1989, 1-69000

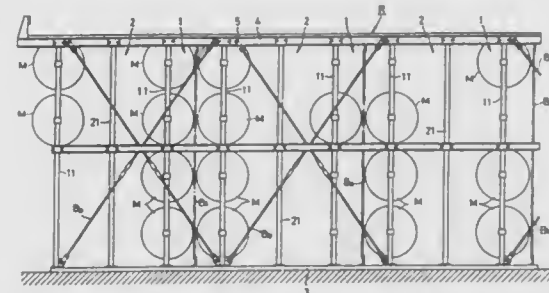
Int. Cl.³ B65G 1/04

U.S. Cl. 414—282

19 Claims

1. An apparatus for storing a plurality of rolls, each having two opposite axial core ends, comprising:
a frame having a top, a base and two opposite sides and forming a plurality of stock spaces extending transversely between the two opposite sides of the frame, each stock space having an adjacent elevating passage;

storing means disposed in each stock space for storing a plurality of rolls in a vertically stacked, horizontally oriented disposition, each roll having a longitudinal axis which is disposed transversely between the two opposite sides of the frame;
a rail disposed along the top of the frame and being substantially perpendicular to the roll axes;
a pickup flatcar running on the rail;
carrier means operatively connected to the pickup flatcar



and being movable up and down the elevating passages to pick-up and store rolls individually in the stock spaces, wherein the frame includes a plurality of vertical support pillars, and the storing means comprises plural pairs of storing brackets connected to the support pillars at spaced intervals, each pair of storing brackets receiving the two opposite axial core ends of a roll, and wherein the frame further includes a plurality of pairs of guide pillars, each pair being disposed in line with the support pillars centrally in each elevating space.

5,087,165

GOLF BALL RETRIEVER

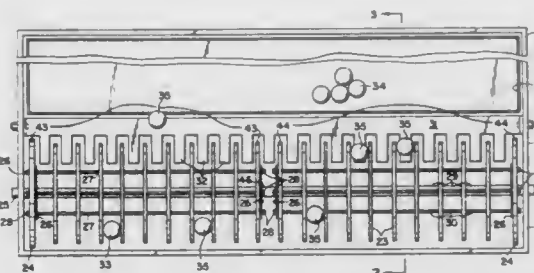
Fred A. Akel, 55 S. Roscoe Blvd., Ponte Vedra Beach, Fla. 32082

Filed Jun. 6, 1990, Ser. No. 533,927

Int. Cl.³ B60P 1/00

U.S. Cl. 414—440

20 Claims



1. A golf ball retrieving apparatus comprising a frame supported by an elongated axle and two ground engaging wheels mounted on opposite end portions of said axle and having a space therebetween, a plurality of spaced generally rigid disc members mounted on said axle between and laterally spaced inwardly from and filling the space between said wheels, said disc members having a diameter less than the diameter of said wheels thereby spacing the outer edges of said disc members upwardly from the ground so that said outer edges do not engage the ground, a plurality of spaced, stationary elongated fingers having fixed ends connected to said frame and opposite free ends extending inwardly in the spaces between adjacent disc members with said fixed ends forward of said disc members and said free ends between said disc members, and basket means located forward of said disc members adapted to catch balls stripped from between adjacent disc members by said fingers, said disc members being arranged in two substantially identical sections each with a respective said wheel, each of

said identical sections being freely rotatable about said axle with a substantially equal number of disc members in each said section, tie rod means connecting said disc members of respective said identical section to cause all said disc members on said section to rotate together with its said wheel around said axle independent of the rotation of another said section with its said wheel around said axle.

5,087,166

HANDLING VEHICLE FOR PRINTED PRODUCT REELS

Werner Honegger, Tan Ruti, Switzerland, assignor to SFT AG Spontanfördertechnik, Weinfelden, Switzerland

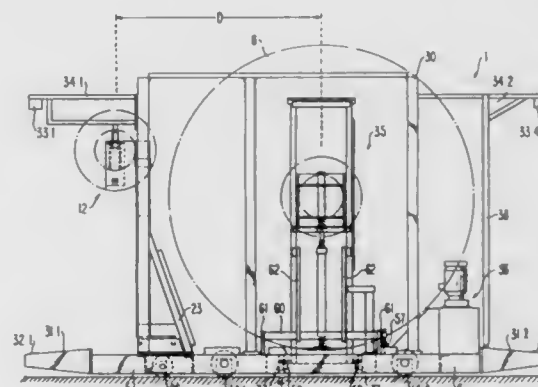
Continuation-in-part of Ser. No. 277,609, Nov. 29, 1988, abandoned. This application Jul. 13, 1990, Ser. No. 552,423

Claims priority, application Switzerland, Nov. 30, 1987, 04713/87

Int. Cl.³ B65G 74/94; B66F 9/18

U.S. Cl. 414—458

12 Claims



1. A handling vehicle for transferring empty and full printed product reels from an external source comprising the combination of

a generally U-shaped frame having end portions, a central, substantially open region defined within said U-shaped frame and a longitudinal central axis;
rolling means for movably supporting said frame for movement in a longitudinal direction parallel with said axis along a support surface;
a working module (35) including support means (4) for supporting a printed product reel;
track means on said frame for supporting said module and moving said module horizontally perpendicularly to said longitudinal direction between a first position in which said module is in said central region of said frame and a second position in which said module is extended laterally of said frame so that said support means can engage, lift, and support a full printed product reel a predetermined lateral distance from a side of said frame;
a gripping arm separate from said module, pivotally mounted on said frame longitudinally spaced from said module and said track means, and
extending means for extending said gripping arm laterally of said frame so that said arm can engage, lift, and support an empty printed product reel a lateral distance from said side of said frame substantially equal to said predetermined lateral distance.

5,087,167

LIFTING SHOE ASSEMBLY FOR USE ON SHEET LIFTERS

Richard H. Johnston, Harrison Township, Allegheny County, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

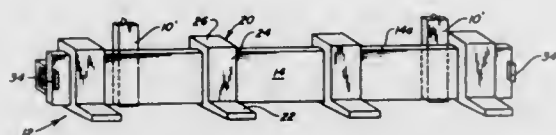
Continuation of Ser. No. 356,737, May 25, 1989, abandoned.

This application Oct. 9, 1990, Ser. No. 571,001

Int. Cl.⁵ B60P 1/50

U.S. Cl. 414-668

3 Claims



1. A material lifting apparatus adapted to be suspended from a hoist means, said apparatus including, in combination: first and second opposed support means positionable on opposite sides of said material for lifting and suspending said material from said hoist means, each said support means including leg means for attachment to said hoist means and a substantially horizontally extending plate secured to said leg means, said plate having substantially vertical front and rear surfaces, upper and lower substantially horizontal edge surfaces and first and second opposite ends; a plurality of lifting shoes suspended by the plate of each of said first and second support means; means for permitting lateral adjustment of each of said lifting shoes relative to said plate, said means for permitting lateral adjustment including a substantially horizontal surface formed on each of said lifting shoes for permitting lateral sliding of each of said shoes along said upper horizontal edge surface of said plate and a means for locking each of said shoes in desired positions along the plate; and reinforcement means comprising a "U" shaped channel member extending laterally across the rear surface of each said plate and welded through for preventing twisting of the plate under loaded conditions thereof.

5,087,168

TILTING DEVICE FOR BACKHOE

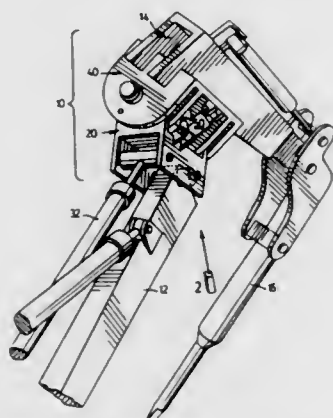
James R. McKinnon, Oberlin; Dennis J. Cogan, Strongsville, both of Ohio, and Joseph J. Riccardi, Bristol, Wis., assignors to Versa-Hoe Sales & Leasing Inc., Cleveland, Ohio

Filed Sep. 6, 1990, Ser. No. 578,260

Int. Cl.⁵ E02F 3/32

U.S. Cl. 414-687

10 Claims



1. A device for tiltable interconnecting a boom section and a dipper section of a backhoe,

said boom section adapted to be attached to a support structure, said device enabling pivotal movement of said dipper section relative to said boom section about first and second non parallel pivotal axes, said device comprising: a first member having mounting means for pivotally mounting said first member to said boom section to be rotatable about said first pivotal axis said first pivotal axis extending generally transverse to said boom section, connecting means on said first member for connecting said first member to a crowd cylinder for pivoting said first member about said first pivotal axis; a second member attachable to said dipper section; two sets of coupling brackets extending between said first and second members for pivotally coupling said first and second members to permit relative pivotal movement about said second pivotal axis, each set comprising a first coupling bracket attached to said first member and a second coupling bracket attached to said second member; and a pair of fluid cylinders acting through an opening defined between said first and second members and between said sets of brackets, to tilt said first and second members relative to each other about said second axis.

5,087,169

PALLETIZING ROBOT

Axel B. Tübke, Berlin, Fed. Rep. of Germany, assignor to System GmbH, Düsseldorf, Fed. Rep. of Germany

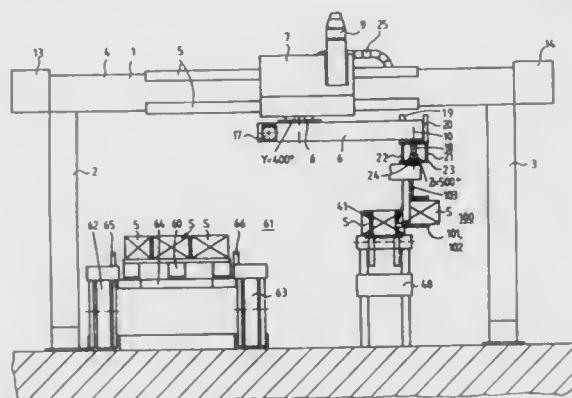
Filed Dec. 28, 1989, Ser. No. 456,690

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1988, 3844502

Int. Cl.⁵ B65G 57/03

U.S. Cl. 414-792.9

10 Claims



1. A palletizing robot for moving stacked objects, comprising: a substantially horizontal transverse member; a track means disposed on and extending along said transverse member; a support bearing means slidably disposed on said track means; an arm having first and second ends, said first end being rotatably attached to said bearing means for rotation about a substantially vertical axis, and said second end being vertically spaced below said transverse member; a gripping device for grasping stacked objects; said gripping device being pivotally attached to said second end of said arm for rotation about a substantially vertical axis; a guide means extending vertically downwardly from said second end of said arm for guiding said gripping device for vertical displacement thereon towards and away from said second end; and means for vertically displacing said gripping device on said guide means by a predetermined amount.

5,087,170

ROTARY COMPRESSOR

Hirokazu Kousokabe, Ibaraki; Hiroshi Iwata, Odawara, and Masahiro Takebayashi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

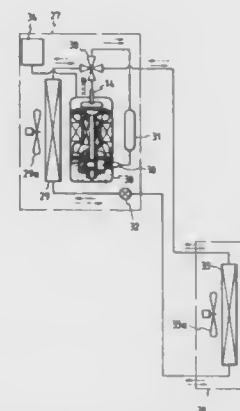
Filed Jan. 11, 1990, Ser. No. 463,556

Claims priority, application Japan, Jan. 23, 1989, 1-12000

Int. Cl.⁵ F01D 25/00; F01M 1/00

U.S. Cl. 415-110

39 Claims



1. A rotary compressor comprising a variable speed motor, a compression mechanism driven by said variable speed motor via a rotary shaft, and a plurality of bearings sandwiching said compression mechanism and rotatably supporting said rotary shaft, the improvement comprising: another bearing rotatably supporting one end of said rotary shaft adjacent to said variable speed motor; oil separation means located outwardly of said bearing for separating oil from gas compressed by said compression mechanism; and oil collection means for collecting said oil as separated by said oil separation means, said another bearing being lubricated by the oil collected in said oil collection means.

5,087,171

PAPER PULP CENTRIFUGAL PUMP WITH GAS SEPARATION

Joseph B. Dosch, Auburn; Charles A. Cappellino, Seneca Falls; George Wilson, Skaneateles, and James C. Osborne, Seneca Falls, all of N.Y., assignors to Goulds Pumps, Incorporated, Seneca Falls, N.Y.

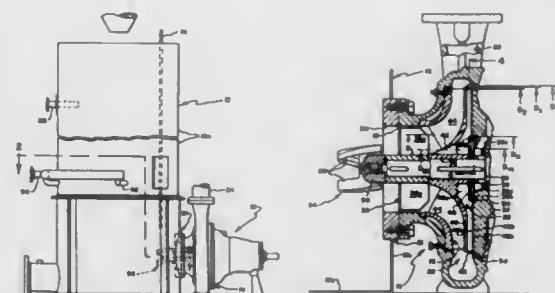
Continuation-in-part of Ser. No. 384,787, Jul. 25, 1989, Pat. No. 4,936,744. This application Jun. 15, 1990, Ser. No. 538,849

The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.

Int. Cl.⁵ F03B 11/04; F04D 1/10

U.S. Cl. 415-169.1

16 Claims



1. A centrifugal pump installation for handling a fibrous suspension having a gas content to be pumped from a reservoir containing such suspension, said reservoir including a bottom wall, a side wall upstanding relative to said bottom wall and discharge means bounding a discharge opening extending through said side wall for discharging said suspension from

within said reservoir, said pump installation comprising in combination:

- a centrifugal pump housing defining a pumping chamber bounded in part by a rear wall, a suction inlet disposed in axial alignment with said discharge opening and cooperating therewith for placing said reservoir in flow communication with said pumping chamber and a discharge outlet disposed in radial flow communication with said pumping chamber and connected to a discharge conduit;
- a drive shaft means passing through a drive shaft receiving opening in said rear wall, said pumping chamber, said suction inlet and said discharge means and projecting into said reservoir;
- rotor means supported for rotation by said drive shaft means wholly within said reservoir and arranged for cooperation with said bottom wall for fluidizing said suspension within said reservoir adjacent said discharge opening, rotation of rotor means tending to centrifugally separate gas from said suspension for collection in a core area disposed concentrically of said drive shaft means;
- an impeller supported for rotation within said pumping chamber by said drive shaft means, said impeller including a hub supported by said drive shaft means, an impeller shroud extending radially from said hub and having front and rear surfaces facing towards said suction inlet and rear wall, respectively, pumping vanes carried by said front surface for pumping said suspension between said suction inlet and said discharge outlet, pump-out vanes carried by said rear surface, a repeller shroud extending radially from said hub and disposed in a spaced facing relationship to said rear surface, said repeller shroud cooperating with said impeller shroud and said pump-out vanes for defining radially extending flow paths, and flow openings having front ends arranged for communication with said core area and rear ends disposed in flow communication with said flow paths; and
- gas removal means for withdrawing gas tending to collect within said pumping chamber outwardly of said drive shaft means between said rear wall and said repeller shroud, wherein said repeller shroud, said pump-out vanes, said flow openings, said impeller shroud and said pumping vanes having outer diameters of D_R , D_{PO2} , D_{BH} , D_S and D_2 , respectively, D_R is equal to or greater than D_{BH} and less than D_{PO2} , D_S and D_2 , and D_{PO2} and D_S are equal to or greater than D_2 .

5,087,172

COMPRESSOR CARTRIDGE SEAL METHOD

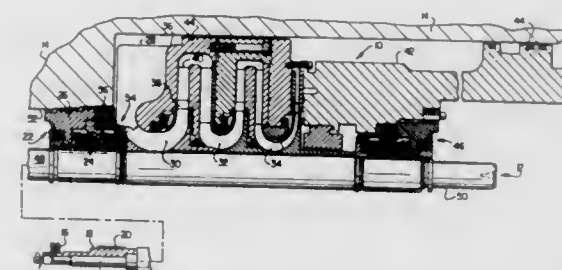
James Ferri, Easton, Pa., and Norman A. Samurin, Allegany, N.Y., assignors to Dresser-Rand Company, A General Partnership, Corning, N.Y.

Division of Ser. No. 310,242, Feb. 13, 1989, Pat. No. 4,961,260. This application Oct. 5, 1990, Ser. No. 593,087

Int. Cl.⁵ F04D 29/10

U.S. Cl. 415-230

15 Claims



1. A fluid seal for use with a compressor of the type having a rotating bundle shaft and a stationary bundle part, comprising:

an inner annular seal part fixed to said bundle shaft and rotatable therewith;
 an outer annular seal part rotatable with respect to said inner annular seal part and insertable into an opening in a compressor housing wall;
 a plurality of elastomeric seal rings encircling said outer annular seal part, and being compressible between said outer annular seal part and the compressor housing wall opening to provide a fluid seal; and
 an irregularity formed at an end face of said outer annular seal part for engagement with other stationary compressor apparatus to prevent rotation of said outer annular seal part.

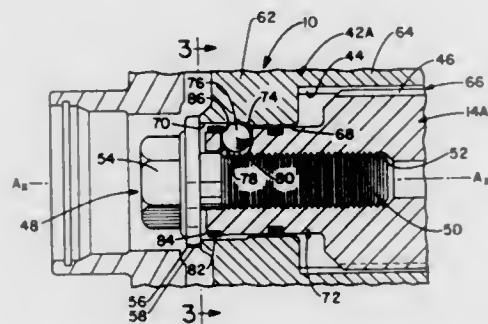
5,087,173

SEATING AND ALIGNMENT DETECTING DEVICE
 Anthony R. Uliana, Brownsburg, and Joel E. Mowatt, Zionsville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1990, Ser. No. 580,992
 Int. Cl.⁵ B63H 1/20

U.S. Cl. 416—204 A

8 Claims



1. A structural arrangement for detecting improper positioning between a hub member mounted concentrically about the exterior of a shaft, said arrangement comprising: an axially oriented bore extending within the shaft to receive a fastening means by which the hub member may be secured to the shaft; a blocking bore extending radially of the shaft to communicate between said axially oriented bore and the exterior of the shaft; a blocking member received within said blocking bore and being movable radially therein; cam flange means provided on the interior of the hub member and presenting a blocking surface and a releasing surface on the radially inner extent thereof; said blocking surface being disposed radially of said blocking bore when the hub member is improperly positioned with respect to the shaft and said releasing surface being disposed radially of said blocking bore when the hub member is properly disposed with respect to the shaft; said blocking member having a radial dimension such that said blocking member will be forced to extend within said axially oriented bore so long as the blocking surface is radially opposed to said blocking bore in order to preclude the fastening means from being secured within the said axially oriented bore and yet said blocking member will retract to clear said axially oriented bore when said releasing surface is radially opposed to said blocking bore in order to permit the fastening means to enter said axially oriented bore.

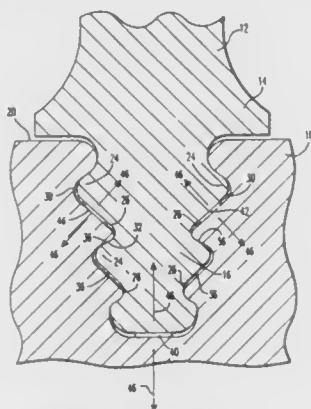
5,087,174
TEMPERATURE ACTIVATED EXPANDING MINERAL SHIM

Robert E. Shannon, Penn Township, Westmoreland County, and William G. Clark, Jr., Murrysburg Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 22, 1990, Ser. No. 468,345
 Int. Cl.⁵ F01D 5/30

U.S. Cl. 416—220 R

22 Claims



1. A turbine apparatus comprising:
 a rotor having an outer peripheral surface provided with a cavity, said cavity having a surface;
 a blade having a blade root extending within said cavity, said blade root having a surface; and
 a thermally expandable mineral silicate material provided between the surface of said blade root and the surface of said cavity, said thermally expandable material being thermally expandable to assume a permanently expanded state.

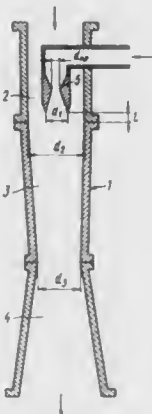
5,087,175
GAS-JET EJECTOR

Isak A. Raizman, ulitsa Razmatullina, 4/7, kv. 52, and Valery A. Pirogov, ulitsa R. Zorge, 105, kv. 81, both of Kazan, U.S.S.R.
 PCT No. PCT/SU89/00068, § 371 Date Dec. 27, 1990, § 102(e)
 Date Dec. 27, 1990, PCT Pub. No. WO90/11450, PCT Pub. Date Oct. 4, 1990

PCT Filed Mar. 17, 1989, Ser. No. 623,882
 Int. Cl.⁵ F04F 5/44

U.S. Cl. 417—196

1 Claim



1. A gas-jet ejector, comprising:
 an inlet chamber adapted for connection to a space to be evacuated;
 a Laval nozzle having a critical section and an outlet section, the Laval nozzle being contained and aligned within the inlet chamber and communicating with the surroundings;

a mixing chamber having an inlet section and an outlet section; and
 a diffuser adapted for connection to a vacuum pump, the inlet chamber, mixing chamber and diffuser being series-arranged in a direction coinciding with a direction of gas flow and in alignment with each other inside a housing, a relationship between a diameter (d_{kp}) of the critical section of the Laval nozzle and diameters (d_1 , d_2) of the inlet section and the outlet section of the mixing chamber and a distance l from the outlet section of the Laval nozzle and the inlet section of the mixing chamber being as follows:

$$\begin{aligned} d_1 &= 1.8-2.7 d_{kp} \\ d_2 &= 2.8-5.2 d_{kp} \\ d_3 &= 2.5-4.5 d_{kp} \\ l &= 2.5-4.5 d_{kp} \end{aligned}$$

wherein

d_1 = the diameter of the outlet section of the Laval nozzle;
 d_2 = the diameter of the inlet section of the mixing chamber;
 d_3 = the diameter of the outlet section of the mixing chamber;
 d_{kp} = the diameter of the critical section of the Laval nozzle; and
 l = the distance from the outlet section of the Laval nozzle to the inlet section of the mixing chamber.

5,087,177

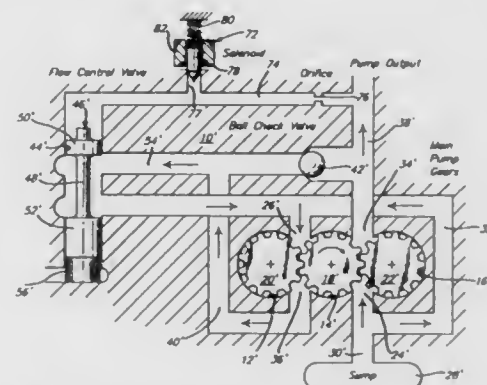
DUAL CAPACITY FLUID PUMP

William J. Haley, Ithaca, and Glenn E. Swanson, Lansing, both of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 429,595, Oct. 31, 1989, abandoned. This application Sep. 27, 1990, Ser. No. 589,045
 Int. Cl.⁵ F04B 49/08

U.S. Cl. 417—426

8 Claims



1. A dual capacity fluid pump comprising:
 first and second pairs of positive displacement pumping elements adapted for operation throughout a range of speeds;
 each of said pairs having a fluid inlet port and a fluid outlet port, the outlet port for said first pair communicating with a flow delivery passage for the pump;
 one-way flow valve means for establishing one-way communication between said outlet ports at low pump speeds whereby flow from the outlet port for said other pair is transferred to said delivery passage;
 flow control valve means for establishing communication at high pump speeds between the inlet port and the outlet port of said other of said pairs of pumping elements and for interrupting said communication at low pump speeds;
 a pump driven speed pressure signal generating means comprising a flow control pump having a fluid outlet port;
 a signal passage communicating with said flow control pump outlet port and a control orifice means communicating with said signal passage for developing a speed pressure in said signal passage;
 said flow control valve means communicating with said signal passage for establishing said communication between the inlet port and the outlet port of said other pair of pumping elements in response to an increase in said speed pressure signal.

5,087,178

OIL FLOODED SCREW COMPRESSOR SYSTEM WITH MOISTURE SEPARATION AND HEATED AIR DRYER REGENERATION, AND METHOD

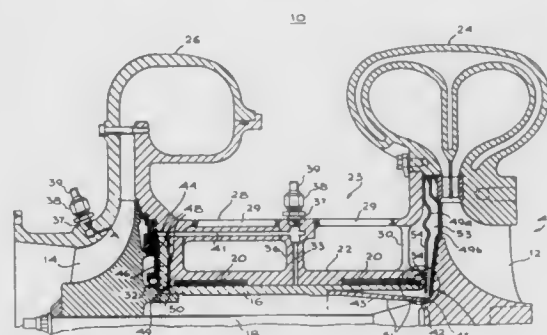
Lyle G. Wells, Milwaukie, Oreg., assignor to Rogers Machinery Company, Inc., Portland, Oreg.

Continuation of Ser. No. 460,733, Jan. 4, 1990, abandoned. This application Sep. 24, 1991, Ser. No. 765,451
 Int. Cl.⁵ F04C 29/04; B01D 53/04

U.S. Cl. 418—1

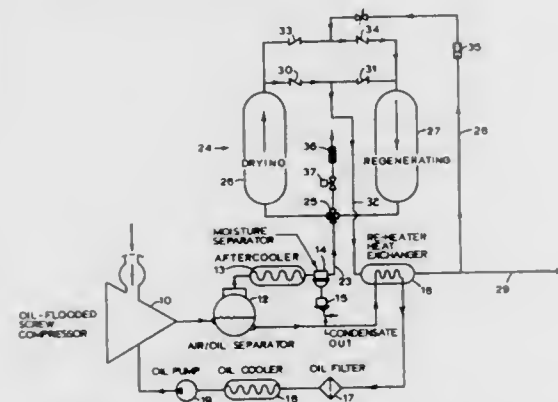
7 Claims

1. An air compressor system comprising:
 an oil flooded screw compressor having an air inlet and an air and oil outlet for compressing air whereby the oil is heated,
 air-oil separator means having an inlet connected to the air and oil outlet of said compressor and also having an oil outlet and an air outlet for separating oil from the compressed air,
 aftercooler means having an outlet and an inlet connected to



1. Apparatus for protecting turbomachinery bearings against excessive heat comprising:
 a pliant foil bearing having a plurality of foils extending about a rotatable shaft;
 a hollow shaft mounted to rotate within the pliant foil bearing and being coupled to a turbine wheel, at least a portion of the hollow shaft comprising a bearing journal;
 axial tie bolt means for coupling the shaft and wheel together in driving relationship at an end of the hollow shaft remote from the wheel, the end of the shaft adjacent the wheel being spatially separated therefrom;
 means for recirculating a gas through the hollow shaft to dissipate heat generated within the bearing; and
 thermal barrier means including an elongated intermediate shaft for isolating the hollow shaft from the hot turbine wheel both during operation and after turbine shutdown.

the air outlet of said separator means for cooling the compressed air,
 moisture separator means having an outlet and an inlet connected to the outlet of said aftercooler means for removing moisture from the compressed air that has been cooled,
 a drying and regenerating tower having an outlet and an inlet connected to the outlet of said moisture separator means and being arranged to dry the air to substantially a moisture free condition,



reheater heat exchange means connected to the outlet of said drying and regenerating tower and to the outlet of said oil outlet of said air-oil separating means whereby to reheat the dry air and cool the heated oil,
 pump means for pumping oil from said separator means through the reheater heat exchanger to the compressor, said reheater heat exchanger means having an outlet of heated, dry air for compressed use,
 and means communicating with the outlet of said reheater heat exchanger means supplying dry heated air as purge air to said drying and regenerating tower.

5,087,179

FILTER ATTACHMENT FOR GEAR PUMP

Sachio Nyui, Tamotu Nakamura, and Junzo Kawakami, all of Saitama, Japan, assignors to Kabushiki Kaisha Showa Seisakusho, Japan

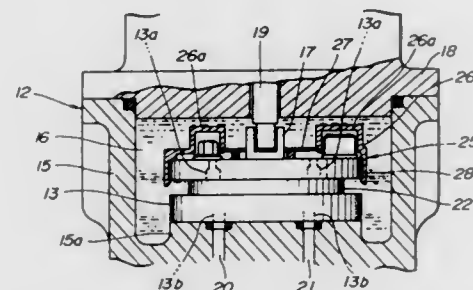
Filed Apr. 6, 1990, Ser. No. 505,497

Claims priority, application Japan, Apr. 17, 1989, 1-44707[U]

Int. Cl.⁵ F04C 2/18, 15/00; B01D 35/30

U.S. Cl. 418-47

5 Claims



1. A filter unit for installing a filter on a gear pump having an outside diameter projections on a surface, comprising:
 a filter for filtering working oil to be introduced into the gear pump; and
 a filter holder for holding said filter in place, including:
 a frame having a plurality of openings and hollow protuberances accommodating the projections of the gear pump out of interference therewith, whereby said filter holder has a configuration substantially complementary to the

shape of said projections and said surface of the gear pump, and
 a rim integral to said frame and having an inside diameter which is substantially the same as the outside diameter of the gear pump, said rim having locking fingers engageable in a recess defined in the gear pump said filter holder being detachably mounted on said gear pump with said locking fingers engaging in said recess.

5,087,180

FLUID MOTOR HAVING REDUCED LUBRICATION REQUIREMENT

John M. Clapp, Sayre, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

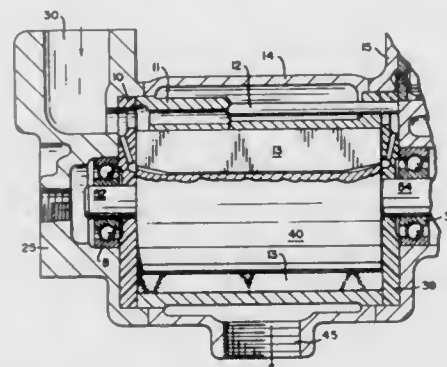
Continuation of Ser. No. 511,111, Apr. 19, 1990, abandoned.

This application Jul. 15, 1991, Ser. No. 733,054

Int. Cl.⁵ F04C 2/344

U.S. Cl. 418-152

11 Claims



1. A fluid powered vane motor, for operation with a reduced amount of externally supplied lubrication, comprising:
 a cylinder having longitudinal cylindrical bore;
 a soft metal coating applied to the surface of said longitudinal bore;
 a rotor rotatably eccentrically supported within said cylinder on bearing means and having a plurality of axially oriented radial slots;
 a plurality of fiber reinforced polymeric vanes slidably disposed in said radial slots;
 stationary porous metal end plates impregnated with a lubricant and abutting both ends of said cylinder bore, said rotor, and said vanes; and
 means for supplying and exhausting motive fluid.

5,087,181

SLIDING STRUCTURE SUCH AS COMPRESSOR OR THE LIKE

Yasuo Kamitsuma, Mito; Isao Ishi, Taga; Yusaku Nakagawa, Hitachi; Noriyuki Ohnaka, Katsuta; Tadashi Iizuka, Ashikaga, and Kazushi Fukuda, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 489,191

Claims priority, application Japan, Mar. 6, 1989, 1-052110

The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.

Int. Cl.⁵ F04C 15/00, 29/00; C04B 35/00

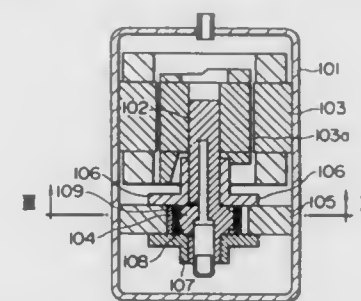
U.S. Cl. 418-178

27 Claims

1. A sliding structure comprising a member made of an iron base material and another member having a porous ceramic layer slidably contacted with said iron base member, said iron

base member being provided on the surface portion thereof opposed to said another member with a porous oxide film

casing against deformation in the support of bearings at the high pressure end of said screw.



containing tri-iron tetroxide as a main constituent, and an oxynitride layer formed under said oxide film.

5,087,182

CASING CONSTRUCTION FOR SCREW COMPRESSION/EXPANSION MACHINES

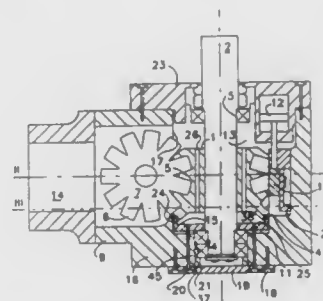
Bernard Zimmern, 302 Strawberry Hill Ave., Norwalk, Conn. 06851, and Jean L. Plcouet, Bridgeport, Conn., assignors to Bernard Zimmern, Norwalk, Conn.

Continuation of Ser. No. 431,592, Sep. 12, 1989, abandoned. This application Dec. 19, 1990, Ser. No. 629,172

Int. Cl.⁵ F04C 18/20

U.S. Cl. 418-195

2 Claims



1. A machine for the compression or expansion of a fluid comprising a screw having opposite low and high pressure ends, said screw being mountable for rotation about an axis and provided with multiple threads, the crests of said threads being disposed on a cylinder concentric with said axis and so arranged as to cooperate in substantially fluid-tight manner with a stationary casing having a cylindrical screw receiving bore to surround said screw at least to a partial extent, at least one pinion having teeth disposed for meshing engagement with said threads and rotatable about an axis which is transverse with respect to said axis of rotation of said screw, at least one low pressure port located near the low pressure end of said screw, a high pressure port located near the opposite high pressure end of said screw in the immediate vicinity of said pinion, said screw being carried by a shaft supported by two sets of bearings respectively disposed on each end of the screw, the low pressure end of the screw receiving bore being of a diameter at least equal to the diameter of said screw for introduction of said screw into said screw receiving bore during assembly of said screw and casing and characterized in that said casing comprises a one-piece, monolithic screw enclosing portion, the material of said screw enclosing portion extending radially inward past the high pressure end of said screw receiving bore to define a hoop portion having an internal hoop bore open at one end to the casing exterior and at the other end to said screw receiving bore, the diameter of said hoop bore being substantially smaller than the diameter of said screw receiving bore, said hoop portion thereby reinforcing the rigidity of the

5,087,183

ROTARY VANE MACHINE WITH SIMPLIFIED ANTI-FRICTION POSITIVE BI-AXIAL VANE MOTION CONTROL

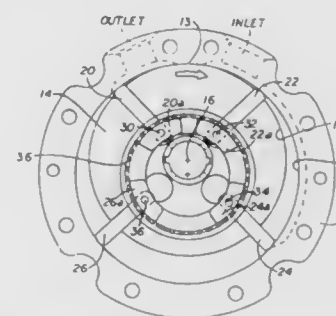
Thomas C. Edwards, 1426 Gleneagles Way, Rockledge, Fla. 32955

Filed Jun. 7, 1990, Ser. No. 534,542

Int. Cl.⁵ F04C 2/344

U.S. Cl. 418-265

26 Claims



1. A non-contact vane type displacement machine comprising a casing having around its interior a conjugate internal conforming profile, said casing being arranged between two opposing endplates, each endplate containing in its interior a circular annulus, said annuli being of substantially matching configuration, the center of each annulus being coincident with the geometric center of said conjugate internal conforming casing profile, a rotor supported by said endplates and mounted for rotation within said interior of said casing in a matching eccentric relationship with said conjugate internal conforming profile, said rotor having ends operationally disposed in a close fitting relationship with said opposing endplates, said rotor being equipped with at least one substantially radially disposed slot, a substantially rectangular vane being contained in each slot and having an accurately configured tip maintained in an exceedingly close but non-contact relationship with said conjugate internal conforming profile, each end of each vane being equipped with a pivotally-mounted tether at a location comparatively remote from said vane tip, each vane tether having inner and outer peripheries, anti-friction rollers operatively disposed at least one interface of each annulus and the respective vane tethers such that at least a portion of each of said tethers directly engages said anti-friction rollers, the annulus in each of said end-plates thus configured as an effective guide for said anti-friction rollers and the respective tethers of said vanes and, therefore, for the tips of said vanes, said vane tips thus being caused to remain in an exceedingly close yet substantially frictionless relationship with said conjugate internal conforming profile.

5,087,184

OPTICAL-DISK MANUFACTURING DEVICE

Hidetoshi Watanabe, Tokyo; Hirotsugu Suzuki, Chiba, and Masanobu Yamamoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 519,398, May 4, 1990. This application Mar. 22, 1991, Ser. No. 673,393

Claims priority, application Japan, May 15, 1989, 1-121073; May 17, 1989, 1-123680

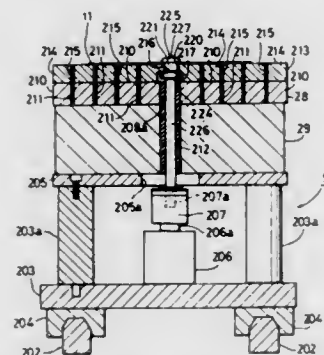
Int. Cl.⁵ B29D 17/00

U.S. Cl. 425-3

2 Claims

1. A transfer device in which one side of a transparent disk plate coated with an ultraviolet-set resin is pressed against a stamper and irradiated by ultraviolet rays through the disk plate so as to transfer a pattern provided in the stamper to the

ultraviolet-set resin of the disk plate, the transfer device having a stamper holding device, comprising:
a top plate formed of alternating bars of ferromagnetic material and spacers of low magnetic permeability material; means for holding the stamper firmly against a surface of said top plate and having a pin extending through said top plate;
an electromagnet plate fixed to a table of the transfer device underlying said top plate with said pin extending there-through and being formed of alternating bars of ferromag-

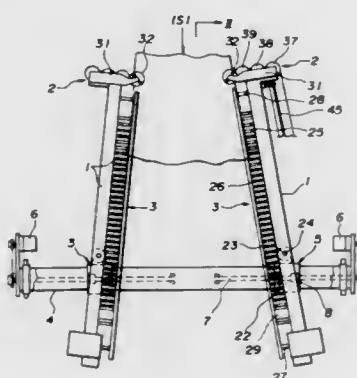


netic material and low magnetic permeability material, said bars and spacers of said electromagnet plate being aligned with said bars and spacers of said top plate, said electromagnet plate being energizable to create an electromagnetic attraction; and
a seizing device affixed to the table of the transfer device for releasably seizing said pin extending through said top plate and said electromagnet plate, whereby upon energization of said electromagnet plate the stamper is magnetically attracted to the top plate and the top plate is magnetically attracted to the electromagnet plate.

5,087,185
APPARATUS FOR TAKING OFF THERMOPLASTIC SYNTHETIC RESIN SHEET
Tooru Yada, Iwata; Hideaki Nakayama, and Hiroyuki Kurita, both of Hamamatsu, all of Japan, assignors to Kyowa Leather Cloth Co., Ltd., Shizuoka, Japan
Filed Sep. 7, 1989, Ser. No. 403,941
Claims priority, application Japan, Sep. 8, 1988, 63-224973
Int. Cl.⁵ B29C 67/20

U.S. Cl. 425—4 C

16 Claims



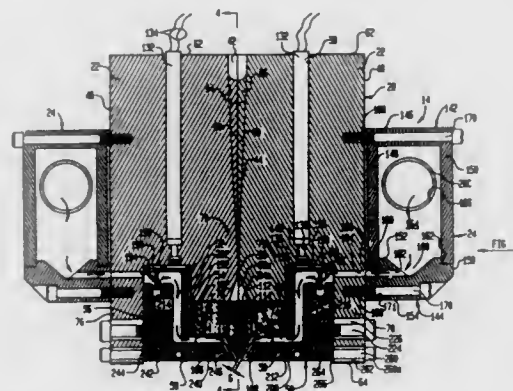
1. An apparatus for continuously taking off a thermoplastic resin sheet foamed by a vertical foaming furnace comprising: a rail fixedly disposed horizontally;
two bodies mounted obliquely at the same angle in a linear symmetrical manner with respect to a vertical line, and moving in parallel along said rail;

a driver for driving said bodies;
two holding roll rows, each row having a plurality of holding rolls disposed in a zigzag manner along a longitudinal direction of each body;
a pair of supports respectively wound on each holding roll row; and
sensors for detecting positions of both lateral ends of the foamed sheet provided at upper ends of said bodies, each sensor having optical fiber sensors electrically connected to said driver.

5,087,186
MELTBLOWING APPARATUS
Peter G. Buehning, Short Hills, N.J., assignor to Accurate Products Co., Hillside, N.J.
Continuation of Ser. No. 124,344, Nov. 20, 1987, Pat. No. 4,818,463, which is a continuation of Ser. No. 856,727, Apr. 26, 1986, abandoned, and a continuation-in-part of Ser. No. 130,359, Nov. 5, 1987, Pat. No. 4,889,476. This application Apr. 3, 1989, Ser. No. 332,889
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.⁵ B29C 47/12

U.S. Cl. 425—72.2

6 Claims



1. A meltblowing die comprising
 - (a) a die body;
 - (b) an elongate die tip mounted on the die body and having
 - (i) a nosepiece of triangular cross section terminating in an elongate apex and (ii) a plurality of orifices formed in the apex of the nosepiece for extruding molten resin there-through to form resin fibers; and
 - (c) means for discharging air along the entire length of the nosepiece onto each side of the resin fibers extruded from the orifices to attenuate the resin fibers in a direction away from said die orifices, said means including
 - (i) a first air chamber positioned on one side of said die body and extending parallel to the die tip; a second air chamber positioned on the opposite side of the die body and extending parallel to the die tip;
 - (ii) a first groove formed in the die body between the die tip and said first air chamber, and a second groove formed in the die body between the die tip and said second air chamber; said first and second grooves extending parallel to the die tip;
 - (iii) a plurality of uniformly spaced air holes extending through portions of the die body from said first and second air chambers to said first and second grooves, respectively;
 - (iv) means within each air chamber for discharging air through the air holes at substantially uniform velocity;
 - (v) air deflector means positioned in each groove to intermix air from the air holes; and
 - (vi) a flow passage from each groove for conducting intermixed air to air outlets on opposite sides of the nosepiece.

5,087,187
APPARATUS FOR MOLDING HOLLOW COMPOSITE ARTICLES HAVING INTERNAL REINFORCEMENT STRUCTURES

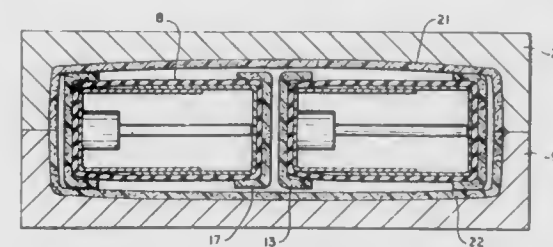
Richard J. Simkulak, Meriden; Terry M. Boustead, West Haven, both of Conn.; Robert L. Folts, St. Charles, Mo., and George N. Sepe, Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 9, 1990, Ser. No. 491,408

Int. Cl.⁵ B29C 43/04

U.S. Cl. 425—112

6 Claims



1. An apparatus for molding a hollow composite article having a plurality of internal webs, using a mold with the contour of the article to be produced and a means to heat said mold and composite, the improvement which comprises:

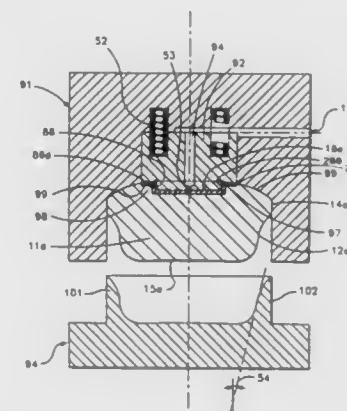
- a plurality of expandable mandrel assemblies, each expandable mandrel assembly having sidewall members at least one of which is slidable, means to effect lateral displacement of said at least one slidable sidewall member, and an inflatable membrane surrounding said sidewall members of each expandable mandrel assembly;
- means to accurately locate the position and insure the straightness of the internal webs;
- means to seal said inflatable membrane of each expandable mandrel assembly to the mold and to adjacent inflatable membranes;
- means to pressurize and inflate said inflatable membranes; and
- means to draw a vacuum between the inner mold surfaces and said inflatable membranes to capture a molded part therebetween.

5,087,188
DIES FOR FORMING SOAP WITH ATTACHED MEMBER

Robert B. Staver, 121 Pepper Dr., Los Altos, Calif. 94022
Continuation of Ser. No. 121,948, Nov. 18, 1987, abandoned, which is a division of Ser. No. 722,826, Apr. 12, 1985, abandoned. This application Oct. 11, 1989, Ser. No. 420,659
Int. Cl.⁵ B29C 43/18; C11D 13/16

U.S. Cl. 425—116

6 Claims



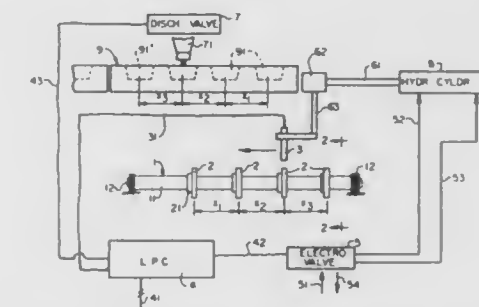
1. An apparatus for producing a body of soap of a size to be grasped and manipulated in a hand, said body having a bottom

surface, a side surface extending upwardly from the bottom surface, a side rim extending outwardly from the side surface and having a side rim surface, and an upper surface with a generally cup-shaped adapter embedded therein, the adapter including a horizontally extending base, a wall extending upwardly from the base, and a flange extending outwardly from an upper end of said wall, said apparatus comprising at least a first die and a second die together defining a cavity for forming said body of soap, the first die including an ejection pin having a ledge adapted to engage against the adapter flange, and an end projecting downwardly from said ledge, said projecting end having a smaller diameter than said ledge to permit said end to project within said adapter against said base, the first die further including an outer die portion having a surface aligned with and extending outwardly from the ledge to form, together with said ledge, the upper soap body surface, and means for moving the pin inwardly relative to the outer die portion to eject a molded soap body therefrom, said second die including an inner side die surface tapering downwardly and inwardly from a diameter generally equal to the outer diameter of the die surface of the outer die portion to a lesser diameter at a bottom surface of said second die for forming the soap body bottom surface, whereby soap material is forced directly upwardly toward the adapter flange thereby securely obturating the flange against the first die.

5,087,189
SYSTEM FOR SYNCHRONIZING THE TRAVEL AND FILLING OF CAVITIES OF A MOLD
Rolando Jeanneret, Vina del Mar, Chile, assignor to Comerial e Industrial Ausonia Ltda., Vina del Mar, Chile
Filed Sep. 14, 1990, Ser. No. 582,064
Claims priority, application Argentina, Jul. 6, 1990, 317,322
Int. Cl.⁵ B29C 31/00

U.S. Cl. 425—145

7 Claims



1. An apparatus for synchronizing the travel and filling of cavities of a mold which is moved along a fixed surface of a forming machine, wherein a cylinder is provided for displacing the mold, comprising:

- a fixed surface;
- means fixedly mounted to said fixed surface and having means for urging at least one mold to move along a path of travel on said fixed surface;
- at least one mold material hopper mounted vertically above said fixed surface for delivering mold material to said at least one mold;
- a bar element having first and second longitudinal ends and a longitudinal axis, said bar element being mounted with respect to said fixed surface so that said longitudinal axis of said bar element is disposed substantially parallel to said path of travel;
- at least two disk elements mounted to said bar element so as to be selectively movable along said longitudinal axis of said bar element;
- a sensor element fixedly coupled to said means for urging so as to move therewith in parallel to and in close proximity to said disks on said bar element;
- control means operatively coupled to said sensor for receiving signals from said sensor.

ing a signal when said sensor is disposed immediately adjacent one of said disks, said control means being operatively coupled to said mean for urging and being operatively coupled to said mold material hopper so as to cease movement of said means for urging and to allow flow of material from said hopper to at least one cavity of said mold when said sensor is aligned with a said disk.

5,087,190

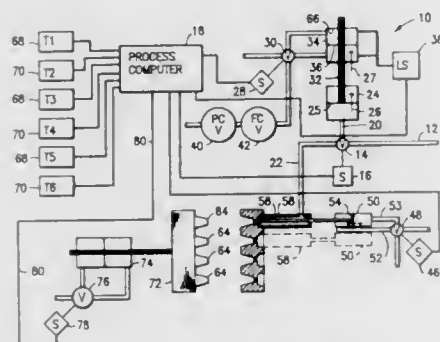
MULTI PLUNGER MOLDING MACHINE FOR LIQUID SILICONE RUBBER

Aldo A. Laghi, 13 Meridian La., Ballston Lake, N.Y. 12019
Filed Dec. 21, 1990, Ser. No. 633,633

Int. Cl.³ B29C 45/80

U.S. Cl. 425—145

14 Claims



1. In a molding machine, comprising:
a mold having a plurality of cavities;
a plurality of nozzle members, there being as many nozzle members as there are cavities;
a plurality of injection plungers, there being as many injection plungers as there are nozzle members;
a plurality of conduit members, there being as many conduit members as there are nozzle members, each conduit member of said plurality of conduit members being disposed in fluid communicating relation between an associated nozzle member and an associated injection plunger;
each injection plunger of said plurality of injection plungers being disposed in fluid communication with a source of mixed components and each injection plunger of said plurality of injection plungers being positioned to deliver a predetermined quantity of said mixed components to its associated nozzle member upon being activated; and
a process computer that activates each of said injection plungers in accordance with a predetermined cycle of operation;
whereby upon activation of each injection plunger by said computer, a predetermined quantity of mixed components is injected into each of said cavities by said nozzle members, all of said injections being performed independently of each other.

5,087,191

EMBOSSING CALENDER ASSEMBLY

Wolfgang Heise, Kurt Trzynka, and Andreas Kubik, all of Hannover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover, Fed. Rep. of Germany

Filed Jan. 10, 1991, Ser. No. 639,265

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1990, 4001105

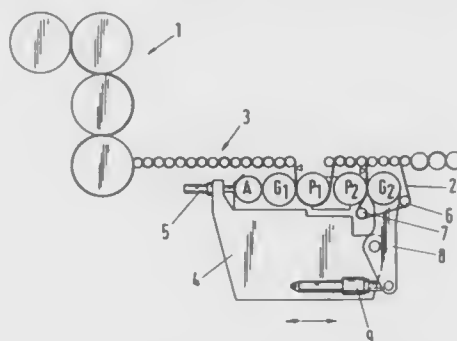
Int. Cl.³ B29C 59/00

U.S. Cl. 425—335

5 Claims

1. An embossing calender arrangement for embossing thermoplastic plastics material films comprising a film calender for producing a film having first and second opposed major surfaces, an embossing calender assembly receiving said produced film and embossing at least one of said surfaces of said film, and transfer means for transferring said film from said film calender to said embossing calender assembly, through said assembly

and from said assembly for further processing, wherein said embossing calender assembly comprises a first roller set defining a first roller nip whereby passage of said film through said first roller nip causes embossing of said first major surface, and a second roller set defining a second roller nip whereby passage of said film through said second roller nip causes embossing of said second major surface, means for mounting said first roller set and said second roller set, common frame means including both said means mounting said first roller set and said means mounting said second roller set and further including means for displacing said frame means horizontally with re-



spect to said transfer means, said transfer means being disposed above said frame means, whereby displacement of said frame means to a first position provides a first mode of embossing wherein said first surface of said film is unilaterally embossed in said first roller nip, displacement of said frame means to a second position provides a second mode of embossing wherein said second surface of said film is unilaterally embossed in said second roller nip, and displacement of said frame means to a third position provides a third mode of embossing wherein said first and said second surfaces are sequentially embossed in said first and said second roller nips.

5,087,192

ROLL FOR FORMING OPTICAL RECORDING MEDIUM SUBSTRATE

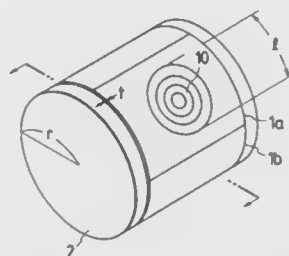
Osamu Kanome, Kawasaki, and Hiroyuki Sugata, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 9, 1990, Ser. No. 491,291

Claims priority, application Japan, Mar. 10, 1989, 1-56024

Int. Cl.³ B29C 43/08, 43/46

U.S. Cl. 425—385

9 Claims



1. A forming roll for producing an optical recording medium substrate, comprising a roll for continuously forming optical recording media substrates having preformatting information; wherein said roll comprises a roll substrate having on its surface a stamper bearing a pattern corresponding with said preformatting information such the $1 \times t \leq 0.1 \times r$ when $r \geq 1/2\pi$ wherein r is the radius of said roll substrate in mm, l is the length of said pattern along the periphery of said roll substrate in mm and t is the thickness of said stamper in mm.

5,087,193

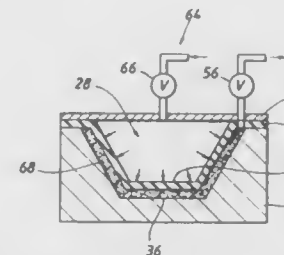
APPARATUS FOR FORMING A COMPOSITE ARTICLE

Kenneth H. Herbert, Jr., 2101 Jane Ct., Grand Haven, Mich. 49417
Filed Aug. 9, 1990, Ser. No. 565,380

Int. Cl.³ B28B 7/30

U.S. Cl. 425—543

5 Claims



1. Apparatus for use in forming a composite article, a portion of said article including a hardenable resin, said apparatus comprising:

a rigid female mold having a cavity defined downwardly therein and a corresponding reference surface facing said cavity;
a flexible male mold having a mold chamber formed therein, a portion of said mold chamber bounded by a flexible wall having a flexible mold surface positionable a variably spaced distance away from said reference surface, said wall deformable away from said reference surface when said hardenable resin is injected between said reference surface and said flexible wall, said wall including an insert cavity extending inwardly from said flexible mold surface for forming a lateral stiffener on said article, and resin injection means for injecting said resin between said reference surface and said flexible wall.

5,087,194

BLOWER-TYPE BURNER SUITABLE FOR USE WITH HEATING BOILERS EMPLOYING GAS RETURN DUCTING

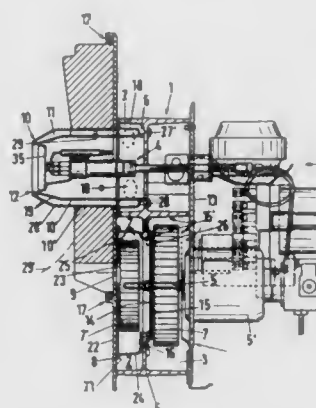
Hans Viessmann, Im Hain, D-3559 Battenberg/Eder, Fed. Rep. of Germany
Filed Aug. 22, 1990, Ser. No. 571,757

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1989, 3928384

Int. Cl.³ F23C 9/00

U.S. Cl. 431—115

10 Claims



1. A blower-type burner for heating a boiler having an interior and a wall opening closed by a closure panel having a joint ledge for mounting the closure panel on the boiler wall, the burner comprising

(a) a housing mounted on the closure panel and open to the interior of the heating boiler in a plane extending substan-

tially parallel to the closure panel, the housing being divided by a partition wall into

- (1) a flue gas chamber adjacent the closure panel and
- (2) an impeller chamber extending parallel to the flue gas chamber,
- (b) a mixing tube including an injection nozzle arranged in the interior thereof, the mixing tube having
 - (1) a double wall defining an interior cavity in communication with the flue gas chamber and at least one flue gas exhaust opening for exhausting flue gas from the interior cavity, and
 - (2) the impeller chamber being in communication with the interior of the mixing tube,
- (c) an impeller arrangement comprising
 - (1) a motor,
 - (2) a motor shaft extending perpendicularly to said plane into the impeller chamber,
 - (3) a blower impeller mounted on the motor shaft in the impeller chamber, and
 - (4) a further impeller in the flue gas chamber, the further impeller being coupled to the motor shaft for operation thereby,
- (5) the injection nozzle and the motor shaft passing through the partition wall,
- (d) an adjoining wall of the housing defining a combustion air intake for delivering a stream of combustion air to the blower impeller, and
- (e) the closure panel defining a flue gas exhaust opening at a suction side of the further impeller, the flue gas exhaust opening being positioned immediately adjacent the joint ledge and the center of the further impeller.

5,087,195

COMBUSTION CYLINDER STRUCTURE FOR OIL BURNER

Yutaka Nakanishi, and Toru Nakagaito, both of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Japan

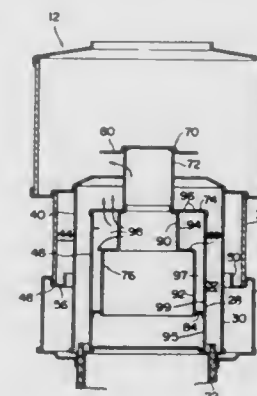
Filed Oct. 27, 1989, Ser. No. 427,405

Claims priority, application Japan, Oct. 29, 1988, 63-274274; Nov. 5, 1988, 63-279871

Int. Cl.³ F23D 3/04

U.S. Cl. 431—309

10 Claims



1. A combustion cylinder structure for an oil burner comprising:

a multi-cylindrical combustion means including a perforated inner cylindrical member, an outer cylindrical member arranged outside said inner cylindrical member and an outermost cylinder arranged outside said outer cylindrical member, said outer cylindrical member being formed at the lower portion thereof with a plurality of through-holes of a smaller diameter and at the middle and upper portions thereof with a plurality of through-holes of a larger diameter, said outermost cylinder including a heat-impermeable cylin-

der arranged so as to surround said lower portion of said outer cylinder member and to heat-permeable cylinder arranged on said heat-impermeable cylinder so as to surround said middle and upper portions of said outer cylindrical member; and,

a collar provided at the upper portion of said heat-impermeable cylinder with a first collar portion which extends inwardly from said heat-impermeable cylinder toward an area of said outer cylindrical member which is a boundary area between said through-holes of smaller diameter and said through-holes of larger diameter,

said heat-permeable cylinder being put on said collar,

said collar having a second collar portion which is bent upwardly at the distal end of the collar to form a cylindrical section which is spaced from said outer cylindrical member to define a vertically extending gap of substantially uniform width between said second collar portion and said outer cylindrical member,

said second collar portion extending upwardly opposite to said boundary area of said outer cylindrical member,

said first collar portion being formed with through-holes,

and said second collar portion extending upwardly for a distance sufficient to prevent turbulent flow between said outer cylindrical member and said heat-permeable cylinder by causing smooth upward flow of air flowing through said vertically extending gap and of air flowing through the through-holes of said first collar portion during a small amount of combustion in said oil burner.

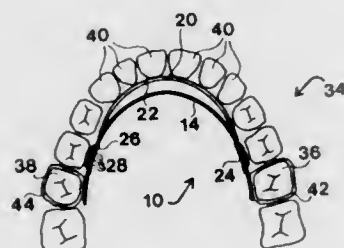
5,087,196

DUAL COIL SPRING LINGUAL ARCH

Julio R. Polanco, 3242 Kimber Ct. #42, San Jose, Calif. 95124
Filed Aug. 6, 1991, Ser. No. 740,719
Int. Cl.⁵ A61C 3/00

U.S. Cl. 433—21

20 Claims



1. An orthodontic appliance for adjustment of molar teeth and further for adjustment of anterior teeth, comprising:
 - a generally U-shaped primary spring wire arch having a curved center portion and two end portions, said end portions being adapted for exerting force against the molar teeth such that the molar teeth tend to be moved distally; and
 - a secondary spring wire arch having a generally U-shaped anterior portion connected to the primary spring wire arch such that said anterior portion of the secondary spring wire arch may be placed against the anterior teeth with force against the anterior teeth being provided by means of compression of, at least a portion of the secondary spring wire arch between the primary spring wire arch and the anterior teeth.

5,087,197

DISC AND SLEEVE ASSEMBLY FOR COUPLING DIE SEGMENTS OF A DENTAL MODEL TO A BASE

Jerry F. Sullivan, Ridgewood, N.J., assignor to Coltene/Whaledent, New York, N.Y.

Filed Feb. 6, 1989, Ser. No. 306,949

Int. Cl.⁵ A61C 19/00

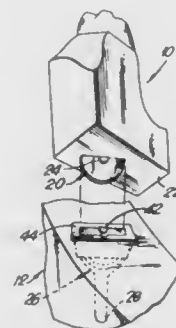
U.S. Cl. 433—74

44 Claims

1. A dental pin and sleeve assembly for removably-coupling

a die section of a dental model into a cast base, the assembly comprising:

a pin member including an internal portion for securement within said die section and an exterior portion protruding from said die section to depend therefrom, said internal portion being of a substantially semi-circular configuration; and



a sleeve member for securement within said cast base, said sleeve member including a head portion having a chamber which is opened at an upper face of said cast base to wholly receive said exterior protruding portion when said die section is coupled to said cast base.

5,087,198

DENTAL SURGERY APPARATUS CAPABLE OF SUPPLYING THREE SEPARATE FLUIDS TO CONNECTED INSTRUMENTS

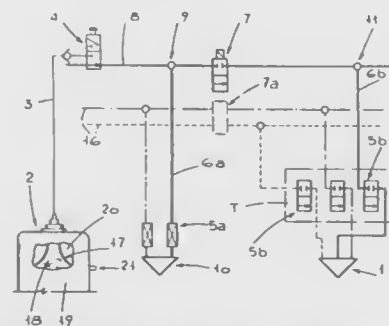
Franco Castellini, Bologna, Italy, assignor to Castellini S.p.A., Bologna, Italy

Filed Sep. 21, 1989, Ser. No. 410,670

Claims priority, application Italy, Sep. 30, 1988, 3608 A/88
Int. Cl.⁵ A61C 1/10, 1/12

U.S. Cl. 433—80

3 Claims



1. A dental surgery system comprising a plurality of dental handpieces, dental holder means (T) for receiving said plurality of dental handpieces, at least one of said handpieces (1) having an air-powered motor and at least one outlet for discharging at least water flow; said system further including a main circuit of combined power-air, and spray-air (16) and a main water supply circuit (8), a plurality of normally closed ON-OFF valves (5b) disposed along single air and single water first supply lines (6b) branched from said main air and water circuits, said first supply lines each carrying the relative fluid to single ones of said plurality of dental handpieces, said normally closed ON-OFF valves (5b) being operable to open the respective first supply lines by removal of the respective handpiece from said dental holder means (T); said at least one powered handpiece controlled by means of said plurality of normally closed ON-OFF valves (5b); a chip blower handpiece (10) provided directly by means of single air and single water second supply lines branched from said main air and water circuits upstream of said first supply line for supplying water and spray air and activated by an ON-OFF valve on each of

said second supply lines; the valves on said second supply lines being operable directly by said user; master overall ON-OFF valve means (7, 7a) operable directly by the said user and located in the said main air and water circuits at a point downstream of said second supply lines (6a); a reservoir (2), a medicament (18) disposed within said reservoir (2), a dispensing pipeline (3) communicating at one end with said reservoir (2) and the opposite end of said dispensing pipeline (3) being connected to said main water supply circuit (8) at a point upstream of said second supply line branch (6a); directional control means installed at the juncture of said dispensing pipeline (3) and said main water supply circuit (8) and interlocked to switchable control means (4) in such a way to permit the user to choose between supplying said medicament only and said water only at any one time.

5,087,200

SPACER FOR DENTAL IMPLANTS

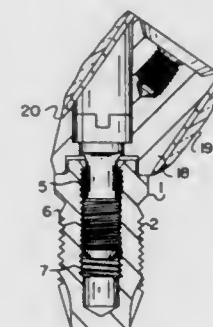
Izidor Brajnovic, and Lars Jorneus, both of Gothenburg, Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden
Continuation of Ser. No. 417,091, Oct. 4, 1989, Pat. No. 5,000,685, which is a continuation of Ser. No. 195,334, May 18, 1988, Pat. No. 4,872,839. This application Nov. 16, 1990, Ser. No. 614,134

Claims priority, application Sweden, Jun. 12, 1987, 8702445
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.⁵ A61C 8/00

U.S. Cl. 433—73

5 Claims



5,087,199

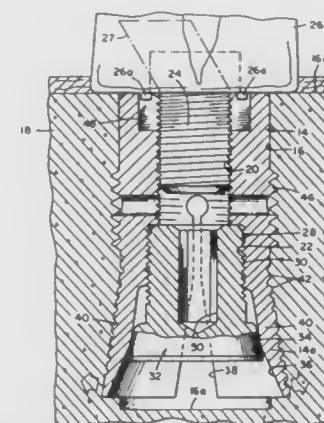
DENTAL IMPLANT AND METHOD OF USING SAME

Sargon Lazarof, 15215 Magnolia Blvd., #126, Sherman Oaks, Calif. 91403
Continuation of Ser. No. 558,494, Jul. 27, 1990, Pat. No. 5,004,421. This application Dec. 24, 1990, Ser. No. 632,532
The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.⁵ A61C 8/00

U.S. Cl. 433—173

11 Claims



1. A dental implant for securement within a bore provided in the jaw bone of a patient, said implant comprising:
 - (a) an elongated hollow body receivable within the bore provided in the jaw bone of the patient, said body having threads and including means for orienting a prosthetic component with respect to said hollow body, said hollow body further including:
 - (i) means for resisting rotation of said hollow body within the bore upon the exertion of a rotational force tending to retract said hollow body from the bore;
 - (ii) a movable portion movable from a first retracted position to a second expanded position; and
 - (b) expander means including a shank portion having external threads mateable with said threads of said body for moving said skirt portion from said first retracted position to said second expanded position upon rotation of said shank portion.

5,087,201

SELF-THREADING PIN FOR THE IMPLANTATION OF DENTAL PROSTHESIS

Luigi P. Mondani, 1723 Corso Europa, Genova-Quinto, and Maria P. Mondani, 12, via S. Bartolomeo, Camogli, both of Italy

Continuation of Ser. No. 277,264, Nov. 29, 1988, abandoned.

This application Aug. 22, 1990, Ser. No. 571,831

Claims priority, application Italy, Dec. 4, 1987, 12594 A/87
Int. Cl.⁵ A61C 8/00

U.S. Cl. 433—174

8 Claims

1. A self-threading pin to be screw-threaded into the maxilla bone for the implantation of a dental prosthesis comprising an intermediate screw-threaded shank portion, a driving head at

one end of the shank portion and a drill bit at the other end of said shank portion, said screw-threaded shank portion of the



pin being provided with two intercalated screw threads of different heights.

5,087,202

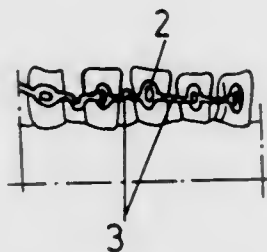
DEVICE TO FIX OR CONTROL THE MUTUAL POSITION OF TEETH

Christian Krenkel, Moosstrasse 126, A-5020 Salzburg, Austria
Filed Dec. 12, 1990, Ser. No. 626,296
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943098

Int. Cl.⁵ A61C 3/00

U.S. Cl. 433-215

22 Claims



1. A dental device for fixing and controlling the mutual position of teeth, comprising a flat, unitary strip of a deformable material substantially elongate in a longitudinal direction and adaptable for shaping and connection to the outer surface of teeth, said unitary strip comprising a plurality of anchor elements connected to each other by means of connecting bars, said anchor elements being substantially ring-like in configuration and having a circumference in the plane of the unitary strip, said connecting bars being substantially elongate in the longitudinal direction of the unitary strip and having a width direction in the plane of the unitary strip, wherein the circumference of said anchoring elements is substantially greater than the width of said connecting bars.

5,087,203

EDUCATIONAL TOOL KIT

Virginia H. James-Hymes, 33 Hummel Rd., New Paltz, N.Y. 12561 now by change of name from Virginia H. James
Filed Apr. 16, 1990, Ser. No. 509,712

Int. Cl.⁵ G09B 1/00

U.S. Cl. 434-84

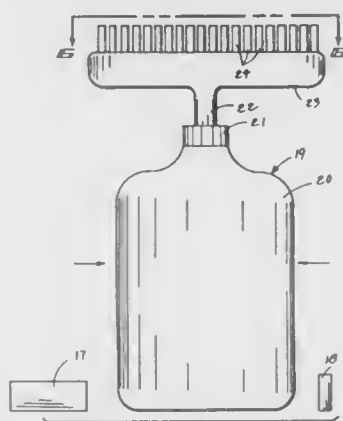
3 Claims

1. An educational teaching tool kit comprising, in combination, a plurality of stencil plates, including a first stencil plate and a second stencil plate, the first stencil plate including at least a rigid outer plate, the rigid outer plate including a series of first geometric shapes directed therethrough, and

the second stencil plate including a further outer plate with a further matrix of geometric patterns directed therethrough,

the first and second stencil plates each including a respective top edge, and each stencil plate including an elongate slot defining a handle directed through the first and second stencil plate adjacent the top edge, and further including chalk applicator means for directing chalk through the openings and further openings in the first and second stencil plate, and

wherein the outer plate member comprises a plate member, and the outer plate member laminated to and coextensive with a rear plate member, the rear plate member defined as a rigid metallic plate member, with the openings and further openings formed through the respective first and



second stencil plates coextensively formed through the rear plate member, and wherein the chalk applicator means includes a rigid chalk stick, an elongate chalk eraser, the chalk eraser defined by an elongate longitudinally aligned rectangular configuration, and a chalk dispenser, and wherein the chalk dispenser includes a flexible elongate polymeric body including a forward end and a rear end, the forward end including a removable cap mounted thereto, the removable cap including a chalk conduit directed through the cap mounted orthogonally thereto in communication with the container body, the chalk conduit including a longitudinally aligned elongate dispensing head mounted orthogonally to the chalk conduit spaced from the cap medially of the dispensing head.

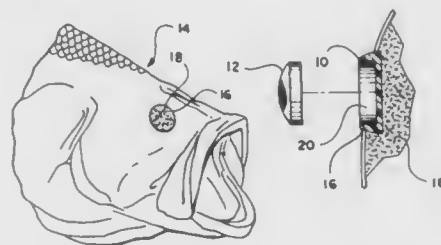
5,087,204

TAXIDERMIC EYE-MOUNTING METHOD AND ARTICLE

James M. Thompson, P.O. Box 130, Lovejoy, Ga. 30250
Filed Mar. 19, 1990, Ser. No. 495,370
Int. Cl.⁵ G09B 23/00

U.S. Cl. 434-296

2 Claims



1. A method for mounting an eye in a fish head which has been prepared for taxidermy mounting comprising: inserting papier-mache into an eye opening of the fish head; setting a substantially rigid but slightly flexible eye socket

which emulates the eyelid and eye membrane of the fish into said eye opening and into said papier-mache; allowing said papier-mache to dry; and inserting the eye into said eye socket.

5,087,205

ADJUSTABLE INTERACTIVE AUDIO TRAINING SYSTEM

Abraham Y. Chen, 2035 Tripiano Ct., Mountain View, Calif. 94040

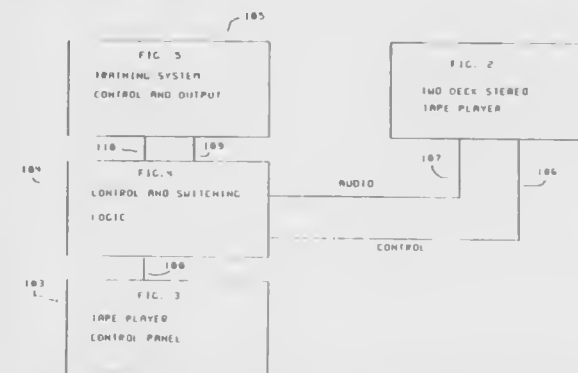
Continuation of Ser. No. 235,473, Aug. 24, 1988, abandoned.

This application Mar. 5, 1990, Ser. No. 489,860

Int. Cl.⁵ G09B 5/04

U.S. Cl. 434-320

6 Claims



1. An adjustable interactive audio training system having a plurality of operating modes comprising:

a two deck, stereo recording playback tape module; manual control means for selecting an operating mode from the plurality of system operating modes; said modes comprising at least a master tape mode and a training mode; means operable in said master tape mode for preparing master tapes in the second deck of said two deck tape module; said master tapes comprising audio training and control information on a first channel of said tape and comprising coded control information on the second channel of said tape in parallel relation with said audio training information;

said audio training information comprises at least one set of training statements comprising a plurality of cues recorded on said first channel in sequence in corresponding cue segments of said tape; and

said coded control information comprises: a first discrete cue control signal recorded on said second channel in parallel with each cue segment, said cue control signals originating in time a first fixed period of time before the beginning of the corresponding cue segment on said first channel and terminating at the end of the corresponding cue segment; a fixed length blank system control signal on both channels preceding the beginning of the cue control signal associated with the first cue segment of each set of training statements; and a second discrete control signal following the cue control signal associated with the last cue of the training information;

means operable in said training mode for playing said master tapes in the first deck to present said audio training information to a trainee;

means for recording audio responses of a trainee to said training information on a training tape in said second deck; independent operator controlled adjustable react time means for defining a react time timeout period of time;

means for measuring the passage of time after the completion of a cue segment; and timeout means for presenting the next succeeding cue statement in the event that a trainee response is not initiated before the end of said react time timeout period; independent operator controlled adjustable pause time means for defining a pause time timeout period of time;

means for measuring the time duration of pauses in a trainee's response to a cue; and timeout means for presenting the next succeeding cue statement in the event that the time duration of a pause in the trainee's response is greater than said pause time timeout period.

5,087,206

LOW IMPEDANCE CONNECTOR

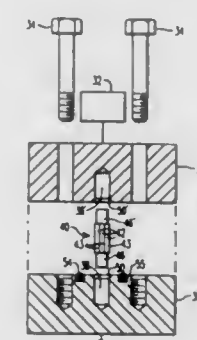
Paul E. Jaenke, Arnold, and Joseph R. Cerniglia, Annapolis, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1990, Ser. No. 618,870

Int. Cl.⁵ H01R 4/66

U.S. Cl. 439-92

6 Claims



1. Low impedance electrical connection apparatus comprising:

a) first and second electrically conducting members, at least one of which is for electrical connection to electrical apparatus;

b) clamping means for releasably maintaining said members in intimate contact when in use;

c) each said member including a cavity which faces the cavity of the other member when said members are clamped together;

d) a metallic grounding insert for placement within one of said cavities and being of a softer material than said members;

e) said grounding insert and said cavities being constructed and arranged that when said grounding insert is inserted into said cavity and said members are clamped together, said grounding insert will align with both said cavities and a surface portion of said grounding device will be shaved as said conducting members are brought together, so as to make intimate electrical contact with and between said members.

5,087,207

CIRCUIT-SELECTING ADAPTER FOR AN ELECTRICAL POWER RECEPTACLE

Norman R. Byrne, 2736 Honey Creek, NE., Ada, Mich. 49301
Filed Dec. 11, 1990, Ser. No. 625,980

Int. Cl.⁵ H01R 25/16

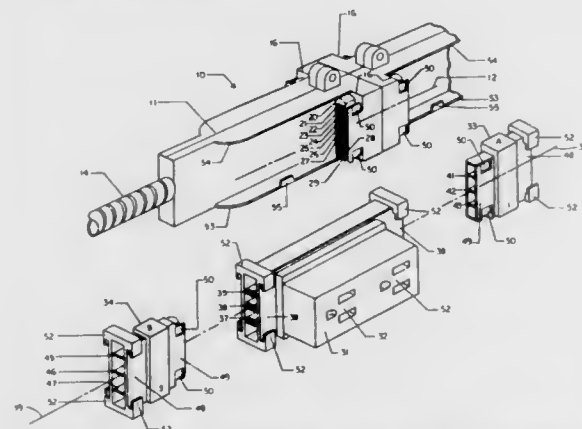
U.S. Cl. 439-215

12 Claims

1. An adaptable power outlet receptacle arrangement for connection to a power distribution block having a plurality of electrical conductors representing a plurality of different electrical circuits, including at least two positive conductors connected to two positive output terminals and two neutral conductors connected to two neutral output terminals, said arrangement comprising:

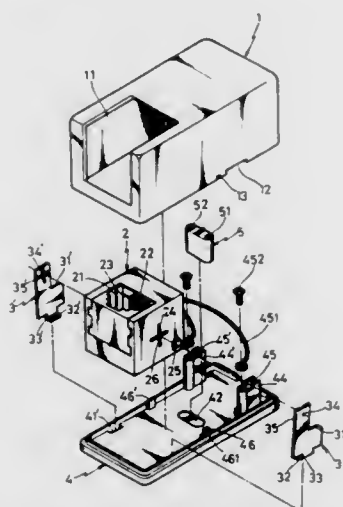
an outlet receptacle block having at least a positive and a neutral input terminal; and an adapter block adjustable to a first and a second physical orientation, said adapter block having opposite ends and comprising first and second terminals on one of said ends for engaging said input terminals of said outlet receptacle

block and first and second terminals at an opposite end opposite said one end for engaging one of said positive output terminals and one of said neutral output terminals in said first physical orientation of said adapter block and another of said positive output terminals and another of said neutral output terminals in said second physical orientation of said adapter block;



said adapter block comprising a horizontal centerline and said first and second terminals for engaging said positive output terminal and neutral output terminal disposed on opposite sides of said centerline and offset from said centerline by different distances.

5,087,208
MOVABLE TELEPHONE ADAPTER
Gong-hwa Chang, 5F-23, 70, Fu-Shing Road, Taoyuan, Taiwan
Filed May 13, 1991, Ser. No. 699,132
Int. Cl.⁵ H01R 27/00
U.S. Cl. 439—224 4 Claims

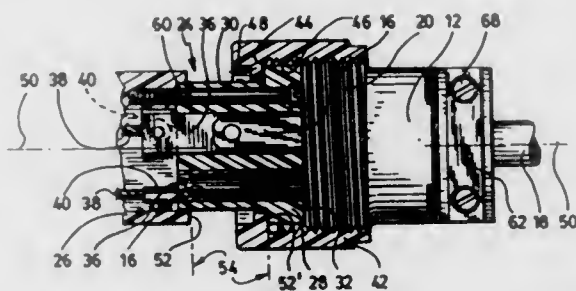


1. A movable telephone adapter, comprising:
 - a) an upper cover including two opposite sides and defining a holding space, an opening provided in the upper cover, a notch formed at one side for inserting a pry tool, and a retainer provided at each of the two opposite sides;
 - b) a telephone receptacle including a plug hole and a connector fastened therein for connecting the connector of a telephone line from a telephone set, the receptacle including a pair of first cross-shaped means and a pair of stop blocks at two opposite sides thereof;
 - c) a base including a pair of retaining notches and a pair of retaining means at two opposite sides, the pair of retaining means being engaged by the retainers of the upper cover to secure the upper cover to the base, an exchange line

holder for holding an exchange line in place, and a pair of conductive supporting bars, each supporting bar having one end for connection with the exchange line and an opposite end connected to the connector;

- d) a pair of receptacle supports, each receptacle support including a hooked bottom end secured in one of the retaining notches and a second cross-shaped means engageable with the first cross-shaped means for securing the telephone receptacle in position so that when the upper cover is secured to the base to hold the telephone receptacle in the opening, the telephone receptacle is permitted to be moved and alternatively positioned at either a horizontal position or a vertical position relative to the receptacle supports.

5,087,209
ELECTRICAL PLUG AND SOCKET ARRANGEMENT
Raymond G. Faucher, 9470, Grondin Avenue, Charlesbourg, Quebec, G1G 5L2, Canada
Filed Mar. 8, 1991, Ser. No. 666,700
Int. Cl.⁵ H01R 4/38
U.S. Cl. 439—320 1 Claim

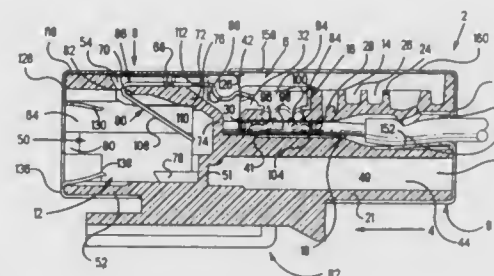


1. An electrical plug and socket adapted to be releasably secured together in an axial longitudinal direction, said plug having a cylindrical body, a substantially flat abutting face and a plurality of prongs orthogonally projecting outside said abutting face, said cylindrical body having a peripheral threaded portion adjacent said abutting face, said socket having a cylindrical body having a first ring-like section and a second ring-like section, said second section co-axially and partially mounted in said first section and a set of screws longitudinally disposed for removably securing said second section to said first section, said second section having a protuberant ring-like peripheral wall forming a substantially flat abutting face for said socket provided with a plurality of bores adapted to receive said prongs to allow the abutting faces of the plug and the socket to substantially contact each other, a cylindrical recess between said first section and said peripheral wall, a ferrule having an inner cylindrical surface comprising a threaded portion adapted to threadedly engage the threaded portion of said plug and an inwardly beaded ring adapted to rotate and restrictingly slide longitudinally into said recess, said wall having an outer diameter sufficiently large to maintain said beaded ring inside said recess and sufficiently small to allow said threaded portion to longitudinally slide thereover, said recess having a width sufficient to allow ferrule to slidably recede over the second section of the socket to completely clear the plane of the abutting face of the second section, whereby said ferrule is adapted to be mounted over said second section by separating, with the removal of said screws, the second section from the first section for introducing the ferrule over said second section.

5,087,210
WIRE-TO-WIRE ELECTRICAL CONNECTING MEANS
Ronald W. Myers, Landisburg, and James Pritulsky, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 21, 1991, Ser. No. 719,222
Int. Cl.⁵ H01R 4/24

U.S. Cl. 439—425

20 Claims



18. A wire-to-wire shielded electrical connector, comprising:

- an insulating housing having a forward portion defining a socket for receiving a shielded electrical plug and a rear portion defining a row of wire receiving passageways and having means for retaining wires in the passageways, the forward portion having a first row of slots communicating with the interior of the socket and the rear portion having a second row of slots each axially aligned with and communicating with, a respective slot of the first row of slots and with a respective one of said passageways;
- a metal shield having a first part receiving said forward portion of the housing and a second part receiving said rear portion thereof and having an opening exposing the second row of slots and an opening exposing said passageways to receive wires therein, the first part of the shield having an opening affording access to said socket for the insertion of said plug thereinto; and
- a plurality of electrical terminals each comprising a wire connecting portion having insulation displacement means and being lodged in a respective one of the slots of the second row, with said insulation displacement means proximate to the passageway with which said respective slot of the second row of slots communicates, a retention portion connected to said wire connecting portion, retention means on said retention portion and a contact spring projecting from said retention portion, the retention portion being retained by the retention means thereof in that slot of the first row of slots which communicates with said respective slot of the second row of slots with the contact spring of the terminal projecting into the interior of said socket for engagement by a contact of said shielded electrical plug when said plug has been inserted into the socket.

5,087,211
MINIATURE CONNECTOR FOR FLAT METAL-CLAD CABLES AND CONTACT DEVICES FORMING THEM
Jean-Claude Prunier, Herblay; Pascal Peuchet, Carrieres Sur Seine; Jean-Jacques Le Gouic Martun, Evreux, and Claude Bonnin, Monts, all of France, assignors to Societe Nouvelle De Connexion, Boulogne Billancourt, France
Filed Oct. 25, 1990, Ser. No. 603,306
Claims priority, application France, Oct. 25, 1989, 89 13987
Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—579

14 Claims

1. Male contact device, said device being connected to a first metal-clad cable comprising a stack of three conductors, namely, one high-voltage conductor (31) and two low-voltage equipotential conductors (32, 33), wherein said device comprises:

- (a) an electrically conductive male contact (10) at an end of said high-voltage conductor (31);
- (b) a fork (11) made of shape-retention material and capable of holding said high-voltage conductor (31) immobilized;

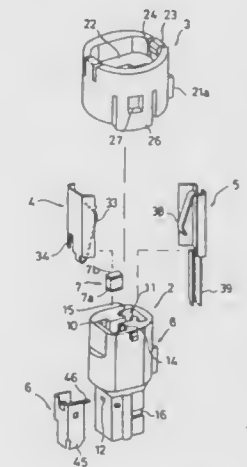


- (c) an oblong-sectioned ring (37) made of a shape-retention material ensuring both junction and equipotentiality of continuity of transfer of ground to the ground of a device to which it is to be connected.

5,087,212
SOCKET FOR LIGHT EMITTING DIODE
Chiyoki Hanami, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Oct. 16, 1990, Ser. No. 598,370
Claims priority, application Japan, Oct. 16, 1989, 1-119693[U]
Int. Cl.⁵ H01R 13/66

U.S. Cl. 439—620

1 Claim



1. A detachable socket for a two-lead electrical device having a pair of leads, comprising:

- an insulating case consisting of a socket body with an insertion portion having a smaller circumference and a terminal opening on its side extending in its axial direction, and a cover portion attached to a top of said socket body and having a recess for receiving said two-lead electrical device;
- a first lead terminal provided in said socket body and having a resistor contact and a first lead contact for contact with one of said leads;
- a second lead terminal provided in said socket body and having a first contact portion extending downwardly along said insertion portion and exposed from said terminal opening on said insertion portion for contact with a first contact element of a mating socket;
- a contact terminal mounted on an outside of said insertion portion and having a second contact portion extending downwardly along said insertion portion for contact with a second contact element of said mating socket and a second resistor contact extending laterally from a top portion thereof into said insertion portion; and
- a resistor provided within said socket body so that said resistor is held between said first and second resistor contacts.

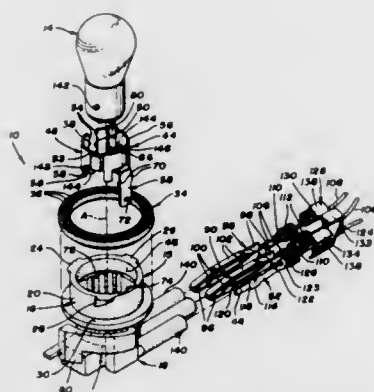
5,087,213 LAMP SOCKET

James M. Drapcho; Kenneth P. Cope, both of Warren; Melodee A. Chapin, Cortland; Edward M. Bungo, Cortland; Ronald A. Baldwin, Cortland, all of Ohio, and Ralph W. Crouse, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1991, Ser. No. 735,144
Int. Cl.⁵ H01R 33/46

U.S. Cl. 439—672

10 Claims



1. A lamp socket for a lamp bulb having a base with contact means, said lamp socket comprising a plastic socket body having a tubular portion provided with an inner wall for receiving an insert member along a first axis and having a connector portion for receiving a feed terminal and a ground terminal along laterally spaced parallel second axes each of which is substantially perpendicular to the first axis, said inner wall having a column member projecting radially inwardly therefrom with its longitudinal center axis being located substantially parallel to said first axis, a guide slot formed in said inner wall along an axis substantially parallel to said longitudinal center axis, said insert member being made of a metallic material and having a body portion in the form of a split ring with each of the opposed facing end surfaces being adapted to engage one side of the column member, and a tongue depending from said body portion and adapted to be located in said guide slot for providing electrical contact with said ground terminal, said feed terminal having a contact member located in line with the inner diameter of said insert member whereby insertion of said lamp bulb into said insert member followed by rotation of the lamp bulb base making electrical engagement with the contact member of the feed terminal and the base of the lamp bulb making electrical engagement with the ground terminal through the insert member.

5,087,214

BATTERY TERMINAL CONNECTOR

John H. Dewar, Grosse Ile, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed May 21, 1991, Ser. No. 703,523
Int. Cl.⁵ H01R 4/42

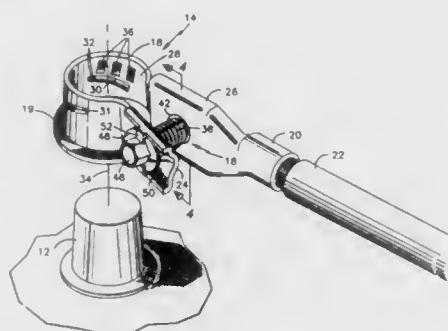
U.S. Cl. 439—762

23 Claims

1. A battery post connector comprising:
(a) a body member formed from sheet metal comprising a clamp section for attachment to a terminal post of a storage battery and a base section for rigid connection to a battery cable;
(b) said clamp section being configured to extend around the battery post and having first and second ends such that drawing said ends together compresses said clamp section about said post to clamp the battery post connector to said battery post;
(c) said clamp section having an inner surface adapted to

grippingly engage a battery post to inhibit angular rotation of the battery post connector about the battery post, (d) said inner surface having

- (1) an elongated slot with an edge adapted to penetrate said battery post, said edge being oblique to the central axis of said battery post when the clamp section is clamped to the battery post, and



- (2) a coined pattern disposed to extend about said battery post and being configured to penetrate said battery post when the clamp section is clamped to the battery post; and
(e) means for drawing together said first and second ends of said clamp section to clamp the battery connector to a battery post.

5,087,215

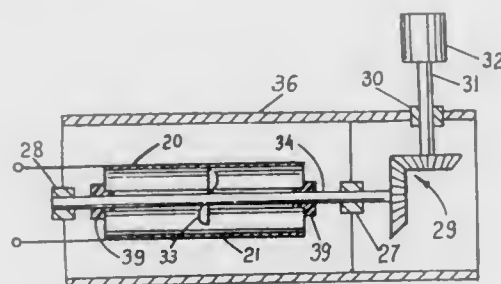
OCEAN-GOING VESSEL AND METHOD FOR INCREASING THE SPEED

Leonid Simuni, 1056 Neilson St., Apt. 6 A, Far Rockaway, N.Y. 11691

Filed Mar. 8, 1990, Ser. No. 563,072
Int. Cl.⁵ B63H 21/20

U.S. Cl. 440—6

3 Claims



1. A side propulsion unit for providing additional thrust to a marine vessel, said system comprising:
a first tube attached to said vessel,
a second tube attached to said vessel,
a third tube attached to said vessel;
said second tube connecting said first and said third tubes;
a first and a second propeller, said first tube surrounding said first propeller and said third tube surrounding said second propeller, each of said propellers being mounted on a propeller shaft, each said propeller being further located inside of a circular duct, said duct comprising a first electrode, a second electrode, and a plurality of insulators connecting said electrodes;
a set of super conducting magnets, each one of said set of magnets being located outwardly of and on each side of said circular duct adjacent one of said plurality of said insulators,
said super conducting magnets and said electrodes forming a magnetohydrodynamic drive;
an electric motor, said electric motor driving one of said propellers through one of said propeller shafts;

and wherein said propellers and said magnetohydrodynamic drives provide additional thrust and maneuverability to said vessel.

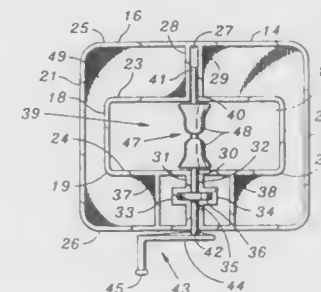
5,087,216

FISHERMAN'S MARKER BUOY WITH INTEGRAL REEL
Edward F. Noggle, 1926 E. La Veta, #105, Orange, Calif. 92666
Filed Mar. 1, 1991, Ser. No. 663,573

Int. Cl.⁵ B63B 22/18

U.S. Cl. 441—26

14 Claims



1. A marker buoy comprising:

- a. a buoyant body having an aperture therethrough, said buoyant body comprising hollow, concave upper and lower shell sections which are bonded together to form a water-tight structure,
b. a reel assembly rotatably fastened to said body, said reel assembly having a spool located within said aperture and adapted for winding and unwinding a flexible cord thereon,
c. a crank shaft attached to said spool, said crank shaft having an outer portion which protrudes exteriorly from said body, and
d. a handle attached to said outer portion of said crank shaft for rotating said crank shaft and said spool.

5,087,217

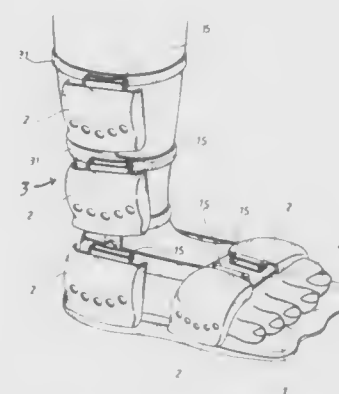
SWIMMING SHOE

C. T. Tuan, and T. L. Duan, both of 4F, 64, Lane 283, Chung Cheng Rd., Yung Ho, Taipei Hsien, Taiwan

Filed Sep. 11, 1990, Ser. No. 580,290
Int. Cl.⁵ A63B 31/12, 31/11, 31/00

U.S. Cl. 441—61

3 Claims



1. A swimming shoe comprising:

- a sole;
a sandal strap extending across the front portion of said sole;
a strap-like fastener extending around a rear portion of said sole from said sandal strap;
a fixing plate extending upwardly from the edge of the rear portion of said sole on each side of said sole and having a

hinge mount on the upper end thereof and a fastener member on the upper end thereof;

a water resisting flange pivotally mounted on each hinge mount for free swinging movement from a position against the fixing plate to a position laterally outwardly of said shoe; and

said sandal strap having a pair of hinge mounts on the upper portion thereof and a further water resisting flange pivotally mounted on each hinge mount for free swinging movement from a position against the sandal strap to a position laterally outwardly of said shoe; all of said water resisting flanges having a free end which, when the flanges are against said fixing plates and said sandal strap, terminate short of the bottom of said sole, whereby when the sole of the shoe is on the ground, the free ends of the flanges do not touch the ground and the wearer can walk in the swimming shoe in the same manner as in an ordinary sandal.

5,087,218

INCANDESCENT LAMPS AND PROCESSES FOR MAKING SAME

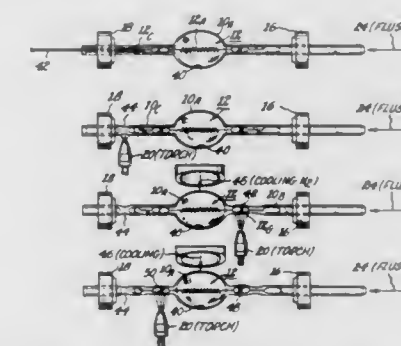
Frederic F. Ahlgren, Shaker Heights; John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike, and John J. Karikas, Shelby, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 414,162, Sep. 28, 1989, Pat. No. 5,045,748, which is a division of Ser. No. 285,576, Dec. 16, 1988, Pat. No. 4,891,555, which is a division of Ser. No. 798,646, Nov. 15, 1985, Pat. No. 4,810,932. This application May 20, 1991, Ser. No. 702,544

Int. Cl.⁵ H01K 3/12, 3/22, 1/32

U.S. Cl. 445—27

9 Claims



1. A process of manufacturing a tipless light source for an incandescent lamp comprising the steps of:

- (a) providing a hollow light source body having a mid-portion with a predetermined shape and a first and a second tubular neck portion;
(b) providing a filament assembly having a filament with predetermined voltage characteristics, a first inlead having one end with an extension and its other end connected to a first seal member which is further connected to a first end of said filament, and a second inlead having one end with an extension and its other end connected to a second seal member which is further connected to the other end of said filament;
(c) inserting said filament assembly into said light source body so that said filament occupies said mid-portion of said light source body and said first and second inleads respectively partially occupy said first and second neck portions of said light source body, said filament assembly having its ends solely supported within said light source body by said first and second seal members respectively occupying said first and second neck portions;
(d) continuously flushing the internal confines of said light source body with a relatively high purity inert gas and continuing such flushing during the conduct of each of the preceding steps;

- (e) sealing-off the first tubular neck portion beyond its seal member;
- (f) reducing the pressure in the hollow light source body;
- (g) heating the region of the first tubular neck portion at its seal member so that the tubular neck portion collapses due to the pressure difference between the outside and inside so as to seal said seal member within the confines of said first tubular neck portion;
- (h) freezing into the mid-portion of the hollow light source body a predetermined quantity of inert gas along with a halide additive light source ingredient;
- (i) heating the region of the second tubular neck portion, related to its seal member so as to seal said seal member within the confines of said second tubular neck portion while keeping the inert gas and halide additive frozen; and
- (j) removing excess portions of said first and second tubular neck portions of said light source body.

5,087,219

ACTION CHARACTER FIGURE

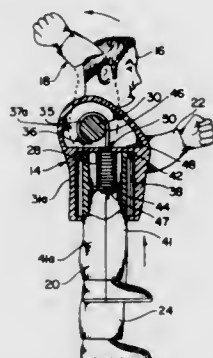
Daniel W. Price, Chepachet, R.I., assignor to Hasbro, Inc., Pawtucket, R.I.

Filed Mar. 15, 1991, Ser. No. 669,857

Int. Cl.³ A63H 13/02, 13/06, 13/00, 3/36

U.S. Cl. 446—336

7 Claims



1. An action character figure comprising:
- a torso portion having a lower end;
 - at least one arm portion mounted on said torso portion so that said arm portion is rotatable about a substantially horizontal axis when said torso portion is in an upright disposition;
 - at least one leg portion;
 - means mounting said leg portion on the lower end of said torso portion so that said leg portion is movable between a normal position wherein the latter extends downwardly from said torso portion and a retracted position wherein said leg portion is at least partially retracted into said torso portion;
 - biasing means biasing said leg portion toward the normal position thereof; and
 - connecting means comprising a flexible connecting element connecting said leg portion to said arm portion so that manual rotation of said arm portion in a predetermined direction causes said connecting element to wind about said axis to draw said leg portion to be retracted from said normal position thereof toward said retracted position thereof.

5,087,220
ANIMAL DEFENSIVE BARRIER AND EXERCISE DEVICE

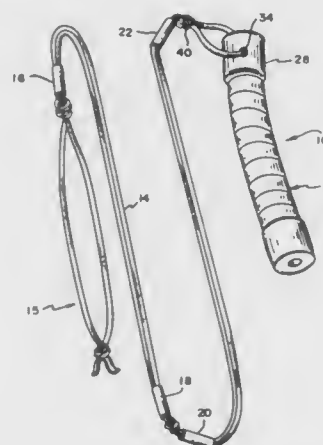
Robert S. Corita, 2034 Tomlinson Rd., Pensacola, Fla. 32526

Filed Nov. 28, 1990, Ser. No. 618,916

Int. Cl.³ A63H 1/06, 33/30; A01K 29/00; A63B 59/00

U.S. Cl. 446—247

5 Claims



1. An animal defensive barrier and exercise device comprising:
- a hand-grip exercise portion having end caps;
 - a double strap of rawhide connected to said hand-grip exercise portion through one of said end caps;
 - a loop portion for wrapping around a wrist of a user distal from said hand-grip exercise portion;
 - a plurality of knots joining said double strap between said hand-grip exercise portion and said distal loop portion;
 - a plurality of sleeves on the double strap adjacent said knots between the hand-grip exercise portion and the loop portion; and
 - means in the hand-grip exercise portion for creating a whistling noise when said device is rotated.

5,087,221

PROCESSED SHRIMP PRODUCT HAVING EASILY REMOVABLE SHELL AND METHOD OF PRODUCING SAME

James B. Linton, Grandville, and John M. Gordon, Jr., Grand Rapids, both of Mich., assignors to Gordon Food Service, Inc., Grand Rapids, Mich.

Filed Oct. 19, 1989, Ser. No. 423,369

Int. Cl.³ A22C 25/00, 29/02

U.S. Cl. 452—5

20 Claims



1. A method for processing shrimp prior to marketing so as to facilitate the removal of the shell from the shrimp after cooking, said shrimp having a curved segmented tail, the method comprising:
- slitting at least one of the segments of said tail along the edge thereof at the inside of the curvature of said tail, the slit being formed such that the shell continues to substantially

surround and protect the flesh of the shrimp during storage and cooking but is more easily removed for eating.

second plies and positioned in at least one of said assembly panels, said sleeve being open at one end and at least

5,087,222

METHOD AND SYSTEM FOR DRESSING CATTLE AND THE LIKE

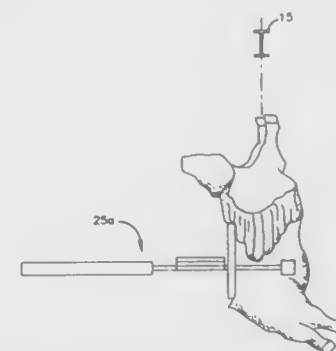
Bruce Sterling, Blue Springs, Mo., and Stuart McGrath, Overland Park, Kans., assignors to Koch Supplies, Inc., Kansas City, Mo.

Filed Apr. 9, 1990, Ser. No. 506,106

Int. Cl.³ A22B 5/16

U.S. Cl. 452—127

8 Claims



1. A method of dehiding and dressing a beef carcass comprising the steps of:
- suspending said carcass by at least one foreleg and one hind leg, with the legs uppermost and the carcass in a substantially horizontal position, and while maintaining said carcass in said position;
 - partially cutting the hide longitudinally in the chin, neck and upper brisket areas to form a longitudinal cut line;
 - freeing portions of the hide around the foreleg and grasping the free hide and pulling it downwardly away from the skin to separate the hide from the skin on the forelegs, brisket and chin, and to form a gap between the underside of the hide and skin on the back of the neck;
 - repositioning said carcass and suspending it from at least one foreleg in the inverted position with the head up and tail down;
 - cutting said hide to form a line of separation in the belly region from the brisket toward the tail; and
 - grasping the confronting edges of said hide along said cut and pulling back generally horizontally to separate the hide on opposite sides from the sides of the carcass.

5,087,223

MULTIPLE PLY ASSEMBLY

Rudolph T. Kaluza, Aurora, Colo., assignor to National Graphics Company, Denver, Colo.

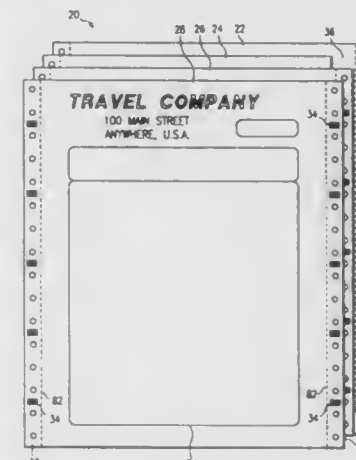
Continuation of Ser. No. 231,776, Aug. 11, 1988, Pat. No. 4,978,142. This application Dec. 18, 1990, Ser. No. 629,382

Int. Cl.³ B41L 1/20

U.S. Cl. 462—2

16 Claims

1. A multiple ply assembly, comprising:
- first and second plies, wherein said first and second plies are correspondingly scored along at least one score line to define at least two assembly panels;
 - connecting means for joining said first and second plies, wherein said connecting means are positioned only along at least portions of a plurality of displaced and substantially parallel lines; and
 - a sleeve defined by corresponding portions of said first and



partially closed on the other end by at least portion of said connecting means.

5,087,224

CONTINUOUS SPEED GEAR FUNCTIONING BY MEANS OF COG WHEELS OF VARIABLE RADIUS

Maria Stranleri, and Dario Dore, both of Via Ponale, 48, 20162 Milan, Italy

PCT No. PCT/IT87/00001, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/04681, PCT Pub. Date Aug. 13, 1987

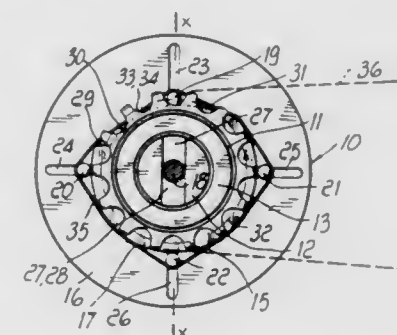
PCT Filed Jan. 14, 1987, Ser. No. 155,930

Claims priority, application Italy, Feb. 10, 1986, 19355 A/86; Nov. 27, 1986, 22470 A/86

Int. Cl.³ F16H 55/52

U.S. Cl. 474—50

10 Claims



1. Continuous speed gear, especially for two-wheeled vehicles, comprising a pair of cog wheels, means of continually varying their center distances, as desired, accompanied by radial translation of cogs, of at least one of the two wheels in relation to said variation, means for allowing meshing of the two wheels practically with one cog at a time and at least with one cog of the wheel with translatable cogs to obtain, by varying a pitch circle of at least one of the two wheels of each pair, continuous variation of their ratio of transmission to the desired value.

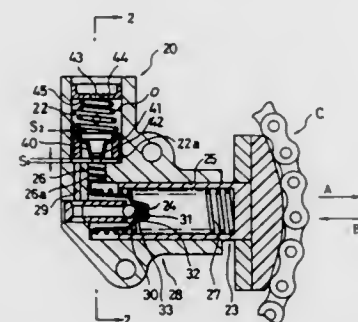
5,087,225

OIL TENSIONER WITH BELL-SHAPED OIL FILTER
Yuichi Futami, Iruma; Masao Murano, Hidaka, and Shigeru Okamura, Zushi, all of Japan, assignors to Tsubakimoto Chain Co., Osaka and Nissan Motor Co., Yokohama, both of Japan

Filed Nov. 6, 1990, Ser. No. 609,514
Int. Cl.⁵ F16H 57/04

U.S. Cl. 474—91

7 Claims



1. In an oil tensioner wherein oil fed from an engine block is first stored in an oil reservoir having a bottom opening, and is sucked through said bottom opening into a cylinder from said oil reservoir by way of a check valve mechanism when a piston within the cylinder moves in one direction, and the oil is returned into said oil reservoir by way of an orifice when said piston moves in the opposite direction, said piston moving more rapidly in said one direction than in the opposite direction to eliminate a possible slack of a chain, belt or the like, the improvement comprising an oil filter located within said oil reservoir in proximity to said bottom opening, said oil filter having an inverted bell-like cross-sectional shape, whereby rapid motion of the piston in said one direction causes flow of oil from said reservoir through said bottom opening without setting up a recess in the surface of the oil in the reservoir which allows air to flow from above the oil in said reservoir into the cylinder through said bottom opening of the reservoir.

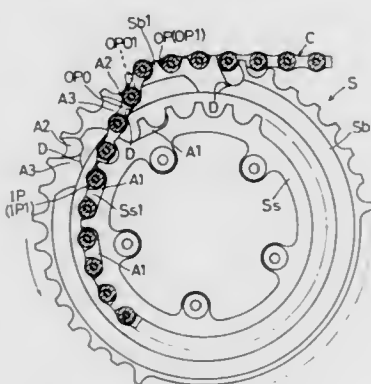
5,087,226

MULTI-STAGE SPROCKET ASSEMBLY FOR BICYCLE
Masashi Nagano, Izumi, Japan, assignor to Shimano Corporation, Osaka, Japan

Filed Feb. 19, 1991, Ser. No. 657,470
Claims priority, application Japan, Feb. 28, 1990, 2-50152
Int. Cl.⁵ F16H 9/00

U.S. Cl. 474—160

5 Claims



1. A multi-stage sprocket assembly for a bicycle, the assembly comprising:
a larger sprocket and a smaller sprocket attached adjacent to each other;
wherein said smaller sprocket has a concave portion defined in a side face thereof opposite to said larger sprocket, said

concave portion being disposed at a position of said smaller sprocket which last interferes with a plate portion of a shifting drive chain segment extending between and engaging both said smaller and larger sprockets when said drive chain is shifted from said smaller sprocket to said larger sprocket.

5,087,227

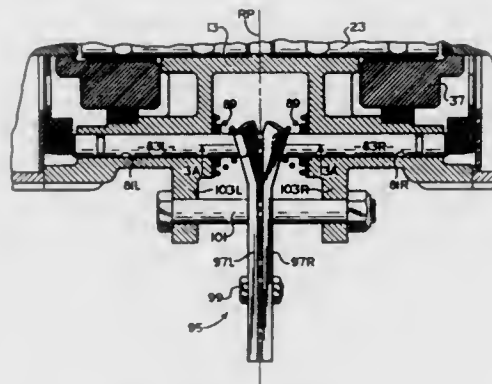
HYDROSTATIC TRANSAXLE AND BRAKE ARRANGEMENT THEREFOR

David W. Giere, Chaska, and Sven B. Gafvert, Eden Prairie, both of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 1, 1990, Ser. No. 531,667
Int. Cl.⁵ F16H 47/04

U.S. Cl. 475—72

15 Claims



13. A hydrostatic transaxle assembly for use on a vehicle having a source of motive power, a fluid pump driven by the source of power, and a pair of driven wheels; said transaxle assembly comprising manifold means and first and second motor assemblies; said manifold means defining a fluid inlet, adapted to be in fluid communication with a fluid port of the fluid pump, said manifold means further defining a fluid outlet, adapted to be in fluid communication with another fluid port of the fluid pump; each of said first and second motor assemblies including a rotary fluid pressure actuated device adapted to receive pressurized fluid from said fluid inlet, and to return exhaust fluid to said fluid outlet; each of said rotary fluid pressure actuated devices including a rotor member, and each of said motor assemblies including an axle shaft adapted to transmit torque from said rotor member to the respective driven wheel; characterized by:

- each of said first and second motor assemblies including a friction brake member disposed adjacent said rotor member;
- said manifold means defining first and second aligned openings, and an elongated brake actuation member disposed in said aligned openings, each of said brake actuation members having an axially inner end disposed away from its respective rotor member, and being axially moveable in its respective opening axially toward its respective rotor member;
- each of said rotor members being disposed axially between said brake actuation member and said friction member and operable in response to axial movement of the respective brake actuation member for engaging the respective friction brake member, thereby braking rotation of said rotor member; and
- cam means including first and second cam members defining first and second cam surfaces, respectively, in engagement with the axially inner ends of said brake actuation members, respectively, each cam member being moveable between a first position in which said brake actuation member is out of braking engagement with said rotor member, and a second position in which said brake

actuation member is in braking engagement with said rotor member.

5,087,228

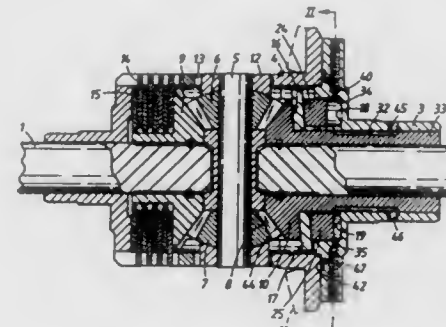
DEVICE TO OPPOSE RELATIVE ROTATIONAL MOVEMENT BETWEEN TWO ROTATABLE SHAFTS
Sigvard Johansson, Solhult 5380 Grunnebo, Vänersborg, Sweden S-462 93

PCT No. PCT/SE88/00355, § 371 Date Dec. 6, 1989, § 102(e) Date Dec. 6, 1989, PCT Pub. No. WO88/10378, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 27, 1988, Ser. No. 438,431
Claims priority, application Sweden, Jun. 24, 1987, 8702625
Int. Cl.⁵ F16H 1/44

U.S. Cl. 475—88

11 Claims



1. A device for opposing relative rotational movement comprising
a rotatable housing defining a cavity,
a plurality of chambers disposed axially in said housing with respect to the axis of rotation of said housing and opening into said cavity,
a plurality of pistons reciprocally mounted in said chambers and projecting into said cavity,
inlet means associated with each of said chambers for supplying a fluid from a fluid source to said chambers, whereby a fluid pressure is established in each of said chambers,
outlet means associated with each of said chambers for releasing said fluid from said chambers,
first and second shafts rotatably disposed in said housing along the axis of rotation of said housing,
first braking means operatively connecting for rotation with said first shaft,
second braking means operatively connected for rotation with said second shaft,
rotation element means operatively connected to said first shaft for rotation therewith and having a surface inclined from a perpendicular direction with respect to the axis of rotation of said housing and arranged for engagement with said plurality of pistons, said rotation element means disposed for axial displacement with respect to the axis of rotation of said housing, whereby a rotational displacement of said inclined surface relative to said plurality of pistons causes an increase in said fluid pressure in at least one of said chambers with a resultant axial displacement of said rotation element means, thereby resulting in braking engagement between said first and second braking means, and
flow control means disposed in fluid communication with said outlet means for controlling the flow rate of said fluid through said outlet means and thus said axial displacement of said rotation element means and said braking engagement between said first and second braking means.

5,087,229

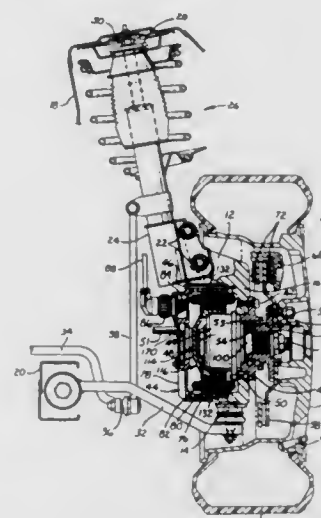
INDEPENDENTLY SUSPENDED STEERABLE MOTOR WHEEL APPARATUS

Lubomyr O. Hewko, Clarkston; Balkrishna R. Patel, Troy, and Andrew L. Bartos, Clarkston, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 6, 1991, Ser. No. 696,423
Int. Cl.⁵ B60K 1/00

U.S. Cl. 475—149

6 Claims



1. An integral motor driven wheel apparatus for a motor vehicle comprising:
a main support element pivotally mounted about a pair of nonparallel axes defined by upper and lower support structures of the vehicle;
a gearset housing rigidly mounted to said main support element;
a rotor cup member disposed radially about said housing and supported by said housing for rotation about a longitudinal axis thereof;
motor means including a stator element rigidly supported on said main support element about said rotor cup member, and a set of permanent magnets secured to said rotor cup member in an area between said rotor cup member and said stator element;
gearset means disposed within said housing including an input element, a reaction element, an output element, and means for drivingly connecting said rotor cup member to said input element of said gearset means;
drive means rigidly mounted to said main support element for rotatably supporting a vehicle drive wheel; and
coupling means for drivingly connecting the output element of said gearset means to said vehicle drive wheel.

5,087,230

DRIVE TRANSMISSIONS

David E. Yates; Geoffrey J. Lack, and Alan De Ville, all of Worcester, England, assignors to Northern Engineering Industries plc, Newcastle Upon Tyne, England

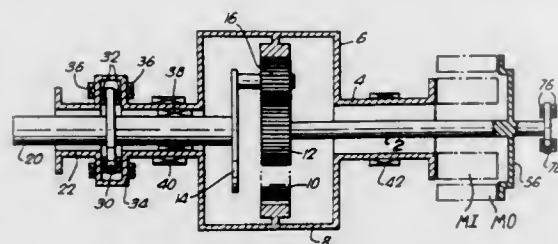
Filed Oct. 11, 1990, Ser. No. 595,999
Claims priority, application United Kingdom, Oct. 23, 1989, 8923784

Int. Cl.⁵ B63H 5/10; F16H 3/60
U.S. Cl. 475—151

8 Claims

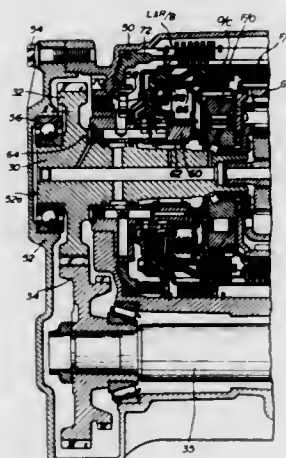
1. A drive transmission for driving a pair of concentric, contra rotating propeller shafts wherein the improvement comprises a powered drive means having concentric, contra rotating elements, one of which is directly, coaxially coupled to one of said shafts, epicyclic gearing providing a coupling

connection between the other element and the other of said shafts and wherein said concentric shafts are coupled together



via planet gearing contained in said epicyclic gearing, so that equal load sharing is ensured between said concentric shafts.

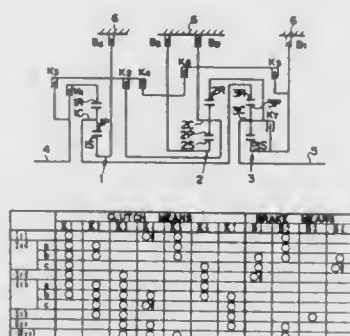
5,087,231
SUPPORTING STRUCTURE FOR OUTPUT SHAFT OF AUTOMOTIVE TRANSAXLE FOR AUTOMOTIVE VEHICLE
 Toshio Yamaguchi; Kazuhiko Sugano, and Kazuyoshi Iwanaga, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan
 Continuation of Ser. No. 281,397, Dec. 8, 1988, abandoned. This application Apr. 15, 1991, Ser. No. 685,985
 Claims priority, application Japan, Dec. 11, 1987, 62-312348
 Int. Cl.⁵ F16H 37/08
 U.S. Cl. 475—200 4 Claims



1. In an automotive power transmission:
 a housing having an open axial end;
 a side cover secured to said housing to sealably close said open end of said housing, said side cover being formed with a generally cylindrical output shaft receptacle including a first cylindrical wall;
 an input shaft rotatably supported in said housing;
 an output shaft with an integral output gear;
 a gear mechanism mounted within said housing and operatively connected between said input shaft and said output shaft;
 an output retainer within said housing, said output retainer being secured to said housing and including an axially extending hollowed portion disposed radially inwardly of said gear mechanism, said axially extending hollowed portion including a radially extending wall and a second cylindrical wall,
 said output shaft including a radially extending portion formed with said output gear and disposed between said side cover and said radially extending wall of said output retainer, and an axially extending portion received in said generally cylindrical output shaft receptacle and received

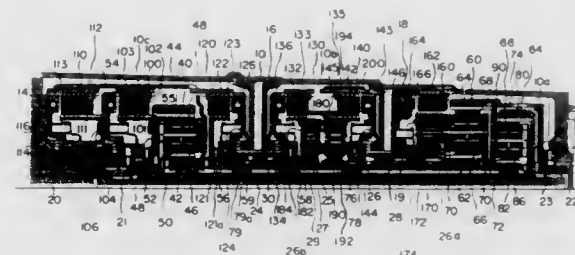
in said hollow axially extending portion of said output retainer,
 said axially extending portion of said output shaft including a first circular surface opposing said first cylindrical wall, and a second circular surface opposing said second cylindrical wall of said output retainer, and
 said radially extending portion of said output shaft including a first radially extending surface adjacent said first circular surface of said axially extending portion, and a second radially extending surface opposing said radially extending wall of said output retainer;
 a ball bearing operatively disposed between said first cylindrical wall of said side cover and said first circular surface of said axially extending portion in abutting relationship with said first radially extending surface of said radially extending portion of said output shaft;
 a radial needle bearing operatively disposed between said second cylindrical wall of said hollow axially extending portion of said output retainer and said second circular surface of said axially extending portion of said output shaft and having a smaller capacity for bearing a radial load than said ball bearing; and
 a thrust needle bearing operatively disposed between said radially extending wall of said output retainer and said radially extending surface of said radially extending portion,
 said first circular surface and said second circular surface of said axially extending portion of said output shaft being disposed on the opposite sides of said radially extending portion of said output shaft.

5,087,232
AUTOMATIC TRANSMISSION
 Toshiyuki Asada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
 Filed May 10, 1990, Ser. No. 521,432
 Claims priority, application Japan, May 10, 1989, 1-116798
 Int. Cl.⁵ F16H 57/10
 U.S. Cl. 475—278 26 Claims



1. An automatic transmission, comprising:
 an input shaft;
 an output shaft; and
 a gear train constituted such that a plurality of gear speeds are set by a plurality of planetary gear sets, each of which is provided with components including a sun gear, a ring gear and a carrier, and one of the planetary gear sets on one of the gear speeds does not participate in the transmission of torque from said input shaft to said output shaft; characterized in that a single or a plurality of uniting clutch means are provided to selectively interconnect at least either two of the components in the planetary gear set adapted not to participate in said transmission of torque.

5,087,233
DUPLICATE TORQUE-TRANSMITTING CONNECTION BETWEEN ROTARY MEMBERS AND SHAFT MEMBERS IN TRANSMISSION
 Toshiyuki Asada, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
 Filed May 3, 1990, Ser. No. 518,414
 Claims priority, application Japan, May 10, 1989, 1-116298
 Int. Cl.⁵ F16H 57/10
 U.S. Cl. 475—278 19 Claims

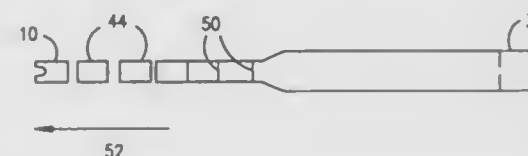


1. A duplicate torque-transmitting connection for connecting a first and a second rotary member, each one of said first and second rotary members having a radial extension and being axially juxtaposed with respect to each other to rotate individually about a common axis with a first shaft member and a hollow second shaft member coaxially and telescopingly disposed around said first shaft member to be respectively in an individually torque-transmitting relationship in a transmission for a vehicle, comprising first external splines formed at an outer periphery of an end portion of said first shaft member axially extending out of an open end of said second shaft member, first internal splines formed at an inner periphery of a central bore formed in said first rotary member and engaged with said first external splines in an axial shifting relationship, second external splines formed at an outer periphery of an end portion of said second shaft member adjacent said open end thereof, and second internal splines formed at an inner periphery of a central bore formed in said second rotary member and engaged with said second external splines in an axial shifting relationship;

wherein said transmission comprises an input rotary member, an output rotary member, a first planetary gear assembly having a first sun gear, a first ring gear, a first set of planetary pinions meshing with both said first sun gear and said first ring gear, and a first carrier supporting said first planetary pinions, a second planetary gear assembly having a second sun gear, a second ring gear, a second set of planetary pinions meshing with both said second sun gear and said second ring gear, and a second carrier supporting said second planetary pinions, a third planetary gear assembly having a third sun gear, a third ring gear, a third set of planetary pinions meshing with both said third sun gear and said third ring gear, and a third carrier supporting said third planetary pinions, a first connecting member for torque-transmittingly connecting said first carrier with said third ring gear, a second connecting member for torque-transmittingly connecting said second ring gear with said third carrier, a third connecting member for torque-transmittingly connecting said second carrier with said third sun gear, a first clutch for selectively torque-transmittingly connecting said input rotary member with said first ring gear, a second clutch for selectively torque-transmittingly connecting said first sun gear with said second carrier as well as said third sun gear, a fourth clutch for selectively torque-transmittingly connecting said first sun gear with said second carrier as well as said third sun gear, a fifth clutch for selectively torque-transmittingly connecting said input rotary member with said second sun gear in series with said second clutch, a first brake for selectively braking rotation of said second car-

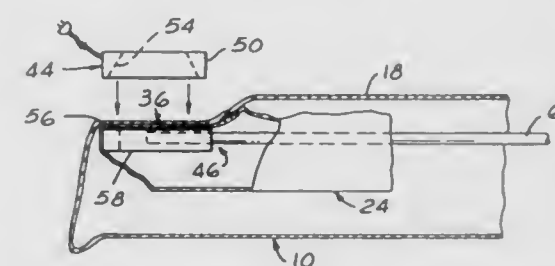
rier as well as said third sun gear, and a second brake for selectively braking rotation of said second sun gear, said output rotary member being torque-transmittingly connected with said second ring gear as well as said third carrier, said first shaft serving for torque-transmittingly connecting said first sun gear with said second carrier as well as said third sun gear through said third clutch, said second shaft member serving for torque-transmittingly connecting said first sun gear with said second carrier as well as said third sun gear through said fourth clutch.

5,087,234
METHOD OF FORMING AN EASY-OPEN BAG PACK
 Randolph D. Prader, Fairport, and Graham Smith, Walworth, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.
 Filed Mar. 19, 1990, Ser. No. 495,070
 Int. Cl.⁵ B31B 23/86, 27/60
 U.S. Cl. 493—194 5 Claims



1. A method of forming a pack of gusseted, polyethylene film, integrally-extended handle bags comprising:
 (a) providing a tube of polyethylene film;
 (b) while in a flattened condition, corona discharge treating the external surfaces of said tube at least in part of the regions which will become cut edges of said bags;
 (c) forming side gussets in said tube;
 (d) transverse-sealing said tube at bag-length distances apart to form a series of end-sealed gusseted pillowcases;
 (e) separating and stacking a plurality of said pillowcases in at least general registration; and
 (f) applying pressure to one end of the stack and severing all the film layers along a line so as to form integrally-extended double-film loop handles and an open mouth region in each bag and simultaneously or sequentially forming handle support orifices in each handle.

5,087,235
METHOD FOR MAKING A COLLAPSIBLE BAG WITH SPOUT
 Lee Lafleur, Manistee, Mich., assignor to Custom Packaging Systems, Inc., Manistee, Mich.
 Filed Sep. 11, 1990, Ser. No. 580,486
 Int. Cl.⁵ B31B 1/84
 U.S. Cl. 493—212 12 Claims



1. A method of forming a collapsible bag having a spout comprising:
 (a) forming a collapsible bag with a continuous peripheral wall from a blank of a flexible and collapsible plastic film;
 (b) forming a separate flexible and collapsible spout from a flexible and collapsible plastic film with a continuous peripheral wall, an enclosed end and an open end;

- (c) positioning the closed end of the spout on the blank;
 (d) attaching and sealing the closed end of the spout to the blank by forming a continuous heat sealed joint; and
 (e) after forming the heat sealed joint removing a portion of the blank of the bag and a portion of the end of the spout both encompassed by the heat sealed joint to provide a through opening encompassed by the heat sealed joint and communicating the spout with the interior of the bag.

5,087,236

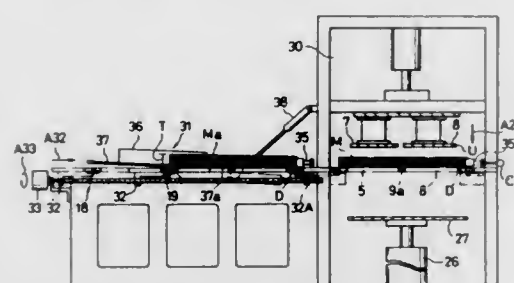
SEPARATING METHOD AND DEVICE FOR SEPARATING A SHAPED SECTION FROM A WASTE SECTION

Hideo Morimoto, 2-16-12 Okino, Adachi-ku Tokyo, Japan
 Filed Dec. 21, 1989, Ser. No. 454,688

Claims priority, application Japan, Dec. 27, 1988, 63-330089;
 Jun. 10, 1989, 63-147182; Jul. 13, 1989, 1-181463
 Int. Cl.³ B26D 1/08, 7/18

U.S. Cl. 493—342

14 Claims



13. A method for separating a shaped section of a sheet of material from a waste section comprising the steps of providing an engaged die including an upper male die and a lower female die, providing at least one sheet of material, said sheet including a plurality of spaced cuts and connecting portions that define the shaped section, conveying said engaged die into a stamping location, disengaging said die members and withdrawing said lower female die from said stamping location, feeding said sheet of material onto said lower female die and conveying said lower female die into said stamping location, separating said connecting portion by urging said sheet into engagement with said female die, supporting said female die with a support while said separating is taking place, and moving said support away from said female die to permit the said separated sections to fall through said female die.

5,087,237

ADJUSTABLE ROTARY WASTE REMOVAL SYSTEM FOR ROLLS OF DIE CUT PAPERBOARD

Forrest E. Nunley, 15240 Las Flores, La Mirada, Calif. 90638
 Filed Oct. 26, 1990, Ser. No. 604,804

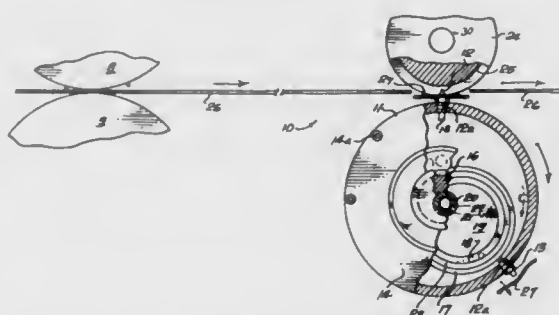
Int. Cl.³ B31B 49/00

U.S. Cl. 493—342

7 Claims

1. An improved adjustable rotary waste removal apparatus for removing and ejecting pieces of paperboard cut from a web of paperboard of the type having a rotary pin cylinder holding a plurality of stripper pins, each of said stripper pins having an ejection sleeve longitudinally movably mounted thereabout, said ejection sleeve being moved outwardly into a stripping position by contact with a cam sleeve mounted within said rotary pin cylinder and said rotary pin cylinder being rotatably mounted adjacent an anvil roller having a plurality of recesses adjacent each stripper pin thereby permitting each stripper pin to pass through a waste portion of a paperboard web so as to remove said waste portion from said stripper pin by said ejection sleeve, wherein said improvement comprises;

a stub shaft and bearing mount for rotatably mounting said rotary pin cylinder;
 an eccentric bushing mounted on said stub shaft, said eccentric bushing having an outer surface and an inner surface, said eccentric bushing supporting a bearing, said bearing rotatably supporting said rotary pin cylinder on the outer surface of the eccentric bushing; and



a cylindrical eccentric cam sleeve having an axis of rotation, said eccentric cam sleeve being rotatably mounted on a hardened cam shaft which is held by said stub shaft at a position separated from said axis of rotation of the cam sleeve, said cam sleeve being within said rotatory pin cylinder.

5,087,238

FORMS CARRIER FOR LASER PRINTERS

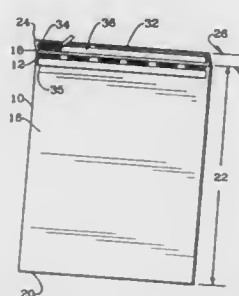
Heidi S. Olson, Barrington, Ill., assignor to HICO Products, Inc., Barrington, Ill.

Filed Aug. 1, 1990, Ser. No. 081,175

Int. Cl.³ B65H 5/28

U.S. Cl. 493—379

6 Claims



1. A method of transporting a plurality of forms through a printing device comprising friction-roller transport means, in which a reusable forms-carrier is provided comprising a reusable sheet of rectangular-shaped, flexible material, the said sheet having a fold-line along its width dividing the sheet into an upper portion and a lower portion that are pivotal relative to each other via the fold-line; the inner surface of the upper portion having a pressure-sensitive adhesive strip along a portion of the width thereof, said method comprising:

- (a) pivoting the upper portion relative to the lower portion along the fold line so that the fold line forms an apex between the lower portion and the upper portion;
 (b) inserting a form to be printed in the printing device on the first portion of the forms-carrier; said step comprising placing the upper edge of the form against the fold-line for substantial linear alignment therewith along the fold line; said step causing the form to be sandwiched between the upper and lower portions;
 (c) pivoting the upper surface after said step (b) until the adhesive strip thereof contacts against a portion of the form juxtapositioned thereat;
 (d) thereafter, inserting the forms-carrier with form into the

- friction-roller transport of the printing device, and printing the form;
 (e) thereafter, separating the adhesive strip from its contact with the form, and removing the form from the forms-carrier; and
 (f) repeating said steps (b) through (e) a second time for a different form to be printed with the same forms-carrier.

5,087,239

TAMPON APPLICATOR

Alan L. Beastall, Havant, and Malcolm G. Guest, Drayton, both of United Kingdom, assignors to Tampax Limited, United Kingdom

Division of Ser. No. 484,434, Feb. 16, 1990, abandoned, which is a continuation of Ser. No. 563,977, Dec. 21, 1983, abandoned.

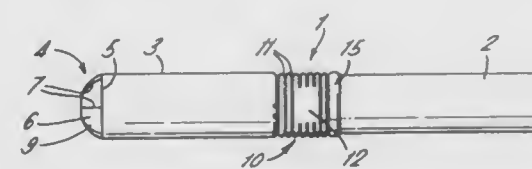
This application Dec. 21, 1990, Ser. No. 631,205

Claims priority, application United Kingdom, Dec. 23, 1982, 8236603

Int. Cl.³ A61F 13/20

U.S. Cl. 604—14

15 Claims



1. A tampon applicator comprising an elongate hollow tampon holder shaped for vaginal insertion and having a tampon expulsion end portion and a plunger mounted in the holder and adapted to expel a tampon through the expulsion end portion from the holder interior, the expulsion end portion comprising a dome-shaped portion, having an appreciable substantially central aperture therein and comprising a plurality of substantially smooth contiguous segments defined by a plurality of radial slits extending from said aperture through said dome-shaped portion to the base of said dome-shaped portion but not beyond, the tampon holder further comprising a weakened region around its periphery positioned at the base of said dome-shaped portion, said weakened region comprising a continuous or discontinuous groove, slots or perforations.

5,087,240

TRANSDERMAL DRUG PATCH WITH CONDUCTIVE FIBERS

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Division of Ser. No. 198,652, May 25, 1988, abandoned, which is a continuation of Ser. No. 922,296, Oct. 23, 1986, which is a division of Ser. No. 839,050, Mar. 12, 1986, Pat. No. 4,640,689, which is a continuation of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 000,080, Jan. 17, 1985, Pat. No. 4,462, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application Oct. 30, 1989, Ser. No. 428,478

Int. Cl.³ A61N 1/30

U.S. Cl. 604—20

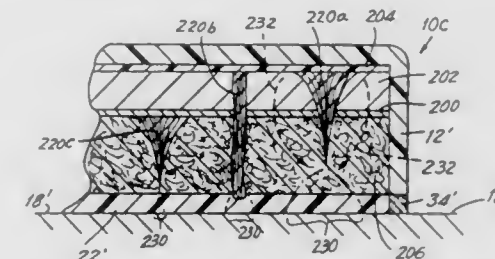
20 Claims

1. A transdermal drug patch for delivery of at least one drug to a living body through the skin into the bloodstream comprising:

- at least two electrodes separated from each other;
 drug reservoir means electrically connected to at least one of said electrodes of said patch for containing the at least one drug, said reservoir means including a medicament-transfer zone for placement at the skin;
 circuit means, including an electrical power source for supplying electric power to said electrodes and said reservoir means;

cover means partially enclosing at least said reservoir means; adhesive means in juxtaposition to said reservoir means for affixing said patch to the skin, whereby when said patch is affixed to the skin the at least one drug is delivered to the skin; and

a plurality of electrically conductive fiber means connected with said circuit means and traversing said reservoir



means for imposing electrical potential between said at least one of said electrodes and the skin so as to substantially bypass the at least one medicament contained in said reservoir means, wherein said electrically conductive fibers bring the electrical potential more directly to the skin where the drug delivery takes place; and aid in reinforcing the drug patch construction.

5,087,241

IONTOPHORESIS ELECTRODE WITH RESERVOIR AND INJECTION SITE

George E. Mathiesen, Inver Grove Heights, and Stacy D. Mattson, Anoka, both of Minn., assignors to Empi, Inc., St. Paul, Minn.

Filed Jul. 24, 1990, Ser. No. 558,250

Int. Cl.³ A61N 1/30

U.S. Cl. 604—20

33 Claims



1. An iontophoresis electrode configured for placement on a patient's skin during a drug treatment, the electrode comprising:

- a flexible backing layer having an aperture and a first surface, the first surface having an adhesive layer for holding the electrode together and for securing the electrode to the skin;
 a conductive material layer attached to the adhesive layer;
 an absorbent pad layer positioned adjacent the conductive material layer, the pad layer holding a drug solution;
 a thin, dispersive material layer which overlies the absorbent pad layer to disperse the solution evenly about a skin-electrode interface, wherein the dispersive material layer and the flexible backing layer enclose the conductive material layer and the absorbent pad layer;
 a plurality of radially oriented slits through the conductive material layer at the aperture in the flexible backing layer, the slits and aperture forming a site at which to inject the drug solution into the absorbent pad layer; and
 an electrical contact attached to the conductive material layer, the contact providing a connection for coupling to a power source.

5,087,242

HYDRATABLE BIOELECTRODE

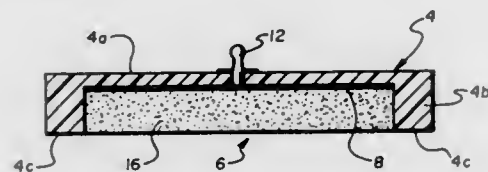
Tomasz J. Petelenz; Stephen C. Jacobsen; Robert L. Stephen; Jon Beck, all of Salt Lake City, Utah, and Jin Shlmada, Falcon Heights, Minn., assignors to Iomed, Inc., Salt Lake City, Utah

Filed Jul. 21, 1989, Ser. No. 383,939

Int. Cl.⁵ A61N 1/30

U.S. Cl. 604—20

6 Claims



1. A hydratable bioelectrode for delivering ions of an ionized fluid into a person's skin or tissue comprising a layer of material for absorbing and holding the ionized fluid when placed in contact therewith, a conductive sheet disposed in close proximity to the layer of material for receiving an electrical charge of the same polarity as the polarity of ions in the fluid to thereby cause such ions form the layer of material away from the conductive sheet, and support means for holding the conductive sheet in close proximity to the layer of material, wherein said layer of material is comprised of a support matrix impregnated with the hydratable polymer, said support matrix comprising a nylon mesh.

5,087,243

MYOCARDIAL IONTOPHORESIS

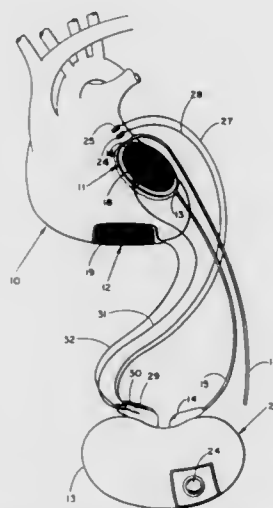
Boaz Avitall, 4868 North Ardmore Ave., Milwaukee, Wis. 53217

Filed Jun. 18, 1990, Ser. No. 539,611

Int. Cl.⁵ A61N 1/30

U.S. Cl. 604—20

8 Claims



1. An implantable iontophoretic delivery system for use in applying medicinal materials rapidly to specific tissue sites of interest comprising:

- a source of electrical current;
- pulse generating means associated with the source of electric current for generating a series of electric current pulses;
- first and second electrodes adapted to be proximately positioned with respect to the tissue site of interest and connected by leads to the source of electrical current, wherein the first electrode further includes means adapted to receive, contain and dispense medicinal materials from a stored supply thereof into proximate tissue of interest in

accordance with a series of benign electric pulses supplied from the pulse generating means and wherein the second electrode is disposed to cooperate with the first electrode to cause infusion of the medicinal material in the desired direction;

- storage means for storing a supply of the medicinal materials;
- conduit means connecting the storage means with the first electrode;
- pump means for supplying an amount of the medicinal materials from the storage means to the first electrode on demand;
- circuit means connected to the source for supplying current pulses generated by the pulse generating means to the electrodes;
- condition sensing means for sensing medical conditions in the tissue of interest requiring application of the medicinal materials to the tissue of interest; and
- control means for activating and deactivating the pump means and pulse generating means in response to sensed conditions.

5,087,244

CATHETER AND METHOD FOR LOCALLY APPLYING MEDICATION TO THE WALL OF A BLOOD VESSEL OR OTHER BODY LUMEN

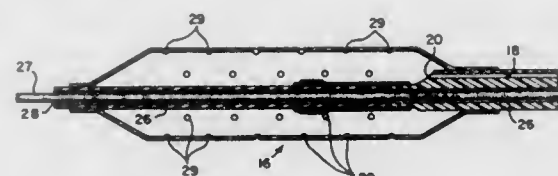
Harvey Wolinsky, New York, N.Y.; Spencer L. King, Atlanta, Ga., and Michael D. Barbere, Dunstable, Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 304,352, Jan. 31, 1989, abandoned. This application Sep. 27, 1990, Ser. No. 590,048

Int. Cl.⁵ A61M 29/00

U.S. Cl. 604—53

21 Claims



4. A catheter for applying a liquid to a surface of the lumen of a body vessel and for effecting penetration of the liquid into the body vessel comprising:

- an elongated flexible shaft having a proximal end and a distal end and having an inflation lumen extending from its proximal toward its distal end;
- a balloon mounted on the distal end of the shaft, the interior of the balloon being in communication with the inflation lumen, the balloon being flexible, and substantially inelastic, the balloon having a plurality of minute perforations adapted to provide a low, weeping flow rate of said liquid, said flow rate being no greater than a predetermined maximum flow rate when liquid in the balloon is under pressure;
- said perforations defining a flow area sufficiently small so as not to adversely restrict collapsing of the balloon about the catheter shaft under the influence of aspiration applied to the inflation lumen.

5,087,245

SYSTEM AND METHOD FOR DETECTING ABNORMALITIES IN INTRAVASCULAR INFUSION

David Doan, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Mar. 13, 1989, Ser. No. 322,291

Int. Cl.⁵ A61M 31/00

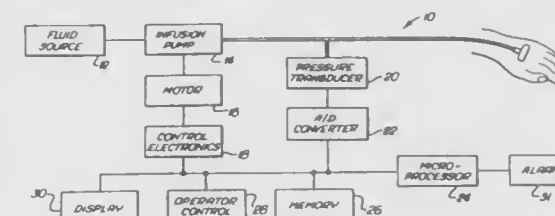
U.S. Cl. 604—67

47 Claims

- 1. A system for detecting abnormalities in infusion of paren-

teral fluid from a parenteral fluid delivery system to a patient comprising:

- a) infusion means for producing a perturbation of said fluid flow by varying the rate of fluid flow from an equilibrium flow rate with a specific volume of fluid;
- b) sensor means for measuring pressure of said fluid over a period of time and adapted to generate a signal representing a pressure response of said fluid to said perturbation and a signal representing an equilibrium pressure level;
- c) first integrator means operatively connected to said sensor means for determining a first integral of the difference between said equilibrium pressure signal and said pressure response signal over time, and for generating a signal representing said first integral;
- d) means for determining resistance to said infusion of fluid from the delivery system adapted to scale said first inte-



gral signal according to said specific volume, and for producing a signal representing the resistance to fluid flow;

- e) second integrator means for determining a second integral by multiplying the difference between said pressure response signal over time and said equilibrium pressure signal by a value representing said time, and integrating the resultant product with respect to said time, and adapted to generate a signal representing said second integral determined; and
- f) means responsive to said first and second integrator means for determining compliance of said fluid delivery system by dividing said second integral signal by said first integral signal to produce a signal representing an effective time constant, and by scaling said effective time constant by said previously determined resistance to produce a signal representing compliance of said fluid delivery system.

5,087,246

DILATION CATHETER WITH FLUTED BALLOON

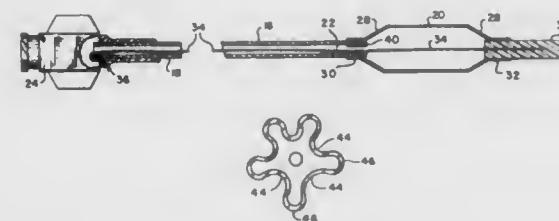
Charles E. Smith, Lowell, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Dec. 29, 1988, Ser. No. 291,566

Int. Cl.⁵ A61M 29/00

U.S. Cl. 604—96

7 Claims



- 1. A balloon dilation catheter comprising: an elongate flexible tubular shaft having proximal and distal ends and at least one lumen extending through the shaft from its proximal to its distal end;
- a dilatation balloon mounted on the distal end of the shaft and in communication with the lumen;
- the balloon being preformed to have a collapsed configuration defined by at least three longitudinally extending flutes and alternating wings;

a fitting at the proximal end of the shaft for connecting the lumen with an inflation and deflation device;

- a stiffening wire extending through the balloon and being rigidly attached to the distal portion of the shaft proximally of the balloon, the distal end of the wire having a catheter tip mounted thereon, the balloon being mounted at its proximal end to the flexible shaft and at its distal end to the catheter tip;
- the balloon being mounted on the catheter in a manner that when the balloon is not inflated, the wire will apply continually a longitudinal tension to the balloon, thereby tensioning the balloon in its fluted configuration, the balloon being substantially non-extendible longitudinally when under said tension.

5,087,247

BALLOON PERFUSION CATHETER

Joseph B. Horn, Topsfield, Mass.; Allen J. Tower, North Lawrence, N.Y., and James F. King, Wauwatosa, Wis., assignors to Cardiovascular Designs, Inc., Peabody, Mass.

Filed Aug. 28, 1990, Ser. No. 574,370

Int. Cl.⁵ A61M 29/00

U.S. Cl. 604—98

17 Claims



1. A dilation catheter, comprising:

- (a) a flexible elongated shaft having a first lumen longitudinally extending therewithin and a second lumen longitudinally extending therewithin;
- (b) a perfusion shaft outwardly extending from and in communication with the first lumen;
- (c) a balloon circumscribing the perfusion shaft, the perfusion shaft having a plurality of openings proximal and distal to the balloon; and
- (d) an inflation shaft outwardly extending from and in communication with the second lumen, the perfusion shaft for at least a portion of its length being physically separate from the inflation shaft.

5,087,248

DEVICE FOR ANCHORING AN INTRAVENOUS NEEDLE

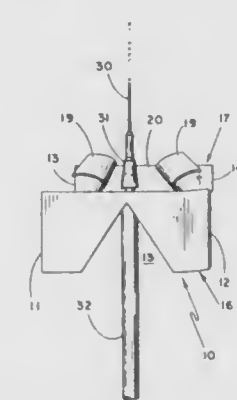
Arthur A. Beisang, III, Shoreview, Minn., assignor to Genetic Laboratories Wound Care, Inc., St. Paul, Minn.

Filed Feb. 20, 1990, Ser. No. 481,319

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—180

2 Claims



- 1. A stabilizing foldover adhesive anchoring device for securing an intravenous needle to the skin of a patient at a point

spaced from the transcutaneous insertion site by engaging the hub of the needle comprising:

- a continuous patch of flexible asymmetrically elastic sheet material having an easy axis and a hard axis with regard to the elasticity;
- wherein the patch is substantially rectangularly shaped and divided to include large and small abutting parallel rectangular sections integrally joined for a distance parallel to the easy axis of elasticity and adapted to engage an intravenous needle disposed generally at right angles to the easy axis of the material;
- the small section further being configured with a tab portion that is predisposed to readily disengage in part from the larger section and fold on itself to adhesively engage the periphery of the needle hub therebetween;
- wherein the large section has a central substantially triangularly shaped cut-out facing the small section and is adapted to fold over itself and the flap portion containing the hub and adhesively attach to the flap portion and the skin, thereby attaching the entire assembly to the skin with the cut-out exposing the transcutaneous insertion site; and
- an amount of adhesive material applied to one surface only of the patch material such that the patch is required to be positioned with the adhesive side away from the skin prior to engaging the needle.

5,087,249

SYRINGE CAP HOLDING DEVICE

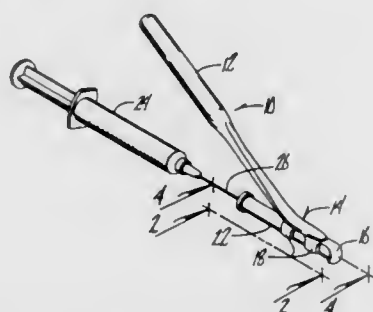
Richard E. Deal, 614 S. Moore, Algona, Iowa 50511

Filed Aug. 21, 1990, Ser. No. 570,504

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—192

16 Claims



1. A hand-held syringe cap holding device, comprising: a handle;
- a head member integrally connected to the handle and having at least one pair of opposed, resilient clips extending therefrom, and having a closed terminal end, whereby a syringe cap is releasably held within the head member by the clips; and
- the handle extending angularly from the head member such that a user's hand is remote from the head member.

5,087,250

AUTOTRANSFUSION UNIT WITH VACUUM REGULATION AND CARDIOTOMY RESERVOIR

Leo J. Lichte, Riverside, and Jack W. Brown, Santa Ana, both of Calif., assignors to Gish Biomedical, Inc., Santa Ana, Calif. Continuation of Ser. No. 224,307, Jul. 26, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 481,861

Int. Cl.⁵ A61M 1/00

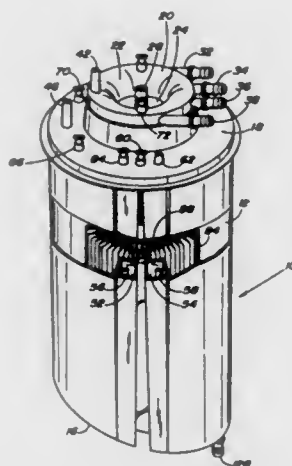
U.S. Cl. 604—321

16 Claims

16. A method of providing cardiomy and autotransfusion functions respectively during and after an operating procedure comprising:

providing a single vessel formed of a non-collapsible material which has a body fluid reservoir, a filter, and vacuum regulating means therein;

- withdrawing body fluid from a patient during an operating procedure;
- delivering said body fluid to said body fluid reservoir through the filter in said reservoir;
- withdrawing said body fluid from said reservoir;
- delivering said body fluid back to a patient during said operating procedure;
- after said operating procedure, discontinuing withdrawing fluid from a patient and discontinuing delivering fluid to a patient;



- connecting said reservoir to a vacuum source through said vacuum regulating means;
- withdrawing fluid from a patient during an autotransfusion procedure by said regulated vacuum drawing body fluid into said body fluid reservoir;
- withdrawing said body fluid from said body fluid reservoir by a positive displacement pump; and,
- pumping said body fluid from said positive displacement pump to a patient to provide autotransfusion after cardiomy functions wherein said cardiomy function and autotransfusion are performed through the same unit.

5,087,251

ENTIRELY DISPOSABLE UNITARY URINE DRAINING BAG AND SUPPORT HARNESS SYSTEM

Arnold M. Heyman, 2701 W. Alameda Ave., Burbank, Calif. 91505, and Paul Choksi, 10935 Yolanda Ave., Northridge, Calif. 91326

Continuation of Ser. No. 317,042, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 127,519, Dec. 1, 1987, abandoned, which is a continuation of Ser. No. 900,818, Jul. 28, 1986, abandoned. This application Jan. 9, 1991, Ser. No. 639,328

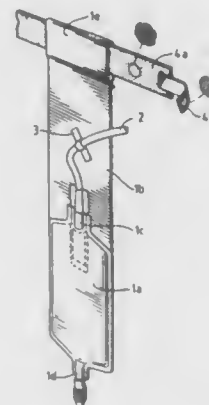
Int. Cl.⁵ A61M 1/00; A61F 5/44

U.S. Cl. 604—327

25 Claims

1. A disposable fluid collection system receiving fluid from a patient via a catheter comprising:
 - (a) an elongated generally rectangular unitary sheet of non-porous, substantially inelastic, material having
 - (i) a first end portion fashioned into at least one belt loop;
 - (ii) an opposite second end portion defining a fluid reservoir having a fluid inlet port and a bottom fluid outlet port; and
 - (iii) a central planar portion extending between the fluid reservoir and the at least one belt loop, the central planar portion being longer in the direction from the reservoir to the belt loop than it is wide and having a length sufficient to extend from adjacent the patient's leg to adjacent the patient's hip such that the reservoir may be located adjacent the patient's leg while the at least one belt loop is located adjacent the patient's waist, the central planar portion presenting a substantially

- smooth surface to which the catheter may readily and repetitively be taped and untaped; and
- (b) a belt disposed through said at least one belt loop of sufficient length so as to circumferentially engage the waist of the patient so that the material sheet hangs at the waist of the patient;



wherein, the substantially inelastic material employed for the sheet of material and the dimension of the sheet of material cooperate to minimize visible bulging of the system when the system is worn under a patient's clothing.

5,087,252

URINARY CATHETER FOR HUMAN MALES

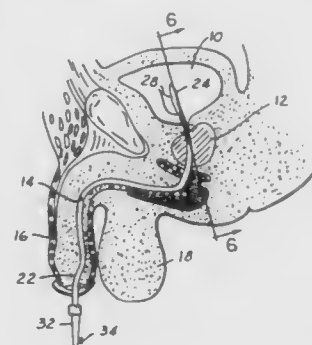
Ruthie Denard, 74 Garfield, Apt. 305, Detroit, Mich. 48201

Filed Jul. 18, 1990, Ser. No. 553,613

Int. Cl.⁵ A61F 5/44

U.S. Cl. 604—346

7 Claims



1. A urinary catheter insertable into the urinary bladder of a human male through the penis and urethra for the withdrawal of urine from the urinary bladder comprising an elongated tubular flexible element having a pair of end portions, the first end portion constituting the leading end of the catheter which is introduced into the urinary bladder, one or more openings provided in said first end portion delivering urine from the urinary bladder into the tubular flexible element, the other end portion of said tubular flexible element constituting the trailing end of the catheter which is not insertable into the penis, and valve means provided between said end portions for opening and closing the tubular element to permit withdrawal of urine from the tubular element or collection of urine within the tubular element, said tubular flexible element extending through a center portion of a support strap, said support strap having a pair of arms with each arm having an adhesive for securing said arm to a patient to assist in preventing accidental withdrawal of the flexible tubular element; and
- said valve means is an on-off type valve having a valve element with a passage therein, a shaft connected to said valve element, and an operating handle secured to said

shaft for rotating same thereby opening or closing said valve means.

5,087,253

COMBINATION DIAPER TRAINING PANT FOR ADULTS AND CHILDREN

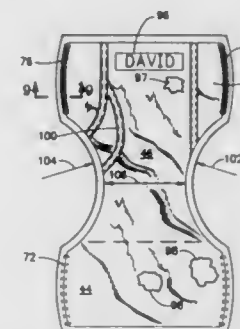
Rosanna M. Cooper, P.O. Box 31869, Aurora, Colo. 80041

Continuation-in-part of Ser. No. 550,969, Nov. 14, 1983, Pat. No. 4,615,695. This application Jun. 20, 1986, Ser. No. 876,767

Int. Cl.⁵ A61F 13/15

U.S. Cl. 604—385.1

1 Claim



1. A disposable incontinent garment adapted to be worn on the body by incontinent persons, comprising an outer fluid resistant panel, a wettable inner absorbent panel and a fluid absorbent intermediate panel positioned between said inner and outer panels, said outer and inner panels having a common hourglass shape and having a perimeter formed by first and second top edge forming portions, arcuate edge portions defining a mid-portion of reduced width and side edge portions extending between the ends of each arcuate edge portions and top edge forming portions, said outer and inner panels joined along said perimeter and configurable in a position during wear such that the wettable inner absorbent panel is against the body and wherein the top edge forming panels will form a waist edge and respective pairs of said side edges will overlap one another to form partible hip sections so that arcuate edge portions each closes on itself to form a leg opening, fastening means along margin portions adjacent said side edges for releasably securing the respective pairs of overlapped side edges together, said inner and said intermediate panels being formed substantially the same, and each including a fly opening offset with respect to a longitudinal axis when the incontinent garment is joined during wear whereby the intermediate and inner panels are oriented with their fly openings staggered with respect to said longitudinal axis, and said outer panel having an outer fly opening offset with respect to the longitudinal axis and which outer fly opening is coextensive with the fly opening of the intermediate panel.

5,087,254

ABSORBENT PRODUCTS HAVING INTEGRAL TRANSVERSE RETAINING TAB AND POCKET

Martha Davis, New York, N.Y.; Daniel Formosa, Montvale, N.J.; Jeannie Gerth, Brooklyn, N.Y.; Patricia A. Moore, Montvale; Stephen Russak, Hoboken, both of N.J.; Tamara Thomsen, and Tucker Viemeister, both of New York, N.Y., assignors to McNeil-PPC, Inc., Milltown, N.J.

Filed Jul. 6, 1990, Ser. No. 548,787

Int. Cl.⁵ A61F 13/15

U.S. Cl. 604—386

20 Claims

1. A sanitary napkin comprising:
 - (a) a central absorbent element having longitudinally extending sides, transverse ends, a body-facing side and an undergarment-facing side;
 - (b) pocket means disposed on said undergarment-facing side of said central absorbent element; and
 - (c) tab means extending laterally from one of said longitudinal

nally extending sides of said central absorbent element for a distance greater than about a width of said absorbent element and sized to be partially inserted into said pocket



means after being wrapped around a crotch area of an undergarment for aiding in securing said sanitary napkin to said undergarment.

5,087,255

ABSORBENT ARTICLE HAVING INFLECTED BARRIER CUFFS

Bret A. Sims, Villa Hills, Ky., assignor to The Procter & Gamble Company, Cincinnati, Ohio

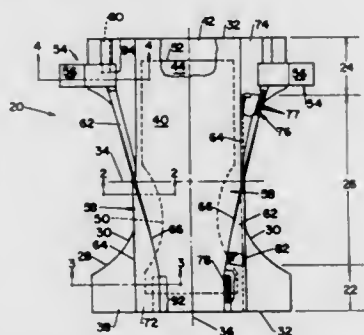
Continuation of Ser. No. 288,045, Dec. 21, 1988, abandoned.

This application Aug. 1, 1990, Ser. No. 561,475

Int. Cl.³ A61F 13/00

U.S. Cl. 604—385.1

6 Claims



1. A unitary disposable absorbent article having a first waist region, a second waist region, a crotch region disposed between said first waist region and said second waist region, longitudinal edges, and end edges, the disposable absorbent article comprising:

a liquid pervious topsheet;
a liquid impervious backsheet associated with said topsheet;
an absorbent core positioned between said topsheet and said backsheet, said absorbent core having side edges and waist edges;

a side flap extending outwardly from each side edge of said absorbent core in at least the crotch region;

a barrier cuff disposed adjacent each longitudinal edge of the absorbent article, each of said barrier cuffs having a proximal edge and a distal edge, said proximal edge being joined to said side flap;

spacing means operatively associated with said barrier cuff for spacing said distal edge away from said topsheet of the absorbent article;

first closing means for securing a portion of said distal edge of said barrier cuffs to the absorbent article inboard of said proximal edge and over said absorbent core, said first closing means being disposed in said first waist region of the absorbent article in a first closure zone which first

closure zone is disposed inboard of said side flap and over said absorbent core; and

second closing means for securing a portion of said distal edge of said barrier cuffs to the absorbent article outboard of said proximal edge, said second closing means being disposed in said second waist region of the absorbent article in a second closure zone.

wherein said barrier cuffs are inverted in said second waist region relative to said first waist region; and

fastening means for securing the absorbent article on the wearer, said fastening means being positioned in said second waist region of the absorbent article which fastening means is secured to said distal edge of said barrier cuff and secures said distal edge to said topsheet to provide the absorbent article with a closure around the circumference of the wearer's waist and an effective means for anchoring the distal edge of the barrier cuff at the top of the wearer's leg which utilizes the same forces utilized to secure the article on the wearer to also provide the barrier cuff with a snug contoured fit around the wearer's buttocks.

5,087,256

THERMAL ATHERECTOMY DEVICE

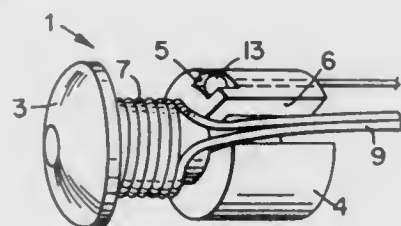
James M. Taylor, Mountain View, Calif.; Eric L. Gay, Ann Arbor, Mich.; Mark J. Cowell, San Carlos, Calif., and David F. Wirt, Prescott, Wis., assignors to Metcal Inc., Menlo Park, Calif. and Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 464,399, Jan. 12, 1990, Pat. No. 5,047,025. This application Oct. 5, 1990, Ser. No. 593,790

Int. Cl.³ A61B 17/36

U.S. Cl. 606—28

21 Claims



1. A thermal atherectomy catheter for use in blood vessels and the like comprising

a tip of high magnetic permeability including a cylindrical body terminating at one end in an enlarged head and at its other end in an enlarged collar,

a coil of wire adapted to be connected to a source of current wound about said cylindrical body essentially abutting said head and removed from said collar.

5,087,257

APPARATUS FOR MONITORING THE APPLICATION OF NEUTRAL ELECTRODES ON A PATIENT UNDERGOING HIGH FREQUENCY ELECTRO-SURGERY

Günter Farin, Tübingen; Franz Geiselhart, Reutlingen, and Johannes Klett, Ofterdingen, all of Fed. Rep. of Germany, assignors to Erbe Elektromedizin GmbH, Tübingen, Fed. Rep. of Germany

Filed Mar. 21, 1990, Ser. No. 496,885

Claims priority, application European Pat. Off., Apr. 1, 1989, 89105740

Int. Cl.³ A61B 17/39

U.S. Cl. 606—35

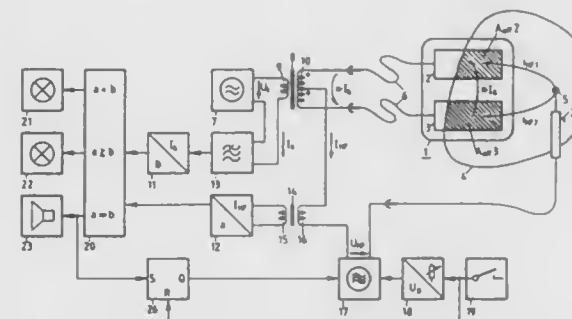
17 Claims

1. Apparatus for monitoring the application, to a patient, of neutral electrode contact surfaces during high-frequency electro-surgery performed with equipment comprising at least two neutral electrodes and an active electrode, as well as a high frequency electric current generator including a power-supply for its energization, said contact surfaces comprising respective

surfaces (2, 3) of said at least two neutral electrodes which are independent of each other and insulated from each other and are applied to the same patient for returning a high frequency current (1HF) said monitoring apparatus comprising:

means (12, 14—16; 28, 29) connectable in circuit with said at least two neutral electrodes and said high frequency electric current generator for producing a first electrical signal (a) dependent upon a parameter representative of heating of biological tissue of the patient;

means (7—11, 13) connectable in circuit with said at least two neutral electrodes for producing a second electrical signal (b) dependent on the electrical conductivity of a current path between said electrode surfaces (2, 3) of said independent neutral electrodes as a measure of transition conduc-



tivities between said respective electrode surfaces and the patient's body;

means (20) connected with said first signal and second signal producing means for comparing respective magnitudes of said first and second signals (a, b) and for thereby producing at least one control signal, and

means connected to said comparing means and responsive to said at least one control signal for producing an optical signal, an acoustic signal or an interruption of said high frequency current, in response, individually, to at least one of the following eventualities: said second signal (b) exceeds said first signal (a) in magnitude; said first signal (a) is equal to or greater than said second signal (b); said first signal (a) greatly exceeds said second signal (b).

5,087,258

RING SPLINT TO SET, AFFIX AND REGULATE THE TENSION POSITION OF BONE SEGMENTS

Thomas Schewior, Fasanenweg 10, D-6903 Neckargemünd, Fed. Rep. of Germany

PCT No. PCT/DE88/00323, § 371 Date Jan. 19, 1990, § 102(e)

Date Jan. 19, 1990, PCT Pub. No. WO88/10099, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 4, 1988, Ser. No. 457,745

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720242

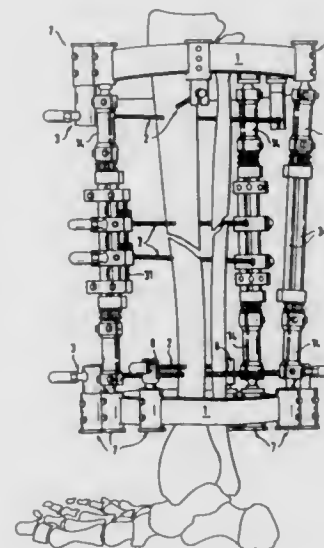
Int. Cl.³ A61F 5/04

U.S. Cl. 606—56

11 Claims

1. A ring splint for setting and fixing bones and regulating stress in the same, comprising a pair of spaced, arcuate members each of which constitutes a ring or ring segment, said arcuate members having rectangular or square cross sections; a plurality of elongated struts connecting said arcuate members to one another and having respective longitudinal axes, each of said struts including a pair of tension sleeves, and each of said tension sleeves having a first bearing portion for adjustably coupling the associated strut to one of said arcuate members and a second bearing portion spaced from the respective first bearing portion, at least one bearing portion of each strut being designed to permit angular adjustment of the respective strut, and each of said struts further including an interchangeable, spindle-like element receivable in a respective second bearing portion for rotation relative thereto so as to adjust the length of the respective strut, each of said struts being provided with a slit-like gap which extends along the longitudinal axis thereof;

a plurality of wires for holding a bone in a predetermined position, said wires being provided with continuous threads; a plurality of wire bearings each of which includes a U-shaped element designed to embrace one of said arcuate members in such a manner as to be shiftable along the respective arcuate member, each of said wire bearings a further including a perforated element having a passage for one of said wires, said U-shaped elements and perforated elements being provided



with cooperating connecting portions for rotatably connecting a U-shaped element to the respective perforated element in a plug-like fashion, and each of said wire bearings also including a coupling element receivable in one of said first bearing portions to adjustably couple the respective wire bearing and arcuate member to a corresponding strut; a plurality of fasteners for clamping said U-shaped elements, perforated elements and spindle-like elements; and a plurality of nuts screwable onto said wires so as to tension and guide the same.

5,087,259

ORTHOPEDIC PLATE TO FIX IN POSITION PORTIONS OF BONE WHEN RECONSTRUCTING THE LOWER JAW

Christian Krenkel, Moosstrasse 126, A-5020 Salzburg, Austria

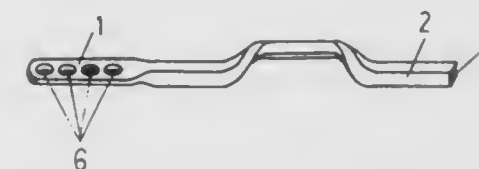
Filed Dec. 12, 1990, Ser. No. 626,297

Claims priority, application Austria, Dec. 22, 1989, 2922/89

Int. Cl.³ A61F 5/00

U.S. Cl. 606—60

3 Claims



1. An orthopedic plate to fix in position portions of bone during reconstruction of the lower jaw, comprising an elongate body having opposite flat end regions and a center portion; said end regions having a width and a thickness, and having a plurality of openings through the thickness for receiving attachment screws; said center portion extending between said end regions in a plane perpendicular to the axis of said openings, wherein said center portion is composed of a material which can be permanently deformed by bending; and wherein the center portion of the plate is essentially in the shape of a square in cross-section.

5,087,260

TOTAL FEMORAL HIP SYSTEM

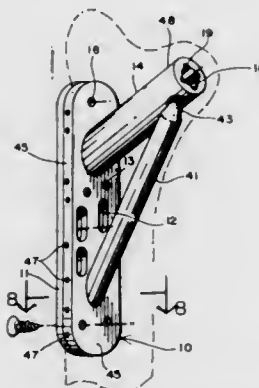
Irving E. Fixel, 111 N. 31st Ave., Hollywood, Fla. 33021

Filed Sep. 15, 1989, Ser. No. 407,563

Int. Cl.⁵ A61F 5/04

U.S. Cl. 606—65

9 Claims



1. Combination hip compression screw and total hip replacement apparatus adapted to be secured to a person's femur comprising:

an elongated plate having a barrel member attached at one end of said plate and extending cantileverly therefrom; said plate including means for attaching said plate to said femur; and

a brace for structurally supporting the cantilever attachment of said barrel to said plate said brace having a first end fixedly attached to said plate and a second end disengaged from, and in supporting contact to said extending barrel member.

5,087,261

SAW-BLADE FOR SAWING LIVING HUMAN BONE

Leif E. S. H. Ryd; Anders O. Bertilsson-Lindstrand, both of Lund, and Sören Toksvik-Larsen, Staffanstorp, all of Sweden, assignors to MIT AB, Sjöbo, Sweden

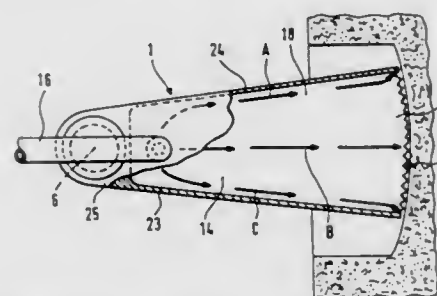
PCT No. PCT/SE89/00141, § 371 Date Sep. 20, 1990, § 102(e) Date Sep. 20, 1990, PCT Pub. No. WO89/09028, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 17, 1988, Ser. No. 572,946

Claims priority, application Sweden, Mar. 21, 1988, 8801016 Int. Cl.⁵ A61B 17/14

U.S. Cl. 606—82

10 Claims



1. A saw blade for sawing living human bone during surgical operations, said saw blade comprising an elongated flattened tube having a substantially rectangular cross section and terminal edges including at least a pair of spaced parallel edges extending along one side of the saw blade, said tube defining a coolant duct terminating at and between said terminal edges over substantially the full length of the terminal edges; saw portions disposed along at least said pair of spaced parallel terminal edges with the terminus of said duct disposed between the saw portions; and means for admitting coolant to the duct;

whereby coolant may be circulated throughout the duct and between the saw portions.

5,087,262

AMNIOTIC MEMBRANE PERFORATOR

John A. Sheahon, U-2, Rte. 4, Lake Lotawana, Mo. 64063

Filed Apr. 6, 1990, Ser. No. 505,692

Int. Cl.⁵ A61B 17/24

U.S. Cl. 606—125

2 Claims



1. A perforator for penetrating amniotic sac tissue of a patient comprising:

an elongated shaft having proximal and distal ends, said shaft having a configuration for insertion into a vaginal canal of the patient with a length to allow said distal end to be positioned adjacent the amniotic sac while said proximal end is positioned exterior of the vaginal canal; perforating means at said distal end of said shaft comprising:

a pair of spaced-apart lobes extending from said distal end of said shaft and diverging from a central longitudinal axis of said shaft, said lobes extending toward the amniotic sac upon said positioning of said shaft in the canal by a user, said lobes having a configuration hindering a puncture of the amniotic sac tissue;

said diverging lobes defining an area therebetween for the reception of a downwardly bulging portion of the adjacent amniotic sac between said lobes upon an urging of said lobes against the sac by a first manipulation of said proximal end of said shaft by the user;

puncture means extending from said distal end of said shaft and fixed between said lobes, said lobes of said shaft extending beyond said puncture means to allow for said bulging of the sac between said lobes upon said first user manipulation of said distal end prior to a subsequent piercing of the bulging portion of the sac between said lobes by said puncture means upon a second manipulation of said proximal shaft end by the user.

5,087,263

SUTURE THROW HOLDER AND RUNDOWN SYSTEM

Lehmann K. Li, Wellesley, Mass., assignor to Mitek Surgical Products, Inc., Norwood, Mass.

Filed Apr. 25, 1990, Ser. No. 514,179

Int. Cl.⁵ A61B 17/00

U.S. Cl. 606—148

4 Claims

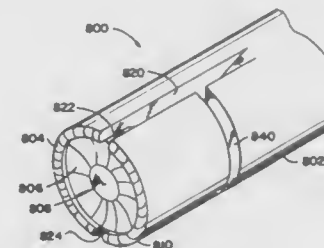
1. A rundown tool for running a throw formed in two lengths of suture emanating from a surgical site down the suture lengths to the surgical site, said tool comprising:

an elongate, substantially cylindrical shaft, said shaft including an outer surface, a longitudinal axis, a proximal end, a distal end, a proximal end portion adjacent said proximal

end, a distal end portion adjacent said distal end, and a connecting portion between said proximal end portion and said distal end portion,

said distal end portion including axially extending walls adjacent said outer surface of said shaft, said walls defining a cavity extending substantially axially into said distal end of said shaft, said cavity being sized to receive said throw,

said connecting portion defining a pair of opposing longitudinal slots and a radial slot in said outer surface of said



shaft, each said slot being sized to receive a length of said suture therein, the radial depth of each of said longitudinal slots being such that said connecting portion defines a diametrical opening sized to receive at least one length of said suture therethrough, said radial slot extending from said opposing longitudinal slots to said outer surface adjacent said diametrical opening in said connecting portion, whereby a length of said suture emanating from said said throw may be inserted into slidable relation with said diametrical opening without threading the free end of said suture length therethrough.

5,087,264

VENOUS VALVE-INCISING DEVICE

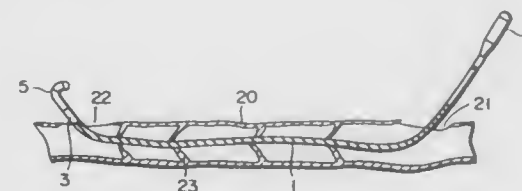
Arnold Miller, Boston, Mass.; David E. Barlow, Hicksville, N.Y., and Tatsuya Saitoh, Funabashi, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 543,229

Claims priority, application Japan, Nov. 28, 1989, 1-308475 Int. Cl.⁵ A61B 17/32

U.S. Cl. 606—159

22 Claims



1. A venous valve-incising device for incising venous valves from a vein, comprising:

a flexible insertion member having a distal end; a plurality of hard tips, each tip being attachable to the distal

end of the insertion member, each of said hard tips including:

a rod portion having an axis; and a curved end portion which is curved at a predetermined angle with respect to said axis of said rod portion, said curved end portion having a front portion and a rear edge portion and a cutting blade formed on said rear edge portion;

said cutting blades of each of said hard tips having a size and shape, at least one of said size and shape of each cutting blade being different from that of another cutting blade; and

coupling means for detachably coupling the rod portion of a selected one of said plurality of said hard tips to the distal end of said insertion member, said selected one of said hard tips being chosen based on the size of the vein and the shape of the venous valve which is to be incised.

5,087,265

DISTAL ATHERECTOMY CATHETER

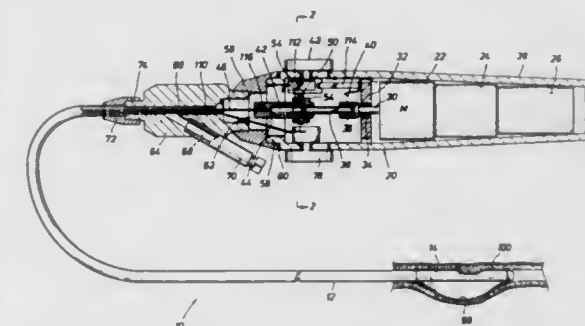
David P. Summers, Montgomery, Tex., assignor to American BioMed, Inc., The Woodlands, Tex.

Continuation-in-part of Ser. No. 312,737, Feb. 17, 1989, Pat. No. 4,994,067. This application Jul. 24, 1989, Ser. No. 383,606

Int. Cl.⁵ A61B 17/00

U.S. Cl. 606—159

15 Claims



1. An atherectomy catheter for removal of occlusive material in a blood vessel, tract, or cavity, comprising:

(a) a catheter tube;

(b) a cutter head assembly mounted on the distal end of said catheter tube for excising occlusive material blocking the blood vessel, tract or cavity;

(c) flexible drive means extending through said catheter tube;

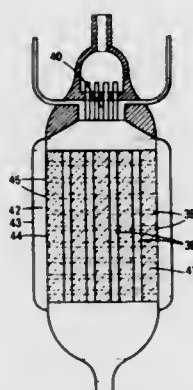
(d) a rotary cutter housed within said cutter head assembly and connected to said flexible drive means;

(e) power means connected to the proximal end of said catheter tube for rotating and reciprocating said rotary cutter;

(f) a pair of bendable wires extending externally along said catheter tube, wherein upon actuation said wires bow outwardly against the interior wall of the blood vessel, tract or cavity for urging said cutter head assembly laterally against the occlusive material; and

(g) means connected to said catheter tube for evacuating the excised occlusive material from the blood vessel, tract or cavity.

second means for feeding a second part of the combustive agent into the reaction zones, said second means comprising a supply chamber for supplying said second part of the combustive agent to said porous wall and said porous wall through which the second part of the combustive agent passes to thereby form a reaction limiting layer for protection of the porous wall from the gases being converted in said reaction zones and for prevention of accumulation of soot on the porous wall within said reaction zones; an interior casing, and at least one porous element positioned within said casing, said at least one porous element defining two groups of channels for the



passage of gases, said porous wall comprising a plurality of porous wall portions located between said two groups of channels, a first group of said two groups of channels defining the several reaction zones within said reactor and a second group of said two groups of channels supplying the second part of the combustive agent to the plurality of porous wall portions; said supply chamber surrounding a portion of said interior casing and being in fluid communication with said second group of channels for supplying the second part of the combustive agent to said second group of channels and into said several reaction zones via said porous wall portions.

5,087,271

PARTIAL OXIDATION PROCESS

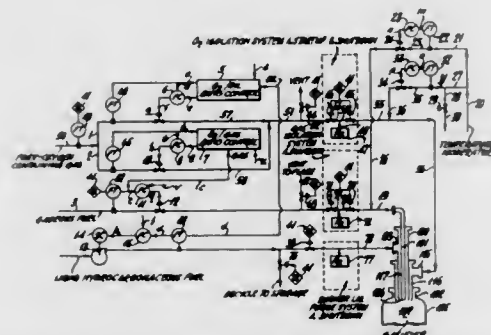
Robert J. Stellaccio, Spring, and Michael M. Dach, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,551

Int. Cl.⁵ C10J 3/46

U.S. Cl. 48—197 R

38 Claims



1. A process for controlling the feed to the reaction zone of a free-flow partial oxidation gas generator comprising the steps of:

- (1) sensing the flow rate of a first stream of free-oxygen containing gas and providing a corresponding signal a to a first ratio control means and to a first flow control means, sensing the flow rate of a second stream of free-oxygen containing gas and providing a corresponding signal b to a second ratio control means and to a second flow control means, wherein said first and second streams of free-oxygen containing gas are supplied with free-oxy-

gen containing gas from a main oxygen feed-line, sensing the flow-rate of a stream of gaseous fuel and providing a corresponding signal c to said second ratio control means and to a third flow control means, sensing the flow rate of a stream of liquid hydrocarbonaceous fuel and providing a corresponding signal d to said first ratio control means and to a fourth flow control means, sensing the flow-rate of a first stream of temperature moderator and providing a corresponding signal m to a fifth flow control means, comparing signal m in said fifth flow control means with a preset signal representing the desired flow rate for said first stream of temperature moderator and providing an adjustment signal n to a flow control means for said first stream of temperature moderator, sensing the flow rate of a second stream of temperature moderator and providing a corresponding signal o to a sixth flow control means, comparing signal o in said sixth flow control means with a preset signal representing the desired flow rate for said second stream of temperature moderator and providing an adjustment signal p to a flow control means for said second stream of temperature moderator;

- (2) dividing said oxygen signal a by said liquid fuel signal d in said first ratio control means to produce a signal corresponding to the actual O₂/liquid hydrocarbonaceous fuel weight ratio and comparing said signal in said first ratio control means with a preset signal representing the desired O₂/liquid hydrocarbonaceous fuel weight ratio and providing a corresponding adjustment signal e to said first flow control means from which adjustment signal f is provided to a first oxygen control valve which controls the rate of flow of said first stream of free-oxygen containing gas from (1);

- (3) dividing said oxygen signal b by said gaseous fuel signal c in said second ratio control means to produce signal t corresponding to the actual O₂/gaseous fuel weight ratio, comparing said signal t in said second ratio control means with a preset signal representing the desired O₂/gaseous fuel weight ratio, and providing a corresponding adjustment signal g to said second flow control means from which adjustment signal h is provided to a second oxygen control valve which controls the rate of flow of said second stream of free-oxygen containing gas from (1);

- (4) combining together said first and second streams of free-oxygen gas streams leaving steps 2 and 3;

- (5) comparing said signal c corresponding to the flow rate of the gaseous fuel in said third flow control means with a preset signal v representing the desired flow rate for the gaseous fuel, and producing a corresponding adjustment signal i for a gas control valve which controls the rate of flow of said stream of gaseous fuel into the reaction zone of said gas generator;

- (6) comparing said signal d corresponding to the flow rate of the liquid hydrocarbonaceous fuel in said fourth flow control means with a preset signal j representing the desired flow rate for the liquid hydrocarbonaceous fuel, and producing a corresponding adjustment signal k for a speed control means of a liquid fuel pump, and passing the stream of liquid hydrocarbonaceous fuel into the reaction zone of said gas generator; and

- (7) mixing said second stream of temperature moderator from step 1 with the combined stream of free-oxygen containing gas from step 4 and introducing the mixture into the reaction zone of said partial oxidation gas generator.

5,087,272

FILTER AND MEANS FOR REGENERATION THEREOF

Richard D. Nixdorf, 11317 Snyder Dr., Knoxville, Tenn. 37932

Filed Oct. 17, 1990, Ser. No. 599,132

Int. Cl.⁵ B01D 46/00

U.S. Cl. 55—96

13 Claims

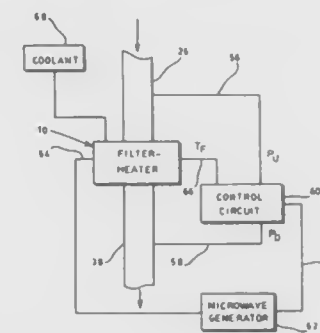
2. A method for the removal of carbon-containing particu-

lates from a gas stream containing the same, which comprises the steps:

- passing said gas stream through a monolithic filter element fabricated from silicon carbide material, said silicon carbide material capable of coupling with microwave radiation for converting microwave energy to thermal energy, said filter element having a porosity size of about 25 micrometers $\pm 50\%$, said filter element removing said particulates from said gas stream;

- monitoring a pressure differential across said filter element to determine collection of said particulates on said filter element;

- isolating said filter element from said gas stream when said pressure differential across said filter element reaches a pre-selected upper value;



heating said silicon carbide material of said filter element with microwave energy of a selected frequency to a selected temperature for a selected time to volatilize said carbon-containing particulates to regenerate said filter element when said pressure differential reaches said pre-selected upper value indicating a maximum effective collection of said particulates on said filter element;

passing air through said filter element during said heating step to assist volatilization of said carbon-containing particulates;

exhausting volatilized carbon-containing particulates from said filter element;

ceasing said heating of said silicon carbide material of said filter element after a selected time period when regeneration of said filter element is substantially complete; and reconnecting said filter element to said gas stream to be filtered.

5,087,273

AIR FRESHENING DEVICE

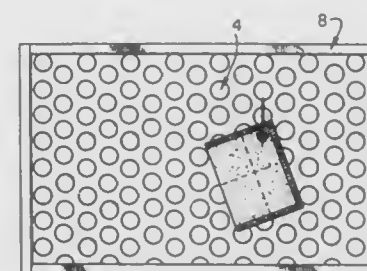
Lacy D. Ward, Midland, Tex., assignor to Ward Products, Inc., Midland, Tex.

Filed Nov. 5, 1990, Ser. No. 609,244

Int. Cl.⁵ B01D 39/04

U.S. Cl. 55—279

12 Claims



1. For use in freshening air, the combination comprising an air circulation system;

an air filter in the circulation system;

an air freshening material comprising a plurality of scented particulate beads;

an air permeable envelope enclosing the air freshening material and keeping the air freshening material inside of the envelope; and

a fastener attached at one end to the air permeable envelope adapted for securing the envelope to the air filter and comprising an eyelet ring secured to the air permeable packet and a single point fastener threaded through the eyelet ring for attaching the air freshening device to the air filter.

5,087,274

BAG SHAKER

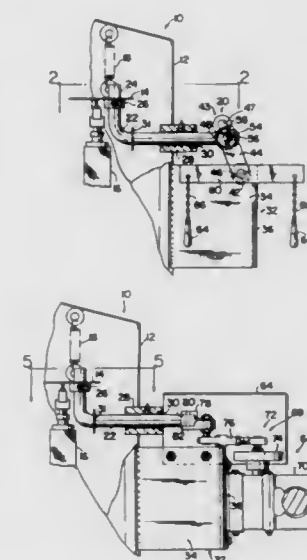
James C. Poor, East Granby; Frederick K. Hoskins, Vernon, and William Morcom, West Hartford, all of Conn., assignors to The Spencer Turbine Company, Windsor, Conn.

Filed Jul. 16, 1990, Ser. No. 553,869

Int. Cl.⁵ B01D 41/00

U.S. Cl. 55—300

2 Claims



1. In a bag separator having a separator housing, a bag head horizontally disposed within the housing for supporting a plurality of filter bags depending therefrom, means supporting said bag head for horizontal movement within and relative to the separator housing, and a bag shaker for agitating the bag head to dislodge particulate material from the filter bags and including a bag shaker rod connected at its inner end to the bag head and extending axially outwardly through a wall of the bag housing and terminating at an outer end, and bushing assembly means for supporting the bag shaker rod for reciprocal axial sliding movement within the bushing assembly and relative to the housing, the improvement comprising a support bracket secured in fixed position to a sidewall of said separator housing, and shaker operating means for reciprocating said bag shaker rod and having a shaker operating mechanism selected from a group of interchangeable operating mechanisms including a manual operating mechanism and a power driven operating mechanism, each said operating mechanism in said group having a part for mounting on said support bracket to support said selected mechanism on said bag separator and a connecting member for operably attaching said selected operating mechanism to the outer end portion of said bag shaker rod to reciprocate said bag shaker rod in response to operation of said selected operating mechanism, said manual operating mechanism including an axially elongate rock shaft comprising said part and mounted on said support bracket for reciprocal axial movement about its axis and relative to said support bracket, a crank arm mounted in fixed position on said rock shaft for angular movement with said rock shaft, a link connecting said

crank arm to said connecting member, and a manually operable rocker arm mounted in fixed position on said rock shaft, said power driven operating mechanism including a drive motor comprising said part and having a rotary output shaft, and a crank mechanism including a crank mounted in fixed position on said output shaft, and a connecting rod connected to said crank in eccentric relation to said output shaft and pivotally connected to said connecting member.

5,087,275
ELECTROCHEMICAL SENSOR
HAVING MICROCAVITIES

Didier Pribat, Paris; Joël Perret, Plaisir; Jean-Claude Rouffy, Poissy, and Gonzalo Velasco, Paris, all of France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 245,731, Sep. 19, 1988, Pat. No. 4,956,073.

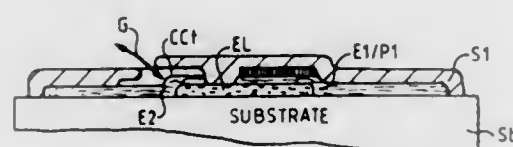
This application Jun. 28, 1990, Ser. No. 544,887

Claims priority, application France, Sep. 22, 1987, 8713058

Int. Cl.⁵ B01D 15/08

U.S. Cl. 55—386

2 Claims



1. An electrochemical sensor for the measurement of relative concentrations of species contained in a fluid mixture, comprising:

- at least one solid electrolyte which is an ion conductor of one of the species of the fluid mixture or of an ion capable of reacting with said species;
- at least one first partial pressure internal reference electrode in contact, by one of its faces, entirely or partly, with the solid electrolyte;
- at least one second measuring electrode in contact, by one of its faces, entirely or partially with the solid electrolyte and receiving the fluid mixture to be analyzed;
- a layer of encapsulating material made of an inert material which is impervious to the species present in the fluid mixture, coating said at least one first electrode, said at least one second measuring electrode, and the solid electrolyte, and having one access hole enabling the fluid mixture to reach the at least one second electrode; and
- at least one microcavity partially covering said at least one second measuring electrode in that zone which covers the electrolyte, said microcavity communicating through the access hole with the fluid mixture to be analyzed and having a thickness enabling a diffusion of a molecular type of fluid.

5,087,276
METHOD AND APPARATUS FOR USER SIZABLE
FURNACE FILTER AND HOLDER

Michael R. Snyder, Leawood, Kans., assignor to Rolox Ltd., Kansas City, Mo.

Filed Jan. 15, 1991, Ser. No. 641,284

Int. Cl.⁵ B01D 46/10, 53/04

U.S. Cl. 55—496

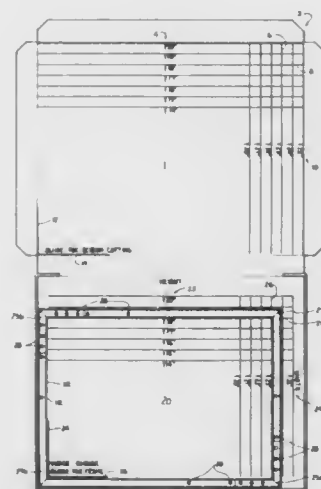
12 Claims

12. A furnace filter system comprising:
- a sizable filter adapted to being trimmed or expanded to a user selectable dimension;
 - a sizable filter support adapted to being trimmed to a user selectable dimension;
 - an adjustable holder for receiving said filter and said filter support comprising at least two frame members in moveable relationship to adjust said holder to a user selectable

dimension to correspond with said user selected size of said filter and said filter support;

means for locking said frame members in said relationship; and

a packaging container comprising a first template and a



second template, said first template presenting a guide to said user for adjusting said filter and said filter support to a user selectable size and second template presenting a guide to said user for conforming said holder to a dimension to correspond with said user selected size of said filter and said filter support.

5,087,277
HIGH TEMPERATURE CERAMIC PARTICULATE
FILTER

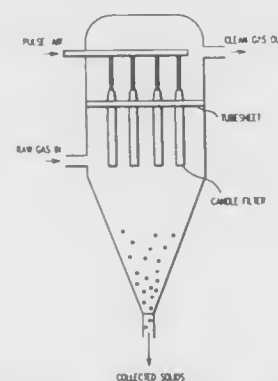
Sandra Gonzalez, Blacksburg; Nancy Brown, and Jesse J. Brown, both of Christiansburg, all of Va., assignors to Virginia Polytechnic Institute; State University Virginia Tech Intellectual Properties, Inc., both of Blacksburg and Center for Innovative Technology, Herndon, all of, Va.

Filed Mar. 28, 1991, Ser. No. 676,813

Int. Cl.⁵ B01D 46/00

U.S. Cl. 55—523

9 Claims



8. A high temperature ceramic filter formed by the following process:

- preparing a mixture of
 - (i) refractory calcium aluminate cement,
 - (ii) ceramic aggregate granules, and
 - (iii) pore forming additives, said pore forming additives being sized so as to enable the creation of continuous pores from a first side to a second side of a high temperature ceramic filter, said pore forming additives constituting a small enough weight percentage of said mixture that gases will pass through said continuous pores of

said high temperature ceramic filter but particulate matter in said gases will be stopped, said pore forming additives having a temperature for melting, sublimating, or other wise disintegrating below a temperature used for firing a cast of said high temperature ceramic filter; forming a cast of said high temperature ceramic filter from said mixture; and

firing said cast of said high temperature ceramic filter at an elevated temperature, whereby pores are formed in situ in said high temperature ceramic filter by the melting, sublimating, or disintegrating of said pore forming additives.

5,087,278
FILTER FOR GAS LIGHTER AND METHOD FOR
PRODUCING THE SAME

Toshiyuki Suzuki, Hyogo, Japan, assignor to Yaka Feodor K.K., Himeji, Japan

Continuation of Ser. No. 458,514, Dec. 28, 1989, abandoned.

This application Jul. 9, 1991, Ser. No. 728,058

Int. Cl.⁵ B01D 39/20

U.S. Cl. 55—523

35 Claims



1. A filter for a gas lighter, constituted by a sintered porous ceramic having interparticle pores, wherein the particles of the porous ceramic are spherical.

5,087,279
METHOD OF PRODUCING OPTICAL GLASS ELEMENT
AND PRODUCTION APPARATUS USING THIS
METHOD

Hideto Monji, Osaka; Kiyoshi Kuribayashi, Neyagawa; Masaaki Sunohara, Nishinomiya; Tadayoshi Yonemoto, Moriguchi; Noriyuki Kawata, Omiya; Tadao Shioyama, Sakurai, and Makoto Umetani, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Sumita Optical Glass, Inc., Tokyo, both of, Japan

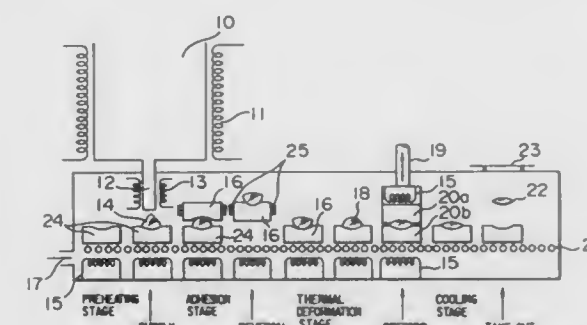
Filed Jul. 6, 1990, Ser. No. 549,437

Claims priority, application Japan, Jul. 14, 1989, 1-182955; Jul. 26, 1989, 1-195061; Oct. 27, 1989, 1-280976

Int. Cl.⁵ C03B 11/00

U.S. Cl. 65—64

13 Claims



1. A method of producing an optical glass element, comprising the steps of:

- bringing a gob of optical glass on a first heat working jig into contact with a second heat working jig and making said gob to adhere to said second heat working jig so as to displace said gob from said first heat working jig to second

heat working jig while said second heat working jig is turned upside down with said gob contacting its lower surface;

thermally deforming said gob on said second heat working jig to form an optical glass preform; and

forming said optical glass preform under heating and pressure by using pressure molds to obtain an optical glass element.

5,087,280
FLOATING MOLD CHANGER CARRIAGE
Yasuhiko Fuchigami, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

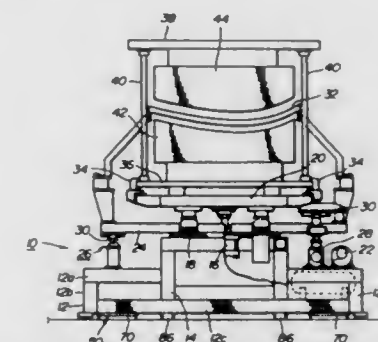
Filed Dec. 7, 1988, Ser. No. 402,898

Claims priority, application Japan, Dec. 7, 1987, 62-308973

Int. Cl.⁵ B60V 1/06; C03B 23/03

U.S. Cl. 65—171

6 Claims



1. A floating mold changer carriage for movement between a shaping device for shaping a sheet of glass with at least one mold and a mold storage area spaced from the shaping device, for replacing the mold with a new mold, said floating mold changer carriage comprising:

- a main frame having a lower surface;
- first means for connection to and fluid communication with a fluid source for discharging fluid supplied from the fluid source, downwardly from a lower surface of said main frame; and
- second means coating with said first means and inflatable for floating said main frame when said second means is supplied with fluid therein;
- plurality of wheels rotatably mounted on said main frame lower surface and oriented for controlling the direction of movement of the floating mold changer carriage; and
- said main frame having wheel supporting means extending downwardly from said lower surface for retractably supporting each of said wheels such that said wheel is spaced from the ground when said main frame is lowered from its floating state to be placed in a predetermined position, said wheel supporting means including a stationary support which engages the ground upon lowering said main frame and which acts to lift said wheels.

5,087,281
MOLD FOR FORMING CURVED WINDOW GLASS
WITH DEEPLY BENT END PORTIONS

Mineo Kakino, Hisai, and Masami Nishitani, Mie, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 21, 1990, Ser. No. 525,722

Claims priority, application Japan, May 22, 1989, 1-58137

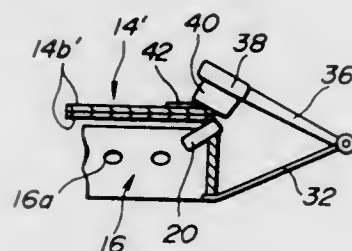
Int. Cl.⁵ C03B 23/027

U.S. Cl. 65—290

8 Claims

- 3. A mold for forming a curved glass with opposite bent end portions, comprising:
 - a stationary main frame;

a pair of side frames pivotally connected to opposite ends of said main frame;
 supporting means provided on at least one of said side frames for supporting thereon a glass plate;
 a bracket secured to said one side frame to project outwardly therefrom;
 an arm pivotally installed at a first end on said bracket and having a second end spaced apart from said bracket;
 a weight plate installed on said second end of said arm; and
 pushing means installed on said weight plate in such a manner as to be capable of being positioned right above said supporting means and contacting with only an upper



peripheral edge of the glass plate held in place on said supporting means;
 said one side frame being channel-shaped and includes opposite end sections and an intermediate section therebetween;
 said supporting means including a plurality of supporting members in the form of pieces of plates arranged in a comb-like array in the direction of said intermediate section of said one side frame;
 said pushing means including a plurality of pushing members in the form of pieces of plates arranged in a comb-like array on said weight plate so as to be alignable with corresponding ones of said supporting members, respectively.

5,087,282

SULFONYLURA AGENTS FOR DEFOLIATING COTTON
 Klaus Grossmann, Limburgerhof; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 561,615

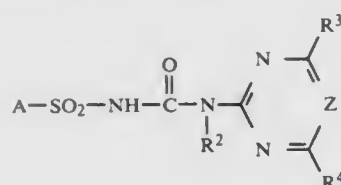
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1989, 3926056

Int. Cl.⁵ A01N 31/08

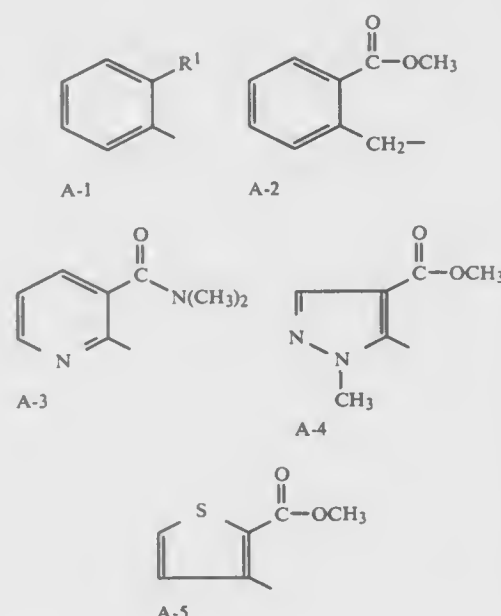
U.S. Cl. 71-72

7 Claims

1. An agent for defoliating cotton plants, containing, in addition to conventional additives, a phenylsulfonyl- or heteraryl-sulfonylurea of the formula I



where A is an aromatic or heteroaromatic radical of the structure A-1 to A-5



in which R¹ is chlorine, carbomethoxy, carboethoxy, 2-chloroethoxy or 2-methoxyethoxy, R² is hydrogen or methyl, R³ is methyl, methoxy, difluoromethoxy, chlorine or methylamino, R⁴ is methyl, methoxy, difluoromethoxy or ethoxy and Z is CH or N, or the alkali metal or alkaline earth metal salts of the compound I.

5,087,283

SYMPATHETIC INK FOR INK JET PRINTER
 Marvin P. Dixon, 2601 Hope Ct., and Haywood A. Walker, Jr., Box 432-D, Rt. 1, both of Liberty, Mo. 64068

Filed Jan. 2, 1990, Ser. No. 459,955

Int. Cl.⁵ C09D 11/02

U.S. Cl. 106-21

12 Claims

1. An ink composition adapted for use in non-impact printers and comprising an aqueous dispersion including therein from about 4 to 20% by weight of a water soluble salt selected from the group consisting of sulfates, nitrates, halides and acetates of cobalt, nickel and copper, and mixtures thereof, and from about 2.0 to 4.5% by weight of an alcohol selected from the group consisting of n-butanol and 2-butanol, said composition being characterized by the properties of having viscosity and surface tension values respectively being from about 0.9 to 1.2 cps. and from about 30 to 50 dynes/cm for permitting the composition to be applied by a non-impact printer and being invisible to the naked eye when so applied to a substrate.

5,087,284

5-SUBSTITUTED THIADIAZOLE UREAS AND THEIR USE AS HERBICIDES

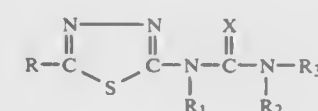
Patrick R. Driscoll, Spotswood, N.J., assignor to Rhone-Poulenc, Inc., Monmouth Jct., N.J.

Continuation of Ser. No. 487,750, Apr. 22, 1983, abandoned, which is a continuation of Ser. No. 299,858, Sep. 19, 1981, abandoned, which is a continuation of Ser. No. 79,413, Sep. 27, 1979, abandoned, which is a continuation of Ser. No. 316,794, Dec. 20, 1972, abandoned, which is a division of Ser. No. 296,389, Oct. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,248, Sep. 10, 1970, abandoned, which is a division of Ser. No. 818,078, Apr. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,756, Dec. 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 702,189, Feb. 1, 1968, abandoned. This application Oct. 31, 1989, Ser. No. 428,489 Int. Cl.⁵ A01N 43/82

U.S. Cl. 71-90

9 Claims

1. A compound of the formula



wherein

R is alkylsulfonyl (C₁-C₆),
 R₁ is hydrogen,
 R₂ is from the group consisting of hydrogen, alkyl (C₁-C₄), haloalkyl (C₁-C₄), alkoxy (C₁-C₄), alkenyl (C₂-C₄), alkynyl (C₂-C₄), aryl, and haloaryl,
 R₃ is selected from the group consisting of hydrogen, alkyl (C₁-C₄), and cycloalkyl (C₃-C₆), and
 X is selected from the group consisting of oxygen and sulfur.

5,087,285

DICHLOROMONOFUOROETHANE COMPOSITIONS

Hans Buchwald, Ronnenberg, and Boleslaus Raschkowski, Wiedensahl, both of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Feb. 20, 1990, Ser. No. 481,151

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1989, 3905125

Int. Cl.⁵ B28B 7/36

U.S. Cl. 106-38.22

15 Claims

1. A liquid composition with release effective properties comprising:
 a hydrogen-containing fluorochlorohydrocarbon solvent consisting essentially of dichloromonofluoroethane, and
 from 0.1 to 80% by weight relative to the total weight of the composition of an agent with release effective properties selected from the group consisting of waxes, wax derivatives, metal soaps, and silicones.

5,087,286

HEAT-CURABLE RESINOUS COATING COMPOSITION

Mitsuhiro Fukuda; Hirotoshi Inoue; Akira Kasari; Yuza Miyamoto; Osamu Isozaki; and Noboru Nakai, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Mar. 19, 1990, Ser. No. 496,201

Claims priority, application Japan, Mar. 20, 1989, 1-68863; Oct. 11, 1989, 1-264675; Oct. 11, 1989, 1-264676

Int. Cl.⁵ C09K 135/00

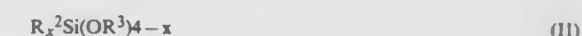
U.S. Cl. 106-287.16

15 Claims

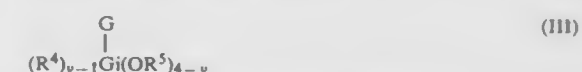
1. A heat-curable resinous coating composition comprising as a binder component
 (A) 5 to 90% by weight of a hydroxyl-containing resin selected from hydroxyl-containing acrylic resins and hydroxyl-containing polyester resins,
 (B) 5 to 50% by weight of an amino resin which reacts under

heat with the hydroxyl groups of the hydroxyl-containing resin (A) to form a crosslinkage, and

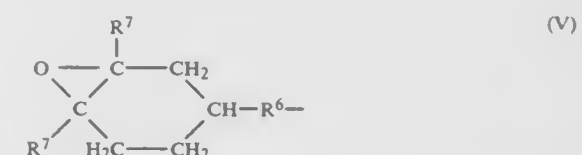
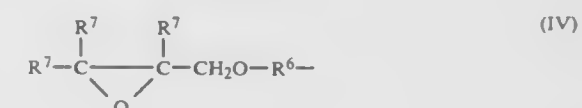
(C) 1 to 90% by weight of a crosslinkable and polyorganosiloxanes having a number average molecular weight of at least 500 and containing at least two silanol groups on an average per molecule and optionally containing an epoxy group, said polyorganosiloxanes being obtained by hydrolyzing and co-condensing a silane represented by the following formula (II)



wherein R² and R³ are same or different and each represents a monovalent hydrocarbon group having 1 to 13 carbon atoms, and x is 1, 2 or 3, optionally together with an epoxy-containing silane represented by the following formula (III)



wherein R⁴ and R⁵ are same or different and each represents a monovalent hydrocarbon group having 1 to 13 carbon atoms, y is 1, 2 or 3, and G represents an epoxy-containing organic group, for example an organic group of formula (IV) or (V) below



wherein R⁶ represents a divalent hydrocarbon group having 1 to 13 carbon atoms, and two or more R⁷ may be identical or different and each represents a hydrogen atom or a methyl group.

and the coating composition optionally comprising as paint additives, at least one of organic solvents, pigments, ultraviolet absorbers, paint surface adjusting agents, curing catalysts and pigment dispersants.

5,087,287

STRENGTHENED CELLULAR CONCRETE COMPOSITIONS AND METHOD OF MAKING

Mikio Hibara, and Nobuhisa Suzuki, both of Fuji, Japan, assignors to Nissei Plan, Inc., Sizuoka, Japan

Filed Aug. 22, 1988, Ser. No. 234,951

Claims priority, application Japan, May 25, 1988, 127852/63; May 25, 1988, 127853/63

Int. Cl.⁵ C04B 7/00

U.S. Cl. 106-677

10 Claims

1. A cellular concrete composition having improved mechanical strength consisting essentially of hydraulic cement, water and at least one alpha,beta-unsaturated dicarboxylic acid.

5,087,288

HERBICIDAL THIOPARACONIC ACID DERIVATIVES
Thomas R. Welter, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

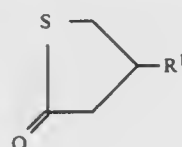
Filed Sep. 17, 1990, Ser. No. 583,537

Int. Cl.⁵ A01N 43/10; C07D 333/32

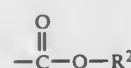
U.S. Cl. 71-90

9 Claims

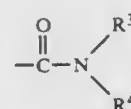
1. A compound having the structure:



wherein

R¹ is carboxy cyano, ester

or amido



wherein

R² is a straight-chained alkyl group or a branched-chain alkyl group having 1 to 8 carbon atoms, and R³ and R⁴ independently of one another represent hydrogen, an alkyl having 1 to 8 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, or a heterocyclyl having 5 to 6 carbon and hetero atoms, with said hetero atoms selected from sulfur, nitrogen, and oxygen, or, R³ and R⁴ taken together with the nitrogen atom of said amido group represent pyrrolidinyl, piperidinyl, or piperazinyl.

5,087,289

ALKANOIC ACID DERIVATIVES AND HERBICIDAL COMPOSITIONS

Koichiro Kaku, Shizuoka; Nobuhide Wada; Akira Takeuchi, both of Kakegawa; Yasufumi Toyokawa, Tokyo; Takeshige Miyazawa, Shizuoka; Ryo Yoshida, Shizuoka, and Kazuhiko Sugiyama, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 368,808, Jun. 20, 1989, Pat. No. 4,968,340.

This application Aug. 23, 1990, Ser. No. 571,118

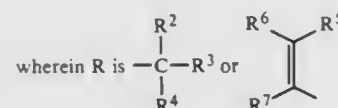
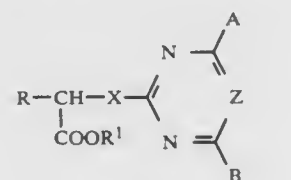
Claims priority, application Japan, Jun. 20, 1988, 63-150063

Int. Cl.⁵ C07D 251/46, 251/30; A01N 43/66

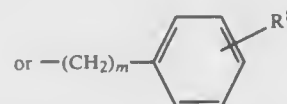
U.S. Cl. 71-93

9 Claims

1. An alkanolic acid derivative of the formula:

wherein R³ is a hydrogen atom, a halogen atom, a halogen-sub-

stituted C₁-C₄ alkyl group, a C₁-C₁₅ alkyl group, a C₃-C₆ cycloalkyl group, a C₁-C₄ -alkylthio-C₁-C₄-alkyl group, a hydroxy-C₁-C₄-alkyl group, a hydroxyl group, a cyano group, a thienyl group, a naphthyl group, a dihydronaphthyl group, a C₁-C₄-alkanoyloxy-C₁-C₄-alkyl group, a benzyloxy-C₁-C₄-alkyl group, or



wherein R⁸ is a hydrogen atom, a halogen atom, a nitro group, a C₁-C₄ alkyl group, a C₁-C₄ alkoxy group or -SO(O)_nR⁹ group, wherein R⁹ is a C₁-C₄ alkyl group, and n is an integer of from 0 to 2, m is an integer of from 0 to 2, each of R² and R⁴, which may be the same or different, is a hydrogen atom or a C₁-C₄ alkyl group, or R² and R⁴ form together with the adjacent carbon atom a 3-, 4-, 5- or 6-membered ring which may contain an oxygen atom and may be substituted by one or two C₁-C₄ alkyl groups, each of R⁵ and R⁶ which may be the same or different is a hydrogen atom or a C₁-C₄ alkyl group, a C₁-C₄ alkoxy group, a C₁-C₄ alkyl group or a phenyl group, or R⁶ and R⁷ form -(CH₂)_l- wherein l is an integer of 3 or 4 which may be substituted by one to two C₁-C₄ alkyl groups, or R is a C₂-C₆ alkenyl group, a dihydronaphthyl group, a tetrahydronaphthyl group, a 1-oxo-1,2,3,4-tetrahydronaphthyl group, a 1,2-epoxy-C₃-C₆-cycloalkyl group or an indanyl group which may be substituted by a C₁-C₄ alkyl or C₁-C₄ alkoxy group; R¹ is a hydrogen atom, a C₁-C₄ alkyl group, a C₂-C₆ alkenyl group, a C₂-C₆ alkenyl group, a phenyl group, a C₁-C₄ alkylideneamino group, a C₁-C₄ alkoxy-C₁-C₄-alkyl group, a C₁-C₄-alkoxycarbonyl-C₁-C₄-alkyl group, a halogen-substituted C₁-C₄ alkyl group, a C₃-C₅ cycloalkyl group, a nitro-substituted phenylthio-C₁-C₄-alkyl group, a halogen atom or a benzyl group which may be substituted by a C₁-C₄ alkyl or C₁-C₄ alkoxy group; or R and R¹ together form ethylene or methyl-substituted ethylene; A is a C₁-C₄ alkyl group, a C₁-C₄ alkoxy group, a C₁-C₄ alkythio group, a halogen atom, a halogen-substituted C₁-C₄ alkoxy group or a di-C₁-C₄-alkylamino group; B is a hydrogen atom, a C₁-C₄ alkyl group, a C₁-C₄ alkoxy group or a halogen-substituted C₁-C₄ alkoxy group; X is an oxygen atom or a sulfur atom; and Z is nitrogen; and a salt thereof.

5,087,290

AGENT FOR THE TREATMENT OF CAST IRON MELTS, PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF FOR TREATING CAST IRON MELTS
Friedrich Wolsgruber, Tacherting; Wolfgang Geiger, Trostberg, and Detlef Missol, Engelsberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 19, 1990, Ser. No. 555,572

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 3924558

Int. Cl.⁵ C22C 33/08

(1) U.S. Cl. 75-303

22 Claims

1. Agent for the desulphurisation, magnesium treatment and inoculation of cast iron melts to produce, in a single step, cast iron with spheroidal graphite, wherein the agent has the following composition:

silicon	30 to 80% by wt.
magnesium	5 to 30% by wt.
calcium	0.1 to 25% by wt.
bismuth	0.1 to 2% by wt.
cerium mischmetal	0.1 to 5% by wt.
iron	balance.

5,087,291

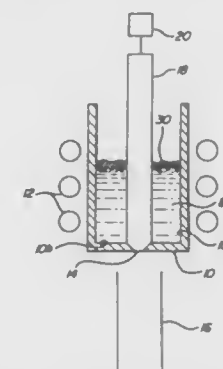
RARE EARTH-TRANSITION METAL SCRAP TREATMENT METHOD

Frederick A. Schmidt; David T. Peterson, both of Ames; John T. Wheelock, Nevada; Lawrence L. Jones, Des Moines, and Lanny P. Lincoln, Woodward, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Oct. 1, 1990, Ser. No. 591,046

Int. Cl.⁵ C22B 59/00

U.S. Cl. 75-581

17 Claims



1. A method of treating rare earth-transition metal scrap contaminated with an impurity element comprising at least one of oxygen and nitrogen for reuse in the manufacture of end-use articles, comprising the steps of:

- melting the scrap to form a melt,
- forming dross on the melt by reaction of the impurity element and the rare earth of the melt whereby the concentration of said impurity element is reduced in said melt, and
- separating the dross and the melt for reuse in the manufacture of end-use articles.

5,087,292

PROCESS AND APPARATUS FOR TREATING A LIQUID WITH A GAS

Guillermo Garrido, Noisy-le-Roi, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude, Paris, France

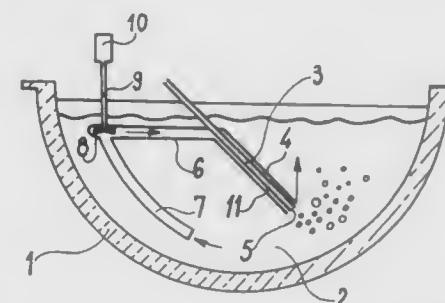
Filed Apr. 11, 1990, Ser. No. 507,432

Claims priority, application France, Apr. 11, 1989, 89 04746

Int. Cl.⁵ C22B 9/05

U.S. Cl. 75-681

9 Claims



1. In a process for treating a molten metal in a molten metal bath with a processing gas, comprising injecting a flow of said processing gas through an outlet end of a gas ejector immersed within said bath of said molten metal, the improvement comprising:

- recirculating a flow of said molten metal from said bath and ejecting said molten metal flow back into said bath in the immediate vicinity of said outlet end of said gas ejector, said ejecting of said molten metal flow being generally

co-axial to the direction of said injecting of said flow of processing gas.

5,087,293

AGGLOMERATION PROCESS UTILIZING EMULSION
William J. Keough, Toronto; Donald L. Parker, Thornhill, and Neil L. Smith, Oakville, all of Canada, assignors to Iron Tiger Investments Inc., Burlington, Canada

Continuation-in-part of Ser. No. 498,659, Mar. 9, 1990, abandoned. This application Dec. 13, 1990, Ser. No. 627,135
Int. Cl.⁵ C22B 1/244

U.S. Cl. 75-771

13 Claims

1. In a method of agglomerating dust particles comprising non-ferrous metals and compounds thereof, having non-uniform size distribution and having originated in metallurgical processes, with a combustible agglomerating agent by first weighing a unit volume of said dust particles and determining the bulk specific gravity of said dust particles expressed as weight of said particles contained in a unit volume, secondly, weighing an amount of said dust particles and passing it through a series of sieves in sequence of diminishing hole sizes, thereby obtaining the particle size range of said dust particles, thirdly, calculating by a first calculation the amount of combustible agglomerating agent required to agglomerate said dust particles comprising non-ferrous metals and compounds thereof into compacts, by utilizing an empirical relationship, wherein an agglomerating R factor is related to (a) the bulk specific gravity as first determined, (b) the particle size range of said particles as secondly determined, and (c) the amount of agglomerating agent, such that

$$R = \left(BD \times \frac{S}{100} \times Aa \right) + 2Aa$$

in said empirical relationship BD being bulk specific gravity (g/cm³), S being the sieve hole size (μm) allowing the passage of 50 wt. % of said particles, and Aa being the wt. % of agglomerating agent to be added to said particles, the improvement comprising the steps of,

- calculating the amount of agglomerating agent required according to said empirical relationship, to derive an R factor having a value between 4.0 and 200 provided that said amount of combustible agglomerating agent is added in the form of an aqueous emulsion,
- calculating by a second calculation the amount of water required to make up said aqueous emulsion with said amount of agglomerating agent obtained by the first calculation,
- producing said aqueous emulsion comprising said calculated amounts of agglomerating agent and water by a method selected from the group of methods consisting of: emulsifying said agglomerating agent in water prior to mixing with said dust particles, and forming the emulsion in-situ of said agglomerating agent and water on the surface of said dust particles, and thereafter
- blending said aqueous emulsion with said dust particles and compacting said blended particles by their own weight at ambient temperature.

5,087,294

METHOD AND APPARATUS FOR CLEANING A PETROLEUM PRODUCTS STORAGE TANK
Allen Rechtzigel, 10620 Courthouse, Inver Grove, Minn. 55077
Filed Apr. 2, 1991, Ser. No. 679,445

Int. Cl.⁵ B08B 3/02, 9/093

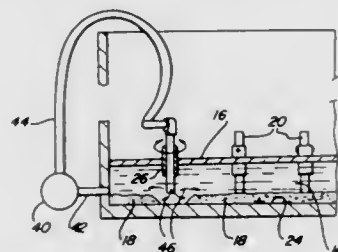
U.S. Cl. 134-22.1

9 Claims

1. A device for cleaning a storage tank for petroleum products, said storage tank having a closed sidewall and a floating roof, said floating roof adapted to float on petroleum contained in said storage tank, said floating roof further comprising a

least one opening, a device for cleaning said storage tank comprising:

an elongated nozzle having a longitudinal axis, an upper end and a lower end, said nozzle being axially inserted through said opening in said floating roof so that the lower end is positioned adjacent the bottom of the storage tank, at least two spray jets adjacent the bottom of said nozzle, said spray jets being disposed on diametrically opposed sides of said nozzle, said spray jets having openings which



discharge effluent in a direction radially outwardly from said nozzle with respect to said longitudinal axis of said nozzle so that said nozzles discharge effluent in opposite radial directions from said nozzle, means for pumping petroleum products at high pressure into the upper end of said nozzle, whereby said high pressure fluid flow of petroleum products out through said jets emulsifies waxes, debris and other petroleum distillates contained within said storage tank.

5,087,295

CLEANING CYCLE FOR FLOW CYTOMETERS

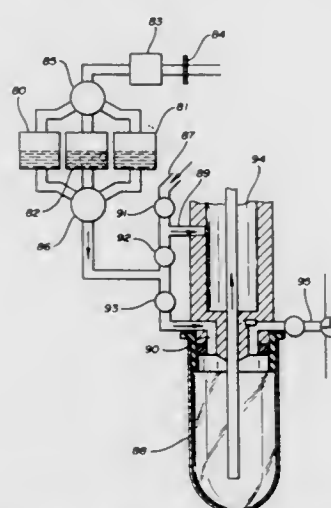
Hans-Joachim Gross, Schoene Aussicht, Fed. Rep. of Germany, and Robert A. Hoffman, Livermore, Calif., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 13, 1990, Ser. No. 537,858

Int. Cl.³ B08B 3/08, 9/02

U.S. Cl. 134—26

13 Claims



1. A method for cleaning a flow cytometer comprising adding sequentially to the fluidics system a strong oxidizing solution, a particle-free neutral pH fluid and a weak acid wherein the weak acid has a value of approximately 3.

5,087,296
SOLAR BATTERY AND PROCESS FOR PREPARING SAME

Shigeki Kondo, Hiratsuka, and Hidemasa Mizutani, Sagami-hara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 537,146, Jun. 12, 1990, abandoned,

which is a continuation of Ser. No. 291,329, Dec. 28, 1988,

abandoned, which is a continuation of Ser. No. 147,227, Jan. 22,

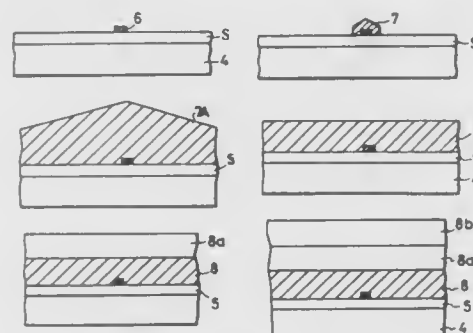
1988, abandoned. This application Nov. 8, 1990, Ser. No. 610,310

Claims priority, application Japan, Jan. 26, 1987, 62-014104

Int. Cl.³ H01L 31/06, 31/18

U.S. Cl. 136—258

18 Claims



1. A solar battery comprising:

- a substrate, a first semiconductor layer of a first conductivity type including a single crystal grown on a nucleation surface (SNDL) formed on a small area of the surface of said substrate as the base for said single crystal growth, said nucleation surface (SNDL) being comprised of an amorphous material which is sufficiently greater in nucleation density (ND) than the material constituting the surface of said substrate and having a sufficiently small area so as to form only a single nucleus from which said single crystal is grown; said nucleation surface positioned on said substrate so as to grow said single crystal to a desired size;
- an overlying second semiconductor layer of a second conductivity type different than the conduction conductivity type of said first semiconductor layer; and
- means for outputting the power generated by said solar battery.

5,087,297

ALUMINUM TARGET FOR MAGNETRON SPUTTERING AND METHOD OF MAKING SAME

Benoit Pouliquen, Spokane, Wash., assignor to Johnson Matthey Inc., Valley Forge, Pa.

Filed Jan. 17, 1991, Ser. No. 642,670

Int. Cl.³ C22F 1/04; C23C 14/00

U.S. Cl. 148—2

5 Claims

- A method of making an aluminum target suitable for magnetron sputtering comprising: providing a body of fine grain aluminum or aluminum alloy having a grain size of less than 2 mm; heating said body to an elevated forging temperature in the range of 550° to 900° F.; and slow forging said body at a rate of 0.5 to 4 inches per minute to produce <110> fiber texture, wherein the fiber axis has an X-ray diffraction intensity greater than 20 times random.

5,087,298

PROCESS OF PRODUCING CONTINUOUS THIN SHEET OF TIAL INTERMETALLIC USING PAIR OF COOLING ROLLS

Toshiaki Mizoguchi; Kenichi Miyazawa; Toshihiro Hanamura, and Naoya Masahashi, all of Kanagawa, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 483,576, Feb. 23, 1990, Pat. No. 5,028,277.

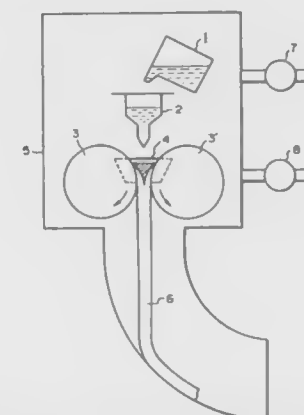
This application Apr. 9, 1991, Ser. No. 682,480

Claims priority, application Japan, Mar. 2, 1989, 1-50649

Int. Cl.³ C22C 14/00; B23K 20/00

U.S. Cl. 148—11.5 F

7 Claims



- A process for producing a continuous thin sheet of a TiAl intermetallic compound comprising the steps of: heating a mixture consisting of from 35 to 44 wt % Al and the balance Ti in an inert gas atmosphere to form a melt, continuously feeding the melt to an open-ended mold defined by a pair of cooling rolls and a pair of side dams, the rolls rotating at a peripheral speed of from 0.1 to 10 m/sec, and cooling the melt within the mold by the cooling rolls while a constant force is applied to the rolls to form a solidified sheet having a thickness corresponding to a distance between the rolls.

5,087,299

VIBRATION-PROOF TUNGSTEN WIRE

Mikiharu Fukuchi; Yasuhiko Nakano, both of Yokohama; Keisuke Hayashi, Chigasaki; Isamu Koseki, Yokosuka; Masami Ito, Kamakura, and Ryoze Akiyama, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Material Engineering Corporation, Yokohama, both of Japan

Filed Jul. 25, 1990, Ser. No. 557,715

Claims priority, application Japan, Apr. 5, 1989, 1-84898

Int. Cl.³ B22F 3/10; C22C 27/04

U.S. Cl. 148—11.5 P

11 Claims

- A process for preparing a vibration-proof tungsten wire having a structure comprising a crystal grain boundary at which bubbles of 0.3 μm or less in diameter are dispersed in bubble rows with lengths of $(0.39/D)^2 \times 3$ μm or more arrayed in the wire axis direction of said crystal grain boundary, and bubbles of 0.2 μm or less in diameter are randomly dispersed; and a crystal grain in which bubbles of 0.3 μm or less in diameter are dispersed in rows with lengths of $(0.39/D)^2 \times 30$ μm or more arrayed in the wire axis direction within said crystal grain, and bubbles of 0.2 μm or less in diameter are randomly dispersed, wherein D denotes the diameter of the wire in mm, the process comprising the steps of subjecting ammonium para-tungstate to reduction at a temperature of 300° to 600° C. to form tungsten oxide; admixing as dopants a potassium compound, and at least one compound selected from the group consisting of a silicon compound and an aluminum compound to the resultant tungsten oxide to form a mixture; subjecting the resultant mixture to reduction in a stream of hydrogen at a temperature of 600° to 900° C. to form a metallic tungsten

powder; subjecting the resultant metallic tungsten powder to acid washing to remove superfluous dopants therefrom; press-molding the resultant metallic tungsten powder followed by pre-sintering in a hydrogen furnace and subsequent sintering by current passage to give a tungsten sintered bar; subjecting the resultant tungsten sintered bar to swaging and drawing to obtain a tungsten wire; and then passing an electric current corresponding to 90% of the fusion current value through the resultant wire for 5 minutes.

5,087,300

METHOD FOR MANUFACTURING HIGH-CONDUCTIVITY COPPER-CLAD STEEL TROLLEY WIRE

Teruyuki Takayama, Tokyo; Hiroki Nagasawa; Sumihisa Aoki, both of Kokubunji; Haruo Tominaga, and Kazuo Yokoyama, both of Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

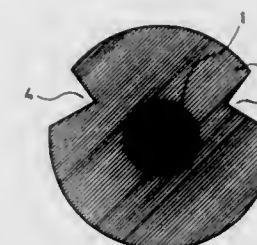
Filed Aug. 22, 1990, Ser. No. 570,792

Claims priority, application Japan, Sep. 1, 1989, 1-226965; Mar. 20, 1990, 2-70049

Int. Cl.³ B32B 31/20

U.S. Cl. 148—11.5 Q

4 Claims



- A process for manufacturing a high-conductivity copper-clad steel trolley wire, comprising the steps of: dipping a steel wire in molten copper or molten copper-alloy in a continuous manner, so that said molten copper or molten copper-alloy builds up and solidifies on the peripheral surface of said steel wire, thereby obtaining an initial copper-clad steel wire; subjecting said initial copper-clad steel wire to a first cycle of hot-rolling by means of a caliber roll, to obtain a first hot rolled wire; dipping said first hot rolled wire at least once in molten copper or molten copper-alloy, so that molten copper or molten copper-alloy builds up and solidifies thereon, producing a final copper-clad steel wire; subjecting said final copper-clad steel wire to a second cycle of hot-rolling at a temperature of from 750° to 850° C., with a rolling ratio of from 10 to 40%, obtaining a second hot-rolled wire; and cold-rolling said second hot rolled wire so that a reduction of area of 20% or more is obtained.

5,087,301

ALLOYS FOR HIGH TEMPERATURE APPLICATIONS
Lynette M. Angers, 1120 Fox Hill Dr., #315, Monroeville, Pa. 15146; Douglas G. Konitzer, 3865 Franklinton Dr., Murrysville, Pa. 15668; Joanne L. Murray, 5744 Kentucky Ave., Pittsburgh, Pa. 15232, and William G. Truckner, R.D. #1, Box 22BC, Avonmore, Pa. 15618

Filed Dec. 22, 1988, Ser. No. 288,635

Int. Cl.³ C22F 1/04

U.S. Cl. 148—12.7 A

16 Claims

- An alloy, comprising a solute and a solvent, the solvent and the solute dissolved therein forming a matrix phase, the matrix phase having a subgrain structure defined by subgrain boundaries and particles at intersections of the boundaries, and within the subgrains a dispersion of particles which are finer than the particles at the subgrain boundaries, the particles

within the subgrains originating from a solid-solid transformation.

11. A process for producing the alloy of claim 1, comprising the steps of:

- rapid solidification of molten metals to provide a solid material having a cellular-type structure defined by incoherent particles and a supersaturated solution;
- consolidation processing to produce a bulk material;



- thermo-mechanical treatment of the bulk material to convert the cellular-type structure to a subgrain structure within a matrix phase, the subgrain structure being defined by subgrain boundaries and particles at the intersections of the boundaries; and
- precipitation heat treatment to produce in the subgrains a dispersion of particles which are finer than the particles at the subgrain boundaries.

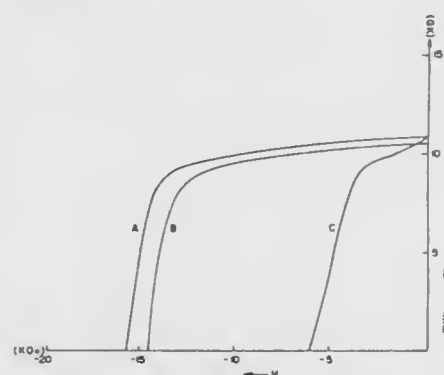
5,087,302

PROCESS FOR PRODUCING RARE EARTH MAGNET

Cheng H. Lin; Shi K. Chen; Ying C. Hung; Wen S. Ko, and Wen C. Chang, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Taiwan
Continuation-in-part of Ser. No. 353,869, May 15, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 644,114
Int. Cl.³ H01F 1/02

U.S. Cl. 148—103

13 Claims



1. Process for producing a rare earth magnet of magnetically improved performance comprising the steps of:

- alloying the ingredient elements of said rare earth magnet to give an ingot;
- crushing said ingot to give coarse particles of an average particle size between 80 and 120 microns;
- milling said coarse particles with the titanate coupling agent of the formula



wherein

m is from 1 to 5;

n is 2 or 3;

R¹ is hydrogen or C₁-C₁₀ alkyl;

X is phosphate, pyrophosphate or phosphite; and

R² is C₃-C₁₅ alkyl;

to give a premix;

- drying said premix in vacuum or an inert atmosphere;
- pressing and magnetizing said dried premix in a magnetic aligning field to give a magnetized article of desired shape, and
- sintering said magnetized article by elevating the temper-

ature to a sintering temperature, and then sintering said article at said sintering temperature, which includes a slow heating degassing phase to remove any residual titanate, in which the temperature is raised from 400° to 500° C. at a temperature increasing rate between 0.5° and 5° C. per minute before said sintering temperature is reached.

5,087,303

MANUFACTURE OF METAL/FIBER COMPOSITES

Robert R. Kieschke, and Trevor W. Clyne, both of Cambridge, England, assignors to Rolls-Royce plc, London, England
Filed Oct. 4, 1990, Ser. No. 592,839
Int. Cl.³ C23C 8/00, 28/00

U.S. Cl. 148—276

5 Claims

1. A method of inhibiting the diffusion of a metal coating, which is capable of producing a thermodynamically stable oxide, into the grain boundaries of a silicon carbide substrate comprising the steps of:

- heating the substrate in air prior to applying the metal coating so as to oxidize the substrate surface, then
- applying the metal coating to the oxidized surface of the substrate such that the metal coating oxidizes only at an interface between the oxidized substrate surface and the metal coating, and then
- applying a further metal coating to the metal coating and further heating the such coated substrate to cause further oxidation only at all of a plurality of interfaces between the substrate and oxidized substrate surface, the oxidized substrate surface and metal coating, and the metal coating and further metal coating, respectively.

5,087,304

HOT ROLLED SHEET OF RAPIDLY SOLIDIFIED MAGNESIUM BASE ALLOY

Chin-Fong Chang, Morris Plains, and Santosh K. Das, Randolph, both of N.J., assignors to Allied-Signal Inc., Morris Township, N.J.
Division of Ser. No. 586,179, Sep. 21, 1990. This application May 6, 1991, Ser. No. 696,372
Int. Cl.³ C22F 1/06; C22C 23/02

U.S. Cl. 148—406

5 Claims



1. A magnesium base metal alloy sheet rolled from rolling stock by a method comprising the steps of:

- compacting a rapidly solidified magnesium based alloy powder to produce a billet, said alloy being defined by the formula $Mg_{bal}/Al_xZn_yX_z$, wherein X is at least one element selected from the group consisting of manganese, cerium, neodymium, praseodymium, and yttrium, "a" ranges from about 0 to 15 atom percent, "b" ranges from about 0 to 4 atom percent, "c" ranges from about 0.2 to 3 atom percent, the balance being magnesium and incidental impurities, with the proviso that the sum of aluminum and zinc present ranges from about 2 to 15 atom percent, and having a microstructure comprised of a uniform cellular network solid solution phase of a size ranging from 0.2-1.0 μm together with precipitates of magnesium and aluminum containing intermetallic phases of a size less than 0.1 μm ;
- forming said billet into a rolling stock; and

c. rolling said rolling stock into sheets, said rolling step further comprising the steps of:

- preheating said rolling stock to a temperature ranging from 200° C. to 300° C.;
- rolling said preheated rolling stock at a rate ranging from 25 to 100 rpm;
- adjusting the roll gaps to produce a reduction of 2 to 25% per pass; and
- repeating steps (i) to (iii) at least once to produce said sheet with thickness ranging from 0.014 to 0.095", said sheet having an ultimate tensile strength of at least 400 MPa.

5,087,306

STRAPPING JOINT AND METHOD FOR FORMING SAME

Nelson Cheung, Hoffman Estates; Robert J. Nix, Algonquin, and Janusz Figiel, Mt. Prospect, all of Ill., assignors to Signode Corporation, Glenview, Ill.

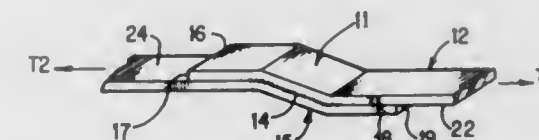
Continuation of Ser. No. 347,569, May 5, 1989, Pat. No. 5,006,385, which is a continuation-in-part of Ser. No. 223,482, Jul. 22, 1988, abandoned. This application Nov. 15, 1990, Ser. No. 614,279

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.³ B65B 13/32; B29C 65/02

U.S. Cl. 156—73.5

1 Claim



1. A method of forming a joint between overlapping portions of a thermoplastic strap surrounding an article, the steps comprising:

- surrounding the article with an untensioned length of thermoplastic strap with an inner surface of the strap facing the article and an outer surface of the strap facing away from the article and overlapping portions of the strap being untensioned;
- joining the overlapping portions of the strap by providing a weldment between said inner and outer surfaces of the strap along at least a portion of the overlapping portions of the strap while the overlapping portions and the portion of the strap surrounding the article are both untensioned; and
- providing means for increasing resistance of said overlapping portions of the strap on opposite sides of said weldment to peel separate above a peel separation resistance provided by said weldment when said overlapping portions of the strap at said weldment are put in tension including providing means for creating opposing forces in response to the tension on said overlapping portions, which opposing forces act on said overlapping portions on opposite sides of said weldment in directions urging said overlapping portions on each of said opposite sides of said weldment together.

5,087,307

METHOD OF MANUFACTURING SEMICONDUCTOR SUBSTRATE

Takehiko Nomura; Yoshinori Natsume, both of Yokohama, and Yoshinori Hosoki, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 273,177, Nov. 15, 1988, abandoned, which is a continuation of Ser. No. 927,389, Nov. 6, 1986, abandoned. This application Dec. 3, 1990, Ser. No. 620,450
Claims priority, application Japan, Dec. 27, 1985, 60-292577
Int. Cl.³ B32B 31/14

U.S. Cl. 156—154

15 Claims

1. A method of manufacturing a semiconductor substrate comprising:

- a first step of polishing a pair of semiconductor wafers, each semiconductor wafer including a major surface having a central planar portion and an outer periphery and further including a side surface remote from the central planar portion and contiguous to the outer periphery, until the central planar portions of the major surfaces are mirror-finished and the outer peripheries are oblique to the respective central planar portions;
- a second step of stacking said semiconductor wafers with the polished surfaces opposed to each other, and heating the

5,087,305

FATIGUE CRACK RESISTANT NICKEL BASE SUPERALLOY

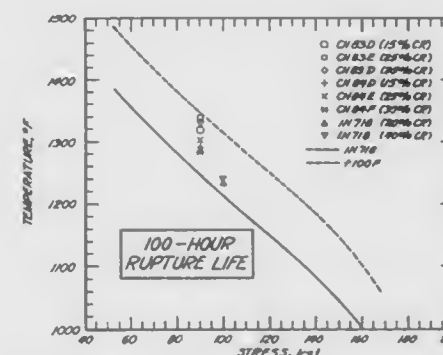
Keh-Minn Chang, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,189

Int. Cl.³ C22C 19/05

U.S. Cl. 148—410

5 Claims



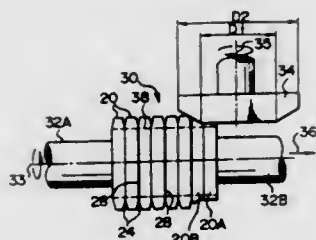
1. A structural article having high strength and low fatigue crack propagation rate which comprises an article formed of a composition consisting essentially of the following in parts by weight:

Ingredient	Concentration	
	From About	To At out
Nickel	balance	
Chromium	16	22
Cobalt	8	14
Molybdenum	2.0	4.0
Aluminum	0.2	0.9
Titanium	0.5	1.5
Tantalum	3.5	4.5
Niobium	3.5	4.5
Carbon	0.0	0.05
Boron	0.002	0.015

the composition having been recrystallized and aged and having grains of minimum average diameter of about 35 microns, and

the grains of the article being deformed by a mechanical working to change the shape of the article by at least 15%.

stacked semiconductor wafers to form a semiconductor body having a gap between the outer peripheries of the polished major surfaces of said semiconductor wafers formed by said polishing, stacking, and heating steps; a third step of preparing a plurality of semiconductor bodies each formed through said first and second steps;



a fourth step of combining the plurality of semiconductor bodies atop each other to form a combined body having a side surface; and
a fifth step of cylindrically grinding the side surface of the combined body by a predetermined amount required to at least remove said gap.

5,087,308

METHOD OF CONNECTING PIPES OF PLASTICS MATERIAL OF A DOUBLE PIPE SYSTEM

Jörg Wermelinger, Schaffhausen, Switzerland, assignor to Georg Fischer AG, Schaffhausen, Switzerland

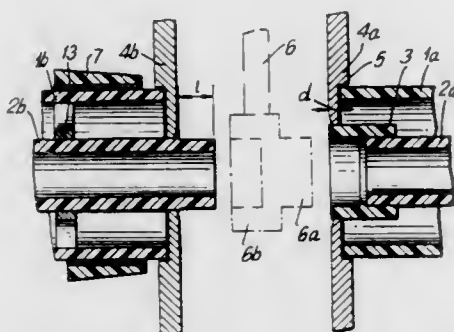
Filed Jul. 6, 1990, Ser. No. 549,361

Claims priority, application Switzerland, Jul. 7, 1989, 02538/89

Int. Cl.⁵ B65H 69/02; B29C 65/00; F16L 41/00

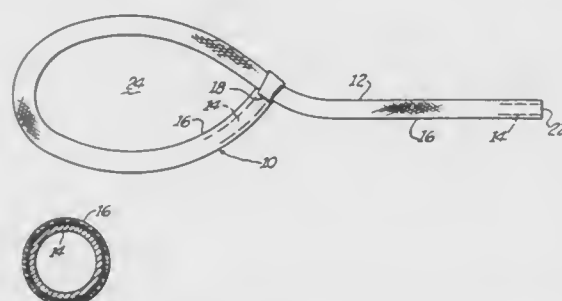
U.S. Cl. 156—158

4 Claims



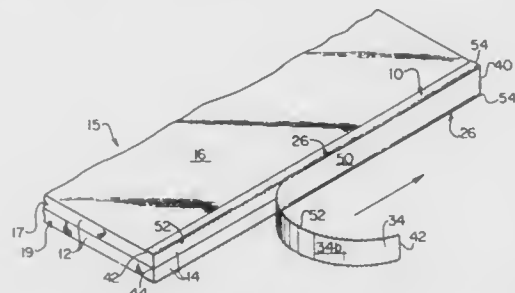
1. In a method of connecting pipes of plastics material of a double pipe system having inner and outer pipes, wherein the inner pipes are rigidly connected by means of a sleeve member and the outer pipes are rigidly connected by means of a welding sleeve, the improvement comprising holding the ends of the inner pipes to be connected concentrically relative to each other by means of clamping jaws and moving the ends of the inner pipes axially together with the clamping jaws until the inner pipes are rigidly connected by means of the sleeve member, spacing the outer pipes apart at the connection location by a distance which corresponds at least to the thickness of the clamping jaws, pushing an expandable intermediate ring which is provided with a radial slot over the inner pipes after the inner pipes have been connected and radially inserting the intermediate ring between the ends of the outer pipes, and rigidly connecting the two ends of the outer pipes and the intermediate ring to each other by means of the welding sleeve.

5,087,309
WRIST STRAP AND METHOD OF MAKING SAME
Eugene R. Melton, Jr., Fort Lauderdale, Fla., assignor to Lacers, Inc., Ft. Lauderdale, Fla.
Division of Ser. No. 390,078, Aug. 7, 1989, Pat. No. 4,962,929.
This application Oct. 9, 1990, Ser. No. 594,280
Int. Cl.⁵ B29C 49/00; B32B 31/00
U.S. Cl. 156—198 20 Claims



18. A method of fabricating a wrist attachment of the type affixed between an item of equipment and the user thereof, said attachment being fabricated of a single braided tubular member having two ends, said method comprising the steps of:
feeding the one end of said tubular member through the inside of said tubular member from an intermediate point to the other end of said tubular member, thereby forming an inner tube, an outer tube and a holding loop;
inserting said two ends through said holding loop;
sliding said outer tube over said inner tube until said holding loop contacts said member; and
welding said two ends together.

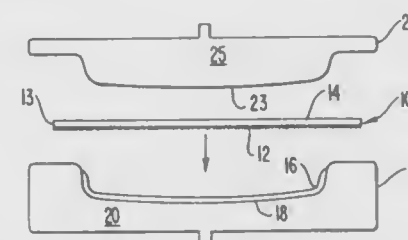
5,087,310
WALLBOARD BUNDLING TAPE AND METHOD
Joseph R. Robinette, 221 Maple Tree Dr., Bristol, Tenn. 37620
Filed Jan. 3, 1990, Ser. No. 460,587
Int. Cl.⁵ B32B 31/00
U.S. Cl. 156—202 7 Claims



1. A method for bundling relatively rigid sheets of material together, comprising:
providing first and second aligned sheets of relatively rigid material each having an edge surface and upper and lower surfaces with the upper surface of the second sheet facing the lower surface of the first sheet, and fastening said sheets together by applying at least one piece of a perforated tape to said first sheet and said second sheet; said tape comprising an elongated strip, said strip having a first edge, a second edge and at least two rows of perforations, said tape further comprising a first band extending from said first edge to a first row of said at least two rows of perforations, a center band extending from said first row to a second row of said at least two rows of perforations, a second band extending from said second row to said second edge; said bands having co-planar top sides and co-planar bottom sides; and adhesive means

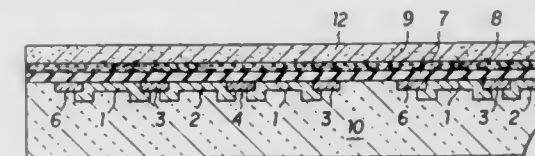
located on said bottom sides of said first band and said second band; wherein:
said fastening step further comprising the steps of:
adhering said adhesive means on said bottom side of said first band to said first sheet; and
adhering said adhesive means on said bottom side of said second band to said second sheet, wherein:
said two sheets are wallboard, said sheets being rectangular in shape and having a smooth surface, a rough surface, and edges, said sheets being arranged with said smooth surface on said first sheet facing said smooth surface on said second sheet, at least one of said edges on each said sheet being co-planar with at least one edge on an adjacent sheet; and wherein said adhering step adheres said adhesive means on said bottom side of said first band and said second band to said rough surface on said first sheet and said second sheet.

5,087,311
PROCESS OF LAMINATING FABRIC TO A CONCAVE SUBSTRATE
George M. Elliott, Alpharetta, and Fred A. Simmons, Atlanta, both of Ga., assignors to Astechonologies, Inc., Roswell, Ga.
Continuation of Ser. No. 905,187, Sep. 10, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 230,480
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.⁵ B32B 31/06
U.S. Cl. 156—212 27 Claims



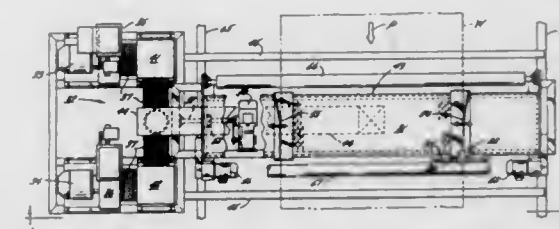
1. A process of laminating a piece of fabric to a rigid substrate having at least one concavity, wherein the fabric is steam-permeable, comprising the following steps:
a) coating the back of the fabric with a layer of heat activatable adhesive;
b) placing the fabric against the concave side of the substrate, with the adhesive next to the substrate;
c) preheating a first die having a complementary shape to that of the substrate, said die being perforated across substantially its entire contact surface, provided that if the adhesive is a thermoplastic adhesive, then the temperature to which the contact surface of the die is heated is below the melting point of the adhesive;
d) pressing the preheated die into the substrate so as to push the adhesive-coated fabric into a concavity of the substrate, thereby placing the fabric under tension in that area;
e) ejecting a shot of superheated steam through the perforations in the die at a pressure sufficient to drive the steam through the fabric, the temperature of the steam being high enough to activate the adhesive across substantially the entire contact surface and to relax those areas of the fabric that are under tension;
f) maintaining the die pressure against the substrate until the adhesive has set, thereby laminating the fabric to the substrate; and
g) disengaging the die and withdrawing the resultant laminated composition.

5,087,312
THERMOPILE HAVING REDUCED THERMAL NOISE
Martin T. Gerber, Carmel, Ind., and Peter J. Hesketh, Chicago, Ill., assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed Jul. 11, 1990, Ser. No. 551,545
Int. Cl.⁵ H01L 35/28
U.S. Cl. 136—225 15 Claims



1. Thermopile apparatus of the type comprising a plurality of reference junctions and a plurality of measurement thermocouple junctions connected electrically alternately in series on a dielectric support, each said measurement junction having thereover a first medium which is thermally responsive, each said reference junction having thereover a second medium which is non-thermally responsive, characterized in that said first and second mediums occupy areas which are arranged in a checkerboard pattern.

5,087,313
PAPER WEB ALIGNMENT SYSTEM
Peter Duecker, Langenfeld, Fed. Rep. of Germany, assignor to ARC Machinery Corporation, Matthews, N.C.
Continuation-in-part of Ser. No. 322,805, Mar. 13, 1989. This application Oct. 6, 1989, Ser. No. 418,106
Int. Cl.⁵ B32B 31/08
U.S. Cl. 156—271 35 Claims



1. An alignment apparatus for continuously monitoring and aligning a web as the web is advanced along a processing or manufacturing line towards an objective with which the web must be aligned, and that is particularly useful in applications in which the web must be maintained at a desired tension at particular positions along the line, such as the location on a corrugating line at which a tensioned single face web and a liner are joined to form a composite laminated product, said alignment apparatus comprising:
a laterally adjustable web guide comprising vacuum tensioning means for applying a desired tension to a web, and said vacuum tensioning means being laterally adjustable with respect to the direction of travel along the line of a web to which said means applies tension so that lateral adjustment of said vacuum tensioning means laterally adjusts the path of travel of the tensioned web;
a detector system adjacent said vacuum tensioning means for identifying the position of the tensioned web, the position of an objective and the relative position of the tensioned web and the objective with respect to each other, and for generating a signal representing the relative position and wherein the position of said detector system adjacent said laterally adjustable vacuum tensioning means minimizes the amount of detected misaligned web material that

progresses along the line between detection and alignment; and
means responsive to said detector system for laterally moving said vacuum tensioning means in response to a signal from said detector system so that the lateral movement of said vacuum tensioning means laterally adjusts the position of the tensioned web with respect to the objective so that any misalignment between the tensioned web and the objective is minimized or eliminated when the tensioned web and the objective are aligned.

5,087,314

ELECTROCONDUCTIVE ADHESIVE

James A. Sandborn, Satellite Beach, and Bobby J. Boan, Indian Harbor Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 267,752, Nov. 2, 1988, Pat. No. 4,880,570, which is a continuation-in-part of Ser. No. 846,537, Mar. 31, 1986, abandoned. This application Jul. 31, 1989, Ser. No. 386,745

Int. Cl.⁵ C09J 4/00; H01B 1/06

U.S. Cl. 156—330

2 Claims

1. A process of bonding two materials so as to provide an electrically conductive medium therebetween, wherein said process includes the steps of:

- mixing an epoxy including a resin from the modified epoxy family including a polyglycidylaminophenyl resin and a polyglycidylether of polyformaldehyde novolac resin and a catalyst from the amine family;
 - adding a mixture of electrically conductive particles of various shapes to said catalyst;
 - interposing the mixture of step (b) between the two materials to be bonded,
- wherein said resin has a percent by weight of greater than 10%, and wherein said catalyst has a percent by weight greater than 4% and wherein said electrically conductive filler has a percent by weight greater than 63%.

5,087,315

FABRIC LIFTING APPARATUS AND METHOD

Alexander J. King, and William M. Nimmo, both of East Kilbride, Scotland, assignors to The Secretary of State for Trade & Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

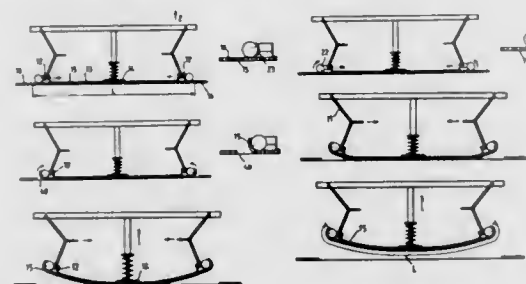
Continuation of PCT/GB88/00882 Oct. 19, 1988 Filed Dec. 15, 1988, Ser. No. 284,632

Claims priority, application United Kingdom, Mar. 18, 1988, 8806550

Int. Cl.⁵ B32B 31/16

U.S. Cl. 156—344

11 Claims



10. A method of lifting fabric including the steps of:
placing a fabric lifting apparatus, including a rigid frame, a flexible base plate and a plurality of individual needle gripper devices located at opposite ends of the base plate, onto a pre-cut panel of fabric, each needle gripper device including a needle of substantially arcuate form rotatable mounted about an axis of the arc;
rotating each needle about its axis so that a tip of the needle penetrates the fabric;
rolling each needle, relative to the frame so that the pre-cut

panel is peeled away from its original position without stretching the fabric; and raising the frame vertically to complete the peeling of the pre-cut panel of fabric away from its original position.

11. A method as claimed in claim 10 which also includes the step of peeling the fabric away from a backing strip.

5,087,316

TRANSFER APPARATUS FOR TIRE CONSTITUTING MEMBERS

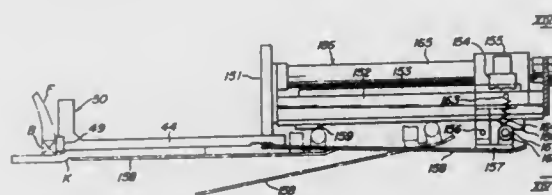
Masaharu Sumiuchi, and Seichiro Nishide, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 31, 1989, Ser. No. 401,588

Claims priority, application Japan, Sep. 6, 1988, 63-222839 Int. Cl.⁵ B29D 30/30

U.S. Cl. 156—396

5 Claims



1. A tire building system comprising: a transfer apparatus for tire constituting members which are transferred from a pre-process drum to a post-process drum, said transfer apparatus having a movable frame movable between the pre-process drum and the post-process drum, a holder mounted on the movable frame to outwardly surround and grasp the tire constituting member, and a correction mechanism mounted on the holder on a near side to the post-process drum to expand an axial end of the tire constituting member on a near side to the post-process drum for correcting the tire constituting member into a substantially cylindrical shape, said correction mechanism comprising correction arms and means carrying said correction arms for translatory movement in an axial direction of said post-process drum, and means for moving said correction arms in a radial direction with respect to said post-process drum, said correction arms movable in an axial direction of the post-process drum to a position around said post-process drum without interference between correction arms of said correction mechanism and said post-process drum.

5,087,317

LABELLING MACHINE FOR THE LABELLING OF CONTAINERS

Wolfgang Rogall, Wuppertal, Fed. Rep. of Germany, assignor to ETI-TEC Maschinenbau GmbH, Erkrath, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 431,587, Nov. 3, 1989. This application Jul. 9, 1990, Ser. No. 550,321

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922934

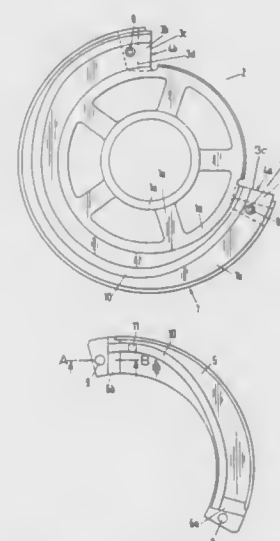
Int. Cl.⁵ B65C 9/00

U.S. Cl. 156—456

16 Claims

1. A labelling machine for labelling a container or the like, said labelling machine comprising:
a rotatable turntable having rotatable plates disposed thereon; said rotatable plates for receiving and positioning containers for labelling;
at least one labelling means adjacent to said rotatable turntable;
means for rotationally controlling each said rotatable plate; said means for rotationally controlling each said rotatable plate comprising a pivoting control lever arm means;
cam means for guiding said lever arm means;
said cam means comprising a first cam segment and a second cam segment;

said second cam being removable from said first cam segment;
each of said first cam segment and said second cam segment having two ends;
at least one of said ends of said first cam segment and said second cam segment comprising at least one overlapping



means for overlapping at least one of said ends of the other one of said first cam segment and said second cam segment; and

said at least one overlapping means in formed by at least one bevelled surface on said first cam segment and at least one bevelled surface on said second cam segment.

5,087,318

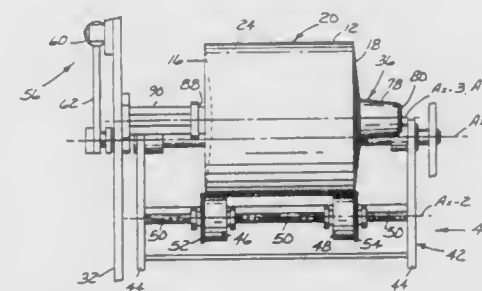
WEB-ALIGNING APPARATUS

Conrad V. Anderson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 279,192, Dec. 2, 1988, Pat. No. 4,990,215. This application Feb. 1, 1991, Ser. No. 649,469
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.⁵ B32B 31/04

U.S. Cl. 156—540

22 Claims



1. Apparatus for aligning an elongate web with respect to a predetermined path of travel, the web having opposite edges extending longitudinally of the web and being supplied from a supply roll formed by the web being wound around an inner web layer and having an outer web layer, the apparatus comprising:
a frame;

a cantilever axle mounted on the frame and having retaining means for mounting the supply roll for rotation about the axis of the cantilever axle to afford unwinding of the web from the supply roll, the cantilever axle being mounted for

movement in the axial direction to allow axial movement of the supply roll within a predetermined range;
means, including an abutment member, for self-centered mounting of the supply roll on the retaining means with the center of the supply roll generally centered on the retaining means by pushing the supply roll onto the retaining means until additional axial motion of the supply roll is blocked by the abutment member, with the supply roll and retaining means being free to translate axially within a predetermined operating range without the supply roll engaging the abutment member when the supply roll is mounted on the retaining means; and

an arm assembly pivotable on an axis generally parallel to the axis of the cantilever axle, the arm assembly having a free end, two guide rollers rotatably mounted on the arm assembly generally adjacent its free end, the guide rollers being constrained from axial motion such that the guide rollers are adapted to guide the outer web layer relative to its predetermined path of travel as the guide rollers roll against the opposite edges of the outer web layer, with the axle affording translation of the supply roll to accommodate telescoped or non-uniformly wound supply rolls, and biasing means for biasing the free end of the arm assembly toward the axle to maintain the guide rollers in rolling engagement with the outer web layer of the supply roll, the biasing means including manually actuatable means for deactivating the biasing means to allow the arm assembly to be pivoted away from the axle assembly, thereby facilitating replacement of the supply roll.

5,087,319

APPARATUS FOR CONTINUOUS MANUFACTURE OF LAMINATES

Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

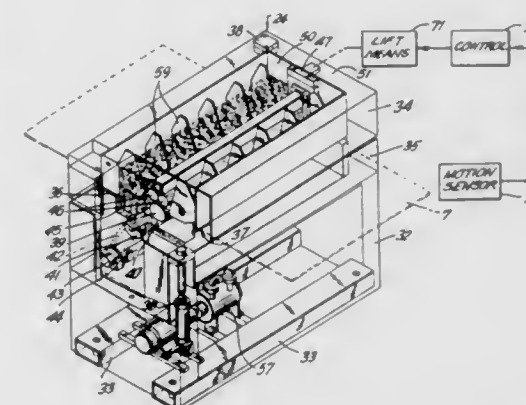
Filed Jun. 19, 1990, Ser. No. 540,359

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3920946

Int. Cl.⁵ B32B 31/00; B24B 55/02

U.S. Cl. 156—555

18 Claims



1. Apparatus for continuous fabrication of laminate comprising several layers of at least partially resin impregnated material webs which are extruded together with each other, comprising means for supplying stacked material webs, a double-band press for receiving the stacked material webs and extruding same into a laminate web using at least area pressure, a cooling station arranged downstream of the double-band press where the laminate web is cooled, a grinding station arranged downstream of the double-band press where the rear side of the laminate web is roughened, and downstream of the cooling and grinding means for winding the laminate web on storage coils or for sub-dividing the laminate web into plates or panels, characterized in that the grinding station is combined with the cooling station in one single device into an integrated grinding

and cooling arrangement, the grinding and cooling arrangement including a support, a housing on the support having an upper portion and a lower portion, an inner tub in the housing upper portion and lower portion, sealing means for substantially sealing off from the outside the housing upper and lower portions, inlet and outlet gaps between the housing upper and lower portions and leading into the inner tub for the laminate web, cooling water in the inner tube, and grinding means rotatably supported in the inner tub and positioned such that the rear side of the laminate web is conveyed so as to contact the surface of the grinding means, the housing upper portion and lower portion forming an outer tub surrounding the inner tub, said outer tub serving for receiving cooling water leaking from the inner tub.

5,087,320

ULTRASONIC ROTARY HORN HAVING IMPROVED END CONFIGURATION

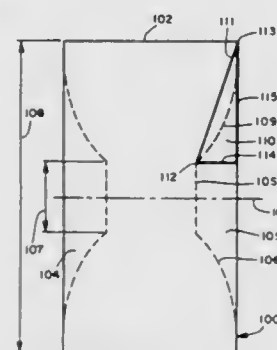
Joseph G. Neuwirth, Cumming, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 18, 1990, Ser. No. 525,507

Int. Cl.⁵ B32B 31/00

U.S. Cl. 156—580.2

8 Claims



1. In an ultrasonic rotary horn intended to be excited at a frequency of from about 18 to about 60 kHz, which horn comprises a shaped, solid metal object having a radial surface terminated by a first end and a second end, and a rotational axis, in which each of said ends is defined by a surface and said object is axially symmetrical, which horn has the following characteristics:

- (A) the diameter of said horn is in the range of from about 4 cm to about 19 cm;
- (B) the width of said horn at said radial surface is from about 0.6 cm to about 13 cm;
- (C) the thickness of said horn at the rotational axis thereof is from about 0.6 cm to about 15 cm and is independent of the width of said horn at said radial surface;
- (D) said horn has a mass in the range of from about 0.06 kg to about 30 kg; and
- (E) said diameter, width, and thickness are selected for a desired frequency so that said horn, upon being excited by ultrasonic energy at such frequency which is input at the rotational axis at, and substantially perpendicular to, one or both ends, is adapted to resonate in a manner such that:
 - (1) the excited end moves substantially in phase with the movement of the source of excitation;
 - (2) the opposing end, whether or not it is actively excited, moves substantially out of phase with the movement of the excited end;
 - (3) said radial work-contacting surface also moves substantially out of phase with the movement of the excited end; and
 - (4) said horn exhibits a single nodal point at its geometric center;

the improvement which comprises said first end and said second end having a substantially concave configuration which comprises a central, circular, flat portion which is concentric

with said rotational axis and a generally convex portion from said flat portion to said radial surface, in which:

- (a) the diameter of said flat portion is at least about 20 percent of the diameter of the horn;
- (b) said generally convex portion is a curved surface having axial symmetry and a curvilinear profile in cross-section through said rotational axis which lies in the triangular area defined by (i) a straight line leading from the outer boundary of said flat portion to the edge of said radial surface; (ii) a straight line parallel with the rotational axis which begins at the outer boundary of the flat portion and extends outwardly away from the horn; and (iii) a straight line which is perpendicular to the rotational axis and which extends from the edge of said radial surface to said straight line parallel with the rotational axis;
- (c) said horn has a variance of no more than about 20 percent across said radial surface; and
- (d) the ratio of the average radial amplitude to the longitudinal amplitude is at least 1.

5,087,321

MANUFACTURING METHOD AND EQUIPMENT OF SINGLE SILICON CRYSTAL

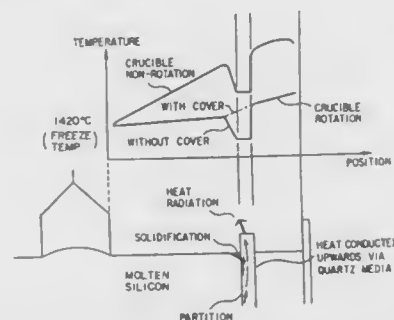
Hiroshi Kamio, Tokyo; Kenji Araki; Yoshinobu Shima, both of Yokohama; Makoto Suzuki; Akira Kazama, both of Kawasaki, and Shigetake Horie, Tokyo, all of Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 281,191, Dec. 7, 1988, abandoned. This application Jan. 3, 1990, Ser. No. 460,581 Claims priority, application Japan, Dec. 8, 1987, 62-308766 The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.⁵ C30B 15/02, 15/12, 15/22, 35/00

U.S. Cl. 156—608

2 Claims



1. A method for manufacturing large columnar single silicon crystals having a diameter of 12 cm–30 cm while rotating in one direction by pulling a molten silicon material from a quartz crucible rotating in the other direction and heated by an electric resistance heater surrounding the side wall of the crucible, which comprises feeding granular silicon to a molten liquid silicon surface around the periphery thereof, but separated by a partition from the area where said columnar single silicon crystal is pulled, and wherein the granular silicon is melted and made to flow through said partition from said peripheral, but separate area into the pulling area, while maintaining the temperature of the molten liquid silicon crystal in the pulling area almost constant and lower than the peripheral granular silicon feeding area, wherein only the surface of molten liquid in the peripheral silicon heating area and the top and the inner side of the partition projecting above the surface of molten liquid are covered by an insulating cover to reduce radiant energy heat loss on the interior of the partition to obtain a temperature at least above the freezing point of said molten liquid silicon to prevent the inner molten silicon from solidifying at the partition interface area.

5,087,322

SELECTIVE METALLIZATION FOR HIGH TEMPERATURE SEMICONDUCTORS

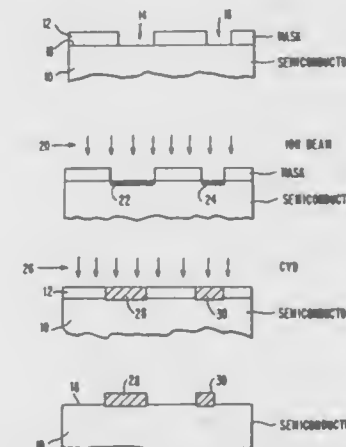
David Lillienfeld, Ithaca, N.Y.; David Thomas, Milton, Vt.; Paul Smith, Geneva, N.Y.; Gerald Comeau, Burdett, N.Y., and Robert Soave, Cortland, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 24, 1990, Ser. No. 602,802

Int. Cl.⁵ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—628

21 Claims



1. A method of forming contact metallization on high temperature semiconductor material, comprising: forming from a wide-band-gap semiconductor material a substrate having a first surface; forming a layer of masking material on said first surface; patterning said layer; removing a selected portion of said layer to expose an implant site on said first surface at the desired location of a metal contact; directing an ion beam against said exposed implant site to modify said semiconductor material; depositing by chemical vapor deposition a refractory metal on the modified semiconductor material at said implant site, said modified semiconductor material reacting with said refractory material to produce contact metallization of said first surface at said implant site.

5,087,323

FINE LINE PATTERN FORMATION BY AEROSOL CENTRIFUGE ETCHING TECHNIQUE

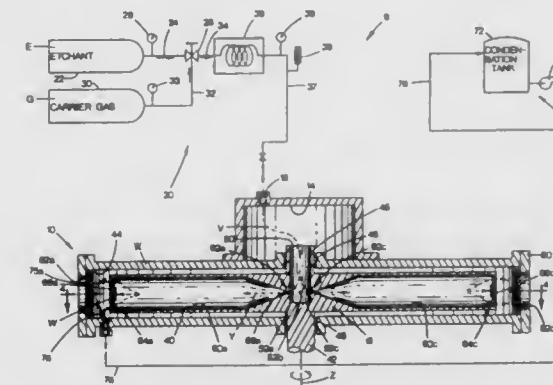
Jun Y. Park, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Filed Jul. 12, 1990, Ser. No. 551,925

Int. Cl.⁵ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—646

29 Claims



11. An aerosol centrifuge etching method of forming a fine

line pattern on a wafer of a semiconductive material having an etchable film layer with an outer surface being divided by masking into exposed etchable regions and masked nonetchable regions, the aerosol centrifuge etching method comprising the steps of:

- providing a rotating housing having a central region and a periphery with support means for releasably supporting the wafer with the etchable film layer outer surface facing the central region, the rotation of the housing providing a centrifugal force within the housing directed toward the periphery;
- mounting the wafer inside the rotating housing using the support means;
- feeding an etchant aerosol which is reactable with the etchable film layer into the central region of the rotating housing;
- propelling the received etchant aerosols outwardly with the centrifugal force from the central region to the periphery of the housing to impinge on the etchable film layer outer surface of the mounted wafer; and
- etching the exposed regions of the etchable film layer outer surface by a chemical reaction of the impinged etchant aerosol and the etchable film layer, thereby forming an etched wafer having a fine line pattern as defined by the masking.

5,087,324

PAPER TOWELS HAVING BULKY INNER LAYER
Anthony O. Awofeso, Appleton, and Frank D. Harper, Neenah, both of Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Filed Oct. 31, 1990, Ser. No. 606,900

Int. Cl.⁵ D21H 11/16

18 Claims

U.S. Cl. 162—111

1. A delaminated stratified paper towel comprising: a first layer of chemical fiber blend; and a second layer of an anfractuuous high bulk softwood fiber blend, unitary with said first layer; said first layer being constructed of a denser chemical softwood and hardwood fiber blend relative to said second layer; said second layer having approximately 30% to 43% of the anfractuuous fiber and approximately 57% to 70% of long mechanical pulp fiber; wherein said first and second layers enhance a rate of absorption and water capacity as compared to a towel of equal strength not having a layer of anfractuuous fiber blend.

5,087,325

APPARATUS FOR MANUFACTURING A DRIED WEB OF PAPER

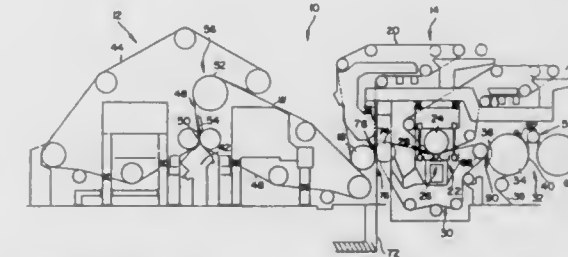
Robert E. Page, Davis, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 13, 1991, Ser. No. 668,536

Int. Cl.⁵ D21F 2/00, 3/04

U.S. Cl. 162—193

17 Claims



17. A method for manufacturing a dried web of paper from stock, the web being positively supported during passage of

the web through the forming section, a pressing section, and a drying section, the method comprising the steps of:

- forming a web from stock such that the formed web is disposed on a forming wire of the forming section;
- cutting a tail of the web on the forming wire upstream relative to a pick-up roll of the press section;
- picking up the tail of the web by applying vacuum through a tail box defined by the pick-up roll such that the tail is supported by a press felt while the remainder of the full width web is removed to a broke pit;
- directly transferring the tail in a closed draw from said press felt to a smooth, water impervious surface of a bearing blanket at said pick-up roll in a transfer nip, said blanket extending through an extended nip press;
- supporting the tail on the impervious surface during passage of the tail through an elongate pressing section;
- directly transferring the tail in a closed draw from the bearing blanket to a heated surface of a dryer in a dryer transfer nip;
- sandwiching the tail between the dryer and a dryer felt disposed downstream relative to the bearing blanket such that the tail is threaded through the press section and the dryer section; and
- subsequently widening the tail to a full width web such that the full width web is threaded through the press section and dryer section, the web being transferred without open draw from the forming section to the dryer section.

5,087,326

ROTATING PULP BLEACHING REACTOR HAVING INNER AND OUTER SHELLS AND LIFTING MEANS ON THE INTERIOR SURFACE OF THE INNER SHELL

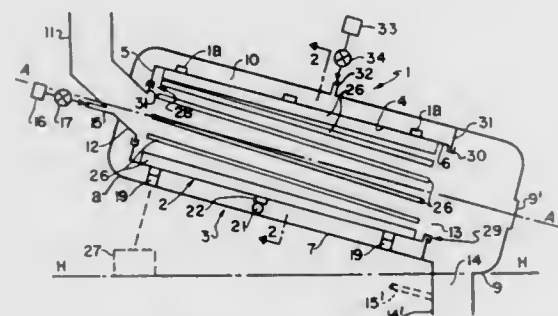
Stuart T. Jones, Franklin, Va., assignor to Union Camp Patent Holding, Inc., Wayne, N.J.

Filed Feb. 20, 1991, Ser. No. 658,284

Int. Cl.⁵ D21C 7/02

U.S. Cl. 162—244

16 Claims



1. A bleaching apparatus for bleaching lignin containing pulp particles comprising:

- an inner tubular shell member having a tubular wall with an input end and an output end at opposite ends of the axial length of the tubular wall, said inner shell member having an internal wall surface defining a free, open reaction zone bounded thereby;
- an outer tubular shell member having a tubular wall with an input end and an output end at opposite ends of the axial length of the tubular wall, said outer shell member being disposed in surrounding relation with respect to the inner shell member to provide a space therebetween and with the input ends adjacent each other and the output ends adjacent each other;
- pulp feed conduit means extending from a location communicating with the exterior of the outer shell member and extending through the input end of both shell members for feeding pulp particles into the inner shell member;
- an output opening at the output end of each shell member for removing pulp particles from both shell members after passing through the reaction zone of the inner shell member;

- rotating means for rotating said inner shell member about its axial length;

- means for introducing a gaseous bleaching agent into the reaction zone of said inner shell member in an amount sufficient to bleach the pulp particles in said reaction zone;

- lifting means mounted on the interior wall surface of said inner shell member for contacting the pulp particles fed into the input end of the inner shell member and directing them into the reaction zone for mixing and reacting with said gaseous bleaching agent as the inner shell member is rotated;

- seal means extending between said shell members at the input and output ends thereof to isolate a space between the walls of the shell members from communication with both the interior of the inner shell member and the exterior of the outer shell member; and

- means for pressurizing said space between the shell members with gas at a level to maintain the seal means free of said pulp particles and gaseous bleaching agent.

5,087,327

PMC YARN WITH SOLUBLE MONOFILAMENT CORE

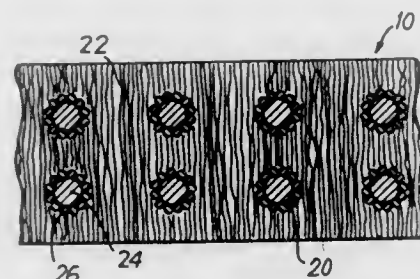
Paul F. Hood, Glenmont, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Jul. 9, 1990, Ser. No. 549,744

Int. Cl.⁵ D21F 3/00

U.S. Cl. 162—358

16 Claims



1. In a papermaker's fabric designed for use on the press section of a papermaking or similar machine, said papermaker's fabric being woven from yarns in longitudinal, or machine, and transverse, or cross-machine, directions, the improvement comprising:

- a composite yarn in one of said longitudinal or transverse directions, said composite yarn having a core and a monofilament layer, said monofilament layer substantially surrounding said core, wherein said core includes at least one strand of a soluble material.

5,087,328

METHOD AND APPARATUS FOR REMOVING FILLING GASES FROM COKE OVENS

Johannes Wegerer; Wilhelm Kandler; Horst Panzer, and Karl Buchberger, all of Linz, Austria, assignors to Voest-Alpine Stahl Linz Gesellschaft m.b.H., Linz, Austria

Filed Sep. 5, 1990, Ser. No. 577,876

Claims priority, application Austria, Sep. 7, 1989, 2095/89

Int. Cl.⁵ C10B 27/04, 43/14

U.S. Cl. 201—2

4 Claims

1. A method of filling a coke oven chamber of a coke oven comprised of adjacently arranged coke oven chambers each having a gas opening by using a stationary gas jumper arrangement including two lid chambers each disposed over a respective gas opening of two adjacently arranged coke oven chambers and each containing a coke oven chamber lid for covering said gas openings and uncovering said gas openings during filling of one of said coke oven chambers,

- said two lid chambers being connected together by a duct in the form of a gas jumper pipe, actuating means for moving each of said coke oven chamber lids from an opened

position to a closed position on said gas openings during which each of said chamber lids is rotationally fitted to said gas openings,

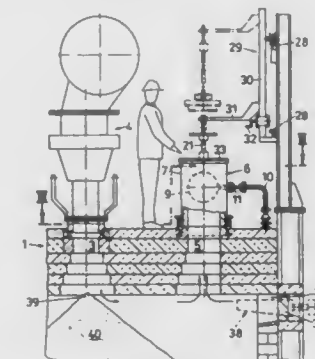
wherein each of said gas openings is characterized by an annular rim having sealing surfaces and each of said coke oven chamber lids has sealing surfaces which mate with said rims to provide a tight fit with each other in the closed position,

wherein a gas feeding duct is connected to said gas jumper pipe for supplying inert gas into said gas jumper pipe when the coke oven chamber lids are closed against the rims of said gas openings and wherein a closable air opening means is provided in each of said coke oven chambers near the gas jumper pipe, said method comprising:

filling a first one of said two adjacent coke oven chamber with coal and thereby generating filling gases;

placing said two adjacent coke oven chambers under negative pressure;

removing part of the filling gases by suction directly from said first one of said two adjacent coke oven chambers and removing another part of the filling gases by suction from the second one of said two adjacent coke oven chambers by transfer through said gas jumper arrangement while aspirating air through the air opening means of the first one of said two adjacent coke oven chambers for combustion with said another part of the filling gases during transfer so as to prevent carbonaceous deposits from forming on the interior of the gas jumper arrangement.



2. In a stationary gas jumper arrangement combined with a coke over comprising adjacently arranged coke oven chambers, each having a gas opening extending through the ceiling of each of said oven chambers, said stationary gas jumper arrangement being adapted to overlap the gas openings of two adjacent oven chambers and comprising annular rims mounted on the ceilings of said oven chambers and peripherally surrounding and defining a gas opening bore coextensive with each of the gas openings and lid chambers mounted on the ceilings of the oven chambers and coaxially surrounding each of the annular rims, each of said lid chambers having a coke oven chamber lid coaxially and rotatably supported therein and configured so as to cover said gas opening bore when fitted against the annular rim, actuation means for vertically moving and rotating said coke oven chamber lids within said lid chambers, and a gas jumper pipe extending between and interconnecting the lid chambers of said two adjacently arranged coke ovens; the improvement comprising:

- annular sealing surfaces provided on each of said coke oven chamber lids which mate with corresponding annular sealing surfaces provided on the rims defining said gas opening bores,

- such that when the chamber lids are brought into contact with and rotated against the annular sealing surfaces of said rims, tight seals are obtained, and

- a gas feeding duct coupled to said gas jumper pipe for supplying inert gas under pressure when the coke oven cham-

ber lids are brought down into sealing contact with the annular rims.

5,087,329

PROCESS FOR SEPARATING PENTAFLUOROETHANE FROM A MIXTURE OF HALOGENATED HYDROCARBONS CONTAINING CHLOROPENTAFLUOROETHANE

Vinci M. Felix, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 16, 1991, Ser. No. 714,374

Int. Cl.⁵ B01D 3/40; C07C 17/38

U.S. Cl. 203—67

9 Claims

1. A process for separating pentafluoroethane from a first mixture of pentafluoroethane and chloropentafluoroethane which comprises:

- adding a fluorocarbon extractive agent having 1-4 carbon atoms optionally containing hydrogen and/or chlorine, and having a boiling point greater than -39°C ., and less than about 50°C ., to the first mixture in order to form a resultant second mixture;

- separating pentafluoroethane from chloropentafluoroethane of the second mixture by extractively distilling the second mixture in an extractive distillation zone and thereby recovering, as overhead product, a pentafluoroethane stream substantially free of chloropentafluoroethane.

5,087,330

POROUS ALUMINUM OXIDE FILM AND METHOD OF FORMING OF THE SAME

Kazuhiro Wada, Kyoto; Nobuyoshi Baba, Kawasaki; Sachiko Ono, Tokyo, and Takako Yoshino, Minamisennoku, all of Japan, assignors to Kyoto University, Kyoto, Japan

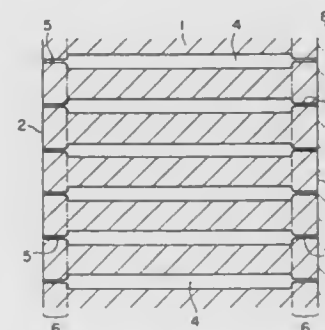
Division of Ser. No. 412,732, Sep. 26, 1989. This application Jan. 28, 1991, Ser. No. 646,298

Claims priority, application Japan, Mar. 31, 1989, 1-82141

Int. Cl.⁵ C25D 1/08

U.S. Cl. 205—75

23 Claims



1. A method of forming a porous aluminum oxide film, comprising the steps of:

- anodizing an aluminum substrate so as to form an aluminum oxide film upon said aluminum substrate;

- changing the voltage applied to said aluminum substrate during said anodizing step so as to form a plurality of pores extending through said aluminum oxide film such that each pore comprises a larger diameter pore located at a central portion of said aluminum oxide film with respect to the thickness of said aluminum oxide film, and a pair of smaller diameter pores extending from opposite surfaces of said aluminum oxide film toward opposite ends of said larger diameter pore so as to communicate with said larger diameter pore; and

- separating said aluminum oxide film from said aluminum substrate.

permeable cell which are divided by a micro- or ultrafiltra-

1. A process for the continuous separation of electrically charged macromolecular compounds by forced-flow membrane electrophoresis, which comprises conducting said process in an electrophoretic cell comprising
 - (1) a membrane compartment consisting of a feed and a permeate cell which are divided by a micro- or ultrafiltration membrane;

tion membrane permeable to said macromolecular compound.

- (2) electrode compartments which comprise anode and cathode compartments at opposite sides of the membrane compartment
- (1) which are partitioned from the cells of the membrane compartment with ion-exchange membranes, wherein the anode compartment is bordering the membrane compartment by an anion-exchange membrane and the cathode compartment is bordering the membrane compartment by a cation-exchange membrane, the ion-exchange membranes being impermeable to said macromolecular compound and having no or very low permeability to salts, and
- (2) means to control the flow rate to the permeate, by the process steps of
 - (a) recycling aqueous solutions containing mixtures of electrically charged macromolecular compounds, and having a pH-value between the isoelectric points of said macromolecular compounds, through said feed cell and subjecting them to a pressure-driven membrane separation treatment,
 - (b) simultaneously applying an electric field across the solutions, the micro- or ultrafiltration membrane and the ion-exchange membranes to induce electrophoretic migration of at least one of the macromolecular compounds through the micro- or ultrafiltration membrane or away from all the membranes,
 - (c) adjusting the flow rate of the permeate to a predetermined value,
 - (d) withdrawing at least one of the macromolecular compounds either from the feed or permeate cell, and
 - (e) recycling a dilute buffer solution through the permeate cell to sweep away macromolecular materials which have permeated through the membrane; the dilute solution may be at a pH equal, lower or higher than the pH of the feed solution, the recycle rate in the permeate and feed cells being many times the rate of feed solution-permeation and the residence time of the solution in the cells being very short.

5,087,339

Patent Not Issued For This Number

5,087,340

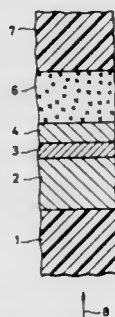
METHOD OF MAKING MAGNETO-OPTICAL RECORDING DISK

Nobuaki Onagi; Shinichiro Suzuki; Seiro Fujii; Takahiro Kobayashi; Takamasa Yoshikawa; Masayasu Yamaguchi, and Kiyohide Ogasawara, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Oct. 10, 1990, Ser. No. 595,367

Claims priority, application Japan, Dec. 1, 1989, 1-312557
Int. Cl.⁵ C23C 14/34

U.S. Cl. 204—192.2

2 Claims



1. A method of manufacturing a magneto-optical recording disk comprising a magneto-optical recording layer made of an amorphous rare earth-transition metal alloy having a uniaxial magnetic anisotropy in the normal direction of said layer, said

magneto-optical recording layer disposed between at least one pair of dielectric layers made of zinc sulfide and formed over a transparent substrate, which comprises the steps of:

- introducing said transparent substrate into an airtight vacuum chamber of a thin film forming apparatus for conducting a sputtering method so that said substrate is positioned in a substantially vacuum atmosphere;
- sputter depositing zinc sulfide onto said substrate under an Argon pressure of 0.2 through 1.0 mTorr, whereby a first zinc sulfide layer is produced in an amorphous state;
- sputter depositing a rare earth-transition metal amorphous alloy onto said first zinc sulfide layer, whereby a magneto-optical recording layer is produced;
- sputter depositing zinc sulfide onto said magneto-optical recording layer under an Argon pressure of 0.2 through 1.0 mTorr, whereby a second zinc sulfide layer is produced in an amorphous state, and wherein the manufactured magneto-optical recording disk has a high C/N ratio greater than 65 dB.

5,087,341

DRY ETCHING APPARATUS AND METHOD

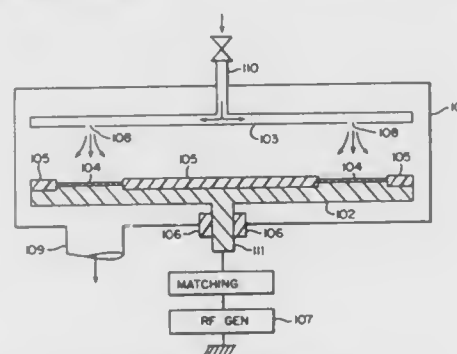
Tsutomu Tsukada; Etsuo Wani, both of Fuchu, and Koki Yasuda, Akita, all of Japan, assignors to ANELVA Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 926,839, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 715,439, Mar. 25, 1985, abandoned. This application Jun. 18, 1990, Ser. No. 538,696

Claims priority, application Japan, Mar. 23, 1984, 59-54476
Int. Cl.⁵ H01L 21/306; B44C 1/22; C03C 15/00

U.S. Cl. 204—192.32

12 Claims



1. A dry etching apparatus comprising:

- a reactor chamber;
 - a first electrode provided in said reactor chamber for supporting a plurality of to be treated substrates;
 - a second electrode positioned opposite to said first electrode;
 - means provided to said second electrode for supplying reactive gas into said reactor chamber; and
 - means for applying high frequency power between said first electrode and said second electrode for generating etchant from said reactive gas to etch said substrates;
- the improvement comprising:

- (a) means intermittently rotating said first electrode for positioning each of said substrates substantially directly beneath said gas supplying means for a predetermined period of time such that said reactive gas, and therefore etchant generated from said reactive gas, is directly blown onto the surface of each of said substrates during said period of time; and
- (b) means for reducing etchant surrounding each of said substrates which is designed such that
 - (i) at least a portion of said first electrode adjacent respective peripheries of said substrates is covered with said etchant reducing means; and
 - (ii) a top main surface of said etchant reducing means is higher than top surfaces of said substrates.

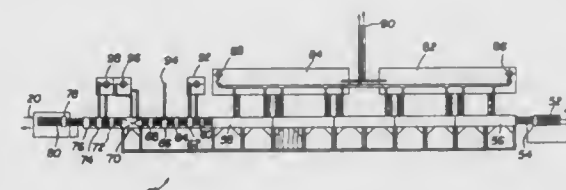
5,087,342 CONTINUOUS STEEL STRAND ELECTROLYTIC PROCESSING

William H. Stokes, Fostoria, Ohio, assignor to Seneca Wire and Manufacturing Company, Seneca, Ohio
Division of Ser. No. 178,593, Apr. 7, 1988. This application Sep. 19, 1989, Ser. No. 409,597

Int. Cl.⁵ C25D 17/00

U.S. Cl. 204—210

7 Claims



1. Apparatus for processing a steel strand to produce steel valve spring wire comprising an electrolytic unit having a series of electrolytic cells of the kind in which no direct electrical contact is made with the strand, and a fluidized bed furnace for heat treating said strand.

5,087,343

ELECTROLYTIC CELL HEADS COMPRISED OF BULK POLYMERIZED CYCLOOLEFIN MONOMERS

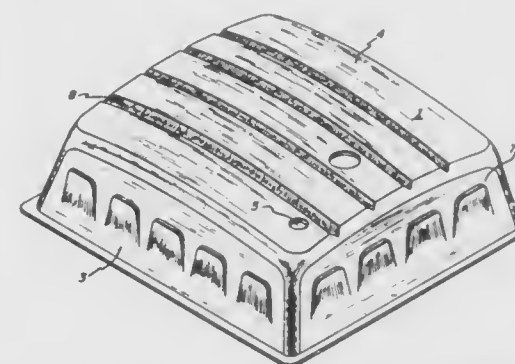
Charles S. Woodson, Conroe, Tex.; Dennis Janda, and Paul T. Strichartz, both of Brecksville, Ohio, assignors to The BF Goodrich Company, Brecksville, Ohio and PTI/END-CORR, Baton Rouge, La.

Filed Jun. 8, 1990, Ser. No. 534,708

Int. Cl.⁵ C25B 9/00; C25C 7/00

U.S. Cl. 204—242

13 Claims



3. A one piece, molded electrolytic cell head weighing more than 100 lbs., which does not contain fiber reinforcement, wherein said electrolytic cell head is comprised of monomers having norbornene functionality which are bulk polymerized in a closed mold by a metathesis catalyst system, said electrolytic cell head having

- (a) a flanged base adapted to help provide a liquid tight seal between said electrolytic cell head and the receptacle which retains the anode and cathode of an electrolytic cell;
 - (b) side walls which extend from the flanged base;
 - (c) a top portion supported by said side walls; wherein said side walls and top portion have a thickness of at least 1/4"; and
 - (d) at least one orifice positioned in or near said top portion having a cross-sectional area adapted to release the gases produced by the anode and cathode of an electrolytic cell, when installed,
- wherein the flanged base, side walls and top portion are integrally connected to provide a sealed cavity for the anode and cathode of an electrolytic cell, when installed, and wherein

said sealed cavity is water tight and gas tight when all orifices are closed or connected to a closed conduit system.

5,087,344

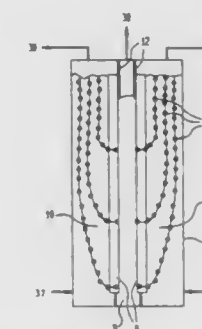
ELECTROLYSIS CELL FOR GAS-EVOLVING ELECTROLYTIC PROCESSES

Hanno Wenske; Arnold Gallien, both of Grimma; Wolfgang Hanke, Leisnig-Tragnitz; Wolfgang Lampe, Grimma, and Lothar Illgen, Dresden, all of Fed. Rep. of Germany, assignors to Heraeus Elektroden GmbH, Hanau, Fed. Rep. of Germany
Filed Sep. 26, 1990, Ser. No. 588,359

Int. Cl.⁵ C25B 9/00, 11/02, 11/03, 15/08

U.S. Cl. 204—256

16 Claims



1. An electrolysis cell for gas-evolving electrolytic processes, in particular for water and chlor-alkali electrolysis, using at least one electrode with electrode elements arranged parallel and forming the anode and cathode, characterized in that the electrode elements (1, 1a, 1b, 1c, 1d, 15, 16, 28, 29, 30, 31) have a thickness (3, 33) of up to three times the means bubble separation diameter, and have a capillary gap (4) relative to one another such that the direction of motion of the gas bubbles through the electrode (8) is substantially parallel to the direction of an electrical field formed between the reaction faces of the anode and cathode, and wherein the electrode elements (1, 1a, 1b, 1c, 1d, 15, 16, 28, 29, 30, 31) comprise profiled portions (23, 24', 24'', 25, 32) for defining the capillary gap (4).

5,087,345

CATION EXCHANGE MEMBRANE HAVING HIGH STABILITY

Akio Kashiwada, and Tatsuo Hiyoshi, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

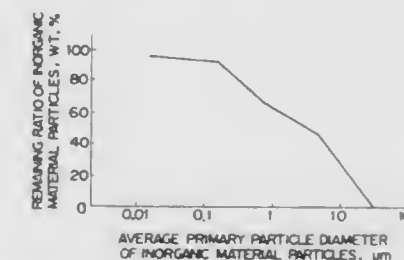
Filed Jul. 16, 1990, Ser. No. 552,890

Claims priority, application Japan, Jul. 17, 1989, 1-182562

Int. Cl.⁵ C25B 13/08

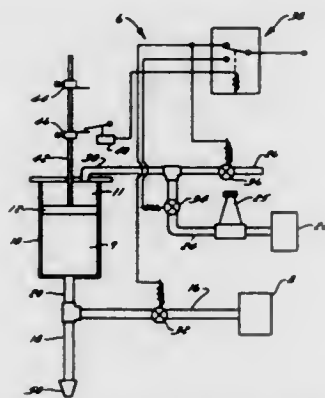
U.S. Cl. 204—295

13 Claims



1. A cation exchange membrane comprising: a reinforced base membrane comprising at least one layer of a fluorocarbon polymer having pendent sulfonate groups, carboxylate groups or a mixture thereof and, encapsulated therein, a reinforcing fabric comprising warp and weft

source with the interior of said upper cylinder chamber in response to said sensing; said control means functioning by sensing the upward movement of said piston to a first position and closing said fluid communication with said foam generator and opening said fluid communication with said pressurized gas source,



causing said piston to move downwardly and expel foam; and said control means further functioning by sensing the downward movement of said piston to a second position and closing fluid communication with said pressurized gas source and opening fluid communication with said foam generator, thereby causing said lower cylinder chamber to fill with foam and said piston to move upwardly.

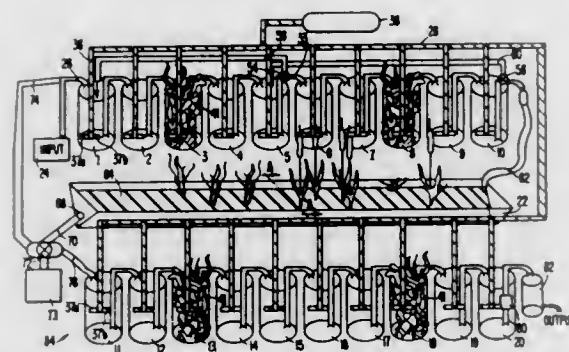
5,087,353

SOLAR AQUATIC APPARATUS FOR TREATING WASTE
John H. Todd, Falmouth, Mass., and Barry Silverstein, New York, N.Y., assignors to Ecological Engineering Associates, Marion, Mass.

Filed Nov. 3, 1988, Ser. No. 266,732
Int. Cl.³ C02F 3/32

U.S. Cl. 210-94

20 Claims



1. An apparatus for removing pollutants from water comprising:

- (a) a series of tanks capable of holding water and organisms for removing pollutants from the water, wherein each of said tanks comprises a bottom and light-transmitting sides, and water contained in the tanks which includes said organisms for removing pollutants from the water;
 - (b) means for connecting said tanks in series such that water can be transferred along said series of tanks from a first tank to a last tank;
 - (c) means for inputting water containing pollutants to the first tank; and
 - (d) means for outputting water from which said pollutants have been removed from the last tank;
- wherein said series of tanks comprises:
a first tank containing polluted water and photosynthetic

bacteria for removing at least some of the pollutants from the water;

- a second tank connected in series with said first tank containing non-aquatic plants capable of removing at least some of the pollutants from the water, and a support for maintaining the non-aquatic plants at the surface of water; and

- a third tank connected in series with said second tank containing polluted water and fish capable of removing at least some of the pollutants from the water.

5,087,354

BIOLOGICAL CONTACTOR FOR PURIFYING WATER TO PRODUCE DRINKING WATER

Jean R. Montagnon, La Celle St. Cloud; Guy P. Bablon, Feucherolles; Gérard L. Dagois, Asnieres, and Claire C. Ventresque, Colombes, all of France, assignors to Societe Pica-Produits Industriels et Charbons Actifs, Levallois Perret Cedex, France

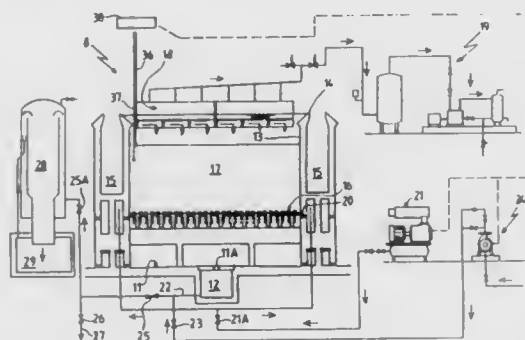
Division of Ser. No. 445,297, Dec. 4, 1989, Pat. No. 5,037,550.

This application Nov. 20, 1990, Ser. No. 616,283

Claims priority, application France, Dec. 5, 1988, 88 15909
Int. Cl.³ C02F 3/32; B01D 41/02

U.S. Cl. 210-108

20 Claims



1. Purification biological contactor (8, 40, 50) for producing drinking water including a tank (10) containing a granular bed (17, 17') and comprising a bottom on top of which is a filter bottom (16) and a side wall (13) with an upper edge (14) forming an overflow lip, a device (18) for supplying water to be treated to the upper part of the tank, a device (12, 22, 25) for removing treated water from beneath the bottom of the tank, a device for injecting washing water (24) and a device for injecting washing air (21) under the filter bottom, characterised in that the granular bed comprises a layer based on activated carbon the material constituting which meets the following conditions:

- density between 0.18 and 0.32 g/cm³,
- carbon tetrachloride adsorbing power between 60% and 120% by weight,
- carbon tetrachloride retention less than 25% by weight of the carbon tetrachloride adsorbed mass,
- methylene blue: between 5 and 30 ml,
- particle size: between 0.5 and 1.5 mm effective size with a coefficient of uniformity less than 2; the tank being further provided with a device (36, 37) for monitoring in time a parameter representative of the population of algae in said layer associated with a triggering device (38) receiving measuring signals from the monitoring device and connected to the water and air injection devices so as to trigger a washing cycle (air only; air plus water; water only) when the representative parameter reaches a predetermined set point threshold.

5,087,355

AUTOMATICALLY SELF-FLUSHING FILTER

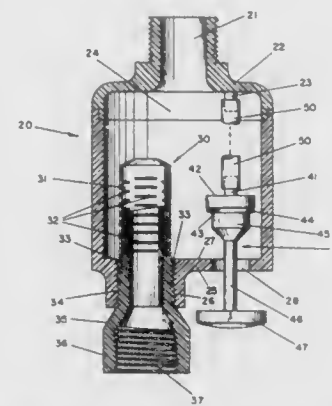
C. T. Godec, P.O. Box 160, Moriarty, N. Mex. 87035

Filed Jul. 19, 1990, Ser. No. 557,151

Int. Cl.³ B01D 21/30

U.S. Cl. 210-136

16 Claims U.S. Cl. 210-169



1. An automatically self-flushing filter comprising:

- a. a hollow body portion, said body portion having a fluid inlet and first and second fluid outlets;
- b. fluid filter means inserted in said first fluid outlet; and
- c. apparatus, partially positioned in said second fluid outlet, for permitting fluid to pass through said second fluid outlet when the fluid pressure within said body portion is below a predetermined value and for closing said second fluid outlet in response to increasing fluid pressure within said body portion, to thereby force said fluid through said filter means.

5,087,356

SOLDER DROSS REMOVAL APPARATUS

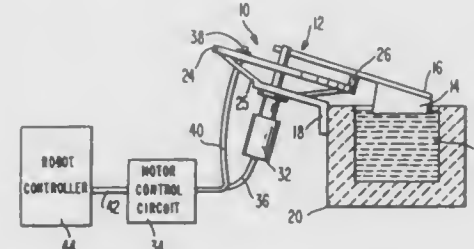
Winston S. Webb, Duadon, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 16, 1990, Ser. No. 524,110

Int. Cl.³ B01D 21/30; B23K 1/00

U.S. Cl. 210-143

6 Claims



4. An apparatus for removal of dross from a top surface of a solder bath comprising:

- a) a pot containing a solder bath;
- b) a rotatable wiper means positioned adjacent said pot to skim the surface of said bath as the wiper means rotates;
- c) motor means attached to said rotatable wiper means to rotate the same; and,
- d) a motor control circuit for said motor means including:
 - i) means to actuate said motor means in response to a signal pulse received from a robot controller indicating that an electrical component to be dipped in said solder bath is approaching said solder bath; and
 - ii) means to deactivate said motor means automatically after said rotatable wiper means has skimmed the surface of said bath once.

5,087,357

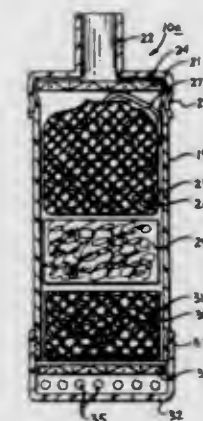
AQUARIUM FILTER APPARATUS

Aquilino L. Villa, 1024 Crest Rd., Pine Hill, N.J. 08021

Filed Sep. 7, 1990, Ser. No. 578,684

Int. Cl.³ A01K 63/04

1 Claim



1. An aquarium filter apparatus, the apparatus in combination with an aquarium, including transparent side walls and a gravel strata, the gravel strata including a top surface, with a filter member, the filter member including inlet conduit means positioned below the top surface, and

an outlet conduit, with the outlet conduit operably associated with a pump member to direct fluid flow through the filter member, and

wherein the filter member includes a central tubular body, the central tubular body including a lower lid, the lower lid including the inlet conduit means mounted thereto, and an upper cap including the outlet conduit, with the upper cap and the lower lid coaxially aligned relative to the tubular body, and the lower lid mounted to a lower terminal end of the tubular body, and the upper cap mounted to an upper end of the tubular body, and

wherein the tubular body includes an upper annular groove, and the upper cap including an interiorly projecting lower annular rib, the lower annular rib selectively receivable within the upper groove for securement of the upper cap to the tubular body, and

including a mesh screen mounted within the upper cap overlying the outlet conduit, and the mesh screen orthogonally oriented relative to an access defined by the tubular body, and

including a mesh bag member, the mesh bag member including an opening, the opening including a drawstring mounted about the opening to effect selective closure of the opening, with the mesh bag member including a predetermined quantity of ammonia activated charcoal, and the mesh bag member defining a cylinder coaxially aligned within the tubular body, and

including a fibrous filter cylinder coaxially aligned within the tubular body adjacent to and underlying the mesh bag member, and

including an upper mesh bag overlying the mesh bag member, wherein the upper mesh bag defines an upper mesh bag cylinder and includes granular sand, with the upper mesh bag member positioned between the mesh bag member and the mesh screen, and

including a lower mesh bag, the lower mesh bag defining a lower mesh bag cylinder and including gravel contained therewithin, with the lower mesh bag underlying the fibrous filter cylinder and positioned adjacent thereto in coaxial alignment with the tubular body, and

wherein the lower lid includes an annular array of inlet openings circumferentially arranged through the lower lid adjacent a lower terminal end of the lower lid, with the

inlet openings radially arranged relative to the axis of the tubular body, and including a lower mesh screen, the lower mesh screen overlying the inlet openings and positioned between the inlet openings and the lower mesh bag, and wherein the lower lid includes an internally threaded annular skirt threadably mounted to the lower terminal end of the tubular body.

5,087,358

FILTERING MACHINE FOR FIBROUS SUBSTANCES HAVING REVOLVING CONE-SHADED FILTERS

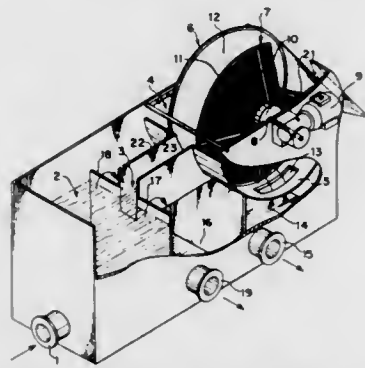
Donato Massignani, Viale Ferrarin 18, Vicenza, Italy

Filed Aug. 8, 1990, Ser. No. 564,182

Int. Cl.⁵ B01D 33/27

U.S. Cl. 210—195.1

3 Claims



1. A machine for the filtering and treatment of solid particles suspended in liquids, comprising a delivery chamber (2) collecting the liquids to be treated, a raceway (3) connecting the delivery chamber with a treatment chamber (4) and defining a flow direction, the treatment chamber (4) having a cylindrical bottom (5), and containing at least a pair of revolving filters (6, 7), an overflow chamber (16) arranged to receive overflow from the delivery chamber connected with a recycling tank, an area (21) arranged to receive discharge of recovered solid particles which have been separated from liquid by the filters, characterized in that each of the filters (12) has a surface shaped as a truncated cone, with a horizontal axis which is essentially perpendicular to a direction of said flow direction, said two filters being coaxial with each other and facing each other, so as to form a concave space (20) therebetween, said pair of filters being rigidly connected with a shaft driven by a gearmotor (19) or by equivalent means.

5,087,359

QUATERNIZED PEI SILICA SOLID SUPPORTS FOR CHROMATOGRAPHY

Sunil V. Kakodkar, Bethlehem, Pa., and Hugh E. Ramsden, Scotch Plains, N.J., assignors to J. T. Baker Inc., Phillipsburg, N.J.

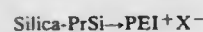
Continuation of Ser. No. 390,324, Aug. 7, 1989, abandoned. This application Jun. 4, 1991, Ser. No. 711,119

Int. Cl.⁵ B01D 15/08

U.S. Cl. 210—198.2

13 Claims

1. A quaternized derivative of covalently bound, non-cross-linked polyethyleneimine bonded phase silica, suitable for use in binding or separating basic proteins having a high pH isoelectric point, of the formula:



wherein Silica-PrSi-PEI is the covalently bound, non-cross-linked polyethyleneimine bonded phase which is the reaction product of

- (1) a silica which is selected from the group consisting of:
 - a) particulate silica gel having an average particle diame-

ter of from about 1 to 200 microns and an average pore size of from about 0 to 1000 Angstrom units or

- b) particulate controlled pore glass having an average particle diameter of from about 1 to about 200 microns and an average pore size of from about 0 to about 1000 Angstrom units, with

- (2) polyethyleneiminopropyl trimethoxy silane having an average molecular weight of from about 400 to about 1800,

the + symbol indicates that all the amino groups of the PEI moiety have been converted to tertiary amino groups by reductive alkylation addition to each amino nitrogen of up to two straight chain alkyl groups of from 1 to 4 carbon atoms and wherein at least about 30% of the tertiary amino groups of the PEI moiety have been quaternized by the addition to the amino nitrogen of tertiary amino groups of a further straight chain alkyl groups of from 1 to 4 carbon; and

X⁻ is an anion.

5,087,360

FIELD-PORTABLE APPARATUS AND METHOD FOR ANALYTICAL SUPERCRITICAL FLUID EXTRACTION OF SORBENT MATERIALS

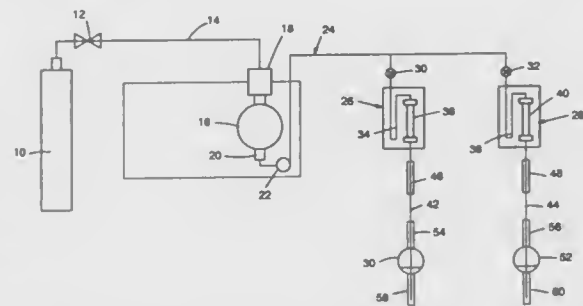
Bob W. Wright, and Jonathan S. Fruchter, both of Richland, Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 19, 1990, Ser. No. 510,987

Int. Cl.⁵ B01D 15/08

U.S. Cl. 210—198.2

2 Claims



1. A field-portable apparatus for use in supercritical fluid extraction of analytes of semivolatile and higher molecular weight materials from a solid sorbent matrix, said apparatus comprising:

- a) Supercritical Fluid Extraction solvent delivery means;
- b) Supercritical Fluid Extraction solvent cooling means prior to a reciprocating pump comprising a copper block through which said Supercritical Fluid Extraction solvent flows, attached to a first thermoelectric cooler assembly;
- c) reciprocating high pressure liquid chromatography pump having a pumphead cooling means;
- d) pumphead cooling means comprising a copper plate mounted on said pumphead, said upper plate attached to a second thermoelectric cooler assembly;
- e) a heated extraction cell oven containing coiled tubing and an extraction cell holding the solid sorbent matrix to which any analytes present are adsorbed, said Supercritical Fluid Extraction solvent passing through said coiled tubing prior to its introduction into said extraction cell, and said SFE solvent and said analytes combining in said extraction cell to form an extraction effluent;
- f) a heated extraction effluent restriction tube; and
- g) a collection flask assembly which is adapted to sealably receive said extraction effluent restriction tube, having a collection tube for holding collection solvent, and said assembly having a collection solvent condenser to condense collection solvent vapors entrained by escaping Supercritical Fluid Extraction solvent, wherein said Su-

percritical Fluid Extraction solvent is introduced to said extraction cell at supercritical conditions, and the resulting extraction effluent is expanded through a restriction orifice;

wherein any analytes present in the extraction effluent are captured in a collection solvent;

wherein said first and second thermoelectric cooler assemblies are characterized by the combination of a wafer-shaped, single stage thermoelectric cooler with a liquid cooled copper heat exchanger to which is connected a convective cooled heat sink; and,

wherein said apparatus is sized and dimensioned for field use.

5,087,361

FILTER FLOOR NOZZLE HOUSING AND SUPPORT ARRANGEMENT

Marie-Pierre Gaudin, Saint Germain en Laye; Marc Gilet, Puteaux, and Alain Motte, Bongival, all of France, assignors to Degremont, Rueil-Malmaison Cedex, France

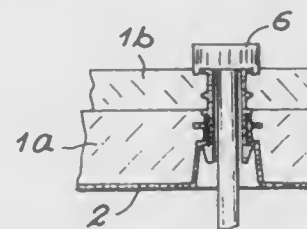
Filed Jan. 2, 1990, Ser. No. 459,601

Claims priority, application France, Jan. 9, 1989, 89 00157

Int. Cl.⁵ B01D 24/12; B05B 15/06

U.S. Cl. 210—293

6 Claims



1. Apparatus constructed and arranged for placing and securing within a filter floor fluid passageway means for transporting fluid through said floor, said floor including a lower layer of shuttering and an upper layer of concrete, said apparatus comprising:

- a plurality of housings integrally formed in said shuttering, each of said housings providing a substantially vertically-extending passageway and comprising a lower hollow truncated portion extending upwardly from said shuttering, a hollow substantially cylindrical portion extending upwardly from said truncated portion, and internal shoulder means providing a transition portion between said truncated and cylindrical portions;
- a nozzle support member adapted for insertion within each of the passageways of said housings, each nozzle support member comprising a substantially cylindrical member having an axially aligned fluid passageway, an upper end for supporting nozzle means, and notch means in the outer surface of said cylindrical member at a lower portion thereof, said notch means being adapted for releasably engaging the internal shoulder of said housing; and,

nozzle means secured to the respective upper end of each of said nozzle support members.

5,087,362

FLUME DISTRIBUTION SYSTEM WITH REMOVABLE BLOCK

Marvin A. Brown, Sewickley, Pa., assignor to F.B. Leopold Company, Inc., Zelienople, Pa.

Filed Jul. 26, 1991, Ser. No. 736,521

Int. Cl.⁵ B01D 24/12, 24/22, 35/28

U.S. Cl. 210—293

20 Claims

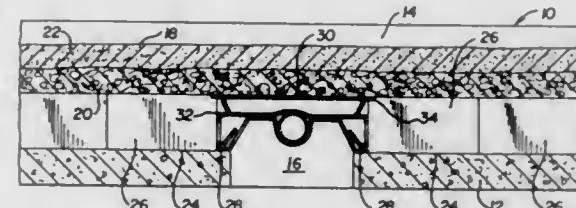
1. In a system for receiving effluent from a bed of granular media during a filtration mode and distributing a backwash liquid uniformly throughout said bed during a backwash mode, including:

- a flume;
- a plurality of underdrain laterals positioned beneath and

supporting said bed of granular media, said underdrain laterals divided by a plurality of walls into primary horizontal conduits and secondary horizontal conduits and containing liquid metering orifices that connect said primary conduits to said secondary conduits and dispersion orifices that connect said secondary conduits to said bed of granular media;

said underdrain laterals extending transverse to said flume, each lateral having an inlet adjacent said flume; and means for supplying backwash liquid to said flume, whereby said liquid flows from said flume to the lateral inlets and into said primary conduits, through said liquid metering orifices into said secondary conduits, and through said dispersion orifices into said bed;

the improvement comprising:



a duct in fluid communication with said flume and with at least one lateral inlet;

a stop positioned within said duct and spaced from said inlet; and

a removable orifice plate housed within said duct facing said inlet, said orifice plate movable between an active position restricting said inlet during backwash and an inactive position abutting said stop during filtration;

said orifice plate caused by backwash pressure to move from the inactive position to the active position when liquid is supplied to said flume, and the orifice plate is held in the active position by a pressure differential across the orifice plate thereby reducing the cross-sectional area of said inlet and regulating the velocity of flow from said flume into said primary conduit, said orifice plate returning to the inactive position abutting said stop during filtration when flow through the system is reversed.

5,087,363

FILTERING CELL

Serge Kurowski, Neupre, Belgium, assignor to Baker-Hughes Incorporated, Houston, Tex.

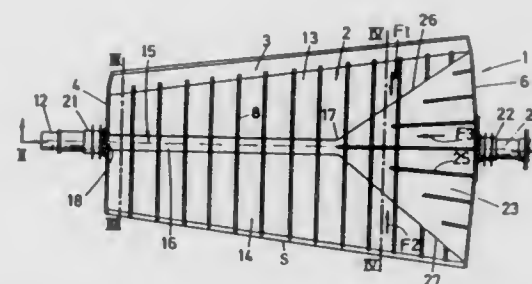
Filed May 10, 1990, Ser. No. 521,595

Claims priority, application Belgium, May 12, 1989, 089000519

Int. Cl.⁵ B01D 33/00

U.S. Cl. 210—328

19 Claims

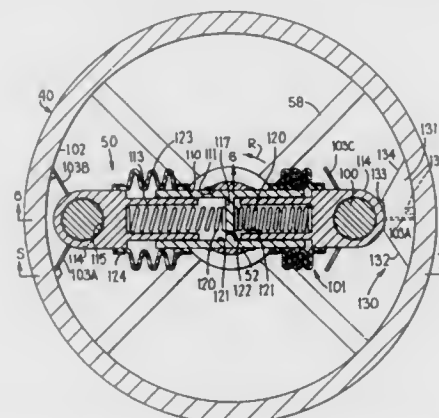


8. Filtering cell, comprising

a tank comprising a base wall, lateral walls extending upwards from the base wall and an upwardly facing opening, a plane filter bed supported in the tank and dividing the latter into an upper compartment for the substance to be filtered and a lower compartment for the filtrate,

indexing means for removing the first blade from cleaning contact with the inside face of the filter element and sub-

22 Claims



said drain plug in said second position permitting flow of liquid from a supply through the chamber into said drain conduit.

7 Claims

1. A self-cleaning filter, comprising:
a housing having an inlet port for process liquid to be filtered
and an outlet port for filtered liquid;
a cylindrical filter element in said housing, the interior of the

13 Claims

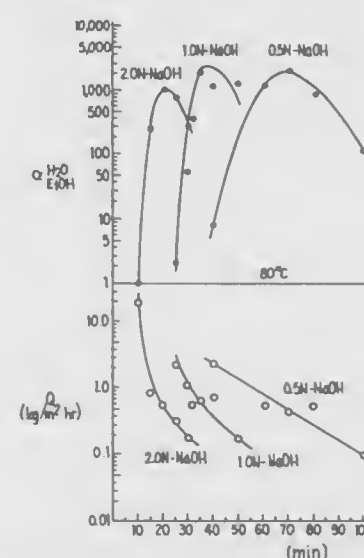
1. A biocompatible dialysis membrane for hemodialysis in the form of flat sheets, tubular sheets or hollow filaments, comprising a mixed polysaccharide ester, formed from at least two members of the group consisting of acetic acid, propionic acid and butyric acid, wherein said mixed polysaccharide ester has a structure represented by the formula

$$\begin{aligned} a + p + b &= (0.5)(x) \text{ to } (0.95)(x); \\ p + b &= (0.13)(x) \text{ to } (0.95)(x); \\ a &= (0 \text{ to } 0.83)(x); \\ b &= (0 \text{ to } 0.9)(x); \text{ and} \\ p &= (0 \text{ to } 0.9)(x). \end{aligned}$$

with the provision that, if $a=0$, then p and b must be greater than 0 and, if p or $b=0$, then a must be greater than 0 selected for providing a C_{54} reduction of about 70% or more.

U.S. Cl. 210—500.39

5 Claims



1. A composite membrane prepared by applying a hydrophilic synthetic polymer alternative to polyacrylonitrile, having a carboxyl or a hydroxyl group on a partially hydrolyzed polyacrylonitrile base membrane, and having properties for separating at least water from ethanol by pervaporation.

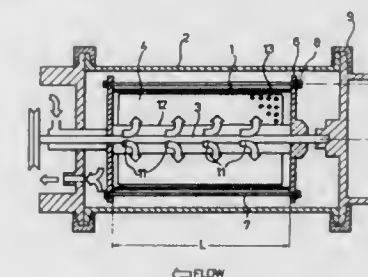
5 Claims

[illegible]

applying a medium containing PN-I to a column containing heparin bound to solid support, said column being preequilibrated,
eluting said column with a gradient of 0.3-1M NaCl to obtain fractions,
recovering the fractions containing classes of PN-I, followed by subjecting said fractions to gel exclusion chromatography using a gel with an exclusion of 100 kd.

U.S. Cl. 210-635

10 Claims



1. In a method for removing and recovering a specific protein or specific proteins from a protein-containing fluid by means of an affinity gel carrier having thereon a substance or group which imparts an affinity to the carrier for the protein, onto which the protein or proteins are absorbed, washed while absorbed thereon and eluted therefrom, the improvement which comprises the steps of charging a particulate affinity gel carrier having a particle size from 10 μ m to 7 mm into a rotary column; passing the protein-containing fluid through the column by way of orifices while rotating the column to non-

mechanically fluidize the carrier, whereby the fluid comes into contact with the carrier in a state of turbulent flow, until the protein contained therein becomes absorbed on the carrier; washing the column of fluidized carrier by passing a washing liquid through the fluidized carrier in the column being rotated; and eluting the desired protein from the washed column of fluid carrier by passing an eluent through the column being rotated without causing any significant damage to the carrier used to adsorb the protein thereon.

5,087,370

METHOD AND APPARATUS TO DETOXYFIFY AQUEOUS BASED HAZARDOUS WASTE

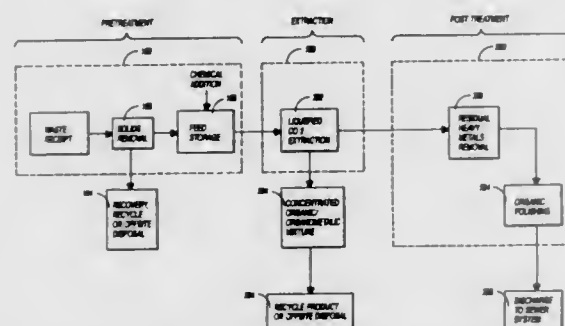
Alexander Schultheis, Wrentham; Mark A. Landrigan, Concord, both of Mass., and Arun Lakshani, Audubon, Pa., assignors to Clean Harbors, Inc., Quincy, Mass.

Filed Dec. 7, 1990, Ser. No. 623,604

Int. Cl.⁵ B01D 59/28, 61/00

U.S. Cl. 210—638

43 Claims



1. Apparatus for processing aqueous waste wherein said waste comprises a plurality of solid components and an aqueous component including organics and heavy metals, comprising:

means for substantially concurrently removing at least some organics and at least some heavy metals from said aqueous waste, including,

means for receiving said waste, and including a first means for removing at least one of said plurality of solid components from said waste;

a plurality of storage means for holding said waste, at least some of said plurality of storage means receiving said waste from said means for receiving, at least one of said plurality of storage means being for storing said waste and at least one of said plurality of storage means being for phase separating a second one of said plurality of solid components and establishing an aqueous stream comprising said at least some organics and said at least some heavy metals;

extraction means for contacting said aqueous stream with a solvent, said solvent dissolving some of said at least some heavy metals from said aqueous stream to form an extract comprising said solvent, some of said at least some organics and some of said at least some heavy metals; and recovery means for processing said extract, recovering said solvent therefrom and generating a concentrate comprising some of said at least some organics and some of said at least some heavy metals and generating a clean aqueous stream.

19. A process comprising: substantially concurrently removing organics and heavy metals from an aqueous based stream, by, removing solids from said aqueous based stream; storing said aqueous based stream; adding a chelating agent to said aqueous based stream to generate an organometallic complex comprising at least some of said heavy metals; dissolving some of said organics and said organometallic complex in a solvent; separating an extract from said aqueous based stream, said

extract comprising said solvent, said organometallic complex, at least some of said organics and at least some of said heavy metals to generate a clean aqueous stream; and recovering said solvent from said extract.

5,087,371

METHOD FOR REGENERATING SCALE SOLVENT

Richard L. Morris, Duncanville, and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 14, 1990, Ser. No. 612,728

Int. Cl.⁵ B01D 61/40

U.S. Cl. 210—643

24 Claims

14. In the method for removing alkaline earth sulfate scale by contacting the scale with an aqueous solvent having a pH of about 8 to about 14 and comprising a chelating agent comprising a polyaminopolycarboxylic acid or salt of such an acid, and a synergist anion; the improvement comprising removing alkaline earth sulfate scale dissolved in said aqueous solvent by:

(a) acidifying the aqueous solvent containing dissolved scale sufficiently to generate free alkaline earth metal ions without forming an insoluble alkaline earth precipitate;

(b) mixing the aqueous solvent with a liquid membrane emulsion comprising an immiscible liquid hydrocarbonaceous membrane phase containing a soluble surfactant and an oil soluble emulsifier, said liquid membrane emulsion enveloped around droplets of an internal aqueous phase comprising an aqueous solution having a pH of from about 8 to about 14 and a chelating agent comprising a polyaminopolycarboxylic acid or a salt of such an acid, wherein the free alkaline earth ions transfer from the solvent into the hydrocarbonaceous membrane and into the internal aqueous phase where the ions are removed by the chelating agent; and

(c) recovering the aqueous solvent and increasing the pH of the aqueous solvent to a value of about 10 to about 14 to produce a regenerated aqueous solvent for reuse.

5,087,372

METHOD FOR REMOVING HEAVY METAL IONS FROM CONTAMINATED WATER AND A POROUS MEMBRANE USABLE THEREFOR

Kazuo Toyomoto, and Takehiko Ootoy, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1990, Ser. No. 493,751

Claims priority, application Japan, Mar. 24, 1989, 1-70407; Jun. 16, 1989, 1-152415; Jun. 26, 1989, 1-160858

Int. Cl.⁵ B01D 61/00, 33/21

U.S. Cl. 210—651

4 Claims

1. A method for simultaneously removing at least two different heavy metal ions selected from the group consisting of an iron ion, a copper ion, a cobalt ion and a nickel ion from contaminated water containing said at least two different heavy metal ions, which comprises:

(1) filtering contaminated water containing at least two different heavy metal ions selected from the group consisting of an iron ion, a copper ion, a cobalt ion and a nickel ion through a porous membrane comprising a membranous, porous resin matrix and a plurality of side chains chemically bound to surfaces of said matrix, in which said surfaces are inclusive of pore wall surfaces, each side chain having bonded thereto an iminodiacetic acid group, to obtain a filtrate, and

(2) terminating the filtration when the concentration of a determinant heavy metal ion in said filtrate reaches a predetermined level, wherein said determinant heavy metal ion is defined as a heavy metal ion which, among said at least two different heavy metal ions, exhibits a maximum adsorption equilibrium for said iminodiacetic acid group and wherein said predetermined level does not

exceed 1/10 of the concentration of the determinant heavy metal ion in said contaminated water.

5,087,373

PROCESS FOR REMOVING TITANIUM AND ZIRCONIUM FROM AQUEOUS SOLUTIONS

Thomas Kolberg, Heppenheim; Horst Gehmecker, Hofheim, and Joachim Heltbaum, Bad Homburg, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 29, 1991, Ser. No. 707,122

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1990, 4018647

Int. Cl.⁵ C02F 9/00

U.S. Cl. 210—665

10 Claims

1. A process for removing complexes of titanium and/or zirconium from an acid aqueous solution, comprising the steps of:

(a) conditioning an acid aqueous solution which contains complexes of titanium and/or zirconium by raising its pH value to at least 8;

(b) removing any precipitate thus formed; and

(c) thereafter passing the solution having its pH thus raised through a cation exchange material and an anion exchange material.

5,087,374

REMOVAL OF CONTAMINATES FROM GRANULAR SOLIDS

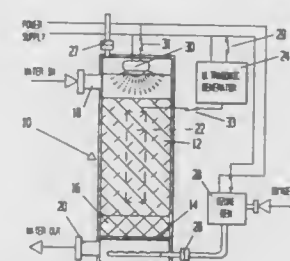
Lambert L. Ding, 1920 Calle Bogota, Rowland Heights, Calif. 91748

Filed Mar. 5, 1990, Ser. No. 488,092

Int. Cl.⁵ C02F 1/28

U.S. Cl. 210—673

19 Claims



11. In a method of the removal of organic compounds from water which comprises:

d. contacting said water with activated carbon in an amount sufficient to adsorb said organic compounds from said water and form an organic-compound adsorbate laden activated carbon; and

e. regenerating organic-compound adsorbate-laden activated carbon adsorbent containing organic adsorbate by: (1) immersing said activated carbon in an aqueous liquid bath containing from 10 to about 250 parts per million of a surface active agent;

(2) applying ultrasonic vibration to said aqueous liquid bath and to said activated carbon contained therein at a frequency from 1 to about 100 kilo-Hertz, said vibration being sufficient to effect a substantial desorption of said organic adsorbate from said activated carbon; and

(3) introducing water into said aqueous liquid bath and withdrawing aqueous liquid therefrom to effect washing of said activated carbon and removal of desorbed organic compounds therefrom.

METHOD FOR PRODUCING INSOLUBLE INDUSTRIAL RAW MATERIAL FROM WASTE

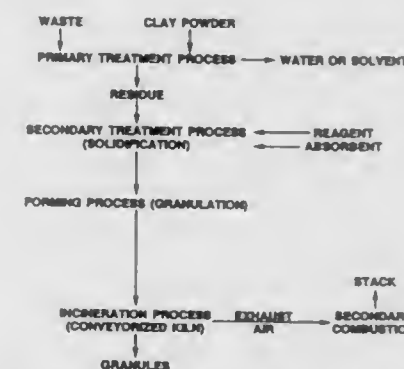
Peter Weinwurm, Mississauga, Canada, assignor to Aggio Recovery, Weston, Canada

Continuation-in-part of Ser. No. 110,838, Oct. 21, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 299,979

Int. Cl.⁵ B01D 15/00; C02F 1/28

U.S. Cl. 210—688

21 Claims



1. A method for treating hazardous or toxic waste containing organic matter and metals, for producing an inorganic insoluble industrial raw material, comprising the steps of:

(a) mixing of said waste materials with a plastic material comprising oxides of silicon and aluminum and capable of forming nonleachable inorganic compounds with said metals to form a plastic mixture;

(b) preparing the plastic mixture into shaped articles with a large surface area;

(c) heat treating the shaped articles to remove the organic matters wherein drying and distillation occur at a temperature in the range of 60°–200° C. and pyrolysis occurs in an oxygen free environment at a temperature in the range of 400°–500° C.; and

(d) bonding the inorganic matters to stable solid insoluble silicate complexes by calcining and sintering at a temperature in the range of 750°–1150° C.

5,087,376

MULTIFUNCTIONAL SCALE INHIBITORS

Beverly Bendiksen, Corapolis; Leonard J. Persinski, and Raymond J. Schaper, both of Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1990, Ser. No. 597,652

Int. Cl.⁵ C02F 5/14

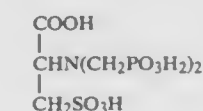
U.S. Cl. 210—700

7 Claims

1. A method of inhibiting the precipitation and deposition of scale-forming salts including calcium carbonate in an aqueous system having a pH of at least about 9, comprising the step of adding to said system an amount sufficient to establish a concentration of from 1 to 150 mg/L of a compound selected from N,N-bis(phosphonomethyl)taurine of the formula



and N,N-bis(phosphonomethyl)cysteic acid of the formula

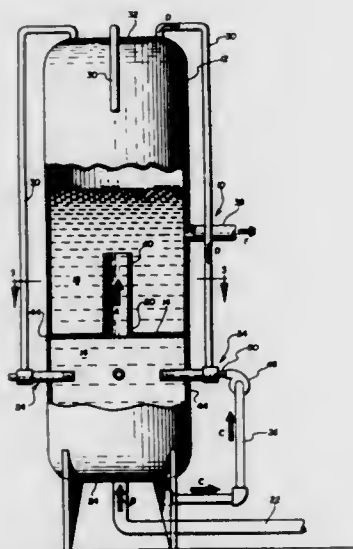


5,087,377
HIGH PRESSURE OXYGEN-SATURATED
WATER-TREATMENT

John Josefik, Berwyn, Ill., assignor to Microlift Systems Limited Partnership, Sturgeon Bay, Wis.
Division of Ser. No. 80,993, Aug. 3, 1987, Pat. No. 4,956,080.
This application Feb. 12, 1990, Ser. No. 478,668
Int. Cl.⁵ C02F 1/24

U.S. Cl. 210—703

2 Claims



1. An improved method of treating waste water by creating an aqueous treatment liquid of super-saturated oxygen in water, said method comprising the steps volume of: providing a pressurized volume for containing the treatment liquid, said treatment volume pressurized and maintained at at least 80–120 P.S.I.; providing chamber separation means disposed within the pressurized treatment volume and thereby defining two connected chambers therewith and permitting the flow of the treatment liquid from the first chamber into the second chamber, wherein said second chamber is disposed substantially vertically above said first chamber, thereof; inputting water into the first chamber to form a treatment water system; injecting a stream of oxygen-containing gas in water into the pressurized treatment volume to form a pressurized, oxygen-containing stream in said first chamber and maintaining thereafter the oxygen-containing gas within the pressurized treatment volume under pressure; receiving and combining the pressurized oxygen-containing stream with the treatment water stream under pressure to form a combined injection volume of pressurized water in said second chamber which is super-saturated with dissolved oxygen; outputting recirculation liquid from the pressurized treatment volume in said first chamber, injecting an oxygen-containing gas therein from said second chamber, and recirculating said liquid to the pressurized treatment volume; and outputting said super-saturated, pressurized, oxygen-containing stream from said second chamber into a containment volume of waste water containing suspended solids and inorganic and organic contaminants having a reduced pressure; wherein the super-saturated, oxygen-containing gas comes out of solution as minute bubbles entraining said suspended solids and providing substantial oxidation of said inorganic and organic contaminants and removing the entrained suspended solids from said waste water.

5,087,378
PROCESS FOR ENHANCING THE DEWATERABILITY
OF WASTE SLUDGE FROM MICROBIOLOGICAL
DIGESTION

Geza L. Kovacs, Baltimore, Md., assignor to Pori, International, Inc., Baltimore, Md.

Filed May 31, 1990, Ser. No. 531,059

Int. Cl.⁵ C02F 11/12

U.S. Cl. 210—742

10 Claims

1. A process for enhancing the dewaterability of concentrated waste sludges which have a substantial content of a water-retaining cellular structure arising from microbiological action and which have a solids content greater than about 15 weight percent comprising:
 - 1) adjusting the pH of said sludge to a value of 4 or less;
 - 2) heat treating said sludge without the addition of an oxygen-bearing gas or oxidizing agent at a temperature between about 260° and 390° F. for a sufficient time to significantly enhance its filterability; and
 - 3) readjusting the pH of said sludge to within 2 points of neutral and heat treating this neutralized or partially neutralized sludge at a temperature between about 260° and 390° F. for a sufficient time to maintain its enhanced filterability.
9. A process of dewatering relatively high solids content waste sludges while minimizing the C.O.D. and B.O.D. load of the resultant effluent, said sludges having a solids content greater than about 15 weight percent and a substantial content of a water retaining cellular structure arising from microbiological action which does not permit significant further dewatering by a simple room temperature filtration on a recessed chamber filter at a filtration pressure of 100 psi, comprising the steps of:
 - 1) adjusting the pH of said sludge to a value of less than about 4;
 - 2) heat treating the acidified sludge at a temperature between about 290° and 370° F. by direct contact with pressurized steam for a period between about 15 minutes and three hours sufficient that the ultimate dewaterability of the concentrated waste sludge is not significantly effected by subjecting the heat treated neutralized material to substantial shear;
 - 3) neutralizing the heat treated sludge to a pH greater than about 5 with a basic calcium compound;
 - 4) heat treating the neutralized sludge at a temperature of at least about 260° F. in excess of about 5 minutes; and
 - 5) filtering the heat treated neutralized sludge to a water content of less than about 55 weight percent in less than about two hours.

5,087,379
ULTRASONIC VIBRATOR TRAY PROCESSES

William E. Morton, Bridgeport; Harold V. Fairbanks, Morgantown; James Wallis, Morgantown, all of W. Va.; Raymond L. Hunicke, Roxbury, and Joseph Krenicki, Danbury, both of Conn., assignors to Lewis Corporation, Oxford, Conn.

Division of Ser. No. 189,361, May 2, 1988, Pat. No. 4,919,807, which is a continuation of Ser. No. 886,010, Jul. 7, 1986, Pat. No. 4,741,839. This application Mar. 2, 1990, Ser. No. 488,275. The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

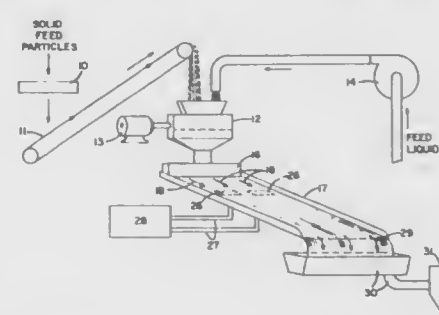
Int. Cl.⁵ B01D 33/03

U.S. Cl. 210—748

20 Claims

1. The process of treating with vibratory energy a flowable slurry of particulate materials mixed in a liquid comprising the steps of providing a first laterally extended downwardly elongated treatment zone bounded by an adjoining flat boundary surface and a laterally extended downwardly elongated reflection surface located over the treatment zone, coupling vibratory energy through said boundary surface to cause the slurry to vibrate in a direction substantially perpendicular to its length and to its width at a frequency

between about 10 kHz and about 50 kHz, while the slurry flows downward through the downwardly elongated treatment zone toward a lower exit end thereof,



and thereafter conducting the treated slurry to a separation zone where the particulate materials are separated from the liquid.

5,087,380
METHOD AND APPARATUS FOR REMOVING OILY
MATERIALS AND FLOATING MATTERS IN GENERAL
FROM THE SURFACE OF BODIES OF WATER

Mirella De Toffoli, Pisa, Italy, assignor to Mytilus S.R.L., Sanremo, Italy

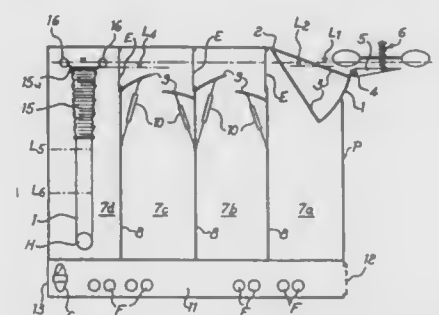
PCT No. PCT/IT89/00021, § 371 Date Sep. 18, 1990, § 102(e) Date Sep. 18, 1990, PCT Pub. No. WO89/09309, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 22, 1989, Ser. No. 474,842

Claims priority, application Italy, Mar. 22, 1988, 45204 A/88 Int. Cl.⁵ C02F 1/40; B63B 35/32

U.S. Cl. 210—776

32 Claims



1. A method for removing from the surface of bodies of water oily matters and floating matters in general, briefly designated as "oil", comprising the operation of preliminarily increasing the concentration thereof per unit of surface in the upper layers, relative to the initial concentration, by withdrawing water from the lower layers, wherein said preliminary concentration increasing operation is performed through the following elementary and contemporary steps of:

- a) initially separating from the surface of the body of water a thin liquid surface layer of a minimum thickness (L_1-L_2), but still sufficient to contain the whole amount of oil, simultaneously giving to the liquid of said separated layer such a relative speed as to forward it to the following treatment with a minimum or no turbulence;
- b) introducing then the liquid of said separated layer into a basin (B) whose horizontal size relative to the cross section where the separation has taken place is such as to substantially reduce said relative velocity of the liquid flow, whereby a first decantation process is enhanced due merely to the density difference between water and oil floating substantially undisturbed thereabove, the average level (L_3) of liquid in the basin (B) being kept near to the average level of the body of water at the outside;
- c) causing the water in the basin (B) to have a flow direction downward by sucking from the basin bottom the lower

layers thereof, thus leaving the already separated oil at the surface, still increasing its concentration;

- d) withdrawing from the basin surface, where the highest oil concentration is present, an upper layer liquid substantially deprived of water and forwarding the same to a further decantation treatment comprising passing at low speed through an array of tanks (U) communicating with each other the liquids withdrawn from those surface layers having a higher oil concentration, wherein a flow is maintained from the first tank (U) to the last, from which the water deposited at the bottom is sucked and discharged, while the oil is in turn withdrawn and sent to store, out of the top portion of said last tank (U).

5,087,381

REFRIGERANTS

Kohji Tamura, Kawanishi; Hiroshi Kashiwagi, Settsu, and Masahiro Noguchi, Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 259,144, Oct. 18, 1988, Pat. No. 4,957,652.

This application Feb. 15, 1990, Ser. No. 480,654

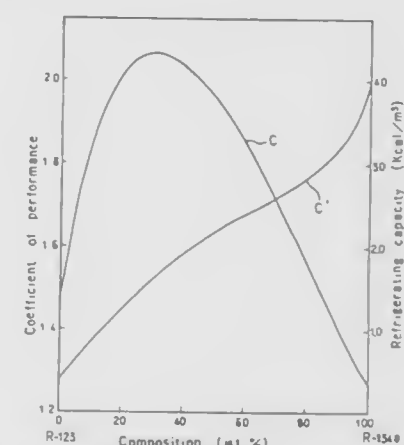
Claims priority, application Japan, Oct. 19, 1987, 62-264700

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.⁵ C09K 5/04

U.S. Cl. 252—67

5 Claims



1. In the development of heating or cooling conditions in a vapor-compression cycle using a liquid refrigerant, the improvement wherein the refrigerant comprises (1) about 10 to about 97% by weight of dichlorotrifluoroethane and (2) about 90 to about 3% by weight of at least one compound selected from the group consisting of 1,1,1,2-tetrafluoroethane, 1,1,2,2-tetrafluoroethane, 1-chloro-1,1-difluoroethane, 1,1,1-trifluoroethane and 1,1-difluoroethane.

5,087,382

ELECTROVISCOUS FLUID

Yuichi Ishino, Fuchu; Toshiyuki Osaki, Higashimurayama; Shigeki Endo, Kodaira; Seisuke Tomita, Tokorozawa; Takayuki Maruyama; Yoshiki Fukuyama, both of Kodaira, and Tasuku Saito, Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 400,134

Claims priority, application Japan, Aug. 29, 1988, 63-212615; Dec. 23, 1988, 63-323569; Apr. 6, 1989, 1-85783

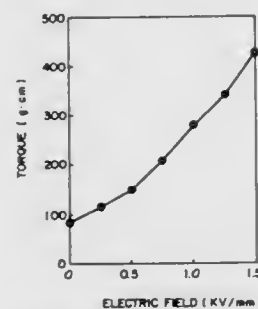
Int. Cl.⁵ C10M 125/02; C09K 3/00

U.S. Cl. 252—73

14 Claims

1. An electroviscous fluid comprising (a) 1–60% by weight of a dispersed phase of carbonaceous particulates having an average particle size of 0.01–100 micrometer, wherein the carbonaceous particulates comprise 80–97% by weight of

carbon and a carbon/hydrogen atomic ratio in the range of 1.2-5, and (b) 99-40% by weight of a continuous liquid phase



of an electric insulating oil having a viscosity of 0.65-500 centistokes at room temperature.

5,087,383

AZEOTROPIC OR AZEOTROPE-LIKE MIXTURE OF 2,2,2-TRIFLUOROETHYL 1,1,2,2-TETRAFLUOROETHYL ETHER AND ETHANOL, AND ITS USE

Horst Robeck, and Hans-Matthias Deger, Both of Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Apr. 24, 1991, Ser. No. 690,659

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013369

Int. Cl.⁵ C11D 7/30, 7/50; C23G 5/028; B08B 3/00

U.S. Cl. 252-171

8 Claims

1. An azeotropic or like mixture which consists essentially of about 90-97% by mass of 2,2,2-trifluoroethyl 1,1,2,2-tetrafluoroethyl ether and about 3-10% by mass of ethanol, said mixture having a boiling point at 1 bar of about 53° C. and wherein the composition of said mixture does not substantially change upon evaporation.

5,087,384

MELAMINE PREPARATION AND STABLE DISPERSION OF MELAMINE IN POLYETHER POLYOLS

Heinrich Horacek; Friedl Heger, and Gerhard Coufal, all of Linz, Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria

Filed Mar. 22, 1990, Ser. No. 497,252

Claims priority, application Austria, Apr. 4, 1989, 781/89

Int. Cl.⁵ C08G 18/14, 18/48

U.S. Cl. 252-182.14

8 Claims

1. Melamine preparation capable of forming a stable dispersion of melamine in polyether polyols, said preparation consisting of 80 to 99.9% by weight of melamine, as a flame retardant, having an average particle size of 0.01 to 0.1 mm and 0.1 to 20% by weight of urea, thiourea, biuret or urea or thiourea substituted by lower alkyl groups, in which 0 to 50% by weight based on the melamine component, of melamine, is optionally replaced by further fire retardants.

5,087,385

ACYLOXYNITROGEN PERACID PRECURSORS

Alfred G. Zielske, Pleasanton, Calif., assignor to The Clorox Company, Oakland, Calif.

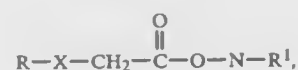
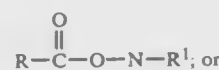
Division of Ser. No. 338,475, Apr. 14, 1989, Pat. No. 4,957,647, which is a continuation of Ser. No. 928,065, Nov. 7, 1986, abandoned. This application Jun. 21, 1990, Ser. No. 542,233

Int. Cl.⁵ C09K 3/00

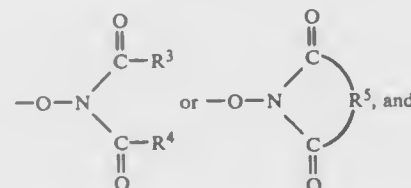
U.S. Cl. 252-186.39

10 Claims

1. A bleaching composition comprising oxymide esters having the structures:



wherein R is C₅ to C₉ alkyl; R¹ has at least one carbon atom singly bonded directly to N; is —O—, —N—, —S— or quaternary ammonium; wherein the substituent —O—N—R¹ is either



wherein R₃ and R₄ are the same or different, and are separately straight or branched chain C₁₋₂₀ alkyl, aryl, alkyl-aryl or mixtures thereof; and R₅ is straight or branched chain C₁₋₂₀ alkyl, aryl, or alkylaryl and completes a heterocycle; and a bleach effective amount of a source of hydrogen peroxide.

5,087,386

FLUORINE-CONTAINING ALCOHOL-BASED DEHYDRATING AGENT AND METHOD OF DRYING ARTICLES

Yukio Omure, Takatsuki; Masahiro Noguchi, Moriguchi, and Naoyoshi Hanatani, Settsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

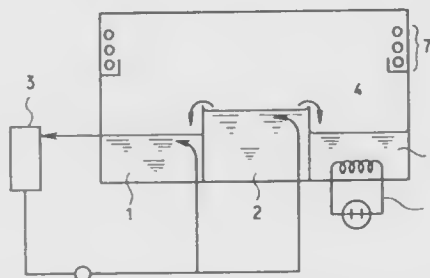
Filed Jun. 12, 1990, Ser. No. 536,890

Claims priority, application Japan, Jun. 19, 1989, 1-156403

Int. Cl.⁵ C09K 3/18

U.S. Cl. 252-154

2 Claims



1. A method of dehydrating and drying an article having a surface moistened with residual water comprising immersing said article in a dehydrating agent selected from the group consisting of either of tetrafluoropropanol or pentafluoropropanol, and mixtures thereof, and drying the article after immersion.

2. A method of dehydrating and drying an article having a surface moistened with residual water comprising immersing the article in a dehydrating agent selected from the group consisting of either of tetrafluoropropanol or pentafluoropropanol, and mixtures thereof, in water and drying the article after immersion.

5,087,387

LIGHT MODULATING MATERIAL AND METHOD FOR PREPARING SAME

Patrick W. Mullen, Green Bay, and Frederick E. Nobile, De Pere, both of, assignors to Kent Research Corporation, Kent, Ohio

Continuation of Ser. No. 404,898, Sep. 8, 1989, abandoned, which is a continuation of Ser. No. 90,793, Aug. 28, 1987, Pat. No. 4,888,126. This application Nov. 16, 1990, Ser. No. 616,747. The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.⁵ G02F 1/13; C09K 19/54, 19/52, 19/00

U.S. Cl. 252-299.5

33 Claims



1. A light modulating material comprising a liquid crystal phase formed within a polymer matrix, the polymer matrix comprising:

an acrylic resin having active hydrogen groups selected from the group consisting of hydroxy-functional acrylic resins;

an organometallic material selected from the group consisting of titanates, zirconates and mixtures thereof; and

a cross-linking agent selected from the group consisting of diisocyanates for reacting with the hydroxy-functional acrylic resin to form a urethane acrylic copolymer;

the light modulating material being capable of reversibly switching between a substantially translucent state and a substantially transparent state when subjected to an electric or magnetic field.

5,087,389

METHOD OF MEASURING THE EFFICIENCY OF GAS MASK FILTERS USING NON-TOXIC MONO DISPERSED AEROSOLS

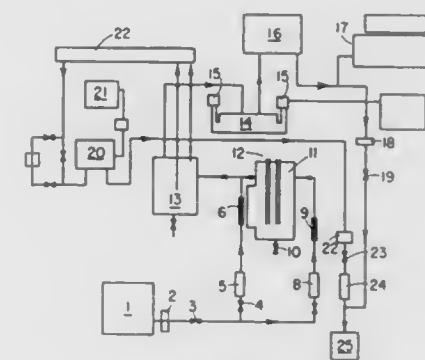
Hugh R. Carlon, Fallston; Mark A. Guelts, White Marsh, and Bernard V. Gerber, Havre de Grace, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 31, 1990, Ser. No. 636,166

Int. Cl.⁵ G01N 32/00

U.S. Cl. 252-408.1

5 Claims



FLOW DIAGRAM TDA-100

1. In an improved process of passing an aerosol mixture through a filter, thereafter measuring the efficiency of the filter the improvement consisting essentially of said aerosol solely containing a composition of the following chemicals in percentages, by volume, of about:

	%	Chemical
A.	60-66	isostearic acid
B.	13-17	isooleic acid
C.	1-3	isopalmitic acid
D.	8-10	stearic acid
E.	6-12	oleic acid.

5,087,390

TETRAAZAPORPHYRIN DYE MIXTURES

James R. Sounik, Somerset, and Jacquelyn Popolo, Bergen, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Apr. 4, 1989, Ser. No. 333,523

Int. Cl.⁵ F21V 9/04; G03C 1/00; C09B 47/04, 62/00

U.S. Cl. 252-587

6 Claims

5,087,388

CARTRIDGE FOR EXTENDING THE LIFETIME OF DYES IN DYE LASERS

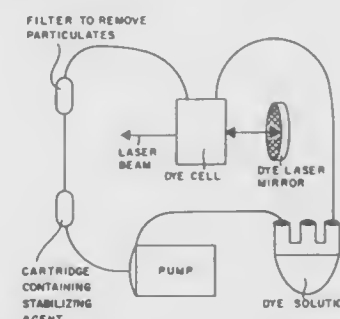
Robert P. Mahoney, and Tad H. Koch, both of Boulder, Colo., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Feb. 26, 1990, Ser. No. 484,533

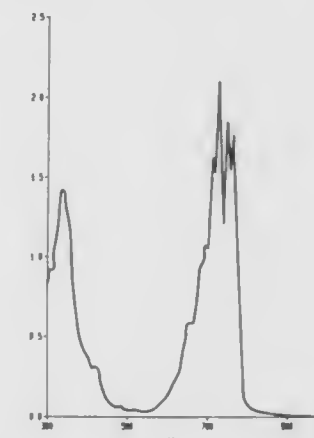
Int. Cl.⁵ C09K 11/07; H01S 3/213

U.S. Cl. 252-301.17

18 Claims

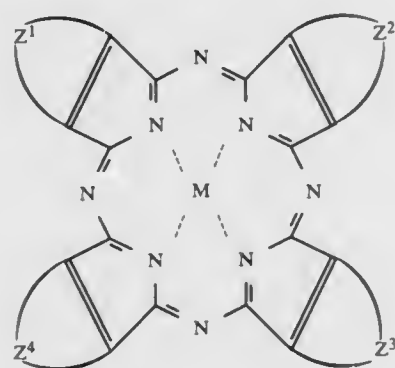


1. A method for improving the performance of a dye laser having a dye circulation stream which comprises adding to the dye circulation stream thereof a resin bound anion stabilizing agent which is capable of releasing trialkylamine into the dye circulation stream and/or reducing carbonyl functional groups of material in the stream to alcohol functional groups.

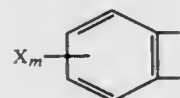


1. A thin film optical medium comprising a mixture of tetra-

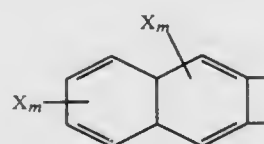
raazaporphyrin dye constituents which exhibits light absorption over a spectrum range of about 660-850 nm, and which dye constituents have different structures respectively corresponding to the formula:



where M is a coordinated silicon or metal containing group, and wherein in one dye constituent Z¹, Z², and Z³ are each a benzo structure represented by the formula:



and Z⁴ is a naphthalo structure that is represented by the formula:



in another dye constituent Z¹ and Z² are each a benzo structure as above, and Z³ and Z⁴ are each a naphthalo structure as above; in another dye constituent Z¹ and Z³ are each a benzo structure as above and Z² and Z⁴ are each a naphthalo structure as above; in another dye constituent Z¹ is a benzo structure as above, and Z², Z³ and Z⁴ are each a naphthalo structure as above, X being hydrogen, halogen, or an aliphatic, alicyclic or aromatic substituent containing 1-12 carbon atoms, and m being an integer with a value of 1-2.

5,087,391 SERVICING MECHANISM FOR ROTATIONAL PIPING ARRAY

David P. Brown, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 8, 1990, Ser. No. 535,212

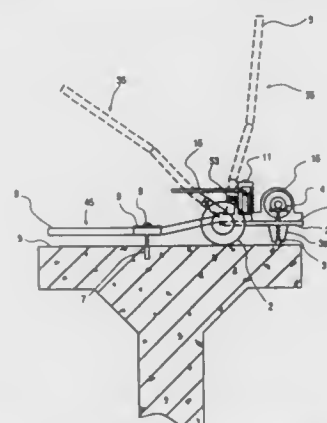
Int. Cl.⁵ B01F 3/04

U.S. Cl. 261-122

10 Claims

4. A servicing hand truck for rotatably raising and lowering a piping array extending from a walkway surface including a frame;
a handle portion extending from a first end of said frame for hand maneuvering said frame;
a pair of wheels mounted on said frame;
a rotary actuator mounted on said frame and being temporarily connectable to said piping array;
means on said frame for actuating said rotary actuator;
means extending downwardly from said handle portion for temporarily fixedly connecting said handle portion and said frame to the walkway surface, while said rotary

actuator is rotatably raising and lowering said piping array and while said piping array is being serviced; and wherein said handle portion is pivotally movable into an essentially horizontal position for connection to the walk-



way surface; to an essentially vertical position for stowage and to an angular position intermediate of said essentially horizontal and vertical positions for maneuvering said frame and said rotary actuator into alignment for connection to said piping array.

5,087,392 METHOD OF MOLD CONTACT LENSES

William J. Burke; Lisa A. Folk, both of Tempe, and Donald J. Ratkowski, Mesa, all of Ariz., assignors to Sola USA, Inc., Mesa, Ariz.

Continuation of Ser. No. 200,744, May 31, 1988. This application Mar. 7, 1990, Ser. No. 490,821

Int. Cl.⁵ B29D 11/00

U.S. Cl. 264-2.7

12 Claims

1. A method of producing an optical lens blank having an interpenetrating network copolymer composition, said method comprising: preparing, in weight percent of the weight of all polymerizable vinyl monomers in the network copolymer composition (W/W), a first mixture of polymerizable vinyl monomers containing a vinyl polymerization inhibitor therein and from about 50% to about 95% (W/W) of polymerizable vinyl monomers, from about 0.01% up to about 25% of a polymerizable monomeric vinyl crosslinking agent, and from about 0.1% up to about 3% (W/W) of a free radical vinyl polymerization initiator; preparing a second mixture of polymerizable vinyl monomers, containing a vinyl polymerization inhibitor therein and from about 5% up to about 50% (W/W) of polymerizable vinyl monomers, from about 0.1% up to about 25% of a polymerizable monomeric vinyl crosslinking agent, and from about 0% up to about 0.3% (W/W) of said free radical vinyl polymerization initiator; polymerizing said first mixture to initiate copolymerization of said polymerizable vinyl monomers until said partially polymerized first mixture obtains a relative viscosity relative to said unpolymerized first mixture of from about 1.15 up to about 10; interrupting the polymerization of said partially polymerized first mixture by mixing said second mixture therein to create a casting solution therewith; introducing said casting solution into a mold having at least one lens finishing surface therein; closing said mold; heating said closed mold in the range of from about 20° C. up to about 70° C. for a time sufficient to complete the polymerization of said casting solution and create a lens blank having at least one optical surface in said mold; and removing said blank from said mold.

5,087,393 SMOKE PRODUCING ARTICLE

Martin J. Guest, Ramsgate; Richard E. Topping, Tunbridge, and Roderick J. McGregor, Lincoln, all of England, assignors to Astra Holdings Public Limited Company, Canterbury, England

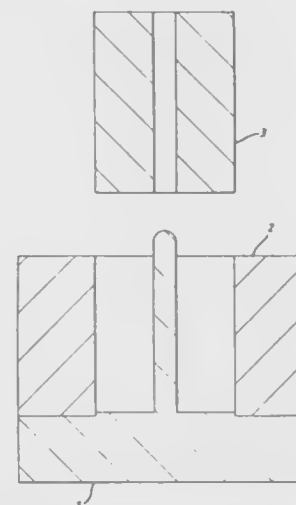
Filed Aug. 31, 1989, Ser. No. 431,593

Claims priority, application United Kingdom, Sep. 1, 1988, 8820660

Int. Cl.⁵ C06B 21/00

U.S. Cl. 264-3.2

5 Claims



1. A method of making a smoke producing article comprising the steps of:
mixing red phosphorus with a polymeric wax binder;
extruding the product of said mixing step to form an elongate product of predetermined diameter;
chopping the product of said extruding step into predetermined lengths to form granules;
placing said granules within a press tool;
compressing said granules within said press tool at a pressure of 2-7 tons/sq. in. (31-110 MPa) until said granules deform to take-up a reduced overall volume;
continuing said compression only until said compressed granules form a block but said granules remain discrete and separable substantially completely from said block; and
removing said block from said press tool.

5,087,394 METHOD FOR FORMING AN INFLATABLE BALLOON FOR USE IN A CATHETER

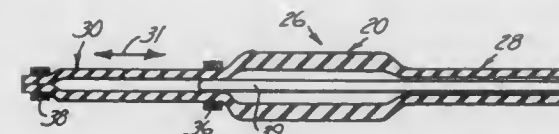
Peter T. Keith, Edina, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Nov. 9, 1989, Ser. No. 434,031

Int. Cl.⁵ B29C 49/14, 55/22

U.S. Cl. 204-22

11 Claims



1. A method of forming a stretched tubing element used for forming a balloon portion of a balloon dilatation catheter from a tubing element having a first outer diameter wherein the tubing element has a first end segment, an intermediate segment, and a second end segment, the method including the steps of:
positioning a first internal support mandrel having a first

diameter within the second end and intermediate segments of the tubing element;
attaching a body clamp about the first support mandrel and intermediate segment of the tubing adjacent a distal end of the first support mandrel;
attaching an end clamp to the first end segment adjacent an outer end thereof;
heating the first end segment;
urging the body clamp and end clamp longitudinally apart thereby stretching the first end segment longitudinally to lengthen said first end segment and reduce the outer diameter thereof to a second, smaller outer diameter;
cooling the first stretched end segment;
positioning a second internal support mandrel, having a second diameter which is smaller than the first support mandrel, within the stretched first end and intermediate segments of the tubing element;
attaching the body clamp about the second support mandrel and intermediate segment of the tubing element adjacent a distal end of the second support mandrel;
attaching the end clamp to the second end segment adjacent an outer end thereof;
heating the second end segment;
urging the body clamp and end clamp longitudinally apart thereby stretching the second end segment longitudinally to lengthen said second end segment and reduce the outer diameter thereof to a third outer diameter smaller than the second outer diameter; and
cooling the second stretched end segment to form the stretched tubing element,
wherein a major extent of the intermediate segment has not been stretched.

5,087,395 METHOD FOR PROCESSING RADIATION CROSS-LINK THIN FILM FOAM

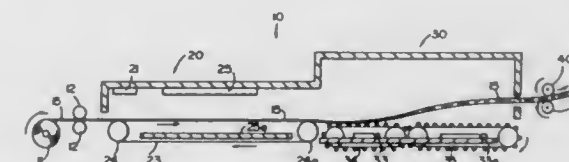
Martin K. Hitchcock, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 12, 1990, Ser. No. 551,823

Int. Cl.⁵ B29C 67/20

U.S. Cl. 264-22

13 Claims



1. A process for producing a radiation cross-linked, fine cell smooth foam having a thickness not greater than about 1/4-inch, and said foam having a uniform orientation across the width and improved thermoformability, comprising:
providing a radiation cross-linked thermoplastic resin sheet containing a heat-decomposable blowing agent;
supplying said sheet onto a conveyor and conveying said sheet horizontally by means of said conveyor;
supplying heat to said sheet while said sheet is conveyed horizontally, and heating said sheet to a temperature below the decomposition temperature of said blowing agent;
discharging said sheet from said conveyor onto a blanket of hot air and conveying said sheet horizontally across said blanket of hot air;
heating the thus horizontally conveyed sheet, while it continues in its horizontal orientation, to a temperature above said decomposition temperature and thereby foaming said sheet; and
conveying the resulting foamed sheet from said blanket of

hot air and simultaneously applying a uniform tension to the leading edge of said foamed sheet.

5,087,396
METHOD OF FORMING HOLES IN UNFIRED CERAMIC LAYERS OF INTEGRATED CIRCUIT PACKAGES

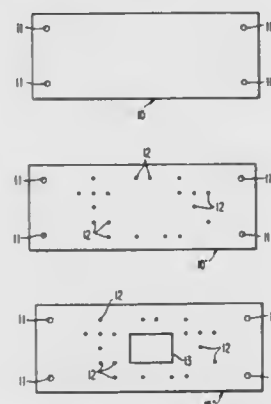
Gordon O. Zablotsky, San Diego; Robert D. Curtis, Encinitas; James William Horner, San Diego; Ronald Allen Norell, Carlsbad; all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 244,330, Sep. 15, 1988, abandoned. This application Feb. 21, 1991, Ser. No. 662,314

Int. Cl.³ B29C 37/02

U.S. Cl. 264—25

12 Claims



1. A method of making a layered electronic device including the steps of:

- forming a layer of said device with an unfired homogeneous composition that consists essentially of an inorganic non-metallic powder having a high melting temperature and a binder having a lower vaporizing temperature;
- directing a laser beam at a location on said layer without protecting said layer around said location with a mask;
- heating said mixture at said location with said directed laser beam to a certain temperature which is above said vaporizing temperature of said binder and below said melting temperature of said powder;
- removing from said directed laser beam during the above steps, both the vaporized binder and the powder of said mixture as the powder becomes unbound by impinging a gas jet at said location where said laser beam is directed and simultaneously vacuuming said location whereby an opening at said location is formed; and,
- keeping the power density of said directed laser beam below 75kw per cm² throughout said heating step.

5,087,397
PROCESS FOR FORMING ARCUATE SHEET ROCK PANELS

Johnny T. Martinez, 815 Maryland Ct., Cheyenne, Wyo. 82009

Filed May 6, 1991, Ser. No. 696,082

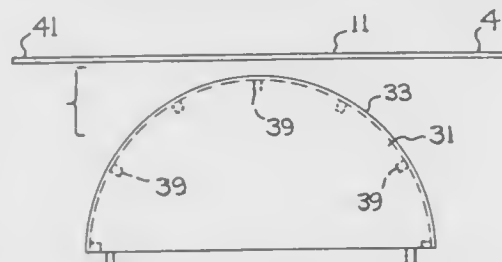
Int. Cl.³ B28B 11/00; E04B 1/32; E04G 23/00

U.S. Cl. 264—32

5 Claims

1. A process of forming an arched ceiling with a sheet rock panel, comprising the steps of thoroughly soaking a sheet rock panel with water, removing free-flowing water from the sheet rock panel by allowing it to lie flat so that the free-flowing water drains from interior void spaces of the panel, placing the still-wet panel on an arcuate form whereby the panel is reconfigured to an arcuate configuration, partially drying the reconfigured panel by allowing it to remain on the arcuate form for

a sufficient time so that it is still pliable but stiff enough to handle without losing its arcuate configuration, and fastening



the partially dried, reconfigured panel to an arcuate ceiling framework.

5,087,398
PROCESS AND APPARATUS FOR COMPRESSING, AND MONITORING THE COMPRESSION OF, PULVERULENT MATERIALS AND A PRESS APPLYING SAME

Roger Le Molaire, Quartier les Chaux, and Dominique H. A. Gavotto, Bourg Les Valence, both of France, assignors to ADL Automation Zone Industrielle, Malissard, France

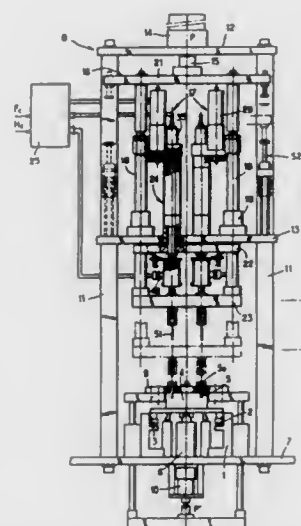
Filed Oct. 16, 1989, Ser. No. 421,956

Claims priority, application France, Oct. 20, 1988, 88 14372

Int. Cl.³ B29C 43/02, 43/18

U.S. Cl. 264—40.5

13 Claims



1. Apparatus for compressing doses of pulverulent material which are compacted in a container by a punch comprising:

- (a) a monitoring spindle;
- (b) means operatively connecting the punch to the spindle;
- (c) a screw nut drive system having a driving member to move the punch so as to compact the pulverulent material;
- (d) a housing having monitoring sensor means to monitor the force of compression exerted on the pulverulent material by the punch, the housing being operatively associated with the spindle and interposed between the screw nut drive system and the punch, and adapted to be displaced by the screw nut drive system; and,
- (e) servo-control circuit means operatively connected to the monitoring means and the screw nut drive means such that the force of compaction is between predetermined minimum and maximum values.

11. A method of controlling an apparatus for compressing doses of pulverulent material which are compacted in a container by a punch comprising the steps of:

- (a) fixing a reference value of at least one of the force of

- compaction, and the compacted height of the does to be attained less than a corresponding maximum value;
- (b) controlling the displacement of the punch until at least one of the force of compaction and the compacted height has reached the corresponding reference value;
- (c) after the reference value of the force of compaction is reached, measuring the maximum force of compaction achieved during the compacting cycle;
- (d) measuring the residual force of compaction to examine the evolution thereof; and,
- (e) controlling displacement of the punch based upon at least one of the measured maximum force of compaction and measured residual force of compaction.

5,087,399
METHOD OF MAKING LARGE CROSS SECTION INJECTION MOLDED OR SLIP CAST CERAMIC SHAPES

Jeffrey T. Neil, Acton; Sheldon Lieberman, Burlington, and Michael Hackney, Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 2, 1990, Ser. No. 474,423

Int. Cl.³ C04B 35/64

U.S. Cl. 264—62

18 Claims

1. A method for making an essentially crack free large cross section ceramic article comprising the following steps:

- Step 1—blending a ceramic article injection molding formulation containing a ceramic powder and a binder with from about 0.25 v/o to about 5.0 v/o short glass whiskers or fibers to form a mixture, said whiskers or fibers being selected from the group consisting of silica glass, high silica content glass, silicon oxynitride based glasses, and combinations thereof;
- Step 2—injecting molding said mixture from step 1 to form a molded article;
- Step 3—heating said molded article from step 2 at a sufficient temperature and for a sufficient time to remove the binder to form a green body;
- Step 4—heating the green body from step 3 to a temperature above the softening point of the glass fibers or whiskers and pressurizing the green body to a density greater than 98% of theoretical.

5,087,400
PROCESS FOR MAKING A PRODUCT SERVING AS A CULTIVATION SUPPORT

Christian Theuveny, Chambourcy, France, assignor to Wogegal S.A., France

PCT No. PCT/FR89/00004, § 371 Date Oct. 31, 1989, § 102(e) Date Oct. 31, 1989, PCT Pub. No. WO89/06488, PCT Pub. Date Jul. 27, 1989

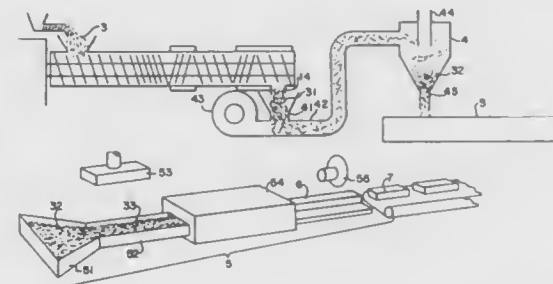
PCT Filed Jan. 11, 1989, Ser. No. 415,257

Claims priority, application France, Jan. 13, 1988, 88 00325

Int. Cl.³ A01G 9/10; D04H 1/58

U.S. Cl. 264—115

14 Claims



1. A process for making a composite product obtained by grinding wood chips or other lignocellulosic raw material, comprising the steps of:
passing the material through a machine, said machine com-

- prising at least two screws driven in rotation inside a barrel which encloses them and provided with flights of various pitches;
- regulating the conveying characteristics of said material so as to produce a controlled degree of grinding to obtain, at the outlet of the machine, a mixture based on isolated fibers and agglomerated bundles of fibers of various lengths and particle sizes;
- introducing an adhesive binder into the barrel during the grinding at a rate regulated as a function of the conveying conditions of the material so that the adhesive is distributed in the mixture of fibers; and
- delaying curing of the adhesive binder by controlling the temperature of the material so that curing takes place only after leaving the machine.

5,087,401
PROCESS FOR PREPARING POLYESTER FILAMENTARY MATERIAL

Tsunenori Yokoyama; Koji Hashimoto, and Koichi Sato, all of Mishima, Japan, assignors to Toray Industries, Inc., Japan

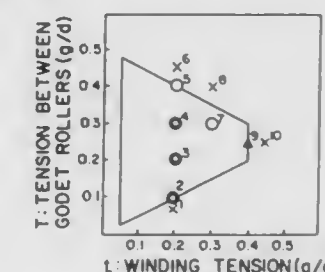
Filed Nov. 22, 1989, Ser. No. 440,562

Claims priority, application Japan, Nov. 24, 1988, 63-296993

Int. Cl.³ B29C 47/88; D01D 5/098

U.S. Cl. 264—130

7 Claims



1. A process for preparing polyester filamentary material comprising

- (a) extruding the polyester material while molten to form molten filaments,
- (b) solidifying the molten filaments by cooling them to a temperature at least as low as their glass transition point,
- (c) drawing the solidified continuous filaments within a hot drawing zone,
- (d) subjecting the drawn continuous filaments to a finishing treatment,
- (e) advancing the finished continuous filaments around first and second godet rollers and, while the continuous filaments are disposed between the first and second godet rollers, subjecting the continuous filaments to heat treatment by advancing them through a heat treatment zone without contacting them with a solid hot surface, the continuous filaments being advanced through the heat treatment zone under a tension T defined by the following formula (I), and
- (f) winding the continuous filaments at a speed of at least 4,500 m/min under a tension t defined in the following formula (II), namely wherein

$$0.5t \leq T \leq 0.5 - 0.5t, \text{ and wherein} \quad (I)$$

$$0.05 \leq t \leq 0.4, \quad (II)$$

wherein

t means winding tension (g/d) and where
T means tension between godet rollers (g/d).

5,087,402

Patent Not Issued For This Number

1. A nuclear reactor facility comprising a primary containment vessel, a reactor pressure vessel installed in the primary containment vessel and accommodating a reactor core in a lower part thereof, a vertical cylindrical wall disposed in a lower part of the primary containment vessel around and spaced from the reactor pressure vessel so as to delimit an annular space therebetween, the vertical cylindrical wall having an upper end disposed at a position higher than an upper end of the reactor core, a diaphragm extending substantially horizontally between the upper end of the vertical cylindrical wall and an inner wall of the primary containment vessel for

cooperating with the vertical cylindrical wall to separate a space in the primary containment vessel around the reactor pressure vessel into a pressure suppression chamber and a drywell which includes the annular space, the pressure suppression chamber accommodating therein a pool of liquid coolant wherein a level of the liquid coolant of the pool is higher than the upper end of the reactor core, the vertical cylindrical wall having a plurality of vent passages having an upper part at the upper end of the vertical cylindrical wall and exposed to the drywell and a lower part exposed to the pool of the liquid coolant in the pressure suppression chamber, a submergence line extending from the pressure suppression chamber to the reactor pressure vessel at a position above the upper end of the reactor core and having at least one valve therein for cooperating with the submergence line to introduce the liquid coolant from the pool of the liquid coolant in the pressure suppression chamber to the reactor pressure vessel when the valve is opened for cooling of the reactor core, and a channel member for enabling liquid coolant to flow from the annular space between the vertical cylindrical wall and the reactor pressure vessel in the drywell into the pressure suppression chamber when liquid coolant fills the annular space, the channel member having one end opened at an upper part of the vertical cylindrical wall to the annular space between the vertical cylindrical wall and the reactor pressure vessel and another end exposed to the pool of the liquid coolant in the pressure suppression chamber, the channel member having the one opened end thereof positioned higher than the level of the liquid coolant of the pool in the pressure suppression chamber.

5,087,409

PRESSURE VESSEL IMPROVEMENT

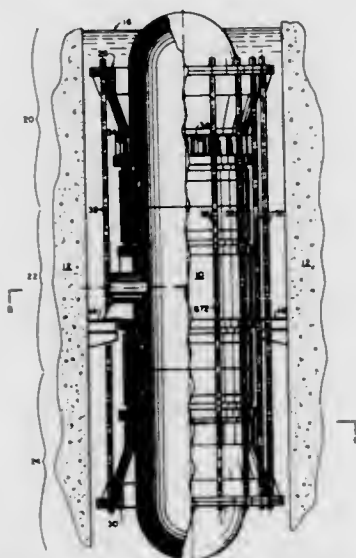
Bendt W. Wedellsborg, and Ulrich W. Wedellsborg, both of 552 Maureen La., Pleasant Hill, Calif. 94523

Filed Nov. 30, 1989, Ser. No. 444,174

Int. Cl.⁵ G21C 13/00

U.S. Cl. 376—294

11 Claims



1. A multiple shell pressure vessel comprising a top head section comprising a top head flange having a lower bearing surface, a shell course section comprising a first inner shell having a top rim, a first inner shell flange attached to said top rim of said first inner shell and having a lower bearing surface and an upper bearing surface, means for sealably connecting said upper bearing surface of said first inner flange to said lower bearing surface of said top head flange,

a second outer shell adapted to telescopically enclose said first inner shell and having a top rim, a second outer shell flange attached to said top rim of said second outer shell and having a lower bearing surface and an upper bearing surface, means for sealably connecting said upper bearing surface of said second outer shell flange to said lower bearing surface of said first flange, a top tendon skirt having a bottom flange, means for connecting said bottom flange to said top head section proximate said top head flange, a bottom tendon skirt having a top flange, means for connecting said top flange to said second outer shell proximate said lower bearing surface of said second flange, means connected to said top and bottom tendon skirts for compressing said flanges between said top and bottom tendon skirts, and a radial spacer bearing ring disposed about the outer surface of said shell module first inner shell and adapted to engage the inner surface of said shell module second outer shell, said radial spacer bearing ring located at a predetermined distance from said first inner shell flange to equalize torsional forces on said first inner shell flange.

5,087,410

METHOD OF AVOIDING LOCALIZED HYDROGEN BUILD-UPS IN SAFETY TANKS OF REACTORS

Joachim Kolditz, Talheim, Fed. Rep. of Germany, assignor to Gemeinschaftskernkraft Neckar GmbH (GKN), Neckarwestheim, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 572,855

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927959

Int. Cl.⁵ G21C 13/04

4 Claims

U.S. Cl. 376—298

1. A method for avoiding localized hydrogen buildups in the atmosphere of a safety tank of a reactor, said method including the step of:

after a break-down accompanied by loss of coolant has occurred, by utilizing the secondary heat of said reactor adjusting the cooling water temperature in the sump of said safety tank in the phase of the long term cooling to a temperature that is higher than the air temperature in the dome of said safety tank so that said secondary heat used to adjust the cooling water temperature is continuously dissipated to the outside via said atmosphere in said safety tank thereby inducing a convection that effects an adequate intermixing of said atmosphere in said safety tank.

5,087,411

DEVICE AND PROCESS FOR UNDERWATER RECOVERY AND ELIMINATION OF RADIOACTIVE WASTE

Louis Guironnet, Lyons, and Michel Blin, L'Arbresle, both of France, assignors to Framatome, Courbevoie and Cogema, Dautier, both of, France

Filed Sep. 19, 1989, Ser. No. 409,490

Claims priority, application France, Sep. 19, 1988, 88 12210

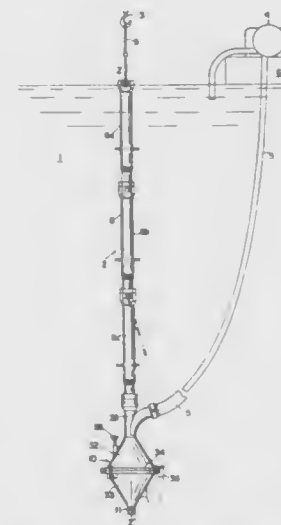
Int. Cl.⁵ G21C 19/42

U.S. Cl. 376—310

12 Claims

1. Device for underwater recovery and elimination of radioactive waste, in a well, said device comprising (a) means (4) for aspiration and delivery of said water from said well; (b) a column (8) suspended in vertical position from a handling and lifting means (3) situated above said well; (c) an aspiration head (10) attached to an end of said column (8) remote from said handling means (3) and consisting of first and second hollow walls (32, 33) assembled to one another; (d) a filter (39) pierced by openings separating an internal

volume of said aspiration head (10) into a first part comprising an aspiration opening (42) communicating with an exterior and a second part connected via a conduit (5) to said aspiration and delivery means (4); and



(e) remotely demountable connecting means (45) connecting said first and second hollow walls (32, 22) of said aspiration head (10).

5,087,412

NUCLEAR REACTOR

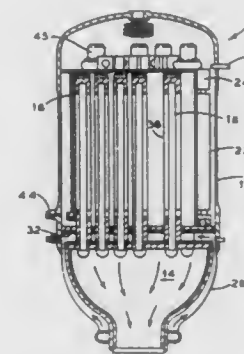
Billy E. Bingham; John R. Coiner, Jr., both of Lynchburg; William G. Pettus, Monroe, and Barrett J. Short, Lynchburg, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 15, 1989, Ser. No. 407,515

Int. Cl.⁵ G21C 15/00

U.S. Cl. 376—368

5 Claims



1. A nuclear reactor including a reactor vessel having a core barrel inside the reactor vessel, fuel elements and safety rods inside the core barrel, a fuel element housing thimble surrounding each fuel element and defining a gap therebetween, and a primary coolant flow path that includes flow through the fuel element housing thimble gaps, wherein the improvement comprises:

- means for circulating a liquid moderator through the core barrel around the fuel element housing thimbles;
- said primary coolant being at a cooler temperature than said liquid moderator when entering said fuel element housing thimble gaps; and
- fins on the fuel element housing thimbles for conducting heat from the liquid moderator to the primary coolant flowing through said fuel element housing thimble gaps.

5,087,413

CONDUCTING MATERIAL AND A METHOD OF FABRICATING THEREOF

Kenichiro Abe, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

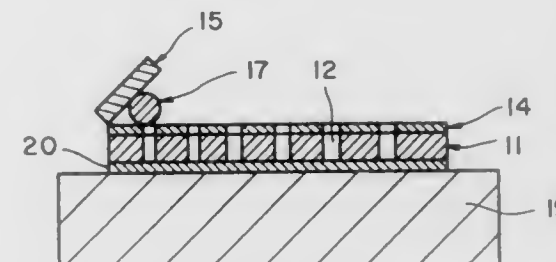
Division of Ser. No. 444,423, Dec. 1, 1989. This application Jan. 9, 1991, Ser. No. 639,262

Claims priority, application Japan, Dec. 1, 1988, 63-306582

Int. Cl.⁵ B23F 7/00

U.S. Cl. 419—9

6 Claims



1. A method for fabricating vias in through holes of a green sheet, said method comprising the steps of:

- kneading a solvent containing organic titanium compound and mixed powder particles, said mixed powder particles including copper powder particles and copper oxide powder particles;
- drying and solidifying said mixed powder particles, thereby producing solidified mixed powder particles;
- cracking said solidified mixed powder particles, thereby producing cracked mixed powder particles;
- classifying said cracked mixed powder particles so as to select grain sizes of said cracked mixed powder particles, thereby producing classified mixed powder particles each having a designated grain size;
- spheroidizing said classified mixed powder particles;
- placing a porous sheet on a surface of the green sheet and applying a sucking force through said porous sheet and to said through holes; and
- filling the through holes with said classified mixed powder particles by sucking said classified mixed powder particles through the through holes with said sucking force.

5,087,414

FREE MACHINING, MON-MAGNETIC, STAINLESS STEEL ALLOY

Guvant N. Maniar, Bern Township, Berks County, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

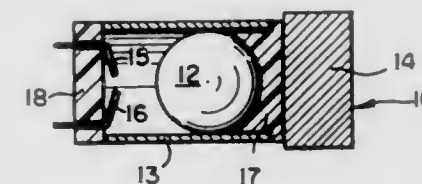
Division of Ser. No. 431,480, Nov. 3, 1989, Pat. No. 4,959,513.

This application Mar. 28, 1990, Ser. No. 500,521

Int. Cl.⁵ C22C 38/44

U.S. Cl. 420—43

16 Claims



1. A non-magnetic, austenitic, corrosion resistant alloy consisting essentially of, in weight percent, about

	w/o
C	0.04-0.10
N	0.03-0.07
Mn	2.00 max.

-continued

	w/o
Si	1.00 max.
P	0.045 max.
S	0.015-0.10
Cr	19.00-24.00
Mo	0.75 max.
Ni	12.00-18.00

the balance essentially iron; said alloy containing no more than about 2 v/o ferrite as determined by the DeLong diagram; said alloy having a coefficient of thermal expansion of about 14.5×10^{-6} to 16.5×10^{-6} per C.^o within the temperature range of about -51 to 121 C.

5,087,415
HIGH STRENGTH, HIGH FRACTURE TOUGHNESS
STRUCTURAL ALLOY
 Raymond M. Hemphill, Wyomissing, and David E. Wert, West Lawn, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.
 Continuation-in-part of Ser. No. 328,875, Mar. 27, 1989, abandoned. This application Feb. 6, 1990, Ser. No. 475,773
 Int. Cl.⁵ C22C 38/52

U.S. Cl. 420-95 29 Claims
 1. An age hardenable, martensitic steel alloy which provides high strength and high fracture toughness, said alloy consisting essentially of, in weight percent, about

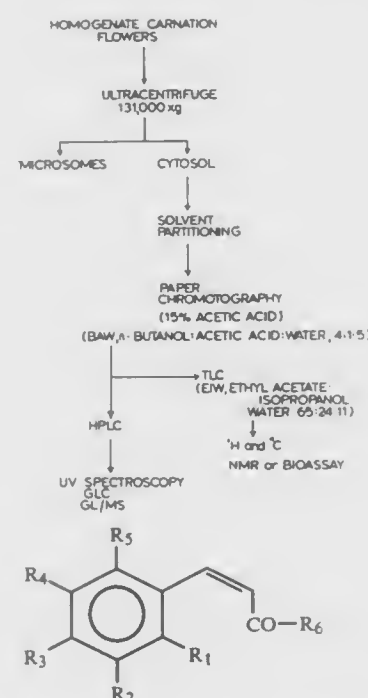
	wt. %
Carbon	0.2-0.33
Chromium	2-4
Nickel	10.5-15
Molybdenum	0.75-1.75
Cobalt	8-17

and the balance is essentially iron.

5,087,416
BRAZING ALLOY OF COPPER, SILICON, TITANIUM,
ALUMINUM
 Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.
 Filed Oct. 12, 1989, Ser. No. 420,416
 Int. Cl.⁵ C22C 9/00, 9/01, 9/10
 U.S. Cl. 420-489 4 Claims
 1. A brazing alloy for brazing ceramics having the following composition, in weight percent: 94 Cu, 2.75 Si, 1 Al, 2.25 Ti.

5,087,417
CONTROL OF SENESCENCE IN FRUITS, VEGETABLES
AND FLOWERS
 Erwin B. Dumbroff, Waterloo; John E. Thompson, Guelph, both of Canada, and Ching Y. Shih, Davis, Calif., assignors to University of Waterloo, Canada
 PCT No. PCT/US87/02557, § 371 Date Aug. 4, 1988, § 102(e) Date Aug. 4, 1988, PCT Pub. No. WO88/02602, PCT Pub. Date Apr. 21, 1988
 PCT Filed Oct. 8, 1987, Ser. No. 322,479
 Claims priority, application United Kingdom, Oct. 8, 1986, 8624100

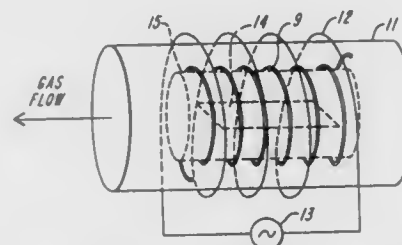
Int. Cl.⁵ A01N 3/02 7 Claims
 U.S. Cl. 422-1
 1. A method of inhibition of senescence in harvested perishable plant tissue, which comprises:
 applying to said harvested perishable plant tissue an effective amount of a compound of the formula:



wherein R₁, R₂, R₃, R₄ and R₅ are each selected from the group consisting of hydrogen, -OH or -OR₇, provided that at least one of R₁ to R₅ is a hydroxyl group, R₆ is selected from the group consisting of -OH, -OR₈ and NHR₉, R₇ is a substituent group, R₈ is the residue of an ester-forming compound and R₉ is the residue of an amide-forming compound.

5,087,418
PROCESS FOR DRY STERILIZATION OF MEDICAL
DEVICES AND MATERIALS
 Adir Jacob, 23 Juniper La., Framingham, Mass. 01701
 Continuation-in-part of Ser. No. 275,325, Nov. 22, 1988, which is a continuation of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427, and a continuation-in-part of Ser. No. 562,392, Aug. 3, 1990, which is a continuation of Ser. No. 331,438, Mar. 31, 1989, Pat. No. 4,976,920, which is a continuation-in-part of Ser. No. 72,899, Jul. 14, 1987, Pat. No. 4,818,488, which is a continuation-in-part of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427. This application Aug. 31, 1990, Ser. No. 576,356
 The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
 Int. Cl.⁵ A61L 2/14

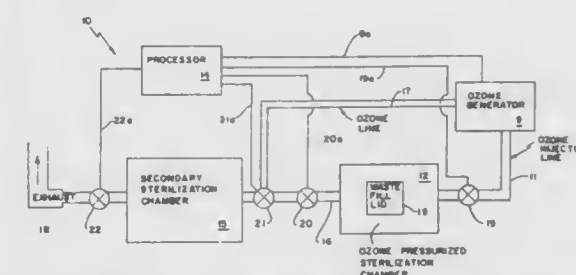
U.S. Cl. 422-23 7 Claims



1. A method for sterilization and treatment of medical and dental devices and materials comprising the steps of, placing said devices and materials within a first metallic perforated electrode, said electrode being positioned within, and spaced from a gas-tight confining chamber, evacuating said chamber to a substantially low pressure and

introducing hydrogen peroxide vapor under dynamic flowing conditions to effect contact between said vapor and said medical devices and materials, initiating an electrical discharge in said vapor within said chamber by application of an RF voltage between said internal perforated electrode and the chamber wall, creating a gas plasma accompanied by a substantially field-free and glowless volume within the perforated electrode containing said devices and materials, whereby said devices and materials are contacted by a substantially electrically neutral active species at a temperature below that which would be detrimental to said devices and materials, maintaining said gas plasma for a controlled period of time, maintaining a flow of said vapor through said chamber; and withdrawing said devices and materials from said chamber.

5,087,419
OZONE STERILIZATION PROCESS WHICH
DECONTAMINATES EVACUATED WASTE WITH
OZONE
 George H. Lutz, Binghamton, N.Y., assignor to Northeast Air/Water Corporation, Binghamton, N.Y.
 Filed Feb. 1, 1990, Ser. No. 473,555
 Int. Cl.⁵ B01J 19/08, 19/12
 U.S. Cl. 422-28 6 Claims

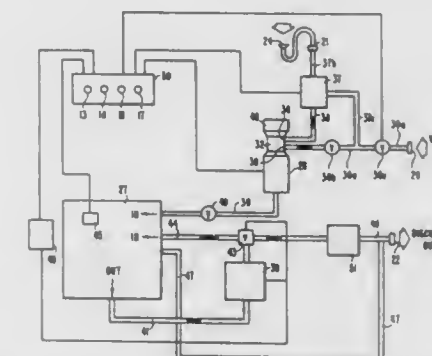


1. A method for sterilizing infectious waste material, the steps comprising:
 (a) loading and waste material into a pressurizable sterilization chamber;
 (b) introducing ozone gas under pressure into said sterilization chamber so as to penetrate and sterilize said waste material;
 (c) after a predetermined time cycle, evacuating gas from said sterilization chamber;
 (d) transferring said evacuated gas from said sterilization chamber into a purification chamber;
 (e) after said evacuated gas has been transferred into said purification chamber further introducing ozone gas into said purification chamber so as to sterilize said evacuated gas; and
 (f) removing said sterilized waste material from said sterilization chamber.

5,087,420
APPARATUS FOR TREATMENT AND DISPOSAL OF
INFECTIOUS WASTE
 Edward E. Jackson, Knightstown, Ind., assignor to Puretech Systems, Inc., Indianapolis, Ind.
 Filed Oct. 14, 1988, Ser. No. 258,156
 Int. Cl.⁵ A61L 2/18

U.S. Cl. 422-37 21 Claims
 1. An apparatus, adapted for use with a suitable disinfectant material, for treating and disposing of infectious waste material and converting it into a non-toxic and non-infectious waste residue, comprising:
 a comminution means including an inlet opening for receiving infectious waste material and disinfectant material therethrough, said comminution means for reducing the

particle size of the infectious waste material received through said inlet opening;
 a reservoir in fluid communication with said comminution means and sized and arranged to receive the infectious waste material and disinfectant material from said comminution means in a slurry form;
 a mixer means for mixing the slurry of infectious waste material and disinfectant material in said reservoir; and
 a control means for controlling the activating and deactivating of said mixer means, said control means including a



level sensor operable to detect when the contents of said reservoir reaches a predetermined level corresponding to a desired batch size for treatment purposes, said control means operable to automatically activate said mixer means and deactivate said comminution means when the waste material in said reservoir reaches said predetermined level, said control means further including a timer which limits the operation of said mixer means to a desired control time sufficient to permit the disinfectant material in said reservoir to disinfect the infectious waste material in said batch.

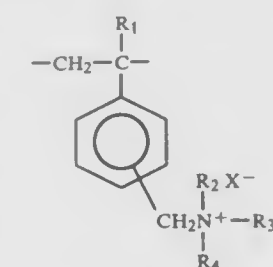
5,087,421
MULTILAYERED ASSAY ELEMENT
 Mikio Koyama; Satoshi Kawakatsu; Tomoji Akashi, and Kenichiro Okaniwa, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan
 Filed May 19, 1989, Ser. No. 353,942
 Claims priority, application Japan, May 20, 1988, 63-124479
 Int. Cl.⁵ G01N 21/29

U.S. Cl. 422-56 4 Claims
 1. A multilayered assay element comprising:
 a support;
 a reagent layer formed on the support; and,
 a spreading layer formed on the reagent layer, said spreading layer having incorporated therein a bilirubin-trapping agent of the formula I



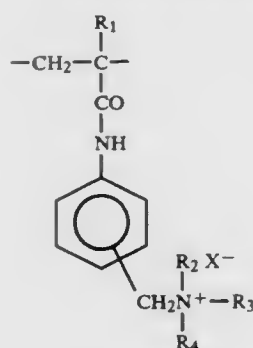
wherein

A represents a monomer unit represented by one of the formulae II to VII

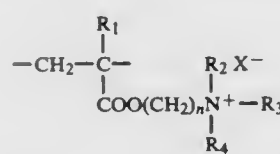


wherein R₁ represents a hydrogen atom or methyl

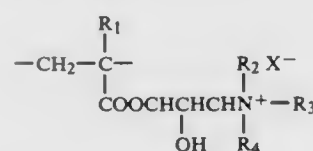
group, R₂, R₃ and R₄, the same or different represent an alkyl, aralkyl, cycloalkyl or cycloaralkyl group, and X⁻ represents a monovalent anion,



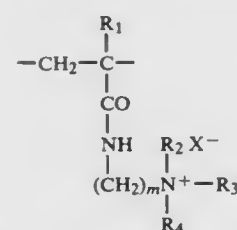
wherein R₁, R₂, R₃, R₄ and X⁻ have the same meaning as in the formula II,



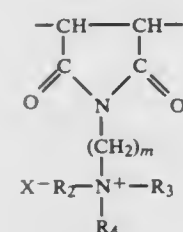
wherein R₁, R₂, R₃, R₄ and X⁻ have the same meaning as in the formula II, and n represents an integer of 1 to 4,



wherein R₁, R₂, R₃, and R₄ and X⁻ have the same meaning as in the formula II,



wherein R₁, R₂, R₃, R₄ and X⁻ have the same meaning as in the formula II, and m represents an integer of 1 to 4,



wherein R₁, R₂, R₃, R₄ and X⁻ have the same meaning as in the formula II, and m has the same meaning as in the formula VI;

B represents a monomer unit having a copolymerizable unsaturated double bond;
C represents a monomer unit having at least two copolymerizable unsaturated double bonds; and
x, y and z represent the number mol% of 100-10, 90-0 and 10-0, respectively.

5,087,422

WICKBOLD COMBUSTION APPARATUS AND KIT FOR THIS APPARATUS

Hans-Jochen Friese, Dulmen, and Aribert Pukropski, Marl, both of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 922,845, Oct. 24, 1986, abandoned.

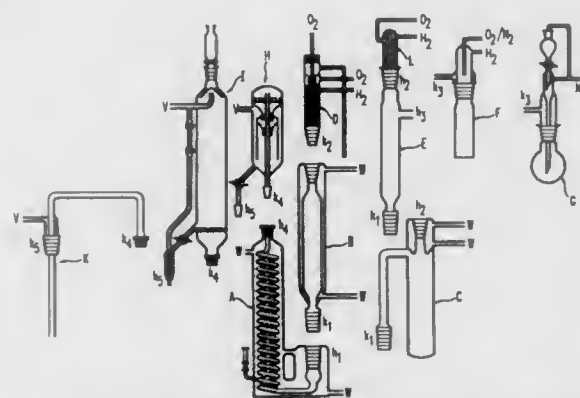
This application Mar. 16, 1988, Ser. No. 171,136

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 8535732[U]

Int. Cl.³ G01N 31/12

U.S. Cl. 422-61

6 Claims



3. A kit from which several different forms of Wickbold combustion apparatus may be formed, said kit comprising a plurality of parts as follows:

- a plurality of combustion chambers;
- a U-shaped cooling part containing a coil condenser having an axis, at least some parts of said U-shaped cooling part coming in contact with combustion gas during use of a Wickbold combustion apparatus formed from said kit;
- a plurality of separating receivers each one of which has an inside space; and
- a plurality of sample containers;
- the parts of said kit recited in paragraphs (a) through (d) having corresponding sockets and cones sized, shaped, and positioned so that the parts are joinable together in a modular manner.

5,087,423

AUTOMATIC ANALYZING APPARATUS COMPRISING A PLURALITY OF ANALYZING MODULES

Kiyochika Ishibashi, Kokubunji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,597

Claims priority, application Japan, Oct. 20, 1988, 63-262982; Dec. 19, 1988, 63-318398

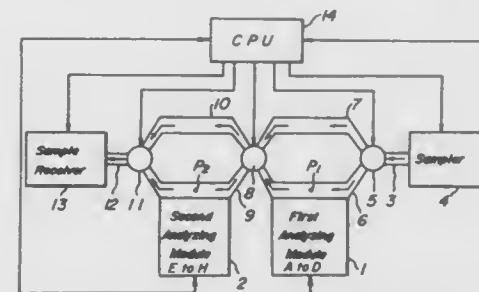
Int. Cl.³ F01N 21/00

U.S. Cl. 422-67

9 Claims

- An automatic analyzing apparatus comprising: sample supply means for successively supplying sample cups containing samples to be analyzed; a plurality of analyzing modules, each of which is capable of analyzing at least one test item and has a sample delivery device for delivering samples into reaction vessels; a plurality of routes arranged in series with each other where in each intermediate portion of which at least one of said analyzing modules is arranged; a plurality of second routes bypassing at least one analyzing

module, each of said plurality of second routes is arranged in parallel with a respective one of said first routes; and means for controlling the delivery of said sample cups such that each sample cup supplied from said sample cup supply means is selectively delivered into one of said first



routes or said second route, at least one of said analyzing modules comprising a plurality of sub-modules and the first route which includes the relevant analyzing module comprises a plurality of sub-routes in each of which is arranged a respective one of said sub-modules.

5,087,424

APPARATUS FOR MECHANICAL PROCESSING OF A SAMPLE AND A MEMBER OF SUCH AN APPARATUS

Lars R. Liljewall, Ödåkra, Sweden, assignor to Kabi Pharmacia AB, Uppsala and Aktiebolaget Leo., Helsingborg, both of, Sweden

PCT No. PCT/SE88/00674, § 371 Date Aug. 1, 1989, § 102(e) Date Aug. 1, 1989, PCT Pub. No. WO89/05970, PCT Pub. Date Jun. 29, 1989

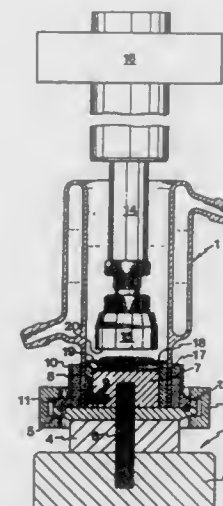
PCT Filed Dec. 12, 1988, Ser. No. 382,629

Claims priority, application Sweden, Dec. 14, 1987, 8704963

Int. Cl.³ G01N 1/10

U.S. Cl. 422-68.1

5 Claims



1. An apparatus for facilitating the release of an ingredient of a plastic or elastic sample of a pharmaceutical or confectionery material while the sample is in contact with a liquid medium, said apparatus comprising the combination of

- a base (2),
- a first jaw (7) fixed on said base (2) and having an upper surface (19) against which a sample positioned immediately thereabove can be compressed,
- a second jaw (15) positioned above said first jaw and having a lower surface against which said sample positioned immediately therebelow can be compressed,
- support means (8) for supporting a sample at a point which is intermediate the upper surface of said first jaw (7)

and the lower surface of said second jaw (15), said support means including a separate member (18) that is foraminated so that a sample will extend above, below and through the separate member (18),

- means (14, 16) for moving said second jaw (15) toward and away from said first jaw (7) and which is capable of imparting a rotary movement to said second jaw when said jaw is in its lowest position so that said jaws will repetitively knead a sample placed therebetween; and
- a vertical container (1) extending upwardly from said base (2) and closely surrounding said first and second jaws (7, 15) so as to confine a liquid medium to the area surrounding said sample.

5,087,425

DEVICE FOR FLOW-INJECTION ANALYSIS

Josef Flossdorf, Neophytos Papamichael, Detlef Hanisch, and Henning Schillig, all of Brunswick, Fed. Rep. of Germany, assignors to Gesellschaft für Biotechnologische Forschung mbH (GBF), Brunswick, Fed. Rep. of Germany

PCT No. PCT/EP88/00979, § 371 Date Aug. 28, 1989, § 102(e) Date Aug. 28, 1989, PCT Pub. No. WO89/04492, PCT Pub. Date May 18, 1989

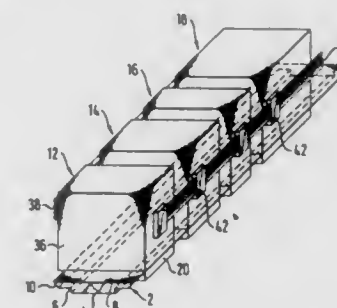
PCT Filed Oct. 28, 1988, Ser. No. 391,585

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737604

Int. Cl.³ G01N 21/24, 21/26, 35/08

U.S. Cl. 422-81

16 Claims



1. Flow-injection analysis apparatus, which comprises; a reaction loop in flow communication with

- a pump attached to a first base plate;
- an injection valve attached to a second base plate; and
- a detector attached to a third base plate;

each of the first, second and third base plates being provided with a guide means, for slidable mounting on a support mounting; the pump, the injection valve and the detector, each with its base plate being substantially uniform in width and height;

the first, second and third base plates being removably joined together on the support mounting by a releasable securing means.

5,087,426

OZONE DEODORIZER FOR REFRIGERATORS

Yoshitaka Inoue, Neyagawa; Teruo Sato, Yahata, and Tutomu Hiromi, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Yushin Engineering Corporation, Kyoto, both of, Japan

Filed May 3, 1990, Ser. No. 518,359

Claims priority, application Japan, May 9, 1989, 1-115352

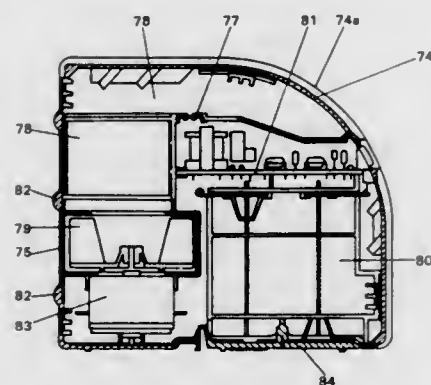
Int. Cl.³ A61L 9/00

U.S. Cl. 422-123

6 Claims

1. An ozone deodorizing device for use in refrigerators, the deodorizing device comprising a battery power source, a timer for controlling the generation of ozone intermittently, a pulse generator for narrowing pulse widths when the battery voltage is high, and widening them when the battery voltage is low, and a creepage discharger for generating ozone, the creepage

discharger comprising a ground electrode, a thin dielectric layer, a high-voltage electrode and outermost layer laid in this



order on a ceramic substrate, wherein the dielectric layer is disposed between the ground electrode and the high-voltage electrode and has a thickness of 45 μm to 100 μm .

5,087,427

CATALYTIC CRACKING UNIT WITH INTERNAL GROSS CUT SEPARATOR AND QUENCH INJECTOR

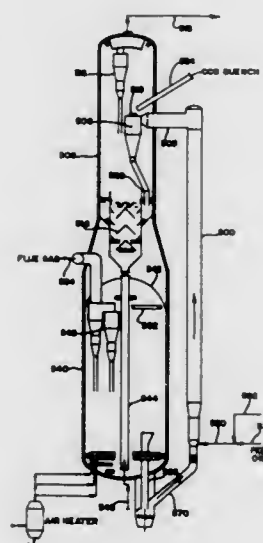
George P. Quinn, Winfield; Larry W. Kruse, Crete; Thomas J. Gebhard, Naperville, and John M. Forgas, Elmhurst, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 26, 1990, Ser. No. 499,097

Int. Cl.⁵ F27B 15/02, 15/12; B01J 8/18

U.S. Cl. 422-144

14 Claims



1. A catalytic cracking unit, comprising:

a catalytic cracker comprising a catalytic cracking reactor for catalytically cracking feed oil comprising gas oil in the presence of a cracking catalyst to produce a stream of catalytically cracked oil containing particulates of coked cracking catalyst, an oil feed line communicating with said catalytic cracking reactor for feeding said feed oil to said catalytic cracking reactor, and a regenerated catalyst line communicating with said catalytic cracking reactor for conveying regenerated cracking catalyst to said catalytic cracking reactor,

a disengager comprising a disengaging vessel communicating with said catalytic cracking reactor for substantially disengaging said particulates of coked cracking catalyst from said catalytically cracked oil, said disengaging vessel

having an upper dilute phase portion and a lower dense phase portion;

an internal rough cut separator positioned inside said disengaging vessel and located in said upper dilute phase portion of said disengaging vessel for making a rough cut separation of said coked cracking catalyst particulates from said catalytically cracked oil, said internal rough cut separator having a product outlet for egress of catalytically cracked oil and having a catalyst outlet for egress of said coked cracking catalyst particulates;

an oil quench injector extending into said upper dilute phase portion of said disengaging vessel at a location above and in proximity to said product outlet of said internal rough cut separator inside said disengaging vessel for inhibiting substantial thermal cracking of said catalytically cracked oil in said upper dilute phase portion of said disengaging vessel;

at least one secondary internal cyclone positioned inside said disengaging vessel and having an inlet at an elevation above said rough cut separator; and said oil quench injector comprises an oil quench line disposed in said disengaging vessel between said product outlet of said internal rough cut separator and said inlet of said secondary cyclone.

5,087,428

AIR PURIFYING SYSTEM

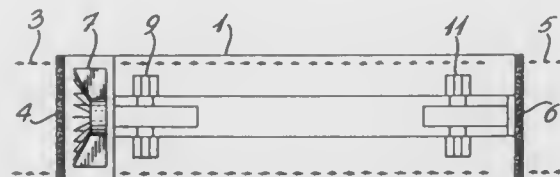
David Fletcher, Hudson Heights, and Barry Welford, Beaconsfield, both of Canada, assignors to Systemes Ozonics Inc., Beaconsfield, Canada

Filed May 30, 1990, Ser. No. 530,207

Int. Cl.⁵ B01J 19/08, 19/12

U.S. Cl. 422-186.07

24 Claims



1. An air purifying system comprising:

a closed container having an input end, for receiving impure air, and an output end, through which purified air is expelled;

means for drawing impure air into said closed container at said input end thereof;

ozone generator means, for producing a high concentration of ozone, inside said closed container, adjacent said input end thereof;

corona generator means, disposed in said closed container, adjacent said output end thereof;

said corona generator means including a dielectric made of a material having a dielectric constant of 1000 or greater; whereby, said impure air drawn in at said input end passes over said ozone generator means, said ozone thereby reacting with said impurities of said impure air to provide purified air, said purified air with remaining ozone passing over said corona generating means;

whereby, ozone remaining in said purified air is destroyed by the corona of said corona generating means instead of being expelled out of said second end of said closed container.

5,087,429

METHOD AND APPARATUS FOR MANUFACTURING SILICON SINGLE CRYSTALS

Hiroshi Kamio, Tokyo; Kenji Araki; Yoshinobu Shima, both of Yokohama; Makoto Suzuki; Akira Kazama, both of Kawasaki; Shigetake Horie, Tokyo, and Yasumitsu Nakahama, Yokohama, all of Japan, assignors to NKK Corporation, Tokyo, Japan

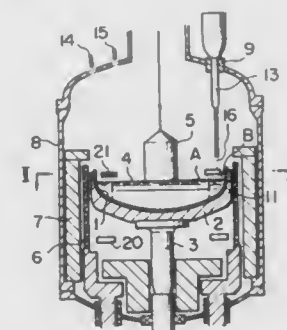
Filed Apr. 26, 1989, Ser. No. 343,833

Claims priority, application Japan, Apr. 28, 1988, 63-104278; May 11, 1988, 63-112614; May 30, 1988, 63-130269; May 31, 1988, 63-131653; Aug. 24, 1988, 63-208446

Int. Cl.⁵ C30B 35/00, 29/06, 15/02

U.S. Cl. 422-249

3 Claims



1. In an apparatus for manufacturing a single silicon crystal which comprises means for continuously feeding silicon starting materials, means for melting silicon materials in a crucible and means for pulling up a single silicon crystal and in which the inside of the crucible, containing the molten silicon and rotating at a constant speed, is divided into the raw materials feeding section and the single silicon crystal growing section by a cylindrical partition fixed at its lower end to the bottom of said crucible and having a plurality of small openings at its lower portion for allowing said molten silicon in said raw material melting section to flow slowly therethrough to said single silicon crystal growing section in one direction,

the improvement which comprises setting the contact area between the molten silicon and the inner wall of the crucible in the raw material feeding section to 30 to 75% of the total contact area between the molten silicon and the crucible as a whole and the full surface area of the molten silicon in the raw materials feeding section is set to 10 to 70% of the free surface area of the molten silicon, and arranging and electric resistance side heater around said crucible for melting the silicon material and a heat keeping board for covering the upper part of said partition and the raw materials feeding section.

5,087,430

PROCESS FOR PURIFYING EXHAUST GAS

Masayuki Hanada; Morio Fukuda, both of Kitakyushu; Takeo Koshikawa, Ami; Akihiro Yamauchi, Koganei, and Hiroshi Ogura, Yokohama, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Petrochemical Engineering Co., Ltd. and Chemicals Industries Co., Ltd., all of Tokyo, Japan

Filed Mar. 27, 1990, Ser. No. 500,244

Claims priority, application Japan, Mar. 28, 1989, 1-75420

Int. Cl.⁵ B01J 8/00; C01B 21/00, 17/00, 25/00

U.S. Cl. 423-239

3 Claims

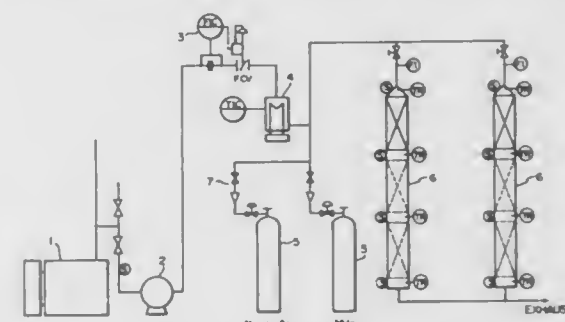
1. A process for purifying an exhaust gas containing nitrogen oxides, sulfur oxides, and soot and hydrocarbons, by passing it through a catalyst bed filled with a denitration catalyst in the presence of ammonia, characterized in that the exhaust gas is passed at a temperature of 250° to 550° C. in the presence of ammonia through a catalyst bed filled with at least one honeycomb-type denitration catalyst having flow channels for the

exhaust gas, said catalyst comprising at least the following three catalyst components

(A) an oxide of at least one metallic element selected from the group consisting of Ti, Si and Zr,

(B) an oxide of at least one metallic element selected from the group consisting of Mo and W, and

(C) an oxide of V such that the concentrations of either the oxide (B) or the oxide (C) or both in the exhaust gas inlet site of the catalyst bed are higher than in the other end site thereof, wherein the catalyst in the end site other than the exhaust gas inlet site of the catalyst bed comprises 55 to



98.9% by weight of the component (A), 1 to 44.9% by weight of the component (B) and 0.1 to 5% by weight of the component (C), and wherein the weights of either component (B) or the component (C) or both in the catalyst filled in the exhaust gas inlet site of the catalyst bed are about 1.1 to 10 times the weights of either component (B) or the component (C) or both in the catalyst filled in the end site other than the exhaust gas inlet site of the catalyst bed, said honeycomb-type catalyst having flow channels of a diameter of 2 to 10 mm, a sectional area of about 200 to 600 cm^2 and a length of about 50 to 200 cm.

5,087,431

CATALYTIC DECOMPOSITION OF CYANURIC ACID AND USE OF PRODUCT TO REDUCE NITROGEN OXIDE EMISSIONS

Ralph A. Gardner-Chavis, Cleveland, and Michael P. May, Canton, both of Ohio, assignors to Molecular Technology Corporation, Canton, Ohio

Filed Sep. 20, 1990, Ser. No. 585,886

Int. Cl.⁵ B01J 8/00; C01B 21/00

U.S. Cl. 423-239

26 Claims

1. A method for reducing the nitrogen oxide content of a gas stream comprising contacting the gas stream with an amount of a gaseous decomposition product mixture obtained by decomposing cyanuric acid in the presence of a catalyst which promotes the decomposition of the cyanuric acid at a temperature of less than about 1000° F., said amount being effective to reduce the nitrogen oxide content of the gas stream.

5,087,432

METHOD FOR THE SEPARATION OF ACID FROM ACID-LADEN VAPORS

Lars J. Hansen, West Alexander, Pa., assignor to Hansen Engineering, Inc., West Alexander, Pa.

Filed May 24, 1990, Ser. No. 528,747

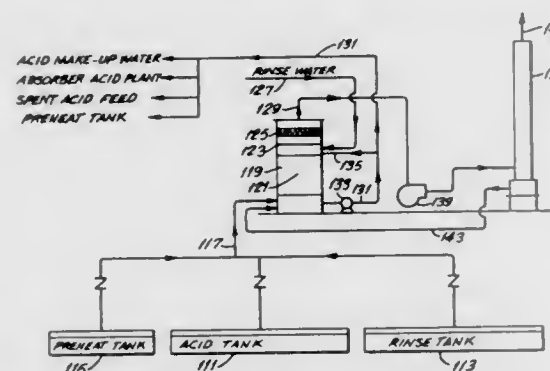
Int. Cl.⁵ C01B 7/01, 17/69; B01D 53/34

U.S. Cl. 423-240 R

12 Claims

1. A method for the removal of hydrochloric or sulfuric acid from vapor laden with said acid which comprises contacting

said acid-laden vapors with packing materials in a zone containing said packing materials wherein said packing materials



are formed of polyester resin containing from about 5 to 40 weight percent aluminum sulfate crystals.

5,087,433

METHOD AND APPARATUS FOR THE PRODUCTION OF SiC WHISKER

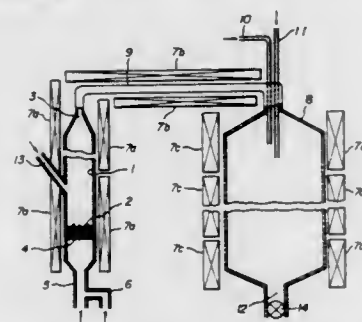
Ryo Enomoto, and Yoshimi Matsuno, both of Gifu, Japan, assignors to Iriden Co., Ltd., Ogaki, Japan
Continuation of Ser. No. 269,741, filed as PCT/JP88/00175, Feb. 19, 1988, abandoned. This application Dec. 5, 1990, Ser. No. 622,375

Claims priority, application Japan, Feb. 20, 1987, 62-35761; Jun. 23, 1987, 62-154447

Int. Cl.⁵ C01B 21/068; C30B 29/062

U.S. Cl. 423—346

1 Claim



1. A method of producing SiC whisker through vapor phase synthesis of silicon sulfide and carbon compound by using an apparatus for the production of SiC whisker being a combination of a vessel for the production of silicon sulfide gas provided with a gas distributing plate, an inlet for metallic silicon and an outlet for silicon sulfide gas located above the gas distributing plate, and inlets for hydrogen sulfide gas and a carrier gas beneath the gas distributing plate, and a vessel for the synthesis of SiC whisker communicated with a supply pipe for the supply of a nucleus forming material and the supply of a carbon compound and provided with an outlet for the discharge of a whisker, comprising successively charging metallic silicon into a temperature atmosphere range of 1000° to 1400° C., blowing hydrogen sulfide gas and carrier gas thereinto to produce a silicon sulfide gas, discharging the resulting silicon sulfide gas from the outlet and introducing it into said vessel for the synthesis of SiC whisker held at 1130° to 1500° C. together with the carrier gas and contacting said silicon sulfide gas with a carbon compound supplied from the supply pipe in the presence of a nucleus forming material provided by the supply pipe; said carbon compound being selected from paraffinic hydrocarbons such as methane, ethane, propane, butane, pentane; olefin hydrocarbons such as ethylene, propylene, butylene, amylene; acetylenic hydrocarbons such as acetylene, allylene, butylene; aromatic hydrocarbons such as benzene, naphthalene, anthracene; alicyclic hydrocarbons such as cycloparaffin, cycloolefin, and said nucleus forming material

being selected from the group consisting of metals selected from iron, nickel, titanium, manganese, cobalt, copper, vanadium, chromium, aluminum and silicon or their oxides, carbides, nitrides, sulfides, halides, sulfates, nitrates and alcoholates, organometallic compounds represented by the formula $M(C_2H_5)_2$ (wherein M is a metal selected from Fe, Ni, Ti, Mn, Co, Cu, V and Cr) and a mixture thereof; wherein whiskers are grown at a floating state and then continuously or intermittently discharged from said outlet.

5,087,434

SYNTHESIS OF DIAMOND POWDERS IN THE GAS PHASE

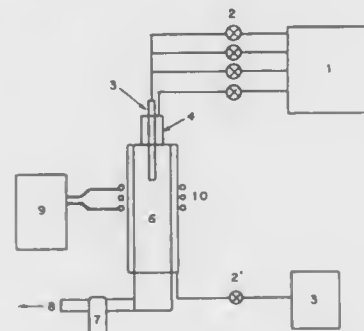
Michael Y. Frenklach; Karl E. Spear, and Richard J. Koba, all of State College, Pa., assignors to The Pennsylvania Research Corporation, University Park, Pa.

Filed Apr. 21, 1989, Ser. No. 341,650

Int. Cl.⁵ B01S 30/06

U.S. Cl. 423—446

8 Claims



1. A method for the synthesis of diamond or diamond-like carbon particles directly in the gas phase through homogeneous nucleation independent of any surface which comprises: providing a reaction vessel for containment of reaction gases; homogeneously precipitating a diamond or diamond-like growth seed from a gas phase in said reaction vessel; depositing diamond or diamond-like carbon from a second gas phase about said seed to produce diamond or diamond-like particles in said reaction vessel; and removing said particles from said vessel.

5,087,435

POLYCRYSTALLINE DIAMOND AND METHOD FOR FORMING SAME

David K. Potter, and Thomas J. Ahrens, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 26, 1987, Ser. No. 54,285

Int. Cl.⁵ C01B 31/06

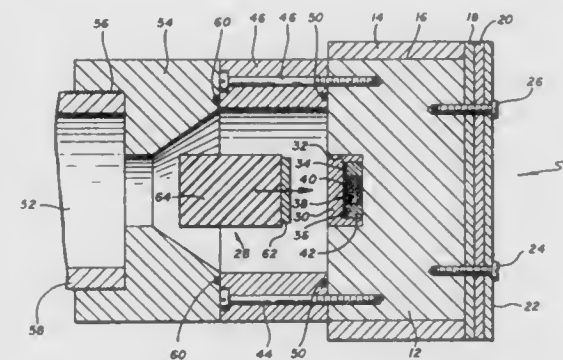
U.S. Cl. 423—446

11 Claims

1. A method for forming a fused compact of polycrystalline diamond comprising the steps of:

- placing a plurality of fine diamond crystals in a target zone, substantially all of the diamond crystals having a particle size of about 4 to about 8 microns; and
- impacting the target zone with a projectile, the projectile having sufficient momentum that at least part of the surface portion of the diamond crystals in the target zone is heated to a sufficiently high temperature under a pressure

ranging from about 7 to about 20 GPa that the crystals fuse together, without cracking, to form a fused compact



of polycrystalline diamond having a particle size greater than the particle size of any of the individual crystals.

5,087,436

RECOVERY OF COMMERCIAL VALUABLE PRODUCTS FROM SCRAP TIRES

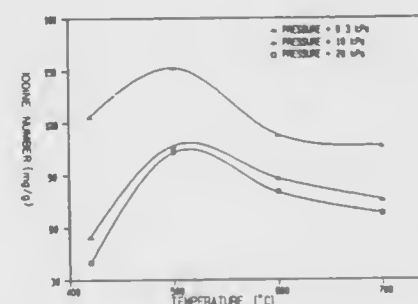
Christian Roy, Sillery, Canada, assignor to Universite Laval, Ste Foy, Canada

Continuation-in-part of Ser. No. 372,568, Jun. 28, 1989. This application Jul. 17, 1990, Ser. No. 553,569

Int. Cl.⁵ C09C 1/48

U.S. Cl. 423—461

4 Claims



1. A carbon black produced by vacuum pyrolysis of used rubber tires at a temperature in the range of about 490° C. to about 510° C. under an absolute pressure of less than about 5 kPa, and having an iodine adsorption number of about 130 to about 150 mg/g, a DBP adsorption of 80 to 100 ml/100 g and a tint strength number of 55 to 63.

5,087,437

PROCESS FOR PREPARING CRYSTALLINE MIXED METAL OXIDES

Salvatore A. Bruno, Wilmington, Del., and William L. Monson, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 144,835, Jan. 15, 1988, abandoned. This application Oct. 27, 1988, Ser. No. 265,295

Int. Cl.⁵ C01G 23/04; C04B 35/46, 35/48, 35/49

U.S. Cl. 423—598

12 Claims

1. A process for preparing crystalline mixed metal oxides having simultaneously a narrow particle size distribution and low surface area of the formula:

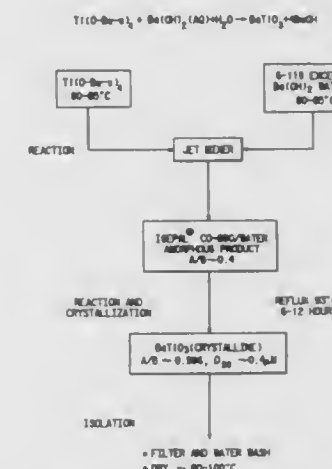


wherein,

A is metal cation selected from Ba, Sr, Ca, Mg, Pb and Nd and mixtures thereof; and B is metal cation selected from

Ti, Zr, Nb, Hf, Zn and Sn and mixtures thereof which comprises the steps of:

- simultaneously and continuously mixing an organometallic compound, mixture of organometallic compounds or a hydrolyzable system, of the structure BL_n , where B is as defined above, L is a hydrolyzable group, or a combination of such groups, selected from alkoxy, aryloxy, aminoalkoxy, acetoxy, acetoacetyl, chlorides, nitrates, and acetates, and n is 2 or 4 with a solution of a compound, or a mixture of compounds, of the general structure AX_y ,



where A is as defined above, X is an anion, or combination of anions, selected from hydroxide, chloride, nitrate and acetate, and y is 2 or 3 in an alkaline, high turbulence energy environment characterized by a turbulence intensity greater than 9×10^6 cm/sec³;

- crystallizing the reaction product; and
- recovering crystals wherein 90% of particles are greater than 0.2 μ m in size up to about 1.0 μ m in size, the surface area is less than 15 m²/g and the A/B mole ratio is from 0.990 to 1.020.

5,087,438

METHOD FOR AFFECTING INTRACELLULAR AND EXTRACELLULAR ELECTRIC AND MAGNETIC DIPOLES

Robert T. Gordon, 4936 W. Estes, Skokie, Ill. 60077
Continuation-in-part of Ser. No. 627,536, Jul. 3, 1984, Pat. No. 4,767,611. This application Jul. 20, 1988, Ser. No. 221,991
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.⁵ A61K 49/00

U.S. Cl. 424—9

19 Claims

1. A process for the treatment of diseased cells in at least one region in the tissue of a host organism containing said diseased cells and living normal cells without substantially damaging said living normal cells comprising:

- providing to said host organism minute particles less than about 1 micron capable of being taken up by said diseased cells;
- selecting said particles to affect intracellular and extracellular events for the enhancement of treating infectious diseases produced by organisms selected from the group consisting of Salmonella, Klebsiella, Escherichia, Clostridium Mycobacterium, Pseudomonas, Peptostreptococcus, Phycomyces, Candida, Ustilago, Entamoeba, Trypanosoma, Leishmania and RNA viruses by the selection of said particles;
- allowing said particles to effect at least one event comprising intracellular events and membrane events in said tissue; subjecting said organism to a relatively low frequency alternating, oscillating, or pulsed electromagnetic field to provide energy to said diseased cells and selectively heat

said diseased cells wherein said particles are selected from the group consisting of:

- cobalt, zinc, iron, chromium, nickel, platinum, rare earth metals and compounds selected from the group consisting of dysprosium, erbium, europium, gadolinium, holmium, samarium, terbium, thulium, ytterbium, yttrium; dysprosium sulfate, erbium sulfate, europium oxide, europium sulfate, gadolinium oxide, gadolinium sulfate, holmium oxide, samarium sulfate, terbium sulfate, thulium oxide, ytterbium sulfide, yttrium oxide, yttrium sulfate, yttrium ferrioxide ($Y_3Fe_3O_{12}$), yttrium oxide ($Y_3Al_5O_{12}$), dysprosium-nickel, dysprosium-cobalt, gadolinium-iron, ytterbium-iron, cobalt-samarium, gadolinium-ytterbium, dysprosium-gallium, and actinide series elements and compounds thereof;
- dextran metal complexes wherein said metal is selected from the group consisting of cobalt, zinc, chromium, iron, gallium, manganese, nickel, platinum, dysprosium, erbium, europium, gadolinium, holmium, samarium, terbium, thulium, ytterbium, yttrium, dysprosium-nickel, dysprosium-cobalt, gadolinium-iron, ytterbium-iron, cobalt-samarium, gadolinium-yttrium, and dysprosium-gallium;
- iron transporting and chelating compounds selected from the group consisting of ferric ammonium citrate, enterochelin, transferrin, metallothionein, hydroxamates, phenolates, ferrichromes, desferri-ferrichromes, ferritin, ferric mycobactins, ferredoxin and rubredoxin;
- porphyrins selected from the group consisting of etioporphyrins, meso-porphyrins, uroporphyrins, coproporphyrins, protoporphyrins, dicarboxylic acid containing porphyrins, tetraphenylporphyrin sulfonate, hematoporphyrins, chlorophylls, and cytochromes;
- and combinations of the materials of said sub-paragraphs a), b), c) and d).

5,087,439
PARAMAGNETIC METAL-DIETHYLENTRIAMINE-PENTAACETIC ACID PARTIAL AMIDE COMPLEXES FOR MAGNETIC RESONANCE IMAGING

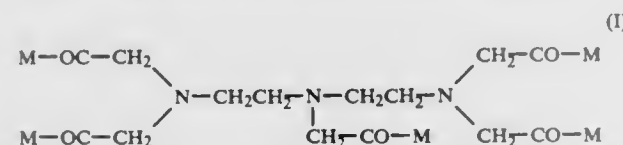
Steven C. Quay, Palo Alto, Calif., assignor to Salutar, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 855,223, Apr. 24, 1986, Pat. No. 4,859,451, which is a continuation-in-part of Ser. No. 657,676, Oct. 4, 1984, Pat. No. 4,687,658, and a continuation-in-part of Ser. No. 671,106, Nov. 13, 1984, Pat. No. 4,687,659. This application Jul. 31, 1989, Ser. No. 386,806

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.⁵ G01N 24/00, 31/00; C07F 13/00, 11/00
U.S. Cl. 424—9 21 Claims

1. In a process of NMR imaging of a subject comprising administering to said subject a composition containing an image-modifying effective amount of an image enhancer, permitting the enhancer to move through the subject, and after a time interval taking an NMR image of the subject, the improvement which comprises administering as said enhancer a complex of a paramagnetic polyvalent metal and a partial amide of diethylenetriaminepentaacetic acid of formula I



in which three groups M are hydroxyl groups and the remaining two groups M are NHR groups, where each group R is an alkyl group of formula $-(CH_2)_nCH_3$ where n is zero or an integer of from 1 to 17.

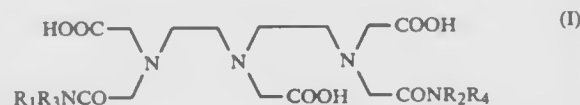
5,087,440
HETEROCYCLIC DERIVATIVES OF DTPA USED FOR MAGNETIC RESONANCE IMAGING

William P. Cacheris, San Jose, and Stephen C. Quay, Sunnyvale, both of Calif., assignors to Salutar, Inc., Sunnyvale, Calif.

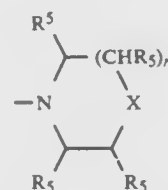
Continuation-in-part of Ser. No. 386,807, Jul. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 314,729, Feb. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,746, Sep. 27, 1988, abandoned. This application Jan. 23, 1990, Ser. No. 468,948

Int. Cl.⁵ G01N 31/00, 24/00; A61K 31/555
U.S. Cl. 424—9 26 Claims

1. A magnetic resonance imaging contrast medium comprising a gadolinium chelate of a compound of formula I:

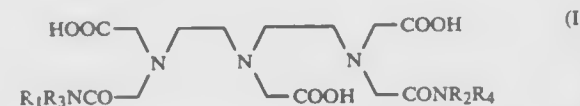


wherein R_1 and R_2 are independently C_{1-6} hydroxyalkyl and R_3 and R_4 are independently hydrogen or C_{1-6} alkyl, or NR_1R_3 and NR_2R_4 are independently a cyclic group of formula:

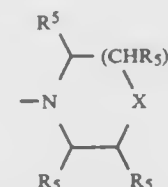


wherein R_5 represents hydrogen, hydroxy or C_{1-6} hydroxy- or alkoxy-substituted alkyl, n is 0, 1 or 2 and X is CHR_5 , NR_5 , oxygen or sulfur, with the proviso that at least one of NR_1R_3 and NR_2R_4 is a said cyclic group, and a toxicity reducing amount of a calcium chelate of a compound of formula I.

15. In a method of magnetic resonance imaging of a human or non-human animal subject, the improvement comprising administering to said subject a contrast effective amount of a contrast medium comprising a gadolinium chelate of a compound of formula I:



wherein R_1 and R_2 are independently C_{1-6} hydroxyalkyl and R_3 and R_4 are independently hydrogen or C_{1-6} alkyl, or NR_1R_3 and NR_2R_4 are independently a cyclic group of formula:



wherein R_5 represents hydrogen, hydroxy or C_{1-6} hydroxy- or alkoxy-substituted alkyl, n is 0, 1 or 2 and X is CHR_5 , NR_5 , oxygen or sulfur, with the proviso that at least one of NR_1R_3 and NR_2R_4 is a said cyclic group, and a toxicity reducing amount of a calcium chelate of a compound of formula I.

5,087,441
PROTECTION AGAINST CHEMICALLY-INDUCED KIDNEY DAMAGE BY METHIMAZOLE

Adnan A. Elfarrar, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 454,884, Dec. 22, 1989, Pat. No. 5,010,092. This application Feb. 8, 1991, Ser. No. 652,964

Int. Cl.⁵ A61K 49/00; A01N 43/50, 43/52
U.S. Cl. 424—10 2 Claims

1. A method for reducing the nephrotoxicity of cisplatin that is being administered to a live mammal in need thereof, the method comprising:

administering to the live mammal the cisplatin as well as an effective amount of a compound selected from the group of methimazole and carbimazole so as to reduce the nephrotoxicity of the cisplatin.

5,087,442
PREPARATION FOR IRON SUPPLY, PREPARATION FOR VITAMIN SUPPLY AND METHOD FOR STABILIZING A FOAM PREPARATION

Akihisa Takaichi, Toshihiko Okamoto, and Toshiaki Matsumoto, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,111
Claims priority, application Japan, Oct. 4, 1988, 63-250663; Dec. 2, 1988, 63-306272

Int. Cl.⁵ A61L 9/04; A61K 33/00, 31/295
U.S. Cl. 424—44 18 Claims

1. A preparation useful for supplying iron upon oral administration comprising:

- 0.01 to 3.5% by weight, in terms of iron, of at least one iron containing compound selected from the group consisting of ammonium iron citrate, sodium ferrous citrate and iron citrate;
- 10 to 35% by weight of sodium carbonate and/or sodium hydrogencarbonate; and
- 20 to 70% by weight of a neutralizing agent, wherein said neutralizing agent is an acid compound which neutralizes said sodium carbonate and/or sodium hydrogencarbonate to generate carbonic acid gas.

5,087,443
EMULSIONS OF ORGANOPOLYSILOXANES CONTAINING A DIESTER FUNCTIONAL GROUP, THEIR APPLICATION IN TEXTILE, COSMETIC AND DERMATOLOGICAL TREATMENT

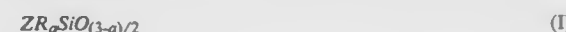
Francois Chizat, Bron; Michel Pelgnier, L'Arbresle; Jean F. Grolier, Paris, and Claude Dubief, Le Chesnay, all of France, assignors to L'Oreal, Paris, France

Filed Oct. 4, 1989, Ser. No. 417,791
Claims priority, application Luxembourg, Oct. 5, 1988, 87360

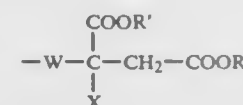
Int. Cl.⁵ A61K 7/021, 7/075, 7/09, 7/48
U.S. Cl. 424—47 23 Claims

1. Silicone/water emulsion, which comprises, in an aqueous medium:

an organopolysiloxane containing a diester functional group containing, per molecule, at least one unit of the following formula (I):



in which:
Z is a radical of formula:



in which:
the symbols R' , which are identical or different, are chosen from C_{1-12} monovalent saturated hydrocarbon radicals,

C_{2-12} alkoxyalkyl radicals and C_6-C_{12} aryl, alkylaryl and alkylalkyl radicals;

the symbol X is chosen from a hydrogen atom and the methyl radical;

the symbol W is chosen from a covalent bond and a linear or branched alkylene radical containing from 1 to 4 carbon atoms;

the symbols R, which are identical or different, are chosen from C_{1-20} alkyl, vinyl, phenyl and 3,3,3-trifluoropropyl or hydroxyl radicals, on condition that only one of the radicals R per silicon atom is a hydroxyl; and

a is chosen from 0, 1 and 2;

an effective quantity, for forming an emulsion, of at least one emulsifier chosen from anionic, cationic, amphoteric and nonionic surface-active agents.

5,087,444
NON-FLUORIDE DESENSITIZING MOUTHWASH
Robert J. Jackson; Susan A. Duke, and Mark A. Wicks, all of Weybridge, England, assignors to Beecham Group p.l.c., England

Filed Mar. 27, 1990, Ser. No. 499,658
Claims priority, application United Kingdom, Mar. 28, 1989, 8906914

Int. Cl.⁵ A61K 7/16 6 Claims

1. A non-fluoride desensitizing mouthwash, comprising:
 - from 0.1 to 15% of a water soluble, non-toxic, desensitizing strontium salt;
 - from 0.1 to 15% of a water soluble, non-toxic, desensitizing potassium salt; and
 - a dentally acceptable excipient.

5,087,445
PHOTOPROTECTION COMPOSITIONS HAVING REDUCED DERMAL IRRITATION

Janet G. Haffey, Norwalk; Jay R. Garfinkel, Wallingford, both of Conn., and Roy L. Blank, Spring Valley, N.Y., assignors to Richardson-Vicks, Inc., Shelton, Conn.

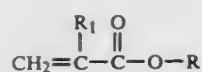
Filed Sep. 8, 1989, Ser. No. 404,751
Int. Cl.⁵ A61K 7/40, 7/42, 7/44, 9/10

U.S. Cl. 424—59 10 Claims

1. A sunscreen composition substantially for daily use comprising:

- from about 0.1% to about 20.0% of a sunscreen compound selected from the group consisting of 4-N,N-dimethylaminobenzoic acid 4-ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; 4-methoxycinnamic acid 4-ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; 4-(2-methylpropoxy)cinnamic acid 4-ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; 4-N-decylaminobenzoic acid 4-ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; 4-N,N-butylmethylaminobenzoic acid 4-ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; 4-N,N-(2-ethylhexyl)methylaminobenzoic acid 4-ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; 4-N,N-butylmethylaminobenzoic acid ester of 4-(2-hydroxyethoxy)dibenzoylmethane; 4-N,N-(2-ethylhexyl)methylaminobenzoic acid ester of 4-(2-hydroxyethoxy)dibenzoylmethane; N,N-di-(2-ethylhexyl)-4-aminobenzoic acid ester of 2-hydroxy-4-(2-hydroxyethoxy)benzophenone; and N,N-di-(2-ethylhexyl)-4-aminobenzoic acid ester of 4-(2-hydroxyethoxy)dibenzoylmethane;

- from about 0.025% to about 0.75% of a carboxylic copolymer comprising polymers of a monomeric mixture containing 95.9 to 98.8 weight percent of an olefinically unsaturated carboxylic monomer selected from the group consisting of acrylic, methacrylic and ethacrylic acids, about 1 to about 3.5 weight percent of an acrylate ester of the formula



wherein R is an alkyl radical containing 10 to 30 carbon atoms and R₁ is hydrogen, methyl or ethyl, and 0.1 to 0.6 weight percent of a polymerizable cross-linking polyalkenyl polyether of a polyhydric alcohol containing more than one alkenyl ether group per molecule wherein the parent polyhydric alcohol contains at least 3 carbon atoms and at least 3 hydroxyl groups; and
(C) from about 0.1% to about 99.8% of a pharmaceutically-acceptable sunscreen carrier.

5,087,446 SKIN COSMETICS

Eriko Suzuki, Jun Hiraki, both of Yokohama, and Masahiro Fujii, Ohta, all of Japan, assignors to Chisso Corporation, Japan

Filed Jan. 30, 1990, Ser. No. 472,296
Claims priority, application Japan, Feb. 15, 1989, 1-33791
Int. Cl.⁵ A61K 7/02

U.S. Cl. 424—62 7 Claims
1. A cosmetic comprising a freeze-dried material which is obtained by freeze-drying an aqueous solution containing hyaluronic acid or sodium hyaluronate and magnesium-L-ascorbyl phosphate.

5,087,447
PHARMACEUTICAL PREPARATIONS OF HIGH GASTRIC ACID BINDING CAPACITY, DELAYED EFFECT AND OF INCREASED BIOAVAILABILITY
István Rácz, H-1105 Nebancsvirág 3; János Plachy, H-1025 Mandula 18, and Péter Szentmiklósi, H-1064 Rudas L 75, all of Budapest, Hungary
Division of Ser. No. 165,102, Mar. 28, 1988, Pat. No. 4,921,707.
This application Oct. 12, 1989, Ser. No. 420,280
Claims priority, application Hungary, Jun. 24, 1986, 2643/86; Apr. 21, 1987, 2643/86; PCT Int'l Appl., Jun. 24, 1987, PCT/HU87/00026
Int. Cl.⁵ A61K 31/78, 33/08

U.S. Cl. 424—78.01 4 Claims
1. A pharmaceutical preparation of high acid neutralizing capacity, of increased bioavailability, and of delayed action, which comprises:
(a) 100 parts by weight of a powdered basic magnesium compound or a powdered mixture comprising a basic magnesium compound and a basic aluminum compound; and
(b) 2 to 2500 parts by weight of a therapeutically acceptable, water-swellable, dry or water-swollen polymeric organic acid selected from the group consisting of carboxymethyl cellulose, polyacrylic acid, polymethacrylic acid, and polyacrylic-methacrylic acid.

5,087,448
ENHANCING GROWTH OF MEGAKARYOCYTES IN MAMMALS USING INTERLEUKIN 6
Samuel A. Burstein, Edmond, Okla., assignor to The Board of Regents of the University of Oklahoma, Norman, Okla.
Filed Feb. 2, 1989, Ser. No. 306,479
Int. Cl.⁵ A61K 45/05

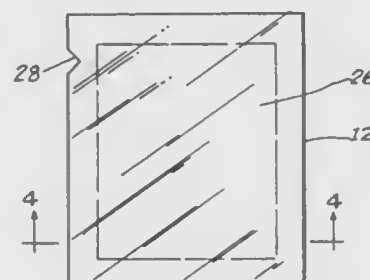
U.S. Cl. 424—85.2 4 Claims
1. A therapeutic method for treating a mammal in need of such therapy, comprising:
administering to the mammal an amount of interleukin 6 effective for increasing the number of platelets in the mammal.

5,087,449 METHOD FOR THE PREPARATION OF A SUBSTANCE CAPABLE OF PROLIFERATING BIFIDOBACTERIA GROWTH AND THE SUBSTANCE

Teruhisa Masai, Kanagawa; Takanobu Shibuta, Tokyo; Yasuyuki Yoshida, Kanagawa, and Yohsuke Suzuki, Chiba, all of Japan, assignors to Calpis Food Industry Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 537,664
Claims priority, application Japan, Jun. 20, 1989, 1-155596
Int. Cl.⁵ C12N 1/38; A61K 35/78; C07K 3/02; B01D 13/02
U.S. Cl. 424—195.1 12 Claims
1. A method for purification of a substance for assisting bifidobacteria growth which comprises subjecting the extract of soybean or its treated matters or soybean whey or treated liquid thereof to ultrafiltration membrane with a fractional molecular weight of at least about 20,000 and activated carbon treatments and then desalting by an electrodialysis treatment.

5,087,450
VIRUCIDAL WIPE CONTAINING HYPOCHLORITE WITH HAND PROTECTIVE BARRIER
Mark W. Lister, 709 NE. 20th St., Wilton Manors, Fla. 33305
Filed Apr. 4, 1990, Ser. No. 504,616
Int. Cl.⁵ A61K 33/14; A61L 2/16; B32B 17/04; B65D 30/26
U.S. Cl. 424—402 2 Claims



1. A viral wipe to remove organic material having viral contaminants from a surface comprising:
a gauze porous layer forming a pad;
a plastic non-porous flexible fluid impervious layer firmly affixed and fused on one side to said porous layer;
said porous layer impregnated with an aqueous solution of sodium hypochlorite in an amount to be effective as a virucide against HIV (AIDS), herpes or hepatitis viruses;
a protective package for storing said viral wipe that prevents escape of said sodium hypochlorite;
said protective package comprising of first and second panels, each panel including an inner plastic sheet, an intermediate foil sheet and an outer paper sheet, said panels being joined together around their perimeters to form a sealed chamber for receiving said viral wipe, said protection package including a notch means for ease of removal of said viral wipe.

5,087,451
TREATMENT OF PERIODONTAL DISEASE
Michael Wilson, London, and Wilson Harvey, Dartford, both of England, assignors to National Research Development Corporation, London, England
Filed Mar. 7, 1988, Ser. No. 164,904
Claims priority, application United Kingdom, Mar. 23, 1987, 8706872

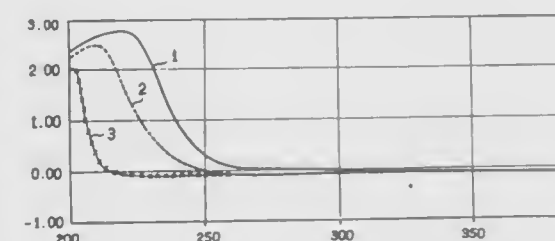
Int. Cl.⁵ A01N 25/24; A61K 9/14, 7/16
U.S. Cl. 424—407 9 Claims
1. A method of treating periodontal disease, which method comprises applying a non-toxic electron acceptor in topically retainable form specifically to the gingival sulcus or crevice or periodontal pocket of the mouth in a therapeutically or pro-

phylactically effective amount sufficient to treat said periodontal disease, said electron acceptor, on said topical application, not supplying molecular oxygen.

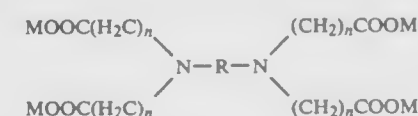
5,087,452 THERAPEUTIC PRODUCT BASED ON AN ORGANIC COMPOUND OF SILICON AND POLYCARBOXYLATED POLYAMINE, PARTICULARLY USEFUL IN THE TREATMENT OF ATHEROMA

Jean Gueyne; Marie-Christine Seguin, both of Perigord 1, 6 Lacets Saint-Léon, Monte Carlo, Monaco, and Gilbert H. Crussol, 19 Avenue Hoche, 75008 Paris, France
Filed Apr. 4, 1990, Ser. No. 503,989

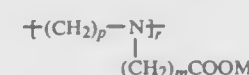
Claims priority, application France, Apr. 7, 1989, 89 04577
Int. Cl.⁵ A01N 55/02, 33/02; A61K 31/695, 31/13
U.S. Cl. 424—422 17 Claims



1. A therapeutic product which comprises a silanol or a siloxane and a polycarboxylated polyamine of the structure:



where n is 1 to 4, R is a (CH₂)_m chain or



m being 1 to 12, p being 2 to 4 and r being 1 to 3, whereas each M and M' individually represents H, alkali or alkaline-earth metal or zinc, and the product contains at least 0.2 atom Si per carboxy group —COO.

5,087,453
METHOD FOR THE TREATMENT OF BACTERIAL CAUSED WEIGHT LOSS AND/OR HYPOGLYCEMIA
Gideon Strassmann, Washington, D.C., assignor to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1990, Ser. No. 607,693
Int. Cl.⁵ A61K 37/22, 45/05, 37/24
U.S. Cl. 424—450 6 Claims
1. A method of treating bacterial caused weight loss and/or hypoglycemia, comprising the step of administering to a patient an amount of macrophage colony-stimulating factor (M-CSF) effective for said treatment.

5,087,454
IBUPROFEN TABLET
Joanne R. Duerholz, Medford; Dolores DiMaria, Vineland, and Robert G. Blank, Hammonton, all of N.J., assignors to American Home Products Corporation, New York, N.Y.
Filed Jul. 30, 1990, Ser. No. 559,862
Int. Cl.⁵ A61K 9/14, 9/20

U.S. Cl. 424—464 1 Claim
1. In an ibuprofen compressed tablet/caplet containing

about 50% to about 70% by weight based on the weight of the tablet/caplet core of ibuprofen formed by (a) wet granulating the ibuprofen with an excipient comprising starch to provide a dry base granulation (b) formulating a compression mix containing the dry base granulation and an excipient comprising starch, and (c) tableting the compression mix, the improvement which comprises providing a compressed tablet having an improved dissolution profile maintained stable on aging by (1) separately incorporating into each of the wet granulation and the compression mix about 1% to about 2% by weight based on the weight of the compressed tablet core of croscarmellose sodium and (2) incorporating into the compression mix about 0.05 to about 0.15% by weight of the compressed tablet core of sodium lauryl sulfate.

5,087,455 HOLLOW GRANULAR MEDICINE AND ITS PREPARATION

Toshiyuki Niwa; Yoshiaki Kawashima; Hirofumi Takeuchi, all of Gifu, and Yoji Ito, Toki, all of Japan, assignors to Showa Yakuhin Kako Co. Ltd. and Yoshiaki Kawashima, Japan
Division of Ser. No. 367,948, Jun. 19, 1989. This application Sep. 20, 1990, Ser. No. 585,670

Claims priority, application Japan, Oct. 18, 1988, 63-262550
Int. Cl.⁵ A61K 9/16

U.S. Cl. 424—497 39 Claims
1. A method for preparing a hollow granular medicine with a spherical hollow structure, in which a drug is distributed in the shell of the structure that essentially consists of an enteric polymer, including the steps of:

- mixing a drug with an enteric polymer in a mixture of an aliphatic alcohol and a chlorohydrocarbon, where the amount of the enteric polymer is from 20 to 1000% by weight with respect to the drug component;
- pouring the resulting solution into an aqueous medium and stirring the solution to make the hollow granular medicine with the spherical hollow structure;
- separating the hollow granular medicine from the solution;
- rinsing the hollow granular medicine with water; and
- drying the hollow granular medicine.

5,087,456 METHOD OF COMBATting PESTS BY APPLYING NOVEL GRANULES TO THE SOIL

Colette Meinard, Marseille; Jean-Claude Suglia, La Destrousse, and Claude Taranta, Aix en Provence, all of France, assignors to Roussel Uclaf, Paris, France
Division of Ser. No. 283,840, Dec. 13, 1988. This application Mar. 1, 1990, Ser. No. 486,798

Claims priority, application France, Dec. 13, 1987, 87 17634
Int. Cl.⁵ A01N 25/14; A61K 9/14, 47/32

U.S. Cl. 424—501 4 Claims
1. A method of combatting insects in a field comprising applying to the field surface an insecticidally effective amount of the granules prepared by absorbing on hydrophilic polymer granules of at least one member of the group consisting of acrylic acid polymers and acrylamide polymers an aqueous emulsion of 30 to 50% of water, 10 to 30% of dimethyl phthalate, 1 to 5% of active principle, 0 to 10% of phosphoric ester, 5 to 20% of propanediol and 5 to 10% of polyvinyl alcohol resin, all percentages based on the total weight of the emulsion, and drying the resulting mixture to obtain granules which release the active principle in uniform manner, wherein the active ingredient is deltamethrin.

5,087,457
SYNERGISTIC MICROBICIDES CONTAINING IONENE POLYMERS AND BORATES FOR THE CONTROL OF FUNGI ON SURFACES

Stephan D. Bryant, Memphis, Tenn.; John Packer, Dorval, and Thomas D. Johnstone, Montreal, both of Canada, assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Jan. 12, 1990, Ser. No. 464,014

Int. Cl.³ A01N 33/12, 59/14

U.S. Cl. 424—78.37

3 Claims

1. A microbicidal mixture effective in the control of fungi which comprises a synergistically effective mixture of an ionene polymer selected from the group consisting of poly(oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylene dichloride) and poly(2-hydroxyethylenedimethyliminio-2-hydroxypropylene-dimethyliminio methylene) dichloride with a water soluble borate selected from the group consisting of disodium octaborate tetrahydrate, boric acid, and sodium pyroborate decahydrate.

5,087,458
SOLUBILIZED OLEORESIN BLACK PEPPER, METHOD OF MAKING SAME, AND METHOD OF ADDING SAME TO CHEWING GUM

David L. Witkewitz, Ridgeview, and Mansukh M. Patel, Downers Grove, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Mar. 13, 1990, Ser. No. 492,851

Int. Cl.³ A23G 3/30

U.S. Cl. 426—3

11 Claims

1. A homogenous, liquid oleoresin black pepper solution comprising from about 10% to about 55% by weight oleoresin black pepper and from about 45% to about 90% by weight cinnamyl alcohol.

5,087,459
NON-TACK CHEWING GUM BASE
 Michael S. Chnu, Northbrook; Albert H. Chapdelaine, Naperville, and Mansukh M. Patel, Downers Grove, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.
 Continuation of Ser. No. 417,165, Oct. 4, 1989, abandoned. This application Mar. 21, 1991, Ser. No. 673,862
 Int. Cl.³ A23G 3/30

U.S. Cl. 426—4

24 Claims

1. A chewing gum base comprising:
 terpene resin in an amount from about 0.1% to about 20% by weight of the gum base wherein the terpene resin has a softening point of about 85° C. to about 135° C.;
 one or more high melting waxes in an amount from about 0.1% to about 10% by weight of the gum base wherein the high melting waxes have a melting point of about 70° C. or greater;
 wherein the combined amount of terpene resin and high melting wax present in the chewing gum base is from about 0.1% to about 20% by weight of the gum base and wherein the ratio of terpene resin to high melting wax is from about 3:1 to about 1:3 by weight;
 low melting wax in an amount from about 0.1% to about 4% by weight of the gum base wherein the low melting wax has a melting point of about 50° C. or less;
 one or more elastomers in an amount from about 10% to about 30% by weight of the gum base;
 low molecular weight polyvinyl acetate in an amount from about 15% to about 30% by weight of the gum base wherein the polyvinyl acetate has a molecular weight of about 8,000 to about 60,000;
 one or more emulsifiers in an amount from 1% to about 10% by weight of the gum base;
 one or more fillers in an amount from about 5% to about 20% by weight of the gum base; and
 one or more chewing gum base solvents in an amount from about 15% to about 40% by weight of the gum base.

5,087,460
REDUCED-CALORIE CONFECTIONERY COATED CHEWING GUM COMPOSITIONS AND METHODS FOR PREPARING SAME

Sabraman R. Cherukuri, Towaco; Steven M. Faust, Stanhope, both of N.J., and Gul Mansukhani, Staten Island, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.
 Continuation-in-part of Ser. No. 939,918, Dec. 10, 1986, Pat. No. 4,872,884. This application Jul. 7, 1989, Ser. No. 377,800
 Int. Cl.³ A23G 3/30

U.S. Cl. 426—5

44 Claims

1. A confectionery coated chewing gum composition having a center portion and a confectionery coating over the center portion wherein the center portion comprises a reduced-calorie gum base which consists essentially of in percentages by weight of the gum base:

- (a) an elastomer present in an amount from about 0.5% to about 20;
- (b) a medium molecular weight polyvinyl acetate polymer having a molecular weight from about 35,000 to about 55,000 present in an amount from about 10% to about 25%;
- (c) an acetylated monoglyceride present in an amount from about 4.5% to about 10%;
- (d) a wax having a melting point below 60° C. present in an amount from about 6% to about 10%; and
- (e) a filler component present in an amount to bring the total amount of gum base to 100%.

5,087,461
DOUBLE-ENCAPSULATED COMPOSITIONS CONTAINING VOLATILE AND/OR LABILE COMPONENTS, AND PROCESSES FOR PREPARATION AND USE THEREOF

Harry Levine; Louise Slade, both of Morris Plains; Bernhard Van Lengerich, Ringwood, and John G. Pickup, Randolph, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 2, 1989, Ser. No. 415,866

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.³ A23L 1/221

U.S. Cl. 426—96

57 Claims

1. A process for encapsulation of a spray-dried composition comprising at least one volatile and/or labile component in a carrier, which process comprises forming a mixture of said composition with:

- (a) from about 40 to about 80 percent by weight of a water-soluble, chemically-modified starch having a dextrose equivalent not greater than about 2;
 - (b) from about 10 to about 40 percent by weight of a maltodextrin having a dextrose equivalent in the range of from about 5 to about 15;
 - (c) from about 5 to about 20 percent by weight of corn syrup solids or a polydextrose having a dextrose equivalent in the range of from about 21 to about 42; and
 - (d) from about 5 to about 20 percent by weight of a mono- or disaccharide,
- all of said percentages being based upon the total weight of said components (a), (b), (c) and (d);
 and extruding the mixture to form a glassy matrix having a glass transition temperature of at least 40° C. wherein the volatile and/or labile component is encapsulated.

5,087,462
VACUUM SKIN PACKAGES WITH REDUCED PRODUCT DISCOLORATION AND METHOD OF MAKING

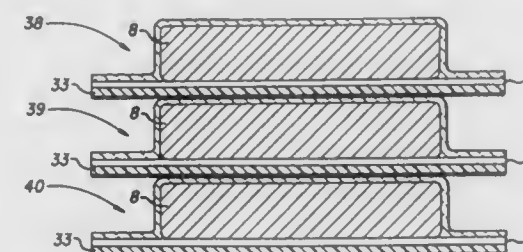
Solomon Bekele, Taylors, and Allen C. Williams, Jr., Spartanburg, both of S.C., assignors to W. R. Grace & Co.-Conn, Duncan, S.C.

Continuation of Ser. No. 194,741, May 13, 1988, Pat. No. 4,910,033. This application Oct. 12, 1989, Ser. No. 420,182
 The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.

Int. Cl.³ B65D 81/20

U.S. Cl. 426—129

6 Claims



1. A skin package comprising:
 - a) a gas impervious support member having a top surface and a textured bottom surface, the peaks and valleys of the textured bottom surface having a thickness less than the average thickness of the support member;
 - b) a meat product held securely to the top surface of the support member; and
 - c) a film member which holds the product to the support member, said film member including
 - i) a first portion which conforms to the shape of the product, and
 - ii) a second portion sealed to the top surface of the support member around the periphery of the product.
3. A method of making a skin package useful in reducing discoloration comprising:
 - a) feeding a gas impervious thermoplastic material toward a loading station, said material having a top surface and a textured bottom surface, the peaks and valleys of the textured bottom surface having a thickness less than the average thickness of the material;
 - b) loading a meat product onto the top surface of the textured material at the loading station;
 - c) covering the product and top surface of the textured material with a film member; and
 - d) sealing the film member to the top surface of the textured material.

5,087,463
METHOD AND APPARATUS FOR VOIDING FOOD PRODUCT FROM THE TAIL OF A STUFFED CASING PRODUCT

Vytas A. Raudys, Chicago, and Reid A. Kennedy, Willow Brook, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Feb. 9, 1990, Ser. No. 477,403

Int. Cl.³ A22C 11/02

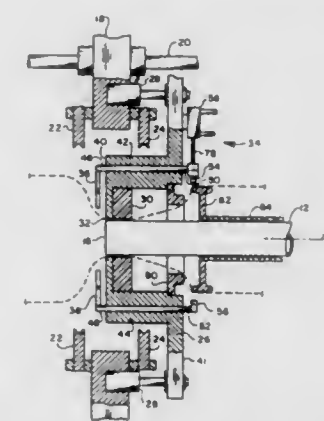
U.S. Cl. 426—138

10 Claims

1. A method of gathering and closing stuffed casing comprising the steps of:
 - a) providing a casing supply on a stuffing horn, said casing supply having a closed end;
 - b) discharging a flowable food product under pressure from a discharge end of the stuffing horn into the casing thereby stuffing said casing and moving the closed end away from the stuffing horn;
 - c) stopping the flow of food product after a predetermined length of casing has been stuffed;
 - d) gathering the stuffed casing towards its longitudinal axis at a location adjacent the discharge end of the stuffing horn and applying a first closure to the gathered casing;
 - e) advancing the stuffed casing in the direction of its longitudinal axis to space the first closure away from the discharge end of the stuffing horn thereby providing a casing tail which extends from the first closure to the stuffing horn and in which is present some portion of the food product;
 - f) closing opposed gates about the casing tail adjacent the first closure and moving the closed gates axially toward

dinal axis to space the first closure away from the discharge end of the stuffing horn thereby providing a casing tail which extends from the first closure to the stuffing horn and in which is present some portion of the food product;

f) closing opposed gates about the casing tail adjacent the first closure and moving the closed gates axially toward

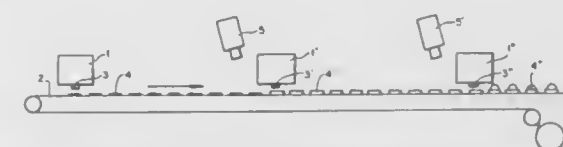


the stuffing horn and progressively constricting the casing tail over its length from the first closure to the discharge end of the stuffing horn thereby axially stripping the portion of food product from the casing tail back to the stuffing horn; and
 g) applying a second closure to the constricted casing tail at a position longitudinally spaced from the first closure.

5,087,464
METHOD FOR PRODUCING MULTI-LAYERED CONFECTIONERY
 Roland Eberhardt, Rengsdorf, and Gerhard Puderbach, Neuwied, both of Fed. Rep. of Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany
 Filed Aug. 16, 1990, Ser. No. 568,482
 Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928864
 Int. Cl.³ A23G 3/00

U.S. Cl. 426—231

4 Claims



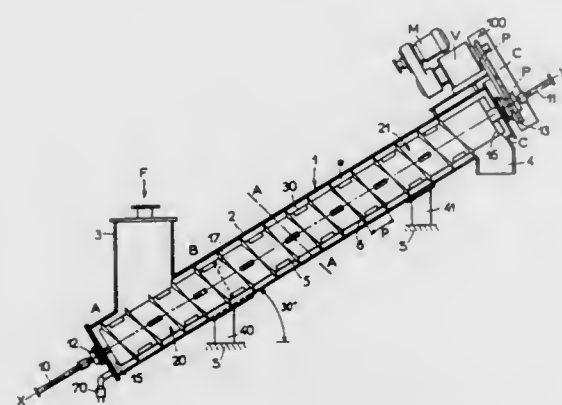
1. A method for producing multi-layered confectionery comprising:
 - aligning the confectionery on a conveyor system in rows oriented at right angles to the transport direction of movement of said conveyor system;
 - building up the confectionery layer by layer by a first, a second and succeeding applicators for delivering a confectionery mass deposited onto the confectionery, said applicators being arranged one behind the other along the transport direction;
 - optically detecting each row of confectionery before said row reaches the second and all succeeding applicators;
 - generating a signal based upon the position of each row relative to the respective applicator; and
 - controlling the spatial position of the respective applicator and its application time interval by said signal in such a way that the delivered mass deposited by the applicator is

placed exactly in a predetermined position onto the row of confectionery passing below said applicators.

5,087,465
METHOD OF MANUFACTURING SOYBEAN CURD
Richard K. Chen, Room 803, Star House, 3 Salisbury Road, Kowloon, Hong Kong
Filed Apr. 19, 1991, Ser. No. 688,013
Int. Cl.⁵ A23L 1/00

U.S. Cl. 426—241 20 Claims
1. A method of manufacturing soybean curd, comprising mixing soybean milk with a coagulating agent to form a liquid mixture, continuously filling the resulting liquid mixture into containers, continuously passing the containers through a zone in which the liquid mixture receives sufficient microwave energy from microwave energy sources of sufficient power relative to the weight of the soybean milk in the liquid mixture and for a sufficient period of time to heat the interior of the mixture to a temperature in a range of about 75° C. to about 85° C., removing the containers from the zone and maintaining the containers at a temperature in a range of about 80° C. to about 90° C. for a period of about 20 to about 50 minutes to coagulate the mixture in the containers to form soybean curd, and cooling and storing the soybean curd in a refrigerated room.

5,087,466
PROCESS AND DEVICE FOR TREATING ANIMAL FLESH, PARTICULARLY FISH, FOR THE PURPOSE OF REMOVING COLOR AND ODOR
Louis Coudrains, Queven, and Emmanuel Starck, Quimper, both of France, assignors to Compagnie des Eaux et de L'Ozone, France
PCT No. PCT/FR88/00141, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/06848, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 18, 1988, Ser. No. 423,411
Claims priority, application France, Mar. 19, 1987, 87 03793
Int. Cl.⁵ A22C 25/02; A23B 4/16
U.S. Cl. 426—256 17 Claims

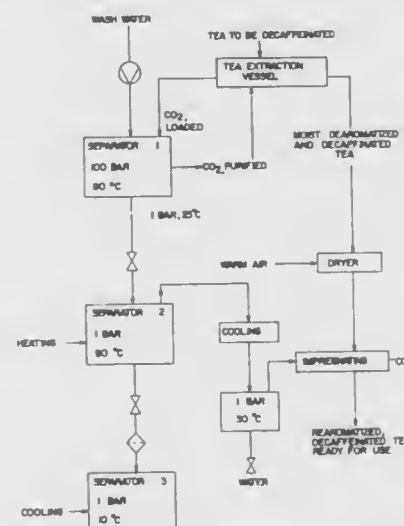


1. A device for treating animal flesh, comprising an envelope in which a hollow tube turns, provided with a helical wall having a pitch, the device assembly further comprising a transfer screw, the free space existing between the inner wall of said envelope and of the tube constituting a bubbling chamber in which a mixture of flesh and water is brought into contact with ozone.

5,087,467
METHOD OF INHIBITING DISCOLORATION OF PRODUCE
Dennis J. Schwank, Stockton, Calif., assignor to Karl R. Mygrant, Byron, Calif.
Filed Mar. 30, 1990, Ser. No. 502,428
Int. Cl.⁵ A23B 7/10

U.S. Cl. 426—262 10 Claims
1. A method for inhibiting the discoloration of produce, comprising the steps of:
a. immersing the produce in an aqueous solution having a pH of less than 2.0, said aqueous solution containing anions capable of maintaining a negative charge at said pH of less than 2.0, said immersion being for a sufficient time to arrest the phenolase coloration;
b. removing the produce from said aqueous solution; and
c. rinsing said aqueous solution from the produce.

5,087,468
PROCESS FOR AROMATIZATION OF TREATED TEA
Josef Schulmeyr, Wolnzach, Fed. Rep. of Germany, assignor to Hopfenextraktion HVG Barth, Raiser & Co., Fed. Rep. of Germany
Filed Nov. 15, 1989, Ser. No. 436,666
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838952
Int. Cl.⁵ A23F 3/36
U.S. Cl. 426—386 8 Claims



1. A process of the production of an aromatic decaffeinated tea comprising the steps of:
a) charging moist tea to a pressure vessel,
b) charging liquid supercritical carbon dioxide to said pressure vessel at a temperature of between 0° to 100° C. and at a pressure of 100 to 500 bars to dissolve therein the caffeine and aroma fractions of said tea to provide a carbon dioxide solution,
c) separating said carbon dioxide solution from said tea,
d) charging said carbon dioxide solution to a first expansion vessel, reducing the pressure therein to 100 bars, raising the temperature to between 50° and 100° C. and continuously adding there 1 part by weight of water for each 10 parts by weight of originally charged moistened tea per hour,
e) recovering the carbon dioxide thus converted to the gaseous state and recycling same into step (b) and collecting the thus produced aqueous extract containing aroma, caffeine, and some carbon dioxide,
f) charging said aqueous extract to a second expansion vessel, lowering the pressure to 1 bar and reheating the con-

tents to between 50° and 100° C. whereby the aromatics, some water and the carbon dioxide are volatilized,
g) collecting the volatiles from step (f) and cooling same to between 0° and 40° C. whereby a portion of the water is condensed,
h) charging the remaining volatiles to decaffeinated decaffeinated tea to obtain aromatized decaffeinated tea.

5,087,469
COFFEE FLAVOR ENHANCERS
Terry E. Acree, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed May 24, 1990, Ser. No. 529,000
Int. Cl.⁵ A23F 5/48

U.S. Cl. 426—544 7 Claims
1. A process for preparing a coffee flavor enhancer having odor and taste characteristics of freshly ground or freshly brewed coffee which comprises:
a) passing an inert gas through ground, roasted coffee at a temperature from about 150° F. to about 190° F. sufficient to entrain the coffee flavor enhancer and other volatiles in said inert gas;
b) removing the said enhancer from the inert gas stream by selective adsorption on a solid adsorbent adapted to adsorb the desired flavor enhancer while allowing the less desirable coffee derived odors present in the inert gas stream to pass without being adsorbed on said adsorbent; wherein said selective adsorbent is a polymer having a siloxane (Si-O-Si) structure in at least a portion of the polymer backbone and having C₁₂ to C₂₄ hydrophobic alkyl or alkenyl hydrocarbyl appendages or C₁₂ to C₂₄ hydrophobic alkoxy appendages pendant to said backbone and said adsorption is effected in the presence of a stabilizing amount of an antioxidant

5,087,470
LEGUME PASTA AND ITS METHOD OF PREPARATION
Anand Sarabhai, 222 Bowery, Room 2-B, New York, N.Y. 10012
Filed Mar. 11, 1991, Ser. No. 667,421
Int. Cl.⁵ A23L 1/16, 1/20

U.S. Cl. 426—557 29 Claims
1. A process of preparing a pasta product comprising:
(a) comminuting urad legumes to produce a flour,
(b) admixing the flour with a quantity of water effective to produce a malleable dough,
(c) subdividing the dough to maintain said dough in a malleable condition,
(d) forming the dough into a pasta shape, and
(e) drying the formed dough to produce a pasta product containing no wheat flour.

5,087,471
LOW CALORIE SALAD DRESSING HAVING SMOOTH, CREAMY, ORGANOLEPTIC CHARACTERISTICS
Richard C. Combes, Schaumburg; William H. Schwimmer, Evanston, and Bradley D. Barbera, Chicago, all of Ill., assignors to Kraft General Foods, Inc., Glenview, Ill.
Filed Dec. 13, 1990, Ser. No. 626,733
Int. Cl.⁵ A23L 1/24

U.S. Cl. 426—573 10 Claims
1. A method for preparing a viscous dressing comprising:
(a) preparing a gum blend comprising a gum and a diluent;
(b) preparing a spice blend comprising water, salt, sweetener, and spice;
(c) preparing an aqueous dispersion of a microreticulated microcrystalline cellulose;
(d) preparing a starch base;
(e) combining and mixing said gum blend, said spice blend and said microreticulated microcrystalline cellulose to provide a premix; and
(f) blending said premix and said starch base to provide a viscous dressing product;
said viscous dressing product comprising from about 0.25%

to about 4% of said microreticulated microcrystalline cellulose, from about 0.2% to about 2% of said gum, from about 60% to about 80% water, from about 2% to about 20% carbohydrates, from 0 to about 10% protein and less than about 4% triglycerides.

5,087,472
FEED COMPOSITIONS FOR DOMESTIC ANIMALS CONTAINING HYDROXYMETHYLBUTYRATE
Steven L. Nissen, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Continuation-in-part of Ser. No. 472,090, Jan. 30, 1990, Pat. No. 5,028,440. This application Feb. 15, 1991, Ser. No. 656,296
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.⁵ A23K 1/00

U.S. Cl. 426—623 2 Claims
1. A feed composition for growing meat-producing beef cattle and lambs, consisting essentially of a protein-containing ruminant feed containing in admixture therewith from 0.01 to 0.1 weight percent of an edible salt of β -hydroxy- β -methylbutyric acid (HMB) on a Ca—HMB dry weight basis, wherein said feed composition increases lean tissue development in the meat production of said beef cattle and lambs.

5,087,473
FOOD PRODUCT FOR DOMESTIC ANIMALS AND A METHOD FOR ITS MANUFACTURE
Franca Leo, Corso Francia 35, 10138 Torino, Italy
Filed Oct. 5, 1990, Ser. No. 594,910
Claims priority, application Italy, Oct. 6, 1989, 67855 A/89; Oct. 31, 1989, 67930 A/89
Int. Cl.⁵ A23K 1/00

U.S. Cl. 426—646 7 Claims
7. A method for the manufacture of a food product for domestic animals consisting essentially of the following steps: forming a mixture of components into a paste, the components comprising from 65 to 85% by weight of meat, from 4 to 12% of vegetables, from 3.5 to 11% of egg, from 0.2 to 2% of mineral salts, from 2 to 8% of maize flour, from 1 to 6% of soya lecithin, from 1 to 8% of milk, modelling the paste to a desired shape in a mould, freeze drying the product, and packaging said product in a gas-impermeable wrapper.

5,087,474
FEED SUPPLEMENT FATS FROM ABATOIR SLUDGE
William P. Moore, Hopewell, Va., assignor to Harmony Products, Inc., Chesapeake, Va.
Filed Mar. 6, 1991, Ser. No. 665,094
Int. Cl.⁵ A23K 1/10

U.S. Cl. 426—646 11 Claims
1. A stepwise method of recovering high integrity particles of feed supplement fats free of pathogens and malodors from abattoir sludge by a primary comminuting, evaporatively heating, second comminuting, and setting in a cylindrical evaporating granulator containing blades scrapingly rotating at a speed between 20 and 80 feet per second along and tangential to a heated stationary inside wall of the cylindrical evaporating granulator, the steps of the method comprising:
(a) primary comminuting aqueous abattoir sludge, containing between about 10 and 50 percent fat on a dry basis, with between 1 and 10 percent strong base selected from the group consisting of sodium hydroxide, potassium hydroxide, calcium hydroxide, magnesium hydroxide, calcium carbonate, sodium carbonate, potassium carbonate, and sodium bicarbonate, to provide a pH between 8 and 14, until a fluid suspension is formed comprising comminuted sludge particles more than 90 percent of which exhibit diameters smaller than 1 millimeter, the fluid suspension

containing dry matter amounting to between 10 and 60 percent;

- (b) evaporatively heating the fluid suspension to a temperature between about 55° and 120° C. until the dry matter amounts to more than 70 percent and the strong base has reacted with fat components to coagulate the fluid suspension to form soft homogeneous solid agglomerates;
- (c) secondary comminuting the agglomerates until particles are formed which exhibit diameters between 0.5 and 5.0 millimeters;
- (d) setting the particles by heating at pressures between 0.02 and 0.5 atmospheres absolute at temperatures between 70° and 110° C. until the dry matter in the particles amounts to between 90.0 and 99.5 percent and the particles exhibit high physical integrity and no malodors or live pathogens.

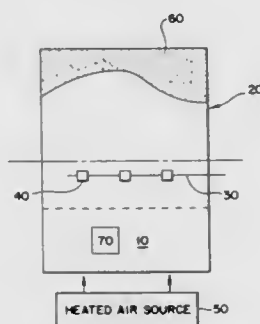
5,087,475

PROCESS FOR THE FILM-COATING OF SEED MATERIALS

Michelle Bazin, Outarville; Antoine Depeyre, La Bastide St. Pierre, and Joel Kamoda, Mereville, all of France, assignors to Etablissements CERES, Mereville, France
Continuation of Ser. No. 532,345, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 92,185, Sep. 2, 1987, abandoned. This application Apr. 5, 1991, Ser. No. 681,428
Claims priority, application France, Sep. 2, 1986, 86 12450
Int. Cl.⁵ A01N 3/00

U.S. Cl. 427—4

11 Claims



1. A process for the film-coating of a batch of seed materials with a gas- and water-permeable, thin, adherent, uniform non-phytotoxic continuous surface film of a polymeric film-former, comprising (a) establishing and continuously maintaining a unit compact volume of moisture-containing viable seed materials in a state of continuous agitation, and (b) continuously spraying and coating said unit compact volume of seed materials with an adjusted essentially steady predetermined flow rate of a liquid solution or suspension of a polymeric film-former, while simultaneously (i) continuously positively drying the coated seed materials by continuously directing a predetermined flow rate of a gaseous feedstream thereagainst that is at a controlled temperature less than that as would adversely affect the viability thereof, (ii) continuously monitoring the temperature within said unit compact volume of seed materials in a state of continuous agitation and (iii) continuously maintaining a moisture content in the final product coated seed materials essentially at the same level as that in the uncoated seed materials, and whereby (c) the final product film-coated seed materials have essentially the same shapes as the corresponding uncoated seed materials.

5,087,476

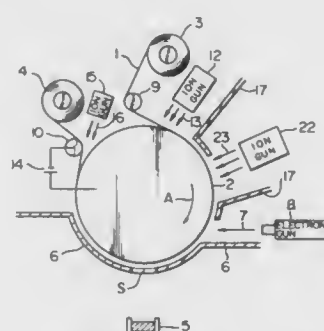
METHOD OF PRODUCING THIN FILM

Kiyokazu Tohma; Ryuji Sugita, both of Hirakata; Kazuyoshi Honda, Takatsuki; Yasuhiro Kawawake, Suita, and Tatsuki Ishida, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 2, 1990, Ser. No. 487,273

Claims priority, application Japan, Mar. 17, 1989, 01-067062; Jun. 19, 1989, 01-156522
Int. Cl.⁵ B05D 3/06, 5/12; C23C 16/00

U.S. Cl. 427—35

13 Claims



6. A method of continuously producing a thin film on a polymer film by vacuum evaporation while and polymer film is moving circumferentially along an outer peripheral surface of a cylindrical can from a supply location of said polymer film relative to said cylindrical can to a takeup location of said polymer film relative to said cylindrical can, said method comprising the steps of:

- (a) neutralizing said polymer film by applying accelerated ions from a first ion gun and unaccelerated electrons onto a part of said polymer film while it is moving through a position near said supply location at which said polymer film begins to make contact with said outer peripheral surface of said cylindrical can;
- (b) at a location relative to said cylindrical can between said position at which said ions and electrons are applied to said polymer film and said take-up location, applying ions from a second ion gun onto said polymer film while it is traveling on said outer peripheral surface of said cylindrical can;
- (c) at a location relative to said cylindrical can between said location at which said ions are applied by said second ion gun onto said polymer film and said take-up location, applying electrons from an electron gun onto said polymer film while it is traveling on said outer peripheral surface of said cylindrical can; and
- (d) at a location relative to said cylindrical can between said location at which said electrons are applied onto said polymer film from said electron gun and said take-up location, continuously depositing the thin film by vacuum evaporation on said polymer film while it is traveling on said outer peripheral surface of said cylindrical can.

5,087,477

EB-PVD METHOD FOR APPLYING CERAMIC COATINGS

Charles S. Giggins, Jr., Simsbury; Neal P. Anderson, South Windsor; Richard S. Mullin, Pomfret, all of Conn.; Leo A. Riendeau, Springfield, Mass., and Nicholas E. Ulion, Marlborough, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 5, 1990, Ser. No. 474,918

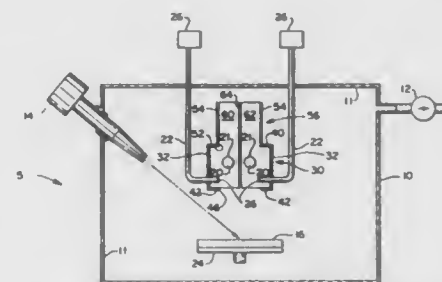
Int. Cl.⁵ B05D 3/06, 5/12

U.S. Cl. 427—38

11 Claims

1. A method for applying a columnar grain ceramic coating to a component, comprising the steps of evaporating a coating target having a composition corresponding to said coating in a coating chamber maintained at reduced gas pressure by im-

ping an electron beam upon the coating target, wherein evaporant produced by said evaporating step forms cationic and anionic constituents of the target; flowing anionic constituent into a reaction chamber within the coating chamber, wherein the component is disposed within the reaction chamber, said flowing step carried out such that anionic constituent



in excess of the anionic constituent produced during said evaporating step is present in the reaction chamber, and confining said anionic constituent about the component within the reaction chamber; and the evaporant upon the surface of the component the anionic constituent with the condensed evaporant the coating.

5,087,478

DEPOSITION METHOD AND APPARATUS USING PLASMA DISCHARGE

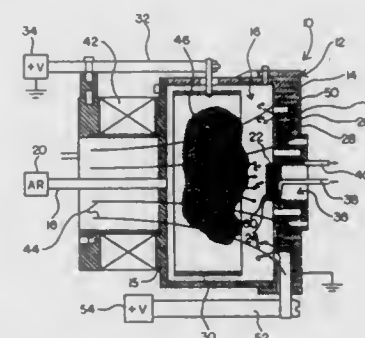
Weldon S. Williamson, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 1, 1989, Ser. No. 388,229

Int. Cl.⁵ B05D 3/06; C23C 16/00

U.S. Cl. 127—39

26 Claims



1. A method of forming a layer on a substrate, comprising the steps of:

- (a) creating a Penning-type gas discharge plasma between an annularly shaped filament cathode and a tubular anode in spaced axial relation from said cathode such that a plasma sheath conforming to the shape of said substrate is created by applying an electric potential to the anode at a value selected to cause the plasma to be at a positive potential relative to the substrate;
- (b) vaporizing a source material mounted coaxially with said cathode and causing a vapor of atoms of the source material to diffuse into the plasma for ionization; and
- (c) applying an electric potential to said substrate to cause ions of the source material to flow from the plasma onto the substrate to form a layer thereon.

5,087,479

METHOD AND APPARATUS FOR ENVELOPING AN ELECTRONIC COMPONENT

Patrick McManus, Munich, and Rudolf Kutscherauer, Forstern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

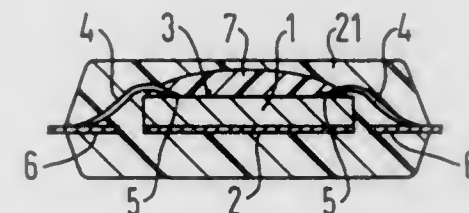
Filed Jun. 5, 1990, Ser. No. 533,387

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1989, 3918315

Int. Cl.⁵ B05D 3/06, 5/12, 1/02; B29C 00/00

U.S. Cl. 427—54.1

8 Claims



1. A method for enveloping an electronic component having a generally planar shape with two generally planar surfaces on opposite sides thereof and bond wires proceeding from a first of the two generally planar surfaces, comprising the steps of: applying a flowable gel onto the first of said two generally planar surfaces having the bond wires, through a plurality of nozzles arranged side-by-side in a row along an alignment axis to form an elastic and compressible intermediate layer of the flowable gel, the flowable gel comprising an ultraviolet-curable gel; moving the row of the plurality of nozzles back and forth above a starting edge of the electronic component in a direction generally parallel to the starting edge to cover the starting edge with the gel; conducting the row across the first one of the two generally planar surfaces to an edge of the electronic component that lies opposite the starting edge; moving an ultraviolet light directed in a strip extending generally parallel to the starting edge of the electronic component from the starting edge to the edge opposite the starting edge at a prescribed spacial distance from the row of the plurality of nozzles from which the gel is discharged to pre-cure the gel applied in the preceding steps by irradiation so that a prescribed time interval is present between the discharge of the gel and the pre-curing by the light so as to set the flowable gel at the locations at which it is supplied by the nozzle row; and applying a surrounding layer of an enveloping compound over the elastic and compressible intermediate layer formed by the pre-cured flowable gel.

5,087,480

METHOD FOR MANUFACTURING A MOISTURE PERMEABLE ELECTRODE IN A MOISTURE SENSOR

Junichi Tanaka, Tenri; Hisatoshi Furubayashi, Yamatokoriyama, and Masanori Watanabe, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 684,347, Dec. 20, 1984, abandoned.

This application Jul. 17, 1989, Ser. No. 380,741

Claims priority, application Japan, Dec. 27, 1983, 58-247175

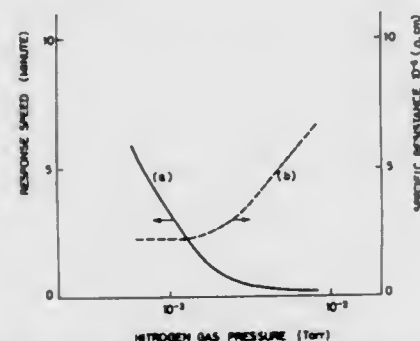
Int. Cl.⁵ H01G 5/20

U.S. Cl. 427—79

7 Claims

1. A method for manufacturing a moisture sensing element comprising the steps of: providing a glass substrate; disposing a moisture sensitive polyvinyl alcohol film on said glass substrate, said moisture sensitive polyvinyl alcohol film being composed of a resin and having a flat surface and; depositing a moisture permeable gold or gold alloy electrode film having a thickness of 100 Å through 200 Å on said

moisture sensitive polyvinyl alcohol film by vacuum evaporation, said vacuum evaporation being carried out under a gas pressure environment of 1.0×10^{-3} Torr through 1.0×10^{-2} Torr, wherein the gas of said gas pressure environment is helium, neon, argon, nitrogen, oxygen or a mixture thereof,



wherein said moisture sensing element manufactured has a response speed of not over 3.4 minutes and a specific resistance of not over 7.3×10^{-6} ohm-cm, and the specific resistance of the moisture permeable electrode film is stable after storage under high temperature and high humidity conditions.

5,087,481

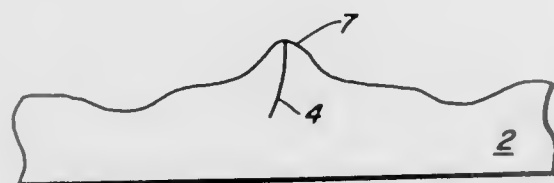
METHOD FOR TEXTURING A MAGNETIC DISK SILICATE GLASS SUBSTRATE

Tu Chen, Monte Sereno, Calif.; Toru Iseda, and Kazuo Manami, both of Yokohama, Japan, assignors to Komag, Inc., Milpitas, Calif. and Asahi Glass Co., Ltd., Tokyo, Japan. Continuation-in-part of Ser. No. 105,612, Oct. 8, 1987, Pat. No. 4,833,001. This application Mar. 29, 1989, Ser. No. 329,993. Claims priority, application Japan, Oct. 9, 1986, 61-239249; Dec. 12, 1986, 61-294927; Aug. 4, 1987, 62-193731; Sep. 9, 1987, 62-224034.

Int. Cl.⁵ G11B 5/00

U.S. Cl. 427-129

17 Claims



1. A method for texturing a silicate glass substrate used to manufacture a magnetic disk comprising the steps of: subjecting said substrate to a polishing step to eliminate or substantially reduce the number of microcracks in the surface of said substrate; and texturing said substrate by subjecting said substrate to a chemical etchant.

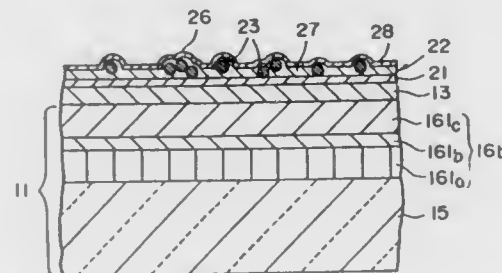
5,087,482

METHOD OF MANUFACTURING MAGNETIC RECORDING MEDIUM CAPABLE OF RECORDING INFORMATION AT A HIGH RECORDING DENSITY

Hisao Kawai; Akinori Kurikawa, and Hisanori Suzuki, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan. Division of Ser. No. 531,024, May 31, 1990, Pat. No. 5,029,317. This application Apr. 12, 1991, Ser. No. 684,573. Claims priority, application Japan, May 31, 1989, 1-138095. Int. Cl.⁵ H01F 10/02.

U.S. Cl. 427-129

17 Claims



1. A method of manufacturing a magnetic recording medium, said method comprising the steps of: preparing a substrate member of a nonmagnetic material providing a principal surface; depositing a magnetic layer on said principal surface; depositing a first protection film of a nonmagnetic material on said magnetic layer; coating, on said first protection film, a solution which is composed of hard minute particles and at least one organic compound selected from the group consisting of organosilic compounds and organometallic compounds; applying a second protection film on said first protection film and which is composed of an inorganic oxide film consisting essentially of said at least one organic compound and said hard minute particles dispersed in said inorganic oxide film; and forming a lubricant layer on said second protection film to form a principal surface for said recording medium.

5,087,483

CARBURIZING CERAMIC PLATES FOR A FAUCET VALVE

Edward J. Vargo, Lincoln Park, Mich., assignor to Masco Corporation, Taylor, Mich. Continuation-in-part of Ser. No. 274,876, Nov. 22, 1988. This application Mar. 21, 1990, Ser. No. 497,781. Int. Cl.⁵ B05D 7/22; C23C 16/00.

U.S. Cl. 427-235

13 Claims

1. A process of manufacturing a flow control member for a faucet valve, a pair of flow control members having mutually cooperating surfaces positioned in adjoining cooperation to selectively control the fluid flow through the faucet valve, the process comprising the steps of: forming the base configuration of the flow control member from a ceramic material, said base form having surface pores therein; subjecting said base form to a carburizing gas at an elevated temperature to impregnate the surface pores of said base form with carbon deposits thereby forming a carburized base form; and finishing said carburized base form to remove excess surface deposits which have built up beyond the surface of the base form and provide the cooperating surface of the flow control member with a smooth finish.

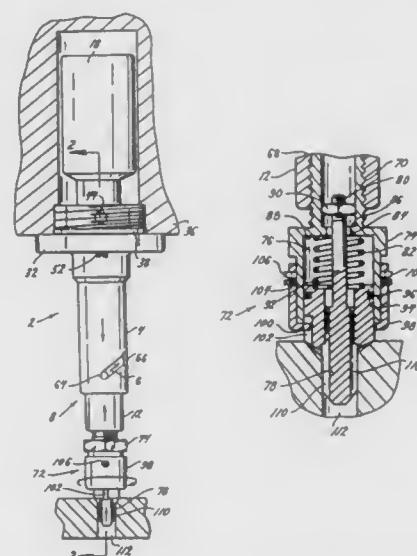
5,087,484

ROTATING SEALANT APPLICATOR

William R. Stewart, LaPalma, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif. Division of Ser. No. 355,674, May 23, 1989, Pat. No. 5,010,841. This application Oct. 1, 1990, Ser. No. 534,252. Int. Cl.⁵ B65D 7/22.

U.S. Cl. 427-239

6 Claims



1. A method for dispensing sealant into a fastener hole, said sealant being dispensed by a sealant dispenser which comprises a sleeve having a first bore and an oblique slot, a dispenser tube within said first bore having a longitudinal channel, a guide pin attached to said dispenser tube which is adapted to extend into said oblique slot, and a nozzle attached to said dispenser tube that dispenses the sealant, said nozzle having a plurality of openings in fluid communication with said longitudinal channel, said method comprising the steps of: a) inserting said sealant dispenser into the fastener hole; b) injecting sealant into the fastener hole through said nozzle; and, c) rotating said sealant dispenser by moving said guide pin along said oblique slot, such that the sealant is uniformly applied around the fastener hole.

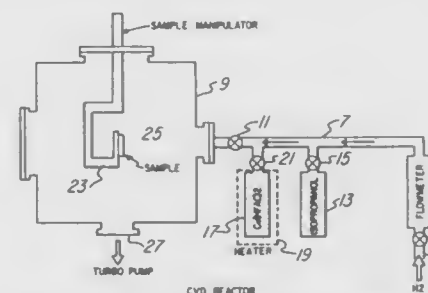
5,087,485

ISOPROPANOL CATALYST FOR COPPER CHEMICAL VAPOR DEPOSITION

Chih-Chen Cho, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex. Filed Aug. 14, 1990, Ser. No. 567,491. Int. Cl.⁵ C23C 16/18, 16/20.

U.S. Cl. 427-253

34 Claims



1. A method of CVD deposition of copper on a surface comprising the steps of: (a) providing said surface;

5,087,486

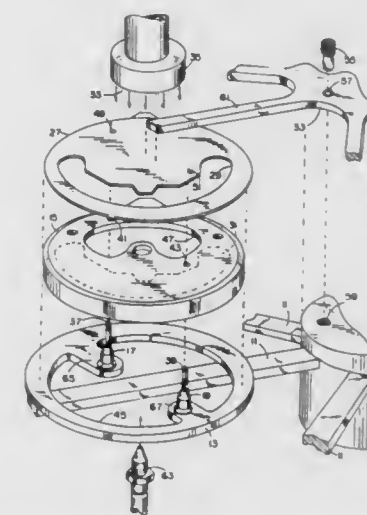
METHOD AND APPARATUS FOR BLASTING PARTS

David J. DeVos; Bruce A. Sterenberg, both of Caledonia, and Michael L. Tubergen, Kentwood, all of Mich., assignors to Progressive Blasting Systems, Inc., Grand Rapids, Mich. Filed Apr. 19, 1989, Ser. No. 340,282.

Int. Cl.⁵ B05D 1/32, 3/12; B05C 11/00, 13/00.

U.S. Cl. 427-264

10 Claims



1. A method of treating a workpiece comprising: a) mounting said workpiece on a supporting surface by means of at least two pins having a workpiece locating surface and a mask locating surface; b) positioning a mask on said workpiece over said mask locating surface on said at least two pins; c) preparing the surface of said workpiece exposed by said mask by blasting with an abrasive media; d) applying air to a lower surface of said mask to cause said mask to move up and down on said pins relative to said workpiece to thereby remove the abrasive material and debris from said workpiece; e) applying a coating to the surface of said workpiece exposed by said mask; f) sealing the coating applied to the exposed surface by said mask; and g) removing the mask from said workpiece. 5. A workpiece and mask supporting tool having at least two pins, each of said pins mounted on a support comprising an elongated member having a surface with a triangular cross section configured to hold a workpiece in a stable position on the support and to hold a mask in an aligned position relative to the surface of said workpiece while allowing said mask to move up and down vertically relative to said workpiece under the influence of a fluid medium applied to the lower side of said workpiece and said mask.

5,087,487

NON-THERMOPLASTIC BINDER FOR USE IN PROCESSING TEXTILE ARTICLES

Howard G. Katz, Hightstown, and Michael T. Sarkis, Lawrenceville, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.
Continuation of Ser. No. 377,695, Jul. 10, 1989, abandoned. This application Apr. 18, 1991, Ser. No. 687,768
Int. Cl.⁵ B05D 3/02

U.S. Cl. 427—366

9 Claims

1. A process for treating textile substrates comprising the steps of

- 1) impregnating the substrate with an emulsion polymer comprising:
 - a) 80–99.5% by weight of a vinyl ester;
 - b) 0–20% by weight of a mono-ethylenically unsaturated copolymerizable comonomer;
 - c) 0.5 to 5% by weight of a polyethylenically unsaturated comonomer;
 - d) 0 to 6% by weight of a post-crosslinking comonomer; and
- 2) drying the coated substrate by contact with a heated metal surface.

5,087,488

METHOD AND APPARATUS FOR FORMING A PLASTIC ARTICLE WITH AN OVERLAY OF VARYING THICKNESS HAVING A SHADED COLOR APPEARANCE

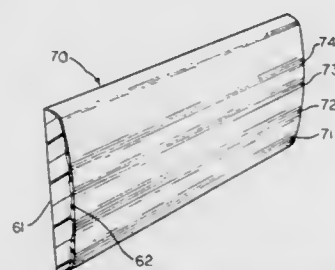
Mehmet Y. Cakmakci, Rochester Hills, Mich., assignor to Aeroquip Corporation, Maumee, Ohio

Filed Oct. 19, 1989, Ser. No. 423,377

Int. Cl.⁵ B60R 13/04

U.S. Cl. 428—31

20 Claims



1. Apparatus for forming an elongated article having an extrusion body and an overlay layer of plastic material and a pair of substantially parallel longitudinal edges, said extrusion body having an outer surface extending between said longitudinal edges, said overlay layer covering at least a portion of said outer surface of the extrusion body, said overlay layer having a varying thickness in a plane perpendicular to said longitudinal edges, said apparatus comprising:

- (a) first die means having an inlet for receiving a first plasticized thermoplastic material and an outlet for extruding said material as the extrusion body along a longitudinal axis parallel to said longitudinal edges; and,
- (b) second die means including an overlay die and a front die cooperating therewith, said overlay die having a passage lying on said longitudinal axis and sized to receive said extrusion body from the outlet of the first die means and having an inlet for receiving a second plasticized thermoplastic material from a source different from the source of thermoplastic material for the first die means, said overlay die and said front die cooperating to define a chamber, means directing said second plasticized thermoplastic material from said inlet to said chamber, said chamber having upper and lower passageways extending transverse to the direction of flow of said extrusion body from said first die means, dam means positioned between said upper and lower passageways controlling the flow of said second plasticized thermoplastic material between said upper and lower passageways, channel means extending

between said upper and lower passageways for directing said second plasticized thermoplastic material around said dam means, said lower passageway opening directly into the passage through which said extrusion body passes to deposit thereon an overlay layer of said second plasticized thermoplastic material, said front die having an aperture aligned with said passageway and sized to

- (i) receive said extrusion body with said overlay layer deposit thereon; and
- (ii) expell said extrusion body and said overlay layer as a unitary elongated article, said overlay layer having a non-uniform thickness transverse to said direction of flow.

16. An elongated automotive trim strip having a decorative viewing surface and having a longitudinal axis comprising (a) an extrusion body of thermoplastic material of a first color having first and second edges on opposite sides of said longitudinal axis, a back surface intended to face toward a panel of a vehicle extending between said edges, a front surface extending between said edges, and (b) an overlay layer of thermoplastic material of a second color extending therewith an integral in situ bond in which molecules of the overlay layer are intermingled with molecules of said extrusion body, said overlay layer having substantially uniform thickness in a direction parallel to the longitudinal axis and predetermined varying thickness in a direction transverse to the longitudinal axis including a plurality of thicker areas followed by thinner areas, said overlay layer providing a surface appearance of a plurality of longitudinal strips of varying color intensity.

18. A method of forming an elongated plastic trim strip having a back intended to face a structure and a front intended for viewing comprising the steps of

- (a) extruding heated and plasticized thermoplastic material from a first source through a first die to form an extrusion body of predetermined shape, said extrusion body having a lower surface forming said back, an upper surface and a pair of substantially parallel edges lying on opposite sides of a longitudinal axis,
- (b) introducing said extrusion body into a second die means while said upper surface is at a temperature at which said first source thermoplastic material is soft,
- (c) introducing a second heated and plasticized thermoplastic material from a second source into said second die means,
- (d) directing said second source of thermoplastic material selectively through said second die means and onto said soft upper surface of the extrusion body in varying thicknesses laterally of said longitudinal axis by diverting selected portions of said second source thermoplastic material to follow selected flow paths through said second die means with
 - (i) a first of said portions flowing directly from said inlet passageway to the aligned portion of the upper surface of said extrusion body as it passes through said second die means, said first portion providing maximum thickness of said overlay layer,
 - (ii) a second of said portions flowing through a longer flow path initially transverse to said longitudinal axis and thereafter downwardly onto other aligned portions of the upper surface of said extrusion body, the resulting overlay layer on said other aligned portions having reduced thicknesses from that of said maximum thickness;

said second source of thermoplastic material being at a temperature causing its molecules to become intermingled with the molecules of the extrusion body, said second source of thermoplastic material forming an overlay layer of varying thickness which is integral with said extrusion body.

5,087,489

LAMINATED MULTILAYER INSULATING GLASS AND A SPACER FOR THE LAMINATED MULTILAYER INSULATING GLASS

Horst Lingemann, Wuppertal, Fed. Rep. of Germany, assignor to Helmut Lingemann GmbH & Co., Fed. Rep. of Germany

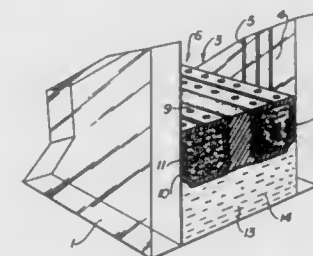
Filed Sep. 27, 1989, Ser. No. 413,164

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 8812216

Int. Cl.⁵ E06B 3/24; E04C 2/54

U.S. Cl. 428—34

3 Claims



1. Heatable multilayer insulating glass comprising at least two panes of glass held a distance apart by means of a spacer with a gas-filled or evacuated interspace and a resistance heating element on a glass surface facing the interspace and with connections for supplying an electric current to the resistance heating element, and wherein:

- the spacer (6) comprises two parallel hollow sections (7, 8) arranged with some distance between them and having side walls (7a, 7b and 8a, 8b) parallel to the glass surfaces; a web (16) of an unfoamed and fully-cured polyurethane casting compound fills the interspace (15) between the two hollow sections (7, 8) and adheres well to the surfaces of the side walls of the hollow sections (7, 8); the casting compound in the interspace (15) forms an insulating web (16) made of a mixture of a finished low viscosity polyol formulation that has unstable phases and contains a water-binding additive with a liquid solvent-free diphenylmethane 4,4'-diisocyanate that contains isomers and higher functional homologs; and
- the web being hard and forming a permanent bond with the hollow sections so as to create a uniformly strong spacer having relatively high torsional rigidity and electrical insulation, and having relatively low thermal conductivity.

5,087,490

METHOD FOR MAKING AN IMPREGNATED CERAMIC MATERIAL

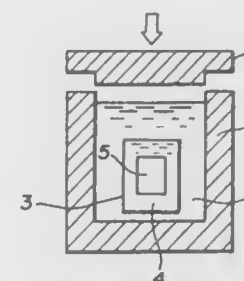
Kazuo Ito, Yamagata; Shuitsu Matsuo, Atsugi, and Yasumi Sasaki, Nagai, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

Division of Ser. No. 309,631, Feb. 13, 1989, Pat. No. 4,963,396. This application Apr. 17, 1990, Ser. No. 510,197

Int. Cl.⁵ E06B 00/00

U.S. Cl. 428—34.1

4 Claims



1. A material consisting essentially of carbon and having a bulk density of 1.5 to 2.0 g/cm³, a specific resistance of 500 to 1900 micro-ohm-cm, a bending strength of at least 300

Kg/cm², an apparent porosity of 0.1 to 7.0%, and a true specific gravity of no greater than 2.10.

2. A crucible made of the carbonaceous material of claim 1.

5,087,491

VIBRATION-DAMPING STRUCTURAL MEMBER

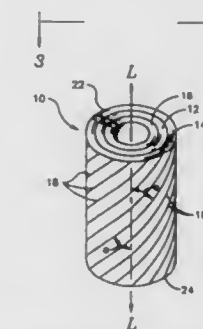
David J. Barrett, Erdenheim, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1990, Ser. No. 479,004

Int. Cl.⁵ F16C 27/06, 1/40; B32B 15/08

U.S. Cl. 428—34.5

4 Claims



1. A laminated structural member in the shape of a cylinder which supports axial loads which are colinear with the cylinder's axis and damps vibrations therefrom, comprising at least one cylindrical layer of viscoelastic material bonded on the outside thereof to a first cylindrical layer of orthotropic load-bearing material and on the inside thereof to a second cylindrical layer of orthotropic load-bearing material, said first orthotropic load-bearing layer having its preferred direction of stiffness at a first angle with respect to the cylinder's axis and said second orthotropic load-bearing layer having its preferred direction of stiffness at a second opposite angle with respect to the cylinder's axis, whereby the axial load causes said first and second load-bearing layers to displace circumferentially and in opposite relative directions, thereby shearing said viscoelastic layer in a direction transverse to the axial load.

5,087,492

EXPANDED ELASTIC SLEEVE WITH WOUND INTERNAL SUPPORT FOR ELECTRIC CABLE JOINTS AND SEALING ENDS

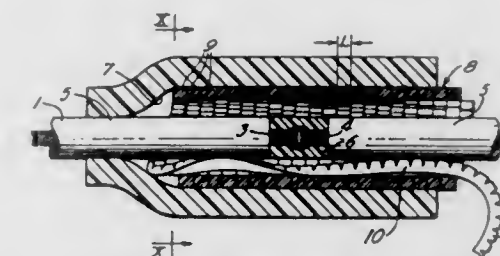
Ubaldo Vallauri, Monza, and Francesco Portas, Quattordio, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed May 23, 1990, Ser. No. 527,517

Claims priority, application Italy, May 24, 1989, 20620 A/89
Int. Cl.⁵ F16L 11/00; H01B 7/00

U.S. Cl. 428—34.9

23 Claims



1. An assembly of an elastic sleeve with a tubular supporting body in the bore of said sleeve for application of said sleeve to a cylindrical body, said assembly comprising:
a radially stretched sleeve of elastic material; and said tubular supporting body formed by a helically wound tape

with contiguous turns with outer surfaces forming an outer surface of said supporting body and with other surfaces radially inwardly of said outer surfaces, said supporting body having an outer surface diameter greater than the inner diameter of the bore of said sleeve in the unstretched state of said sleeve and being disposed within said bore of said sleeve, said supporting body having a radial resistance to the pressure applied thereto by the stretched sleeve sufficient to maintain said sleeve in its stretched state and said tape having along substantially its entire length a plurality of spaced notches extending transversely to the length of said tape, and with said tape helically wound to form said supporting body, said notches extend from at least one of said other surfaces of said turns in the direction toward another of said surfaces but having a depth dimension in said direction less than the distance between said one of said other surfaces and said another of said surfaces in said direction to provide a continuous portion of the tape extending lengthwise of the tape and said notches are defined by facing and contacting but separable walls

whereby said tape may be bent relatively easily along a curved path in a plane parallel to a plane tangent to the surface of said cylindrical body and may be removed from said sleeve by pulling said tape out of said bore to permit said sleeve to contract around a cylindrical body.

5,087,493

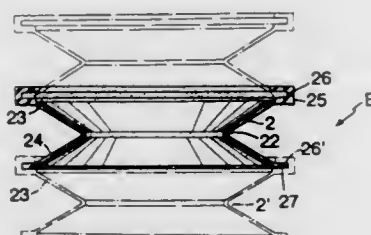
DUST PROTECTOR

John Wang, No. 129, Tuan-Chu Lane, Tuan-Chu Li, Chiayi City, Taiwan

Filed Oct. 22, 1990, Ser. No. 601,447

Int. Cl.⁵ B29D 23/18; F01B 19/00

U.S. Cl. 428—36.9



1. A dust protector comprising:

a hollow collapsible tube member having a plurality of pleated units detachably engaged with one another; each of said pleated units including a first truncated cone-shaped member and a second truncated cone-shaped member, each of said truncated cone shaped members having a converging end and a diverging end, said converging ends being joined together so that a first flared portion and a second flared portion are formed on either side of said joined converging ends, said first flared portion having a first flange with an annular groove therein, said second flared portion having a second flange which is adapted to detachably engage said annular groove of said first flange of said first flared portion of an adjacent first flared portion.

5,087,494

ELECTRICALLY CONDUCTIVE ADHESIVE TAPE

Clyde D. Calhoun; James G. Berg; David C. Koskenmaki, and Robert M. Swinehart, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 12, 1991, Ser. No. 684,606

Int. Cl.⁵ C09J 7/02

U.S. Cl. 428—40

13 Claims



1. Electrically conductive adhesive tape comprising a flexible carrier web that has a low-adhesion face in which is formed a predetermined pattern of spaced dimples of substantially equal size, each having a maximum breadth of 0.1 mm and containing a plurality of electrically conductive particles that are bound into a coherent cluster by a binder, and a layer of adhesive that contacts said clusters has a substantially uniform thickness and is substantially free from electrically conductive material other than said clusters, which adhesive layer can be separated from the carrier web, carrying with it the particle clusters, and then used for adhesively bonding two substantially flat electrically conductive surfaces, with particles of individual clusters bridging the adhesive layer to afford electrical interconnections between those surfaces.

5,087,495

ASSEMBLY FOR USE IN A PROCESS FOR MAKING SELECTIVE TRANSFERS TO XEROGRAPHIC IMAGES ON SHEET MATERIAL

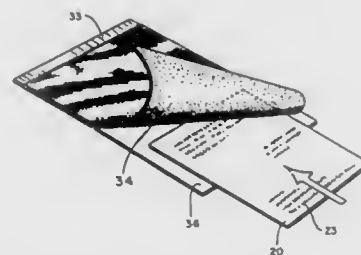
Marshall A. Nelson, Lansing, Ill., assignor to Esselte Letraset Limited, England

Continuation-in-part of Ser. No. 87,022, Aug. 19, 1987, abandoned, which is a division of Ser. No. 753,313, Jul. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 698,241, Feb. 5, 1985, abandoned, and a continuation-in-part of Ser. No. 53,066, May 21, 1987, Pat. No. 4,868,049, which is a division of Ser. No. 918,365, Oct. 14, 1986, Pat. No. 4,724,026, which is a continuation-in-part of Ser. No. 698,241, Feb. 5, 1985, abandoned. This application Apr. 7, 1989, Ser. No. 334,924. The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.⁵ B32B 3/04, 7/06

U.S. Cl. 428—46

10 Claims



1. An assembly for use in a process for making selective transfers to xerographic images on sheet material by passing it, beginning with a leading edge, between heated rollers, the assembly comprising:

a) a selective transfer sheet comprising a carrier film and a transfer layer affixed to the carrier film, said transfer layer

being suitable to effect selective transfer to cover the xerographic images as the assembly passes between the heated rollers,

b) a backing sheet, and

c) a connector securing the carrier film of the selective transfer sheet to the backing sheet only at the leading edge of the assembly.

5,087,496

SELF-ADHESIVE NYLON STOCKING PATCH

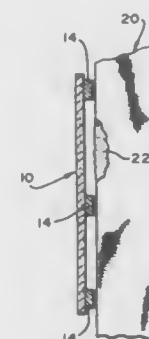
Michel Bonchouca, 1431 Ocean Ave., No. 810, Santa Monica, Calif. 90401

Filed Feb. 14, 1991, Ser. No. 655,800

Int. Cl.⁵ A41B 11/00; B32B 3/06

U.S. Cl. 428—63

3 Claims



1. A self-adhesive stocking patch for mending a nylon stocking, comprising:

a) a thin resilient element of a shape and size to approximate typical tears occurring in nylon stockings; and,

b) adhesive attachment means affixed to said element for securely attaching said element to portions of said nylon stocking adjacent to such a tear, said adhesive attachment means including at least one piece of synthetic material having a plurality of slender, hooked filaments so arranged and constructed to efficiently attach to said nylon stocking, the attachment of said element to said stocking thereby patching said tear.

5,087,497

ELECTRIC CIRCUIT SUBSTRATE

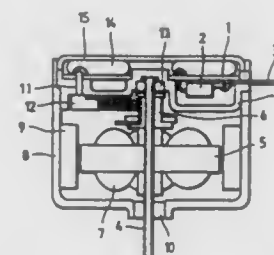
Koji Suzuki, and Minoru Tanaka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 363,920, Jun. 9, 1989, abandoned. This application Jan. 25, 1990, Ser. No. 470,349. Claims priority, application Japan, Jun. 13, 1988, 63-077861[U]

Int. Cl.⁵ B32B 3/02

U.S. Cl. 428—64

10 Claims



1. A circuit substrate to be used in an electric apparatus, comprising:

a circuit substrate having on one surface thereof a copper film pattern for electrically connecting electrical parts, said circuit substrate having a plurality of through-holes formed therein;

electrical parts having terminals soldered to said copper film

pattern surface through the through-holes formed in said circuit substrate; and

a radiator plate having a supporting portion for supporting one or more electrical parts thereon, a supply terminal for supplying electrical power to said circuit substrate, and a terminal for radiation heat accumulated in the electric apparatus, with said radiator plate being secured to come into contact with a surface of said circuit substrate opposite to said copper film pattern surface to supply the electrical power from said supply terminal, and said heat radiating terminal also serving as a ground terminal.

5,087,498

MEAT L-BOARD

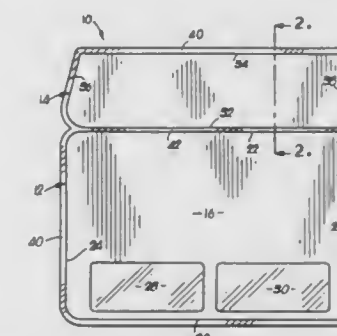
Greydon W. Nedblake, 40420 Claymont Woods Dr., Kansas City, Mo. 64116, and Lawrence E. Johnson, 6504 N. Wabash, Gladstone, Mo. 64118

Filed Apr. 12, 1990, Ser. No. 508,950

Int. Cl.⁵ B32B 3/00

U.S. Cl. 428—76

13 Claims



1. A sanitary L-board for supporting a food product within a package thereof, said L-board comprising:

a flat baseboard presenting a surface area large enough for supporting the food product within the area thereof; a flat flap adjacent to said baseboard, said baseboard and flap being positioned to present an outer periphery and to present inner and outer, opposed faces; a first cover sheet engaging said inner face in covering relationship therewith and presenting a first sealing portion extending continuously around said outer periphery; and a second cover sheet engaging said outer face in covering relationship therewith and presenting a second sealing portion extending around said outer periphery, said first and second sealing portions being sealed to one another to form a continuous seal around said periphery, said sheets thereby cooperatively presenting structure enclosing said baseboard and flap therebetween.

5,087,499

PUNCTURE-RESISTANT AND MEDICINAL TREATMENT GARMENTS AND METHOD OF MANUFACTURE THEREOF

Thomas M. Sullivan, P.O. Box 4615, San Diego, Calif. 92104

Filed May 9, 1990, Ser. No. 520,815

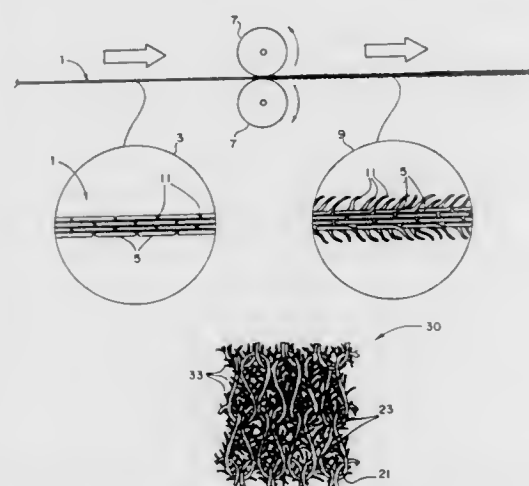
Int. Cl.⁵ A41D 13/10; B32B 5/14, 33/00; D02G 3/34, 3/44; D06C 11/00

U.S. Cl. 428—85

32 Claims

1. In the method of making garments having improved puncture resistance against sharp penetrating objects including the steps of providing a fiber having puncture-resistant properties, producing a plurality of individual fibrils from said fiber, forming said fibrils into a yarn and manufacturing a puncture-resistant garment from said yarn, the improvement comprising the step of brushing said yarn with an abrasive device to loosen

the ends of said fibrils, said loosened ends of said fibrils providing enhanced puncture-resistance by crossing and covering



holes between yarns and intertwining, thereby providing increased surface area to engage a sharp penetrating object.

5,087,500

MULTILAYER PANEL

Dietmar Kasper, Ludwigshafen; Herbert Woltron, Worms; Guenter Kreibich, Ludwigshafen; Ulrich Eichenauer, Frankfurt, and Norbert Becker, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

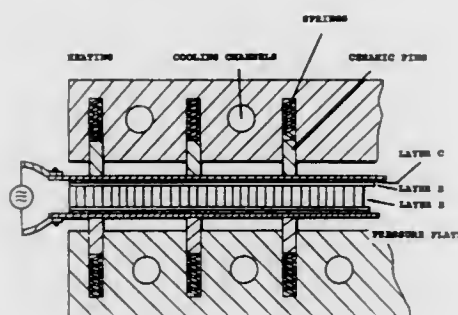
Filed Mar. 28, 1990, Ser. No. 500,648

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1989, 3910021; Jun. 16, 1989, 3919657

Int. Cl.⁵ B32B 3/26

U.S. Cl. 428—116

6 Claims



1. A multilayer panel comprising a core layer A with a honeycomb structure or a foam structure and at least one cover layer C made of a fiber-reinforced thermoplastic, wherein the layers A and C are bonded to each other by an adhesive B which is compatible with the thermoplastic of layer C.

5,087,501

MAGNETIC RECORDING MEDIUM

Hajime Takeuchi, and Yuji Koguchi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 28, 1988, Ser. No. 213,707

Claims priority, application Japan, Jun. 30, 1987, 62-163146

Int. Cl.⁵ G11B 23/00

U.S. Cl. 428—141

7 Claims

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon, said magnetic layer consisting essentially of a ferromagnetic powder and a resinous binder in an amount in the range of 2 to 30 parts by weight based on 100 parts of said ferromagnetic powder, said

magnetic layer having a deformation ratio in the direction perpendicular to the film surface of the magnetic layer of not more than $1 \times 10^{-2} \mu\text{m}^3/\text{mgf}$ and a surface roughness in the range of 0.003 to 0.1 μm .

5,087,502

PROCESS AND INTERMEDIATE SHEET FOR FORMING SHAPED INTERLAYER BLANKS

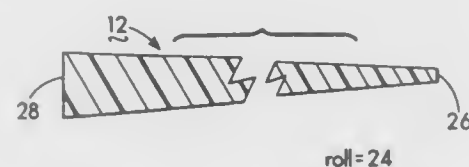
Robert A. Esposito, Amherst, and David P. Bourcier, Ludlow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 121,555, Nov. 17, 1987. This application Oct. 12, 1989, Ser. No. 420,807

Int. Cl.⁵ B32B 3/00

U.S. Cl. 428—156

4 Claims



1. Clear, intermediate plasticized polyvinyl butyral sheet for forming vehicle window blanks, said sheet being a single layer at least about twenty inches wide having substantially parallel longitudinally extending edges, a wedge-shaped thickness profile extending continuously across the width from edge to edge and a transversely graduated color strip adjacent one edge.

5,087,503

COMPOSITE CONSTANT STRESS BEAM WITH GRADIENT FIBER DISTRIBUTION

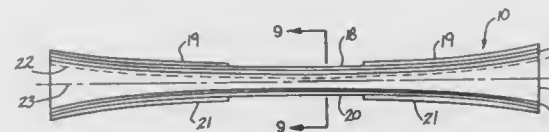
Franklin D. Meatto, Cromwell, Conn., assignor to Pacific Coast Composites, Inc., San Marcos, Calif.

Filed Sep. 14, 1989, Ser. No. 407,877

Int. Cl.⁵ B32B 3/00; D04H 1/58; D32B 17/10

U.S. Cl. 428—162

15 Claims



1. A constant stress composite beam having a first side and an opposing second side with a center line passing therebetween and being deflectable in a given direction in response to a force applied in the given direction causing compressive force on the first or opposing second side, the beam having in combination:

(a) an elongated central core portion formed by pulforming a fiber impregnated resin, the core portion having a first fiber content and at least a first surface normal to the direction of deflection on the side of the compressive stress and a second opposing surface normal to the direction of deflection;

(b) a plurality of facing layers of fiber impregnated resin adhesively fastened to the first and second opposing surfaces, each of the facing layers normal to the direction of deflection having a higher fiber content than the first fiber content of the core portion to produce a composite beam with a cross section having a varying fiber content thereacross such that the highest fiber content of between greater than about 63 to about 78% by weight is adjacent the first surface of the core portion on the side of the

compressive stress in at least one facing layer that is normal to the direction of deflection where the highest stress normal to the direction of loading is located and the compressive stress is a maximum.

5,087,504

MULTI-INJECTION MOLDED FLANGE WITH GASKET IN WEDGE SHAPED OPENING

Toshiyuki Kanai, and Nobuo Shinnoh, both of Hanishina, Japan, assignors to Nissel Jushi Kogyo Kabushiki Kaisha, Nagano, Japan

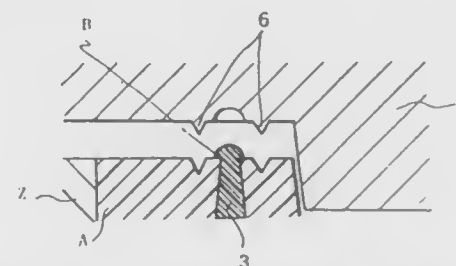
Continuation of Ser. No. 347,908, May 5, 1989, abandoned. This application May 16, 1990, Ser. No. 523,887

Claims priority, application Japan, May 11, 1988, 63-114453

Int. Cl.⁵ B32B 3/30; F16L 23/16

U.S. Cl. 428—167

3 Claims



1. An injected molded body consisting essentially of a first resin; the molded body having a concave section therein, the concave section having an opening which forms on a surface of the molded body, wherein the opening of said concave section forms a ring having an inner and outer fringe, the concave section having sidewalls wherein parts of the sidewalls of the concave section are projected inward to form undercut sections in the concave section, the concave section having a bottom; and the molded body having depressed push-marks, the push-marks being formed on a surface of said molded body continuously about the opening of said concave section, wherein a push-mark is formed along both the inner and outer fringes of the opening of said concave section, whereby the formation of the depressed push-marks projects parts of the sidewalls of said concave section inward, to give undercut sections in the concave section.

5,087,505

SUBSTRATE, CONSISTING OF COPPER AND CERAMIC LAYERS, FOR PRINTED CIRCUIT BOARDS OF ELECTRICAL CIRCUITS

Jürgen Schulz-Harder, AM Stadtwald 2, D-8489 Eschenbach, Fed. Rep. of Germany

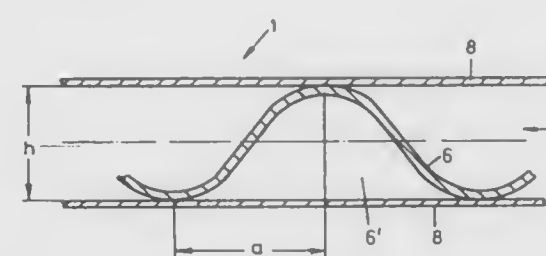
Filed Apr. 18, 1990, Ser. No. 510,601

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913161

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—192

13 Claims



1. A multilayered substrate for printed circuit boards of electrical circuits, said substrate consisting of copper and ceramic layers which are joined together by the DBC method

into said multilayered substrate, with each copper layer being formed by a copper sheet and each ceramic layer being formed by a ceramic plate, at least two of said layers forming a layer sequence having a hollow section or core, said at least two layers being arranged essentially parallel to each other, said at least two layers being spaced apart from one another by an intermediate spacing layer.

5,087,506

ABSORBENT ELEMENT AND AN ABSORBENT ARTICLE INCLUDING THE ELEMENT

Gianfranco Palumbo, Pescara, Italy, assignor to Faricerca S.p.A., Pescara, Italy

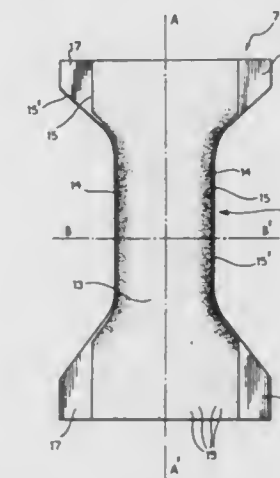
Filed Mar. 16, 1990, Ser. No. 494,355

Claims priority, application Italy, Mar. 16, 1989, 67188 A/89

Int. Cl.⁵ B32B 23/02

U.S. Cl. 428—194

22 Claims



1. An absorbent element made from hydrophilic fibres comprising in combination:
a discontinuous layer of hydrogelling absorbent material distributed at a concentration between 5 g/m² and 70 g/m² on an upper surface thereof facing the user, and a region along each of laterally opposed longitudinal edges having a high concentration of hydrogelling absorbent material distributed at a concentration of between 100 g/m² and 300 g/m².

5,087,507

METHOD OF RENDERING A DOCUMENT OR PORTION OF IT RESISTANT TO PHOTOCOPYING

Paul Heinzer, Pully/Lausanne, Switzerland, assignor to Lipatec Etablissement, Vaduz, Liechtenstein

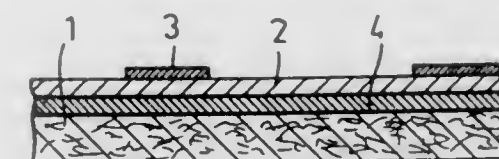
Filed Nov. 8, 1988, Ser. No. 268,754

Claims priority, application Switzerland, Nov. 20, 1987, 4518/87

Int. Cl.⁵ B32B 3/00

U.S. Cl. 428—195

2 Claims



1. A method of preparing a document consisting of a sheet at least a portion of which carries alphanumeric or graphical

information and resistant to photocopying, the method comprising the steps of:

- applying a continuous layer of a color that copies black directly to the portion of the sheet;
- applying to the portion of the sheet directly over the layer of color that copies black a continuous layer of an iridescent substance; and
- applying to the sheet directly over the iridescent-substance layer a layer forming the information against the continuous layer and having a dark color that also copies black, whereby photocopying gives a black copy without information.

5,087,508

DEW AND FROST RESISTANT SIGNS

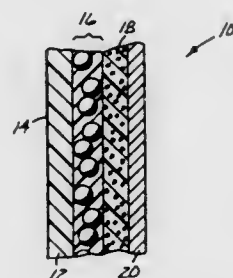
Warren R. Beck, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 30, 1990, Ser. No. 530,648

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—195

9 Claims



1. A sign comprising at least one outer layer that has a display surface bearing indicia and a thermal reservoir disposed behind said outer layer, said thermal reservoir containing at least one phase change material that undergoes at least one phase change between about -20° C. and about 40° C.

5,087,509

SUBSTRATE USED FOR FABRICATION OF THICK FILM CIRCUIT

Yoshiro Kuromitsu; Hideaki Yoshida; Toshiyuki Nagase; Tadaharu Tanaka, and Yoshio Kanda, all of Saitama, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed May 18, 1990, Ser. No. 524,936

Claims priority, application Japan, May 22, 1989, 1-128285; Nov. 7, 1989, 1-289243

Int. Cl.⁵ B32B 3/00

U.S. Cl. 428—195

20 Claims



19. A multi-level surface film structure forming a part of an insulating substrate for a paste containing a glass frit and provided on a surface of a foundation, of aluminum nitride comprising:

- a) a lower surface film provided on a surface of said foundation and containing aluminum oxide and incidental impurities said lower surface film having a thickness ranging from about 0.2 micron to about 15 micron;
- b) an intermediate surface film provided on said lower surface film and containing a substance having a relatively

small acidity and incidental impurities said intermediate surface film having a thickness ranging from about 0.05 micron to about 1 micron; and

- c) an upper surface film provided on said intermediate surface film and containing a substance having a relatively large acidity and incidental impurities said upper surface film having a thickness ranging from about 0.01 micron to about 1 micron.

5,087,510

ELECTROLESSLY DEPOSITED METAL HOLOGRAMS

Edward F. Tokas, Creve Coeur; George D. Vaughn, Ballwin; David L. Taylor, St. Louis, and Albert W. Morgan, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 22, 1990, Ser. No. 497,960

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—209

9 Claims



1. A hologram comprising a polymeric substrate having a hologram generating relief-patterned surface coated with catalytic, polymeric film comprising a Group 8 metal which conforms to and reproduces said hologram generating relief pattern and a layer of metal electrolessly deposited onto said catalytic film, wherein said metal layer conforms to said hologram generating relief-pattern whereby light incident to the surface of said metal opposite to said polymeric substrate is reflected to reproduce a holographic image inherent in said relief-patterned polymeric substrate.

5,087,511

COMPOSITE ELEMENT HAVING A VARIABLE DENSITY CORE

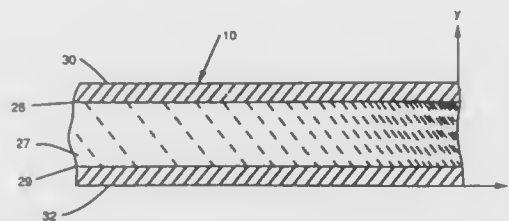
Bryan A. Locey, Hamilton, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Aug. 31, 1990, Ser. No. 575,763

Int. Cl.⁵ B32B 7/02

U.S. Cl. 428—218

25 Claims



1. A composite element comprising: a core having two faces and having a length extending along a longitudinal axis and a thickness extending along a transverse axis perpendicular to the longitudinal axis, said core having a density varying along the core length; and two face sheets, each face sheet attached to a respective core face.

5,087,512

SURFACE COATING FOR PROTECTING A COMPONENT AGAINST TITANIUM FIRE AND METHOD FOR MAKING THE SURFACE COATING

Thomas Uihlein, Karlsfeld, and Gerhard Wydra, Oberschleissheim, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

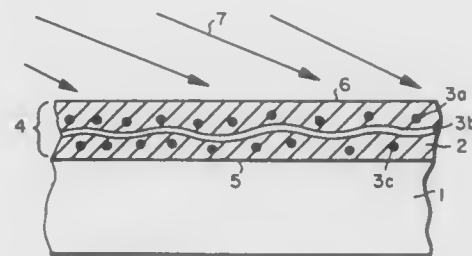
Filed Dec. 11, 1990, Ser. No. 625,747

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3940914

Int. Cl.⁵ B32B 15/04, 33/00

U.S. Cl. 428—266

12 Claims



1. A structural component made of metal to be protected against titanium fire caused by a component of titanium or titanium alloy by a surface coating comprising a matrix material including a mixture of at least one silicate and aluminum powder dispersed in said silicate, and ceramic fibers made of a material selected from the group consisting of silicon oxide, aluminum oxide, zirconium oxide, and mixtures of the foregoing oxides, said ceramic fibers being embedded in said matrix material to form said surface coating against damage by molten titanium or titanium alloy droplets protective coating.

5,087,513

FLAME RETARDANT FILM AND COMPOSITE CONTAINING SUPERABSORBENT POLYMER

Dai W. Kim, Chatham, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 7, 1990, Ser. No. 624,171

Int. Cl.⁵ B32B 27/06, 27/14

U.S. Cl. 428—283

23 Claims

1. A polybenzimidazole polymer/superabsorbent polymer composite product comprising:
 - (a) a polybenzimidazole polymer material first layer;
 - (b) a superabsorbent polymer particulate material containing second layer; and
 - (c) means for binding the polybenzimidazole polymer layer to the superabsorbent polymer layer.

5,087,514

THERMOPLASTIC RESIN LAYER CHEMICALLY BONDED TO THERMOSET RESIN LAYER

Peter U. Graefe, Wayside, N.J., assignor to Intellex Corporation, Uniondale, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,669

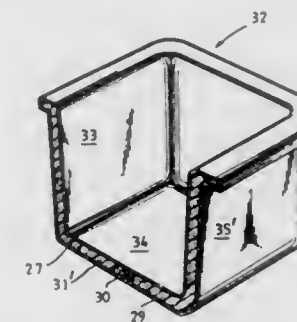
Int. Cl.⁵ B32B 3/26, 7/04, 7/10

U.S. Cl. 428—315.5

31 Claims

1. A polymeric resin laminate which comprises:
 - a) a rigid layer of thermoplastic resin possessing a molecularly-modified, adhesion-improved surface, the properties of the bulk resin remaining substantially unaffected by the molecular modification of such surface; and,
 - b) a thermoset resin layer in adherent contact with, and chemically bonded to, the molecularly-modified adhesion-improved surface of rigid layer (a).
20. The polymeric resin laminate of claim 1 wherein rigid layer (a) possesses an average thickness of from about 0.5 to

about 10 mm and thermoset resin layer (b) is a rigid dense microcellular thermoset resin possessing an average thickness



of from about 2 to about 30 times the average thickness of rigid layer (a).

5,087,515

CHAFF FIBER COMPRISING INSULATIVE COATING THEREON, AND HAVING AN EVANESCENT RADAR REFLECTANCE CHARACTERISTIC, AND METHOD OF MAKING THE SAME

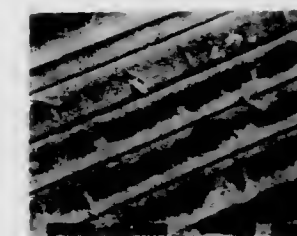
Ward C. Stevens, New Fairfield; Edward A. Sturm, New Milford, and Bruce C. Roman, Danbury, all of Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Filed Dec. 11, 1989, Ser. No. 449,695

Int. Cl.⁵ B32B 3/26

U.S. Cl. 428—315.9

27 Claims



1. An article comprising a substrate formed of a material selected from the group consisting of glasses, polymers, pre-oxidized carbon, non-conductive carbon, and ceramic materials, which is coated with an oxidizable conductive metal at a thickness of less than 1.0 micron, and overcoated with an outer layer consisting essentially of an inorganic electrically insulating material having a porous microstructure characterized by: an average pore size of from about 50 to about 1,000 Angstroms; a thickness of from about 200 to about 2500 Angstroms; and sufficient porosity to permit permeation of atmospheric moisture and oxygen to the underlying oxidizable metal when the article is exposed to atmospheric exposure conditions.

5,087,516

BODY ARMOR

Trevor K. Groves, Calgary, Canada, assignor to Dorothy Groves, Calgary, Canada

Continuation-in-part of Ser. No. 861,812, May 12, 1986, abandoned. This application Dec. 17, 1987, Ser. No. 135,531

Claims priority, application Canada, Jul. 2, 1985, 486220

Int. Cl.⁵ F41H 1/02, 5/04, 5/06

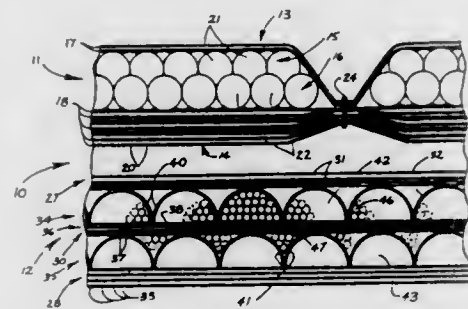
U.S. Cl. 428—323

17 Claims

10. A body armour structure comprising: an outer component for flattening and trapping a bullet, said outer component including two layers of flexible material and at least two layers of hard beads tightly confined between said layers of flexible material,

said beads in each layer having substantially void interstices therebetween, a thin flexible barrier positioned between the adjacent layers of beads, and a separate inner backing component for spreading the impact of the bullet striking the outer component, said inner component including at least two outer layers of flexible material and at least one layer of compressible material confined between the outer layers thereof.

15. A body armour structure comprising: an outer component for flattening and trapping a bullet, said outer component including two layers of flexible material and at least two layers of hard beads tightly confined between said layers of flexible material.



the beads in each layer having substantially void interstices therebetween, the beads in adjacent layers being of the same diameter and disposed in the same close-packed lattice pattern with the beads and the layers being in the most compact relation whereby the beads in the adjacent layers interest in the interbead spaces of each other, said beads being threaded to retain said beads in said pattern, and a separate inner backing component for spreading the impact of the bullet striking the outer component, said inner component including at least two other layers of flexible material and at least one layer of compressible material confined between the outer layers thereof.

5,087,517

COMPOSITE SHEET USED FOR REPRODUCIBLE ELECTROSTATIC IMAGE DISPLAY OR RECORD

Kouichiro Sagawa, Kawasaki; Nobuyoshi Kitamura, Sagami-hara; Masako Ueda, Mitaka, and Koji Takeuchi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc. and Sony Corporation, both of Tokyo, Japan

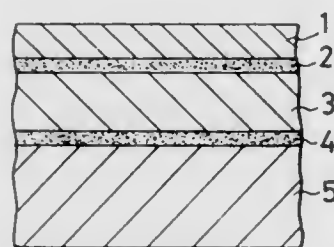
Filed Nov. 8, 1989, Ser. No. 433,136

Claims priority, application Japan, Nov. 9, 1988, 63-282977; Dec. 23, 1988, 63-326463; Dec. 23, 1988, 63-326464; Dec. 23, 1988, 63-326465

Int. Cl.⁵ B32B 5/16

U.S. Cl. 428—329

20 Claims



1. A composite sheet for reproducible electrostatic image display or record comprising, a semiconductor film containing a fibrous or flaky electro-

conductive filler and having a uniform surface resistivity of a range from 10^3 to $10^{10} \Omega/\square$ and a highly dielectric film having a specific dielectric constant of not less than 5, laminated with the semiconductor film.

5,087,518

GLASS FLAKE COMPOSITE

Sbigeiki Shimada; Hidekazu Tanaka, and Tsunefumi Nakagawa, all of Mie, Japan, assignors to Nippon Glass Fiber Co., Ltd., Tsu, Japan

Division of Ser. No. 220,033, Jul. 15, 1988, Pat. No. 5,002,827.

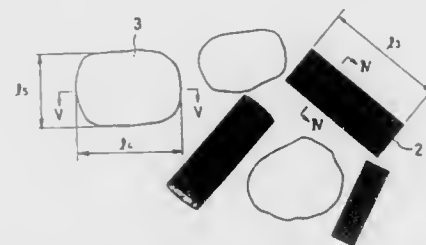
This application Nov. 2, 1990, Ser. No. 608,394

Claims priority, application Japan, Oct. 26, 1987, 62-269828; May 18, 1988, 63-121076

Int. Cl.⁵ B29C 67/02

U.S. Cl. 428—372

10 Claims



1. A glass flake composite, comprising, short glass fibers made of chopped strands, each chopped strand having a cut length of 0.5 to 25 mm, and glass flakes in granular form mixed with the short glass fibers in a ratio of 1:99 to 99:1, said glass flakes in the granular form having diameter under 5 mm with approximately the same particle size as said short glass fibers and being formed by bonding glass flakes with a binder, an amount of said binder being 0.2 to 10 parts by weight relative to 100 parts by weight of the glass flakes, each glass flake having an average thickness of 0.5 to 7.0 micron, an average particle diameter of 5 to 1,000 microns and an aspect ratio of 2 to 1,000, said binder bonding the glass flakes together so that each granule of the glass flakes includes tens to thousands of glass flakes laminating one after another to be parallel to each other.

5,087,519

ETHYLENE-VINYL ALCOHOL COPOLYMER COMPOSITE FIBER AND PRODUCTION THEREOF

Shinji Yamaguchi; Kiyoshi Hirakawa, both of Kurashiki; Seiji Kashima, Takatsuki; Kazuhiko Tanaka, Kurashiki; Masao Kawamoto, Kurashiki, and Takao Akagi, Kurashiki, all of Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

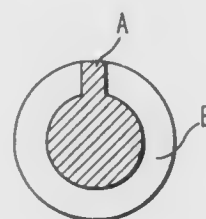
Filed Dec. 1, 1989, Ser. No. 444,794

Claims priority, application Japan, Dec. 5, 1988, 63-308492

Int. Cl.⁵ D02G 3/00

U.S. Cl. 428—373

3 Claims



1. An ethylene-vinyl alcohol copolymer composite fiber comprising a component (A) of a saponified product of an ethylene-vinyl acetate copolymer having an ethylene content of 30 to 70 mol % and a component (B) of a thermoplastic

polyester or polyamide, said component A being exposed on at least part of the surface of said composite fiber and acetalized with a compound represented by the following formula [1] and having a melting point satisfying the following relationship [11]



wherein

n is 0 or an integer of 1 to 10,

$$-1.524 \times (\text{Et}\%) + 234 < \text{Ma}$$

where

Et%=ethylene content in component A (mol %) and

Ma=melting point of component A (°C).

5,087,520

DURABLE HYDROPHILIC FIBERS

Masayasu Suzuki, and Hisanobu Kuroda, both of Moriyama, Japan, assignors to Chisso Corporation, Ohsaka, Japan

Filed Dec. 5, 1989, Ser. No. 446,091

Claims priority, application Japan, Dec. 8, 1988, 63-310862

Int. Cl.⁵ B32B 9/00; D02G 3/00

U.S. Cl. 428—389

7 Claims

1. Coated fibers comprising polyolefin or polyester fibers having adhered onto the surface thereof from about 0.2 to about 1.0% by weight of an oiling agent based on the weight of said fibers, wherein said oiling agent comprises a mixture of (A) from about 30% to about 60% by weight of a fatty acid diethanolamide, (B) from about 20% to about 55% by weight of a polyether-modified silicone, (C) from about 10% to about 25% by weight of a sorbitan fatty acid ester and (D) from about 5% to about 10% by weight of a metal salt of an alkylsulfonate, each said % by weight based on the weight of said mixture.

5,087,521

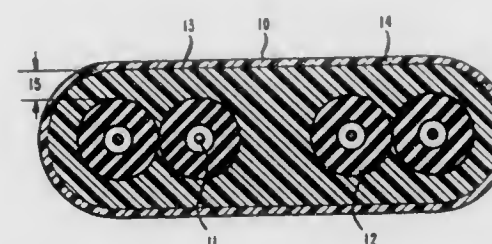
MODIFIED POLYMER CONTAINING ARTICLES

Jae H. Choi, Indianapolis, Ind.; John J. Mottine, West Keansburg, N.J.; Walter J. Spazak, Sr., Catonsville, Md.; Walter D. Bates, Baltimore, Md., and William C. Vesperman, Belair, Md., assignors to AT&T Bell Laboratories, Murray Hill, N.J. Continuation of Ser. No. 639,107, Aug. 9, 1984, abandoned, which is a continuation of Ser. No. 451,787, Dec. 21, 1982, abandoned. This application Oct. 2, 1986, Ser. No. 914,558

Int. Cl.⁵ B32B 9/00; H01B 7/00

U.S. Cl. 428—389

7 Claims



1. A cable comprising an electrical conductor surrounded by an electrically insulating body wherein said electrically insulating body includes a region of a flame retardant composition, said flame retardant composition comprising a poly(vinyl chloride) based polymer region having a property modifying additive system CHARACTERIZED IN THAT said additive system includes 2-ethylhexyldiphenyl phosphate and isopropylphenyldiphenyl phosphate wherein the total concentration of said phosphates in said poly(vinyl chloride) based polymer region is in the range 45 to 70 parts per 100 parts by weight of said polymer and wherein the percentage by weight of said isopropylphenyldiphenyl phosphate of said total concentration of said phosphates is in the range 30 to 45 percent.

5,087,522

PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF ALPHA-OLEFINS IN A FLUIDIZED BED

Jean C. Bailly; Laszlo Havas, both of Martigues; Stylianos Sandis, Laverna; Alain Blaya, and Pierre Crouzet, both of Martigues, all of France, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 72,401, Aug. 20, 1987, abandoned,

which is a division of Ser. No. 920,930, Oct. 17, 1986,

abandoned, which is a continuation of Ser. No. 504,982, Jun. 16,

1983, abandoned. This application Feb. 27, 1990, Ser. No.

488,422

Claims priority, application France, Jun. 24, 1982, 82 11053; Jun. 24, 1982, 82 11055; Jun. 24, 1982, 82 11056; Jun. 24, 1982, 82 11057

Int. Cl.⁵ C08F 12/34, 4/00, 4/64

U.S. Cl. 428—402

21 Claims

1. Polyolefin prepolymer powder comprising a Ziegler-Natta catalyst in an active form for use in a (co-) polymerisation of olefins in a gas fluidised bed process, the said prepolymer containing per gram 0.002 to 0.1 milligram-atoms of a transition metal belonging to Groups IV, V or VI of the Periodic Table of Elements and consisting of particles having a mean diameter by mass D_m comprised between 80 and 300 microns and a particle size distribution such that the ratio D_m/D_n between the mean diameter by mass D_m and the mean diameter by number D_n is less than or equal to 3.

5,087,523

PHOSPHORS WITH IMPROVED LUMEN OUTPUT AND LAMPS MADE THEREFROM

A. Gary Sigai, Lexington, and Keith A. Klindinst, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

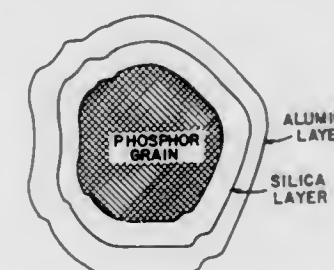
Division of Ser. No. 468,632, Jan. 22, 1990, Pat. No. 5,051,277.

This application Mar. 11, 1991, Ser. No. 667,694

Int. Cl.⁵ B32B 33/00; C09K 11/70

U.S. Cl. 428—404

5 Claims



1. A particle of a finely-divided fluorescent lamp phosphor having a bi-layer coating comprising a coating of alumina surrounding a coating of silica which surrounds the particle.

5,087,524

ARTICLE MOLDED FROM A POLYCARBONATE COMPOSITION HAVING IMPROVED PLATABILITY

Sivaram Krishnan, Pittsburgh, Pa.; Ronald L. Price, Weirton, W. Va.; Peter H. C. Shu, Upper St. Clair, Pa., and Mark W. Witman, Naperville, Ill., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 247,975, Sep. 22, 1988,

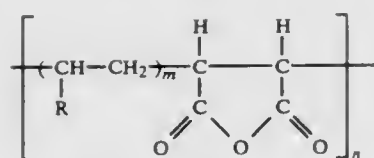
abandoned. This application May 4, 1990, Ser. No. 519,036

Int. Cl.⁵ C08L 69/00; B32B 15/08

U.S. Cl. 428—412

2 Claims

1. An article molded from a thermoplastic molding composition comprising an aromatic polycarbonate resin and about 0.5 to 5 percent of an anhydride plating modifier conforming to



wherein R is hydrogen or a C₁₋₂₈ alkyl, aryl or alkylaryl radical, m is 1 to 3 and n is 1 to 200, said article being characterized in that it is at least partially coated with a metal layer deposited by an electroless plating process, with the proviso that said composition contains no conjugated diene and that said copolymer contains no basic nitrogen atoms.

5,087,525

COATED GLASS ARTICLES

Ronald D. Goodman, Toledo, and Peter J. Tausch, Perrysburg, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

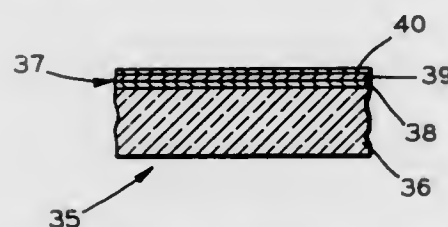
Continuation-in-part of Ser. No. 423,196, Oct. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 313,396, Feb. 21, 1989, abandoned. This application May 3, 1990, Ser. No. 518,217

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.⁵ B32B 17/06

U.S. Cl. 428-428

20 Claims



1. A coated glass article, comprising:
 - (A) a glass substrate, having a surface;
 - (B) a coating of titanium nitride deposited on and adhering to the surface of the glass substrate;
 - (C) a coating of a silicon complex, represented by the general formula SiC_xO_y, wherein x is more than 0 but not more than 1, and y is more than 0 but not more than 2, deposited on and adhering to the coating of titanium nitride; and
 - (D) optionally, a coating of a metal oxide or an oxide of silicon deposited on and adhering to the coating of the silicon complex, said coated glass article having a visible light transmittance less than about 36%, a shading coefficient measured at both the coated and glass sides less than about 0.5, a glass side reflectance less than about 20%, and a coated side reflectance less than about 25%.

5,087,526

BIAXIALLY ORIENTED POLYESTER FILM FOR USE IN FLOPPY DISC

Kichinojo Tomitaka, Nagahama, and Masumi Koizumi, Kawasaki, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Oct. 18, 1990, Ser. No. 599,813

Claims priority, application Japan, Oct. 24, 1989, 1-276228

Int. Cl.⁵ B32B 27/06, 27/00

U.S. Cl. 428-480

4 Claims

1. A biaxially oriented polyester film for use in a floppy disc, which has a coefficient of thermal expansion (α_T) in film plane of $(1.0 \pm 0.5) \times 10^{-5}$ mm/mm/°C. and a heat shrinkage of not higher than 0.09% after treating the film for 72 hours under conditions of a temperature of 60° C. and a humidity of 80%

RH in any directions in film plane, and simultaneously satisfies the following equations (1) to (5):

$$1.490 \leq n_{\alpha} \leq 1.500 \quad (1)$$

$$0.155 \leq \Delta P \leq 0.168 \quad (2)$$

$$1.600 \leq n \leq 1.603 \quad (3)$$

$$40 \leq X_{100} \leq 60 \quad (4)$$

$$1.385 \leq \rho \leq 1.400 \quad (5)$$

wherein n_{α} represents a refractive index in film thickness direction, ΔP represents a degree of planar orientation, n represents an average refractive index, X_{100} represents a crystal size (\AA) of (110) face, and ρ represents a density (g/cm^3).

5,087,527

THERMAL TRANSFER RECORDING MEDIUM

Ryouchi Shimura, Motoo Tasaka, both of Susono; Minoru Hakiri, Numazu, and Yonji Ide, Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

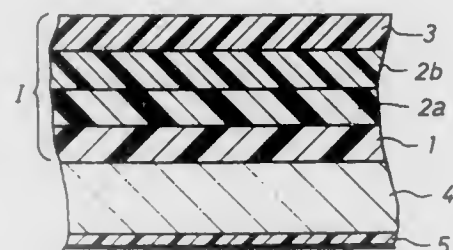
Continuation-in-part of Ser. No. 247,450, Sep. 22, 1988, abandoned. This application Jan. 31, 1990, Ser. No. 473,045

Claims priority, application Japan, Sep. 24, 1987, 62-240369

Int. Cl.⁵ B41M 5/26

U.S. Cl. 428-488.4

15 Claims



1. A thermal transfer recording med comprising an ink layer and a heat resistant supporting material, said ink layer comprising:

- a first thermally fusible material layer containing a wax having a melting point of 55° C. or higher, stacked on one surface of said heat resistant supporting material;
 - at least one second thermally fusible material layer containing as a major component a thermal softening resin comprising ethylene vinyl acetate copolymer, ethylene ethylacrylate copolymer or a mixture thereof which on average contains 65% or more of ethylene and has a number average molecular weight of 20,000 or less, and a coloring material, stacked on a surface of said first thermally fusible material layer which is opposite to a surface of said first thermally fusible layer facing said heat resistant supporting material; and
 - a third thermally fusible material layer which is compatible with thermally fusible material of the second thermally fusible material layer, stacked on a surface of said second thermally fusible material layer which is opposite to a surface of said second thermally fusible layer facing said heat resistant supporting material,
- an elongation rate of said second thermally fusible material layer at 20° C. being higher than the respective elongation rates of said first and third thermally fusible material layers at 20° C.

5,087,528

FASHION ARTICLE

Juergen Bock, Pforzheim, Fed. Rep. of Germany, assignor to Bock and Schupp GmbH & Co. KG, Zifferblätter-Fabrik, Pforzheim, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 367,884

Int. Cl.⁵ A44C 25/00; G02B 5/08

U.S. Cl. 428-542.4

7 Claims



1. A metallic fashion article which has opposite sides and is treated on at least one of its sides, said article comprising a flat single crystal member with a crystal plane coinciding essentially with a plane in which the flat single crystal member extends, said single crystal member carrying on at least one of its sides a layer consisting of a metal or metal compound material of 0.01 to 2 μm thickness thereby providing for light reflection from said article in colors depending on the thickness of said layer.

5,087,529

LAMINATE MATERIAL

Ulrich Engel, and Karl-Heinz Wegner, both of Bad Schwalbach, Fed. Rep. of Germany, assignors to Glyco Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

PCT No. PCT/DE89/00220, § 371 Date Dec. 20, 1989, § 102(e) Date Dec. 20, 1989, PCT Pub. No. WO89/10423, PCT Pub. Date Nov. 2, 1989

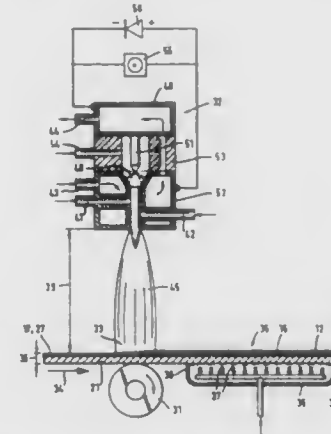
PCT Filed Apr. 13, 1989, Ser. No. 457,755

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813804

Int. Cl.⁵ B22F 3/00

U.S. Cl. 428-552

15 Claims



1. A laminate article comprising:

- (i) a solid backing layer; and
- (ii) a functional layer which is a friction bearing layer applied by air plasma spraying of a fine powder to a surface of said solid backing layer, said functional layer being a solid dispersion comprising a matrix having at least one fusible component and dispersion elements selected from the group consisting of those that at least in a solid state are insoluble in said fusible component and those that are soluble only in amounts smaller than those amounts present, said dispersion elements being directly bonded to said surface of said backing layer or indirectly via a thin intermediate adhesive layer, and said backing layer having a border zone bordering said functional layer, said border

zone being formed with a refined structure down to a depth of approximately 25 μm to 300 μm .

5,087,530

AUTOMATIC BONDING TAPE USED IN SEMICONDUCTOR DEVICE

Norio Wada, Katsuya Fukase, and Hirofumi Uchida, all of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

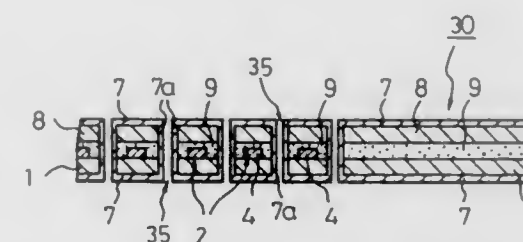
Filed Dec. 13, 1989, Ser. No. 450,067

Claims priority, application Japan, Dec. 13, 1988, 63-314400

Int. Cl.⁵ H05K 1/02

U.S. Cl. 428-596

10 Claims



1. A tape useful for an automatic boding process when manufacturing high-frequency semiconductor devices which tape comprises:

- a first flexible insulative film;
- a plurality of electrically conductive circuit patterns formed on an upper surface of said insulative film for transmitting high-frequency signals, said conductive patterns defining gaps therebetween on said first insulative film;
- a second flexible insulative film overlapping said upper surface of said first insulative film;
- said first and second insulative films having a plurality of corresponding holes penetrating therethrough and located in said gaps; each of said holes having an inner peripheral wall;
- a first metallic ground layer formed on a back surface of said first insulative film opposite to an upper surface thereof;
- a second metallic ground layer formed on an upper surface of said second insulative film opposite to a lower surface thereof facing the upper surface of said first insulative film; and
- electrically conductive material formed on the inner peripheral walls of said holes or filled in said holes, so that said first and second ground layers are electrically connected to said respective conductive material.

5,087,531

ELECTROLUMINESCENT DEVICE

Kousuke Terada, Tenri; Akiyoshi Mikami, Yamatotakada; Kouji Taniguchi, Nara; Koichi Tanaka, Nara; Masaru Yoshida, Nara, and Shigeo Nakajima, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1989, Ser. No. 442,634

Claims priority, application Japan, Nov. 30, 1988, 63-304820; Nov. 30, 1988, 63-304821

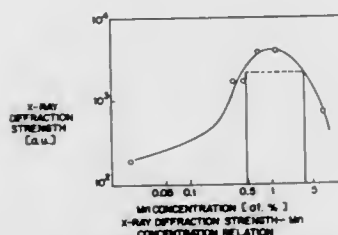
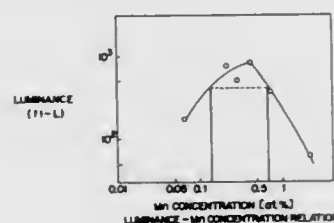
Int. Cl.⁵ B32B 18/00; H01J 1/62

U.S. Cl. 428-690

3 Claims

1. An electroluminescent device comprising:
 - a substrate; and
 - an electroluminescent film on the substrate, wherein said electroluminescent film is composed of a II-VI group compound semiconductor matrix and an electroluminescent center element, said electroluminescent film having a crystal structure of a hexagonal system and containing an electroluminescent center element for an initial grown

layer in a concentration (Ci) of 0.5 to 4 atom % within a thickness of 0.2 micrometer from the side of the substrate



and in a concentration (Cr) of 0.15 to 0.7 atom % at the residual portion whereby Ci is greater than Cr.

5,087,532

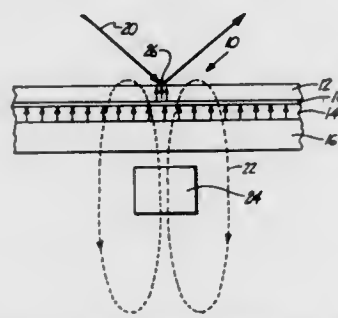
DIRECT-OVERWRITE MAGNETO-OPTIC MEDIA

William A. Challenger, IV, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 1, 1989, Ser. No. 388,121
Int. Cl.⁵ G11B 5/66

U.S. Cl. 428-694

9 Claims



1. A magneto-optic recording medium for use with a single laser beam operable at a first energy level and a second energy level higher than the first energy level and a magnetic field source generating a first magnetic field, the medium comprising:

- a substrate;
- a magneto-optic storage layer, supported on the substrate, for maintaining areas of selected magnetic orientation;
- a magnetic biasing layer supported on the substrate in selected heat conductive relationship with the storage layer and having a coercivity level such that the magnetization of the biasing layer is not substantially affected by the first magnetic field, and having a Curie temperature such that the magnetization generally monotonically decreases from a non-zero value at ambient temperature to zero at the Curie temperature;
- an insulating separating the storage layer and the biasing layer;
- wherein when the storage layer is subjected to the first energy level, the first magnetic field sets the magnetic orientation of the areas of the storage layer; and
- wherein when the storage layer is subjected to the second energy level, the biasing layer is heated to a first temperature at which the biasing layer generates a second mag-

netic field in a direction and at a level such that the magnetic orientation of the areas of the storage layer are changed.

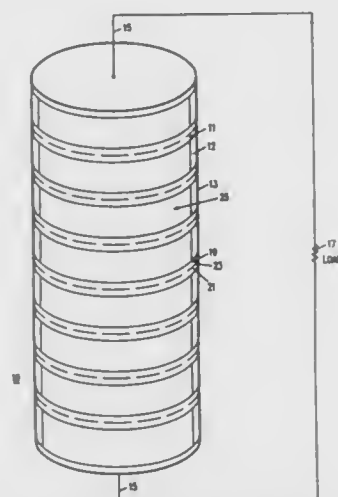
5,087,533

CONTACT POTENTIAL DIFFERENCE CELLE

Paul M. Brown, 10492 Summerwind, Boise, Id. 83704
Continuation-in-part of Ser. No. 420,294, Oct. 12, 1989, abandoned. This application Jan. 7, 1991, Ser. No. 638,222
Int. Cl.⁵ H01M 14/00

U.S. Cl. 429-5

13 Claims



1. An apparatus for generating electrical energy comprising: first and second spaced electrodes, said first and second electrodes of dissimilar materials having different work functions; and
- a solid dielectric medium disposed between said first and second electrodes, said solid dielectric medium comprising a radioactive material and a solid dielectric material, said radioactive material providing an ionizing flux for ionizing said dielectric medium.

5,087,534

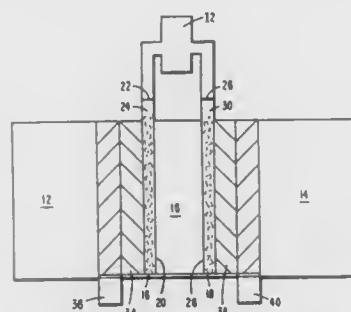
GAS-RECIRCULATING ELECTRODE FOR ELECTROCHEMICAL SYSTEM

Frank A. Ludwig, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 22, 1990, Ser. No. 542,380
Int. Cl.⁵ H01M 8/04

U.S. Cl. 429-11

22 Claims



1. An electrode apparatus for use in an electrochemical system having an anode compartment containing an anode liquid and a cathode compartment containing a cathode liquid, in which gas and ions are produced and consumed in said compartments during electrical current generation by said system, wherein said electrode apparatus comprises:

(a) a membrane for separating said anode compartment from

said cathode compartment, said membrane having a cathode side and an anode side and comprising an ion permeable material to provide transfer of ions between said cathode side and said anode side of said membrane;

- (b) a hydrogen cathode means located in said cathode compartment on said cathode side of said membrane and in contact with said membrane for generating electric current, wherein said cathode means has a major longitudinal surface and a minor edge surface, said cathode means comprises a porous hydrophobic catalytic structure which provides the passage of hydrogen gas along said longitudinal surface of said cathode means and perpendicular to said longitudinal surface of said cathode means, and an external portion of said cathode means extends outside of said cathode compartment, to expose said edge surface of said cathode means;
- (c) a hydrogen anode means located in said anode compartment on said anode side of said membrane and in contact with said membrane for generating electric current, wherein said anode means has a major longitudinal surface and a minor edge surface, said anode means comprises a porous hydrophobic catalytic structure which provides the passage of hydrogen gas along said longitudinal surface of said anode means and perpendicular to said longitudinal surface of said anode means, and an external portion of said anode means extends outside of said anode compartment to expose said edge surface of said anode means; and
- (d) a gas chamber connected to said external portions of said cathode means and said anode means and providing a path for transfer of gas from said cathode means directly to said anode means, wherein hydrogen gas generated at said cathode means passes through said cathode means and along said major longitudinal surface thereof to said edge surface of said cathode means, into said gas chamber, and then to said edge surface of said anode means and along said major longitudinal surface of said anode means to thereby recirculate said hydrogen gas from said cathode means directly to said anode means, to replenish said hydrogen gas consumed at said anode means during generation of said electric current.

5,087,535

METHOD OF MANUFACTURING PHOTO-MASK AND PHOTO-MASK MANUFACTURED THEREBY

Junji Hirokane, Tenri; Hiroyuki Katayama, Ikoma; Akira Takahashi, Nara; Tetsuya Inui, Nara; Kenji Ohta, Nara; Junichi Washio, Ikoma; Tomoyuki Miyake, Tenri; Kazuo Van, Nara, and Michinobu Mieda, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,704

Claims priority, application Japan, Feb. 28, 1986, 61-45754; Apr. 1, 1986, 61-76337; Apr. 1, 1986, 61-76338; May 21, 1986, 61-117932; Jul. 29, 1986, 61-178195

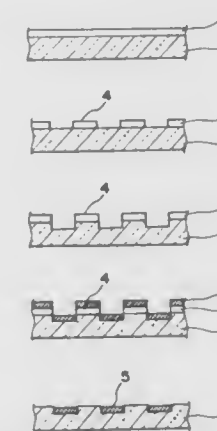
Int. Cl.⁵ G03F 9/00

U.S. Cl. 430-5

25 Claims

1. A method of manufacturing a photo-mask for an optical disc, which comprises the steps of: forming a light-transmitting first thin film on a mask substrate, applying a resist film on said first thin film; subjecting said resist film to light exposure and development so as to form a fine resist pattern, subjecting said first thin film to dry isotropic etching so as to form grooves in a portion of said first thin film not covered by said resist pattern and so as to widen said groove in said mask substrate, applying on said fine resist pattern and said groove a light-shielding second thin film, and removing said light-shielding second thin film formed on

said fine resist pattern together with said resist film so as to form said photo-mask having a mask pattern of said light-



shielding second thin film formed in said grooves on said light-transmitting first thin film.

5,087,536

RECEIVING SHEET BEARING A TONER IMAGE EMBEDDED IN A THERMOPLASTIC LAYER

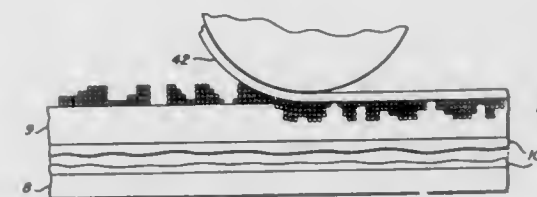
Muhammad Aslam, Rochester; Thomas J. Farnand, Webster, and Ernest J. Tamary, Brighton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 405,175, Sep. 11, 1989, Pat. No. 5,023,038. This application Apr. 22, 1991, Ser. No. 688,762

Int. Cl.⁵ G03G 13/14

U.S. Cl. 430-13

6 Claims



1. An image bearing receiving sheet comprising: a paper support, a thermoplastic layer on one side of said support having a toner image embedded therein, the outside surface of said layer having a textured finish, and a curl preventing layer on the other side of said support, said curl preventing layer being sufficiently similar to said thermoplastic layer to prevent curl of said receiving sheet in changing ambient conditions but having a substantially higher melting temperature than said thermoplastic layer.

5,087,537

LITHOGRAPHY IMAGING TOOL AND RELATED PHOTOLITHOGRAPHIC PROCESSES

John F. Conway, Sterling; Edward C. Fredericks, Manassas, and Giorgio G. Via, McLean, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1989, Ser. No. 419,860

Int. Cl.⁵ G03C 3/00

U.S. Cl. 430-15

18 Claims

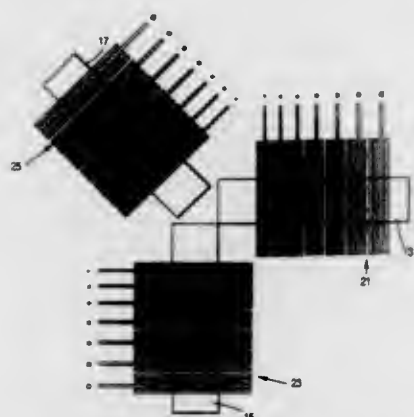
1. A method for optimizing a lithography process performed by a lithography tool on a substrate comprising the steps of: depositing a layer of photoresist material on said substrate; exposing at least a selected area of said photoresist material in a periodic pattern of fine elements on the same order as a critical element in said lithography process with said lithography tool in a single exposure step, said selected area substantially afield area of said lithography tool, said fine elements arranged in groups of at least three sets, each

group having a first set of fine elements positioned along a line parallel to a first direction, a second set of fine elements positioned along a line parallel to a second direction, said second direction at a 90 degree angle from said first direction, and a third set of fine elements positioned along a line parallel to a third direction, said third direction at an angle other than 90 degrees from said first direction, each respective set of fine elements oriented in an orthogonal or a parallel direction to the respective line said set of fine elements is positioned along, said pattern of fine elements in said photoresist layer representative of the ability of said lithography tool to accurately transfer an image of said critical element within said selected area and,

examining said fine elements to determine whether any changes in lithography process parameters are necessary to accurately transfer an image of said critical element within said selected area.

15. A substrate used for optimizing a lithography process comprising:

a first pattern of topography elements arranged in groups over a selected area of said substrate each group having a first topography element positioned along a line parallel to



a first direction, a second topography element positioned along a line parallel to a second direction at a 90 degree angle from said first direction, and a third topographic element positioned along a line parallel to a third direction, said third direction at an angle not equal to 90 degrees from said first direction; and

a second pattern of fine photoresist elements disposed in a periodic pattern over said first plurality of topographic elements in said preselected area, said fine photoresist elements arranged in groups, each group having a first set of fine photoresist elements positioned along a line parallel to said first direction, a second set of fine photoresist elements positioned along a line parallel to said second direction, and a third set of fine photoresist elements positioned along a line parallel to said third direction, said second pattern being formed in a single exposure step, said selected area substantially a field area of a lithography tool, and,

said groups in said first and second patterns being spaced from one another such that upon superposition of said fine elements upon said large elements, each group of large elements is aligned with a respective group of fine elements.

5,087,538

TONER AND IMAGING PROCESSES

Linda J. Nelson, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 547,362

Int. Cl.⁵ G03G 13/14, 13/06

U.S. Cl. 430—45

80 Claims

1. An imaging process which comprises (1) charging an

imaging member in an imaging apparatus; (2) creating on the member a latent image comprising areas of high, intermediate, and low potential; (3) developing the low areas of potential with a first developer comprising first carrier and a first negatively charged toner comprised of resin, a positively charging colored pigment, and a negatively charging colored pigment; (4) developing the high areas of potential with a second developer comprising second carrier and a second toner comprised of resin, pigment, and a charge enhancing additive that enables a positively charged toner; (5) transferring the resulting developed image to a substrate; and (6) fixing the image thereto.

5,087,539

METHOD AND APPARATUS FOR TRANSFERRING AN ELECTROSTATIC LATENT IMAGE

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga, and Tsutou Asakura, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 27, 1989, Ser. No. 385,862

Claims priority, application Japan, Jul. 28, 1988, 63-186947

Int. Cl.⁵ G03G 13/18

U.S. Cl. 430—48

25 Claims

1. A method for non-destructively transferring an electrostatic latent image comprising the steps of:

preparing a master recording member one side of which is provided with a first electrode and another side of which is provided with a first recording layer in which an image information is preformed in a form of material characteristic change of the first recording layer;

preparing a blank recording member having a second recording layer;

disposing the first recording layer of the master recording member in a non-contact confronting position with respect to the second recording layer;

providing a uniform layer of charges to the second recording layer of the blank recording member by charge providing means on a side of the second recording layer opposite to the side confronting the preformed image information, to produce a transferred electrostatic latent image on the second recording layer of the blank recording member correspondingly with and in response to the image information preformed in the first recording layer of the master recording member;

said first and second recording layers being first and second charge hold layers, respectively, thus allowing the second charge hold layer to produce said transferred electrostatic latent image thereon in response to the provision of the uniform layer of charges to the second charge hold layer of the blank recording member;

said charge providing means comprising a stationary electrode contacting the second charge hold layer of the blank recording member, and a predetermined voltage source connected between the first and the stationary electrodes;

moving said first and blank recording members synchronously together with respect to the stationary electrode; moving said first recording member away from said blank recording member after a position where said first recording member and said second blank recording member are interposed between said first and stationary electrodes;

attaching a second electrode to said second charge hold layer of the blank recording member at a side thereon opposite to the side contacted with the stationary electrode.

5,087,540

PHthalocyanine PHOTOSENSITIVE MATERIALS FOR ELECTROPHOTOGRAPHY AND PROCESSES FOR MAKING THE SAME

Mutsuaki Murakami, Tokyo; Sohji Tsuchiya, Kanagawa, and Atsushi Omote, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 12, 1990, Ser. No. 551,538

Claims priority, application Japan, Jul. 13, 1989, 1-181044; Aug. 5, 1989, 1-203384; Aug. 5, 1989, 1-203385; Aug. 5, 1989, 1-203386; Aug. 5, 1989, 1-203387; Aug. 5, 1989, 1-203388; Mar. 12, 1990, 2-60191; Mar. 26, 1990, 2-76034; Mar. 26, 1990, 2-76037; Mar. 26, 1990, 2-76038

Int. Cl.⁵ G03G 5/047, 5/087

U.S. Cl. 430—58

24 Claims

1. A photosensitive material for electrophotography which is adapted for positive charging and which comprises a conductive support and an organic photoconductive layer formed on the conductive support and formed from a mixture of the least one compound selected from the group consisting of X-type metal-free phthalocyanine and γ -type metal-free phthalocyanine and a binder resin which has been mixed in a solvent system for both the at least one compound and the binder resin such that said at least one compound is dispersed in said binder resin partly in a molecular state and partly in a particulate state and until said photoconductive layer exhibits both charge transportability and charge generating ability.

22. A photosensitive material according to claim 1, further comprising a layer of a charge generating compound provided between said photoconductive layer and said conductive support, said charge generating compound being dispersed in a resin binder in a particulate form.

5,087,541

BISAZO PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

Masami Kuroda, Masayo Amano, and Noboru Furusho, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

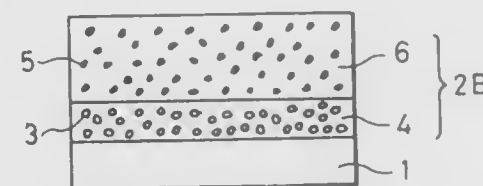
Filed May 31, 1990, Ser. No. 530,088

Claims priority, application Japan, Jun. 6, 1989, 1-143523

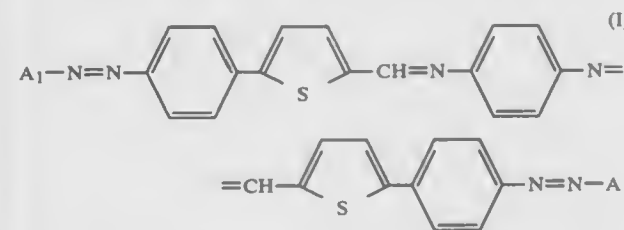
Int. Cl.⁵ G03G 5/047, 5/06

U.S. Cl. 430—58

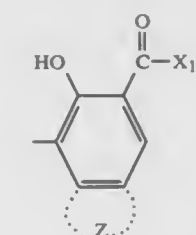
3 Claims



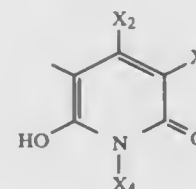
1. A photoconductor for electrophotography, comprising: an electroconductive substrate, and a photosensitive layer formed on said substrate and including a charge transporting substance and a charge generating substance which is at least one bisazo compound represented by general formula (I):



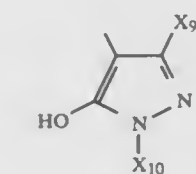
wherein A₁ is a coupler residual group represented by one of general formulae (IX) to (XV):



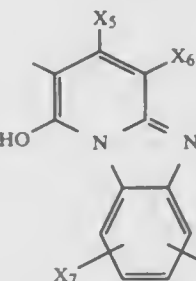
(IX)



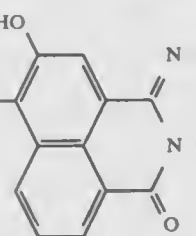
(X)



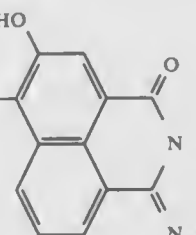
(XI)



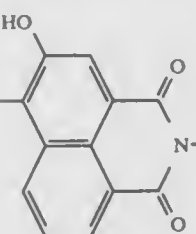
(XII)



(XIII)



(XIV)



(XV)

wherein Z is a residual group which condenses with a benzene ring to form an aromatic polycycle or heterocycle, X₁ is one of OR₁ and NR₂R₃, and each of R₁, R₂ and R₃ is selected from the group consisting of a hydrogen atom,

an alkyl group, an aryl group and a heterocyclic group, which groups may be substituted, each of X_2 and X_5 is selected from the group consisting of an alkyl group, an aryl group and a heterocyclic group, which groups may be substituted, each of X_3 and X_6 is selected from the group consisting of a hydrogen atom, a cyano group, a carbanoyl group, a carboxyl group, an ester group and an acyl group, each of X_4 and X_{11} is selected from the group consisting of a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an aryl group and a heterocyclic group, each of X_7 and X_8 is selected from the group consisting of a hydrogen atom, a halogen atom, a nitro group, an alkyl group and an alkoxy group, the alkyl group and the alkoxy group of which may be substituted, X_9 is selected from the group consisting of an alkyl group, an aryl group, a carboxyl group and an ester group, X_{10} is one of an aryl group and a heterocyclic group, which groups may be substituted, and Y is a residual group which forms an aromatic ring or a heterocycle.

3. The photoconductor as claimed in claim 1, wherein said photosensitive layer comprises a laminate of a charge transporting layer mainly composed of the charge transporting substance and a binder, and a charge generating layer including the charge generating substance and a binder.

5,087,542

ELECTROPHOTOGRAPHIC IMAGE-FORMING METHOD WHEREIN AN AMORPHOUS SILICON LIGHT RECEIVING MEMBER WITH A LATENT IMAGE SUPPORT LAYER AND A DEVELOPED IMAGE SUPPORT LAYER AND FINE PARTICLE INSULATING TONER ARE USED

Koji Yamazaki; Toshimitsu Kariya; Tatsuyuki Aoi; Toshiyuki Ehara; Takehito Yoshino, and Hirokazu Otoshi, all of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 455,227

Claims priority, application Japan, Dec. 27, 1988, 63-329631; Dec. 27, 1988, 63-329632; Dec. 27, 1988, 63-329633; Dec. 27, 1988, 63-329634; Dec. 27, 1988, 63-329635

Int. Cl.⁵ G03G 5/14

U.S. Cl. 430—60

13 Claims

1. An electrophotographic process comprising the steps of:
 - (a) maintaining a surface of a light receiving member at a temperature from 10° to 40° C., said light receiving member for use in electrophotography comprising a substrate and a light receiving multilayer, said light receiving multilayer comprising (i) a photoconductive layer comprising an amorphous material containing silicon atoms as a matrix and at least one kind of atoms selected from the group consisting of hydrogen atoms and halogen atoms; (ii) a latent image supporting layer comprising an amorphous material containing silicon atom as a matrix, carbon atoms, atoms of an element belonging to Group III of the Periodic Table and at least one kind of atoms selected from the group consisting of hydrogen atoms and halogen atoms; and (iii) a developed image supporting layer comprising an amorphous material containing silicon atoms as a matrix, carbon atoms and at least one kind of atoms selected from the group consisting of hydrogen atoms and halogen atoms;
 - (b) charging said light receiving member;
 - (c) exposing said light receiving member to form a latent image;
 - (d) developing said latent image employing a fine particle insulating toner comprising a colorant and a binder, said toner having a volume average particle size from 4.5 to 9 microns to thereby form a developed toner image on said light receiving member; and
 - (e) transferring said developed toner image formed on said light receiving member to a transfer sheet.

5,087,543

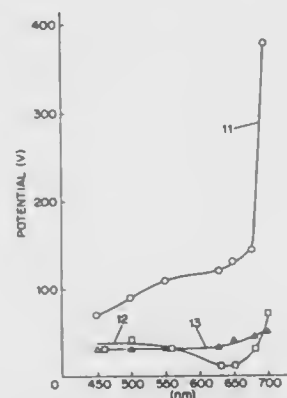
ELECTROPHOTOGRAPHIC PRINTER

Mitsuru Narita, and Tatuo Tanaka, both of Matsumoto, Japan, assignors to Fuji Electric Co., Ltd., Japan
Continuation of Ser. No. 566,898, Aug. 13, 1990, abandoned, which is a continuation of Ser. No. 300,424, Jan. 23, 1989, abandoned. This application Mar. 20, 1991, Ser. No. 673,254
Claims priority, application Japan, Jan. 21, 1988, 63-11192; Nov. 16, 1988, 63-289232

Int. Cl.⁵ G03G 15/04

U.S. Cl. 430—66

1 Claim



1. A method for reproducing successive images using an electrophotographic printer comprising a photoconductor, the photoconductor comprising, in sequence, a conductive substrate; a carrier transport layer; a carrier generation layer comprising a Selenium-Tellurium alloy containing about 42% by weight of Tellurium; and an overcoat layer comprising As_2-xSe_{3+x} , wherein $0 \leq x \leq 0.5$, comprising in successive cycles the steps of

- (a) electrifying the photoconductor;
- (b) exposing the electrified photoconductor to create an image thereon;
- (c) applying toner to the exposed photoconductor;
- (d) transferring the toner to a substrate; and
- (e) illuminating the photoconductor with light having a wavelength of from 500 to 680 nm to remove residual electrical charge from the photoconductor, wherein at least 400 msec elapses after the removal of charge before a successive electrification.

5,087,544

PERYLENE ELECTROPHOTOSENSITIVE MATERIAL WITH M-PHENYLENEDIAMINE

Nariaki Muto, Daito; Mikio Kakui, Mino; Keisuke Sumida, Hirakata; Toru Nakazawa, Osaka, and Kazuo Matsumoto, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 26, 1990, Ser. No. 498,647

Claims priority, application Japan, Mar. 30, 1989, 1-80019

Int. Cl.⁵ G03G 5/06, 5/09

U.S. Cl. 435—83

4 Claims

1. An electrophotosensitive material comprising a conductive substrate and a single layer type photosensitive layer provided on said conductive substrate, said photosensitive layer containing a m-phenylenediamine compound as charge-transferring material and a perylene compound as charge-generating material, said m-phenylenediamine compound represented by formula

of the colored particles and to stabilize the triboelectric charge characteristics thereof and to reduce agglomerates of said powdery additive, to obtain a toner composition.

5,087,547

DUAL-TONE PHOTORESIST UTILIZING DIAZONAPHTHOQUINONE RESIN AND CARBODIIMIDE STABILIZER

James W. Taylor, South Charleston, and David R. Bassett, Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Mar. 2, 1990, Ser. No. 487,657

Int. Cl.⁵ G03F 7/023; G03C 1/61

U.S. Cl. 430—169

20 Claims

1. A liquid, dual-tone photoresist formulation of improved stability for the production of positive or negative images comprising a photoresist of a phenol-formaldehyde resin and a diazonaphthoquinone sensitizer wherein the diazonaphthoquinone sensitizer is attached to the backbone of said phenol-formaldehyde resin; and a stabilizing amount of a carbodiimide of the formula:



wherein each R, independently, can be a secondary or tertiary alkyl group of from 3 to 30 carbon atoms, a cycloalkyl group of up to 30 carbon atoms, or one R can be an aryl group of up to 30 carbon atoms.

11. A process for providing a liquid, dual-tone photoresist formulation of improved stability which comprises adding to a photoresist of a phenol-formaldehyde resin and a diazonaphthoquinone sensitizer wherein the diazonaphthoquinone sensitizer is attached to the backbone of said phenol-formaldehyde resin, at least a stabilizing amount of a carbodiimide of the formula:



wherein each R, independently, can be a secondary or tertiary alkyl group of from 3 to 30 carbon atoms, a cycloalkyl group of up to 30 carbon atoms, or one R can be an aryl group of up to 30 carbon atoms.

5,087,548

POSITIVE TYPE RADIATION-SENSITIVE RESIN COMPOSITION

Yoshihiro Hosaka, Yokohama; Ikuro Nozue, Yokkaichi; Masashi Takatori, Yokohama; Yoshiyuki Harita, Kawasaki, and Kiyoshi Honda, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Inc., Tokyo, Japan
Continuation of Ser. No. 946,056, Dec. 24, 1986, abandoned.

This application Dec. 5, 1988, Ser. No. 282,958

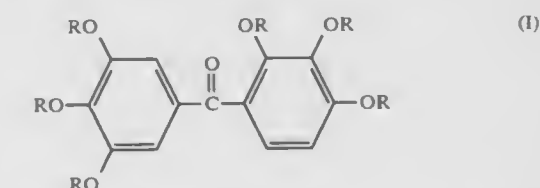
Claims priority, application Japan, Dec. 27, 1985, 60-296653; Jan. 27, 1986, 61-15333

Int. Cl.⁵ G03E 7/022

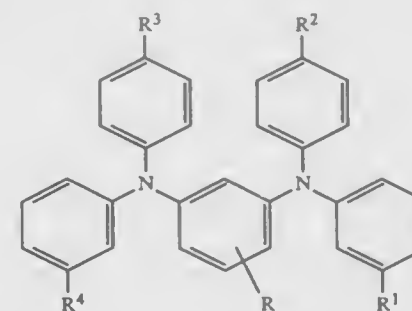
U.S. Cl. 430—192

1 Claim

1. A positive-working photoresist composition comprising, in admixture, as a binder, an alkali-soluble novolak resin and a photosensitive amount of at least one photosensitive compound represented by Formula (I):



wherein at least one R group represents a 1,2-naphthoquinone diazido-4-sulfonyl group or a 1,2-naphthoquinone



wherein R^1 , R^2 , R^3 , R^4 and R are the same as one another, or are different from one another, and represent a hydrogen atom, an alkyl group, an alkoxy group or a halogen atom, provided that, when one of R^1 and R^4 is the hydrogen atom, the other should not be the hydrogen atom, and when one of R^2 and R^3 is the hydrogen atom, the other should not be the hydrogen atom.

5,087,545

CARRIER AND DEVELOPER COMPOSITIONS GENERATED FROM FLY ASH PARTICLES

Robert J. Hagenbach, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 850,650, Apr. 11, 1986, Pat. No. 4,899,305, which is a continuation-in-part of Ser. No. 611,294, May 17, 1984, abandoned. This application Oct. 2, 1989, Ser. No. 416,088

Int. Cl.⁵ G03G 9/107

U.S. Cl. 430—137

3 Claims

1. A process for obtaining spherical carrier particles from fly ash, which particles are useful for incorporation into xerographic developer compositions, which comprises (1) providing residual fly ash particles containing as a component magnetic particles; (2) subjecting the fly ash particles to an air jet sieve classification for the purpose of removing particles of a diameter of less than about 44 microns; (3) introducing the resulting particles with a diameter of greater than about 44 microns into a magnetic separator, wherein the magnetic components contained in the fly ash are separated therefrom; (4) removing the deposited magnetic particles; and (5) subjecting the magnetic particles to further separation, wherein there are obtained carrier particles of an apparent density equal to or greater than 2.4 grams/cm³, magnetic moment of from about 60 to about 70 electromagnetic units per gram, and an average diameter of greater than 44 microns.

5,087,546

DEVICE FOR CONTINUOUSLY MIXING POWDER AND PROCESS FOR PRODUCING TONER FOR DEVELOPING ELECTROSTATIC IMAGE

Hitoshi Kanda, Yokohama, and Atsuko Kobayashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,447

Claims priority, application Japan, Dec. 7, 1988, 63-307914; Dec. 7, 1988, 63-307915

Int. Cl.⁵ G03G 9/08; B01F 7/00

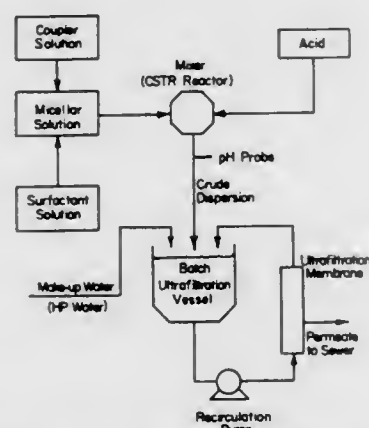
U.S. Cl. 430—137

11 Claims

1. A process for producing a toner composition for developing electrostatic latent images comprising introducing colored particles having at least a binder resin, a colorant and a powdery additive for controlling the flowability of said colored particles and subject to agglomeration into a continuous mixing device; and

continuously mixing the colored particles and the powdery additive in a fluidized state in gaps between multiple stages of said continuous mixing device between opposed pairs of a fixed blade and a rotatable blade thereof to provide a circuitous, continuous mixing path for said colored particles and said powdery additive in order to finely disperse and fix the powdery additive on the surface

a hydrophilic head group comprising sulfate or sulfonate and a hydrophobic tail group comprising between about 8 and about 20 carbon atoms, forming a coupler solution by dissolving a coupler in a basic solvent solution, which comprises a mixture of organic solvent and aqueous base, combining said coupler solution and said water solution, adding acid to form a dispersion of coupler particles of a pH between about 5.0 and about 5.5,



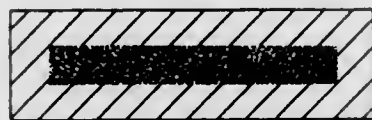
washing said dispersion to remove substantially all organic solvent to form a washed dispersion, adding acid to adjust the pH of said washed dispersion to between about 5.0 and about 5.5 to form a pH adjusted washed dispersion, and removing water from said pH adjusted washed dispersion to form a concentrated dispersion.

5,087,555

SILVER HALIDE PHOTOGRAPHIC EMULSION AND METHOD FOR MANUFACTURE THEREOF
Mitsuo Saitou, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 336,406, Apr. 11, 1989, Pat. No. 4,945,037.
This application Mar. 30, 1990, Ser. No. 501,825
Claims priority, application Japan, Apr. 11, 1988, 63-088376
Int. Cl.³ G03C 1/02

U.S. Cl. 430—567

5 Claims



1. A silver halide photographic emulsion comprising silver halide grains, wherein at least 60% of the total projected area of said silver halide grains is comprised of tabular silver halide grains having a central portion and an outer portion, of which the iodide content of the central portion is from 7 mol% to the solid solution limit, and which have two parallel twinned crystal planes.

5,087,556

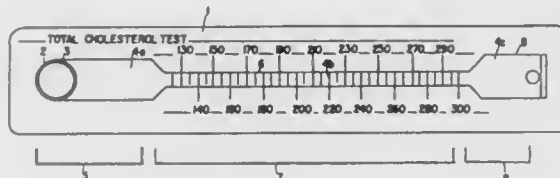
METHOD FOR QUANTITATIVE ANALYSIS OF BODY FLUID CONSTITUENTS
Gerhard Ertinghausen, Princeton, N.J., assignor to Actimed Laboratories, Inc., Mount Laurel, N.J.
Filed May 17, 1989, Ser. No. 352,985
Int. Cl.³ G01N 33/543, 33/558

U.S. Cl. 435—7.9

14 Claims

1. A method for quantitatively analyzing a biological fluid for an analyte comprising the following steps:
depositing a biological fluid sample in a first open reservoir

of an analytical device, said first open reservoir having means for separating solids from a fluid sample, whereby solids in said biological fluid sample are substantially retained in said first open reservoir;
drawing said biological fluid sample through a channel from said first open reservoir to a second open reservoir to fill said second open reservoir with said biological fluid sample, said second reservoir being configured so as to draw a precise predetermined volume of biological fluid sample through said channel;



said channel including a permeable membrane having at least one reagent specific for the analyte to be determined, said reagent including a chromatic indicator immobilized in said membrane in a predetermined amount to quantify the analyte in said biological fluid, whereby analyte in said biological fluid sample reacts with said reagent to produce a color change in said channel;
said channel being provided with calibration means related to said color change to quantify the amount of analyte present in said biological fluid sample.

5,087,557

HUMAN MONOCLONAL ANTIBODY TO LYMPHADENOPATHY-ASSOCIATED VIRUS
Janela McClare, Vashon Island, Wash., assignor to Genetic Systems Corporation, Redmond, Wash.
Continuation of Ser. No. 877,579, Jun. 23, 1986, abandoned.
This application Mar. 19, 1990, Ser. No. 498,454
Int. Cl.³ G01N 33/569

U.S. Cl. 435—5

18 Claims

2. A human monoclonal antibody that binds an epitope on the envelope glycoprotein gp41.

5,087,558

METHOD FOR IDENTIFYING AND CHARACTERIZING ORGANISMS
John A. Webster, Jr., 8343 Carreligh Pkwy., Springfield, Va. 22152
Continuation of Ser. No. 892,064, Aug. 1, 1986, abandoned, which is a continuation of Ser. No. 477,431, Mar. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 305,498, Sep. 25, 1981, Pat. No. 4,717,653. This application Jan. 4, 1989, Ser. No. 294,903

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.³ C12Q 1/70, 1/68

U.S. Cl. 435—5

43 Claims

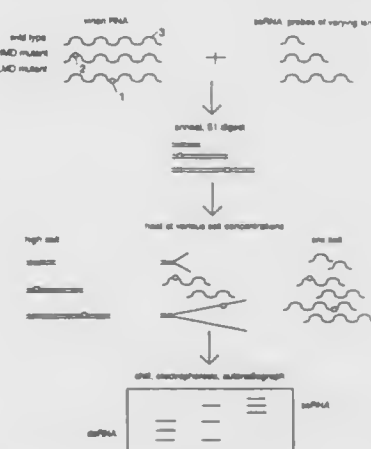
1. A method for characterizing an unknown organism species which comprises the steps of:
a) hybridizing evolutionarily conserved sequences in the DNA of said organism with conserved DNA sequence information-containing nucleic acid from or derived from a probe organism, said nucleic acid capable of hybridizing to said evolutionarily conserved sequences of said unknown organism DNA;
b) determining the position of said conserved sequences in said unknown organism relative to the position of restriction endonuclease cleavage sites in said DNA, thereby to obtain an identifying genetic characterization of said unknown organism;
c) comparing said characterization with information from at least two sets of identifying genetic characterizations

derived from the same conserved sequences, each of said sets representing the hybridization of evolutionarily conserved sequence-information containing nucleic acid from or derived from said probe organism to the DNA of a known organism, each of said sets defining a known different organism species; and
d) establishing the species of said unknown organism.

5,087,559

METHOD OF DETECTING SINGLE BASE SUBSTITUTIONS IN NUCLEIC ACIDS
Frances Smith, New York, N.Y., and Peter Palese, Leonia, N.J., assignors to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.
Filed Mar. 18, 1988, Ser. No. 169,856
Int. Cl.³ C12Q 1/68; C07H 15/12; C12N 15/00
U.S. Cl. 435—6

10 Claims



1. A method of detecting point mutations in the highest melting domain of a nucleic acid polymer, comprising:

- preparing a solution containing a double-stranded nucleic acid polymer comprising a duplex of a single-stranded nucleic acid polymer to be analyzed and a complementary portion of a corresponding wild-type nucleic acid polymer;
- placing an aliquot of the solution of the double-stranded nucleic acid polymer into each of a series of containers having a range of denaturing conditions, said series including at least one container in which the denaturing conditions are such that a nucleic acid duplex having one or more base-pair mismatches within its highest melting domain would be denatured to single-stranded nucleic acid polymers, but in which a nucleic acid duplex having no basepair mismatches within its highest melting domain would not be so denatured;
- allowing the contents of each container to incubate for a period of time sufficient to allow denaturation to occur;
- analyzing the contents of each container for the presence of single stranded nucleic acid polymers to determine under which conditions denaturation of the double-stranded nucleic acid polymer occurs; and
- comparing the results of steps a-d with results for the same method for a corresponding nucleic acid duplex standard perfectly base-pair matched in the highest melting domain, wherein the presence of a point mutation in the highest melting domain is indicated by denaturation of the double-stranded nucleic acid polymer under conditions different from the perfectly base-pair matched standard.

5,087,560

MONOCLONAL ANTIBODY FOR USE IN DRUG RESISTANT CANCERS AND PRODUCTION THEREOF
Takashi Tsuruo, Hirofumi Hamada, and Haruo Sugano, all of Tokyo, Japan, assignors to Japanese Foundation for Cancer Research, Tokyo, Japan
Continuation of Ser. No. 312,336, Feb. 16, 1989, abandoned, which is a continuation of Ser. No. 905,452, Sep. 10, 1986, abandoned. This application Oct. 1, 1990, Ser. No. 593,276
Claims priority, application Japan, Sep. 11, 1985, 60-201445
Int. Cl.³ C12G 1/68; C12P 21/00; C12N 15/00

U.S. Cl. 435—6

4 Claims

1. A hybridoma capable of producing a monoclonal antibody, which hybridoma is formed as a fusion product between a mouse myeloma cell and a spleen cell from a mouse that has been immunized with a doxorubicin-resistant K562/ADM cell line of a human myelogenous leukemia cell K562.

5,087,561

HUMORAL HYPERCALCEMIC FACTOR ANTAGONISTS MODIFIED AT POSITION 13 BY BIOTIN
Michael Rosenblatt, Ardmore, Pa.; Michael Chorev, Jerusalem, Israel; Eliahu Roubini, Lensvale, Pa.; Ruth F. Nutt, Green Lane, Pa., and Le T. Duong, Jenkintown, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Jun. 28, 1990, Ser. No. 545,256
Int. Cl.³ G01N 33/567; C07K 7/10; A61K 37/24

U.S. Cl. 435—7.21

3 Claims

1. A peptide which is [Leu¹¹,D-Trp¹²,Lys¹³(N-biotinyl-β-Ala)]-hHCF(7-34)NH₂.

5,087,562

HUMORAL HYPERCALCEMIC FACTOR ANTAGONISTS WITH MODIFICATION AT POSITION 13 . . .
Michael Rosenblatt, Ardmore; Eliahu Roubini, Lensvale, both of Pa.; Michael Chorev, Jerusalem, Israel, and Ruth F. Nutt, Green Lane, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Apr. 25, 1990, Ser. No. 514,633
Int. Cl.³ G01N 33/567; C07K 7/10; A61K 37/24

U.S. Cl. 435—7.21

3 Claims

1. A peptide which is desamino[Leu¹¹,D-Trp¹²,Lys¹³(N-CO(CH₂)₂-Phenyl)]hHCF(8-34)NH₂.

5,087,563

ACYL CARRIER PROTEIN-1/PROTEIN-A GENE FUSION, PRODUCTS AND METHODS
Phillip D. Beremand, Peoria, Ill., and Daniel J. Guerra, Troy, Id., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.
Filed Mar. 9, 1990, Ser. No. 494,004
Int. Cl.³ C12P 21/02; C12N 15/62; C07K 3/00

U.S. Cl. 435—69.7

20 Claims

1. A recombinant DNA which encodes a plant acyl carrier protein and the F_ε-binding portion of staphylococcal protein A, wherein the recombinant DNA comprises a first sequence encoding the acyl carrier protein gene downstream and in frame with a second DNA sequence encoding the F_ε-binding portion of staphylococcal protein A.

19. A method of producing an enzymatically active acyl carrier protein bound to the F_ε-binding portion of staphylococcal A protein comprising:

- transforming cells for expressing said protein with an expression vector carrying a recombinant DNA comprising a first sequence encoding the acyl carrier protein gene downstream and in frame with a second DNA sequence encoding the F_ε-binding portion of staphylococcal protein A; and
- culturing said cells under conditions wherein said proteins are expressed.

5,087,564

RELEASE OF RECOMBINANT PEPTIDES FROM POLYPEPTIDES USING V8 ENDOPEPTIDASE
Marilyn S. Mai, Ballwin; Michael L. Bittner, Maryland Heights, and Sarah R. Bradford, Creve Coeur, all of Mo., assigns to Monsanto Company, St. Louis, Mo.
Continuation of Ser. No. 856,385, May 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 747,135, Jun. 20, 1985, abandoned. This application Jun. 18, 1989, Ser. No. 382,050

Int. Cl.⁵ C12P 21/02; C12N 15/16, 15/70
U.S. Cl. 435—69.7 24 Claims

1. A method for producing a heterologous peptide in bacteria which comprises expressing DNA comprising a fusion protein to produce a fusion protein in bacteria, said fusion protein comprising a heterologous peptide not susceptible to V8 endopeptidase cleavage linked to *E. coli* recA protein at a Glu-Ser junction site, wherein both the *E. coli* recA protein and the junction site have a V8 endopeptidase Glu-Ser cleavage site; recovering said fusion protein from the bacteria; treating said fusion protein with V8 endopeptidase such that the endopeptidase cleavage site at said Glu-Ser junction site is preferentially cleaved while the V8 endopeptidase cleavage site in the recA protein is substantially intact, and obtaining therefrom said desired heterologous peptide.

5,087,565

SYNTHETIC PROCESS FOR PREPARATION OF ³²P-LABELED NUCLEOTIDES
James J. Di Meo, Watertown, Mass., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.
Filed Jul. 2, 1984, Ser. No. 627,866
Int. Cl.⁵ C12P 19/30; C07H 15/12, 17/00

U.S. Cl. 435—89 10 Claims
1. A process for the production of ³²P-labeled NTP comprising (i) reacting H₃³²PO₄ with an excess of X-CoA where X is selected from the group consisting of acetyl, propionyl, butyryl and succinyl in the presence of phosphotransacetylase, inducing the formation of ³²PO₄-labeled X, (ii) simultaneously reacting the resulting X-³²PO₄, as it is formed, with NDP in the presence of acetate kinase, under conditions capable of both inducing the formation of X-³²PO₄ and conversion of NDP to ³²P-labeled NTP, and (iii) stopping the reactions before excess hydrolysis of ³²P-labeled NTP occurs to prepare said product having a specific activity greater than 7500 Ci/mM.

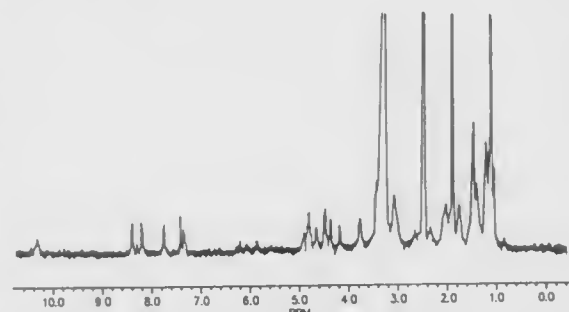
5,087,566

PROCESS FOR PRODUCING L-THREONINE
Junichi Takano; Satoru Furukawa, both of Hofu, and Toshihide Nakanishi, Ube, all of Japan, assigns to Kyowa Hakko Kogyo, Ltd., Tokyo, Japan
Filed Oct. 30, 1989, Ser. No. 428,947
Claims priority, application Japan, Nov. 10, 1988, 63-284386
Int. Cl.⁵ C12P 13/08; C12N 1/20, 15/00, 1/38

U.S. Cl. 435—115 9 Claims
1. A process for producing L-threonine which comprises culturing in a medium a microorganism selected from the group consisting of *Escherichia coli* H-7256 (FERM BP-2137), *Escherichia coli* H-7263 (FERM BP-2138), *Escherichia coli* H-7293 (FERM BP-2139) and *Escherichia coli* H-7294 (FERM BP-2140) which has a resistance to cysteine or cystine, or their analogue and an ability to produce L-threonine until L-threonine is accumulated in the culture broth, and recovering L-threonine therefrom.

5,087,567

ANTITUMOR ANTIBIOTIC BMY-42428
Thomas T. Dabrah, Wallingford; Grace A. Hesler, Branford; Sandra J. Hofstead, Middletown; Kin S. Lam, Cheshire; Jacqueline M. Mattei, Branford; Daniel R. Schroeder, Cromwell, all of Conn., and Koji Tomita, Tokyo, Japan, assigns to Bristol-Myers Squibb Company, New York, N.Y.
Filed Jan. 12, 1990, Ser. No. 464,046
Int. Cl.⁵ C12P 01/06, 17/16; C07G 03/00, 11/00
U.S. Cl. 435—169 6 Claims



1. The antibiotic compound BMY-42428 characterized by:
(a) appearing as a greenish-orange solid when crystallized from methanol/chloroform/hexane;
(b) an ultraviolet absorption spectrum when dissolved in methanol at a concentration of 9.06×10^{-7} g/l of:

	λ_{max} (nm)	$E_{1\text{ cm}}^{1\%}$
Neutral methanol	226	239
	254	262
	324	157
	396	76
Acidic methanol	224	292
	254	317
	324	187
	396	85
Basic methanol	222	302
	246	315
	344	120
	444	95

(c) an infrared absorption spectrum (KBr pellet) showing peaks at 3440, 2976, 2935, 2876, 1695, 1666, 1616, 1471, 1414, 1384, 1366, 1326, 1284, 1219, 1164, 1134, 1059, 987, 906, 890, 860, 582, 558 cm^{-1} ;
(d) a ¹H-NMR spectrum in d₆-DMSO exhibiting principal signals at 10.35 (br, s, 1H), 8.39 (d, 1H), 8.22 (d, 1H), 7.75 (d, 1H), 7.42 (br, s, 1H), 7.36 (d, 1H), 4.94 (m, 1H), 4.80 (m, 2H), 4.66 (m, 1H), 4.47 (m, 2H), 4.38 (d, 1H), 4.17 (br, s, 1H), 3.79 (m, 2H), 3.46 (m, masked by H₂O), 3.09 (m, 6H), 2.33 (m, 1H), 2.01 (m, 6H), 1.89 (br, s, 8H), 1.75 (m, 4H), 1.47 (d, 6H), 1.40 (d, 3H), 1.20 (d, 6H), 1.12 (d, 9H), 1.05 (d, 3H);
(e) a ¹³C-NMR spectrum in CDCl₃/MeOD (4:1) exhibiting principal signals at 186.6 (s); 177.9 (s); 173.9 (s); 170.1 (s); 159.3 (s); 156.1 (s); 153.8 (s); 148.6 (s); 140.2 (s); 138.2 (s); 136.3 (s); 131.7 (s); 129.5 (s); 126.7 (d); 126.3 (s); 124.8 (d); 124.3 (d); 120.3 (d); 119.6 (s); 119.3 (s); 108.7 (d); 104.4 (s); 102.8 (d); 102.7 (d); 100.8 (d); 99.1 (d); 80.0 (d); 79.7 (d); 79.5 (d); 77.4 (s); 77.2 (d); 76.5 (d); 76.0 (d); 74.5 (d); 74.3 (d); 74.2 (d); 70.5 (d); 68.3 (d); 67.9 (d); 63.2 (d); 62.4 (d); 49.4 (d); 37.4 (t); 32.3 (d); 31.7 (t); 30.5 (t); 29.6 (t); 20.3 (q); 18.3 (q); 17.93 (q); 17.89 (q); 17.8 (q); 16.3 (q);
(f) exhibiting in silica gel thin layer chromatography an R_f value of 0.30 with the solvent system CHCl₃/MeOH (4:1);
(g) exhibiting a high performance liquid chromatography retention time of 5.5 minutes with a C₁₈ reversed phase silica gel column and the solvent system 0.1M NH₄OAc:THF:MeOH (4:5:1 v/v); and

(h) which is effective in inhibiting the growth of P388 leukemia in mice.

5,087,568
PROCESS FOR PREPARATION OF SUPEROXIDE DISMUTASE

Kiyoshi Fukui; Fumio Kubo, both of Ube, and Masayuki Watanabe, Ogori, all of Japan, assigns to UBE Industries, Ltd., Yamaguchi, Japan

Filed Feb. 11, 1988, Ser. No. 155,157
Claims priority, application Japan, Feb. 14, 1987, 62-31928
Int. Cl.⁵ C12N 9/02

U.S. Cl. 435—189 3 Claims
1. A process for producing recombinant human Cu, Zn-superoxide dismutase, which comprises contacting a solution of recombinant human Cu,Zn-superoxide dismutase free from copper or containing less than 2 gram atoms of copper per molecule of superoxide dismutase, with a copper salt in the presence of β -mercaptoethanol, and recovering the obtained recombinant human Cu,Zn-superoxide dismutase from the resultant reaction mixture.

5,087,569

ANTIMICROBIAL PROTEINS, COMPOSITIONS CONTAINING SAME AND USES THEREOF
Joelle E. Gabay, New York, and Carl F. Nathan, Larchmont, both of N.Y., assigns to Cornell Research Foundation, Inc. and The Rockefeller University, Ithaca, N.Y.
Continuation-in-part of Ser. No. 106,525, Oct. 6, 1987, which is a continuation-in-part of Ser. No. 935,509, Nov. 26, 1986, abandoned. This application Nov. 25, 1987, Ser. No. 125,684
Int. Cl.⁵ C12N 9/50; C07K 15/00; A61K 37/54

U.S. Cl. 435—212 2 Claims
1. A purified polypeptide having an apparent molecular weight of about 29,000 daltons, said polypeptide being the polypeptide present in peak 6 of FIG. 13A.

5,087,570

HOMOGENEOUS MAMMALIAN HEMATOPOIETIC STEM CELL COMPOSITION
Irving L. Weissman, 662 Mirada Ave., Stanford, Calif. 94305; Gerald J. Spangrude, c/o Dr. Roland Scollay, The Walter & Eliza Hall Institute P.O. Royal Melbourne Hospital, VIC 3050, Australia; Christa Muller-Sieburg, 3672 Clairmont Dr., San Diego, Calif. 92117, and Shelly Heimfeld, 700 Hermosa Way, Menlo Park, Calif. 94025
Filed May 10, 1988, Ser. No. 192,378
Int. Cl.⁵ A01N 1/02; C12N 5/02; C12P 21/00; A61K 39/00
U.S. Cl. 435—240.1 7 Claims

1. A cell composition consisting essentially of as the cellular population viable murine hematopoietic Sca-1+ stem cells from a genetically identical or congenic source.
3. A method for preparing a cell composition according to claim 1, said method comprising:
(1) separating a bone marrow cell population into a population characterized by T-cell markers, high levels of the thy-1 differentiation marker and markers of major cell populations of dedicated hematopoietic cells and a substantially T-cell free low level thy-1 population also substantially free of markers of major cell populations of dedicated hematopoietic cells by means of T-cell markers, thy-1 differentiation markers and dedicated hematopoietic cell markers to provide a substantially T-cell free, low level thy-1 differentiation marker population also lacking markers characteristic of major cell populations of dedicated hematopoietic cells for use in the next step,
(2) separating said bone marrow cell population of (1) into cells that bind to the Sca-1 antibody and those that do not bind, wherein said cells which bind to the Sca-1 antibody are a substantially homogeneous population of stem cells.

5,087,571

METHOD FOR PROVIDING A CELL CULTURE FROM A TRANSGENIC NON-HUMAN MAMMAL
Philip Leder, Chestnut Hill, Mass., and Timothy A. Stewart, San Francisco, Calif., assigns to President and Fellows of Harvard College, Cambridge, Mass.
Division of Ser. No. 623,774, Jun. 22, 1984, Pat. No. 4,736,866.
This application Mar. 22, 1988, Ser. No. 171,806
Int. Cl.⁵ C12N 5/00

U.S. Cl. 435—240.2 2 Claims
1. A method of providing a cell culture comprising
(1) providing a transgenic non-human mammal, all of whose germ cells and somatic cells contain a recombinant activated oncogene sequence introduced into said mammal, or an ancestor of said mammal, at an embryonic stage; and
(2) culturing one or more of said somatic cells.

5,087,572

DNA ENCODING HUMAN PLASMINOGEN MODIFIED AT THE CLEAVAGE SITE
Francis J. Castellino, Granger, Ind., and Deborah L. Higgins, San Carlos, Calif., assigns to Genentech, Inc., South San Francisco, Calif.
Filed Dec. 1, 1989, Ser. No. 444,584
Int. Cl.⁵ C12N 15/57, 15/00, 5/10, 1/21, 1/19

U.S. Cl. 435—240.2 12 Claims
1. A nucleic acid sequence encoding a human plasminogen variant having the arginine residue at position 561 of native-sequence plasminogen replaced with a different amino acid, which variant is incapable of cleavage to its two-chain plasmin form and, when in a binary complex with streptokinase, is capable of activating native plasminogen.

5,087,573

MONOCLONAL ANTIBODY AGAINST BONE ALKALINE PHOSPHATASE
H. Clarke Anderson, Shawnee Mission, Kans., and Kensaku Masuhara, Kobe, Japan, assigns to University of Kansas, Kansas City, Kans.
Filed Mar. 2, 1988, Ser. No. 162,995
Int. Cl.⁵ C12N 5/20; C07K 15/28

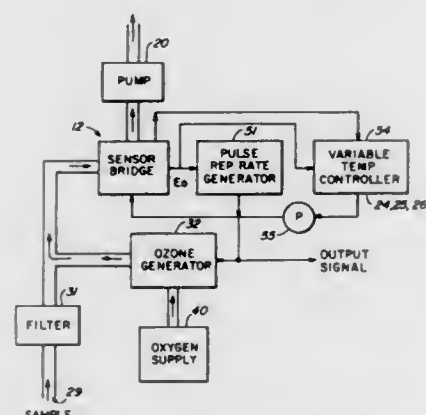
U.S. Cl. 435—240.27 7 Claims
1. A monoclonal antibody capable of immunologically distinguishing between different human tissue isoenzymes of alkaline phosphatase wherein said monoclonal antibody is 1E10.1 which specifically binds to human bone alkaline phosphatase but does not bind to human liver alkaline phosphatase and is produced by the hybridoma having ATCC accession number HB 9660.

5,087,574

FLUID COMPONENT DETECTION METHOD WITH FEEDBACK
William E. Bell, and John J. McNeerney, both of Jerome, Ariz., assigns to Arizona Instrument Corp., Tempe, Ariz.
Division of Ser. No. 146,149, Jan. 21, 1988, Pat. No. 5,010,021, which is a division of Ser. No. 735,485, May 20, 1985, Pat. No. 4,724,008, which is a continuation-in-part of Ser. No. 529,578, Sep. 6, 1983, abandoned. This application Jun. 11, 1990, Ser. No. 536,166
Int. Cl.⁵ G01N 33/00

U.S. Cl. 436—120 1 Claim
1. A method of detecting the presence of a selected component in a fluid mixture which comprises the steps of:
selectively absorbing the component from the mixture onto a thin layer of material having a chemical affinity for the component to produce a reaction to affect a change in an electrical parameter of the layer;
sensing the electrical parameter of the layer to derive an output;
adding ozone to the fluid mixture in response to the output

to counteract the change in the electrical parameter produced by the selected component; and



measuring the amount of the ozone fed back to counteract the effect of the selected component to derive a measure of the selected component.

5,087,575 COMPOSITION FOR DETERMINING TRACE AMOUNT OF PROTEIN

Arthur L. Y. Lau, Granger, Ind., assignor to Miles Inc., Elkhart, Ind.

Division of Ser. No. 202,552, Jun. 6, 1988, Pat. No. 4,960,710. This application May 7, 1990, Ser. No. 520,072

Int. Cl.⁵ G01N 33/48 U.S. Cl. 436—166 10 Claims

1. A composition capable of exhibiting a sufficient color transition upon contacting a protein-containing liquid test sample to show the presence and/or concentration of protein in the test sample at protein concentration levels in the range of 0-2000 mg/dL, said composition consisting essentially of a water-soluble tungstate; a polyhydroxybenzenesulfonophthalin-type dye and/or a polyhydroxybenzenephthalin-type dye; and a nonchelating buffer to maintain the composition at an acidic pH.

5,087,576 IMPLANTATION AND ELECTRICAL ACTIVATION OF DOPANTS INTO MONOCRYSTALLINE SILICON CARBIDE

John A. Edmond, Apex, and Robert F. Davis, Raleigh, both of N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation of Ser. No. 113,561, Oct. 26, 1987, abandoned. This application May 24, 1989, Ser. No. 356,333

Int. Cl.⁵ H01L 21/265 U.S. Cl. 437—22 24 Claims

1. A method of producing an n or p-doped region of silicon carbide suitable for semiconductor electrical devices, the method comprising:

directing an ion implantation beam of dopant ions onto a monocrystalline silicon carbide substrate in which the silicon carbide is maintained at a temperature high enough to substantially prevent damage to the silicon carbide crystal lattice and to position implanted dopant ions from the ion beam in the near vicinity of substitutional lattice sites in the monocrystalline silicon carbide substrate; removing the highly conductive near surface layer from the monocrystalline silicon carbide substrate which layer results from the directed ion beams independently of the effects of maintaining the substrate at the high temperature of implantation or of the temperature of any subsequent heating and the heating the monocrystalline silicon carbide substrate to a temperature higher than the temperature at which the

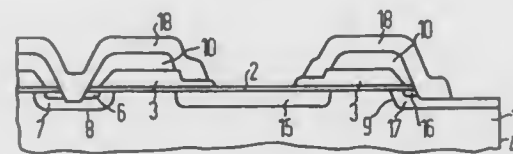
substrate is maintained during implantation while low enough to prevent silicon atoms from evaporating from the substrate in any substantial amounts, and which heating supplies sufficient kinetic energy to the implanted dopant ions to encourage the implanted dopant ions to move to and occupy substitutional lattice sites thereby electrically activating the implanted dopant ions.

5,087,577 MANUFACTURING METHOD FOR A POWER MISFET

Helmut Strack, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,588

Claims priority, application European Pat. Off., Jun. 5, 1990, 90110611.2 U.S. Cl. 437—29 6 Claims



1. A method for manufacturing a power MISFET with a semiconductor body which comprises a field of transistor cells as well as at least one field plate and at least one channel stopper, comprising the steps of:

covering the semiconductor body with a first oxide layer; covering the first oxide layer with a polysilicon layer; structuring the polysilicon layer with a first photostep; producing the transistor cells and producing edge zones lying above one another for the channel stopper; covering the semiconductor body with a second oxide layer; with a second photostep, producing through holes in the second oxide layer in a region of the transistor cells and producing an opening for contact regions at the edge zones in the second oxide layer, and producing an annular depression which surrounds the transistor cells in the polysilicon layer between the transistor cells and the edge zones;

implanting dopants which have a conductivity type opposite that of the semiconductor body into the semiconductor body through the depression with a dose which is lower than a dose employed for the transistor cells and for the edge zones;

covering the semiconductor body with a metal layer; and with a third photostep, completely interrupting the metal layer and the polysilicon layer in a region of the annular depression.

5,087,578 SEMICONDUCTOR DEVICE HAVING MULTI-LAYERED WIRING

Kazuo Endo, and Takashi Kimura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 265,354, Oct. 28, 1988, abandoned, which is a continuation of Ser. No. 42,889, Apr. 27, 1987, abandoned.

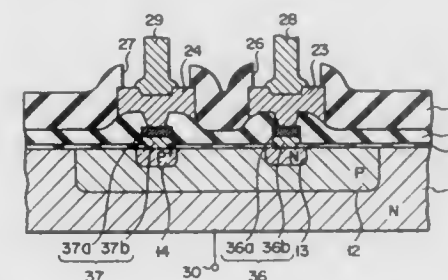
This application Oct. 11, 1989, Ser. No. 420,727

Claims priority, application Japan, Sep. 26, 1986, 61-227252 Int. Cl.⁵ H01L 21/223, 21/285

U.S. Cl. 437—31 2 Claims

1. A method of manufacturing a semiconductor device having multi-layered wiring, comprising the steps of: diffusing impurities of a first conductivity type into a surface region of a semiconductor substrate of a second conductivity type, to form a base region; diffusing impurities of the second conductivity type into a surface portion of said base region, to form an emitter region;

forming an insulation layer over the entire surface of the semiconductor substrate; forming first contact holes in said insulation layer, which correspond, in locations, to the emitter and base regions; forming a first metal layer on the insulation layer, said first metal layer including at least a metal silicide layer selected from the group consisting of MoSi, WSi, and TiSi; patterning the first metal layer formed on the insulation layer, to form first emitter and base electrodes; depositing a boron phosphor silicate glass (BPSG) layer on the insulation layer and the emitter and base electrodes, to obtain a semiconductor structure, the first metal layer having a melting point higher than that of the BPSG layer;



heat treating the semiconductor structure at a predetermined temperature, to melt the BPSG layer for making the BPSG layer substantially flat; forming second contact holes for the first base and emitter electrodes in the BPSG layer; forming a second metal layer over the entire surface of the BPSG layer; patterning the second metal layer, to form second base and emitter electrodes in contact with the first base and emitter electrodes; and bonding wires to the second base and emitter electrodes.

5,087,579 METHOD FOR FABRICATING AN INTEGRATED BIPOLAR-CMOS CIRCUIT ISOLATION FOR PROVIDING DIFFERENT BACKGATE AND SUBSTRATE BIAS

Stephen R. Tomassetti, Lewisville, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 336,162, Apr. 11, 1989, which is a continuation of Ser. No. 55,480, May 28, 1987, Pat. No. 4,825,275. This application Jun. 29, 1990, Ser. No. 546,461 The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.⁵ H01L 21/265 U.S. Cl. 437—31 15 Claims



1. A method for fabricating a bipolar-CMOS circuit, comprising the steps of: forming a bipolar transistor in a semiconductor substrate; forming a CMOS circuit comprising a MOS transistor of a first conductivity type and a MOS transistor of a second conductivity type in the substrate, said MOS transistor of the second conductivity type having a backgate; electrically isolating the MOS transistor of the second conductivity type from the substrate by forming a semiconductor isolation ring around said MOS transistor of the second conductivity type;

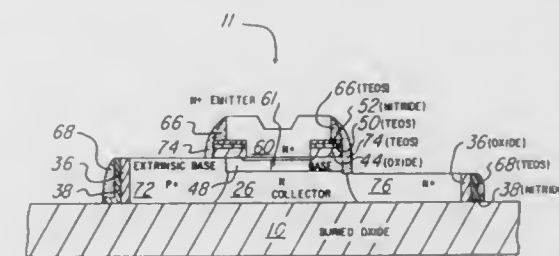
forming a connection to the substrate for connection thereof to a voltage source; and forming a different connection to the isolated MOS transistor of the second conductivity type for providing a backgate bias to the MOS transistor of the second conductivity type, said backgate bias being of a different magnitude than said voltage source, whereby the substrate can be biased with a voltage different than a voltage applied to the backgate of said MOS transistor of the second conductivity type.

5,087,580 SELF-ALIGNED BIPOLAR TRANSISTOR STRUCTURE AND FABRICATION PROCESS

Robert H. Eklund, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 17, 1990, Ser. No. 583,422

Int. Cl.⁵ H01L 21/265 U.S. Cl. 437—31 5 Claims



1. A process of forming a vertical, fully self-aligned bipolar transistor on a single-crystal silicon surface, said process comprising:

a. forming an oxide surface on said silicon surface; b. opening an emitter contact region in said oxide surface; c. depositing a layer of poly; d. applying and patterning an etch resist on said poly, thereby providing an exposed portion of said poly; e. etching said exposed portion of poly using said oxide surface as an etch stop, said etching thereby forming an emitter contact of unetched poly; f. etching an extrinsic collector portion of said silicon surface to provide a recessed region; g. forming a collector-side emitter sidewall and a base-side emitter sidewall on said emitter contact; h. forming an extrinsic base, using said base-side emitter sidewall to align said extrinsic base to said emitter contact; and i. forming an extrinsic collector in said recessed region using said collector-side emitter sidewall to align said extrinsic collector to said emitter contact, wherein the method utilizes etching an extrinsic collector portion of said silicon surface but not an extrinsic base portion, thereby forming a recessed extrinsic collector.

5,087,581 METHOD OF FORMING VERTICAL FET DEVICE WITH LOW GATE TO SOURCE OVERLAP CAPACITANCE

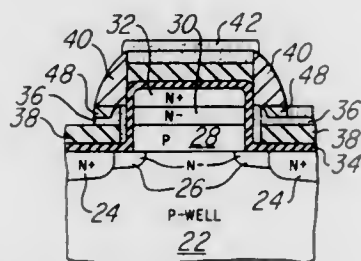
Mark S. Rodder, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1990, Ser. No. 606,674

Int. Cl.⁵ H01L 21/265 U.S. Cl. 437—41 12 Claims

1. A method of forming a vertical MOSFET device on a semiconductor substrate, the device having a pillar on the substrate, with the pillar having a channel region in a lower portion and with the channel region having a top and a highly doped first source/drain region in an upper portion of the pillar, and with the substrate having a highly doped second source/drain region and with a gate insulator on the substrate and on the pillar; said method comprising:

- a. isotropically forming a first gate electrode material layer on said pillar and said substrate;
- b. anisotropically etching said first gate electrode material leaving a vertical portion of said first gate electrode material on sidewalls of said pillar;



- c. anisotropically depositing an insulating spacer adjacent to a portion of said first gate electrode material; and
- d. conformally depositing a second gate electrode material layer at least a portion of which is over at least a portion of said insulating spacer.

5,087,582

MOSFET AND FABRICATION METHOD

Richard N. Campbell, Cwmbran; Michael K. Thompson, Newport, and Robert P. Haase, Cwmbran, all of United Kingdom, assignors to Immos Limited, Bristol, England

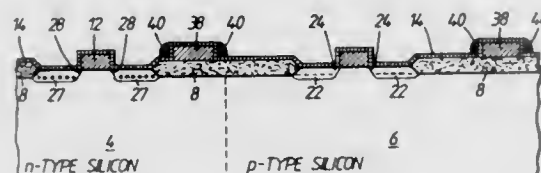
Filed Aug. 21, 1989, Ser. No. 396,844

Claims priority, application United Kingdom, Aug. 24, 1988, 8820058

Int. Cl.⁵ H01L 21/265

U.S. Cl. 437-41

3 Claims



1. A method of fabricating complementary p-channel and n-channel MOSFETs, the method comprising the steps of:

- (a) providing gate electrodes for complementary p-channel and n-channel MOSFETs, each gate electrode being located on a respective oxide layer which extends over a respective region of silicon doped with respectively, an n- or p-type impurity, the gate electrodes being separated by a region of isolation oxide;
 - (b) forming on the gate electrodes and the adjacent exposed portions of the oxide layer an insulating layer which acts as a barrier to diffusion of impurities in silicon;
 - (c) forming over the insulating layer an etchable layer composed of an insulating material; and
 - (d) anisotropically etching the etchable layer to provide sidewall spacers of the etchable layer on the insulating layer and adjacent the gate electrodes;
- wherein the n-channel MOSFET is a lightly doped drain MOSFET and is fabricated by steps (e) to (i);
- (e) masking the n-regions of silicon;
 - (f) implanting an n+ type dopant impurity into the unmasked p-region of silicon, the sidewall spacers in the p-region acting to mask against implantation portions of the p-region which are located under the said sidewall spacers;
 - (g) isotropically etching the said sidewall spacers from the insulating layer;

- (h) implanting an n-type dopant impurity into the said portions of the p-regions; and
- (i) unmasking the n-region of silicon; and wherein the p-channel MOSFET is fabricated either before or after the n-channel MOSFET by steps (j) to (m);
- (j) masking the p-region of silicon;
- (k) implanting a p+ type dopant impurity into the unmasked n-region of silicon, the sidewall spacers in the n-region acting to mask against implantation portions of the n-region which are located under the said sidewall spacers;
- (l) unmasking the p-region of silicon; and
- (m) diffusing the p+ implant towards the respective gate thereby to produce a zero drain overlap p-channel MOSFET.

5,087,583

PROCESS FOR EEPROM CELL STRUCTURE AND ARCHITECTURE WITH SHARED PROGRAMMING AND ERASE TERMINALS

Emanuel Hazani, 1210 Sesame Dr., Sunnyvale, Calif. 94087

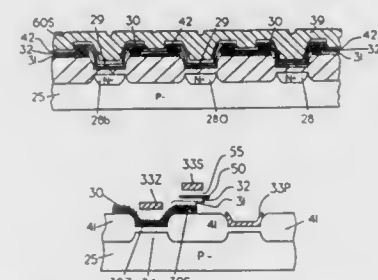
Division of Ser. No. 152,702, Jul. 7, 1989, Pat. No. 4,845,538.

This application Jul. 27, 1989, Ser. No. 385,436

Int. Cl.⁵ H01L 21/265

U.S. Cl. 437-43

19 Claims



1. A method of manufacturing a non-volatile memory transistor containing a floating gate in an array comprising:

- depositing a nitride layer on, but separated from a surface of semiconductor substrate by first insulation;
- forming first resist layer on said nitride layer and patterning said first resist into spaced apart first resist segments separated by first resist windows;
- etching said nitride layer through said first resist windows to form first nitride windows directly underneath said resist windows and extending in the direction of the semiconductor surface down to surface of said insulation thereby forming nitride segments separated by said nitride windows;
- removing said first resist to reveal said nitride segments and nitride windows;
- depositing first polycrystalline silicon layer over the entire structure;
- anisotropically etching said polycrystalline silicon in a direction perpendicular to the surface of said substrate thereby exposing the top surface of said nitride segments and forming pairs of said polycrystalline silicon segments each segment laterally extending from said nitride segment into a separate said nitride windows and having first edge connected across top surface of said polycrystalline silicon to second edge and first edge of each of said polycrystalline silicon segments positioned near said nitride segments and said second edge of a selected said polycrystalline silicon segment spaced apart from said second edge of a first adjacent polycrystalline silicon segment across a portion of said nitride window to form first opening therein;
- implanting selected impurities layer through said first opening into first portions of said semiconductor substrate thereby to simultaneously form source and drain regions each extending from and self aligned to said second edge of respective polycrystalline silicon segments;

chemically stripping said nitride segments to expose second portions of said semiconductor substrate extending from first edge of said selected polycrystalline silicon segment to first edge of a second adjacent polycrystalline silicon segment laterally extending from first source region by geometrical width of said polycrystalline silicon segment; forming a second resist pattern over said selected polycrystalline silicon segment but not on said first adjacent or said second adjacent polycrystalline silicon segment, and said second resist layer covers section of said drain region extending from said second edge of said selected polycrystalline silicon segment and said second resist layer also covers section of said second portion of said substrate extending from first edge of said selected polycrystalline silicon segment; and etching said first polycrystalline silicon layer and removing said second resist layer thereby forming a floating gate polycrystalline silicon from said selected polycrystalline silicon segment and a channel region including drain area extending laterally from said drain region to said first edge of said floating gate polycrystalline silicon and source area extending from first edge of said polycrystalline silicon floating gate to said source region.

5,087,584

PROCESS FOR FABRICATING A CONTACTLESS FLOATING GATE MEMORY ARRAY UTILIZING WORDLINE TRENCH VIAS

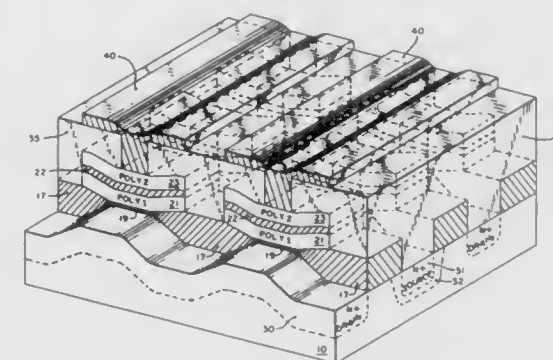
Glen N. Wada, Fremont, and Murray L. Trudel, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 30, 1990, Ser. No. 516,161

Int. Cl.⁵ H01L 21/265, 21/76

U.S. Cl. 437-43

30 Claims



1. A process for fabricating an array of floating gate memory cells in a p-type silicon substrate comprising the steps of: forming field oxide regions in said substrate which define the channel regions of said cells;
- forming gate oxide regions over said substrate between said field oxide regions;
- depositing a first polysilicon layer over said substrate;
- forming a dielectric layer over said polysilicon layer;
- depositing a second polysilicon layer over said dielectric layer;
- etching said second polysilicon, said dielectric and said first polysilicon layers to form a plurality of island members over said gate oxide regions, each of said island members comprising said dielectric layer sandwiched between said first and said second polysilicon layers, and each of said island members being associated with one of said cells in said array, said island members being separated from each other by trenches wherein said first polysilicon layer comprises the floating gate members and said second polysilicon layer comprises the control gate members of said cells;
- introducing n-type dopants into said substrate to form spaced-apart source/drain regions adjacent to said channel regions of said cells;

filling said trenches with an insulating material by: depositing an insulative layer over said substrate to fill said trenches and cover said island members; masking said insulative layer; etching said insulative layer to form a plurality of elongated, parallel, spaced-apart openings in said insulative layer over said control gate members; and forming a plurality of wordlines across said array, said wordlines making electrical contact to said control gate members associated with a row of said cells.

5,087,585

METHOD OF STACKING SEMICONDUCTOR SUBSTRATES FOR FABRICATION OF THREE-DIMENSIONAL INTEGRATED CIRCUIT

Yoshihiro Hayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

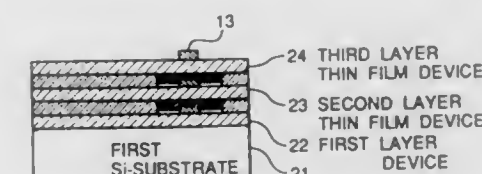
Filed Jul. 11, 1990, Ser. No. 551,095

Claims priority, application Japan, Jul. 11, 1989, 1-179268

Int. Cl.⁵ H01L 21/98

U.S. Cl. 437-51

6 Claims



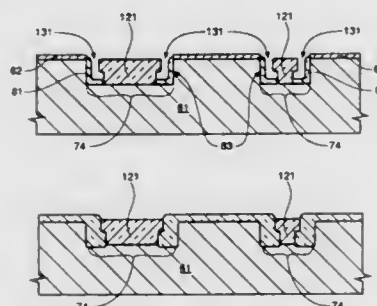
1. A semiconductor substrate stacking method comprising the steps of:

- preparing first and second thin film devices each in the form of a thin film having an upper surface connection electrode formed on an upper surface thereof and an undersurface connection electrode formed on an undersurface thereof, each of the thin film devices being bonded at its upper surface thereof to a support plate by adhesive;
- stacking and bonding the first thin film device onto a base substrate having a device formed thereon and a connection electrode formed on the device, in such a manner that the device formed on the base substrate faces the undersurface of the first thin film device and the connection electrode formed on the device formed on the base substrate is in alignment with and in contact with the undersurface connection electrode formed on the first thin film device;
- removing the support plate and the adhesive of the first thin film device so that the upper surface of the first thin film device and the upper surface connection electrode formed on the upper surface of the first thin film device are exposed;
- stacking and bonding the second thin film device onto the first thin film device stacked on the base substrate, in such a manner that the device formed on the first thin film device faces the undersurface of the second thin film device and the upper surface connection electrode formed on the device formed on the first thin film device is in alignment with and in contact with the undersurface connection electrode formed on the second thin film device; and
- removing the support plate and the adhesive of the second thin film device so that the upper surface of the second thin film device and the upper surface connection electrode formed on the upper surface of the second thin film device are exposed.

5,087,586
PROCESS FOR CREATING FULLY-RECESSED FIELD ISOLATION REGIONS BY OXIDIZING A SELECTIVELY-GROWN EPITAXIAL SILICON LAYER
 Hiang C. Chan, and Pierre C. Fazan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
 Filed Jul. 3, 1991, Ser. No. 725,139
 Int. Cl.⁵ H01L 21/76

U.S. Cl. 437-72

9 Claims



1. A process for creating fully-recessed field isolation regions within the substrate of a substantially planar silicon wafer, said process comprising the following sequence of steps:
 - a) creating a first pad oxide layer on the upper surface of the wafer;
 - b) depositing a silicon nitride layer on top of the first pad oxide layer;
 - c) creating a photoresist mask on the upper surface of the wafer which covers future active areas and exposes future field oxide regions;
 - d) performing an anisotropic plasma etch which removes portions of the first pad oxide layer and first nitride layer in unmasked regions of the wafer, and also etches the substrate in said unmasked regions to create recessed substrate regions in the future field oxide regions, said recessed regions having substantially vertical sidewalls and substantially horizontal floors;
 - e) removing the photoresist mask;
 - f) creating a second pad oxide layer on exposed silicon within the recessed substrate regions;
 - g) blanket depositing a second nitride layer;
 - h) performing a second anisotropic etch which creates silicon nitride spacers on the substantially vertical sidewalls of said recessed regions, clears the floors of silicon nitride and silicon dioxide, and leaves said first nitride layer on top of the future active areas essentially intact;
 - i) growing an epitaxial silicon layer within the recessed regions;
 - j) thermally oxidizing the epitaxially-grown silicon layer to create field oxide plugs within the recessed regions;
 - k) removing all remaining silicon nitride, thus creating substantially vertical voids around the peripheries of the field oxide plugs; and
 - l) filling the voids with silicon dioxide.

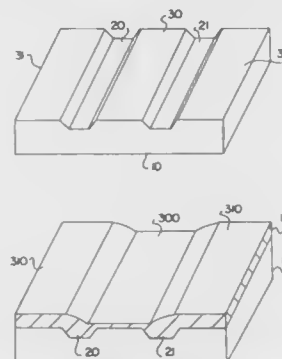
5,087,587
EPITAXIAL GROWTH PROCESS FOR THE PRODUCTION OF A WINDOW SEMICONDUCTOR LASER
 Taiji Morimoto, Nara; Shigeki Maei, Tenri; Hiroshi Hayashi, Kyoto, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
 Filed Feb. 9, 1987, Ser. No. 12,249
 Claims priority, application Japan, Feb. 13, 1986, 61-31646; Feb. 17, 1986, 61-33146
 Int. Cl.⁵ H01L 21/20

U.S. Cl. 437-129

1 Claim

1. An epitaxial growth process the production of a semiconductor laser device comprising forming striped channels having a width of 10 microns and a depth of 1 micron facing each other at an interval of 40 microns in parallel on the growth

surface of a substrate by etching and growing a crystal layer on the substrate by liquid phase epitaxy, and controlling the growth rate of that portion of the crystal layer which is positioned between or surrounded by said striped channels so that



the portion of the crystal layer is substantially flat and a portion of the epitaxially growing layer between and surrounded by the striped channels is thinner than the portions of the epitaxially grown layer in the other areas than between the striped channels.

5,087,588
METHOD OF MAKING A SIDE WALL CONTACT WITH REACTIVE ION ETCHING

Masahiro Shimizu, and Katsuhiko Tsukamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

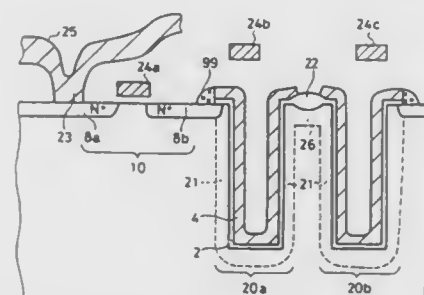
Continuation of Ser. No. 511,818, Apr. 18, 1990, which is a continuation of Ser. No. 350,822, May 12, 1988, abandoned, which is a division of Ser. No. 146,384, Jan. 21, 1988, abandoned.

This application Jul. 5, 1990, Ser. No. 548,335
 Claims priority, application Japan, Feb. 13, 1987, 62-32002

Int. Cl.⁵ H01L 21/70

U.S. Cl. 437-191

1 Claim



1. A method of manufacturing a semiconductor device, comprising:
 - forming a first insulating layer on the main surface of a substrate made of a material having an impurity of a certain conductivity type;
 - forming a first conductor layer on said first insulating layer above only a portion of the major surface of said substrate;
 - forming a second insulating layer above a remaining portion of the first insulating layer on the major surface of said substrate and above said first conductor layer;
 - removing a portion of said first and second insulating layers adjacent a sidewall of said first conductor layer to expose said substrate;
 - forming a second conductor layer on said exposed surface of said substrate and above said first conductor layer and said remaining portion of said substrate;
 - reactive ion etching said second conductor except at a re-

gion above said exposed portion of said substrate to form a sidewall contact; and
 removing said second insulating layer.

5,087,589
SELECTIVELY PROGRAMMABLE INTERCONNECTIONS IN MULTILAYER INTEGRATED CIRCUITS

Glenn H. Chapman, Bedford, and Terry O. Herndon, Carlisle, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

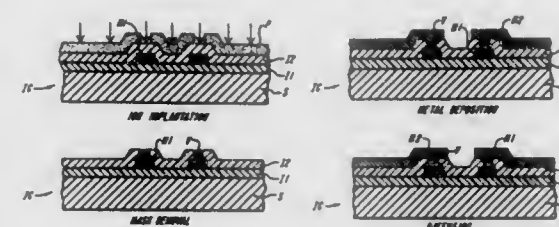
Continuation-in-part of Ser. No. 194,720, May 23, 1988, Pat. No. 4,843,034, which is a continuation-in-part of Ser. No. 61,885, Jun. 12, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 371,587

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.⁵ H01L 21/44

U.S. Cl. 437-195

25 Claims



1. A method for selectively activating interlayer conductive paths in an integrated circuit structure, the method comprising the steps of:

- depositing an insulative layer upon a lower element of an integrated circuit structure;
- implanting ions into at least one region of the insulative layer;
- depositing an upper layer of conductive material over the implant region of the insulative layer; and
- selectively applying energy to at least one of said implant regions of said integrated circuit structure to locally diffuse material from the upper conductive layer into the selected region of the insulative layer, thereby forming a discrete conductive path in the selected region between the upper conductive layer and the lower element.

5,087,590
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Hitoshi Fujimoto; Hisao Masuda; Shuichi Osaka, all of Itami, and Noriaki Uwagawa, Kikuchi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 24, 1989, Ser. No. 426,004
 Claims priority, application Japan, Jun. 28, 1989, 1-163664
 Int. Cl.⁵ H01L 21/60

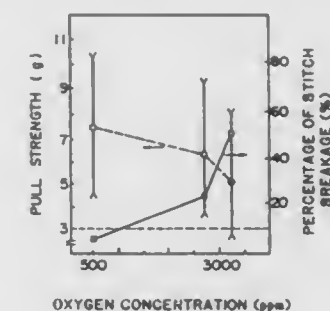
U.S. Cl. 437-209

12 Claims

1. A method of manufacturing semiconductor devices comprising:

- bonding a semiconductor pellet having electrodes to a die pad of an unplated copper-alloy lead frame with a resin;
- curing said resin by heating said lead frame, resin, and semiconductor pellet in a non-oxidizing atmosphere having an oxygen concentration of no more than 1000 ppm;
- reducing the thickness of an oxide film formed on the surface of said lead frame during the curing of said resin in a deoxidizing atmosphere having an oxygen concentration of no more than 500 ppm;
- transferring said lead frame with the reduced thickness oxide film to a deoxidizing atmosphere having an oxygen concentration at the surface of said lead frame of no more than 3000 ppm; and
- wire-bonding wires between said electrodes of said semicon-

ductor pellet and leads of said lead frame within 12 seconds of transfer of said lead frame to the deoxidizing

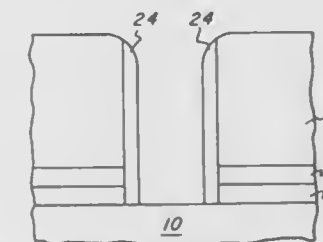


atmosphere having an oxygen concentration at the surface of said lead frame of no more than 3000 ppm.

5,087,591
CONTACT ETCH PROCESS
 Clarence W. Teng, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
 Continuation of Ser. No. 936,958, Dec. 1, 1986, abandoned, which is a division of Ser. No. 693,482, Jan. 22, 1985, abandoned.
 This application Mar. 16, 1988, Ser. No. 169,078
 Int. Cl.⁵ H01L 21/302

U.S. Cl. 437-225

26 Claims



1. A method for fabricating integrated circuits, comprising the steps of:

- (a) providing over a partially fabricated integrated circuit structure a conformal dielectric layer, a conformal intermediate layer over said conformal dielectric layer, and a planarizing layer over said intermediate layer;
- (b) i. providing a masking layer above said planarizing layer to define contact holes in predetermined locations, ii. selectively etching said planarizing layer in accordance with said masking layer to open a plurality of contact holes each having a portion of said intermediate layer exposed at the bottom thereof, iii. selectively etching away said exposed portions of said intermediate layer from said bottoms of said contact holes to expose said conformal dielectric layer at said bottoms of said holes, and iv. selectively etching away said exposed portions of said conformal dielectric layer from said bottoms of said holes to expose underlying portions of said partially formed integrated circuit structures; and
- (c) providing a patterned conductive layer to interconnect said contact holes to configure a predetermined electrical circuit.

5,087,592
METHOD OF PRODUCING PLATELETS OF BORIDES OF REFRACTORY METALS
 Sadashiv K. Nadkarni, Lexington, Mass., assignor to Alcan International Limited, Montreal, Canada
 Filed May 25, 1990, Ser. No. 528,856
 Int. Cl.⁵ C04B 35/58; C01B 35/04, 6/13, 35/00
 U.S. Cl. 501—96 21 Claims



1. A method of producing substantially unagglomerated particles of borides of refractory metals, which method comprises:

reacting an oxide of said refractory metal or a precursor thereof with carbon or a precursor thereof and B₂O₃ or a precursor thereof, at an elevated temperature below about 1800° C. in the presence of an alkali metal oxide or a precursor thereof in an amount sufficient for at least some of said particles to be in the form of platelets.

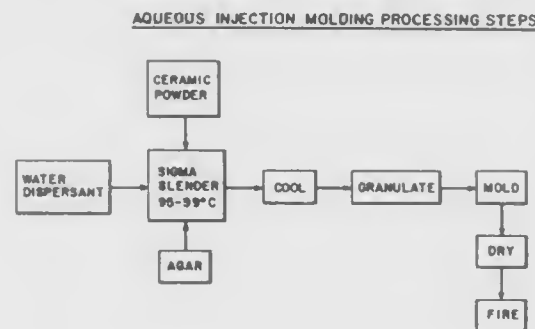
5,087,593
PREPARATION OF TITANIUM NITRIDE FROM ORGANOMETALLIC PRECURSORS
 Chaitanya K. Narula, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
 Filed Dec. 10, 1990, Ser. No. 625,180
 Int. Cl.⁵ C04B 35/58 20 Claims

1. A process for preparing titanium nitride, consisting essentially of the steps of:
 (A) contacting a titanium tetrahalide with at least one disilazane, at a temperature and for a period of time sufficient to prepare a titanium-containing organometallic precursor; and
 (B) heating the precursor to a temperature and for a period of time sufficient to pyrolyze the precursor.

5,087,594
CERAMIC MATERIAL FOR INJECTION MOLDING AND METHOD OF INJECTION MOLDING USING THE SAME
 Shigeki Kato, Nagoya, and Katsuhiko Inoue, Ama, both of Japan, assignors to NGK Insulators, Ltd., Japan
 Filed Dec. 22, 1989, Ser. No. 454,894
 Claims priority, application Japan, Dec. 24, 1988, 63-326929
 Int. Cl.⁵ C04B 35/58, 35/48 10 Claims

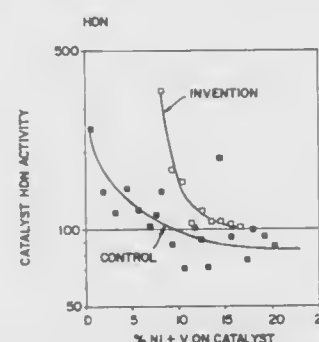
1. A ceramic material for injection molding comprising a composition of 48–60 vol % of ceramic powder, and 52–40 vol % of organic binder, said organic binder consisting of 3–15 wt % of an organic binder of an average molecular weight of 10,000–50,000, and 85–97 wt % of at least one organic binder of an average molecular weight of 200–1,000; wherein said ceramic material is injection molded in a molding die at an injection condition of 55°–95° C. of said ceramic material and 40°–52° C. of said die.

5,087,595
INJECTION MOLDING OF ZIRCONIA OXYGEN SENSOR THIMBLES BY AN AQUEOUS PROCESS
 Gary B. Marsh, Pittstown; Anthony J. Fanelli; Joan V. Burlew, both of Rockaway, and Clifford P. Ballard, Lebanon, all of N.J., assignors to Allied-Signal, Inc., Morristownship, Morris County, N.J.
 Continuation-in-part of Ser. No. 553,505, Jul. 18, 1990, abandoned. This application Jun. 25, 1991, Ser. No. 720,548
 Int. Cl.⁵ C04B 35/48 22 Claims



1. A method of forming the ceramic element in a zirconia oxygen sensor, comprising the steps of:
 a) forming a mixture comprising
 1) ZrO₂ and a stabilizer selected from the element group consisting of oxides of Y, Ce, Mg, Ca and mixtures thereof and having an average particle size less than or equal to 1 micron;
 2) an agaroid gel-forming material having a gel strength, measured at a temperature between 0° C. and about 22° C. on a gel consisting essentially of about 4 wt % of the gel-forming material and water, of at least about 100 g/cm²;
 3) a gel-forming material solvent; and
 b) molding the mixture at a temperature sufficient to produce said ceramic element; and
 c) sintering the ceramic element at an elevated temperature to a density of at least 5.5 g/cm³.

5,087,596
PROCESS FOR REGENERATING SPENT HEAVY HYDROCARBON HYDROPROCESSING CATALYST
 Frederick T. Clark, Wheaton, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Amoco Corporation, Chicago, Ill.
 Filed Jun. 21, 1990, Ser. No. 541,616
 Int. Cl.⁵ B01J 23/94, 38/64; C10G 45/08 9 Claims



1. A process for regenerating a metals contaminated heavy hydrocarbon hydroprocessing catalyst with a total contaminant metals buildup of greater than about 4 wt.% nickel plus vanadium based on the total weight of fresh catalyst wherein said spent catalyst prior to being deactivated by contact with a

hydrocarbon stream possessed at least 0.05 cc/g pore volume in pores having pore diameters greater than about 1200 Angstroms consisting essentially of the steps:

- partially decoking said catalyst in an initial coke-burning step wherein said catalyst is contacted with an oxygen-containing gas at a temperature ranging from about 400° F. to about 700° F.;
- incorporating at least one Group VIB metal with said partially decoked catalyst, such that said partially decoked catalyst contains from about 0.1 to about 20.0 wt.% of said Group VIB metal calculated as the oxide and based on the fresh weight of said spent catalyst; and
- decoking said Group VIB metal-containing catalyst in a final coke-burning step wherein said Group VIB metal-containing catalyst is contacted with an oxygen-containing gas at a temperature of about 600° F. to about 1400° F.

5,087,597
CARBON DIOXIDE ADSORBENT AND METHOD FOR PRODUCING THE ADSORBENT
 Orlando Leal; Carmelo Bolivar; Gonzalo Sepúlveda; Gregorio Molleja, all of Caracas; Germán Martínez, Carabobo, and León Esparragoza, Caracas, all of Venezuela, assignors to Armada de la Republica de Venezuela, San Bernardino and Universidad Central de Venezuela, Caracas, both of, Venezuela
 Filed Jul. 19, 1990, Ser. No. 554,551
 Int. Cl.⁵ B01J 20/10, 20/12, 20/22 39 Claims

1. A method for producing a reversible adsorbent having between about 2.0 and 3.0 molecules of modifying agent per square nanometer and displaying near infrared bands at 7220, 6720, 6557, 5970–5480, 5270, 4945 and 4545 cm⁻¹ for use in the removal of carbon dioxide comprising the steps of:
 providing a silica gel;
 providing a clay material;
 mixing said silica gel with said clay material to obtain a material containing between about 10 wt. % and about 30 wt. % of clay;
 forming an extruded solid material from said silica gel-clay material; and
 treating said extruded solid material in a solution containing a surface modifying agent so as to modify chemically the surface of said extruded solid material and thereby form said reversible adsorbent for removing carbon dioxide.

5,087,598
METHOD FOR PRODUCTION OF PILLARED CLAY
 Kenzi Suzuki, Aichi, and Toshiaki Mori, Yokkaichi, both of Japan, assignors to Agency of Industrial Science and Ministry of International Trade & Industry, both of Tokyo, Japan
 Filed Aug. 17, 1989, Ser. No. 394,969
 Claims priority, application Japan, Aug. 22, 1988, 63-207526
 Int. Cl.⁵ B01J 21/16, 20/12 15 Claims

1. A method for the production of a pillared clay containing a desired amount of pillars, comprising the steps of:
 heating a given clay structured of silicate layers and containing at least one cation species having a radius of not more than 1.4 Å to a temperature sufficient to cause fixation of a reduced amount of the original amount of cations in the clay between said silicate layers, thereby changing the cation exchange capacity possessed by said clay; and
 treating said clay with a cationic oligomer, as a pillar precursor, thereby inducing ion exchange between the cations of the clay and the cations of said precursor.
 2. The method according to claim 1, wherein said clay is a smectite compound.
 3. The method according to claim 1, wherein the cations of said clay are a member selected from the group consisting of H, Na, Mg, Al, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, Sr, Y, Zr,

Mo, Ru, Rh, Pd, Ag, Sn, Ba, rare earth elements, Hf, Ta, W, and Pt.

5,087,599
NICKEL/SILICA CATALYSTS AND THEIR PREPARATION
 Martha J. P. Botman, Berkel en Rodenrijs; Peter Nootenboom, Oud-Beyerland; Johannes C. Oudejans, Zevenaar, and Dirk Verzijl, Barendrecht, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands
 Filed Dec. 21, 1988, Ser. No. 287,226
 Claims priority, application European Pat. Off., Dec. 21, 1987, 87202585.3 4 Claims

1. A process for preparing a nickel/silica catalyst which optionally contains cations of a lower Group II metal by continuously precipitating nickel ions from an aqueous salt solution optionally together with X-ions with an excess alkaline precipitating agent in a stirred reactor with a residence time between 20 and 120 seconds followed by continuous addition of an aqueous silicate solution in a second reactor, collecting, drying and reducing of the precipitate characterized in that the residence time of suspension when adding the aqueous silicate solution is between 60 and 240 seconds, the resulting catalyst being characterized in that the reduced catalyst satisfies the following combination of features:

- a molar ratio of SiO₂/Ni=0.15–0.35
- a molar ratio of X/Ni=0–0.15
- an active nickel surface area above 120 m²/g
- a BET surface area of which at least 40% is found with pores with a radius above 2.5 nm and wherein the catalyst also contains at least 50% of nickel, the catalyst being characterized by a pore volume of at least 0.35 ml/g, a selectivity by hydrogenation of soya bean oil leading to an N₃₀ and N₃₅ below 7 and below 1%, respectively and a selectivity by hydrogenation of fish oil providing a melting point of below 32° C. for the hydrogenated fish oil.

5,087,600
PROCESS FOR PRODUCING A CATALYST FOR DENITRATION BY CATALYTIC REDUCTION USING AMMONIA
 Yasuyoshi Kato; Kunihiko Konishi; Hiroshi Akama; Toshiaki Matsuda, and Nobue Teshima, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 201,536, Jun. 2, 1988, Pat. No. 4,966,882. This application Sep. 27, 1990, Ser. No. 589,452
 Int. Cl.⁵ B01J 21/06, 23/14, 23/28, 23/30 8 Claims

1. A process for producing a catalyst for denitrating by catalytic reduction using ammonia an exhaust gas discharged from an ash-circulating boiler system in which heavy metal compounds are concentrated, the process comprising the steps of:
 mixing and kneading titanate acid or titanium oxide with a compound of metal selected from the group consisting of V, Cu, Fe and Mn in a water medium to form a resulting paste;
 drying said resulting paste;
 calcining said resulting paste to obtain a calcined material;
 grinding said calcined material to obtain a catalyst powder; and
 contacting said catalyst powder with vapor of a molybdenum compound, tungsten compound or tin compound to adsorb said compound on the catalyst powder.

5,087,601 REVERSIBLE THERMOSENSITIVE RECORDING MATERIAL

Yoshihiko Hotta, Numazu; Keishi Kubo, Yokohama; Makoto Kawaguchi, and Toru Nogiwa, both of Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,063

Claims priority, application Japan, Oct. 6, 1988, 63-252767; Dec. 6, 1988, 63-306855; Jan. 12, 1989, 1-005510; Mar. 14, 1989, 1-061586; Jun. 19, 1989, 1-156173

Int. Cl.⁵ B41M 5/28

U.S. Cl. 503—200

30 Claims



1. A reversible thermosensitive recording material comprising (i) a reversible thermosensitive recording layer which comprises a matrix resin and an organic low-molecular-weight material which is dispersed in said resin, (ii) a light reflection layer made of a metal thin film, and (iii) a transparent support interposed between said thermosensitive recording layer and said light reflection layer.

5,087,602 RECORDING MATERIAL

Toshihiko Matsushita, Tokyo, and Sadao Morishita, Ushiku, both of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,725

Claims priority, application Japan, Aug. 30, 1989, 1-224950

Int. Cl.⁵ B41M 5/155

U.S. Cl. 503—216

7 Claims

1. A recording material which comprises a normally colorless or palely colored dye precursor and a developer which causes the dye precursor to form color upon contact with the dye precursor, said developer being a copolymer of (A) a styrene monomer with (B) at least one monomer selected from the group consisting of a vinylsulfonic acid monomer, a (meth)acrylic phosphorus-containing monomer and a (meth)acrylic acid monomer.

5,087,603 HEAT-SENSITIVE RECORDING PAPER HAVING AN OVERCOAT LAYER FORMED FROM AN AQUEOUS CROSSLINKABLE RESIN DISPERSION

Masuji Izubayashi, Nishinomiya; Masatoshi Yoshida, Osaka; Toshiaki Matsunaga, Suita; Kohei Hori, Takarazuka; Tetsuo Kikuta, Nagaokakyo; Shiro Nakano, Nichinan, and Hidetoshi Hatta, Yonago, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka and Oji Paper Co., Ltd., Tokyo, both of Japan

Filed Oct. 14, 1988, Ser. No. 257,746

Claims priority, application Japan, Dec. 14, 1987, 62-314069; Dec. 14, 1987, 62-314071; Jan. 12, 1988, 63-3089; Feb. 9, 1988, 63-26674; Feb. 9, 1988, 63-26675; Feb. 29, 1988, 63-44337; Apr. 25, 1988, 63-103396; May 16, 1988, 63-117065

Int. Cl.⁵ B41M 5/18

U.S. Cl. 503—226

14 Claims

1. A heat-sensitive recording paper sheet which comprises an overcoat layer formed on a heat-sensitive color-developing layer on a supporting member, by applying a coating composition which comprises the compositions (1), (2) and (3) below; (1) an aqueous crosslinkable resin dispersion characterized by its being obtained by emulsion-polymerizing in an aqueous medium, a monomer composition (I) comprised

of 0.1%–40% by weight of at least one polymerizable monomer (a) having, within its molecule, a group reactive with a carboxyl group, and 60%–99.9% by weight of one or more other polymerizable monomers (b) including at least one organosilane monomer having, within its molecule, a polymerizable unsaturated group and at least one hydrolyzable group directly bonded to the silicon atom, the sum total of the polymerizable monomers (a) and (b) being 100% by weight, in the presence of a water-soluble or water-dispersible emulsifier or emulsifiers selected from one or both of the groups (P) or (Q) below:

(P) Polymers (IIa) having a terminal alkyl group and an acid value of not less than 200 obtained by polymerizing a polymerizable monomer composition (A) containing an unsaturated carboxylic acid as an essential component thereof, in the presence of an alkylmercaptan (B) having 6 to 18 carbon atoms and salts thereof;

(Q) Polymers (IIb) having a terminal alkyl group and an acid value of not less than 200 obtained by polymerizing a polymerizable monomer composition (A) containing an unsaturated carboxylic acid as an essential component thereof, in the presence of an alkylmercaptan (B) having 6 to 18 carbon atoms, and further reacting the resulting polymer with at least one polymerizable monomer (c) having, within its molecule, a group reactive with a carboxyl group and salts thereof;

(2) a crosslinking agent;

(3) a filler.

5,087,604 METHOD OF MANUFACTURING A SUPERCONDUCTOR

Shoji Shiga, Utsunomiya; Naoki Uno, Yokohama; Yasuzo Tanaka, Yokohama; Hiroyuki Kikuchi, Yokohama, and Kaisuke Shiroyama, Zama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 232,493, Aug. 15, 1988, abandoned.

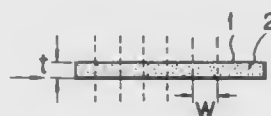
This application Feb. 28, 1990, Ser. No. 492,292

Claims priority, application Japan, Sep. 4, 1987, 62-221304

Int. Cl.⁵ H01L 39/24

U.S. Cl. 505—1

24 Claims



1. A method of manufacturing a superconductor, comprising the steps of:

filling a ceramic superconductive material into a metal container;

elongating the metal container after sealing said ceramic superconductive material therein, thereby forming an elongated mass of said ceramic superconductive material;

slitting the elongated metal container with at least two elongated slits in the longitudinal direction of the elongated metal container after said elongating step, said at least two slits each being continuous over the entire length of the elongated metal container and having a predetermined spacing therebetween thereby producing at least one slit section of the filled elongated metal container of given width, thereby separating the at least one slit section of the elongated metal container from a remainder of the elongated metal container, thereby partially exposing the ceramic superconductive material inside the at least one

slit section along substantially the entire length thereof, to an outside atmosphere;

sintering the ceramic superconductive material inside the at least one slit section of the elongated metal container after said slitting step while reacting the exposed superconductive material with oxygen in said outside atmosphere, thereby forming a sintered elongated mass.

5,087,605 LAYERED LATTICE-MATCHED SUPERCONDUCTING DEVICE AND METHOD OF MAKING

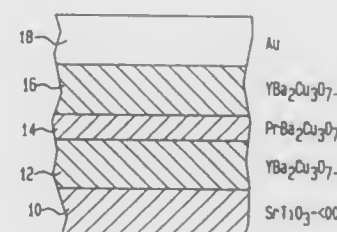
Manjanath S. Hegde, Bangalore, India; Arun Inam, Piscataway, N.J.; Charles T. Rogers, Jr., Oceanport, N.J., and Thirumalai Venkatesan, Bridgewater, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jun. 1, 1989, Ser. No. 360,090

Int. Cl.⁵ H01B 12/00; H01L 39/12, 27/12

U.S. Cl. 505—1

11 Claims



1. A superconducting device, comprising:

a substrate having a crystal structure with a substrate crystalline direction aligned in a predetermined direction with respect to a surface of said substrate;

a first layer of a first composition and having a perovskite crystal structure with a first crystalline direction deposited vertically upon said surface of said substrate, said first crystalline direction of said first layer being aligned with said substrate crystalline direction;

a second layer of a second composition and having a crystal structure with said first crystalline direction deposited vertically upon said second layer, said first crystalline direction of said second layer being aligned with said first crystalline direction of said first layer;

a third layer of a third composition and having a perovskite crystal structure with said first crystalline direction deposited vertically upon on said second layer, said first crystalline direction of said third layer being aligned with said first crystalline direction of said first layer; and

electrical contacts electrically connected to at least one of said first and third layers to form an electrical path passing through portions of said first and second compositions and therebetween across a horizontally extending interface between said first and second layers.

5,087,606 BISMUTH-CONTAINING SUPERCONDUCTORS CONTAINING RADIOACTIVE DOPANTS

Robert L. Fleischer, and Ronald H. Arendt, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 29, 1990, Ser. No. 529,814

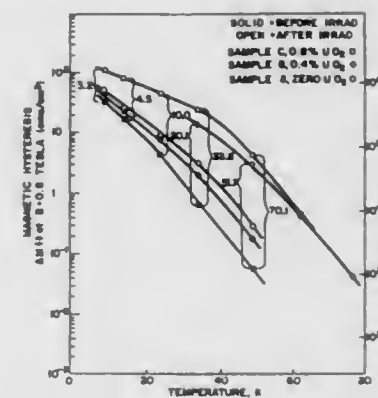
Int. Cl.⁵ H01B 12/00

U.S. Cl. 505—1

4 Claims

1. A sinterable polycrystalline doped superconductive oxide powder having a maximum particle size of about 40 microns comprising a superconductive oxide selected from the group consisting of $\text{Bi}_2\text{CaSr}_2\text{Cu}_2\text{O}_{8\pm x}$ and $\text{Bi}_{2-y}\text{Pb}_y\text{Ca}_2\text{Sr}_2\text{Cu}_3\text{O}_{10\pm z}$ in which x is from zero to 0.5, y is from 0.1 to 0.5, and z is from zero to less than 1, and sufficient fissionable atoms

selected from the group consisting of uranium-235 and plutonium-239 to produce from about 0.25×10^{14} to about 5×10^{14}



fission events per cubic centimeter upon irradiation by thermal neutrons.

5,087,607 PROCESS FOR PREPARING SUPERCONDUCTIVE THICK FILMS

Laurie A. Strom, Geneseo; Edward Carnall, Jr.; Steven A. Feranti, both of Rochester, and Jose M. Mir, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1990, Ser. No. 556,520

Int. Cl.⁵ B05D 5/12, 3/02

U.S. Cl. 505—1

41 Claims

1. A process of forming an electrical conductor on a substrate capable of withstanding processing temperatures comprising

forming on the substrate a coating of a precursor of a crystalline electrical conductor chosen from the group consisting of (a) a rare earth alkaline earth copper oxide and (b) a heavy pnictide mixed alkaline earth copper oxide and converting the precursor to the crystalline electrical conductor by heating,

characterized by the steps of

preparing a solution comprised of volatilizable aqueous solvent and, as a solute, inorganic salts forming metal-ligand compounds of each of the metals forming the crystalline electrical conductor, the proportions of the solute metals corresponding to those present in the precursor coating and the ligands being inorganic ligands chosen to be volatilizable on heating,

spraying the aqueous solution to form discrete liquid particles each containing the metals as metal-ligand compounds in proportions corresponding to those present in the precursor coating,

evaporating at least a portion of the volatilizable solvent from the ligand particles to form solid particles each containing the metals as metalligand compounds in proportions corresponding to those present in the precursor coating,

coating the solid particles together with a volatilizable liquid as a paste on the substrate,

thereafter heating the solid particles in the presence of oxygen to volatilize the ligands and form the precursor as an intermediate coating on the substrate, and

converting the intermediate coating to the crystalline electrical conductor by heating to a temperature in the range of from 900° to 1100° C. when the rare earth alkaline earth copper oxide crystalline electrical conductor is being formed and by heating to a temperature in the range of from 750° to 1000° C. when the heavy pnictide mixed alkaline earth copper oxide crystalline electrical conductor is being formed.

5,087,608
ENVIRONMENTAL PROTECTION AND PATTERNING OF SUPERCONDUCTING PEROVSKITES
 Siu W. Chan, Metuchen, and Leonilda A. Farrow, Middletown, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 28, 1989, Ser. No. 458,185
 Int. Cl.⁵ H01L 39/00

- U.S. Cl. 505—1** **10 Claims**
 1. Method for patterning a superconducting film comprising a rare earth barium cuprate which comprises the steps of:
 (a) depositing a thin film of a rare earth barium cuprate upon a substrate,
 (b) depositing a thin film consisting of a material selected from the group consisting of amorphous and diamond-like carbon upon said cuprate in a thickness ranging from 100 Å to 10 microns,
 (c) depositing a pattern of an organic film upon the carbon by photolithographic techniques,
 (d) etching the carbon film from these areas not protected by the organic film with an oxygen plasma, and
 (e) chemically etching the exposed superconducting film to leave a patterned as-deposited superconducting film covered by the carbon and organic films.

5,087,609
FORMATION OF HIGH TEMPERATURE SUPERCONDUCTOR THIN FILMS BY SOL-GEL TECHNIQUES

George E. Whitwell, Campbell Hall, and Meilyn F. Antezzo, Carmel, both of N.Y., assignors to Akzo NV, Arnhem, Netherlands

Filed Sep. 24, 1990, Ser. No. 586,656
 Int. Cl.⁵ B05D 5/12, 3/02

- U.S. Cl. 505—1** **6 Claims**
 1. A process for forming an alkoxide-derived yttrium-barium-copper oxide high temperature superconductor thin film which comprises:
 (a) forming a thin film comprising solubilized yttrium and barium alkoxides, and copper aminoalkoxide under an inert gas atmosphere, on a non-reactive substrate, the amount of the copper aminoalkoxide being used at from about 110% to about 150%, by weight, of the stoichiometric amount to compensate for losses due to volatility of the copper aminoalkoxide;
 (b) heating the thin film from (a) first in a moisture laden inert gas atmosphere, to hydrolyze the aminoalkoxide, to a temperature in excess of the formation temperature of the superconductor; and
 (c) thereafter calcining the film in an oxygen atmosphere at a higher temperature to form the high temperature superconductor thin film

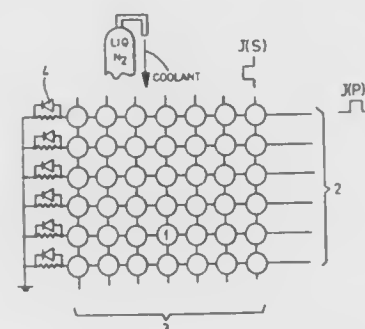
5,087,610
SWITCHABLE SUPERCONDUCTING ELEMENTS AND PIXELS ARRAYS

Aharon Z. Hed, Nashua, N.H., assignor to International Superconductor Corp., Riverdale, N.Y.

Filed Feb. 22, 1989, Ser. No. 314,427
 Int. Cl.⁵ H01B 12/00; G09G 3/20; H03K 17/92

- U.S. Cl. 505—1** **22 Claims**
 1. A multielement control or display device, comprising: an array of discrete flat, intrinsically continuous superconductive elements in mutually parallel rows and, orthogonal to said rows, in mutually parallel columns and constituting individual pixels of said array, each of said superconductive elements being composed of a material having a critical temperature below which the superconductive element is in a superconductive state and above which the superconductive element is in a nonsuperconductive state and a critical current density below which said superconductive element is in said superconductive state and above which the superconductive element is in said nonsuper-

conductive state, said superconductive elements also switching between said states upon application of a critical magnetic field, whereby applied current traversing said elements, applied temperatures of said elements and applied magnetic fields affecting said elements form state-changing parameters of said elements; and



means for selectively applying at least one of said parameters to at least selected ones of said elements to quench said selected ones of said elements to provide selected directly optically discernible patterns of said pixels of said array.

5,087,611
METHOD OF DRILLING WITH FLUID COMPRISING PEANUT HULLS GROUND TO A POWDER

Gabriel T. Forrest, Bering Place II, 800 Bering, Ste. 301, Houston, Tex. 77257

Division of Ser. No. 537,169, Jun. 12, 1990, which is a continuation of Ser. No. 233,895, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 831,850, Feb. 24, 1986, abandoned. This application Jun. 28, 1991, Ser. No. 724,539

Int. Cl.⁵ C09K 7/02

- U.S. Cl. 507—104** **7 Claims**
 7. A method of carrying out operations wherein a fluid is circulated in a well extending into the ground, comprising the steps of:
 taking peanut hulls which have been ground to a powder form,
 adding said ground peanut hulls to a fluid, and
 circulating said fluid, with said ground peanut hulls added thereto, in said well.

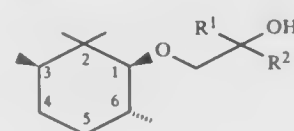
5,087,612
OXYGENATED ALICYCLIC COMPOUNDS AND THEIR USE IN PERFUMERY

Christian Chapuis, Grand-Saconnex, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Sep. 4, 1990, Ser. No. 577,408
 Claims priority, application Switzerland, Sep. 25, 1989, 3472/89; Oct. 3, 1989, 3613/89

Int. Cl.⁵ A61K 7/46

- U.S. Cl. 512—23** **21 Claims**
 1. A compound of formula



wherein

R¹ represents a hydrogen atom or a saturated, linear or branched alkyl radical having from 1 to 4 carbon atoms; and

R² designates a saturated or unsaturated, linear or branched lower alkyl radical.

12. A method to confer, enhance, improve or modify the odor properties of a perfuming composition or a perfumed article, which method comprises adding to said composition or article a fragrance effective amount of a compound of formula I as defined in claim 1.

5,087,613
HIRUDIN VARIANTS

Michael Courtney, Geudertheim; Eric Degryse, Strasbourg, and Gérard Loison, Toulouse, all of France, assignors to Transgene S.A., Courbevoie, France

Filed Mar. 8, 1989, Ser. No. 320,530

Claims priority, France, Mar. 8, 1988, 88 02925
 Int. Cl.⁵ C07K 7/10; A61K 37/64

- U.S. Cl. 514—12** **6 Claims**
 1. A hirudin variant hirudin Lys⁴⁷, Arg³³, Asp³⁵, Ser³⁶ or hirudin variant 2Lys⁴⁷, Arg³³, Asp³⁵, Ser³⁶.

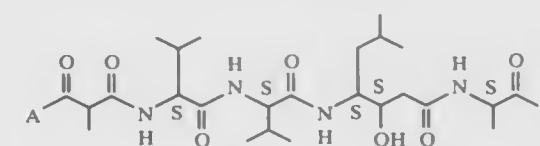
5,087,614
ENZYME INHIBITOR AND METHOD OF PRODUCING THE SAME

Mitsuru Maeda, Shiga; Tohru Kodama, Osaka; Norio Iwasawa, Osaka; Naoki Higuchi, Osaka, and Norihide Amano, Osaka, all of Japan, assignors to Suntory Limited, Osaka, Japan

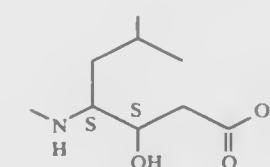
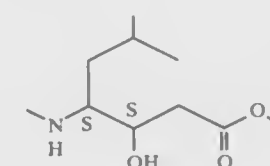
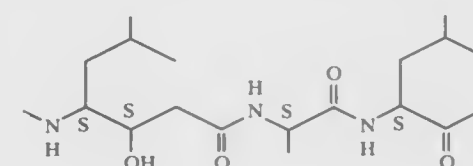
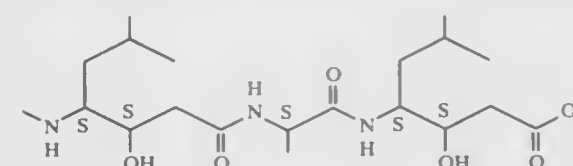
Filed Nov. 16, 1988, Ser. No. 271,965

Claims priority, application Japan, Nov. 17, 1987, 62-289995
 Int. Cl.⁵ A61K 37/02

- U.S. Cl. 514—16** **2 Claims**
 1. A compound of the general formula I:

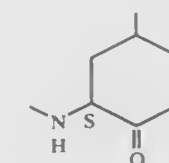


wherein A represents —OH or —O—CH₃ and B represents



-continued

or



5,087,615
NOVEL METHOD OF OVULATION INDUCTION IN HUMANS

Scott C. Chappel, Boston, Mass., assignor to Applied Research Systems ARS Holding N.V., Curacao, Netherlands

Filed Mar. 17, 1989, Ser. No. 324,949

Int. Cl.⁵ A61K 37/00, 37/24; C07K 7/10

- U.S. Cl. 514—21** **9 Claims**
 1. In a method for stimulating follicle development and ovulation in a female patient by administering FSH to said patient during the follicular phase of the ovulatory cycle, the improvement comprising initially administering a first FSH isoform having a relatively long plasma half-life and subsequently administering a second FSH isoform having a shorter plasma half-life.

5,087,616
CYTOTOXIC DRUG CONJUGATES AND THEIR DELIVERY TO TUMOR CELLS

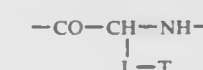
Andre E. Myers, Geneva, Switzerland, and Daniel Bichon, Thorens-Glieres, France, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Aug. 6, 1987, Ser. No. 82,244

Claims priority, application European Pat. Off., Aug. 7, 1986, 86810347

Int. Cl.⁵ A61K 37/36, 37/02; C07K 13/00
U.S. Cl. 514—21 **10 Claims**

1. A therapeutic chemical conjugate including EGF as a first moiety, and a second moiety linked covalently to the EGF, said second moiety comprising a plurality of repeating units, each unit having the structure



where L is selected from the group consisting of polyglutamic acid and polyaspartic acid, and T is selected from the group consisting of anthracycline drugs, bleomycin, melphalan, chlorambucil, cisplatin, adriamycin, daunomycin, and daunorubicin, and where said conjugate has a molecular weight of between 10,000 and 100,000 D and is effective in target cells in vivo and is internalized by tumor cells whereby the latter are inhibited or destroyed.

5,087,617
METHODS AND COMPOSITIONS FOR TREATMENT OF CANCER USING OLIGONUCLEOTIDES

Larry J. Smith, Houston, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Feb. 15, 1989, Ser. No. 311,096

Int. Cl.⁵ A61K 31/70

- U.S. Cl. 514—44** **26 Claims**
 1. A method for treating bone marrow cells from an individual having cancer prior to infusion of the bone marrow cells back into the individual, comprising the steps of:
 a) obtaining bone marrow cells from the individual; and
 b) exposing the bone marrow cells to a proliferation inhibitor

5,087,622

METHOD OF CONTROLLING T₃ AND T₄ LEVELS IN VIVO WITH COBALT PORPHYRINS

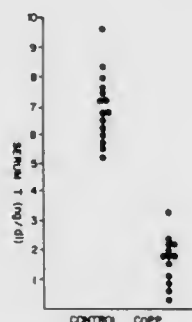
Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 310,855, Feb. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 105,591, Nov. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 927,830, Nov. 6, 1986, abandoned, which is a

continuation-in-part of Ser. No. 832,512, Feb. 21, 1986, abandoned, which is a continuation of Ser. No. 708,228, Mar. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 363,588, Mar. 30, 1982, abandoned. This application Mar. 23, 1990, Ser. No. 498,275
Int. Cl.⁵ A61K 31/40

U.S. Cl. 514—185

7 Claims



1. A method of suppressing production of thyroid hormones in animals in need of such suppression which comprises parental administration of 5 to 50 $\mu\text{m/kg}$ b.w. of cobalt protoporphyrin or cobalt mesoporphyrin which is effective to effect such suppression.

5,087,623

CHROMIC PICOLINATE TREATMENT

Herb Boynton, La Jolla, Calif., and Gary W. Evans, Puposky, Minn., assignors to Nutrition 21, San Diego, Calif.

Continuation-in-part of Ser. No. 200,390, May 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,588, Nov. 30, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 326,590

Int. Cl.⁵ A61K 31/555

U.S. Cl. 514—188

8 Claims

1. A method for reducing hyperglycemia and stabilizing the level of serum glucose in humans comprising the administration of an effective amount of a composition comprising synthetic chromic tripicolinate to a human in need thereof.

5,087,624

CHROMIC PICOLINATE TREATMENT

Herb Boynton, La Jolla, Calif., and Gary W. Evans, Puposky, Minn., assignors to Nutrition 21, San Diego, Calif.

Division of Ser. No. 326,590, Mar. 21, 1990, which is a continuation-in-part of Ser. No. 200,390, May 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,588, Nov. 30, 1987, abandoned. This application Jul. 13, 1990, Ser. No. 553,184

Int. Cl.⁵ A61K 31/555

U.S. Cl. 514—188

13 Claims

1. A method for increasing the lean body mass of a mammal in need of such increase, comprising administering to said mammal an effective, lean-body-mass increasing amount of a composition consisting essentially of chromic tripicolinate.

5,087,625

PYRIDODIAZEPINES AND THEIR USE IN THE PREVENTION OR TREATMENT OF HIV INFECTION

Karl D. Hargrave, Brookfield, Conn.; Gunther Schmidt, deceased, late of Munich, Fed. Rep. of Germany by his legal representative Margaret Schmidt; Wolfhard Engel, and Volkhard Austel, both of Biberach an der Riss, of Fed. Rep. of Germany, assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn. and Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

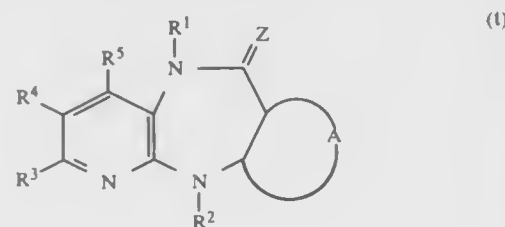
Continuation-in-part of Ser. No. 600,554, Oct. 19, 1990, which is a continuation-in-part of Ser. No. 438,922, Nov. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 372,728, Jun. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 340,937, Apr. 20, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 650,141

Int. Cl.⁵ A61K 31/55; C07D 471/04, 495/14

U.S. Cl. 514—220

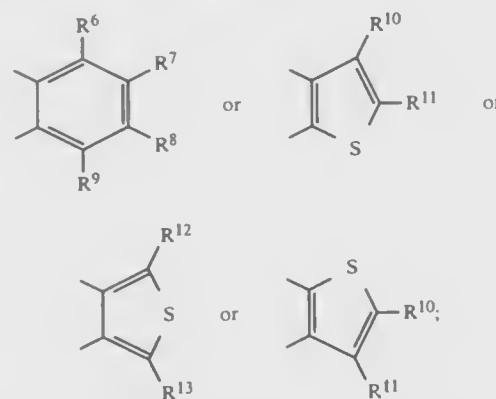
3 Claims

1. A method for preventing or treating HIV-1 infection which comprises administering, to a human exposed to or infected by HIV-1, a prophylactically or therapeutically effective amount of a compound of the formula I



wherein,

A is a fused ring of the formula



Z is oxygen, sulfur, =NCN or a group of the formula =NOR¹⁴ wherein R¹⁴ is alkyl of 1 to 3 carbon atoms;

R¹ is hydrogen, alkyl or fluoroalkyl of 1 to 4 carbon atoms, cyclopropyl, alkenyl or alkynyl of 3 to 4 carbon atoms, 2-halo-propen-1-yl, arylmethyl (wherein the aryl moiety is phenyl or thienyl, which is either unsubstituted or substituted by methyl, methoxy or halogen), acetyl, or alkoxyalkyl or alkylthioalkyl of 2 to 3 carbon atoms;

R² is alkyl or fluoroalkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 5 carbon atoms, alkenyl or alkynyl of 2 to 4 carbon atoms, alkoxyalkyl or alkylthioalkyl of 2 to 3 carbon atoms, alkanoyl of 2 to 3 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, arylmethyl (wherein the aryl moiety is phenyl, thienyl or furanyl, which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, hydroxyl or halogen), phenyl (which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, halogen or hydroxyl) or alkoxyalkylmethyl wherein the alkoxy moiety contains 1 to 5 carbon atoms; R³, R⁴ and R⁵ are each independently hydrogen, alkyl of 1 to

3 carbon atoms or chloro, with the proviso that at least one of these substituents is hydrogen or methyl; or, one of R³, R⁴ and R⁵ is butyl, alkanoyl of 2 to 4 carbon atoms, alkoxyalkyl of 2 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl moieties each contain 1 to 2 carbon atoms, halogen, trihalomethyl, hydroxyl, alkoxy of 1 to 3 carbon atoms, alkylthio of 1 to 3 carbon atoms, aryl or arylalkyl (wherein the alkyl moiety contains 1 to 3 carbon atoms, and the aryl moiety is phenyl, thienyl, furanyl, pyridyl, or imidazolyl, which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, hydroxyl or halogen), alkanoyloxy of 2 to 3 carbon atoms, alkanoylamino of 1 to 3 carbon atoms, aminoalkyl of 1 to 3 carbon atoms, mono- or di-alkylamino wherein each alkyl moiety contains 1 to 3 carbon atoms, N-pyrrolidino, N-piperidino, N-morpholino, carboxyalkyl of 2 to 3 carbon atoms, cyano, nitro, carboxyl, carbamyl, amino, azido, mono- or di-alkylaminoalkyl wherein each alkyl moiety contains 1 to 2 carbon atoms, with the proviso that the remaining two substituents are hydrogen or methyl; or, when Z is oxygen, one of R³, R⁴ and R⁵ is alkylsulfinyl or alkylsulfonyl of 1 to 3 carbon atoms, with the proviso that the remaining two substituents are hydrogen or methyl; R⁶, R⁷, R⁸ and R⁹ are each hydrogen; or

one of R⁶, R⁷, R⁸ and R⁹ is alkyl of 1 to 4 carbon atoms, alkanoyl of 2 to 4 carbon atoms, alkoxyalkyl of 2 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl moieties each contain 1 to 2 carbon atoms, halogen, trihalomethyl, hydroxyl, alkoxy of 1 to 3 carbon atoms, alkylthio of 1 to 3 carbon atoms, alkanoyloxy of 2 to 3 carbon atoms, alkanoylamino of 1 to 3 carbon atoms, aminoalkyl of 1 to 3 carbon atoms, mono- or di-alkylamino wherein each alkyl moiety contains 1 to 2 carbon atoms, carboxyalkyl of 2 to 3 carbon atoms, cyano, nitro, carboxyl, carbamyl, amino, azido, mono- or di-alkylaminoalkyl wherein each alkyl moiety contains 1 to 2 carbon atoms, and the remaining three substituents are hydrogen or two of the remaining three substituents are hydrogen and one is methyl, ethyl or halogen;

R¹⁰ and R¹¹ are each independently hydrogen, alkyl of 1 to 3 carbon atoms or halogen; and,

R¹² and R¹³ are each independently hydrogen, methyl, ethyl or halogen,

or a pharmaceutically acceptable acid addition salt thereof.

5,087,626

METHOD FOR INCREASING THE WEIGHT GAIN AND IMPROVING THE FEED UTILIZATION EFFICIENCY OF LIVESTOCK

Jonathan R. Arch, Banstead, England, assignor to Beecham Group p.l.c., England

Division of Ser. No. 937,030, Oct. 30, 1986, Pat. No. 4,880,834.

This application Sep. 7, 1989, Ser. No. 404,090

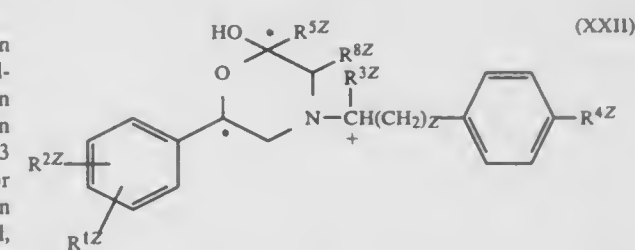
Claims priority, application United Kingdom, Mar. 1, 1985, 8505284; Aug. 22, 1985, 8521068

Int. Cl.⁵ A61K 31/535

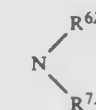
U.S. Cl. 514—230.5

2 Claims

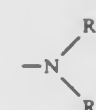
1. A method for increasing the weight gain and/or improving the feed utilization efficiency of livestock which comprises administering to livestock in need thereof an effective amount of a compound of formula (XXII):



or a pharmaceutically acceptable salt thereof, wherein R^{1Z} is hydrogen, halogen, or trifluoromethyl; R^{2Z} is hydrogen or halogen; R^{3Z} is hydrogen or methyl; R^{4Z} is —O(CH₂)_δCO₂H or an ester or amide thereof, O(CH₂)_δM⁴ or —CO₂H or an ester or amide thereof, wherein δ is an integer from 1 to 6, ε is an integer from 2 to 7, and M⁴ is hydroxy, alkoxy of 1 to 6 carbon atoms, or



wherein R^{6Z} and R^{7Z} are each hydrogen or alkyl of 1 to 6 carbon atoms or



is a 5- or 6-membered ring; R^{5Z} is alkyl of 1 to 6 carbon atoms; alkyl of 1 to 6 carbon atoms substituted by carboxy or an ester or amide thereof; or phenyl unsubstituted or substituted by alkyl of 1 to 6 carbon atoms, halogen, lower alkoxy or trifluoromethyl R^{8Z} is hydrogen or alkyl of 1 to 6 carbon atoms or R^{8Z} together with R^{5Z} is a carbocyclic ring.

5,087,627

AGENT FOR TREATMENT OF DISORDERS OF THE CEREBRO-NEURAL TRANSMISSION SYSTEM

Takakazu Morita, Toyonaka; Tadashi Iso, Kawachinagano, and Hideyasu Yamauchi, Nagaokakyo, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 28, 1990, Ser. No. 486,542

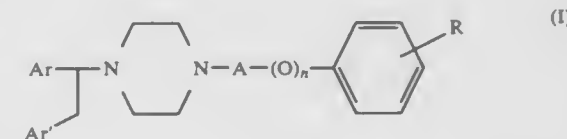
Claims priority, application Japan, Mar. 15, 1989, 64-148

Int. Cl.⁵ A61K 31/495; C07D 295/08

U.S. Cl. 514—255

10 Claims

1. A method for treatment of disorders of the cerebro-neural transmission system which comprises administering a compound of the formula (I) or a pharmaceutically acceptable salt thereof in a therapeutically effective amount, alone or in admixture with one or more pharmaceutically acceptable excipients,



wherein

Ar or Ar' is phenyl or pyridyl, which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen or lower alkylendioxy;

R is hydrogen, lower alkyl, lower alkoxy, halogen or lower alkylendioxy;

A is straight or branched alkylene having 1 to 6 carbon atoms; and
n is 0 or 1.

5,087,628
4,4'-[9H-FLUOREN-9-YLIDENE]BISPYRIMIDINE FOR TREATING NEUROLOGICAL DISORDERS

Richard A. Earl, Wilmington, and Victor J. DeNoble, Newark, both of Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Jan. 12, 1990, Ser. No. 464,433

Int. Cl.⁵ A61K 31/505; C07D 239/26

U.S. Cl. 514—256

3 Claims

1. 4,4'-[9H-fluoren-9-ylidenebis(methylene)]-bispyrimidine, or a pharmaceutically acceptable salt thereof.

5,087,629
PHARMACOLOGICALLY ACTIVE PYRAZOLOPYRIDINE COMPOUNDS

Yoshiichi Shiokawa, Ibaraki; Atsushi Akahane, Hyogo; Hirohito Katayama, Nishinomiya, and Takafumi Mitsunaga, Ashiya, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 202,526, Jun. 6, 1988, Pat. No. 4,925,849.

This application Mar. 12, 1990, Ser. No. 492,486

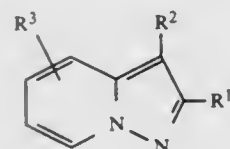
Claims priority, application United Kingdom, Jun. 15, 1987, 8713908; Aug. 20, 1987, 8719724; Dec. 31, 1987, 8730330

Int. Cl.⁵ A61K 31/435; C07D 471/04

U.S. Cl. 514—300

8 Claims

1. A pyrazolopyridine compound of the formula:



wherein R¹ is lower alkyl, aryl which may be substituted by one or more suitable substituent(s) or a heterocyclic group, R² is a group of the formula:



wherein R⁶ is carboxy or lower alkoxy group which may be substituted by a N-containing heterocyclic group; and, A is C₂-C₆ aliphatic hydrocarbon group which may be substituted by one or more halogen atoms; and

R³ is hydrogen, lower alkyl, lower alkoxy or halogen, or a pharmaceutically acceptable salt thereof.

5,087,630
METHOD FOR THE TREATMENT OF A HYPONATRAEMIC DISEASE

Roberto Colle, Antonio Pizzi, and Geoffrey D. Clarke, all of Milan, Italy, assignors to Dr. Lo. Zambelletti SpA, Italy

Filed Oct. 16, 1989, Ser. No. 422,122

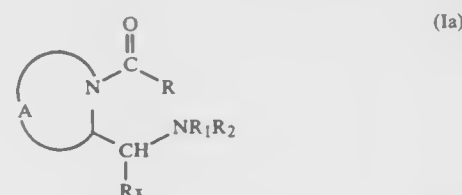
Claims priority, application United Kingdom, Oct. 17, 1988, 8824291

Int. Cl.⁵ A61K 31/47, 31/445, 31/44

U.S. Cl. 514—307

8 Claims

1. A method for the treatment of hyponatraemic disease states in mammals, which comprises administering to the mammal in need of such treatment an effective amount of a compound of formula (Ia), or a pharmaceutically acceptable salt or solvate thereof, formula (Ia) being:



in which

A, together with the nitrogen atom, represents —(CH₂)_p—, where p is an integer from 3 to 6, or an optionally substituted tetrahydroisoquinoline ring system; each of R₁ and R₂ are independently hydrogen, C₁₋₆ alkyl, C₂₋₆ alkenyl, C₃₋₆ cycloalkyl or C₄₋₁₂ cycloalkylalkyl, or together form a C₂₋₆ polymethylene or C₂₋₆ alkenylene group, optionally substituted with a hetero-atom, R_x is hydrogen, C₁₋₆ alkyl or phenyl, or together with R₁ forms a —(CH₂)₃— or —(CH₂)₄— group; and R comprises a substituted or unsubstituted carbocyclic or heterocyclic aromatic group.

5,087,631
OXATHI(SIV)AZOL-5-ONE COMPOUNDS

Joel E. Shaffer, Chapel Hill, and Stephen A. Thomson, Durham, both of N.C., assignors to Glaxo Inc., Research Triangle Park, N.C.

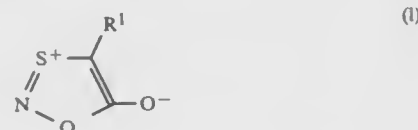
Filed Dec. 18, 1990, Ser. No. 629,936

Int. Cl.⁵ C07D 291/04; A61K 31/41

U.S. Cl. 514—342

12 Claims

1. A compound of formula (I)



wherein R¹ is C₁₋₈ alkyl, C₂₋₈ alkenyl, C₅₋₈ cycloalkyl, aryl, C₁₋₄ alkyl, heteroaryl or aryl or heteroaryl which is mono-, di-, or trisubstituted independently with halogen, nitro, C₂₋₄ alkyl, C₁₋₄ alkoxy, trifluoromethyl, amino or C₁₋₄ alkyl mono or disubstituted amino with the proviso that R¹ can not be 4-bromophenyl or 2,3,4-trimethoxyphenyl, wherein said aryl is phenyl or naphthyl and said heteroaryl is a 5, 6 or 7 member heteroaryl ring interrupted by one or more N, S or O hetero atoms.

5,087,632
FORMICIDAL AGENT FOR COMBATING TERMITES
Sinichi Tsuboi; Ikuro Honda; Sakae Murata, and Yumi Hattori, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 537,405

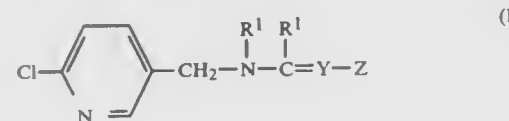
Claims priority, application Japan, Jun. 16, 1989, 1-152243; Feb. 28, 1990, 2-45720

Int. Cl.⁵ A01N 43/40

U.S. Cl. 514—357

12 Claims

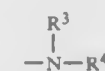
1. A method of combating termites comprising contacting termites or their habitat with an effective termite combating amount of at least one active compound of the formula (I)



wherein

R¹ represents hydrogen atom or a C₁₋₄ alkyl group,

R² represents —S—CH₃ or



wherein R³ and R⁴ each represents hydrogen atom or a C₁₋₄ alkyl group,

Y represents CH or N, and

Z represents a nitro group either alone or in admixture with an extender or a surface active agent.

5,087,633
USE OF A GLYCINE B PARTIAL AGONIST FOR MEMORY AND LEARNING ENHANCEMENT OR TREATMENT OF A COGNITIVE DISORDER

Alex A. Cordi, St. Louis; Gail E. Handelsmann, Chesterfield, and Joseph B. Monahan, Black Jack, all of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

PCT No. PCT/US88/04244, § 371 Date Jul. 27, 1989, § 102(e)

Date Jul. 27, 1989, PCT Pub. No. WO89/05144, PCT Pub. Date Jun. 15, 1989

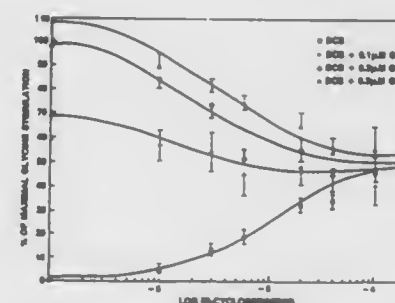
Continuation-in-part of Ser. No. 127,121, Dec. 1, 1987, Pat. No. 4,904,681. This PCT application Dec. 1, 1988, Ser. No. 438,494

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

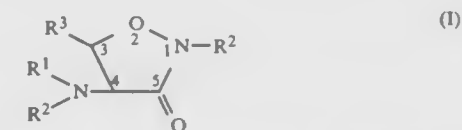
Int. Cl.⁵ A01N 43/80

U.S. Cl. 514—380

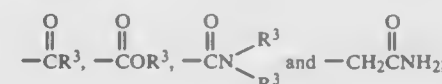
9 Claims



1. A method to improve cognitive function or to treat a neurodegenerative disease, which method comprises administering to a subject a therapeutically-effective amount of one or more compounds, selected from the family of compounds of Formula I



wherein R¹ is selected from hydrido, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, aralkyl and aryl; wherein R² is selected from hydrido, alkyl, aralkyl, aryl,



wherein R¹ and R² which are attached to the 4-amino nitrogen atom of Formula I may be taken together to form a Schiff-base derived group selected from derivatives of aldehydes and ketones; wherein R³ is selected from hydrido, alkyl, haloalkyl, alkoxy, alkoxyalkyl, cycloalkyl, aralkyl and aryl; or a pharmaceutically-acceptable salt thereof.

5,087,634
N-SUBSTITUTED IMIDAZOL-2-ONE COMPOUNDS FOR TREATMENT OF CIRCULATORY DISORDERS

David B. Reitz, Chesterfield, and Robert E. Manning, St. Louis, both of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

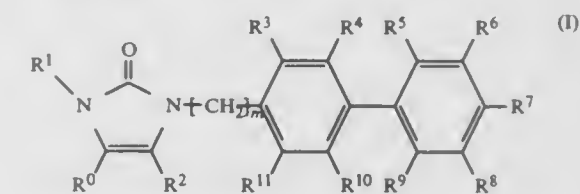
Filed Oct. 31, 1990, Ser. No. 606,806

Int. Cl.⁵ A61K 31/41, 31/415; C07D 403/10, 233/70

U.S. Cl. 514—381

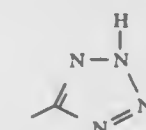
33 Claims

1. A compound of Formula I:



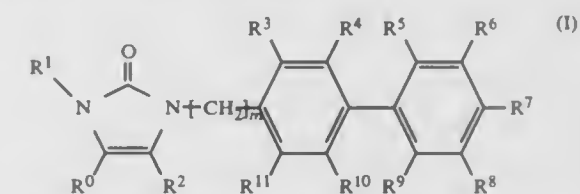
wherein m is one; wherein R¹ is selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, 4-methylbutyl, n-pentyl, neopentyl, phenyl, benzyl, phenethyl, cyclohexyl, cyclohexylmethyl, cyclohexylethyl, cyclohexanoyl, 1-oxo-2-cyclohexylethyl, benzoyl, 1-oxo-2-phenethyl, 1-oxoethyl, 1-oxopropyl, 1-oxobutyl, 1-oxopentyl, 2-butenyl, 3-butenyl, 2-butenyl, 3-butenyl and 2-hydroxybutyl; wherein R⁰ is selected from hydrido, methyl, ethyl, fluoro, chloro, monofluoromethyl, difluoromethyl, trifluoromethyl, formyl, carboxyl, dimethoxymethyl, 1,1-dimethoxybutyl, 1,1-difluoroethyl and 1,1-difluoropropyl;

wherein R² is selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, n-pentyl, isopentyl, neopentyl, phenyl, benzyl, phenethyl, cyclohexyl, cyclohexylmethyl, cyclohexylethyl, 2-butenyl, 3-butenyl, 2-butenyl, 3-butenyl, propylthio, butylthio and 2-hydroxybutyl; wherein at least one of R³, R⁶, R⁸ and R⁹ is an acidic group selected from CO₂H and



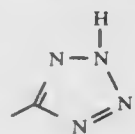
and the remaining of R³ through R¹¹ is hydrido or a tautomer thereof or a pharmaceutically-acceptable salt thereof.

21. A therapeutic method for treating a circulatory disorder, said method comprising administering to a subject susceptible to or afflicted with such disorder a therapeutically-effective amount of a compound of Formula I:



wherein m is one; wherein R¹ is selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, 4-methylbutyl, n-pentyl, neopentyl, phenyl, benzyl, phenethyl, cyclohexyl, cyclohexylmethyl, cyclohexylethyl, cyclohexanoyl, 1-oxo-2-cyclohexylethyl, benzoyl, 1-oxo-2-phenethyl, 1-oxoethyl, 1-oxopropyl, 1-oxobutyl, 1-oxopentyl, 2-butenyl, 3-butenyl, 2-butenyl, 3-butenyl and 2-hydroxybutyl; wherein R⁰ is selected from hydrido, methyl, ethyl, fluoro, chloro, monofluoromethyl, difluoromethyl, trifluoromethyl, formyl, carboxyl, dimethoxymethyl, 1,1-dimethoxybutyl, 1,1-difluoroethyl and 1,1-difluoropropyl; wherein R² is selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, n-pentyl, isopentyl, neopentyl, phenyl, benzyl,

phenethyl, cyclohexyl, cyclohexylmethyl, cyclohexylethyl, 2-butenyl, 3-butenyl, 2-butynyl, 3-butynyl, propylthio, butylthio and 2-hydroxybutyl; wherein at least one of R^5 , R^6 , R^8 and R^9 is an acidic group selected from CO_2H and



and the remaining of R^3 through R^{11} is hydrido or a tautomer thereof or a pharmaceutically-acceptable salt thereof.

5,087,635

ALPHA-ARYL-ALPHA-PHENYLETHYL-1H-1,2,4-TRIAZOLE-1-PROPANENITRILES

Steven H. Shaber, Horsham, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

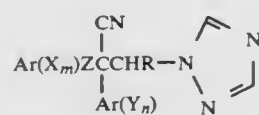
Continuation of Ser. No. 880,990, Jul. 2, 1986, abandoned. This application Jul. 7, 1989, Ser. No. 376,948

Int. Cl.⁵ A01N 43/653; C07D 249/08

U.S. Cl. 514—383

25 Claims

1. A compound of the formula



wherein Z is ethylene, ethynylene, ethynylene, isopropylene, halogenated ethylene, halogenated ethynylene or halogenated isopropylene;

$\text{Ar}(\text{X}_m)$ is a substituted, with (X_m) , or unsubstituted ($\text{C}_6\text{--C}_{10}$) aromatic ring structure;

$\text{Ar}(\text{Y}_n)$ is a substituted, with (Y_n) , or unsubstituted ($\text{C}_6\text{--C}_{10}$) aromatic ring structure;

each X and Y are independently the same or different and are selected from the group consisting of halogen; ($\text{C}_1\text{--C}_6$) alkyl optionally substituted with up to three halogens; ($\text{C}_2\text{--C}_6$) alkenyl optionally substituted with up to three halogens; hydroxy; ($\text{C}_1\text{--C}_6$) alkoxy; ($\text{C}_2\text{--C}_6$) alkenoxy; phenyl optionally substituted with up to two halogens; cyano; amino; monoalkylamino having up to six carbon atoms; dialkylamino having up to six carbon atoms in each alkyl group; —C(O)H ; ($\text{C}_1\text{--C}_6$) alkylsulfonyl; and $\text{—C(O)NR}_1\text{R}_2$ wherein R_1 and R_2 are independently hydrogen or ($\text{C}_1\text{--C}_6$) alkyl;

R is hydrogen or phenyl optionally substituted with trifluoromethyl, ($\text{C}_1\text{--C}_6$) alkyl or up to three halogens; and m and n are independently 0 to 3;

and the agronomically acceptable enantiomorphs, acid addition and metal salt complexes thereof.

5,087,636

METHOD TO DESTROY MALIGNANT CELLS IN MONONUCLEAR CELL POPULATIONS

Catriona Jamieson, West Vancouver, and Julia G. Levy, Vancouver, both of Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Feb. 20, 1990, Ser. No. 482,942

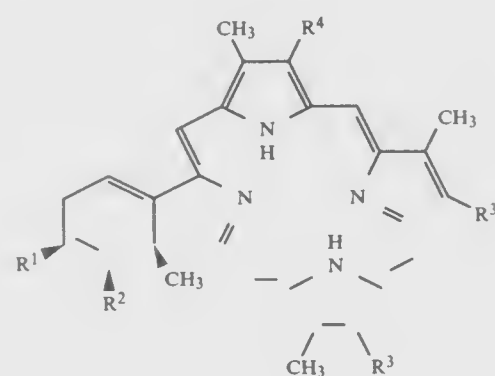
Int. Cl.⁵ A61K 31/40

U.S. Cl. 514—410

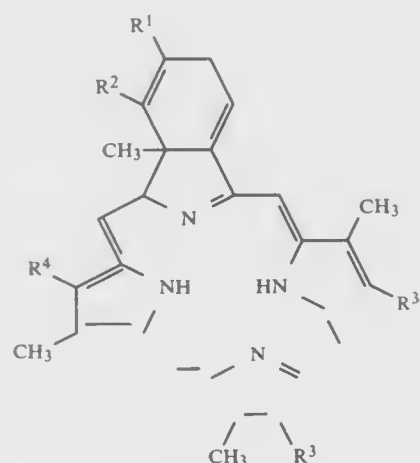
37 Claims

1. A method to purge a composition of bone marrow cells of malignant cells, which method comprises contacting said cell composition containing malignant cells with a composition of green porphyrin (Gp) for a time sufficient to permit uptake of the Gp by said malignant cells; followed by irradiating said cell composition with light of a wavelength absorbed by said Gp for a time sufficient and with an

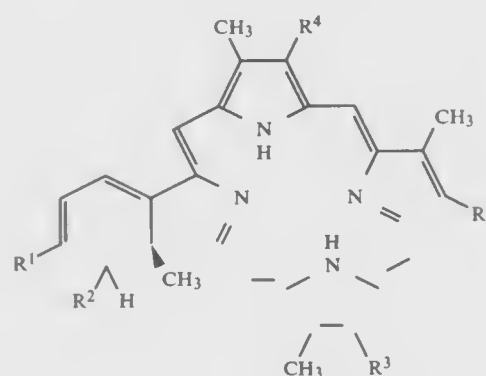
intensity sufficient to effect the destruction of the malignant cells, wherein said Gp is of the formula



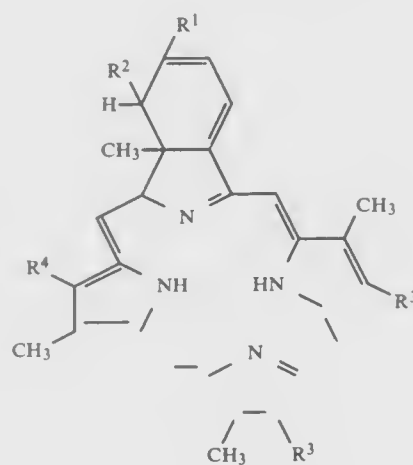
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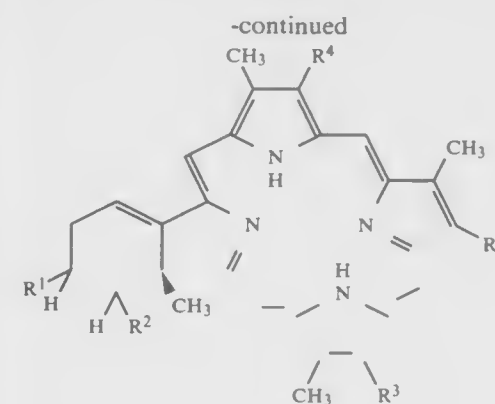
2



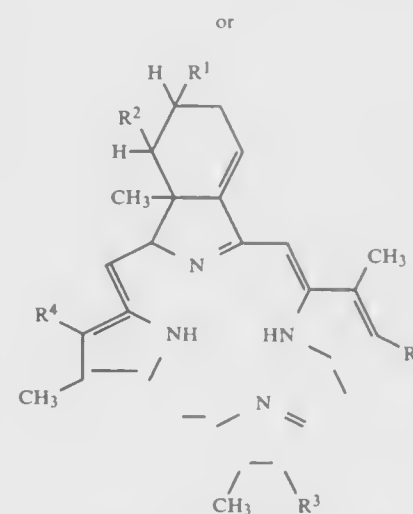
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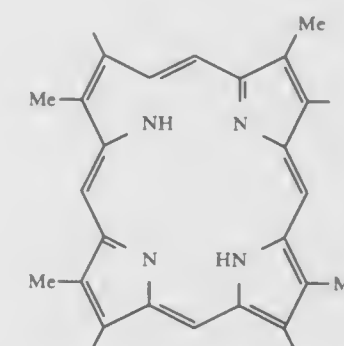
4



5



6



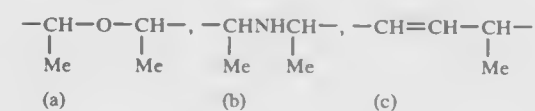
wherein two of the bonds shown as unoccupied on adjacent rings are joined to R^3 and one of the remaining bonds shown as unoccupied is joined to R^4 and the other to L.

37. A method to detect the presence or absence of malignant cells in a composition selected from the group consisting of bone marrow and a preparation of cells therefrom, which method comprises contacting said composition with Gp for a time sufficient to effect the uptake of said Gp by malignant cells; followed by

irradiating said composition with light at a wavelength effective to excite fluorescence of said Gp; and detecting the presence or absence of said fluorescence wherein said Gp is of the formula

or the metalated and/or labeled form thereof; wherein each R^1 and R^2 is independently selected from the group consisting of carbalkoxy (2-6C), alkyl (1-6C) sulfonyl, aryl (6-10C) sulfonyl, aryl (6-10C); cyano; and $\text{—CONR}^5\text{CO—}$ where R^5 is aryl (6-10C) or alkyl (1-6C); each R^3 is independently carboxyalkyl (2-6C) or a salt, amide, ester or acylhydrazone thereof, or is alkyl (1-6C); and

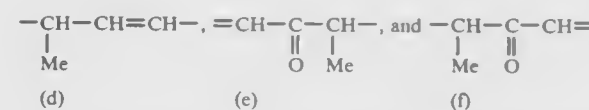
R^4 is CHCH_2 , $\text{—CH}_2\text{OR}^4$, —CHO , —COOR^4 , $\text{—CH(OR}^4\text{)CH}_3$, $\text{CH(OR}^4\text{)CH}_2\text{OR}^4$, $\text{—CH(SR}^4\text{)CH}_3$, $\text{—CH(NR}^4\text{)CH}_3$, —CH(CN)CH_3 , $\text{—CH(COOR}^4\text{)CH}_3$, $\text{—CH(OOCR}^4\text{)CH}_3$, —CH(halo)CH_3 , or $\text{—CH(halo)CH}_2\text{(halo)}$, wherein R^4 is H or alkyl (1-6C) optionally substituted with a hydrophilic substituent, or wherein R^4 consists of 1-3 tetrapyrrole-type nuclei of the formula —L—P wherein —L— is selected from the group consisting of



(a)

(b)

(c)

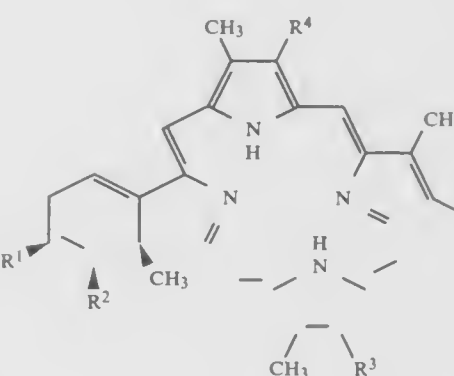


(d)

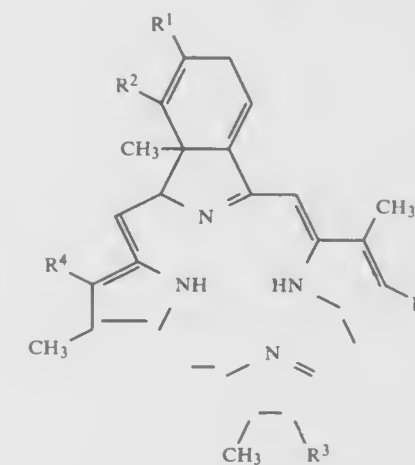
(e)

(f)

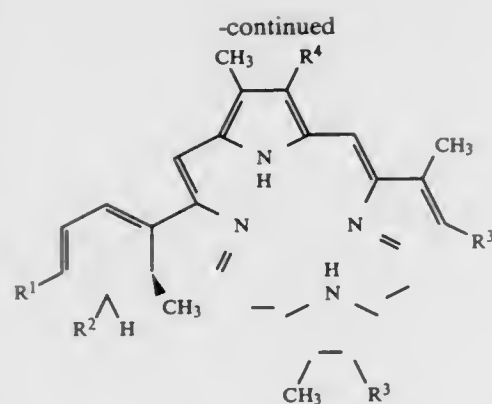
and P is selected from the group consisting of Gp which is of the formula 1-6 but lacking R^4 and conjugated through the position shown as occupied by R^4 to L, and a porphyrin of the formula:



1



2



- 3 group consisting of carbalkoxy (2-6C), alkyl (1-6C) sulfonyl, aryl (6-10C) sulfonyl, aryl (6-10C); cyano; and CONR^5CO where R^5 is aryl (6-10C) or alkyl (1-6C); each R^3 is independently carboxyalkyl (2-6C) or a salt, amide, ester or acylhydrazone thereof, or is alkyl (1-6C); and
- R_4 is CHCH_2 , CH_2OR^4 , CHO , COOR^4 , $\text{CH}(\text{OR}^4)\text{CH}_3$, $\text{CH}(\text{OR}^4)\text{CH}_2\text{OR}^4$, $\text{CH}(\text{SR}_4)\text{CH}_3$, $\text{CH}(\text{NR}^4)_2\text{CH}_3$, $\text{CH}(\text{CN})\text{CH}_3$, $\text{CH}(\text{COOR}^4)\text{CH}_3$, $\text{CH}(\text{OOCR}^4)\text{CH}_3$, $\text{CH}(\text{halo})\text{CH}_3$, or $\text{CH}(\text{halo})\text{CH}_2(\text{halo})$, wherein R^4 is H or alkyl (1-6C) optionally substituted with a hydrophilic substituent, or wherein R^4 is an organic group of less than 12C resulting from direct or indirect derivatization of vinyl.

5,087,637

4 DIARYLACETYLENES, THE PREPARATION AND USE THEREOF

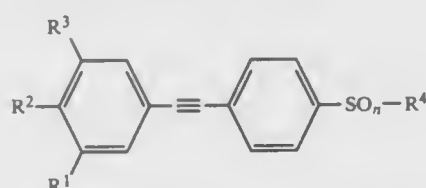
Bernd Janssen, Ludwigshafen, and Hans-Heiner Wuest, Dossenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Aug. 1, 1990, Ser. No. 561,328
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 3926148

Int. Cl. 5 A61K 31/335

U.S. Cl. 514-456

18 Claims

1. A diarylacetylene of the formula I



5

where R^1 is hydrogen or C_1 - C_4 -alkyl, R^2 and R^3 are each hydrogen or, when R^1 is hydrogen, together form a $\text{C}(\text{CH}_3)_2$ - B - $\text{C}(\text{CH}_3)_2$ group where B is CH_2CH_2 or $\text{CH}(\text{CH}_3)$ or an $\text{OC}(\text{CH}_3)(\text{Z})\text{CH}_2\text{CH}_2$ group where Z is C_1 - C_2 -alkyl or R^2 is C_1 - C_3 -alkoxy and R^3 is C_1 - C_{10} -alkyl or, when R^2 is hydrogen, R^1 and R^3 are each alkyl as defined above, R^4 is C_1 - C_6 -alkyl and n is 0, 1 or 2.

5,087,638

BENZOFURAN DERIVATIVES

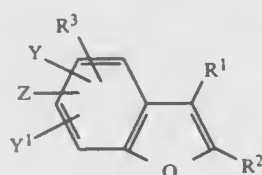
Patrice C. Belanger, John Scheiget, both of Dollard des Ormeaux, and Joshua Rokach, Hudson, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada
Division of Ser. No. 183,877, Apr. 20, 1988, Pat. No. 4,863,958, which is a continuation-in-part of Ser. No. 146,882, Jan. 22, 1988, abandoned, which is a continuation of Ser. No. 931,751, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 741,379, Jun. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 622,372, Jun. 20, 1984, abandoned. This application Jun. 28, 1989, Ser. No. 372,501

Int. Cl. 5 A61K 31/35; C07F 9/06; C07D 307/78

U.S. Cl. 514-456

10 Claims

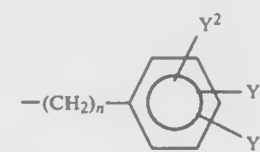
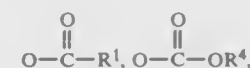
1. A compound of the formula:



wherein:

each R^1 is independently hydrogen or C_1 to C_6 alkyl;
 R^2 is C_1 to C_6 alkyl or

or the metalated and/or labeled form thereof;
wherein each R^1 and R^2 is independently selected from the

 R^3 is hydroxyl, $\text{OCOCH}_2\text{CH}_2\text{COOH}$, OSO_3H , or OPO_3H_2 ; R^4 is C_1 to C_6 alkyl;each R^5 is independently H or C_1 to C_6 alkyl;

Y , Y^1 , Y^2 , Y^3 , Y^4 and Z is each independently H, halogen, OH, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, COOR^1 , COR^1 , nitro, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, CH_2SR^1 , CONR^1R^1 , SCF_3 , $\text{SO}_2\text{NR}^1\text{R}^1$, CN , CF_3 , or NR^5R^5 ; and

 n is 0 to 10;

with the provisos that:

- not all of R^1 , Y , Y^1 , Y^2 , Y^3 , Y^4 , and Z are simultaneously H;
- when up to 2 of R^1 , R^2 , Y , Y^1 , and Z are C_1 to C_2 alkyl, and the others of R^1 , R^2 , Y , Y^1 , and Z are H, then R^3 is not OH;
- when n is 0 and one of R^3 , Y , Y^1 , or Z is OH, then R^1 is not H or C_1 to C_2 alkyl; and
- at least one of Y , Y^1 , and Z is not H;

or a pharmaceutically acceptable salt thereof.

5,087,639

PREVENTING CNS TOXICITY OF ACIVICIN WHEN USED WITH FOUR LARGE NEUTRAL AMINO ACIDS
J. Patrick McGovern, Schoolcraft Township, Kalamazoo County; Marta G. Williams, Prairieville Township, Allegan County, and Robert H. Earhart, Richland Township, Kalamazoo County, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 2, 1988, Ser. No. 266,437

Int. Cl. 5 A61K 31/195

U.S. Cl. 514-561

15 Claims

1. A method for the prevention of CNS toxicity of acivicin in animals which comprises the concomitant administration of acivicin and an amino acid solution consisting essentially of one or any combination of the large amino acids valine, leucine, isoleucine or phenyl alanine in concentrations of 100 to 1000 mg/ml.

5,087,640

NOVEL CYANOQUANIDINE DERIVATIVES

Tominori Morita, Nishinomiya; Kazuya Yoshiizumi; Noriyasu Nishimura, both of Osaka; Katsumi Goto, Kagoshima; Takayuki Sukamoto, Osaka, and Kohichiro Yoshino, Suita, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan
Filed Jun. 27, 1990, Ser. No. 544,448

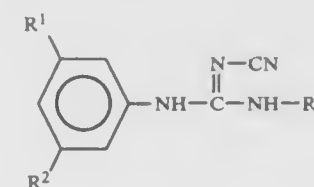
Claims priority, application Japan, Jun. 28, 1989, 1-166119

Int. Cl. 5 A61K 31/155

U.S. Cl. 514-609

15 Claims

1. A compound of the formula:



wherein R^1 and R^2 are independently fluorine, chlorine or bromine atom, and R^3 is a C_4 - C_7 alkyl having at least a branch at the C_1 position.

5,087,641

POROUS POLYTETRAFLUOROETHYLENE RESIN MATERIAL

Yoshiaki Sato, 350-7 Kawadera, Hanno, Saitama, Japan

Filed Aug. 31, 1990, Ser. No. 576,337

Claims priority, application Japan, Sep. 1, 1989, 1-227142

Int. Cl. 5 C08J 9/40

U.S. Cl. 521-53

1 Claim

1. A porous polytetrafluoroethylene resin material which comprises sintered or irradiated fluororesin powder inside the porous spaces of a continuously porous polytetrafluoroethylene resin base material.

5,087,642

FRICTION MATERIAL

Katsuji Seki, Saitama, and Naoyuki Hashimoto, Tsukuba, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre, Ltd., Hanyu, both of Japan

Filed Oct. 24, 1989, Ser. No. 426,008

Claims priority, application Japan, Nov. 29, 1988, 63-299613

Int. Cl. 5 C08J 5/14

U.S. Cl. 523-156

6 Claims

1. A friction material comprising 10-50 vol. % of reinforcing material selected from the group consisting of metal fiber, metal powder and mixtures thereof, 5-10% vol. % of friction modifier selected from the group consisting of rubber dust, cashew dust, alumina powder and mixtures thereof, 10-30 vol. % of solid lubricant selected from the group consisting of graphite, molybdenum disulfide and mixtures thereof, 5-20 vol. % of filler made of basic material selected from the group consisting of barium sulfate, calcium silicate and mixtures thereof and 10-30 vol. % of binder made of thermosetting resin selected from the group consisting of a condensed polycyclic polynuclear resin and a xylene resin, the hydroxyl group content of which is lower than that of phenol resin and the curing reaction of which proceeds by means of an acidic catalyst, and wherein said filler made of basic material is coated with a coupling agent or treated with acid on the surface thereof so as to avoid hindering the curing reaction of said thermosetting resin.

5,087,643

CHEMICALLY STABLE ANAEROBIC ACRYLIC ADHESIVE FORMULATION

Dinh Nguyen Truong, Pau, France, assignor to Societe Nationale Elf Aquitaine, Courbevoie, France

PCT No. PCT/FR88/00628, § 371 Date Oct. 10, 1989, § 102(e)

Date Oct. 10, 1989, PCT Pub. No. WO89/05841, PCT Pub.

Date Jun. 29, 1989

PCT Filed Dec. 21, 1988, Ser. No. 415,303

Claims priority, application France, Dec. 22, 1987, 87 17907

Int. Cl. 5 C08F 299/00; C08G 59/14

U.S. Cl. 523-176

37 Claims

1. A single component anaerobic acrylic adhesive formulation, which is chemically stable and capable of producing a cured adhesive joint exhibiting improved impact and shear

- (a) starch which has been neither destructurelized nor gelatinized, and
 (b) a copolymer consisting essentially of an olefin of from about two to about four carbon atoms, inclusive, and a comonomer selected from the group consisting of a C₁₋₆ alkylacrylate, a C₁₋₆ alkylmethacrylate, and vinyl acetate to form a polymer alloy composition consisting of said starch which has been neither destructurelized nor gelatinized and said copolymer.

5,087,651

NON-TOXIC RUBBER-BASED COMPOSITION AND METHOD FOR MAKING THE RUBBER BASED COMPOSITION

Toncil Cha, Seoul, Rep. of Korea, assignor to Pop Limited, Georgetown, Cayman Islands

Division of Ser. No. 719,701, Apr. 4, 1985, Pat. No. 4,877,566.

This application Oct. 2, 1989, Ser. No. 415,650

Int. Cl.⁵ C08J 0/00

U.S. Cl. 524—55

7 Claims

1. A sticky injection moldable, non-toxic rubber-based composition suitable for use in manufacturing toys which comprises about 40 to 45% styrene butadiene rubber, from about 30 to 35% of an oil selected from the group consisting of paraffin and naphthene oils, from about 15 to 25% of an ester gum from about 2 to 8% calcium carbonate and 0.2 to 6% of a coloring agent.

5,087,652

ASPHALT BLENDS WITH CHLOROPRENE POLYMERS OR COPOLYMERS THEREOF WITH DICHLOROBUTADIENE

Lance A. Christell, Prospect, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1989, Ser. No. 374,130

Int. Cl.⁵ C08L 95/00

U.S. Cl. 524—59

6 Claims

1. A blend of asphalt and 0.1 to 5 weight percent, based on asphalt, of mercaptan-modified or dialkyl- or dialkoxy xanthogen disulfide-modified chloroprene polymer consisting essentially of repeating units derived from chloroprene and up to 12 weight percent of a monoethylenically unsaturated monomer containing 3 to 10 carbon atoms copolymerizable with chloroprene, 2,3-dichlorobutadiene-1,3, or mixtures thereof; which chloroprene polymer is modified by addition of sufficient mercaptan or dialkyl- or dialkoxy xanthogen disulfide to provide a gel content of from 10 to 50 percent by weight, based on chloroprene.

5,087,653

CLEANING RESIN COMPOSITION

Keojiro Obama; Hiroshi Takasu; Susumu Arase, and Hiroyuki Fujii, all of Ichihara, Japan, assignors to Chisso Corporation, Japan

Filed May 10, 1990, Ser. No. 521,549

Claims priority, application Japan, May 22, 1989, 1-128428; Jun. 20, 1989, 1-157490

Int. Cl.⁵ C08K 5/42

U.S. Cl. 524—158

2 Claims

1. A cleaning resin composition having 1 to 10% by weight of a polystyrene resin, 1 to 20% by weight of a neutral salt of an alkylbenzenesulfonic acid, 1 to 30% by weight of an inorganic filler and 0.5 to 10% by weight of a water-repellent compound, blended with a high density polyethylene resin having a melt index of 1.0 or less and a Q value expressing a molecular weight distribution, of 10 or less, the total % by weight of said composition being 100.

5,087,654

POLYPROPYLENE RESIN COMPOSITION

Hiroyuki Harada; Kenichi Ohkawa; Masashi Yamamoto, all of Ichihara; Minoru Yoshinaka, Higashiosaka; Jun Yagi, Hirakata, and Kouziro Matsuo, Yamatokoriyama, all of Japan, assignors to Sumitomo Chemical Company, Limited and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Feb. 12, 1990, Ser. No. 478,508

Claims priority, application Japan, Feb. 21, 1989, 1-042172

Int. Cl.⁵ C08K 3/22

U.S. Cl. 524—432

2 Claims

1. A polypropylene resin composition which comprises 45–85% by weight of (A) a crystalline polypropylene, 10–20% by weight of (B) a polypropylene modified with an unsaturated carboxylic acid or an acid anhydride thereof, and 5–35% by weight of (C) zinc oxide whiskers which have a tetrapod-formed crystal structure.

5,087,655

RUBBER MODIFIED STYRENE RESIN COMPOSITION

Yasushi Okamoto; Yoshinori Kanno, both of Chiba; Kouziro Matsuo, Yamatokoriyama; Minoru Yoshinaka, Higashiosaka, and Jun Yagi, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Feb. 12, 1990, Ser. No. 478,514

Claims priority, application Japan, Feb. 21, 1989, 1-042173

Int. Cl.⁵ C08K 3/22

U.S. Cl. 524—432

8 Claims

1. A rubber modified styrene resin composition which comprises 50–98% by weight of a rubber modified styrene resin and 50–2% by weight of a zinc oxide whiskers.

5,087,656

HIGHLY WATER-ABSORPTIVE POWDERY POLYMER COMPOSITION

Kenji Yoshinaga; Hirochika Hosaka, and Toshiko Nakamura, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

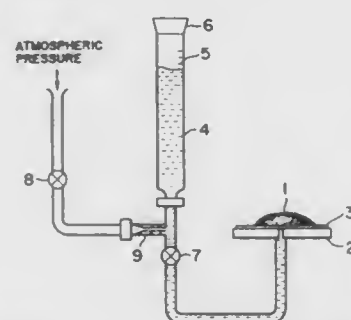
Filed Mar. 9, 1990, Ser. No. 491,252

Claims priority, application Japan, Mar. 13, 1989, 1-60430

Int. Cl.⁵ C08K 3/34, 7/26

U.S. Cl. 524—493

4 Claims



1. A water-absorptive powdered polymer composition comprising a mixture of a water-absorptive polymer produced from an acrylic monomer selected from the group consisting of acrylic acid, methacrylic acid and their alkali metal salts and a porous powder of a silicon dioxide, said powder having (a) a mean particle size of 0.1 to 30 μm, as measured by the Coulter counter method, and (b) a specific surface area of 500 m²/g or more as measured by the BET (Brunauer-Emmett-Teller) method.

5,087,657

FIBER-REINFORCED COMPOSITES TOUGHENED WITH RESIN PARTICLES

Shahid P. Qureshi, Piscataway; Richard H. Newman-Evans, and Hugh C. Gardner, both of Hillsborough, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 23, 1989, Ser. No. 314,165

Int. Cl.⁵ C08K 3/04, 71/12, 73/00

U.S. Cl. 524—508

12 Claims

1. A composition comprising from about 20 to about 80 wt %, based on final composition, of a continuous fiber reinforcement, and a curable matrix resin formulation comprising a cycloaliphatic epoxy ether resin and from 1 to about 25 wt % of said formulation of polyphenylene ether resin particles having a smallest dimension in the range of from about 1 to about 75 microns.

5,087,658

HEAT-RESISTANT RESIN PASTE AND INTEGRATED CIRCUIT DEVICE PRODUCED BY USING THE HEAT-RESISTANT RESIN PASTE

Hiroshi Nishizawa; Kenji Suzuki; Yoshiyuki Mukoyama; Tohru Kikuchi, and Hidetaka Sato, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Dec. 18, 1989, Ser. No. 452,520

Claims priority, application Japan, Dec. 29, 1988, 63-333976

Int. Cl.⁵ C08K 5/34; C08L 51/00; C08J 3/09

U.S. Cl. 524—538

18 Claims



1. A heat-resistant resin paste consisting essentially of a first organic liquid (A₁), a second organic liquid (A₂), a heat-resistant resin (B) which are soluble in an organic liquid mixture consisting of the first organic liquid (A₁) and the second organic liquid (A₂), and fine particles of a heat-resistant resin (C) which is soluble in the first organic liquid (A₁) but, insoluble in the second organic liquid (A₂), the first organic liquid (A₁), the second organic liquid (A₂), and the heat-resistant resin (B) being brought into a solution in which the fine particles of a heat-resistant resin (C) are dispersed.

5,087,659

INK COMPOSITIONS AS STEAM STERILIZING INDICATORS FOR USE IN INK JET PRINTING

Toshiki Fujisawa, Osaka, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed Oct. 2, 1989, Ser. No. 416,324

Claims priority, application Japan, Sep. 30, 1988, 63-248529

Int. Cl.⁵ C08L 61/10

U.S. Cl. 524—594

11 Claims

1. An ink composition as a steam sterilizing indicator for use in ink jet printing which comprises a salt of a cyanine dyestuff with phenol resins in amounts of 0.1–5% by weight as the cyanine dyestuff and in amounts of 0.2–30% by weight as the phenol resins, dissolved in organic solvent in amounts of 70–96% by weight of solvent based on the ink composition.

5,087,660

PROCESS AND APPARATUS FOR HEAT TREATMENT OF POLYMER CONTAINING LIQUID

Noriyuki Kunishi, Ichihara, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

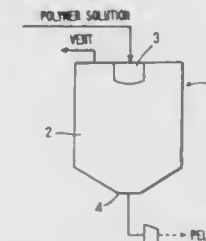
Filed Feb. 27, 1990, Ser. No. 485,491

Claims priority, application Japan, Mar. 8, 1989, 1-53940; Sep. 5, 1989, 1-228378

Int. Cl.⁵ C08J 5/02; C08F 283/00, 2/00, 6/00

U.S. Cl. 524—611

19 Claims



1. A process for treating a mixture of a polymer and a chlorinated organic solvent under heating wherein coloring of the polymer due to thermal deterioration in the presence of the solvent is reduced, which comprises treating the mixture within an apparatus in which a portion thereof to be brought into contact with the heated mixture is made of an acid resistant inorganic material selected from the group consisting of a metallic composition containing at least 85% by weight of copper, nickel or a mixture thereof, and a ceramic material.

5,087,661

MOISTURE CURABLE POLYURETHANE COMPOSITION COMPRISING POLYALDIMINE

Masaaki Aoki; Masayuki Kamiyama, and Hiroshi Honda, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,536

Claims priority, application Japan, Jul. 20, 1990, 65-190730; Aug. 21, 1990, 65-218120; Nov. 30, 1990, 65-336081

Int. Cl.⁵ C08K 5/16

U.S. Cl. 524—714

24 Claims

1. A moisture curable polyurethane composition comprising a polyaldimine represented by the formula (I):



wherein X is an aryl group having from 6 to 15 carbon atoms, Y is a divalent or trivalent hydrocarbon group having from 2 to 15 carbon atoms, or a divalent or trivalent polyoxyalkylene group having a molecular weight of from 70 to 6000, and n is an integer of 2 or 3; and a polyisocyanate and/or a polyurethane prepolymer having 2 or more isocyanate groups.

5,087,662

POLYESTER, POLYCARBONATE AND/OR POLYPHENYLENE ETHER WITH POLYORGANOSILOXANE/POLYVINYL-BASED GRAFT (METH) ACRYLATE POLYMERS

Muhanad A. Alsmarraie, Clifton Park; Stanley Y. Hobbs, Scotia, both of N.Y.; I-Chung W. Wang, Williamstown, Mass., and Vicki H. Watkins, Alplaus, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 14, 1988, Ser. No. 271,247

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.⁵ C08L 51/08

U.S. Cl. 525—63

30 Claims

1. A composition comprising a mixture (A) comprising (i) a polycarbonate resin and (ii) a polyester resin; or a mixture (A-1) comprising (ii) a polyester resin and (iii) a polyphenylene

ether resin; or a mixture (A-2) comprising (i) a polycarbonate resin, (ii) a polyester resin and (iii) a polyphenylene ether resin; or a mixture (A-3) of any of the foregoing mixtures; and

an effective impact strength, weld line strength, agglomeration, rubber dispersion, or morphology modifying amount of a multi-stage polyorganosiloxane/polyvinyl-based graft polymer composition (B) comprising:

- (a) as a first stage, a substrate selected from
 - (i) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer and at least one vinyl-based polymer;
 - (ii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which are derived from a cross-linking agent or agents;
 - (iii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which serve as a graft-linking agent or agents;
 - (iv) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, units which derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; or
 - (v) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and a mixture of any of units which are derived from a cross-linking agent or agents, or units which serve as a graft-linking agent or agents, or units derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; and
- (b) at least one subsequent stage or stages graft polymerized in the present of any previous stages and which is comprised of a (meth)acrylate polymer, a vinyl aromatic/(meth)acrylate copolymer or a vinyl aromatic/vinyl cyanide/(meth)acrylate terpolymer.

5,087,663

MOLDING COMPOSITIONS WITH METHYL (METH)ACRYLATE-BUTADIENE-STYRENE GRAFT COPOLYMERS

Michael K. Laughner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 320,663, Mar. 8, 1989, abandoned. This application Oct. 27, 1989, Ser. No. 428,284

Int. Cl.⁵ C08L 69/00

U.S. Cl. 525—67

8 Claims

1. A blow moldable or thermoforming composition comprising

- A) about 20 to about 95% by weight of a carbonate polymer selected from the group consisting of
 - (i) randomly branched carbonate polymers, and
 - (ii) blends of randomly branched carbonate polymers with linear carbonate polymers,
- B) about 5 to about 75% by weight of a graft copolymers of butadiene or a butadiene-vinyl aromatic hydrocarbon copolymer with a mixture consisting of acrylonitrile and styrene which contains greater than 18% by weight of acrylonitrile and less than 40% rubber and
- C) about 1 to about 20% by weight of an MBS melt strength enhancing agent having a T_g less than 0° C. and greater than 40% rubber, which MBS is a core/shell graft copolymer having a core polymer of butadiene or butadiene-vinyl aromatic hydrocarbon or butadiene-vinyl aromatic hydrocarbon-alkyl acrylate with either a second phase polymer of vinyl aromatic hydrocarbon and an outer shell polymer consisting essentially of alkyl (meth)acrylate or an outer shell polymer consisting essentially of alkyl (meth)acrylate and vinyl aromatic hydrocarbon

wherein at least part of the MBS copolymer is located in the carbonate polymer, component A), or in the interface between

the carbonate polymer and the butadiene, acrylonitrile and styrene graft copolymer, component B).

5,087,664

PLASTISOL COMPOSITION AND UNDERCOATING MATERIAL

Satoru Sugino, Yokkaichi, and Yoshimichi Kobayashi, Yokohama, both of Japan, assignors to Mitsubishi Kasei Vinyl Company and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Division of Ser. No. 268,043, Nov. 7, 1988, Pat. No. 5,030,673, which is a continuation of Ser. No. 895,813, Aug. 12, 1986, abandoned. This application Feb. 27, 1991, Ser. No. 661,254

Claims priority, application Japan, Aug. 19, 1985, 60-181194; Dec. 23, 1985, 60-290250; Feb. 17, 1986, 61-32376

Int. Cl.⁵ C08L 75/04

U.S. Cl. 525—124

8 Claims

1. A plastisol composition consisting essentially of a vinyl chloride polymer, a plasticizer and an adhesion-imparting agent of an aromatic diisocyanate polymer blocked with an oxybenzoic acid ester.

5,087,665

TOUGHENED, HYDROLYSIS RESISTANT POLYCARBONATE/POLYESTER BLENDS

James Y. J. Chung, Wexford, John J. Charles, Upper St. Clair, and Nelson R. Lazear, McMurray, all of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1989, Ser. No. 453,557

Int. Cl.⁵ C08L 69/00

U.S. Cl. 525—133

1 Claim

1. A thermoplastic molding composition comprising:
 - (i) 65–75 percent of an aromatic polycarbonate resin,
 - (ii) 35–25 percent of a polyethylene terephthalate resin and
 - (iii) 3–5 percent of a high density polyethylene resin having a melt flow index of at least about 23.0 gm/10 min. as determined in accordance with ASTM D 1238 said composition being further characterized in that articles molded therefrom exhibit a characteristic ductile impact failure said percents being relative to the weight of the composition.

5,087,666

MODIFIED POLY(ARYLENE SULFIDE) COMPOSITION WITH IMPROVED IMPACT STRENGTH AND REDUCED SHRINKAGE

Michael C. Yu, and John B. Allison, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 10, 1990, Ser. No. 550,783

Int. Cl.⁵ C08L 81/00

U.S. Cl. 525—189

21 Claims

1. A composition consisting essentially of poly(arylene sulfide), a polymeric rubber, a polyethylene and an unsaturated carboxylic anhydride.

5,087,667

FILM FROM MIXTURE OF ETHYLENE POLYMER, BUTENE POLYMER, PROPYLENE POLYMER

Charles C. Hwo, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 50,648, May 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 750,342, Jun. 28, 1985, abandoned. This application Jul. 15, 1991, Ser. No. 729,918

Int. Cl.⁵ C08L 23/20

U.S. Cl. 525—222

8 Claims

1. A packaging film or sheet which is capable of forming peel seals comprising a mixture containing: from about 10 percent by weight to about 45 percent by weight of an ethylenic homopolymer or copolymer, wherein said ethylenic homopolymer is selected from the

group consisting of medium density polyethylene, and high density polyethylene, said ethylenic copolymer is selected from the group consisting of linear low density polyethylene copolymer, ethylene vinyl acetate copolymer, and ethylene methyl acrylate copolymer, and wherein said ethylenic copolymer is a random copolymer; from about 50 percent by weight to about 85 percent by weight of a butene-1 copolymer with an ethylene comonomer content of 1–15 mole percent; and from about 3 percent by weight to about 15 percent by weight of a propylene homopolymer or copolymer.

5,087,668

RUBBER BLEND AND TIRE WITH TREAD THEREOF

Paul H. Standstrom; Tallmadge; J. Dale Massie, II; Hudson; John J. A. Verthe; Gregory M. Holtzapple, all of Kent, and Raymond R. DiRossi, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

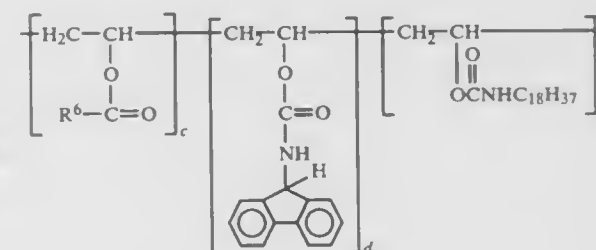
Continuation of Ser. No. 600,381, Oct. 19, 1990, abandoned. This application May 9, 1991, Ser. No. 698,007

Int. Cl.⁵ C08L 9/00, 9/06, 7/00

U.S. Cl. 525—237

16 Claims

1. A sulfur cured rubber composition composed of, based on 100 parts by weight rubber (phr): (A) about 5 to about 35 parts by weight 3,4-polyisoprene rubber; (B) about 20 to about 60 parts by weight cis 1,4-polyisoprene rubber; and (C) about 10 to about 50 parts by weight of at least one other rubber selected from at least one of solution polymerization formed styrene/butadiene copolymer rubber having a styrene/butadiene ratio in the range of about 5/95 to about 30/70, emulsion polymerization formed styrene/butadiene copolymer rubber having a styrene/butadiene ratio in the range of about 10/90 to about 60/40, cis 1,4-polybutadiene rubber, isoprene/butadiene copolymer rubber having an isoprene/butadiene ratio in a range of about 30/70 to about 70/30, styrene/isoprene copolymer rubber having a styrene/isoprene ratio in a range of about 10/90 to about 35/65, and styrene/isoprene/butadiene terpolymer rubber; wherein said 3,4-polyisoprene rubber, in its uncured state, is characterized by having a glass transition temperature (T_g) in the range of about –15° C. to about –20° C., a Mooney (ML1 + 4) value in the range of about 70 to about 90, and, further, a polymer structure containing about 50 to about 60, 3,4-vinyl isoprene units, about 30 to about 48 percent 1,4-cis and trans units and about 2 to about 10 percent 1,2-isoprene units with the total of its 3,4- and 1,2-units being in the range of about 56 to about 63 percent.



or



wherein

R⁶ is independently selected from the group consisting of one or more of lower alkyl groups (C₁ to C₄) or phenyl groups, and c, d, and e are integers, the sum of which is 10 to 20,000, d is 0.01% to 10% of the sum, and e is 5% to 95% of the sum, and p and q are integers, the ratio of p/q being 0.2/1 to 5/1 and the number average molecular weights of the polymers containing p and q units being 500 to 20,000.

5,087,671

POLYMERS FOR SCAVENGING NITROSATING AGENTS

Richard N. Loeppky, and Yen T. Bao, both of Columbia, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Jun. 25, 1990, Ser. No. 543,349

Int. Cl.⁵ C08F 8/00

U.S. Cl. 525—328.2

38 Claims

1. A method for reducing the concentration of an unwanted nitrosating agent in a fluidized material, comprising the step of contacting a fluidized material containing an unwanted nitrosating agent with a polymeric substance which is insoluble in said fluidized material, wherein the polymeric substance comprises reactive groups bonded to polymeric backbones,

5,087,669

VINYL CHLORIDE POLYMER COMPOSITION WITH IMPROVED FUSION PROPERTIES

Thomas G. Prejean, Brusly, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 18, 1989, Ser. No. 408,589

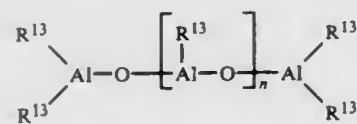
Int. Cl.⁵ C08L 23/28, 23/20, 27/06

U.S. Cl. 525—239

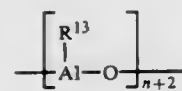
13 Claims

1. A composition comprising polyvinyl chloride, an impact-modifying amount of a chlorinated olefin polymer, and a fusion-promoting amount of an oxidized high density polyethylene homopolymer from about 0.05 to about 0.15 weight parts per 100 weight parts of polyvinyl chloride having an acid number of from about 5 to about 40.

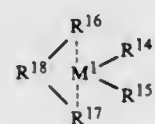
metallocene as the transition metal component and an aluminum of the formula VII



for the linear type, and/or of the formula VIII



for the cyclic type, R^{13} in the formulae VII and VIII denoting a C_1 - C_6 -alkyl group or phenyl or benzyl and n being an integer from 2 to 50, which comprises carrying out the polymerization in the presence of a catalyst the transition metal component of which is a compound of the formula IX

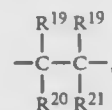
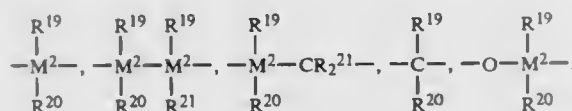


in which

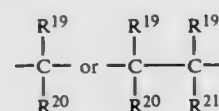
M^1 is titanium, zirconium, hafnium, vanadium, niobium or tantalum,

R^{14} and R^{15} are identical or different and denote a hydrogen atom, a halogen atom, a C_1 - C_{10} -alkyl group, a C_1 - C_{10} -alkoxy group, a C_6 - C_{10} -aryl group, a C_6 - C_{10} -aryloxy group, a C_2 - C_{10} -alkenyl group, a C_7 - C_{40} -arylalkyl group, a C_7 - C_{40} -alkylaryl group or a C_8 - C_{40} -arylalkenyl group, R^{16} and R^{17} are identical or different and denote a mononuclear or polynuclear hydrocarbon radical which can form a sandwich structure together with the central atom M^1 ,

R^{18} is



$=BR^{19}$, $=AlR^{19}$, $-Ge-$, $-Sn-$, $-O-$, $-S-$, $=SO$, $=SO_2$, $=NR^{19}$, $=CO$, $=PR^{19}$ or $=P(O)R^{19}$; R^{19} , R^{20} and R^{21} being identical or different and denoting a hydrogen atom, a halogen atom, a C_1 - C_{10} -alkyl group, a C_1 - C_{10} -fluoroalkyl group, a C_6 - C_{10} -fluoroaryl group, a C_6 - C_{10} -aryl group, a C_1 - C_{10} -alkoxy group, a C_2 - C_{10} -alkenyl group, a C_7 - C_{40} -arylalkyl group, a C_8 - C_{40} -arylalkenyl group or a C_7 - C_{40} -alkylaryl group or R^{19} and R^{20} or R^{19} and R^{21} , in each case with the atoms linking them, forming a ring, provided that when R^{16} and R^{17} are identical and R^{18} is



R^{19} and R^{20} are not hydrogen or C_1 - C_{10} -alkyl; and

M^2 is silicon, germanium or tin.

(VII)

5,087,678
METHOD FOR REDUCING FOAMING IN A VINYL CHLORIDE POLYMERIZATION REACTOR
Genji Noguki; Shigehiro Hoshida, and Kouzou Kuwabara, all of Ibaraki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,280
Claims priority, application Japan, Jan. 5, 1989, 64-784
Int. Cl.⁵ C08F 2/20

(VIII)

U.S. Cl. 526—194 2 Claims
1. In a method for the polymerization of vinyl chloride monomer or a monomer mixture composed mainly of vinyl chloride in an aqueous polymerization medium contained in a polymerization reactor equipped with a reflux condenser for the removal of the heat of polymerization, the improvement which comprises admixing the aqueous polymerization mixture with additives comprising

- from 0.002 to 0.007 part by weight of a partially saponified polyvinyl alcohol having a degree of saponification in the range from 20 to 50% by moles and an average degree of polymerization in the range from 200 to 400 and
- from 0.001 to 0.01 part by weight of a defoaming agent comprising an aqueous emulsion of a silicone fluid containing from 0.05 to 0.4 part by weight of a finely divided silica powder per 100 parts by weight of the silicone fluid, each amount being per 100 parts by weight of the vinyl chloride monomer or the monomer mixture mainly composed of vinyl chloride, at a moment when the cumulative amount of the heat of polymerization removed through the reflux condenser does not exceed 10% of the overall heat of polymerization which should be evolved when the whole amount of the vinyl chloride monomer of the monomer mixture mainly composed of vinyl chloride has been polymerized.

(IX)

5,087,679

POLYMERIC DIELECTRICS

Hiroshi Inukai; Noriko Kawai; Takahiro Kitahara; Shinichiro Kai, and Motonobu Kubo, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Apr. 4, 1990, Ser. No. 503,970
Claims priority, application Japan, Apr. 7, 1989, 1-88329
Int. Cl.⁵ C08F 214/22

U.S. Cl. 526—249 10 Claims
1. A polymeric dielectric which comprises 60% to 79% by mole of repeating units of vinylidene fluoride, 18% to 22% by mole of repeating units of trifluoroethylene and 3% to 22% by mole of repeating units of chlorotrifluoroethylene.

5,087,680

FLUOROPOLYMER ALLOYS

Youlu Duan; Shanrong Jin; Tingchun Huang; Jin Sun, and Xinying Yu, all of Shanghai, China, assignors to Shanghai Institute of Organic Chemistry Academia Sinica, Shanghai, China

Continuation of Ser. No. 166,094, Mar. 9, 1988, abandoned, which is a division of Ser. No. 843,089, Mar. 24, 1986, Pat. No. 4,749,752. This application Oct. 10, 1989, Ser. No. 423,482
Claims priority, application China, Apr. 1, 1985, 85100490; Apr. 1, 1985, 85100491

Int. Cl.⁵ C08L 214/26, 214/28

U.S. Cl. 526—254 1 Claim
1. An extra-high-molecular weight tetrafluoroethylene hexafluoropropylene copolymer which is melt fabricatable comprising a hexafluoropropylene content of 12-30% by weight, a weight-average molecular weight of over 2.1×10^5 , a melt viscosity higher than 1.5×10^6 poises, and a melt flow index less than 0.8 gram/10 minutes.

5,087,681 COMPOSITION FROM REACTING VINYLIDENE TERMINATED POLYBUTADIENE/ACRYLONITRILE AND BISIMIDE

Anthony J. Kinloch, Bishops Stortford, and Stephen J. Shaw, Saffron Walden, both of England, assignors to Secretary of State for Defence in her Majesty's Government of United Kingdom, London, England

Continuation of Ser. No. 113,322, Oct. 28, 1987, abandoned, which is a continuation of Ser. No. 747,460, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 645,311, Aug. 21, 1984, abandoned. This application Aug. 8, 1989, Ser. No. 391,667

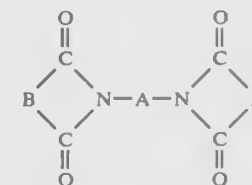
Claims priority, application United Kingdom, Dec. 24, 1982, 8236849; Jun. 22, 1984, 8416024

Int. Cl.⁵ C08G 236/06, 236/12

U.S. Cl. 526—262

14 Claims
1. A method for preparing a thermosetting imide resin composition which comprises chemically reacting a liquid mixture of a vinylidene terminated polybutadiene/acrylonitrile (VTBN) polymer having a polybutadiene/acrylonitrile backbone and terminal groups at both ends of the formula $-C(R)=CH_2$ wherein R is independently selected from the group consisting of H and an alkyl group containing 1 to 4 carbon atoms, with a co-reactant selected from the group consisting of:

- at least one N,N'-bisimide of an unsaturated carboxylic acid of the formula I



wherein B represents a divalent radical containing a carbon-carbon double bond and A represents a divalent radical having at least two carbon atoms,

- the imide resin reaction product of at least one N,N'-bisimide of formula I and at least one primary organic diamine or organic hydrazide, and
- the imide resin reaction product of at least one N,N'-bisimide of formula I, at least one monoimide, and at least one organic hydrazide,

to yield a thermosetting imide resin composition containing copolymerised VTBN and co-reactant, said composition being curable at a temperature between 100° C. and 350° C. to a fully cross-linked polyimide matrix containing a dispersion of phase separated solid particles of copolymerised VTBN and co-reactant.

5,087,682

POLYETHER POLYCARBOXYLATE COMPOSITIONS USEFUL AS DETERGENT BUILDERS

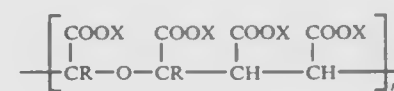
Carmino P. Iovine, Bridgewater; Rama S. Chandran, So. Bound Brook, and John C. Leighton, Flanders, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Oct. 16, 1989, Ser. No. 422,355

Int. Cl.⁵ C08F 34/02

U.S. Cl. 526—271

2 Claims
1. A polymer, derived from a polymer of furan and maleic anhydride, comprising a repeating unit of the structure:



wherein R is H, $-CH_3$, $-CH_2CH_3$, or a combination thereof; X is H, or a salt forming cation, or a C_1 - C_{12} alkyl substituent,

or a C_5 - C_{12} cycloalkyl substituent having at least one five- or six-membered ring, or a combination thereof; and m is at least 1.

5,087,683

PROCESS FOR PRODUCING α , ω -HYDROXYFLUOROALKYLPOLYSILOXANES

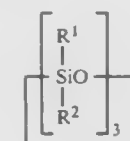
Masatoshi Arai; Shinichi Satoh, and Kesao Ide, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Japan

Filed Feb. 6, 1990, Ser. No. 475,870

Claims priority, application Japan, Feb. 7, 1989, 1-26782
Int. Cl.⁵ C08G 77/06

U.S. Cl. 528—14

14 Claims
1. A process for producing an α , ω -hydroxyfluoroalkyl-polysiloxane comprising polymerizing a cyclotrisiloxane of formula (I) in the presence of a polymerization catalyst of lithium hydroxide or a lithium salt of a diorganosiloxane obtained by blending and heating lithium hydroxide and a diorganosiloxane, and a promoter of a phthalic diorganosiloxane and/or ortho-dialkoxybenzene, and adding an effective amount of a neutralizer to stop the polymerization reaction at the desired viscosity:



wherein

- R^1 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 8 carbon atoms;
- R^2 is a fluoroalkyl group having 1 to 10 carbon atoms.

5,087,684

CURABLE KETIMINOXY/ORGANOPOLYSILOXANE COMPOSITIONS DEVOID OF ORGANOMETALLIC CURING CATALYSTS

Patrice Perrin, Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 27, 1991, Ser. No. 661,296

Claims priority, application France, Feb. 27, 1990, 90 02697
Int. Cl.⁵ C08G 77/06

U.S. Cl. 528—22

9 Claims
1. An organopolysiloxane composition of matter that is stable in storage in the absence of moisture and curable into elastomeric state in the presence of moisture, devoid of any organometallic curing catalyst, and which comprises (A) an α , ω -dihydroxydiorganopolysiloxane polymer, (B) a ketiminoxysilane crosslinking agent, (C) inorganic filler material; (D) an organofunctional silane other than the ketiminoxysilane claimed as component (B) and (E) a substituted hydroxylamine.

5,087,685

PROCESS FOR PREPARING POLYCARBOSILANES AND NEW POLYCARBOSILANES

Peter Sartori, Rheinberg, Fed. Rep. of Germany; Baudouin van Aefferden, Duisburg, Belgium, and Wolfgang Habel, Duesseldorf, Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

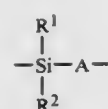
Filed Dec. 4, 1989, Ser. No. 445,742

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841348

Int. Cl.⁵ C08G 77/04

U.S. Cl. 528—25

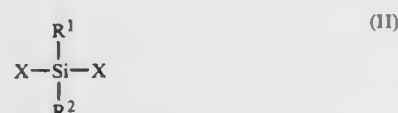
37 Claims
1. A process for preparing a polycarbosilane based on structural units corresponding to the formula I



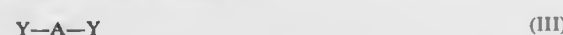
wherein

R^1 represents hydrogen, alkyl, cycloalkyl, aryl or arylalkyl, whereby R^1 may also have different meanings in different units of one and the same polycarbosilane, R^2 represents alkyl, cycloalkyl, aryl or arylalkyl, whereby R^2 may also have different meanings in different units of one and the same polycarbosilane, and A represents a straight-chain or branched alkylene radical or a cycloalkylene radical, whereby A may also have different meanings in different units of one and the same polycarbosilane,

comprising reacting at least one dihalosilane corresponding to the formula II



wherein R^1 and R^2 have the meanings given above, and X represents halogen, with at least one dihalo-hydrocarbon corresponding to the formula III



wherein A has the meaning given above and Y represents chlorine, bromine or iodine, in the presence of an alkali metal.

5,087,686

CURABLE COMPOSITIONS

Christopher W. G. Ansell, Cambridge, and Colin Butler, Upper Boddington, both of United Kingdom, assignors to Smith and Nephew p.l.c., United Kingdom

Continuation-in-part of Ser. No. 129,526, Dec. 7, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,783 Claims priority, application United Kingdom, Aug. 28, 1987, 8720440

Int. Cl.⁵ C08G 18/14

U.S. Cl. 528—49

27 Claims

1. A radiation or thermally curable composition for a pressure sensitive adhesive which comprises a polyurethane capped with residues of a hydroxyalkyl acrylate or methacrylate and non-polymerisable residues of a primary or secondary alcohol.

5,087,687

POLYETHERS CONTAINING PERFLUOROALKYL GROUPS, METHODS FOR THEIR SYNTHESIS AND THEIR USE AS SURFACTANTS AND AS POLYOL COMPONENTS IN THE PREPARATION OF POLYURETHANES

Jürgen Fock, Duesseldorf, and Eberhard Esselborn, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jan. 26, 1990, Ser. No. 470,932

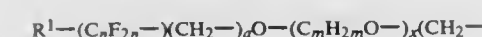
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906220

Int. Cl.⁵ C08L 75/04; C08G 18/38, 59/30, 59/42

U.S. Cl. 528—50

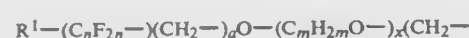
13 Claims

1. Polyether containing perfluoroalkyl groups and having the average formula

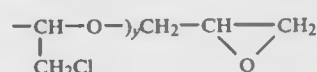
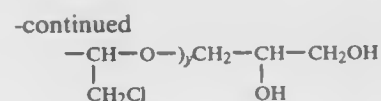


(I)

or



II



wherein

R^1 is the same or different in the polymer mixture and represents hydrogen or a fluoro group, n has an average value of 4 to 12, a has an average value of 0 to 4, m has an average value of 2 to 18, x has an average value of 2 to 50 and y has an average value of 0 to 3.

5,087,688

FIBROUS COMPOSITE STRUCTURE IMPREGNATED WITH A SOLVENT-FREE CURABLE EPOXY RESIN MATRIX

Urs Gruber, Arlesheim; Friedrich Stockinger, Courtepin, and Elvio Manso, Giubiasco, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1990, Ser. No. 541,237

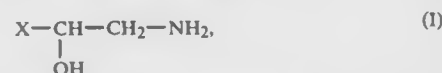
Claims priority, application Switzerland, Jun. 29, 1989, 2409/89

Int. Cl.⁵ C08G 59/28

U.S. Cl. 528—99

9 Claims

1. A fibrous composite structure impregnated with a solvent-free, curable epoxy resin matrix and comprising (a) a liquid epoxy resin or a liquid epoxy resin mixture, (b) a liquid β -hydroxyamine of formula I



wherein X is phenyl or the radical $R-O-CH_2-$, wherein R is an alkyl group of 4 to 20 carbons or is phenyl or phenyl which is substituted by one or more C_1-C_4 alkyl groups, a liquid mixture of β -hydroxyamines of formula I or a liquid mixture of one or more β -hydroxyamines of formula I and of a primary monoamine different from formula I or of a primary or secondary diamine, and (c) a catalytically curing tertiary amine, said curable epoxy resin matrix containing 0.15 to 1.2 amine hydrogen equivalents of the amine component (b) and 0 to 0.1 mol of the tertiary amine (c) per 1 epoxide equivalent of the epoxy resin (a).

5,087,689

POLYIMIDE AND HIGH-TEMPERATURE ADHESIVE OF POLYIMIDE BASED ON META-PHENOXY DIAMINES

Masahiro Ohta, Yokohama; Saburo Kawashima, Yokosuka; Yoshiho Sonobe, Yokohama; Shoji Tamai; Hideaki Oikawa, both of Yokohama, and Kouji Ohkoshi, Kanagawa; Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

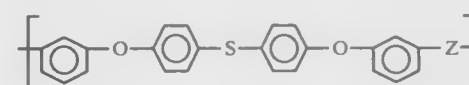
Continuation of Ser. No. 334,372, Apr. 6, 1989, abandoned, which is a division of Ser. No. 44,028, Jun. 3, 1987, Pat. No. 4,847,349. This application Nov. 9, 1990, Ser. No. 611,471 Claims priority, application Japan, Aug. 27, 1985, 60-186610; Sep. 19, 1985, 60-205283; Oct. 11, 1985, 60-224812; Mar. 5, 1986, 61-46369

Int. Cl.⁵ C08G 73/10

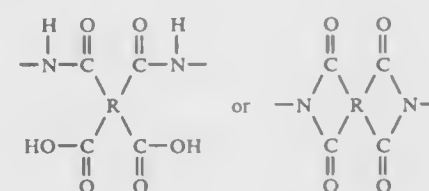
U.S. Cl. 528—185

4 Claims

1. A polymer consisting essentially of recurring units of the formula:



wherein Z is:



and R is a tetravalent radical selected from the group consisting of an aliphatic radical having 2 or more carbon atoms, a cycloaliphatic radical, a monoaromatic radical, a condensed polyaromatic radical and a non-condensed polyaromatic radical wherein the aromatic radicals are mutually connected with a bond or a crosslinking function.

5,087,690

HYBRID AMINO RESIN COMPOSITIONS

David W. Demarey, Westhampton, Mass., assignor to Monsanto, St. Louis, Mo.

Filed Jan. 24, 1989, Ser. No. 301,208

Int. Cl.⁵ C08F 283/00; C08G 8/28; C08L 61/00, 61/20

U.S. Cl. 528—230

27 Claims

1. A curable composition comprising an alkoxymethyl amino resin component, a hydroxy-functional component co-reactive with the alkoxymethyl amino resin, a (meth)acryloyl component, an allylic or vinylenearylenemethylidene component and a metal sulfonate of a metal selected from Groups IB, IIIB, IVB, VB, VIB, VIIB, and VIII of the CAS version of the Periodic Table.

5,087,691

POLY-PHENYLATED DIAMINES AND THEIR USE AS POLYCONDENSATION MONOMERS IN THE SYNTHESIS OF POLYAMIDE, POLY(AMIDE-IMIDE), AND POLYIMIDE POLYMERS

Frank W. Harris, Akron, Ohio, assignor to University of Akron, Akron, Ohio

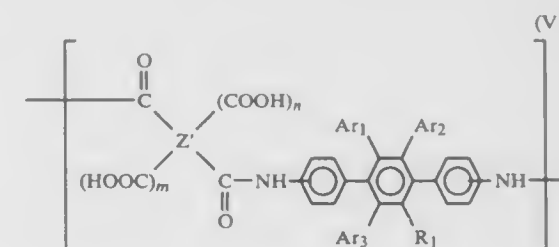
Filed Sep. 1, 1989, Ser. No. 402,272

Int. Cl.⁵ C08G 69/26

U.S. Cl. 528—353

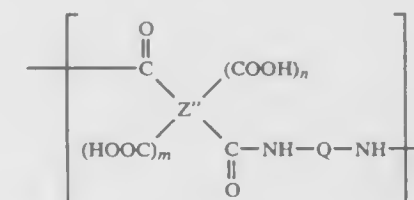
15 Claims

1. A polyamide, a polyamide-amide-acid or a polyamide-acid which comprises 1 to 100 mole percent of structural elements of the formula (VI)



(VII)

and from 99 to 0 mole percent of a repeat unit of formula (VII)



where both imido (CONH) groups are independently in either the meta or para position with respect to the covalent bond to the center polysubstituted benzene ring, where Ar_1 , Ar_2 , and Ar_3 are separately and independently aryl groups selected from the group consisting of a phenyl group, a halogen substituted phenyl group, an alkoxy substituted phenyl group, a halo-alkyl substituted phenyl group, an alkyl substituted phenyl group, or a cycloalkyl substituted phenyl group, where R_1 is selected from the group consisting of a H atom, an alkyl group, cycloalkyl group or an aryl group, n and m are whole numbers separately and independently having the numeric value of either 0 or 1, Z' and Z'' is separately and independently one or more organic radical selected from the group consisting of an aliphatic radical, a cycloaliphatic radical, a carbocyclic-aromatic radical, or a hetero-cyclic aromatic radical, and Q is one or more divalent organic radical selected from the group consisting of an aliphatic radical having at least 2 carbon atoms, a carbocyclic aliphatic radical, a carbocyclic aromatic radical, or a heterocyclic radical.

5,087,692

PREPARATION OF LINEAR POLYCARBONATES FROM CYCLIC OLIGOMER COMPOSITIONS WITH SALICYLIC ACID SALT AS CATALYST

Kevin R. Stewart, and Andrew J. Salem, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 431,818, Nov. 6, 1989, abandoned. This application Jun. 7, 1990, Ser. No. 534,566 Int. Cl.⁵ C08G 64/38

U.S. Cl. 528—371

20 Claims

1. A method for preparing a resinous composition which comprises contacting, at a temperature in the range of about 250°–350° C., at least one cyclic polycarbonate oligomer with a catalytic amount of at least one monobasic metal salicylate.

5,087,693
BOVINE MONOCLONAL ANTIBODIES TO BOVINE
HERPESVIRUS 1 FROM SEQUENTIAL FUSION
HETEROHYBRIDIMAS

Randall L. Levings, Ames, and Ione R. Stoll, Story City, both of Iowa, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C. Division of Ser. No. 271,825, Nov. 16, 1988, Pat. No. 5,026,646. This application Apr. 23, 1991, Ser. No. 689,572

Int. Cl.⁵ C07K 15/28

U.S. Cl. 530—387

2 Claims

1. A neutralizing and protective monoclonal antibody to bovine herpesvirus-1.
2. A neutralizing monoclonal antibody as described in claim 1 produced by a heterohybridoma selected from the group consisting of α BL5C2.870005 (ATCC H 9907), α BL5C2.870009 (ATCC HB 9908), and α BL5C2.870016 (ATCC HB 9909).

5,087,694
FLUORINATED GELATIN AND PROCESS FOR ITS
PREPARATION

Sylviane Dumas, Isle sur la Sorgue, and Georges Takerkart, Isle-sur-Sorgue, both of France, assignors to Sanofi, Paris, France

Filed Dec. 15, 1989, Ser. No. 451,169

Claims priority, application France, Dec. 16, 1988, 8816673

Int. Cl.⁵ C09H 7/00

U.S. Cl. 530—354

13 Claims

1. A modified gelatin bearing inert polyfluorinated substituents covalently bonded to the protein chain by a process consisting essentially of reacting gelatin with a monofunctional polyfluorinated reagent containing only one group capable of reacting with the OH or NH₂ groups of the protein chain.

5,087,695
IMMUNOGLOBULIN EXTRACTION UTILIZING
PROPERTIES OF COLLOIDAL SOLUTIONS

William A. J. McAuley, Portland Township, Frontenac County, Canada, assignor to MCY Laboratories Canada, Inc., Canada Filed Jul. 12, 1989, Ser. No. 378,975

Claims priority, application Canada, Jul. 29, 1988, 573360

Int. Cl.⁵ C07K 3/24; A61K 37/04

U.S. Cl. 530—387

3 Claims

1. A process for extracting undenatured immunoglobulins from a water soluble precipitate containing EDTA-insoluble undenatured immunoglobulins and EDTA-soluble lipid material, which consists essentially of:

- washing the water insoluble precipitate with a solution of EDTA to remove lipid material therefrom; and
- rendering the resulting essentially lipid material-free undenatured immunoglobulins-containing precipitate into colloidal suspensions in a fluid system comprising:
 - a source of positive ions selected from the group consisting of L-lysine.HCl, L-arginine.HCl, and mixtures thereof; and
 - sodium bicarbonate as a source of negative ions.

5,087,696
CONJUGATE COMPOUND

David Parker, Durham, and Thomas A. Millican, Mladenhead, both of United Kingdom, assignors to Celltech Limited, England

PCT No. PCT/GB87/00106, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/05030, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 13, 1987, Ser. No. 132,955

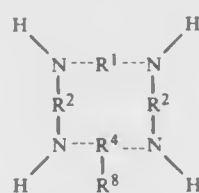
Claims priority, application United Kingdom, Feb. 13, 1986, 8603537

Int. Cl.⁵ C07D 257/02; A61K 43/00, 40/00; C07K 15/00

U.S. Cl. 540—465

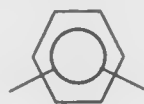
8 Claims

1. A compound having the structure:

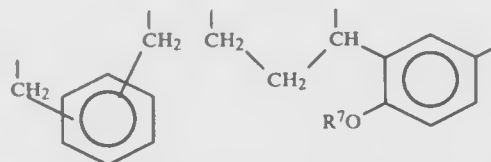


wherein

R¹ is $-(CH_2)_p-R^6-(CH_2)_q-$ where p and q are the same or different and are 0, 1 or 2, and $-R^6-$ is $-(CH_2)_n-$, where n is 0 or 1, $-NH-$, $-O-$, $-S-$ or



R¹ optionally being alkyl substituted, provided that neither p nor q is 0 unless R⁶ is $-CH_2-$, R² are $-CH_2CH_2-$ or $-CH_2CH_2CH_2-$, optionally alkyl, alkoxyalkyl or hydroxyalkyl substituted, R⁴ is



$-CH_2-CH_2-CH-$ or $-CH_2-CH-CH_2-$ optionally alkyl substituted, wherein R₇ is $-H$, alkyl, hydroxyalkyl, or alkoxyalkyl provided that when R⁴ is $-CH_2-CH-CH_2-$, R³ is not carboxyalkyl, and R⁸ comprises an exocyclic amine having a pK_a from 8 to 10 covalently attached to R⁴.

6. The compound according to claim 1, including a complexed metal atom.

5,087,697

THERAPEUTIC NUCLEOSIDES

Susan M. Daluge, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

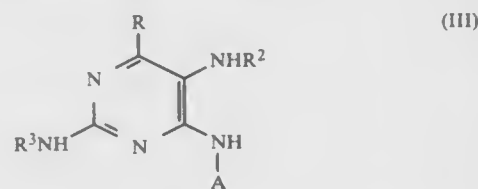
Continuation-in-part of Ser. No. 455,201, Dec. 22, 1989, which is a continuation-in-part of Ser. No. 371,870, Jun. 26, 1989, abandoned. This application Dec. 19, 1990, Ser. No. 630,129 Claims priority, application United Kingdom, Jun. 27, 1988, 8815265

Int. Cl.⁵ A61K 31/52; C07D 473/00, 239/02

U.S. Cl. 544—323

9 Claims

1. Enantiomeric compounds of formula (III)



wherein A represents the 2-cyclopentene-1-methanol-4-yl group in either the (1S,4R) or (1R,4S) configuration, R represents a cyclopropylamino or N-cyclopropyl-N-methylamino group, R² represents hydrogen or a formyl group and R³ represents a C₁₋₆alkanoyl group, or a salt or ester thereof.

9. N-(4-Chloro-1,6-dihydro-5-nitro-6-oxo-2-pyrimidinyl)isobutyramide.

5,087,698
PROCESS FOR THE OPTICAL RESOLUTION OF
DROPOPIZINE

Roberto Giani, Milan, Italy, assignor to Dompe' Farmaceutici S.p.A., Milan, Italy

Filed Jul. 19, 1990, Ser. No. 553,796

Claims priority, application Italy, Jul. 20, 1989, 21244 A/89

Int. Cl.⁵ C07D 295/08

U.S. Cl. 544—394

6 Claims

1. A process for the optical resolution of racemic dropopizine, characterized in that it is carried out using L-(+)-tartaric acid as the optical resolution agent.

5,087,699

3,4-PYRIDINE-DITHIOL COMPOUNDS AND METHOD
OF PRODUCING THE SAME

Kazukiyo Nagai, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

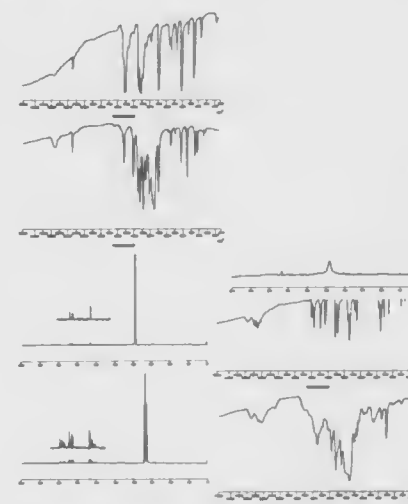
Filed Jul. 11, 1990, Ser. No. 551,204

Claims priority, application Japan, Jul. 18, 1989, 1-185678

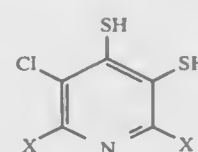
Int. Cl.⁵ C07D 213/26, 213/70

U.S. Cl. 546—296

5 Claims



1. A 3,4-pyridine-dithiol compound having formula (I):



wherein X is chlorine or a trifluoromethyl group.

5,087,700
METHOD OF PRODUCING PRIMARY AMINES IN
HIGH YIELDS

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Division of Ser. No. 226,080, Jul. 29, 1988, Pat. No. 4,918,229.

This application Mar. 26, 1990, Ser. No. 498,855

Int. Cl.⁵ C07C 209/88

U.S. Cl. 546—329

7 Claims

1. A process for obtaining an optically active amine of essentially 100% ee in high yields represented by the formula R*NH₂ wherein R* is a chiral organo group other than alkyl selected from the group consisting of an aliphatic, alicyclic, steroidal or heterocyclic organyl group having up to 30 carbon atoms attached to the nitrogen comprising the steps of: heating an optically active dimethylboronborane of the formula R*BME₂, wherein R* is the same chiral organo group but attached to boron, in a suitable solvent with an aminating agent

selected from the group consisting of NH₂X wherein X is halo, ammonia and NaOCl or CaOCl₂, NH₃ and Cl₂, chloramine-T and hydroxylamine-O-sulfonic acid, followed by hydrolysis with aqueous base to liberate the optically active primary amine, and isolation of same.

5,087,701

PHTHALIMIDE ACID HALIDES

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

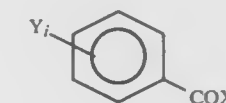
Division of Ser. No. 46,202, May 4, 1987, Pat. No. 4,935,523, which is a continuation-in-part of Ser. No. 865,228, May 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 781,847, Sep. 30, 1985, abandoned. This application Mar. 5, 1990, Ser. No. 489,205

Int. Cl.⁵ C07D 491/08, 495/08, 209/48

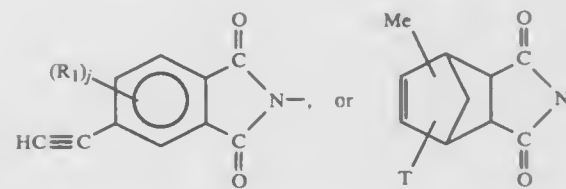
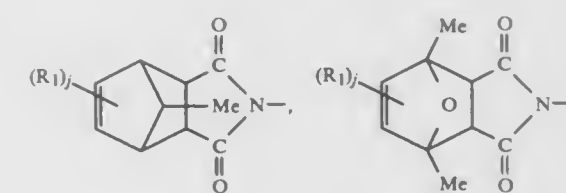
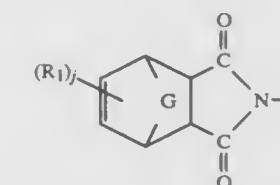
U.S. Cl. 548—431

29 Claims

1. A crosslinking end cap monomer selected from the group consisting of



wherein Y =



R₁=lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, or mixtures thereof, wherein the substituents for alkyl or aryl are selected from the group consisting of hydroxyl or halogeno;

X=halogen;

Me=methyl;

T=allyl or methallyl;

i=1 or 2;

j=0, 1, or 2; and

G= $-CH_2-$, $-O-$, $-S-$, or $-SO_2-$.

5,087,702

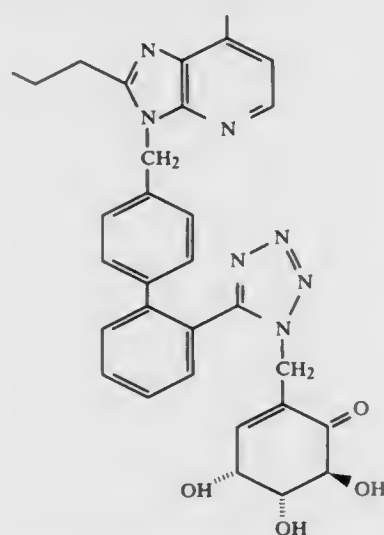
MICROBIAL TRANSFORMATION PROCESS FOR PRODUCING AN ANTIHYPERTENSIVE PRODUCT
 Shieh-Shung T. Chen, Morganville; Byron H. Arison, Edison; Raymond F. White, Englishtown, and Edward S. Inamine, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 30, 1991, Ser. No. 647,945
 Int. Cl.⁵ C07D 471/04; C12P 17/18

U.S. Cl. 546—118

1. A compound of structural formula I:

6 Claims



or a pharmaceutically acceptable salt thereof.

5,087,703

PROCESS FOR SYNTHESIS OF FK-506 INTERMEDIATES

Ralph P. Volante, East Windsor; David Askin, Edison; Ichiro Shinkai, Westfield, and Kenneth M. Ryan, Clark, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

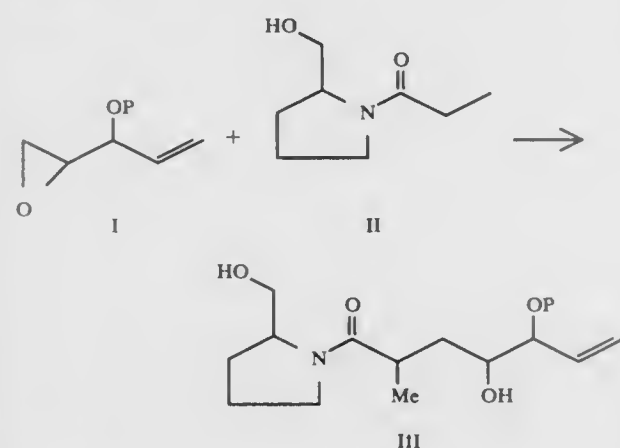
Continuation of Ser. No. 149,464, Jan. 28, 1988, abandoned. This application Apr. 11, 1990, Ser. No. 508,153

Int. Cl.⁵ C07D 207/08

U.S. Cl. 548—406

9 Claims

1. An alkylation process comprising the step of reacting Structures I and II to yield III, as shown by the following sequence:



wherein P is a triorganosilyl protecting group, wherein "organo" is C₂-C₆ alkyl, C₆-C₈ aryl, C₃-C₁₀ aralkyl, or mixtures thereof, removable by catalytic hydrogenation or mild acid hydrolysis, said process being conducted in the presence of two equivalents of a lithium secondary di C₁-C₁₀ alkylamine

salt, in the temperature range of -10° to +40° C., in an anhydrous inert non-hydroxylic organic solvent, under an inert atmosphere for sufficient time to form III.

5,087,704

CYANINE COMPOUNDS

Osamu Manabe, Osaka; Shigeo Fujita, Kawachinagao; Shizuo Iwata, Kishiwada, and Morihiro Kamiyama, Ibaraki, all of Japan, assignors to Asahi Chemical Co., Ltd., Osaka, Japan
 PCT No. PCT/JP89/00918, § 371 Date May 4, 1990, § 102(e)
 Date May 4, 1990, PCT Pub. No. WO90/02777, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 6, 1989, Ser. No. 474,094

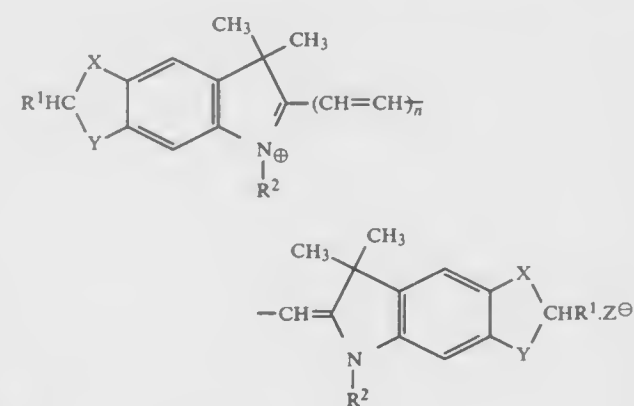
Claims priority, application Japan, Sep. 9, 1988, 63-227091

Int. Cl.⁵ C07D 209/56, 491/044, 491/056

U.S. Cl. 548—427

6 Claims

1. A cyanine compound represented by the formula



wherein

R¹ is a hydrogen atom or a lower alkyl group;

R² is a lower alkyl group which is unsubstituted or substituted with a substituent selected from C₁-C₈ alkoxy-, hydroxyl-, carboxyl-, (C₁-C₈ alkyl)amino-, phenylsulfonylamino-, p-methylphenylsulfonylamino-, acetoxy-, acetoxy-, (C₁-C₃ alkoxy)carbonyl-, (C₁-C₃ alkoxy)-(C₁-C₃ alkoxy) carbonyl- and sulfonic acid group;

X and Y are the same or different and each represents a methylene group or an oxygen atom;

Z is an acidic residue, and

n is 2 or 3.

5,087,705

PROCESS FOR PREPARATION OF N-SUBSTITUTED MALEIMIDES

Takashi Okada; Takamichi Aoyama; Shoichi Mizuno; Akihiro Akatsuka, all of Yokkaichi, and Kiyonari Matsuoka, Mie, all of Japan, assignors to Shin-Daikyo Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,884

Claims priority, application Japan, Apr. 21, 1989, 1-102891; Sep. 7, 1989, 1-232142; Sep. 7, 1989, 1-232143

Int. Cl.⁵ C07D 207/444

U.S. Cl. 548—458

19 Claims

1. A process for preparation of an N-substituted maleimide represented by formula (2):

5,087,706

FLUORAN COMPOUNDS, PROCESS FOR PREPARATION THEREOF AND RECORDING MATERIALS COMPRISING SAID COMPOUND

Atsuo Otsuji, Kamakura; Masakatsu Nakatsuka; Kiyoharu Hasegawa, both of Yokohama; Masatoshi Takagi, and Akihiro Yamaguchi, both of Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

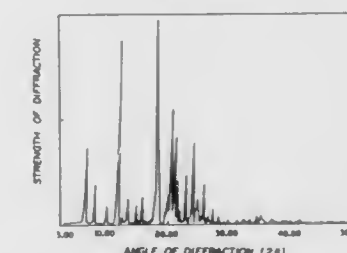
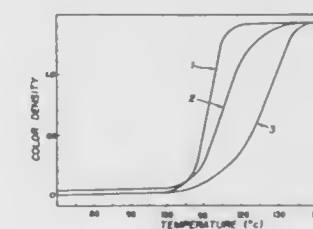
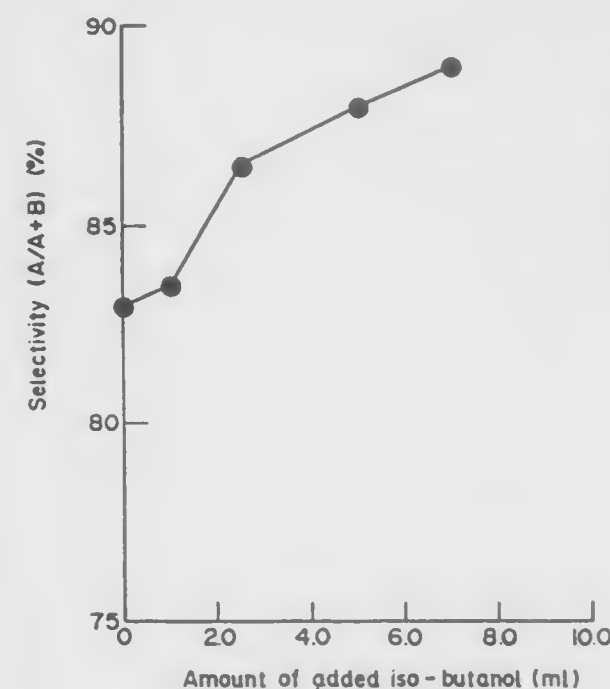
Filed Sep. 18, 1990, Ser. No. 584,219

Claims priority, application Japan, Sep. 29, 1989, 1-252054

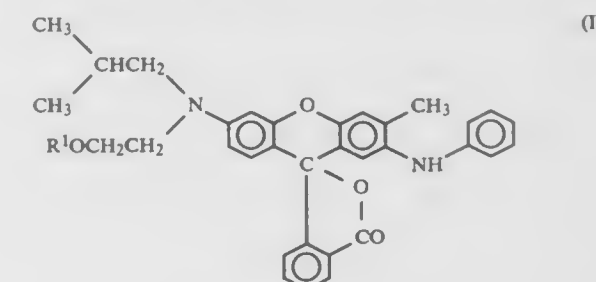
Int. Cl.⁵ C07D 311/88

U.S. Cl. 549—226

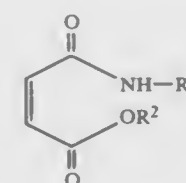
4 Claims



1. A fluoran compound represented by the formula (I):

wherein R¹ is an alkyl group having from 1 to 4 carbon atoms.

from an N-substituted maleamic acid monoester represented by formula (1):



wherein R¹ represents an unsubstituted or substituted alkyl group having 1 to 20 carbon atoms, an unsubstituted or substituted cycloalkyl group having 3 to 12 carbon atoms, an unsubstituted or substituted naphthyl group; and R² represents an unsubstituted or substituted alkyl group having 1 to 7 carbon atoms, or an unsubstituted or substituted cycloalkyl group having 3 to 7 carbon atoms, wherein said N-substituted maleamic acid monoester is heated in the presence of an acid catalyst to eliminate an alcohol from the monoester.

5,087,707

SUBSTITUTED CYCLOPENTENYL-OXABICYCLOOCTANES, CYCLOPENTENYL-FORMYLCYCLOHEXENES AND CYCLOPENTENYL-HYDROXYMETHYL CYCLOHEXENES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Anubhav P. S. Narula, Hazlet; John J. De Virgilio, Freehold, both of N.J.; Carlos Benaim, Bedford Hills, N.Y.; Anton V. Ouwerkerk, Livingston, and Olivier Gillotin, Denville, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

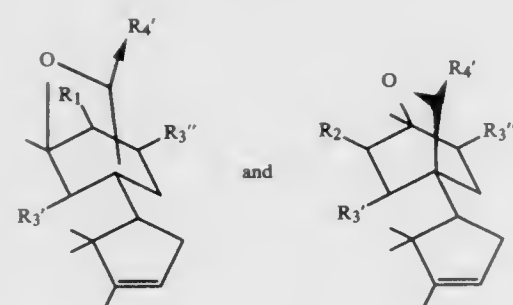
Division of Ser. No. 588,825, Sep. 27, 1990. This application Apr. 11, 1991, Ser. No. 683,618

Int. Cl.⁵ C07D 311/00

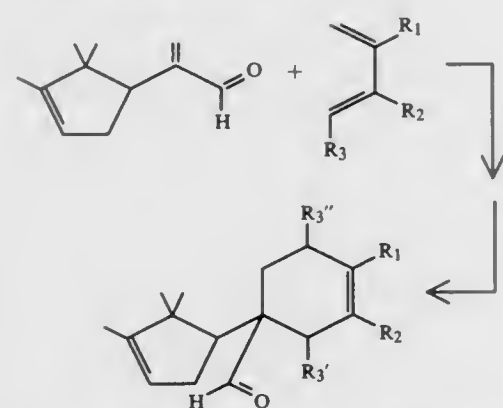
U.S. Cl. 549—396

2 Claims

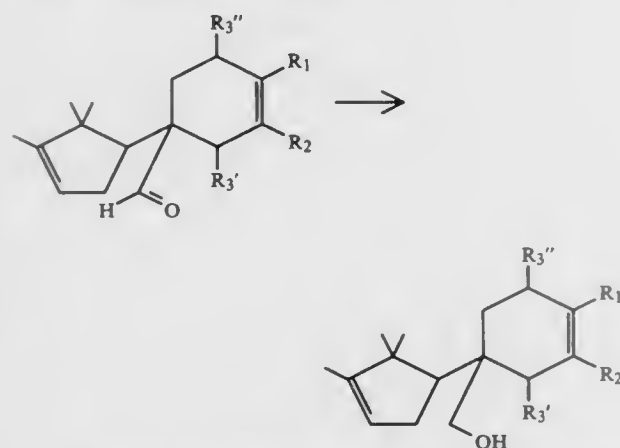
1. The process for preparing a mixture of compounds defined according to the structures:



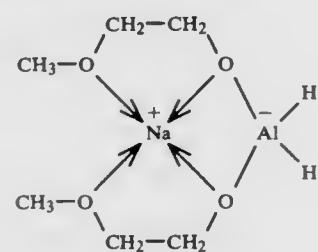
comprising the steps of:
(i) carrying out the reaction:



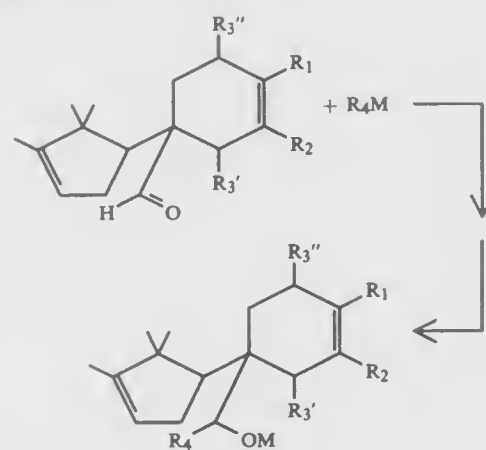
at a temperature up to 200° C. in the absence of catalyst or at a temperature of between -10° C. and +30° C. in the presence of a Lewis acid catalyst;
(ii) then carrying out the reaction:



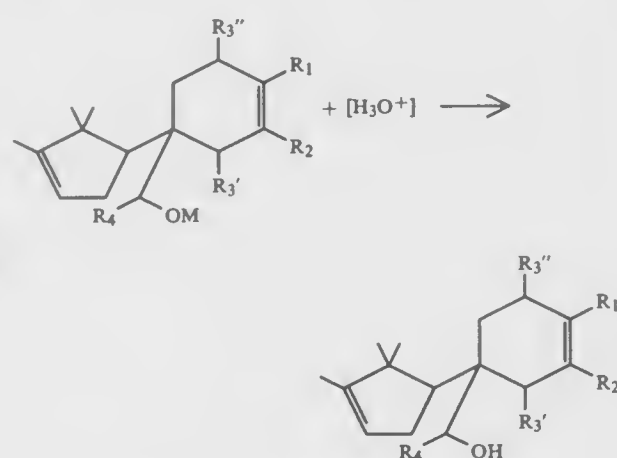
with a reducing agent selected from the group consisting of sodium borohydride, lithium aluminum hydride and the compound having the structure:



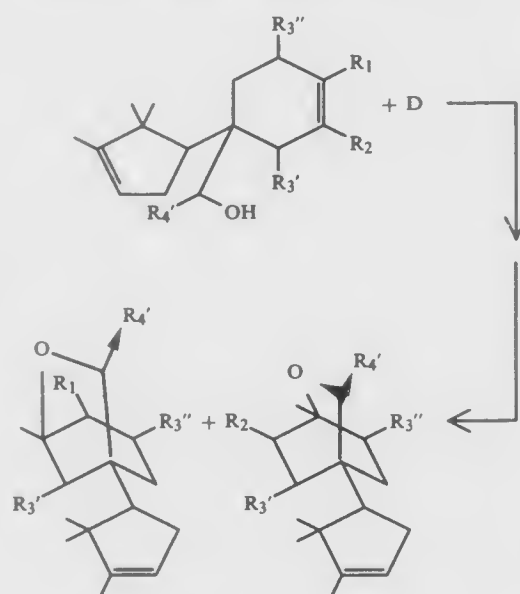
(iii) or carrying out the two reactions:
(a)



in the presence of an inert solvent at a temperature in the range of 0° C. to 100° C.; and
(b)



(iv) and then carrying out the reaction:



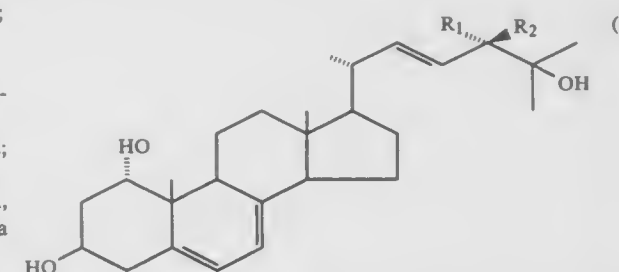
at a temperature in the range of 25° C. up to 150° C. in the presence of a solvent and an acid catalyst

wherein R₁, R₂, R₃' and R₃'' each represents hydrogen or methyl with the provisos:

- (i) one or two of R₁, R₂, R₃' and R₃'' represents methyl;
- (ii) R₁ and/or R₂ represents methyl;
- (iii) at least one of R₃' and R₃'' is hydrogen; and
- (iv) when R₁ and R₂ is methyl then R₃' and R₃'' are hydrogen

wherein R₄' hydrogen or C₁-C₅ alkyl; R₄ is C₁-C₅ alkyl; D represents a cyclizing reagent which is either:

- (a) methane sulfonic acid, aqueous hydrochloric acid, sulfuric acid or phosphoric acid in combination with a polar solvent; or
 - (b) a Lewis acid in the presence of toluene, xylene or chloroform
- and M represents MgX or Li wherein X is chloro, bromo or iodo.



wherein R₂ is H when R₁ is CH₃ (24 S form) and R₁ is H when R₂ is CH₃ (24 R form) which comprises reacting (22E)-5,7,22-ergostatriene-1α,3β-diol diacetate with 4-phenyl-1,2,4-triazoline-3,5-dione to form a Diels-Alder adduct of formula (IV),

5,087,708
METHOD OF PREPARING
2,2-DIMETHYL-4-(2',3'-EPOXY)
PROPOXYMETHYL-1,3-DIOXOLANE AND USE
THEREOF

Gerald Jakobson, and Werner Siemanowski, both of Rheinberg, Fed. Rep. of Germany, assignors to Deutsche Solvay-Werke GmbH, Solingen, Fed. Rep. of Germany

Filed Mar. 22, 1991, Ser. No. 673,334

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1990, 4009739

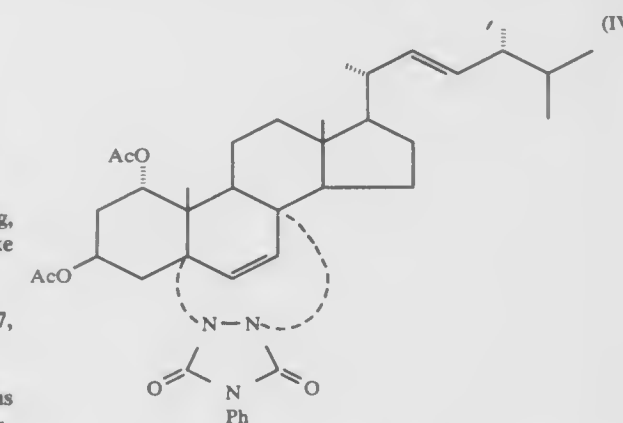
Int. Cl.⁵ C07D 317.22, 317.10

U.S. Cl. 549-448

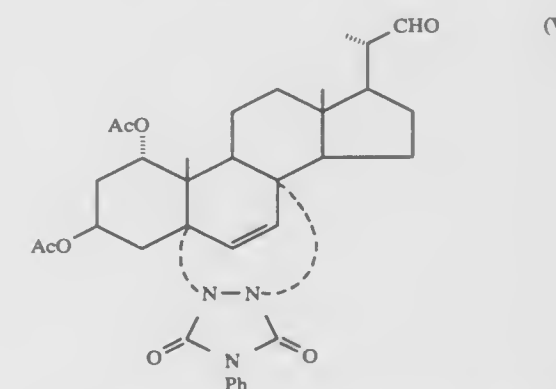
6 Claims

1. A method of making 2,2-dimethyl-4-(2',3'-epoxy)propoxymethyl-1,3-dioxolane comprising:

- a first step of producing isopropylidene glycerol chlorohydrin ether by reacting epichlorohydrin and isopropylidene glycerol using a catalyst at a temperature range from 283° K. to 373° K. in a reactor vessel,
- and a second step of reacting the isopropylidene glycerol chlorohydrin ether and an alkaline base, wherein the catalyst is selected from the group consisting of Lewis acids and inorganic acids, the molar ratio between the epichlorohydrin and isopropylidene glycerol is between approximately 0.7:1.0 to 1.0:0.7, respectively, and the molar ratio between the isopropylidene glycerol chlorohydrin ether and the alkaline base is between approximately 1.0:1.0 to 1.0:1.1, respectively.



subjecting the Diels-Alder adduct (IV) to oxidation with ozone followed by reductive workup to afford an aldehyde compound of formula (V),



reacting the aldehyde compound (V) with a sulfone compound of formula (A)



5,087,709
PROCESS FOR THE PREPARATION OF
1α,25-DIHYDROXYVITAMIN D₂ AND THE 24-EPIMER
THEREOF

Masahiro Tsuji; Shinji Yokoyama, and Yoji Tachibana, all of Saitama, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 333,547

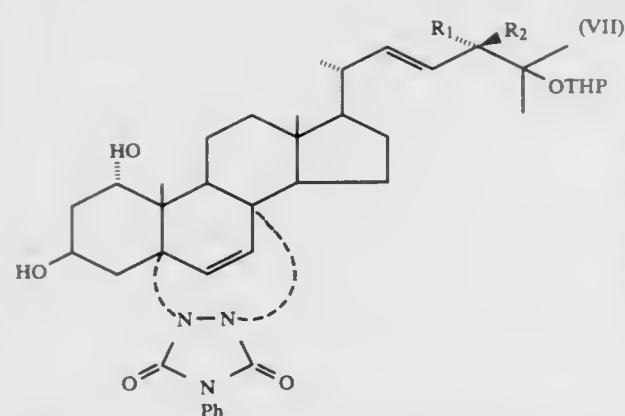
Claims priority, application Japan, Apr. 11, 1988, 63-87269; Dec. 28, 1988, 63-329178

Int. Cl.⁵ C07J 9/00; C07C 172/00

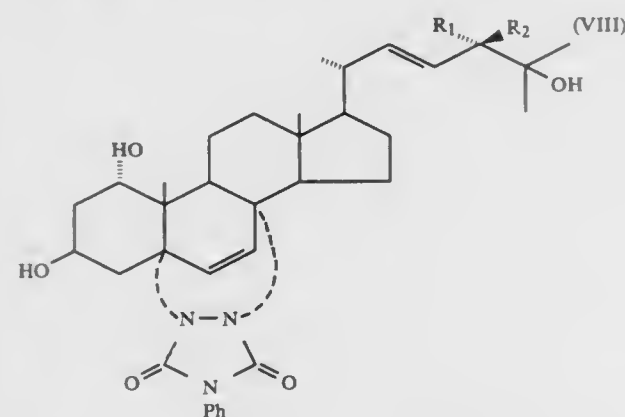
U.S. Cl. 552-541

1 Claim

1. A process of preparing (22E)-5,7,22-ergostatriene-1α,3β,25-triol or its 24-epimer thereof of formula (I)



wherein R_1 and R_2 are as defined above, removing the tetrahydropyranyl group which protects the 25-hydroxy group of the (22E)-olefin compound (VII) to afford a triol compound of formula (VIII)



and reducing the triol compound (VIII) to remove the protecting group in the 5,7-diene.

5,087,710 HOMOGENEOUS RHENIUM CATALYSTS FOR METATHESIS OF OLEFINS

Richard R. Schrock, Winchester, Mass., and Robert Toreki, Morrisville, Pa., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 4, 1990, Ser. No. 461,040
Int. Cl.⁵ C07F 13/00

U.S. Cl. 556—46

17 Claims

1. A homogeneous rhenium metathesis catalyst, comprising a rhenium (VII) atom centrally linked to an alkylidene ligand, an alkylidyne ligand, and two other ligands of which at least one ligand is an electron withdrawing ligand in which its corresponding free ligand in protonated form has a pKa below about 9; wherein the catalyst has significant metathesis activity that can effect the metathesis of an ordinary or functionalized olefin at room temperature at a rate of at least one turnover per hour.

5,087,711 METHOD FOR THE PREPARATION OF TETRAALKYL-TIN

Erich Ruf, Essen-Haarzopf, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany
Filed Jan. 31, 1991, Ser. No. 648,572

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4006043

Int. Cl.⁵ C07F 7/22, 7/30

U.S. Cl. 556—102

2 Claims

1. A method for the production of tetraalkyl-tin, wherein the alkyl groups each contain 1 to 18 carbon atoms, comprising:
(a) dispersing tin-tetraacetate in tetrahydrofuran;
(b) slowly adding to the dispersion trialkyl-aluminum whose alkyl groups each contain 1 to 18 carbon atoms, the amount of said trialkyl-aluminum being sufficient for complete reaction with the tin-tetraacetate and being at least a stoichiometric amount;
(b1) conducting step (b) in such a manner that the temperature in the reaction mixture is $<80^\circ\text{C}$.;
(c) heating the reaction mixture to the reflux temperature of the tetrahydrofuran in the mixture during a time period of about between 1 to 2 hours and until complete reaction; and
(d) separating the aluminum tri-acetate formed and removing the tetrahydrofuran by distillation.

5,087,712 DERIVATIVES OF PLATINUM (II) WITH POLYMETHYLSILOXANE, METHOD FOR PREPARING SAME AND ANTITUMOR AGENT BASED THEREON

Ilimia I. Volchenskova, ulitsa Terem kovskaya, 13, kv. 40, Kiev; Nadezhda N. Maidanovich, oblast, Kievo-Svyatoshinsky raion, Vishnevy, ulitsa Oktyabrskaya, 13, kv. 49, Kievskaya; Lev. I. Budarin, ulitsa Semashko, 10, kv. 31, Kiev; Inna M. Samodumova, prospekt Nauki, 103/2, kv. 44, Kiev, and Vitaly N. Girin, ulitsa Florentsli, 1/11, kv. 57, Kiev, all of U.S.S.R.
PCT No. PCT/SU90/00034, § 371 Date Oct. 3, 1990, § 102(e)
Date Oct. 3, 1990, PCT Pub. No. WO90/08768, PCT Pub. Date Aug. 9, 1990

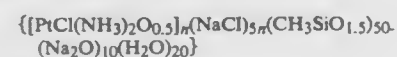
PCT Filed Jan. 30, 1990, Ser. No. 582,921

Claims priority, application U.S.S.R., Jan. 2, 1989, 4645412
Int. Cl.⁵ C07F 15/00

U.S. Cl. 556—137

5 Claims

1. Derivatives of platinum (II) with polymethylsiloxane comprising exogels—a product of interaction of a complex compound of platinum (II) in an aqueous solution of sodium chloride with a hydrogel of polymethylsiloxane at a molar ratio of Pt:Si:NaCl equal to 1-3:40:23-69 representing a three-dimensionally cross-linked polymer of a globular structure with a globule diameter of from 4.0 to 7.0 nm and with a specific surface area of from 80 to 200 m²/g having a unit of the general formula:



wherein n is 1 to 3.

5,087,713 PROCESS FOR PRODUCING ALUMINUM OXANES, IN PARTICULAR METHYLALUMINUM OXANE, FROM WATER AND ORGANOALUMINUM COMPOUNDS, IN PARTICULAR TRIMETHYLALUMINUM, IN INERT HYDROCARBONS

Hansjoerg Sinna, Norderstedt; Dieter Clausnitzer, Reinbek, and Hergen Winter, Quickborn, all of Fed. Rep. of Germany, assignors to Schering AG, Bergkamen, Fed. Rep. of Germany
PCT No. PCT/EP88/00864, § 371 Date Mar. 20, 1990, § 102(e)
Date Mar. 20, 1990, PCT Pub. No. WO89/02434, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 19, 1988, Ser. No. 469,579

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1987, 3731665

Int. Cl.⁵ C07F 5/06

U.S. Cl. 556—179

20 Claims

1. A process for producing methylaluminum oxane, which comprises subjecting frozen water in a solution of trimethylaluminum in hydrocarbons to erosive action exerted by mechanical action on the surface of the frozen water or by one or more intensive liquid jets of the solution sweeping over the surface of the frozen water.

5,087,714 METHOD OF PREVENTING DISCOLORATION OF VINYLACETOXYSIANES

Claus-Dietrich Selter, Hartwig Rauleder, Albert Frings, and Hans-Joachim Kötzsch, all of Rheinfelden, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 3, 1991, Ser. No. 709,593

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1990, 4021869

Int. Cl.⁵ C07F 7/08

U.S. Cl. 556—401

3 Claims

1. The method of preventing the discoloration of a vinylacetoxysilane during storage, which comprises admixing a freshly prepared vinylacetoxysilane at a temperature between room temperature and 70°C . with 25 to 500 ppm, based on the amount of vinylacetoxysilane, of a compound selected from the group consisting of 3,5-di-tert.-butylpyrocatechol, 2,6-di-tert.-butyl-4-methylphenol, 2-mercaptobenzimidazole and mixtures thereof.

5,087,715 ALKANOLANMINO FUNCTIONAL SILOXANE COMPOSITIONS

Steven A. Snow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 7, 1989, Ser. No. 390,019

Int. Cl.⁵ C07F 7/10

U.S. Cl. 556—413

8 Claims

1. Compositions comprising a structure with a general formula selected from the group consisting of:



and



wherein

x is an integer of 1 to 100;

y is an integer of from 1 to 10;

R^1 comprises a C_1 to C_6 alkyl group and M is a radical selected from the group consisting of:



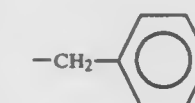
and



wherein a is an integer of from 1 to 10;

b is an integer of from 1 to 10;

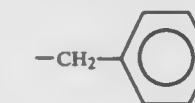
R^2 is a member of the group consisting of hydrogen, a C_1 to C_{18} alkyl group, a C_6 to C_{18} aryl group,



and a C_5 to C_{18} cycloalkyl group;

R^3 is a member of the group consisting of hydrogen, a C_1 to C_{18} alkyl group, a C_6 to C_{18} aryl group, a C_5 to C_{18} cycloalkyl group, $-\text{C}(\text{O})\text{R}^5$, $-\text{C}(\text{O})\text{NHR}^6$, $-\text{SO}_3^-$, $-\text{Si}(\text{CH}_3)_3$, and $-\text{P}(\text{O})(\text{OCH}_3)_2$;

R^4 is a member of the group consisting of hydrogen, a C_1 to C_{18} alkyl group, a C_6 to C_{18} aryl group,



and a C_5 to C_{18} cycloalkyl group;

R^5 is a member of the group consisting of a C_1 to C_{18} alkyl group, a C_6 to C_{18} aryl group, and a C_5 to C_{18} cycloalkyl group;

R^6 is a member of the group consisting of a C_1 to C_{18} alkyl group, a C_6 to C_{18} aryl group, and a C_5 to C_{18} cycloalkyl group; and

Z is a member selected from the group consisting of Cl, Br, I, NO_3 , a C_1 to C_8 alkylsulfate group, $-\text{CH}_3\text{COO}^-$, BF_4^- , and PF_6^- .

5,087,716 SYNTHESIS OF DIFUNCTIONAL HALO ORGANO NONCARBON GROUP IV MAIN GROUP ELEMENT AMIDES

Antony P. Wright, Rhodes, and Padmakumari J. Varapath, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 467,868, Jan. 22, 1990. This application
Dec. 24, 1990, Ser. No. 607,194

Int. Cl.⁵ C07F 7/10, 7/22, 7/24

U.S. Cl. 556—413

15 Claims

1. A method for preparing a derivative of a difunctional halo noncarbon Group IV main group element amide comprising: reacting the halo functionality of said difunctional halo noncarbon Group IV main group element amide with a reactant selected from the group consisting of an alkali metal amide, an alkali metal salt of an organic acid, an amine, an alkali metal amine salt, and an alkali metal hydroxide; said difunctional halo noncarbon Group IV main group element amide having been prepared by a process comprising cleaving a noncarbon Group IV main group element-nitrogen bond in a heterocyclic ring with a reactive halide moiety.

5,087,717
ORGANOSILANE STABILIZERS FOR INORGANIC
SILICATES IN ANTIFREEZER/COOLANT
COMPOSITIONS

Il Nam Jung; Sang Yo Hwang, and Hae Kyung Bae, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea
Division of Ser. No. 180,489, Apr. 12, 1988, Pat. No. 4,965,385.
This application Sep. 10, 1990, Ser. No. 562,030

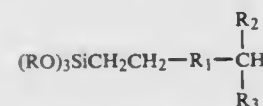
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.⁵ C07F 7/04; C09K 3/18

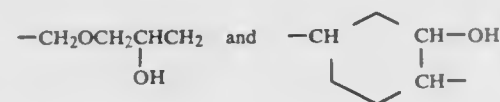
U.S. Cl. 556—416

6 Claims

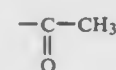
1. A stabilizer of inorganic silicates in antifreeze/coolant formulations having the formula



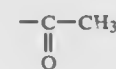
wherein R is an alkyl group of 1-4 carbon atoms, R₁ is a member selected from the group consisting of



and R₂ is a member selected from the group consisting of —CN and



and R₃ is a member selected from the group consisting of phenyl and



5,087,718
PROCESS FOR THE MANUFACTURE OF
KETOXIMOSILANES

Günter Zoche, Bonn, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 4, 1990, Ser. No. 460,689

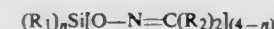
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903985

Int. Cl.⁵ C07F 7/10

U.S. Cl. 556—422

4 Claims

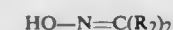
1. In the method of preparing ketoximosilanes of the formula



wherein R₁ is alkyl of 1 to 18 carbon atoms or alkenyl of 2 to 18 carbon atoms, n is an integer from 0 to 3, inclusive, R₂ are identical or different alkyls of 1 to 6 carbon atoms, by reacting an acetoxysilane of the formula



wherein R₁ and n have the meanings previously defined, with a ketoxime of the formula



wherein R₂ has the meanings previously defined, the im-

provement which comprises reacting a mixture of said acetoxysilane and ketoxime with ammonia in the presence of a solvent for complete conversion into the ketoximosilane, filtering off the ammonium acetate released by the reaction, and isolating the ketoximosilane by distilling off the solvent.

5,087,719
DEHYDROGENATIVE POLYMERIZATION OF SILANES
TO POLYSILANES BY CATALYSTS OF
TRANSITION-METAL SILYL DERIVATIVES

T. Don Tilley, San Diego, Calif., and Hee-Gweon Woo, Cambridge, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1990, Ser. No. 589,704

Int. Cl.⁵ C07F 7/08

U.S. Cl. 556—430

8 Claims

1. A method for catalytic dehydrogenative silane polymerization comprising, adding metal silyl catalyst precursors to silanes in a hydrocarbon solution to obtain polysilanes.

5,087,720
POLYSILETHYLENESILOXANE

Hirofumi Kishita; Shinichi Sato; Hitoshi Kinami; Toshio Takago; Kenichi Fukuda, and Hirokazu Yamada, all of An-naka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., To-kyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,335

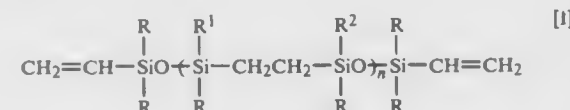
Claims priority, application Japan, Jul. 6, 1990, 2-178727; Jul. 6, 1990, 2-178729; Jul. 6, 1990, 2-178731

Int. Cl.⁵ C07L 7/08

U.S. Cl. 556—434

9 Claims

1. A polysilethylensiloxane having the following general formula [I]:



wherein R may be the same or different and are each a mono-valent hydrocarbon group of from 1 to 10 carbon atoms, R¹ and R² may be the same or different and are each a mono-valent hydrocarbon group of from 1 to 10 carbon atoms or a perfluoroalkylethyl group, and n is an integer of from 10 to 1,000.

5,087,721
RADIOIODINATED PHOSPHATE ESTERS

Raymond E. Counsell, Ann Arbor, Mich.; Karen L. Meyer, Norman, Okla.; Susan W. Schwendner, Ann Arbor, Mich., and Terushi Haradahira, Fukuoka, Japan, assignors to The Uni-versity of Michigan, Ann Arbor, Mich.

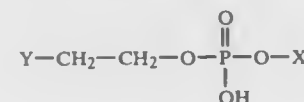
Continuation-in-part of Ser. No. 573,586, Aug. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 112,865, Oct. 23, 1987, Pat. No. 4,965,391. This application Oct. 22, 1990, Ser. No. 602,157

Int. Cl.⁵ C07F 9/10, 9/11

U.S. Cl. 558—166

4 Claims

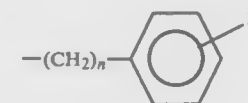
1. A compound of the general formula:



where

Y is selected from the group of NH₂, NR₂, N₃, and NR₂R';

R is selected from the group of alkyl and aralkyl substituents;
R' is a monoiodinated aralkyl of the formula:



where

Z is selected from the group consisting of radioactive and stable isotopes of iodine and n=1-15; and

X is selected from the group consisting of a monoiodinated aralkyl of formula R' and an alkyl substituent; provided that one and only one of X or Y is a monoiodinated aralkyl.

5,087,722
PROCESS FOR PRODUCING NORCAMPHANE
DICARBONITRILES

Masamitsu Inomata; Naokazu Shiotani; Kazuo Koshizuka, and Minato Karasawa, all of Chiba, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 592,314

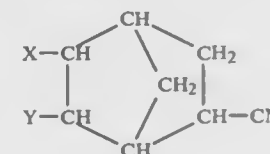
Claims priority, application Japan, Dec. 27, 1989, 1-336611

Int. Cl.⁵ C07C 253/10

U.S. Cl. 558—338

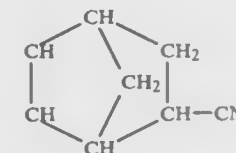
8 Claims

1. A process for producing a norcamphane dicarbonitrile of the formula (II):

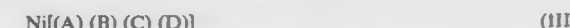


where X and Y are selected from the group consisting of hydrogen and cyano provided that X and Y are different, which comprises:

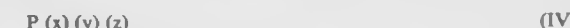
hydrocyanating bicyclo [2,2,1]-5-heptane-2-carbonitrile of the formula (I):



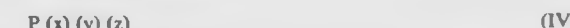
in the presence of a zerovalent nickel complex catalyst represented by the formula (III):



where A, B, C and D are, similar or dissimilar, neutral ligands of the formula (IV):



where P is phosphorus atom, x, y and z are similar or dissimilar groups represented by OR where R is selected from the group consisting of alkyl having 18 carbon atoms or less and aryl having 18 carbon atoms or less; a neutral ligand of the formula (IV):



where P is phosphorus atom and x, y and z are similar or dissimilar groups represented by OR where R is selected from the group consisting of alkyl having 18 carbon atoms

or less and aryl having 18 carbon atoms or less; and a Lewis acid, in a liquid phase, and treating the resulting crude norcamphane carbodinitrile product fluid by contact with a catalyst treating agent which comprises an aqueous alkaline solution, an aqueous acidic solution or an oxidizing agent so as to hydrolyze or oxidize the catalyst, ligand and Lewis acid.

5,087,723
HYDROCYANATION OF CONJUGATED
2-ALKENOATES

Ronald J. McKinney, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1990, Ser. No. 517,135

Int. Cl.⁵ C07C 253/10

U.S. Cl. 558—338

5 Claims

1. A process for the hydrocyanation of alkyl 2-pentenoate mono-olefins of the form:



where R'' is alkyl of 1 to 18 carbon atoms, conducted in a liquid phase, in the presence of a zero valent nickel catalyst free of carbon monoxide, and in the presence of one or more Lewis acid promoters, wherein the hydrocyanated product distribution contains at least about 88% alkyl 5-cyanovalerate.

5,087,724
SUBSTITUTED BENZENES USEFUL AS
INTERMEDIATES

(II) Norio Tanaka; Takuya Kakuta; Eiichi Oya, and Masatoshi Baba, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 360,468, Jun. 2, 1989, Pat. No. 4,942,246. This application May 7, 1990, Ser. No. 519,727

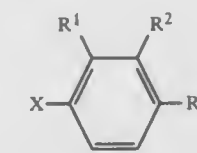
Claims priority, application Japan, Jun. 3, 1988, 63-137095; Apr. 18, 1989, 1-98284

Int. Cl.⁵ C07C 323/09, 323/20, 323/62

U.S. Cl. 558—425

34 Claims

1. A substituted benzene of the formula I':



selected from the group consisting of wherein:

- X is I, R¹ is CN, R² is H and R³ is SMe,
- X is I, R¹ is OMe, R² is H and R³ is SMe,
- X is Br, R¹ is Cl, R² is CO₂Me and R³ is SO₂Me,
- X is Br, R¹ is Cl, R² is CO₂H and R³ is SO₂Me,
- X is I, R¹ is Cl, R² is CO₂Me and R³ is SMe,
- X is I, R¹ is Cl, R² is CO₂H and R³ is SMe,
- X is I, R¹ is Cl, R² is CO₂Pr-i and R³ is SMe,
- X is Br, R¹ is Me, R² is CO₂Me and R³ is SMe,
- X is Br, R¹ is Me, R² is CO₂H and R³ is SMe,
- X is I, R¹ is Me, R² is CO₂Pr-i and R³ is SMe,
- X is I, R¹ is Me, R² is CO₂Me and R³ is SMe,
- X is I, R¹ is Me, R² is CO₂Me and R³ is SO₂Me,
- X is I, R¹ is Me, R² is CO₂Et and R³ is SMe,
- X is I, R¹ is Me, R² is CO₂Pr-i and R³ is SMe,
- X is I, R¹ is Me, R² is CO₂CH₂CH₂OMe and R³ is SMe,
- X is I, R¹ is Me, R² is CO₂CH₂CH₂Cl and R³ is SMe,
- X is I, R¹ is OMe, R² is CO₂Me and R³ is SMe,
- X is Br, R¹ is Cl, R² is CH₂OMe and R³ is SO₂Me,
- X is I, R¹ is Cl, R² is CH₂OMe and R³ is SMe,
- X is I, R¹ is Me, R² is CH₂OMe and R³ is SO₂Me,
- X is I, R¹ is Me, R² is CH₂OMe and R³ is SMe,
- X is I, R¹ is Me, R² is CH₂OEt and R³ is SMe,
- X is I, R¹ is Me, R² is CH₂OPr-i and R³ is SMe,

- x) X is I, R¹ is OMe, R² is CH₂OMe and R³ is SMe,
 y) X is I, R¹ is Me, R² is CHMeOMe and R³ is SMe,
 z) X is I, R¹ is Me, R² is CHMeOEt and R³ is SMe,
 aa) X is I, R¹ is Me, R² is CH₂OMe and R³ is SMe,
 bb) X is I, R¹ is Me, R² is OMe and R³ is SMe,
 cc) X is I, R¹ is Cl, R² is Cl and R³ is SMe,
 dd) X is I, R¹ is Me, R² is NO₂ and R³ is SMe,
 ee) X is Br, R¹ is Cl, R² is Me and R³ is SO₂Me,
 ff) X is Br, R¹ is Cl, R² is Me and R³ is SMe,
 gg) X is Br, R¹ is Cl, R² is CH₂OPr-i and R³ is SO₂Me.

5,087,725

PROCESS FOR THE PREPARATION OF ALKYL NITROBENZOATES

Theodor Papenfuhs, Frankfurt am Main; Reiner Hess, Weisbaden, and Andreas Fuss, Karlstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 24, 1990, Ser. No. 513,661

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1989, 3913781

Int. Cl.⁵ C07C 205/00

U.S. Cl. 560—20

10 Claims

1. A process for the preparation of alkyl (C₁-C₃) nitrobenzoates, which comprises reacting the nitrobenzoic acid to be esterified with an excess of about 300 to about 600 mol % of an alkanol (C₁-C₃) in a mixture consisting essentially of a solvent which is inert towards the starting compounds and the reaction product and a polyfluoroalkanesulfonic acid of the general formula (I)



in which Y is a hydrogen or fluorine atom, with the proviso that, if Y is H, this hydrogen atom is in the β -position relative to the sulfo group, or the hydrate thereof as catalyst in an amount of about 0.1 to about 20 mol %, relative to the nitrobenzoic acid used, at temperatures from about 60° to about 120° C.

5,087,726

CARBAMATE ACAT INHIBITORS

Patrick M. O'Brien, Northville, and Drago R. Sliskovic, Ypsilanti, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 13, 1990, Ser. No. 479,313

Int. Cl.⁵ C07C 271/42

U.S. Cl. 560—25

4 Claims

1. A compound of the formula



wherein of Ar is selected from:

- phenyl which is unsubstituted or is substituted with from one to three substituents selected from alkyl having from one to six carbon atoms and which is straight or branched, alkoxy having from one to six carbon atoms and which is straight or branched, phenoxy, hydroxy, fluorine, chlorine, bromine, nitro, trifluoromethyl, —COOH, —COOalkyl wherein alkyl has from one to four carbon atoms

—NR₁R₂ wherein R₁ and R₂ are independently hydrogen or alkyl of from one to four carbon atoms;

wherein Ar' is selected from:

phenyl which is unsubstituted or is substituted with from one to three substituents selected from alkyl having from one to six carbon atoms and which

is straight or branched; alkoxy having from one to six carbon atoms and which is straight or branched,

phenoxy, hydroxy, fluorine, chlorine, bromine, nitro, trifluoromethyl, —COOH,

—COOalkyl wherein alkyl has from one to four carbon atoms

—NR₁R₂ wherein R₁ and R₂ are independently hydrogen or alkyl of from one to four

wherein Z is



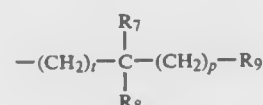
wherein R is selected from:

(a) a straight or branched hydrocarbon chain having from one to twenty carbon atoms and which is saturated or contains from one to three double bonds;

(b) a straight or branched hydrocarbon chain having from one to six carbon atoms wherein there terminal carbon atom is substituted with chlorine, fluorine, bromine, straight or branched lower alkoxy having from one to four carbon atoms, straight or branched thioalkoxy having from one to four carbon atoms, a COOR₄ group wherein R₄ is hydrogen or a straight or branched alkyl having from one to four carbon atoms, an —NR₅R₆ group wherein R₅ and R₆ are independently hydrogen or lower alkyl having from one to four carbon atoms, wherein said alkyl is unsubstituted or substituted with hydroxy, or wherein —NR₅R₆ taken together form a monocyclic heterocyclic group selected from pyrrolidines, piperidine, piperazine or piperazine substituted in the 4-position with a lower alkyl having from one to four carbon atoms or —COOR₄ wherein R₄ has the meaning defined above; and

(c) a 5- or 6-membered monocyclic or fused bicyclic teterocycle containing at least one to four nitrogen, oxygen or sulfur atoms in at least one ring member;

(d) the group



wherein t is zero to four; p is zero to four with the proviso that the sum of t and p is not greater than five; R₇ and R₈ are independently selected from hydrogen or alkyl having from one to six carbon atoms, or when R₇ is hydrogen, R₈ can be the same as R₉ and R₉ is phenyl or phenyl substituted with from one to three substituents selected from straight or branched alkyl having from one to six carbon atoms, straight or branched alkoxy having from one to four carbon atoms, straight or branched thioalkoxy having from one to four carbon atoms, phenoxy, hydroxy, fluorine, chlorine, bromine, nitro, trifluoromethyl, —COOH, COO alkyl wherein alkyl has from one to four carbon atoms, or —NR₅R₆ wherein R₅ and R₆ have the meanings defined above; and

(e) phenyl or phenyl substituted with from one to three substituents selected from straight or branched alkyl having from one to six carbon atoms, straight or branched alkoxy having from one to four carbon atoms, straight or

branched thioalkoxy having from one to four carbon atoms, phenoxy, hydroxy, fluorine, chlorine, bromine, nitro, trifluoromethyl, —COOH, COOalkyl wherein alkyl has from one to four carbon atoms, or —NR₅R₆ wherein R₅ and R₆ have the meanings defined above; or a pharmaceutically acceptable salt or an N-oxide thereof.

5,087,727

A ZULENES CONTAINING A URETHANE GROUP

Wolfgang Schrott, Ludwigshafen; Peter Neumann, Mannheim; Michael Schmitt, Ludwigshafen; Sibylle Brosius, Mannheim; Klaus D. Schomann, Ludwigshafen, and Harald Kuppelmaier, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 347,439, May 2, 1989, Pat. No. 4,990,649.

This application Oct. 30, 1990, Ser. No. 605,436

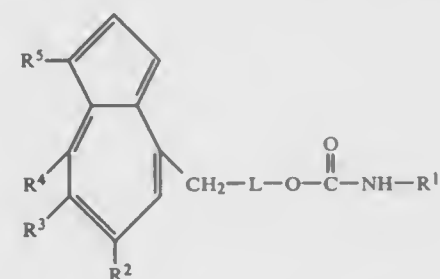
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816068

Int. Cl.⁵ C07C 271/10, 271/28; C09B 57/00; G11B 7/74

U.S. Cl. 560—29

1 Claim

1. An azulene that contains a urethane group and has the formula II



where

L is C₁-C₁₂-alkylene or C₁-C₁₂-alkylene substituted by phenyl,

R¹ is C₁-C₂₀-alkyl, C₅-C₇-cycloalkyl, phenyl or phenyl substituted by C₁-C₄-alkyl, C₁-C₄-alkoxy or halogen,

R², R³, R⁴ and R⁵ are identical or different and are each independently of the others hydrogen or C₁-C₁₂-alkyl, C₁-C₁₂-alkyl substituted by halogen, C₁-C₁₂-alkoxy, phenyl, phenyl substituted by C₁-C₄-alkyl, C₁-C₄-alkoxy or halogen, C₁-C₁₂-alkoxycarbonyl or cyano.

5,087,728

PROCESS FOR PRODUCING CARBOXYLIC ACIDS AND ESTERS THEREOF

Hiroyuki Nohira, Saitama; Hidemasa Takaya, Shiga, and Akira Miyashita, Saitama, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Jul. 11, 1990, Ser. No. 551,107

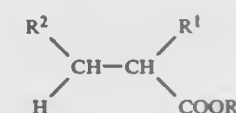
Claims priority, application Japan, Jul. 11, 1989, 1-177257; Mar. 9, 1990, 2-58791

Int. Cl.⁵ C07C 229/00

U.S. Cl. 560—41

8 Claims

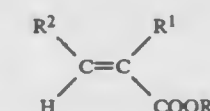
1. A process for producing a carboxylic acid or an ester thereof represented by formula (I):



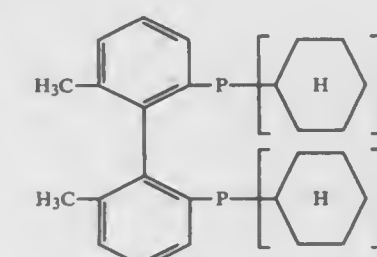
wherein:

R represents a hydrogen atom or a lower alkyl group; R¹ represents a lower alkyl group; CH₂COOR³, wherein R³ represents a hydrogen atom or a lower alkyl group; or

NHR⁴, wherein R⁴ represents a formyl group, an acetyl group, a benzoyl group, or a chloroacetyl group, and R² represents a hydrogen atom, a lower alkyl group, or a phenyl group, which comprises hydrogenating an unsaturated compound represented by formula (II):



wherein R, R¹, and R² are as defined above, in the presence of a rhodium or ruthenium complex catalyst having, as a ligand, BICHEP which means 2,2'-bis(dicyclobexylphosphino)-6,6'-dimethyl-1,1'-biphenyl represented by formula (III):



5,087,729

BENZYLIDENE COMPOUNDS, COSMETIC COMPOSITIONS CONTAINING THE SAME AND ULTRAVIOLET ABSORBER COMPRISING THE SAME

Kazuhiro Matsuno; Toru Kobayashi; Takeshi Miyoshi, and Hideaki Kawashima, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 259,257, Oct. 18, 1988, Pat. No. 4,985,237, which is a division of Ser. No. 38,364, Apr. 14, 1987, Pat. No. 4,797,493. This application Apr. 17, 1990, Ser. No. 509,765

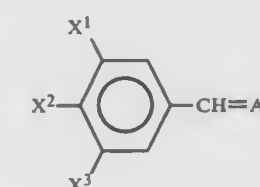
Claims priority, application Japan, Apr. 22, 1986, 61-92481; Oct. 16, 1986, 61-246308; Oct. 16, 1986, 61-246309; Nov. 14, 1986, 61-271287

Int. Cl.⁵ C07C 229/06, 233/04, 233/02

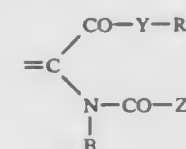
U.S. Cl. 560—41

3 Claims

1. A benzylidene compound represented by the formula (I):



wherein A represents



wherein B represents a hydrogen atom or an acetyl group Z is a methyl group or a phenyl group; X¹, X² and X³ each represent independently a hydrogen atom, a hydroxy group or a methoxy group; Y represents an oxygen atom or an imino

to a biscarbamate of the formula



and thermally cracking said biscarbamate, to obtain said diisocyanate, an alcohol of the formula R^2OH and by-products, which comprises at least one compound selected from the group consisting of high molecular weight, undistillable compounds containing uretdione, isocyanurate, allophanate, urea, polyurea, or carbodiimide groups; wherein:

- said (cyclo)aliphatic diamine and said by-products are reacted with urea and said alcohol of the formula R^2OH in the presence of N-unsubstituted carbamates and dialkyl carbonates with the simultaneous separation of any ammonia formed, to obtain a reaction mixture containing said biscarbamate, unreacted alcohol, N-unsubstituted carbamate, and dialkyl carbonate;
- said biscarbamate obtained in (i) is separated from said unreacted alcohol, N-unsubstituted carbamate, and dialkyl carbonate, which are recycled into (i) and from any unutilizable product;
- said cracking of said biscarbamate is carried out continuously in the liquid phase, without solvent, in the presence of a catalyst, with the reaction mixture boiling, and with fractionation of the vapors which contain said diisocyanate and said alcohol of the formula R^2-OH ;
- said diisocyanate and said alcohol obtained in said cracking are fractionally condensed as crude products;
- a portion of the cracking reaction mixture containing said by-products is continuously discharged and recycled to said reaction in (i) after reacting with said crude alcohol from (iv); wherein:

R^1 is a straight-chain or branched aliphatic hydrocarbon group with a total of 4 to 12 carbon atoms or a substituted or unsubstituted cycloaliphatic hydrocarbon group with a total of 5 to 13 carbon atoms, and

R^2 is a group obtained by removing the hydroxyl group from a primary aliphatic alcohol with 1 to 8 carbon atoms.

5,087,740

PROCESS FOR PURIFYING N-PHOSPHONOMETHYLGLYCINE

Lowell R. Smith, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 394,998, Aug. 17, 1989, abandoned.

This application Jul. 30, 1990, Ser. No. 561,483

Int. Cl.⁵ C07F 9/38

U.S. Cl. 562—17

8 Claims

1. A method of obtaining purified N-phosphonomethylglycine from an aqueous solution containing N-phosphonomethylglycine and various impurities which comprises:

- passing the aqueous solution through a first ion exchange column containing a weakly basic ion exchange resin to remove impurities from the aqueous solution that are more acidic than N-phosphonomethylglycine;
- passing the aqueous solution as an effluent from the first ion exchange column through a second ion exchange column containing a weakly basic ion exchange resin until breakthrough of N-phosphonomethylglycine occurs in the aqueous solution as an effluent from the second column; and thereafter,
- recovering the N-phosphonomethylglycine from the weakly basic ion exchange resin in the second ion exchange column by passing a base or a strong mineral acid through the column, wherein the ion exchange resin in the first and second ion exchange columns can sorb acids having a pKa value of about 2.2 and less.

5,087,741 CONTINUOUS PRODUCTION OF AROMATIC CARBOXYLIC ACIDS

Brent A. Tennant, and Terry D. Bryson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1990, Ser. No. 619,568

Int. Cl.⁵ C07C 51/265

U.S. Cl. 562—414

3 Claims

1. Method for the continuous production of an aromatic carboxylic acid in a pressurized oxidation reactor by liquid-phase, exothermic oxidation of an alkyl aromatic compound with an oxygen-containing gas in the presence of an oxidation catalyst and aqueous C_2 to C_6 aliphatic, monocarboxylic acid reaction medium which comprises the steps of:

- continuously feeding to the reactor the alkyl aromatic compound, the aqueous, monocarboxylic acid reaction medium having the oxidation catalyst dissolved therein and an oxygen-containing gas;
- continuously removing from the lower portion of the reactor an oxidizer product comprising the aromatic carboxylic acid and the aqueous, monocarboxylic acid reaction medium having the oxidation catalyst dissolved therein;
- continuously removing from the upper portion of the reactor oxygen-depleted gas and vaporized aqueous, monocarboxylic acid reaction medium;
- condensing from the stream of step (3) the aqueous, monocarboxylic acid reaction medium; and
- returning at least a portion of the condensed, aqueous, monocarboxylic acid reaction medium obtained in step (4) in the form of a spray between the top of the gas/liquid contents of the reactor and the point within the reactor which the stream of (3) is removed.

5,087,742

PROCESS FOR PREPARING AROMATIC POLYCARBOXYLIC ACIDS

Kazuo Yoshida, Iwaki; Nobuyuki Okubo, Tokyo; Toshiharu Matsuda, Iwaki, and Yutaka Konai, Machida, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Japan

Filed Jun. 14, 1990, Ser. No. 538,057

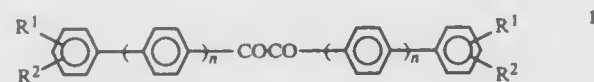
Claims priority, application Japan, Jul. 20, 1989, 1-186062

Int. Cl.⁵ C07C 51/245, 49/213

U.S. Cl. 562—421

9 Claims

1. A process for the preparation of an aromatic polycarboxylic acid, which comprises oxidizing a benzil derivative represented by the following formula I:



wherein R^1 means a hydrogen atom, or a methyl, ethyl or isopropyl group, R^2 denotes a methyl, ethyl or isopropyl group, and n stands for 0 or 1,

- in a solvent containing at least 50 wt. % of an aliphatic monocarboxylic acid having at most three carbon atoms;
- in the presence of an oxidation catalyst consisting substantially of at least one heavy metal catalyst selected from the group consisting of cobalt and manganese in an amount of 0.0003–0.17 gram atom in terms of elemental metal per 100 g of the solvent;
- in the presence of a bromine catalyst in an amount of 0.0001–0.05 gram atom in terms of element bromine per 100 g of the solvent;
- at a reaction temperature in the range of from 80° to 220° C.;
- at an oxygen partial pressure in the range of from 0.1 to 8 kg/cm² in terms of absolute pressure.

5,087,743 DIPHENYLHETEROALKYL DERIVATIVES, THE PREPARATION THEREOF AND DRUGS AND COSMETICS PREPARED THEREFROM

Bernd Janssen, Ludwigshafen, and Hans-Heiner Wuest, Dossenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 23, 1990, Ser. No. 469,063

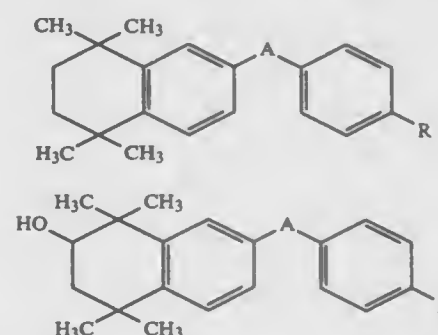
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903989

Int. Cl.⁵ C07C 63/44, 69/94, 235/46, 43/267

U.S. Cl. 562—466

2 Claims

1. A diphenylheteroalkyl derivative of the formula I or Ia



where

A is $-X-CH_2-$ or $-X-CH(CH_3)-$,

X, which can be linked to the left or right phenyl nucleus, is oxygen, $-S(O)_n-$ or $-NR'-$, with n being 0, 1 or 2 and R' being hydrogen, C_{1-6} -alkyl or C_{1-6} -alkanoyl, and

R is $-COOH$, $-COO-C_{1-6}$ -alkyl, $-CHO$, $-CH_2OH$, $-CN$ or $-COHN_2$; or the physiologically tolerated salt thereof.

5,087,744

PREPARATION OF METHACRYLIC ACID

Richard Krabetz, Kirchheim; Gerd Duembgen, Ludwigshafen; Franz Merger, Frankenthal; Michael Jaeger, Schifferstadt; Fritz Thiessen, and Herbert Vogel, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,837

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721865

Int. Cl.⁵ C07C 51/25, 57/055

U.S. Cl. 562—535

6 Claims

1. A process for preparing methacrylic acid by gas phase oxidation of methacrolein or isobutyraldehyde with an oxygen- and steam-containing gas mixture over a molybdenum- and phosphorus-containing catalyst at from 250° to 400° C. in which hot reaction gases from the oxidation reaction are cooled down to below 100° C., passed, for absorption of the methacrylic acid formed, through an absorber operated with water at below 100° C., and, after being replenished with a fresh amount of methacrolein or isobutyraldehyde and oxygen corresponding to the amount of these substances consumed in said oxidation reaction, said gases are partly recycled into the oxidation reaction, which process further comprises feeding an amount of fresh methacrolein or isobutyraldehyde equal to the amount of methacrolein or isobutyraldehyde consumed in said oxidation reaction, in liquid form, together with a polymerization inhibitor, into said reaction gas in the lower two-thirds of said absorber, and either (i) upstream of the feed point for said fresh methacrolein or isobutyraldehyde or (ii) downstream of said absorber, splitting off the reaction offgas as a side stream which is washed in a wash column operated with water having a temperature of from 0° to <10° C. to remove unconverted methacrolein or isobutyraldehyde which is fed as an aqueous solution to the top of said absorber.

5,087,745

PROCESS FOR THE PRODUCTION OF GAMMA-BUTYROBETAINE

Peter Hardt, Visp; Andrej Strava, Ried bei Brig, and Pius Abgottspon, Stalden, all of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Continuation of Ser. No. 409,792, Sep. 20, 1989, abandoned. This application Mar. 12, 1991, Ser. No. 667,367

Claims priority, application Switzerland, Sep. 21, 1988, 3514/88

Int. Cl.⁵ C07C 227/18, 229/06

U.S. Cl. 562—553

4 Claims

1. Process of the production of gamma-butyrobetaine, comprising (a) conducting a step consisting of converting gamma-butyrolactone only with an excess of 5 to 40 weight percent, relative to the gamma-butyrolactone, of hydrogen chloride at a pressure of 1 to 25 bars and a temperature of 40° to 150° C. to obtain gamma-chlorobutyric acid, (b) a step consisting of converting the gamma-chlorobutyric acid from step (a), without isolation, only with a lower aliphatic alcohol selected from the group consisting of methanol, ethanol, a propanol and a butanol, in the presence of an amount of hydrogen chloride sufficient to act as an esterification catalyst at a pressure of 1 to 15 bars and a temperature of 40° to 150° C. to obtain the corresponding gamma-chlorobutyric acid lower alkyl ester, (c) converting the corresponding gamma-chlorobutyric acid lower alkyl ester with trimethylamine to trimethylammonium butyric acid lower alkyl ester chloride, the conversion being done at a pressure of 1 to 10 bars and a temperature of 20° to 180° C., and (d) saponifying the trimethylammonium butyric acid lower alkyl ester chloride, without isolation, with a base to the gamma-butyrobetaine, the saponification being done at a temperature of 20° to 100° C.

5,087,746

PROCESS FOR THE PRODUCTION OF HIGH PURITY TARTARIC ACID

Richard J. Bosch, Creve Coeur, and Skippy H. Ramsey, Fenton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 72,375, Jul. 13, 1987, abandoned. This application Feb. 11, 1991, Ser. No. 652,498

Int. Cl.⁵ C07C 59/155

U.S. Cl. 562—585

8 Claims

1. A process for producing d,l-tartaric acid alkali metal salt which comprises hydrolyzing an alkali metal epoxysuccinate in aqueous solution at a pH in the range of from about 6 to 11 at a temperature in the range of up to about 200° C. under superatmospheric pressure.

5,087,747

PROCESS FOR THE PREPARATION OF TRIFLUOROMETHANESULPHENYL CHLORIDE

Dietmar Bielefeldt, Ratingen; Rudolf Braden, Odenthal, and Albrecht Marhold, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 15, 1990, Ser. No. 523,627

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 3918545

Int. Cl.⁵ C07C 313/08

U.S. Cl. 562—821

2 Claims

1. A process for the preparation of trifluoromethanesulphenyl chloride in which bis-(trifluoromethyl)-disulfane is reacted at a temperature of from about -18° to +120° C., in the liquid phase with chlorine wherein at least 0.8 mole of chlorine is employed per mole of the disulfane, in the presence of an effective amount of a strong acid selected from the group consisting of sulfuric acid, nitric acid, phosphoric acid, fluorosulphonic acid and chlorosulphonic acid, in anhydrous form or in the presence of up to 10% water by weight of acid when said acid is sulfuric acid, up to 5% water by weight of acid when said acid is nitric acid, fluorosulphonic acid or chlorosulphonic acid.

acid, or up to 3% water by weight of acid when said acid is phosphoric acid.

5,087,748
PROCESS FOR THE CONTINUOUS
OLIGOMERIZATION OF HEXAFLUOROPROPENE
OXIDE

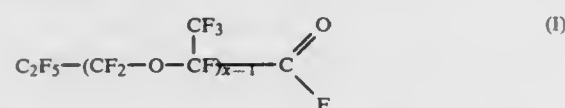
Manfred Finke, Kelkheim; Günter Siegemund, Hofheim am Taunus, and Heinz Strutz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 11, 1990, Ser. No. 463,391

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1989, 3901001

Int. Cl.⁵ C07C 51/58

U.S. Cl. 562—851 8 Claims
1. A process for the continuous preparation of perfluorinated carbonyl fluorides of the formula



in which x denotes an integer from 1 to 31, comprising a catalyzed oligomerization of hexafluoropropene oxide (HFPO), entailing a reaction device which is composed of one or more reaction vessels and whose first vessel is equipped with an introduction device which is attached on the side in the lower third, with an appliance for controlling the level of the contents, and with a drainage device located at the bottom, the reaction device being charge with a catalyst solution allows structural phase separation and catalyzes the oligomerization process of HFPO into which HFPO is fed continuously at a temperature of -10°C . to $+25^\circ\text{C}$. through the introduction device and is thereby converted into oligomers, entailing the mixture of catalyst solution and HFPO oligomers which have formed being continuously separated into phases underneath the introduction device, or after transfer into another reaction vessel, and the heavier product phase being continuously removed through the drainage device located at the bottom of the reaction system.

5,087,749
PROCESS FOR THE PREPARATION OF
PHENYLSULFONAMIDES

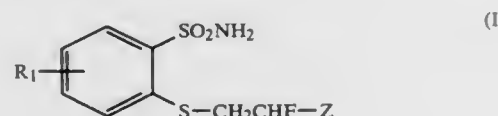
Bernard Wirz, Birsfelden; Willy Meyer, Riehen, and Wolfgang Stutz, Münchenwilten, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,406

Claims priority, application Switzerland, Dec. 8, 1989, 4413/89

Int. Cl.⁵ C07C 311/15

U.S. Cl. 564—90 11 Claims
1. A process for the preparation of 2-(2-fluoroethylthio)-phenylsulfonamide of formula I



wherein

R₁ is hydrogen, C₁—C₅alkyl or C₂—C₅alkenyl; and Z is hydrogen, fluorine or chlorine; which comprises

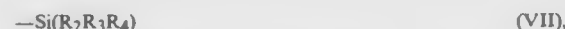
A) converting a phenylsulfonamide of formula II



wherein

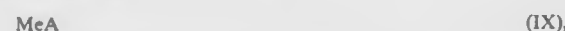
R₁ is as defined under formula I and

Y is a tertiary alkyl group having from 4 to 8 carbon atoms, benzyl, diphenylmethyl, triphenylmethyl or a silyl group of formula VII

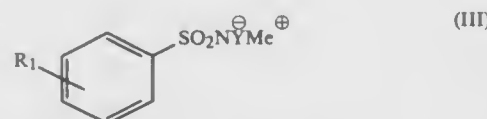


wherein each of R₂, R₃ and R₄, independently of the others, is C₁—C₆alkyl or phenyl, in succession and without isolating intermediates, with

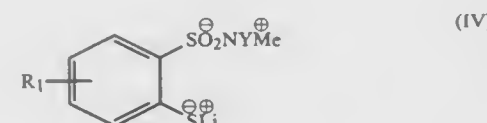
a) a strong base of formula IX



wherein Me is sodium or potassium, A is hydrogen, OH, NH₂ or OR₅ and R₅ is C₁—C₅alkyl, into the compound of formula III

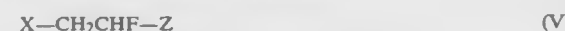


wherein Me, R₁ and Y are as defined above, converting that compound with
b) one equivalent of n-butyllithium and
c) sulfur
into the compound of formula IV

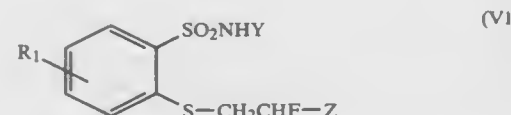


wherein Me, R₁ and Y are as defined above, reacting that compound with

d) a 2-haloethoxyethane of formula V



wherein X is chlorine or bromine and Z is as defined under formula I, to form a phenylsulfonamide of formula VI



wherein Z and R₁ are as defined under formula I and Y is as defined under formula II and
B) then removing the group Y.

5,087,750
PROCESS FOR PRODUCING
ALPHA-HYDROXYISOBUTYRIC ACID AMIDE
Akitomo Uda; Shuji Ebata, and Hirofumi Higuchi, all of Nii-gata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 586,802

Claims priority, application Japan, Dec. 19, 1989, 1-327346
Int. Cl.⁵ C07C 231/06

U.S. Cl. 564—126 15 Claims

1. In a process for producing α -hydroxyisobutyric acid amide by a hydration reaction of acetonecyanohydrin in the presence of a catalyst comprising manganese dioxide as a main component, the improvement which comprises carrying out the reaction in the presence of at least one oxidizing agent selected from the group consisting of oxygens, oxides, oxyacids and oxyacid salts, said oxidizing agent in an amount such that a molar ratio of effective oxygen to the acetonecyanohydrin is 0.001 to 0.1.

5,087,751
METHOD OF PREPARING OPTICALLY ACTIVE
3,4-DIHYDROXY BUTYRIC ACID DERIVATIVES

Kenji Inoue, Hyogo; Mitsunori Matsumoto, Nakatsu, and Satomi Takahashi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo K.K., Osaka, Japan

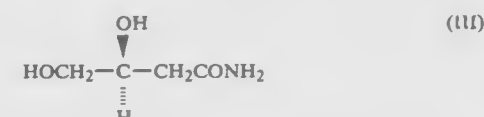
Division of Ser. No. 343,565, Apr. 27, 1989, Pat. No. 4,994,597.

This application Nov. 9, 1990, Ser. No. 610,873

Claims priority, application Japan, Mar. 31, 1989, 63-106856
Int. Cl.⁵ C07C 53/124, 223/09

U.S. Cl. 564—192 6 Claims

1. A method for the preparation of S-3,4-dihydroxybutyric acid amide of structural formula (III):



which consists essentially of reacting R-3-chloro-1,2-propanediol of structural formula (I):



with a metal cyanide in a solvent containing water and hydrating S-3,4-dihydroxy butyronitrile which is produced as an intermediate of the structural formula (II):



directly with water in the solvent.

3. The method of claim 1, wherein the reaction is conducted in water.

5,087,752
SYNTHESIS OF NITROXIDES USING DIOXIRANES
Robert W. Murray, Creve Coeur, and Megh Singh, Normandy, both of Mo., assignors to Curators of the University of Missouri, Columbia, Mo.

Continuation-in-part of Ser. No. 407,116, Sep. 14, 1989, abandoned. This application Sep. 12, 1990, Ser. No. 581,520

Int. Cl.⁵ C07C 283/04

U.S. Cl. 564—298 17 Claims

1. A method of synthesizing a nitroxide of a secondary

amine, comprising the step of reacting a secondary amine with a dioxirane compound, wherein the secondary amine comprises two alpha carbon atoms attached directly to a nitrogen atom, and wherein none of the atoms attached directly to either of the two alpha carbon atoms comprises hydrogen, and wherein two molecules of the dioxirane compound are provided for each molecule of the secondary amine which is converted into a nitroxide.

5,087,753
PROCESS FOR RECOVERING α -AMINOALCOHOLS

Wilhelmus H. J. Boesten, Sittard; Catharina H. M. Schepers, Stein, and Mathieu J. A. Roberts, Schinnen, all of Netherlands, assignors to Stamicarbon B.V., Geleen

Continuation of Ser. No. 290,357, Dec. 27, 1988, abandoned.

This application Sep. 19, 1990, Ser. No. 585,271

Claims priority, application Netherlands, Dec. 30, 1987, 8703159

Int. Cl.⁵ C07C 209/60; C07B 57/00

U.S. Cl. 564—302 13 Claims

1. Process for recovering an α -aminoalcohol by extraction from an aqueous solution comprising the following steps: at elevated pH an aromatic aldehyde is added to an aqueous solution of an aminoalcohol, the resulting mixture is converted with formation of the Schiff base of the aldehyde and the aminoalcohol, the resulting aqueous solution is extracted using a water-immiscible organic solvent, upon which the Schiff base in the resulting extract is hydrolyzed and the α -aminoalcohol or a salt thereof is recovered.

5,087,754
PROCESS FOR THE PREPARATION OF
N,N-DIALKYLANILINE

Hans-Josef Buysch, Krefeld; Heinrich Pelster, Odenthal-Globusch; Lothar Puppe, Burscheid, and Peter Wimmer, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 13, 1990, Ser. No. 567,478

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928152

Int. Cl.⁵ C07C 209/28

U.S. Cl. 564—401 19 Claims

1. A process for the preparation of an N,N-dialkylaniline by reacting the aniline on which it is based with a lower alcohol or with the corresponding ether at a temperature of 200° – 400°C . in the gas phase, wherein the alkylation process is carried out in the presence of a proton-containing zeolite catalyst selected from the group consisting of ZSM 5, ZSM 11, ZSM 8, ZSM 5/ZSM 11 intermediates, Zeta 1, Zeta 3, ZBM 10, Ultrasil, Ultrasil, TS-01, NU-4, NU-5, and AZ-1 having a SiO₂/Al₂O₃ ratio of 60 under a pressure of 2–30 bar.

5,087,755
PROCESS FOR PRODUCING AROMATIC AMINES BY
REDUCTION OF AROMATIC NITRO COMPOUNDS

Kotohiro Nomura, and Masaru Ishino, both of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 15, 1989, Ser. No. 436,690

Claims priority, application Japan, Nov. 18, 1988, 63-293394; Aug. 31, 1989, 1-226930

Int. Cl.⁵ C07C 209/36

U.S. Cl. 564—422 35 Claims

1. A process for producing an aromatic amine which comprises reducing an aromatic nitro compound under a CO/H₂O system in the presence of a catalyst comprising a rhodium compound wherein the reduction is carried out in the presence of an aqueous alkali solution which is an aqueous solution of LiOH, NaOH, KOH, RbOH or CsOH.

2. A process for producing an aromatic amine which comprises reducing an aromatic nitro compound under a CO/H₂O

system in the presence of a catalyst comprising a rhodium compound or a ruthenium compound wherein the reduction is carried out in the presence of an aqueous alkali solution with addition of at least one compound selected from the group consisting of amine compounds, diamine compounds, phosphine compounds, phosphite compounds and diphosphine compounds, wherein the aqueous alkali solution is an aqueous solution of LiOH, NaOH, KOH, RbOH or CsOH.

5,087,756

3-HYDROXY-2-CYCLOBUTEN-1-ONE SALTS

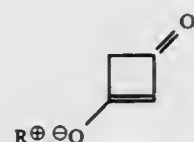
Barry Jackson, Glis, and Thomas Scholl, Visp, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland
Filed Feb. 21, 1991, Ser. No. 658,707
Claims priority, application Switzerland, Feb. 26, 1990, 598/90

Int. Cl.⁵ 35C 211/63

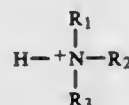
U.S. Cl. 564—457

10 Claims

1. A 3-hydroxy-2-cyclobuten-1-one salt of the formula:



wherein R is an ammonium group of the formula:



wherein which R₁, R₂ and R₃ are the same or different in meaning and each is a hydrogen atom, a lower alkyl group or a cycloalkyl group, or R is an alkali metal atom.

5,087,757

PREPARATION OF ALKYLTHIOETHYLAMINE SALTS
Kidisti G. Mariani, James A. Sinclair, both of Pittsburg; Terry L. Wright, Oakland, all of Calif., and Charles D. Gartner, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

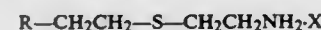
Continuation-in-part of Ser. No. 133,663, Dec. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 917,129, Oct. 9, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 255,210

Int. Cl.⁵ C07C 323/25

U.S. Cl. 564—501

17 Claims

1. A process for the preparation of a product of the formula



wherein

R is a C₂-C₂₀ alkyl moiety, and

X is a suitable acid,

which comprises contacting a compound of the formula



where

R is as previously defined with a compound of the formula



wherein X is as previously defined, in the presence of one or more solvents selected from the group consisting of propylene glycol, dipropylene glycol, propylene glycol methyl ether, dipropylene glycol methyl ether, ethylene glycol, diethylene glycol, triethylene glycol, and tetraethylene glycol, and combinations thereof with water, in the presence of a catalytic amount of a free radical initiator at temperatures between

about 25° C. and about 300° C. so as to obtain said product in a yield of at least 90 percent as a mixture in said solvent.

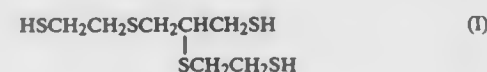
5,087,758

MERCAPTO COMPOUND, A HIGH REFRACTIVE INDEX RESIN AND LENS AND A PROCESS FOR PREPARING THEM

Yoshinobu Kanemura; Katsuyoshi Sasagawa; Masao Imai, all of Yokohama, and Toshiyuki Suzuki, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Aug. 29, 1989, Ser. No. 399,990

Claims priority, application Japan, Dec. 22, 1988, 63-321928
Int. Cl.⁵ C07C 148/00, 149/30; C08G 18/00; C08F 28/04
U.S. Cl. 568—57 19 Claims

1. A mercapto compound of the formula (I)



5,087,759

SYNTHESIS OF VICINAL ALKANEDITHIOLS

Yannick Vallee, Caen, and Yves Lahat, Pau, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Feb. 7, 1990, Ser. No. 476,244

Claims priority, application France, Feb. 8, 1989, 89 01635

Int. Cl.⁵ C07C 149/06, 148/00

U.S. Cl. 568—66

17 Claims

1. Method for the preparation of vicinal alkanedithiols, consisting of reacting an alkylene trithiocarbonate with an alkaline sulfide in a solvent, followed by acidification of the reaction medium and separation of the alkanedithiol produced.

5,087,760

PROCESS FOR THE PRODUCTION OF 1,3-CYCLOPENTANEDIONE

Rudolf Fuchs, Slon, and John McGarrity, Visp, both of Switzerland, assignors to Lonza Ltd., Basle, Switzerland
Filed Jan. 3, 1990, Ser. No. 460,658

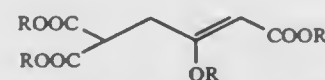
Claims priority, application Switzerland, Jan. 6, 1989, 00041/89

Int. Cl.⁵ C07C 45/00

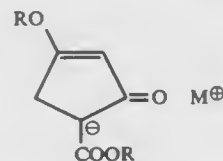
U.S. Cl. 568—361

15 Claims

1. Process for the production of 1,3-cyclopentanedione, comprising: (a) reacting a malonic acid ester in the presence of an effective amount of a base with a 4-halo-3-alkoxy-2E-pentenoic acid ester to a 5,5-bis(alkoxycarbonyl)-3-alkoxy-2E-pentenoic acid ester of the formula:



wherein the radicals R are each the same or different and are alkyl being 1 to 4 C atoms, the reaction being performed at a temperature of 0° to 180° C. and in the presence of a polar solvent, (b) cyclizing said 5,5-bis(alkoxycarbonyl)-3-alkoxy-2E-pentenoic acid ester in the presence of an effective amount of a base with the corresponding salt of 5-alkoxycarbonyl-3-alkoxy-2-cyclopenten-1-one of the formula:



wherein M is sodium or potassium and R has the above-named

meaning, the cyclization being performed at a temperature between 0° and 180° C. in the presence of a polar solvent, (c) saponifying the ester function in the presence of an effective amount of a base, the saponification being performed at a temperature of 0° to 100° C., and (d) decarboxylating the saponified compound of step (c) in the presence of an effective amount of mineral acid to the end produce, the decarboxylation being performed at a temperature of 20° to 100° C.

5,087,761

SYNTHESIS OF ALPHA-HYDROXY KETONES

Thakor Kikabhai, North Humberside, England, assignor to BP Chemicals Limited, London, England
Filed Jul. 6, 1990, Ser. No. 550,334

Claims priority, application United Kingdom, Jul. 26, 1989, 8917092

Int. Cl.⁵ C07C 45/45

U.S. Cl. 568—388

16 Claims

1. A process for condensing aldehydes to alpha-hydroxyketones in a liquid reaction system comprising at least one aldehyde and an active condensation catalyst formed by the abstraction of HX from a thiazolium salt in which X represents the anion, characterised in that the reaction is carried out in the substantial absence of

- (a) a base other than the active catalyst and
- (b) the anion X.

5,087,762

PROCESS FOR PRODUCING VITAMIN A ALDEHYDE

Toshiki Mori; Takashi Onishi, and Kazuo Yamamoto, all of Kurashiki, Japan, assignors to Kuraray Company Ltd., Kurashiki, Japan

Filed Nov. 28, 1990, Ser. No. 618,922

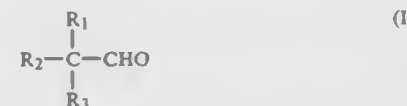
Claims priority, application Japan, Jan. 8, 1990, 2-1948

Int. Cl.⁵ C07C 45/61, 47/42

U.S. Cl. 568—447

6 Claims

1. A process for producing vitamin A aldehyde which comprises reacting vitamin A with an aldehyde of the formula (I)



wherein R₁, R₂ and R₃ are the same or different and each represent a lower alkyl group or a lower alkenyl group, in the presence of a catalytic amount of aluminum alkoxide.

5,087,763

HYDROFORMYLATION PROCESS

Kirk D. Sorensen, Charleston, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Nov. 9, 1990, Ser. No. 611,081

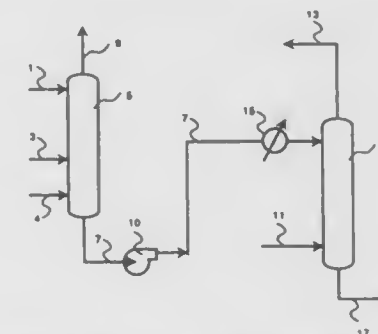
Int. Cl.⁵ C07C 45/78, 45/50

U.S. Cl. 568—492

7 Claims

1. In an improved liquid recycle rhodium-catalyzed hydroformylation process for producing C₃ to C₅ aldehydes, wherein an olefin containing from 2 to 4 carbon atoms, carbon monoxide and hydrogen are reacted in the presence of a solubilized rhodium-phosphorus complex catalyst, free phosphorus ligand and higher boiling aldehyde condensation by-products, to produce an aldehyde product selected from the class consisting of propanal, a mixture of n-butanal and iso-butanal, and a mixture of n-pentanal and branched-chain pentanals, and wherein a gaseous effluent comprising unreacted olefin, carbon monoxide and hydrogen gases is vented from the process, the improvement which comprises recovering said unreacted olefin from said vent gas by (1) absorbing the unreacted olefin in an absorbent comprising the liquid aldehyde product produced by said hydroformylation process and wherein the ab-

sorption treatment is carried out at a pressure of from 3.5 bar to about 9.5 bar and at a temperature of from about 0° C. to about 60° C.; (2) stripping the absorbed unreacted olefin from said absorbent by passing synthesis gas through the resultant absorbent containing said unreacted olefin to obtain a gaseous mix-



ture of synthesis gas and the stripped unreacted olefin and wherein the stripping treatment is carried out at a pressure of from about 100 psia to about 500 psia and at a temperature of from about 0° C. to about 130° C.; and (3) recycling said gaseous mixture to the hydroformylation reactor of said hydroformylation process.

5,087,764

PROCESS FOR THE PREPARATION OF 2,3-DIFLUOROBENZENES

Volker Reiffenrath, Rosdorf, and Joachim Krause, Dieburg, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00181, § 371 Date May 12, 1989, § 102(e) Date May 12, 1989, PCT Pub. No. WO89/08629, PCT Pub. Date Sep. 21, 1989

PCT Filed Feb. 27, 1989, Ser. No. 359,667

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807910

Int. Cl.⁵ C07C 25/13

U.S. Cl. 568—656

15 Claims

1. A process for the preparation of a 1-substituted 2,3-difluorophenol of the formula



wherein

R³ is OH;

A⁰ is 2,3-difluoro-1,4-phenylene; and

R¹ is alkyl, perfluoroalkyl or alkenyl, in each case having 1-15 C atoms, wherein one or more non-adjacent CH₂ or CF₂ groups is optionally replaced by O; said process comprising:

deprotonating in the 4-position a 1-substituted 2,3-difluorobenzene at a temperature below about -50° C. using an organometallic reagent; and reacting the resultant product with an electrophile, said electrophile being nitrobenzene, oxygen, or a peroxide.

5,087,765
PROCESS FOR PREPARING
CHLOROTRIFLUOROETHYLENE TELOMERS AND
NEW TELOMERS OBTAINED

Antonio Marraccini; Antonio Pasquale, both of Novara, and Marco Vincenti, Turin, all of Italy, assignors to Ausimont S.r.l., Milan, Italy

Filed Jan. 11, 1990, Ser. No. 463,550
 Claims priority, application Italy, Jan. 12, 1989, 19078 89
 Int. Cl.⁵ C07C 41/01

U.S. Cl. 568—677 11 Claims

1. A process for preparing chlorotrifluoroethylene telomers which comprises reacting chlorotrifluoroethylene, elemental fluorine and a perhalofluoroxy compound of formula CF_3OF or R_x-CF_2-OF , in which R_x represents a perhalogenated alkyl radical, a perhaloalkylmonoetheral radical or a perhaloalkylpolyetheral radical, either straight or branched, having from 1 to 10 carbon atoms and containing fluorine atoms or fluorine and chlorine atoms, at a temperature ranging from -100° to $+40^\circ$ C.; the perhalofluoroxy compound and the elemental fluorine being fed to the reaction medium after being diluted in a gas which is inert under the reaction conditions, the ratio, in N liters/hour, between fluorine and perhalofluoroxy compound ranging from 0.1 to 20 and the ratio

$$\frac{\text{perhalofluoroxy compound} + \text{fluorine}}{\text{inert gas}}$$

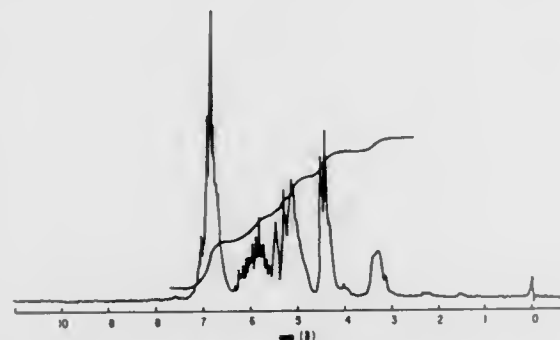
in N liters/hour, ranging from 0.01 to 1.

5,087,766
PROCESS FOR PRODUCING ALLYL-SUBSTITUTED
PHENOL COMPOUND AND THE PRODUCT

Kaoru Kanayama, and Shuji Ichikawa, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 512,149
 Claims priority, application Japan, Apr. 25, 1989, 1-103446;
 Aug. 7, 1989, 1-204080

Int. Cl.⁵ C07C 39/12 11 Claims
 U.S. Cl. 568—718



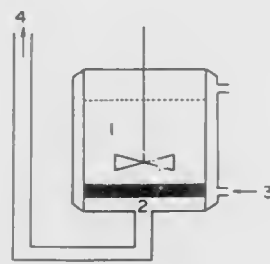
1. A process for producing an allyl-substituted phenol compound, comprising the steps of:
 reacting a phenol, in which at least one of the ortho-positions and para-position based on the phenolic hydroxyl group of said phenol is unsubstituted, with an allyl chloride or allyl bromide in the presence of an alkaline aqueous medium at a temperature and for a reaction time sufficient to allyl-etherify said phenol; and then rearranging said allyl-etherified phenol at a temperature and for a time sufficient to rearrange said allyl-etherified phenol by Claisen rearrangement in the absence of a reaction medium.

5,087,767
METHOD FOR PREPARING BISPHENOL A

Kenichi Okamoto; Hidetoshi Kita, both of Yamaguchi; Yasuo Tanaka, Tokyo, and Shigeru Iimuro, Aichi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 630,814
 Claims priority, application Japan, Dec. 25, 1989, 1-332802
 Int. Cl.⁵ C07C 39/6, 37/20

U.S. Cl. 568—727 14 Claims



1. A method for preparing 2,2-bis(4-hydroxyphenyl) propane comprising reacting acetone and phenol in the presence of an acidic ion-exchange resin as a catalyst wherein the reaction of acetone and phenol is performed at a temperature of from 30° to 120° C. removing a part of the water generated during the reaction from a mixed solution containing acetone and phenol by a pervaporation method with a selectively water-permeable membrane.

5,087,768
PROCESS FOR THE PURIFICATION OF
DIHYDROXYBIPHENYLS

Alain Nonn, Pfaffatt, France, assignor to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 372,251, Jun. 27, 1989, abandoned.
 This application Oct. 1, 1990, Ser. No. 593,268
 Claims priority, application France, Jun. 29, 1988, 88 08725
 Int. Cl.⁵ C07C 37/68, 37/84

U.S. Cl. 568—730 6 Claims
 1. A process for the purification of a dihydroxybiphenyl, comprising the steps of:

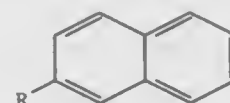
- (1) esterifying, with a derivative of an acetic acid in the presence of a strong acid, a reaction product mixture containing a dihydroxybiphenyl and at least one other by-product resulting from a reaction used to prepare said dihydroxybiphenyl, to form a biphenyl diester, said reaction is selected from the hydrolysis of dibromobiphenyls or the dealkylation of tetra-tert-butylbiphenols;
- (2) allowing the biphenyl diester prepared in step (1) to crystallize;
- (3) recovering said crystallized biphenyl diester; and
- (4) converting said biphenyl diester to a dihydroxybiphenyl.

5,087,769
PREPARATION OF
6-SUBSTITUTED-2-VINYLNAPHTHALENE

Mohammad Aslam, Corpus Christi, Tex.; Henry C. Linstid, III, Clinton, N.J., and Kenneth G. Davenport, North Kingstown, R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 26, 1990, Ser. No. 588,212
 Int. Cl.⁵ C07C 39/14, 23/36, 43/13

U.S. Cl. 568—736 12 Claims
 1. A method of forming 6-substituted-2-vinyl-naphthalene from a 2-substituted naphthalene compound of the formula:



wherein R is an ortho-para directing electron-donating group not reactive with hydrogen fluoride, comprising:

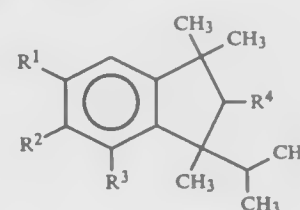
- a) contacting a reaction mixture of said 2-substituted naphthalene compound and an acylating agent with substantially anhydrous hydrogen fluoride at a temperature ranging from about 40° C. to about 100° C. for a time sufficient to cause substantially complete acylation of the naphthalene compound to a 6-substituted-2-aclynaphthalene compound;
- b) hydrogenating said 6-substituted-2-aclynaphthalene compound at a hydrogen pressure ranging from about 50 to about 500 psig, and at a temperature ranging from about 50° C. to about 175° C. for a time period sufficient to convert the carbonyl substituent to a hydroxy moiety; and
- c) dehydrating the product of said hydrogenation in the presence of a free radical inhibitor under vacuum, at a temperature of at least 130° C. to convert said hydroxy moiety to an olefinic substituent, and isolating the formed 6-substituted-2-vinylnaphthalene subsequent to the dehydration.

5,087,770
ISOPROPYL TETRAMETHYL AND PENTAMETHYL
INDANE MUSKS

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Dec. 3, 1990, Ser. No. 621,697
 Int. Cl.⁵ C07C 49/215

U.S. Cl. 568—327 24 Claims
 1. A compound of the formula:



wherein:

- R^1 is H, CH_3 , CHO, or CH_3CO ;
 R^2 is H, CH_3 , CHO, or CH_3CO ;
 R^3 is H, or CH_3 ; and
 R^4 is H, or CH_3 ;

provided that

- (i) one of R^1 or R^2 is CHO, or CH_3CO ;
- (ii) one of R^1 or R^2 is H, or CH_3 ;
- (iii) when R^3 and R^4 are both H, R^1 and R^2 are other than CH_3CO ; and
- (iv) when R^1 and R^3 are both CH_3 , R^2 is CHO.

5,087,771
PROCESS FOR THE PURIFICATION OF
MONOTERTIARYBUTYL HYDROQUINONE

James R. Hilderbrand, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1990, Ser. No. 622,453
 Int. Cl.⁵ C07C 37/84

U.S. Cl. 568—753 15 Claims
 1. A process for purifying monotertiarybutyl hydroquinone comprising:

- (a) agitating a mixture of impure monotertiarybutyl hydroquinone crystals containing 2,5 ditertiarybutyl hydroquinone, assaying between about 90 and 99 weight percent

monotertiarybutyl hydroquinone on a dry basis, and a non-polar solvent at a temperature of about 80° C. to about 118° C. under conditions of pressure such that a sufficient amount of solvent remains in the contacting vessel at the contacting temperature for a sufficient time to remove a majority of impurities from the monotertiarybutyl hydroquinone; and

- (b) separating monotertiarybutyl hydroquinone crystals from the solvent at a temperature above the crystallization point of 2,5 ditertiarybutyl hydroquinone in the solvent, said crystals assaying 99.0 weight percent minimum monotertiarybutyl hydroquinone on a dry basis.

5,087,772
METHOD FOR PREPARING 4-HYDROXYSTYRENE
 Michael T. Sheehan, Corpus Christi, Tex., and Lan Shen, Riehen, Switzerland, assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 16, 1990, Ser. No. 614,767
 Int. Cl.⁵ C07C 37/11, 39/20

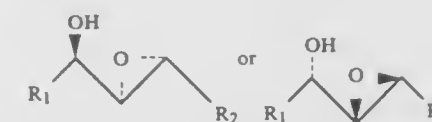
U.S. Cl. 568—804 7 Claims
 1. A method for preparing 4-hydroxystyrene, which comprises:

reacting 4-acetoxystyrene with an alcohol having the formula ROH, wherein R is an alkyl having from 1 to 6 carbon atoms; in the presence of a catalytic amount of a base selected from the group consisting of metal hydroxides, alkali metal alkoxides, nitrogen base alkali organic acid salts, alkyl and aromatic amines, and combinations thereof; to form the 4-hydroxystyrene.

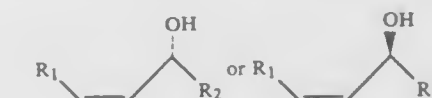
5,087,773
SELECTIVE TELLURIUM-MEDIATED SYNTHESIS OF
OPTICALLY ACTIVE E- OR Z-ALLYL ALCOHOLS
FROM OPTICALLY ACTIVE EPOXY ALCOHOLS
 Donald C. Dittmer; Christopher K. Murphy, and Robert Discordia, all of Syracuse, N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Apr. 23, 1990, Ser. No. 512,863
 Int. Cl.⁵ C07C 29/00, 33/03, 33/14

U.S. Cl. 568—828 8 Claims
 1. A process of converting an erythro epoxy alcohol of the general form



to a substantially pure cis-allyl alcohol of the form



respectively where R_1 is hydrogen, normal lower alkyl, allyl, or cyclohexyl and R_2 is normal lower alkyl or cyclohexyl; comprising the steps of

introducing toluenesulfonic anhydride in a suitable carrier into said erythro epoxy alcohol to form an epoxy tosylate; and contacting the epoxy tosylate with a salt of an element selected from the group that consists of Te and Se to form said cis-allyl alcohol.

5,087,774
PROCESSES FOR THE CONVERSION OF MYRCENE TO NEROL AND CITRAL

James B. Woell, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 269,278, Nov. 9, 1988, Pat. No. 5,017,726.

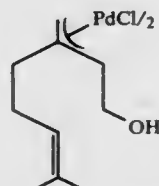
This application Jul. 10, 1990, Ser. No. 550,419

Int. Cl.⁵ C07C 33/025, 47/02

U.S. Cl. 568—840

38 Claims

1. A process for producing nerol comprising contacting a palladium-myrcene complex of the formula



with a nitrogen-donor compound in the presence of hydrogen gas.

5,087,775
PROCESS FOR THE PREPARATION OF PARTIALLY FLUORINATED ALCOHOLS

Karl-Rudolf Gassen, Odenthal; Dietmar Blefeldt, Ratingen; Michael Negele, Cologne, and Heinz Ziemann, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 24, 1990, Ser. No. 604,026

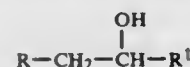
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1989, 3939535

Int. Cl.⁵ C07C 31/34

U.S. Cl. 568—842

8 Claims

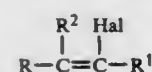
1. A process for the preparation of a partially fluorinated alcohol of the formula (I)



in which

R and R¹ are identical or different and represent C₁-C₄-alkyl which is substituted by fluorine, or R and R¹ together represent the group —(CF₂)_n—, wherein n represents 2, or 3, wherein

a) a compound of the formula (II)



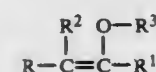
in which

R and R¹ have the abovementioned meaning, R² represents hydrogen, fluorine, or chlorine and Hal represents halogen, are reacted with an alcohol of the formula (III)



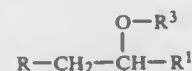
in which

R³ represents C₁-C₃-alkyl, C₃-C₆-cycloalkyl, benzyl or phenyl, in the presence of a base to give a compound of the formula



in which

R, R¹, R² and R³ have the abovementioned meaning, and (b) the compound of the formula (IV), after its isolation, is hydrogenated catalytically with hydrogen in the presence of a base to give a compound of the formula (V)



in which

R, R¹ and R³ have the abovementioned meaning, and the compound of the formula (V) is converted, after its isolation, into a compound of the formula (I) using an ether-cleaving agent selected from the group consisting of HCl, sulphuric acid, FeCl₃ and BF₃.

5,087,776
NEW PERFLUOROALKANES OBTAINED BY PHOTOCHEMICAL FLUORINATION AND USE THEREOF AS POLYMERIZATION INITIATORS

Claudio Tonelli, and Vito Tortelli, both of Milan, Italy, assignors to Ausimont, S.p.A., Milan, Italy

Division of Ser. No. 294,557, Dec. 6, 1988. This application Feb. 6, 1991, Ser. No. 651,086

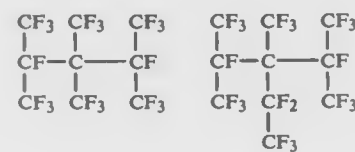
Claims priority, application Italy, Apr. 10, 1987, 20061/87; PCT Int'l Appl., Apr. 8, 1988, PCT/EP88/00296

Int. Cl.⁵ C07C 19/08, 17/04; C08F 4/00

U.S. Cl. 570—134

1 Claim

1. Branched perfluoroalkanes having the following formulas:



(V)

(VI)

5,087,777
PARTIALLY FLUORINATED ALKENES HAVING A TERTIARY STRUCTURE

Chien C. Li, East Aurora; Kane D. Cook, Buffalo, and Rajat S. Basu, Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

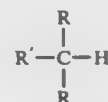
Filed Dec. 4, 1990, Ser. No. 622,877

Int. Cl.⁵ C07C 21/18

U.S. Cl. 570—136

14 Claims

1. A compound having the formula



wherein each R is the same or different and is selected from the group consisting of CF₃, CHF₂, CH₂F, and CH₃CF₂, and R' is an alkenyl or fluoroalkenyl group having 2 to 6 carbon atoms.

5,087,778
REGENERATION OF ZEOLITES USED FOR PURIFYING 1,1,1,2-TETRAFLUOROETHANE

Stephen F. Yates, Arlington Heights, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 10, 1990, Ser. No. 506,969

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.⁵ C07C 17/39; B01J 20/34

U.S. Cl. 570—179

20 Claims

1. A method for regenerating zeolites or carbon molecular sieves used for removing 2-chloro-1,1-difluoroethylene (R1122) from 1,1,1,2-tetrafluoroethane (R134a) comprising:

- removing R134a by stripping the zeolite or carbon molecular sieve with an inert gas at a temperature of about 0° to 60° C. and a pressure not higher than about 300 kPa;
- separating and recovering R134a from the inert gas
- removing R1122 from said zeolite by passing an inert gas over said zeolite or carbon molecular sieve at a temperature of about 150° to 300° C. and a pressure no higher than about 300 kPa.

5,087,779
HYDROCARBON HALOGENATION

Philip O. Nubel, Naperville; Larry C. Satek, Wheaton; Michael J. Spangler, Sandwich, and Glenn O. Michaels, South Holland, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 25, 1990, Ser. No. 514,172

Int. Cl.⁵ C07C 17/154

U.S. Cl. 570—245

30 Claims

1. A method for halogenating hydrocarbons comprising the step of:

- contacting a reaction mixture comprising hydrocarbon-containing feed, a hydrogen halide and an oxygen-containing gas with a catalyst comprising crystalline copper aluminum borate under reaction conditions to form halogenated hydrocarbons.

5,087,780
HYDROISOMERIZATION PROCESS

Robert P. Arganbright, Seabrook, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

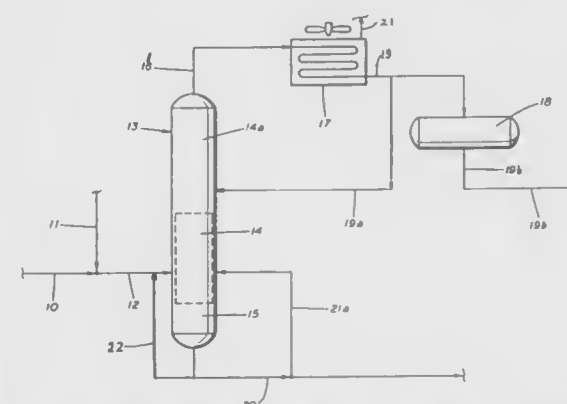
Continuation of Ser. No. 264,355, Oct. 31, 1988, abandoned.

This application May 14, 1991, Ser. No. 701,696

Int. Cl.⁵ C07C 5/03

U.S. Cl. 585—259

15 Claims



1. A process for the isomerization of C₄ alkenes comprising:
 - feeding a mixed C₄ stream at least partially in liquid phase and containing butene-1 and butene-2 to a distillation column reactor containing a fixed bed of alumina supported PdO catalyst prepared as a distillation structure,
 - concurrently feeding an effectuating amount of hydrogen to said fixed bed,

- contacting said C₄ stream and said hydrogen with said fixed bed to isomerize said butene-2 to butene-1
- withdrawing an overhead stream rich in said butene-1
- withdrawing a bottom stream rich in said butene-2 and
- returning a portion of said bottoms to said column to further convert butene-2 to butene-1.

5,087,781
METHOD OF MAKING MESITYLENE

Alain A. Schutz, Penn Township, Westmoreland County, and Leonard A. Cullo, Greensburg, both of Pa., assignors to Aris-chem Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1991, Ser. No. 710,843

Int. Cl.⁵ B01J 23/00, 23/16; C07C 15/02, 1/20

U.S. Cl. 585—409

5 Claims

1. Method of making mesitylene comprising passing acetone over a niobium supported catalyst at a temperature of about 250° C. to about 500° C.

5,087,782
DEHYDROCYCLIZATION OF POLYALPHA-OLEFIN LUBRICANTS

Bruce P. Pelrine, Trenton, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 28, 1989, Ser. No. 344,935

Int. Cl.⁵ C07C 5/367

U.S. Cl. 585—417

24 Claims

1. A process for producing a polyalpha-olefin containing aromatic structures by the dehydrocyclization of polyalpha-olefin comprising:

- contacting a polyalpha-olefin produced by the oligomerization of a C₆-C₂₀ olefin with dehydrocyclization catalyst in a dehydrocyclization zone under dehydrocyclization conditions whereby modified polyalpha-olefin is produced which contains aromatic structure attached as pendant groups to the backbone of the polyalpha-olefin structure.

5,087,783
TRANSALKYLATION OF BENZENE IN A MOVING BED

Roger C. Johnson; Daniel McCarthy, both of Randolph, and Andrei Rhoe, Wyckoff, all of N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.

Division of Ser. No. 186,959, Apr. 27, 1988, Pat. No. 4,973,780.

This application Nov. 9, 1990, Ser. No. 610,950

Int. Cl.⁵ C07C 5/22, 15/12; B01J 20/34

U.S. Cl. 585—475

7 Claims

1. A process for transalkylating benzene with polyalkylbenzene in a transalkylation reactor containing at least one bed of transalkylation catalyst, comprising:

- introducing a feed of benzene and polyalkylbenzene at a first end of said bed;
- monitoring the temperature of said bed to determine deactivated portions of said bed;
- removing an inactive portion of said catalyst from the first end of said bed based on said monitoring of temperature of said bed; and
- adding an active portion of said catalyst to a second end of said bed, said second end being an end opposite to said first end of said bed.

5,087,784
AROMATIC ALKYLATION PROCESS AND APPARATUS

Harold S. Primack, Skokie, and Ronald L. Cutshall, Mokena, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1990, Ser. No. 606,329

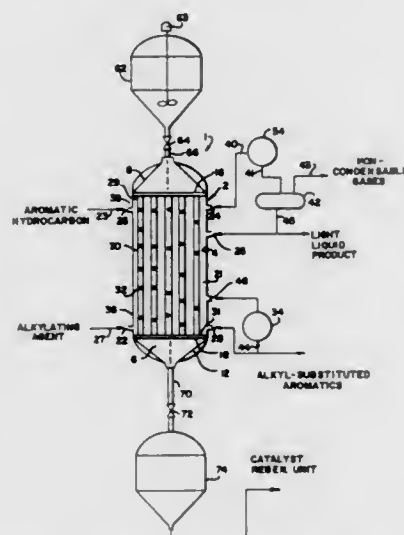
Int. Cl.⁵ C07C 2/66

U.S. Cl. 585—446

15 Claims

1. A process for producing an alkyl-substituted aromatic comprising the steps of feeding catalyst particles downwardly by gravity through at least one substantially vertically-posi-

tioned permeable tube disposed in a shell distillation zone surrounding said permeable tube, contacting said catalyst particles with at least one liquid aromatic hydrocarbon and at least one gaseous alkylating agent inside said permeable tube under liquid continuous phase alkylation conditions to produce said



alkyl-substituted aromatic, removing said catalyst particles from a lower end of said permeable tube, separating said alkyl-substituted aromatic from said alkylating agent by fractionation within said shell distillation zone, and recovering said alkyl-substituted aromatic from a lower end of said shell distillation zone.

5,087,785
PROCESSES FOR PREPARING ALKYLATED INDANES AND TETRAHYDRONAPHTHALENES
Walter C. Frank, Holland, Pa., assignor to Union Carbide Corporation, Wayne, N.J.

Filed Dec. 3, 1990, Ser. No. 621,688
Int. Cl.⁵ C07C 2/70, 2/64, 5/22

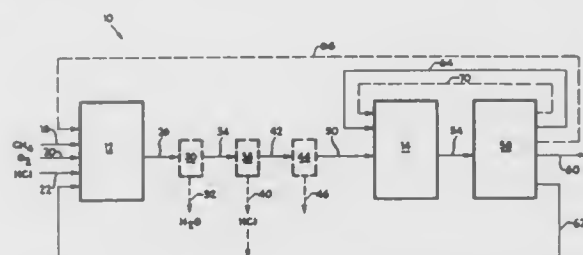
U.S. Cl. 585—459 62 Claims
1. A process for producing a secondary alkyl indane compound comprising contacting an alkylated tetrahydronaphthalene compound, with less than about 50 mole percent of a Lewis acid based on the amount of said alkylated tetrahydronaphthalene compound, in the presence of a solvent.

5,087,786
HALOGEN-ASSISTED CONVERSION OF LOWER ALKANES
Philip O. Nubel, Naperville; Larry C. Satek, Wheaton; Michael J. Spangler, Sandwich; Charles A. Lutman, West Chicago, and Glenn O. Michaels, South Holland, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 25, 1990, Ser. No. 514,173
Int. Cl.⁵ C01C 2/00

U.S. Cl. 585—500 22 Claims
1. A method for converting lower alkanes to higher molecular weight hydrocarbons, said method comprising the steps of: contacting a first reaction mixture comprising lower alkanes, a hydrogen halide and an oxygen-containing gas with a first catalytic composition comprising crystalline copper aluminum borate at appropriate reaction conditions to form an intermediate composition comprising halogenated alkanes; and contacting said halogenated alkanes with a second catalytic

composition comprising a pentasil molecular sieve material under appropriate reaction conditions to form a product mixture comprising hydrocarbons having molecular weights greater than said lower alkanes.



uct mixture comprising hydrocarbons having molecular weights greater than said lower alkanes.

5,087,787
METHOD OF OXIDATIVE CONVERSION
James B. Kimble, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 208,830, Jun. 14, 1988, abandoned, which is a continuation of Ser. No. 947,235, Dec. 29, 1986, abandoned. This application May 6, 1991, Ser. No. 700,092
Int. Cl.⁵ C07C 2/00

U.S. Cl. 585—500 20 Claims
1. A method for the oxidative conversion of feed organic compounds comprising methane to product organic compounds comprising higher hydrocarbons, comprising: contacting said feed organic compounds, a free oxygen-containing gas and water with at least one solid contact material selected from the group consisting of a solid contact material consisting essentially of lanthanum oxide and solid contact materials comprising (a) at least one promoter comprising a metal selected from the group consisting of lithium and sodium and (b) at least one base material selected from the group consisting of magnesium oxide, calcium oxide, lanthanum oxide and samarium oxide, under oxidative conversion conditions sufficient to convert said feed organic compounds to said product organic compounds.

5,087,788
PREPARATION OF HIGH PURITY VINYLINDENE OLEFIN
Feng-Jung Wu, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 4, 1991, Ser. No. 663,387
Int. Cl.⁵ C01J 2/24

U.S. Cl. 585—512 9 Claims
1. A process for dimerizing an alpha-olefin of the general formula $RCH=CH_2$, where R is alkyl, cycloalkyl, or cycloalkenyl with a carbon number ranging from 1 to about 30, to a vinylidene olefin, said process comprising contacting said alpha-olefin at temperature between about -60°C . and 280°C . with a catalyst comprising (a) a metallocene having the general formula $(\text{cyclopentadienyl})_n\text{MY}_{4-n}$ wherein n=2 or 3, M is titanium, zirconium or hafnium and each Y is individually selected from hydrogen, C_1 - C_5 alkyl, C_6 - C_{20} aryl, C_2 - C_{20} alkoxy, C_2 - C_{20} ester, and halogen, (b) an alkylaluminum compound other than methylaluminum, and (c) trimethyl aluminum.

5,087,789
OLEFIN OLIGOMERIZATION
Max P. McDaniel; M. Bruce Welch, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

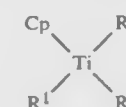
Filed Aug. 23, 1990, Ser. No. 571,684
Int. Cl.⁵ C07C 2/02

U.S. Cl. 585—525 20 Claims
1. A process for producing oligomers comprising:
(a) contacting at least one monoolefin selected from the group consisting of propylene or ethylene in a reaction zone, under a reaction temperature within the range of about 130°C . to about 300°C ., with a catalyst comprising a chromium component on an aluminophosphate support; and
(b) recovering oligomerization products.

5,087,790
METHOD FOR OLEFINATION OF CARBONYL COMPOUNDS USING TITANOCENE DERIVATIVES
Nicos A. Petasis, Hacienda Heights, Calif., and Eugene I. Bzowej, Thornhill, Canada, assignors to University of Southern California, Los Angeles, Calif.

Filed Jun. 12, 1991, Ser. No. 713,907
Int. Cl.⁵ C07C 11/02, 15/40, 15/44

U.S. Cl. 585—638 16 Claims
1. A method for conversion of a starting compound containing a carbon-oxygen double bond to a corresponding product containing a carbon-carbon bond, which method comprises: reacting the compound with a titanocene compound of the formula



wherein Cp is cyclopentadienyl or substituted cyclopentadienyl;
 R^1 is Cp or R^4 ; and
 R^2 , R^3 and R^4 are independently selected from the group consisting of alkyl, alkenyl, alkynyl and aryl, with the proviso that at least one of R^2 , R^3 and R^4 is $-\text{CHR}^5\text{R}^6$, in which R^5 and R^6 are non-interfering substituents, whereby the carbon-oxygen double bond is replaced by a carbon-carbon double bond to provide an olefin.

5,087,791
PROCESS FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE IN THE PRESENCE OF WATER
Angelo J. Magistro, Bricksville, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

Filed Nov. 19, 1990, Ser. No. 615,193
Int. Cl.⁵ C07C 5/327

U.S. Cl. 585—657 13 Claims
1. A process for preparing ethylene from ethane, comprising contacting a charge amount of ethane, an oxygen source, a balanced amount of a chlorine source relative to the amount of

ethane, and water in the presence of a solid solution catalyst containing iron cations stabilized with a metal oxide stabilizer, at an effective temperature.

5,087,792
PROCESS FOR THE DEHYDROGENATION OF HYDROCARBONS
Paul R. Cottrell, Arlington Heights, and Michael E. Fettes, Prospect Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jan. 9, 1991, Ser. No. 638,952
Int. Cl.⁵ C07C 5/32

U.S. Cl. 585—661 2 Claims
1. In a process for the dehydrogenation of a hydrocarbon selected from the group consisting of propane and butane in the presence of a catalyst comprising platinum and a carrier material wherein said dehydrogenation is conducted at severe operating conditions which promote rapid deactivation of said catalyst including the agglomeration of said platinum on said carrier material and the deposition of coke on said catalyst, the improvement which comprises the steps of contacting said catalyst comprising platinum and a carrier material having coke deposited thereon with an oxygen containing gas to remove said coke by combustion; contacting said catalyst having coke removed therefrom with a drying gas having a temperature in a range of from about 800°F . (426°C .) to about 1100°F . (593°C .) and an oxygen concentration from about 21 to about 39 mole percent until said catalyst has a water concentration of less than about 1 weight percent; contacting said catalyst comprising platinum and a carrier material having a water concentration of less than about 1 weight percent with a re-dispersion gas comprising chlorine and having an oxygen concentration from about 21 to about 39 mole percent to re-disperse platinum on said catalyst; contacting the resulting catalyst having re-dispersed platinum in a reduction zone with a hydrogen-rich gas at a temperature from about 900°F . (482°C .) to about 950°F . (510°C .) and a pressure from about 5 psig (34.5 kPa gauge) to about 125 psig (862 kPa gauge); and recovering reconditioned catalyst from said reduction zone.

5,087,793
PROCESS FOR PREPARING INNER OLEFINS
Naoki Akiyama, and Masaharu Mori, both of c/o Mitsubishi Monsanto Chemical Company Yokkaichi-Kenkyusho: 1, Toho-cho, Yokkaichi-shi, Mie-ken, Japan

Filed May 24, 1990, Ser. No. 476,433
Claims priority, application Japan, Sep. 27, 1988, 63-242168
Int. Cl.⁵ C07C 5/23

U.S. Cl. 585—666 5 Claims
1. A process for preparing inner olefins comprising using 1-olefins having 6 to 34 carbon atoms as a starting material and conducting an isomerization reaction in the presence of an isomerization catalyst selected from the group consisting of mordenite and a zeolite having the same structure as mordenite at temperatures ranging from 130°C . to 180°C . and wherein 0.05 to 1.0 percent by weight of catalyst based on 1-olefine is present, and wherein the catalyst is present in the hydrogen form.

VOL

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ELECTRICAL

5,087,794

THERMOSTAT GUARD

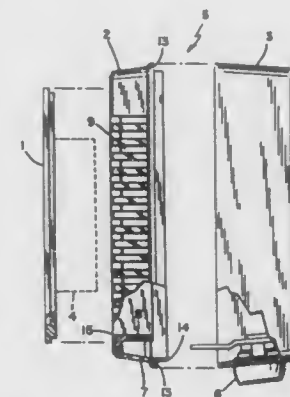
Clifford L. Nelson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 19, 1990, Ser. No. 554,769

Int. Cl.⁵ H05K 5/00; B65D 55/14

U.S. Cl. 174—52.1

10 Claims



1. A thermostat guard for protecting a thermostat from unauthorized adjustment, comprising:
- a base member adapted to be mounted on a support surface, wherein the base member has an outer wall having ventilation holes therein, a solid inner wall, of which portions are positioned so as to block access to the thermostat, and a bottom wall which has an opening through which the thermostat will fit; and
 - a cover member with locking means, capable of being secured to a front side of base member.

5,087,795

STRAIN RELIEF LIQUID TIGHT ELECTRICAL CONNECTOR

Frank Guginsky, Commack, N.Y., assignor to Berger Industries, Inc., Maspeth, N.Y.

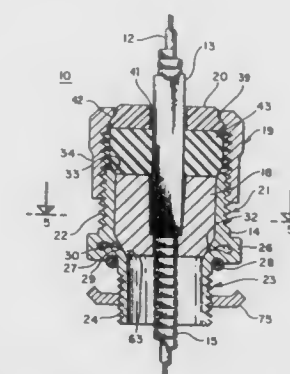
Filed May 24, 1990, Ser. No. 528,157

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.⁵ H02G 3/22

U.S. Cl. 174—65 SS

17 Claims



1. A strain relief electrical fitting comprising:
- a metal tubular body member having an inwardly projecting abutment below the top thereof;
 - a gland cap having a central opening in threaded engagement with the upper part of said body member and delineating with said abutment and the inside face of said body member a compression chamber;
 - a compressible packing member located in said compression chamber and including a cylindrical upper section with an axial bore and peripherally spaced first fingers longitudinally depending from said upper section;
 - a metal grip member located in said compression chamber

and including an upper ring encircling said packing member and peripherally spaced grip second fingers depending from and swingable about said ring and interdigitating said first fingers and having top faces underlying the bottom face of said packing member upper section and cooperating with said body member and packing member whereby longitudinal contraction of said compression chamber by said gland cap compresses said packing member upper section to radially contract said axial bore and depress said grip member to contract the lower ends of said grip fingers.

5,087,796

ELECTRICAL OUTLET SAFETY COVER

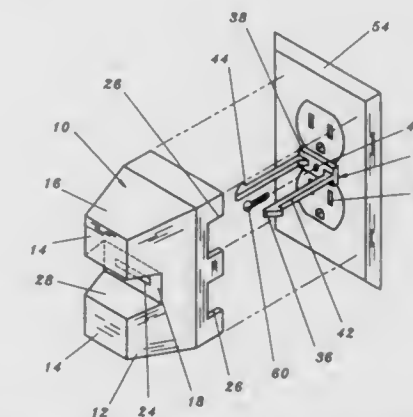
Victor R. Norman, 5730 E. Bloomfield, Simi Valley, Calif. 93063

Filed Apr. 19, 1990, Ser. No. 511,089

Int. Cl.⁵ H02G 3/18

U.S. Cl. 174—67

4 Claims



- I. A safety cover for a household electrical outlet having a faceplate and a separated pair of sockets extending through said faceplate, said safety cover comprising:

- a) a housing dimensioned to enclose a plug end of two electrical cords when said plug ends are connected to said sockets, said plug ends configured with two prongs or three prongs;
- b) said housing having an open face, said open face is dimensioned to seat flush on the faceplate front surface;
- c) said housing having a plurality of access cutouts for routing said electrical cords from inside said housing to appliances;
- d) a clip having a base and a separated pair of latching elements extending from said base, said base is seatable against said faceplate front surface and between said separated sockets, said base having a hole dimensioned to accept a threaded fastener which secures said clip to the faceplate screw position;
- e) said housing having means to actuate said latching elements as said housing is pressed onto said latching elements, said latching elements having means to securely hold said housing against said faceplate front surface after said actuation, whereby said housing can be installed without using a tool;
- f) said latching elements being flexible under finger pressure as to release said housing from said latching elements, whereby said housing can be removed without using a tool.

5,087,797

AIR-CUSHION PANTOGRAPH

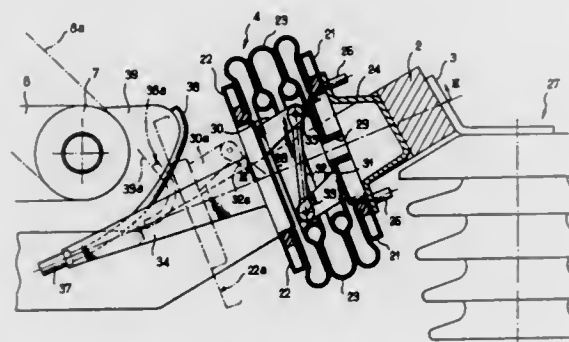
Gérard Blanvillain, Veretz, and Pascal Forte, Tours, both of France, assignors to Faiveley Transport, Saint-Ouen Cedex, France

PCT No. PCT/FR90/00418, § 371 Date Feb. 6, 1991, § 102(e) Date Feb. 6, 1991, PCT Pub. No. WO90/15730, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 13, 1990, Ser. No. 646,643
Claims priority, application France, Jun. 14, 1989, 89 07864
Int. Cl. B60L 5/16

U.S. Cl. 191—66

7 Claims



1. A pantograph (1) for an electric-traction locomotive, comprising a horned slipper holder (16) establishing electrical contact with an overhead contact wire, and an elastic device (4) of an air-cushion type for pressing the horned slipper holder (16) against the overhead contact wire by way of a torque exerted on a shaft (7) of a lower arm (8) of the pantograph (1), characterized in that the said elastic device (4) comprises:

a first cover plate (21) integral with the structure of the locomotive, situated facing the first cover plate (21) and connected to the latter by means of a wall (23) made of an elastic material, a second cover plate (22) which can move relative to the first cover plate (21), the first and second cover plates (21, 22) forming, together with the said elastic wall (23), a leaktight enclosure (28) containing a gas at a pressure which may differ from the atmospheric pressure, arranged inside the leaktight enclosure (28), a means for guiding the second cover plate which consists of an elongated member (32) whose two ends are connected in an articulated manner to the first and second cover plates (21, 22), respectively, this guiding means enabling the second cover plate (22) to be displaced in a substantially translational movement relative to the first cover plate (21), means for transforming the translational movement of the second cover plate (22) into a rotation of the said shaft (7) of the pantograph.

5,087,798

ILLUMINATED ELASTOMERIC ROCKER SWITCH ASSEMBLY

Mark W. Rohde, Scio; George T. Kirkwood, Hillsboro, and Dick G. Schalk, Portland, all of Oreg., assignors to Rodgers Instrument Corporation, Hillsboro, Oreg.

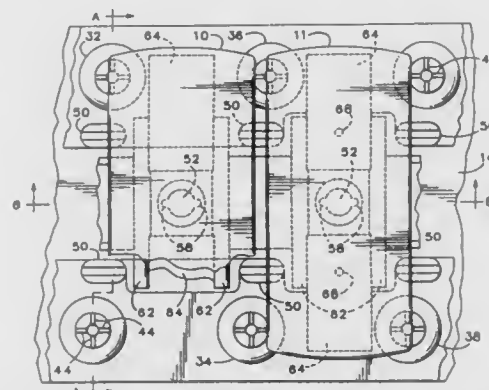
Filed Mar. 14, 1990, Ser. No. 494,147
Int. Cl. H01H 13/70, 9/00

U.S. Cl. 200—5 A

24 Claims

16. An rocker switches assembly, comprising:
(a) base means for supporting an electric switch;
(b) a plurality of tabs, each tab having a C-shaped cross section forming a face and sides thereof, the sides being substantially perpendicular to the face, each tab being mounted on said base means by its sides at a pivot point such that said tab pivots on an axis which is substantially perpendicular to the sides thereof; and
(c) a first plurality of electric switches mounted adjacent one

another on said base means, each said electric switch being offset from the pivot point of a corresponding tab and disposed beneath one side of one of said tabs so as to be activated by said one side when said tab is pivoted toward said switch, the other side of said tab offset in the same



direction from the pivot point as said one side being recessed so as not to activate an adjacent elastomeric switch when said tab is pivoted, thereby enabling said tabs and said elastomeric switches to be closely packed side by side without said tabs activating elastomeric switches of adjacent tabs.

5,087,799

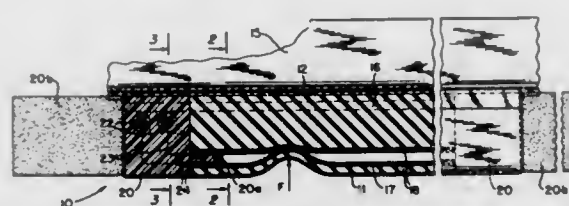
POWER DOOR SENSING STRIP

Robert Pariot, New Windsor, N.Y., and J. Mortimer Traugott, Riverton, N.J., assignors to Techstrip Inc., Oaklyn, N.J.

Filed Dec. 27, 1990, Ser. No. 634,412
Int. Cl. H01H 3/16

U.S. Cl. 200—61.43

4 Claims



1. An elongated sensing strip for attachment to a power door edge for sensing an object obstructing closure of the door comprising a sealed elongated and flexible plastic tube, two foil conductors attached to opposite inner sides of the tube, a block of soft and resilient foam encapsulating and surrounding the tube and formed with a generally rectangular cross-section, relatively incompressible blocks at each end of the foam block, two electric terminals in at least one of the blocks, conductor means located in said one of said blocks connecting the electric terminals to the foil conductors, a cover including attachment means for the door edge along a side of the foam block, and a tough flexible plastic jacket extending around the sensing strip, whereby moisture and contaminants entering the foam block through breaks in the jacket will not cause short circuiting of the sealed foil conductors.

5,087,800

HIGH FREQUENCY, LARGE CURRENT, SWITCH INCLUDING A PRESSURE-ACTUATED CURRENT-CARRYING EXTENSIBLE BELLOWS ELEMENT

Roland Gesche, Seligenstadt, and Stefan Locher, Alzenau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

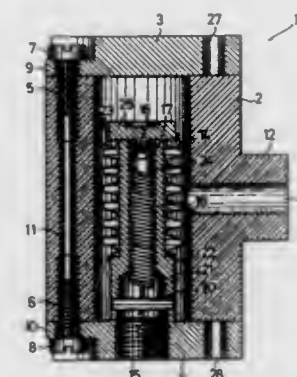
Continuation of Ser. No. 408,251, Sep. 18, 1989, abandoned. This application Jan. 17, 1991, Ser. No. 642,704

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1989, 3923660

Int. Cl. H01H 35/32

U.S. Cl. 200—83 C

23 Claims



1. An on-off switch, especially suitable for switching large, high-frequency currents, comprising:

- two non-deforming contact parts, maintained a predetermined distance apart, which are to be electrically connected;
- an insulator extending between the contact parts, electrically insulating them from each other and comprising a cavity, the respective ends of said insulator being in physical contact with said contact parts; and
- an electrically conducting bellows disposed within the cavity, said bellows having a fixed end attached to one of said contact parts and a movable distal end comprising an electrically conducting contact head closing said distal end, whereby in a stretched state said bellows via said contact head is placed in contact with both contact parts to electrically connect the two contact parts to each other without deforming the same and provides an electrical current-carrying path therebetween, said bellows in an unstretched state physically separating said head at its distal end from the corresponding one of the contact parts to break electrically conductive contact between the two contact parts.

5,087,801

SPHERE-ACTUATED FLOAT SWITCH

Stephen P. Johnston, Detroit Lakes, Minn., assignor to S.J. Electro Systems, Inc., Detroit, Mich.

Filed Jun. 19, 1990, Ser. No. 540,189

Int. Cl. H01H 35/18

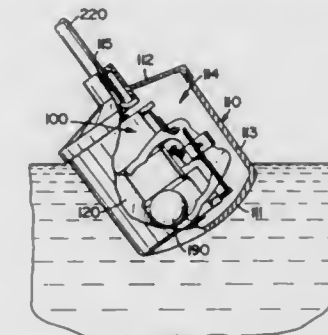
U.S. Cl. 200—84 R

12 Claims

1. A switch used in a float switch system, the switch comprising:

- a cage defining a longitudinal raceway;
- a yoke pivotally mounted to an exterior of the cage and having first and second legs which extend into the raceway;
- biasing means capable of biasing the yoke in a first direction when the yoke is in a first position and biasing the yoke in a second direction, which is substantially diametrically opposed to the first direction, when the yoke is in a second position;
- electrical switching means which is electrically open when the yoke is in the first position and electrically closed

when the yoke is in the second position, wherein the electrical switching means includes first and second electrical contacts, the first electrical contact mounted to the cage, the second electrical contact mounted to the yoke, the second electrical contact movable with the yoke as the yoke is pivoted between the first position and the second position, the second electrical contact being in electrical



contact with the first electrical contact when the yoke is in the second position, and the second electrical contact being spaced apart from the first electrical contact when the yoke is in the first position; and means for urging the yoke between the first and second positions against the bias of the biasing means based upon the longitudinal angle of the raceway.

5,087,802

RETAINING DEVICE FOR A CONTROL BUTTON OF THE PIANO-KEY TYPE AND DEVICE IN WHICH SAME IS USED

Pierre Guillemot, Rambouillet, France, assignor to U.S. Philips Corporation, New York, N.Y.

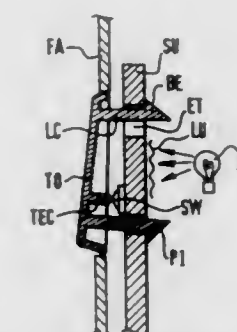
Filed Jul. 20, 1990, Ser. No. 558,114

Claims priority, application France, Jul. 21, 1989, 89 09884

Int. Cl. H01H 13/70, 3/12

U.S. Cl. 200—343

5 Claims



1. A combination of a control button and a support for the button, which button has an operating surface and a liberty of movement of the piano-key type with a rest position and an actuating position, comprising positioning means for positioning the button in spaced relation with respect to the support in the rest position and returning with respect to the support in the rest position and returning means for returning the button to the rest position after an actuating operation consisting of pressing of the button, characterized in that the support is provided with an opening in the shape of a flattened T extending through its thickness, and said button is provided with 3 contiguous strips including a central strip and two lateral strips situated in a plane substantially perpendicular to the operating surface of said button and made of an elastic material, the central strip being provided with a catch which is removed from the button by a distance which is at least equal to the thickness of the support and the distance of the button from the

support, said central strip being inserted in the leg of the T and, simultaneously, said two lateral strips being inserted in the wings of the T, and the catch being snapped around the support thereby constituting said positioning means, while the two lateral strips bear on the wings of the T, thus constituting said returning means.

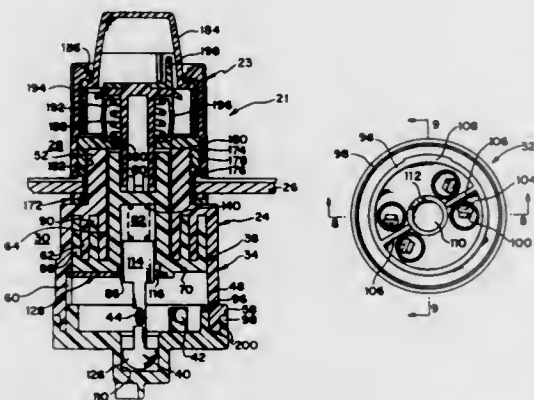
5,087,803 ELECTRICAL SWITCH FOR HAZARDOUS ENVIRONMENTS

Michael A. Kurtz, Belleville, Ill., assignor to Hnbell Incorporated, Orange, Conn.

Filed May 22, 1990, Ser. No. 526,716
Int. Cl.⁵ H01H 13/52, 9/04

U.S. Cl. 200—526

19 Claims



1. An electrical switch, comprising:
 - a non-metallic terminal base supporting a plurality of stationary electrical contacts;
 - a non-metallic operator body having a radial wall and a tubular outer wall extending from said radial wall, said outer wall having a free end coupled to said terminal base and defining a contact chamber therein, said radial wall having a central passageway and at least one tubular inner wall extending from said radial wall toward said terminal base substantially concentrically to said outer wall and said passageway;
 - a non-metallic operator member having an axial portion slidably received in said passageway between first and second positions and having a radial portion extending from said axial portion with at least one tubular flange extending therefrom substantially concentrically to said axial portion, said tubular flange being slidably received between and overlapping said inner and outer walls of said operator body in both of said first and second positions of said operator member;
 - operator means, coupled to said operator member, for movement between open and closed positions in response to movement of said operator member between said first and second positions thereof; and
 - movable contacts mounted on said operator means for simultaneous movement therewith between positions engaging and disengaging said stationary contacts on said terminal base.

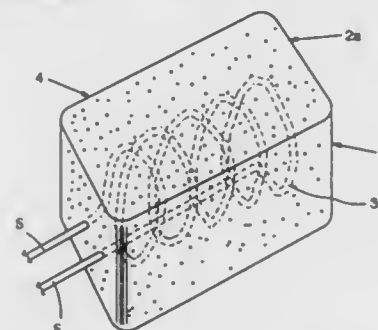
5,087,804 SELF-REGULATING HEATER WITH INTEGRAL INDUCTION COIL AND METHOD OF MANUFACTURE THEREOF

Thomas H. McGaffigan, Half Moon Bay, Calif., assignor to Metcal, Inc., Menlo Park, Calif. and Amp, Inc., Middletown, Pa.

Filed Dec. 28, 1990, Ser. No. 635,790
Int. Cl.⁵ H05B 6/40

U.S. Cl. 219—10.43

34 Claims



1. A self-regulating heater, comprising:
 - a body comprising electrically non-conductive material; an internal induction coil embedded within the body;
 - lossy heating particles dispersed within the body, the lossy heating particles producing heat when subjected to an alternating magnetic field produced by the internal induction coil, the lossy heating particles having a Curie transition temperature approximately equal to an auto-regulation temperature at which the body is heated; and
 - connection means for supplying power to the internal induction coil so that the induction coil can produce an alternating magnetic field of sufficient intensity to cause the lossy heating particles to heat the body to the auto-regulation temperature.

5,087,805 PRINTED AND ENCODED MASS DISTRIBUTABLE RESPONSE PIECE AND METHOD OF MAKING THE SAME

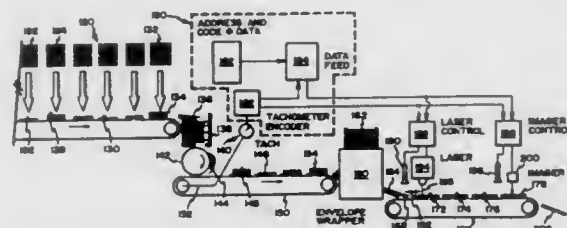
Stanford Silverschotz, Livingston; George P. Hipko, Milltown, both of N.J., and Michael Dennis, Doylestown, Pa., assignors to Webcraft Technologies, Inc., North Brunswick, N.J.

Continuation-in-part of Ser. No. 360,040, Jun. 1, 1989, Pat. No. 4,939,888. This application Oct. 31, 1989, Ser. No. 430,869

Int. Cl.⁵ B23K 26/00

U.S. Cl. 219—121.71

20 Claims



1. The method of simultaneously encoding a plurality of paper sheets, comprising the steps of:
 - a) arranging a plurality of different sheets in successive groups;
 - b) passing the successive groups beneath a laser which is capable of piercing the sheets of the group simultaneously producing on each sheet with a series of accurately spaced holes which are visually unnoticeable and in their aggregate form a code; and
 - c) operating the laser to place a different coded series of holes on each successive group as its passes the laser, each coded series of holes being exclusively machine-readable.

5,087,806

Patent Not Issued For This Number

5,087,807

ELECTRIC HOTPLATE

Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

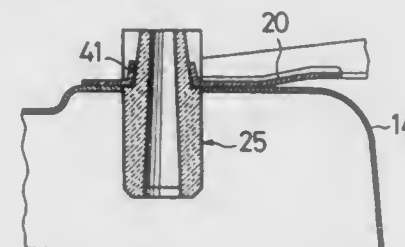
Filed Feb. 6, 1991, Ser. No. 652,556

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004308

Int. Cl.⁵ H05B 3/70

U.S. Cl. 219—451

12 Claims



8. An electric hotplate comprising:
 - a cover fitted to the underside of the hotplate;
 - connecting plate means fitted to the cover and projecting laterally away from the hotplate, the connecting plate being adapted to be fitted with connecting means; and
 - passage means passing through openings in the cover and the connecting plate, the passage means being interlockingly fixed relative to all sides by the cover and the connecting plate means, wherein the passage means comprises two sets of support shoulders each of which sets points in opposite directions to each other.

5,087,808

COMBINED OPTICAL POWER AND NOISE METER

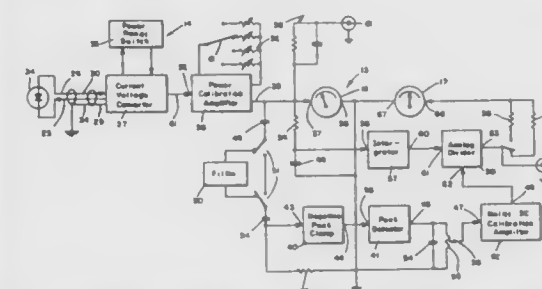
Edwin A. Reed, 1092 W. 17th St., Upland, Calif. 91786

Filed Feb. 26, 1991, Ser. No. 661,427

Int. Cl.⁵ G01J 1/44

U.S. Cl. 250—214 R

1 Claim



1. A combined optical power and noise meter for measuring both optical power and optical noise, said combined optical power and noise meter comprising:
 - a detector housing;
 - a photodiode which is disposed in said detector housing and the resistance of which changes continually in response to the application of optical power thereon;
 - current to voltage converting means for applying a bias voltage to said photodiode and for transforming an output current therefrom in order to obtain a power voltage which is proportional to the optical power;
 - a first voltage meter which is electrically coupled to said current to voltage converting means in order to display said power voltage;
 - noise measuring means for measuring noise in the output voltage of said current to voltage converting means and

- for processing said output voltage in order to obtain a noise voltage which is proportional to the optical noise;
- dividing means for dividing said noise voltage by said power voltage in order to obtain an optical noise to optical power voltage which is proportional to the ratio of optical noise to optical power; and
- a second voltage meter which is electrically coupled to said dividing means in order to display said optical noise to optical power voltage.

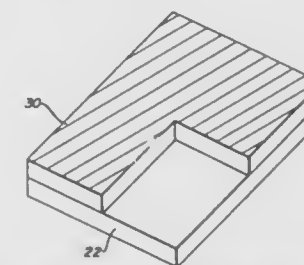
5,087,809 SPECTRALLY SELECTIVE DITHERING AND COLOR FILTER MASK FOR INCREASED IMAGE SENSOR BLUE SENSITIVITY

Todd A. Jackson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 26, 1990, Ser. No. 617,731
Int. Cl.⁵ G01J 3/50

U.S. Cl. 250—226

3 Claims



1. An improved method of operating a color scanning system of the type that incorporates a monochrome image sensor having at least one photosensitive area that is sequentially exposed to individual colors of a scene and to a dithering of the scene with respect to the image sensor photosensitive area comprising the steps of:
 - forming a blue filter mask over a portion said photosensitive area;
 - imaging and dithering a red filtered version of said scene onto said photosensitive area to generate a red image signal;
 - imaging and dithering a green filtered version of said scene onto said photosensitive area to generate a green image signal; and
 - imaging a blue filtered version of the scene onto the photosensitive area, without dithering, to generate a blue image signal.

5,087,810 FIBER OPTIC MAGNETIC FIELD SENSOR

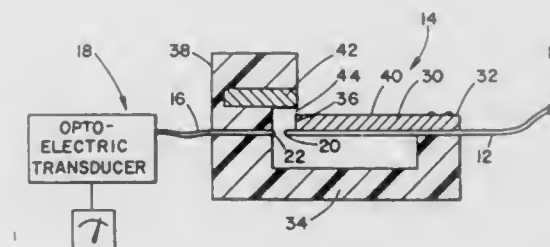
Edward F. Carome, Cleveland, Ohio, assignor to Edjewis Sensor Products, Inc., Cleveland, Ohio

Filed Oct. 17, 1990, Ser. No. 599,010

Int. Cl.⁵ H01J 5/16

U.S. Cl. 250—227.21

19 Claims



1. A magnetic field sensor comprising:
 - a cantilevered beam member which is mounted at a fixed end

thereof, the cantilevered beam member defining a magnetic flux path therealong generally between the fixed end and a free end thereof;

- a means for defining a second magnetic flux path, the second flux path being disposed adjacent the cantilevered beam member free end and separated from the first magnetic flux path by a magnetic flux gap, whereby when a magnetic flux flows through the first and second flux paths, the cantilevered beam member is deflected;
- a light emitting means for emitting light and a target means for receiving light emitted by a light emitting means, one of the light emitting and target means being connected with a beam member free end for movement therewith as the beam member is deflected altering an amount of light transmitted between the light emitting and target means.

5,087,811

OPTICAL TRAIN FOR MEASURING ANGLE OR POSITION WITH TRANSMISSION BY INTRINSICALLY LINEAR AND REFERENCED OPTICAL FIBERS USING ONE OR MORE LIGHT SOURCES

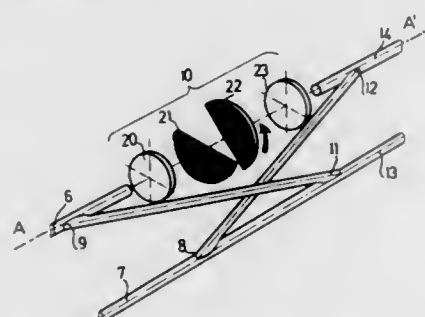
Pascal Schweizer, Nice, France; Antoine Neveux, Monaco, Monaco, and Louis Macon, Golfe Juan, France, assignors to Spectec S.A., Nice, France

Filed Mar. 13, 1990, Ser. No. 492,564

Claims priority, application France, Mar. 13, 1989, 89 03370
Int. Cl.⁵ H01J 5/16; G01J 3/50

U.S. Cl. 250—227.21

8 Claims



1. Optical device for measuring angles, comprising in coaxial assembly along an axis a supply optical fiber, a return optical fiber, and a measuring head, means for directing non-coherent light through said supply optical fiber to said measuring head and then through said return optical fiber, the measuring head comprising a collimator for light arriving from said supply optical fiber, a diaphragm and an element which is either a diaphragm or a filter, one of said diaphragm and element being fixed and the other of said diaphragm and element being rotatable about said axis, and means to refocus light passing beyond said diaphragm and element into said return optical fiber.

5,087,812

INCREMENTAL ENCODER WITH DIRECTION-INDICATING SHUTTER

Jiro Tsukada, Wakuya, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1990, Ser. No. 606,010

Claims priority, application Japan, Nov. 20, 1989, 1-133918[U]

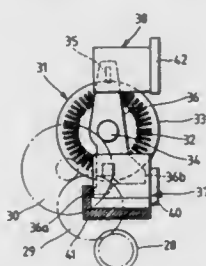
Int. Cl.⁵ G01D 5/34

U.S. Cl. 250—231.14

8 Claims

1. A light-transmission-type encoder including a rotary body having on its periphery slits permitting light to be transmitted therethrough, said encoder being adapted to detect both the amount of rotation and the direction of rotation of the rotary body, said encoder comprising: a shaft on which said rotary body is integrally mounted; a shutter loosely and swingably fitted on said shaft; a spring for causing force of friction between said shutter, on one hand, and either said shaft or said rotary body, on the other; a first light-emitter and a first light-

receiver which are disposed with said slits of said rotary body positioned therebetween; and a second light-emitter and a



second light-receiver which are disposed with said shutter positioned therebetween.

5,087,813

HORIZONTAL SYNC SIGNAL GENERATING DEVICE FOR USE WITH AN OPTICAL PRINTER TO DETERMINE STARTING POSITIONS OF HORIZONTAL SCANNING ON A PHOTOCONDUCTIVE MEMBER

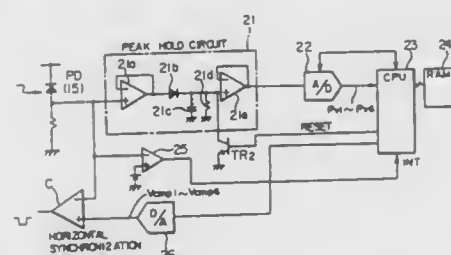
Kiyoshi Negishi, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 83,373, Aug. 10, 1987. This application Nov. 29, 1990, Ser. No. 619,404

Claims priority, application Japan, Aug. 12, 1986, 61-189324
Int. Cl.⁵ H01J 3/14

U.S. Cl. 250—236

22 Claims



1. A horizontal sync signal generating device comprising: a photodetector for receiving light beams containing image information transmitted by a rotatable polygonal member having a plurality of scanning faces, a light receiving area associated with said photodetector being smaller than the diameter of said light beams being received by said photodetector, said photodetector being arranged to produce an output having a Gaussian distribution;
- means for detecting a characteristic voltage from each of said light beams transmitted by said scanning faces of said polygonal member by using a peak hold circuit to retain a maximum voltage outputted from said photodetector for each of said light beams;
- means for setting an associated voltage for each of said light beams based upon said Gaussian distribution of each of said light beams transmitted by each scanning face of said rotatable polygonal member by dividing said maximum voltage outputted from said photodetector for each of said light beams by a predetermined integer;
- means for comparing said associated voltage set for each of said scanning faces with a voltage generated by said photodetector; and
- means for generating a horizontal sync signal when said voltage produced by said photodetector attains a predetermined relationship with respect to said associated voltage.

5,087,814

METHOD AND APPARATUS FOR COUNTING CHARGED PARTICLES

Shingo Ichimura, Tsukuba; Kiyohide Kokubun, Ibaraki, and Hazime Shimizu, Tsukuba, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

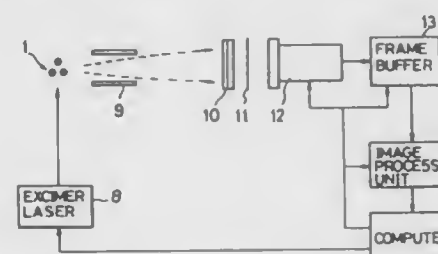
Filed Jul. 3, 1990, Ser. No. 547,159

Claims priority, application Japan, Jul. 7, 1989, 1-176412

Int. Cl.⁵ H01J 49/06

U.S. Cl. 250—287

5 Claims



1. A method for counting charged particles comprising: spatially distributing generated charged particles without selecting the particles with reference to energy and mass thereof, forming screen images of the distributed charged particles and counting the particles by processing the screen images.

5,087,815

HIGH RESOLUTION MASS SPECTROMETRY OF RECOILED IONS FOR ISOTOPIC AND TRACE ELEMENTAL ANALYSIS

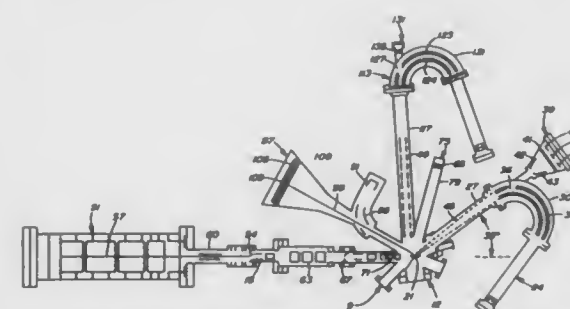
J. Albert Schultz, 2427 Bolsover, and Howard K. Schmidt, 1714 Albans, both of Houston, Tex. 77005

Continuation-in-part of Ser. No. 433,482, Aug. 11, 1989, abandoned. This application Jul. 30, 1990, Ser. No. 559,731

Int. Cl.⁵ H01J 37/08

U.S. Cl. 250—309

47 Claims



21. An apparatus for measuring recoiled and direct recoiled ions comprising:
- a sample chamber;
- an ion beam pulsing means for generating a pulsed ion beam, said pulsing means oriented at an angle to the sample chamber, wherein the pulsing ion beam impinges a surface of a sample in the sample chamber at a grazing incidence of about 45° to 80°;
- a first mass analyzer attached to the sample chamber at an elevation angle of about 0° to 85° relative to the sample and in the forward specular direction, said first mass analyzer having at least one field free drift tube and at least one toroidal or spherical energy filter with sector halves polarizable +/− V for the deflection of positive or negative ions and, wherein the outer sector of said filter includes a hole;
- a second mass analyzer for detecting direct recoiled ions and neutrals when the sectors of the first analyzer are grounded, said second analyzer having an electrostatic

deflector and an ion detector containing three separate anodes, said ion detector attached to at least one field free drift tube of said first mass analyzer in a position to simultaneously detect ions and neutrals separated by the electrostatic deflector, after said ions and neutrals exit through the hole in the outer sector of the first mass analyzer; and a computer system for regulating the frequency of pulsing and the collection of data from the first and second mass analyzers.

5,087,816

INFRARED DETECTOR BASED ON PYROELECTRIC MATERIAL

Philippe Robin, Bourg La Reine; Dominique Broussoux, Marcoussis, and Jean C. Dubois, St. Remy Les Chevreuses, all of France, assignors to Thomson-CSF, Puteaux, France

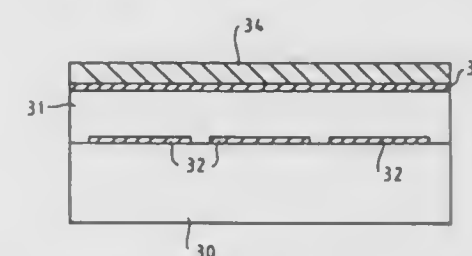
Filed Jun. 14, 1990, Ser. No. 537,699

Claims priority, application France, Jun. 30, 1989, 89 08799

Int. Cl.⁵ G01J 5/20

U.S. Cl. 250—338.3

15 Claims



1. An infrared detector based on pyroelectric material, of the type associated with a reading circuit prepared on a semiconductor substrate, said substrate also supporting conductive blocks designed to transmit the electrical signals generated by the pyroelectric material towards the reading circuit, each conductive block corresponding to a picture element or pixel, wherein the detector is formed by a layer of pyroelectric material deposited on that side of the semiconductor layer having the conductive blocks, the pyroelectric material having a thermal conductivity of $K < 1 \text{ W/m} \cdot \text{K}$, a counter-electrode covering said layer of pyroelectric material on the side opposite the conductive blocks.

5,087,817

INFRARED RAY MOISTURE METER

Ryuji Chiba; Hitoshi Hara; Tomoyuki Yamada, and Kenji Isozaki, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

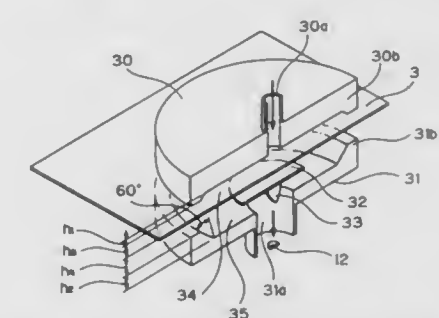
Filed Mar. 25, 1991, Ser. No. 674,810

Claims priority, application Japan, Apr. 26, 1990, 2-111539; Jan. 18, 1991, 3-4544

Int. Cl.⁵ G01N 21/35

U.S. Cl. 250—339

12 Claims



7. An infrared ray moisture meter for measuring moisture contained in paper using absorption of infrared rays, said meter comprising

an upper reflector having a return portion at a periphery thereof;
 a lower reflector having a return portion at a periphery thereof and disposed opposite said upper reflector with a space therebetween for paper to be measured for moisture content to be movable therethrough;
 a shielding plate having two mirror finished sides and disposed between said upper reflector and said lower reflector so as to comprise means for reflecting radiation that has passed through paper to be measured;
 means for applying to said paper infrared rays of a first wavelength range which are absorbed by moisture, infrared rays of a second wavelength which are absorbed by cellulose, and infrared rays of a third wavelength range which are absorbed by neither moisture nor cellulose;
 detecting means for detecting the infrared rays of said first wavelength range, the infrared rays of said second wavelength range, and the infrared rays of the third wavelength range, and for generating output signals corresponding thereto; and
 calculating means for calculating the value of moisture of the paper from the output signals from the detecting means.

5,087,818

BETA SCINTILLATION PROBE

Joseph G. Bellian, and Charles R. Hurlbut, both of Chesterland, Ohio, assignors to Bicon Corporation, Newbury, Ohio
 Filed May 6, 1991, Ser. No. 696,155
 Int. Cl.⁵ G01T 1/20

U.S. Cl. 250—361 R

13 Claims



1. A beta scintillation probe that rejects a Cerenkov light constituent, said probe comprising:
 a light-opaque window;
 a scintillator communicating with said window, said window and scintillator together forming a skin equivalent structure of between 5 mg/cm² and 10 mg/cm² and said scintillator being adapted to scintillate in the presence of beta particles at a wavelength different than that of the Cerenkov light constituent;
 a light pipe adapted to provide a light path for light from said scintillator;
 at least one optical filter adapted to block light at the wavelength of the Cerenkov light constituent in said light path;
 a light detection means in said light path, said detection means providing an electrical signal representative of beta particles entering said window.

5,087,819

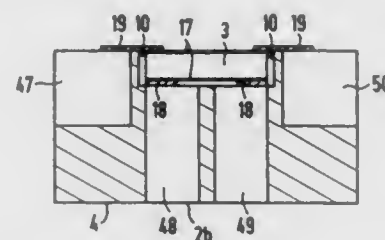
X-RAY DETECTOR

Reiner Schulz, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
 Filed Aug. 23, 1990, Ser. No. 571,123
 Claims priority, application European Pat. Off., Sep. 6, 1989, 89116452.7

Int. Cl.⁵ G01T 1/202

U.S. Cl. 250—370.11

11 Claims



1. An x-ray detector comprising:
 scintillation means for converting x-ray energy into light, said scintillation means having a plurality of electrical contact surfaces; and
 a photosensor for converting said light into electrical signals disposed on at least one surface of said scintillation means, said photosensor being flat and having electrical contact surfaces attached thereto, said photosensor disposed against said at least one surface of said scintillation means so that said photosensor covers a portion of said scintillation means and such that said contact surfaces attached to said photosensor overlie and abut said contact surfaces of said scintillation means so as to allow a direct electrical connection.

5,087,820

RADIOMETRIC ANALYSIS SYSTEM FOR SOLID SUPPORT SAMPLES

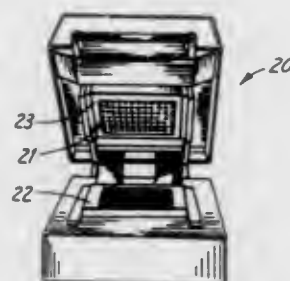
Edward G. Kearns, North Haven, Conn.; Norbert Roessler, Naperville, Ill.; Gustaaf van Cauter, Middletown, and Kreso Ukraincik, Cromwell, both of Conn., assignors to Digital Diagnostic Corp., Hamden, Conn.

Filed May 31, 1989, Ser. No. 359,203

Int. Cl.⁵ G01T 1/185

U.S. Cl. 250—385.1

17 Claims



1. Apparatus for simultaneously measuring the radioactivity of multiple samples arranged in a predetermined array of x rows and y columns on a sample carrier, said apparatus comprising:
 a fixed array of radiation counters arranged in the same array of x rows and y columns as said multiple samples so that one of said counters is aligned with each of said multiple samples, each of said counters comprising a windowless cavity which is open at one end for receiving radiation from a sample to be measured, a pair of spaced electrodes and inlet and exit means for passing an ionizable gas through the space between said electrodes, said fixed array of radiation counters being adapted to fit against said sample carrier so that said carrier closes the

open ends of said cavities with each sample located within the projected side walls of one of said cavities, an electrical voltage source connected to said electrodes for applying a substantially uniform voltage across the electrodes of each of the radiation counters in said array, means for maintaining a substantially uniform flow of said ionizable gas through each of the radiation counters in said array, and
 sensing means connected to the electrodes of each of said radiation counters for independently detecting pulses of electrical current produced by ionization of the gas flowing between the respective pairs of electrodes of each of said radiation counters, said sensing means including means for simultaneously but independently detecting and counting pulses from all of said radiation counters.

5,087,821

METHOD AND APPARATUS FOR LOCATING PHOTONS OR NEUTRAL PARTICLES TWO-Dimensionally, IN PARTICULAR AT LOW COUNTING RATES

Serge Maitrejean, Paris; Mario Ruscev, Cachan, and Irène Dorion, Paris, all of France, assignors to Schlumberger Industries, Montrouge, France

PCT No. PCT/FR89/00553, § 371 Date Apr. 26, 1991, § 102(e) Date Apr. 26, 1991, PCT Pub. No. WO90/04851, PCT Pub. Date May 3, 1990

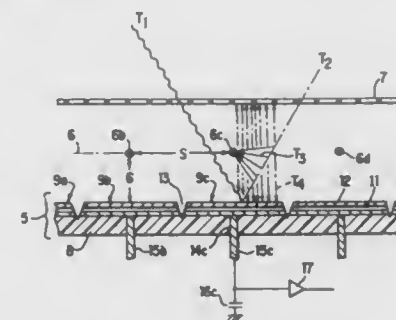
PCT Filed Oct. 24, 1989, Ser. No. 678,279

Claims priority, application France, Oct. 28, 1988, 88 14186; Oct. 28, 1988, 88 14187

Int. Cl.⁵ G01T 1/185, 3/00

U.S. Cl. 250—385.1

14 Claims



1. A device for detecting and locating photons or neutral particles in a flux of photons or neutral particles emitted by a source (1), the device comprising:
 a substantially plane solid converter (5) suitable for producing electrical charges under the impact of said photons or neutral particles, the converter comprising conversion elements (9a, 9b, 9c) which are electrically independent from one another;
 anode wires (6a, 6b) for raising to an electric potential different from that of the converter to cause an electric field to appear, and for amplifying charges by ionizing a surrounding gas under stimulation from said electric field;
 charge collecting means (9c, 15c) comprising conductor elements that are electrically independent from one another, with at least some of them constituting conversion elements; and
 an enclosure (4a, 4b) permeable to the photons or neutral particles and containing the converter, the anode wires, the charge collecting means, and the gas;
 the device being characterized in that said conversion elements for collecting charge are constituted by cells distributed over a plane two-dimensional matrix disposed on the opposite side of the anode wires to the source.

5,087,822

ILLUMINATION SYSTEM WITH INCIDENT BEAMS FROM NEAR AND FAR DARK FIELD FOR HIGH SPEED SURFACE INSPECTION OF ROLLED ALUMINUM SHEET

Matthew Fairlie; David Smith; Warren Fraser, all of Kingston, Canada, and Otto Meijer, Fulton, N.Y., assignors to Alcan International Limited, Montreal, Canada

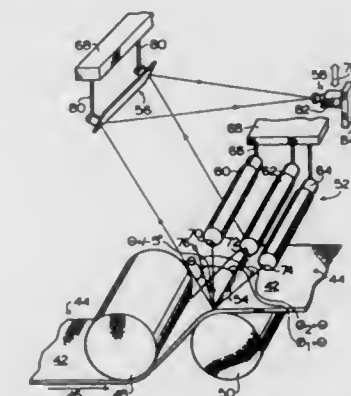
Continuation of Ser. No. 543,202, Jun. 22, 1990, abandoned.

This application May 13, 1991, Ser. No. 701,306

Int. Cl.⁵ G01N 21/88

U.S. Cl. 250—572

19 Claims



1. An apparatus for inspecting surface quality of a moving sheet of metal comprising:
 means for supporting said apparatus in a stationary position relative to a moving sheet of metal to be inspected;
 means for illuminating a surface of a moving sheet of metal to be inspected with at least two incident beams of light;
 means for inspecting said illuminated surface to detect intensity differences in light reflected by such illuminated surface from such at least two incident beams of light;
 said illuminating means is mounted on said support means for directing such at least two incident beams of light in a direction along such moving sheet of metal and said inspecting means being mounted on said support means to receive such reflected light;
 said illuminating means comprises at least two lamps each of which is adapted to emit a respective beam of light where each beam is elongate and narrow in cross-section and of a width at least as wide as a moving sheet of metal to be inspected;
 each of said at least two lamps is positioned on said support means to direct its corresponding beam of light onto an inspection region through which such sheet of metal moves and where each such beam emitted from said at least two lamps is at a different angle of incidence relative to other such beams of light to provide at least two corresponding incident beams from a near dark field and a far dark field;
 means for controlling beam intensity of each of said lamps to permit independent adjustment of beam intensity of each of said at least two lamps;
 said inspecting means comprising means for sensing light reflected by a surface irregularity from at least one of said near dark field and said far dark field of said inspection region;
 said sensing means senses reflected light simultaneously from said at least two lamps while remaining at a single angle of reflection relative to normal for said inspection region;
 means for detecting sensed reflected light from said inspection region which is of an increased intensity greater than a predetermined minimum intensity or less than a predetermined maximum intensity, said detected reflected light of increased intensity or decreased intensity being indicative of an irregularity in surface quality of said moving sheet of metal; and

means for recording location on such moving sheet of metal of a detected irregularity in surface finish quality.

5,087,823

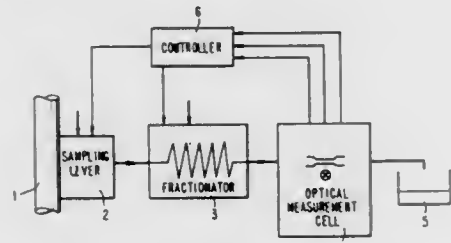
DEVICE FOR DETERMINING THE CHARACTERISTICS OF PARTICLES IN SUSPENSION IN A LIQUID

Jacques Silvy, Grenoble, and René Pascal, Meylan, both of France, assignors to Association de Gestion de l'Ecole Française de Papeterie et de l'Imprimerie, Paris, France
Filed Apr. 11, 1990, Ser. No. 507,209

Claims priority, application France, Apr. 12, 1989, 89 05162
Int. Cl.⁵ G01N 15/06; D21F 7/06

U.S. Cl. 250—573

9 Claims



1. A device for determining the characteristics of particles in suspension in a liquid as a function of a size parameter of said particles, comprising:
means for collecting samples of said particles,
a fractionator which classifies said particles in each of said samples into a continuous sequence ordered according to said size parameter,
an optical measurement cell which receives said continuous sequence from said fractionator, said cell comprising means for sending a polarized coherent optical radiation through the flow of particles in suspension and for collecting diffracted, possibly depolarized light, partially absorbed and diffused in various directions, and
means for calculating the values of the intensities and combinations of said values in the various directions of said optical radiation.

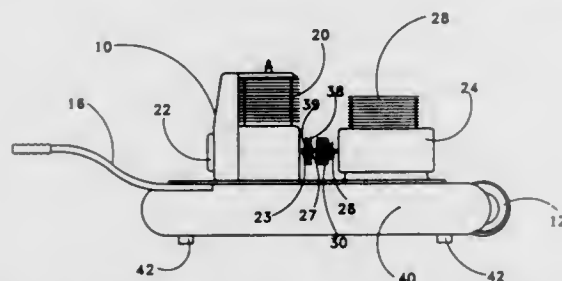
5,087,824

POWER PLANT FOR GENERATION OF ELECTRICAL POWER AND PNEUMATIC PRESSURE

Bill Nelson, 400 N. Frankwood, Sanger, Calif.
Filed Apr. 9, 1990, Ser. No. 506,169
Int. Cl.⁵ H02P 9/04; G05D 16/20

U.S. Cl. 290—1 A

9 Claims



1. In a power plant for concurrently or selectively providing electrical power and pneumatic pressure to an end use, comprising, in combination, a free standing low output internal combustion drive engine having a power output shaft; an A.C. electrical power system, said electrical power system including an electrical generator having an input shaft, and an electrical output circuit; and clutch means interconnecting said power output shaft, and said input shaft;
and a pneumatic power system, said pneumatic power system including a pneumatic compressor disposed adjacent to said generator, and drivingly interconnected therewith

such that rotation of said input shaft also drives said compressor; said compressor having a pressure output line interconnected with, and adopted to charge at least one storage tank;
control means interconnecting said generator, and said compressor, and including sensor means for measuring electrical demand on said electrical output circuit, and including pressure sensor relief means for diminishing the load on the drive engine by relieving the demand thereon by the compressor to thereby permit the generator to operate at full capacity.

5,087,825

CAPACITY RESPONSIVE KEYBOARD

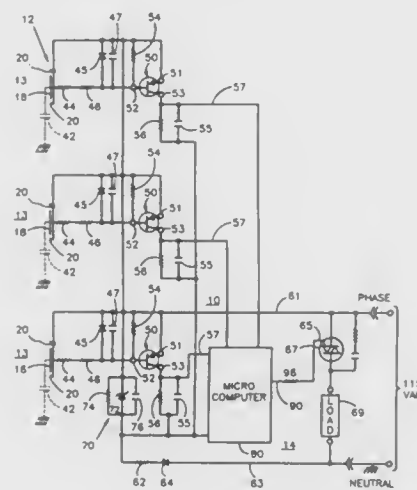
Ronald D. Ingraham, Quincy, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Feb. 15, 1990, Ser. No. 480,293

Int. Cl.⁵ H01H 47/00, 35/00

U.S. Cl. 307—132 EA

18 Claims



1. A capacity responsive keyboard system comprising:
a substrate having a plurality of electrically conductive plate members mounted thereto, said plate members being insulated from each other;
a substantially rigid dielectric member overlying said plate members having a surface facing said plate members;
a plurality of electrically conductive transmission members, each of said transmission members being a compressible conductive polymer extending between said dielectric member and one of said plate members in order to provide an airtight interface with said dielectric member and with the associated one of said plate members; and
circuit means connected with said plate members and responsive to capacity between said plate members and ground for providing a signal indicative of a change in capacity between at least one of said plate members and ground.

5,087,826

MULTI-LAYER NEURAL NETWORK EMPLOYING MULTIPLEXED OUTPUT NEURONS

Mark A. Holier, Palo Alto, and Simon M. Tam, Redwood City, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 28, 1990, Ser. No. 635,231

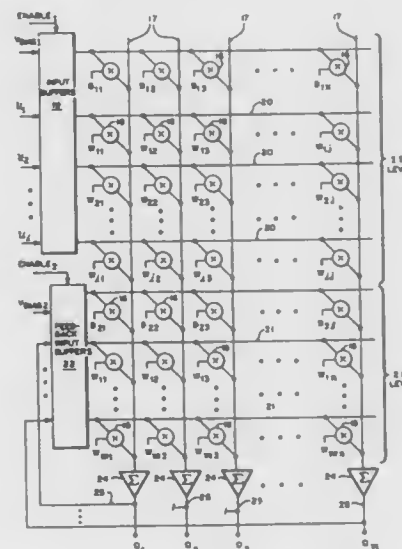
Int. Cl.⁵ G06C 7/12

U.S. Cl. 307—201

10 Claims

1. A multi-layer electrically trainable neural network comprising:
a first synaptic layer for multiplying an input vector with a first stored weight;

a second synaptic layer for multiplying a recurrent vector with a second stored weight;
a plurality of neurons deriving Sigmoid output from either or both of said synaptic layers;



means for multiplexing said neurons between said first and second synaptic layers.

5,087,827

VARIABLE VOLTAGE TRANSITION CIRCUIT

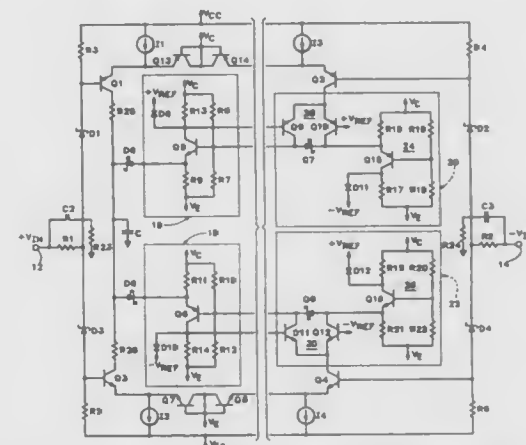
Matthew J. Hadwin, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 11, 1991, Ser. No. 652,859

Int. Cl.⁵ H03K 17/56, 3/01

U.S. Cl. 307—246

3 Claims



1. An improved variable voltage transition circuit of the type having means for switching a charge current and a discharge current from respective first current sources to and from a capacitor in response to a transition of an input voltage, means coupled to the capacitor by respective Schottky diodes for clamping the capacitor voltage between respective voltage levels, the improvement comprising:

second current sources coupled to the switching means, second current sources providing currents matched to the charge and discharge currents respectively of the first current sources;
a compensation circuit coupled between the switching means and the clamping means for turning on and off the Schottky diodes rapidly when the input voltage transi-

tions to reduce distortion in the capacitor output caused by the Schottky diodes.

5,087,828

TIMING CIRCUIT FOR SINGLE LINE SERIAL DATA

Hideki Sato, and Toshihide Masamora, both of Tokyo, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Japan

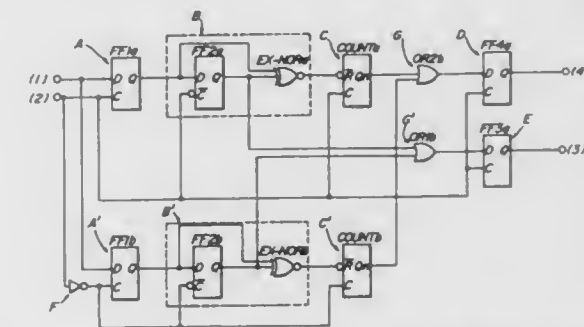
Filed Feb. 12, 1991, Ser. No. 642,762

Claims priority, application Japan, Feb. 14, 1990, 2-33507

Int. Cl.⁵ H03K 19/92, 17/16

U.S. Cl. 307—269

1 Claim



1. A synchronized circuit for single line serial data comprising:

a data sampling circuit (A) composed of a delay flip-flop (FF1a) operated by positive logic clock pulses for sampling data input from the exterior with reference clock pulses supplied from a digital data processor;
a data edge detection circuit (B) composed of a delay flip-flop (FF2a) operated by negative logic clock pulses and an exclusive negative OR gate (EX-NORa) for detecting change in signal of output data from said data sampling circuit to output data edge detection signals synchronized with reference clock pulses;
a synchronous pulse generation circuit (C) composed of a counter (COUNTa) operated by positive logic clock pulses and receiving said data edge detection signals as reset input signals for generating repeated pulses synchronized with outputs from the second mentioned delay flip-flop (FF2a);
an inversion circuit (F) for branching part of reference clock pulses supplied from the digital data processor and inverting the branched part of the reference clock pulses;
a sub-data sampling circuit (A') composed of a delay flip-flop (FF1b) operated by positive logic clock pulses for sampling the branched input data at the inverted reference clock pulses;
a sub-data edge detection circuit (B') composed of a delay flip-flop (FF2b) operated by negative logic clock pulses and an exclusive negative OR gate (EX-NORb) for detecting the change in signal of output data from said sub-data sampling circuit to output edge detection signals synchronized with the inverted reference clock pulses;
a sub-synchronous pulse generation circuit (C') composed of a counter (COUNTb) operated by positive logic pulses and receiving the data edge detection signals from the sub-data edge detection circuit as reset input signals for generating repetitive pulses synchronized with output from said second mentioned delay flip-flop (FF2b);
an adder (G) for performing logical addition of output of said synchronous pulse generation circuit (COUNTa) and said sub-synchronous pulse generation circuit (COUNTb);
an adder (E') for performing logical addition of output of said delay flip-flops (FF2a, FF2b);
a waveform shaping circuit (D) composed of a delay flip-flop (FF4a) operated by positive logic pulses for eliminating hazardous or extraneous signals
and an output timing circuit (E) composed of a delay flip-

flop (FF3a) operated by positive logic clock pulses for adjusting output timing of output data and synchronous clock pulses output from said waveform shaping circuit.

5,087,829

HIGH SPEED CLOCK DISTRIBUTION SYSTEM

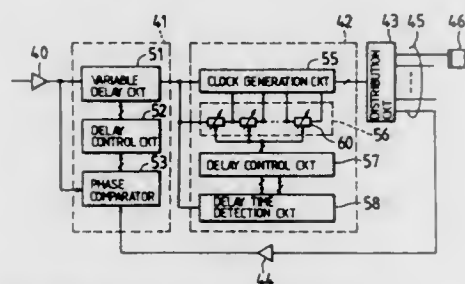
Kenichi Ishibashi, Kokubunji; Takehisa Hayashi, Kodaira; Toshio Doi, Kokubunji; Mitsuo Asai, Kokubunji; Noboru Masuda, Kokubunji; Akira Yamagiwa, and Toshihiro Okabe, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1989, Ser. No. 443,503

Claims priority, application Japan, Dec. 7, 1988, 63-307897
Int. Cl.⁵ H03K 5/13, 5/00

U.S. Cl. 307-269

21 Claims



1. A clock distribution system comprising:
 - a clock signal generation block for generating a one-phase reference clock;
 - a first control means for comparing a phase of said reference clock with a phase of a feedback signal and controlling the phase of said reference clock so that the phases are coincident with each other and providing a phase adjusted reference clock;
 - a delay circuit having a plurality of variable delay circuits which are connected in series and to which said phase adjusted reference clock is inputted;
 - means for generating multi-phase clock signals in response to output signals of said plurality of variable delay circuits and said phase-adjusted reference clock; and
 - a second control means for comparing a delay time of said plurality of variable delay circuits with a period of said phase-adjusted reference clock and controlling the delay time of said plurality of variable delay circuits so as to establish a predetermined relation with the period of said phase-adjusted reference clock, wherein one of said multi-phase clock signals is applied as said feedback signal to said first control means.

5,087,830

START CIRCUIT FOR A BANDGAP REFERENCE CELL
David Cave, 5-8 Ooyama-cho, Shibuya-ku 151, Tokyo, Japan, and Michael D. Gadberry, 1810 E. Randall Dr., Tempe, Ariz. 85281

Filed May 22, 1989, Ser. No. 354,574

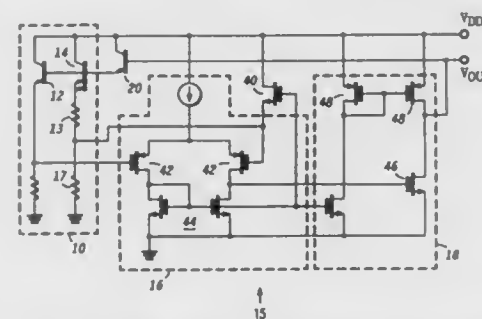
Int. Cl.⁵ H03K 3/01, 5/22

U.S. Cl. 307-296.6

6 Claims

1. A bandgap reference cell with a start circuit comprising:
 - a pair of bipolar transistors connected into a bandgap reference cell having bases connected in common providing an input and a pair of output terminals providing output voltages proportional to current flowing in each of said pair of bipolar transistors, respectively;
 - a differential amplifier having a pair of inputs and a single ended output, said pair of inputs being connected to said pair of output terminals of said pair of bipolar transistors, and said single ended output being connected as an output of the bandgap reference cell and also to said bases of said pair of bipolar transistors; and
 - an offset transistor having a control electrode connected to said differential amplifier, a second electrode coupled to

one of said pair of output terminals of said pair of bipolar transistors and a third electrode coupled to a power supply input terminal, so that said offset transistor produces an offset voltage in said pair of bipolar transistors when



power is supplied to said power supply input terminal and said control electrode turns off said offset transistor when said differential amplifier is turned on by said pair of bipolar transistors.

5,087,831

VOLTAGE AS A FUNCTION OF TEMPERATURE STABILIZATION CIRCUIT AND METHOD OF OPERATION

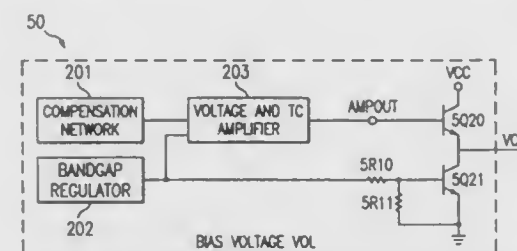
Timothy A. Ten Eyck, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1990, Ser. No. 502,211

Int. Cl.⁵ H03K 3/01; G06G 7/10

U.S. Cl. 307-296.6

9 Claims



1. A circuit for receiving a temperature stable voltage and providing a precise output voltage, over a range of temperatures, to external components, said circuit comprising:
 - a first circuit having a first input terminal to which is applied said temperature stable voltage;
 - a second circuit having a second input terminal to which is applied said temperature stable voltage compensated to match the temperature coefficient of said external components;
 - said second circuit including a first transistor, having a base, emitter and collector, connected between said second input terminal and said external components, the VBE of said first transistor causing a reduced voltage output at said external components; and
 - said first circuit, as a result of said applied temperature stable voltage, offsetting said reduced voltage output, at said external components, as a result of any change in said VBE due to temperature changes.

5,087,832

BALANCED SIGNAL RECEIVING CIRCUIT

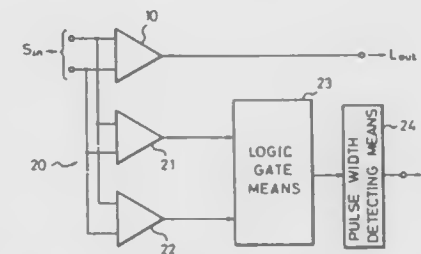
Hiroshi Matsunaga, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 19, 1990, Ser. No. 584,737

Claims priority, application Japan, Sep. 19, 1989, 01-240689
Int. Cl.⁵ H03K 5/22

U.S. Cl. 307-350

12 Claims



1. A balanced signal receiving circuit which receives a transmitted balanced signal as an input, comprising:
 - a differential amplifier having a step-like input-output characteristic where the logic of the output inverts when an input voltage crosses zero volts;
 - alarm generating means which issues an alarm signal when the transmission of the balanced signal has been blocked, said alarm generating means comprising:
 - small differential voltage detecting means including:
 - a first differential amplifier having a negatively biased input-output characteristic; and
 - a second differential amplifier having a positively biased input-output characteristic, the inputs of said first and second differential amplifiers being connected in parallel with respect to an input of said differential amplifier which detects the small differential voltage at the input;
 - logic gate means which receives the outputs of said first and second differential amplifiers and outputs a small differential voltage detection display signal showing that a small differential voltage has been detected when it appears; and
 - pulse width detecting means which outputs an alarm signal when the pulse width of the output pulse from said logic gate means exceeds a predetermined threshold value.

5,087,833

SIGNAL SWITCHING CIRCUIT AND SIGNAL CHANGE-OVER CIRCUIT USING THE SAME

Masao Sugai, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 505,992

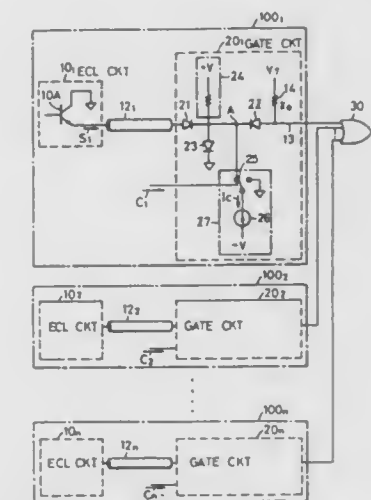
Int. Cl.⁵ H03K 19/086, 3/313

U.S. Cl. 307-443

15 Claims

1. A signal switching circuit comprising:
 - an emitter-coupled logical circuit having an output transistor which outputs a logical signal from its emitter;
 - a transmission line having an input end connected in series to the emitter of said output transistor of said emitter-coupled logical circuit and having an output end;
 - switching diode means connected in series to the output end of said transmission line; and
 - bias control means responsive to a control signal to effect ON/OFF control of said switching diode means, said switching diode means, when in the ON state, permitting the passage therethrough of the logical signal for output and, when in the OFF state, operating to prevent the logical signal from being provided on said transmission line from the emitter of said output transistor of said emitter-coupled logical circuit;
 - said switching diode means including:
 - a pair of series-connected switching diodes which have their cathodes interconnected, one of which has its

anode connected to the output end of said transmission line and the other which has its anode disposed at an output side of said signal switching circuit; a parallel switching diode having its anode connected to a common connection point of said pair of series-connected switching diodes and having its cathode connected to a common potential point; said bias control means including:



current pull-in means responsive to the control signal to pull-in current via said series-connected switching diodes to turn them ON; and bias supply means connected to said common connection point of said pair of series-connected switching diodes, for applying a reverse bias to said pair of series-connected switching diodes and a forward bias to said parallel switching diode when said current pull-in means does not pull in current.

5,087,834

BUFFER CIRCUIT INCLUDING COMPARISON OF VOLTAGE-SHIFTED REFERENCES

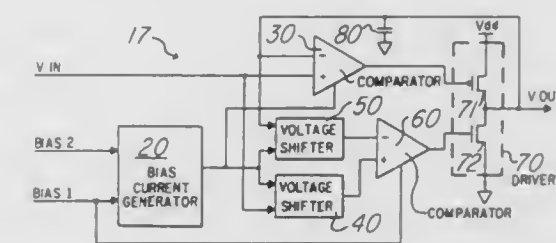
Ching-Yuh Tsay, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 12, 1990, Ser. No. 493,085

Int. Cl.⁵ H03K 17/16, 19/02

U.S. Cl. 307-443

19 Claims



1. An integrated circuit comprising:
 - a voltage generator circuit for receiving a first control signal and a second control signal, and for producing an output voltage;
 - a first control circuit for receiving the output voltage and an input voltage, and for producing the first control signal; and
 - a second control circuit for receiving the output voltage and the input voltage, and for producing the second control signal, the second control circuit comprising:
 - an input voltage shifter circuit for shifting the input voltage;

an output voltage shifter circuit for shifting the output voltage; and
a voltage comparator circuit for comparing the shifted input voltage to the shifted output voltage.

5,087,835

POSITIVE EDGE TRIGGERED SYNCHRONIZED PULSE GENERATOR

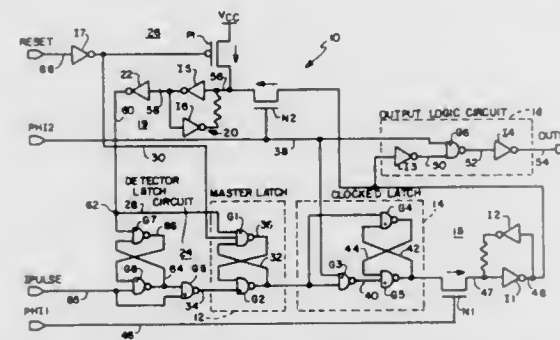
Rajiv M. Hattangadi, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 7, 1991, Ser. No. 666,101

Int. Cl.⁵ H03K 17/16, 19/03

U.S. Cl. 307—443

20 Claims



18. A pulse generator for generating an output pulse which is synchronized to an internal clock pulse, comprising:
latch means (24, 12, 14, 16) responsive only to the positive edge of an asynchronous pulse of a varying width for generating a control signal having a low logic level; and
output logic circuit means (18) responsive to said control signal and an internal clock pulse for generating an output pulse signal which is synchronized to the internal clock pulse signal.

5,087,836

ELECTRONIC CIRCUIT INCLUDING A PARALLEL COMBINATION OF AN E-FET AND A D-FET

Stewart S. Taylor, Beaverton, Oreg., assignor to TriQuint Semiconductor, Inc., Beaverton, Oreg.

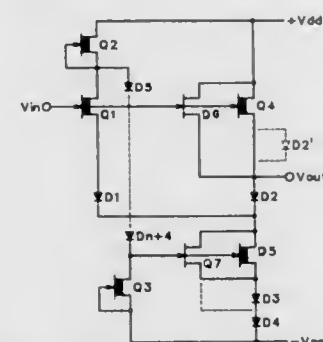
Continuation of Ser. No. 317,702, Feb. 28, 1989, abandoned.

This application Jul. 30, 1990, Ser. No. 561,499

Int. Cl.⁵ H03K 19/094, 19/084

U.S. Cl. 307—450

32 Claims



1. An electronic circuit having an input terminal and an output terminal and comprising:

a first E-FET and a first D-FET, each having a gate, a source, and a drain, the input terminal of the circuit being connected to the gate of the first D-FET,
means connecting the gate of the first E-FET to the gate of the first D-FET,
means connecting the source of the first E-FET to the source of the first D-FET,

means connecting the drain of the first E-FET to the drain of the first D-FET,
means connecting the output terminal to the source of the first D-FET,
a second E-FET and a second D-FET, each having a gate, a source, and a drain,
means connecting the gate of the second E-FET to the gate of the second D-FET,
means connecting the source of the second E-FET to the source of the second D-FET,
means connecting the drain of the second E-FET to the drain of the second D-FET, and
means connecting the drain of the second D-FET to the source of the first D-FET.

5,087,837

ELECTRONIC CIRCUIT WITH CAPACITIVELY ENHANCED SWITCHING

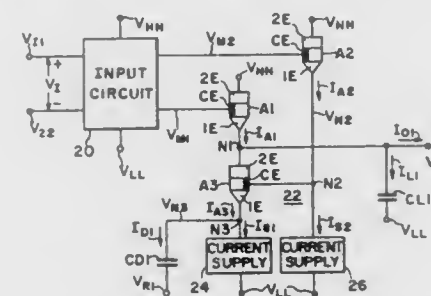
Ronald L. Cline, Monte Sereno, Calif., assignor to North American Philips Corp., Signetics Div., Sunnyvale, Calif.

Filed Aug. 6, 1990, Ser. No. 563,021

Int. Cl.⁵ H03K 19/086, 5/12, 3/01; G06G 7/12

U.S. Cl. 307—455

23 Claims



1. An electronic switching circuit comprising (a) input means responsive to at least one input signal for producing largely complementary first and second intermediate signals and (b) output means that comprises:

a first amplifier having a first flow electrode coupled to a first node, a second flow electrode, and a control electrode responsive to the first intermediate signal for controlling current transmission between the first amplifier's flow electrodes, a bias supply connected commonly to the second flow electrodes of the first and second amplifiers;
a second amplifier having a first flow electrode coupled to a second node, a second flow electrode, and a control electrode responsive to the second intermediate signal for controlling current transmission between the second amplifier's flow electrodes, a bias supply connected commonly to the second flow electrodes of the first and second amplifiers;

a third amplifier having a first flow electrode coupled to a third node, a second flow electrode coupled to the first node, and a control electrode coupled to the second node for controlling current transmission between the third amplifier's flow electrodes;

first current-supply means for providing supply current at the third node; and

first charge/discharge means for providing a capacitive-type charge/discharge action between the third node and a source of a first reference voltage.

5,087,838

SOURCING OR SINKING OUTPUT CIRCUIT

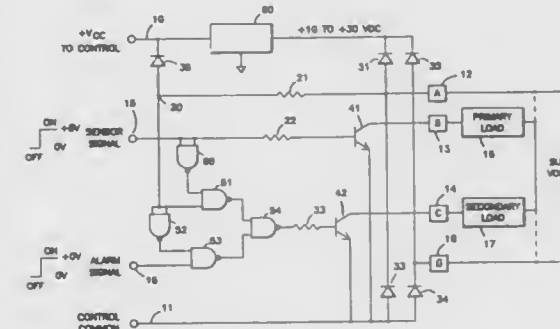
Robert W. Fayfield, Shorewood, Minn., assignor to Banner Engineering Corporation, Minneapolis, Minn.

Filed Feb. 7, 1991, Ser. No. 652,999

Int. Cl.⁵ H03K 19/082

U.S. Cl. 307—465

4 Claims



1. A DC circuit, comprising:
input means including first and second input terminals for supplying voltage to said circuit;
output means responsive to first and second input signals for delivering at first and second output terminals either a first output signal and a complement of said first output signal in a first mode of operation, or said first output signal and a second output signal unrelated to said first output signal in a second mode of operation; and
control means coupled to receive said first and second input signals, said input means, and said output means, said control means establishing said first mode of operation when said first input terminal is positive with respect to said second input terminal, and establishing said second mode of operation when said second input terminal is positive with respect to said first input terminal.

5,087,839

METHOD OF PROVIDING FLEXIBILITY AND ALTERABILITY IN VLSI GATE ARRAY CHIPS

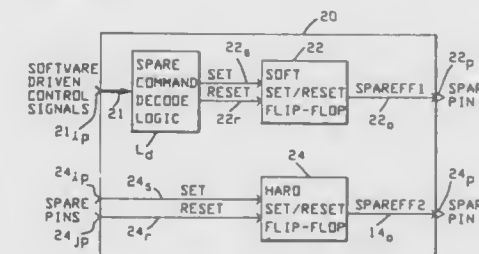
Bruce E. Whittaker, Mission Viejo, and Saul Barajas, Capistrano Beach, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 5, 1990, Ser. No. 593,175

Int. Cl.⁵ H03K 19/177

U.S. Cl. 307—465

11 Claims



1. A VLSI gate array package having normally used input and output pins comprising:

(a) logic circuitry connected to said normally used input and output pins for executing predetermined functions;
(b) redundant flip-flop circuitry connected to normally unused spare input and output pins;
(c) means for controlling said redundant flip-flop circuitry to provide later-determined functions within said gate array package.

5,087,840

INTEGRATED OUTPUT BUFFER LOGIC CIRCUIT WITH A MEMORY CIRCUIT

Thomas J. Davies, Eindhoven, Netherlands; Leonardus C. M. G. Pfennings, deceased, late of Sittard; by Henricus J. Kunnen, legal representative, Valkenswaard, both of Netherlands; Peter H. Voss; Cormac M. O'Connell; Cathal G. Phelan, and Hans Ontrop, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

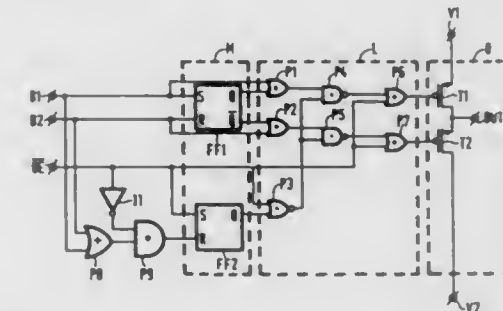
Continuation of Ser. No. 332,861, Apr. 3, 1989, abandoned. This application Feb. 13, 1991, Ser. No. 657,334

Claims priority, application Netherlands, Apr. 6, 1989, 880872

Int. Cl.⁵ H03K 19/0175, 19/00

U.S. Cl. 307—475

10 Claims



1. An integrated circuit comprising a memory circuit for receiving logic data signals and a logic output circuit connected to a memory circuit output for receiving an output signal from the memory circuit and for transmitting this output signal, wherein the logic output circuit comprises a second input, wherein the logic output circuit and the memory circuit, for bringing the logic output circuit and the memory circuit directly and in substantially undelayed fashion into a logic state determined by a received data signal, said output circuit being maintained in said logic state by the output signal of the memory circuit, the input and the output of the memory circuit being connected to a logic sub-circuit with a symmetrical logic function, which sub-circuit forms part of the logic output circuit, the memory circuit comprising at least a single flip-flop circuit having two inputs, the logic sub-circuit comprising at least first and second logic gates which perform an OR function, the inverted output (Q) and the first input of the flip-flop circuit being connected, respectively, to an input and a further input of the second logic gate, and the non-inverted output (Q) and the second input of the flip-flop circuit being connected, respectively, to an input and a further input of the first logic gate.

5,087,841

TTL TO CMOS TRANSLATING CIRCUITS WITHOUT STATIC CURRENT

Alan C. Rogers, South Portland, Me., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 9, 1990, Ser. No. 508,283

Int. Cl.⁵ H03K 19/092, 19/094, 19/003, 19/017

U.S. Cl. 307—475

40 Claims

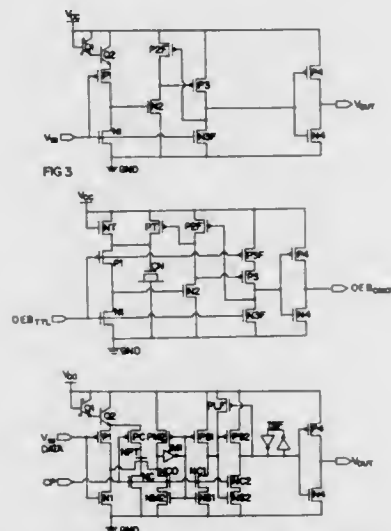
1. A TTL to CMOS translating buffer circuit having a TTL input node with input data signals at TTL high and low potential levels, and at least one CMOS output node with output data signals at CMOS high and low potential levels, said buffer circuit having a plurality of digital logic inverter stages respectively coupled between high and low potential rails, each said stage having a pullup transistor element coupled to the high potential rail, a pulldown transistor element coupled to the low potential rail, at least one input node, and an output node, comprising:

first, second and third stages each comprising a PMOS pullup transistor element and an NMOS pulldown transistor element, said first, second and third stages comprising digital logic inverter stages;

voltage drop threshold component means coupled between the PMOS pullup transistor element of the first stage and the high potential rail, said threshold component means interposing sufficient voltage drop for substantially turning off the first stage PMOS pullup transistor element with a TTL high potential level signal at the respective first stage input node;

the output node of said first stage being coupled to an input node of the second stage to drive the second stage NMOS pulldown transistor element;

the output node of the second stage being coupled to an input node of the third stage to drive the third stage PMOS pullup transistor element;



and the output node of the third stage being coupled in a feedback coupling to an input node of the second stage to drive the second stage PMOS pullup transistor element for pullup of a control gate node of the second stage PMOS pullup transistor element to the CMOS high potential level for turning off the second stage PMOS pullup transistor element;

said second stage PMOS pullup transistor element causing pullup of the output node of the second stage to the CMOS high potential level for turning off the third stage PMOS pullup transistor element;

said buffer circuit thereby having substantially no static current ICC through the respective PMOS pullup transistor elements of said first, second and third stages.

5,087,842
DELAY CIRCUIT HAVING ONE OF A PLURALITY OF DELAY LINES WHICH MAY BE SELECTED TO PROVIDE AN OPERATION OF A RING OSCILLATOR
 James A. Pulsipher, Robert H. Wolff, and Steven G. Worthington, all of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.
 Continuation of Ser. No. 141,203, Jan. 6, 1988, abandoned. This application Apr. 19, 1989, Ser. No. 341,250
 Int. Cl.⁵ H03K 5/159

U.S. Cl. 307—603 8 Claims

1. Delay apparatus for receiving an input signal and providing a delayed version of the input signal, the actual delay between the input signal and the delayed version being controlled to remain near a desired delay, comprising:

an integrated circuit comprising:

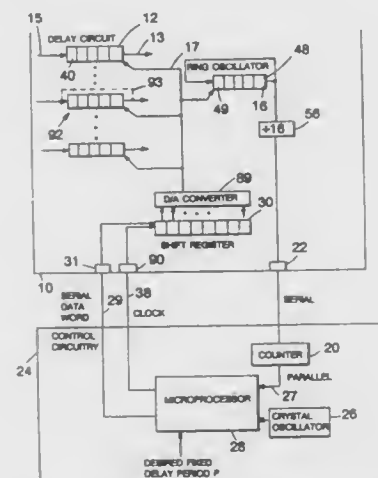
a first voltage controlled delay circuit having an input line for receiving the input signal, an output line for generating the delayed version of the input signal, and a control input line for receiving a control voltage for controlling the length of the actual delay,

a second voltage controlled delay circuit having the same physical and electrical configuration as the first delay

circuit, the control input line of the second delay line being connected to the control input line of the first delay circuit,

an inverter, connected between the output and the input of the second delay circuit to cause the second delay circuit to oscillate at a frequency determined by the delay period of the second delay circuit,

buffer circuitry connected to the output of the second delay circuit for providing a periodic reference signal having a frequency representative of the frequency of oscillation of the second delay circuit, and



conversion circuitry for receiving a digital value indicative of the desired delay and in response thereto providing a control voltage to the control input line of the first and second delay circuits; and

off-chip control circuitry, separate from the integrated circuit, for receiving the periodic reference signal and in response thereto computing the digital value, and transmission circuitry for transmitting the digital value from the off-chip control circuit to the conversion circuitry.

5,087,843
INPUT CIRCUIT FOR CCD DELAY LINE
 Tadakuni Narabu, and Hisanori Miura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
 Filed Aug. 30, 1990, Ser. No. 575,381
 Claims priority, application Japan, Sep. 1, 1989, 1-226749
 Int. Cl.⁵ H03K 5/13; G06G 7/12; G11C 19/28; H01L 29/78
 U.S. Cl. 307—607 8 Claims

1. A charge-coupled device delay line system, comprising:

a semiconductor substrate;

a CCD delay line on the substrate having a set of transfer electrodes, an input portion having an input source, and having a maximum treating charge amount;

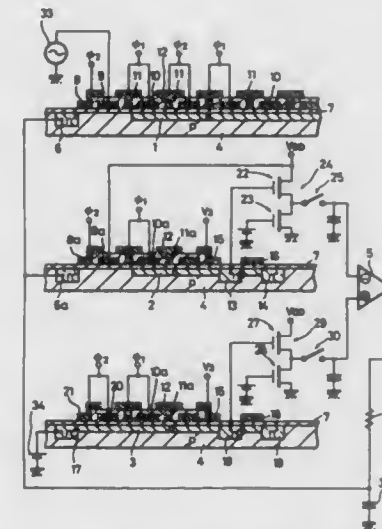
first and second registers on the substrate each having a set of transfer electrodes and having substantially the same maximum treating charge amount as that of said CCD delay line, said first and second registers each having an input portion with an input gate and an input source, the input portion of the first register being formed to have substantially a same structure as that of said input portion of said CCD delay line, and each of said first and second registers having output portions which are formed to have substantially a same structure as each other;

control means connected to the second register for controlling it such that an output signal from the second register corresponds to said maximum treating charge amount of the CCD delay line;

comparing means for comparing an output signal of the first

register and the output signal of the second register and for producing a feedback signal;

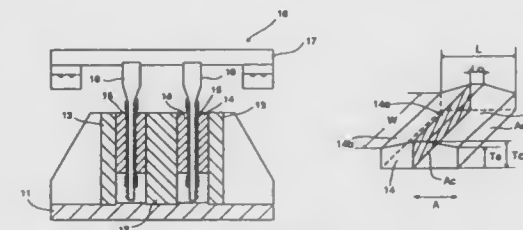
means for feeding back the feedback signal of said comparing means to said input source of the input portion of said first register so that the output signal from the first register becomes substantially equal to the output signal from the second register and the amount of charges transferred through the first register is made substantially equal to the amount of charges transferred through the second register;



means for supplying to the input gate of the input portion of said first register a substantially constant voltage at least as high as a high level of a clock signal supplied to the CCD delay line transfer electrodes; and

means for supplying a voltage at the input source of the first register to the input source of the CCD delay line, whereby charge overflow in the CCD delay line can be avoided.

5,087,844
LINEAR MOTOR
 Seiki Takedomi, Fukaya, and Tetsuo Umehara, Hanyu, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan
 Filed Nov. 7, 1990, Ser. No. 610,114
 Claims priority, application Japan, Nov. 7, 1989, 1-289192
 Int. Cl.⁵ H02K 41/02, 41/00
 U.S. Cl. 310—12 6 Claims



1. A linear motor comprising:

(a) at least one pair of permanent magnet assemblies opposing each other across a gap therebetween, each of said permanent magnet assemblies comprising a plurality of permanent magnets arranged end-to-end such that adjacent permanent magnets in each assembly have magnetic poles of opposite polarities on their surfaces facing said gap, and that permanent magnets opposing each other across said gap also have magnetic poles of opposite polarities on their surfaces facing said gap;

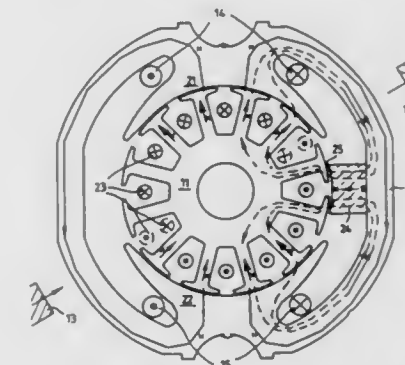
(b) a movable member comprising at least one multi-phase coil assembly comprising a plurality of flat coils and mov-

able in said gap in a direction parallel to the permanent magnet assemblies; and

(c) a driving circuit for supplying an AC sinusoidal current to said multi-phase coil assembly,

wherein each of said permanent magnets further comprises means for generating a sinusoidal magnetic flux distribution, said sinusoidal flux generating means including each of said permanent magnets having in a plane perpendicular to the moving direction of the movable member a cross section satisfying the relation: $A_c > A_e$, wherein A_c represents a cross section in a center portion of said permanent magnet and A_e represents a cross section at each end of said permanent magnet.

5,087,845
SERIES ELECTRIC MOTOR WITH PERMANENT MAGNET BRAKE
 Axel Behrens, Denkendorf; Walter Berwarth, Esslingen-Zell; Gerhard Fetzner, Denkendorf, and Hansjörg Nothdurft, Esslingen, all of Fed. Rep. of Germany, assignors to Festo KG, Esslingen, Fed. Rep. of Germany
 Filed Jan. 31, 1991, Ser. No. 648,220
 Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 4004785
 Int. Cl.⁵ H02K 7/106, 13/10, 23/38
 U.S. Cl. 310—77 13 Claims



9. A series electric motor, comprising an annular stator having two radially inwardly directed stator poles and a field winding wound around each stator pole, a rotor having a rotor winding thereon which is adapted to be fed electrical energy thereto via a commutator and brushes, a short circuiting means for short circuiting the rotor, and at least one permanent braking magnet secured to the annular stator and located between the stator and the rotor and oriented in at least one of the two stator poles.

5,087,846
SUBMERSIBLE MOTOR HOUSING
 John J. Wright, 9 Hix Ave., Rye, N.Y. 10580
 Filed Dec. 17, 1990, Ser. No. 627,953
 Int. Cl.⁵ H02K 5/12; F04B 35/04
 U.S. Cl. 310—87 9 Claims

1. A submersible motor housing for a climber screen motor assembly and a gear casing assembly comprising:

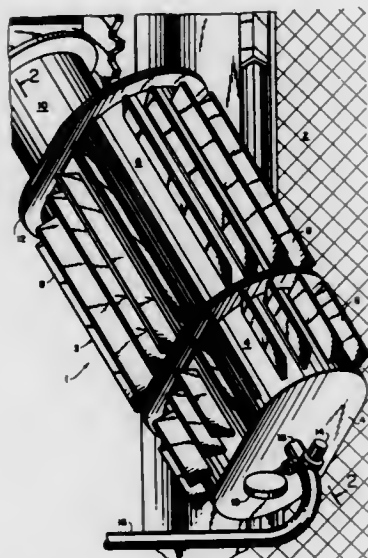
a base plate securely disposed between said motor assembly and said gear casing assembly, wherein said base plate, said motor assembly and said gear casing assembly are secured together;

a lower housing member disposed about said motor assembly and affixed to said base plate;

a first gasket means disposed between said base plate and said lower housing member to ensure a water-tight seal therebetween;

an upper housing member disposed about a top portion of said motor assembly and removably affixed to said lower housing member;

a second gasket means disposed between said lower housing member and said upper housing member to ensure a water-tight seal therebetween; and



said upper and lower housing members including exterior vanes for heat dissipation.

5,087,847

BEARING RETAINER FOR ELECTROMAGNETIC ROTATING ACTUATOR

Michael Giesbert, Tamm; Johannes Meiwes, Markgroeningen; Friedrich Wendel, Weissach; Dieter Dick, Muehlacker; Henning Teiwes, Ditzingen, and Helmut Schellbase, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

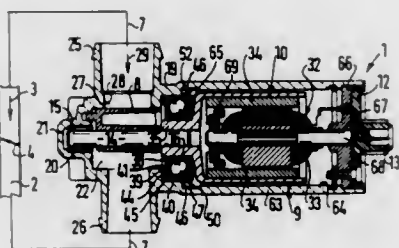
Filed Apr. 29, 1991, Ser. No. 692,881

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1990, 4019749

Int. Cl.⁵ H02K 5/16, 7/08; F16C 35/06, 27/04

U.S. Cl. 310—90

4 Claims



1. An electromagnetic rotating actuator, for controlling a throttle cross section of a control opening by a throttle device in a line carrying an operating medium of an internal combustion engine, having a one-piece housing and a servomotor, which has both a stator that is stationary relative to the housing and a rotatable rotor, with which said throttle device that opens said control opening to a variable extent is connected, a bearing opening, at least one roller bearing disposed in said bearing opening, for rotatably supporting said rotatable rotor wherein the bearing opening is defined by a radially extending bearing shoulder (44), a spring washer (45) is disposed between the bearing shoulder and the at least one roller bearing (15, 16), to exert a force in an axial direction upon the at least one roller bearing (15, 16), a resilient detent ring (50) including resilient detent tongues including free ends thereon, and at least one roller bearing (15, 16) is engaged by said free ends (51) of said resilient detent tongues (47) secured on a said resilient detent ring (50) which is supported in an annular groove (52) of the

housing (19) in such a way that the at least one roller bearing (15, 16) is pressed toward the spring washer (45).

5,087,848

SLOTTED BUS BAR FOR A PIEZOELECTRIC SOLID STATE MOTOR

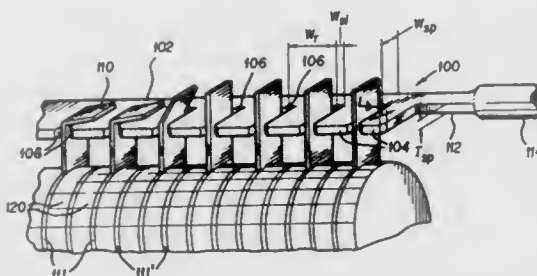
Kurtis C. Kelley, Washington, and John M. Sloma, Lacon, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 28, 1990, Ser. No. 590,111

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—328

4 Claims



1. A slotted bus bar for a piezoelectric solid state motor stack having a housing encasing a plurality of piezoelectric disks interleaved with a plurality of electrodes including tabs, wherein when the electrodes are connected to the slotted bus bar and biased by a source of electrical potential, in axial displacement is produced between opposite end surfaces of the stack, comprising:

a substantially rigid spine member formed solely of electrically conductive material for connecting the bus bar to the source of electrical potential; and

a plurality of ribs formed integrally with and extending from said spine member and defining slots therebetween, wherein when said bus bar is assembled with the stack, the electrode tabs extend through said slots and are electrically connected to said ribs.

5,087,849

LAMINATED PARTS AND A METHOD FOR MANUFACTURE THEREOF

Thomas R. Neuenschwander, Fort Wayne, Ind., assignor to L H Carbide Corporation, Fort Wayne, Ind.

Continuation of Ser. No. 853,207, Apr. 17, 1986, Pat. No. 4,738,020, which is a division of Ser. No. 478,692, Mar. 25, 1983, Pat. No. 4,619,028. This application Mar. 22, 1988, Ser. No. 171,555

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.⁵ H02K 1/00

U.S. Cl. 310—216

2 Claims

1. A rotor or stator made according to the method of stamping electric motor stator or rotor laminas from sheet stock material, provided from a supply, to form a stack of laminas each having a planar surface, the method comprising:

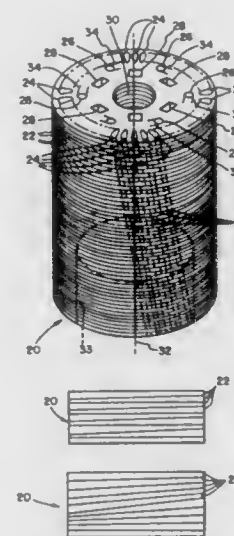
a first step of guiding sheet stock material from the supply; a second step of stamping laminas in predetermined planar configurations each having an axis substantially perpendicular to the lamina plane and each having conductor slot openings arcuately spaced about said axis;

a third step of coaxially stacking said laminas so that the lamina axes are coaxial to form a stack having a stack axis substantially coaxial with said lamina axes, said stack axis being substantially perpendicular to the plane of each of said laminas;

a fourth step of providing incremental indexing of each of said laminas relative said stack rotationally about said stack axis a predetermined degree of rotational arc prior to stacking of said each lamina so that said openings form conductor slots having a slot axis skewed to said stack axis

by a skew angle corresponding to said degree of rotational arc;

a fifth step of adjustably presetting the degree of said rotational arc to automatically obtain a desired skew angle; a sixth step of utilizing certain ones of the parameters including relative skew between said slot axes and said stack axis, stack height, the predetermined degree of rotational arc through which prior lamina were incrementally indexed, and lamina thickness to determine said predetermined degree of rotational arc for automatically arcuately indexing each lamina to obtain said desired skew angle;



a seventh step of rotating at least one of said laminas relative to said stack about a stack axis that is substantially perpendicular to the planar surface of said laminas in a rotational arc that is in addition to and substantially greater than said fourth step indexing rotational arc; said fourth and seventh steps, in addition to providing incremental indexing of each of said laminas relative to said stack rotationally about said stack axis, rotating said at least one lamina relative to said stack to compensate for lamina thickness variations.

5,087,850

ULTRASONIC TRANSDUCER APPARATUS

Toshihiko Suzuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

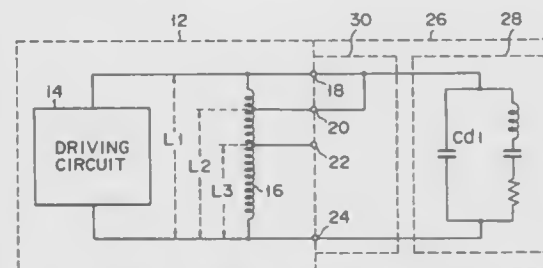
Filed Jan. 9, 1990, Ser. No. 462,699

Claims priority, application Japan, Apr. 19, 1989, 1-99447; Apr. 25, 1989, 1-105285; Apr. 25, 1989, 1-105286

Int. Cl.⁵ H01L 11/08

U.S. Cl. 310—316

6 Claims



1. An ultrasonic transducer apparatus comprising: a probe including an ultrasonic transducer having: a series connection of an inductor, a resistor, and a capacitor; and a capacitive component for providing a capacitive susceptance connected in parallel with said series connection; a driving unit detachably connected to said probe and in-

cluding means for supplying to said ultrasonic transducer a driving signal having a frequency, said driving signal being such that a phase difference between a voltage applied to said ultrasonic transducer and a current supplied through said ultrasonic transducer is substantially zero; and

matching means including first means arranged in said driving unit and second means arranged in said probe for causing varying of an impedance of said first means when said probe is connected to said driving unit, said first means of said matching means including a variable impedance component which is variable by said second means so as to have an impedance value corresponding to the capacitive susceptance provided by said capacitive component of said probe;

said impedance component of said first means of said matching means comprising an inductive element having a plurality of intermediate taps having different inductances of a multiple of two; and

said second means of said matching means comprising means for connecting at least two corresponding pairs of said intermediate taps in accordance with said capacitive susceptance.

5,087,851

DEVICE FOR DRIVING A PART ON A VEHICLE

Toru Nakazawa, Yuji Kokumai, Koichi Naito, all of Nagano; Shoji Suzuki, and Tadao Noguchi, both of Iwaki, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

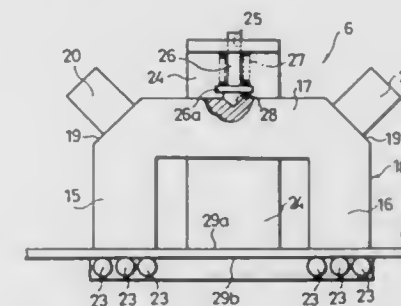
Filed May 3, 1990, Ser. No. 518,697

Claims priority, application Japan, Jun. 21, 1989, 1-72569[U]; Jun. 23, 1989, 1-161880

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—323

3 Claims



1. A device for driving a component having a driving portion and including a vibrating body made of an elastic substance and vibrating elements mounted on the vibrating body, said vibrating body comprising:

a pair of leg portions operatively contacting said driving portion; and

a connecting portion connecting to one end of each leg portion, wherein one of said vibrating elements is mounted on a chamfered surface formed where each leg portion connects to said connecting portion and each said vibrating element produces a longitudinal vibration and a bending vibration at the chamfered surfaces of said vibrating body, the combination of longitudinal and bending vibrations producing an elliptical vibration driving force, said driving force operating said driving portion.

5,087,852

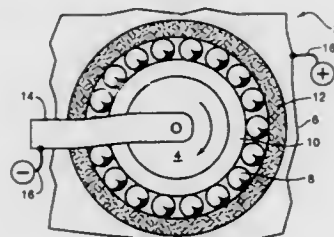
DIRECT CURRENT TRAVELING WAVE MOTOR
Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 13, 1990, Ser. No. 492,152

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—323

18 Claims



1. A direct current traveling wave motor, comprising:
 - a first layer of material connected to a first electric potential;
 - a second layer of material connected to a second electric potential having a polarity opposed to that of said first electric potential;
 - a rolling element disposed between and in electrical and frictional contact with said first and second layers;
 - at least one of said first layer, said second layer, and said rolling element comprising shear-deformable material that experiences shear deformation in response to an electric field generated in said shear-deformable material as a result of said electrical contact; and
 - a traveling wave formed by said shear deformation, said wave causing said rolling element to roll as said wave travels with the electrical contact of said rolling element, the frictional contact between said rolling element and said layers causing motion of said first layer relative to said second layer.

5,087,853

MAGNETRON AND DIELECTRIC HEATER USING MAGNETRON

Tomokatsu Oguro; Mamoru Tsuzurahara, and Hironobu Yamada, all of Mofara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

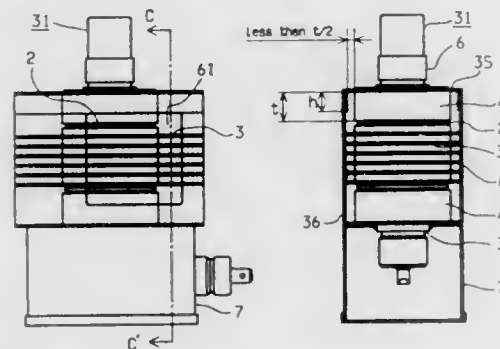
Filed Oct. 19, 1989, Ser. No. 424,197

Claims priority, application Japan, Oct. 26, 1988, 63-268043; Mar. 17, 1989, 1-63642

Int. Cl.⁵ H01J 1/02, 25/50, 7/26; H05B 6/64

U.S. Cl. 313—45

2 Claims



1. A magnetron comprising:
 - a bulb body;
 - permanent magnets disposed at upper and lower ends of said bulb body;
 - cooling fins fixed to an outer periphery of an anode cylinder provided at a central portion of said bulb body; and
 - yokes for surrounding said bulb body, said permanent mag-

nets, and said cooling fins in a rectangularly frame-like configuration;

wherein:

- cooling air is fed into a space defined by said yokes and is discharged from a vent hole perforated in a surface of said frame-like yokes which is parallel with a tubular axis of said anode cylinder after changing its direction due to hindrance from said anode cylinder;
- a distance which is shortest between interior surface of said yokes which are parallel with the tubular axis and external surfaces of said permanent magnets is less than one-half of a thickness t of said permanent magnets in a direction of the tubular axis of said anode cylinder; and
- a height h of a remaining part of said yokes is set such that $h < t$, with h being measured from an upper edge of the vent hole to an inside surface of a top of said yokes.

5,087,854

DISPLAY DEVICE AND METHODS OF MANUFACTURING SUCH A DISPLAY DEVICE
Maria C. van Uden; Ronald van der Wilk; Josephus J. van Moorsel, and Werner D. P. Kauwenberg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

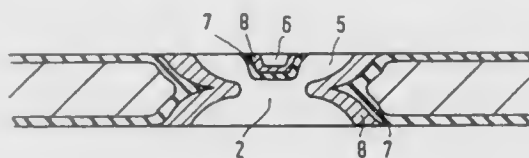
Filed Oct. 31, 1990, Ser. No. 606,297

Claims priority, application Netherlands, Nov. 8, 1989, 8902758

Int. Cl.⁵ H01J 9/00, 29/07

U.S. Cl. 313—403

15 Claims



5. A method of manufacturing a display device comprising means for generating an electron beam and an electrode, the electrode comprising a plate defining a pattern of apertures for transmitting the electron beam and having a pattern of conductors for influencing the passage of the electron beam, the plate and the pattern being mechanically interconnected and electrically separated,

the method characterized in that grooves are formed between the apertures, an electrically insulating layer is provided covering at least the walls of the apertures and the grooves, the surface between the apertures and the grooves is covered with a further, removable layer, after which a conducting material is applied to at least the walls of the apertures and the grooves, after which the removable layer is removed from the surface between the apertures and the grooves.

5,087,855

DISPLAY TUBE WITH ELECTRICAL CONNECTION MEANS

Johannes J. M. Overbeek, and Hendrik A. Verkuijlen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1990, Ser. No. 550,769

Claims priority, application Netherlands, Jul. 18, 1989, 8901845

Int. Cl.⁵ H01J 29/88, 29/92

U.S. Cl. 313—477 HC

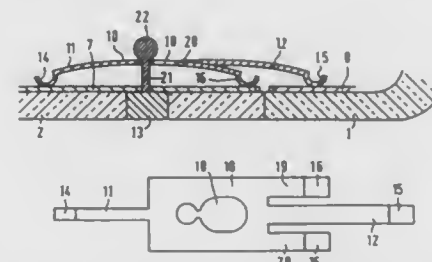
8 Claims

1. A display tube comprising
 - (a) an envelope structure having a first electrically conductive coating at an interior surface,
 - (b) a display window connected to said envelope structure, said display window having a second electrically conductive coating at an interior side,
 - (c) a high voltage contact disposed through said envelope

structure, said high voltage contact including a pillar with a widened end structure,

- (d) connection means for connecting high voltage from said high voltage contact to each of said first electrically conductive coating and said second electrically conductive coating, said connection means having a curved shape, said connection means including

- (i) a strip-shaped base member having a locking opening for receiving said widened end structure of said high voltage contact,
- (ii) at least one first elongated tongue member disposed at one end of said strip-shaped base member and extending to a first contact end,



- (iii) a second elongated tongue member disposed at an opposite end of said strip-shaped base member and extending to a second contact end, and
- (iv) a pair of arms disposed adjacent to said second tongue member and extending from said opposite end of said strip-shaped base member, said pair of arms each being shorter in length than said second tongue member, and said pair of arms each having respective third and fourth contact ends,

wherein said widened end structure of said high voltage contact pulls said connection means under tension to dispose said first, third and fourth contact ends against said first electrically conductive coating and said second contact end against said second electrically conductive coating.

5,087,856

DISCHARGE ELECTRODE HAVING A THIN WIRE CORE AND SURFACE COATING OF AMORPHOUS ALLOY FOR A DISCHARGER

Michio Yoshizawa, Yokohama; Tsunehumi Matsunaga, Ichihara; Makoto Ebata, Tokyo, and Yasuo Oyama, Ichihara, all of Japan, assignors to Ricoh Company, Ltd. and Mitsui Engineering & Shipbuilding Co., Ltd., both of Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,123

Claims priority, application Japan, Jun. 19, 1989, 1-156551; May 29, 1990, 2-138835

Int. Cl.⁵ H01J 1/14, 1/38, 1/48; H01T 19/00

U.S. Cl. 313—631

11 Claims



1. A discharge electrode for effecting a corona discharge, consisting essentially of:
 - a thin wire constituting a core of said discharge electrode; and
 - a layer formed on a surface of said thin wire by coating said surface with an amorphous alloy which contains a predetermined metal element, wherein the predetermined metal

element is at least one member selected from the group consisting of tantalum, niobium, zirconium, and titanium.

5,087,857

PLASMA GENERATING APPARATUS AND METHOD USING MODULATION SYSTEM

Tae-Hyuk Ahn, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

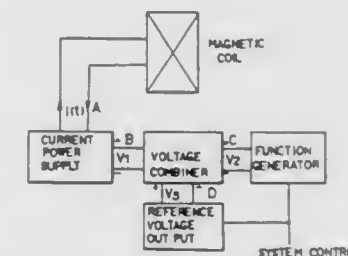
Filed Jul. 31, 1990, Ser. No. 560,756

Claims priority, application Rep. of Korea, Jun. 18, 1990, 8939/1990

Int. Cl.⁵ H05H 1/24

U.S. Cl. 315—111.21

2 Claims



1. A method for modulating a plasma generating apparatus comprising:
 - modulating a voltage waveform of input electrical energy applied to a coil surrounding an electron cyclotron resonance plasma chamber to combine a reference voltage and an output voltage of a modulating function generator to transform said input electrical energy from fixed current to variable current; and
 - varying the combined output voltage.

5,087,858

GAS DISCHARGE SWITCHED EL DISPLAY

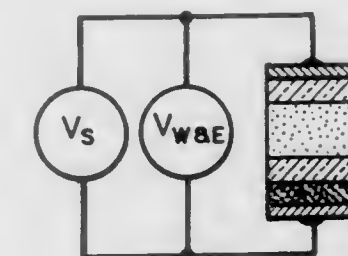
Walter L. Cherry, Waukegan, Ill., and George A. Kupsky, El Paso, Tex., assignors to Cherry Display Products Corporation, El Paso, Tex.

Filed Aug. 14, 1989, Ser. No. 393,639

Int. Cl.⁵ G09G 3/10

U.S. Cl. 315—169.3

3 Claims



1. A display, comprising:
 - a plurality of conducting first electrode arranged parallel to one another;
 - a cover means for supporting said first electrodes;
 - first and second dielectric layers disposed in stacked spaced relation for forming a hermetically sealed gas chamber, the first electrodes abutting the first dielectric layer outside said chamber;
 - gas disposed in said chamber for selectively ionizing to provide a selected first color of light;
 - a plurality of conducting second electrodes disposed parallel to one another and orthogonal to said first electrodes and arranged in groups of three electrodes disposed side-by-side to form an electrode triad;
 - a plurality of electroluminescent phosphor stripes arranged in an alternating pattern to provide second and third

colors of light and disposed adjacent and parallel to two of the electrodes of each triad, the third electrode of the triad having no associated phosphor stripe; and
a transparent substrate for supporting said second electrodes and the overlying phosphor stripes against said second transparent dielectric layer outside said chamber, whereby the light of selectively ionized gas and selectively energized phosphor stripes forms pixels having selected colors.

5,087,859

SWITCHING ARRANGEMENT FOR HIGH PRESSURE DISCHARGE LAMP

Hendrik J. Blankers, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

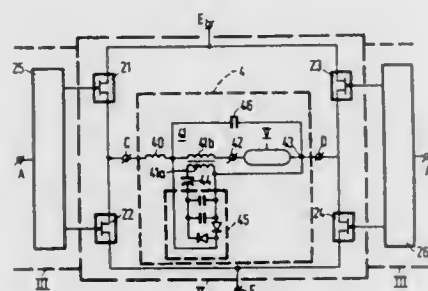
Filed May 11, 1990, Ser. No. 522,437

Claims priority, application Netherlands, May 17, 1989, 8901223

Int. Cl.⁵ H05B 41/36

U.S. Cl. 315-209 R

3 Claims



1. A switching arrangement suitable for ignition and operation of a high-pressure discharge lamp with a pulsatory current of changing polarity provided with

- a bridge network including a first switching means switched alternately to a conducting and a non-conducting state for obtaining the pulsatory current of changing polarity;
- a driving circuit for driving the switching means, which includes a shortcircuit switch between a control electrode and a main electrode of the switching means, which maintains for the time in which the switching means is switched to the non-conducting state a shortcircuit between the control electrode and the main electrode, and
- a control circuit for supplying a control signal to the driving circuit,

characterized in that the driving circuit comprises a controlled current source for controlling the shortcircuit switch.

5,087,860

POWER SUPPLY CIRCUIT FOR GAS DISCHARGE TUBE

David Doss, Overland Park, Kans., assignor to Everbrite, Inc., Milwaukee, Wis.

Filed Oct. 16, 1989, Ser. No. 422,148

The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.

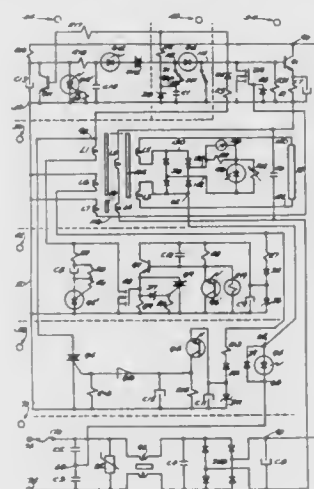
Int. Cl.⁵ H05B 41/36

U.S. Cl. 315-224

5 Claims

1. A power supply circuit for energizing a gas-filled tube, said circuit including oscillating means for energizing said tube and transformer means having primary winding means and secondary winding means, said secondary winding means being defined by first and second winding portions, each of said winding portions having a first terminal means for being connected to the tube and second terminal means, circuit means including rectifying means connected in series with the second terminal means of said winding portions for providing a rectified current related to the current flowing in the secondary winding portions, said circuit means including first and second terminals con-

nected in series with said rectifying means and said winding portions and being constructed and arranged for con-



necting an ampere meter in series between said terminals, and impedance means connected in parallel with said ampere meter.

5,087,861

DISCHARGE LAMP LIFE AND LAMP LUMEN LIFE-EXTENDER MODULE, CIRCUITRY, AND METHODOLOGY

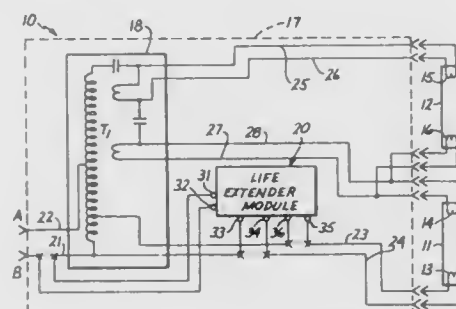
Dudley G. Boyd, El Toro; Edward G. Price, Costa Mesa; Valiant G. Kanaga, Huntington Beach, and Nian Chen, Costa Mesa, all of Calif., assignors to Deltave Limited, Toronto, Canada

Filed Sep. 1, 1989, Ser. No. 402,484

Int. Cl.⁵ H05B 41/16

U.S. Cl. 315-247

11 Claims



1. A discharge lamp system comprising:
 - a ballast adapted to be coupled to a discharge lamp for supplying lamp arc current having a predetermined crest factor to the discharge lamp;
 - a waveform conditioning module coupled to the ballast for causing the lamp arc current to have a crest factor less than the predetermined value; and
 - said waveform conditioning module including an inductor coupled to the ballast between the ballast and a source of electrical power for the ballast and a capacitor coupled to the ballast between the ballast and the lamp.

5,087,862

DISCHARGE LAMP LIGHTING APPARATUS FOR CONTROLLING VOLTAGE OF SWITCHING TRANSISTOR BY RAISING STARTING VOLTAGE

Kazutoshi Mita, and Keiichi Shimizu, both of Yokohama, Japan, assignors to Toshiba Lighting and Technology Corporation, Tokyo, Japan

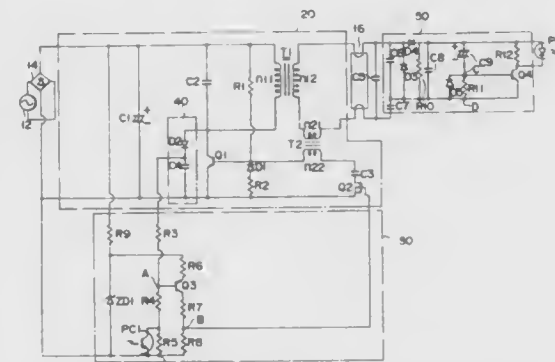
Filed Nov. 30, 1989, Ser. No. 443,491

Claims priority, application Japan, Nov. 30, 1988, 63-302393

Int. Cl.⁵ H05B 37/02

U.S. Cl. 315-289

8 Claims



1. A discharge lamp lighting apparatus comprising:
 - means for supplying a D.C. voltage;
 - means for switching said D.C. voltage provided by said D.C. voltage supplying means, said switching means being turned on and off at a predetermined frequency;
 - a parallel voltage resonance circuit, including an inductor and a capacitor, connected at a connection point in series with said switching means across said D.C. voltage supplying means;
 - means, connected to said connection point, for detecting a voltage of said switching means at said connection point; and
 - control means for:
 - raising, independently from the lighting condition of the discharge lamp, the voltage of said switching means, detected by said voltage detection means, to a relatively high constant preset level in a predetermined period of time from the time at which said D.C. voltage supplying means is turned on, and
 - setting the voltage of said switching means detected by said voltage detection means to a relatively low constant level after said predetermined period of time has elapsed.

5,087,863

FEEDBACK ARRANGEMENT IN A DEFLECTION CIRCUIT

Leroy W. Nero, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Mar. 15, 1991, Ser. No. 670,113

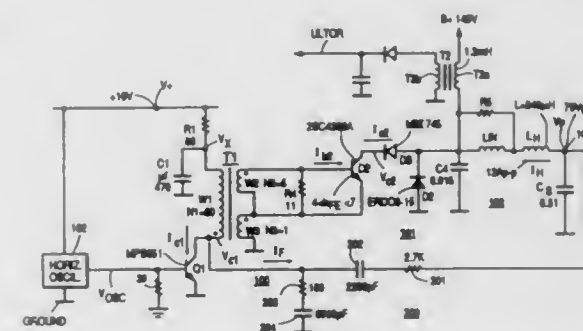
Int. Cl.⁵ H01J 29/70, 29/72

U.S. Cl. 315-388

14 Claims

1. A deflection apparatus of a video display apparatus, comprising:
 - a deflection winding coupled to a retrace capacitance to form a retrace resonant circuit, during a retrace interval of a deflection cycle;
 - a first switching transistor responsive to a control signal at a frequency that is related to a deflection frequency developed at a control terminal of said transistor and having a main current conducting terminal that is coupled to said retrace resonant circuit for generating a deflection current in said deflection winding such that, during a portion of a given trace interval of said deflection cycle, at least a portion of said deflection current flows in said main current conducting terminal;
 - a transformer having a first winding that is coupled to said

control terminal of said first switching transistor and a second winding responsive to a signal produced by said first switching transistor for developing a ramping portion of said control signal in a positive feedback manner with respect to the current in said main current conducting terminal of said first switching transistor such that a change in said current that flows in said main current conducting terminal of said first switching transistor,



- occurring in a ramping manner during said portion of said given trace interval, produces a change in said ramping portion of said control signal during the same portion of said given trace interval; and
- a feedback network responsive to a signal produced by said first switching transistor for developing a feedback signal that is applied to a control terminal of said first switching transistor in a negative feedback manner with respect to the current in said main current conducting terminal.

5,087,864

APPARATUS FOR SELECTIVELY CONTROLLING A PLURALITY OF ELECTRIC MOTORS

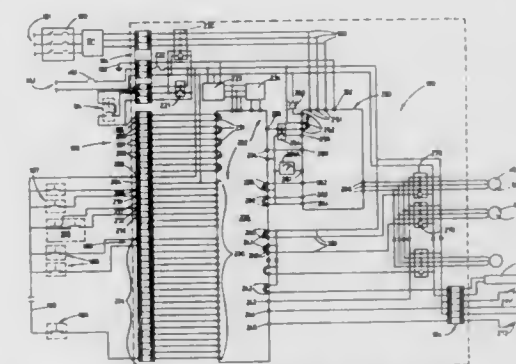
Donald B. Abel, Appleton, Wis., assignor to Abel Manufacturing Co., Inc., Appleton, Wis.

Continuation of Ser. No. 434,805, Oct. 30, 1989, Pat. No. 4,947,089. This application May 25, 1990, Ser. No. 529,144

Int. Cl.⁵ G01G 19/34, 11/12

U.S. Cl. 318-34

9 Claims



1. In a machine for dispensing materials and wherein the machine includes a plurality of electric motors which are individually disposed in driving relation relative to a plurality of conveyors which carry the materials to a remote location, an apparatus for controlling a plurality of electric motors comprising:
 - means for selecting individual electric motors and controlling the dynamic operating parameters thereof, the selecting means producing binary signals which vary at least one dynamic function of the electric motor selected, and wherein the selecting means includes a first electric binary switch signal input and a second electric binary switch signal input, and wherein the second electric binary

switch signal input selects the electric motor to be activated, and wherein the first electric binary switch signal input, acting in combination with the second electric binary switch signal input, provides a binary signal which varies the dynamic function of the electric motor selected; a programmable controller coupled with the selecting means for storing and generating a predetermined signalling sequence unique to the individual electric motor selected and in response to the binary signals received from the selecting means;

a single, variable speed motor drive coupled with the programmable controller and;

means for selectively coupling the single, variable speed motor drive to the electric motors, and wherein the coupling means is further electrically connected with and controlled by the programmable controller, and wherein the single, variable speed motor drive controls the dynamic function of the electric motor selected and in response to the signalling sequence received from the programmable controller.

5,087,865

POWER GOVERNANCE CIRCUITRY

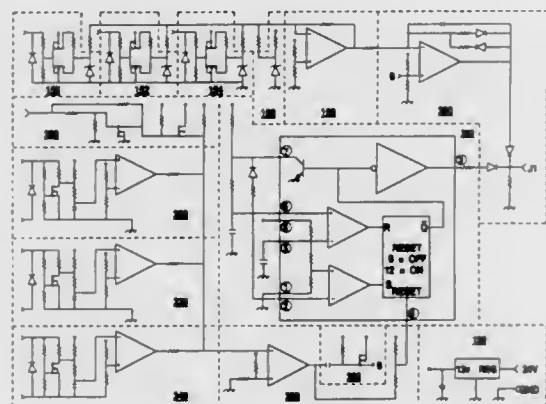
James C. Nelson, III, San Antonio, Tex., assignor to DAX Industries, Inc., Colorado Springs, Colo.

Filed Feb. 22, 1991, Ser. No. 660,437

Int. Cl.⁵ H02P 7/29

U.S. Cl. 318—139

7 Claims



1. A power governance circuit for attachment to a power control circuit that requires an analog signal input that is characteristic of a desired action of a powered device under control, comprising:

- a power level transition circuit capable of providing an analog signal to said power control circuit that is indicative of a power level at which said powered device is to function and that varies at a controlled rate;
- a power level select circuit capable of providing an analog voltage to said power level transition circuit that is indicative of the power level at which said powered device is to function;
- a controlled power limiting circuit capable of providing a variable voltage to said power control circuit that interacts with said power level transition circuit and interrupts said analog signal provided by said power level transition circuit to said power control circuit in a manner that provides a controlled decrease in said power level at which said powered device is to function when said decrease is demanded; and
- a power initiation reset circuit capable of providing a signal voltage to said power level transition circuit that allows said power level transition circuit to resume a controlled response to said power level select circuit after a period of time during which said controlled power limiting circuit

has been interacting with said power level transition circuit.

5,087,866

TEMPERATURE COMPENSATING CIRCUIT FOR LVDT AND CONTROL SYSTEM

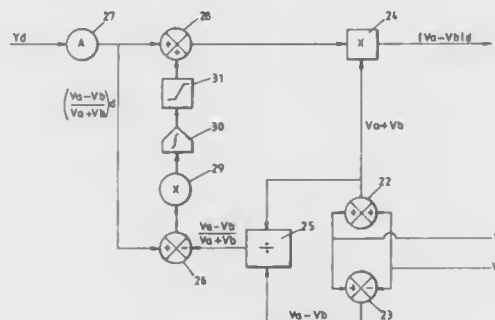
Trevor S. Smith, Sutton Coldfield, England, assignor to Lucas Industries, England

Filed May 22, 1991, Ser. No. 704,280

Int. Cl.⁵ G05B 13/00

U.S. Cl. 318—653

4 Claims



1. A control system for a movement transducer, comprising: demodulating means for receiving first and second output signals from a linear variable displacement transducer and for supplying first and second amplitude signals corresponding to amplitudes of the first and second output signals, respectively; means for energizing the linear variable displacement transducer; displacement signal producing means responsive to said demodulating means for producing a displacement signal by forming a difference between the first and second amplitude signals; signal forming means responsive to said demodulating means for forming a compensated demand signal by multiplying a demand signal by a sum of the first and second amplitude signals; and driving means responsive to said signal forming means and said displacement signal producing means for driving the movement transducer in accordance with a difference between the compensated demand signal and the displacement signal.

5,087,867

MOTOR DRIVING APPARATUS AND PRINTER

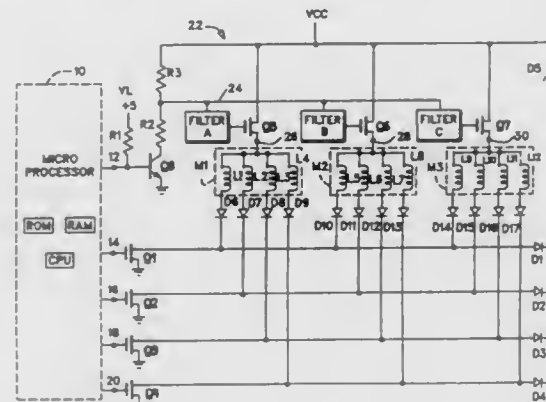
Robert W. Kruppa, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1991, Ser. No. 660,460

Int. Cl.⁵ H02P 8/00

U.S. Cl. 318—696

18 Claims



1. A controller for driving motors of a printer comprising: a control means for generating a multi-frequency select

signal on one of its output pins and at least one drive signal on at least another of its output pins;

a frequency discriminating means coupled to said one of its output pins; said frequency discriminating means being responsive to a range of frequencies outputted in the select signal to generate discrete signals which activate selected ones of said motors for selected frequency bands within said range of frequencies;

at least one switch means interconnecting an energization coil in the selected ones of said motors to said at least another of its output pins; and

a discharge means coupled to the energization coil in the selected one of said motors said discharge means discharging said energization coil.

15. A circuit arrangement for use in a printer to interface a controller with a plurality of motors, each motor having a plurality of coils, comprising:

- logic means, responsive to coded signals outputted from the controller, to generate a plurality of selection signals with each selection signal being operable to select a set of motor coils;
- at least one switch means responsive to the selection signals and operable for adjusting the selection signals to a desired signal level;
- at least one selection energization means, responsive to one of the adjusted selection signals and operable for activating one set of motor coils; and
- a plurality of control energization means, responsive to control signals outputted by the controller, and operable for controlling one selected coil in said one set of motor coils.

5,087,868

ROTARY ACTUATOR

Takehisa Ishibashi; Shioobu Kakizaki; Yoshiaki Watanabe, and Fukashi Kanai, all of Atsugi, Japan, assignors to Atsugi Motor Parts Company, Ltd., Kanagawa, Japan

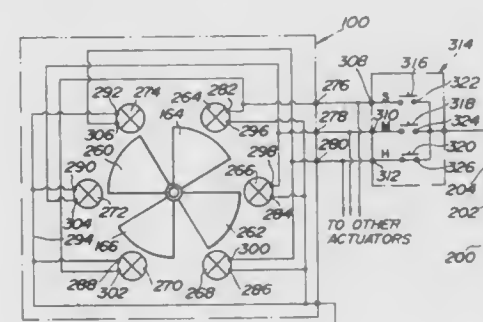
Continuation of Ser. No. 171,011, Mar. 21, 1988, abandoned, which is a division of Ser. No. 115,249, Oct. 30, 1987, Pat. No. 4,776,437. This application Aug. 7, 1990, Ser. No. 563,866

Claims priority, application Japan, Oct. 31, 1986, 61-167849; Oct. 31, 1986, 61-259985; Feb. 16, 1987, 62-21084; Feb. 16, 1987, 62-33121

Int. Cl.⁵ F16F 9/50; H02P 8/00

U.S. Cl. 318—696

13 Claims



1. A rotary actuator for rotatingly driving a rotatable member for controlling a shock absorber in a vehicle, comprising: a rod member connected to a rotatable member for rotation therewith;

a rotor assembly including a permanent magnet having a first pole at first side and a second pole at second side thereof, said permanent magnet being associated with said rod member for rotatingly drive the latter according to angular displacement thereof;

a stator assembly provided essentially in alignment with said rotor assembly along the axis of said rod member and opposing to said first side of said permanent magnet, said stator assembly including a plurality of pairs of electromagnets which are arranged in axially spaced apart rela-

tionship with said permanent magnet with a predetermined clearance in a direction of the axis of said rod member, and each electromagnet of said plurality of pairs being placed symmetrically opposite each other in relation to the axis, each of said electromagnets being adapted to be energized to have a second pole at the side adjacent said permanent magnet and a first pole at the side remote from said permanent magnet; and

switch means for selectively energizing one pair of said electromagnets for rotatingly driving said permanent magnet with said rotatable member via said rod member in a stepwise manner sequentially to a plurality of predetermined positions.

5,087,869

PROTECTIVE CIRCUIT IN A DEVICE FOR REDUCING VIBRATIONS OF A VEHICLE BODY

Shigeru Kuriyama, Katsuta; Yozo Nakamura, Ibaraki; Yuji Maeda, Katsuta; Kenichi Nakamura, Katsuta; Keiichi Mashino, Katsuta; Yuzo Kadomukai, Ibaraki; Masao Fukushima, Machida, and Kei Murakami, Zama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Nissan Motor Co. Ltd., Yokohama, both of Japan

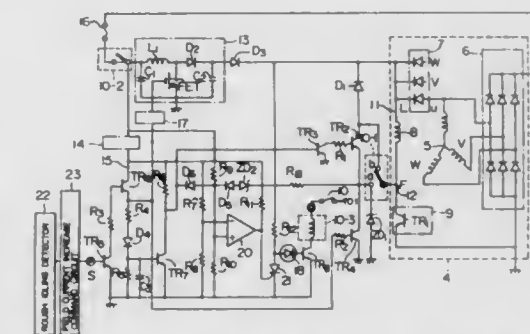
Filed Jan. 25, 1991, Ser. No. 645,610

Claims priority, application Japan, Jan. 27, 1990, 2-16347

Int. Cl.⁵ F02B 75/06; F02N 11/04; H02P 9/10; H02J 7/14

U.S. Cl. 322—15

5 Claims



1. A protective circuit in apparatus for reducing vehicle body vibrations due to rough idling of a vehicle engine, comprising:

- a generator attached to the vehicle engine and including a voltage regulator for controlling a field winding current so as to output a predetermined voltage to a battery;
- means for detecting the occurrence of the rough idling of the engine on the basis of at least one of a change in the rotational speed of the engine and a change in the vibrations of the engine;
- means responsive to the detection of the rough idling for generating a command signal to command an increase in the field winding current;
- means responsive to the command signal for generating a high voltage higher than the predetermined voltage for a predetermined time;
- first switching means responsive to the command signal for applying a voltage generated by said high voltage generating means to the field winding to increase the field current and hence to increase a load torque on said generator during which time the voltage regulator is at rest;
- means for detecting the voltage of the battery when there is no command signal;
- means for comparing the detected battery voltage and a predetermined reference value and for generating a changeover signal when the detected battery voltage exceeds the reference value; and
- second switching means responsive to the changeover signal from said comparing means for interrupting the connection of said first switching means to the field winding.

5,087,870

CONSTANT POWER CIRCUIT

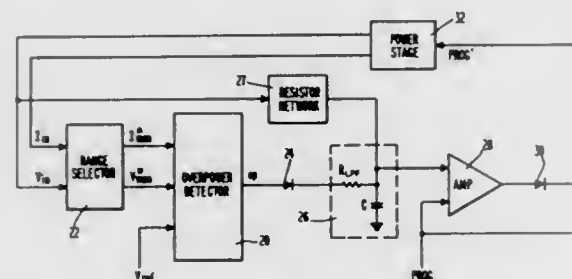
Emery Salesky, Denville, and Tom Sterk, Newfoundland, both of N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 5, 1989, Ser. No. 417,372

Int. Cl.⁵ H02M 3/26

U.S. Cl. 323—276

23 Claims



1. A constant power circuit for causing a load having a predetermined power limit to dissipate power at a constant power level less than said predetermined power limit, comprising:

means responsive to the voltage across and current drawn by said load for determining whether the power dissipated by said load for a selected load demand exceeds said predetermined power limit for said load, said determining means comparing the power dissipated by said load for said selected load demand with an approximation of a constant power curve over a predetermined range of current and voltage and outputting an overpower signal during an overpower state in which said predetermined power limit for said load is exceeded by the power dissipated by said load for said selected load demand; and means responsive to said overpower signal and said selected load demand for regulating the power dissipated by said load during said overpower state whereby the magnitude of the power dissipated by said load during said overpower state is within a predetermined hysteresis band about said constant power level.

5,087,871

POWER SUPPLY WITH INRUSH CURRENT LIMITER

Walter Losel, Fürth, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

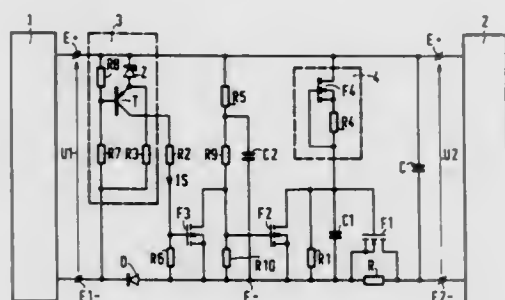
Filed Oct. 2, 1990, Ser. No. 591,539

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 3934577

Int. Cl.⁵ H02H 9/02

U.S. Cl. 323—299

20 Claims



1. A power supply comprising, between an input terminal for a supply voltage and a storage capacitor at an output terminal, an inrush current limiting circuit including a first semiconductor switch with a switching path and a shunt resistor in parallel to said switching path, a first capacitor coupled to a

source of charge current, means connecting a circuit in parallel to a control path of the first semiconductor switch, said parallel circuit comprising the first capacitor, a first resistor and a switching path of a second semiconductor switch, wherein a control electrode of the second semiconductor switch is connected to a tap on a first voltage divider to which a second capacitor is connected in parallel, a switching path of a third semiconductor switch being connected in parallel to a control path of the second semiconductor switch, and a threshold circuit which supplies a control current to cut off the third semiconductor switch below a threshold value of the supply voltage.

5,087,872

CIRCULATING LOAD APPARATUS

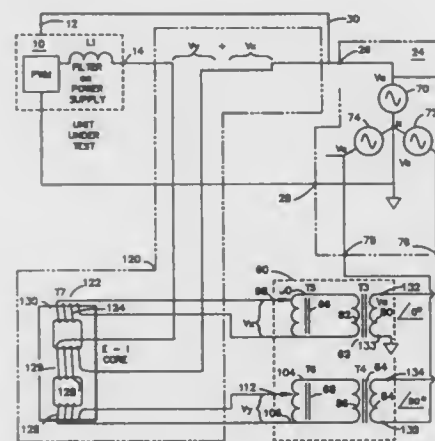
Suresh C. Gupta, Los Alamitos, Calif., assignor to Deltec Electronics Corporation, San Diego, Calif.

Filed Feb. 13, 1990, Ser. No. 479,467

Int. Cl.⁵ G05F 5/00

U.S. Cl. 323—340

22 Claims



1. A circulating load apparatus for loading a power supply having a power input terminal, a power output terminal and a power return terminal, the power supply having an internal impedance and operable to provide an output voltage at the power output terminal with respect to the power return terminal, the output voltage of the power supply being controlled to be substantially identical in amplitude to the network voltage of a network source, provided at a network source terminal with respect to a source return terminal, the power return terminal being coupled to the source return terminal, the power supply power input terminal being coupled to the network source terminal to be powered by voltage and current from said network source terminal, the circulating load apparatus comprising:

a voltage source for supplying a voltage between a first and second terminal, the voltage source being connected in series between the network source terminal and the power supply power output terminal; the output voltage of the power supply and the voltage source adding to provide output power to the network source; adjusting means for adjusting the amplitude of the voltage of the voltage source to position the output current of the power supply within a predetermined range.

5,087,873

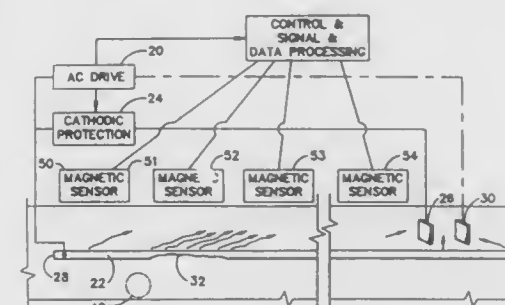
NON-INVASIVE, HIGH RESOLUTION DETECTION OF ELECTRICAL CURRENTS AND ELECTROCHEMICAL IMPEDANCES AT SPACED LOCALITIES ALONG A PIPELINE

John C. Murphy; Glenn S. Hartong, both of Columbia, Md.; Ralph F. Cohn, Worcester, Mass., and Patrick J. Moran, Arnold, Md., assignors to New York Gas Group, New York, N.Y.; Southern California Gas Company, Elmonte, Calif. and Columbia Gas System Service Corporation, Columbus, Ohio Division of Ser. No. 504,100, Apr. 2, 1990, which is a continuation of Ser. No. 309,394, Feb. 10, 1989, abandoned. This application Apr. 24, 1991, Ser. No. 690,290

Int. Cl.⁵ G01N 27/26; C23F 13/02

U.S. Cl. 324—71.2

4 Claims



1. A non-invasive method for detecting electrical current flow characteristics in a circuit having local regions of an electrically conductive object buried in an electrolyte, the method comprising:

- impressing an electrical potential, which is alternating at at least one selected frequency, between the buried object and an electrode which is buried in the electrolyte and spaced from the object the object being a metallic object subject to corrosion in the electrolyte and the impressed potential causing perturbations of ambient currents, the perturbations being sufficiently small to avoid significant depolarization of the corroding object/electrolyte interface away from its steady state in its ambient environment; and
- detecting the alternating magnetic field induced by electrical currents which are injected into said circuit by the electrical potential and are distributed in the electrolyte at a local region of the circuit and flow transversely away from the pipe, the field being detected along at least one selected spatial axis at the frequency of potential impression.

5,087,874

APPARATUS AND METHOD FOR LOCATING A SHORT

David Robinson, 72 Redner Road, Morristown, N.J. 07960

Filed Aug. 28, 1989, Ser. No. 399,691

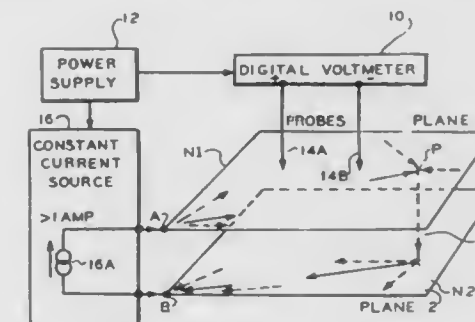
Int. Cl.⁵ G01R 27/14

U.S. Cl. 324—73.1

12 Claims

1. A method for locating a short between a first and second planar conductor in a printed circuit, comprising the steps of: injecting current to cause current to flow within and between said first and second planar conductors; initially measuring the voltage at each one of a group of spaced points in said first planar conductor as defined with respect to an arbitrary, initial reference point, said group of spaced points being distributed about and within a predetermined distance from said initial reference point; identifying initial polarities from said initial reference point to each distinct one of said group of spaced points in said first planar conductor; and

determining if the initial polarities are different from a predetermined polarity, so that the presence of the short can be



determined by observing a commonly focused pattern of polarities near the short.

5,087,875

ISOLATED HIGH VOLTAGE TRANSFORMER FOR ELECTRIC POWER METER

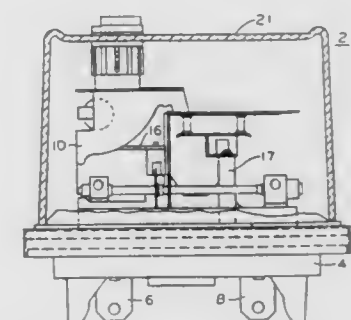
Richard A. Balch, North Hampton; Andrius A. Keturakis, Portsmouth, and Scott D. Velte, Rochester, all of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Apr. 5, 1990, Ser. No. 505,194

Int. Cl.⁵ G01R 1/00

U.S. Cl. 324—157

24 Claims



1. An electronic energy meter comprising: base means comprising means for connecting said electronic energy meter in circuit with a source of power and a load to be metered; electronic register assembly means spaced from and supported on said base means and including register means, output indicator means, and a register circuit board positioned intermediate said output indicator means and said base means; power supply transformer means mounted on said register circuit board and including a primary winding and at least one secondary winding; said secondary winding connected in circuit with the circuitry for said electronic register assembly means; said power supply transformer means including primary terminals for connecting said primary winding in circuit with said base means, and one or more shrouds of insulating material extending through said register circuit board and surrounding said primary terminals; and means to secure said power supply transformer means to said register circuit board.

5,087,876

APPARATUS AND METHOD FOR MAKING SURFACE PHOTOVOLTAGE MEASUREMENTS OF A SEMICONDUCTOR

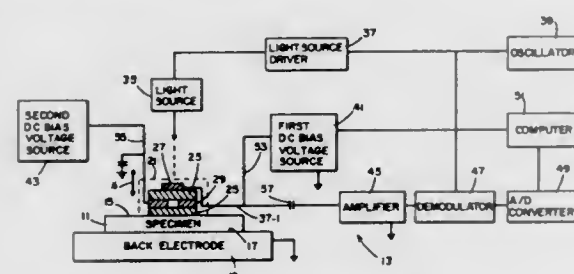
Leszek Reiss, and Emil Kamieniecki, both of Lexington, Mass., assignors to Semitest, Inc., Billerica, Mass.

Filed Jul. 16, 1990, Ser. No. 553,916

Int. Cl.⁵ G01R 31/26

U.S. Cl. 324—158 D

14 Claims



1. Apparatus for use in making ac surface photovoltage measurements of a specimen of semiconductor material under variable dc bias voltage conditions, said specimen having first and second major surfaces, said apparatus comprising:

- means for illuminating at least a portion of said first major surface of said specimen with a beam of intensity modulated light;
 - a back electrode adapted to receive said second major surface of said specimen;
 - a probe assembly positionable in the path of said light beam in close proximity to said first major surface of said specimen, said probe assembly comprising:
 - a reference electrode, and
 - a guard electrode;
 - first dc voltage means for applying a variable dc bias voltage between said back electrode and said reference electrode, and
 - second voltage means independent of said first voltage means for applying a bias voltage between said back electrode and said guard electrodes.
- f. the ac surface photovoltage signals generated by said light beam appearing between said reference electrode and said back electrode.

5,087,877

TEST CONTACT FIXTURE USING FLEXIBLE CIRCUIT TAPE

Dieter Frentz, Phoenix; Gregory L. Westbrook, Chandler, and William M. Williams, Gilbert, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Feb. 25, 1991, Ser. No. 659,644

Int. Cl.⁵ G01R 1/02, 1/067

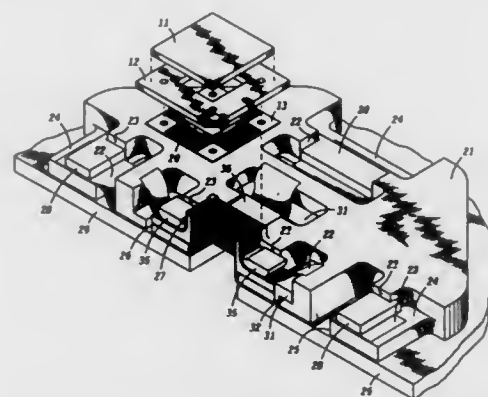
U.S. Cl. 324—158 F

12 Claims

1. A test contact fixture using flexible printed circuit tape, comprising:

- a rigid mounting plate used to support and align the test contact fixture;
- at least one flexible printed circuit tape which makes a plurality of electrical connections between an electrical device under test and a tester board and wherein the flexible printed circuit tape is fabricated to facilitate adjustment longitudinally so as to bring a fresh portion of the flexible printed circuit tape surface into contact with the leads of the electrical device under test;
- a tape former means to hold the flexible circuit tape in

contact with the leads of the electrical device under test; and



a plurality of pressure clamps to hold the flexible printed circuit tape in position on the rigid mounting plate.

5,087,878

TOP-ACCESSIBLE SYSTEM, AND RELATED METHODS, FOR SIMULTANEOUSLY TESTING THE OPPOSITE SIDES OF PRINTED CIRCUIT BOARD

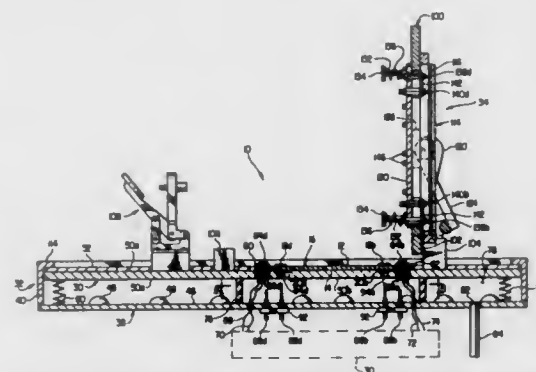
Walter J. Belmore, III, and Raymond G. Basinger, both of Spring, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 30, 1990, Ser. No. 621,324

Int. Cl.⁵ G01R 1/02

U.S. Cl. 324—158 F

30 Claims



1. A method of electrically testing a circuit board or the like having a first side with a series of test contact points thereon, and an oppositely facing second side, said method comprising the steps of:

- operatively positioning said circuit board, second side down, on the upper side of a base structure;
- providing a probe structure having a series of parallel, longitudinally resilient, electrically conductive upper test pins, and a series of essentially rigid hold-down members, projecting outwardly therefrom;
- said probe and mounting structures, respectively, being parallel probe and mounting plates, said upper test pins projecting through said probe plate toward said mounting plate;
- securing a mounting structure to said base structure for movement relative thereto;
- attaching said probe structure to said mounting structure for movement therewith, and for translational movement relative thereto in a direction parallel to the axes of said upper test pins;
- moving said mounting structure relative to said base structure to a test position in which said upper test pins are perpendicular to and spaced upwardly apart from the

5,087,880

METHOD FOR SENSING NUCLEAR MAGNETIC RESONANCE SIGNALS GIVEN ARBITRARY GRADIENT SHAPES

Herbert Bruder, Hemhofen; Hubertus Fischer; Hans-Erich Reinfelder, both of Erlangen, and Franz Schmitt, Baiersdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

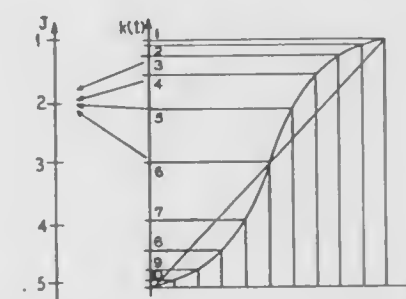
Filed Feb. 22, 1990, Ser. No. 482,963

Claims priority, application European Pat. Off., Feb. 24, 1989, 89103292.2

Int. Cl.⁵ G01R 33/20

U.S. Cl. 324—309

6 Claims



operatively positioned circuit board, and are laterally aligned with said test contact points; releasably restraining said mounting structure against movement away from said test position; downwardly translating said probe structure relative to said mounting structure in a manner causing said upper test pins to perpendicularly engage and be compressed against said test contact points, without appreciable lateral movement relative thereto, and causing said hold-down members to engage the operatively positioned circuit board and rigidly resist its upward movement relative to said base structure; and

forming an opening through said mounting plate which overlies and permits top access to said upper test pins during electrical testing of the operatively positioned circuit board.

5,087,879

CONSTRUCTION FOR ADJUSTABLY MOUNTING SENSOR PORTION OF MAGNETIC ROTATION SENSOR AND METHOD OF ADJUSTING GAP BETWEEN SENSOR AND ROTATING DRUM

Shin Sugifune, Sendai, and Hiraku Abe, Iwadeyama, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

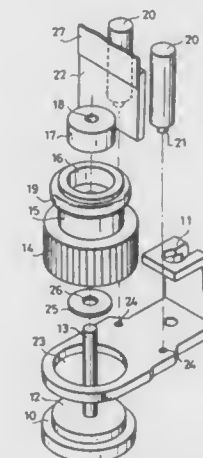
Filed Sep. 19, 1990, Ser. No. 585,337

Claims priority, application Japan, Dec. 8, 1989, 1-317649

Int. Cl.⁵ G01B 7/14; H02H 15/00

U.S. Cl. 324—207.25

2 Claims



- A magnetic rotation sensor comprising: a housing including a planar surface having a first positioning hole and a plurality of second positioning holes disposed adjacent said first positioning hole; a magnetic rotating drum positioned through said first positioning hole formed in said housing; pin guides comprising two cylindrical portions, first cylindrical portions having a first diameter inserted in said second positioning holes formed in said housing and second cylindrical portions having a second diameter; and an MR sensor supported by said second cylindrical portions of said guide pins and located so as to be opposite to a perimeter of said magnetic rotating drum; wherein the interval between said first hole and said second holes is set to form a gap having a predetermined size between said magnetic rotating drum and said magnetic sensor; wherein said second diameter of said second cylindrical portions is selectively adjustable to adjust said gap.

5,087,881

IC ENGINE CYLINDER OUTPUT POWER MEASUREMENT APPARATUS BY MONITORING THE OUTPUT OF AN ALTERNATOR DRIVEN BY THE ENGINE

David J. H. Peacock, 200-204 Bye Pass Rd., Chilwell, Nottingham NG9, England

PCT No. PCT/GB89/01094, § 371 Date May 17, 1990, § 102(e) Date May 17, 1990, PCT Pub. No. WO90/03558, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 19, 1989, Ser. No. 476,380

Claims priority, application United Kingdom, Sep. 19, 1988, 8814759

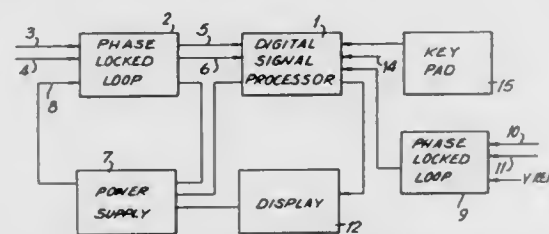
Int. Cl.⁵ F02P 17/00

U.S. Cl. 324—378

11 Claims

1. Power measurement apparatus for measuring the comparative output power of each cylinder of an internal combustion engine of the kind having at least two cylinders, the apparatus comprising first pick-up means for detecting current flow in an output lead of an electrical generator driven by the engine, second pick-up means for detecting engine timing pulses and

comparison means to compare the levels of current flows from said first pick-up means in respect of each power stroke of the



engine whereby the comparative output of each cylinder of the engine may be determined.

5,087,882

IONIZATION CURRENT DETECTOR DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Toshio Iwata, Himeji City, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

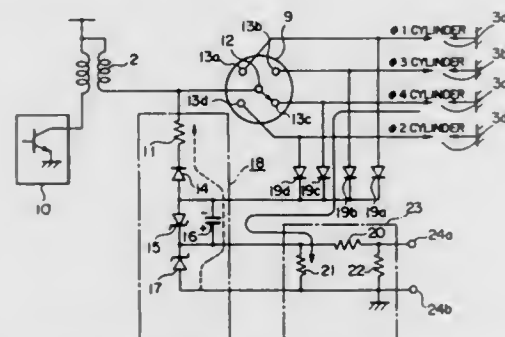
Filed May 11, 1990, Ser. No. 522,012

Claims priority, application Japan, May 15, 1989, 1-118757; May 15, 1989, 1-118758

Int. Cl.³ F02P 17/00

U.S. Cl. 324-388

10 Claims



1. An ionization current detector device for detecting combustion states within cylinders of a multicylinder internal combustion engine having an ignition system including an ignition coil, a distributor, and spark plugs for respective cylinders having gaps electrically coupled across respective peripheral terminals of the distributor and the ground, said ionization current detector device comprising:

high voltage circuit means, coupled across ground and an output terminal of a secondary side of the ignition coil, for providing a high voltage for an ionization current by means of a high voltage produced across the ground and the output terminal of the secondary side of the ignition coil, said high voltage circuit means including a capacitor means for maintaining thereacross the high voltage produced across the ground and the output terminal of the secondary side of the ignition coil;

ionization current detector circuit means, coupled across a grounded side terminal of the capacitor means and the ground, for generating a detector output voltage proportional to an ionization current flowing therethrough; and a plurality of rectifier diodes, each coupled across a peripheral terminal of the distributor and a terminal of the capacitor means opposite to the grounded side terminal thereof, each diode having a forward conducting direction to allow an ionization current to flow through a series circuit comprising: a gap of the spark plug, the diode, the capacitor means, and the ionization current detector circuit means, the ionization current being produced by the voltage maintained across the capacitor means.

5,087,883 DIFFERENTIAL CONDUCTIVITY METER FOR FLUIDS AND PRODUCTS CONTAINING SUCH METERS

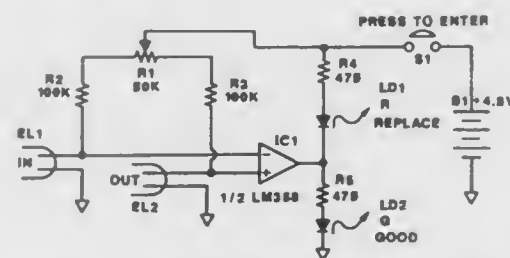
Ronald J. Hoffman, Solon, Ohio, assignor to Mr. Coffee, inc., Bedford Heights, Ohio

Filed Sep. 10, 1990, Ser. No. 579,941

Int. Cl.³ G01N 27/02

U.S. Cl. 324-443

14 Claims



1. A differential conductivity meter for detecting the difference in conductivity between a sample of unfiltered fluid and a sample of filtered fluid, said meter comprising:

momentary switch means for applying power from a battery to said meter for a brief period of time to extend battery life, for actuating said meter to detect the difference in conductivity;

differential comparator means having an input means and an output means, for measuring the voltage difference of the input means;

direct current differential bridge means for measuring the differential conductivity of said unfiltered fluid and said filtered fluid, said bridge means including:

electrode means connected to the input means of said differential comparator for contacting said filtered fluid and said unfiltered fluid; and

bridge adjustment means operatively connected to said electrode means and said comparator means, to compensate for voltage offsets of said differential bridge means and said differential comparator means;

wherein said differential bridge means detects only the differential conductivity of said unfiltered fluid and said filtered fluid and eliminates the effects of the fluid temperature and the amounts of absolute conductivity of the fluid; and

wherein the short actuation of said momentary switch means to detect the difference in fluid conductivity substantially minimizes electrode plating; and indicator means operatively connected to the output means of said differential comparator means for generating an output indicative of the differential conductivity of said fluid samples.

5,087,884

OPEN HEAD DETECTION CIRCUIT AND METHOD

Craig M. Brannon, Golden Valley, Minn., assignor to VTC Bipolar Corporation, Bloomington, Minn.

Filed Jun. 28, 1990, Ser. No. 546,009

Int. Cl.³ G01R 31/08, 33/12

U.S. Cl. 324-523

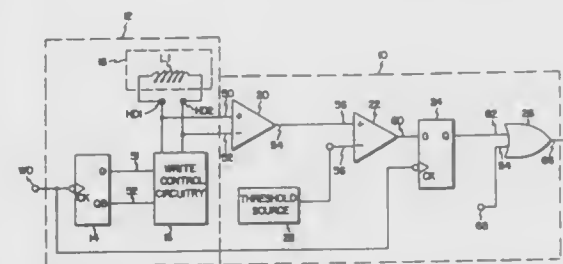
21 Claims

1. An open head detector circuit for detecting an open-circuit condition in a magnetic head having head contacts electrically coupled to write data circuitry responsive to write data signals for controlling current flow through the magnetic head, the detector circuit comprising:

a threshold source for generating a threshold voltage that is between a head contact voltage representative of a connected head and a head contact voltage representative of an open head;

a comparator coupled to receive head voltage signals from the head contacts and coupled to the threshold source for comparing the head voltage signals to the threshold volt-

age and for generating comparator signals representative of the comparison; and sampling circuitry coupled to the comparator and config-



ured for coupling to receive the write data signals for sampling the comparator signals in response to the write data signals and before the write data signals affect the comparator signals.

5,087,885

LIGHTING ARRESTER TESTER

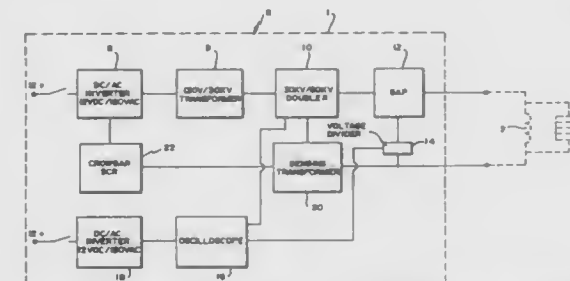
Russell N. Bergstrom, Loveland, Colo., assignor to Electron Instruments, Loveland, Colo.

Filed Apr. 16, 1990, Ser. No. 509,154

Int. Cl.³ G01R 31/00, 31/12

U.S. Cl. 324-547

32 Claims



1. A tester for determining the condition of a lightning arrester connected in parallel with a high voltage winding of a transformer, said tester comprising:

- a power source;
- means for transforming the output of said power source to a high voltage having a magnitude greater than the breakdown voltage rating of a lightning arrester connected in parallel to the high voltage winding of a transformer being tested;
- means for generating a high voltage pulse from the output of said transforming means and discharging the high voltage pulse across the high voltage winding of the transformer;
- said generating and discharging means including a spark gap switch means connected to the output of said transforming means and connected across the high voltage winding of the transformer being tested;
- means for detecting the response of the winding to the high voltage pulse;
- whereby a normally functioning arrester will clamp the impressed high voltage pulse across the transformer winding at the arrester's known breakdown level.

5,087,886

RAIN-ACTIVATED SPRINKLER SHUT-OFF SYSTEM

Harold E. Mann, 3114 E. Clarmont Ave., Phoenix, Ariz. 85016

Filed Sep. 28, 1990, Ser. No. 589,770

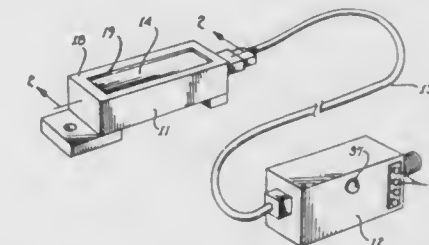
Int. Cl.³ G01R 27/02

U.S. Cl. 324-696

5 Claims

1. A sprinkler shut-off system comprising a sensor unit exposed to the atmosphere for sensing the presence of rain water, said sensor unit having a body of porous concrete therein

adapted to be wetted by rain water, a pair of electrodes embedded in said concrete body, electrical circuitry including said electrodes for sensing the conductivity of said concrete body, a control for the sprinkler, and means for shutting off the control when said electrical circuitry senses an increase in



conductivity of said concrete body as a result of wetting of said body by rain water and for turning said control back on when said electrical circuitry senses a decrease in the conductivity of said concrete body as a result of drying of said concrete body in the absence of rain water.

5,087,887

STANDING WAVE TYPE LINEAR ACCELERATOR

Hideyuki Kawakami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

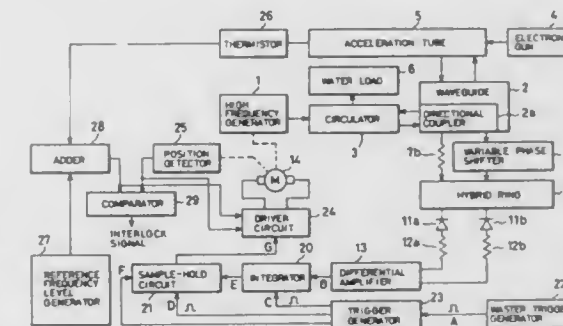
Filed Oct. 12, 1990, Ser. No. 596,447

Claims priority, application Japan, May 31, 1990, 2-140026

Int. Cl.³ H01J 23/34

U.S. Cl. 328-233

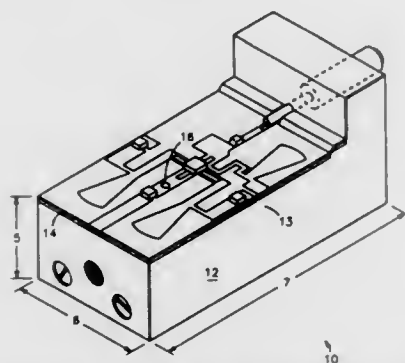
2 Claims



- A standing wave type linear accelerator comprising: a high frequency generator which generates high frequency power;
- a standing wave type accelerating tube on which the generated high frequency power is incident and from which the same is reflected;
- a means which is disposed between the high frequency generator and the accelerating tube to take out one part of each of the incident high frequency power and the reflected high frequency power;
- a variable phase shifter which changes a phase of either one of the both parts of the incident and reflected high frequency power;
- a high frequency mixer which mixes the phase-shifted one part with the other part of the incident and reflected high frequency power;
- a differential amplifier which generates a signal showing a phase difference between the incident and reflected high frequency power based on an output from the high frequency mixer;
- an integration and sample-hold means which integrates the phase difference signal and sample-holds the same; and
- a feedback means which feeds back an output of the integration and sample-hold means to said high frequency generator to perform follow-up control so as to make an oscillation frequency of said high frequency generator coincide

cluding means for varying bias current within said shaping means.

5,087,895
MINIATURE MICROSTRIP/CAVITY OSCILLATOR
 Bernard E. Sigmon, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
 Filed Feb. 2, 1988, Ser. No. 151,341
 Int. Cl.⁵ H03B 5/18
 U.S. Cl. 331-96 3 Claims



1. A miniature microstrip cavity oscillator which is mechanically tunable over a wide range of microwave frequencies and maintains high frequency stability over changes in temperature, said oscillator comprising:

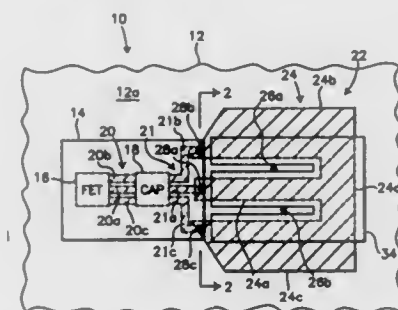
a resonant frequency determining element constructed of a plurality of predetermined materials having different coefficients of linear expansion, said resonant frequency determining element comprising a housing member, said housing member being substantially hollow and having an open end; a plate enclosing said open end of said housing member, said plate having an outer face and an inner face; a cantilever member fixedly attached to a central area of said inner face of said cover plate; a threaded bore extending concentrically through said cantilever member and said cover plate; a mechanical tuning screw inserted in said threaded bore, said tuning screw having a slot on one end for mechanically adjusting said tuning screw and a center conductor fixedly attached to an opposite end of said tuning screw; and first fastening means for attaching said cover plate to said housing member;

a microstrip circuit board including circuit means for creating a positive feedback signal for a resonant frequency of oscillation determined within said resonant frequency determining element, for amplifying said resonant frequency, and for eliminating unwanted stable frequencies of oscillation; second fastening means attaching said microstrip circuit board to said resonant frequency determining element; and

a capacitive coupling probe suspended in said resonant frequency determining element, said capacitive coupling probe coupling said circuit means to said resonant frequency determining element.

5,087,896
FLIP-CHIP MMIC OSCILLATOR ASSEMBLY WITH OFF-CHIP COPLANAR WAVEGUIDE RESONANT INDUCTOR

Cheng P. Wen, Mission Viejo; Gregory S. Mendolia, Torrance; Mario Siracusa, Fountain Valley, all of Calif.; Joseph J. Maieron, Kokomo, and William D. Higdon, Greentown, both of Ind., assignors to Hughes Aircraft Company, Los Angeles, Calif. and Delco Electronics Corporation, Kokomo, Ind.
 Filed Jan. 16, 1991, Ser. No. 641,954
 Int. Cl.⁵ H03B 5/18; H01P 3/08
 U.S. Cl. 331-99 26 Claims



1. A microwave frequency resonant circuit assembly, comprising:

an electrically insulative substrate;
 an integrated circuit chip mounted on the substrate;
 capacitor means formed on the chip;
 inductor means including a shorted coplanar waveguide section formed on the substrate; and
 electrical connector means interconnecting the capacitor means and the inductor means to form a resonant circuit.

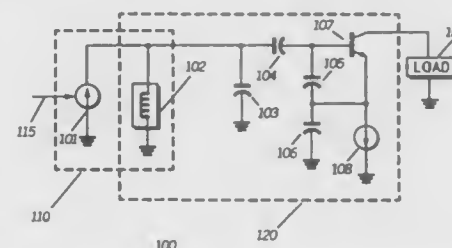
13. A method of fabricating a microwave frequency inductor on an electrically insulative substrate, comprising the steps of:

- forming a shorted coplanar waveguide section on the substrate, the waveguide section including first and second ground strips, a conductor strip extending between the first and second ground strips in parallel relation thereto and being separated therefrom by first and second spaces respectively, and a shorting strip for electrically interconnecting adjacent first ends of the conductor strip and first and second ground strips respectively;
- forming a dielectric film over at least adjacent portions of the conductor strip and first and second ground strips;
- sensing the inductance of the waveguide section;
- removing part of the dielectric film from at least one of the first and second spaces; and
- repeating steps (c) and (d) until the sensed inductance is substantially equal to a predetermined value.

5,087,897
OSCILLATOR TUNABLE BY VARYING CURRENT IN SPIRAL INDUCTOR ON FERRITE SUBSTRATE
 Jose I. Suarez, Coral Gables, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
 Filed Mar. 4, 1991, Ser. No. 663,533
 Int. Cl.⁵ H03B 5/12 12 Claims

U.S. Cl. 331-117 R 12 Claims
 5. A circuit for generating a frequency output comprising: a tunable oscillator circuit; and a tuning means for tuning said oscillator circuit including:

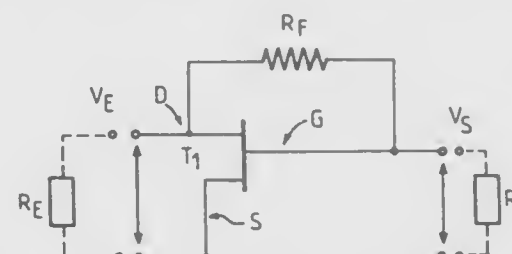
a conductive inductor pattern formed on a ferrite substrate; and



a current source for providing current through said spiral inductor.

5,087,898
INTEGRATED SEMICONDUCTOR ACTIVE ISOLATOR CIRCUIT

Ramesh Pyndiah, Valenton, France, and Francis van den Boogaart, Leidschendam, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
 Continuation of Ser. No. 490,119, Mar. 7, 1990, abandoned. This application Feb. 28, 1991, Ser. No. 663,074
 Claims priority, application France, Mar. 14, 1989, 89 03308
 Int. Cl.⁵ H03H 11/38
 U.S. Cl. 333-24 R 18 Claims



5,087,901

SURFACE ACOUSTIC WAVE BAND-PASS FILTER WITH DIFFERENT PHASE WEIGHTED TRANSDUCERS

Kazuhito Kurosawa, Ibaraki; Mitsutaka Hikita, Tokyo; Toyoji Tabuchi, Kanagawa; Nobuhiko Shibagaki, Tokyo, and Tetsuya Hirashima, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

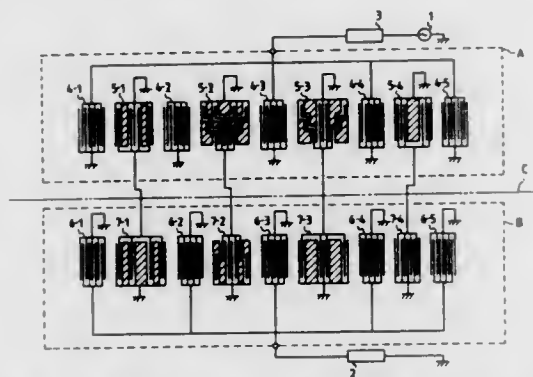
Filed Mar. 8, 1990, Ser. No. 490,446

Claims priority, application Japan, Mar. 13, 1989, 1-57796

Int. Cl.⁵ H03H 9/25

U.S. Cl. 333—193

1 Claim



1. In a surface acoustic wave band-pass filter comprising a surface acoustic wave propagating substrate, a first surface acoustic wave device disposed on said substrate, a second surface acoustic wave device disposed on said substrate, said first and second surface acoustic wave devices are symmetrically arranged about a line therebetween and a propagating direction of a surface acoustic wave being parallel to said line, said first surface acoustic wave device including a first electro-acoustic transducer unit divided in the surface wave propagating direction into a plurality of repetitively arranged first electro-acoustic transducers, said plurality of first electro-acoustic transducers being connected commonly to an input electric signal source for converting said input electric signal to a first surface acoustic wave, and said first surface acoustic wave device including a first acousto-electric transducer unit having a plurality of first acousto-electric transducers arranged repetitively and alternatively to said first electro-acoustic transducers for receiving said first surface acoustic wave emitted from said first electro-acoustic transducers and converting said first surface acoustic wave into an intermediate electric signal, said second surface acoustic wave device including a second acousto-electric transducer unit divided in the surface acoustic wave propagating direction into a plurality of repetitively arranged second acousto-electric transducers, said plurality of second acousto-electric transducers being connected commonly to an output terminal, and said second surface acoustic wave device including a second electro-acoustic transducer unit having a plurality of second electro-acoustic transducers arranged repetitively and alternatively to said second acousto-electric transducers and correspondingly electrically connected to said plurality of first acousto-electric transducers of said first acousto-electric transducer unit for converting said intermediate electric signal from said first acousto-electric transducer unit into a second surface acoustic wave to said second acousto-electric transducer unit which provides an output electric signal at said output terminal, an improvement comprising:

at least one of a first acousto-electric transducer and a correspondingly electrically connected second electro-acoustic transducer being phase-weighted differently from each other and each said first acousto-electric transducer and said second electro-acoustic transducer being respectively phased weighted differently from other transducers of the same type on the same device.

5,087,902

RESONANT FREQUENCY-TEMPERATURE CHARACTERISTICS COMPENSABLE HIGH FREQUENCY CIRCUIT ELEMENTAL DEVICE

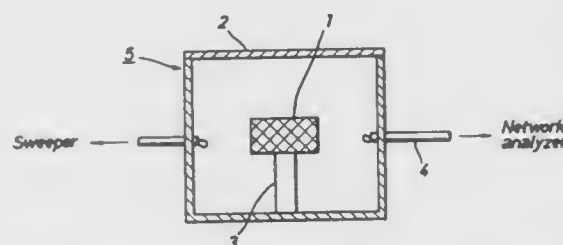
Takehiro Hyuga, Ichikawa; Kazutoshi Matsumoto, and Tetsuya Mukai, both of Matsudo, all of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,284

Int. Cl.⁵ H01P 7/10

U.S. Cl. 333—219.1

9 Claims



1. A high frequency circuit elemental device comprising a casing and a dielectric ceramic mounted in said casing, said dielectric ceramic undergoing order-disorder structural transformation when it is heat treated to change the temperature coefficient of the resonant frequency of said elemental device.

5,087,903

SEESAW TYPE MECHANICALLY INTERLOCKED ELECTROMAGNETIC SWITCH FOR CONTROLLING FORWARD/REVERSE CURRENT SYSTEMS

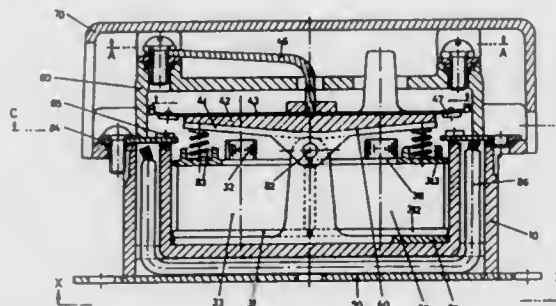
Han-Tsung Chiu, No. 33, Lane 145, Fu-Ying Road, Hsin-Chuang, Taipei Hsien, Taiwan

Filed May 30, 1990, Ser. No. 530,325

Int. Cl.⁵ H01H 67/02

U.S. Cl. 335—128

4 Claims



1. A seesaw mechanically interlocked electromagnetic switch to controlling a forward/reverse current system, comprising:

- a main casing, an exciter set, a seesaw assembly, a soleplate, an upper casing, and a transparent top cover, said main casing having an inner casing in which a U-shaped seat is fixedly disposed to receive the exciter set, said U-shaped seat including two coil holders arranged in parallel, two round holes separately formed on sidewalls of the U-shaped seat, a fixed pivot supported in the two round holes, said fixed pivot supporting said seesaw assembly and permitting the same to swing around said fixed pivot;
- a plurality of side openings formed between said inner casing and outer walls of said main casing at two opposite sides of said main casing, and a bottom space formed between said inner casing and a bottom of said main casing, said side openings forming means for permitting conductors to pass therethrough; and
- a plurality of fixed strip conductors disposed in said side openings with fixed contact points provided at inner ends

of each of said fixed strip conductors, said seesaw assembly including a plurality of elastic strip conductor, and a plurality of contact points provided on two ends of each of said elastic strip conductors at a position corresponding to said fixed contact points on said fixed strip conductors to permit formation of closed or open circuits; and

two springs disposed under two ends of said seesaw assembly, said springs being positioned between said seesaw assembly and said exciter set to balance said seesaw assembly and form an interlocked forward/reverse current electromagnetic switch,

wherein said soleplate fixedly joined to a bottom of said main casing to allow various conductors to pass through a bottom of said main casing without being damaged to exposure to the outside of said main casing, said upper casing covers said seesaw assembly and is secured to said main casing with screws, a plurality of openings are formed on a top of said upper casing allowing flexible conductors connected at one end of said elastic strip conductors to pass through said upper casing and be connected at their other ends to terminals provided on top of said upper casing, a transparent top cover covers said upper casing to protect the terminals thereon and has a plurality of round holes formed therein to permit round bars on said upper casing to be inserted into said round holes so that said transparent top cover is securely joined to said upper casing, and said top cover also has a plurality of conductor holes formed at a position nearby the outside of said terminal on said upper casing to allow conductors to pass therethrough.

5,087,904

JOY STICK

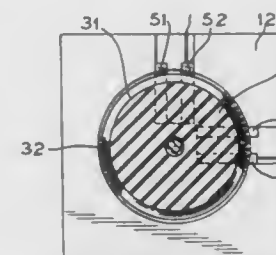
Dean DeVolpi, 603 Columbine, Lisle, Ill. 60532

Filed Feb. 9, 1990, Ser. No. 477,478

Int. Cl.⁵ H01C 10/16

U.S. Cl. 338—128

13 Claims



1. A joy stick comprising a ball of insulating material formed with a groove, a contact assembly mounted in said groove, a body member formed with a spherically-shaped socket in which said ball is moveably mounted, an electrical resistive path formed on said body member within said socket and engageable with said contact assembly and means for moving said ball.

5,087,905

METHOD FOR SUPERIMPOSING INDEPENDENTLY TRANSMITTED DATA ON PAGER DISPLAY

Hiroyasu Kuramatsu; Toshifumi Sato; Masahiro Matai, all of Tokyo, and Sadayuki Anma, Shizuoka, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,427

Claims priority, application Japan, Jun. 19, 1989, 1-156095; Jun. 19, 1989, 1-157700

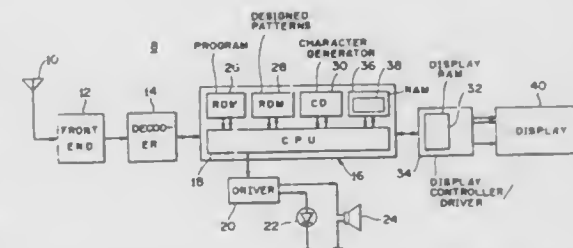
Int. Cl.⁵ H04Q 1/30; G08B 5/22

U.S. Cl. 340—311.1

9 Claims

9. A portable pager having a display, comprising: receiving means for receiving a first and sequential second radio data transmissions; determining means for determining, based on information contained in the first transmission whether or not the data

contained in the second data transmission is to be superimposed on the data contained in the first transmission; superimposing means for superimposing the data contained in the second transmissions on the data contained in the



first transmission in response to the result obtained from said determining means; and means for producing an image on the display of the pager indicative of the most recent superimposition.

5,087,906

SELECTIVE CALL RECEIVER HAVING A LIGHT CHANNEL FOR PROVIDING A VISUAL ALERT

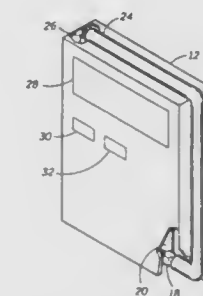
Eric T. Eaton, Lake Worth, and Rodney S. Whaley, Lantana, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 5, 1990, Ser. No. 489,128

Int. Cl.⁵ H04Q 1/30; G08B 5/22

U.S. Cl. 340—311.1

14 Claims



12. A selective call receiver, comprising: receiver means for receiving a message; alert means for providing an alert of the reception of the message by illuminating an optical fiber disposed substantially along at least one external surface of the selective call receiver so that light is emitted substantially along the length of said optical fiber.

5,087,907

FRICTION LINING WARNING DEVICE

Rolf Weiler, Eppstein; Uwe Bach, Niedernhausen; Klaus-Dieter Paschke, Frankfurt am Main, and Gerald Roth, Hanau, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 26, 1990, Ser. No. 471,143

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903306

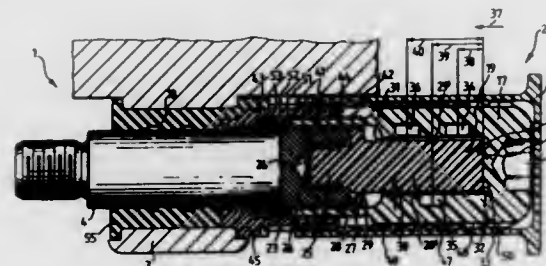
Int. Cl.⁵ B60Q 1/00

U.S. Cl. 340—454

21 Claims

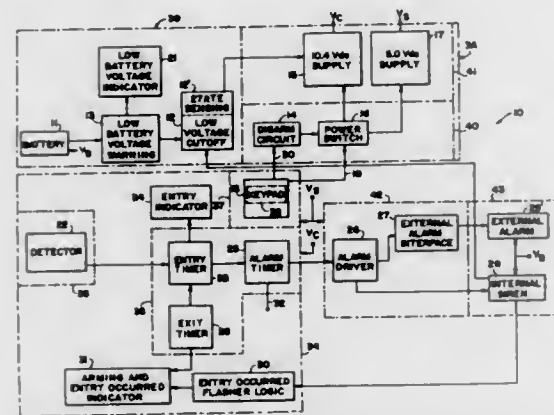
20. A friction lining warning device for a spot-type disc brake slidably arranged on a pin, with an axially extending stud presenting a front surface and with a bushing surrounding said stud and presenting an internal bottom surface which are movable relative to each other, wherein said front surface (20, 68) of said stud (19, 61, 62, 91, 101, 102, 121, 141, 190, 201) is abutable against said bottom surface (21) and means for indi-

cating that a warning state has been detected including electric switches mounted in said bushing adjacent said stud, and



wherein said stud provides a stop which is axially abutable with said pin.

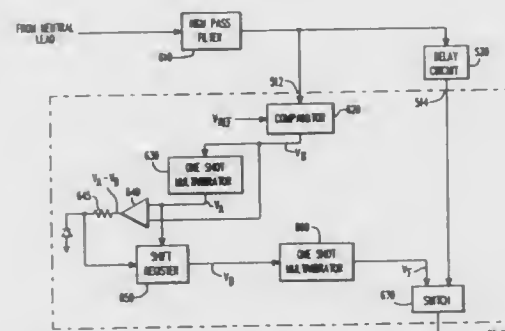
5,087,908
PORTABLE ALARM SYSTEM WITH AUTOMATIC OPERATING STATE TRANSFERRAL
 William A. Sanders, Jr., Jacksonville, Fla., assignor to Homes Beautiful Investment & Service Co., Jacksonville, Fla.
 Filed Jan. 12, 1990, Ser. No. 464,451
 Int. Cl.⁵ G08B 13/18
 U.S. Cl. 340—567 24 Claims



1. A portable security alarm system for detecting the presence of an intruder in a protected area comprising a direct current power source, an output terminal circuit means for receiving power from said source, said direct current power source including a battery and battery voltage sensing circuit means, said battery voltage sensing circuit means being operable to prevent power from being provided to said output terminal circuit means from said battery when the output voltage of said battery falls below a predetermined low voltage cutoff value as established by said battery voltage sensing circuit means, switching circuit means connected between said power source and said output terminal circuit means for selectively controlling power to said output terminal circuit means, alarm circuit means including an alarm connected to and selectively energized by said power source, and electronic circuit means connected to and selectively receiving power from said output terminal circuit means and connected to said alarm circuit means for selective energization of said alarm by said power source, said electronic circuit means including detecting circuit means for detecting the presence of an intruder in a protected area and providing a first output signal in response to the detection of an intruder, said electronic circuit means further including control circuit means responsive to said first output signal and selectively operating said system in one of a plurality of states and selectively transferring said system from said one state to another of said states; said plurality of states including an alarm state wherein said alarm is energized for a first time period in response to the detection of an intruder by said detection circuit means, a monitoring state wherein said

system is responsive to the detection of an intruder by said detection circuit means, said system being transferable to said alarm state only after a second time period, and an arming state wherein said alarm is incapable of being energized during a third time period, said control circuit means including programmable circuit means connected to said switching circuit means and having manual entry means for providing an arming signal in response to a first predetermined method of operation of said manual entry means as programmed in said programmable circuit means, said switching circuit means being responsive to said arming signal to provide power from said power source to said output terminal circuit means when said arming signal is received, said electronic circuit means being energized when power is applied to said output terminal circuit means to allow said system to be operated selectively in said plurality of states by said control circuit means.

5,087,909
METHOD AND APPARATUS FOR RADIO FREQUENCY SIGNAL DETECTION
 Michael Twerdochlib, Ovideo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
 Filed Aug. 18, 1989, Ser. No. 395,633
 Int. Cl.⁵ G08B 21/00
 U.S. Cl. 340—635 6 Claims

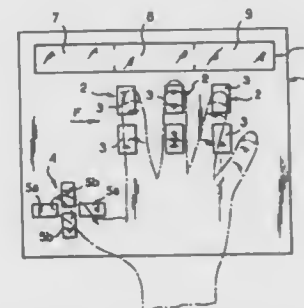


1. A method for detecting an actual fault condition occurring in a generator, comprising the steps of:
 (a) sensing an RF signal from the generator;
 (b) discriminating between false fault signals and actual fault signals, comprising the steps of:
 (b1) detecting a level of a first occurrence of the sensed RF signal;
 (b2) detecting a second occurrence of the sensed RF signal; and
 (b3) allowing output of an actual fault signal only if the level of the first occurrence of the RF signal exceeds a predetermined level and the second occurrence of the RF signal is within a predetermined time period;
 (c) outputting only the actual fault signals; and
 (d) indicating the existence of the actual fault condition by testing the actual fault signals against a threshold.

5,087,910
ELECTRONIC KEYBOARD FOR ONE-HAND OPERATION
 Laurent Gnyot-Slonnest, 82 rue du Général Leclerc, 92270 Bois-Colombes, France
 Continuation of Ser. No. 285,357, Dec. 24, 1988, abandoned, which is a continuation of Ser. No. 890,464, Jul. 29, 1986, abandoned. This application Sep. 14, 1990, Ser. No. 585,012
 Claims priority, application France, Jul. 29, 1985, 85 11532
 Int. Cl.⁵ G09G 3/02 20 Claims

1. An electronic keyboard for one-hand operation, more particularly for generating alphanumeric and analog characters and/or processing instructions, the keyboard comprising a

plurality of keys and an electronic circuit electrically connected to said key to interpret the state of the keys and to deliver a signal indicative thereof, said electronic circuit also being connected to display means and external connection means, said keyboard comprising three keys associated with the fingers of the hand other than the thumb and one key associated with the thumb, each key associated with a finger of the hand other than the thumb comprising two parts extending in continuation of said finger, so that each of the two parts can be actuated by the corresponding finger at the same time as other parts of adjacent keys by other fingers, without appreciable movement of the hand, and the key associated with the thumb can assume five different states in response to the thumb, said thumb key comprising four parts which are so



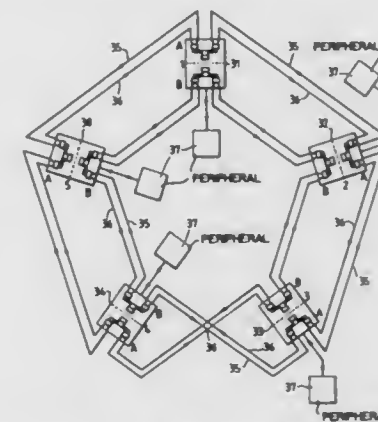
disposed as to be actuated selectively by the thumb without appreciable movement of the hand, wherein the actuation of the keys associated with the fingers other than the thumb permits obtaining 26 different characters, the electronic circuit being so arranged that

- a first group of six characters is obtained when the different parts of said three keys are actuated selectively by one of said fingers,
- a second group of twelve characters is obtained when two key parts corresponding to two different keys are actuated selectively simultaneously by two fingers, and
- a third group of eight characters is obtained when three key parts corresponding to three different keys are actuated selectively simultaneously by three fingers.

5,087,911
DATA COMMUNICATION NETWORK
 Howard Green, Coventry, and Anthony P. Lumb, Nuneaton, both of England, assignors to GEC Plessey Telecommunications Limited, England
 Filed Jun. 20, 1988, Ser. No. 209,338
 Claims priority, application United Kingdom, Jun. 19, 1987, 8714388
 Int. Cl.⁵ H04Q 3/00 4 Claims

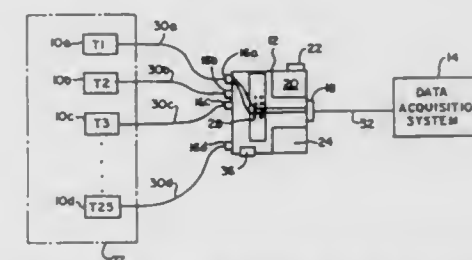
U.S. Cl. 340—825.05 4 Claims
 1. A fault-tolerant data communications network, comprising:
 (a) a plurality of user terminals, each terminal having two stations, each station being independently operable and having means for receiving data and means for transmitting data;
 (b) ring means having a signal path along which the terminals are electrically interconnected, said ring means including a primary data line electrically interconnecting one station of each terminal for routing data in one direction around the ring means, and a secondary data line electrically interconnecting another station of each terminal for routing data in an opposite direction around the ring means;
 (c) said one station and said other station of each terminal being physically located adjacent each other at a particular terminal site on the ring means; and

(d) said one station and said other station of each terminal being electrically interconnected at opposite ends of a



portion of the signal path, along which path portion are located half of the remaining stations of the network.

5,087,912
UNIVERSAL PRESSURE MEASUREMENT INTERFACE
 Daniel Horwitz, Altamonte Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
 Filed Jan. 31, 1990, Ser. No. 472,746
 Int. Cl.⁵ G08C 19/02
 U.S. Cl. 340—870.390 11 Claims



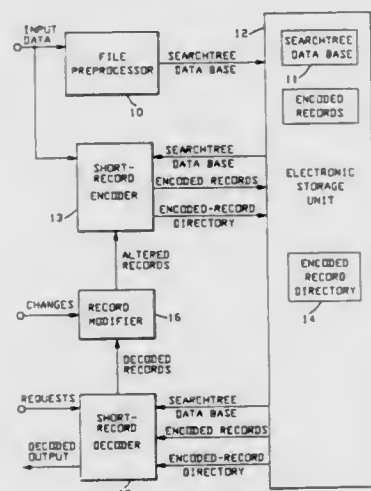
1. Transducer output measurement interface apparatus for providing an interface between at least one DC powered transducer and a data acquisition system wherein transducer generated data signals are transmitted to the data acquisition system over at least one multi-wire transmitter cable and a data acquisition cable, the interface comprising:

- at least one multi-pin connector for coupling signals between the multi-wire cable and said interface apparatus;
- master pin connector means for coupling signals between said interface apparatus and the data acquisition system;
- a power entry module for receiving an input power signal of approximately 100 to 240 VAC and 50 to 60 Hz;
- power supply means for converting the input power to a predefined DC voltage, the DC voltage depending upon the power requirements of the transducer; and
- means for coupling the DC voltage to the multi-pin connector, thereby providing means for supplying DC power to the transducer.

5,087,913
SHORT-RECORD DATA COMPRESSION AND DECOMPRESSION SYSTEM
 Willard L. Eastman, Lexington, Mass., assignor to Unisys Corporation, Blue Bell, Pa.
 Filed Aug. 27, 1990, Ser. No. 572,647
 Int. Cl.⁵ H03M 7/30 6 Claims
 U.S. Cl. 341—95 6 Claims
 1. Apparatus for compressing and decompressing short data

records, said records being comprised of data over a predetermined alphabet, said apparatus comprising:

preprocessor means responsive to a sample of said data over said predetermined alphabet for constructing a searchtree database therefrom using Lempel-Ziv data compression, said searchtree database being incrementally grown until a predetermined limit is attained and thereafter maintained fixed, thereby constructing a fixed searchtree database, storage means for storing said fixed searchtree database, encoder means responsive to said fixed searchtree database in said storage means and to said short data records for compressing said short data records in accordance with said fixed searchtree database using said Lempel-Ziv data



compression, thereby generating encoded records, said encoded records being stored in said storage means at locations thereof, encoded-record directory means responsive to said encoder means for generating a directory of said encoded records in accordance with said locations, said directory means being stored in said storage means, and decoder means responsive to said fixed searchtree database, said encoded records and said directory for decompressing, in accordance with said fixed Searchtree Database using Lempel-Ziv data decompression, an encoded record located by means of said directory, thereby generating a decompressed short-record.

5,087,914

DC CALIBRATION SYSTEM FOR A DIGITAL-TO-ANALOG CONVERTER

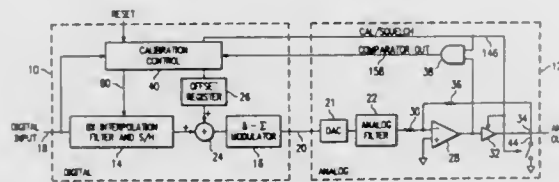
Navdeep S. Sooch; Jeffrey W. Scott, both of Austin, Tex., and Tadashi Tanaka, Aiko, Japan, assignors to Crystal Semiconductor Corp., Austin, Tex.

Filed Aug. 22, 1990, Ser. No. 571,375

Int. Cl.⁵ H03M 1/10

U.S. Cl. 341-120

31 Claims



1. A digital-to-analog converter with an integrated calibration system, comprising:
a digital-to-analog converter for receiving a digital input signal on a digital input and outputting an analog output

signal having an analog output level corresponding to the digital value of said digital input signal;
an offset circuit for offsetting said analog output level by an offset value, said offset circuit including:
a digital summing junction disposed within said digital-to-analog converter, and
an offset register for storing said offset value as a digital value, the output of said offset register input to a digital input of said digital summing junction for summing with a digital signal in the processing path of said digital-to-analog converter;
sampling circuitry for sampling the analog output level of said analog output signal of said digital-to-analog converter when a predetermined calibrating digital input signal is input to said digital-to-analog converter; and
register control circuitry for varying said offset value in said offset register until the analog output level of said analog output signal is substantially equal to a predetermined calibration analog output signal when said predetermined calibrating digital input signal is input to said digital-to-analog converter.

5,087,915

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH ANALOG TO DIGITAL CONVERTER

Tatsuro Toya, Tokyo, Japan, assignor to Hitachi, Ltd., & Hitachi Microcomputer Engineering Ltd., Tokyo, Japan

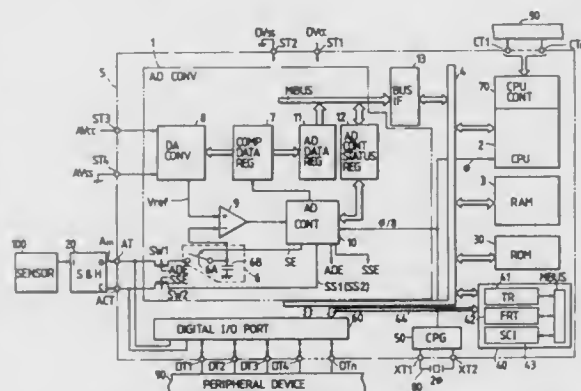
Filed Jan. 2, 1990, Ser. No. 459,531

Claims priority, application Japan, Jan. 10, 1989, 01-3504

Int. Cl.⁵ H03M 1/00, 1/12

U.S. Cl. 341-155

8 Claims



1. In a single-chip microcomputer including a central processing unit coupled to an analog to digital converter which converts an analog signal into digital data, the analog to digital converter having a control register for controlling an operation of the analog to digital converter, an internal sampling circuit for sampling the analog signal to be converted, a converting circuit for providing a converting operation for converting the analog signal to the digital data and a data register for storing the digital data which is to be provided to the central processing unit, the control register of the analog to digital converter comprising:

a first control bit for controlling a start of the converter operation of the analog to digital converter, the first control bit set in the control register by the central processing unit when conversion of the analog signal to digital data is required;
a second control bit for indicating a completion of the converting operation of the analog to digital converter;
a third control bit for controlling an interrupt request to the central processing unit; and
a fourth control bit having a first state and a second state, selectively determined by the central processing unit, where the first state enables use of both an external sample

and hold circuit and the internal sampling circuit, and the second state enables use of the internal sampling circuit.

5,087,916

METHOD OF NAVIGATION

Walter Metzendorf, Friedrichshafen; Peter Lux, Langenargen, and Max Elbert, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Fed. Rep. of Germany

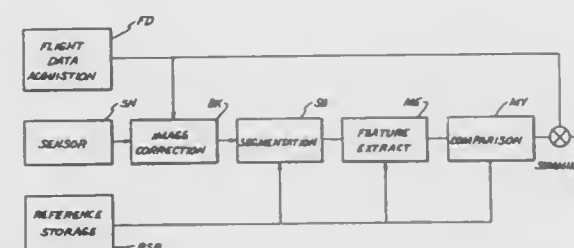
Filed May 14, 1990, Ser. No. 523,130

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915631

Int. Cl.⁵ G06F 15/50

U.S. Cl. 342-64

6 Claims



1. Apparatus for navigation and updating of navigation for aircraft under utilization of sensor image processing and a reference store comprising,

a scanning sensor including a circuit for obtaining a two dimensional range image of a portion of overflight territory; the image being composed of image points each being represented by a brightness value corresponding to the distance of the craft from the respective territory point represented by the respective image point;
means connected to the sensor for segmentizing the image data in order to obtain an areal pattern of type features of and within and as part of the image for purposes of classifying particular types of objects across which the craft flies in terms of range/brightness information and relation between such information as between neighboring image points in transverse direction as well as in the direction of flight;
means connected to the means for segmentizing, for extracting particular signature defining features from the segmentizing means, including localized elevational jumps; and
means connected to the means for extracting for determining the position of the craft by correlating a plurality of features and their spatial orientation to each other as extracted with corresponding stored reference information in order to provide a maximum fit that is indicative of deviation of the flight from a flight path as identified by the reference information.

5,087,917

RADAR SYSTEM

Takahiko Fujisaka; Tetsuo Kirimoto; Yoshimasa Oh-hashii, and Michimasa Kondo, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,157

Claims priority, application Japan, Sep. 20, 1989, 1-244069; Sep. 20, 1989, 1-244070

Int. Cl.⁵ G01S 13/00

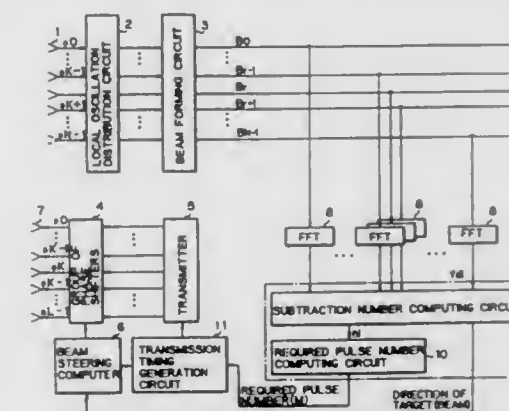
U.S. Cl. 342-84

6 Claims

1. A radar system comprising:
transmission means having a phased array antenna for transmitting beams toward respective targets during each of transmission sub-cycles of transmission/reception main cycles in accordance with transmission pulses generated in each of said sub-cycles;
reception means having a digital beam forming antenna capable of forming multiple beams for receiving waves

reflected from said targets during each of reception sub-cycles of said main cycles;
means for detecting Doppler frequencies (f_{di}) of said respective targets based on signals corresponding to said formed beams;

subtraction control means for calculating a subtraction reference number (n_i) of said transmission pulses for each of said targets in accordance with said detected Doppler frequency (f_{di}) and then a required number (M) of transmission pulses to be transmitted for each of said transmission sub-cycles in accordance with said subtraction refer-



ence number (n_i) so as not to cause ambiguity on said detected Doppler frequencies, and for determining a beam direction for each of said transmission pulses;
means for controlling the transmission timing of said transmission pulses in accordance with said required number (M);
means for controlling a direction of each of transmission beams in accordance with said determined beam direction, in synchronism with said transmission timing; whereby a plurality of slow moving targets are alternatively observed for a plurality of said main cycles.

5,087,918

FMCW/2FD IMPLEMENTATION FOR VEHICLE NEAR OBSTACLE DETECTION SYSTEM

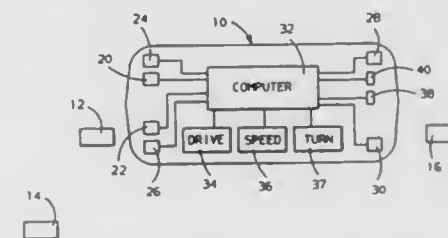
Phillip A. May, Lompoc, Calif.; John L. Ward, Kokomo, Ind., and Kassahun Kebede, Philadelphia, Pa., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 2, 1990, Ser. No. 503,435

Int. Cl.⁵ G01S 13/38

U.S. Cl. 342-85

6 Claims



1. A vehicle near obstacle detection system, the system comprising:

a radio frequency head capable of transmitting and receiving both frequency-modulated, continuous wave radar signals and two-frequency Doppler radar signals;
signal processing means responsive to received radar signals reflected from an object for determining the range to the object;
means for sensing vehicle speed; and
means for controlling the radio frequency head to (A) trans-

a circular piezoelectric transducer disposed in said recess and defining with said body a short ink chamber adjacent to the end face of the body, said piezoelectric transducer being adapted to expand and contract in a direction of a radial axis of said transducer when an excitation voltage is applied thereto;

an ink feed channel connecting with said recess for feeding ink to said ink chamber;
a nozzle plate detachably mounted on said end face of said body, said nozzle plate having one or more nozzles disposed to eject ink under pressure when said piezoelectric transducer is actuated.

5,087,925

SMALL DIAMETER DRUM THERMAL PRINTER USING EDGE DETECTOR

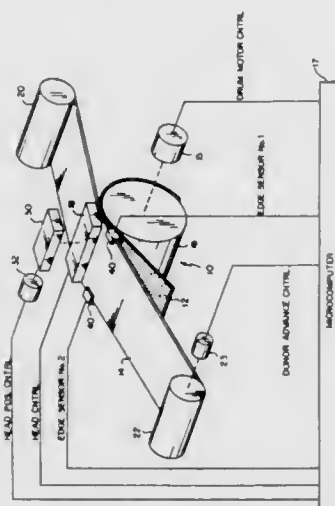
Young No, Pittsford, and Stanley W. Stephenson, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1990, Ser. No. 591,205

Int. Cl.⁵ G01D 15/10

U.S. Cl. 346—76 PH

6 Claims



1. In a small diameter drum color thermal printer apparatus in which colored dye is sequentially transferred from colored dye frames in a dye-carrier into a receiver having a leading and trailing edge by heat applied from an energized print head which forms a nip by pressing the carrier and the receiver against a small diameter drum, the receiving means for incrementally rotating said small diameter drum in a first direction to advance the receiver until a colored dye frame is printed and then rotating said drum being rotated in a counter direction to a position where said receiver is spaced from the nip and ready to be fed again into the nip, the improvement comprising:

- (a) said small diameter drum having a platen surface wherein the drum is configured so that both side edges of the receiver when in the nip hangs over one end of such platen surface;
- (b) sensor means disposed adjacent to the nip for detecting the lead edge of a portion of the receiver which overhangs one end of the platen surface when in the nip and produces a signal just prior to said receiver entering the nip; and
- (c) means responsive to such signals for controlling the energization of the print head as the drum rotates in the first direction to form a colored dye frame in the receiver.

DUAL TOGGLE MECHANISM FOR PRESSING A THERMAL PRINTING HEAD AGAINST A PLATEN ROLL IN A PRINTER FOR USE WITH AN INSERTABLE CASSETTE

Yoshiaki Wakui, Suginami, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

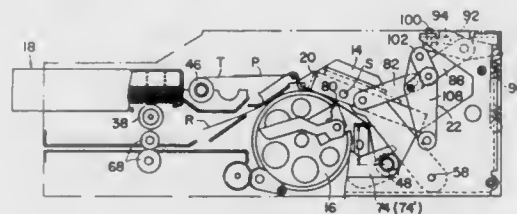
Filed Mar. 30, 1990, Ser. No. 501,942

Claims priority, application Japan, Mar. 31, 1989, 1-83763

Int. Cl.⁵ B41J 25/304, 2/325; G01D 15/00, 15/22

U.S. Cl. 346—76 PH

7 Claims



1. A thermal ink transfer printer for use with an insertable cassette in which there are housed both an elongate strip of ink transfer sheet wound at least in part on, and extending between, a payoff mandrel and a detachable takeup mandrel, and a stack of recording sheets for thermally receiving ink from the ink transfer strip, the printer including means for withdrawing the takeup mandrel from within the cassette and holding the takeup mandrel in a preassigned position within the printer in order to hold the ink transfer strip between a thermal printing head and a platen and means for introducing the recording sheets from the cassette onto the platen one by one, wherein the improvement resides in a head pressing mechanism for pressing the thermal printing head against the platen with the transfer strip and a recording sheet for ink transfer interposed between the printing head and the platen, the head pressing mechanism comprising:

- (a) frame means;
- (b) head support means rigidly supporting the thermal printing head and pivotally mounted to the frame means so that the printing head is movable with the head support means into and out of engagement with the platen with the transfer strip and recording sheet interposed therebetween;
- (c) a first toggle joint acting between the frame means and the head support means; and
- (d) a second toggle joint acting between the frame means and the first toggle joint for causing the first toggle joint to move the head support means toward and away from the platen.

5,087,927

ON-AXIS AIR GAGE FOCUS SYSTEM

Tim Thomas, Beaverton; Eric Christenson, Portland; Bob Holstrom, Portland, and Eugene Mino, Jr., Portland, all of Oreg., assignors to Ateo Corporation, Beaverton, Oreg.

Filed Jan. 31, 1990, Ser. No. 472,894

Int. Cl.⁵ G01D 9/42; G01M 3/02

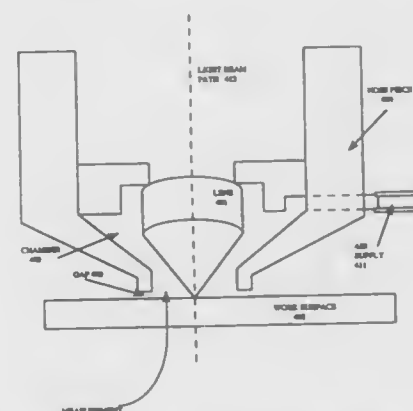
U.S. Cl. 346—108

21 Claims

1. A focus system for focusing a beam onto a surface comprising:

- (a) a chamber for holding a lens, said chamber defining a

orifice, said orifice located in a path between said lens and a workpiece;
(b) supply means for supplying a fluid to said chamber; and



(c) measurement means for measuring fluid flow from said supply means to said chamber to determine the distance between said lens and said workpiece.

5,087,928

IMAGE RECORDING APPARATUS

Yoshiharu Okino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

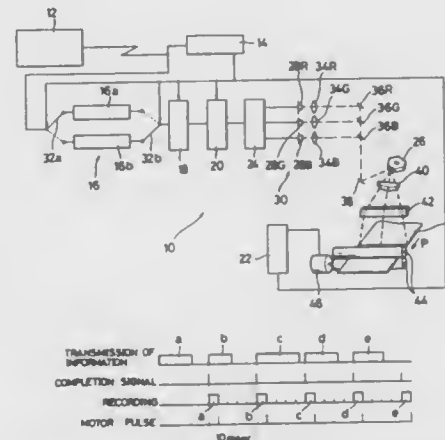
Filed May 25, 1990, Ser. No. 528,510

Claims priority, application Japan, May 26, 1989, 1-134416

Int. Cl.⁵ G01D 9/42; H04N 1/21

U.S. Cl. 346—108

4 Claims



2. An image recording apparatus for recording image information transmitted from an information source on a recording material, wherein the image information transmitted from the information source is received by a light beam-source, said image information being transmitted such that a predetermined unit of image information is transmitted at a predetermined speed within a predetermined recording time interval; the image information received by the light-beam source is converted to a light beam corresponding to the image information; the light beam is deflected by means of an optical deflector in a main scanning direction, the optical deflector being moved at a predetermined scanning cycle such that the recording time interval correspond to at least one scanning period; and an image is recorded at the predetermined recording time interval on the recording material which is transported in a direction perpendicular to the main scanning direction for a sub-scanning;

said image recording apparatus being provided with a means for setting the recording time interval to an integer multiple of the scanning period of the optical deflector, based

on the image information-transmission speed from the information source;
a means for receiving the predetermined unit of the image information transmitted from the image information source within the recording time interval;
a means for recording the image on the recording material at the predetermined time interval within an effective image recording period; and
a means for adjusting the sub-scanning speed of the recording material to correspond to the recording time interval.

5,087,929

METHOD ELECTROPHOTOGRAPHIC PRINTING

Itsuo Takanashi, Kamakura; Takashi Yamamura, Yokohama; Shintaro Nakagaki, Miura; Toshikatsu Ichito, Kawasaki; Atsushi Nakano, Sagami; Tadayuki Shimada, and Toshio Konno, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

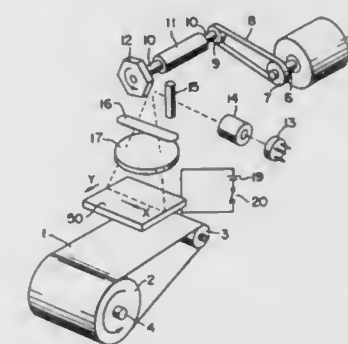
Filed Jan. 3, 1991, Ser. No. 637,171

Claims priority, application Japan, Jan. 5, 1990, 2-280

Int. Cl.⁵ H04N 1/21; G01D 9/42

U.S. Cl. 346—108

9 Claims



1. A method of electrophotographic printing, comprising the steps of:

- arranging a recording medium comprising a photoconductive member and photo-modulation member laminated to each other, both exhibiting photoelectric effect and a sensitized member made of a chargeable photoconductive member such that the recording medium and sensitized member face each other;
- radiating a first electro-magnetic radiation beam which is intensity-modulated with data to be recorded to the recording medium at the photoconductive member side thereof to record the data to the photo-modulation member with the photoelectric effect;
- radiating a second electro-magnetic radiation beam of constant intensity to the recording medium to emit therefrom a third electro-magnetic radiation beam exhibiting intensity variation subjected to the recorded data;
- exposing the sensitized member with the third electro-magnetic radiation beam to form thereon a charge image corresponding to the recorded data;
- sticking toner onto the sensitized member formed with the charge image to form thereon a toner image; and
- transferring the toner image onto a printing paper, thus to perform repeated printing utilizing the data once recorded to the recording medium.

5,087,930

DROP-ON-DEMAND INK JET PRINT HEAD

Joy Roy, and John S. Moore, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 1, 1989, Ser. No. 430,213

Int. Cl.⁵ B41J 2/045

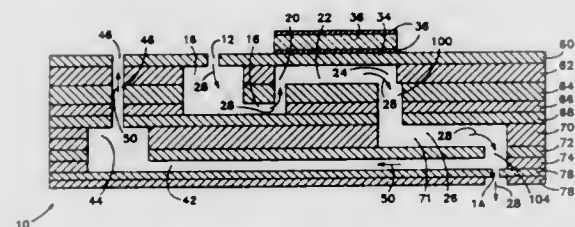
U.S. Cl. 346—140 R

10 Claims

1. A multiple-nozzle drop-on-demand ink jet print head for receiving ink from an ink supply and for ejecting ink drops

toward a print medium in response to an acoustic driver coupled to each nozzle, the ink jet print head comprising:

- a plurality of plates held together to form the ink jet print head;
- a first of such plates including therein at least one row of nozzles through which ink drops are ejected;
- a second of such plates defining a plurality of generally circular ink pressure chambers each of which having a geometric center and being arranged with its geometric center positioned in one of at least three nonintersecting rows, the geometric centers of the ink pressure chambers in one row being staggered from those in adjacent ones of the other rows, and each of the ink pressure chambers having an ink inlet connected to an ink supply channel and having an ink outlet connected to a passageway, the ink inlets and ink outlets being spaced oppositely across the



ink pressure chambers from one another for drawing ink from the ink supply channel and directing ink through a passageway toward an associated one of the nozzles in the first plate;

the first and second plates also separated by at least one passageway-defining plate having passageways of substantially equal lengths and cross-sectional areas for connecting each of the nozzles with an associated one of the ink outlets; and

a third of such plates positioned contiguous with the second plate and including acoustic drivers coupled to each of the ink pressure chambers, whereby the nozzles have similar resonance characteristics and exhibit substantially identical jetting characteristics when the acoustic drivers associated with their respective nozzles are driven with substantially identical waveforms.

5,087,931

PRESSURE-EQUALIZED INK TRANSPORT SYSTEM FOR ACOUSTIC INK PRINTERS

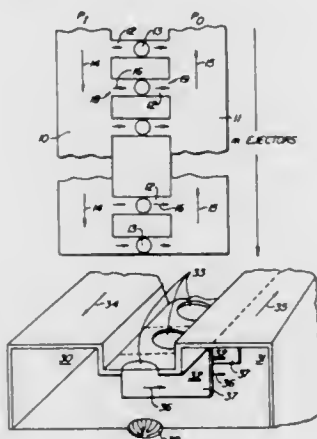
Eric G. Rawson, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 15, 1990, Ser. No. 523,624

Int. Cl.⁵ B41J 2/04, 2/175

U.S. Cl. 346—140 R

34 Claims



1. In an acoustic ink printer having a plurality of ejectors aligned in an axis, each ejector associated with a free surface of

liquid ink, said ejector radiating acoustic pressure upon said free surface to eject individual ink droplets on demand, a system for transporting ink under flow constantly to said free surfaces comprising:

- an input manifold parallel to said ejector axis for supplying ink to said ejectors, said manifold having a first end connected to a first ink supply source at a first predetermined pressure, said manifold having a plurality of openings, each opening corresponding to one of said ejectors, said manifold having a predetermined fluidic resistance between each of two adjacent openings;
- an output manifold parallel to said ejector axis for removing ink from said ejectors, said manifold having a first end adjacent to said input manifold first end connected to a second ink supply source at a second predetermined pressure equal in magnitude but opposite in sign to said first predetermined pressure, said manifold having a plurality of openings, each opening corresponding to one of said ejectors, said manifold having a predetermined fluidic resistance between each two adjacent openings, each fluidic resistance between said two adjacent output manifold openings being equal to fluidic resistance between said two corresponding adjacent input manifold openings; and
- a plurality of transverse conduits, each transverse conduit coupled to one of said ejectors and connected to said input manifold opening and to said output manifold opening corresponding to said ejector, said transverse conduit having an opening defining said free surface associated with said ejector, said conduit having a predetermined input fluidic resistance between said input manifold opening and said transverse conduit opening, and a predetermined output fluidic resistance between said conduit opening and said output manifold opening, said input and output fluid resistances being equal to each other; whereby hydrostatic gauge pressure at each free surface associated with each ejector is substantially equal and zero.

5,087,932

ELECTROPHOTOGRAPHIC IMAGE FORMING TERMINAL HAVING AN IMPROVED ARRANGEMENT OF ELECTRICAL PARTS

Hisao Chikano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

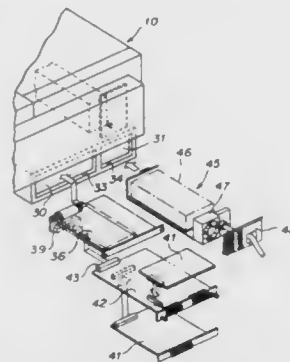
Filed May 18, 1990, Ser. No. 525,548

Claims priority, application Japan, May 23, 1989, 1-129451

Int. Cl.⁵ G01D 15/00

U.S. Cl. 346—145

12 Claims



1. A terminal device having an electrophotographic recording function comprising:

- a main frame of said terminal device;
- a metallic lower frame provided in a bottom portion of said main frame, said metallic lower frame having a first accommodation portion and a second accommodation portion, said metallic lower frame electromagnetically shield-

ing an inside portion of said metallic lower frame from an outside portion thereof, and said metallic lower frame having a first opening through which said first accommodation portion is partially exposed, and a second opening through which said second accommodation portion is partially exposed;

image recording means, provided in said main frame and positioned above said metallic lower frame, for recording an image on a photosensitive member and for transferring said image on paper which passes on said photosensitive member;

a controller board having a controller which generates character code data from a host system coupled to said terminal device, said controller board being accommodated in said first accommodation portion of said metallic lower frame, said controller board being detachable from said first accommodation portion through said first opening;

an engine board having a print engine controller which generates image data related to said image from said character code data, said engine board being accommodated in said first accommodation portion of said metallic lower frame, said engine board being detachable said first accommodation portion through said first opening; and

a power supply unit providing said controlling board and said print engine board with electrical power, said power supply unit having a casing and a fan for cooling said power supply unit, said power supply unit being accommodated in said second accommodation portion of said metallic lower frame, said power supply unit being detachable from said second accommodation portion through said second opening, and a window generated by said fan being transmitted to said first accommodation portion so that said controller board and said engine board can also be cooled by said fan; and

a shield member magnetically shielding said first and second accommodation portions from each other as well as an external device.

5,087,933

IN SITU INONOGRAPHIC UNIFORMITY CORRECTION

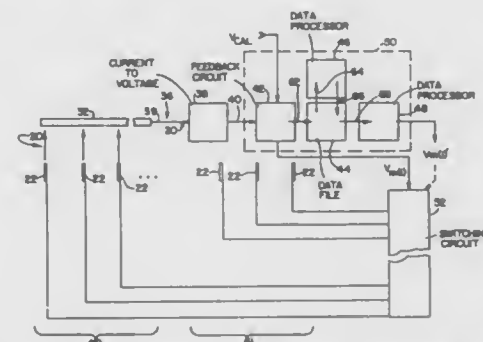
Richard G. Stearns, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 31, 1990, Ser. No. 636,326

Int. Cl.⁵ G01D 15/06

U.S. Cl. 346—159

14 Claims



1. In combination with an ionographic print head (10) apparatus having a source of ions moving in a stream through a modulation channel (24) in which a print array (16) of modulation electrodes (22) is positioned and individually biased by a modulation voltage ($V_m(i)$) to modulate said stream projected from said print head (10) as an ion current (20) to form a charge image on a dielectric surface of an electroreceptor, the improvement for correcting in situ, non-uniformity of said ion current (20) which comprises:

- an ion sensing means (36) for sensing values of said ion current (20) associated with one or more said modulation electrodes (22);
- a switching means (52) for addressing each one of said mod-

ulation electrodes (22) in said print array (16), and applying said modulation voltage ($V_m(i)$), respectively, to each of said modulation electrodes (22), said addressing of said modulation electrodes (22) being arranged by group (60), (61); and

a data processing means (50) for constructing by algorithm, storing and retrieving a plurality of values of corrected modulation voltage ($V_m(i)$) associated with each value of said modulation voltage ($V_m(i)$) which produces a predetermined, uniform value of ion current (20), associated with each of said modulation electrodes (22), and a plurality of values of corrected modulation voltage ($V_m(i)$) associated with each said value of ion current (20) achieved when said modulation voltage ($V_m(i)$) is fixed at a uniform, predetermined value ($V_m(0)$);

said ion sensing means (36) being positioned to intercept all of said ion current (20), projected from said print head (10), associated with one or more said modulation electrodes (22), and having an output of a stream of ion current data (40), said data processing means (50) being coupled to said switching means (52) and to said data processing means (50).

5,087,934

WATERPROOF CAMERA HOUSING

John D. Johnson, 10 Rathgar Avenue, London, Earling, England

PCT No. PCT/GB88/00467, § 371 Date Jan. 19, 1990, § 102(c)

Date Jan. 19, 1990, PCT Pub. No. WO89/01184, PCT Pub.

Date Feb. 9, 1989

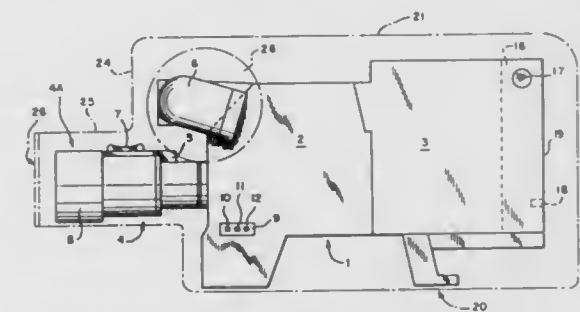
PCT Filed Jun. 16, 1988, Ser. No. 460,160

Claims priority, application United Kingdom, Jul. 23, 1987, 8717455

Int. Cl.⁵ G03B 17/08

U.S. Cl. 354—64

8 Claims



1. A watertight housing for enclosing a camera, said camera having an extended lens assembly and a viewfinder, said extended lens assembly having a first end at which said extended lens assembly is attached to said camera and a second end through which light is gathered, said viewfinder having a viewing end and being moveable through an operative range, said housing comprising:

a main body constructed of a flexible, waterproof material having sufficient flexibility to allow said camera to be operated through said material when said camera is enclosed in said housing;

a first portion projecting from said main body constructed of said flexible, waterproof material, shaped to accommodate said extended lens assembly, having a transparent lens port, and having a reinforcement means to locate positively said lens port with respect to said second end of said extended lens assembly;

a second portion projecting from said main body constructed of said flexible, waterproof material, having a planar viewing port arranged to permit viewing substantially throughout said operative range of said camera viewfinder, and having a reinforcement means to locate positively said planar viewing port with respect to said viewing end of said camera viewfinder, said reinforcement

ment means being an annular reinforcing collar in which said planar viewing port is retained, said annular reinforcing collar fitting over said viewing end of said camera viewfinder.

5,087,935

ACTIVE EXTERNAL DISTANCE MEASURING SYSTEM HAVING AN OPTICAL DEVICE IN THE LIGHT PROJECTION AND LIGHT RECEIVING PATHS TO REDUCE PARALLAX

Naoya Kaneda; Youichi Iwasaki, and Sadahiko Tsuji, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

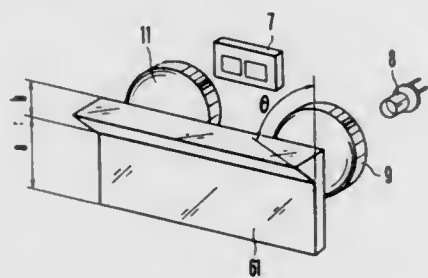
Filed Jan. 23, 1990, Ser. No. 469,044

Claims priority, application Japan, Feb. 1, 1989, 1-024418; Apr. 3, 1989, 1-085188

Int. Cl.⁵ G03B 13/36

U.S. Cl. 354-403

10 Claims



1. An external distance measurement type focusing apparatus for a photographic lens, comprising:
light projecting means for projecting light onto an object field;
light receiving means for receiving light reflected from the object field, the reflected light having bypassed the photographic lens;
an optical member arranged in the light projected by said light projecting means and in the light incident on said light receiving means to refract a portion of each of the projected and the reflected light, for reducing distance measurement parallax; and
detecting means for detecting a focusing state of said photographic lens on the basis of the reflected light reaching said light receiving means.

5,087,936
CAMERA

Kazutsugu Ogata; Kazuhisa Seki; Kouji Kaneko; Satoshi Mikajiri, all of Omiya; Kiyotaka Kaneko, and Masanori Yoshida, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 6, 1989, Ser. No. 403,356

Claims priority, application Japan, Sep. 8, 1988, 63-223604; Sep. 8, 1988, 63-223605

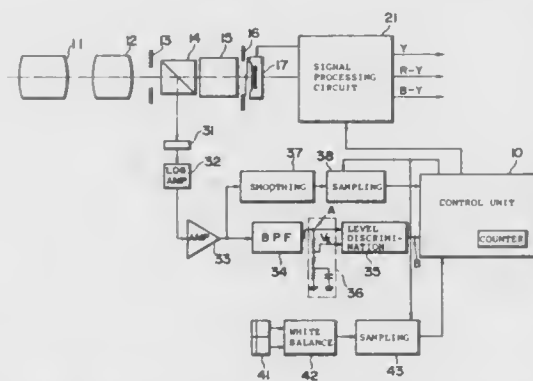
Int. Cl.⁵ G03B 7/08

U.S. Cl. 354-430

5 Claims

1. A camera comprising:
a light-receiving element for receiving incident light thereto and for outputting an output signal representing a quantity of said incident light;
a band-pass filter for passing therethrough only a signal component having a frequency corresponding to a secondary higher harmonic component of fluorescent light in response to said output signal from said light-receiving element when said incident light is fluorescent light; and
detecting means for detecting whether said incident light is

fluorescent light based on whether said signal component having said frequency corresponding to said secondary



higher harmonic component of fluorescent light is passed through said band-pass filter.

5,087,937

PHOTOELECTRIC SCANNER

Beat Frick, Buchs; Walter Kraft, Zurich, and Karl Ursprung, Niederhasli, all of Switzerland, assignors to Gretag Systems, Bothell, Wash.

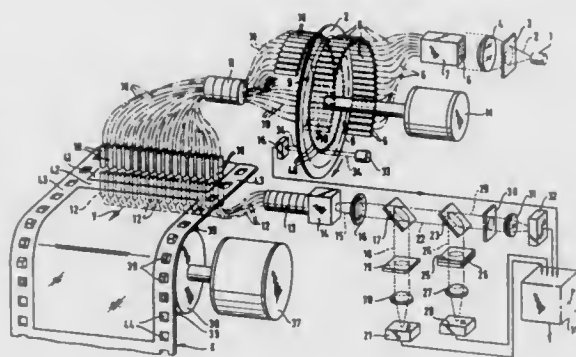
Filed Sep. 7, 1990, Ser. No. 578,571

Claims priority, application Switzerland, Sep. 7, 1989, 3244/89

Int. Cl.⁵ G03B 27/00

U.S. Cl. 355-1

13 Claims



1. Photoelectric scanner for scanning a transparent master, comprising a light source, a first light conducting means disposed between said light source and the plane of said master and formed by optical fibers or bundles of optical fiber having light emitting ends disposed along a plurality of scanning lines at a slight distance from and approximately perpendicular to the plane of the master, the light emitting end of each optical fiber or fiber bundle corresponding to a scanning point, for guiding the light emitted by said light source line by line over said master to be scanned and detected by a receiver disposed behind said master.

5,087,938

IMAGE RECORDING APPARATUS

Akihiko Nagumo, and Yuji Nishio, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 2, 1989, Ser. No. 361,013

Claims priority, application Japan, Jun. 3, 1988, 63-137102; Jun. 3, 1988, 63-137104; Dec. 27, 1988, 63-329607; Dec. 27, 1988, 63-329608

Int. Cl.⁵ G03B 27/72, 27/52

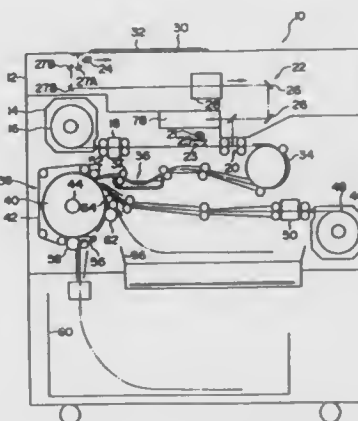
U.S. Cl. 355-27

23 Claims

1. An image recording apparatus for recording an image of

an original to a photo-sensitive material having predetermined characteristics, comprising:

- a means provided with a first source for performing primary exposure to expose said photo-sensitive material with an



- image of an original by the light illuminated from said first light source; and
a means for performing auxiliary exposure to expose said photo-sensitive material by an amount of light corresponding to the type of said original.

5,087,939

IMAGE FORMING APPARATUS AND IMAGE MEMBER CARTRIDGE

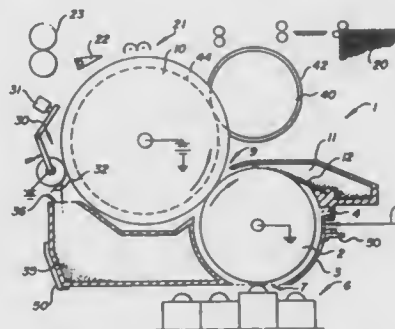
David R. McDougal, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1991, Ser. No. 650,260

Int. Cl.⁵ G03G 15/00

U.S. Cl. 355-200

21 Claims



1. An image forming apparatus comprising:
a replaceable cartridge supporting an image member having an image surface, which image member is movable to bring said image surface past a series of stations for forming transferable images on said image surface, said cartridge having a transfer opening providing access to said image surface,
a transfer member having associated therewith a transfer surface, said surface being engageable with said image surface through said transfer opening, said transfer surface being movable with said image surface for transfer of toner images, and
means for moving said transfer member to move said transfer surface, said transfer surface in turn moving said image member to move said image surface past the series of stations.

5,087,940

CONTROL SYSTEM FOR DOCUMENT REPRODUCTION MACHINES

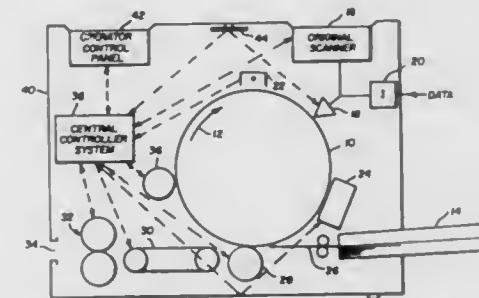
Conrad Altmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 23, 1990, Ser. No. 571,479

Int. Cl.⁵ G03G 15/00

U.S. Cl. 355-204

16 Claims



1. Apparatus for producing hardcopy outputs on receiver sheets from information delivered to the apparatus by at least one of electrical signals, visual originals, and manual instruction, said apparatus comprising:
a plurality of process subsystems;
a controller system for coordinating the operation of the process subsystems, one with another;
controller signal connecting means associated with the controller system, said controller signal connecting means utilizing two-way transmitting and receiving signals for controlling the process subsystems;
subsystem signal connecting means associated with the process subsystems, said subsystem signal connecting means utilizing at least one-way transmitting or receiving signals for connection with the controller system;
said one-way and two-way signals being free to propagate between the process subsystem and the controller system without confinement to a defined electrical path or optical fiber system;
means for identifying the source of a signal sent to the controller system from a particular process subsystem; and
an enclosure surrounding the process subsystems and the controller system, said enclosure substantially preventing the leakage of transmitting signals to the area outside the enclosure, and substantially preventing the entrance of interference signals into the region surrounded by the enclosure.

5,087,941

XEROGRAPHIC REPRODUCING MACHINE FOR CONTROLLED COPYING OF MANUALLY DISPOSED DOCUMENTS

Craig A. Smith, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1991, Ser. No. 635,838

Int. Cl.⁵ G03G 21/00

U.S. Cl. 355-204

22 Claims

1. In a xerographic reproducing machine including a manually operable start switch, means responsive to actuation of the start switch for cycling from a standby condition to an operating condition for performing a process for copying a document, the copying process including machine preparation to a copy ready state and subsequent initiation of the sequential copying steps, a timing circuit for initiating the copying steps after achieving the copy ready state, and a standby circuit for cycling the machine to the standby condition after a predetermined time absent re-actuation of the start switch, the improvement comprising:

(a) a heat-fixing and a pressure roll which are rotatable in a pressed contact state for heat fixing of toner image carried on a continuous paper and for defining a first gap through which said paper passes during heat fixing;

(b) an introduction guide disposed upstream of said heat roll and said pressure roll for guiding said continuous paper

into said first gap between said heat roll and said pressure roll; and

(c) a pair of paper-discharging rolls disposed downstream of said heat roll and said pressure roll, rotatable in a pressed contact state, and defining a second gap for permitting said continuous paper to pass therethrough;

said pressure roll being movable away from said heat roll, wherein said heat-fixing apparatus further includes means for preventing scorching of said continuous paper by said heat roll during non-fixing periods of operation, said means including said first gap between said heat roll and said pressure roll being located above a plane including a downstream end of said introduction guide and said second gap between said pair of paper-discharging rolls, said pair of paper-discharging rolls providing tension to said continuous paper when said pressure roll moves away from said heat roll, so that said continuous paper separates not only from said heat roll but also from said pressure roll.

5,087,948

DISORDER-INDUCED NARROWBAND HIGH-SPEED ELECTRONIC DEVICES

Philip W. Phillips; Hong-L. Wu, both of Cambridge, Mass.; David H. Dunlap, Albuquerque, N. Mex., and Kalyan Kundu, Calcutta, India, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 25, 1990, Ser. No. 542,596

Int. Cl.⁵ H01L 29/161

U.S. Cl. 357—16

22 Claims



1. A device for transporting charge-carrying particles applied to a disordered molecular system wherein a plurality of different molecules appear in a lattice arrangement and are arranged in the lattice in such a manner that only charge-carrying particles in some energy range transport superdiffusively through the molecular system.

5,087,949

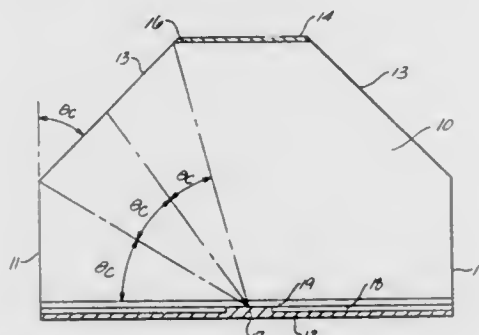
LIGHT-EMITTING DIODE WITH DIAGONAL FACES
Roland H. Haitz, Portola Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 582,803, Sep. 13, 1990, abandoned, which is a continuation of Ser. No. 372,275, Jun. 27, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 666,467

Int. Cl.⁵ H01L 33/00, 9/31, 23/48, 29/44

U.S. Cl. 357—17

17 Claims



1. A transparent light-emitting diode comprising: an opaque back face at a back of the light-emitting diode;

a front electrical contact at the front of the light-emitting diode; and

a body of transparent semiconductor between the back and the front electrical contact having a back p-n junction substantially parallel and adjacent to the back face and remote from the front electrical contact, the body being in the form of a polygonal base adjacent to the back and having side faces perpendicular to the back p-n junction, the body also being surmounted by a truncated polygonal pyramid through the side faces of which light is emitted from the light-emitting diode, each face of the pyramid intersecting a face of the base along a line, the front electrical contact being in the truncated end of the pyramid.

5,087,950

SCHOTTKY BARRIER JUNCTION GATE FIELD EFFECT TRANSISTOR

Fumiaki Katano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

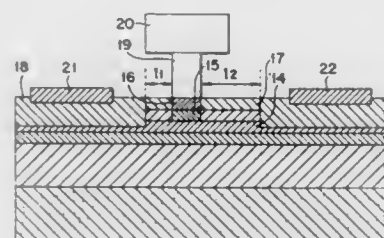
Filed Feb. 26, 1991, Ser. No. 660,897

Claims priority, application Japan, Feb. 26, 1990, 2-45068

Int. Cl.⁵ H01L 29/80

U.S. Cl. 357—22

8 Claims



1. A Schottky barrier junction gate type field effect transistor which includes a semi-insulating gallium-arsenide (GaAs) substrate, a buffer layer formed on said substrate and including at least an undoped GaAs crystalline layer, a first n-type GaAs crystalline layer having a first carrier concentration and formed on said buffer layer, a second n-type GaAs crystalline layer formed on said first n-type GaAs crystalline layer and having a second carrier concentration which is lower than said first carrier concentration, a gate electrode made of a Schottky barrier metal and formed on said second n-type GaAs crystalline layer, and a pair of ohmic electrodes formed at opposite sides of said gate electrode separately from said gate electrode, the Schottky barrier junction gate type field effect transistor comprising a third n-type GaAs crystalline layer formed under each of said pair of ohmic electrodes and having a third carrier concentration which is higher than said first carrier concentration, and a fourth n-type GaAs crystalline layer formed between said third n-type GaAs crystalline layer and a region which is composed of said first and second n-type GaAs crystalline layers, said fourth n-type GaAs crystalline layer having a fourth carrier concentration which is not less than said first carrier concentration, and a thickness corresponding to a total thickness of said first and second n-type GaAs crystalline layers.

5,087,951

SEMICONDUCTOR MEMORY DEVICE TRANSISTOR AND CELL STRUCTURE

Randal W. Chance, and Tyler A. Lowrey, both of Boise, Id., assignors to Micron Technology, Boise, Id.

Continuation of Ser. No. 189,414, May 2, 1988, abandoned. This application Jun. 6, 1991, Ser. No. 713,535

Int. Cl.⁵ H01L 29/68, 29/78, 29/92

U.S. Cl. 357—23.6

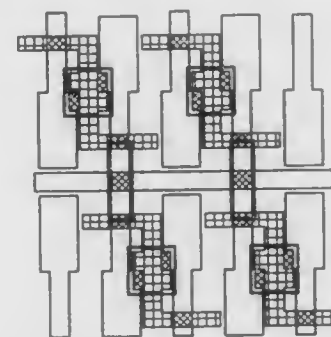
4 Claims

1. DRAM semiconductor memory device, in which a semiconductor material wafer having a top surface is used as a

substrate and the top surface is enhanced by deposition, etching and doping, the device comprising:

a substrate;
an oxide layer on the substrate defining active and isolation regions of the top surface, the isolation layers exhibiting an increase in thickness of the oxide layer over the active regions;

the active regions forming a "dogbone" pattern, wherein each active region exhibits an elongate shape, with each end of the elongate shape being wider than a center leg of the elongate shape, the active regions being arrayed in alternating sequence such that the ends of alternating columns of the active regions nests with the center legs of alternate columns of the active regions;



a first series of polysilicon overlays having center portions which overlap nested active regions at intersections of the center legs and the ends, and having extensions, each extending first parallel to the elongate shapes and then perpendicularly across an elongate shape at the center section, the first series of polysilicon overlays being etched in a pattern of transistor gates, thereby defining a series of transistors;

a second series of polysilicon overlay forming a pattern of straight lines which alternately intersect the active regions across the center legs at the center of the center legs and passes between pairs of the ends; and each further polysilicon overlay having a contact pad on its center portion.

5,087,952

LIPID-PROTEIN COMPOSITIONS AND ARTICLES AND METHODS FOR THEIR PREPARATION

Hans O. Ribi, Atherton, Calif., assignor to Biocircuits Corporation, Burlingame, Calif.

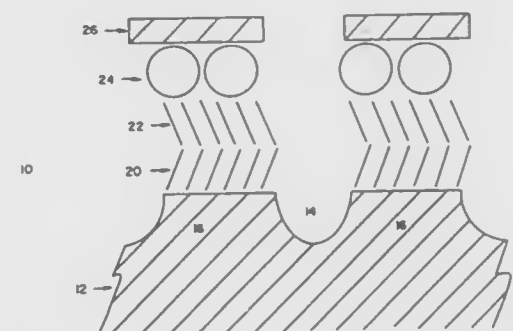
Division of Ser. No. 933,034, Nov. 20, 1986, Pat. No. 4,859,538.

This application Mar. 10, 1989, Ser. No. 321,962

Int. Cl.⁵ H01L 29/66, 29/96

U.S. Cl. 357—25

3 Claims



1. An electronic device comprising a semi-conductor substrate and an article comprising at least one polymerized ordered surfactant layer, wherein said polymerized surfactant layer is obtained by polymerization of a triple bond functionality present in the surfactant, wherein said triple bond function-

ality is separated from the termini of the surfactant by at least 1 carbon atom, and an ordered protein layer providing optical diffraction patterns specifically bound to said surfactant layer, wherein said article is in juxtaposition to at least a portion of said semi-conductor substrate surface.

5,087,953

FLEXIBLE GATE ARRAY SYSTEM FOR COMBINATORIAL LOGIC

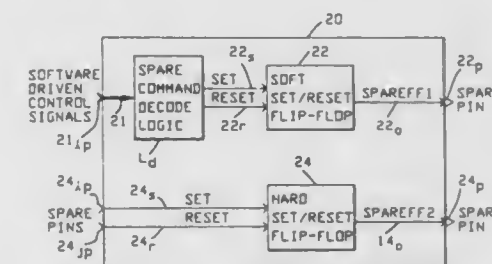
Bruce E. Whittaker, Mission Viejo, and Saul Barajas, Capistrano Beach, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 5, 1990, Ser. No. 593,440

Int. Cl.⁵ H01L 27/02

U.S. Cl. 357—40

8 Claims



1. A VLSI gate array package carrying more pins than normally required for the internal combinatorial logic and the normal output connections to provide spare normally un-used pins, said package holding a plurality of combinatorial logic units and comprising:

- (a) a plurality of combinatorial logic unit means each of which provides an output to a final gate means;
- (b) said final gate means for receiving said outputs of said logic means;
- (c) additive means for receiving signals on said normally un-used gate array package pins, said additive means providing an input to said final gate means.

5,087,954

MOS-TYPE INTEGRATED CIRCUIT

Koji Shirai, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

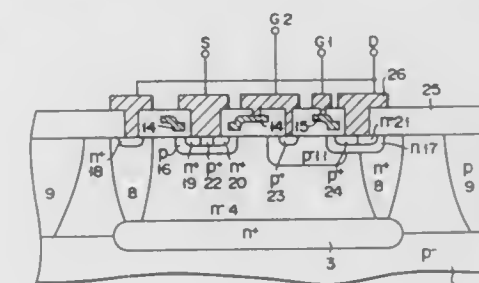
Filed Oct. 16, 1990, Ser. No. 598,206

Claims priority, application Japan, Oct. 19, 1989, 1-272074

Int. Cl.⁵ H01L 27/02

U.S. Cl. 357—41

6 Claims



1. A MOS-type integrated circuit comprising:
a semiconductor substrate of a first conductivity type;
a semiconductor layer of a second conductivity type, on the semiconductor substrate;
a buried region of the second conductivity type, having high impurity concentration and located between the semiconductor substrate and semiconductor layer;
an annular contact region of the second conductivity type, extending from the buried region to the surface of the

semiconductor layer and having high impurity concentration;

- a first region of the second conductivity type, in contact with the second conductivity-type annular contact region and having low impurity concentration;
- a first region of the first conductivity type and a first region of the second conductivity type, which have high impurity concentration and which are in contact with each other in the first region of the second conductivity type having low impurity concentration;
- a first region of the first conductivity type, having low impurity concentration and in contact with the first region of the second conductivity type, having low impurity concentration;
- a second region of the first conductivity type, having high impurity concentration and in the first region of the first conductivity type, having low impurity concentration;
- a second region of the first conductivity type, having low impurity concentration and located on the upper surface of the semiconductor layer of the second conductivity type surrounded by the annular contact region;
- a second region of the second conductivity type, a third region of the first conductivity type, and a third region of the second conductivity type, which have high impurity concentration, and are in the second region of the first conductivity type, having low impurity concentration, and which are continuous in the order;
- an insulating layer covering junctions of the regions of different conductivity types, and exposed in the surface of the semiconductor layer of the second conductivity type;
- a first polycrystalline silicon layer buried in the insulating layer at a location corresponding to the first region of the second conductivity type, having low impurity concentration and surrounding the first region of the first conductivity type, having high impurity concentration, and the first region of the second conductivity type, having high impurity concentration;
- a second polycrystalline silicon layer buried in the insulating layer at a location corresponding to the second region of the first conductivity type, having low impurity concentration and surrounding the second region of the second conductivity type, the third region of the first conductivity type, and the third region of the second conductivity type, these three regions having high impurity concentration;
- a drain electrode electrically connected to the first region of the first conductivity type, having high impurity concentration, and to the first region of the second conductivity type, having high impurity concentration, the drain electrode projecting from the surface of the insulating layer;
- a source electrode electrically connected to the third region of the first conductivity type, and to the second and third regions of the second conductivity type, these three regions having high impurity concentration, and the source electrode projecting from the surface of the insulating layer; and
- first and second gate electrodes electrically connected to the first and second polycrystalline layers, and projecting from the surface of the insulating layer.

5,087,955

INPUT-OUTPUT CIRCUIT OF REDUCED DEVICE AREA FOR SEMICUSTOM SEMICONDUCTOR INTEGRATED CIRCUIT

Haruji Futami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,232

Claims priority, application Japan, Aug. 8, 1989, 1-205925

Int. Cl.⁵ H01L 27/02

U.S. Cl. 357—41

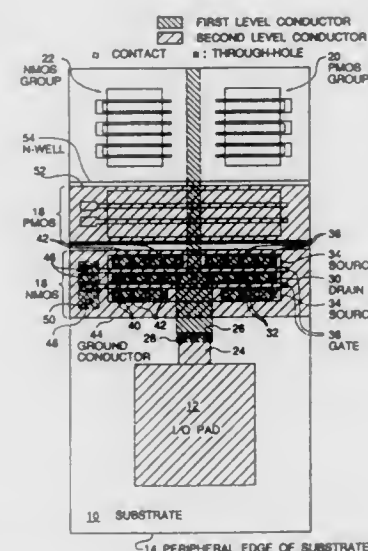
8 Claims

1. A peripheral block of a semicustom integrated circuit comprising:

one input/output pad formed on a peripheral portion of a substrate, an N-channel MOS transistor formed in prox-

imity of said input/output pad and having a drain region connected to said input/output pad and an internal circuit, a source and a gate of said N-channel MOS transistor being connected to a ground;

- a first level conductor connected to said input/output pad and extending toward said internal circuit through a region in which said N-channel MOS transistor is formed, said conductor being connected to said drain region of said N-channel MOS transistor above said drain region of said N-channel MOS transistor by means of contacts; and



- a second level conductor is positioned above said first level conductor and to cover said N-channel MOS transistor, said second level conductor being connected to said source region of said N-channel MOS transistor by means of through-holes and connected to the ground level; wherein said gate of said N-channel MOS transistor is connected through a contact to said substrate and said substrate itself is grounded so that said gate of said N-channel MOS transistor is grounded through a resistive component of said substrate itself.

5,087,956

SEMICONDUCTOR MEMORY DEVICE

Shuji Ikeda, Koganei; Satoshi Meguro, Hinode; Kotaro Nishimura; Sho Yamamoto, both of Kodaira, and Nobuyoshi Tanimura, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

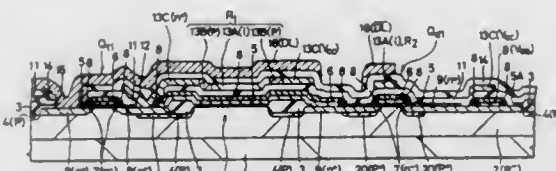
Division of Ser. No. 225,467, Jul. 28, 1988, which is a division of Ser. No. 899,404, Aug. 22, 1986, Pat. No. 4,774,203. This application May 30, 1989, Ser. No. 358,261

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.⁵ H01L 27/02

U.S. Cl. 357—41

37 Claims



1. A memory cell structure formed on a semiconductor substrate having a flip-flop comprised of first and second inverters, output terminals of said first and second inverters

being respectively connected to input terminals of said second and first inverters, each of said first and second inverters being comprised of a MISFET and a polysilicon film which is connected in series to said MISFET, said polysilicon film being connected to a first wiring line for supplying a first fixed potential to said memory cells and having a plurality of first regions of a first conductivity type, a second region which has higher resistivity than that of said first regions, and a third region of a second conductivity type, wherein said second and third regions are disposed between said first regions.

5,087,957

CMOS MEMORY DEVICE WITH IMPROVED SENSE AMPLIFIER BIASING

Tamihito Ishimura; Masahumi Miyawaki; Sanpei Miyamoto, and Hidenori Uehara, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

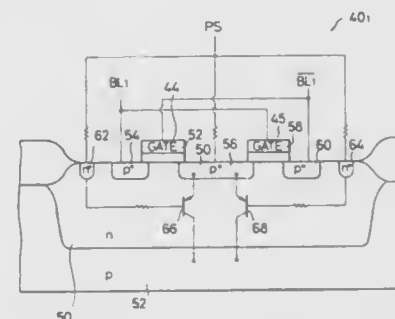
Filed Mar. 20, 1991, Ser. No. 672,359

Claims priority, application Japan, Mar. 22, 1990, 1-72639

Int. Cl.⁵ H01L 27/102, 27/105; G11C 7/00

U.S. Cl. 357—42

8 Claims



1. A CMOS memory device fabricated on a substrate of a first conductive type, comprising: a memory cell array for storing data; a plurality of bit line pairs connected to said memory cell array, for output of said data; a plurality of wells of a second conductive type disposed in said substrate; a plurality of sense amplifiers connected to respective bit line pairs for amplifying potential differences on said bit line pairs, one sense amplifier being disposed in each well in said plurality of wells; and a sense amplifier drive signal line for driving said sense amplifiers, said sense amplifier drive signal line also being used to bias said wells.

5,087,958

MISALIGNMENT TOLERANT ANTIFUSE

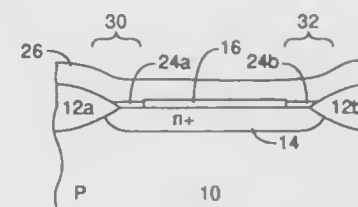
Shih-Oh Chen, Fremont; Steve S. Chiang, Saratoga, and Gregory W. Bakker, Sunnyvale, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Filed Nov. 5, 1990, Ser. No. 609,177

Int. Cl.⁵ H01L 29/04, 27/02, 29/34

U.S. Cl. 357—51

19 Claims



1. An antifuse including: a lower electrode having first and second opposing sides, a dielectric layer on the surface of said lower electrode, a pair of regions in said dielectric layer, one each of said pair

of regions abutting said first and second opposing sides of said lower electrode, said regions having a thickness less than the thickness of the remainder of said dielectric layer, said regions having a total area of less than about 0.7 μm^2 , an upper electrode disposed above said dielectric layer and lying over said pair of regions.

5,087,959

PROTECTIVE COATING USEFUL AS A PASSIVATION LAYER FOR SEMICONDUCTOR DEVICES

Masahiro Omori, Palo Alto, and Edward B. Stoneham, Los Altos, both of Calif., assignors to Microwave Technology, Inc., Fremont, Calif.

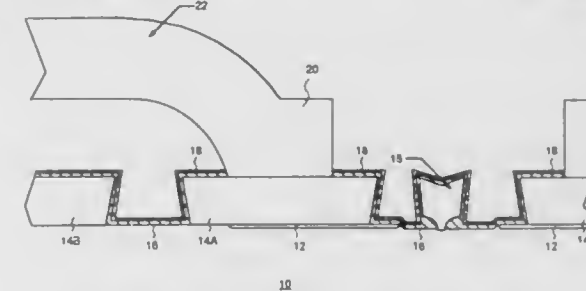
Continuation-in-part of Ser. No. 20,920, Mar. 2, 1987, Pat. No. 4,972,250. This application Mar. 2, 1988, Ser. No. 162,912

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.⁵ H01L 21/94, 21/469, 21/441

U.S. Cl. 357—54

21 Claims



1. An assembly comprising:

a support on which a number of electrically conductive elements are formed; and passivation material consisting essentially of one of diamond-like carbon, polycrystalline diamond, and monocrystalline diamond disposed on portions of the surface of said support and said conductive elements.

5,087,960

Patent Not Issued For This Number

5,087,961

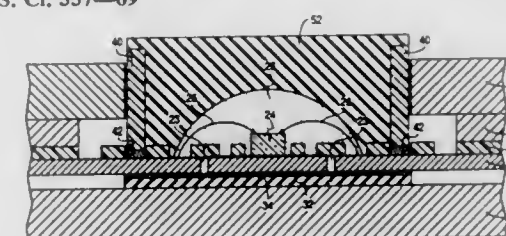
SEMICONDUCTOR DEVICE PACKAGE

Jon Long, Livermore, and Rachel S. Sidorovsky, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif. Continuation of Ser. No. 115,228, Oct. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 8,208, Jan. 28, 1987, and a continuation-in-part of Ser. No. 49,641, May 13, 1987. This application Feb. 20, 1990, Ser. No. 483,284

Int. Cl.⁵ H01L 23/48, 23/28, 39/02

U.S. Cl. 357—69

1 Claim



1. An integrated circuit package comprising:

a flexible die-supporting substrate having a metal layer and an insulative layer, where the metal layer includes lead finger portions and a die-supporting surface area separated from said lead finger portions; an integrated circuit die supported on the metal die-supporting surface area of the die-supporting substrate; a frame body having an annular cross section, the frame body being adhered to the metal layer of the die-support-

ing substrate with an adhesive epoxy, with the frame body surrounding the die-supporting surface area and the integrated circuit die; and
wherein the insulative layer of the substrate includes one or more insulative dams adjacent inner or outer walls of the annular frame body for containing the adhesive epoxy.

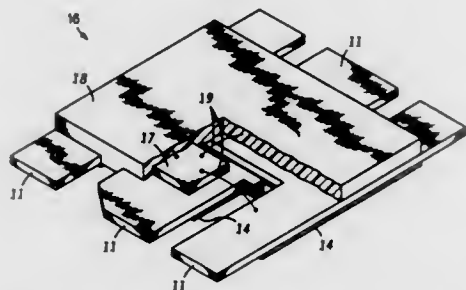
5,087,962
INSULATED LEAD FRAME USING PLASMA SPRAYED DIELECTRIC

James W. G. deVos, Mesa; Denise M. Ommen, Tempe, and Robert H. Palmer, Gilbert, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Feb. 25, 1991, Ser. No. 660,206
Int. Cl.⁵ H01L 23/48, 23/50

U.S. Cl. 357—70

4 Claims



1. An insulated lead frame for a semiconductor package which comprises:
a die attach area on a first surface of a semiconductor device lead frame;
a plurality of leads projecting outward from the die attach area wherein the plurality of leads have proximal lead ends near the die attach area; and
a layer of plasma spray ceramic material that is less than approximately 125 microns thick on a second surface of the lead frame wherein the layer of plasma sprayed ceramic material covers at least a portion of the plurality of proximal lead ends and an area that is opposite the die attach area.

5,087,963
GLASS-SEALED SEMICONDUCTOR DEVICE

Kenichi Kaneda, and Akio Tanda, both of Tokyo, Japan, assignors to NEC Corporation, Japan

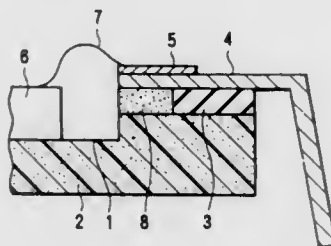
Filed Oct. 12, 1990, Ser. No. 596,477

Claims priority, application Japan, Oct. 16, 1989, 1-269645

Int. Cl.⁵ H01L 23/29

U.S. Cl. 357—73

5 Claims



1. A glass-sealed semiconductor device in which low-melting glass is glazed on a ceramic base to fix a lead frame, and a distal end portion of said lead frame, said distal end portion being connected to a semiconductor element and being fixed to said ceramic base through devitrifying glass layer adjacent said low-melting glass.

5,087,964
PACKAGE FOR A LIGHT-RESPONSIVE SEMICONDUCTOR CHIP

Muneo Hatta, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

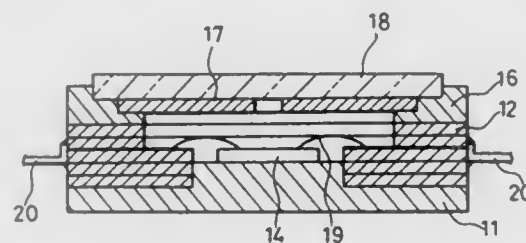
Filed Aug. 2, 1990, Ser. No. 561,578

Claims priority, application Japan, Oct. 31, 1989, 1-285224

Int. Cl.⁵ H01L 23/02

U.S. Cl. 357—74

4 Claims



1. A packaged semiconductor device comprising:
a semiconductor chip responsive to light and including a plurality of pads for making electrical connections to said chip; and
a package including:
an opaque, electrically insulating lower plate having a coefficient of thermal expansion substantially the same as that of said semiconductor chip, said lower plate including a central protrusion on which said semiconductor chip is bonded and a peripheral flange surrounding said central protrusion;
a middle plate comprising at least first and second laminated plates, said first plate including three layers and having opposed first and second surfaces and a first central opening, a plurality of inner leads disposed on said first surface proximate the first central opening, and a plurality of outer leads projecting from said first plate outside and mechanically attached to said package, said outer leads being electrically connected to respective inner leads, said second surface being bonded to said peripheral flange of said lower plate abutting said central protrusion, said second plate being bonded to said first surface of said first plate and including two layers and a second central opening larger than the first central opening exposing said inner leads on said first surface;
wires interconnecting respective inner leads and pads;
an opaque, electrically insulating upper plate having a coefficient of thermal expansion substantially the same as that of said semiconductor chip, bonded to said middle plate opposite the lower plate, said upper plate including a central opening for admitting light to said semiconductor chip; and
a lid that transmits light bonded to said upper plate and sealing the central opening of said upper plate.

5,087,965
RECOGNITION OF IMAGE COLORS USING ARBITRARY SHAPES IN COLOR SPACE

Jose R. Torre-Bueno, San Diego, Calif., assignor to American Innovation, Inc., San Diego, Calif.

Filed Jun. 28, 1989, Ser. No. 373,321

Int. Cl.⁵ H04N 9/68

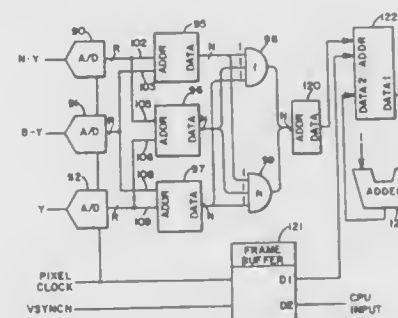
U.S. Cl. 358—22

12 Claims

1. In a system for detecting the presence of colored features in a colored video image by detecting in a video image signal representing said colored video image a color in a predetermined set of defined colors, said system including means for rendering said video image signal into a set of color element signals corresponding to a set of mutually distinct color elements, each color in said set of defined colors being composed of a set of compound color components, each of said com-

pound color components being composed of a combination of a respective two of said color elements, an improved apparatus for identifying a color in said set of defined colors, said improved apparatus comprising, in combination:

- a set of converters, each of said converters for converting a respective one of said color element signals into a time-varying, multi-bit signal representing the magnitude of a respective one of said color elements;
- a set of M memories, each of said M memories having a set of sequentially addressed storage locations, an address port for receiving a storage location address, and a data port for providing a signal stored at an addressed storage location;
- the address port of each of said M memories connected to a respective two converters of said set of converters to receive two multi-bit signals;



- said each of said M memories including an N-bit presence signal stored in a storage location of said each of said M memories, said storage location having an address corresponding to one of said compound color components including the color element magnitudes represented by the two multi-bit signals received at the address port of said each of said M memories, each bit position of said N-bit presence signal corresponding to a respective color in said set of defined colors; and
- N gate circuits, each of said N gate circuits having M inputs and one output, each of said M inputs connected to a respective memory data port, said M inputs receiving signals from identical bit positions of said N-bit presence signals stored in said M memories, said each of said gate circuits producing an identification signal indicating the presence of a first defined color of said set of defined colors in response to the M input signals received by said each of said gate circuits.

5,087,966
DIGITAL GAMMA CORRECTION

Vincent C. Harradine, Basingstoke, England, assignor to Sony Corporation, Tokyo, Japan

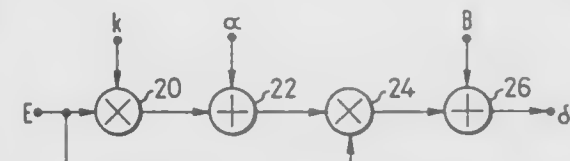
Filed Feb. 20, 1990, Ser. No. 482,049

Claims priority, application United Kingdom, Apr. 21, 1989, 8909145

Int. Cl.⁵ H04N 9/64, 9/69, 9/72; G03F 3/08

U.S. Cl. 358—27

12 Claims



1. Color correction apparatus for correction of a color component signal of a video signal comprising:
first multiplying means for receiving a color component signal of a video signal and for multiplying the component signal by a first factor indicative of a desired gamma correction to produce a first multiplied signal;
first summing means for adding a second factor to the first

multiplied signal to produce a first summed signal, said second factor being indicative of the desired gamma correction, a desired gain and a desired black level;
second multiplying means for multiplying the first summed signal by the color component signal to produce a second multiplied signal; and
second summing means for adding a third factor indicative of the desired black level to produce an offset correction signal to be added to the color component signal.

5,087,967
COLOR IMAGE PICKUP DEVICE HAVING A LEVEL CORRECTING CIRCUIT FOR CORRECTING LEVEL VARIATIONS IN COLOR IMAGE SIGNALS

Hiroaki Matsumoto, Chiba, and Tokuya Fukuda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

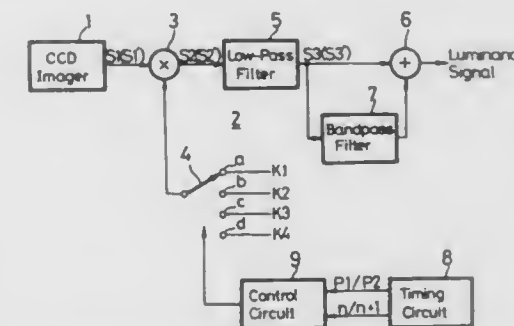
Filed Oct. 10, 1989, Ser. No. 419,276

Claims priority, application Japan, Oct. 13, 1988, 63-258293

Int. Cl.⁵ H04N 9/77

U.S. Cl. 358—41

10 Claims



1. Apparatus for processing a color video signal comprising:
imager means for generating a color video signal representing an image picked up by said imager means;
low-pass filter means supplied with said color video signal from said imager means for generating a luminance signal therefrom;
level correcting means supplied with said color video signal for producing a level-corrected luminance signal therefrom;
bandpass filter means for extracting an outline component from the level-corrected luminance signal; and
adding means for adding said outline component from said bandpass filter means to said luminance signal generated by said low-pass filter means.

5,087,968
DIGITAL COLOR COPIER WITH COLOR SEPARATION PROCESSING

Kyoji Omi, Kawasaki, and Mitsuo Hasebe, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 222,705, Jul. 21, 1988, Pat. No. 5,003,382.

This application Sep. 25, 1990, Ser. No. 588,200

Claims priority, application Japan, Jul. 22, 1987, 62-181217

Int. Cl.⁵ H04N 1/46

U.S. Cl. 358—75

3 Claims



1. A digital color copying machine having a fundamental

a D/A converter, and wherein the data signals stored in said RAM are subjected to an operation by said CPU such that noise reduction control signal in correspondence with a level of noise introduced during transfer or recording is determined by obtaining the variance of the data signals stored in said RAM, said noise reduction control signal is outputted from an output port of said CPU, a clamp level signal is determined by smoothing the data signals stored in said RAM and said clamp level signal is outputted from said D/A converter.

5,087,974

IMAGE PROCESSING WITH HORIZONTAL BLANKING WIDTH CORRECTION

Takeo Tsutsui, Tokyo; Tetsuo Takayanagi, Saitama; Yasushi Kimura, and Nozomu Hasegawa, both of Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

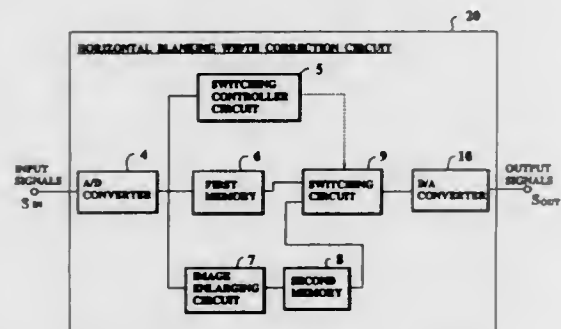
Filed Sep. 6, 1990, Ser. No. 578,271

Claims priority, application Japan, Sep. 6, 1989, 1-229123

Int. Cl.⁵ H04N 3/223

U.S. Cl. 358—180

6 Claims



1. An image processing apparatus for processing video signals, comprising:
 - means for performing digital processings on the video signals; and
 - horizontal blanking width correction means for treating those video signals which have missing portions as a result of the digital processings, including:
 - means for separating a part of the video signals corresponding to a central region of an image given by the video signals from other parts;
 - means for enlarging the other parts of the video signals corresponding to horizontally peripheral regions of the image, to supplement the missing portions of the video signals; and
 - means for combining the part of the video signals corresponding to the central region of the image separated by the separating means and the other parts of the video signals corresponding to horizontally peripheral regions of the image obtained by the enlarging means, to obtain full video signals without missing portions.

5,087,975

VSB HDTV TRANSMISSION SYSTEM WITH REDUCED NTSC CO-CHANNEL INTERFERENCE

Richard W. Citta, Oak Park; Dennis M. Matzabangh, and Gary J. Sgrignoli, both of Mt. Prospect, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 9, 1990, Ser. No. 611,236

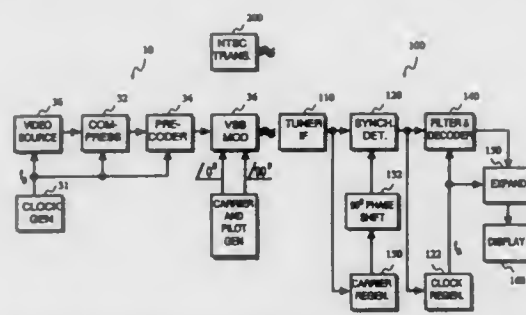
Int. Cl.⁵ H04N 5/260, 5/44, 9/78, 7/00

U.S. Cl. 358—183

38 Claims

1. A method of transmitting a television signal comprising: providing an N-level digitally encoded signal at a sample rate f_s substantially equal to three times the NTSC color subcarrier frequency; generating a carrier signal;

modulating said carrier signal with said N-level digitally encoded signal; and



forming a transmission signal in response to said modulated carrier signal.

5,087,976

AUTOMATIC ADJUSTMENT APPARATUS FOR INDEPENDENTLY ADJUSTING DIFFERENT REGIONS OF A PICTURE RASTER

Osamu Oda, Saitama, and Toshio Amano, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

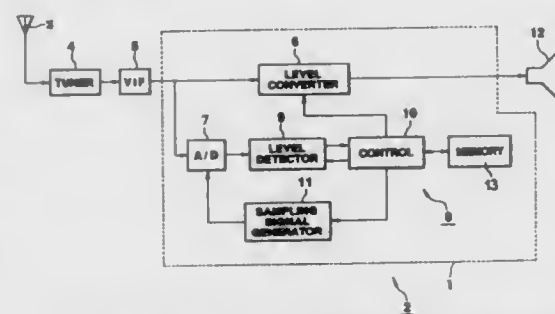
Filed Oct. 31, 1990, Ser. No. 607,284

Claims priority, application Japan, Nov. 10, 1989, 1-293588

Int. Cl.⁵ H04N 5/262

U.S. Cl. 358—183

3 Claims



1. An automatic picture adjustment apparatus comprising, a level converter for performing level conversion on input video signals for adjusting the picture quality of a displayed image; a level detector receiving and detecting the level of said input video signals, a controller which controls said level converter and receiving the output signal of said level detector, wherein said controller controls said level detector within a predetermined time period shorter than one vertical synchronization period, further comprising a sampling signal generator which generates sampling signals for determining individual sampled video signals which respectively correspond to different regions of a picture raster, and an A/D converter controlled by said sampling signal generator and converting the input video signals into corresponding digital signals, wherein said controller is formed of a micro-computer circuit, wherein said micro-computer circuit establishes individual parameters for each of said different regions of said picture raster, and wherein said level converter is controlled such that said different regions of a picture raster are individually adjusted.

5,087,977

CHANNEL SELECTING APPARATUS AUTOMATICALLY DETECTING DIFFERENT MODES OF TELEVISION SIGNALS

Katsuto Suizu, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

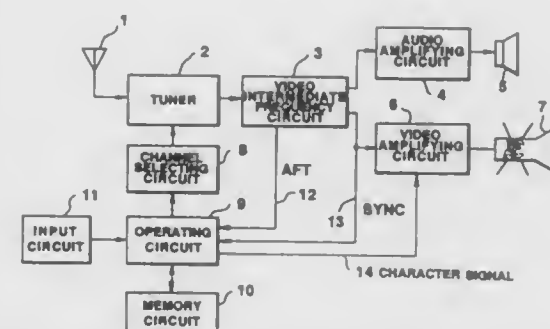
Filed Jan. 4, 1990, Ser. No. 461,037

Claims priority, application Japan, Jan. 10, 1989, 1-3359

Int. Cl.⁵ H04N 5/50

U.S. Cl. 358—193.1

5 Claims



5. A channel selecting apparatus which operates to receive television signals defined by a plurality of broadcasting modes and signals of predetermined channels in the respective modes, comprising:

- an input circuit for providing a channel selection instructing signal indicative of a commanded channel;
- a channel selecting circuit receiving channel selection instructing data, for providing a control signal for selecting a signal of a predetermined channel;
- a tuner receiving said control signal from said channel selecting circuit, and to which television signals defined by any of said modes are input, said tuner amplifying signals of channels selected by said control signal and producing output signals which are converted in frequency;
- a video signal processing circuit which amplifies and detects said output signals from said tuner, to produce detected signals, automatic fine tuning (AFT) signals and synchronizing signals as an output;
- a memory means for storing data necessary to select said predetermined channel; and
- operating means, connected to said memory means and connected between said input circuit and said channel selecting circuit, for:

- 1) providing said channel selection instructing data to said channel selecting circuit based on the channel selection instructing signal from said input circuit and the AFT signals and synchronizing signals from said video signal processing circuit,
- 2) varying said channel selection instructing data to said channel selecting circuit, and monitoring said tuner to confirm at which frequencies, within a predetermined first frequency band within which said predetermined channel is located, said television signal exists and,
- 3) responsive to said varying and monitoring, for determining in which mode among said plurality of broadcasting modes the television signal of the frequency is defined and for using the data stored in said memory means in accordance with a determined mode.

5,087,978

CAMERA SYSTEM AND INTERCHANGEABLE LENS

Tetsuo Hieda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 392,883, Aug. 14, 1989, abandoned.

This application May 13, 1991, Ser. No. 701,304

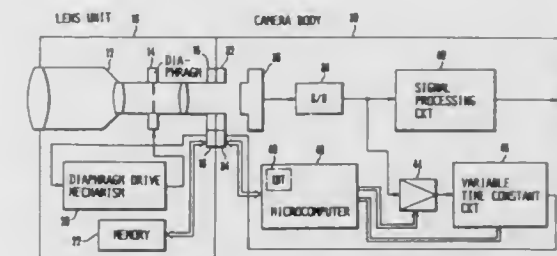
Claims priority, application Japan, Sep. 5, 1988, 63-220370;

Nov. 30, 1988, 63-300849

Int. Cl.⁵ H04N 5/238, 5/225; G02B 13/16; G03B 17/00

U.S. Cl. 358—228

30 Claims



1. A camera system capable of freely interchanging lenses, comprising a camera body, a lens unit, and a memory for storing discrimination data for discriminating operational characteristics of a diaphragm, said memory being provided in said lens unit, wherein characteristics of control of the diaphragm are adjusted inside said camera body on the basis of the discrimination data.

5,087,979

DIGITAL COPIER OR PRINTER WITH COLLATING BUFFER MEMORY OF LIMITED PAGE CAPACITY AND WITH ALTERNATIVE PRINTING MODES WHEN REQUIRED MEMORY EXCEEDS CAPACITY

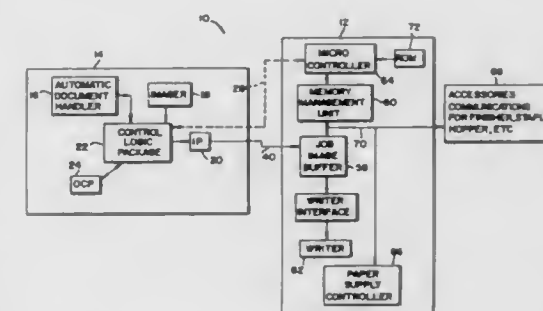
Daniel P. Schaertel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,817

Int. Cl.⁵ H04N 1/21, 1/23

U.S. Cl. 358—296

5 Claims



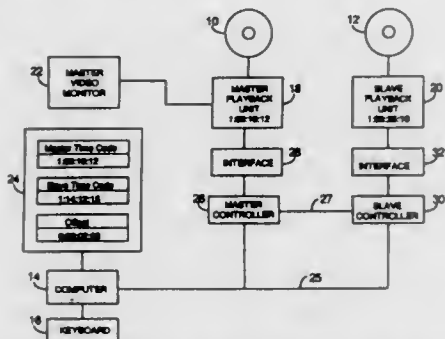
1. Reproduction apparatus comprising:
 - a writer;
 - an addressable buffer memory means, of predetermined capacity, for storing electrical signals representative of an image content of a plurality of pages of a multiple-page original document;
 - means for selectively retrieving said stored signals from the buffer memory by page, and for inputting the retrieved signals to said writer, in a scheduled order of pages, said retrieving and inputting having (1) a first mode for producing a single reproduction of said multiple-page original document and (2) a second mode for producing plural sets of collated reproductions of said multiple-page original document; and
 - control means operable in said second mode for selectively switching the apparatus to said first mode when the capac-

ity of said buffer memory is exceeded by the electrical signals of said multiple-page original document.

5,087,980

SYNCHRONIZATION OF RECORDINGS

Andrew Staffer, Westlake Village, Calif., assignor to Soundmaster International, Inc., Ontario, Canada
Continuation of Ser. No. 148,053, Jan. 25, 1988, Pat. No. 4,991,032. This application Feb. 4, 1991, Ser. No. 649,997
Int. Cl.⁵ H04N 5/782; G11B 27/10
U.S. Cl. 358—335 11 Claims



1. A method of synchronizing contemporaneous playback of first and second recordings at different relative playback speeds thereby to compress or expand playback of the first recording relative to playback of the second recording and of thereafter advancing the recordings to desired respective portions thereof that corresponded during such contemporaneous playback, the first recording being one of an audio recording and a video recording played back on a first playback unit that produces a first time code identifying sequentially spaced-apart portions of the first recording during playback and advancing of the first recording, the second recording being the other of the audio recording and the video recording played back on a second playback unit that produces a second time code identifying sequentially spaced-apart portions of the second recording during playback and advancing of the second recording, the method comprising:

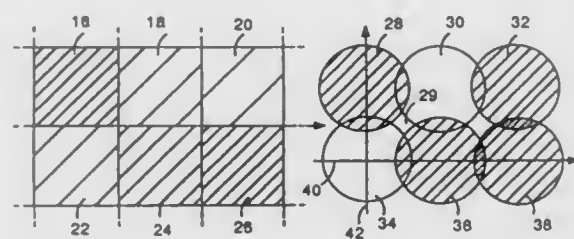
- selecting a constant offset reference;
- continually transforming the first time code into a virtual time code according to a preselected relationship;
- comparing the second time code with the virtual time code and generating a virtual offset representing the difference between the virtual time code and the second time code;
- controlling the speed of playback of the first recording relative to the speed of playback of the second recording during the contemporaneous playback such that the virtual offset is substantially equal to the constant offset reference throughout the contemporaneous playback thereby synchronizing the contemporaneous playback of the first and second recording at different relative speeds determined by the preselected relationship, the relationship being preselected to produce one of an expansion and a contraction of the playback of the first recording relative to the playback of the second recording during the controlling of the playback speed; and,

advancing the recordings after the contemporaneous playback in response to the virtual and second time codes to a desired portions of the second recording and to a portion of the first recording for which the virtual time code corresponds to the time code of the second recording plus the constant offset reference whereby the recordings are advanced to desired portions thereof that corresponding during the contemporaneous playback.

5,087,981

ERROR DIFFUSION OF OVERLAPPING DOTS

Yee S. Ng, Fairport, and Hwai T. Tai, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 2, 1990, Ser. No. 459,492
Int. Cl.⁵ H04N 1/40
U.S. Cl. 358—459 20 Claims



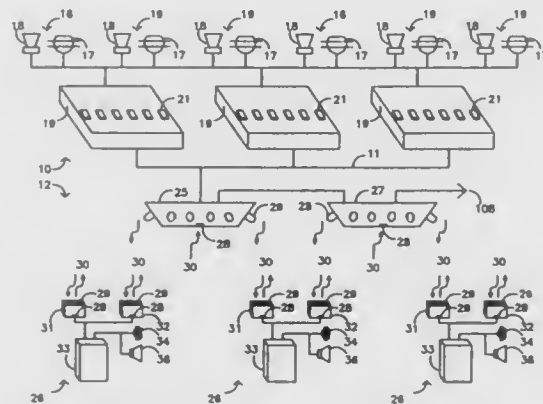
1. An error diffusion method for converting gray-scale pixel information into binary data capable of being rendered by dots, which may overlap, each dot having one of two levels of density, said method including the steps of:

- providing a fixed threshold value;
- determining which level of density is to be rendered for a first dot, said determination being based upon a comparison of the fixed threshold value with a gray-scale value of pixel information corresponding to the first dot;
- propagating, to an adjacent dot, at least a portion of any error between the determined density level of the first dot and the fixed threshold value;
- modifying the propagated error based upon the amount of overlap between the first dot and the adjacent dot and upon the rendered level of the first dot;
- using the modified error to adjust the gray-scale value of the pixel corresponding to the adjacent dot; and
- comparing the adjusted gray-scale value with the threshold value to determine which density level is to be rendered for the adjacent dot.

5,087,982

PULSED COMMUNICATION SYSTEM

Steven W. Smothers, Marion, Iowa, assignor to Inter Innovation LeFebure Manufacturing, Cedar Rapids, Iowa
Filed Nov. 14, 1990, Ser. No. 613,092
Int. Cl.⁵ H04J 14/08
U.S. Cl. 359—137 19 Claims



1. A pulsed communication system comprising:
means for generating consecutive cycles, each cycle defining a plurality of sequential time slots including a plurality of first data time slots and a plurality of second data time slots;
a plurality of first communication units each first unit includ-

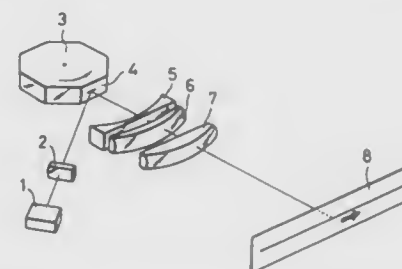
ing a communication port having an input and an output terminal and means for receiving from the input terminal a communication in the form of first type signals and for transferring to the output terminal a communication in the form of first type signals, means for converting the received first type signals to a sequence of pulses and for transmitting the converted first type signals as pulsed signals, one pulse during each cycle and during a predetermined one of the second data time slots thereof, means for receiving pulsed signals, one pulse during each cycle and during a predetermined one of the first data time slots thereof, and means for converting the received pulsed signals to first type signals and for transferring the received pulsed signals as first type signals to the output terminal of each first communication unit; and

a master unit including an interface having a plurality of separate input and output ports, means for receiving from each input port a separate communication in the form of said first type signals and for transferring to each output port a separate communication in the form of said first type signals, means for converting the received first type signals to a sequence of pulses and for transmitting the converted first type signals as pulsed signals, one pulse of each separate communication during a predetermined first data time slot of each cycle to correspond to a predetermined first data time slot for receipt of said pulse by a designated one of said first units, and means for receiving a plurality of separate communications independently of each other from the first communication units in the form of said pulsed signals, one pulse of each separate communication during a predetermined second data time slot indicative of transmission from a predetermined one of the first units, means for converting said pulsed signals to separate communications of first type signals and for transferring the separate communications to a predetermined one of the output ports.

5,087,983

LIGHT SCANNING DEVICE

Yasushi Takahashi, Iwate, and Kenichi Takanashi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 70,790, Jul. 6, 1987, abandoned. This application Nov. 2, 1989, Ser. No. 431,673
Claims priority, application Japan, Jul. 8, 1986, 61-160604
Int. Cl.⁵ G02B 26/10, 3/06, 13/08
U.S. Cl. 359—205 2 Claims



1. A scanning optical system capable of correcting deflecting surface irregularity, comprising:
a light source for emitting a light beam;
a first focusing optical system for focusing the light beam as a linear image;
a light deflector having a deflecting surface in the vicinity of the linear image formed by said first focusing optical system, for deflecting the light beam from said first focusing optical system; and
a second focusing optical system for focusing the light beam deflected by said light deflector onto an object surface to be scanned, said second focusing optical system comprising:

a single anamorphic lens,
a single spherical lens having positive refracting power, and
a single lens having a toric surface, successively arranged in order from said light deflector toward said object surface; wherein said anamorphic lens has a spherical lens surface facing toward said light deflector and a cylindrical surface facing toward said object surface, and is a plano-concave lens in the plane in which the light beam is deflected by said light deflector, and said anamorphic lens is a double-concave lens in a direction normal to said plane, and wherein said lens having a toric surface is a plano-convex lens in said plane of light beam deflection and a plano-concave lens in said direction normal to said plane;

said lenses having refracting surfaces having respective radii of curvature indicated respectively by r:1 and r:2 for said anamorphic lens, r:3 and r:4 for said spherical lens, and r:5 and r:6 for said lens having a toric surface, in order from said light deflector, and said lenses in said scanning optical system meeting the following condition:

$$-1.0 < r:6Y/r:2Y < -0.3$$

where Y is a component of each of the radii of curvature in a direction normal to a main scanning direction in which the light beam is deflected.

5,087,984

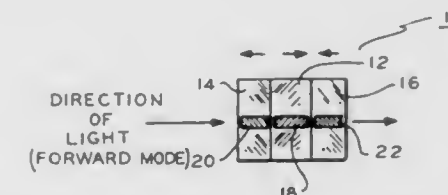
OPTICAL ISOLATORS EMPLOYING OPPOSITELY SIGNED FARADAY ROTATING MATERIALS

Allan J. Heiney, Highland Park, and Donald K. Wilson, West Caldwell, both of N.J., assignors to Optics for Research, Caldwell, N.J.

Filed Mar. 9, 1990, Ser. No. 502,783

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.⁵ G02F 1/09 12 Claims

U.S. Cl. 359—282



1. A Faraday rotator comprising:
a first magnet surrounding a first optical element having an optical axis, said first optical element made of a material having a positive Verdet constant or a negative Verdet constant, said first magnet having a front end and rear end, said first magnet generating a magnetic field in a first direction along the optical axis of said first optical element, said first magnet having a specified length of 1.0 L; and first and second tuning magnets, each tuning magnet being located at a front end or a rear end of said first magnet, said first tuning magnet and said second tuning magnet each surrounding a second optical element and a third optical element, respectively, said second and third optical elements each having an optical axis, and each of said second optical element and said third optical element being made of a material having a Verdet constant of a sign opposite that of the Verdet constant of said first optical element, and each of said first and second tuning magnets generating a magnetic field along the optical axes of said second and third optical elements in a direction opposite to the direction of the magnetic field being generated by said first magnet, wherein the total combined length of said first and second tuning magnets is from about 0.8 L to about 1.4 L.

5,087,985

POLARIZER FOR VISIBLE LIGHT

Koichi Kitaura, Shoji Kigoshi, both of Otsu, and Hisao Hisaki, Echi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP89/00700, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO90/00750, PCT Pub. Date Jan. 25, 1990

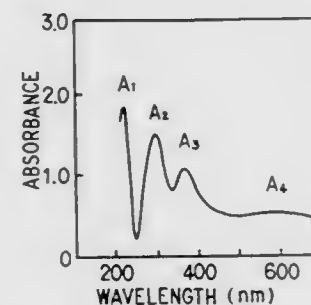
PCT Filed Jul. 12, 1989, Ser. No. 465,196

Claims priority, application Japan, Jul. 12, 1988, 63-174227

Int. Cl.⁵ G02B 5/22

U.S. Cl. 359—350

7 Claims



1. A polarizer for visible light comprising a laminate of a polarizing element and a protective film, said polarizing element being a polyvinyl alcohol film wherein at least 60% of the dichromophore absorbed thereon is iodine, said polarizing element characterized by three absorption bands in the ultraviolet region of 210 nm to 400 nm and a UA value of not less than 4.0 wherein said UA value represents ultraviolet absorption characteristics.

5,087,986

MULTI-PORT LIGHT DISTRIBUTOR WITH MECHANICALLY INSERTED AND WITHDRAWN BEAM SPLITTERS

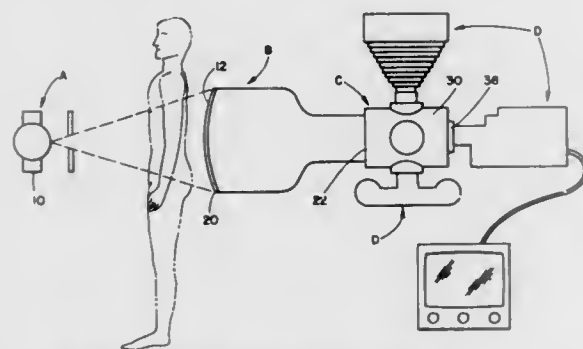
Robert P. Hunt, Palo Alto; Alex Lurye, Fremont, and George C. Riser, Santa Clara, all of Calif., assignors to Picker International, Inc., Highland Hts., Ohio

Filed Dec. 14, 1989, Ser. No. 450,685

Int. Cl.⁵ G02B 27/14

U.S. Cl. 359—629

19 Claims



1. A multiport light distributor comprising:
a housing that includes a base portion having an input port for receiving light to be distributed, the housing further defining at least first, second, and third ports through which light is selectively discharged;
at least first and second beam splitters, in a beam splitting position the first beam splitter selectively splits light from the input port between the first and second ports and in its beam splitting position the second beam splitter selectively splits light from the input port between the first and third ports;
at least first and second drive mechanisms for selectively

moving the first and second beam splitters into and out of their respective beam splitting positions, the first beam splitter and first drive mechanism are mounted in a first module and the second beam splitter and second drive mechanism is mounted in a second module, the first and second modules being substantially identical and configured to occupy a pie-shaped angular section of the housing to facilitate mounting of additional like modules within the housing.

5,087,987

COLOR-CORRECTED TELECENTRIC SCAN LENS

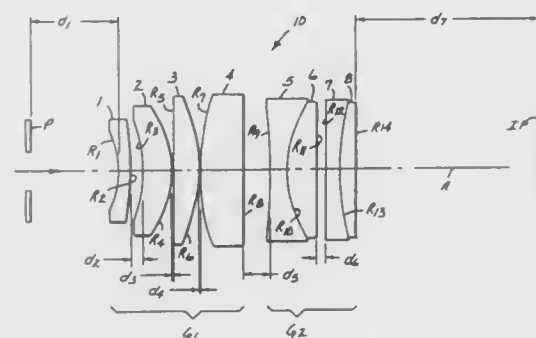
John J. Simbal, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1991, Ser. No. 676,817

Int. Cl.⁵ G02T 13/22

U.S. Cl. 359—663

10 Claims



1. A multiple element telecentric scan lens comprising, in succession from a side of incident light:
a first meniscus lens element, concave toward the incident light side;
a second meniscus lens element, concave toward the incident light side;
a first plano-convex lens element, convex away from the incident light side;
a second plano-convex lens element, convex toward the incident light side; and
a first cemented doublet including bi-concave and plano-convex lens elements, the cemented surface convex toward the incident light side.

5,087,988

ZOOM LENS

Hiroki Nakayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

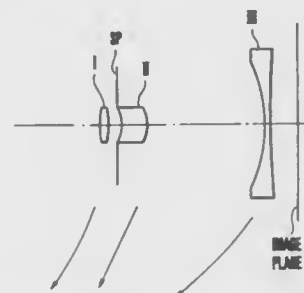
Filed Jul. 30, 1991, Ser. No. 738,110

Claims priority, application Japan, Aug. 7, 1990, 2-208995

Int. Cl.⁵ G02B 15/15

U.S. Cl. 359—689

11 Claims



1. A zoom lens comprising, from an object side, a first lens unit of positive refractive power, a second lens unit of positive refractive power and a third lens unit of negative refractive

power, wherein each of said first, second and third lens units is constructed from a single block, and zooming from a wide-angle end to a telephoto end is performed by moving said first and third lens units axially toward the object side independent of each other.

5,087,989

OBJECTIVE OPTICAL SYSTEM FOR ENDOSCOPES

Tsutomu Igarashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

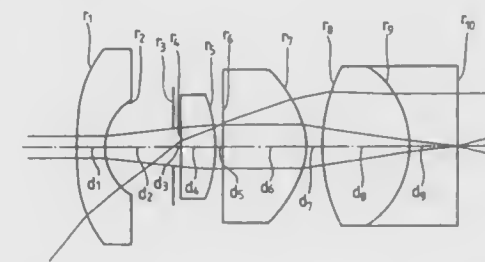
Filed Apr. 18, 1990, Ser. No. 510,661

Claims priority, application Japan, Apr. 19, 1989, 1-097600

Int. Cl.⁵ G02B 9/04

U.S. Cl. 359—692

10 Claims



1. An objective optical system for endoscopes comprising, in order from the object side, a front lens unit having a negative refractive power, an aperture stop and a rear lens unit having a positive refractive power, and satisfying the following conditions (1) through (7):

$$S(0.8\omega) \geq \frac{3 \tan(0.8\omega/3)}{\sin 0.8\omega} - 1$$

$$0.6 < \frac{S(\theta_1)}{S_k(\theta_1)} < 1.7$$

within a range of $0.6\omega \leq \theta_1 \leq \omega$

$$0.15 < \frac{S_2(0.8\omega)}{S_1(0.8\omega)} < 4$$

$$0.4 < \frac{S_2(\theta_1)/S_1(\theta_1)}{S_2(0.8\omega)/S_1(0.8\omega)} < 2.5$$

within a range of $0.6\omega \leq \theta_1 \leq \omega$

$$|\beta_E| > 2.5$$

$$|f_1/f| < 3.5$$

$$|f_2/f| < 2.5$$

wherein the reference symbol ω represents a half field angle of the objective optical system, the reference symbols $S_1(\theta_1)$ and $S_2(\theta_1)$ represent offense against the sine condition of the front lens unit and rear lens unit, respectively, normalized by $f \sin \theta$, and determined by tracing a principal ray having an angle of θ , relative to the optical axis on the object side of the objective optical system from an image toward an object, the reference symbol β_E represents a paraxial pupil magnification of the objective optical system as a whole, the reference symbol f designates focal length of the objective optical system as a whole, the reference symbol f_1 denotes focal length of the front lens unit, the reference symbol f_2 represents focal lengths of the rear lens unit, the reference symbol

$$S_k(\theta_1) = \frac{k_0.8\omega \tan(\theta_1/k_0.8\omega)}{\sin \theta_1} - 1$$

and $k_0.8\omega$ is selected so as to satisfy the following formula:

$$S(0.8\omega) = \frac{k_0.8\omega \tan(0.8\omega/k_0.8\omega)}{\sin 0.8\omega} - 1$$

5,087,990

COLLIMATOR LENS OF ERASABLE AND RE-RECORDABLE MAGNETO-OPTICAL DISK SYSTEM

Koichi Maruyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

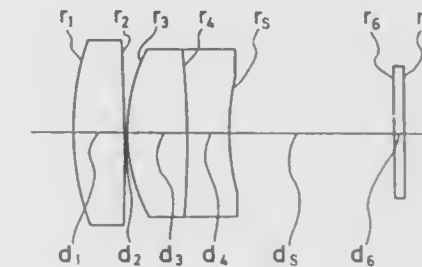
Filed Jun. 11, 1990, Ser. No. 535,485

Claims priority, application Japan, Jun. 13, 1989, 1-150172

Int. Cl.⁵ G02B 9/06

U.S. Cl. 359—794

3 Claims



1. A collimator lens for an erasable and re-recordable magneto-optical disk system comprising:

a positive first lens having a convex light emergent surface and a light incident surface, wherein said light incident surface has a greater radius of curvature than the radius of curvature of said convex light emergent surface,

a positive cemented lens having

a positive second lens having a convex light emergent surface and a light incident surface, wherein said light incident surface has a greater radius of curvature than the radius of curvature of said convex light emergent surface, and

a negative third lens having a light emergent surface and a concave light incident surface, wherein said light emergent surface has a greater radius of curvature than the radius of curvature of said concave light incident surface,

wherein said lenses are arranged from a light emergent side in order, and said collimator lens satisfies a relation as follows:

$$n1 < 1.686$$

where

$$n1: \text{refractive index of the first lens.}$$

5,087,991

MULTI-IMAGE VIEWER APPARATUS

Mark D. Miner, Brooklyn Park, Minn., assignor to InterNatural Designs, Inc., Minneapolis, Minn.

Filed Nov. 13, 1990, Ser. No. 611,544

Int. Cl.⁵ G02B 7/00

U.S. Cl. 359—894

13 Claims

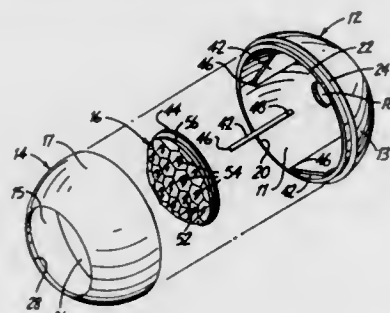
1. An apparatus for multi-image viewing, the apparatus including:

a first hollow eye piece housing having a first eye aperture and a second equator aperture concentric with first eye aperture;

a second hollow lens housing having a third equator aperture and a fourth lens mount aperture concentric with the third equator aperture;

connecting means for connecting the first hollow housing to the second hollow housing at the second and third apertures;

a prismatic lens seated within the second hollow housing adjacent the fourth aperture; and

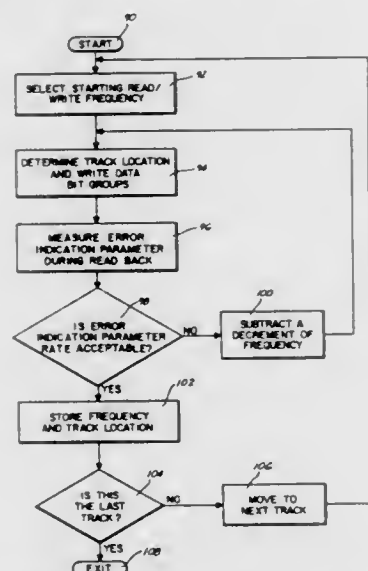


holding means for holding the lens adjacent the fourth aperture.

5,087,992 METHOD FOR ASSIGNING TRACKS ON A MAGNETIC DATA STORAGE DISK TO DIFFERENT READ/WRITE FREQUENCY ZONES

Shafaollah Dahandeh, Norman; Stephen R. Genheimer, and Steven L. Welty, both of Mustang, all of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.
Filed May 31, 1989, Ser. No. 359,740
Int. Cl.⁵ G11B 27/36, 5/09; H03M 13/00
U.S. Cl. 360—31

6 Claims



1. For a data storage system of the type comprising a rotatable magnetic disk and means for writing and subsequently reading groups of data bits on concentric tracks of the disk, wherein the tracks are grouped into zones and each zone is written at a selected zone frequency differing from the zone frequency at which each of the other zones is written, a method for assigning tracks to the zones comprising the steps of:

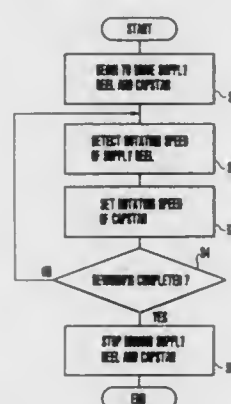
- selecting a plurality of tracks on the disk;
- writing a plurality of data bit groups for selected ones of the zone frequencies on each of the selected tracks;
- reading the data bit groups written on the selected tracks;
- comparing the read data bit groups to the written data bit groups to generate an error indication parameter indicative of the error rate in writing and subsequently reading data on the disk for each of the selected tracks and for each of the selected frequencies; and
- from the error indication parameters for each of the selected tracks, assigning each track on the disk to the highest

frequency zone for which the value of the error indication parameter will not exceed a preselected value.

5,087,993 MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH ADJUSTABLE CAPSTAN SPEED

Junji Kobayashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 23, 1990, Ser. No. 513,214
Claims priority, application Japan, May 1, 1989, 1-109076
Int. Cl.⁵ G11B 15/46
U.S. Cl. 360—73.03

17 Claims



1. A recording and reproducing apparatus comprising:
 - (a) a supply reel and a take-up reel for supplying and taking up a tape;
 - (b) reel driving means for driving said two reels;
 - (c) a capstan;
 - (d) capstan driving means for driving said capstan to transport the tape from said supply reel to said take-up reel in a forward tape transporting mode, and rewinding the tape from said take-up reel to said supply reel in a backward tape transporting mode;
 - (e) detecting means for detecting the rotating speed of said supply reel in rewinding the magnetic tape; and
 - (f) control means for controlling and varying the rotating speed of said capstan, during a tape rewinding mode, according to the rotating speed of said supply reel detected by said detecting means.

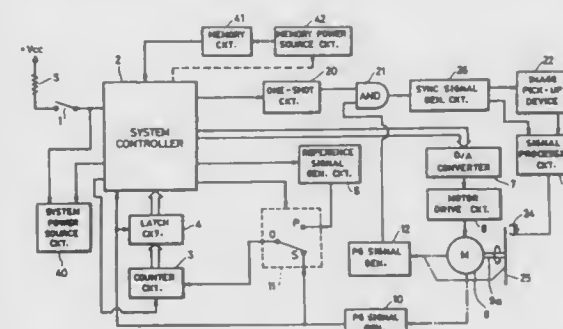
5,087,994 RECORDING AND/OR REPRODUCTION APPARATUS CAPABLE OF RETAINING START UP INFORMATION

Nobuo Fukushima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 272,818, Nov. 18, 1988, abandoned, which is a continuation of Ser. No. 914,321, Oct. 2, 1986, Pat. No. 4,816,937. This application Oct. 17, 1990, Ser. No. 598,819
Claims priority, application Japan, Oct. 17, 1985, 60-231784; Oct. 21, 1985, 60-234904
Int. Cl.⁵ G11B 19/247
U.S. Cl. 360—73.03

24 Claims

1. A recording and/or reproducing apparatus comprising:
 - (A) head means for recording signals on and/or reproducing signals from a recording medium by contacting the recording medium, said head means being movable relative to the recording medium;
 - (B) drive means for relatively rotating said head means and the medium;
 - (C) memory means for storing information corresponding to the load condition of said drive means in the state that the medium is being driven by said drive means at a predetermined speed and phase and said head has contacted the medium for recording or reproducing;
 - (D) holding means for holding said information stored in said memory means while said drive means is inoperative,

said holding means holding said information in a non-volatile manner, said holding means clearing the information stored in said memory means when said drive means is inoperative over a predetermined period of time; and

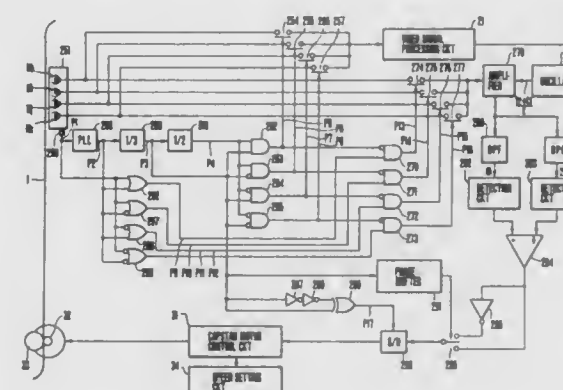


(E) drive control means for controlling the speed and phase of the relative rotation between said head means and the medium on the basis of the information stored in said memory means at least when said drive means starts to operate, for recording or reproducing on or from the medium with said head means.

5,087,995 INFORMATION SIGNAL REPRODUCING APPARATUS FOR EFFECTING TRACKING CONTROL BY USING THREE OR MORE ROTARY HEADS

Kenichi Nagasawa, Kanagawa, and Hiroo Edakubo, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 256,105, Oct. 7, 1988, abandoned, which is a continuation of Ser. No. 805,959, Dec. 5, 1985, abandoned.
This application Aug. 7, 1990, Ser. No. 564,045
Claims priority, application Japan, Dec. 6, 1984, 59-257958; Dec. 20, 1984, 59-269884; Dec. 20, 1984, 59-269885; Dec. 21, 1984, 59-271263
Int. Cl.⁵ G11B 5/584
U.S. Cl. 360—77.140

6 Claims



1. A rotating head type reproducing apparatus for reproducing an information signal by means of rotary heads from each of many recording tracks formed in parallel with each other on a tape-shaped record bearing medium, comprising:

- a) a cylinder member arranged to have said tape-shaped record bearing medium wound around said cylinder member at a wrap angle which is at least

$$360^\circ \times \left(\frac{n-1}{n} \right),$$

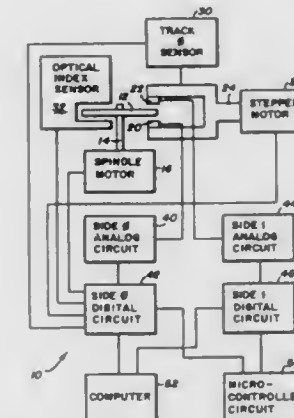
wherein "n" represents an integer at least 3;
b) a number "n" of rotary heads arranged to revolve around

the periphery of said cylinder member at a phase difference of $360^\circ/n$ from each other;
c) reproducing means for reproducing said information signal by selectively using one by one signals reproduced respectively by said "n" number of rotary heads; and
d) control means for controlling the positions of said "n" number of rotary heads relative to said record bearing medium by using at least one of signals reproduced by an (n-1) number of rotary heads other than one of said "n" number of rotary heads which is in use by said reproducing means.

5,087,996 DISK DRIVE METHOD AND APPARATUS

Roger O. Williams, Fremont, and Titus E. Davis, Sunnyvale, both of Calif., assignors to Tronix Peripherals, Inc., Santa Clara, Calif.
Filed Dec. 22, 1989, Ser. No. 455,078
Int. Cl.⁵ G11B 5/55, 5/596
U.S. Cl. 360—78.01
MICROFICHE APPENDIX INCLUDED
(12 Microfiche, 1 Pages)

17 Claims



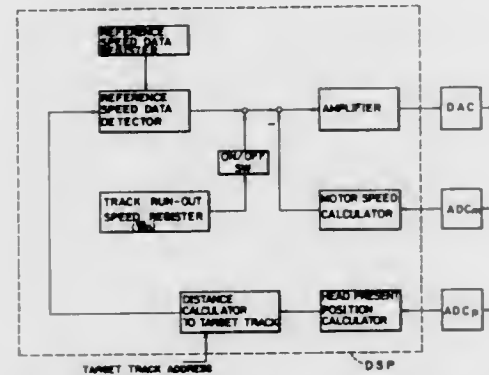
1. A method for writing a disk comprising the steps of: writing a first track with a head located at a first radial position on a disk for one full revolution, starting at a designated radial line on said disk; detecting said radial line after writing said first track and stepping said head to a second radial position on said disk responsive thereto; and waiting a predetermined time after detecting said radial line and then writing a second track on said disk, said predetermined time being a time period less than the time required for the disk to complete one revolution.

5. A disk drive system comprising:
 - a data recording disk;
 - rotation means connected to said disk for rotating said disk;
 - at least one recording head;
 - head movement means connected to said head(s) for radially moving said head(s) relative to and proximate to said disk;
 - index means in communication with said disk for detecting when said disk is in a particular angular position relative to said head(s) and generating a sensor index signal responsive thereto;
 - writing means connected to said head(s) for generating recording signals on receipt of a secondary index signal; and
 - signal delay means for generating said secondary index signal a predetermined time relative to said sensor index signal.

5,087,997
POSITION CONTROL SYSTEM FOR READ/WRITE DEVICE

Yotaka Osada, Fujisawa, and Keiichi Kaneko, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 16, 1989, Ser. No. 324,136
 Claims priority, application Japan, Mar. 17, 1988, 63-64295
 Int. Cl.⁵ G11B 5/55, 21/08, 21/10
 U.S. Cl. 360—78.06 3 Claims



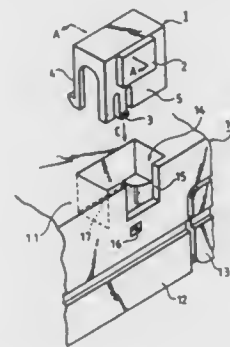
3. A position control system for a read/write device for positioning the read/write device at a particular track of a disk having a tracking pattern in the recording medium, comprising:

- an actuator having means for detecting a transporting speed of said read/write device;
- speed control means for causing the speed detected by said speed detecting means to follow a reference speed so as to transport the read/write device to a target track;
- position control means for controlling the position of said read/write device to track the target track;
- means for switching between said speed control means and said position control means;
- means for detecting a rotational phase of the disk;
- means for storing speed variation data of said read/write device in the radial direction of a track of said disk associated with the rotational phase of the disk, said speed variation data being obtained by said means for detecting during one rotation of said disk while said positioning means positions said read/write device at a specific track within a predetermined area of said disk; and
- means for adjusting the reference speed of speed control means in accordance with said speed variation data stored in said storage means corresponding to the rotational phase of the disk.

5,087,998
MAGNETIC TAPE CASSETTE HAVING IMPROVED ERASURE PREVENTING DEVICE
 Kengo Oishi, c/o Fuji Photo Film Co., Ltd., No. 12-1, Ogi-cho 2-chome, Odawara-shi, Kanagawa, Japan
 Filed Dec. 29, 1988, Ser. No. 291,829
 Claims priority, application Japan, Jan. 14, 1988, 63-2662[U]
 Int. Cl.⁵ G11B 23/02 5 Claims

- U.S. Cl. 360—132
1. A magnetic tape cassette, comprising:
 - a cassette casing in which a pair of tape reels on which a magnetic tape is wound are rotatably housed, an insertion hole being formed on an end face of said cassette casing, said hole being disposed near one end of an openable lid of said casing;
 - a snap-off tab positioned in said end face near an opposite end of said openable lid, said tab in-turn covers a cavity which can accept an erasure prevention detecting member therein; and
 - an immovable plug for inserting into and which becomes

immovable when fitted in said insertion hole for covering said insertion hole, wherein said insertion hole can accom-



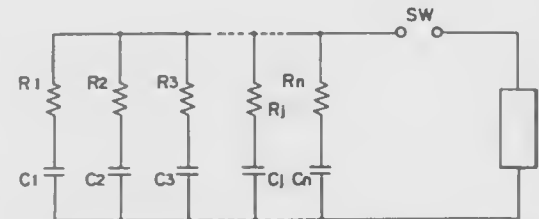
modate said immovable plug or movable erasure prevention plug.

5,087,999
CAPACITOR BANK PROVIDED WITH A PROTECTIVE DEVICE

Yasuhiro Sato, Yoichi Hirano, both of Tsukuba, and Satoru Yamaguchi, Tokyo, all of Japan, assignors to Director General, Agency of Industrial Science and Technology and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan
 Filed Aug. 28, 1990, Ser. No. 573,697

Claims priority, application Japan, Sep. 21, 1989, 1-245491; Sep. 21, 1989, 1-245492
 Int. Cl.⁵ H01G 1/11 9 Claims

U.S. Cl. 361—17



1. A capacitor bank adapted to be coupled across a load via a circuit-closure switch for supplying a large current instantaneously to the load upon closure of the circuit-closure switch, the capacitor bank comprising:

- a plurality of capacitor units coupled in parallel; and
- energy absorbing resistors each coupled in series with one of said capacitor units such that each one of the capacitor units is coupled in series with at least one of the energy absorbing resistors, whereby when any one of the capacitor units undergoes an electrical insulation failure, electrical energy flowing into the failing capacitor unit from other capacitor units is substantially absorbed and dissipated by the energy absorbing resistors.

5,088,000
ELECTRONIC THERMAL RELAY AND APPROPRIATE THERMAL ELEMENT

Guy Laudereau, Arcueil; Gilles Benrand, Montesson la Borde; Isabelle Lubin, Ruell Malmaison; Sylvie Gay, Chatou, and Jacques Berdahi, Paris, all of France, assignors to Telemecanique, France

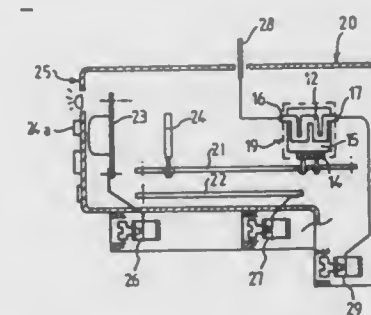
Filed Dec. 28, 1989, Ser. No. 458,023
 Claims priority, application France, Jan. 5, 1989, 89 00067
 Int. Cl.⁵ H02H 5/04 8 Claims

U.S. Cl. 361—103

1. An electronic thermal relay which can be associated with

a multiphase electric load for cutting off the power supply to the load in the case of a current overload in at least one phase or an imbalance between phase currents, this relay comprising in a case:

- i. a detecting means per phase for delivering a signal depending on the intensity of the phase current,
- ii. an electronic processing circuit which receives and processes the signals delivered by the detecting means, this circuit comprising a logic means capable of delivering a tripping signal, each detecting means being a thermal element with a resistive heating element through which



the phase current passes, a relay sensor having a resistivity which varies continuously with the temperature and which is electrically connected to the processing circuit for transmitting thereto an analog signal representative of the heating produced by the resistive element, and a thermal mass forming a thermal memory of the heating of the load, said heating element being thermally coupled to a thermal coupling body distinct from the thermal memory mass, said body carrying the sensor and being in thermal connection with the memory mass and having a lower thermal inertia than the thermal mass.

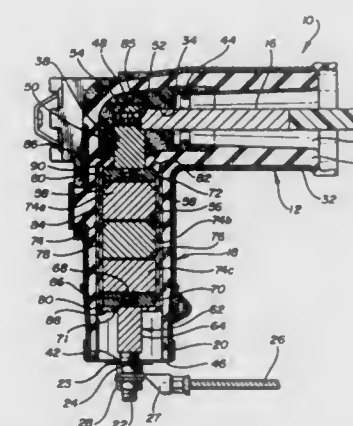
5,088,001
SURGE ARRESTER WITH RIGID INSULATING HOUSING

Harry G. Yaworski, Easton, Pa., and Larry N. Siebens, Port Murray, N.J., assignors to Amerace Corporation, Parsippany, N.J.

Filed Feb. 23, 1990, Ser. No. 483,656
 Int. Cl.⁵ H02H 9/04

U.S. Cl. 361—127

20 Claims



1. A surge arrester comprising:
 - at least one cylindrical metal oxide varistor block having a first end and a second end and an outer peripheral surface between said first end and said second end;
 - two metal end fittings, one adjacent each of said first and second ends;
 - a rigid dielectric insulating tube having an inside diameter

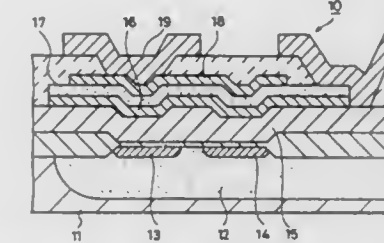
larger than the outer diameter of the outer peripheral surface of said block; and

- a dielectric material layer between the interior surface of said tube and the outer peripheral surface of said block to completely fill the space between said tube and said at least one varistor and said end fittings, said material layer extending beyond the ends of said tube and over at least a portion of the free end surfaces of said end fittings to seal said end fittings and said block and lock said tube thereto.

5,088,002
CERAMIC ELECTRONIC COMPONENT AND METHOD OF FABRICATING THE SAME

Toshio Ogawa, Nagaokakyo, Japan, assignor to Murata Mfg. Co., Ltd., Japan

Filed Mar. 26, 1991, Ser. No. 675,148
 Claims priority, application Japan, Mar. 26, 1990, 2-77199
 Int. Cl.⁵ H01G 4/10, 7/00; H01L 27/02
 U.S. Cl. 361—321 9 Claims



1. A ceramic electronic component, comprising:
 - a ceramic thin film; and
 - thin film electrodes made of a Ni-Al system alloy or a Ni-Cr-Al system alloy which are formed so as to make contact with the ceramic thin film.

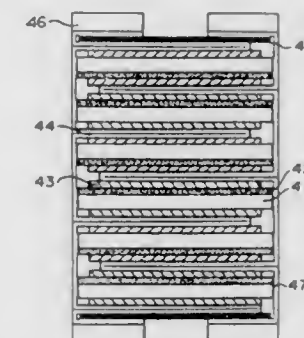
5,088,003
LAMINATED SILICON OXIDE FILM CAPACITORS AND METHOD FOR THEIR PRODUCTION

Naomichi Sakai, Ayase; Masanaga Kikusawa, Ichikawa; Yoshitaka Kubota, Sagami-hara; Hiroshi Yamamura, and Hiroya Nagata, both of Yokohama, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Aug. 17, 1990, Ser. No. 568,994
 Claims priority, application Japan, Aug. 24, 1989, 1-216023; Aug. 31, 1989, 1-223109; Oct. 5, 1989, 1-258713
 Int. Cl.⁵ H01G 4/38, 7/00

U.S. Cl. 361—330

9 Claims



1. A laminated silicon oxide film capacitor, comprising:
 - a plurality of single silicon oxide film capacitors, each having an oxide layer disposed on a conductive or semiconductive substrate and first and second conductive layers respectively formed on said oxide layer and said substrate;
 - a first electrode electrically connected to each of said first conductive layers;

a second electrode electrically connected to each of said second conductive layers; and first and second external electrodes respectively connected to said first and second electrodes; wherein said plurality of capacitors are laminated such that said first conductive layers of adjacent capacitors oppose each other and said first electrode is disposed between adjacent of said first conductive layers, and such that said second conductive layers of adjacent capacitors oppose each other and said second electrode is disposed between adjacent of said second conductive layers to obtain a parallel connection of said plurality of capacitors.

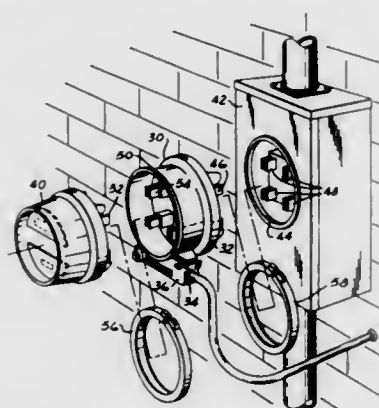
5,088,004

ELECTRICITY METERING DEVICE WITH COVER
Chesley R. Howell, Scarborough, Canada, assignor to Schlumberger Canada, Ltd., Toronto, Canada

Filed May 31, 1991, Ser. No. 708,517
Int. Cl.⁵ H02B 1/00

U.S. Cl. 361—373

9 Claims



1. An electrical metering interbase device for connecting between a primary electrical metering device and a power source, said interbase device comprising:

- a base portion having first terminal means for connecting with said primary metering device and second terminal means for connecting with said power source;
- a terminal device connected to said base portion, said terminal device having a housing with a cavity therein and a cover member;

first hinge means on said cover;

second hinge means on said housing;

said first and second hinge means hingedly attaching together said housing and cover member around an axis of rotation, but allowing removal of said cover from said housing upon disassembly of said hinge means in the direction of said axis of rotation;

barrier means for preventing disassembly of said first and second hinge means when said cover is in a closed position covering said cavity of said housing; and securing means for attaching together said cover and said housing.

5,088,005

COLD PLATE FOR COOLING ELECTRONICS
Michael P. Ciacio, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

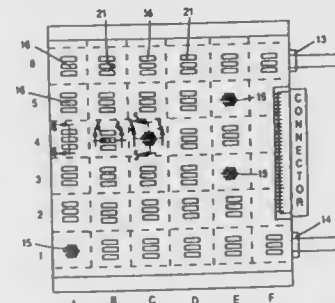
Filed May 8, 1990, Ser. No. 520,801
Int. Cl.⁵ H05K 7/20

U.S. Cl. 361—385

20 Claims

1. A cold plate for cooling electronic components comprising a plurality of layers which are assembled in stacked relation, said plurality of layers including a heat exchanger layer, means defining a flow path for circulating a cooling liquid through said cold plate for cooling electronic components

located in heat conducting relation to said cold plate, said flow path extending through a plurality of cooling zones of said cold plate, respective portions of said heat exchanger layer being located in said cooling zones for heat exchange with coolant circulated along the flow path, said respective portions of the heat exchanger layer including at least one first heat exchanger structure for relatively high efficiency cooling and at least one second heat exchanger structure for relatively lower efficiency



cooling, each of said first and second heat exchanger structures being located in a respective one of said cooling zones whereby for heat removal efficiency a relatively high heat producing electronic component can be located adjacent one of said cooling zones with a first heat exchanger structure associated therewith and a relatively lower heat producing electronic component can be located adjacent one of said cooling zones with a second heat exchanger structure associated therewith.

5,088,006

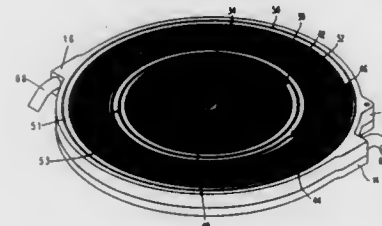
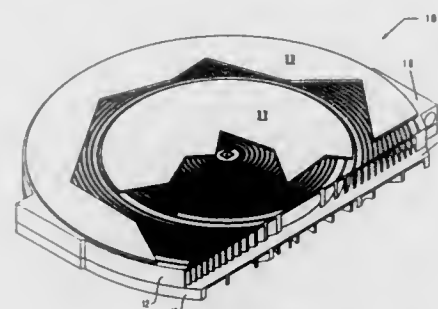
LIQUID FILM INTERFACE COOLING SYSTEM FOR SEMICONDUCTOR WAFER PROCESSING

Santiago E. del Puerto, Milton, and Paul M. Gaschke, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1991, Ser. No. 691,628
Int. Cl.⁵ H05K 7/20

U.S. Cl. 361—385

12 Claims



1. A cooling system for a substrate comprising:

- a chuck having a top and a bottom, said top having a liquid interface cooling circuit means adapted to provide a liquid interface between said chuck and the substrate, said liquid interface cooling circuit means having an input means and an output means;

a source vessel connected to said input means for providing

a first liquid to said liquid interface cooling circuit means, said source vessel maintaining said first liquid at atmospheric pressure; and, a collection vessel connected to said output means for collecting said first liquid, said collection vessel maintaining collected fluid below atmospheric pressure to thereby cause liquid to flow from said source vessel through said liquid interface cooling circuit means and into said collection vessel, wherein said liquid interface is adapted to provide both a clamping force to the substrate in order to clamp the substrate to said chuck and a cooling interface in order to cool the substrate.

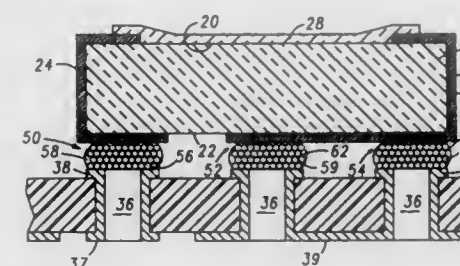
5,088,007

COMPLIANT SOLDER INTERCONNECTION
Carl Missele, Elgin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1991, Ser. No. 680,472
Int. Cl.⁵ H05K 7/20

U.S. Cl. 361—386

2 Claims



1. In an electronic device comprising a component attached to a substrate by a solder interconnection, the improvement comprising

- a composite interconnection comprising a solder body bonded to the component and the substrate and extending continuously therebetween to physically affix the component and the substrate, and an interwoven copper fiber mat embedded within the solder body to enhance electrical and thermal conduction through the interconnection.

5,088,008

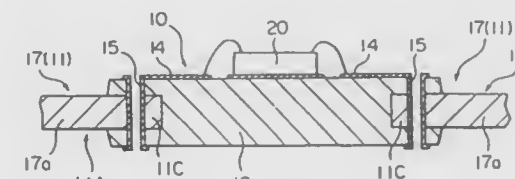
CIRCUIT BOARD FOR MOUNTING ELECTRONIC COMPONENTS

Takeshi Takeyama, and Mitsuhiro Kondo, both of Oogaki, Japan, assignors to Ibiden Co., Ltd., Japan

Continuation of Ser. No. 460,004, Jan. 12, 1990, Pat. No. 5,022,960. This application Sep. 28, 1990, Ser. No. 589,522
Claims priority, application Japan, May 1, 1989, 1-113425
Int. Cl.⁵ H05K 7/10, 5/02; H01L 23/48; B44C 1/22

U.S. Cl. 361—403

4 Claims



1. A circuit board for mounting electronic components comprising:

- an electrically insulating substrate having opposed first and second surfaces and third and fourth beveled side surfaces substantially transverse to the first and second surfaces;

a central mounting pad disposed on the first surface of said substrate for mounting an electronic component; a plurality of electrically conducting leads disposed on the first surface, each lead including a first end proximate the mounting pad and a second end; a plurality of through holes penetrating the substrate from the first to the second surface, the substrate surfaces defining the through holes being plated with an electrically conducting material, the second end of each of said leads being electrically connected to the plated surface of a respective through hole; and a plurality of electrical leads embedded in the substrate and extending outwardly from the third and fourth beveled side surfaces, each lead intersecting and being electrically connected to the plated surface of a respective through hole.

5,088,009

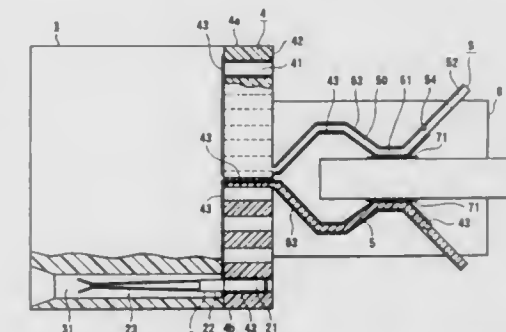
SURFACE-MOUNTING CONNECTOR

Katsumi Harada; Toshiaki Nagafuji; Wataru Takahashi, all of Tokyo; Kenichi Nakano, Kokubunji, and Kei-ichi Yasuda, Tokyo, all of Japan, assignors to NEC Corporation and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Dec. 13, 1990, Ser. No. 625,667
Claims priority, application Japan, Dec. 15, 1989, 1-326911
Int. Cl.⁵ H01R 23/68

U.S. Cl. 361—413

17 Claims



1. A surface-mounting connector, mounted on a printed board, for electrically connecting the printed board to an external unit, comprising:

- a repeater pin block including a main body comprising a resin and having regularly arranged through holes, and a continuously extended resin spring contact portion integrally and continuously extending from said main body to be brought into contact with a surface of the printed board, said main body and said continuously extended resin spring contact portion comprising contact portions to be brought into contact with conductive pads of the printed board and conductive paths to be connected to said regularly arranged through holes; and

connector pins having a first pin portion on a first end thereof, said first pin portion having a press-fit structure and being forcibly inserted in a corresponding one of said regularly arranged through holes, and a second pin portion on a second end thereof, said second pin portion being used for electrical connection with an external unit, wherein said contact portions to be brought into contact with said conductive pads arranged in a row on the same surface of the printed board are arranged on said continuously extended resin spring contact portion.

5,088,010
FASTENING MEANS FOR A TRANSFORMER MODULE AND A SIGNAL GENERATOR FOR MOUNTING AT A SIGNAL TOWER

Walter Wimmer, Pullach; Herbert Krautwald, and Guenter Heinzel, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

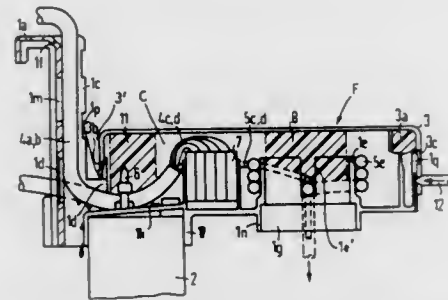
Filed Sep. 26, 1990, Ser. No. 589,787

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1989, 8912886[U]

Int. Cl.⁵ H05K 7/02

U.S. Cl. 361-419

20 Claims



1. A fastening mechanism for mounting a signal generator to a signal tower, said signal generator having cables to be routed to said signal tower, comprising:
 - a transformer module;
 - a bottom pan, having:
 - sidewalls,
 - a floor, said sidewalls extending from said floor,
 - a receptacle means mounted to said floor for mounting the transformer module to said bottom pan, and
 - a holding means mounted to said floor for mounting the signal generator to said bottom pan;
 - a cover installed onto said bottom pan, forming a terminal space together with said pan, said pan providing an access for said cables to be routed from said signal generator into said terminal space;
 - a terminal block arranged in said terminal space;
 - a holder applied to said pan and fastenable to said signal tower, said holder comprising a cable channel region for guiding said cables from said terminal space to said signal tower; and
 - said sidewalls having an open area communicating with said channel region forming a cable pathway extending from said signal tower through said cable channel region, through said open area, into said terminal space, to said terminal block.

5,088,011
HEADLAMP CAPSULE BASE WITH FORMED SEAL LUG

Warren F. Williams, Warner, N.H., and John F. Culver, Russel, Pa., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 24, 1990, Ser. No. 632,570

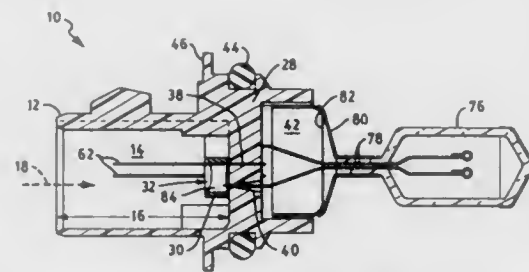
Int. Cl.⁵ F21M 3/02

U.S. Cl. 362-61

26 Claims

1. A base for a headlamp capsule comprising: a molded body having an open ended plug chamber, the plug chamber having an axis, the molded body further having an intermediate wall formed as an end of the plug chamber and which has a cross sectional area within said plug chamber, a lamp chamber formed on the opposite side of the intermediate wall, a walled region formed on the intermediate wall having an interior wall defining a surrounded lug well, the lug well having a cross sectional area substantially less than the plug

chamber cross sectional area of the intermediate wall, and having a lug passage with a minor width, and formed to extend



from the lug well, through the intermediate wall to the lamp chamber.

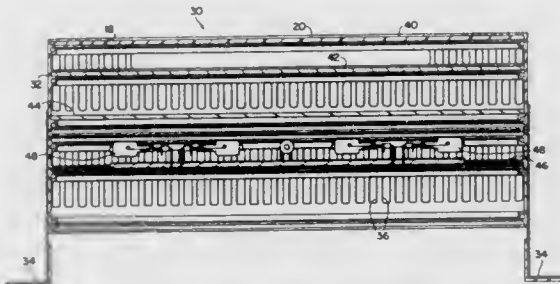
5,088,012
HIGH INTENSITY PLANAR LIGHT SOURCE
 Kenneth G. Burgess, 92 Knollwood Dr., Old Saybrook, Conn. 06475

Filed Nov. 21, 1990, Ser. No. 616,361

Int. Cl.⁵ G09F 13/04

U.S. Cl. 362-97

20 Claims



1. A high intensity planar light source comprising:
 - a frame defining a rectangular illumination surface on which films and other objects to be illuminated are positioned for viewing when illuminated by the source;
 - an array of lamps, each having a light emitting element, all disposed within a rectangular area having major axes extending parallel to the sides of the rectangular area and located midway between the corners of the rectangular area and generally equidistant from the rectangular illumination surface defined by the frame, the sides of the rectangular area being generally parallel to the respective sides of the rectangular illumination surface, at least some of the lamps being arranged with the light emitting elements distributed along a peripheral region of the rectangular area with a higher density of elements near the corners of the rectangular area than at the major axes of the area.

5,088,013
CLIP FOR HOLDING MESSAGES WITH REMINDER LIGHT

Arthur N. Revis, 670 Beau Ct., Des Plaines, Ill. 60016

Filed Aug. 30, 1990, Ser. No. 574,894

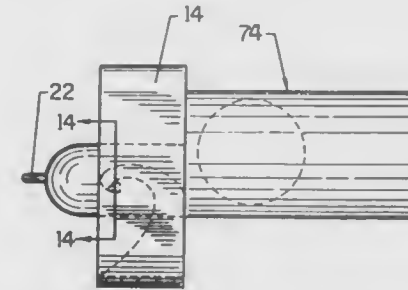
Int. Cl.⁵ F21V 33/00

U.S. Cl. 362-99

14 Claims

1. A holder for holding messages, notes, paper, and then like, comprising:
 - a first jaw member comprising a first clamping face;
 - a second jaw member comprising a second clamping face;
 - mounting means for rotatably mounting said second jaw member with respect to said first jaw member for moving said clamping surfaces toward and away from each other to clamp and release, respectively, a note therebetween;
 - biasing means for urging said first and second jaw members

into a clamping state where said first and second clamping faces are urged toward each other;
 illuminating means mounted by at least one of said first and second jaw members;
 power source means for energizing said illuminating means;
 switch means operatively positioned between said illuminating means and said power source means for alternatively opening and closing the couplement of said illuminating means with said power source means;



said switch means being at least partially mounted by said second jaw member, said switch means comprising means responsive to the pivotal movement of said second jaw member for alternatively coupling and decoupling said power source means from said illuminating means in response to the pivotal rotations of said second jaw member, said pivotal rotations of said second jaw member occurring in same direction.

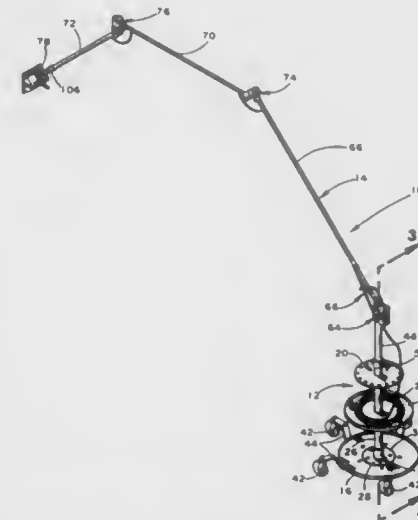
5,088,014
TOOL CADDY WITH ADJUSTABLE LIGHT BOOM
 Kenneth Boughey, 314 N. First St., Laurens, Iowa 50554

Filed Jan. 14, 1991, Ser. No. 640,894

Int. Cl.⁵ F21V 33/00

U.S. Cl. 362-132

8 Claims



1. An improved tool caddy that is readily movable on a supporting surface, said tool caddy comprising:
 - (a) a vertically aligned central support member;
 - (b) means attached to said support member for storing a plurality of tools on said caddy;
 - (c) a plurality of caster wheels connected to said storing means;
 - (d) an extension member associated with the upper end of said support member in a telescoping relationship and having an upper end and a lower end;
 - (e) means for semi-permanently fixing the telescoping rela-

tionship of said extension member with respect to said support member;
 (f) a light boom pivotally connected at one end to the upper end of said extension member;
 (g) a light fixture secured to the other end of said boom;
 (h) said light boom having:

1. a main inner arm that is connected at one end to said extension member; and
2. an outer section that is pivotally connected to the other end of said main arm to thereby provide a means for two dimensional freedom of movement of said light fixture; and

 (i) means for adjustably changing and semi-permanently fixing the position of said light boom with respect to said extension member.

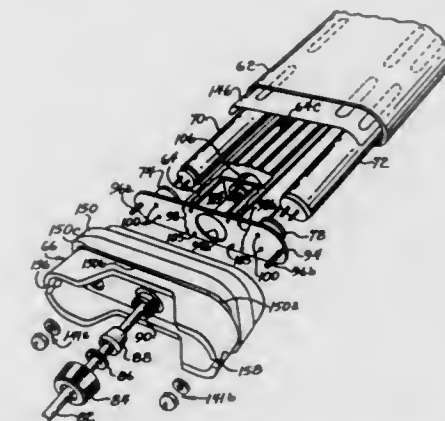
5,088,015
PORTABLE FLUORESCENT LAMP FIXTURE
 Horacio A. Baggio, Niles, and Mark D. Burrows, Barrington, Ill., assignors to Woodhead Industries, Inc., Northbrook, Ill.

Filed Jan. 26, 1991, Ser. No. 721,410

Int. Cl.⁵ F21L 3/00

U.S. Cl. 362-217

16 Claims



1. A portable fluorescent lamp fixture including a plurality of fluorescent lamps and associated circuitry and wires, said portable fluorescent lamp fixture comprising: elongated, tube-like lamp guard means open at both ends for enclosing said fluorescent lamps; first and second support plates each disposed on a respective end of said lamp guard means; a plurality of lamp holders attached to each of said first and second support plates for engaging respective ends of said fluorescent lamps and coupling said fluorescent lamps to said circuitry and wires; channel support means disposed within said lamp guard means and coupled at respective ends thereof to each of said first and second end plate means for substantially enclosing and maintaining said circuitry and wires in position within said lamp fixture; removable cover means disposed on said channel support means and over said circuitry and wires for enclosing said circuitry and wires; first and second end caps removably coupled to said first and second support plates, respectively; and quick disconnect coupling means for electrically coupling the portable fluorescent lamp fixture to a source of power, said coupling means including a receptacle integral with said first end cap and removable therewith and a plug coupled to said first support plate and disposed within said channel support means and coupled to the circuitry and wires therein.

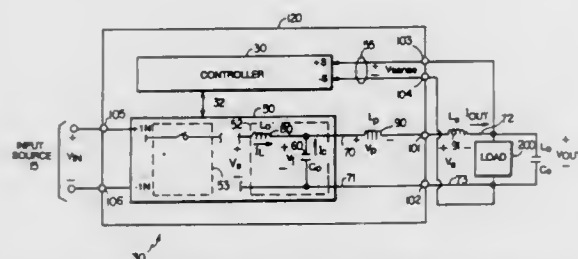
5,088,016

VOLTAGE-COMPLIANT DC-DC CONVERTER MODULE
 Patrizio Vinciarelli, Boston, and Jay M. Prager, Tyngsboro,
 both of Mass., assignors to VLT Corporation, San Antonio,
 Tex.

Filed Sep. 17, 1990, Ser. No. 583,863
 Int. Cl. H02M 3/00

U.S. Cl. 363-15

12 Claims



1. A voltage-compliant power converter module which converts power from an input source for delivery to a load, said load being external to said voltage-compliant power converter module and including an external filter capacitance of value C_e for providing ripple filtering of the load voltage delivered to said load, said load being corrected to said voltage-compliant power converter module via load interconnections external to said voltage-compliant power converter module, said load interconnections being characterized by a total parasitic load inductance of value L_l , said voltage-compliant power converter module comprising

input terminations for connection to said input source, output terminations for connection to said load interconnections,

switching power conversion circuitry connected to receive input power via said input terminations from said input source, said power conversion circuitry including one or more switching devices, said switching devices delivering a pulsating voltage waveform at switching frequencies within a nominal operating range,

power delivery circuitry for receiving said pulsating voltage waveform from said switching power conversion circuitry and delivering power to said loads via said output terminations and said load interconnections, said power delivery circuitry including an output capacitor, of value C_o , an output inductor, of value L_o , and output interconnections between said output capacitor and said output terminations, said output interconnections and said output terminations being characterized by a total parasitic output inductance of value L_p , said output inductor, said external filter capacitor, said output capacitor, said parasitic load inductance and said parasitic output inductance defining a first breakpoint frequency, f_1 , given by the expression on the right side of the following equality:

$$f_1 = \frac{1}{2\pi \sqrt{(L_o + L_p + L_l) \cdot (C_o + C_e)}}$$

which is lower than the lowest switching frequency in the nominal operating range, the output capacitance, C_o , of said output capacitor included within said power delivery circuitry being less and (a) the expression on the right side of the following inequality:

$$C_o < \frac{1}{(L_p + L_l) \cdot (2\pi(V_m - V_o))^2}$$

and (b) the expression on the right side of the following inequality:

$$C_o < \frac{1}{(2\pi f_{opmin})^2 L_o}$$

wherein V_o is the output voltage, I_o is the load current, V_m is the maximum input filter voltage, f_{opmin} is the maximum operating frequency, and $L_s = L_o + L_p + L_l$.

5,088,017

DC-DC CONVERTER AND A COMPUTER USING THE CONVERTER

Takao Yaginuma, Hitachiota; Kenichi Onda, Hitachi, both of Japan; Yasuo Matsuda, Eastchester, N.Y., and Kenichi Mizuta, Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

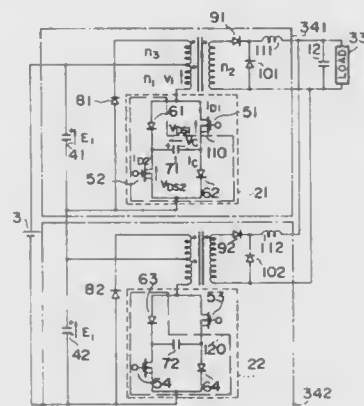
Filed Jun. 20, 1990, Ser. No. 540,789

Claims priority, application Japan, Jun. 21, 1989, 1-156788

Int. Cl. H02M 3/335

U.S. Cl. 363-21

27 Claims



1. A DC-DC converter comprising a DC voltage source, a load circuit and a switching element connected in series, power being supplied to the load circuit by turning on and off the switching element, wherein the DC voltage source is connected in series with a capacitor through a diode when the switching element is turned off, and wherein the DC voltage source and the capacitor are connected in series through the switching element when the switching element is turned on such that the respective voltages across the DC voltage source and the capacitor are combined additively.

5,088,018

OVERVOLTAGE PROTECTION POWER SUPPLY CIRCUIT

Chang-beum Lee, Anyang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Jul. 5, 1990, Ser. No. 548,558

Claims priority, application Rep. of Korea, Feb. 22, 1990, 90-2243

Int. Cl. H02M 7/5383

U.S. Cl. 363-56

4 Claims

1. An overvoltage protection power supply circuit comprising:

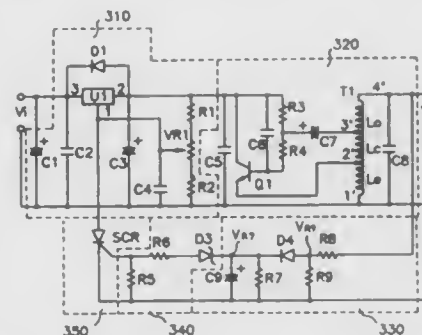
voltage regulating means for receiving an unregulated DC voltage and outputting a regulated DC voltage;

DC to AC voltage converting means coupled to said voltage regulating means for receiving said regulated DC voltage and converting said regulated DC voltage to an AC voltage;

means coupled to said converting means for outputting said AC voltage;

rectifying means coupled to said converting means for rectifying the AC voltage output from said converting means

to obtain a rectified feedback voltage, said rectifying means comprising:
 a voltage divider;
 a rectifying diode coupled to said voltage divider;
 a filter capacitor coupled to said rectifying diode for removing any surge voltage, and
 a discharge resistor coupled in parallel with said filter capacitor;



means coupled to said rectifying means for determining whether the rectified feedback voltage exceeds a predetermined voltage; and

switching means coupled to said determining means and said voltage regulating means for causing said voltage regulating means to disable said regulated DC output when said rectified feedback voltage exceeds said predetermined level.

5,088,019

LOW HARMONIC CURRENT AND FAULT TOLERANT POWER SUPPLY

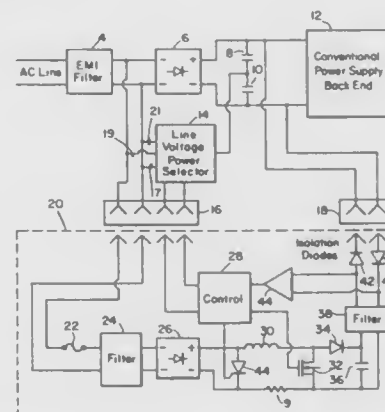
James B. Williams, Westford, and Bahman Sharifipour, Westborough, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 18, 1990, Ser. No. 584,067

Int. Cl. H02M 7/08, 7/04

U.S. Cl. 363-69

5 Claims



1. A method of providing a power supply from an AC line to a capacitive load which comprises:

providing a first rectifier in a first circuit;

providing a second rectifier with limited harmonic current drawn from the AC line in a second circuit, wherein said first and second circuits are connected in parallel, said second rectifier having a circuit for actively controlling current therethrough to limit harmonic current drawn;

sensing when the line voltage exceeds a predetermined voltage; and
 activating said second rectifier only when the line voltage exceeds said predetermined voltage so that said first rectifier is removed as a power supply.

5,088,020

PIVOTAL MOVEMENT CONTROL DEVICE FOR BOOM-EQUIPPED WORKING MACHINE

Tetsuya Nishida, and Yoshiyuki Katayama, both of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

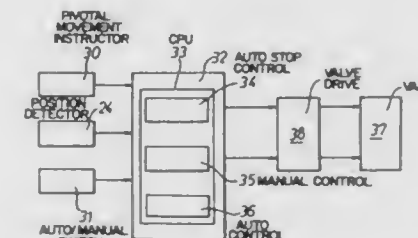
Filed Aug. 14, 1989, Ser. No. 393,669

Claims priority, application Japan, Nov. 18, 1988, 63-150970[U]; Nov. 18, 1988, 63-293297; Nov. 18, 1988, 63-293298; Nov. 18, 1988, 63-293299

Int. Cl. G05B 13/02

U.S. Cl. 364-160

18 Claims



1. A pivotal movement control device for a boom-equipped working machine comprising (1) a control lever which is movable between inclined positions on either side of a neutral region, (2) pivotal movement instructing means for controlling a pivotal movement of a boom in response to an inclined position of said control lever and (3) position detecting means for detecting the pivotal position of the boom in a lateral direction, wherein the improvement comprises:

switch means for changing between an automatic mode and a manual mode;

automatic target stop position control means for (a) storing a target stop signal from said position detecting means when said switch means is changed from the manual mode to the automatic mode, said target stop signal being representative of a target stop position of the boom, (b) controlling a pivotal movement of the boom so as to move the boom to the target stop position and stop the boom at the target stop when (b1) the boom is positioned away from the target stop position and (b2) said control lever is moved away from the neutral region in a direction opposite to the direction in which the boom is positioned away from the target stop position and (c) reading a positional signal from said position detecting means during movement of the boom to the target stop position;

manual control means for controlling a pivotal movement of the boom in response to a signal from said pivotal movement instructing means while said switch means is in the manual mode or while said control lever is operated other than as specified in (b1) and (b2) above; and

means for changing from the automatic mode to the manual mode when the boom is positioned away from the target stop position and said control lever is moved away from the neutral region in a direction which corresponds to the direction in which the boom is positioned away from the target stop position.

5,088,021

APPARATUS AND METHOD FOR GUARANTEED DATA STORE IN REDUNDANT CONTROLLERS OF A PROCESS CONTROL SYSTEM

Paul F. McLaughlin, Hatfield, and Pankaj H. Mody, Horsham, both of Pa., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Sep. 7, 1989, Ser. No. 404,124

Int. Cl. G06F 11/20

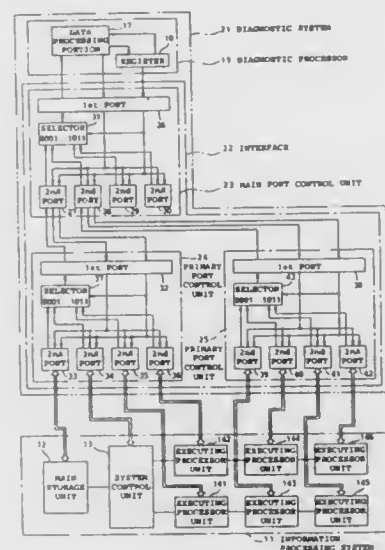
U.S. Cl. 364-187

5 Claims

1. A processing unit coupled to a data processing system, said processing unit comprising a primary and a secondary controller, each controller including:

i) decision means for determining which controller is the primary controller;

said interface means further including N_1 primary port control units corresponding to said N_1 primary port control groups and each of said N_1 primary port control units coupled to elementary diagnosed units in each of said primary port control groups;



interface means for delivering said diagnosis indicating data signal to said plurality of diagnosed units and for selecting, as said specific diagnostic data set, one of said diagnostic

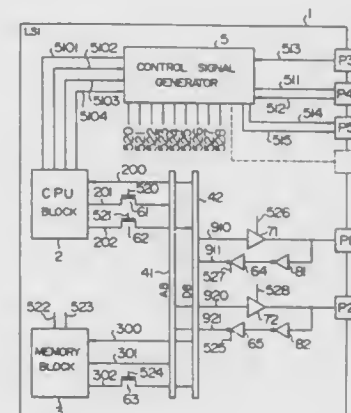
N_{i-1} (i-1)-th order port control units corresponding to said N_{i-1} (i-1)-th port control groups and being classified into N_i i-th order controller groups corresponding to said N_i i-th order port control groups;

N_i i-th order port control units each coupled to said (i-1)-th order port control units in each of said N_i i-th order controller groups;

N_k k-th order port control units corresponding to said N_k k-th order port control groups; and

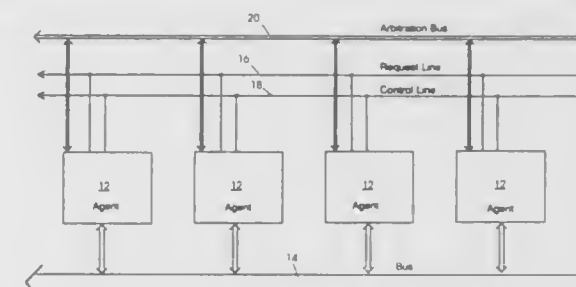
a main port control unit coupled to said N_k k-th order port control units, said main port control unit being coupled to said diagnostic processor for receiving a pair signal of said specific processing unit number and said diagnosis indicating data signal, said pair signal being delivered from said main port control unit to said diagnosed units through said k-th order port control units, said i-th port control units and said primary port control units, said specific diagnostic data set being delivered from said specific diagnosed unit to said diagnostic processor through one of said primary port control units, one of said (i-1)-th order port control units, one of said i-th order port control units, one of said k-th order port control units, and said main port control unit.

10 Claims



means to effect programming thereof independent of said CPU block.

5 Claims

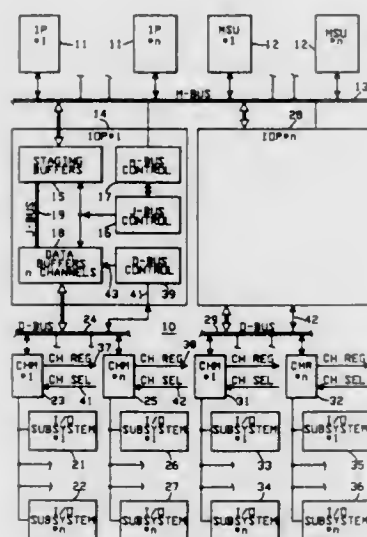


(g) the winning agent stopping asserting the control line when it gains control of the bus.

20 Claims

a plurality of staging buffers coupled to said main bus and

adapted to receive data from and transmit data to said main bus,
main bus transfer control means coupled to said main bus for receiving request to transfer data to or from said staging buffers,
a plurality of data buffers coupled to said data bus and adapted to receive data from and transmit data to said data bus,
data bus transfer control means coupled to said data bus for receiving request to transfer data to or from said data buffers,



a J-Bus connected to said staging buffers and to said data buffers for transmitting data between said buffers,
a sequencer storage buffer connected to said J-Bus, said J-Bus being connected to said staging buffers and to said sequencer storage buffer for storing micro sequencer control data, and
J-Bus transfer control means coupled to said data buffers, and staging buffers and to said sequencer storage buffer for effecting data transfer between said buffers.

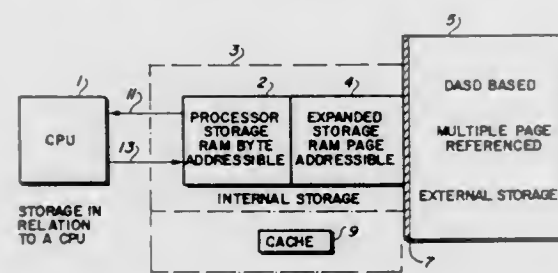
5,088,026 METHOD FOR MANAGING A DATA CACHE USING VIRTUAL EXTERNAL STORAGE ADDRESSES AS ARGUMENTS

Gerald P. Bozman, Oakland, N.J.; George Eisenberger, White Plains; Alexander S. Lett, Mahopac, both of N.Y.; James J. Myers, San Francisco, Calif.; William H. Tetzlaff, Mount Kisco, and Jay H. Unger, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1990, Ser. No. 477,704
Int. Cl. G06F 1/00

U.S. Cl. 395—425

6 Claims



1. A CPU implemented method for managing a cache for external storage having a first and second page organized files including a data file versioning feature, said CPU including

internal storage formed from RAM addressable pages and external storage formed from DASD addressable pages, comprising the steps of:

- creating at least two named pages (FIG. 5 PAGE 0, PAGE 1) in a predetermined file (FIG. 5 AV1) and assigning device independent locations in a logical external storage space (VF0, VF1);
- writing the pages (PAGE 0, PAGE 1) into a cache and indexing the cache location of said pages by the logical external storage space address (VF0, VF1);
- responsive to an update of a page (FIG. 5 PAGE 1') not common to said first (AV1) and second (AV2) files, assigning another logical external storage space (VF2 for PAGE 1') and storing the updated pages in cache in said another storage space location; and
- responsive to an update of a page common (PAGE 0) to the first (AV1) and second (AV2) files, updating the page in place in the cache (FIG. 6 VF0'), otherwise responsive to an update of a page not in common (PAGE 1'), writing the update in cache at yet another logical external storage space (FIG. 6 VF2') and retaining the original page at its former cache location (FIG. 6 VF2').

5,088,027

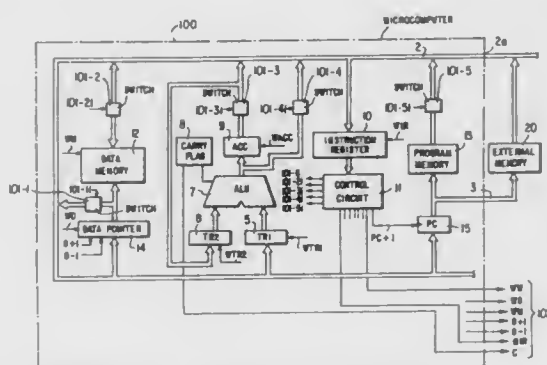
SINGLE-CHIP MICROCOMPUTER

Kouji Tanagawa, and Tomoaki Yoshida, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 116,862, Nov. 4, 1987, Pat. No. 4,969,087. This application Aug. 27, 1990, Ser. No. 572,545
Claims priority, application Japan, Nov. 10, 1986, 61-267399
The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl. G06F 12/00, 13/38

U.S. Cl. 395—575

13 Claims



1. A method for evaluating the operation of a single-chip microcomputer while a program is being debugged, comprising the steps of:

- providing a single-chip microcomputer which includes an internal bus having external bus terminals, circuit elements connected to said internal bus and capable of storing data or of arithmetic operation, the contents of said circuit elements being required to be known outside of the single-chip microcomputer during debugging,
- a program memory,
- a control circuit means for decoding instructions supplied through said internal bus and producing control signals for controlling said circuit elements,
- means, responsive to said control signals from said control circuit means, for transmitting instructions from said program memory to said internal bus during execution of a program stored in said program memory, and for transmitting the data written in any of said circuit elements to said internal bus during execution of an instruction involving transfer of data into a selected element, and
- output terminals for outputting at least a part of the con-

trol signals from the control circuit means, said control signals including write control signals for writing data into said circuit elements;

- providing, outside said single-chip microcomputer, shadow circuit elements corresponding to the circuit elements inside the single-chip microcomputer whose contents should be examined during debugging;
- providing, outside said single-chip microcomputer, an external memory storing the program to be debugged;
- connecting the output of said external memory to the external bus terminals;
- connecting said shadow circuit elements to receive data from said external bus terminals and to receive control signals;
- causing said program stored in said external memory to be executed by said single-chip microcomputer;
- while step (f) is being conducted, using said control circuit means to inhibit transmission of instructions from said program memory to said internal bus by said means for transmitting; and
- indirectly observing the contents of said circuit elements inside said single-chip microcomputer by reference to the corresponding shadow circuit elements.

5,088,028

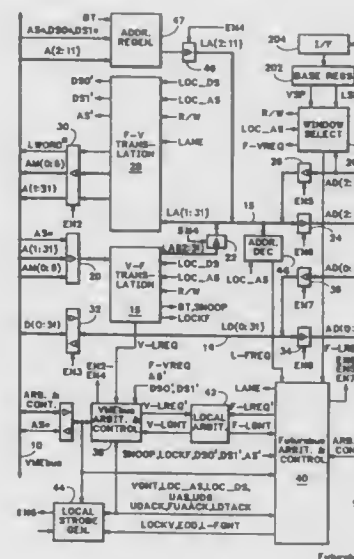
LOCK CONVERTING BUS-TO-BUS INTERFACE SYSTEM

John G. Theus, Sherwood, and Jeffrey L. Beachy, Wilsonville, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Continuation of Ser. No. 334,830, Apr. 7, 1989, abandoned. This application Jun. 17, 1991, Ser. No. 715,869

Int. Cl. G06F 13/364

U.S. Cl. 395—325

4 Claims



1. An apparatus for providing data communications between first and second computer systems, each computer system having a bus master coupled to a bus to arbitrate for control of the bus, to read and write access data storage locations mapped to separate addresses within an address space, and then to relinquish control of the bus, with a bus master writing or reading data to or from a particular data storage location by placing on the bus an address to which the particular data storage location is mapped and transmitting or receiving the data via the bus, the apparatus comprising:

- first means coupled to the first computer system bus for mapping an address within the first computer system address space to an address within the second computer system address space as a function of first mapping data loaded into the first mapping means, for asserting a first request signal for access to an internal bus of the apparatus as a function of the address from the first computer system

and the first mapping data, and for receiving a first lock signal from the first computer system, the first lock signal barring access to the first computer system bus by other devices of the first computer system;

second means coupled to the second computer system bus for mapping an address within the second computer system address space to an address within the first computer system address space as a function of second mapping data loaded into the second mapping means, for asserting a second request signal for access to the internal bus of the apparatus as a function of the address from the second computer system and the second mapping data, and for receiving a second lock signal from the second computer system, the second lock signal barring access to the second computer system bus by other devices of the second computer system; and

means coupled to the first and second mapping means for arbitrating for access to the internal bus in response to the first and second request signals, for controlling data flow between the first computer system and the second computer system via the internal bus of the apparatus when the internal bus is accessed by one of the computer systems according to the result of arbitrating between the first and second request signals, and for converting the first lock signal to the second lock signal, and vice versa, so that when the first computer system has access to the internal bus and asserts the first lock signal the bus of the second computer system is locked to bar access by devices of the second computer system, and vice versa.

5,088,029

SYSTEM FOR RESTRUCTURING INPUT/OUTPUT CONTROL SYSTEM

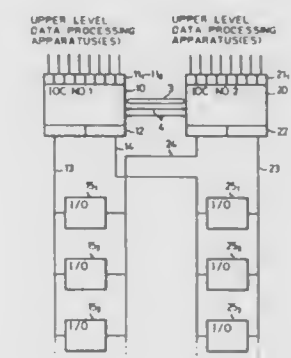
Susumu Koyama, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 5, 1989, Ser. No. 347,756

Claims priority, application Japan, May 11, 1988, 63-114226
Int. Cl. G06F 15/16, 11/16

U.S. Cl. 395—275

8 Claims



1. A system for restructuring an input/output control system having first and second input/output controller each respectively connects a group of peripheral devices and data processing apparatus, and controls data transfer operations of data between each of the group of peripheral devices and the data processing apparatus, each of the group of peripheral devices also connects the input/output controller corresponding to the other group of peripheral devices, the first input/output controller comprising:

- first memory means for holding first control data used for controlling data transfer operations between the group of peripheral devices and the data processing apparatus;
- first off-line situation notifying means for notifying an arising of a first situation, requiring the first input/output control-

ler to be in an off-line state, to the second input/output controller;

first on-response status indicating means for indicating a no-response status of the first input/output controller when the first situation arises in the first input/output controller;

first temporary stopping means for temporarily stopping a reception of a new I/O command in the first input/output controller when the first input/output controller receives notification of an arising of a second situation from the second input/output controller;

first temporary stop notifying means for notifying a temporary stop state of the first input/output controller to the second input/output controller;

first controller data transfer means for transferring the first control data held in the first memory means to a second memory means, when the first input/output controller receives notification of the temporary stop state from the second input/output controller;

first off-line means for carrying out an off-line operation of the first input/output controller after completion of the transfer of the first control data; and

first restructuring means for receiving second control data from the second input/output controller and for restructuring the first control data held in the first memory means and the second control data transferred, so that the first input/output controller can control both the group of peripheral devices and the data processing apparatus; and the second input/output controller comprising:

said second memory means for holding the second control data used for controlling data transfer operation between the group of peripheral devices and the data processing apparatus;

second off-line situation notifying means for notifying an arising of the second situation, requiring the second input/output controller to be in an off-line state, to the first input/output controller;

second no-response status indicating means for indicating a no-response status of the second input/output controller when the second situation arises in the second input/output controller;

second temporary stopping means for temporarily stopping a reception of a new I/O command in the second input/output controller when the second input/output controller receives notification of an arising of the first situation from the first input/output controller;

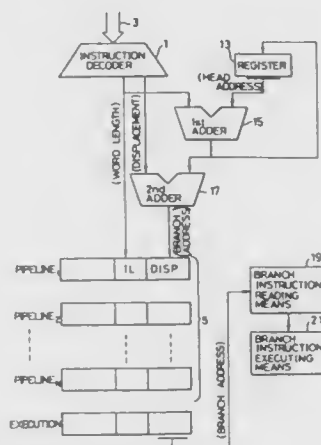
second temporary stop notifying means for notifying a temporary stop state of the second input/output controller to the first input/output controller;

second control data transfer means for transferring the second control data held in the second memory means to the first memory means, when the second input/output controller receives notification of the temporary stop state from the first input/output controller;

second off-line means for carrying out an off-line operation of the second input/output controller after completion of the transfer of the second control data; and

second restructuring means for receiving the first control data from the first input/output controller and for restructuring the second control data held in the second memory means and the first control data transferred, so that the second input/output controller can control both the group of peripheral devices and the data apparatus.

5,088,030
**BRANCH ADDRESS CALCULATING SYSTEM FOR
 BRANCH INSTRUCTIONS**
 Toshiya Yoshida, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
 Continuation of Ser. No. 934,784, Nov. 25, 1986, abandoned.
 This application Aug. 8, 1989, Ser. No. 391,665
 Claims priority, application Japan, Mar. 28, 1986, 61-068409
 Int. Cl.³ G06F 9/32, 9/28
 U.S. Cl. 364—275 6 Claims



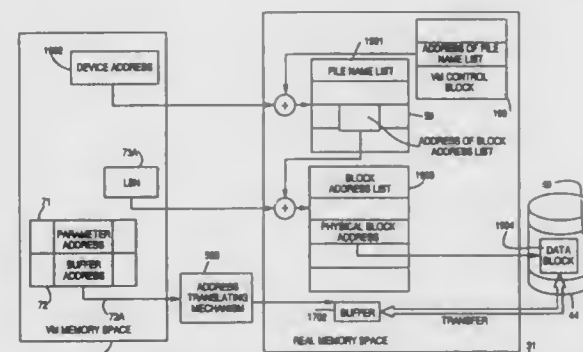
1. An apparatus comprising:
 - a processing pipeline including a plurality of successive processing stages and an execution stage, wherein said processing stages receive individual instructions to be executed and transfer each instruction to said execution stage where it is executed;
 - a branch address instruction control system coupled to said processing pipeline; and
 - an instruction decoder means coupled to said processing pipeline and said branch address instruction control system for decoding said instructions to be executed in said pipeline processing stages and simultaneously transferring decoded instructions to said processing pipeline and to said branch address instruction control system;
 wherein said branch address instruction control system calculates a target branch address of a branch instruction decoded by said instruction decoder and applies said target branch address to one of said successive processing stages preceding said execution stage in said processing pipeline wherein address calculation and decoding operations are operated simultaneously in parallel which enables the decode operation and address calculation to occur in the same machine cycle.

5,088,031
**VIRTUAL MACHINE FILE CONTROL SYSTEM WHICH
 TRANSLATES BLOCK NUMBERS INTO VIRTUAL
 ADDRESSES THEN INTO REAL ADDRESSES FOR
 ACCESSING MAIN STORAGE**
 Shigeo Takasaki; Masaichiro Yoshioka, both of Sagami; Takashi Kubo, Hachioji; Yoshio Ukai; Yasuo Kubo, both of Yokohama; Jinichi Imura, Yokosuka, and Nobutaka Hagiwara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
 Filed Feb. 10, 1986, Ser. No. 827,607
 Claims priority, application Japan, Feb. 20, 1985, 60-30365
 Int. Cl.³ G06F 12/10 2 Claims

1. In a computer which realizes virtual machines by concurrently running operating system (OS) programs under control of a virtual machine control program, a file access method for enabling an access to a temporary file in terms of a file name assigned to the file and a data block number assigned to a data

block to be accessed within the file, wherein the temporary file is a file located in a main storage of the computer, the method comprising the steps of:

- (a) determining, by one of the OS programs, a device address of a virtual secondary storage device for a temporary file in response to a file access request which designates a file name of the file, wherein the virtual secondary storage device has the same number of virtual areas as a total number of data blocks included in the file;
- (b) informing, by the one OS program, said virtual machine control program of the device address and a block number within the file designated by the file access request and assigned to a data block to be accessed;
- (c) translating, under control of the virtual machine control



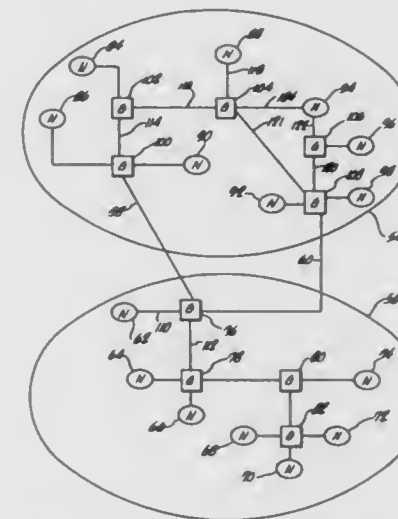
program, the informed block number within the file into a real address for a real data area of said main storage, in which real data area the data block is, or is to be held, the step of translation including:

- (c1) a first substep of translating the informed block number within the file into a virtual address for a virtual data area assigned to a data block of the informed block number among virtual data areas provided in a virtual secondary storage device assigned with the informed device address; and
- (c2) a second substep of translating the virtual address into the real address; and
- (d) accessing said real data area of said main storage under control of the virtual machine control program and in response to the real address obtained by the step (c).

5,088,032
**METHOD AND APPARATUS FOR ROUTING
 COMMUNICATIONS AMONG COMPUTER NETWORKS**
 Leonard Bosack, Atherton, Calif., assignor to Cisco Systems, Inc., Menlo Park, Calif.
 Filed Jan. 29, 1988, Ser. No. 149,820
 Int. Cl.³ H04Q 11/04; H04J 3/26 64 Claims

1. A method performed by a processor for dynamically routing a data transmission in a network from a source computer to a destination computer with a gateway, comprising the steps of:
 - identifying routing paths from said gateway to said destination computer;
 - characterizing each of said paths by a vector of metric values, each of said metric values corresponding to a characteristic of a path;
 - transmitting said vector of metric values to a node in said network;

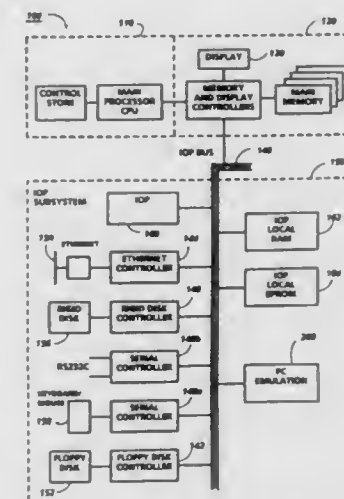
computing a single composite metric from a first predetermined algorithm based on said vector of metric values;



determining a best path from a second predetermined algorithm based on said composite metric; and directing said data transmission over said best path.

5,088,033
**DATA PROCESSING SYSTEM EMULATION IN A
 WINDOW WITH A COPROCESSOR AND I/O
 EMULATION**

Joseph H. Binkley; Perry A. Caro; John B. Dillon, all of Palo Alto; Charles R. Fay, Long Beach; Jonathan Gibbons, Mountain View; Hilary N. Hooks, Newark; Abdo G. Kadifa; Jeffery W. Lee, both of Sunnyvale; William C. Lynch, Palo Alto; Clayton W. Mock, Redwood City; Everett T. Neely, Montara; Michael L. Tallan, Mountain View; Geoffrey O. Thompson, Palo Alto; Gaya Vukkadala, Sunnyvale; John D. Wick, Palo Alto, and Donald R. Woods, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
 Continuation of Ser. No. 856,526, Apr. 28, 1986, abandoned.
 This application Mar. 23, 1990, Ser. No. 499,196
 Int. Cl.³ G06F 9/455 47 Claims



1. A system for emulating a target system having a central processor for executing a set of target system instructions and a set of target system devices that provides an environment for the central processor, the target system devices including a target system I/O device for performing a target system I/O

operation and for receiving output signals from the central processor while performing the target system I/O operation, the target system further including communication means for communicating the output signals from the central processor to the target system I/O device; the emulating system comprising:

- a host system having a host processor for executing a set of host system instructions different from the target system instructions; and
- an emulating processor for executing a sequence of the target system instructions; the emulating processor providing signals during execution of the sequence of target system instructions, one of the signals being a target I/O output signal that is one of the output signals received by the target system I/O device while performing the target system I/O operation;
- the host system further comprising environment means connected for providing an environment for the emulating processor so that the emulating processor continues to execute the sequence of target system instructions and connected for providing an environment for the host processor so that the host processor executes the host system instructions;
- the environment means comprising I/O monitoring circuitry for detecting the target I/O output signal and for obtaining monitoring data relating to the target system I/O operation;
- the environment means further comprising I/O device data from which the environment means can determine a current emulated state of the communication means;
- the environment means further comprising device emulating means for emulating the target system I/O operation by using the I/O device data to determine the current emulated state of the communication means; the device emulating means accessing the I/O device data based on the monitoring data in response to the target I/O output signal;
- the host processor independently executing a sequence of the host system instructions while the emulating processor executes the sequence of target system instructions.

5,088,034

COMPILING METHOD FOR DETERMINING PROGRAMS TO BE EXECUTED PARALLEL BY RESPECTIVE PROCESSORS IN A PARALLEL COMPUTER WHICH TRANSFER DATA WITH A DATA IDENTIFIER TO OTHER PROCESSORS

Sigeo Ihara, Tokorozawa; Teruo Tanaka, Hachioji; Kyoko Iwasawa, and Naoki Hatanaka, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 25, 1989, Ser. No. 301,648
Claims priority, application Japan, Jan. 29, 1988, 63-17075
Int. Cl.⁵ G06F 15/16

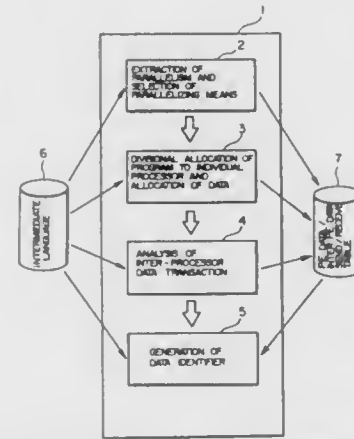
U.S. Cl. 395—700

7 Claims

1. A compiling method for generating object programs to be executed in parallel by a plurality of processors constituting a parallel computer from a serial type source program to be executed serially, comprising steps executed by an apparatus, the steps including:

- a) translating the serial type source program into a plurality of parallel type programs to be executed in parallel by different ones of said plurality of processors, each of the parallel type programs including i) a data send processing when first data produced by said each parallel type program is to be used by a different one of the processors, the data send processing sending the first data together with a data identifier, and ii) a data receive processing when second data used by said each parallel type program is produced by one of the processors, said data receive processing receiving the second data among data sent out from one of the processors by designating a second data identifier, wherein values of the first and second identifiers are yet to be determined;
- b) determining values of data identifiers used in data receive

processings and data send processings included in said plurality of parallel type programs such that a pair of data identifiers employed in a pair of a data receive processing and a data send processing for same data correspond, while data identifiers employed in data receive process-



ings and data send processings for different data, respectively, do not correspond for the different data; and, c) translating said plurality of the parallel type programs correspondingly to said object programs which use the determined values of the data identifiers.

5,088,035

SYSTEM FOR ACCELERATING EXECUTION OF PROGRAM INSTRUCTIONS BY A MICROPROCESSOR

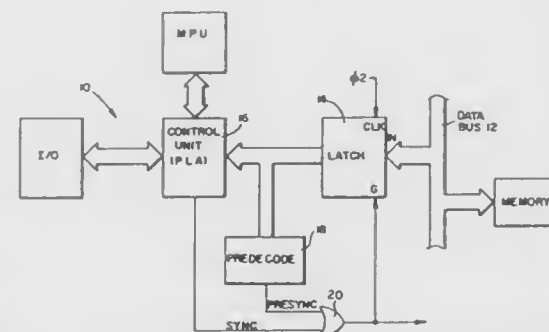
William F. Gardei, Downingtown, Pa., and Charles E. Hauck, Jr., Framingham, Mass., assignors to Commodore Business Machines, Inc., West Chester, Pa.

Filed Dec. 9, 1988, Ser. No. 282,820

Int. Cl.⁵ G06F 9/30, 9/305

U.S. Cl. 395—375

7 Claims



1. A system for accelerating execution of program instructions by a microprocessor provided with memory, a data bus for carrying opcodes fetched from the memory, and a control unit for generating a SYNC pulse train for controlling execution of the opcodes over one or more machine cycles, comprising:

- a latch for transferring a fetched opcode from the data bus to the control unit, said control unit transferring said fetched opcode to the microprocessor for execution;
- a pre-decode circuit for detecting a coded bit pattern in a first fetched opcode transferred from the latch to the control unit and determining the number of machine cycles required for transferring and executing the first fetched opcode, and if the number of machine cycles required for transferring and executing the first fetched opcode equals one, generating a PRESYNC signal at the beginning of the next machine cycle immediately follow-

ing transferring and executing the first fetched opcode, and means for causing the latch to transfer a second fetched opcode in between successive SYNC signals and during the PRESYNC signal to the control unit within one machine cycle of transferring and executing said first fetched opcode whereby said second fetched opcode commences transferring and executing at the next machine cycle immediately following transferring and executing the first fetched opcode.

5,088,036

REAL TIME, CONCURRENT GARBAGE COLLECTION SYSTEM AND METHOD

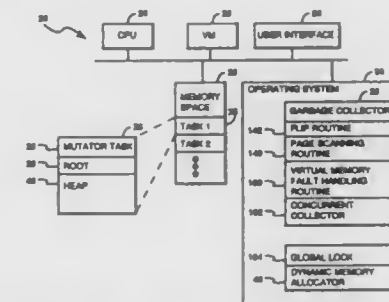
John R. Ellis, Woodside, Calif.; Kai Li, and Andrew Appel, both of Princeton, N.J., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 17, 1989, Ser. No. 297,845

Int. Cl.⁵ G06F 12/00, 12/08

U.S. Cl. 395—425

7 Claims



5. In a multitasking computer having at least one mutator task;

a heap of storage space in which objects generated by each mutator task are stored, said heap being divided into old-space and new-space, said new-space being further divided into a multiplicity of pages; and root means, associated with each said mutator task, for identifying a root set of pointers which point to a root set of objects stored in said heap;

a memory management system, comprising:

flip means, coupled to said root means and said heap, for interchanging said old-space and new-space, copying at least a portion of said root set of objects from old-space into new-space, and protecting those pages of said new-space which contain said copied objects;

memory allocation means, coupled to said heap and called by said at least one mutator task, for allocating portions of new-space for storing objects; said memory allocation means invoking said flip means when predefined conditions are met;

page scanning means, coupled to said heap, for scanning objects stored in a specified protected page for pointers to objects in old-space which have not been previously copied into new-space, including means for copying each such object in old-space into new-space, protecting those pages of said new-space which contain said copied objects, and then unprotecting said specified page;

trap handling means, coupled to said page scanning means, for trapping each memory access by said at least one mutator task to a protected page in new-space and then calling said page scanning means to scan and unprotect said page; and

concurrent scanning means, operating concurrently with each said mutator task and coupled to said page scanning means, for calling said page scanning means to scan and unprotect each of said protected pages in the new-space of the corresponding heap until there are no remaining protected pages in new-space.

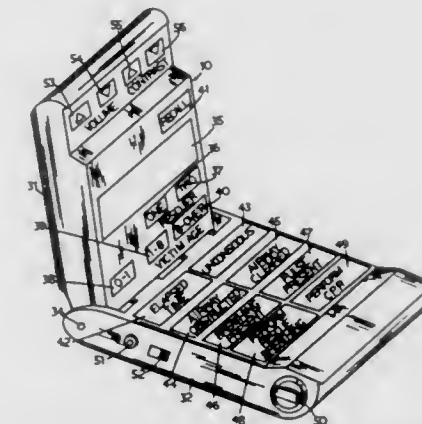
5,088,037
PORTABLE RESCUE ADMINISTRATION AID DEVICE
Anthony Battaglia, 363 Pharmacy Avenue, Scarborough, Ontario, Canada M1L 3G4

Filed Mar. 22, 1990, Ser. No. 497,264

Int. Cl.⁵ G06F 15/42; G09B 23/28

U.S. Cl. 364—413.01

14 Claims



1. A compact portable rescue operation administration aid device, comprising:

- a foldable casing including an upper casing member and a lower casing member hingedly connected to one another at a hinge arrangement means;
- a microprocessor means disposed in said lower casing member, said microprocessor means being programmable to store a series of rescue administration instructions according to physical conditions of a victim observed by the rescuer;
- a display means disposed in said upper casing member, said display means being coupled to said microprocessor means and having a display screen, and being operative by said microprocessor means to display sequentially a selective series of readable messages of said rescue instructions;
- a plurality of parameter input means disposed in said upper casing member, and operative to set said microprocessor means for actuating said display means to display sequentially said selective readable messages for prompting selectively one and two rescuers to perform said rescue operation on a victim of a selected age group;
- a plurality of condition selection means disposed in said lower casing member, and operative in association with said parameter input means to set said microprocessor means for actuating said display means to display sequentially said selected readable messages in response to said victim's physical conditions.

5,088,038

MACHINE TRANSLATION SYSTEM AND METHOD OF MACHINE TRANSLATION

Katumi Tanaka; Hideki Hirakawa; Hiroyasu Nogami, and Shinya Amano, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1990, Ser. No. 527,894

Claims priority, application Japan, May 24, 1989, 1-128722

Int. Cl.⁵ G06F 15/38

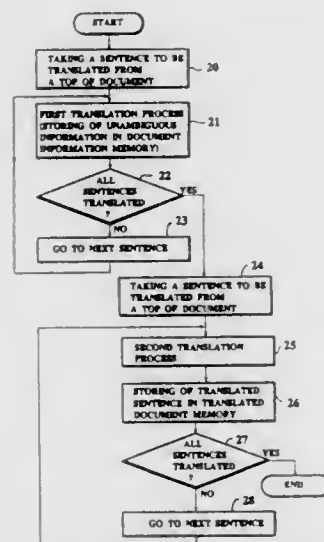
U.S. Cl. 364—419

10 Claims

6. A method of machine translation for translating an original document in a first language into a translated document in a second language, comprising the steps of:

- providing transformation rules for translating the original document in the first language into the translated document in the second language;
- accumulating a document information indicating a manner to remove an uncertainty of a translation word in the second language corresponding to a particular word in the

original document which arises in translating the original document by using the transformation rules because of a presence of a plurality of candidates for the translation word; and
translating the original document by using the translation rules and the document information, in which the docu-



ment information is used for removing the uncertainty arising in translating the original document by using the translation rules, where the document information used in the translating the particular word of the original document is obtained by translating other parts of the original document different from the particular word.

5,088,039
SYSTEM FOR TRANSLATING ADVERB PHRASES PLACED BETWEEN TWO COMMAS THROUGH A CONVERTER USING TREE-STRUCTURED CONVERSION RULES

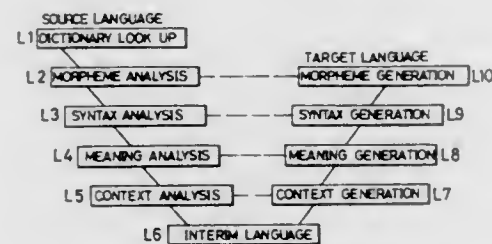
Shuzo Kigimiya, Nara; Yoji Fukumochi, Ikoma; Ichiko Sata, Nara; Tokuyuki Hirai, Yamato-Koriyama, and Hitoshi Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1990, Ser. No. 513,283

Claims priority, application Japan, Apr. 24, 1989, 1-104238
Int. Cl.⁵ G06F 15/38

U.S. Cl. 364—419

5 Claims



1. A machine translation system for translating a sentence of a source language into a sentence of a target language comprising:

- input means for storing an input sentence of said source language to be translated, said input sentence including an adverb phrase put between two commas;
- means for storing the number of words of said adverb phrase and inserted-adverb phrase information;
- means for deleting from said input sentence succeeding a word just before said adverb phrase as many words as indicated by said inserted-adverb-phrase information in

order to define said whole of said input sentence excepting said adverb phrase;
first analysing means for analysing said input sentence morphologically by means of a dictionary;
second analysing means for analysing said input sentence syntactically by means of said dictionary and grammatical rules on the basis of result of analysis by said first analysing means;
converting means for converting said input sentence into an equivalent output sentence of said target language by means of tree-structure conversion rules on the basis of result of analysis by said first and second analysing means; and
output means for outputting said equivalent output sentence; wherein said second analysis means analyses said adverb phrase and the whole of said input sentence excepting said adverb phrase separately, said converting means converts said adverb phrase and said whole of said input sentence excepting said adverb phrase into an equivalent adverb phrase and an equivalent sentence of said target language, respectively, and said output means attaches a punctuation mark after said equivalent adverb phrase and puts said equivalent sentence after said punctuation mark in order to compose an output sentence equivalent to said input sentence.

5,088,040
AUTOMOTIVE CONTROL SYSTEM PROVIDING ANTI-SKID STEERING

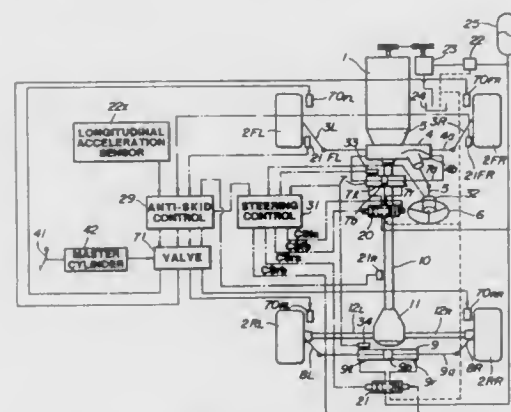
Toshiro Matsuda, and Kazuo Chiba, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 17, 1990, Ser. No. 464,885

Claims priority, application Japan, Jan. 18, 1989, 1-4009
Int. Cl.⁵ B62D 6/00

U.S. Cl. 364—424.05

16 Claims



1. A four wheel steering control system for an automotive vehicle which includes a primary steerable wheel turned by a manually operable vehicular steering mechanism, and a subsidiary steerable wheel, said control system comprising:

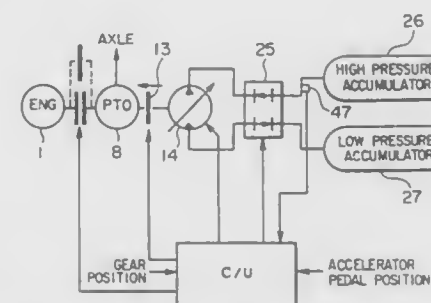
- a subsidiary wheel toe control mechanism operatively connected to said subsidiary steerable wheel for controlling a toe angle according to a subsidiary wheel steering control signal, said subsidiary wheel toe control mechanism including a power assist cylinder for generating assistant force so as to turn said subsidiary wheel;
- a steering wheel angle sensing means disposed adjacent to said manually operable steering mechanism for producing a steering wheel angle indicating signal representative of the magnitude of a manually entered steering demand for said primary steerable wheel;
- a wheel speed monitoring means for monitoring the rotation speed of each of said primary and subsidiary steerable wheels for producing a wheel speed indicating signal;
- means for deriving a calculated vehicle speed representing

value on the basis of said wheel speed indicating signal from said wheel speed monitoring means, such that said calculated vehicle speed representing value is constantly held at a current value of said wheel speed indicating signal for a predetermined time interval when a speed difference between said wheel speed indicating signal and said calculated vehicle speed representing value is within a predetermined range, a velocity gradient for said calculated vehicle speed representing value is set to a predetermined velocity gradient so as to decrease said speed difference with said predetermined velocity gradient when said speed difference exceeds said predetermined range at an expiration of said predetermined time interval or when said speed difference is less than said predetermined range at expiration of said predetermined time interval; and
a first control system for determining an optimal magnitude of said assistant force by said subsidiary wheel steering control signal derived on the basis of both said steering wheel angle indicating signal and said calculated vehicle speed representing value.

5,088,041
REGENERATIVE BRAKING SYSTEM FOR CAR
Koji Tanaka, and Takashi Shima, both of Tokyo, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan
Filed Oct. 20, 1989, Ser. No. 424,825
Claims priority, application Japan, Oct. 27, 1988, 63-271529
Int. Cl.⁵ B60K 17/00

U.S. Cl. 364—426.01

7 Claims



1. A regenerative braking system for a car having an accelerator pedal power take-off unit, an engine and a transmission gear, comprising:

- a hydraulic oil circuit formed of:
 - a high pressure accumulator;
 - a pump/motor having a maximum motoring capacity;
 - a circuit valve coupled to said pump/motor and said high pressure accumulator; and
 - a low pressure accumulator coupled to said circuit valve;
- an electromagnetic clutch, coupled to said pump/motor, for connecting or disconnecting said pump/motor to or from the power take-off unit;
- means for sensing the position of the accelerator pedal;
- means for sensing the pressure of said hydraulic oil circuit;
- means for sensing the position of the transmission gear;
- means for sensing the speed of the car;
- control means for automatically controlling the position of the transmission gear based on the sensed position of the accelerator pedal and the sensed car speed, for determining a driving torque required for the car according to the sensed position of the accelerator pedal and the sensed position of the transmission gear, and for determining the motoring capacity of said pump/motor based on the determined driving torque and the sensed pressure of said hydraulic oil circuit, said control means coupling the engine of the car and said electromagnetic clutch, and closing said hydraulic oil circuit in which said pump/motor is controlled to have the maximum motoring capacity, the engine being controlled to have the output for providing a supplemental torque when the determined driving

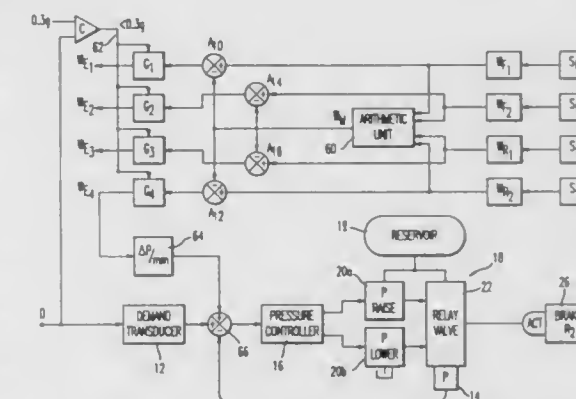
torque exceeds the maximum motoring capacity in an accelerating mode of the car.

5,088,042
ELECTRONIC BRAKING SYSTEM
Malcolm Brearley, West Midlands, and Richard B. Moseley, Warwickshire, both of England, assignors to Lucas Industries public limited company, Birmingham, England
Filed Mar. 5, 1990, Ser. No. 488,976
Claims priority, application United Kingdom, Mar. 4, 1989, 8905022

Int. Cl.⁵ B60T 13/00

U.S. Cl. 364—426.01

5 Claims



1. A method for controlling brake actuation in an electronically controlled braking system comprising measuring brake demand level and splitting the operation of the brake actuation into three bands depending upon the measured brake demand level, wherein at low demand in a first band the braking pressures are set to generate equal brake lining wear at the vehicle axles, and at higher demands in a third band braking pressures are set to apportion braking between axles dependent upon the axle loads being carried, whilst in a second band, located intermediate the first and second bands, the braking is gradually changed from being equal to being fully apportioned, the extent of this change-over depending upon the actual level of demand within this second band, and including monitoring the actual wear equalization by sensors incorporated within the linings of said brakes, producing wear error signals for each brake compared with the average wear, and using such error signals to generate limited values of pressure differential between brakes such as to create small increases in braking at those brakes with the minimum wear and small reductions in braking at those brakes with above average wear.

5,088,043
ENGINE CONTROLLING SYSTEM FOR VEHICLE
Katsuo Akishino; Osamu Hirako, and Makoto Shimada, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP88/01326, § 371 Date Mar. 23, 1990, § 102(e)
Date Mar. 23, 1990, PCT Pub. No. WO90/05650, PCT Pub. Date May 31, 1990

PCT Filed Dec. 24, 1988, Ser. No. 455,324

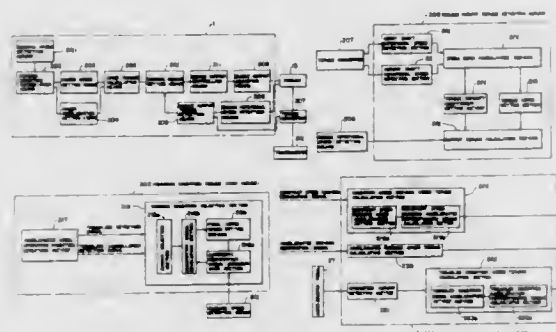
Claims priority, application Japan, Nov. 14, 1988, 63-288449
Int. Cl.⁵ B60K 31/04

U.S. Cl. 364—426.04

8 Claims

1. An engine controlling system for a vehicle, comprising a running speed detecting means for detecting a running speed of said vehicle to develop a running speed detection signal, a running condition change-over means for alternatively developing one of a constant speed running designating signal which designates constant speed running as an aimed running condition of said vehicle and an accelerated running designating signal which designates accelerated running as the aimed running condition, an aimed speed setting means for setting, when

the constant speed running designating signal is received, an aimed speed at which said vehicle should make constant speed running, an aimed acceleration setting means for setting, when the accelerated running designating signal is received, an aimed acceleration with which said vehicle should make accelerated running, an aimed torque calculating means for calculating, when the constant speed running designating signal is received, and aimed output torque of an engine of said vehicle in accordance with the aimed speed but calculating, when the accelerated running designating signal is received, an aimed output torque of said engine in accordance with the aimed acceleration, an engine rotational speed detecting means for detecting a speed of rotation of said engine to develop an



engine rotational speed detection signal, a torque converter provided between said engine and a transmission, an engine output torque detecting means for developing, as a measured value of an output power of said engine, an output torque of said torque converter calculated from the engine rotational speed detection signal and a value preset in accordance with characteristics of said converter, an engine output adjusting means for adjusting the output power of said engine, a control amount setting means for setting a control amount of said engine output adjusting means so that the engine output torque detected by said engine output torque detecting means may be equal to the aimed torque, and an engine output controlling means for controlling said engine output adjusting means in accordance with the control amount.

5,088,044

KNOCKING DETECTION DEVICE FOR AN AUTOMOTIVE ENGINE

Takashi Matsuura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

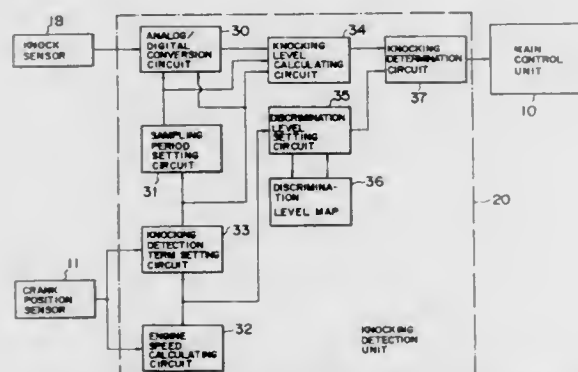
Filed Apr. 13, 1990, Ser. No. 508,571

Claims priority, application Japan, Apr. 14, 1989, 1-95690

Int. Cl.⁵ F02P 5/14

U.S. Cl. 364—431.08

5 Claims



1. A knocking detection device for an automotive engine comprising
 - a knock sensor for detecting analog vibration waveforms due to knocking in said engine;

a crank position sensor for producing a crank position signal at a predetermined crank angle of said engine; engine speed calculating means responsive to said crank position signal for calculating an engine speed of said engine; knocking detection term setting means responsive to said crank position signal and said engine speed for setting a knocking detection term in one cycle of said engine, in which term knocking may occur; sampling period setting means for setting a sampling period for the analog/digital conversion of said analog vibration waveforms, said sampling period being set so as to digitally reproduce said vibration waveforms with fidelity; conversion means for converting said vibration waveform sampled every sampling period set by said sampling period setting means into digital data during said knocking detection term set by said knocking detection term setting means; knocking level calculating means for calculating a knocking level of said engine based on an average value of all digital data converted by said conversion means; discrimination level setting means responsive to said vehicle speed for setting a discrimination level to determine the occurrence of knocking after said knocking detection term is terminated; and determination means for determining the occurrence of knocking by comparing said knocking level calculated by said knocking level calculating means with said discrimination level set by said discrimination level setting means.

5,088,045

PRODUCTION MANAGEMENT SYSTEM

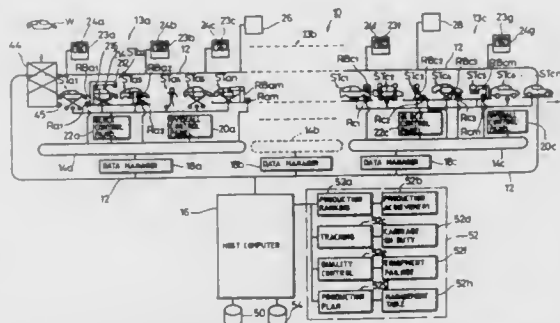
Chikafumi Shimanaka; Shinzo Urushidani; Michio Fujinuma; Hiroshi Hamano, and Shinji Imai, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1990, Ser. No. 460,027

Int. Cl.⁵ G06F 15/46

U.S. Cl. 364—468

10 Claims



5. A production management system for controlling a production line having a plurality of assembling/machining stations including pieces of production equipment, comprising:
 - an information network for interconnecting the assembling/machining stations;
 - display means in the assembling/machining stations, for displaying results of a completed operation in the assembling/machining stations;
 - detecting means associated with the pieces of production equipment, for detecting proper and improper completed operations on workpieces in the assembling/machining stations and transmitting data on the detected proper and improper completed operations from upstream assembling/machining stations to the display means in downstream assembling/machining stations through said information network;
 - entering means associated with said display means, respectively, for entering chronological data on repairs effected

on workpieces based on the data displayed by said display means; and control means for controlling said display means in the downstream assembling/machining stations to successively display the data on the detected proper and improper completed operations from the detecting means in the upstream assembling/machining stations and the chronological data from said entering means in synchronism with arrival of the workpieces at the downstream assembling/machining stations.

5,088,046

MOUNTING FOR SURFACE-SENSING STYLUS AND A METHOD OF USING SAID MOUNTING

David R. McMurtry, Wotton-Under-Edge, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom
PCT No. PCT/GB88/01135, § 371 Date Jul. 28, 1989, § 102(e)
Date Jul. 28, 1989, PCT Pub. No. WO89/05960, PCT Pub. Date Jun. 29, 1989

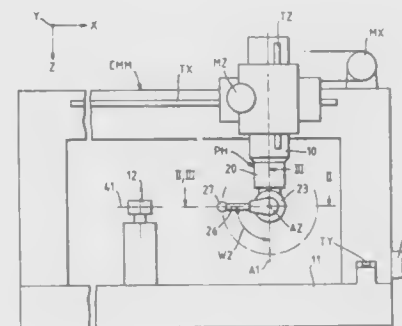
PCT Filed Dec. 19, 1988, Ser. No. 391,542

Claims priority, application United Kingdom, Dec. 19, 1987, 8729638

Int. Cl.⁵ G06F 15/46; G01B 21/20

U.S. Cl. 364—474.03

9 Claims



1. Apparatus for use on a coordinate positioning machine in measuring a surface, the machine having a head movable relative to a table on which said surface is supported, the apparatus comprising:
 - a base connectable to the head;
 - a first rotor supporting a surface-sensing device, the first rotor being mounted to, and for rotation relative to the base about a first axis;
 - a first motor for rotating the first rotor about said first axis in response to an input signal;
 - first transducing means for measuring, relative to a reference orientation, an angle of rotation of the first rotor about the first axis; and
 - first controlling means for providing:
 - (a) a torque input signal or operating said first motor to apply a constant torque to said first rotor; and
 - (b) a positioning input signal for operating said first motor to position said first rotor at a given angle of rotating relative to said reference orientation,
 wherein said first controlling means is selectively operable for passing on of said torque input signal and said positioning input signal to the motor as said input signal.

1. A system for manufacturing a three-dimensional object directly from design that comprises:
 - a means for receiving electronic sectional data corresponding to an electronic representation of the object to be manufactured;
 - a means for exposing a charged electro-photographic element with an electromagnetic radiation pattern corresponding to said electronic section to form an electrostatic latent image on said electrophotographic element;
 - a means for applying a plurality of forming powders to said electrostatic latent image contained on said electrophotographic element to form a physical lamina;
 - a means for transferring said physical lamina to an intermediate support;
 - a means for causing said physical lamina to become tacky;
 - a means for transferring and bonding said physical lamina to previously formed laminae, and building up a physical replication of said object in a step-wise fashion whereby the three dimensional object is auto-matically formed from a composite of laminae.

5,088,047 AUTOMATED MANUFACTURING SYSTEM USING THIN SECTIONS

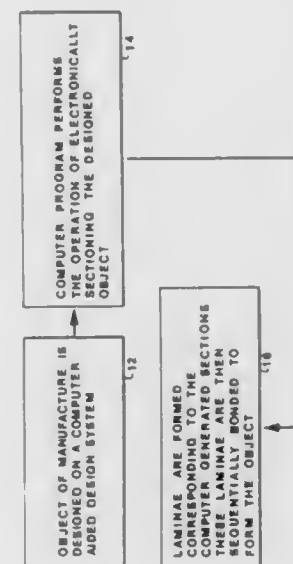
David K. Bynum, 1460 Rue de Trust, Erie, Colo. 80516

Filed Oct. 16, 1989, Ser. No. 421,840

Int. Cl.⁵ G06F 15/46; B27N 3/00

U.S. Cl. 364—474.24

14 Claims



5,088,048

MASSIVELY PARALLEL PROPOSITIONAL REASONING

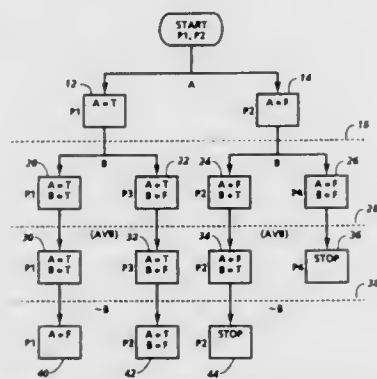
Michael Dixon, San Francisco; Johan de Kleer, and John O. Lamping, both of Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 10, 1988, Ser. No. 205,125

Int. Cl.⁵ G09C 00/00; G10L 00/00

U.S. Cl. 395—11

23 Claims



19. A system that comprises a host processor and a parallel processor;

the system being for performing a propositional reasoning task on a set of formulas; the formulas including a number of elements, each element having a respective set of possible values so that the elements together have a number of possible combinations of values, each possible combination of values including, for each element, at most one of the respective set of possible values; the elements including a first element whose respective set of possible values includes a first value and a second value; the propositional reasoning task searching for possible combinations of values that are consistent with the set of formulas;

the parallel processor comprising a plurality of processing units including first and second processing units, each processing unit having respective memory for storing data;

the host processing comprising:

means for operating the parallel processor to store first data in the first processing unit's respective memory indicating a first one of the possible combinations of values and second data in the second processing unit's respective memory indicating a second one of the possible combinations of values; the first element being assigned the first value in the first possible combination of values and the second value in the second possible combination of values so that the first possible combination of values includes the first element's first value and the second possible combination of values includes the first element's second value; the first and second possible combinations of values being independent subcombinations of a third one of the possible combinations of values in which the first element is not assigned a value; and

means for operating the first processing unit and the second processing unit in parallel to perform propositional reasoning for the first and second possible combination of values; the first processing unit using the first data to perform propositional reasoning for the first possible combination of values and the second processing unit using the second data to perform propositional reasoning for the second possible combination of values.

5,088,049

Patent Not Issued For This Number

5,088,050

APPARATUS FOR PREPARING OUTPUT DATA FROM INPUT IMAGE DATA, USING BASIC OUTPUT-IMAGE UNIT PATTERN DATA

Yosuke Ito, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

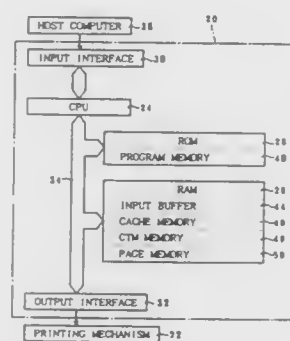
Filed Jul. 11, 1990, Ser. No. 550,983

Claims priority, application Japan, Jul. 14, 1989, 1-183514

Int. Cl.⁵ G06F 3/00, 15/66

U.S. Cl. 395—142

17 Claims



1. An apparatus for preparing output data representative of positions of a plurality of output picture elements which collectively define a plurality of output image segments corresponding to respective input picture elements of a received input image, said output image segments being reproduced on an output medium according to said output data, said apparatus comprising:

first data preparing means for determining a basic output image area for each of at least one group of output image segments, and preparing at least one set of basic output-image unit pattern data corresponding to said at least one group of output image segments, respectively, each of said at least one set of basic output-image unit pattern data being representative of a pattern of positions of output picture elements of said basic output image area, said each group of output image segments consisting of the output image segments which have the same pattern of positions of the output picture elements as said pattern represented by the corresponding set of basic output-image unit pattern data;

pattern data memory means for storing said at least one set of basic output-image unit pattern data such that any one of said at least one set of basic output-image unit pattern data is readable from said pattern data memory means; and

second data preparing means operable such that if the pattern of any one of said output image segments corresponding to said input picture elements is identical with the pattern of said basic output image area represented by any one of said at least one set of basic output-image unit pattern data stored in said pattern data memory means, said second data preparing means prepares a set of output data representative of positions of the output picture elements of said any one output image segment, according to the corresponding set of basic output-image unit pattern data, without determining positions of the individual output picture elements of said any one output image segment.

5,088,051

USER INVISIBLE, PRINTER LINE CONNECTED TELECOMMUNICATIONS LINK

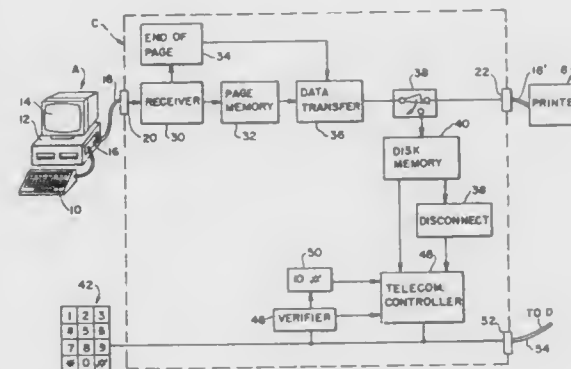
Robert G. Forsythe, Richmond Heights; Brian J. Barnt, Rocky River, both of Ohio; Karl Rautenkranz, Tucson, Ariz.; Fred R. Schraff, Cleveland, and William H. Davis, Fairview Park, both of Ohio, assignors to Medical Payment Systems, Westlake, Ohio

Filed Feb. 12, 1990, Ser. No. 478,821

Int. Cl.⁵ G06K 15/00

U.S. Cl. 395—117

11 Claims



1. A data manipulating system comprising:

a remote telecommunications means which intercepts print data passing from a remote computer means to a printer and which transmits the intercepted print data on a communication line to a central processing system that includes a computer program for processing data of the type intercepted;

a data format translating means which translates print data received on the communication line into a preselected data format of data normally received by the central processing system data processing program.

A. a database for storing data and for retrieving data in response to the receipt of a data retrieval criteria;

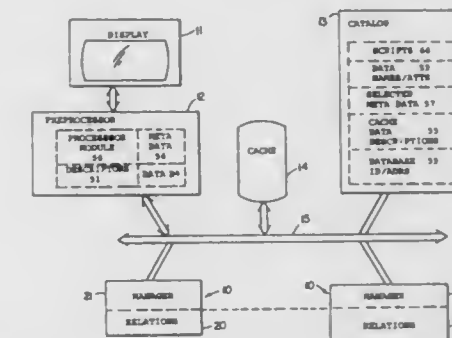
B. a terminal including:

i. an input screen display generated in response to receipt of said data retrieval criteria, said input screen display comprising:

a. data selection criteria identifiers for selection by a user; and

b. function selection criteria identifiers for selection by a user; and

ii. means for selecting at least one of said data selection criteria identifiers and for selecting at least one of said functions selection criteria identifiers;



iii. an output screen display, replacing said input screen display in said terminal in response to a selection of said data selection criteria and said function selection criteria, said output screen display comprising processed data;

C. a processor for generating, in response to the selection of data selection criteria from said terminal, a data retrieval request and for processing the retrieved data as called for by the selection of function selection criteria to generate the processed data, the processor transmitting the processed data to the terminal for use in the output screen display.

5,088,053

MEMORY CONTROLLER AS FOR A VIDEO SIGNAL PROCESSOR

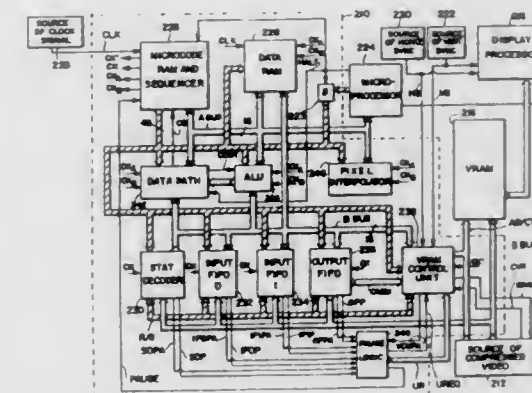
David L. Sprague, Hopewell; Allen H. Simon, Belle Mead, and Alfred Kwan, Old Bridge, all of N.J., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 16, 1987, Ser. No. 121,025

Int. Cl.⁵ G06F 5/153

U.S. Cl. 395—166

4 Claims



1. In a video processing system including a memory for holding digital data, an input channel for reading data from the memory, a processor, responsive to data read from the memory via the input channel for generating processed data, and an output channel for writing the processed data into the mem-

5,088,052

SYSTEM FOR GRAPHICALLY REPRESENTING AND MANIPULATING DATA STORED IN DATABASES

Howard A. Spielman, Sharon, and C. J. Considine, Newton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 15, 1988, Ser. No. 219,652

Int. Cl.⁵ G06F 15/62

U.S. Cl. 395—158

7 Claims

1. A system comprising:

ory, circuitry for controlling access to the memory comprising:

- first requesting means, coupled to said input channel, for generating by said first requesting means both a normal memory read request signal and an urgent memory read request signal;
- second requesting means, coupled to said output channel, for generating by said second requesting means both a normal memory write request signal and an urgent memory write request signal;
- first scheduling means, coupled to receive said normal read request signal and said normal write request signal for conditioning said memory to provide data to said input channel and accept data from said output channel, respectively, according to a first priority scheme; and
- second scheduling means, coupled to receive said urgent read request signal and said urgent write request signal for conditioning said memory to provide data to said input channel and accept data from said output channel according to a second priority scheme, wherein said second scheduling means overrides said first scheduling means.

5,088,054

COMPUTER GRAPHICS HIDDEN SURFACE REMOVAL SYSTEM

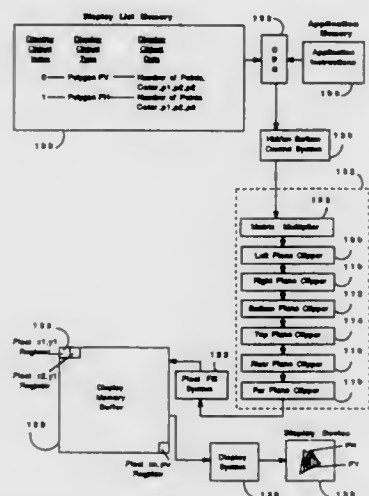
Earl A. Paris, II, 12555 Euclid #108, Garden Grove, Calif. 92640

Filed May 9, 1988, Ser. No. 192,009

Int. Cl.⁵ G06F 15/72

U.S. Cl. 395—121

10 Claims



1. A computer graphics hidden surface removal system for processing a display list representing a plurality of objects to provide an image on a display device, said system comprising:
 - means for determining a primary viewing volume in which said objects are located, the depth of said primary viewing volume being defined as the distance between parallel aligned primary far and primary near clipping planes;
 - means for dividing the primary viewing volume into a series of temporary viewing volumes having respective depths which are less than the depth of said primary viewing volume by successively relocating said primary far and primary near clipping planes to define the depth of each temporary viewing volume, with each of the relocated clipping planes being parallel to each other and to the primary far and near clipping planes of said primary viewing volume;
 - processing means to produce information signals that correspond to portions of the objects that are represented by the display list and located in the temporary viewing volumes; and
 - display memory means into which the signals produced by

said processing means are sequentially loaded for display at the display device.

5,088,055

COORDINATE MEASURING APPARATUS HAVING A STYLUS FRICTION COMPENSATING MEANS

Hiroshi Oyama, Ooguchi, Japan, assignor to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

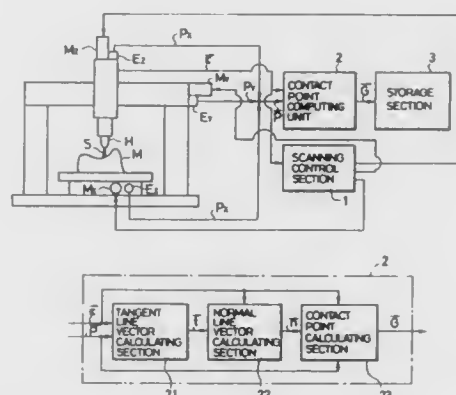
Filed Feb. 22, 1990, Ser. No. 483,461

Claims priority, application Japan, Feb. 22, 1989, 1-42735

Int. Cl.⁵ G01B 21/00

U.S. Cl. 364—560

6 Claims



1. A coordinate measurement apparatus for determining contact points between a stylus and a model, said coordinate measurement apparatus comprising:
 - conveying means for conveying the stylus relative to a surface of the model while maintaining a constant magnitude of a displacement of the stylus;
 - scanning head means for detecting the displacement of the stylus;
 - position detecting means for detecting a relative position of the stylus;
 - tangent line vector calculating means for calculating a tangent line vector of the model which is tangent a trace of a first position vector indicating a center of the stylus, the first position vector corresponding to a sum of a displacement vector denoting the displacement of the stylus obtained by said scanning head means and a second position vector denoting the relative position of the stylus obtained by said position detecting means;
 - normal line vector calculating means for calculating a normal line vector which intersects normal to the tangent line vector at a magnitude in accordance with the displacement vector; and
 - means for calculating a third position vector denoting a contact point between the stylus and the model based on the displacement vector, the second position vector, the normal line vector and a radius of the stylus.

5,088,056

MEDICATION CLOCK

Kenneth B. McIntosh, Rte. 4, Box 119, Greensburg, Ind. 47240; James O. Pratt, Murfreesboro, Tenn., and Donald E. Stout, Annandale, Va., assignors to Kenneth B. McIntosh, Greensburg, Ind.

Continuation of Ser. No. 338,594, Apr. 14, 1989, Pat. No. 4,970,669, which is a continuation of Ser. No. 70,221, Jul. 6, 1987, Pat. No. 4,837,719, which is a continuation-in-part of Ser. No. 702,746, Feb. 19, 1985, Pat. No. 4,682,299. This application

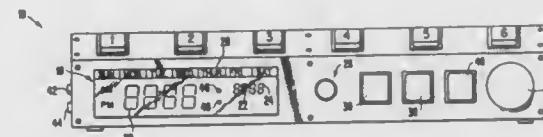
Sep. 24, 1990, Ser. No. 587,044

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.⁵ G08B 1/00; G06F 15/42

U.S. Cl. 364—569

10 Claims



1. A medication compliance device comprising:
 - (a) a plurality of compartments with each compartment being separately usable for holding one or more medications to be taken by a person;
 - (b) a programmable timer which produces a medication dispensing signal indicating the time that a person is to take one or more medications to be taken at specific times;
 - (c) an alarm, responsive to the medication dispensing signal produced by the programmable timing means, for producing an alarm for alerting the person that it is time to take a medication located within one of the compartments;
 - (d) means located in proximity to each of the compartments which are separately activable by the person for producing an acknowledgment signal that any one of the medications stored in one of the compartments has been taken;
 - (e) a memory, coupled to the programmable timer, for storing the time of occurrence of each acknowledgment signal produced by one of the means for producing an acknowledgment signal and an identification of the compartment in proximity therewith and for storing prerecorded information used for correlating an actual identification of the medications being taken with the compartment which is recorded with each acknowledgment signal; and
 - (f) a record producer, coupled to the memory, for providing a record of the prerecorded information, permitting a correlation to be made between the medication being taken and the compartment within which the medication is being stored, and a dosage record of the medication being taken, and time of taking each dosage of medication for each of the medications being taken by the person.

5,088,057

RATIONAL RATE FREQUENCY GENERATOR

Daniel Amrany, Wayside, and Cecil W. Farrow, Highlands, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 5, 1990, Ser. No. 504,812

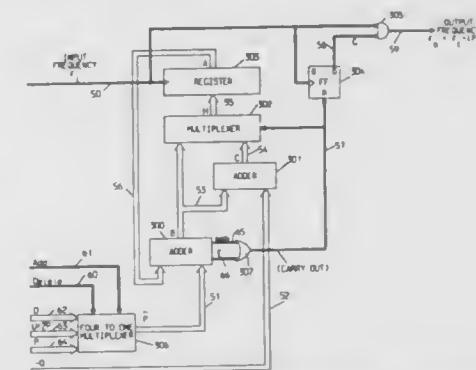
Int. Cl.⁵ H03K 21/00

U.S. Cl. 364—703

2 Claims

1. A rational rate generator circuit comprising:
 - logic means comprising means for receiving Add and Delete input signals and input data representative of integers U and P, and for providing an output quantity representative of the integer P when the Add input is equal to zero and the Delete input is equal to zero, and for providing an output quantity representative of the integer U when the Add input is equal to one and the Delete input is equal to zero, and for providing an output quantity representative

of the integer zero when the Delete input is equal to one and the Add input is equal to zero; an accumulator comprising means for receiving input data representative of integer Q, an input clock signal f_i , and the output of the logic means, to accumulate the sum of the output of the logic means, modulo 2^M , for every input



- clock cycle in which the sum does not overflow and for subtracting Q when the sum overflows and for providing an overflow signal, where M is an integer, and $P < Q$ and $Q < 2^M$; and
- output means responsive to the overflow signal of the accumulator to output a clock pulse when the sum overflows.

5,088,058

APPARATUS AND METHOD FOR EVALUATING AND PREDICTING COMPUTER I/O PERFORMANCE USING I/O WORKLOAD SNAPSHOTS FOR MODEL INPUT

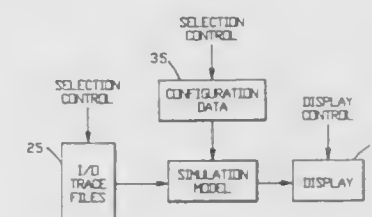
Michael A. Salsburg, West Chester, Pa., assignor to Unisys Corporation, Detroit, Mich.

Filed Aug. 26, 1988, Ser. No. 237,120

Int. Cl.⁵ G06F 15/36, 15/40, 15/46

U.S. Cl. 364—500

10 Claims



1. A method of using a data processor for providing predicted operation of an I/O system comprised of one or more controllers and one or more storage units cooperating therewith, said I/O system having a plurality of operating delays, said method comprising:
 - programming said processor to provide a simulation model of said I/O system constructed such that said delays are formulated as sets of stochastic processes having settable delay parameters;
 - selectably setting said settable delay parameters by operator control of said simulation model to correspond to said I/O system taking into account said controllers and said storage units and their interconnection;
 - applying to said simulation model signals representing a previously derived I/O workload comprised of a snapshot of I/Os; and
 - producing an output from said simulation module in response to said I/O workload, said output being indicative of said predicted operation;
 - said storage units including a disk device and said simulation model including a statistical submodel which is used by said simulation model for deriving seek delay times for

said disk device, said statistical submodel providing a seek time for an I/O operation based on the number of cylinders over which the disk transducer is required to be moved for that I/O operation.

5,088,059
DETECTION DEVICE FOR MAGNETIC BUBBLE MEMORY

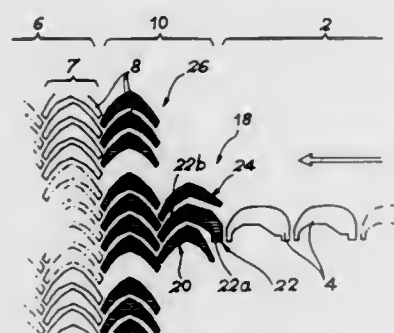
Jean-Marc Fedell, Beaucroissant, and Joël Magnin, Saint Martin d'Heres, both of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed Mar. 21, 1990, Ser. No. 496,941

Claims priority, application France, Mar. 31, 1989, 89 04275
Int. Cl.⁵ G11C 19/08

U.S. Cl. 365—8

7 Claims



1. Detection device of magnetic bubbles, in a magnetic bubble memory having a propagation path for magnetic bubbles formed by propagation patterns of soft magnetic material said propagation path having an end with a final propagation pattern, said device comprising:

- a detection zone, suitable for magnetic bubble propagation in strip form, constituted by rows of patterns of soft magnetic material;
- a transition zone for stretching magnetic bubbles from said final propagation pattern into the form of a strip, wherein the transition zone has at least one row of patterns of soft magnetic material, said row having at least one asymmetrical central pattern adjacent to said end of the propagation path and a second asymmetrical pattern adjacent to the central pattern, said central pattern having a first part able to guide a magnetic bubble and a second part favoring the propagation of a bubble in strip form, said second pattern favoring propagation of bubbles in strip form without disturbing the propagation of a bubble along the first part of the central pattern, propagation patterns in said transition zone being suitable for stretching bubbles into said form of a strip, said form of a strip being perpendicular to a propagation direction of bubbles along the propagation path.

5,088,060
ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH NAND MEMORY CELL STRUCTURE

Tetsuo Endoh, Yokohama; Riichiro Shirota, Kawasaki; Masaki Momodomi, Yokohama; Tomoharu Tanaka, Yokohama; Fujio Masuoka, Yokohama, and Shigeyoshi Watanabe, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

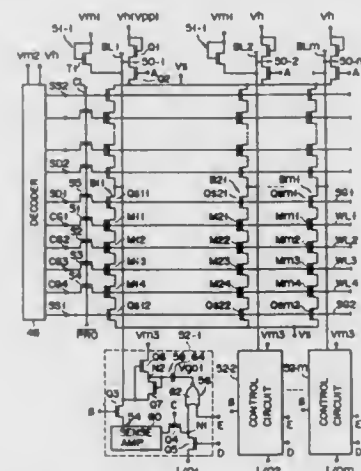
Continuation of Ser. No. 489,967, Mar. 7, 1990, Pat. No. 4,996,669. This application Dec. 26, 1990, Ser. No. 634,325
Int. Cl.⁵ G11C 11/40

U.S. Cl. 365—185

21 Claims

21. A non-volatile semiconductor memory device comprising:
a semiconductive substrate having a top surface that is free from additional doping of impurity;

parallel bit lines on said substrate;
parallel word lines insulatively crossing said bit lines to define crossing points therebetween on said substrate;
an array of memory cells at the crossing points on said top surface of said substrate, each of said memory cells including one transistor with a carrier storage layer and a control gate;
said array of memory cells including two adjacent, first and second memory cell transistors which are connected at their control gates in common to one of said word lines and which have heavily-doped semiconductive regions that define a source and a drain of a transistor structure for turning on, when one of these memory cell transistors is



selected for data write, so that leak current flows therebetween;

leak current eliminator means for forcing said transistor structure to turn off during data write for the selected memory cell transistor, by causing potential difference between said heavily-doped semiconductive regions to be low enough to render said transistor structure nonconductive even when a highest voltage is applied to said one of said word lines which serves as a gate electrode of said transistor structure; and
means for applying to said substrate a voltage of negative polarity while the selected memory cell transistor is subjected to a write operation.

5,088,061
ROUTING INDEPENDENT CIRCUIT COMPONENTS
Habib Golnabi, Dallas; William C. Martin, and Timothy J. Powers, both of Carrollton, all of Tex., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 24, 1990, Ser. No. 557,228

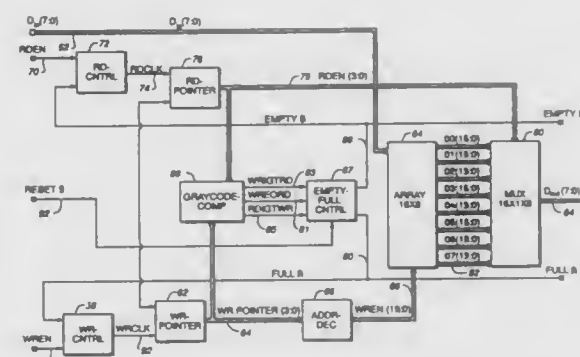
Int. Cl.⁵ G11C 13/00

U.S. Cl. 365—189.01

25 Claims

1. An apparatus having a routing independent architecture which comprises:
means for receiving digital information;
means for storing said digital information, said means for storing including at least two registers of memory cells;
means for generating a write enable signal to input digital information to said means for storing;
means for generating a read enable signal to output digital information from said means for storing;
means for addressing said at least two registers of memory cells in response to said read and write enable signals, said means for addressing further including:
a first means for producing a code sequence wherein at most one bit changes at any given time, said code sequence identifying one of said registers of memory cells during a write operation;

a first decoder for selecting the register identified by said first code sequence producing means;
a second means for producing said code sequence for identifying one of said registers of memory cells during a read operation;
a second decoder for selecting the register identified by said second code sequence producing means; and



means for continuously comparing the code sequence of said first and second code sequence producing means, said comparing means further generating memory full and empty memory signals to disable said means for generating a write enable or read enable signal, respectively.

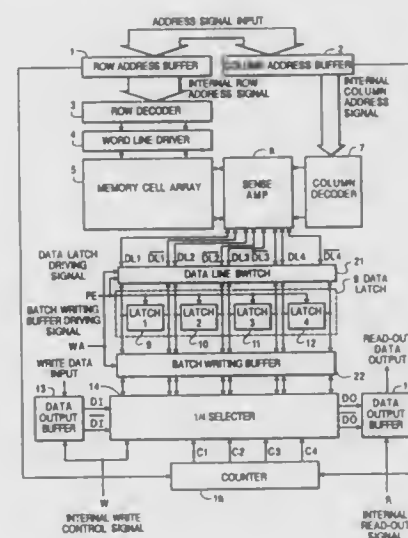
5,088,062
MEMORY DEVICE HAVING COMMON DATA LINES FOR READING AND WRITING
Michiharu Shikata, Kusatsu, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 15, 1990, Ser. No. 493,683

Claims priority, application Japan, Mar. 15, 1989, 1-62534
Int. Cl.⁵ G11C 7/00, 11/409

U.S. Cl. 365—189.05

20 Claims



1. A semiconductor memory device comprising:
a memory cell array having plural memory cells disposed in an array;
selecting means for selecting a plurality of memory cells from among said plural memory cells of said memory cell array;
a plurality of data lines coupled to said selecting means, each of said plurality of data lines for transmitting write data to and read data from said memory cell array;
a read data latch means, having a plurality of latch circuits

respectively coupled to said plurality of data lines, for temporarily storing data therein; and,
a write data latch means, having a plurality of buffer circuits respectively coupled to said plurality of data lines, for temporarily storing data therein;
wherein, upon carrying out a write operation for writing of the write data into said memory cell array, the write data is stored in both said read data latch means and said write data latch means at the same time.

5,088,063
SEMICONDUCTOR MEMORY DEVICE HAVING ON-CHIP TEST CIRCUIT

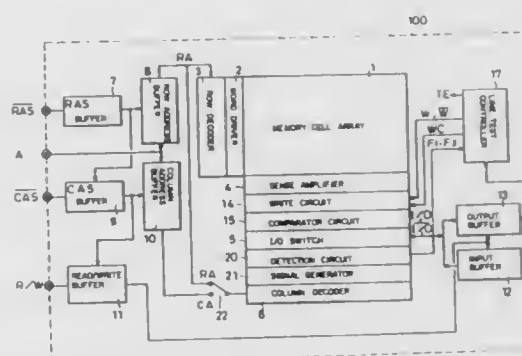
Yoshio Matsuda; Kazutami Arimoto; Tsukasa Oishi; Masaki Tsukude, and Kazuyasu Fujishima, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1990, Ser. No. 532,338

Claims priority, application Japan, Jun. 14, 1989, 1-152653
Int. Cl.⁵ G11C 13/00

U.S. Cl. 365—201

10 Claims



1. A semiconductor memory device comprising a plurality of word lines, a plurality of bit lines arranged to intersect said word lines and a plurality of memory cells arranged at points of intersection of said word lines and said bit lines, said memory device further comprising
first selection means for selecting said word lines during testing,
a plurality of detection means for detecting possible failures respectively of the memory cells connected to the word line selected by said first selection means during testing, an output line provided in common in said detection means and having plural junction points to which detection results by said detection means are separately applied, and dividing means for dividing said output line into two parts at a portion between ones of said junction points in correspondence with the word line selected by said first selection means.

5,088,064
DYNAMIC SEMICONDUCTOR MEMORY DEVICE OF A TWISTED BIT LINE SYSTEM HAVING IMPROVED RELIABILITY OF READOUT

Masaki Tsukude, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,898, Aug. 30, 1989, Pat. No. 4,977,542. This application Oct. 24, 1990, Ser. No. 603,961

Claims priority, application Japan, Aug. 30, 1988, 63-217108

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.⁵ G11C 11/40

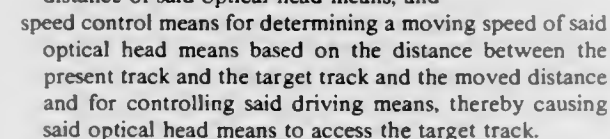
U.S. Cl. 365—207

12 Claims

1. A semiconductor memory device comprising:
a plurality of memory cells arranged in a matrix of rows and columns for storing information charge;
a plurality of bit line pairs, each comprising a pair of bit lines having at least one twisted portion, the respective bit lines

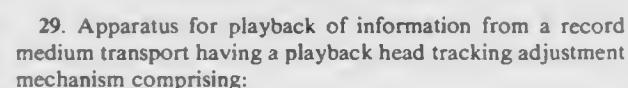
6 Claims

24 Claims

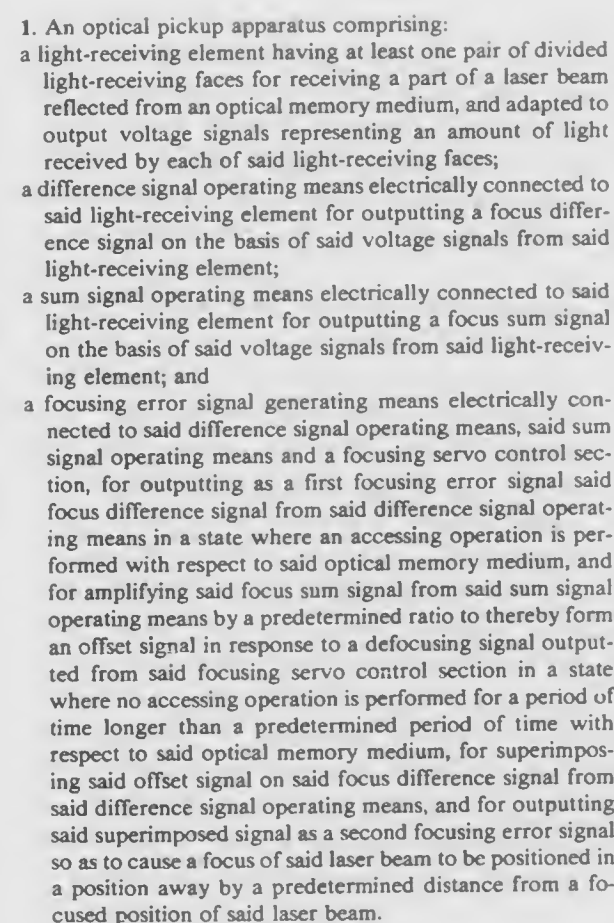


said disk player comprising: a turntable, a transducer, means for lifting said disk out of said selected tray and clamping said disk in a playback position, and means for moving said selected tray slightly radially with respect to said disk to expose to said transducer a portion of said disk including an entire radius of an information content portion of said disk.

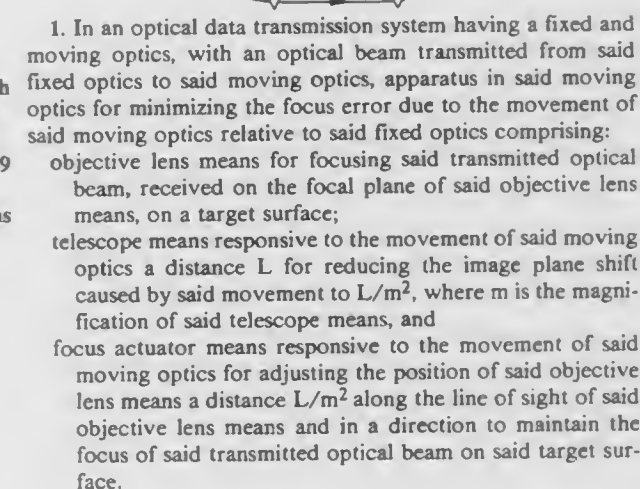
43 Claims



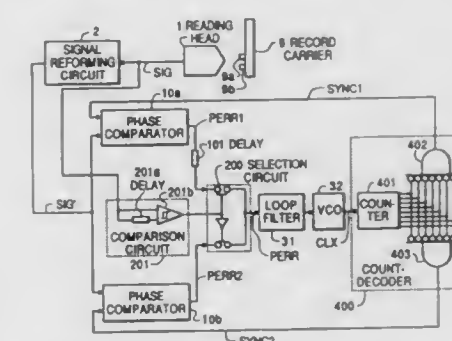
5,088,078
OPTICAL PICKUP APPARATUS
Isamu Moriwaki, Hiratsuka, and Hiroyuki Kiguchi, Atsugi, both
of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed May 11, 1989, Ser. No. 350,512
Claims priority, application Japan, May 18, 1988, 63-119259
Int. Cl.⁵ G11B 7/095
U.S. Cl. 369—44.25 6 Claims



6 Claims



U.S. Cl. 369—44.26

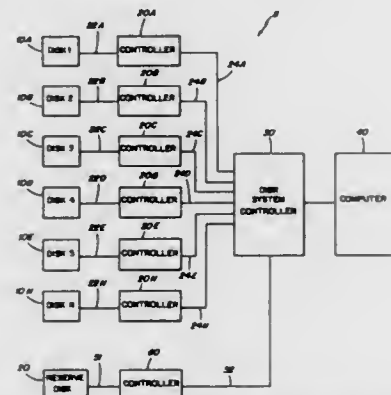


1. An apparatus for deriving a synchronizing signal from groups of synchronizing marks pre-formed along information tracks on a record carrier, each of said groups having a plurality of synchronizing marks at least one of which is located adjacent a track center line on which information data are to be recorded, said apparatus comprising:

- reading means for producing read-out signals sequentially from said synchronizing marks;
- phase comparison means for producing a plurality of phase

error signals from said read-out signals and synchronizing signals;
selection means for transmitting one of said phase error signals;
means for producing a clock signal as a function of said transmitted one of said phase error signals; and
count-decoding means for producing said synchronizing signals from said clock signal.

5,088,081
METHOD AND APPARATUS FOR IMPROVED DISK ACCESS
William Farr, Framingham, Mass., assignor to Prime Computer, Inc., Natick, Mass.
Filed Mar. 28, 1990, Ser. No. 500,729
Int. Cl.⁵ G11B 7/00, 5/09
U.S. Cl. 369—54 19 Claims



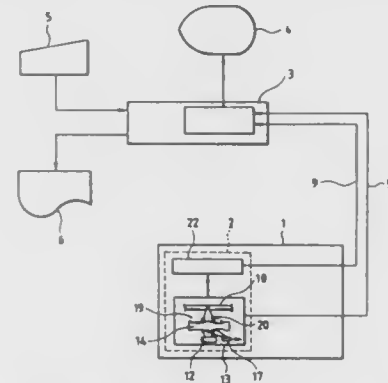
1. In a system including an array of disk drives comprising a plurality of disk drives connected to and controlled by a disk system controller, said disk drives having sectors for storing information in a digital format thereon, said information including a combination of digital data and digital redundant information, the redundant information allowing recovery of the digital data if a sector storing at least a portion of the digital information on one of the disk drives is defective, the improvement comprising:

at least one additional disk drive means intercoupled to the array of disk drives; and
control means for storing recovered digital data on the at least one additional disk drive means if a sector on one of the disk drives in the plurality of disk drives is defective.

5,088,082
DUST REMOVING SYSTEM FOR OPTICAL DISK DEVICE
Yuichi Yamada, Yokohama; Kazuo Ikeda, Toyokawa, and Kouichi Ihara, Yokohama, all of Japan, assignors to Hitachi Video Engineering, Inc., Yokohama and Hitachi, Ltd., Tokyo, both of Japan
Filed Aug. 7, 1990, Ser. No. 563,701
Claims priority, application Japan, Aug. 9, 1989, 1-204678; Oct. 25, 1989, 1-275850
Int. Cl.⁵ G11B 3/58, 15/18
U.S. Cl. 369—71 18 Claims

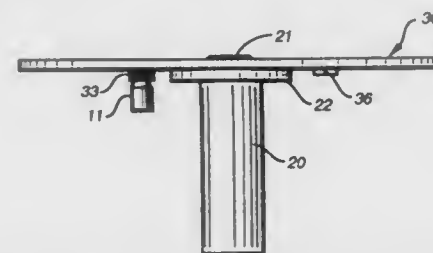
1. A dust removing system for an optical disk device, comprising:
an optical disk device for irradiating light to an optical disk to read out information recorded on the optical disk;
first controlling means connected to said optical disk device for controlling the read out of information from said optical disk device; and
second controlling means for detecting an influence of dust upon said optical disk device and for displaying different messages regarding the removal of the dust on a display unit in response to different levels of the influence of said dust, including means for detecting at least a first stage,

where a level of influence of said dust is in a predetermined low range, and a second stage where a level of influence of said dust is in a second range greater than said predetermined low range, and further including means, when said first stage is detected, for automatically discharging the optical disk device, automatically cleaning



an objective lens of said optical disk device, and displaying a message on said display unit that said cleaning is in process, and means, when said second stage is detected, for automatically discharging the optical disk device and displaying a message on said display unit indicating that cleaning of said objective lens should be performed using a cleaning disk.

5,088,083
DEVICE FOR CLEANING THE LASER LENS OF A COMPACT DISC PLAYER
Norman J. Olson, 934 Baileyana Rd., Hillsborough, Calif. 94010
Filed Dec. 16, 1988, Ser. No. 285,540
Int. Cl.⁵ G11B 3/58, 5/02, 5/10, 23/20
U.S. Cl. 369—71 1 Claim



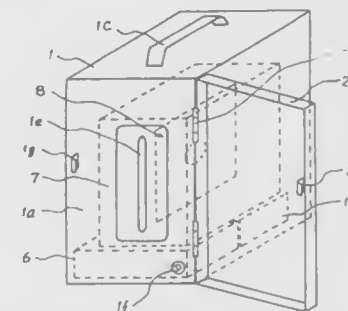
1. A laser lens cleaner for a compact-disc playing machine having a turntable-like compact-disc support for a compact disc, a laser-reading device with a laser lens facing the reflective, playing lower surface of a compact disc, motor means for rotating said compact-disc support and control means for receiving electrically coded instructions from a compact disc or a cleaning disc relative to playing and stopping said compact-disc support for cleaning said laser lens, comprising:

a cleaning disc substantially the same size as a compact disc for said playing machine, said cleaning disc being adapted to be supported on said turntable-like compact-disc support,

said cleaning disc having a reflective lower surface with a cleaning brush projecting out downwardly therefrom, a set of irregular surface features on said lower cleaning surface of said cleaning disc for setting up air currents during rotation of said cleaning disc to assist in cleaning said laser lens even when said brush does not touch said laser lens, said surface features including a member depending from said lower surface for a distance that is too short to touch said lens,

said cleaning disc also having digital data thereon with a portion containing instructions for said control means, said instructions instructing said control means via said laser lens to act during rotation of said compact-disc support, said cleaning disc being in place, to initiate cleaning of said laser lens, and for stopping said compact-disc support and said cleaning disc after said laser lens has been cleaned, said instructions being inaudible to a person, but detected by and acted on by said control means, to give the running time required to clean said lens, and to stop said disc after said lens has been cleaned.

5,088,084
FLOPPY DISK AUXILIARY MEMORY DEVICE
Hidetsugu Komiya; Mitsuo Kurakake, both of Hino, and Seiichi Hattori, Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP85/00592, § 371 Date May 21, 1986, § 102(e) Date May 21, 1986, PCT Pub. No. WO86/02769, PCT Pub. Date May 9, 1986
Continuation of Ser. No. 256,064, Oct. 11, 1988, abandoned, which is a continuation of Ser. No. 871,414, May 21, 1986, abandoned. This PCT application Oct. 24, 1985, Ser. No. 553,344
Claims priority, application Japan, Oct. 29, 1984, 59-226980
Int. Cl.⁵ G11B 19/04, 1/00; E05B 41/00
U.S. Cl. 369—75.1 8 Claims



1. A portable floppy disk auxiliary memory device for a machine control unit of a numeric control apparatus having a main memory for storing numeric control machining information, comprising:

a body disposed outside the machine control unit and having an interior formed by sidewalls and containing a floppy disk drive device in the interior and having a floppy disk insertion slot defined in one of the sidewalls to receive a floppy disk having auxiliary numeric control machining information stored therein as an auxiliary memory;

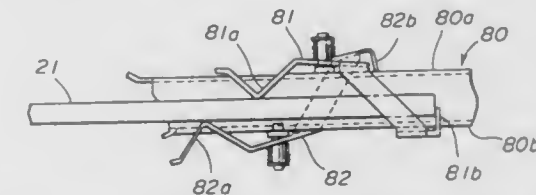
an input/output interface disposed in the body for data transfer from the auxiliary memory to the machine control unit;

a door pivotally connected to a front portion of said body and being movable between open and closed positions over the sidewall of said body having the insertion slot; detecting means disposed in the vicinity of said door for detecting open and closed positions of said door,

a control unit disposed in said body and coupled to the floppy disk drive and the detecting means for permitting access to the floppy disk when the door is detected in the closed position and for issuing an alarm signal and blocking access to the disk drive device when position of the door is open; and

alarm means operable in response to the alarm signal from said control unit for indicating an alarm when the door is detected in the open position.

5,088,085
MAGNETO-OPTIC DISK UNIT HAVING MEANS FOR PREVENTING ERRONEOUS INSERTION OF DISK CARTRIDGE
Keiji Uehara, Iruma, Japan, assignor to Teac Corporation, Tokyo, Japan
Filed Apr. 20, 1990, Ser. No. 511,643
Claims priority, application Japan, Apr. 21, 1989, 1-47365[U]
Int. Cl.⁵ G11B 33/02 8 Claims



1. A magneto-optic disk unit for playing a magneto-optic disk which is accommodated within a magneto-optic disk cartridge, said magneto-optic disk unit having a casing including an opening through which a disk cartridge is inserted into and extracted from said casing along a cartridge insertion path, said magneto-optic disk cartridge having a size and structure similar to that of a magnetic disk cartridge which accommodates a magnetic disk with a thickness t_2 which is smaller than a thickness t_1 of the magneto-optic disk cartridge, said magneto-optic disk unit comprising:

a cartridge holder having an insertion opening through which a disk cartridge is inserted along the cartridge insertion path, an inner portion located along the cartridge insertion path, and first and second surfaces confronting respective sides of the magneto-optic disk;

erroneous insertion preventing means for preventing erroneous insertion of the magnetic disk cartridge, said erroneous insertion preventing means having a stopper portion at one end and an insertion detecting portion at the other end, said stopper portion and said insertion detecting portion being rigidly connected, said stopper portion serving to prevent insertion of the magnetic disk cartridge when said erroneous insertion preventing means is in a first position and said stopper portion serving to allow insertion of the magneto-optic disk cartridge when said erroneous insertion preventing means is in a second position; and

supporting means for supporting rotatably said erroneous insertion preventing means, said supporting means having a spring means for urging said erroneous insertion preventing means so that said insertion detecting portion projects inside of said cartridge holder in the vicinity of said opening of the cartridge holder and said stopper portion projects inside of said cartridge holder in the vicinity of said inner portion of the cartridge holder,

said erroneous insertion preventing means being rotatably supported by said supporting means on said first surface of the cartridge holder, and said first surface of the cartridge holder, and said insertion detecting portion projects inside of the cartridge holder when said erroneous insertion prevention means is in said first position, said insertion detecting portion having a shape and structure such that when the magneto-optic disk cartridge is partially inserted said insertion detecting portion is moved outward from said cartridge holder to allow full insertion of said magneto-optic disk cartridge, and that when the magnetic disk cartridge is partially inserted said insertion detecting portion does not move enough to remove said stopper portion from said cartridge insertion path, thus permitting said stopper portion to prevent full insertion of the magnetic disk cartridge.

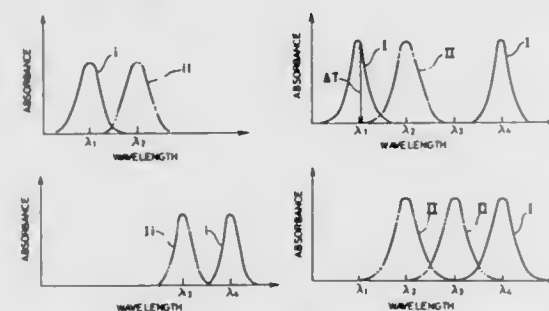
5,088,086
OPTICAL RECORDING MEDIUM AND THE METHOD OF RECORDING, READING, AND ERASING INFORMATION USING IT

Kazuo Van; Hiroyuki Katayama; Akira Takahashi, and Kenji Ohta, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1989, Ser. No. 385,444
 Claims priority, application Japan, Aug. 5, 1988, 63-196372
 Int. Cl.⁵ G11B 7/00

U.S. Cl. 369—100

18 Claims



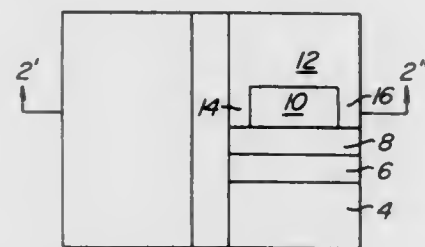
1. An optical recording medium by which information is recorded, read, and erased with respect to a recording medium layer by changing optical characteristics thereof through beams applied from a light source capable of varying wavelength, comprising:

- a transparent substrate; and
- a recording medium having only one layer, formed on the transparent substrate, wherein the recording medium layer includes at least two kinds of photochromic organic compounds which are supported in an optically transparent binder in a dispersed condition, the photochromic organic compounds having optical characteristics which are changeable by respectively different wavelengths, and the optically transparent binder being an organic polymer or an inorganic glass compound.

5,088,087
DUAL-METAL REFLECTIVE LAYER RECORDABLE/ERASABLE OPTICAL MEDIA
 Don P. Paquin, San Jose, Calif., assignor to Tandy Corporation, Ft. Worth, Tex.

Filed Jul. 25, 1990, Ser. No. 558,137
 Int. Cl.⁵ G11B 7/24; G01D 15/34; G11C 13/04
 U.S. Cl. 369—283

15 Claims



1. A recording medium comprising:
- a substrate;
 - an expansion region adjacent the substrate, the expansion region expanding in the presence of radiation at a write wavelength;
 - a retention region adjacent the expansion region, the retention region ceasing to retain an optically detectable bump upon exposure to radiation at an erase wavelength; and
 - a heterogeneous dual-metal reflective region adjacent the

retention region, the reflective region reflecting received radiation.

5,088,088
DYE-POLYMER OPTICAL DATA STORAGE MEDIA WITH IMPROVED RECORDING SENSITIVITY

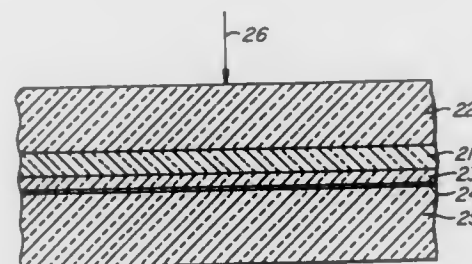
Bryan K. Clark, Sunnyvale, Calif., assignor to Tandy Corporation, Ft. Worth, Tex.

Continuation of Ser. No. 152,690, Feb. 5, 1988, Pat. No. 4,879,709. This application Aug. 25, 1989, Ser. No. 398,803
 The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.⁵ G11B 7/24

U.S. Cl. 369—284

3 Claims



1. An optical data storage medium comprising:
- a rigid substrate;
 - an expansion layer joined on one side to said rigid substrate, said expansion layer being absorptive of light at a first wavelength and reversibly expandable thereupon; and
 - a retention layer joined to said expansion layer on the side opposite said rigid substrate, said retention layer having a glass transition temperature above ambient temperature and thereby convertible between a rubbery state permitting deformation in response to forces exerted thereon by said expansion layer and a glassy state substantially nonresponsive to said forces, said retention layer having a first dye absorptive of light at a second wavelength distinct from said first wavelength and comprising a controlled amount of dye absorptive at said first wavelength, said retention layer at least about 15% absorptive of light at said first wavelength passing through it in a single pass, said controlled amount of dye quickening a response of said medium to said first wavelength.

5,088,089
APPARATUS FOR PROGRAMMABLY ACCESSING AND ASSIGNING TIME SLOTS IN A TIME DIVISION MULTIPLEXED COMMUNICATION SYSTEM
 Michael J. Gingell, and Joseph E. Sutherland, both of Raleigh, N.C., assignors to Alcatel NA Network Systems Corp., Raleigh, N.C.

Filed Dec. 15, 1989, Ser. No. 451,419
 Int. Cl.⁵ H04Q 11/04

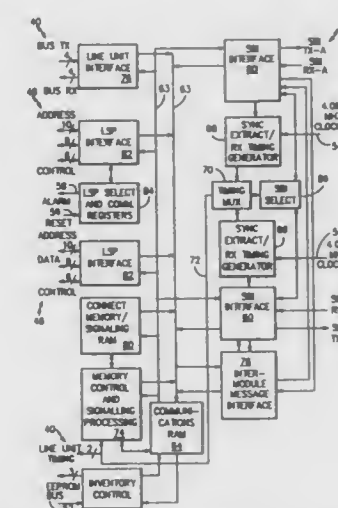
U.S. Cl. 370—67

9 Claims

1. Apparatus for use in a time division multiplexed communications system terminal of the type which information to and from a plurality of subscriber line units is inserted into and extracted from time slots of a time division multiplexed bidirectional bus, said apparatus comprising:
- line unit interface means for receiving and transmitting information from and to said line units;
 - time division multiplexed bus interface means for extracting and inserting information from and into time slots on said time division multiplexed bus;
 - memory means for storing information, said memory means connected to said line unit interface means and said time division multiplexed bus interface means;
 - processor means connected to said memory means, said line unit interface means and said time division multiplexed

interface means for communicating with all three said means; and

read/write means associated with said memory means and under control of said processor means for writing information received from said line units and said time division multiplexed bus into said memory means and for reading information from said memory means and sending it to



said line unit interface means and time division multiplexed bus interface means for delivering said information to said line units and insertion into time slots of said time division multiplexed bus, whereby information is temporarily stored in said memory and is accessible to and modifiable by said processor means, which controls the read/write means to read information from the memory during selected time slots for insertion into the selected time slots.

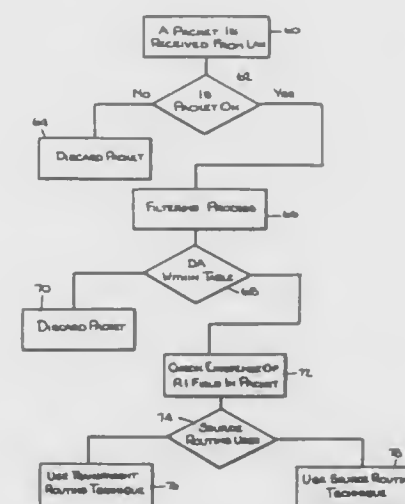
5,088,090
ROUTING SYSTEM TO INTERCONNECT LOCAL AREA NETWORKS

Amnon Yacoby, Doar Na Modim, Israel, assignor to RAD Network Devices Ltd., Tel Aviv, Israel

Filed Jan. 31, 1990, Ser. No. 472,904
 Int. Cl.⁵ H04J 3/24

U.S. Cl. 370—85.13

11 Claims



1. A method for transmitting information in a communications system including interconnected plural local area networks having both source routing nodes and transparent routing nodes connected thereto from a transmitting node which transmits data into the system to a receiving node connected to separate local area networks comprising the steps determining

whether the transmitting node operates according to source routing or transparent routing and applying source routing or transparent routing to said data to transmit said data from the transmitting node to the receiving node in accordance with that determination.

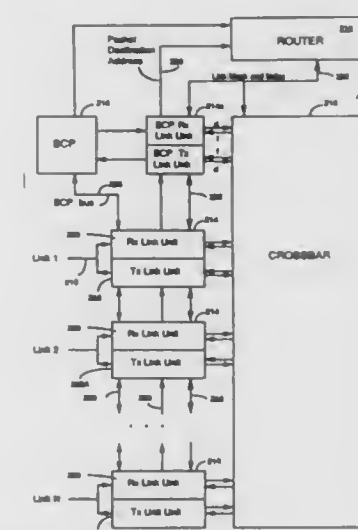
5,088,091
HIGH-SPEED MESH CONNECTED LOCAL AREA NETWORK

Michael D. Schroeder, Santa Clara County, Calif.; Roger M. Needham, Coton, United Kingdom; Charles P. Thacker, Santa Clara County, Calif.; Andrew D. Birrell, Santa Clara County, Calif.; Thomas L. Rodeheffer, Santa Clara County, Calif.; Edwin H. Satterthwaite, Jr., Santa Clara County, Calif., and Hallam G. Murray, Jr., San Mateo County, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 22, 1989, Ser. No. 370,285
 Int. Cl.⁵ H04J 3/24; H04Q 11/04

U.S. Cl. 370—94.3

32 Claims



29. A mesh connected local area network for interconnecting a multiplicity of hosts, said network comprising:
- a multiplicity of switch means for simultaneously routing a multiplicity of data packets between hosts in the network; said hosts and switch means together comprising network members;
 - a multiplicity of point to point link means for interconnecting said switch means and the hosts in said network, each point to point link means providing a communication channel between two of said network members;
 - said multiplicity of link means including spanning tree links and a multiplicity of additional links;
 - said multiplicity of switch means and said spanning tree links together comprising a spanning tree in which one of said switch means is designated the root of said spanning tree; each switch means including reconfiguration means for determining the position of said switch means in said spanning tree, said reconfiguration means including:
 - position denoting means for denoting a tree position within said spanning tree;
 - epoch denoting means for denoting an epoch value associated with said tree position;
 - configuration change detection means for detecting a change in the configuration of said network, including means for detecting the existence of a new connection between said switch means and another one of said network members and for detecting the breaking of a connection between said switch means and another one of said network members;
 - said configuration change detection means including

means for incrementing said epoch value when a change in the configuration of said network is detected; message sending means coupled to said position denoting means for sending a configuration message to each switch means neighboring said switch means; said configuration message including said tree position and said epoch value;

message receiving means for receiving configuration messages from neighboring switch means, for generating a derived tree position which is a function of the tree position in each received configuration message, and for replacing the tree position denoted by said position denoting means with said derived tree position when said derived tree position is better than the tree position denoted by said position denoting means;

said message receiving means including means for replacing said tree position with said derived tree position and replacing said epoch value with the epoch value in said received configuration message when said epoch value in said received configuration message is larger than the epoch value denoted by said epoch denoting means; said message sending means including means for sending a configuration message to said neighboring switch means when said tree position denoted by said position denoting means is replaced by said derived tree position;

said configuration change detection means including epoch value overflow detecting means for detecting epoch value overflow when said epoch value is incremented to a predefined overflow value, and for sending a predefined epoch value reset message to said neighboring switch means and for resetting said epoch value to a predefined initial value when epoch value overflow is detected;

said message receiving means including means for responding to the receipt of an epoch value reset message by resetting said epoch value to said predefined initial value, sending said predefined epoch value reset message to said neighbor switch means, ignoring all subsequent epoch value reset messages received from said neighboring switch means for a predefined period of time, and then sending configuration messages to said neighboring switch means;

whereby changes in the configuration of the network automatically cause the switch means in said network to redetermine their relative tree positions in said spanning tree.

5,088,092

WIDTH-EXPANSIBLE MEMORY INTEGRITY STRUCTURE

James H. Jeppesen, III, El Toro, and Bruce E. Whittaker, Mission Viejo, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 22, 1989, Ser. No. 441,128

Int. Cl.³ G06F 11/10

U.S. Cl. 371—49.3

2 Claims

2. An expansible width memory structure for concatenating a plurality of n bit data words to form a final output data word of $k \times n$ bits, said memory structure comprising:

(a) a plurality of k ROM/PROM data memory chips wherein each ROM/PROM data memory chip is a duplicate-type of the other and each data memory chip stores N data words of n bits each while providing a chip output bus of n bits;

(b) a single auxiliary parity ROM/PROM memory chip which is a duplicate-type of said k data memory chips, said parity memory chip storing one predetermined related parity bit for each n -bit data word in each one of said k data memory chips;

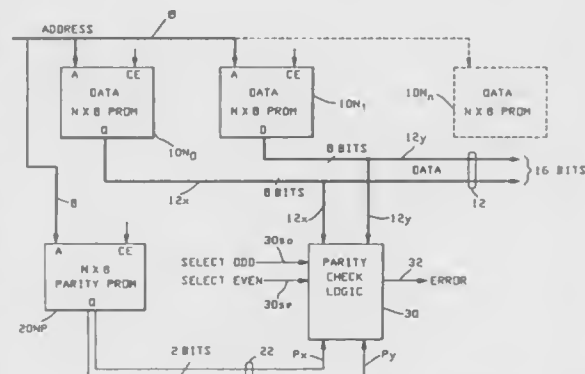
(c) address bus means connected to address each one of said ROM/PROM data memory chips and said auxiliary ROM/PROM parity memory chip;

(d) final output data bus means of $k \times n$ bits forming said final output data word;

(e) integrity checking means for verifying the accuracy of data accessed on said final output data bus means, said integrity checking means including:

(e1) bus means to carry accessed related parity bits from said auxiliary parity ROM/PROM memory chip to a parity check logic means;

(e2) said parity check logic means for receiving accessed



data words from each one of said k data memory chips via said chip output buses and including:

(e2a) means for calculating the parity value of each data word accessed and comparing it with each accessed predetermined related parity bit to determine whether the parity values are inconsistent and thus indicate error;

(e3) selection means to permit said parity check logic means to operate on an odd parity or an even parity format.

5,088,093

SELF-CORRECTING REGISTERS, ERROR-DETECTING/CORRECTING REGISTERS, AND INVERSION CODING USING ONE BIT, AND OTHER INFORMATION STORAGE MEDIA

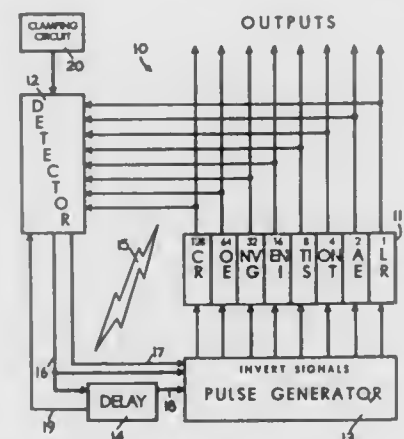
Leonard Storch, and Ernst van Haagen, both of New York, N.Y., assignors to CIAS, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 853,745, Apr. 18, 1986, Pat. No. 4,814,589. This application Oct. 16, 1987, Ser. No. 109,075

Int. Cl.³ H03M 13/00

U.S. Cl. 371—30

16 Claims



1. A register having two or more locations which may act as outputs to define the information content of said register, said locations representing n binary digits, n being equal to two or more, each of said locations being capable of assuming each of

two binary states, the construction of said register being such that when the binary state of any of said locations is inverted by interference, the binary states of all of said locations not already inverted by interference are inverted, the binary states of said locations before said interference defining original information of said register and the states of said locations after said interference defining inverted information of said register that is inverted digit for corresponding digit from said original information, and means for inverting the states of all of said locations to define again said original information subsequent to said interference, and subsequent to the states of all of said locations not already inverted by interference having previously been inverted in response to said interference.

5,088,094

ACCESSING OF TRANSMISSION CHANNELS OF A COMMUNICATION SYSTEM

Christoph Grauel, Feucht, and Werner Schmidt, Heroldsberg, both of Fed. Rep. of Germany, assignors to Philips Kommunikations Industrie Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,691

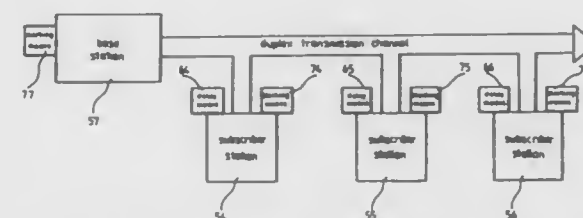
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133347

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.³ H04J 3/16

U.S. Cl. 370—95.1

21 Claims



1. A method for accessing of transmission channels in a communication system with at least a central base station at least a duplex transmission channel and a plurality of independent subscriber stations comprising originating at a subscriber station a short access signal, carrying call request information amounting to less than a complete identification of the subscriber station, engaging a duplex transmission channel for initiating an information transmission from the subscriber station; responding of the central base station with a request for complete identification to that subscriber station characterized by its short access signal thereby initiating an information transmission from and to that subscriber station.

5,088,095

GAIN STABILIZED FIBER AMPLIFIER

Martin Zirngibl, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 31, 1991, Ser. No. 648,713

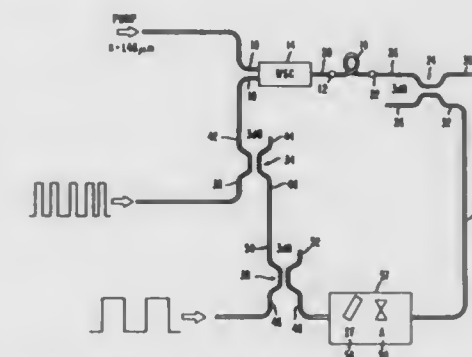
Int. Cl.³ H01S 3/13, 3/30

U.S. Cl. 372—6

9 Claims

1. An fiber amplifier comprising an optical fiber doped with a rare earth element, a pump means coupled to pump said doped optical fiber, an input port adapted to couple signals to said optical fiber, an optical feedback loop interposed between the output of said doped optical fiber and the input port of said doped optical fiber, wavelength selective means coupled to said optical feedback loop to pass a signal having a frequency other than the

frequency of the pump means and the frequency of the signals applied to said input port, and



an output port coupled to receive the signal amplified by said doped optical fiber.

5,088,096

TUNABLE POWER LASER

Jean-Paul Pocholle, Arpaon/La Norville; Michel Papachon, Massy, and Claude Puech, Ballainvilliers, all of France, assignors to Thomson-CSF, Puteaux, France

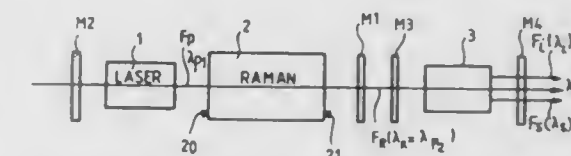
Filed Jul. 3, 1990, Ser. No. 547,146

Claims priority, application France, Jul. 11, 1989, 89 09303

Int. Cl.³ H01S 3/10

U.S. Cl. 372—20

9 Claims



1. A power laser source comprising:

a first laser cavity defined by a first set of two optically aligned reflection means, said cavity including a pump laser source emitting an optic pump wave at a first predetermined wavelength;

a pressurized gas cell containing a gas of a nature such that, receiving the pump wave, the cell emits a Stokes wave at a second wavelength which is different from the first wavelength;

a second cavity defined by a second set of two optically aligned reflection means, said second cavity including a non-linear crystal receiving the Stokes wave at a determined angle with respect to the optical axis of the crystal and providing two output waves with wavelengths which are different from the second wavelength wherein the wavelengths of said two output waves depend upon the value of said determined angle.

5,088,097

SEMICONDUCTOR LASER ELEMENT CAPABLE OF CHANGING EMISSION WAVELENGTH, AND METHOD OF DRIVING THE SAME

Takeo Ono, Sagami-hara, and Hajime Sakata, Hiratsuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1990, Ser. No. 504,626

Int. Cl.³ H01S 3/10

U.S. Cl. 372—20

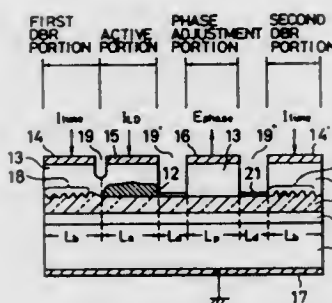
29 Claims

1. A wavelength selective filter comprising:

a substrate; an optical waveguide layer which includes a superlattice structure and which is formed on said substrate, said optical waveguide layer including a reflection portion and

an optical waveguide portion which are arranged along a light propagation direction;
a grating formed in said reflection portion of said optical waveguide layer; and
an electrode formed on said reflection portion of said optical waveguide layer for applying voltage;
wherein said filter satisfies the following equation:

$$l_A \Delta \alpha_A(E) + l_B \Delta \alpha_A(\lambda) = 0$$



where l_A and l_B are the lengths of said reflection portion and said optical waveguide portions in the light propagation direction, E is the voltage applied from said electrode, $\Delta \alpha_A(E)$ is the increase in absorption coefficient in the optical waveguide layer caused upon application of the voltage, λ is the wavelength of light guided in said optical waveguide layer, and $\Delta \alpha_A(\lambda)$ is the decrease in absorption coefficient when guided light is shifted toward a long wavelength side.

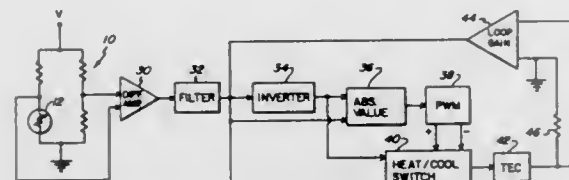
5,088,098

THERMOELECTRIC COOLER CONTROL CIRCUIT
Mathias Muller, Lexington, and Dean Stoneback, Souderton, both of Pa., assignors to General Instrument Corporation, Hatboro, Pa.

Filed Oct. 16, 1990, Ser. No. 598,190
Int. Cl.⁵ H01S 3/043

U.S. Cl. 372-34

8 Claims



1. A temperature control circuit for a thermoelectric cooler comprising:
temperature sensor means for providing an output signal related to a sensed temperature, said output signal having a first polarity when the sensed temperature is on one side of a threshold and a second polarity when the sensed temperature is on the other side of said threshold;
means for obtaining an absolute value of said output signal;
means responsive to the absolute value of said output signal for generating complementary positive and negative going control signal pulse streams, each having a substantially constant peak-to-peak magnitude and an average value that varies over a continuous range dependent on said sensed temperature; and
means for selectively coupling said control signal pulse streams to said thermoelectric cooler to regulate the temperature thereof.

5,088,099

APPARATUS COMPRISING A LASER ADAPTED FOR EMISSION OF SINGLE MODE RADIATION HAVING LOW TRANSVERSE DIVERGENCE

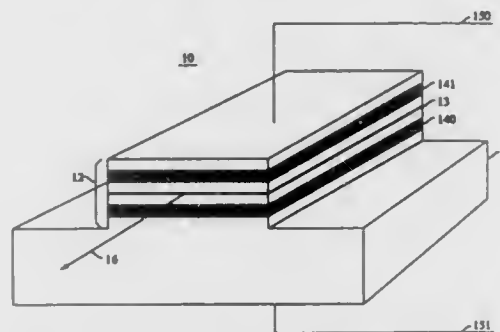
Young-Kai Chen; Mingwei Hong, both of Berkeley Heights, and Ming-Chiang Wu, Bridgewater, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1990, Ser. No. 631,292

Int. Cl.⁵ H01S 3/19

U.S. Cl. 372-45

9 Claims



1. An edge-emitting semiconductor laser capable of emitting single mode radiation, associated with the laser is a junction, a longitudinal direction and, in a plane perpendicular to the longitudinal direction, a first direction that is perpendicular to the junction and a second direction that is parallel to the junction, and associated with the radiation is a far field pattern having a divergence in the first and the second direction, respectively; the laser comprising a n-doped semiconductor region and a p-doped semiconductor region, means for making electrical contact to the p-doped and n-doped semiconductor regions, respectively, and reflecting means that form an optical cavity;

CHARACTERIZED IN THAT

- a) the laser comprises a single waveguiding structure, and furthermore comprises
- b) means for reducing the divergence of the far-field pattern in the first direction.

5,088,100

LASER DIODE OPTICAL AMPLIFIER

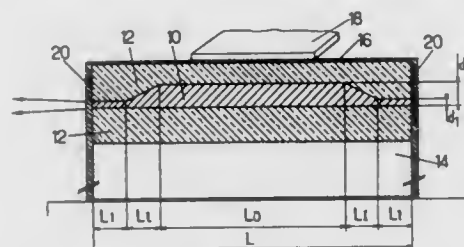
Charles Vassallo, Tregastel, and Jean-Claude Simon, Perros Guirec, both of France, assignors to French State, represented by the Minister of Post, Telecommunications and Space, Issy les Moulineaux, France

Filed Nov. 8, 1990, Ser. No. 610,588

Claims priority, application France, Nov. 13, 1989, 89 14848
Int. Cl.⁵ H01S 3/19

U.S. Cl. 372-45

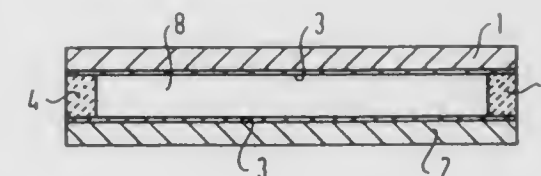
7 Claims



1. Non-resonating laser diode optical amplifier, comprising:
a strip of optically active material forming an amplifying optical guide;
confinement layers covering said strip on both sides thereof for forming a confinement sheath;
anti-reflection layers on end faces of said strip;
a substrate supporting said strip and confinement sheath; and

electrode means for feeding current to said strip;
wherein said strip has end portions whose thickness is about 1/100 of the wavelength of the laser diode and a central portion whose thickness is about 1/10 of said wavelength, whereby the difference between the wavelength corresponding to the reflectivity minima for the two inherent polarization states of said laser diode is low as compared with the difference of a laser diode optical amplifier which would have the same thickness as said end portions throughout its length,
and wherein said end portions are connected to the central portion by transition sections having a progressively increasing thickness,
the ratio being the thickness of said end portions and the thickness of said central portion having a value between 1/5 and 1/10.

which is insensitive to oxidation by an adjoining plasma within the laser; and



said layer means having a roughness which is sufficiently small such that it does not substantially disturb waveguiding in the laser.

5,088,101

LASER GAS DISPLACEMENT AMOUNT CONTROL METHOD

Michiaki Irie; Nobuaki Iehisa, both of Yamanashi, and Etsuo Yamazaki, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

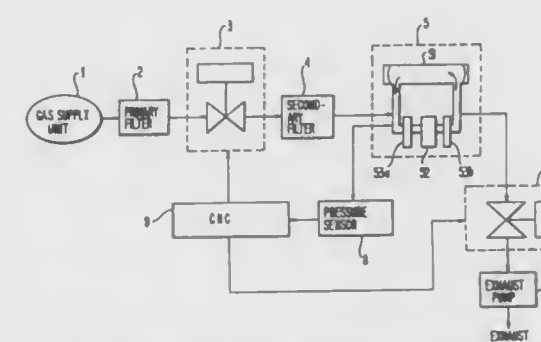
Filed May 30, 1990, Ser. No. 476,432

Claims priority, application Japan, Oct. 7, 1988, 63-253229

Int. Cl.⁵ H01S 3/22

U.S. Cl. 372-59

2 Claims U.S. Cl. 372-68



1. A laser gas displacement amount control method for controlling the displacement amount of laser gas in a discharge pumping type gas laser device, said laser gas displacement amount control method comprising displacing said laser gas by a predetermined displacement amount, which is set to a value sufficient to remove contaminants which have seeped into said laser gas, during a fixed period immediately after starting; effecting a beam-output correction during said fixed period before a beam is output from the laser device; and subsequently displacing said laser gas by a displacement amount smaller than said predetermined displacement amount during an operational period after said fixed period has lapsed.

5,088,102

CO OR CO₂ WAVEGUIDE LASER

Hans Krueger, Munich,* and Hubert Weber, Augsburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1991, Ser. No. 659,072

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 4006460

Int. Cl.⁵ H01S 3/03

U.S. Cl. 372-64

12 Claims

1. A transversal excitation sealed-off type CO or CO₂ waveguide laser, comprising:
two metal electrodes arranged as waveguide surfaces and separated from one another by insulator strips;
the electrodes being coated with a passivation layer means

5,088,103

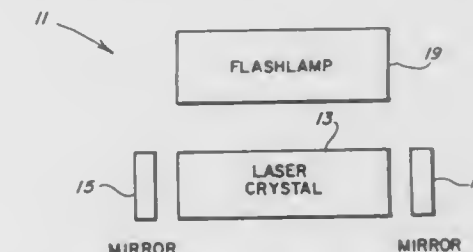
ROOM-TEMPERATURE, FLASHPUMPED, 2.09 MICRON SOLID STATE LASER

Leon Esterowitz, Springfield, Va., and Gregory J. Quarles, Bowie, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1990, Ser. No. 516,943

Int. Cl.⁵ H01S 3/14, 3/13

14 Claims



1. A room temperature solid state laser comprising:
a laser cavity defined by first and second reflective elements opposing each other on a common axis to form a reflective path therebetween;
a laser crystal disposed in said laser cavity, said laser crystal having a host material capable of accepting Cr³⁺ sensitizer ions, Tm³⁺ sensitizer ions and Ho³⁺ activator ions, an amount of Cr³⁺ sensitizer ions between about 0.3% and about 2% dispersed within said host material, an amount of Tm³⁺ sensitizer ions between about 3% and about 12% dispersed within said host material, and an amount of Ho³⁺ activator ions between about 0.1% and about 0.7% dispersed within said host material; and
flashlamp means for exciting said laser crystal to produce a laser emission at substantially 2.09 microns; and
a predetermined one of said first and second reflective elements outputting a portion of said laser emission at substantially 2.09 microns when said laser crystal is excited by said flashlamp means.

5,088,104

MULTIPLE DISCHARGE GAS LASER APPARATUS
Edward J. McLellan, 422 Connie Ave., Los Alamos, N. Mex. 87544

Filed Jul. 3, 1989, Ser. No. 375,250

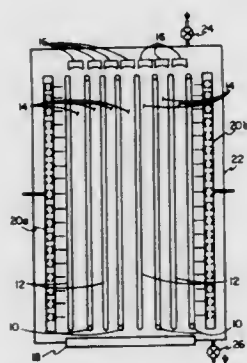
Int. Cl.⁵ H01S 3/097

U.S. Cl. 372-87

11 Claims

1. A multiple discharge laser apparatus generating a plurality of laser oscillations in a lasing gas, said apparatus comprising in combination:
a plurality of spaced-apart, elongated, negatively charged electrodes having a chosen distance therebetween, said negatively charged electrodes being disposed such that the

long dimension of each electrode is substantially parallel, a plurality of spaced-apart, elongated positively charged electrodes, said positively charged electrodes being disposed such that one of said positively charged electrodes is located parallel to and spaced-apart from at least one of said negatively charged electrodes at substantially one-half the chosen distance therebetween, said negatively charged electrodes and said positively charged electrodes forming an array of oppositely charged pairs of electrodes, each pair forming an electrical discharge region therebetween, providing excitation to a lasing gas for generating laser oscillation therein, said array having a first outer electrode and a second outer electrode, a first elongated preionizer electrode disposed parallel to and spaced-apart from said first outermost electrode of the array such that the long axis of said first preionizer electrode is substantially parallel to the long axis of said first outermost electrode, a second elongated preionizer electrode disposed parallel to and spaced-apart from said second outermost electrode of the array such that the long axis of said second preion-



izer electrode is substantially parallel to the long axis of said second outermost electrode, charging means for providing an electrical charge to said positively charged electrodes and said negatively charged electrodes, switching means for controlling which of said negatively charged electrodes discharges to said positively charged electrodes adjacent thereto, means for charging said first preionizer electrode and said second preionizer electrode to said first outermost electrode and said second outermost electrode, reflecting means located at one end of each of the lasing gas excitation regions, partially transmitting means located at the end of the lasing gas excitation region opposite to said reflecting means for coupling laser radiation out of the gas excitation regions forming thereby a plurality of parallel laser optical cavities supporting laser oscillations therein, and means for introducing and controlling the pressure of the lasing gas; whereby a plurality of laser oscillations are generated to produce a chosen array.

5,088,105

OPTICAL AMPLIFIER WITH FOLDED LIGHT PATH AND LASER-AMPLIFIER COMBINATION

Donald R. Scifres; David F. Welch, both of San Jose, Calif., and William Streifer, deceased, late of Palo Alto, Calif. by Shirley R. Streifer, executor, assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

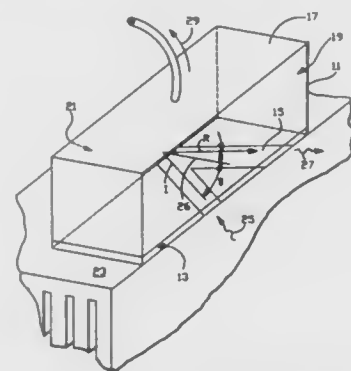
Filed Mar. 26, 1991, Ser. No. 675,432
Int. Cl.³ H01S 3/08

U.S. Cl. 372-92

105 Claims

1. An optical amplifier device comprising:
a body containing at least one optical gain region having an input region and at least one output region, said body having at least a first amplifier region defined within said body, said first amplifier region accepting a light input at said input region,
means for providing a nonlinear light path within said body,

at least a portion of said light path passing through said first amplifier region,



means for pumping said body of optical gain regions to cause amplification of light propagating in said light path, at least a portion of said amplified light being emitted from said output region or regions of said body.

5,088,106

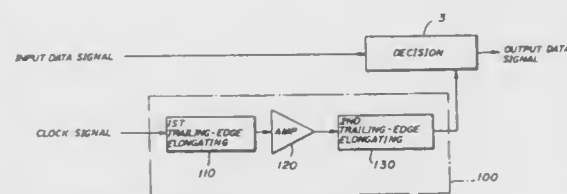
PHASE SHIFT CIRCUIT AND REPEATER USING THE SAME

Mitsuo Kitamura, Kawasaki, and Kazunori Hayami, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 9, 1990, Ser. No. 490,911

Claims priority, application Japan, Mar. 16, 1989, 1-64220
Int. Cl.³ H04L 25/20

U.S. Cl. 375-4

31 Claims



1. A phase shift circuit, comprising:
first trailing-edge elongating means for elongating a trailing edge of each pulse of an input clock signal so as to fall gradually and for outputting a first clock signal having a first elongated fall time;
signal inverting means, coupled to said first trailing-edge elongating means, for inverting the first clock signal supplied from said first trailing-edge elongating means and for outputting an inverted version of the first clock signal; and
second trailing-edge elongating means, coupled to said signal inverting means, for elongating a trailing edge of each pulse of the inverted version of the first clock signal so as to fall gradually and for outputting a second clock signal having a second elongated fall time, the second clock signal lagging behind the input clock signal by a predetermined time based on the first and second elongated fall times; and

wherein said first trailing-edge elongated means is operatively connected to positive and negative power sources and comprises:

- a first emitter follower transistor having a base supplied with the input clock signal, a collector coupled to the positive power source, and an emitter through which the first clock signal is output;
- a first capacitor coupled between the positive power source and the emitter of said first emitter follower transistor; and
- a first variable constant-current supplying means, coupled between the emitter of said first emitter follower transis-

tor and the negative power source, for supplying a first variable constant-current passing therethrough from said first capacitor, the first elongated fall time being adjusted by the first variable constant-current passing through said first variable constant-current supplying means, and

wherein said second trailing-edge elongating means comprises:

a second emitter follower transistor having a base supplied with the inverted versions of said first clock signal, a collector coupled to the positive power source, and an emitter through which the second clock signal is output;

a second variable constant-current supplying means, coupled between the emitter of said second emitter follower transistor and the negative power source, for supplying a second variable constant-current passing therethrough from said second capacitor, the second elongated fall time being adjusted by the second variable constant-current passing through said second variable constant-current supplying means.

5,088,107

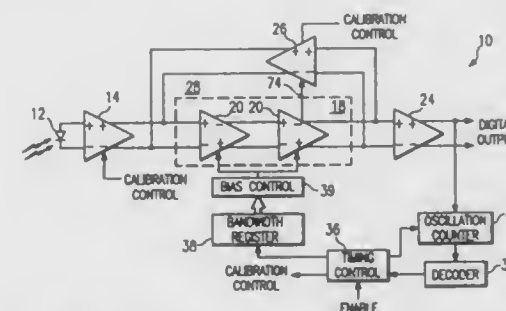
LINEAR CHANNEL BANDWIDTH CALIBRATION CIRCUIT

Douglas S. Piasecki, Austin, and Eric J. Swanson, Buda, both of Tex., assignors to Crystal Semiconductor, Austin, Tex.

Filed Oct. 27, 1989, Ser. No. 429,225
Int. Cl.³ H04L 27/06; H04B 01/14

U.S. Cl. 375-10

16 Claims



1. A calibration circuit for a linear channel of a data receiver, the linear channel having a finite bandwidth, an input and an output, comprising:

- means interconnected to the linear channel for causing the linear channel to operate in an oscillation mode and oscillate at an oscillation frequency;
- means interconnected to the output of the linear channel for monitoring the oscillation frequency of the linear channel during the oscillation mode;
- means for correlating the monitored oscillation frequency to the bandwidth of the linear channel such that the bandwidth of the linear channel bears a relationship to the oscillation frequency; and
- means responsive to said monitoring means and correlating means for determining if the bandwidth of the linear channel deviates from a desired bandwidth, and for adjusting the bandwidth of the linear channel from the determined bandwidth to a new bandwidth when the determined bandwidth deviates from the desired bandwidth.

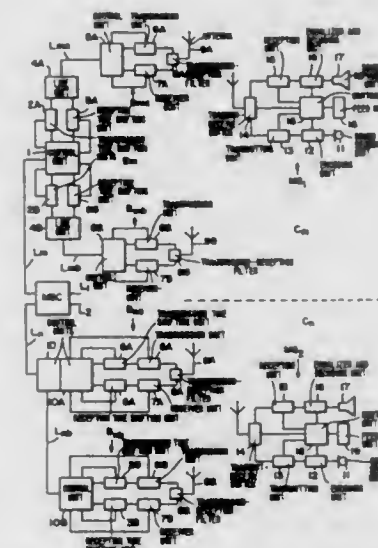
5,088,108
CELLULAR DIGITAL MOBILE RADIO SYSTEM AND METHOD OF TRANSMITTING INFORMATION IN A DIGITAL CELLULAR MOBILE RADIO SYSTEM
Jan E. Uddenfeldt, Vällingby, and Alex K. Ralith, Kista, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Sweden

Continuation of Ser. No. 315,561, Feb. 27, 1989, abandoned.
This application Sep. 6, 1990, Ser. No. 579,283

Claims priority, application Sweden, Feb. 29, 1988, 8800698
Int. Cl.³ H04B 7/04, 7/26

U.S. Cl. 375-12

10 Claims



1. A cellular mobile radio system comprising a plurality of mobile stations which are movable within and between a plurality of cells and a plurality of associated base stations assigned to said cells for digital transmission of message information, each of said plurality of base stations and mobile stations having associated therewith a respective set of a transmitter and a receiver so that said message information in the form of radio signals with digital modulation can be communicated therebetween, said radio signals being digitally modulated with said message information within modulation time intervals, each of said receivers including means for reconstructing the digital modulation from corresponding radio signals received within a predetermined reception time interval; said cells and base stations being associated with one another in a manner such that at least two base station transmitters are assigned to each of predetermined cells within a limited geographic area, said at least two base station transmitters being disposed at a predetermined transmitting distance from each other and each operable to transmit segments of digitally modulated radio signals virtually simultaneously and within the same frequency range with identical message information being transmitted by the other of said at least two base station transmitters to mobile stations within a cell to which both of said transmitters are assigned, the digitally modulated radio signals from said at least two base station transmitters having modulation time intervals which are shorter than the time required for radio signals to propagate a distance which is as long as a greatest transmitting distance between two base station transmitters assigned to one cell within said geographic area, wherein

said reconstructing means associated with each of said receivers in said plurality of mobile stations operate to reconstruct digital modulation of corresponding radio signals received during a reception time interval which is at least as long as a time required for radio signals to propagate a distance which is as long as said greatest transmitting distance.

5,088,109

CIRCUIT ARRANGEMENT FOR THE EQUALIZATION OF DIGITAL SIGNALS RECEIVED IN ANALOG FORM
Heinrich Schenk, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

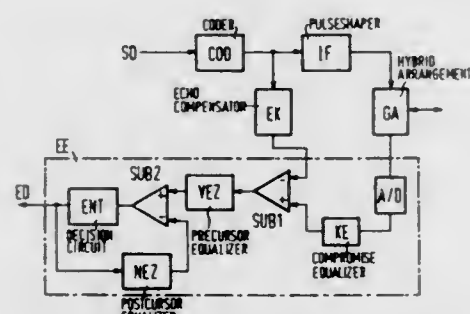
Filed Sep. 26, 1989, Ser. No. 412,744

Claims priority, application European Pat. Off., Sep. 29, 1988, 88116124.4

Int. Cl.³ H03H 7/30

U.S. Cl. 375-14

4 Claims



1. An adaptively adjustable equalizer arrangement for removing precursor and postcursor effects from a digital input signal, comprising:

compromise equalizer means connected upstream of a precursor equalizer means and a postcursor equalizer means for reducing said precursor and postcursor effects from said digital signal, said compromise equalizer means having an input adapted to receive said digital signal and having a transfer function

$$H(z) = [-A/2 + z^{-1}]/[1 + Az^{-1}]$$

where A is a positive real number; Where z is variable defining the z transform,

precursor equalizer means, responsive to an output of said compromise equalizer means, for removing said precursor effects from said output of said compromise equalizer means; and

postcursor equalizer means, responsive to an output of said precursor equalizer means, for removing said postcursor effects from said output of said precursor equalizer means; such that the stability and convergence characteristics of the adaptively adjustable equalizer are improved.

5,088,110

BASEBAND-CONTROLLED PASSBAND EQUALIZING ARRANGEMENT

Georges Bonnerot, Les Ulis, and Laurent Bourgeade, Vanves, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France
Continuation of Ser. No. 880,336, Jun. 24, 1986, abandoned, which is a continuation of Ser. No. 607,324, May 4, 1984, abandoned. This application Mar. 15, 1989, Ser. No. 325,085

Claims priority, application France, May 11, 1983, 83 07909
Int. Cl.³ H04B 3/04

U.S. Cl. 375-15

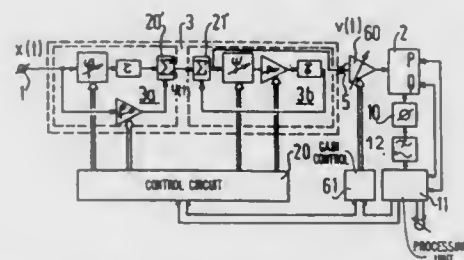
7 Claims

1. A passband signal controlled passband equalizing apparatus for correcting passband data signals $x(t)$ comprising:

a passband correction circuit connected to receive at its input said signals $x(t)$ and to provide at its output corrected passband signals $v(t)$ comprising:

means, including a plurality of fixed delay elements respectively coupled to the input and output of said passband correction circuit for delaying by time intervals t_j and t_m , the signals $x(t)$ and $v(t)$, respectively, thereby forming delayed replicas $x(t-t_j)$ and $v(t-t_m)$, respectively; a plurality of variable parameter circuit elements including multipliers for multiplying said delayed replicas $v(t-t_m)$ and $x(t-t_j)$, respectively, by factors of r_m

and P_j , respectively, and phase shifters for making $e^{i\psi_m}$ and $e^{i\phi_j}$ phase shift operations by applying phase shift factors of ψ_m and ϕ_j to the delayed replicas $v(t-t_m)$ and $x(t-t_j)$, respectively; and addition means coupled to said delay elements for respectively adding the de-



layed replicas $x(t-t_j)$ and $v(t-t_m)$ after being processed in said plurality of variable parameter circuit elements,

for providing a continuous transfer function in time defined by:

$$\sum_{m=1}^M r_m \cdot e^{i\psi_m} \cdot v(t-t_m) + \sum_{j=0}^N P_j \cdot e^{i\phi_j} \cdot x(t-t_j)$$

where M and N are the number of multipliers and phase shifters;

a carrier recovery circuit;

a first demodulation circuit cooperating with said carrier recovery circuit for converting said passband modulated signals from said passband correction circuit into baseband data signals; and

a control circuit connected to said first demodulation circuit and said passband correction circuit for estimating an error of said passband signals, said control circuit altering said multiplying and phase shift factors (r_m , P_j , ψ_m , ϕ_j) of the circuit elements in a direction to reduce said error.

5,088,111

MODULATION AND DEMODULATION SYSTEM EMPLOYING AM-PSK AND FSK FOR COMMUNICATION SYSTEM USING DIGITAL SIGNALS

Robert P. McNamara, San Jose, and Timothy P. Murphy, Mountain View, both of Calif., assignors to First Pacific Networks, Sunnyvale, Calif.

Filed Feb. 28, 1989, Ser. No. 317,214

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.³ H04L 25/34, 25/49

U.S. Cl. 375-18

16 Claims

1. A communication system comprising:

a head end device coupled to a first broadband communications medium to receive and translate bursts of information received in a partial response format into continuous information in a partial response format and to transmit said continuous information to a second broadband communications medium;

a first broadband communications medium coupled to said head end device;

a second broadband communications medium coupled to said head end device; and

a plurality of node devices, each one of said node devices having modulator means coupled to said first broadband communications medium for transmitting signals upstream to said head end device and having demodulator means coupled to said second broadband communications medium for receiving signals downstream from said head end device, each said modulator means comprising means for communicating bursts of information in a partial re-

sponse format with zero energy output for a zero value input, and each said demodulator means comprising:

a serial transmission connection; multiplexing means for multiplexing parallel interface signals including timing, control, and data signals into serial signals for application to the serial transmission connection;

demultiplexing means for demultiplexing serial signals including timing, control and data signals received from the serial transmission connection into parallel interface signals; and

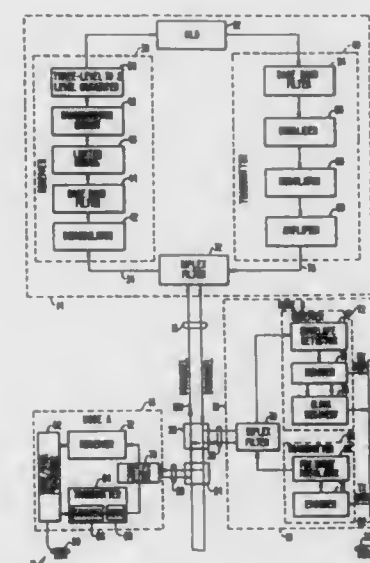
I/O means for connecting the parallel interface signals to the multiplexing means and demultiplexing means, and I/O means including,

a plurality of I/O lines connectible to the parallel interface signals of either the data communication equipment or the terminal equipment;

means for forming selectively at least a portion of the plurality of I/O lines into either input or output lines,

means for switching at least a portion of the I/O lines to either inputs or outputs of the multiplexing means and demultiplexing means,

said selecting means and switching means being governed in accordance with the connection of the interface unit to either the terminal equipment or the data communication equipment.



means for receiving continuous information in a partial response AM-PSK format.

5,088,112

INTERFACE UNIT

Seppo Pyhälä, Helsinki, and Matti Reini, Espoo, both of Finland, assignors to Nokia Data Systems Oy, Mikonkatu 15 A, SF-00100 Helsinki, Finland

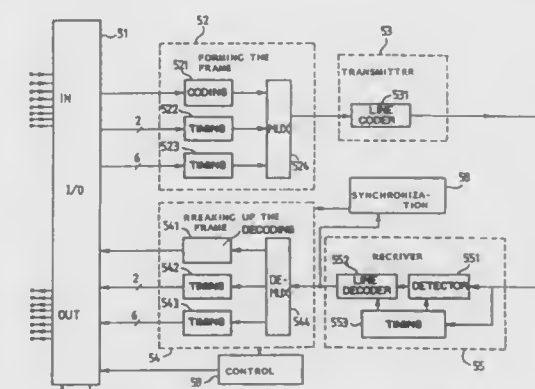
Filed Nov. 21, 1989, Ser. No. 435,446

Claims priority, application Finland, Jun. 30, 1988, 883131

Int. Cl.³ H04B 3/00; H04L 25/00

U.S. Cl. 375-36

9 Claims



1. An interface unit connectible in the alternative to both a parallel interface of data communication equipment and a

5,088,113

DIVERSITY CODED MODULATION

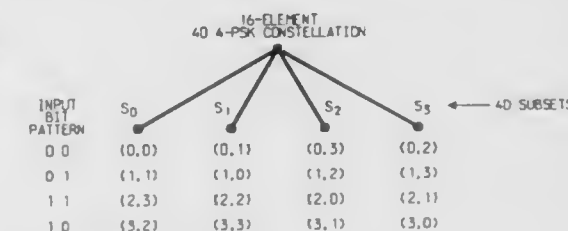
Lee-Fang Wei, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 2, 1990, Ser. No. 459,883

Int. Cl.³ H04L 1/02; H04B 7/02

U.S. Cl. 375-53

31 Claims



1. Apparatus comprising means for receiving sequences of input data, and means for encoding said sequences of input data into sequences of groups of R modulated signal points taken from a predetermined constellation, R being an integer greater than unity, said sequences of modulated signal points comprising a predetermined expanded modulated code having built-in X-fold diversity, where X is an integer greater than unity,

each of said groups being mapped from a respective base signal point of a respective sequence of modulated signal points of a predetermined modulated base code.

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DESIGN PATENTS

GRANTED Feb. 11, 1992

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PATENT NO.

D24-041 323,909

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DESIGNS

FEBRUARY 11, 1992

323,732
PASTAEdward J. Meyers, Jr., Roseile Park, N.J.; Deborah L. Bernar-
dini, Mahopac, N.Y.; Frank Ceglia, and Eileen Fogarty, both
of New York, N.Y., assignors to CPC International Inc.,
Englewood Cliffs, N.J.Filed Mar. 5, 1990, Ser. No. 488,789
Term of patent 14 years

U.S. Cl. D1—106



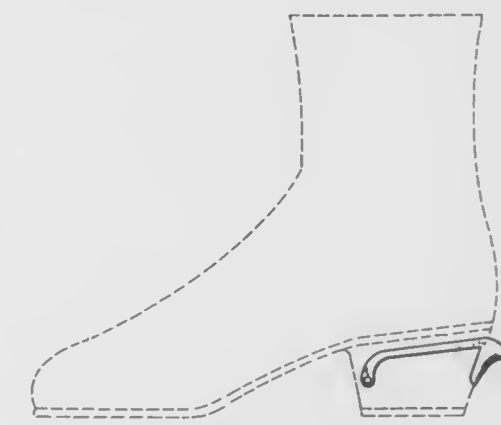
323,734

ATTACHABLE BOOT JACK

Guy J. Haines, 2801 Fountainhead Dr., San Ramon, Calif. 94583
Filed Aug. 15, 1989, Ser. No. 394,185

Term of patent 14 years

U.S. Cl. D2—314



323,735

SIDE ELEMENT FOR A CUP-SHAPED SHOE SOLE
Michael A. Aveni, Lake Oswego, Oreg., assignor to Nike, Inc.
and Nike International Ltd., both of Beaverton, Oreg.
Division of Ser. No. 373,778, Jun. 30, 1989, Pat. No. Des.
307,212. This application Nov. 21, 1989, Ser. No. 439,564

Term of patent 14 years

U.S. Cl. D2—314



323,733

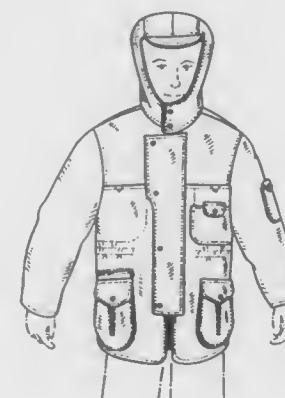
COMBINED JACKET AND SEPARABLE HOOD

Elliot Shalom, and Richard Kastleman, both of New York, N.Y.,
assignors to Elliot Kastle, Inc., New York, N.Y.

Filed Nov. 20, 1989, Ser. No. 438,216

Term of patent 14 years

U.S. Cl. D2—185



323,736

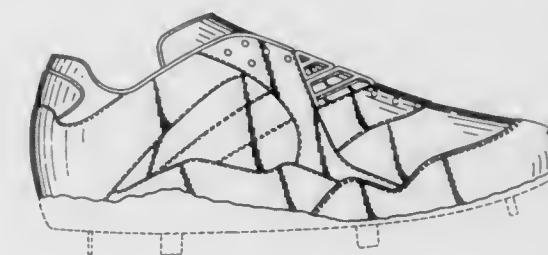
SHOE UPPER

William J. Worthington, Portland, Oreg., assignor to Nike, Inc.
and Nike International Ltd., both of Beaverton, Oreg.

Filed Dec. 26, 1990, Ser. No. 634,502

Term of patent 14 years

U.S. Cl. D2—314

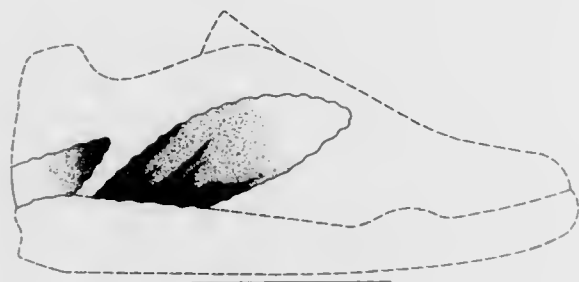


323,737

GRAPHIC PATTERN FOR A POSITION OF A SHOE UPPER

Wilson W. Smith, Beaverton, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Feb. 21, 1991, Ser. No. 658,570
Term of patent 14 years

U.S. Cl. D2—314



323,740

SHOE SOLE

Shigeyuki Mitsui, Kobe, Japan, assignor to ASICS Corporation, Hyogo, Japan

Filed Jun. 22, 1990, Ser. No. 542,393
Claims priority, application Japan, Dec. 28, 1989, 1-48341
Term of patent 14 years

U.S. Cl. D2—320

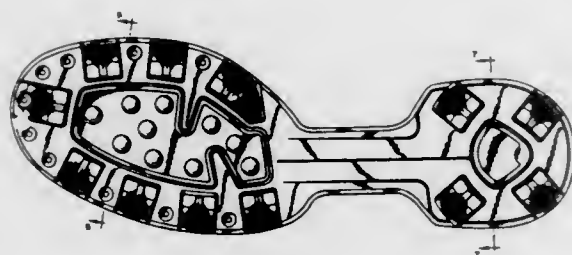


323,738

SHOE SOLE PLATE BOTTOM

Lawrence P. Eisenbach, Beaverton, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Feb. 21, 1990, Ser. No. 483,430
Term of patent 14 years

U.S. Cl. D2—317

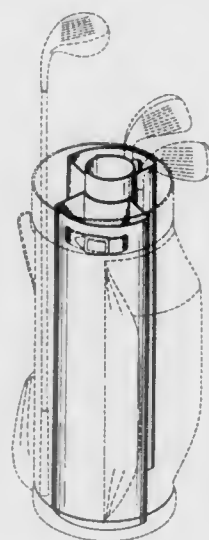


323,741

GOLF CLUB HOLDER INSERT FOR A GOLF BAG

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Apr. 12, 1990, Ser. No. 507,905
Term of patent 14 years

U.S. Cl. D3—37



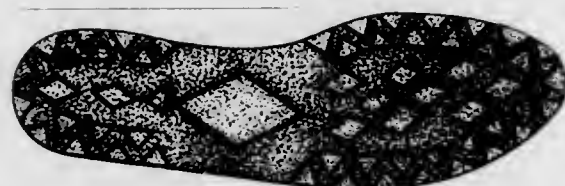
323,739

LUG SHOE SOLE

Emilio Kaiser, Florence, Italy, assignor to What's What, Inc., Edison, N.J.

Filed Apr. 25, 1990, Ser. No. 514,355
Term of patent 14 years

U.S. Cl. D2—320



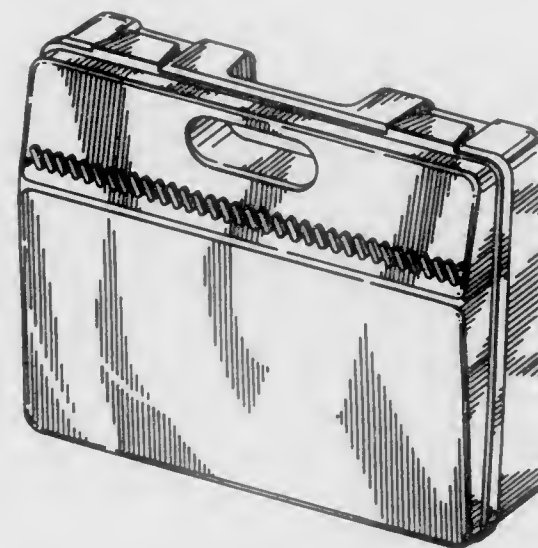
323,742

ATTACHE CASE

John D. Breen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jan. 19, 1990, Ser. No. 467,240
Term of patent 14 years

U.S. Cl. D3—73



323,744

CLIP-ON PURSE

Linda Casale, New York, N.Y. 10003
Filed Jul. 9, 1990, Ser. No. 549,721
Term of patent 14 years

U.S. Cl. D3—106



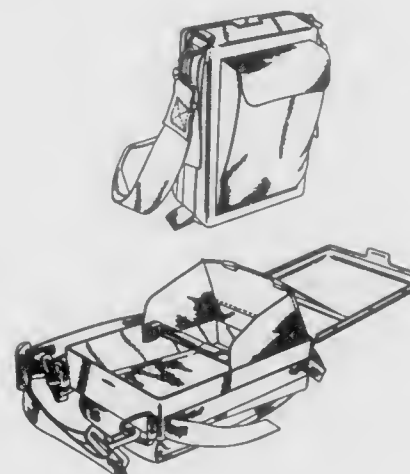
323,743

COMPUTER CARRYING CASE

Vincent DiSessa, Walled Lake, Mich., and Matthew D. Marhefska, Southampton, Pa., assignors to Unisys Corporation, Detroit, Mich.

Filed Mar. 6, 1989, Ser. No. 320,240
Term of patent 14 years

U.S. Cl. D3—74

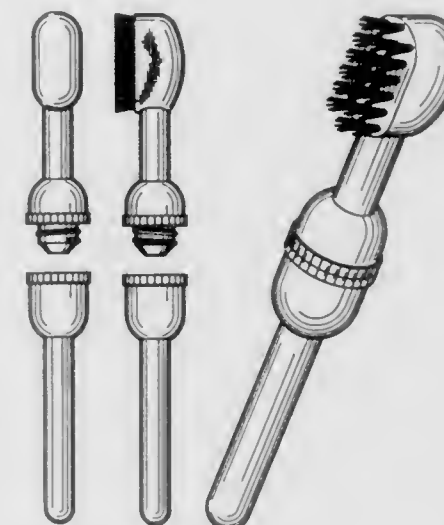


323,745

TOOTHBRUSH WITH REPLACEABLE HEAD

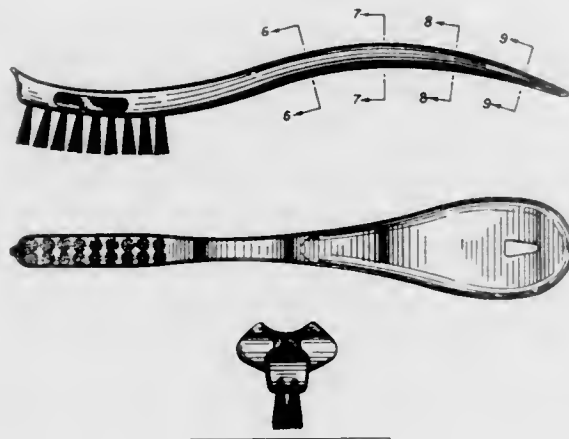
Sean L. Stuart, 1070 Park Pl., Brooklyn, N.Y. 11213
Filed Aug. 16, 1989, Ser. No. 394,511
Term of patent 14 years

U.S. Cl. D4—104

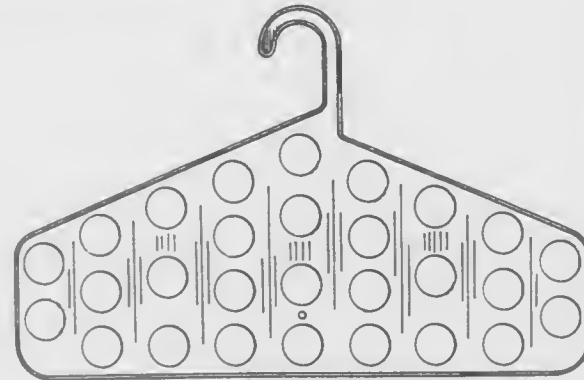


323,746
COMBINED CLEANING BRUSH, PICK, AND
SHOEHORN

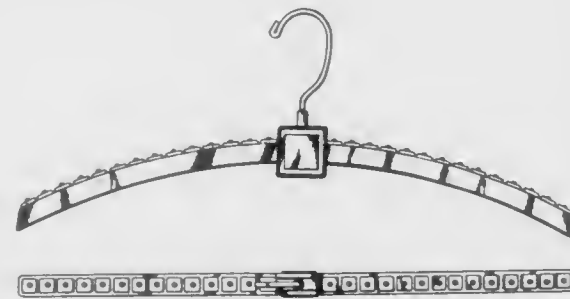
Charles T. Mehan, 1949 N. 11th St., Sheboygan, Wis. 53081
Filed Oct. 2, 1989, Ser. No. 415,541
Term of patent 14 years
U.S. Cl. D4—116



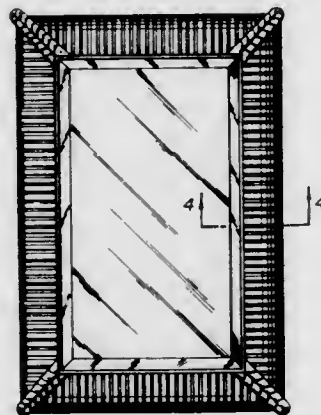
323,748
SCARF HANGER
Ann M. LaCroix, 14 Elm Hill Dr., Rye Brook, N.Y. 10573, and
Louise L. Sylvester, 30 Ridge Rd., Newtown, Conn. 06470
Filed Apr. 16, 1990, Ser. No. 510,393
Term of patent 14 years
U.S. Cl. D6—315



323,749
HANGER FOR GARMENT TOPS OR THE LIKE
Russell O. Blanchard, Zeeland, Mich., and Michael J. Mankowski, Portland, Oreg., assignors to Batts, Inc., Zeeland, Mich.
Filed Oct. 9, 1990, Ser. No. 594,201
Term of patent 14 years
U.S. Cl. D6—318



323,747
MIRROR
Sally S. Lewis, 8950 St. Ives Dr., Los Angeles, Calif. 90069
Filed Dec. 26, 1989, Ser. No. 456,296
Term of patent 14 years
U.S. Cl. D6—300



323,750
CHAIR
Giancarlo Piretti, Piazza Trento e Trieste 2/2, Bologna, Italy
Filed Oct. 24, 1988, Ser. No. 261,823
Term of patent 14 years
U.S. Cl. D6—373



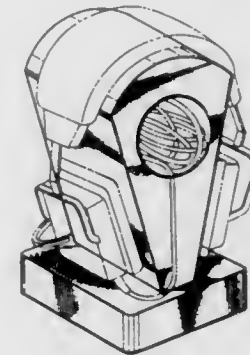
323,751
GROUND INSERTED SUPPORT FOR A DOWNPIPE
Arvi Hinrikus, 364 Carson Drive, Kitchener Ontario N2B 2W2, Canada
Filed Jul. 21, 1987, Ser. No. 50,373
Term of patent 14 years
U.S. Cl. D6—417



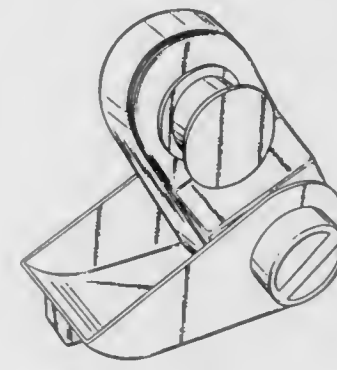
323,752
COMBINED CLIPBOARD AND ADJUSTABLE SUPPORT
THEREFOR
Nick Montagner, 5719 Young Rd., Hudson, Ohio 44236
Filed Dec. 18, 1989, Ser. No. 451,537
Term of patent 14 years
U.S. Cl. D6—420



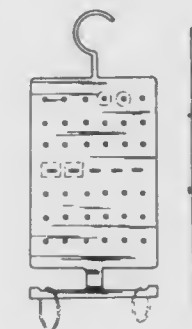
323,753
HEADPHONE SUPPORT STAND
Elmer M. Johnston, 148 Dufferin Street, Trenon, Ontario K8V 5E3, Canada
Filed Jun. 12, 1989, Ser. No. 364,393
Claims priority, application Canada, Dec. 23, 1988, 23-12-88-12
Term of patent 14 years
U.S. Cl. D6—466



323,754
POWER ACTUATOR FOR AN INFANT ROCKER
Sidney Tepper, Milburn, N.J., and Mark A. Sedlack, Macedonia, Ohio, assignors to Century Products Company, Macedonia, Ohio
Filed Nov. 9, 1988, Ser. No. 269,935
Term of patent 14 years
U.S. Cl. D6—491



323,755
JEWELRY ORGANIZER
Kathleen D. Harney, 10 Summit Ave., Wakefield, Mass. 01880
Filed Jun. 26, 1990, Ser. No. 544,262
Term of patent 14 years
U.S. Cl. D6—513



323,756

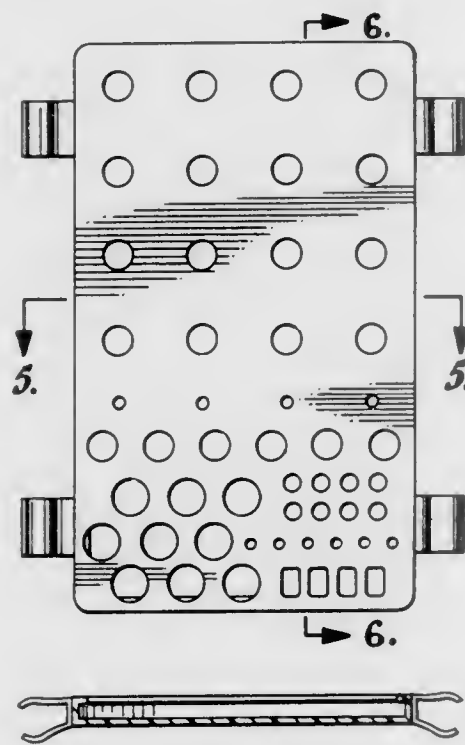
BULB AND BATTERY STORAGE PANEL

John A. Simpson, 2530 S. Marlan, Springfield, Mo. 65805

Filed Aug. 25, 1989, Ser. No. 398,511

Term of patent 14 years

U.S. Cl. D6—571



323,758

VACUUM BOTTLE

Siegfried Hoelterscheidt, Hückelhoven, Fed. Rep. of Germany,

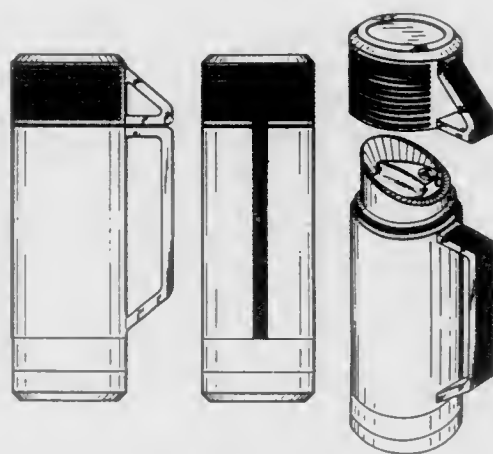
assignor to Walter Henkels GmbH, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 348,445

Claims priority, application World Int. Prop. O., Jan. 9, 1989, DM/012567

Term of patent 14 years

U.S. Cl. D7—317



323,759

ELECTRIC TOASTER

Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to

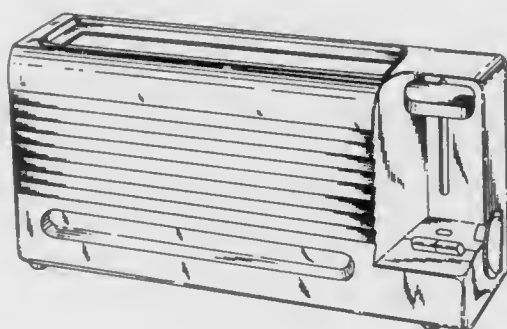
Moulinex (Societe Anonyme), Bagnolet, France

Filed Aug. 24, 1989, Ser. No. 397,920

Claims priority, application France, Feb. 24, 1989, 89 1342

Term of patent 14 years

U.S. Cl. D7—330



323,760

BARBECUE STOVE

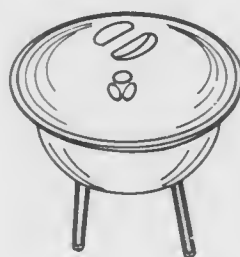
Kuei-Feng Chen, Hsinchu, Taiwan, assignor to Wu Feng Metal

Industrial Co., Ltd., Hsinchu, Taiwan

Filed Jul. 28, 1989, Ser. No. 386,137

Term of patent 14 years

U.S. Cl. D7—332



323,757

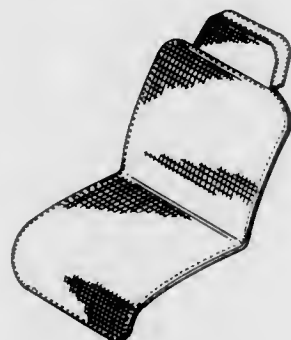
CAR SEAT PROTECTIVE COVER

Keith M. Beauchan, P.O. Box 1004, Kailua, Hi. 96734

Filed Aug. 7, 1989, Ser. No. 390,681

Term of patent 14 years

U.S. Cl. D6—611



323,761

MICROWAVE OVEN

Masayoshi Kubo, Nara; Masuo Ichihara, Kyoto; Kensuke

Mizuma, and Hisayoshi Matoba, both of Nara, all of Japan,

assignors to Matsushita Electric Industrial Co., Ltd., Osaka,

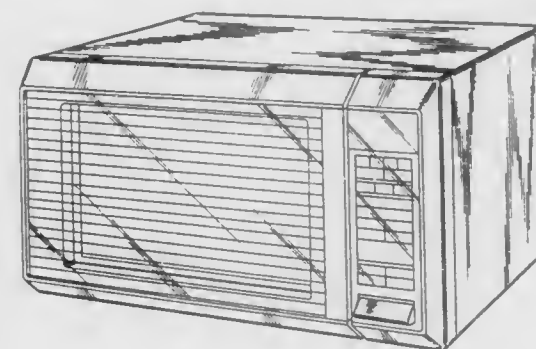
Japan

Filed Mar. 10, 1989, Ser. No. 321,744

Claims priority, application Japan, Oct. 14, 1988, 63-40427

Term of patent 14 years

U.S. Cl. D7—351



323,763

FOOD PROCESSOR

Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to

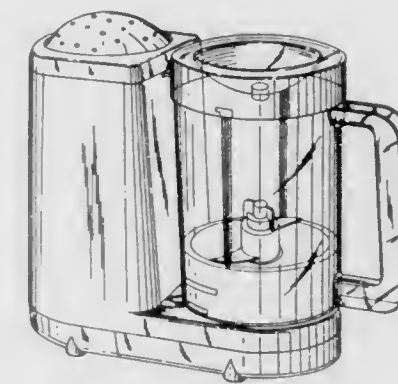
Moulinex (Societe Anonyme), Bagnolet, France

Filed Nov. 21, 1989, Ser. No. 439,470

Claims priority, application France, May 25, 1989, 89 3427

Term of patent 14 years

U.S. Cl. D7—384



323,764

HANDLE FOR A COOKING POT LID

Philippe Sautour, Paris, France, assignor to Terraillon, An-

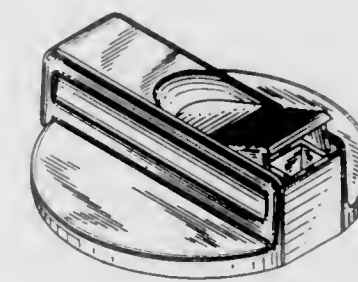
nemasse, France

Filed Dec. 30, 1988, Ser. No. 292,511

Claims priority, application France, Jul. 12, 1988, 884616

Term of patent 14 years

U.S. Cl. D7—393



323,765

SERVING PLATTER

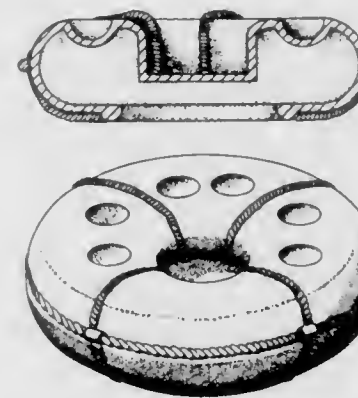
Victoria A. Corthum, 4503 Indian Wells Dr., Greensboro, N.C.

27406

Filed Mar. 6, 1989, Ser. No. 318,950

Term of patent 14 years

U.S. Cl. D7—556



323,762

ELECTRIC DEEP FAT FRYER

Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to

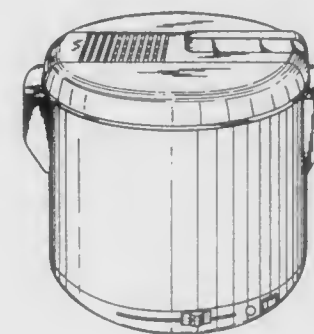
Moulinex (Societe Anonyme), Bagnolet, France

Filed Nov. 30, 1989, Ser. No. 443,383

Claims priority, application France, Jun. 15, 1989, 89 3947

Term of patent 14 years

U.S. Cl. D7—354



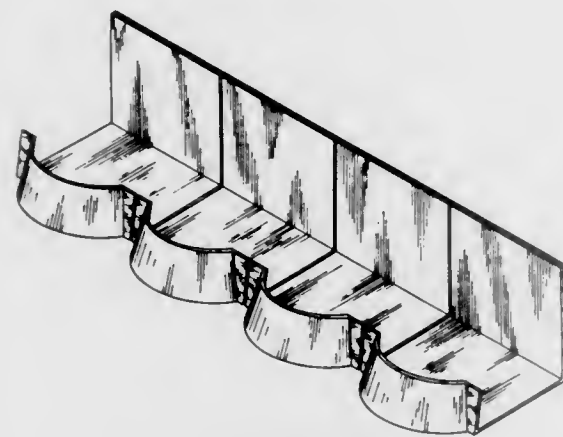
323,766

RACK FOR SPICE JARS

E. Stanley Robbins, P.O. Box 174, Killen, Ala. 35645, and
Rodney W. Robbins, 207 Cherokee Rd., Nashville, Tenn.
37205

Filed Feb. 16, 1989, Ser. No. 311,208
Term of patent 14 years

U.S. Cl. D7—590



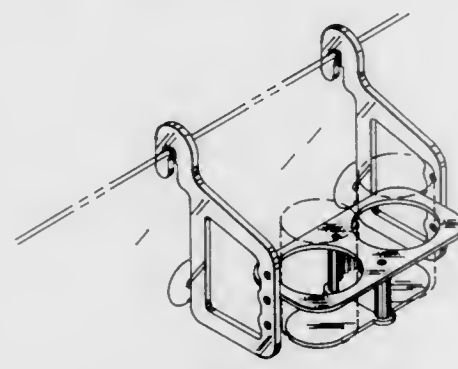
323,767

BEVERAGE HOLDER OR THE LIKE

Thomas J. Polski, 12526 Bronco Dr., Tampa, Fla. 33625
Filed Feb. 9, 1990, Ser. No. 477,657

Term of patent 14 years

U.S. Cl. D7—620



323,768

LADLE

Gary L. Friederichs, Cedarburg, Wis., assignor to The Vollrath
Company, Inc., Sheboygan, Wis.

Filed Jan. 25, 1989, Ser. No. 302,312
Term of patent 14 years

U.S. Cl. D7—691



323,769

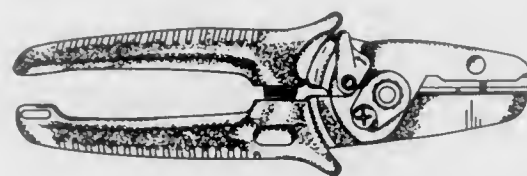
PRUNING SHEARS

Kimikazu Ishida, and Tsuneo Ishida, both of Miki, Japan, as-
signors to Saboten Co., Ltd., Hyogo, Japan

Filed Dec. 4, 1989, Ser. No. 446,161

Claims priority, application Japan, Aug. 10, 1989, 1-29415
Term of patent 14 years

U.S. Cl. D8—5



323,770

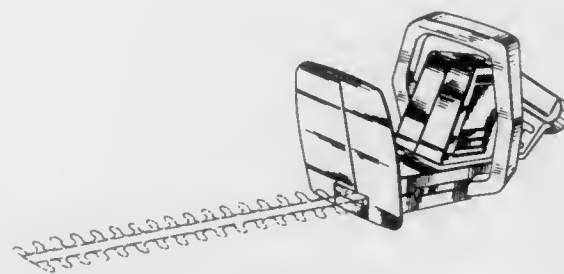
COMBINED ENGINE HOUSING AND HANDLE GRIP FOR A HEDGE TRIMMER

J. Douglas Alsup, and James B. Watson, both of Conyers, Ga.,
assignors to Ryobi Motor Products Corp., Pickens, S.C.

Filed Oct. 17, 1989, Ser. No. 422,440

Term of patent 14 years

U.S. Cl. D8—8



323,771

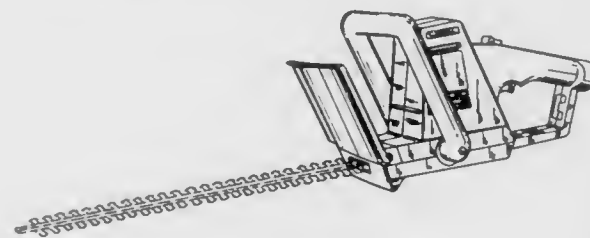
COMBINED ENGINE HOUSING AND HANDLE GRIP FOR A HEDGE TRIMMER

J. Douglas Alsup, and James B. Watson, both of Conyers, Ga.,
assignors to Ryobi Motor Products Corp., Pickens, S.C.

Filed Nov. 24, 1989, Ser. No. 440,736

Term of patent 14 years

U.S. Cl. D8—8



323,772

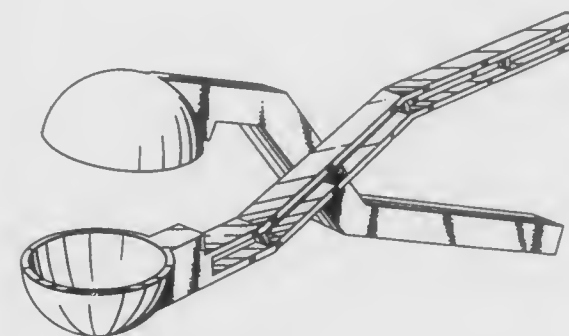
TOOL FOR MAKING SNOWBALLS

David O. Sage, Springfield, Mo., assignor to Sagebrush Indus-
tries, Inc., Springfield, Mo.

Division of Ser. No. 587,460, Sep. 6, 1990, which is a
continuation-in-part of Ser. No. 346,540, May 2, 1989,
abandoned, Continuation of Ser. No. 587,460, Sep. 6, 1990. This
application Nov. 6, 1990, Ser. No. 610,988

Term of patent 14 years

U.S. Cl. D8—51



323,773

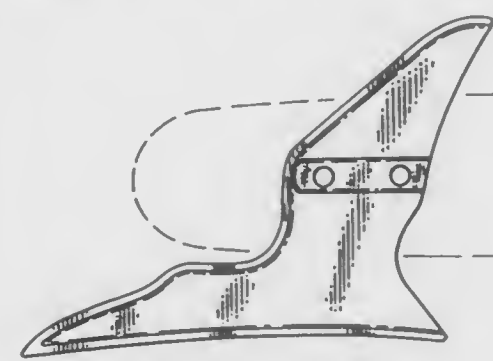
ATTACHMENT FOR A CHAIN SAW

Christopher M. Allen, Milwaukie, Oreg., assignor to Blount,
Inc., Portland, Oreg.

Filed Apr. 29, 1988, Ser. No. 188,387

Term of patent 14 years

U.S. Cl. D8—70



323,774

FOLDING KNIFE

Denis Opinel, Chambery, France, assignor to Etablissements
Joseph Opinel & Cie., Cognin, France

Filed Nov. 16, 1989, Ser. No. 437,530

Claims priority, application France, Sep. 27, 1989, 89 6033
Term of patent 14 years

U.S. Cl. D8—99



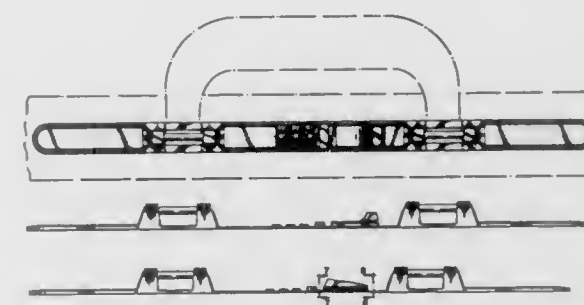
323,775

LUGGAGE HARDWARE AND LOCK CONSOLE

Charles S. Gehrie, West Orange, N.J., assignor to Presto Lock,
Inc., Garfield, N.J.

Continuation-in-part of Ser. No. 255,420, Oct. 11, 1988,
abandoned. This application Nov. 22, 1989, Ser. No. 441,343
Term of patent 14 years

U.S. Cl. D8—331



323,776

T-HANDLE LATCH PLATE

William Hansen, Waukegan, Ill., assignor to A. L. Hansen
Manufacturing Company, Waukegan, Ill.

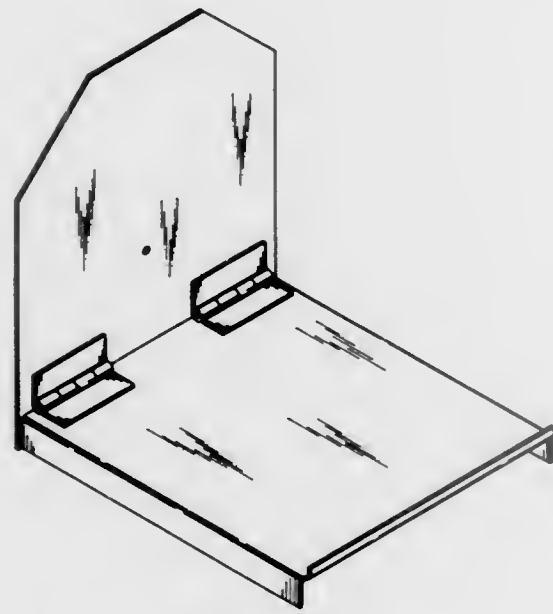
Filed Feb. 9, 1990, Ser. No. 477,664

Term of patent 14 years

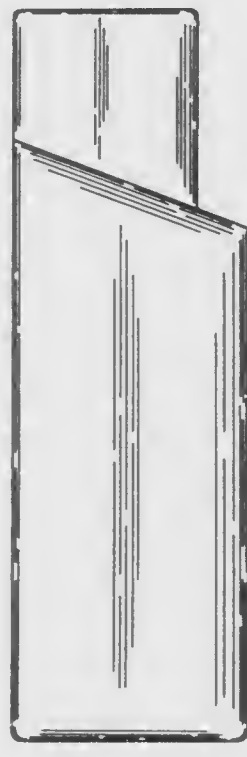
U.S. Cl. D8—338



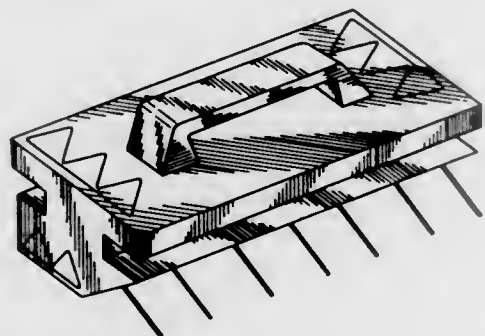
323,777
BRACKET TO SUPPORT ROOF SHAKES OR A SIMILAR ARTICLE
 Ulysses G. Knox, III, 4008 Wooster Dr., Oceanside, Calif. 92056
 Filed Aug. 20, 1990, Ser. No. 569,459
 Term of patent 14 years
 U.S. Cl. D8—380



323,779
COMBINED BOTTLE AND CAP
 Maria G. Flocco, Verona, Italy, assignor to Campagna per le Farmacie in Italia, S.p.A., Vicenza, Italy
 Filed Mar. 25, 1988, Ser. No. 174,319
 Term of patent 14 years
 U.S. Cl. D9—371



323,778
DOOR STOP
 Bernard J. Roman, 7241 Wembley Ter. W., Toledo, Ohio 43617
 Filed Jul. 12, 1990, Ser. No. 551,728
 Term of patent 14 years
 U.S. Cl. D8—402



323,780
COMBINED CONTAINER AND CAP
 James V. Addante, New York, N.Y., assignor to L'Oreal S.A., France
 Filed May 8, 1990, Ser. No. 521,163
 Term of patent 14 years
 U.S. Cl. D9—371



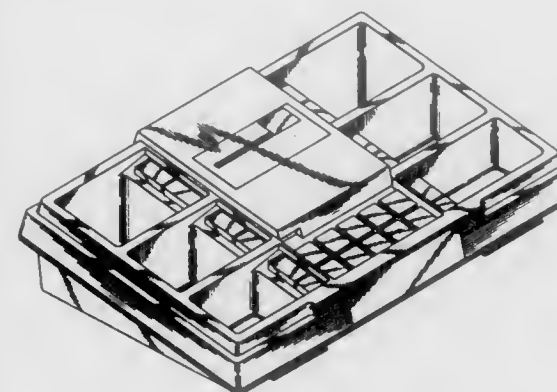
323,781
BOTTLE
 Robert B. Hamly, Kentwood, and Mark F. Mettler, Grand Rapids, both of Mich., assignors to Amway Corporation, Ada, Mich.
 Filed Feb. 17, 1989, Ser. No. 312,562
 Term of patent 14 years
 U.S. Cl. D9—372



323,783
WATCH
 Enrico Margaritelli, Monteciarugolo, Italy, assignor to Compagnia Nazionale S.p.A., Parma, Italy
 Filed May 24, 1989, Ser. No. 356,926
 Claims priority, application Italy, Jan. 19, 1989, 20454/89[U]
 Term of patent 14 years
 U.S. Cl. D10—32



323,782
MEDICATION CLOCK
 H. Keith McQuarrie, Kitchener, Canada, assignor to Namera Group Incorporated, Ontario, Canada
 Filed Sep. 20, 1989, Ser. No. 409,869
 Term of patent 14 years
 U.S. Cl. D10—2



323,784
WRIST WATCH
 Jean C. Gueit, Perly, Switzerland, assignor to Harry Winston Ultimate Timepiece S.A., Genève, Switzerland
 Filed Jul. 10, 1989, Ser. No. 378,393
 Term of patent 14 years
 U.S. Cl. D10—32



323,785

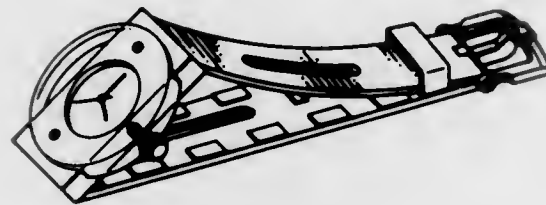
WRISTWATCH

Andrew C. S. Tse, Kwai Chung, Hong Kong, assignor to HBL Ltd., Tsuen Wan, Hong Kong
Filed Oct. 17, 1989, Ser. No. 422,436

Claims priority, application United Kingdom, Aug. 17, 1989, 2000442

Term of patent 14 years

U.S. Cl. D10—32



323,786

WRIST WATCH

Shingo Ishizaka, Hachioji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1989, Ser. No. 403,722

Term of patent 14 years

U.S. Cl. D10—38



323,787

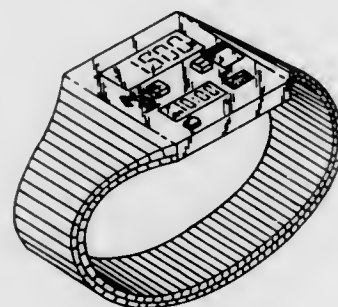
COMBINED WRISTWATCH AND CALORIE COUNTER

Myron L. Moorman, 225 S. McCann St., Kokomo, Ind. 46901

Filed Aug. 7, 1989, Ser. No. 390,356

Term of patent 14 years

U.S. Cl. D10—97



323,788

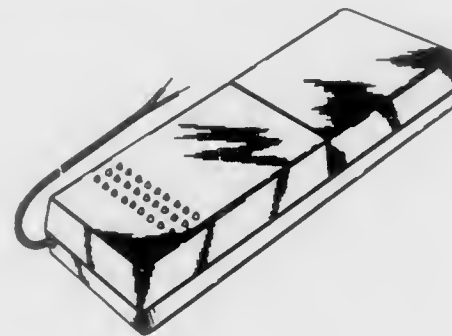
DOOR/WINDOW SIGNAL TRANSMITTER FOR ALARM SYSTEMS

Ken Roberts; Miles Conklin, both of Battle Creek; Doug Wolff, Marshall, all of Mich., and Mark T. Salander, Barrington, R.I., assignors to Amway Corporation, Ada, Mich.

Filed Sep. 15, 1989, Ser. No. 408,096

Term of patent 14 years

U.S. Cl. D10—106



323,789

REFLECTOR

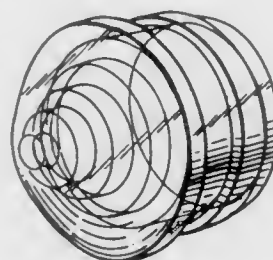
Henri Cohen, Lipperkerstraat 375, 7533 AD Enschede; Gertjan R. Willemsen, Pinksterbloemstraat 9, 7531 XW Enschede, and Remco S. Schoppen, Lipperkerstraat 373, 7533 AD Enschede, all of Netherlands

Filed Oct. 24, 1989, Ser. No. 426,064

Claims priority, application Hague, Apr. 26, 1989, DM/013 454

Term of patent 14 years

U.S. Cl. D10—111



323,790

NECKLACE

Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy

Filed Nov. 13, 1989, Ser. No. 436,019

Claims priority, application Hague, May 23, 1989, DM013.637

Term of patent 14 years

U.S. Cl. D11—6



323,791

JEWELRY CHAIN

Giuseppe Disegna, Romano D'Ezzelino, Italy, assignor to David Chabbott, Inc., New York, N.Y.

Division of Ser. No. 149,073, Jan. 26, 1988, Pat. No. D. 306,145.

This application Jan. 27, 1989, Ser. No. 303,558

Claims priority, application Italy, Nov. 20, 1987, 64353/87[U]
The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—14



323,792

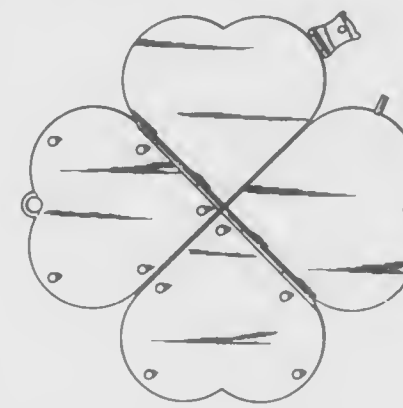
CONVERTIBLE PENDANT

Sylvie V. Scotti, 706 N. Beverly Dr., Beverly Hills, Calif. 90210

Filed Sep. 6, 1989, Ser. No. 403,468

Term of patent 14 years

U.S. Cl. D11—84



323,793

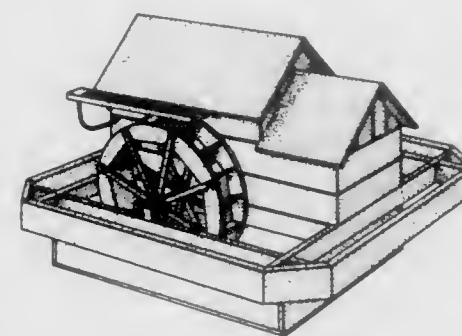
FLORAL PLANTER

Dale D. Buth, 1310 16 1/2 St., South, Fargo, N. Dak. 58103

Filed Jul. 17, 1989, Ser. No. 391,322

Term of patent 14 years

U.S. Cl. D11—149



323,794

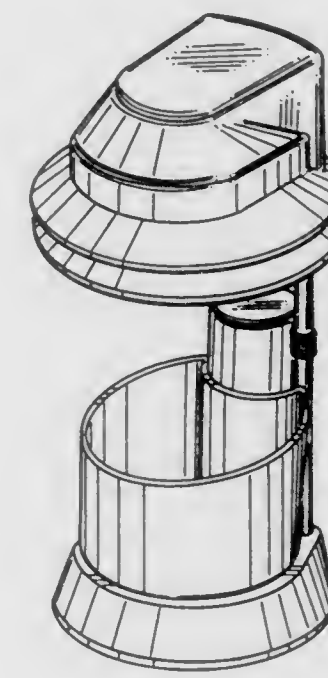
COMBINED PLANTER AND LAMP

Richard A. Wlancicki, 405 Tracey Ct., Westmont, Ill. 60559

Filed Sep. 25, 1989, Ser. No. 411,598

Term of patent 14 years

U.S. Cl. D11—144



323,795

FLOWER POT COVER

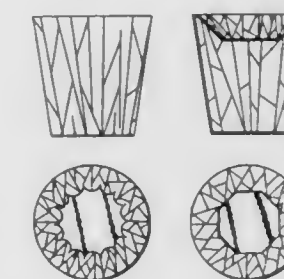
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 108,023, Oct. 13, 1987, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. 293,224. This application Mar. 9, 1989, Ser. No. 321,462

The portion of the term of this patent subsequent to Mar. 12, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—152



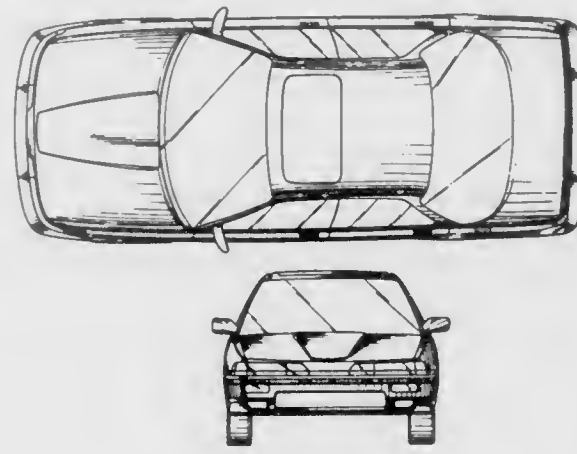
323,796
TROPHY

Luca Spensieri, 24 Eton Rd., Bronxville, N.Y. 10708
Filed Jun. 11, 1990, Ser. No. 535,878
Term of patent 14 years
U.S. Cl. D11—160



323,798
AUTOMOBILE

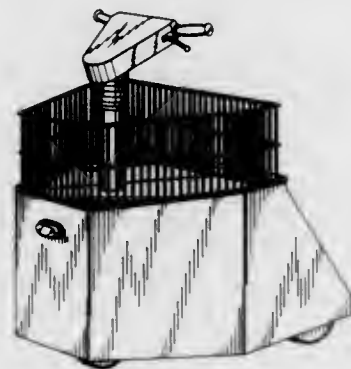
Yoshihisa Shimazu, Tokyo; Toshihiko Shimizu, and Motoaki Minowa, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 24, 1989, Ser. No. 385,262
Term of patent 14 years
U.S. Cl. D12—92



323,797

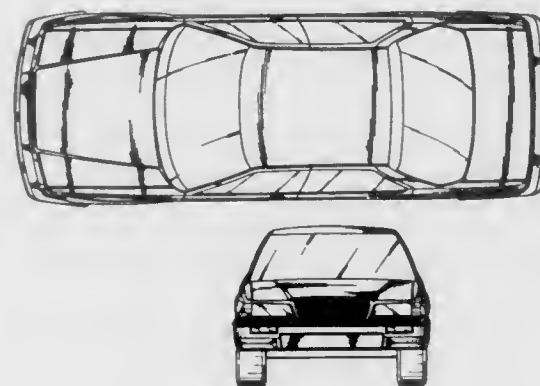
ELECTRIC RUNABOUT VEHICLE

Arunas P. Oslapas, Park Township, Ottawa County, and Wesley G. Koops, Fillmore Township, Allegan County, both of Mich., assignors to JWI, Inc., Holland, Mich.
Filed Jan. 4, 1990, Ser. No. 460,740
Term of patent 14 years
U.S. Cl. D12—85



323,799
AUTOMOBILE

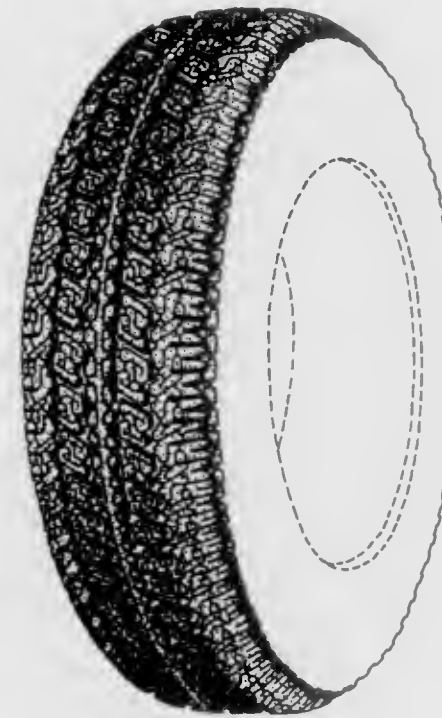
Tsuyoshi Nishimura, Saitama; Kunitoshi Murakami, and Kunihiro Tachibana, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 15, 1989, Ser. No. 394,422
Term of patent 14 years
U.S. Cl. D12—92



323,800

TIRE TREAD AND BUTTRESS

Robert L. Crump, Cumberland, Md., and Herbert H. Schad, Hyndman, Pa., assignors to Goodyear Tire & Rubber Company
Filed Feb. 22, 1990, Ser. No. 483,517
Term of patent 14 years
U.S. Cl. D12—146



323,802

MOTORCYCLE TIRE

Michael Jackson, Birmingham; David R. Watkins, Sutton Coldfield, and Gerald A. Griffiths, Tamworth, all of Great Britain, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Oct. 23, 1989, Ser. No. 425,320
Claims priority, application United Kingdom, Apr. 28, 1989, 1059122
Term of patent 14 years
U.S. Cl. D12—151



323,803

COMBINED VEHICLE BODY COVER AND SUPPORT HOUSING UNIT

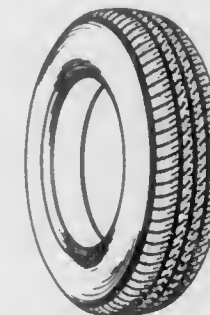
Isao Shimasaki, Kumamoto, Japan, assignor to Kabushiki Kaisha JCS, Kumamoto, Japan
Filed Nov. 7, 1989, Ser. No. 432,968
Claims priority, application Japan, May 12, 1989, 1-17376
Term of patent 14 years
U.S. Cl. D12—156



323,801

AUTOMOBILE TIRE

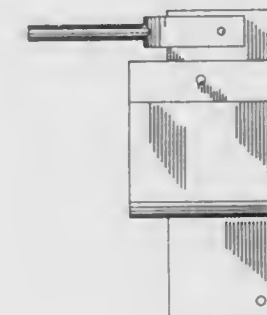
Hiroaki Kajita, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jan. 18, 1989, Ser. No. 298,506
Claims priority, application Japan, Jul. 19, 1988, 63-28790
Term of patent 14 years
U.S. Cl. D12—147



323,804

ANTI-JACKKNIFE UNIT FOR A TRAILER FIFTH WHEEL

Carol R. Randolph, 14787 Madison Rd., Three Forks, Mont. 59752
Filed Feb. 8, 1990, Ser. No. 476,657
Term of patent 14 years
U.S. Cl. D12—161



323,805

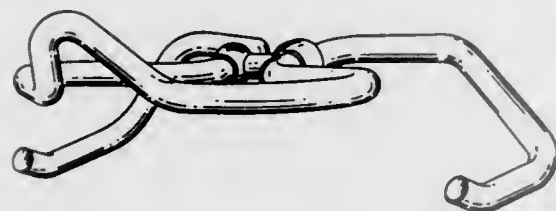
BICYCLE HANDLEBAR

Edward H. Giard, Jr., Oak Park, Ill., assignor to Profile for Speed, Inc., Chicago, Ill.

Filed Jun. 13, 1990, Ser. No. 537,742

Term of patent 14 years

U.S. Cl. D12—178



323,808

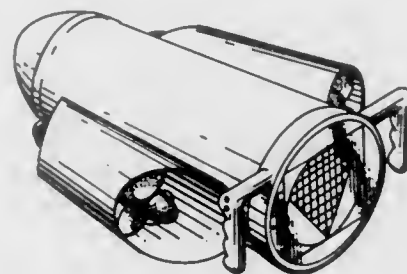
UNDERWATER VEHICLE

Albert DeSantis, 7929 NW. 3 Pl., Margate, Fla. 33063

Filed Aug. 31, 1990, Ser. No. 575,785

Term of patent 14 years

U.S. Cl. D12—308



323,809

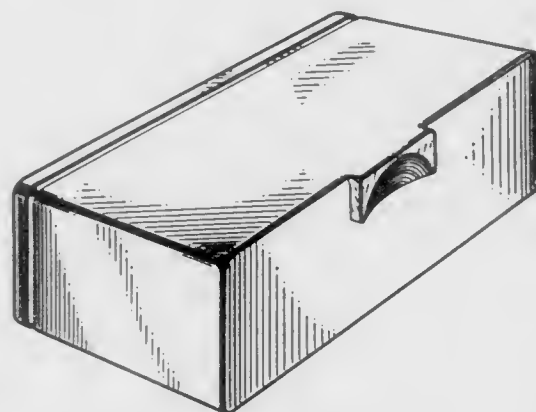
BATTERY HOUSING

Grant D. Ross, Jr., Morgan Hill, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 20, 1989, Ser. No. 326,206

Term of patent 14 years

U.S. Cl. D13—103



323,806

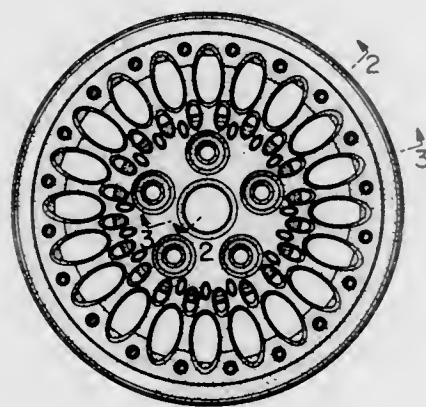
VEHICLE WHEEL SEGMENT

Charles H. Stewart, Clawson, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1990, Ser. No. 608,960

Term of patent 14 years

U.S. Cl. D12—209



323,807

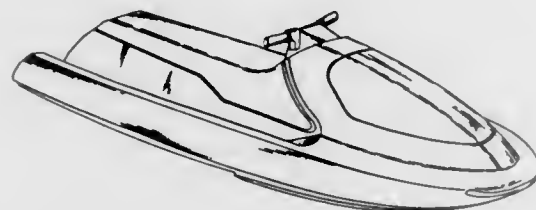
POWER BOAT

Ronald O. Jones, Sr., P.O. Box 657, Kent, Wash. 98035, and Wayne T. Yutani, 10414 60th Ave. S., Seattle, Wash. 98178

Filed Aug. 1, 1990, Ser. No. 561,519

Term of patent 14 years

U.S. Cl. D12—307



323,810

ELECTRICAL CONNECTOR HOUSING

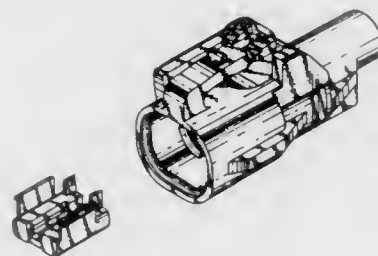
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,556

Claims priority, application Japan, Jul. 31, 1989, 1-28072

Term of patent 14 years

U.S. Cl. D13—133



323,811

ELECTRICAL CONNECTOR HOUSING

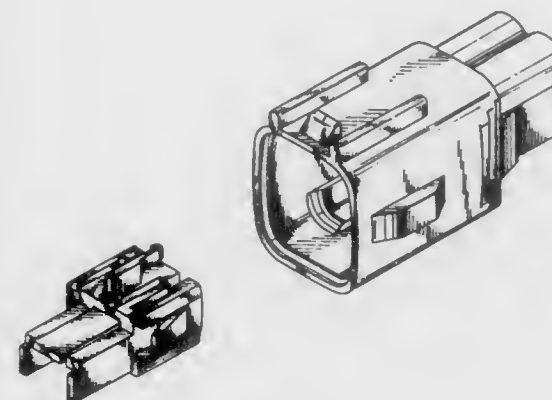
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,555

Claims priority, application Japan, Jul. 31, 1989, 1-28079

Term of patent 14 years

U.S. Cl. D13—146



323,813

TERMINAL BLOCK ASSEMBLY FOR A LEADLESS MOTOR

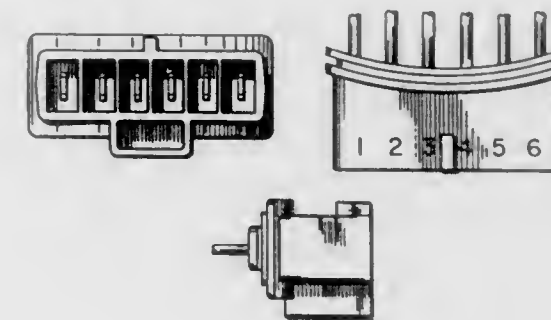
Arthur C. Keck, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 155,365, Feb. 12, 1988, Pat. No. 4,851,725, and a continuation-in-part of Ser. No. 155,625, Feb. 12, 1988, Pat. No. Des. 311,378. This application Sep. 28, 1988, Ser. No. 250,148

The portion of the term of this patent subsequent to Oct. 16, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D13—147



323,812

ELECTRICAL CONNECTOR HOUSING

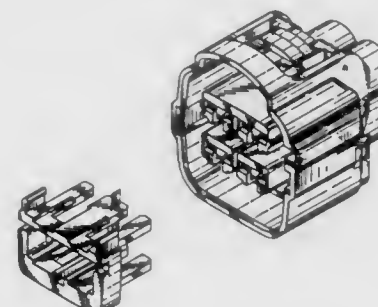
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,564

Claims priority, application Japan, Jul. 31, 1989, 1-28025

Term of patent 14 years

U.S. Cl. D13—146



323,814

HOUSING FOR ELECTRICAL CONNECTOR

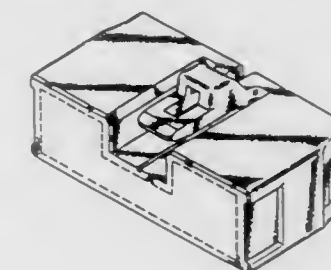
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Shigekazu Wakata; Shinichi Yamada, both of Yokkaichi, and Yoshihiro Tanaka, Mie, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Apr. 18, 1989, Ser. No. 339,630

Claims priority, application Japan, Oct. 20, 1988, 63-41172

Term of patent 14 years

U.S. Cl. D13—147



323,815

THERMAL RELAY HOUSING

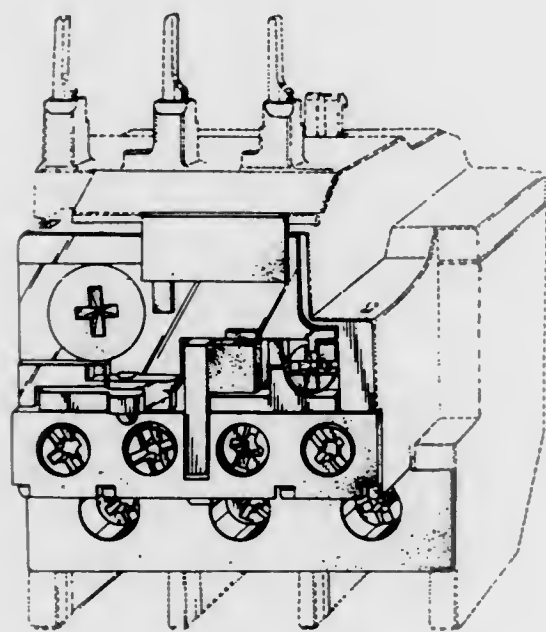
Christian Bouteiller, Rueil Malmaison, France, assignor to La Telemecanique Electrique, France

Filed Dec. 16, 1988, Ser. No. 285,886

Claims priority, application France, Jun. 16, 1988, 88 3928

Term of patent 14 years

U.S. Cl. D13—159



323,817

COMPUTER TERMINAL WITH ERGONOMIC ALPHANUMERIC KEYBOARD

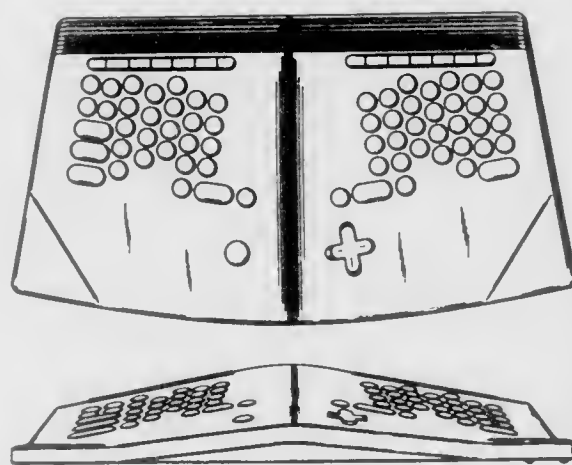
Karl Büchlin, Berlin, Fed. Rep. of Germany, assignor to Krone AG, Berlin, Fed. Rep. of Germany

Filed Jan. 12, 1990, Ser. No. 463,972

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1989, 8905008

Term of patent 14 years

U.S. Cl. D14—100



323,816

COMPUTER TERMINAL WITH ERGONOMIC NUMERICAL KEYBOARD

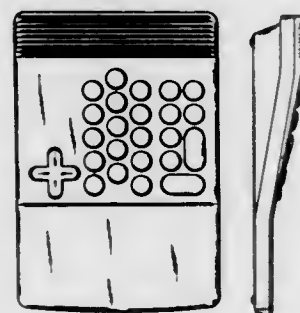
Karl Büchlin, Berlin, Fed. Rep. of Germany, assignor to Krone AG, Berlin, Fed. Rep. of Germany

Filed Jan. 12, 1990, Ser. No. 463,971

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1989, 8905009

Term of patent 14 years

U.S. Cl. D14—100



323,818

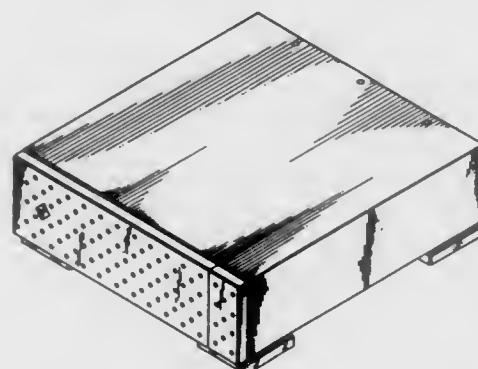
SECURE COMPUTER PERIPHERAL HOUSING

Clifford B. Willis, Tracy; Craig E. Erickson, Saratoga, and William K. Szaroletta, Cupertino, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 10, 1990, Ser. No. 595,485

Term of patent 14 years

U.S. Cl. D14—100



323,819

IMAGE SCANNER

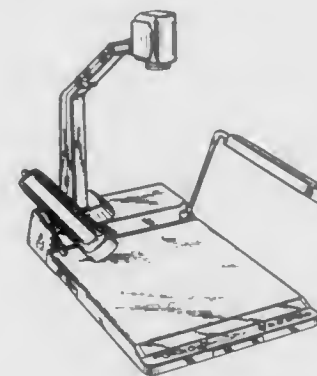
Masayuki Iimura, Akishima, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 410,966

Claims priority, application Japan, Mar. 25, 1989, 1-10758

Term of patent 14 years

U.S. Cl. D14—107



323,822

TELECONFERENCING TRANSMISSION TERMINAL

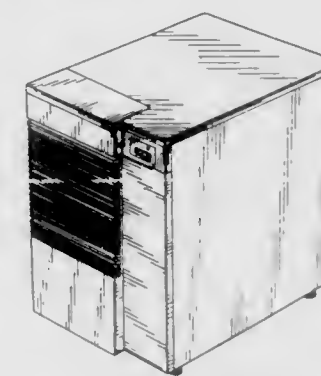
Noboru Fujihara, and Keigo Kawasaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 25, 1989, Ser. No. 343,120

Claims priority, application Japan, Oct. 28, 1988, 63-42529

Term of patent 14 years

U.S. Cl. D14—125



323,820

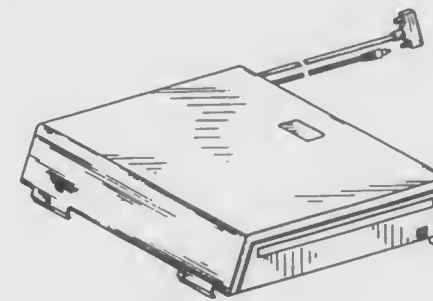
PORTABLE OPTICAL DISK STORAGE DEVICE

David M. Gauldfeldt, Sterling, Va., and Alan E. Dixon, Potomac, Md., assignors to Magnavox Electronic Systems Company, Fort Wayne, Ind.

Filed Dec. 7, 1989, Ser. No. 447,144

Term of patent 14 years

U.S. Cl. D14—109



323,823

TELEVISION CONVERTER

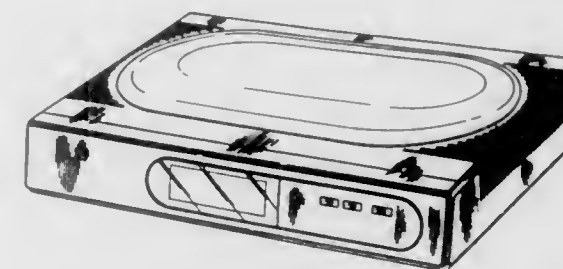
Hiroshi Yonekura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1989, Ser. No. 365,984

Claims priority, application Japan, Dec. 15, 1988, 63-48908

Term of patent 14 years

U.S. Cl. D14—125



323,821

FACSIMILE

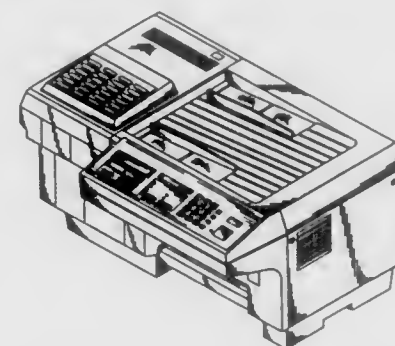
Shigetoshi Ishikawa, Itami; Tadakazu Ogiri, Takatsuki, and Hiroyuki Tanaka, Yamatokoriyama, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 4, 1990, Ser. No. 532,994

Claims priority, application Japan, Dec. 8, 1989, 1-44671

Term of patent 14 years

U.S. Cl. D14—118



323,824

TELEVISION RECEIVER

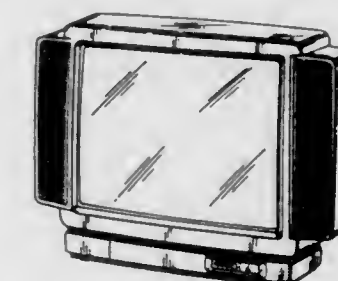
Masahiro Kawanabe, Tokyo, and Michihiro Nakahara, Koshigaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1990, Ser. No. 510,818

Claims priority, application Japan, Oct. 25, 1989, 1-38723

Term of patent 14 years

U.S. Cl. D14—126



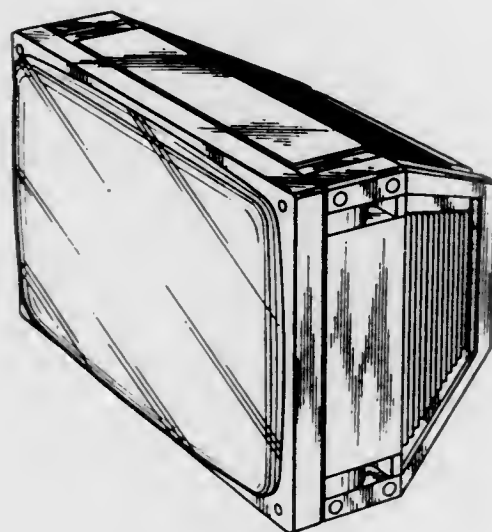
323,825

MONITOR TELEVISION RECEIVER

Hiroshi Yasuno; Toshihiro Iyama; Takaharu Kabetani; Mitsunari Fujii, and Toshikazu Asanuma, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1990, Ser. No. 636,966
Term of patent 14 years

U.S. Cl. D14—126



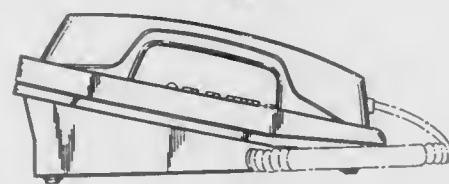
323,827

TELEPHONE SET

Shigeaki Kido, and Sadao Isozaki, both of Tokyo, Japan, assignors to Meisel Electric Co., Ltd., Tokyo, Japan
Division of Ser. No. 458,536, Dec. 28, 1989. This application
Dec. 19, 1990, Ser. No. 631,052

Claims priority, application Japan, Jul. 13, 1989, 1-25999; Jul. 13, 1989, 1-26000; Jul. 13, 1989, 1-26001; Jul. 13, 1989, 1-26002

Term of patent 14 years
U.S. Cl. D14—241



323,826

TRANSCEIVER

Hideo Suzuki, Ryugasaki, and Shinichi Ogasawara, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 1, 1989, Ser. No. 317,348

Claims priority, application Japan, Sep. 1, 1988, 63-34596
Term of patent 14 years

U.S. Cl. D14—137



323,828

SHOULDER REST FOR TELEPHONE HANDSET

Lyle J. Martinsen, 315 E. 6310 South, and Stewart L. Martinsen, 631 E. 6140 South, both of Murray, Utah 84107
Filed May 2, 1990, Ser. No. 517,905

Term of patent 14 years
U.S. Cl. D14—253



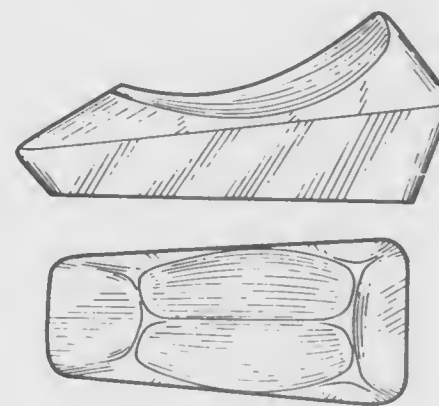
323,829

SHOULDER REST FOR TELEPHONE HANDSET

Lyle J. Martinsen, 315 E. 6310 South, and Stewart L. Martinsen, 631 E. 6140 South, both of Murray, Utah 84107
Filed Jun. 14, 1990, Ser. No. 538,946

Term of patent 14 years

U.S. Cl. D14—253



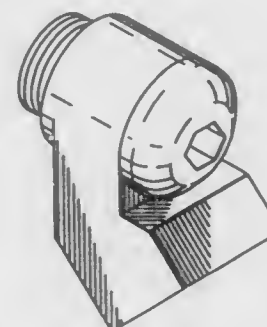
323,830

ADAPTOR FITTING FOR FUEL LINES

Paul D. Sergi, 2351 Ravenna Rd., Hudson, Ohio 44236
Filed Oct. 6, 1989, Ser. No. 417,864

Term of patent 14 years

U.S. Cl. D15—5



323,831

NUT HARVESTER

Paul S. Hollis, Rte. 6, Box 138, Ozark, Ala. 36360
Filed Sep. 18, 1990, Ser. No. 584,332

Term of patent 14 years

U.S. Cl. D15—10



323,832

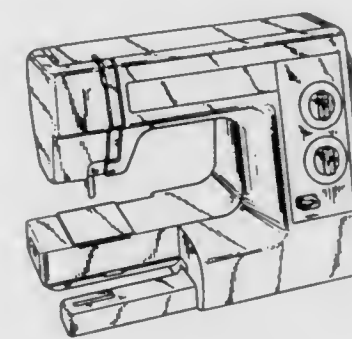
SEWING MACHINE

Yoshiaki Eguchi, and Masatomo Amemiya, both c/o Janome Sewing Machine Co., Ltd., No. 1-1, Kyobashi, 3-chome, Chuo-ku, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,540

Term of patent 14 years

U.S. Cl. D15—69



323,833

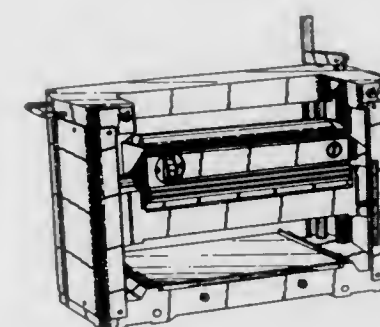
SURFACE PLANING MACHINE

Louis C. Brickner, Pittsburgh, Pa., assignor to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Apr. 3, 1989, Ser. No. 332,755

Term of patent 14 years

U.S. Cl. D15—127



323,834

PLANER

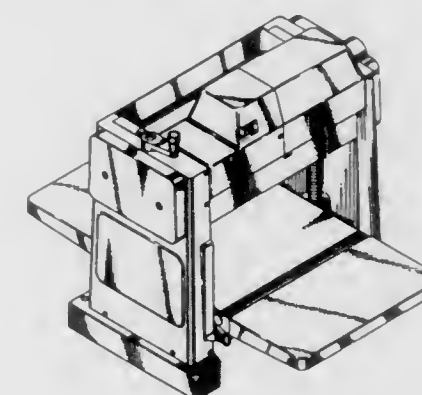
Fusao Fushiya; Katsuyasu Ito, and Kenichi Kawai, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Dec. 6, 1988, Ser. No. 280,516

Claims priority, application Japan, Jun. 9, 1988, 63-22834

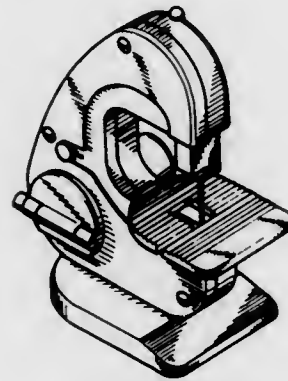
Term of patent 14 years

U.S. Cl. D15—133



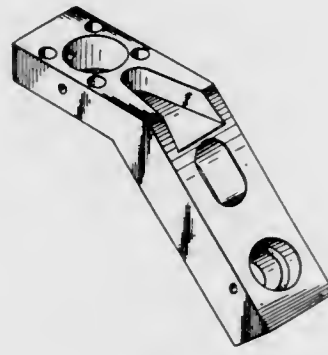
323,835
SCROLL SAWING MACHINE

Shyue J. Lwu, Taipei Hsien, Taiwan, assignor to Rexon Industrial Corp. Ltd., Taichung Hsien, Taiwan
Filed Jul. 19, 1989, Ser. No. 382,951
Term of patent 14 years
U.S. Cl. D15—133



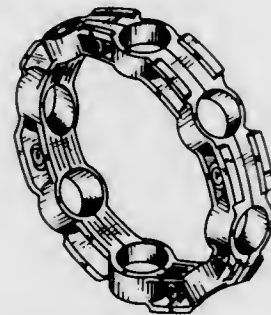
323,836
FIXED FOCAL POINT TOOL HOLDER

Richard F. Woolman, 1736 Shipley La., Huntington Beach, Calif. 92648, and Martin K. Taylor, 7958 Fifth St., Downey, Calif. 90241
Filed Oct. 20, 1989, Ser. No. 424,581
Term of patent 14 years
U.S. Cl. D15—140



323,837
BALL SEPARATOR FOR BEARING ASSEMBLY

James P. Johnson, Sugar Grove, Ill., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jun. 12, 1989, Ser. No. 364,987
Term of patent 14 years
U.S. Cl. D15—143



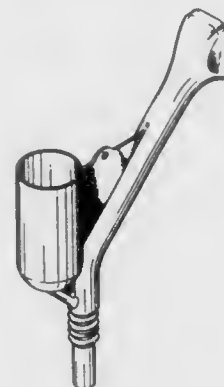
323,838
STRIKER ATTACHMENT FOR GAS CUTTING TORCHES

Matthew V. Rebstock, 1642 Nie Parkway, New Orleans, La. 70114
Filed Jul. 22, 1988, Ser. No. 223,770
Term of patent 14 years
U.S. Cl. D15—144



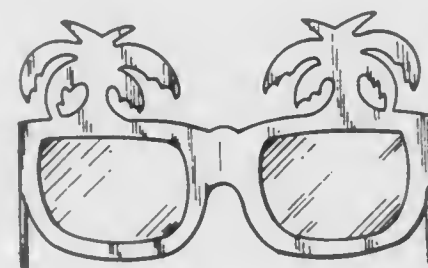
323,839
OIL AND GAS MIXING FUNNEL

Larry D. Cox, 7203 Lawrence Lake Rd., Fort Worth, Tex. 76135
Filed Nov. 13, 1989, Ser. No. 434,844
Term of patent 14 years
U.S. Cl. D15—150



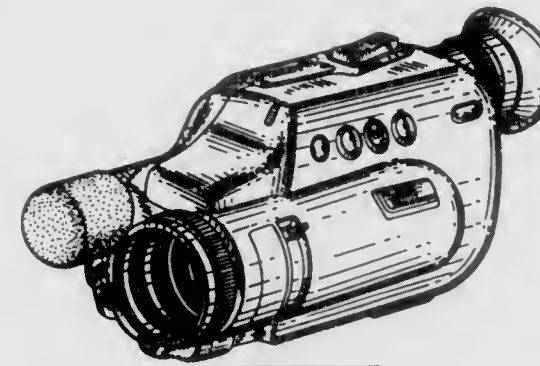
323,840
FANCIFUL SUNGLASSES

Craig T. Jones, Aurora, Colo.; David M. Vaughan, Denver, and Brett J. Sachett, Aurora, all of Colo., assignors to Day Shades U.S.A. Inc., Denver, Colo.
Filed Oct. 25, 1989, Ser. No. 427,306
Term of patent 14 years
U.S. Cl. D16—102



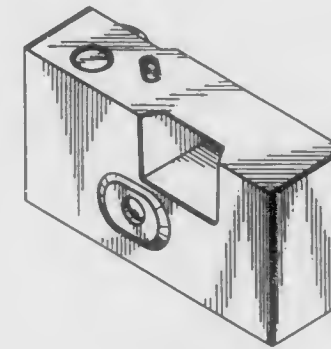
323,841
VIDEO CAMERA

Takeshi Iwama, Tokyo, and Kazuki Isono, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Feb. 7, 1990, Ser. No. 476,348
Claims priority, application Japan, Sep. 22, 1989, 1-34665
Term of patent 14 years
U.S. Cl. D16—202



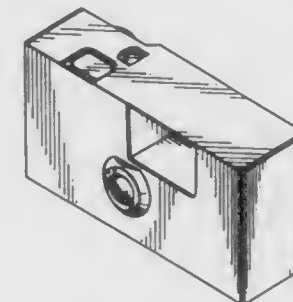
323,842
DISPOSABLE CAMERA

Takuya Arai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 31, 1989, Ser. No. 428,101
Claims priority, application Japan, May 19, 1989, 1-18271
Term of patent 14 years
U.S. Cl. D16—208



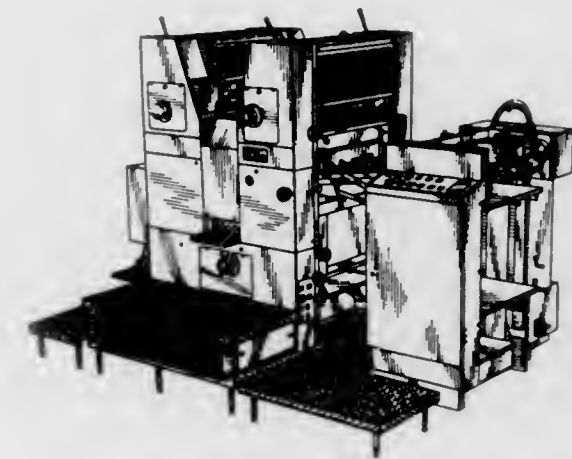
323,843
DISPOSABLE CAMERA

Takuya Arai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 31, 1989, Ser. No. 428,102
Claims priority, application Japan, Jul. 13, 1989, 1-25900
Term of patent 14 years
U.S. Cl. D16—208



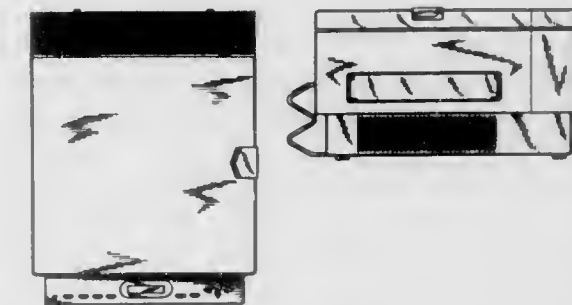
323,844
OFFSET PRINTING MACHINE

Yusaku Kitamura, and Tetsuyuki Doi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jan. 4, 1989, Ser. No. 293,382
Claims priority, application Japan, Jul. 4, 1988, 63-26835
Term of patent 14 years
U.S. Cl. D18—53



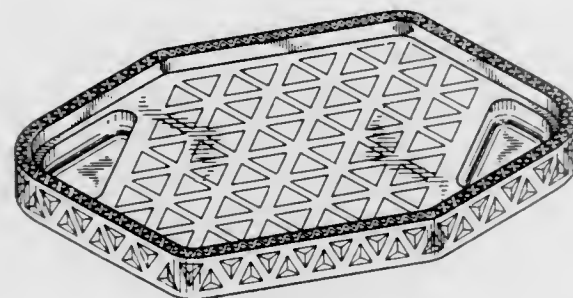
323,845
PRINTER FOR ELECTRONIC COMPUTER

Mitsuro Kawaguchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 19, 1989, Ser. No. 424,370
Claims priority, application Japan, Apr. 25, 1989, 1-15411
Term of patent 14 years
U.S. Cl. D18—55



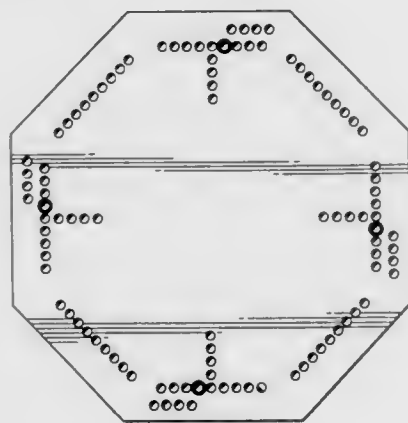
323,856
GAME BOARD

Yared Atnafu, 6060 Gulfon, Apt. 906, Houston, Tex. 77081
Filed Aug. 16, 1989, Ser. No. 394,516
Term of patent 14 years
U.S. Cl. D21—20



323,857
GAME BOARD

Dale Bocek, and Joanne Bocek, both of 65 Austin Drive,
Hamilton, Ontario, Canada L8V 3V5
Filed Nov. 13, 1989, Ser. No. 435,781
Term of patent 14 years
U.S. Cl. D21—20



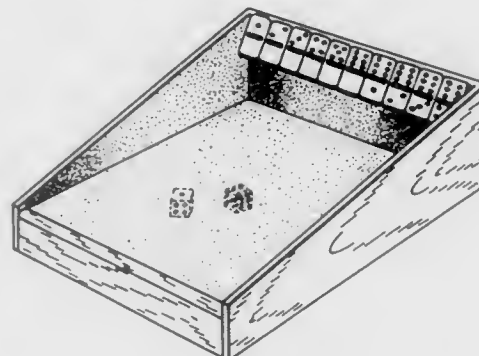
323,858
GAME BOARD

Richard C. Levy, P.O. Box 34828, Bethesda, Md. 20817; Scott
Robinson, 9709 Kingston Rd., Kensington, Md. 20395, and
Marcus Grodi, 117 Sunset Dr., NE., Newark, Ohio 43055
Filed Dec. 18, 1989, Ser. No. 451,551
Term of patent 14 years
U.S. Cl. D21—25



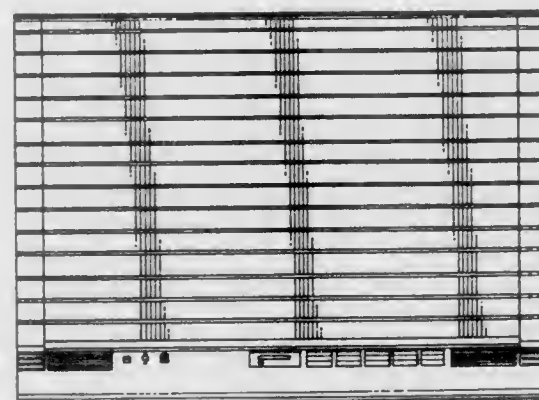
323,859
GAME APPARATUS

Dale A. Russell, 3049 Carlson Rd., Rossville, Kans. 66533
Filed Apr. 24, 1989, Ser. No. 341,891
Term of patent 14 years
U.S. Cl. D21—41



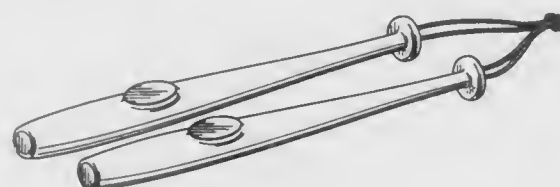
323,860
EDUCATIONAL GAME BOARD

Burton Cutler, 19560 S. Rancho Way, Dominguez Hills, Calif.
90220, and Stanley Culter, 15354 Oxnard St., Van Nuys,
Calif. 91411
Filed Sep. 18, 1989, Ser. No. 408,322
Term of patent 14 years
U.S. Cl. D21—59



323,861
NOISEMAKER

Gary N. Cooper, 254 Sugarberry Cir., Houston, Tex. 77024
Filed Jan. 25, 1990, Ser. No. 471,235
Term of patent 14 years
U.S. Cl. D21—64



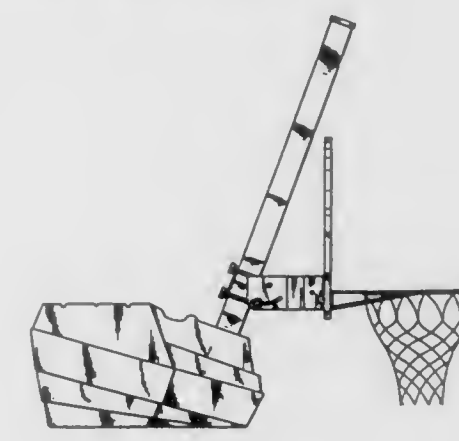
323,862
FAT LADY

Charles E. Joynes, 11 Cooks Hill La., Somerset, Bermuda
MAOS
Filed Mar. 29, 1990, Ser. No. 501,198
Term of patent 14 years
U.S. Cl. D21—171



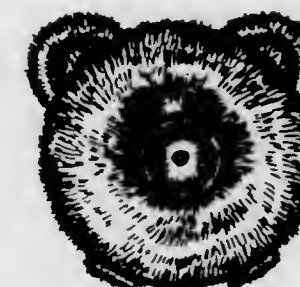
323,864
POOLSIDE BASKETBALL GOAL

Edward G. Dunn, Sr., and Edward C. Dunn, Jr., both of Indian-
apolis, Ind., assignors to Dunn-Rite Products, Inc., Elwood,
Ind.
Filed Sep. 26, 1989, Ser. No. 412,402
Term of patent 14 years
U.S. Cl. D21—201



323,865
TOY BALL

William A. Clarke, Erie, Pa., assignor to U.S. Design Co., North
East, Pa.
Filed Mar. 17, 1989, Ser. No. 324,642
Term of patent 14 years
U.S. Cl. D21—204



323,863
STATIONARY EXERCISE CYCLE

Scott R. Watterson, River Heights, Utah, assignor to Proform
Fitness Products, Inc., Logan, Utah
Continuation of Ser. No. 857,539, Apr. 17, 1986, abandoned.
This application Sep. 7, 1989, Ser. No. 405,060
Term of patent 14 years
U.S. Cl. D21—194



323,866
STRIKING FACE FOR AN IRON TYPE GOLF CLUB
HEAD

Donna M. Hamilton, 2725 Woodmont Dr., Xenia, Ohio 45385
Filed Dec. 4, 1989, Ser. No. 445,339
Term of patent 14 years
U.S. Cl. D21—215



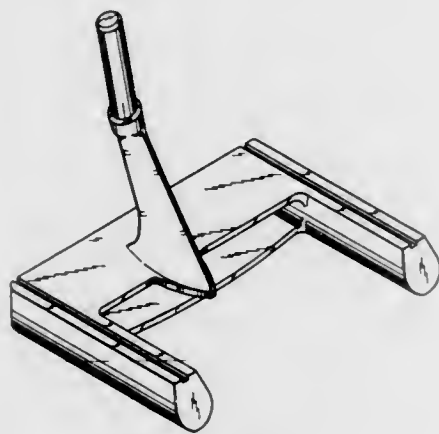
323,867

GOLF PUTTER HEAD

Bennie J. Rizzotto, 33501 Atlantic Ave., Laguna Niguel, Calif. 92677

Filed Aug. 21, 1989, Ser. No. 396,467
Term of patent 14 years

U.S. Cl. D21—219



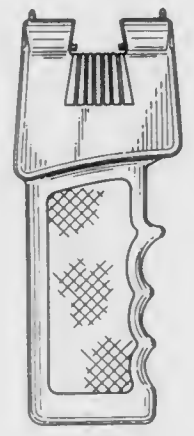
323,870

ELECTRONIC RESTRAINT WEAPON

Dennis R. Kaufman, 5508 Sutton La., Willoughby, Ohio 44094
Filed Jun. 16, 1989, Ser. No. 367,500

Term of patent 14 years

U.S. Cl. D22—117



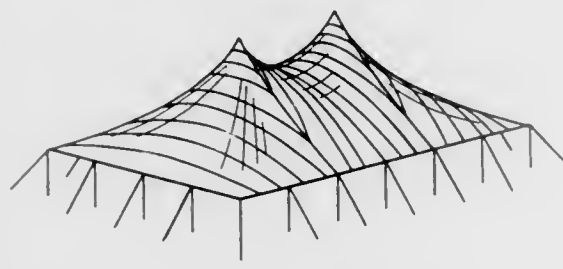
323,868

TENT

Todd Dalland, 110 Reed St., New York, N.Y. 10013
Continuation-in-part of Ser. No. 475,430, Feb. 5, 1990, which is a division of Ser. No. 30,912, Mar. 26, 1987, Pat. No. Des. 316,341. This application Apr. 17, 1990, Ser. No. 510,413

Term of patent 14 years

U.S. Cl. D21—253



323,869

TENT

Robert R. Cantwell, New Haven, Mo., assignor to American Recreation Products, Inc., St. Louis, Mo.

Filed Aug. 16, 1990, Ser. No. 568,334

Term of patent 14 years

U.S. Cl. D21—253



323,872

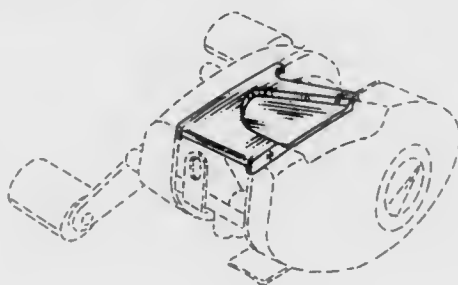
THUMB REST FOR BAITCAST REEL

Richard J. Robbins, Derby, Kans., and Steven W. Vogts, Broken Arrow, Okla., assignors to Zebco Corporation, Tulsa, Okla.

Filed Jan. 31, 1989, Ser. No. 364,335

Term of patent 14 years

U.S. Cl. D22—140



323,873

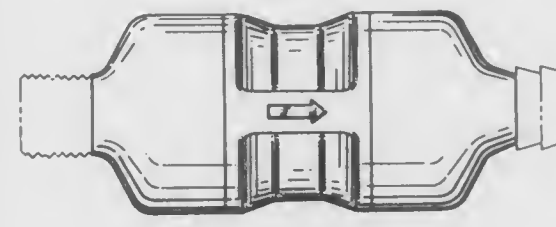
MICRO FILTER FOR WATER OR GAS

Manabu Yanou, Nagoya, and Akira Hoshide, Yokohama, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Filed Jan. 18, 1990, Ser. No. 466,738

Claims priority, application Japan, Jul. 28, 1989, 1-28005; Jul. 28, 1989, 1-28006; Jul. 28, 1989, 1-28007; Jul. 28, 1989, 1-28008; Jul. 28, 1989, 1-28009; Jul. 28, 1989, 1-280010

Term of patent 14 years

U.S. Cl. D23—209



323,874

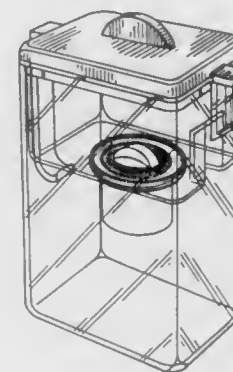
COUNTER-TOP WATER FILTER

Bernie R. Hirman, Elk River, and Bruce D. Saaski, Bloomington, both of Minn., assignors to Ecowater Systems, Inc., Woodbury, Minn.

Filed Mar. 28, 1990, Ser. No. 500,282

Term of patent 14 years

U.S. Cl. D23—209



323,875

WATER PURIFIER

Ik J. Kang, Mamaroneck, N.Y., and Yang K. Sik, Seoul, Rep. of Korea, assignors to Onetek Corp., Mamaroneck, N.Y.

Filed Jul. 2, 1990, Ser. No. 547,108

Term of patent 14 years

U.S. Cl. D23—209



323,876

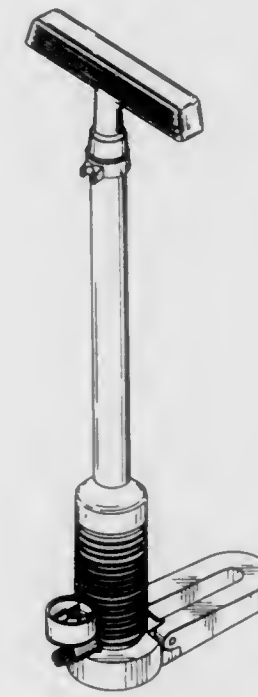
COMBINED PRESSURE GAUGE AND AIR PUMP

Masahiro Furusawa, 12-3, Ryouke 1-chome, Urawa-shi, Saitama-ken, Japan

Filed Feb. 12, 1990, Ser. No. 478,974

The portion of the term of this patent subsequent to Jul. 10, 2004, has been disclaimed.
Term of patent 14 years

U.S. Cl. D23—231



323,877

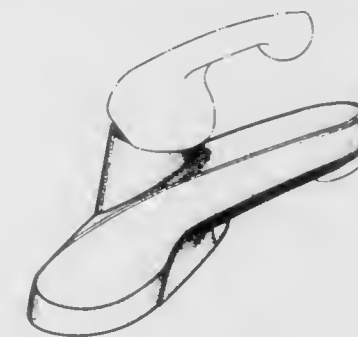
FAUCET BODY

Andreas Haug, Thomas W. Schönherr, both of Stuttgart, and José Delhaes, Altensteig, all of Fed. Rep. of Germany, assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Jan. 30, 1989, Ser. No. 304,306

Term of patent 14 years

U.S. Cl. D23—238

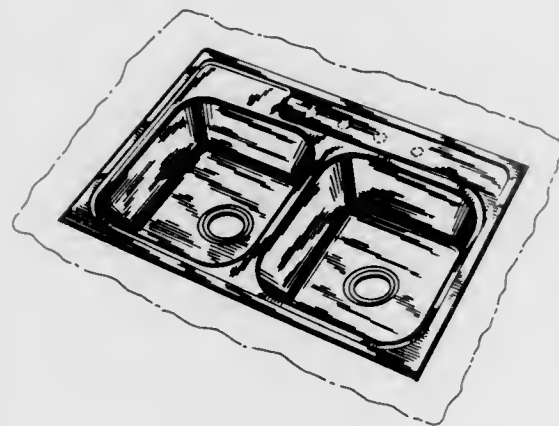


323,878
SINK

Bruce M. Sauter, Schaumburg, Ill., and Raymond A. Dickson, Jr., Searcy, Ark., assignors to Kohler Co., Kohler, Wis.
Filed Mar. 30, 1989, Ser. No. 331,578

The portion of the term of this patent subsequent to Feb. 11, 2006, has been disclaimed.
Term of patent 14 years

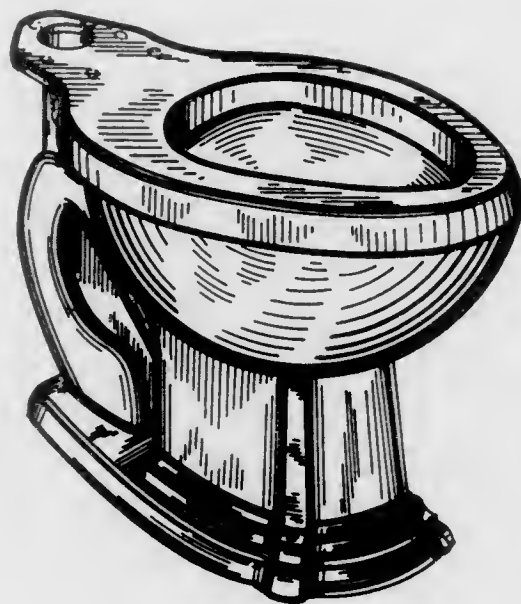
U.S. Cl. D23—290

323,880
WATER CLOSET

William C. McKeone, and Mark A. Zmuda, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1990, Ser. No. 466,570

Term of patent 14 years

U.S. Cl. D23—295

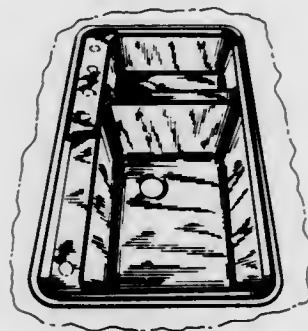
323,879
SINK

Bruce M. Sauter, Schaumburg, Ill., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 17, 1990, Ser. No. 466,571

The portion of the term of this patent subsequent to Feb. 11, 2006, has been disclaimed.
Term of patent 14 years

U.S. Cl. D23—290

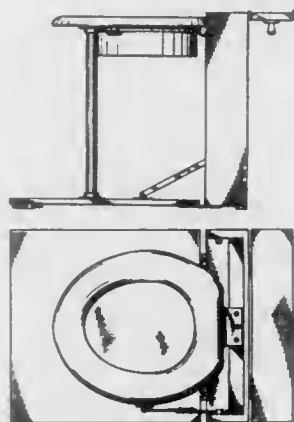
323,881
PORTABLE COMMODE

Joseph M. Franey, 7432 Landau Curve, Bloomington, Minn. 55438

Filed Oct. 31, 1989, Ser. No. 429,347

Term of patent 14 years

U.S. Cl. D23—299



323,882

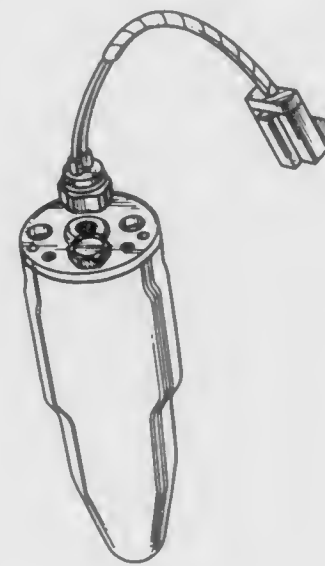
LIQUID RECEIVER FOR STORAGE OF LIQUID REFRIGERANT AND HAVING A DESICCANT CHARGING PORTION, FOR USE IN VEHICLE AIR CONDITIONERS AND THE LIKE

Yoshikazu Takematsu, and Toshio Suzuki, both of Sano, Japan, assignors to Calsonic Corporation, Tokyo, Japan
Filed Sep. 11, 1989, Ser. No. 405,667

Claims priority, application Japan, Mar. 13, 1989, 1-8657; Mar. 13, 1989, 1-8658

Term of patent 14 years

U.S. Cl. D23—325



323,884

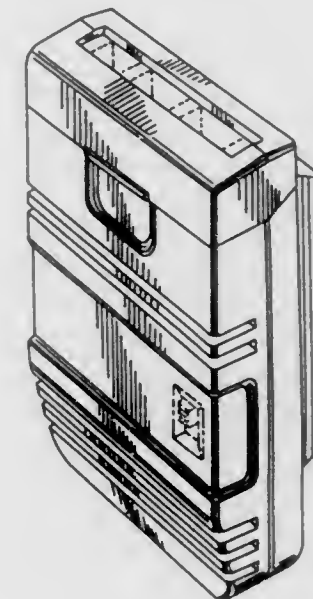
FRAGRANCE DIFFUSER HOUSING

Kenneth J. Muderlak, Shorewood, Wis., assignor to Technical Concepts, L.P., Chicago, Ill.

Continuation of Ser. No. 521,981, May 7, 1990. This application Jul. 26, 1990, Ser. No. 558,192

Term of patent 14 years

U.S. Cl. D23—366



323,883

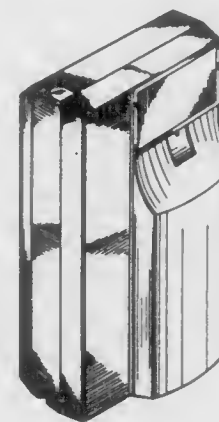
AEROSOL DISPENSER

James J. Caporale, Watertown, Conn., assignor to Waterbury Companies, Inc., Waterbury, Conn.

Filed Apr. 20, 1990, Ser. No. 511,611

Term of patent 14 years

U.S. Cl. D23—366



323,885

FLOOR FAN

Brent J. Wortham, Pasadena, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.

Filed Mar. 20, 1990, Ser. No. 495,937

Term of patent 14 years

U.S. Cl. D23—378



323,886

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY TUBE
George J. Picha, Independence, and Dean J. Secrest, Euclid,
both of Ohio, assignors to Applied Medical Technology, Inc.,
Independence, Ohio

Filed May 16, 1989, Ser. No. 352,451

Term of patent 14 years

U.S. Cl. D24—108



323,888

DISPOSABLE URINARY PAD

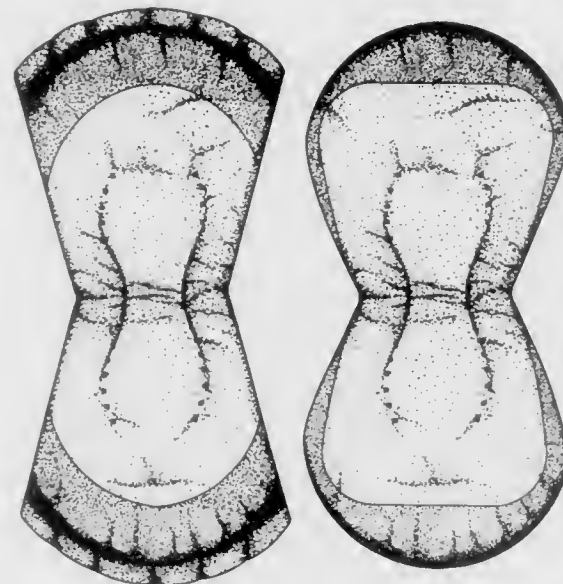
Jonas Hermanson; Anders Roos, both of Göteborg, and Bard
Eiterjord, Kungsbacka, all of Sweden, assignors to Molnlycke
Aktiebolag, Gothenburg, Sweden

Filed Nov. 30, 1989, Ser. No. 443,379

Claims priority, application Sweden, May 31, 1989, 89-1316

Term of patent 14 years

U.S. Cl. D24—125



323,887

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY TUBE
George J. Picha, Independence, and Dean J. Secrest, Euclid,
both of Ohio, assignors to Applied Medical Technology, Inc.,
Independence, Ohio

Filed May 16, 1989, Ser. No. 352,452

Term of patent 14 years

U.S. Cl. D24—108



323,889

**COMBINED GUARD AND INJECTION SITE FOR
INTRAVENOUS INFUSION OR THE LIKE**

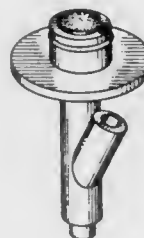
Philip Wyatt, 1018 Marengo Dr., Glendale, Calif. 91206, and
Michael R. Pescovitz, 20628 Jay Carroll Dr., Saugus, Calif.
91350

Filed Mar. 21, 1988, Ser. No. 171,521

The portion of the term of this patent subsequent to Feb. 4, 2006,
has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—129



323,890

UMBILICAL CLAMP

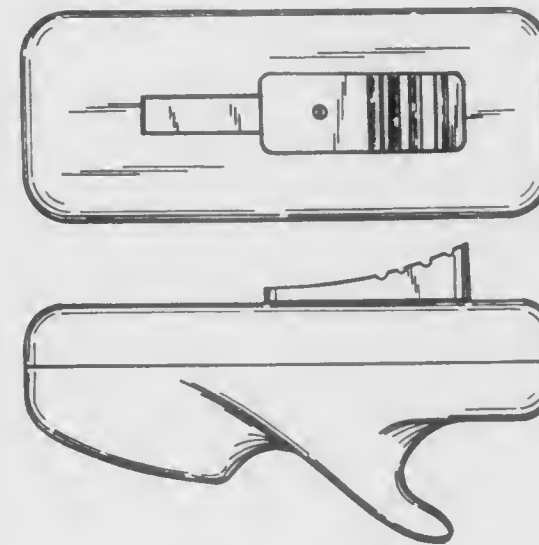
Jason H. Collins, 1344 Covington Hwy., Slidell, La. 70460

Continuation-in-part of Ser. No. 392,201, Aug. 10, 1989,

abandoned. This application Dec. 22, 1989, Ser. No. 454,850

Term of patent 14 years

U.S. Cl. D24—143



323,892

PANORAMA TOMOGRAPHIC X-RAY UNIT

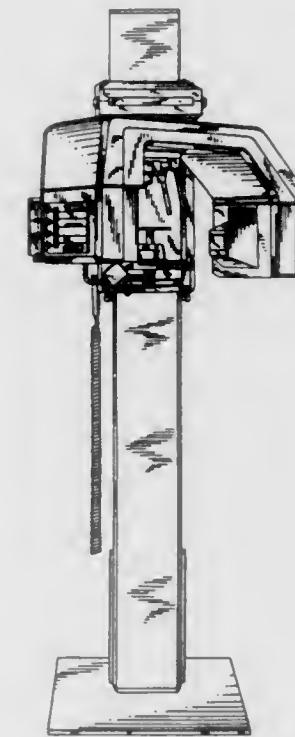
Davor Spoljaric, Espoo, Finland, assignor to Orion-Yhtymä Oy,
Espoo, Finland

Filed Apr. 11, 1988, Ser. No. 180,024

Claims priority, application Finland, Oct. 12, 1987, 842/87

Term of patent 14 years

U.S. Cl. D24—158



323,893

BLOOD GLUCOSE METER

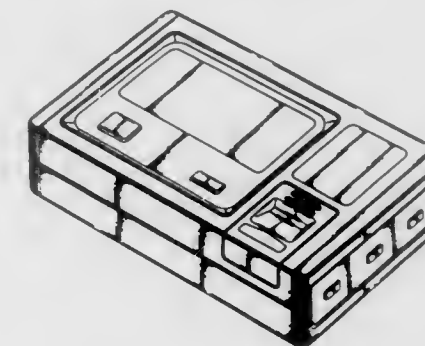
Tetsuya Arioka, Tokyo, Japan, assignor to Terumo Kabushiki
Kaisha, Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,796

Claims priority, application Japan, Jun. 6, 1989, 1-20657

Term of patent 14 years

U.S. Cl. D24—169



323,891

**COMBINED ABRASIVE DENTAL INSTRUMENT AND
CAP FOR REMOVING DISCOLORATIONS ON TEETH**
Stefan Arkel, Stockholm, Sweden, assignor to Seth Neuman,
Stockholm, Sweden, a part interest

Filed May 11, 1990, Ser. No. 521,935

Claims priority, application Sweden, Nov. 23, 1989, 89-2653

Term of patent 14 years

U.S. Cl. D24—146



323,894

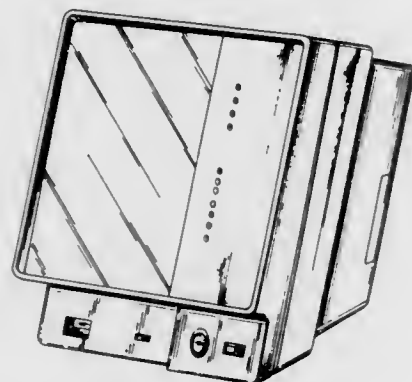
VITAL SIGNS MONITOR

Robert J. Rosati, Carlsbad; Dennis M. Lanci, San Diego, and Tom C. Lorenzana, Spring Valley, all of Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Jun. 19, 1989, Ser. No. 367,705

Term of patent 14 years

U.S. Cl. D24—186



323,895

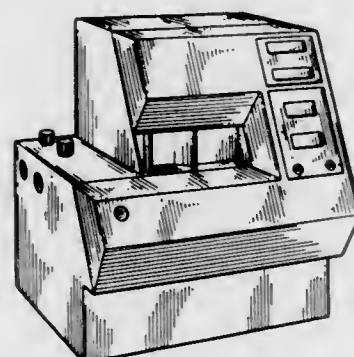
CRYO SLAMMER FOR COOLING TISSUE SAMPLES

Peter J. Protzmann, Houston, Tex., assignor to LifeCell Corporation, The Woodlands, Tex.

Filed Apr. 13, 1989, Ser. No. 343,882

Term of patent 14 years

U.S. Cl. D24—216



323,896

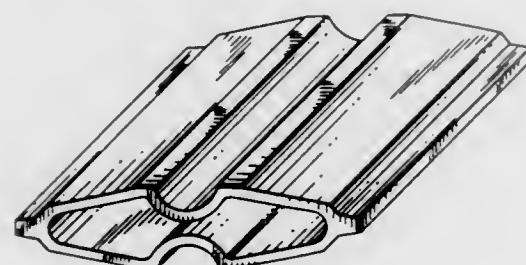
RIGID PLASTIC JOINT FOR VERTICAL WALLS

Bernardino B. Alcazar, Guadalajara, Spain, assignor to Vicasa, S.A., Madrid, Spain

Filed Feb. 3, 1989, Ser. No. 305,996

Term of patent 14 years

U.S. Cl. D25—103



323,897

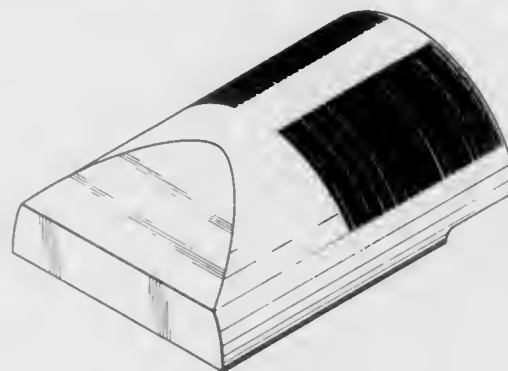
LUMINAIRE

Wayne W. Compton, Chino Hills, Calif., assignor to Kim Lighting, Inc., City of Industry, Calif.

Filed Oct. 27, 1989, Ser. No. 428,660

Term of patent 14 years

U.S. Cl. D26—24



323,898

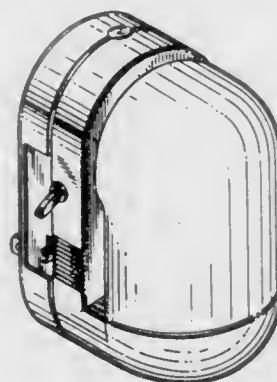
NIGHTLIGHT

Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Continuation of Ser. No. 254,894, Oct. 7, 1988, abandoned. This application Nov. 1, 1990, Ser. No. 609,932

Term of patent 14 years

U.S. Cl. D26—26



323,899

VEHICLE HEADLIGHT

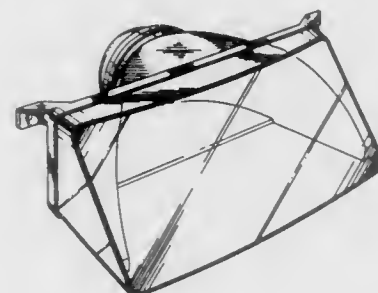
Y. Anselme LaPointe, St-Eli d'Orford, Canada, assignor to Bombardier Inc., Canada

Filed Nov. 15, 1989, Ser. No. 436,678

Claims priority, application Canada, Jun. 6, 1989, 06-06-89-6

Term of patent 14 years

U.S. Cl. D26—28



323,900

REVERSE LIGHT FOR AN AUTOMOBILE

Frans G. Falck, Torslanda, and Håkan Malmgren, Gothenburg, both of Sweden, assignors to Aktiebolaget Volvo, Gothenburg, Sweden

Filed Dec. 4, 1990, Ser. No. 622,417

Claims priority, application Sweden, Jul. 3, 1990, 90-1475

Term of patent 14 years

U.S. Cl. D26—35



323,901

TURN LIGHT FOR AN AUTOMOBILE

Frans G. Falck, Torslanda, and Håkan Malmgren, Gothenburg, both of Sweden, assignors to Aktiebolaget Volvo, Gothenburg, Sweden

Filed Dec. 4, 1990, Ser. No. 622,418

Claims priority, application Sweden, Jul. 3, 1990, 90-1475

Term of patent 14 years

U.S. Cl. D26—35



323,902

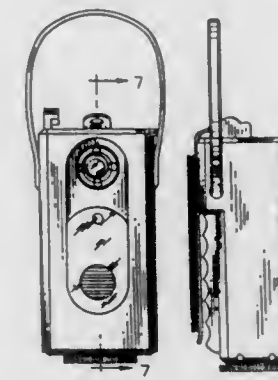
MINIATURE WATER RESISTANT FLASHLIGHT

Robert L. Garner, P.O. Box 1445, Arcadia, Calif. 91006, and John W. Hutcheson, P.O. Box 370, San Gabriel, Calif. 91778

Filed Jun. 10, 1987, Ser. No. 60,365

Term of patent 14 years

U.S. Cl. D26—37



323,903

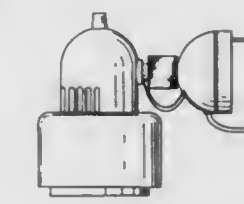
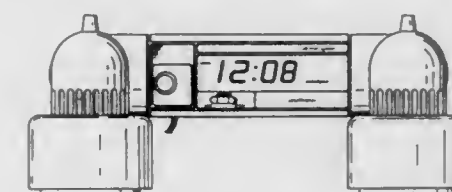
COMBINED LAMP AND CLOCK

Janice L. Tonyan, Des Plaines; Charles Flynn, Mt. Prospect, and Alex Kowalenko, Barrington, all of Ill., assignors to Spartus Corporation, Arlington Heights, Ill.

Filed Jul. 27, 1989, Ser. No. 390,804

Term of patent 14 years

U.S. Cl. D26—54



323,904

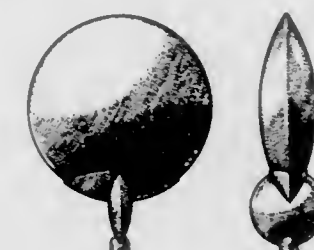
EXTERIOR LIGHTING FIXTURE

Santiago M. Camino, and Perry King, both of Milan, Italy, assignors to Sociedad Estatal para la Exposición Universal Sevilla 92, S.A., Sevilla, Spain

Filed Nov. 20, 1989, Ser. No. 439,649

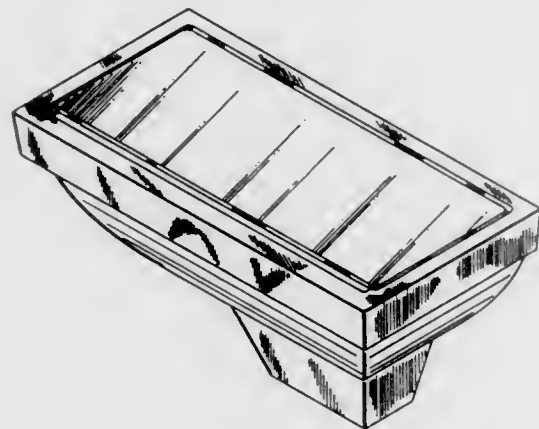
Term of patent 14 years

U.S. Cl. D26—67



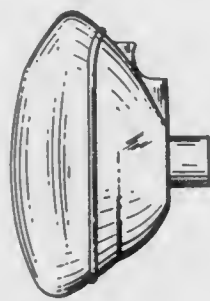
323,905
WALL SCONCE

Kevin von Kluck, Western Springs, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Nov. 6, 1989, Ser. No. 432,278
Term of patent 14 years
U.S. Cl. D26—85



323,908
FACE MASK

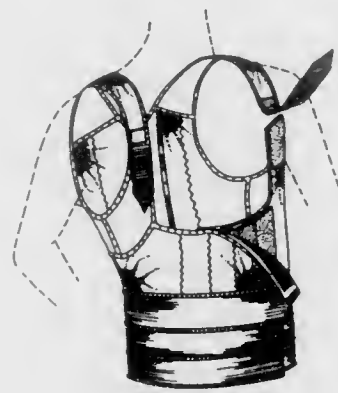
William H. Hollister, Nelson, and Cary D. Carruthers, Fitzwilliam, both of N.H., assignors to Smith Industries Medical Systems, Inc., Keene, N.H.
Filed Nov. 9, 1989, Ser. No. 435,325
Term of patent 14 years
U.S. Cl. D29—7



323,909

BACK SUPPORT VEST

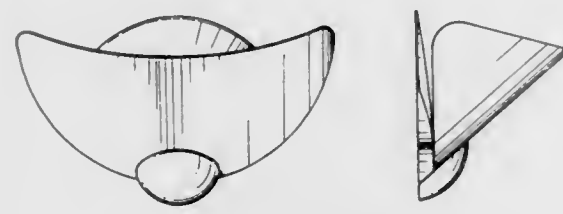
Terry L. Dewart, 10504 Sprague Plz., Omaha, Nebr. 68134
Filed Jun. 13, 1989, Ser. No. 365,516
Term of patent 14 years
U.S. Cl. D24—190



323,906

WALL LAMP

Santiago Miranda, and Perry A. King, both of Milan, Italy, assignors to Flos, S.p.A., Brescia, Italy
Filed Mar. 13, 1990, Ser. No. 492,875
Term of patent 14 years
U.S. Cl. D26—85

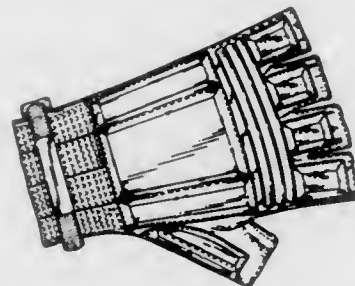


323,910

ATHLETIC GLOVE

Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012
Continuation-in-part of Ser. No. 857,782, Apr. 25, 1986, Pat. No. Des. 299,564, which is a continuation-in-part of Ser. No. 687,745, Dec. 31, 1984, Pat. No. Des. 287,904. This application
Jan. 27, 1987, Ser. No. 7,432
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years

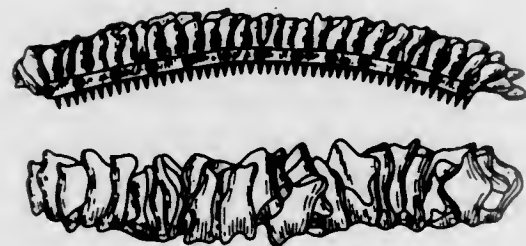
U.S. Cl. D29—22



323,907

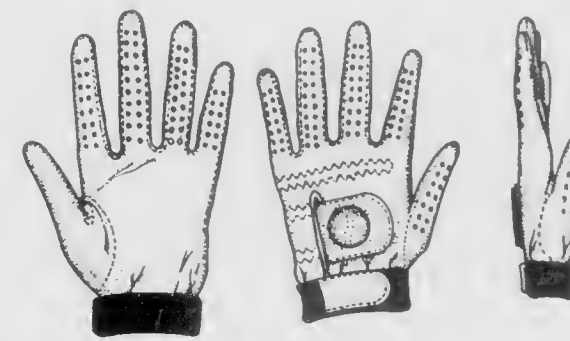
HAIR FASTENER

Diane L. Andrade, 1223 S. 23rd St., Milwaukee, Wis. 53204
Filed Nov. 4, 1988, Ser. No. 266,987
Term of patent 14 years
U.S. Cl. D28—41



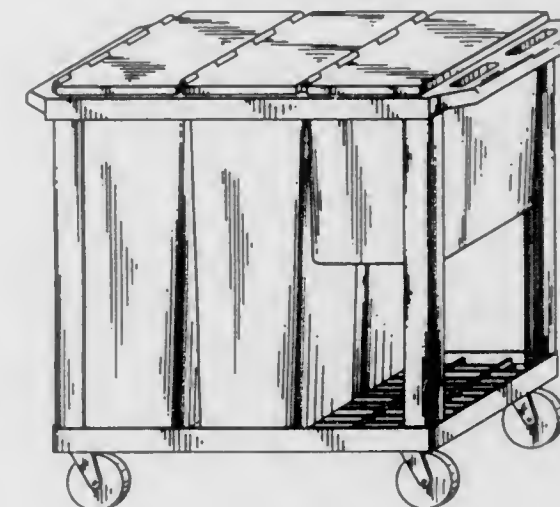
323,911
GOLF GLOVE

Steven B. Dunn, Santa Ana, Calif., assignor to Bullet Golf Ball, Inc., Santa Ana, Calif.
Filed Aug. 27, 1990, Ser. No. 572,809
Term of patent 14 years
U.S. Cl. D29—22



323,913
TRASH CART

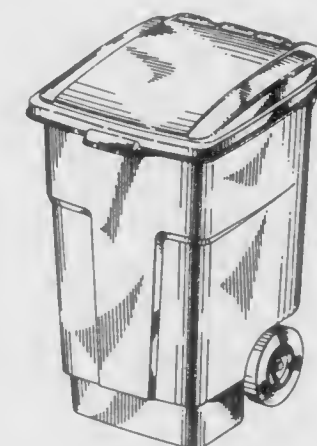
Ronald E. Ernsberger, Fort Wayne, and Richard M. DeLucenay, Garrett, both of Ind., assignors to Fort Wayne Pools, Inc., Fort Wayne, Ind.
Filed Sep. 25, 1990, Ser. No. 587,440
Term of patent 14 years
U.S. Cl. D34—5



323,912

WHEELED REFUSE CONTAINER

Paul E. Delmerico, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Aug. 23, 1990, Ser. No. 572,095
Term of patent 14 years
U.S. Cl. D34—5



323,914

RECTANGULAR REFUSE CONTAINER

André G. Doxey, Shaker Heights, and John L. Hradisky, Medina, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 28, 1990, Ser. No. 635,326
Term of patent 14 years
U.S. Cl. D34—5



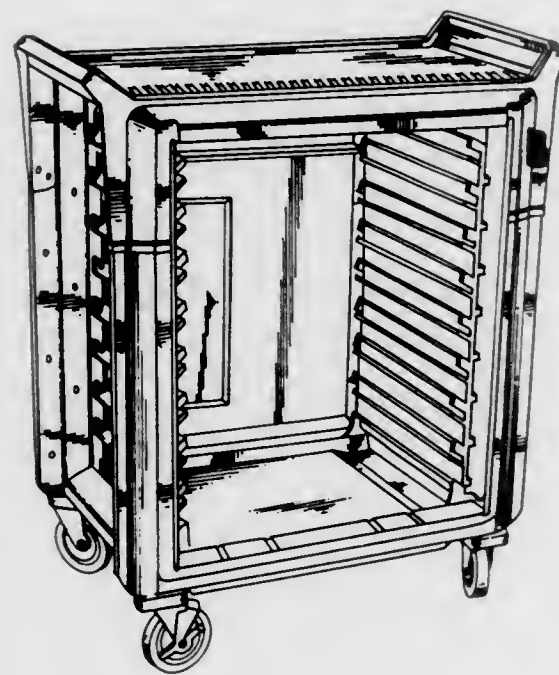
323,915 MODULAR UTILITY CART

Robert J. Welch, Dallas, Pa., assignor to InterMetro Industries, Wilkes-Barre, Pa.

Filed Feb. 3, 1989, Ser. No. 305,653

Term of patent 14 years

U.S. Cl. D34—21



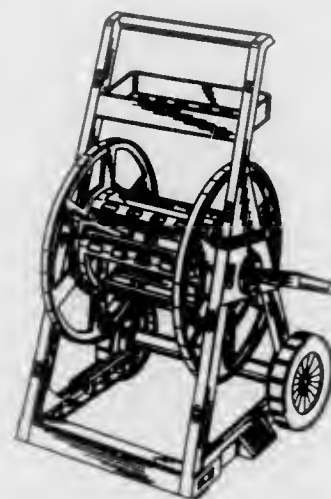
323,916 HOSE CART WITH TRAY

Joseph J. Sanchez, Jr., and Stephen P. Whitehead, both of Elgin, Ill., assignors to Suncoast Corporation, Batavia, Ill.

Filed Mar. 14, 1990, Ser. No. 493,714

Term of patent 14 years

U.S. Cl. D34—24



323,917 UNDERGROUND ELEVATOR FOR AIRPORT USE OR THE LIKE

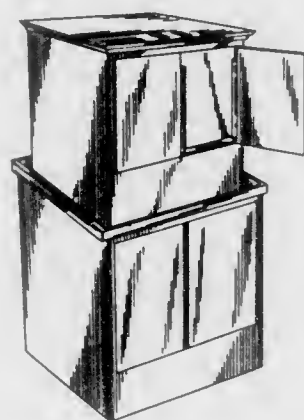
Nils-Erik Anderberg, Trelleborg, Sweden, assignor to FMT International Trade Aktiebolag, Trelleborg, Sweden

Filed May 22, 1989, Ser. No. 354,935

Claims priority, application Sweden, Nov. 22, 1988, 88-2663

Term of patent 14 years

U.S. Cl. D34—37



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF FEBRUARY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. B. Carter, Inc.: See—
Bodnar, Michael L., 5,086,615, Cl. 57-120.000.
- A. S. Thomas, Inc.: See—
Thomas, Robert F., 5,087,159, Cl. 409-132.000.
- Abbott Laboratories: See—
Schmitt, Robert J., 5,086,780, Cl. 128-763.000.
- Abe, Hiraku: See—
Sugifune, Shin; and Abe, Hiraku, 5,087,879, Cl. 324-207.250.
- Abe, Kenichiro, to Fujitsu Limited. Conducting material and a method of fabricating thereof. 5,087,413, Cl. 419-9.000.
- Abel, Donald B., to Abel Manufacturing Co., Inc. Apparatus for selectively controlling a plurality of electric motors. 5,087,864, Cl. 318-34.000.
- Abel Manufacturing Co., Inc.: See—
Abel, Donald B., 5,087,864, Cl. 318-34.000.
- Abernethy, Robert R. Writing instrument advertising device. 5,086,577, Cl. 40-334.000.
- Abgottspon, Pius: See—
Hardt, Peter; Stravs, Andrej; and Abgottspon, Pius, 5,087,745, Cl. 562-553.000.
- Abrams/Gentile Entertainment Inc.: See—
Gentile, Christopher T.; Wallace, Michael; Avalon, Timothy D.; Goodman, Scott; Fuller, Richard; and Hall, Tracy, 5,086,785, Cl. 128-782.000.
- ABU Garcia Produktion AB: See—
Johansson, Arne, 5,086,991, Cl. 242-321.000.
- ACA Industries: See—
Wainfan, Barnaby, 5,086,993, Cl. 244-48.000.
- ACB: See—
Huet, Jean-Paul, 5,086,636, Cl. 72-296.000.
- Accurate Products Co.: See—
Buehning, Peter G., 5,087,186, Cl. 425-72.200.
- Acquaviva, Thomas, to Xerox Corporation. Document handler staple detector. 5,087,027, Cl. 271-258.000.
- Acree, Terry E., to Cornell Research Foundation, Inc. Coffee flavor enhancers. 5,087,469, Cl. 426-544.000.
- Actel Corporation: See—
Chen, Shih-Oh; Chiang, Steve S.; and Bakker, Gregory W., 5,087,958, Cl. 357-51.000.
- Actimed Laboratories, Inc.: See—
Ertinghausen, Gerhard, 5,087,556, Cl. 435-7.900.
- Adachi, Etsushi: See—
Adachi, Hiroshi; Adachi, Etsushi; Aiba, Yoshiko; and Hayashi, Osamu, 5,087,553, Cl. 430-323.000.
- Adachi, Hiroshi; Adachi, Etsushi; Aiba, Yoshiko; and Hayashi, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Method for transferring patterns on silicone ladder type resin and etching solution used in such method. 5,087,553, Cl. 430-323.000.
- ADL Automation Zone Industrielle: See—
Le Molaire, Roger; and Gavotto, Dominique H. A., 5,087,398, Cl. 264-40.500.
- Adolph, Grant H.: See—
Newbery, Brian L.; Loewen, Kel W.; and Adolph, Grant H., 5,086,869, Cl. 180-329.000.
- Advanced Micro Devices, Inc.: See—
Hattangadi, Rajiv M., 5,087,835, Cl. 307-443.000.
- Advanced Technology Materials, Inc.: See—
Stevens, Ward C.; Sturm, Edward A.; and Roman, Bruce C., 5,087,515, Cl. 428-315.900.
- Advantest Corporation: See—
Sugai, Masao, 5,087,833, Cl. 307-443.000.
- Advenier, Pierre; and Regneault, Marcel, to Automobiles Peugeot et al. Electromagnetic valve in particular for injection pump. 5,087,016, Cl. 251-129.150.
- Aeroquip Corporation: See—
Cakmakci, Mehmet Y., 5,087,488, Cl. 428-31.000.
- Aerospatiale Societe Nationale Industrielle: See—
Auternaud, Jacques; Barteau, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foucras, Jean; Louis, Michel; Marelli, Georges; Poveda, Pierre; and Roux, Christian, 5,086,541, Cl. 16-227.000.
- Agbay, Anthony J., to Olson Manufacturing Co. Disc cylinder lock. 5,086,631, Cl. 70-366.000.
- Agency of Industrial Science: See—
Suzuki, Kenji; and Mori, Toshiaki, 5,087,598, Cl. 502-63.000.
- Agency of Industrial Science & Technology, Ministry of International Trade & Industry: See—
Ichimura, Shingo; Kokubun, Kiyohide; and Shimizu, Hazime, 5,087,814, Cl. 250-287.000.
- Tanaka, Makoto, 5,086,618, Cl. 60-527.000.
- Aggio Recovery: See—
Weinwurm, Peter, 5,087,375, Cl. 210-688.000.
- Agnoff, Charles, to Interroll Holding AG. Tandem brake roller system. 5,086,903, Cl. 193-35.00A.
- Ahlgren, Frederic F.; Davenport, John M.; Hansler, Richard L.; and Karikas, John J., to General Electric Company. Incandescent lamps and processes for making same. 5,087,218, Cl. 445-27.000.
- Ahn, Tae-Hyuk, to Samsung Electronics Co., Ltd. Plasma generating apparatus and method using modulation system. 5,087,857, Cl. 315-111.210.
- Ahnradfabrik Friedrichshafen, AG.: See—
Elsner, Dieter; Hetzel, Helmut; and Kogel, Walter, 5,086,687, Cl. 91-375.00A.
- Ahrens, Thomas J.: See—
Potter, David K.; and Ahrens, Thomas J., 5,087,435, Cl. 423-446.000.
- Aiba, Yoshiko: See—
Adachi, Hiroshi; Adachi, Etsushi; Aiba, Yoshiko; and Hayashi, Osamu, 5,087,553, Cl. 430-323.000.
- Aichinger, Dietmar F. Pilfer-proof closure for containers and injection mould for producing the closure. 5,086,938, Cl. 215-252.000.
- Airbus Industrie: See—
Roeder, Jean; and Geering, Leslie J., 5,086,996, Cl. 244-119.000.
- Aisin Seiki Kabushiki Kaisha: See—
Momose, Yutaka; Tabata, Shigeyoshi; and Mori, Katsuhiro, 5,086,625, Cl. 62-172.000.
- Ajinomoto Co., Inc.: See—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 5,087,729, Cl. 560-41.000.
- Sagawa, Kouichiro; Kitamura, Nobuyoshi; Ueda, Masako; and Takeuchi, Koji, 5,087,517, Cl. 428-329.000.
- Akagi, Takao: See—
Yamaguchi, Shinji; Hirakawa, Kiyoshi; Kashima, Seiji; Tanaka, Kazuhiko; Kawamoto, Masao; and Akagi, Takao, 5,087,519, Cl. 428-373.000.
- Akahane, Atsushi: See—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 5,087,629, Cl. 514-300.000.
- Akama, Hiroshi: See—
Kato, Yasuyoshi; Konishi, Kunihiko; Akama, Hiroshi; Matsuda, Toshiaki; and Teshima, Nobue, 5,087,600, Cl. 502-309.000.
- Akashi, Tomoji: See—
Koyama, Mikio; Kawakatsu, Satoshi; Akashi, Tomoji; and Okaniwa, Kenichiro, 5,087,421, Cl. 422-56.000.
- Akatsu, Yohsuke: See—
Fukanaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,087,068, Cl. 280-707.000.
- Akatsuchi, Kazuyuki. Electrical component placing apparatus and method of placing electrical component. 5,086,559, Cl. 29-834.000.
- Akatsuka, Akihiro: See—
Okada, Takashi; Aoyama, Takamichi; Mizuno, Shoichi; Akatsuka, Akihiro; and Matsuoka, Kiyonari, 5,087,705, Cl. 548-458.000.
- Akebono Brake Industry Co., Ltd.: See—
Seki, Katsuji; and Hashimoto, Naoyuki, 5,087,642, Cl. 523-156.000.
- Akebono Research and Development Centre, Ltd.: See—
Seki, Katsuji; and Hashimoto, Naoyuki, 5,087,642, Cl. 523-156.000.
- Akechi Ceramics Co., Ltd.: See—
Ozeki, Hidekichi; and Aoki, Takafumi, 5,086,957, Cl. 222-607.000.
- Akel, Fred A. Golf ball retriever. 5,087,165, Cl. 414-440.000.
- Akishino, Katsuo; Hirako, Osamu; and Shimada, Makoto, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Engine controlling system for vehicle. 5,088,043, Cl. 364-426.040.
- Akita, Minoru: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouichirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
- Akiyama, Kazuhiro: See—
Odagawa, Satoshi; Kashiwazaki, Takashi; Araki, Morio; Fukushima, Atsuhiko; and Akiyama, Kazuhiro, 5,087,919, Cl. 342-357.000.
- Akiyama, Naoki; and Mori, Masaharu. Process for preparing inner olefines. 5,087,793, Cl. 585-666.000.
- Akiyama, Ryojo: See—
Fukuchi, Mikiharu; Nakano, Yasuhiko; Hayashi, Keisuke; Koseki, Isamu; Ito, Masami; and Akiyama, Ryojo, 5,087,299, Cl. 148-11.50P.
- Akstiebolaget Leo: See—
Liljewall, Lars R., 5,087,424, Cl. 422-68.100.
- Akzo N.V.: See—
Diamantoglou, Michael; and Tilgner, Hans Georg, 5,087,366, Cl. 210-500.230.

- Whitwell, George E.; and Antezzo, Meiylin F., 5,087,609, Cl. 505-1.000.
- AL Industries: See—
Ludke, Arnold, 5,086,906, Cl. 198-372.000.
- Alagna, Ettore: See—
Guerinat, Daniel; Marolda, Giuseppe; and Alagna, Ettore, 5,086,794, Cl. 134-56.00R.
- Albany International Corp.: See—
Hood, Paul F., 5,087,327, Cl. 162-358.000.
- Albertson, William C., to General Motors Corporation. Compressed air supply, 5,086,746, Cl. 123-533.000.
- Alcan International Limited: See—
Fairlie, Matthew; Smith, David; Fraser, Warren; and Meijer, Otto, 5,087,822, Cl. 250-572.000.
- Nadkarni, Sadashiv K., 5,087,592, Cl. 501-96.000.
- Alcatel NA Network Systems Corp.: See—
Gingell, Michael J.; and Sutherland, Joseph E., 5,088,089, Cl. 370-67.000.
- Aldrich Chemical Company, Inc.: See—
Brown, Herbert C., 5,087,700, Cl. 546-329.000.
- Alfa Metal Corp.: See—
Lin, Fan-Nan, 5,086,872, Cl. 182-18.000.
- Alfred Teves GmbH: See—
Weiler, Rolf; Bach, Uwe; Paschke, Klaus-Dieter; and Roth, Gerald, 5,087,907, Cl. 340-454.000.
- Aligena AG: See—
Perry, Mordechai; Gilron, Jack; Ketraro, Reuven; and Linder, Charles, 5,087,338, Cl. 204-182.00B.
- Allegheny Ludlum Corporation: See—
Johnston, Richard H., 5,087,167, Cl. 414-668.000.
- Allied Extrusions: See—
Danchulis, James E.; and Walde, Robert A., 5,086,823, Cl. 160-236.000.
- Allied-Signal Inc.: See—
Chang, Chin-Fong; and Das, Santosh K., 5,087,304, Cl. 148-406.000.
- Li, Chien C.; Cook, Kane D.; and Basu, Rajat S., 5,087,777, Cl. 570-136.000.
- Marsh, Gary B.; Fanelli, Anthony J.; Burlew, Joan V.; and Ballard, Clifford P., 5,087,595, Cl. 501-105.000.
- Wieland, Kurt H., 5,087,176, Cl. 417-407.000.
- Yates, Stephen F., 5,087,778, Cl. 570-179.000.
- Allison, Charles E.: See—
Holland, Geary C.; and Allison, Charles E., 5,086,600, Cl. 52-594.000.
- Allison, John B.: See—
Yu, Michael C.; and Allison, John B., 5,087,666, Cl. 525-189.000.
- Alps Electric Co., Ltd.: See—
Nakazawa, Toru; Kokumai, Yuji; Naito, Koichi; Suzuki, Shoji; and Noguchi, Tadao, 5,087,851, Cl. 310-323.000.
- Sugifune, Shin; and Abe, Hiraku, 5,087,879, Cl. 324-207.250.
- Tsukada, Jiro, 5,087,812, Cl. 250-231.140.
- Alsmarraie, Muhamad A.; Hobbs, Stanley Y.; Wang, I-Chung W.; and Watkins, Vicki H., to General Electric Company. Polyester, polycarbonate and/or polyphenylene ether with polyorganosiloxane/polyvinyl-based graft (meth) acrylate polymers, 5,087,662, Cl. 525-63.000.
- Altmann, Conrad, to Eastman Kodak Company. Control system for document reproduction machines, 5,087,940, Cl. 355-204.000.
- Amada Company, Limited: See—
Aoyagi, Minoru; and Hasegawa, Takayoshi, 5,086,678, Cl. 83-13.000.
- Amano, Masayo: See—
Kuroda, Masami; Amano, Masayo; and Furusho, Noboru, 5,087,541, Cl. 430-58.000.
- Amano, Norihide: See—
Maeda, Mitsuru; Kodama, Tohru; Iwasawa, Norio; Higuchi, Naoki; and Amano, Norihide, 5,087,614, Cl. 514-16.000.
- Amano, Shin-ya: See—
Tanaka, Katumi; Hirakawa, Hideki; Nogami, Hiroyasu; and Amano, Shin-ya, 5,088,038, Cl. 364-419.000.
- Amano, Toshio: See—
Oda, Osamu; and Amano, Toshio, 5,087,976, Cl. 358-183.000.
- Amerace Corporation: See—
Yaworski, Harry G.; and Siebens, Larry N., 5,088,001, Cl. 361-127.000.
- American BioMed, Inc.: See—
Summers, David P., 5,087,265, Cl. 606-159.000.
- American Home Products Corporation: See—
Duerholz, Joanne R.; DiMaria, Dolores; and Blank, Robert G., 5,087,454, Cl. 424-464.000.
- American Innovation, Inc.: See—
Torre-Bueno, Jose R., 5,087,965, Cl. 358-22.000.
- American Mining Supply, Inc.: See—
Pezzutto, Mario, 5,087,160, Cl. 411-5.000.
- Amoco Corporation: See—
Clark, Frederick T.; and Hensley, Albert L., Jr., 5,087,596, Cl. 502-49.000.
- Nubel, Philip O.; Satek, Larry C.; Spangler, Michael J.; and Michaels, Glenn O., 5,087,779, Cl. 570-245.000.
- Nubel, Philip O.; Satek, Larry C.; Spangler, Michael J.; Lutman, Charles A.; and Michaels, Glenn O., 5,087,786, Cl. 585-300.000.
- Primack, Harold S.; and Cutshall, Ronald L., 5,087,784, Cl. 585-446.000.
- Quinn, George P.; Kruse, Larry W.; Gebhard, Thomas J.; and Forgac, John M., 5,087,427, Cl. 422-144.000.
- Qureshi, Shahid P.; Newman-Evans, Richard H.; and Gardner, Hugh C., 5,087,657, Cl. 524-508.000.
- Amp, Inc.: See—
McGaffigan, Thomas H., 5,087,804, Cl. 219-10.430.
- Myers, Ronald W.; and Pritulsky, James, 5,087,210, Cl. 439-425.000.
- Ampex Corporation: See—
Lemoine, Maurice G., 5,088,077, Cl. 369-43.000.
- Amplas, Inc.: See—
Blaser, Giles R., 5,086,964, Cl. 226-108.000.
- Amrany, Daniel; and Farrow, Cecil W., to AT&T Bell Laboratories. Rational rate frequency generator, 5,088,057, Cl. 364-703.000.
- Amsted Industries Incorporated: See—
McKeown, Franklin S., Jr.; Moehling, Charles; and Spencer, Charles P., 5,086,708, Cl. 105-207.000.
- Spencer, Charles P.; and Pitchford, Terry L., 5,086,707, Cl. 105-199.300.
- Analog Devices, Inc.: See—
Butler, James R., 5,087,889, Cl. 330-253.000.
- DeVito, Lawrence M.; and Brokaw, A. Paul, 5,087,894, Cl. 331-66.000.
- Andersen Corporation: See—
Galowitz, Dennis A.; and Evans, Harold H., 5,086,601, Cl. 52-656.000.
- Anderson, Conrad V., to Minnesota Mining and Manufacturing Company. Web-aligning apparatus, 5,087,318, Cl. 156-540.000.
- Anderson, H. Clarke; and Masuhara, Kensaku, to University of Kansas. Monoclonal antibody against bone alkaline phosphatase, 5,087,573, Cl. 435-240.270.
- Anderson, Heather E. Tail lengthener assembly and method of use, 5,086,612, Cl. 54-78.000.
- Anderson, Neal P.: See—
Giggins, Charles S., Jr.; Anderson, Neal P.; Mullin, Richard S.; Rlendeau, Leo A.; and Ullion, Nicholas E., 5,087,477, Cl. 427-38.000.
- Andre, Thierry: See—
Melchior, Jean; Andre, Thierry; and Edelmann, Henri B., 5,086,735, Cl. 123-65.0VD.
- Andrews, Zenas B. Balanced beam latching apparatus, 5,086,587, Cl. 49-395.000.
- ANELVA Corporation: See—
Tsukada, Tsutomu; Wani, Etsuo; and Yasuda, Koki, 5,087,341, Cl. 204-192.320.
- Angel, James A.; Hagar, Gilbert G.; and Clement, Michael H., to Kwik Snap Corporation. Pipe severing method and apparatus, 5,086,961, Cl. 225-1.000.
- Angers, Lynette M.; Konitzer, Douglas G.; Murray, Joanne L.; and Truckner, William G. Alloys for high temperature applications, 5,087,301, Cl. 148-12.70A.
- Anglen, Connie I. Log marking apparatus, 5,086,955, Cl. 222-402.150.
- Ankers, David: See—
Turner, Thomas J.; and Ankers, David, 5,087,011, Cl. 248-501.000.
- Anma, Sadaoyuki: See—
Kuramatsu, Hiroyasu; Sato, Toshifumi; Matai, Masahiro; and Anma, Sadaoyuki, 5,087,905, Cl. 340-311.100.
- Annis, Clifford C.: See—
Petronis, Thomas J.; and Annis, Clifford C., 5,086,901, Cl. 192-150.000.
- Ansell, Christopher W. G.; and Butler, Colin, to Smith and Nephew p.l.c. Curable compositions, 5,087,686, Cl. 528-49.000.
- Antberg, Martin: See—
Brekner, Michael-Joachim; Rohrmann, Jurgen; Spaleck, Walter; and Antberg, Martin, 5,087,677, Cl. 526-160.000.
- Antezzo, Meiylin F.: See—
Whitwell, George E.; and Antezzo, Meiylin F., 5,087,609, Cl. 505-1.000.
- Anthonsen, Niels A., to Indu-Tech Enterprises Ltd. Rotary joint, 5,087,082, Cl. 285-94.000.
- Anthony, William S., to United States of America, Agriculture. System for capturing, pressing and analyzing entrained solids such as cotton, 5,087,120, Cl. 356-36.000.
- Anton Hummel GmbH Metallwarenfabrik: See—
Gehring, Peter, 5,087,084, Cl. 285-319.000.
- Antopolsky, Eliahu; and Ramon, Efraim. Cover for motor vehicles, 5,087,092, Cl. 296-95.100.
- Aoiike, Tatsuyuki: See—
Yamazaki, Koji; Kariya, Toshimitsu; Aoiike, Tatsuyuki; Ehara, Toshiyuki; Yoshino, Takehito; and Ootshi, Hirokazu, 5,087,542, Cl. 430-60.000.
- Aoki, Masaaki; Kamiyama, Masayuki; and Honda, Hiroshi, to Mitsui Toatsu Chemicals, Inc. Moisture curable polyurethane composition comprising polyaldimine, 5,087,661, Cl. 524-714.000.
- Aoki, Sumihisa: See—
Takayama, Teruyuki; Nagasawa, Hiroki; Aoki, Sumihisa; Tominaga, Haruo; and Yokoyama, Kazuo, 5,087,300, Cl. 148-11.50Q.
- Aoki, Takafumi: See—
Ozeki, Hidekichi; and Aoki, Takafumi, 5,086,957, Cl. 222-607.000.
- Aoki, Tsunetaka; and Ishii, Susumu, to Yoshida Kogyo K. K. Slide fasteners slider, 5,086,546, Cl. 24-429.000.
- Aoyagi, Minoru; and Hasegawa, Takayoshi, to Amada Company, Limited. Workpiece conveying method and device for a cutting machine, 5,086,678, Cl. 83-13.000.
- Aoyama, Takamichi: See—
Okada, Takashi; Aoyama, Takamichi; Mizuno, Shoichi; Akatsuka, Akihiro; and Matsuoka, Kiyonari, 5,087,705, Cl. 548-458.000.

- Aoyama, Toshimi: See—
Horigome, Tomoki; Tazawa, Kenji; and Aoyama, Toshimi, 5,087,552, Cl. 430-280.000.
- Appel, Andrew: See—
Ellis, John R.; Li, Kai; and Appel, Andrew, 5,088,036, Cl. 395-425.000.
- Appleyard, Andrew P.: See—
Grasso, Giorgio; Scrivener, Paul L.; and Appleyard, Andrew P., 5,087,108, Cl. 385-27.000.
- Applied Research Systems ARS Holding N.V.: See—
Chappel, Scott C., 5,087,615, Cl. 514-21.000.
- Applied Robotics, Inc.: See—
Petronis, Thomas J.; and Annis, Clifford C., 5,086,901, Cl. 192-150.000.
- Arai, Kunio: See—
Kanaya, Yasuhiko; Otani, Tamio; and Arai, Kunio, 5,087,156, Cl. 408-1.00R.
- Arai, Masatoshi; Satoh, Shinichi; and Ide, Kesao, to Shin-Etsu Chemical Co. Ltd. Process for producing α , ω -hydroxyfluoroalkyl-polysiloxanes, 5,087,683, Cl. 528-14.000.
- Arai, Michio. Ventilating device for helmet, 5,086,520, Cl. 2-424.000.
- Arai, Yasuyuki: See—
Nakayama, Shunichi; Takayanagi, Yasushi; and Arai, Yasuyuki, 5,086,951, Cl. 222-129.100.
- Arakawa, Eiji: See—
Suzuki, Hiroshi; Arakawa, Eiji; Takagi, Kazuhiko; and Watanabe, Hiroshi, 5,087,142, Cl. 400-616.000.
- Araki, Kenji: See—
Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; and Horie, Shigetake, 5,087,321, Cl. 156-608.000.
- Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; Horie, Shigetake; and Nakahama, Yasumitsu, 5,087,429, Cl. 422-249.000.
- Araki, Morio: See—
Odagawa, Satoshi; Kashiwazaki, Takashi; Araki, Morio; Fukushima, Atsuhiko; and Akiyama, Kazuhiro, 5,087,919, Cl. 342-357.000.
- Arase, Susumu: See—
Obama, Kenjiro; Takasu, Hiroshi; Arase, Susumu; and Fujii, Hiroyuki, 5,087,653, Cl. 524-158.000.
- ARC Machinery Corporation: See—
Duecker, Peter, 5,087,313, Cl. 156-271.000.
- Arch, Jonathan R., to Beecham Group p.l.c. Method for increasing the weight gain and improving the feed utilization efficiency of livestock, 5,087,626, Cl. 514-230.500.
- Arendt, Ronald H.: See—
Fleischer, Robert L.; and Arendt, Ronald H., 5,087,606, Cl. 505-1.000.
- Arganbright, Robert P., to Chemical Research & Licensing Company. Hydroisomerization process, 5,087,780, Cl. 585-259.000.
- Arii, Takashi: See—
Mizuta, Fumio; Arii, Takashi; Matsuda, Yoshiharu; and Takegami, Itsuo, 5,086,858, Cl. 180-68.300.
- Arimoto, Kazutami: See—
Matsuda, Yoshio; Arimoto, Kazutami; Oishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,088,063, Cl. 365-201.000.
- Arison, Byron H.: See—
Chen, Shieh-Shung T.; Arison, Byron H.; White, Raymond F.; and Inamine, Edward S., 5,087,702, Cl. 546-118.000.
- Aristech Chemical Corporation: See—
Schutz, Alain A.; and Cullo, Leonard A., 5,087,781, Cl. 585-409.000.
- Arizona Instrument Corp.: See—
Bell, William E.; and McNerney, John J., 5,087,574, Cl. 436-120.000.
- Arkla Products Company: See—
Broadway, John M.; Koschmann, Martin L.; and Mullikin, William D., 5,086,555, Cl. 29-714.000.
- Armada de la Republica de Venezuela: See—
Leal, Orlando; Bolivar, Carmelo; Sepulveda, Gonzalo; Molleja, Gregorio; Martinez, German; and Esparragoza, Leon, 5,087,597, Cl. 502-62.000.
- Armco Corporation: See—
Washburn, Robert B., 5,087,153, Cl. 405-154.000.
- Arnolds, Carl: See—
Gasparrini, Charles R.; and Arnolds, Carl, 5,086,701, Cl. 101-425.000.
- Asada, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission, 5,087,232, Cl. 475-278.000.
- Asada, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Duplicate torque-transmitting connection between rotary members and shaft members in transmission, 5,087,233, Cl. 475-278.000.
- Asahi Chemical Co., Ltd.: See—
Osamu, Manabe; Shigeo, Fujita; Shizuo, Iwata; and Morihiro, Kamiyama, 5,087,704, Cl. 548-427.000.
- Asahi Glass Co., Ltd.: See—
Chen, Tu; Iseda, Toru; and Mannami, Kazuo, 5,087,481, Cl. 427-129.000.
- Katagiri, Yoshitaka, 5,086,729, Cl. 118-729-.
- Asahi Kasei Kogyo Kabushiki Kaisha: See—
Kashiwada, Akio; and Hiroyoshi, Tatsuo, 5,087,345, Cl. 204-295.000.
- Toyomoto, Kazuo; and Ootoyo, Takehiko, 5,087,372, Cl. 210-651.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: See—
Maruyama, Koichi, 5,087,990, Cl. 359-794.000.
- Negishi, Kiyoshi, 5,087,813, Cl. 250-236.000.
- Asai, Mitsuo: See—
Ishibashi, Kenichi; Hayashi, Takehisa; Doi, Toshio; Asai, Mitsuo; Masuda, Noboru; Yamagiwa, Akira; and Okabe, Toshihiro, 5,087,829, Cl. 307-269.000.
- Asakawa, Kyoichi, to NEC Corporation. Liquid cooling apparatus with improved leakage detection for electronic devices, 5,086,829, Cl. 165-12.000.
- Asakura, Tsutou: See—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; and Asakura, Tsutou, 5,087,539, Cl. 430-48.000.
- Asano, Katsuo: See—
Wada, Yoshihiro; Suzuki, Kazunori; Kono, Tadashi; and Asano, Katsuo, 5,087,144, Cl. 401-199.000.
- Asano, Osamu: See—
Shoji, Michihiro; and Asano, Osamu, 5,087,157, Cl. 408-9.000.
- Asano, Yasushi; and Kataumi, Yoshimasa, to Fuji Kiko Company, Limited. Adjustable pedal, 5,086,663, Cl. 74-512.000.
- Askin, David: See—
Volante, Ralph P.; Askin, David; Shinkai, Ichiro; and Ryan, Kenneth M., 5,087,703, Cl. 548-406.000.
- Aslam, Mohammad; Linstid, Henry C., III; and Davenport, Kenneth G., to Hoechst Celanese Corporation. Preparation of 6-substituted-2-vinylnaphthalene, 5,087,769, Cl. 568-736.000.
- Aslam, Muhammad; Farnand, Thomas J.; and Tamary, Ernest J., to Eastman Kodak Company. Receiving sheet bearing a toner image embedded in a thermoplastic layer, 5,087,536, Cl. 430-13.000.
- ASMO Co., Ltd.: See—
Kikuta, Tomoyuki; and Kawaguchi, Chikara, 5,086,900, Cl. 192-142.00R.
- Association de Gestion de l'Ecole Francaise de Papeterie et de l'Imprimerie: See—
Silvy, Jacques; and Pascal, Rene, 5,087,823, Cl. 250-573.000.
- Astechnologies, Inc.: See—
Elliott, George M.; and Simmons, Fred A., 5,087,311, Cl. 156-212.000.
- Astra Holdings Public Limited Company: See—
Guest, Martin J.; Topping, Richard E.; and McGregor, Roderick J., 5,087,393, Cl. 264-3.200.
- AT&T Bell Laboratories: See—
Amrany, Daniel; and Farrow, Cecil W., 5,088,057, Cl. 364-703.000.
- Chen, Young-Kai; Hong, Minghui; and Wu, Ming-Chiang, 5,088,099, Cl. 372-45.000.
- Choi, Jae H.; Mottine, John J.; Spazak, Walter J., Sr.; Tate, Walter D.; and Vesperman, William C., 5,087,521, Cl. 428-389.000.
- Wei, Lee-Fang, 5,088,113, Cl. 375-53.000.
- Zirngibl, Martin, 5,088,095, Cl. 372-6.000.
- Ateo Corporation: See—
Thomas, Tim; Christenson, Eric; Holstrom, Bob; and Mino, Eugene, Jr., 5,087,927, Cl. 346-108.000.
- Athanasiou, George. Tool checking device for use with numerically controlled machines, 5,086,590, Cl. 51-165.710.
- Atlas Powder Company: See—
Jacob, Merritt, 5,086,702, Cl. 102-275.500.
- Atsugi Motor Parts Company, Ltd.: See—
Ishibashi, Takehisa; Kakizaki, Shinobu; Watanabe, Yoshiaki; and Kanai, Fukashi, 5,087,868, Cl. 318-696.000.
- Atsugi Unisia Corporation: See—
Yamaoka, Fumiyuki, 5,086,649, Cl. 73-118.100.
- Audi AG: See—
Motzet, Josef; Sprehe, Harald; and Stemmer, Xaver, 5,087,146, Cl. 403-13.000.
- Ausimont S.r.l.: See—
Marraccini, Antonio; Pasquale, Antonio; and Vincenti, Marco, 5,087,765, Cl. 568-677.000.
- Ausimont, S.p.A.: See—
Tonelli, Claudio; and Tortelli, Vito, 5,087,776, Cl. 570-134.000.
- Austel, Volkhard: See—
Hargrave, Karl D.; Schmidt, Gunther, deceased; Engel, Wolfhard; and Austel, Volkhard, 5,087,625, Cl. 514-220.000.
- Auternaud, Jacques; Barthelemy, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foucras, Jean; Louis, Michel; Marelllo, Georges; Poveda, Pierre; and Roux, Christian, to Aerospatiale Societe Nationale Industrielle. Self-motorized antifriction joint and an articulated assembly, such as a satellite solar panel, equipped with such joints, 5,086,541, Cl. 16-227.000.
- Automobiles Peugeot et al.: See—
Advenier, Pierre; and Regneault, Marcel, 5,087,016, Cl. 251-129.150.
- Avalon, Timothy D.: See—
Gentile, Christopher T.; Wallace, Michael; Avalon, Timothy D.; Goodman, Scott; Fuller, Richard; and Hall, Tracy, 5,086,785, Cl. 128-782.000.
- Avital, Boaz. Myocardial iontophoresis, 5,087,243, Cl. 604-20.000.
- AVL Gesellschaft fuer Verbrennungskraftmaschinen und Messtechnik mbH: See—
Fredericks, George E.; and Jaschek, Alfred, 5,086,653, Cl. 73-861.610.
- Awofeso, Anthony O.; and Harper, Frank D., to James River Corporation of Virginia. Paper towels having bulky inner layer, 5,087,324, Cl. 162-111.000.
- B. F. Goodrich Company, The: See—
Magistro, Angelo J., 5,087,791, Cl. 585-657.000.
- Russell, Donald L.; and Kahrs, Michael P., 5,086,821, Cl. 152-410.000.

Woodson, Charles S.; Janda, Dennis; and Strichartzuk, Paul T., 5,087,343, Cl. 204-242.000.

Baba, Masatoshi: See—
Tanaka, Norio; Kakuta, Takuya; Oya, Eiichi; and Baba, Masatoshi, 5,087,724, Cl. 558-425.000.

Baba, Nobuyoshi: See—
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,087,330, Cl. 205-75.000.

Babcock-Hitachi Kabushiki Kaisha: See—
Kato, Yasuyoshi; Konishi, Kunihiko; Akama, Hiroshi; Matsuda, Toshiaki; and Teshima, Nobue, 5,087,600, Cl. 502-309.000.

Babcock & Wilcox Company, The: See—
Bingham, Billy E.; Coiner, John R., Jr.; Pettus, William G.; and Short, Barrett J., 5,087,412, Cl. 376-368.000.

Babirad, Stefan A.; Janulis, Eugene P.; Stacey, Nicholas A.; and Elsbernd, Cheryl L. S., to Minnesota Mining and Manufacturing Company. Fluorine-containing acrylate and methacrylate side-chain liquid crystal monomers and polymers. 5,087,672, Cl. 525-329.500.

Bablon, Guy P.: See—
Montagnon, Jean R.; Bablon, Guy P.; Dagois, Gerard L.; and Ventresque, Claire C., 5,087,354, Cl. 210-108.000.

Baby Trend, Inc.: See—
Mong-Hsing, Chai, 5,087,066, Cl. 280-644.000.

Bacchicocchi, Alberto, to Sao Paulo Alparagatas, S.A. Impact damping system applicable to sport shoes. 5,086,574, Cl. 36-35.00R.

Bach, Gary M.; Baehman, Carl R.; Holt, Frederick M., Jr.; and Highfield, Terry T., to Reynolds Consumer Products, Inc. Pallet for heavy loads. 5,086,927, Cl. 206-597.000.

Bach, Uwe: See—
Weiler, Rolf; Bach, Uwe; Paschke, Klaus-Dieter; and Roth, Gerald, 5,087,907, Cl. 340-454.000.

Bae, Hae Kyung: See—
Jung, Il Nam; Hwang, Sang Yo; and Bae, Hae Kyung, 5,087,717, Cl. 556-416.000.

Baehman, Carl R.: See—
Bach, Gary M.; Baehman, Carl R.; Holt, Frederick M., Jr.; and Highfield, Terry T., 5,086,927, Cl. 206-597.000.

Baer, James W., to Stiff Technology Partners-II. Carriage optics system for optical data storage system. 5,088,079, Cl. 369-44.260.

Baggio, Horacio A.; and Burrows, Mark D., to Woodhead Industries, Inc. Portable fluorescent lamp fixture. 5,088,015, Cl. 362-217.000.

Baggiolini, Barbara J.: See—
Baggiolini, Enrico G., deceased; Baggiolini, Barbara J.; Hennessy, Bernard M.; Shuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 5,087,619, Cl. 514-167.000.

Baggiolini, Barbara Judith, executrix: See—
Baggiolini, Enrico G., deceased; Baggiolini, Barbara J.; Hennessy, Bernard M.; Shuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 5,087,619, Cl. 514-167.000.

Baggiolini, Enrico G., deceased (by Baggiolini, Barbara Judith, executrix); Baggiolini, Barbara J.; Hennessy, Bernard M.; Shuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R. Vitamin D₃ analogs. 5,087,619, Cl. 514-167.000.

Baglin, Richard, to Societe Jaeger. Static sealing system between two flat-faced casings. 5,087,056, Cl. 277-180.000.

Bagwell, Alan C., to Reynolds Metals Company. Can end testing. 5,086,653, Cl. 73-835.000.

Bailey, Wam. Paint roller cover cleaning apparatus. 5,086,796, Cl. 134-182.000.

Bailly, Jean C.; Havas, Laszlo; Sandis, Stylianos; Blaya, Alain; and Crouzet, Pierre, to BP Chemicals Limited. Process for the polymerization and copolymerization of alpha-olefins in a fluidized bed. 5,087,522, Cl. 428-402.000.

Baird, Thomas E.: See—
Lackner, John R.; Grzywna, Stanley E.; Weber, Ralph A.; and Baird, Thomas E., 5,086,536, Cl. 15-328.000.

Baker Hughes Incorporated: See—
Baugh, J. Lindley, 5,086,845, Cl. 166-382.000.

Brown, David P., 5,087,391, Cl. 261-122.000.

Cassel, Terry E.; and Lynde, Gerald D., 5,086,838, Cl. 166-55.600.

Kurowski, Serge, 5,087,363, Cl. 210-328.000.

Baker, Joffre B.: See—
Scott, Randy W.; and Baker, Joffre B., 5,087,368, Cl. 210-635.000.

Bakker, Gregory W.: See—
Chen, Shih-Oh; Chiang, Steve S.; and Bakker, Gregory W., 5,087,958, Cl. 357-51.000.

Balch, Richard A.; Keturakis, Andrius A.; and Velte, Scott D., to General Electric Company. Isolated high voltage transformer for electric power meter. 5,087,875, Cl. 324-157.000.

Baldwin, Ronald A.: See—
Drapcho, James M.; Cope, Kenneth P.; Chapin, Melodee A.; Bungo, Edward M.; Baldwin, Ronald A.; and Crouse, Ralph W., 5,087,213, Cl. 439-672.000.

Baldwin Technology Corp.: See—
Gasparrini, Charles R.; and Arnolds, Carl, 5,086,701, Cl. 101-425.000.

Ballard, Clifford P.: See—
Marsh, Gary B.; Fanelli, Anthony J.; Burlew, Joan V.; and Ballard, Clifford P., 5,087,595, Cl. 501-105.000.

Balls-Technique Ltd.: See—
Ben-Dosa, Chaim, 5,086,833, Cl. 165-95.000.

Bally, Alexander: See—
Castel, John C.; and Bally, Alexander, 5,086,788, Cl. 128-800.000.

Bamelis, Jean-Marie: See—
Van Bogaert, Philippe; Bamelis, Jean-Marie; Peeters, Jozef; and Markey, Hugo, 5,086,812, Cl. 139-435.200.

Ban, Mikichi: See—
Kakuchi, Osamu; and Ban, Mikichi, 5,087,121, Cl. 356-73.000.

Banjo, Tetsuya; Iida, Eiji; Tokunaga, Katsuhiko; and Kiyota, Satoshi, to Suzuki Kabishiki Kaisha. Motorcycle having body height adjustor. 5,086,866, Cl. 180-219.000.

Banner Engineering Corporation: See—
Fayfield, Robert W., 5,087,838, Cl. 307-465.000.

Bao, Yen T.: See—
Loepky, Richard N.; and Bao, Yen T., 5,087,671, Cl. 525-328.200.

Barajas, Saul: See—
Whittaker, Bruce E.; and Barajas, Saul, 5,087,839, Cl. 307-465.000.

Whittaker, Bruce E.; and Barajas, Saul, 5,087,953, Cl. 357-40.000.

Baran, Jeffrey K.: See—
Van Maanen, Keith D.; and Baran, Jeffrey K., 5,086,887, Cl. 188-77.00R.

Barbe, Alain. Omnidirectional electro-acoustical chamber. 5,086,871, Cl. 181-145.000.

Barbera, Bradley D.: See—
Combes, Richard C.; Schwimmer, William H.; and Barbera, Bradley D., 5,087,471, Cl. 426-573.000.

Barbere, Michael D.: See—
Wolinsky, Harvey; King, Spencer L.; and Barbere, Michael D., 5,087,244, Cl. 604-53.000.

Barlow, David E.: See—
Miller, Arnold; Barlow, David E.; and Saitoh, Tatsuya, 5,087,264, Cl. 606-159.000.

Barnish, Ian T.; and James, Keith, to Pfizer Inc. Glutaric acid derivatives and preparation thereof. 5,087,732, Cl. 560-122.000.

Barni, Brian J.: See—
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Barra, Charles L.; and Neese, William M. Electronic fishing bobber. 5,086,581, Cl. 43-26.100.

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- Blank, Roy L.: See—
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- Blankers, Hendrik J., to U. S. Philips Corporation. Switching arrangement for high pressure discharge lamp. 5,087,859, Cl. 315-209.00R.
- Blanvillain, Gerard; and Forte, Pascal, to Faiveley Transport. Air-cushion pantograph. 5,087,797, Cl. 191-66.000.
- Blase, Michael R.; Rosendall, Henry J.; and Goodrich, Gordon W., to Bissell Inc. Fluid flow control valve. 5,087,018, Cl. 251-245.000.
- Blaser, Giles R., to Amplas, Inc. Dual drive web feed apparatus and method. 5,086,964, Cl. 226-108.000.
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- Large, David T., 5,086,995, Cl. 244-102.00R.
- Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,087,701, Cl. 548-431.000.
- Twede, Shane K., 5,086,953, Cl. 222-322.000.
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- Bohmholdt, Gerd; Disteldorf, Josef; Kirchner, Peter; and Michalczak, Hans-Werner, to Huels Aktiengesellschaft. Circulation process for the production of aliphatic and cycloaliphatic diisocyanates. 5,087,739, Cl. 560-345.000.
- Boivin, Gilbert, to GEC Alsthom SA. Hinged bogey for rail vehicles. 5,086,706, Cl. 105-168.000.
- Bojas, Edward J., to Eaton Corporation. Viscous coupling by-pass element for a torque converter and improved bushing design. 5,086,893, Cl. 192-3.290.
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- Botman, Martha J. P.; Nootenboom, Peter; Oudejans, Johannes C.; and Verzijl, Dirk, to Unilever Patent Holdings B.V. Nickel/silica catalysts and their preparation. 5,087,599, Cl. 502-252.000.
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- Boyd, Dudley G.; Price, Edward G.; Kanaga, Valiant G.; and Chen, Nian, to Deltave Limited. Discharge lamp life and lamp lumen life-extender module, circuitry, and methodology. 5,087,861, Cl. 315-247.000.
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- Boynton, Herb; and Evans, Gary W., to Nutrition 21. Chromic picolinate treatment. 5,087,624, Cl. 514-188.000.
- Boysen, John E.: See—
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- Braner, Inc.: See—
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- Brearely, Malcolm; and Moseley, Richard B., to Lucas Industries public limited company. Electronic braking system. 5,088,042, Cl. 364-426.010.
- Breen, William C. Method and apparatus for holding cut trees. 5,086,583, Cl. 47-40.500.
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- Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., to Zenith Electronics Corporation. VSB HDTV transmission system with reduced NTSC co-channel interference, 5,087,975, Cl. 358-183.000.
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- Compagnie des Eaux et de L'Ozone: See—
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- Compaq Computer Corporation: See—
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- Cooper, James H. Exercise device and method for foot muscle stretching. 5,087,036, Cl. 272-96.000.
- Cooper, Rosanna M. Combination diaper training pant for adults and children. 5,087,253, Cl. 604-385.100.
- Coöperatieve Verkoop-en Productievereniging van Aardappelmeel en Derivaten "AVEBE" B.A.: See—
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Kearns, Edward G.; Roessler, Norbert; van Cauter, Gustaaf; and Ukrainick, Kreso, 5,087,820, Cl. 520-385.100.

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Ellis, John R.; Li, Kai; and Appel, Andrew, 5,088,036, Cl. 395-425.000.

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Spielman, Howard A.; and Considine, C. J., 5,088,052, Cl. 395-158.000.

Dillon, John B.: See—

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Sato, Yasuhiro; Hirano, Yoichi; and Yamaguchi, Sataro, 5,087,999, Cl. 361-17.000.

DiRossi, Raymond R.: See—

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Crossdale, Garry W.; Johnson, Paul A.; and Bird, Kenneth J. H., 5,086,950, Cl. 222-88.000.

Kryk, Lewis R., 5,086,952, Cl. 222-189.000.

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Bolduc, Scott, 5,086,870, Cl. 180-333.000.

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Zaba, Jerzy M.; and Manning, Howard J., 5,087,924, Cl. 346-75.000.

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Giani, Roberto, 5,087,698, Cl. 544-394.000.

Donnelly, John J.; and Germano, Bruno J., to Grumman Aerospace Corporation. Oscillating and continuous motion gear drive assembly. 5,086,994, Cl. 244-50.000.

Donovan, Thomas D. History game apparatus utilizing fiber optic cable segments. 5,087,050, Cl. 273-237.000.

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Dorion, Irene: See—

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Dornier GmbH: See—

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Dosako, Shinichi: See—

Tanimoto, Morimasa; Sato, Kaoru; Dosako, Shinichi; and Honda, Yoshihiko, 5,087,369, Cl. 210-635.000.

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Doss, David, to Everbrite, Inc. Power supply circuit for gas discharge tube. 5,087,860, Cl. 315-224.000.

Doublet, Luc, to Ets. Doublet S.A. Table flag holder. 5,087,012, Cl. 248-512.000.

Douglas, Patrick J., to Extec Screens and Crushers Limited. Foldable framework for belt conveyors. 5,086,911, Cl. 198-632.000.

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Hlavaty, David G.; Doveinis, Juozas; and Gergoe, Bela, 5,086,586, Cl. 49-211.000.

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Hitchcock, Martin K., 5,087,395, Cl. 264-22.000.

Laughner, Michael K., 5,087,663, Cl. 525-67.000.

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Prejean, Thomas G., 5,087,669, Cl. 525-239.000.

Tong, Wen H.; and Priddy, Duane B., 5,087,738, Cl. 560-302.000.

Dow Corning Corporation: See—

Snow, Steven A., 5,087,715, Cl. 556-413.000.

Wright, Antony P.; and Varaprath, Padmakumari J., 5,087,716, Cl. 556-413.000.

Dowell Schlumberger Incorporated: See—

Soucemarianadin, Arthur; and Chan, Keng S., 5,086,840, Cl. 166-294.000.

Dragerwerk Aktiengesellschaft: See—

Jessel, Wolfgang; and Masurat, Kurt, 5,086,642, Cl. 73-1.00G.

Drapcho, James M.; Cope, Kenneth P.; Chapin, Melodee A.; Bungo, Edward M.; Baldwin, Ronald A.; and Crouse, Ralph W., to General Motors Corporation. Lamp socket. 5,087,213, Cl. 439-672.000.

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Ferri, James; and Samurin, Norman A., 5,087,172, Cl. 415-230.000.

Driscoll, Patrick R., to Rhone-Poulenc, Inc. 5-substituted thiadiazole ureas and their use as herbicides. 5,087,284, Cl. 71-90.000.

Drug Delivery Systems Inc.: See—

Sibalis, Dan, 5,087,240, Cl. 604-20.000.

Drummond, George S.: See—

Kappas, Attallah; and Drummond, George S., 5,087,622, Cl. 514-185.000.

Drummond, James E.: See—

Chang, David B.; and Drummond, James E., 5,086,972, Cl. 239-3.000.

Du Pont Canada Inc.: See—

Turek, Douglas E.; and Sibley, Mark A., 5,086,984, Cl. 242-18.00R.

Du Pont Merck Pharmaceutical Company: See—

Di Meo, James J., 5,087,565, Cl. 435-89.000.

Earl, Richard A.; and DeNoble, Victor J., 5,087,628, Cl. 514-256.000.

Duan, T. L.: See—

Tuan, C. T.; and Duan, T. L., 5,087,217, Cl. 441-61.000.

Duan, Youlu; Jin, Shanrong; Huang, Tingchun; Sun, Jin; and Yu, Xinying, to Shanghai Institute of Organic Chemistry Academia Sinica. Fluoropolymer alloys. 5,087,680, Cl. 526-254.000.

Dubief, Claude: See—

Chizat, Francois; Peignier, Michel; Grollier, Jean F.; and Dubief, Claude, 5,087,443, Cl. 424-47.000.

Dubois, Jean C.: See—

Robin, Philippe; Broussoux, Dominique; and Dubois, Jean C., 5,087,816, Cl. 250-338.300.

Ducane Company, Inc.: See—

Berger, Bernard B., 5,086,753, Cl. 126-41.00R.

Duecker, Peter, to ARC Machinery Corporation. Paper web alignment system. 5,087,313, Cl. 156-271.000.

Duemngen, Gerd: See—

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Duffy, Douglas C.; and Temby, Richard D., to Rheem Australia Ltd. Drum or pail closure. 5,086,944, Cl. 220-658.000.

Duke, Susan A.: See—

Jackson, Robert J.; Duke, Susan A.; and Wicks, Mark A., 5,087,444, Cl. 424-49.000.

Dumas, Sylviane; and Takerkart, Georges, to Sanofi. Fluorinated gelatin and process for its preparation. 5,087,694, Cl. 530-354.000.

Dumbroff, Erwin B.; Thompson, John E.; and Shih, Ching Y., to University of Waterloo. Control of senescence in fruits, vegetables and flowers. 5,087,417, Cl. 422-1.000.

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Provence, Marc; Rousset, Didier; and Dunand, Josiane, 5,087,065, Cl. 280-615.000.

Duncan, James L., to Siemens-Pacesetter, Inc. System and method for automatically compensating for latency conduction time in a programmable pacemaker. 5,086,774, Cl. 128-419.0PG.

Dunk The Clown, Inc.: See—

O'Neil, T. Scott, 5,087,054, Cl. 273-384.000.

Dunlap, David H.: See—

Phillips, Philip W.; Wu, Hong-L.; Dunlap, David H.; and Kundu, Kalyan, 5,087,948, Cl. 357-16.000.

Dunn, Wallace. Multi-tank liquid variable container storage system. 5,086,800, Cl. 137-1.000.

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Bruno, Salvatore A.; and Monson, William L., 5,087,437, Cl. 423-598.000.

Christell, Lance A., 5,087,652, Cl. 524-59.000.

Felix, Vinci M., 5,087,329, Cl. 203-67.000.

McKinney, Ronald J., 5,087,723, Cl. 558-338.000.

Peiffer, Robert W., 5,087,549, Cl. 430-253.000.

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Vulpitta, Anthony C.; Dwyer, William P.; and Patrosch, Thomas P., 5,086,949, Cl. 222-1.000.

Dyes GmbH: See—

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Gladish, Herbert E.; and Raikums, Christopher L., 5,086,908, Cl. 198-468.600.

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Schreder, Felix, 5,087,807, Cl. 219-451.000.

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McGovren, J. Patrick; Williams, Marta G.; and Earhart, Robert H., 5,087,639, Cl. 514-561.000.

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Earnshaw, John M.; and Bly, Michael H., to Holyand Fox Limited. Umbrella frame. 5,086,797, Cl. 135-20.100.

Earp, Leonard, to Eaton Corporation. Upshift brake. 5,086,659, Cl. 74-411.500.

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Altmann, Conrad, 5,087,940, Cl. 355-204.000.

Aslam, Muhammad; Farnad, Thomas J.; and Tamary, Ernest J., 5,087,536, Cl. 430-13.000.

Chari, Krishnan; and Beck, James T., 5,087,554, Cl. 430-546.000.

Creveling, Clyde M., 5,087,943, Cl. 355-215.000.

Hilderbrand, James R., 5,087,771, Cl. 568-753.000.

Jackson, Todd A., 5,087,809, Cl. 250-226.000.

McDougal, David R., 5,087,939, Cl. 355-200.000.

Ng, Yee S.; and Tai, Hwai T., 5,087,981, Cl. 358-459.000.

No, Young; and Stephenson, Stanley W., 5,087,925, Cl. 346-76.0PH.

Randall, Kent A., 5,087,945, Cl. 355-272.000.

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Sachs, Gunter; and Mirlieb, Bernd, 5,087,024, Cl. 271-11.000.

Schaertel, Daniel P., 5,087,979, Cl. 358-296.000.

Strom, Laurie A.; Carnall, Edward, Jr.; Ferranti, Steven A.; and Mir, Jose M., 5,087,607, Cl. 505-1.000.

Taylor, Roy Y., II, 5,087,116, Cl. 359-851.000.

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Bojas, Edward J., 5,086,893, Cl. 192-3.290.

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Giere, David W.; and Gafvert, Sven B., 5,087,227, Cl. 475-72.000.

Latsko, James M., 5,086,899, Cl. 192-88.00B.

Reynolds, Joseph D., 5,086,897, Cl. 192-53.00E.

Eaton, Eric T.; and Whaley, Rodney S., to Motorola, Inc. Selective call receiver having a light channel for providing a visual alert. 5,087,906, Cl. 340-311.100.

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Yoshizawa, Michio; Matsunaga, Tsunobumi; Ebata, Makoto; and Oyama, Yasuo, 5,087,856, Cl. 313-631.000.

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Higuchi, Hirofumi; Kida, Koichi; and Ebata, Shuji, 5,087,737, Cl. 560-215.000.

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Eckhardt, Dennis C.: See—

Grabner, David W.; Eckhardt, Dennis C.; and Pawlak, Andrzej M., 5,086,862, Cl. 180-132.000.

Ecological Engineering Associates: See—

Todd, John H.; and Silverstein, Barry, 5,087,353, Cl. 210-94.000.

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Melchior, Jean; Andre, Thierry; and Edelmann, Henri B., 5,086,735, Cl. 123-65.0VD.

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Carome, Edward F., 5,087,810, Cl. 250-227.210.

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Ehlinger, Jeffrey C.: See—

Mims, Michael G.; Mueller, Mark D.; and Ehlinger, Jeffrey C., 5,086,844, Cl. 166-383.000.

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Kasper, Dietmar; Woltron, Herbert; Kreibiehl, Guenter; Eichenauer, Ulrich; and Becker, Norbert, 5,087,500, Cl. 428-116.000.

Eisenberger, George: See—

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Wright, Bob W.; and Fruchter, Jonathan S., 5,087,360, Cl. 210-198.200.

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Bergstrom, Russell N., 5,087,885, Cl. 324-547.000.

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Lisiecki, Robert E., 5,086,928, Cl. 229-217.000.

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Shamaly, Thomas P.; and Schwartz, Sidney D., 5,086,551, Cl. 29-243.523.

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Swars, Helmut, 5,086,660, Cl. 74-446.000.

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English, Brent W.; Manthey, Robert W.; and Gottwalt, Kevin, to University of Wisconsin System on Behalf of University of Wisconsin - Stout, Board of Regents of the. Dispenser closure assembly. 5,086,941, Cl. 220-254.000.

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Ets. Doublet S.A.: See—
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Exer Icer Towels, Inc.: See—
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Extac Screens and Crushers Limited: See—
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Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; and Davis, William M., 5,087,674, Cl. 525-356.000.

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Marsh, Gary B.; Fanelli, Anthony J.; Burlew, Joan V.; and Ballard, Clifford P., 5,087,595, Cl. 501-105.000.

Fanuc Ltd.: See—
Irie, Michiaki; Ichisa, Nobuaki; and Yamazaki, Etsuo, 5,088,101, Cl. 372-59.000.

Komiyama, Hidetsugu; Kurakake, Mitsuo; and Hattori, Seiichi, 5,088,084, Cl. 369-75.100.

Faricerea S.p.A.: See—
Palumbo, Gianfranco, 5,087,506, Cl. 428-194.000.

Farin, Gunter; Geiselhart, Franz; and Klett, Johannes, to Erbe Elektromedizin GmbH. Apparatus for monitoring the application of neutral electrodes on a patient undergoing high frequency electro-surgery. 5,087,257, Cl. 606-35.000.

Farnand, Thomas J.: See—
Aslam, Muhammad; Farnand, Thomas J.; and Tamary, Ernest J., 5,087,536, Cl. 430-13.000.

Farr, William, to Prime Computer, Inc. Method and apparatus for improved disk access. 5,088,081, Cl. 369-54.000.

Farrow, Cecil W.: See—
Amrany, Daniel; and Farrow, Cecil W., 5,088,057, Cl. 364-703.000.

Farrow, Leonilda A.: See—
Chan, Siu W.; and Farrow, Leonilda A., 5,087,608, Cl. 505-1.000.

Faucher, Raymond G. Electrical plug and socket arrangement. 5,087,209, Cl. 439-320.000.

Faust, Steven M.: See—
Cherukuri, Subraman R.; Faust, Steven M.; and Mansukhani, Gul, 5,087,460, Cl. 426-5.000.

Fawley, Robert W.; Keetley, R. G.; and Treece, William D., to Sundstrand Corporation. Weld repairable combustor. 5,086,968, Cl. 228-119.000.

Fay, Albert B., Jr.: See—
Jerry, George J.; and Fay, Albert B., Jr., 5,086,959, Cl. 223-114.000.

Fay, Charles R.: See—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 5,088,033, Cl. 395-500.000.

Fayfield, Robert W., to Banner Engineering Corporation. Sourcing or sinking output circuit. 5,087,838, Cl. 307-465.000.

Fazan, Pierre C.: See—
Chan, Hiang C.; and Fazan, Pierre C., 5,087,586, Cl. 437-72.000.

Fedeli, Jean-Marc; and Magnin, Joel, to Commissariat a l'Energie Atomique. Detection device for magnetic bubble memory. 5,088,059, Cl. 365-8.000.

Fee, Brendan: See—
Burnard, Jonathan J.; and Fee, Brendan, 5,087,137, Cl. 400-249.000.

Feinbloom, Richard E., to Designs For Vision, Inc. Optical magnifier apparatus. 5,087,112, Cl. 359-800.000.

Fel-Pro Incorporated: See—
Kropp, Harry C., 5,086,652, Cl. 73-767.000.

Felix, Vinci M., to Du Pont de Nemours, E. I., and Company. Process for separating pentafluoroethane from a mixture of halogenated hydrocarbons containing chloropentafluoroethane. 5,087,329, Cl. 203-67.000.

Ferguson, Victor A.: See—
Gordon, Ralph A.; Ferguson, Victor A.; Foulleux, Bernard; Schonenberger, Eric; and Gregoire, Gabriel, 5,086,884, Cl. 188-71.900.

Ferranti, Steven A.: See—
Strom, Laurie A.; Carnall, Edward, Jr.; Ferranti, Steven A.; and Mir, Jose M., 5,087,607, Cl. 505-1.000.

Ferrari, Dario, to Interco Italia S.p.A. Process for the production of a cosmetic product with powders of several colors or different characteristics. 5,086,791, Cl. 132-200.000.

Ferri, James; and Samurin, Norman A., to Dresser-Rand Company, A General Partnership. Compressor cartridge seal method. 5,087,172, Cl. 415-230.000.

Fertig, Douglas B. Multiple jar turret air brush. 5,086,978, Cl. 239-305.000.

Festo KG: See—
Behrens, Axel; Berwarth, Walter; Fetzer, Gerhard; and Nothdurft, Hansjorg, 5,087,845, Cl. 310-77.000.

Fettis, Michael E.: See—
Cottrell, Paul R.; and Fettis, Michael E., 5,087,792, Cl. 585-661.000.

Fetzer, Gerhard: See—
Behrens, Axel; Berwarth, Walter; Fetzer, Gerhard; and Nothdurft, Hansjorg, 5,087,845, Cl. 310-77.000.

Feugier, Alain: See—
Gateau, Paul; Maute, Michel; Feugier, Alain; and Perthuis, Edmond, 5,087,270, Cl. 48-127.900.

Fiat Auto S.p.A.: See—
dibenedetto, Giuseppe, 5,086,589, Cl. 49-502.000.

Fichtel & Sachs AG: See—
Schierling, Bernhard, 5,086,892, Cl. 192-3.290.

Figiel, Janusz: See—
Cheung, Nelson; Nix, Robert J.; and Figiel, Janusz, 5,087,306, Cl. 156-73.500.

Figley, Robert S. Bird feeder. 5,086,730, Cl. 119-52.300.

Filcon Corporation: See—
Niemeyer, Trenton A., 5,086,768, Cl. 128-205.240.

Finke, Manfred; Siegmund, Gunter; and Strutz, Heinz, to Hoechst Aktiengesellschaft. Process for the continuous oligomerization of hexafluoropropene oxide. 5,087,748, Cl. 562-851.000.

Finses, Gregory R., to Krueger International, Inc. Office panel partition and frame therefore. 5,086,606, Cl. 52-794.000.

Firmenich SA: See—
Chapuis, Christian, 5,087,612, Cl. 512-23.000.

First Pacific Networks: See—
McNamara, Robert P.; and Murphy, Timothy P., 5,088,111, Cl. 375-18.000.

Fischbach, Clark D.: See—
Petersen, Michael W.; and Fischbach, Clark D., 5,087,893, Cl. 330-296.000.

Fischer, Hubertus: See—
Bruder, Herbert; Fischer, Hubertus; Reinfelder, Hans-Erich; and Schmitt, Franz, 5,087,880, Cl. 324-309.000.

Fischer, Robert T.; and Galvan, Guadalupe L., to Miner Enterprises, Inc. Sliding gate structure with dual linkage per single actuator arrangement. 5,086,709, Cl. 105-282.100.

Fitzmorris, Bernard. Sport counting and timing device. 5,088,072, Cl. 368-69.000.

Fixel, Irving E. Total femoral hip system. 5,087,260, Cl. 606-65.000.

Flakus, Werner, to Huels Aktiengesellschaft. Two-component systems based on epoxides and diamines. 5,087,647, Cl. 523-412.000.

Flatley, Stephen L.; and Mears, Donald B., Jr., to Smith & Wesson Corp. Decocking mechanism for a semi-automatic firearm. 5,086,579, Cl. 42-70.080.

Fleischer, Robert L.; and Arendt, Ronald H., to General Electric Company. Bismuth-containing superconductors containing radioactive dopants. 5,087,606, Cl. 505-1.000.

Fletcher, David; and Welford, Barry, to Systemes Ozonics Inc. Air purifying system. 5,087,428, Cl. 422-186.070.

Fletcher, Grant M., to BASF Fibres Inc. Process for apparatus for collecting continuous supplied yarn to waste. 5,086,679, Cl. 83-24.000.

Flintab AB: See—
Haggstrom, Rolf P., 5,086,856, Cl. 177-161.000.

Florence, Thomas, to Owl 1990 Trust. Composite drywell, drywell system and method. 5,086,594, Cl. 52-169.500.

Florian, David W.: See—
Humphrey, Edward F.; De Angelo, Nelson J.; and Florian, David W., 5,087,090, Cl. 292-359.000.

Flory, Donald M.; Moore, Clark D.; Osterday, Craig A.; and De Hoff, Edward J., to General Motors Corporation. Booster interlock divider and diaphragm concept. 5,086,690, Cl. 92-48.000.

Flossdorf, Josef; Papamichael, Neophytos; Hanisch, Detlef; and Schilling, Henning, to Gesellschaft fur Biotechnologische Forschung mbH (GBF). Device for flow-injection analysis. 5,087,425, Cl. 422-81.000.

Fock, Jurgen; and Esselborn, Eberhard, to Th. Goldschmidt AG. Polyethers containing perfluoroalkyl groups, methods for their synthesis and their use as surfactants and as polyol components in the preparation of polyurethanes. 5,087,687, Cl. 528-50.000.

Folk, Lisa A.: See—
Burke, William J.; Folk, Lisa A.; and Ratkowski, Donald J., 5,087,392, Cl. 264-2.700.

Folts, Robert L.: See—
Simkulak, Richard J.; Boustead, Terry M.; Folts, Robert L.; and Sepe, George N., 5,087,187, Cl. 425-112.000.

Fontaine Industries: See—
Klumpp, Harry R., 5,086,566, Cl. 33-247.000.

Fontaine, William G.; and Beard, Vernon D., to Fontaine, William G. Automotive protection system with a telescoping protective sleeve between brake pedal and brake actuator. 5,086,868, Cl. 180-287.000.

Ford Motor Company: See—
Hickey, John C., 5,086,743, Cl. 123-468.000.
Hickey, John C., 5,086,980, Cl. 239-585.000.
Narula, Chaitanya K., 5,087,593, Cl. 501-96.000.

Ford New Holland, Inc.: See—
Newbery, Brian L.; Loewen, Kel W.; and Adolph, Grant H., 5,086,869, Cl. 180-329.000.

Forestry Injection Company FIC AB: See—
Mervig, Hans A. K., 5,086,584, Cl. 47-57.500.

Forgac, John M.: See—
Quinn, George P.; Kruse, Larry W.; Gebhard, Thomas J.; and Forgac, John M., 5,087,427, Cl. 422-144.000.

Formosa, Daniel: See—
Davis, Martha; Formosa, Daniel; Gerth, Jeannie; Moore, Patricia A.; Russak, Stephen; Thomsen, Tamara; and Viemeister, Tucker, 5,087,254, Cl. 604-386.000.

Forrest, Gabriel T. Method of drilling with fluid comprising peanut hulls ground to a powder. 5,087,611, Cl. 507-104.000.

Forsythe, Robert G.; Barnt, Brian J.; Rautenkranz, Karl; Schraff, Fred R.; and Davis, William H., to Medical Payment Systems. User invisible, printer line connected telecommunications link. 5,088,051, Cl. 395-117.000.

Forte, Pascal: See—
Blanvillain, Gerard; and Forte, Pascal, 5,087,797, Cl. 191-66.000.

Fortmann, Robert C.; Pinnow, Curtis C.; and Porcaro, Louis, to Carter-Hoffmann Corp. Liquid control assembly. 5,087,364, Cl. 210-390.000.

Foucras, Jean: See—
Auternaud, Jacques; Barteian, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foucras, Jean; Louis, Michel; Marelo, Georges; Poveda, Pierre; and Roux, Christian, 5,086,541, Cl. 16-227.000.

Fouilleux, Bernard: See—
Gordon, Ralph A.; Ferguson, Victor A.; Foulleux, Bernard; Schonenberger, Eric; and Gregoire, Gabriel, 5,086,884, Cl. 188-71.900.

Foulkes, Keith, Jr. Pots. 5,086,939, Cl. 220-94.00A.

Fowler, Franklin S., Jr.; and Jurgensen, Russell P., to Precision Diagnostics, Inc. Apparatus and method for sensing cardiac performance. 5,086,776, Cl. 128-661.090.

Fox, Thomas R.; and Kidd, Bruce R., to MacDon Industries Ltd. Check-relief valve for a hydraulic circuit. 5,086,613, Cl. 56-10.900.

Framatome: See—
Guironnet, Louis; and Blin, Michel, 5,087,411, Cl. 376-310.000.

Francis, Laurie A.; and Krentz, Richard H., to Saturn Corporation. Vehicular battery retainer and shield. 5,086,860, Cl. 180-68.500.

Frank, Walter C., to Union Camp Corporation. Isopropyl tetramethyl and pentamethyl indane musks. 5,087,770, Cl. 568-327.000.

Frank, Walter C., to Union Camp Corporation. Processes for preparing alkylated indanes and tetrahydronaphthalenes. 5,087,785, Cl. 585-459.000.

Frankle, Gerhard, to Daimler-Benz AG. Electronic speed governor for an air-compression internal-combustion engine. 5,086,739, Cl. 123-357.000.

Franklin, James R.; and Wright, Larry R. Electronic stop motion for textile draw frame. 5,086,542, Cl. 19-0.250.

Fraser, Warren: See—
Fairlie, Matthew; Smith, David; Fraser, Warren; and Meijer, Otto, 5,087,822, Cl. 250-572.000.

Frauenkron, Armin; and Gellenbeck, Herbert, to Sundwiger Eisenhutte Maschinenfabrik GmbH & Co. Apparatus for the after-cooling and coiling of cast metal strips. 5,086,826, Cl. 164-417.000.

Fredericks, Edward C.: See—
Conway, John F.; Fredericks, Edward C.; and Via, Giorgio G., 5,087,537, Cl. 430-15.000.

Fredericks, George E.; and Jaschek, Alfred, to AVL Gesellschaft fuer Verbrennungskraftmaschinen und Messtechnik mbH. Orifice measuring device. 5,086,655, Cl. 73-861.610.

French State, represented by the Minister of Post, Telecommunications and Space: See—
Vassallo, Charles; and Simon, Jean-Claude, 5,088,100, Cl. 372-45.000.

Frenklach, Michael Y.; Spear, Karl E.; and Koba, Richard J., to Pennsylvania Research Corporation. The synthesis of diamond powders in the gas phase. 5,087,434, Cl. 423-446.000.

Frentz, Dieter; Westbrook, Gregory L.; and Williams, William M., to Motorola Inc. Test contact fixture using flexible circuit tape. 5,087,877, Cl. 324-158.00F.

Frick, Beat; Kraft, Walter; and Ursprung, Karl, to Gretag Systems. Photoelectric scanner. 5,087,937, Cl. 355-1.000.

Friese, Hans-Jochen; and Pukropski, Aribert, to Huels Aktiengesellschaft. Wickbold combustion apparatus and kit for this apparatus. 5,087,422, Cl. 422-61.000.

Frings, Albert: See—
Seiler, Claus-Dietrich; Rauleder, Hartwig; Frings, Albert; and Kotsch, Hans-Joachim, 5,087,714, Cl. 556-401.000.

Fritz, Atlee E.: See—
Barth, Roy E.; Venable, Joseph M.; Fritz, Atlee E.; and McDonald, Arthur, 5,086,836, Cl. 165-164.000.

Frohlich, Eckhard, to Stahl GmbH & Co. Maschinenfabrik. Aligning table. 5,087,028, Cl. 271-273.000.

Fruchter, Jonathan S.: See—
Wright, Bob W.; and Fruchter, Jonathan S., 5,087,360, Cl. 210-198.200.

Fuchigami, Yasuhiro, to Nippon Sheet Glass Co., Ltd. Floating mold changer carriage. 5,087,280, Cl. 65-171.000.

Fuchs, Rudolf; and McGarrity, John, to Lonza Ltd. Process for the production of 1,3-cyclopentanediene. 5,087,760, Cl. 568-361.000.

Fuel Systems Textron Inc.: See—
Koblish, Theodore R.; and Bell, Leonard D., 5,086,979, Cl. 239-404.000.

Fuji Electric Co., Ltd.: See—
Kuroda, Masami; Amano, Masayo; and Furusho, Noboru, 5,087,541, Cl. 430-58.000.

Narita, Mitsuru; and Tanaka, Tatuo, 5,087,543, Cl. 430-66.000.

Fuji Jukogyo Kabushiki Kaisha: See—
Matsura, Takashi, 5,088,044, Cl. 364-431.080.

Takahashi, Tsutomu; Oshita, Seiichi; and Mouri, Toyohiko, 5,086,859, Cl. 180-79.100.

Watanabe, Hideo; and Morikawa, Koji, 5,086,737, Cl. 123-295.000.

Fuji Kiko Company, Limited: See—
Asano, Yasushi; and Kataumi, Yoshimasa, 5,086,663, Cl. 74-512.000.

Fuji Photo Film Co., Ltd.: See—
Hamada, Shingo, 5,087,025, Cl. 271-14.000.

Nagumo, Akihiko; and Nishio, Yuji, 5,087,938, Cl. 355-27.000.

Ogata, Kazutosugu; Seki, Kazuhisa; Kaneko, Kouji; Mikajiri, Satoshi; Kaneko, Kiyotaka; and Yoshida, Masanori, 5,087,936, Cl. 354-430.000.

Okino, Yoshiharu, 5,087,928, Cl. 346-108.000.

Saitou, Mitsuo, 5,087,555, Cl. 430-567.000.

Sakata, Takashi; and Yumoto, Toshiharu, 5,087,971, Cl. 358-160.000.

Sumi, Katsuo, 5,087,972, Cl. 358-166.000.

Fujii, Hiroyuki: See—
Obama, Kenjiro; Takasu, Hiroshi; Arase, Susumu, and Fujii, Hiroyuki, 5,087,653, Cl. 524-158.000.

Fujii, Masahiro: See—
Suzuki, Eriko; Hiraki, Jun; and Fujii, Masahiro, 5,087,446, Cl. 424-62.000.

Fujii, Seiro: See—
Onagi, Nobuaki; Suzuki, Shinichiro; Fujii, Seiro; Kobayashi, Takahiro; Yoshikawa, Takamasa; Yamaguchi, Masayasu; and Ogasawara, Kiyohide, 5,087,340, Cl. 204-192.200.

Fujikura Ltd.: See—
Takayama, Teruyuki; Nagasawa, Hiroki; Aoki, Sumihisa; Tominaga, Haruo; and Yokoyama, Kazuo, 5,087,300, Cl. 148-11.500.

Fujimoto, Akira, to Unisys Corporation. Input/output processor control system with a plurality of staging buffers and data buffers. 5,088,025, Cl. 395-275.000.

Fujimoto, Hitoshi; Masuda, Hisao; Osaka, Shuichi; and Uwagawa, Noriaki, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing semiconductor devices. 5,087,590, Cl. 437-209.000.

Fujimura, Itaru: See—
Fukanaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,087,068, Cl. 280-707.000.

Fujinaka, Mitsuru: See—
Komatsu, Nobuhiro; Fujinaka, Mitsuru; Sannomiya, Masayoshi; Kondo, Toshiro; and Nishiyama, Atsushi, 5,087,074, Cl. 280-788.000.

- Fujinuma, Michio: See—
Shimanaka, Chikafumi; Urushidani, Shinzo; Fujinuma, Michio; Hamano, Hiroshi; and Imai, Shinji, 5,088,045, Cl. 364-468.000.
- Fujisaka, Takahiko; Kirimoto, Tetsuo; Oh-hashi, Yoshimasa; and Kondo, Michimasa, to Mitsubishi Denki Kabushiki Kaisha. Radar system. 5,087,917, Cl. 342-84.000.
- Fujisawa, Masanori: See—
Ishiguro, Kazuhisa; and Fujisawa, Masanori, 5,087,890, Cl. 330-259.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 5,087,629, Cl. 514-300.000.
- Fujisawa, Toshiki, to Sakura Color Products Corporation. Ink compositions as steam sterilizing indicators for use in ink jet printing. 5,087,659, Cl. 524-594.000.
- Fujishima, Kazuyasu: See—
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,088,063, Cl. 365-201.000.
- Fujitsu Limited: See—
Abe, Kenichiro, 5,087,413, Cl. 419-9.000.
- Inagaki, Shinya; Yoshizawa, Sakae; and Sasaki, Kazuya, 5,087,110, Cl. 385-110.000.
- Kamada, Hiroshi; and Ozaki, Tooru, 5,087,969, Cl. 358-103.000.
- Kitamura, Mitsuo; and Hayami, Kazunori, 5,088,106, Cl. 375-4.000.
- Koyama, Susumu, 5,088,029, Cl. 395-275.000.
- Matsunaga, Hiroshi, 5,087,832, Cl. 307-350.000.
- Nakamura, Yuko; and Takechi, Satoshi, 5,087,551, Cl. 430-270.000.
- Fujiwara, Takuji; Ishii, Kozo; and Yoshimura, Hiroshi, to Mazda Motor Corporation. Line pressure control system for automatic transmission. 5,086,668, Cl. 74-866.000.
- Fujiwara, Takuji; and Ishii, Kozo, to Mazda Motor Corporation. Line pressure controller for automatic transmission. 5,086,669, Cl. 74-866.000.
- Fukanaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, to Nissan Motor Company, Limited. Anti-rolling control for actively controlled automobile suspension system with enhanced rolling detecting ability. 5,087,068, Cl. 280-707.000.
- Fukase, Katsuya: See—
Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, 5,087,530, Cl. 428-596.000.
- Fukuchi, Mikiharu; Nakano, Yasuhiko; Hayashi, Keisuke; Koseki, Isamu; Ito, Masami; and Akiyama, Ryoza, to Kabushiki Kaisha Toshiba; and Toshiba Material Engineering Corporation. Vibration-proof tungsten wire. 5,087,299, Cl. 148-11.50P.
- Fukuda, Kazushi: See—
Kamitsuma, Yasuo; Ishi, Isao; Nakagawa, Yusaku; Ohnaka, Noriyuki; Izuka, Tadashi; and Fukuda, Kazushi, 5,087,181, Cl. 418-178.000.
- Fukuda, Kenichi: See—
Kishita, Hirofumi; Sato, Shinichi; Kinami, Hitoshi; Takago, Toshio; Fukuda, Kenichi; and Yamada, Hirokazu, 5,087,720, Cl. 556-434.000.
- Fukuda, Mitsuhiro; Inoue, Hirotoshi; Kasari, Akira; Miyamoto, Yuzo; Isozaki, Osamu; and Nakai, Noboru, to Kansai Paint Co., Ltd. Heat-curable resinous coating composition. 5,087,286, Cl. 106-287.160.
- Fukuda, Morio: See—
Hanada, Masayuki; Fukuda, Morio; Koshikawa, Takeo; Yamauchi, Akihiro; and Ogura, Hiroshi, 5,087,430, Cl. 423-239.000.
- Fukuda, Tokuya: See—
Matsumoto, Hiroaki; and Fukuda, Tokuya, 5,087,967, Cl. 358-41.000.
- Fukui, Kiyoshi; Kubo, Fumio; and Watanabe, Masayuki, to UBE Industries, Ltd. Process for preparation of superoxide dismutase. 5,087,568, Cl. 435-189.000.
- Fukui, Takeshi; and Watanabe, Toshio, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal device wherein the most optimum ratio of spacing between substrates in which the liquid crystal is disposed and before disposing of the liquid crystal is 0.77-0.87. 5,087,114, Cl. 359-81.000.
- Fukumochi, Yoji: See—
Kigimiya, Shuzo; Fukumochi, Yoji; Sata, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,088,039, Cl. 364-419.000.
- Fukushima, Atsuhiko: See—
Odagawa, Satoshi; Kashiwazaki, Takashi; Araki, Morio; Fukushima, Atsuhiko; and Akiyama, Kazuhiro, 5,087,919, Cl. 342-357.000.
- Fukushima, Masao: See—
Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.
- Fukushima, Naoto: See—
Fukanaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,087,068, Cl. 280-707.000.
- Fukushima, Nobuo, to Canon Kabushiki Kaisha. Recording and/or reproduction apparatus capable of retaining start up information. 5,087,994, Cl. 360-73.030.
- Fukuyama, Yoshiki: See—
Ishino, Yuichi; Osaki, Toshiyuki; Endo, Shigeki; Tomita, Seisuke; Maruyama, Takayuki; Fukuyama, Yoshiki; and Saito, Tasuku, 5,087,382, Cl. 252-73.000.
- Fukuzawa, Keiji: See—
Tsurumaru, Shinobu; Fukuzawa, Keiji; and Ito, Fumihio, 5,087,920, Cl. 343-700.0MS.
- Fuller, Richard: See—
Gentile, Christopher T.; Wallace, Michael; Avalon, Timothy D.; Goodman, Scott; Fuller, Richard; and Hall, Tracy, 5,086,785, Cl. 128-782.000.
- Fully Compounded Plastics, Inc.: See—
Willert, Julius L., 5,087,650, Cl. 524-47.000.
- Fumanelli, Giuseppe E., to M.I.B. Elettronica S.R.L. Device and process for protecting and handling bank notes and valuables. 5,087,107, Cl. 312-319.000.
- Fursier, Roger; and Bovermann, Claus-Dieter, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Closure for a three-part control cabinet. 5,087,104, Cl. 312-100.000.
- Furubayashi, Hisatoshi: See—
Tanaka, Junichi; Furubayashi, Hisatoshi; and Watanabe, Masanori, 5,087,480, Cl. 427-79.000.
- Furukawa Electric Co., Ltd., The: See—
Shiga, Shoji; Uno, Naoki; Tanaka, Yasuzo; Kikuchi, Hiroyuki; and Shiroyama, Katsuke, 5,087,604, Cl. 505-1.000.
- Furukawa, Satoru: See—
Takano, Junichi; Furukawa, Satoru; and Nakanishi, Toshihide, 5,087,566, Cl. 435-115.000.
- Furusho, Noboru: See—
Kuroda, Masami; Amano, Masayo; and Furusho, Noboru, 5,087,541, Cl. 430-58.000.
- Fusco, James V.: See—
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; and Davis, William M., 5,087,674, Cl. 525-356.000.
- Fuss, Andreas: See—
Papenfuss, Theodor; Hess, Reiner; and Fuss, Andreas, 5,087,725, Cl. 560-20.000.
- Futami, Haruji, to NEC Corporation. Input-output circuit of reduced device area for semicustom semiconductor integrated circuit. 5,087,955, Cl. 357-41.000.
- Futami, Yuichi; Murano, Masao; and Okamura, Shigeru, to Tsubakimoto Chain Co.; and Nissan Motor Co. Oil tensioner with bell-shaped oil filter. 5,087,225, Cl. 474-91.000.
- G B Instruments, Inc.: See—
Richter, Robert A.; Rochman, Maurice C.; and Gordon, Stephen M., 5,086,929, Cl. 209-698.000.
- G. D. Searle & Co.: See—
Cordi, Alex A.; Handelsmann, Gail E.; and Monahan, Joseph B., 5,087,633, Cl. 514-380.000.
- Reitz, David B.; and Manning, Robert E., 5,087,634, Cl. 514-381.000.
- Gabay, Joelle E.; and Nathan, Carl F., to Cornell Research Foundation, Inc. and The Rockefeller University. Antimicrobial proteins, compositions containing same and uses thereof. 5,087,569, Cl. 435-212.000.
- Gadberry, Michael D.: See—
Cave, David; and Gadberry, Michael D., 5,087,830, Cl. 307-296.000.
- Gaderick, Franklin. Combination shower enclosure caddy and garment hanger. 5,087,007, Cl. 248-215.000.
- Gafvert, Sven B.: See—
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Sigai, A. Gary; and Klinedinst, Keith A., 5,087,523, Cl. 428-404.000.

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Guest, Malcolm G.: See—
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Gueyne, Jean; Seguin, Marie-Christine; and Crussol, Gilbert H. Therapeutic product based on an organic compound of silicon and polycarboxylated polyamine, particularly useful in the treatment of atheroma. 5,087,452, Cl. 424-422.000.

Guginsky, Frank, to Berger Industries, Inc. Strain relief liquid tight electrical connector. 5,087,795, Cl. 174-65.05S.

Guhlin, Kall G. Anti-theft and safety device for a ball and socket trailer hitch. 5,087,064, Cl. 280-507.000.

Guilleminot, Pierre, to U.S. Philips Corporation. Retaining device for a control button of the piano-key type and device in which same is used. 5,087,802, Cl. 200-343.000.

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Gullett, Watson L.: See—
Gilbert, L. Eldean; Gullett, Watson L.; and Thornburg, W. Edwin, 5,087,023, Cl. 270-39.000.

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Gunn, Dennis R. Spaced elastic ring product. 5,087,161, Cl. 411-433.000.

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Wegner, Juergen; Dierichs, Wolfgang; Haller, Werner; Jansen, Johannes J.; Capelle, Anthony; Kamminga, Willem; and Guns, Jacobus, 5,087,649, Cl. 524-30.000.

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Gerlach, Edgar; Dencks, Carl G.; Gunther, Uwe; and Rodel, Gunther, 5,087,123, Cl. 356-307.000.

Gupta, Suresh C., to Deltec Electronics Corporation. Circulating load apparatus. 5,087,872, Cl. 323-340.000.

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Habel, Wolfgang: See—
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Habuchi, Ryoji: See—
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Hackney, Michael: See—
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Haggstrom, Rolf P., to Flintab AB. Method and apparatus for weighing a wheel supported load. 5,086,856, Cl. 177-161.000.

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Haitz, Roland H., to Hewlett-Packard Company. Light-emitting diode with diagonal faces. 5,087,949, Cl. 357-17.000.

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Ostrander, Frederick M.; and Hakimi, Hosain, 5,087,122, Cl. 356-73.100.

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Hamaue, Tetsuya, to Takata Corporation. Seat belt system. 5,087,075, Cl. 280-806.000.

Hamilton, Robert E. Spot sprayer for tall weeds. 5,086,582, Cl. 47-1.700.

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Hanami, Chiyoki, to Hirose Electric Co., Ltd. Socket for light emitting diode. 5,087,212, Cl. 439-620.000.

- Hanamura, Shoji; Kubotera, Masaaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, to Hitachi, Ltd. Static type semiconductor memory. 5,088,065, Cl. 365-208.000.
- Hanamura, Toshihiro: See—
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- Hanatan, Naoyoshi: See—
Omure, Yukio; Noguchi, Masahiro; and Hanatani, Naoyoshi, 5,087,386, Cl. 252-154.000.
- Hancock, Michael T., to Torrington Company, The. Vehicle steering column. 5,086,661, Cl. 74-493.000.
- Hancz, Robert: See—
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- Handelmann, Gail E.: See—
Cordi, Alex A.; Handelmann, Gail E.; and Monahan, Joseph B., 5,087,633, Cl. 514-380.000.
- Hanisch, Detlef: See—
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- Hanke, Wolfgang: See—
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- Hansen Engineering, Inc.: See—
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- Hansler, Richard L.: See—
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- Harada, Hiroyuki; Ohkawa, Kenichi; Yamamoto, Masashi; Yoshinaka, Minoru; Yagi, Jun; and Matsuo, Kouziro, to Sumitomo Chemical Company, Limited; and Matsushita Electric Industrial Co., Ltd. Polypropylene resin composition. 5,087,654, Cl. 524-432.000.
- Harada, Katsumi; Nagafuji, Toshiaki; Takahashi, Wataru; Nakano, Kenichi; and Yasuda, Kei-ichi, to NEC Corporation; and Nippon Telegraph and Telephone Corporation. Surface-mounting connector. 5,088,009, Cl. 361-413.000.
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- Harding Brothers, Inc.: See—
Terwilliger, Donald N., 5,087,059, Cl. 279-1.0ME.
- Hardt, Peter; Stravs, Andrej; and Abgottson, Pius, to Lonza Ltd. Process for the production of gamma-butyrobetaine. 5,087,745, Cl. 562-553.000.
- Hargrave, Karl D.; Schmidt, Gunther, deceased (by Schmidt, his legal representative Margaret); Engel, Wolfhard; and Austel, Volkhard, to Boehringer Ingelheim Pharmaceuticals, Inc.; and Dr. Karl Thomae GmbH. Pyridodiazepines and their use in the prevention or treatment of HIV infection. 5,087,625, Cl. 514-220.000.
- Harita, Yoshiyuki: See—
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- Harlow, Richard L.: See—
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Moore, William P., 5,087,474, Cl. 426-646.000.
- Harms, Eugene H., to Henry Filters, Inc. Removable flushing system for machine tool coolant return system flumes. 5,086,795, Cl. 134-166.00R.
- Harper, Frank D.: See—
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- Harradine, Vincent C., to Sony Corporation. Digital gamma correction. 5,087,966, Cl. 358-27.000.
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- Harris, Frank W., to University of Akron. Poly-phenylated diamines and their use as polycondensation monomers in the synthesis of polyamide, poly(amide-imide), and polyimide polymers. 5,087,691, Cl. 528-353.000.
- Harris, Kirk L.; and Cook, Clyde, Jr., to Halliburton Company. Well bore drilling direction changing method. 5,086,850, Cl. 175-61.000.
- Hartong, Glenn S.: See—
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- Harvey, Wilson: See—
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- Hasebe, Mitsuo: See—
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- Hasegawa, Kiyoharu: See—
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- Hasegawa, Mitsuru: See—
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- Hasegawa, Nozomu: See—
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- Hasegawa, Takayoshi: See—
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- Hashimoto, Kazunobu, to Nissan Motor Company, Ltd. Automotive air tempering apparatus. 5,086,628, Cl. 62-244.000.
- Hashimoto, Koji: See—
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- Hashimoto, Naoyuki: See—
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- Hathman, Johnnie L. Protective reclosable wound dressing. 5,086,763, Cl. 602-42.000.
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- Hattan, Mark: See—
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- Hattangadi, Rajiv M., to Advanced Micro Devices, Inc. Positive edge triggered synchronized pulse generator. 5,087,835, Cl. 307-443.000.
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- Hattori, Seiichi: See—
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- Hattori, Yumi: See—
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- Hauck, Charles E., Jr.: See—
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- Hayami, Kazunori: See—
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- Hayashi, Hiroshi: See—
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- Hayashi, Keisuke: See—
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- Hayashi, Osamu: See—
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- Hayashi, Yuzo: See—
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- Hazani, Emanuel. Process for EEPROM cell structure and architecture with shared programming and erase terminals. 5,087,583, Cl. 437-43.000.
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- Hed, Aharon Z., to International Superconductor Corp. Switchable superconducting elements and pixels arrays. 5,087,610, Cl. 505-1.000.
- Hegde, Manjanath S.; Inam, Arun; Rogers, Charles T., Jr.; and Venkatesan, Thirumalai, to Bell Communications Research, Inc. Layered lattice-matched superconducting device and method of making. 5,087,605, Cl. 505-1.000.
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- Hehn, Bruce A. High chair tray attachment. 5,087,097, Cl. 297-153.000.
- Heidelberger Druckmaschinen AG: See—
Junghans, Rudi, 5,086,696, Cl. 101-148.000.
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- Heinzer, Paul, to Lipatec Etablissement. Method of rendering a document or portion of it resistant to photocopying. 5,087,507, Cl. 428-195.000.
- Heise, Wolfgang; Trzynka, Kurt; and Kubik, Andreas, to Hermann Berstorff Maschinenbau GmbH. Embossing calender assembly. 5,087,191, Cl. 425-335.000.
- Heitbaum, Joachim: See—
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- Held, Kurt. Apparatus for continuous manufacture of laminates. 5,087,319, Cl. 156-555.000.
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- Henry Filters, Inc.: See—
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- Heraeus Elektroden GmbH: See—
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- Herbert, Kenneth H., Jr. Apparatus for forming a composite article. 5,087,193, Cl. 425-543.000.
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- Herndon, Terry O.: See—
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- Hetzl, Helmut: See—
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- Haitz, Roland H., 5,087,949, Cl. 357-17.000.
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- Salesky, Emery; and Sterk, Tom, 5,087,870, Cl. 323-276.000.
- Williams, James B.; and Sharifpour, Bahman, 5,088,019, Cl. 363-69.000.
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- Hickey, John C., to Ford Motor Company. Integrally formed and tuned fuel rail/injectors. 5,086,743, Cl. 123-468.000.
- Hickey, John C., to Ford Motor Company. Fuel injector for an internal combustion engine. 5,086,980, Cl. 239-585.000.
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- Hieda, Teruo, to Canon Kabushiki Kaisha. Camera system and interchangeable lens. 5,087,978, Cl. 358-228.000.
- Hietanen, Pekka, to Oy Tampella Ab. Device in the drying section of a paper machine. 5,086,571, Cl. 34-117.000.
- Higdon, William D.: See—
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- Higgins, Deborah L.: See—
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- Higuchi, Hirofumi: See—
Uda, Akitomo; Ebata, Shuji; and Higuchi, Hirofumi, 5,087,750, Cl. 564-126.000.
- Higuchi, Naoki: See—
Maeda, Mitsuru; Kodama, Tohru; Iwasawa, Norio; Higuchi, Naoki; and Amano, Norihide, 5,087,614, Cl. 514-16.000.
- Hihara, Mikio; and Suzuki, Nobuhisa, to Nissei Plan, Inc. Strengthened cellular concrete compositions and method of making. 5,087,287, Cl. 106-677.000.
- Hikita, Mitsutaka: See—
Kurosawa, Kazuhito; Hikita, Mitsutaka; Tabuchi, Toyoy; Shibagaki, Nobuhiko; and Hirashima, Tetsuya, 5,087,901, Cl. 333-193.000.
- Hilderbrand, James R., to Eastman Kodak Company. Process for the purification of monoteritarybutyl hydroquinone. 5,087,771, Cl. 568-753.000.
- Hipko, George P.: See—
Silverschotz, Stanford; Hipko, George P.; and Dennis, Michael, 5,087,805, Cl. 219-121.710.
- Hirai, Tokuyuki: See—
Kigimiya, Shuzo; Fukumochi, Yoji; Sata, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,088,039, Cl. 364-419.000.
- Hirakawa, Hideki: See—
Tanaka, Katumi; Hirakawa, Hideki; Nogami, Hiroyasu; and Amano, Shin-ya, 5,088,038, Cl. 364-419.000.
- Hirakawa, Kiyoshi: See—
Yamaguchi, Shinji; Hirakawa, Kiyoshi; Kashima, Seiji; Tanaka, Kazuhiko; Kawamoto, Masao; and Akagi, Takao, 5,087,519, Cl. 428-373.000.
- Hiraki, Jun: See—
Suzuki, Eriko; Hiraki, Jun; and Fujii, Masahiro, 5,087,446, Cl. 424-62.000.
- Hirako, Osamu: See—
Akishino, Katsuo; Hirako, Osamu; and Shimada, Makoto, 5,088,043, Cl. 364-426.040.
- Hirano, Hideo; and Kaneko, Takuo, to Mitsubishi Kasei Corporation. Pulverizer. 5,086,982, Cl. 241-40.000.
- Hirano, Hiroshi: See—
Katayama, Kenji; Hirano, Hiroshi; Takeda, Toshio; and Yashiki, Seiji, 5,086,667, Cl. 74-860.000.
- Hirano, Yoichi: See—
Sato, Yasuhiro; Hirano, Yoichi; and Yamaguchi, Sataro, 5,087,999, Cl. 361-17.000.
- Hirashima, Tetsuya: See—
Kurosawa, Kazuhito; Hikita, Mitsutaka; Tabuchi, Toyoy; Shibagaki, Nobuhiko; and Hirashima, Tetsuya, 5,087,901, Cl. 333-193.000.
- Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, to Sharp Kabushiki Kaisha. Method of manufacturing photo-mask and photo-mask manufactured thereby. 5,087,535, Cl. 430-5.000.
- Hiromi, Tutomu: See—
Inoue, Yoshitaka; Sato, Teruo; and Hiromi, Tutomu, 5,087,426, Cl. 422-123.000.
- Hirose Electric Co., Ltd.: See—
Hanami, Chiyoki, 5,087,212, Cl. 439-620.000.
- Hirota, Isao; Teraoka, Masao; Kurihara, Sakuo; and Hasegawa, Mitsuru, to Tochigifujisangyo Kabushiki Kaisha. Power transmission apparatus. 5,086,867, Cl. 180-248.000.

Hisaki, Hisao: *See—*
Kitaura, Koichi; Kigoshi, Shoji; and Hisaki, Hisao, 5,087,985, Cl. 359-350.000.

Hishii, Toshiyasu, to NEC Corporation. Small-sized disposable pressure transducer apparatus with a temperature compensating circuit disposed adjacent a passageway coupled with a catheter. 5,086,777, Cl. 128-675.000.

Hitachi Chemical Company, Ltd.: *See—*
Nishizawa, Hiroshi; Suzuki, Kenji; Mukoyama, Yoshiyuki; Kikuchi, Tohru; and Sato, Hidetaka, 5,087,658, Cl. 524-538.000.

Takeo, Ohwada; and Kobayashi, Kengo, 5,087,675, Cl. 525-455.000.

Hitachi, Ltd.: *See—*
Hanamura, Shoji; Kubotera, Masaaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, 5,088,065, Cl. 365-208.000.

Ihara, Sigeo; Tanaka, Teruo; Iwasawa, Kyoko; and Hamanaka, Naoki, 5,088,034, Cl. 395-700.000.

Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 5,087,956, Cl. 357-41.000.

Ishibashi, Kenichi; Hayashi, Takehisa; Doi, Toshio; Asai, Mitsuo; Masuda, Noboru; Yamagiwa, Akira; and Okabe, Toshihiro, 5,087,829, Cl. 307-269.000.

Kamitsuma, Yasuo; Ishi, Isao; Nakagawa, Yusaku; Ohnaka, Noriyuki; Izuka, Tadashi; and Fukuda, Kazushi, 5,087,181, Cl. 418-178.000.

Kousokabe, Hirokatsu; Iwata, Hiroshi; and Takebayashi, Masahiro, 5,087,170, Cl. 415-110.000.

Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadamukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.

Kurosawa, Kazuhito; Hikita, Mitsutaka; Tabuchi, Toyoji; Shibagaki, Nobuhiko; and Hirashima, Tetsuya, 5,087,901, Cl. 333-193.000.

Nakamura, Hideo; and Sawase, Terumi, 5,088,023, Cl. 395-425.000.

Nakamura, Kenichi; Nakamura, Yozo; Maeda, Yuji; Nagano, Masami; and Kadamukai, Yuzo, 5,086,741, Cl. 123-419.000.

Oguro, Tomokatsu; Tsuzurahara, Mamoru; and Yamada, Hironobu, 5,087,853, Cl. 313-45.000.

Sugahara, Jun; Takahashi, Hideaki; and Nara, Toshihiko, 5,086,882, Cl. 187-95.000.

Takasaki, Shigeo; Yoshioka, Masaichiro; Kubo, Takashige; Ukai, Yoshio; Kubo, Yasuo; Imura, Jinichi; and Hagiwara, Nobutaka, 5,088,031, Cl. 395-400.000.

Yaginuma, Takao; Onda, Kenichi; Matsuda, Yasuo; and Mizuta, Kouichi, 5,088,017, Cl. 363-21.000.

Yamada, Yuichi; Ikeda, Kazuo; and Ihara, Kouichi, 5,088,082, Cl. 369-71.000.

Hitachi, Ltd., & Hitachi Microcomputer Engineering Ltd.: *See—*
Toya, Tatsuro, 5,087,915, Cl. 341-155.000.

Hitachi Metals, Ltd.: *See—*
Goto, Ryo; Tomitani, Tadafumi; Nitanda, Fumio; Yamazaki, Masanobu; Toyoda, Manabu; and Ushijima, Makoto, 5,086,553, Cl. 29-603.000.

Takedomi, Seiki; and Umehara, Teruo, 5,087,844, Cl. 310-12.000.

Torino, Mitsuyasu, 5,087,947, Cl. 355-290.000.

Hitachi Seiko Ltd.: *See—*
Kanaya, Yasuhiko; Otani, Tamio; and Arai, Kunio, 5,087,156, Cl. 408-1.00R.

Hitachi Video Engineering, Inc.: *See—*
Yamada, Yuichi; Ikeda, Kazuo; and Ihara, Kouichi, 5,088,082, Cl. 369-71.000.

Hitchcock, Martin K., to Dow Chemical Company. The. Method for processing radiation cross-link thin film foam. 5,087,395, Cl. 264-22.000.

Hiyoshi, Tatsuo: *See—*
Kashiwada, Akio; and Hiyoshi, Tatsuo, 5,087,345, Cl. 204-295.000.

Hladun, Kenneth W. Vibratory hearth. 5,086,714, Cl. 110-281.000.

Hlavaty, David G.; Doveinis, Juozas; and Gergoe, Bela, to General Motors Corporation. Vehicle side door flush glass system. 5,086,586, Cl. 49-211.000.

Hobbs, Stanley Y.: *See—*
Alsmarraie, Muhanad A.; Hobbs, Stanley Y.; Wang, I-Chung W.; and Watkins, Vicki H., 5,087,662, Cl. 525-63.000.

Hoechst Aktiengesellschaft: *See—*
Brekner, Michael-Joachim; Rohrmann, Jurgen; Spaleck, Walter; and Antberg, Martin, 5,087,677, Cl. 526-160.000.

Finke, Manfred; Siegmund, Gunter; and Strutz, Heinz, 5,087,748, Cl. 562-851.000.

Papenfus, Theodor; Hess, Reiner; and Fuss, Andreas, 5,087,725, Cl. 560-20.000.

Robeck, Horst; and Deger, Hans-Matthias, 5,087,383, Cl. 252-171.000.

Hoechst Celanese Corporation: *See—*
Aslam, Mohammad; Linstid, Henry C., III.; and Davenport, Kenneth G., 5,087,769, Cl. 568-736.000.

Kim, Dai W., 5,087,513, Cl. 428-283.000.

Sheehan, Michael T.; and Shen, Lan, 5,087,772, Cl. 568-804.000.

Sounik, James R.; and Popolo, Jacquelyn, 5,087,390, Cl. 252-587.000.

Hoechst CeramTec Aktiengesellschaft: *See—*
Roll, Rudolf; Brandenburger, Jurgen; and Hempel, Horst, 5,087,331, Cl. 205-118.000.

Hoff, Ross W. Arm exerciser. 5,087,031, Cl. 272-67.000.

Hoffman-La Roche Inc.: *See—*
Baggiolini, Enrico G., deceased; Baggiolini, Barbara J.; Hennessy, Bernard M.; Shieuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 5,087,619, Cl. 514-167.000.

Hoffman, Robert A.: *See—*
Gross, Hans-Joachim; and Hoffman, Robert A., 5,087,295, Cl. 134-26.000.

Hoffman, Ronald J., to Mr. Coffee, inc. Differential conductivity meter for fluids and products containing such meters. 5,087,883, Cl. 324-443.000.

Hoffmann, Werner: *See—*
Petrzelka, Miloslav; and Hoffmann, Werner, 5,087,147, Cl. 403-268.000.

Hofstead, Sandra J.: *See—*
Dabrah, Thomas T.; Hesler, Grace A.; Hofstead, Sandra J.; Lam, Kin S.; Mattei, Jacqueline M.; Schroeder, Daniel R.; and Tomita, Koji, 5,087,567, Cl. 435-169.000.

Hohne, Wolfgang: *See—*
Tork, Leo; Rottmaier, Ludwig; and Hohne, Wolfgang, 5,087,646, Cl. 523-406.000.

Holland, Geary C.; and Allison, Charles E., to Revelation Builders, Inc. Block for concrete wall form construction. 5,086,600, Cl. 52-594.000.

Holler, Mark A.; and Tam, Simon M., to Intel Corporation. Multi-layer neural network employing multiplexed output neurons. 5,087,826, Cl. 307-201.000.

Hollmann GmbH: *See—*
Basler, Guenter, 5,087,162, Cl. 412-4.000.

Holoff, Richard S.; and Riggins, David J. Twist-cam suction cup assembly. 5,087,005, Cl. 248-205.800.

Holstrom, Bob: *See—*
Thomas, Tim; Christenson, Eric; Holstrom, Bob; and Mino, Eugene, Jr., 5,087,927, Cl. 346-108.000.

Holt, Frederick M., Jr.: *See—*
Bach, Gary M.; Baehman, Carl R.; Holt, Frederick M., Jr.; and Highfield, Terry T., 5,086,927, Cl. 206-597.000.

Holtzapfel, Gregory M.: *See—*
Verthe, John J. A.; Holtzapfel, Gregory M.; and DiRossi, Raymond R., 5,087,668, Cl. 525-237.000.

Holyand Fox Limited: *See—*
Earnshaw, John M.; and Bly, Michael H., 5,086,797, Cl. 135-20.100.

Homes Beautiful Investment & Service Co.: *See—*
Sanders, William A., Jr., 5,087,908, Cl. 340-567.000.

Hon, Wai-Leung: *See—*
Birchak, James R.; Hon, Wai-Leung; and Ruhovets, Michael, 5,087,900, Cl. 333-100.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.

Seki, Kazuhiro; Yamaguchi, Yukihiko; Kanda, Minoru; and Takizawa, Satoshi, 5,087,067, Cl. 280-732.000.

Shimadzu, Chikafumi; Urushidani, Shinzo; Fujinuma, Michio; Hamano, Hiroshi; and Imai, Shinji, 5,088,045, Cl. 364-468.000.

Honda, Hiroshi: *See—*
Aoki, Masaaki; Kamiyama, Masayuki; and Honda, Hiroshi, 5,087,661, Cl. 524-714.000.

Honda, Ikuro: *See—*
Tsuboi, Shinichi; Honda, Ikuro; Murata, Sakae; and Hattori, Yumi, 5,087,632, Cl. 514-357.000.

Honda, Kazuyoshi: *See—*
Tohma, Kiyokazu; Sugita, Ryuji; Honda, Kazuyoshi; Kawawake, Yasuhiro; and Ishida, Tatsuki, 5,087,476, Cl. 427-35.000.

Honda, Kiyoshi: *See—*
Hosaka, Yoshihiro; Nozue, Ikuo; Takatori, Masashige; Harita, Yoshiyuki; and Honda, Kiyoshi, 5,087,548, Cl. 430-192.000.

Honda, Yoshihiko: *See—*
Tanimoto, Morimasa; Sato, Kaoru; Dosako, Shinichi; and Honda, Yoshihiko, 5,087,369, Cl. 210-635.000.

Honegger, Werner, to SFT AG Spontanfordertechnik. Handling vehicle for printed product reels. 5,087,166, Cl. 414-458.000.

Honeywell, Inc.: *See—*
McLaughlin, Paul F.; and Mody, Pankaj H., 5,088,021, Cl. 364-187.000.

Nelson, Clifford L., 5,087,794, Cl. 174-52.100.

Hong, Minghui: *See—*
Chen, Young-Kai; Hong, Minghui; and Wu, Ming-Chiang, 5,088,099, Cl. 372-45.000.

Hood, Paul F., to Albany International Corp. PMC yarn with soluble monofilament core. 5,087,327, Cl. 162-358.000.

Hooks, Hilary N.: *See—*
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukadala, Gaya; Wick, John D.; and Woods, Donald R., 5,088,033, Cl. 395-500.000.

Hopfenextraktion HVG Barth, Raiser & Co.: *See—*
Schulmeyr, Josef, 5,087,468, Cl. 426-386.000.

Horacek, Heinrich; Heger, Friedl; and Coufal, Gerhard, to Chemie Linz Gesellschaft m.b.H. Melamine preparation and stable dispersion of melamine in polyether polyols. 5,087,384, Cl. 252-182.140.

Hori, Kohei: *See—*
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.

Horie, Shigetake: *See—*
Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; and Horie, Shigetake, 5,087,321, Cl. 156-608.000.

Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; Horie, Shigetake; and Nakahama, Yasumitsu, 5,087,429, Cl. 422-249.000.

Horigome, Tomoki; Tazawa, Kenji; and Aoyama, Toshimi, to Tokyo Ohka Kogyo Co., Ltd. Photosensitive resin composition. 5,087,552, Cl. 430-280.000.

Horiuchi, Tetsuo: *See—*
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.

Horn, Joseph B.; Tower, Allen J.; and King, James F., to Cardiovascular Designs, Inc. Balloon perfusion catheter. 5,087,247, Cl. 604-98.000.

Horwitz, Daniel, to Westinghouse Electric Corp. Universal pressure measurement interface. 5,087,912, Cl. 340-870.390.

Hosaka, Hirochika: *See—*
Yoshinaga, Kenji; Hosaka, Hirochika; and Nakamura, Toshiko, 5,087,656, Cl. 524-493.000.

Hosaka, Yoshihiro; Nozue, Ikuo; Takatori, Masashige; Harita, Yoshiyuki; and Honda, Kiyoshi, to Japan Synthetic Rubber Co., Inc. Positive type radiation-sensitive resin composition. 5,087,548, Cl. 430-192.000.

Hoshida, Shigehiro: *See—*
Noguki, Genji; Hoshida, Shigehiro; and Kuwabara, Kouzou, 5,087,678, Cl. 526-194.000.

Hoskins, Frederick K.: *See—*
Poor, James C.; Hoskins, Frederick K.; and Morcom, William, 5,087,274, Cl. 55-300.000.

Hosokai, Tetsushi: *See—*
Ishihara, Toshihiro; Hosokai, Tetsushi; Takaba, Tetsuro; and Kobayashi, Hideki, 5,086,744, Cl. 123-480.000.

Hosoki, Yoshinori: *See—*
Nomura, Takehiko; Natsume, Yoshinori; and Hosoki, Yoshinori, 5,087,307, Cl. 156-154.000.

Hotta, Yoshihiko; Kubo, Keishi; Kawaguchi, Makoto; and Nogiwa, Toru, to Ricoh Company, Ltd. Reversible thermosensitive recording material. 5,087,601, Cl. 503-200.000.

Houseki, Sigeki: *See—*
Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, 5,086,981, Cl. 239-700.000.

Howden, Dwight E., Jr. Ambulator for carpet rolls or the like. 5,086,912, Cl. 198-776.000.

Howell, Chesley R., to Schlumberger Canada, Ltd. Electricity metering device with cover. 5,088,004, Cl. 361-373.000.

Hoya Corporation: *See—*
Ishibai, Isao; Otsu, Hironobu; and Kawai, Yutaka, 5,087,115, Cl. 359-719.000.

Kawai, Hisao; Kurikawa, Akinori; and Suzuki, Hisanori, 5,087,482, Cl. 427-129.000.

Hsu, Yun-Tung. Flexible key and lock assembly. 5,086,632, Cl. 70-375.000.

Huang, Sung-Rung: *See—*
Parker, Kevin J.; Lerner, Robert M.; and Huang, Sung-Rung, 5,086,775, Cl. 128-660.010.

Huang, Tingchun: *See—*
Duan, Youlu; Jin, Shanrong; Huang, Tingchun; Sun, Jin; and Yu, Xinying, 5,087,680, Cl. 526-254.000.

Huang, Yuchi; Talbot, Charles; and Henderson, Jeffrey R., to Nicolet Instrument Corporation. Filler apparatus for providing cryogenic liquid coolant to dewars such as those used in radiation detectors. 5,086,619, Cl. 62-50.100.

Hubbell Incorporated: *See—*
Kurtz, Michael A., 5,087,803, Cl. 200-526.000.

Hudak, Donald M. Reversible impact hole driller and method of reversing. 5,086,848, Cl. 173-1.000.

Huels Aktiengesellschaft: *See—*
Bohmholdt, Gerd; Disteldorf, Josef; Kirchner, Peter; and Michalczak, Hans-Werner, 5,087,739, Cl. 560-345.000.

Flakus, Werner, 5,087,647, Cl. 523-412.000.

Seiler, Claus-Dietrich; Rauleder, Hartwig; Frings, Albert; and Kotsch, Hans-Joachim, 5,087,714, Cl. 556-401.000.

Zoche, Gunter, 5,087,718, Cl. 556-422.000.

Huet, Jean-Paul, to ACB. Stretch-forming machine. 5,086,636, Cl. 72-296.000.

Hughes Aircraft Company: *See—*
Chang, David B.; and Drummond, James E., 5,086,972, Cl. 239-3.000.

Kurtz, Louis A., 5,087,921, Cl. 343-771.000.

Ludwig, Frank A., 5,087,534, Cl. 429-11.000.

Tang, Raymond; Lee, Kuan M.; and Chu, Ruey S., 5,087,922, Cl. 343-814.000.

Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; and Higdon, William D., 5,087,896, Cl. 331-99.000.

Williamson, Weldon S., 5,087,478, Cl. 127-39.000.

Huls Aktiengesellschaft: *See—*
Friese, Hans-Jochen; and Pukropski, Aribert, 5,087,422, Cl. 422-61.000.

Humphrey, Edward F.; De Angelo, Nelson J.; and Florian, David W., to International Security Products, Inc. Combination lockout/hold-back apparatus. 5,087,090, Cl. 292-359.000.

Hung, Ying C.: *See—*
Lin, Cheng H.; Chen, Shi K.; Hung, Ying C.; Ko, Wen S.; and Chang, Wen C., 5,087,302, Cl. 148-103.000.

Hunicke, Raymond L.: *See—*
Morton, William E.; Fairbanks, Harold V.; Wallis, James; Hunicke, Raymond L.; and Krenicki, Joseph, 5,087,379, Cl. 210-748.000.

Hunt, Robert P.; Lurye, Alex; and Riser, George C., to Picker International, Inc. Multiport light distributor with mechanically inserted and withdrawn beam splitters. 5,087,986, Cl. 359-629.000.

Hurlbut, Charles R.: *See—*
Bellian, Joseph G.; and Hurlbut, Charles R., 5,087,818, Cl. 250-361.00R.

Huser, Marc; and Osborn, John, to Rhone-Poulenc Chimie. Alkoxy-carbonylation process. 5,087,731, Cl. 560-91.000.

Huttemann, Wilfried; Hettenhausen, Ulrich; and Moller, Horst, to Miele & Cie, GmbH & Co. Cutlery basket for dish-washing machine. 5,086,544, Cl. 211-41.000.

Hwang, Jui-Fang: *See—*
Hao, Kuo-Hua; and Hwang, Jui-Fang, 5,087,038, Cl. 272-135.000.

Hwang, Sang Yo: *See—*
Jung, Il Nam; Hwang, Sang Yo; and Bae, Hae Kyung, 5,087,717, Cl. 556-416.000.

Hwo, Charles C., to Shell Oil Company. Film from mixture of ethylene polymer, butene polymer, propylene polymer. 5,087,667, Cl. 525-222.000.

Hyatt, Richard G., Jr., to Medeco Security Locks, Inc. Method of assembling electronic component systems. 5,086,557, Cl. 29-832.000.

Hyuga, Takehiro; Matsumoto, Kazutoshi; and Mukai, Tetsuya, to Sumitomo Metal Mining Co., Ltd. Resonant frequency-temperature characteristics compensable high frequency circuit elemental device. 5,087,902, Cl. 333-219.100.

Ibiden Co., Ltd.: *See—*
Enomoto, Ryo; and Matsuno, Yoshimi, 5,087,433, Cl. 423-346.000.

Takeyama, Takeshi; and Kondo, Mitsuhiro, 5,088,008, Cl. 361-403.000.

Ichikawa, Shuji: *See—*
Kanayama, Kaoru; and Ichikawa, Shuji, 5,087,766, Cl. 568-718.000.

Ichimura, Shingo; Kokubun, Kiyohide; and Shimizu, Hazime, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method and apparatus for counting charged particles. 5,087,814, Cl. 250-287.000.

Ichito, Toshikatsu: *See—*
Takanashi, Itsuo; Yamamura, Takashi; Nakagaki, Shintaro; Ichito, Toshikatsu; Nakano, Atsushi; Shimada, Tadayuki; and Konno, Toshio, 5,087,929, Cl. 346-108.000.

Idaho Research Foundation, Inc.: *See—*
Park, Jin Y., 5,087,323, Cl. 156-646.000.

Ide, Kesao: *See—*
Arai, Masatoshi; Satoh, Shinichi; and Ide, Kesao, 5,087,683, Cl. 528-14.000.

Ide, Youji: *See—*
Shimura, Ryouchi; Tasaka, Motoo; Hakiri, Minoru; and Ide, Youji, 5,087,527, Cl. 428-488.400.

Idemitsu Petrochemical Co., Ltd.: *See—*
Kunishi, Noriyuki, 5,087,660, Cl. 524-611.000.

Iehisa, Nobuaki: *See—*
Irie, Michiaki; Iehisa, Nobuaki; and Yamazaki, Etsuo, 5,088,101, Cl. 372-59.000.

Igarashi, Tsutomu, to Olympus Optical Co., Ltd. Objective optical system for endoscopes. 5,087,989, Cl. 359-692.000.

Ihara Chemical Industry Co., Ltd.: *See—*
Kaku, Koichiro; Wada, Nobuhide; Takeuchi, Akira; Toyokawa, Yasufumi; Miyazawa, Takeshige; Yoshida, Ryo; and Sugiyama, Kazuhiko, 5,087,289, Cl. 71-93.000.

Ihara, Kouichi: *See—*
Yamada, Yuichi; Ikeda, Kazuo; and Ihara, Kouichi, 5,088,082, Cl. 369-71.000.

Ihara, Sigeo; Tanaka, Teruo; Iwasawa, Kyoko; and Hamanaka, Naoki, to Hitachi, Ltd. Compiling method for determining programs to be executed parallelly by respective processors in a parallel computer which transfer data with a data identifier to other processors. 5,088,034, Cl. 395-700.000.

Iida, Eiji: *See—*
Banjo, Tetsuya; Iida, Eiji; Tokunaga, Katsuhiko; and Kiyota, Satoshi, 5,086,866, Cl. 180-219.000.

Iida, Hideyo: *See—*
Sekiguchi, Mikio; Imai, Mizuho; Shiba, Nobuyasu; and Iida, Hideyo, 5,086,727, Cl. 118-324.000.

Iida, Tadasato, to Kabushiki Kaisha Toshiba. Air conditioner with function for temperature control of radiant heat exchanger. 5,086,626, Cl. 62-184.000.

Imuro, Shigeru: *See—*
Okamoto, Kenichi; Kita, Hidetoshi; Tanaka, Yasuo; and Imuro, Shigeru, 5,087,767, Cl. 568-727.000.

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Iizuka, Tadashi: *See—*
Kamitsuma, Yasuo; Ishi, Isao; Nakagawa, Yusaku; Ohnaka, Noriyuki; Izuka, Tadashi; and Fukuda, Kazushi, 5,087,181, Cl. 418-178.000.

Ikeda, Kazuo: *See—*
Yamada, Yuichi; Ikeda, Kazuo; and Ihara, Kouichi, 5,088,082, Cl. 369-71.000.

- Ikedo, Masaaki: See—
Tanaka, Kouji; Ikeda, Masaaki; Tsubakimoto, Yasumasa; Koizumi, Takashi; Nakagawa, Takerou; and Kanehira, Makato, 5,087,132, Cl. 384-276.000.
- Ikedo, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, to Hitachi, Ltd. Semiconductor memory device. 5,087,956, Cl. 357-41.000.
- Illgen, Lothar: See—
Wenske, Hanno; Gallien, Arnold; Hanke, Wolfgang; Lampe, Wolfgang; and Illgen, Lothar, 5,087,344, Cl. 204-256.000.
- Imai, Masao: See—
Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; Imai, Masao; and Suzuki, Toshiyuki, 5,087,758, Cl. 568-57.000.
- Imai, Mizuho: See—
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- Imai, Shinji: See—
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- Imo Industries Inc.: See—
D'Andrea, Peter, 5,087,131, Cl. 384-208.000.
- Imperial Chemical Industries plc: See—
Kelham, Stephen F., 5,087,335, Cl. 204-128.000.
- Imura, Jinichi: See—
Takasaki, Shigeo; Yoshioka, Masaichiro; Kubo, Takashige; Ukai, Yoshio; Kubo, Yasuo; Imura, Jinichi; and Hagiwara, Nobutaka, 5,088,031, Cl. 395-400.000.
- Inagaki, Shinya; Yoshizawa, Sakae; and Sasaki, Kazuya, to Fujitsu Ltd. Optical fiber cable and manufacture of optical fiber cable. 5,087,110, Cl. 385-110.000.
- Inam, Arun: See—
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- Inamine, Edward S.: See—
Chen, Shieh-Shung T.; Arison, Byron H.; White, Raymond F.; and Inamine, Edward S., 5,087,702, Cl. 546-118.000.
- Incyte Pharmaceuticals: See—
Scott, Randy W.; and Baker, Joffre B., 5,087,368, Cl. 210-635.000.
- Indu-Tech Enterprises Ltd.: See—
Anthonen, Niels A., 5,087,082, Cl. 285-94.000.
- Industrial Technology Research Institute: See—
Lin, Cheng H.; Chen, Shi K.; Hung, Ying C.; Ko, Wen S.; and Chang, Wen C., 5,087,302, Cl. 148-103.000.
- Industrial Waste Management, Inc.: See—
Laffer, Fred A., Jr., 5,086,716, Cl. 110-345.000.
- Ingersoll-Rand Company: See—
Clapp, John M., 5,087,180, Cl. 418-152.000.
- Ingraham, Ronald D., to Nartron Corporation. Capacity responsive keyboard. 5,087,825, Cl. 307-132.0EA.
- Ingram, Patrick T. Multi-adjustable knee brace. 5,086,761, Cl. 602-26.000.
- Inmos Limited: See—
Campbell, Richard N.; Thompson, Michael K.; and Haase, Robert P., 5,087,582, Cl. 437-41.000.
- Cytera, Christopher, 5,087,891, Cl. 330-288.000.
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Fukuda, Mitsuhiro; Inoue, Hirotohi; Kasari, Akira; Miyamoto, Yuzo; Isozaki, Osamu; and Nakai, Noboru, 5,087,286, Cl. 106-287.160.
- Inoue, Katsuhiko: See—
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- Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, to Honda Giken Kogyo Kabushiki Kaisha. Cooling system for multi-cylinder engine. 5,086,733, Cl. 123-41.840.
- Inoue, Kenji; Matsumoto, Mitsunori; and Takahashi, Satomi, to Kanegafuchi Kagaku Kogyo K.K. Method of preparing optically active 3,4-dihydroxy butyric acid derivatives. 5,087,751, Cl. 564-192.000.
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- Inoue, Yoshitaka; Sato, Teruo; and Hiromi, Tutomu, to Matsushita Electric Industrial Co., Ltd.; and Yushin Engineering Corporation. Ozone deodorizer for refrigerators. 5,087,426, Cl. 422-123.000.
- Insinooritoimisto Pesmel Oy: See—
Maki-Rahkola, Jari; Kononen, Mauri; and Surakka, Jorma, 5,086,610, Cl. 53-587.000.
- Institut Francais du Petrol: See—
Gateau, Paul; Maute, Michel; Feugier, Alain; and Perthuis, Edmond, 5,087,270, Cl. 48-127.900.
- Institut Francais du Petrole: See—
Cholet, Henri, 5,086,842, Cl. 166-312.000.
- Intel Corporation: See—
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- Holler, Mark A.; and Tam, Simon M., 5,087,826, Cl. 307-201.000.
- Sprague, David L.; Simon, Allen H.; and Kwan, Alfred, 5,088,053, Cl. 395-166.000.
- Wada, Glen N.; and Trudel, Murray L., 5,087,584, Cl. 437-43.000.
- Intellex Corporation: See—
Graefe, Peter U., 5,087,514, Cl. 428-315.500.
- Inter Innovation LeFebure Manufacturing: See—
Smothers, Steven W., 5,087,982, Cl. 359-137.000.
- Interco Italia S.p.A.: See—
Ferrari, Dario, 5,086,791, Cl. 132-200.000.
- Interlego A.G.: See—
Bolli, Peter; Kunz, Philippe; Looser, Heinz; and Tanner, Werner, 5,087,001, Cl. 246-327.000.
- International Business Machines Corporation: See—
Bozman, GERALD P.; Eisenberger, George; Lett, Alexander S.; Myers, James J.; Tetzlaff, William H.; and Unger, Jay H., 5,088,026, Cl. 395-425.000.
- Conway, John F.; Fredericks, Edward C.; and Via, Giorgio G., 5,087,537, Cl. 430-15.000.
- del Puerto, Santiago E.; and Gaschke, Paul M., 5,088,006, Cl. 361-385.000.
- Grube, Gary W.; and Khandros, Igor Y., 5,086,558, Cl. 29-832.000.
- Kruppa, Robert W., 5,087,867, Cl. 318-696.000.
- International Flavors & Fragrances Inc.: See—
Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwkerk, Anton V.; and Gillotin, Olivier, 5,087,707, Cl. 549-396.000.
- International Sanitary Ware Manufacturin Cy, S.A.: See—
Van Marcke, Karel C., 5,086,526, Cl. 4-623.000.
- International Security Products, Inc.: See—
Humphrey, Edward F.; De Angelo, Nelson J.; and Florian, David W., 5,087,090, Cl. 292-359.000.
- International Superconductor Corp.: See—
Hed, Aharon Z., 5,087,610, Cl. 505-1.000.
- InterNatural Designs, Inc.: See—
Miner, Mark D., 5,087,991, Cl. 359-894.000.
- Interroll Holding AG: See—
Agnoff, Charles, 5,086,903, Cl. 193-35.00A.
- Inui, Motokazu: See—
Sakono, Ikuo; Inui, Motokazu; and Kato, Hiroaki, 5,087,113, Cl. 359-59.000.
- Inui, Tetsuya: See—
Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, 5,087,535, Cl. 430-5.000.
- Inukai, Hiroshi; Kawai, Noriko; Kitahara, Takahiro; Kai, Shinichi; and Kubo, Motonobu, to Daikin Industries Ltd. Polymeric dielectrics. 5,087,679, Cl. 526-249.000.
- Inventio AG: See—
Schroder, Deceased Joris, 5,086,883, Cl. 187-127.000.
- Iomed, Inc.: See—
Petelenz, Tomasz J.; Jacobsen, Stephen C.; Stephen, Robert L.; Beck, Jon; and Shimada, Jin, 5,087,242, Cl. 604-20.000.
- Iovine, Carmine P.; Chandran, Rama S.; and Leighton, John C., to National Starch and Chemical Investment Holding Corporation. Polyether polycarboxylate compositions useful as detergent builders. 5,087,682, Cl. 526-271.000.
- Iowa State University Research Foundation, Inc.: See—
Nissen, Steven L., 5,087,472, Cl. 426-623.000.
- Schmidt, Frederick A.; Peterson, David T.; Wheelock, John T.; Jones, Lawrence L.; and Lincoln, Lanny P., 5,087,291, Cl. 75-581.000.
- Irie Koken Kabushiki Kaisha: See—
Sawa, Toshio; Irie, Norikimi; and Hayashi, Yuzo, 5,087,017, Cl. 251-175.000.
- Irie, Michiaki; Iehisa, Nobuaki; and Yamazaki, Etsuo, to Fanuc Ltd. Laser gas displacement amount control method. 5,088,101, Cl. 372-59.000.
- Irie, Norikimi: See—
Sawa, Toshio; Irie, Norikimi; and Hayashi, Yuzo, 5,087,017, Cl. 251-175.000.
- Iron Tiger Investments Inc.: See—
Keough, William J.; Parker, Donald L.; and Smith, Neil L., 5,087,293, Cl. 75-771.000.
- Iseda, Toru: See—
Chen, Tu; Iseda, Toru; and Mannami, Kazuo, 5,087,481, Cl. 427-129.000.
- Ishi, Isao: See—
Kamitsuma, Yasuo; Ishi, Isao; Nakagawa, Yusaku; Ohnaka, Noriyuki; Iizuka, Tadashi; and Fukuda, Kazushi, 5,087,181, Cl. 418-178.000.
- Ishibai, Isao; Otsu, Hitonobu; and Kawai, Yutaka, to Hoya Corporation. Aspherical glass lens element suitable for an object lens element of a disk device. 5,087,115, Cl. 359-719.000.
- Ishibashi, Hiromichi; and Tanaka, Shinichi, to Matsushita Electric Industrial Co., Ltd. Apparatus for deriving synchronizing signal from pre-formed marks on record carrier. 5,088,080, Cl. 369-44.260.
- Ishibashi, Kenichi; Hayashi, Takehisa; Doi, Toshio; Asai, Mitsuo; Masuda, Noboru; Yamagiwa, Akira; and Okabe, Toshihiro, to Hitachi, Ltd. High speed clock distribution system. 5,087,829, Cl. 307-269.000.
- Ishibashi, Kiyochika, to Olympus Optical Co., Ltd. Automatic analyzing apparatus comprising a plurality of analyzing modules. 5,087,423, Cl. 422-67.000.
- Ishibashi, Takehisa; Kakizaki, Shinobu; Watanabe, Yoshiaki; and Kanai, Fukashi, to Atsugi Motor Parts Company, Ltd. Rotary actuator. 5,087,868, Cl. 318-696.000.
- Ishida, Tatsuki: See—
Tohma, Kiyokazu; Sugita, Ryuji; Honda, Kazuyoshi; Kawawake, Yasuhiro; and Ishida, Tatsuki, 5,087,476, Cl. 427-35.000.
- Ishiguro, Kazuhisa; and Fujisawa, Masanori, to Sanyo Electric Co., Ltd. Amplifier circuit. 5,087,890, Cl. 330-259.000.

- Ishihara, Toshihiro; Hosokai, Tetsushi; Takaba, Tetsuro; and Kobayashi, Hideki, to Mazda Motor Corporation. Fuel control system for internal combustion engine. 5,086,744, Cl. 123-480.000.
- Ishii, Kohzo: See—
Fujiwara, Takuji; and Ishii, Kohzo, 5,086,669, Cl. 74-866.000.
- Ishii, Kozo: See—
Fujiwara, Takuji; Ishii, Kozo; and Yoshimura, Hiroshi, 5,086,668, Cl. 74-866.000.
- Ishii, Susumu: See—
Aoki, Tsunetaka; and Ishii, Susumu, 5,086,546, Cl. 24-429.000.
- Ishikura, Tsukasa; and Matsuyama, Shigeru, to Nippon Kayaku Kabushiki Kaisha. Crystal modification of magnesium salt of mono-p-nitrobenzyl malonate and process for producing the same. 5,087,734, Cl. 560-193.000.
- Ishimizu, Hideaki: See—
Tanuma, Jiro; Ishimizu, Hideaki; Kasai, Tadashi; and Komori, Chihiro, 5,087,134, Cl. 400-54.000.
- Ishimura, Tamihiko; Miyawaki, Masahumi; Miyamoto, Sanpei; and Uehara, Hidenori, to Oki Electric Industry Co., Ltd. CMOS memory device with improved sense amplifier biasing. 5,087,957, Cl. 357-42.000.
- Ishino, Masaru: See—
Nomura, Kotohiro; and Ishino, Masaru, 5,087,755, Cl. 564-422.000.
- Ishino, Yuichi; Osaki, Toshiyuki; Endo, Shigeki; Tomita, Seisuke; Maruyama, Takayuki; Fukuyama, Yoshiki; and Saito, Tasuku, to Bridgestone Corporation. Electroviscous fluid. 5,087,382, Cl. 252-73.000.
- Ishizuka, Satoshi; Toda, Kazuro; and Kato, Osamu, to Matsushita Electric Industrial Co., Ltd. Method for coupling semiconductor laser with optical fiber. 5,087,109, Cl. 385-34.000.
- Ishizuka, Takanori, to Tachi-S Co., Ltd. Lumbar support device. 5,087,098, Cl. 297-284.00C.
- Iso, Tadashi: See—
Morita, Takakazu; Iso, Tadashi; and Yamauchi, Hideyasu, 5,087,627, Cl. 514-255.000.
- Isover Saint-Gobain: See—
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- Isozaki, Kenji: See—
Chiba, Ryuji; Hara, Hitoshi; Yamada, Tomoyuki; and Isozaki, Kenji, 5,087,817, Cl. 250-339.000.
- Isozaki, Osamu: See—
Fukuda, Mitsuhiro; Inoue, Hirotohi; Kasari, Akira; Miyamoto, Yuzo; Isozaki, Osamu; and Nakai, Noboru, 5,087,286, Cl. 106-287.160.
- Isozumi, Shuzou, to Mitsubishi Denki K.K. Coaxial engine starter. 5,086,658, Cl. 74-70.000.
- Isozu Motors Limited: See—
Tanaka, Koji; and Shima, Takashi, 5,086,865, Cl. 180-165.000.
- Tanaka, Koji; and Shima, Takashi, 5,088,041, Cl. 364-426.010.
- Ito, Fumihoro: See—
Tsurumaru, Shinobu; Fukuzawa, Keiji; and Ito, Fumihoro, 5,087,920, Cl. 343-700.0MS.
- Ito, Kazuo; Matsuo, Shutsu; and Sasaki, Yasumi, to Toshiba Ceramics Co., Ltd. Method for making an impregnated ceramic material. 5,087,490, Cl. 428-34.100.
- Ito, Masami: See—
Fukuchi, Mikiharu; Nakano, Yasuhiko; Hayashi, Keisuke; Koseki, Isamu; Ito, Masami; and Akiyama, Ryoze, 5,087,299, Cl. 148-11.50P.
- Ito, Yoji: See—
Niwa, Toshiyuki; Kawashima, Yoshiaki; Takeuchi, Hirofumi; and Ito, Yoji, 5,087,455, Cl. 424-497.000.
- Ito, Yosuke, to Brother Kogyo Kabushiki Kaisha. Apparatus for preparing output data from input image data, using basic output-image unit pattern data. 5,088,050, Cl. 395-142.000.
- Itoh, Hiroshi: See—
Kato, Nobuyuki; Habuchi, Ryoji; Morisawa, Kunio; and Itoh, Hiroshi, 5,086,672, Cl. 74-868.000.
- Ivac Corporation: See—
Doan, David, 5,087,245, Cl. 604-67.000.
- Iwamoto, Masaki: See—
Serita, Kaoru; Kiyomiya, Masaaki; Takahashi, Jun; Watanabe, Masatoshi; and Iwamoto, Masaki, 5,088,076, Cl. 369-36.000.
- Iwamoto, Norihiro: See—
Tsuda, Akihiko; and Iwamoto, Norihiro, 5,086,824, Cl. 164-4.100.
- Iwanaga, Kazuyoshi: See—
Yamaguchi, Toshio; Sugano, Kazuhiko; and Iwanaga, Kazuyoshi, 5,087,231, Cl. 475-200.000.
- Iwasaki, Youichi: See—
Kaheda, Naoya; Iwasaki, Youichi; and Tsuji, Sadahiko, 5,087,935, Cl. 354-403.000.
- Iwasawa, Kyoko: See—
Ihara, Sigeo; Tanaka, Teruo; Iwasawa, Kyoko; and Hamanaka, Naoki, 5,088,034, Cl. 395-700.000.
- Iwasawa, Norio: See—
Maeda, Mitsuru; Kodama, Tohru; Iwasawa, Norio; Higuchi, Naoki; and Amano, Norihide, 5,087,614, Cl. 514-16.000.
- Iwata, Hiroshi: See—
Kousokabe, Hirokazu; Iwata, Hiroshi; and Takebayashi, Masahiro, 5,087,170, Cl. 415-110.000.
- Iwata, Jun, to NEC Corporation. Diagnostic system having multi-level port and flexible interface with a main port control unit and plurality of order port and primary port control units. 5,088,022, Cl. 395-325.000.
- Iwata, Toshio, to Mitsubishi Denki K.K. Ionization current detector device for an internal combustion engine. 5,087,882, Cl. 324-388.000.
- Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, to Nippon Shokubai Co., Ltd.; and Oji Paper Co., Ltd. Heat-sensitive recording paper having an overcoat layer formed from an aqueous crosslinkable resin dispersion. 5,087,603, Cl. 503-226.000.
- J. G. Furniture Systems Inc.: See—
Valentine, Ellis B., 5,086,593, Cl. 52-36.000.
- J. Hudson & Co. (Whistles) Ltd.: See—
Sharp, Michael C., 5,086,726, Cl. 116-137.00R.
- J. P. Tool, Inc.: See—
Gifford, David A.; and Taylor, John L., 5,086,676, Cl. 82-1.110.
- J. T. Baker Inc.: See—
Kakodkar, Sunil V.; and Ramsden, Hugh E., 5,087,359, Cl. 210-198.200.
- Jachowicz, Janusz Z.: See—
Deppert, Thomas M.; Jachowicz, Janusz Z.; and Murphy, Bryan P., 5,087,733, Cl. 560-147.000.
- Jackson, Barry; and Scholl, Thomas, to Lonza Ltd. 3-Hydroxy-2-cyclobuten-1-one salts. 5,087,756, Cl. 564-457.000.
- Jackson, Edward E., to Puretech Systems, Inc. Apparatus for treatment and disposal of infectious waste. 5,087,420, Cl. 422-37.000.
- Jackson, Levin: See—
Sparrow, Tim H.; Harlow, Richard L.; Wilder, Don; and Jackson, Levin, 5,087,404, Cl. 264-219.000.
- Jackson, Robert J.; Duke, Susan A.; and Wicks, Mark A., to Beecham Group p.l.c. Non-fluoride desensitizing mouthwash. 5,087,444, Cl. 424-49.000.
- Jackson, Todd A., to Eastman Kodak Company. Spectrally selective dithering and color filter mask for increased image sensor blue sensitivity. 5,087,809, Cl. 250-226.000.
- Jacob, Adir. Process for dry sterilization of medical devices and materials. 5,087,418, Cl. 422-23.000.
- Jacob, Merritt, to Atlas Powder Company. Modular blasting system. 5,086,702, Cl. 102-275.500.
- Jacob, Werner; and Schepp, Martin, to SKF GmbH. Arrangement for attaching running rings to a rotary drum. 5,087,133, Cl. 384-549.000.
- Jacobsen, Stephen C.: See—
Petelenz, Tomasz J.; Jacobsen, Stephen C.; Stephen, Robert L.; Beck, Jon; and Shimada, Jin, 5,087,242, Cl. 604-20.000.
- Jacoff, Daniel, to Great Neck Saw Manufacturers, Inc. Utility knife. 5,086,562, Cl. 30-162.000.
- Jaeger, Michael: See—
Krabetz, Richard; Duembgen, Gerd; Merger, Franz; Jaeger, Michael; Thiessen, Fritz; and Vogel, Herbert, 5,087,744, Cl. 562-535.000.
- Jaenke, Paul E.; and Cerniglia, Joseph R., to Westinghouse Electric Corp. Low impedance connector. 5,087,206, Cl. 439-92.000.
- Jakobson, Gerald; and Siemanowski, Werner, to Deutsche Solvay-Werke GmbH. Method of preparing 2,2-dimethyl-4-(2',3'-epoxy) propoxymethyl-1,3-dioxolane and use thereof. 5,087,708, Cl. 549-448.000.
- James-Hymes, Virginia H. Educational tool kit. 5,087,203, Cl. 434-84.000.
- James, Keith: See—
Barnish, Ian T.; and James, Keith, 5,087,732, Cl. 560-122.000.
- James River Corporation of Virginia: See—
Awofeso, Anthony O.; and Harper, Frank D., 5,087,324, Cl. 162-111.000.
- Jamieson, Catriona; and Levy, Julia G., to University of British Columbia. Method to destroy malignant cells in mononuclear cell populations. 5,087,636, Cl. 514-410.000.
- Jaminet, Jerome F.: See—
Gagnon, Ernest P.; Jaminet, Jerome F.; and Olsen, Eric G., 5,086,881, Cl. 187-17.000.
- Jamison, Dale E.; and Clements, William R. Apparatus and method for analyzing well fluid sag. 5,086,646, Cl. 73-65.000.
- Janda, Dennis: See—
Woodson, Charles S.; Janda, Dennis; and Strichartzuk, Paul T., 5,087,343, Cl. 204-242.000.
- Jansen, Johannes J.: See—
Wegner, Juergen; Dierichs, Wolfgang; Haller, Werner; Jansen, Johannes J.; Capelle, Anthony; Kamminga, Willem; and Guns, Jacobus, 5,087,649, Cl. 524-30.000.
- Jansen, John H.: See—
Gress, Paul W.; and Jansen, John H., 5,087,013, Cl. 248-676.000.
- Janssen, Bernd; and Wuest, Hans-Heiner, to BASF Aktiengesellschaft. Diarylacetylenes, the preparation and use thereof. 5,087,637, Cl. 514-456.000.
- Janssen, Bernd; and Wuest, Hans-Heiner, to BASF Aktiengesellschaft. Diphenylheteroalkyl derivatives, the preparation thereof and drugs and cosmetics prepared therefrom. 5,087,743, Cl. 562-466.000.
- Janulis, Eugene P.: See—
Babirad, Stefan A.; Janulis, Eugene P.; Stacey, Nicholas A.; and Elsbernd, Cheryl L. S., 5,087,672, Cl. 525-329.500.
- Japan represented by Ministry of International Trade and Industry, Director-General Basic Industries Bureau: See—
Tsuyumoto, Michio; Maeda, Yasushi; and Karakane, Hiroki, 5,087,367, Cl. 210-500.390.
- Japan Synthetic Rubber Co., Inc.: See—
Hosaka, Yoshihiro; Nozue, Ikuo; Takatori, Masashige; Hanta, Yoshiyuki; and Honda, Kiyoshi, 5,087,548, Cl. 430-192.000.
- Japanese Foundation for Cancer Research: See—
Tsuruo, Takashi; Hamada, Hirofumi; and Sugano, Haruo, 5,087,560, Cl. 435-6.000.

- Kato, Hiroaki: See—
Sakono, Ikuo; Inui, Motokazu; and Kato, Hiroaki, 5,087,113, Cl. 359-59.000.
- Kato, Nobuyuki; Habuchi, Ryoji; Morisawa, Kunio; and Itoh, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control apparatus for vehicle transmission system, incorporating valves for reverse inhibit valve. 5,086,672, Cl. 74-868.000.
- Kato, Osamu: See—
Ishizuka, Satoshi; Toda, Kazuro; and Kato, Osamu, 5,087,109, Cl. 385-34.000.
- Kato, Shigeki; and Inoue, Katsuhiro, to NGK Insulators, Ltd. Ceramic material for injection molding and method of injection molding using the same. 5,087,594, Cl. 501-97.000.
- Kato, Yasuyoshi; Konishi, Kunihiro; Akama, Hiroshi; Matsuda, Toshiaki; and Teshima, Nobue, to Babcock-Hitachi Kabushiki Kaisha. Process for producing a catalyst for denitration by catalytic reduction using ammonia. 5,087,600, Cl. 502-309.000.
- Katz, Howard G.; and Sarkis, Michael T., to National Starch and Chemical Investment Holding Corporation. Non-thermoplastic binder for use in processing textile articles. 5,087,487, Cl. 427-366.000.
- Kauwenberg, Werner D. P.: See—
van Uden, Maria C.; van der Wilk, Ronald; van Moorsel, Josephus J.; and Kauwenberg, Werner D. P., 5,087,854, Cl. 313-403.000.
- Kawaguchi, Chikara: See—
Kikuta, Tomoyuki; and Kawaguchi, Chikara, 5,086,900, Cl. 192-142.00R.
- Kawaguchi, Makoto: See—
Hotta, Yoshihiro; Kubo, Keishi; Kawaguchi, Makoto; and Nogiwa, Toru, 5,087,601, Cl. 503-200.000.
- Kawaguchi, Shigeru: See—
Miura, Masahiko; Kawaguchi, Shigeru; Inoue, Kunitoshi; Yamamoto, Hideo; and Ohkura, Ken, 5,087,058, Cl. 277-235.00B.
- Kawahara, Isao, to Matsushita Electric Industrial Co., Ltd. Clamp signal processing apparatus. 5,087,973, Cl. 358-167.000.
- Kawai, Hiromitsu: See—
Vianello, Daniele; Kawai, Hiromitsu; Ubezio, Antonio; and Jemma, Orlando, 5,086,769, Cl. 128-377.000.
- Kawai, Hisao; Kurikawa, Akiori; and Suzuki, Hisanori, to Hoya Corporation. Method of manufacturing magnetic recording medium capable of recording information at a high recording density. 5,087,482, Cl. 427-129.000.
- Kawai, Noriko: See—
Inukai, Hiroshi; Kawai, Noriko; Kitahara, Takahiro; Kai, Shinichi; and Kubo, Motonobu, 5,087,679, Cl. 526-249.000.
- Kawai, Yutaka: See—
Ishibai, Isao; Otsu, Hitonobu; and Kawai, Yutaka, 5,087,115, Cl. 359-719.000.
- Kawakami, Hideyuki, to Mitsubishi Denki Kabushiki Kaisha. Standing wave type linear accelerator. 5,087,887, Cl. 328-233.000.
- Kawakami, Junzo: See—
Nyui, Sachio; Nakamura, Tamotzu; and Kawakami, Junzo, 5,087,179, Cl. 418-47.000.
- Kawakatsu, Satoshi: See—
Koyama, Mikio; Kawakatsu, Satoshi; Akashi, Tomoji; and Okaniwa, Kenichi, 5,087,421, Cl. 422-56.000.
- Kawamoto, Masao: See—
Yamaguchi, Shinji; Hirakawa, Kiyoshi; Kashima, Seiji; Tanaka, Kazuhiko; Kawamoto, Masao; and Akagi, Takao, 5,087,519, Cl. 428-373.000.
- Kawarasaki, Yoshihiro, to Nissan Motor Company, Limited. Attitude change suppressive control system for active suspension system for automotive vehicle. 5,087,072, Cl. 280-772.000.
- Kawasaki Jukogyo Kabushiki Kaisha: See—
Mizuta, Fumio; Arai, Takashi; Matsuda, Yoshiharu; and Takegami, Itsuo, 5,086,858, Cl. 180-68.300.
- Kawashima, Hideaki: See—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 5,087,729, Cl. 560-41.000.
- Kawashima, Saburo: See—
Ohta, Masahiro; Kawashima, Saburo; Sonobe, Yoshiho; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,087,689, Cl. 528-185.000.
- Kawashima, Yoshiaki: See—
Niwa, Toshiyuki; Kawashima, Yoshiaki; Takeuchi, Hirofumi; and Ito, Yoji, 5,087,455, Cl. 424-497.000.
- Kawata, Noriyuki: See—
Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.
- Kawawake, Yasuhiro: See—
Tohma, Kiyokazu; Sugita, Ryuji; Honda, Kazuyoshi; Kawawake, Yasuhiro; and Ishida, Tatsuki, 5,087,476, Cl. 427-35.000.
- Kazama, Akira: See—
Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; and Horie, Shigetake, 5,087,321, Cl. 156-608.000.
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- Kearns, Edward G.; Roessler, Norbert; van Cauter, Gustaaf; and Ukraincik, Kreso, to Digital Diagnostic Corp. Radiometric analysis system for solid support samples. 5,087,820, Cl. 250-385.100.
- Kebede, Kassahun: See—
May, Phillip A.; Ward, John L.; and Kebede, Kassahun, 5,087,918, Cl. 342-85.000.
- Keck, Volkmar: See—
Weber, Otto; Keck, Volkmar; Grohnert, Siegfried; and Thesenvitz, Manfred, 5,087,020, Cl. 267-35.000.
- Keetley, R. G.: See—
Fawley, Robert W.; Keetley, R. G.; and Treece, William D., 5,086,968, Cl. 228-119.000.
- Keeton, David A.: See—
Keeton, J. Herbert; and Keeton, David A., 5,087,140, Cl. 493-23.000.
- Keeton, J. Herbert; and Keeton, David A. Festooning machine for cloth strips. 5,087,140, Cl. 493-23.000.
- Keicher, Eckard: See—
Merz, Johann; Schmid, Josef; and Keicher, Eckard, 5,086,942, Cl. 220-302.000.
- Keighler, Howard V. Arch treatment. 5,086,822, Cl. 160-38.000.
- Keith, Peter T., to SciMed Life Systems, Inc. Method for forming an inflatable balloon for use in a catheter. 5,087,394, Cl. 204-22.000.
- Kelham, Stephen F., to Imperial Chemical Industries plc. Process for cooling of gaseous chlorine. 5,087,335, Cl. 204-128.000.
- Kelley, James O.; and Stumpf, William E., to Herman Miller, Inc. Work space management system hallway wall arrangement. 5,086,597, Cl. 52-239.000.
- Kelley, Kurtis C.; and Sloma, John M., to Caterpillar Inc. Slotted bus bar for a piezoelectric solid state motor. 5,087,848, Cl. 310-328.000.
- Kelly, John K. Radiographic file holder. 5,086,934, Cl. 211-45.000.
- Kelly, Kieran B., to Hewlett-Packard Company. Combination pinch roller and carriage guide for printer. 5,087,141, Cl. 400-352.000.
- Kennedy, Reid A.: See—
Raudys, Vytautas A.; and Kennedy, Reid A., 5,087,463, Cl. 426-138.000.
- Kent Research Corporation: See—
Mullen, Patrick W.; and Nobile, Frederick E., 5,087,387, Cl. 252-299.500.
- Kentennial Engineering Limited: See—
Betts, David R., 5,087,106, Cl. 312-263.000.
- Keough, William J.; Parker, Donald L.; and Smith, Neil L., to Iron Tiger Investments Inc. Agglomeration process utilizing emulsion. 5,087,293, Cl. 75-771.000.
- Kervagoret, Gilbert, to Bendix Europe Services Techniques. Hydraulic booster device with valve means for damping of input rod. 5,086,688, Cl. 91-440.000.
- Ketraro, Reuven: See—
Perry, Mordechai; Gilron, Jack; Ketraro, Reuven; and Linder, Charles, 5,087,338, Cl. 204-182.00B.
- Keturakis, Andrius A.: See—
Balch, Richard A.; Keturakis, Andrius A.; and Velte, Scott D., 5,087,875, Cl. 324-157.000.
- Khandros, Igor Y.: See—
Grube, Gary W.; and Khandros, Igor Y., 5,086,558, Cl. 29-832.000.
- Kida, Koichi: See—
Higuchi, Hirofumi; and Kida, Koichi, 5,087,736, Cl. 560-215.000.
- Higuchi, Hirofumi; Kida, Koichi; and Ebata, Shuji, 5,087,737, Cl. 560-215.000.
- Kidd, Bruce R.: See—
Fox, Thomas R.; and Kidd, Bruce R., 5,086,613, Cl. 56-10.900.
- Kiefer, Heinz E. Continuous mining machine. 5,087,102, Cl. 299-72.000.
- Kieschke, Robert R.; and Clyne, Trevor W., to Rolls-Royce plc. Manufacture of metal/fiber composites. 5,087,303, Cl. 148-276.000.
- Kigimiya, Shuzo; Fukumochi, Yoji; Sata, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, to Sharp Kabushiki Kaisha. System for translating adverb phrases placed between two commas through a converter using tree-structured conversion rules. 5,088,039, Cl. 364-419.000.
- Kigoshi, Shoji: See—
Kitaura, Koichi; Kigoshi, Shoji; and Hisaki, Hisao, 5,087,985, Cl. 359-350.000.
- Kiguchi, Hiroyuki: See—
Moriwaki, Isamu; and Kiguchi, Hiroyuki, 5,088,078, Cl. 369-44.250.
- Kikabhai, Thakor, to BP Chemicals Limited. Synthesis of alpha-hydroxy ketones. 5,087,761, Cl. 568-388.000.
- Kikuchi, Akira: See—
Murakami, Yoshiaki; Murakami, Takahisa; and Kikuchi, Akira, 5,086,896, Cl. 192-48.910.
- Kikuchi, Hiroyuki: See—
Shiga, Shoji; Uno, Naoki; Tanaka, Yasuzo; Kikuchi, Hiroyuki; and Shiroyama, Kaisu, 5,087,604, Cl. 505-1.000.
- Kikuchi, Tohru: See—
Nishizawa, Hiroshi; Suzuki, Kenji; Mukoyama, Yoshiyuki; Kikuchi, Tohru; and Sato, Hidetaka, 5,087,658, Cl. 524-538.000.
- Kikusawa, Masanaga: See—
Sakai, Naomichi; Kikusawa, Masanaga; Kubota, Yoshitaka; Yamamura, Hiroshi; and Nagata, Hiroya, 5,088,003, Cl. 361-330.000.
- Kikuta, Teruo: See—
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.
- Kikuta, Tomoyuki; and Kawaguchi, Chikara, to ASMO Co., Ltd. Power converting mechanism. 5,086,900, Cl. 192-142.00R.
- Kim, Dai W., to Hoechst Celanese Corp. Flame retardant film and composite containing superabsorbent polymer. 5,087,513, Cl. 428-283.000.
- Kim, Samuel. Putting green with adjustable topography and multi-ball return. 5,087,045, Cl. 273-176.00H.
- Kimberly-Clark Corporation: See—
Leubke, Emory E.; and Haen, Keith R., 5,086,608, Cl. 53-443.000.
- Neuwirth, Joseph G., 5,087,320, Cl. 156-580.200.

- Kimble, James B.; and Kolts, John H., to Phillips Petroleum Company. Method of oxidative conversion. 5,087,787, Cl. 585-500.000.
- Kimura, Takashi: See—
Endo, Kazuo; and Kimura, Takashi, 5,087,578, Cl. 437-31.000.
- Kimura, Yasushi: See—
Tsuetsui, Takeo; Takayanagi, Teruo; Kimura, Yasushi; and Hasegawa, Nozomu, 5,087,974, Cl. 358-180.000.
- Kinami, Hitoshi: See—
Kishita, Hirofumi; Sato, Shinichi; Kinami, Hitoshi; Takago, Toshio; Fukuda, Kenichi; and Yamada, Hirokazu, 5,087,720, Cl. 556-434.000.
- King, Alexander J.; and Nimmo, William M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade & Industry in Her Britannic Majesty's Government of the. Fabric lifting apparatus and method. 5,087,315, Cl. 156-344.000.
- King, James F.: See—
Horn, Joseph B.; Tower, Allen J.; and King, James F., 5,087,247, Cl. 604-98.000.
- King, Richard W.; and Wiley, Timothy P., to Lakewood Industries, Inc. Enclosure for optical disk or the like. 5,086,923, Cl. 206-444.000.
- King, Spencer L.: See—
Wolinsky, Harvey; King, Spencer L.; and Barbere, Michael D., 5,087,244, Cl. 604-53.000.
- Kingsford, Ted L., to Maybe Holding Co. Adjustable mascara applicator. 5,086,793, Cl. 132-218.000.
- Kinloch, Anthony J.; and Shaw, Stephen J., to Secretary of State for Defence in her Majesty's Government of United Kingdom. Composition from reacting vinylidene terminated polybutadiene/acrylonitrile and bisimide. 5,087,681, Cl. 526-262.000.
- Kinoshita, Masahide, to Canon Kabushiki Kaisha. Developing apparatus. 5,086,728, Cl. 118-653.000.
- Kinoshita, Mitsuo; Shimono, Toshihide; Yamaguchi, Shozo; and Yamamoto, Tsuneo, to Takemoto Yushi Kabushiki Kaisha. Method of providing fluidizing property to hydraulic cement compositions using cement dispersion agents comprising water soluble vinyl copolymer. 5,087,648, Cl. 524-3.000.
- Kinoshita, Shouchirou: See—
Tomimaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
- Kira, Norisuke: See—
Yashima, Kenichi; Kira, Norisuke; and Minagawa, Yoshinori, 5,086,915, Cl. 206-204.000.
- Kiramatsu, Yasuo: See—
Sakuma, Shuji; Kanematsu, Seigo; and Kiramatsu, Yasuo, 5,086,563, Cl. 30-260.000.
- Kirchner, Peter: See—
Bohmholdt, Gerd; Disteldorf, Josef; Kirchner, Peter; and Michalczak, Hans-Werner, 5,087,739, Cl. 560-345.000.
- Kirimoto, Tetsuo: See—
Fujisaka, Takahiko; Kirimoto, Tetsuo; Oh-hashi, Yoshimasa; and Kondo, Michimasa, 5,087,917, Cl. 342-84.000.
- Kirkwood, George T.: See—
Rohde, Mark W.; Kirkwood, George T.; and Schalk, Dick G., 5,087,798, Cl. 200-5.00A.
- Kisanuki, Hisayuki: See—
Nakano, Shuji; and Kisanuki, Hisayuki, 5,086,588, Cl. 49-441.000.
- Kish, Conrad W.: See—
Billings, Zeb; Pierce, Harold D.; Kish, Conrad W.; and Kusina, Patrick E., 5,087,043, Cl. 273-157.00R.
- Kishi, Noriyuki: See—
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.
- Kishita, Hirofumi; Sato, Shinichi; Kinami, Hitoshi; Takago, Toshio; Fukuda, Kenichi; and Yamada, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Polysilthylensiloxane. 5,087,720, Cl. 556-434.000.
- Kita, Hidetoshi: See—
Okamoto, Kenichi; Kita, Hidetoshi; Tanaka, Yasuo; and Iimuro, Shigeru, 5,087,767, Cl. 568-727.000.
- Kitagawa, Kiyoshi: See—
Sogawa, Akira; Kitagawa, Kiyoshi; Onodera, Chikau; and Onuma, Tadashi, 5,086,786, Cl. 128-783.000.
- Kitahara, Genichi, to Nihon Biso Kabushiki Kaisha. Device for cleaning a window glass. 5,086,533, Cl. 15-103.000.
- Kitahara, Takahiro: See—
Inukai, Hiroshi; Kawai, Noriko; Kitahara, Takahiro; Kai, Shinichi; and Kubo, Motonobu, 5,087,679, Cl. 526-249.000.
- Kitamura, Mitsuo; and Hayami, Kazunori, to Fujitsu Limited. Phase shift circuit and repeater using the same. 5,088,106, Cl. 375-4.000.
- Kitamura, Nobuyoshi: See—
Sagawa, Kouichiro; Kitamura, Nobuyoshi; Ueda, Masako; and Takeuchi, Koji, 5,087,517, Cl. 428-329.000.
- Kitauchi, Hajime: See—
Matsuoka, Fumio; Okajima, Jiro; Okuma, Keiko; Tomita, Ken; Shibuya, Yasuo; Nakamura, Mutsumi; and Kitauchi, Hajime, 5,086,624, Cl. 62-160.000.
- Kitaura, Koichi; Kigoshi, Shoji; and Hisaki, Hisao, to Toray Industries, Inc. Polarizer for visible light. 5,087,985, Cl. 359-350.000.
- Kiyomiya, Masaaki: See—
Serita, Kaoru; Kiyomiya, Masaaki; Takahashi, Jun; Watanabe, Masatoshi; and Iwamoto, Masaki, 5,088,076, Cl. 369-36.000.
- Kiyota, Satoshi: See—
Banjo, Tetsuya; Iida, Eiji; Tokunaga, Katsuhiko; and Kiyota, Satoshi, 5,086,866, Cl. 180-219.000.
- Klein, James H.: See—
Borlinghaus, Hans J.; and Klein, James H., 5,087,009, Cl. 248-429.000.
- Klein, John M. Universal projectile ammunition. 5,086,703, Cl. 102-439.000.
- Klett, Johannes: See—
Farin, Gunter; Geiselhart, Franz; and Klett, Johannes, 5,087,257, Cl. 606-35.000.
- Klinedinst, Keith A.: See—
Sigai, A. Gary; and Klinedinst, Keith A., 5,087,523, Cl. 428-404.000.
- Klumpp, Harry R., to Fontaine Industries. Adjustable telescopic sight mount. 5,086,566, Cl. 33-247.000.
- Knelson, Benjamin. Removal of concentrate from a centrifugal separator. 5,087,127, Cl. 366-27.000.
- Ko, Wen S.: See—
Lin, Cheng H.; Chen, Shi K.; Hung, Ying C.; Ko, Wen S.; and Chang, Wen C., 5,087,302, Cl. 148-103.000.
- Koba, Richard J.: See—
Frenklach, Michael Y.; Spear, Karl E.; and Koba, Richard J., 5,087,434, Cl. 423-446.000.
- Kobayashi, Atsuko: See—
Kanda, Hitoshi; and Kobayashi, Atsuko, 5,087,546, Cl. 430-137.000.
- Kobayashi, Hideki: See—
Ishihara, Toshihiro; Hosokai, Tetsushi; Takaba, Tetsuro; and Kobayashi, Hideki, 5,086,744, Cl. 123-480.000.
- Kobayashi, Junji, to Canon Kabushiki Kaisha. Magnetic recording and reproducing apparatus with adjustable capstan speed. 5,087,993, Cl. 360-73.050.
- Kobayashi, Kengo: See—
Takeo, Ohwada; and Kobayashi, Kengo, 5,087,675, Cl. 525-455.000.
- Kobayashi, Takahiro: See—
Onagi, Nobuaki; Suzuki, Shinichiro; Fujii, Seiro; Kobayashi, Takahiro; Yoshikawa, Takamasa; Yamaguchi, Masayasu; and Ogasawara, Kiyohide, 5,087,340, Cl. 204-192.200.
- Kobayashi, Toru: See—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 5,087,729, Cl. 560-41.000.
- Kobayashi, Yoshimichi: See—
Sugino, Satoru; and Kobayashi, Yoshimichi, 5,087,664, Cl. 525-124.000.
- Koblish, Theodore R.; and Bell, Leonard D., to Fuel Systems Textron Inc. Small airblast fuel nozzle with high efficiency inner air swirler. 5,086,979, Cl. 239-404.000.
- Koch Supplies, Inc.: See—
Sterling, Bruce; and McGrath, Stuart, 5,087,222, Cl. 452-127.000.
- Koch, Tad H.: See—
Mahoney, Robert P.; and Koch, Tad H., 5,087,388, Cl. 252-301.170.
- Kodama, Tohru: See—
Maeda, Mitsuru; Kodama, Tohru; Iwasawa, Norio; Higuchi, Naoki; and Amano, Norihide, 5,087,614, Cl. 514-16.000.
- Koga, Nobuhito: See—
Tsutsumi, Toshihiko; Nakamura, Toshiyuki; Morikawa, Shuichi; and Koga, Nobuhito, 5,087,644, Cl. 523-205.000.
- Kogel, Walter: See—
Elser, Dieter; Hetzel, Helmut; and Kogel, Walter, 5,086,687, Cl. 91-375.00A.
- Koguchi, Yuji: See—
Takeuchi, Hajime; and Koguchi, Yuji, 5,087,501, Cl. 428-141.000.
- Kohda, Toshiyuki: See—
Sakae, Shigeo; Kohda, Toshiyuki; Shimaki, Yasuharu; Takagi, Hideyuki; and Togawa, Hayato, 5,088,049, Cl. 395-23.000.
- Koizumi, Masumi: See—
Tomitaka, Kichinojo; and Koizumi, Masumi, 5,087,526, Cl. 428-480.000.
- Koizumi, Takashi: See—
Tanaka, Kouji; Ikeda, Masaaki; Tsubakimoto, Yasumasa; Koizumi, Takashi; Nakagawa, Takerou; and Kanehira, Makoto, 5,087,132, Cl. 384-276.000.
- Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, to Toyo Seikan Kaisha Ltd. Emulsion type water paint, process for its production, and process for applying same. 5,087,645, Cl. 523-406.000.
- Kokubun, Kiyohide: See—
Ichimura, Shingo; Kokubun, Kiyohide; and Shimizu, Hazime, 5,087,814, Cl. 250-287.000.
- Kokumai, Yuji: See—
Nakazawa, Toru; Kokumai, Yuji; Naito, Koichi; Suzuki, Shoji; and Noguchi, Tadao, 5,087,851, Cl. 310-323.000.
- Kolberg, Thomas; Gehmecker, Horst; and Heitbaum, Joachim, to Metallgesellschaft Aktiengesellschaft. Process for removing titanium and zirconium from aqueous solutions. 5,087,373, Cl. 210-665.000.
- Kolbus GmbH & Co. KG: See—
Erdberies, Ulrich; Grannemann, Gerhard; and Rathert, Horst, 5,087,163, Cl. 412-35.000.
- Kolditz, Joachim, to Gemeinschaftskernkraft Neckar GmbH (GKN). Method of avoiding localized hydrogen build-ups in safety tanks of reactors. 5,087,410, Cl. 376-298.000.
- Kolts, John H.: See—
Kimble, James B.; and Kolts, John H., 5,087,787, Cl. 585-500.000.

- Komag, Inc.: See—
Chen, Tu; Iseda, Toru; and Mannami, Kazuo, 5,087,481, Cl. 427-129.000.
- Komatsu, Nobuhiro; Fujinaka, Mitsuru; Sannomiya, Masayoshi; Kondo, Toshiro; and Nishiyama, Atsushi, to Mazda Motor Corporation. Vehicle suspension mounting structure. 5,087,074, Cl. 280-788.000.
- Komiyu, Hidetsugu; Kurakake, Mitsuo; and Hattori, Seiichi, to Fanuc Ltd. Floppy disk auxiliary memory device. 5,088,084, Cl. 369-75.100.
- Komori, Chihoro: See—
Tanuma, Jiro; Ishimizu, Hideaki; Kasai, Tadashi; and Komori, Chihoro, 5,087,134, Cl. 400-54.000.
- Konai, Yutaka: See—
Yoshida, Kazuo; Okubo, Nobuyuki; Matsuda, Toshiharu; and Konai, Yutaka, 5,087,742, Cl. 562-421.000.
- Kondo, Michimasa: See—
Fujisaka, Takahiko; Kirimoto, Tetsuo; Oh-hashii, Yoshimasa; and Kondo, Michimasa, 5,087,917, Cl. 342-84.000.
- Kondo, Mitsuhiro: See—
Takeyama, Takeshi; and Kondo, Mitsuhiro, 5,088,008, Cl. 361-403.000.
- Kondo, Shigeki; and Mizutani, Hidemasa, to Canon Kabushiki Kaisha. Solar battery and process for preparing same. 5,087,296, Cl. 136-258.000.
- Kondo, Toshiro: See—
Komatsu, Nobuhiro; Fujinaka, Mitsuru; Sannomiya, Masayoshi; Kondo, Toshiro; and Nishiyama, Atsushi, 5,087,074, Cl. 280-788.000.
- Konica Corporation: See—
Koyama, Mikio; Kawakatsu, Satoshi; Akashi, Tomoji; and Okaniwa, Kenichiro, 5,087,421, Cl. 422-56.000.
- Pochieh, Hung, 5,087,126, Cl. 356-402.000.
- Konieczka, Howard R.: See—
Koper, Robert P.; and Konieczka, Howard R., 5,086,697, Cl. 101-336.000.
- Konishi, Kunihiko: See—
Kato, Yasuyoshi; Konishi, Kunihiko; Akama, Hiroshi; Matsuda, Toshiaki; and Teshima, Nobue, 5,087,600, Cl. 502-309.000.
- Konitzer, Douglas G.: See—
Angers, Lynette M.; Konitzer, Douglas G.; Murray, Joanne L.; and Truckner, William G., 5,087,301, Cl. 148-12.70A.
- Konno, Toshio: See—
Takanashi, Itsuo; Yamamura, Takashi; Nakagaki, Shintaro; Ichito, Toshiakatsu; Nakano, Atsushi; Shimada, Tadayuki; and Konno, Toshio, 5,087,929, Cl. 346-108.000.
- Konno, Tsuneo: See—
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.
- Kono, Tadashi: See—
Wada, Yoshihiro; Suzuki, Kazunori; Kono, Tadashi; and Asano, Katsuo, 5,087,144, Cl. 401-199.000.
- Kononen, Mauri: See—
Maki-Rahkola, Jari; Kononen, Mauri; and Surakka, Jorma, 5,086,610, Cl. 53-587.000.
- Koper, Robert P.; and Konieczka, Howard R., to Paymaster Corporation. The inked ribbon cartridge for money order imprinter. 5,086,697, Cl. 101-336.000.
- Korb, Daniel, to Dyes GmbH. Table with support frame and tabletop and control device for varying the height and inclination of the tabletop. 5,086,710, Cl. 108-4.000.
- Korea Advanced Institute of Science and Technology: See—
Jung, Il Nam; Hwang, Sang Yo; and Bae, Hae Kyung, 5,087,717, Cl. 556-416.000.
- Korty, David. Ratchet wrench with positive locking capability. 5,086,673, Cl. 81-59.10.
- Koschmann, Martin L.: See—
Broadway, John M.; Koschmann, Martin L.; and Mullikin, William D., 5,086,555, Cl. 29-714.000.
- Koseki, Isamu: See—
Fukuchi, Mikiharu; Nakano, Yasuhiko; Hayashi, Keisuke; Koseki, Isamu; Ito, Masami; and Akiyama, Ryozo, 5,087,299, Cl. 148-11.50P.
- Koshikawa, Takeo: See—
Hanada, Masayuki; Fukuda, Morio; Koshikawa, Takeo; Yamauchi, Akihiro; and Ogura, Hiroshi, 5,087,430, Cl. 423-239.000.
- Koshizuka, Kazuo: See—
Inomata, Masamitsu; Shiotani, Naokazu; Koshizuka, Kazuo; and Karasawa, Minato, 5,087,722, Cl. 558-338.000.
- Koskenmaki, David C.: See—
Calhoun, Clyde D.; Berg, James G.; Koskenmaki, David C.; and Swinehart, Robert M., 5,087,494, Cl. 428-40.000.
- Kotzsch, Hans-Joachim: See—
Seiler, Claus-Dietrich; Rauleder, Hartwig; Frings, Albert; and Kotzsch, Hans-Joachim, 5,087,714, Cl. 556-401.000.
- Kousokabe, Hirokatsu; Iwata, Hiroshi; and Takebayashi, Masahiro, to Hitachi, Ltd. Rotary compressor. 5,087,170, Cl. 415-110.000.
- Kovacs, Geza L., to Pori, International, Inc. Process for enhancing the dewaterability of waste sludge from microbiological digestion. 5,087,378, Cl. 210-742.000.
- Kowalski, Ronald C.: See—
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; and Davis, William M., 5,087,674, Cl. 525-356.000.
- Koyama, Mikio; Kawakatsu, Satoshi; Akashi, Tomoji; and Okaniwa, Kenichiro, to Konica Corporation. Multilayered assay element. 5,087,421, Cl. 422-56.000.
- Koyama, Susumu, to Fujitsu Limited. System for restructuring input/output control system. 5,088,029, Cl. 395-275.000.
- Kozio, Walter, to Modern Home Products Corp. Handle and timer assembly for a barbecue grill. 5,088,069, Cl. 368-10.000.
- Krabetz, Richard; Duembgen, Gerd; Merger, Franz; Jaeger, Michael; Thiessen, Fritz; and Vogel, Herbert, to BASF Aktiengesellschaft. Preparation of methacrylic acid. 5,087,744, Cl. 562-535.000.
- Kraft General Foods, Inc.: See—
Combes, Richard C.; Schwimmer, William H.; and Barbera, Bradley D., 5,087,471, Cl. 426-573.000.
- Kraft, Walter: See—
Frick, Beat; Kraft, Walter; and Ursprung, Karl, 5,087,937, Cl. 355-1.000.
- Krall, Thomas J.; and Myers, Robert A., to Owens-Illinois Plastic Products Inc. Method for making a multi-layer plastic container with a handle. 5,087,406, Cl. 264-512.000.
- Kraus, Rudolf: See—
Detzel, Josef; Schraegle, Walter; and Kraus, Rudolf, 5,086,971, Cl. 229-188.000.
- Krause, Joachim: See—
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- Krautwald, Herbert: See—
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- Krebs & Cie: See—
Marais, Dominique; and Collantes, Jesus, 5,087,334, Cl. 204-95.000.
- Kreibichl, Guenter: See—
Kasper, Dietmar; Woltron, Herbert; Kreibichl, Guenter; Eichenauer, Ulrich; and Becker, Norbert, 5,087,500, Cl. 428-116.000.
- Krenicki, Joseph: See—
Morton, William E.; Fairbanks, Harold V.; Wallis, James; Hunicke, Raymond L.; and Krenicki, Joseph, 5,087,379, Cl. 210-748.000.
- Krenkel, Christian. Device to fix or control the mutual position of teeth. 5,087,202, Cl. 433-215.000.
- Krenkel, Christian. Orthopedic plate to fix in position portions of bone when reconstructing the lower jaw. 5,087,259, Cl. 606-60.000.
- Krentz, Richard H.: See—
Francis, Laurie A.; and Krentz, Richard H., 5,086,860, Cl. 180-68.500.
- Krishnan, Sivaram; Price, Ronald L.; Shu, Peter H. C.; and Witman, Mark W., to Mobay Corporation. Article molded from a polycarbonate composition having improved platability. 5,087,524, Cl. 428-412.000.
- Kropp, Harry C., to Fel-Pro Incorporated. Multiple pad contact sensor and method for measuring contact forces at a plurality of separate locations. 5,086,652, Cl. 73-767.000.
- Krueger, Hans; and Weber, Hubert, to Siemens Aktiengesellschaft. CO or CO₂ waveguide laser. 5,088,102, Cl. 372-64.000.
- Krueger International, Inc.: See—
Finses, Gregory R., 5,086,606, Cl. 52-794.000.
- Kruppa, Robert W., to International Business Machines Corporation. Motor driving apparatus and printer. 5,087,867, Cl. 318-696.000.
- Kruse, Larry W.: See—
Quinn, George P.; Kruse, Larry W.; Gebhard, Thomas J.; and Forgac, John M., 5,087,427, Cl. 422-144.000.
- Kryk, Lewis R., to Diversey Corporation. Detergent container. 5,086,952, Cl. 222-189.000.
- Kubik, Andreas: See—
Heise, Wolfgang; Trzynka, Kurt; and Kubik, Andreas, 5,087,191, Cl. 425-335.000.
- Kubis, Herbert; and Wittmann, Dieter, to MAN Nutzfahrzeuge Aktiengesellschaft. Motor brake for air-compressing internal combustion engines. 5,086,738, Cl. 123-322.000.
- Kubo, Fumio: See—
Fukui, Kiyoshi; Kubo, Fumio; and Watanabe, Masayuki, 5,087,568, Cl. 435-189.000.
- Kubo, Keishi: See—
Hotta, Yoshihiko; Kubo, Keishi; Kawaguchi, Makoto; and Nogiwa, Toru, 5,087,601, Cl. 503-200.000.
- Kubo, Motonobu: See—
Inukai, Hiroshi; Kawai, Noriko; Kitahara, Takahiro; Kai, Shinichi; and Kubo, Motonobu, 5,087,679, Cl. 526-249.000.
- Kubo, Takashige: See—
Takasaki, Shigeo; Yoshioka, Masaichiro; Kubo, Takashige; Ukai, Yoshio; Kubo, Yasuo; Imura, Jinichi; and Hagiwara, Nobutaka, 5,088,031, Cl. 395-400.000.
- Kubo, Yasuo: See—
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- Kubota Ltd.: See—
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- Kubota, Ryuji: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouichirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
- Kubota, Yoshitaka: See—
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- Kubotera, Masaaki: See—
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- Kumamoto, Michihisa: See—
Nakajima, Hiroharu; Suzuki, Naohisa; and Kumamoto, Michihisa, 5,087,136, Cl. 400-214.000.
- Kumiai Chemical Industry Co., Ltd.: See—
Kaku, Koichiro; Wada, Nobuhide; Takeuchi, Akira; Toyokawa, Yasufumi; Miyazawa, Takeshige; Yoshida, Ryo; and Sugiyama, Kazuhiko, 5,087,289, Cl. 71-93.000.
- Kundu, Kalyan: See—
Phillips, Philip W.; Wu, Hong-L.; Dunlap, David H.; and Kundu, Kalyan, 5,087,948, Cl. 357-16.000.
- Kunishi, Noriyuki, to Idemitsu Petrochemical Co., Ltd. Process and apparatus for heat treatment of polymer containing liquid. 5,087,660, Cl. 524-611.000.
- Kunnen, Henricus J., legal representative: See—
Davies, Thomas J.; Pfennings, Leonardus C. M. G., deceased; Kunnen, Henricus J., legal representative; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 5,087,840, Cl. 307-475.000.
- Kunz, Philippe: See—
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- Kuppelmaier, Harald: See—
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- Kupsky, George A.: See—
Cherry, Walter L.; and Kupsky, George A., 5,087,858, Cl. 315-169.300.
- Kurakake, Mitsuo: See—
Komiya, Hidetsugu; Kurakake, Mitsuo; and Hattori, Seiichi, 5,088,084, Cl. 369-75.100.
- Kuramatsu, Hiroyasu; Sato, Toshifumi; Matai, Masahiro; and Anma, Sada-yuki, to NEC Corporation. Method for superimposing independently transmitted data on pager display. 5,087,905, Cl. 340-311.100.
- Kuraray Company Ltd.: See—
Mori, Toshiaki; Onishi, Takashi; and Yamamoto, Kazuo, 5,087,762, Cl. 568-447.000.
- Yamaguchi, Shinji; Hirakawa, Kiyoshi; Kashima, Seiji; Tanaka, Kazuhiko; Kawamoto, Masao; and Akagi, Takao, 5,087,519, Cl. 428-373.000.
- Kurata, Takafumi: See—
Iizuka, Nanori; and Kurata, Takafumi, 5,086,894, Cl. 192-3.290.
- Kureha Kagaku Kogyo K.K.: See—
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- Kureha Kagaku Kogyo Kabushiki Kaisha: See—
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- Kuriabayashi, Kiyoshi: See—
Monji, Hideto; Kuriabayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.
- Kurihara, Sakuo: See—
Hirota, Isao; Teraoka, Masao; Kurihara, Sakuo; and Hasegawa, Mitsuru, 5,086,867, Cl. 180-248.000.
- Kurikawa, Akinori: See—
Kawai, Hideo; Kurikawa, Akinori; and Suzuki, Hisanori, 5,087,482, Cl. 427-129.000.
- Kurita, Hiroyuki: See—
Yada, Tooru; Nakayama, Hideaki; and Kurita, Hiroyuki, 5,087,185, Cl. 425-4.00C.
- Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadamukai, Yuzo; Fukushima, Masao; and Murakami, Kei, to Hitachi, Ltd.; and Nissan Motor Co. Ltd. Protective circuit in a device for reducing vibrations of a vehicle body. 5,087,869, Cl. 322-15.000.
- Kurkowski, Ronald C. Helical cut seal. 5,087,057, Cl. 277-222.000.
- Kuroda, Hisanobu: See—
Suzuki, Masayasu; and Kuroda, Hisanobu, 5,087,520, Cl. 428-389.000.
- Kuroda, Masami; Amano, Masayo; and Furusho, Noboru, to Fuji Electric Co., Ltd. Bisazo photoconductor for electrophotography. 5,087,541, Cl. 430-58.000.
- Kuromitsu, Yoshiro; Yoshida, Hideaki; Nagase, Toshiyuki; Tanaka, Tadaharu; and Kanda, Yoshio, to Mitsubishi Metal Corporation. Substrate used for fabrication of thick film circuit. 5,087,509, Cl. 428-195.000.
- Kurosawa, Kazuhito; Hikita, Mitsutaka; Tabuchi, Toyoji; Shibagaki, Nobuhiko; and Hirashima, Tetsuya, to Hitachi, Ltd. Surface acoustic wave band-pass filter with different phase weighted transducers. 5,087,901, Cl. 333-193.000.
- Kurowski, Serge, to Baker-Hughes Incorporated. Filtering cell. 5,087,363, Cl. 210-328.000.
- Kurtz, John H.: See—
Sloope, Charles E.; and Kurtz, John H., 5,086,722, Cl. 114-74.00R.
- Kurtz, Louis A., to Hughes Aircraft Company. Array beam position control using compound slots. 5,087,921, Cl. 343-771.000.
- Kurtz, Michael A., to Hubbell Incorporated. Electrical switch for hazardous environments. 5,087,803, Cl. 200-526.000.
- Kusaka, Takao: See—
Murata, Shimichi; Yamauchi, Yoshiyuki; Kusaka, Takao; Sawa, Takao; and Yagi, Noriaki, 5,086,554, Cl. 29-605.000.
- Kusina, Patrick E.: See—
Billings, Zeb; Pierce, Harold D.; Kish, Conrad W.; and Kusina, Patrick E., 5,087,043, Cl. 273-157.00R.
- Kutscherauer, Rudolf: See—
Manns, Patrick; and Kutscherauer, Rudolf, 5,087,479, Cl. 427-54.100.
- Kuwabara, Kouzou: See—
Noguki, Genji; Hoshida, Shigehiro; and Kuwabara, Kouzou, 5,087,678, Cl. 526-194.000.
- Kwan, Alfred: See—
Sprague, David L.; Simon, Allen H.; and Kwan, Alfred, 5,088,053, Cl. 395-166.000.
- Kwik Snap Corporation: See—
Angel, James A.; Hagar, Gilbert G.; and Clement, Michael H., 5,086,961, Cl. 225-1.000.
- Kwitkowski, Peter A.: See—
Mountz, Michael C.; and Kwitkowski, Peter A., 5,087,888, Cl. 330-65.000.
- Kyoto University: See—
Wada, Kazuhiko; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,087,330, Cl. 205-75.000.
- Kyowa Hakko Kogyo, Ltd.: See—
Takano, Junichi; Furukawa, Satoru; and Nakanishi, Toshihide, 5,087,566, Cl. 435-115.000.
- Kyowa Leather Cloth Co., Ltd.: See—
Yada, Tooru; Nakayama, Hideaki; and Kurita, Hiroyuki, 5,087,185, Cl. 425-4.00C.
- L. H. Carbide Corporation: See—
Neuenschwander, Thomas R., 5,087,849, Cl. 310-216.000.
- Labat, Yves: See—
Vallee, Yannick; and Labat, Yves, 5,087,759, Cl. 568-66.000.
- Laboratorios del Dr. Esteve: See—
Pinol, Augusto C.; Constans, Jordi F.; and Corominas, Juan P., 5,087,621, Cl. 514-210.000.
- Laboratorios Paris, C.A.: See—
Paris-Marcano, Lucinda C., 5,087,350, Cl. 208-221.000.
- Lacers, Inc.: See—
Melton, Eugene R., Jr., 5,087,309, Cl. 156-198.000.
- Lack, Geoffrey J.: See—
Yates, David E.; Lack, Geoffrey J.; and De Ville, Alan, 5,087,230, Cl. 475-151.000.
- Lackner, John R.; Grzywna, Stanley E.; Weber, Ralph A.; and Baird, Thomas E., to Scott Fetzer Company, The. Convertible vacuum cleaner. 5,086,536, Cl. 15-328.000.
- Laflour, Lee, to Custom Packaging Systems, Inc. Method for making a collapsible bag with spout. 5,087,235, Cl. 493-212.000.
- Lafser, Fred A., Jr., to Industrial Waste Management, Inc. System, apparatus and method for disposing of solid waste. 5,086,716, Cl. 110-345.000.
- Laghi, Aldo A. Multi plunger molding machine for liquid silicone rubber. 5,087,190, Cl. 425-145.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—
Garrido, Guillermo, 5,087,292, Cl. 75-681.000.
- Gauthier, Pierre, 5,086,623, Cl. 62-114.000.
- Lasnier, Didier; Beaco, Bruno; and Sakreiter, Daniel, 5,086,807, Cl. 137-505.110.
- Lakewood Industries, Inc.: See—
King, Richard W.; and Wilsey, Timothy P., 5,086,923, Cl. 206-444.000.
- Lakhani, Arun: See—
Schultheis, Alexander; Landrigan, Mark A.; and Lakhani, Arun, 5,087,370, Cl. 210-638.000.
- Lam, Kin S.: See—
Dabrah, Thomas T.; Hesler, Grace A.; Hofstead, Sandra J.; Lam, Kin S.; Mattei, Jacqueline M.; Schroeder, Daniel R.; and Tomita, Koji, 5,087,567, Cl. 435-169.000.
- Lamothe, Michele: See—
Delalle, Jacques; Ouani, Mahrez; Lamothe, Michele; Passa, Frederic; and Roucaute, Philippe, 5,086,967, Cl. 228-56.300.
- Lampe, Wolfgang: See—
Wenske, Hanno; Gallien, Arnold; Hanke, Wolfgang; Lampe, Wolfgang; and Illgen, Lothar, 5,087,344, Cl. 204-256.000.
- Lamping, John O.: See—
Dixon, Michael; de Kleer, Johan; and Lamping, John O., 5,088,048, Cl. 395-11.000.
- Lamson, Donald W. Bicycle shoe. 5,086,576, Cl. 36-131.000.
- Landolt, Claus-Dieter, to W. Schlafhorst AG & Co. Yarn guide drum. 5,086,985, Cl. 242-43.200.
- Landrigan, Mark A.: See—
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- Languillat, Jean P., to Lhomme S.A. Tube truncation apparatus and method. 5,086,677, Cl. 82-92.000.
- LaPoint, David A.; LaPoint, James P.; and LaPoint, J. Philip. Car cover deployment and storage system. 5,086,988, Cl. 242-96.000.
- LaPoint, J. Philip: See—
LaPoint, David A.; LaPoint, James P.; and LaPoint, J. Philip, 5,086,988, Cl. 242-96.000.
- LaPoint, James P.: See—
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- Large, David T., to Boeing Company, The. Aft cantilevered wing landing gear for heavy airplane with aft center of gravity. 5,086,995, Cl. 244-102.00R.

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Laseke, Erik A. Baseball bat swing training device. 5,087,039, Cl. 273-26.00R.

Laser Precision Corporation: See—
Ostrander, Frederick M.; and Hakimi, Hosain, 5,087,122, Cl. 356-73.100.

Lasnier, Didier; Beaco, Bruno; and Sakreiter, Daniel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude. Pressure reducer. 5,086,807, Cl. 137-505.110.

Latimer, David L.; Nofiri, Howard H.; Million, James F.; Grimm, Steven R.; and Platt, David S., to Spectra-Physics, Inc.; and Toledo Scale Corporation. Scale calibration/zeroing in data gathering system. 5,086,879, Cl. 186-61.000.

Latsko, James M., to Eaton Corporation. Coupling assembly component. 5,086,899, Cl. 192-88.00B.

Lau, Arthur L. Y., to Miles Inc. Composition for determining trace amount of protein. 5,087,575, Cl. 436-166.000.

Laudereau, Guy; Baurand, Gilles; Lubin, Isabelle; Gay, Sylvie; and Berdahl, Jacques, to Telemecanique, Electronic thermal relay and appropriate thermal element. 5,088,000, Cl. 361-103.000.

Laughner, Michael K., to Dow Chemical Company, The. Molding compositions with methyl (meth)acrylate-butadiene-styrene graft copolymers. 5,087,663, Cl. 525-67.000.

Lauper, Alfred, to Siemens-Albis AG. Variable attenuation network with constant input and output resistances. 5,087,899, Cl. 333-81.00R.

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Ozeki, Masamichi, 5,086,607, Cl. 53-64.000.

Lazarof, Sargon. Dental implant and method of using same. 5,087,199, Cl. 433-173.000.

Lazear, Nelson R.: See—
Chung, James Y. J.; Charles, John J.; and Lazear, Nelson R., 5,087,665, Cl. 525-133.000.

Leachy, Jeffrey L.: See—
Theus, John G.; and Leachy, Jeffrey L., 5,088,028, Cl. 395-325.000.

Leal, Orlando; Bolivar, Carmelo; Sepulveda, Gonzalo; Molleja, Gregorio; Martinez, German; and Esparragoza, Leon, to Armada de la Republica de Venezuela; and Universidad Central de Venezuela. Carbon dioxide adsorbent and method for producing the adsorbent. 5,087,597, Cl. 502-62.000.

Leder, Philip; and Stewart, Timothy A., to President and Fellows of Harvard College. Method for providing a cell culture from a transgenic non-human mammal. 5,087,571, Cl. 435-240.200.

Lee, Chang-heum, to Samsung Electronics Co., Ltd. Overvoltage protection power supply circuit. 5,088,018, Cl. 363-56.000.

Lee, Jeffery W.: See—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 5,088,033, Cl. 395-500.000.

Lee, Kuan M.: See—
Tang, Raymond; Lee, Kuan M.; and Chu, Ruey S., 5,087,922, Cl. 343-814.000.

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Lee, Leon L. M. Bag security seal and method of manufacturing same. 5,087,089, Cl. 292-308.000.

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Grandjean, Pierre-Andre; Bourgeois, Ivan; and Lee, Philip H. J., 5,086,787, Cl. 128-786.000.

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Le Gouic Martun, Jean-Jacques: See—
Prunier, Jean-Claude; Peuchet, Pascal; Le Gouic Martun, Jean-Jacques; and Bonnin, Claude, 5,087,211, Cl. 439-579.000.

Leighton, John C.: See—
Iovine, Carmine P.; Chandran, Rama S.; and Leighton, John C., 5,087,682, Cl. 526-271.000.

Lemoine, Maurice G., to Ampex Corporation. Synchronization of record media transports and tracking adjustment. 5,088,077, Cl. 369-43.000.

Le Molaire, Roger; and Gavotto, Dominique H. A., to ADL Automation Zone Industrielle. Process and apparatus for compressing, and monitoring the compression of, pulverulent materials and a press applying same. 5,087,398, Cl. 264-40.500.

Leo, Franca. Food product for domestic animals and a method for its manufacture. 5,087,473, Cl. 426-646.000.

Lerner, Robert M.: See—
Parker, Kevin J.; Lerner, Robert M.; and Huang, Sung-Rung, 5,086,775, Cl. 128-660.010.

Lestini, William F. Three-point cervical fixation device. 5,086,757, Cl. 602-17.000.

Lett, Alexander S.: See—
Bozman, GERAL P.; Eisenberger, George; Lett, Alexander S.; Myers, James J.; Tetzlaff, William H.; and Unger, Jay H., 5,088,026, Cl. 395-425.000.

Leubke, Emory E.; and Haen, Keith R., to Kimberly-Clark Corporation. Ergonomic hand loading carton bucket. 5,086,608, Cl. 53-443.000.

Leung, Tai L.; and Leung, Tai T. Corkscrew. 5,086,675, Cl. 81-3.290.

Leung, Tai T.: See—
Leung, Tai L.; and Leung, Tai T., 5,086,675, Cl. 81-3.290.

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Detzel, Josef; Schraegle, Walter; and Kraus, Rudolf, 5,086,971, Cl. 229-188.000.

Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., to Nabisco Brands, Inc. Double-encapsulated compositions containing volatile and/or labile components, and processes for preparation and use thereof. 5,087,461, Cl. 426-96.000.

Levine, Robert A.; and Wardlaw, Stephen C. Centrifuged material layer measurements taken in an evacuated tube. 5,086,784, Cl. 128-771.000.

Levine, Walter. Nebulizer. 5,086,765, Cl. 128-200.210.

Levings, Randall L.; and Stoll, Ione R., to United States of America, Agriculture. Bovine monoclonal antibodies to bovine herpesvirus 1 from sequential fusion heterohybridomas. 5,087,693, Cl. 530-387.000.

Levy, Julia G.: See—
Jamieson, Catriona; and Levy, Julia G., 5,087,636, Cl. 514-410.000.

Lewis Corporation: See—
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Leybold Aktiengesellschaft: See—
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Lhomme S.A.: See—
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Li, Chien C.; Cook, Kane D.; and Basu, Rajat S., to Allied-Signal Inc. Partially fluorinated alkenes having a tertiary structure. 5,087,777, Cl. 570-136.000.

Li, Kai: See—
Ellis, John R.; Li, Kai; and Appel, Andrew, 5,088,036, Cl. 395-425.000.

Li, Lehmann K., to Mitek Surgical Products, Inc. Suture throw holder and rundown system. 5,087,263, Cl. 606-148.000.

Libbey-Owens-Ford Co.: See—
Goodman, Ronald D.; and Tausch, Peter J., 5,087,525, Cl. 428-428.000.

Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., to Life Resonances, Inc. Methods and apparatus for regulating transmembrane ion movement utilizing selective harmonic frequencies and simultaneous multiple ion regulation. 5,087,336, Cl. 204-155.000.

Lichte, Leo J.; and Brown, Jack W., to Gish Biomedical, Inc. Auto-transfusion unit with vacuum regulation and cardiomy reservoir. 5,087,250, Cl. 604-321.000.

Lieberman, Sheldon: See—
Neil, Jeffrey T.; Lieberman, Sheldon; and Hackney, Michael, 5,087,399, Cl. 264-62.000.

Liebold, August: See—
Toral, Jose; Brandstetter, Hermann; Thiele, Hartmut; Liebold, August; and Gruber, Leo, 5,086,919, Cl. 206-303.000.

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Lin, Fan-Nan, to Alfa Metal Corp. Foldable ladder. 5,086,872, Cl. 182-18.000.

Lincoln, Lanny P.: See—
Schmidt, Frederick A.; Peterson, David T.; Wheelock, John T.; Jones, Lawrence L.; and Lincoln, Lanny P., 5,087,291, Cl. 75-581.000.

Linder, Charles: See—
Perry, Mordechai; Gilron, Jack; Kettraro, Reuven; and Linder, Charles, 5,087,338, Cl. 204-182.00B.

Lingemann, Horst, to Helmut Lingemann GmbH & Co. Laminated multilayer insulating glass and a spacer for the laminated multilayer insulating glass. 5,087,489, Cl. 428-34.000.

Link Special Machinery, Inc.: See—
David, Michael W., 5,086,638, Cl. 72-451.000.

Linstid, Henry C., III: See—
Aslam, Mohammad; Linstid, Henry C., III; and Davenport, Kenneth G., 5,087,769, Cl. 568-736.000.

Linton, James B.; and Gordon, John M., Jr., to Gordon Food Service, Inc. Processed shrimp product having easily removable shell and method of producing same. 5,087,221, Cl. 452-5.000.

Lipatov, Etablissement: See—
Heinzer, Paul, 5,087,507, Cl. 428-195.000.

Lishness, Bryant L.; and Scirica, Paul A., to Colt's Manufacturing Company, Inc. Sear positioning spring for a firearm. 5,086,578, Cl. 42-69.020.

Lisicki, Robert E., to Elopak Systems A.G. Flat top end closure for liquid containers. 5,086,928, Cl. 229-217.000.

Lister, Mark W. Virucidal wipe containing hypochlorite with hand protective barrier. 5,087,450, Cl. 424-402.000.

Littoral, Inc.: See—
Schall, William S.; and Richardson, James E., 5,088,068, Cl. 367-173.000.

LoBue, Salvatore. Quiz football board game. 5,087,051, Cl. 273-247.000.

Locey, Bryan A., to General Electric Company. Composite element having a variable density core. 5,087,511, Cl. 428-218.000.

Locher, Stefan: See—
Gesche, Roland; and Locher, Stefan, 5,087,800, Cl. 200-83.00C.

Lockett, John F.; and Lua, Aik B., to British Gas plc. Water heater. 5,086,731, Cl. 122-31.100.

Loder, Harry A.: See—
Blackwell, Elmer; Samuelson, Bruce E.; Emmel, John J.; and Loder, Harry A., 5,086,946, Cl. 221-45.000.

Loeppky, Richard N.; and Bao, Yen T., to University of Missouri, The. Curators of the. Polymers for scavenging nitrosating agents. 5,087,671, Cl. 525-328.200.

Loewen, Kel W.: See—
Newbery, Brian L.; Loewen, Kel W.; and Adolph, Grant H., 5,086,869, Cl. 180-329.000.

Loison, Gerard: See—
Courtney, Michael; Degryse, Eric; and Loison, Gerard, 5,087,613, Cl. 514-12.000.

Long, Jon; and Sidorovsky, Rachel S., to LSI Logic Corporation. Semiconductor device package. 5,087,961, Cl. 357-69.000.

Lonza Ltd.: See—
Fuchs, Rudolf; and McGarrity, John, 5,087,760, Cl. 568-361.000.

Hardt, Peter; Stravs, Andrej; and Abgottspon, Pius, 5,087,745, Cl. 562-553.000.

Jackson, Barry; and Scholl, Thomas, 5,087,756, Cl. 564-457.000.

Looser, Heinz: See—
Bolli, Peter; Kunz, Philippe; Looser, Heinz; and Tanner, Werner, 5,087,001, Cl. 246-327.000.

L'Oreal: See—
Chizat, Francois; Peignier, Michel; Grollier, Jean F.; and Dubief, Claude, 5,087,443, Cl. 424-47.000.

Losel, Walter, to U.S. Philips Corporation. Power supply with inrush current limiter. 5,087,871, Cl. 323-299.000.

Louis, Michel: See—
Auternaud, Jacques; Barteian, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foucras, Jean; Louis, Michel; Marello, Georges; Poveda, Pierre; and Roux, Christian, 5,086,541, Cl. 16-227.000.

Lowrey, Tyler A.: See—
Chance, Randal W.; and Lowrey, Tyler A., 5,087,951, Cl. 357-23.600.

LSI Logic Corporation: See—
Long, Jon; and Sidorovsky, Rachel S., 5,087,961, Cl. 357-69.000.

Lua, Aik B.: See—
Lockett, John F.; and Lua, Aik B., 5,086,731, Cl. 122-31.100.

Lubin, Isabelle: See—
Laudereau, Guy; Baurand, Gilles; Lubin, Isabelle; Gay, Sylvie; and Berdahl, Jacques, 5,088,000, Cl. 361-103.000.

Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. Phthalimide acid halides. 5,087,701, Cl. 548-431.000.

Lucas Industries: See—
Smith, Trevor S., 5,087,866, Cl. 318-653.000.

Lucas Industries public limited company: See—
Brearley, Malcolm; and Moseley, Richard B., 5,088,042, Cl. 364-426.010.

Smith, Trevor S., 5,086,617, Cl. 60-39.281.

Ludke, Arnold, to AL Industries. Diverter for roller conveyors. 5,086,906, Cl. 198-372.000.

Ludwig, Frank A., to Hughes Aircraft Company. Gas-recirculating electrode for electrochemical system. 5,087,534, Cl. 429-11.000.

Lumb, Anthony P.: See—
Green, Howard; and Lumb, Anthony P., 5,087,911, Cl. 340-825.050.

Lumblau, John J. Vehicle cover. 5,086,799, Cl. 135-90.000.

Lummus Crest, Inc.: See—
Johnson, Roger C.; McCarthy, Daniel; and Rhoe, Andrei, 5,087,783, Cl. 585-475.000.

Lund, Mark A. Anti-roll system with tilt limitations. 5,087,073, Cl. 280-772.000.

Lundell, Louis J.; and Carlson, Kenneth W., to Motorola, Inc. Convertible mounting apparatus. 5,087,004, Cl. 248-126.000.

Lurye, Alex: See—
Hunt, Robert P.; Lurye, Alex; and Riser, George C., 5,087,986, Cl. 359-629.000.

Lutman, Charles A.: See—
Nubel, Philip O.; Satek, Larry C.; Spangler, Michael J.; Lutman, Charles A.; and Michaels, Glenn O., 5,087,786, Cl. 585-500.000.

Lutz, George H., to Northeast Air/Water Corporation. Ozone sterilization process which decontaminates evacuated waste with ozone. 5,087,419, Cl. 422-28.000.

Lux, Peter: See—
Metzdorff, Walter; Lux, Peter; and Eibert, Max, 5,087,916, Cl. 342-64.000.

Lynch, William C.: See—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 5,088,033, Cl. 395-500.000.

Lynde, Gerald D.: See—
Cassel, Terry E.; and Lynde, Gerald D., 5,086,838, Cl. 166-55.600.

M.I.B. Elettronica S.R.L.: See—
Fumanelli, Giuseppe E., 5,087,107, Cl. 312-319.000.

Mabboux, Michel; and DeMarchi, Jean-Louis, to Salomon S.A. Wearing apparel having an energy consuming device. 5,086,573, Cl. 362-2.600.

MacDon Industries Ltd.: See—
Fox, Thomas R.; and Kidd, Bruce R., 5,086,613, Cl. 56-10.900.

Macon, Louis: See—
Schweizer, Pascal; Neveux, Antoine; and Macon, Louis, 5,087,811, Cl. 250-227.210.

Macors, Paul P. M. G. J.; Paulussen, Henricus F.; and Vos, Jellard, to Sherwood Medical Company. Blood sampling device. 5,086,783, Cl. 128-765.000.

Madden, John: See—
Parker, Donna M.; and Madden, John, 5,086,940, Cl. 220-214.000.

Maddock, Thomas J.: See—
Neumann, Holm W.; and Maddock, Thomas J., 5,086,760, Cl. 602-27.000.

Madill, Kent W., to General Motors Corporation. Multiple purpose vehicle. 5,087,091, Cl. 296-26.000.

Maeda Kogyo Kabushiki Kaisha: See—
Mokamoto, Kenichi, 5,087,164, Cl. 414-282.000.

Maeda, Mitsuru; Kodama, Tohru; Iwasawa, Norio; Higuchi, Naoki; and Amano, Norihide, to Suntory Limited. Enzyme inhibitor and method of producing the same. 5,087,614, Cl. 514-16.000.

Maeda, Yasushi: See—
Tsuyumoto, Michio; Maeda, Yasushi; and Karakane, Hiroki, 5,087,367, Cl. 210-500.390.

Maeda, Yuji: See—
Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.

Nakamura, Kenichi; Nakamura, Yozo; Maeda, Yuji; Nagano, Masami; and Kadomukai, Yuzo, 5,086,741, Cl. 123-419.000.

Maei, Shigeki: See—
Morimoto, Taiji; Maei, Shigeki; Hayashi, Hiroshi; and Yamamoto Saburo, 5,087,587, Cl. 437-129.000.

Magistro, Angelo J., to B. F. Goodrich Company, The. Process for the preparation of ethylene and vinyl chloride from ethane in the presence of water. 5,087,791, Cl. 585-657.000.

Magnin, Joel: See—
Fedeli, Jean-Marc; and Magnin, Joel, 5,088,059, Cl. 365-8.000.

Mahle GmbH: See—
Wiemann, Lothar, 5,086,736, Cl. 123-193.600.

Mahoney, Robert P.; and Koch, Tad H., to Research Corporation Technologies, Inc. Cartridge for extending the lifetime of dyes in dye lasers. 5,087,388, Cl. 252-301.170.

Mai, Marilyn S.; Bittner, Michael L.; and Braford, Sarah R., to Monsanto Company. Release of recombinant peptides from polypeptides using V8 endopeptidase. 5,087,564, Cl. 435-69.700.

Maidanovich, Nadezhda N.: See—
Volchenskova, Ilima I.; Maidanovich, Nadezhda N.; Budarin, Lev. I.; Samodumova, Inna M.; and Girin, Vitaly N., 5,087,712, Cl. 556-137.000.

Maieron, Joseph J.: See—
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; and Higdon, William D., 5,087,896, Cl. 331-99.000.

Maitrejean, Serge; Ruscev, Mario; and Dorion, Irene, to Schlumberger Industries. Method and apparatus for locating photons or neutral particles two-dimensionally, in particular at low counting rates. 5,087,821, Cl. 250-385.100.

Maiuccoro, John V.; and Gardener, John, to Saratoga Spa & Bath. Stair support system. 5,086,595, Cl. 52-183.000.

Maker, Walter J., to Coplas, Inc. In mold overlay process for gel coated glass fiber reinforced laminates. 5,087,405, Cl. 264-255.000.

Maki-Rahkola, Jari; Kononen, Mauri; and Surakka, Jorma, to Insinoritoimisto Pessm Oy. Device assembly. 5,086,610, Cl. 53-587.000.

Mallet, Bernard: See—
Pinoteau, Maurice; and Mallet, Bernard, 5,087,139, Cl. 401-206.000.

Malmgren, Karl, to Th-Flow, Inc. Variable area flowmeter. 5,086,654, Cl. 73-861.580.

MAN Nutzfahrzeuge Aktiengesellschaft: See—
Kubis, Heribert; and Wittmann, Dieter, 5,086,738, Cl. 123-322.000.

MAN Nutzfahrzeuge GmbH: See—
Rieck, Gerhard; Scholly, Ingo; and Mertens, Armin, 5,087,022, Cl. 267-219.000.

Manber, Udi: See—
Vernon, Mary K.; and Manber, Udi, 5,088,024, Cl. 395-725.000.

Maniar, Gunvant N., to Carpenter Technology Corporation. Free machining, non-magnetic, stainless steel alloy. 5,087,414, Cl. 420-43.000.

Mann, Harold E. Rain-activated sprinkler shut-off system. 5,087,886, Cl. 324-696.000.

Mannami, Kazuo: See—
Chen, Tu; Iseda, Toru; and Mannami, Kazuo, 5,087,481, Cl. 427-129.000.

Manning, Howard J.: See—
Zaba, Jerzy M.; and Manning, Howard J., 5,087,924, Cl. 346-75.000.

Manning, Robert E.: See—
Reitz, David B.; and Manning, Robert E., 5,087,634, Cl. 514-381.000.

Manso, Elvio: See—
Gruber, Urs; Stockinger, Friedrich; and Manso, Elvio, 5,087,688, Cl. 528-99.000.

Mansukhani, Gul: See—
Cherukuri, Subraman R.; Faust, Steven M.; and Mansukhani, Gul, 5,087,460, Cl. 426-5.000.

Manthey, Robert W.: See—
English, Brent W.; Manthey, Robert W.; and Gottwalt, Kevin, 5,086,941, Cl. 220-254.000.

Manus, Patrick; and Kutscherauer, Rudolf, to Siemens Aktiengesellschaft. Method and apparatus for enveloping an electronic component. 5,087,479, Cl. 427-54.100.

Marais, Dominique; and Collantes, Jesus, to Krebs & Cie. Continuous process for the manufacture of potassium chlorate by coupling with a sodium chlorate production plant. 5,087,334, Cl. 204-95.000.

Marek, Benjamin F., to Mobil Oil Corporation. System and method for determining multi-phase relative permeability of a subterranean reservoir. 5,086,643, Cl. 73-38.000.

Marello, Georges: See—
Auternaud, Jacques; Barthelemy, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foueras, Jean; Louis, Michel; Marello, Georges; Poveda, Pierre; and Roux, Christian, 5,086,541, Cl. 16-227.000.

Marhold, Albrecht: See—
Bielefeldt, Dietmar; Braden, Rudolf; and Marhold, Albrecht, 5,087,747, Cl. 562-821.000.

Mariam, Kidisti G.; Sinclair, James A.; Wright, Terry L.; and Gartner, Charles D., to Dow Chemical Company. The Preparation of alkylthioethylamine salts. 5,087,757, Cl. 564-501.000.

Marinex International, Inc.: See—
Goldbach, Robert D.; and Cuneo, Joseph, 5,086,723, Cl. 114-78.000.

Markey, Hugo: See—
Van Bogaert, Philippe; Bamelis, Jean-Marie; Peeters, Jozef; and Markey, Hugo, 5,086,812, Cl. 139-435.200.

Marolda, Giuseppe: See—
Guerinat, Daniel; Marolda, Giuseppe; and Alagna, Ettore, 5,086,794, Cl. 134-56.00R.

Marposs Societa' per Azioni: See—
Possati, Mario; and Golinelli, Guido, 5,086,569, Cl. 33-549.000.

Marracchini, Antonio; Pasquale, Antonio; and Vincenti, Marco, to Ausimont S.r.l. Process for preparing chlorotrifluoroethylene telomers and new telomers obtained. 5,087,765, Cl. 568-677.000.

Marsh, Gary B.; Fanelli, Anthony J.; Burlew, Joan V.; and Ballard, Clifford P., to Allied-Signal, Inc. Injection molding of zirconia oxygen sensor thimbles by an aqueous process. 5,087,595, Cl. 501-105.000.

Marsteller, K. Edward; and McGlone, Patrick, to Penn Engineering & Manufacturing Corp. Fastener press with workpiece protection system. 5,086,965, Cl. 227-8.000.

Martin, Bobby R.: See—
Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Martin, Bobby R., 5,087,348, Cl. 208-111.000.

Martin, Myron M.: See—
Matthews, James S.; Matthews, Robert K.; and Martin, Myron M., 5,087,128, Cl. 366-141.000.

Martin, William C.: See—
Golnabi, Habib; Martin, William C.; and Powers, Timothy J., 5,088,061, Cl. 365-189.010.

Martinez, German: See—
Leal, Orlando; Bolivar, Carmelo; Sepulveda, Gonzalo; Molleja, Gregorio; Martinez, German; and Esparragoza, Leon, 5,087,597, Cl. 502-62.000.

Martinez, Johnny T. Process for forming arcuate sheet rock panels. 5,087,397, Cl. 264-32.000.

Maruki, Toshimitsu: See—
Sano, Kaoru; Mizushima, Fumio; Goto, Takashi; and Maruki, Toshimitsu, 5,086,648, Cl. 73-118.100.

Maruyama, Koichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Collimator lens of erasable and re-recordable magneto-optical disk system. 5,087,990, Cl. 359-794.000.

Maruyama, Takayuki: See—
Ishino, Yuichi; Osaki, Toshiyuki; Endo, Shigeki; Tomita, Seisuke; Maruyama, Takayuki; Fukuyama, Yoshiki; and Saito, Tasuku, 5,087,382, Cl. 252-73.000.

Masahashi, Naoya: See—
Mizoguchi, Toshiaki; Miyazawa, Kenichi; Hanamura, Toshihiro; and Masahashi, Naoya, 5,087,298, Cl. 148-11.50F.

Masai, Teruhisa; Shibata, Takanobu; Yoshida, Yasuyuki; and Suzuki, Yohsuke, to Calpis Food Industry Co., Ltd. Method for the preparation of a substance capable of proliferating bifidobacteria growth and the substance. 5,087,449, Cl. 424-195.100.

Masamura, Toshihide: See—
Sato, Hideki; and Masamura, Toshihide, 5,087,828, Cl. 307-269.000.

Masco Corporation: See—
Vargo, Edward J., 5,087,483, Cl. 427-235.000.

Mashino, Keiichi: See—
Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.

Massachusetts Institute of Technology: See—
Chapman, Glenn H.; and Herndon, Terry O., 5,087,589, Cl. 437-195.000.

Phillips, Philip W.; Wu, Hong-L.; Dunlap, David H.; and Kundu, Kalyan, 5,087,948, Cl. 357-16.000.

Schrock, Richard R.; and Toreki, Robert, 5,087,710, Cl. 556-46.000.

Massignani, Donato. Filtering machine for fibrous substances having revolving cone-shaped filters. 5,087,358, Cl. 210-195.100.

Masuda, Hideo: See—
Fujimoto, Hitoshi; Masuda, Hideo; Osaka, Shuichi; and Uwagawa, Noriaki, 5,087,590, Cl. 437-209.000.

Masuda, Kenji, to Daikin Industries Ltd. Axial piston machine. 5,086,689, Cl. 91-499.000.

Masuda, Noboru: See—
Ishibashi, Kenichi; Hayashi, Takehisa; Doi, Toshio; Asai, Mitsuo; Masuda, Noboru; Yamagiwa, Akira; and Okabe, Toshihiro, 5,087,829, Cl. 307-269.000.

Masuhara, Kensaku: See—
Anderson, H. Clarke; and Masuhara, Kensaku, 5,087,573, Cl. 435-240.270.

Masukawa, Tsuyoshi: See—
Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriaki, Noboru, 5,087,673, Cl. 525-356.000.

Masuoka, Fujio: See—
Endoh, Tetsuo; Shiota, Riichi; Momodomi, Masaki; Tanaka, Tomoharu; Masuoka, Fujio; and Watanabe, Shigeyoshi, 5,088,060, Cl. 365-185.000.

Masurat, Kurt: See—
Jessel, Wolfgang; and Masurat, Kurt, 5,086,642, Cl. 73-1.00G.

Matai, Masahiro: See—
Kuramatsu, Hiroyasu; Sato, Toshifumi; Matai, Masahiro; and Anma, Sadayuki, 5,087,905, Cl. 340-311.100.

Matheus, Frank J., to Screen Printing Enterprises, Inc. Drying apparatus for screen process printing and coating. 5,086,570, Cl. 34-1.00L.

Mathiesen, George E.; and Mattson, Stacy D., to Empi, Inc. Ionophoretic electrode with reservoir and injection site. 5,087,241, Cl. 604-20.000.

Matsubara, Isao: See—
Takeishi, Hideo; Houseki, Sigeaki; and Matsubara, Isao, 5,086,981, Cl. 239-703.000.

Matsuda, Toshiaki: See—
Kato, Yasuyoshi; Konishi, Kunihiko; Akama, Hiroshi; Matsuda, Toshiaki; and Teshima, Nobue, 5,087,600, Cl. 502-309.000.

Matsuda, Toshiharu: See—
Yoshida, Kazuo; Okubo, Nobuyuki; Matsuda, Toshiharu; and Konai, Yutaka, 5,087,742, Cl. 562-421.000.

Matsuda, Toshiro; and Chiba, Kazuo, to Nissan Motor Company, Limited. Automotive control system providing anti-skid steering. 5,088,040, Cl. 364-424.050.

Matsuda, Yasuo: See—
Yaginuma, Takao; Onda, Kenichi; Matsuda, Yasuo; and Mizuta, Kouichi, 5,088,017, Cl. 363-21.000.

Matsuda, Yoshiharu: See—
Mizuta, Fumio; Arai, Takashi; Matsuda, Yoshiharu; and Takegami, Itsuo, 5,086,858, Cl. 180-68.300.

Matsuda, Yoshio; Arimoto, Kazutami; Oishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having on-chip test circuit. 5,088,063, Cl. 365-201.000.

Matsumoto, Hiroaki; and Fukuda, Tokuya, to Sony Corporation. Color image pickup device having a level correcting circuit for correcting level variations in color image signals. 5,087,967, Cl. 358-41.000.

Matsumoto, Kazuo: See—
Muto, Nariaki; Kakui, Mikio; Sumida, Keisuke; Nakazawa, Toru; and Matsumoto, Kazuo, 5,087,544, Cl. 435-83.000.

Matsumoto, Kazutoshi: See—
Hyuga, Takehiro; Matsumoto, Kazutoshi; and Mukai, Tetsuya, 5,087,902, Cl. 333-219.100.

Matsumoto, Masaki: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouichirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.

Matsumoto, Mitsunori: See—
Inoue, Kenji; Matsumoto, Mitsunori; and Takahashi, Satomi, 5,087,751, Cl. 564-192.000.

Matsumoto, Toshiaki: See—
Takaichi, Akihisa; Okamoto, Toshihiko; and Matsumoto, Toshiaki, 5,087,442, Cl. 424-44.000.

Matsunaga, Hiroshi, to Fujitsu Limited. Balanced signal receiving circuit. 5,087,832, Cl. 307-350.000.

Matsunaga, Toshiaki: See—
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.

Matsunaga, Tsunehumi: See—
Yoshizawa, Michio; Matsunaga, Tsunehumi; Ebata, Makoto; and Oyama, Yasuo, 5,087,856, Cl. 313-631.000.

Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, to Ajinomoto Co., Inc. Benzylidene compounds, cosmetic compositions containing the same and ultraviolet absorber comprising the same. 5,087,729, Cl. 560-41.000.

Matsuno, Yoshimi: See—
Enomoto, Ryo; and Matsuno, Yoshimi, 5,087,433, Cl. 423-346.000.

Matsuoka, Koujiro: See—
Harada, Hiroyuki; Ohkawa, Kenichi; Yamamoto, Masashi; Yoshinaka, Minoru; Yagi, Jun; and Matsuoka, Koujiro, 5,087,654, Cl. 524-432.000.

Okamoto, Yasushi; Kanno, Yoshinori; Matsuoka, Koujiro; Yoshinaka, Minoru; and Yagi, Jun, 5,087,655, Cl. 524-432.000.

Matsuoka, Shuitsu: See—
Ito, Kazuo; Matsuoka, Shuitsu; and Sasaki, Yasumi, 5,087,490, Cl. 428-34.100.

Matsuoka, Fumio; Okajima, Jiro; Okuma, Keiko; Tomita, Ken; Shibuya, Yasuo; Nakamura, Mutsumi; and Kitauchi, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Cooling and heating concurrent operation type of multiple refrigeration cycle. 5,086,624, Cl. 62-160.000.

Matsuoka, Kiyonari: See—
Okada, Takashi; Aoyama, Takamichi; Mizuno, Shoichi; Akatsuka, Akihiro; and Matsuoka, Kiyonari, 5,087,705, Cl. 548-458.000.

Matsushita Electric Industrial Co., Ltd.: See—
Harada, Hiroyuki; Ohkawa, Kenichi; Yamamoto, Masashi; Yoshinaka, Minoru; Yagi, Jun; and Matsuoka, Koujiro, 5,087,654, Cl. 524-432.000.

Inoue, Yoshiaki; Sato, Teruo; and Hiromi, Tutomu, 5,087,426, Cl. 422-123.000.

Ishibashi, Hiromichi; and Tanaka, Shinichi, 5,088,080, Cl. 369-44.260.

Ishizuka, Satoshi; Toda, Kazuro; and Kato, Osamu, 5,087,109, Cl. 385-34.000.

Kawahara, Isao, 5,087,973, Cl. 358-167.000.

Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.

Murakami, Mutsuki; Tsuchiya, Soji; and Omote, Atsushi, 5,087,540, Cl. 430-58.000.

Okamoto, Yasushi; Kanno, Yoshinori; Matsuoka, Koujiro; Yoshinaka, Minoru; and Yagi, Jun, 5,087,655, Cl. 524-432.000.

Sakaue, Shigeo; Kohda, Toshiyuki; Shimaki, Yasuharu; Takagi, Hideyuki; and Togawa, Hayato, 5,088,049, Cl. 395-23.000.

Tohma, Kiyokazu; Sugita, Ryuji; Honda, Kazuyoshi; Kawawake, Yasuhiro; and Ishida, Tatsuaki, 5,087,476, Cl. 427-35.000.

Yasutake, masanori, 5,086,904, Cl. 198-346.100.

Matsushita Electronics Corporation: See—
Shikata, Michiharu, 5,088,062, Cl. 365-189.050.

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Aoki, Masaki; Kamiyama, Masayuki; and Honda, Hiroshi, 5,087,661, Cl. 524-714.000.

Inomata, Masamitsu; Shiotani, Naokazu; Koshizuka, Kazuo; and Karasawa, Minato, 5,087,722, Cl. 558-338.000.

Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; Imai, Masao; and Suzuki, Toshiyuki, 5,087,758, Cl. 568-57.000.

Ohta, Masahiro; Kawashima, Saburo; Sonobe, Yoshiho; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,087,689, Cl. 528-185.000.

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Tsutsumi, Toshihiko; Nakakura, Toshiyuki; Morikawa, Shuichi; and Koga, Nobuhito, 5,087,644, Cl. 523-205.000.

Mitsunaga, Takafumi: See—
Shiokawa, Youichi; Akahane, Atshushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 5,087,629, Cl. 514-300.000.

Miura, Hisanori: See—
Narabu, Tadakuni; and Miura, Hisanori, 5,087,843, Cl. 307-607.000.

Miura, Masahiko; Kawaguchi, Shigeru; Inoue, Kunitoshi; Yamamoto, Hideo; and Ohkura, Ken, to Nippon Gasket Co., Ltd. Metal gasket for manifold. 5,087,058, Cl. 277-235.00B.

Miyake, Tomoyuki: See—
Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, 5,087,535, Cl. 430-5.000.

Miyamoto, Kenichi; Murakami, Yoshitaka; Suruga, Toshimichi; and Nanjoh, Hideo, to Omron Tateisi Electronics Co. Time switch. 5,088,071, Cl. 368-10.000.

Miyamoto, Sanpei: See—
Ishimura, Tamihoro; Miyawaki, Masahumi; Miyamoto, Sanpei; and Uehara, Hidenori, 5,087,957, Cl. 357-42.000.

Miyamoto, Yuzo: See—
Fukuda, Mitsuhiro; Inoue, Hiroto; Kasari, Akira; Miyamoto, Yuzo; Isozaki, Osamu; and Nakai, Noboru, 5,087,286, Cl. 106-287.160.

Miyao, Masakatsu: See—
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.

Miyashita, Akira: See—
Nohira, Hiroyuki; Takaya, Hidemasa; and Miyashita, Akira, 5,087,728, Cl. 560-41.000.

Miyawaki, Masahumi: See—
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Miyazawa, Kenichi: See—
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Miyazawa, Takeshige: See—
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Miyoshi, Takeshi: See—
Matsuno, Kazuhiro; Kobayashi, Toru; Miyoshi, Takeshi; and Kawashima, Hideaki, 5,087,729, Cl. 560-41.000.

Mizoguchi, Toshiaki; Miyazawa, Kenichi; Hanamura, Toshihiro; and Masahashi, Naoya, to Nippon Steel Corporation. Process of producing continuous thin sheet of TiAl intermetallic using pair of cooling rolls. 5,087,298, Cl. 148-11.50F.

Mizuhara, Howard, to GTE Products Corporation. Brazing alloy of copper, silicon, titanium, aluminum. 5,087,416, Cl. 420-489.000.

Mizuno, Hatsutaro: See—
Ono, Sumio; Hattori, Hitoshi; and Mizuno, Hatsutaro, 5,087,055, Cl. 277-139.000.

Mizuno, Shoichi: See—
Okada, Takashi; Aoyama, Takamichi; Mizuno, Shoichi; Akatsuka, Akihiro; and Matsuoka, Kiyonari, 5,087,705, Cl. 548-458.000.

Mizushima, Fumio: See—
Sano, Kaoru; Mizushima, Fumio; Goto, Takashi; and Maruki, Toshimitsu, 5,086,648, Cl. 73-118.100.

Mizuta, Fumio; Arai, Takashi; Matsuda, Yoshiharu; and Takegami, Itsuo, to Kawasaki Jukogyo Kabushiki Kaisha. Air intake system for utility vehicle. 5,086,858, Cl. 180-68.300.

Mizuta, Kouichi: See—
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Mizutani, Hidemasa: See—
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MKS Instruments, Inc.: See—
Peacock, Roy N.; and Vestman, Lee E., 5,086,801, Cl. 137-12.000.

Mobay Corporation: See—
Chung, James Y. J.; Charles, John J.; and Lazear, Nelson R., 5,087,665, Cl. 525-133.000.

Krishnan, Sivaram; Price, Ronald L.; Shu, Peter H. C.; and Witman, Mark W., 5,087,524, Cl. 428-412.000.

Mobil Oil Corporation: See—
Dziarski, Mark; Rader, Melissa; Tucker, A. Stanley; and Wilsford, Walter, 5,086,917, Cl. 206-216.000.

Marek, Benjamin F., 5,086,643, Cl. 73-38.000.

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Pelrine, Bruce P., 5,087,782, Cl. 585-417.000.

- Pestka, Thomas J., 5,086,614, Cl. 56-17.200.
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Modern Home Products Corp.: See—
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Mody, Pankaj H.: See—
McLaughlin, Paul F.; and Mody, Pankaj H., 5,088,021, Cl. 364-187.000.
Moehling, Charles: See—
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Molecular Technology Corporation: See—
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Molleja, Gregorio: See—
Leal, Orlando; Bolivar, Carmelo; Sepulveda, Gonzalo; Molleja, Gregorio; Martinez, German; and Esparragoza, Leon, 5,087,597, Cl. 502-62.000.
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Molloy, Michael C., to Cincinnati Sub-Zero Products, Inc. Configured pad for therapeutic cooling effect. 5,086,771, Cl. 128-400.000.
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Endoh, Tetsuo; Shiota, Riichiro; Momodomi, Masaki; Tanaka, Tomoharu; Masuoka, Fujio; and Watanabe, Shigeyoshi, 5,088,060, Cl. 365-185.000.
Momose, Yutaka; Tabata, Shigeyoshi; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Air-cycle air conditioning system. 5,086,625, Cl. 62-172.000.
Monahan, Joseph B.: See—
Cordi, Alex A.; Handelman, Gail E.; and Monahan, Joseph B., 5,087,633, Cl. 514-380.000.
Monarch Marking Systems, Inc.: See—
Shieh, Roung-Min, 5,086,987, Cl. 242-56.00R.
Mondani, Luigi P.; and Mondani, Maria P. Self-threading pin for the implantation of dental prosthesis. 5,087,201, Cl. 433-174.000.
Mondani, Maria P.: See—
Mondani, Luigi P.; and Mondani, Maria P., 5,087,201, Cl. 433-174.000.
Mong-Hsing, Chai, to Baby Trend, Inc. Foldable baby stroller. 5,087,066, Cl. 280-644.000.
Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, to Matsushita Electric Industrial Co., Ltd.; and Sumita Optical Glass, Inc. Method of producing optical glass element and production apparatus using this method. 5,087,279, Cl. 65-64.000.
Monsanto: See—
Demarey, David W., 5,087,690, Cl. 528-230.000.
Monsanto Company: See—
Bosch, Richard J.; and Ramsey, Skippy H., 5,087,746, Cl. 562-585.000.
Esposito, Robert A.; and Bourcier, David P., 5,087,502, Cl. 428-156.000.
Mai, Marilyn S.; Bittner, Michael L.; and Bradford, Sarah R., 5,087,564, Cl. 435-69.700.
Smith, Lowell R., 5,087,740, Cl. 562-17.000.
Tokas, Edward F.; Vaughn, George D.; Taylor, David L.; and Morgan, Albert W., 5,087,510, Cl. 428-209.000.
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Bruno, Salvatore A.; and Monson, William L., 5,087,437, Cl. 423-598.000.
Montagnon, Jean R.; Bablon, Guy P.; Dagois, Gerard L.; and Ventresque, Claire C., to Societe Pica-Produits Industriels et Charbons Actifs. Biological contactor for purifying water to produce drinking water. 5,087,354, Cl. 210-108.000.
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Moore, Patricia A.: See—
Davis, Martha; Formosa, Daniel; Gerth, Jeannie; Moore, Patricia A.; Russak, Stephen; Thomsen, Tamara; and Viemeister, Tucker, 5,087,254, Cl. 604-386.000.
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Moore, William P., to Harmony Products, Inc. Feed supplement fats from abattoir sludge. 5,087,474, Cl. 426-646.000.
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Mori, Katsuhiro: See—
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Mori, Toshiaki: See—
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Morihiro, Kamiyama: See—
Osamu, Manabe; Shigeo, Fujita; Shizuo, Iwata; and Morihiro, Kamiyama, 5,087,704, Cl. 548-427.000.
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Morikawa, Shuichi: See—
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Moriki, Daisaku, to Mazda Motor Corporation. Shift control system for an automatic transmission. 5,086,666, Cl. 74-857.000.
Morimoto, Hideo. Separating method and device for separating a shaped section from a waste section. 5,087,236, Cl. 493-342.000.
Morimoto, Taiji; Maei, Shigeki; Hayashi, Hiroshi; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Epitaxial growth process for the production of a window semiconductor laser. 5,087,587, Cl. 437-129.000.
Morisawa, Kunio: See—
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Morishima, Hideo: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
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Morita, Tominori; Yoshizumi, Kazuya; Nishimura, Noriyasu; Goto, Katsumi; Sukamoto, Takayuki; and Yoshino, Kohichiro, to Kanebo, Ltd. Novel cyanoguanidine derivatives. 5,087,640, Cl. 514-609.000.
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Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
Moriya, Kumiaki: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
Morris, Daniel R., Jr. Watertight note card assembly. 5,087,079, Cl. 462-8.000.
Morris, Richard L.; and Paul, James M., to Mobil Oil Corporation. Method for regenerating scale solvent. 5,087,371, Cl. 210-643.000.
Morrow, George S. Pneumatically elevating recreational exercise device. 5,087,037, Cl. 272-110.000.
Morton, William E.; Fairbanks, Harold V.; Wallis, James; Hunicke, Raymond L.; and Krenicki, Joseph, to Lewis Corporation. Ultrasonic vibrator tray processes. 5,087,379, Cl. 210-748.000.
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Eaton, Eric T.; and Whaley, Rodney S., 5,087,906, Cl. 340-311.100.
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Lundell, Louis J.; and Carlson, Kenneth W., 5,087,004, Cl. 248-126.000.
Melton, Cynthia M.; Raleigh, Carl J.; Scheifers, Steven; and Beckenbaugh, William, 5,086,966, Cl. 228-208.000.
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- Mountz, Michael C.; and Kwitkowski, Peter A., 5,087,888, Cl. 330-65.000.
Petersen, Michael W.; and Fischbach, Clark D., 5,087,893, Cl. 330-296.000.
Signon, Bernard E., 5,087,895, Cl. 331-96.000.
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Motts, Glen. Versatile knee rest walker. 5,086,798, Cl. 135-67.000.
Motzet, Josef; Sprehe, Harald; and Stemmer, Xaver, to Audi AG. Assembly for the positioning of two structural elements in relation to each other. 5,087,146, Cl. 403-13.000.
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Mowatt, Joel E.: See—
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Crawford, David W., 5,087,154, Cl. 405-216.000.
MTU Motoren- und Turbinen-Union Muenchen GmbH: See—
Uihlein, Thomas; and Wydra, Gerhard, 5,087,512, Cl. 428-266.000.
MTU Motoren- und Turbinen-Union Muenchen GmbH: See—
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Mims, Michael G.; Mueller, Mark D.; and Ehlinger, Jeffrey C., 5,086,844, Cl. 166-383.000.
Mueller, Michael E.: See—
Mueller, Wieland R., 5,086,704, Cl. 104-44.000.
Mueller, Peter; and Sebastiani, Oscar, to Mueller & Sebastiani Elektronik GmbH. Method and system for evaluating data picked-up by means of long term ECG devices. 5,086,778, Cl. 128-696.000.
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Mueller, Peter; and Sebastiani, Oscar, 5,086,778, Cl. 128-696.000.
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Mukai, Tetsuya: See—
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Mukaimoto, Kenichi, to Maeda Kogyo Kabushiki Kaisha. Apparatus for storing roll materials. 5,087,164, Cl. 414-282.000.
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Nishizawa, Hiroshi; Suzuki, Kenji; Mukoyama, Yoshiyuki; Kikuchi, Tohru; and Sato, Hidetaka, 5,087,658, Cl. 524-538.000.
Mullen, Charles F. Modular space structure. 5,086,999, Cl. 244-159.000.
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Weissman, Irving L.; Spangrude, Gerald J.; Muller-Sieburg, Christa; and Heimfeld, Shelly, 5,087,570, Cl. 435-240.100.
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De Toffoli, Mirella, 5,087,380, Cl. 210-776.000.
Nabisco Brands, Inc.: See—
Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., 5,087,461, Cl. 426-96.000.
Nadkarni, Sadashiv K., to Alcan International Limited. Method of producing platelets of borides of refractory metals. 5,087,592, Cl. 501-96.000.
Nagafuji, Toshiaki: See—
Harada, Katsumi; Nagafuji, Toshiaki; Takahashi, Wataru; Nakano, Kenichi; and Yasuda, Kei-ichi, 5,088,009, Cl. 361-413.000.
Nagai, Kazukiyo, to Ricoh Company, Ltd. 3,4-Pyridine-dithiol compounds and method of producing the same. 5,087,699, Cl. 546-296.000.
Nagano, Masami: See—
Nakamura, Kenichi; Nakamura, Yozo; Maeda, Yuji; Nagano, Masami; and Kadamukai, Yuzo, 5,086,741, Cl. 123-419.000.
Nagano, Masashi, to Shimano Corporation. Multi-stage sprocket assembly for bicycle. 5,087,226, Cl. 474-160.000.
Nagasawa, Hiroki: See—
Takayama, Teruyuki; Nagasawa, Hiroki; Aoki, Sumihisa; Tominaga, Haruo; and Yokoyama, Kazuo, 5,087,300, Cl. 148-11.50Q.
Nagasawa, Kenichi; and Edakubo, Hiroo, to Canon Kabushiki Kaisha. Information signal reproducing apparatus for effecting tracking control by using three or more rotary heads. 5,087,995, Cl. 360-77.140.
Nagase, Toshiyuki: See—
Kuromitsu, Yoshirou; Yoshida, Hideaki; Nagase, Toshiyuki; Tanaka, Tadaharu; and Kanda, Yoshio, 5,087,509, Cl. 428-195.000.
Nagata, Hiroya: See—
Sakai, Naomichi; Kikusawa, Masanaga; Kubota, Yoshitaka; Yamamura, Hiroshi; and Nagata, Hiroya, 5,088,003, Cl. 361-330.000.
Nagata, Tsuyoshi; and Okuda, Shinji, to Sunstar Engineering Inc. Method of detecting breakage of a bead of fluid material. 5,086,640, Cl. 73-661.000.
Nagumo, Akihiko; and Nishio, Yuji, to Fuji Photo Film Co., Ltd. Image recording apparatus. 5,087,938, Cl. 355-27.000.
Nagy, Giselle. Vehicular accessory mounting organization. 5,086,958, Cl. 224-42.420.

- Naito, Koichi: See—
Nakazawa, Toru; Kokumai, Yuji; Naito, Koichi; Suzuki, Shoji; and Noguchi, Tadao, 5,087,851, Cl. 310-323.000.
- Nakagaito, Toru: See—
Nakanishi, Yutaka; and Nakagaito, Toru, 5,087,195, Cl. 431-309.000.
- Nakagaki, Shintaro: See—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; and Asakura, Tsutou, 5,087,539, Cl. 430-48.000.
- Takanashi, Itsuo; Yamamura, Takashi; Nakagaki, Shintaro; Ichito, Toshikatsu; Nakano, Atsushi; Shimada, Tadayuki; and Konno, Toshio, 5,087,929, Cl. 346-108.000.
- Nakagawa, Takerou: See—
Tanaka, Kouji; Ikeda, Masaki; Tsubakimoto, Yasumasa; Koizumi, Takashi; Nakagawa, Takerou; and Kanehira, Makato, 5,087,132, Cl. 384-276.000.
- Nakagawa, Tsunefumi: See—
Shimada, Shigeki; Tanaka, Hidekazu; and Nakagawa, Tsunefumi, 5,087,518, Cl. 428-372.000.
- Nakagawa, Yusaku: See—
Kamitsuma, Yasuo; Ishi, Isao; Nakagawa, Yusaku; Ohnaka, Noriyuki; Izuka, Tadashi; and Fukuda, Kazushi, 5,087,181, Cl. 418-178.000.
- Nakahama, Yasumitsu: See—
Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; Horie, Shigetake; and Nakahama, Yasumitsu, 5,087,429, Cl. 422-249.000.
- Nakai, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Cylinder sleeve for two-cycle engine. 5,086,734, Cl. 123-65.00P.
- Nakai, Noboru: See—
Fukuda, Mitsuhiko; Inoue, Hiroto; Kasari, Akira; Miyamoto, Yuzo; Isozaki, Osamu; and Nakai, Noboru, 5,087,286, Cl. 106-287.160.
- Nakajima, Hiroharu; Suzuki, Naohisa; and Kumamoto, Michihisa, to Canon Kabushiki Kaisha. Printing mechanism with a cam and groove arrangement. 5,087,136, Cl. 400-214.000.
- Nakajima, Hiromi, to Taiyo Ltd. Solenoid valve and manifold assembly. 5,086,803, Cl. 137-270.000.
- Nakajima, Shigeo: See—
Terada, Kousuke; Mikami, Akiyoshi; Taniguchi, Kouji; Tanaka, Koichi; Yoshida, Masaru; and Nakajima, Shigeo, 5,087,531, Cl. 428-690.000.
- Nakakura, Toshiyuki: See—
Tsutsumi, Toshihiko; Nakakura, Toshiyuki; Morikawa, Shuichi; and Koga, Nobuhito, 5,087,644, Cl. 523-205.000.
- Nakamura, Hideo; and Sawase, Terumi, to Hitachi, Ltd. Integrated circuit having processor coupled by common bus to programmable read only memory for processor operation and processor uncoupled from common bus when programming read only memory from external device. 5,088,023, Cl. 395-425.000.
- Nakamura, Katsunori: See—
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.
- Nakamura, Kenichi; Nakamura, Yozo; Maeda, Yuji; Nagano, Masami; and Kadomukai, Yuzo, to Hitachi, Ltd. Method and apparatus for detecting and controlling combustion condition in an internal combustion engine. 5,086,741, Cl. 123-419.000.
- Nakamura, Kenichi: See—
Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.
- Nakamura, Mutsumi: See—
Matsuoka, Fumio; Okajima, Jiro; Okuma, Keiko; Tomita, Ken; Shibuya, Yasuo; Nakamura, Mutsumi; and Kitauchi, Hajime, 5,086,624, Cl. 62-160.000.
- Nakamura, Tamotu: See—
Nyu, Sachio; Nakamura, Tamotu; and Kawakami, Junzo, 5,087,179, Cl. 418-47.000.
- Nakamura, Toshiko: See—
Yoshinaga, Kenji; Hosaka, Hirochika; and Nakamura, Toshiko, 5,087,656, Cl. 524-493.000.
- Nakamura, Yozo: See—
Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.
- Nakamura, Kenichi; Nakamura, Yozo; Maeda, Yuji; Nagano, Masami; and Kadomukai, Yuzo, 5,086,741, Cl. 123-419.000.
- Nakamura, Yuko; and Takechi, Satoshi, to Fujitsu Limited. Process for preparing of semiconductor device and pattern-forming coating solution used for this process. 5,087,551, Cl. 430-270.000.
- Nakanishi, Toshihide: See—
Takano, Junichi; Furukawa, Satoru; and Nakanishi, Toshihide, 5,087,566, Cl. 435-115.000.
- Nakanishi, Yutaka; and Nakagaito, Toru, to Toyotomi Kogyo Co., Ltd. Combustion cylinder structure for oil burner. 5,087,195, Cl. 431-309.000.
- Nakano, Atsushi: See—
Takanashi, Itsuo; Yamamura, Takashi; Nakagaki, Shintaro; Ichito, Toshikatsu; Nakano, Atsushi; Shimada, Tadayuki; and Konno, Toshio, 5,087,929, Cl. 346-108.000.
- Nakano, Kenichi: See—
Harada, Katsumi; Nagafuji, Toshiaki; Takahashi, Wataru; Nakano, Kenichi; and Yasuda, Kei-ichi, 5,088,009, Cl. 361-413.000.
- Nakano, Shiro: See—
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.
- Nakano, Shuji; and Kisanuki, Hisayuki, to Toyoda Gosei Co. Ltd. Glass run for motor vehicle. 5,086,588, Cl. 49-441.000.
- Nakano, Yasuhiko: See—
Fukuchi, Mikiharu; Nakano, Yasuhiko; Hayashi, Keisuke; Koseki, Isamu; Ito, Masami; and Akiyama, Ryoze, 5,087,299, Cl. 148-11.50P.
- Nakatsuka, Masakatsu: See—
Otsuji, Atsuo; Nakatsuka, Masakatsu; Hasegawa, Kiyoharu; Takagi, Masatoshi; and Yamaguchi, Akihiro, 5,087,706, Cl. 549-226.000.
- Nakayama, Hideaki: See—
Yada, Tooru; Nakayama, Hideaki; and Kurita, Hiroyuki, 5,087,185, Cl. 425-4.00C.
- Nakayama, Hiroki, to Canon Kabushiki Kaisha. Zoom lens. 5,087,988, Cl. 359-689.000.
- Nakayama, Shunichi; Takayanagi, Yasushi; and Arai, Yasuyuki, to Sanden Corporation. Portable post-mix beverage dispenser unit. 5,086,951, Cl. 222-129.100.
- Nakayama, Takashi: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouichirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
- Nakazawa, Toru; Kokumai, Yuji; Naito, Koichi; Suzuki, Shoji; and Noguchi, Tadao, to Alps Electric Co., Ltd. Device for driving a part on a vehicle. 5,087,851, Cl. 310-323.000.
- Nakazawa, Toru: See—
Muto, Nariaki; Kakui, Mikio; Sumida, Keisuke; Nakazawa, Toru; and Matsumoto, Kazuo, 5,087,544, Cl. 435-83.000.
- Nalco Chemical Company: See—
Reid, Ansell L.; and Grichuk, Henry A., 5,086,841, Cl. 166-295.000.
- Nanjoh, Hideo: See—
Miyamoto, Kenichi; Murakami, Yoshitaka; Suruga, Toshimichi; and Nanjoh, Hideo, 5,088,071, Cl. 368-10.000.
- Nanno, Takanobu: See—
Tanahashi, Hiroaki; and Nanno, Takanobu, 5,087,021, Cl. 267-140.10C.
- Napier Company, The: See—
Ziemelis, Herbert, 5,086,547, Cl. 24-615.000.
- Nara, Toshihiko: See—
Sugahara, Jun; Takahashi, Hideaki; and Nara, Toshihiko, 5,086,882, Cl. 187-95.000.
- Narabu, Tadakuni; and Miura, Hisanori, to Sony Corporation. Input circuit for CCD delay line. 5,087,843, Cl. 307-607.000.
- Narang, Rajendra, to Narang, Rajendra K. Fuel burning furnace. 5,086,754, Cl. 126-110.00R.
- Narang, Rajendra K.: See—
Narang, Rajendra, 5,086,754, Cl. 126-110.00R.
- Narita, Mitsuru; and Tanaka, Tatuo, to Fuji Electric Co., Ltd. Electro-photographic printer. 5,087,543, Cl. 430-66.000.
- Natron Corporation: See—
Ingraham, Ronald D., 5,087,825, Cl. 307-132.0EA.
- Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerek, Anton V.; and Gillotin, Olivier, to International Flavors & Fragrances Inc. Substituted cyclopentenyl-oxabicyclooctanes, cyclopentenyl-formylcyclohexenes and cyclopentenyl-hydroxymethyl cyclohexenes, processes for preparing same and organoleptic uses thereof. 5,087,707, Cl. 549-396.000.
- Narula, Chaitanya K., to Ford Motor Company. Preparation of titanium nitride from organometallic precursors. 5,087,593, Cl. 501-96.000.
- Narutaki, Yoshinori, to Optec Co., Ltd. Equipment for measuring a difference in elevation. 5,087,125, Cl. 356-375.000.
- Nasu, Atsushi. Fuel additives. 5,087,267, Cl. 44-302.000.
- Nathan, Carl F.: See—
Gabay, Joelle E.; and Nathan, Carl F., 5,087,569, Cl. 435-212.000.
- Nathan, Daniel M. Safety knife and protection garment for processing operations. 5,086,561, Cl. 30-1.000.
- National Graphics Company: See—
Kaluz, Rudolph T., 5,087,223, Cl. 462-2.000.
- National Research Development Corporation: See—
Wilson, Michael; and Harvey, Wilson, 5,087,451, Cl. 424-407.000.
- National Semiconductor Corporation: See—
Rogers, Alan C., 5,087,841, Cl. 307-475.000.
- National Starch and Chemical Investment Holding Corporation: See—
Iovine, Carmine P.; Chandran, Rama S.; and Leighton, John C., 5,087,682, Cl. 526-271.000.
- Katz, Howard G.; and Sarkis, Michael T., 5,087,487, Cl. 427-366.000.
- Natsume, Yoshinori: See—
Nomura, Takehiko; Natsume, Yoshinori; and Hosoki, Yoshinori, 5,087,307, Cl. 156-154.000.
- NEC Corporation: See—
Asakawa, Kyoichi, 5,086,829, Cl. 165-12.000.
- Futami, Haruji, 5,087,955, Cl. 357-41.000.
- Harada, Katsumi; Nagafuji, Toshiaki; Takahashi, Wataru; Nakano, Kenichi; and Yasuda, Kei-ichi, 5,088,009, Cl. 361-413.000.
- Hayashi, Yoshihiro, 5,087,585, Cl. 437-51.000.
- Hishii, Toshiyasu, 5,086,777, Cl. 128-675.000.
- Iwata, Jun, 5,088,022, Cl. 395-325.000.

- Kaneda, Kenichi; and Tanda, Akio, 5,087,963, Cl. 357-73.000.
- Katano, Fumiaki, 5,087,950, Cl. 357-22.000.
- Kuramatsu, Hiroyasu; Sato, Toshifumi; Matai, Masahiro; and Anma, Sadayuki, 5,087,905, Cl. 340-311.100.
- Nedblake, Greydon W.; and Johnson, Lawrence E. Meat L-board. 5,087,498, Cl. 428-76.000.
- Needham, Roger M.: See—
Schroeder, Michael D.; Needham, Roger M.; Thacker, Charles P.; Birrell, Andrew D.; Rodeheffer, Thomas L.; Satterthwaite, Edwin H., Jr.; and Murray, Hallam G., Jr., 5,088,091, Cl. 370-94.300.
- Neely, Everett T.: See—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 5,088,033, Cl. 395-500.000.
- Neese, William M.: See—
Barra, Charles L.; and Neese, William M., 5,086,581, Cl. 43-26.100.
- Neff, Andreas, to Braecker A.G. Storing element for ring travellers for spinning or twisting machines. 5,086,921, Cl. 206-338.000.
- Negele, Michael: See—
Gassen, Karl-Rudolf; Bielefeldt, Dietmar; Negele, Michael; and Ziemann, Heinz, 5,087,775, Cl. 568-842.000.
- Negishi, Kiyoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Horizontal sync signal generating device for use with an optical printer to determine starting positions of horizontal scanning on a photoconductive member. 5,087,813, Cl. 250-236.000.
- Neil, Jeffrey T.; Lieberman, Sheldon; and Hackney, Michael, to GTE Laboratories Incorporated. Method of making large cross section injection molded or slip cast ceramic shapes. 5,087,399, Cl. 264-62.000.
- Nelson, Bill. Power plant for generation of electrical power and pneumatic pressure. 5,087,824, Cl. 290-1.00A.
- Nelson, Clifford L., to Honeywell Inc. Thermostat guard. 5,087,794, Cl. 174-52.100.
- Nelson, James C., III, to DAX Industries, Inc. Power governance circuitry. 5,087,865, Cl. 318-139.000.
- Nelson, Linda J., to Xerox Corporation. Toner and imaging processes. 5,087,538, Cl. 430-45.000.
- Nelson, Marshall A., to Esselte Letraset Limited. Assembly for use in a process for making selective transfers to xerographic images on sheet material. 5,087,495, Cl. 428-46.000.
- Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co., Ltd. Brake-actuating mechanism for vehicle parking brakes. 5,086,895, Cl. 192-4.00A.
- Nero, Leroy W., to Thomson Consumer Electronics, Inc. Feedback arrangement in a deflection circuit. 5,087,863, Cl. 315-388.000.
- Neuenschwander, Thomas R., to L H Carbide Corporation. Laminated parts and a method for manufacture thereof. 5,087,849, Cl. 310-216.000.
- Neumann, Holm W.; and Maddock, Thomas J. Articulated orthotic brace for an anatomical joint. 5,086,760, Cl. 602-27.000.
- Neumann, Peter: See—
Schrott, Wolfgang; Neumann, Peter; Schmitt, Michael; Brosius, Sibylle; Schomann, Klaus D.; and Kuppelmaier, Harald, 5,087,727, Cl. 560-29.000.
- Neuwirth, Joseph G., to Kimberly-Clark Corporation. Ultrasonic rotary horn having improved end configuration. 5,087,320, Cl. 156-580.200.
- Neveux, Antoine: See—
Schweizer, Pascal; Neveux, Antoine; and Macon, Louis, 5,087,811, Cl. 250-227.210.
- New York Gas Group: See—
Murphy, John C.; Hartong, Glenn S.; Cohn, Ralph F.; and Moran, Patrick J., 5,087,873, Cl. 324-71.200.
- Newberry, Brian L.; Loewen, Kel W.; and Adolph, Grant H., to Ford New Holland, Inc. Rotatable operator control station. 5,086,869, Cl. 180-329.000.
- Newman-Evans, Richard H.: See—
Qureshi, Shahid P.; Newman-Evans, Richard H.; and Gardner, Hugh C., 5,087,657, Cl. 524-508.000.
- Newman, Neil F.: See—
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; and Davis, William M., 5,087,674, Cl. 525-356.000.
- Ng, Yee S.; and Tai, Hwai T., to Eastman Kodak Company. Error diffusion of overlapping dots. 5,087,981, Cl. 358-459.000.
- Ngai, Eugene Y., to Solkatronic Chemicals, Inc. Emergency security device for head of a leaking gas cylinder. 5,086,804, Cl. 137-312.000.
- NGK Insulators, Ltd.: See—
Kato, Shigeki; and Inoue, Katsuhiro, 5,087,594, Cl. 501-97.000.
- Nicholas, Edward L.: See—
Paige, Lawrence E.; and Nicholas, Edward L., 5,086,926, Cl. 206-542.000.
- Nicolet Instrument Corporation: See—
Huang, Yuchi; Talbot, Charles; and Henderson, Jeffrey R., 5,086,619, Cl. 62-50.100.
- Niemeyer, Trenton A., to Filcon Corporation. Respiratory protective device. 5,086,768, Cl. 128-205.240.
- Nihon Biso Kabushiki Kaisha: See—
Kitahara, Genichi, 5,086,533, Cl. 15-103.000.
- Nihon Tokushu Nyokaku Seizo K.K.: See—
Tsuboi, Sinichi; Honda, Ikuro; Murata, Sakae; and Hattori, Yumi, 5,087,632, Cl. 514-357.000.
- Niino, Tsuyoshi: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouichirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.
- Nikon Corporation: See—
Sato, Masatoshi, 5,088,074, Cl. 369-13.000.
- Nimmo, William M.: See—
King, Alexander J.; and Nimmo, William M., 5,087,315, Cl. 156-344.000.
- Nippon Gasket Co., Ltd.: See—
Miura, Masahiko; Kawaguchi, Shigeru; Inoue, Kunitoshi; Yamamoto, Hideo; and Ohkura, Ken, 5,087,058, Cl. 277-235.00B.
- Nippon Glass Fiber Co., Ltd.: See—
Shimada, Shigeki; Tanaka, Hidekazu; and Nakagawa, Tsunefumi, 5,087,518, Cl. 428-372.000.
- Nippon Hoso Kyokai: See—
Tsutsui, Takeo; Takayanagi, Teruo; Kimura, Yasushi; and Hasegawa, Nozomu, 5,087,974, Cl. 358-180.000.
- Nippon Kayaku Kabushiki Kaisha: See—
Ishikura, Tsukasa; and Matsuyama, Shigeru, 5,087,734, Cl. 560-193.000.
- Nippon Seiko Kabushiki Kaisha: See—
Tsukada, Toru, 5,087,130, Cl. 384-15.000.
- Nippon Sheet Glass Co., Ltd.: See—
Fuchigami, Yasuhiro, 5,087,280, Cl. 65-171.000.
- Nippon Shokubai Co., Ltd.: See—
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.
- Nippon Steel Corporation: See—
Mizoguchi, Toshiaki; Miyazawa, Kenichi; Hanamura, Toshihiro; and Masahashi, Naoya, 5,087,298, Cl. 148-11.50F.
- Nippon Telegraph and Telephone Corporation: See—
Harada, Katsumi; Nagafuji, Toshiaki; Takahashi, Wataru; Nakano, Kenichi; and Yasuda, Kei-ichi, 5,088,009, Cl. 361-413.000.
- Nishida, Tetsuya; and Katayama, Yoshiyuki, to Kubota Ltd. Pivotal movement control device for boom-equipped working machine. 5,088,020, Cl. 364-160.000.
- Nishide, Seiichi: See—
Sumiuchi, Masaharu; and Nishide, Seiichi, 5,087,316, Cl. 156-396.000.
- Nishimura, Kotaro: See—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 5,087,956, Cl. 357-41.000.
- Nishimura, Noriyasu: See—
Morita, Tominori; Yoshiizumi, Kazuya; Nishimura, Noriyasu; Goto, Katsumi; Sukamoto, Takayuki; and Yoshino, Kohichiro, 5,087,640, Cl. 514-609.000.
- Nishimura, Yukinobu; Shimomura, Setsuhiro; Taniguchi, Nobutake; and Tanimoto, Kouji, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for processing a thermal flowrate sensor signal. 5,086,745, Cl. 123-494.000.
- Nishio, Yuji: See—
Nagumo, Akihiko; and Nishio, Yuji, 5,087,938, Cl. 355-27.000.
- Nishitani, Masami: See—
Kakino, Mineo; and Nishitani, Masami, 5,087,281, Cl. 65-290.000.
- Nishiyama, Atsushi: See—
Komatsu, Nobuhiro; Fujinaka, Mitsuru; Sannomiya, Masayoshi; Kondo, Toshiro; and Nishiyama, Atsushi, 5,087,074, Cl. 280-788.000.
- Nishizawa, Hiroshi; Suzuki, Kenji; Mukoyama, Yoshiyuki; Kikuchi, Tohru; and Sato, Hidetaka, to Hitachi Chemical Company, Ltd. Heat-resistant resin paste and integrated circuit device produced by using the heat-resistant resin paste. 5,087,658, Cl. 524-538.000.
- Nissan Chemical Industries Ltd.: See—
Tanaka, Norio; Kakuta, Takuya; Oya, Eiichi; and Baba, Masatoshi, 5,087,724, Cl. 558-425.000.
- Nissan Motor Co.: See—
Futami, Yuichi; Murano, Masao; and Okamura, Shigeru, 5,087,225, Cl. 474-91.000.
- Nissan Motor Company, Limited: See—
Fukanaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,087,068, Cl. 280-707.000.
- Hashimoto, Kazunobu, 5,086,628, Cl. 62-244.000.
- Kawarasaki, Yoshihiro, 5,087,072, Cl. 280-772.000.
- Kuriyama, Shigeru; Nakamura, Yozo; Maeda, Yuji; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,087,869, Cl. 322-15.000.
- Matsuda, Toshiro; and Chiba, Kazuo, 5,088,040, Cl. 364-424.050.
- Oshidari, Toshikazu, 5,086,671, Cl. 74-867.000.
- Yamaguchi, Toshio; Sugano, Kazuhiko; and Iwanaga, Kazuyoshi, 5,087,231, Cl. 475-200.000.
- Nissei Jushi Kogyo Kabushiki Kaisha: See—
Kanai, Toshiyuki; and Shinnoh, Nobuo, 5,087,504, Cl. 428-167.000.
- Nissei Plan, Inc.: See—
Hihara, Mikio; and Suzuki, Nobuhisa, 5,087,287, Cl. 106-677.000.
- Nissen, Steven L., to Iowa State University Research Foundation, Inc. Feed compositions for domestic animals containing hydroxymethylbutyrate. 5,087,472, Cl. 426-623.000.
- Nishin Flour Milling Co., Ltd.: See—
Tsuiji, Masahiro; Yokoyama, Shinji; and Tachibana, Yoji, 5,087,709, Cl. 552-541.000.
- Nitanda, Fumio: See—
Goto, Ryo; Tomitani, Tadaaki; Nitanda, Fumio; Yamazaki, Masanobu; Toyoda, Manabu; and Ushijima, Makoto, 5,086,553, Cl. 29-603.000.

Nitriton 21: See—
Boynton, Herb; and Evans, Gary W., 5,087,623, Cl. 514-188.000.
Nitschke, David B.; and Hersch, Christopher, to Glasstech, Inc. Glass sheet transferring device. 5,086,907, Cl. 198-468.600.
Nitto Kohki Co., Ltd.: See—
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Nitz, Larry T.; and Milunas, Rimas S., to Saturn Corporation. Adaptive transmission shift pressure control with closed-loop compensation. 5,086,670, Cl. 74-856.000.
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Nixdorf, Richard D. Filter and means for regeneration thereof. 5,087,272, Cl. 55-96.000.
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Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; and Horie, Shigetake, 5,087,321, Cl. 156-608.000.
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Henshaw, Terry L., 5,086,974, Cl. 239-101.000.
No, Young; and Stephenson, Stanley W., to Eastman Kodak Company. Small diameter drum thermal printer using edge detector. 5,087,925, Cl. 346-76.0PH.
Nobelpharma AB: See—
Bratnovic, Izidor; and Jorneus, Lars, 5,087,200, Cl. 433-73.000.
Nobile, Frederick E.: See—
Mullen, Patrick W.; and Nobile, Frederick E., 5,087,387, Cl. 252-299.500.
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Noggie, Edward F. Fisherman's marker buoy with integral reel. 5,087,216, Cl. 441-26.000.
Nogiwa, Toru: See—
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Tamura, Kohji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 5,087,381, Cl. 252-67.000.
Noguchi, Tadao: See—
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Nojiri, Howard H.: See—
Latimer, David L.; Nojiri, Howard H.; Million, James F.; Grimm, Steven R.; and Platt, David S., 5,086,879, Cl. 186-61.000.
Nokia Data Systems Oy: See—
Pyhalampi, Seppo; and Reini, Matti, 5,088,112, Cl. 375-36.000.
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Nomura, Takehiko; Natsume, Yoshinori; and Hosoki, Yoshinori, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor substrate. 5,087,307, Cl. 156-154.000.
Nonn, Alain, to Rhone-Poulenc Chimie. Process for the purification of dihydroxybiphenyls. 5,087,768, Cl. 568-730.000.
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Botman, Martha J. P.; Nootenboom, Peter; Oudejans, Johannes C.; and Verzijl, Dirk, 5,087,599, Cl. 502-252.000.
Norman, Victor R. Electrical outlet safety cover. 5,087,796, Cl. 174-67.000.
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Cavallerano, Alan P.; Wittig, Karl; and Tsinberg, Mikhail, 5,087,970, Cl. 358-141.000.
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Cline, Ronald L., 5,087,837, Cl. 307-455.000.
North Carolina State University: See—
Edmond, John A.; and Davis, Robert F., 5,087,576, Cl. 437-22.000.
Northeast Air/Water Corporation: See—
Lutz, George H., 5,087,419, Cl. 422-28.000.
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Yates, David E.; Lack, Geoffrey J.; and De Ville, Alan, 5,087,230, Cl. 475-151.000.
Nothdurft, Hansjorg: See—
Behrens, Axel; Berwarth, Walter; Fetzter, Gerhard; and Nothdurft, Hansjorg, 5,087,845, Cl. 310-77.000.

Novak, Conrad M.: See—
O'Loughlin, John P.; and Novak, Conrad M., 5,086,550, Cl. 29-163.800.
O'Loughlin, John P.; and Novak, Conrad M., 5,087,070, Cl. 280-740.000.
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Hosaka, Yoshihiro; Nozue, Ikuo; Takatori, Masashige; Harita, Yoshiyuki; and Honda, Kiyoshi, 5,087,548, Cl. 430-192.000.
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Nunley, Forrest E. Adjustable rotary waste removal system for rolls of die cut paperboard. 5,087,237, Cl. 493-342.000.
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Boynton, Herb; and Evans, Gary W., 5,087,624, Cl. 514-188.000.
Nutt, Ruth F.: See—
Rosenblatt, Michael; Chorev, Michael; Roubini, Eliahu; Nutt, Ruth F.; and Thi Duong, Le T., 5,087,561, Cl. 435-7.210.
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Obama, Kenjiro; Takasu, Hiroshi; Arase, Susumu; and Fujii, Hiroyuki, to Chisso Corporation. Cleaning resin composition. 5,087,653, Cl. 524-158.000.
Oberle, Timothy T., to W. R. Grace & Co. - Conn. Perforated cook-in shrink bag. 5,086,924, Cl. 206-497.000.
O'Brien, Patrick M.; and Sliskovic, Drago R., to Warner-Lambert Company. Carbamate ACAT inhibitors. 5,087,726, Cl. 560-25.000.
Ochiai, Kanehiro: See—
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O'Connell, Cormac M.: See—
Davies, Thomas J.; Pfenning, Leonardus C. M. G.; deace, Kun-
nen, Henricus J., legal representative; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 5,087,840, Cl. 307-475.000.
Oda, Osamu; and Amano, Toshio, to Sony Corporation. Automatic adjustment apparatus for independently adjusting different regions of a picture raster. 5,087,976, Cl. 358-183.000.
Odagawa, Satoshi; Kashiwazaki, Takashi; Araki, Morio; Fukushima, Atsuhiko; and Akiyama, Kazuhito, to Pioneer Electronic Corporation. On-board navigation apparatus. 5,087,919, Cl. 342-357.000.
Ogasawara, Kiyohide: See—
Onagi, Nobuaki; Suzuki, Shinichiro; Fujii, Seiro; Kobayashi, Takahiro; Yoshikawa, Takamasa; Yamaguchi, Masayasu; and Ogasawara, Kiyohide, 5,087,340, Cl. 204-192.200.
Ogata, Kazutsugu; Seki, Kazuhisa; Kaneko, Kouji; Mikajiri, Satoshi; Kaneko, Kiyotaka; and Yoshida, Masanori, to Fuji Photo Film Co., Ltd. Camera. 5,087,936, Cl. 354-430.000.
Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Sewing machine with automatic thread take-up and threading. 5,086,718, Cl. 112-225.000.
Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Sewing machine provided with a threading device and a needle bar raising device. 5,086,719, Cl. 112-225.000.
Ogawa, Toshio, to Murata Mfg. Co., Ltd. Ceramic electronic component and method of fabricating the same. 5,088,002, Cl. 361-321.000.
Ogura, Hiroshi: See—
Hanada, Masayuki; Fukuda, Morio; Koshikawa, Takeo; Yamauchi, Akihiro; and Ogura, Hiroshi, 5,087,430, Cl. 423-239.000.
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Oh-hashi, Yoshimasa: See—
Fujisaka, Takahiko; Kirimoto, Tetsuo; Oh-hashi, Yoshimasa; and Kondo, Michimasa, 5,087,917, Cl. 342-84.000.
Ohgi Paint Trading Co., Ltd.: See—
Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, 5,086,981, Cl. 239-703.000.
Ohkawa, Kenichi: See—
Harada, Hiroyuki; Ohkawa, Kenichi; Yamamoto, Masashi; Yoshinaka, Minoru; Yagi, Jun; and Matsuo, Kouziro, 5,087,654, Cl. 524-432.000.
Ohkura, Ken: See—
Miura, Masahiko; Kawaguchi, Shigeru; Inoue, Kunitoshi; Yamamoto, Hideo; and Ohkura, Ken, 5,087,058, Cl. 277-235.00B.
Ohnaka, Noriyuki: See—
Kamitsuma, Yasuo; Ishi, Isao; Nakagawa, Yusaku; Ohnaka, Noriyuki; Iizuka, Tadashi; and Fukuda, Kazushi, 5,087,181, Cl. 418-178.000.
Ohta, Kenji: See—
Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, 5,087,535, Cl. 430-5.000.
Van, Kazuo; Katayama, Hiroyuki; Takahashi, Akira; and Ohta, Kenji, 5,088,086, Cl. 369-100.000.

Ohta, Masahiro; Kawashima, Saburo; Sonobe, Yoshiho; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Polyimide and high-temperature adhesive of polyimide based on meta-phenoxy diamines. 5,087,689, Cl. 528-185.000.
Ohto Kabushiki Kaisha: See—
Suzuki, Takatoshi, 5,086,545, Cl. 24-67.00R.
Oikawa, Hideaki: See—
Ohta, Masahiro; Kawashima, Saburo; Sonobe, Yoshiho; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,087,689, Cl. 528-185.000.
Oishi, Kengo. Magnetic tape cassette having improved erasure preventing device. 5,087,998, Cl. 360-132.000.
Oji Paper Co., Ltd.: See—
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Tetsuo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.
Okabe, Toshihiro: See—
Ishibashi, Kenichi; Hayashi, Takehisa; Doi, Toshio; Asai, Mitsuo; Masuda, Noboru; Yamaguchi, Akira; and Okabe, Toshihiro, 5,087,829, Cl. 307-269.000.
Okada, Takashi; Aoyama, Takamichi; Mizuno, Shoichi; Akatsuka, Akihiro; and Matsuo, Kiyonari, to Shin-Daikyowa Petrochemical Co., Ltd. Process for preparation of N-substituted maleimides. 5,087,705, Cl. 548-458.000.
Okajima, Jiro: See—
Matsuo, Fumio; Okajima, Jiro; Okuma, Keiko; Tomita, Ken; Shibuya, Yasuo; Nakamura, Mutsumi; and Kitauchi, Hajime, 5,086,624, Cl. 62-160.000.
Okamoto, Kenichi; Kita, Hidetoshi; Tanaka, Yasuo; and Iimuro, Shigeru, to Mitsui Toatsu Chemicals, Inc. Method for preparing bisphenol A. 5,087,767, Cl. 568-727.000.
Okamoto, Toshihiko: See—
Takaichi, Akihisa; Okamoto, Toshihiko; and Matsumoto, Toshiaki, 5,087,442, Cl. 62-44.000.
Okamoto, Yasushi; Kanno, Yoshinori; Matsuo, Kouziro; Yoshinaka, Minoru; and Yagi, Jun, to Sumitomo Chemical Company, Limited; and Matsushita Electric Industrial Co., Ltd. Rubber modified styrene resin composition. 5,087,655, Cl. 524-432.000.
Okamura, Shigeru: See—
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Okaniwa, Kenichiro: See—
Koyama, Mikio; Kawakatsu, Satoshi; Akashi, Tomoji; and Okaniwa, Kenichiro, 5,087,421, Cl. 422-56.000.
Oki Electric Industry Co., Ltd.: See—
Ishimura, Tamihiko; Miyawaki, Masahumi; Miyamoto, Sanpei; and Uehara, Hidenori, 5,087,957, Cl. 357-42.000.
Tanagawa, Kouji; and Yoshida, Tomoaki, 5,088,027, Cl. 395-575.000.
Tanuma, Jiro; Ishimizu, Hideaki; Kasai, Tadashi; and Komori, Chihiro, 5,087,134, Cl. 400-54.000.
Okino, Yoshiharu, to Fuji Photo Film Co., Ltd. Image recording apparatus. 5,087,928, Cl. 346-108.000.
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Okuda, Shinji: See—
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Okura, Masahiko. Anchoring apparatus for telephone wire. 5,087,002, Cl. 248-65.000.
Okushima, Kaoru. Marking member storage device for golf club. 5,087,044, Cl. 273-162.00D.
Olin Corporation: See—
Vulpitta, Anthony C.; Dwyer, William P.; and Patrosch, Thomas P., 5,086,949, Cl. 222-1.000.
O'Loughlin, John P.; and Novak, Conrad M., to TRW Inc. Method of assembling an inflator for a vehicle occupant restraint. 5,086,550, Cl. 29-163.800.
O'Loughlin, John P.; and Novak, Conrad M., to TRW Inc. Method of assembling an inflator for a vehicle occupant restraint. 5,087,070, Cl. 280-740.000.
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Gagnon, Ernest P.; Jaminet, Jerome F.; and Olsen, Eric G., 5,086,881, Cl. 187-17.000.
Olson, Heidi S., to HICO Products, Inc. Forms Carrier for laser printers. 5,087,238, Cl. 493-379.000.
Olson Manufacturing Co.: See—
Agbay, Anthony J., 5,086,631, Cl. 70-366.000.
Olson, Norman J. Device for cleaning the laser lens of a compact disc player. 5,088,083, Cl. 369-71.000.
Olympus Optical Co., Ltd.: See—
Igarashi, Tsutomu, 5,087,989, Cl. 359-692.000.
Ishibashi, Kiyochika, 5,087,423, Cl. 422-67.000.
Miller, Arnold; Barlow, David E.; and Saitoh, Tatsuya, 5,087,264, Cl. 606-159.000.
Suzuta, Toshihiko, 5,087,850, Cl. 310-316.000.
Om, Kyoo; and Hasebe, Mitsuo, to Ricoh Company, Ltd. Digital color copier with color separation processing. 5,087,968, Cl. 358-75.000.
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deVos, James W. G.; Ommen, Denise M.; and Palmer, Robert H., 5,087,962, Cl. 357-70.000.

Omori, Masahiro; and Stoneham, Edward B., to Microwave Technology, Inc. Protective coating useful as a passivation layer for semiconductor devices. 5,087,959, Cl. 357-54.000.
Omote, Atsushi: See—
Murakami, Mutsuaki; Tsuchiya, Sohji; and Omote, Atsushi, 5,087,540, Cl. 430-58.000.
Omron Tateisi Electronics Co.: See—
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Omure, Yukio; Noguchi, Masahiro; and Hanatani, Naoyoshi, to Daikin Industries, Ltd. Fluorine-containing alcohol-based dehydrating agent and method of drying articles. 5,087,386, Cl. 252-154.000.
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Onda, Kenichi: See—
Yaginuma, Takao; Onda, Kenichi; Matsuda, Yasuo; and Mizuta, Kouichi, 5,088,017, Cl. 363-21.000.
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Ono, Sachiko: See—
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,087,330, Cl. 205-75.000.
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Onodera, Chikau: See—
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Ontrop, Hans: See—
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nen, Henricus J., legal representative; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 5,087,840, Cl. 307-475.000.
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Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,088,063, Cl. 365-201.000.
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Optec Co., Ltd.: See—
Narutaki, Yoshinori, 5,087,125, Cl. 356-375.000.
Optics for Research: See—
Heiney, Allan J.; and Wilson, Donald K., 5,087,984, Cl. 359-282.000.
Orscheln Co.: See—
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Orth, Robert W. Mounting for storm windows. 5,086,604, Cl. 52-741.000.
Osada, Yutaka; and Kaneko, Keichi, to Victor Company of Japan, Ltd. Position control system for read/write device. 5,087,997, Cl. 360-78.060.
Osaka, Shuichi: See—
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Osamu, Manabe; Shigeo, Fujita; Shizuo, Iwata, and Morihoro, Kamiyama, to Asahi Chemical Co., Ltd. Cyanine compounds. 5,087,704, Cl. 548-427.000.
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Osborne, James C.: See—
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Flory, Donald M.; Moore, Clark D.; Osterday, Craig A.; and De Hoff, Edward J., 5,086,690, Cl. 92-48.000.
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- Otis Elevator Company: See—
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Otsuji, Atsuo; Nakatsuka, Masakatsu; Hasegawa, Kiyoharu; Takagi, Masatoshi; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Fluorane compounds, process for preparation thereof and recording materials comprising said compound, 5,087,706, Cl. 549-226.000.
Otsuka Pharmaceutical Co., Ltd.: See—
Strassmann, Gideon, 5,087,453, Cl. 424-450.000.
Takaichi, Akihisa; Okamoto, Toshihiko; and Matsumoto, Toshiaki, 5,087,442, Cl. 424-44.000.
Otto Tuchenhagen GmbH & Co. KG: See—
Mieth, Hans O., 5,086,816, Cl. 141-83.000.
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Delalle, Jacques; Ouaniche, Mahrez; Lamothe, Michele; Passa, Frederic; and Roucaute, Philippe, 5,086,967, Cl. 228-56.300.
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Outboard Marine Corporation: See—
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Overbeek, Johannes J. M.; and Verkuiljen, Hendrik A., to U.S. Philips Corporation. Display tube with electrical connection means, 5,087,855, Cl. 313-477.0HC.
Owens-Illinois Plastic Products Inc.: See—
Krall, Thomas J.; and Myers, Robert A., 5,087,406, Cl. 264-512.000.
Robinson, Gerald R., 5,086,937, Cl. 215-100.00A.
Owl 1990 Trust: See—
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Oy Tampella Ab: See—
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Ozaki, Kenji: See—
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Page, Robert E., to Beloit Corporation. Apparatus for manufacturing a dried web of paper, 5,087,325, Cl. 162-193.000.
Paige, Clive R., to Shop Vac Corporation. Pressure washer with springless outlet to inlet bypass, 5,086,975, Cl. 239-124.000.
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Palmer, Robert H.: See—
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Pinoteau, Maurice; and Mallet, Bernard, 5,087,139, Cl. 401-206.000.
Pariot, Robert; and Traugott, J. Mortimer, to Techstrip Inc. Power Door sensing strip, 5,087,799, Cl. 200-61.430.
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Weiler, Rolf; Bach, Uwe; Paschke, Klaus-Dieter; and Roth, Gerald, 5,087,907, Cl. 340-454.000.
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Hewko, Lubomir O.; Patel, Balkrishna R.; and Bartos, Andrew L., 5,087,229, Cl. 475-149.000.
Patel, Mansukh M.: See—
Chuu, Michael S.; Chapdelaine, Albert H.; and Patel, Mansukh M., 5,087,459, Cl. 426-4.000.
Witkewitz, David L.; and Patel, Mansukh M., 5,087,458, Cl. 426-3.000.
Patrosch, Thomas P.: See—
Vulpitta, Anthony C.; Dwyer, William P.; and Patrosch, Thomas P., 5,086,949, Cl. 222-1.000.
Patton, Robert J.; and Bay, Adam G., to Gould Inc. Rotary slip clutch, 5,086,898, Cl. 192-70.120.
Paul, James M.: See—
Morris, Richard L.; and Paul, James M., 5,087,371, Cl. 210-643.000.
Paul Journée S.A.: See—
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Macors, Paul P. M. G. J.; Paulussen, Henricus F.; and Vos, Jellard, 5,086,783, Cl. 128-765.000.
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Grabner, David W.; Eckhardt, Dennis C.; and Pawlak, Andrzej M., 5,086,862, Cl. 180-132.000.
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Pearce, Leonard, to Otis Elevator Company. Elevator traveling cable grip, 5,086,880, Cl. 187-1.00R.

- Peeters, Jozef: See—
Van Bogaert, Philippe; Bamelis, Jean-Marie; Peeters, Jozef; and Markey, Hugo, 5,086,812, Cl. 139-435.200.
Peiffer, Robert W., to Du Pont de Nemours, E. I., and Company. Image reproduction process using a peel-apart photosensitive element, 5,087,549, Cl. 430-253.000.
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Pelrine, Bruce P., to Mobil Oil Corporation. Dehydrocyclization of polyalpha-olefin lubricants, 5,087,782, Cl. 585-417.000.
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Penn Engineering & Manufacturing Corp.: See—
Marsteller, K. Edward; and McGlone, Patrick, 5,086,965, Cl. 227-8.000.
Pennsylvania Research Corporation, The: See—
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Pentel Kabushiki Kaisha: See—
Wada, Yoshihiro; Suzuki, Kazunori; Kono, Tadashi; and Asano, Katsuo, 5,087,144, Cl. 401-199.000.
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Pribat, Didier; Perret, Joel; Rouffy, Jean-Claude; and Velasco, Gonzalo, 5,087,275, Cl. 55-386.000.
Perrin, Patrice, to Rhone-Poulenc Chimie. Curable ketiminoxy/organopolysiloxane compositions devoid of organometallic curing catalysts, 5,087,684, Cl. 528-22.000.
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Persinski, Leonard J.: See—
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Gateau, Paul; Maute, Michel; Feugier, Alain; and Perthuis, Edmond, 5,087,270, Cl. 48-127.900.
Pestka, Thomas J., to Mobil Oil Corporation. Engine powered safety mower with self cleaning deck, 5,086,614, Cl. 56-17.200.
Petasis, Nicos A.; and Bzowej, Eugene I., to University of Southern California. Method for olefination of carbonyl compounds using titanocene derivatives, 5,087,790, Cl. 585-638.000.
Petelenz, Tomas J.; Jacobsen, Stephen C.; Stephen, Robert L.; Beck, Jon; and Shimada, Jin, to Iomed, Inc. Hydratable bioelectrode, 5,087,242, Cl. 604-20.000.
Petersen, Michael W.; and Fischbach, Clark D., to Motorola, Inc. RF driven gate bias, 5,087,893, Cl. 330-296.000.
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Schmidt, Frederick A.; Peterson, David T.; Wheelock, John T.; Jones, Lawrence L.; and Lincoln, Lanny P., 5,087,291, Cl. 75-581.000.
Peterson, Donald W. Electric rear wheel steering actuator, 5,086,861, Cl. 180-79.100.
Petronis, Thomas J.; and Annis, Clifford C., to Applied Robotics, Inc. Robot overload detection device, 5,086,901, Cl. 192-150.000.
Petrzelka, Miloslav; and Hoffmann, Werner, to GKN Automotive AG. Assembly of shaft and hub member, 5,087,147, Cl. 403-268.000.
Pettus, Ronald G., to Cooper Industries, Inc. Balanced sleeve control choke, 5,086,808, Cl. 137-625.300.
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Bingham, Billy E.; Coiner, John R., Jr.; Pettus, William G.; and Short, Barrett J., 5,087,412, Cl. 376-368.000.
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Davies, Thomas J.; Pfenning, Leonardus C. M. G., deceased; Kunnen, Henricus J., legal representative; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 5,087,840, Cl. 307-475.000.
Pfister, Johann; and Daum, Karl, to Tyrolit Schleifmittelwerke Swarovski K.G. Saw cable with spacers between adjacent cutting beads, 5,086,751, Cl. 125-21.000.
Pfizer Inc.: See—
Barnish, Ian T.; and James, Keith, 5,087,732, Cl. 560-122.000.
Phelan, Cathal G.: See—
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Grauel, Christoph; and Schmidt, Werner, 5,088,094, Cl. 370-95.100.
Phillips, Geoff. Protective book cover, 5,087,078, Cl. 281-31.000.
Phillips Petroleum Company: See—
Kimble, James B.; and Kolts, John H., 5,087,787, Cl. 585-500.000.
McDaniel, Max P.; Welch, M. Bruce; and Johnson, Marvin M., 5,087,789, Cl. 585-525.000.
Yu, Michael C.; and Allison, John B., 5,087,666, Cl. 525-189.000.
Phillips, Philip W.; Wu, Hong-L.; Dunlap, David H.; and Kundu, Kalyan, to Massachusetts Institute of Technology. Disorder-induced narrowband high-speed electronic devices, 5,087,948, Cl. 357-16.000.
Philpot, Ivan N., to Matthews International Inc. Combination roll covering and specially configured printing plate securement apparatus, 5,086,699, Cl. 101-415.100.
Piasecki, Douglas S.; and Swanson, Eric J., to Crystal Semiconductor. Linear channel bandwidth calibration circuit, 5,088,107, Cl. 375-10.000.
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Van Bogaert, Philippe; Bamelis, Jean-Marie; Peeters, Jozef; and Markey, Hugo, 5,086,812, Cl. 139-435.200.
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Hunt, Robert P.; Lurye, Alex; and Riser, George C., 5,087,986, Cl. 359-629.000.
Pickup, John G.: See—
Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., 5,087,461, Cl. 426-96.000.
Picouet, Jean L.: See—
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Billings, Zeb; Pierce, Harold D.; Kish, Conrad W.; and Kusina, Patrick E., 5,087,043, Cl. 273-157.00R.
Pieron, Henri G. W., to D & C Limited. Web guidance and tracking mechanism for a continuous belt filter, 5,086,963, Cl. 226-17.000.
Pinnow, Curtis C.: See—
Fortmann, Robert C.; Pinnow, Curtis C.; and Porcaro, Louis, 5,087,364, Cl. 210-390.000.
Pinol, Augusto C.; Constans, Jordi F.; and Corominas, Juan P., to Laboratorios del Dr. Esteve. Substituted azetidinyliothiazolopyridone derivatives, their preparation and their application as medicinal products, 5,087,621, Cl. 514-210.000.
Pinoteau, Maurice; and Mallet, Bernard, to Parfums Christian Dior. Device for applying make-up, incorporating replaceable reservoir, 5,087,139, Cl. 401-206.000.
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Odagawa, Satoshi; Kashiwazaki, Takashi; Araki, Morio; Fukushima, Atsuhiko; and Akiyama, Kazuhiro, 5,087,919, Cl. 342-357.000.
Onagi, Nobuaki; Suzuki, Shinichiro; Fujii, Seiro; Kobayashi, Takahiro; Yoshikawa, Takamasa; Yamaguchi, Masayasu, and Ogasawara, Kiyohide, 5,087,340, Cl. 204-192.200.
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Pirogov, Valery A.: See—
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Pitchford, Terry L.: See—
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Pizzi, Antonio: See—
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Plachy, Janos: See—
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Placontrol Corp.: See—
Chodorow, Ingram S., 5,086,792, Cl. 132-323.000.
Platt, David S.: See—
Latimer, David L.; Nojiri, Howard H.; Million, James F.; Grimm, Steven R.; and Platt, David S., 5,086,879, Cl. 186-61.000.
Pochieh, Hung, to Konica Corporation. Method of estimating colors for color image correction, 5,087,126, Cl. 356-402.000.
Pocholle, Jean-Paul; Papuchon, Michel; and Puech, Claude, to Thomson-CSF. Tunable power laser, 5,088,096, Cl. 372-20.000.
Podd, George O., III. Recreational apparatus for propelling a person about a fixed point, 5,087,035, Cl. 272-93.000.
Polanco, Julio R. Dual coil spring lingual arch, 5,087,196, Cl. 433-21.000.
Polhemus, Marlan H., to Mobil Oil Corporation. Easy-opening leak-resistant liquid storage and dispensing container, 5,086,956, Cl. 222-472.000.
Polling, Ludger, to Bernhard Beumer Maschinenfabrik KG. Tipping-conveyor element for a package conveyor, 5,086,905, Cl. 198-365.000.
Pom, Inc.: See—
Speas, Gary W., 5,088,073, Cl. 368-90.000.
Pompier, Jean-Pierre, to Compagnie Generale des Etablissements-michelin - Michelin & Cie. Auxiliary wheel to be paired temporarily with a vehicle wheel and traveling device thus obtained, 5,087,103, Cl. 301-39.00R.
Poor, James C.; Hoskins, Frederick K.; and Morcom, William, to Spencer Turbine Company, The. Bag shaker, 5,087,274, Cl. 55-300.000.
Pop Limited: See—
Cha, Toncil, 5,087,651, Cl. 524-55.000.
Popolo, Jacquelyn: See—
Sounik, James R.; and Popolo, Jacquelyn, 5,087,390, Cl. 252-587.000.
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Fortmann, Robert C.; Pinnow, Curtis C.; and Porcaro, Louis, 5,087,364, Cl. 210-390.000.
Pori, International, Inc.: See—
Kovacs, Geza L., 5,087,378, Cl. 210-742.000.
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Poskie, Fredrick R., to General Motors Corporation. Sealing cap assembly for an access aperture, 5,086,943, Cl. 220-374.000.

Possati, Mario; and Golinelli, Guido, to Marposs Societa' per Azioni. Apparatus for checking dimensions of workpieces. 5,086,569, Cl. 33-549.000.

Potter, David K.; and Ahrens, Thomas J., to California Institute of Technology. Polycrystalline diamond and method for forming same. 5,087,435, Cl. 423-446.000.

Pouliquen, Benoit, to Johnson Matthey Inc. Aluminum target for magnetron sputtering and method of making same. 5,087,297, Cl. 148-2.000.

Poveda, Pierre: See—
Auteraud, Jacques; Barthevin, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foucras, Jean; Louis, Michel; Marelli, Georges; Poveda, Pierre; and Roux, Christian, 5,086,541, Cl. 16-227.000.

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Powell, James R. Hand operated oral irrigation device for packaged liquids. 5,086,756, Cl. 128-66.000.

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Powers, Timothy J.: See—
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Prader, Randolph D.; and Smith, Graham, to Mobil Oil Corporation. Method of forming an easy-open bag pack. 5,087,234, Cl. 493-194.000.

Prager, Jay M.: See—
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Prangle, Gordon N. Therapeutic apparatus with jewels. 5,086,770, Cl. 128-395.000.

Pratt, James O.: See—
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Precision Diagnostics, Inc.: See—
Fowler, Franklin S., Jr.; and Jurgensen, Russell P., 5,086,776, Cl. 128-661.090.

Precision Processes (Textiles) Limited: See—
Connell, David L.; Michael, Kenneth; and Szpala, Anthony, 5,087,266, Cl. 8-109.000.

Prejean, Thomas G., to Dow Chemical Company, The. Vinyl chloride polymer composition with improved fusion properties. 5,087,669, Cl. 525-239.000.

President and Fellows of Harvard College: See—
Leder, Philip; and Stewart, Timothy A., 5,087,571, Cl. 435-240.200.

Preston, Christopher C.: See—
Gold, Raymond; Roberts, James H.; and Preston, Christopher C., 5,087,407, Cl. 376-159.000.

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Tew, Nicholas H.; and Preys, Lyudmila M., 5,087,135, Cl. 400-56.000.

Pribat, Didier; Perret, Joel; Rouffy, Jean-Claude; and Velasco, Gonzalo, to Thomson-CSF. An improved electrochemical sensor having microcavities. 5,087,275, Cl. 55-386.000.

Price, Daniel W., to Hasbro, Inc. Action character figure. 5,087,219, Cl. 446-336.000.

Price, Edward G.: See—
Boyd, Dudley G.; Price, Edward G.; Kanaga, Valiant G.; and Chen, Nian, 5,087,861, Cl. 315-247.000.

Price, Ronald L.: See—
Krishnan, Sivaram; Price, Ronald L.; Shu, Peter H. C.; and Witman, Mark W., 5,087,524, Cl. 428-412.000.

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Tong, Wen H.; and Priddy, Duane B., 5,087,738, Cl. 560-302.000.

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Prime Computer, Inc.: See—
Farr, William, 5,088,081, Cl. 369-54.000.

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Miller, Gordon; Dykstra, Ronald; Spykerman, David; and Buonodono, Joseph, 5,087,008, Cl. 248-311.200.

Pritulsky, James: See—
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Procter & Gamble Company, The: See—
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Proffitt, Michael A.: See—
VanRens, Russell J.; and Proffitt, Michael A., 5,086,825, Cl. 164-4.100.

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DeVos, David J.; Sterenberg, Bruce A.; and Tubergen, Michael L., 5,087,486, Cl. 427-264.000.

Provence, Marc; Rousset, Didier; and Dunand, Josiane, to Salomon S.A. Binding for connecting a shoe or boot to a ski. 5,087,065, Cl. 280-615.000.

Prunier, Jean-Claude; Peuchet, Pascal; Le Gouic Martun, Jean-Jacques; and Bonnin, Claude, to Societe Nouvelle De Connexion. Miniature connector for flat metal-clad cables and contact devices forming them. 5,087,211, Cl. 439-579.000.

PTI/END/CORR: See—
Woodson, Charles S.; Janda, Dennis; and Stricharczuk, Paul T., 5,087,343, Cl. 204-242.000.

Puderbach, Gerhard: See—
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Puech, Claude: See—
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Pukas, Paul, to Tech-Crete Processors Ltd. Insulation clip. 5,086,602, Cl. 52-713.000.

Pukropski, Aribert: See—
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Pulsipher, James A.; Wolff, Robert H.; and Worthington, Steven G., to Digital Equipment Corporation. Delay circuit having one of a plurality of delay lines which may be selected to provide an operation of a ring oscillator. 5,087,842, Cl. 307-603.000.

Puppe, Lothar: See—
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Purdy, Howard A. Animal halter. 5,086,611, Cl. 54-24.000.

Puretech Systems, Inc.: See—
Jackson, Edward E., 5,087,420, Cl. 422-37.000.

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Pyramid, Inc.: See—
Hait, Paul W., 5,086,752, Cl. 126-9.00R.

Quarles, Gregory J.: See—
Esterowitz, Leon; and Quarles, Gregory J., 5,088,103, Cl. 372-68.000.

Quay, Stephen C.: See—
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Quay, Steven C., to Salutar, Inc. Paramagnetic metal-diethylenetriamine-pentaacetic acid partial amide complexes for magnetic resonance imaging. 5,087,439, Cl. 424-9.000.

Quinn, George P.; Kruse, Larry W.; Gebhard, Thomas J.; and Forgac, John M., to Amoco Corporation. Catalytic cracking unit with internal gross cut separator and quench injector. 5,087,427, Cl. 422-144.000.

Qureshi, Shahid P.; Newman-Evans, Richard H.; and Gardner, Hugh C., to Amoco Corporation. Fiber-reinforced composites toughened with resin particles. 5,087,657, Cl. 524-508.000.

R. J. Reynolds Tobacco Company: See—
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Racz, Istvan; Plachy, Janos; and Szentmiklos, Peter. Pharmaceutical preparations of high gastric acid binding capacity, delayed effect and of increased bioavailability. 5,087,447, Cl. 424-78.010.

RAD Network Devices Ltd.: See—
Yacoby, Amnon, 5,088,090, Cl. 370-85.130.

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Ramon, Efraim: See—
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Randall, Kent A., to Eastman Kodak Company. Method and apparatus for forming multicolor toner images. 5,087,945, Cl. 355-272.000.

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Buchwald, Hans; and Raschkowski, Boleslaus, 5,087,285, Cl. 106-38.220.

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Chen, Johnny C., 5,087,332, Cl. 205-135.000.

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Reed, Edwin A. Combined optical power and noise meter. 5,087,808, Cl. 250-214.00R.

Regneault, Marcel: See—
Advenier, Pierre; and Regneault, Marcel, 5,087,016, Cl. 251-129.150.

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Bruder, Herbert; Fischer, Hubertus; Reinfelder, Hans-Erich; and Schmitt, Franz, 5,087,880, Cl. 324-309.000.

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Reitz, David B.; and Manning, Robert E., to G. D. Searle & Co. N-substituted imidazol-2-one compounds for treatment of circulatory disorders. 5,087,634, Cl. 514-381.000.

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Birchak, James R.; Hon, Wai-Leung; and Ruhovets, Michael, 5,087,900, Cl. 333-100.000.

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Holland, Geary C.; and Allison, Charles E., 5,086,600, Cl. 52-594.000.

Revis, Arthur N. Clip for holding messages with reminder light. 5,088,013, Cl. 362-99.000.

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Bach, Gary M.; Baehman, Carl R.; Holt, Frederick M., Jr.; and Highfield, Terry T., 5,086,927, Cl. 206-597.000.

Reynolds, Joseph D., to Eaton Corporation. Pre-energizer pins for a synchronizer. 5,086,897, Cl. 192-53.00E.

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Bagwell, Alan C., 5,086,653, Cl. 73-835.000.

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Duffy, Douglas C.; and Temby, Richard D., 5,086,944, Cl. 220-658.000.

Rhoe, Andrei: See—
Johnson, Roger C.; McCarthy, Daniel; and Rhoe, Andrei, 5,087,783, Cl. 585-475.000.

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Denis, Philippe, 5,087,735, Cl. 560-204.000.

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Nonn, Alain, 5,087,768, Cl. 568-730.000.

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Ribi, Hans O., to Biocircuits Corporation. Novel lipid-protein compositions and articles and methods for their preparation. 5,087,952, Cl. 357-25.000.

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Schall, William S.; and Richardson, James E., 5,088,068, Cl. 367-173.000.

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Haffey, Janet G.; Garfinkel, Jay R.; and Blank, Roy L., 5,087,445, Cl. 424-59.000.

Richter, Robert A.; Rochman, Maurice C.; and Gordon, Stephen M., to G B Instruments, Inc. Sorting apparatus and method. 5,086,929, Cl. 209-698.000.

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Chikano, Hisao, 5,087,932, Cl. 346-145.000.

Hotta, Yoshihiko; Kubo, Keishi; Kawaguchi, Makoto; and Nogiwa, Toru, 5,087,601, Cl. 503-200.000.

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Nagai, Kazukiyo, 5,087,699, Cl. 546-296.000.

Omi, Kyoji; and Hasebe, Mitsuo, 5,087,968, Cl. 358-75.000.

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Takahashi, Yasushi; and Takanashi, Kenichi, 5,087,983, Cl. 359-205.000.

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Riendeau, Leo A.: See—
Giggins, Charles S., Jr.; Anderson, Neal P.; Mullin, Richard S.; Riendeau, Leo A.; and Ulion, Nicholas E., 5,087,477, Cl. 427-38.000.

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Wetter, Kurt, 5,086,990, Cl. 242-157.00R.

Riggins, David J.: See—
Holoff, Richard S., and Riggins, David J., 5,087,005, Cl. 248-205.800.

Rinder, Herbert R. Single pedal vehicle braking and acceleration control system. 5,086,891, Cl. 192-1.560.

Riser, George C.: See—
Hunt, Robert P.; Lurye, Alex; and Riser, George C., 5,087,986, Cl. 359-629.000.

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Fursier, Roger; and Bovermann, Claus-Dieter, 5,087,104, Cl. 312-100.000.

Robeck, Horst; and Deger, Hans-Matthias, to Hoechst Aktiengesellschaft. Novel azeotropic or azeotrope-like mixture of 2,2,2-trifluoroethyl 1,1,2,2-tetrafluoroethyl ether and ethanol, and its use. 5,087,383, Cl. 252-171.000.

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Geisbert, Michael; Meiwes, Johannes; Wendel, Friedrich; Dick, Dieter; Teiwes, Henning; and Schellhase, Helmut, 5,087,847, Cl. 310-90.000.

Schwendemann, Bernhard; and Stumpe, Werner, 5,086,656, Cl. 73-862.540.

Vogtmann, Hans-Jorg, 5,086,742, Cl. 123-449.000.

Robert J. Matthews Co.: See—
Matthews, James S.; Matthews, Robert K.; and Martin, Myron M., 5,087,128, Cl. 366-141.000.

Roberts, James H.: See—
Gold, Raymond; Roberts, James H.; and Preston, Christopher C., 5,087,407, Cl. 376-159.000.

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Boesten, Wilhelmus H. J.; Schepers, Catharina H. M.; and Roberts, Mathieu J. A., 5,087,753, Cl. 564-302.000.

Robin, Philippe; Broussoux, Dominique; and Dubois, Jean C., to Thomson-CSF. Infrared detector based on pyroelectric material. 5,087,816, Cl. 250-338.300.

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Robinson, Gerald R., to Owens-Illinois Plastic Products Inc. Lightweight plastic bottle and method and apparatus for forming. 5,086,937, Cl. 215-100.00A.

Rochman, Maurice C.: See—
Richter, Robert A.; Rochman, Maurice C.; and Gordon, Stephen M., 5,086,929, Cl. 209-698.000.

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Kappas, Attallah; and Drummond, George S., 5,087,622, Cl. 514-185.000.

Rockwell International Corporation: See—
Culp, Gordon W., 5,087,852, Cl. 310-323.000.

Rodder, Mark S., to Texas Instruments Incorporated. Method of forming vertical FET device with low gate to source overlap capacitance. 5,087,581, Cl. 437-41.000.

Rodeheffer, Thomas L.: See—
Schroeder, Michael D.; Needham, Roger M.; Thacker, Charles P.; Birrell, Andrew D.; Rodeheffer, Thomas L.; Satterthwaite, Edwin H., Jr.; and Murray, Hallam G., Jr., 5,088,091, Cl. 370-94.300.

Rodel, Gunther: See—
Gerlach, Edgar; Dencks, Carl G.; Gunther, Uwe; and Rodel, Gunther, 5,087,123, Cl. 356-307.000.

Rodgers Instrument Corporation: See—
Rohde, Mark W.; Kirkwood, George T.; and Schalk, Dick G., 5,087,798, Cl. 200-5.00A.

Roeder, Jean; and Geering, Leslie J., to Airbus Industrie. High-capacity fuselage for aircraft. 5,086,996, Cl. 244-119.000.

Roessler, Norbert: See—
Kearns, Edward G.; Roessler, Norbert; van Cauter, Gustaaf; and Ukraincik, Kreso, 5,087,820, Cl. 250-385.100.

Rogall, Wolfgang, to ETI-TEC Maschinenbau GmbH. Labelling machine for the labelling of containers. 5,087,317, Cl. 156-456.000.

Rogalski, Joseph; and Spector, George. Rowing sled. 5,087,060, Cl. 280-12.110.

Rogers, Alan C., to National Semiconductor Corporation. TTL to CMOS translating circuits without static current. 5,087,841, Cl. 307-475.000.

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Hegde, Manjanath S.; Inam, Arun; Rogers, Charles T., Jr.; and Venkatesan, Thirumalai, 5,087,605, Cl. 505-1.000.

Rogers Machinery Company, Inc.: See—
Wells, Lyle G., 5,087,178, Cl. 418-1.000.

Rogers, Walter C., Jr. Recliner chair. 5,087,094, Cl. 297-68.000.

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Shaber, Steven H., 5,087,635, Cl. 514-383.000.

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Brekner, Michael-Joachim; Rohrmann, Jürgen; Spaleck, Walter; and Antberg, Martin, 5,087,677, Cl. 526-160.000.

Rokach, Joshua: See—
Belanger, Patrice C.; Scheiget, John; and Rokach, Joshua, 5,087,638, Cl. 514-456.000.

Rokasky, Fred J. Interactive lingerie undergarment. 5,086,519, Cl. 2-408.000.

Roll, Rudolf; Brandenburger, Jürgen; and Hempel, Horst, to Hoechst CeramTec Aktiengesellschaft. Process and jig for plating pin grid arrays. 5,087,331, Cl. 205-118.000.

Rolls-Royce plc: See—
Kieschke, Robert R.; and Clyne, Trevor W., 5,087,303, Cl. 148-276.000.

Rolox Ltd.: See—
Snyder, Michael R., 5,087,276, Cl. 55-496.000.

Roman, Bruce C.: See—
Stevens, Ward C.; Sturm, Edward A.; and Roman, Bruce C., 5,087,515, Cl. 428-315.900.

Roselli, Leonard, to Westinghouse Air Brake Company. Arrangement for dynamic calibrating an absolute position encoder. 5,086,641, Cl. 73-1.00D.

Rosenblatt, Michael; Chorev, Michael; Roubini, Eliahu; Nutt, Ruth F.; and Thi Duong, Le T., to Merck & Co., Inc. Humoral hypercalcemic factor antagonists modified at position 13 by biotin. 5,087,561, Cl. 435-7.210.

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Rosendall, Henry J.: See—
Blase, Michael R.; Rosendall, Henry J.; and Goodrich, Gordon W., 5,087,018, Cl. 251-245.000.

Ross, Gary. Inflatable protective cushion to be worn by people in high speed and high impact sports. 5,086,514, Cl. 2-2.000.

Roth, Gerald: See—
Weiler, Rolf; Bach, Uwe; Paschke, Klaus-Dieter; and Roth, Gerald, 5,087,907, Cl. 340-455.000.

Rottmaier, Ludwig: See—
Tork, Leo; Rottmaier, Ludwig; and Hohne, Wolfgang, 5,087,646, Cl. 523-406.000.

Roubini, Eliahu: See—
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Roucaute, Philippe: See—
Delalle, Jacques; Ouaniche, Mahrez; Lamothe, Michele; Passa, Frederic; and Roucaute, Philippe, 5,086,967, Cl. 228-56.300.

Rouffly, Jean-Claude: See—
Pribat, Didier; Perret, Joel; Rouffly, Jean-Claude; and Velasco, Gonzalo, 5,087,275, Cl. 55-386.000.

Roussel Uclaf: See—
Meinard, Colette; Suglia, Jean-Claude; and Taranta, Claude, 5,087,456, Cl. 424-501.000.

Rousset, Didier: See—
Provence, Marc; Rousset, Didier; and Dunand, Josiane, 5,087,065, Cl. 280-615.000.

Roussy, Raymond J. Drill pipes for rotary-vibratory drills. 5,086,854, Cl. 175-320.000.

Routh, Andre G.: See—
Larnard, Donald J.; and Routh, Andre G., 5,086,772, Cl. 128-419.00D.

Roux, Christian: See—
Auternaud, Jacques; Barteian, Jean; Bertheux, Philippe; Blanc, Eric; de Mollerat du Jeu, Thierry; Foucras, Jean; Louis, Michel; Marelllo, Georges; Poveda, Pierre; and Roux, Christian, 5,086,541, Cl. 16-227.000.

Roy, Christian, to Universite Laval. Recovery of commercially valuable products from scrap tires. 5,087,436, Cl. 423-461.000.

Roy, Joy; and Moore, John S., to Tektronix, Inc. Drop-on-demand ink jet print head. 5,087,930, Cl. 346-140.00R.

Roy, Serge H.: See—
DeLuca, Carlo J.; Gilmore, L. Donald; and Roy, Serge H., 5,086,779, Cl. 128-733.000.

Royal Appliance Mfg. Co.: See—
Zahranec, Terry L., 5,086,538, Cl. 15-354.000.

Rudowski, Werner: See—
Paikert, Paul; Rudowski, Werner; and Ruff, Clemens, 5,086,831, Cl. 165-47.000.

Ruetschle, Rudolph H.; and Yakovac, Philip A., to K. S. Macey Machine Company, Inc. Book feeding and trimming apparatus. 5,086,681, Cl. 83-277.000.

Ruf, Erich, to Th. Goldschmidt AG. Method for the preparation of tetraalkyl-tin. 5,087,711, Cl. 556-102.000.

Ruff, Clemens: See—
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Ruhovets, Michael: See—
Birchak, James R.; Hon, Wai-Leung; and Ruhovets, Michael, 5,087,900, Cl. 333-100.000.

Ruscev, Mario: See—
Maitrejean, Serge; Ruscev, Mario; and Dorion, Irene, 5,087,821, Cl. 250-385.100.

Rushing, Allen J., to Eastman Kodak Company. Automatic set-up for electrophotographic copying of transparency originals. 5,087,942, Cl. 355-214.000.

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Davis, Martha; Formosa, Daniel; Gerth, Jeannie; Moore, Patricia A.; Russak, Stephen; Thomsen, Tamara; and Viemeister, Tucker, 5,087,254, Cl. 604-386.000.

Russell, Donald L.; and Kahrs, Michael P., to B. F. Goodrich Company, The. Aircraft wheel. 5,086,821, Cl. 152-410.000.

Ryan, Kenneth M.: See—
Volante, Ralph P.; Askin, David; Shinkai, Ichiro; and Ryan, Kenneth M., 5,087,703, Cl. 548-406.000.

Ryd, Leif E. S. H.; Bertilsson-Lindstrand, Anders O.; and Toksvik-Larsen, Soren, to MIT AB. Saw-blade for sawing living human bone. 5,087,261, Cl. 606-82.000.

S.J. Electro Systems, Inc.: See—
Johnston, Stephen P., 5,087,801, Cl. 200-84.00R.

S.N.C. Melchior Technologie: See—
Melchior, Jean; Andre, Thierry; and Edelmann, Henri B., 5,086,735, Cl. 123-65.0VD.

Saam, Werner: See—
Synatschke, Dieter; Sattelberger, Paul; and Saam, Werner, 5,086,877, Cl. 184-7.400.

Sab Wabco (Holdings) B.V.: See—
Bowsher, Glynn T., 5,086,885, Cl. 188-71.900.

Sachs, Gunter; and Mirlieb, Bernd, to Eastman Kodak Company. Sheet-removal device. 5,087,024, Cl. 271-11.000.

Sacks, Ford. Storage system for holding athletic equipment and a method. 5,086,930, Cl. 211-17.000.

SAFT: See—
Guerinault, Jean-Marc; and Brunarie, Joel, 5,086,969, Cl. 228-189.000.

Sagawa, Kouichiro; Kitamura, Nobuyoshi; Ueda, Masako; and Takeuchi, Koji, to Ajinomoto Co., Inc.; and Sony Corporation. Composite sheet used for reproducible electrostatic image display or record. 5,087,517, Cl. 428-329.000.

Sagstetter, William E.; and Cooke, John E., to Medical Safety Products, Inc. Disposal for needles and syringes. 5,086,922, Cl. 206-366.000.

Saito, Tasuku: See—
Ishino, Yuichi; Osaki, Toshiyuki; Endo, Shigeki; Tomita, Seisuke; Maruyama, Takayuki; Fukuyama, Yoshiki; and Saito, Tasuku, 5,087,382, Cl. 252-73.000.

Saitoh, Tatsuya: See—
Miller, Arnold; Barlow, David E.; and Saitoh, Tatsuya, 5,087,264, Cl. 606-159.000.

Saitou, Mitsuo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion and method for manufacture thereof. 5,087,555, Cl. 430-567.000.

Sakai, Naomichi; Kikusawa, Masanaga; Kubota, Yoshitaka; Yamamura, Hiroshi; and Nagata, Hiroya, to Tosoh Corporation. Laminated silicon oxide film capacitors and method for their production. 5,088,003, Cl. 361-330.000.

Sakaki, Minzi: See—
Nobumoto, Hidetoshi; and Sakaki, Minzi, 5,086,889, Cl. 192-0.076.

Sakata, Hajime: See—
Ono, Takeo; and Sakata, Hajime, 5,088,097, Cl. 372-20.000.

Sakata, Takashi; and Yumoto, Toshiharu, to Fuji Photo Film Co., Ltd. Video image display processor. 5,087,971, Cl. 358-160.000.

Sakaue, Shigeo; Kohda, Toshiyuki; Shimaki, Yasuharu; Takagi, Hideyuki; and Togawa, Hayato, to Matsushita Electric Industrial Co., Ltd. Neural network with plural weight calculation methods and variation of plural learning parameters. 5,088,049, Cl. 395-23.000.

Sakono, Ikuo; Inui, Motokazu; and Kato, Hiroaki, to Sharp Kabushiki Kaisha. Liquid crystal display device. 5,087,113, Cl. 359-59.000.

Sakreiter, Daniel: See—
Lasnier, Didier; Beaco, Bruno; and Sakreiter, Daniel, 5,086,807, Cl. 137-505.110.

Sakuma, Shuji; Kanematsu, Seigo; and Kiramatsu, Yasuo, to Kabushiki Kaisha Sangi; Kanematsu Koguo Kabushiki Kaisha; and Yugen Kaisha Works. Scissors with replaceable cutting blades. 5,086,563, Cl. 30-260.000.

Sakura Color Products Corporation: See—
Fujisawa, Toshiaki, 5,087,659, Cl. 524-594.000.

Salem, Andrew J.: See—
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Salesky, Emery; and Sterk, Tom, to Hewlett-Packard Company. Constant power circuit. 5,087,870, Cl. 323-276.000.

Salomon S.A.: See—
Bonaventure, Laurent, 5,086,575, Cl. 36-117.000.

Mabboux, Michel; and DeMarchi, Jean-Louis, 5,086,573, Cl. 362-2.600.

Provence, Marc; Rousset, Didier; and Dunand, Josiane, 5,087,065, Cl. 280-615.000.

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Cacheris, William P.; and Quay, Stephen C., 5,087,440, Cl. 424-9.000.

Quay, Steven C., 5,087,439, Cl. 424-9.000.

Samodumova, Inna M.: See—
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SamSung Electronics Co., Ltd.: See—
Ahn, Tae-Hyuk, 5,087,857, Cl. 315-111.210.

Lee, Chang-heum, 5,088,018, Cl. 363-56.000.

Yoon, Eui-Chang, 5,087,081, Cl. 285-8.000.

Samuelson, Bruce E.: See—
Blackwell, Elmer; Samuelson, Bruce E.; Emmel, John J.; and Loder, Harry A., 5,086,946, Cl. 221-45.000.

Samurin, Norman A.: See—
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Sandborn, James A.; and Boan, Bobby J., to Harris Corporation. Electroconductive adhesive. 5,087,314, Cl. 156-330.000.

Sanden Corporation: See—
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Shinmura, Toshiharu, 5,086,835, Cl. 165-144.000.

Sanders, Stephen P.: See—
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Sanders, William A., Jr., to Homes Beautiful Investment & Service Co. Portable alarm system with automatic operating state transferral. 5,087,908, Cl. 340-567.000.

Sandis, Stylianos: See—
Bailly, Jean C.; Havas, Laszlo; Sandis, Stylianos; Blaya, Alain; and Crouzet, Pierre, 5,087,522, Cl. 428-402.000.

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Sannomiya, Masayoshi: See—
Komatsu, Nobuhiko; Fujinaka, Mitsuru; Sannomiya, Masayoshi; Kondo, Toshiro; and Nishiyama, Atsushi, 5,087,074, Cl. 280-788.000.

Sano, Kaoru; Mizushima, Fumio; Goto, Takashi; and Maruki, Toshimitsu, to Kabushiki Kaisha Meidensha. Simulation system for automotive prime mover. 5,086,648, Cl. 73-118.100.

Sanofi: See—
Dumas, Sylviane; and Takerkart, Georges, 5,087,694, Cl. 530-354.000.

Sanshin Kogyo Kabushiki Kaisha: See—
Nakai, Hiroshi, 5,086,734, Cl. 123-65.00P.

Santen Pharmaceutical Co., Ltd.: See—
Morita, Takakazu; Iso, Tadashi; and Yamauchi, Hideyasu, 5,087,627, Cl. 514-255.000.

Sanyo Electric Co., Ltd.: See—
Ishiguro, Kazuhisa; and Fujisawa, Masanori, 5,087,890, Cl. 330-259.000.

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Sarabhai, Anand. Legume pasta and its method of preparation. 5,087,470, Cl. 426-557.000.

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Katz, Howard G.; and Sarkis, Michael T., 5,087,487, Cl. 427-366.000.

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Sasagawa, Katsuyoshi: See—
Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; Imai, Masao; and Suzuki, Toshiyuki, 5,087,758, Cl. 568-57.000.

Sasaki, Hiroyuki: See—
Hanzawa, Hohtaro; Sugita, Kunihiro; and Sasaki, Hiroyuki, 5,086,685, Cl. 84-605.000.

Sasaki, Katsuro: See—
Hanamura, Shoji; Kubotera, Masaaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, 5,088,065, Cl. 365-208.000.

Sasaki, Shinya: Yoshizawa, Sakae; and Sasaki, Kazuya, 5,087,110, Cl. 385-110.000.

Sasaki, Yasumi: See—
Ito, Kazuo; Matsuo, Shutsu; and Sasaki, Yasumi, 5,087,490, Cl. 428-34.100.

Sata, Ichiko: See—
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Satek, Larry C.: See—
Nubel, Philip O.; Satek, Larry C.; Spangler, Michael J.; and Michaels, Glenn O., 5,087,779, Cl. 570-245.000.

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Nishizawa, Hiroshi; Suzuki, Kenji; Mukoyama, Yoshiyuki; Kikuchi, Tohru; and Sato, Hidetaka, 5,087,658, Cl. 524-538.000.

Sato, Kaoru: See—
Tanimoto, Morimasa; Sato, Kaoru; Dosako, Shinichi; and Honda, Yoshihiko, 5,087,369, Cl. 210-635.000.

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Sato, Masatoshi, to Nikon Corporation. Magneto-optical recording apparatus with parts arranged to minimize height. 5,088,074, Cl. 369-13.000.

Sato, Motohisa; and Matuda, Ichiro, to Taito Co., Ltd. Device for releasing remaining gas in pressure can containers and storage cap of the degassing device. 5,086,814, Cl. 141-65.000.

Sato, Shinichi: See—
Kishita, Hirofumi; Sato, Shinichi; Kinami, Hitoshi; Takago, Toshio; Fukuda, Kenichi; and Yamada, Hirokazu, 5,087,720, Cl. 556-434.000.

Sato, Takahiro: See—
Takahashi, Takehiko; Sato, Takahiro; and Shimizu, Yuji, 5,086,527, Cl. 5-136.000.

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Inoue, Yoshitaka; Sato, Teruo; and Hiromi, Tutomu, 5,087,426, Cl. 422-123.000.

Sato, Toshifumi: See—
Kuramatsu, Hiroyasu; Sato, Toshifumi; Matai, Masahiro; and Anma, Sadaaki, 5,087,905, Cl. 340-311.100.

Sato, Yasuhiro; Hirano, Yoichi; and Yamaguchi, Sataro, to Director General, Agency of Industrial Science and Technology; and Mitsubishi Denki Kabushiki Kaisha. Capacitor bank provided with a protective device. 5,087,999, Cl. 361-17.000.

Sato, Yoshiaki. Porous polytetrafluoroethylene resin material. 5,087,641, Cl. 521-53.000.

Satoh, Masaharu: See—
Fukanaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,087,068, Cl. 280-707.000.

Satoh, Shinichi: See—
Arai, Masatoshi; Satoh, Shinichi; and Ide, Kesao, 5,087,683, Cl. 528-14.000.

Sattelberg, Douglas L.: See—
Kadle, Prasad S.; and Sattelberg, Douglas L., 5,086,832, Cl. 165-76.000.

Sattelberger, Paul: See—
Synatschke, Dieter; Sattelberger, Paul; and Saam, Werner, 5,086,877, Cl. 184-7.400.

Satterthwaite, Edwin H., Jr.: See—
Schroeder, Michael D.; Needham, Roger M.; Thacker, Charles P.; Birrell, Andrew D.; Rodeheffer, Thomas L.; Satterthwaite, Edwin H., Jr.; and Murray, Hallam G., Jr., 5,088,091, Cl. 370-94.300.

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Corbett, Thomas J.; Smith, Michele A.; and Worrell, Barry C., 5,087,069, Cl. 280-731.000.

Francis, Laurie A.; and Krentz, Richard H., 5,086,860, Cl. 180-68.500.

Milunas, Rimas S.; and Nitz, Larry T., 5,086,665, Cl. 74-856.000.

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Sawa, Takao: See—
Murata, Shinichi; Yamauchi, Yoshiyuki; Kusaka, Takao; Sawa, Takao; and Yagi, Noriaki, 5,086,554, Cl. 29-605.000.

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Sawase, Terumi: See—
Nakamura, Hideo; and Sawase, Terumi, 5,088,023, Cl. 395-425.000.

Schaertel, Daniel P., to Eastman Kodak Company. Digital copier or printer with collating buffer memory of limited page capacity and with alternative printing modes when required memory exceeds capacity. 5,087,979, Cl. 358-296.000.

Schall, William S.; and Richardson, James E., to Littoral, Inc. Hand-held underwater distance measurement device. 5,088,068, Cl. 367-173.000.

Schalk, Dick G.: See—
Rohde, Mark W.; Kirkwood, George T.; and Schalk, Dick G., 5,087,798, Cl. 200-5.00A.

Schaltz, Karl-Josef, to Wild Leitz GmbH. Device and method for active vibration damping. 5,086,564, Cl. 33-1.00M.

Schaper, Raymond J.: See—
Bendiksen, Beverly; Persinski, Leonard J.; and Schaper, Raymond J., 5,087,376, Cl. 210-700.000.

Scheifers, Steven: See—
Melton, Cynthia M.; Raleigh, Carl J.; Scheifers, Steven; and Beckenbaugh, William, 5,086,966, Cl. 228-208.000.

Scheiget, John: See—
Belanger, Patrice C.; Scheiget, John; and Rokach, Joshua, 5,087,638, Cl. 514-456.000.

Schellhase, Helmut: See—
Geisbert, Michael; Meiwes, Johannes; Wendel, Friedrich; Dick, Dieter; Teiwes, Henning; and Schellhase, Helmut, 5,087,847, Cl. 310-90.000.

Schendel, Robert E., to Environmental Protection Technology, Inc. Ultra sensitive leak detection. 5,086,644, Cl. 73-49.200.

Schenk, Heinrich, to Siemens Aktiengesellschaft. Circuit arrangement for the equalization of digital signals received in analog form. 5,088,109, Cl. 375-14.000.

Schepers, Catharina H. M.: See—
Boesten, Wilhelmus H. J.; Schepers, Catharina H. M.; and Roberts, Mathieu J. A., 5,087,753, Cl. 564-302.000.

Scheppe, Martin: See—
Jacob, Werner; and Scheppe, Martin, 5,087,133, Cl. 384-549.000.

Schering AG: See—
Sinn, Hansjoerg; Clausnitzer, Dieter; and Winter, Hergen, 5,087,713, Cl. 556-179.000.

Schewior, Thomas. Ring splint to set, affix and regulate the tension position of bone segments. 5,087,258, Cl. 606-56.000.

Schiek, James M.: See—
Schiek, James W., Sr.; and Schiek, James M., 5,086,758, Cl. 602-19.000.

Schiek, James W., Sr.; and Schiek, James M. Belt support device with adjustable hook and loop-type fastener. 5,086,758, Cl. 602-19.000.

Schierling, Bernhard, to Fichtel & Sachs AG. Hydrodynamic torque converter. 5,086,892, Cl. 192-3.290.

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Flossdorf, Josef; Papamichael, Neophytos; Hanisch, Detlef; and Schilling, Henning, 5,087,425, Cl. 422-81.000.

Schlumberger Canada, Ltd.: See—
Howell, Chesley R., 5,088,004, Cl. 361-373.000.

Schlumberger Industries: See—
Maitrejean, Serge; Ruscev, Mario; and Dorion, Irene, 5,087,821, Cl. 250-385.100.

Schlyper, Omer T.; and Stokes, Daniel E., to Bend Millwork Systems, Inc. Weep and sealing window system. 5,086,596, Cl. 52-204.000.

Schmid-Eilber, Helmut, to GfPE-Gesellschaft für Persönlichkeitsentwicklung GmbH. Therapeutic chaise longue. 5,086,755, Cl. 128-33.000.

Schmid, Josef: See—
Merz, Johann; Schmid, Josef; and Keicher, Eckard, 5,086,942, Cl. 220-302.000.

Schmidt, Frederick A.; Peterson, David T.; Wheelock, John T.; Jones, Lawrence L.; and Lincoln, Lanny P., to Iowa State University Research Foundation, Inc. Rare earth-transition metal scrap treatment method. 5,087,291, Cl. 75-581.000.

Schmidt, Gunther, deceased: See—
Hargrave, Karl D.; Schmidt, Gunther, deceased; Engel, Wolfhard; and Austel, Volkhard, 5,087,625, Cl. 514-220.000.

Schmidt, his legal representative Margaret: See—
Hargrave, Karl D.; Schmidt, Gunther, deceased; Engel, Wolfhard; and Austel, Volkhard, 5,087,625, Cl. 514-220.000.

Schmidt, Howard K.: See—
Schultz, J. Albert; and Schmidt, Howard K., 5,087,815, Cl. 250-309.000.

Schmidt, Werner: See—
Grael, Christoph; and Schmidt, Werner, 5,088,094, Cl. 370-95.100.

Schmitt, Franz: See—
Bruder, Herbert; Fischer, Hubertus; Reinfelder, Hans-Erich; and Schmitt, Franz, 5,087,880, Cl. 324-309.000.

Schmitt, Michael: See—
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Schmitt, Robert J., to Abbott Laboratories. Blood collection device. 5,086,780, Cl. 128-763.000.

Schneider, Klaus O. Apparatus for producing a hydrostatic thrust bearing. 5,087,129, Cl. 384-12.000.

Scholl, Thomas: See—
Jackson, Barry; and Scholl, Thomas, 5,087,756, Cl. 564-457.000.

Scholly, Ingo: See—
Rieck, Gerhard; Scholly, Ingo; and Mertens, Armin, 5,087,022, Cl. 267-219.000.

Schomann, Klaus D.: See—
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Schonenberger, Eric: See—
Gordon, Ralph A.; Ferguson, Victor A.; Fouilleux, Bernard; Schonenberger, Eric; and Gregoire, Gabriel, 5,086,884, Cl. 188-71.900.

Schraegle, Walter: See—
Detzel, Josef; Schraegle, Walter; and Kraus, Rudolf, 5,086,971, Cl. 229-188.000.

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Forsythe, Robert G.; Barnt, Brian J.; Rautenkranz, Karl; Schraff, Fred R.; and Davis, William H., 5,088,051, Cl. 395-117.000.

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Schreiber, Jürgen, to Buderus Schleiftechnik GmbH. Grinding tool and method of using same. 5,086,592, Cl. 51-291.000.

Schreiber, Ralph E. Anchor apparatus. 5,086,724, Cl. 114-301.000.

Schrock, Richard R.; and Torek, Robert, to Massachusetts Institute of Technology. Homogeneous rhenium catalysts for metathesis of olefins. 5,087,710, Cl. 556-46.000.

Schroder, Deceased Joris, to Inventio AG. Group control for elevators with double cars with immediate allocation of target calls. 5,086,883, Cl. 187-127.000.

Schroeder, Daniel R.: See—
Dabrah, Thomas T.; Hesler, Grace A.; Hofstead, Sandra J.; Lam, Kin S.; Mattei, Jacqueline M.; Schroeder, Daniel R.; and Tomita, Koji, 5,087,567, Cl. 435-169.000.

Schroeder, Michael D.; Needham, Roger M.; Thacker, Charles P.; Birrell, Andrew D.; Rodheffer, Thomas L.; Satterthwaite, Edwin H., Jr.; and Murray, Hallam G., Jr., to Digital Equipment Corporation. High-speed mesh connected local area network. 5,088,091, Cl. 370-94.300.

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Schulmeier, Josef, to Hopfenextraktion HVG Barth, Raiser & Co. Process for aromatization of treated tea. 5,087,468, Cl. 426-386.000.

Schultheis, Alexander; Landrigan, Mark A.; and Lakhani, Arun, to Clean Harbors, Inc. Method and apparatus to detoxify aqueous based hazardous waste. 5,087,370, Cl. 210-638.000.

Schultz, J. Albert; and Schmidt, Howard K. High resolution mass spectrometry of recoiled ions for isotopic and trace elemental analysis. 5,087,815, Cl. 250-309.000.

Schulz-Harder, Jürgen. Substrate, consisting of copper and ceramic layers, for printed circuit boards of electrical circuits. 5,087,505, Cl. 428-192.000.

Schulz, Reiner, to Siemens Aktiengesellschaft. X-ray detector. 5,087,819, Cl. 250-370.110.

Schumacher, Markus, to Messerschmitt-Boelkow-Blohm GmbH. Support mechanism for room dividers. 5,086,540, Cl. 16-87.40R.

Schupp, Hans: See—
Blum, Rainer; Rehmer, Gerd; and Schupp, Hans, 5,087,550, Cl. 430-270.000.

Schutz, Alain A.; and Cullo, Leonard A., to Aristech Chemical Corporation. Method of making mesitylene. 5,087,781, Cl. 585-409.000.

Schwank, Dennis J., to Mygrant, Karl R. Method of inhibiting discoloration of produce. 5,087,467, Cl. 426-262.000.

Schwartz, Sidney D.: See—
Shamaly, Thomas P.; and Schwartz, Sidney D., 5,086,551, Cl. 29-243.523.

Schweizer, Pascal; Neveux, Antoine; and Macon, Louis, to Spectec S.A. Optical train for measuring angle or position with transmission by intrinsically linear and referenced optical fibers using one or more light sources. 5,087,811, Cl. 250-227.210.

Schwendemann, Bernhard; and Stumpe, Werner, to Robert Bosch GmbH. Method and apparatus for calculating the axle load of a vehicle. 5,086,656, Cl. 73-862.540.

Schwendner, Susan W.: See—
Counsell, Raymond E.; Meyer, Karen L.; Schwendner, Susan W.; and Haradaira, Terushi, 5,087,721, Cl. 558-166.000.

Schwietzer, Janet. Grocery cart attachment. 5,086,960, Cl. 224-277.000.

Schwimmer, William H.: See—
Combes, Richard C.; Schwimmer, William H.; and Barbera, Bradley D., 5,087,471, Cl. 426-573.000.

Scifres, Donald R.; Welch, David F.; and Streifer, William, deceased (by Streifer, Shirley R., executor), to Spectra Diode Laboratories, Inc. Optical amplifier with folded light path and laser-amplifier combination. 5,088,105, Cl. 372-92.000.

SciMed Life Systems, Inc.: See—
Keith, Peter T., 5,087,394, Cl. 204-22.000.

Scirica, Paul A.: See—
Lishness, Bryant L.; and Scirica, Paul A., 5,086,578, Cl. 42-69.02u.

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Lackner, John R.; Grzywna, Stanley E.; Weber, Ralph A.; and Baird, Thomas E., 5,086,536, Cl. 15-328.000.

Scott, Jeffrey W.: See—
Sooch, Navdeep S.; Scott, Jeffrey W.; and Tanaka, Tadashi, 5,087,914, Cl. 341-120.000.

Scott, Randy W.; and Baker, Joffre B., to Incyte Pharmaceuticals; and University of Kansas. Purified protease nexin. 5,087,368, Cl. 210-635.000.

Screen Printing Enterprises, Inc.: See—
Matheus, Frank J., 5,086,570, Cl. 34-1.00L.

Scrivener, Paul L.: See—
Grasso, Giorgio; Scrivener, Paul L.; and Appleyard, Andrew P., 5,087,108, Cl. 385-27.000.

Seagate Technology, Inc.: See—
Dahandeh, Shafatollah; Genheimer, Stephen R.; and Welty, Steven L., 5,087,992, Cl. 360-31.000.

Sebastiani, Oscar: See—
Mueller, Peter; and Sebastiani, Oscar, 5,086,778, Cl. 128-696.000.

Secretary of State for Defence in her Majesty's Government of United Kingdom: See—
Kinloch, Anthony J.; and Shaw, Stephen J., 5,087,681, Cl. 526-262.000.

Seguin, Marie-Christine: See—
Gueyne, Jean; Seguin, Marie-Christine; and Crussol, Gilbert H., 5,087,452, Cl. 424-422.000.

Seiler, Claus-Dietrich; Rauleder, Hartwig; Frings, Albert; and Kotzsch, Hans-Joachim, to Huels Aktiengesellschaft. Method of preventing discoloration of vinylacetoxysilanes. 5,087,714, Cl. 556-401.000.

Seki, Katsuji; and Hashimoto, Naoyuki, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre, Ltd. Friction material. 5,087,642, Cl. 523-156.000.

Seki, Kazuhiro; Yamaguchi, Yukihiko; Kanda, Minoru; and Takizawa, Satoshi, to Honda Giken Kogyo Kabushiki Kaisha. Inflatable bag assembly for protecting a vehicle occupant. 5,087,067, Cl. 280-732.000.

Seki, Kazuhisa: See—
Ogata, Kazutsugu; Seki, Kazuhisa; Kaneko, Kouji; Mikajiri, Satoshi; Kaneko, Kiyotaka; and Yoshida, Masanori, 5,087,936, Cl. 354-430.000.

Sekiguchi, Mikio; Imai, Mizuho; Shiba, Nobuyasu; and Iida, Hideyo, to Taiyo Yuden Co., Ltd. Thin film forming apparatus having adjustable guide. 5,086,727, Cl. 118-324.000.

Selby, John S. Curved pruner blades. 5,086,819, Cl. 144-2.00Z.

Semiconductor Energy Laboratory Co., Ltd.: See—
Fukui, Takeshi; and Watanabe, Toshio, 5,087,114, Cl. 359-81.000.

Semitest, Inc.: See—
Reiss, Leszek; and Kamieniecki, Emil, 5,087,876, Cl. 324-158.00D.

Seneca Wire and Manufacturing Company: See—
Stokes, William H., 5,087,342, Cl. 204-210.000.

Seno, Cornelio L. Four stroke concentric oscillating rotary vane internal combustion engine. 5,086,732, Cl. 123-18.00R.

Sepe, George N.: See—
Simkulak, Richard J.; Boustead, Terry M.; Folts, Robert L.; and Sepe, George N., 5,087,187, Cl. 425-112.000.

Sepulveda, Gonzalo: See—
Leal, Orlando; Bolivar, Carmelo; Sepulveda, Gonzalo; Molleja, Gregorio; Martinez, German; and Esparragoza, Leon, 5,087,597, Cl. 502-62.000.

Serita, Kaoru; Kiyomiya, Masaaki; Takahashi, Jun; Watanabe, Masatoshi; and Iwamoto, Masaki, to Pioneer Electronic Corporation. Automatic disk changer with disk case and clamper. 5,088,076, Cl. 369-36.000.

Serre, Jean-Claude: See—
Coalier, Guy; and Serre, Jean-Claude, 5,086,925, Cl. 206-497.000.

Sessions, James R. Sprinkler pipe flow limiter. 5,086,976, Cl. 239-200.000.

Setterberg, John R., Jr.; and White, Pat M., to Otis Engineering Corporation. Well packer. 5,086,839, Cl. 166-138.000.

Severson, Gary E. Foot actuated ladder brace. 5,086,876, Cl. 182-172.000.

SFT AG Spontanfordertechnik: See—
Honegger, Werner, 5,087,166, Cl. 414-458.000.

Sgrignoli, Gary J.: See—
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 5,087,975, Cl. 358-183.000.

Shaber, Steven H., to Rohm and Haas Company. Alpha-aryl-alpha-phenylethyl-1H-1,2,4-triazole-1-propanenitriles. 5,087,635, Cl. 514-383.000.

Shaffer, Joel E.; and Thomson, Stephen A., to Glaxo Inc. Oxathi(SIV)-azol-5-one compounds. 5,087,631, Cl. 514-342.000.

Shamaly, Thomas P.; and Schwartz, Sidney D., to Emhart Inc. Rivet setting tool. 5,086,551, Cl. 29-243.523.

Shanghai Institute of Organic Chemistry Academia Sinica: See—
Duan, Youlu; Jin, Shanrong; Huang, Tingchun; Sun, Jin; and Yu, Xinying, 5,087,680, Cl. 526-254.000.

Shannon, Robert E.; and Clark, William G., Jr., to Westinghouse Electric Corp. Temperature activated expanding mineral shim. 5,087,174, Cl. 416-220.00R.

Sharifpour, Bahman: See—
Williams, James B.; and Sharifpour, Bahman, 5,088,019, Cl. 363-69.000.

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Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, 5,087,535, Cl. 430-5.000.

Kigimiya, Shuzo; Fukumochi, Yoji; Sata, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,088,039, Cl. 364-419.000.

Morimoto, Taiji; Maei, Shigeki; Hayashi, Hiroshi; and Yamamoto, Saburo, 5,087,587, Cl. 437-129.000.

Sakono, Ikuo; Inui, Motokazu; and Kato, Hiroaki, 5,087,113, Cl. 359-59.000.

Tanaka, Junichi; Furubayashi, Hisatoshi; and Watanabe, Masanori, 5,087,480, Cl. 427-79.000.

Terada, Kousuke; Mikami, Akiyoshi; Taniguchi, Kouji; Tanaka, Koichi; Yoshida, Masaru; and Nakajima, Shigeo, 5,087,531, Cl. 428-690.000.

Van, Kazuo; Katayama, Hiroyuki; Takahashi, Akira; and Ohta, Kenji, 5,088,086, Cl. 369-100.000.

Sharp, Michael C., to J. Hudson & Co. (Whistles) Ltd. Whistle. 5,086,726, Cl. 116-137.00R.

Shaw, Stephen J.: See—
Kinloch, Anthony J.; and Shaw, Stephen J., 5,087,681, Cl. 526-262.000.

Sheahon, John A. Amniotic membrane perforator. 5,087,262, Cl. 606-125.000.

Sheehan, Michael T.; and Shen, Lan, to Hoechst Celanese Corporation. Method for preparing 4-hydroxystyrene. 5,087,772, Cl. 568-804.000.

Shell Oil Company: See—
Hwo, Charles C., 5,087,667, Cl. 525-222.000.

Shen, Lan: See—
Sheehan, Michael T.; and Shen, Lan, 5,087,772, Cl. 568-804.000.

Sheppard, Clyde H.: See—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,087,701, Cl. 548-431.000.

Sherwood, David E., Jr.: See—
Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Martin, Bobby R., 5,087,348, Cl. 208-111.000.

Sherwood Medical Company: See—
Macors, Paul P. M. G. J.; Paulussen, Henricus F.; and Vos, Jellard, 5,086,783, Cl. 128-765.000.

Shiba, Nobuyasu: See—
Sekiguchi, Mikio; Imai, Mizuho; Shiba, Nobuyasu; and Iida, Hideyo, 5,086,727, Cl. 118-324.000.

Shibagaki, Nobuhiko: See—
Kurosawa, Kazuhito; Hikita, Mitsutaka; Tabuchi, Toyoyuki; Shibagaki, Nobuhiko; and Hirashima, Tetsuya, 5,087,901, Cl. 333-193.000.

Shibuta, Takanobu: See—
Masai, Teruhisa; Shibuta, Takanobu; Yoshida, Yasuyuki; and Suzuki, Yoshio, 5,087,449, Cl. 424-195.100.

Shibuya, Yasuo: See—
Matsuoka, Fumio; Okajima, Jiro; Okuma, Keiko; Tomita, Ken; Shibuya, Yasuo; Nakamura, Mutsumi; and Kitauchi, Hajime, 5,086,624, Cl. 62-160.000.

Shieh, Rong-Min, to Monarch Marking Systems, Inc. Method of making rolls of record members. 5,086,987, Cl. 242-56.00R.

Shiff, Victor, to Timex Corporation. Selecting apparatus for a multi-mode electronic wrist instrument. 5,088,070, Cl. 368-10.000.

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Shigeo, Fujita: See—
Osamu, Manabe; Shigeo, Fujita; Shizuo, Iwata; and Morihiro, Kamiyama, 5,087,704, Cl. 548-427.000.

Shih, Ching Y.: See—
Dumbroff, Erwin B.; Thompson, John E.; and Shih, Ching Y., 5,087,417, Cl. 422-1.000.

Shikata, Michiharu, to Matsushita Electronics Corporation. Memory device having common data lines for reading and writing. 5,088,062, Cl. 365-189.050.

Shima, Takashi: See—
Tanaka, Koji; and Shima, Takashi, 5,086,865, Cl. 180-165.000.

Tanaka, Koji; and Shima, Takashi, 5,088,041, Cl. 364-426.010.

Shima, Yoshinobu: See—
Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; and Horie, Shigetake, 5,087,321, Cl. 156-608.000.

Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; Horie, Shigetake; and Nakahama, Yasumitsu, 5,087,429, Cl. 422-249.000.

Shimada, Hiroo: See—
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.

Shimada, Jin: See—
Petelenz, Tomasz J.; Jacobsen, Stephen C.; Stephen, Robert L.; Beck, Jon; and Shimada, Jin, 5,087,242, Cl. 604-20.000.

Shimada, Makoto: See—
Akishino, Katsuo; Hirako, Osamu; and Shimada, Makoto, 5,088,043, Cl. 364-426.040.

Shimada, Shigeki; Tanaka, Hidekazu; and Nakagawa, Tsunefumi, to Nippon Glass Fiber Co., Ltd. Glass flake composite. 5,087,518, Cl. 428-372.000.

Shimada, Tadayuki: See—
Takanashi, Itsuo; Yamamura, Takashi; Nakagaki, Shintaro; Ichito, Toshikatsu; Nakano, Atsushi; Shimada, Tadayuki; and Konno, Toshio, 5,087,929, Cl. 346-108.000.

Shimadzu, Chikafumi; Urushidani, Shinzo; Fujinuma, Michio; Hamano, Hiroshi; and Imai, Shinji, to Honda Giken Kogyo Kabushiki Kaisha. Production management system. 5,088,045, Cl. 364-468.000.

Shimano Corporation: See—
Nagano, Masashi, 5,087,226, Cl. 474-160.000.

Shimeki, Yasuharu: See—
Sakaue, Shigeo; Kohda, Toshiyuki; Shimeki, Yasuharu; Takagi, Hideyuki; and Togawa, Hayato, 5,088,049, Cl. 395-23.000.

Shimizu, Hazime: See—
Ichimura, Shingo; Kokubun, Kiyohide; and Shimizu, Hazime, 5,087,814, Cl. 250-287.000.

Shimizu, Keiichi: See—
Mita, Kazutoshi; and Shimizu, Keiichi, 5,087,862, Cl. 315-289.000.

Shimizu, Masahiro; and Tsukamoto, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Method of making a side wall contact with reactive ion etching. 5,087,588, Cl. 437-191.000.

Shimizu, Yuji: See—
Takahashi, Takehiko; Sato, Takahiro; and Shimizu, Yuji, 5,086,527, Cl. 5-136.000.

Shimomura, Setsuhiro: See—
Nishimura, Yukinobu; Shimomura, Setsuhiro; Taniguchi, Nobutake; and Tanimoto, Kouji, 5,086,745, Cl. 123-494.000.

Shimono, Toshihide: See—
Kinoshita, Mitsuo; Shimono, Toshihide; Yamaguchi, Shozo; and Yamamoto, Tsuneo, 5,087,648, Cl. 524-3.000.

Shimura, Ryouchi; Tasaka, Motoo; Hakiri, Minoru; and Ide, Youji, to Ricoh Company, Ltd. Thermal transfer recording medium. 5,087,527, Cl. 428-488.400.

Shin-Daikyo Petrochemical Co., Ltd.: See—
Okada, Takashi; Aoyama, Takamichi; Mizuno, Shoichi; Akatsuka, Akihiro; and Matsuoka, Kiyonari, 5,087,705, Cl. 548-458.000.

Shin-Etsu Chemical Co. Ltd.: See—
Arai, Masatoshi; Satoh, Shinichi; and Ide, Kesao, 5,087,683, Cl. 528-14.000.

Kishita, Hirofumi; Sato, Shinichi; Kinami, Hitoshi; Takago, Toshio; Fukuda, Kenichi; and Yamada, Hirokazu, 5,087,720, Cl. 556-434.000.

Noguki, Genji; Hoshida, Shigehiro; and Kuwabara, Kouzou, 5,087,678, Cl. 526-194.000.

Shinkai, Ichiro: See—
Volante, Ralph P.; Askin, David; Shinkai, Ichiro; and Ryan, Kenneth M., 5,087,703, Cl. 548-406.000.

Shinko Electric Industries Co., Ltd.: See—
Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, 5,087,530, Cl. 428-596.000.

Shinmura, Toshiharu, to Sanden Corporation. Heat exchanger. 5,086,835, Cl. 165-144.000.

Shinnoh, Nobuo: See—
Kanai, Toshiyuki; and Shinnoh, Nobuo, 5,087,504, Cl. 428-167.000.

Shinonaga, Hirohiko: See—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; and Asakura, Tsutou, 5,087,539, Cl. 430-48.000.

Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, to Fujisawa Pharmaceutical Co., Ltd. Pharmacologically active pyrazolopyridine compounds. 5,087,629, Cl. 514-300.000.

Shiotani, Naokazu: See—
Inomata, Masamitsu; Shiotani, Naokazu; Koshizuka, Kazuo; and Karasawa, Minato, 5,087,722, Cl. 558-338.000.

Shioyama, Tadao: See—
Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.

Shiozawa, Akihiko: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchirou; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.

Shirai, Koji, to Kabushiki Kaisha Toshiba. MOS-type integrated circuit. 5,087,954, Cl. 357-41.000.

Shirota, Riichiro: See—
Endoh, Tetsuo; Shirota, Riichiro; Momodomi, Masaki; Tanaka, Tomoharu; Masuoka, Fujio; and Watanabe, Shigeyoshi, 5,088,060, Cl. 365-185.000.

Shiroyama, Katsuke: See—
Shiga, Shoji; Uno, Naoki; Tanaka, Yasuzo; Kikuchi, Hiroyuki; and Shiroyama, Katsuke, 5,087,604, Cl. 505-1.000.

Shiuey, Shian-Jan: See—
Baggiolini, Enrico G., deceased; Baggiolini, Barbara J.; Hennessy, Bernard M.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 5,087,619, Cl. 514-167.000.

Shizuo, Iwata: See—
Osamu, Manabe; Shigeo, Fujita; Shizuo, Iwata; and Morihiro, Kamiyama, 5,087,704, Cl. 548-427.000.

Shoji, Michihito; and Asano, Osamu, to Nitto Kohki Co., Ltd. Electromagnetic base drill with intermittent feed. 5,087,157, Cl. 408-9.000.

Shop Vac Corporation: See—
Paige, Clive R., 5,086,975, Cl. 239-124.000.

Short, Barrett J.: See—
Bingham, Billy E.; Coiner, John R., Jr.; Pettus, William G.; and Short, Barrett J., 5,087,412, Cl. 376-368.000.

Showa Denko K.K.: See—
Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriuchi, Noboru, 5,087,673, Cl. 525-356.000.

Showa Yakuhin Kako Co. Ltd.: See—
Niwa, Toshiyuki; Kawashima, Yoshiaki; Takeuchi, Hirofumi; and Ito, Yoji, 5,087,455, Cl. 424-497.000.

Shreve, Arthur L., III. Folding scaffold. 5,086,875, Cl. 182-152.000.

Shu, Peter H. C.: See—
Krishnan, Sivaram; Price, Ronald L.; Shu, Peter H. C.; and Witman, Mark W., 5,087,524, Cl. 428-412.000.

Shutt, George V., to Zimmer Inc. Arthroscopic sheath with quick coupling socket. 5,087,080, Cl. 285-5.000.

Sibalis, Dan, to Drug Delivery Systems Inc. Transdermal drug patch with conductive fibers. 5,087,240, Cl. 604-20.000.

Sibley, Mark A.: See—
Turek, Douglas E.; and Sibley, Mark A., 5,086,984, Cl. 242-18.000.

Sidorovsky, Rachel S.: See—
Long, Jon; and Sidorovsky, Rachel S., 5,087,961, Cl. 357-69.000.

Siebens, Larry N.: See—
Yaworski, Harry G.; and Siebens, Larry N., 5,088,001, Cl. 361-127.000.

Siegmund, Gunter: See—
Finke, Manfred; Siegmund, Gunter; and Strutz, Heinz, 5,087,748, Cl. 562-851.000.

Siemanowski, Werner: See—
Jakobson, Gerald; and Siemanowski, Werner, 5,087,708, Cl. 549-448.000.

Siemens Aktiengesellschaft: See—
Bruder, Herbert; Fischer, Hubertus; Reinfelder, Hans-Erich; and Schmitt, Franz, 5,087,880, Cl. 324-309.000.

Krueger, Hans; and Weber, Hubert, 5,088,102, Cl. 372-64.000.

Manus, Patrick; and Kutscherauer, Rudolf, 5,087,479, Cl. 427-54.100.

Schenk, Heinrich, 5,088,109, Cl. 375-14.000.

Schulz, Reiner, 5,087,819, Cl. 250-370.110.

Strack, Helmut, 5,087,577, Cl. 437-29.000.

Wimmer, Walter; Krautwald, Herbert; and Heinzel, Guenter, 5,088,010, Cl. 361-419.000.

Siemens-Albis AG: See—
Lauper, Alfred, 5,087,899, Cl. 333-81.000.

Siemens Automotive L.P.: See—
Wiggins, Kregg S.; and Wright, Danny O., 5,086,740, Cl. 123-361.000.

Siemens-Pacesetter, Inc.: See—
Duncan, James L., 5,086,774, Cl. 128-419.0PG.

Sigai, A. Gary; and Klindinst, Keith A., to GTE Laboratories Incorporated. Phosphors with improved lumen output and lamps made therefrom. 5,087,523, Cl. 428-404.000.

Sight and Sound Inc.: See—
Billings, Zeb; Pierce, Harold D.; Kish, Conrad W.; and Kusina, Patrick E., 5,087,043, Cl. 273-157.000.

Sigmon, Bernard E., to Motorola Inc. Miniature microstrip/cavity oscillator. 5,087,895, Cl. 331-96.000.

Signode Corporation: See—
Cheung, Nelson; Nix, Robert J.; and Figiel, Janusz, 5,087,306, Cl. 156-73.500.

Silverman, James D.: See—
Mish, Stanley L.; and Silverman, James D., 5,086,914, Cl. 206-63.300.

Silvershotz, Stanford; Hipko, George P.; and Dennis, Michael, to Webcraft Technologies, Inc. Printed and encoded mass distributable response piece and method of making the same. 5,087,805, Cl. 219-121.710.

Silverstein, Barry: See—
Todd, John H.; and Silverstein, Barry, 5,087,353, Cl. 210-94.000.

Silvy, Jacques; and Pascal, Rene, to Association de Gestion de l'Ecole Francaise de Papeterie et de l'Imprimerie. Device for determining the characteristics of particles in suspension in a liquid. 5,087,823, Cl. 250-573.000.

Sim, Ah T., to Sun Industrial Coatings Private Limited. Method and apparatus for electroplating. 5,087,333, Cl. 205-138.000.

Simbal, John J., to Minnesota Mining and Manufacturing Company. Color-corrected telecentric scan lens. 5,087,987, Cl. 359-663.000.

Simkulak, Richard J.; Boustead, Terry M.; Folts, Robert L.; and Sepe, George N., to United Technologies Corporation. Apparatus for molding hollow composite articles having internal reinforcement structures. 5,087,187, Cl. 425-112.000.

Simmons, Fred A.: See—
Elliott, George M.; and Simmons, Fred A., 5,087,311, Cl. 156-212.000.

Simon, Allen H.: See—
Sprague, David L.; Simon, Allen H.; and Kwan, Alfred, 5,088,053, Cl. 395-166.000.

Simon, Jean-Claude: See—
Vassallo, Charles; and Simon, Jean-Claude, 5,088,100, Cl. 372-45.000.

Simon, Richard M. Game with variably configured board. 5,087,052, Cl. 273-284.000.

Sims, Bret A., to Procter & Gamble Company. The Absorbent article having inflected barrier cuffs. 5,087,255, Cl. 604-385.100.

Simuni, Leonid. Ocean-going vessel and method for increasing the speed. 5,087,215, Cl. 440-6.000.

Sinclair, James A.: See—
Mariam, Kidisti G.; Sinclair, James A.; Wright, Terry L.; and Gartner, Charles D., 5,087,757, Cl. 564-501.000.

Singh, Megh: See—
Murray, Robert W.; and Singh, Megh, 5,087,752, Cl. 564-298.000.

Sinn, Hansjoerg; Clausnitzer, Dieter; and Winter, Hergen, to Schering AG. Process for producing aluminum oxanes, in particular methylaluminum oxane, from water and organoaluminum compounds, in particular trimethylaluminum, in inert hydrocarbons. 5,087,713, Cl. 556-179.000.

Siracusa, Mario: See—
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; and Higdon, William D., 5,087,896, Cl. 331-99.000.

SKF GmbH: See—
Jacob, Werner; and Schepp, Martin, 5,087,133, Cl. 384-549.000.

Skis Rossignol SA: See—
Fagot, Jacques; and Gobis, Claude, 5,087,076, Cl. 280-819.000.

SKW Trostberg Aktiengesellschaft: See—
Wolfsgruber, Friedrich; Geiger, Wolfgang; and Missol, Detlef, 5,087,290, Cl. 75-303.000.

Slade, Louise: See—
Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., 5,087,461, Cl. 426-96.000.

Sliskovic, Drago R.: See—
O'Brien, Patrick M.; and Sliskovic, Drago R., 5,087,726, Cl. 560-25.000.

Sloma, John M.: See—
Kelley, Kurtis C.; and Sloma, John M., 5,087,848, Cl. 310-328.000.

Sloope, Charles E.; and Kurtz, John H. Transient Damage Strategy. 5,086,722, Cl. 114-74.000.

Slusarz, Bennet A. Tennis ball pack dispensing and retrieving apparatus. 5,086,948, Cl. 221-185.000.

Smith, Charles E., to C. R. Bard, Inc. Dilation catheter with fluted balloon. 5,087,246, Cl. 604-96.000.

Smith, Craig A., to Xerox Corporation. Xerographic reproducing machine for controlled copying of manually disposed documents. 5,087,941, Cl. 355-204.000.

Smith, David: See—
Fairlie, Matthew; Smith, David; Fraser, Warren; and Meijer, Otto, 5,087,822, Cl. 250-572.000.

Smith, Frances; and Palese, Peter, to Mount Sinai School of Medicine of the City University of New York. Method of detecting single base substitutions in nucleic acids. 5,087,559, Cl. 435-6.000.

Smith, Graham: See—
Prader, Randolph D.; and Smith, Graham, 5,087,234, Cl. 493-194.000.

Smith, Larry J., to Board of Regents, The University of Texas System. Methods and compositions for treatment of cancer using oligonucleotides. 5,087,617, Cl. 514-44.000.

Smith, Lowell R., to Monsanto Company. Process for purifying N-phosphonomethylglycine. 5,087,740, Cl. 562-17.000.

Smith, Michele A.: See—
Corbett, Thomas J.; Smith, Michele A.; and Worrell, Barry C., 5,087,069, Cl. 280-731.000.

Smith, Neil L.: See—
Keough, William J.; Parker, Donald L.; and Smith, Neil L., 5,087,293, Cl. 75-771.000.

Smith and Nephew p.l.c.: See—
Ansell, Christopher W. G.; and Butler, Colin, 5,087,686, Cl. 528-49.000.

Smith, Paul: See—
Lillienfeld, David; Thomas, David; Smith, Paul; Comeau, Gerald; and Soave, Robert, 5,087,322, Cl. 156-628.000.

Smith, Rosemary L.; and Collins, Scott D. Interferometric pressure sensor capable of high temperature operation and method of fabrication. 5,087,124, Cl. 356-358.000.

Smith, Stephen D.: See—
Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., 5,087,336, Cl. 204-155.000.

Smith, Trevor S., to Lucas Industries Public Limited Company. Gas turbine engine fuel control system, and metering valve. 5,086,617, Cl. 60-39.281.

Smith, Trevor S., to Lucas Industries. Temperature compensating circuit for LVDT and control system. 5,087,866, Cl. 318-653.000.

Smith & Wesson Corp.: See—
Flatley, Stephen L.; and Mears, Donald B., Jr., 5,086,579, Cl. 42-70.080.

Smothers, Steven W., to Inter Innovation LeFebure Manufacturing. Pulsed communication system. 5,087,982, Cl. 359-137.000.

Snedeker, Clarke R., to General Motors Corporation. Quick connect coupling with pressure relief. 5,087,086, Cl. 285-361.000.

Snow Brand Milk Products Co., Ltd.: See—
Tanimoto, Morimasa; Sato, Kaoru; Dosako, Shinichi; and Honda, Yoshihiko, 5,087,369, Cl. 210-635.000.

Snow, Steven A., to Dow Corning Corporation. Alkanolanmino functional siloxane compositions. 5,087,715, Cl. 556-413.000.

Snyder, Michael R., to Rolox Ltd. Method and apparatus for user sizeable furnace filter and holder. 5,087,276, Cl. 55-496.000.

Soave, Robert: See—
Lillienfeld, David; Thomas, David; Smith, Paul; Comeau, Gerald; and Soave, Robert, 5,087,322, Cl. 156-628.000.

Societa' Cavi Pirelli S.p.A.: See—
Grasso, Giorgio; Scrivener, Paul L.; and Appleyard, Andrew P., 5,087,108, Cl. 385-27.000.

Vallauri, Ubaldo; and Portas, Francesco, 5,087,492, Cl. 428-34.900.

Societe des Usines Quiri & Cie: See—
von Hatten, Didier, 5,086,691, Cl. 92-83.000.

Societe Jaeger: See—
Baglin, Richard, 5,087,056, Cl. 277-180.000.

Societe Nationale Elf Aquitaine: See—
Truong, Dinh Nguyen, 5,087,643, Cl. 523-176.000.

Societe Nationale Elf Aquitaine (Production): See—
Vallee, Yannick; and Labat, Yves, 5,087,759, Cl. 568-66.000.

Societe Nationale Industrielle et Aerospatiale: See—
Darrieux, Jean-Louis, 5,086,983, Cl. 242-4.000.

Societe Nouvelle d'Applications Serigraphiques: See—
Czeczota, Stephane, 5,086,695, Cl. 101-129.000.

Societe Nouvelle De Connexion: See—
Prunier, Jean-Claude; Peuchet, Pascal; Le Gouic Martun, Jean-Jacques; and Bonnin, Claude, 5,087,211, Cl. 439-579.000.

Societe Pica-Produits Industriels et Charbons Actifs: See—
Montagnon, Jean R.; Bablon, Guy P.; Dagois, Gerard L.; and Ventresque, Claire C., 5,087,354, Cl. 210-108.000.

Sogawa, Akira; Kitagawa, Kiyoshi; Onodera, Chikau; and Onuma, Tadashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Electrode device for heating tumor in endotracheal organ. 5,086,786, Cl. 128-783.000.

Sola USA, Inc.: See—
Burke, William J.; Folk, Lisa A.; and Ratkowski, Donald J., 5,087,392, Cl. 264-2.700.

Solheim, Karsten, to Karsten Manufacturing Corporation. Golf club grip. 5,087,042, Cl. 273-81.000.

Solis, Kenneth M. Illuminated jump rope. 5,087,034, Cl. 272-75.000.

Solkatronic Chemicals, Inc.: See—
Ngai, Eugene Y., 5,086,804, Cl. 137-312.000.

Sonobe, Yoshiho: See—
Ohta, Masahiro; Kawashima, Saburo; Sonobe, Yoshiho; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,087,689, Cl. 528-185.000.

Sony Corporation: See—
Harradine, Vincent C., 5,087,966, Cl. 358-27.000.

Matsumoto, Hiroaki; and Fukuda, Tokuya, 5,087,967, Cl. 358-41.000.

Narabu, Tadakuni; and Miura, Hisanori, 5,087,843, Cl. 307-607.000.

Oda, Osamu; and Amano, Toshio, 5,087,976, Cl. 358-183.000.

Sagawa, Kouichiro; Kitamura, Nobuyoshi; Ueda, Masako; and Takeuchi, Koji, 5,087,517, Cl. 428-329.000.

Toi, Hiroshi, 5,086,556, Cl. 29-740.000.

Tsurumaru, Shinobu; Fukuzawa, Keiji; and Ito, Fumihior, 5,087,920, Cl. 343-700.000.

Watanabe, Hidetoshi; Suzuki, Hirotosugu; and Yamamoto, Masanobu, 5,087,184, Cl. 425-3.000.

Sooch, Navdeep S.; Scott, Jeffrey W.; and Tanaka, Tadashi, to Crystal Semiconductor Corp. DC calibration system for a digital-to-analog converter. 5,087,914, Cl. 341-120.000.

Sorensen, Kirk D., to Union Carbide Chemicals & Plastics Technology Corporation. Hydroformylation process. 5,087,763, Cl. 568-492.000.

Soucemarianadin, Arthur; and Chan, Keng S., to Dowell Schlumberger Incorporated. Delayed rigid foam systems and applications in particular for plugging selective treatments in the oil industry. 5,086,840, Cl. 166-294.000.

Soundmaster International, Inc.: See—
Staffer, Andrew, 5,087,980, Cl. 358-335.000.

Sounik, James R.; and Popolo, Jacquelyn, to Hoechst Celanese Corp. Tetraazaporphyrin dye mixtures. 5,087,390, Cl. 252-587.000.

Southern California Gas Company: See—
Murphy, John C.; Hartong, Glenn S.; Cohn, Ralph F.; and Moran, Patrick J., 5,087,873, Cl. 324-71.200.

Spaleck, Walter: See—
Brekner, Michael-Joachim; Rohrmann, Jurgen; Spaleck, Walter; and Antberg, Martin, 5,087,677, Cl. 526-160.000.

Spangler, Michael J.: See—
Nubel, Philip O.; Satek, Larry C.; Spangler, Michael J.; and Michaels, Glenn O., 5,087,779, Cl. 570-245.000.

Nubel, Philip O.; Satek, Larry C.; Spangler, Michael J.; Lutman, Charles A.; and Michaels, Glenn O., 5,087,786, Cl. 585-500.000.

Spangrude, Gerald J.: See—
Weissman, Irving L.; Spangrude, Gerald J.; Muller-Sieburg, Christa; and Heimfeld, Shelly, 5,087,570, Cl. 435-240.100.

Sparrow, Tim H.; Harlow, Richard L.; Wilder, Don; and Jackson, Levin, to YKK Corporation. Method for molding on carrier strip material. 5,087,404, Cl. 264-219.000.

Sparzak, Walter J., Sr.: See—
Choi, Jae H.; Mottine, John J.; Sparzak, Walter J., Sr.; Tate, Walter D.; and Vesperman, William C., 5,087,521, Cl. 428-389.000.

Spear, Karl E.: See—
Frenklach, Michael Y.; Spear, Karl E.; and Koba, Richard J., 5,087,434, Cl. 423-446.000.

Spears, Harry L. Safety check valve. 5,086,802, Cl. 137-68.100.

Spears, James R., to Wayne State University. Method of microencapsulation of hyperbaric gas. 5,086,620, Cl. 62-51.100.

Speas, Gary W., to Pom, Inc. Status indicator for an electronic parking meter. 5,088,073, Cl. 368-90.000.

Spectec S.A.: See—
Schweizer, Pascal; Neveux, Antoine; and Macon, Louis, 5,087,811, Cl. 250-227.210.

Spector, George: See—
Rogalski, Joseph; and Spector, George, 5,087,060, Cl. 280-12.110.

Tagney, Lee; and Spector, George, 5,087,033, Cl. 272-69.000.

Terbrusch, Rosemarie; and Spector, George, 5,087,138, Cl. 401-206.000.

Spectra Diode Laboratories, Inc.: See—
Scifres, Donald R.; Welch, David F.; and Streifer, William, deceased, 5,088,105, Cl. 372-92.000.

Spectra-Physics, Inc.: See—
Latimer, David L.; Nojiri, Howard H.; Millon, James F.; Grimm, Steven R.; and Platt, David S., 5,086,879, Cl. 186-61.000.

Spencer, Charles P.; and Pitchford, Terry L., to AMSTED Industries Incorporated. Self adjusting constant contact side bearing for railcars. 5,086,707, Cl. 105-199.300.

Spencer, Charles P.: See—
McKeown, Franklin S., Jr.; Moehling, Charles, and Spencer, Charles P., 5,086,708, Cl. 105-207.000.

Spencer Turbine Company, The: See—
Poor, James C.; Hoskins, Frederick K.; and Morcom, William, 5,087,274, Cl. 55-300.000.

Speno International S.A.: See—
Panetti, Romolo, 5,086,591, Cl. 51-165.710.

Spielman, Howard A.; and Considine, C. J., to Digital Equipment Corporation. System for graphically representing and manipulating data stored in databases. 5,088,052, Cl. 395-158.000.

Sprague, David L.; Simon, Allen H.; and Kwan, Alfred, to Intel Corporation. Memory controller as for a video signal processor. 5,088,053, Cl. 395-166.000.

Sprehe, Harald: See—
Motzet, Josef; Sprehe, Harald; and Stemmer, Xaver, 5,087,146, Cl. 403-13.000.

Spykerman, David: See—
Miller, Gordon; Dykstra, Ronald; Spykerman, David; and Buonodono, Joseph, 5,087,008, Cl. 248-311.200.

Stacey, Nicholas A.: See—
Babirad, Stefan A.; Janulis, Eugene P.; Stacey, Nicholas A.; and Elsbernd, Cheryl L. S., 5,087,672, Cl. 525-329.500.

Stack, Robert J.: See—
Brandley, Brian K.; Tiemeyer, Michael; and Stack, Robert J., 5,087,337, Cl. 204-182.100.

Staffer, Andrew, to Soundmaster International, Inc. Synchronization of recordings. 5,087,980, Cl. 358-335.000.

Stahl GmbH & Co. Maschinenfabrik: See—
Frohlich, Eckhard, 5,087,028, Cl. 271-273.000.

Staley, William L. Method for making a vented sock. 5,086,518, Cl. 2-239.000.

Stamcarbon B.V.: See—
Boesten, Wilhelmus H. J.; Schepers, Catharina H. M.; and Roberts, Mathieu J. A., 5,087,753, Cl. 564-302.000.

Standard Register Company, The: See—
Gilbert, L. Eldean; Gullett, Watson L.; and Thornburg, W. Edwin, 5,087,023, Cl. 270-39.000.

Starck, Emmanuel: See—
Coudrains, Louis; and Starck, Emmanuel, 5,087,466, Cl. 426-256.000.

Starnier, Keith E.; and Cromis, Robert A., to York International Corporation. Oil recovery system for low capacity operation of refrigeration systems. 5,086,621, Cl. 62-84.000.

State University Virginia Tech Intellectual Properties, Inc.: See—
Gonzalez, Sandra; Brown, Nancy; and Brown, Jesse J., 5,087,277, Cl. 55-523.000.

- Staver, Robert B. Dies for forming soap with attached member. 5,087,188, Cl. 425-116.000.
- Stearns, Richard G., to Xerox Corporation. In situ inonographic uniformity correction. 5,087,933, Cl. 346-159.000.
- Steidinger, Donald J., to Tamarack Products, Inc. Apparatus for cutting and method. 5,086,683, Cl. 83-674.000.
- Steinke, Richard; See—
Panaroni, Vincent F.; and Steinke, Richard, 5,086,815, Cl. 152-251.000.
- Steinwachs, Peter. Side-member for spectacle frames. 5,087,117, Cl. 351-117.000.
- Stellaccio, Robert J.; and Dach, Michael M., to Texaco Inc. Partial oxidation process. 5,087,271, Cl. 48-197.00R.
- Stemmer, Xaver; See—
Motzet, Josef; Sprehe, Harald; and Stemmer, Xaver, 5,087,146, Cl. 403-13.000.
- Stephen, Robert L.; See—
Petelenz, Tomasz J.; Jacobsen, Stephen C.; Stephen, Robert L.; Beck, Jon; and Shimada, Jin, 5,087,242, Cl. 604-20.000.
- Stephenson, Stanley W.; See—
No, Young; and Stephenson, Stanley W., 5,087,925, Cl. 346-76.0PH.
- Sterenber, Bruce A.; See—
DeVos, David J.; Sterenber, Bruce A.; and Tubergen, Michael L., 5,087,486, Cl. 427-264.000.
- Sterk, Tom; See—
Salesky, Emery; and Sterk, Tom, 5,087,870, Cl. 323-276.000.
- Sterling, Bruce; and McGrath, Stuart, to Koch Supplies, Inc. Method and system for dressing cattle and the like. 5,087,222, Cl. 452-127.000.
- Stevens, Charles F. Double-acting water closet metering device. 5,086,524, Cl. 4-415.000.
- Stevens, Ward C.; Sturm, Edward A.; and Roman, Bruce C., to Advanced Technology Materials, Inc. Chaff fiber comprising insulative coating thereon, and having an evanescent radar reflectance characteristic, and method of making the same. 5,087,515, Cl. 428-315.900.
- Stewart, John M., to Sanitation Equipment Limited. Padded toilet seat lid. 5,086,521, Cl. 4-234.000.
- Stewart, Kevin R.; and Salem, Andrew J., to General Electric Company. Preparation of linear polycarbonates from cyclic oligomer compositions with salicylic acid salt as catalyst. 5,087,692, Cl. 528-371.000.
- Stewart, Timothy A.; See—
Leder, Philip; and Stewart, Timothy A., 5,087,571, Cl. 435-240.200.
- Stewart, Vernon E.; See—
Tayon, Jeffrey E.; Stewart, Vernon E.; and Hass, Tave E., 5,086,662, Cl. 74-501.50R.
- Stewart, William R., to McDonnell Douglas Corporation. Rotating sealant applicator. 5,087,484, Cl. 427-239.000.
- Stockinger, Friedrich; See—
Gruber, Urs; Stockinger, Friedrich; and Manso, Elvio, 5,087,688, Cl. 528-99.000.
- Stofko, George D., Sr. Drain plug apparatus. 5,086,522, Cl. 4-295.000.
- Stokes, Daniel E.; See—
Schlyper, Omer T.; and Stokes, Daniel E., 5,086,596, Cl. 52-204.000.
- Stokes, William H., to Seneca Wire and Manufacturing Company. Continuous steel strand electrolytic processing. 5,087,342, Cl. 204-210.000.
- Stolar, Inc.; See—
Stolarczyk, Larry G., 5,087,099, Cl. 299-1.000.
- Stolarczyk, Larry G., to Stolar, Inc. Long range multiple point wireless control and monitoring system. 5,087,099, Cl. 299-1.000.
- Stoll, Ione R.; See—
Levings, Randall L.; and Stoll, Ione R., 5,087,693, Cl. 530-387.000.
- Stone & Webster Engineering Corporation; See—
Goelzer, Alan R.; and Demers, Francis A., 5,087,349, Cl. 208-113.000.
- Stoneback, Dean; See—
Muller, Mathias; and Stoneback, Dean, 5,088,098, Cl. 372-34.000.
- Stoneham, Edward B.; See—
Omori, Masahiro; and Stoneham, Edward B., 5,087,959, Cl. 357-54.000.
- Storch, Leonard; and van Haagen, Ernst, to CIAS, Inc. Self-correcting registers, error-detecting/correcting registers, and inversion coding using one bit, and other information storage media. 5,088,093, Cl. 371-30.000.
- Storck, Gerhard; See—
Heider, Lothar; Storck, Gerhard; and Weintz, Hans-Joachim, 5,087,676, Cl. 526-93.000.
- Stout, Donald E.; See—
McIntosh, Kenneth B.; Pratt, James O.; and Stout, Donald E., 5,088,056, Cl. 364-569.000.
- Strack, Helmut, to Siemens Aktiengesellschaft. Manufacturing method for a power MISFET. 5,087,577, Cl. 437-29.000.
- Stranieri, Maria; and Dore, Dario. Continuous speed gear functioning by means of cog wheels of variable radius. 5,087,224, Cl. 474-50.000.
- Strassmann, Gideon, to Otsuka Pharmaceutical Co., Ltd. Method for the treatment of bacterial caused weight loss and/or hypoglycemia. 5,087,453, Cl. 424-450.000.
- Stravs, Andrej; See—
Hardt, Peter; Stravs, Andrej; and Abgottspon, Pius, 5,087,745, Cl. 562-553.000.
- Streifer, Shirley R., executor; See—
Scifres, Donald R.; Welch, David F.; and Streifer, William, deceased, 5,088,105, Cl. 372-92.000.
- Streifer, William, deceased; See—
Scifres, Donald R.; Welch, David F.; and Streifer, William, deceased, 5,088,105, Cl. 372-92.000.
- Stricharczuk, Paul T.; See—
Woodson, Charles S.; Janda, Dennis; and Stricharczuk, Paul T., 5,087,343, Cl. 204-242.000.
- Strom, Laurie A.; Carnall, Edward, Jr.; Ferranti, Steven A.; and Mir, Jose M., to Eastman Kodak Company. Process for preparing superconductive thick films. 5,087,607, Cl. 505-1.000.
- Strub, Eric W.; and Strub, Kenneth M. Band cutting apparatus. 5,086,682, Cl. 83-382.000.
- Strub, Kenneth M.; See—
Strub, Eric W.; and Strub, Kenneth M., 5,086,682, Cl. 83-382.000.
- Structural Panels, Inc.; See—
Meyerson, Steven C., 5,086,599, Cl. 52-309.900.
- Strutz, Heinz; See—
Finke, Manfred; Siegemund, Gunter; and Strutz, Heinz, 5,087,748, Cl. 562-851.000.
- Stuck, Robert M.; and Maw, Samuel H., Jr. Apparatus for cooking food products, especially for broiling whole chickens, with means for controlling internal air temperature. 5,086,694, Cl. 99-443.00C.
- Stuff Technology Partners-II; See—
Baer, James W., 5,088,079, Cl. 369-44.260.
- Stumpe, Werner; See—
Schwendemann, Bernhard; and Stumpe, Werner, 5,086,656, Cl. 73-862.540.
- Stumpf, William E.; See—
Kelley, James O.; and Stumpf, William E., 5,086,597, Cl. 52-239.000.
- Sturm, Edward A.; See—
Stevens, Ward C.; Sturm, Edward A.; and Roman, Bruce C., 5,087,515, Cl. 428-315.900.
- Stutz, Wolfgang; See—
Wirz, Bernard; Meyer, Willy; and Stutz, Wolfgang, 5,087,749, Cl. 564-90.000.
- Su, Charles S. C.; See—
Sun, Donald J. C.; and Su, Charles S. C., 5,087,048, Cl. 273-232.000.
- Su, Ken J. Envelope for safely protecting documents. 5,086,970, Cl. 229-84.000.
- Suarez, Jose I., to Motorola, Inc. Oscillator tunable by varying current in spiral inductor on ferrite substrate. 5,087,897, Cl. 331-117.00R.
- Sugahara, Jun; Takahashi, Hideaki; and Nara, Toshihiko, to Hitachi, Ltd. Elevator apparatus provided with guiding device used for preventing passenger cage vibration. 5,086,882, Cl. 187-95.000.
- Sugai, Masao, to Advantest Corporation. Signal switching circuit and signal change-over circuit using the same. 5,087,833, Cl. 307-443.000.
- Sugano, Haruo; See—
Tsuruo, Takashi; Hamada, Hirofumi; and Sugano, Haruo, 5,087,560, Cl. 435-6.000.
- Sugano, Kazuhiko; See—
Yamaguchi, Toshio; Sugano, Kazuhiko; and Iwanaga, Kazuyoshi, 5,087,231, Cl. 475-200.000.
- Sugata, Hiroyuki; See—
Kanome, Osamu; and Sugata, Hiroyuki, 5,087,192, Cl. 425-385.000.
- Sugifune, Shin; and Abe, Hiraku, to Alps Electric Co., Ltd. Construction for adjustably mounting sensor portion of magnetic rotation sensor and method of adjusting gap between sensor and rotating drum. 5,087,879, Cl. 324-207.250.
- Sugino, Satoru; and Kobayashi, Yoshimichi, to Mitsubishi Kasei Vinyl Company; and Mitsubishi Kasei Corporation. Plastisol composition and undercoating material. 5,087,664, Cl. 525-124.000.
- Sugishima, Yoshio, to Mita Industrial Co., Ltd. Sorter having noise-eliminating member. 5,087,029, Cl. 271-293.000.
- Sugita, Kunihiro; See—
Hanzawa, Hozitaro; Sugita, Kunihiro; and Sasaki, Hiroyuki, 5,086,685, Cl. 84-605.000.
- Sugita, Ryuiji; See—
Tohma, Kiyokazu; Sugita, Ryuiji; Honda, Kazuyoshi; Kawawake, Yasuhiro; and Ishida, Tatsuki, 5,087,476, Cl. 427-35.000.
- Sugiyama, Kazuhiko; See—
Kaku, Koichiro; Wada, Nobuhide; Takeuchi, Akira; Toyokawa, Yasufumi; Miyazawa, Takeshige; Yoshida, Ryo; and Sugiyama, Kazuhiko, 5,087,289, Cl. 71-93.000.
- Suglia, Jean-Claude; See—
Meinard, Colette; Suglia, Jean-Claude; and Taranta, Claude, 5,087,456, Cl. 424-501.000.
- Suhr, Robert N. Flexible cable intermediate support with rigid hollow tube for a heddle frame. 5,086,811, Cl. 139-91.000.
- Suizu, Katsuto, to Kabushiki Kaisha Toshiba. Channel selecting apparatus automatically detecting different modes of television signals. 5,087,977, Cl. 358-193.100.
- Sukamoto, Takayuki; See—
Morita, Tominori; Yoshiizumi, Kazuya; Nishimura, Noriyasu; Goto, Katsumi; Sukamoto, Takayuki; and Yoshino, Kohichiro, 5,087,640, Cl. 514-609.000.
- Sullivan, Edmund J.; and Moden, James R., to United States of America, Navy. Water-activated sonobuoy system. 5,088,067, Cl. 367-4.000.
- Sullivan, Jerry F., to Coltene/Whaledent. Disc and sleeve assembly for coupling die segments of a dental model to a base. 5,087,197, Cl. 433-74.000.
- Sullivan, Thomas M. Puncture-resistant and medicinal treatment garments and method of manufacture thereof. 5,087,499, Cl. 428-85.000.
- Sumi, Katsuto, to Fuji Photo Film Co., Ltd. Method of and apparatus for processing image signals at a point of interest based on image signal curvature. 5,087,972, Cl. 358-166.000.

- Sumida, Keisuke; See—
Muto, Nariaki; Kakui, Mikio; Sumida, Keisuke; Nakazawa, Toru; and Matsumoto, Kazuo, 5,087,544, Cl. 435-83.000.
- Sumita Optical Glass, Inc.; See—
Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.
- Sumitomo Chemical Company, Limited; See—
Harada, Hiroyuki; Ohkawa, Kenichi; Yamamoto, Masashi; Yoshinaka, Minoru; Yagi, Jun; and Matsuo, Kouzuro, 5,087,654, Cl. 524-432.000.
- Nomura, Kotohiro; and Ishino, Masaru, 5,087,755, Cl. 564-422.000.
- Okamoto, Yasushi; Kanno, Yoshinori; Matsuo, Kouzuro; Yoshinaka, Minoru; and Yagi, Jun, 5,087,655, Cl. 524-432.000.
- Sumitomo Electric Industries, Ltd.; See—
Hayashi, Shigeo, 5,087,892, Cl. 330-296.000.
- Sumitomo Metal Mining Co., Ltd.; See—
Hyuga, Takehiro; Matsumoto, Kazutoshi; and Mukai, Tetsuya, 5,087,902, Cl. 333-219.100.
- Sumiuchi, Masaharu; and Nishide, Seiichi, to Bridgestone Corporation. Transfer apparatus for tire constituting members. 5,087,316, Cl. 156-396.000.
- Summers, David P., to American BioMed, Inc. Distal atherectomy catheter. 5,087,265, Cl. 606-159.000.
- Sun, Donald J. C.; and Su, Charles S. C. Golf ball. 5,087,048, Cl. 273-232.000.
- Sun Industrial Coatings Private Limited; See—
Sim, Ah T., 5,087,333, Cl. 205-138.000.
- Sun, Jin; See—
Duan, Youlu; Jin, Shanrong; Huang, Tingchun; Sun, Jin; and Yu, Xinying, 5,087,680, Cl. 526-254.000.
- Sundstrand Corporation; See—
Ciaccio, Michael P., 5,088,005, Cl. 361-385.000.
- Fawley, Robert W.; Keetley, R. G.; and Treece, William D., 5,086,968, Cl. 228-119.000.
- Sundwiger Eisenhutte Maschinenfabrik GmbH & Co.; See—
Frauenkron, Armin; and Gellenbeck, Herbert, 5,086,826, Cl. 164-417.000.
- Sunohara, Masaaki; See—
Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.
- Sunstar Engineering Inc.; See—
Nagata, Tsuyoshi; and Okuda, Shinji, 5,086,640, Cl. 73-661.000.
- Suntory Limited; See—
Maeda, Mitsuru; Kodama, Tohru; Iwasawa, Norio; Higuchi, Naoki; and Amano, Norihide, 5,087,614, Cl. 514-16.000.
- Surakka, Jorma; See—
Maki-Rahkola, Jari; Kononen, Mauri; and Surakka, Jorma, 5,086,610, Cl. 53-587.000.
- Suruga, Toshimichi; See—
Miyamoto, Kenichi; Murakami, Yoshitaka; Suruga, Toshimichi; and Nanjoh, Hideo, 5,088,071, Cl. 368-10.000.
- Sutherland, Joseph E.; See—
Gingell, Michael J.; and Sutherland, Joseph E., 5,088,089, Cl. 370-67.000.
- Suto, Shohsei, to Taiyo Kogyo Co., Ltd. Toy Airplane. 5,087,000, Cl. 244-189.000.
- Suzuki, Eriko; Hiraki, Jun; and Fujii, Masahiro, to Chisso Corporation. Skin cosmetics. 5,087,446, Cl. 424-62.000.
- Suzuki, Hiroshi; Arakawa, Eiji; Takagi, Kazuhiko; and Watanabe, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Sheet feeder for printers including means to control and detect the sheet. 5,087,142, Cl. 400-616.000.
- Suzuki, Hirotosugu; See—
Watanabe, Hidetoshi; Suzuki, Hirotosugu; and Yamamoto, Masanobu, 5,087,184, Cl. 425-3.000.
- Suzuki, Hisanori; See—
Kawai, Hisao; Kurikawa, Akinori; and Suzuki, Hisanori, 5,087,482, Cl. 427-129.000.
- Suzuki, Hitoshi; See—
Kigimiya, Shuzo; Fukumochi, Yoji; Sata, Ichiko; Hirai, Tokuyuki; and Suzuki, Hitoshi, 5,088,039, Cl. 364-419.000.
- Suzuki Kabushiki Kaisha; See—
Banjo, Tetsuya; Iida, Eiji; Tokunaga, Katsuhiko; and Kiyota, Satoshi, 5,086,866, Cl. 180-219.000.
- Suzuki, Kazunori; See—
Wada, Yoshihiro; Suzuki, Kazunori; Kono, Tadashi; and Asano, Katsuo, 5,087,144, Cl. 401-199.000.
- Suzuki, Kenji; See—
Nishizawa, Hiroshi; Suzuki, Kenji; Mukoyama, Yoshiyuki; Kikuchi, Tohru; and Sato, Hidetaka, 5,087,321, Cl. 156-608.000.
- Suzuki, Kenji; and Mori, Toshiaki, to Agency of Industrial Science; and Ministry of International Trade & Industry. Method for production of pillared clay. 5,087,598, Cl. 502-63.000.
- Suzuki, Koji; and Tanaka, Minoru, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Electric circuit substrate. 5,087,497, Cl. 428-64.000.
- Suzuki, Makoto; See—
Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; and Horie, Shigetake, 5,087,321, Cl. 156-608.000.
- Kamio, Hiroshi; Araki, Kenji; Shima, Yoshinobu; Suzuki, Makoto; Kazama, Akira; Horie, Shigetake; and Nakahama, Yasumitsu, 5,087,429, Cl. 422-249.000.
- Suzuki, Masayasu; and Kuroda, Hisanobu, to Chisso Corporation. Durable hydrophilic fibers. 5,087,520, Cl. 428-389.000.
- Suzuki, Naohisa; See—
Nakajima, Hiroharu; Suzuki, Naohisa; and Kumamoto, Michihisa, 5,087,136, Cl. 400-214.000.
- Suzuki, Nobuhisa; See—
Hihara, Mikio; and Suzuki, Nobuhisa, 5,087,287, Cl. 106-677.000.
- Suzuki, Ryoichi; See—
Kaneko, Yoshiyuki; and Suzuki, Ryoichi, 5,087,119, Cl. 356-1.000.
- Suzuki, Shinichiro; See—
Onagi, Nobuaki; Suzuki, Shinichiro; Fujii, Seiro; Kobayashi, Takahiro; Yoshikawa, Takamasa; Yamaguchi, Masayasu; and Ogasawara, Kiyohide, 5,087,340, Cl. 204-192.200.
- Suzuki, Shoji; See—
Nakazawa, Toru; Kokumai, Yuji; Naito, Koichi; Suzuki, Shoji; and Noguchi, Tadao, 5,087,851, Cl. 310-323.000.
- Suzuki, Takatoshi, to Ohto Kabushiki Kaisha, a part interest. One-action paper clip. 5,086,545, Cl. 24-67.00R.
- Suzuki, Toshiyuki, to Yaka Feudor K.K. Filter for gas lighter and method for producing the same. 5,087,278, Cl. 55-523.000.
- Suzuki, Toshiyuki; See—
Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; Imai, Masao; and Suzuki, Toshiyuki, 5,087,758, Cl. 568-57.000.
- Misawa, Yoichi; and Suzuki, Toshiyuki, 5,086,686, Cl. 84-718.000.
- Suzuki, Yohsuke; See—
Masai, Teruhisa; Shibuta, Takanobu; Yoshida, Yasuyuki; and Suzuki, Yohsuke, 5,087,449, Cl. 424-195.100.
- Suzuta, Toshihiko, to Olympus Optical Co., Ltd. Ultrasonic transducer apparatus. 5,087,850, Cl. 310-316.000.
- Swanson, Eric J.; See—
Piasecki, Douglas S.; and Swanson, Eric J., 5,088,107, Cl. 375-10.000.
- Swanson, Glenn E.; See—
Haley, William J.; and Swanson, Glenn E., 5,087,177, Cl. 417-426.000.
- Swanton, Paul C.; See—
Dalal, Edul N.; and Swanton, Paul C., 5,087,946, Cl. 355-285.000.
- Swars, Helmut, to Emitec Gesellschaft fur Emissionstechnologie mbH. Gearwheel attached to an expanded tube. 5,086,660, Cl. 74-446.000.
- Swift, Steven M. Tool and workplace lubrication system having a modified air line lubricator to create and to start the delivery of a uniformly flowing pressurized air flow with oil, to deliver the oil continuously and uniformly where a metal part is being formed. 5,086,878, Cl. 184-55.200.
- Swinehart, Robert M.; See—
Calhoun, Clyde D.; Berg, James G.; Koskenmaki, David C.; and Swinehart, Robert M., 5,087,494, Cl. 428-40.000.
- Sykes, David G.; and Jordan, Alan, to GEC Plessey Telecommunications Limited. Printed wiring board mounting assembly. 5,086,933, Cl. 211-41.000.
- Synatschke, Dieter; Sattelberger, Paul; and Saam, Werner, to 501 Joseph vogle AG. Lubricant supply limiting device. 5,086,877, Cl. 184-7.400.
- Syracuse University; See—
Dittmer, Donald C.; Murphy, Christopher K.; and Discordia, Robert, 5,087,773, Cl. 568-828.000.
- System GmbH; See—
Tubke, Axel B., 5,087,169, Cl. 414-792.900.
- Systemes Ozonics Inc.; See—
Fletcher, David; and Welford, Barry, 5,087,428, Cl. 422-186.070.
- Szentmiklost, Peter; See—
Racz, Istvan; Plachy, Janos; and Szentmiklost, Peter, 5,087,447, Cl. 424-78.010.
- Szpala, Anthony; See—
Connell, David L.; Michael, Kenneth; and Szpala, Anthony, 5,087,266, Cl. 8-109.000.
- Tabata, Shigeyoshi; See—
Momose, Yutaka; Tabata, Shigeyoshi; and Mori, Katsuhiko, 5,086,625, Cl. 62-172.000.
- Tabuchi, Toyoji; See—
Kurosawa, Kazuhito; Hikita, Mitsutaka; Tabuchi, Toyoji; Shibagaki, Nobuhiko; and Hirashima, Tetsuya, 5,087,901, Cl. 333-193.000.
- Tachi-S Co., Ltd.; See—
Ishizuka, Takanori, 5,087,098, Cl. 297-284.00C.
- Tachibana, Yoji; See—
Tsuji, Masahiro; Yokoyama, Shinji; and Tachibana, Yoji, 5,087,709, Cl. 552-541.000.
- Taggart, Ken B.; See—
Wallner, John P.; and Taggart, Ken B., 5,087,071, Cl. 280-743.000.
- Tagney, Lee; and Spector, George. Jogging generator. 5,087,033, Cl. 272-69.000.
- Tai, Hwai T.; See—
Ng, Yee S.; and Tai, Hwai T., 5,087,981, Cl. 358-459.000.
- Taito Co., Ltd.; See—
Sato, Motohisa; and Matuda, Ichiro, 5,086,814, Cl. 141-65.000.
- Taiyo Kogyo Co., Ltd.; See—
Suto, Shohsei, 5,087,000, Cl. 244-189.000.
- Taiyo Ltd.; See—
Nakajima, Hiromi, 5,086,803, Cl. 137-270.000.
- Taiyo Yuden Co., Ltd.; See—
Sekiguchi, Mikio; Imai, Mizuho; Shiba, Nobuyasu; and Iida, Hideo, 5,086,727, Cl. 118-324.000.
- Takaba, Tetsuro; See—
Ishihara, Toshihiro; Hosokai, Tetsushi; Takaba, Tetsuro; and Kobayashi, Hideki, 5,086,744, Cl. 123-480.000.

Takagi, Hideyuki: See—
Sakaue, Shigeo; Kohda, Toshiyuki; Shimaki, Yasuhiro; Takagi, Hideyuki; and Togawa, Hayato, 5,088,049, Cl. 395-23.000.

Takagi, Kazuhiko: See—
Suzuki, Hiroshi; Arakawa, Eiji; Takagi, Kazuhiko; and Watanabe, Hiroshi, 5,087,142, Cl. 400-616.000.

Takagi, Masatoshi: See—
Otsuji, Atsuo; Nakatsuka, Masakatsu; Hasegawa, Kiyoharu; Takagi, Masatoshi; and Yamaguchi, Akihiro, 5,087,706, Cl. 549-226.000.

Takago, Toshio: See—
Kishita, Hirofumi; Sato, Shinichi; Kinami, Hitoshi; Takago, Toshio; Fukuda, Kenichi; and Yamada, Hirokazu, 5,087,720, Cl. 556-434.000.

Takahashi, Akira: See—
Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, 5,087,535, Cl. 430-5.000.

Van, Kazuo; Katayama, Hiroyuki; Takahashi, Akira; and Ohta, Kenji, 5,088,086, Cl. 369-100.000.

Takahashi, Hideaki: See—
Sugahara, Jun; Takahashi, Hideaki; and Nara, Toshihiko, 5,086,882, Cl. 187-95.000.

Takahashi, Jun: See—
Serita, Kaoru; Kiyomiya, Masaaki; Takahashi, Jun; Watanabe, Masatoshi; and Iwamoto, Masaki, 5,088,076, Cl. 369-36.000.

Takahashi, Satomi: See—
Inoue, Kenji; Matsumoto, Mitsunori; and Takahashi, Satomi, 5,087,751, Cl. 564-192.000.

Takahashi, Takehiko: Sato, Takahiro; and Shimizu, Yuji, to Toyoda Gosei Co., Ltd.; and Combi Corporation. Folding baby bed. 5,086,527, Cl. 5-136.000.

Takahashi, Tooru: See—
Tominaga, Kenji; Miki, Minoru; Takahashi, Tooru; Horiuchi, Tetsuo; Morishima, Hideo; Nakayama, Takashi; Moriya, Kumiaki; Matsumoto, Masaki; Akita, Minoru; Niino, Tsuyoshi; Ochiai, Kanehiro; Shiozawa, Akihiko; Uchiyama, Yuichi; Yasuno, Toyoharu; Moriya, Kenji; Kinoshita, Shouchiro; Kage, Kazuo; and Kubota, Ryuji, 5,087,408, Cl. 376-283.000.

Takahashi, Tsutomu; Oshita, Seichiro; and Mouri, Toyohiko, to Fuji Jukogyo Kabushiki Kaisha. Method and system for controlling electric power steering. 5,086,859, Cl. 180-79.100.

Takahashi, Wataru: See—
Harada, Katsumi; Nagafuji, Toshiaki; Takahashi, Wataru; Nakano, Kenichi; and Yasuda, Kei-ichi, 5,088,009, Cl. 361-413.000.

Takahashi, Yasushi; and Takanashi, Kenichi, to Ricoh Company, Ltd. Light scanning device. 5,087,983, Cl. 359-205.000.

Takaichi, Akihisa; Okamoto, Toshihiko; and Matsumoto, Toshiaki, to Otsuka Pharmaceutical Co., Ltd. Preparation for iron supply, preparation for vitamin supply and method for stabilizing a foam preparation. 5,087,442, Cl. 424-44.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; and Asakura, Tsutou, to Victor Company of Japan, Ltd. Method and apparatus for transferring an electrostatic latent image. 5,087,539, Cl. 430-48.000.

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Takasu, Hiroshi: See—
Obama, Kenjiro; Takasu, Hiroshi; Arase, Susumu; and Fujii, Hiroyuki, 5,087,653, Cl. 524-158.000.

Takata Corporation: See—
Hamaue, Tetsuya, 5,087,075, Cl. 280-806.000.

Takatori, Masashige: See—
Hosaka, Yoshihiro; Nozue, Ikuo; Takatori, Masashige; Harita, Yoshiyuki; and Honda, Kiyoshi, 5,087,548, Cl. 430-192.000.

Takaya, Hidemasa: See—
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Takayama, Teruyuki; Nagasawa, Hiroki; Aoki, Sumihisa; Tominaga, Haruo; and Yokoyama, Kazuo, to Fujikura Ltd. Method for manufacturing high-conductivity copper-clad steel trolley wire. 5,087,300, Cl. 148-11.500.

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Takayanagi, Yasushi: See—
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Kousokabe, Hirokazu; Iwata, Hiroshi; and Takebayashi, Masahiro, 5,087,170, Cl. 415-110.000.

Takechi, Satoshi: See—
Nakamura, Yuko; and Takechi, Satoshi, 5,087,551, Cl. 430-270.000.

Takeda, Toshio: See—
Katayama, Kenji; Hirano, Hiroshi; Takeda, Toshio; and Yashiki, Seiji, 5,086,667, Cl. 74-860.000.

Takedomi, Seiki; and Umehara, Teruo, to Hitachi Metals, Ltd. Linear motor. 5,087,844, Cl. 310-12.000.

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Mizuta, Fumio; Arai, Takashi; Matsuda, Yoshiharu; and Takegami, Itsuo, 5,086,858, Cl. 180-68.300.

Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, to Ohgi Paint Trading Co., Ltd. Electrostatic spray coating apparatus. 5,086,981, Cl. 239-703.000.

Takemoto Yushi Kabushiki Kaisha: See—
Kinoshita, Mitsuo; Shimono, Toshihide; Yamaguchi, Shozo; and Yamamoto, Tsuneo, 5,087,648, Cl. 524-3.000.

Takeo, Ohwada; and Kobayashi, Kengo, to Hitachi Chemical Company, Ltd. Process for producing graft copolymer. 5,087,675, Cl. 525-455.000.

Takerkart, Georges: See—
Dumas, Sylviane; and Takerkart, Georges, 5,087,694, Cl. 530-354.000.

Taketomi, Harumi: See—
Inoue, Kazuo; Kishi, Noriyuki; Shimada, Hiroo; Miyao, Masakatsu; Nakamura, Katsunori; Konno, Tsuneo; and Taketomi, Harumi, 5,086,733, Cl. 123-41.840.

Takeuchi, Akira: See—
Kaku, Koichiro; Wada, Nobuhide; Takeuchi, Akira; Toyokawa, Yasufumi; Miyazawa, Takeshige; Yoshida, Ryo; and Sugiyama, Kazuhiko, 5,087,289, Cl. 71-93.000.

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Takeuchi, Hirofumi: See—
Niwa, Toshiyuki; Kawashima, Yoshiaki; Takeuchi, Hirofumi; and Ito, Yoji, 5,087,455, Cl. 424-497.000.

Takeuchi, Koji: See—
Sagawa, Kouichiro; Kitamura, Nobuyoshi; Ueda, Masako; and Takeuchi, Koji, 5,087,517, Cl. 428-329.000.

Takeyama, Takeshi; and Kondo, Mitsuhiro, to Ividen Co., Ltd. Circuit board for mounting electronic components. 5,088,008, Cl. 361-403.000.

Takizawa, Satoshi: See—
Seki, Kazuhiro; Yamaguchi, Yukihiko; Kanda, Minoru; and Takizawa, Satoshi, 5,087,067, Cl. 280-732.000.

Talbot, Charles: See—
Huang, Yuchi; Talbot, Charles; and Henderson, Jeffrey R., 5,086,619, Cl. 62-50.100.

Tallan, Michael L.: See—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukadala, Gaya; Wick, John D.; and Woods, Donald R., 5,088,033, Cl. 395-500.000.

Tam, Simon M.: See—
Holler, Mark A.; and Tam, Simon M., 5,087,826, Cl. 307-201.000.

Tamai, Shoji: See—
Ohta, Masahiro; Kawashima, Saburo; Sonobe, Yoshiho; Tamai, Shoji; Oikawa, Hideaki; and Yamaguchi, Akihiro, 5,087,689, Cl. 528-185.000.

Tamarack Products, Inc.: See—
Steidinger, Donald J., 5,086,683, Cl. 83-674.000.

Tamary, Ernest J.: See—
Aslam, Muhammad; Farnand, Thomas J.; and Tamary, Ernest J., 5,087,536, Cl. 430-13.000.

Tampax Limited: See—
Beastall, Alan L.; and Guest, Malcolm G., 5,087,239, Cl. 604-14.000.

Tamura, Kohji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, to Daikin Industries, Ltd. Refrigerants. 5,087,381, Cl. 252-67.000.

Tanagawa, Kouji; and Yoshida, Tomoaki, to Oki Electric Industry Co., Ltd. Single-chip microcomputer. 5,088,027, Cl. 395-575.000.

Tanahashi, Hiroaki; and Nanno, Takanobu, to Tokai Rubber Industries, Ltd. Fluid-filled cylindrical elastic mount having annular fluid chamber and annular movable member to provide restricted resonance portion. 5,087,021, Cl. 267-140.10C.

Tanaka, Hidekazu: See—
Shimada, Shigeki; Tanaka, Hidekazu; and Nakagawa, Tsunefumi, 5,087,518, Cl. 428-372.000.

Tanaka, Junichi; Furubayashi, Hisatoshi; and Watanabe, Masanori, to Sharp Kabushiki Kaisha. Method for manufacturing a moisture permeable electrode in a moisture sensor. 5,087,480, Cl. 427-79.000.

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Tanaka, Kazuhiko: See—
Yamaguchi, Shinji; Hirakawa, Kiyoshi; Kashima, Seiji; Tanaka, Kazuhiko; Kawamoto, Masao; and Akagi, Takao, 5,087,519, Cl. 428-373.000.

Tanaka, Kohbun; and Tsuge, Hiroshi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Buckle device for seatbelt system. 5,086,548, Cl. 24-632.000.

Tanaka, Koichi: See—
Terada, Kousuke; Mikami, Akiyoshi; Taniguchi, Kouji; Tanaka, Koichi; Yoshida, Masaru; and Nakajima, Shigeo, 5,087,531, Cl. 428-690.000.

Tanaka, Koji; and Shima, Takashi, to Isuzu Motors Limited. Regenerative braking system for car. 5,086,865, Cl. 180-165.000.

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Tanaka, Makoto, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Torque generating device using shape memory alloy. 5,086,618, Cl. 60-527.000.

Tanaka, Minoru: See—
Suzuki, Koji; and Tanaka, Minoru, 5,087,497, Cl. 428-64.000.

Tanaka, Norio; Kakuta, Takuya; Oya, Eiichi; and Baba, Masatoshi, to Nissan Chemical Industries Ltd. Substituted benzenes useful as intermediates. 5,087,724, Cl. 558-425.000.

Tanaka, Shinichi: See—
Ishibashi, Hiromichi; and Tanaka, Shinichi, 5,088,080, Cl. 369-44.260.

Tanaka, Tadaharu: See—
Kuromitsu, Yoshiro; Yoshida, Hideaki; Nagase, Toshiyuki; Tanaka, Tadaharu; and Kanda, Yoshio, 5,087,509, Cl. 428-195.000.

Tanaka, Tadashi: See—
Sooch, Navdeep S.; Scott, Jeffrey W.; and Tanaka, Tadashi, 5,087,914, Cl. 341-120.000.

Tanaka, Tatuo: See—
Narita, Mitsuru; and Tanaka, Tatuo, 5,087,543, Cl. 430-66.000.

Tanaka, Teruo: See—
Ihara, Sigeo; Tanaka, Teruo; Iwasawa, Kyoko; and Hamanaka, Naoki, 5,088,034, Cl. 395-700.000.

Tanaka, Tomoharu: See—
Endoh, Tetsuo; Shiota, Riichiro; Momodomi, Masaki; Tanaka, Tomoharu; Masuoka, Fujio; and Watanabe, Shigeyoshi, 5,088,060, Cl. 365-185.000.

Tanaka, Yasuo: See—
Okamoto, Kenichi; Kita, Hidetoshi; Tanaka, Yasuo; and Iimuro, Shigeru, 5,087,767, Cl. 568-727.000.

Tanaka, Yasuzo: See—
Shiga, Shoji; Uno, Naoki; Tanaka, Yasuzo; Kikuchi, Hiroyuki; and Shiroyama, Katsuke, 5,087,604, Cl. 505-1.000.

Tanda, Akio: See—
Kaneda, Kenichi; and Tanda, Akio, 5,087,963, Cl. 357-73.000.

Tandy Corporation: See—
Clark, Bryan K., 5,088,088, Cl. 369-284.000.

Paquin, Don P., 5,088,087, Cl. 369-283.000.

Tang, Raymond; Lee, Kuan M.; and Chu, Ruey S., to Hughes Aircraft Company. Multi-frequency band phased array antenna using coplanar dipole array with multiple feed ports. 5,087,922, Cl. 343-814.000.

Taniguchi, Kouji: See—
Terada, Kousuke; Mikami, Akiyoshi; Taniguchi, Kouji; Tanaka, Koichi; Yoshida, Masaru; and Nakajima, Shigeo, 5,087,531, Cl. 428-690.000.

Taniguchi, Nobutake: See—
Nishimura, Yukinobu; Shimomura, Setsuhiro; Taniguchi, Nobutake; and Tanimoto, Kouji, 5,086,745, Cl. 123-494.000.

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Tanimoto, Morimasa; Sato, Kaoru; Dosako, Shinichi; and Honda, Yoshihiko, to Snow Brand Milk Products Co., Ltd. Fluidized bed separation and recovery of proteins from fluids in a rotary column. 5,087,369, Cl. 210-635.000.

Tanimura, Nobuyoshi: See—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 5,087,956, Cl. 357-41.000.

Tanner, Werner: See—
Bolli, Peter; Kunz, Philippe; Looser, Heinz; and Tanner, Werner, 5,087,001, Cl. 246-327.000.

Tanuma, Jiro; Ishimizu, Hidesaki; Kasai, Tadashi; and Komori, Chihiro, to Oki Electric Industry Co., Ltd. Method of and device for printer control. 5,087,134, Cl. 400-54.000.

Taranta, Claude: See—
Meinard, Colette; Suglia, Jean-Claude; and Taranta, Claude, 5,087,456, Cl. 424-501.000.

Tasaka, Motoo: See—
Shimura, Ryouchi; Tasaka, Motoo; Hakiri, Minoru; and Ide, Youji, 5,087,527, Cl. 428-488.400.

Tates, Walter D.: See—
Choi, Jae H.; Mottine, John J.; Spazak, Walter J., Sr.; Tate, Walter D.; and Vesperman, William C., 5,087,521, Cl. 428-389.000.

Tausch, Peter J.: See—
Goodman, Ronald D.; and Tausch, Peter J., 5,087,525, Cl. 428-428.000.

Taylor, David L.: See—
Tokas, Edward F.; Vaughn, George D.; Taylor, David L.; and Morgan, Albert W., 5,087,510, Cl. 428-209.000.

Taylor, James M.; Gay, Eric L.; Cowell, Mark J.; and Wirt, David F., to Metcal Inc.; and Minnesota Mining and Manufacturing Company. Thermal atherectomy device. 5,087,256, Cl. 606-28.000.

Taylor, James W.; and Bassett, David R., to Union Carbide Chemicals & Plastics Technology Corporation. Dual-tone photoresist utilizing

diazonaphthoquinone resin and carbodiimide stabilizer. 5,087,547, Cl. 430-169.000.

Taylor, John L.: See—
Gifford, David A.; and Taylor, John L., 5,086,676, Cl. 82-1.110.

Taylor, Roy Y., II, to Eastman Kodak Company. Reflective image display including a first mirror and a Fresnel mirror. 5,087,116, Cl. 359-851.000.

Taylor, Stewart S., to TriQuint Semiconductor, Inc. Electronic circuit including a parallel combination of an E-FET and a D-FET. 5,087,836, Cl. 307-450.000.

Tayon, Jeffrey E.; Stewart, Vernon E.; and Hass, Tave E., to Orscheln Co. Reaction brake system including clip adjusting means. 5,086,662, Cl. 74-501.50R.

Tazawa, Kenji: See—
Horigome, Tomoki; Tazawa, Kenji; and Aoyama, Toshimi, 5,087,552, Cl. 430-280.000.

Teac Corporation: See—
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Tech-Crete Processors Ltd.: See—
Pukas, Paul, 5,086,602, Cl. 52-713.000.

Techstrip Inc.: See—
Pariot, Robert; and Traugott, J. Mortimer, 5,087,799, Cl. 200-61.430.

Teiwes, Henning: See—
Geisbert, Michael; Meiwe, Johannes; Wendel, Friedrich; Dick, Dieter; Teiwes, Henning; and Schellhase, Helmut, 5,087,847, Cl. 310-90.000.

Tektronix, Inc.: See—
Hadwin, Matthew J., 5,087,827, Cl. 307-246.000.

Roy, Joy; and Moore, John S., 5,087,930, Cl. 346-140.00R.

Theus, John G.; and Leachy, Jeffrey L., 5,088,028, Cl. 395-325.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: See—
Bonnerot, Georges; and Bourgeade, Laurent, 5,088,110, Cl. 375-15.000.

Teletronics Pacing Systems, Inc.: See—
Larnard, Donald J.; and Routh, Andre G., 5,086,772, Cl. 128-419.00D.

Telefonaktiebolaget L M Ericsson: See—
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Telemecanique: See—
Laudereau, Guy; Baurand, Gilles; Lubin, Isabelle; Gay, Sylvie; and Berdahl, Jacques, 5,088,000, Cl. 361-103.000.

Temby, Richard D.: See—
Duffy, Douglas C.; and Temby, Richard D., 5,086,944, Cl. 220-658.000.

Ten Eyck, Timothy A., to Texas Instruments Incorporated. Voltage as a function of temperature stabilization circuit and method of operation. 5,087,831, Cl. 307-296.600.

Teng, Clarence W., to Texas Instruments Incorporated. Contact etch process. 5,087,591, Cl. 437-225.000.

Tennant, Brent A.; and Bryson, Terry D., to Eastman Kodak Company. Continuous production of aromatic carboxylic acids. 5,087,741, Cl. 562-414.000.

Terada, Kousuke; Mikami, Akiyoshi; Taniguchi, Kouji; Tanaka, Koichi; Yoshida, Masaru; and Nakajima, Shigeo, to Sharp Kabushiki Kaisha. Electroluminescent device. 5,087,531, Cl. 428-690.000.

Teraoka, Masao: See—
Hirota, Isao; Teraoka, Masao; Kurihara, Sakuo; and Hasegawa, Mitsuru, 5,086,867, Cl. 180-248.000.

Terbrusch, Rosemarie; and Spector, George. Suntan oil applicator. 5,087,138, Cl. 401-206.000.

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Terronics Development Corp.: See—
Escallon, Eduardo C.; Parker, Theodore; and Walters, Steven Y., 5,086,973, Cl. 239-3.000.

Terumo Kabushiki Kaisha: See—
Yashima, Kenichi; Kira, Norisuke; and Minagawa, Yoshinori, 5,086,915, Cl. 206-204.000.

Terwilliger, Donald N., to Harding Brothers, Inc. Tool for installing or removing a collet head. 5,087,059, Cl. 279-1.0ME.

Teshima, Nobue: See—
Kato, Yasuyoshi; Konishi, Kunihiko; Akama, Hiroshi; Matsuda, Toshiaki; and Teshima, Nobue, 5,087,600, Cl. 502-309.000.

Tetenborg, Konrad; to Windmoller & Holscher. Method and an apparatus for producing, filling and sealing bags. 5,086,609, Cl. 53-452.000.

Tetzlaff, William H.: See—
Bozman, GERALD P.; Eisenberger, George; Lett, Alexander S.; Myers, James J.; Tetzlaff, William H.; and Unger, Jay H., 5,088,026, Cl. 395-425.000.

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Texaco Inc.: See—
Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Martin, Bobby R., 5,087,348, Cl. 208-111.000.

Stellaccio, Robert J.; and Dach, Michael M., 5,087,271, Cl. 48-197.00R.

Texas Instruments Incorporated: See—
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Curhan, Jeffrey A., 5,086,747, Cl. 123-549.000.

Eklund, Robert H., 5,087,580, Cl. 437-31.000.

Rodder, Mark S., 5,087,581, Cl. 437-41.000.

Ten Eyck, Timothy A., 5,087,831, Cl. 307-296.600.

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Tomassetti, Stephen R., 5,087,579, Cl. 437-31.000.

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Th. Goldschmidt AG: See—
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Ruf, Erich, 5,087,711, Cl. 556-102.000.
Thacker, Charles P.: See—
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Thompson, James M. Taxidermic eye-mounting method and article. 5,087,204, Cl. 434-296.000.
Thompson, John E.: See—
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Thomson-CSF: See—
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Tippmann, Vincent P.; and Tippmann, Joseph R. Apparatus for heating and cooling food articles. 5,086,693, Cl. 99-333.000.

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- University of Missouri, The Curators of the: See—
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- University of Oklahoma, The Board of Regents of the: See—
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- University of Southern California: See—
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- University of Waterloo: See—
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- University of Wisconsin System on Behalf of University of Wisconsin-Stout, Board of Regents of the: See—
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- Uno, Naoki: See—
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- UOP: See—
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- Upjohn Company, The: See—
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- Ursprung, Karl: See—
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- Urushidani, Shinzo: See—
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- Ushijima, Makoto: See—
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- Uskokovic, Milan R.: See—
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- Usui, Masayoshi; and Washizu, Katsushi, to Usui Kokusai Sangyo Kaisha Ltd. Connector for connecting small diameter pipe. 5,087,083, Cl. 285-286.000.
- Uwagawa, Noriaki: See—
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- Valentine, Howard E., Sr., to Golden Peanut Company, a Georgia General Partnership. Fluidized bed peanut sorter. 5,087,351, Cl. 209-20.000.
- Vallauri, Ubaldo; and Portas, Francesco, to Societa' Cavi Pirelli S.p.A. Expanded elastic sleeve with wound internal support for electric cable joints and sealing ends. 5,087,492, Cl. 428-34.900.
- Vallee, Yannick; and Labat, Yves, to Societe Nationale Elf Aquitaine (Production). Synthesis of vicinal alkanedithiols. 5,087,759, Cl. 568-66.000.
- Van, Kazuo; Katayama, Hiroyuki; Takahashi, Akira; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Optical recording medium and the method of recording, reading, and erasing information using it. 5,088,086, Cl. 369-100.000.
- Van, Kazuo: See—
Hirokane, Junji; Katayama, Hiroyuki; Takahashi, Akira; Inui, Tetsuya; Ohta, Kenji; Washo, Junichi; Miyake, Tomoyuki; Van, Kazuo; and Mieda, Michinobu, 5,087,535, Cl. 430-5.000.
- van Aefforden, Baudouin: See—
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- van Bogaert, Philippe; Bamelis, Jean-Marie; Peeters, Jozef; and Markey, Hugo, to Picanol N.V., naamloze vennootschap. Weft thread supplying device with rotary throttle valve in airjet weaving machines. 5,086,812, Cl. 139-435.200.
- van Buskirk, W. Jeffrey, to WADA Ventures. Fluid flow control system for operating a down-hole tool. 5,086,852, Cl. 175-269.000.
- van Cauter, Gustaaf: See—
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- Van Den Berg, Eduard. Drying/curing apparatus for printing presses. 5,086,700, Cl. 101-424.100.
- van den Bogaart, Francis: See—
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- van der Wilk, Ronald: See—
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- van Haagen, Ernst: See—
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- Van Lengerich, Bernhard: See—
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- Van Maanen, Keith D.; and Baran, Jeffrey K., to General Motors Corporation. Anchor pin for brake band. 5,086,887, Cl. 188-77.00R.
- Van Marcke, Karel C., to International Sanitary Ware Manufacturin Cy, S.A. Body heat responsive control apparatus. 5,086,526, Cl. 4-623.000.
- van Moorsel, Josephus J.: See—
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- VanRens, Russell J.; and Proffitt, Michael A., to Outboard Marine Corporation. Method for manufacturing foam pattern assemblies. 5,086,825, Cl. 164-4.100.
- Van Steenburgh, Leon R., Jr. Refrigerant reclaim apparatus. 5,086,630, Cl. 62-475.000.
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- Varaprath, Padmakumari J.: See—
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- Vargo, Edward J., to Masco Corporation. Carburizing ceramic plates for a faucet valve. 5,087,483, Cl. 427-235.000.
- Vassallo, Charles; and Simon, Jean-Claude, to French State, represented by the Minister of Post, Telecommunications and Space. Laser diode optical amplifier. 5,088,100, Cl. 372-45.000.
- Vaughn, George D.: See—
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- Velasco, Gonzalo: See—
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- Velte, Scott D.: See—
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- Venable, Joseph M.: See—
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- Venkatesan, Thirumalai: See—
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- Ventresque, Claire C.: See—
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- Vercillo, Alfredo J., to General Binding Corporation. Staple based binding system. 5,087,077, Cl. 281-28.000.
- Verkuijlen, Hendrik A.: See—
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- Vernon, Mary K.; and Manber, Udi, to Wisconsin Alumni Research Foundation. Round-robin protocol method for arbitrating access to a shared bus arbitration providing preference to lower priority units after bus access by a higher priority unit. 5,088,024, Cl. 395-725.000.
- Versa-Hoe Sales & Leasing Inc.: See—
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- Verthe, John J. A.; Holtzapple, Gregory M.; and DiRossi, Raymond R., to Goodyear Tire & Rubber Company, The. Rubber blend and tire with tread thereof. 5,087,668, Cl. 525-237.000.
- Verzijl, Dirk: See—
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- Vesperman, William C.: See—
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- Vestman, Lee E.: See—
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- Vetter, Gregory J.; and Tucker, Daniel G., to Truth Division of SPX Corporation. Sash lock. 5,087,087, Cl. 292-48.000.
- Via, Giorgio G.: See—
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- Vianello, Daniele; Kawai, Hiromitsu; Ubezio, Antonio; and Jemma, Orlando, to Whitesun S.p.A. Tanning chair. 5,086,769, Cl. 128-377.000.
- Victor Company of Japan, Ltd.: See—
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- Viemeister, Tucker: See—
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- Viessmann, Hans. Blower-type burner suitable for use with heating boilers employing gas return ducting. 5,087,194, Cl. 431-115.000.
- Villa, Aquilino L. Aquarium filter apparatus. 5,087,357, Cl. 210-169.000.
- Vincenti, Marco: See—
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- Vinciarelli, Patrizio; and Prager, Jay M., to VLT Corporation. Voltage-compliant DC-DC converter module. 5,088,016, Cl. 363-15.000.
- Virginia Polytechnic Institute: See—
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- Virotherm Laboratories Ltd.: See—
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- Viskase Corporation: See—
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- VLSI Technology, Inc.: See—
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- VLT Corporation: See—
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- Voeft-Alpine Stahl Linz Gesellschaft m.b.H.: See—
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- Vogel, Herbert: See—
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- Vogtmann, Hans-Jorg, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 5,086,742, Cl. 123-449.000.
- Volante, Ralph P.; Askin, David; Shinkai, Ichiro; and Ryan, Kenneth M., to Merck & Co., Inc. Process for synthesis of FK-506 intermediates. 5,087,703, Cl. 548-406.000.
- Volchenskova, Ilima I.; Maidanovich, Nadezhda N.; Sudarin, Lev. I.; Samodumova, Inna M.; and Girin, Vitaly N. Derivatives of platinum (II) with polymethylsiloxane, method for preparing same and antitumor agent based thereon. 5,087,712, Cl. 556-137.000.
- Volkswagen AG: See—
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- Volz, Wolfgang: See—
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- von Hatten, Didier, to Societe des Usines Quiri & Cie. Gas compression device having isolated compression and lubrication chambers. 5,086,691, Cl. 92-83.000.
- Vos, Jellard: See—
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- Voss, Peter H.: See—
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- VTC Bipolar Corporation: See—
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- Vukkadala, Gaya: See—
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- Vulpitta, Anthony C.; Dwyer, William P.; and Patrosch, Thomas P., to Olin Corporation. Chemical flow stream separator. 5,086,949, Cl. 222-1.000.
- W&E Umwelttechnik AG: See—
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- W. L. Gore & Associates, Inc.: See—
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- W. R. Grace & Co.-Conn: See—
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- W. Schlafhorst AG & Co.: See—
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- Wada, Glen N.; and Trudel, Murray L., to Intel Corporation. Process for fabricating a contactless floating gate memory array utilizing wordline trench vias. 5,087,584, Cl. 437-43.000.
- Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, to Kyoto University. Porous aluminum oxide film and method of forming of the same. 5,087,330, Cl. 205-75.000.
- Wada, Nobuhide: See—
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- Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, to Shinko Electric Industries Co., Ltd. Automatic bonding tape used in semiconductor device. 5,087,530, Cl. 428-596.000.
- WADA Ventures: See—
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- Wada, Yoshihiro; Suzuki, Kazunori; Kono, Tadashi; and Asano, Katsuo, to Pentel Kabushiki Kaisha. Temporary ink storage member and writing instrument using the same. 5,087,144, Cl. 401-199.000.
- Wagner, John T. Energy storage flywheels using fluid transfer to vary moments of inertia. 5,086,664, Cl. 74-572.000.
- Wainfan, Barnaby, to ACA Industries. Airplane with variable-incidence wing. 5,086,993, Cl. 244-48.000.
- Wakui, Yoshiaki, to Victor Company of Japan, Ltd. Dual toggle mechanism for pressing a thermal printing head against a platen roll in a printer for use with an insertable cassette. 5,087,926, Cl. 346-76.0PH.
- Walde, Robert A.: See—
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- Walentine, Ellis B., to J. O. Furniture Systems Inc. Modular built-in storage wall system. 5,086,593, Cl. 52-36.000.
- Walker, Haywood A., Jr.: See—
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- Wallace, Astor J. Wheelbarrow-trailer implement. 5,087,061, Cl. 280-30.000.
- Wallace, Michael: See—
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- Waller, A. J., Jr. Interlocking wooden mat roadway. 5,087,149, Cl. 404-35.000.
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- Wallman, Lennert K. O. Arrangement for carrying out pressing in eccentric presses. 5,086,639, Cl. 74-455.000.
- Wallner, John P.; and Taggart, Ken B., to TRW Vehicle Safety Systems Inc. Vehicle air bag structure and method of forming. 5,087,071, Cl. 280-743.000.
- Walters, Gregory M. Speaker's prompting podium. 5,087,010, Cl. 248-455.000.
- Walters, Steven Y.: See—
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- Wang, Dazong; and Zahlan, Mazen M., to General Motors Corporation. Engine starting apparatus. 5,086,657, Cl. 74-7.00C.
- Wang, I-Chung W.: See—
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- Wang, John. Dust protector. 5,087,493, Cl. 428-36.900.
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- Ward, John L.: See—
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- Ward, Lacy D., to Ward Products, Inc. Air freshening device. 5,087,273, Cl. 55-279.000.
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- Wardlaw, Stephen C.: See—
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- Ware, Lyle A., to Cardiac Pacemakers, Inc. Tool-less pacemaker lead assembly. 5,086,773, Cl. 128-419.00P.
- Warner, John L., to United Technologies Corporation. Environmental control system condensing cycle. 5,086,622, Cl. 62-88.000.
- Warner-Lambert Company: See—
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- O'Brien, Patrick M.; and Sliskovic, Drago R., 5,087,726, Cl. 560-25.000.
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- Washo, Junichi: See—
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- Watanabe, Hideo; and Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection timing control system for an internal combustion engine with a direct fuel injection system. 5,086,737, Cl. 123-295.000.
- Watanabe, Hidetoshi; Suzuki, Hirotosugu; and Yamamoto, Masanobu, to Sony Corporation. Optical-disk manufacturing device. 5,087,184, Cl. 425-3.000.
- Watanabe, Hiroshi: See—
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- Watanabe, Masanori: See—
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- Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriaki, Noboru, to Showa Denko K.K. Process for production of chlorinated ethylene-propylene copolymers. 5,087,673, Cl. 525-356.000.
- Watanabe, Shigeyoshi: See—
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- Watanabe, Yoshiki: See—
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- Webcraft Technologies, Inc.: See—
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- Weber, Otto; Keck, Volkmar; Grohnert, Siegfried; and Thesenvitz, Manfred, to Volkswagen AG. Cushion bearing for motor vehicles. 5,087,020, Cl. 267-35.000.
- Weber, Ralph A.: See—
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- Webster, John A., Jr. Method for identifying and characterizing organisms. 5,087,558, Cl. 435-5.000.
- Wedellsborg, Bendt W.; and Wedellsborg, Ulrich W. Pressure vessel improvement. 5,087,409, Cl. 376-294.000.
- Wedellsborg, Ulrich W.: See—
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- Wegerer, Johannes; Kandler, Wilhelm; Panzer, Horst; and Buchberger, Karl, to Voest-Alpine Stahl Linz Gassellschaft m.b.H. Method and apparatus for removing filling gases from coke ovens. 5,087,328, Cl. 201-2.000.
- Wegner, Juergen; Dierichs, Wolfgang; Haller, Werner; Jansen, Johannes J.; Capelle, Anthony; Kamminga, Willem; and Gans, Jacobus, to Henkel Kommanditgesellschaft auf Aktien; and Cooperative Verkoop- en Productievereniging van Aardappelmeel en Derivaten "AVEBE" B.A. Process for the production of a dry product suitable as a paste base. 5,087,649, Cl. 524-30.000.
- Wegner, Karl-Heinz: See—
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- Weiler, Rolf; Bach, Uwe; Paschke, Klaus-Dieter; and Roth, Gerald, to Alfred Teves GmbH. Friction lining warning device. 5,087,907, Cl. 340-454.000.
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- Weinwurm, Peter, to Aggio Recovery. Method for producing insoluble industrial raw material from waste. 5,087,375, Cl. 210-688.000.
- Weissman, Irving L.; Spangrude, Gerald J.; Muller-Sieburg, Christa; and Heimfeld, Shelly. Homogeneous mammalian hematopoietic stem cell composition. 5,087,570, Cl. 435-240.100.
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- Welford, Barry: See—
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- Wietek, Bernhard. Sheathing pipe for a steel rod. 5,087,346, Cl. 204-404.000.
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- Wilder, Don: See—
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Vernon, Mary K.; and Manber, Udi, 5,088,024, Cl. 395-725.000.

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Yamazaki, Masanobu: See—
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Sparrow, Tim H.; Harlow, Richard L.; Wilder, Don; and Jackson, Levin, 5,087,404, Cl. 264-219.000.

Yokogawa Electric Corporation: See—
Chiba, Ryuji; Hara, Hitoshi; Yamada, Tomoyuki; and Isozaki, Kenji, 5,087,817, Cl. 250-339.000.

Yokota, Tsuneshi, to Kabushiki Kaisha Toshiba. Optical disk apparatus with shortened access time and rotated method. 5,088,075, Cl. 369-32.000.

Yokoyama, Kazuo: See—
Takayama, Teruyuki; Nagasawa, Hiroki; Aoki, Sumihisa; Tominaga, Haruo; and Yokoyama, Kazuo, 5,087,300, Cl. 148-11.50Q.

Yokoyama, Shinji: See—
Tsuiji, Masahiro; Yokoyama, Shinji; and Tachibana, Yoji, 5,087,709, Cl. 552-541.000.

Yokoyama, Tsunenori; Hashimoto, Koji; and Sato, Koichi, to Toray Industries, Inc. Process for preparing polyester filamentary material. 5,087,401, Cl. 264-130.000.

Yokoyama, Yoshiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Fuel supplying system for gas engine. 5,086,748, Cl. 123-549.000.

Yonemoto, Tadayoshi: See—
Monji, Hideto; Kuribayashi, Kiyoshi; Sunohara, Masaaki; Yonemoto, Tadayoshi; Kawata, Noriyuki; Shioyama, Tadao; and Umetani, Makoto, 5,087,279, Cl. 65-64.000.

Yonkers, Robert A.: See—
McDowell, David E.; and Yonkers, Robert A., 5,086,537, Cl. 15-353.000.

Yoon, Eui-Chang, to Samsung Electronics Co., Ltd. Water supply hose connecting device for washing machine. 5,087,081, Cl. 285-8.000.

York, Danny T.: See—
Garrett, Paul D.; Meyer, Michael R.; and York, Danny T., 5,086,725, Cl. 114-356.000.

York International Corporation: See—
Starnier, Keith E.; and Cromis, Robert A., 5,086,621, Cl. 62-84.000.

Yoshiaki Kawashima: See—
Niwa, Toshiyuki; Kawashima, Yoshiaki; Takeuchi, Hirofumi; and Ito, Yoji, 5,087,455, Cl. 424-497.000.

Yoshida, Hideaki: See—
Kuromitsu, Yoshiro; Yoshida, Hideaki; Nagase, Toshiyuki; Tanaka, Tadaharu; and Kanda, Yoshio, 5,087,509, Cl. 428-195.000.

Yoshida, Kazuo; Okubo, Nobuyuki; Matsuda, Toshiharu; and Konai, Yutaka, to Kureha Kagaku Kogyo K.K. Process for preparing aromatic polycarboxylic acids. 5,087,742, Cl. 562-421.000.

Yoshida Kogyo K. K.: See—
Aoki, Tsunetaka; and Ishii, Susumu, 5,086,546, Cl. 24-429.000.

Yoshida, Masanori: See—
Ogata, Kazutsugu; Seki, Kazuhisa; Kaneko, Kouji; Mikajiri, Satoshi; Kaneko, Kiyotaka; and Yoshida, Masanori, 5,087,936, Cl. 354-430.000.

Yoshida, Masaru: See—
Terada, Kousuke; Mikami, Akiyoshi; Taniguchi, Kouji; Tanaka, Koichi; Yoshida, Masaru; and Nakajima, Shigeo, 5,087,531, Cl. 428-690.000.

Yoshida, Masatoshi: See—
Izubayashi, Masuji; Yoshida, Masatoshi; Matsunaga, Toshiaki; Hori, Kohei; Kikuta, Teruo; Nakano, Shiro; and Hatta, Hidetoshi, 5,087,603, Cl. 503-226.000.

Yoshida, Ryo: See—
Kaku, Koichiro; Wada, Nobuhide; Takeuchi, Akira; Toyokawa, Yasufumi; Miyazawa, Takeshige; Yoshida, Ryo; and Sugiyama, Kazuhiko, 5,087,289, Cl. 71-93.000.

Yoshida, Tomoaki: See—
Tanagawa, Kouji; and Yoshida, Tomoaki, 5,088,027, Cl. 395-575.000.

Yoshida, Toshiya, to Kabushiki Kaisha Toshiba. Branch address calculating system for branch instructions. 5,088,030, Cl. 364-275.000.

- Yoshida, Yasuyuki: See—
Masai, Teruhisa; Shibuta, Takanobu; Yoshida, Yasuyuki; and Suzuki, Yohsuke, 5,087,449, Cl. 424-195.100.
- Yoshiizumi, Kazuya: See—
Morita, Tomonori; Yoshiizumi, Kazuya; Nishimura, Noriyasu; Goto, Katsumi; Sukamoto, Takayuki; and Yoshino, Kohichiro, 5,087,640, Cl. 514-609.000.
- Yoshikawa, Takamasa: See—
Onagi, Nobuaki; Suzuki, Shinichiro; Fujii, Seiro; Kobayashi, Takahiro; Yoshikawa, Takamasa; Yamaguchi, Masayasu; and Ogasawara, Kiyohide, 5,087,340, Cl. 204-192.200.
- Yoshimura, Hiroshi: See—
Fujiwara, Takuji; Ishii, Kozo; and Yoshimura, Hiroshi, 5,086,668, Cl. 74-866.000.
- Yoshinaga, Kenji; Hosaka, Hirochika; and Nakamura, Toshiko, to Mitsubishi Petrochemical Company Limited. Highly water-absorptive powdery polymer composition. 5,087,655, Cl. 524-493.000.
- Yoshinaka, Minoru: See—
Harada, Hiroyuki; Ohkawa, Kenichi; Yamamoto, Masashi; Yoshinaka, Minoru; Yagi, Jun; and Matsuo, Kouziro, 5,087,654, Cl. 524-432.000.
- Okamoto, Yasushi; Kanno, Yoshinori; Matsuo, Kouziro; Yoshinaka, Minoru; and Yagi, Jun, 5,087,655, Cl. 524-432.000.
- Yoshino, Kohichiro: See—
Morita, Tomonori; Yoshiizumi, Kazuya; Nishimura, Noriyasu; Goto, Katsumi; Sukamoto, Takayuki; and Yoshino, Kohichiro, 5,087,640, Cl. 514-609.000.
- Yoshino, Takako: See—
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,087,330, Cl. 205-75.000.
- Yoshino, Takehito: See—
Yamazaki, Koji; Kariya, Toshimitsu; Aoike, Tatsuyuki; Ehara, Toshiyuki; Yoshino, Takehito; and Otoshi, Hirokazu, 5,087,542, Cl. 430-60.000.
- Yoshioka, Masaichiro: See—
Takasaki, Shigeo; Yoshioka, Masaichiro; Kubo, Takashige; Ukai, Yoshio; Kubo, Yasuo; Imura, Jinichi; and Hagiwara, Nobutaka, 5,088,031, Cl. 395-400.000.
- Yoshizawa, Michio; Matsunaga, Tsunebumi; Ebata, Makoto; and Oyama, Yasuo, to Ricoh Company, Ltd.; and Mitsui Engineering & Shipbuilding Co., Ltd. Discharge electrode having a thin wire core and surface coating of amorphous alloy for a discharger. 5,087,856, Cl. 313-631.000.
- Yoshizawa, Sakae: See—
Inagaki, Shinya; Yoshizawa, Sakae; and Sasaki, Kazuya, 5,087,110, Cl. 385-110.000.
- Yu Chou Enterprise Co., Ltd.: See—
Her, Jern-Shong, 5,086,674, Cl. 81-124.400.
- Yu, Michael C.; and Allison, John B., to Phillips Petroleum Company. Modified poly(arylene sulfide) composition with improved impact strength and reduced shrinkage. 5,087,666, Cl. 525-189.000.
- Yu, Xinying: See—
Duan, Youlu; Jin, Shanrong; Huang, Tingchun; Sun, Jin; and Yu, Xinying, 5,087,680, Cl. 526-254.000.
- Yugen Kaisha Works: See—
Sakuma, Shuji; Kanematsu, Seigo; and Kiramatsu, Yasuo, 5,086,563, Cl. 30-260.000.
- Yumoto, Toshiharu: See—
Sakata, Takashi; and Yumoto, Toshiharu, 5,087,971, Cl. 358-160.000.
- Yushin Engineering Corporation: See—
Inoue, Yoshitaka; Sato, Teruo; and Hiromi, Tutomu, 5,087,426, Cl. 422-123.000.
- Zaba, Jerzy M.; and Manning, Howard J., to Domino Printing Sciences PLC. Continuous ink jet printer. 5,087,924, Cl. 346-75.000.
- Zablony, Gordon O.; and Curtis, Robert D., to Unisys Corporation. Method of forming holes in unfired ceramic layers of integrated circuit packages. 5,087,396, Cl. 264-25.000.
- Zahlan, Mazen M.: See—
Wang, Dazong; and Zahlan, Mazen M., 5,086,657, Cl. 74-7.00C.
- Zahnradfabrik Friedrichshafen, AG.: See—
Merz, Johann; Schmid, Josef; and Keicher, Eckard, 5,086,942, Cl. 220-302.000.
- Zahnradfabrik Friedrichshafen, AG.: See—
Elser, Dieter, 5,086,864, Cl. 180-147.000.
- Tischer, Werner, 5,086,863, Cl. 180-140.000.
- Zahuranec, Terry L., to Royal Appliance Mfg. Co. Incremental foot operated height adjuster for upright vacuum cleaner. 5,086,538, Cl. 15-354.000.
- Zenith Electronics Corporation: See—
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 5,087,975, Cl. 358-183.000.
- Zielske, Alfred G., to Clorox Company, The. Acyloxynitrogen peracid precursors. 5,087,385, Cl. 252-186.390.
- Ziemann, Heinz: See—
Gassen, Karl-Rudolf; Bielefeldt, Dietmar; Negele, Michael; and Ziemann, Heinz, 5,087,775, Cl. 568-842.000.
- Ziemelis, Herbert, to Napier Company, The. Box and catch assembly for bracelets, necklaces, etc. 5,086,547, Cl. 24-615.000.
- Zimmer Inc.: See—
Shutt, George V., 5,087,080, Cl. 285-5.000.
- Zimmern, Bernard; and Picouet, Jean L., to Zimmern, Bernard. Casing construction for screw compression/expansion machines. 5,087,182, Cl. 418-195.000.
- Zinser Textilmaschinen GmbH: See—
Gunkinger, Siegfried, 5,086,616, Cl. 57-264.000.
- Zirngibl, Martin, to AT&T Bell Laboratories. Gain stabilized fiber amplifier. 5,088,095, Cl. 372-6.000.
- Zocher, Gunter, to Huels Aktiengesellschaft. Process for the manufacture of ketoximosilanes. 5,087,718, Cl. 556-422.000.
- Zucker, Jerry. Syringe for withdrawal of fluids. 5,086,782, Cl. 128-765.000.
- Zweifel, Martin R.: See—
Burgin, Markus E.; and Zweifel, Martin R., 5,086,715, Cl. 110-342.000.
- 501 Joseph voge AG: See—
Synatschke, Dieter; Sattelberger, Paul; and Saam, Werner, 5,086,877, Cl. 184-7.400.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF FEBRUARY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Banks, Gilbert H., to Tranbrook Pty. Limited. Syringe hypodermic needle. Re. 33,821, Cl. 604-110.000.
- BASF Aktiengesellschaft: See—
Becker, Rainer; and Rohr, Wolfgang, Re. 33,820, Cl. 549-253.000.
- Becker, Rainer; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Preparation of alkoxy maleic anhydrides. Re. 33,820, Cl. 549-253.000.
- Crowther, Russell L., Jr. deceased; Johansson, Eric B.; and Matzner, Bruce, to General Electric Company. Axially shaped channel and integral flow trippers. Re. 33,818, Cl. 376-443.000.
- Eastman Kodak Company: See—
Moore, William H.; Weaver, Max A.; and Lum, Kin K., Re. 33,819, Cl. 503-227.000.
- General Electric Company: See—
Crowther, Russell L., Jr. deceased; Johansson, Eric B.; and Matzner, Bruce, Re. 33,818, Cl. 376-443.000.
- Ikuta, Eishi: See—
Nagasaki, Tatsuo; Taguchi, Koji; Imade, Shinichi; Ikuta, Eishi; and Shionoya, Kazunori, Re. 33,816, Cl. 128-660.070.
- Imade, Shinichi: See—
Nagasaki, Tatsuo; Taguchi, Koji; Imade, Shinichi; Ikuta, Eishi; and Shionoya, Kazunori, Re. 33,816, Cl. 128-660.070.
- Johansson, Eric B.: See—
Crowther, Russell L., Jr. deceased; Johansson, Eric B.; and Matzner, Bruce, Re. 33,818, Cl. 376-443.000.
- Lor-al, Inc.: See—
Tyler, Loren E., Re. 33,817, Cl. 239-167.000.
- Lum, Kin K.: See—
Moore, William H.; Weaver, Max A.; and Lum, Kin K., Re. 33,819, Cl. 503-227.000.
- Matzner, Bruce: See—
Crowther, Russell L., Jr. deceased; Johansson, Eric B.; and Matzner, Bruce, Re. 33,818, Cl. 376-443.000.
- Moore, William H.; Weaver, Max A.; and Lum, Kin K., to Eastman Kodak Company. Magenta dye-donor element used in thermal dye transfer. Re. 33,819, Cl. 503-227.000.
- Nagasaki, Tatsuo; Taguchi, Koji; Imade, Shinichi; Ikuta, Eishi; and Shionoya, Kazunori, to Olympus Optical Co., Ltd. Pulse compression apparatus for ultrasonic image processing. Re. 33,816, Cl. 128-660.070.
- Olympus Optical Co., Ltd.: See—
Nagasaki, Tatsuo; Taguchi, Koji; Imade, Shinichi; Ikuta, Eishi; and Shionoya, Kazunori, Re. 33,816, Cl. 128-660.070.
- Rohr, Wolfgang: See—
Becker, Rainer; and Rohr, Wolfgang, Re. 33,820, Cl. 549-253.000.
- Shionoya, Kazunori: See—
Nagasaki, Tatsuo; Taguchi, Koji; Imade, Shinichi; Ikuta, Eishi; and Shionoya, Kazunori, Re. 33,816, Cl. 128-660.070.
- Taguchi, Koji: See—
Nagasaki, Tatsuo; Taguchi, Koji; Imade, Shinichi; Ikuta, Eishi; and Shionoya, Kazunori, Re. 33,816, Cl. 128-660.070.
- Tranbrook Pty. Limited: See—
Banks, Gilbert H., Re. 33,821, Cl. 604-110.000.
- Tyler, Loren E., to Lor-al, Inc. Apparatus for folding an outboard boom on a liquid spraying implement. Re. 33,817, Cl. 239-167.000.
- Weaver, Max A.: See—
Moore, William H.; Weaver, Max A.; and Lum, Kin K., Re. 33,819, Cl. 503-227.000.

LIST OF DESIGN PATENTEEES

- A. L. Hansen Manufacturing Company: See—
Hansen, William, 323,776, Cl. D8-338.000.
- Addante, James V., to L'Oreal S.A. Combined container and cap. 323,780, 2-11-92, Cl. D9-371.000.
- Aktiebolaget Volvo: See—
Falck, Frans G.; and Malmgren, Håkan, 323,900, Cl. D26-35.000.
- Falck, Frans G.; and Malmgren, Håkan, 323,901, Cl. D26-35.000.
- Alcazar, Bernardino B., to Vicasa, S.A. Rigid plastic joint for vertical walls. 323,896, 2-11-92, Cl. D25-103.000.
- Allen, Christopher M., to Blount, Inc. Attachment for a chain saw. 323,773, 2-11-92, Cl. D8-70.000.
- Alsup, J. Douglas; and Watson, James B., to Ryobi Motor Products Corp. Combined engine housing and handle grip for a hedge trimmer. 323,770, 2-11-92, Cl. D8-8.000.
- Alsup, J. Douglas; and Watson, James B., to Ryobi Motor Products Corp. Combined engine housing and handle grip for a hedge trimmer. 323,771, 2-11-92, Cl. D8-8.000.
- Amemiya, Masatomo: See—
Eguchi, Yoshiaki; and Amemiya, Masatomo, 323,832, Cl. D15-69.000.
- American Recreation Products, Inc.: See—
Cantwell, Robert R., 323,869, Cl. D21-253.000.
- Amway Corporation: See—
Hamly, Robert B.; and Mettler, Mark F., 323,781, Cl. D9-372.000.
- Roberts, Ken; Conklin, Miles; Wolff, Doug; and Salander, Mark T., 323,788, Cl. D10-106.000.
- Anderberg, Nils-Erik, to FMT International Trade Aktiebolag. Underground elevator for airport use or the like. 323,917, 2-11-92, Cl. D34-37.000.
- Andrade, Diane L. Hair fastener. 323,907, 2-11-92, Cl. D28-41.000.
- Antonious, Anthony J. Golf club holder insert for a golf bag. 323,741, 2-11-92, Cl. D3-37.000.
- Apple Computer, Inc.: See—
Ross, Grant D., Jr., 323,809, Cl. D13-103.000.
- Applied Medical Technology, Inc.: See—
Picha, George J.; and Secrest, Dean J., 323,886, Cl. D24-108.000.
- Picha, George J.; and Secrest, Dean J., 323,887, Cl. D24-108.000.
- Arai, Takuya, to Fuji Photo Film Co., Ltd. Disposable camera. 323,842, 2-11-92, Cl. D16-208.000.
- Arai, Takuya, to Fuji Photo Film Co., Ltd. Disposable camera. 323,843, 2-11-92, Cl. D16-208.000.
- Arioka, Tetsuya, to Terumo Kabushiki Kaisha. Blood glucose meter. 323,893, 2-11-92, Cl. D24-169.000.
- Arkel, Stefan, to Neuman, Seth, a part interest. Combined abrasive dental instrument and cap for removing discolorations on teeth. 323,891, 2-11-92, Cl. D24-146.000.
- Asanuma, Toshikazu: See—
Yasuno, Hiroshi; Iyama, Toshihiro; Kabetani, Takaharu; Fujii, Mitsunari; and Asanuma, Toshikazu, 323,825, Cl. D14-126.000.
- ASICS Corporation: See—
Mitsui, Shigeyuki, 323,740, Cl. D2-320.000.
- Atnafu, Yared. Game board. 323,856, 2-11-92, Cl. D21-20.000.
- Aveni, Michael A., to Nike, Inc.; and Nike International Ltd. Side element for a cup-shaped shoe sole. 323,735, 2-11-92, Cl. D2-314.000.
- Barrault, Jean-Louis, to Moulinex (Societe Anonyme). Electric toaster. 323,759, 2-11-92, Cl. D7-330.000.
- Barrault, Jean-Louis, to Moulinex (Societe Anonyme). Electric deep fat fryer. 323,762, 2-11-92, Cl. D7-354.000.
- Barrault, Jean-Louis, to Moulinex (Societe Anonyme). Food processor. 323,763, 2-11-92, Cl. D7-384.000.
- Batts, Inc.: See—
Blanchard, Russell O.; and Mankowski, Michael J., 323,749, Cl. D6-318.000.
- Beauchan, Keith M. Car seat protective cover. 323,757, 2-11-92, Cl. D6-611.000.
- Bernardini, Deborah L.: See—
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 323,732, Cl. D1-106.000.
- Blanchard, Russell O.; and Mankowski, Michael J., to Batts, Inc. Hanger for garment tops or the like. 323,749, 2-11-92, Cl. D6-318.000.
- Blount, Inc.: See—
Allen, Christopher M., 323,773, Cl. D8-70.000.
- Bochek, Dale; and Bochek, Joanne. Game board. 323,857, 2-11-92, Cl. D21-20.000.
- Bochek, Joanne: See—
Bochek, Dale; and Bochek, Joanne, 323,857, Cl. D21-20.000.
- Bombardier Inc.: See—
LaPointe, Y. Anselme, 323,899, Cl. D26-28.000.
- Bouteiller, Christian, to La Telemeccanique Electrique. Thermal relay housing. 323,815, 2-11-92, Cl. D13-159.000.
- Breen, John D., to Rubbermaid Incorporated. Attache case. 323,742, 2-11-92, Cl. D3-73.000.

Brickner, Louis C., to Delta International Machinery Corp. Surface planing machine. 323,833, 2-11-92, Cl. D15-127.000.

Buchin, Karl, to Krone AG. Computer terminal with ergonomic numerical keyboard. 323,816, 2-11-92, Cl. D14-100.000.

Buchin, Karl, to Krone AG. Computer terminal with ergonomic alphanumeric keyboard. 323,817, 2-11-92, Cl. D14-100.000.

Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Necklace. 323,790, 2-11-92, Cl. D11-6.000.

Bullet Golf Ball, Inc.: See—
Dunn, Steven B., 323,911, Cl. D29-22.000.

Buth, Dale D. Floral planter. 323,793, 2-11-92, Cl. D11-149.000.

Cable Electric Products, Inc.: See—
Schwartz, Frederic W., 323,898, Cl. D26-26.000.

Calsonic Corporation: See—
Takematsu, Yoshikazu; and Suzuki, Toshio, 323,882, Cl. D23-325.000.

Camino, Santiago M.; and King, Perry, to Sociedad Estatal para la Exposicion Universal Seville 92, S.A. Exterior lighting fixture. 323,904, 2-11-92, Cl. D26-67.000.

Campagna per le Farmacie in Italia, S.p.A.: See—
Fiocco, Maria G., 323,779, Cl. D9-371.000.

Canon Kabushiki Kaisha: See—
Iimura, Masayuki, 323,819, Cl. D14-107.000.

Cantwell, Robert R., to American Recreation Products, Inc. Tent. 323,869, 2-11-92, Cl. D21-253.000.

Caporale, James J., to Waterbury Companies, Inc. Aerosol dispenser. 323,883, 2-11-92, Cl. D23-366.000.

Carruthers, Cary D.: See—
Hollister, William H.; and Carruthers, Cary D., 323,908, Cl. D29-7.000.

Casale, Linda. Clip-on purse. 323,744, 2-11-92, Cl. D3-106.000.

Casio Computer Co., Ltd.: See—
Ishizaka, Shingo, 323,786, Cl. D10-38.000.

Ceglia, Frank: See—
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 323,732, Cl. D1-106.000.

Century Products Company: See—
Tepper, Sidney; and Sedlack, Mark A., 323,754, Cl. D6-491.000.

Chen, Kuei-Feng, to Wu Feng Metal Industrial Co., Ltd. Barbecue stove. 323,760, 2-11-92, Cl. D7-332.000.

Clarke, William A., to U.S. Design Co. Toy ball. 323,865, 2-11-92, Cl. D21-204.000.

Cohen, Henri; Willemssen, Gertjan R.; and Schoppen, Remco S. Reflector. 323,789, 2-11-92, Cl. D10-111.000.

Collins, Jason H. Umbilical clamp. 323,890, 2-11-92, Cl. D24-143.000.

Compagnia Nazionale S.p.A.: See—
Margaritelli, Enrico, 323,783, Cl. D10-32.000.

Compton, Wayne W., to Kim Lighting, Inc. Luminaire. 323,897, 2-11-92, Cl. D26-24.000.

Conklin, Miles: See—
Roberts, Ken; Conklin, Miles; Wolff, Doug; and Salander, Mark T., 323,788, Cl. D10-106.000.

Cooper, Gary N. Noisemaker. 323,861, 2-11-92, Cl. D21-64.000.

Cooper Industries, Inc.: See—
von Kluck, Kevin, 323,905, Cl. D26-85.000.

Corthum, Victoria A. Serving platter. 323,765, 2-11-92, Cl. D7-556.000.

Cox, Larry D. Oil and gas mixing funnel. 323,839, 2-11-92, Cl. D15-150.000.

CPC International Inc.: See—
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 323,732, Cl. D1-106.000.

Crump, Robert L.; and Schad, Herbert H., to Goodyear Tire & Rubber Company. Tire tread and buttress. 323,800, 2-11-92, Cl. D12-146.000.

Culter, Stanley: See—
Cutler, Burton; and Culter, Stanley, 323,860, Cl. D21-59.000.

Cutler, Burton; and Culter, Stanley. Educational game board. 323,860, 2-11-92, Cl. D21-59.000.

Dalland, Todd. Tent. 323,868, 2-11-92, Cl. D21-253.000.

David Chabbot, Inc.: See—
Disegna, Giuseppe, 323,791, Cl. D11-14.000.

Day Shades U.S.A. Inc.: See—
Jones, Craig T.; Vaughan, David M.; and Sachett, Brett J., 323,840, Cl. D16-102.000.

Delhaes, Jose: See—
Haug, Andreas; Schonherr, Thomas W.; and Delhaes, Jose, 323,877, Cl. D23-238.000.

Delmerico, Paul E., to Rubbermaid Commercial Products Inc. Wheeled refuse container. 323,912, 2-11-92, Cl. D34-5.000.

Delta International Machinery Corp.: See—
Brickner, Louis C., 323,833, Cl. D15-127.000.

DeLucenay, Richard M.: See—
Ernsberger, Ronald E.; and DeLucenay, Richard M., 323,913, Cl. D34-5.000.

DeSantis, Albert. Underwater vehicle. 323,808, 2-11-92, Cl. D12-308.000.

Dewall, Terry L. Back support vest. 323,909, 2-11-92, Cl. D24-190.000.

Dickson, Raymond A., Jr.: See—
Sauter, Bruce M.; and Dickson, Raymond A., Jr., 323,878, Cl. D23-290.000.

Disegna, Giuseppe, to David Chabbot, Inc. Jewelry chain. 323,791, 2-11-92, Cl. D11-14.000.

DiSessa, Vincent; and Marhefka, Matthew D., to Unisys Corporation. Computer carrying case. 323,743, 2-11-92, Cl. D3-74.000.

Distant, Hope M. Combined box and greeting card. 323,851, 2-11-92, Cl. D19-2.000.

Dixon, Alan E.: See—
Gauldfeldt, David M.; and Dixon, Alan E., 323,820, Cl. D14-109.000.

Doi, Tetsuyuki: See—
Kitamura, Yusaku; and Doi, Tetsuyuki, 323,844, Cl. D18-53.000.

Doxey, Andre G.; and Hradisky, John L., to Rubbermaid Incorporated. Rectangular refuse container. 323,914, 2-11-92, Cl. D34-5.000.

Dunn, Edward C., Jr.: See—
Dunn, Edward G., Sr.; and Dunn, Edward C., Jr., 323,864, Cl. D21-201.000.

Dunn, Edward G., Sr.; and Dunn, Edward C., Jr., to Dunn-Rite Products, Inc. Poolside basketball goal. 323,864, 2-11-92, Cl. D21-201.000.

Dunn-Rite Products, Inc.: See—
Dunn, Edward G., Sr.; and Dunn, Edward C., Jr., 323,864, Cl. D21-201.000.

Dunn, Steven B., to Bullet Golf Ball, Inc. Golf glove. 323,911, 2-11-92, Cl. D29-22.000.

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- Danziger, Micha. Aster plant named Dark Pink Star. 7,786, 2-11-92, Cl. 68.000.
- Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Charade. 7,787, 2-11-92, Cl. 68.000.
- Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Ambrosia. 7,788, 2-11-92, Cl. 68.000.
- Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Innocence. 7,789, 2-11-92, Cl. 68.000.
- Meilland, Alain A., to Conard-Pyle Company, The. Rose plant—Meipitac variety. 7,783, 2-11-92, Cl. 1.000.
- Meilland, Alain A., to Conard-Pyle Company, The. Rose plant—Meicijas variety. 7,784, 2-11-92, Cl. 15.000.
- Meilland, Alain A., to Conard-Pyle Company, The. Rose plant—Meikiji variety. 7,785, 2-11-92, Cl. 22.000.
- Mikkelsen, Inc.: See—
Drewlow, Lyndon W., 7,787, Cl. 68.000.
Drewlow, Lyndon W., 7,788, Cl. 68.000.
Drewlow, Lyndon W., 7,789, Cl. 68.000.
- VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Cream Frolic. 7,790, 2-11-92, Cl. 78.000.
- Yoder Brothers, Inc.: See—
VandenBerg, Cornelis P., 7,790, Cl. 78.000.

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CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 11, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	70.08	5,086,579	171	5,087,280	83	5,086,691	21	5,086,751	CLASS 148			
2	5,086,514	CLASS 43	290	5,087,281	CLASS 99		CLASS 126	2	5,087,297			
8	5,086,515	21.2	5,086,580	CLASS 70	333	5,086,693	9 R	5,086,752	11.5 F	5,087,298		
104	5,086,517	26.1	5,086,581	366	5,086,631	443 C	5,086,694	41 R	5,086,753	11.5 P	5,087,299	
108	5,086,516	CLASS 44	375	5,086,632	CLASS 101		5,086,754	110 R	5,086,754	11.5 Q	5,087,300	
239	5,086,518	302	5,087,267	CLASS 71	129	5,086,695	CLASS 127		12.7 A	5,087,301		
408	5,086,519	312	5,087,268	72	5,087,282	148	5,086,696	39	5,087,478	103	5,087,302	
424	5,086,520	626	5,087,269	90	5,087,284	336	5,086,697	CLASS 128		276	5,087,303	
CLASS 4		CLASS 47		93	5,087,289	409	5,086,698	33	5,086,755	406	5,087,304	
234	5,086,521	1.7	5,086,582	CLASS 72	425	5,086,701	415.1	5,086,699	66	5,086,756	410	5,087,305
251	5,086,523	40.5	5,086,583	24	5,086,633	CLASS 102	424.1	5,086,700	200.21	5,086,765	CLASS 152	
295	5,086,522	57.5	5,086,584	161	5,086,634	275.5	5,086,702	203.27	5,086,766	251	5,086,815	
415	5,086,524	64	5,086,585	176	5,086,635	439	5,086,703	205.18	5,086,767	410	5,086,821	
498	5,086,525	CLASS 48		296	5,086,636	CLASS 104		205.24	5,086,768	CLASS 156		
623	5,086,526	127.9	5,087,270	302	5,086,637	44	5,086,704	377	5,086,769	73.5	5,087,306	
CLASS 5		197 R	5,087,271	451	5,086,638	CLASS 105		395	5,086,770	154	5,087,307	
136	5,086,527	CLASS 49		CLASS 73		30	5,086,705	400	5,086,771	158	5,087,308	
451	5,086,528	211	5,086,586	1 D	5,086,641	30	5,086,705	419 D	5,086,772	198	5,087,309	
465	5,086,529	395	5,086,587	1 G	5,086,642	168	5,086,706	419 PG	5,086,773	202	5,087,310	
484	5,086,530	441	5,086,588	38	5,086,643	199.3	5,086,707	660.01	5,086,774	212	5,087,311	
493	5,086,531	502	5,086,589	49.2	5,086,644	207	5,086,708	660.07	5,086,775	271	5,087,313	
CLASS 8		CLASS 51		65	5,086,646	282.1	5,086,709	661.09	5,086,776	330	5,087,314	
109	5,087,266	165.71	5,086,590	117	5,086,647	CLASS 106		675	5,086,777	344	5,087,315	
CLASS 10		291	5,086,591	118.1	5,086,648	21	5,087,283	696	5,086,778	396	5,087,316	
86 A	5,086,532	CLASS 52		151	5,086,645	38.22	5,087,285	733	5,086,779	456	5,087,317	
CLASS 15		36	5,086,593	204.21	5,086,650	287.16	5,087,286	734	5,086,781	540	5,087,318	
103	5,086,533	169.5	5,086,594	661	5,086,651	677	5,087,287	763	5,086,782	555	5,087,319	
250.2	5,086,534	183	5,086,595	763	5,086,652	CLASS 108		765	5,086,783	580.2	5,087,320	
319	5,086,535	204	5,086,596	767	5,086,653	4	5,086,710	771	5,086,784	608	5,087,321	
328	5,086,536	239	5,086,597	835	5,086,654	50	5,086,712	782	5,086,785	628	5,087,322	
353	5,086,537	288	5,086,598	861.58	5,086,655	119	5,086,711	783	5,086,786	646	5,087,323	
354	5,086,538	309.9	5,086,599	861.61	5,086,655	CLASS 110		800	5,086,788	CLASS 160		
384	5,086,539	594	5,086,600	862.54	5,086,656	234	5,086,720	866	5,086,789	236	5,086,822	
CLASS 16		656	5,086,601	CLASS 74		250	5,086,713	CLASS 131		238	5,086,823	
87.4 R	5,086,540	713	5,086,602	7 C	5,086,657	281	5,086,714	96	5,086,790	111	5,087,324	
227	5,086,541	718.1	5,086,603	7 E	5,086,658	342	5,086,715	CLASS 132		193	5,087,325	
CLASS 19		741	5,086,604	411.5	5,086,659	345	5,086,716	200	5,086,791	244	5,087,326	
0.25	5,086,542	745	5,086,605	446	5,086,660	346	5,086,717	218	5,086,793	358	5,087,327	
CLASS 24		794	5,086,606	455	5,086,661	CLASS 112		323	5,086,792	CLASS 164		
16 PB	5,086,543	CLASS 53		493	5,086,662	225	5,086,718	CLASS 134		4.1	5,086,824	
67 R	5,086,545	64	5,086,607	501.5 R	5,086,662	225	5,086,718	22.1	5,087,294	417	5,086,826	
429	5,086,546	443	5,086,608	512	5,086,663	CLASS 114		26	5,087,295	452	5,086,827	
615	5,086,547	452	5,086,609	572	5,086,664	61	5,086,721	56 R	5,087,295	CLASS 165		
632	5,086,548	587	5,086,610	856	5,086,665	74 R	5,086,722	166 R	5,086,795	1	5,086,828	
CLASS 29		CLASS 54		857	5,086,666	78	5,086,723	182	5,086,796	12	5,086,829	
23.35	5,086,549	24	5,086,611	860	5,086,667	301	5,086,724	CLASS 135		16	5,086,830	
163.8	5,086,550	78	5,086,612	866	5,086,668	356	5,086,725	20.1	5,086,797	47	5,086,831	
243.523	5,086,551	CLASS 55		867	5,086,671	CLASS 116		67	5,086,798	76	5,086,832	
403.1	5,086,552	96	5,087,272	868	5,086,672	137 R	5,086,726	90	5,086,799	95	5,086,833	
603	5,086,553	279	5,087,273	CLASS 75		324	5,086,727	CLASS 136		135	5,086,834	
605	5,086,554	300	5,087,274	303	5,087,290	653	5,086,728	225	5,087,312	144	5,086,835	
714	5,086,555	386	5,087,275	581	5,087,291	CLASS 118		258	5,087,296	164	5,086,836	
740	5,086,556	681	5,087,292	771	5,087,293	CLASS 119		CLASS 137		170	5,086,837	
832	5,086,557	CLASS 56		CLASS 81		52.3	5,086,730	1	5,086,800	CLASS 166		
834	5,086,558	10.9	5,086,613	3.29	5,086,675	CLASS 122		12	5,086,801	55.6	5,086,838	
898.061	5,086,559	17.2	5,086,614	59.1	5,086,673	31.1	5,086,731	68.1	5,086,802	138	5,086,839	
CLASS 30		CLASS 57		124.4	5,086,674	CLASS 123		270	5,086,803	294	5,086,840	
1	5,086,561	120	5,086,615	CLASS 82		18 R	5,086,732	312	5,086,804	295	5,086,841	
162	5,086,562	264	5,086,616	1.11	5,086,676	41.84	5,086,733	341	5,086,805	312	5,086,842	
260	5,086,563	CLASS 60		92	5,086,677	65 P	5,086,734	486	5,086,806	380	5,086,843	
CLASS 33		39.281	5,086,617	CLASS 83		65 VD	5,086,735	505.11	5,086,807	382	5,086,845	
1 AA	5,086,565	527	5,086,618	13	5,086,678	193.6	5,086,736	625.3	5,086,808	383	5,086,844	
1 M	5,086,564	CLASS 62		24	5,086,679	CLASS 138		CLASS 139		CLASS 169		
247	5,086,566	50.1	5,086,619	167	5,086,680	99	5,086,809	1 C	5,086,810	15	5,086,846	
265	5,086,567	382	5,086,620	277	5,086,681	CLASS 141		91	5,086,811	CLASS 172		
275 G	5,086,568	795	5,086,684	361	5,086,739	435.2	5,086,812	435.2	5,086,812	466	5,086,847	
549	5,086,569	CLASS 64		419	5,086,741	CLASS 144		CLASS 145		CLASS 173		
CLASS 34		50.1	5,086,624	449	5,086,742	1	5,086,813	1	5,086,813	1	5,086,848	
1 L	5,086,570	84	5,086,621	468	5,086,743	65	5,086,814	83	5,086,816	126	5,086,849	
117	5,086,571	114	5,086,623	480	5,086,744	271	5,086,817	358	5,086,818	CLASS 174		
CLASS 36		160	5,086,624	494	5,086,745	CLASS 146		CLASS 147		52.1	5,087,794	
3 R	5,086,572	172	5,086,625	533	5,086,746	1	5,086,813	2 Z	5,086,819	65 SS	5,087,795	
35 R	5,086,574	184	5,086,626	549	5,086,747	83	5,086,816	193 A	5,086,820	67	5,087,796	
117	5,086,575	229	5,086,627	CLASS 91		271	5,086,817	CLASS 148		CLASS 175		
131	5,086,576	244	5,086,628	375 A	5,086,687	358	5,086,818	CLASS 149		61	5,086,850	
CLASS 40		259.3	5,086,629	440	5,086,688	CLASS 150		CLASS 151		101	5,086,851	
334	5,086,577	475	5,086,630	499	5,086,689	CLASS 152		CLASS 153		269	5,086,852	
CLASS 42		64	5,087,279	CLASS 92		13.01	5,086,750	CLASS 154		297	5,086,853	
69.02	5,086,578	48	5,086,690	CLASS 93		13.01	5,086,750	CLASS 155		320	5,086,854	

CLASS 177	210	5,087,342	322	5,086,953	572	5,087,822	772	5,087,072	5,087,868			
5	5,086,855	242	5,087,343	402.11	5,086,954	573	5,087,823	5,087,073	CLASS 322			
161	5,086,856	256	5,087,344	402.150	5,086,955			5,087,074	15	5,087,869		
CLASS 180	404	5,087,345	472	5,086,956	129.15	5,087,016	788	5,087,075	CLASS 323			
53.4	5,086,857	5,087,346	607	5,086,957	175	5,087,017	806	5,087,076	276	5,087,870		
68.3	5,086,858	CLASS 205	114	5,086,959	245	5,087,018	819	5,087,077	299	5,087,871		
68.5	5,086,860	75	5,087,330	CLASS 223	31	5,087,078	28	5,087,078	340	5,087,872		
79.1	5,086,859	118	5,087,331	42.42	5,086,958	67	5,087,381	CLASS 281	71.2	5,087,873		
CLASS 180	5,086,861	135	5,087,332	277	5,086,960	73	5,087,382	CLASS 285	73.1	5,087,874		
132	5,086,862	138	5,087,333	1	5,086,961	154	5,087,386	5	5,087,080	157	5,087,875	
140	5,086,863	CLASS 206	5.1	5,086,913	171	5,087,383	8	5,087,081	94	5,087,876		
147	5,086,864	63.3	5,086,914	93	5,086,962	182.14	5,087,384	286	5,087,083	158 D	5,087,877	
165	5,086,865	204	5,086,915	1	5,086,961	186.39	5,087,385	319	5,087,084	158 F	5,087,878	
219	5,086,866	209.1	5,086,916	17	5,086,963	299.5	5,087,387	328	5,087,085	207.25	5,087,879	
248	5,086,867	216	5,086,917	108	5,086,964	301.17	5,087,388	361	5,087,086	309	5,087,880	
287	5,086,868	250	5,086,918	CLASS 227	100	5,087,019	408.1	5,087,882	378	5,087,881		
329	5,086,869	303	5,086,919	8	5,086,965	CLASS 228	587	5,087,883	388	5,087,882		
333	5,086,870	335	5,086,920	56.3	5,086,967	CLASS 254	122	5,087,391	443	5,087,883		
CLASS 181	145	338	5,086,921	119	5,086,968	CLASS 261	122	5,087,391	523	5,087,884		
CLASS 182	18	344	5,086,922	189	5,086,969	CLASS 264	2.7	5,087,392	547	5,087,885		
5,086,871	497	542	5,086,923	208	5,086,966	CLASS 266	3.2	5,087,393	696	5,087,886		
5,086,872	597	597	5,086,924	CLASS 208	84	5,086,970	22	5,087,395	CLASS 328	233	5,087,887	
5,086,873	CLASS 184	111	5,086,925	56.3	5,086,971	CLASS 229	25	5,087,396	CLASS 330	65	5,087,888	
5,086,874	55.2	111	5,086,926	188	5,086,972	CLASS 239	32	5,087,397	253	5,087,889		
5,086,875	CLASS 186	123	5,086,927	217	5,086,973	CLASS 249	40.5	5,087,398	259	5,087,890		
5,086,876	61	20	5,086,928	5,087,350	CLASS 259	115	5,087,399	62	5,087,399	288	5,087,891	
CLASS 187	170	170	5,086,929	5,087,351	CLASS 269	130	5,087,400	115	5,087,400	296	5,087,892	
1 R	5,086,880	698	5,086,930	5,086,929	CLASS 279	157	5,087,401	130	5,087,401	CLASS 331	66	5,087,894
17	5,086,881	108	5,086,931	5,086,930	CLASS 289	219	5,087,402	157	5,087,402	99	5,087,895	
95	5,086,882	136	5,086,932	5,086,931	CLASS 299	255	5,087,403	140.1 C	5,087,403	117 R	5,087,896	
127	5,086,883	143	5,086,933	5,087,353	CLASS 309	255	5,087,404	219	5,087,404	CLASS 333	24	5,087,898
71.9	5,086,884	169	5,086,934	5,087,354	CLASS 319	255	5,087,405	512	5,087,406	81 R	5,087,899	
73.44	5,086,885	195.1	5,086,935	5,087,355	CLASS 329	255	5,087,406	35	5,087,406	100	5,087,900	
77 R	5,086,887	198.2	5,086,936	5,087,356	CLASS 339	255	5,087,407	140.1 C	5,087,407	193	5,087,901	
CLASS 190	293	328	5,086,937	5,087,357	CLASS 349	255	5,087,408	219	5,087,408	219.1	5,087,902	
107	5,086,888	390	5,086,938	5,087,358	CLASS 359	255	5,087,409	39	5,087,409	CLASS 335	128	5,087,903
CLASS 191	66	390	5,086,939	5,087,359	CLASS 369	255	5,087,410	39	5,087,410	CLASS 338	335	5,087,904
5,087,797	CLASS 192	500.39	5,086,940	5,087,360	CLASS 379	255	5,087,411	39 R	5,087,411	CLASS 340	311.1	5,087,905
5,087,798	0.076	635	5,086,941	5,087,361	CLASS 389	255	5,087,412	132 EA	5,087,412	CLASS 341	95	5,087,913
5,087,799	1.44	638	5,086,942	5,087,362	CLASS 399	255	5,087,413	201	5,087,413	CLASS 342	120	5,087,914
5,087,800	1.56	643	5,086,943	5,087,363	CLASS 409	255	5,087,414	246	5,087,414	CLASS 343	155	5,087,915
5,087,801	3.29	643	5,086,944	5,087,364	CLASS 419	255	5,087,415	269	5,087,415	CLASS 344	64	5,087,916
5,087,802	4 A	643	5,086,945	5,087,365	CLASS 429	255	5,087,416	296.6	5,087,416	CLASS 345	84	5,087,917
5,087,803	48.91	643	5,086,946	5,087,366	CLASS 439	255	5,087,417	450	5,087,417	CLASS 346	85	5,087,918
5,087,804	53 E	643	5,086,947	5,087,367	CLASS 449	255	5,087,418	450	5,087,418	CLASS 347	357	5,087,919
5,087,805	70.12	643	5,086,948	5,087,368	CLASS 459	255	5,087,419	455	5,087,419	CLASS 348	711	5,087,920
5,087,806	88 B	643	5,086,949	5,087,369	CLASS 469	255	5,087,420	465	5,087,420	CLASS 349	825.05	5,087,921
5,087,807	142 R	643	5,086,950	5,087,370	CLASS 479	255	5,087,421	475	5,087,421	870.390	5,087,922	
5,087,808	150	643	5,086,951	5,087,371	CLASS 489	255	5,087,422	603	5,087,422	CLASS 351	95	5,087,923
5,087,809	CLASS 193	17	5,086,952	5,087,372	CLASS 499	255	5,087,423	607	5,087,423	CLASS 352	120	5,087,924
5,087,810	25 C	32	5,086,953	5,087,373	CLASS 509	255	5,087,424	77	5,087,424	CLASS 353	155	5,087,925
5,087,811	35 A	40	5,086,954	5,087,374	CLASS 519	255	5,087,425	12	5,087,425	CLASS 354	64	5,087,926
5,087,812	CLASS 194	41	5,086,955	5,087,375	CLASS 529	255	5,087,426	77	5,087,426	CLASS 355	84	5,087,927
5,087,813	346.1	45	5,086,956	5,087,376	CLASS 539	255	5,087,427	87	5,087,427	CLASS 356	85	5,087,928
5,087,814	365	103	5,086,957	5,087,377	CLASS 549	255	5,087,428	90	5,087,428	CLASS 357	357	5,087,929
5,087,815	372	126	5,086,958	5,087,378	CLASS 559	255	5,087,429	216	5,087,429	CLASS 358	700 MS	5,087,930
5,087,816	468.6	205.8	5,086,959	5,087,379	CLASS 569	255	5,087,430	316	5,087,430	CLASS 359	771	5,087,931
5,087,817	534	214	5,086,960	5,087,380	CLASS 579	255	5,087,431	323	5,087,431	CLASS 360	814	5,087,932
5,087,818	572	215	5,086,961	5,087,381	CLASS 589	255	5,087,432	475	5,087,432	CLASS 361	771	5,087,933
5,087,819	632	216	5,086,962	5,087,382	CLASS 599	255	5,087,433	603	5,087,433	CLASS 362	771	5,087,934
5,087,820	776	217	5,086,963	5,087,383	CLASS 609	255	5,087,434	607	5,087,434	CLASS 363	771	5,087,935
5,087,821	CLASS 195	10.43	5,086,964	5,087,384	CLASS 619	255	5,087,435	77	5,087,435	CLASS 364	771	5,087,936
5,087,822	5 A	121.71	5,086,965	5,087,385	CLASS 629	255	5,087,436	12	5,087,436	CLASS 365	771	5,087,937
5,087,823	61.43	451	5,086,966	5,087,386	CLASS 639	255	5,087,437	12	5,087,437	CLASS 366	771	5,087,938
5,087,824	83 C	508	5,086,967	5,087,387	CLASS 649	255	5,087,438	77	5,087,438	CLASS 367	771	5,087,939
5,087,825	84 R	508	5,086,968	5,087,388	CLASS 659	255	5,087,439	87	5,087,439	CLASS 368	771	5,087,940
5,087,826	343	508	5,086,969	5,087,389	CLASS 669	255	5,087,440	90	5,087,440	CLASS 369	771	5,087,941
5,087,827	526	508	5,086,970	5,087,390	CLASS 679	255	5,087,441	216	5,087,441	CLASS 370	771	5,087,942
5,087,828	CLASS 201	214	5,086,971	5,087,391	CLASS 689	255	5,087,442	316	5,087,442	CLASS 371	771	5,087,943
5,087,829	2	254	5,086,972	5,087,392	CLASS 699	255	5,087,443	323	5,087,443	CLASS 372	771	5,087,944
5,087,830	67	302	5,086,973	5,087,393	CLASS 709	255	5,087,444	475 HC	5,087,444	CLASS 373	771	5,087,945
5,087,831	CLASS 203	374	5,086,974	5,087,394	CLASS 719	255	5,087,445	631	5,087,445	CLASS 374	771	5,087,946
5,087,832	534	658	5,086,975	5,087,395	CLASS 729	255	5,087,446	43	5,087,446	CLASS 375	771	5,087,947
5,087,833	22	45	5,086,976	5,087,396	CLASS 739	255	5,087,447	405	5,087,447	CLASS 376	771	5,087,948
5,087,834	95	72	5,086,977	5,087,397	CLASS 749	255	5,087,448	477 HC	5,087,448	CLASS 377	771	5,087,949
5,087,835	128	185	5,086,978	5,087,398	CLASS 759	255	5,087,449	631	5,087,449	CLASS 378	771	5,087,950
5,087,836	155	185	5,086,979	5,087,399	CLASS 769	255	5,087,450	43	5,087,450	CLASS 379	771	5,087,951
5,087,837	182 B	1	5,086,980	5,087,400	CLASS 779	255	5,087,451	477 HC	5,087,451	CLASS 380	771	5,087,952
5,087,838	182.1	88	5,086,981	5,087,401	CLASS 789	255	5,087,452	631	5,087,452	CLASS 381	771	5,087,953
5,087,83												

204	5,087,940	56	5,088,018	CLASS 384	12	5,087,129	1	5,087,178	366	5,087,487	212	5,087,569
	5,087,941	69	5,088,019		15	5,087,130	47	5,087,179	31	5,087,488	240.1	5,087,570
214	5,087,942			CLASS 364	208	5,087,131	152	5,087,180	34	5,087,489	240.2	5,087,571
225	5,087,943	160	5,088,020		276	5,087,132	178	5,087,181	34.1	5,087,490		5,087,572
272	5,087,944	187	5,088,021		549	5,087,133	195	5,087,182	34.5	5,087,491	CLASS 436	5,087,573
285	5,087,945	275	5,088,030				265	5,087,183	34.9	5,087,492		5,087,574
290	5,087,946	413.01	5,088,037	CLASS 385	27				36.9	5,087,494	120	5,087,575
	5,087,947	419	5,088,038		34	5,087,108	9	5,087,413	46	5,087,495	164	
			5,088,039		110	5,087,110			63	5,087,496	CLASS 437	
1	5,087,119	424.05	5,088,040	CLASS 395	43		43	5,087,414	64	5,087,497	22	5,087,576
36	5,087,120	426.01	5,088,041		95	5,088,048	95	5,087,415	76	5,087,498	29	5,087,577
73	5,087,121		5,088,042		489	5,087,416		5,087,416	116	5,087,499	31	5,087,578
73.1	5,087,122	426.04	5,088,043		11	5,088,049			141	5,087,500		5,087,579
307	5,087,123	431.08	5,088,044		23	5,088,051			156	5,087,501	41	5,087,580
358	5,087,124	468	5,088,045		117	5,088,054			162	5,087,502		5,087,581
375	5,087,125	474.03	5,088,046		121	5,088,055			167	5,087,503	43	5,087,582
402	5,087,126	474.24	5,088,047		142	5,088,056	1	5,087,417	162	5,087,504		5,087,583
		500	5,088,058		156	5,088,052	23	5,087,418	167	5,087,505		5,087,584
16	5,087,948	560	5,088,055		168	5,088,053	28	5,087,419	192	5,087,506	51	5,087,585
17	5,087,949	569	5,088,056		200	5,088,032	37	5,087,420	194	5,087,507	72	5,087,586
22	5,087,950	703	5,088,057		275	5,088,025	56	5,087,421	195	5,087,508	129	5,087,587
23.6	5,087,951			CLASS 365	325	5,088,029	61	5,087,422		5,087,509	191	5,087,588
25	5,087,952					5,088,022	67	5,087,423	209	5,087,510	195	5,087,589
40	5,087,953	8	5,088,059		375	5,088,028	68.1	5,087,424	218	5,087,511	209	5,087,590
41	5,087,954	185	5,088,060		400	5,088,035	81	5,087,425	266	5,087,512	225	5,087,591
	5,087,955	189.01	5,088,061		375	5,088,031	123	5,087,426	283	5,087,513	CLASS 439	
	5,087,956	189.05	5,088,062		425	5,088,023	144	5,087,427	315.5	5,087,514	92	5,087,206
42	5,087,957	201	5,088,063		425	5,088,026	186.07	5,087,428	323	5,087,515	215	5,087,207
51	5,087,958	207	5,088,064		500	5,088,036	249	5,087,429	329	5,087,516	224	5,087,208
54	5,087,959	208	5,088,065		575	5,088,027			373	5,087,517	320	5,087,209
69	5,087,961	230.06	5,088,066		700	5,088,034	239	5,087,430	373	5,087,518	425	5,087,210
70	5,087,962			CLASS 366	725	5,088,024			389	5,087,519	579	5,087,211
73	5,087,963	27	5,087,127				240 R	5,087,431		5,087,520	620	5,087,212
74	5,087,964	141	5,087,128				346	5,087,432		5,087,521	672	5,087,213
				CLASS 400	54	5,087,134	446	5,087,433	402	5,087,522	762	5,087,214
22	5,087,965			CLASS 367	56	5,087,135		5,087,434	404	5,087,523		
27	5,087,966	4	5,088,067		214	5,087,136	461	5,087,435	412	5,087,524	CLASS 440	
41	5,087,967	173	5,088,068		249	5,087,137	598	5,087,436	428	5,087,525	6	5,087,215
75	5,087,968			CLASS 368	352	5,087,141		5,087,437	488.4	5,087,526		
103	5,087,969				616	5,087,142			542.4	5,087,527	CLASS 441	
141	5,087,970	10	5,088,069				9	5,087,438	552	5,087,528	26	5,087,216
160	5,087,971		5,088,070					5,087,439	596	5,087,529	61	5,087,217
166	5,087,972		5,088,071					5,087,440	690	5,087,530	CLASS 445	
167	5,087,973	69	5,088,072		146	5,087,143	10	5,087,441	694	5,087,531		
180	5,087,974	90	5,088,073		199	5,087,144	44	5,087,442		5,087,532	27	5,087,218
183	5,087,975			CLASS 369	206	5,087,139	47	5,087,443			CLASS 446	
	5,087,976						49	5,087,444	5	5,087,533		
193.1	5,087,977	13	5,088,074				59	5,087,445	11	5,087,534	247	5,087,220
228	5,087,978	32	5,088,075				62	5,087,446			336	5,087,219
296	5,087,979	36	5,088,076		79	5,087,145	78.01	5,087,447			CLASS 452	
335	5,087,980	43	5,088,077				78.37	5,087,457	5	5,087,535		
459	5,087,981	44.25	5,088,078		13	5,087,146	85.2	5,087,448	13	5,087,536	5	5,087,221
		44.26	5,088,079		268	5,087,147	195.1	5,087,449	15	5,087,537	127	5,087,222
			5,088,080				402	5,087,450	45	5,087,538	CLASS 454	
59	5,087,113		5,088,081				407	5,087,451	48	5,087,539	187	5,086,692
81	5,087,114	54	5,088,082		12	5,087,148	422	5,087,452	58	5,087,540		
137	5,087,982	71	5,088,083		35	5,087,149	450	5,087,453		5,087,541	CLASS 462	
205	5,087,983		5,088,084				464	5,087,454	60	5,087,542		
282	5,087,984	75.1	5,088,085				497	5,087,455	66	5,087,543	2	5,087,223
350	5,087,985	77.2	5,088,086		31	5,087,150	501	5,087,456	137	5,087,544	8	5,087,079
479	5,087,111	100	5,088,087		43	5,087,151			169	5,087,546	CLASS 474	
629	5,087,986	283	5,088,088		68	5,087,152			192	5,087,547	50	5,087,224
663	5,087,987	284	5,088,088		154	5,087,153			253	5,087,548	91	5,087,225
689	5,087,988			CLASS 370	216	5,087,154			270	5,087,549	160	5,087,226
692	5,087,989						3	5,087,184		5,087,550		
719	5,087,115	67	5,088,089				72.2	5,087,185		5,087,551	CLASS 475	
794	5,087,990	85.13	5,088,090				112	5,087,186		5,087,552	72	5,087,227
800	5,087,112	94.3	5,088,091		61	5,087,155	116	5,087,187		5,087,553	88	5,087,228
851	5,087,116	95.1	5,088,094				145	5,087,188		5,087,554	149	5,087,229
894	5,087,991			CLASS 408				5,087,189		5,087,555	151	5,087,230
					1 R	5,087,156	335	5,087,191		5,087,556	200	5,087,231
		30	5,088,093		9	5,087,157	385	5,087,192		5,087,557	278	5,087,232
		49.3	5,088,092		67	5,087,158	543	5,087,193		5,087,558		5,087,233
				CLASS 409					115	5,087,194	CLASS 493	
31	5,087,992								309	5,087,195		
73.03	5,087,994			CLASS 372	132	5,087,159	3	5,087,458			23	5,087,140
73.05	5,087,993	6	5,088,095				4	5,087,459			194	5,087,234
77.140	5,087,995	20	5,088,096				5	5,087,460	21	5,087,196	24	5,087,235
78.01	5,087,996		5,088,097				96	5,087,461	73	5,087,200	212	5,087,236
78.06	5,087,997	34	5,088,098		433	5,087,161	129	5,087,462	74	5,087,197	342	5,087,237
132	5,087,998	45	5,088,099				138	5,087,463	80	5,087,198		5,087,238
			5,088,100				231	5,087,464	173	5,087,199	379	5,087,239
17	5,087,999	59	5,088,101		4	5,087,162	241	5,087,465	174	5,087,201	CLASS 501	
103	5,088,000	64	5,088,102		35	5,087,163	256	5,087,466	215	5,087,202		
127	5,088,001	68	5,088,103				262	5,087,467			96	5,087,592
211	5,088,002	87	5,088,104				386	5,087,468				5,087,593
330	5,088,003	92	5,088,105				544	5,087,469			97	5,087,594
373	5,088,004			CLASS 375	440	5,087,165	557	5,087,470	84	5,087,203	105	5,087,595
385	5,088,005				458	5,087,166	573	5,087,471	296	5,087,204		
	5,088,006	4	5,088,106		668	5,087,167	623	5,087,472	320	5,087,205	CLASS 502	
386	5,088,007	10	5,088,107		687	5,087,168	646	5,087,473			49	5,087,596
403	5,088,008	12	5,088,108		792.9	5,087,169			5	5,087,557	62	5,087,597
413	5,088,009	14	5,088,109						6	5,087,558	63	5,087,598
419	5,088,010	15	5,088,110						7.21	5,087,559	252	5,087,599
		18	5,088,111							5,087,560	309	5,087,600
		36	5,088,112		110	5,087,170	4	5,087,475		5,087,561	CLASS 503	
		53	5,088,113		169.1	5,087,171	35	5,087,476		5,087,562		
2.6	5,086,573			CLASS 376	230	5,087,172	54.1	5,087,477		5,087,563	200	5,087,601
61	5,088,011						79	5,087,478	7.9	5,087,564	216	5,087,602
97	5,088,012	159	5,087,407		204 A	5,087,173	129	5,087,481	69.7	5,087,565	226	5,087,603
99	5,088,013	283	5,087,408		220 R	5,087,174		5,087,482		5,087,566	227	Re 33,819
132	5,088,014	294	5,087,409					5,087,483	83	5,08		

CLASSIFICATION OF PATENTS

	5,087,606	176	5,087,643		137	5,087,712	192	5,087,751	657	5,087,791	
	5,087,607	205	5,087,644	CLASS 528	179	5,087,713	298	5,087,752	661	5,087,792	
	5,087,608	406	5,087,645	14	5,087,683	401	5,087,714	302	5,087,753	666	5,087,793
	5,087,609		5,087,646	22	5,087,684	413	5,087,715	401	5,087,754		
	5,087,610	412	5,087,647	25	5,087,685		5,087,716	422	5,087,755	CLASS 602	
	CLASS 507			49	5,087,686	416	5,087,717	457	5,087,756	4	5,086,762
104	5,087,611	3	5,087,648	50	5,087,687	422	5,087,718	501	5,087,757	17	5,086,757
	CLASS 512	30	5,087,649	99	5,087,688	430	5,087,719			19	5,086,758
23	5,087,612	47	5,087,650	185	5,087,689	434	5,087,720	CLASS 568		26	5,086,759
		55	5,087,651	230	5,087,690			57	5,087,758	27	5,086,760
	CLASS 514	59	5,087,652	353	5,087,691	CLASS 558		327	5,087,759	42	5,086,761
12	5,087,613	158	5,087,653	371	5,087,692	5,087,721	361	5,087,760			5,086,763
16	5,087,614	432	5,087,654	354	5,087,694	5,087,722	388	5,087,761	CLASS 604		
21	5,087,615		5,087,655	387	5,087,693	5,087,723	447	5,087,762	14	5,087,239	
	5,087,616	493	5,087,656		5,087,695		492	5,087,763	20	5,087,240	
44	5,087,617	508	5,087,657	CLASS 540	20	5,087,725	656	5,087,764			5,087,241
45	5,087,618	538	5,087,658	25	5,087,726	5,087,726	677	5,087,765			5,087,242
167	5,087,619	594	5,087,659	465	5,087,696	5,087,727	718	5,087,766			5,087,243
171	5,087,620	611	5,087,660	CLASS 544	41	5,087,728	727	5,087,767			5,087,244
185	5,087,622	714	5,087,661	323	5,087,697	5,087,729	730	5,087,768	53	5,087,245	
188	5,087,623	CLASS 525		394	5,087,698	78	736	5,087,769	67	5,087,246	
	5,087,624	63	5,087,662			91	753	5,087,771	96	5,087,247	
210	5,087,621	67	5,087,663	CLASS 546	122	5,087,730	804	5,087,772	98	5,087,248	
220	5,087,625	124	5,087,664	118	5,087,702	147	828	5,087,773	110	Re.33,821	
230.5	5,087,626	133	5,087,665	296	5,087,699	193	840	5,087,774	180	5,087,249	
255	5,087,627	189	5,087,666	329	5,087,700	204	842	5,087,775	192	5,087,248	
256	5,087,628	222	5,087,667	CLASS 548		215		5,087,736	321	5,087,250	
300	5,087,629	237	5,087,668	406	5,087,703	302	134	5,087,737	327	5,087,251	
307	5,087,630	239	5,087,669	427	5,087,704	345	136	5,087,738	346	5,087,252	
342	5,087,631	326.2	5,087,670	431	5,087,701		179	5,087,739	385.1	5,087,253	
357	5,087,632	328.2	5,087,671	458	5,087,705	CLASS 562	245	5,087,779		5,087,255	
380	5,087,633	329.5	5,087,672						386	5,087,254	
381	5,087,634	356	5,087,673	CLASS 549	17	5,087,740	CLASS 585		CLASS 606		
383	5,087,635		5,087,674	414	5,087,741	5,087,741	259	5,087,780	28	5,087,256	
410	5,087,636	455	5,087,675	421	5,087,742	5,087,742	409	5,087,781	35	5,087,257	
456	5,087,637			466	5,087,743	5,087,743	417	5,087,782	28	5,087,258	
	5,087,638			535	5,087,744	5,087,744	446	5,087,783	56	5,087,259	
561	5,087,639	93	5,087,676	585	5,087,745	5,087,745	459	5,087,784	60	5,087,260	
609	5,087,640	160	5,087,677	821	5,087,746	5,087,746	475	5,087,785	82	5,087,261	
	CLASS 521	194	5,087,678	851	5,087,747	5,087,747	500	5,087,786	65	5,087,262	
53	5,087,641	249	5,087,679	CLASS 552	5,087,748	5,087,748		5,087,787	125	5,087,263	
	CLASS 523	254	5,087,680	CLASS 556			512	5,087,788	148	5,087,264	
		262	5,087,681	46	5,087,710	5,087,749	525	5,087,789	159	5,087,265	
156	5,087,642	271	5,087,682	102	5,087,711	90	638	5,087,790			

CLASSIFICATION OF DESIGNS

D1—	106	323,732	384	323,763	149	323,793		323,825	D21—	20	323,856		323,887			
D2—	185	323,733	393	323,764	152	323,795	137	323,826		125	323,857		323,888			
	314	323,734	556	323,765	160	323,796	241	323,827	25	323,858		323,889				
		323,735	590	323,766	D12—	85	323,797	253	323,828	41	323,859		323,890			
		323,736	620	323,767		92	323,798		323,829	59	323,860		323,891			
		323,737	691	323,768		323,799	D15—	5	323,830	64	323,861		323,892			
	317	323,738	D8—	5	323,769	146	323,800	10	323,831	171	323,862		323,893			
	320	323,739		8	323,770	147	323,801	69	323,832	194	323,863		323,894			
		323,740			323,771	151	323,802	127	323,833	201	323,864		323,895			
D3—	37	323,741		51	323,772	156	323,803	133	323,834	204	323,865		323,896			
	73	323,742		70	323,773	161	323,804		323,835	215	323,866	D25—	103	323,896		
	74	323,743		99	323,774	178	323,805		323,836	219	323,867	D26—	24	323,897		
		323,744		331	323,775	209	323,806	143	323,837	253	323,868		26	323,898		
D4—	104	323,745		338	323,776	307	323,807	144	323,838		323,869		28	323,899		
	116	323,746		380	323,777	308	323,808	150	323,839	D22—	117	323,870	35	323,900		
D6—	300	323,747		402	323,778	D13—	103	323,809	D16—	102	323,840		122	323,871		
	315	323,748	D9—	371	323,779		133	323,810		202	323,841		140	323,872		
	318	323,749			323,780		146	323,811		208	323,842	D23—	209	323,873		
	373	323,750		372	323,781			323,812			323,843		323,874	67	323,904	
	417	323,751	D10—	2	323,782	147	323,813	D18—	14	323,848		323,875		85	323,905	
	420	323,752		32	323,783		323,814		24	323,849	231	323,876			323,906	
	466	323,753			323,784	159	323,815		36	323,847	238	323,877	D28—	41	323,907	
	491	323,754			323,785	D14—	100	323,816		50	323,846	290	323,878	D29—	7	323,908
	513	323,755		38	323,786		323,817		53	323,844		323,879		22	323,910	
	571	323,756		97	323,787		323,818		54	323,850	295	323,880			323,911	
	611	323,757		106	323,788	107	323,819		55	323,845	299	323,881	D34—	5	323,912	
	317	323,758		111	323,789	109	323,820	D19—	2	323,851	325	323,882			323,913	
	330	323,759	D11—	6	323,790	118	323,821		48	323,852	366	323,883			323,914	
	332	323,760		14	323,791	125	323,822		77	323,853		323,884		21	323,915	
	351	323,761		84	323,792		323,823		90	323,854		323,885		24	323,916	
	354	323,762		144	323,794	126	323,824		92	323,855	D24—	108	323,886	37	323,917	

CLASSIFICATION OF PLANTS

P.—	1	7,783	22	7,785									
	15	7,784	68	7,786	7,787	7,788	7,789	78	7,790				

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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01 :	5,087,351	5,087,033	5,087,826	5,086,578	5,087,039	5,087,306
04 :	5,086,550	5,087,037	5,087,837	5,086,622	5,087,062	5,087,325
	5,086,724	5,087,048	5,087,839	5,086,633	5,087,100	5,087,364
	5,086,914	5,087,066	5,087,852	5,086,749	5,087,150	5,087,377
	5,087,042	5,087,073	5,087,861	5,086,784	5,087,165	5,087,427
	5,087,070	5,087,078	5,087,872	5,086,881	5,087,183	5,087,438
	5,087,392	5,087,080	5,087,889	5,086,913	5,087,220	5,087,458
	5,087,574	5,087,124	5,087,896	5,086,917	5,087,260	5,087,459
	5,087,877	5,087,129	5,087,918	5,087,007	5,087,309	5,087,463
	5,087,886	5,087,135	5,087,921	5,087,090	5,087,314	5,087,471
	5,087,895	5,087,176	5,087,922	5,087,131	5,087,356	5,087,495
	5,087,962	5,087,188	5,087,931	5,087,151	5,087,405	5,087,563
05 :	5,086,555	5,087,196	5,087,933	5,087,182	5,087,450	5,087,596
	5,088,073	5,087,199	5,087,949	5,087,187	5,087,618	5,087,650
06 :	Re.33,818	5,087,205	5,087,952	5,087,274	5,087,897	5,087,778
	5,086,514	5,087,216	5,087,958	5,087,445	5,087,906	5,087,779
	5,086,517	5,087,237	5,087,958	5,087,477	5,087,908	5,087,784
	5,086,524	5,087,245	5,087,959	5,087,503	5,087,909	5,087,786
	5,086,528	5,087,250	5,087,961	5,087,515	5,087,912	5,087,792
	5,086,532	5,087,251	5,087,965	5,087,567	13 : 5,086,654	5,087,803
	5,086,566	5,087,256	5,087,980	5,087,625	5,086,774	5,087,848
	5,086,570	5,087,332	5,087,986	5,087,732	5,086,809	5,087,858
	5,086,576	5,087,337	5,087,996	5,087,733	5,086,811	5,087,118
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	5,086,581	5,087,368	5,088,033	5,088,012	5,087,036	5,087,934
	5,086,582	5,087,374	5,088,036	5,088,068	5,087,204	5,087,974
	5,086,590	5,087,385	5,088,048	5,088,070	5,087,311	5,088,005
	5,086,598	5,087,396	5,088,054	5,088,079	5,087,320	5,088,007
	5,086,651	5,087,409	5,088,066	5,087,437	15 : 5,086,523	5,088,013
	5,086,682	5,087,416	5,088,077	5,087,549	16 : 5,087,323	5,088,016
	5,086,750	5,087,435	5,088,083	5,087,628	5,087,533	5,088,069
	5,086,759	5,087,439	5,088,087	5,087,723	5,087,586	5,086,693
	5,086,762	5,087,440	5,088,088	5,086,757	5,087,951	5,086,923
	5,086,763	5,087,467	5,088,091	5,087,453	17 : Re.33,817	5,086,973
	5,086,781	5,087,478	5,088,092	5,088,072	5,086,634	5,087,173
	5,086,789	5,087,481	5,088,105	5,086,518	5,086,652	5,087,312
	5,086,815	5,087,484	5,088,111	5,086,599	5,086,683	5,087,420
	5,086,843	5,087,496	5,088,125	5,086,600	5,086,697	5,087,521
	5,086,844	5,087,499	5,088,128	5,086,635	5,086,697	5,087,572
	5,086,846	5,087,534	5,088,130	5,086,722	5,086,709	5,087,575
	5,086,931	5,087,570	5,088,188	5,086,725	5,086,765	5,087,700
	5,086,945	5,087,583	5,088,228	5,086,730	5,086,805	5,087,849
	5,086,948	5,087,584	5,088,229	5,086,761	5,086,847	5,087,863
	5,086,954	5,087,623	5,087,118	5,086,772	5,086,891	5,088,056
	5,086,958	5,087,624	5,087,223	5,086,793	5,086,949	5,086,627
	5,086,960	5,087,701	5,087,253	5,086,817	5,086,956	5,087,249
	5,086,961	5,087,719	5,087,269	5,086,822	5,086,966	5,087,291
	5,086,968	5,087,757	5,087,388	5,086,868	5,087,004	5,087,472
	5,086,972	5,087,790	5,087,842	5,086,929	5,087,035	5,087,693
	5,086,976	5,087,796	5,087,885	5,086,934	5,087,045	5,087,982
	5,086,988	5,087,804	5,088,047	5,086,936	5,087,061	5,088,014
	5,086,993	5,087,808	5,086,547	5,086,977	5,087,077	5,086,612
	5,087,005	5,087,824	5,086,551	5,087,032	5,087,238	5,086,705

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21 :	5,086,788 5,086,926 5,086,930 5,086,997 5,087,276 5,087,573 5,087,860 5,086,712 5,087,140 5,087,255 5,087,352 5,087,404 5,087,652 5,086,838 5,086,998 5,087,669 5,087,788 5,086,932 5,087,152 5,087,841 5,086,870 5,086,875 5,087,011 5,087,085 5,087,088 5,087,206 5,087,378 5,087,389 5,087,873 5,086,579 5,086,594 5,086,631 5,086,720 5,086,747 5,086,764 5,086,779 5,086,856 5,087,054 5,087,148 5,087,158 5,087,159 5,087,246 5,087,247 5,087,263 5,087,264 5,087,353 5,087,370 5,087,399 5,087,418 5,087,502 5,087,523 5,087,565 5,087,571 5,087,589 5,087,592 5,087,615 5,087,690 5,087,710 5,087,876 5,087,894 5,087,913 5,087,948 5,088,016 5,088,019 5,088,052 5,088,081 5,086,537 5,086,586 5,086,597 5,086,603 5,086,614 5,086,620 5,086,638 5,086,650 5,086,657 5,086,665 5,086,670 5,086,676 5,086,703 5,086,740 5,086,743 5,086,746 5,086,849 5,086,860 5,086,861 5,086,862 5,086,887 5,086,893 5,086,897 5,086,920 5,086,928 5,086,943 5,086,974	5,086,979 5,086,980 5,086,989 5,087,008 5,087,009 5,087,018 5,087,046 5,087,057 5,087,069 5,087,071 5,087,091 5,087,145 5,087,193 5,087,207 5,087,214 5,087,221 5,087,229 5,087,235 5,087,232 5,087,252 5,087,336 5,087,365 5,087,483 5,087,486 5,087,488 5,087,593 5,087,639 5,087,715 5,087,716 5,087,721 5,087,726 5,087,738 5,087,825 5,086,601 5,086,604 5,086,717 5,086,768 5,086,876 5,086,935 5,086,946 5,087,019 5,087,019 5,087,087 5,087,227 5,087,241 5,087,248 5,087,294 5,087,318 5,087,394 5,087,494 5,087,508 5,087,532 5,087,670 5,087,672 5,087,794 5,087,801 5,087,838 5,087,884 5,087,987 5,087,991 5,086,587 5,087,111 5,087,120 5,086,662 5,086,708 5,086,716 5,086,800 5,087,222 5,087,262 5,087,283 5,087,498 5,087,510 5,087,564 5,087,633 5,087,634 5,087,671 5,087,740 5,087,746 5,087,752 5,086,820 5,087,060 5,087,137 5,087,349 5,087,610 5,087,875 5,088,011 5,086,516 5,086,549 5,086,792 5,086,804 5,086,906 5,087,093 5,087,186 5,087,197 5,087,284	5,087,304 5,087,357 5,087,390 5,087,454 5,087,460 5,087,461 5,087,487 5,087,513 5,087,514 5,087,556 5,087,595 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5,088,006 5,088,093 5,086,542 5,086,561 5,086,615 5,086,684 5,086,790 5,086,903 5,086,953 5,087,003 5,087,094 5,087,576 5,087,631 5,087,697 5,087,867 5,088,089 5,086,902 5,086,536 5,086,538 5,086,577 5,086,583 5,086,681 5,086,690 5,086,700 5,086,721 5,086,754 5,086,771 5,086,795 5,086,798 5,086,821 5,086,848 5,086,884 5,086,898 5,086,899 5,086,907 5,086,937 5,086,939 5,086,987 5,087,013 5,087,023 5,087,031 5,087,047 5,087,063 5,087,097 5,087,128 5,087,153 5,087,168 5,087,213 5,087,218 5,087,342 5,087,395 5,087,406 5,087,431 5,087,511 5,087,525 5,087,668 5,087,691 5,087,791 5,087,810 5,087,818 5,087,883 5,088,051 5,086,850 5,087,448 5,086,836 5,086,839 5,086,841 5,086,845 5,086,851 5,086,853 5,086,959 5,086,994 5,086,999	5,087,064 5,087,149 5,087,154 5,087,265 5,087,271 5,087,273 5,087,343 5,087,348 5,087,371 5,087,485 5,087,579 5,087,580 5,087,581 5,087,591 5,087,611 5,087,617 5,087,663 5,086,704 5,086,714 5,086,723 5,086,823 5,086,916 5,086,965 5,087,050 5,087,059 5,087,095 5,087,167 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DESIGN PATENTS

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01 :	323,766 323,831 323,734 323,747 323,777 323,792 323,809 323,818 323,836 323,849 323,854 323,855 323,860 323,867 323,885 323,889 323,894 323,897	323,902 323,911 323,840 323,883 323,767 323,808 323,770 323,771 323,757 323,776 323,794 323,805 323,837 323,878 323,879 323,903 323,905 323,916	18 :	323,787 323,813 323,864 323,913 323,859 323,872 323,770 323,741 323,800 323,775 323,858 323,795 323,743 323,749 323,781 323,788 323,797 323,806 323,874	29 :	323,881 323,756 323,772 323,869 323,804 323,909 323,908 323,732 323,754 323,910 323,733 323,744 323,745 323,748 323,780 323,796 323,851 323,868	37 :	323,875 323,765 323,793 323,742 323,778 323,830 323,866 323,870 323,886 323,887 323,914 323,735 323,745 323,736 323,737 323,738 323,773 323,833	44 :	323,865 323,915 323,898 323,839 323,856 323,861 323,895 323,828 323,829 323,863 323,820 323,912 323,807 323,746 323,768 323,880 323,884 323,907
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PLANT PATENTS

06 :	7,790	39 :	7,787	7,788	7,789		
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O.G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

	Small Entity	Regular
U.S. National Stage fees		
USPTO was IPEA	310.00	620.00

USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 14, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,803,740 through 4,805,237
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 12, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,498,199 through 4,499,610
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 29, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees	4,419,824	06/403,800	12/13/83
	4,419,827	06/316,280	12/13/83
(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,419,828	06/265,176	12/13/83
	4,419,829	06/288,985	12/13/83
	4,419,833	06/460,160	12/13/83
	4,419,834	06/346,923	12/13/83
	4,419,841	06/414,617	12/13/83
By a small entity (\$1.9f)	4,419,844	06/440,844	12/13/83
By other than a small entity	4,419,848	06/297,054	12/13/83
	4,419,849	06/233,323	12/13/83
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,419,850	06/345,047	12/13/83
	4,419,853	06/305,071	12/13/83
	4,419,860	06/368,114	12/13/83
	4,419,867	06/394,772	12/13/83
	4,419,872	06/284,354	12/13/83
By a small entity (\$1.9f)	4,419,873	06/278,623	12/13/83
By other than a small entity	4,419,887	06/377,894	12/13/83
	4,419,902	06/308,113	12/13/83
(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:	4,419,907	06/333,601	12/13/83
	4,419,908	06/314,541	12/13/83
	4,419,927	06/233,505	12/13/83
	4,419,928	06/378,837	12/13/83
	4,419,929	06/348,015	12/13/83
By a small entity (\$1.9f)	4,419,930	06/284,205	12/13/83
By other than a small entity	4,419,931	06/285,444	12/13/83
	4,419,932	06/331,214	12/13/83
The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:	4,419,938	06/327,479	12/13/83
	4,419,940	06/442,143	12/13/83
	4,419,941	06/437,428	12/13/83
	4,419,942	06/401,946	12/13/83
	4,419,952	06/233,075	12/13/83
	4,419,956	06/378,339	12/13/83
(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980	4,419,958	06/331,920	12/13/83
	4,419,973	06/289,850	12/13/83
	4,419,975	06/308,864	12/13/83
	4,419,980	06/478,782	12/13/83
	4,419,986	06/438,596	12/13/83
	4,419,988	06/289,267	12/13/83
By a small entity (\$1.9f)	4,420,003	06/259,970	12/13/83
By other than a small entity	4,420,004	06/322,976	12/13/83
	4,420,008	06/344,095	12/13/83
(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable	4,420,009	06/310,934	12/13/83
	4,420,014	06/276,142	12/13/83
	4,420,018	06/372,612	12/13/83
	4,420,019	06/365,361	12/13/83
	4,420,021	06/308,854	12/13/83
	4,420,027	06/494,499	12/13/83
	4,420,031	06/350,035	12/13/83
	4,420,032	06/235,755	12/13/83
	4,420,036	06/245,585	12/13/83
	4,420,037	06/249,156	12/13/83
35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.	4,420,047	06/335,238	12/13/83
According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.	4,420,053	06/294,781	12/13/83
	4,420,056	06/351,118	12/13/83
	4,420,057	06/294,808	12/13/83
	4,420,062	06/391,931	12/13/83
	4,420,063	06/374,526	12/13/83
	4,420,073	06/238,675	12/13/83
	4,420,078	06/316,780	12/13/83
	4,420,079	06/236,501	12/13/83
	4,420,091	06/419,778	12/13/83
	4,420,093	06/356,496	12/13/83
	4,420,094	06/341,518	12/13/83
	4,420,102	06/263,899	12/13/83
	4,420,103	06/415,473	12/13/83
	4,420,104	06/324,644	12/13/83
	4,420,105	06/431,712	12/13/83
	4,420,109	06/274,718	12/13/83
	4,420,110	06/308,282	12/13/83
	4,420,114	06/249,936	12/13/83
	4,420,115	06/324,413	12/13/83
	4,420,117	06/281,075	12/13/83
	4,420,118	06/285,371	12/13/83
	4,420,119	06/308,239	12/13/83
	4,420,123	06/312,202	12/13/83
	4,420,127	06/299,406	12/13/83
	4,420,138	06/290,618	12/13/83
	4,420,150	06/217,553	12/13/83
	4,420,158	06/307,801	12/13/83
	4,420,170	06/304,321	12/13/83

Notice of Expiration of Patents
Due to Failure to Pay Maintenance Fees

PATENTS WHICH EXPIRED DECEMBER 15, 1991
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,419,774	06/451,399	12/13/83
4,419,778	06/291,172	12/13/83
4,419,781	06/370,717	12/13/83
4,419,782	06/313,752	12/13/83
4,419,787	06/422,000	12/13/83
4,419,790	06/404,803	12/13/83
4,419,793	06/311,818	12/13/83
4,419,794	06/308,883	12/13/83
4,419,803	06/444,671	12/13/83
4,419,807	06/239,536	12/13/83
4,419,811	06/371,599	12/13/83
4,419,816	06/353,069	12/13/83
4,419,820	06/354,777	12/13/83
4,419,821	06/293,637	12/13/83
4,419,823	06/379,780	12/13/83

Patent Number	Serial Number	Issue Date	4,420,471	06/457,093	12/13/83
4,420,172	06/326,114	12/13/83	4,420,481	06/235,992	12/13/83
4,420,173	06/300,104	12/13/83	4,420,486	06/227,377	12/13/83
4,420,178	06/318,864	12/13/83	4,420,489	06/309,280	12/13/83
4,420,181	06/270,645	12/13/83	4,420,505	06/479,420	12/13/83
4,420,184	06/327,356	12/13/83	4,420,510	06/360,852	12/13/83
4,420,205	06/301,989	12/13/83	4,420,514	06/413,868	12/13/83
4,420,208	06/254,398	12/13/83	4,420,518	06/361,215	12/13/83
4,420,212	06/429,471	12/13/83	4,420,532	06/364,181	12/13/83
4,420,219	06/244,755	12/13/83	4,420,533	06/314,330	12/13/83
4,420,221	06/359,919	12/13/83	4,420,538	06/336,174	12/13/83
4,420,222	06/253,079	12/13/83	4,420,552	06/460,720	12/13/83
4,420,225	06/305,756	12/13/83	4,420,553	06/376,596	12/13/83
4,420,229	06/347,564	12/13/83	4,420,561	06/230,461	12/13/83
4,420,232	06/336,466	12/13/83	4,420,564	06/318,000	12/13/83
4,420,234	06/357,668	12/13/83	4,420,572	06/331,805	12/13/83
4,420,235	06/347,569	12/13/83	4,420,579	06/338,452	12/13/83
4,420,243	06/396,781	12/13/83	4,420,582	06/271,956	12/13/83
4,420,249	06/376,028	12/13/83	4,420,585	06/412,545	12/13/83
4,420,258	06/314,298	12/13/83	4,420,591	06/365,117	12/13/83
4,420,259	06/314,299	12/13/83	4,420,598	06/290,633	12/13/83
4,420,260	06/374,896	12/13/83	4,420,599	06/400,471	12/13/83
4,420,262	06/388,262	12/13/83	4,420,605	06/412,043	12/13/83
4,420,266	06/410,549	12/13/83	4,420,612	06/470,640	12/13/83
4,420,267	06/333,770	12/13/83	4,420,613	06/358,891	12/13/83
4,420,270	06/423,294	12/13/83	4,420,615	06/295,930	12/13/83
4,420,288	06/275,037	12/13/83	4,420,617	06/395,737	12/13/83
4,420,297	06/257,902	12/13/83	4,420,619	06/247,427	12/13/83
4,420,301	06/277,797	12/13/83	4,420,630	06/329,548	12/13/83
4,420,309	06/401,015	12/13/83	4,420,650	06/356,573	12/13/83
4,420,318	06/315,858	12/13/83	4,420,654	06/347,049	12/13/83
4,420,324	06/322,673	12/13/83	4,420,655	06/277,077	12/13/83
4,420,327	06/308,824	12/13/83	4,420,662	06/316,518	12/13/83
4,420,330	06/368,984	12/13/83	4,420,666	06/270,312	12/13/83
4,420,331	06/341,417	12/13/83	4,420,675	06/326,391	12/13/83
4,420,335	06/337,472	12/13/83	4,420,676	06/258,051	12/13/83
4,420,337	06/394,209	12/13/83	4,420,677	06/308,114	12/13/83
4,420,338	06/302,280	12/13/83	4,420,679	06/352,656	12/13/83
4,420,340	06/440,573	12/13/83	4,420,682	06/360,272	12/13/83
4,420,341	06/365,673	12/13/83	4,420,684	06/271,953	12/13/83
4,420,342	06/348,197	12/13/83	4,420,687	06/437,486	12/13/83
4,420,345	06/321,881	12/13/83	4,420,688	06/285,566	12/13/83
4,420,351	06/373,165	12/13/83	4,420,696	06/238,039	12/13/83
4,420,352	06/465,367	12/13/83	4,420,697	06/251,811	12/13/83
4,420,356	06/354,438	12/13/83	4,420,698	06/236,358	12/13/83
4,420,358	06/304,888	12/13/83	4,420,699	06/363,475	12/13/83
4,420,360	06/279,306	12/13/83	4,420,701	06/414,371	12/13/83
4,420,361	06/419,271	12/13/83	4,420,703	06/400,989	12/13/83
4,420,369	06/352,426	12/13/83	4,420,715	06/280,084	12/13/83
4,420,372	06/396,994	12/13/83	4,420,724	06/378,739	12/13/83
4,420,373	06/289,843	12/13/83	4,420,726	06/271,026	12/13/83
4,420,376	06/410,346	12/13/83	4,420,728	06/327,142	12/13/83
4,420,382	06/224,803	12/13/83	4,420,729	06/367,110	12/13/83
4,420,385	06/485,556	12/13/83	4,420,731	06/291,618	12/13/83
4,420,390	06/342,154	12/13/83	4,420,740	06/297,637	12/13/83
4,420,391	06/310,007	12/13/83	4,420,743	06/334,257	12/13/83
4,420,392	06/354,813	12/13/83	4,420,746	06/246,960	12/13/83
4,420,397	06/331,808	12/13/83	4,420,758	06/382,099	12/13/83
4,420,399	06/382,870	12/13/83	4,420,762	06/344,381	12/13/83
4,420,400	06/341,617	12/13/83	4,420,763	06/340,018	12/13/83
4,420,404	06/330,227	12/13/83	4,420,774	06/479,975	12/13/83
4,420,405	06/291,396	12/13/83	4,420,776	06/325,711	12/13/83
4,420,407	06/313,564	12/13/83	4,420,782	06/278,956	12/13/83
4,420,415	06/294,930	12/13/83	4,420,785	06/274,443	12/13/83
4,420,418	06/322,629	12/13/83	4,420,794	06/300,965	12/13/83
4,420,421	06/326,623	12/13/83	4,420,798	06/328,106	12/13/83
4,420,424	06/319,267	12/13/83	4,420,799	06/409,999	12/13/83
4,420,429	06/291,952	12/13/83	4,420,809	06/267,614	12/13/83
4,420,430	06/344,375	12/13/83	4,420,810	06/421,141	12/13/83
4,420,433	06/396,568	12/13/83	4,420,819	06/243,541	12/13/83
4,420,435	06/391,092	12/13/83	4,420,838	06/342,672	12/13/83
4,420,436	06/334,862	12/13/83	4,420,841	06/268,223	12/13/83
4,420,440	06/450,144	12/13/83	4,420,854	06/942,956	12/15/87
4,420,442	06/421,002	12/13/83	4,420,858	07/035,923	12/15/87
4,420,445	06/337,169	12/13/83	4,420,861	07/049,554	12/15/87
4,420,446	06/357,920	12/13/83	4,420,863	07/004,640	12/15/87
4,420,452	06/277,854	12/13/83	4,420,865	06/946,305	12/15/87
4,420,462	06/360,605	12/13/83	4,420,868	06/820,950	12/15/87
4,420,466	06/376,341	12/13/83	4,420,871	06/854,999	12/15/87
			4,420,872	07/009,837	12/15/87

Patent Number	Serial Number	Issue Date	4,712,652	06/839,953	12/15/87
4,712,272	06/942,440	12/15/87	4,712,664	06/865,207	12/15/87
4,712,274	06/886,107	12/15/87	4,712,668	06/832,355	12/15/87
4,712,289	06/762,676	12/15/87	4,712,669	06/947,856	12/15/87
4,712,290	06/890,939	12/15/87	4,712,670	06/799,844	12/15/87
4,712,293	06/935,871	12/15/87	4,712,679	06/921,548	12/15/87
4,712,294	07/018,852	12/15/87	4,712,682	06/784,514	12/15/87
4,712,297	06/908,676	12/15/87	4,712,684	06/762,762	12/15/87
4,712,300	06/920,417	12/15/87	4,712,695	06/889,396	12/15/87
4,712,301	06/514,588	12/15/87	4,712,700	06/937,072	12/15/87
4,712,302	06/902,439	12/15/87	4,712,701	06/906,968	12/15/87
4,712,305	06/850,025	12/15/87	4,712,703	06/861,719	12/15/87
4,712,307	07/030,558	12/15/87	4,712,704	07/016,345	12/15/87
4,712,308	06/901,557	12/15/87	4,712,711	06/355,280	12/15/87
4,712,313	06/847,664	12/15/87	4,712,715	06/882,636	12/15/87
4,712,315	06/767,310	12/15/87	4,712,735	06/767,857	12/15/87
4,712,319	06/881,982	12/15/87	4,712,737	06/764,017	12/15/87
4,712,321	06/924,617	12/15/87	4,712,746	06/900,095	12/15/87
4,712,322	06/887,814	12/15/87	4,712,748	06/940,520	12/15/87
4,712,330	06/890,506	12/15/87	4,712,754	06/882,422	12/15/87
4,712,332	06/881,478	12/15/87	4,712,758	06/822,323	12/15/87
4,712,333	06/821,724	12/15/87	4,712,760	06/918,707	12/15/87
4,712,339	06/869,332	12/15/87	4,712,762	06/896,838	12/15/87
4,712,342	06/871,407	12/15/87	4,712,764	06/867,233	12/15/87
4,712,343	06/867,146	12/15/87	4,712,766	07/028,735	12/15/87
4,712,346	06/863,138	12/15/87	4,712,778	06/332,993	12/15/87
4,712,351	06/929,117	12/15/87	4,712,779	06/326,485	12/15/87
4,712,364	06/880,462	12/15/87	4,712,780	06/825,284	12/15/87
4,712,365	06/914,518	12/15/87	4,712,787	06/851,107	12/15/87
4,712,368	07/031,295	12/15/87	4,712,788	06/916,888	12/15/87
4,712,370	06/855,243	12/15/87	4,712,793	06/839,639	12/15/87
4,712,374	06/291,518	12/15/87	4,712,794	06/916,014	12/15/87
4,712,375	06/849,471	12/15/87	4,712,797	06/941,665	12/15/87
4,712,381	06/665,482	12/15/87	4,712,798	06/835,983	12/15/87
4,712,384	06/909,856	12/15/87	4,712,801	06/916,512	12/15/87
4,712,390	06/805,009	12/15/87	4,712,803	06/894,620	12/15/87
4,712,396	06/915,658	12/15/87	4,712,804	06/827,090	12/15/87
4,712,398	06/842,684	12/15/87	4,712,806	06/867,641	12/15/87
4,712,401	06/881,227	12/15/87	4,712,816	06/861,980	12/15/87
4,712,428	06/887,247	12/15/87	4,712,820	06/930,467	12/15/87
4,712,438	06/729,487	12/15/87	4,712,824	06/839,023	12/15/87
4,712,445	06/866,623	12/15/87	4,712,827	07/015,028	12/15/87
4,712,446	06/820,001	12/15/87	4,712,828	06/796,074	12/15/87
4,712,449	06/908,590	12/15/87	4,712,833	06/919,369	12/15/87
4,712,462	06/811,021	12/15/87	4,712,837	06/916,870	12/15/87
4,712,464	06/793,178	12/15/87	4,712,843	06/885,604	12/15/87
4,712,466	06/828,916	12/15/87	4,712,844	06/878,295	12/15/87
4,712,469	06/662,637	12/15/87	4,712,845	06/823,033	12/15/87
4,712,473	06/831,956	12/15/87	4,712,849	06/874,862	12/15/87
4,712,481	06/942,874	12/15/87	4,712,853	06/834,190	12/15/87
4,712,482	06/927,247	12/15/87	4,712,854	06/629,442	12/15/87
4,712,486	06/870,414	12/15/87	4,712,867	06/817,765	12/15/87
4,712,491	06/836,494	12/15/87	4,712,881	06/747,214	12/15/87
4,712,498	06/920,462	12/15/87	4,712,905	06/792,694	12/15/87
4,712,500	06/831,766	12/15/87	4,712,918	06/671,729	12/15/87
4,712,502	06/904,712	12/15/87	4,712,921	06/924,343	12/15/87
4,712,506	06/834,559	12/15/87	4,712,922	06/815,928	12/15/87
4,712,510	06/890,039	12/15/87	4,712,923	06/877,471	12/15/87
4,712,512	06/891,657	12/15/87	4,712,929	06/545,474	12/15/87
4,712,515	06/884,560	12/15/87	4,712,944	06/924,575	12/15/87
4,712,533	06/866,391	12/15/87	4,712,946	06/831,823	12/15/87
4,712,539	06/748,827	12/15/87	4,712,950	06/806,827	12/15/87
4,712,551	06/918,148	12/15/87	4,712,954	06/903,606	12/15/87
4,712,562	06/914,088	12/15/87	4,712,960	06/885,019	12/15/87
4,712,565	06/923,576	12/15/87	4,712,967	06/675,079	12/15/87
4,712,567	06/712,953	12/15/87	4,712,968	06/797,215	12/15/87
4,712,569	06/826,678	12/15/87	4,712,971	06/701,151	12/15/87
4,712,578	06/853,430	12/15/87	4,712,972	06/815,082	12/15/87
4,712,589	06/830,611	12/15/87	4,712,979	06/797,581	12/15/87
4,712,596	07/011,311	12/15/87	4,712,983	06/796,178	12/15/87
4,712,604	06/917,934	12/15/87	4,712,995	07/032,549	12/15/87
4,712,605	07/002,006	12/15/87	4,712,999	06/905,409	12/15/87
4,712,616	06/906,112	12/15/87	4,713,000	07/014,631	12/15/87
4,712,621	06/943,278	12/15/87	4,713,007	06/786,871	12/15/87
4,712,627	06/941,052	12/15/87	4,713,011	06/941,726	12/15/87
4,712,629	06/903,279	12/15/87	4,713,014	06/946,551	12/15/87
4,712,641	06/653,438	12/15/87	4,713,028	06/875,921	12/15/87
4,712,648	06/897,737	12/15/87	4,713,030	07/008,146	12/15/87
4,712,649	06/921,070	12/15/87	4,713,031	06/876,773	12/15/87
			4,713,034	06/758,174	12/15/87

Patent Number	Serial Number	Issue Date	4,713,423	06/881,689	12/15/87
4,713,039	06/909,170	12/15/87	4,713,425	06/800,942	12/15/87
4,713,041	06/907,273	12/15/87	4,713,437	06/875,570	12/15/87
4,713,047	06/830,641	12/15/87	4,713,441	06/892,520	12/15/87
4,713,053	06/887,040	12/15/87	4,713,445	06/641,639	12/15/87
4,713,055	06/842,351	12/15/87	4,713,451	06/597,944	12/15/87
4,713,056	06/877,288	12/15/87	4,713,470	06/736,724	12/15/87
4,713,062	06/868,076	12/15/87	4,713,471	06/896,794	12/15/87
4,713,065	06/869,877	12/15/87	4,713,481	06/924,831	12/15/87
4,713,066	06/841,590	12/15/87	4,713,484	06/945,257	12/15/87
4,713,067	06/876,089	12/15/87	4,713,485	06/800,228	12/15/87
4,713,077	06/812,281	12/15/87	4,713,486	06/789,571	12/15/87
4,713,078	06/849,702	12/15/87	4,713,488	06/786,546	12/15/87
4,713,084	06/790,822	12/15/87	4,713,490	06/802,799	12/15/87
4,713,086	06/585,661	12/15/87	4,713,497	06/384,729	12/15/87
4,713,093	06/883,356	12/15/87	4,713,500	07/032,991	12/15/87
4,713,104	06/846,190	12/15/87	4,713,509	06/916,899	12/15/87
4,713,106	06/853,511	12/15/87	4,713,512	06/897,772	12/15/87
4,713,111	06/894,548	12/15/87	4,713,519	06/915,862	12/15/87
4,713,112	06/737,868	12/15/87	4,713,525	06/888,400	12/15/87
4,713,114	06/841,034	12/15/87	4,713,531	06/635,427	12/15/87
4,713,116	07/000,226	12/15/87	4,713,535	06/772,553	12/15/87
4,713,119	06/841,989	12/15/87	4,713,537	06/897,259	12/15/87
4,713,128	06/851,224	12/15/87	4,713,538	06/681,852	12/15/87
4,713,130	06/640,667	12/15/87	4,713,551	06/853,272	12/15/87
4,713,135	06/774,108	12/15/87	4,713,558	06/696,510	12/15/87
4,713,148	06/801,151	12/15/87	4,713,562	06/910,301	12/15/87
4,713,150	06/796,195	12/15/87	4,713,569	06/876,634	12/15/87
4,713,151	06/925,327	12/15/87	4,713,573	06/734,872	12/15/87
4,713,152	07/023,724	12/15/87	4,713,574	06/784,986	12/15/87
4,713,153	06/876,498	12/15/87	4,713,575	06/911,849	12/15/87
4,713,156	07/000,283	12/15/87	4,713,578	06/449,897	12/15/87
4,713,158	06/887,214	12/15/87	4,713,583	07/048,997	12/15/87
4,713,164	06/758,826	12/15/87	4,713,584	07/028,125	12/15/87
4,713,165	06/881,099	12/15/87	4,713,592	06/800,136	12/15/87
4,713,170	06/846,308	12/15/87	4,713,604	06/721,600	12/15/87
4,713,172	06/874,643	12/15/87	4,713,606	06/751,328	12/15/87
4,713,173	06/816,084	12/15/87	4,713,608	06/840,606	12/15/87
4,713,174	06/888,126	12/15/87	4,713,610	06/676,763	12/15/87
4,713,175	06/893,486	12/15/87	4,713,612	06/885,502	12/15/87
4,713,179	06/839,689	12/15/87	4,713,629	06/932,787	12/15/87
4,713,186	06/898,193	12/15/87	4,713,643	06/945,927	12/15/87
4,713,201	06/875,547	12/15/87	4,713,647	06/846,691	12/15/87
4,713,204	06/798,167	12/15/87	4,713,648	06/778,223	12/15/87
4,713,206	06/707,680	12/15/87	4,713,657	06/856,842	12/15/87
4,713,208	06/866,031	12/15/87	4,713,658	06/752,361	12/15/87
4,713,212	06/647,444	12/15/87	4,713,660	06/896,591	12/15/87
4,713,214	06/541,749	12/15/87	4,713,667	07/030,401	12/15/87
4,713,217	06/617,287	12/15/87	4,713,671	06/926,370	12/15/87
4,713,222	06/890,206	12/15/87	4,713,676	06/721,797	12/15/87
4,713,223	06/891,416	12/15/87	4,713,690	06/912,944	12/15/87
4,713,229	06/774,084	12/15/87	4,713,691	06/912,946	12/15/87
4,713,234	06/750,909	12/15/87	4,713,692	06/850,634	12/15/87
4,713,237	06/621,580	12/15/87	4,713,694	06/774,105	12/15/87
4,713,239	06/799,210	12/15/87	4,713,713	06/731,735	12/15/87
4,713,240	06/719,775	12/15/87	4,713,724	06/880,064	12/15/87
4,713,249	06/789,933	12/15/87	4,713,727	06/920,721	12/15/87
4,713,253	06/899,725	12/15/87	4,713,732	06/870,941	12/15/87
4,713,265	06/931,078	12/15/87	4,713,735	06/920,430	12/15/87
4,713,285	06/858,941	12/15/87	4,713,737	06/848,634	12/15/87
4,713,298	06/853,078	12/15/87	4,713,738	06/897,294	12/15/87
4,713,304	06/875,800	12/15/87	4,713,740	06/634,882	12/15/87
4,713,315	06/939,909	12/15/87	4,713,745	06/888,911	12/15/87
4,713,317	06/852,375	12/15/87	4,713,760	06/743,398	12/15/87
4,713,335	06/476,954	12/15/87	4,713,763	06/698,797	12/15/87
4,713,336	06/655,193	12/15/87	4,713,770	06/725,038	12/15/87
4,713,344	06/629,584	12/15/87	4,713,781	06/777,886	12/15/87
4,713,346	06/825,619	12/15/87	4,713,787	06/646,123	12/15/87
4,713,364	06/836,554	12/15/87	4,713,790	06/760,841	12/15/87
4,713,369	06/829,482	12/15/87	4,713,823	06/781,441	12/15/87
4,713,373	06/793,657	12/15/87	4,713,826	06/903,303	12/15/87
4,713,377	06/936,282	12/15/87			
4,713,379	06/735,498	12/15/87			
4,713,382	06/739,393	12/15/87			
4,713,383	06/844,447	12/15/87			
4,713,388	06/783,875	12/15/87			
4,713,389	06/774,271	12/15/87			
4,713,414	06/886,274	12/15/87			
4,713,422	06/889,585	12/15/87			

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,834,884, Re. S.N. 07/706,840, Filed May 29, 1991, Cl. 210/401, PRESSURE DEVICE AND SEAL FOR FILTER BELT MACHINES, Dag Bergloff, et. al., Owner of Record: *Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria*, Attorney or Agent: David L. Tamoff, Ex. Gp.: 138

4,849,005, Re. S.N. 07/818,472, Filed Jan. 6, 1992, Cl. 071, INOCULANT COMPOSITION FOR PLANTS, Paul M. Williams, et. al., Owner of Record: *Agricultural Genetics Co. Ltd., Cambridge, England*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 117

4,875,174, Re. S.N. 07/777,861, Filed Oct. 16, 1991, Cl. 364/519, INSTANT LABEL PRINTER FOR HOST COMPUTER, Robert Olodort, et. al., Owner of Record: *Print Things, Santa Monica, Calif.*, Attorney or Agent: Stephen A. Becker, Ex. Gp.: 231

4,882,675, Re. S.N. 07/795,128, Filed Nov. 20, 1991, Cl. 364/401, PAPERLESS SYSTEM FOR DISTRIBUTING REDEEMING AND CLEARING MERCHANDISE COUPONS, Steven Nichtberger, et. al., Owner of Record: *Inventor, New Rochelle, N.Y.*, Attorney or Agent: Michael J. Sweedler, Ex. Gp.: 231

4,892,753, Re. S.N. 07/819,296, Filed Jan. 8, 1992, Cl. 427/38, PROCESS FOR PECVD OF SILICON OXIDE USING TEOS DECOMPOSITION, David N. Wang, et. al., Owner of Record: *Applied Materials Inc., Santa Clara, Calif.*, Attorney or Agent: Robert J. Stern, Ex. Gp.: 139

4,893,333, Re. S.N. 07/817,733, Filed Jan. 7, 1992, Cl. 379/100, INTERACTIVE FACSIMILE SYSTEM AND METHOD OF INFORMATION RETRIEVAL, Paul Baran, et. al., Owner of Record: *Interfax, Inc., Menlo Park, Calif.*, Attorney or Agent: Allston L. Jones, Ex. Gp.: 261

4,976,031, Re. S.N. 07/818,641, Filed Jan. 7, 1992, Cl. 30/296.001, TELESCOPE HEDGE TRIMMING, Ron Miller, Owner of Record: *Inventor*, Attorney or Agent: Michael A. Corman, Ex. Gp.: 324

4,981,324, Re. S.N. 07/713,960, Filed June 11, 1991, Cl. 297/180, VENTILATED BACK-SEAT SUPPORT PAD PARTICULARLY FOR VEHICLES, Ignace K. Law, Owner of Record: *Inventor*, Attorney or Agent: James Bartholomew, Ex. Gp.: 357

5,005,905, Re. S.N. 07/821,017, Filed Jan. 15, 1992, Cl. 297/320, CHAIR FOR AN OFFICE OR THE LIKE, Horst Lonolergeld, Owner of Record: *Inventor*, Attorney or Agent: Richard B. Klar, Ex. Gp.: 357

5,010,401, Re. S.N. 07/818,277, Filed Jan. 8, 1992, Cl. 358/136, PICTURE CODING AND DECODING APPARATUS USING VECTOR QUANTIZATION, Tokumichi Murakami, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Vincent M. Deluca, Ex. Gp.: 262

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,589,876, Reexam. No. 90/002,606, Requested Jan. 10, 1992, Cl. 604/385.1, SANITARY NAPKIN, Kees J. Von Tilburg, Owner of Record: *The Proctor & Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Monte D. Witte, Cincinnati, Ohio, Ex. Gp.: 338, Requester: Harold C. Wegner, Wegner, Cantor, Mueller & Player, Washington, DC

4,883,331, Reexam. No. 90/002,607, Requested Jan. 15, 1992, Cl. 312/195, METHOD OF AND STRUCTURE FOR THE JOINING OF SUBSTANTIALLY RIGID PARTS TOGETHER, Craig Mengel, Owner of Record: *Inventor*, Attorney or Agent: William A. Knoeller, Stevens, Davis, Miller & Mosher, Alexandria, Va., Ex. Gp.: 357, Requester: Owner

4,897,522, Reexam. No. 90/002,608, Requested Jan. 15, 1992, Cl. 219/130.32, OUTPUT CONTROL CIRCUIT FOR INVERTER, Dale L. Bilczko, et. al., Owner of Record: *The Lincoln Electric Co., Cleveland, Ohio*, Attorney or Agent: Body, Vickers & Daniels, Cleveland, Ohio, Ex. Gp.: 216, Requester: Owner

4,966,421, Reexam. No. 90/002,609, Requested Jan. 15, 1992, Cl. 312/195, METHOD OF AND STRUCTURE FOR THE JOINING OF SUBSTANTIALLY RIGID PARTS TOGETHER, Craig Mengel, Owner of Record: *Inventor*, Attorney or Agent: William A. Knoeller, Stevens, Davis, Miller & Mosher, Alexandria, Va., Ex. Gp.: 357, Requester: Owner

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Chubby's of Tulsa, Inc., Tulsa, Okla., Reg. No. 1,479,830, for the mark "CHUBBY'S", Canc. No. 20,018

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Use of Metric System of Measurements in Patent Applications

The ability of the United States to compete in world trade and improve our trade balance is becoming more important and more difficult each day as our competitors get stronger. Presently, the United States is the only industrial country which has not adopted the metric system of weights and measures. The lack of U.S. goods being produced and packaged under metric standards results in our country being at a competitive disadvantage in world markets.

To improve our competitiveness, in the 1988 trade bill, Congress established metric as the Nation's "preferred system of units for United States trade and commerce," and set a 1992 date for Federal agencies to complete their transition to metric uses in "procurement, grants and other business related activities".

To implement the congressional designation of the metric system of measurement for U.S. trade and commerce, the President on July 25, 1991, issued an Executive Order (Metric Usage in Federal Government Programs) for the Federal Government to lead the way in metric usage. The Department of Commerce has been designated as the lead agency responsible for coordinating usage by the Federal Government.

The Patent and Trademark Office (PTO) does not currently require weights and measures in patent applications to be stated in the metric system. However, in Section 608.01 of the Manual of Patent Examining Procedure, all patent applicants are strongly encouraged to use either (1) only metric units or (2) inch-pound units together with their metric equivalents, when describing their inventions in the specifications of patent applications.

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In the spirit of the Executive Order, the PTO reiterates and emphasizes strong encouragement for patent applicants to use the metric system of weights and measurements in patent applications. At some future time when there has been a sufficient conversion to metric usage by U.S. research and development industries, the PTO will consider making it a requirement that patent applicants use metric units in patent applications.

Jan. 15, 1992

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks

Errata

All reference to Patent No. 5,071,691 to Mark K. Debe of Minnesota for LOW GRAVITY ENHANCED GROWTH OF PHTHALOCYANINE POLYMORPH FILMS appearing in the *Official Gazette* of Dec. 10, 1991 should be deleted since no patent was granted.

The following registration number was erroneously listed as cancelled in the "Trademark Registrations Cancelled Section

18" and "Index of Registrants" sections of the Trademark *Official Gazette* of March 14, 1989:

TM 198 and TMI 21 613,322

Consequently, the above-identified registration is still active.

Jan. 15, 1992

PATRICIA M. DAVIS
Deputy Director for
Trademark Examining Groups

The following registration number was erroneously listed as cancelled as to all classes, in the "Trademark Registrations Cancelled, Section 7(d)" and "Index of Registrants" sections of the Trademark *Official Gazette* of March 19, 1991:

TM 190 and TMI 12 1,468,921

Consequently, the above-identified registration is cancelled as to class 18 only.

Jan. 15, 1992

PATRICIA M. DAVIS
Deputy Director for
Trademark Examining Groups

Certificates of Correction For Week of February 18, 1992

D. 310,329	4,901,322	4,935,049	4,953,235
D. 317,769	4,901,387	4,935,416	4,954,008
Re. 33,333	4,901,552	4,935,509	4,956,521
4,377,679	4,902,128	4,935,958	4,958,438
4,618,662	4,903,244	4,936,327	4,959,424
4,665,114	4,905,003	4,937,010	4,961,056
4,758,156	4,905,453	4,937,750	4,962,535
4,763,908	4,907,862	4,937,882	4,964,990
4,777,962	4,909,183	4,937,996	4,965,234
4,781,058	4,909,780	4,938,581	4,965,518
4,781,768	4,910,271	4,938,594	4,965,726
4,782,232	4,910,542	4,938,755	4,965,755
4,792,574	4,911,404	4,939,228	4,965,817
4,804,506	4,911,805	4,940,426	4,965,822
4,808,555	4,912,500	4,941,426	4,965,836
4,812,683	4,913,931	4,941,898	4,966,191
4,814,138	4,915,985	4,942,484	4,966,196
4,827,835	4,920,135	4,943,833	4,966,369
4,828,373	4,921,436	4,943,924	4,966,527
4,835,002	4,921,456	4,943,947	4,966,528
4,845,504	4,923,026	4,945,142	4,966,619
4,846,041	4,923,934	4,944,972	4,966,624
4,846,977	4,923,990	4,945,236	4,966,659
4,848,608	4,923,994	4,945,448	4,966,731
4,849,209	4,924,959	4,946,150	4,967,260
4,851,365	4,927,620	4,946,796	4,967,298
4,851,511	4,928,258	4,946,831	4,968,023
4,852,522	4,928,525	4,946,855	4,968,629
4,853,373	4,929,309	4,947,121	4,968,831
4,860,810	4,929,317	4,947,188	4,969,128
4,865,434	4,929,425	4,947,666	4,969,720
4,871,162	4,929,705	4,947,718	4,971,917
4,871,243	4,930,132	4,948,974	4,972,850
4,876,054	4,930,363	4,949,271	4,981,803
4,876,541	4,931,431	4,949,865	4,982,312
4,878,174	4,932,323	4,950,119	4,983,870
4,888,720	4,932,431	4,950,528	5,036,633
4,889,901	4,932,551	4,951,518	5,048,669
4,892,800	4,932,969	4,952,230	5,050,364
4,896,328	4,932,970	4,952,357	5,059,104
4,897,675	4,933,160	4,952,666	5,060,370
4,898,328	4,933,649	4,952,686	
4,899,290	4,934,308	4,952,751	

Disclaimers

4,263,634—Roger D. Chenoweth, Rochester; Donald J. Smith, Byron, both of Minn. MAGNETIC DISK-JACKET ASSEMBLY. Patent dated April 21, 1981. Disclaimer filed Nov. 22, 1991, by the assignee, International Business Machines Corp.

The term of this patent subsequent to June 30, 1991, has been disclaimed.

4,535,774—Walter H. Olson, North Oaks, Minn. STROKE VOLUME CONTROLLED PACER. Patent dated Aug. 20,

PATENT NOTICES

1985. Disclaimer filed Jan. 17, 1992, by the assignee, Medtronic, Inc.

Hereby enters this disclaimer to claims 1-5 of said patent.

4,888,647—Kanji Wada, Osaka, Japan. IMAGE RECORDING APPARATUS WITH IMPROVED SOS DETECTION. Patent dated Dec. 19, 1989. Disclaimer filed April 13, 1990, by the assignee, Minolta Camera Kabushiki Kaisha.

Hereby enters this disclaimer to claims 7 through 13 of said patent.

5,055,723—Derek F. Bowers; Douglas S. Smith, both of Sunnyvale, Calif. JFET ANALOG SWITCH WITH GATE CURRENT CONTROL. Patent dated Oct. 8, 1991. Disclaimer filed Nov. 12, 1991, by the assignee, Analog Devices, Inc.

The term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Dedication

Re. 30,322—Clarence F. Hammer, Wilmington, Del.; Harold K. Sinclair, Louisville, Ky., NOVEL ELASTOMERIC GRAFT COPOLYMERS. Patent dated July 1, 1980. Dedication filed April 16, 1986, by the assignee, E. I. du Pont de Nemours and Co.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedications

4,851,305—William H. Kump, St. Paul; Richard M. Sahli, Cottage Grove, both of Minn. COVER ASSEMBLIES FOR ELECTRIC STORAGE BATTERIES AND BATTERIES UTILIZING SUCH COVER ASSEMBLIES. Patent dated July 25, 1989. Disclaimer and Dedication filed June 7, 1990, by the assignee, GNB Inc.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,929,890—Robert L. Bell, Agoura Hills; Herman L. Renger, Calabasa, both of Calif. SYSTEM FOR OBTAINING DIGITAL OUTPUTS FROM MULTIPLE TRANSDUCERS. Patent dated May 29, 1990. Disclaimer and Dedication filed Sept. 6, 1991, by the assignee, Bell Microsensors, Inc.

Hereby disclaims and dedicates to the Public the term of this patent subsequent to Sept. 1, 1991.

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
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Box Assignment	All assignment documents except those filed with new applications.
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Box PATENT APPLICATION	New patent application and associated papers and fees.
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Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
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	San Diego Public Library	(619) 236-5813
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Texas	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
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	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	10/27/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	4/26/90
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — DONALD CZAJA, Acting Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/6/90
BIOTECHNOLOGY, GROUP 180 — BARRY S. RICHMAN, Acting Director	308-0196	6/30/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	6/12/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	6/12/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	10/12/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS, GROUP 240 — CARLTON CROYLE, Director	308-0771	12/24/90
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	508-0956	12/15/90
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	7/07/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	4/18/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	3/04/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	2/12/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	11/26/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	2/05/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	11/28/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during January 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents	Numbers 3,858,241 to 3,863,270 inclusive
Plant Patents	3,674 to 3,677

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REEXAMINATIONS

FEBRUARY 18, 1992

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,198,327 (1640th)

GRAFTED POLYOLEFIN COMPOSITION HAVING
IMPROVED ADHESIVENESS

Hisashi Matsumoto, 2-35, 1-chome, Munonoki-machi, Iwakuni-shi, Yamaguchi-ken, and Hiroji Niimi, 888, Oaza Waki, Waki-machi, Kuga-gun, Yamaguchi-ken, both of Japan

Reexamination Request No. 90/002,419, Aug. 27, 1991.

Reexamination Certificate for Patent No. 4,198,327, issued Apr. 15, 1980, Ser. No. 753,412, Dec. 22, 1976.

Claims priority, application Japan, Dec. 27, 1975, 50-155864
Int. Cl.³ C08L 51/04, 51/06

U.S. Cl. 525—73

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2-3, dependent on an amended claim, are determined
to be patentable.1. A composition having improved adhesion to polar solid
materials which consists essentially of

(A) 97 to 80 parts by weight based on the total weight of the resin composition of a modified crystalline polyolefin having grafted thereto a monomer selected from the group consisting of unsaturated aliphatic carboxylic acids selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid and citraconic acid, or its anhydride, ester, amide, imide or metal salt, said crystalline polyolefin having a degree of crystallinity measured by an X-ray analysis, of at least 25%, and containing the grafting monomer in an amount of 0.0001 to 3% by weight based on the total amount of the crystalline polyolefin and the grafting monomer; and

(B) 3 to 20 parts by weight of a hydrocarbon elastomer selected from the group consisting of [natural rubber,] polyisobutylene, ethylene/propylene rubber, ethylene/1-butene rubber, butyl rubber, styrene butadiene rubber, ethylene/butadiene rubber, or isoprene rubber.

B1 4,884,814 (1641st)

GOLF BALL

Michael J. Sullivan, Chicopee, Mass., assignor to Spalding & Evenflo Companies, Inc.

Reexamination Request No. 90/002,017, May 9, 1990.

Reexamination Certificate for Patent No. 4,884,814, issued Dec. 5, 1989, Ser. No. 144,200, Jan. 15, 1988.

Int. Cl.³ A63B 37/12; C08K 3/14, 3/30; C08L 33/02
U.S. Cl. 273—235 RAS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

Claims 7-11 having been finally determined to be unpatentable, are cancelled.

Claims 1 and 21 are determined to be patentable as amended.

Claims 2-7, 12-20 and 22-26, dependent on an amended claim, are determined to be patentable.

1. A golf ball comprising a core and a cover, wherein said cover comprises from about 25 to about [75] 70 percent of a hard ionomer which is a sodium or zinc salt of the copolymer of an olefin having from 2 to 8 carbon atoms and an unsaturated monocarboxylic acid having from 3 to 8 carbon atoms, wherein said hard ionomer has a modulus of from about 30,000 to 50,000 P.S.I. and from about 75 to about [25] 30 percent of a soft ionomer which is a sodium or zinc salt of a terpolymer of an olefin having from 2 to 8 carbon atoms, an unsaturated monocarboxylic acid having from 3 to 8 carbon atoms, and an unsaturated monomer of the acrylate ester class having from 2 to 22 carbon atoms, wherein said soft ionomer has a modulus of from about 3,000 to 7,000 P.S.I. and an effective amount of a suitable pigment.

B1 4,916,004 (1642nd)

CEMENT BOARD HAVING REINFORCED EDGES

Robert P. Ensminger, Carman; Robert E. McCleary, Geneva, and Ludwig Wenzlow-Lukasch, Deerfield, all of Ill., assignors to United States Gypsum Company

Reexamination Request No. 90/002,100, Aug. 1, 1990.

Reexamination Certificate for Patent No. 4,916,004, issued Apr. 10, 1990, Ser. No. 290,841, Dec. 27, 1988.

Int. Cl.³ B32B 23/02

U.S. Cl. 428—192

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

Claims 1, 4 and 6 are determined to be patentable as amended.

Claims 2, 3, 5, 7 and 8, dependent on an amended claim, are determined to be patentable.

New claims 9-11, 12 and 13 are added and determined to be patentable.

1. A cement board prepared from a thin, indefinitely long panel which is cut into desired lengths consisting essentially of a cementitious core, a bottom surface, a top surface, uniform longitudinal edge surfaces, and a mesh of reinforcing glass fibers embedded in the core just beneath said surfaces.

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REISSUES

FEBRUARY 18, 1992

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

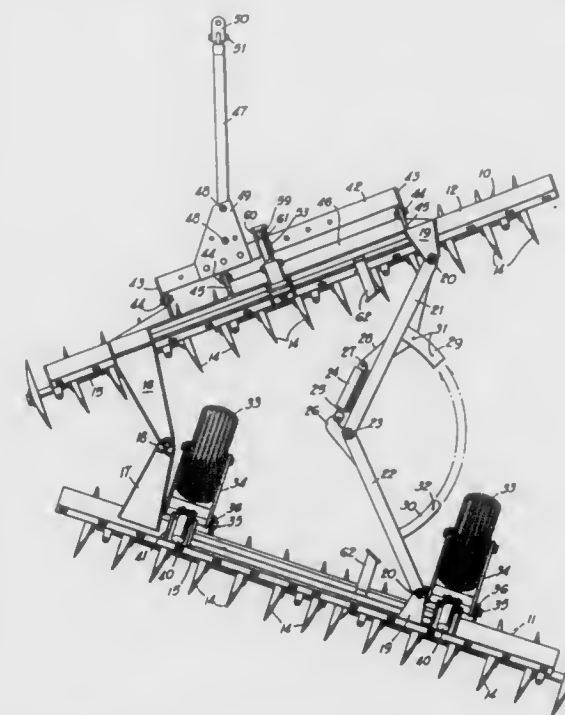
Re. 33,822

HINGE-TYPE OFFSET WHEEL HARROW

Samuel J. Coughran, Jr., Cedartown, Ga., assignor to Rome Industries, Inc., Cedartown, Ga.
Original No. 4,308,919, dated Jan. 5, 1982, Ser. No. 109,551, Jan. 4, 1980. Application for reissue Jan. 3, 1984, Ser. No. 567,900

Int. Cl.⁵ A01B 21/08, 63/22, 73/06
U.S. Cl. 172—240

5 Claims



5. A harrow comprising leading and trailing harrow units, means pivotally coupling said units near corresponding ends thereof for relative angular adjustment, a toggle linkage interconnecting said units near the other ends of the units, power means connected with the toggle linkage to open and close it for adjusting the angle between said units and for drawing said units into substantially parallel relationship for transport, spaced transport wheels on the trailing unit substantially at right angles thereto and being pivotally attached to the trailing unit for vertical swinging movement for raising and lowering the trailing unit relative to the ground, power means connected with the transport wheels to swing them on their pivots, a drawbar and tongue assembly pivotally coupled with said leading unit for vertical swinging relative thereto, said drawbar and tongue assembly adapted for coupling with a hitch of a towing vehicle for the harrow, power means on the leading unit coupled with said drawbar and tongue assembly to raise and lower the assembly on its pivot for lowering and raising the leading unit relative to the ground through the reactive force of said hitch when coupled to said drawbar and tongue assembly, said power means on the leading unit comprising an assembly having a hydraulic cylinder pivotally coupled to a rocker element, said assembly being pivotally attached at one end to said drawbar and tongue assembly and at the opposite end to said leading unit, and an adjustable stop element positioned in the path of rocking movement of said rocker element so as to selectively limit the swing of said rocker element under the influence of said hydraulic cylinder.

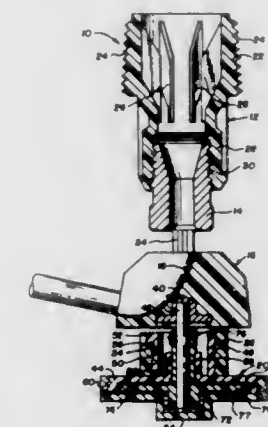
Re. 33,823

ROTARY SPRINKLER HEAD

Barton R. Nelson; Larry P. Meyer, and George L. Sesser, all of Walla Walla, Wash., assignors to Nelson Irrigation Corporation, Walla Walla, Wash.
Original No. 4,660,766, dated Apr. 28, 1987, Ser. No. 777,411, Sep. 18, 1985. Application for reissue Apr. 24, 1989, Ser. No. 343,815

Int. Cl.⁵ B05B 3/04
U.S. Cl. 239—222.17

60 Claims



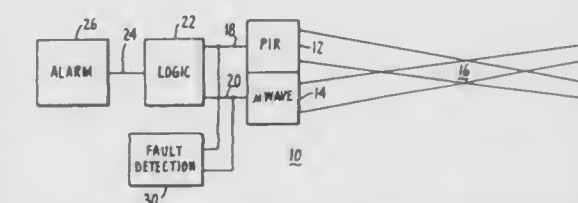
46. A rotary sprinkler comprising:
a sprinkler body having an inlet and an outlet, said outlet mounting a removable outlet nozzle;
a distributor supported at one end of a rotatable shaft and axially spaced from said outlet nozzle, said distributor having at least one surface for engaging a liquid stream discharged from said outlet nozzle, and for causing the distributor to rotate, said shaft mounted for rotation in a bearing supported in a brake assembly housing, said housing including a chamber substantially filled with a viscous fluid; and
a brake element secured to the other end of said shaft and located within said chamber to dampen rotation of said shaft and said distributor.

Re. 33,824

FAULT DETECTING INTRUSION DETECTION DEVICE
Richard A. Johnson, 3285 Curtis Cir., Pleasanton, Calif. 94566
Original No. 4,710,750, dated Dec. 1, 1987, Ser. No. 893,399, Aug. 5, 1986. Application for reissue Oct. 30, 1989, Ser. No. 429,054

Int. Cl.⁵ G08B 13/18
U.S. Cl. 340—522

11 Claims



7. In an intrusion detection system of the class employing dual technology subsystems, wherein a first subsystem provides a first output signal responsive to the detection of an intruder and wherein a second subsystem provides a second output signal responsive to the detection of an intruder and including means responsive to said

first and second output signals for generating an alarm, the improvements therein comprising:

first counting means for counting the number of said first output signals provided by said first subsystem and for providing an output signal when said count equals a selected count;

second counting means for counting the number of said second output signals provided by said second subsystem and for providing an output signal when said count equals a predetermined count;

logic means coupled to said first and second counting means for generating a fault signal indicating a system malfunction for said output signal from said first or second counting means.

Re. 33,825

SUB-MILLIAMP MECHANICAL RELAY CONTROL

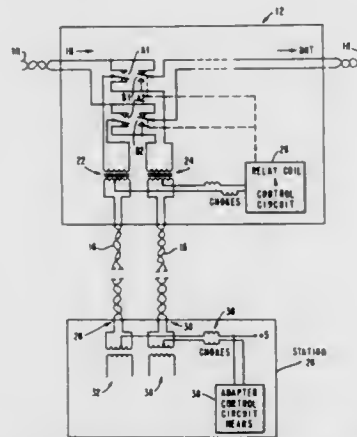
Thomas E. Stammely, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,527,216, dated Jul. 2, 1985, Ser. No. 475,780, Mar. 16, 1983. Application for reissue Aug. 21, 1989, Ser. No. 396,270

Int. Cl.⁵ H01H 47/32

U.S. Cl. 361—156

23 Claims



1. A control circuit suitable for attaching a station to a serial communication network by driving the set and reset energization coils of a bistable relay comprising:

a bistable relay including a switch means having a first and second state connected to the communications network; said bistable relay also including a set energization coil responsive to a first energization current to set the bistable relay and switch means to the first state in which the station is inserted into the network and a reset energization coil responsive to a second energization current to reset said bistable relay and switch means into the second state in which the station is bypassed;

a transformer means including a primary winding means for receiving time varying data signals and a direct current control signal from a station which wants to communicate time varying data signals over the said network and a secondary winding means for applying said time varying data signals to said switch means;

a control circuit means coupled to the bistable relay means and a primary winding means, said control circuit means having a first circuit means disposed in parallel with the set and reset coils; said first circuit means being operable in response to the direct current control signal for setting a first reference voltage level;

at least one storage means coupled to the first circuit means and the set and reset coils, said first storage means being operable in response to the direct current control signal for storing a predetermined electrical charge with a value of sufficient magnitude for setting and resetting the bistable relay;

a first switching means coupled to the set energization coil and the storage means; said first switching means being

operable when the charge on said storage means exceeds the value for causing the storage means to discharge a portion of its charge into the set energization coil to set the bistable relay and switch means into [a] the first state in which a path is established for time-varying signals between the station and the network; and

a second switching means coupled to the storage means and the reset coil; said second switching means being operable when the direct current control signal is discontinued for causing the storage means to discharge the remaining portion of its charge into the reset coil to reset the bistable relay and switch means into [a] the second state in which the path for time-varying signals between the network and the station is interrupted.

Re. 33,826

MICROSCOPE INSPECTION SLIDE

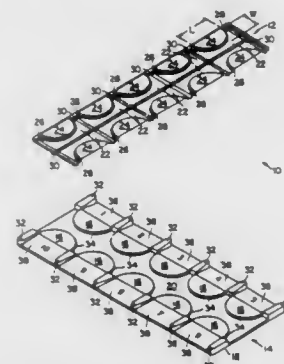
Vance C. Mitchell, Irvine, Calif., assignor to Hycor Biomedical, Inc., Garden Grove, Calif.

Original No. 4,637,693, dated Jan. 20, 1987, Ser. No. 758,056, Jul. 23, 1985. Continuation of Ser. No. 258,839, Oct. 12, 1988, abandoned. Application for reissue Sep. 7, 1989, Ser. No. 409,951

Int. Cl.⁵ G01N 21/01; G02B 21/34

U.S. Cl. 359—398

16 Claims



16. Separate cover and base plate elements for assembly by ultrasonic welding to provide a unitary liquid specimen examination slide having at least one examination chamber

said base plate having at least one flat optically smooth examination chamber floor surface,

said cover plate having at least one flat, optically smooth examination chamber roof surface,

at least one of said base and cover plates having chamber depth control means for maintaining said chamber floor and roof surfaces in a predetermined spaced, parallel relationship when said base and cover plates are assembled and ultrasonically welded, and

at least one ultrasonic energy directing means spaced sufficiently away from said depth control means to yield a unitary ultrasonically welded slide having a chamber of uniform depth defined by said predetermined, parallel spaced relationship of said optically smooth chamber floor and roof surfaces.

Re. 33,827

LOCKING FASTENER

Sydney L. Terry, 47 Pine Ct., Grosse Pte. Farms, Mich. 48236

Original No. 4,708,555, dated Nov. 24, 1987, Ser. No. 811,113, Dec. 19, 1985. Application for reissue Aug. 2, 1989, Ser. No. 388,692

Int. Cl.⁵ F16B 39/24

U.S. Cl. 411—149

11 Claims

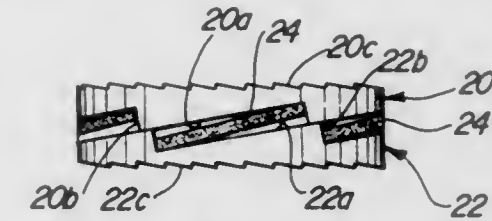
1. An annular locking fastener adapted to be mounted on an elongated threaded member, said locking fastener comprising: (A) a first portion;

(B) a second portion movable relative to said first portion;

(C) confronting coacting parallel first and second ramp surfaces on said first and second portions, respectively, inclined at a circumferential angle [of at least 7°] and movable into sliding wedging contact with each other in response to relative movement between said portions in a first, tightening direction to cause said first ramp surface to move slidably down said second ramp surface to decrease the overall axial height of said fastener and operative in response to relative movement between said portions in the opposite, loosening direction to cause said first ramp surface to move slidably up said second ramp surface to increase said overall height; and

(D) spring means yieldably resisting relative movement of said portion in said first, tightening direction and operative in response to such tightening movement to store

energy in said fastener biasing said portions for movement in said opposite, loosening direction to urge said first ramp



surface to move slidably up said second ramp surface to increase the overall height of the fastener.

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PLANT PATENTS

GRANTED FEBRUARY 18, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

- 7,791
IMPATIENS PLANT NAMED ROSETTA
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,023
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Impatiens plant named Rosetta, as illustrated and described.
- 7,792
KALANCHOE PLANT NAMED SPLENDOR
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,374
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Kalanchoe plant named Splendor, as illustrated and described.
- 7,793
IMPATIENS PLANT NAMED BLAZON
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,376
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Impatiens plant named Blazon, as illustrated and described.
- 7,794
KALANCHOE PLANT NAMED MAJESTIC
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,377
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Kalanchoe plant named Majestic, as illustrated and described.
- 7,795
KALANCHOE PLANT NAMED REVELRY
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,378
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Kalanchoe plant named Revelry, as illustrated and described.
- 7,796
IMPATIENS PLANT NAMED ILLUSION
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,379
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Impatiens plant named Illusion, as illustrated and described.
- 7,797
IMPATIENS PLANT NAMED HEATHERMIST
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,380
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Impatiens plant named Heathermist, as illustrated and described.
- 7,798
KALANCHOE PLANT NAMED KEEPSAKE
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Oct. 31, 1990, Ser. No. 607,442
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Kalanchoe plant named Keepsake, as illustrated and described.
- 7,799
POINSETTIA PLANT NAMED MARJO CHARM
James White, Stouffville, Canada, assignor to Ball Seed Co., West Chicago, Ill.
Filed Nov. 9, 1990, Ser. No. 611,404
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Poinsettia plant named Marjo Charm, as illustrated and described.
- 7,800
POINSETTIA PLANT NAMED MARJO ROSE
James White, Stouffville, Canada, assignor to Ball Seed Co., West Chicago, Ill.
Filed Nov. 9, 1990, Ser. No. 611,403
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Poinsettia plant named Marjo Rose, as illustrated and described.
- 7,801
POINSETTIA PLANT NAMED MARJO WHITE
James White, Stouffville, Canada, assignor to Ball Seed Co., West Chicago, Ill.
Filed Nov. 9, 1990, Ser. No. 611,405
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of Poinsettia plant named Marjo White, as illustrated and described.
- 7,802
CARNATION NAMED 'STADIA'
Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staavern, B.V., Aalsmeer, Netherlands
Filed Jun. 21, 1990, Ser. No. 541,523
Int. Cl.⁵ A01H 5/00
U.S. Cl. Plt.—70 1 Claim
1. The new and distinctive carnation plant, substantially as herein shown and described, particularly characterized by the red purple coloration of its flowers and the intermittent and profuse production of flowers on strong, upright stem.

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PATENTS

GRANTED Feb. 18, 1992

ERRATA

For CLASS	See PATENT NO.
404-071	5,088,219
57-280	5,088,264
57-328	5,088,265
57-408	5,088,266
34-015	5,088,387
454-271	5,088,388
141-234	5,088,436
606-241	5,088,476
600-040	5,088,477
602-027	5,088,478
602-027	5,088,479
602-023	5,088,480
602-023	5,088,481
602-018	5,088,482
602-046	5,088,483
602-044	5,088,484
454-220	5,088,540
297-219	5,088,747
292-092	5,088,786
385-033	5,088,803
385-081	5,088,804
359-814	5,088,805
359-084	5,088,806
359-094	5,088,808
359-276	5,088,808
297-344	5,088,841
600-030	5,088,908
55-025	5,089,048
106-486	5,089,056
205-075	5,089,092
210-287	5,089,108
204-427	5,089,133
204-078	5,089,359
501-104	5,089,455
501-119	5,089,456
525-314	5,089,550
359-333	5,089,786
395-275	5,089,951
395-725	5,089,952
395-425	5,089,953
395-600	5,089,954
395-800	5,089,957

ERRATA—Continued

395-600	5,089,958
395-425	5,089,957
395-575	5,089,958
395-650	5,089,984
395-600	5,089,985
395-375	5,089,990

PATENTS
GRANTED FEBRUARY 18, 1992
GENERAL AND MECHANICAL

5,088,114
DISPOSABLE FACESHIELD AND METHOD OF
MANUFACTURE THEREOF
Arthur J. Salce, and Richard T. Metcalfe, both of Southbridge,
Mass., assignors to Cabot Safety Corporation, Southbridge,
Mass.
Division of Ser. No. 206,597, Jun. 14, 1988, which is a
continuation-in-part of Ser. No. 152,624, Feb. 5, 1988. This
application Jan. 16, 1990, Ser. No. 464,965
Int. Cl.⁵ A61F 9/00, 9/04, 9/06
U.S. Cl. 2—9 36 Claims

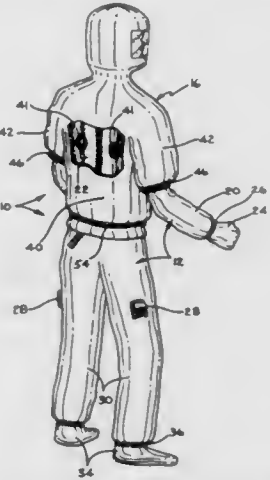


1. A one piece, protective faceshield comprising:
a curved brow member adapted to substantially conform
with and contact a wearer's forehead; and
a faceshield body extending outwardly and downwardly
from said brow member along an edge and wherein said
brow member and faceshield body is permanently integral
along the entirety of said edge, said faceshield body being
adapted to cover at least a portion of the wearer's face
without contacting any part thereof below the forehead,
said faceshield extending below the wearer's nose wherein
said faceshield body has an upper viewing portion dis-
posed in the wearer's viewing path and a lower portion
extending outwardly and downwardly therefrom such
that air exhaled by the wearer is directed away from said
upper viewing portion.

5,088,115
VENTILATED FULL BODY PROTECTIVE GARMENT
Michael L. Napolitano, Georgetown, Ky., assignor to E. D.
Bullard Company, Sausalito, Calif.
Filed Dec. 12, 1990, Ser. No. 626,542
Int. Cl.⁵ A41D 13/00

- U.S. Cl. 2—69 11 Claims
1. A ventilatable full body protective garment for use in a
contaminated atmospheric environment comprising
a body suit including a long pants portion, a shirt portion
having a pair of long sleeves and a manually cinchable
neck opening, a pair of gloves, and a pair of foot covers,
all being joined together in an air tight manner,
means for venting excess air from said suit through said shirt
portion such that the pressure of air within an upper body
region of said suit does not exceed a predetermined maxi-
mum value, and
a parka including a pull-over torso covering portion having
a pair of sleeves with elastic bands and an elastic waist
band for closing around the arms and waist, respectively,
of a wearer, a supplied air respirator hood attached to and
around a neck opening of said torso covering portion, and
means for directing excess air from said hood through the
neck opening of said shirt portion into said suit, whereby
excess air vented from said suit through said shirt portion
circulates in a space between said shirt and torso covering
portions to form a pair of overlying positive pressure air
barriers in the upper body region of the garment to inhibit

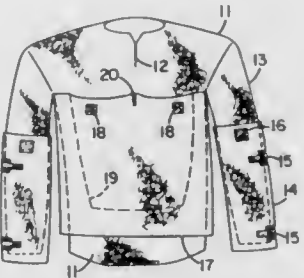
exposure of a wearer to air borne contaminants contained
in the ambient atmosphere, and excess air is vented from



said space to ambient atmosphere through said waist and
sleeve bands, said suit and parka being constructed of a
flexible, air impervious non-stretchable material.

5,088,116
ALL WEATHER GARMENT SYSTEM
Russell P. Gould, P.O. Box 262, Youngstown, Pa. 15696
Filed Apr. 10, 1989, Ser. No. 335,586
Int. Cl.⁵ A11D 3/06

U.S. Cl. 2—82 11 Claims



1. An all-weather garment assembly comprising a plurality
of detachable components, including:
A. a two-part foundation garment of non-water-resistant
fabric, including
1) a shirt-jacket forming an upper-body foundation gar-
ment portion, and
2) a pant forming a lower-body foundation garment por-
tion, having a water-resistant hip-covering skirt,
B. a removable sleeved yoke constructed of water-resistant
rainproof fabric to encase the arms, shoulders, upper chest
and back, overlapping and detachably attached to said
shirt-jacket,
C. a pair of leg chaps of water-resistant rainproof fabric
detachably attached to said pant,
D. both portions of said two-part foundation garment incor-
porating water-resistant rainproof panels exposed wher-
ever said yoke or leg chaps when worn do not afford the
wearer protection from precipitation, and
E. means for removable attachment of said yoke and said leg
chaps to a respective portion of said two-part foundation
garment in top-to-bottom shingled overlapping water-
shedding relation,

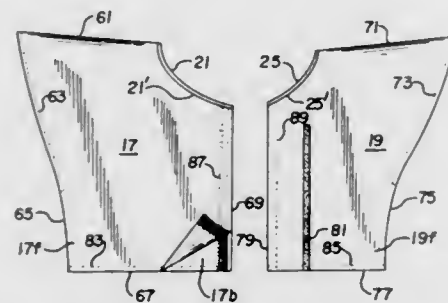
whereby when worn together, said yoke, said leg chaps and said two-part foundation garment form a rainproof assembly.

5,088,117

VERSATILE HOSPITAL AND OUT-PATIENT GOWN
Dorothy A. Fulmer, 3800 Liberty Way, McKeesport, Pa. 15133
Filed Aug. 1, 1990, Ser. No. 561,945
Int. Cl.⁵ A41D 13/00

U.S. Cl. 2—114

6 Claims



1. A patient gown top enabling access for diagnosis including testing, treatment and care, comprising:

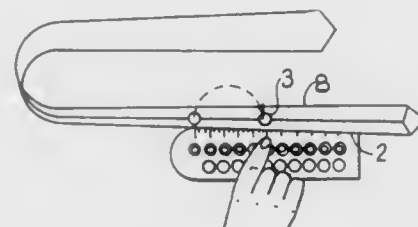
- a left side having a front left side and an identical back left side with a left neck cut-out, said front and back left sides being joined together along a first shoulder seam which extends upward from a top of the left neck cut-out to a left side outer edge so that the left side resembles a butterfly wing;
 - a left arm opening defined by said front and back left sides and extending from said first shoulder seam downward approximately two-thirds of length along said left side outer edge;
 - a left outer edge seam extending from a bottom of said arm opening to a bottom of the left side;
 - a first fastener secured to the front and back left sides on the outsides thereof at respective locations spaced inwardly of a left side vertical inner edge, said inner edge extending from a bottom of the left neck cut-out to the bottom of the left side;
 - a right side having a front right side and back right side with a right neck cut-out, said front and back right sides being joined together along a second shoulder seam which extends upward from a top of the right neck cut-out to a right side outer edge so that the right side resembles a butterfly wing;
 - a right arm opening defined by said front and back right sides and extending from said second shoulder seam downward approximately two-thirds a length along said right side outer edge;
 - a right outer edge seam extending from a bottom of said arm opening to a bottom of the right side; and
 - a second fastener secured to the front and back right sides on the insides thereof at respective locations along a vertical right side inner edge, which extends from a bottom of the right neck cut-out to the bottom of the right side;
- said right side overlapping said left side with said second fasteners engaging said first fasteners to secure said right side and said left side, the shoulders of a patient engaging an inside of said shoulder seams at spaced locations from said neck cut-outs, thereby draping an outer portion of each shoulder seam downward along the patient's arms to form a simulated sleeve with an open axilla.

5,088,118
ARTICLE AND METHOD FOR TYING NECKTIES
F. Howard Whiteley, 1913-A W. Chipman Rd., Lee's Summit, Mo. 64081

Filed Mar. 6, 1989, Ser. No. 319,558
Int. Cl.⁵ A41D 25/08

U.S. Cl. 2—144

17 Claims



1. A method of tying a necktie presenting a first end and a second end for wear about the collar of a human wearer comprising the steps of:

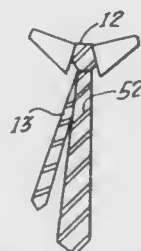
- affixing a small marker element which is visually and tactily distinguishable from the material of the necktie to the necktie;
- positioning said affixed marker element proximate a chosen location point on one of the wearer's apparel and anatomy; and
- draping said tie around the collar of the wearer with said first and second ends draping from opposing sides of the wearer's collar whereby, upon tying of the tie by the user in the user's habitual manner, the first and second ends of the tie will be located in a desired position.

5,088,119
NECKTIE HAVING A KNOT PORTION, DISPLAY PORTION AND TAIL PORTION WITH AN ALIGNED DESIGN WHEN TIED

Robert A. Fortier, 1 Hammond Pl., Boynton Beach, Fla. 33462
Continuation-in-part of Ser. No. 533,808, Jun. 6, 1990, abandoned. This application Oct. 9, 1990, Ser. No. 594,604
Int. Cl.⁵ A41D 25/06

U.S. Cl. 2—146

25 Claims

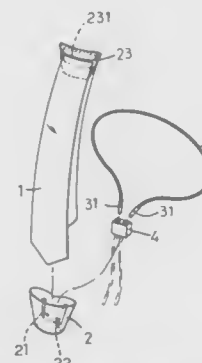


1. In a necktie having a knot portion, a display portion connected to one end of said knot portion and a tail portion connected to the other end of said knot portion, said knot portion being sized and positioned such that when said tie is worn, an exposed knot is formed solely from said knot portion and said display portion is draped forward of said tail portion, the improvement comprising a different pattern being on said display portion than on said knot portion.

5,088,120
COMBINED AND FIXED NECKTIE
Chen-Chou Yen, Tainan, Taiwan, assignor to Ching Yang Necktie Co., Ltd., Tainan, Taiwan
Filed Mar. 26, 1991, Ser. No. 678,545
Int. Cl.⁵ A41D 25/14

U.S. Cl. 2—152 R

1 Claim



1. A combined and fixed necktie comprising:

- (a) a necktie body;
- (b) an adjusting plate member having rectangularly contoured apertures for passage therethrough of said necktie body for fixing the length of said necktie body when worn by a user;
- (c) a metallic sheath member having a through opening for insertion of said adjusting plate member and a neck rope retainer, said metallic sheath member having a pair of protruding strip members and a pair of non-slipping block members formed on an inner surface of said metallic sheath member for contacting and intercepting the path of said neck rope retainer when said neck rope retainer is inserted within said metallic sheath member;
- (d) said neck rope retainer having a box contour, said neck rope retainer including a centrally located longitudinally extending divider plate fixed to a wall of said neck rope retainer, and an arcuately contoured spring pincer member having inwardly biased end sections, said arcuately contoured spring pincer member being positionally located between a pair of transversely displaced wall members and said divider plate of said neck rope retainer, said spring pincer member having a pair of receiving holes formed through a frontal section thereof for alignment with a pair of retainer holes formed through a frontal wall of said rope retainer; and
- (e) a flexible neck rope member having a pair of fitted pair rings secured to opposing ends thereof, said flexible neck rope insertable through said retainer holes and said receiving holes, said flexible neck rope member being clamped between said divider plate and said inwardly biased end sections of said spring pincer member, said flexible neck rope member extending through a pair of openings formed through a rear wall of said neck rope retainer.

5,088,121
GLOVE WITH A POCKET FOR HOLDING MACE AND A METHOD OF MAKING SAME

Jacqueline E. Wallace, 2383 23rd St., 2nd Flr., Astoria, N.Y. 11105

Filed Jan. 29, 1991, Ser. No. 647,542
Int. Cl.⁵ A41D 19/00

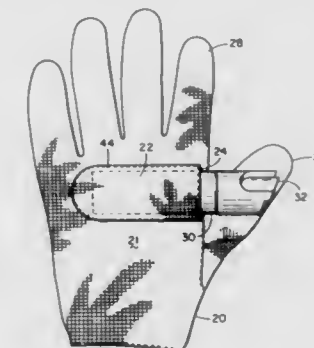
U.S. Cl. 2—160

5 Claims

1. A holder for retaining a canister of repellant in the palm of the hand of the user, comprising:

- a hand encircling member disposed at least around the palm of the hand, said encircling member comprised of a glove having a thumb and an index finger and a retaining means attached to said encircling member, which retains said canister of repellant in the palm of the user, said retaining

means comprises a pocket having an inner surface of "non-skid" material and transversely attached to the palm area of the hand encircling member and configured to

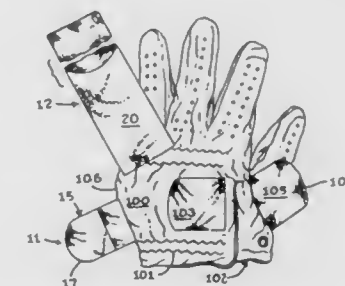


receive said canister of repellant and to fractionally engage such canister and further configured so that the pocket is open in the area between the thumb and index finger of the user.

5,088,122
GOLF SWING TRAINING GLOVE
Martin R. O'Toole, 18 Clare Ter., Pembroke, Mass. 02359
Filed Feb. 28, 1991, Ser. No. 662,074
Int. Cl.⁵ A41D 19/00

U.S. Cl. 2—161 A

3 Claims



1. A golf grip training glove apparatus for teaching the proper grip on the handle of a golf club wherein the apparatus comprises:

- a golf glove construction; wherein the golf glove construction has a top, two sides, a bottom; and an opening controlled by a pair of cooperating closure flaps; wherein, a top surface of one of the pair of cooperating closure flaps is provided with a first hook and loop fastener
- a releasable flap closure member secured on one end to the top of the golf glove construction and having a free end provided with second and third hook and loop fasteners on both the top and bottom of said free end; wherein, the second hook and loop fastener on the bottom of the free end of the releasable flap closure member releasably engages the first hook and loop fastener dispensed on the top of the said one of the pair of cooperating closure flaps; and,
- an elongated strap unit comprising an elongated flat wide strap member secured on one end to the top of the golf glove construction; wherein the other end of the strap member is provided with a fourth hook and loop fastener; wherein, the strap member is of sufficient length to encircle the users fingers and the base of the thumb as well as the handle of said golf club when said fourth hook and loop fastener is engaged with said third hook and loop fastener on the top surface of the releasable flap closure member.

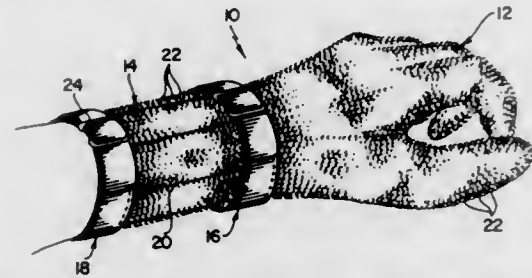
5,088,123

PROTECTIVE GARMENT

Ross E. MacDonald, North Attleboro, Mass., assignor to Whiting and Davis Company, Inc., Plainville, Mass.
Filed May 10, 1991, Ser. No. 698,265
Int. Cl.⁵ A41D 19/00

U.S. Cl. 2—162

14 Claims



8. A protective glove comprising a hand portion and a cuff portion attached to said hand portion, said glove being adapted to be received on a hand of a wearer so that said cuff portion extends a distance upwardly along an adjacent wrist toward an adjacent elbow of said wearer, said cuff portion including a wire mesh portion comprising a plurality of loosely interlinked wire rings and resiliently flexible stiffening means for maintaining at least a portion of said wire mesh portion in a predetermined orientation, said stiffening means comprising at least one elongated resilient helically coiled stiffening element interwoven through a portion of said wire rings in said portion of said wire mesh portion for maintaining the latter substantially in said predetermined orientation.

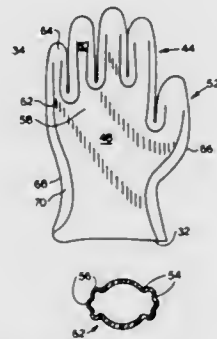
5,088,124

GLOVE AND FORM FOR MAKING SAME

Robert A. Dutchik, Valencia, Calif., assignor to Baxter International Inc., Deerfield, Ill.
Continuation of Ser. No. 262,548, Oct. 25, 1988, abandoned.
This application Nov. 7, 1990, Ser. No. 614,045
Int. Cl.⁵ A41D 19/00

U.S. Cl. 2—163

1 Claim



1. A glove, comprising:
a front surface (48)
a back surface, said back surface being substantially a mirror image of said front surface,
both said front and back surfaces being substantially flat,
each of said front and back surfaces having a palm surface (58), five digit surfaces (60), and a periphery (66),
each of said digit surfaces having a base (62) by which each of said digit surfaces is connected to said palm surface,
each of said digit surfaces also having a tip portion (64) spaced distally from said palm surface (58);
a side section connecting said periphery of said front surface to said periphery of said back surface,
said side section having four concave portions (54) alter-

nated with three convex portions (56) that extend substantially along said side section between said periphery of said front and back surfaces except along said periphery adjacent each of said tip portions.

5,088,125

GLOVES

Christopher W. Ansell, Sawston; Nicholas Medcalf, Ware, and Peter W. Williams, Saffron Walden, all of United Kingdom, assignors to Smith & Nephew Associated Companies plc, United Kingdom

PCT No. PCT/GB88/00301, § 371 Date Oct. 17, 1989, § 102(e) Date Oct. 17, 1989, PCT Pub. No. WO88/08311, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 21, 1988, Ser. No. 424,246

Claims priority, application United Kingdom, Apr. 21, 1987, 8709329; Apr. 28, 1987, 8710073

Int. Cl.⁵ A41D 19/00

U.S. Cl. 2—167

22 Claims

1. A glove fabricated from an allergenic elastomer, wherein the hand contacting surface of the glove has been modified by an ionic polyurethane which allows donning without the use of powders and renders the glove hypoallergenic.

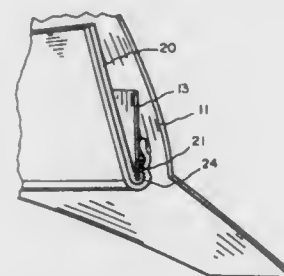
5,088,126

DISPOSABLE LINER FOR PROTECTIVE HEAD COVERINGS

Richard M. Mathis, 110 South 400 East, Vernal, Utah 84078
Filed Apr. 26, 1990, Ser. No. 514,979
Int. Cl.⁵ A42C 5/02

U.S. Cl. 2—181

20 Claims



1. A disposable liner for lining a forehead-contacting flap of a protective head covering such as a hard hat, said forehead-contacting flap having an inner forehead-contacting flap with a portion along a side thereof folded approximately 180°, and wherein the forehead-contacting surface, comprising a piece of absorbent, cushioning material sized to fit over the forehead-contacting surface of the forehead-contacting flap of the protective head covering, said material having a forehead-contacting surface and an opposite surface; pressure sensitive adhesive covering the opposite surface so that the piece of material may be removably secured to the forehead-contacting surface of the forehead-contacting flap by placing the pressure sensitive adhesive against such flap, one edge of said material being adapted to be folded over the folded portion of the flap; slits in the side of said material adapted to be folded over the folded portion of the flap to facilitate such folding; and removable adhesive covering means covering the pressure sensitive adhesive to protect such adhesive until it is desired to adhere the piece of material to the forehead-contacting flap.

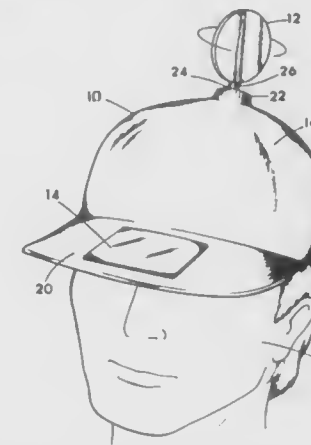
5,088,127

POWERED ROTATING DISPLAY IN A HAT

Del. N. Thornock, 1206 Aspen Dr., Concord, Calif. 94520
Filed Dec. 3, 1990, Ser. No. 621,740
Int. Cl.⁵ A42B 1/24

U.S. Cl. 2—199

1 Claim



1. A hat comprising a crown with attached bill and sized for wearing on the head of a person, said hat further including a rotatable advertisement placard sized and shaped for exhibiting advertisement information applied thereon, said advertisement placard affixed to a rotatable shaft, said shaft rotatable by an electric motor affixed to said hat, whereby rotation in said shaft rotates said advertisement placard, a photovoltaic panel attached to an exterior surface of said hat, an electrically conductive circuit between said photovoltaic panel and said motor, said circuit providing means for supplying electrical power produced in said photovoltaic panel to said motor to power rotation in said shaft and thereby rotate said advertisement placard so as to attract increased attention to the exhibited advertisement information on said advertisement placard.

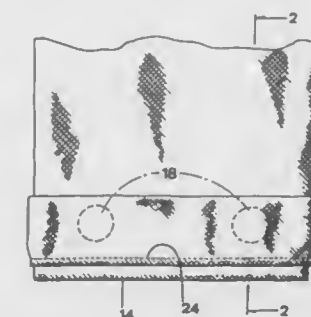
5,088,128

DROP DOWN CUFF ARRANGEMENT FOR PANT LEGS OR SLEEVES

Sandy N. Kape, 405 Charlotte St., Punta Gorda, Fla. 33950
Continuation of Ser. No. 446,314, Dec. 5, 1989, abandoned. This application Apr. 4, 1991, Ser. No. 680,411
Int. Cl.⁵ A41D 27/10

U.S. Cl. 2—269

3 Claims



1. A drop down cuff arrangement for a pant leg, or sleeve comprising:
a pant leg or sleeve having an un-extended position wherein a first portion of the leg or sleeve includes a finished hem at the end to form an un-extended position hemline,
a cuff strip stitched to the outside of the leg or sleeve above the un-extended position hemline, folded upwards away from the un-extended position hemline, said cuff strip being held in place by stiffening means therefor,
the pant leg or sleeve having an extended position wherein the cuff strip is folded down over the un-extended position hemline.

the cuff strip is folded down over the un-extended position hemline.

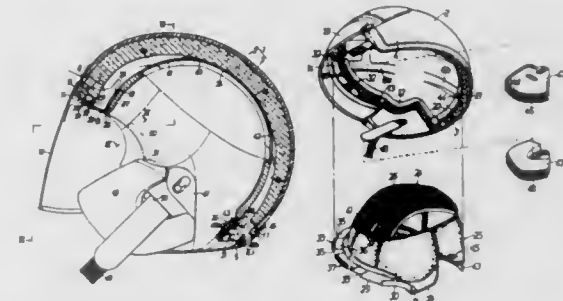
5,088,129

HELMET

Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kako Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1990, Ser. No. 628,047
Claims priority, application Japan, Aug. 20, 1990, 2-86857[U]
Int. Cl.⁵ A42B 3/00

U.S. Cl. 2—411

7 Claims



1. A helmet comprising:
a cap body which is formed of a shell with a buffer liner fitted therein and said cap body includes an inner pad, covered with a cloth cover, disposed inside an inner surface of the buffer liner, wherein said cap body further includes a supporting plate fixed to said cap body for covering a lower end face of a front portion of said buffer liner and a mounting plate fixedly secured to said cover so as to oppose said supporting plate, said supporting plate and said mounting plate are provided with guide means for guiding a longitudinal sliding movement of said mounting plate between an engaging position and a separating position in order to define a predetermined mounting position of said mounting plate with respect to said supporting plate, and said supporting plate and said mounting plate are provided with first locking means for separating and engaging both said mounting plate and said supporting plate in response to the separating position and engaging position of said mounting plate, and a rear end of said inner pad is detachably connected to a rear end of said cap body through second locking means.

5,088,130

PROTECTIVE HELMET HAVING INTERNAL REINFORCING INFRASTRUCTURE

Michele A. Chiarella, Via Vall'Orba 22, 6977 Ruvigliana, Switzerland

Filed Feb. 6, 1990, Ser. No. 475,725

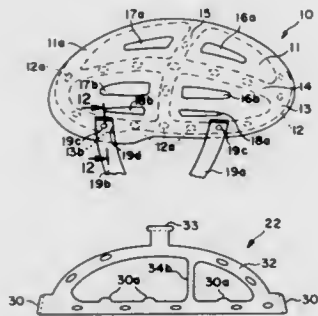
Int. Cl.⁵ A42B 3/00

U.S. Cl. 2—411

4 Claims

1. A protective helmet to be worn on the head of a wearer, comprising:
a foam shell comprising a formed concave-shaped layer of plastic foam material having substantial impact energy absorptive characteristics;
an infrastructure having a plurality of elongated members embedded at least partially within said foam shell and, wherein said elongated members comprise:
a ring shaped member extending around the lower portion of the infrastructure;
at least one elongated strip member connected to the ring shaped member and extending longitudinally relative to the infrastructure; and
at least one transverse strip connecting with said ring shaped member and said elongated longitudinal strip member; and
wherein said infrastructure contains a plurality of openings

spaced apart in the ring shaped and elongated members; and



a retention strap means attached to said infrastructure so as to retain the helmet on the wearer's head.

5,088,131

HELMET WITH LOCKING PORTION FOR HOLDING SHIELD PLATE IN CLOSED POSITION

Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kako Kabushiki Kaisha, Tokyo, Japan

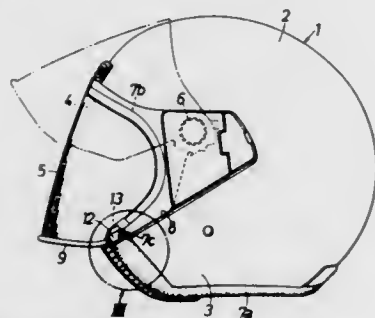
Filed Nov. 19, 1990, Ser. No. 615,563

Claims priority, application Japan, Aug. 21, 1990, 2-87330[U]

Int. Cl.³ A42B 1/08

U.S. Cl. 2—424

4 Claims



1. A helmet comprising:
 - a cap body; and
 - a shield plate formed of a synthetic resin having elasticity and supported on opposite sidewalls of said cap body so as to open or close a window defined in a front of said cap body,
 - an edge member provided on said cap body at an edge of the window for close contact with an inner surface of said shield plate in a closing position thereof, said shield plate being provided at least at one of right and left side lower portions thereof with an engaging projection projected inwardly of the shield plate, the edge member being integrally and projectingly provided with a locking portion for engaging with the engaging projection so as to retain said shield plate in the closing position, the engagement of the engaging projection with the locking portion being released when the shield plate is deflected elastically.

5,088,132

HYGIENIC PROTECTIVE SHIELD FOR FLUSH TOILETS

Hermann Walka, 701 Kingswood Dr., Tyler, Tex. 75703

Filed Aug. 24, 1990, Ser. No. 572,219

Int. Cl.³ E03D 9/00

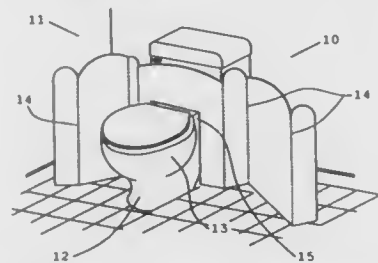
U.S. Cl. 4—300.3

11 Claims

1. A protective shield device for use in conjunction with a toilet disposed over a floor surface and having a toilet bowl,

for protecting wall surfaces adjacent to the toilet from splashes of urine and other liquids, comprising:

a planar body of generally rectangular configuration, having an upper edge and a lower edge and first and second ends, said body being of substantially greater width along its upper and lower edges than the width of the toilet, said body including a cut-out portion in the form of a notch extending into said body from said lower edge thereof intermediate said first and second ends, said notch being of



sufficient width and extension into said body from said lower edge to be received over the portion of a toilet at the rear of the toilet bowl with said lower edge of said body resting upon the floor and with said first and second ends of said body extending upwardly from the floor, and said body further including a plurality of bend lines extending between said lower edge and said upper edge of said body perpendicular to said lower edge, to facilitate bending of said body into a selected configuration around the sides of the toilet bowl.

5,088,133

FLUSH MECHANISM FOR TOILETS

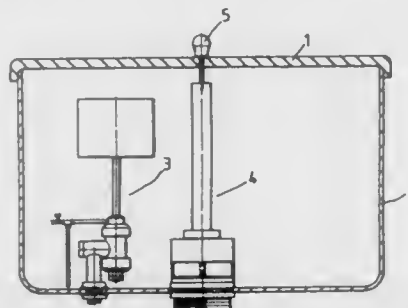
Tsai-An Chen, 201, Sec. 3, Ba-Dar Road, Taipei, Taiwan

Filed Jan. 25, 1990, Ser. No. 470,246

Int. Cl.³ E03D 1/34

U.S. Cl. 4—390

3 Claims



1. A flush mechanism comprising a water supply control device and a water escape control device separately disposed in a flush tank and actuation means, said water supply control device including:
 - support means defining a passage therethrough and having a first end secured to a bottom of the flush tank with an intake end extending outwardly through the bottom for water inlet and a second end bent to extend horizontally within said flush tank;
 - a valve body member defining a passage extending vertically therethrough and communicating with the passage of the support means through an opening in a side wall of the valve body member and communicatively secured to the bent end of the support means;
 - valve seat members of resilient material fitted in opposed ends of the valve body member and defining respective passages normally intercommunicating the passage in said valve body member with the interior of said tank;
 - a rod member extending upwardly through the passage of the valve body to a predetermined height;
 - means in the passage of said valve body member for slidably

retaining the rod member in position relative to said valve body member;

valve head members mounted on the rod member and adapted to be moved by the rod member synchronously between a first position closing the passages and a second position wherein the passages are open;

a float connected to said rod member for actuating the valve members to move between the first and second positions via the rod member;

means for securing the valve seat members in position in the valve body member;

said water escape control device including:

cylinder means having an open bottom, a top plate formed with an opening and a plurality of openings in a side wall thereof;

means for securing the cylinder member to the bottom of the tank;

piston means having a piston adapted to reciprocate in the cylinder means between a first position wherein the openings in the cylinder means are not sealed and a second position closing the openings, a pipe upstanding from the piston through the opening of the top plate of the cylinder member and defining a passage therebetween, and a passage extending through the pipe and the piston and downwardly communicating with the open bottom of the cylinder means; and

said actuation means including a plunger and means interconnecting the plunger and the piston means for actuating the piston to move from its second position to its first position.

5,088,134

PORTABLE NON-FLUSHING TOILET

Ian F. Douglas, 11 Hawthorn Avenue, Caulfield North, Victoria, Australia 3162

PCT No. PCT/AU87/00348, § 371 Date May 9, 1989, § 102(c)

Date May 9, 1989, PCT Pub. No. WO88/02614, PCT Pub.

Date Apr. 21, 1988

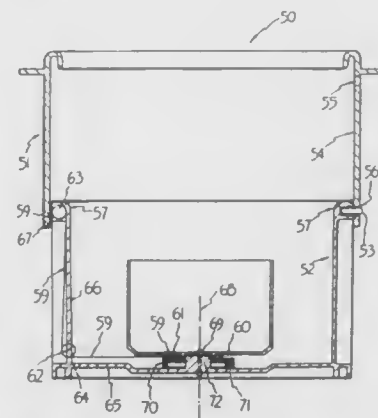
PCT Filed Oct. 16, 1987, Ser. No. 345,541

Claims priority, application Australia, Oct. 20, 1986, PH8582; Nov. 27, 1986, 9198

Int. Cl.³ A47K 11/06

U.S. Cl. 4—484

13 Claims



7. A portable toilet device comprising:
 - a lower section having a portion for supporting a bag;
 - an upper section mounted for movement with respect to said lower section;
 - a toilet seat on said upper section;
 - means on said upper section for releasably supporting a disposable waste receiving bag having a closed lower end and an open upper end with said upper end opened, so that said toilet seat opens into said opened upper end of a disposable waste receiving bag held by said supporting means;

means for closing a disposable waste receiving bag supported by said supporting means comprising:

a lining bag formed of waterproof material, having an open upper end and a lower end and being outwardly of a disposable waste receiving bag supported by said supporting means;

means for attaching the upper end of said lining bag in opened position to said upper section, said open upper end of said lining bag being beneath said toilet seat so that said toilet seat opens into said opened upper end of said lining bag;

means for attaching said lining bag at its lower end to said lower section; and

means responsive to movement of said upper section in one direction for causing gathering of said lining bag intermediate its upper end and its lower end to thereby effect a closure of said lining bag and of a disposable waste receiving bag supported by said supporting means within said lining bag, and being responsive to movement of said upper section in the opposite direction for causing opening of the gathered portion of said lining bag and a said waste receiving bag therein.

5,088,135

CONVERTIBLE SOFA, BED AND TABLE ASSEMBLY

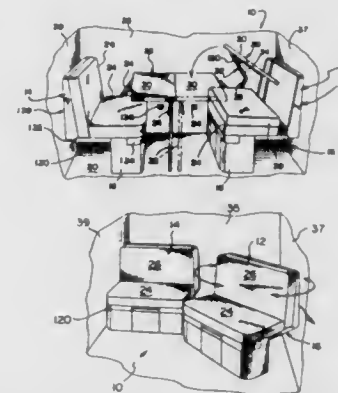
Dennis G. Violette, 7136 N. W. 69th Pl., Redmond, Ore. 97756

Filed Apr. 9, 1991, Ser. No. 682,245

Int. Cl.³ A47C 17/34

U.S. Cl. 5—2.1

20 Claims



1. An improved two-unit convertible facility arranged to be positioned within a limited space that includes at least a side wall and oppositely disposed first and second end walls, and wherein said units are adapted to be selectively arranged to define a mode of use such as a sofa, a bed or a dinette, wherein said convertible facility comprises:

- a first furniture unit;
- a second furniture unit positioned in close relation to the other;
- said first and second furniture units comprising:
 - a main frame section;
 - a secondary frame section extendibly attached to said main frame section;
- means for extending said secondary frame section outwardly from said main frame section;
- a back-rest frame member attached to said main frame section;
- means for releasably securing each of said furniture units to respective adjacent walls;
- means for rotating said first and second furniture units between the side wall and a respective end wall so as to selectively define one of the modes of use; and
- a table assembly foldably mounted within each of said furniture units.

5,088,136

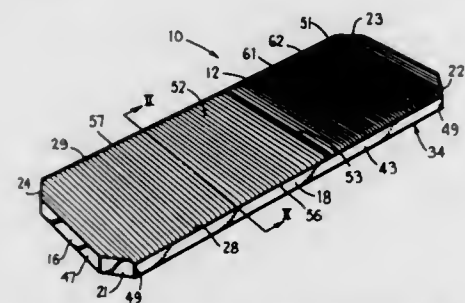
PATIENT TRANSFER MATTRESS SURFACE

Martin W. Stryker, Kalamazoo, and Richard J. Bartow, Calhoun County, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Jan. 26, 1990, Ser. No. 470,856
Int. Cl.⁵ A61G 7/08; A47C 27/00

U.S. Cl. 5—81.1

10 Claims



1. An apparatus comprising: a mattress having an upwardly facing support surface which can support a person and having means for resisting sliding movement of the person in a first direction and for simultaneously facilitating sliding movement of the person in a second direction which is perpendicular to said first direction; wherein said means includes said top surface of said mattress having a plurality of small, parallel ribs extending substantially parallel to said second direction; and wherein the number of said ribs is in the range of 10 to 25 per inch.

5,088,137

BACKBOARD HAVING REMOVABLE PAD

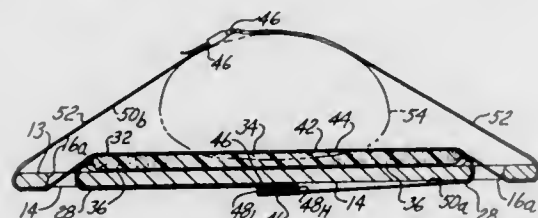
Eric R. Rose, 6677 Suzanne La., San Bernardino, Calif. 92404

Filed Jun. 4, 1991, Ser. No. 710,067

Int. Cl.⁵ A61G 1/04, 1/044

U.S. Cl. 5—625

23 Claims



1. A backboard apparatus for supporting an injured patient, comprising:

- (a) a rigid substantially rectangular board member having opposite, substantially planar top and bottom supportive surfaces, a plurality of elongate slots being formed in spaced relation to a peripheral edge extremity of the board, the slots being located in aligned side pairs along opposite side portions of the edge extremity; and
- (b) a pad assembly removably connected to the board member, the pad assembly comprising:
 - (i) a pad member having a bottom surface supported by the board member and a top surface for supporting the patient, the top and bottom surfaces being bounded by opposite sides and ends of the pad member; the pad member substantially covering the top surface of the board member between the side pairs of the slots; and
 - (ii) first strap means connected to member and having free ends extending beyond opposite sides of the pad member, the free ends of the first strap means having fastener means for adjustably connecting the free ends to form a first closed loop, the loop extending downwardly through corresponding ones of a side pair of the slots, and under a portion, of the bottom supportive surface of

the board member between the slots for securing the pad member to the board member

5,088,138

CRY RESPONSIVE BABY CRIB

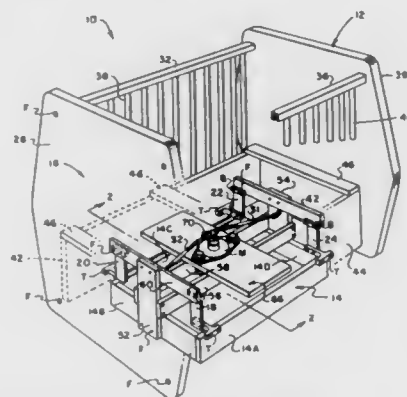
Candice W. Munster, P.O. Box 155, Westin, Tex. 75097

Filed Mar. 5, 1991, Ser. No. 664,939

Int. Cl.⁵ A47D 9/02

U.S. Cl. 5—109

10 Claims



1. A baby crib comprising, in combination:

- a bed frame assembly;
- a foundation base;
- first and second stanchions attached to said foundation base and projecting upright therefrom;
- first and second cross arms attached to said first and second stanchions, respectively, and projecting transversely with respect thereto;
- a plurality of flexible straps attached to said cross arms and said bed frame assembly, said flexible straps suspending said bed frame from said first and second cross arms, respectively;
- a motor mounted on said bed frame assembly for imparting swinging motion to said bed frame, said motor having a rotor shaft; and,
- apparatus coupling said bed frame assembly to said rotor shaft.

5,088,139

PORTABLE INFANT'S PLAY MAT WITH INTEGRAL CARRYING CASE

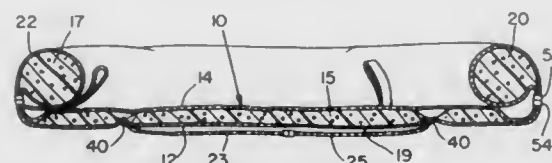
Stuart J. Bloom, Marlborough, Mass., assignor to Pockets of Learning, Sudbury, Mass.

Filed Aug. 2, 1991, Ser. No. 739,668

Int. Cl.⁵ A47D 3/00, 13/06; A47C 21/08

U.S. Cl. 5—420

5 Claims



1. An infant's play mat comprising: a cushioned foldable base portion defined by a top fabric layer, a bottom fabric layer and a cushioning material located between said top and bottom layers; a cushioned wall portion following the perimeter of the base portion and being releasably connected thereto by separable fastener means; connecting straps attached to opposite sides of the mat and securable to each other when said opposite sides of the mat are folded toward each other;

5,088,141

THERAPEUTIC PILLOW

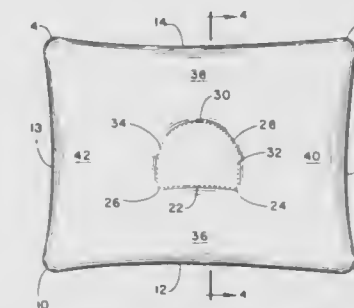
Randall A. Meyer, Minneapolis, and Philip H. Mattison, Forest Lake, both of Minn., assignors to Core Products International, Inc., St. Paul, Minn.

Filed May 6, 1991, Ser. No. 696,115

Int. Cl.⁵ A47G 9/00

U.S. Cl. 5—464

1 Claim



1. A head and neck supporting pillow having:

- a. a first concave edge having a first end and a second end;
- b. a second concave edge having a first end and a second end;
- c. a third concave edge having a first end and a second end, said first and second ends of said third concave edge respectively joined to the first ends of the first and second concave edges to form first and second corners;
- d. a fourth concave edge having first and second ends, said first and second ends of said fourth concave edge respectively joined to the second end of the first and second concave edges to form third and fourth corners;
- e. a hollow defined by an arcuate base having a pair of ends, generally the same radius of curvature as the first concave edge and an orientation parallel to said first concave edge, and an arch projecting from the ends of said base toward said second concave edge, said arch having an apex, said apex being the point on the arch closest to said second concave edge, said hollow positioned so said base is closer to the first concave edge than said apex is to said second concave edge; and
- f. a separate support lobe associated with each of said four concave edges defined by said concave edges and said hollow.

5,088,140

PILLOWS OF POLYESTER FIBERFILL

Wilbur D. Belcher, Wilmington, Del., and Teddy H. Grindstaff, Kinston, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 228,800, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 934,200, Nov. 21, 1986, abandoned. This application Oct. 12, 1989, Ser. No. 420,452

Int. Cl.⁵ A47C 20/00

U.S. Cl. 5—636

5 Claims

1. An improved pillow or like bedding or furnishing article whose filling material comprises at least 25% by weight of polyester fiberfill, wherein the polyester fiberfill has been prepared by a process of melt-spinning polyester into filaments that are quenched as they are withdrawn from the spinneret at a speed termed the withdrawal speed treating the freshly-extruded filaments with a spin-finish and collecting them in the form of a bundle, further processing such filaments in the form of a tow by drawing and annealing to increase orientation and crystallinity, crimping to produce crimped filaments, and converting such crimped filaments to staple fiber, wherein the improvement consists in treating the freshly-extruded polyester filaments with a spin-finish containing an amount of caustic selected and at a location selected such that, in combination with the withdrawal speed and quenching conditions, the caustic treatment is sufficiently soon so as to improve the moisture-wicking properties, after washing as indicated by the polyester having at least 0.2 surface carboxyl equivalents per million grams of drawn fiber.

5,088,142

DEVICE FOR SECURING A CABLE TO THE CONCRETE PLATFORM OF A BRIDGE, AND BRIDGE EQUIPPED WITH SUCH DEVICES

Jean Muller, Suresnes, France, assignor to Societe Anonyme Dite Societe Centrale d'Etudes et de Realisations Routieres, Paris, France

PCT No. PCT/FR89/00041, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990, PCT Pub. No. WO89/07174, PCT Pub. Date Aug. 10, 1989

PCT Filed Feb. 3, 1989, Ser. No. 425,201

Claims priority, application France, Feb. 5, 1988, 88 01343

Int. Cl.⁵ E01D 19/00, 11/00

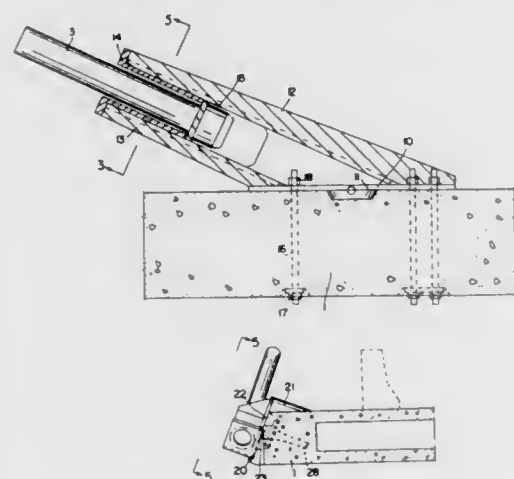
U.S. Cl. 14—22

8 Claims

1. Device for fastening a guy to a concrete deck of a bridge, characterized in that it comprises:

- a metal plate, one face of which is designed to come to bear against a plane bearing surface of the deck, this face carrying at least one projection capable of penetrating into a cavity of the deck, to prevent the plate and the said plane bearing surface from sliding one relative to the other, means for fastening the end of the guy, these means being carried by mountings fixed to the face of the plate opposite that designed to come to bear against the deck, and

prestressing cables or ties capable of keeping the plate bearing against the plane surface of the deck, these cables



or ties bearing on the side of the deck opposite that carrying the said plane surface.

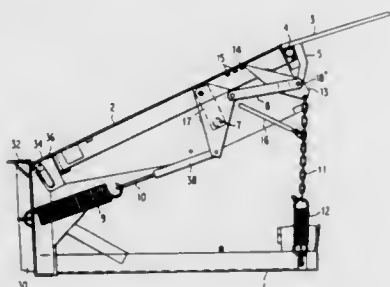
5,088,143

DOCK LEVELER LIP ACTUATION MECHANISM
James C. Alexander, London, Canada, assignor to The Serco Corporation, Canada

Filed Dec. 4, 1990, Ser. No. 622,068
Int. Cl.⁵ E01D 1/00

U.S. Cl. 14—69.5

13 Claims



1. A dock lever comprising:
 - a frame, a deck pivotably mounted to said frame, a lip pivotably mounted to one end of said deck, stop means on an underside of said deck;
 - a lip arm attached to said lip, a lever assembly pivotably mounted on said deck and coupled to said lip arm, resilient means coupled to said lever arm assembly to extend said lip as said deck raises;
 - a latch arm coupled to said lever assembly an engageable with said stop means to hold said lip in an outward extended position; and a chain attached at one end to said frame and at another end to said latch arm, whereby as deck pivots on said frame to raise, said chain tensions to extend said lip by rotation relative to said deck and to rotate said latch arm into engagement with said stop means.

7. A dock leveler comprising:
 - a frame, a deck pivotably mounted to said frame, a lip pivotably mounted to one end of said deck,
 - a lever assembly pivotably mounted on said deck and coupled to said lip;
 - a hydraulic shock absorber mounted to said deck and said lever assembly and, a series of mounting positions on said lever assembly to position one end of shock absorber at different spaced locations relative to a pivot point for said lever assembly.

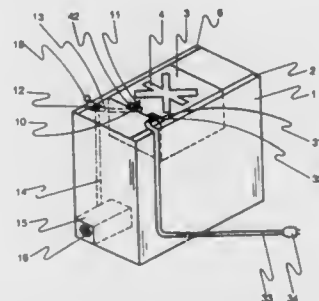
5,088,144
BAR CODE CLEANER

Howard Schneider, 149 Finchley Rd., Montreal, Quebec, Canada H3X 3A3

Filed Dec. 11, 1990, Ser. No. 625,493
Int. Cl.⁵ B08B 7/00

U.S. Cl. 15—1.51

9 Claims



1. A bar code cleaning system consisting of:
 - (a) bar code reader means anchored to a stationary ground-supported member;
 - (b) a blade member comprising a scraping edge projecting upwards from said stationary ground-supported member and clearing same, and having an opposite edge anchored to said stationary ground-supported member in proximity to said bar code scanner means;
 - (c) heating means mounted in proximity to said blade member so as to heat said blade member;
 - (d) a plate mounted to said stationary ground-supported member so as to be proximal to both said bar code scanner means and said blade member, and wherein said plate contains an opening;
 - (e) a tubular structure operatively connected and in fluid communication with said plate;
 - (f) air compressor means feeding said tubular structure with compressed air;
 - (g) valve means operatively connected and in fluid communication with said tubular structure so that when said valve means is activated said compressed air is allowed to pass through said valve means and exit at the outlet defined by said plate;
 - (h) bar code labels consisting of a pigment substrate able to resist degradation when scraped and heated by said blade member and blown by the said compressed air exiting from said plate so as to then be of sufficient quality to be successfully read by the said bar code reader means;
- wherein said cleaning system is for use to clean said bar code labels immediately prior to bar code scanning thereof by first heated scraping of said bar code labels by said scraping edge followed by activation of said valve means and the blowing of said bar code labels by said compressed air to remove remaining particulate matter followed by the immediate bar code scanning of said bar code labels by said scanner means.

5,088,145

ELECTRICALLY POWERED TOOTHBRUSH

Robert O. Whitefield, 19909 - 163rd Ave. NE., Woodinville, Wash. 98072

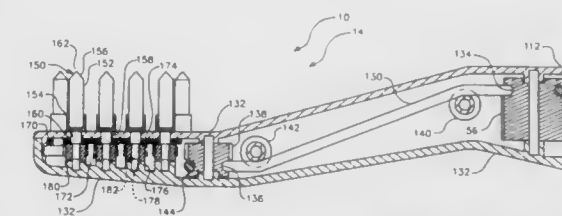
Filed Mar. 26, 1990, Ser. No. 498,895
Int. Cl.⁵ A61C 17/16

U.S. Cl. 15—22.1

19 Claims

1. A device for cleaning teeth comprising:
 - a brush head;
 - at least one tuft holding assembly mounted in the head for rotation about its central axis;
 - means for automatically rotating the assembly in both an

intermittent and a unidirectional manner about the central axis; and,



means for reciprocating the holding assembly with respect to the brush head along the central axis simultaneously with the rotation.

5,088,146

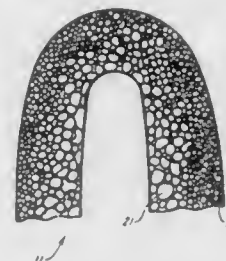
CONTACT LENS CLEANING AND CONDITIONING POUCH AND METHOD OF USE

Francis X. Smith, Salem, N.H.; Stanley J. Wrobel, Andover, and Manohar K. Raheja, Lowell, both of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Filed Jun. 28, 1990, Ser. No. 545,518
Int. Cl.⁵ B08B 7/02, 3/04, 11/02

U.S. Cl. 15—104.94

9 Claims



1. A contact lens cleaning or conditioning pouch for treating contact lenses, said pouch comprising,
 - a first sheet and a second sheet substantially joined together to form an enclosed inner lens chamber between said sheets having first and second inner walls defined by said first and second sheets, respectively, and defining an opening to said chamber for insertion and removal of a contact lens,
 - said first and second sheets defining a peripheral edge where joined together, such that the pouch can be easily manipulated between two fingers of a user to rub the pouch inner chamber walls against a contact lens contained within the chamber,
 - said first and second sheets being formed of an organic polymeric material having an inner open cell foam portion for applying a liquid treating material to a lens carried in said chamber and each sheet having an outer barrier portion preventing substantial flow-through of said liquid treating material to the outside,
 - said first first and second sheets each having an outside wall surface on the outside of said pouch, such that the fingers of a user will move with the walls when a side to side rubbing force is exerted, causing the inside walls of the chamber of said pouch to move against and to scour the lens to clean and/or condition it.

5,088,147

ADJUSTABLE LENGTH HANDLE FOR FLAT FINISHERS

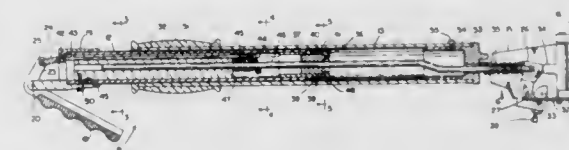
Donald M. MacMillan, Chilliwack, Canada, assignor to Concorde Tool Corp., Surrey, Canada

Continuation-in-part of Ser. No. 390,969, Aug. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,048, Oct. 3, 1988, abandoned. This application Sep. 24, 1990, Ser. No. 588,055

Int. Cl.⁵ B05C 17/10

U.S. Cl. 15—144 B

4 Claims



1. A handle for a pivotable flat finisher, said handle comprising:
 - first and second tubes, said first tube being inserted telescopically into said second tube with the amount of insertion adjustable within a range of insertion,
 - said first and second tubes defining an adjustable first length of said handle, one of said tubes having a lever mounted on a free end portion thereof, and the other of said tubes having a locking mechanism mounted on a free end portion thereof and adapted to lock said flat finisher in a selected position,
 - means for locking said first tube to said second tube at any of various amounts of insertion within said range of insertion and
 - means for mechanically interconnecting said operating lever and said locking mechanism, said means for mechanically interconnecting having an adjustable second length, said second length being automatically adjusted when said first length is adjusted.

5,088,148

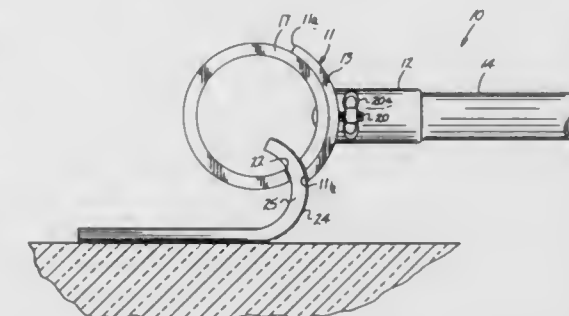
CLEANING MOP APPARATUS

Luis R. Hernandez, 1125 E. Sonora Ave., Glendale, Calif. 91201
Filed Oct. 5, 1990, Ser. No. 594,719

Int. Cl.⁵ A47L 13/24

U.S. Cl. 15—228

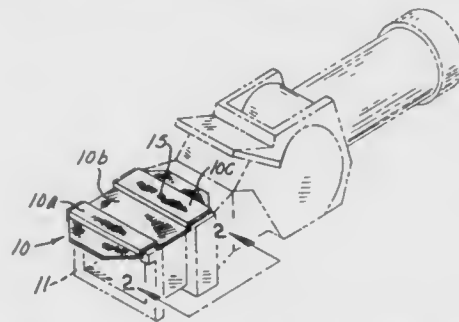
2 Claims



1. A cleaning mop apparatus comprising,
 - a support housing defined by a predetermined length, the housing including an elongate support cylinder defined by the predetermined length arranged for selectively mounting to the support housing, and
 - mounting means for selectively mounting the support cylinder to the support housing, and
 - the support housing including a tubular mounting socket fixedly and orthogonally mounted medially to the support housing to an exterior surface thereof, and
 - the support cylinder including an elongate flexible cleaning pad selectively mounted to the support cylinder, and wherein the support housing includes a first and second

threaded support opening formed in the support housing spaced apart a predetermined spacing, with each of the first and second threaded support openings mounted on opposed sides of the mounting socket, and an elongate handle rod securable within the mounting socket, and wherein the support cylinder includes a respective first and second support cylinder aperture, wherein the first and second support cylinder apertures are spaced apart the predetermined spacing and the mounting means include a first and second threaded shaft, with the first threaded shaft directed through the first threaded support opening and the first support cylinder aperture, and the second threaded shaft directed through the second threaded support opening and the second support cylinder aperture to secure the support cylinder to the support housing, and including a respective first and second fastener threadedly mounted to the respective first and second threaded shaft exteriorly of the support housing to secure the support housing to the support cylinder, and wherein the support cylinder includes an elongate slot coextensively directed through the support cylinder, the support cylinder formed of a tubular construction, and the support housing defined by a semi-cylindrical shell defining an arc of less than 180 degrees, with the support housing including a forward edge and a rear edge, and the rear edge overlying the slot when the support cylinder is mounted to the support housing.

way for airflow, a repair plate comprising a body disposed in the longitudinal direction of said throat and overlying the



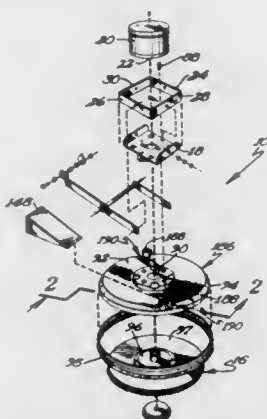
upper surface thereof, and means securing said body to said throat.

5,088,151 COLLECTION SYSTEM FOR A FLOOR POLISHING MACHINE

Donald J. Legatt, St. Michael, Minn., assignor to Advance Machine Company, Plymouth, Minn.
Continuation of Ser. No. 691,457, Apr. 25, 1991, abandoned.
This application Sep. 23, 1991, Ser. No. 764,977
Int. Cl.⁵ A47L 11/20

U.S. Cl. 15—385

20 Claims



1. In a machine for maintaining a work surface including a planar member for rotation about an axis generally perpendicular to the work surface in a plane substantially parallel to the work surface and a housing including a planar portion located on the opposite side of the planar member than the work surface and having a periphery, with the housing further including a flange extending from the periphery of the planar member towards and adjacent to the work surface, with the planar member located within the planar portion and flange of the housing, an improved collection system comprising, in combination: a plurality of air barriers extending from the planar portion of the housing towards but spaced from the planar member, with the air barriers being circumferentially spaced from each other and extending from the periphery of the planar portion towards the axis of the planar member; and an air outlet associated with each air barrier and extending from the housing adjacent the periphery of the planar portion and the air barrier, with the air outlet positioned on the side of the air barrier opposite to the direction of rotation of the planar member.

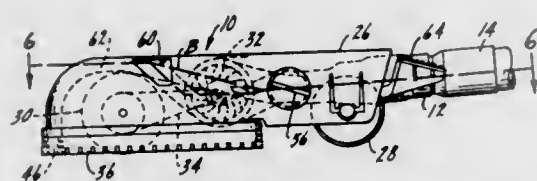
5,088,150 REPAIR PLATE

Gerald B. Ritchie, R. 3, Cynthiana, Ky. 41031
Filed Jun. 28, 1990, Ser. No. 545,037
Int. Cl.⁵ A47L 9/02

U.S. Cl. 15—377

5 Claims

1. In combination with a vacuum cleaner including a power nozzle presenting a defective plastic throat having a passage-



1. Apparatus for cleaning a floor, comprising a rotatable floor cleaning tool, means to controllably dispense cleaning solution to the floor for agitation by the tool, a vacuum pickup device for removing soiled cleaning solution from the floor, an air turbine in driving relationship with said cleaning tool and having an inlet connected to essentially clean ambient air and an outlet, and a source of vacuumized air, means for selectively connecting said vacuumized air to either said air turbine outlet to drive the rotatable floor cleaning tool whereby the tool may perform a cleaning function on the floor, or to the vacuum pickup device, whereby the pickup device may remove soiled cleaning solution from the floor.

5,088,152 DOOR SECURITY TRACK

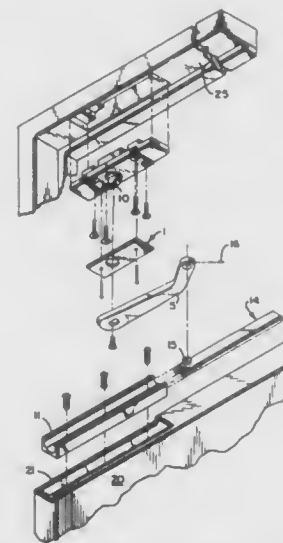
William L. Downey, Peru, Ill., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Sep. 8, 1989, Ser. No. 404,776

Int. Cl.⁵ E05F 1/00

U.S. Cl. 16—80

11 Claims



1. A linear translation track and track cover device for use with pivoted panel control apparatus having rotary output on an arm comprising:

an elongated track, slidably coupled to the rotary output arm;

a complimentary elongated slide coupled to said arm in complimentary enclosing and sliding relationship with said track so as to form a closure of substantially all of said track when the pivoted panel is in an open position, said complimentary elongated slide being coupled to said rotary output arm as a means of accommodating linear translation of said rotary output arm relative to said elongated track and deploying said complimentary elongated slide means as a security cover.

5,088,153 EXPANSION ANCHOR

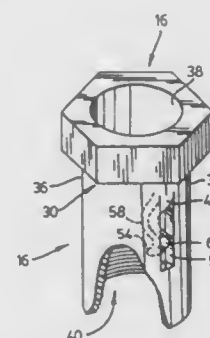
Kenneth R. Winder, 1307 Greenwood Crescent, Oakville, Ontario, Canada L5L 2M7, and Ann M. Wilkins, Etobicoke, Canada, assignors to Kenneth R. Winder, Oakville, Canada
Filed Aug. 20, 1990, Ser. No. 569,833

Claims priority, application Canada, Aug. 21, 1989, 608873

Int. Cl.⁵ F16B 13/04

U.S. Cl. 16—108

10 Claims



1. An adaptor for removably mounting a body having a support rod, on a support base, comprising:

a tubular element having a tubular wall adapted to be mounted in a bore of a support base, said tubular element

having a central passage for axially receiving a support rod of a body to be mounted on the support base; at least one resilient, deformable gripping member integral with said tubular wall and extending into the central passage to engage and retain the support rod located therein; said tubular wall having a slot associated with each gripping member; the gripping member having a serpentine gripping portion deformable longitudinally and transversely into said slot; and means for retaining the tubular element in said bore.

5,088,154

DOOR HINGE SYSTEM

Masayoshi Ishikawa, Toyama, Japan, assignor to Yoshida Kogyo K.K., Japan

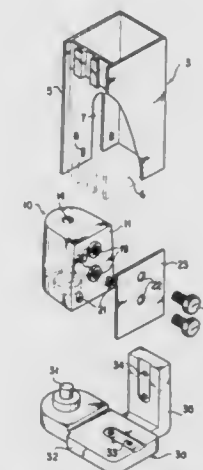
Filed Mar. 29, 1990, Ser. No. 501,013

Claims priority, application Japan, Mar. 29, 1989, 1-77806

Int. Cl.⁵ E05D 5/02, 7/12

U.S. Cl. 16—252

5 Claims



1. A hinge system comprising a hinge member adapted to be fixedly secured to a side wall of a stile member of a door body on the mounting side thereof, and a support member for supporting the hinge member from under or from above, the hinge system comprising: a mounting surface portion formed on one side surface of said hinge member, said mounting surface portion having a plurality of mounting screw-threaded holes formed therein in vertically spaced-apart and parallel relationship with each other; fasteners adapted to be threadably engaged with the mounting screw-threaded holes, respectively, to fixedly secure the hinge member to the side wall of said stile member; at least one insert portion located adjacent to the entry parts of said mounting screw-threaded holes and adapted to be inserted into a guide notch, for passage of said fasteners, formed in the side wall of the stile member; engaging portions located on the left and right side of the lower part of said mounting surface portion near the support member and adapted to be engaged with or fitted in slots formed in the side wall of the stile member on the mounting side thereof; said at least one insert portion and said engaging portions projecting from said mounting surface by an amount nearly equal to the thickness of said side wall; and a seating plate adapted to be abutted against the inner surface of the side wall of said stile member on the mounting side thereof and fixedly secured thereto by means of said fasteners, the arrangement being made such that said hinge member is fixedly secured to said stile member by temporarily tightening said seating plate onto the mounting surface portion of said hinge member by means of said fasteners, inserting said hinge member from an opening formed in the lower part of the side wall of the stile member into the guide notch and the slots in such a manner that said side wall may be located at a predetermined position between

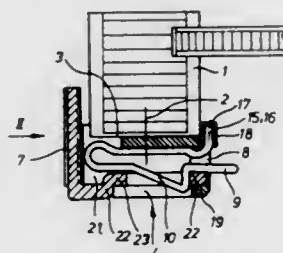
the seating plate and the mounting surface portion, and then tightening said fasteners fully.

5,088,155 DOOR HINGE WITH RESILIENTLY BIASED RETAINING MEANS

Alfred Grass, Höchst, Austria, assignor to Grass AG, Höchst/Vlb, Austria
Filed Sep. 7, 1990, Ser. No. 579,163
Int. Cl.⁵ E05D 7/10

U.S. Cl. 16—257

4 Claims



1. A device for releasably mounting an adjustable, single-articulation type door hinge on a supporting frame member comprising:

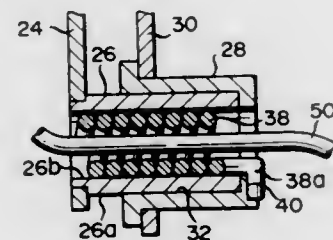
- a base plate mountable on a supporting frame member and having portions defining a spring receiver and a base plate recess;
- a spring member having a first spring leg provided with an end portion releasably engageable in the spring receiver and having a second spring leg provided with an inclined portion and a stop shoulder; and
- an intermediate plate attachable to a door hinge and having portions defining an intermediate plate recess with marginal edges, wherein said intermediate plate is releasably connectable to the base plate with the intermediate plate recess overlapping the base plate recess, the stop shoulder of the second spring leg abutting one of the marginal edges of the intermediate plate recess, and the inclined portion of the second spring leg projecting into said overlapping recesses.

5,088,156 SHAFT LOCK DEVICE AND PORTABLE INFORMATION PROCESSING APPARATUS WITH SHAFT LOCK DEVICE

Takashi Hosoi, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 30, 1990, Ser. No. 472,573
Claims priority, application Japan, Jan. 31, 1989, 1-10047[U]
Int. Cl.⁵ E05C 17/64; E05D 11/08

U.S. Cl. 16—342

26 Claims



1. A shaft lock device comprising:
- a cylindrical rotational shaft having inner and outer circumferential surfaces;
 - a first member supporting one end portion of the rotational shaft so that the shaft is rotatable around an axis thereof;
 - a second member fixed to another end portion of the rota-

tional shaft and rotatable integrally with the rotational shaft; and

- a coil spring coil in a predetermined direction and having a coil diameter greater than an inner diameter of the rotational shaft, said coil spring being arranged in the rotational shaft along an axial direction thereof while an outer surface of the coil spring is pressed against the inner circumferential surface, and having one end anchored to the first member and a free end situated on the second member side, said coil spring being adapted to expand in a radial direction to restrain the rotational shaft from rotating when the second member is rotated in a direction opposite the coiling direction and the coil spring is rotated in the same direction by means of friction between the coil spring and the rotational shaft, and adapted to contract in the radial direction to allow the rotational shaft to rotate when the second member is rotated in the coiling direction and the coil spring is rotated in the same direction by means of friction between the coil spring and the rotational shaft.

5,088,157 UNIT DRAFTING MECHANISM HAVING AIR JET APERTURED SLIDE METALS AND ROLLERS

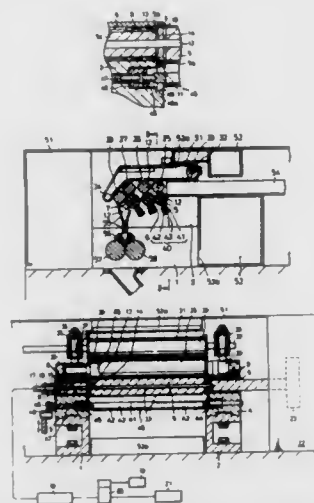
Hironori Yasuda, Inazawa, and Yoshiharu Tomoto, Gifu, both of Japan, assignors to Howa Machinery, Ltd., Nagoya, Japan
Filed Oct. 3, 1990, Ser. No. 592,082

Claims priority, application Japan, Oct. 3, 1989, 1-258271

Int. Cl.⁵ D01H 5/66

U.S. Cl. 19—263

10 Claims



1. A unit drafting mechanism of a spinning machine provided with at least one unit drafting mechanism, wherein a pair of slide metals are disposed on roller stands facing each other, a plurality of bottom rollers and top rollers are journaled on said slide metals in a rotatable condition, each one of said bottom rollers provided with a fluted working section of a length substantially corresponding to a distance between inside surfaces of said slide metals, a pair of journal portions are rotatably supported by said slide metals, and a pair of shoulder portions, each thereof provided with an intermittent portion between a corresponding end portion of said fluted working section and a corresponding one of said journal portions, comprising:

- a cylindrical recess formed at an inside position of each one of said slide metals for receiving a corresponding shoulder portion of said bottom roller with an annular gap therebetween,
- an axial air passage formed along an axis center of each said bottom roller,
- at least one air jet aperture radially formed at each of said shoulder portions thereof in a direction facing said gap

between said cylindrical recess and said shoulder portion, each one of said air jet apertures connected to said axial air passage,

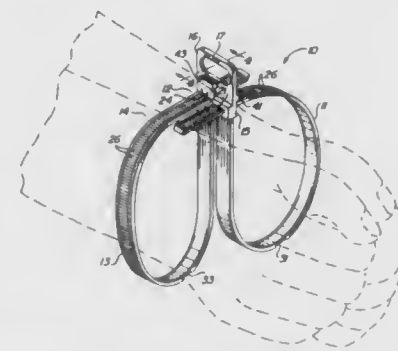
- a compressed air supply source to supply compressed air to said axial air passage of each one of said bottom rollers, and
- means for connecting said compressed air supply source to said axial air passage of each one of said bottom rollers.

5,088,158 RESTRAINING APPARATUS AND METHOD

Gary D. Burkholder, 15671 SW. 85th Terr., Miami, Fla. 33193
Filed Mar. 15, 1990, Ser. No. 494,729
Int. Cl.⁵ E05B 75/00; B65D 63/00

U.S. Cl. 24—16 PB

12 Claims



1. Apparatus for restraining the wrists or ankles of a person, comprising:

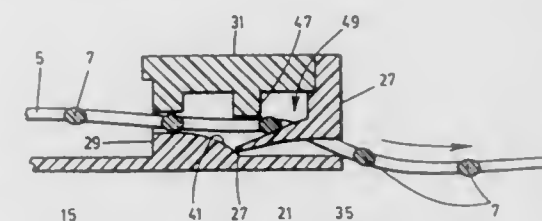
- a body portion having upper and lower ends, opposite sides, first and second laterally-spaced apertures extending between said sides, and first and second laterally-spaced loops located on said sides in respective alignment with said apertures;
- a first flexible arm normally extending longitudinally outwardly and downwardly from said body portion and having an end attached below said first aperture to said body portion lower end, and a free end; said first arm being dimensioned, configured and adapted to be looped back on itself around one wrist or ankle to a position with said first arm free end inserted through said first aperture from one to the other of said body portion side; and said first arm being further dimensioned, configured and adapted to be folded about a midpoint, upwardly back on itself, to a position with said first arm free end inserted through said first loop from said lower to said upper body portion end;
- a second flexible arm normally extending longitudinally outwardly and downwardly from said body portion, laterally spaced from said first arm, and having an end attached below said second aperture to said body portion lower end, and a free end; said second arm being dimensioned, configured and adapted to be looped back on itself around the other wrist or ankle to a position with said second arm free end inserted through said second aperture from said other to said one body portion side; and said second arm being further dimensioned, configured and adapted to be folded about a midpoint, upwardly back on itself, to a position with said second arm free end inserted through said second loop from said lower to said upper body portion end;
- first means for adjustably locking said first arm in said first arm looped back position; and
- second means for adjustably locking said second arm in said second arm looped back position.

5,088,159 SECURITY SEAL BRACELET

Serge Lafleur, 1900 Ivry, Duvernay, Quebec, Canada H7G 1S8
Filed Nov. 21, 1990, Ser. No. 616,911
Int. Cl.⁵ B65D 63/00

U.S. Cl. 24—16 PB

7 Claims



1. A tamper-proof bracelet comprising:
- an elongated band having a front end and a rear end; at least one tongue-engageable opening in the front end of said band;
 - a fastener portion including a housing forming an integral part of said band at the rear end thereof, said housing comprising a bottom wall, a set of side walls including two transverse walls transversal to said band, and a top wall, one of said two transverse walls being formed close to said bottom wall, with a through aperture sized to allow snug insertion of the front end of said band into said housing;
 - a tapering locking tongue having a thick end solid with said one transverse wall above said through aperture and projecting away from said one transverse wall into said housing, said tongue gradually tapering down lengthwise thereof, pointing toward said housing bottom wall and terminating into a thin forward edge, said tongue being resilient at least in the area of said thin forward edge and having a length sufficient to engage one of said at least one opening when the front end of said band is inserted and pushed into the housing through said through aperture; and
 - a ramp projecting up from said housing bottom wall, said ramp having a top ramp surface extending transversally to said locking tongue and sloping up towards the other one of said two transverse walls of said housing, said ramp forcing upwardly the front end of said band during insertion of said front end in the housing and keeping it up in fully engaged position after insertion, whereby any attempt at pulling the front end of the band out from the housing while lifting the tongue with a blade inserted into the aperture to tamper the bracelet, is rendered much more difficult;
- wherein said bracelet also comprises an additional locking means comprising a block projecting downwardly from said top wall of said housing at a distance from said one transverse wall to define therewith a locking chamber, said block having a lower end terminating short of said locking tongue, whereby any pull-back on the band causes part of the front end of the band adjacent said at least one opening engaged by said tongue to be forced up into said locking chamber and be locked therein.

5,088,160 LAP BELT WEBBING ADJUSTER

James C. Warrick, Tempe, Ariz., assignor to Am-Safe, Inc., Chicago, Ill.

Filed Feb. 5, 1990, Ser. No. 475,300

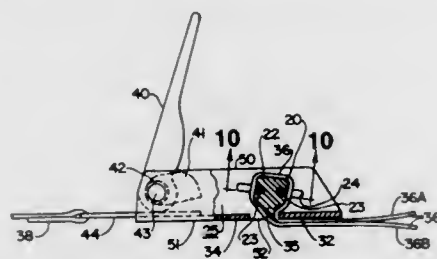
Int. Cl.⁵ A44B 11/10

U.S. Cl. 24—196

5 Claims

1. A webbing adjuster for adjusting and locking seat belt webbing which is anchored at one end, the webbing adjuster including a base frame, said base frame including a transverse bar stop, an elongated load bar mounted for sliding movement on said base frame toward and away from said bar stop, said

load bar having an outer surface about which the webbing is wrapped in a forward direction from said anchored end, said outer surface of said load bar having a transverse substantially planar surface and a plurality of transverse rounded edge surfaces each having a radius of curvature, said rounded edge surfaces displaced from said planar surface and from each other, the position of said planar surface on said load bar relative to said bar stop being such that when the webbing is placed under tension, it is pinched over a transverse area be-



tween said planar surface and said bar stop, the webbing when placed under further tension from the anchor end is moved in the reverse direction from said pinched area and progressively frictionally gripped at each of said plurality of rounded edge surfaces, the radii of curvature of all of said rounded edge surfaces closer to the anchored end being larger than all of the rounded edge surfaces of said plurality of rounded edge surfaces closer to the pinched area of the webbing, such that the frictional gripping of the webbing is greatest near the pinched area and less near the anchored end of the webbing.

5,088,161

SEAT BELT SAFETY CLIP

Sharon L. Robertson, RR 2, Burns Lake, British Columbia, Canada V0J 1E0

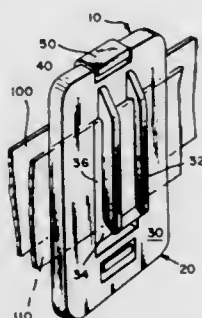
Filed Apr. 20, 1990, Ser. No. 512,776

Claims priority, application Canada, Nov. 8, 1989, 2002676

Int. Cl.⁵ A44B 11/25

U.S. Cl. 24—305

5 Claims



1. A seat belt safety clip comprising:

- a generally rectangular frame member having a flat front surface, a rear surface, a top edge and a bottom edge;
- a first clip member attached to said front surface of said frame member and extending generally parallel to and spaced apart from said flat front surface and terminating in a lower tip proximate the bottom edge of said frame member, thereby forming an opening adjacent the lower tip which leads to a recess between the front surface and the first clip member;
- said frame member further comprising clip member receiving means in said frame including a centrally disposed opening extending transversely through the entire frame member adjacent its lower end with a lip extending partially into the opening and a centrally disposed upper lip adjacent the upper end of the frame member; and
- a removable second clip member including a generally elongated flat body and a pair of mating members including a pair of transverse hook members which extend trans-

versely to the elongated body at each end and terminate in a hook such that a respective one hook engages a respective one of the lips in the clip member receiving means so that the elongated flat body lies parallel to said rear surface of said frame member;

- whereby said frame member may be fastened to a location along the length of a lap seat belt by entrapping a portion of the lap seat belt between said rear surface of said frame member and said removable second clip member and a portion of the length of a shoulder seat belt may be inserted into the recess between said flat front surface and said first clip member to thereby cause the shoulder seat belt to be oriented across a passenger's torso and away from the passenger's neck.

5,088,162

CONNECTOR APPARATUS

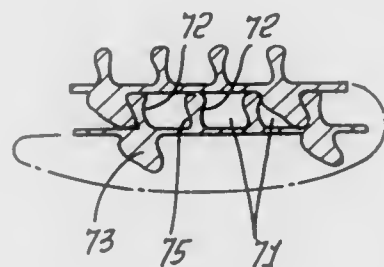
Robert M. Allan, 1631 Colgate Cir., La Jolla, Calif. 92037

Filed Jul. 16, 1990, Ser. No. 553,258

Int. Cl.⁵ A44B 18/00

U.S. Cl. 24—442

53 Claims



1. An elongated connector, comprising

- a flexible, lengthwise elongated first body part having a plurality of generally flexible C-shaped cross sections defining recesses in planes crosswise of and normal to a major dimension of said body part,
- said first body part having a base and a succession of side walls together defining said C-shaped recesses, each side wall having a mid-section and an outer side wall portion, said mid-section being sufficiently narrow to allow said upper side wall portion to flex, certain of said side walls also forming a side wall of an adjacent C-shaped cross section recess,
- the common side walls of said C-shaped cross section recesses having upwardly convex termini which are inverted relative to said C-shaped recess cross sections,
- and a second body part having a plurality of substantially inflexible ridge members configured to nest in and be gripped by the side walls of certain of said recesses which are expanded by said ridge members,
- and wherein said ridge members are spaced apart from one another and fitted in said certain C-shaped recesses spaced apart and separated by at least one other of said recesses bridged over and unoccupied by said second body part;
- and including means associated with said base to confirm complete adjusted interlock of said first and second parts.

5,088,163

BELT LOCK

Reiner van Riesen, Besenheide 36, 2200 Elmsborn, Fed. Rep. of Germany

Filed Jun. 27, 1990, Ser. No. 544,845

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 8907836

Int. Cl.⁵ A44B 11/25

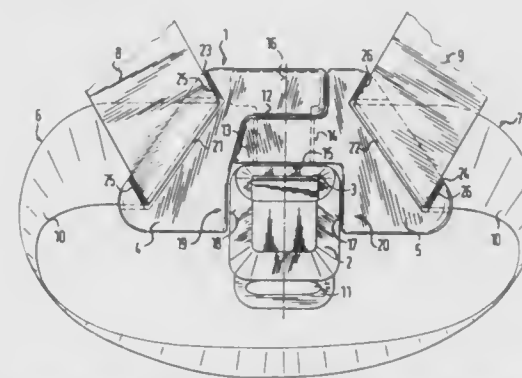
U.S. Cl. 24—573.5

3 Claims

1. A belt lock for a belt strap retaining system in which

shoulder strap sections of a belt continue through the lock into a lap belt section thereof, the belt lock comprising:

- a lock housing having a lock closure mechanism and having an insertion side and two longitudinal sides on either side of a longitudinal axis of the lock;
- a pair of belt strap holding pieces having means for insertion into said lock mechanism for locking engagement therein, each of said holding pieces having an inclined slot for receiving a respective belt strap section to allow it to run through said slot, said holding pieces lying against each other to provide a substantially continuous body contact surface; and



a release button on the lock housing for causing said mechanism to release said insertion means;

wherein said holding pieces, which lie adjacent to each other, cooperate to enclose the lock housing in unspaced relationship therewith along said insertion side thereof and at least along between half and three-quarters of the length of said longitudinal sides thereof, said slots being angled by substantially 45° with respect to said longitudinal axis of the lock and being set back with respect to the insertion side of the lock housing to the extent of between a third and a half of their lengths.

5,088,164

CONTAINER WITH INTERMESHABLE CLOSURE MEMBERS

Shari J. Wilson, St. Paul; Roger H. Appeldorn, both of St. Paul, and Robert N. Hamlin, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

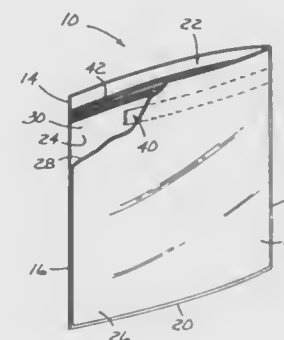
Continuation-in-part of Ser. No. 172,631, Mar. 24, 1988, Pat. No. 4,875,279, which is a continuation of Ser. No. 904,358, Sep. 8, 1986, abandoned. This application Mar. 22, 1989, Ser. No. 325,272

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.⁵ A44B 1/04

U.S. Cl. 24—576

14 Claims



1. For use with a container having an opening providing access to an interior of the container and including a first container portion and a second container portion that enclose

the opening when joined together, a closure for securing the first container portion and the second container portion together, comprising:

- a first intermeshable closure member adapted for mounting on the first container portion;
- a second intermeshable closure member adapted for mounting on the second container portion;
- said first intermeshable closure member and said second intermeshable closure member each having a structured surface, with said structured surfaces being brought into contact with each other when the first and second container portions are brought together; and
- each of said structured surfaces including a plurality of solid tapered elements, each of said elements having at least one side inclined relative to a common plane of each of said structured surfaces at an angle sufficient to form a taper such that each element may mesh with at least one corresponding element of the other of said structured surfaces when brought into contact with said corresponding element and adhere thereto at least partially because of the frictional force of adherence of said contacting tapered sides and wherein the tangent of the half angle of said tapered sides of said elements is no greater than the coefficient of friction of the material of the contacting tapered sides.

5,088,165

THEFT DETERRENT FASTENER AND FASTENER ASSEMBLY

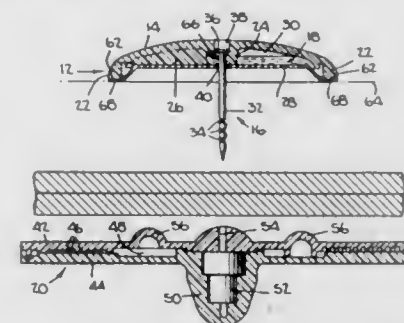
Arthur J. Minasy, Woodbury, and Thomas A. Nicolette, Fort Salonga, both of N.Y., assignors to Knogo Corporation, Hauppauge, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,688

Int. Cl.⁵ A44B 9/00

U.S. Cl. 24—704.1

16 Claims



1. A fastener for attaching an element to a sheet-like object in a manner which will discourage unauthorized removal of said element, said fastener comprising:

an expansive head of molded plastic material and formed in a dish configuration with an outer peripheral skirt surrounding a central axial hub and said skirt being spaced from the hub to form a hollow region therebetween; a pine extending through said hub along a line substantially perpendicular to a plane defined by the edge of said skirt and extending from the skirt edge side of the head; a fluid substance capable of producing an undesirable effect upon release from containment and being contained in said hollow region; and a frangible membrane extending between said hub and said skirt and sealed to said hub and skirt to contain said fluid substance,

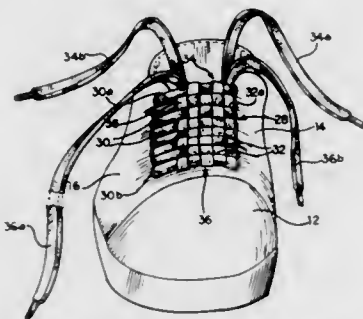
whereby a prying force or the edge or said head which causes it to bend will impose a stress on said membrane, causing it to shatter and release fluid substance.

5,088,166 SHOE LACING

Mick J. Lavinio, 46 Weston Ave., Dalton, Mass. 01226
Filed Mar. 20, 1991, Ser. No. 672,427
Int. Cl.⁵ A43B 11/00

U.S. Cl. 24—712

11 Claims



1. A fastening assembly for a shoe having left and right quarters each provided with a row of eyelets adjacent an inner edge comprising:

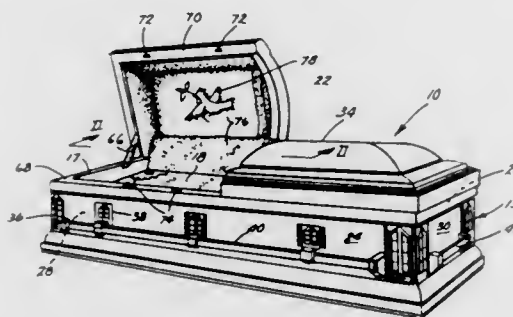
- a first lacing segment threaded through said eyelets to provide a plurality of horizontal stretches spanning laterally opposed ones of said eyelets of said left and right quarters,
- a second lacing segment woven through said horizontal stretches and between said eyelet rows of said left and right quarters to provide a plurality of vertical stretches each alternately passing over and under adjacent ones of said horizontal stretches, and
- at least one said lacing segment having free ends secured to one another.

5,088,167 CREMATION REMAINS HOLDER

Gwendolyn A. Rahe, Rt. #1 - Box 135, Jansen, Nebr. 68377
Filed Jan. 7, 1991, Ser. No. 637,822
Int. Cl.⁵ A61G 17/08

U.S. Cl. 27—1

14 Claims



1. A cremation remains holder comprising:
- a holder base having the shape of a miniature casket and including a hollow portion suitable for receiving cremated remains, the hollow portion having an access opening;
 - a tray sized to fit within the access opening to sealingly close the hollow portion, the tray positionable in the holder base such that memorabilia can be placed thereon;
 - means for holding the tray securely in the holder base;
 - a cover shaped to sealingly close on the access opening and over the tray to retain the memorabilia in the holder base; and
 - means for holding the cover closed on the holder base.

5,088,168 YARN TEXTURING APPARATUS WITH HEAT SENSOR IN STUFFER BOX TO CONTROL HEAT FLOW

Hans-Peter Berger, Remscheid; Klaus Burkhardt, Schwelm; Klaus Gerhards, Hückeswagen, and Hans-Peter Eck, Wipperfurth, all of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

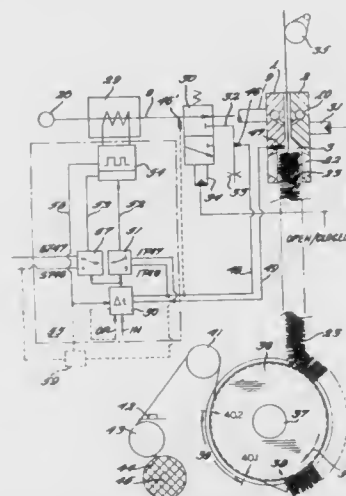
Filed Nov. 13, 1990, Ser. No. 612,071

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1989, 3937664; Apr. 25, 1990, 4013104

Int. Cl.⁵ D02G 1/00; D02J 1/00

U.S. Cl. 28—249

20 Claims



12. An apparatus for texturing an advancing yarn with a pressurized heating fluid such as hot air, and comprising

- a nozzle including a duct through which the yarn is to advance at high speed from an inlet end to an outlet end, passageway means for conducting a pressurized heating fluid into said duct during operation of said apparatus, and a perforated stuffer box disposed adjacent the outlet end of said yarn duct for receiving and forming a compressed plug from the advancing yarn exiting from said duct, with said nozzle comprising two sections which are moveable with respect to each other and so as to define an operating position of said nozzle wherein said duct is laterally closed, and a non-operating position of said nozzle wherein said duct is laterally open to facilitate insertion of a yarn into said duct,
- a heating fluid supply line connected to said passageway means of said nozzle,
- valve means positioned in said supply line and moveable between a first position when said nozzle is in said operating position and wherein said supply line is open to said nozzle, and a second position when said nozzle is in said non-operating position and wherein said supply line is open to the atmosphere through an exhaust line,
- heating means for maintaining the temperature of the heating fluid at a predetermined level, and comprising a heater disposed in said supply line, and heater regulating means for controlling the output of said heater in response to an input signal,
- a first temperature sensor positioned in said nozzle, a second temperature sensor positioned in said supply line upstream of said valve or in said exhaust line, and
- switch means for operatively connecting said first temperature sensor to said heater regulating means to provide said input signal when said nozzle is in said operating position, and for operatively connecting said second temperature sensor to said heater regulating means to provide said input signal when said nozzle is in said non-operating position.

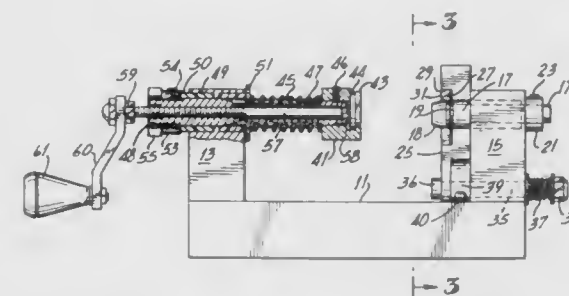
5,088,169 SHOTGUN SHELL TRIMMER

Lorenzo J. Touzet, 10831 SW. 33rd St., Miami, Fla. 33165
Filed May 28, 1991, Ser. No. 706,028

Int. Cl.⁵ F42B 5/26; B21D 51/54

U.S. Cl. 29—1.32

14 Claims



1. A machine to trim a shotgun shell to a desired length and to develop a smooth edge in a plane of cutting essentially normal to a longitudinal axis of said shell comprising:

- a mandrel having a circumferential groove in a fixed plane of cutting, said mandrel being constructed and arranged to receive an open mouth of said shell to the rear of said circumferential groove,
- a flat blade pivotally mounted for movement in said plane of cutting into and away from said circumferential groove, an outer axle supported for axial adjustment to a preselected position along an axis common to an axis for said mandrel, a shell base holder fixed to the rear end of said outer axle and constructed and arranged to receive a base of said shell, an inner axle bolt constructed and arranged for limited axial movement relative to said outer axle and having a rear head received by said shell base holder, said rear head constructed and arranged to occupy a rearmost position corresponding to a preselected position for said outer axle at one limit of said limited axial movement,
- means to adjust the axial position of said outer axle to establish a desired axial distance between said rear head and said circumferential groove when said rear head occupies a predetermined rearmost position relative to said outer axle defined by said construction and arrangement for limited axial movement,
- said outer axle and inner axle bolt being rotatable in unison in one direction without any axial displacement when said rear head occupies said predetermined rearmost position relative to said outer axle, whereby
- when said shell is held between said rear head in its rearmost position and said mandrel, said blade is held within said circumferential groove, and said outer axle and inner axle bolt are rotated in unison, said shell rotates around said mandrel and said blade cuts said shell along said plane of cutting to produce a trimmed shell of a desired length defined by the distance between said rear head in said predetermined rearmost position and said circumferential groove and having a smooth cut in said plane of cutting.

5,088,170 DEVICE FOR MANUFACTURING EXPANDED MATERIAL

Michael M. Späth, Oberachweg 7, D-8183 Rottach-Egern, Fed. Rep. of Germany

PCT No. PCT/EP89/00460, § 371 Date Feb. 28, 1990, § 102(e)
Date Feb. 28, 1990, PCT Pub. No. WO89/10219, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 26, 1989, Ser. No. 455,345

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814448

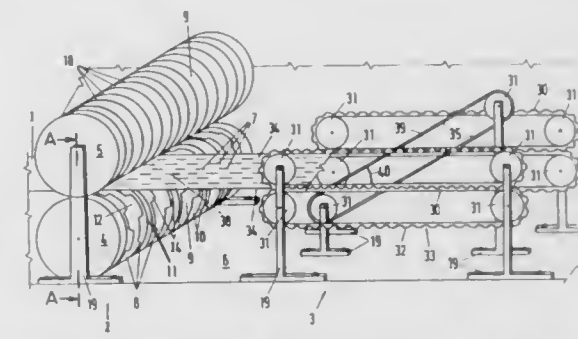
Int. Cl.⁵ B21D 31/04

U.S. Cl. 29—6.1

14 Claims

1. A device for manufacturing expanded material from foil, in particular expanded metal from aluminum foil, comprising a

cutting unit to continuously produce individual, discontinuous cuts in the foil, the cutting unit includes a cylindrical cutting roller and a pressure roller and a stretching unit for expanding the cut foil transversely to the longitudinal direction of the



cuts, wherein grooves (8) are provided in the cylindrical cutting roller (4) and the cylindrical pressure roller (5) includes grooves (18) arranged annularly in the circumferential surfaces of the cutting roller (4) and the pressure roller (5).

5,088,171

ASSEMBLY ROBOT WITH DRILLING UNIT

Takashi Suzuki, Utsunomiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

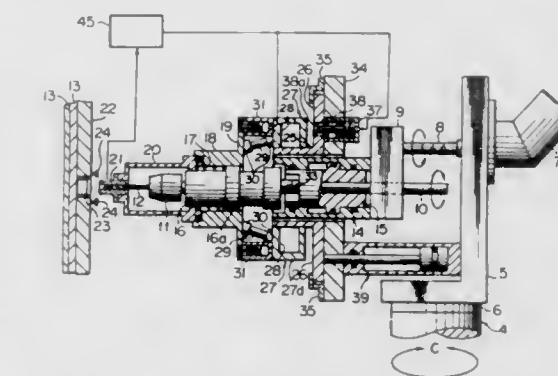
Filed Jul. 15, 1991, Ser. No. 731,135

Claims priority, application Japan, Jul. 23, 1990, 1-194200[U]

Int. Cl.⁵ B23Q 37/00; B23B 39/14

U.S. Cl. 29—26 A

12 Claims



1. A drilling unit of an assembly robot comprising a robot body and a robot arm swingably extending from the robot body, said drilling unit being mounted on one end of said robot arm and having a rotational shaft driven by a motor, a drill chuck mounted on one end of the rotational shaft, a drilling tool secured by the chuck to be inserted into a bore of a template applied to a workpiece, first actuator means for moving the drilling unit toward and away from the workpiece, and second actuator means for moving said rotational shaft toward and away from the workpiece, said drilling unit comprising:

- a nose piece enclosing said drill chuck and having at a forward end thereof a drill bush in which said drilling tool is advanced and retracted;
- a first cylindrical member carrying said nose piece on a forward end thereof;
- a second cylindrical member supporting said first cylindrical member on a forward end thereof and having a radial flange on a rear end thereof;
- an annular guide plate supporting said radial flange in face-to-face sliding contact;
- said first and second cylindrical members and said guide plate being disposed around said rotational shaft in a substantially coaxial arrangement;

first remote compliance means comprising a plurality of elastic support members connecting said first and second cylindrical members to mount the first cylindrical member on the second cylindrical member, said elastic members constituting oblique links of a trapezoidal link mechanism having an imaginary intersection of the oblique links at a front end of said drill bush;

first lock means for preventing displacement of the first cylindrical member relative to the second cylindrical member;

second remote compliance means comprising said guide plate, said radial flange and stopper means for limiting sliding displacement of the radial flange relative to the guide plate;

second lock means for preventing displacement of the second cylindrical member relative to the guide plate; and means for securing said drill bush to said template.

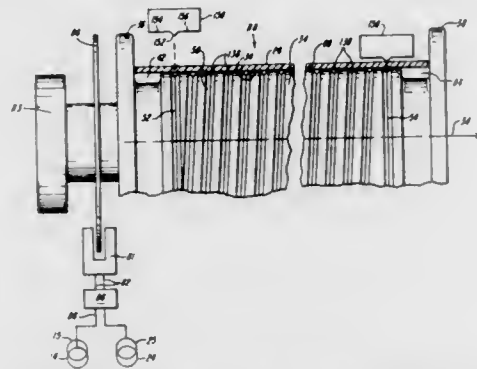
5,088,172
TAPE DRIVE ASSEMBLY WITH NON-SLIP
TACHOMETER ROLLER

Keith L. Daly, Clinton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 29, 1990, Ser. No. 620,465
Int. Cl.⁵ B21B 1/40; B30B 3/00

U.S. Cl. 29—121.4

8 Claims



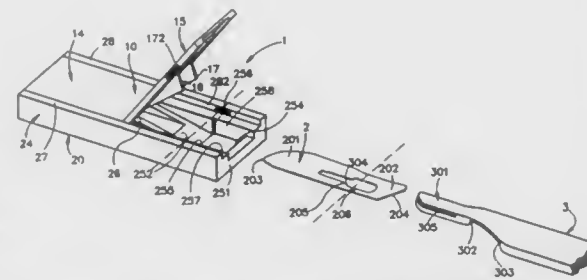
1. A tachometer roller for a tape drive assembly for detecting the speed of a magnetic tape moving along a reference axis when the tape is in contact with the roller, the tape having a recording surface having a central data portion bounded by respective non-data edge portions, the roller comprising

a cylinder having a longitudinal axis and having mounting means for affixation of the cylinder in a tape drive assembly essentially perpendicular to the reference axis, the cylinder periphery defining a thread groove running obliquely to the longitudinal axis for venting of air captured between the cylinder periphery and magnetic tape streaming along the reference axis across the cylinder periphery,

the cylinder further comprising a center circumferential portion over which the central data portion of the tape passes, the center circumferential portion being bounded by respective edge circumferential portions corresponding to the non-data portions of the tape, and

wherein a first terminus of the thread groove is formed as a first circumferential groove in a first of the respective edge circumferential portions and the other terminus of the thread groove is formed as a second circumferential groove in the other of the respective edge circumferential portions, a respective plane extending through respective circumferential groove perpendicular to the cylinder longitudinal axis, each circumferential groove providing an axially unchanging contact surface and air vent for the respective non-data portion of the tape streaming thereover.

5,088,173
ONE-TIME-USE PRECISION-BLADE-BENDING
SCALPEL BLADE REMOVER-RECEPTACLE
Martin W. Kromer, 12308 Holland Rd., Poway, Calif. 92064, and William W. Seneski, 13075 Wimberly Sq., #90, San Diego, Calif. 92128
Continuation of Ser. No. 343,926, Apr. 26, 1989, abandoned.
This application Jun. 12, 1990, Ser. No. 536,936
Int. Cl.⁵ B23P 19/04; B65D 83/00, 25/00; B65F 7/00
U.S. Cl. 29—239 2 Claims



1. A device for bending a scalpel blade, the scalpel blade having an aperture presenting detents, at and from its locked position on a blade-retaining projection at the tang of a handle in order to remove the blade from the handle, the device comprising:

two members spaced to form a channel, the members having distal and proximal ends;

the distal end regions of the two members mutually shaped and spaced apart so as to form within a corresponding distal end region of the channel a blade-receiving surface that accepts the width and the breadth of the scalpel blade up to a position proximal along the scalpel blade from its aperture's detents in order to hold the distal end region of the scalpel blade substantially planar;

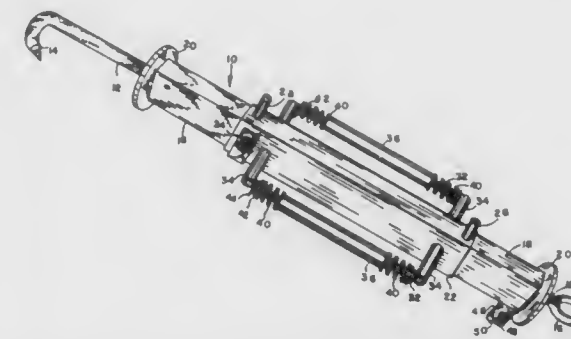
a first one of the two members that is disposed on the same side of the channel as the blade-retaining projection on the tang of the handle having a position proximate to a proximal end region of the channel a recess that is capable of receiving the proximal end region of the scalpel blade; the other, second, one of the two members that is disposed on the opposite side of the channel to the blade-retaining projection on the tang of the handle having a camming surface that may be moved from lesser to greater proximity to the proximal end region of the channel, to the proximal end region of the scalpel blade, and to the recess of the first member;

the second member's camming surface serving to pressure the scalpel blade to bend in its region that is proximal from a position along the blade that is itself proximal to the aperture's detents into the first member's recess while simultaneously permitting that the handle's tang should not be substantially pressured; and

interlock means, between the moving camming surface of the second one of the two members and the first one of the two members, for locking the moving camming surface in its position bending the scalpel blade and disengaging the handle;

therein disengaging the scalpel blade from the handle to that the handle is withdrawable from the two members, and from the bent scalpel blade within the channel, without any appreciable scraping frictional force between the scalpel blade aperture's detents and the tang of the handle.

5,088,174
FORCIBLE ENTRY TOOL
Harold L. Hull, 401 Canyon Way, SP.43, Sparks, Nev. 89434, and Patrick N. Dowden, 9400 Forest Vista Way, Elk Grove, Calif. 95758
Filed Feb. 11, 1991, Ser. No. 653,167
Int. Cl.⁵ B23P 19/04
U.S. Cl. 29—254 17 Claims



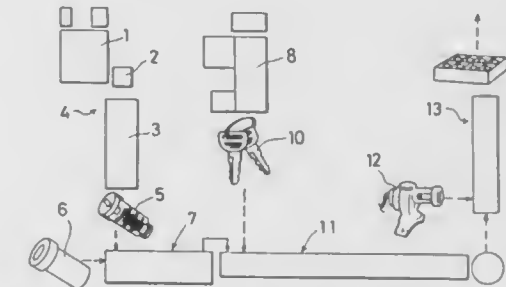
1. A forcible entry tool comprising: an elongated substantially square, tubular first member, said first member having a bulkhead secured to each end of said first member, said first member and said bulkheads supporting a shaft, said shaft piercing and being secured to said bulkheads substantially at center sections of the bulkheads, said shaft extending through and beyond each end of said first member, said shaft having a first end including a substantially pronged hook, said tool further having a weight means comprising an elongated substantially square tubular second member, said second member being of a lesser length than said first member, said second member being of a larger circumference than said first member, said first member and said second member having a slidable relationship, said slidably relationship being between and limited by said bulkheads, said tool including locking means to releasably lock said second member to said first member, said second member having handle means, whereby, when said hook is impaled into an object to be forcibly removed, said second member may be forcibly moved on said first member to forcibly strike one of said bulkheads with a hammer blow, said hammer blow transferring kinetic energy to said hook and said object to be forcibly removed, said tool further including a support leg, means to pivotally mount one end of said support leg to said first member adjacent a second end of said shaft, wherein said support leg includes releasable retaining means to retain said leg to said first square tubular member, said releasable retaining means being located on an end of the support leg opposite the pivotable mounting means.

5,088,175
CYLINDER LOCK MANUFACTURING METHOD
Hiroshi Nakamura, Yoshibu Saita, and Hitoshi Ikeda, all of Miyazaki, Japan, assignors to Kabushiki Kaisha Honda Rokku, Miyazaki, Japan
Filed Oct. 26, 1988, Ser. No. 262,657
Claims priority, application Japan, Oct. 29, 1987, 62-273912
Int. Cl.⁵ B21D 39/03 4 Claims

1. A cylinder lock manufacturing method for a plurality of cylinder locks differing in place of use but using a common key for their unlocking comprising:

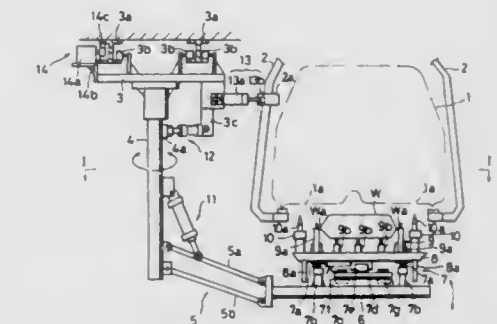
carrying out the following steps on said plurality of cylinder locks and said key as a group having a specific key code assigned thereto on a free flowing assembly operation having a plurality of work stations operating in series one after another; assembling inner members and outer members of cylinder locks into respective cylinder locks one lock after another at respective work stations among the plurality of work

stations in series continuously one group after another wherein all cylinder locks within one group are associated with the specific key code assigned thereto, further a specific key code of one group of cylinder locks being different from a specific key code of another group of cylinder locks; and



synchronously with said assembling notching a key for each group of locks, and thereafter combining each group of cylinder locks and the key notched for that group of cylinder locks as a set.

5,088,176
APPARATUS FOR AID IN ATTACHING WORK
Michitaka Koga, Kumagaya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1991, Ser. No. 660,742
Claims priority, application Japan, Mar. 16, 1990, 2-26214[U]
Int. Cl.⁵ B21D 39/03; B23P 11/00 5 Claims

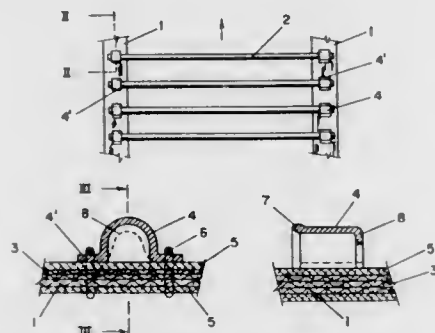


1. An apparatus for aid in attaching a work; comprising an assembly line along which a car body is suspendedly conveyed by a hanger, a truck which is disposed so as to be movable sideways of and along said assembly line, a synchronous motion unit which is installed on said truck and which moves said truck in synchronism with said car body being conveyed, in engagement with said hanger, a pole which is mounted on said truck so as to be horizontally turnable, a jig table which is secured to said pole through a parallel link mechanism so as to be vertically movable, a jig which is installed on said jig table through a position regulation unit so as to be horizontally movable, a work support unit which is installed on said jig and which positions said work so as to be placed on a predetermined position of said jig, positioning pins which are erected on said jig and which are respectively inserted into gauge holes formed in said car body, so as to position said jig relative to said car body, an air cylinder which is spanningly interposed between said pole and said parallel link mechanism and which fulfills a balancing actuator function of holding said jig table in a balanced state in correspondence with a weight of said work, and a rotation driver which drives and rotates said pole horizontally so as to permit said jig table to move between the work placement position and a work attachment position of a lower surface of a car.

5,088,177
METHOD AND APPARATUS FOR PRODUCING CONVEYOR BELTS HAVING RIGID CARRIER MEANS
 Arnold Jäger, Gehrbergsweg 6, 3164 Burgdorf, Fed. Rep. of Germany

Filed Jun. 29, 1990, Ser. No. 546,398
 Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921518

Int. Cl.⁵ B23P 11/02
 U.S. Cl. 29—450 3 Claims



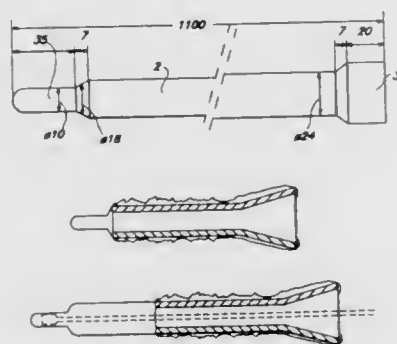
1. In a method of producing conveyor belts that are provided with a reinforcing insert disposed below an elastic cover layer, and with rigid carrier means that rest on said cover layer and are held by fastening means that overlap said carrier means and are secured to a conveyor belt, the improvement including the steps of:

first connecting said fastening means to a conveyor belt; and then forcing said carrier means between said conveyor belt and said fastening means thereby elastically deforming said cover layer.

5,088,178
ULTRASONIC ENDOSCOPE PROVIDED WITH PROTECTIVE SHEATH
 Albert F. Stolk, Moerkapelle, Netherlands, assignor to bv Optische Industrie, Delft, Netherlands
 PCT No. PCT/EP88/00629, § 371 Date Dec. 20, 1989, § 102(e) Date Dec. 20, 1989, PCT Pub. No. WO89/00832, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 12, 1988, Ser. No. 449,885
 Claims priority, application Netherlands, Jul. 27, 1987, 8701770

Int. Cl.⁵ B23P 11/02; A61B 1/00
 U.S. Cl. 29—453 7 Claims



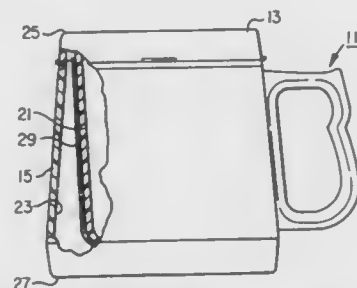
1. Method for fitting a flexible elongated thin-walled protective sheath including a sealed end section around an endoscopic device having an imaging head and an elongated transmission tube joined thereto for transmitting image signals originating from said imaging head, said elongated transmission tube being connected to an operating case having a con-

cally-shaped sloping section towards said transmission tube comprising the steps of:

- sliding and gathering said protective sheath except said sealed end section onto a nozzle section of a fitting funnel including an enlarged conically-shaped end section;
- splaying an open end section of said protective sheath about said enlarged conically-shaped end section of said fitting funnel;
- coursing said imaging head and elongated transmission tube into said fitting funnel via said conically-shaped end section to a point where said imaging head is positioned in said sealed end section of said protective sheath;
- moving said fitting funnel over said transmission tube towards said operating case; and
- coupling said fitting funnel to said operating case by a detachable coupling.

5,088,179
METHOD OF FORMING A MICROWAVEABLE CONTAINER
 Robert M. Gibbon, Fort Worth, Tex., assignor to JMK International, Inc., Fort Worth, Tex.
 Filed Oct. 12, 1990, Ser. No. 596,946

Int. Cl.⁵ B05D 5/00
 U.S. Cl. 29—458 4 Claims



arranging a number of the thin wall hexagonal subassemblies inside an extrusion can;
compacting the assembled extrusion can to a composite; and
extruding the composite to the final size desired.

5,088,184

PROCESS FOR MAKING A SUPERCONDUCTING MAGNET FOR PARTICLE ACCELERATORS

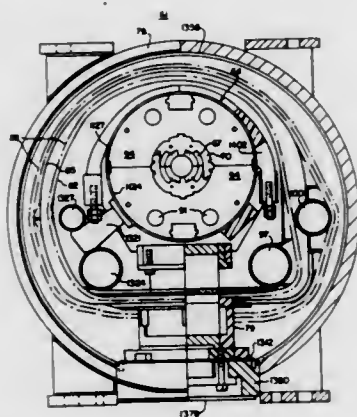
Andrew J. Jarabak, Pittsburgh; Wallace H. Sunderman, McCandless Township, Allegheny County; Edward G. Mendola, Fallowfield Township, Washington County, and Ralph W. Kalkbrenner, Hempfield Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 360,192, Jun. 1, 1989. This application Oct. 30, 1990, Ser. No. 605,865

Int. Cl.⁵ H01L 39/24

U.S. Cl. 29—599

1 Claim



1. A method of constructing a particle accelerator having superconducting properties, said method comprising the steps of:

- winding superconducting material into a plurality of inner coils and a plurality of outer coils, said inner and outer coils having a fixed shape;
- placing a tubular member between said inner and outer coils;
- placing said inner and outer coils with the tubular member therein within a collaring member to form a collared coil subassembly;
- securing said collared coil subassemblies between a pair of U-shaped yoke half assemblies and a pair of arcuate-shaped shell members to form a cold mass assembly;
- positioning said cold mass assembly in a vacuum vessel assembly having a cooling tube, through which is passed a cryogenic fluid, disposed therein, to thereby form a superconducting magnet;
- joining a plurality of said superconducting magnets into a ring-shaped structure, whereby a particle accelerator having superconducting properties is constructed.

5,088,185

METHOD FOR MANUFACTURING GRADIENT COIL SYSTEM FOR A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Horst Siebold, and Konrad Meier, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 442,211, Nov. 28, 1989, Pat. No. 5,012,191.

This application Jan. 22, 1991, Ser. No. 643,369

Claims priority, application European Pat. Off., Nov. 28, 1988, 88119826.1

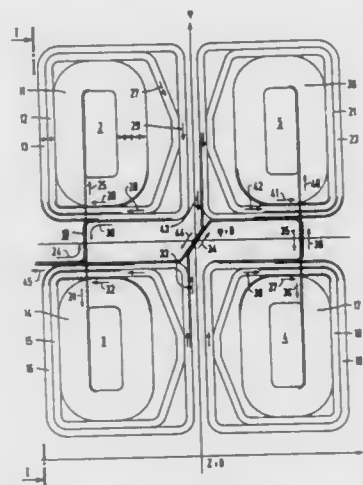
Int. Cl.⁵ H01F 7/06

U.S. Cl. 29—605

1 Claim

1. A method for manufacturing a gradient coil system for use in a nuclear magnetic resonance tomography apparatus, with

reference to an x-y-z coordinate system, said method comprising the steps of:
winding a first set of four saddle coils on a cylindrical surface by winding a cable conductor exclusively with con-



vex curvature on said surface to form, for each of said four saddle coils, three sub-coils; and
within said three sub-coils, forming a middle coil having an arced portion, facing the z=0 plane, which approximates an arc of an ellipse.

5,088,186

METHOD OF MAKING A HIGH EFFICIENCY ENCAPSULATED POWER TRANSFORMER

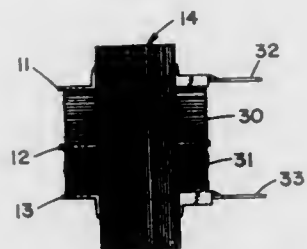
Robert P. Boesel, St. Paul, Minn., assignor to Valentine Engineering, Inc., St. Paul, Minn.

Filed Mar. 13, 1990, Ser. No. 492,821

Int. Cl.⁵ H01F 41/02

U.S. Cl. 29—605

4 Claims



1. A method of making an encapsulated transformer comprising the steps of:

- a. forming a unitary bobbin having a central bobbin aperture, the bobbin aperture having tapered walls;
- b. forming a first and second winding on the unitary bobbin;
- c. connecting the first and second windings to electrical terminals;
- d. successively inserting a central portion of an E-core piece into the tapered bobbin aperture, thereby forming layers of E-core pieces;
- e. joining a mating I-core piece to each E-core piece;
- f. continuing the insertion and mating of the core pieces at least until mechanical deformation of the core pieces occurs, whereby the core pieces and the unitary bobbin together form a self supporting core structure;
- g. inserting additional E-core pieces into the tapered bobbin aperture so as to substantially completely fill the tapered bobbin aperture, thereby forming an assembled transformer;
- h. compressing the assembled transformer between conformed molds by applying force to the core pieces; and
- i. injecting thermoplastic encapsulant into a mold cavity

formed by the conformed molds, thereby forming compressed windings that are mechanically and thermally bonded to the core pieces.

5,088,187

APPARATUS FOR AUTOMATICALLY MOUNTING ELECTRONIC COMPONENTS

Kazunori Takata; Tsuneshi Akaishi, and Masayuki Mohara, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

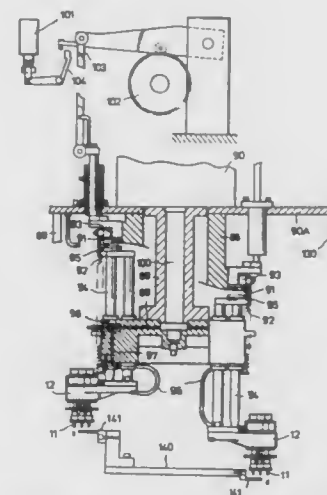
Filed Jun. 6, 1990, Ser. No. 534,611

Claims priority, application Japan, Jun. 7, 1989, 1-144377

Int. Cl.⁵ H05K 3/30

U.S. Cl. 29—705

3 Claims



1. In an apparatus for automatically mounting electronic component having a take-out nozzle rotated by nozzle rotating means based on data on an angular position assumed by an electronic component, the electronic component being firmly held on said take-out nozzle, said angular position being recognized by recognizing means in order to perform a correcting operation so as to cause said electronic component to assume an acceptable angular position, and wherein after completion of said correcting operation, said electronic component being mounted a printed-circuit board, the improvement comprising:

- storage means for storing an allowable error range of acceptable angular positions which can be assumed by said electronic component;
- comparing means for determining whether or not a present angular position of said electronic component recognized by said recognizing means is within said allowable error range stored in said storage means;
- a counter for counting the number of times a correcting operation has been performed in response to the determination made by said comparing means; and
- controlling means for controlling said nozzle rotating means for performing a correcting operation to be repeatedly performed, until the respective angular positions which have been recognized by said recognizing means after completion of the respective correction operations remain within said allowable error range and moreover allowing said electronic component firmly held on said take-out nozzle not to be mounted on said printed-circuit board when the number of times the correction operation which has been performed reaches a predetermined number which has been preset by said counter.

5,088,188

METHOD AND MACHINE FOR THE AUTOMATIC LAYING OF INTERPOSED JOINTS BETWEEN THE ELEMENTS OF A MULTIPLE GLAZING

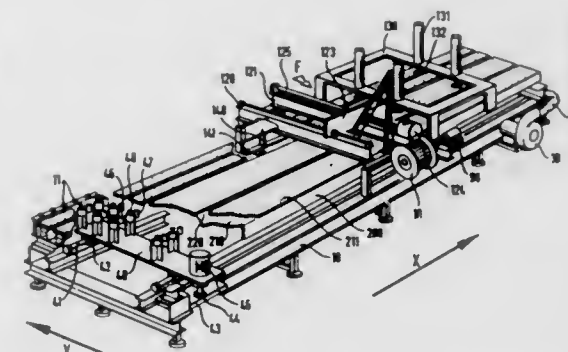
Pierre Riou, Pont-Audemer, France, assignor to Vitrages Isolants De Pont Audemer, France

Filed Jun. 22, 1990, Ser. No. 542,306

Int. Cl.⁵ B23P 21/00

U.S. Cl. 29—787

34 Claims



1. Apparatus for automatically placing flexible joint material between panes of a multiple glazing during the producing of the multiple glazing, comprising:

- an air-cushion table of a length equal to at least twice the greatest length of a pane of the glazing;
- a maneuvering carriage movable with respect to the air-cushion table, on which there are fixed retractable stops, first extensible means having suction cup means at end thereof for engaging and lifting a pane of the glazing and proximity detectors;
- a plurality of lateral reference rollers arranged along a side of the table for guiding a pane of the glazing;
- a movable carriage supporting a joint material laying head; a first transverse gantry above a first portion of the table and approximately in the middle thereof for supporting the movable carriage supporting the laying head, said laying head being adjustable in height and in orientation;
- a second gantry being disposed above a portion of the table and being provided with second extensible means having suction cups at ends thereof for holding a pane of said glazing above the table and for placing a pane of glazing on another pane on which joint material has been placed by said laying head;
- means disposed adjacent the table for removing a protective film from the joint material before the joint material is disposed in place on a pane of the glazing;
- unwinder means for unwinding a spool on which the joint material is wound;
- means for cutting the joint material from the spool; and
- blower means for supplying pressurized air to said air-cushion table for reducing friction of the panes of said glazing with the table.

5,088,189

ELECTRONIC MANUFACTURING PROCESS

John E. Brown, Southington, Ohio, assignor to Federated Fry Metals, Altoona, Pa.

Division of Ser. No. 575,638, Aug. 31, 1990. This application

Feb. 28, 1991, Ser. No. 662,459

Int. Cl.⁵ H05K 3/34

U.S. Cl. 29—840

7 Claims

1. A surface mount electronic manufacturing process comprising the steps of:

- 1) applying a solder paste including a solder powder and a solder flux containing an epoxy resin onto pads of a printed circuit board;
- 2) assembling electrical components onto the printed circuit board wherein the peripheral contacts of the electronic

- components are in contact with the solder paste coated pads;
- 3) heating the printed circuit board to a temperature, and for a period of time, sufficient to cause the solder paste to reflow and the epoxy residue from the epoxy resin to cure to form a protective coating for the solder joint;
 - 4) allowing the printed circuit board to cool.

5,088,190

METHOD OF FORMING AN APPARATUS FOR BURN IN TESTING OF INTEGRATED CIRCUIT CHIP

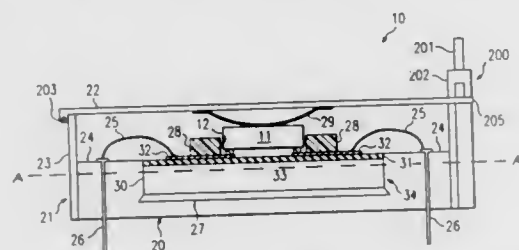
Satwinder Malhi, Garland, and Oh-Kyong Kwon, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 30, 1990, Ser. No. 575,456

Int. Cl.⁵ H01R 9/06

U.S. Cl. 29—843

7 Claims



1. A method for forming an apparatus for burn-in testing of a base integrated circuit chip comprising the steps of: forming a substrate; forming a compliant layer over said substrate; forming a connection circuit over said compliant layer; and forming an est to receive the integrated circuit chip over said connection circuit.

5,088,191

MODULAR, CIRCULAR, ENVIRONMENT RESISTANT ELECTRICAL CONNECTOR ASSEMBLY HAVING RETENTION CLIPS FOR MANUALLY OR AUTOMATICALLY LOADING OF ELECTRICAL CONTACTS

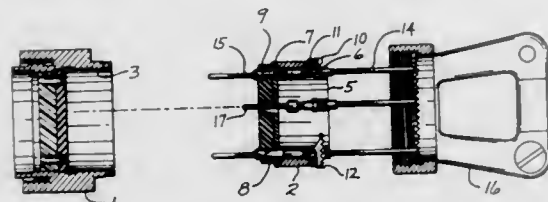
Luis J. Lazaro, Jr., Seattle, and Franklin D. Harsch, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 454,213, Dec. 21, 1989, abandoned. This application Jul. 30, 1990, Ser. No. 559,742

Int. Cl.⁵ H01R 13/40

U.S. Cl. 29—867

1 Claim



1. The method of assembling an electrical connector comprising the steps of: stripping a plurality of wires (14); crimping a plurality of electrical contacts (15) onto said plurality of wires (14); inserting the crimped wires (14) through a backshell (16); loading said plurality of electrical contacts onto a grommet assembly (2) by pushing electrical contacts (15) onto a grommet (5);

- assembling said electrical contacts (15) into retention clips (8) using pneumatic contact loader (18); aligning a keyway (13) of said grommet assembly (2) to an alignment key (3) of the connector shell (1) and pushing grommet assembly (2) inside said connector shell (1), and then, installing backshell (16).

5,088,192

METHOD OF FORMING A SHELL AND COIL HEAT EXCHANGER

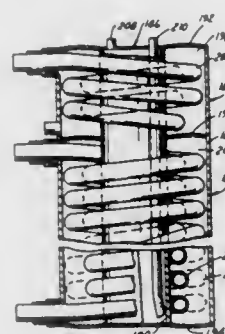
Jack C. Dempsey, Brown City, Mich., assignor to Aqua Systems, Inc., Hampton Falls, N.H.

Continuation of Ser. No. 339,390, Apr. 17, 1989, abandoned, which is a division of Ser. No. 832,517, Feb. 21, 1986, Pat. No. 4,865,124. This application Jan. 31, 1991, Ser. No. 649,376

Int. Cl.⁵ B23P 15/00

U.S. Cl. 29—890.037

9 Claims



1. A method of forming a helical coil assembly comprising the following steps: providing an elongated mandrel having a central axis, a large diameter region and a small diameter region; winding a first tube spirally about the mandrel, thereby forming a first coil having large and small diameter regions; removing the first coil from the mandrel; winding a second tube spirally about the mandrel, thereby forming a second coil having large and small diameter regions; removing the second coil from the mandrel; placing the first and second coils together in coaxial alignment, one inside the other with a substantial portion of each small diameter region nested within the large diameter region of the opposite coil, each coil having an axial spacing between each winding; and compressing the two coils axially, thereby deforming the coils and reducing the axial spacing between the windings.

5,088,193

METHOD FOR MANUFACTURING A HEAT EXCHANGER

Shigeru Okada, Isesaki, and Nobuyasu Ando, Takasaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Division of Ser. No. 402,696, Sep. 5, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 611,822

Claims priority, application Japan, Sep. 2, 1988, 58-115039[U]

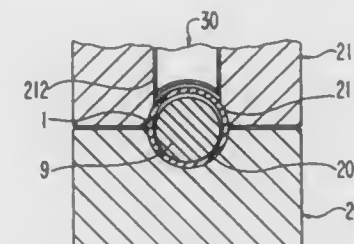
Int. Cl.⁵ B23P 15/26

U.S. Cl. 29—890.043

4 Claims

2. A method for manufacturing a heat exchanger having a first header connected to a second header by a plurality of flattened oval heat exchange tubes, said method comprising: forming a plurality of elongated holes on each of said headers by a pressing process comprising for each (a) inserting a core bar into one of said headers, (b) pressing a plurality of tapered depressions into one surface of said header; and (c) removing said core bar from said header; and

- (d) punching out the central portion of the tapered depressions to form elongated holes surrounded by an annular depression;
- connecting the headers by inserting heat exchange tubes into



- elongated holes in the first header and the second header; and sealing the connections between the headers and the tubes and filling in the annular depressions around each tube with a sealing material.

5,088,194

FLUID DISTRIBUTION SYSTEM, AND APPARATUS AND METHOD FOR MAKING SAME

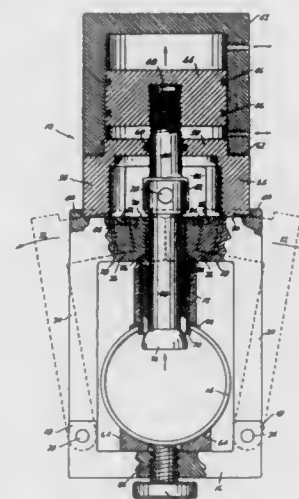
John A. Lasko, Box 737, 52 North Hill Rd., North Branford, Conn. 06471

Continuation-in-part of Ser. No. 335,950, Apr. 10, 1989, abandoned. This application May 31, 1990, Ser. No. 531,046

Int. Cl.⁵ B21D 41/02, 39/04

U.S. Cl. 29—890.148

5 Claims



1. A method for assembling a cylindrical fitting constituted of deformable metal to a pipe, wherein the pipe has a hole in a side wall and the fitting has a fishmouth, said one end of the fitting has a circumferential external bead whose dimension is less than the diameter of the pipe hole and further said one end of the fitting has a convergent bore that tapers to a smaller dimension toward one end, and wherein an apparatus is provided for accomplishing said method, said apparatus including means for engaging and holding said fitting, and a pull rod having an expansion head, said pull rod and expansion head being movable with respect to the holding means, said expansion head having an external dimension which exceeds the smallest dimension of the convergent bore of the fitting, prior to assembly, the method comprising the steps of:
 - a) inserting the pull rod into the bore of the fishmouth configuration of the fitting with the expansion head outside the fitting,
 - b) inserting the fishmouth configuration of the fitting, together with the inserted pull rod and expansion head, into the hole in the pipe to a depth wherein the bead lies within

- c) forcibly withdrawing the pull rod and expansion head completely through the fishmouth configuration of the fitting thereby forcibly expanding and deforming the bead and bringing it into tight, sealing engagement with the edges of the hole and expanding the relatively smaller, convergent bore by an amount sufficient to enable the expansion head to by-pass the bead and to enter the interior of the fitting and subsequently to be completely withdrawn therefrom together with the pull rod, thereby physically retaining the fishmouth configuration of the fitting in the hole in the pipe in tight sealing relation therewith.

5,088,195

SHAVING SYSTEM

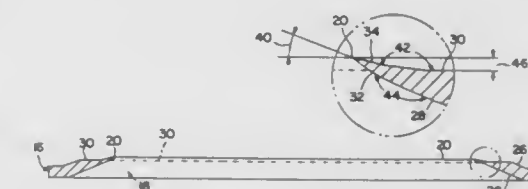
Daniel B. Lazarshik, Two Melrose St., Apt. 2, Boston, Mass. 02116, and Henryk J. Chylinski, 374 Lake St., Haverhill, Mass. 01832

Filed Jul. 30, 1990, Ser. No. 559,646

Int. Cl.⁵ B26B 21/00

U.S. Cl. 30—49

14 Claims



1. A shaving system comprising a holder and a blade member secured to said holder, said blade member having an aperture that defines an annular sharpened edge, said sharpened edge being defined by inner and outer main facet portions that converge at an angle of less than 30° and supplemental facet portions that are extensions of said main facet portions and define an ultimate tip defining portion that has an included angle of less than about 30°, said supplemental facet portions being angularly offset in the same direction from said main facet portions, the outer one of said main facet portions defining a shaving plane and said ultimate tip being disposed above said shaving plane in the range of 0.01–0.1 millimeter, and the bisector of said included angle defined by said supplemental facet portions being disposed at an angle in the range of 15°–35° to said shaving plane.

5,088,196

PIPE CUTTER

Kenji Fukuda, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

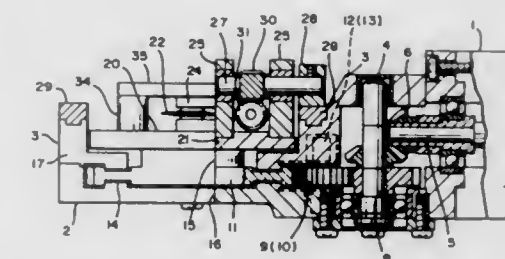
Filed Nov. 23, 1990, Ser. No. 617,355

Claims priority, application Japan, Mar. 12, 1990, 2-24798[U]

Int. Cl.⁵ B26D 3/16, 1/04; B23D 21/08, 21/06

U.S. Cl. 30—102

2 Claims



1. A pipe cutter comprising:

housing means;

- a disk mounted in the housing means so as to be rotated selectively in a forward direction and a reverse direction by a power drive, said disk having a pipe receiving slot extending to the central axis of rotation of the disk for receiving a pipe to be cut;
- a cutter blade and rotatable roller means disposed on said disk in symmetrical locations about the central axis of rotation, said cutter blade being adapted to move linearly into and out of contact with the pipe inserted in said receiving slot, and said roller means being engageable with the outer peripheral surface of the pipe;
- a holder for supporting said cutter blade, said holder being mounted on said disk for rotation therewith about the central axis of rotation and for linear motion toward and away from the central axis of rotation across the disk;
- rotating means adapted to be rotated on its own axis while revolving along the peripheral edge of said housing means around said central axis of rotation in response to the rotation of the disk;
- a worm wheel carried by said disk and connected to said rotating means to be driven by the rotating means; and
- a worm carried by said disk and in mesh with said worm wheel and having an externally threaded extension shaft; said holder having an internally threaded portion in mesh with said externally threaded extension shaft of said worm, whereby the holder and the cutter blade are caused to move linearly toward and away from the central axis of rotation by means of said rotating means, worm wheel, worm and externally threaded extension shaft in response to the rotation of the disk in a forward direction and a reverse direction, respectively.

5,088,197

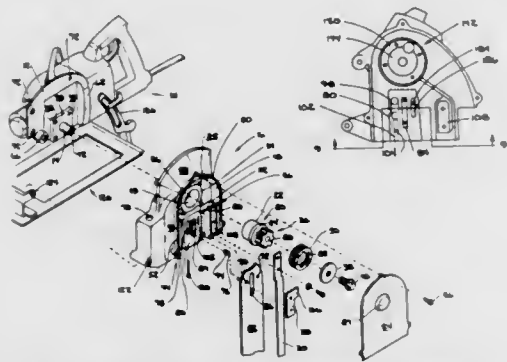
POWER-DRIVEN CHAIN SAW

Harvey G. Anderson, Muskegon, Mich., assignor to Pro Power Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 294,765, Jan. 6, 1989, Pat. No. 4,945,637. This application May 10, 1990, Ser. No. 521,582
Int. Cl.⁵ B27B 17/08, 17/12

U.S. Cl. 30—122

13 Claims



1. In a power-driven chain saw which comprises: a power unit having a mounting face and a drive shaft projecting normally therefrom;
- a housing member having a base portion, having a bottom edge and an obverse face, the reverse face of which is adapted to be affixed to said mounting face;
- side members which project from all of the periphery of said base portion except at the bottom edge thereof;
- a cover member adapted to be affixed to said side members;
- a driven shaft projecting from said base portion axially into said housing member parallel to said side members and adapted to be driven by said drive shaft when said housing member is mounted on said mounting face;
- a chain-saw sprocket mounted on said driven shaft within said housing member;
- a chain-saw chain support bar affixed to said housing mem-

ber on a raised support-bar boss on the obverse face of said base member in functional alignment with said sprocket; a raised chain-saw chain guard support-boss on the obverse face of said base portion;

said support-bar boss having parallel side faces, one of which is parallel to a side member and forms therewith a first chain-saw chain channel for the portion of the chain traveling to the sprocket and the other of which is parallel to a face of said guard-support and forms therewith a second chain-saw chain channel for the portion of the chain traveling from the sprocket;

the improvement in said housing member in which: the sides of said housing member comprise an arcuate portion spanning said first and second channels and flaring out and down beyond said guard support-boss thereby forming a vent channel for venting sawdust; and deflecting means for deflecting sawdust into said vent channel.

5,088,198

DEVICE FOR THE DISINFECTION OF PRUNED BRANCHES OR VINE-SHOOTS, APPLIED OR APPLICABLE TO PNEUMATIC SHEARS

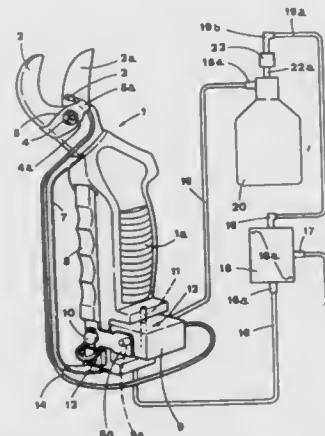
Franco Drusiani, Savona, Italy, assignor to M.A.I.Bo S.R.L., Bologna, Italy

Filed Oct. 30, 1990, Ser. No. 605,755

Claims priority, application Italy, Aug. 3, 1990, 3633A/90
Int. Cl.⁵ B25F 3/00

U.S. Cl. 30—123.3

7 Claims



1. A pneumatic pruning shear system for disinfection of pruned branches or vine-shoots, comprising: a shear body and blades, each blade having a cutting edge, said blades being hinged to each other by means of a pin, said body including a seat;
- at least one pneumatic valve removably fastened in said seat to said body, each said at least one valve having an inlet and an outlet;
- actuating means connected to said body for causing said at least one valve to open and close, when actuated;
- spraying means removably located near the cutting edge of one said blade, said spraying means including an outlet nozzle directed toward the cut surface of a branch or shoot remaining on the pruned plant after a cutting operation;
- locking means for removably fastening said spraying means to said blade of said shears;
- a first duct connected between an outlet of said at least one valve and said spraying means;
- at least one tank for containing a disinfectant liquid;
- a second duct connected between said at least one tank and the inlet of said at least one valve, opening said at least one valve by said actuating means connecting said first duct to said second duct for flow therethrough;

an air distributor for connection to a source of air under pressure, said distributor having at least one air outlet;

a third duct connected between said at least one air outlet and said at least one tank to pressurize said disinfectant liquid;

a fourth duct connected between said at least one air outlet to said at least one valve, opening said valve by said actuating means connecting the pressurized air of said fourth duct to said shears to operate said blades, liquid disinfectant being sprayed concurrently with closing of said blades.

5,088,199

VARIABLE VACUUM ATTACHMENT FOR HAIR GROOMING CLIPPERS

R. Marlene Romani, Indiana, Pa., assignor to MDC Romani Inc., Indiana, Pa.

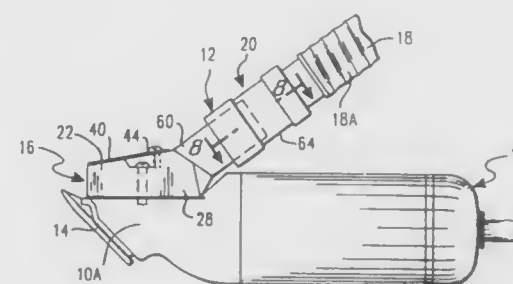
Filed Jul. 18, 1990, Ser. No. 554,619

Int. Cl.⁵ B25F 3/00; B26B 11/00

U.S. Cl. 30—133

12 Claims

U.S. Cl. 30—305



1. A vacuum attachment for a hair grooming clipper, comprising:
 - (a) a suction head having a body defining an internal air flow passage and an inlet to and outlet from said passage;
 - (b) a vacuum relief port defined through said suction head body intermediate between said inlet and outlet of said air flow passage for providing communication between said passage and the exterior of said suction head; and
 - (c) a closure in the form of a flexible sealing lid attached to the exterior and disposed on the exterior of said body so as to overlie said relief port and being movable for varying the amount of area of said port closed by said closure and thereby regulating the degree of relief through said port of a vacuum condition within said internal passage of said suction head.

5,088,200

HAIR TRIMMER HAVING A LOW-FRICTION ROTARY DRIVE

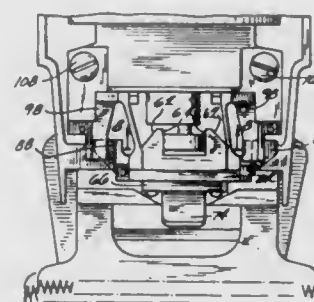
John M. Piwaron, Milwaukee; Daniel L. Sukow, Grafton, and Matthew L. Andis, Racine, all of Wis., assignors to Andis Company, Racine, Wis.

Filed Oct. 11, 1990, Ser. No. 595,590

Int. Cl.⁵ B26B 19/02

U.S. Cl. 30—216

10 Claims



1. A hair trimmer comprising a body adapted to support a

cutting assembly having a reciprocable cutter, drive means housed by said body for reciprocating the cutter, a hinge including a guide plate, and a reciprocable yoke supported engaged with said drive means and being reciprocally moveable with respect to said guide plate, and having thereon means movably engaging said guide plate for guiding movement of said yoke support relative to said guide plate.

5,088,201

SPAGHETTI CUTTING DEVICE

John Van Manen, 51331 Range Road, #224, Sherwood Park, AB, Canada T8C-1H3

Filed Mar. 8, 1991, Ser. No. 666,599

Int. Cl.⁵ B26B 3/04

U.S. Cl. 30—305

7 Claims



1. A device for cutting spaghetti off of a fork comprising:
 - (a) a pair of first members, each first member having a cutting edge along a bottom edge thereof;
 - (b) a second member, said second member connecting said pair of first members together such that said pair of first members are parallel and spaced apart a distance slightly greater than the width of the tines of said fork, said second member having a cutting edge thereon connected with each first member cutting edge to form a continuous generally U-shaped cutting edge; and
 - (c) a handle including two upright legs, each of said legs being attached to one of said first members and extending away therefrom in a direction generally perpendicular to a cutting edge thereof, said legs being interconnected by a generally V-shaped portion, said generally V-shaped portion being interconnected with said legs at respective bent connection locations;
 - (d) whereby said device is adapted to be placed over said fork having spaghetti wrapped therearound such that said cutting edges cut off any spaghetti strands extending outwardly from the sides and end of the fork.

5,088,202

SHAVING RAZORS

Ross F. Boland, West Hartford; Carl A. Hultman, Derby; William E. Vreeland, Shelton, and Peter S. Williams, Stratford, all of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 218,637, Jul. 13, 1988. This application Sep. 21, 1990, Ser. No. 586,472

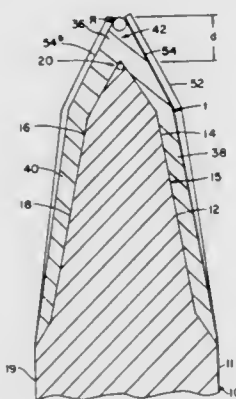
Int. Cl.⁵ C23C 13/00; B26B 21/54

U.S. Cl. 30—246.54

15 Claims

1. A razor having a cutting edge, comprising:
 - (1) a sharpened substrate comprising a ferrous alloy;
 - (2) a coating overlying and in direct contact with at least part of said substrate along said cutting edge, said coating consisting essentially of a composition selected from the group consisting of: (a) an essentially stoichiometric combination of boron and carbon and (b) boron and carbon in

combination with an element selected from the group consisting of Si, Zr, Hf and combinations thereof;



(3) a fluorinated polyolefin film overlying and in direct contact with at least part of said coating.

5,088,203

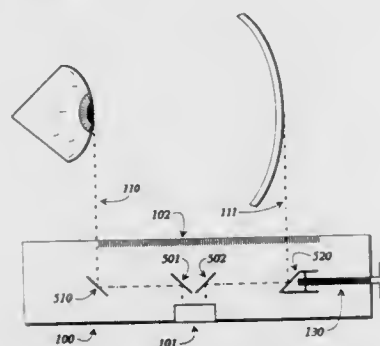
METHOD AND APPARATUS FOR EYE GLASSES POSITION MEASUREMENT SYSTEM AND/OR FOR VERTEX MEASUREMENT SYSTEM

Leonard E. Neiswander, 1536 Parkwy., Sevierville, Tenn. 37862
Filed Jun. 17, 1991, Ser. No. 716,090

Int. Cl.⁵ A61B 3/10

U.S. Cl. 33—200

2 Claims



1. An apparatus for taking measurements of the dimensioning of eyeglasses, said apparatus comprising:
 - a housing;
 - means for producing a first light beam a point of which is coincident with the cornea of a patient's eyeball, said means contained within the housing;
 - means for producing a second light beam a point of which is coincident with the respective lens of the patient's eyeglasses;
 - means for adjusting the position of the two beams with respect to each other and to the patient; and
 - means for measuring the distance between the two points.

5,088,204

LEVEL SENSING UNIT AND A LEVEL INDICATING DEVICE BASED THEREON

Kenneth E. Wolf, 995 Sheridan, Wauconda, Ill. 60084
Filed Oct. 25, 1990, Ser. No. 603,563

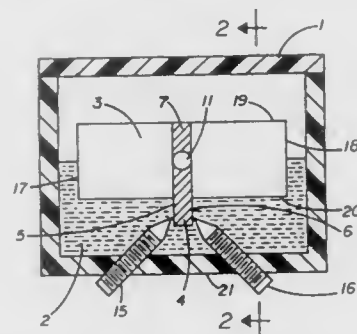
Int. Cl.⁵ G01C 9/06

U.S. Cl. 33—366

7 Claims

1. A level sensing unit comprising a sealed housing with a front and back wall, a top and bottom wall, two side walls, and containing a fluid reservoir;
 - a first pin with a first pivot point and an electrically conduc-

- tive surface connected to the front wall and extending toward the back wall;
- a second pin with a second pivot point and an electrically conductive surface connected to the back wall and extending toward the front wall in a direction collinear with the first pin;
- a generally cylindrical float, with a top and bottom surface and two ends, having an electrically conductive plate approximately bisecting said float between its ends and extending beyond at least one of the top and bottom surfaces, said plate having opposing first and second surfaces, first and second opposing edges, and a first and second recess located on the opposing edges and receivably disposed for the first and second pivot points, respectively;



- said float pivotally mounted on, and in electrical contact with, the first and second pins with the first and second pivot points pivotally engaged in the first and second recess, respectively;
- a first electrically conductive strip having a first and a second end, said first end embedded in any one of the walls of the housing with said second end terminating within the housing, and with at least some portion of the electrically conductive strip proximate to the first surface of the plate; and
- a second electrically conductive strip having a first and a second end, said first end embedded in any one of the walls of the housing with said second end terminating within the housing, and with at least some portion of the second electrically conductive strip proximate to the second surface of the plate.

5,088,205

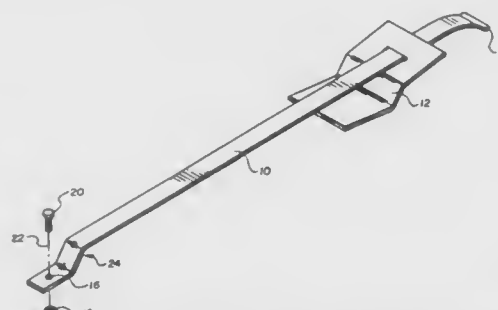
APPARATUS FOR ATTACHING LEVELS TO STUDS AND OTHER OBJECTS

Jeffrey T. Egbert, 1749 Village La., Orem, Utah 84058
Filed Feb. 1, 1991, Ser. No. 649,611

Int. Cl.⁵ G01C 9/12

U.S. Cl. 33—371

22 Claims



1. An apparatus for attaching a leveling device to an object, the apparatus comprising:
 - means for gripping the surface of the object;
 - means for connecting the means for gripping to the leveling device;

- means for swingably mounting the means for connecting on the leveling device and for allowing the means for connecting to swing between a first position which is substantially parallel to a side of the leveling device and a second position which is substantially perpendicular to the measurement side; and
- means for holding the means for gripping at any one of a plurality of locations on the means for connecting such that the means for gripping can be positioned in any one of a plurality of spaced relationships from the leveling device such that the leveling device can be attached to any one of a plurality of objects having differing dimensions and readily removed therefrom.

5,088,206

APPARATUS AND METHOD FOR CHECKING MECHANICAL PARTS

Guido Golinelli, Bologna, Italy, assignor to Marposs Societa' per Azioni, S. Marino di Bentivoglio, Italy

PCT No. PCT/EP89/00315, § 371 Date Jul. 24, 1990, § 102(e)

Date Jul. 24, 1990, PCT Pub. No. WO89/10531, PCT Pub.

Date Nov. 2, 1989

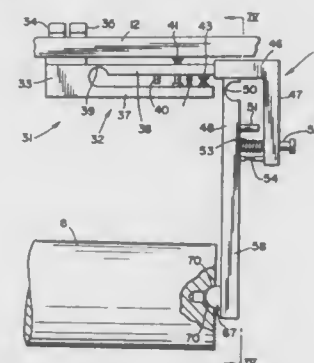
PCT Filed Mar. 22, 1989, Ser. No. 543,815

Claims priority, application Italy, Apr. 26, 1988, 3432 A/88

Int. Cl.⁵ G01B 5/25, 7/28, 7/31

U.S. Cl. 33—550

11 Claims



1. Apparatus for checking geometrical features of a mechanical part with symmetry of rotation and having two end centers, with first supporting means (1-5) for supporting the part to be checked, by cooperating with it at positions different from said end centers; second supporting means (12); gauging means (14-17, 30, 31) fixed to the second supporting means and adapted to cooperate with the part (6); and processing means (80) connected with the gauging means (14-17, 30, 31) for determining said geometrical features, wherein said gauging means comprise two gauging heads (30, 31), each of which has a base fixed to the second supporting means and a feeler (67, 72) movable substantially in three orthogonal directions with respect to the base and adapted to cooperate with a corresponding one of said end centers (70), the processing means (80) being connected to said gauging heads (30, 31) for determining the position of the geometrical axis of the part defined by said end centers.

5,088,207

TRUE END-TO-END ELECTRONIC SADDLE MICROMETER

Harry E. Betsill, 28 Cherrywood Ct., Cockeysville, Md. 21030, and Bruce E. Bresnick, 6009 Mannington Ave., Baltimore, Md. 21206

Filed Dec. 13, 1989, Ser. No. 450,175

Int. Cl.⁵ G01B 5/10, 7/12

U.S. Cl. 33—555.3

36 Claims

1. A true end-to-end electronic saddle micrometer for measuring the diameter of objects, particularly rolls used in flat rolled product mills, comprising:
 - (a) a saddle with two ends;
 - (b) wheels supporting the saddle;
 - (c) two measuring arm assemblies attached to either end of the saddle, each measuring arm assembly having two elongated members projecting on opposite sides diagonally downward and outward from the saddle, said measuring arm assemblies being permitted to rotate independently within a vertical plane perpendicular to the axis of the object to be measured, but not within a horizontal plane;
 - (d) four probe holders, one attached to each elongated member of the measuring arm assemblies, said probe holders being adjustable and able to be moved to and fixed at various points along the elongated members of the measuring arm assemblies;
 - (e) two distance transducers, one attached to one of the probe holders affixed to one of the measuring arm assemblies and the other attached to one of the probe holders affixed to the other measuring arm assembly, which produce an analog signal;
 - (f) two follower/counterweight probes, each affixed to one of the probe holders not holding a distance transducer, such that each follower/counterweight probe opposes one of the distance transducers;
 - (g) a means for converting the analog signal from the distance transducers to digital output;
 - (h) an optical shaft encoder with a mechanical drive for measuring distance along the length of the object to be measured, which optical shaft encoder is electronically connected to the microcomputer;
 - (i) a microcomputer with a data and program memory and a communications interface electronically connected to the means for converting the analog signal from the distance transducer to digital output, and electronically connected to the optical shaft encoder, and capable of storing and then combining data from the first distance transducer to create a single curve reflecting the profile of the object to be measured so that at one end of the object to be measured, the measurement is taken by the first distance transducer, then over the central portion of the object to be measured, measurements are taken at the same points by both distance transducers, the measurement of the first distance transducer being averaged with the measurement of the second distance transducer, then at the other end of the object to be measured, measurement is taken by the second distance transducer;
 - (j) a power supply.

5,088,208

MEASUREMENT PROBE FOR POSITION DETERMINING APPARATUS

Peter J. Wells, Stonehouse; David G. Powley, Alveston, and Richard H. Lewis, Horfield, all of United Kingdom, assignors to Renishaw plc, Gloucestershire, United Kingdom
PCT No. PCT/GB89/01197, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO90/04149, PCT Pub. Date Apr. 19, 1990

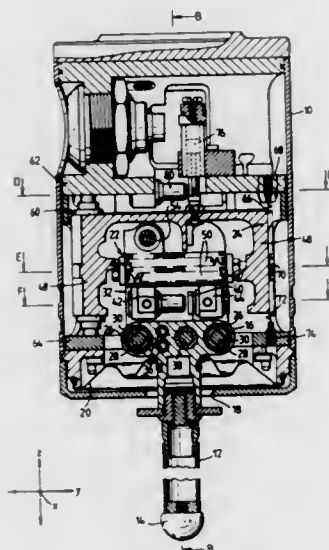
PCT Filed Oct. 11, 1989, Ser. No. 476,377

Claims priority, application United Kingdom, Oct. 11, 1988, 8823811; Sep. 12, 1989, 8920559

Int. Cl.⁵ G01B 7/03

U.S. Cl. 33—559

17 Claims



1. A measurement probe for mounting in a position determining apparatus whereby the probe is movable bodily in space relative to a workpiece, comprising:

- a probe body having an axis, the probe body being mountable in said position determining apparatus for said movement in space,
- a stylus for contacting said workpiece, which projects from the probe body in the direction of said axis and which is displaceable relative to the probe body both in the direction of said axis and in at least one direction lateral to said axis,
- support means for supporting the stylus in said probe body for said displacement in each of said directions,
- means for measuring the displacement of the stylus relative to the probe body in each of said directions,
- the support means for supporting the stylus for displacement in the axial direction comprising two linear bearings, each parallel to said axis, and spaced laterally from each other.

5,088,209

METROLOGICAL SCALE

Stephen E. Lummes, Stroud; Robert B. Morrison, and Brian C. R. Henning, both of Avon, all of United Kingdom, assignors to Renishaw plc, Gloucestershire, United Kingdom
PCT No. PCT/GB89/01019, § 371 Date Aug. 19, 1990, § 102(e) Date Aug. 19, 1990, PCT Pub. No. WO90/02315, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 17, 1989, Ser. No. 473,984

Claims priority, application United Kingdom, Aug. 19, 1988, 8819723

Int. Cl.⁵ G01B 11/02

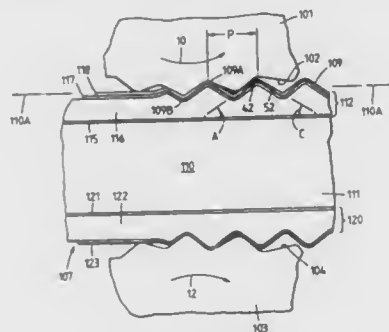
U.S. Cl. 33—707

11 Claims

1. A method of producing a metrological scale wherein the scale comprises an elongate scale member having a reference plane, opposing faces parallel to the reference plane, and intended to have a periodic surface profile in one of the opposing

faces composed of alternate first and second surface regions which are elongate in a direction transverse to the length of the member and which differ regarding their position relative to the reference plane, the method comprising:

- providing a rolling nip comprising two nip members both having profiles extending around their circumferences



which consist of alternate raised and lowered portions, the profile of at least one nip member being the counterpart of said surface profile of the scale; and
passing the scale member through the nip of the nip members while applying pressure therebetween thereby to deform opposing faces of the scale member in accordance with the respective profiles of the nip members.

5,088,210

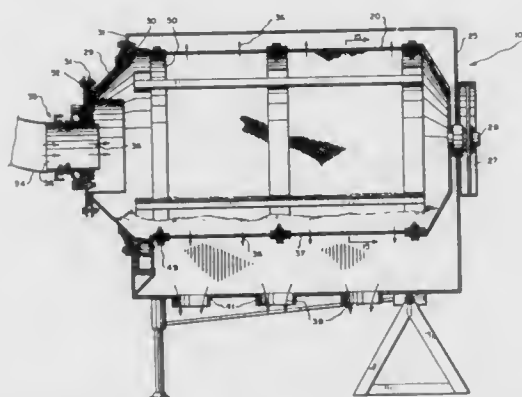
METHOD AND APPARATUS FOR DRYING BRINE SHRIMP CYSTS

Simon S. Goe, No. 1 Main St., Snowville, Utah 84336
Division of Ser. No. 183,143, Apr. 19, 1988, Pat. No. 4,996,780.
This application Sep. 28, 1990, Ser. No. 589,252

Int. Cl.⁵ F26B 11/04

U.S. Cl. 34—130

13 Claims



1. An apparatus for drying brine shrimp cysts for storage, said apparatus comprising:

- a generally closed drum having a longitudinal axis with a substantial horizontal component, and a front end and a rearward end, and being supported to be rotated about said axis, at least a portion of the drum comprising an air permeable, cyst retaining fine mesh screen, the remainder of the drum being impermeable to air;
- means for admitting and directing a flow of cyst drying air forced by fan means into the interior of the rotating drum, at least a portion of the screen being open to allow the drying air to flow out of the interior of the drum;
- sealable removable access means for placing and removing cysts into and from the drum; and
- means rotating the drum said axis.

5,088,211

SKI BOOT

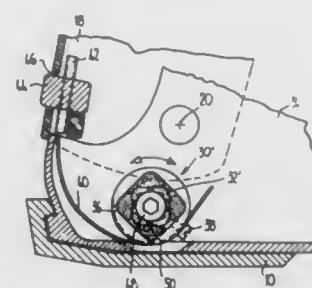
Klaus Walkhoff, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland
Filed Oct. 27, 1989, Ser. No. 427,495

Claims priority, application Switzerland, Nov. 21, 1988, 4308/88

Int. Cl.⁵ A43B 5/04

U.S. Cl. 36—117

22 Claims



1. A ski boot with a boot shell which has a boot sole and is formed by a lower shell and a boot shaft which is movable relative to the lower shell at least in a forward lean direction, the ski boot comprising a damping arrangement which is effective between the lower shell and the boot shaft to resiliently dampen the forward lean movement, said damping arrangement having at least one rubber spring element comprising a core piece having a longitudinal axis, a tubular piece coaxially surrounding said core piece, one of said core piece and said tubular piece being rotatable upon the forward lean movement relative to the other of said core piece and said tubular piece, and further comprising flexible, compressible members of elastomeric material arranged radially outward of said longitudinal axis of said core piece and radially inward of said tubular piece, as to be between said core piece and said tubular piece, said compressible, flexible members being compressed by the relative rotation between said core piece and said tubular piece occurring during the forward lean movement, thus elastically limiting said relative rotation, said at least one spring element seated in said lower shell; and a force transmission member extending between at least one of said core and said tubular piece of said spring member and said boot shaft.

5,088,212

SKI BOOT HAVING A MOVABLE FRONT FLAP MEMBER UNINHIBITED BY TIGHTENING FORCES

Gerhard Trinkaus, Bärnbach, and Josef Löcker, Voitsberg, both of Austria, assignors to Koflach Sport Gesellschaft m.b.H. & Co. KG, Vocklabruck, Austria

PCT No. PCT/AT89/00103, § 371 Date Jul. 6, 1990, § 102(e) Date Jul. 6, 1990, PCT Pub. No. WO90/05465, PCT Pub. Date May 31, 1990

PCT Filed Nov. 16, 1989, Ser. No. 536,646

Claims priority, application Austria, Nov. 18, 1988, 2835/88

Int. Cl.⁵ A43B 5/04

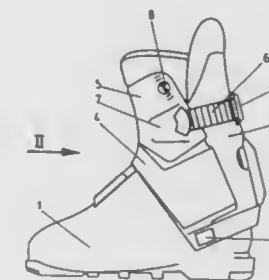
U.S. Cl. 36—120

20 Claims

- 1. A ski boot having a toe, a heel, and a median plane, and comprising:
- a rear part which can be bent or folded back, for rear entry;
- a lower shell;
- an upper mounted to said lower shell so that it can swivel with respect to said lower shell;
- said upper having a flap running in a peripheral direction of said upper, and backwardly toward said rear part, and having a free end region; said flap for fitting different leg shapes of wearers of the boot;
- said rear part overlapping said upper on the outside thereof in a region of said upper facing the toe of the boot and lying perpendicular to the median plane of the boot;
- said flap free end region connectable to said upper at various vertical positions;
- said flap having a tunnel-shaped protuberance on its free end

region, said protuberance having a given inside width and comprising an opening in said flap, opening towards said free end region, and limited by a flange;

- a fastening element, and a strap shaped tightening element associated with said upper, said fastening element for fastening said strap shaped element in the region of said tunnel shaped protuberance of said flap; and



said strap shaped tightening element having a width which is smaller than the inside width of said tunnel shaped protuberance, so that the tightening forces exerted by said strap shaped tightening element act only on said flange of said flap, allowing said flap to movably adjust for fitting different leg shapes while the leg area adjacent said flap remains substantially free of undesirable pressure from the tightening forces.

5,088,213

FRONT HOE ATTACHMENT FOR LOADER

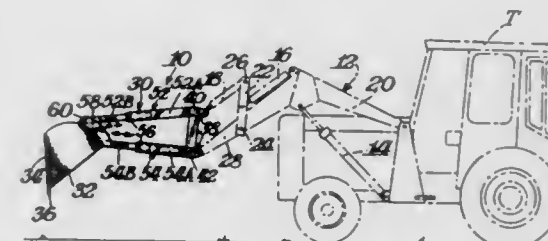
Anthony J. Raimondo, and Madeline D. Raimondo, both of 117 Chandler Mill Rd., Kennett Square, Pa. 19348

Filed Feb. 19, 1991, Ser. No. 656,436

Int. Cl.⁵ E02F 5/02

U.S. Cl. 37—103

7 Claims



1. In combination therewith, a loader having a front and a back, a manipulating assembly having a back end fixedly connected to said front of said loader and a front end remote from said back end, said front end of said manipulating assembly terminating in a pair of parallel piston cylinder assemblies having forward and rearward piston cylinders and in a frame member mounted below said forward and rearward piston cylinders, said front end of said manipulating assembly being capable of selective extension/retraction and elevation/lowering with respect to said front of said loader, a front hoe, detachable connecting means detachably mounting said front hoe to said front end of said manipulating assembly, said front hoe comprising a connecting frame and a bucket, said connecting frame comprising a rear connecting assembly and a side link means, said detachable connecting means comprising a plurality of connecting members on said rear connecting assembly and disposed against said piston cylinder assemblies and against said frame member and fasteners detachably connecting said respective connecting members to their juxtaposed forward piston cylinder and said frame member, said side link means being secured to and extending outwardly from said rear connecting assembly and being connected to said bucket, a plurality of digging teeth on said bucket, and said rear connecting

assembly and said side link means and said bucket being rigidly connected together whereby said manipulating assembly comprises the sole means for the extension/retraction and elevation/lowering and pivoting of said bucket during the digging operation of said bucket.

5,088,214

EXCAVATOR WEAR EDGE

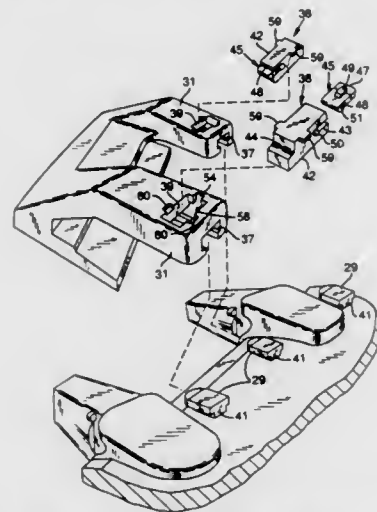
Larren F. Jones, Aloha, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Jan. 17, 1991, Ser. No. 642,390

Int. Cl.⁵ E02F 9/28

U.S. Cl. 37—141 R

15 Claims



1. A wear edge assembly for an excavator provided with inner and outer faces terminating in a forward edge, a rearwardly-extending generally T-shaped boss secured to one of said faces spaced rearwardly of said forward edge, a generally U-shaped wear member slidably mounted on said faces and having a pair of legs so that said wear member extends around said excavator forward edge, each of said legs having inner and outer surfaces confronting respectively said excavator inner and outer faces, at least one leg of said member having a rearwardly-extending slot in its inner surface, said slot being generally T-shaped to receive said generally T-shaped boss upon slidable, rearward movement thereon, said member one leg having a laterally enlarged opening in the outer surface thereof adjacent the rear end of said boss and communicating with said slot, said opening being defined by front, rear and side walls, and lock means in said opening confined between the rear end of said boss and the rear wall of said opening, said lock means being equipped with laterally extending latch means, and keeper means in one of said opening side walls upsettably confining said latch means whereby rearwardly exerted forces on said latch means do not affect the keeper means.

5,088,215

PLASTIC MOLDBOARDS FOR SNOWPLOWS AND THE LIKE

James C. Ciula, Mentor, Ohio, assignor to The Lewis Berkman Company, Cleveland, Ohio

Filed Dec. 3, 1990, Ser. No. 620,564

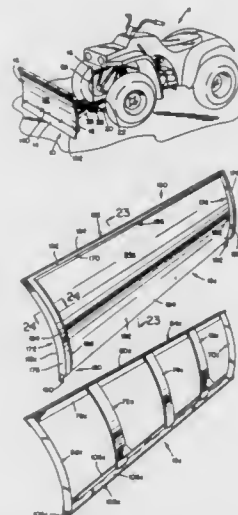
Int. Cl.⁵ E01H 5/06

U.S. Cl. 37—197

56 Claims

1. In a plow comprising a frame having top and bottom longitudinally extending mounting members and vertically extending end mounting members located at opposite ends of the top and bottom mounting members, said end mounting

members attached at one end to said top mounting member and at the other end to said bottom mounting member; a flexible plastic moldboard of desired curvature with a forward facing, inwardly curved surface at one side and a rearward facing, similarly curved surface on the opposite side; wherein the moldboard includes means for securing said curved moldboard to said frame, the improvement comprising:



- prising: the securing means including an elongated upper end portion of said moldboard gripping said top mounting member; vertically extending side portions at opposite ends of said moldboard, each of said side portions gripping one of said end mounting members; and a longitudinally extending lower end portion of said moldboard fastened to said bottom mounting member.

5,088,216

DISPLAY HOLDER FOR CARDS, FLOWERS, AND THE LIKE

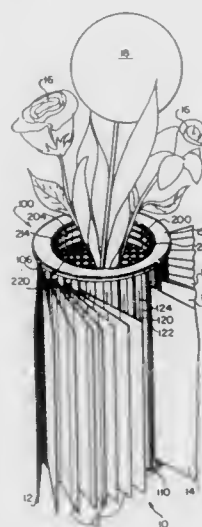
Carol Wasilko, 4728 Frederick Ave., Shady Side, Md. 20764

Filed Mar. 7, 1991, Ser. No. 666,078

Int. Cl.⁵ G09F 1/10

U.S. Cl. 40—124.4

20 Claims



1. A display holder for cards, flowers, and stemmed objects, comprising: a bottom portion having a solid base, an inner sleeve extend-

ing upwardly from said base, and an outer sleeve axially aligned with said inner sleeve and extending upwardly from said base, said outer sleeve comprising a plurality of elongated, spaced-apart upwardly-extending post means for holding cards, said post means being flexible and resilient and having upper free ends and being spaced apart from said inner sleeve, and said inner sleeve having an open upper end including retaining means for retaining said free ends of said post means; and a top portion slidably receivable in said upper end of said bottom portion, said top portion including holder means for holding flowers, balloons with stems, and stemmed objects in an upright position; said bottom portion also having an inner surface having support means for supporting said top portion.

5,088,217

LINE READER APPARATUS

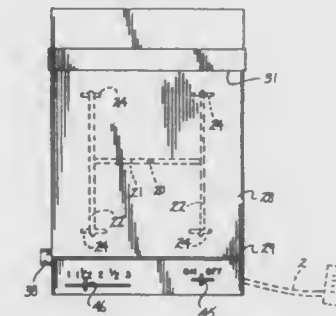
Cameron Canada, 2786 Hidden Arbor Ct. #208, Memphis, Tenn. 38128

Filed May 17, 1991, Ser. No. 701,746

Int. Cl.⁵ B41J 11/64, 13/10

U.S. Cl. 40—356

5 Claims



1. A line reader apparatus comprising, a clamping member, the clamping member arranged for securement to a support platform, wherein the clamping member includes a first support base, the first support base pivotally mounted to the clamping member, and a plurality of first support legs pivotally mounted to the first support base at lower terminal ends of the first support legs, and an intermediate second support base to pivotally receive upper terminal ends of the first support legs, and the intermediate second support base including a plurality of second support legs pivotally mounted to the intermediate second support base, and the second support legs pivotally mounted at lower terminal ends of the second support legs to a third support, the third support including a mounting rod fixedly mounted to the third support base, wherein the mounting rod is orthogonally and medially mounted to a bridge support leg, the bridge support leg includes spaced parallel mounting legs, the spaced parallel mounting legs include mounting bores at opposed ends of each mounting leg, and a reader housing, the reader housing including a housing rear wall, the housing rear wall including plural pairs of mounting ears, each pair of mounting ears mounted to one of said mounting legs, and mounting pins to mount each of the mounting legs to each pair of mounting ears, and the housing including a front wall, the front wall including a support plate fixedly mounted to the front wall adjacent the lower terminal end thereof, wherein the support plate defines an oblique angle between the housing front wall and the support plate, and a transparent line reader bar, wherein the transparent line reader bar is positioned in a spaced relationship relative to the housing front wall above the support plate.

5,088,218

STRUCTURE OF THE ROTARY TYPE CRYSTAL BALL

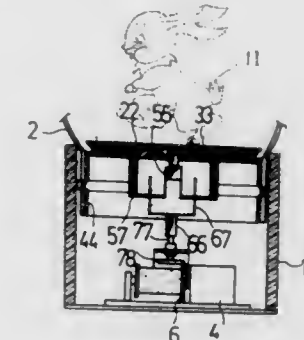
J. H. Liu, No. 3, Alley 202, Kao-Fon Rd., Hsin-Chu City, Taiwan

Filed Aug. 7, 1990, Ser. No. 563,614

Int. Cl.⁵ G09F 19/08

U.S. Cl. 40—411

10 Claims



6. An improved rotary crystal ball that comprises a stand; a music box having a main drive shaft, said music box being mounted to said stand; a rotary disc having a depending central axle, said axle having a lower terminal portion; a fixed base having a circular disc having an annular lip portion, said rotary disc being mounted on said circular disc; a depending fixed neck portion integral with the bottom of said circular disc and having a bottom surface, and a central orifice through said disc and fixed neck portion, said central axle of said rotary disc passing through said central orifice of said circular disc; a resilient plug mounted at a lower side of said fixed base; an elastic axle coupling located a lower side of said rotary disc and rigidly connected to said rotary disc terminal portion, a lower end of said coupling being provided with a plurality of angularly spaced elastic claws having terminal end portions which together define a diameter, said diameter being such that said elastic claws at least partially overlap the bottom surface of said fixed neck portion; and a crystal ball drive shaft located at a lower side of said elastic axle and connected to the main drive shaft of the music box, an upper end of said crystal ball drive shaft being provided with two opposed driving claws having terminal end portions which define a diameter that is about half of the diameter defined by said elastic claws, an axial height of said driving claws terminal end portions extending upwardly to about the middle of said fixed neck portion and thereby overlapping said elastic claws; whereby upon rotation of said main drive shaft, said main drive shaft rotates said crystal ball drive shaft, which in turn rotates said elastic axle and said rotary disc connected thereto.

5,088,219

SCROLLING DISPLAY DEVICE

Reza Toraby-Payhan, 1889 N. 105th E. Ave., Tulsa, Okla. 74116

Filed Oct. 19, 1989, Ser. No. 424,342

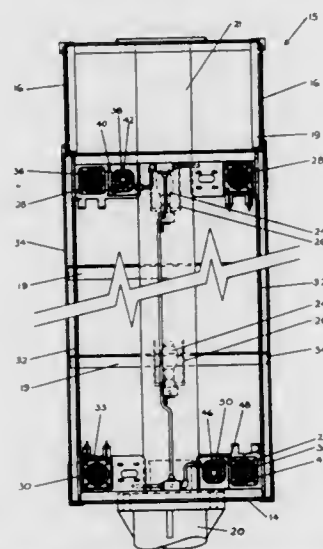
Int. Cl.⁵ G09F 11/18

U.S. Cl. 40—471

10 Claims

1. A scrolling display device which comprises: a. first roller means and second roller means opposed and parallel to each other; b. a web display extending between said first and second roller means; c. first motor means including a rotatable drive shaft drivingly engaged with said first roller means in order to rotate said first roller means and wind a portion of said web thereupon, said first motor means rotatably driving

- said drive shaft in a single direction only, said drive shaft being free to overrun in the opposite direction;
- d. second motor means including a rotatable drive shaft drivingly engaged with second roller means in order to rotate said second roller means and wind a portion of said web thereupon;
- e. first brake means for said first motor means including brake shoes in contact with said rotatable drive shaft when said first motor means is off, said brake means being released when said drive shaft rotates in said drive direction;



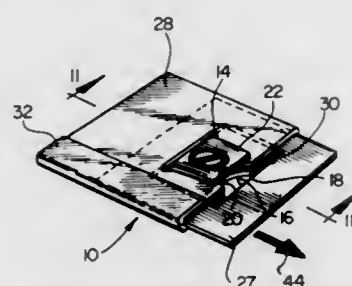
- f. second brake means for said second motor means including brake shoes in contact with said rotatable drive shaft when said second motor means is off; and
- g. control and switch means for said first motor means and said second motor means so that said first motor means may be engaged to rotate said web upon said first roller means, or alternatively, said second motor means may be engaged to rotate said web upon said second roller means.

5,088,220 POP-OUT SLIDE

Susan Hirsch, Woodridge, Ill., assignor to The Lehigh Press, Inc., Cherryhill, N.J.
Filed Aug. 30, 1990, Ser. No. 575,421
Int. Cl.⁵ G09F 7/00

U.S. Cl. 40—488

3 Claims



1. A pop-out slide fabricated from a single continuous web of material, comprising:
- a base panel;
 - a slotted panel connected along a fold line to said base panel having a slot formed therein;
 - a slide panel enclosed between said base panel and said slotted panel having a cutout therein defining a pop-out member aligned with and sized for slidable extension through, and complete retraction from said slot in said slotted panel, and;
 - a glue seam securing said base panel and said slotted

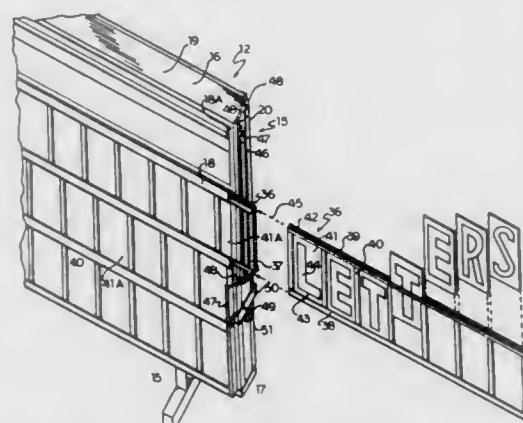
panel together through said cutout in said slide panel, said glue seam cooperating with said cutout for limiting the movement of said slide panel relative to said slotted panel and enabling extension and complete retraction of said pop-out member relative to said slot.

5,088,221 SIGN ASSEMBLY

Joseph P. Bussiere; Richard A. Bussiere; Daniel J. Bussiere, and Christopher M. Lindop, all of Edmonton, Canada, assignors to Canadian Consumer Products Ltd., Nisku, Canada
Filed Jul. 7, 1989, Ser. No. 377,185
Int. Cl.⁵ G09F 7/02

U.S. Cl. 40—618

11 Claims



1. A sign assembly comprising in combination:
- an enclosure including a pair of spaced and parallel end frame components, at least one pair of spaced and parallel cartridge guide and retaining track components extending between the said end components thereby defining a substantially rectangular open frame;
 - at least one elongated cartridge detachably engageable and removable from said cartridge guiding and retaining track components;
 - gate means in cooperation with said enclosure for detachably retaining said cartridges within said enclosure;
 - said cartridge being mounted between a pair of adjacent cartridge guiding and retaining track components, said gate means being situated vertically and selectively closing off one end of said cartridge guiding and retaining track components for selectively retaining said cartridge within said components and permitting removal of same from said cartridge guiding and retaining track components, and means closing off the other end of said cartridge guiding and retaining track components;
 - each said cartridge including a pair of spaced and parallel end frame members, a longitudinally extending lower frame member and a longitudinally extending upper frame member and a plurality of vertical divider members extending between said upper and lower frame members in equal spaced and parallel relationship with said end frame members, said frame members and said dividers defining a plurality of side by side rectangular plate receiving openings, elongated slots in said upper frame member at least through the portions thereof between said vertical dividers, track means in said side and lower frame members and in said dividers, and a plurality of plates slidably engageable through said slots and into said track means, transparent indicia formed on at least some of said plates with the surrounding portions of said plates and the remainder of said plates being opaque;
 - a source of illumination within said assembly inboard of said cartridge guiding and retaining track components; and
 - at least one longitudinally extending cartridge guiding and retaining support member extending between said frame

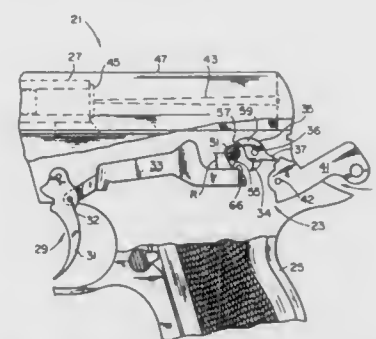
components and a double sided cartridge guiding and retaining track component detachably securable to at least one side of said support member, said double sided cartridge guiding and retaining track component having guide means for said cartridges for support cartridges on the upper and lower longitudinally extending sides thereof, selective removal of said double sided cartridge guiding and retaining track components doubling the vertical distance between the now adjacent remaining cartridge guiding and retaining track components for the receipt of oversize cartridges substantially twice the height of standard cartridges.

5,088,222 FIREARM SAFETY

Mark A. Larson, Colona, Ill., assignor to Springfield Armory, Inc., Geneseo, Ill.
Filed Feb. 4, 1991, Ser. No. 650,050
Int. Cl.⁵ F41A 17/56

U.S. Cl. 42—70.04

19 Claims



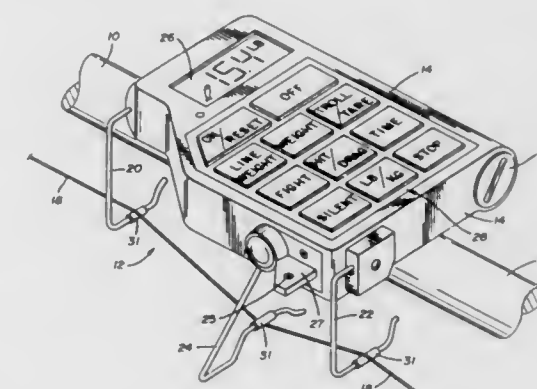
1. A firearm having a safety, comprising:
- a frame supporting a barrel and a trigger assembly;
 - a trigger bar which is reciprocally movable in response to movement of said trigger assembly;
 - a sear mounted in said frame and having a hammer catch;
 - a hammer assembly mounted to said frame and biased forwardly to fire a round through said barrel, wherein said hammer assembly engages said hammer catch in a cocked position and disengages said catch during firing, and wherein said trigger bar engages and moves said sear during firing to cause said catch to disengage said hammer assembly; and,
 - a safety movable between a safe position and a fire position to prevent firing of the firearm, wherein said safety comprises:
 - a pivot shaft mounted transversely in said frame and pivotable with respect thereto;
 - a manually actuated lever arm secured to said pivot shaft for pivoting said pivot shaft;
 - a cam projection connected to and projecting radially outwardly from said pivot shaft a radial cam distance, wherein said trigger bar passes beneath said pivot shaft at a distance which is less than said radial cam distance, and wherein said cam projection pivots downwardly in response to pivoting of said pivot shaft so that said cam projection engages said trigger bar in a camming action to urge said trigger bar downwardly out of engagement with said sear with said safety in said safe position; and,
 - a second projection connected to and projecting radially outwardly from said pivot shaft, wherein said second projection swings, during movement of said safety from said fire position to said safe position, into an obstructing position to obstruct movement of said sear to prevent said hammer catch of said sear from disengaging said hammer assembly.

5,088,223 FISHING ACCESSORY

Tak Y. W. Chu, Lot 232 D.D. 233 Off Clear Water Bay Road, House 10, Ha Yueng New Village, Sai Kung, Kowloon, Hong Kong
Continuation-in-part of Ser. No. 393,883, Aug. 14, 1989, abandoned. This application Nov. 8, 1990, Ser. No. 610,521
Int. Cl.⁵ A01K 97/12

U.S. Cl. 43—17

21 Claims



1. A sensing device for use with a fishing rod and line comprising a body; support means connected to said body and adapted to secure the sensing device to the fishing rod; sensing means extendable from said body into contact with the fishing line of the fishing rod; said sensing means being mounted in such a way that any force exerted on the line is transferred to said sensing means and thus to said body; electronic means positioned within said body and adapted to receive the force exerted on said sensing means, and transform that force into an indication that a pull is being exerted on the fishing line; and at least part of said sensing means being collapsible to a position adjacent said body such that said sensing means are out of contact with the fishing line during casting.

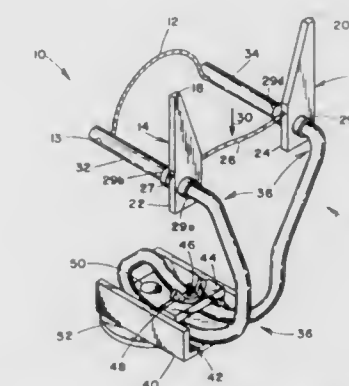
5,088,224 FISHING ROD HOLDER AND STAND

Manuel Gutierrez, 1273 Meadow Sweet Rd., Golden, Colo. 80401

Filed Feb. 1, 1991, Ser. No. 649,677
Int. Cl.⁵ A01K 97/10

U.S. Cl. 43—21.2

25 Claims



1. A holder for a rod having a handle, comprising:
- a rearward rod handle support;
 - a forward rod handle support comprising a first and second finger each having a tip and a bottom end portion, said bottom end portions being connected by at least one cable; said fingers mounted for pivotal movement of said tips in unison toward each other when a downward force is applied to said cable; and

a frame upon which said rearward and forward rod handle supports are mounted.

5,088,225

REEL LOCKING DEVICE

Shigeru Yamamoto, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

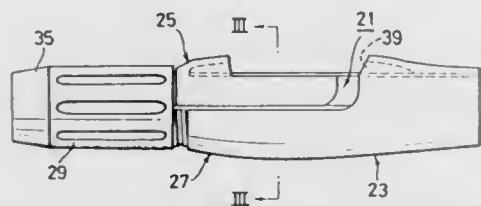
Filed Mar. 20, 1990, Ser. No. 495,997

Claims priority, application Japan, Mar. 29, 1989, 1-79378

Int. Cl.⁵ A01K 87/00

U.S. Cl. 43—22

10 Claims



1. A reel locking device wherein first and second hoods for locking a reel leg to a reel seat body are positioned vis-a-vis a specified distance part in the longitudinal axial direction of the reel seat body and the first hood is movably structured along the reel seat body by rotation of a lock ring, said device comprising an extension formed on the first hood to extend to the far end of the second hood and the lock ring disposed behind the second hood such that rotation thereof moves the extension along the reel seat body, and in which the rear of the extension is formed with an external thread which mates with an internal thread formed in the inside surface of the lock ring.

5,088,226

FISHING LURE WITH ROTATIONAL LATERAL FINS

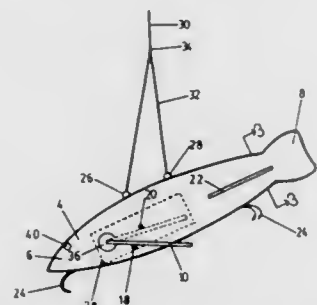
Norman L. Bazinet, 10 Oak St., Guelph, Ontario, Canada N1G 2M9

Filed Dec. 12, 1990, Ser. No. 626,453

Int. Cl.⁵ A01K 85/00

U.S. Cl. 43—42.03

12 Claims



1. An artificial fishing lure intended for use in water with a fishing line while ice fishing and still fishing, said lure comprising a stream-lined elongated body generally simulating a fish, said body having a head and a tail, said tail being thin and being curved to one side when the lure is in an upright position, two movable lateral fins located near said head, one lateral fin extending outward from each side of said body, each lateral fin having a forward edge and a rear edge, each lateral fin being pivotally mounted about a pivot point located approximately one-quarter of the distance from said head to said tail, said pivot point being located sufficiently close to the forward edge of each lateral fin so that a surface area of each lateral fin to the rear of the pivot point is much greater than the surface area of each lateral fin in front of said pivot point, each lateral fin being mounted so that said rear edge rises relative to said forward edge when the lure moves downward and winks relative to said forward edge when the lure moves upward, limiting means to limit a degree of rotation of said lateral fins in both directions, guide means being located between said

lateral fins and said tail, hooks suitably placed on said body, and means for attaching a fishing line to said lure, said lateral fins being substantially parallel to one another at all times and imparting a strong forward motion in an irregular circular path towards the side to which the tail is curved as the lure is moved upward or downward by means of the fishing line.

5,088,227

SIMULATED FROG FISHING LURE

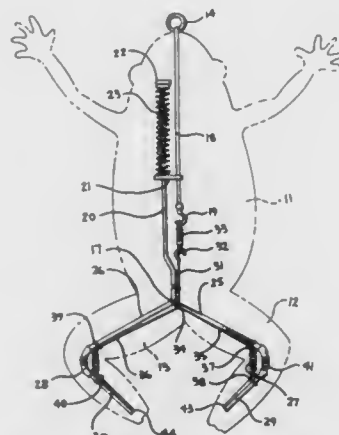
Jeffrey T. Toner, and Christopher Winterroll, both of 10 Violet Ave., Hicksville, N.Y. 11801

Filed Jan. 28, 1991, Ser. No. 646,819

Int. Cl.⁵ A01K 85/00

U.S. Cl. 43—42.3

5 Claims



1. A simulated frog fishing lure comprising, in combination, an elongate, longitudinally aligned rigid body portion, the rigid body portion including a flexible right leg member and a flexible left leg member mounted to a respective right and left rear end portion of the rigid body portion, and a first body rod longitudinally directed through the rigid body portion extending through a forward end of the rigid body portion exteriorly of the rigid body portion, and the first body rod reciprocatably mounted within the rigid body portion, and an articulated right leg member link mounted within the right leg member, and an articulated left leg member link mounted within the left leg member, and actuator line means mounted to the first body rod, wherein the actuator line means is further mounted to the right and left leg member links for effecting articulation of the respective right and left leg members upon reciprocation of the first body rod within the rigid body portion, and including a second body rod fixedly mounted within the rigid body portion spaced from the first body rod, and a body positioning plate mounted at a forward second body rod portion, and a connector bar orthogonally and fixedly mounted to the first body rod, and the second body rod slidably directed through the connector bar, and a first spring member captured between the connector bar and the body positioning plate to bias the first body rod interiorly of the rigid body portion.

5,088,228

RELEASEABLE SINKER ASSEMBLY

Robert Waldie, Jr., 912 Sheridan Ave., Bexley, Ohio 43209

Filed Sep. 24, 1990, Ser. No. 587,108

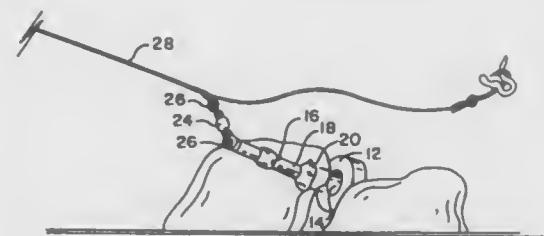
Int. Cl.⁵ A01K 91/00

U.S. Cl. 43—43.12

6 Claims

1. A releasable sinker assembly which comprises: a sinker having an opening;

a spindle having a main body adapted to extend through the opening in said sinker, an enlarged base at one end of said spindle and attaching means for attaching said spindle to a fishing line at the other end of said main body; wherein said base is formed of an elastomeric material and is larger than said opening; wherein said opening and said base are sized such that said



base cannot pass freely through said opening when said base is in its free state but that said base may be deformed and pulled through said opening when said sinker is held in place; and said attaching means has an insert affixed to said other end of said body, a swivel adapted to be connected to a fishing line and a fastener which attaches said swivel to said insert.

5,088,229

BAIT TANK

Del Andrews, No. 3 Montilla, San Clemente, Calif. 92672

Continuation-in-part of Ser. No. 414,759, Sep. 29, 1989,

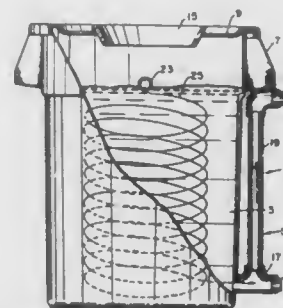
abandoned, which is a continuation of Ser. No. 297,191, Jan. 17, 1989, Pat. No. 4,887,380, which is a continuation of Ser. No. 076,771, Jul. 27, 1987, abandoned. This application Aug. 6, 1990, Ser. No. 563,530

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.⁵ A01K 97/04

U.S. Cl. 43—57

1 Claim



1. A method for keeping fragile bait alive, comprising the steps of:

- (1) flowing oxygenated water in a continuous downward circular stream from a top inlet of a bait tank or bag holding water and having a substantially unobstructed interior in which the bait is to be held;
 - (2) sweeping floating and suspended debris within said bait tank or bag circularly downward and cleaning the water thereby; and
 - (3) flushing water and the debris from said bait tank or bag through a bottom outlet having an external standpipe or fabric pocket connected thereto and of a predetermined height relative to said top inlet to regulate the level of the water within said bait tank or bag;
- wherein said steps of flowing, sweeping, and flushing are continuously performed and uninterrupted by opening and closing valves.

5,088,230

CRAB TRAP

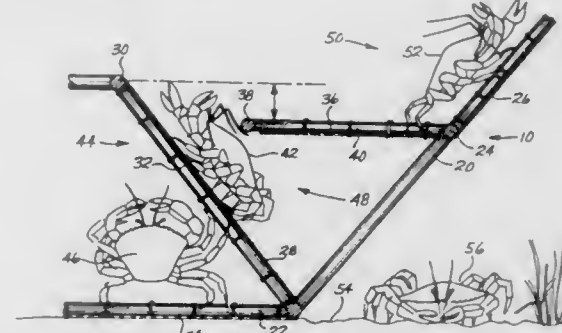
Andrew J. Moritz, 3200 W. Commodore Way, (Condo 3-10), Seattle, Wash. 98199

Filed Jul. 10, 1990, Ser. No. 553,174

Int. Cl.⁵ A01K 69/08, 69/04

U.S. Cl. 43—100

5 Claims



1. A crab trap, comprising: bottom, top, and side walls substantially enclosing a crab-trapping interior; an unobstructed entryway in a side wall, said entryway including an upwardly and inwardly sloped ramp terminating at an inner edge which is spaced between said top and bottom walls; and said side wall having a portion at said entryway terminating at a lower edge which is spaced outwardly from and below said ramp's inner edge defining a space between said inner edge and said lower edge of sufficient size to allow a crab to enter said trap therebetween without displacement of either of said edges.

5,088,231

AUTOMATED SYSTEM FOR MICROPROPAGATION AND CULTURING ORGANIC MATERIAL

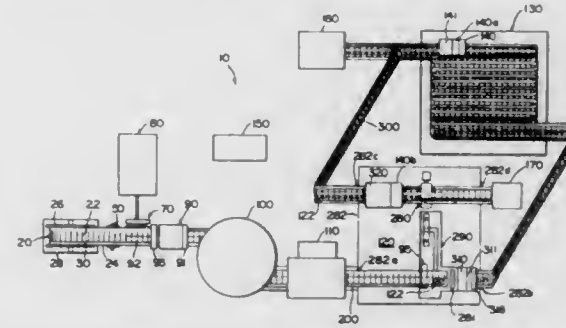
Malcolm G. Kertz, Sealy, Tex., assignor to Agristar, Inc., Sealy, Tex.

Division of Ser. No. 278,681, Dec. 1, 1988, Pat. No. 4,978,505, which is a continuation-in-part of Ser. No. 207,405, Jun. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 21,408, Mar. 4, 1987, Pat. No. 4,908,315. This application Aug. 24, 1990, Ser. No. 573,606

Int. Cl.⁵ A01G 31/02

U.S. Cl. 47—1.01

6 Claims



1. An automated system for culturing plant tissue, comprising:

- a first length of membrane material forming a plurality of first chambers having an open end;
- a second length of membrane material having a plurality of second chambers enclosing individual plant tissue;
- opening means for opening said second chambers;
- removal means for removing the plant tissue from said second chambers;
- cutting means for cutting the plant tissue into a plurality of pieces;

inserting means for inserting individual pieces of plant tissue into said first chambers; and
closing means for closing said open ends of said first chambers.

5,088,232

WATER AND FERTILIZER APPLICATOR FOR LAWN AND SHRUBS

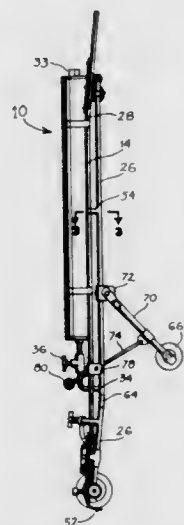
Harold O. Aurness, 5808 Knox Ave. N., Brooklyn Center, Minn. 55430, and Daniel R. Saufferer, 8126 Colfax Ave. S., Bloomington, Minn. 55420

Filed May 29, 1990, Ser. No. 529,592

Int. Cl.⁵ A01C 00/00

U.S. Cl. 47-1.5

4 Claims



1. A lawn applicator unit adapted to roll across a lawn in a direction of travel and to dispense a mixture of fertilizer and water, said unit comprising:

- A) a rigid frame having upper and lower ends and a mid portion extending between said ends;
a handle means at the upper end of the frame;
a first set of wheels mounted on an axil supported transversely at the lower end of said rigid frame; and
a second set of wheels provided on adjustable support legs and secured to the mid portion of said rigid frame, and said applicator unit further including:

- B) a flow distribution system adapted to evenly spread fertilizer mixture on a lawn said distribution system comprising:
a main water conduit extending along said frame having an upper, lower and mid portions;
a tubular tank secured on said frame having an upper, lower and mid portions and means causing fertilizer mixture stored in said tank to flow at a predetermined rate into said main water conduit;
a distributor means extending along said axil and connected to said lower portion of said main frame; and
a parting means provided ahead of said axil in the direction of travel of said applicator unit to part the grass and permit the fertilizer mixture to go directly to the ground.

5,088,233

GYPSY MOTH LARVAE BARRIER APPARATUS

Lee R. Frankenberry, P.O. Box 184, Chalk Hill, Pa. 15421

Filed Mar. 27, 1991, Ser. No. 675,876

Int. Cl.⁵ A01G 17/12

U.S. Cl. 47-24

5 Claims

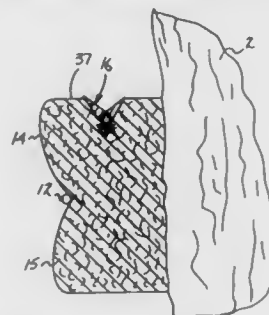
1. A gypsy moth larvae barrier apparatus for mounting about a tree trunk, wherein the tree trunk is defined by a trunk access, and the apparatus comprising:

- a porous, fabric web circumferentially and continuously mounted about the tree trunk to define a continuous web orthogonally oriented relative to the axis, and

the web including an exterior surface and an interior surface, the interior surface in contiguous communication with the tree trunk, the exterior surface including a mounting band continuously positioned in contiguous communication with the exterior surface of the web for securement of the web to the tree trunk, and

the mounting band defining a central web valley positioned medially and circumferentially to the exterior surface of the web defining an upper projecting barrier ridge and a lower projecting barrier ridge, and

further including a dispensing band, and the web including a web top surface adjacent the upper projecting barrier ridge, with the dispensing band mounted within the web



top surface, and the dispensing band including a central reservoir cavity, and the dispensing band including a top surface, the top surface including first channel means directed from the top surface into communication with the central reservoir cavity for directing fluid into the central reservoir cavity, and second channel means in communication with the central reservoir cavity and projecting from the central reservoir cavity to a lower side wall surface for directing a fluid mixture from the central reservoir cavity exteriorly of the dispensing band and into the porous fabric web.

5,088,234

PLANT HOLDER

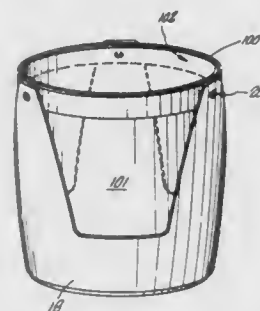
Robert K. W. Wong, 1725 Camino Lindo, S. Pasadena, Calif. 91030

Continuation-in-part of Ser. No. 228,027, Aug. 4, 1988, Pat. No. 5,020,274. This application Oct. 19, 1990, Ser. No. 600,486

Int. Cl.⁵ A01G 47/72

U.S. Cl. 47-67

19 Claims



12. A hangable holder suitable for suspending plants and the like comprising:

- (a) a receptacle suitable for holding a plant, the receptacle having at least one drainage hole in the bottom;
(b) a unitary support for the receptacle, the support comprising (i) a solid, non-porous, non-leaking, waterproof bottom, (ii) an upstanding, exterior, peripheral wall extending upwardly from the bottom, the height of the wall being less than the height of the receptacle, with the wall ending proximate to the bottom end of the receptacle, and (iii) at least three longitudinally extending arms projecting upwardly from the exterior wall above the top of the receptacle, each arm having a support hole in its upper portion for suspending the support; wherein the peripheral wall

and the arms are adapted to provide access to a substantial portion of the side of the receptacle, including a portion proximate to the bottom of the receptacle; and
(c) ring means between the arms for securely permitting a removable container to be located in the unitary support.

5,088,235

TURNSTILE CONTROL SYSTEM

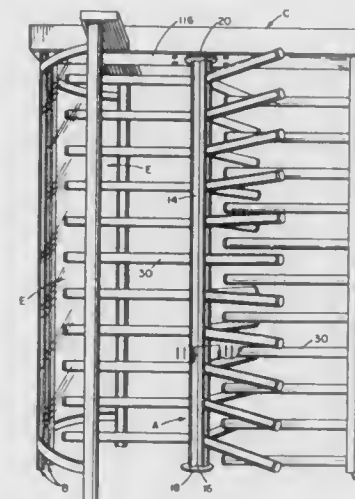
Emmanuel M. Trikili, 1545 W. 130th St., Brunswick, Ohio 44212

Continuation-in-part of Ser. No. 397,050, Aug. 22, 1989, Pat. No. 4,989,368. This application Sep. 11, 1990, Ser. No. 580,664

Int. Cl.⁵ E06B 11/08

U.S. Cl. 49-42

20 Claims



1. A rotary gate control assembly comprising:
a pivot rod on which the rotary gate is adapted to rotate;
a cam having a continuous cam surface with a plurality of lobes disposed at spaced intervals therealong for defining a plurality of rotary gate home positions, said cam being operatively secured to said pivot rod; and
a first control means for selectively allowing a rotational movement of said cam, wherein said first control means comprises an elongated bar having an axis, a flat side and a round side, said bar being selectively rotatable around its axis to present one of said flat side and said round side to said cam surface and a means for selectively rotating said elongated bar, said bar flat side when facing said cam allowing a rotation of said cam and said bar round side when facing said cam preventing a rotation of said cam.

5,088,236

PIVOTABLE GLAZING FOR A BALCONY

Niilo Karhu, Vantaa, Finland, assignor to Lemminkainen OY, Helsinki, Finland

PCT No. PCT/FI88/00197, § 371 Date Aug. 9, 1990, § 102(e) Date Aug. 9, 1990, PCT Pub. No. WO89/05389, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 8, 1988, Ser. No. 476,406

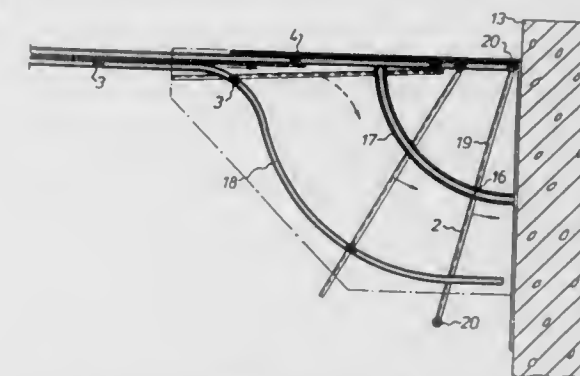
Claims priority, application Finland, Dec. 9, 1987, 875416 Int. Cl.⁵ E05D 15/26

U.S. Cl. 49-127

13 Claims

1. A pivotable glazing for a balcony, comprising at least two movable panes, which are arranged to preferably cover the entire width of said balcony and to slide on a first upper track and a lower track secured to a ceiling and a balustrade of said balcony, respectively, an upper edge of each pane having a profile provided with at least two spaced upper slides, one of said at least two upper slides arranged to move along a straight outer rail of said first upper track and the other upper slide along an inner rail of said first upper track, said inner rail including a curved portion such that said inner rail turns in-

wards toward a side wall of said balcony, a lower edge of each pane having a profile provided with at least one first lower slide that is aligned with said one of said at least two upper slides which moves along said inner rail of said first upper track, said curved portion of said inner rail including a first portion starting from said straight outer rail and having a gently curving shape similar to the middle region of an inverted S-curve, a second portion continuing from the gentle curve to form a portion of a circular arc having a radius which generally corresponds to the distance between said at least two upper slides in said first upper track, and a third portion approximately parallel with said straight outer rail of said first



upper track and extending to said side wall of said balcony, and a center point of said circular arc situated on said straight outer rail at a distance from said side wall of said balcony generally corresponding to said third portion of said inner rail, wherein at least one of said panes comprises a side pane which is hinged to said side wall of said balcony and which is provided with an upper middle slide arranged to move in a second upper track disposed in said ceiling and forming a smooth arc having a radius generally corresponding to one half of the width of said side pane, and said side pane being rotatable 180° about mounting means on said middle slide such that a face surface of said pane can be changed from having been turned inside to being turned outside and vice-versa.

5,088,237

METHOD, MACHINE AND TOOL FOR THE HONING OF WORKPIECES

Peter Nagel, Neuffen, and Wolf Nagel, Nuertingen-Zizishausen, both of Fed. Rep. of Germany, assignors to Nagel Maschinen- und Werkzeugfabrik GmbH, Fed. Rep. of Germany

Filed Oct. 10, 1989, Ser. No. 419,082

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835185

Int. Cl.⁵ B24B 5/10

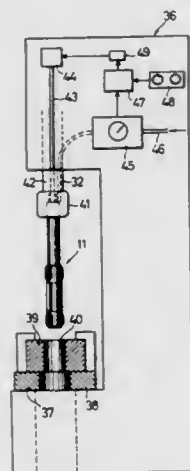
U.S. Cl. 51-34 J

10 Claims

1. A honing tool, comprising:

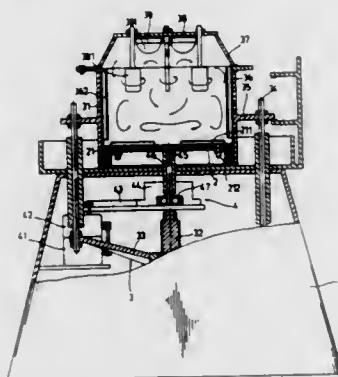
- a widenable honing surface having a work area for removing material from a machining surface of a workpiece, said honing surface having a widening cutting zone and a calibrating zone which can be preset in a fixed manner prior to start of machining to correspond to the desired size of the machining surface;
measuring means positioned outside said work area, said measuring means having at least one nozzle;
a dynamic pressure air measuring device connected by a line in the tool to said nozzle; and

an air stagnation ring displaceably mounted on said tool, said ring being moved automatically on said tool to cover said



at least one nozzle when said at least one nozzle is not positioned in said workpiece.

5,088,238
POLISHING GRINDER WITH TURBULENT FLOW OF GRINDING SOLUTION FOR GRINDING
Chao-Tong Lin, 3F, No. 1-5, Lane 101, Ta Tung S. Rd., San Chung City, Taipei Hsien, Taiwan
Filed Feb. 20, 1991, Ser. No. 658,153
Int. Cl.⁵ B24B 31/108
U.S. Cl. 51—163.1

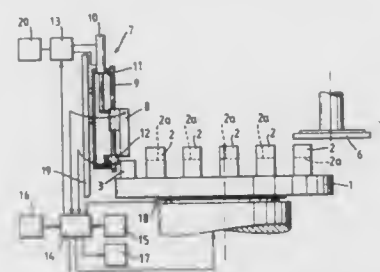


1. A grinder comprising a power unit set inside a base, said power unit comprising a container a motor controlled by a speed reducer, a driving shaft driver by said motor a centrifugal disc carried by said shaft to centrifugalize grinding solution contained in said container for polishing work pieces therein, and characterized in that:

said centrifugal disc has a top with three elongated, raised strips radially disposed thereon for centrifugalizing said grinding solution contained in said container;
said container has an inner wall surface and a top opening, three elongated semi-circular channel bars equidistantly and longitudinally formed on said inner wall surface thereof for interrupting the movement of said grinding solution centrifugalized by said centrifugal disc and an upper cap pivotably connected thereto for covering said top opening, said upper cap having an inner bottom and a rotary wheel rotatably secured to said inner bottom, said rotary wheel having three stirring blades fixed thereon and equidistantly spaced from one another for stirring said grinding solution contained in said container, and three stirring bars equidistantly disposed on said upper cap around said rotary wheel for stirring said grinding solution contained each of in said container, said stirring bars

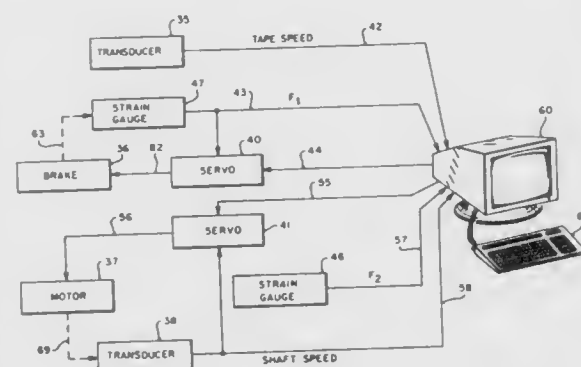
rotatable about a respective stationary axis and respectively adjustable in a vertical position.

5,088,239
MONITORING A MACHINING OPERATION
John M. Osman, Bristol, England, assignor to Rolls-Royce plc, London, England
Filed Feb. 7, 1991, Ser. No. 651,935
Claims priority, application United Kingdom, Feb. 14, 1990, 9003338
Int. Cl.⁵ B24B 49/00
U.S. Cl. 51—165.71 9 Claims



1. A method of monitoring the progress of a machining operation on a workpiece using a distance sensor supported by a supporting structure allowing the movement of the sensor relative to the workpiece, this movement having a limit at a position where a workpiece having a dimension the same as that of a machined workpiece would be within an accurate measuring range of the sensor, including the steps of;
(i) during the machining operation, moving the sensor towards the workpiece until the separation of the workpiece and sensor reaches a pre-set value or the sensor reaches the limit of its movement,
(ii) if the separation of the workpiece and sensor reaches the pre-set value the sensor is moved away from the workpiece again and the sequence is repeated from step i,
(iii) if the sensor reaches the limit of its movement it remains in this position and measures the separation of sensor and workpiece.

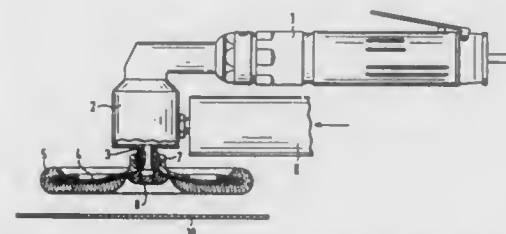
5,088,240
AUTOMATED RIGID-DISK FINISHING SYSTEM PROVIDING IN-LINE PROCESS CONTROL
Frank D. Ruble, Saratoga; John N. Walsh, Pleasanton, and Robert A. Smith, Berkeley, all of Calif., assignors to Exclusive Design Company, Inc., San Mateo, Calif.
Filed Sep. 22, 1989, Ser. No. 410,952
Int. Cl.⁵ B24B 21/20, 21/12
U.S. Cl. 51—165.71 14 Claims



1. A system for texturing the surface of a rigid-disk substrate comprising:
an abrasive tape;

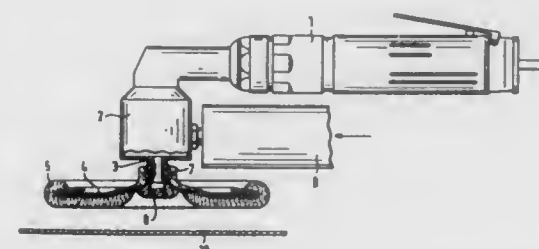
a force application means for pressing said tape against said substrate, thereby texturing said surface;
a supply means for supplying said tape to said force application means;
a collecting means for collecting said tape from said force application means; and
a control means for simultaneously controlling the speed and tension of said tape, said control means including means for sensing the tension on a first section of said tape located between said supply means and said force application means, and on a second section of said tape located between said force application means and said collecting means, the difference between the tension of said first and second sections being indicative of the work being performed on said substrate.

5,088,241
POLISHING DEVICE
Johannes Lubbering, Herzbrock; Peter Ihme, Dusseldorf; Jürgen Busse, Monchen-Gladbach; Erwin Schmitz, and Wolfgang Volker, both of Tonisvorst, all of Fed. Rep. of Germany, assignors to MG, Fed. Rep. of Germany
Division of Ser. No. 498,768, Mar. 26, 1990. This application Oct. 25, 1990, Ser. No. 603,914
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 3910581; Apr. 1, 1989, 3910582; Apr. 1, 1989, 3910590
Int. Cl.⁵ B24B 55/02
U.S. Cl. 51—266 8 Claims



1. In device to provide and feed cold-gas into the working area of a processing tool having a liquefied-gas storage tank, a connection tube connecting said storage tank to said processing tool and insulated against cold, the improvement being in that said storage tank has a tank heating unit and an after-heating unit, a control mechanism being provided, to said heating units, and said control mechanism regulating the performance of said tank heating unit and of said after-heating unit as a function of the prespecified temperature and pressure values.

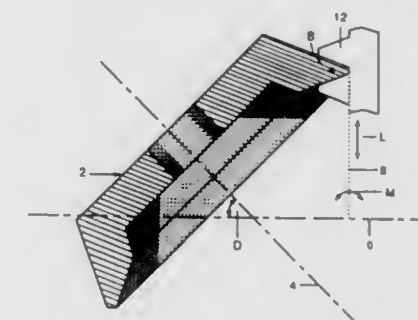
5,088,242
POLISHING DEVICE
Johannes Lubbering, Herzbrock; Peter Ihme, Dusseldorf; Jürgen Busse, Monchengladbach; Erwin Schmitz, and Wolfgang Volker, both of Tonisvorst, all of Fed. Rep. of Germany, assignors to Messer Griesheim, Fed. Rep. of Germany
Filed Mar. 26, 1990, Ser. No. 498,768
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 3910581; Apr. 1, 1989, 3910582; Apr. 1, 1989, 3910590
Int. Cl.⁵ B24B 55/02
U.S. Cl. 51—266 14 Claims



1. In a polishing device having a rotatable polishing disc

which is movably mounted relative to the surface being treated, the improvement being in that a lambskin hood is mounted over the exposed work surface of said polishing disc, a feed line communicating with the area of said lambskin hood, means for feeding a cold-gas flow through said feed line and directed into said lambskin hood area during operation of said polishing device, said work surface being entirely disposed toward the surface being treated, said cold-gas flow being directed to exit from said entire work surface to be directed at the surface being treated, and said cold gas being selected from the group consisting of cold air and nitrogen and carbon dioxide having a temperature below minus 20° C.

5,088,243
METHOD OF FORMING THE TEETH OF LONGITUDINALLY CURVED TOOTH GEARS
Theodore J. Krenzer, West Rush, N.Y., assignor to The Gleason Works, Rochester, N.Y.
Continuation-in-part of Ser. No. 563,587, Aug. 6, 1990, abandoned. This application May 9, 1991, Ser. No. 697,839
Int. Cl.⁵ B24B 49/00
U.S. Cl. 51—287 32 Claims



1. A method of forming the teeth of longitudinally curved tooth gears, said method comprising:

mounting a work gear on a work support,
mounting a dish-shaped tool on a tool support,
rotating said dish-shaped tool about a tool axis passing substantially through the center of said dish-shaped tool, and wherein said tool axis is inclined at an angle relative to the theoretical position of the axis of a cup-shaped cutter, said cup-shaped cutter axis being the theoretical axis of rotation of a cutting tool that would be required to form cut said teeth of said work gear,

oscillating said dish-shaped tool with respect to said work gear, said oscillating being relative to said cup-shaped cutter axis,

contacting said work gear with said rotating and oscillating dish-shaped tool, said dish-shaped tool having top-to-flank line contact with at least one side of a tooth of said work gear, said line of contact and said cup-shaped cutter axis forming an instantaneous radial plane,

variably positioning said dish-shaped tool with respect to said cup-shaped cutter axis by varying the relative angle of inclination between said tool axis and said cup-shaped cutter axis to effect a pivotal movement of said dish-shaped tool about a line extending along the height of a tooth of said work gear and in a direction substantially perpendicular to said instantaneous radial plane, said varying of said relative angle being in a timed relationship with said oscillating of said dish-shaped tool for defining a working path of said dish-shaped tool,

controlling said timed relationship to effect a relative change in pressure angle with respect to the relative angular displacement of said oscillating of said dish-shaped tool about said cup-shaped cutter axis.

5,088,244

MACHINING METHOD FOR MEMBER INCLUDED SCREW-SHAPED PORTION

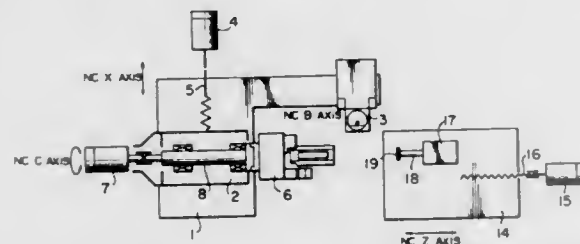
Takeo Shirakura, Aichi; Fumitoshi Terasaki, Kani, and Takashi Nishimoto, Inazawa, all of Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Continuation of Ser. No. 365,009, Jun. 9, 1989, abandoned. This application May 15, 1991, Ser. No. 702,106

Claims priority, application Japan, Jun. 13, 1988, 63-144987 Int. Cl.⁵ B24B 1/00

U.S. Cl. 51—288

3 Claims



1. A method of machining a member, said method using an apparatus having a first position for dressing a grindstone having a rotational axis, and having a second position for machining said member, said member including a screw-shaped portion, comprising the steps of:
 - moving said grindstone to said first position;
 - dressing said grindstone with a single point dresser operated by a NC controlling apparatus so that said grindstone has a projecting profile adapted to produce a predetermined thread-groove configuration intended for said screw-shaped portion of the member to be machined, said configuration being on a section normal to the axis of the screw-shaped portion;
 - moving said grindstone to said second position;
 - positioning the rotational axis of said grindstone in parallel with the axis of said screw-shaped portion to be machined; and
 - grinding the relevant surface of said screw-shaped portion by moving said grindstone relative to said screw-shaped portion while the rotational axis of said grindstone is maintained parallel with the axis of said screw-shaped portion of the member.

5,088,245

INTERCONNECTED HEXAGONAL BUILDING STRUCTURES

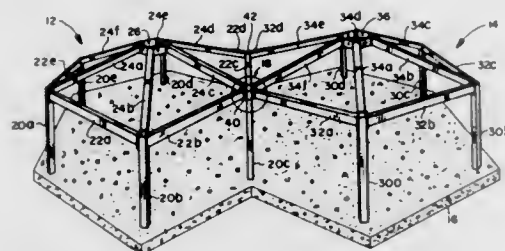
Mark Anderson, Holland, Mich., assignor to W. H. Porter, Inc., Holland, Mich.

Filed Aug. 7, 1990, Ser. No. 564,059

Int. Cl.⁵ E04B 7/00

U.S. Cl. 52—82

12 Claims



1. A building structure comprising:
 - a first hexagonal building structure including a first plurality of support columns, eave beams and roof trusses;
 - a second hexagonal building structure including a second plurality of support columns, eave beams and roof trusses;
 - first and second connecting means for coupling an eave beam and first and second support columns forming portions of said first and second hexagonal building structures

and connecting said first and second hexagonal building structures, wherein said first and second connecting means include respective connector tubes each having six lateral walls adapted for coupling to the ends of respective support columns, eave beams and roof trusses and wherein each of said connecting means further includes nut and bolt combinations for coupling the lateral walls of a connector tube to respective ends of said support columns, eave beams and roof trusses, each of said connector tubes including a lower cap coupled to an upper end of a support beam and cover means attached to an upper portion of said connector tube for enclosing said nut and bolt combinations within said connector tube.

5,088,246

ACCESS BOX FOR CONDUITS

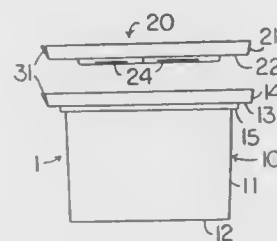
Noel S. Brown, 10 Hopson Rd., Jacksonville Beach, Fla. 32250

Filed Apr. 10, 1990, Ser. No. 507,598

Int. Cl.⁵ H02G 3/08

U.S. Cl. 52—127.8

10 Claims



1. An access box forming a void in a poured slab comprising:
 - (A) a main body having substantially vertical side walls extending upwardly from a bottom, said side walls defining an open upper perimeter on said main body;
 - (B) a substantially horizontal seating flange extending outwardly from said side walls at said upper perimeter;
 - (C) a flared seating rim extending upwardly and outwardly from said seating flange;
 - (D) a removable lid adapted to correspond to said main body, said lid having a lid bottom and a flared lid rim extending upwardly and outwardly from said lid bottom, whereby said lid acts to receive a portion of the poured slab, where said flared lid rim abuts said flared seating rim of said main body, and where a portion of said lid bottom abuts said horizontal seating flange of said main body, whereby said lid and said main body together form an enclosed, internal void;
 - (E) a pry lip said pry lip comprising a short segment of said seating rim extending more outwardly from said seating flange than the remainder of said seating rim and a corresponding short segment of said lid rim extending more outwardly from said lid bottom than the remainder of said lid rim; and
 - (F) a plateau extending upwardly from said lid bottom, said plateau having a relatively horizontal upper surface.

5,088,247

RETURNED STAIR TREAD HAVING MOISTURE COMPENSATED JOINT

Robert H. Young, Route #3, Box 177, Beaver Dam, Ky. 42320

Filed Jun. 11, 1990, Ser. No. 536,318

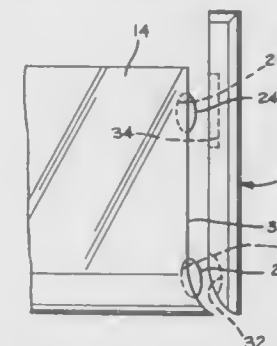
Int. Cl.⁵ E04F 11/00

U.S. Cl. 52—182

11 Claims

1. A returned tread for use on an open portion of a stairway comprising
 - a stair tread constructed of wood and having at least one side edge fashioned to fit flush against an opposing surface of a return nosing to form an exposed joint between said tread

and nosing along a forward end portion of said tread and nosing, a return nosing fitting flush against said side edge, said tread and nosing being slidably connected to one another by an expansion joint, said expansion joint being spaced rearwardly from said exposed joint, and



means for securing said nosing to said tread only in a region containing said exposed joint which is spaced forwardly from said expansion joint to prevent gapping or other deformation of said exposed joint as said tread expands and contracts in width.

5,088,248

STAIRTREAD WITH POSITIONING AND LOCKING MECHANISM

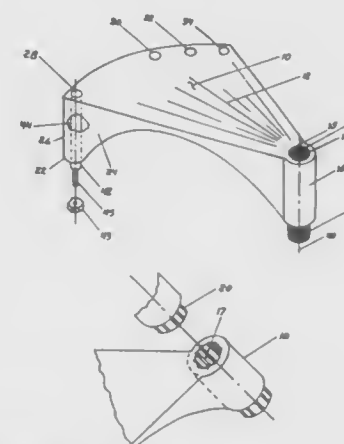
Joseph P. Manna, P.O. Box 408, 495 Town Farm Rd., Pascoag, R.I. 02859, assignor to Edwin H. Paul; James V. Leicht and Joseph P. Manna

Filed Mar. 6, 1991, Ser. No. 665,346

Int. Cl.⁵ E04F 11/00

U.S. Cl. 52—187

7 Claims



3. A spiral stair tread comprising:
 - a slab with a top and a bottom surface, said top surface arranged and constructed for stepping upon,
 - a cylindrical shaft, with upper and lower surfaces, attached to said slab and disposed at one end of said slab, said cylindrical shaft having a cylindrical shaft axis with the cylindrical shaft axis normal to said slab top surface, said normal direction defining a longitudinal direction,
 - one of said cylindrical upper and lower surfaces constructed and arranged with a longitudinally recessed chamber, said recessed chamber having an inner surface with grooves, said grooves running generally longitudinally and parallel with the axis of the cylinder, along the inner surface of the recessed chamber,
 - the other of said cylinder upper or lower surfaces constructed and arranged with an axial cylindrical extension, said extension matingly arranged to correspond with said recessed chamber, said extension having projections run-

ning generally longitudinally and parallel with the axis of the cylinder, along the outer surface of the extension, wherein said grooves on the recessed chamber inner surface and said projections on the cylindrical extension outer surface, are constructed and arranged to mate, and wherein said mating defines a plurality of angular positions with respect to said cylindrical shaft axis, and wherein said mating selects one of the plurality of angular positions and prevents rotational motion around said shaft axis.

5,088,249

ROOF COVERING OR WALL COVERING

Taieb Marzouki, Langwedel-Etelsen, Fed. Rep. of Germany, assignor to Roland-Werke Dachbaustoffe und Bauchemie GmbH & Co. KG, Fed. Rep. of Germany

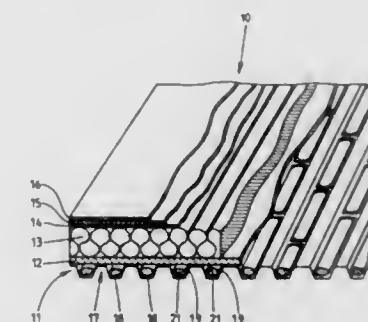
Filed Apr. 19, 1989, Ser. No. 340,880

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 8805266[U]

Int. Cl.⁵ E04B 1/94

U.S. Cl. 52—232

9 Claims



1. A roof covering or wall covering for a building comprising a supporting layer (11), having open channels, made of corrugated metal sheet (17), and encasing structures arranged in said channels (18), said encasing structures being formed as tubes or cushions sealed in a gas-tight manner and formed from a plastic laminate having at least two layers, and said encasing structures filled with a fire-retarding substance, said fire-retarding substance being a thickened liquid.

5,088,250

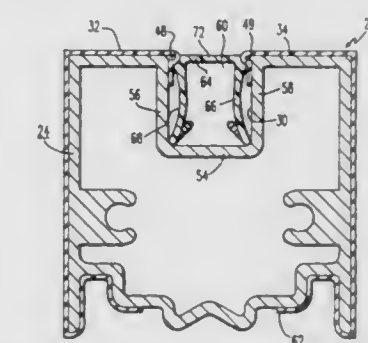
PANEL FOR AN OFFICE SPACE DIVIDING SYSTEM
Ronald B. DeLong, Belmont, and Allen L. Palmbo, Jenison, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 14, 1991, Ser. No. 640,742

Int. Cl.⁵ E04B 1/62, 1/343

U.S. Cl. 52—239

7 Claims



1. A substantially rectangular panel suitable for use in an office space dividing system, comprising:
 - a frame having a plurality of rails and stiles which cooperatively define a window,

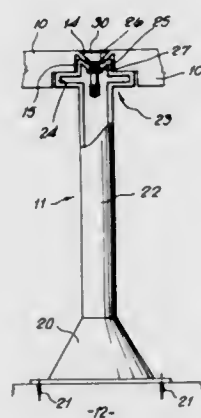
said rails and stiles each having an inner facing edge which borders said window, each of said inner facing edges including a longitudinally extending channel, with said channel having a substantially U-shaped cross-sectional configuration which includes a bight and first and second spaced leg portions which define an opening to the channel, said channels cooperatively providing a continuous annular channel about the frame window, a plurality of glazing strips, each of said glazing strips having a substantially U-shaped configuration including a bight and first and second spaced leg portions having extreme ends which define an opening to the glazing strip, each of said glazing strips being dimensioned and configured to provide first and second different functions in first and second selectable orientations thereof relative to an associated channel, with each glazing strip being insertable into a channel in a selected one of said first and second orientations, with the first orientation being an object holding position in which the bight of the glazing strip is adjacent to the bight of the associated leg portions of the glazing strip are adjacent to the opening of the associated channel, and with the second orientation being an object blocking shipping position wherein the glazing strip is inverted, compared with the first orientation, with the extreme ends of the first and second leg portions of a glazing strip being adjacent to the bight of the associated channel, and with the bight of the glazing strip being adjacent to the opening of the associated channel, such that the bight of the glazing strip extends across the opening to the associated channel to prevent foresight matter from entering until such time that the glazing strips are inverted to hold an object inserted into the frame window.

5,088,251 ACCESS FLOORING

Albert Hazeldine, Stanford Bridge, England, assignor to Tate Access Floors Limited, Shropshire, England
Filed Mar. 23, 1990, Ser. No. 497,987
Int. Cl.⁵ E04B 1/18

U.S. Cl. 52—263

3 Claims



- Access flooring, which comprises:
 - a plurality of support pedestals each including a floor substrate engaging base and an upper, floor panel receiving cup formation with a screw thread formed in said cup formation;
 - captive screw means engageable with said screw thread; and
 - a plurality of floor panels having corners for engaging said cup formation so that four adjacent corners of said panels form a concave cup for engaging said cup formation of one of the pedestals and are engaged and retained by said captive screw means.

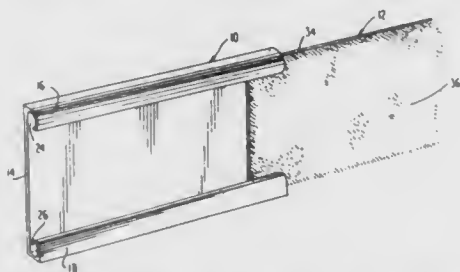
5,088,252 BASEBOARD CHANNEL MEMBER FOR PRE-CUT CARPET STRIPS

Mark D. Antekier, 0-290 Leonard NW., Grand Rapids, Mich. 49504

Filed Oct. 16, 1990, Ser. No. 598,271
Int. Cl.⁵ E04F 19/04

U.S. Cl. 52—288

6 Claims



- An elongated unitary resilient baseboard channel member comprising a flat rear wall having a generally L-shaped bottom wall projecting outwardly thereof from one longitudinal edge, and an integral, reversely directed arcuate upper wall projecting to the same side as the lower wall and defining therebetween and with said rear wall, upper and lower, oppositely facing slots for receiving upper and lower edges of an elongated decorative pre-cut carpet strip including a base and a woven pile on one surface thereof over the surface area of the base, having a width on the order of the distance between the extremities of said upper and lower slots and being of a thickness on the order of the maximum distance between the outwardly projecting upper and lower walls and said rear wall of said channel member at said upper and lower slots and having upper and lower edges slidably insertably mounted within said slots, and wherein said reversely directed arcuate upper wall terminates in a free edge having a generally right angle lip projecting laterally outwardly thereof in the direction of the channel member rear wall and engaging said pile surface to restrict movement of the decorative strip into and out of the slot formed by the upper wall and the rear wall of the channel member, and wherein a front wall portion of said L-shaped lower wall terminates in a generally right angle, laterally inwardly directed lip in the direction of the rear wall and engages the front surface of the carpet strip pile and limits movement of the decorative strip into and out of the slot defined by the lower wall and the rear wall of the channel member.

5,088,253 METHOD AND APPARATUS FOR HOUSING AND WASTE DISPOSAL

Gary W. Christ, 5309 Briarwood, Woodstock, Ill. 60098
Filed Oct. 22, 1990, Ser. No. 600,864

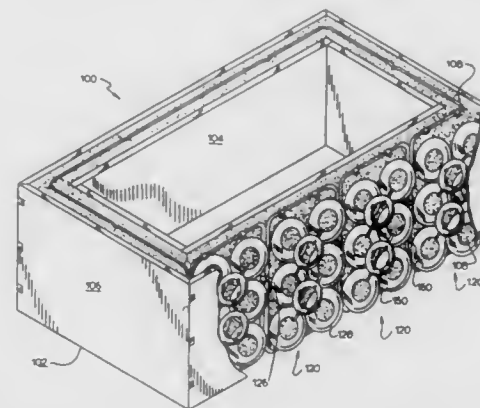
Int. Cl.⁵ E04C 1/40

U.S. Cl. 52—309.7

20 Claims

- A house using a tire frame assembly to form a wall of said house, wherein:
 - said tire frame assembly includes a support panel;
 - said support panel includes a frame mechanism, at least four tires mounted in said frame, and a tire sidewall secured to said four tires;
 - a frame securing means holds said tires to said frame;

- a sidewall securing means secures said side wall to said four tires; and



- a flexibility of said four tires and said sidewall provides for a secure attachment therebetween.

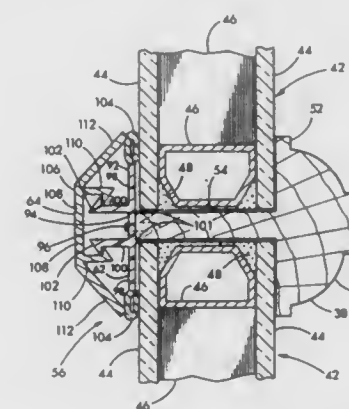
5,088,255 WINDOW AND DOOR GLAZING SYSTEM

Brian A. Emanuel, Merrill, Wis., assignor to Lincoln Wood Products, Inc., Merrill, Wis.

Filed Jan. 10, 1991, Ser. No. 640,276
Int. Cl.⁵ E06B 1/08, 1/18

U.S. Cl. 52—395

14 Claims



- An exterior glazing system for a wooden window or door having a sash with a light; comprising:
 - an extruded vinyl strip adapted to engage with the wooden window, the strip having a planar base and a barb projecting from the base; wherein the base has a flexible vinyl tube integrally attached thereto, the tube being adapted to overlie and press against the light;
 - an extruded metal cap having a projecting barb adapted to engage with the strip projecting barb in snap-fit relation, wherein the cap has a compression member extending towards the strip from the barb, wherein the compression member is adapted to press against the vinyl tube of the strip when the cap is engaged with the strip to compress the tube against the light and to form a seal between the strip and the light, wherein the cap is adapted to substantially cover the strip and shield the strip from exposure to sunlight.

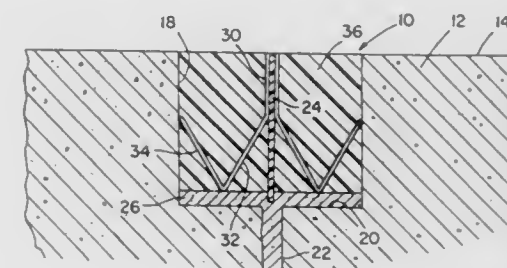
5,088,256 CONCRETE JOINT WITH SPRING CLIP RETAINED INSERT AND BOTTOM SEAL

Samuel A. Face, Jr., Norfolk, Va., assignor to Face Construction Technologies, Inc., Norfolk, Va.

Filed Aug. 6, 1990, Ser. No. 562,908
Int. Cl.⁵ E01C 11/02, 11/04

U.S. Cl. 52—396

12 Claims



- A joint in a concrete slab structure having an elongated recess formed in the upper surface thereof with the recess including a bottom surface spaced below the upper surface of the concrete slab structure and opposed side surfaces, an insert positioned in the recess and extending generally vertically in the recess with the insert including an upper edge generally aligned with the upper surface of the concrete slab structure and a lower edge spaced below the upper surface of the concrete slab structure, a filler in the form of a bonding material filling the space of the recess on both sides of the insert, the improvement comprising seal means completely covering the bottom surface of the recess with the bottom edge of the insert embedded into the seal means to prevent filler material from migrating under the insert, said seal means being a hardenable material with the bottom edge of the insert embedded into the seal means prior to the seal means becoming set thereby preventing the filler material from connecting the opposed side surfaces of the recess to enable relative movement of slab structure without fracturing.

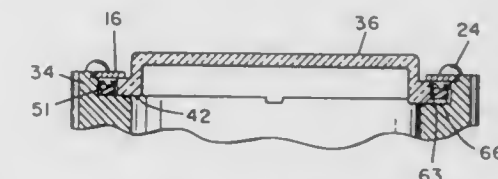
5,088,257 ACCESSORY WINDOW SEAL ASSEMBLY

Thomas H. Loga, and Ronald D. Biggerstaff, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 10, 1990, Ser. No. 580,115
Int. Cl.⁵ G01D 11/26

U.S. Cl. 52—397

23 Claims



- An improved window seal assembly comprising:
 - a housing having a ledge for supporting the edge of a window panel, the ledge having a supporting surface and a sealing surface which surround a central area to be enclosed by the housing and a window panel;
 - a window panel defined by a peripheral edge having a sealing surface, being adapted to be supported around the peripheral edge by said ledge with the sealing surface of the window spaced apart from the sealing surface of the ledge to form a seal groove when said window is supported by said ledge; and
 - a seal member adapted to seal said groove.

5,088,258

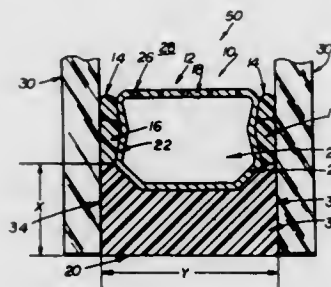
THERMAL BROKEN GLASS SPACER

Edward L. Schield, Medford, and Myron D. Reeves, Ladysmith, both of Wis., assignors to Weather Shield Mfg., Inc., Medford, Wis.

Filed Sep. 7, 1990, Ser. No. 588,978
Int. Cl.⁵ E04C 2/54; E06B 7/12

U.S. Cl. 52—398

15 Claims



1. An insulating spacer assembly for separating at least one pair of glass panes of an insulating glazing unit comprising: a hollow metal spacer for interposition between two glass panes; a thermal break element comprising a normally solid, dimensionally stable, flexible, thermoplastic resin extending longitudinally of said spacer and sealingly secured to at least a portion of the two sides of said spacer which face the glass panes; a primary sealant composition comprising a permanently elastic plastic sealing composition capable of cold flowing and adhesively secured to each of the two sides of the spacer which face the glass panes, said primary sealant being parallel to said thermal break and running lengthwise along the spacer wall, said primary sealant covering at least a portion of the two sides of the spacer which face the glass panes, said primary sealant being in sealing contact with a lower portion of said thermal break; and said thermal break element having sufficient dimensional stability to minimize cold flow of said primary sealant to reduce the tendency of said primary sealant to be squeezed from between said glass panes and said spacer during assembly or use of an insulating glazing unit.

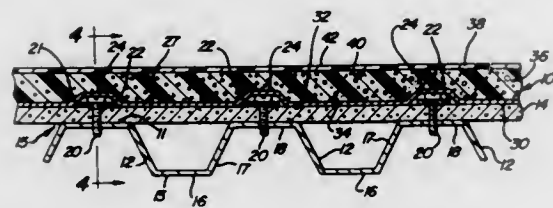
5,088,259

ROOF CONSTRUCTION SYSTEM

J. Milton Myers, 16561 Greenfield Rd., Southfield, Mich. 48235 Division of Ser. No. 120,935, Nov. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 22,104, Feb. 27, 1987, abandoned. This application Sep. 18, 1989, Ser. No. 409,266
Int. Cl.⁵ E04B 5/00

U.S. Cl. 52—410

14 Claims



1. A building roof structure comprising: a metallic roof deck; a fire retardant layer extending substantially continuously across said roof deck, comprising gypsum, perlite or a siliceous material; means mechanically fastening said fire retardant layer to said roof deck; a moisture impermeable vapor barrier membrane disposed atop and extending across said fire retardant layer, com-

posed of a rubberized adhesive material different from said fire retardant layer and a reinforcing mesh core about which said adhesive material is disposed; a thermal insulating member disposed atop and extending continuously across said membrane, comprising a urethane material foamed from a liquid applied atop said membrane; and a layer of waterproof material disposed atop and extending continuously across said thermal insulating member.

5,088,260

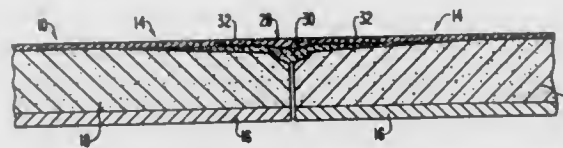
SYSTEM AND METHOD FOR JOINING STRUCTURAL PANELS

James J. Barton, 2020 Bruck St., Columbus, Ohio 43207, and Bonnie L. Skelly, P.O. Box 4340, East Providence, R.I. 02914
Filed Jul. 23, 1990, Ser. No. 556,151

Int. Cl.⁵ E04B 2/10

U.S. Cl. 52—416

6 Claims



1. A method for joining structural panels together comprising the steps of providing: a pair of structural panels having along at least one marginal edge thereof a bevelled portion with increases surface area relative to non-bevelled edges; positioning said bevelled surface areas in substantially confronting relationships so as to define a longitudinal seam; applying an adhesive compound in the seam to a depth sufficient to provide preselected shear and tensile strength needed for joints; spreading the adhesive compound so as to substantially fill the volume between the opposing bevelled surfaces of said panels; and applying a finishing compound over the adhesive compound wherein the finishing compound is comparable with both the adhesive compound and the structural panels.

5,088,261

CURVED GRID TEES FOR SUSPENSION CEILINGS

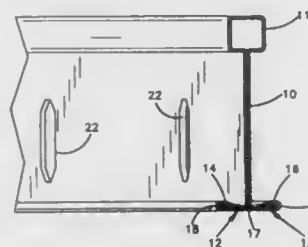
David F. Mieyal, Strongsville, and James A. Fletterick, Olmsted Falls, both of Ohio, assignors to USG Interiors, Inc., Chicago, Ill.

Filed Dec. 20, 1990, Ser. No. 631,337

Int. Cl.⁵ E04C 3/00

U.S. Cl. 52—729

20 Claims



1. A curved grid tee comprising an elongated metal strip providing a central web and planar flange portions extending along a plane in opposite directions from one edge of said web, said grid tee being initially straight and being bent and curved in a direction parallel to the plane of said flanges causing compressive stresses and reducing the initial length of the metal forming the inner of said flange portions and tensile stresses

and stretching the metal forming the outer of said flange portions, and connector means on said grid tee for connecting said grid tee with other grid tees to form a ceiling grid.

5,088,262

ANCHOR SYSTEM FOR INSTALLING AND HOLDING SHEET INSULATION FUNCTIONALLY IN PLACE AND METHOD OF USE

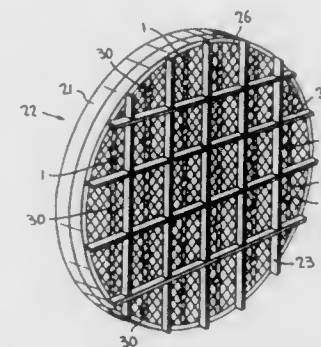
Thomas M. Miller, Walnut, Calif., and Raymond J. Schraff, Cleveland, Ohio, assignors to Industrial Insulations, Inc., City of Industry, Calif.

Filed Aug. 29, 1990, Ser. No. 574,218

Int. Cl.⁵ E04B 1/00

U.S. Cl. 52—745

12 Claims



1. Method of installing heat insulation sheet material to a support surface using an anchoring system comprising at least one C-track, and at least one anchor having a base, a side wall, a first prong and a second prong, wherein said base is slidably held in said C-track, said second prong is longer in length than said first prong and extends at approximately a 90° angle from the top of said side wall, and said first prong extends upward from the top of said side wall and is capable of being bent to extend in a direction opposite that of said second prong, said method comprising the following steps: (a) affixing at least one of said C-tracks to a support surface; (b) forming a plurality of folds from sheets of heat insulation material over said C-track with one fold being stacked on top of another fold until said folds equal a height greater than the length of said second prong; (c) placing at least one of said anchors in said C-track and sliding said anchor in said C-track toward said stacked folds in a manner so that when said anchor is slid in said C-track said second prong passes into and through said folds and said first prong pushes down on the top surface of said folds, causing said folds to compress; and (d) repeating steps (b)-(c) until said support surface is covered by said folds.

5,088,263

CONSTRUCTION APPARATUS AND CONSTRUCTION METHOD

Shuji Horii, Shinagawa, and Hiroshi Teraoku, Niiza, both of Japan, assignors to Ohbayashi Corporation, Osaka, Japan Division of Ser. No. 402,811, Sep. 5, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 668,854

Claims priority, application Japan, Sep. 5, 1988, 63-222048; Sep. 5, 1988, 63-222049; Jul. 27, 1989, 1-192680

Int. Cl.⁵ E04B 1/00

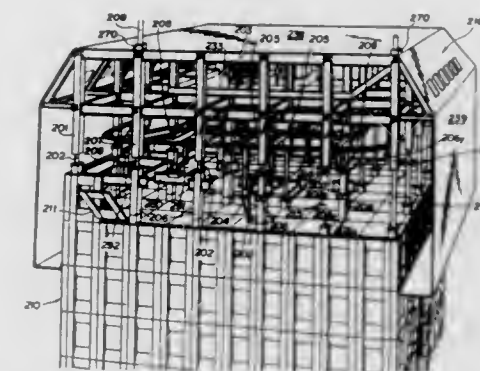
U.S. Cl. 52—745

2 Claims

1. A construction method of constructing a multistory building in ascending order of stories by sequentially repeating steps of:

simultaneously extending extension columns provided on a framework placed on a completed structure of the building to form a working space over the completed structure; sequentially contracting the extension columns one at a time to sequentially form spaces respectively for receiving permanent columns therein between the framework and

the completed structure and installing permanent columns in the spaces formed sequentially; installing beams between the adjacent permanent columns;



executing construction work in a structure formed by the permanent columns and the beams to complete the structure; and sequentially repeating the steps in that order to construct the next upper structure.

5,088,264

YARN THREADING APPARATUS

Klaus Bartkowiak, Herne, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

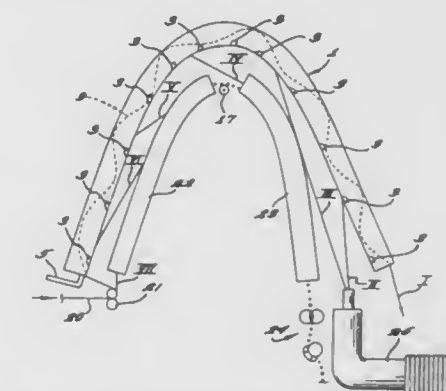
Filed Jul. 12, 1990, Ser. No. 551,896

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923081; Sep. 28, 1989, 3932306

Int. Cl.⁵ D01H 5/28, 15/00

U.S. Cl. 57—280

15 Claims



14. A yarn false twist crimping machine for processing synthetic yarn comprising: elongate yarn heating plate means, elongate yarn cooling plate means, yarn false twisting means, means for advancing a yarn serially along said heating plate means and said cooling plate means and through said false twisting means, and means for threading a yarn into an operative position extending along said heating plate means and said cooling plate means, comprising: an elongate tube positioned so as to extend along the entire length of said heating plate means and said cooling plate means and having a continuous slot extending through the wall of said tube and longitudinally along the entire length thereof, and air nozzle means for forming a helical airstream which extends longitudinally through the interior of said tube, whereby a yarn is adapted to be inserted into one end of said tube and entrained in the helical airstream so as to be advanced thereby through said tube and outwardly from the other end of said tube.

the opposite end thereof, and the yarn may thereafter be withdrawn from the tube through said slot and so as to be positioned along said heating plate and said cooling plate.

5,088,265

APPARATUS FOR PRODUCING SPUN YARN

Euro Suganuma, Nagaokakyo; Shinichi Nishimura, Ohtsu, and Akihiko Takeshita, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 264,450, Oct. 28, 1988, abandoned.

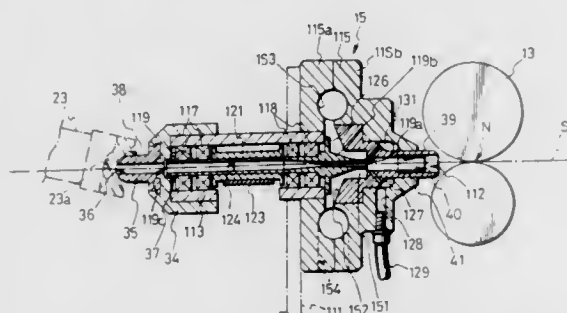
This application Oct. 19, 1990, Ser. No. 600,178

Claims priority, application Japan, Oct. 29, 1987, 62-274454

Int. Cl.³ D01H 1/115

U.S. Cl. 57—328

8 Claims



1. An apparatus for producing spun yarn from a sliver including a plurality of fibers defining a sliver core and a sliver periphery, the apparatus comprising:
 - a drafting device including a pair of front rollers rotatable at a first circumferential speed,
 - a delivery device including a pair of delivery rollers rotatable at a second circumferential speed, the second circumferential speed being not less than the first circumferential speed,
 - a spinning device disposed between the drafting device and the delivery device, the spinning device comprising:
 - a rotary pipe having an entrance and defining a sliver path for passing a sliver therethrough,
 - a rotary plate integral with the rotary pipe and spaced from the entrance of the rotary pipe,
 - a casing for covering the rotary pipe and the rotary plate,
 - a guide path for introducing and guiding a sliver to the entrance of the rotary pipe,
 - guide means for guiding the sliver along a substantially straight line, and
 - jet means for blowing air against the sliver, whereby at least a portion of the fibers adjacent the sliver periphery are fluffed out and caused to wind around at least a portion of the fibers adjacent the sliver core.

5,088,266

SLIVER FEEDING AND OPENING DEVICE OF AN OPEN-END SPINNING MACHINE

Heinz-Georg Wassenhoven, Monchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,581

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809717

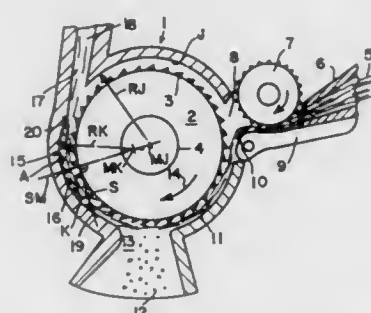
Int. Cl.³ D01H 4/36

U.S. Cl. 57—408

5 Claims

1. A sliver feeding and opening device for an open-end spinning machine, comprising:
 - a housing with an interior wall, the interior wall including a pair of continuous arcuate portions defining a cylindrical surface of the housing and the interior wall including a recess in the form of an arcuate segment of a cylinder having a radius less than the radius of the cylindrical circle

of the housing and extending concavely in the circumferential direction of the cylindrical surface of the housing; a toothed opening roller rotatably disposed in the housing co-axial with the cylindrical surface of the housing; an intake opening for intake of sliver into the housing; a guide plate associated with the intake opening; a discharge conduit for the discharge of sliver fibers from the housing, the continuous arcuate portions of the interior wall being disposed between the intake opening and the discharge opening in the direction of rotation of the toothed opening roller and extending axially inwardly from a respective circumferential edge of the interior wall, the continuous arcuate portions being spaced from one another relative to the axis of the toothed opening roller and defining therebetween an intermediate portion, the



- intermediate portion having a continuous surface co-extensive with the continuous arcuate portions of the interior wall; and
- means for aligning the sliver fibers in generally parallel alignment with one another, the aligning means being disposed on the intermediate portion between the intake opening and the discharge conduit and being integrally formed with the intermediate portion of the interior wall of the housing, the aligning means including a plurality of angled teeth arranged in rows, the angled teeth being formed in the recess of the interior wall of the housing, the teeth projecting inwardly with respect to the housing and terminating in apices, the apices defining an arcuate extent of the cylindrical surface concentric with the toothed opening roller.

5,088,267

APPARATUS AND METHODS FOR PLACING AN OBJECT INSIDE AN INFLATED BALLOON

Anthony L. Gee, 1207 N. 1650 West, Provo, Utah 84604

Filed Aug. 25, 1989, Ser. No. 398,781

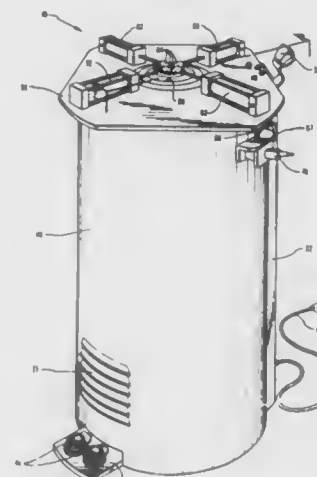
Int. Cl.³ B65B 31/00, 31/02, 43/36, 67/02

U.S. Cl. 53—86

9 Claims

1. An apparatus for use in placing an object inside an inflated balloon, the apparatus comprising:
 - a housing forming a first chamber, the housing having an orifice therein which communicates with the first chamber;
 - means for forming a substantially air-tight seal between the orifice in the housing and the neck of a balloon when the balloon is positioned within said first chamber with the neck of the balloon extending through the orifice in the housing, said means for forming a substantially air-tight seal comprising a flexible diaphragm positioned in said orifice in the housing so as to substantially occlude the orifice, the diaphragm having a hole therethrough which communicates with said first chamber; and

means for evacuating said first chamber, whereby the balloon is inflated and the object can be placed inside the



inflated balloon through the orifice in the housing and the neck of the balloon.

5,088,268

VACUUM PACKAGING APPARATUS

Werner Gunter, Horw, Switzerland, assignor to W. R. Grace & Co., Conn., Duncan, S.C.

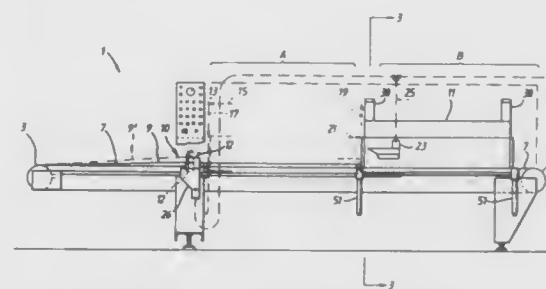
Filed Oct. 30, 1990, Ser. No. 605,814

Claims priority, application United Kingdom, Dec. 22, 1989, 8929118

Int. Cl.³ B65B 31/02, 59/02

U.S. Cl. 53—86

12 Claims



1. Vacuum packaging apparatus comprising:
 - (a) a vacuum chamber having a base member and a cover member movable relative to one another for opening and closing the vacuum chamber;
 - (b) at least one of the base and cover members comprising first and second parts which can be repositioned relative to one another to define a minimum chamber volume configuration and a maximum chamber volume configuration;
 - (c) a releasable seal between said parts for maintenance of sealing between said parts after readjustment and,
 - (d) means for releasing the seal prior to and during readjustment of the chamber volume and re-engagement of the seal between said parts after selection of a new chamber volume.

5,088,269

PROCESS AND APPARATUS FOR PRODUCING A SANITARY CARRIER FOR A PLURALITY OF CONTAINERS

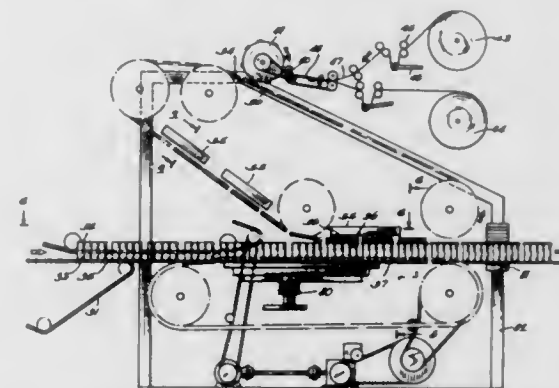
Brian L. Thelen, Food du Lac, Wis., assignor to Nigrell Systems, Inc., School Hill, Wis.

Filed Nov. 26, 1990, Ser. No. 617,685

Int. Cl.³ B65B 21/00, 53/00

U.S. Cl. 53—398

2 Claims



1. The method of forming a carrier-cover for a plurality of containers, each of said containers having a top, an upper lip or chine, and a sidewall, and said carrier cover comprising a single sheet of thermo-formable plastic material which is stiff at room temperature, said method including the steps of:
 - advancing an array of containers to a forming section which includes a heater, a plastic sheet supply, and a forming plate having openings therein,
 - said forming plate including a mask having at least one ring which shields a portion of said plastic sheet and said plate adjacent the chines from said heater,
 - positioning the forming plate between the plastic sheet and the heater,
 - bringing the plastic sheet into contact with the forming plate,
 - heating a portion of said plastic sheet by said heater so that only selected areas thereof, which are smaller than the tops of the containers and substantially smaller than the openings in the forming plate, are softened,
 - moving said mask closely adjacent the plastic sheet as said sheet comes close to the tops of the containers while the forming plate moves the unheated portion of the plastic sheet into contact with the containers beneath the chines, causing the tops of the containers to move against the softened portions of the plastic sheet while simultaneously causing the forming plate to move the unheated portions of the plastic sheet beyond the chines,
 - thereby stretching the heated portion of the plastic sheet across the tops of the containers and causing unheated portions of the plastic sheet adjacent the heated portions to snap beneath the chines to form an assembled array of containers and plastic sheet, and
 - moving the assembled array of containers and plastic sheet from the forming section.

5,088,270

FILM-TAIL HEAT SEALING SYSTEM

Werner K. Diehl, Coral Springs, Fla., assignor to Mima Incorporated, Pompano Beach, Fla.

Filed Dec. 31, 1990, Ser. No. 636,485

Int. Cl.³ B65B 11/02, 13/04

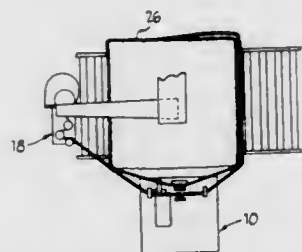
U.S. Cl. 53—399

20 Claims

1. A heat seal assembly for securing aligned first and second

wraps of stretch film with a sealing gap therebetween at a sealing position, said assembly comprising:

- a mounting platform;
- a first rope guide,
- a second rope guide, which first and second rope guides are mounted on said platform and pivotable between a disengaged position and an engaged position;
- first means for moving said first rope guide and second rope guide between said disengaged and engaged positions;
- a sealer anvil mounted on said platform and movable between an inactive position and an actuated position to retain said first wrap at the sealing position;
- second means for moving said anvil between said inactive and actuated positions;



a sealer pressure bar for compressing said aligned first and second film wraps to said anvil,

third means for moving said pressure bar between a withdrawn position and a film-engaging position; and

a film-heater bar for heating said stretch film,

fourth means for moving said film-heater bar into said gap between said first and second wraps from a disengaged reference position, said third means for moving operable to move said pressure bar to compress said first and second wraps against said heater bar to melt a portion of said first and second wraps and thereafter allow said heater bar to withdraw to said reference position and immediately compress said first and second film wraps at said melted portions against said anvil for sealing said film first and second wraps.

5,088,271

METHOD OF AND APPARATUS FOR PRESERVING FORAGE IN BAGS

Mark Westaway, Love Lane Farm, Marldon, Paignton, Devon TQ3 1SP, United Kingdom

Continuation of Ser. No. 350,706 filed as PCT/GB87/00758, Oct. 27, 1987, abandoned.

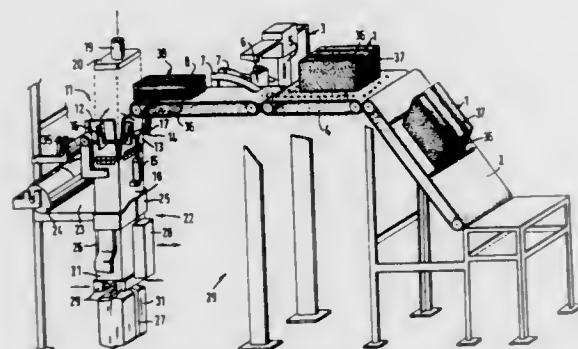
This application May 3, 1991, Ser. No. 700,078

Claims priority, application United Kingdom, Oct. 27, 1986, 862562

Int. Cl.⁵ B65B 63/02, 25/02

U.S. Cl. 53—515

4 Claims



1. An apparatus for bagging forage crop comprising:

- i) a means for conveying a compacted baled crop to a cutting station having:

- (a) a knife for cutting the baled crop along the longitudinal axis of the bale;
 - (b) a divider for separating the thus formed part-bales; and
 - (c) a pair of rails to rotate each part bale through a quarter-turn about the longitudinal axis of the base;
- ii) a vertical bale compactor and a bagger apparatus arranged side by side with a second vertical bale compactor and a bagger apparatus to further process each part-bale individually and simultaneously:
- (a) each vertical bale compactor having:
 - (1) an in-feed hopper with hinged side and face plates attached to a pivoted stirrup by cams which are acted upon by a hydraulic ram such that the movement of the in-feed hopper plates is controlled by the hydraulic ram, pivoted stirrups, and cams to open away from one another to form a tapering chute to receive a part-bale and to subsequently close the plates to compress and align a part-bale with the compaction chamber located directly below the in-feed hopper;
 - (2) each vertical bale compactor further having a long-stroke hydraulic ram which terminates in a plunger of complementary shape to the compaction chamber, wherein the plunger operates down through the in-feed hopper and acts to further compact the uppermost part-bale against part-bales already in the compaction chamber, and a discharge spout to deliver further compacted part-bales into plastic bags;
 - (3) each vertical bale compactor being arranged to permit the insertion of plastic separator sheets between part bales; and
 - (b) each bagger apparatus having a means for plastic sheeting to be drawn from a roll of plastic sheeting through a forming shoulder to form a plastic tube, the overlapping seam of which is sealed by a vertical sealing bar, further having a horizontal sealing bar for sealing and cutting the sealed plastic tube to form a plastic bag, a sensor to control the downward feed of the plastic bag, and directed pressurized air to inflate the formed plastic bag in order to receive the further compacted part-bale.

5,088,272

ATTACHABLE GUIDE RING FOR DOG HEAD COLLARS

Robert K. Anderson, Roseville, and Ruth E. Foster, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 365,932, Jun. 12, 1989, abandoned, which is a continuation of Ser. No. 169,294, Mar. 17, 1988, Pat. No. 4,838,206, which is a continuation of Ser. No. 922,156, Oct. 23, 1986, Pat. No. 4,741,288, which is a

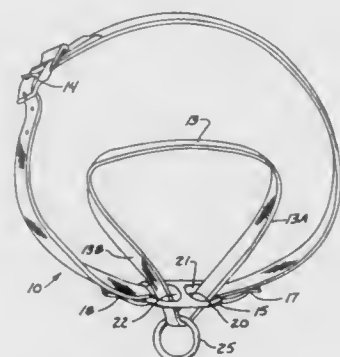
continuation-in-part of Ser. No. 719,697, Apr. 4, 1985, Pat. No. 4,621,591. This application Jan. 12, 1990, Ser. No. 464,184

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.⁵ B68B 1/02

U.S. Cl. 54—24

8 Claims



1. A humane training aid for dogs having a head with a

muzzle, a neck and ears, the training aid being for use in combination with a collar adapted to fit closely around the neck of a dog on which the humane training aid is placed and the collar fitting across an upper side of the neck immediately behind the ears of such dog and extending closely behind the head along laterally sides of the neck to a lower side of the neck, and a muzzle loop that fits over the muzzle of such dog, wherein the improvement comprises a slide-guide ring for slidably receiving the muzzle loop and for supporting the muzzle loop relative to the collar, said slide-guide ring having a portion which receives the collar and slides thereon, and a second portion which receives the muzzle loop and permits free sliding movement of the muzzle loop relative to the slide-guide ring and the collar, the muzzle loop having a portion extending out of the ring for attachment to a leash, the first and second portions of said slide-guide ring being supported on the collar so that when the muzzle loop is pulled, pressure is applied downwardly on the muzzle of a dog by the muzzle loop sliding through the slide ring and applying pressure to the collar so the collar substantially continuously bears on the upper side and the lateral sides of the neck of a dog wearing the humane training aid while pressure is applied by a leash on the muzzle loop.

5,088,273

LAWNMOWER HANDLE ASSEMBLY

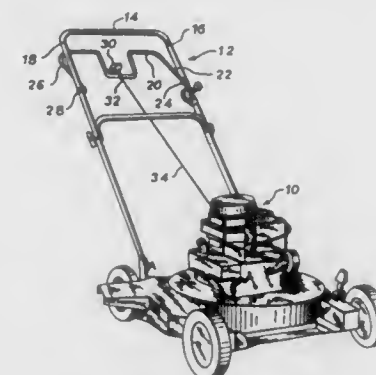
Daniel E. Braun, Robert K. Mitchell, and Casimir F. Laska, all of Brookfield, Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 21, 1990, Ser. No. 633,251

Int. Cl.⁵ A01D 34/82; F02N 3/02

U.S. Cl. 56—10.5

21 Claims



1. A handle assembly for a lawnmower chassis, the lawnmower having a starter rope and a rope handle attached to the starter rope, said rope handle adapted to being pulled by a lawnmower operator, said handle assembly comprising:

- a handle member attached to said lawnmower chassis, said handle member adapted to being held by a hand of said operator;
- a lever that engages said handle member and adapted to being held by said operator hand while said lawnmower is running; and
- retainer means interconnected with said lever for retaining said starter rope handle.

5,088,274

COTTON CONVEYING STRUCTURE FOR A COTTON HARVESTER

Lee F. Garter, West Springs, and Michael J. Covington, La-Grange, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 13, 1990, Ser. No. 626,827

Int. Cl.⁵ A01D 46/10

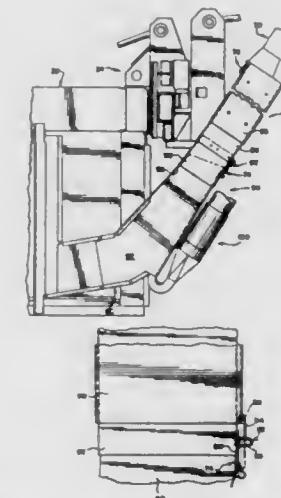
U.S. Cl. 56—30

11 Claims

1. Cotton conveying structure for a cotton harvester having a harvesting unit supported at a forward end of a frame and movable vertically and horizontally relative to said frame, said harvesting unit including a harvesting mechanism for remov-

ing cotton from plants as the harvester is driven across a field, said cotton conveying structure directing cotton from said harvesting unit toward a cotton receiving receptacle and comprising:

a discharge unit assembly comprised of lower duct structure, intermediate duct structure, and upper duct structure defining an elongated passage through which cotton is adapted to flow, said lower duct structure opening at a lower end to the harvesting mechanism of said harvesting unit for receiving cotton therefrom, said upper duct structure opening at an upper end to exhaust cotton into said cotton receptacle, with said intermediate duct structure



being connected to and joining said lower and upper duct structure, said intermediate duct structure including a pair of elongated tubes telescopically interconnected to each other and defining a portion of said elongated passage, said tubes being movable relative to each to maintain integrity of the duct assembly upon movement of the harvesting unit, upper and lower ends of respective tubes of the intermediate duct structure being connected to adjacent duct structure by hinge means allowing for flexible movement between adjacent duct structures of said duct assembly about two vertically spaced axes in response to movement of the harvesting unit relative to the frame.

5,088,275

IMPLEMENT FOR PROCESSING MOWN CROP

Maarten Koorn, Vlaardingen, and Sape Sikkema, Maasland, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Division of Ser. No. 236,747, Aug. 26, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 742,102

Claims priority, application Netherlands, Aug. 28, 1987, 8702019

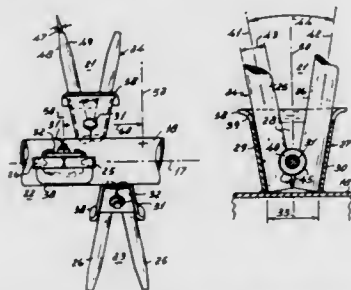
Int. Cl.⁵ A01D 89/00

U.S. Cl. 56—364

19 Claims

1. An implement for processing mown crop comprising:
 - a frame;
 - a processing member, said processing member being attached to said frame; and
 - a hood, said hood attached to said frame above said processing member wherein said processing member further comprises:
 - a carrier;
 - projecting, tine-shaped elements, said tine-shaped elements being connected to said carrier by means of connecting members, said connecting members mounted rigidly on said carrier comprising supports in the form of supporting walls located at least at the side of said

tine-shaped elements facing away from the side from which they are loaded during normal operation, a portion of said supporting walls enclosing, at least near the end remote from said carrier, an angle with said tine-shaped elements contained therein; and a locking mem-



ber arranged between said tine-shaped elements which is adapted to lock said tine-shaped elements against movement in their longitudinal direction relative to said carrier by pressing them tightly into a substantially rigid relationship against said supporting walls.

5,088,276

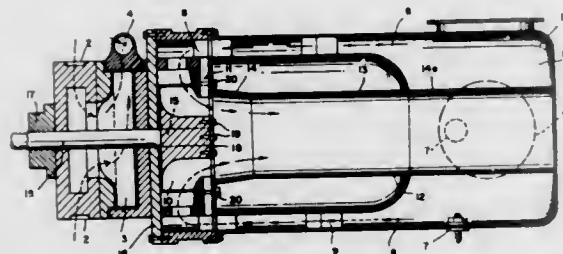
TURBO-COMPRESSOR ENGINE

Frank Rifkin, 111 Lincoln Park East, Cranford, N.J. 07016
Filed Nov. 13, 1989, Ser. No. 434,316

Int. Cl.⁵ F02C 3/14

U.S. Cl. 60—39.41

7 Claims



1. A turbo-compressor engine for a continuous supply of compressed gases, comprising a first compressor means adapted to compress a body of air and connected to a combustion chamber to pass compressed air thereinto; means to introduce and mix fuel into said compressed air; means to ignite said fuel-air mixture; housing means; an exhaust chamber located in said housing means and defining with said housing means guide means to guide combustion products from said combustion chamber; combustion products turbine means positioned downstream of said combustion means and in communication with said guide means; second compressor means downstream of said turbine means for compressing combustion products and connected to said exhaust chamber, said first and second compressor means and said turbine means being axially aligned on a common shaft, said shaft terminating before said exhaust chamber, and an end plate separating said exhaust chamber from said turbine means, said end plate secured to an end face of said shaft, said turbine means and second compressor means attached to said end plate, forming a rotatable subassembly, and said end plate including openings therethrough adapted to pass combustion products, compressed by second compressor means into said exhaust chamber.

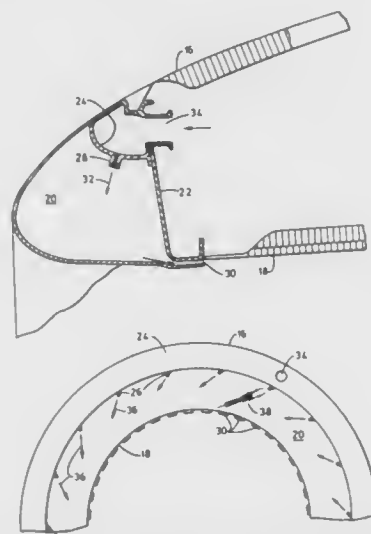
5,088,277
AIRCRAFT ENGINE INLET COWL ANTI-ICING SYSTEM
Wallace M. Schulze, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 3, 1988, Ser. No. 251,727

Int. Cl.⁵ F02C 7/047

U.S. Cl. 60—39.093

22 Claims



1. Apparatus for preventing and removing ice accumulation from the leading edge of a gas turbine engine inlet cowl, said engine having an center engine axis thereof and said cowl having an inboard wall and an outboard wall, said inboard wall defining an inlet duct for directing inlet air into said engine, the apparatus comprising:

- a) an annular chamber at the leading edge of said cowl, the forward inboard and forward outboard walls of said cowl forming walls of said chamber;
- b) a plurality of ejector nozzles spaced about said chamber, each of said nozzles oriented so as to direct a gas stream toward the forward inboard wall of said cowl and said nozzles are also angled toward a tangential direction so as to produce a swirling gas flow; and
- c) means for providing high pressure gases of an elevated temperature relative to the temperature of said inlet air, to each of said ejector nozzles.

5,088,278

FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Trevor S. Smith; John M. Binns, both of Sutton Coldfield; Graham F. Johnson, Solihull, all of Great Britain, and Paul M. Maker, Pequannock, N.J., assignors to Lucas Industries public limited company, Solihull, England

Filed Dec. 19, 1990, Ser. No. 631,097

Claims priority, application United Kingdom, Jan. 4, 1990, 9000176

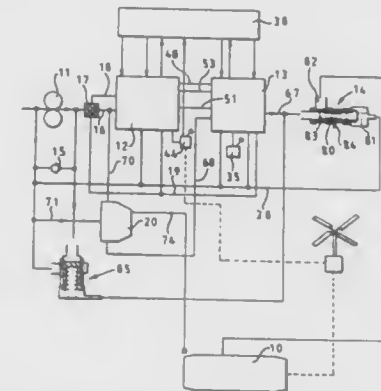
Int. Cl.⁵ F02C 9/28

8 Claims

U.S. Cl. 60—39.281

1. A fuel control system for a gas turbine engine, comprising a first metering device responsive to a first servo pressure in a chamber of said device, a first, electrically operable regulating valve for controlling said first servo pressure, a second, metering device responsive to a power demand for the engine, a selector device for selecting fuel flow regulation by said first or said second metering device, an interrupt valve operable in response to absence of an electrical control signal to said regulating valve, for creating a hydraulic lock in said chamber

thereby to arrest operation of said first device, and means operable when fuel control by said second metering device has



been established, for moving said first metering device to a fully open condition.

5,088,279

DUCT SUPPORT ASSEMBLY

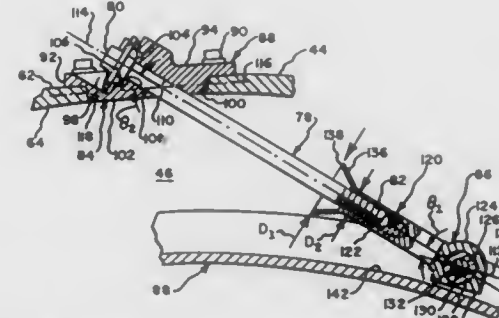
Andrew MacGee, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 30, 1990, Ser. No. 501,994

Int. Cl.⁵ F02K 3/02

U.S. Cl. 60—226.1

14 Claims



1. A duct support assembly comprising:

- a) a first ring having an outer surface;
- b) a second ring spaced radially inwardly from said first ring to define an annular duct there between;
- c) a plurality of circumferentially spaced links joining said first and second rings, each of said links comprising a bolt having a first end, and a second end wherein:
 - i) said bolts are aligned generally tangentially to said second ring,
 - ii) said first end comprises a bolt head, and said bolt is rotationally adjustable for preloading said bolt in tension from said first ring outer surface;
- d) first means for pivotally joining said link first ends to said first ring wherein said first joining means includes:
 - i) a partly spherical bearing surface on said bolt head facing toward said first ring outer surface,
 - ii) a bearing seat fixedly joined to said first ring and being complementary to said bearing surface, said seat including a central aperture receiving said bolt and allowing said bearing surface to slideably contact said seat, and
 - iii) a bracket fixedly secured to said first ring, wherein said bracket includes:
 - A) an outer surface defining said bearing seat,
 - B) an inclined bore extending through said bracket for receiving said bolt, and
 - C) a base having an outer surface including said bearing seat, an inner surface contacting said first ring outer surface, and a platform extending from said base

toward said second ring and disposed in a complementary slot in said first ring; and
e) second means for pivotally joining said link second ends to said second ring.

5,088,280

PREVENTION OF ICING IN THE INTAKES OF AEROSPACE PROPULSORS

John L. Scott-Scott, Warwick; Bryan L. Belcher, Leamington Spa, and Alan Bond, Oxford, all of England, assignors to Rolls-Royce plc, London, England

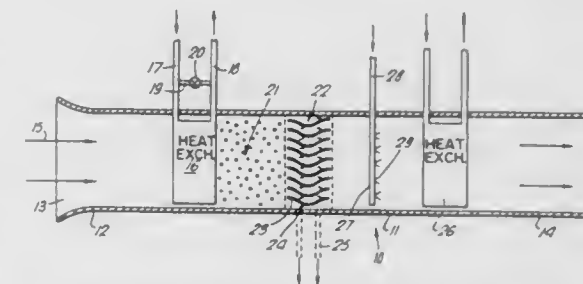
Filed Feb. 17, 1989, Ser. No. 314,701

Claims priority, application United Kingdom, Mar. 23, 1988, 8806886

Int. Cl.⁵ F02K 9/00

U.S. Cl. 60—257

11 Claims



1. An air intake suitable for an aerospace propulsor comprising a duct having an upstream end for receiving an air flow and a downstream end of delivering said air flow to said propulsor, said duct containing, in flow series relationship, a heat exchanger, and a cryogen injector, said heat exchanger being adapted to place said air flow through said duct in heat exchange relationship with a fluid, the temperature of which fluid is in operation arranged to be lower than that of said air flow upstream of said heat exchanger, said heat exchanger being so arranged that said heat exchanger fluid reduces the temperature of said air flow sufficiently to cause the majority of any water vapour in said air flow through said heat exchanger to condense into liquid droplet form, said cryogen injector being adapted to operationally direct a cryogen into said air flow to provide the conversion of water in said air flow into discreet dry ice particles.

5,088,281

METHOD AND APPARATUS FOR DETERMINING DETERIORATION OF THREE-WAY CATALYSTS IN DOUBLE AIR-FUEL RATIO SENSOR SYSTEM

Takahide Izutani, Susono; Nobuaki Kayanuma, Gotenba; Michio Furuhashi, Susono; Yukihiko Sonoda, Susono; Hiroyuki Sawamoto, Susono; Kouichi Hoshi, Susono; Konichi Osawa, Susono, and Hironori Bessho, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1989, Ser. No. 381,532

Claims priority, application Japan, Jul. 20, 1988, 63-179155; Jul. 21, 1988, 63-180336; Feb. 3, 1989, 1-23962

Int. Cl.⁵ F01N 3/20

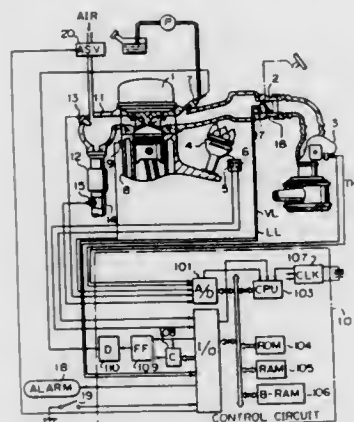
U.S. Cl. 60—274

54 Claims

1. A method of determining a state of deterioration of a three-way catalyst converter for removing pollutants in the exhaust gas of an internal combustion engine having an air-fuel ratio sensor disposed downstream of said three-way catalyst converter, for detecting a specific component in the exhaust gas, comprising the steps of:

- determining whether or not said engine is switched from a stoichiometric air-fuel ratio driving state to a rich air-fuel ratio driving state;
- determining whether or not the output of said downstream air-fuel ratio sensor is switched from a lean state to a rich state;

counting a time from a timing when said engine is switched from the stoichiometric air-fuel ratio driving state to the rich air-fuel ratio driving state to a timing when the output of said downstream air-fuel ratio sensor is switched from the lean state to the rich state; and



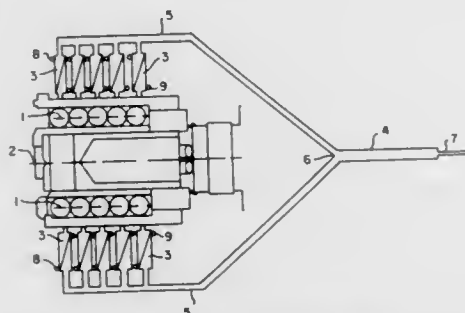
determining whether or not said time is shorter than a predetermined time,
thereby determining that said three-way catalyst converter is deteriorated when said time is shorter than said predetermined time.

5,088,282
PROCESS AND APPARATUS FOR THE REMOVAL OF
SOOT AND CONDENSABLE MATTER FROM DIESEL
EXHAUST GASES

Jan Kramb, Simmern, Fed. Rep. of Germany, assignor to Kramb Mothermik GmbH & Co. KG, Simmern, Fed. Rep. of Germany

many
Filed Nov. 28, 1990, Ser. No. 618,509
Claims priority, application Fed. Rep. of Germany, Dec. 8,
1989, 3940677

U.S. Cl. 60—274



1. In a process for cleansing hot exhaust gases from a diesel engine having plural cylinders by removing from said exhaust gases soot and condensable matter, wherein said hot exhaust gases are cooled and partially cleansed by being passed through a heat exchanger in heat exchange relation with a heat transfer medium, during which part of the soot and condensable matter in said exhaust gases precipitate therefrom as a precipitate onto said heat exchanger, thereby forming partially cleansed and cooled exhaust gases which then are passed through an electrostatic precipitation device and further cleansed thereby, whereby said precipitate eventually builds up on said heat exchanger, and for regenerating said heat exchanger to remove therefrom built-up precipitate by interrupting said heat transfer medium in said heat exchanger such that said hot exhaust gases passing therethrough heat said precipitate to cause incineration thereof, during which regeneration partial cleansing of exhaust gases is performed in another heat exchanger, whereby said heat exchangers are oper-

ated alternately for partial cleansing and regeneration, the improvement comprising:

improvement comprising:

providing a plurality of said heat exchangers, with each said heat exchanger being operable for partial cleansing and for regeneration independently of the operation of the other said heat exchangers;

passing said hot exhaust gases from each of said cylinders of said diesel engine individually through only a selected respective one of said heat exchangers;

operating only a single of said heat exchangers at a time for regeneration thereof, such that the remainder of said heat exchangers are operated for partially cleansing; and

combining said exhaust gases from all of said heat exchangers and then passing the thus combined exhaust gases through said electrostatic precipitation device and therein further cleansing said combined exhaust gases.

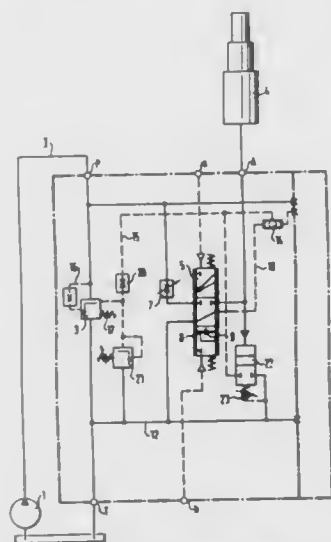
5,088,283
VALVE DEVICE FOR ACTUATING THE TELESCOPIC
CYLINDER OF A TIPPER

Dejan Bosniac, Lohr/Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

many
Filed Jan. 10, 1990, Ser. No. 462,792
Claims priority, application Fed. Rep. of Germany, Jan. 13,
1989. 3900887

U.S. Cl. 60—468

6 Claims



1. A valve device for operating a telescopic cylinder of a tipper truck from a system comprised of a pressure pump and a reservoir, said valve device comprising a directional control valve including a throttling area, a pressure line extending from said pump to said directional control valve, a cylinder line for said cylinder, said directional control valve being selectively operable between a lifting position for connecting said cylinder line to said pressure line and a lowering position for connecting a control conduit to said reservoir, a pressure compensating valve connecting said pressure line, between said pump and said directional control valve, to said reservoir for maintaining a constant pressure difference between said pressure line and said control conduit, a load holding valve downstream of the throttling area for precluding flow from said cylinder line to maintain a holding pressure in said cylinder, said control conduit being connected to a port between the throttling area and said load holding valve when said directional control valve is in the lifting position, and a pressure unloading valve responsive to the pressure in said cylinder line for connecting said control conduit to said reservoir when the pressure in said cylinder line exceeds a predetermined

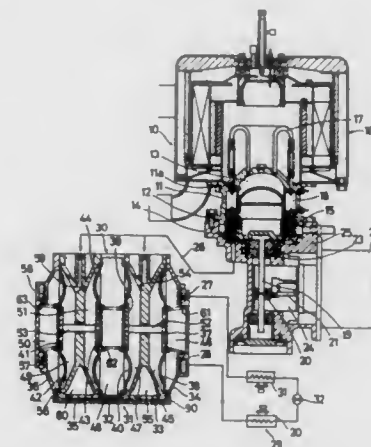
value for returning fluid pumped by said pump to said reservoir when said cylinder is maintained in position by said load holding valve.

5,088,284
COMPRESSOR INTEGRAL WITH STIRLING ENGINE
 Yutaka Momose, Anjo, Japan, assignor to Aisin Seiki Kabushiki
 Kaisha, Kariya, Japan

Filed Mar. 20, 1991, Ser. No. 672,635
Claims priority, application Japan, Mar. 21, 1990, 2-71692
Int. Cl.⁵ F02G 1/043

U.S. Cl. 60—517

2 Claims



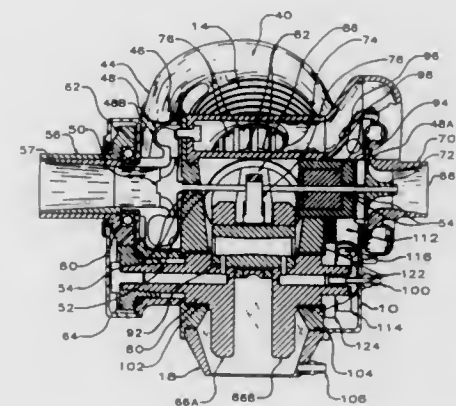
1. A compressor integral with a Stirling engine having a cylinder, comprising:

- a displacer piston slidably inserted in the cylinder;
- an expansion space formed on one side of the piston;
- a compression space formed on the other side of the piston, the compression space being in communication with the expansion space through heat transfer tubes, a regenerator, and a cooler, the heat transfer tubes being heated by heat source;
- a first resilient member whose outer fringe is hermetically held to a casing;
- a first pressure chamber which is formed on one side of the first resilient member and in communication with the compression chamber;
- a second pressure chamber which is formed on the other side of the first resilient member and in communication with a fluid circuit through an inlet-and-exhaust valve mechanism;
- a second resilient member whose outer fringe is hermetically held to the casing;
- a first buffer chamber formed between one side of the second resilient member and a partition wall formed in the casing, the first buffer chamber being partitioned from the first pressure chamber by the second resilient member, the first buffer chamber being in communication with the compression space via a first attenuation means;
- a second buffer chamber which is formed on the other side of the second resilient member and in communication with the second pressure chamber via a second attenuation means; and
- a connecting member extending through the partition wall so as to be hermetically slidable, the connecting member acting to connect together the first and second resilient members in such a way that these resilient members move together axially.

5,088,285
INTERNAL COMBUSTION ENGINE
Gregory S. Stevenson, Pasadena, Calif., assignor to Wagner &
Middlebrook, Glendale, Calif., a part interest
Filed Jun. 5, 1989, Ser. No. 361,450
Int. Cl.⁵ F02B 37/00

U.S. Cl. 60—605.1

18 Claims



1. An internal combustion engine for driving a shaft constituting the power output of the engine and defining an axis of the engine comprising:

a plurality of cylinders positioned at radial locations with respect to the axis of the engine defined by said power output shaft;

said output shaft being hollow including an axial opening communication with the exterior of said engine; and

an exhaust manifold communicating between said cylinders and said the axial opening of said output shaft whereby the engine exhaust is discharged through the axial opening said output shaft.

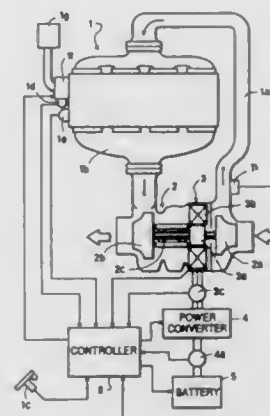
5,088,286
CONTROL SYSTEM FOR TURBOCHARGER WITH
ROTARY ELECTRIC MACHINE

Hiroshi Muraji, Yokohama, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Sep. 28, 1990, Ser. No. 589,544
Claims priority, application Japan, Sep. 29, 1989, 1-254499
Int. Cl.⁵ F02B 37/14

U.S. Cl. 60-608

9 Claims



1. A control system for controlling a turbocharger of an internal combustion engine in a motor vehicle, the turbocharger having a rotatable shaft on which a rotary electric machine is mounted and the turbocharger being energized with supplied electric power to rotate the turbocharger to

control the amount of supercharged intake air to be supplied to the engine, said control system comprising:

an accelerator pedal movement sensor for detecting an amount of depression of an accelerator pedal which controls an amount of fuel to be supplied to the engine, said accelerator pedal movement sensor producing an acceleration signal;

means for determining whether the amount of depression of the accelerator pedal is maximum based on the acceleration signal;

means for supplying electric power to the rotary electric machine if the amount of depression of the accelerator pedal is determined as being maximum;

a rotation sensor for detecting a rotational speed of the turbocharger and producing a rotation signal;

means for calculating a rate of change of the rotational speed of the turbocharger, based on the rotation signal from said rotation sensor;

means for calculating a power change amount by which the electric power to be supplied to the rotary electric machine is to be reduced or increased, depending on the rate of change of the rotational speed;

means for setting a speed control range for the turbocharger; and

means for controlling the electric power to be supplied to the rotary electric machine based on said power change amount when the rotational speed of the turbocharger is in said speed control range.

5,088,287

COMBUSTOR FOR A TURBINE

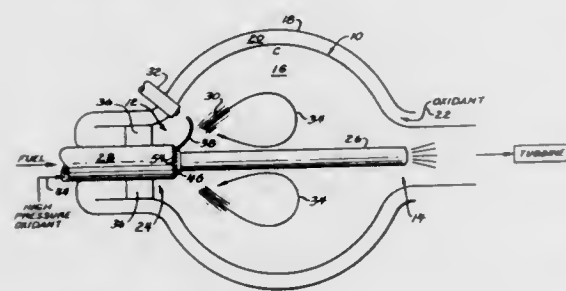
Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 13, 1989, Ser. No. 379,494

Int. Cl.⁵ F02C 1/00

U.S. Cl. 60—740

9 Claims



1. A small volume combustor for a gas turbine or the like comprising:

a generally spherical combustion chamber;

an inlet to said chamber;

an outlet from said chamber generally diametrically opposite from said inlet;

means for injecting fuel into said chamber including a first injector in said inlet including an annular oxidant port provided with swirl vanes and a fuel injecting head including a ring-like series of fuel injection orifices within said port and directed to inject fuel into said chamber in paths having both axial and radial components, and a second injector for injecting fuel into said chamber at or near said outlet;

an igniter in said chamber at said inlet end; and

a small tube connected to said fuel injecting means within said chamber for directing a small quantity of fuel at said igniter, said tube being mounted on said head in one of said orifices.

5,088,288

REFRIGERATOR

Yoshihiro Katagishi; Takeshi Miyazawa; Hiroyuki Kiyota, and Nobuo Fujii, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

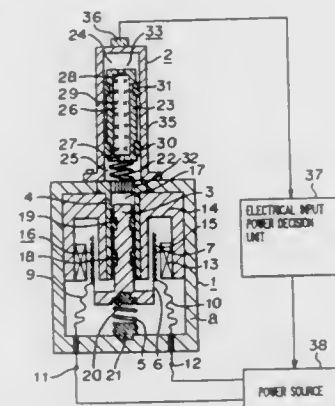
Filed Oct. 9, 1990, Ser. No. 594,631

Claims priority, application Japan, Jan. 17, 1990, 2-7520

Int. Cl.⁵ F25B 9/00

U.S. Cl. 62—6

10 Claims



1. A refrigerator comprising:

a compressor including a first cylinder having an inner cylindrical surface, a piston reciprocating in the first cylinder, and a linear motor for having a.c. electric input power applied thereto to drive the piston;

a cold finger including a second cylinder having an elongated inner cylindrical surface, a displacer reciprocating in the second cylinder, and a cold space and a hot space which are divided by the displacer;

a temperature detector for detecting the temperature in the cold space;

an electric input power decision unit for having a detection signal inputted from the temperature detector and for deciding the electric input power to be applied to the linear motor so that the electric input power grows greater and greater as the temperature in the cold space decreases; and

a power source for providing the electric input power to the linear motor based on the output from the electric input power decision unit.

5,088,289

REFRIGERATION SYSTEM

Hideo Mita, Okazaki; Akiyoshi Hirano, Toyota, and Yoshihira Shirohita, Toyooka, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 26, 1991, Ser. No. 674,956

Claims priority, application Japan, Mar. 31, 1990, 2-85874

Int. Cl.⁵ F25B 9/00

U.S. Cl. 62—6

4 Claims

1. A refrigeration system comprising:

a refrigerator including a compression portion having a cylinder and a piston moving slidably in the cylinder to define a compression portion;

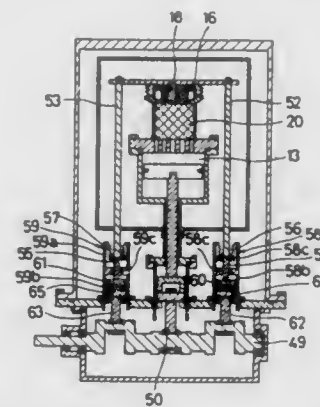
a first heat exchanger in thermal communication with the compression portion;

a regenerator in thermal communication with the first heat exchanger;

a second heat exchanger in thermal communication with the regenerator; and

an expansion portion in thermal communication with the second heat exchanger and having a bellows and a head formed integrally with the bellows; and driving means for driving the piston, the driving means

including a first rod driving the piston and a second rod driving the head,



wherein the cylinder comprises a large diameter portion within which the piston is slidably moved and a small diameter portion within which the first rod is slidably moved.

5,088,290

TRANSFER VESSEL APPARATUS AND METHOD OF STORING SAMPLES

Takao Yasue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

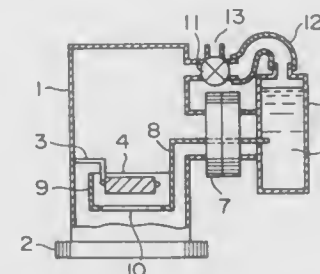
Filed Aug. 22, 1990, Ser. No. 570,809

Claims priority, application Japan, May 21, 1990, 2-129002

Int. Cl.⁵ F25B 9/00

U.S. Cl. 62—51.1

9 Claims



1. A transfer vessel apparatus comprising:

a hermetic vessel for housing a sample;

means for detachably connecting the hermetic vessel to a vacuum system;

a heat insulated vessel containing a cooling medium;

a sample cooling member disposed within the hermetic vessel and having a portion extending into the heat insulated vessel and establishing thermal communication between the sample cooling member and the cooling medium; and

means for introducing gas generated in the heat insulated vessel by evaporation of the cooling medium into the hermetic vessel.

5,088,291

APPARATUS FOR PASSIVE REFRIGERANT RETRIEVAL AND STORAGE

David C. Squires, Port Huron, Mich., assignor to Squires Enterprises, Port Huron, Mich.

Continuation-in-part of Ser. No. 593,689, Oct. 10, 1990. This application Jan. 18, 1991, Ser. No. 643,527

Int. Cl.⁵ F25B 45/00

U.S. Cl. 62—77

17 Claims

1. An apparatus for retrieval and storage of refrigerant from

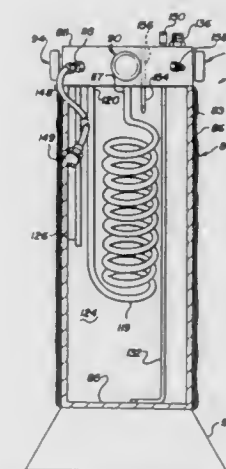
a cooling system having a low pressure side and a high pressure side, said apparatus comprising:

a housing formed in part by a manifold block, said housing defining an interior volume;

a collector vessel in heat exchange relationship with said housing;

first connecting means for connecting said collector vessel to the high pressure side of said cooling system to receive refrigerant from said cooling system, said first connecting means including a high side inlet passage through said manifold block;

second connecting means for connecting said collector ves-



sel to the interior of said housing, said second connecting means including a metering passage through said manifold block;

a metering device disposed in said manifold block and there by establishing means for regulating refrigerant flow through said metering passage into the interior of said housing where a portion of the refrigerant vaporizes and cools refrigerant in said collector vessel; and

third connecting means for connecting said housing interior to the low pressure side of said cooling system to return evaporated refrigerant from the housing interior to said cooling system, said third connecting means including a low side suction passage through said manifold block.

5,088,292

BEARING PUMP CONTROL FOR LUBRICATING HYDRODYNAMIC COMPRESSOR BEARINGS

John M. Champagne, Seattle, Wash., and Peter D. Waters, San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 10, 1990, Ser. No. 550,544

Int. Cl.⁵ F25B 31/02

U.S. Cl. 62—84

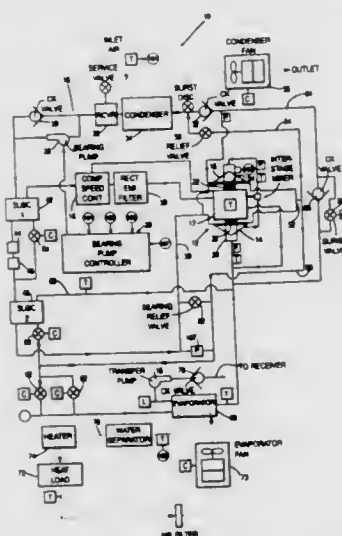
25 Claims

1. A refrigeration system having a compressor rotor rotatably supported by a plurality of hydrodynamic bearings lubricated by oilless pressurized liquid refrigerant and pressurizing refrigerant which flows to a condenser providing liquid refrigerant which flows to an evaporator in fluid communication with the condenser and the compressor comprising:

a refrigerant circuit, coupled to the compressor and to the condenser, for providing pressurized liquid refrigerant to the hydrodynamic bearings from the condenser continuously during operation of the compressor and pressurized liquid refrigerant flowing from the bearings to the condenser;

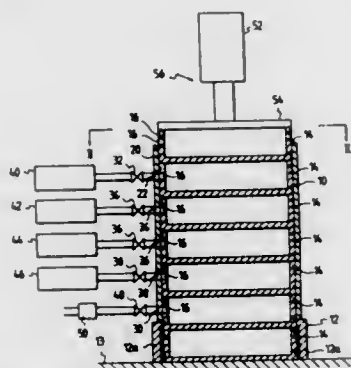
a bearing pump, coupled to the refrigerant circuit and to the condenser, for providing pressurized liquid refrigerant at a pressure higher than a pressure of the refrigerant provided by the compressor rotor when the bearing pump is operating to the refrigeration circuit;

at least one sensor, each sensor sensing an operational parameter of the refrigeration system and providing a signal representative of the sensed parameter; and a controller, responsive to at least one signal representative



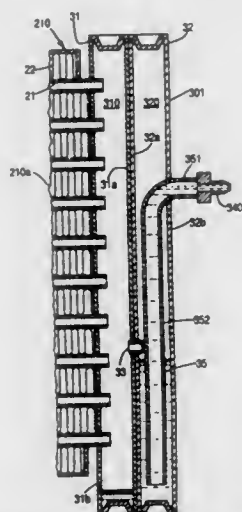
of a sensed parameter, for controlling the operation of the bearing pump as a function of the at least one signal to provide pressurized refrigerant to the refrigerant circuit at a pressure higher than a pressure of refrigerant provided by the compressor.

5,088,293
VACUUM COOLING METHOD AND APPARATUS
Shunji Ito, Hokkaido, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan
Filed Aug. 30, 1990, Ser. No. 574,859
Int. Cl. F25B 19/00; A23B 3/00
U.S. Cl. 62—100 8 Claims



1. A vacuum cooling method comprising the steps of: putting heated foodstuffs in a plurality of containers; inserting said containers into a hollow receptacle from one end thereof; increasing the degrees of vacuum in said containers by vacuum source units coupled thereto through a plurality of through-holes, formed in said receptacle in an axial direction thereof, and corresponding through-holes formed in said containers, thereby to cool said foodstuffs in said containers in stepwise fashion by providing a progressively higher degree of vacuum at each of said vacuum source units; and taking said containers out of said receptacle from the other end, one after another, as each said container is released from evacuation.

5,088,294
CONDENSER WITH A BUILT-IN RECEIVER
Nobuyasu Ando, Takasaki, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Feb. 2, 1990, Ser. No. 473,831
Claims priority, application Japan, Feb. 3, 1989, 1-11466[U]
Int. Cl. F25D 15/00
U.S. Cl. 62—119 36 Claims



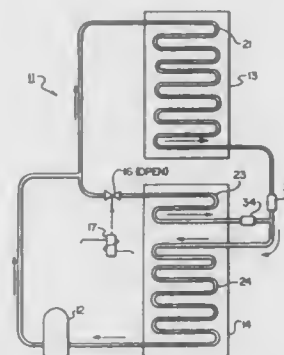
34. In a condenser for a refrigerant fluid circuit, said condenser comprising a plurality of tubes having opposite first and second open ends, a plurality of fin units disposed between said plurality of tubes, first and second header pipe assemblies fixedly disposed at said opposite ends respectively, said open ends of said tubes disposed in fluid communication with the interior of said header pipe assemblies, said first header pipe assembly having an inlet means for linking the condenser to an external element of the circuit, and said second header pipe assembly having an outlet means for linking the condenser to an external element of the circuit, a method for accumulating condensed refrigerant in the condenser, said method comprising the steps of:

partitioning the second header pipe into first and second cavities with a fluid conducting element linking the first and second cavities; causing refrigerant to flow through the tubes in a direction from the first header pipe assembly to the second header pipe assembly and condense into a mist, the mist forming in the first cavity, the mist including small particles of liquid refrigerant; and causing the mist to flow from the first cavity to the second cavity through the conducting element, the flow of the mist through the conducting element causing the small particles of liquid refrigerant to accumulate into larger drops, the larger drops collecting in the second cavity.

5,088,295
AIR CONDITIONER WITH DEHUMIDIFICATION MODE
Ian Shapiro-Baruch, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Jul. 30, 1990, Ser. No. 559,745
Int. Cl. F25B 41/00
U.S. Cl. 62—196.4 6 Claims

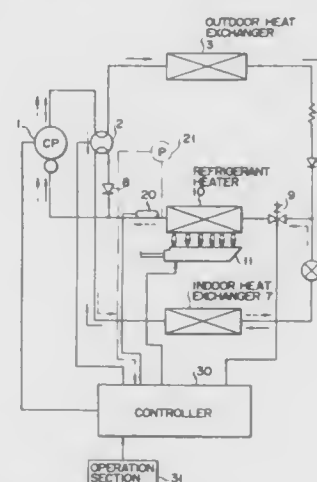
1. A vapor compression air conditioning apparatus having at least air cooling and air dehumidification operating modes comprising:
an inside heat exchanger section containing evaporator means in parallel air flow relationship with dehumidification air heater means;
a primary refrigerant flow loop from compressor means to

condenser means to cooling throttling means to said evaporator means to said compressor means;
a humidification mode refrigerant flow path, by which refrigerant can flow from said compressor means through said dehumidification air heater means and dehumidification throttling means, in parallel refrigerant flow relationship with the portion of said primary refrigerant flow loop that contains said condenser means and said cooling throttling means;



flow control means for allowing refrigerant flow through said dehumidification mode refrigerant flow path when said system is operating in the air dehumidification mode; and
means for mixing air passing in heat exchange relationship with said evaporator means with air passing in heat exchange relationship with said dehumidification air heater means.

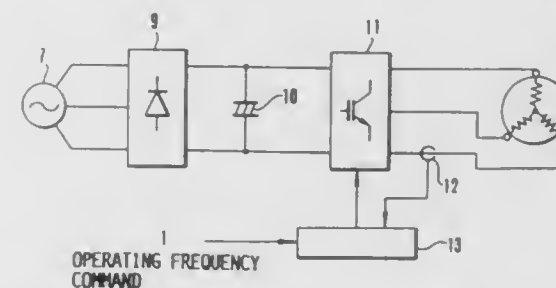
5,088,296
AIR CONDITIONER SYSTEM WITH REFRIGERANT CONDITION DETECTION FOR REFRIGERANT RECOVERING OPERATION
Makoto Hamaoka, Fujinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 28, 1989, Ser. No. 442,199
Claims priority, application Japan, Nov. 30, 1988, 63-300912
Int. Cl. F25B 29/00; 41/00; F24F 5/00
U.S. Cl. 62—174 7 Claims



1. An air conditioner, comprising:
a compressor;
an outdoor heat exchanger;
an expansion valve;
an indoor heat exchanger;
a refrigerant heater;
means for causing refrigerant to circulate through a first flow path during a cooling operation, the first flow path

sequentially including the compressor, outdoor heat exchanger, expansion valve, indoor heat exchanger, and compressor;
means for causing refrigerant to circulate through a second flow path during a heating operation, the second flow path sequentially including the compressor, indoor heat exchanger, expansion valve, refrigerant heater, and compressor;
means for causing refrigerant to circulate through a third flow path during a refrigerant mass recovery operation associated with the heating operation, whereby refrigerant stored in the outdoor heat exchanger is withdrawn therefrom and is drawn into the compressor;
refrigerant condition detecting means, for detecting a condition of the refrigerant in the second flow path and for providing a first output signal indicative thereof, the detecting means including means for directly sensing a temperature of the refrigerant; and
control means, for controlling the air conditioner in response to the first output signal by continuing the heating operation when the first output signal indicates an appropriate condition of the refrigerant, and by initiating the mass recovery operation when a predetermined number of determinations of an inappropriate condition of the refrigerant is reached, the control means including:
means for comparing the first output signal to a reference value during a predetermined short period, to determine the condition of the refrigerant;
means for temporarily stopping the operation of the compressor when the inappropriate condition has been determined;
means for counting the number of determinations of the inappropriate condition and generating a second output signal indicative thereof, and
means for executing the refrigerant mass recovery operation when the second output signal reaches the predetermined value.

5,088,297
AIR CONDITIONING APPARATUS
Hiroshi Maruyama, Takashi Kato, and Masaya Taniguchi, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 25, 1990, Ser. No. 587,740
Claims priority, application Japan, Sep. 27, 1989, 1-249145; May 24, 1990, 2-134314
Int. Cl. F25B 1/00; H02P 1/00
U.S. Cl. 62—228.4 2 Claims



1. An air conditioning apparatus, comprising:
a scroll compressor for compressing a refrigerant to effect a refrigerating cycle;
an induction motor for driving said scroll compressor; and
an inverter for feeding an AC voltage of variable operating frequency to said induction motor, said inverter including a voltage pulse-width modulating circuit for pulse-width modulating the AC voltage by a carrier frequency higher than 10 KHz, and control means for detecting the slip of said induction motor and correcting the detected slip to a predetermined optimum value.

5,088,298

APPARATUS FOR CONTROLLING COMPRESSOR OF
AUTOMOBILE AIR-CONDITIONERKazuo Fujii, Konan, Japan, assignor to Diesel Kiki Co., Ltd.,
Tokyo, Japan

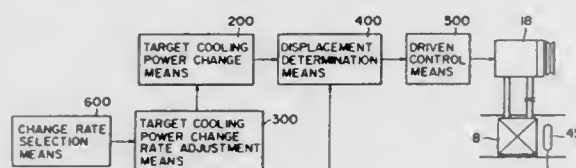
Filed Jun. 18, 1990, Ser. No. 539,744

Claims priority, application Japan, Jun. 22, 1989, 1-159919

Int. Cl.⁵ F25B 49/00

U.S. Cl. 62—228.5

2 Claims



1. An apparatus for controlling a compressor of an automobile air-conditioner, comprising:

- (a) a variable displacement compressor capable of varying its displacement according to an external control signal;
- (b) a mode sensor for detecting the cooling power of an evaporator of the automobile air-conditioner;
- (c) target cooling power change means for manually or automatically changing a target cooling power for the evaporator;
- (d) target cooling power change rate adjustment means for limiting the rate of change of the target cooling power to a predetermined rate after the target cooling power is changed by said target cooling power change means;
- (e) displacement determination means for determining the displacement of said variable displacement compressor in such a manner as to reduce the deviation of an actual cooling temperature of said evaporator from said target cooling power of said evaporator; and
- (f) drive control means for controlling the operation of said variable displacement compressor according to the output from said displacement determination means.

5,088,299

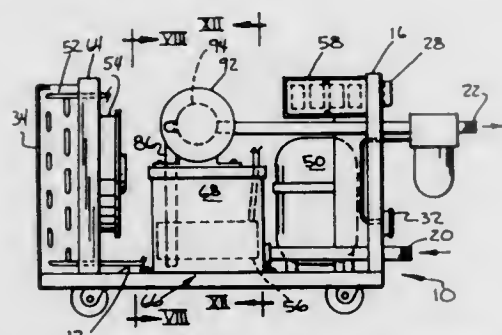
INDUSTRIAL LIQUID CIRCULATING AND COOLING
MACHINERoger A. Peterson, Braham, Minn., assignor to McLean Mid-
west Corporation, Brooklyn Park, Minn.

Filed Mar. 29, 1990, Ser. No. 501,099

Int. Cl.⁵ F25D 19/00

U.S. Cl. 62—298

10 Claims



1. An industrial liquid cooling machine comprising

- a) a chassis;
- b) an operative electro-mechanical refrigeration system mounted on said chassis and having a compressor, a condenser and an evaporator;
- c) a liquid heat exchanger mounted to said chassis, said evaporator being an operative part of said heat exchanger;
- d) first and second removable side panels;
- e) manually operable latches locking said side panels to said chassis;

- f) a removable cover panel over said chassis and said side panels;
- g) at least one manually operable latch locking said cover panel to one of said side panels;
- h) a base plate in said chassis, said base plate having downward extending edge flanges;
- i) U-shaped lower open hem flanges on said side panels, said hem flanges being extended under said edge flanges;
- j) means above said hem flanges for vertical support of said side panels upon said chassis; and in which,
- k) said side panel latches are all adjacent a top edge of said side panels.

5,088,300

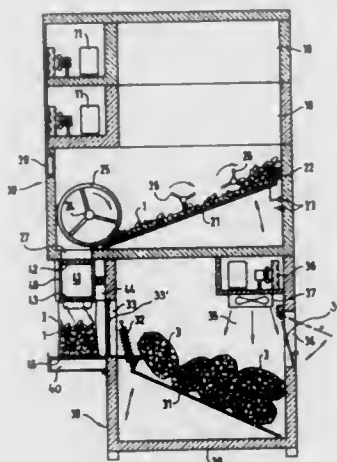
ARRANGEMENT FOR MAKING, PROPORTIONING,
DISCHARGING AND STORING SMALL CLEAR ICE
BODIESTheo Wessa, Siedlung 19, 6751 Mackenbach/Pfalz, Fed. Rep. of
Germany

Filed Dec. 5, 1990, Ser. No. 623,285

Claims priority, application European Pat. Off., Dec. 5, 1989,
89122443Int. Cl.⁵ F25C 5/18

U.S. Cl. 62—340

20 Claims



1. In an arrangement for making, proportioning, discharging and storing small clear ice bodies, the arrangement including at least one freezer unit for continuously producing small ice bodies from water, an insulated housing for an intermediate storage of the small ice bodies, the intermediate storage housing including a bottom with an outlet opening, the intermediate storage housing including means for revolving the small ice bodies and for conveying the small ice bodies to the outlet opening, a unit for proportioning and filling the small ice bodies into bags, and an insulated housing for storing the filled bags, the improvement comprising the at least one freezer unit being mounted above the intermediate storage housing and the intermediate storage housing being mounted above the bag storage housing, a bottom plate being mounted in the intermediate storage housing, the bottom plate being downwardly inclined toward the outlet opening, the unit for revolving and conveying the small ice bodies being a pipe screw, the proportioning and filling unit including a filling chamber having a top and a bottom, a closure each being provided at the top and the bottom of the filling chamber, the bag storage housing having at least one inlet opening positioned at the proportioning and filling unit and at least one removal opening for removing the filled bags, and a means for producing a veil of cold air and for lowering the storage temperature below the freezing point being positioned at least above the removal opening.

5,088,301

COOLING BOWL

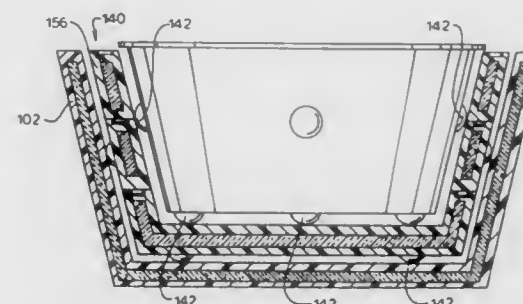
Joseph J. Piepenbrink, 714 Lincoln, McHenry, Ill. 60050

Filed Dec. 21, 1990, Ser. No. 631,970

Int. Cl.⁵ F25D 3/08

U.S. Cl. 62—457.6

12 Claims



1. A cooling device, said cooling device having an outer shell, a cooling member to fit said outer shell and a lid for said outer shell, wherein:

- a. said cooling member includes a base member and at least one ring member removably secured to said base member;
- b. said base member includes at least one side member and a bottom member;
- c. said bottom member is an integral part of said side member at a first edge of said side member;
- d. said ring member includes a ring fastening means to removably secure said ring member to a second edge of said side member;
- e. said first edge is oppositely disposed from said second edge of said side member;
- f. said base member includes a base hollow portion through-out;
- g. said ring member includes a ring hollow portion through-out; and
- h. said base hollow portion and said ring hollow portion contain a reusable refrigerant therein.

5,088,302

PORTABLE COOLER USING CHEMICAL REACTION
Takeshi Tomizawa, Ikoma, and Koji Arita, Osaka, both of Ja-
pan, assignors to Matsushita Electric Industrial Co., Ltd.,
Osaka, Japan

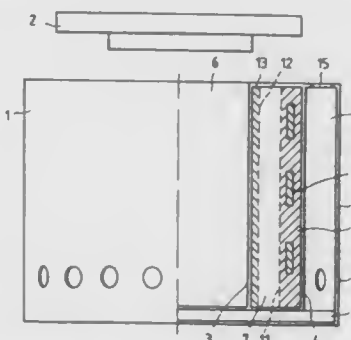
Filed Apr. 11, 1991, Ser. No. 683,728

Claims priority, application Japan, Apr. 12, 1990, 2-97113

Int. Cl.⁵ F25B 17/08

U.S. Cl. 62—480

13 Claims



1. A cooler comprising:

- (a) an inner wall defining a cooling chamber for receiving therein an article to be cooled;
- (b) an outer wall defining jointly with said inner wall a reaction chamber sealingly receiving therein an adsorbent and a working medium, said adsorbent being disposed on said outer wall;
- (c) a working medium retaining member disposed on said

inner wall within said reaction chamber for holding therein said working medium, said working medium retaining member being spaced from said adsorbent;

(d) a heater held in contact with said adsorbent; and

(e) a heat radiating portion constituting at least a part of said outer wall.

5,088,303

MIGRATION BLOCKING VALVE IN A REFRIGERATING
SYSTEMCaio Mario F. N. Da Costa, Joinville, Brazil, assignor to Em-
presa Brasileira De Compressores S.A. - Embraco, Joinville,
Brazil

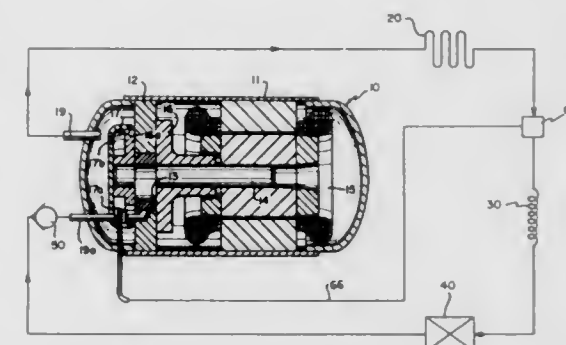
Filed Mar. 8, 1990, Ser. No. 491,467

Claims priority, application Brazil, Mar. 9, 1989, 8901186

Int. Cl.⁵ F25B 41/04

U.S. Cl. 62—498

9 Claims



1. A refrigerant fluid migration blocking valve for a refrigeration system having in operation a low pressure side and a high pressure side, said system including a compressor in a case, said compressor having a discharge outlet for a compressed refrigerant and in inlet for a refrigerant to be compressed, said valve comprising:

- a valve housing having a cylindrical chamber therein with first and second opposed ends and an inlet for said compressed refrigerant to enter said chamber, and an outlet from said chamber for said compressed refrigerant, said first chamber end being closed;
- a piston positioned within said chamber, said piston sealingly and slidably separating said chamber ends, said piston having a first passage therethrough, in a first position of said piston said piston blocking refrigerant flow from said inlet to said outlet, in a second position of said piston said first passage aligning with said inlet and said outlet to permit refrigerant flow through said valve housing, a second passage in said piston connecting said first passage to a portion of said chamber between said piston and said first chamber end;
- means for connection to the high pressure side of said refrigerant system for moving said piston from said first position to said second position when said system changes from an inoperative to an operative state, and from said second position to said first position when said system changes from an operative to an inoperative state.

5,088,304

HEAT TRANSFER SYSTEM WITH RECOVERY MEANS
Ralph C. Schlichtig, 11212 Third Ave. S., Seattle, Wash. 98168

Filed Oct. 15, 1990, Ser. No. 598,836

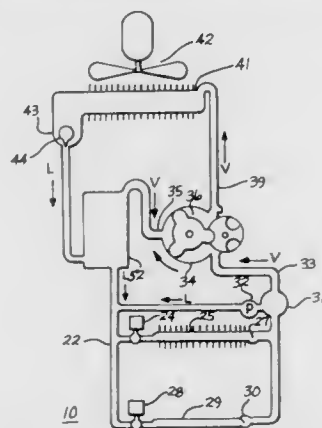
Int. Cl.⁵ F25B 1/10

U.S. Cl. 62—510

4 Claims

1. A heat transfer system comprising an evaporator for receiving heat, a compressor in fluid connection with the evaporator for compressing refrigerant vapor from the evaporator, a condenser connected to receive compressed vapor

refrigerant from the compressor for delivering heat, a liquid supply duct providing fluid connection between the evaporator and the condenser, and a system refrigerant flowing within the system, the improvement comprising in the compressor, a two-stage, rotary lobe compressor with a primary input port for receiving vaporized refrigerant and a secondary input port for receiving vaporized refrigerant at pressure greater than vapor received at the primary input port and three or more lobes in rotation, during which rotation lobes on each side of the secondary



input port define and bound a constant compressor volume, therein providing for input of recovered refrigerant vapor and establishing a compressor second stage, and further comprising a flash vapor receiver between the condenser and the liquid supply duct for pooling warm refrigerant from the condenser assembly and fitted to deliver liquid refrigerant from the receiver to the liquid supply duct and further fitted to delivery vapor refrigerant from the receiver to the secondary input port of the compressor.

5,088,305

SNAP-IN SELF HOLDING DISC TUMBLER CONSTRUCTION

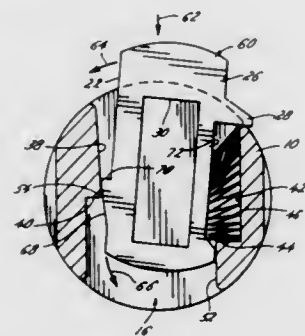
Gary L. Myers, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Mar. 18, 1991, Ser. No. 670,564

Int. Cl.⁵ E05B 29/04

U.S. Cl. 70—369

16 Claims



1. A plug for use in a combining tumbler lock, said plug comprising:

- a plurality of combining tumbler slots, each combining tumbler slot including means for bearing against combining tumbler biasing means in a first wall thereof and combining tumbler retaining means in a second wall thereof;
- each combining tumbler configured to include means for bearing against the combining tumbler biasing means in a first wall thereof and an upwardly and outwardly extending ramp from said second combining tumbler wall

which terminates in a detent projecting back into said combining tumbler wall for bearing against said combining tumbler retaining means; and said combining tumbler configured to be snap-fit into and retained in said combining tumbler slot without significant physical damage to the structure of said combining tumbler or said slot, said snap-fit configuration includes a recess in the first combining tumbler wall and said ramped detent in said second combining tumbler wall such that said recess and said ramped detent interact to allow said combining tumbler to rotationally pivot within said combining tumbler slot upon insertion into said combining tumbler slot.

5,088,306

CYLINDER LOCK WITH CHANGEABLE KEYWAY

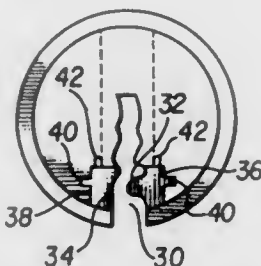
Peter H. Field, Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Filed Oct. 31, 1989, Ser. No. 429,634

Int. Cl.⁵ E05B 15/06

U.S. Cl. 70—375

13 Claims



1. A plug for a cylinder lock for providing desired selected keyway configurations independently of the cross-sectional shape of a longitudinal key access slot through the plug, comprising:

- (a) a cylinder plug body rotatable in a shell when tumblers clear a shear line;
- (b) a longitudinal keyway access slot in the cylinder plug body extending to a front face thereof, the cross-sectional area of the access slot, in its lower part, being larger than the desired cross-sectional area of a properly shaped key blade and, in its upper part, conforming to the cross-sectional shape of an upper part of the keyblade;
- (c) groove means in the plug body extending along at least one side of the lower part of the keyway access slot;
- (d) removable and replaceable elongated warding member means, slidable in the groove means, including two elongated warding members, one of each side of the keyway access slot, the elongated warding member means having a portion which extends into the cross-sectional area of the lower part of the access slot to limit and define said area to provide a desired keyway configuration for a portion of a configured side surface of a flat keyblade with edge bits so that by providing a selected configuration warding member means a desired selected keyway can be defined and provided, and wherein each warding member is connected to the other at a bottom of the keyway access slot.

5,088,307

METHOD OF MAKING MUNTIN BARS

Richard D. Cole, 40 Santa Barbara Dr., Plainview, N.Y. 11803

Filed Dec. 20, 1990, Ser. No. 630,517

Int. Cl.⁵ B21D 5/00

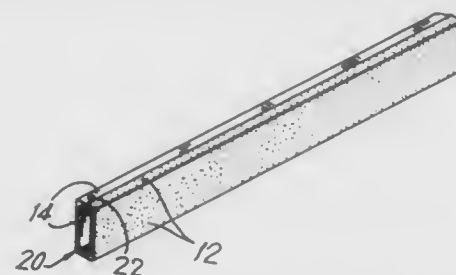
U.S. Cl. 72—46

5 Claims

1. A method of making a muntin bar for use in windows comprising the following steps:

- providing a sheet of formable material;

applying at least two different colors of material on substantially equal portions of the sheet of material; and



forming the material into a rectangular shaped muntin bar such that each color is disposed upon opposite sides of the bar.

5,088,308

METHOD OF MAKING SPACER BARS

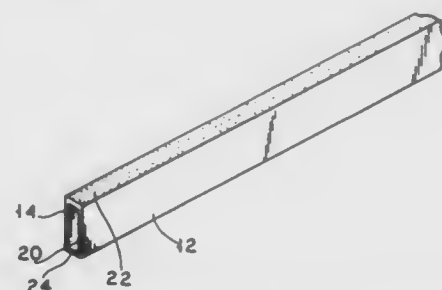
Richard D. Cole, Plainview, and Howard T. Anger, Nesconset, both of N.Y., assignors to Hygrade Metal Moulding Manufacturing Corp., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 630,517, Dec. 20, 1990. This application Mar. 25, 1991, Ser. No. 674,673

Int. Cl.⁵ B21D 5/00

U.S. Cl. 72—46

4 Claims



1. A method of making a spacer bar for use in insulating glass units fabricated from glass in association with spacer bars comprising the following steps:

- providing a sheet of formable material;
- applying on a selected portion of one side of the sheet a colored material along a length of the sheet of material; and
- forming the material into a spacer bar such that the colored material is exposed substantially only upon a side of the spacer bar disposed between the glass making up the insulating glass units.

5,088,309

ROTARY PUNCH

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Division of Ser. No. 512,378, Apr. 23, 1990, Pat. No. 5,038,592.

This application Feb. 25, 1991, Ser. No. 660,397

Int. Cl.⁵ B21D 5/14; B26D 7/18

U.S. Cl. 72—129

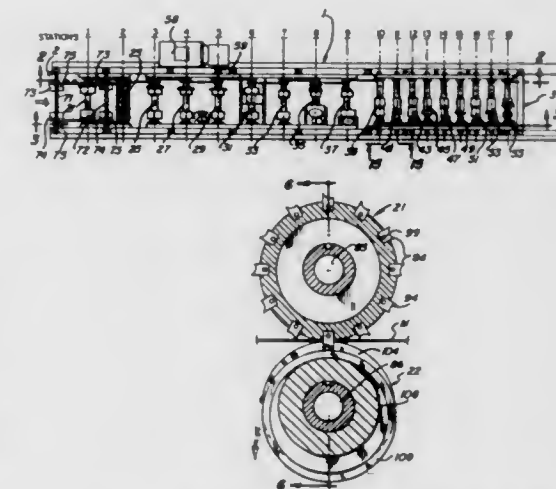
4 Claims

1. In apparatus for making different siding using a series of spaced stations each having cooperating pairs of opposed upper and lower rollers arranged at spaced intervals and supported for rotary movement to form a selected shape in the sheet material and including a rotary punch at a selected of said stations, said rotary punch comprising:

- a first roller portion having a plurality of circumferentially spaced and radially projecting punch members, each punch member having a pair of spaced punch teeth that substantially simultaneously engage the material as said first roller portion is rotated and punch through the sheet material to form a punched out slug, said spaced punch teeth of each punch member being circumferentially

spaced on said first roller portion so as to form two longitudinally spaced shearing points in said sheet material during initial engagement with said sheet material as said sheet material is fed therethrough

a second roller portion opposite said first roller portion with a circumferential slot that receives a punch member during punching, said circumferential slot being defined by a pair of annular side walls connected by a bottom wall, the bottom wall defining an internal diameter on said second



roll portion, a substantially continuous floating ring surrounding the bottom wall of said circumferential slot and slidably supported in said slot, the internal diameter of said slot being less than the internal diameter of said floating ring so said ring will move up and down in said slot as said first and second roller portions rotate and push said slug away, said first and second roller portions being rotated for forming a series of spaced holes along an edge of the sheet material to form a one piece nail strip siding.

5,088,310

ADDITIONAL BENDER OF METAL WIRE WORKING MACHINES FOR CREATION OF THREE DIMENSIONAL SHAPES (FORMS)

Maria Anagnostopoulou, Velissariou 1, Cholongos, Greece

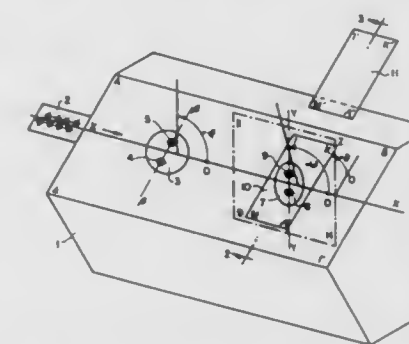
Filed Apr. 9, 1990, Ser. No. 505,682

Claims priority, application Greece, Apr. 11, 1989, 890100232

Int. Cl.⁵ B21D 7/024

U.S. Cl. 72—306

7 Claims



1. A metal wire working machine for forming three dimensional shapes in metal wire comprising:

- a housing;
- means for feeding a length of metal wire to said housing;
- means for bending wire fed to said housing in a first plane;
- a bender body pivotally mounted to said housing, downstream from said means for bending wire;

means for pivoting said bender body about said pivotal mounting through an angle θ in a second plane, said second plane being substantially perpendicular to said first plane;

a bender element rotatably mounted to said bender body at a point spaced from said pivotal mounting of said bender body to said housing; and

means for rotating said bender element about a longitudinal axis thereof through an angle ω in a third plane disposed substantially perpendicular to said second plane, said third plane being angularly offset from said first plane;

said bender body being pivotal through said angle θ to dispose said bender element in a position adjacent to a length of wire fed to said housing, said bender element including means for engaging the length of wire fed to said housing so that rotation of said bender element about said longitudinal axis, after said bender body has been pivoted through said angle θ , bends said metal wire in said third plane by said angle ω .

5,088,311

METHOD OF MAKING A TUBULAR MEMBER

Kiyoshi Inoue, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 541,673, Jun. 21, 1990, abandoned.

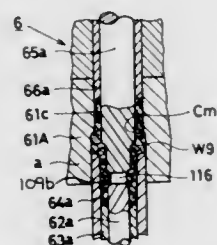
This application Aug. 15, 1991, Ser. No. 746,177

Claims priority, application Japan, Jun. 21, 1989, 1-158823; Jun. 21, 1989, 1-158824; Apr. 24, 1990, 2-108227; Apr. 26, 1990, 2-112927

Int. Cl.⁵ B21K 21/08

U.S. Cl. 72—333

6 Claims



1. A method of making a tubular member comprising the steps of:

centering a vertical columnar solid blank, and making a recess at both upper and lower end surface of the blank by extrusion;

extruding the blank in a first die to enlarge the recess on the upper end surface of the blank so as to make an upper tubular portion, and simultaneously extruding said blank to enlarge the recess on the lower end surface to make a first tubular end circular in section, an outer diameter of which is smaller than that of the upper tubular portion;

further extruding the upper tubular portion of the blank to make a stepped portion at an inner wall of the upper tubular portion;

transferring the blank from the first die to a second die without inverting the blank and punching the blank in the second die so as to form an axial bore which communicates the first tubular end with the upper tubular portion, the punching process allowing a fringe portion to remain at an inner wall of the first tubular portion; and

transferring the blank from the second die to a third die without inverting the blank, and forcing a mandrel into the upper tubular portion of the blank in the third die to reduce the blank so as to form a second tubular end hexagonal in section, and simultaneously forcing a punch into the first tubular portion to press the fringe portion by each end of the punch and the mandrel so as to provide a tapered seat, the second tubular end is diametrically smaller than that of a middle portion of the blank, but greater than that of the first tubular end.

5,088,312
UPSETTING DEVICE FOR UPSETTING THE ENDS OF ELONGATED WORKPIECES SUCH AS WIRE PIECES
Gerhard Lange, Reutlingen/Württ., Fed. Rep. of Germany, assignor to WAFIOS Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

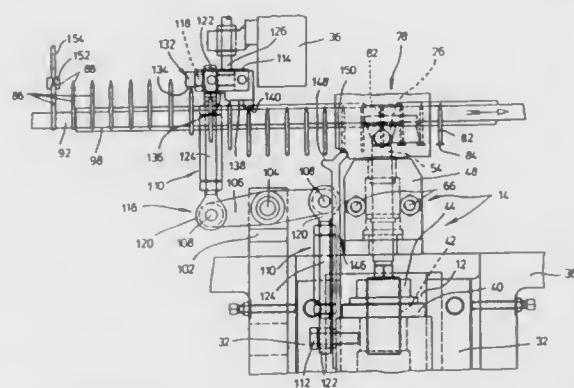
Filed Jun. 8, 1990, Ser. No. 535,059

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 3922531

Int. Cl.⁵ B21J 13/10; B21G 3/20

U.S. Cl. 72—420

2 Claims



1. An upsetting device for upsetting the ends of elongated workpieces such as wire pieces, in particular for the production of heads on nails, comprising:

an upsetting tool movable forward by means of an upsetting carriage provided with a carriage guide and having a part acting directly on said upsetting tool, said part adapted to be movable backwards;

said upsetting tool being mounted and displaceable separately from said upsetting carriage in a longitudinal guide separate from said carriage guide;

said upsetting tool being displaceable in its direction of movement; wherein

said upsetting tool bears continuously and positively against said part of said upsetting carriage acting upon said upsetting tool; and

a positioning device comprised of first and second positioning tools for arranging the workpieces in opposite directions along their axes, said positioning device coupled to said upsetting tool.

5,088,313

MONITORING PRESSURE INTERFERENCE IN GAS ANALYZERS

Walter Fabinski, Krieffel; Georg Taubitz, Oberursel; Gerhard Franck, and Josef Nevoles, both of Frankfurt, all of Fed. Rep. of Germany, assignors to Hartmann & Braun, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 29, 1989, Ser. No. 443,259

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1988, 3840322

Int. Cl.⁵ G01D 18/00

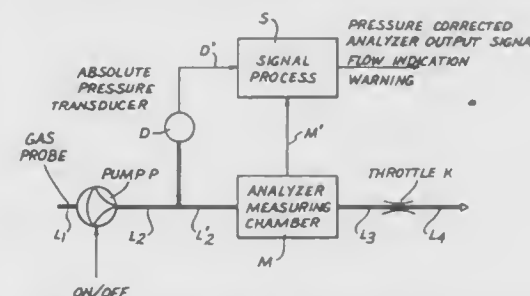
U.S. Cl. 73—1 G

4 Claims

1. Arrangement for monitoring and correcting a gas analyzer having a measuring chamber with an inlet and an outlet, there being pumping means for supplying a pressurized measuring gas, said gas analyzer producing a measuring signal, comprising:

a flow throttle for providing flow resistance and being connected to the outlet to obtain an absolute gas pressure in the chamber above a level downstream from the throttle; pressure transducer means connected to the analyzer for measuring absolute gas pressure of the measuring gas upstream from the throttle but downstream from the pump; and

means for using an output signal from the transducer for correcting errors of the measuring signal of the gas analyzer.



zer on account of any variations in the gas pressure in the measuring chamber, and for using the same output signal to extract a rate of flow indication as to the measuring gas.

5,088,314

GAS DETECTING METHOD AND SYSTEM

Yamaguchi Takashi, Osaka, Japan, assignor to Figaro Engineering, Inc., Osaka, Japan

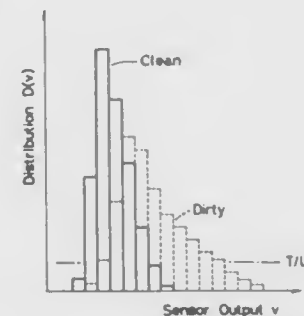
Filed May 19, 1989, Ser. No. 354,206

Claims priority, application Japan, May 19, 1988, 63-122734

Int. Cl.⁵ G01N 27/04, 27/62

U.S. Cl. 73—23.21

4 Claims



1. A method of detecting a gas comprising: preparing a histogram of prior gas sensor detection outputs; determining a detection threshold value using said histogram; and comparing a gas sensor detection output of said gas with said gas detection threshold value to determine the presence of said gas.

5,088,315

GAS PURITY ANALYZER AND METHOD

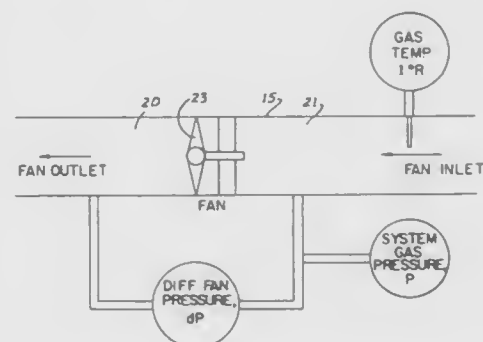
Walter A. Johnson, W233 S6900, Big Bend, Wis. 53103

Filed Sep. 12, 1990, Ser. No. 581,004

Int. Cl.⁵ G01N 7/00

U.S. Cl. 73—23.2

15 Claims



1. A method for determining the purity of a known first gas in a mixture of the first gas, a second known gas, and a water

vapor fraction, said mixture being circulated in a closed system by a fan, comprising the steps of:

- (1) determining a first fan differential pressure with the fan operating at a first speed and with said first gas at essentially 100% purity in the system;
- (2) measuring a second fan differential pressure with the fan operating at said first speed and with the gas mixture in the system;
- (3) utilizing the ratio of said first and second fan differential pressures to calculate the volume percent purity of said first gas in accordance with the equations:

$$\frac{dP_M}{dP_1} = \frac{W_M}{W_1};$$

and,

$$W_M = W_1(X) + W_2 \left(1 - X - \frac{P_{dp}}{P_M} \right) + W_3 \left(\frac{P_{dp}}{P_M} \right),$$

where:

X=volume percent purity of said first gas as a decimal fraction

dP_M=measured fan differential pressure with the gas mixture

dP₁=fan differential pressure with the first gas

w_M=molecular weight of the gas mixture

w₁=molecular weight of the first gas

w₂=molecular weight of the second gas

w₃=molecular weight of water

P_{dp}=vapor pressure of water vapor at the dew point temperature

P_M=measured pressure of the gas mixture in the system

(4) correcting said first gas purity calculation, if necessary, for variations in system pressure and temperature.

5,088,316

APPARATUS AND METHOD FOR TESTING MATERIAL SAMPLES FOR GAS DIFFUSION CHARACTERISTICS

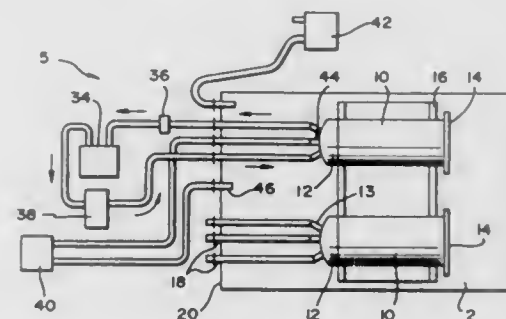
William F. McKelvey, Langhorne, Pa., and Jay W. Davis, Clifton, Colo., assignors to Versar, Inc., Springfield, Va.

Filed Sep. 27, 1989, Ser. No. 413,198

Int. Cl.⁵ G01N 15/08

U.S. Cl. 73—38

15 Claims



1. A system for testing the gas diffusion characteristics of a test sample, comprising:

a test chamber containing a test gas at a pressure greater than atmospheric;

a test cell within said test chamber, and having an opening, and arranged to support a test sample over said opening, wherein said test cell and test chamber are arranged so that gas present in said test chamber may enter said test cell only by diffusing across said test sample through said opening; and

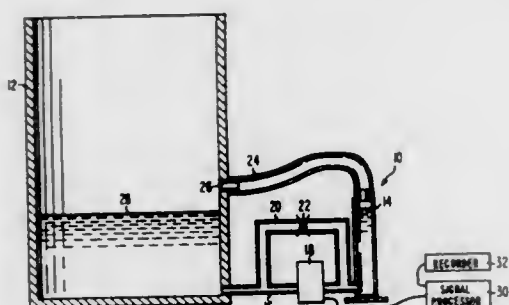
counting means connected to said test cell for determining

the concentration of test gas that diffuses across said test sample into said test cell.

5,088,317
METHOD AND APPARATUS FOR DETECTING LIQUID LEAKS FROM ABOVE-GROUND STORAGE TANKS
 Jay E. Jensen, Raritan, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.
 Continuation-in-part of Ser. No. 413,577, Sep. 28, 1989, Pat. No. 4,964,296, which is a division of Ser. No. 183,181, Apr. 19, 1988, Pat. No. 4,893,498, and a continuation-in-part of Ser. No. 384,612, Jul. 25, 1989, abandoned. This application Sep. 26, 1990, Ser. No. 588,236
 Int. Cl.⁵ G01M 3/26

U.S. Cl. 73—49.2

13 Claims



1. A liquid leak detector for detecting a change in liquid amount in a storage tank, comprising:
 - (a) a vertically upright standpipe having an upper end and a bottom end for filling with a liquid to a level that generates a head pressure substantially equivalent to that exerted by the liquid in the storage tank;
 - (b) a first pipe connected to said standpipe at about said bottom end thereof and adapted to be connected to the tank at about the bottom of the tank;
 - (c) means for sensing hydrostatic head pressure differential between the liquid in the storage tank and the liquid in the standpipe to determine a change in pressure differential resulting from a change in the amount of liquid in the storage tank, said means for sensing hydrostatic head pressure differential comprising a pressure transducer disposed within said first pipe having an electrical output signal proportional to the head pressure differential;
 - (d) a hose connected above the level of the liquid in the standpipe and adapted to be connected to the tank above the level of the liquid in the tank; and
 - (e) a signal processor electrically connected to said pressure transducer.

5,088,318
DETERMINING DEVICE FOR DETERMINING A FAILURE IN AN ENGINE CYLINDER
 Kouichi Osawa, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
 Filed Mar. 29, 1991, Ser. No. 677,113
 Claims priority, application Japan, Apr. 2, 1990, 2-88093
 Int. Cl.⁵ G01M 15/00

U.S. Cl. 73—117.3

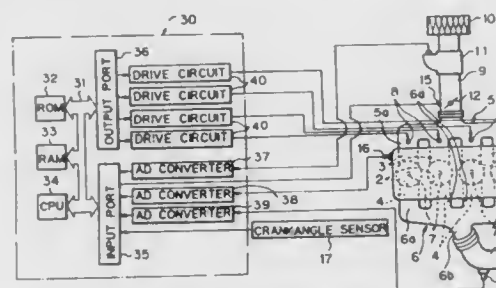
17 Claims

1. A determining device for determining a failure in an engine cylinder of an internal combustion engine, comprising:
 - an engine load detecting means for detecting an engine load;
 - an engine speed detecting means for detecting an engine speed at a predetermined crank angle;
 - a variation detecting means for sequentially detecting a variation in an engine speed between a first engine speed detected by said engine speed detecting means during a combustion process at a first engine cylinder and a second engine speed detected by said engine speed detecting means during a combustion process at a second engine cylinder immediately preceding said first engine cylinder

with respect to an ignition sequence of all of the engine cylinders;

a first determining means for determining that a misfire has occurred when the variation in the engine speed detected by said variation detecting means is larger than a predetermined first variation in the engine speed;

a second determining means for determining that a failure has occurred in an engine cylinder when a frequency at



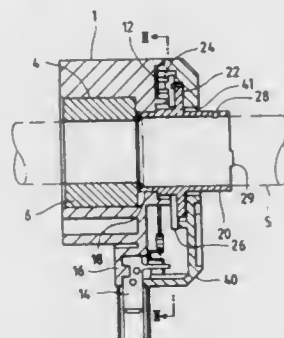
which said first determining means determines that a misfire has occurred is larger than a predetermined frequency; and

a value control means for increasing at least one of said predetermined first variation in the engine speed and said predetermined frequency in accordance with an increase in said engine load detected by said engine load detecting means.

5,088,319
STEERING ANGLE SENSOR
 Hisashi Hirose, and Kazuo Kouno, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan
 Filed Dec. 28, 1990, Ser. No. 633,537
 Claims priority, application Japan, Dec. 29, 1989, 1-152879[U]
 Int. Cl.⁵ G01M 19/00

U.S. Cl. 73—118.1

14 Claims

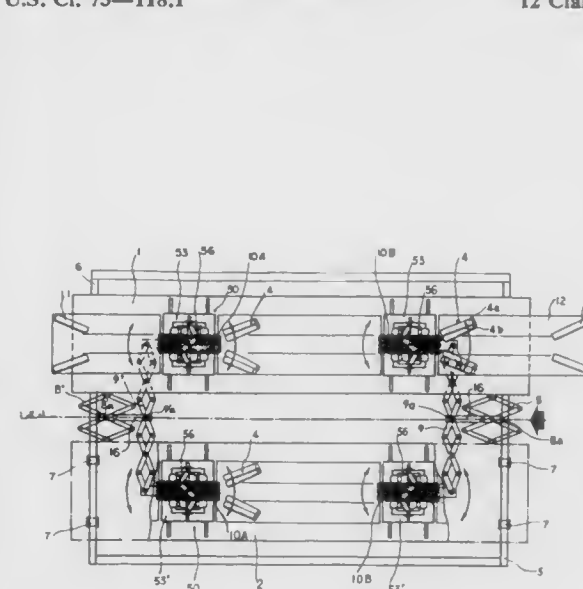


1. A steering angle sensor for use in a vehicle having a steering shaft, comprising:
 - a case body, adapted for coupling to a vehicle body and for accommodating the shaft;
 - a hollow rotor, rotatably supported by the case body and adapted for coupling around the circumference of the steering shaft, including a positioning portion for positioning the steering shaft;
 - a printed board, provided in the case body, including flat longitudinal resistor means including a middle portion having a first resistivity and 2 end portions each having a resistivity lower than the first resistivity; and
 - a contactor, coupled to the rotor and in sliding contact with the resistor means.

5,088,320
VEHICLE COMPOSITE TEST APPARATUS
 Yutaka Fukuda, Tokorozawa; Yukio Higuchi, Fuji; Yukihiko Imoto, Sakado, and Noriyoshi Nakano, Yokohama, all of Japan, assignors to Anzen Motor Co., Ltd., Tokyo, Japan
 Filed Dec. 14, 1989, Ser. No. 450,304
 Claims priority, application Japan, Dec. 14, 1988, 63-161294; Dec. 14, 1988, 63-161295; Dec. 14, 1988, 63-161296; Dec. 14, 1988, 63-161297

U.S. Cl. 73—118.1

12 Claims

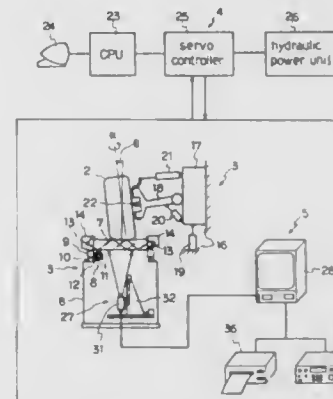


1. In a vehicle composite test apparatus for testing a wheeled vehicle received thereon aligned with a measurement reference line and with wheels of said vehicle received on movable support bases, the improvement comprising said test apparatus comprising:
 - a base frame;
 - a pair of spaced platforms mounted on said base frame to extend longitudinally of a vehicle received on said apparatus, said platforms being arranged equidistant on each side of and parallel to said measurement reference line, said platforms being reciprocally movable toward or away from said measurement reference line to adjust the spacing of said platforms to a track width of said vehicle;
 - a platform linkage operatively connected to said platforms for moving said platforms simultaneously in opposite directions toward or away from said measurement reference line and maintaining said platforms evenly spaced from said measurement reference line;
 - a plurality of support bases for receiving the wheels of said vehicle; said support bases comprising a front wheel support base and a rear wheel support base on each of said platforms; said support bases being attached to the respective platforms; and said front wheel and rear wheel support bases being reciprocally movable independently of said platforms toward or away from said measurement reference line;
 - a first support base linkage operatively connected to said front wheel support bases for moving said front wheel support bases simultaneously in opposite directions toward or away from said measurement reference line and maintaining said support bases evenly spaced from said measurement reference line; and
 - a second support base linkage operatively connected to said rear wheel support bases for moving said rear wheel support bases simultaneously in opposite directions toward or away from said measurement reference line and maintaining said support bases evenly spaced from said measurement reference line.

5,088,321
APPARATUS AND METHOD FOR OBSERVING THE GROUND CONTACT PATCH OF A TIRE
 Akira Kajikawa, and Kenji Saito, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
 Filed Oct. 26, 1990, Ser. No. 603,561
 Claims priority, application Japan, Nov. 2, 1989, 1-286098
 Int. Cl.⁵ G01M 17/02

U.S. Cl. 73—146

10 Claims

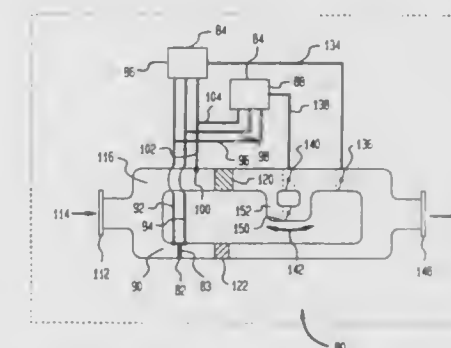


1. An apparatus for observing the ground contact patch of a tire characterized by a moving road way, comprising a transparent body, having a predetermined thickness, a light source arranged so that the light emitted therefrom is reflected within the transparent body, a tire press unit for pressing the outer circumference of a tire onto a surface of the moving roadway and a camera unit arranged so as to observe the resultant ground contact patch of the tire through the transparent moving roadway from opposite the ground contact patch of the tire.

5,088,322
EXTENDED RANGE FLOW METER
 James Fitzpatrick, Dubois, and Fred K. Enseli, Reynoldsville, both of Pa., assignors to Equimeter, Inc., Dubois, Pa.
 Filed May 29, 1990, Ser. No. 530,100
 Int. Cl.⁵ G01F 7/00

U.S. Cl. 73—197

25 Claims



1. An extended range flow meter comprising:
 - (a) a meter inlet for receiving a main flow said inlet being divided into
 - (b) a higher volume line and a lower volume line the lower volume line being smaller than the main flow; and the higher volume line containing therein
 - (c) a line specific flow meter; and, the lower volume line containing therein
 - (d) a line specific flow meter and further the lower volume line having
 - (e) a flow rate monitor in readable connection with a differ-

ential pressure controller means said pressure controller means having

- (f) a senior controller aspect maintaining on/off control of higher volume line flow through a senior control valve located in the higher volume line, and
- (g) a junior controller aspect maintaining proportional control of higher and lower volume line flow through a junior control valve located in the higher volume line at a bypass point, and said point comprising a bypass line, down stream of the higher volume line specific flow meter and up stream of the senior control valve;
- (h) wherein said junior and senior controller aspects are designed and configured for meter-adaptive flow balance.

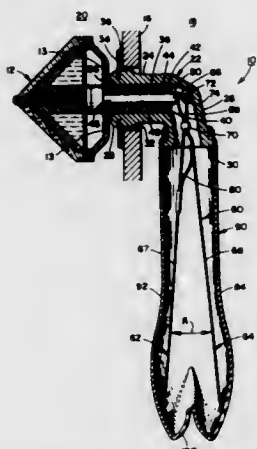
5,088,323

ACTUATOR FOR VISUAL INDICATOR

Leonard W. Johnson, and Thomas C. Johnson, both of Roseau, Minn., assignors to LTJ Enterprises, Inc., Roseau, Minn.
Continuation of Ser. No. 464,898, Jan. 16, 1990, abandoned. This application May 15, 1991, Ser. No. 702,364
Int. Cl.⁵ G01F 23/00

U.S. Cl. 73—290 R

10 Claims



1. An actuating mechanism for a material lever indicator, said mechanism comprising:

- a mounting bracket for mounting to a container having an opening extending between a container interior and a container exterior, said opening being of predetermined dimensions;
- a force transmitting member coupled to said material level indicator and slidably connected to said bracket;
- an actuator having means for collapsing said actuator to a collapsed size sized to be extended through said opening, with said actuator having a rest size greater than said collapsed size and having means for pivotally connecting said actuator to said bracket for said actuator to pivot in response to a force of a material contained within said container, and with said actuator coupled to said force transmitting member to displace said force transmitting member in response to movement of said actuator;
- said actuator including a lever switch for displacing said member in response to a material contained in said container, said switch including a first switch arm and a second switch arm pivotally connected at an intermediate pivot point;
- said lever switch connected to said bracket with said first switch arm presenting a contact end opposing said force transmitting member in force transmitting relation;
- whereby said material within said container urges said first and second arms together to pivot about said pivot point with said contact end urging said force transmitting member to become displaced, and thereby actuate said indicator.

5,088,324 COMBINED LIQUID-LEVEL AND CONDUCTIVITY SENSOR

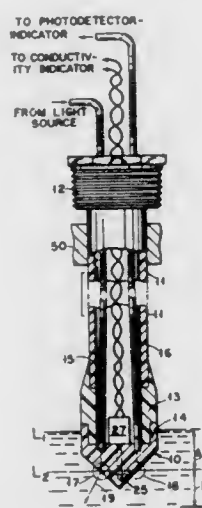
Frank A. Nemeth, Harwinton, Conn., assignor to Imo Industries, Inc., Princeton, N.J.

Filed Mar. 8, 1991, Ser. No. 666,265

Int. Cl.⁵ G01F 23/02; G01N 21/41

U.S. Cl. 73—291

10 Claims



1. A unit-handling sensor component for use in optically detecting the presence or absence of liquid at a given elevation and for use in electrically determining the conductivity of such liquid as may be determined to exist at said elevation, said component having a body of light-transmitting material adapted for suspension on a central axis in vertical orientation, said body having an exterior profile reduction which is downwardly convergent at least at spaced locales which are at equal but opposite offset from said central axis, the geometric apex angle of downward convergence being 90 degrees, the upper end of said body having a pair of upwardly open like bores sized for optical-fiber reception and located on diametrically opposed axes that are parallel to said central axis, the geometric downward projection of each of said bore having incidence with a different one of said spaced locales, whereby light entering said body on one of said opposed axes will be reflected in essentially a single radial plane from one to the other of said locales in the absence of liquid immersion of said locales, and a pair of like conductivity-sensing electrode elements extending from the upper end of said body downwardly and completely through said body on diametrically opposed axes that are parallel to said central axis, said pair of electrode elements having emergent exposure from said body at substantially said radial plane, the diametrically opposed axes of said upwardly open bore defining a first geometric plane and the diametrically opposed axes of said electrode elements defining a second geometric plane that is approximately normal to said first geometric plane.

5,088,325

SYSTEM FOR INDICATING A CONDITION OF MATERIAL

Robert T. Eichberger, Mt. Clemens, and Scott M. Hewelt, Marine City, both of Mich., assignors to Bindicator Company, Port Huron, Mich.

Filed Feb. 11, 1991, Ser. No. 653,135

Int. Cl.⁵ G01F 23/26; G01R 27/26, 35/00

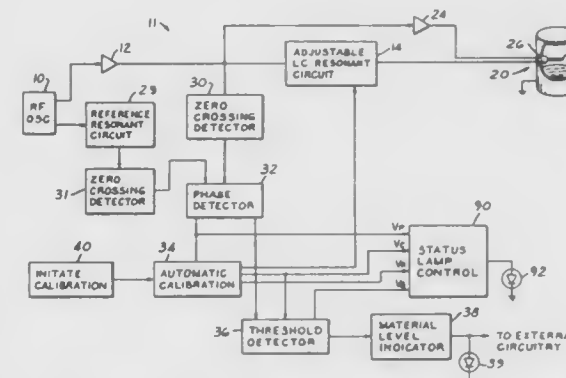
U.S. Cl. 73—304 C

5 Claims

1. A system for indicating a condition of material comprising:

probe means adapted to be positioned with respect to the material such that an electrical property of said probe means varies as a function of material condition,

circuit means coupled to said probe means and responsive to said electrical property of said probe means for indicating said material characteristic, said circuit means including: means coupled to said probe means for providing a first electrical signal that varies as a function of said electrical property at said probe means, means for calibrating said circuit means such that said first electrical signal is at a first predetermined level independent of material at said probe means, means responsive to variation of said first signal from said first predetermined level to a second predetermined level



for indicating said material characteristic, including sensitivity adjustment means for selectively varying said second predetermined level so as to vary sensitivity of said circuit means, and

means responsive to said first signal and coupled to said sensitivity adjustment means for indicating loss of calibration at said circuit means when said first signal reaches a third level, including means for varying said third level as a function of sensitivity of said circuit means such that departure of said first signal from said first level to indicate loss of calibration at said circuit means increases with decreasing sensitivity at said circuit means.

5,088,326

PIEZOELECTRIC ACCELEROMETER FOR AUTOMOBILES

Shunichi Wada, and Masayuki Yano, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

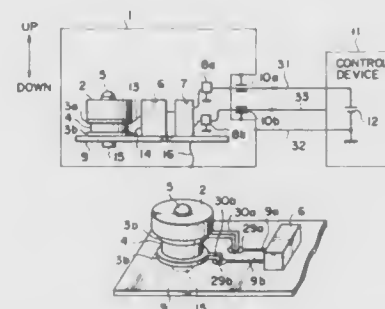
Filed May 22, 1990, Ser. No. 526,913

Claims priority, application Japan, May 24, 1989, 1-60711[U]; May 24, 1989, 1-60712[U]; Jun. 2, 1989, 1-65137[U]

Int. Cl.⁵ G01P 15/09

U.S. Cl. 73—517 R

11 Claims



1. An accelerometer comprising:

- a closed box-shaped electrically conductive casing which is grounded;
- an electrically insulating plate disposed within said electrically conductive casing and having a wiring pattern formed thereon;
- piezoelectric element means, mounted on the electrically insulating plate and including a piezoelectric element, a

pair of electrodes holding the piezoelectric element therebetween, and a weight, for generating a voltage across the piezoelectric element corresponding to an acceleration in response to a force acting on the piezoelectric element from acceleration of the weight; and

charge amplifier circuit means, mounted on the electrically insulating plate and having input terminals electrically coupled to said electrodes, for amplifying the voltage generated across the piezoelectric element; wherein the electrodes of the piezoelectric element means are electrically coupled to input terminals of the charge amplifier circuit means via the wiring pattern formed on the electrically insulating plate, and wherein each of said electrodes comprises an extension whose bent end is soldered to a terminal of a wiring of the wiring pattern on the electrically insulating plate, which wiring is electrically coupled to an input terminal of the charge amplifier circuit means.

5,088,327

PHASE CANCELLATION ENHANCEMENT OF ULTRASONIC EVALUATION OF METAL-TO-ELASTOMER BONDING

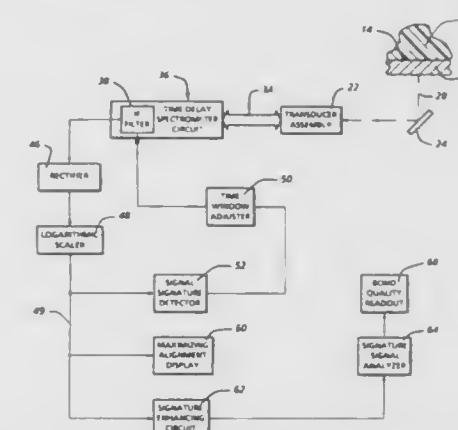
Paul M. Gammell, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1990, Ser. No. 524,414

Int. Cl.⁵ G01N 29/04

U.S. Cl. 73—588

17 Claims



1. In a system for inspection of a bonding interface between a radiation transmissive material and another material, involving emission of radiation conducted along a path through the transmissive material from an entry surface thereon and reception of echoes of the emitted radiation reflected along said path from the entry surface and the bonding interface to produce a response; a method of monitoring adhesion between said materials at the bonding interface, including the steps of:

modifying said response by partial attenuation of a portion thereof resulting from said reception of the echoes of the emitted radiation reflected from only the entry surface; maximizing a resonance peak portion of the modified response to identify a signature signal characteristic quantized with respect to amplitude and width; and determining integrity of said adhesion at the bonding interface as an inverse function of the quantized amplitude and a direct function of the quantized width of said identified signature signal characteristic.

5,088,328

**RAPID CHANGEOVER MULTI-DIAMETER
ULTRASONIC TUBE INSPECTION SYSTEM**

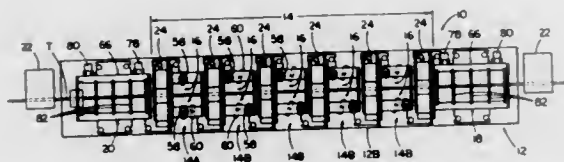
Clarence D. John, Jr., Penns Hills Twp., Allegheny County, and
Richard S. Wengiewicz, Murrysville, both of Pa., assignors to
Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1990, Ser. No. 555,866

Int. Cl.⁵ G01N 9/24

U.S. Cl. 73—622

25 Claims



1. An ultrasonic tube inspection system capable of rapid changeover for inspecting tubes of different diameters, said inspection system comprising:

- a serial arrangement of multiple separate inspection stations corresponding to different tube diameter sizes to be inspected, each inspection station being capable of inspecting tubes of a given one of different tube diameter sizes; and
- tube parameter measuring means supported at each of said stations in an predetermined orientation corresponding to the given one diameter size of a tube to be inspected at said respective station;
- each of said inspection stations including a receptacle defining a cavity for holding a quantity of energy coupling liquid and mounting said tube parameter measuring means;
- each of said receptacles having a pair of opposite openings to said cavity for receiving and passing a tube therethrough such that the parameters of tube can be measured by said tube parameter measuring means as the tube passes through said cavity;
- each of said stations also including means for guiding a tube through said receptacle cavity, said tube guiding means having a housing with a central passage for receiving and passing the tube therethrough;
- said cavities of said receptacles being interconnected in liquid flow relationship with one another by said opposite openings of each of said receptacles and said central passage of said housing of each said tube guiding means.

5,088,329

PIEZORESISTIVE PRESSURE TRANSDUCER

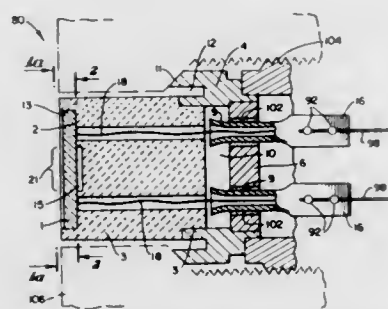
Armen N. Sahagen, 16757 Bolero La., Huntington Beach, Calif. 92649

Filed May 7, 1990, Ser. No. 520,262

Int. Cl.⁵ G01L 7/08, 9/06

U.S. Cl. 73—727

25 Claims



1. A piezoresistive pressure transducer for monitoring a fluid pressure, comprising:
a ceramic body having a cavity in the upper surface thereof;
a crystalline sapphire force collector diaphragm having first

and second major surfaces, bonded on the ceramic body over the cavity, so that the first major surface faces toward the upper surface of the ceramic body and the second major surface faces toward the fluid being monitored so that the pressure of the fluid is applied in a direction that causes an unsupported portion of the diaphragm over the cavity to flex into the cavity of the ceramic body; and

a thin layer of piezoresistive material on the first major surface of the diaphragm, a first portion of the piezoresistive material forming at least one piezoresistive element located in an area of the diaphragm defined by an outer radius R2 and an inner radius R1, wherein R2 coincides with the edge of the cavity where the diaphragm becomes unsupported by the ceramic body and R1 is about 0.66R2.

5,088,330

SQUARE WAVE EXCITATION OF A TRANSDUCER

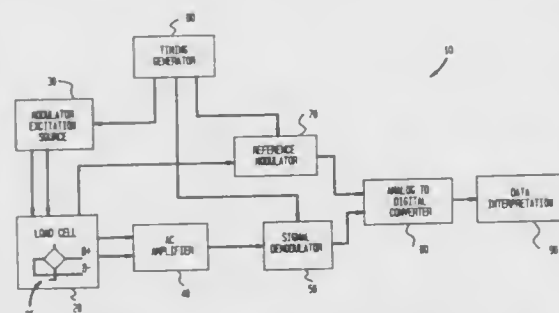
Paul C. Talmadge, Ansonia, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 29, 1990, Ser. No. 619,624

Int. Cl.⁵ G10L 1/20

U.S. Cl. 73—769

15 Claims



1. An apparatus for measuring a force, comprising:

- a transducer, said transducer comprising a strain gauge;
- excitation means for applying an excitation a.c. voltage to said transducer, said voltage having a wave form, said wave form being essentially a square wave; said transducer outputting a data signal, said signal representing a force applied to said strain gauge;
- signal amplifying means for receiving said data signal and amplifying said data signal, said amplifying means outputting an amplified data signal, said amplified data signal essentially having the form of an a.c. square wave, the amplitude of said a.c. square wave being modulated by said applied force;
- signal demodulating means, for synchronously demodulating said amplified data signal and outputting a demodulated signal, said demodulated signal being essentially a d.c. voltage, the amplitude of said d.c. voltage being modulated by said applied force;
- first low pass filter means for filtering noise from said demodulated signal; and
- an analog-to-digital converter (A/D converter) for receiving said filtered demodulated signal and outputting a digital word representative of said filtered demodulated signal; said excitation means comprising a circuit for modulating an input potential, said circuit comprising:
 - first amplifying means for receiving said input potential;
 - second amplifying means for outputting an output potential;
 - a resistor network connected to said first and second amplifying means;
 - switching means for changing an effective gain of at least one of said amplifying means, said switching means having a first position and a second position, said

switching means being connected to said resistor network and to at least one of said amplifying means; and
(v) means for repeatedly driving said switching means between said first position and said second position; said output potential equalling said input potential when said switching means is in said first position; said output potential equalling minus one times said input potential when said switching means is in said second position; said signal demodulating means including first and second amplifying means and said signal demodulating means and said modulating circuit being substantially identical, except that said first and second amplifying means of said signal demodulating means have a substantially faster slew rate than said first and second amplifying means of said modulating circuit.

5,088,331

APPARATUS FOR MEASURING A MASS STREAM

Hans-Georg Fassbinder, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to CRA Services Limited, Melbourne, Australia

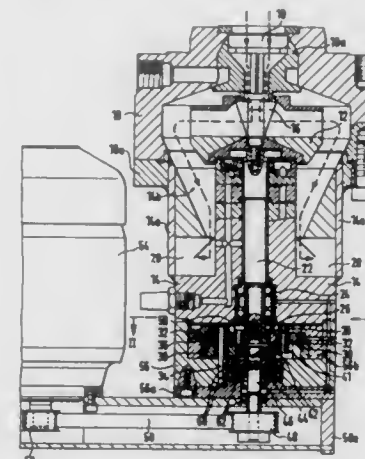
Filed Nov. 30, 1990, Ser. No. 620,107

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1989, 3940576

Int. Cl.⁵ G01F 1/82

U.S. Cl. 73—861.37

5 Claims



1. An apparatus for measuring a preferably heterogeneous mass stream, having a rotary member (12) carried by a main shaft (22) and driven at constant speed, said rotary member deflecting radially the mass stream acting axially upon the rotary member, thereby giving it a tangential velocity component, whereby the torque dependent on the mass stream is measured on the main shaft (22), a first spur wheel (26) mounted on the main shaft (22) and meshing with a second spur wheel (30) mounted in a carrier member (58) that is in turn mounted so as to rotate about the axis of the main shaft (22) and held in position by a force-sensing device (40), and an internal toothed wheel rim (32) which is set rotating by a driving pinion (36) in geared connection with a drive motor (54) and in turn drives the second spur wheel (30), characterized in that the internal toothed wheel rim (32) is in toothed engagement with the second spur wheel (30), below the first spur wheel (26) a rotational body (44) is mounted, so as to rotate therewith, on an additional shaft (46) disposed as an axial prolongation of the main shaft (22), the additional shaft (46) being coupled with the drive motor (54) and having a substantially higher speed than the main shaft (22) in the same direction of rotation as the main shaft (22), and the rotational body (44) is connected via a hydrodynamic frictional engagement with the carrier member (58) and/or with the first spur wheel (26), the strength of the hydrodynamic frictional engagement being coordinated in such a way that the moments of friction of the first and second

spur wheels (26, 30) are compensated by the moment of friction of the hydrodynamic frictional engagement.

5,088,332

**GAS FLOW RESTRICTING AND DIRECTING DEVICE
INTENDED FOR FLOW MEASUREMENT**

Pekka T. Meriläinen, Kari Eskelinen, and Hannu E. Hänninen, all of Helsinki, Finland, assignors to Instrumentarium Corporation, Finland

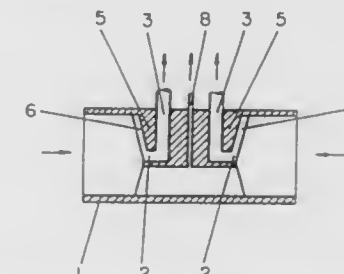
Filed Dec. 7, 1989, Ser. No. 447,210

Claims priority, application Finland, Dec. 16, 1988, 885756

Int. Cl.⁵ G01F 1/46; A61B 5/087

U.S. Cl. 73—861.65

22 Claims



1. A gas flow pickup device for use in measuring the properties of a flowing gas containing liquid or viscous material, said device comprising:

- a tube through which the gas flows, said tube having an axis and an inner wall spaced from said axis and along which wall the material tends to settle as the gas flows through the tube;
- aperture means within said tube providing first and second apertures opening into said tube, said apertures being spaced apart along the axial direction of the tube and communicating with conduit means providing an output from said device, said apertures being located generally on said axis of said tube so that fouling of said apertures by the material is lessened; and
- at least one baffle means mounted within said tube and coupled to said aperture means, said baffle means comprising the sole means for positioning said aperture means in said tube, said baffle means having at least one surface facing the gas flow in the tube and extending inwardly from said tube to said aperture means adjacent one of said apertures for collecting and guiding the pressure generated by the gas flowing in the tube toward the apertures.

5,088,333

**SYSTEM FOR TESTING ELASTIC COMPONENTS AND
METHODS OF USING SAME**

John Kiely, P.O. Box 332, Paris, Ontario, Canada N3L 3G2, and Peter Van Kruistum, R.R. #4, Brantford, Ontario, Canada N3T 5L7

Filed Oct. 27, 1989, Ser. No. 427,426

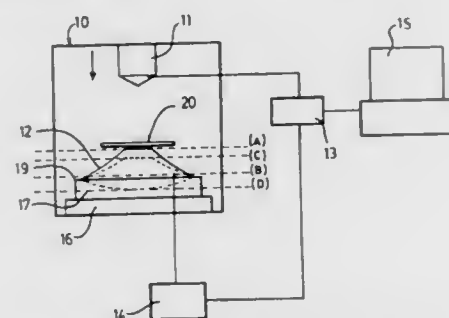
Int. Cl.⁵ G01L 5/00; G06F 15/46

U.S. Cl. 73—862.53

2 Claims

1. A method for determining the optimum setting of a clutch in a system comprising a support member for holding the clutch, a means for applying a compressive force to the clutch when held by the support member and for measuring the force applied, a transducer which is detachably attached to the clutch for measuring the displacement of the clutch in response to the force applied, an interface unit connected to the transducer and to the means for applying force, which interface unit collects the force and displacement measurements, converts them to digital signals and transmits them to a personal computer; said method comprising the steps of:

- (a) attaching the clutch to the support member;
(b) applying a force to the clutch;



- (c) determining from the readout from the personal computer, the position of the clutch at which the greatest pressure was applied to displace the clutch.

5,088,334

LEAF SPRING DYNAMOMETER

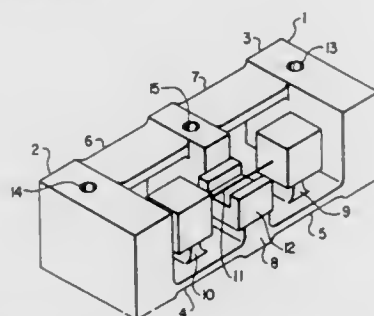
Johannes Wirth, Zurich, Switzerland, assignor to Wirth Gallo Messtechnik AG, Zurich, Switzerland
Filed Dec. 8, 1987, Ser. No. 130,713

Claims priority, application Switzerland, Dec. 10, 1986, 04923/86

Int. Cl.⁵ G01L 1/10, 1/04

U.S. Cl. 73—862.59

5 Claims



1. A dynamometer for measuring a force and being constructed with an elastic parallel scaling mechanism having a frame (1), constructed with an L-shaped block (8) the dynamometer comprising:

a pair of similar leaf springs (4 and 5), lying in approximately the same plane which comprise an elastic absorption mechanism such that a portion of the force being measured is absorbed thereby and, in which an outer part of each leaf spring (4 and 5) is attached to the frame (1) and an inner part of each spring is attached to the L-shaped block (8);

at least one additional leaf spring, the outer part of which being attached to the frame (1) and the inner part being attached to the block (8), and which lies in a plane approximately parallel to that of the paired leaf springs (4 and 5); first and second elastic rods (9 and 10), each of said rods being installed in the middle of each of the paired leaf springs (4 and 5), respectively, such that each is perpendicular to the plane in which the leaf springs (4 and 5) lie; a force-measuring device (11) being located between the two elastic rods (9 and 10) so that it is tensioned by the force being measured, and

said frame (1) having two holes (13 and 14) formed therein and the block (8) having one hole (15), all of which lie in the same plane.

5,088,335
PERIODICALLY ACTIVATED CONSTANT PRESSURE
MAINTAINING PISTONED CHAMBER LIQUID
SAMPLER

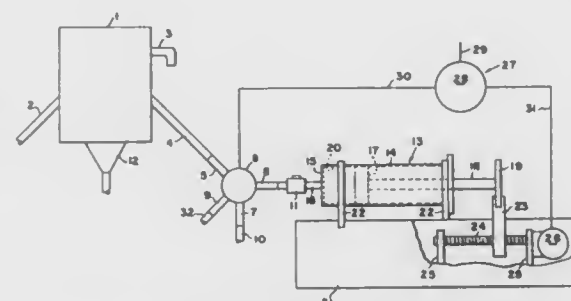
Bryant R. LaFreniere, Midland; Mark T. Zaranski, Freeland, and Marvin P. Miller, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 316,274, Feb. 27, 1989, abandoned. This application Feb. 26, 1990, Ser. No. 485,045

Int. Cl.⁵ G01N 1/14

U.S. Cl. 73—864.62

27 Claims



1. Apparatus for sampling a liquid comprising container means; means forming a liquid sample chamber within said container means; means for periodically establishing communication between said chamber and a source of said liquid; and means for enlarging the volume of said chamber while the latter is in communication with said source for admitting to said chamber a volume of said liquid corresponding to and concurrently with the enlargement of said chamber and at a rate to maintain substantially constant the pressure of liquid admitted to and accommodated dated in said chamber.

5,088,336

PIPELINE CALIPER PIG

Jeffrey S. Rosenberg, and Kevin W. Lockyear, both of Tulsa, Okla., assignors to TDW Delaware, Inc., Tulsa, Okla.

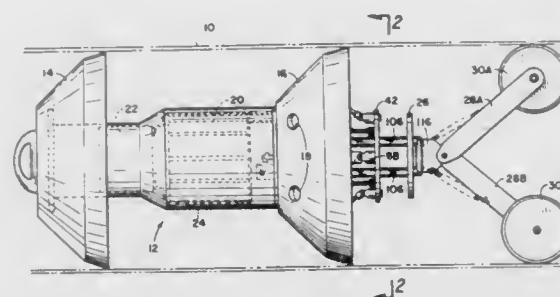
Continuation of Ser. No. 545,054, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 822,755, Jan. 17, 1986, Pat. No. 4,953,412. This application Jun. 5, 1991, Ser. No. 711,368

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.⁵ G01B 5/00

U.S. Cl. 73—865.8

2 Claims



1. A pipeline caliper pig for providing information about an indentation in the inner wall of a pipeline, comprising:
a pig body assembly having a longitudinal axis and having means for support thereof in a pipeline and for impeding the flow of fluid therepast so that the pig body is propelled by such fluid flow along the interior of the pipeline, the pig body being subject to at least limited rotation about its longitudinal axis as it is propelled along the interior of a pipeline;

means carried by said pig body for measuring indentations in the internal pipeline wall;
means for indicating the axial orientation of said measured pipe wall indentation relative to said pig body;
means for detecting the axial orientation of said pig body about its longitudinal axis relative to the vertical;
means employing said measuring means, said indicating means and said detecting means to determine the axial orientation of said internal pipe wall indentation relative to the vertical; and
means carried by said pig body for recording said detected pipeline wall indentation and said axial orientation thereof.

5,088,337

PROBE HEAD

Simon J. Bennett, Painswick, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom
Continuation of Ser. No. 497,654, Mar. 23, 1990, abandoned.

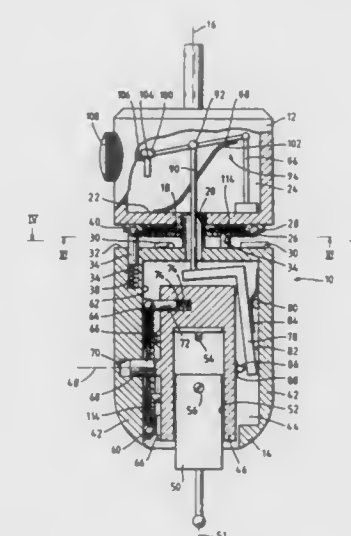
This application Aug. 30, 1991, Ser. No. 752,924

Claims priority, application United Kingdom, Apr. 14, 1989, 8908537; Dec. 2, 1989, 8927312

Int. Cl.⁵ G01B 7/02

U.S. Cl. 73—866.5

8 Claims



1. A probe head for orienting a probe relative to a head of a coordinate positioning machine, comprising:

a support for connection to the head of the machine;
a first rotor mounted to the support, and for rotation relative to the support about a first axis;
a second rotor mounted to the first rotor for rotation with the first rotor about the first axis, and for rotation relative to the first rotor about a second axis, the second axis being substantially perpendicular to the first axis;

the second rotor carrying a connector onto which the probe is directly mountable, the probe having an axis; wherein when the relative orientation of the first and second rotors is such that said probe is directed away from said support and has its axis parallel to the first axis, the distance between a point of attachment of the probe to the connector and the support is smaller than the distance between the second axis and the support; and wherein a plane of rotation of the probe about the second axis is coplanar with the first axis.

2. A manually operable probe head, mountable to a quill of a coordinate positioning machine, for orienting a probe relative to the quill, the probe head comprising:
a support for connection to the quill;
a first rotor for supporting a probe, the first rotor being mounted to the support;

means for providing rotation of the first rotor relative to the support about a first axis;
primary indexing means for providing a plurality of repeatable rest locations, each of said plurality of repeatable rest locations being provided at a discrete angular orientation about said first axis of said rotor on said support;
locking means for locking said first rotor into and unlocking said first rotor out of, each of said plurality of repeatable rest locations; and
secondary indexing means for positioning said first rotor in a plurality of discrete adjacent locations, each adjacent location being adjacent a corresponding rest location when said first rotor and support are unlocked, said first rotor being rotatable between said adjacent location when unlocked.

5,088,338

PLANET GEAR TYPE REDUCTION GEAR DEVICE

Keiichi Konishi, Himeji, Japan, assignor to Mitsubishi Denki K. K., Tokyo, Japan

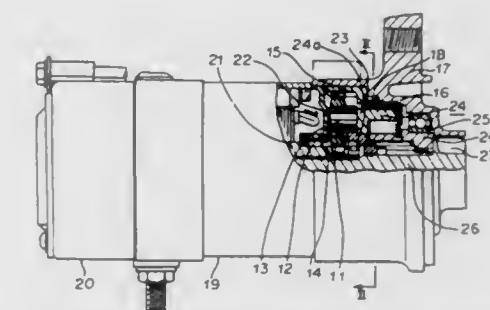
Filed Jun. 8, 1990, Ser. No. 534,901

Claims priority, application Japan, Jun. 14, 1989, 1-152669

Int. Cl.⁵ F02N 15/06

U.S. Cl. 74—7 E

3 Claims



1. A planet gear type reduction gear device comprising:

a casing;
a rotating shaft rotatably supported in the casing;
a sun gear formed at an outer circumferential portion of the rotating shaft;
a planet gear supported by a support pin and meshed with the sun gear; and
an internal gear wheel attached to an inner circumferential portion of the casing and meshed with the planet gear whereby the planet gear revolves around the sun gear and rotates on the support pin, wherein at least one projection is formed at an end surface in the axial direction of the internal gear wheel at the extreme inner peripheral portion thereof, and at least one recess having the shape corresponding to the projection is formed in the casing so that the internal gear wheel is fixed to the casing by the mutual engagement of the projection and the recess.

5,088,339

LIMIT STOP ASSEMBLY FOR A SCREW AND NUT LINEAR ACTUATOR

Stephen A. Lochmoeller, St. Louis, Mo., assignor to Roton Products, Inc., Kirkwood, Mo.

Filed Nov. 30, 1990, Ser. No. 620,140

Int. Cl.⁵ F16H 27/02; F16D 7/00

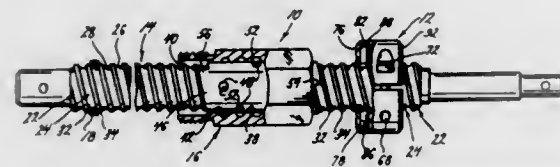
U.S. Cl. 74—89.15

14 Claims

1. A screw and nut linear actuator comprising:

a threaded drive screw;
a drive nut threaded onto the drive screw and axially translatable thereover by rotating the drive screw relative to the drive nut;
said drive nut having a first member translatable along said drive screw upon rotation of said drive screw relative to said first member, and a second member mounted to said

first member for rotation relative thereto, said drive screw and first member being allowed to rotate but not translate relative to said second member with said first member restrained from rotation relative to said drive screw; and a limit stop threaded onto said drive screw and having stop means engageable by said first member to restrain rotation



of said first member upon engagement of said first member therewith; whereby, engagement of said first member with said stop means restrains further rotation of said first member thereby restraining further translation of said drive nut while allowing rotation of said drive screw and first member relative to said second member.

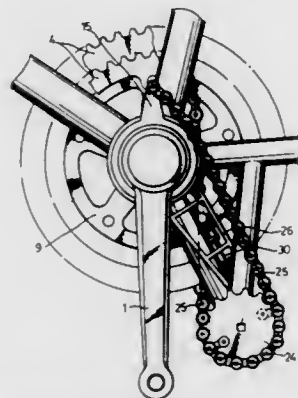
5,088,340
MULTIPURPOSE TRANSMISSION MECHANISM FOR BICYCLES

Marn T. Seol, No. 4-1, Lane 312, Min Chen Road, Shi Chiu, Taichung, Taiwan

Filed Mar. 27, 1991, Ser. No. 675,812
Int. Cl.⁵ F16H 27/02

U.S. Cl. 74-143

1 Claim



1. A power transmission mechanism for bicycles of the type having a bottom bracket bearing axle fastened in a bottom bracket and driven by two cranks to drive a chain wheel to carry a free-wheel to rotate via a bushed chain, the improvement comprising:

- a chain wheel holder on said bottom bracket bearing axle at one end and incorporated in said chain wheel;
- a fixed lock wheel on said bottom bracket bearing axle at an opposite end;
- two clutch bearings respectively mounted on said bottom bracket bearing axles at two opposite ends between said two cranks;
- two alternative wheels and two movable lock wheels respectively mounted on said cranks above said bottom bracket bearing axle, said alternative wheels being able to freely rotate on said cranks;
- steel balls set between said movable lock wheels and said cranks to prohibit said movable lock wheels from rotary motion permitting said movable lock wheels to be respectively moved horizontally to couple with said alternative wheels, said fixed lock wheel or said chain wheel holder;
- a reciprocating lever motion mechanism comprising an auxiliary bracket connected to said bottom bracket at the bottom, an auxiliary axle rotatable fastened in said auxiliary bracket, two auxiliary chain wheels respectively

mounted on said auxiliary axle at two opposite ends, two chain lines respectively mounted between said auxiliary chain wheels and said alternative wheels, spaced from and crossed over each other, permitting said alternative wheels to be driven to rotate in direction against each other;

a control mechanism comprising two control crank brackets above said auxiliary bracket, two control crank-arms having each an end secured to said control crank brackets and an opposite end attached to said movable lock wheels, two double helical springs having each two opposite ends respectively stopped against said control crank-arms and said control crank brackets, two control levers respectively connected to said control crank-arms by a steel wire each to drive said movable lock wheels to displace transversely; and

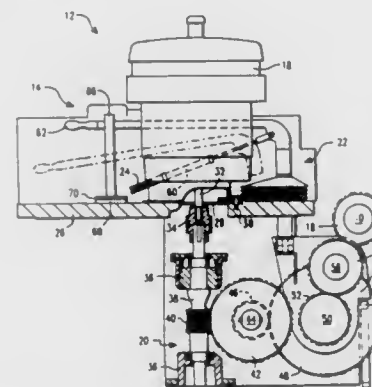
wherein said control levers can be respectively adjusted to drive said movable lock wheels to respectively couple with or disengage from said alternative wheels, said fixed lock wheel or said chain wheel holder, permitting said two cranks to be driven to perform reciprocating lever motion or circular crank motion alternatively or synchronously.

5,088,341
ENGAGING LEVER LOCK FOR ROTOR TURNING GEAR
Gilbert F. Hyde, Winter Springs, and David B. Berrong, Oviedo, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1990, Ser. No. 477,399
Int. Cl.⁵ F16H 63/34, 51/00

U.S. Cl. 74-405

12 Claims



1. An engaging lever lock for rotor turning gear, comprising:

- (a) electromagnetic means for holding an engaging lever locked at an engaged position, said electromagnetic means comprising (i) an electromagnet having a force, when activated, of a predetermined strength adapted to overcome a disengaging force acting upon the engaging lever, said disengaging force comprising a gland steam leakage force, and (ii) means for mounting said electromagnet in a manner whereby said force maintains the engaging lever at said engaged position; and
- (b) means for activating said electromagnetic means.

5,088,342
PIVOTABLE STEERING WHEEL MECHANISM AND BIASING MEANS

Curtis R. Bening, Burnett, and Dean J. Tessenske, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Nov. 21, 1990, Ser. No. 616,560
Int. Cl.⁵ B62D 1/18; G05G 5/06

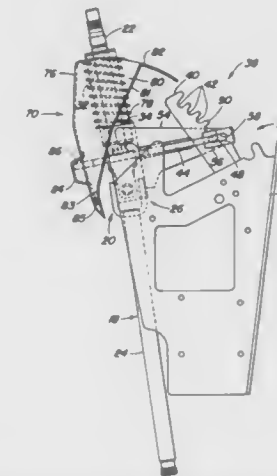
U.S. Cl. 74-493

10 Claims

1. A mechanism for adjusting the inclination of a vehicle's tiltable steering column, said mechanism being controllable by

an operator riding in an operator station of the vehicle, said vehicle having a longitudinal direction of travel, said mechanism comprising:

- a latch plate rigidly fixed to the vehicle, and having a plurality of recesses each corresponding to a particular tilted position of the steering column;
- a member carried by the steering column for tilting motion therewith, and having a first portion engagable with the recess, said member having engaged modes wherein the first portion is engaged within one of the recesses for operatively fixing the steering column at a corresponding tilted position, said member being shiftable to a disengaged mode wherein the first portion is disengaged from



the recesses for allowing the column to tilt to a different position;

biasing means for forcing and urging the member in a direction toward the engaged mode;

said member having a second portion pushable by the operator to shift the member in a direction away from the engaged mode and toward the disengaged mode for shifting the member from an engaged mode to the disengaged mode, the direction that the operator pushes the second portion being generally aligned with the direction that the member shifts when traveling between the engaged and disengaged modes;

wherein the member is a single integral part, and is aligned generally perpendicularly to the steering column.

5,088,343
ACCELERATOR PEDAL ASSEMBLY
Hiroshi Yokoyama, Zama City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Jun. 19, 1990, Ser. No. 540,244
Claims priority, application Japan, Sep. 7, 1989, 1-232090
Int. Cl.⁵ G05G 1/14

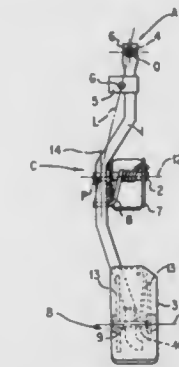
U.S. Cl. 74-560

4 Claims

1. An accelerator pedal assembly for use in a motor vehicle having an accelerator cable with an end mounting portion, said accelerator pedal assembly comprising:

- an elongate member having an upper end portion and a lower end portion, said upper end portion having a recess for detachably seating an end mounting portion of an accelerator cable;
- an accelerator pedal mounted to said lower end portion of said elongate member;
- pivot shaft extending laterally of said elongate member for pivotally supporting said elongate member said pivot shaft being situated between said upper and lower end portions; and
- a damping mass secured to said elongate member between said upper end portion and said given shaft so that a center of gravity of said damping mass is positioned to lie on an imaginary straight line which passes through a geometric

center of said recess and in intersection point where an longitudinal axis of said elongate member intersects a



longitudinal axis of said pivot shaft so that when said accelerator pedal is depressed by applying force, no torsional stress is produced in said elongate member.

5,088,344
MARINE PROPULSION INTERNAL COMBUSTION ENGINE

Philip A. Anderson, Waukegan; William A. Bernau, Lindenhurst, both of Ill.; Paul W. Breckenfeld, Kenosha, Wis.; George L. Broughton, Zion, Ill., and Wallace R. Karrasch, Milwaukee, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

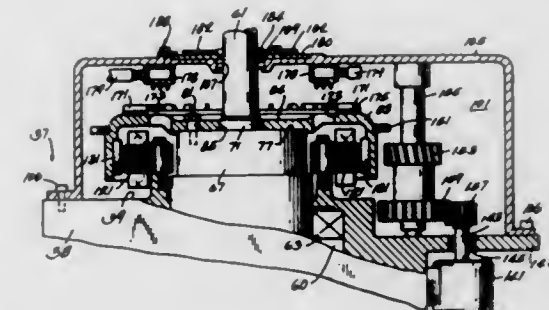
Continuation of Ser. No. 315,593, Feb. 27, 1989, abandoned.

This application Dec. 6, 1990, Ser. No. 623,272

Int. Cl.⁵ G05G 1/00

U.S. Cl. 74-572

8 Claims



1. An engine comprising an engine block having an exterior surface and an interior, a crankshaft extending from said engine block interior, being rotatably supported by said block, and including a first portion extending exteriorly of said engine block surface, having a first radius, and a second portion extending from said first portion in concentric relation thereto and having a second radius less than said first radius so as to define a radially extending shoulder on said first portion, a flywheel including a surface engaging said shoulder, and a central aperture receiving said second portion of said crankshaft and having a third radius less than said first radius and greater than said second radius, and means extending through said flywheel and into said first portion of said crankshaft for securing said flywheel to said crankshaft.

5,088,345

COMPOSITE CRANKSHAFT FOR A TWO-STROKE ENGINE

Ralf-Rainer Kemmler, Althütte; Hans P. Stehle, Waiblingen, and Andreas Decool, Fellbach, all of Fed. Rep. of Germany, assignors to Stihl Andreas, Waiblingen

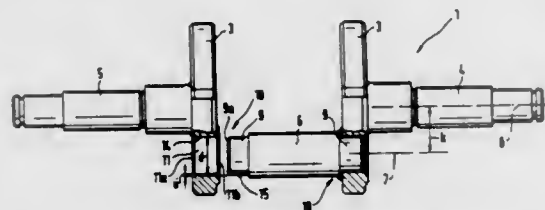
Filed Jun. 7, 1991, Ser. No. 711,801

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1990, 4018542

Int. Cl.⁵ F16C 3/04

U.S. Cl. 74—598

9 Claims



1. A composite crankshaft for a two-stroke engine such as for a two-stroke engine in portable handheld work apparatus including chain saws, cutoff machines and the like, the composite crankshaft comprising:

- a crank web;
- a crank pin;
- a press-fit for connecting said crank web and said crank pin to each other;
- said crank web having a first surface formed therein and said crank pin having a second surface formed thereon for engaging said first surface to define said press fit;
- said press fit defining a center longitudinal axis and having respective axial ends;
- said press fit further defining an axial center disposed between said axial ends;
- at least one of said surfaces being configured to have a radial spacing (R) from said axis which changes as a function of the axial distance (x) to said axial center of said press fit pursuant to an exponential function defined by the equation

$$f(x) = a \cdot e^{bx}$$

wherein (a) and (b) are pre-given constants and f(x) is the radial distance (R).

5,088,346

POWER PLANT STRUCTURE FOR MOTOR VEHICLE

Yuji Hirabayashi, Zushi, and Kazuhiko Kanetoshi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 16, 1990, Ser. No. 552,707

Claims priority, application Japan, Jul. 21, 1989, 1-190050

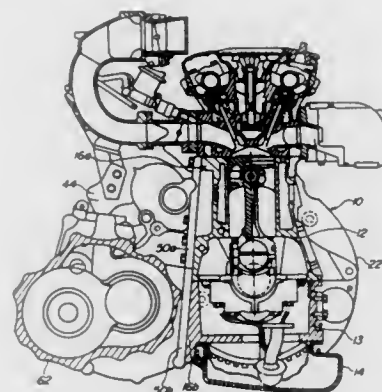
Int. Cl.⁵ F16H 57/02

U.S. Cl. 74—606 R

14 Claims

1. A power plant structure for motor vehicle, comprising:
- an engine including a cylinder block, a bearing cap support housing and an oil pan;
 - a clutch part including a clutch which is received in a clutch housing, said clutch being coaxially connected to said engine, said clutch housing being directly mounted on said engine;
 - a transmission part including a transmission which is received in a transmission case, said transmission part being arranged in parallel with said engine;
 - a transfer part including a transfer and differentials which are received in a transfer case, said transfer part being arranged in parallel with said engine;
 - a mounting portion monolithically formed on said engine to directly mount thereon both said transmission case and said transfer case;
 - first connecting means for directly securely connecting said clutch housing to said engine; and
 - second connecting means for securely connecting said trans-

mission case and said transfer case to said mounting portion;



wherein, said clutch housing, said transmission case and said transfer case are one-piece in construction.

5,088,347

DOOR LOCK ACTUATOR

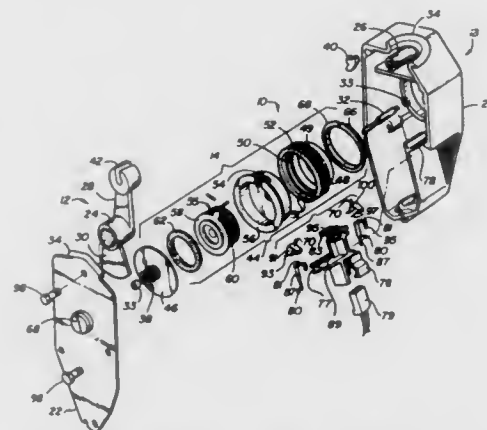
Bert R. Wanlass, Woodland Hills, Utah, assignor to Automation Inc., Woodland Hills, Utah

Continuation-in-part of Ser. No. 130,715, Dec. 9, 1987, Pat. No. 4,885,954. This application Dec. 11, 1989, Ser. No. 449,699

Int. Cl.⁵ G05G 11/00; F16D 27/04

U.S. Cl. 74—625

19 Claims



1. A door lock actuator for use in a vehicle having a door lock, a manual lock control, and a connecting arm interconnecting the door lock and the manual lock control so that upon manual operation of said manual lock control, said door lock is locked and unlocked, said actuator comprising:

- a housing;
- a power means;
- an output member pivotally mounted to said housing, said output member having first and second ends with said first end being adapted for connection to said connecting arm and said second end having a first gear means thereon;
- a clutch disc having first and second sides and a second gear extending outwardly from said first side of said clutch disc for coupling said clutch to said first gear of said output member, with at least said second side of said clutch disc being ferro-magnetic, said clutch disc being slidable with respect to said output member;
- a worm gear connected to said power means;
- a drive assembly for driving said clutch disc, said drive assembly including a third gear interconnected to said worm gear and an electromagnet interconnected to a power source, said power source including a contact ring mounted to said third gear and interconnected to said

5,088,349

SPEED STAGE SHIFTING OF AUTOMATIC TRANSMISSION WITH MODIFICATION OF TORQUE LOAD IN FRICTION ENGAGING MEANS

Toshiyuki Asada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

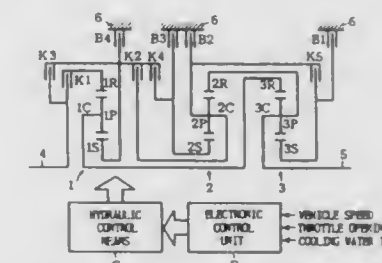
Filed Jul. 24, 1991, Ser. No. 735,073

Claims priority, application Japan, Aug. 1, 1990, 2-204524

Int. Cl.⁵ F16H 61/04

U.S. Cl. 74—861

5 Claims



1. A method of controlling an automatic transmission comprising a housing and a speed change gear mechanism including a plurality of rotary gear members and a plurality of friction engaging means adapted to be selectively engaged and disengaged for selectively interconnecting said rotary gear members and said housing so as to selectively provide a plurality of speed stages, a certain one of said plurality of speed stages being available by first and second patterns of combination of engagement and disengagement of said friction engaging means with a certain one of said friction engaging means bearing a first magnitude of torque under said first pattern of combination of engagement and disengagement of said friction engaging means and a second magnitude of torque greater than said first magnitude of torque under said second pattern of combination of engagement and disengagement of said friction engaging means, wherein a speed stage shifting to change a pattern of combination of engagement and disengagement of said friction engaging means at least either to or from said first pattern of combination of engagement and disengagement of said friction engaging means is carried out through said second pattern of combination of engagement and disengagement of said friction engaging means.

5,088,350

AUTOMATIC TRANSMISSION SYSTEM FOR AN ALCOHOL ENGINE

Masaru Kurihara, and Yoichi Saito, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

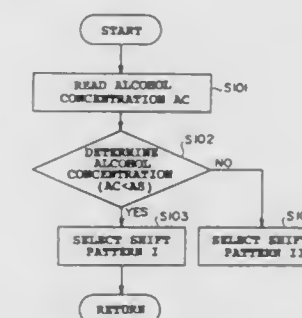
Filed Jan. 18, 1991, Ser. No. 643,569

Claims priority, application Japan, Jan. 24, 1990, 2-15418

Int. Cl.⁵ B60K 41/06

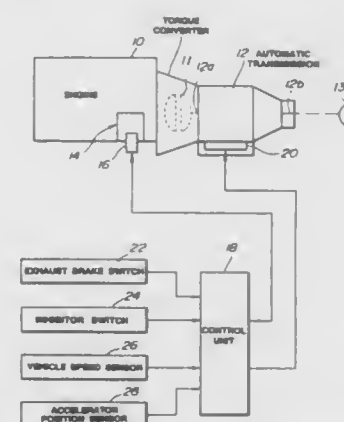
U.S. Cl. 74—861

5 Claims



1. In a motor vehicle having an engine and an automatic transmission, the automatic transmission having an input shaft and an output shaft and being shiftable to an engine brake running state wherein a direct motion connection is established between the input and output shafts, the motor vehicle also having an exhaust brake system:

- means for generating a command for the engine brake running state; and
- means for rendering the exhaust brake system inoperable temporarily for a predetermined period of time when a predetermined shift is in progress in the automatic transmission after said command has been generated.

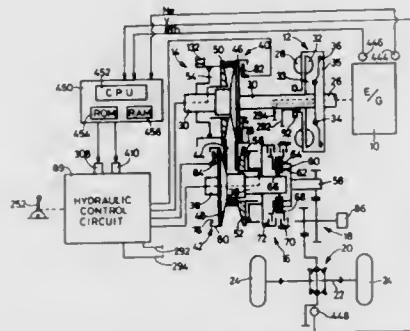


1. A power transmitting system for a motor vehicle having an engine, a drive wheel, and a shift lever having a low-gear position, and a high-gear position for normal cruising, the

system including a continuously variable transmission, a reversing device, and a hydraulic control apparatus for controlling a speed ratio of the transmission, the transmission having an input and an output shaft and a hydraulic actuator, said system comprising:

means for producing a required output pressure corresponding to a currently required acceleration value of the vehicle;

a shift control valve device for controlling said hydraulic actuator to change a speed ratio of said transmission, based on at least said required output pressure, such that a speed of said input shaft of said transmission increases with an increase in said currently required acceleration value and such that the speed of said input shaft is higher when said shift lever is placed in said low-gear position than when said shift lever is placed in said high-gear position;



said reversing device being disposed downstream of said transmission as seen in a forward power transmitting direction from said engine toward said drive wheel; means for producing a modified speed-ratio pressure which varies with said speed ratio when said speed ratio is higher than a predetermined value, and which is held constant when said speed ratio is lower than said predetermined value; and pressure selecting means for applying said required output pressure to said shift control valve device while said shift lever is placed in said high-gear position, and applying said modified speed-ratio pressure to said shift control valve device while said shift lever is placed in said low-gear position and when said required output pressure is lower than said modified speed-ratio pressure.

5,088,356 AUTOMATIC TRANSMISSION HYDRAULIC CONTROL SYSTEM

Shigeo Takahashi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 1, 1990, Ser. No. 590,785

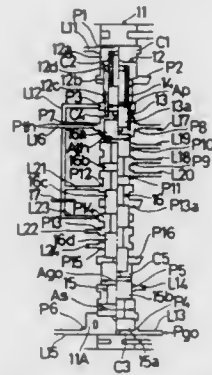
Claims priority, application Japan, Sep. 30, 1989, 1-253750
Int. Cl. B60K 41/14

U.S. Cl. 74—868

5 Claims

1. An automatic transmission control system comprising:
a shift valve,
a valve body,
a valve spool in said valve body and having a land urged by a throttle pressure in a predetermined direction,
a sleeve disposed in said valve body at an end of said spool,
a plunger disposed in said sleeve and in contact with said end of said spool,
a return spring disposed between said plunger and said sleeve and compressed by said throttle pressure acting on said plunger and by a governor pressure acting on said spool and said plunger, and
an area of said plunger acted on by said throttle pressure being smaller than an area of said land acted on by said throttle pressure,

whereby said spool moves against said throttle pressure to upshift said transmission when said governor pressure



exceeds a predetermined value in relation to said throttle pressure.

5,088,357 AUTOMATIC TRANSMISSION CONTROL SYSTEM Shinya Kamada, and Hidehiko Mishima, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

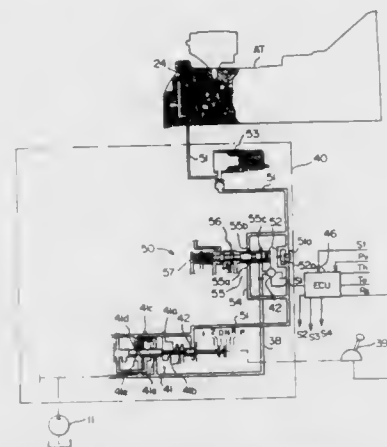
Filed Jan. 25, 1991, Ser. No. 645,882

Claims priority, application Japan, Jan. 25, 1990, 2-16445;
Mar. 9, 1990, 2-59595

Int. Cl. F16H 61/06

U.S. Cl. 74—868

14 Claims



1. A hydraulic control system for a planetary type automatic transmission of an engine, shiftable into at least a reverse range and a drive range having a plurality of forward speed gear stages by selectively coupling a plurality of frictional coupling means, including reverse coupling means, the hydraulic control system comprising:

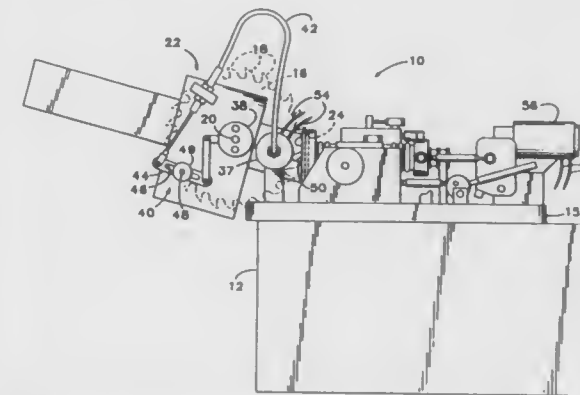
a hydraulic control circuit for selectively applying hydraulic pressure to the plurality of frictional coupling means so as to couple necessary frictional coupling elements to shift the automatic transmission into a desired range, said hydraulic control circuit including at least one shift valve for providing a desired one of said forward speed gear stages; throttle means disposed in said hydraulic control circuit for controlling said hydraulic pressure applied to the reverse coupling means;
a bypass circuit for applying said hydraulic pressure, bypassing said throttle means, to said reverse coupling means; and
control means for actuating said at least one shift valve, to selectively provide the desired one of said forward speed gear stages, and to open said bypass circuit when a specific operating condition of the automatic transmission of the

engine is created, thereby applying said hydraulic pressure through said bypass circuit to said reverse coupling means so as to rapidly achieve a coupling of said reverse coupling means.

5,088,358 AUTOMATIC DUAL-SIDE SAW BLADE GRINDER HAVING COMMON BLADE ADVANCEMENT AND CLAMP ACTUATOR AND METHOD OF USING SAME James Enter, 23429 NE, 29th Ave., Ridgefield, Wash. 98642 Filed Mar. 4, 1991, Ser. No. 664,088 Int. Cl. B23D 63/14

U.S. Cl. 76—75

13 Claims



1. A side grinder for sharpening the teeth of a circular saw blade comprising:

- (a) means for rotating the saw blade to advance a tooth to a grinding position;
- (b) means for clamping the saw blade, subsequent to rotation thereof, for preventing side-to-side movement of the saw blade during grinding;
- (c) wherein said means for rotating and said means for clamping comprise a single linear actuator.

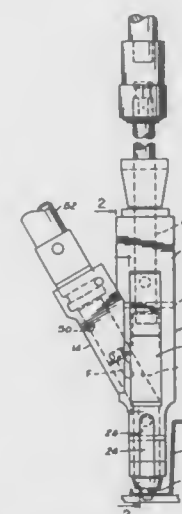
5,088,359 FASTENER NOSE PIECE FEEDER Edward N. Hockman, Auburn Hills, Mich., assignor to Clyde Corporation, Rochester Hills, Mich.

Filed Jul. 10, 1990, Ser. No. 550,663

Int. Cl. B25B 23/10

U.S. Cl. 81—57.37

4 Claims



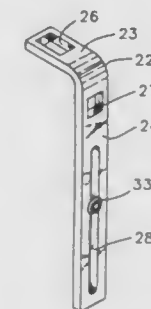
1. A nose piece assembly for feeding fasteners having a head and a shank, comprising a body having an elongated first

passage therein, said first passage having an outlet at one end thereof, retainer means adjacent said outlet for releasably retaining a fastener oriented with its shank extending toward the outlet from the head thereof, means providing said first passage with a fastener inlet at a point spaced from said outlet, means providing a second passage opening into said inlet and extending toward said outlet at an acute angle to said first passage to introduce a plurality of such fasteners into said inlet of said first passage one at a time and with the shank extending toward said outlet, means for guiding a fastener into said inlet so that it will enter said first passage without jamming and with its shank leading its head until it reaches said outlet for retention by said retainer means, said guiding means comprising a pair of jaws, means mounting said jaws on said body for pivotal movement from an operative fastener guiding position to a retracted position, means urging said jaws to said operative position thereof, said jaws when in said operative position cooperating with one another to define a fastener guide having recessed wall portions of said jaws forming a channel from said second passage to said first passage, and a driver carried by said body and movable forward in said first passage to expel from said outlet a fastener held by said retainer means, said jaws having camming surfaces in the path of forward movement of said driver when said jaws are in said operative position thereof, and said driver during forward movement toward said outlet engaging said camming surfaces and moving said jaws to said retracted position to permit said driver to pass between them.

5,088,360 UNIVERSAL LOCK-ON WRENCH Dennis N. Lish, 2501 Greenbrier La., La Habra, Calif. 90631 Filed Nov. 1, 1990, Ser. No. 607,722 Int. Cl. B25B 13/06

U.S. Cl. 81—180.1

3 Claims



1. In a wrench of the type having an elongated body which is formed into a right angle forming a short leg and a long leg, said short leg having a first socket formed therein and said on leg having a second socket formed therein and disposed near one end thereof; the improvement comprising:

said long leg having an overly elongated slot having opposing ends each of which are spaced from said second socket and from the other end of said long leg thereof respectively;
a slidable stop disposed within said slot; and
means are provided to secure said stop in a respective place along said slot.

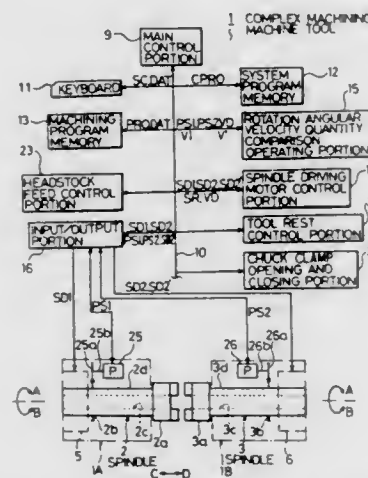
5,088,361 MACHINING CONTROL APPARATUS IN A MACHINE TOOL

Hiroshi Kojima, Aichi; Keikichi Sakata, Hiroshima; Seigo Watanabe, Gifu, and Yukio Mitsukuchi, Aichi, all of Japan, assignors to Yamazaki Mazak Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 310,831, Feb. 8, 1989, abandoned. This application May 15, 1991, Ser. No. 701,631

Claims priority, application Japan, Feb. 9, 1988, 63-28488
Int. Cl.⁵ B23B 13/04

U.S. Cl. 82-127

4 Claims



1. A machining control apparatus in a machine tool, comprising:

first and second headstocks disposed so as to face each other, said first and second headstocks having first and second workpiece spindles rotatably supported thereby, respectively, at least one of said headstocks being free to move only in the direction of the central axis of said workpiece spindles, said first and second workpiece spindles being connected to respective spindle driving motors, said first and second workpiece spindles having first and second chucks, respectively, and said chucks being openable and closable such that said chucks are able to hold and release a workpiece to be machined;

first and second tool rests corresponding to said first and second headstocks, respectively, said tool rests being free to be moved in at least a direction perpendicular to said direction of said central axis of said first and second workpiece spindles;

said machine tool being capable of performing first and second machining routines on one or more than one workpiece being held by and between said first and second workpiece spindles with said first and second chucks according to a machining program;

a rotational speed digital detection means connected to said first and second workpiece spindles for detecting the rotational speed of said workpiece spindles and outputting the rotational speed of said workpiece spindles as digital signals;

a rotational speed comparison and operation means for comparing said rotational speeds of said workpiece spindles on the basis of said digital signals outputted from said rotational speed digital detection means and outputting an operation signal;

a spindle driving motor control means for controlling said first and second spindle driving motors according to said operation signal from said rotational speed comparison and operation means such that the rotational speeds of said first and second workpiece spindles are equal;

a headstock feed control means for driving and controlling at least one of said first and second headstocks in said direction of said central axis of said workpiece spindles;

a chuck drive and control means for driving and controlling the opening and closing of said first and second chucks; said first and second workpiece spindles having respective through holes therein such that said through holes penetrate said workpiece spindles in the direction of said central axis; and

a workpiece pulling unit disposed on the opposite side of said chuck of at least one of said workpiece spindles such that a machined workpiece held by said workpiece spindle having said workpiece pulling unit is removed passing through the inside of said through hole.

5,088,362

DRIVE FOR WORKPIECE SPINDLE OF MACHINE TOOL

Erhard Schalles, Bielefeld, Fed. Rep. of Germany, assignor to Gildemeister Aktiengesellschaft, Bielefeld, Fed. Rep. of Germany

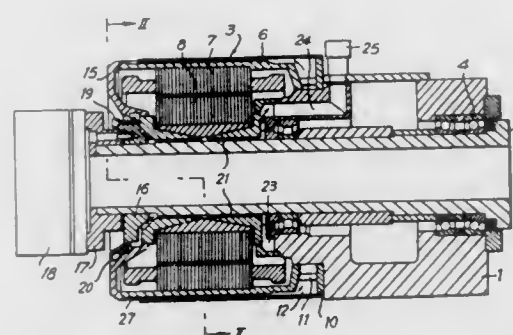
Filed Jan. 29, 1990, Ser. No. 472,360

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1989, 3902592

Int. Cl.⁵ B23B 19/02; H02K 9/00

U.S. Cl. 82-142

9 Claims



1. A drive for workpiece spindle of a machine tool, comprising a drive motor arranged on a free end of a workpiece spindle, said drive motor including a motor housing, a rotor mounted on the workpiece spindle and a stator arranged in said motor housing, said motor housing being connected with a spindle box and having a motor cover; and means forming cooling medium passages between said motor housing and said motor cover, between the spindle box and said rotor.

5,088,363

METHOD AND APPARATUS FOR AN AUTOMATIC SAWMILL

Aaron U. Jones, 1880 McLean Blvd., Eugene, Oreg. 97405; Vincent M. Howard, Eugene, Oreg.; Edward A. Kohler, Eugene, Oreg.; Mark L. Carter, Springfield, Oreg.; Edward A. Komori, Surrey; Ralph Wijesinghe, Vancouver, both of Canada, and Ronald W. McGeebee, Redwood Valley, Calif., assignors to Aaron U. Jones, Eugene, Oreg.

Continuation of Ser. No. 89,489, Aug. 21, 1987, abandoned. This application Jun. 20, 1990, Ser. No. 541,092

Int. Cl.⁵ B27B 31/02, 31/06

U.S. Cl. 83-35

38 Claims

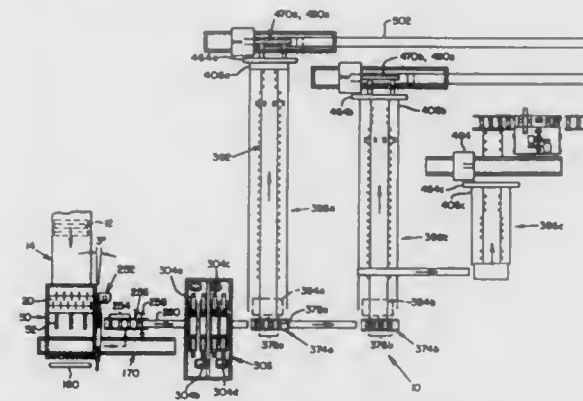
1. A method of sawing logs comprising:

gripping a log at ends thereof and sawing the same lengthways into two sections each having the same length as the log,

rotating the log to deposit a first of said sections flat side down,

sawing the first section into further horizontal pieces with respect to a predetermined level on which said flat side rests,

further rotating the second of said sections and depositing the second section flat side down, and



sawing said second section into further horizontal pieces with respect to a predetermined level on which the flat side of the second section rests.

5,088,364

WORKPIECE HANDLING SYSTEM, PARTICULARLY CUT-OFF PIECES FROM ROD OR RAIL-SHAPED STOCK MATERIAL, AND METHOD

Armin Stolz, Renchen, Fed. Rep. of Germany, assignor to Keuro Maschinenbau GmbH & Co. KG, Achern-Gamshurst, Fed. Rep. of Germany

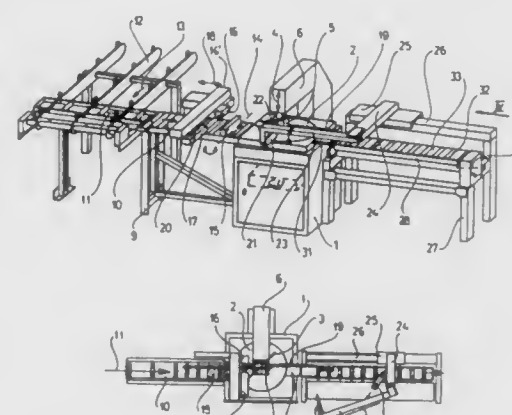
Filed Jul. 25, 1990, Ser. No. 558,148

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1989, 3927530

Int. Cl.⁵ B23D 47/04

U.S. Cl. 83-43

21 Claims



1. A method of operating a cut-off saw system for severing elongated stock material to cut workpieces or other cut elements therefrom, said system including a work table (2) formed with a slit for a cutting saw, the slit defining a cutting plane (3); supply feed means (10) for feeding said stock material (40) in a feeding direction (11) towards the cutting plane (3); guide means (19) defining a guide plane for guiding said stock material, before severing, and said cut-off elements, located downstream, with respect to said feeding direction (11), of the cutting plane (3); positioning means (21, 23, 30) movable towards the guide means and engaging said stock material prior to severing thereof for positioning said stock material against the guide means (19); and hold-down means (4, 5) for holding the stock material against the work table (2).

comprising the steps of feeding a predetermined length of stock material (40) past said cutting plane and parallel to said guide means (19); locating the positioning means (21) laterally against said stock material to press said stock material against said guide means (19); moving the hold-down means (5) against the stock material to clamp the stock material against the work table (2); retracting the positioning means (21) and removing it from engagement with said clamped stock material; severing the stock material to form a workpiece (41) while the stock material and the then severed workpiece are clamped against the work table by said hold down means; retracting said hold down means (5) to release the now severed workpiece; moving said positioning means (21) counter said feeding direction and engaging said positioning means behind the cut surface of the cut-off element; longitudinally moving the positioning means (21) in a removal direction essentially in line with said feeding direction (11) to a removal position to thereby rake said cut-off element (41) to the removal position; and disengaging said positioning means (21) from the cut-off element and returning said positioning means to a position in the vicinity of said cutting plane and laterally with respect to said stock material.

5,088,365

NOTCHING APPARATUS FOR A DOUBLE CUT DIE SET

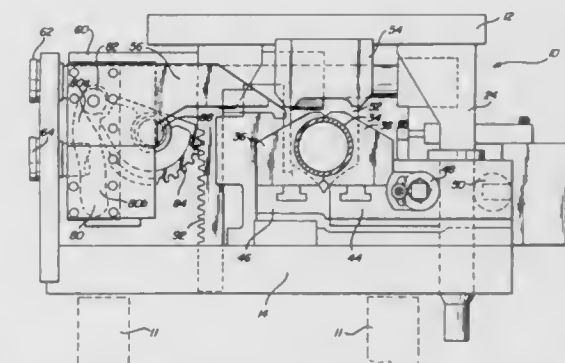
John H. Nolan, Mt. Clemens, Mich., assignor to Alpha Industries, Inc., Novi, Mich.

Continuation of Ser. No. 465,416, Jan. 16, 1990, abandoned. This application Dec. 27, 1990, Ser. No. 634,777

Int. Cl.⁵ B23D 21/00

U.S. Cl. 83-300

21 Claims



1. A cut-off die set of a double cut type used to sever sections of an elongated stock comprising: an upper and lower platen interconnected by a plurality of guide rods and bushings; a shearing blade mounted on one of said platens; a cross slide mounted for reciprocal motion on one of said platens; a cam track located on said cross slide; and means for mounting a notching blade on said cross slide; a first toothed member mounted to one of said platens; a second toothed member meshingly engaging said first toothed member; and a drive member mounted to said second toothed member, said drive member engaging said cam track and operative in response to relative movement between said platens to reciprocate said cross slide.

5,088,366

PINFEED HOLE PUNCH ASSIST

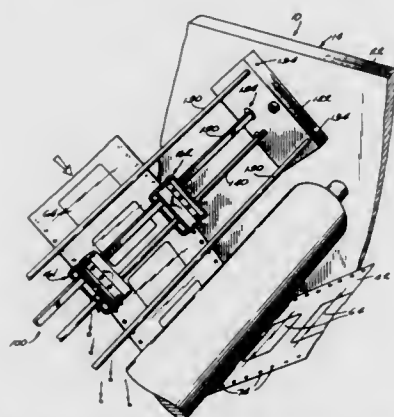
Marvin E. Weiss, Menomonee Falls, Wis., assignor to Tailored Label Products, Inc., Menomonee Falls, Wis.

Filed Oct. 1, 1990, Ser. No. 591,075

Int. Cl.⁵ B26F 1/00

U.S. Cl. 83—326

20 Claims



1. A label press for manufacturing labels on an elongated web of release liner having thereon label stock and having a longitudinal axis, said press comprising means for moving the web in the direction of the axis, means for forming labels from the label stock, means for cutting pinfeed holes in the web, and means located downstream of said cutting means for removing cut-outs from said pinfeed holes, said removing means including an endless surface having thereon a plurality of projections adapted to extend into said pinfeed holes to remove cut-outs, said surface moving along an endless path in response to movement of the web.

5,088,367

ROTARY DIE WITH ADJUSTABLE BLADE SEGMENT

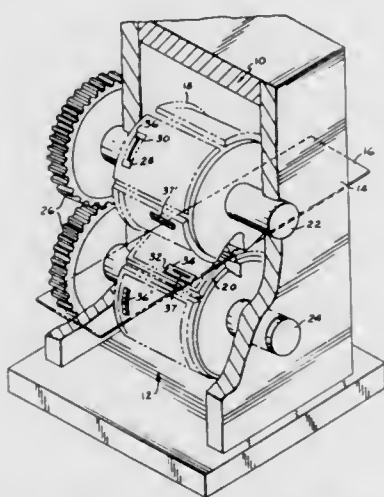
Vincenzo Cracchiolo, Shelby Township, Macomb County; Terry L. Hawley, Howell; Robert E. Moore, Oxford; David D. Radlick, and Frank S. Stuben, both of Sterling Heights, all of Mich., assignors to Zerand-Bernal Group, Inc., Troy, Mich.

Filed Jul. 30, 1990, Ser. No. 559,057

Int. Cl.⁵ B26D 1/62; B31B 1/14

U.S. Cl. 83—345

3 Claims



1. A pair of rotary die cylinders journaled for rotation in axially and circumferentially adjusted positions relative to one another and having first co-acting cutting blades fixed on the die cylinders and adapted to cut a web of material along a

predetermined line of severance defining a closed figure and second co-acting cutting blades adapted to cut such web of material in an area within said line of severance, each of said die cylinders comprising a cylindrical body, a recess in one of said cylindrical bodies, a die segment receivable in said recess in said one cylindrical body, one of said second blades being carried by said die segment, means for guiding the adjustment of said die segment in said recess in at least one of the axially and circumferentially extending directions of said one cylindrical body, means supporting said die segment in said recess in said one cylindrical body in adjusted position with said one second cutting blade projecting radially outwardly, means for releasably securing said die segment in adjusted position in said recess, and means for shifting said die segment in said recess in said at least one of the axially and circumferentially extending direction when said securing means is released and preventing adjustment in any other directions.

5,088,368

CUTTING DEVICE FOR MATERIALS SUCH AS GAUZE

Louis Marion, Vieux Bourg de Condamine, Saint Victor Sur Loire, France

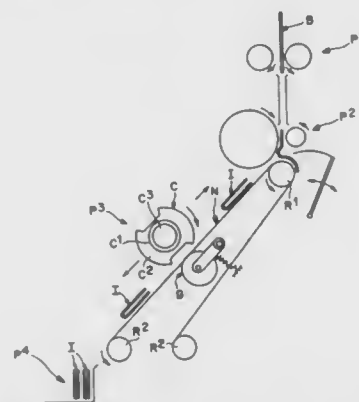
Filed Nov. 29, 1989, Ser. No. 443,704

Claims priority, application France, Dec. 1, 1988, 88 16489

Int. Cl.⁵ B26D 1/62; B23D 25/12

U.S. Cl. 83—348

4 Claims



1. A cutting device for materials such as gauze, comprising: a circular knife having at least one cutting edge, the knife being rotatable in correspondence with a succession of swabs moving along a path, the swabs having a folded edge disposed toward a direction of movement; and, a counter roller which is elastically biased against the knife and disposed for passage of the moving swabs between the counter roller and the knife, whereby an incision is made in the moving swabs, the incision being Y-shaped and defining a leg extending from the folded edge to a central part of the swab, the incision further defining arms extending from the leg at the central part.

5,088,369

BLADE TENSIONING DEVICE FOR SCROLL SAW

Verle L. Rice, Harrisonville, and Richard Keener, Garden City, both of Mo., assignors to R. B. Industries, Inc., Harrisonville, Mo.

Filed May 28, 1991, Ser. No. 706,176

Int. Cl.⁵ B23D 49/00; B27B 19/02

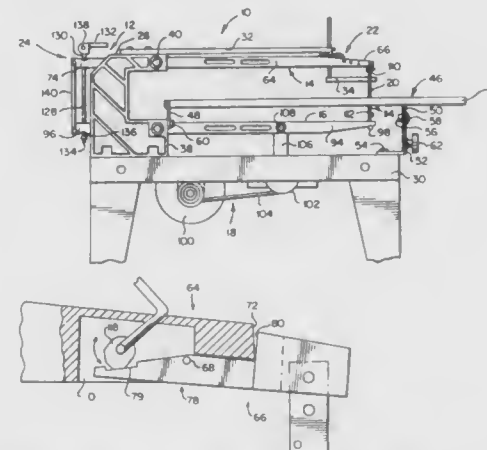
U.S. Cl. 83—783

7 Claims

1. A scroll saw comprising: a frame, including a pair of vertically spaced pivot axes, said frame having a work surface including an aperture; an upper first arm pivotally mounted on said frame, said first arm having an apertured inboard section pivotally coupled with an outboard section; a lower second arm pivotally mounted on said frame in

spaced, generally parallel relationship to said first arm, said second arm having first and second end portions; power means for reciprocating said arms about said pivot axes;

a saw blade extending through said aperture in the work surface, said blade presenting a pair of opposed ends, one end being coupled with said first end portion of said lower arm, the other blade end being coupled with said outboard section of said first arm; and



camming means pivotally coupled with said first arm at a point inboard of the pivot axis of said outboard section, and presenting a plurality of camming surfaces which are engageable with said outboard section to move the latter about its pivot axis, whereby said blade is selectively shifted between a plurality of tensioned positions and a relaxed position.

5,088,370

SHEET MATERIAL CUTTING APPARATUS

Takajiro Kondo, Yonago, Japan, assignor to Hitachi Metals Ltd., Tokyo and Yasugi Seimitsu, Ltd., Yasugi, both of Japan

Filed Oct. 26, 1990, Ser. No. 603,379

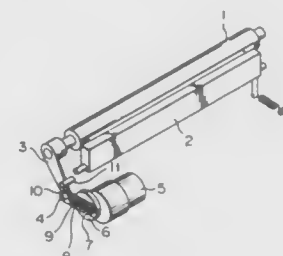
Claims priority, application Japan, Nov. 10, 1989, 1-292892;

Aug. 2, 1990, 2-205463

Int. Cl.⁵ B26D 5/14

U.S. Cl. 83—528

5 Claims



1. A sheet material cutting apparatus comprising a movable blade and a fixed blade, drive means for reciprocally driving the movable blade, said drive means including a connecting lever, a drive arm having a first end connected to said movable blade and a second end having an arm shaft, an elastically deformable groove provided in said connecting lever, a rotary shaft for connecting one end of said connecting lever to a rotor, and hole means formed in said connecting lever for

receiving said arm shaft, and wherein said arm shaft is elastically fitted into said hole means whereby, upon an occurrence of an overload condition in the cutting apparatus, the arm shaft is displaced out of said hole means so as to interrupt the drive of said movable blade.

5,088,371

SAW TOOTH AND HOLDER

Charles D. MacLennan, 153 Cote St-Charles, Hudson Heights, Quebec, Canada J0P 1J0

Division of Ser. No. 578,165, Sep. 6, 1990, which is a

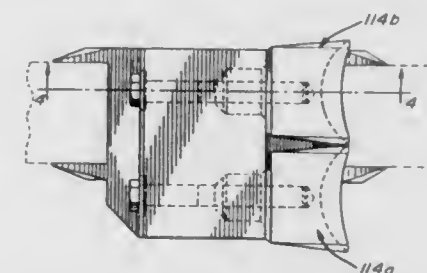
continuation-in-part of Ser. No. 469,853, Jan. 23, 1990,

abandoned. This application Jul. 9, 1991, Ser. No. 727,188

Int. Cl.⁵ B27B 33/08

U.S. Cl. 83—840

5 Claims



1. A saw tooth and tooth holder combination for a cutting saw, wherein the saw includes a substrate and the holder is adapted to be releasably fastened to the substrate, the holder including a tooth receiving seat which includes a first platform surface and an abutment surface at an angle thereto formed in a body of the holder, bore means extending in the body through the abutment surface, and a pair of teeth mounted on the tooth seat in side-by-side relationship, with each tooth being identical and having a head including a small end and a large end with divergent surfaces therebetween, the small end being adapted to fit against the abutment surface and divergent surfaces adapted to fit on the platform; shank means passing through the bore means to each head and attached thereto, each of the tooth heads including a concave recess at the large end thereof and forming cutting edges at the intersections of the concave recess and the divergent surfaces, whereby each tooth is capable of being rotated about its axis to present exposed cutting surfaces.

5,088,372

SLICER BLADE FOR CYLINDRICAL POTATO STRIPS

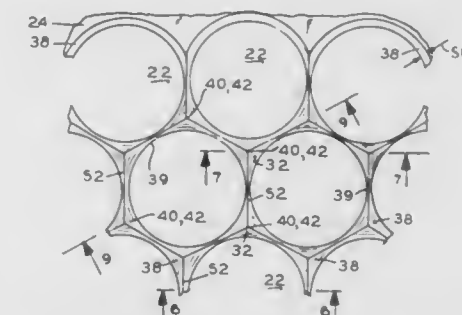
Michael E. Lund, 15050 Keno-Worden Rd., and William L. Sharrar, 3840 Crest, both of Klamath Falls, Oreg. 97603

Filed Jul. 5, 1991, Ser. No. 726,326

Int. Cl.⁵ B26D 1/02

U.S. Cl. 83—858

9 Claims



1. A slicer blade for the preparation of cylindrically-shaped potato strips, comprising: a plate member, having a plurality of cylindrical holes

formed therethrough, which circularly intersect said plate member, said cylindrical holes being spaced in close proximity to adjacent cylindrical holes;

b. each said cylindrical hole, at said circular intersection with plate member, being formed with a bevel disposed continuously about said circular intersection, said bevel having a sloping surface which intersects sloping surfaces from adjacent cylindrical holes so as to form a sharp border between said cylindrical hole and adjacent cylindrical holes.

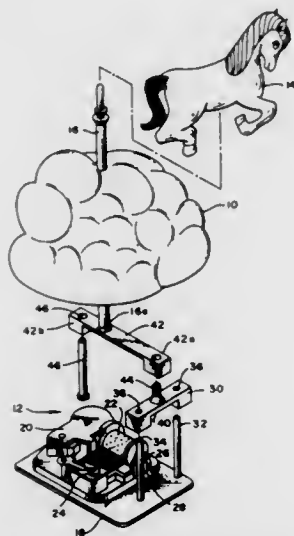
5,088,373

MOVING ORNAMENTAL DISPLAY ASSEMBLY

Jack Hou, P.O. Box 78-5, Taipei, Taiwan
Filed Sep. 12, 1990, Ser. No. 581,305
Int. Cl.⁵ G10F 1/06

U.S. Cl. 84—95.2

8 Claims



1. An ornamental display assembly comprising:
 - a) a base member;
 - b) a music box mechanism having a rotating power output shaft;
 - c) a crank mechanism operatively associated with the rotating output shaft, the crank mechanism having a cam element located eccentrically with respect to the rotating output shaft;
 - d) a follower member operatively associated with the cam element such that rotation of the output shaft causes reciprocating motion of the follower member;
 - e) an arm member having a first end attached to the follower member such that the arm member reciprocates with the follower member, and a second end;
 - f) first guide means operatively associated with the arm member;
 - g) at least one ornamental object; and,
 - h) means to attach the at least one ornamental object to the arm member.

5,088,374

TREMOLO DEVICE FOR A GUITAR

Yatsuse Saijo, Tokyo, Japan, assignor to Fernandes Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,525

Claims priority, application Japan, Feb. 26, 1990, 2-42357

Int. Cl.⁵ G10D 3/00

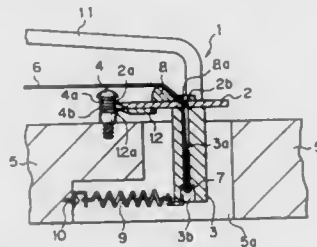
U.S. Cl. 84—313

6 Claims

1. A tremolo device for a guitar comprising:
 - (1) base plate means pivotably mounted relative to a guitar body, said base plate means including a flat plate and a bar secured on an under surface of said flat plate, said bar extending downward from said flat plate into a guitar

recess provided in said guitar body and being adapted to receive anchor strings of said guitar;

- (2) spring means for urging said base plate means in one direction of rotation opposite to a rotating force applied to said base plate means in another direction of rotation due to a tension of said guitar strings;
- (3) a tremolo arm secured to said base plate means and manipulated by a guitarist to pivot said base plate means to thereby vary a tension applied to said strings, whereby a tremolo effect is produced;
- (4) a first fulcrum part provided in said base plate means for a pivotal movement thereof by which a tone of said guitar is lowered;
- (5) a second fulcrum part provided in said base plate means independently of said first fulcrum part for a pivotal movement of said base plate means by which a tone of said guitar is raised;
- (6) receiving means provided on said guitar body and con-



tactable with said first fulcrum part and said second fulcrum part, to thereby provide two fulcrums about which said base plate means can be pivoted;

said base plate means coming into contact with said receiving means at both said first fulcrum part and said second fulcrum part when said tremolo arm is inactivated, and said base plate means coming into contact with said receiving means at only said first fulcrum part and said second fulcrum part is separated from said receiving means when said tremolo arm is activated in such a manner that said base plate means is rotated in said one direction of rotation over a stable position in which both of said fulcrum parts are in contact with said receiving means, and said base plate means coming into contact with said receiving means at only said second fulcrum part and said first fulcrum part is separated from said receiving means when said tremolo arm is activated in such a manner that said base plate means is rotated in said another direction of rotation over said stable position.

5,088,375

TREMOLO DEVICE FOR STRING MUSICAL INSTRUMENT

Yatsuse Saijo, Tokyo, Japan, assignor to Fernandes Co., Ltd., Japan

Filed Oct. 9, 1990, Ser. No. 594,760

Claims priority, application Japan, Oct. 9, 1989, 1-262182

Int. Cl.⁵ G10D 3/00

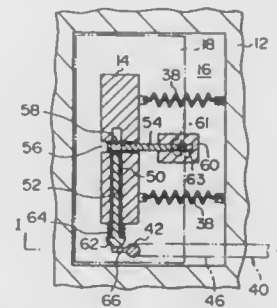
U.S. Cl. 84—313

9 Claims

1. A tremolo device for string musical instruments comprising:
 - a) a movable block member to which strings of a musical instrument are anchored, said movable block member being swingable about a swing axis perpendicular to the strings, and being provided with a counter balance tensile spring so that an equilibrium is established between a tension imposed by said counter balance tensile spring and a tension imposed on all of said strings, whereby the movable block member is kept at a neutral position;
 - a) tremolo handle rotatably attached to said movable block member so that said tremolo handle is rotatable between an operative position at which said tremolo handle can be manually operated by a player to produce a movement of

said movable block member about said swing axis to change the tension imposed on all of said strings and an inoperative position at which said tremolo handle cannot be accidentally touched by the player; and

a lock mechanism for locking said movable block member at



5,088,376

BASS DRUM ACOUSTIC MUFFLING APPARATUS

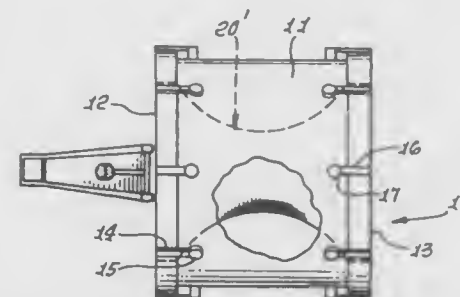
Scott F. Crago, 12566 Preston Way, Los Angeles, Calif. 90066, and Jeff E. Obermeyer, 469 Carroll Ave., Venice, Calif. 90291

Filed Nov. 23, 1990, Ser. No. 617,192

Int. Cl.⁵ G10D 13/02

U.S. Cl. 84—411 M

12 Claims



11. In combination with a bass drum having a curved side wall and two heads, sound muffling means comprising
 - (a) a pillow having longitudinally spaced opposite ends, the pillow received in the drum with said pillow ends engaging said heads, the pillow having a longitudinal length between said ends such that the pillow is slightly compressed between said heads,
 - (b) the pillow having lateral width which decreases away from at least one of said ends, toward that portion of the pillow midway between said ends,
 - (c) the pillow lateral width also decreasing from the other of said opposite ends toward said portion of the pillow midway between said ends,
 - (d) the pillow having laterally spaced opposite sides at least one of which has concave curvature along the longitudinal length of the pillow at said one side, and wherein the other of said sides also has concave curvature along the longitudinal length of the pillow, at said other side,
 - (e) the pillow having a surface which is outwardly and widthwise convex along the pillow longitudinal length and which engages the drum curved side wall which is concave toward the pillow.

5,088,377

HI-HAT CYMBAL CARRIER AND PROTECTOR

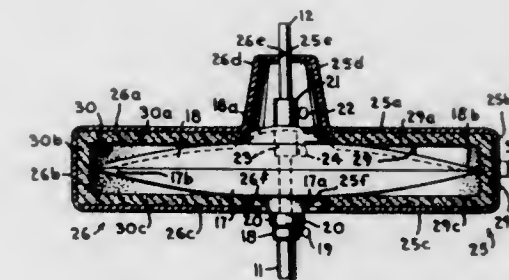
Frank A. Delecaris, 225 W. 124th St., Kansas City, Mo. 64145

Filed Jan. 9, 1991, Ser. No. 639,187

Int. Cl.⁵ G10D 13/02

U.S. Cl. 84—422.3

9 Claims



1. An enclosure for securing together and holding a pair of opposed, facing, hi-hat cymbals in face-to-face circumferential edge contact, comprising, in combination:
 - (1) a container having two essentially like, opposed, symmetrical mirror image halves, each with inner and outer sides thereto and moveable towards and away from one another to respectively enclose and then release said two facing cymbals,
 - (2) a hinge hinging together said container halves at one juncture thereof for pivotal arcuate movement therearound with respect to one another,
 - (3) a first one of said halves, when the two halves are opened around said hinge and substantially separated from one another, fittable over a substantial portion of the two, opposed, facing cymbals,
 - (4) the other, second one of said halves fittable over the substantial remainder of the two said cymbals when closed around said hinge towards and against the said first container half,
 - (5) the inner surfaces of each of said container halves substantially covered by a layer of cushioning material for engaging and protecting the outward surfaces and peripheral edges of said cymbals;
 - (6) openings in said container halves positioned substantially centrally of each one thereof operable to receive there-within the usual, generally outwardly extending, central portion of the paired, facing cymbals, should such be present and
 - (7) closure means on portions of each of said container halves spaced substantially away from said hinge operable to be engaged with one another when the two container halves are enclosing said cymbals and are closed against one another.

5,088,378

METHOD OF ADAPTING A TYPEWRITER KEYBOARD TO CONTROL THE PRODUCTION OF MUSIC

Marcus M. DeLaTorre, 4119 W. Missouri Ave., Phoenix, Ariz. 85019

Filed Nov. 19, 1990, Ser. No. 615,175

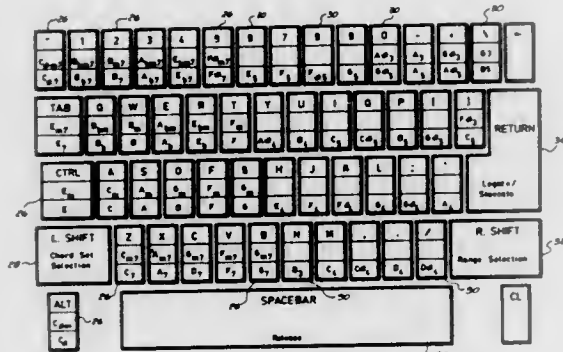
Int. Cl.⁵ G10H 1/00

U.S. Cl. 84—470 R

27 Claims

1. A method of emitting tones in response to the activation of keys included in a typewriter keyboard having a first set of keys ergonomically placed for operation by a first hand and a second set of keys ergonomically placed for operation by a second hand, said first and second sets of keys each having said keys thereof positioned within four rows wherein each of said rows includes a plurality of said keys, said method comprising the steps of:
 - monitoring said keys included in said first-hand and second-hand sets of keys to detect activations and deactivations thereof;
 - generating a chord, which results from a combination of at

least two of said tones, when said monitoring step detects activation of any key from said first-hand set of keys; and



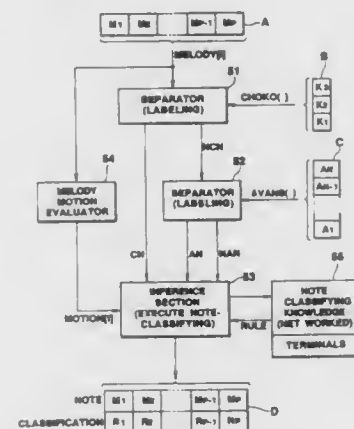
producing a melody note, which represents a single one of said tones, when said monitoring step detects activation of any key from said second-hand set of keys.

5,088,380
MELODY ANALYZER FOR ANALYZING A MELODY WITH RESPECT TO INDIVIDUAL MELODY NOTES AND MELODY MOTION

Junichi Minamitaka, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed May 17, 1990, Ser. No. 525,152
Claims priority, application Japan, May 22, 1989, 1-126705
Int. Cl.⁵ G10H 1/38, 7/00

U.S. Cl. 84—637

13 Claims



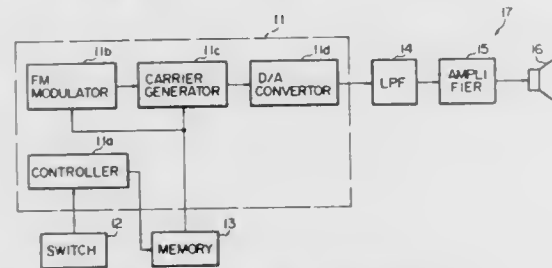
1. A melody analyzer for analyzing a given melody from a given chord and a given tonality, comprising:
available note generator means for generating a set of available note pitches from said chord and said tonality;
melody motion evaluator means for evaluating motions in said melody; and
melody note classifying means for classifying each note in said melody based on at least said set of available note pitches and said evaluated motions in said melody, the melody analyzer analyzing a melody in which a note in said set of available note pitches is freely used based on classification of notes by said classifying means.

5,088,379
ELECTRONIC MELODY GENERATING SYSTEM HAVING MEMORY SEPARATED FROM MELODY GENERATING UNIT

Manabu Komiyama, Shizuoka, Japan, assignor to Yamaha Corporation, Shizuoka, Japan
Filed Mar. 14, 1990, Ser. No. 493,263
Claims priority, application Japan, Mar. 24, 1989, 1-72384
Int. Cl.⁵ G10H 1/14, 7/00

U.S. Cl. 84—609

5 Claims

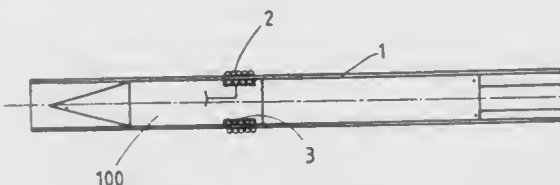


1. A melody generating system comprising
 - a) a switch unit operative to produce an activation signal,
 - b) an analog signal producing circuit integrated on a single semiconductor chip and coupled to said switch unit, said analog signal producing circuit being responsive to said activation signal for producing a read out controlling signal, said analog signal producing circuit being further responsive to a digital melody signal for producing an analog melody signal carrying pieces of melody information used for reproducing a melody,
 - c) a memory circuit storing the pieces of melody information and coupled to said analog signal producing circuit, said memory circuit being formed outside said single semiconductor chip, said memory circuit being responsive to the read out controlling signal for producing the digital melody signal indicative of said pieces of melody information, and
 - d) a sound unit coupled to said analog signal producing circuit and responsive to the analog melody signal for reproducing the melody.

5,088,381
PROJECTILE-LAUNCHER ACTUATED BY INDUCTION
Etienne Lamarque, Orleans; Jacques Rabuel, deceased, late of Paris by Jean Rabuel, Marcelle Jacquemin, legal representatives, and Jean Sikora, Olivet, all of France, assignors to Thomson-Brandt Armements, Boulogne Billancourt, France
Continuation of Ser. No. 390,889, Aug. 8, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,516
Claims priority, application France, Aug. 9, 1988, 88 10730
Int. Cl.⁵ F41F 3/04, 3/055

U.S. Cl. 89—1,814

10 Claims



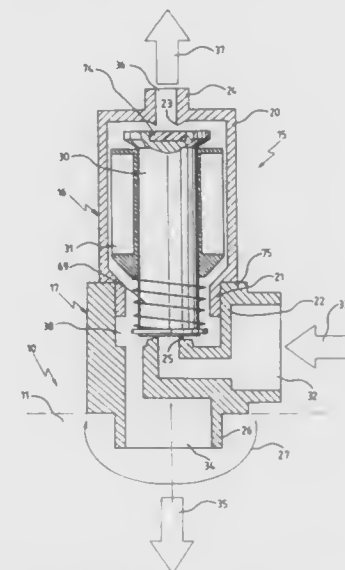
1. A projectile-launcher activated by induction, comprising a plurality of tubes for the guidance of projectiles, each fitted out, respectfully, with an induction coil and an armature winding capable of transmitting, by induction, signals and the energy needed for the warhead programming and firing up the projectiles;
wherein each of the guidance tubes is made of austenitic, nickel-alloy steel of the kind corresponding to U.S. Standard Designation AISI-304H or AISI-316L which is a metallic non-magnetic material, with high resistivity (ρ),

capable of fulfilling the guidance function through high mechanical strength while, at the same time, being transparent with respect to the induction phenomenon.

5,088,382
LINEAR UNIT
Wolf-Dieter Goedecke, Unterkirnach, and Victor Cobanciuc, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Filed Jan. 23, 1991, Ser. No. 644,986
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1990, 4001938
Int. Cl.⁵ F01L 25/08; F15B 13/00

U.S. Cl. 91—275

25 Claims



1. A linear unit with a cylinder, comprising
a pressure-fluid-actuated piston having two sides;
a cylinder having cylinder heads and a borehole, wherein the piston runs in the borehole of the cylinder;
a slider running at the cylinder;
a band connecting the piston to the slider and guided via deflection means at the cylinder heads;
valves screwed into the cylinder heads for supplying and discharging a pressure fluid into the borehole on the two sides of the piston;
swivelling screw fittings for screwing the valves into the cylinder heads;
a seat of the valve disposed in the swivelling screw fittings; at least one pressure-fluid connector branching off from the swivelling screw fittings.

5,088,383
MULTIPLEXED HYDRAULIC CONTROL SYSTEM WITH MULTIPLEXING VALVE HAVING PLANAR PORT ARRAY

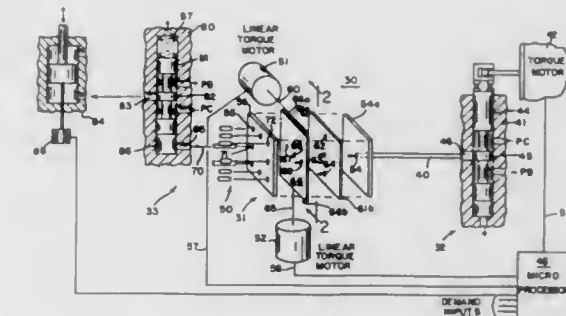
John W. Wardle, Roscoe; Plato J. Leeson; David G. Clay, both of Rockford, and Dale W. Sievert, Freeport, all of Ill., assignors to Woodward Governor Company, Rockford, Ill.
Filed Jan. 22, 1990, Ser. No. 468,353
Int. Cl.⁵ F15B 9/07, 9/09

U.S. Cl. 91—361

19 Claims

6. A multiplexed hydraulic control system having a plurality of channels for individually controlling the positions of a plurality of actuators in the respective channels in accordance with a corresponding plurality of electrical control signals, the control system comprising the combination of:
a multiplexing valve having a plurality of output ports arranged in a predetermined planar two-dimensional array,

each output port being connected to its associated hydraulic channel for passing hydraulic fluid thereto;
a hydraulic input selectively modulated in accordance with individual ones of the plurality of electrical signals;
multiplexing means responsive to a plurality of selector signals for selectively connecting the hydraulic input to individual ones of the hydraulic output ports; and

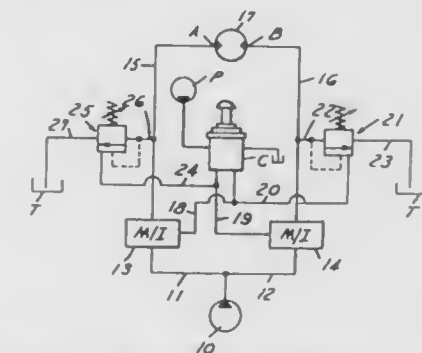


control means for controlling the multiplexing means in coordination with said electrical signals for distributing modulated hydraulic fluid to the associated channels under a program of control for positioning of said actuators.

5,088,384
HYDRAULIC ACTUATOR CONTROLLED BY METER-IN VALVES AND VARIABLE PRESSURE RELIEF VALVES
Kurt R. Lonnemo, Bloomfield Hills, Mich., assignor to Vickers, Incorporated, Troy, Mich.
Filed Aug. 30, 1989, Ser. No. 400,670
Int. Cl.⁵ F15B 11/04

U.S. Cl. 91—461

12 Claims



1. A hydraulic control system comprising
a hydraulic actuator having opposed openings adapted to alternately function as inlets and outlets for moving an element of the actuator in opposite directions, a pump for supplying fluid to the actuator,
pilot pressure operated meter-in valves to which fluid from the pump is supplied, a first pair of lines extending from the respective meter-in valves to the respective openings of the actuator,
a second pair of lines extending from the first pair of lines to tank and
a pilot pressure operated variable pressure relief valve positioned in each line of the second pair of lines and comprising the sole means for permitting flow from the actuator to tank,
each said pilot pressure operated variable pressure relief valve being such that at zero pilot pressure the pressure relief setting is at a maximum and as pilot pressure in-

creases, the pressure relief setting will be proportionally lowered such that deceleration of the load is controlled solely by the pressure of flow from the actuator, a controller for alternately actuating a respective meter-in valve for controlling the direction of movement of the load, said controller being constructed and arranged such that when it is actuated to supply pilot pressure to one of the meter-in valves for supplying fluid through one of said first pair of lines to one of the openings of the actuator, the controller also provides pilot pressure to the pilot pressure controlled variable relief valve positioned in the other line of the second pair of lines associated with the other of said first pair of lines to the other opening of actuator to control the flow out of the other opening so that the controller substantially simultaneously supplies fluid to the actuator and controls the pressure of flow from the actuator thereby simultaneously controlling the driving function of the meter-in valve and the braking function of the pressure of flow from the actuator, and such that when the controller is moved from neutral in either direction, pilot pressure will progressively lower the setting of the variable pressure relief valve in the other line to control the pressure of flow from the actuator to decrease the braking of the load while the pilot pressure progressively moves the meter-in valve to increasingly engage and supply flow and pressure to accelerate the load, and such that when the controller is actuated to return toward neutral, the decreasing pilot pressure progressively increases the setting of the variable pressure relief valve to control the pressure of flow from the actuator to progressively increase the braking as well as progressively disengage the respective meter-in valve.

5,088,385

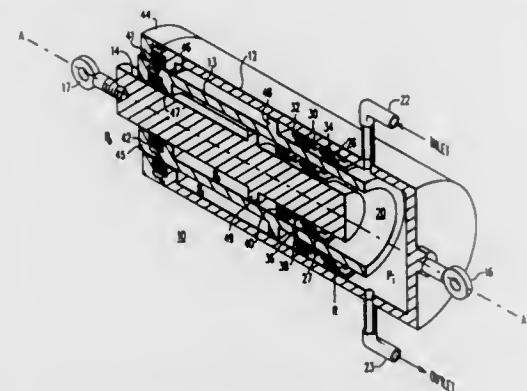
ACTUATOR APPARATUS WITH SECONDARY SEAL MOTION

Bobby D. McKee, San Jose, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1991, Ser. No. 656,531

Int. Cl.⁵ F01B 31/00

U.S. Cl. 92—130 R



1. Actuator apparatus, comprising:
 - a) a plurality of concentric cylinders moveable relative to one another along a longitudinal axis;
 - b) a flexible sealing ring for each adjacent pair of said cylinders and positioned between, and in sliding contact with both said adjacent cylinders and being coaxial with said longitudinal axis;
 - c) spring means positioned between each adjacent pair of said cylinders;
 - d) a coaxial, longitudinally moveable motion ring for each adjacent pair of said cylinders and positioned on one side of said sealing ring between said adjacent cylinders and moveable against said spring means;

- e) means for limiting movement of said spring means;
- f) means for supplying and removing a pressurized fluid to the volume between said cylinders;
- g) the pressure of said fluid being of a relatively low value, in a first mode of operation, to cause longitudinal movement of said flexible sealing ring and said motion ring against said spring means whereby when said pressure is relieved, said flexible sealing ring and said motion ring will return to their original position;
- h) the pressure of said fluid being of a relatively higher value, in a second mode of operation, to cause said relative movement of said cylinders.

5,088,386

PNEUMATIC BRAKE BOOSTER

Jean-Pierre Gautier, Ulysse Verbo, both of Aulnay-sous-Bois, and Miguel Perez, Argenteuil, all of France, assignors to Bendix Europe Services Techniques, Drancy, France

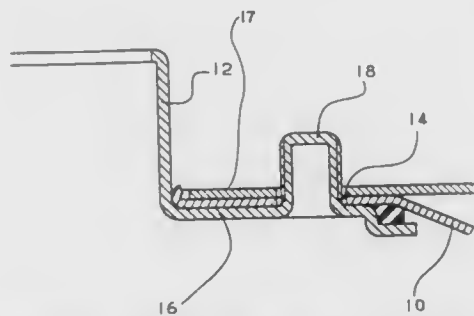
Filed Nov. 9, 1990, Ser. No. 611,580

Claims priority, application France, Nov. 30, 1989, 89 15774

Int. Cl.⁵ F01B 29/00

U.S. Cl. 92—161

3 Claims



1. A pneumatic brake-boost located in a vehicle between a fixed part of the vehicle and a master cylinder and comprising a casing on which is formed a well which houses an operating valve means, a first wall having at least one opening cooperating with a first means for fastening the casing on the fixed part of the vehicle, a second wall having at least one opening cooperating with a second means for fastening the master cylinder on the casing, at least one annular member being disposed in the casing against the first and/or second walls, the first and/or second fastening means comprising at least one projecting portion of the annular member and the projecting portion being made of one piece with the annular member, the projecting portion of the annular member passing through the respective opening of the first and/or second walls and having an external screw thread.

5,088,387

FLUIDIZED BED FLUID PRESSURE REGULATOR

Moye Wicks, III, and Boyd B. Moore, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 439,914, Nov. 20, 1989, abandoned.

This application May 20, 1991, Ser. No. 703,581

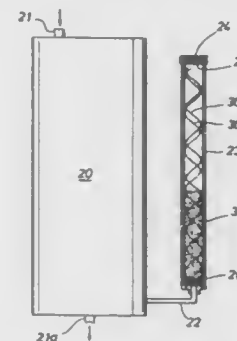
Int. Cl.⁵ B64D 13/02

U.S. Cl. 34—15

23 Claims

1. A method for venting an enclosed space, said method comprising:
 - supplying a constant flow of purge fluid to the space;

venting said purge fluid through a fluidized bed column containing a preset quantity of particles; and maintaining a



positive known reference back pressure on the space with respect to the atmosphere surrounding the space.

5,088,388

FRESH-AIR INTAKE WITH ADJUSTABLE AIR DEFLECTORS

Ronald E. Schaefer, 5818 Michael Ct., St. Cloud, Minn. 56301

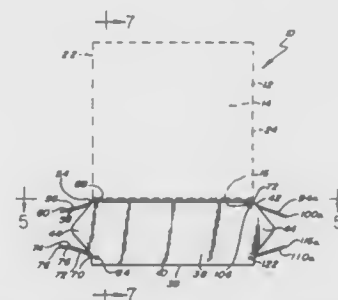
Continuation of Ser. No. 508,591, Apr. 13, 1990, abandoned.

This application Jul. 29, 1991, Ser. No. 737,814

Int. Cl.⁵ F24F 13/08

U.S. Cl. 454—271

19 Claims



1. An all season adjustable air intake for an agriculture building with a ceiling and a floor adapted to adjust the volume, velocity and direction of fresh air which is drawn from outside through the intake and into the building, comprising:
 - (a) a hollow building body extending through the building with an opening directed into the building for bringing fresh air into the building from the outside;
 - (b) an air intake housing attachable to the building body on the inside of the building at the body opening having an air intake housing opening into the building with opposing edges at the air intake housing opening through which fresh air from outside, through the body, may flow; and
 - (c) a pair of adjustable deflectors independent of each other wherein each deflector has an inner edge which is pivotally mounted onto the air intake housing at one edge of the air intake housing opening and opposing each other, both deflectors to move outwardly over a wide range directed from the ceiling to the floor to open and close the opening as well as to control the air volume, velocity and to direct the fresh air from ceiling to floor which is drawn into the building through the intake.

5,088,389

HOUSEHOLD TOASTERS

Miguel Labadia del Fresno, Miracruz, 5, 20001 San Sebastian Guipuzcoa, Spain

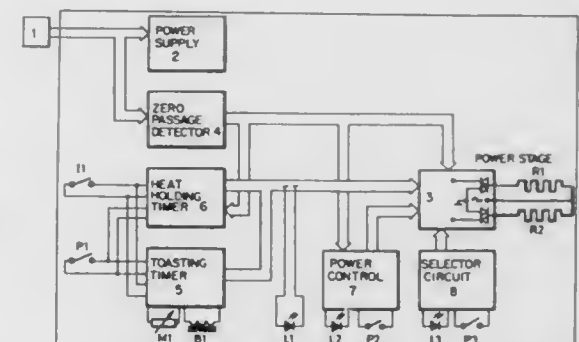
Filed Jan. 29, 1991, Ser. No. 647,552

Claims priority, application Spain, Jan. 31, 1990, 900,0290

Int. Cl.⁵ A47J 37/08; H05B 1/02

U.S. Cl. 99—327

4 Claims



1. In a household toaster, an electronic power control comprising a power stage (3) fitted with two triacs (3a) for controlling the power supplied to two heating resistors (R1, R2) of the toaster; control elements including a zero passage detector (4), a heating timer (5), a heat-holding timer (6), a power control (7), a selector circuit (8) for selecting one or two of said resistors to operate one or two sides of the toaster; a start button (11); an ejector-and-stop button (P1); and a power supply (2) to supply requisite continuous voltage to the control elements, said control elements being each connected to said power stage so as to selectively provide a normally required power in both of said resistors, a normally required power in only one of said resistors, and a fractional power in both of said resistors for keeping a toast toasted in the toaster warm.

5,088,390

AUTOMATIC FOOD COOKING DEVICE

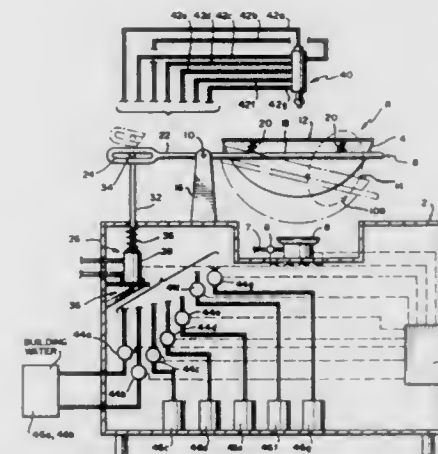
Henry Wong, 3704 Emily St., Kensington, Md. 20895, and Peng W. Zhou, Arlington, Va., assignors to Henry Wong, Kensington, Md.

Filed Jan. 26, 1990, Ser. No. 470,721

Int. Cl.⁵ A47J 27/00

U.S. Cl. 99—327

23 Claims



1. A cooking device, comprising:
 - a) a base;
 - b) a fulcrum mounted on said base;
 - c) support means for carrying a pan;
 - d) said support means being mounted on said fulcrum and

including first and second portions extending respectively from each side of said fulcrum a substantial distance;

e) means for mounting the pan on said first portion of said support means and on one side of said fulcrum; and

f) actuating means operably associated with said second portion of said support means and on the other side of said fulcrum for periodically accelerating and decelerating rapidly said first portion about said fulcrum between first and second positions, thereby causing the pan to move upwardly and downwardly with said first portion and propel food placed therein into the air upon rapid upward deceleration and downward acceleration of said first portion and causing the food to be turned for uniform heating of different portions of the food.

5,088,391

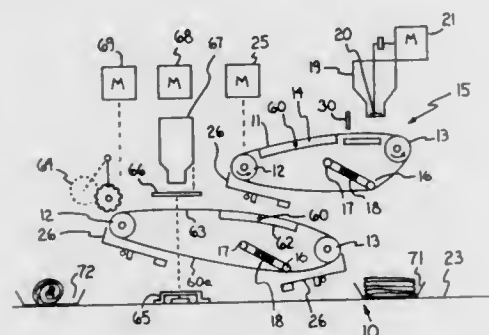
METHOD AND APPARATUS FOR COOKING FOOD WITH A MOVING BELT

Edward M. Anderson, 2620 E. Medicine Lake Blvd., Minneapolis, Minn. 55441

Filed Nov. 14, 1989, Ser. No. 436,491

Int. Cl.⁵ A23P 1/08; A21B 1/48; A23L 1/01

U.S. Cl. 99-423 4 Claims



1. A food cooking machine comprising:
 - a thermally conductive flexible belt;
 - a hot plate under said belt;
 - means for moving said belt over said hot plate;
 - means for placing food upon said belt; and
 - a scraper for removing food from said belt, said scraper having
 - a scraper blade comprising a flat sheet of material having a scraping edge resiliently conformal to the cooking surface of the belt,
 - a rigid backing on the outside of the blade, said blade being held against said backing,
 - a plurality of convex generally dome shaped protrusions on the outside of said rigid backing,
 - a knife edge on said rigid backing adjacent to the scraping edge, and
 - a serrated separation surface extending from said knife edge to adjacent an apex of each dome shaped protrusion, for separating the cooked food items from the scraper.

5,088,392

KITCHEN UNIT

Bruce Ancona, and Jane Ancona, both of New York City, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.

Filed Nov. 8, 1990, Ser. No. 607,620

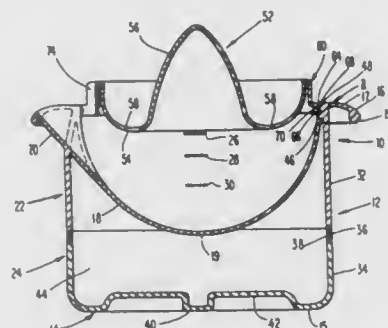
Int. Cl.⁵ A47J 19/02, 43/14; A23N 1/00

U.S. Cl. 99-499 33 Claims

1. A kitchen article, comprising:
 - a body having a bottom and sidewalls;
 - supporting means formed in said body for supporting a kitchen implement over a top of said body;
 - a bowl formed in an upper portion of the interior of said

body, a spout being formed in a perimeter of said bowl at one location; and

(d) a chamber in said body below said bowl and above said



bottom, said body having provision therein for access to said chamber, said chamber being large enough to accommodate at least one kitchen implement of the proper size to be supported on said supporting means.

5,088,393

APPARATUS FOR REMOVING PULP FROM FRUIT

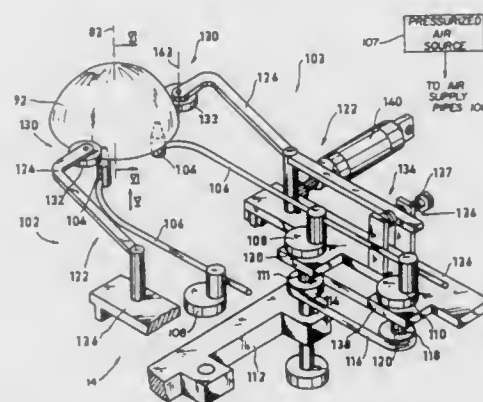
David Nahir, Bai Yam, and Binyamin Ronen, Ra'anana, both of Israel, assignors to State of Israel-Ministry of Agriculture, Bet Dagan, Israel

Filed Mar. 5, 1990, Ser. No. 489,807

Claims priority, application Israel, Mar. 9, 1989, 89560

Int. Cl.⁵ A23N 4/00, 4/24

U.S. Cl. 99-516 16 Claims



1. Apparatus for removing pulp from which has been cut so as to expose a portion of the fruit pulp surrounded by an exposed lip of peel comprising:
 - means for mounting the fruit;
 - means arranged in spaced relation to said means for mounting for directing at least one pressurized jet of gas onto the exposed portion of pulp so as to separate it from the remainder of the fruit;
 - means for substantially preventing impingement of said at least one jet of gas on the exposed lip of the peel; and
 - means for causing relative rotation between the fruit and said means for directing, said means for preventing impingement comprising means for adjusting said relative rotation to conform to the shape of the fruit.

5,088,394

BINDING DEVICE WITH IMPROVED TWISTING HEAD AND BINDER EQUIPPED WITH SUCH DEVICES, IN PARTICULAR FOR BINDING COILS OF WIRE

Jean M. Bertrand, Cormeilles, and Jean V. Joannic, Paris, both of France, assignors to Botalam (S.A.R.L.), France

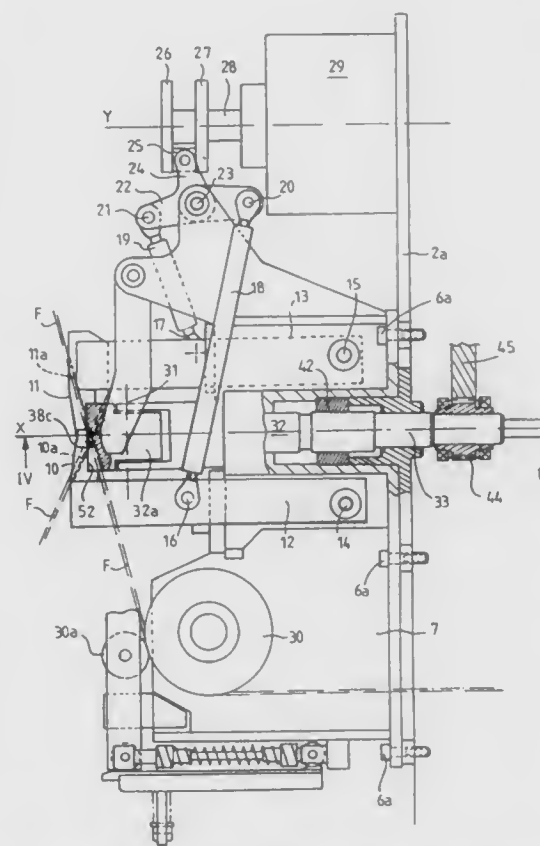
Filed Aug. 20, 1990, Ser. No. 569,821

Claims priority, application France, Aug. 21, 1989, 89 11062

Int. Cl.⁵ B65B 13/28

U.S. Cl. 100-12

6 Claims



1. Binding device comprising, a frame (7) associated with a supporting structure (4) for an article to be bound (C), means on the frame (7) for placing a flexible bond (F) around the article to be bound (C), the flexible bond (F) including opposed end lengths (F1, F2), the means for placing the flexible bond comprising guide members (10, 11) having opposed front and rear ends, the front ends being configured for bringing the two end lengths (F1, F2) to cross over one another, and a twisting head (32) for twisting the two end lengths (F1, F2), the twisting head being arranged at the rear of said guide members and being formed by a gripper (32a) and a rotary body (33), the gripper (32a) being mounted on the end of the rotary body (33), the binding device being characterized in that it comprises means (41, 42, 43, 44) for guiding and driving the twisting head (32) in translation as it rotates, comprising a nut (42) integral with the frame (7), a threaded portion (41) being defined on the body (33) of the twisting head (32), and being threadably engaged with the nut (42) such that rotation of the body (33) generates axial movement of the body (33) relative to both the nut (42) and the frame (7), a coupling member (44) surrounding a portion of the body (33) such that the body (33) is slidably mounted in the coupling member (44), the coupling member (44) being coupled to a means for ensuring its rotation, the said guide members of the flexible bond further being withdrawable in synchronism with the translation of the twisting head.

5,088,395

TOOL FOR TENSIONING AND CUTTING OFF A TAPE LOOP PLACED ABOUT AN OBJECT

Horst Schlottke, Tangstedt, Fed. Rep. of Germany, assignor to Paul Hellermann GmbH, Pinneberg, Fed. Rep. of Germany

PCT No. PCT/EP88/00662, § 371 Date Jan. 23, 1990, § 102(e)

Date Jan. 23, 1990, PCT Pub. No. WO89/01227, PCT Pub. Date Feb. 9, 1989

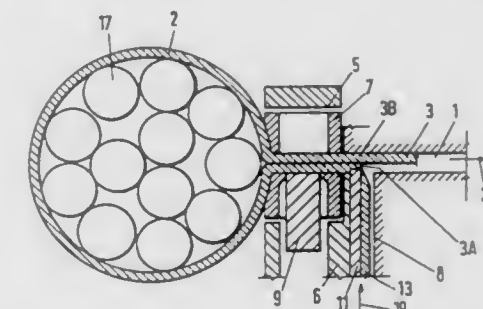
PCT Filed Jul. 22, 1988, Ser. No. 458,705

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 8710185

Int. Cl.⁵ B65B 13/34

U.S. Cl. 100-30

14 Claims



1. A tool for tensioning, locking, and cutting off a tape loop (2) placed about an object (17), comprising:
 - a support (5) for a lock (7),
 - an opening in the lock support for the passage of the tape free end from a tape supply behind the support, out of the opening and around the object in front of the support, and back into the opening in overlapping relation with a trailing portion of the tape,
 - a tensioning device for the trailing portion of the tape while the tape is connected to the tape supply,
 - clamp means (11) for pressing the free tape end (3A) and overlapping trailing portion (3B) against an abutment (4) associated with the tool,
 - a cutting device for cutting the trailing portion while the free end is clamped thereto,
 wherein the clamp means is arranged directly behind the lock support (5) and the cutting device (13) is arranged behind the clamp means (11).

5,088,396

TRASH COMPACTOR APPARATUS AND METHOD

Kenneth D. Thomas, 892 Summit, #214, Round Rock, Tex. 78664

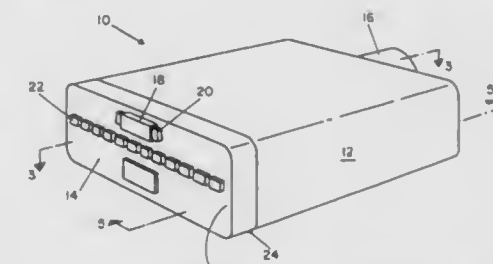
Division of Ser. No. 380,112, Jul. 14, 1989, Pat. No. 5,025,719.

This application Jan. 4, 1991, Ser. No. 637,345

Int. Cl.⁵ B30B 13/00

U.S. Cl. 100-35

9 Claims



1. A method for compacting trash comprising the steps of:
 - placing trash to be compacted into a receptacle through an opening in the receptacle;
 - securing a closure member over the opening of the receptacle;
 - drivingly engaging a compacting mechanism with drive means mounted adjacent to the receptacle, the compacting mechanism (4) being driven by means (5) mounted adjacent to the receptacle, the compacting mechanism (4) being driven by means (5) mounted adjacent to the receptacle.

ing mechanism being mounted on the closure member and the step of drivingly engaging the compacting mechanism being performed simultaneously with the step of securing the closure member over there opening of the receptacle; D. extending a compacting head into the receptacle through the receptacle opening by driving the compacting mechanism with the drive means, the compacting head being connected to the compacting mechanism; and E. retracting the compacting head substantially from the receptacle through the receptacle opening by driving the compacting mechanism with the drive means.

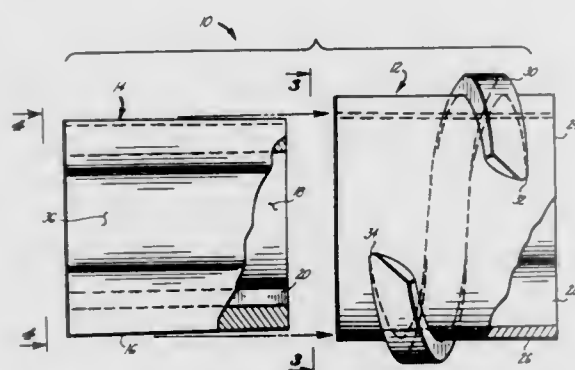
5,088,397

CAST FORMED BI-METALLIC WORM ASSEMBLY
Peter W. Mansfield, Holmes Beach, Fla., and Frank N. Dupps, Germantown, Ohio, assignors to The Dupps Co., Germantown, Ohio

Filed Jan. 11, 1991, Ser. No. 640,246
Int. Cl.⁵ B30B 3/00

U.S. Cl. 100—145

4 Claims



1. A cast formed bi-metallic worm assembly in a mechanical screw press having a rotary drive shaft in driving engagement with said worm assembly comprising:

an inner hub having a uniform cylindrical outer surface and a hollow interior surface structured for slidable engagement around and in driving communication with the drive shaft, said inner hub formed of a first rigid homogeneous cast material;

a flight body having a uniform cylindrical inner surface closely mated with, and in tight gripping relationship around and over substantially the entire length of, said inner hub outer surface, said flight body also having an integral helical flight extending radially therefrom, said flight body formed of a second rigid homogeneous cast material;

said second cast material harder than said first cast material; said flight body inner surface in rotational driving engagement with said inner hub outer surface held thusly only by a layer of bonded braze welding between substantially the entire mating surfaces of said flight body and said inner hub;

said mating inner and outer cylindrical surfaces including at least one longitudinal lobe having a smooth, uniform cross sectional shape along the entire length of said worm assembly for increased rotational driving engagement between said inner hub and said flight body.

5,088,398

CONTINUOUSLY WORKING PRESS

Friedrich B. Bielfeldt, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

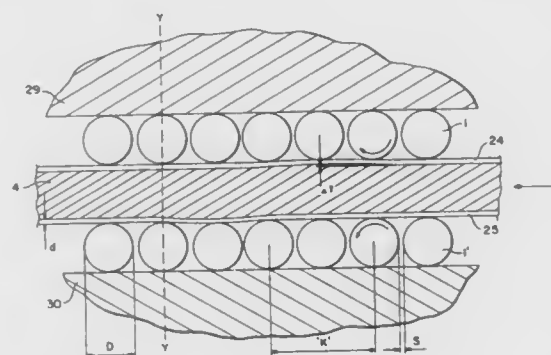
Filed Apr. 27, 1990, Ser. No. 514,028

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913991

Int. Cl.⁵ B30B 5/06

U.S. Cl. 100—154

8 Claims



1. A continuously working press, comprising:
a table member;
a press member disposed thereover defining a horizontal pressing plane therebetween;
first and second flexible bands disposed about said table member and press member, respectively;
means for rotating said bands about said table member and press member, respectively;
a roller rod assembly disposed between each of said table member and said first flexible band and said press member and said second flexible band, respectively;
each of said roller rod assemblies comprising:

1) a plurality of roller rods extending transversely of the direction of rotation of said flexible bands;
2) a guide chain assembly, including a guide chain, connected to said roller rods and extending beyond the pressing plane, said guide chain assembly aligning center axes of roller rods corresponding to said first flexible band with those of said second flexible band in a pressing direction of the press; and
3) means for force-guiding said roller rods and said guide chain assembly onto said horizontal pressing plane with the same arc and secant dimensions as the path of said roller rods;

wherein said flexible bands each have a thickness d which is greater than 2 mm and said roller rods each have a diameter D which is about $d \cdot 10$ and which is greater than 20 mm.

5,088,399

APPARATUS FOR COMPACTING SCRAP METAL
Antonino G. Cacace, Swansea, and Robert Madeley, Poole, both of United Kingdom, assignors to Camborne Industries PLC, West Glamorgan, United Kingdom

Filed Sep. 21, 1990, Ser. No. 586,542

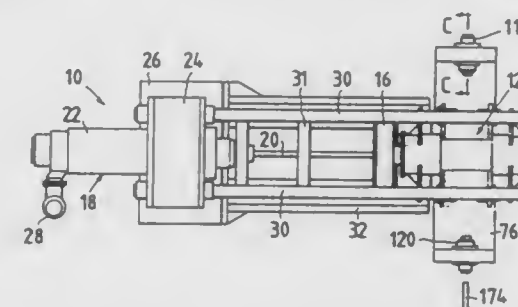
Int. Cl.⁵ B30B 15/32, 9/32

U.S. Cl. 100—218

10 Claims

1. Pressing apparatus including a die comprising at least two die portions which together define a cavity in which swarf is compacted by a compacting ram advanced along an axis of the cavity to form a billet; at least one sleeve mounted for movement over the die to hold the die portions together; release means for moving the sleeve in the axial direction and releasing the die portions; and at least one die portion separating device which is axially spaced from one end of the die and is provided

with die gripping means and means to advance the die gripping means into engagement with said one end of the die and to



move the die portions apart transversely to the axis of the cavity.

5,088,400

ADJUSTING PRESS PLATEN CLEARANCE

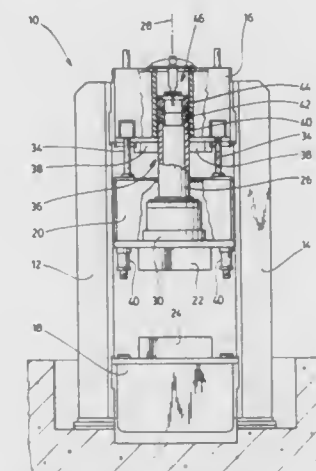
Andrew Ferguson, Bramalea, Canada, assignor to John T. Hepburn, Limited, Mississauga, Canada

Filed Jan. 25, 1991, Ser. No. 645,655

Int. Cl.⁵ B30B 1/32, 15/06

U.S. Cl. 100—257

16 Claims



1. In a hydraulic press comprising a frame including an upper frame portion, a lower platen, a movable upper platen, a hydraulic cylinder aligned with a predetermined generally vertical axis, the hydraulic cylinder having a lower end portion attached to the movable platen and an upper end portion, means for displacing the hydraulic cylinder together with the movable platen along the vertical axis, and a gate mechanism located above the movable platen, the gate mechanism having an open orientation permitting upward movement of the upper end portion of the hydraulic cylinder along the axis and closed orientation obstructing upward movement of the upper end portion of the hydraulic cylinder along the axis, apparatus for adjusting vertical clearance occurring between the upper and lower platens when the gate mechanism is closed, comprising:

a spacer shaped to seat in vertically releasable interlocking relationship on the upper end portion of the hydraulic cylinder and comprising locking structure shaped for horizontally releasable interlocking;

spacer retaining means positioned to engage and disengage from the spacer when the spacer is located at a predetermined vertical position above the gate, the retaining means comprising:

(a) a support structure connected to the upper frame portion;

(b) displaceable locking means shaped to engage the lock-

ing structure of the spacer in horizontally interlocking relationship;

(c) displacing means connected to the support structure and to the displaceable locking means for displacing the locking means transversely relative to the axis, when the spacer is at the predetermined vertical position, between a locking orientation in which the locking means interlock horizontally with the spacer to support the spacer against downward displacement and an unlocking orientation in which the locking means are clear of the spacer; and,

(d) control means coupled to the displacing means for controlling displacement of the locking means between the locking and unlocking orientations.

5,088,401

MARKING METHOD AND APPARATUS

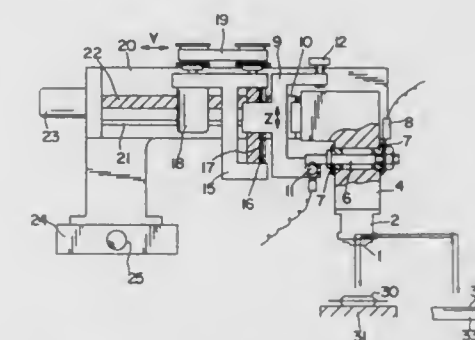
Noboru Fujino, and Tohru Takamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 621,224

Int. Cl.⁵ B41F 17/00

U.S. Cl. 101—41

3 Claims



1. An apparatus for marking a workpiece characterized in that said apparatus comprises: (a) a plate holder to which a printing plate is attached, (b) a moving table to which said plate holder is mounted so that said plate holder is free to move up and down and that said plate holder moves up and down following said table, (c) a Z-direction motor means for driving said moving table in the Z-direction and bringing said plate into contact with the workpiece, (d) a detection means which detects the point at which the printing plate contacts the workpiece, and (e) a control means which controls the Z-direction driving motor so that the plate holder is lowered by a fixed amount after the detection means detects the point the printing plate contacts said workpiece.

5,088,402

PRESSURIZED PRINTING FLUID INPUT SYSTEM FOR KEYLESS LITHOGRAPHIC PRINTING

Stanley H. Hycner, Batavia; Garry F. Tupek, Naperville, and Walter J. Pelczarski, Downers Grove, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 7, 1990, Ser. No. 534,404

Int. Cl.⁵ B41F 31/06, 31/08; B41L 27/08

U.S. Cl. 101—142

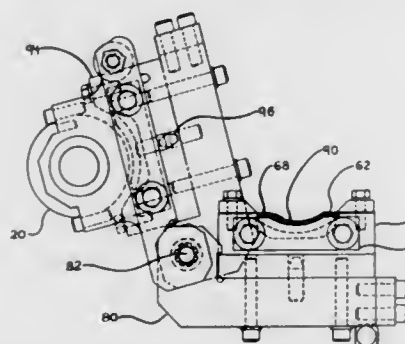
39 Claims

1. In a keyless lithographic printing press having blanket cylinder, plate cylinder with printing plate mounted thereon, form rollers, a set of two or more inking rollers, metering roller having at least an oleophilic and hydrophobic surface which retains a quantity of printing fluid, and a system for supplying dampening water to the printing plate, an improved printing fluid input apparatus comprising:

means for housing having an open side which mates with at least a portion of said surface of said metering roller to define a closed chamber substantially filled with said printing fluid under a predetermined pressure;

at least first and second means for end sealing mounted on

opposed ends of said means for housing, each of said first and second means for end sealing slidably engaging said metering roller;
 means for substantially removing excess printing fluid adhering to said surface of said metering roller as said metering roller rotates past said chamber containing said printing fluid, said means for substantially removing excess printing fluid attached to said means for housing and having at least an edge for substantially contacting said surface of said metering roller;
 means for surface sealing attached to said means for housing opposed from said means for substantially removing excess printing fluid, said means for surface sealing having a surface area for substantially sealing said chamber, said surface area being substantially adjacent said surface of said metering roller and located intermediate first and



second edges of said means for surface sealing, said means for surface sealing being a sealing member that seals statically and floats dynamically, said sealing member substantially floating and forming a hydrodynamic seal between said surface of said metering roller and said surface area of said sealing member when said metering roller rotates, and said sealing member substantially contacting said surface of said metering roller and said surface area of said sealing member when said metering roller is stationary, thereby sealing said chamber to keep said printing fluid in said chamber under pressure;
 at least one inlet means in said means for housing for inputting said printing fluid into said chamber and at least one outlet means in said means for housing for outputting printing fluid from said chamber, said inlet means and said outlet means connected to a means for pressurizing said printing fluid.

5,088,403
MARKER FOR CONFIRMATION OF PAPER
WEB-THREADED PATHS AND PAPER
WEB-THREADED PATH CONFIRMING APPARATUS
FOR ROTARY PRESSES

Akihiro Shoji, Toyama, and Noriyuki Shiba, Tokyo, both of Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 397,927, Aug. 24, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 627,456
 Claims priority, application Japan, Aug. 31, 1988, 63-215195
 Int. Cl.⁵ B41F 5/04, 13/02, 33/16

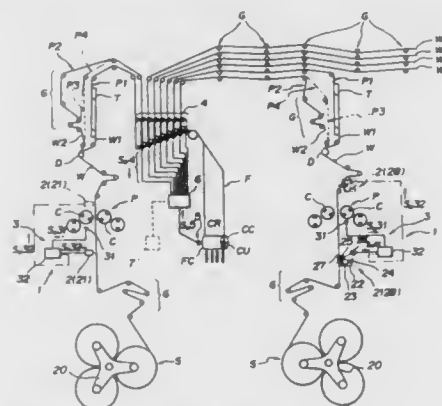
U.S. Cl. 101—227

4 Claims

1. A paper web-threaded path confirming apparatus for rotary presses, having printing cylinders which prints on paper webs fed thereto and a folder unit which cuts and folds said paper webs, said folder unit having a cutter cylinder which rotates, said apparatus comprising:

- a marker used for confirmation of paper web-threaded paths, said marker includes
- a marking unit printing marks on a paper web, and
- a regulator connected to said marking unit, said regulator including
- a timing detector located adjacent said printing cylinders, said timing detector detecting a rotational phase

of said printing cylinders and transmitting a detected timing signal, and
 an operating signal transmitter, connected to said marking unit and said timing detector, said operating signal transmitter transmitting an operating signal to said marking unit when said operating transmitter receives said detected timing signal from said timing detector,
 said regulator controlling printing of said marks on said paper web by said marking unit wherein said marks always have a predetermined phase with respect to printed images produced during a printing operation;
 a mark detector, located downstream of said marker along



said paper web-threaded paths, said mark detector detecting said marks printed on said paper web by said marking unit and transmitting a detected mark signal;
 a transmitter located adjacent said folder unit, said transmitter transmitting a rotational phase signal based on a rotational phase of said cutter cylinder rotated in said folder unit; and
 an examination unit connected to said transmitter and said mark detector, said examination unit determining whether the detected mark signal is within a predetermined range of said rotational phase signal and outputting a signal indicating whether the detected mark signal is within said predetermined range indicating said web-threaded path is correct.

5,088,404
DELIVERY APPARATUS FOR PRINTING PRESS
 Edward P. MacConnell, 2308 Woodcliff Ct., Arlington, Tex. 76012, and Shigeki Matsukawa, 2807 Cripple Creek, Grapevine, Tex. 76051

Filed May 9, 1989, Ser. No. 349,446

Int. Cl.⁵ B41F 13/24

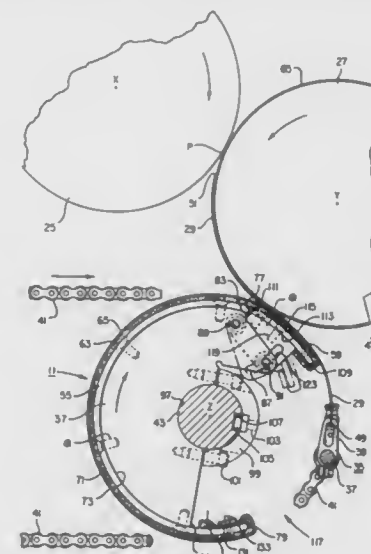
U.S. Cl. 101—232

16 Claims

1. A delivery apparatus for use in a sheet-fed printing press, said printing press having inking means for providing an application of ink to a sheet, and having gripper means for gripping a leading edge of said sheet as said sheet exits from said inking means, comprising:

- a) main wall means having first and second ends and a central axis extending between said ends, said main wall means being arcuate;
- b) said main wall means having a gap extending between said first and second ends, said gap forming leading and trailing edges on said main wall means;
- c) leading edge wall means having a trailing edge and a leading edge, said leading edge wall means being located in said gap and being movably coupled to said main wall means such that said trailing edge of said leading edge wall means is adjacent to said leading edge of said main wall means, said leading edge wall means forming a smaller gap between said leading edge of said leading edge wall means and said trailing edge of said main wall means;

d) said main wall means and said leading edge wall means having respective outside surface portions that form an outside surface, said outside surface having a myriad of minute projections projecting radially outward, said projections having rounded outer ends;
 e) said leading edge wall means being movable between innermost and outermost positions, such that with said leading edge wall means being in said outermost position said leading edge of said leading edge wall means is fur-



ther away from said central axis than said leading edge of said leading edge wall means when said leading edge wall means is in said innermost position;

f) said main wall means being adapted to be rotatably mounted to said press adjacent to the exit of said inking means, said smaller gap being adapted to receive said gripper means when said gripper means grips the leading edge of said sheet, whereby said leading edge wall means is adapted to contact the portion of said sheet adjacent to said sheet leading edge.

5,088,405
PRINTER WITH SHEET FEEDING APPARATUS
 Kazuaki Sugimoto; Tomio Nishijima; Teruhisa Inoue; Yoshihiko Sugimoto; Masashi Suzuki, and Izumi Matsushita, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

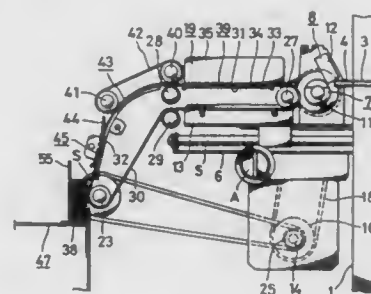
Division of Ser. No. 628,432, Dec. 17, 1990, Pat. No. 5,056,432, which is a division of Ser. No. 469,021, Jan. 23, 1990, Pat. No. 5,007,340. This application Jul. 2, 1991, Ser. No. 724,775

Claims priority, application Japan, Jan. 24, 1989, 1-14796; Jan. 25, 1989, 1-15651; Jan. 26, 1989, 1-16676; Jan. 27, 1989, 1-18574; Jan. 27, 1989, 1-18575

Int. Cl.⁵ B41F 13/64

U.S. Cl. 101—240

3 Claims



1. A printer with a sheet feeding apparatus having a continu-

ous forms feeding path equipped with a printing mechanism locationally followed downstream by a cutter device, said cutter device forwarding a sheet of paper having been cut from said continuous forms, said sheet being secured by an endless sheet feeding belt pressed against a pressure member for downward feed, the end of said sheet feeding belt being locationally followed downstream by a stacking member with which the lower edge of said sheet comes in contact and which has a substantially horizontal sheet receiving surface, said stacking member being supported in a vertically movable manner by a stacking member support means, said sheet being supported upright by a sheet support member which is located above said sheet receiving surface and which has a substantially vertical sheet support surface, said sheet support member being slidably supported in the stacking direction by two guide rods on both sides, said guide rods being positioned at substantially the same height as the end of said sheet feeding belt.

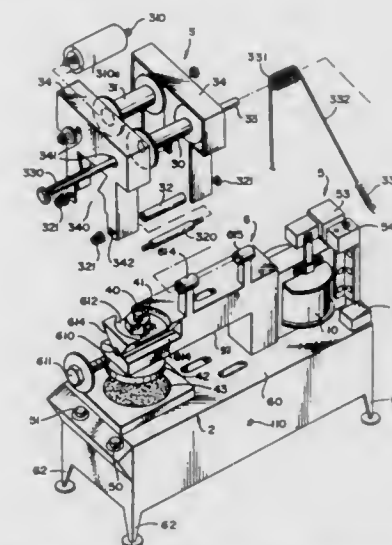
5,088,406
STRUCTURE OF AUTOMATIC STAMPING MACHINE
 Ciang P. Clin, 4F., No 282 Section 2 Li Nung Street, Taipei, Taiwan

Filed Jan. 29, 1991, Ser. No. 647,409

Int. Cl.⁵ B41F 1/44

U.S. Cl. 101—332

1 Claim



1. An automatic stamping machine, comprising:
 a machine table having a platform at the top for supporting a substantially L-shaped support;
 a driving mechanism comprising a solenoid, a reciprocating rod, a spring element and a rocker arm secured beneath said platform by a pivot and driven by said solenoid through said reciprocating rod, said rocker arm having an end connected to said reciprocating rod and confined by said spring element, and having an opposite end with an elongated hole made thereon;

a noise deadening device comprising a recessed hollow cylinder on said platform, a T-shaped paper rack inserted in said cylinder, and a compression spring disposed in between said T-shaped paper rack and said cylinder, said cylinder having a hole at the bottom and a bolt sleeve disposed in said hole, said T-shaped paper rack comprising a cylindrical body having a top edge made of flexible rubber and covered with a layer of rigid rubber, and a connecting rod vertically extending downward from said top edge and inserted through said bolt sleeve and fixedly secured in said elongated hole of said rocker arm by a lock nut;

an automatic ribbon take-up mechanism comprising a T-shaped ribbon casing, having mounted therein a ribbon take-up reel, a ribbon supply reel, two rollers and a re-

volving shaft, said T-shaped ribbon casing defining an opening at the bottom and mounted on said L-shaped support, a first pair of round holes at an upper position of said T-shaped ribbon casing for mounting said ribbon take-up reel and said ribbon supply reel, and a second pair of round holes at a lower position of said T-shaped ribbon casing for mounting said two rollers, one end of said revolving shaft being inserted through said T-shaped ribbon casing and supported by two bearings mounted on said L-shaped support, the other end of said revolving shaft having a chain to secure said ribbon take-up reel, said revolving shaft having a one-way bearing mounted thereon, said one-way bearing having a rope winding thereon, one end of said rope having an elastic element and connected to said rocker arm at one side relative to said pivot through said elastic element, and an opposite end directly connected to said rocker arm at an opposite side relative to said pivot;

a stamp mounting device comprising a stamp and an electromagnet fastened at a front bottom side of said L-shaped support to attract said stamp in place; and
an electronic control system comprising a main switch, a starting switch, an AC/DC converter, a relay and a timer, said main switch controlling the power supply for the machine, said starting switch controlling said AC/DC converter, said relay and said timer to drive said driving mechanism to operate said noise deadening device and said automatic ribbon take-up mechanism to perform stamping operation.

5,088,407

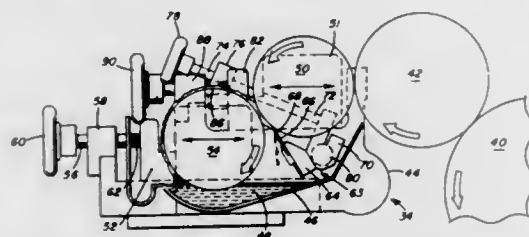
ROTARY PRINTER FOR AN ENVELOPE MACHINE
Herbert W. Helm; William R. Hornung, both of Hollidaysburg; Ilya D. Khrakovsky, Duncansville, and Fredrick L. Steinbeiser, Altoona, all of Pa., assignors to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Apr. 25, 1990, Ser. No. 514,086

Int. Cl.⁵ B41F 31/00

U.S. Cl. 101—350

7 Claims



1. A rotary printer for an envelope machine comprising, a housing having a frame movable thereon, an impression cylinder rotatably supported adjacent to said housing and arranged to rotate in a first direction, a plate cylinder rotatably supported adjacent to said housing and mounted parallel to and adjacent to said impression cylinder, said plate cylinder arranged to rotate in a second direction, an anilox roll mounted on said frame parallel to and adjacent said plate cylinder, said anilox roll arranged to rotate in said first direction, said anilox roll having a lower quadrant, a subframe movably positioned on said frame, a fountain roll mounted on said subframe parallel to and adjacent said anilox cylinder, said fountain roll arranged to rotate in said second direction, an ink fountain mounted on said housing below said fountain roll and said anilox roll, said fountain roll arranged to be partially immersed in said ink in said ink fountain so that upon rotation of said fountain roll a continuous film of ink adheres to the surface of said fountain roll, a distributor blade pivotally mounted on said frame below said anilox roll and above the surface of the ink in said ink fountain, said distributor blade being movable with said

anilox roll upon movement of said frame relative to said fountain roll on said subframe, said distributor blade having an edge portion in approximate juxtaposition with the lower quadrant of said anilox roll adjacent said fountain roll so that rotation of said anilox roll is against said edge portion of said distributor blade to distribute and control the thickness of the film of ink transferred from said fountain roll to said anilox roll and deflect excess ink removed from the surface of said anilox roll back into said ink fountain, and
first adjustment means for adjusting the position of said distributor blade relative to the surface of said anilox roll to thereby control the thickness of the film of ink on said anilox roll that is transferred to said plate cylinder.

5,088,408

PRINTING PLATE MOUNTING SYSTEM AND A PRINTING PLATE COMPOSITE UTILIZING SUCH SYSTEM

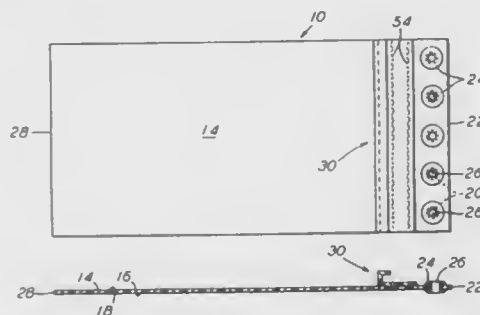
Ivan N. Philpot, Irving, Tex., assignor to Matthews International Inc., Pittsburgh, Pa.

Filed Feb. 28, 1991, Ser. No. 662,727

Int. Cl.⁵ B41F 27/00

U.S. Cl. 101—415.1

20 Claims



1. An apparatus which enables a flexible printing plate member to be accurately positioned on and quickly secured to at least a predetermined portion of a working surface of a printing plate cylinder, having a pin-like member, disposed in at least one print station of a printing arrangement, said apparatus comprising:

- (a) a first substantially rectangular and generally flexible sheet-like member, said first sheet-like member having each of a predetermined width, a predetermined length and a predetermined thickness, said first sheet-like member further having a bottom surface portion engageable with such predetermined portion of such working surface of such printing plate cylinder and an axially opposed upper surface portion;
- (b) a predetermined plurality of apertures formed through said first sheet-like member across a width dimension and adjacent one edge thereof, each of said plurality of apertures having a first predetermined configuration;
- (c) a predetermined plurality of generally rigid reinforcing means having a shaft member extending through each aperture and being engageable with a portion of each of said upper surface portion and said bottom surface portion of said first sheet-like member for reinforcing said first sheet-like member adjacent said apertures, each said rigid reinforcing means including an aperture formed there-through for receiving therein such pin-like member, disposed adjacent such working surface of such printing plate cylinder and along a line parallel to a longitudinal axis of such printing plate cylinder, said aperture formed through said each of said rigid reinforcing means having a common axis with said aperture formed through said sheet-like member and a second predetermined configuration;
- (d) a first substantially J-shaped hook-like member secured

to said axially opposed upper surface portion of said first sheet-like member substantially across said width dimension and closely adjacent said plurality of apertures, said first J-shaped hook-like member being disposed intermediate said plurality of apertures and an axially opposed second edge of said first sheet-like member, said first J-shaped hook-like member including,

- (i) a first elongated flat strip-like portion having each of first and second axially opposed edges and first and second axially opposed surfaces, one of said first and second axially opposed surfaces being engageable with and securable to said upper surface portion of said first sheet-like member adjacent said apertures, said first flat strip-like portion having a first predetermined length and a first predetermined width and a first predetermined thickness,
- (ii) a second elongated substantially flat strip-like portion having each of first and second axially opposed edges and first and second axially opposed surfaces, said second flat strip-like portion having a second predetermined length and a second predetermined width and a second predetermined thickness, and
- (iii) a first elongated connecting strip-like portion having each of a first and second axially opposed edges and first and second axially opposed surfaces, said first edge of said first connecting strip-like portion is engaged with and secured to said first edge of said first flat strip-like portion and said second edge of said first connecting strip-like portion is engaged with and secured to said first edge of said second flat strip-like portion thereby forming said first J-shaped hook-like member, said first connecting strip-like portion having a third predetermined length and third predetermined width and third predetermined thickness, and
- (e) a first securing means engageable with said first flat strip-like portion and said first sheet-like member for securing said first J-shaped hook-like member to said upper surface portion of said first sheet-like member.

5,088,409

DEVICE FOR ADJUSTING A FLEXIBLE PRINTING PLATE ON A PLATE CYLINDER OF A ROTARY PRINTING PRESS

Bernhard Roskosch, Leimen, Fed. Rep. of Germany, assignor to Heidelberg Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

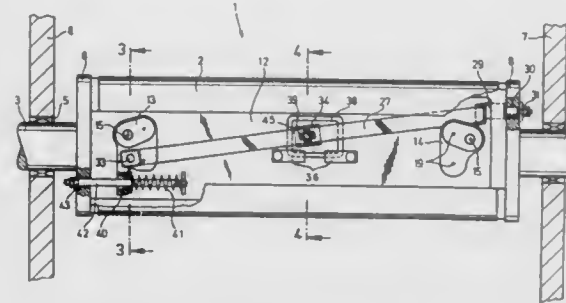
Filed May 21, 1990, Ser. No. 526,902

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1989, 3918215

Int. Cl.⁵ B41F 1/28

U.S. Cl. 101—415.1

20 Claims



1. A device for adjusting the angular positioning of a flexible printing plate on a plate cylinder of a rotary printing press, said adjustment device comprising:
said plate cylinder having a cylinder body and a longitudinally extending recess formed in said cylinder body; said cylinder body being for supporting the flexible printing plate, the flexible printing plate having opposite end por-

tions for being positioned in said recess, and the printing plate extending around said cylinder body;
a pair of rails positioned in said recess, said pair of rails being aligned substantially parallel to one another;
each said rails of said pair of rails being provided with attachment means for attaching one of the opposite end portions of the flexible printing plate thereto;
a swivelable member pivotally mounted on said cylinder body at a pivot point within said recess for joining said rails in an articulated fashion to thereby change the position of the printing plate on said cylinder body through the parallel relative displacement of said rails, said rails being pivotally connected to said swivelable member on opposite sides of said pivot point;
a deflectable member, said deflectable member being connected, at one end thereof, to said cylinder body and, at the other end thereof, to said swivelable member; and
actuating means connected to said deflectable member for bending said deflectable member to turn said swivelable member and longitudinally displace said rails relative and parallel to one another to thereby adjust the position of the printing plate on said plate cylinder.

5,088,410

PLATE LOCKUP APPARATUS FOR PRINTING PRESS
Toshiyuki Murakami, Ibaraki, Japan, assignor to Komori Corporation, Tokyo, Japan

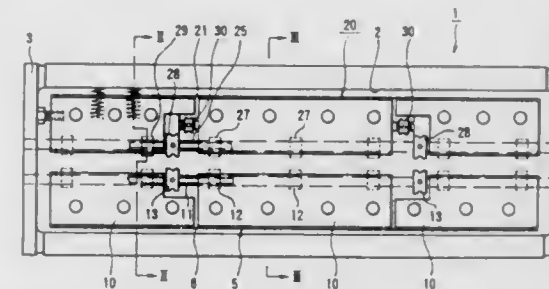
Filed May 17, 1991, Ser. No. 702,240

Claims priority, application Japan, May 25, 1990, 2-54156[U]

Int. Cl.⁵ B41F 1/28, 21/00

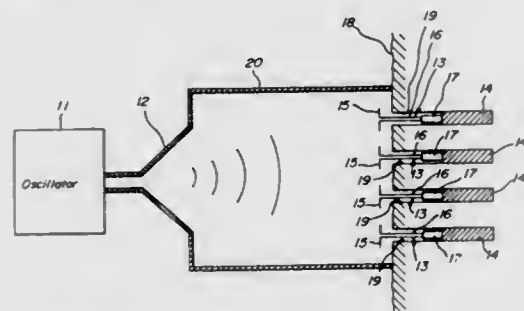
U.S. Cl. 101—415.1

6 Claims



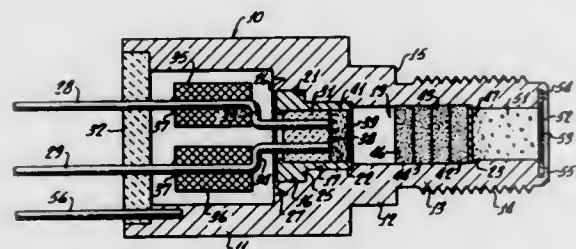
1. A plate lockup apparatus for a printing press, characterized by comprising:
a leading-side plate lockup table (6) axially extending on one side in a gap (2) of a circumferential surface of a plate cylinder (1) and a trailing-side plate lockup table (21) axially extending on the other side in the gap (2) of the circumferential surface of said plate cylinder (1);
leading- and trailing-side gripper plates (10, 23) pivotally supported to oppose said leading- and trailing-side plate lockup tables (6, 21) and biased in a plate release direction;
a plurality of plate gripper cams (12, 27), mounted on a plate tightening pivot shaft (11) and a trailing-side pivot shaft (25) parallel to said leading- and trailing-side gripper plates (10, 23) at equal intervals, for pivoting said leading- and trailing-side gripper plates (10, 23) in a plate gripping direction upon pivotal movement of said pivot shafts (11, 25);
spring members, interposed between said trailing-side plate lockup table (21) and a wall surface of said gap (2), for biasing said trailing-side plate lockup table (21) in a plate tightening direction; and
plate tightening cams (29), mounted on said trailing-side pivot shaft (25), for moving said trailing-side plate lockup table (21) against the biasing forces of said spring members in a plate loosening direction.

5,088,411
APPARATUS FOR IGNITING DETONATING PRIMER WITH THE AID OF ELECTROMAGNETIC WAVE
 Kouichi Kurokawa, and Youji Tasaki, both of Aichi, Japan, assignors to Nippon Oil and Fats Company, Tokyo, Japan
 Filed Jun. 4, 1990, Ser. No. 532,616
 Claims priority, application Japan, Jun. 9, 1989, 1-145267
 Int. Cl.⁵ F42D 5/00; F42B 3/18
 U.S. Cl. 102—200 19 Claims



1. An apparatus for igniting at least one detonating primer having a receiving antenna connected thereto with the aid of an electromagnetic wave comprising
 an oscillator for generating an electric oscillation signal;
 a transmitting antenna which is excited by said electric oscillation signal supplied from said oscillator to radiate an electromagnetic wave toward the receiving antenna connected to said detonating primer; and
 a shield housing for surrounding a space between the transmitting antenna and the receiving antenna connected to the detonating primer and having a property for reflecting or absorbing the electromagnetic wave which is made incident upon the shield housing.

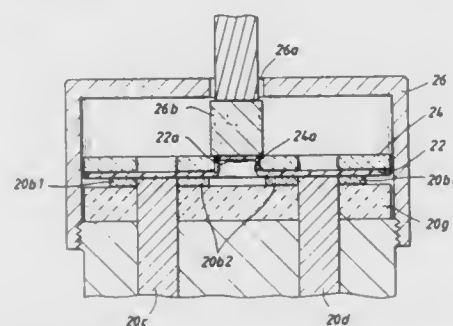
5,088,412
ELECTRICALLY-INITIATED TIME-DELAY GAS GENERATOR CARTRIDGE FOR MISSILES
 Mihai D. Patrichi, Los Angeles, Calif., assignor to Networks Electronic Corp., Chatsworth, Calif.
 Filed Jul. 16, 1990, Ser. No. 556,636
 Int. Cl.⁵ F42C 9/10, 19/02
 U.S. Cl. 102—202.13 20 Claims



1. An electrically-initiated time-delay gas generator, which comprises:
 (a) a housing having an elongate passage therein, said passage having an inner end portion that extends to an end of said housing, said housing having a relatively large diameter hollow body portion and a relatively small diameter head portion, said body portion having a relatively large chamber therein, said body portion and said head portion being coaxial, said elongate passage extending from said relatively large chamber to the inner end of said head portion;
 (b) filter means provided in said relatively large chamber in circuit with said igniter assembly to prevent undesired firing of said igniter assembly;
 (c) a metal barrier disc mounted in said passage transversely thereof so as to block said passage, said barrier disc being

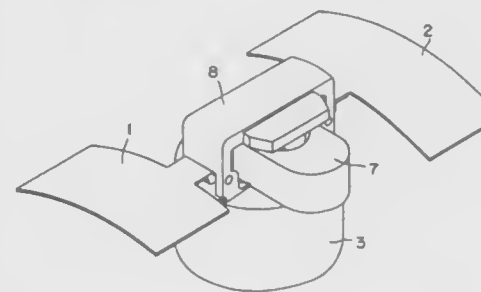
spaced from the inner end of said passage, the portion of said passage on the opposite side of said barrier disc from said inner passage end being unvented,
 (d) an output seal provided in sealing relationship across said inner end of said passage so as to seal the portion of said passage between said barrier disc and said inner end, said output seal being adapted to rupture and permit rapid escape of gas from said last-mentioned passage portion,
 (e) an electrically-operated igniter assembly communicating with the outer end of said passage, said igniter assembly including ignition powder and means to effect burning of said powder when an electric current is delivered to said igniter assembly,
 (f) a delay column comprising a plurality of layers of delay powder provided in said passage between said igniter assembly and said barrier disc, said layers being compressed in place in said passage at pressures, sufficiently high to provide function time tolerances of less than 25msec, the outer one of said layers being packed against said barrier disc,
 (g) an igniter layer provided in said passage between said delay column and said igniter assembly, said igniter layer being packed against said delay column, and
 (h) an output charge provided in said passage between said barrier disc and said output seal, said delay column being adapted to burn over an accurately predetermined time period and then to heat said barrier disc, said barrier disc being thus heated to ignite and generate high-pressure gas.

5,088,413
METHOD AND APPARATUS FOR SAFE TRANSPORT HANDLING ARMING AND FIRING OF PERFORATING GUNS USING A BUBBLE ACTIVATED DETONATOR
 Klaus B. Huber, Sugar Land; Nolan C. Lerche, Stafford; Arnold G. Edwards, Hockley; Kenneth E. Rozek, Houston, and Edward G. Smith, Jr., San Leon, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
 Filed Sep. 24, 1990, Ser. No. 587,298
 Int. Cl.⁵ F42B 3/12; F42D 5/00
 U.S. Cl. 102—202.5 22 Claims



1. A perforating gun including a system, the system including an explosive, said system comprising:
 a first conductor adapted for conducting a current;
 a second conductor adapted for receiving said current;
 a foil interconnected between the first conductor and the second conductor, said foil including a bridge means for vaporizing when said current flows therethrough;
 a first layer deposited over said foil; and
 a spacer layer deposited over said first layer and disposed between said first layer and said explosive, said spacer layer including a hole disposed directly above said bridge means;
 said first layer expanding to form a bubble when said bridge means vaporizes,
 said bubble impacting and detonating said explosive during the expanding of said first layer.

5,088,414
SUBWARHEAD
 Reijo Vesa, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden
 Filed Oct. 19, 1990, Ser. No. 599,852
 Claims priority, application Sweden, Oct. 20, 1989, 8903474
 Int. Cl.⁵ B64D 19/02; F42B 10/14, 10/54, 12/58
 U.S. Cl. 102—388 5 Claims

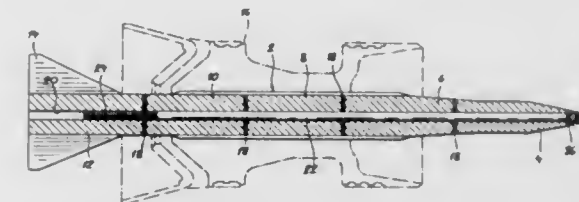


4. A subwarhead which is separable from a missile over a target area, comprising:
 an active part;
 a target detector, said target detector being displaceably mounted on the warhead in order to allow a free view at the side of the active part; and
 means for imparting a rotation to the subwarhead for scanning of the target area in a helical pattern during the descent of the subwarhead towards the target area, said means including two diametrically situated aerofoils which are pivotably mounted each on its own shaft, said shafts being situated in a plane which is substantially at right angles to the axis of symmetry of the active part, said aerofoils being made from an elastically flexible material and pivotable from a folded position outwardly by 90° to an unfolded position, said flexible aerofoils being pre-curved to a predetermined curvature selected for desired flight characteristics and in said folded position are in contact with the outer surface of the subwarhead, and in said unfolded position form a braking area for controlling the rate of descent of the subwarhead, said predetermined curvature being maintained in said unfolded position.

5,088,415
ENVIRONMENTALLY IMPROVED SHOT
 John Huffman, and John Shannon, both of Memphis, Tenn., assignors to Safety Shot Limited Partnership, Memphis, Tenn.
 Filed Oct. 31, 1990, Ser. No. 606,814
 Int. Cl.⁵ F42B 12/80
 U.S. Cl. 102—515 7 Claims

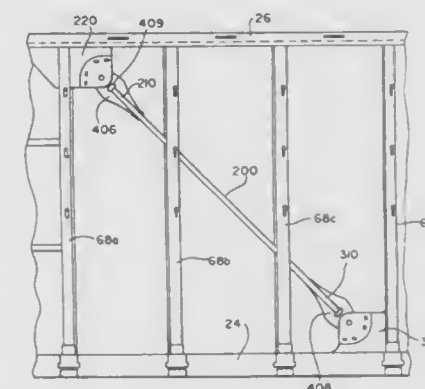
1. Ballistic shot comprised of a spherical core of lead provided with a coating of chemically resistant and abrasion-resistant polymer thereabout, said polymer having been applied to said lead core, said coated core then being heated above the melting point of the core, which allows the polymer to be heated to the temperature required to optimally cure and bond the polymer without deformation occurring to the lead shot, said molten shot with the baked polymer coating being allowed to cool for mechanical bonding at the lead-polymer interface.
 2. The shot of claim 1, wherein said polymer is a fluorinated polymer.

5,088,416
IMPACT PROJECTILE
 Udo Sabranski, Willich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany
 Filed Oct. 18, 1979, Ser. No. 86,760
 Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845431
 Int. Cl.⁵ F42B 12/04
 U.S. Cl. 102—517 3 Claims



1. An impact projectile for firing from a smooth-bore barrel-type weapon such as a tank for targeting on an armored wall, comprising:
 a plurality of axially aligned, axially spaced, elongated annular impact bodies including a nose body at a leading end of said projectile, a tail body at a trailing end of said projectile, and a plurality of intermediate bodies between said nose body and said tail body whereby said bodies are adapted to successively engage said wall, all of said bodies being formed with axial bores;
 a rod extending through said bores and anchored to said tail body at a trailing end of said body;
 respective dish-disk springs received between each body and the next body along said rod and forming elastic spreading means for biasing said bodies apart;
 means at said nose body releasably engaging a leading end of said rod for retaining said bodies against relative axial movement and axial movement relative to said body and simultaneously maintaining each of said dish-disk springs under compression until release of said means;
 a fin-stabilizing structure on said tail body; and
 a drive cage surrounding at least some of said bodies whereby said projectile forms a subcaliber projectile for said barrel-type weapon.

5,088,417
LIGHT WEIGHT CENTER BEAM RAILROAD CARS WITH PINNED CONNECTIONS
 Shaun Richmond, Orland Park, Ill.; Charles T. Carter, Gary, Ind., and James J. Schuller, Crete, Ill., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.
 Filed Aug. 16, 1990, Ser. No. 568,518
 Int. Cl.⁵ B61D 3/08
 U.S. Cl. 105—411 2 Claims



1. A center beam for a railroad car comprising a center sill,

a top chord parallel to and spaced above said center sill, at least first and second longitudinally spaced columns having upper ends secured to said top chord at upper joints and lower ends secured to said center sill at lower joints, and at least one diagonal tension member having an upper end secured by a first pivot at the upper joint of said first column and a lower end secured by a second pivot at the lower joint of said second column.

5,088,418

TRANSPORT PALLET

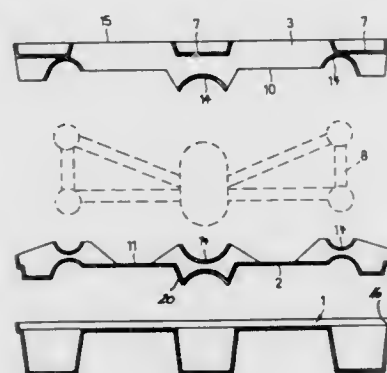
Hans-Dieter Reckermann, Vlotho, and Wolfgang Berkenkamp, Bad Oeynhausen, both of Fed. Rep. of Germany, assignors to Rebo-Plastic GmbH & Co. KG, Kalletal-Erder, Fed. Rep. of Germany

Filed Jul. 20, 1990, Ser. No. 556,085

Claims priority, application European Pat. Off., Aug. 4, 1989, 89114430

Int. Cl.⁵ B65D 19/38

U.S. Cl. 108—51.1



1. A transport pallet comprising: a base pallet (1), a cover (3) and a bottom inlay member (2) disposed between said base pallet (1) and said cover (3) so that a side (10) of said cover (3) faces a side (11) of said bottom inlay member (2); said bottom inlay member (2) being snugly inserted in said base pallet (1); said bottom inlay member side (11) and said cover side (10) including receptacle means (14) for supporting objects (8) which are being transported, the objects (8) being arranged between said bottom inlay member (2) and said cover (3); and said base pallet (1), said bottom inlay member (2) and said cover (3) being constructed as synthetic material deep-drawn shaped parts.

5,088,419
TABLES

Clive R. Hartwell, 17 Loch Bay, Watnish, Isle of Skye, Great Britain IV55 8GD, and David W. Hartwell, 156 Coventry Road, Market Harborough, Leicestershire, Great Britain LE16 9DA

PCT No. PCT/GB88/00379, § 371 Date Nov. 13, 1989, § 102(e) Date Nov. 13, 1989, PCT Pub. No. WO88/08681, PCT Pub. Date Nov. 17, 1988

PCT Filed May 13, 1988, Ser. No. 435,397

Claims priority, application United Kingdom, May 13, 1987, 8711250

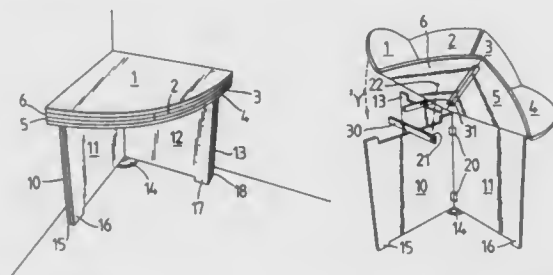
Int. Cl.⁵ A47B 1/00

U.S. Cl. 108—66

10 Claims

1. A table consisting of a top and a base, the top consisting of a plurality of hingedly connected sections capable of being folded between a first position in which the sections are coplanar to a second position in which the sections are superimposed to form a top having at least two layers, and the base consisting of a plurality of hingedly connected sections capable of being folded from an extended position in which the base supports

the top in said second position to a retracted position in which the base supports the top formed of the superimposed sections, wherein the hingedly connected sections of the top comprise two quadrant sections and four octant sections with each of said quadrant and said octant sections being hinged on both



5,088,420

WORK STATION

Edwin R. Russell, 414 Stirling Highway, Cottesloe, Western Australia, Australia

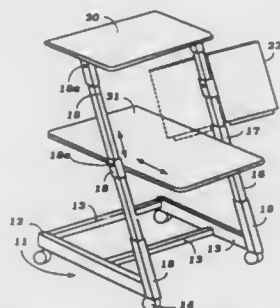
Filed Oct. 22, 1987, Ser. No. 112,739

Claims priority, application Australia, Oct. 23, 1986, PH08653

Int. Cl.⁵ A47B 57/00

U.S. Cl. 108—106

15 Claims



1. A work station comprising a base comprised of a pair of generally parallel side members joined at a point spaced rearwardly of their forward ends by a cross member to define a work area therebetween, a pair of transversely spaced upward extending sockets extending from the forward ends of said side members obliquely in a rearward direction from the forward-most portion of said base, a pair of supports each received in a respective one of said sockets and extending obliquely from the front of said base rearwardly, an upper platform supported by at least one of said supports above said base and an intermediate platform supported by at least one of said supports above said base and below said upper platform, at least one of said platforms being vertically adjustable its respective support along the support.

5,088,421

ADJUSTABLE HEIGHT DESK

Douglas S. Beckstead, 139 Burke La., Kneeland, Calif. 95549

Filed Aug. 20, 1990, Ser. No. 569,333

Int. Cl.⁵ A47B 9/12

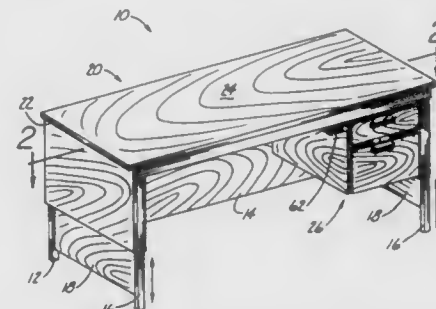
U.S. Cl. 108—144

6 Claims

1. An adjustable height desk, comprising: an open front base including rear support legs intercon-

nected by a rear panel, and front support legs attached to the rear support legs by side panels, each of the front and rear support legs having a hollow center channel and a threaded nut secured to the support leg and disposed over the hollow channel;

an outer skirting disposed to extend over and being spaced outwardly from the entire exterior of the open front base including the front support legs, the skirting including an upper edge disposed to receive and support a horizontal work surface, the skirting being movable between a lowered seated position and a raised standing position;



corner support brackets attached to the skirting below the work surface and disposed above each of the support legs; a threaded shaft rotatably attached to each support bracket, the shaft having a lower end disposed to engage the threaded nut of the corresponding support leg and an upper end disposed to receive a drive sprocket; a continuous drive chain disposed to drivably engage each of said drive sprockets; and reversible drive means for simultaneously driving the drive sprockets to selectively move the outer skirting between the lowered seated position and the raised standing position.

5,088,422

ROTARY ISOLATION DOOR

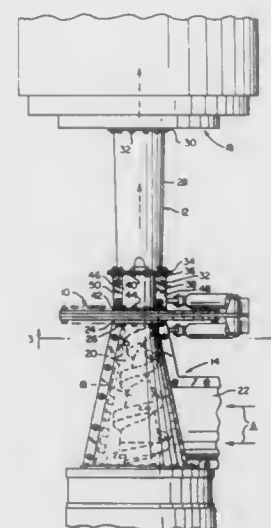
Larry E. Koenig, Komar Industries, Inc. 4425 Marketing Pl., Pickerington, Ohio 43125

Filed Dec. 21, 1990, Ser. No. 632,766

Int. Cl.⁵ F23M 7/00

U.S. Cl. 110—173 R

19 Claims



1. For use with a conduit of the type used for conveying hazardous solid, liquid and gaseous material, including radioactive material, a rotary isolation door comprising: a first housing plate having a first opening therethrough

offset from a center of said first housing plate, said first opening being sized to communicate with said conduit; a second housing plate having a second opening therethrough offset from a center of said second housing plate and being sized to communicate with said conduit, said second opening and said second plate being positioned in registry with said first opening and said first plate, respectively;

a spacer plate having an annular interior opening, said first and second housing plates being attached to opposing sides of said spacer plate such that an interior chamber is formed which communicates with said first and second openings;

a door plate rotatably mounted within said interior chamber and having a door opening displaced from a center of said plate and positionable in registry with said first and second openings, said door opening having an annular door blade mounted about a periphery thereof; and

means, mounted on said isolation door, for rotating said door plate to an open position, wherein said first, second and door openings are aligned to form a flow path through said door, and to closed position, wherein said door opening blade shears through material in said flow path and said door opening is out of alignment with said first and second openings such that said door plate blocks said flow path.

5,088,423

BURNER TILE ASSEMBLY

Kouji Ogura, and Makio Yamaguchi, both of Aichi Pref, Japan, assignors to NGK Insulators, Ltd., Japan

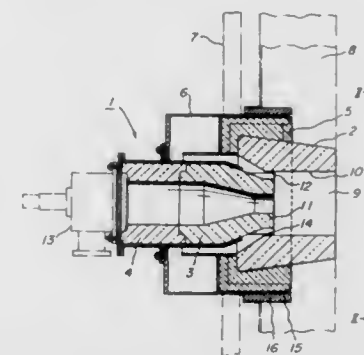
Filed Apr. 30, 1990, Ser. No. 516,918

Claims priority, application Japan, Apr. 28, 1989, 1-49616[U]

Int. Cl.⁵ F23L 5/00

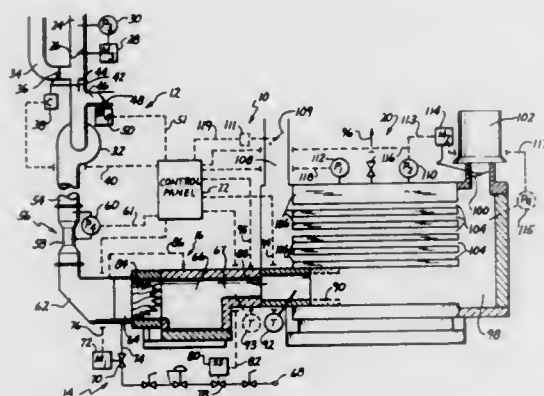
U.S. Cl. 110—182.5

8 Claims



1. A high-speed type burner tile assembly arranged in a furnace side wall, said assembly comprising a cylindrical mixing tile formed independent of said furnace side wall, said cylindrical mixing tile having a central through-hole, and a combustion tile having a tip portion aligned with the mixing tile, the tip portion of the combustion tile being coaxially extended into the central through-hole of the mixing tile to provide diffusion air delivery passages extending in parallel with an axis of the mixing tile between the tip portion and an inner surface of the through-hole of the mixing tile, wherein combustion occurs within said combustion tile.

5,088,424
POLLUTION CONTROL APPARATUS AND METHOD FOR POLLUTION CONTROL
 Abbas Sardari, Laguna Beach, and John D. Von Bargaen, Cypress, both of Calif., assignors to White Horse Technologies, Inc., Irvine, Calif.
 Filed Jun. 26, 1990, Ser. No. 545,335
 Int. Cl.⁵ F23J 11/00, 15/00
 U.S. Cl. 110—344 15 Claims

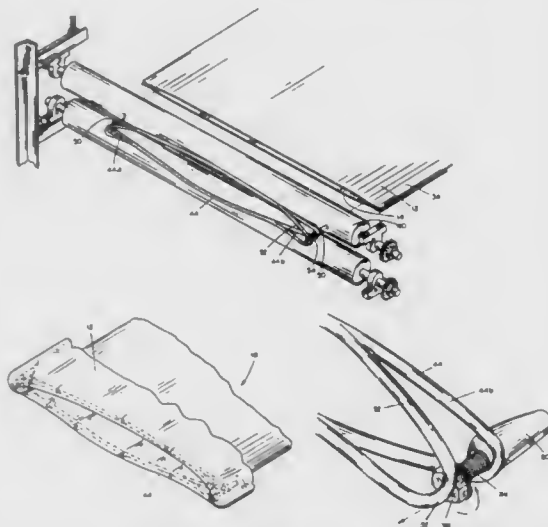


1. A process for thermally oxidizing a gaseous component comprising:
 - passing an amount of an oxygen component, a controlled amount of a fuel component and an amount of a gaseous component to be thermally oxidized to a combustion zone to combust said oxygen component and said fuel component, to partially thermally oxidize said gaseous component and to form a gaseous effluent;
 - contacting said gaseous effluent in a retention zone located downstream of said combustion zone at conditions effective to thermally oxidize said gaseous component, thereby producing a flue gas;
 - transferring heat from said flue gas, thereby generating a useful product;
 - controlling the amount of fuel component passed to said combustion zone based on the temperature in said retention zone, said controlling being effective to maintain the temperature in said retention zone at at least a predetermined, minimum value; and
 - additionally controlling the amount of fuel component passed to said combustion zone based on the amount of heat to be transferred, provided that said additional controlling step is effective only when the temperature in said retention zone is at least about said predetermined, minimum value.

5,088,425
COMFORTER ASSEMBLY APPARATUS
 Rex A. Adams, Omaha, Nebr., assignor to Products Unlimited, Inc., Omaha, Nebr.
 Filed Mar. 9, 1990, Ser. No. 492,079
 Int. Cl.⁵ D05B 11/00 10 Claims

3. A comforter assembly apparatus, comprising:
 - a frame;
 - a first source of fabric, for supplying an upper sheet to said frame;
 - a second source of fabric, for supplying a lower sheet to said frame;
 - attachment means operably mounted on said frame for attaching the side edges of said upper sheet of fabric to the side edges of said lower sheet of fabric, to form a fabric assembly;
 - a pair of feed rollers operably mounted on said frame so as to feed the fabric assembly therebetween;
 - a turning ring means operably associated with said feed rollers for continuously inverting the fabric assembly into

an inside-out condition as it is fed from said feed rollers, including:
 an elongated rigid ring formed from a rod having first and second ends;
 a first leg attached to said first end, having a free end projecting perpendicular to the plane of said ring and extending between said feed rollers when in an operating position; and

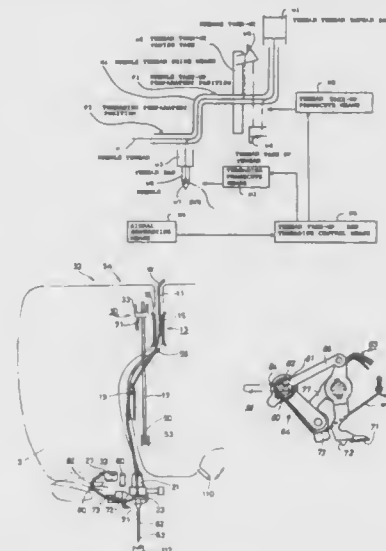


a second leg attached to said second end, having a free end projecting perpendicular to the plane of said ring and extending between said feed rollers when in an operating position; and
 take-up reel means for pulling the inverted fabric assembly through said turning ring means.

5,088,426
SEWING MACHINE WITH AUTOMATIC THREAD TAKE-UP AND THREADING
 Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
 Filed Oct. 4, 1990, Ser. No. 592,832
 Claims priority, application Japan, Oct. 9, 1989, 1-263608
 The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.
 Int. Cl.⁵ D05B 87/02 20 Claims

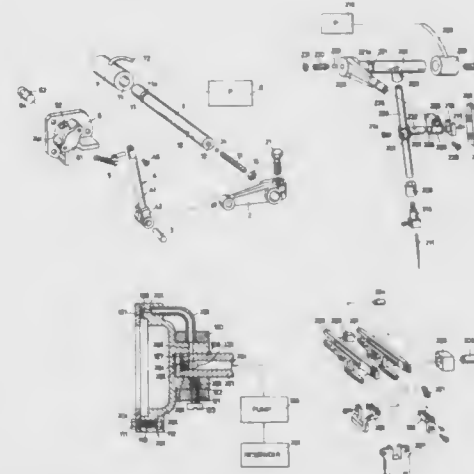
1. Apparatus included in a sewing machine to provide automatic thread take-up and threading comprising:
 - a) needle thread guide means for guiding a needle thread from a needle thread supply source to a threading preparatory position in the vicinity of a needle bar via a thread take-up preparatory position intersecting a thread take-up moving area;
 - b) thread take-up means for extracting said needle thread at said thread take-up preparatory position along said thread take-up moving area, said thread take-up means including a thread take-up member for taking up a separate loop of needle thread between the supply source and an eye of a needle;
 - c) threading means for pulling a loop of said needle thread at said threading preparatory position through an eye of a needle provided at a lower end of said needle bar;
 - d) signal generating means provided in association with the sewing machine for generating signals when operated by a human operator; and
 - e) thread take-up and threading control means for controlling said threading means and said thread take-up means in combination in a pre-established timing relationship in response to signals from said signal generating means

whereby said threading means pulls a loop of said needle thread through said eye of said needle and said thread



take-up member takes up said separate loop of needle thread.

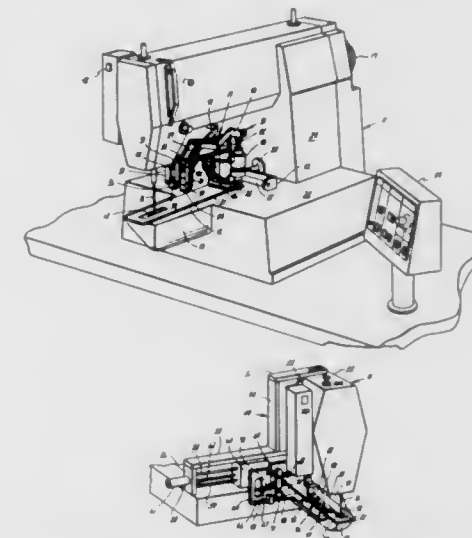
5,088,427
RELATIVELY SLIDING ARRANGEMENT FOR USE IN SEWING MACHINE
 Atsubiro Takagi, Kariya; Mitsuru Muto, Kasugai, and Jun Isono, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
 Filed Apr. 12, 1990, Ser. No. 508,174
 Claims priority, application Japan, Apr. 26, 1989, 1-106255
 Int. Cl.⁵ D05B 71/02, 71/00 22 Claims



1. A relatively sliding arrangement comprising:
 - a sliding member having a first sliding portion;
 - an opponent sliding member having a second sliding portion, the first and the second sliding portions being in relative sliding contact with each other, and at least one of the first and second sliding portions being formed of a ceramic material having high hardness and high wear resistance; and
 - means for supplying a minute amount of a lubrication oil to the sliding portions, wherein said sliding member and said opponent sliding member comprise a pair of sewing machine components selected from the group of paired com-

ponents consisting of an upper looper support member and an upper looper guide means, a shuttle race body and a shuttle body, a needle bar and a needle bar guide means, and feed bars and feed bars supporting means.

5,088,428
BUTTON ATTACHING MACHINE AND METHOD
 Ricky J. Frye, Miamisburg, Ohio, assignor to MIM Industries, Inc., Miamisburg, Ohio
 Continuation-in-part of Ser. No. 408,891, Sep. 18, 1989, abandoned. This application Nov. 15, 1989, Ser. No. 438,255
 Int. Cl.⁵ D05B 3/22 20 Claims



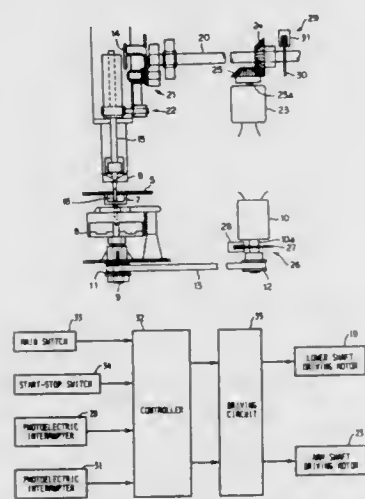
17. A method for sewing a row of buttons, each having at least one stitch aperture, at predetermined respective positions along a work piece, said method comprising the steps of:
 - (a) feeding the row of buttons to gripping means, each of the buttons being placed in a predetermined position relative to the gripping means on a programmable sewing machine having stitch-forming means and with each stitch aperture at a predetermined orientation;
 - (b) gripping the buttons from opposite sides of the row while maintaining a known orientation of each stitch aperture;
 - (c) bringing the row of buttons into predetermined relation with respect to the work piece;
 - (d) moving the buttons and the work piece to a succession of locations to bring a stitch aperture of each button in turn into alignment with the stitch-forming mechanism; and
 - (e) forming stitches to attach each button, in turn, to the work piece.

5,088,429
SEWING MACHINE INDIVIDUALLY DRIVING NEEDLE BAR AND LOOPER
 Takahiro Kanegae, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
 Filed Nov. 7, 1990, Ser. No. 610,111
 Claims priority, application Japan, Feb. 13, 1990, 2-31833
 Int. Cl.⁵ D05B 69/10 14 Claims

6. A sewing machine comprising
 - a reciprocable needle bar movable between a top position and a lower position;
 - first drive means for driving the needle bar;
 - a looper movable into and out of a loop engaging position;
 - second drive means for driving the looper;
 - control means for initializing the starting positions of the needle bar and the looper to permit synchronized move-

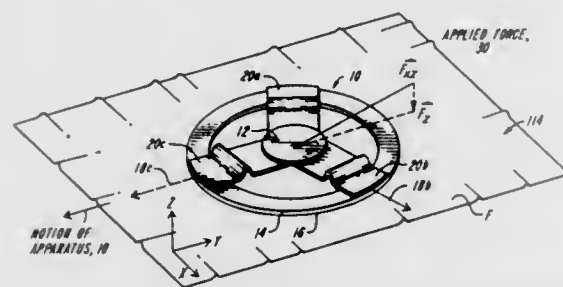
ment of the needle bar and the looper during a sewing operation; said control means comprising:

first means for initializing the needle bar toward the top



position, the first initializing means including means for driving the needle bar in a reverse direction; and second means for initializing the looper away from a loop-engaging position.

5,088,430
LIMP MATERIAL SEGMENT COUPLER FOR A SEWING MACHINE TO TRANSPORT FABRIC WORKPIECES
 Mitchell L. Hansberry, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
 Filed May 15, 1990, Ser. No. 523,726
 Int. Cl.³ D05B 27/00
 U.S. Cl. 112—320 7 Claims



1. Apparatus for resiliently biasing a material segment against a substantially planar work surface, comprising:

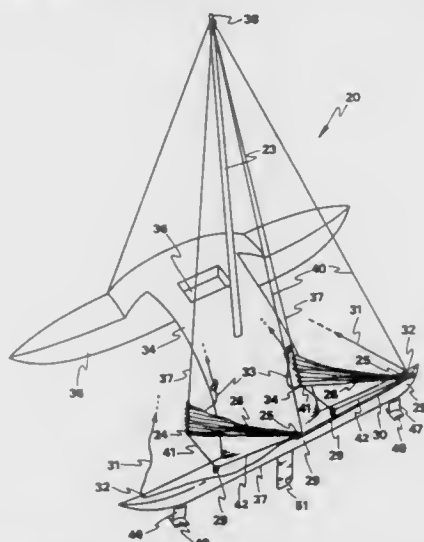
A. a rigid drive member;

B. a segment coupler including a substantially planar surface, said surface having means for frictionally engaging said material segment;

C. spring coupling means for coupling said segment coupler to said drive member, said spring coupling means including:

at least one bent sheet spring extending at least partially within the boundary of said segment coupler, each said spring including a resilient sheet extending from an inner end to an outer end along at least one spring axis and being bent along an axis perpendicular to said spring axis, and each said spring being coupled at an inner end to said drive member and at said outer end to said segment coupler with each spring axis being substantially parallel to said planar surface of said segment coupler.

5,088,431
SAILING VESSELS
 John K. Pizzey, 72 Duro Road, Wellington Point, Queensland, Australia 4160
 Continuation-in-part of Ser. No. 18,901, filed as PCT/AU86/00159, Jun. 3, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 528,831
 Claims priority, application Australia, Jun. 3, 1985, PH0868
 Int. Cl.³ B63H 9/04
 U.S. Cl. 114—39.1 8 Claims



1. A proa sailing vessel comprising:

a pair of spaced hulls comprising a windward hull and a leeward hull;

a cross beam assembly interconnecting said hulls;

a fixed mast assembly having its lower end supported on said cross beam intermediate said hulls and being inclined athwartship whereby its upper end is disposed substantially vertically above said windward hull;

rigging means for supporting said mast assembly and including a standing stay extending between the upper end portion of said mast assembly and the windward side of said proa and a pair of pivot stays extending from an elevated pivotable mounting on said upper end portion of said mast assembly to respective opposite ends of a first boom connected through a lower pivotable mountings disposed intermediate said respective opposite ends to the leeward side of said proa, whereby said pivot stays may be pivoted with said boom between respective opposing longitudinal positions at opposite sides of a pivot axis extending between said elevated and lower pivotable mountings and wherein one said pivot stay constitutes a forestay along which a sail may be hoisted.

5,088,432
ANTI-FOULING SYSTEM FOR SUBSTANCES IN CONTACT WITH SEAWATER
 Masahiro Usami; Kenji Ueda; Kiyomi Tomoshige; Shozo Ohta; Tsutomu Horiguchi, and Hiroshi Yamazaki, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
 Filed Nov. 14, 1989, Ser. No. 436,047
 Claims priority, application Japan, Nov. 14, 1988, 63-287190; Jun. 1, 1989, 1-139973
 Int. Cl.³ C23F 13/00
 U.S. Cl. 114—67 R 9 Claims

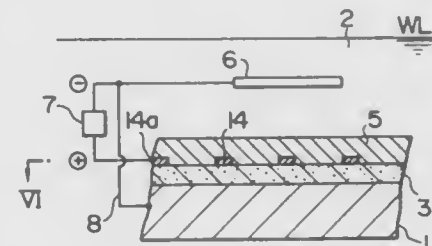
1. An anti-fouling system for a substance having an outer surface in contact with seawater comprising:

an electric insulator coating on said outer surface of the substance and having an outer surface;

a first conductive membrane coating on said outer surface of said electric insulator coating, said first conductive mem-

brane coating having an outer surface and comprising a thin sheet of material selected from the group consisting of metals having low electrical resistance, titanium, niobium, metal oxide, spray-coated membrane, evaporated membrane, and fused membrane;

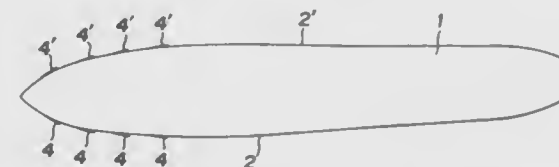
a second conductive anti-fouling membrane coating having higher electrical resistance than said first conductive membrane coating on said outer surface of said first conductive membrane coating and comprising an oxidation-resistant insoluble material and an organic binder;



an electric conductor made of a material selected from the group consisting of steel, iron, copper and carbon and mixtures thereof positioned in the seawater in opposed spaced relation to said second conductive membrane coating; and

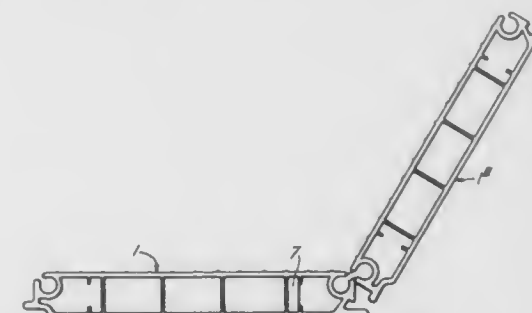
a power source connected between said first conductive membrane coating and said electric conductor for supplying direct current flowing from said first conductive membrane coating through said second conductive membrane coating toward said electric conductor.

5,088,433
WAVE-MAKING RESISTANCE SUPPRESSING MEANS IN SHIP AND SHIP PROVIDED THEREWITH
 Masakazu Osawa, and Hidemori Osawa, both of 34-14, Kameido 9-chome, Koto, Tokyo, Japan
 Filed Jul. 31, 1990, Ser. No. 560,390
 Claims priority, application Japan, Jul. 31, 1989, 1-196934; Jul. 31, 1990, 2-184295
 Int. Cl.³ B63B 1/34
 U.S. Cl. 114—67 R 3 Claims



1. A means for attachment to a ship for reducing the resistance to motion through water, said means comprising at least one pair of fins each having substantially identical form extending above and below the draft line of the ship hull symmetrically on both sides of the hull from the stem to the stern, each fin being attached to the hull in direct contact therewith along the front end line thereof and the rear end of each fin being spaced apart from the hull surface wherein each fin is pivotally mounted on the hull of the ship along the front end line of said fin, and means for pushing and pulling the rear end of said fin thereby making a variable angle with the hull.

5,088,434
INFLATABLE BOAT AND DECK THEREFOR
 Richard J. A. Harding, Trimsaran, Great Britain, assignor to Avon Inflatables Limited, Wilshire, England
 Filed Dec. 21, 1990, Ser. No. 629,820
 Claims priority, application United Kingdom, Dec. 21, 1989, 8928881
 Int. Cl.³ B63B 7/02
 U.S. Cl. 114—85 25 Claims

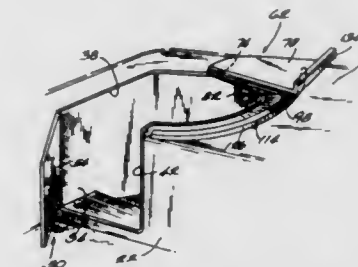


1. A deck for an inflatable boat comprising:

a plurality of parallel elongate deck elements each having an upper and lower surface and arranged in a side by side relationship so as to be in a plane when in a first condition, adjacent sides of said elements configured so as to have an interengagement means for preventing relative translational movement of said deck elements out of the plane while at the same time permitting relative angular movement out of the plane; and

link means for connecting said adjacent sides of said deck elements in the side by side relationship, wherein said link means remains connected upon said relative angular movement and said interengagement means disengages upon a predetermined degree of said relative angular movement.

5,088,435
RECREATIONAL BOAT WITH IMPROVED COMPANIONWAY HATCH
 Michael W. Lathers, Tustin, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.
 Filed Sep. 27, 1989, Ser. No. 413,106
 Int. Cl.³ B63B 19/00
 U.S. Cl. 114—177 25 Claims



3. A boat comprising a hull, a wall which is supported by said hull, which partially defines a space, and which has therein an opening affording access to said space, and a cover mounted on said wall for pivotal movement relative thereto about a pivot axis extending generally perpendicular to said wall, said cover being movable between an opening position wherein said cover substantially uncovers said opening and a closed position wherein said cover substantially covers said opening, and said cover including a first generally planar portion mounted on said wall for pivotal movement relative thereto about said pivot axis, and a second generally planar portion mounted on said first portion for common pivotal movement therewith about said pivot axis and for pivotal

movement relative thereto about a hinge axis extending generally parallel to said wall.

5,088,436

APPARATUS FOR CHARGING GAS PRESSURIZED BEVERAGE STORAGE AND DISPENSING SYSTEMS

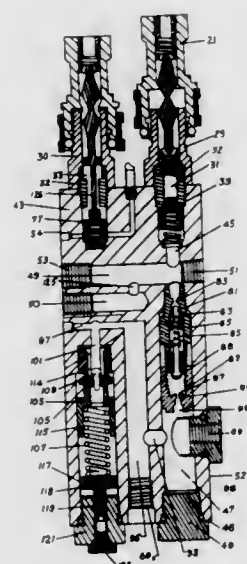
Ronald L. Stritmatter, Fort Worth, Tex., assignor to Thad Keenan, Fort Worth, Tex.

Filed Apr. 2, 1990, Ser. No. 503,326

Int. Cl.³ F17C 5/02

U.S. Cl. 141—234

4 Claims



1. A valve manifold for use in a system for charging storage cylinders with liquid, inert, cryogenic gas, comprising a valve manifold body, an inlet to said body for receiving liquid gas at a relatively high pressure, exit ports for connecting one or more storage cylinders to the manifold valve body to receive the liquid gas at said relatively high pressure, phase transformation means disposed downstream from said exit ports, which receive incoming liquid gas and allow a controlled transition of the liquid to gaseous phase, said transformation means including a pressure reduction valve, a choke and an expansion chamber, which is connected to a further exit port for gaseous phase gas, said pressure reduction valve of the transformation means being disposed immediately upstream from the choke and the choke comprises a diffusion means for dispersing the liquid gas into a chamber having a relatively small exit through which the liquid gas passes to the expansion chamber.

5,088,437

BOAT HULL CONSTRUCTION METHOD AND PRODUCT THEREOF

William H. Harper, Jr., 1454 Amon Dr., Richland, Wash. 99352

Filed May 9, 1990, Ser. No. 521,244

Int. Cl.³ B63B 3/00

U.S. Cl. 114—355

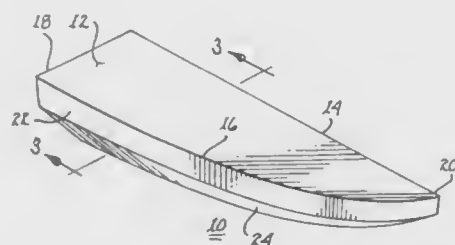
26 Claims

1. A method for constructing a boat hull, said method comprising the steps of:

- a) fabricating a deck having one straight longitudinal edge and a curved longitudinal edge;
- b) forming a gunnel having a first straight longitudinal edge and a second longitudinal edge;
- c) attaching the straight longitudinal edge of the gunnel to the curved longitudinal edge of the deck;
- d) rotating the deck about its straight longitudinal edge disposed in a first plane to an angle of 45° with respect to the first plane;
- e) attaching a straight longitudinal edge of a first longitudinal bulkhead to the straight longitudinal edge of the deck

to locate the first bulkhead in a second plane perpendicular to the first plane;

- f) projecting a first scribe line upon the first bulkhead from the second edge of the gunnel parallel with the first plane;
- g) cutting the first bulkhead along the first scribe line to develop a curved edge of the first bulkhead;
- h) locating a straight longitudinal edge of a first hull plate coincident with the curved edge of the first bulkhead and resting the first hull plate upon the second edge of the gunnel;
- i) cutting the first hull plate in proximity to its line of contact with the second edge of the gunnel;
- j) attaching the first hull plate to the curved edge of the first bulkhead and to the second edge of the gunnel;
- k) rotating the deck about its straight longitudinal edge disposed in the first plane to a position coincident with the first plane;



- l) attaching a straight longitudinal edge of a second longitudinal bulkhead to the straight longitudinal edge of the deck to locate the second bulkhead in a second plane perpendicular to the first plane;
- m) projecting a second scribe line upon the second bulkhead from the curved edge of the first bulkhead parallel with the first plane;
- n) cutting the second bulkhead along the second scribe line to develop a curved edge of the second bulkhead;
- o) locating a straight longitudinal edge of a second hull plate coincident with the curved edge of the second bulkhead and resting the second hull plate upon the curved edge of the first bulkhead;
- p) cutting the second hull plate in proximity to its line of contact with the curved edge of the first bulkhead; and
- q) attaching the second hull plate to the curved edge of the second bulkhead and to the curved edge of the first bulkhead.

5,088,438

APPARATUS FOR FLEXIBLE MARINE WINDOWS

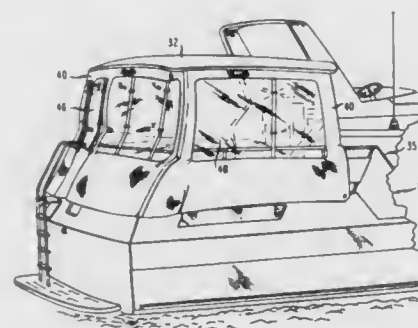
Jay Richardson, Jr., and Dolores Decker, both of Riviera Beach, Fla., assignors to Glass Partners, Inc., Riviera Beach, Fla.

Filed Mar. 28, 1990, Ser. No. 500,523

Int. Cl.³ B63B 17/00

U.S. Cl. 114—361

11 Claims



1. A method for preventing singeing of flexible plastic shelters for marine vessels, said shelters being supported by frame-

work members, said method comprising the attachment to said framework members of at least one detachable clip, said clip being adapted to engage said framework members and having at least one insulator portion, and further comprising the step of interposing said insulating portion between said flexible plastic shelter and said framework members, whereby a plurality of said clips can be attached to said framework members in spaced-apart relation to prevent contact between said flexible plastic shelter and said framework members, whereby singeing of said flexible plastic shelter upon contact with said framework members will be prevented.

5,088,439

SAFETY REFLECTOR INCLUDING BRACKET

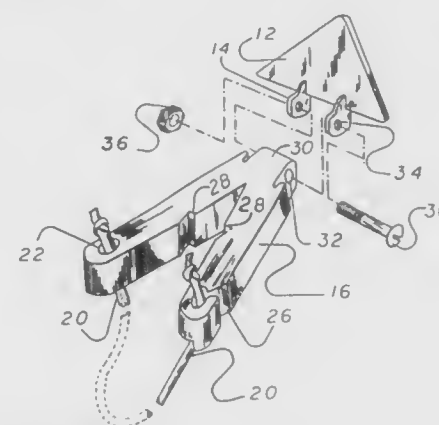
Ronald L. Anderson, 3623 Deal, Houston, Tex. 77025

Filed Apr. 22, 1991, Ser. No. 688,844

Int. Cl.³ B60Q 1/30; B61L 15/02

U.S. Cl. 116—30

14 Claims



9. A safety reflector comprising:
a safety sign comprising:
a frame having a triangular shape;
a reflective surface positioned within said frame, said reflective surface being reflective on a front side and a back side; and
interconnecting means attached to a portion of said frame, said interconnecting means for hinged attachment to a V-shaped bracket, said interconnecting means comprising a pair of spaced flat surfaces extending outwardly from said frame, each of said flat surfaces having a hole centrally formed therein, said flat surfaces for hinged connection with a proximal end of said V-shaped bracket;
said V-shaped bracket having a first side and a second side, said first side having a first notch formed along an inner surface, said second side having a second notch formed along an inner surface, said first and second notches in symmetrical relation to each other; and
securement means connected to an end of said V-shaped bracket opposite said safety sign, said securement means for attaching said bracket to an object.

5,088,440

INDICATOR FOR AN INDICATING DEVICE

Carl J. Keaney, P.O. Box 1082, Knoxville, Tenn. 37901

Filed Dec. 28, 1990, Ser. No. 636,074

Int. Cl.³ G01D 13/00

U.S. Cl. 116—298

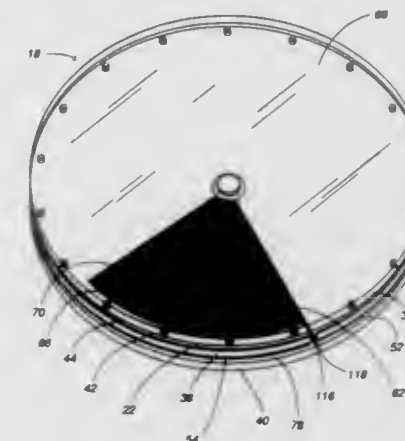
8 Claims

5. In an indicating device having a shaft which is rotatable about an axis of rotation during use of the device, means for rotating the shaft about the rotation axis and an indicator associated with said shaft for movement as the shaft is rotated, the improvement comprising:

- a flexible belt for use as the indicator of the device including
- (a) a first discoidal side portion including a first face having

a circular periphery, a circular hole in the center of the first face and a slit having two sides which extend radially across the first face from the edge of the circular hole in the center to the circular periphery of said first face and

(b) a second discoidal side portion including a second face having a circular periphery, a circular hole in the center of the second face and a slit having two sides which extend radially across the second face from the edge of the circular hole in the center to the circular periphery of said second side portion, said first side portion and said second side portion being arranged in a back-to-back relationship so that the faces thereof face in opposite directions and so that the slits thereof are positioned in registry and provide a single two-sided gap extending from the edges of the circular holes in the center to the circular peripheries of the faces, and said first and second side portions being joined to one another along each side of said two-sided gap;



means for connecting the belt to the rotatable shaft of the device for rotating said first and second side portions in opposite directions relative to each other about an axis extending through the center of and generally perpendicular to said faces so that as a sector of the first side portion moves through the two-sided gap to the belt side corresponding with the face of the second side portion a sector of the second side portion moves through the two-sided gap to the belt side corresponding with the face of the first side portion whereby as the face of one side portion is viewed frontally, the face of the belt side portion being viewed disappears through the gap, and the face of the opposite belt side portion appears through the gap; and
indicia means associated with at least one of the first and second side portions for indicating the positional relationship of the first and second side portions as the side portions are rotated relative to each other as aforesaid.

5,088,441

CORD IMPREGNATOR

Joseph V. Bell, Santa Barbara, Calif., assignor to Belpoint Co., Inc., Camarillo, Calif.

Filed Aug. 23, 1990, Ser. No. 571,218

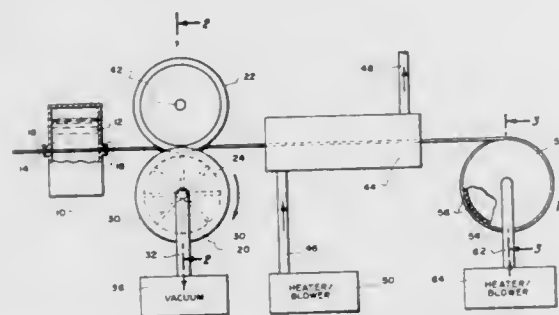
Int. Cl.³ B05C 3/172, 11/02

U.S. Cl. 118—67

3 Claims

1. A cord impregnator comprising:
a length of thin cord;
a bath containing a liquid medium, said cord being immersed in said liquid medium;
a powered squeezing roller assembly, said squeezing roller assembly comprising a first wheel and a second wheel, said first wheel having a V-shaped continuous groove, said second wheel having a continuous tongue matingly connecting with said groove, said cord being movable through said groove of said squeezing roller assembly,

said tongue and said groove applying squeezing pressure against said cord compressing said cord to evenly distribute said liquid medium within said cord and for removing excess said liquid medium from said cord;



a first drying means, said cord to be moved through said first drying means after passage through said squeezing roller assembly; and
a wind-up drum, said cord to be moved onto said wind-up drum and retained thereon.

5,088,442

DEVICE FOR SELECTIVELY MOISTENING ENVELOPE FLAPS

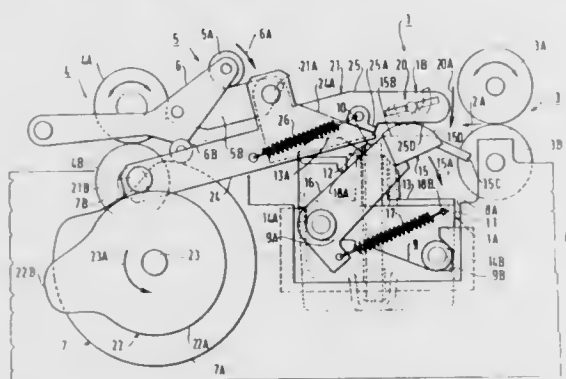
Michel Joson, Fontenay Tresigny, and Jean-Pierre Gregoire, Bagnaux, both of France, assignors to Societe Anonyme dite: ALCATEL SATMAM, Bagnaux, France

Filed Sep. 20, 1990, Ser. No. 585,453

Claims priority, application France, Sep. 28, 1989, 89 12706
Int. Cl.⁵ B05C 1/00, 1/06

U.S. Cl. 118—238

15 Claims



1. Device for selectively moistening flaps of envelopes as they move along a path comprising a moistening member and a pivoting moistening deflector which receive between them the flap of each envelope and first means for actuating the moistening deflector between a rest position in which it is spaced from the moistening member and does not operate on the flap and a moistening position in which it forces the flap against an edge of the moistening member which is the front edge of the moistening member with reference to the direction of forward movement of the flap, said device further comprising:

a slide bar having a substantially plane slide surface associated with said moistening member and being on the same side as the moistening member with respect to the flap, said slide bar being pivoted and facing said front edge of said moistening member, and second means for actuating said slide bar between a protection position in which said slide bar adjoins the moistening member with its slide surface flush with said front edge of the moistening member and a retracted position in which slide bar is retracted

with its slide surface set back relative to said front edge of the moistening member, and
means for controlling said first and second actuator means to place the slide bar in the protection position substantially simultaneously with placing the moistening deflector in the rest position and to place the slide bar in the retracted position substantially simultaneously with placing the moistening deflector in the moistening position.

5,088,443

METHOD AND APPARATUS FOR SPRAYING A LIQUID COATING CONTAINING SUPERCRITICAL FLUID OR LIQUIFIED GAS

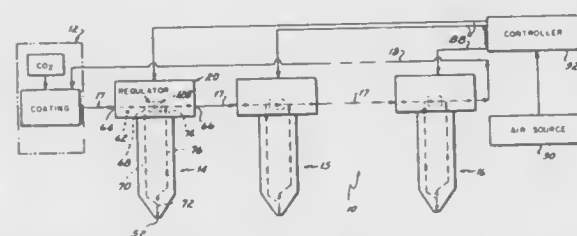
Donald R. Hastings, Elyria, and John A. Hendricks, Vickery, both of Ohio, assignors to Nordson Corporation, West Lake, Ohio

Filed Oct. 4, 1989, Ser. No. 416,855

Int. Cl.⁵ B05B 1/00

U.S. Cl. 118—314

26 Claims



1. Apparatus for spraying a liquid coating material containing supercritical fluid or liquified gas, comprising:
a dispensing device formed with an inlet and an outlet, said inlet being adapted to connect to a source of the liquid coating material containing supercritical fluid or liquified gas;
a nozzle having a discharge bore, said nozzle being carried by said dispensing device;
said dispensing device being formed with passage means for transmitting the liquid coating material containing supercritical fluid or liquified gas from said inlet, to said nozzle and then to said outlet at sufficient pressure so that the supercritical fluid or liquified gas is maintained in solution in the liquid coating material within said dispensing device;
means for transmitting the liquid coating material containing supercritical fluid or liquified gas from said passage means into said nozzle so that the supercritical fluid or liquified gas is maintained substantially in solution in the liquid coating material before being emitted through said discharge bore of said nozzle for application onto a substrate.

5,088,444

VAPOR DEPOSITION SYSTEM

Toshimitsu Ohmine, Tokyo, and Keiichi Akagawa, Yamato, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 1, 1990, Ser. No. 487,188

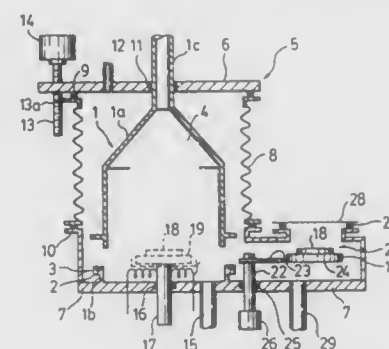
Claims priority, application Japan, Mar. 15, 1989, 1-060824
Int. Cl.⁵ C23C 16/00

U.S. Cl. 118—719

13 Claims

1. A vapor deposition system for depositing a semiconductor film on a substrate, comprising:
(a) a susceptor on which the substrate is positioned;
(b) a reactor tube in which said susceptor having the substrate is positioned and the semiconductor film is deposited on the substrate;
(c) said reactor tube being composed of two parts to be fitted to and separated from each other;
(d) an airtight vessel airtightly covering said reactor tube;
(e) moving means disposed outside of said airtight vessel for

moving at least one of the two parts of said reactor tube relative to the other part, thereby fitting and separating the two parts to and from each other; and
(f) carrying means for carrying said susceptor having the



substrate from said airtight vessel into said reactor tube through an opening to be opened by separating the two parts of said reactor tube from each other, and carrying said susceptor from said reactor tube to said airtight vessel through the opening.

5,088,445

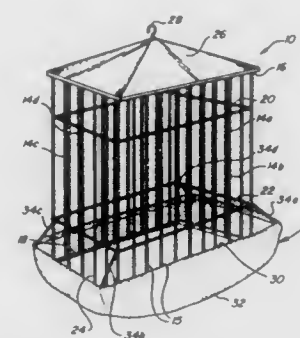
ANIMAL CAGE COVER AND LITTER CATCHER

Elizabeth C. Brindamour, 15050 Fenton, Redford, Mich. 48239
Filed Sep. 10, 1990, Ser. No. 579,488

Int. Cl.⁵ A01K 31/00

U.S. Cl. 119—17

9 Claims



1. A litter catcher adapted for attachment to an animal cage, comprising:
a frame;
means for attaching said frame to the animal cage;
means removably attached to said frame for catching objects from the animal cage;
said catching means comprising a sheet supported along its periphery and wrapped around said frame and means for fastening and unfastening said sheet around said frame to allow said sheet to be removed from said frame for cleaning and replacement; and
said fastening and unfastening means comprising cooperating surfaces along the periphery of said sheet and facing each other with one surface carrying a plurality of hook-like members and the other surface carrying a felt-like material, said surfaces being engageable and disengageable with each other.

5,088,446

ANIMAL ACTIVITY APPARATUS

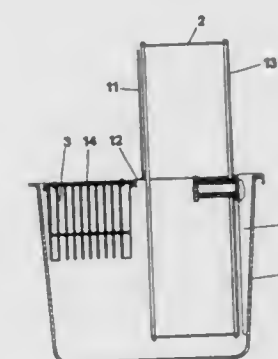
Alfredo Campiotti, Malnate, Italy, assignor to Techniplast S.r.l., Buguggiate, Italy

Filed Apr. 11, 1990, Ser. No. 507,441

Claims priority, application Italy, Jan. 10, 1990, 19037 A190
Int. Cl.⁵ A01K 31/00

U.S. Cl. 119—17

15 Claims



1. A stalling cage comprising in combination:
a cage housing;
a rotary activity cage rotatably and unilaterally supported within said cage housing by a pivot pin; and
an auxiliary element having a pivot pin support wall to which said pivot pin is fixed, said pivot pin support wall being positioned between the rotary cage and a wall of the cage housing, said pivot pin support wall being attached at an upper end thereof to the cage housing wall by a hook, and a lower end of the pivot pin support wall abuts the cage housing wall whereby the pivot pin support wall through the pivot pin firmly holds said rotary cage within said stalling cage.

5,088,447

TRANSPONDER READER ARM ASSEMBLY

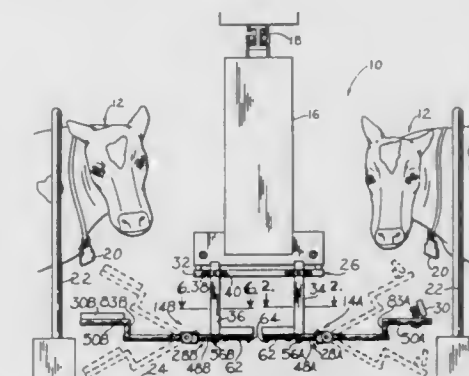
William E. Spencer, Kansas City, Mo., and Mofazzal H. Chowdhury, Lenexa, Kans., assignors to Alfa-Laval Agri, Inc., Kansas City, Mo.

Filed Jul. 16, 1990, Ser. No. 553,522

Int. Cl.⁵ A01K 5/02; B61K 1/00; B61L 3/12

U.S. Cl. 119—51.02

21 Claims



1. A transponder reader arm adapted for use with a feed car movable along a path for feeding livestock in response to signals sent by individual transponders associated with members of the livestock, said transponder reader arm comprising:
an arm presenting a first end and a second, distal end;
means for pivotally mounting said arm relative to said car proximate said first end; and
means mounting a transponder reader proximate said second end, whereby said car dispenses feed to the members of

the livestock in response to said transponder reader receiving a signal from said individual transponders.

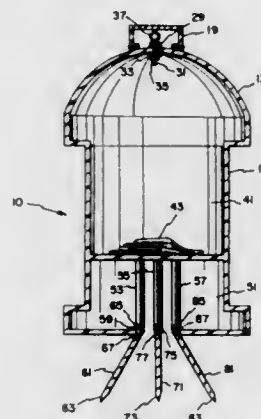
5,088,448
COMBINED PET HITCHING POST AND STORAGE DEVICE

Mary A. Gladding, 195 Brookside Dr., Hope, Ind. 47246
Filed Apr. 23, 1991, Ser. No. 689,636

Int. Cl.⁵ A01K 3/00

U.S. Cl. 119—121

7 Claims



1. A hitching post, comprising:
 - a) a housing having a handle;
 - b) a plurality of ground insertion spikes movable from a first stored position within said housing to a second extended position; and
 - c) a swivel mounted adjacent said handle with a tether removably attachable thereto;
 - d) said housing having a first subchamber and a second subchamber, said first subchamber being accessible through an opening in a wall of said housing; said second subchamber receiving said spikes in said first position thereof.

5,088,449
CALF CATCHING AND HOLDING DEVICE
Lloyd E. Lamb, Sr., and Norman E. Alm, both of P.O. Box 384, Helena, Mont. 59624

Continuation-in-part of Ser. No. 503,372, Apr. 25, 1990, abandoned. This application Mar. 8, 1991, Ser. No. 667,242
Int. Cl.⁵ A01K 29/00

U.S. Cl. 119—153

1 Claim



1. A device for catching and restraining animals comprising:
 - (a.) an elongate tubular member having first and second ends;
 - (b.) an end cap secured to the first end of the tubular member so as to close off said first end, the tubular member having an aperture extending through a sidewall thereof and located proximate said first end;
 - (c.) a tubular handle attached to the second end of the tubular member, the handle having an aperture extending through an end wall thereof;
 - (d.) a rope having first and second ends, a first loop formed on the first end of said rope and a second smaller loop formed on the second end of said rope, the first loop being positioned proximate the handle on the second end of the tubular member, and a first portion of the rope extending

through the aperture in the handle, through the tubular member, and out through the aperture adjacent the first end of said tubular member, said first portion of the rope extending through the tubular member being fixedly secured therein; and

- (e.) a retaining washer having a peripheral edge extending outwardly beyond the periphery of said handle and being located between the first loop and the end wall of the handle, the rope passing through said washer, the smaller loop passing over the tubular member so that a second portion of the rope extends along the outside of said tubular member forming a noose, the smaller loop being passed over the washer and prevented from sliding back down the tubular member; whereby, when the smaller loop is manually released from the washer, it slides down the tubular member, passing over the end cap on the first end of said tubular member, and further slides along the second portion of the rope so as to tighten the noose thus created.

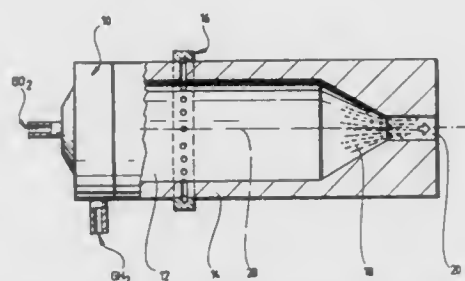
5,088,450
STEAM GENERATOR
Hans Sternfeld, Jagsthausen; Karlheinz Wolfmueller, Eppingen-Adelshofen, and Alfred Brunn, Adelsheim-Sennfeld, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Fed. Rep. of Germany
Filed Oct. 30, 1990, Ser. No. 605,802

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1989, 3936806

Int. Cl.⁵ F22B 1/02

U.S. Cl. 122—31.1

16 Claims



1. Steam generator comprising a blow-in head through which an oxidizer and a fuel are blown into a combustion chamber adjoining said blow-in head, and injection devices for water leading into said combustion chamber, said blow-in head having several blow-in elements which blow said oxidizer and said fuel jointly into said combustion chamber and having means for conducting one of these two in an inner cylinder flow and the other in a cylindrical ring flow surrounding said inner cylinder flow, wherein said oxidizer and fuel are arranged as concentric cylinders when they enter said combustion chamber.

5,088,451
SLUDGE REMOVAL SYSTEM FOR REMOVING SLUDGE FROM HEAT EXCHANGERS

Min H. Hu, Murrysville; Allen C. Smith, Jr., Bethel Park; Robert M. Wilson, Plum Boro; Robert M. Wepfer, Murrysville, and Howard E. Braun, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1990, Ser. No. 506,726

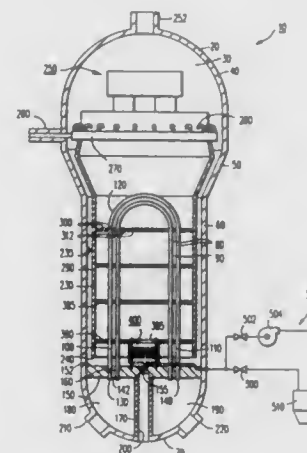
Int. Cl.⁵ F22B 37/48; F28G 9/00

U.S. Cl. 122—388

20 Claims

1. A system for removing sludge from a sludge-bearing fluid flowing in a vertically oriented heat exchanger, comprising:
 - (a) separating means disposed in the heat exchanger for separating the sludge from the sludge-bearing fluid;
 - (b) blowdown means having an intake orifice disposed in

said separating means for removing the sludge separated from the sludge-bearing fluid; and



- (c) flow means disposed adjacent said separating means for directing the flow of the sludge-bearing fluid toward said separating means.

5,088,452
METHOD FOR STARTING A HYDROGEN ENGINE AND A METHOD FOR STOPPING A HYDROGEN ENGINE
Takashi Iwaki, Okazaki; Kazuo Ito, Obu; Hiroshi Matsumoto, Toyota; Kunitoshi Watanabe, Mizumaki; Hiroyuki Suzuki, Kitakyushu; Juzo Shibata, Aichi; Nobuyuki Uematsu, Hoya, and Mamoru Takeda, Chiba, all of Japan, assignors to Kabushiki Kaisha Toyota Jidoshokki Seisakusho, Kariya and Nippon Steel Corporation, Tokyo, both of Japan

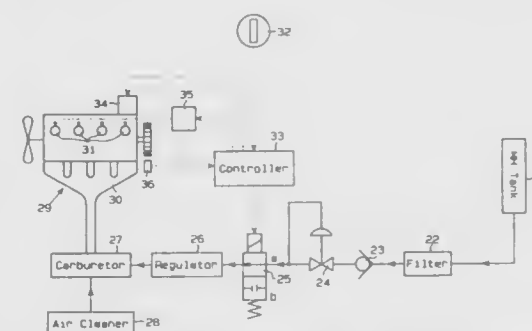
Division of Ser. No. 384,302, Jul. 24, 1989, This application Dec. 12, 1990, Ser. No. 626,472

Claims priority, application Japan, Jul. 26, 1988, 63-184535; Sep. 22, 1988, 63-237852; Sep. 22, 1988, 63-237857; Nov. 21, 1988, 63-294172; Nov. 21, 1988, 63-294173

Int. Cl.⁵ F02B 43/00

U.S. Cl. 123—3

5 Claims



1. A method for starting a hydrogen engine comprising:
 - a first step wherein while a communicating route between a metal hydride container and an engine is cut off so as to stop supply of hydrogen gas from said metal hydride container to said engine, said engine rotates idle so as to exhaust residual hydrogen gas remaining in a route between the cutoff portion of the communicating route and said engine,
 - a second step wherein after the exhaustion of said residual hydrogen gas is completed, the cutoff of said communicating route is canceled so as to provide said engine with the hydrogen gas, and said engine starts running.

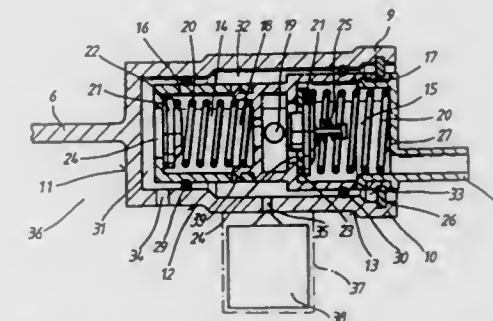
5,088,453
DELIVERY VALVE UNIT ON A COMPENSATING TANK
Wolfgang Kleineberg, Calw; Hans Schaal, Esslingen, and Thomas Attinger, Stuttgart, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed May 9, 1991, Ser. No. 697,435

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020866

Int. Cl.⁵ F01P 3/22

U.S. Cl. 123—41.54

16 Claims



1. A delivery-valve unit arrangement on a compensating tank in the cooling circuit of an internal-combustion engine, comprising a receiving housing arranged within a cover of the tank and in which the delivery valve unit is inserted, a first relief valve, and a second relief valve following the first relief valve in a downstream direction, each of the relief valves having a spring associated with a valve body for closing valve orifices and a float controlling a first overflow bore located between the two relief valves, wherein the relief valves are provided in valve housings separate from the compensating tank and inserted sealingly in the receiving housing, and valve orifices being operatively connected to an interior portion of the tank via the first overflow bore and a second overflow bore, wherein the float is located between the relief valves and is guided in the interior portion of the tank.

5,088,454
INTAKE SYSTEM FOR AUTOMOTIVE ENGINE
Takehiro Washizu, and Tsutomu Nagamatsu, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

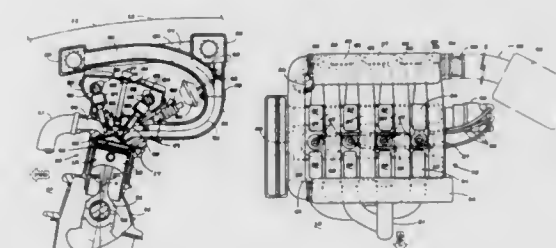
Division of Ser. No. 485,466, Feb. 27, 1990, This application Feb. 8, 1991, Ser. No. 652,871

Claims priority, application Japan, Mar. 3, 1989, 1-51612

Int. Cl.⁵ F02M 35/10

U.S. Cl. 123—52 MB

23 Claims



1. An induction system for an internal combustion engine having a combustion chamber, a first plenum chamber, first intake passage means communicating said first plenum chamber with said combustion chamber, a second plenum chamber spaced from said first plenum chamber, second intake passage means communicating said second plenum chamber with said combustion chamber, said first intake passage means and said second intake passage means.

first plenum chamber being tuned to improve low and mid-range performance of the engine, said second plenum chamber and said second intake passage means being tuned to improve the high speed running conditions of said engine, throttle valve means for controlling the communication of said second plenum chamber with said combustion chamber, a common atmospheric air inlet for both of said plenum chambers for providing the sole source of atmospheric air for said plenum chambers, and a single throttle valve means in said common atmospheric air inlet providing the sole means for controlling air flow into each of said plenum chambers.

5,088,455

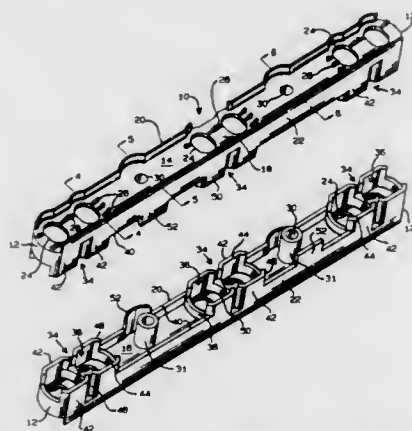
ROLLER VALVE LIFTER ANTI-ROTATION GUIDE
Ralph D. Moretz, Jackson, Mich., assignor to Mid-American Products, Inc., Jackson, Mich.

Filed Aug. 12, 1991, Ser. No. 743,901

Int. Cl.⁵ F01L 1/46

U.S. Cl. 123—90.5

20 Claims



1. A roller valve lifter anti-rotation guide for internal combustion engine valve lifters reciprocally mounted within an engine bore along an axis and having a pair of substantially parallel spaced flat surfaces defined thereon adjacent a valve lifter end and radially spaced from the lifter axis, comprising, in combination, a body molded of a heat resistant material, engine mounting means defined on said body for mounting said body on an engine adjacent valve lifters to be guided, an elongated socket defined on said body having an axis and adapted to receive the end of a valve lifter having the flat surfaces defined thereon, said socket including and at least being partially defined by a pair of spaced elongated fingers having internal flat surfaces defined thereon in spaced opposed relationship to each other, the spacing between said finger's internal surfaces being substantially equal to the spacing between the valve lifter flat surfaces whereby said finger's internal surfaces engage and receive therebetween the valve lifter flat surfaces and prevent rotation of the valve lifter about its axis.

5,088,456

VALVE TIMING CONTROL SYSTEM TO ADJUST PHASE RELATIONSHIP BETWEEN MAXIMUM, INTERMEDIATE, AND MINIMUM ADVANCE POSITION

Seiji Suga, Kanagawa, Japan, assignor to Atsugi-Unisia Corporation, Kanagawa, Japan

Filed Jan. 29, 1991, Ser. No. 647,290

Claims priority, application Japan, Jan. 30, 1990, 2-20050; Feb. 28, 1990, 2-19537[U]

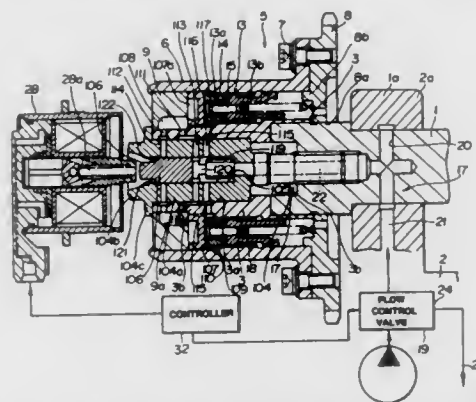
Int. Cl.⁵ F01L 1/34

U.S. Cl. 123—90.17

9 Claims

1. A valve timing control system for an automotive vehicle, comprising:
an engine revolution synchronous rotary element rotatingly driven in synchronism with engine revolution;

a camshaft for driving intake and/or exhaust valve of an induction system of the engine;
a camshaft synchronous rotary element rotating in synchronism with engine revolution;
a phase adjusting means disposed between said engine revolution synchronous rotary element and said camshaft synchronous rotary element for adjusting rotational phase relationship between said rotary elements for adjusting rotational phase of said camshaft relative to engine revolution system;
a control means associated with said phase adjusting means, for actuating said phase adjusting means, for shifting said phase adjusting means between a minimum advance position corresponding to a predetermined minimum ad-



vanced phase of said camshaft relative to the engine revolution cycle and a maximum advance position corresponding to a predetermined maximum advanced phase of said camshaft relative to the engine revolution cycle, said control means actuating said phase adjusting means to said minimum advance position in response to low engine load condition and to said maximum advance position in response to high engine load; and means responsive to a predetermined medium load between said low and high load for restricting magnitude of shifting of said phase adjusting means to a predetermined medium advance position in which magnitude of phase shift of said camshaft is greater than that at said minimum advance position and smaller than that at said maximum advance position.

5,088,457

INTERNAL COMBUSTION ENGINE WITH A TENSIONER FOR THE TRANSMISSION CHAIN BETWEEN TWO OVERHEAD CAMSHAFTS

Francesco Ferrazzi, Torino, Italy, assignor to Fiat Auto SPA, Torino, Italy

Filed Apr. 22, 1991, Ser. No. 688,397

Claims priority, application Italy, May 8, 1990, 67335 A/90

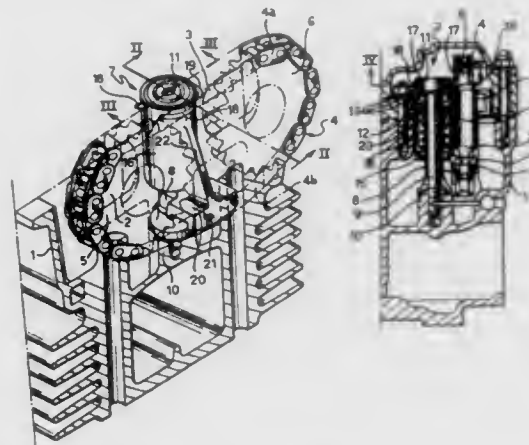
Int. Cl.⁵ F01L 1/02; F16H 7/08

U.S. Cl. 123—90.31

8 Claims

1. An internal combustion engine for motor vehicles having a cylinder head, two overhead camshafts carrying at one end respective sprockets, a chain passing around said sprockets for transmitting the drive from one shaft to the other, said chain having a free pass and defining with said sprocket a general plane, and a tensioning device including a shoe in sliding pressure contact with the free pass of the transmission chain, wherein the tensioning device comprises a rod-like support body fixed to the head in a position which is offset laterally from the general plane of the sprockets and the chain, a bush which slides coaxially on the rod and is formed with a cantilevered bracket which projects between the two sprockets and carries the shoe, thrust means for urging the bush in a direction such that the shoe comes into contact with the chain, and means for automatically taking up the play between the shoe

and the chain, including frictional axial positioning means between the bush and the rod for enabling unidirectional sliding of the bush relative to the rod under the action of the thrust means.



5,088,458

LASH ADJUSTED FOR ENGINE VALVE ACTUATOR ASSEMBLY

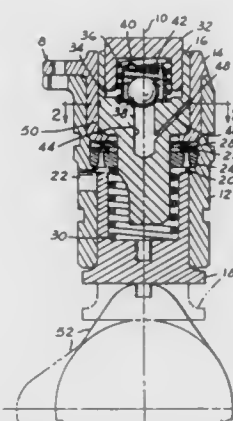
Russell J. Wakeman, and Stephen F. Shea, both of Newport News, Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Feb. 1, 1991, Ser. No. 649,643

Int. Cl.⁵ F01L 1/24

U.S. Cl. 123—90.55

12 Claims



1. In a hydraulic engine valve lifter which comprises housing means comprising through-bore structure that is closed at each respective end by the telescopic sliding fit engagement with said housing means of a respective one of two pistons which are hydraulically coupled via a pressure chamber means which is cooperatively defined by said pistons within said housing means, which is supplied with pressurized hydraulic fluid, and which contains means to impart a certain damping characteristic to at least one of said two pistons at least at times during operation of the lifter and a lash adjusting piston which is telescopically arranged on one of said first two pistons for cooperation therewith in defining a lash adjusting chamber that is hydraulically communicated with said pressure chamber means via a communication path which includes a check-valve means that allows hydraulic fluid to pass from said pressure chamber means to said lash adjusting chamber but not vice versa, the improvement which comprises said communication path comprising a restriction that is cooperatively defined by a portion of the telescopic fit between said one of said first two pistons and said housing means to provide a pressure drop in

5,088,459

DISTRIBUTOR FOR IGNITING COMBUSTION ENGINE
Toshiyuki Kunimitsu, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo and Nissan Kohki Co., Ltd., Kanagawa, both of, Japan

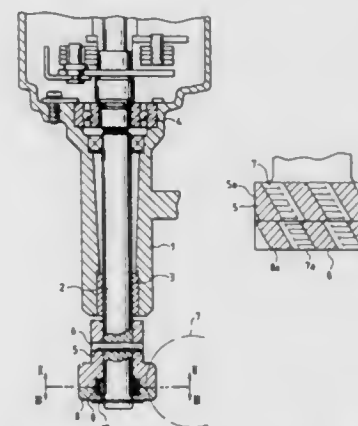
Filed Feb. 21, 1991, Ser. No. 658,716

Claims priority, application Japan, Feb. 22, 1990, 2-39780

Int. Cl.⁵ F02P 7/10; F16H 55/06

U.S. Cl. 123—146.5 A

16 Claims



1. A distributor for igniting a combustion engine including: (7) a first gear in synchronism with a crank shaft of said combustion engine; a second gear (5) meshed with said first gear (7); a rotating shaft (2) firmly secured to said second gear (5) having a distributing rotor on an end portion thereof, said distributing rotor being rotated through said first gear (7), said second gear (5) and said rotating shaft (2) as said crank shaft rotates so that a high voltage is sequentially distributed to a plug of each of cylinder of said combustion engine; said distributor further comprising:

a movable gear (8) rotatably provided on one of said first and second gears (5 or 7); and
a resilient member (9) provided between said movable gear (8) and said one of said first and second gears (5 or 7) having said movable gear (8),
said resilient member (9) displacing radially in an amount larger than a backlash caused between a tooth of said first gear (7) and a tooth of said second gear (5), whereby said tooth of the other of said first and second gears (5 or 7) not having said movable gear (8) is interposed and pressed between a tooth of said movable gear (8) and said tooth of said one of said first and second gears (5 or 7) having said movable gear (8) by a resilient force of said displaced resilient member (9).

5,088,460

ENGINE BRAKE SYSTEM FOR ALL TYPES OF DIESEL AND GASOLINE ENGINES

Gregorio J. Echeverría, Arroyo Grande, Municipio Cutzamala de Pinzón, Guerrero, Mexico

Filed Sep. 1, 1989, Ser. No. 402,127

Claims priority, application Mexico, Sep. 5, 1988, 12929

Int. Cl.⁵ F02D 17/02

U.S. Cl. 123—322

46 Claims

1. An engine brake system for all types of diesel and gasoline engines, comprising a control means arranged on the upper part of the line of rocker arms, resting over the supports of the rocker arms, and a dislodgement valve installed in the intake manifold of the engine, which remains closed until the brake system is applied, and which is open when the engine brake is applied by a valve activating device; a second activating device longitudinally displaces the control means when the brake

partitioning plates each having through holes;
a pair of electrodes provided in one of said sub-chambers,

said one of sub-chambers being filled with an adsorbent and communicating with the other sub-chambers having an inlet port, an outlet port and a purge port, respectively; and
a control circuit for detecting changes in electrical characteristics of said adsorbent between said electrodes so that an amount of a fuel gas adsorbed by said adsorbent is detected.

5,088,467

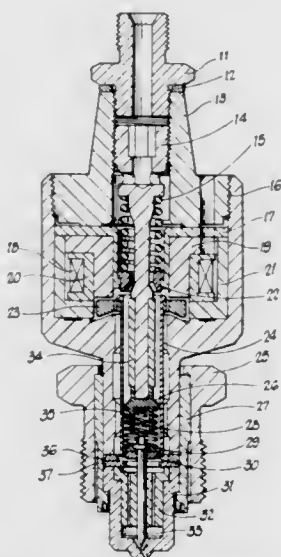
ELECTROMAGNETIC INJECTION VALVE

Gerhard Mesenich, Bochum, Fed. Rep. of Germany, assignor to Coltec Industries Inc, New York, N.Y.
Division of Ser. No. 120,638, Nov. 13, 1987, Pat. No. 4,984,549, which is a continuation of Ser. No. 706,162, Feb. 28, 1985, abandoned. This application Nov. 15, 1990, Ser. No. 613,364

Int. Cl.⁵ F02M 23/00

U.S. Cl. 123—531

22 Claims



1. In combination with an electromagnetic duty cycle type liquid fuel metering valving assembly having liquid fuel metering port means and valving means cyclically moved to opened and closed positions with respect to said liquid fuel metering port means to thereby correspondingly intermittently permit and terminate the flow of said liquid fuel through said liquid fuel metering port means as to thereby control the rate of metered liquid fuel discharged through and from said liquid fuel metering port means to an associated combustion engine, first passage means communicating at one end with said liquid fuel metering port means downstream thereof and at an other end communicating with said engine, second passage means for supplying fuel atomizing air to said first passage means for creating from said air and said metered liquid fuel a fuel-air mixture, wherein at least a portion of said first passage means is tapered as to thereby enhance the mixing of said fuel-air mixture flowing therethrough and toward said engine, wherein said first passage means is comprised of a body portion forming a part of said duty cycle type liquid fuel metering valving assembly and is further comprised of conduit means operatively connected to said body portion, wherein said tapered portion is formed in said conduit means, wherein said second passage means is so formed as to supply said atomizing air in a direction of flow which generally transversely intersects the direction of flow of said metered liquid fuel, wherein said first passage means comprises a chamber-like portion situated immediately downstream of said liquid fuel metering port means, and wherein said tapered portion is situated downstream of said chamber-like portion, wherein said second passage means communicates with said first passage means by communicating directly with said chamber-like portion, wherein said second

passage means comprises a plurality of atomizing air directing and supplying passages.

5,088,468

INTERLINKING MECHANISM FOR MULTIPLE CARBURETOR SYSTEM

Hirofumi Imaeda, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

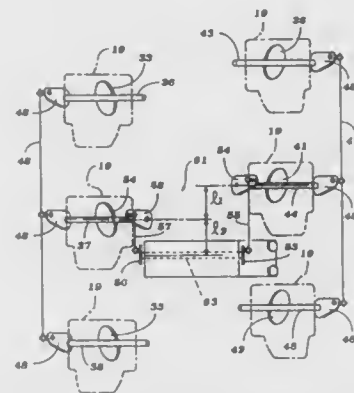
Filed Jan. 30, 1990, Ser. No. 472,589

Claims priority, application Japan, Feb. 2, 1989, 1-24470

Int. Cl.⁵ F02B 13/00

U.S. Cl. 123—583

17 Claims



1. A valve arrangement for synchronizing the operation of first and second butterfly valves of first and second induction system controls, said first and said second butterfly valves being rotatable about a non parallel, non coincident first and second axes, an intermediate shaft rotatable about an axis, first and second levers affixed to opposite ends of said intermediate shaft, third and fourth levers affixed to one end of the said first and said second butterfly valves, and first and second links interconnecting said first and said third levers and said second and said fourth levers, respectively.

5,088,469

PLASTIC LID LAUNCHER

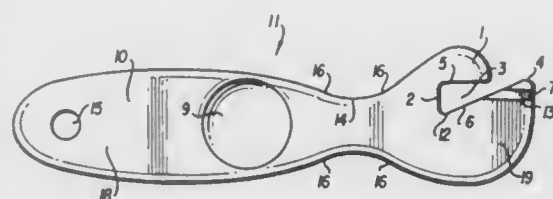
Fred M. Hargrave, 408 Spencer Ave., Marion, Ind. 46952

Filed Oct. 16, 1990, Ser. No. 598,024

Int. Cl.⁵ A63B 65/00; F41B 3/04; F41J 9/18

U.S. Cl. 124—5

16 Claims



1. A lid launcher for launching into free flight a circular planar lid having upper and lower surfaces and a peripheral upstanding flange, said flange having radial inner and outer surfaces, said launcher comprising:
an elongated spring member of a shape and size to be held by an operator's hand;
said member having an opening at one end to receive said peripheral upstanding flange;
said opening having a first edge projecting over said flange for engaging the upper surface of said lid adjacent said flange and a second edge projecting under said flange for engaging the lower surface of said lid radially inwardly of said flange.

5,088,470

ACCESS WINDOW FOR BARBECUE GRILLS

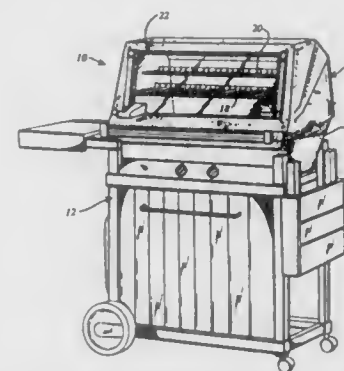
Charles W. James, Jr.; James R. Carden, and William E. Kirkland, all of Columbus, Ga., assignors to W.C. Bradley Company, Columbus, Ga.

Filed Feb. 27, 1991, Ser. No. 661,177

Int. Cl.⁵ A47J 37/00; F24C 3/00

U.S. Cl. 126—41 R

15 Claims



1. An access window assembly for barbecue grills in which the barbecue grill includes a hood portion with an opening formed therein and said window assembly has open and closed positions, said window assembly comprising a transparent panel means sized to substantially cover said opening in said hood portion, frame means disposed around said panel means and having hinge means disposed near the upper portion of said panel means, said hinge means being formed from a lateral extension of said frame means on each side of said panel means and bracket means on said hood portion for pivotally receiving said hinge means and allowing said panel means to move between open and closed positions.

5,088,471

SOLAR HEATING STRUCTURE

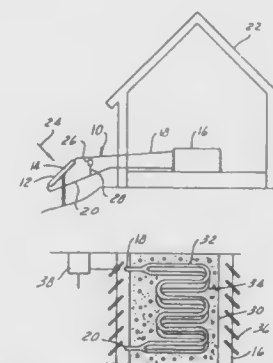
Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich.

Continuation of Ser. No. 339,728, Jan. 15, 1982, abandoned. This application Apr. 18, 1990, Ser. No. 510,886

Int. Cl.⁵ F24J 2/34

U.S. Cl. 126—436

1 Claim



1. A totally passive type closed solar heating system for a building, comprising a solar collector located exteriorly of the building to be heated at a substantial distance therefrom positioned lower than a heat exchanger located within the building, said solar collector being so positioned to receive substantially maximum radiation from the sun and tilted with respect to the sun so as to be substantially perpendicular to the sun's rays, a heat exchanger which includes a heat storing matrix located within the building to be heated, said heat exchanger being positioned at a level substantially higher than said solar collector, a plurality of spaced apart parallel connected coils supported within said heat exchanger and extending from adjacent the top of said heat exchanger to adjacent the bottom

thereof through which a heat transfer medium may pass by gravity, first conduit means extending in a generally upward direction between the top of said solar collector to the top of said coils within said heat exchanger, second conduit means extending in a generally upward direction between the bottom of said solar collector to the bottom of said coils within said heat exchanger, third conduit means connecting said first and said second conduit means, an accumulator connected to said third conduit means and thereby positioned between said solar collector and said heat exchanger for preventing a liquid refrigerant from passing directly from said solar collector to said heat exchanger, and means positioned adjacent said heat exchanger for selectively insulating the same.

5,088,472

RETRACTOR

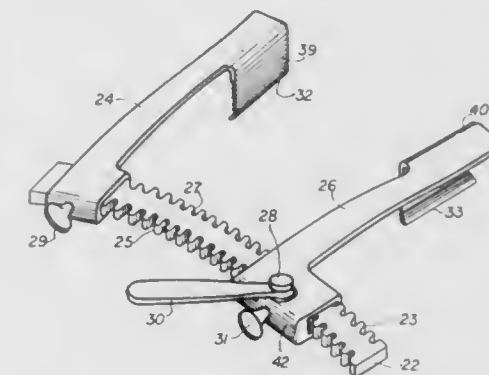
Mehdi Fakbrai, 1242 S. Barrington Ave., Apt. 201, Los Angeles, Calif. 90025

Filed Apr. 4, 1990, Ser. No. 504,260

Int. Cl.⁵ A61B 17/02

U.S. Cl. 128—20

20 Claims



1. A surgical sternal retractor comprising:
a curved flat rack bar having at least one radius of curvature;
two elongated arms, each of said arms being mounted near one end thereof to said bar in a non-parallel relation to each other and having at least one blade means disposed at the other end thereof; and
pinion means for moving at least one of said arms along the bar with sufficient force to spread the sternum.

5,088,473

CHAIR HAVING ALIGNED MOVEMENT WITH CURVILINEAR-CIRCULAR, SWIVEL-ROCK, AND VERTICAL MOTIONS

Jing-Qi Chen, deceased, late of Houston, Tex., and by Judy C. Huai-Xue Zhu, heir, 6225 Highway 6 S., Houston, Tex. 77083

Filed Mar. 28, 1990, Ser. No. 500,417

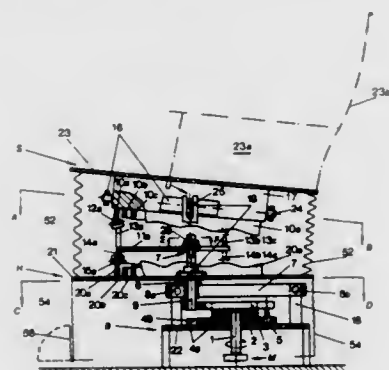
Int. Cl.⁵ A61H 1/00

U.S. Cl. 128—25 R

28 Claims

1. An exercising device of the type that includes a chair having a seat portion and a back portion, the invention comprising:
a base means for supporting the exercising device above a selected surface;
closed horizontal loop means for producing a controlled closed loop movement of an essentially perpendicular axis in a substantially horizontal plane;
vertically rising means for producing a controlled vertical movement;
rocking means for imparting a selected rocking movement to the seat;
first connecting means for mechanically coupling the closed loop means to the vertically rising means;
second connecting means for mechanically coupling the vertically rising means to the rocking means;

motor means for providing energy to drive the closed loop means through its travel;



whereby, activation of the motor means generates movement in the seat in essentially a horizontal plane, vertically, or a rocking motion, or any desired combination of the three movements.

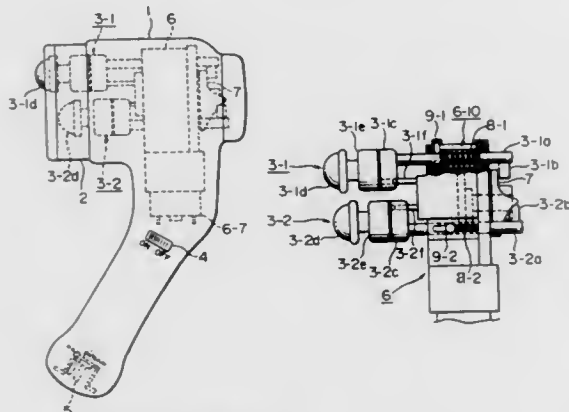
5,088,474 MASSAGER

Selya Mabuchi, and Tatsuo Katsunuma, both of Kashiwa, Japan, assignors to Bio Pit Co., Ltd., Chiba, Japan
Filed Dec. 11, 1989, Ser. No. 449,551
Claims priority, application Japan, Dec. 28, 1988, 63-332308; Jan. 13, 1989, 1-7132

Int. Cl.⁵ A61H 7/00

U.S. Cl. 128—52

6 Claims



1. A massager comprising:
pushing attachments;

drive means for reciprocating said pushing attachments, said drive means having a rotating cam means engaging with each of said pushing attachments, said rotating cam means formed in such a manner that a position of said pushing attachments in a reciprocating direction sequentially changes corresponding with a rotating angle position of said rotating cam means, a length of said reciprocation of said pushing attachments corresponding with a rotating angular position of said rotating cam means, said pushing attachments being sequentially driven by said rotating cam means, said rotating cam means having two crests, and a surface of said rotating cam means beyond each crest being inclined more steeply than said rotating cam means surface before each crest; and
independent energy storage means for each pushing attachment storing energy when corresponding said pushing attachment is retracted and releasing said stored energy when said corresponding pushing attachment is moved forward; and

an attachment spacer for controlling a range of said reciprocating pushing attachments.

6. A massager comprising:

a pushing attachment; and

drive means for retracting said pushing attachment into the massager and for limiting movement of said pushing attachment out of the massager, the speed of said retracting of said pushing attachment into the massager being slower than the speed of said limiting of movement of said pushing attachment out of the massager.

5,088,475 CHIROPRACTIC MASSAGE TABLE

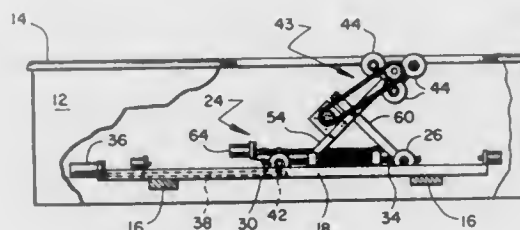
Lloyd A. Steffensmeier, 102-122 West Main St., Lisbon, Iowa 52253

Filed Jun. 15, 1990, Ser. No. 539,726

Int. Cl.⁵ A61H 7/00

U.S. Cl. 128—52

7 Claims



1. A therapeutic massage table for providing musculoskeletal massage along a patient's spine, said table comprising: a top having sides and ends supporting the table top at a level above the floor, the table providing for support of the patient's body in a supine position on the top, the table top having an elongated opening formed therein between the ends, a carriage moveable between the ends of the table beneath the elongated opening in the top, a first support arm extending upwardly from the carriage and pivotally connected at its lower end to the carriage about a first pivot means that is fixed relative to the carriage, a second support arm extending upwardly from the carriage and pivotally connected at its lower end to the carriage about a second pivot means that is movable relative to the carriage toward and away from the first pivot means, the first support arm being pivotally connected near its upper end to the second support arm at a point between the ends of the second support arm, spring means biasing the lower ends of the support arms toward each other, massage rollers supported at the upper end of the second support arm and positioned so as to be extendible through the elongated opening for engagement with the back of a patient supported on the table top over the elongated opening, the massage rollers including two or more pairs of tandem-mounted rollers, each such pair being rotatable about an axis that is spaced radially outwardly from a common axis so that the pairs are rotatable as a unit, means for rotating the pairs of rollers about said common axis, and power means for moving the carriage and thus the rollers along the back of a patient properly positioned on the table, the spring means biasing the rollers toward the patient's body while providing for limited movement of the rollers away from the patient's body against resistance of the spring means.

5,088,476 GRAVITY TRACTION DEVICE WITH A SAFETY STRAP AND BASE SUPPORT AND METHOD

Charles V. Burton, Excelsior, Minn., assignor to Spinal Designs International, Inc., Minneapolis, Minn.

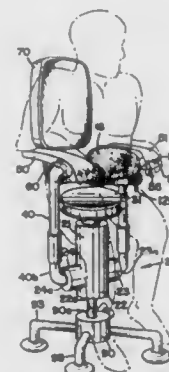
Continuation-in-part of Ser. No. 609,065, Oct. 29, 1990, Pat. No. 5,033,459, which is a continuation of Ser. No. 488,534, Feb. 28, 1990, abandoned, which is a continuation of Ser. No. 301,172, Jan. 24, 1989, abandoned. This application Jul. 22, 1991, Ser. No. 733,669

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.⁵ A61F 5/00

U.S. Cl. 606—241

19 Claims



1. A device for transferring stress, starting from a seated position, from a lumbar spine to a rib cage of a person, the device comprising:

- a support member for engaging and supporting the person below the rib cage;
- means for supporting the support member, said support means including means for progressively moving the support member inward toward the person from a disengaged position to an engaged position, said supporting means being capable of maintaining the support member in the engaged position without use of a person encircling cinch strap connected to the support member;
- a seat member positioned below the support member, on which the person assumes a sitting position with the person being temporarily supported thereby;
- means for varying the amount of support provided to the person by the seat member and the amount of support provided by the person by the support member, said varying means including means to vary a distance between the seat member and the support member; and
- a safety strap operatively connected to said support member.

5,088,477 PENILE FILLING IMPLANT

Louis Subrini, 27 Boulevard Suchet, 75016 Paris, France

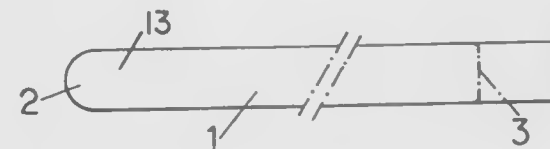
Filed Nov. 28, 1990, Ser. No. 618,283

Claims priority, application France, Nov. 28, 1989, 89 15620

Int. Cl.⁵ A61F 2/26

U.S. Cl. 600—40

12 Claims



1. A penile filling implant comprising:
an elongate body of synthetic material having a thickness of at least about 10 mm, said elongated body including a penile segment for filling a portion of the corpus cavernosum of the penis, at least said penile segment having a

modular of elasticity less than about 50 kg/cm² for a relative extension of 100% and a hardness between about 5 and 70 Shore A.

5,088,478

GEL AND AIR CUSHION ANKLE BRACE

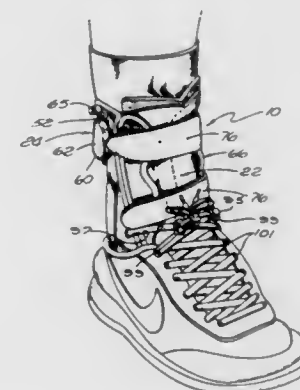
Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Westlake Village, Calif.

Continuation-in-part of Ser. No. 308,689, Feb. 8, 1989, abandoned, and Ser. No. 192,461, May 10, 1988, Pat. No. 4,869,204. This application Aug. 24, 1990, Ser. No. 572,843
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.

Int. Cl.⁵ A61F 3/00

U.S. Cl. 602—27

28 Claims



15. A brace for permitting limited or restricted movement of a portion of the human body which has been subject to minor injury, comprising:

- an outer flexible casing conforming to the shape of the portion of the anatomy as to which limited movement is to be permitted;
- means for adjustably holding said flexible casing to the body of the user;
- at least one gel pad for mounting within said casing and adjacent the anatomy and for cushioning and conforming to the physical configuration of the anatomy of the user;
- at least one air bladder mounted between the gel pad and the casing;
- means for inflating said bladder to apply pressure to said gel pad to exert a restraining force to limit movement of the selected portion of the anatomy; and
- said brace further including resilient or elastic means for applying additional force to said gel pad in combination with that provided by said air bladder.

5,088,479

ANKLE AND FOOT ORTHOSIS

William W. Detoro, 930 Trailwood Dr., Boardman, Ohio 44512

Filed Apr. 26, 1990, Ser. No. 514,738

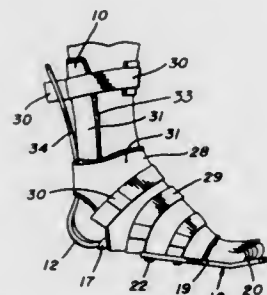
Int. Cl.⁵ A61F 5/00

U.S. Cl. 602—27

5 Claims

1. A therapeutic leg and foot device comprising a leg portion and a foot portion interconnected by a resilient member at right angles to one another, said resilient member comprises a flat metallic bar configuration having a compound L-shaped curved configuration adjacent one end thereof, said leg portion is of a generally contoured elongated channel shape of thermoplastic material with an elongated pocket formed in one end thereof for removable registration with said resilient member, a foot extension longitudinally advanced from one end of said foot portion, said foot extension having a generally flat base portion and an upturned end portion, said foot portion comprising a generally rectangular configuration having contoured sides, and a recessed pocket in the free end thereof for fixed

registration with said resilient member, in spaced relation to said compound L-shaped curved configuration, means for adjustably securing said interconnecting resilient member to



said leg portion and said foot extension to said foot portion, means for releasably securing the device to the leg and foot of a patient.

5,088,480 LOWER LEG ORTHOSIS APPARATUS

Tzu C. Wang, 1446 Sugar Creek Blvd., Sugar Land, Tex. 77478
Filed Sep. 1, 1989, Ser. No. 401,886
Int. Cl.⁵ A61F 5/00

U.S. Cl. 602-23

5 Claims



1. An adjustable lower leg orthosis apparatus for patients having different foot and calf configurations wherein the apparatus consisting of:

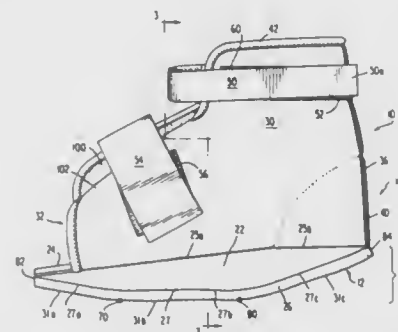
- a calf unit including a rounded contoured calf support member having a lower portion provided with a plurality of vertically aligned mounting apertures;
- a foot unit including a base support member having a heel portion and a toe portion wherein the heel portion is provided with a plurality of horizontally aligned mounting apertures;
- a connector brace unit consisting of a single generally L-shaped connector member having apertured foot and leg portions;
- a first and second set of standard fasteners for operatively, selectively and adjustably engaging the calf unit and the foot unit to the connector brace unit to accommodate different length feet and different height calves; and,
- at least one fastening strap associated with the calf unit, the foot unit; and the connector brace unit for securing the orthosis apparatus to the users lower leg.

5,088,481 CASTED FOOT MEDICAL BOOT WITH DUAL PIVOT POINTS

H. Darrel Darby, Huntington, W. Va., assignor to Darco International Inc., Huntington, W. Va.
Filed Oct. 10, 1990, Ser. No. 596,114
Int. Cl.⁵ A61F 5/04; A43B 3/12

U.S. Cl. 602-23

9 Claims



1. A medical boot capable of conforming to a form fitting cast, enveloping a foot and ankle of a patient, said boot comprising:

- a sole assembly,
- an upper assembly secured to said sole assembly and adapted to surround the heel, sides and dorsal portions of the patient's foot while leaving the toe region open,
- said upper assembly including a pair of side walls of flexible material which mold comfortably to the contours of either the cast or the foot and ankle of the patient, one of said upper assembly side walls including a flap which underlies the other side wall and is adapted to cover the dorsal region of the foot, said sole assembly comprising an outer sole extending generally the length of the shoe, from heel to toe, having an outer sole bottom surface which tapers from the toe and heel oppositely in directions away from the upper, wherein said outer sole bottom surface includes a flat horizontal central portion and a flat rearwardly, upwardly oblique portion forming therebetween a first pivot point for said medical boot, at a position, which is in vertical alignment with the front of the ankle of the patient, and wherein, said bottom of said outer sole includes a forwardly and upwardly oblique, flat portion from the end of the flat horizontal central portion remote from the heel, to the toe defining therebetween a second pivot point in vertical alignment with the metatarsal-phalangeal joint is located on the foot of the patient borne by said shoe, and an outer sole top surface which is flat and which tapers forwardly and downwardly over the flat central portion and said upwardly oblique flat portion of the sole bottom surface from the central portion to the toe, whereby; the combination of said two pivot points ensures that there is no stress on the cast or on the lower leg and foot of the patient during the gait cycle upon ambulation of the patient.

5,088,482 CERVICAL BRACE

Charles McGuinness, 10 Karen Ave., Plainview, N.Y. 11803
Filed Dec. 11, 1990, Ser. No. 625,744
Int. Cl.⁵ A61F 5/04

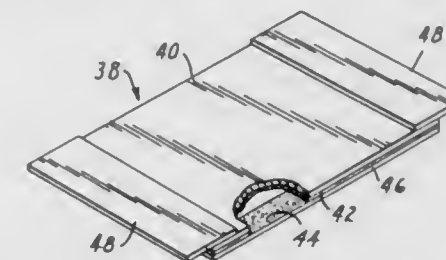
U.S. Cl. 602-18

23 Claims

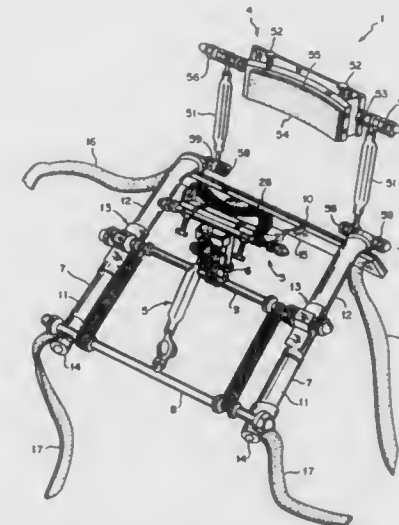
1. A cervical brace comprising:
- a torso engaging member having a back portion and a front portion, the front portion, in use, being adjacent to the front of the torso and the back portion, in use, being adjacent to the back of the torso;
 - a chin support member for engaging and supporting the chin of the wearer;
 - mounting means for adjustably mounting the chin support

member to the torso engaging member, the mounting means including a strut and a brace member each supporting the chin support member, said strut having one end operatively coupled with the chin supporting member, and an opposite end being pivotally connected to the front portion of the torso engaging member so that the chin support member is movable backwardly and forwardly relative to the torso engaging member for accommodating, in use, different positions of a wearer's chin, said brace member operatively coupled at one end to the chin support member, and engaging at the other end a front portion of the torso engaging member at a position spaced rearwardly from the pivotal mounting of the strut, adjusting means being provided on the brace member for adjusting the length thereof, said mounting means allowing adjustment backwardly, forwardly, upwardly and downwardly, said mounting means including release means for permitting release and remounting of said brace member from the front of said torso engaging member, when re-

coated on at least a portion of the bottom face of the backing;
c) a reinforcing amount of a permanent adhesive reinforcement that is an adhesive or adhesive laminate applied to



the bottom face of the backing and that is inseparable from the backing; and
d) a liner releasably adhered to the exposed adhesive on the backing.



leased said chin support member and said brace member, secured by said strut, pivot away from the wearer's head, thereby allowing the wearer's head to be inserted and removed from the torso engaging member without affecting said adjusting means;
a head support member for engaging and supporting the occiput of the wearer; and
mounting means for adjustably mounting the head support member to the torso engaging member, the mounting means comprising at least one strut, said strut having one end operatively coupled with said head support member, and an opposite end movably attached to said back portion of the torso engaging member so that said head support member is movable upwardly and downwardly relative to the torso engaging member for accommodating, in use, different positions of a wearer's head, said mounting means allowing adjustment backwardly, forwardly, upwardly and downwardly, so that said chin support member and said head support member cooperatively restrict movement of the wearer's head.

5,088,483 ADHESIVE FRAME BANDAGE

Steven B. Heinecke, New Richmond, Wis., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.
Continuation of Ser. No. 267,230, Nov. 4, 1988, abandoned. This application Mar. 20, 1991, Ser. No. 672,777
Int. Cl.⁵ A61F 13/00, 19/00

U.S. Cl. 602-46

23 Claims

1. An adhesive composite comprising:
- a) a conformable backing having top and bottom faces;
 - b) a backing adhesive that is a pressure-sensitive adhesive

5,088,484

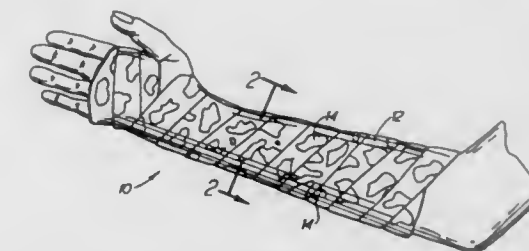
ORTHOPEDIC CASTING BANDAGE

Horace L. Freeman, Burlington, N.C., and Hee K. Yoon, North Brunswick, N.J., assignors to Carolina Narrow Fabric Company, Winston-Salem, N.C.

Filed Oct. 5, 1990, Ser. No. 593,852
Int. Cl.⁵ A61L 15/00; A61F 5/04

U.S. Cl. 602-44

33 Claims



1. An orthopedic cast bandage comprising:
- (a) an open mesh fibrous tape;
 - (b) a hardenable liquid resin coated on the fibrous tape and being capable of curing to form a hardened plastic; and
 - (c) at least one coloring agent visibly disposed on at least a portion of the fibrous tape, the coloring agent being stably retained by the fibrous tape while the tape is in a soft state in the presence of the hardenable liquid resin, wherein after the liquid resin becomes hard there is substantially no adverse effect on the coloring agent.

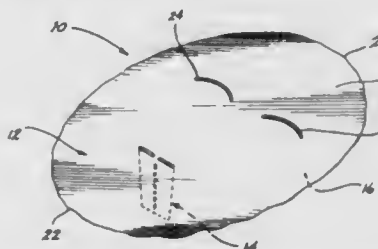
5,088,485

RESPIRATION MASK

Peter B. Schock, 13109 NE. 33rd St., Bellevue, Wash. 98005
Filed Jun. 1, 1990, Ser. No. 532,276
Int. Cl.⁵ A61M 16/00

U.S. Cl. 128-202.28

19 Claims



1. A respiration face mask for use by a rescuer in administering

ing at least artificial respiration to a victim, said mask comprising

protection means for substantially completely covering the victim's face to provide facial protection to the rescuer; and,

a valve including first and second duckbill elements, each said duckbill element having an inlet end attached to said protection means and an outlet end, said outlet ends of said first and second duckbill elements being coupled to each other.

5,088,486

CLOSED SYSTEM REUSABLE DUAL PURPOSE CATHETER

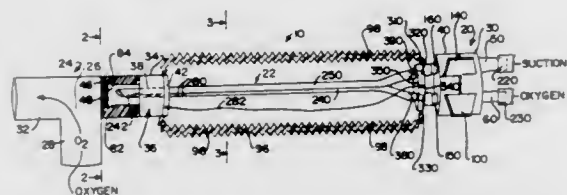
Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08902

Filed Apr. 11, 1990, Ser. No. 507,494

Int. Cl.⁵ A61M 16/00, 25/00; A62B 9/06

U.S. Cl. 128—207.14

20 Claims



1. A dual-purpose apparatus for a pulmonary catheter comprising

a rigid valve mechanism including a patient end and a second end for applying oxygen and suction thereto, a suction tube connected to said second end of said valve mechanism for applying suction thereto, an oxygen tube connected to said second end of said valve mechanism for applying oxygen thereto, a patient oxygen tube coupled to said patient end of said valve mechanism, a patient suction tube coupled to said patient end of said valve mechanism, said patient oxygen tube and said patient suction tube being adapted to have tubes coupled thereto for insertion into a patient, an oxygen vent hole and a suction vent hole in said valve mechanism,

a first blocking means in said valve mechanism, a second blocking means in said valve mechanism, and means for moving said second end of said valve mechanism with respect to said patient end thereof whereby:

- (1) when said suction tube is coupled to said patient suction tube to apply suction to a patient, said oxygen tube is not coupled to said patient oxygen tube, said oxygen vent hole and said suction vent hole being open, and said first blocking means obstructs said patient oxygen tube which is thereby blocked from communication with a patient,
- (2) when said oxygen tube is coupled to said patient oxygen tube said suction tube is not coupled to said patient suction tube, said suction vent hole and said oxygen vent hole being open and said second blocking means obstructs said patient suction tube which is thereby blocked from communication with a patient.

5,088,487 BODY WRAP WITH POCKET FOR PLIABLE FROZEN COMPOSITION

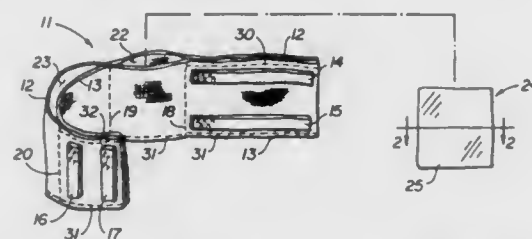
Ronald L. Turner, Golden, Colo., assignor to Cecil R. Jackson, Mesa; Gerald L. Collard, Case Grande and Cathryn L. Macon, Phoenix, all of, Ariz.

Filed Sep. 6, 1990, Ser. No. 578,195

Int. Cl.⁵ A61F 7/00

U.S. Cl. 128—402

13 Claims



1. A flexible wrap for circumscribing a selected portion of the human anatomy and supporting a thermal pack in heat transfer relation to the human anatomy, the wrap comprising:

- (a) an elongate pliable band of material shaped and dimensioned to circumscribe a selected anatomical portion;
- (b) container means carried by said elongate band such that said container means is in heat transfer relation with at least a portion of the anatomical portion circumscribed by said band; and,
- (c) a quantity of thermal material in said container means, said thermal material comprising a slurry including
 - (i) 40.0 to 70.0 weight percent water,
 - (ii) 15.0 to 40.0 weight percent of solid particles each passing through a screen having a size in the range of 30 mesh to 150 mesh,
 - (iii) 2.0 to 21.0 weight percent of a gum, and
 - (iv) 3.0 to 11.0 weight percent of a water antifreeze composition;
 said slurry on being frozen solid forming a pliable mixture having a crunchy consistency and including said solid particles and frozen crystalline particles.

5,088,488

METHOD AND APPARATUS FOR IMPLEMENTING HISTOGRAM STORAGE AND TREND ANALYSIS IN A MEDICAL STIMULATOR

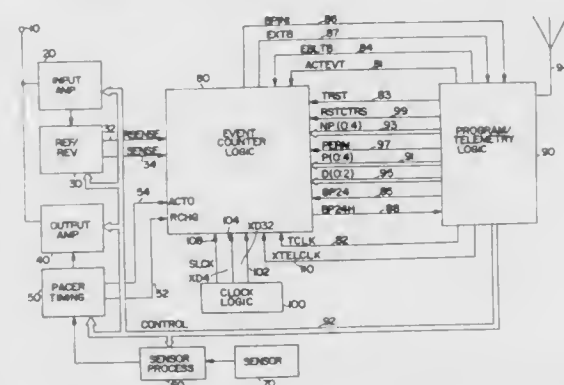
Harold T. Markowitz, Roseville, and Ann L. Ledin, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 22, 1989, Ser. No. 455,646

Int. Cl.⁵ A61M 1/362

U.S. Cl. 128—419 PG

12 Claims



1. In an implantable device of the type comprising means for repeatedly measuring one of more predetermined parameters and memory means for storing information related to the mea-

surements of said parameter for later transmission to an external monitoring device, the improvement wherein:

said measuring means comprises means for providing digital codes indicative of the measurements of said one or more parameters;

wherein said memory means comprises a random access memory capable of storing data at a plurality of addresses, means for initializing said random access memory such that the data at each of said addresses of said random access memory is set to a predetermined value, and memory addressing means for addressing said random access memory and altering the data stored therein; and

wherein said memory addressing means operates in first and second alternative modes, such that in said first mode said addressing means sequentially addresses said addresses of said random access memory and sequentially stores said digital codes at successive ones of said addresses within said random access memory and such that in said second mode, said addressing means employs said digital codes to address said addresses of said random access memory, and with each said addressing of said random access memory incremented the value in said random access memory at the one of said addresses corresponding to the said digital code used to address said random access memory.

5,088,489

CURRENT-BASED DEFIBRILLATING METHOD

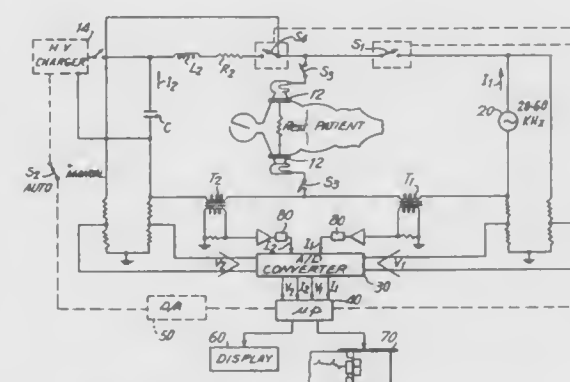
Bruce B. Lerman, 450 E. 63rd St., Apt. 3N, New York, N.Y. 10021

Continuation-in-part of Ser. No. 915,080, Oct. 3, 1986, Pat. No. 4,771,781. This application Jun. 27, 1988, Ser. No. 211,871 The portion of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁵ A61N 1/39

U.S. Cl. 128—419

9 Claims



1. A method of treatment of a patient in ventricular fibrillation, ventricular tachycardia, or supraventricular tachycardia, using a resistance, inductance, capacitance discharge pulse and comprising the steps of:

- selecting a particular peak current level suitable for said treatment;
- applying a low amplitude exploration current from electrodes forming part of a defibrillating apparatus applied to the chest of said patient and sensing a response voltage developed thereby between said electrodes;
- calculating an explored transthoracic resistance from said exploration current and response voltage; and
- charging a discharge capacitor of said defibrillating apparatus, based on said selected peak current and explored transthoracic resistance, sufficiently to create a capacitor discharge voltage generative of said selected peak current level, and thereafter discharging said capacitor through said resistance and inductance via said electrodes thereby delivering said selected peak current for treatment of said patient.

5,088,490

BANDPASS FILTER CLOCK CONTROL

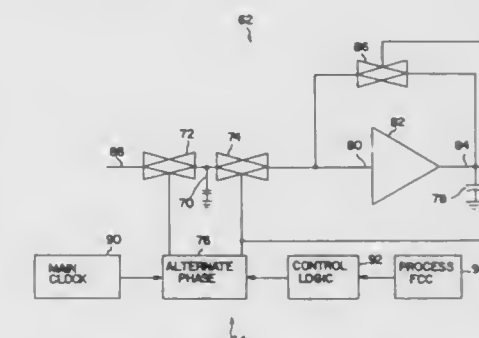
Joseph P. Pagliolo, Columbia Heights; Russell E. Anderson, Brooklyn Park; Richard F. Weispfenning, and Robert A. Betzold, both of Fridley, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 19, 1990, Ser. No. 467,591

Int. Cl.⁵ A61N 1/36

U.S. Cl. 128—419 PG

6 Claims



1. A method of processing transients with a switched capacitor bandpass filter comprising:

- a. determining a time period likely to contain said transients;
- b. changing the rate of the clock of said switched capacitor bandpass filter to zero during said time period likely to contain said transients;
- c. restoring the rate of said clock to its initial rate, while preserving the phase of said clock with respect to the phase of said clock at said changing step, following said time period likely to contain said transients.

5,088,491

HEART PACEMAKER

Max Schaldach, Erlangen, Fed. Rep. of Germany, assignor to Biotronik Mess- und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 26,676, Mar. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 908,367, Sep. 17, 1986, abandoned. This application Mar. 23, 1990, Ser. No. 501,305

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533500

Int. Cl.⁵ A61N 1/365

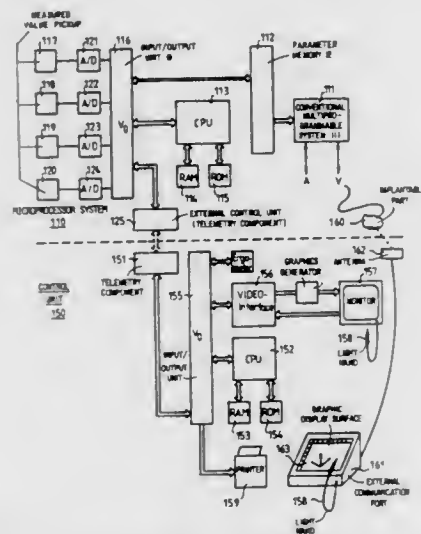
U.S. Cl. 128—419 PG

8 Claims

1. A cardiac pacemaker for implanting in a patient, comprising:

- means for applying stimulating pulses to the heart of the patient at a rate determined by a pacing parameter;
- means for detecting at least a first physiological parameter which is correlated with physical exertion of the patient and producing a first output signal representative of said at least first physiological parameter;
- means for providing a second output signal corresponding to the heart rate and a third output signal corresponding to the stroke volume or a variable representative of the stroke volume; and
- circuitry means, receiving said first second and third output signals, for varying the pacing parameter as a function of said first output signal received as an input variable, said circuitry means including a closed-loop control means for determining the product of said second and third output signals as the cardiac output, and for regulating the pacing

parameter to vary the stimulation rate to cause said product to change corresponding to changes in said first output



signal, which represents a standard for the current physical exertion of the patient.

5,088,492

RADIOACTIVE RAY DETECTING ENDOSCOPE

Shuichi Takayama; Masaaki Hayashi; Eiichi Fuse; Koichiro Ishiwara; Mutsumi Yoshikawa; Motoyuki Tagawa, and Makoto Inaba, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

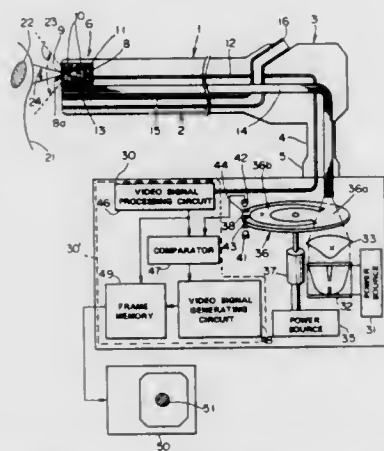
Continuation of Ser. No. 245,175, Sep. 15, 1988, abandoned. This application Oct. 9, 1990, Ser. No. 593,585

Claims priority, application Japan, Sep. 16, 1987, 62-231658; May 23, 1988, 63-126588; Jul. 21, 1988, 63-96907[U]; Jul. 21, 1988, 63-182194; Jul. 21, 1988, 63-182195; Jul. 21, 1988, 63-182196; Jul. 26, 1988, 63-187769; Aug. 10, 1988, 63-200463

Int. Cl.⁵ A61B 6/00, 1/00

U.S. Cl. 128—654

33 Claims



1. A radioactive ray detecting endoscope comprising: an elongated insertable part having a tip part and an observing window located in the tip part; an imaging means for converting an optical image of an observed cavity, obtained through said observing window, into an electrical signal forming an optical image output, said imaging means having a visual field; and a radioactive ray detecting means for detecting radioactive rays, said radioactive ray detecting means having a radioactive ray detecting field of view for detecting the radioactive rays generated from said observed cavity located within said visual field of said imaging means and said

radioactive ray detecting means for outputting radioactive ray detecting information forming a radioactive ray image.

5,088,493

MULTIPLE WAVELENGTH LIGHT PHOTOMETER FOR NON-INVASIVE MONITORING

Ivo Giannini; Marco Ferrari; Amilcare C. de Resmini, all of Rome, Italy, and Paolo Fasella, Bruxelles, France, assignors to Sclavo, S.p.A., Siena, Italy

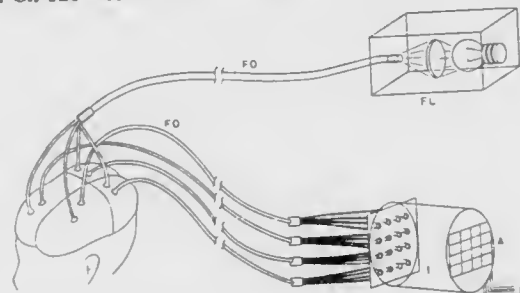
Continuation-in-part of Ser. No. 756,394, Jul. 17, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 161,206

Claims priority, application Italy, Aug. 7, 1984, 22247 A/84

Int. Cl.⁵ A61B 5/14

U.S. Cl. 128—633

6 Claims



1. An improved multiple wavelength light spectrophotometer for non-invasive monitoring of a body organ in vivo comprising:

- (a) a single light source emitting radiation at at least four near infrared wavelengths including a lamp powered by AC-timed pulses;
- (b) an optical fiber transmitting the near infrared radiation emitted from said single light source to a body organ;
- (c) an optical fiber receiving near infrared radiation transmitted through the organ by said transmitting optical fiber (b) and conducting the received infrared radiation to a radiation detector (d), which receiving optical fiber is disposed in relation to said transmitting optical fiber (b) so that the two optical fibers are aligned or form an angle therebetween of up to 180°;
- (d) a radiation detector having means for branching the radiation conducted from optical fiber (c) into at least four different wavelengths, comprising a system of at least four interference filters and complimentary photomultipliers whereby at least four individual signals corresponding to said at least four different wavelengths are produced and transmitted to amplifier means (e);
- (e) amplifier means for converting said at least four individual signals to continuous signals; and
- (f) data acquisition means connected to said amplifier means for converting the continuous signals into display signals representing values of physiological parameters, including a microprocessor utilizing the following algorithm to correct the display signals for light diffusion effects:

$$\delta OD_{app}(\lambda) = (C_2\lambda - 2C_3\lambda A)(a_1\lambda\delta V + a_2\lambda - \delta O + a_3\lambda\delta R) + A\gamma(C_2\lambda - AC_3\lambda)\delta S,$$

wherein

OD_{app} is the apparent optical density at a given wavelength (λ);

A is absorbance;

S is the blood volume;

R is the redox state of cyt aa3;

O is the hemoglobin oxygen saturation; and

V is the heme value.

5,088,494

Patent Not Issued For This Number

5,088,495

MECHANICAL ULTRASONIC SCANNER

Toyomi Miyagawa, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

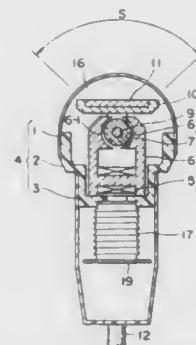
Filed Jan. 31, 1990, Ser. No. 472,880

Claims priority, application Japan, Mar. 27, 1989, 1-71906; Sep. 20, 1989, 1-241862

Int. Cl.⁵ A61B 8/00

U.S. Cl. 128—660.1

25 Claims



1. A mechanical ultrasonic scanner for providing an ultrasonic scanning beam comprising:

- a housing;
- a transducer element arranged in said housing;
- means for swinging said transducer element; and
- means for detecting a swinging angle of said transducer element, said detecting means including a first member which is swung together with said transducer element, and a second member having front and rear surfaces and attached to said housing in a manner such that the rear surface of said second member is in contact with the housing and the front surface of the second member faces to a part of a front surface of said first member which defines a swinging locus plane of the first member, said detecting means causing one of the first and second members to generate a magnetic field at least in a space between the front surface of the second member and the part of the swinging locus plane of the first member, causing the other of the first and second members to detect a strength of the magnetic field which changes in correspondence with a swinging angle of the first member, and detecting the swinging angle of said transducer element on the basis of the change in strength of the detected magnetic field.

5,088,496

ULTRASONIC ECHOGRAPHY APPARATUS UTILIZING A DIGITAL DEVICE FOR FORMING CHANNELS, IN THE RECEIVING MODE

Xavier Bernard, Marolles-en-Brie, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1990, Ser. No. 590,398

Claims priority, application France, Sep. 29, 1989, 89 12762

Int. Cl.⁵ A61B 8/00

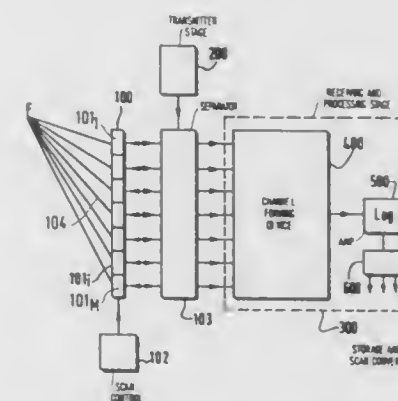
U.S. Cl. 128—660.07

25 Claims

1. An ultrasonic echography apparatus, comprising a piezoelectric transducer composed of M elementary transducers which operate at a central frequency f_c and are connected to an electronic scanning control device for controlling said transducers, a stage for causing the transducers to transmit an ultrasonic beam, and a stage for receiving and processing echographic signals returned to each elementary transducer, said receiving and processing stage comprising means for forming M channels and, for each channel (i), an analog-to-digital converter which operates at the sampling frequency f_s , digital delay means with a delay step of $1/f_s$, and means for interpolation and selection from N samples for each input sample, said latter means being formed by:

N parallel processing chains ($j=1, \dots, N$), $N-1$ of said chains comprising a respective digital interpolation filter which

supplies samples which have been shifted by j/Nf_s with respect to the non-interpolated signal of the N^{th} chain, the latter chain comprising a fixed delay line for compensating the delay introduced by said interpolation filter in order to obtain a fixed delay which is identical and a multiple of $1/f_s$ for all chains of a given channel during a given period $1/f_s$.



- and a multiplexer for said N parallel chains in order to select one of the N chains during each period $1/f_s$, said digital delay means for delivering at the rate f_s , a delay equal to k/f_s , including said fixed compensation delay (k integer), the value of k being variable, for each channel, from one sampling period to the next.

5,088,497

FETUS MONITORING APPARATUS

Makoto Ikeda, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

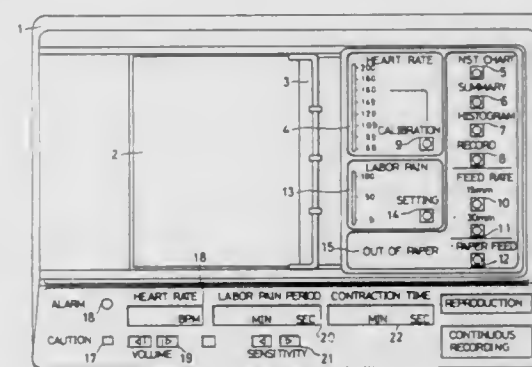
Division of Ser. No. 392,962, Jul. 31, 1989. This application Mar. 13, 1991, Ser. No. 668,962

Claims priority, application Japan, Feb. 3, 1987, 62-14720; Feb. 3, 1987, 62-14721; Feb. 3, 1987, 62-22934; Feb. 3, 1987, 62-22935

Int. Cl.⁵ A61B 8/02

U.S. Cl. 128—661.07

4 Claims



1. A fetus monitoring apparatus for use in a multiple fetuses monitoring system as one component thereof, comprising: a mother signal detection means for detecting a mother signal representative of the state of a mother;
- a first interface means for transmitting said mother signal to another fetus monitoring apparatus;
- a second interface means for receiving a mother signal from another fetus monitoring apparatus;
- a Doppler probe provided for each fetus monitoring apparatus, said Doppler probe employing a different frequency for each fetus;
- a Doppler heart beat signal input means for inputting a fetal

Doppler heart beat signal from said Doppler probe; and at least
 a data processing means for correspondingly processing the mother signal received by said second interface means and said Doppler heart beat signal input by said Doppler heart beat signal input means; and
 a recording means for recording the two signals which have been processed.

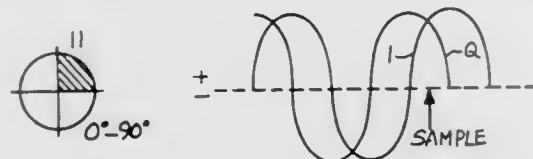
5,088,498

ULTRASONIC PLETHYSMOGRAPH

Kirk W. Beach; David J. Phillips, both of Seattle, Wash., and John Kinsky, Indianapolis, Ind., assignors to The Board of Regents of the University of Washington, Seattle, Wash.
 Continuation of Ser. No. 258,534, Oct. 17, 1988, abandoned.
 This application Jan. 18, 1991, Ser. No. 644,477
 Int. Cl.⁵ A61B 8/02

U.S. Cl. 128—661.07

15 Claims



10. In the method of displaying a representation of tissue in the area of the uterus of a pregnant female which includes scanning such tissue with a pulsed Doppler medical instrument which includes transmitting waves toward such area and detecting and analyzing echoes of such waves, the improvement which comprises measuring displacement of such tissue at a plurality of different depths of interest by measurement of phase change of the echoes, comparing such displacements so as to detect relative expansion and contraction of tissue at different depths, calculating the frequency of expansion and contraction of such tissue so as to determine tissue expanding and contracting at a frequency indicative of pulsing of blood through such tissue supplied by the fetal heart, and providing an output indicating the location of such tissue expanding and contracting at a frequency indicative of supply of blood through such tissue by the fetal heart.

5,088,499

LIPOSOMES AS CONTRAST AGENTS FOR ULTRASONIC IMAGING AND METHODS FOR PREPARING THE SAME

Evan C. Unger, 13365 E. Camino La Cebadilla, Tucson, Ariz. 85749

Continuation-in-part of Ser. No. 455,707, Dec. 22, 1989, abandoned. This application Aug. 20, 1990, Ser. No. 569,828
 Int. Cl.⁵ A61K 49/00

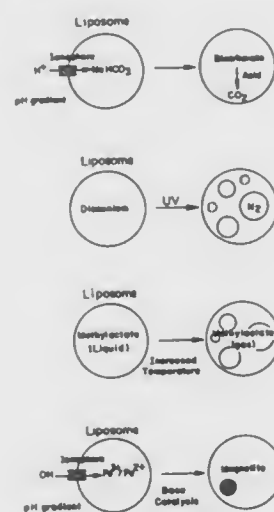
U.S. Cl. 128—662.02

30 Claims

1. A method of providing an image of an internal region of a patient comprising:

(a) administering to the patient a contrast agent selected from the group consisting of (i) a liposome having encapsulated therein a pH-activated gaseous precursor, said liposome having incorporated therein an ionophore, said ionophore being capable of facilitating the transport of hydrogen or hydroxide ions across the liposome membrane, (ii) a liposome having encapsulated therein a photo-activated gaseous precursor, and (iii) a liposome having

encapsulated therein a temperature-activated gaseous precursor;
 (b) activating the gaseous precursor; and



(c) scanning the patient using ultrasonic imaging to obtain enhanced visible images of the region, due to the resulting gas containing liposomes.

5,088,500

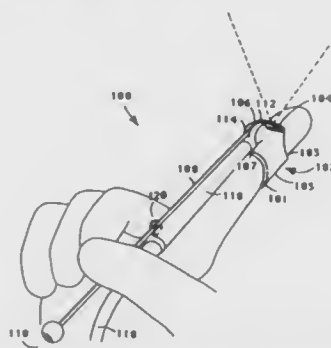
ULTRASONIC FINGER PROBE AND METHOD FOR USE

Victor J. Wedel, Rt. 3 Box 121, Washington, Iowa 52353, and Rick L. Pruter, Davenport, Iowa, assignors to Victor J. Wedel, Washington, Iowa

Filed Nov. 22, 1989, Ser. No. 440,881
 Int. Cl.⁵ A61B 8/12

U.S. Cl. 128—662.06

15 Claims



1. An ultrasound transducer probe for cooperation with the finger of a medical professional and further cooperating the an ultrasound imaging system, of a type that produces a visual display when coupled with an ultrasound transducer probe, the ultrasound transducer probe comprising in cooperative combination:

an annular member having a top side, a bottom side, an interior side, and exterior side, a palm end opening, and a finger tip end opening;

said annular member further having an ultrasound transducer head coupled to said top side for generating a transmitted ultrasound signal in response to an input electrical signal for producing an output electrical signal in response to a received reflected ultrasound signal;

an elongated cylinder coupled with said annular member having an interior surface, an exterior surface, an annular member end, a connecting cable end and a longitudinal dimension extending from said annular member end to said connecting cable end;

a connecting cable coupled with said ultrasound transducer head for carrying said input electrical signal and said output electrical signal;
 said cable being disposed with said cylinder;
 a plurality of cannula receiving ridges coupled to said top side of said annular member;
 a plurality of cannula retaining protuberances coupled to said exterior surface of said cylinder;
 said transducer head being pivotally attached to said annular member, so that said transducer head is maintainable at various angles with respect to said longitudinal dimension of said cylinder.

5,088,501

MEASUREMENT ARRANGEMENT FOR ACQUIRING A SIGNAL CORRESPONDING TO RESPIRATORY MOTION

Joachim Niewisch, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

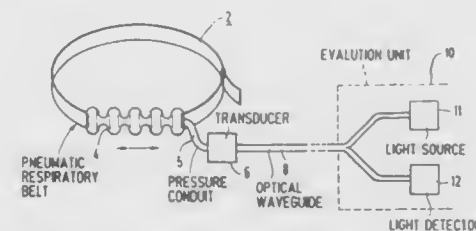
Filed Oct. 17, 1990, Ser. No. 599,016

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3935083

Int. Cl.⁵ A61B 5/08

U.S. Cl. 128—721

9 Claims



1. A measuring arrangement for acquiring a signal corresponding to respiratory motion comprising:
 a pneumatic respiratory belt adapted to be worn by an examination subject which generates a pneumatic pressure signal in response to respiratory motion;
 a light source;
 a pressure transducer in fluid communication with said belt via a releasable connection, permitting said belt to assume an arbitrary operating point before connection to said pressure transducer, for receiving said pneumatic pressure signal therefrom and in optical communication with said light source for receiving light therefrom, said pressure transducer having a flexible membrane deformable by said pneumatic pressure signal, said membrane carrying a reflector thereon disposed in the path of light from said light source and which generates an intensity-modulated optical signal corresponding to the deformations; and
 means for detecting said intensity-modulated optical signal.

5,088,502

SKIN SURFACE SAMPLING AND VISUALIZING DEVICE

David L. Miller, Dallas, Tex., assignor to Cuderm Corporation, Dallas, Tex.

Filed Dec. 12, 1990, Ser. No. 626,635

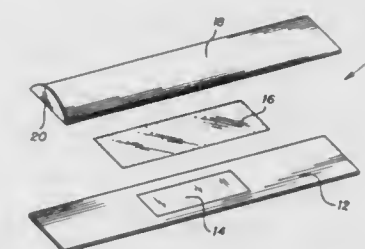
Int. Cl.⁵ A61B 10/00

U.S. Cl. 128—759

2 Claims

1. A device for observing the degree of dry skin comprising:
 an opaque, flexible substrate;
 a dark colored light absorbing area printed on said substrate;
 a layer of adhesive disposed on said substrate and overlaying said light absorbing area, said adhesive layer being optically clear and when under pressure conformable to the surface of the skin being observed for transferring dry skin

flakes to said substrate in the region of said light absorbing area; and



a removable protective film disposed on said adhesive layer for protecting said adhesive layer prior to use of the device.

5,088,503

METHOD AND APPARATUS FOR THE PRODUCTION OF INSERTS

Peter Seitz, Moehlstasse 29, Munchen 80, Fed. Rep. of Germany

PCT No. PCT/EP88/00444, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO88/09147, PCT Pub. Date Dec. 1, 1988

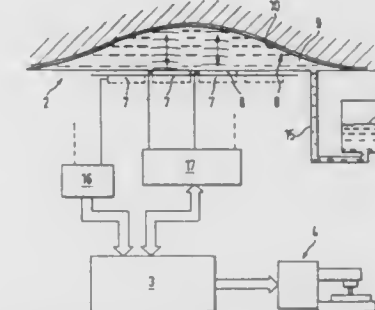
PCT Filed May 19, 1988, Ser. No. 335,207

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717126

Int. Cl.⁵ A61B 5/103

U.S. Cl. 128—779

15 Claims



1. A method for the production of inserts and the like for a person, comprising the steps of:
 electronically measuring a spatial pattern of forces applied by the person to a measuring arrangement;
 producing output signals in correspondence with said measured forces;
 supplying said output signals to a computer;
 comparing said supplied output signals in the computer with stored signals corresponding to a stored set of desired values of a force distribution pattern;
 producing control signals in response to differences between said output signals and said stored signals;
 controlling apparatus for making the inserts and the like in response to said control signals such that a desired force distribution pattern results.

5,088,504

MACHINE AND METHOD FOR MEASURING SKELETAL MISALIGNMENTS

Peter Benesh, Monroe, and Ralph R. Gregory, deceased, late of Monroe, both of Mich. by Keith E. Denton, legal representative, assignors to National Upper Cervical Chiropractic Research Assn., Monroe, Mich.

Filed Oct. 23, 1990, Ser. No. 601,910

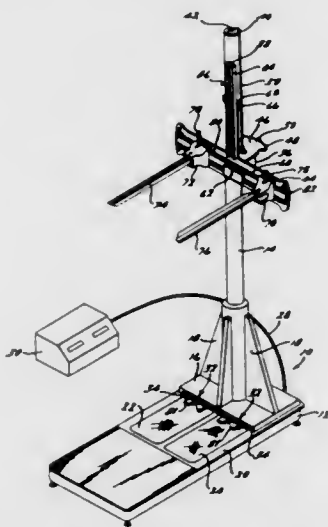
Int. Cl.⁵ A61B 5/103

U.S. Cl. 128—781

14 Claims

1. In an improved checking machine for determining a pa-

tient's skeletal misalignments and postural distortions including a base, a top plate for said base, a column extending upwardly from said top plate near one end of the base, a cylindrical sleeve on said column for moving upwardly and downwardly and angularly thereon, a fixed transverse plate on said sleeve for rotation and vertical movement therewith, a cross bar pivotally secured to said plate forwardly thereof, a pair of slidable housings movable toward and away from each other on said cross bar, and arms secured to said housings and mov-



able angularly from a horizontal plane to indicate tilt and movable laterally of each other to increase or decrease the distance therebetween, the improvement comprising:

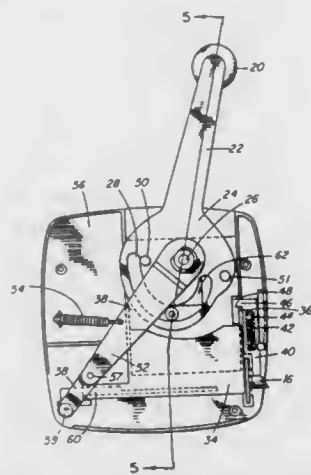
- a pair of platforms mounted at equal fixed heights above the top plate for receiving the feet of said patient;
- means for indicating the amount of the patient's body weight resting on each platform; and
- means for adjusting the relative position of the patient's feet to insure that said feet are directly below said patient's ilii.

5,088,505
CONTRACEPTIVE IMPLANT
Hendrik De Nijs, Oss, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands
Division of Ser. No. 229,066, Aug. 5, 1988, Pat. No. 4,957,119.
This application Jun. 21, 1990, Ser. No. 541,559
Claims priority, application Netherlands, Aug. 8, 1987, 8701868

Int. Cl.⁵ A61F 6/06
U.S. Cl. 128—830 6 Claims

1. A method for preparing an implant comprising: mixing a core material of ethylene/vinyl acetate copolymer having such a molecular weight that the melt index is greater than 10 grams/10 minutes, and having a vinyl acetate content of at least 20% by weight with a highly active progestogen; and co-axially extruding said mixture with an ethylene/vinyl acetate copolymer having such a molecular weight that the melt index is less than 10 gram/10 minutes and the vinyl acetate content is less than 20% by weight, thereby forming an implant intended for subcutaneous local administration having a core encased with a member having a layer thickness of 50-250 micrometers thus producing a contact layer at the interface of said core and member.

5,088,506
PORTABLE MANUALLY OPERABLE CIGARETTE MAKING MACHINE
Arnold Kastner, 10220 Armand Lavergne, Montreal North, Quebec, Canada H1H 3N5
Filed May 12, 1989, Ser. No. 350,915
Claims priority, application Canada, May 16, 1988, 566930
Int. Cl.⁵ A24C 5/02, 5/06
U.S. Cl. 131—70 18 Claims

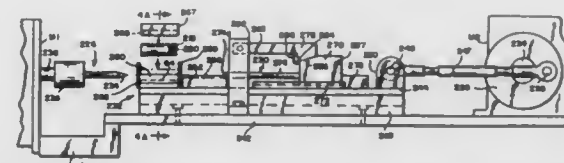


1. A machine for compacting a batch of tobacco into a generally cylindrical body, then injecting said cylindrical body into a tube to form a cigarette, comprising a frame; a first compacting member and a movable second compacting member, said members having faces defining between themselves a tobacco receiving chamber having first and second ends, said second movable member normally spaced apart from said first member; a shaft turnably mounted in said frame forming a fixed pivot axis; an actuating member turnable about said axis in an arcuate path between a first position, through a second position to a third position; cam means turnable about said fixed pivot axis by said actuating member, said cam means having an internal raceway, and stud means on said second member, engaged by said internal raceway, said cam means acting directly on said second member and urging said second member toward said first member when said actuating member moves from said first position toward said second position, whereby the volume of said chamber is reduced and a batch of tobacco contained in said chamber is compacted by said faces into a substantially cylindrical body; said cam means, internal raceway, and stud means combining to urge said second member away from said first member when said actuating member moves from said second position toward said first position; tube supporting means aligned with and communicating with one end of said chamber; and means for expelling said compacted body from said chamber comprising a plunger located at the other end of said chamber and motion transmitting means connected to said plunger, so that when said actuating member moves from said second position toward said third position, said plunger is moved through said chamber expelling the body through said tube supporting means into a tube mounted on said supporting means.

5,088,507
APPARATUS FOR ASSEMBLING COMPONENTS OF A SMOKING ARTICLE
Max N. Baker, Rural Hall, and Douglas C. Clark, Winston-Salem, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Jul. 17, 1987, Ser. No. 75,001
Int. Cl.⁵ A24C 5/00

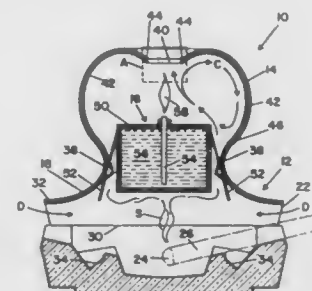
U.S. Cl. 131—280 80 Claims
1. Apparatus for making an aerosol generating module, the

apparatus comprising jacket holding means for holding a jacket segment, cartridge holding means for holding an aerosol generating cartridge, and insertion means for inserting the aerosol generating cartridge into the jacket segment, wherein



the jacket segment comprises a sleeve of insulating material preformed about a tubular member, and wherein the insertion means includes means for ejecting the tubular member from the sleeve.

5,088,508
APPARATUS AND METHOD FOR ELIMINATING CIGARETTE SIDESTREAM SMOKE
Steven A. Duncan, 8606-B Mesa Dr., Austin, Tex. 78759
Filed Feb. 15, 1991, Ser. No. 656,768
Int. Cl.⁵ A24F 19/00
U.S. Cl. 131—330 20 Claims



1. An apparatus for eliminating sidestream smoke from a cigarette or other smoking article, the apparatus comprising:
 - (a) smoke collecting means for collecting sidestream smoke from a lit end of a smoking article and air for combustion of the collected sidestream smoke;
 - (b) a combustion area associated with the smoke collecting means for receiving smoke and air collected by the smoke collecting means; and
 - (c) ignition means for igniting at least a portion of the sidestream smoke received in the combustion area.

5,088,509
MANICURE FILE KIT
Arthur H. Savage, III, 6722 N.W. Pennsylvania, Kansas City, Mo. 64118
Filed Dec. 31, 1990, Ser. No. 636,205
Int. Cl.⁵ A45D 29/18

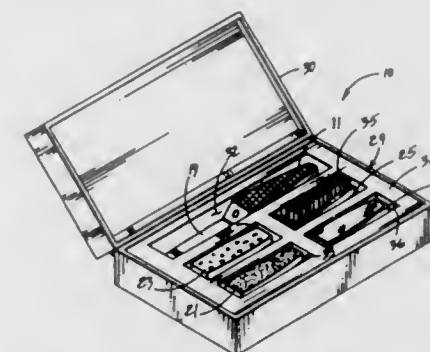
- U.S. Cl. 132—76.5 1 Claim
1. A manicure file kit comprising, in combination, a container, the container including a container body and a lid, the lid mounted for overlying the container body, and the container body including a floor, with the floor defining a first elongate recess, and an elongate, longitudinally aligned, generally "S" shaped file body mounted within the first elongate recess, the file body including a central holding plate, the holding plate including a forward terminal edge and a rear terminal edge, the forward terminal edge integrally mounting a first planar body at an obtuse angle thereto, with the rear terminal edge of the holding plate mounting a second elongate planar blade body at an obtuse included angle to

the holding plate, wherein the first elongate blade body and the second elongate blade bodies are arranged parallel relative one another in a spaced relationship,

and wherein the first elongate planar blade body includes a file surface, with the file surface defined by a predetermined coarseness, and the first planar blade body including a forward terminal end remote from the holding plate, wherein the forward terminal end defines an arcuate nose, and wherein the second planar blade body includes a second planar blade body free terminal end remote from the holding plate, wherein the free terminal end includes a plurality of spaced fixed rigid blades, the blades defining an acute angle therebetween,

and including a first cover sheath, the first cover sheath defining a first cavity complementarily receiving the second blade body therewithin, and the first cover sheath including an end surface, wherein the end surface is planar to define a pushing surface,

and including a second cover sheath, the second cover sheath defined by a second cover sheath cavity complementarily receiving the first blade body therewithin, and the second cover sheath including an exterior surface of a second coarseness less than that defined by the predetermined



coarseness of the file surface of the first blade body, and the container floor including a second elongate recess to complementarily receive the second cover sheath therewithin,

and including a third cover sheath, the third cover sheath defined by a third cover sheath cavity to complementarily receive the second blade body therewithin, and the third cover sheath including a third cover sheath exterior abrasive surface defined by a third coarseness, wherein the third coarseness is greater than the second coarseness, and the container floor including a third elongate recess to complementarily receive the third cover sheath therewithin, and a fourth cover sheath, the fourth cover sheath including a fourth cover sheath cavity, the fourth cover sheath cavity complementarily receiving the first blade body therewithin, and the fourth cover sheath including a matrix of bristle brush members orthogonally mounted to an exterior surface of the fourth cover sheath, and the container floor including a fourth cover sheath recess to complementarily receive the fourth cover sheath therewithin, and a fifth cover sheath, the fifth cover sheath including a fifth cover sheath cavity to complementarily receive the first blade body therewithin, and the fifth cover sheath including a polishing cloth laminate mounted to an exterior surface of the fifth cover sheath, and the container floor including a fifth elongate recess to complementarily receive the fifth cover sheath therewithin.

5,088,510

ULTRASONIC PARTS CLEANING CONTAINER

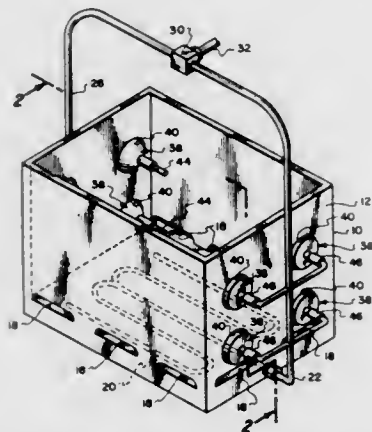
John H. Bannon, 4208 Crownfield Ct., Westlake Village, Calif. 91361

Filed Feb. 4, 1991, Ser. No. 650,242

Int. Cl.⁵ B08B 3/10

U.S. Cl. 134—105

9 Claims



9. A parts container adapted to be submerged in a bath of a cleaning solution, said parts container to minimize ultrasonic energy losses plus allow usage of non-toxic cleaning solutions, said parts container comprising:

- a) an enclosing sidewall being open at the top and substantially closed by a floor at the bottom; and
- b) a plurality of ultrasonic transducer assemblies being mounted within said sidewall, each said ultrasonic transducer assembly including an ultrasonic transducer being fixedly mounted on a separate mounting plate, each said mounting plate being adjustably mounted by a gimbal arrangement within said sidewall, said mounting plate and said transducer being able to move randomly within said sidewall within the limits of movement which are pre-established between said mounting plate and said sidewall.

5,088,511

APPARATUS FOR PROTECTING CEILING WORK AREA FROM DISPERSAL OF ASBESTOS FIBERS

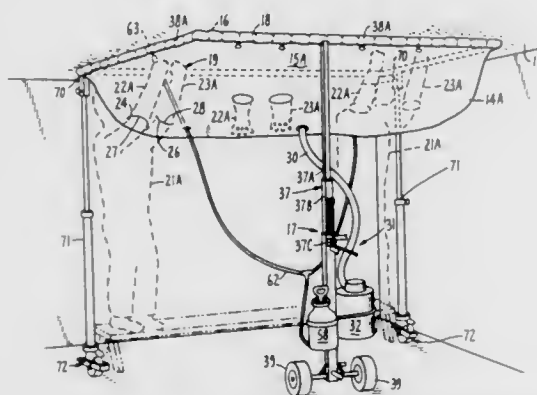
G. William Bain, 35860 Ashton Pl., Fremont, Calif. 94536
Continuation-in-part of Ser. No. 462,599, Jan. 9, 1990, Pat. No. 5,024,246, which is a continuation of Ser. No. 337,140, Apr. 12, 1989, Pat. No. 4,911,191. This application Nov. 28, 1990, Ser. No. 620,531

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.⁵ B08B 7/04

U.S. Cl. 134—200

3 Claims



1. A containment for asbestos fibers and the like floating in

the air adjacent to a ceiling as a consequence of removing or repairing materials on or near the ceiling, comprising a substantially fiber tight bag of flexible material having an open top adapted for placement in a position fitting in close proximity to a ceiling in surrounding relation to the ceiling area to be worked upon;

- a) support means formed for removably holding said bag in the desired position relative to said ceiling;
- b) sealing means on said open top of said bag adapted for cooperating with said ceiling to confine asbestos fibers;
- c) glove means of flexible material sealed to said bag and adapted for providing protected access to the interior of said bag for the hands and arms of users;
- d) the major portion of said bag being substantially transparent whereby a user having a hand inserted in said glove means can view the area of the ceiling being worked upon from outside said bag, said bag being formed of transparent flexible sheet plastic, said glove means comprising a plurality of pairs of flexible gloves sealed in laterally spaced relation to openings through said bag in position to accommodate simultaneously the hands and forearms of a plurality of users.

5,088,512

LIGHTLY OPERABLE FULLY AUTOMATIC UMBRELLA

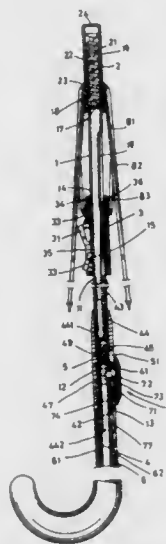
Luc L. Chou, and Jonathan C. Cheng, both of Taipei, Taiwan, assignors to Sheng-Tong Day, Taichung, Taiwan

Filed Jul. 31, 1991, Ser. No. 738,666

Int. Cl.⁵ A45B 25/14

U.S. Cl. 135—24

6 Claims



1. A lightly operable fully automatic umbrella comprising, in combination:

- a) a hollow shank having a reduced neck at intermediate portion to divide it into an upper section having upper and lower apertures and a lower section having upper and lower holes, a longitudinal guide groove at said upper section and a middle ring provided at a location having a distance from the top end, said guide groove having a through hole communicating with the interior of said shank;
- b) a cylinder mounted around said shank at the end section above said middle ring for receiving an umbrella opening spring therein, and provided with an upper ring at outer lower end;
- c) a slidable sleeve mounted around said shank at said upper section, having upper and lower pawls, and provided with a lower ring at outer upper end, including an inner sleeve having a slot;
- d) an inner shaft inserted in said lower section of said shank, having upper and lower holes, including an umbrella

5,088,514

TANNING AND SCREENING APPARATUS

J. C. House, and Jonathan C. House, both of 4701 Lake Shore, Port Arthur, Tex. 77640

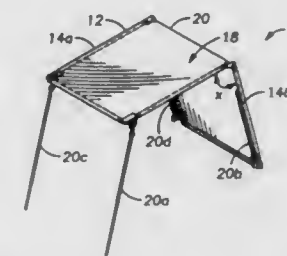
Continuation of Ser. No. 206,253, Jun. 13, 1988, abandoned.

This application May 2, 1990, Ser. No. 519,340

Int. Cl.⁵ E04H 15/46

U.S. Cl. 135—107

16 Claims



1. A tanning and screening apparatus alternatively to reflect the rays of the sun or a sun lamp towards a user, or to protect the user from such rays, comprising:

- a) an elongate rectangular frame having a central hinged portion, the axis of rotation of said hinged portion running transversely across said rectangular frame substantially at its center and enabling said frame alternately to be opened flat or to be doubled back on itself, said frame further including releasable locking means for maintaining said frame in substantially any position between such opened flat configuration and such doubled back configuration;
- b) a panel attached to said frame, said panel having a sun reflecting surface for reflecting toward the user such rays including those ultraviolet or other rays primarily responsible for effecting tanning of the user's skin in order to promote and accelerate the tanning process when the user is positioned to receive the reflected rays, and for shielding the user from such rays when placed between the source of such rays and the user; and

telescopically extendable, incrementally lockable leg means pivotally attached to each of the four corners of said rectangular shaped frame for selectively supporting each of said corners of said frame off the ground, floor, or the like an incremental distance from none or substantially only a minimal distance, equal to the thickness of or a partial thickness of said leg means, to the maximum distance permitted by said telescopically extendable leg means.

said hinged frame and said telescopically extendable, incrementally lockable leg means comprising means for securing said tanning and screening apparatus in any of a plurality of positions comprising a flat opened position with said legs folded underneath said frame, said corners being supported substantially only a minimal distance above the ground or the like; a flat opened position with said legs extended substantially the same amount to support the four corners of the frame substantially the same distance above the ground or the like; a flat opened position with two corners of said frame on the same longitudinal side thereof supported not at all or only minimally by the respective ones of said legs, and the two remaining sides being supported above the ground or the like by the respective ones of said incrementally extendable telescoping legs; a bent frame position with two corners of said bent frame on the same longitudinal side thereof being supported above the ground or the like not at all or only minimally by said frame, and the two remaining sides being free of support from said legs on the same longitudinal side of said frame; and a canopy position with the frame in a bent orientation and both legs of a pair of legs on the same end of said frame being alternately pivoted under said frame and away from supporting said corners above the ground or the like, or extended an equal amount from substantially none to the maximum permitted by

closing spring received in a space between the top end thereof and said reduced neck, a wire and a slide block, the upper end of said wire extending out of said through hole in said guide groove of said shank and hooking onto said inner sleeve;

a handle with a grip, mounted outside of said lower section of said shank; and

an actuating member disposed at lateral side of said handle, having upper and lower locking means for controlling the action of opening and closing the umbrella, respectively.

5,088,513

SUPPORT LEG FOR STICK-SHAPED WALKING AIDS

Thomas Ostermeyer, Attenweiler, Fed. Rep. of Germany, assignor to Schilling-Ostermeyer Maschinenbau GmbH, Attenweiler, Fed. Rep. of Germany

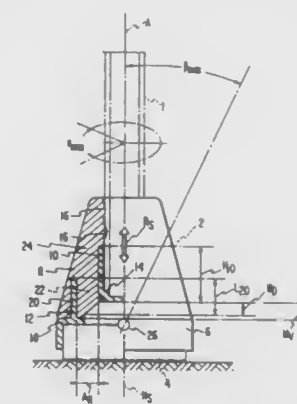
Division of Ser. No. 269,789, filed as PCT/EP87/00067, Feb. 12, 1987, abandoned. This application Mar. 25, 1991, Ser. No. 675,034

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 3604414

Int. Cl.⁵ A01G 25/00

U.S. Cl. 135—82

20 Claims



1. A support leg for a canelike walking aid, comprising:

- a) a cylindrical adapter part to which a support tube of a walking aid may be fitted to extend in a direction of support;
- b) a sole body adapted to bear on the ground; and
- c) joint means connecting said adapter part and said sole body for permitting elastic swivelling about an axis extending generally in a direction of support between said adapter part and said sole body, said joint means comprising a composite body including:

- a) one stiffener component comprising said adapter part,
- b) another stiffener component comprising a support plate supporting said sole body and being axially spaced from said adapter part by an axial space along the direction of support, and a cylindrical stabilizing collar extending substantially perpendicularly from said support plate and having a diameter greater than said adapter part, wherein said stabilizing collar is positioned around, and is radially spaced from, said adapter part, and
- c) an elastic body in which said stiffener components are imbedded, except in said axial space, wherein a portion of said elastic body between said adapter part and said stabilizing collar comprises a shear section,

whereby said stiffener components can pivot, shift and twist relative to one another in response to loads applied from said support tube by shearing of said shear section, said shearing being stabilized and guided by said stiffener components.

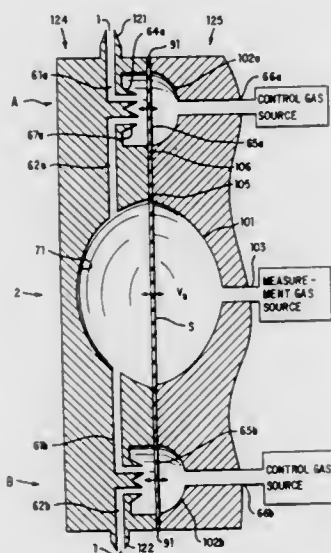
such telescopically extendable leg means, such that the respective corners of said frame are supported alternately not at all or only minimally, or substantially the same distance above the ground or the like.

5,088,515 VALVE SYSTEM WITH REMOVABLE FLUID INTERFACE

Dean L. Kamen, 44 Gage Rd., Bedford, N.H. 03102
Continuation-in-part of Ser. No. 345,387, May 1, 1989, Pat. No. 4,976,162, which is a continuation-in-part of Ser. No. 92,481, Sep. 3, 1987, Pat. No. 4,826,482, which is a continuation-in-part of Ser. No. 22,167, Mar. 5, 1987, Pat. No. 4,808,161, which is a continuation-in-part of Ser. No. 836,023, Mar. 4, 1986, Pat. No. 4,778,451. This application May 15, 1990, Ser. No. 523,801
Int. Cl.⁵ F16K 7/14

U.S. Cl. 137-15

18 Claims



18. A method for providing a valve in a line that delivers liquid, such that the portion of the valve that comes into contact with the liquid in the line may be easily disposable, the method comprising:

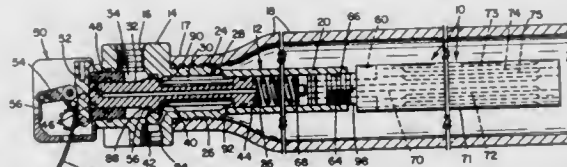
- providing a first flexible membrane having a first side and a second side;
- placing a housing against the first side of the flexible membrane, the housing including a valving chamber and a liquid path passing through the housing from a first port through the valving chamber to a second port so as to provide liquid communication between the valving chamber and the line, the path entering the valving chamber at first and second mouths, wherein at least one of said mouths inside the valving chamber protrudes from one side of the housing towards the membrane;
- holding the first flexible membrane and the housing against a fixture, such that the second side of the membrane is pressed against the fixture, and the first flexible membrane is sealed against the housing around the valving chamber;
- providing pressure to the second side of the first flexible membrane so as to force the first flexible membrane against the protruding mouth;
- relieving pressure on the external side of the first flexible membrane so as to permit relatively unrestricted flow through the liquid path through the valving chamber; and
- removing the first flexible membrane and the housing from the fixture.

5,088,516 TEMPERATURE COMPENSATOR FOR PRESSURE REGULATOR

John M. Fisher, Cuyaboga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Apr. 23, 1991, Ser. No. 690,413
Int. Cl.⁵ F16K 17/38

U.S. Cl. 137-80

7 Claims



1. A temperature compensator for a gas pressure regulator, said gas pressure regulator having a discharge orifice, said gas pressure regulator having a valve member movable to open said gas discharge orifice, said valve member having at least a first effective end area exposed to gas under pressure in said regulator and positioned to provide a force for urging said valve member in a direction to close said orifice and a second effective end area exposed to gas under pressure and positioned to provide a force for urging said valve member in a direction to open said orifice, a resilient means providing a force for urging said valve member in a direction to open said orifice, a sleeve adjustably secured to said gas pressure regulator, at least three or more nested tubes in telescopic arrangement, said nested tubes having an outer tubular member and an inner tubular member, said outer tubular member having one end connected to said sleeve, a piston secured to said inner tubular member, said nested tubes having adjacent ones of said tubes with different coefficients of thermal expansion to provide an expansion and contraction in linear length of said nested tubes upon a change in temperature resulting in a linear movement of said piston in response to an increase or reduction of temperature, and said piston being engageable with said resilient means to vary the amount of force provided by said resilient means in response to said increases and reductions in temperature.

5,088,517 APPARATUS FOR ADMITTING FLOWABLE ADDITIVE TO A LIQUID

Friedrich Bersch, Industriestrasse 18, W-5401 Halsenbach, Fed. Rep. of Germany

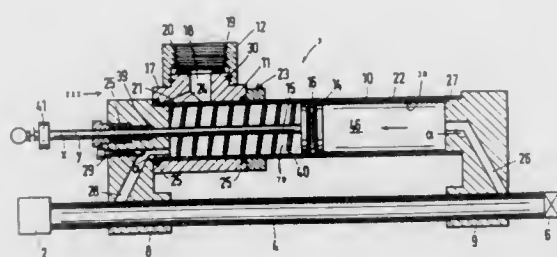
Filed Apr. 3, 1991, Ser. No. 679,750

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1990, 4010962; Nov. 13, 1990, 4036083

Int. Cl.⁵ G05D 11/00

U.S. Cl. 137-101.11

36 Claims



1. Apparatus for admitting metered quantities of a flowable additive into a receiver, comprising an elongated cylinder having at least one opening and a first channel; an additive-containing vessel; a connector defining a second channel for reception of additive from said vessel, said connector and said vessel being turnable about a substantially horizontal axis between a first position in which said vessel is located at a first position and a second position in which said vessel is located at a second position.

level and said second channel admits additive into said cylinder by way of said at least one opening, and a second position in which said vessel is located at a second level below said first level and is sealed from said cylinder; and means for expelling additive from said cylinder by way of said first channel, including a fluid-operated piston which is reciprocally mounted in said cylinder.

5,088,518 STEAM RESTRICTER DEVICE

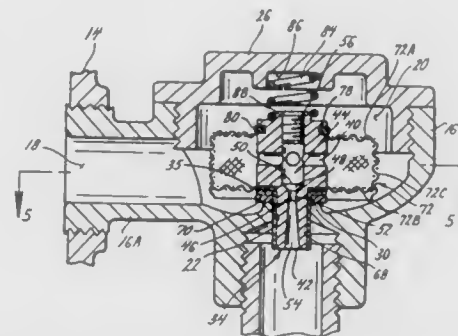
E. M. Stamatakis, and Robert B. Nicholson, both of St. Louis, Mo., assignors to Steam Tech, Inc., St. Louis, Mo.

Filed Feb. 28, 1991, Ser. No. 662,465

Int. Cl.⁵ F16T 1/34

U.S. Cl. 137-171

17 Claims



1. A steam restricter device adapted to be retrofitted to an existing steam trap of the type comprising a chamber-defining member with an inlet for admitting steam and condensate into the chamber and a drain for draining condensate from the chamber to a condensate return, the device comprising, a body including an upper portion with an intake therein and an unthreaded lower portion with an outlet therein, the lower portion being generally sized for sliding into and out of the drain, a passage extending through the body from the intake to the outlet, the passage including a nozzle configured to permit passage of condensate but to inhibit passage of steam, means for holding the lower portion of the body in the drain, said holding means comprising biasing means adapted to engage a wall of the chamber-defining member and resiliently urge the lower portion of the body into the drain, sealing means on the lower portion of the body for making a seal with the drain when the lower portion is inserted therein such that substantially all communication from the chamber to the condensate return is blocked except through the nozzle in the body, and filter means enclosing the intake.

5,088,519 DEVICE FOR CONNECTING TWO CONDUIT PARTS

Patrice Giroux, Saint Egreve, and Jean-Christophe Rey, Echirolles, both of France, assignors to Sames S.A., Meylan, France

Filed Jun. 14, 1990, Ser. No. 537,802

Claims priority, application France, Jun. 16, 1989, 89 08026

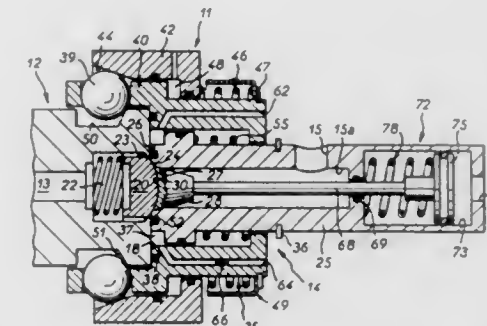
Int. Cl.⁵ B08B 9/02, 3/04; F16K 1/44

U.S. Cl. 137-240

10 Claims

1. A device for connecting two conduit parts, in particular two parts of a pollutant fluid circuit, comprising: a first connector part enclosing a first valve member elastically urged towards a first valve seat to isolate a fluid outlet, a second connector part comprising a tubular element defining an inlet conduit and enclosing a second valve member elastically urged towards a second valve seat to isolate a fluid inlet, and means for cleaning contacting surfaces of the two connector parts and in particular those of the two valve members, in

which device the valve members have respective complementary shape mutually contacting surfaces and are adapted to be movable conjointly while remaining in contact so as to enable said fluid to pass, wherein said cleaning means include a coaxial element and said tubular element are able to slide coaxially relative to each other,



said coaxial element being adapted to be applied against one end of said first connector part at which said first valve member is disposed, said coaxial element, said tubular element and said one end together defining, when said connector parts are connected together, an annular chamber for injecting cleaning fluid and/or drying air.

5,088,520 MODULAR SOLENOID VALVE

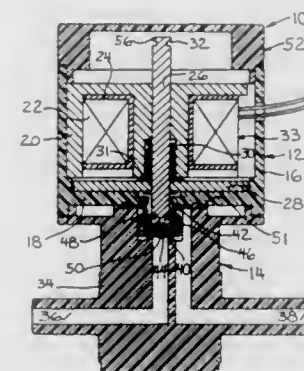
Andrew S. Haynes, New Carlisle, and Charles T. Zakreski, Mishawaka, both of Ind., assignors to South Bend Controls, Inc., South Bend, Ind.

Filed May 20, 1991, Ser. No. 703,021

Int. Cl.⁵ F16K 31/06

U.S. Cl. 137-270

8 Claims



1. A solenoid valve comprising a valve part and a solenoid part, said valve part including inlet and outlet port means to accommodate fluid flow through the valve part, said solenoid part including a movable armature and an electromagnetic coil means for inducing upon activation magnetic flux through said armature, said armature including a shaft extending through said coil means and being shiftable in one direction upon said induction of magnetic flux by said coil means and biasing means for shifting said shaft in an opposite direction upon the inactivation of said coil means, said shaft having first and second opposite ends each constituting means to terminate fluid flow through the valve part upon shiftable movement of the shaft, said armature and coil means being reversible as a unit relative to said valve part with the selected one of said shaft first and second ends serving to terminate said fluid flow through the valve part.

5,088,521

MUD PUMP VALVE

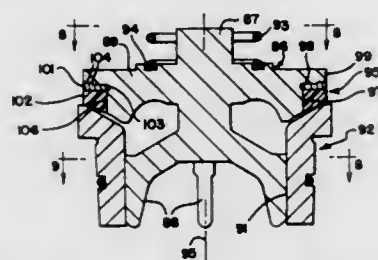
Jerry E. Johnson, Houston, Tex., assignor to Harrisburg, Inc., Houston, Tex.

Filed Oct. 29, 1990, Ser. No. 604,183

Int. Cl.⁵ F16K 15/06

U.S. Cl. 137—516.29

12 Claims



1. A valve for use in a valve housing which forms a flow passage, an annular valve seat being mounted on said housing and in said passage, the seat forming an annular seal surface, the housing, the seat and the passage being concentric on a valve axis, said valve comprising:

- a valve body which reciprocates during use on said axis in said housing, said body comprising a radially extending portion having an outer periphery adjacent said seal surface, an annular groove formed in said outer periphery, and a flange forming one side of said groove;
- an insert mounted in said groove, said insert comprising a rigid support part and an elastomeric seal part, said parts being bonded together, said seal part being engageable with said seal surface, said support part engaging and being supported by said flange, and said support part being out of engagement with said seat when said seal part engages said valve seat, said seal part being between said seat and said support part; and
- interlock means connecting said insert with said radially extending portion.

5,088,522

PUMP HOSE FOR A PERISTALTIC PUMP

Dieter Rath; Friedrich von der Haar, both of Melsungen; Hans-Josef Gerlach, Marsberg, and Reinhard Knuth, Melsungen, all of Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany

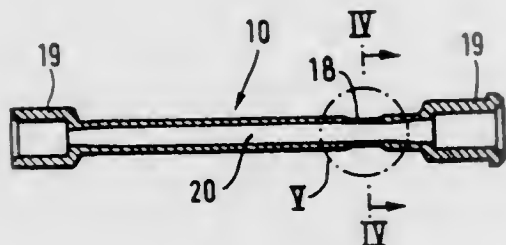
Filed Mar. 21, 1990, Ser. No. 496,792

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909657

Int. Cl.⁵ B32B 7/04; F16L 11/14

U.S. Cl. 138—119

7 Claims



1. A hose for a peristaltic pump, the hose having a longitudinal portion for being mechanically squeezed by at least one member of the peristaltic pump at progressive locations along the length of the hose, the hose comprising:

- a first arcuate portion having a thickness and defining an inner wall,
- a second arcuate portion having a thickness and defining an inner wall, the first arcuate portion and the second arcuate portion being substantially symmetrically disposed and being joined at at least one joining to define a lumen, the

inner wall of the first arcuate portion and the inner wall of the second arcuate portion defining an opening angle at the joining of less than 180°, and at least one rib protruding outwardly from the joining, the rib having a thickness which is approximately equal to the sum of the thickness of the first arcuate portion and the thickness of the second arcuate portion.

5,088,523

HEDDLE SELECTION IN A WEAVING MACHINE FOR RETHREADING

Robert Bucher, Frick, and Umberto Dünni, Ruti, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

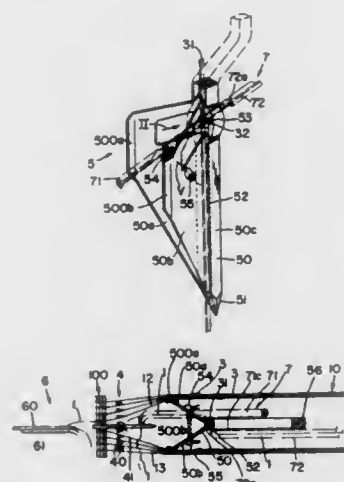
Filed Sep. 27, 1990, Ser. No. 589,076

Claims priority, application Switzerland, Oct. 3, 1989, 03595/89

Int. Cl.⁵ D03J 1/14

U.S. Cl. 139—35

13 Claims



1. A device for selecting a heddle in a weaving machine for re-threading, said device comprising a shaft for positioning between a pair of warp yarns in a weaving machine in a position of a broken warp yarn, said shaft having a groove for receiving a heddle therein; a sensing means for generating a signal in response to movement of the device past a heddle; and means responsive to said signal for moving said shaft a predetermined amount to receive a sensed heddle in said groove.

5,088,524

DOUBLE LEFT DOBBY

Abdul W. Omer, Lahorn, Pakistan, and Khalid Omer, 2212 Nathan Lowe Rd., Arlington, Tex. 76017, assignors to Khalid Omer, Pakistan

Filed Oct. 23, 1989, Ser. No. 425,685

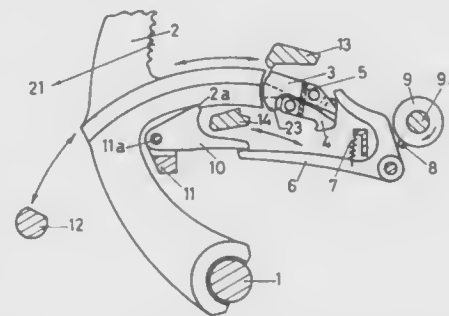
Int. Cl.⁵ D03C 1/06

U.S. Cl. 139—71

3 Claims

1. A double lift opened dobby for selectively shedding the warp harnesses of a weaving loom comprising: a drive mechanism which includes two drive knives reciprocated in opposite phases at half the frequency of the related loom; a plurality of swing levers which are mounted and selectively operated on one and the same central shaft on which said drive knives are mounted and operated and, in use, transmit an inclined lift to the loom harnesses which they shed and to which they are individually connected; means for holding said swing levers in two static rest positions selectively to define a static opened; linkage means carried directly in each swing lever for linking

this lever selectively in either of said rest positions with either of said drive knives for movement therewith between said rest positions; and selection means which selects said swing levers



to stay in their current static rest positions or move therefrom on each stroke of said drive knives according to a predetermined program of shedding.

5,088,525

REED BEAM CONSTRUCTION WITH ADJUSTABLE GRIPPER ROD GUIDE SURFACES

Ewald Zimmermann, Meerbusch, Fed. Rep. of Germany, assignor to Lindauer Dornier GmbH, Lindau, Fed. Rep. of Germany

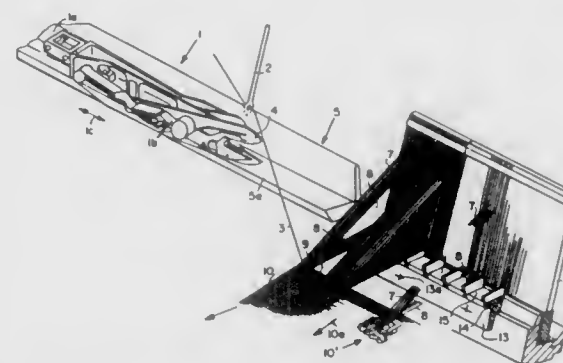
Filed Dec. 21, 1990, Ser. No. 632,157

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1990, 4000686

Int. Cl.⁵ D03D 47/18, 49/60

U.S. Cl. 139—188 R

7 Claims



1. A reed beam construction for a gripper loom on which a shed is formed by lower shed warp threads and upper shed warp threads for weaving heavy duty fabrics, comprising a reed beam for supporting a reed, and separation walls disposed along said reed beam for forming a plurality of separate upwardly open compartments on said reed beam, said separation walls extending parallel to said lower shed warp threads, said compartments having such a depth and width between said separation walls that all of said lower shed warp threads pass through said compartments, said construction further comprising a slay or reed beam section separable from said reed beam, means for securing said separable reed beam section to said reed beam, a plurality of parallel grooves in said reed beam section, said separation walls having lower edges rigidly secured in said parallel grooves, so that each parallel groove holds one of said separation walls.

5,088,526

METHOD FOR DISPOSAL OF AEROSOL SPRAY CONTAINERS

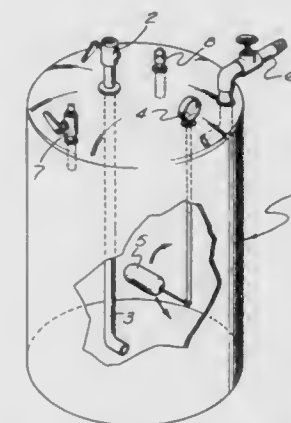
John P. Nash, 13254 LaQuinta St., La Mirada, Calif. 90638

Filed Dec. 7, 1989, Ser. No. 447,952

Int. Cl.⁵ B65B 31/00

U.S. Cl. 141—1

21 Claims



1. A method for disposal of residual contents of an aerosol dispenser containing a dispensable liquid material and at least one aerosol propellant having a substantial vapor pressure at ambient temperature, which method comprises:

- cooling the aerosol dispenser to a reduced temperature below which the at least one aerosol propellant exhibits a substantially reduced vapor pressure, thereby forming a mixed residual liquid comprising the dispensable liquid material and liquefied aerosol propellant with a substantially reduced vapor pressure;
- puncturing the cooled aerosol dispenser; and
- draining the mixed residual liquid from the aerosol dispenser while maintaining the mixed residual liquid at said reduced temperature into a collection container capable of accommodating the vapor pressure of the aerosol propellant at ambient temperature.

5,088,527

CHOKE VALVE FOR BOTTLE FILLING DEVICE

Len W. Monnig, Moncks Corner, S.C., assignor to Figgie International, Inc., Willoughby, Ohio

Filed Nov. 14, 1990, Ser. No. 612,626

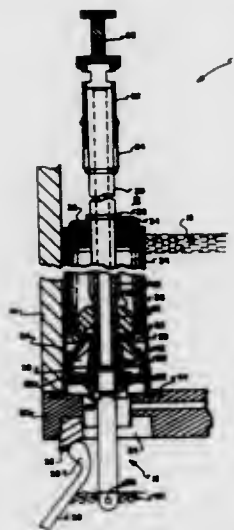
Int. Cl.⁵ B65B 31/00

U.S. Cl. 141—39

15 Claims

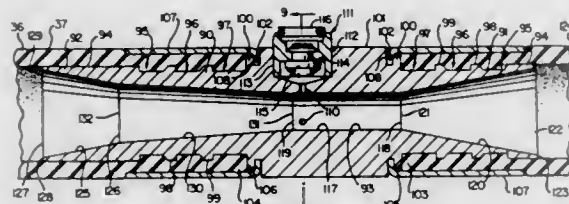
- A bottle filling apparatus, comprising: a filling tank for receiving liquid therein; a seal in a base portion of said tank for sealingly securing a mouth of a bottle;
- a vent tube extending within said tank at a first end thereof to an interior of said bottle at a second end thereof, said tube having respective first and second apertures at said first and second ends;
- a sleeve receiving said tube, said sleeve receiving liquid from said filling tank and serving as a conduit for passing said liquid from said tank to said bottle; and
- a choke valve interposed between said sleeve and said bottle for selectively inhibiting and enabling said passing of liquid, said choke valve comprising an inner ring and an

outer ring, said inner ring being received within said outer ring, said inner and outer rings being out of contact with



each other both when said valve is open and when said valve is closed.

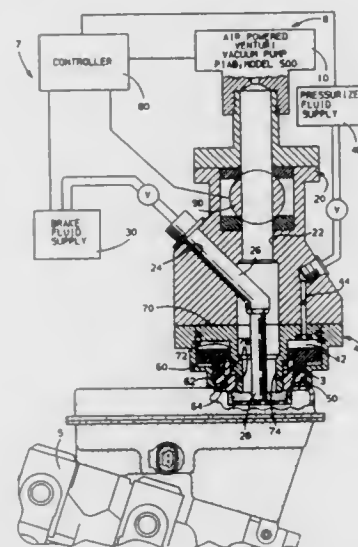
5,088,528
HOSE ASSEMBLY AND METHOD OF MAKING THE SAME
Rodger P. Grantham, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio
Continuation of Ser. No. 98,641, Sep. 18, 1987, abandoned. This application May 31, 1991, Ser. No. 709,031
Int. Cl.⁵ B67D 5/06
U.S. Cl. 141-44 14 Claims



1. In a hose assembly having a first fluid passage therein for conveying a volatile liquid in one direction to a container and a second fluid passage therein for returning the vapors of the volatile liquid from the container, the assembly comprising a flexible inner hose having an outer peripheral surface and defining said first fluid passage therein, and a flexible outer hose having an inner peripheral surface and being disposed around said inner hose, said inner peripheral surface of said outer hose and said outer peripheral surface of said inner hose defining said second fluid passage therebetween, said inner hose having a substantially straight Venturi section therein that tends to remove liquid from a certain area of said second fluid passage, said inner hose having adjacent intermediate ends, said Venturi section having opposed ends respectively interconnected to said ends of said inner hose to provide said first fluid passage therewith, the improvement wherein said ends of said inner hose are respectively telescopically disposed on said opposed ends of said Venturi section, said Venturi section having a flow passage therethrough, said flow passage having an intermediate substantially cylindrical portion provided with opposed ends and a substantially circular transverse cross-sectional configuration throughout the length thereof, said Venturi section having a radial passage leading from said second fluid passage to said flow passage at said cylindrical portion thereof and at a point spaced inwardly from said ends thereof,

said flow passage having opposed substantially frusto-conical portions at each end thereof with the smaller bases of said frusto-conical portions facing each other, said flow passage having a third frusto-conical portion disposed between said cylindrical portion and one of said end frusto-conical portions, said third frusto-conical portion having the smaller base thereof joining said cylindrical portion and having substantially the same diameter therewith, said third frusto-conical portion having the larger base thereof joining the smaller base of said one of said end frusto-conical portions and having substantially the same diameter therewith, said third frusto-conical portion being downstream from said cylindrical portion.

5,088,529
VEHICLE BRAKE VACUUM EVACUATION AND BRAKE FLUID FILL MACHINE
Daniel G. Jones, Romeo, and James A. Cole, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 27, 1990, Ser. No. 572,634
Int. Cl.⁵ B65B 31/00
U.S. Cl. 141-59 6 Claims



1. A vacuum evacuation and brake fluid fill machine for applying a vacuum to a vehicle braking system having a master cylinder, a master cylinder reservoir and a filler tube, the system in combination comprising:

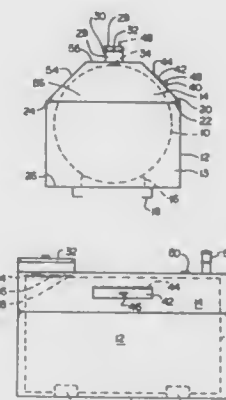
- a frame having a first passage for communication of air therethrough and the frame having a second passage intersecting with the first passage for communication of brake fluid therethrough, and the frame having an internal chamber with a connected third passage for communication of pressurized fluid therethrough;
- a seal adapter connected with the frame providing means to seal an inner diameter of the filler tube and having a passage in fluid communication with the frame first passage;
- a piston sealably slidably mounted within the interior chamber translationally responsive to the pressurized fluid communicated through the third passage, the piston also having a contact surface;
- an elastomeric seal surrounding the filler tube and sealing a periphery thereof when the seal is contacted by the contact surface of the piston;
- pressurized fluid supply means for selectively communicating with the third passage;
- brake fluid supply means for selectively supplying and withdrawing brake fluid through the second passage;
- a compact air power vacuum pump connected with the

frame for supplying a vacuum to the braking system via the first passage;

valve means to isolate the vacuum pump at least from a portion of the first passage; and

a controller for directing the operation of the pressurized fluid supply means, brake fluid supply means, air pump, and valve means, to sequentially move said piston to seal the filler tube of the master cylinder, open the valve means to connect air pump with the braking system, evacuate the braking system, close the valve to isolate the air pump from the braking system, fill and/or afterwards remove braking fluid from the braking system, and release the sealing means from a sealed relationship with the filler tube.

5,088,530
SECONDARY CONTAINMENT OF ABOVE-GROUND TANKS
Robert W. Harp, Pilot Mountain, N.C., assignor to Industrial Environmental Supply, Inc., Greensboro, N.C.
Filed Apr. 30, 1990, Ser. No. 516,291
Int. Cl.⁵ B65B 1/04; B65D 25/24
U.S. Cl. 141-86 5 Claims



1. An above-ground secondary containment system comprising:

- a) a closed tank suitable for safely holding liquids and a dike in the shape of a right parallelepiped having an open top and a floor surrounding said tank;
- b) a hood over said dike and together with said dike substantially completely enclosing said tank for preventing ambient precipitation and trash from entering said dike and having a flat top surface and surfaces sloping downward from said flat top surface to two opposing sides of said right parallelepiped with said sloping surfaces having lower edges and inwardly turned flanges along the lower edges to return liquid condensate flowing down the inside of said sloping surfaces to said dike; and
- c) a closable tank port access means in said hood for permitting access to tank input or output ports when desired but closable to maintain said hood's property of preventing ambient precipitation and trash from entering said dike at other times.

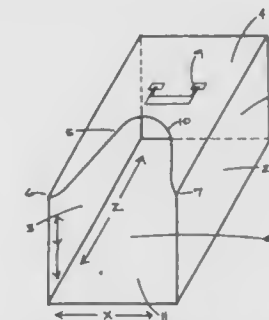
5,088,531
WASTE COLLECTION DEVICE
Bita L. Wade, 4892 Lake Dr., Memphis, Tenn. 38117
Filed Dec. 11, 1990, Ser. No. 607,110
Int. Cl.⁵ A01B 1/04
U.S. Cl. 141-108 2 Claims

1. A waste collection device for the collection of waste materials especially yard wastes comprising:
- a rectangular back wall;
 - a pair of rectangular side walls having a front and a rear end;
 - a rectangular bottom wall having a front and a rear end;
 - and a rectangular top wall having a front wall and rear end,

said top wall also having a generally elliptically shaped opening extending from the front end toward the rear end but terminating at an apex short of the rear end, the generally elliptically shaped opening originating at corners of the front end of the rectangular top wall;

said rear ends of said pair of side walls, said bottom wall and said top end joined together at said back wall to form a generally rectangularly box-shaped configuration;

said box configuration having an open front end proximate

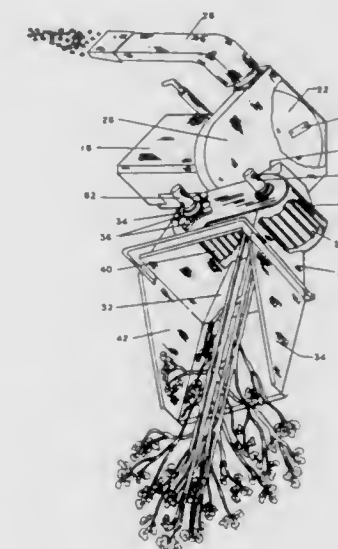


said front ends of said pair of side walls, said bottom wall and said top end at the origination of said generally elliptically shaped opening;

said open front end being large enough to allow a user of said device to move waste materials into the box-shaped configuration through the assistance of a rake or broom;

said generally elliptically shaped opening being sufficiently large enough to permit the rake or broom to be moved inside the box-shaped configuration toward the back wall to compress the waste materials.

5,088,532
MATERIAL FEED CONTROL METHOD AND APPARATUS FOR A WOOD OR BRUSH CHIPPING MACHINE
Thomas A. Eggers, and Alan J. Yoder, both of Pella, Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa
Filed Jun. 5, 1990, Ser. No. 533,370
Int. Cl.⁵ B27C 1/00; B27B 1/00
U.S. Cl. 144-356 10 Claims



5. A method of material feed control for a wood or brush chipping machine having a pair of coaxial feed rolls for feed-

ing material to be chipped into a rotating chipper driven by an engine of variable speed, comprising the steps of:

- providing a pair of hydraulic motors, one of which is drivably attached to each of the feed rolls;
- a hydraulic pump driven by the engine for supplying pressurized hydraulic fluid to drive said hydraulic motors;
- actuating said hydraulic motors by opening of a valve means downstream of said hydraulic motors and interrupting said hydraulic motors by closing said valve means; and
- opening said valve means when the pressure of said hydraulic fluid to said hydraulic motors is at least at a preselected high level and closing said valve means when said pressure is below a selected low level.

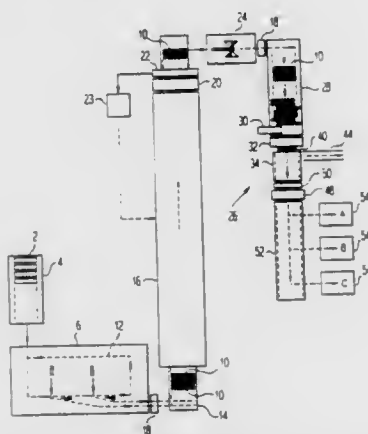
5,088,533

METHOD AND DEVICE FOR THE PRODUCTION OF WOOD SHEETS FROM CUT WOOD

Hans Binder, Haus Nr 396, A-6263 Fügen, Austria
Continuation-in-part of Ser. No. 454,583, Dec. 12, 1989, Pat. No. 5,002,106. This application Dec. 14, 1990, Ser. No. 627,463
Claims priority, application European Pat. Off., Dec. 30, 1988, 88121905.9; Jan. 2, 1990, 90100005.9

Int. Cl.⁵ B27M 1/00

U.S. Cl. 144—364



14. A device for use with a sawdust-free wood cutting apparatus for the production of finished wood sheets from wood planks, comprising:

- a drying apparatus automatically receiving said wood planks cut into individual sheets by said sawdust-free wood cutting apparatus for drying; and
- a wood machining apparatus receiving dried individual sheets from said drying apparatus.

5,088,534

TRACTION DEVICE HAVING PROJECTING RIBS WHICH FIT INTO GROOVES OF A TIRE TREAD

Rudolf Engel, Michael-Steinherr-Str. 17, D-8904 Friedberg, Fed. Rep. of Germany

Filed Aug. 29, 1990, Ser. No. 575,157

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1989, 3931279

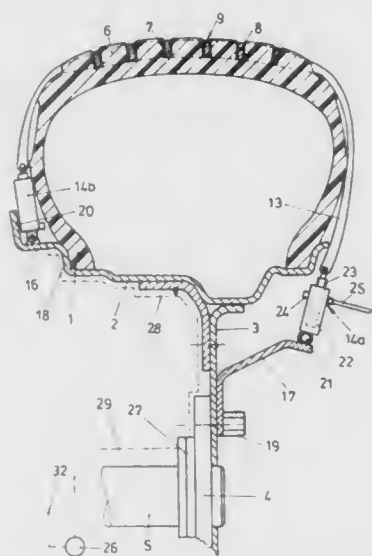
Int. Cl.⁵ B60C 27/20, 7/22

U.S. Cl. 152—208

22 Claims

1. A device for improving the winter road holding properties of an automobile tire having a tread with lugs separated by grooves, comprising lug-surrounding anti-skid members composed of an arrangement of lug-surrounding ribs, the anti-skid members, whose height is at the most equal to a depth of the grooves in the tread and which are arranged so that they may be radially slid in relation to the axis of the tire, being con-

nected by way of lateral stiff arms with a wheel rim carrying the respective tire and being able to be slid in a radial direction



19 Claims

by means of at least one actuating device associated with one of their arms.

5,088,535

BICYCLE OR MOTORCYCLE TIRE TREAD

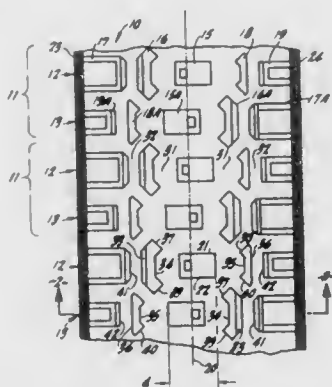
Stephen M. Potts; Mark J. Slate, both of Mill Valley; Charles B. Cunningham, Fairfax, and James H. Merz, Morgan Hill, all of Calif., assignors to Specialized Bicycle Components, Inc., Morgan Hill, Calif.

Continuation of Ser. No. 267,683, Nov. 2, 1988, abandoned, which is a continuation of Ser. No. 907,370, Sep. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 906,834, Sep. 10, 1986, abandoned. This application May 25, 1990, Ser. No. 529,785

Int. Cl.⁵ B60C 11/11

U.S. Cl. 152—209 B

12 Claims



4. A bicycle or motorcycle tire having a tread comprising a circumferentially repeated pattern of first and second laterally-extending rows of tread blocks; each of the first row and the second row of tread blocks comprising a center tread block and left and right tread blocks laterally adjacent to and aligned with the center tread block; the center tread blocks of the first and second rows being laterally off-set relative to one another; each center tread block having circumferentially-extending left and right side edges facing the right and left side edges respectively of the left and right tread blocks in the same row and the left and right tread blocks having circumferentially-extending inside edges laterally aligned with the

left and right side edges of the associated center tread block; the inside edges of the right and left tread blocks having a section which is concave, the length of the concave section extending in the circumferential direction, and the circumferential length thereof for at least every other tread block in each circumferential column of right and left tread blocks being greater than the circumferential length of the facing side edge of the adjacent center tread block; and said left and right tread blocks having laterally-extending convex front and rear edges.

5,088,536

ALL SEASON TYPE TIRE TREAD

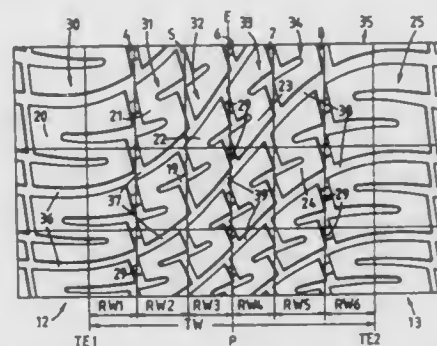
Maurice Grass, Reichlange, and Michel Constant, Bastogne, both of Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 10, 1990, Ser. No. 521,514

Int. Cl.⁵ B60C 11/11

U.S. Cl. 152—209 R

15 Claims



1. An all season type tire having a tread comprising an elastomeric substance extending circumferentially about the axis of rotation of the tire, said tread having:

- a pair of shoulders which define the lateral edges of a ground engageable surface;
- a plurality of laterally extending grooves having curved portions adjacent each lateral edge, each said curved portions extending in opposite directions so as to have the laterally extending groove being the shape of an elongated "S" or "Z"; and

at least three circumferentially extending axially spaced wide zig-zag shaped grooves, having a plurality of first, second, third and fourth legs every fourth leg of a said laterally extending grooves and the two adjacent legs to said fourth leg connecting the laterally extending grooves to short semi-blind grooves each having a central portion coincident with every second leg of blind grooves being straight or slightly curved over its entire length, said circumferentially extending, laterally block elements, arranged in circumferential rows and having the shape of an "S" or a "Z" wherein the semi-blind grooves extend substantially half the axial width of the respective adjacent block rows.

5,088,537

RADIAL TIRE WITH A SIDEWALL HAVING A THREE-LAYER STRUCTURE

Masanori Kan, and Keijiro Oda, both of Hyogo, Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed May 25, 1989, Ser. No. 357,576

Claims priority, application Japan, Oct. 7, 1988, 63-254623

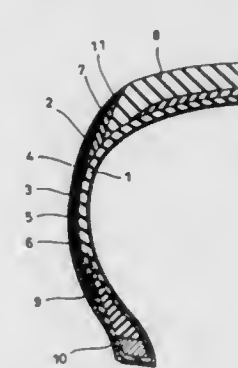
Int. Cl.⁵ B60C 13/00, 1/00; C08L 45/00

U.S. Cl. 152—525

4 Claims

1. A radial tire in which each sidewall covering and protecting the side face of the carcass is composed of a plurality of layers differing in rubber composition, the sidewall having a three-layer structure consisting of an adhesive layer adjacent

to the carcass, an inner layer disposed outwardly on said adhesive layer and an outer layer disposed outwardly on said inner layer, the rubber component of the rubber composition constituting said adhesive layer consisting essentially of 0 to 10% by weight of at least one rubber having a low degree of unsaturation selected from Group I consisting of halogenated butyl rubber and ethylene-propylene-diene rubber and 100 to 90% by weight of at least one rubber having a high degree of unsaturation selected from Group II consisting of natural rubber, polyisoprene, polybutadiene and styrene-butadiene copolymer, the rubber component of the rubber composition constituting said inner layer consisting essentially of 10 to 50% by weight of at least one rubber having a low degree of unsaturation selected from said Group I and 90 to 50% by weight of at least



one rubber having a high degree of unsaturation selected from said Group II, the rubber component of the rubber composition constituting said outer layer consisting essentially of 30 to 70% by weight of at least one rubber having a low degree of unsaturation selected from said Group I and 70 to 30% by weight of a rubber having a high degree of unsaturation selected from said Group II and the high-degree-of-unsaturation rubber content in each rubber component of each layer-constituting rubber composition decreasing in the order of adhesive layer, inner layer and outer layer, the high-unsaturation rubber content in each rubber composition constituting said adhesive layer, inner layer and outer layer is such that, for neighboring two layers, the high-unsaturation rubber content in the outside layer is not less than 40% of that in the inside layer.

5,088,538

RADIAL PLY TIRE WITH SHOULDER REINFORCEMENT BETWEEN BELT AND CARCASS

Stanley Navanx, Bastogne, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 29, 1990, Ser. No. 604,268

Int. Cl.⁵ B60C 9/26, 9/18, 9/00

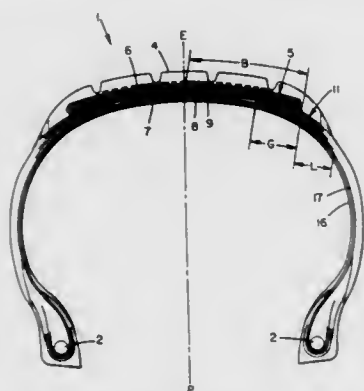
U.S. Cl. 152—528

9 Claims

1. A radial pneumatic tire comprising at least one carcass ply folded at least in part axially around a pair of axially spaced apart bead cores, each carcass ply comprising a plurality of parallel reinforcing elements which are oriented at 75 to 90 degrees with respect to an equatorial plane (EP) of the tire and a crown reinforcement with one belt ply folded around at least two unfolded belt plies and a shoulder reinforcing structure comprising at least:

- a first layer adjacent to the radially outermost carcass ply being reinforced by cords forming with an axial plane intersecting them, an angle ranging between 20 and 50 degrees; a second layer adjacent to said first layer reinforced by cords forming with an axial plane intersecting them, an angle ranging between -20 and -50 degrees; a third layer adjacent to said second layer reinforced by cords forming with an axial plane intersecting them, an angle ranging between 45 and 75 degrees;

the layers extending each laterally under the folded belt ply and into the sidewall of the tire and wherein each radially outer layer of the shoulder reinforcement has both a smaller width than its adjacent radially inner layer and



lateral ends located inside the width of its adjacent radially inner layer;
each layer having an extension G into the crown reinforcement of no greater than B/3, where B is half the lateral width of the folded belt ply.

5,088,539

TIRE CHANGING APPARATUS

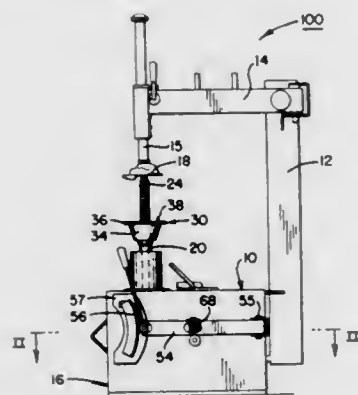
Bryce Mannen; Gregory M. Calico, both of Conway, Ark., and Tumkur R. Vijay, Newark, Del., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 11, 1990, Ser. No. 580,707

Int. Cl. B60C 25/132

U.S. Cl. 157—1.17

5 Claims



1. A tire changing apparatus comprising:

- a base;
- a wheel hold-down shaft rotatably attached to said base at a shaft base end portion and extending upward along a generally vertical axis to a wheel mount end portion;
- wheel mount means for mounting a wheel in fixed relation to said wheel mount end portion such that a rotational axis of said wheel is coincident with said shaft axis and said wheel rotates in fixed angular relation to said shaft;
- a piston;
- piston support means for supporting said piston in fixed relation to said base;
- a piston cylinder including a side wall and an end wall said side wall surrounding a longitudinal cylinder axis lying generally normal to said shaft axis, said cylinder adapted to slidingly and sealingly engage said piston such that said cylinder may move along said longitudinal cylinder axis and said piston, said side wall and said end wall define a piston chamber of variable volume;

a fluid port through which fluid may flow into and out of said piston chamber;
a pinion gear;
pinion gear attachment means for attaching said pinion gear to said hold-down shaft such that when said pinion gear is rotated in a first direction, said shaft is caused to rotate in a first direction, but when said pinion gear is rotated in a second direction, said shaft is not caused to rotate; and,
a rack attached to said cylinder with a longitudinal rack axis parallel to said cylinder axis and said rack cooperatively engaged with said pinion gear.

5,088,540

WINDOW RAINSHIELD APPARATUS

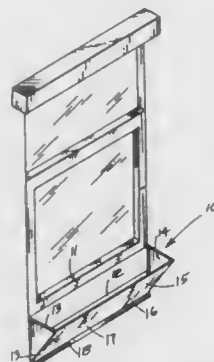
Shirley J. Harris, 1908 Wellington Way, Fort Smith, Ark. 72903

Filed Dec. 5, 1990, Ser. No. 622,546

Int. Cl. E06B 7/03

U.S. Cl. 454—220

1 Claim



1. A window rain shield apparatus in combination with a window, wherein the window includes an upper window and a lower window, with the lower window relatively movable relative to the upper window, and the lower window including a lower window sash cooperative with a window sill, and the apparatus includes a first triangular side plate and a second triangular side plate, with each first and second triangular side plate positionable between the lower window sash and the window sill, and the first triangular side plate including a planar shield housing, the shield housing telescopically receiving a shield plate, the shield plate orthogonally mounted to the second triangular side plate, and wherein the shield housing includes a lip housing coextensively mounted to a lower terminal edge of the shield housing defining a fixed obtuse angle therebetween, and the shield plate including a shield plate flange mounted to a lower terminal edge of the shield plate defining the fixed obtuse angle therebetween, and wherein the shield housing includes an "L" shaped flange mounted coextensively to an upper terminal edge of the shield housing defining a channel to receive the shield plate therewithin, and further including a rectangular frame, the rectangular frame including a registration leg orthogonally and fixedly mounted to a lower terminal edge of the rectangular frame adjacent each corner of the rectangular frame, and the rectangular frame including a filter screen mounted coextensively within the rectangular frame, the filter screen including a charcoal and liquid scent impregnated webbing to enhance filtration of air directed therethrough, and wherein the rectangular frame includes a positioning bore directed orthogonally to the rectangular frame adjacent each corner thereof overlying each positioning leg, and a rectangular fan plate, the rectangular fan plate including a fan plate leg orthogonally and fixedly mounted to the fan plate adjacent each corner thereof, with each fan plate leg receivable within an associated positioning bore, and the fan plate including a plurality of motorized fan members,

each fan member mounted within an opening within the fan plate for directing air through the fan plate and the filter screen.

5,088,541

SPACE DIVIDING PANEL SYSTEM WITH COUNTER CAP

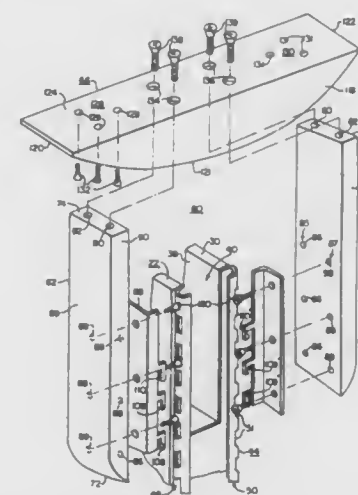
Brian J. Persing, Northgate, and John P. Connor, Jamestown Township, Ottawa County, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 5, 1991, Ser. No. 680,874

Int. Cl. E04B 2/74

U.S. Cl. 160—135

7 Claims



1. A space dividing panel system, comprising:

- a plurality of panels,
- each of said panels having first and second major sides, and a periphery which includes upper and lower edges and first and second side edges,
- means joining predetermined side edges of said plurality of panels,
- a slotted standard accessible between adjacent panels, with each slotted standard having first and second columns of vertically spaced slots respectively accessible from the first and second sides of the panels,
- a counter cap,
- support means, including at least one support assembly, with said at least one support assembly supporting said counter cap in vertically spaced relation above the upper edge of at least one of the panels,
- said at least one support assembly including first and second vertically oriented elongated bracket members having first and second ends, and a horizontally oriented third bracket member,
- said first and second bracket members including mounting means adjacent to their first ends respectively engaging the first and second columns of a slotted standard, with the second ends extending upwardly,
- said third bracket member being supported by the second ends of the first and second bracket members,
- means fixing the first and second vertically oriented bracket members to the horizontally oriented third bracket member,
- and means fixing the counter cap to said horizontally oriented third bracket member.

5,088,542

VERTICAL BLIND APPARATUS

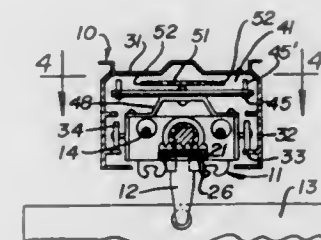
Scott I. Biba, Mazomanie, and Dean R. Sommerfeld, Cottage Grove, both of Wis., assignors to Graber Industries, Inc., Middleton, Wis.

Filed Jul. 22, 1991, Ser. No. 733,623

Int. Cl. E06B 9/30

U.S. Cl. 160—168.1

8 Claims



1. A vertical blind apparatus including an elongated carriage guide track, a plurality of panel support carriages mounted on the track for movement in a path lengthwise of the track, lazy-tong linkage means extending lengthwise of said path and including a plurality of pairs of levers and center pivot means pivotally interconnecting the levers of each pair and pairs of outer pivot means pivotally interconnecting adjacent pairs of levers, means connecting the carriages to the lazy-tong linkage means, traverse means for moving a lead end of the lazy-tong linkage means along the path between a retracted blind open condition and an extended blind closed condition, the pairs of outer pivot means being spaced apart a first distance when the lazy-tong linkage means is in a retracted blind open condition, rail means extending parallel to said path, and finger means on said lazy-tong linkage means for engaging the rail means to limit movement of the pairs of outer pivot means toward each other to a preselected minimum distance less than said first distance when the lead end of the lazy-tong linkage means is moved toward the blind closed condition.

5,088,543

SKYLIGHT SHADE

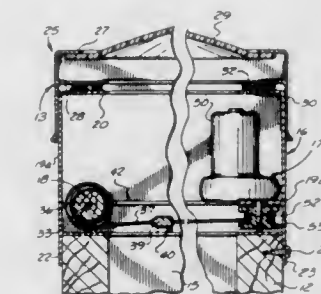
Paul J. Bilbrey, 7021 West Augusta, Glendale, Ariz. 85303

Filed Jun. 4, 1990, Ser. No. 533,021

Int. Cl. A47H 1/00

U.S. Cl. 160—310

21 Claims



1. A shade unit for operation with a skylight, comprising:

- a) a frame defining a skylight and including
 - i) a first end wall,
 - ii) a second end wall opposite said first end wall,
 - iii) a first side wall extending between said first and second end walls,
 - iv) a second side wall opposite said first side wall,
 - v) a bottom lip extending inwardly from the bottom of each of said walls, and
 - vi) a top lip extending inwardly from the top of each of said walls;

- b) a shade assembly attached to the inner surface of said frame proximate said first end wall, said shade assembly including
- a rod having a first end mounted in said first side wall and a second end mounted in said second side wall,
 - a generally tubular roller movably enclosing said rod, and
 - a shade screen having a first end fixedly secured to said roller;
- c) a motor assembly attached to the inner surface of said second end wall, said motor assembly including
- a reversible gear drive motor,
 - a drive shaft extending from a said motor, and
 - a spool mounted on said shaft;
- d) a draw line having a first end secured to a second end of said shade screen at a location between said first and second ends of said rod, and a second end secured to said spool;
- e) control means for turning said motor assembly on and off and reversing its polarity, and
- f) attachment means for attaching said frame to a roof.

5,088,544

PROCESS FOR THE LOST-FOAM CASTING, UNDER CONTROLLED PRESSURE, OF METAL ARTICLES
Michel Garat, Voiron, France, assignor to Aluminium Pechiney, Courbevoie, France

Continuation-in-part of Ser. No. 550,499, Jul. 10, 1990, Pat. No. 5,058,653, and a continuation-in-part of Ser. No. 437,103, Nov. 16, 1989, Pat. No. 5,014,764, which is a continuation-in-part of Ser. No. 334,530, Apr. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 116,213, Nov. 3, 1987, abandoned. This application Oct. 9, 1990, Ser. No. 594,706
Claims priority, application France, Oct. 31, 1989, 89 14730
Int. Cl.⁵ B22C 9/02, 9/04; B22D 27/09

U.S. Cl. 164—34 5 Claims
1. In a process for lost foam casting of a metal part comprising the steps of:

obtaining a pattern of the part to be cast formed by a foam of organic material coated with a film of refractory material, immersing said pattern in a mold formed by dry sand without binder, filling the mold with metal in the molten state to burn said pattern, evacuating the vapors and the liquid residues emitted by the burned pattern, and causing the molten metal to solidify to produce said part, the improvement comprising applying to the mold with molten metal a substantially isostatic gas pressure, continuously increasing said gas pressure up to a maximum pressure of 0.5 to 10 MPa, and maintaining said maximum pressure, said increasing taking place at an initial rate of 0.003 to 0.3 MPa/sec for a first period of at most 5 seconds from the initiation of the increase, then during a second period at a rate higher than said initial rate up to said maximum pressure, said increase in pressure generating an overpressure in the molten metal relative to the sand having a maximum within 5 seconds from the initiation of the increase.

5,088,545

EVAPORABLE FOAM PATTERN FOR USE IN CASTING A METAL ENGINE BLOCK HAVING A LOOP CHARGE SYSTEM

William D. Corbett, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

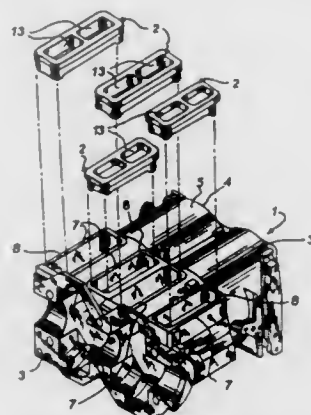
Filed Oct. 18, 1990, Ser. No. 599,704

Int. Cl.⁵ B22C 9/04

U.S. Cl. 164—246 10 Claims

1. An evaporable foam pattern for use in casting a metal block for a two-cycle engine, comprising a first pattern section formed of an evaporable foam material and defining at least one cylinder, said first pattern section having a plurality of

slots extending through the section and communicating with said cylinder, each slot being bordered by an outer surface, a second evaporable foam pattern section for each-slot, each second pattern section having a portion extending within the



5,088,546

VACUUM-ASSISTED COUNTER GRAVITY CASTING APPARATUS WITH VALVE TO PREVENT FLOW OF MELT FROM MOLD

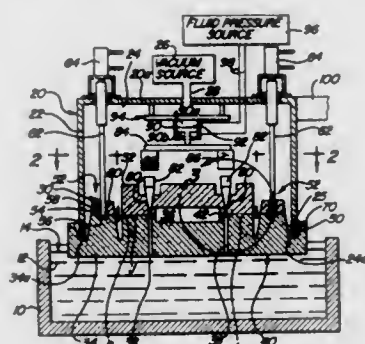
Anthony C. Greanias, Saginaw; John G. Kabisch, Midland; James B. Mercer, and Wilmer G. Schaeff, both of Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 698,456, May 10, 1991, abandoned.
This application Aug. 19, 1991, Ser. No. 749,626

Int. Cl.⁵ B22D 18/06

U.S. Cl. 164—255

12 Claims



1. Countergravity casting apparatus, comprising:

- a gas permeable casting mold defining a mold cavity and a melt inlet passage communicating the mold cavity to a lower mold portion adapted to engage an underlying source of melt,
- a vacuum box defining a vacuum chamber confronting the casting mold for evacuating the mold cavity when the lower mold portion and the underlying source of the melt are engaged,
- a valve member carried by said mold for closing off said passage and blocking the backflow of melt from said mold cavity when said cavity is filled with melt, said member being (1) disposed in said mold in a first position adjacent said passage during filling of said mold cavity so as not to restrict the melt from being drawn upwardly through said passage into the mold cavity when the lower mold portion and the source are engaged with the mold cavity evacu-

ated and (2) movable to a second position inside said passage after the mold cavity is filled with the melt to block the backflow of melt from the mold cavity when the lower mold portion and the source are disengaged, and

d) means carried on the vacuum box for engaging and moving said valve member from said first position in said mold to said second position in said passage after the mold cavity is filled with the melt.

5,088,547

ELECTROMAGNETIC STIRRER FOR CONTINUOUS CASTING

Markus Schmid, Wädenswil, Switzerland, assignor to Concast Standard AG, Zürich, Switzerland

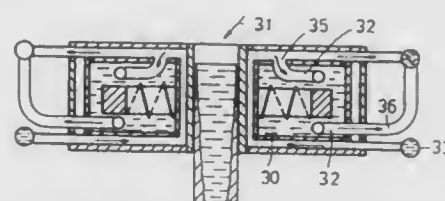
Filed Aug. 24, 1990, Ser. No. 572,861

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1989, 3928311

Int. Cl.⁵ B22D 27/02

U.S. Cl. 164—504

18 Claims



1. An electromagnetic stirrer for stirring the molten core of a partially solidified, continuously cast strand in a continuous casting apparatus, comprising a casing; a body of fluid confined in said casing and being mechanically unagitated from internally thereof; an electromagnetic coil at least partly immersed in said body; and conduit means defining a flow path for a cooling fluid, at least a portion of said conduit means being immersed in said body.

5,088,548

HEAT ACCUMULATOR WITH EXPANSION RECESSES

Friedrich Lindner, Leinfelden-Echterdingen; Hans-Joerg Staehle, Filderstadt, and Peter Tattermusch, Altdorf, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsgesellschaft fuer Luft- und Raumfahrt e.V., Fed. Rep. of Germany
PCT No. PCT/EP90/00250, § 371 Date Dec. 7, 1990, § 102(e)
Date Dec. 7, 1990, PCT Pub. No. WO90/10187, PCT Pub. Date Sep. 7, 1990

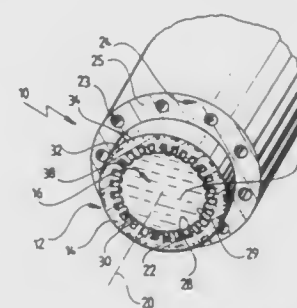
PCT Filed Feb. 16, 1990, Ser. No. 598,619

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905706

Int. Cl.⁵ F28D 20/00

U.S. Cl. 165—10

25 Claims



1. Heat accumulator comprising a storage container with a wall region provided for the introduction of heat and a storage medium arranged in this storage container, wherein said wall region is provided with recesses which are open towards said storage medium, a wall surface of said wall region facing said storage medium is made of a material which is not wettable by said storage medium, and facing wall surfaces in said recesses

exhibit such a spacing from one another that said storage medium does not penetrate into these to any substantial degree in the completely liquid state owing to the capillary forces.

5,088,549

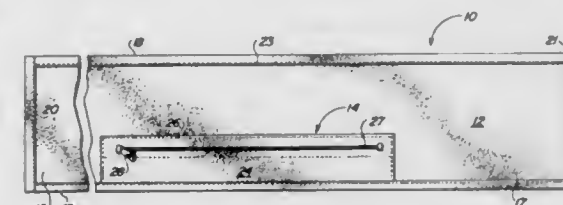
TYING NECKBAND HEAT TRANSFER DEVICE
Mark Schneider, Orlando, Fla., assignor to Warren Locke Franz, Orlando, Fla.

Filed Jun. 13, 1991, Ser. No. 714,647

Int. Cl.⁵ A61F 7/02

U.S. Cl. 165—46

1 Claim



1. A heat transfer device for cooling or heating the neck area of a user, said device comprising:

- a main body of flexible fabric material having a length and width;
 - a pocket of flexible fabric material, having a length, width and an interior, and being located lengthwise centrally of the length of said main body; and
 - a heat transfer element dimensioned, configured and adapted to match said pocket interior and including a substance suitable for transferring heat to or from said neck area;
- said lengths of said main body and pocket being relatively dimensioned for enabling said pocket-matching heat transfer element to be received circumferentially about the back and sides of the neck, yet leaving opposite free ends lengthwise of said main body and away from said pocket, to permit loose tying of said main body of said free ends in front of said neck; and
- said widths of said main body and said pocket being relatively dimensioned for permitting said main body to be folded widthwise over said pocket to permit optional user-selectable variation of the number of layers of fabric material between said heat transfer element and said neck area.

5,088,550

RADIAL FLOW HEAT EXCHANGER

Joseph R. Tippman, HRC-33, Box 8419, Rapid City, S. Dak. 57701, and Vincent P. Tippmann, 8605 N. River Rd., New Haven, Ind. 46774

Filed Apr. 16, 1991, Ser. No. 686,148

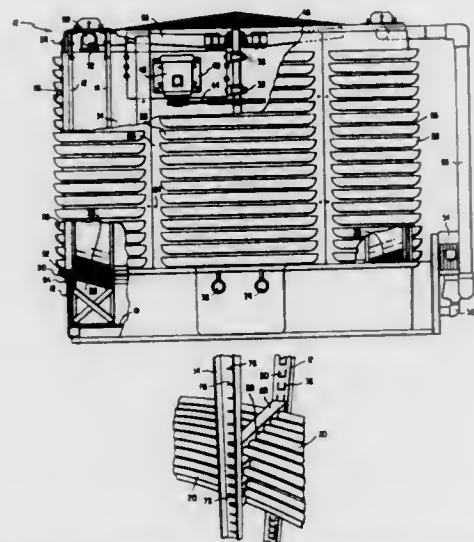
Int. Cl.⁵ F28D 3/00

U.S. Cl. 165—117

8 Claims

1. A radial flow heat exchanger for fluids comprising:
- a plurality of tubes connected to an inlet header at vertically spaced points for receiving said fluid, each tube having a plurality of convolutions which slope in proceeding outwardly to the larger diameter convolutions thereof forming an annular assembly, and a vertically disposed outlet header connected to each tube at the outer periphery, said annular assembly having an open central area,
 - means for drawing air over the outside of said tubes,
 - means for dispensing a coolant liquid over the outside of said tubes,
 - pan means beneath said annular assembly to receive said coolant liquid,

e. means for supporting each of said tubes in spaced apart relationship, and



f. means for varying the slope of said tubes depending on the nature of said fluid to be supplied to said exchanger.

5,088,551

HEAT EXCHANGER FOR COOLING HOT REACTING GAS

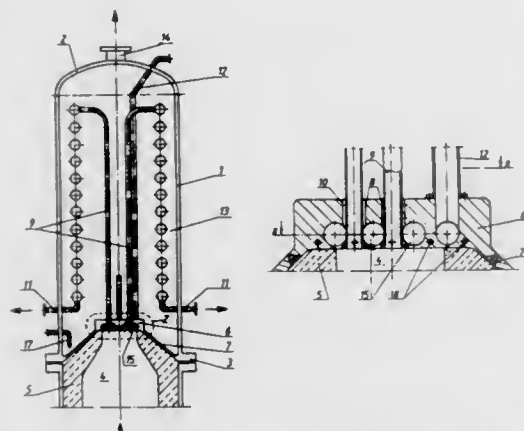
Peter Brücher, Wolfgang Kehr, and Dieter Bormann, all of Berlin, Fed. Rep. of Germany, assignors to Deutsche Babcock-Borsig AG, Berlin, Fed. Rep. of Germany
Filed Jan. 9, 1991, Ser. No. 639,027

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000527

Int. Cl.⁵ F28F 9/02

U.S. Cl. 165—134.1

8 Claims



1. A heat exchanger for cooling hot reaction gas with a coolant, comprising: a gas supply chamber; a jacket around said heat exchanger and having a diameter; a tube sheet with a first side and a second side separating said jacket from said gas supply chamber; a plurality of gas-conveying pipes with a central portion and extending loosely through said tube sheet second side and leaving annular gaps between said gas-conveying pipes and said tube sheet second side; said gas-conveying pipes being connected tightly to said tube sheet on said first side, gas entering said pipes from said supply chamber at said first side; at least one pipe line for supplying coolant to said second side of said tube sheet, said second side facing opposite said first side; said tube sheet having a diameter smaller than the diameter of said jacket; a cone tapering inwardly in

direction of the central portion of said gas-conveying pipes and connecting said tube sheet to a lower edge of said jacket; a source of coolant supply; said tube sheet having cooling channels with at least one open end and communicating with said source of coolant supply.

5,088,552

METHOD OF CONSTRUCTING A HEAT EXCHANGER AND A HEAT EXCHANGER CONSTRUCTED BY USING THAT METHOD

Pentti Raunio, Riihimäki, Finland, assignor to Racert Oy, Riihimäki, Finland

PCT No. PCT/FI88/00111, § 371 Date Dec. 20, 1989, § 102(e) Date Dec. 20, 1989, PCT Pub. No. WO89/00671, PCT Pub. Date Jan. 26, 1989

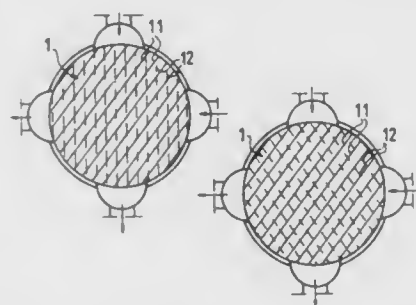
PCT Filed Jul. 7, 1988, Ser. No. 438,449

Claims priority, application Finland, Jul. 13, 1987, 873085

Int. Cl.⁵ F28F 3/08

U.S. Cl. 165—166

8 Claims



1. A method of constructing a heat exchanger having essentially similar regularly corrugated thermal transmission plates, said transmission plates having corrugations therein, and grooves between said corrugations extending in one direction, in which method the plates are piled to cover each other, and spaces between the plates are from edges of the plates connected with inlet and outlet conduits for flowing mediums participating in thermal transmission, such that through every second of said spaces between the plates is passed a flow of heat giving medium, and through every alternate of said spaces between the plates is passed a flow of heat receiving medium, characterized in that the thermal transmission plates are piled such that the grooves in different plates are disposed in a selected angle with each other, said angle defining pressure losses of the flowing mediums as well as a thermal transmission coefficient, for which purpose there is used in the method plates selected from a group consisting of essentially circular thermal transmission plates and regular polygonal thermal transmission plates with at least five sides in which the direction of the grooves is such that the grooves in said plates cross selectively at least in two different angles with respect to each other, and the heat exchanger is constructed of said thermal transmission plates such that said angle between said grooves in different of said plates may be selected from the range of 0°-90°.

5,088,553

LATERAL CUTTER DEVICE

Trent H. Ralston, Harwood, Md.; Kenneth R. Guthrie, Orlando, Fla., and James C. Veatch, Annapolis, Md., assignors to TRB Specialty Rehabilitation, Inc.

Division of Ser. No. 470,056, Jan. 25, 1990. This application

Dec. 19, 1990, Ser. No. 630,313

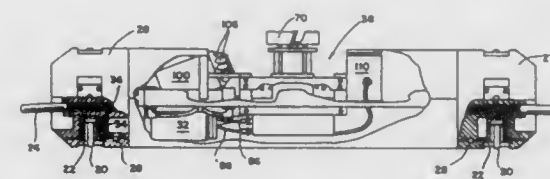
Int. Cl.⁵ E03F 3/06; E21B 97/09

U.S. Cl. 166—55.7

5 Claims

1. A device for cutting lateral holes in a pipe liner, from the inside thereof, comprising a body movable within the pipe,

a rotary cutter including a motor and a head, driven by said motor, for both boring and enlarging holes in the tube, means for supporting the cutter within said body, said means allowing three-dimensional translatory movement of the cutter with respect to said body,



means for moving the cutter in any of said three directions with respect to said body, whereby holes of various sizes and shapes may be cut in the tube, and means for turning the body about its own axis, within the pipe, to align the cutter with a desired opening orientation.

5,088,554

SINTERED METAL SAND SCREEN

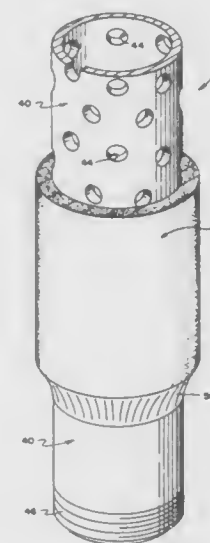
Bryant A. Arterbury, and James E. Spangler, both of Houston, Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed Oct. 22, 1990, Ser. No. 601,271

Int. Cl.⁵ B01D 39/20; E21B 43/08

U.S. Cl. 166—228

19 Claims



6. A well screen for separating unconsolidated material out of inflowing well fluid in water, oil, gas and recovery wells comprising a tubular, porous body of sintered powdered metal, said tubular well screen body having an external surface which has been smoothed by electropolishing.

5,088,555

CONSOLIDATION AGENT AND METHOD

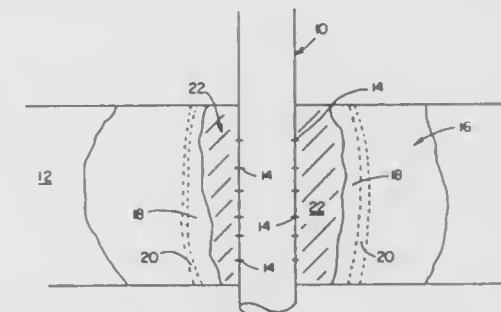
Paul Shu, Cranbury, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 3, 1990, Ser. No. 622,586

Int. Cl.⁵ E21B 33/138

U.S. Cl. 166—292

10 Claims



1. A sand consolidating method for an unconsolidated or loosely consolidated formation comprising:

- perforating a cased borehole at an interval expected to produce fines or sand when producing hydrocarbonaceous fluids from said interval;
- injecting an aqueous solution of an alkali metal silicate into said interval through perforations contained in the borehole which solution is of a strength sufficient to react with an alcoholic solution of calcium salt to form a permeability retention cement; and
- injecting thereafter a solvent containing a calcium salt into said interval via the perforations in an amount sufficient to react with the alkali metal silicate so as to form a calcium silicate cement with permeability retention characteristics whereupon the interval is consolidated in a manner sufficient to prevent formation sand from being produced from the formation during the production of hydrocarbonaceous fluids, which solvent is selected from a member of the group consisting of methanol, ethanol, higher alcohols, ketones, tetrahydrofuran, and dimethyl sulfoxide.

5,088,556

SUBSEA WELL GUIDE BASE RUNNING TOOL

David E. Short, Houston, and William A. Valka, Spring, both of Tex., assignors to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 561,542, Aug. 1, 1990. This application Nov. 14, 1990, Ser. No. 613,594

Int. Cl.⁵ E21B 41/04

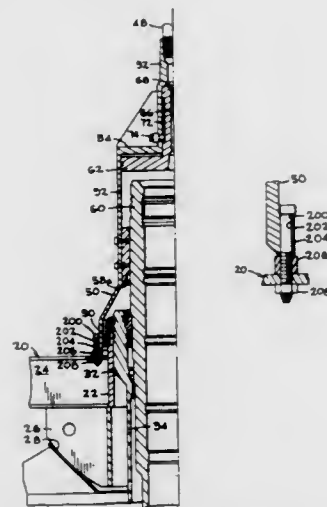
U.S. Cl. 166—339

8 Claims

1. A running tool for a subsea well guide base, said tool comprising

- a generally bell-shaped housing with means for integral attachment to a pipe string, said housing including a circumferential flange with a plurality of generally parallel axial bores;
- means for releasably attaching said housing to a subsea well guide base, said releasably attaching means including (i) corresponding generally parallel bores in said guide base, (ii) rod-like elements extending through the bores in said housing and into said corresponding bores in said guide base, and (iii) means to secure said rod-like elements to said guide base and to release said elements from said base upon

exertion solely of a predetermined non-rotational lifting force on said elements; and



c) means to lift the housing with respect to the guide base to disengage said housing from said base.

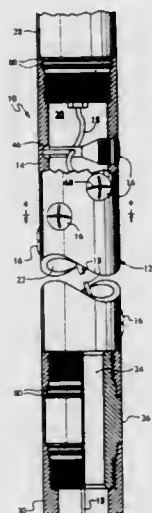
5,088,557

DOWNHOLE PRESSURE ATTENUATION APPARATUS
Thomas D. Ricles, Kingwood, and John A. Barton, Houston, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 15, 1990, Ser. No. 494,096
Int. Cl.⁵ E21B 43/117

U.S. Cl. 166—297

22 Claims



19. A process for preventing damage to tool strings and other downhole equipment in a well caused by pressures produced during detonation of one or more downhole explosive devices, comprising the steps of:

adding to a tool string at least one pressure attenuating apparatus for attenuating the peak pressure wave and quasi-static pressure pulse produced by said explosive devices, said pressure attenuating apparatus including an initially closed relief vent including tubing means supporting a plurality of charge port assemblies each including an explosive filled shaped charge and a prestressed disc, said shaped charges interconnected by a detonating cord, the amount of explosive in each shaped charge being sufficient to rupture its associated disc without damaging surrounding tubular bodies in the well, and a vent cham-

ber defined by said tubing means and providing a liquid free volume, and opening said relief vent substantially contemporaneously with downhole explosive device detonation by detonating the shaped charges to rupture said discs of said charge port assemblies.

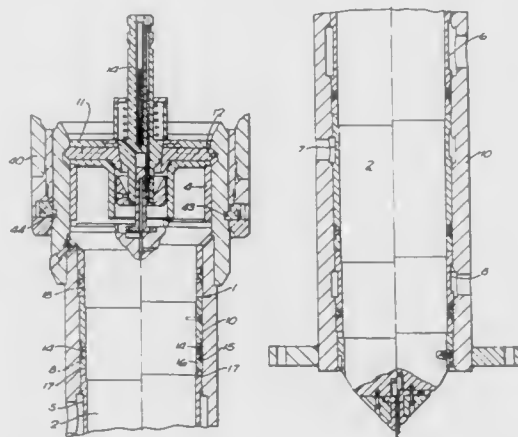
5,088,558

UNDERSEA PACKAGE AND INSTALLATION SYSTEM
Frank Mohn, 108 Coombe Lane, London, England SW20 0AY
PCT No. PCT/GB90/00292, § 371 Date Nov. 28, 1990, § 102(e)
Date Nov. 28, 1990, PCT Pub. No. WO90/10139, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 23, 1990, Ser. No. 598,738
Claims priority, application United Kingdom, Feb. 24, 1989, 8904295

Int. Cl.⁵ E21B 43/01

U.S. Cl. 166—339

18 Claims



4. Apparatus comprising a subsea station and an operational package for retrievable installation at said subsea station, comprising:

a receptacle at said subsea station adapted to receive said operational package therein,
co-operable connection means on said operational package and said receptacle, said co-operable connection means being adapted to establish at least one of fluid and electrical communication between said operational package and said receptacle on installation of said operational package within said receptacle,

a handling tool,
means suspending said package from said handling tool,
co-operating releasable connector means on said handling tool and said receptacle, and
hydraulically actuatable operating means located at the upper end of said operational package, said operating means being actuatable to effect movement of said operational package inwardly of said receptacle after connection of said connector means.

5,088,559

METHOD AND APPARATUS FOR RUNNING WIRELINE AND REELED TUBING INTO A WELLBORE AND STUFFING BOX USED IN CONNECTION THEREWITH
William D. Taliaferro, 408 Shockley, Desoto, Tex. 75115
Filed Nov. 28, 1990, Ser. No. 620,876
Int. Cl.⁵ E21B 19/08, 33/02

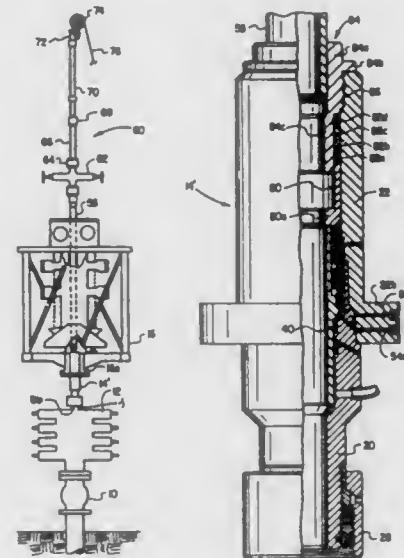
U.S. Cl. 166—379

16 Claims

9. A method for converting apparatus that includes an injector and a stuffing box which are normally adapted for inserting and withdrawing reel tubing from a wellbore to an apparatus for inserting and withdrawing wireline from said wellbore, said method comprising the steps of inserting an adapter tube

through said injector, connecting the lower end of said adapter tube to said stuffing box, connecting the upper end of said adapter tube to a lubricating assembly for said wireline, and converting said stuffing box to accommodate said wireline.

13. A stuffing box comprising tubular housing means, an adapter sleeve having a stepped main body portion and a reduced diameter portion, said reduced diameter portion ex-



tending downwardly from said main body portion into the bore of said housing means to define an annular sealing chamber, seal means disposed in said chamber and engaging for its entire length the outer surface of said reduced diameter portion and the inner surface of said housing means, and means for compressing said seal means to seal against the passage of fluid between said adapter sleeve and said housing means.

5,088,560

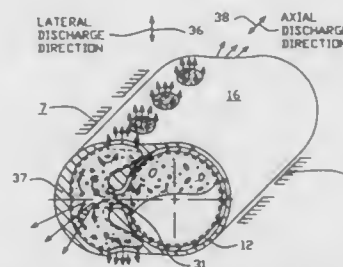
ZERO FORCE FIRE EXTINGUISHER

Omar M. Fawal, Antioch, Calif., assignor to Syston Donner Corporation, Concord, Calif.

Filed Nov. 1, 1990, Ser. No. 607,661
Int. Cl.⁵ A62C 35/08, 3/08

U.S. Cl. 169—28

8 Claims



1. A linear fire extinguisher, for use attached to the airframe of an aircraft and other similar applications where a linear distribution of a fire extinguishing agent, is accomplished along a long linear distance, consisting of a high strength tubular container having an axis along which it is elongated, said container comprising means for containing a highly pressurized fire extinguishant, said extinguisher having a means for releasing said extinguishant which comprises means for explosively cutting along a line, substantially parallel to said axis and extending the length of the container, wherein such release of said extinguishant and resultant outflow causes a reaction force, R1, from said airframe; said extinguisher comprising: means for providing an opposite and substantially equal force, R2, to said force R1 relative to said airframe including deflector means mounted to said airframe adjacent

said cutting line for redirecting said outflow of extinguishant into a pair of opposed paths lying in a plane substantially perpendicular to the forces R1 and R2, and for producing forces which substantially cancel each other.

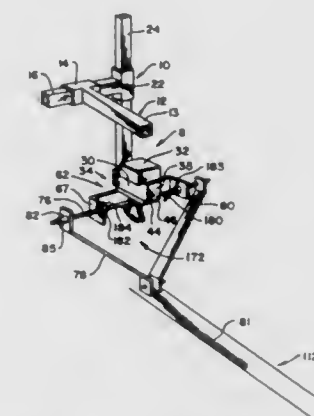
5,088,561

SENSING APPARATUS FOR A GUIDANCE SYSTEM
Larry F. Jurgens, Hampton, Iowa, assignor to Sukup Manufacturing Company, Sheffield, Iowa

Filed Nov. 2, 1990, Ser. No. 608,252
Int. Cl.⁵ A01B 69/00

U.S. Cl. 172—5

19 Claims



18. In a guidance system for a ground traversing implement comprising a position sensor mechanism which includes sensor means for mounting in a fixed position on said implement, an element for tracking ground reference indicia and which has a portion for contacting the ground, means responsive to the lateral deviation in position of said tracking element relative to said sensor means for generating a correction signal, the improvement wherein said tracking element is a chain which is attached directly to said sensor means and is of uniform construction throughout its length from said attachment to said sensor means to and throughout the portion which contacts the ground.

5,088,562

HAND AERATOR

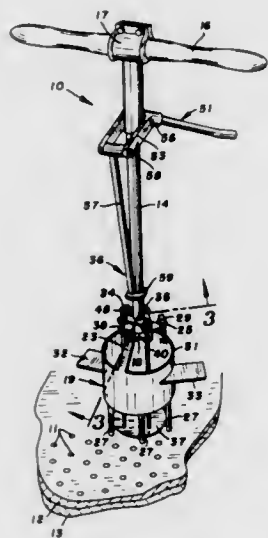
Robert L. Shields, P.O. Box 164, Miltona, Minn. 56354
Filed Dec. 3, 1990, Ser. No. 621,338
Int. Cl.⁵ A01B 45/02

U.S. Cl. 172—22

23 Claims

19. An apparatus for making holes in soil comprising: a first member having an upper end and a lower end, a second member secured to the lower end of the first member, first means including a plurality of tubular members secured to the second member and extended downwardly from the second member for making holes in the soil, said tubular members having open upper and lower ends whereby soil moves through the tubular members when they are inserted into the soil, a foot located below said second member, second means movably mounting the foot on the first member for movement relative to said second member, and third means mounted on the first member operable to move the second means movably mounting the foot on the first member thereby moving said foot whereby

when the first means is in the soil the second means mounted on the first member can be moved to push the foot onto the soil



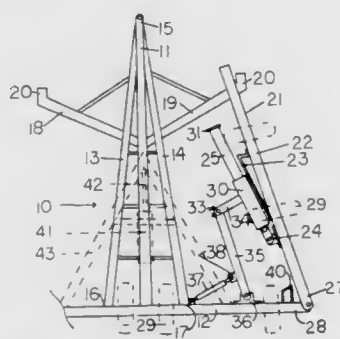
and extract the tubular members from the soil thereby making holes in the soil.

5,088,563 HYDRAULIC FOLDING SYSTEM FOR FARM IMPLEMENTS

John M. Shidler, R.R. 3, Box 390, Lawrenceville, Ill. 62439
Filed Aug. 17, 1990, Ser. No. 569,402
Int. Cl.⁵ A01B 73/02

U.S. Cl. 172—456

1 Claim



1. An improved folding system for large agricultural implements adapted to be towed by a towing tractor, said implement having a main frame section and a pair of wing sections disposed laterally outboard on each side of the main frame section, said folding system having a main hydraulic cylinder assembly connected to the main frame section to raise the main frame and the wing sections from a horizontal operating position to a vertical position, and the reverse, with the wing sections unfolded, said folding system for each wing section comprising:

- an elongated link member pivotally connected at its outer end to a foldable wing section of said implement;
- a tubular member slidably mounted on the link member;
- a jointed connecting arm connected at its outer end to the tubular member, and pivotally connected at its inner end to the main frame section;
- a push-off arm mounted on the wing section which rests against the elongated link member and tubular member when said implement is in the folded position to facilitate the initial outward movement of the wing section when unfolding is commenced;
- an auxiliary hydraulic cylinder assembly connected at its

outer end to the jointed connecting arm intermediate its ends, said auxiliary hydraulic cylinder assembly being connected at its inner end to the main frame, whereby operation of the auxiliary hydraulic cylinder assembly causes the wing section to fold or unfold towards and away from the main frame section when the main frame and the wing sections are disposed in the vertical position; a stop member mounted on the main frame adjacent the inner end of the jointed connecting arm to limit the outward pivoting of the connecting arm to prevent excessive strain on the auxiliary hydraulic cylinder assembly when folding of the wing sections is initiated, and during operation of the agricultural implement over irregular terrain; and

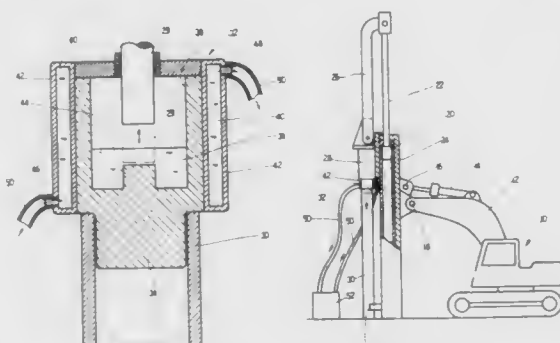
a towing member centrally attached to the front of the main frame section of the agricultural implement, said towing member having a rest stand on which the wing sections come to rest in the folded position, whereby the complete folding and unfolding operation may be controlled by the operator of the towing tractor without leaving the operator's seat.

5,088,564 METHOD OF AND APPARATUS FOR DRIVING PILES

Yoshiaki Kobayashi, Toyama, Japan, assignor to Kobayashi Construction Co., Ltd., Toyama, Japan
Filed May 3, 1991, Ser. No. 695,277
Claims priority, application Japan, Jun. 2, 1990, 2-145165
Int. Cl.⁵ E02D 7/00

U.S. Cl. 173—1

20 Claims



1. A method of driving a member into the ground by hammering a head of the member, which comprises the steps of: providing a hammer for driving the head of the driven member; providing a vibrator for providing an impact force to the hammer; providing between the hammer and the driven member an adapter for transmitting a hammering force of the hammer to the driven member; providing the adapter with an oil accommodation chamber; providing the oil accommodation chamber with a head portion to be hammered by the hammer; filling the oil accommodation chamber with oil to a level above the head portion; and causing striking of the head portion with said hammer while cooling the neighborhood of the adapter; thereby effecting a driving of the driven member with the hammer.

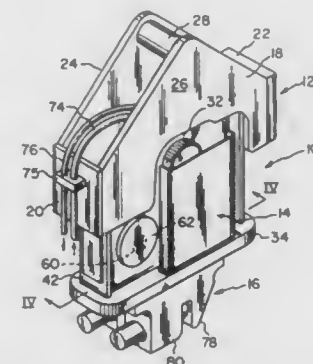
5,088,565 VIBRATORY PILE DRIVER

Kingsley S. Evarts, Cheswick, Pa., assignor to J & M Hydraulic Systems, Inc., Pittsburgh, Pa.

Filed Mar. 23, 1990, Ser. No. 498,098
Int. Cl.⁵ E02D 7/18

U.S. Cl. 173—49

10 Claims



1. A vibratory pile driver having means for clamping onto a pile or similar structure comprising:
a hydraulic gear motor having a case and two oppositely rotatable shafts, each shaft having an outboard end extending from the case;
a pair of semicircular weights aligned in the same plane, each weight being rotatably secured to a weight shaft in parallel to the motor shafts, each weight shaft having an outboard end;
connecting means for driving the weights from the motor shafts, said connecting means including:
drive means secured to the outboard end of each motor shaft and driven means secured to the outboard end of each weight shaft, the drive means and driven means being aligned with each other; and
means for positively connecting the drive means and driven means
whereby the weights are rotatably driven in synchronism by the hydraulic gear motor to provide vibratory forces in a linear direction.

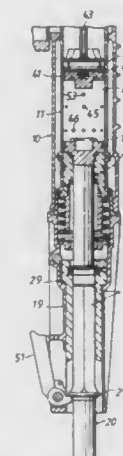
5,088,566 HAND HELD HAMMER MACHINE

Klas R. L. Gustafsson, Kalmar, and Ulf J. Lagne, Saltsjöbaden, both of Sweden, assignors to Berema Aktiebolag, Solna, Sweden

Filed Oct. 26, 1990, Ser. No. 604,765
Claims priority, application Sweden, Oct. 28, 1989, 8903620
Int. Cl.⁵ B25D 9/04

U.S. Cl. 173—116

10 Claims



1. A hand held hammer machine comprising a housing; a

cylinder in said housing; spring means in said housing at a forward end of said cylinder in alignment therewith and compressively supported on a frontal abutment in said housing; a limit stop in said housing; a tool and tool sleeve assembly axially movable in said housing relative to said cylinder at said forward end of said cylinder between a first position in which said tool and sleeve assembly further compresses said spring means away from said frontal abutment in response to axial movement of said tool and sleeve assembly towards said cylinder, and a second position in which said limit stop in said housing limits said movement of said tool and sleeve assembly towards said cylinder; a drive piston reciprocally movable in said cylinder at rear end of said cylinder; a hammer piston reciprocally movable in said cylinder between said drive piston and said tool and sleeve assembly; said hammer piston being driven by said drive piston through a working chamber defined in said cylinder between said drive piston and said hammer piston; portion means defined in a wall of said cylinder swept by said hammer piston during reciprocal movement of said hammer and drive pistons for providing fluid communication between ambient air and said working chamber so as to alternately reduce pressure in said working chamber to cause said hammer piston away from said tool, and to increase pressure to provide a gas cushion in said working chamber for driving said hammer piston to impact on said tool during movement of said drive piston towards said tool; said first and second positions of said tool and sleeve assembly being selected to define a range of movement of said hammer piston such that said hammer piston sweeps past and uncovers said portion means upon said impact of said hammer piston against said tool.

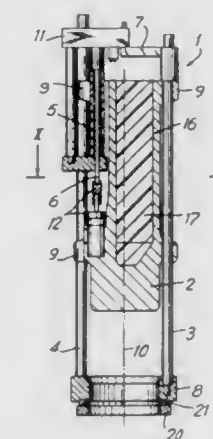
5,088,567 RAM DEVICE WITH ECCENTRIC DRIVE

Hans Schnell; Hans Kühn, both of Hamburg, and Jochen Rüsen, Quickborn-Heide, all of Fed. Rep. of Germany, assignors to Menck GmbH, Ellerau, Fed. Rep. of Germany
PCT No. PCT/DE89/00166, § 371 Date Dec. 15, 1989, § 102(e)
Date Dec. 15, 1989, PCT Pub. No. WO89/08747, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 15, 1989, Ser. No. 445,698
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808708; Apr. 28, 1988, 3814317
Int. Cl.⁵ B23B 45/16

U.S. Cl. 173—122

10 Claims



1. A ram device, comprising at least two guides; a striking mass movable on said two guides along a movement path defined by a longitudinal axis of said ram device; and a fluid cylinder for moving said striking mass along the movement path, said fluid cylinder having a longitudinal axis extending parallel to and spaced from the longitudinal axis of said ram device and defining therewith a plane symmetry of said ram

device, said at least two guides having axes extending parallel to and outside of the plane of symmetry of said ram device on respective opposite sides of the plane of symmetry and symmetrically thereto, the longitudinal axis of said fluid cylinder being located inside an angle formed by two planes passing through a respective longitudinal axis of a respective one of said at least two guides, and intersecting the plane of symmetry of said ram device; and a third guide having a longitudinal axis located in the plane of symmetry of said ram device, said striking mass having three end regions to be guided thereat, said striking mass being arranged inside an imaginary prism formed by three planes passing through said longitudinal axes of said three guides.

5,088,568

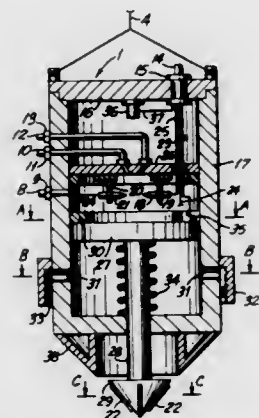
HYDRO-MECHANICAL DEVICE FOR UNDERGROUND DRILLING

Leonid Simuni, Apt. 6A, Far Rockaway, N.Y. 11691
Filed Jun. 18, 1990, Ser. No. 539,884

Int. Cl.⁵ E21B 7/14

U.S. Cl. 175-14

4 Claims



1. A hydro-mechanical device for underground drilling for use with a drilling rig comprising:
a container defining a combustion chamber therein;
inlet means associated with said container for introducing a fuel, an oxidizer and a liquid respectively into said combustion chamber;
outlet means associated with said container for discharging combustion products from said combustion chamber;
a piston slidably mounted in said container for movement between an upper position above said outlet means and a lower position below said outlet means and allowing the discharge of said combustion products from said combustion chamber through said outlet means; drilling means outside of said container and connected to said piston for movement therewith;
means operatively connected to said container for providing remote information regarding the formation being drilled;
a generator of instantaneous electro-impulses, said generator having means for accumulation of electro-energy; and
electrodes separately secured to said container and connected to said generator of instantaneous electro-impulses to produce electro-discharge between said electrodes.

5,088,569 CHECK-WEIGHING MACHINE FOR WEIGHING MOVING OBJECTS

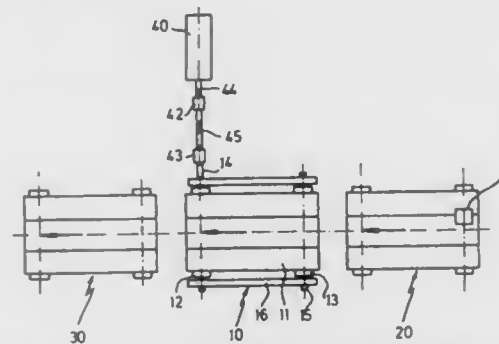
Tommaso M. Checucci, Parma, Italy, assignor to Tecno Europa Elettromeccanica S.R.L., Parma, Italy

Filed Jan. 3, 1991, Ser. No. 637,149

Claims priority, application Italy, Jan. 12, 1990, 46803 A/90
Int. Cl.⁵ G01G 19/00

U.S. Cl. 177-145

6 Claims



1. A simplified check-weighing machine comprising:
a first belt conveyor (10) provided with a shaft supported drive roller (12) and having a support structure (16) which acts on a balance (4) arranged to weigh objects (2) in transit on the first conveyor (10);
at least one other belt conveyor (20, 30) positioned in line with the first conveyor (10), said at least one other belt conveyor having a support structure (26, 36) which does not act on the balance (4);
a geared motor unit (40) rotatably communicating with the drive roller (12) of the first conveyor (10), said geared motor unit (40) being spaced apart from the first conveyor (10) and axially supported by a shaft (44) in a fixed position substantially coaxial to an axis of the drive roller (12), by a fixed structure (5) which does not act on the balance (4); and
mechanical members arranged to axially transmit motion from a shaft (44) of the geared motor unit (40) to a shaft (14) of the drive roller (12), said members allowing relative movement between the axis of the drive shaft (44) and the axis of the shaft (14) of said drive roller (12).

5,088,570

STEERABLE REAR DUAL AXLE SYSTEM FOR LARGE TRUCKS

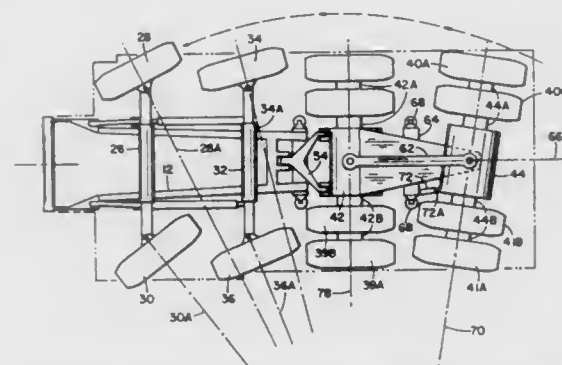
Frederick W. Loeber, Tulsa, Okla., assignor to Terex Corporation, Green Bay, Wis.

Filed Feb. 4, 1991, Ser. No. 650,442

Int. Cl.⁵ B62D 61/10; B60G 5/02

U.S. Cl. 180-24.01

8 Claims



1. A steerable rear dual axle system for large trucks, comprising:

a frame with a longitudinal axis in the direction of normal travel, the frame having a front end and a rear end, steerable front wheel means secured to said frame;
a leading rear axle having a bottom, an axis and opposed ends;
a trailing rear axle having a bottom, an axis and opposed ends;
a draft arm having one end pivotally affixed to said leading rear axle and having another end pivotally affixed to said frame in the direction toward said frame front end;
a salient having a forward end affixed to said leading rear axle and a rearward end pivotally attached at a point of pivotation to said trailing rear axle;
means providing spring support between said salient and said frame to thereby transfer weight from said frame to said leading and trailing rear axles;
means retaining said axis of said leading rear axle in a vertical plane perpendicular to said frame longitudinal axis; and
means of steerably pivoting said trailing rear axle about a vertical axis through said point of pivotation of said salient rearward end.

5,088,571

MODULAR STRUCTURAL INSTRUMENT PANEL CARRIER

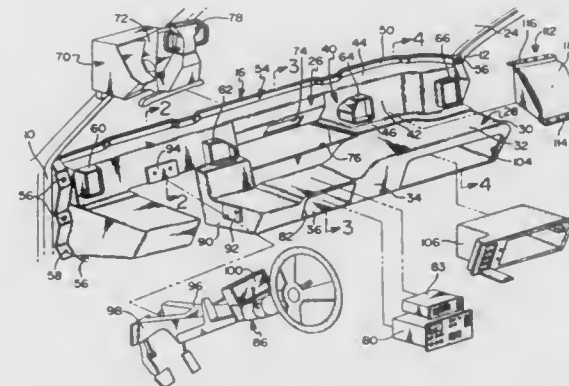
Donald L. Burry, Royal Oak, and Leonard J. Pilato, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1990, Ser. No. 628,031

Int. Cl.⁵ B60K 37/00; B62D 25/14

U.S. Cl. 180-90

1 Claim



1. An instrument panel carrier for mounting instrument panel components in a motor vehicle body having a bulkhead extending between pillars, comprising:
a box shaped beam extending transversely across the vehicle and defined by first and second panels of fiber reinforced plastic connected together, said first panel being generally L-shaped and including a horizontal extending wall and a vertical extending wall, said second panel being an inverted generally L-shape and including a horizontal wall and a generally vertical wall, said panels having flanged edges bonded together to define within the box shaped beam an air flow duct extending fully across the vehicle, said box shaped beam adapted for attachment to the bulkhead and the pillars of the vehicle so that the beam is an integral member of the vehicle body;
said beam having a vertical extending wall including a plurality of air flow openings therein spaced transversely along the beam to communicate air flow across the vehicle;
and one of said panels extending rearward and generally horizontally from the beam to define a shelf structure adapted to cooperate with the vertical extending wall in defining a shelf structure to receive and mount the instrument panel components.

5,088,572

FORWARD CONTROL BUS CHASSIS WITH LOW ENGINE MOUNTING ASSEMBLY

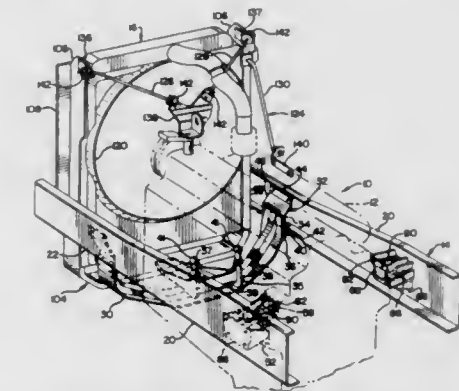
Ronald C. Schroeder, and Kjell Pedersen, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Mar. 28, 1991, Ser. No. 676,642

Int. Cl.⁵ B60K 5/12

U.S. Cl. 180-300

8 Claims



1. In combination with a forward control vehicle chassis, said chassis including fore-and-aft extending parallelly spaced frame rails, an engine, and a radiator, apparatus for mounting said engine and said radiator to said chassis comprising:
left and right rear engine mounts connected respectively between a flywheel housing of said engine and an adjacent frame rail, said rear engine mounts incorporating vibration isolating members therein;
a front cross member secured to and extending between frame rails, said cross member having a U-shaped intermediate portion extending beneath said frame rails;
a front engine mounting bracket having a rear end portion secured to a front portion of said engine and an intermediate portion secured at a single point through a vibration isolating means to said front cross member, said front engine mounting bracket extending forwardly beyond said cross member to a forward end portion having radiator mounting means thereat;
a U-shaped radiator frame having a horizontal lower portion secured to said radiator mounting means of said forward end portion of said front engine mounting bracket and a pair of upstanding leg portions extending to distal ends;
a plurality of stabilizing rod means extending respectively from each distal end of said leg portions to bracket means therefor secured to an upper portion of said engine; and
a radiator secured within said radiator frame and operatively connected to said engine.

5,088,573

FOUR-WHEEL STEERING ARRANGEMENT FOR MOTOR VEHICLES

Patrick Moll, Leonberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Continuation of Ser. No. 317,911, Mar. 1, 1989, abandoned. This application May 9, 1991, Ser. No. 697,626

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807274

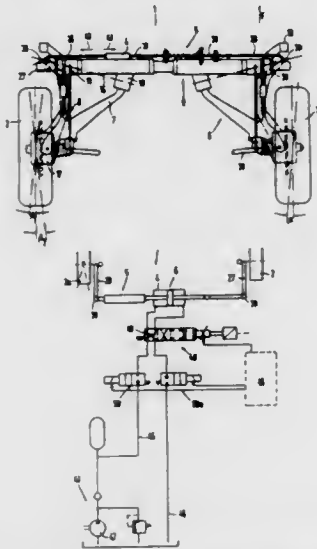
Int. Cl.⁵ B62D 6/00

U.S. Cl. 180-140

6 Claims

1. A steering system for a motor vehicle having:
a first steering device for front wheels of the motor vehicle operatively arranged to be actuated by a steering wheel; and
a second steering device for rear wheels of the motor vehicle held by wheel suspension links, comprising (a) an integral semi-trailing arm device for each of the rear wheels linked

to a body side of the motor vehicle by bearings to define a swivel axis of the semi-trailing arm device and configured to have two bearing arms rigidly secured with respect to each other and operatively arranged to hold wheel carriers of the rear wheels so that the rear wheels are pivotable about a vertical axis of rotation, (b) support joints arranged in planes one above the other and above and below a wheel axis of the rear wheels and operatively associated with the bearing arms for permitting pivoting of the rear wheels about the vertical axis, (c) a hydraulic control cylinder, (d) a restoring device operatively connected with the hydraulic control cylinder along a common axis, (e) bearing levers integral with the wheel carrier,



ers, (f) tie rods operatively connected between, on one hand, a respective one of the hydraulic control cylinder and the restoring device, and, on the other hand, to the bearing levers via a deflecting joint arranged in a swivel axis of the semi-trailing arm device, wherein the tie rods share the common axis of the hydraulic control cylinder and the restoring device, (g) a cross tube secured at the body of the motor vehicle for supporting the semi-trailing arm device via the bearings defining the swivel axis, and (h) an electronic control unit operatively connected with the hydraulic control cylinder for steering of the rear wheels in response to driving conditions fed to the electronic control unit independently of the front wheels.

5,088,574

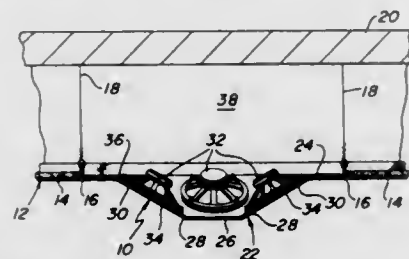
CEILING SPEAKER SYSTEM

Emery Kertesz, III, Fatima La., Box 374, Ottsville, Pa. 18942
Filed Apr. 16, 1990, Ser. No. 509,663

Int. Cl.⁵ H05K 5/00

U.S. Cl. 181-150

22 Claims



1. A speaker system for mounting on a ceiling, said system comprising mounting means of pyramidal shape for mounting said system on said ceiling and an array of acoustic driver means for broadcasting sound, said mounting means having a

plurality of mounting surfaces connected together to form said pyramidal shape, said mounting means also including a flange that is secured against said ceiling, said mounting means being connected to at least one of mounting surfaces, each of said surfaces mounting a respective one of said acoustic driver means thereon at a first predetermined acute angle to the vertical axis and at a second predetermined angle to each immediately adjacent acoustic driver means, said angles of mounting of said array of acoustic drivers producing a flat frequency response hemispherically into the space below the ceiling with good sound dispersion therein radiating said sound outwardly and downwardly in multiple directions, and with minimal phase cancellation and diffraction effects among said acoustic driver means.

5,088,575

ACOUSTIC SYSTEM WITH TRANSDUCER AND VENTURI

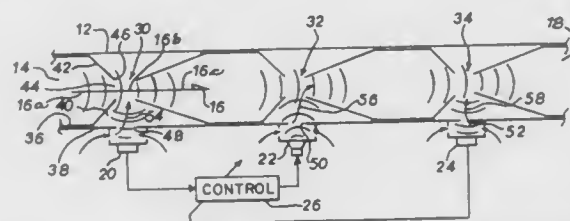
Larry J. Eriksson, Madison, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Sep. 13, 1990, Ser. No. 582,514

Int. Cl.⁵ F01N 1/00

U.S. Cl. 181-206

31 Claims



1. An acoustic system comprising a chamber having an input for receiving an input acoustic wave and guiding said input acoustic wave along a flowpath to a chamber output, an acoustic transducer interacting with said acoustic wave in said chamber, a venturi in said chamber drawing air into said flowpath to flow to said chamber output, wherein at least a portion of said flowpath flows through said venturi, and wherein said venturi directs said flowpath away from said transducer and also prevents backflow from said flowpath to said transducer to prevent air in said flowpath from traveling to said transducer.

5,088,576

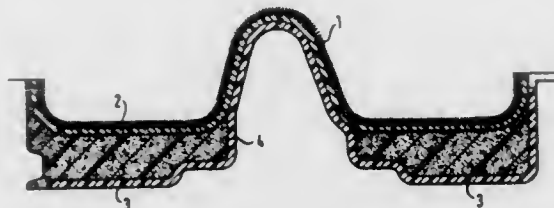
MASS AND SPRING SYSTEMS FOR SOUNDPROOFING
Hans-Hermann Potthoff, Heidelberg-Kirchheim; Ingolf Scheffler, Wiesloch; Klaus Ruch, Wiesloch/Balertal, and Rainer Joesel, Karlsruhe, all of Fed. Rep. of Germany, assignors to E.A.P. Akustik GmbH, Heidelberg, Fed. Rep. of Germany
Filed Jul. 12, 1989, Ser. No. 378,896

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824171

Int. Cl.⁵ E04B 1/82, 2/02

U.S. Cl. 181-290

14 Claims



1. Mass and spring system for soundproofing, particularly in vehicles, comprising a bending-soft heavy plastic layer as the mass and a soft layer as the spring and which is applied to (a

sound radiating surface or wall,) characterized in that the soft layer serving as a spring is a gel of 10 to 50% by weight of an organic polymer or silicone polymer and 50 to 90% by weight of a plasticizer compatible therewith, which at room temperature has a modulus of elasticity $E' \leq 5 \times 10^5$ Pa and an internal loss factor $d \geq 0.5$.

5,088,577

SCAFFOLDING TRANSFER APPARATUS

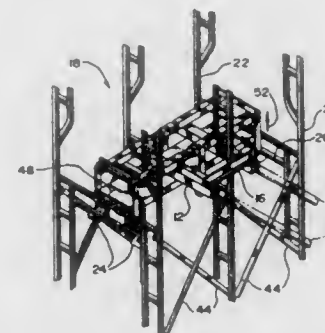
Gerald W. Pierce, 12228 Partridge St. N.W., Coon Rapids, Minn. 55433

Filed Aug. 27, 1990, Ser. No. 572,870

Int. Cl.⁵ E04G 1/00

U.S. Cl. 182-63

7 Claims



1. An apparatus for moving at least partially assembled scaffolding comprising:

- (a) substantially parallel sleeves adapted to receive the tines of a forklift, the sleeves further including;
- (b) support members, said support members being telescoping and affixed to and projecting substantially perpendicular from said sleeves, the support members including;
- (c) downward projecting hook means, the hook means being attached to the end of the support members opposite their point of attachment to said sleeves; and
- (d) an interconnecting support member, the interconnecting member being substantially parallel to and non-colinear with the support members and rigidly attached to said sleeves adjacent the forklift side of the apparatus so as to maintain the sleeves a distance apart corresponding to the separation of the tines of a forklift.

5,088,578

MOVABLE SUPPORT MECHANISM FOR CONSTRUCTION OF ELEVATOR SHAFTS AND THE LIKE

H. Gordon Gates, Lakewood, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 364,229, Jun. 12, 1989, Pat. No. 4,974,700. This application Sep. 21, 1990, Ser. No. 586,310

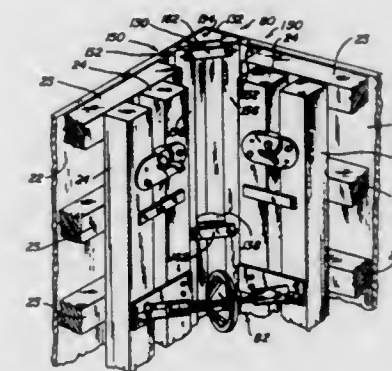
Int. Cl.⁵ E04G 3/00

U.S. Cl. 182-128

11 Claims

1. A retractable corner mechanism for the inside corner of a concrete form, said mechanism comprising:
an elongated angle corner member having first and second perpendicular members whose outer faces form the inside corner of intersecting concrete walls and having form attaching means connected to the inner faces thereof;
a concrete form having an end attached to each of said form attaching means;
means for sliding said form attaching means outwardly and inwardly relative to said corner members; and

means for extending and retracting said forms to cause said corner members to be extended and retracted in response



to sliding of said form attaching means relative to said corner members.

5,088,579

OIL PICKUP STRUCTURE OF A COMPRESSOR

Ki M. Kim, Suwon, and Gyu D. Kim, Pusan, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

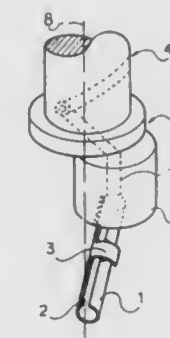
Filed Jul. 10, 1990, Ser. No. 550,512

Claims priority, application Rep. of Korea, Sep. 26, 1989, 89-14010

Int. Cl.⁵ F01M 1/00

U.S. Cl. 184-6.16

19 Claims



1. An oil pickup structure of a compressor provided with a lubricating device including a tube for transporting a lubricant therethrough, having a first end for connection to a crankshaft and a second end for immersion into a lubricant, the central axis of the tube being positioned at an angle with respect to the rotational axis of the crankshaft, the improvement comprising:
a first opening in the wall of said tube between said first and second ends;
a second opening extending from said first end to said first opening;
a third opening extending from said second end to said first opening; and
a vane projecting from said tube and extending over said first opening;
wherein said tube has a uniform interior passage throughout its length.

5,088,580

HYDRAULICALLY ACTING DAMPING ELEMENT
Manfred Grothe, München, and Volker Härtel, Germering, both of Fed. Rep. of Germany, assignors to Metzeler GmbH, Munich, Fed. Rep. of Germany

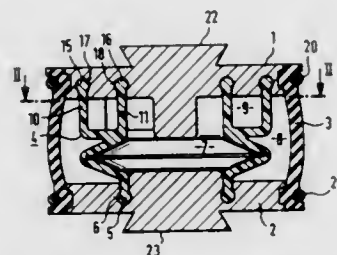
Filed May 10, 1990, Ser. No. 521,592

Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915311

Int. Cl.³ F16F 9/08; B60G 13/08

U.S. Cl. 188—298

22 Claims



1. Hydraulically acting damping element, comprising two rigid end walls and a rubber-elastic circumferential load bearing wall defining a main chamber between said rigid end walls, a compensate chamber being disposed coaxially within said main chamber and being defined by an elastic separating wall rigidly joined to said end walls separating said main chamber from said compensation chamber, said separating wall being in the form of a pressure-stable bellows having ends and a circumference, and an overflow conduit fluidically connecting said chambers and being formed on one of said ends of said bellows and forming a part of said bellows.

5,088,581

ONE-WAY CLUTCH

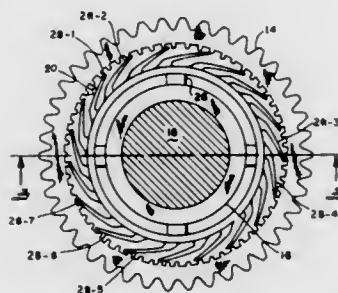
John P. Duve, Brookfield, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 30, 1991, Ser. No. 647,947

Int. Cl.³ F16D 41/18, 41/00

U.S. Cl. 192—46

9 Claims



1. A one-way ratcheting clutch comprising:
(a) a primary annular driving member having a first plurality of rigid teeth disposed circumferentially thereabout and extending radially inwardly with substantially parallel sides, said outer annular member having other driving surfaces thereon for power transmission therewith;
(b) an inner annular member disposed concentrically with said outer member and a second plurality of resilient fingers relatively thin with respect to the length thereof with a generally straight configuration disposed circumferentially thereabout and extending in a generally outward direction and inclined substantially to the radial direction, with the free ends thereof engaging said plurality of rigid teeth, wherein one of said plurality of rigid teeth and resilient fingers has an even integer number and the other has an odd integer number, wherein, at any rotational position of said outer member with respect to said inner member, at least one, and less than one half, of said fingers are in a free, substantially undeflected state and the remainder

thereof are resiliently deflected by contact with said first plurality of teeth, thereby effecting one-way generally fine-resolution and relatively soft feel ratcheting action upon said relative rotation in one direction and torque transmission in the opposite direction.

5,088,582

ENGINE BRAKE CONTROLLING APPARATUS USING A LOCK-UP SYSTEM

Yoshitami Saitou, Nobuyuki Isono, and Nobuyasu Suzumura, all of Aichi, Japan, assignors to Aisin Seiki K.K., Aichi, Japan
Continuation of Ser. No. 498,067, Mar. 23, 1990, abandoned.

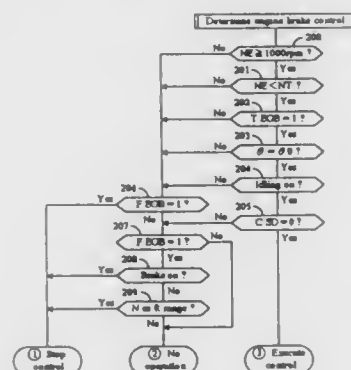
This application Aug. 27, 1991, Ser. No. 754,256

Claims priority, application Japan, Mar. 25, 1989, 1-073189; Mar. 25, 1989, 1-073190

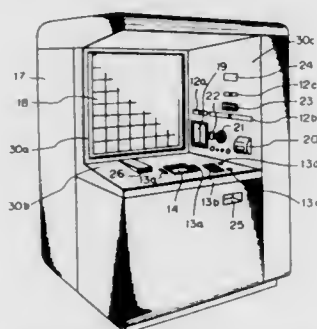
Int. Cl.³ B60K 41/28; F16H 61/14

U.S. Cl. 192—0.055

1 Claim



storage shelves for storing articles to be rented;
 an input operation unit having input keys operable by a patron for entering rental information;
 an information storage means for storing information concerning said articles stored on said storage shelves including storage positions of said articles, and for storing information concerning said patron;
 a rental information storage unit for storing information concerning rented articles;
 a replacement schedule information storage unit for storing information concerning new articles which are scheduled to replace specified articles stored in said storage shelves



including dates in which said new articles are scheduled to replace said specified articles in said storage shelves;
 a display unit for displaying guidance instructions for prompting said patron in the operation of said input operation unit, and for displaying said information concerning said new articles when an article selected by said patron is not located in said storage shelves and is not included in said information concerning said rented articles;
 a subscription information storage unit for storing information concerning articles to be rented in which advance subscriptions have been made, and for storing rental information concerning an advance subscription which has been inputted by said patron in said input operation unit.

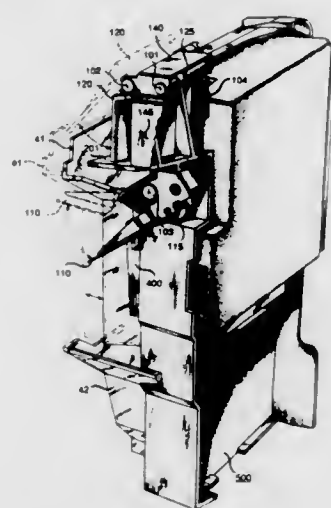
5,088,587

CLEAR-OUT APPARATUS FOR A COIN CHUTE

Robert R. Goodrich, and James D. York, both of Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
 Filed Apr. 30, 1990, Ser. No. 516,932
 Int. Cl.⁵ G07F 1/04

U.S. Cl. 194—345

10 Claims



7. In a coin-operated machine, a coin chute comprising a coin entrance, a first section adjacent to the coin entrance for trapping unwanted material therein, a second section adjacent

to the first section for examining coins for authenticity and denomination, and a return chute for returning certain coins and unwanted material; a guideway extends through the first and second sections for guiding coins between the coin entrance and the return chute, within the first section the guideway is substantially wider than in the second section and includes movable inner and outer sidewalls on opposite sides thereof, said sidewalls being connected, via mechanical linkage, to an actuator for pushing trapped material into the return chute; whereby unwanted material is readily trapped in the enlarged portion of the guideway and positively ejected by the pair of moving sidewalls.

5,088,588

BAKERY UTENSIL STORAGE SYSTEM

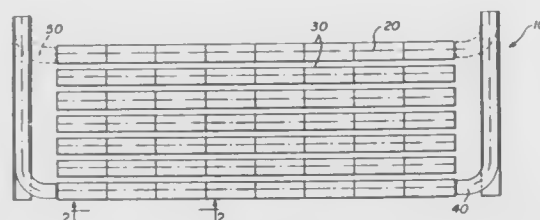
Bill E. Davis, Irving; Eugene W. Meyers, Allen, and Paul Podsiad, Plano, all of Tex., assignors to Stewart Systems, Inc., Plano, Tex.

Filed Sep. 7, 1989, Ser. No. 403,930

Int. Cl.⁵ B65G 1/06

U.S. Cl. 198—347.3

13 Claims



1. In an automated commercial baking system, an apparatus for automatically receiving, storing and discharging individual baking utensils without need for a stacker or unstacker, the individual utensils moving through the baking system over a continuous conveyor, comprising:

at least one table top conveyor for receiving a horizontally disposed, longitudinally spaced array comprising a predetermined number of individual baking utensils from the continuous conveyor and for discharging said array of utensils onto the continuous conveyor;
 means for selectively directing the array of utensils from the continuous conveyor to the table top conveyor;
 an elevator associated with the table top conveyor for simultaneously lifting the entire array of utensils from the table top conveyor and thereafter lowering the entire array of utensils onto the table top conveyor;
 means for selectively actuating the elevator to lift and remove the array of utensils from the table top conveyor and thereafter lowering the array of utensils to engage with the table top conveyor for return to the baking system; and
 means for receiving the array of utensils from the table top conveyor for discharge onto the continuous conveyor for return to the baking system.

5,088,589

CONVEYOR SYSTEM, CONVEYOR OR BUFFER AND DISTRIBUTION SYSTEM, AND PROCESS FOR TRANSFORMING A GOODS FLOW

Johannes G. C. Geerts, Westerduinweg 32, 2116 VH Bentveld, Netherlands

Continuation of Ser. No. 506,559, Apr. 9, 1990, abandoned, which is a continuation of Ser. No. 300,906, Jan. 24, 1989, abandoned. This application Aug. 21, 1990, Ser. No. 569,732
 Claims priority, application Netherlands, Feb. 4, 1988, 8800265

Int. Cl.⁵ B65G 47/26

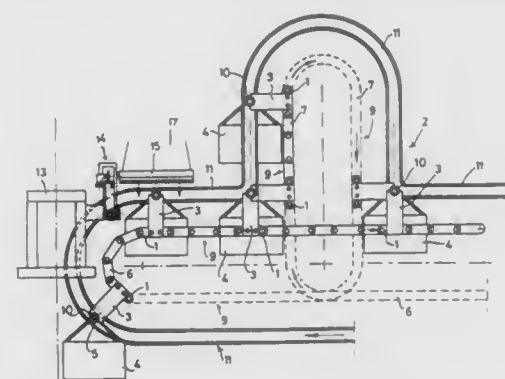
U.S. Cl. 198—457

6 Claims

1. A conveyor system for receiving, transporting, buffering and discharging loads, said system comprising a plurality of

cooperating endless conveyors, each conveyor provided with carrying members for carrying containers, said containers including suspension members for coupling to said carrying members, said conveyors with containers traversing a closed route, said closed route including a series of subsequent route portions running at angles to each other, with each of said conveyors traversing one of said subsequent route portions and wherein each route portion meets another route portion at a transition location,

said conveyor system including a rail forming said route portions, each suspension member of each said container including an element being supported and guided in said rail while said container traverses said route,



each carrying member of each conveyor being detachably coupled to a suspension member of a container, and each suspension member of a container providing positive simultaneous contact with a carrying member of two of said conveyors when said container reaches a transition location between route portions of said two conveyors, whereby a container traversing said route is detached from one conveyor toward the end of one route portion and taken over by a conveyor traversing a subsequent route portion as said container moves from said one route portion to said subsequent route portion while traversing said route.

5,088,590

SYSTEM FOR CHANGING THE SPEED OF CONVEYED SHEETS WHILE HOLDING REGISTER

Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Continuation-in-part of Ser. No. 502,175, Mar. 30, 1990, Pat. No. 4,987,991. This application Jan. 7, 1991, Ser. No. 638,121
 The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.⁵ A65G 47/31

U.S. Cl. 198—461

6 Claims



1. A system for changing the speed and spacing of discrete items being conveyed in register on a first conveyor operating at a first speed, said system comprising:

a speed changing belt operating at a constant linear speed, said belt operating around an arcuate surface positioned to present a cylindrical portion of said belt operating at an initial peripheral speed equal to said first speed in tangent contact with the items;

flexible holding means aligned with the tangent contact surface of said cylindrical portion and positioned to form therewith a nip for receiving items from said first conveyor; and,

a speed change lobe on said belt defining a region of continu-

ously changing radius as said belt operates around said arcuate surface, whereby the outer surface of the belt including said lobe at the tangent contact surface operates at a continuously changing speed from said first speed to a second speed.

5,088,591

TUBE TRANSPORT ASSEMBLY FOR TRANSPORTING YARN PACKAGES ON A TEXTILE MACHINE INCLUDING A VERTICAL TRANSPORT COMPONENT

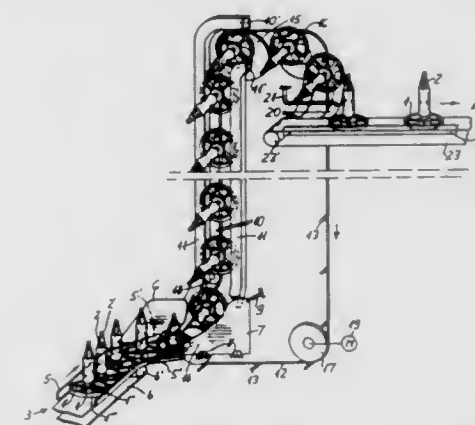
Hans Grecksch, and Dieter Spinnen, both of Moenchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co., Moenchengladbach, Fed. Rep. of Germany
 Filed May 13, 1991, Ser. No. 699,452

Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015173

Int. Cl.⁵ B65G 29/00

U.S. Cl. 198—465.1

20 Claims



1. An assembly for transporting tubes in association with a textile machine, the tubes being of the type on which yarn is wound, comprising:

a plurality of tube support members, each tube support member for individually supporting a tube thereon in a fixed disposition relative to the tube support member and each tube support member having an engagement portion;
 a vertical transport component for transporting tube support members along a transport path which includes at least one portion extending between vertically spaced locations, the vertical transport component including a carrier member conveying means operable to travel in an endless loop between a feed location at which tube support members are transferred to the carrier member conveying means and a discharge location at which tube support members being transported by the carrier member conveying means are transferred therefrom, the endless loop in which the carrier member conveying means travels defining a travel plane and the carrier member conveying means traveling upwardly at the feed location and traveling downwardly at the discharge location, and a plurality of carrier members secured to the carrier member conveying means at spacings therealong, each carrier member for individually supporting a tube support member during transport of the tube support member by the carrier member conveying means, and each carrier member having a re-orientation movement support portion for cooperating with the engagement portion of a tube support member to support the tube support member during a re-orienting movement thereof in which the tube support member moves relative to the carrier member from its feed position orientation to a travel position orientation in which the tube support member is oriented at a greater angle relative to the horizontal;

means for supporting tube support members at the feed location in position for sequential individual engagement

of each tube support member by a respective one of the carrier members;
means for guiding each tube support member in the lateral direction during upward movement of the tube support member at the feed location in correspondence with the engagement of the tube support member by a respective carrier member, the guiding means effecting complete seating of the engaged tube support member on the respective carrier member; and
means for effecting release of tube support members from the downwardly moving carrier members at the discharge location.

5,088,592

METHOD FOR CONVEYING AND DEPOSITING ADHESIVE, FLEXIBLE MATERIAL AND A DEVICE FOR PERFORMING THE METHOD

Göran Palmertz, Askim, Sweden, assignor to Institutet för Verkstads-teknisk, Sweden

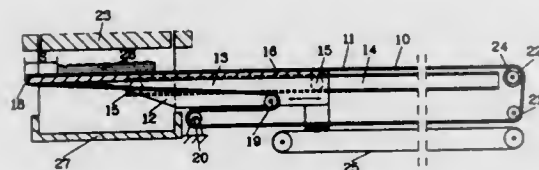
PCT No. PCT/SE88/00656, § 371 Date Jun. 1, 1990, § 102(e) Date Jan. 1, 1990, PCT Pub. No. WO89/05223, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 1, 1988, Ser. No. 476,476

Claims priority, application Sweden, Dec. 3, 1987, 8704401 Int. Cl.⁵ B65G 47/34

U.S. Cl. 198—465.3

14 Claims



1. A method for conveying an adhesive, flexible material to a deposition station and depositing such material therein by means of a device comprising a flexible base in a right-side-up position which essentially maintains its shape in the deposition station, the base being supported by a displaceable supporting device, displaceable to and from the deposition station, the supporting device having a guiding member with a front end normally facing the deposition station, the front end having a radius of curvature (r) which imparts a direction change to the base, which method comprises:

- positioning the adhesive flexible material on the base at one end thereof and at a distance from the front end of the supporting device corresponding to a predetermined acceleration distance of the base;
- blocking an end of the base opposite to said one end to prevent displacement of the base;
- moving the supporting device in the direction away from the deposition station, such that the base is urged to make an abrupt direction change over the front end of the guiding member, the supporting device being moved at a speed such that the centripetal acceleration of the base around the radius (r) of the guiding member is at least 1 g, to thereby disengage the base from the material causing the material to be deposited by means of free fall.

5,088,593

CONVEYOR BELT WITH BUILT-IN MAGNETIC-MOTOR LINEAR DRIVE

Heinz-Ulrich Lewin, Brinksitzerweg 14, D-4600 Dortmund, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 607,167

Claims priority, application Fed. Rep. of Germany, Nov. 1, 1989, 3936302

Int. Cl.⁵ B65G 35/00

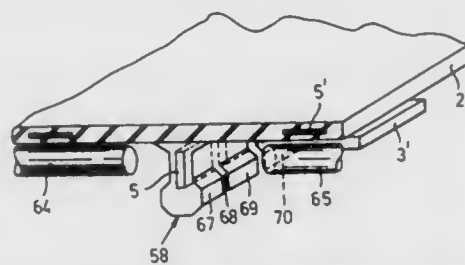
U.S. Cl. 198—619

4 Claims

1. In a conveyor having an endless belt spanned over upstream and downstream rollers and having upper and lower stretches, the belt having an outer surface adapted to carry a

load in the upper stretch and a lower surface turned inward, the improvement comprising:

permanent magnets fixed to the inner surface of the belt; and a linear-motor stator underneath the upper stretch and juxtaposed with the permanent magnets thereof, the stator and



magnets together forming a linear motor for advancing the upper stretch downstream, the lower surface being formed relative to a normal longitudinal travel direction of the belt with a longitudinally extending ridge in which the magnets are imbedded.

5,088,594

CHAIN AND FLIGHT CONVEYOR

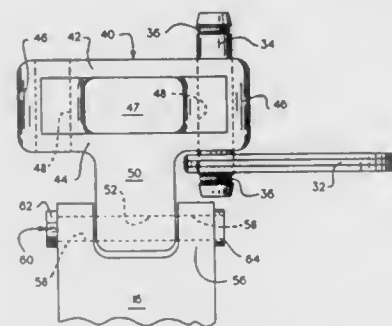
Wayne L. Edmondson, Franklin, Pa., assignor to Joy Technologies Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 367,831, Jun. 16, 1989, Pat. No. 5,000,310. This application Dec. 18, 1990, Ser. No. 629,735

Int. Cl.⁵ B65G 19/24

U.S. Cl. 198—731

3 Claims



1. A chain and flight conveyor adapted to be driven by a toothed sprocket, comprising:

- a. a pair of spaced, parallel driving chains, each of said driving chains comprising:
 - 1) first block links having at least one end surface which may be drivingly engaged by the teeth of said sprocket and having internal apertures defining drive surfaces which may be drivingly engaged by the teeth of said sprocket;
 - 2) second links coupled to and interconnecting said first links; and
 - 3) a predetermined corresponding number of said first block links on each of said chains comprising flight attachment block links having extension members facing the opposite chain, said extension members having a bore therethrough in the direction parallel to said driving chains; and
- b. a plurality of conveying flights connected between said corresponding number of said flight attachment block links, said flights comprising a bar member having U-shaped open ended receptacles provided on the ends thereof which are adapted to receive one of said extension members and in which the ends of said U-shaped open ended receptacles on said flights extend inwardly toward one another so that the distance between the ends of each of said receptacles substantially corresponds to the width of the corresponding extension members, the ends of said bar member including apertures aligned with the bore in a

corresponding extension member to receive a fastener therethrough.

5,088,595

WATERPROOF RECIPROCATING CONVEYOR

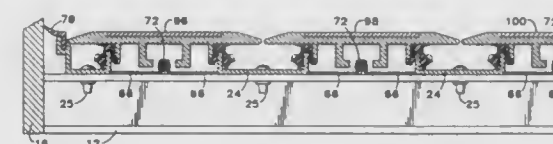
Olof A. Hallstrom, Jr., 1920 Hallstrom Rd., Tillamook, Oreg. 97141

Filed Dec. 17, 1990, Ser. No. 628,517

Int. Cl.⁵ B65G 25/04

U.S. Cl. 198—750

7 Claims



1. A slat-type reciprocating conveyor, comprising:

- a) an elongated frame,
- b) a plurality of elongated, imperforate, slat-mounting base members secured side-by-side across the frame,
- c) seal means interengaging the longitudinal sides of adjacent base members and forming a waterproof seal therebetween,
- d) a plurality of elongated load-supporting slats supported on the base members for longitudinal reciprocation, and
- e) drive means supported by the frame and engaging the slats for reciprocating said slats.

5,088,596

MOTORIZED CONVEYOR ROLLER

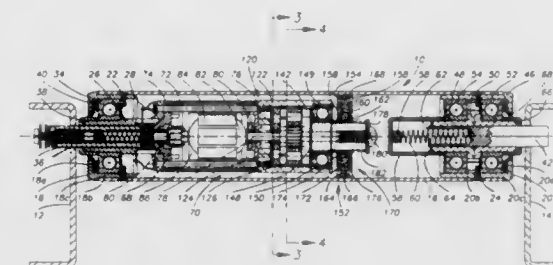
Charles Agnoff, Wilmington, N.C., assignor to Interroll Holding A. G., Switzerland

Filed Dec. 17, 1990, Ser. No. 628,377

Int. Cl.⁵ B65G 13/06

U.S. Cl. 198—788

21 Claims



1. A motorized conveyor roller comprising: a roller tube; means for rotatably mounting the roller tube in a conveyor frame; a motor mounted inside the roller tube, said motor being non-rotatable relative to the conveyor frame; a gear reducer mounted inside the roller tube and operatively connected to the motor, said gear reducer including an output shaft; a drive member having an outer periphery frictionally engaged with the inner wall of the roller tube for rotating the roller tube, said driving member being driven by the gear reducer output shaft.

5,088,597

TRACTION WHEEL

Louis F. Counter, Philip M. Dindinger, both of Greendale, and Theodore F. Raske, Germantown, all of Wis., assignors to Rexnord Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 340,237, Apr. 19, 1989, abandoned. This application Mar. 20, 1991, Ser. No. 672,543

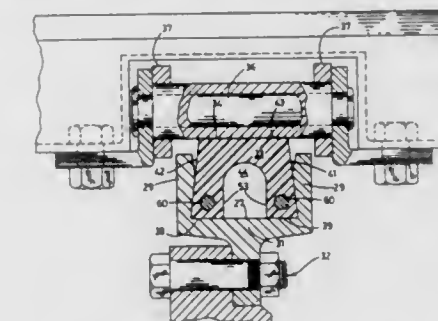
Int. Cl.⁵ B65G 23/04

U.S. Cl. 198—835

28 Claims

1. An impact damping device for a conveyor traction wheel assembly to support an elongated flexible drive member, the

traction wheel assembly including a periphery having a circumferential support surface, said impact damping device comprising an elongated generally elastomeric impact damping member having a base adapted to extend along at least a portion of the circumferential support surface, said impact damping member further including spaced apart sides, a radially outwardly facing surface adapted to define at least a por-



tion of a circumferential surface for supporting the elongated flexible drive member, and a hollow portion formed radially interiorly to said outwardly facing surface and extending radially outwardly from said base of said impact damping member, said impact damping member being adapted to extend in the circumferential direction defined by the circumferential support surface, said impact damping member being generally formed of molded polyurethane material.

5,088,598

PLASTIC-MODEL KIT

Yuji Iguchi, Kanagawa, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

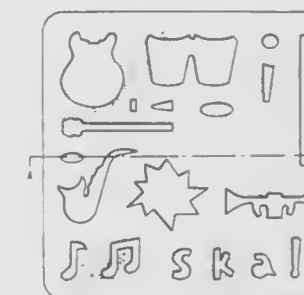
Filed Apr. 25, 1990, Ser. No. 514,470

Claims priority, application Japan, Apr. 25, 1989, 1-105084; May 1, 1989, 1-112440

Int. Cl.⁵ B65D 71/00; B29C 39/12

U.S. Cl. 206—223

16 Claims



wherein said individually shaped and solidified molded pieces are assembled to obtain the ornament or decoration.

5,088,599

JACKET FOR A COMPACT DISC

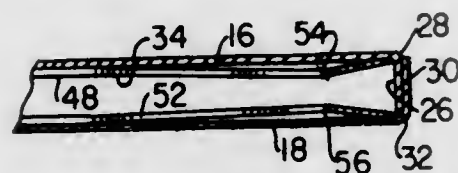
Steven Mahler, Bayside, N.Y., assignor to Shorewood Technologies, Inc., Wilmington, Del.

Filed Jun. 29, 1990, Ser. No. 548,225

Int. Cl.³ B65D 85/57

U.S. Cl. 206—313

37 Claims



1. A jacket for a compact disc carrier having length, width and thickness, comprising:

- a generally rectangular space defined by a first panel and a second panel, said first and second panels being spaced apart one from the other by a distance to accommodate said carrier thickness therebetween, a third panel and fourth panel, said third and fourth panels being spaced apart one from the other by a distance to accommodate said width of said carrier, said third and fourth panels being positioned between said first and second panels and maintaining said distance between said first and second panels, a carrier being slidable within said space in the direction of said jacket and carrier lengths and containable at least in part in said space,

engagement means for stopping lengthwise sliding motion of a carrier in at least one direction in said jacket at a predetermined position of said carrier relative to said jacket, a fifth generally rectangular panel closing said jacket at one end, the other end being open for sliding insertion therethrough of a carrier in said length direction into said jacket space,

wherein said engagement means is a first flap having ends and edges, one edge being hingedly connected to said first panel proximate said open jacket end, and said ends extending within said jacket space between said third and fourth panels, said first flap extending in the sliding direction of a carrier when said carrier is inserted into said space within said jacket, a portion of said first flap being further connected between its ends to said first panel, and at its ends proximate said third and fourth panels said first flap being spaced away from said first panel leaving a gap therebetween.

13. A jacket for a compact disc carrier having length, width and thickness, comprising:

- a generally rectangular space defined by a first panel and a second panel, said first and second panels being spaced apart one from the other by a distance to accommodate said carrier thickness therebetween, a third panel and fourth panel, said third and fourth panels being spaced apart one from the other by a distance to accommodate said width of said carrier, said third and fourth panels being positioned between said first and second panels and maintaining said distance between said first and second panels, a carrier being slidable within said space in the direction of said jacket and carrier lengths and containable at least in part in said space,

engagement means for stopping lengthwise sliding motion of a carrier in at least one direction in said jacket at a predetermined position of said carrier relative to said jacket, each said panel being generally rectangular in surface area, said first and second panels being generally parallel, said third and fourth panels being generally parallel, wherein said engagement means is a first flap having ends and edges, one edge being hingedly connected to said first

panel proximate said open jacket end, and said ends extending within said jacket space between said third and fourth, said first flap extending in the sliding direction of a carrier when said carrier is inserted into said space within said jacket, a portion of said first flap being further connected between its ends to said first panel, and at its ends proximate said third and fourth panels said first flap being spaced away from said first panel leaving a gap therebetween.

17. A carton for storage of a compact disc carrier having length, width and thickness, comprising:

- a jacket for containing said disc carrier therein, said jacket having one open end for sliding insertion and extraction therethrough of said carrier in said length direction;
- a dummy housing dimensioned to obstruct said jacket open end and prevent extraction therethrough of said carrier;
- means for joining said housing to said jacket with a single-use destructible connection, said open end being obstructed by said joined housing when said jacket and said dummy housing are connected, said connection producing an integral jacket/housing assembly, said connection when destroyed irreversibly releasing said jacket from said housing.

5,088,600

GOLF CLUB SHAFT PROTECTOR TUBE

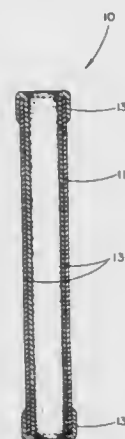
Fred H. Kopp, Jr., 7 Roxbury Rd., Westbury, N.Y. 11590

Filed Mar. 5, 1991, Ser. No. 664,662

Int. Cl.³ B65D 85/20

U.S. Cl. 206—315.2

3 Claims



1. A golf club shaft protecting device for use within a golf club bag; said device comprising:

- a hollow, elongate, cylindrical tube,
- said tube including open opposite distal ends structured and disposed to receive a handled end of a golf club therethrough such that a head portion of the golf club extends from one of the ends thereof,
- said tube being substantially rigid and elongate so as to protectively cover and encase the shaft and the handle of the golf club, thereby protecting it from shocks and impacts within the golf club bag,
- said tube further including a substantially soft material lining attached in covering, non-sliding relation to an interior surface thereof,
- said lining including protruding end portions which extend beyond said open opposite distal ends of said tube, and said protruding end portions of said lining being structured and disposed to be overlapped and secured in protective, covering relation over said opposite distal ends of said tube on an outer portion of said tubes, thereby allowing a plurality of said tubes to fit securely in substantially snug fitting, adjacent relation within the golf bag while preventing said lining from sliding into said tube.

5,088,601

CIRCUIT BOARD SHIPPING CARTON

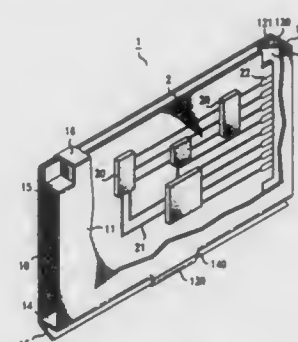
Roger L. Seefeldt, Oklahoma City, Okla., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 5, 1991, Ser. No. 740,220

Int. Cl.³ B65D 85/30, 73/02

U.S. Cl. 206—334

4 Claims



1. A carton having a pair of parallel side members separated by top and bottom members for receiving a circuit board wherein the carton comprises

- an open end at one end of the side, top and bottom member for receiving the circuit board and formed with a segment across the top and extending down the side members to have three sections having identical widths and with the other side section having a width less than the top and one side section width and formed with a crease line separating the other side section from an adjacent side member enabling rotation of the other side section thereabout so that the top section may be positioned parallel to the adjacent side member with the one side section across the open end to retain the circuit board within the carton; and
- a closed end opposite the open end with one side member formed with a center tab and the other side member formed with three panels opposite the center tab wherein a first panel is formed at right angle with respect to both side members with a middle panel inserted into the carton and positioned parallel and adjacent the one side member and wherein a third panel having a width greater than the other panels is formed at an acute angle with respect to the middle panel to extend into the space between the side members and wherein a center slot is formed in a perforated line separating the first panel from the middle panel to receive the center tab with the third panel positioned to engage and position a circuit board inserted into the carton and thereby prevent movement thereof.

5,088,602

BOOK-LIKE STORAGE CONTAINER FOR A VIDEOCASSETTE OR THE LIKE

Mark B. Heyderman, 4 Erie Ct., Miller Place, N.Y. 11764, and Melvyn M. Sloves, 18 Balmoral Dr., Chestnut Ridge, N.Y. 10977

Filed Feb. 7, 1991, Ser. No. 651,994

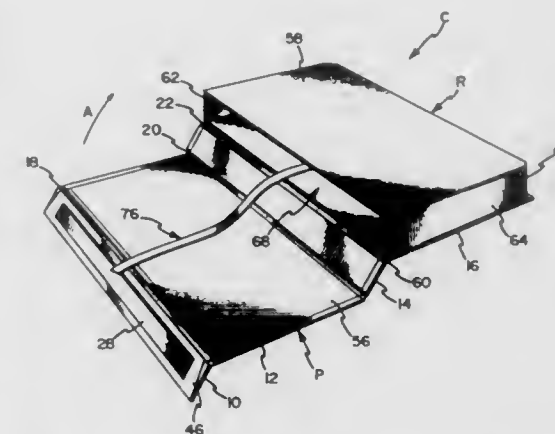
Int. Cl.³ B65D 85/672, 15/50

U.S. Cl. 206—387

14 Claims

- 1. A book-like storage container for articles, comprising:
 - (a) receptacle means for removably receiving an article therein;
 - (b) said receptacle means including top, bottom, left, right, and rear walls;
 - (c) each of said walls having surface dimensions;
 - (d) said receptacle means including a front opening;
 - (e) panel means including first, second and third hinges;
 - (f) said panel means including first, second and third panels;
 - (g) said first panel foldably connected to said bottom wall by said first hinge;

- (h) said second panel foldably connected to said first panel by said second hinge;
- (i) said third panel foldably connected to said second panel by said third hinge;
- (j) each of said first, second and third panels having a first open position and a second closed position;
- (k) each of said first, second and third panels including inside surface dimensions;
- (l) said inside surface dimension of said first panel being substantially equal to said front opening;
- (m) said inside surface dimension of said second panel being substantially equal to the surface dimension of said top wall;
- (n) said inside surface dimension of said third panel being substantially equal to the surface dimension of said rear wall;
- (o) each of said third panel and said rear wall having affixed thereto individual cooperating securement means;
- (p) means for removing the article from said receptacle means;
- (q) means for mounting said article removing means to said receptacle means;



- (r) said article removing means including a string member with first and second ends;
- (s) said mounting means including a reinforcement member with a generally U-shaped cut-out slot for guiding a portion of said string member;
- (t) said reinforcement member including first and second surfaces;
- (u) said top wall including first and second surfaces;
- (v) said reinforcement member mounted to said first surface of said top wall; and
- (w) said first end of said string member secured between said first surface of said top wall and said first surface of said reinforcement member and said second end remaining free such that said string member suspends freely in said receptacle means;
- (x) whereby when said first, second and third panels are folded about said first, second, and third hinges, respectively, for assuming said closed position, said first panel abuts and substantially closes said front opening, said second panel substantially overlies said top wall, and said third panel substantially overlies said rear wall so that said individual securement means thereof are releasably locked for thereby securing the article in said receptacle means.

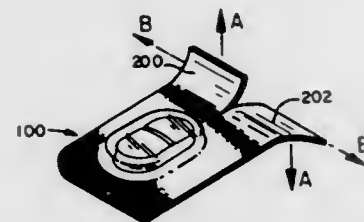
5,088,603

TEAR-OPENING CAPLET BLISTER FOIL PACKAGE
Jack H. Kirkpatrick, Haverford, Pa., assignor to Sharp Packaging, Conshohocken, Pa.

Continuation of Ser. No. 41,656, Apr. 21, 1987, abandoned, which is a continuation of Ser. No. 898,219, Aug. 20, 1986, abandoned, which is a continuation of Ser. No. 633,145, Jul. 23, 1984, abandoned. This application Jun. 26, 1990, Ser. No. 544,023

Int. Cl.⁵ B65D 83/04; A61J 1/03
U.S. Cl. 206—530

13 Claims



1. A combination of a chile-resistant blister-foil package and a medicament packaged therein, comprising:
(a) a base layer; and
a rigid substantially rectangular blister layer composed of low extensible film joined to said base layer, said blister layer having an oblong longitudinally oriented blister formed at one end thereof which contains said medicament and a tear slit directed at one end of the blister, said tear slit being disposed through the other end of said blister layer;
said slit and said blister defining tear tabs which allow the package to be torn open through the entire length of said blister, said base and blister layers being joined such the opening of the package requires tearing through the blister formed on the blister layer.

5,088,604

REVOLVING STORAGE FACILITY

Rolf Baur, deceased, late of Heubach-Lautern by Helga Baur, heir; Joerg Linser, Heubach-Lautern; Herbert Grau; Manfred Bareis, both of Schwaebisch Gmuend, and Wolfgang Bastek, Boebingen, all of Fed. Rep. of Germany, assignors to Grau GmbH & Co., Schwaebisch Gmuend, Fed. Rep. of Germany

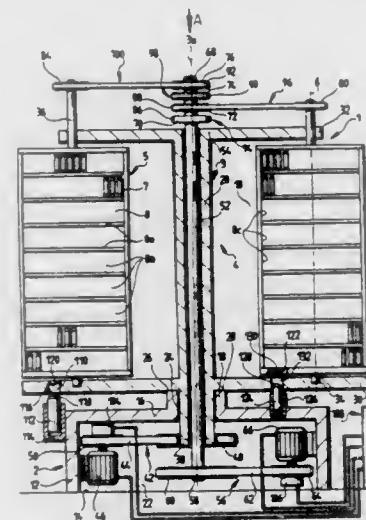
Continuation-in-part of Ser. No. 306,181, Feb. 6, 1989, abandoned, and Ser. No. 472,047, Dec. 28, 1989, abandoned. This application Dec. 28, 1989, Ser. No. 456,688
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844303; Sep. 23, 1989, 3931789; European Pat. Off., Dec. 11, 1989, 89122803.3

Int. Cl.⁵ A47F 3/08
U.S. Cl. 211—1.5

36 Claims

1. Revolving storage facility for data storage cassettes comprising:
a base;
a rotary unit including a supporting frame;
said supporting frame being rotatable about an axis of rotation relative to said base;
said rotary unit further including rotatable subframes mounted on said supporting frame for rotation about a subframe axis of rotation extending parallel to said axis of rotation;
said rotatable subframes being arranged on said supporting frame around said axis of rotation and forming intermediate zones between each other;
said rotatable subframes carrying shelf units with cassette compartments for said data storage cassettes at their outer periphery;
said rotary unit further including stationary shelf units with

cassette compartments for said data storage cassettes arranged at a peripheral area of said supporting frame and in



said intermediate zones formed between said rotatable subframes.

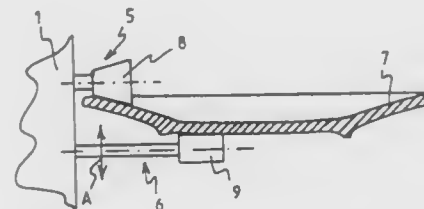
5,088,605

DEVICE FOR STORING DISH-TYPE CONTAINERS
Arnoldus T. B. M. Nales, Herpjeskamp 13, 7396 CA, Terwolde, Netherlands

Filed Nov. 15, 1990, Ser. No. 617,521
Claims priority, application Netherlands, Nov. 27, 1989, 8902919

Int. Cl.⁵ A47G 19/00
U.S. Cl. 211—41

9 Claims



1. Device for storing dish-type containers such as plates, dishes or serving trays containing a product, comprising a vertical column which has a base support at the bottom side thereof, said column having a plurality of supporting elements disposed at equal intervals above one another for the accommodation of the containers in horizontal position, said column being triangular or rectangular in cross section to define a plurality of sides thereon and said supporting elements placed on each side thereof at equal intervals above one another, each said supporting element comprises two pin-projections lying in line with each other in the horizontal direction, and a third pin-shaped projection which is longer than the other two projections, and lies centrally below the other two projections at a predetermined distance below the line connecting the other two projections to each other.

5,088,606

ELONGATE DISPLAY PRONG

Barry Boas, Hertfordshire, United Kingdom, assignor to Boas Investments Limited, Finchley, England

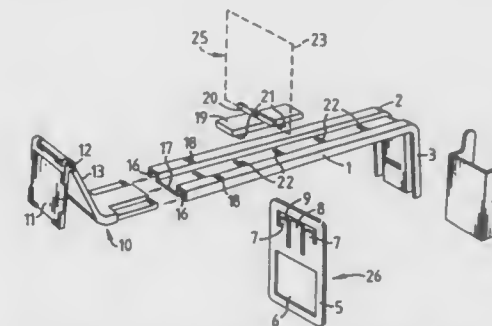
Filed Nov. 29, 1989, Ser. No. 435,473

Claims priority, application United Kingdom, Jun. 5, 1987, 8713196

U.S. Cl. 211—571

Int. Cl.⁵ A47F 7/00

12 Claims



1. A display prong comprising an elongate arm having a predetermined cross section for passing through a correspondingly sized aperture formed in packaging for an article, the arm being provided at one end with mounting means for mounting the prong to a display apparatus and the other end of the arm having restricting means for preventing accidental removal of the article from the prong, characterised in that the arm has interposed between said ends and forming an integral part thereof releasable attachment means whereby additional display prong device elements can be releasably mounted to the arm, and the restricting means is slidably detachable from the arm.

5,088,607

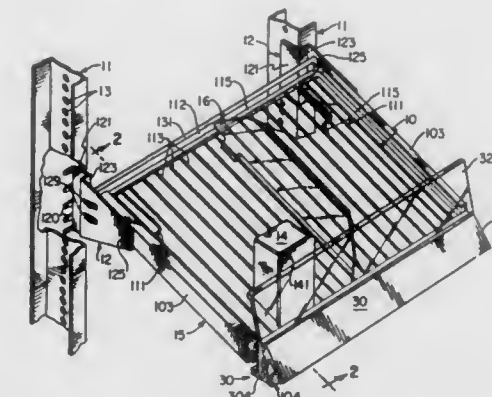
PULL-OUT TRAY ASSEMBLY FOR AN INTEGRATED MODULAR STORE FIXTURE SYSTEM

Chris Risafi, Aberdeen, N.J., and Fred Howard, New York, N.Y., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Mar. 12, 1990, Ser. No. 492,949

Int. Cl.⁵ A47F 7/00
U.S. Cl. 211—59.3

21 Claims



1. A tray assembly for displaying merchandise in a store fixture system comprising:
a tray support having a front panel and left and right side panels, said front panel having a front wall and a bottom wall;
a slidable tray having a plurality of rods extending towards said front panel, said tray being in slidable engagement with said side panels for sliding movement between forward and rearward positions;
pusher means for pressing merchandise placed on said rods

forwardly towards said front panel, said pusher means having a lower surface;
means for mounting said pusher means to effect slidable movement along at least one of said rods; and
means for restricting forward movement of said pusher means when said tray is in said forward position, said restricting means comprising a first tab depending from said lower surface of said pusher means for abutting said front wall of said front panel as said tray reaches said forward position so as to prevent further forward movement of said pusher means.

5,088,608

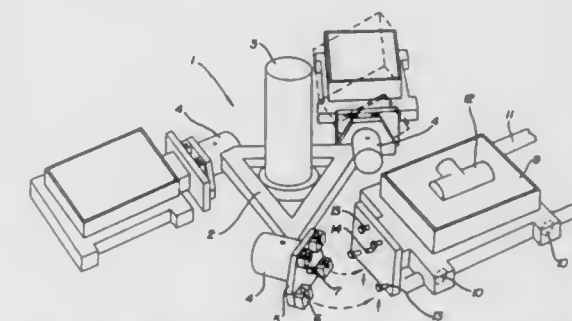
LOCKING AND HOLDING DEVICE, PRINCIPALLY FOR HOLDING AND HANDLING OF PATTERN PLATES, CORE MASKS, AND THE LIKE

Jens C. Grum-Schwensen, Frederikssund, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark
Filed Jun. 1, 1990, Ser. No. 531,708

Claims priority, application Denmark, Jun. 19, 1989, 3021/89
Int. Cl.⁵ A47F 5/00

U.S. Cl. 211—70.6

5 Claims



1. A locking and holding device, suitable for holding and handling a part, such as a pattern plate, core mask or the like, at molding machines in foundries, said device comprising:
a base plate having a plurality of parallel open grooves, a central, stationary bushing projecting through said base plate and having a projecting part with a recess comprising an upward facing opening, and
said part to be held having locking studs matched to, and adapted to be received by, said open grooves,
a central stud provided on said part to be held which is adapted to engage said recess in said stationary bushing, and
wherein said base plate is adapted to rotate on said stationary bushing between unlocked position wherein said open grooves face upwards to receive said part and a locked position wherein said open grooves are rotated to thereby secure said part.

5,088,609

APPARATUS FOR SUPPORTING WORKPIECES OF DIFFERENT SIZES AND CONFIGURATIONS
Oldrich Fryc, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 20, 1990, Ser. No. 482,431

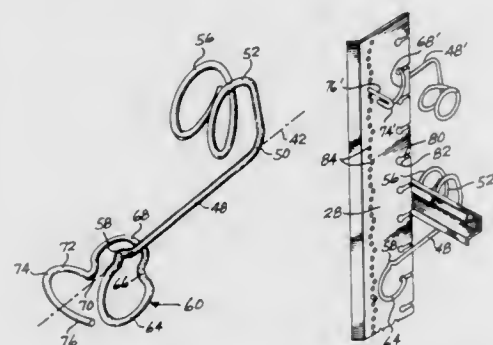
Int. Cl.⁵ A47F 5/08
U.S. Cl. 211—117

11 Claims

1. Apparatus for supporting a workpiece, the apparatus comprising:
a. a support member having a first side and a second side, the support member further including an edge surface which is formed by the joining of the first side and the second side; and
b. engaging means for engaging the workpiece so as to support the workpiece between the support member and

the engaging means in a manner that a force applied by the engaging means against the workpiece causes the workpiece to be supported between the support member and the engaging means, the engaging means including

- (1) an element for contacting the workpiece,
- (2) attaching means for attaching the contacting element to the support member so as to position the contacting



element at a selected distance from the support member and so as to hold the workpiece between the support member and the contacting element, the attaching means including a first grasping element and a second grasping element which are spaced apart in a manner to engage the support member therebetween at the first and second sides in an interference fit.

5,088,610

HANDLING MACHINE TO BE SUSPENDED FROM A LIFTING UNIT

André Garnier, Loudun, France, assignor to SIT (Société D'Innovations Techniques), Chatellerault, France

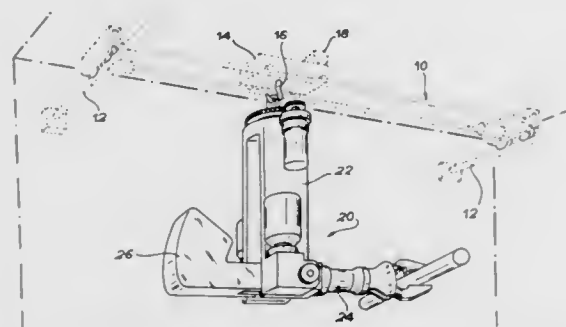
Filed Apr. 10, 1990, Ser. No. 507,395

Claims priority, application France, Apr. 13, 1989, 8904912

Int. Cl.⁵ B66C 23/76

U.S. Cl. 212—196

4 Claims



1. A handling machine for suspension from a horizontally movable lifting unit, comprising:

- a support having an upper section and a lower section, a member mounted on said upper section by which said support can be suspended from said lifting unit;
- a gripping arm including means pivotally attaching said arm to said lower section of said support, means for rotating said arm about a first horizontal axis, gripping pliers, means mounting said pliers on said arm for rotation around an actual axis of the arm perpendicular to said first horizontal axis, a first device to control the gripping action of the pliers and a second device to control rotation of the pliers around the actual axis of the arm;
- counterweight means for balancing the gripping arm, means for pivotally attaching said counterweight means to said support for rotation about said first horizontal axis;
- a first orientation control means to control the rotation of

the gripping arm with respect to the support about said first horizontal axis;

a second orientation control means to control the rotation of said counterweight means with respect to the support about said first horizontal axis;

a slanting detection means to detect a slanting of the support around a second horizontal axis parallel to said first horizontal axis and passing through said member, said slanting detection means including means to produce signals that represent the amount of slanting of said support, means for connecting each of said orientation control means to said slanting detection means to receive signals therefrom, said orientation control means including means responsive to said signal to annul the slanting of said support;

means for pivotally mounting said lower section of said support to said upper section for rotation about a vertical axis perpendicular to said first and second horizontal axes; and

third control means for rotating said lower section relative to said upper section about said vertical axis.

5,088,611

CONTAINER OVERCAP SEAL

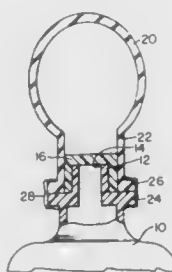
Philip R. Katz, Kinnelon, N.J., assignor to Cosrich Incorporated, Perth Amboy, N.J.

Filed Nov. 28, 1990, Ser. No. 618,988

Int. Cl.⁵ B65D 51/18

U.S. Cl. 215—230

6 Claims



1. A closure for a container comprising:

- a generally cylindrical neck portion of said container, said neck portion having an opening for accessing the contents of said container and a circumferential flange at least partially surrounding said neck portion and spaced from said opening;
- a cup-like closure cap embracing the neck portion between the opening and the flange for covering the opening;
- an overcap having a downwardly depending cylindrical skirt sized so as to fit closely around said closure cap, said skirt having a circumferential flange at its distal end at least partially surrounding said skirt; and
- means for removably securing said overcap skirt flange to said neck portion flange, comprising a band of shrink wrap plastic;
- wherein both said flanges are formed with irregularities so as to prevent relative rotation within said band of shrink wrap plastic.

5,088,612

VIAL CAP

James R. Storar, Buena, and David A. Manera, Vineland, both of N.J., assignors to Comar, Inc., Buena, N.J.

Filed Jun. 10, 1991, Ser. No. 712,484

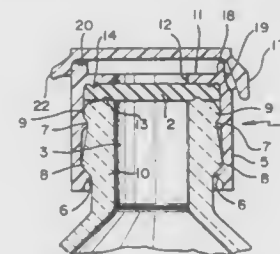
Int. Cl.⁵ B65D 41/20

U.S. Cl. 215—247

7 Claims

1. In combination, a cap and overcap on a vial having a neck portion surrounding an open end portion thereof, a pair of axially spaced radially outwardly extending annular beads integral with the outer wall surface of said vial neck, said cap

having a skirt portion, a pair of axially spaced radially inwardly extending annular ribs integral with the inner wall of said skirt portion, said skirt portion being press fit onto the neck portion of the vial wherein each annular rib extends inwardly against the lower surface of a respective bead, a transversely extending wall portion integral with the upper end portion of the skirt, a self-sealing disc mounted on the upper edge portion of the neck between the open end of the



vial and the transversely extending wall portion, a central opening formed in the transversely extending wall of the cap, whereby a hypodermic needle may be inserted through the sealing disc to remove contents from the vial, a lid, and a hinge connected between the lid and the upper end portion of the cap skirt, whereby the lid can be pivoted from an open position to a closed position over the central opening in the transverse wall to thereby cover the sealing disc to prevent the accumulation of atmospheric debris thereon during storage.

5,088,613

TAMPER EVIDENT CLOSURE

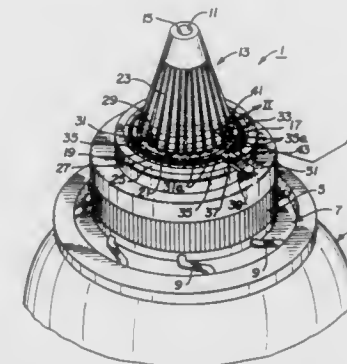
Herbert V. Dutt, Venetia, and Thomas F. Hudak, Bethel Park, both of Pa., assignors to Continental Plastics, Inc., Philadelphia, W. Va.

Filed Feb. 25, 1991, Ser. No. 660,640

Int. Cl.⁵ B65D 47/10, 41/32

U.S. Cl. 215—250

23 Claims



1. A tamper evident closure for a container having an axially extending member defining a container opening and a shoulder extending generally radially outward from a base of said axially extending member, said closure comprising:

- a skirt extending around and generally axially along said axially extending member of said container and terminating in a free edge adjacent said shoulder on the container;
- a generally radially extending tear band extending substantially around and spaced radially outward from said free edge of said skirt;
- a generally radially extending anchoring member extending substantially around and spaced radially outward from said tear band, said anchoring member being permanently secured to the shoulder of said container;
- first tearable connecting means extending radially between said free edge of said skirt and said tear band; and
- second tearable connecting means extending radially between said tear band and said anchoring member; and
- a pull tab secured to said tear band through which a force is

applied to the tear band to tear said first and second tearable connecting means and thereby separate the tear band from both the skirt of said closure and said anchoring member secured to the container shoulder to free said closure for removal from the container.

5,088,614

CANNED DRINK COVER APPARATUS

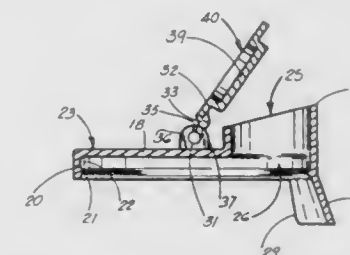
Camille Dumestre, P.O. Box 3211, Covington, La. 70433

Filed Apr. 25, 1991, Ser. No. 691,440

Int. Cl.⁵ A47G 19/22

U.S. Cl. 220—713

5 Claims



1. A canned drink cover apparatus for use with a cylindrical drink can, comprising:

- a) a generally circular cover member of a flexible plastic material and having a first, annular skirt extending downwardly therefrom and surrounding the cover member and a can and of a size and diameter to be fitted to the top portion of a cylindrical drink can forming a seal therewith;
- b) the skirt carrying an internal annular surface that forms a seal with top portion of the can;
- c) a dispensing opening in the cover member surrounded by an outlet wall defining a spout that extends away from the cover and the can during use;
- d) a second skirt extending downwardly from the first skirt and extending around only a portion of the can and the first annular skirt, terminating circumferentially at a pair of side portions; and
- e) a stopper pivotally mounted to the cover for selectively sealing the dispensing opening.

5,088,615

PAIL HAVING AN IMPROVED BAIL

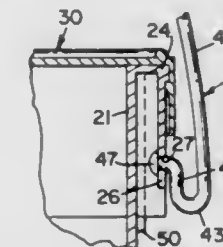
Clayton L. Neuman, Coon Rapids, Minn., assignor to Schwan's Sales Enterprises, Inc., Marshall, Minn.

Filed May 17, 1990, Ser. No. 525,127

Int. Cl.⁵ B65D 25/28

U.S. Cl. 220—95

22 Claims



1. An apparatus for containing goods, comprising:

- (a) a container having a center;
- (b) a bail member;
- (c) connecting means, a first part of which is an integral part of said container, and a second part of which is an integral part of said bail member, for connecting said container and said bail member;
- (d) impact dispersing means, a first part of which is an integral part of said container, and a second part of which is

an integral part of said bail member, for dispersing impact upon said bail member to said container; and
(e) impact absorbing means, forming an integral part of said bail member, for absorbing impact upon said bail member directed approximately toward said center of said container wherein said impact absorbing means includes U-shaped members of said bail member which are arranged and configured external of said first part of said impact dispersing means.

5,088,616

COVER FOR USE WITH A RECEPTACLE

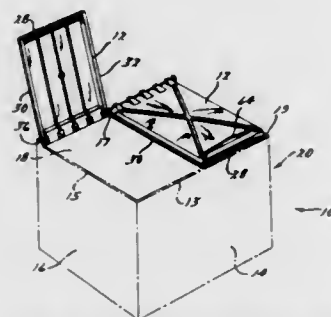
Thomas J. Susko, East Detroit; James P. Constantino, Mt. Clemens, and Gerald A. Parylo, Detroit, all of Mich., assignors to Cadillac Products, Inc., Troy, Mich.

Filed Oct. 11, 1990, Ser. No. 595,980

Int. Cl.⁵ B65D 51/04

U.S. Cl. 220—343

19 Claims



1. A cover for use with a receptacle having an open top, said cover comprising a substantially planar body formed from upper and lower sheets of flexible polymer material and having a deformation reinforced central section sized to extend across the open top of the receptacle, said central section comprising a plurality of parallel linearly extending first stiffening ribs extending from one said sheet and welded to the other said sheet, and a pair of linearly extending second stiffening ribs extending from said other sheet, said second ribs intersecting one another and said first ribs.

5,088,617

PACKAGE FOR FOOD PRODUCTS

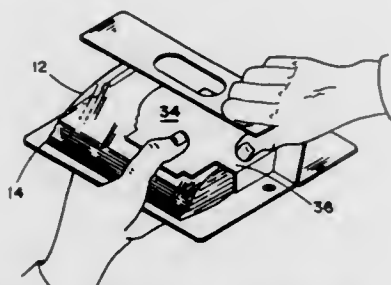
Roger S. Williams, Calhoun, Ga., and Lee Kramer, Germantown, Tenn., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Feb. 28, 1991, Ser. No. 661,608

Int. Cl.⁵ B65D 5/54

U.S. Cl. 220—403

12 Claims



1. A package for food products comprising: a clear container having openable and resealable means; a unitary blank enveloping the clear container, the paperboard blank having first and second ends, securing means to attach the first and second ends to each other, separating means enabling the opening of the unitary blank, a detachable label secured to the clear container, separating means enabling the opening of the unitary

blank, and a window positioned to permit viewing the openable and resealable means of the clear container.

5,088,618

CLEANING SYSTEM APPARATUS

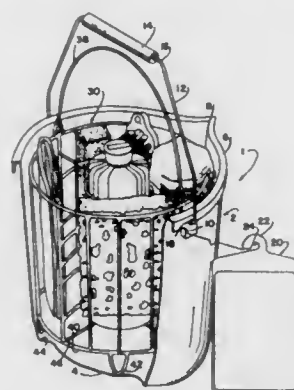
Michael J. Colombo, Honolulu, Hi., assignor to Jed Gaines and Michael J. Colombo, both of Honolulu, Hi.

Continuation of Ser. No. 356,616, Mar. 9, 1982, abandoned. This application Jul. 3, 1984, Ser. No. 627,525

Int. Cl.⁵ B65D 6/08

U.S. Cl. 220—408

20 Claims



1. An apparatus comprising an open container for holding cleaning implements, the container having a rigid base constructed of interconnected wires, a plurality of wire legs extending downward from the base for supporting the base above the bottom of a bucket, rigid outer rods extending upward from the base to an upper rim, a central section positioned above the base and having wire rings positioned upward therefrom for holding cleaning material, and wire dividers extending outward from the central section to the outer rods and being connected thereto and compartments between the wire dividers for receiving cleaning implements, and a handle connected to the upper rim adjacent an upper extremity thereof so that the container may be lifted from a bucket on which it is supported by the legs extending downward from the bottom, whereby the cleaning material and implements may be stored in a bucket spaced from the walls of the bucket by the open container so that the implements may have ventilation and so that the cleaning material and implements may be lifted from the bucket by lifting the handle of the container prior to use of the bucket for cleaning operations with water and the cleaning material and the implements.

5,088,619

CONTAINERS FOR COMPACT DISCS AND METHOD OF FABRICATION

Robert A. Shank, 1733 Beach Dr., SE., St. Petersburg, Fla. 33701

Filed Sep. 26, 1990, Ser. No. 588,272

Int. Cl.⁵ B65D 1/36

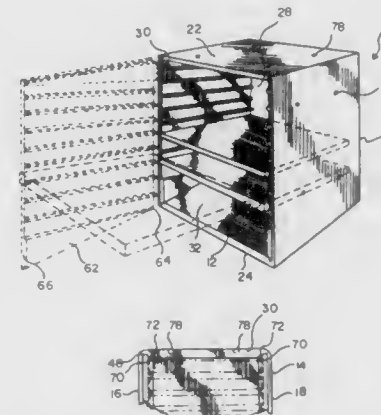
U.S. Cl. 220—532

2 Claims

1. A container for supporting compact discs in an orientation slightly offset from the horizontal, one above the other, comprising:

- a main body portion having parallel vertical side walls, parallel horizontal upper and lower walls coupled to the side walls along their edges, and a back wall for defining a chamber therewithin with recesses within the upper and lower walls adjacent to the side walls, the recesses extending the entire depth of the chamber, the recesses including extensions formed by stepped lateral extensions in the upper and lower walls of the main body portion for greater stability; and
- a pair of rectangular, injection molded insert panels, each removably positioned within the chamber with the upper

and lower edges of the panels being receivable in the recesses with the faces of the insert panels in sliding contact with the faces of the recesses and the side walls of the main body portion and with separate shelves extending into the chamber from the panels a predetermined distance for supporting the edges of the compact discs thereon, the shelves being essentially horizontally oriented but slightly angled with respect to the upper and lower walls of the main body portion, the shelves being of a length to extend between the back wall and the open



edge of the chamber, the side panels including an upper most ledge positionable above the upper most compact disc within the container, the upper most ledge being triangular in shape with its point located adjacent to the open edge of the chamber and its remote edge located adjacent to the back wall, the lowermost edge positionable beneath the lowermost compact disc in the container, the lowermost edge being triangular in shape with its point located adjacent to the back wall of the chamber and its forward edge located adjacent to the opening edge of the chamber.

5,088,620

GLOVE DISPENSER

Richard Kelliher, 18-B Meadow Way, Scotts Valley, Calif. 95066, and Martin Schutt, 9-13 Creekside Pl., Manteca, Calif. 95336

Filed Apr. 30, 1991, Ser. No. 693,806

Int. Cl.⁵ B65H 1/08

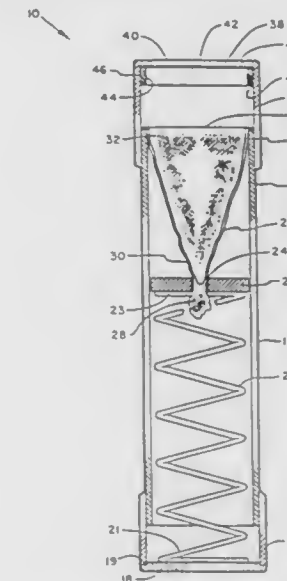
U.S. Cl. 221—59

20 Claims

1. A glove dispenser for dispensing disposable gloves, comprising:

- a tubular body having a first end and a second end, said first end having a bottom element secured thereto,
- a spring having a first end and a second end, said first end being operably secured to said bottom element,
- a disc shaped member having an aperture therethrough secured to said second end of said spring and adapted to slideably fit within said tubular body,
- a mammilliated shaped element having a first end and a second end, said first end of said mammilliated element is secured to said disc shaped member, and said second end is secured to said second end of said tubular member,
- a top element adapted to be slideably received by said second end of said tubular body,
- a diaphragm element having an aperture therethrough and operably coupled to said top element thereby providing

access to gloves removably secured within said mammilliated shaped element, and



means for retaining said diaphragm element to said top element.

5,088,621

BULK DISPENSING APPARATUS SYSTEM

Bruce Thompson, and Randall B. Thompson, both of Box 823, Stouffville, Ont., Canada L4A 7Z9

Continuation-in-part of Ser. No. 216,105, Jul. 7, 1988,

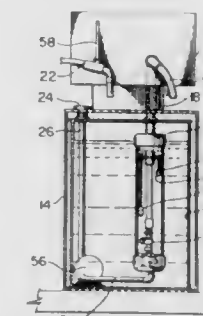
abandoned. This application May 8, 1990, Ser. No. 520,895

Claims priority, application Canada, Jul. 10, 1987, 541812

Int. Cl.⁵ B67D 5/30

U.S. Cl. 222—1

28 Claims



22. A method of dispensing bulk liquid from a bulk source, comprising:

- pumping a liquid from a bulk storage by a first mounted in said bulk storage to a reservoir mounted on said bulk storage for holding a smaller supply of liquid;
- feeding said liquid from said reservoir by a second pump mounted in said reservoir;
- initiating said pumping by said first pump by detection of a liquid level at a lower level and shutting off said pumping by said first pump by detection of the liquid level at an upper level, and actuating said second pump to pump liquid from said reservoir to an outlet, after filling said reservoir.

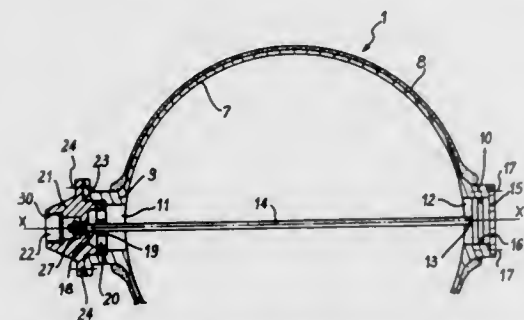
5,088,622
UNDER PRESSURE GAS TANK WITH CONTROL OF
DELIVERED GAS FLOW

Yves H. G. Vally, St. Medard en Jalles; Pascal D. Coquet, Bordeaux, and Michel Amagat, St. Aubin du Medoc, all of France, assignors to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Sep. 20, 1990, Ser. No. 585,410
Claims priority, application France, Sep. 29, 1989, 89 12733; Nov. 22, 1989, 89 15343

Int. Cl.⁵ B67D 5/00
U.S. Cl. 222—3

26 Claims



1. A tank for storage of gas under pressure comprising: an elastically deformable casing having an opening; flow control means communicating with said opening for controlling the flow of gas between the interior of said casing and an orifice communicating with the outside of said casing; actuating means for controlling said flow control means, said actuating means including an actuating member linked between said casing and said flow control means; whereby movement of said actuating member resulting from expansion or contraction of said casing under increasing or decreasing gas pressure is communicated to said flow control means to control in a predetermined manner the flow of gas through said orifice.

5,088,623
DISPENSER WITH INDICATOR

John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Jul. 7, 1988, Ser. No. 216,071

Int. Cl.⁵ B67D 5/38

U.S. Cl. 222—40

15 Claims



1. A dispenser, comprising: a container having a chamber for retaining a flowable material, and a nozzle defining an outlet orifice; means for pumping the material through the orifice; a first flowable material of a first regular color arranged in the chamber to be pumped and dispensed first through the orifice; and a second flowable material of a second color which contrasts with the first color arranged in the chamber to be pumped

and dispensed last through the orifice when the chamber is nearly empty of the material.

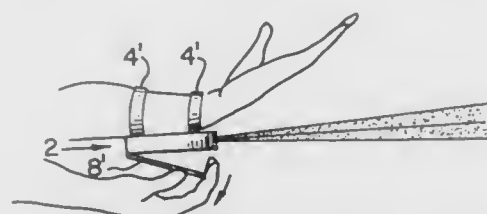
5,088,624
ATTACK-REPELLENT DEVICE

Hugh Hackett, R.R. #1, Glencairn, Ontario, Canada L0M, 1K0; James H. Stade, 101 Clearmont Dr., Elk Grove Village, Ill. 60007, and Russell E. Hattis, 1522 Sherwood Rd., Highland Park, Ill. 60035

Filed Feb. 12, 1990, Ser. No. 478,654
Int. Cl.⁵ B67D 5/00

U.S. Cl. 222—78

17 Claims



1. In an attack-repellent device comprising: a housing to be attached to the user, a container in said housing for holding a supply of an attack-repellent chemical and a pressurized fluid for dispensing said chemical under pressure from the device, an nozzle on said housing for directing the pressurized chemical in a direction away from the user to impinge upon the attacker; user operated chemical release means operable from an initial dormant condition to an active chemical release condition, and means responsive to the operation of said user operable means to said active condition for feeding said pressurized attack-repellent chemical to the nozzle for dispersal; releasable attaching structure for attaching said housing to the user, said device being unarmed and incapable of use when attached by said attaching structure to the user, said attaching structure including a section responsive to the user moving said housing away from said attaching structure for releasing the housing therefrom; and mechanism responsive to the detachment of said housing from said attaching structure for arming the device so that operation of said user operated chemical release means to said active condition will then result in the feeding of said attack-repellent chemical through the nozzle of the device, the improvement wherein said housing includes a canister for holding a propellant fluid and an attack-repellent chemical, said releasable attaching structure includes a member attached to the upper end of the housing, said member including a stem which depends through an aperture in said upper end of said housing, and a washer in said housing through with the stem passes, the end of the stem being spread outwardly to retain the washer on the flared bottom end of the stem; and said housing including a first spring compressed between said washer and the upper end of said housing; said user operated chemical release means being an open top slide member applied over the bottom end of said housing, said open top slide member being raisable with respect to the bottom end of said housing, a second spring compressed between the bottom end of said open top slide and the bottom of said canister to hold said canister in a raised position; said canister having a discharge orifice in the bottom thereof and a one-way valve normally closing said discharge orifice; and there being formed on the bottom of said slide member an upwardly projecting nozzle-forming projecting adapted to be inserted within said discharge orifice of said canister to open said valve to cause the propellant and chemical within said canister to be fed through said nozzle-forming projection only when said device is armed and said slide member is pulled toward said canister; and shoulder forming means on the bottom of said housing for engaging a portion of said canister when said canister is forced into a lowered position by said first spring means when said flared bottom end of said stem of said detaching means is removed from said washer aperture, to arm the device when the user

pulls down upon said housing, said first spring then expanding to press said canister down to said lowered position where it bears on said shoulder-forming means on the bottom of said housing, thereby to position the bottom of the canister in a position where the movement of said slide member can bring the inner end of said nozzle-holding projection within said discharge orifice.

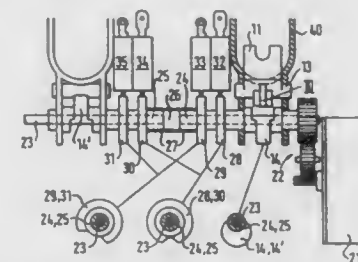
5,088,625
DRIVE MECHANISM FOR THE MEASURED
DISPENSING OF LIQUIDS OUT OF A STORAGE
CONTAINER

Karlheinz Färber, Giengen; Klaus Erdmann, Mergelstetten; Willi Niess, Halzhausen, and Willi Lindenmaier, Herbrechtlingen, all of Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga. and Bosch-Siemens Hausgerate GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 10, 1990, Ser. No. 625,057
Int. Cl.⁵ B67D 5/00

U.S. Cl. 222—129.1

4 Claims



1. An apparatus for dispensing metered quantities of beverage concentrate for mixing with a diluent to produce a post-mix beverage comprising:

at least two storage tanks for containing the beverage concentrate, each said storage tank having a discharge opening through which the concentrate may flow by gravity; a positive displacement pump means integrally connected with each said storage tank at the discharge opening thereof for withdrawing concentrate through the discharge opening from the storage tank by suction into a housing of the pump means, and discharging metered quantities of concentrate from said pump housing through an outlet thereof for mixing with the diluent in response to mechanical movement of an actuator of said pump means; a cabinet for housing said at least two storage tanks in a spaced side-by-side relationship for operative association with a supply of diluent, said cabinet including a coupling member therein for engaging the pump housing and rigidly supporting the storage tanks; and drive means in said cabinet for engaging the actuator of the pump means of each storage tank while the storage tank is rigidly supported and imparting said mechanical movement thereto to thereby dispense concentrate from the outlet of the pump housing, said drive means including, a reversible electric motor, a main drive shaft selectively rotatable by said electric motor in a forward or reverse direction, and coupling means for selectively connecting said drive shaft to the actuator of one of the pump means when said electric motor runs in a forward direction, and coupling the other of said pump means to the drive shaft when the electric motor runs in the reverse direction.

5,088,626
SALAD BAR APPARATUS

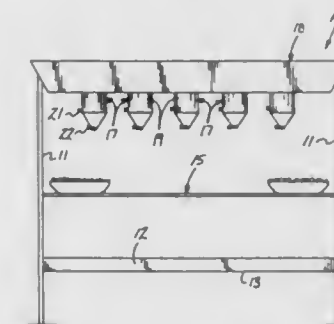
John D. Patton, 800 Quesnel Dr., Virginia Beach, Va. 23454, and Elwood Whitney, 5520 Lynbrook Landing, Virginia Beach, Va. 23462

Filed Nov. 5, 1990, Ser. No. 609,235

U.S. Cl. 222—132

Int. Cl.⁵ B67D 5/64

1 Claim



1. A salad bar apparatus comprising, a framework, the framework including a support grid mounted within the framework, the support grid spaced from and underlying a dispensing tube support housing, with the dispensing tube support housing mounted in the framework, and the dispensing tube support housing including a plurality of dispensing tubes fixedly mounted within the dispensing tube support housing, and each dispensing tube including an upper dispensing tube portion fixedly mounted within the dispensing tube support housing, and a lower portion positioned below the dispensing tube support housing coaxially aligned with the upper dispensing tube portion to direct a food component through each dispensing tube, and wherein the upper dispensing tube portion is opaque and the lower dispensing tube portion is transparent, and the upper dispensing tube portion includes a first valve to direct food from the upper dispensing tube portion into the lower dispensing tube portion, and the lower dispensing tube portion includes a second valve to direct food contained within the lower dispensing tube portion to a position exteriorly thereof, and wherein the upper dispensing tube portion is cylindrical and the lower dispensing tube portion is conical and includes a series of gradations mounted thereon for visual observation of a quantity of food to be dispensed from the lower dispensing tube portion, and further including a medial support shelf spaced below and parallel the support grid, the medial support shelf including a catch tray container removably mounted overlying the medial support shelf and coextensive therewith to receive and contain food components directed through the support grid, the support grid formed of intersecting rods to define an open rigid mesh, and wherein the first valve includes a rod reciprocatably and diametrically directed through the upper dispensing tube portion, and the reciprocable rod including a first valve plate, and a conical funnel coaxially arranged within the upper dispensing tube portion, with the conical funnel including a lowermost funnel outlet overlying the first valve plate, and the lowermost funnel outlet defined by a first predetermined diameter and the first valve plate defined by a diameter equal to the first predetermined diameter, and a biasing means secured to the first valve rod to bias the first valve plate into a first position overlying the lowermost funnel outlet and manually displaced to a second position removed from the lowermost funnel outlet, and wherein the lower dispensing tube portion includes a second outlet opening formed at a lower terminal end thereof defined by a second predetermined diameter, and the second valve rod rotatably mounted through the second

outlet opening and including a second valve plate rotatably mounted within the second outlet opening, wherein the second valve plate is of an annular configuration and of a valve plate diameter equal to the second predetermined diameter, and

wherein the dispensing tube support housing includes an enclosed conduit, and a cooling medium delivery conduit, and the enclosed conduit including an inlet opening in communication with the cooling medium delivery conduit including a cooling medium, and the cooling medium directed through the dispensing tube support housing about each upper dispensing tube portion, and the dispensing tube support housing including an outlet to direct the cooling medium therefrom and to permit circulation thereof.

5,088,627

MULTI-CHAMBER PACKAGE FOR MIXING AND DISPENSING

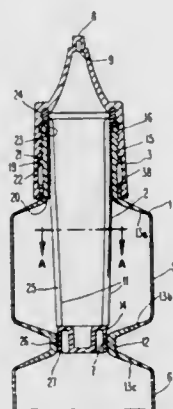
Robert J. Musel, Pleasantville, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed Jul. 25, 1990, Ser. No. 557,941

Int. Cl.⁵ B67D 5/60

U.S. Cl. 222-145

13 Claims



1. A container for holding separated ingredients to be commingled, and for commingling and dispensing said ingredients, comprising:

- (a) at least two chambers having a cross-sectional area circumscribed by a side wall of said container, each chamber adapted to hold one of said ingredients to be commingled, the first of said chambers having an exterior opening;
- (b) a passageway connecting said chambers with an axis centrally disposed in said passageway and extending through said first chamber of said exterior opening, said passageway having a side wall circumscribing a cross-sectional area, perpendicular to said axis, smaller than the cross-sectional area, perpendicular to said axis, circumscribed by said side wall of said first chamber;
- (c) a tubular member located substantially within said first chamber, the first end of which is open to said exterior opening and the second end of which includes a stopper which, in a closed position, seals said passageway by contact of a sealing surface at said second end with said side wall of said passageway, said member further including a second opening from the interior of said tubular member to said first chamber, said opening comprising at least one elongated slot in said tubular member extending substantially from said first end to said second end, said slot being adapted to function both as an air vent and as a fluid flow path;
- (d) a cap attached to said first end of said tubular member, said cap adapted to move with said tubular member between a closed position in which the second end of said tubular member is sealed in and blocks said passageway, and an open position, wherein said second end of said

tubular member is not in said passageway, the top of said cap having a means for dispensing ingredients from said first end of said tubular member, through said cap, to the exterior of said container.

5,088,628

DISPENSER HAVING CHILD-RESISTANT NOZZLE ASSEMBLY

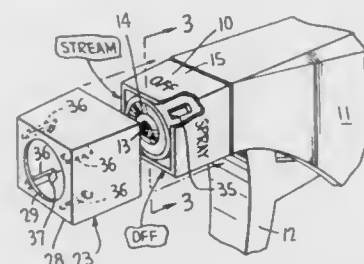
Michael G. Knickerbocker, Upland, Calif., assignor to Calmar Inc., Watchung, N.J.

Filed Jul. 13, 1990, Ser. No. 552,068

Int. Cl.⁵ B65D 50/00

U.S. Cl. 222-153

7 Claims



1. A manually actuated liquid dispenser comprising a dispenser body for mounting with a closure cap to the upper end of a container for fluent product, said body extending transversely above the closure, cap, said body having means defining a pump chamber having an inlet port in communication with a valve controlled inlet passage, said chamber being in communication with a valved discharge passage extending in a forward direction, a discharge nozzle having a discharge orifice in communication with said discharge passage, said nozzle being mounted on said body adjacent a forward end of said body for rotation between discharge open and closed positions upon manual rotation of said nozzle about a central axis thereof, manually operable means on said pump body for pressurizing said chamber for expelling product through said discharge orifice, a child-resistant element mounted on said nozzle for manual axial movement between extended and retracted positions and being rotatable together with said nozzle, said element comprising an overcap having an opening coaxial with said discharge orifice, external stop means on said body, said element engaging said stop means in said retracted position for resisting rotation of said nozzle from said closed position, and said element in said extended position permitting rotation of said nozzle from said closed position to said open position.

5,088,629

PRESSURE BUILD-UP PUMP SPRAYER HAVING IMPROVED VALVING MEANS

Richard K. O'Neill, P.O. Box 2452, Wrightwood, Calif. 92397

Filed Jul. 30, 1990, Ser. No. 560,087

Int. Cl.⁵ G01F 11/00

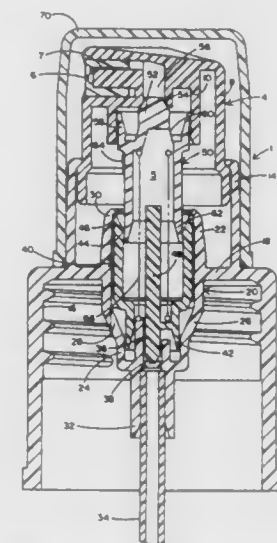
U.S. Cl. 222-321

18 Claims

1. A manually operated, pressure build-up pump sprayer for dispensing a liquid from a container, said pump sprayer comprising:

- cap means to be removably connected to the container, said cap means having a stationary bore extending longitudinally therethrough, and said bore having a sealing surface at the interior thereof;
- hollow valve body means received within and slidable reciprocally through the bore of said cap means;
- poppet means having a hollow pressure chamber to communicate fluidically with the interior of the container and also having a skirt projecting outwardly therefrom, said poppet means being received within and slidable reciprocally through said valve body means between first and second locations, such that at said first location, the outwardly projecting skirt of said poppet means engages said

valve body means to position said valve body means in sealing engagement with the sealing surface of the bore of said cap means to form an air tight seal therebetween and, at said second location, the outwardly projecting skirt of said poppet means releases said valve body means for permitting said valve body means to slide away from and out of engagement with the sealing surface of the bore of said cap means to break the seal between said valve body



means and said bore and thereby open an air vent from the atmosphere to the interior of the container; and spray head means having a spray orifice through which the liquid from the container is dispensed, said spray head means being interconnected with and slidable reciprocally relative to said cap means in response to a manually applied force for causing said poppet means to slide through said valve body means and said valve body means to slide through the bore of said cap means.

5,088,630

SEALANT CARTRIDGE WITH RESILIENT BELLOWS

Edward D. Arch, Tervuren, and Heinz M. Schmitt, Waterloo, both of Belgium, assignors to Dow Corning S.A., Seneffe, Belgium

Division of Ser. No. 511,889, Apr. 19, 1990, abandoned, which is a continuation of Ser. No. 269,280, Nov. 9, 1988, abandoned.

This application Oct. 22, 1990, Ser. No. 588,112

Claims priority, application United Kingdom, Nov. 11, 1987, 8726437

Int. Cl.⁵ B67D 5/42

U.S. Cl. 222-326

3 Claims

1. A dispensing cartridge comprising a self-supporting tube having an interior surface; an end cap having a sealed exit port closing one end of the tube; a body of sealant composition within the tube; a plunger positioned within the tube in slidable relationship therewith; the plunger having a pressure portion confining the body of sealant composition in the volume defined by the plunger, tube and end cap, and a skirt portion engaging the interior surface of the self-supporting tube; means for constantly urging the plunger toward the end cap and into pressing engagement with the body of sealant composition in order to retain the body of sealant composition under pressure until its removal from the tube through the exit port, said

means for constantly urging the plunger toward the end cap and into pressing engagement with the body of sealant composition being a removable resilient bellows provided between the skirt portion and the pressure portion of the plunger.



5,088,631

DOSER-DISPENSER AND PROCESS FOR DOSING A PASTY AND/OR LIQUID PRODUCT

Roland Torterotot, Longvilliers, France, assignor to ERCA Holding, Les-Usis Cedex, France

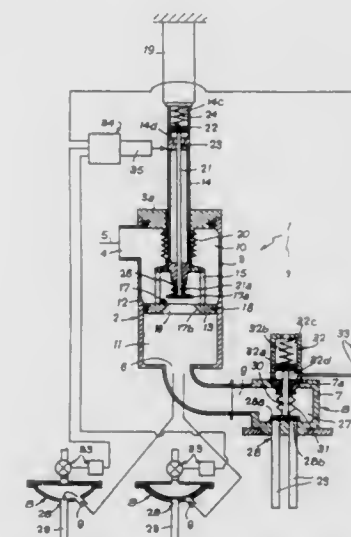
Filed Jan. 22, 1991, Ser. No. 644,806

Claims priority, application France, Jan. 23, 1990, 90 00758

Int. Cl.⁵ B65D 83/14

U.S. Cl. 222-389

9 Claims



1. In a doser-dispenser having a first doser unit which includes a cylindrical housing having a first storage reservoir and serving to dispense determined doses of at least one flowable product contained under pressure in said first storage reservoir, the improvement comprising in the cylindrical housing an upper supply chamber, a supply conduit connecting said supply chamber to said first reservoir, a doser-piston, a lower dosing chamber separated from said supply chamber by said doser-piston and having an active volume swept by said doser piston during suction and delivery strokes thereof, a first control tube, a supporting stirrup element having opposite ends and connected fixedly to said doser piston at one of its opposite ends and at the other of its opposite ends with the lower end of said first control tube, said first control tube penetrating said housing and being in liquid tight and sliding relationship there-

with, said first control tube having opposite ends, a control device coupled to said first control tube in tight manner in said housing, and said housing having a central passage obturated by an intake valve having an obturation member provided by a flap, a seat for said intake valve surrounding said central passage, a second control member projecting in tight relationship from one of said opposite ends of the first control tube, control means distinct from the device for controlling the first control tube, a return spring, said obturation member being urged by said return spring in the direction of closure of the intake valve, and being guided with respect to said doser-piston and cooperating with said valve seat surrounding said central passage, a first dispenser unit comprising an ejection tube having an upstream end, an ejection valve, a dispensing chamber having an inlet connected to the outlet of the dosing chamber of said doser unit and having an outlet connected to said ejection tube said ejection valve having an obturation member, a flap or membrane providing said ejection valve's obturation member, said obturation member of said ejection valve being disposed in cooperating relationship with the upstream end of said ejection tube, said upstream end providing a seat of said ejection valve, a control unit for said ejection valve, a second dispenser unit having all of the components of said first dispenser unit, said doser unit being associated with said first and a second dispenser unit in that the outlet of the supply chamber of said doser unit is connected in parallel to each of the dispensing chambers of said first and second dispenser units, the active volume of the dosing chamber of the doser unit being swept regularly by the doser-piston during the suction stroke and the delivery stroke thereof, corresponding to at least two whole doses of product to be dispensed through said two dispenser units, and further comprising synchronization means for coordinating the movements of said first control tube and of said second control tube during the same delivery stroke thereof and for controlling the ejection valve of each of the first and second dispenser units, whereby during the delivery of a first dose of product out of the dosing chamber of said doser unit, only the ejection valve of the first dispenser unit is opened, that, during the delivery of the second dose of product, only the ejection valve of the second dispenser unit is opened, and so on, until all the dispenser units have each delivered a dose of product during the same delivery stroke of the doser-piston of the doser unit.

5,088,632

LIQUID-TIGHT CLOSURE ASSEMBLY WITH MULTIDIRECTIONAL ORIENTATION AND RETRACTIBLE POURER TUBE

Philippe Odet, Chasselat, and Jean Y. Rognard, Trevoux, both of France, assignors to Astra Plastique, Saint Georges de Renels, France

PCT No. PCT/FR90/00044, § 371 Date Sep. 5, 1990, § 102(e) Date Sep. 5, 1990, PCT Pub. No. WO90/08074, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 22, 1990, Ser. No. 571,576

Claims priority, application France, Jan. 23, 1989, 89 00982 Int. Cl.⁵ B65D 47/06

U.S. Cl. 222—529

8 Claims

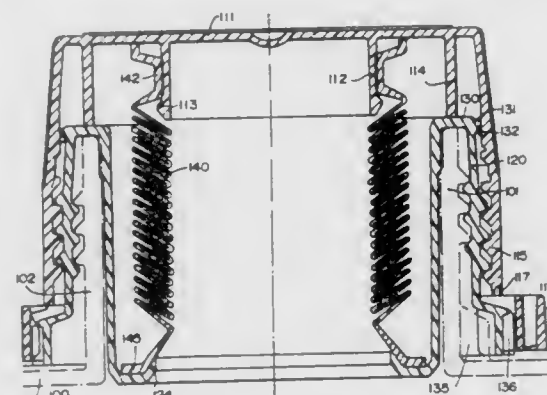
1. A leaktight stopper unit and pouring tube for a container having an opening surrounded by a cylindrical neck, comprising:

an annular intermediate element comprising inner and outer generally cylindrical sleeves connected by a top surface, having a U-shaped cross-section and defining a cylindrical cavity for placement over the cylindrical neck of the container;

said pouring tube including a memory effect bellows and which is retractable into the annular intermediate element; said stopper unit including a removable closing stopper having a top portion such that an inner face of said top portion contacts the top of said pouring tube to compress said pouring tube in a retracted position substantially within the annular intermediate element; and

said inner sleeve of the annular intermediate element is sized

to fit snugly within the cylindrical neck of the container and additionally comprises an inwardly extending shoulder



der flange for retaining the pouring tube within the intermediate element.

5,088,633

BIKE HELMET HOLDING SYSTEM

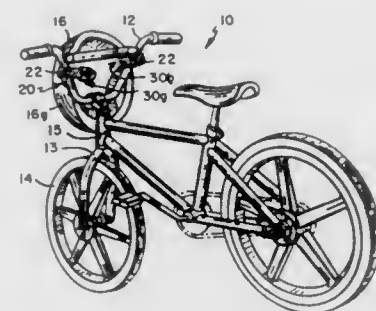
Joel C. Cunard, Bedford, and Paula W. Prescott, Everett, both of Pa., assignors to Hedstrom Corp., Bedford, Pa.

Filed Mar. 19, 1991, Ser. No. 672,116

Int. Cl.⁵ B62J 7/00, 7/06

U.S. Cl. 224—30 A

2 Claims



1. A helmet holding system comprising

a vehicle having handlebars;

a safety helmet having a crown and opposite sides;

a chin strap composed of two cooperating sections, each said

section having corresponding first and second ends;

means for connecting the corresponding first ends of said

strap sections to opposite sides of said helmet;

cooperating connector means at the corresponding second

ends of said strap sections for releasably coupling said

strap section second ends under the chin of a wearer of the

helmet;

means defining a pair of first fastener elements at spaced-

apart locations on the handlebars,

means defining a pair of second fastener elements at selected

locations on said two strap sections such that when the

first and second strap sections are wrapped around the

handlebars at the locations of said first fastener elements

thereon, said second-fastener elements can be fastened to

corresponding ones of said first fastener elements so that

the helmet is suspended by its strap in front of said handle-

bars with the helmet crown facing forwardly and wherein

one of said pairs of fastener elements comprises hooks and

the other comprises eyelets.

5,088,634

MAILBAG SUPPORT HARNESS

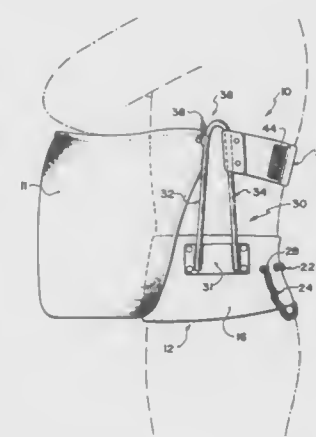
Terrence R. MacLaren, 530 Singh Street, Kamloops, British Columbia, Canada V2B 5C2

Filed Oct. 23, 1990, Ser. No. 601,846

Int. Cl.⁵ A45F 5/00, 3/00

U.S. Cl. 224—252

12 Claims



1. A shoulder strap free harness to be worn by a user for supporting a load to be carried by a user, comprising:

(a) an adjustable length belt securely fastenable around the user's hips;

(b) a pair of upright brackets rigidly mounted on generally opposed sides of said belt and positionable alongside side portions of the user's body below shoulder level, said brackets comprising means for suspending said load snugly against a front portion of the user's body; and

(c) an adjustable support strap extending between said brackets above said belt and positionable against a back portion of the user's body.

5,088,635

GOLF BAG RACK

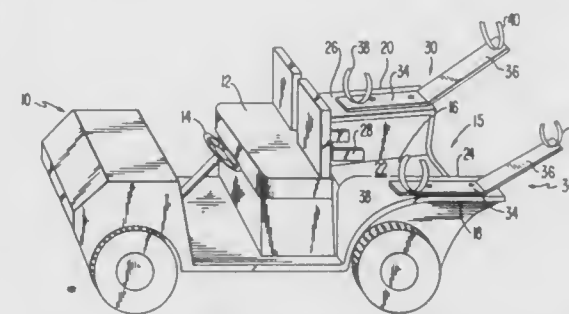
Mansell M. Taylor, P.O. Box 1482, Auburn, Me. 04211-1482, and Kevin J. Ross, 75 Valview Dr., both of Auburn, Me. 04210

Filed Aug. 10, 1990, Ser. No. 565,496

Int. Cl.⁵ B60R 9/08

U.S. Cl. 224—274

17 Claims



1. A rack for holding a golf bag mountable on a horizontal flat planar surface on a motor driven golf cart substantially parallel to the cart travel surface to expand the golf bag holding capacity of the cart, said rack comprising:

(a) horizontal mounting base means for attaching said rack to said horizontal flat planar surface so that said mounting base means is substantially parallel to the cart travel surface;

(b) support arm means for positioning a golf bag in an optimum angular position relative to said cart horizontal flat planar surface, said support arm means being connected to

said horizontal mounting base means at an angle which supports the bag in said optimum position; and
(c) bag engaging means on said horizontal mounting base means and on said support arm means for receiving and holding opposite ends of a golf bag so that the bag is supported in said optimum position.

5,088,636

ROLLING TOOL BOX

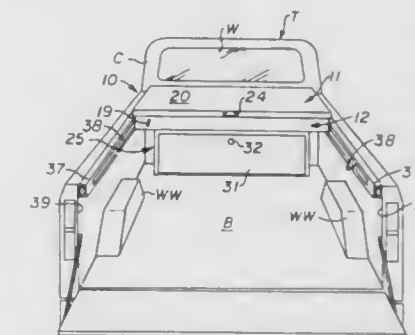
Antonio J. Barajas, 12809 County 38, Rt. 1, Alvin, Tex. 77511

Filed Mar. 4, 1991, Ser. No. 663,626

Int. Cl.⁵ B60R 9/055

U.S. Cl. 224—281

11 Claims



1. A rolling tool box comprising in combination, a generally rectangular box-like enclosure for storing tools therein and track means for slidably supporting said tool box between opposite side walls of a pickup truck bed so as to slide said tool box between a forward end and a tailgate rear end of said bed; said rectangular box-like enclosure having a shallow rectangular upper storage compartment extending transversely between said track means and above the wheel wells of the truck bed and a rectangular lower storage compartment extending transversely between the wheel wells of the truck bed and above the floor of the bed,

a pair of roller plates affixed on opposite side walls of said tool box upper compartment having a plurality of side-wardly extending shafts with rollers rotatably mounted thereon, and

said track means being an elongate channel member mounted on an inner side of each truck bed side wall to extend substantially from one end of the bed adjacent the truck cab to the tailgate end of the bed and each apertured to receive and movably contain said rollers and having a stop surface adjacent the tailgate end of each said channel, whereby

said tool box may be moved on said channels between a stored position adjacent the truck cab to a position adjacent the truck tailgate.

5,088,637

METHOD OF, AND APPARATUS FOR, BREAKING AN OPTICAL FIBER

Lucas G. C. Teurlings, 's-Hertogenbosch, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 24, 1990, Ser. No. 528,309

Claims priority, application United Kingdom, Sep. 27, 1988, 8822619; PCT Int'l Appl., Aug. 16, 1989, PCT/US89/03461

Int. Cl.⁵ G02B 6/25

U.S. Cl. 225—1

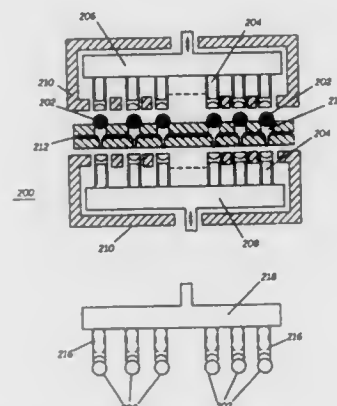
19 Claims

1. A method of breaking an optical fiber at a notch formed therein, the method comprising the steps of:

clamping an optical fibre between confronting surfaces of first and second resilient members with the notch therebetween, and thereby applying a compressive force to the fiber;

during the application of the compressive force, bending the fiber about the notch in a first sense tending to close the

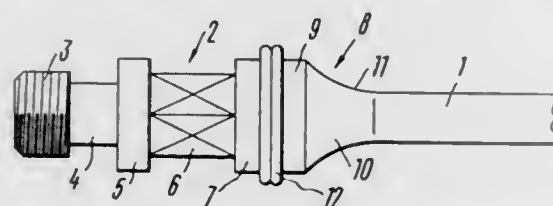
8 Claims



Int. CL⁵ B65D 1/34

4 Claims U.S. Cl. 229—2.5 R

7 Claims



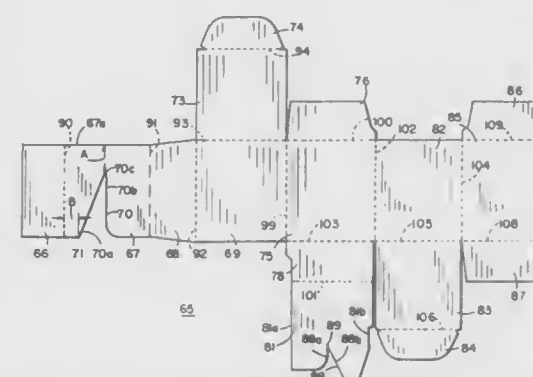
1. A pressed paper plate having a substantially planar center section;

- a first rim portion outward from and joined to said substantially planar center section, said first rim portion being convex upward, subtending an arc of A1, having a radius of curvature of R1;
- a second rim portion outward from and joined to said first rim portion, said second rim portion being convex downward, subtending an arc of A2, having a radius of curvature of R2;
- a third rim portion outward from and joined to said second rim portion, said second rim portion being convex downward, subtending an arc of A3, having a radius of curvature of R3, and having a tangent which is substantially parallel to the plane of said substantially planar center section, and
- a fourth rim portion outward from and joined to said third rim portion, said fourth rim portion being convex downward, subtending an arc of A4, having a radius of curvature of R4; wherein the length of the arc S2 of said second

Int. Cl.⁵ B65D 5/48

U.S. Cl. 229—120.17

16 Claims



1. An assembleable container having cells therein when fully assembled, said container moveable between a folded flat position and an open position, comprising:

a back panel and an adjacent first side panel having spaced side edges, a top edge and a bottom edge;

a first divider having top, bottom and side edges, one of said side edges of said divider abutting said first side panel intermediate the edges of said first side panel:

a first joining tab attached to and extending from said back panel and joining said first divider at a point spaced from said first side, whereby said first divider and said first joining tab are folded flat against said back panel and said first side panel in said folded flat position, and said first divider and said first joining tab can also be folded into a position in which said first divider projects from said first side panel and is spaced from said back panel by folding said back panel to an angle of less than 180° with respect to said first side panel in said open position, said first divider dividing the volume of said container when said container is in said open position and including a first slot extending upwardly from said bottom edge thereof, said first slot being wider at side bottom edge and narrowing to an apex located intermediate said top and bottom edge of said first divider;

a second divider attached to a bottom tab which in turn is attached to said bottom edge of said first side;
said second divider adapted to be folded up into engagement with and oriented at an angle of less than 180° with respect to said first divider when said container is fully assembled;
said second divider including a second slot which is open at an edge of said second divider which is spaced from said bottom tab, said second slot narrowing to an apex at a point intermediate said spaced edge and said bottom tab, and said second divider being folded flat against said first side panel and said first divider in said folded flat position;
and

said first slot in said first divider including a first edge and a

second edge, said first edge closer to said first side panel than said second edge, and said first edge extending substantially from said bottom edge of said first divider to said apex of said first slot at an angle between 10° and 30° with respect to a plane which intersects said edge, said plane parallel to said first side panel when said first divider is in said open position, whereby when said container is opened from said folded flat position to said open position, said second divider tends to move along said first divider into position within said first slot, and when said second divider is positioned within said first slot during the opening of the container, said first edge pushes said second divider into said first slot, and said first edge of said first slot not interfering with the movement of the second divider within said first slot.

Jürgen Färber, Kaarst, Fed. Rep. of Germany, assignor to PKL Verpackungssysteme GmbH, Düsseldorf, Fed. Rep. of Germany

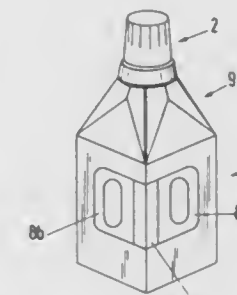
Filed Nov. 1, 1990, Ser. No. 607,896

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942319

Int. Cl.⁵ B65D 43/08

U.S. Cl. 229—125.14

17 Claims



1. A container for liquids and bulk material formed from a blank having a plurality of sets of folding lines, comprising
a substantially parallelepipedic body having side walls and lateral edges between said side walls, said lateral edges comprising a first set of folding lines of said blank,
a funnel-shaped head portion on top of said body, said head portion comprising faces extending from said side walls, said head portion tapering in cross-section towards a central annular opening of predetermined shape,

said head portion further comprising folding pockets between said faces, said folding pockets being formed from second and third sets of folding lines, said folding pockets being folded inwardly along said second set of folding lines towards the interior of said head portion so that said second set of folding lines constitute interior folds and said third set of folding lines constitute exterior folds of said folding pockets, said second set of folding lines constituting extensions of said first set of folding lines, said second and third sets of folding lines being folded so that said folding pockets are disposed in pairs bearing against interior surfaces of said faces, said folding pockets being sealed to the interior surfaces along said interior folds and along upper edges of said folding pockets so that said folding pockets are closed off to the interior of said head portion. and

means for pouring said liquid and bulk materials out of the interior of said container disposed from the interior on said funnel-shaped head portion of said container, said pouring means including a flange, said pouring means and said flange being shaped to conform to the predetermined shape of said central annular opening.

5,088,643

METHOD FOR BONDING POUR SPOUTS TO CONTAINERS

Stephen L. Frazier, Midlothian, Va., and James A. Hiller, Trout Run, Pa., assignors to Westvaco Company, New York, N.Y.
Filed Sep. 26, 1991, Ser. No. 765,987
Int. Cl.⁵ B65D 43/00
U.S. Cl. 229—125.15

10 Claims



1. In combination, a container body and an externally applied pour spout fitment, said container body having an outer surface coated with a low surface energy thermoplastic polymeric coating and including a pour opening of a desired size in a predetermined part thereof, said coated surface being treated for improved ink adhesion, and a pour spout fitment with an integral flange portion which is adhered to the outer surface of the said container body in alignment with said pour opening, the improvement wherein the region of the container body immediately adjacent to said pour opening is deliberately untreated to achieve an improved bond between the flange of said pour spout fitment and the container body.

5,088,644

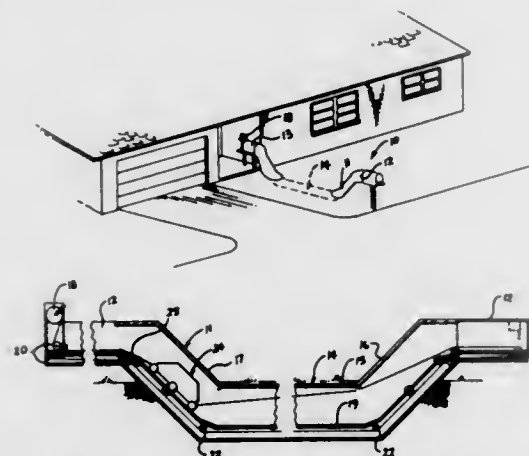
MAILBOX APPARATUS

James Scott, 2330 Valleywood SE, Apt. K-9, Grand Rapids, Mich. 49546

Filed Jun. 13, 1991, Ser. No. 714,556
Int. Cl.⁵ B65D 91/00

U.S. Cl. 232—17

4 Claims



1. A mailbox apparatus comprising, a delivery conduit member, the delivery conduit member defining a first forward section spaced from a rear second section, with a third central "U" shaped section mounted between and below the first and second sections, and a drive pulley mounted adjacent the rear section, and a guide track extending coextensively throughout the conduit member, with the drive pulley cooperative with spaced driven pulleys mounted in cooperation with the guide track and the drive pulley, and a drive belt wound about the drive pulley and driven pul-

leys, with the drive belt including a forward end and a rear end, and a vehicle member movably mounted on the guide track, with the vehicle member including a bottom base plate, the bottom base plate including a front edge aperture mounted to the drive belt forward end, and a rear edge aperture through the bottom base plate mounted to the drive belt rear end, and relative rotation of the drive pulley effects reciprocation of the vehicle member throughout the guide track.

5,088,645

SELF-PROGRAMMABLE TEMPERATURE CONTROL SYSTEM FOR A HEATING AND COOLING SYSTEM

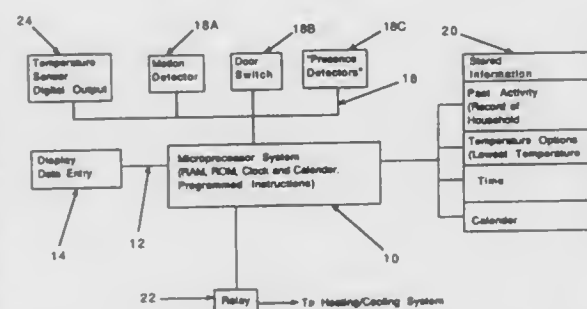
Ian Bell, 111 Granton Drive, Unit 409, Richmond, Ontario, Canada L4B 1L5

Filed Jun. 24, 1991, Ser. No. 720,249

Int. Cl.⁵ G05D 23/00

U.S. Cl. 236—46 R

14 Claims



1. A temperature control system for automatically adjusting the temperature control setpoint of a heating and cooling system of a space in accordance with the present or anticipated occupancy status of the space, said temperature control system comprising:

- a) detecting means for detecting the occupancy status of the space and providing an output of the occupancy status of the space;
- b) timing means for providing time intervals to the control system;
- c) storage means for storing the output of the detecting means in relation to the time interval provided by the timing means to provide a stored past occupancy record of the space; and
- d) programmed processor means including programmed instructions for reading and processing the past occupancy record of the space stored in the storage means to derive an anticipated occupancy status for the space and thereby control the temperature of the space in accordance with the programmed instructions and the stored past occupancy record of the space.

5,088,646

HEAT PUMP TYPE HEATING APPARATUS AND CONTROL METHOD THEREOF

Katsuaki Yamagishi; Koji Kashima, both of Yokohama, and Toru Kubo, Fuji, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1990, Ser. No. 621,870

Claims priority, application Japan, Dec. 6, 1989, 1-315154; Jan. 23, 1990, 2-11905

Int. Cl.⁵ G05D 23/00

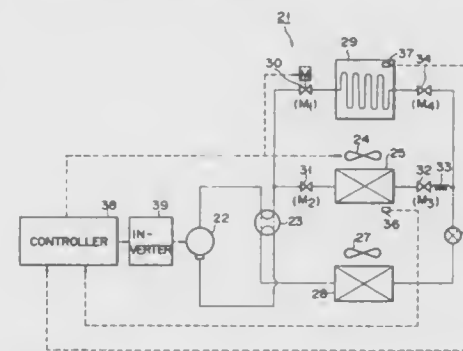
U.S. Cl. 237—2 B

15 Claims

1. A heat pump type heating apparatus comprising: a refrigeration cycle which constitutes a closed cycle for circulating a refrigerant therein and includes at least a variable capacity compressor, an outdoor heat exchanger, an expansion valve, and an indoor heat exchanger being

provided with a room temperature sensor and an indoor fan; a floor heating panel connected in parallel with said indoor heat exchanger in the refrigeration cycle, said floor heating panel being provided with a floor temperature sensor; a flow control valve arranged in a refrigerant upstream side of said floor heating panel at a heating operation; and control means for

- (A) controlling said variable capacity compressor, said indoor fan, and said flow control valve in a first predetermined drive state at a start of a heating operation, to simultaneously start air heating by said indoor heat exchanger and floor heating by said floor heating panel;
- (B) controlling said variable capacity compressor, said



indoor fan, and said flow control valve in a second predetermined drive state when a detection output from said room temperature sensor reaches a preset value, to maintain a room temperature by said air heating and increase a floor temperature by said floor heating;

- (C) controlling at least one of said variable capacity compressor and said flow control valve in a third predetermined drive state when a detection output from said floor temperature sensor reaches a preset value, to maintain the floor temperature by said floor heating, and
- (D) controlling at least one of said variable capacity compressor and said indoor fan in a fourth predetermined drive state, to control the room temperature to a predetermined value by said air heating.

5,088,647

FEEDER WIRE STRUCTURE FOR HIGH PRESSURE FUEL INJECTION UNIT

Takeo Yoshida, and Minoru Suzuki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 8, 1990, Ser. No. 610,539

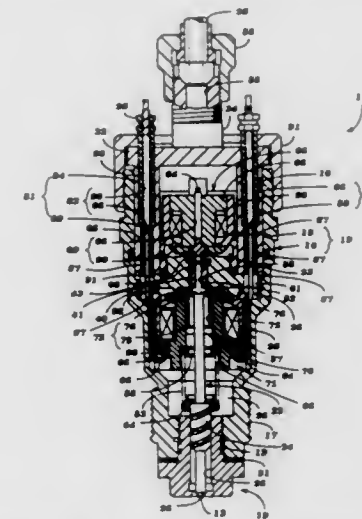
Claims priority, application Japan, Nov. 9, 1989, 1-293362
Int. Cl.⁵ F02M 47/00

U.S. Cl. 239—96

9 Claims

1. An accumulator type of injection nozzle comprising an outer housing assembly defining a cavity partitioned into an accumulator chamber adapted to be supplied with high pressure fuel and a coil chamber, a nozzle port leading from said accumulator chamber, an injection valve moveable between a closed position and an open position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injection valve for retaining said injection valve in its closed position when said control chamber is pressurized and for movement of said injection valve to its open position when pressure is relieved in said control chamber, valve means moveable between a closed position for maintaining pressure in said control chamber and an open position for relieving pressure in said control chamber for effecting fuel discharge through said nozzle port, a first electromagnet within said accumulator chamber for control-

ling the lift of said injection valve, and at least one wire passage formed in said outer housing assembly and extending axially,



and at least one feeder wire extending axially through said wire passage for energizing said first electromagnet.

5,088,648

NOZZLE HEAD FOR A PAINT SPRAY GUN

Ewald Schmon, Metzingen, Fed. Rep. of Germany, assignor to Sata-Farbspritztechnik GmbH & Co., Ludwigsburg, Fed. Rep. of Germany

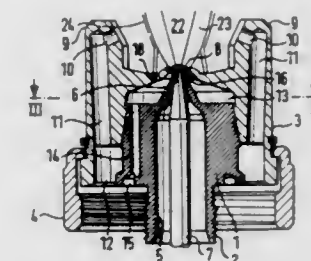
Filed Apr. 23, 1990, Ser. No. 512,316

Claims priority, application European Pat. Off., Jul. 19, 1989, 89113217

Int. Cl.⁵ B05B 1/28

U.S. Cl. 239—296

19 Claims



1. A nozzle head for a paint spray gun comprising,

- (a) a paint nozzle,
- (b) a nozzle needle for closing the paint nozzle, the paint nozzle having a small spigot,
- (c) a circular jet air nozzle surrounding the small spigot whereby the small spigot projects therefrom,
- (d) at least a pair of horn jet air nozzles diagonally inclined toward the direction of the axis of the paint nozzle,
- (e) an annulus surrounding the circular jet air nozzle,
- (f) first air supply bores connected to the horn jet nozzles extending through the nozzle head to the annulus, circular jet air nozzle,
- (g) means for supplying compressed air to the air supply bores,
- (h) a depression contained in the circular air jet nozzle for producing a conical fanning of circular jet air passing over the paint nozzle,
- (i) further air bores extending toward the front of the spray gun from the annulus surrounding the circular jet air nozzle, and
- (k) the outlet area of the circular jet air nozzle being larger by more than 50% than the total cross-sectional area of the further air bores.

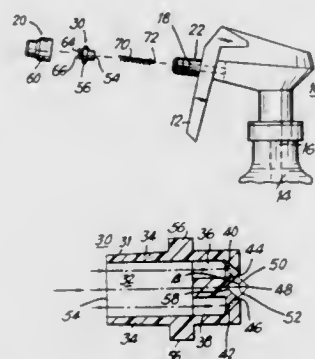
5,088,649

PUMP SPRAYABLE DISPENSING SYSTEM FOR VEGETABLE OIL BASED PAN COATINGS
H. Wayne Hanson, La Quinta, and Beauford C. Doering, Santa Ana, both of Calif., assignors to Par-Way Group, Costa Mesa, Calif.

Filed Jul. 12, 1990, Ser. No. 553,786
Int. Cl.⁵ B05B 1/26

U.S. Cl. 239—329

37 Claims



19. A hand pump sprayer of the trigger type wherein pressurized fluid is brought from a reservoir to the outlet of a delivery passageway the improvement comprising:
a nozzle assembly having an inlet end and an outlet end;
said nozzle assembly inlet interconnected with said outlet of said delivery passageway;
a first and second passageway located in said nozzle assembly to split the fluid from said delivery passageway into two streams;
each said first and second passageway having a cross sectional area less than one half the cross sectional of the delivery passageway so that the velocity of said fluid increases in the first and second passageway from its velocity in said delivery passageway;
a first and second discharge means in fluid communication with said first and second passageway said first discharge means having a first discharge axis to dispense the fluid from said nozzle assembly and said second discharge means having a second discharge axis to dispense fluid from said nozzle assembly;
said first and second discharge means including a first and second discharge outlet to separately direct the fluid flow from the first and second passageways beyond the nozzle assembly prior to the intersection of fluid flowing along the first and second discharge axis;
said first discharge axis and said second discharge axis intersecting at a collision point exterior to said nozzle assembly so that when said fluid is pumped from said reservoir and discharged to the atmosphere the fluid exiting from said first discharge means collides with the fluid exiting from said second discharge means to break the fluid into small droplets to form a wide angle mist for application to a surface.

5,088,650

FUEL INJECTOR WITH STRAINER

Takaaki Takagi, Toshiro Makimura, both of Obu, and Kenji Kurita, Nagoya, all of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

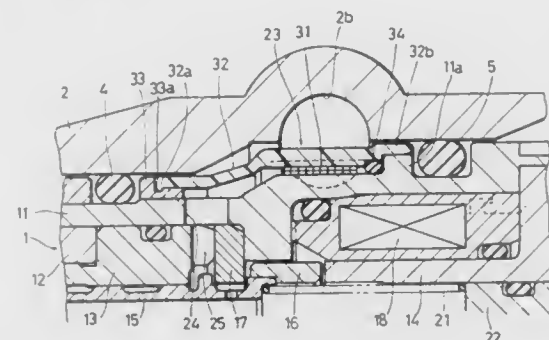
Filed Mar. 16, 1990, Ser. No. 494,539
Claims priority, application Japan, Mar. 18, 1989, 1-30966[U]
Int. Cl.⁵ B01D 35/02

U.S. Cl. 239—575

3 Claims

1. A fuel injector comprising:
an injector casing having a fuel inlet at a side portion thereof;
a valve housing having a fuel injection hole at a front end thereof and having a guide hole at an axial central portion

thereof, said guide hole being communicated with said fuel inlet;
a valve reciprocatably accommodated in said guide hole, said valve being adapted to close said fuel injection hole when advancing and open said fuel injection hole when retracting;
means for driving said valve to advance and retract said valve; and



a fuel strainer (23) mounted on an outer circumference of said injector casing (11), said strainer comprising a synthetic resin frame (32) having annular portions (32a, 32b) at front and rear ends thereof and a metal ring (33) connected to said front end portion (32a) of said frame (32) by insert molding of synthetic resin, said metal ring (33) being press-fitted with said injector casing (11) to inhibit sliding creep of said frame.

5,088,651

ROLL CRUSHER AND CRUSHING METHOD IN USE FOR THE ROLL CRUSHER

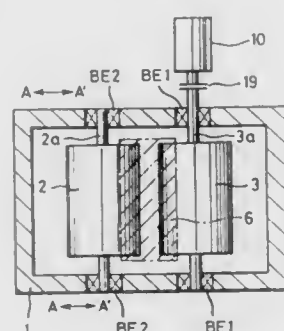
Nobuhiro Takahashi, and Fumio Takagi, both of Tokyo, Japan, assignors to Nittetsu Mining Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 364,450, Dec. 5, 1988, abandoned. This application Sep. 28, 1990, Ser. No. 590,562

Claims priority, application Japan, Apr. 28, 1987, 62-103320; Apr. 28, 1987, 62-103321

Int. Cl.⁵ B02C 4/42

U.S. Cl. 241—30

5 Claims



1. A roll crusher for crushing material comprising a pair of rolls facing each other, in which the pair of said rolls rolls feed material therebetween to crush the material,
one of the pair of said rolls being a driver roll which is driven for rotation, and
another of the pair of rolls being a follower roll, a larger capacity main motor operatively connected to the driver roll for rotating the driver roll, and
means for rotating the follower roll when the crusher is under no load and then only a light load before crushing begins, the rotating means comprising a smaller capacity auxiliary motor and means for operatively connecting the auxiliary motor to the follower roll while the crusher is being operated without crushing yet being effected so that

the follower roll rotates slower than the driver roll to forcibly entrain said material between said driver roll and said follower roll before crushing begins;
the follower roll being driven by the driver roll at the same speed as the driver roll through material being rolled in between said rolls while crushing is being effected.

5,088,652

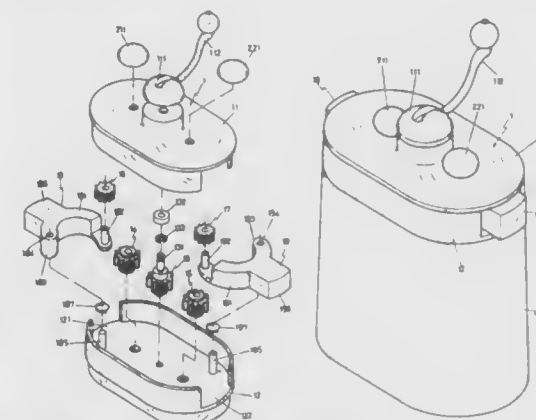
HAND PEPPER GRINDER

Tzung-Wen Chen, No. 13, Yen-Ping St., Tainan, Taiwan
Filed Mar. 1, 1991, Ser. No. 662,710

Int. Cl.⁵ A47J 42/04

U.S. Cl. 241—169.1

7 Claims



1. A hand pepper grinder comprising:
a lid consisting of an upper half lid and a lower half lid, the upper half lid having a rotatable cover screwed with a central shaft of a main gear accommodated between the upper and the lower half lid and is rotated by the handle;
a main gear accommodated in the lid and having a central shaft extending upward through the upper half lid and fixed with the rotatable cover, the central shaft having a shaft ring and a helical lock washer fitted around to keep the shaft ring from moving downward;
two auxiliary gears accommodated in the lid and located at both sides of the main gear, normally not engaging with the main gear, fixed with and penetrated through respectively by a turning rod to be rotated thereby;
two movable small gears respectively and movably fixed on a long foot of a Y-shaped press rod, and normally engaging with the auxiliary gears separately;
two Y-shaped rods having a curved long upward foot fixed with a small gear, a short curved downward foot and a body at the left extending out of an opening at the right and the left side of the lid, movably fixed between the upper half lid and the lower half lid with a shaft passing through the short curved foot upward, a retracting spring fitted around the shaft under the short curved downward foot;
two turning rods vertically positioned in two store chambers in a body, having their upper ends extending through the lid and fixed with two auxiliary gears and screwed with two buttons, and their lower ends fitted around by a spring and extending through a cylindrical base to screw firmly with two grinding wheels, the buttons can be screwed to adjust the height of the position of the grinding wheels so that the minuteness of ground pepper or salt can be adjusted;
two cylindrical bases consisting of three sections—the outer, the middle and the inner, the outer section having two inclined posts and a central hole for supporting the turning rods, the inner section having a long groove for a projecting post of a grinding cylinder to fit in to stabilize the grinding cylinder immovable, and the middle section

having a bottom plate to support the turning rods and the grinding wheels from dropping down off;
two grinding cylinders;
two grinding wheels; and
said Y-shaped rods can be manually pushed inward with the shafts inserted through their short curved foot as a pivot to push the movable small gears to engage with the main gear, said main gear can be rotated by rotating the handle united with the rotatable cover, said turning rods can be rotated by the auxiliary gears engaged with the small gears temporarily engaged with the main gear temporarily rotated by the handle being manually rotated, said grinding wheels can be rotated in the grinding cylinder by the turning rods to grind the content placed in the two store chambers in the body.

5,088,653

YARN TRAVERSING METHOD AND A DEVICE FOR CARRYING OUT THE SAME

Kenji Baba, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

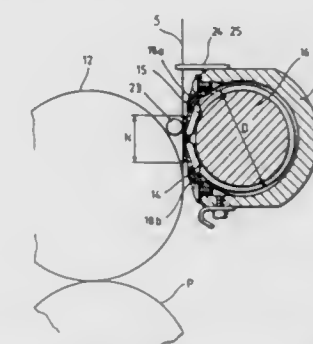
Filed Feb. 28, 1990, Ser. No. 486,437

Claims priority, application Japan, Mar. 4, 1989, 1-52508; May 19, 1989, 1-58463[U]; May 19, 1989, 1-58464[U]; Jul. 21, 1989, 1-86369[U]

Int. Cl.⁵ B65H 54/30

U.S. Cl. 242—43 R

7 Claims



1. A method for traversing yarn, the yarn defining a yarn running direction, the method comprising:
providing a rotatable cam roller comprising first and second substantially helical cam channels, the first cam channel comprising a first active groove and a first return groove, the first active groove defining an endpoint C and an endpoint E, the second cam channel comprising a second active groove and a second return groove, the second active groove defining an endpoint B and an endpoint D, providing a first yarn guide for engaging the first cam channel,
providing a second yarn guide for engaging the second cam channel,
moving the first yarn guide along the first return groove and moving the second yarn guide along the second active groove substantially concurrently,
moving the second yarn guide along the second return groove and moving the first yarn guide along the first active groove substantially concurrently,
transferring yarn from the first yarn guide to the second yarn guide when the first yarn guide is at the endpoint E and the second yarn guide is at the endpoint D, and
transferring yarn from the second yarn guide to the first yarn guide when the second yarn guide is at the endpoint B and the first yarn guide is at the endpoint C, whereby the traverse direction of the yarn is reversed substantially instantaneously when the yarn guides are at the endpoints of the active grooves.

5,088,654

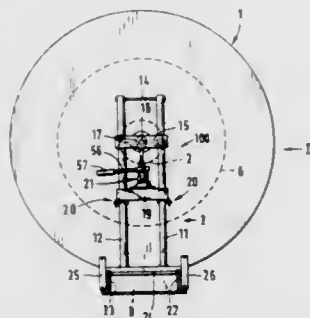
EQUIPMENT FOR LIFTING (AND LOWERING) A CABLE DRUM

Werner Cielker, Birgel, Fed. Rep. of Germany, assignor to Katimex-Cielker GmbH, Fed. Rep. of Germany
Filed May 30, 1990, Ser. No. 530,761
Claims priority, application European Pat. Off., Jun. 9, 1989, 39110434.1

Int. Cl.⁵ B65H 16/06

U.S. Cl. 242—85

16 Claims



1. A mechanism for lifting a cable drum comprising a pair of stands between which a cable drum is adapted to be positioned, each stand includes a foot and a pair of tubular cylindrical posts, an upper hollow polygonal crossbeam and a lower hollow polygonal crossbeam, said upper and lower crossbeams each having a hole in opposite end portions thereof slidably receiving an associated pair of posts, each upper crossbeam carrying a support pin adapted to enter a journal of an associated cable drum, means for selectively adjusting the position of each lower crossbeam relative to its pair of posts, a hydraulic hoist disposed between each upper and lower crossbeam for raising and lowering the upper crossbeam, its support pin and the associated cable drum, each foot having a first end portion adjacent its associated posts and a second end portion remote therefrom, wheels carried by said foot second end portions whereby said stands can be individually tilted and transported by said wheels rolling along an associated supporting surface, and each hydraulic hoist includes a piston rod engageable against a lower wall of its associated upper crossbeam.

5,088,655

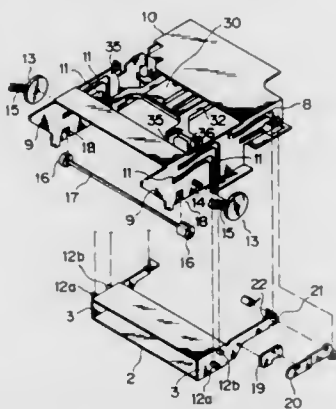
CASSETTE LOADING DEVICE

Yasuyuki Nakanishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 10, 1990, Ser. No. 507,127
Claims priority, application Japan, Apr. 11, 1989, 1-89754; May 15, 1989, 1-118751

Int. Cl.⁵ G11B 23/00

U.S. Cl. 242—198

3 Claims



1. A cassette loading device for loading a cassette from a

cassette receiving position to a cassette playing position along a cassette loading path, comprising:

- a frame;
- a cassette holder movably mounted on said frame to receive a cassette and carry the cassette between said cassette receiving position and said cassette playing position along said cassette loading path;
- a slide plate movably mounted on said frame; and
- a slide lever movably mounted on said slide plate such that said slide lever is movable into said cassette loading path to engage the cassette when the cassette is carried by said cassette holder in said cassette receiving position.

5,088,656

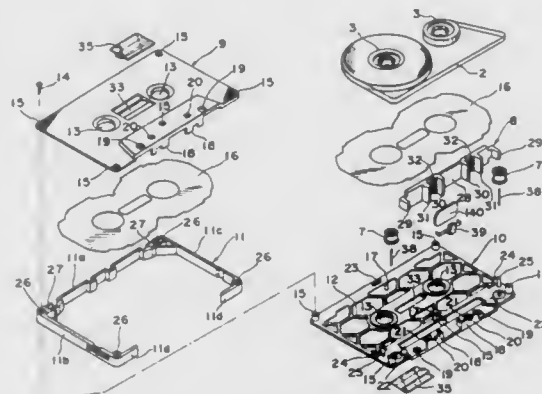
TAPE CARTRIDGE USING METAL AND PLASTIC RESIN

Osamu Yamamoto, Takatsuki; Akihiko Sato, Nagaokakyo, and Hitoshi Shiba, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Continuation of Ser. No. 411,892, Sep. 25, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 713,005
Claims priority, application Japan, Sep. 26, 1988, 63-240537; Dec. 19, 1988, 63-164798[U]; Dec. 19, 1988, 63-321624; Dec. 19, 1988, 63-321625

Int. Cl.⁵ G11B 23/87

U.S. Cl. 242—199

6 Claims



1. A tape cartridge comprising a top plate and a bottom plate both made of metal so as to provide weight and rigidity to said cartridge, and an intermediate frame made of a high elastic plastic resin material disposed between said top and bottom plates joining lateral and back sides of said top plate and bottom plate to provide flexibility to said cartridge so as to absorb and thereby suppress vibrations, said top plate, bottom plate and intermediate frame defining a tape chamber, and a tape guide block made of plastic resin material disposed at a front portion of said cartridge in said tape chamber.

5,088,657

MOTORIZED SPINNING REEL DRIVING DEVICE

A-Tien Chen, 6, Lane 71, Min Hsing St., Taichung, Taiwan
Filed Apr. 2, 1990, Ser. No. 502,676

Int. Cl.⁵ A01K 89/012

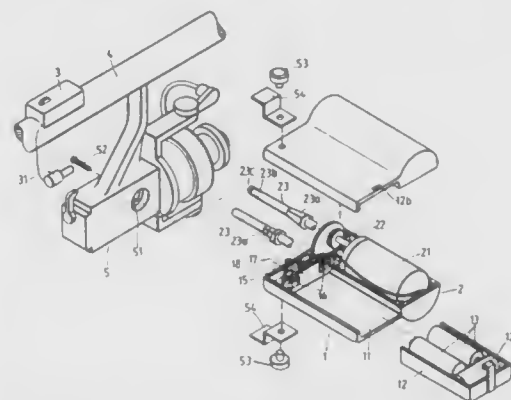
U.S. Cl. 242—225

2 Claims

1. A motorized spinning reel driving device comprising:
- a housing having a hollow, rectangular body portion incorporated with an unitary cylindrical body portion at one side;
 - a battery case received in said rectangular body portion and having set therein a plurality of dry cells connected in series by means of conductive strips wherein said rectangular body portion of said housing defines a space for holding the battery case which can be inserted and removed through an opening at one side and a retaining hole on the top adjacent to said opening, and said battery case has a vertical hook member releasably fastened in said retaining hole in said rectangular body portion, so that

said battery case can be retained in said space inside said rectangular body portion by its vertical hook member in said retaining hole;

- a motor received in said cylindrical body portion and connected to said dry cells through a conductor, said motor having a power output end;
- a reducing gear set coupled with the power output end of said motor and received in said cylindrical body portion;
- a driving shaft coupled with said reducing gear set and protruding beyond said cylindrical body portion of the



housing, said driving shaft having a hexagonal conical portion on its rear end and a cylindrical terminal end portion longitudinally extending forward from the front end of said hexagonal conical portion and defining a bolt hole on the front end of said cylindrical terminal end; wherein said hexagonal conical portion of said driving shaft is adapted to be inserted in a side hexagonal hole of a spinning reel and secured thereto by means of a screw bolt so as to drive said spinning reel to take up a fishing line by means of the operation of said motor.

5,088,658

FIN COMMAND MIXING METHOD

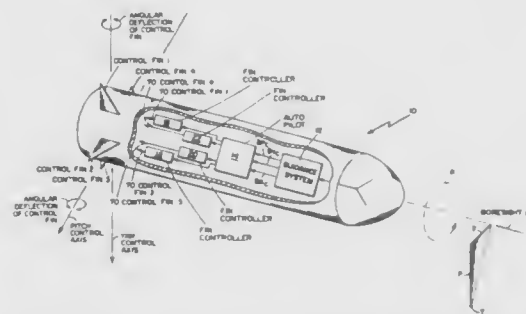
Dennes P. Forsmo, Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 20, 1991, Ser. No. 672,279

Int. Cl.⁵ F42B 10/64

U.S. Cl. 244—3.21

11 Claims



1. A method of operating a vehicle comprising the step of apportioning, in response to a pitch command and a yaw command, a roll command to at least one of a plurality of control surfaces.

5,088,659

PROJECTILE EQUIPPED WITH AN INFRARED SEARCH SYSTEM AT ITS BOW

Helmut Neff, Jürgen Heinrich, both of Hermannsburg, and Gerhard Glotz, Celle, all of Fed. Rep. of Germany, assignors to TZN Forschungs-und Entwicklungszentrum Unterlöss GmbH, Unterlöss, Fed. Rep. of Germany

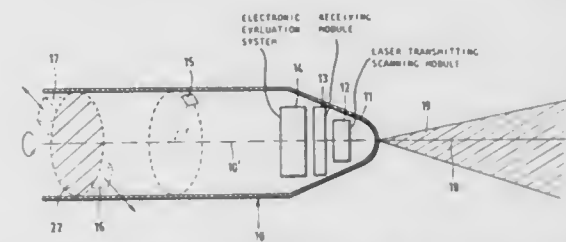
Filed Mar. 8, 1991, Ser. No. 672,656

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1990, 4007712

Int. Cl.⁵ F41G 7/26

U.S. Cl. 244—3.16

7 Claims



1. In a projectile having an infrared target seeking system at its bow, and means, responsive to signals from said target seeking system, for correcting the flight course of the projectile, with said target seeking system including means for scanning a target area; the improvement wherein: the projectile rotates about its longitudinal axis; said target seeking system includes a laser; and said means for scanning includes means for deflecting an output beam of said laser, periodically and linearly within a fixed scanning plane passing through said longitudinal axis of said projectile, so that the rotation of said projectile causes the target area to be scanned in a rosette-shaped pattern.

5,088,660

BLEED STABILITY DOOR

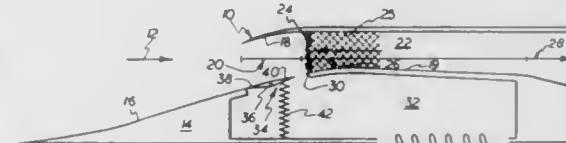
Arthur J. Karanian, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 389,432, Aug. 4, 1989, abandoned. This application Jan. 30, 1991, Ser. No. 649,284

Int. Cl.⁵ B64B 1/24

U.S. Cl. 244—53 B

4 Claims



1. In a supersonic diffuser duct receiving a flow of gas at supersonic velocity and diffusing said gas flow across a sonic shock train disposed in a throat section of the duct, the improvement comprising:

- surface pressure actuated means for preventing uncontrolled upstream movement of the shock train from within a preselected, streamwise displacement range, including a bleed opening disposed in the duct wall, the bleed opening continuously venting a portion of the gas flow from the duct immediately upstream of the streamwise displacement range,
- a hinged door, disposed adjacent the bleed opening and forming a portion of the duct wall upstream of the bleed opening, including a supporting hinge oriented transversely with respect to the gas flow,
- the door further including a surface extending upstream of the supporting hinge and forming a portion of the duct wall, wherein the door is pivotable about the hinge between a normal, closed position in which the door cooper-

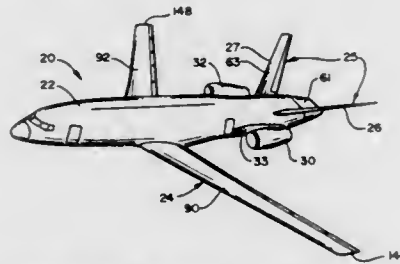
ates with the remainder of the duct wall to confine the gas therewithin, and at least one open position wherein an additional portion of the gas flow is vented, and means for biasing the hinged door in the closed position, said biasing means adapted to yield under static pressure at the door surface at a pressure level higher than a preselected wall pressure.

5,088,661 AIRCRAFT

Philip C. Whitener, Bainbridge Island, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 345,085, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 948,317, Dec. 31, 1986, abandoned. This application Apr. 11, 1990, Ser. No. 512,086
Int. Cl.⁵ B64C 13/16

U.S. Cl. 244—76 R

24 Claims



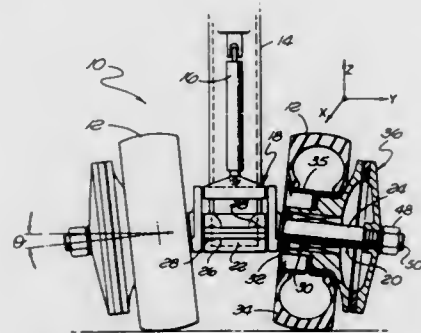
4. A high efficiency airplane which comprises: a body, a single, swept main wing having a root attached to said body, said wing extending laterally from said body and having an aspect ratio on the range of 10-14, displaceable control members at the trailing edge of said wing, and a tail at the rear of said body, the center of gravity of said airplane being on a line which passes through a point lying between 44 percent and 70 percent of the mean area chord of said swept airplane wing, said center of gravity of said airplane being sufficiently far aft of said trailing edge of said wing which is adjacent said wing root that: (a) operation of said control members which are located inboard and adjacent said body which increases the coefficient of lift of said airplane wing results in pitch-up of said airplane, and (b) operation of said control members which are located inboard and adjacent said body which reduces that coefficient of lift results in pitch-down of said airplane.

5,088,662 KINETIC ENERGY WHEEL BRAKES

Walter T. Appleberry, Long Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Dec. 11, 1989, Ser. No. 448,460
Int. Cl.⁵ B64C 25/42

U.S. Cl. 244—111

20 Claims



1. A braking device for a vehicle having a main structure with a longitudinal axis, x, defining the direction of vehicle motion, a perpendicular axis, y, and a vertical axis, z, the axes x, y, z defining an orthogonal coordinate system, said vehicle

utilizing a plurality of wheels for motion thereof relative to a surface, each wheel having an axis of rotation, comprising: support means for supporting at least one of said wheels, said support means including:
(a) bent axle means, said bent axle means being unitary, one piece and having a first axle portion being disposed parallel to said y-axis and at least one terminal axle portion angularly disposed from said first axle portion,
(b) means for rotatably engaging the first axle portion of said bent axle means, relative to said main structure, about an axis parallel to said y-axis, and
(c) means for rotatably engaging said at least one terminal axle portion of said bent axle means with said at least one wheel, said wheel thereby rotating in a plane that is not parallel to the direction of vehicle motion.

5,088,663

METHOD OF LAUNCHING PAYLOADS
Keith Henson, 1794 Cardel Way, San Jose, Calif. 95124
Filed Jun. 25, 1990, Ser. No. 543,224
Int. Cl.⁵ B64D 1/08

U.S. Cl. 244—137.4

10 Claims



1. A method of launching a payload comprising:
extending said payload on a line from an airplane;
flying said airplane so as to cause said payload to follow the path of said airplane;
turning said airplane so as to cause said payload to follow a curved path at the end of said line, said payload having a velocity greater than the velocity of said airplane, said step of turning comprising:
banking said airplane so as to cause said payload to sling outwardly; and
turning said airplane on a downward pathway, said payload accelerating upwardly relative to said airplane; and
releasing said payload from said line when said payload attains a desired velocity.

5,088,664

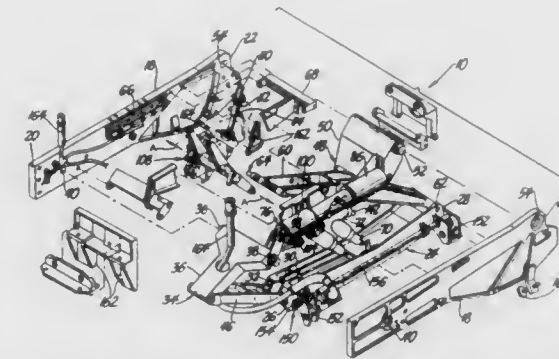
ORDNANCE EJECTOR SYSTEM FOR AN AIRCRAFT
Larry G. Ellis, Provo, Utah, and William R. Carter, Dayton, Ohio, assignors to Teleflex Incorporated, Limerick, Pa.
Filed Feb. 19, 1991, Ser. No. 657,854
Int. Cl.⁵ B64D 1/12

U.S. Cl. 244—137.4

14 Claims

1. An ordnance ejector apparatus (10) for ejecting an ordnance (16) from an aircraft (14), said apparatus (10) comprising: a support frame (18) extending between a forward end (20) and a rearward end (22) for fixed attachment to an aircraft (14); a rail (24) extending between a forward end (26) and a rearward end (28) for releasably retaining an ordnance (16) thereto; forward link means (34) pivotally connected between said forward end (20) of said support frame (18) and said forward end (26) of said rail (24) for displacing said forward end (26) of said rail (24) a predetermined distance from said support frame (18); rearward link means (48) pivotally connected between said rearward end (22) of said support frame (18) and said rearward end (28) of said rail (24) for displacing said

rearward end (28) of said rail (24) a predetermined distance from said support frame (18); an energy source; forward actuator means (76) energized from said energy source and operatively connected to said forward link means (34) for independently controlling pivotal movement of said forward link means (34); rearward actuator means (86) energized from said energy source and operatively connected to said rearward link means (48) for independently controlling the pivotal move-



ment of said rearward link means (48); and characterized by energy conduction means (102) for conducting energy from said energy source initially to said forward actuator means (76) and thereafter to said rearward actuator means (86) to initiate movement of said forward link means (34) before movement of said rearward link means (48) for initially displacing said rail (24) in a forward end (26) down condition whereby the ordnance (26) is initially ejected in a forward end down condition.

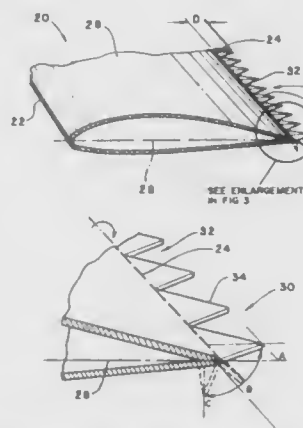
5,088,665

SERRATED TRAILING EDGES FOR IMPROVING LIFT AND DRAG CHARACTERISTICS OF LIFTING SURFACES

Paul M. H. W. Vijgen; Floyd G. Howard, both of Hampton; Dennis M. Bushnell, Wicomico, and Bruce J. Holmes, Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 31, 1989, Ser. No. 429,516
Int. Cl.⁵ B64C 21/10

U.S. Cl. 244—200

19 Claims



1. An apparatus for improving lift and drag characteristics of

a lifting surface in a fluid flow having a span, a leading edge, a trailing edge, and a chord, comprising:
a serrated panel having an upper and a lower surface and a plurality of span-wise, periodic indentations; and
a pivotal connecting means for connecting the serrated panel to the trailing edge of the lifting surface such that the serrated panel extends from the trailing edge into the fluid flow and both the upper and lower surfaces of the serrated indentations remain in contact with the fluid.

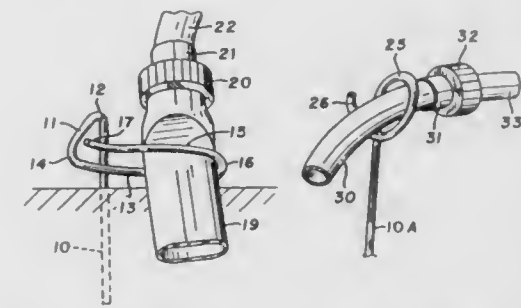
5,088,666

HOSE ANCHORS
Paul A. Lang, 7960 Grafton Ave. S., Cottage Grove, Minn. 55016

Filed Sep. 4, 1990, Ser. No. 577,036
Int. Cl.⁵ A47G 29/00

U.S. Cl. 248—87

13 Claims



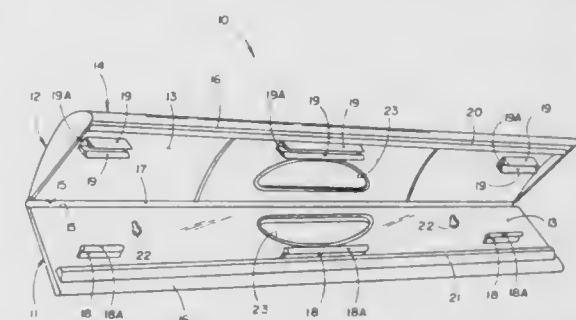
1. A lawn and garden hose anchor comprising:
A) a first elongated soil-engaging straight stiff spindle member adapted to be inserted vertically into the ground, and
B) a hose-engaging second member integral with said first member, said second member:
1) being offset laterally from the longitudinal axis of said first member, and
2) having a hose-engaging loop lying in a plane spaced from and generally parallel to the longitudinal axis of said first member, the axis of said loop lying in a plane generally perpendicular to the longitudinal axis of said first member.

5,088,667

TRASH BAG HOLDING AND SPREADING DEVICE
Ralph C. Olson, 520 Gwynnwest Rd., Reisterstown, Md. 21136
Filed Jul. 26, 1990, Ser. No. 558,661
Int. Cl.⁵ B65B 67/04

U.S. Cl. 248—101

24 Claims



23. In a trash bag holder for a trash bag, wherein the bag has an opening bounded by a peripheral edge, and wherein the holder comprises an integrally-molded unitary article having an open position and a closed position and further comprises a pair of mating portions constituting a base portion and a cover portion joined together intermediately by an integral flexible

hinge, the improvement which comprises retention means carried by the base portion and cover portion, respectively, and remote from the hinge for retaining the peripheral edge of the trash bag at the opening thereof when the holder is in its closed position, and positioning means carried by the base portion and cover portion, respectively, and between the hinge and retention means for piloting the cover portion on to the base portion as the portions are brought together towards the closed position of the holder, the positioning means further providing a locking of the cover portion to the base portion with a "snap action" therebetween and with the same manual movement in closing the holder, thereby obviating the necessity for a separate locking member or a separate manual movement to retain the cover portion to the base portion of the holder.

5,088,668
WRIST REST

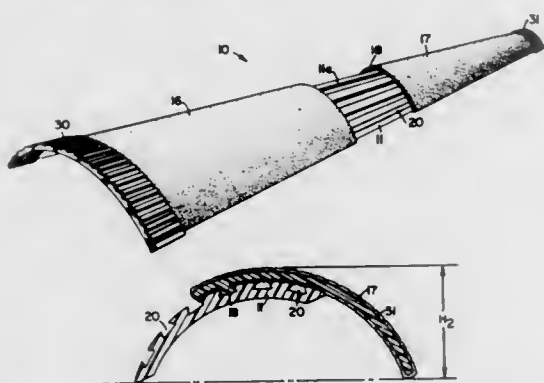
Thomas M. Grimm, Robbinsdale, Minn., assignor to Ergodyne Corporation, St. Paul, Minn.

Filed Apr. 26, 1991, Ser. No. 692,190

Int. Cl.⁵ B43L 15/00

U.S. Cl. 248—118.3

15 Claims



1. A wrist rest for supporting a user's wrist, said wrist rest being positioned on a generally planar surface, said rest comprising:

- (a) a generally cylindrical sector support member having an outer surface and an inside surface;
- (b) a generally cylindrical sector base member having an outside surface and an inner surface, said inside surface of said support member positioned proximate said outside surface of said base member, said members substantially concentric; and
- (c) means for locking said members in a plurality of relative positions after relative rotational movement between said members, thereby defining a plurality of radial heights of said wrist rest with respect to the planar surface.

5,088,669
FURNITURE EXTREMITY

Jerry Zinnbauer, Charlotte, N.C., assignor to Technimark, Inc., Greensboro, N.C.

Filed Apr. 15, 1991, Ser. No. 685,824

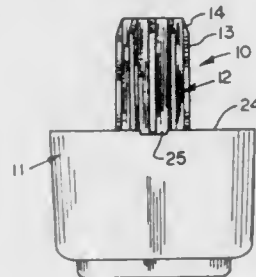
Int. Cl.⁵ A47B 91/00

U.S. Cl. 248—188.9

20 Claims

1. A furniture extremity for mounting on a furniture leg which has a bottom face with a hole comprising:
- a body for ground engagement,
 - a stem extending from said body and having a plurality of radially extending ribs thereon, said ribs having profiles, which are asymmetrical about a vertical radial plane through their midsections and which differ from one rib to another,
- whereby said stem may be inserted into the hole in the

furniture leg so that said ribs engage the inside face of the hole and the differing asymmetrical profiles of the ribs



inhibit rotation of the extremity in the hole in either direction.

5,088,670

CLIP FOR SECURING LENS ELEMENTS IN LIGHT FIXTURES

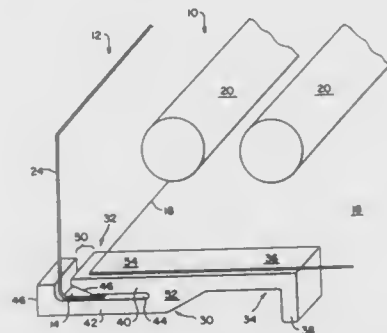
Graham W. Taylor, 1037 Donwood Drive, Victoria, British Columbia, Canada V8X 4G3

Filed Aug. 22, 1990, Ser. No. 571,222

Int. Cl.⁵ F21V 17/00

U.S. Cl. 248—225.1

12 Claims



1. A clip for securing a lens within a light fixture comprising:
- a jaw portion which securely fastens said clip to a frame of said light fixture;
 - a tail portion longitudinally extending from said jaw portion and away from said frame in the horizontal direction, wherein said tail portion includes a flattened surface onto which said lens is freely laid and a downturned portion to facilitate removal of the clip from the light fixture.

5,088,671

RETAINING DEVICE FOR A SENSOR OF A REVOLUTION COUNTER OF A CYCLING VEHICLE

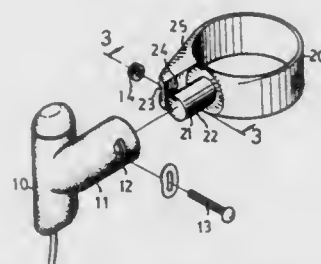
Hsi L. Chen, No. 171, Wu Chuan Wu St., Taichung, Taiwan

Filed Jun. 3, 1991, Ser. No. 710,376

Int. Cl.⁵ E04G 3/00

U.S. Cl. 248—229

2 Claims



1. A retaining device for coupling a sensor of a revolution counter to a frame fork of a cycling vehicle comprising a

sleeve formed integral with said sensor, said sleeve including a pair of oblong holes oppositely formed therein, a clamp ring engageable on said frame fork and including a first end and a second end, a rod radially extended outward from said first end of said clamp ring and having an aperture formed therein, a lug formed in said second end of said clamp ring and having a hole formed therein, and a bolt extended through said oblong holes of said sleeve and said aperture and said hole of said clamp ring, and said sleeve being rotatable relative to said rod before said bolt is fixed in place so that an angular position of said sleeve can be adjusted.

5,088,672

CIRCUMSCRIBING SIGN CLAMP AND METHOD OF FABRICATION

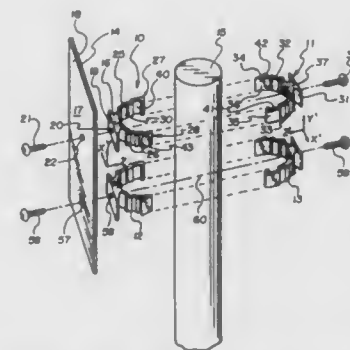
Paul A. Neuendorf, 7 Boyd St., Doncaster, Victoria, Australia 3108, and John A. Petrie, 5 Carters Lane, Seville, Australia 3139

Filed Jan. 2, 1991, Ser. No. 636,748

Int. Cl.⁵ F16B 9/00

U.S. Cl. 248—230

12 Claims



1. A circumscribing clamp useful for attaching a sign or other structure to a post or other support structure permitting circumferential positioning of the clamp there around, said clamp comprising:

- (1.1) a first clamp member having a central base section positioned in a first plane of reference and first and second wing sections respectively attached at opposing sides of the base section and extending forward from the base section with a directional component along a second plane of reference which is orthogonal with respect to the first plane, said wing sections having corresponding first and second distal ends and an intermediate, internal face therebetween;
- (1.2) a second clamp member having a central base section positioned in a third plane of reference which is parallel with the first plane of reference and first and second wing sections respectively attached at opposing sides of the base section and extending forward from the base section with a directional component along a second plane of reference which is orthogonal with respect to the first plane and third planes, said wing sections having corresponding first and second distal ends and an intermediate, internal face therebetween;
- (1.3) said first distal ends including first interlock means and said second distal ends including second interlock means, said first and second interlock means being configured for unidirectional interlocking engagement along a single engagement orientation parallel with the second plane, which interlocking engagement is stabilized by imposition of opposing counter forces along the single engagement orientation and between the respective interlock means; and
- (1.4) counter force imposing means coupled to at least one of the respective bases of the first and second clamp members and being operable to generate the opposing counter forces along the engagement orientation for stabilizing the

interlocking engagement of the first and second clamp members.

5,088,673

CUP ADAPTER FOR USE IN CYLINDRICAL SOCKETS

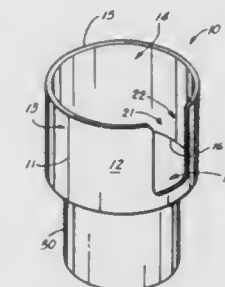
Cynthia Chandler, 114 Elodie Ave., Harahan, La. 70123

Filed Sep. 28, 1990, Ser. No. 590,296

Int. Cl.⁵ A47K 1/08

U.S. Cl. 248—311.2

5 Claims



1. A generally cylindrical adapter for use with enlarged generally cylindrical drinking articles such as enlarged mugs, insulated drinking articles and the like comprising:

- a) an enlarged receptacle member having an uppermost outer vertical side wall circumferencing a cylindrical socket, and the socket having a central vertical axis;
- b) a lower, smaller diameter pedestal with a vertical axis and having an outer diameter that is smaller than the inner diameter of the socket, the upper portion of the pedestal having an annular shoulder that communicates with the top portion of the receptacle member;
- c) the upper side wall including a slot that is open at its top portion for accommodating a handle of a mug; and
- d) removable sleeve means affixable to the pedestal for adapting the pedestal to a rectangular or cylindrical receptacle of a moving vehicle; and wherein the receptacle and pedestal axes are vertically aligned.

5,088,674

BRACKET FOR WALL MOUNTING A COMPACT DISK CASE

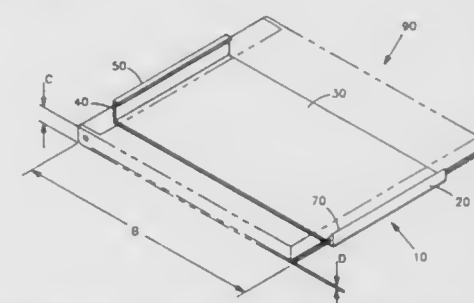
Kevin R. Prince, San Juan Capistrano, Calif., assignor to Vertical Designs, Inc., Newport Beach, Calif.

Filed Jul. 23, 1990, Ser. No. 557,160

Int. Cl.⁵ A47K 1/08

U.S. Cl. 248—311.2

3 Claims



1. A bracket for supporting a compact disk case on a vertical mounting surface, the case having two opposite vertical sides defining a case width and a hinged cover such that the cover may be moved between a closed position for covering the case, and an open position, through an arc of 180 degrees, the cover lying to one side of the case when the cover is in the open position, comprising:

- a planar for attachment to the mounting surface; a first and a second resilient arms attached to the base at opposite sides thereof, the arms extending away from the mounting

surface, clearance between the arms being approximately the same as the case width, the end of each arm having a lip, the lips extending toward each other, clearance between the lips and the base being slightly less than the thickness of the case at each lip, such that with the case inserted between the arms, the arms being located at said opposing vertical sides of the case, the case forces the lips to flex generating a restoring force within each arm, whereby the case is prevented from sliding downward by the gripping action of the lips on the case, the lips preventing the case from falling out of the bracket.

5,088,675

OVERHEAD HANGER

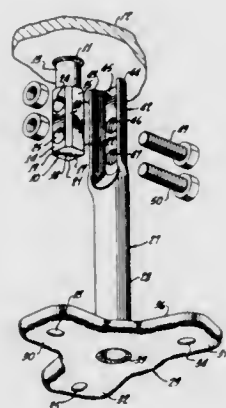
Frederick Perrault, 1727 Date Ave., Torrance, Calif. 90503, and Raymond E. Perrault, 3845 Crest Rd., Rancho Palos Verdes, Calif. 90274

Filed Nov. 13, 1990, Ser. No. 611,767

Int. Cl.⁵ F16L 3/00

U.S. Cl. 248—327

5 Claims



1. In combination with a stud attached to a supporting surface, said stud having a lower portion provided with four flat sides interconnected by finite convexly rounded corners, and having at least one opening extending transversely therethrough and interconnecting two of said flat sides,

- a supporting device comprising
 - a first member
 - a second member carried by said first member,
 - said second member being adapted to be connected to a device to be supported,
 - said first member being tubular,
 - one end portion only of said first member being collapsed to provide two opposed contiguous walls, and being generally U-shaped so as to provide a substantially flat central part and two opposite curved side flanges, said substantially flat central part substantially complementarily overlying one of said flat sides of said stud, said curved side flanges substantially complementarily overlying two of said corners,
 - said end portion of said first member having at least one opening therethrough aligned with said opening in said stud, and
 - a fastener extending through said opening in said first member and said opening in said stud for thereby connecting said first member to said stud.

5,088,676

COMPACT HEIGHT ADJUSTABLE BASE FOR A DISPLAY

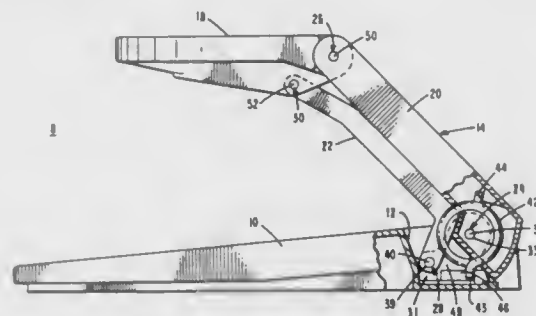
Anthony R. Orchard, Wantagh, and Brian K. Fisher, Douglaston, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 30, 1988, Ser. No. 213,879

Int. Cl.⁵ F16M 11/00

U.S. Cl. 248—421

16 Claims



1. A height adjustable base for supporting a display, comprising:
- a base having a recess therein;
 - a bracket mounted in said recess and fastened to said base;
 - a first hinge joint and a second hinge joint attached to said bracket;
 - a first arm connected at a lower end to said first hinge joint;
 - a first hinge pin connecting said first hinge joint to said lower end of said first arm;
 - a second arm, located below said first arm, connected at a lower end to said second hinge joint;
 - a second hinge pin connecting said second hinge joint to said lower end of said second arm;
 - a mounting platform;
 - said mounting platform having a concave surface therein for mounting a display with a rounded tilt and swivel portion;
 - a third hinge joint and a fourth hinge joint attached to said mounting platform;
 - said first arm connecting to said third hinge joint at an upper end thereof;
 - a third hinge pin connecting said third hinge joint to said upper end of said first arm;
 - said second arm connecting to said fourth hinge joint at an upper end thereof;
 - a fourth hinge pin connecting said fourth hinge joint to said upper end of said second arm; and
 - a torsion spring having a first end bearing against said bracket and a second end bearing against said first arm to provide a counterbalancing force supporting the display.

5,088,677

RESTRAINT APPARATUS FOR PAGES AND THE LIKE

William H. Chandler, Rte. 3, Box 1855, Ellensburg, Wash. 98926, and Francis D. Reynolds, 3060 W. Lake Sammamish Pkwy. N., Redmond, Wash. 98052

Continuation-in-part of Ser. No. 240,804, Jul. 6, 1988, abandoned. This application Dec. 11, 1989, Ser. No. 448,302

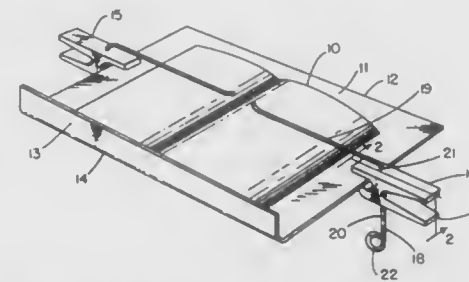
Int. Cl.⁵ A47B 97/00

U.S. Cl. 248—451

1 Claim

1. Restraint apparatus for holding leafed material in place on a planar support surface having at least one edge, said leafed material having a width, said apparatus having a relaxed state and an engaged state and comprising:
- a resilient component having a pivot portion having a pivot axis and an arm portion at an angle to each other in the range of 75 degrees to 85 degrees,
 - means for attaching said apparatus to said at least one edge and supporting said resilient component,
 - said means for attaching having a hole having an axis, said means for attaching comprising clamping means which

further comprises a tab having a center portion and a tip, said tab and said tip being disposed such that said tip is opposite said center portion, whereby, when said means for attaching is attaching said apparatus, said center portion is firmly held essentially parallel to said surface, said resilient component being supported by said means for attaching by said pivot portion in said hole and pivotable and slidable in said hole, whereby said resilient component is attached to said surface by said means for attaching with said pivot axis in a plane essentially perpendicular to said planar surface and with capability for slidable and rotatable adjustments of the position of said resilient component with respect to said surface, said slidable adjustment being adjustment of said distance by sliding said pivot portion in said hole and



said rotatable adjustment being rotation of said arm portion with respect to said surface and rotation of said pivot portion in said hole, whereby said resilient component is put into said engaged state from said relaxed state by said sliding of said pivot portion in said hole toward said surface such that said arm contacts said leafed material over virtually all of said width and said angle in the range of 75 degree to 85 degree is increased to an angle in the range of 85 degrees to 95 degrees; and whereby said axis of said hole in said means for attaching and said pivot axis lie in a plane perpendicular to said surface and said axes are disposed at an angle to said surface in the range of 80 degrees to 89 degrees, whereby when said arm is rotated out of said plane, the arm moves away from said leafed material.

5,088,678

MULTI-STATION EASEL

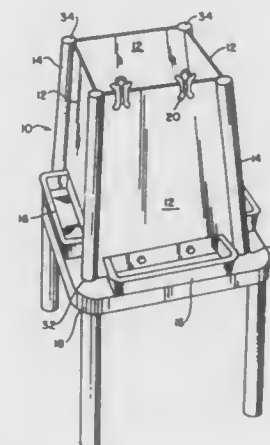
Nachum Bitan, 21 Bunker Hill Dr., Toms River, N.J. 08755

Filed Jul. 25, 1990, Ser. No. 557,686

Int. Cl.⁵ A47B 97/08

U.S. Cl. 248—460

12 Claims



1. An easel for simultaneous use by more than one person comprising:
- a) four substantially identical side panels, each having a

substantially planar front face and rear face, a bottom edge, a side edge and another side edge, said side edges being equal in length and being displaced an equal number of degrees from said bottom edge, said edges forming at least a portion of the periphery of each of said panels, said planar faces of each of said panels having a trapezoidal profile;

- b) each of said panels having disposed proximate to said side edge thereof means for removably interlocking with mating interlocking means disposed proximate said another side edge of another said panel of said four panels, said four panels when interlocked forming a hollow polyhedron with an open bottom, said interlocking means including at least one tab projecting in the plane of said panel from said side edge, said tab partially separated from said panel for a portion of the length of said tab by a notch extending parallel to said side edge, said notch having a width approximating the thickness of said panel from said front face to said back face, said mating interlocking means including at least one slot-like orifice into which said tab may be slideably introduced, said notch accommodating said panel proximate said orifice when said panels are interlocked, said panels when interlocked each being inclined inwardly away from the vertical in the direction from said bottom edge to a top edge of said trapezoidal panel, said top edges of said panels providing said polyhedron with an open top; and
- c) means for removably covering said side and said another side edges of said interlocked panels at a juncture of said panels and external to said hollow polyhedron after said panels have been interlocked, said covering means restraining said panels from becoming disengaged and including a hollow, substantially cylindrical member having an open end and a closed end and a slot extending from said closed end to said open end permitting said cylindrical member to slide over and cover said juncture of said interlocked panels, said cylindrical member including a pair of channels formed by partitions extending inwardly from the interior of said cylindrical member, said channels slideably receiving therein said side edge and said another side edge of a pair of interlocked panels when said covering means is slid over said juncture of a pair of interlocked panels, said closed end abutting said upper edge of said interlocked panels proximate said juncture.

5,088,679

MIRROR CASE POSITIONING DEVICE FOR DOOR MIRROR OF AUTOMOBILE

Morihiko Ogasawara, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

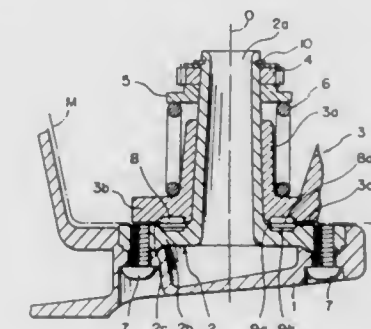
Filed Mar. 19, 1991, Ser. No. 671,952

Claims priority, application Japan, Mar. 19, 1990, 2-69219

Int. Cl.⁵ G02B 7/18

U.S. Cl. 248—479

6 Claims



1. A door mirror for use in an automobile comprising: support means to be secured on a door of the automobile,

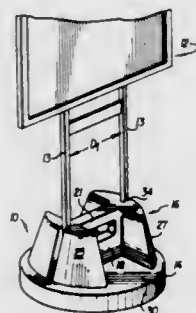
mirror case means rotatably mounted on the support means, and
positioning means which includes a first means arranged on one of the support means and the mirror case means and a second means arranged on the other of the support means and the mirror case means, the first and second means cooperating with each other such that they, on one hand, hold the mirror case means at least in a normal position and, on the other hand, permit the mirror case means to rotate between the normal position and a rest position, the first means comprising a first friction member having a friction face,
the second means comprising a second friction member having a friction face to be in contact with the friction face of the first friction member, and a vibration element cooperating with the second friction member and connected to a supersonic generator.

5,088,680

WEIGHTED SIGN BASE

Kenneth R. Farmer, 2397 Church Rd., Smyrna, Ga. 30080
Filed Mar. 11, 1991, Ser. No. 667,488
Int. Cl.⁵ F16M 13/00
U.S. Cl. 248—523

16 Claims



1. A base for supporting a sign having at least two spaced posts, said base being formed as one unitary part of a resilient material, said base part having a wall defining an interior cavity for containing a fluent ballast material, means in the wall of said base part for filing the cavity with the ballast material, means on said base part for gripping said posts and means on said base part defining a handle adapted to be grasped with a hand for lifting and transporting the sign base, said post gripping means comprising a pair of slots in said base part, each of said slots frictionally engaging a respective one of said two posts and supporting the sign.

5,088,681

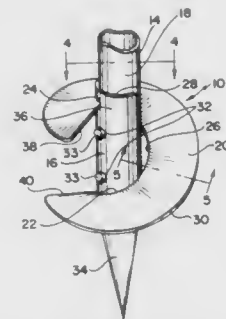
ANCHOR DEVICE

Rudolph J. Procaccianti, 134 Kenyon Ave., East Greenwich, R.I. 02818, and Bartolo Rizzo, Providence, R.I., assignors to Rudolph J. Procaccianti, East Greenwich, R.I.
Filed May 17, 1991, Ser. No. 702,593
Int. Cl.⁵ A01K 97/10
U.S. Cl. 248—530

2 Claims

1. Anchor device for use with a beach umbrella or the like having a pointed stake, comprising
(a) an elongated main body having a semi-circular cross-sectional shape;
(b) means fastening said body to the surface of the stake adjacent to but spaced from the pointed end thereof

whereby the pointed end is exposed for penetration into the ground;
(c) a helical flight; and



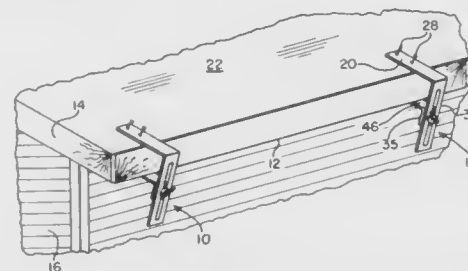
(d) means fastening said flight to the outer surface of said body at two longitudinally spaced positions, which positions are adjacent the extremities of said flight.

5,088,682

FACIA INSTALLATION HOLDER

Ronald F. Gibbs, 7019 Clark Rd., Pulaski, N.Y. 13142
Filed Jun. 5, 1989, Ser. No. 361,247
Int. Cl.⁵ F16M 13/00
U.S. Cl. 248—542

10 Claims



1. A device for holding a facia board in a position for attachment to a building, comprising:
a generally L-shaped member including a first leg having a planer mounting surface adapted to engage against a flat external surface of a roof deck of the building proximate an edge of the roof, said first leg including at least one aperture for receiving a fastener there through to be driven into said roof deck, said L-shaped member including a second leg extending from the first leg disposed adjacent the attachment position with the first leg attached to the external surface of said roof deck; and
a support member extending from said second leg disposed beneath the attachment position with the first leg attached to the external surface of the roof deck said support member mounted to said second leg for selective positioning at a plurality of different positions spaced from said first leg to accommodate a plurality of facia boards having different widths.

5,088,683

BREAKAWAY POLE ASSEMBLY

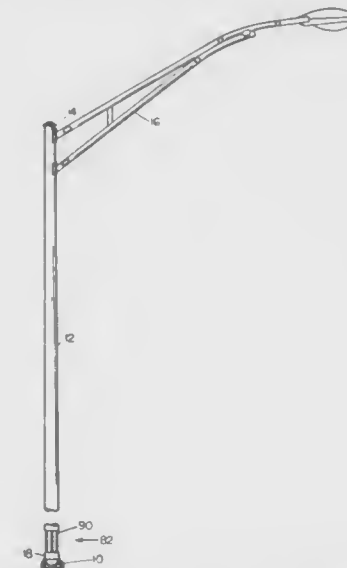
C. Richard Briden, Bound Brook, N.J., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Apr. 18, 1990, Ser. No. 510,726
Int. Cl.⁵ F16M 13/00
U.S. Cl. 248—548

14 Claims

1. A breakaway apparatus for anchoring a standard to a foundation comprising:
a base having support means for supporting the standard, a plate for anchoring to the foundation, and a plurality of pairs of angular gussets, each pair having first and second angular gussets extending from said plate to said support means;

a connection point disposed in said plate between said first and second angular gussets of each of said pairs for connecting said plate to the foundation;
said plate having a reduced thickness in an area located between said connection point and said first angular gusset, in an area located between said connection point and said second angular gusset, and in an area located between

to a longitudinal axis of said holder and extending laterally from said base for insertion into a bottom of a cigarette packet; and
said extension having a longitudinal U-shaped slot producing a resilient longitudinal flap fully within said extension for use in keeping said extension in contact with the bottom of the cigarette packets.



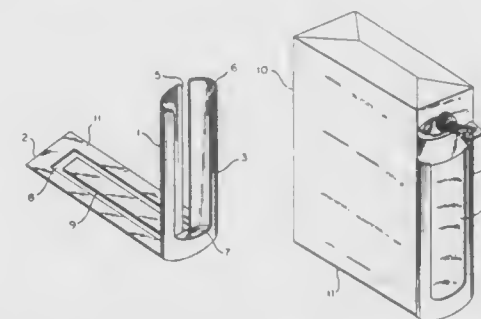
said connection point and said support means, said areas not extending to a periphery of said plate;
said reduced thicknesses weakening said plate adjacent each said connection point whereby upon a bending moment being applied to the standard and thus said base, said plate shears at said reduced thickness allowing said support means to breakaway from said foundation.

5,088,684

LIGHTER-HOLDER FOR CIGARETTE PACKET

Gabriel Torras, and Felipe Camacho, both of Barcelona, Spain, assignors to Mar Planet, S.A., Sabadell, Spain
Filed Dec. 17, 1990, Ser. No. 628,686
Claims priority, application Spain, Dec. 18, 1989, 8903775[U]
Int. Cl.⁵ A24F 13/00
U.S. Cl. 248—682

1 Claim



1. A lighter holder for cooperation with the bottom of cigarette packets and conventional lighters comprising:
a laminated resilient holder element with a size and shape corresponding to that of a conventional lighter;
said holder having a base at a bottom of said holder, an inner side adapted to be adjacent to a cigarette packet, and an outer side;
said inner side of said holder having a vertical slot for resilient expansion of said holder;
said outer side of said holder having a wide vertical cut-out for revealing lighters;
an extension plate integrally fixed to said base, perpendicular

1. In a gas cylinder having a narrowed top portion provided with external threads of a diameter substantially less than the diameter of the gas cylinder and adapted to releasably receive internal threads formed on the skirt of a protector cap, the improvement comprising:

a removable unitary ring adaptor having a circular collar provided with an upper portion and a lower portion,
a radially projecting ring plate on said ring adaptor intermediate said upper and lower portions and having a diameter substantially greater than the gas cylinder top portion to provide a clearance therebeneath fully throughout its circumference,
said ring adaptor lower portion having internal threads matching in diameter the internal threads on the skirt of the protector cap and mating with and engageable with the external threads on the gas cylinder top portion, and
said ring adaptor upper portion having external threads matching in diameter the external threads on the gas cylinder top portion and mating with and engageable with the internal threads on the skirt of the protector cap, whereby

a protector cap attached to a gas cylinder with its internal threads engaging the external threads on the gas cylinder top portion may be removed and said ring adaptor attached to the gas cylinder by engagement of said lower portion internal threads with the gas cylinder top portion external threads and the protector cap attached to said ring adaptor with the protector cap internal threads engaging said external threads on said upper portion, and said ring plate thereby providing engageable means by which the attached gas cylinder may be lifted, transported and stored.

5,088,685

GAS CYLINDER RING ASSEMBLY

Frank S. Salvucci, Sr., 1401 E. Palm, El Segundo, Calif. 90245
Filed Feb. 5, 1991, Ser. No. 650,600
Int. Cl.⁵ F16M 13/00
U.S. Cl. 248—682

5 Claims



5,088,686

BUBBLE PACK PLASTIC FILMS AS PATTERNS FOR PRODUCING DIMPLED EFFECTS IN CAST CERAMIC PIECES

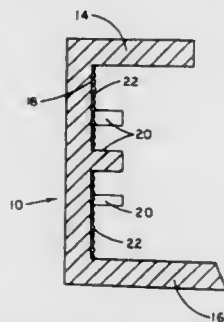
Madjid Soofi, St. Charles, Ill., assignor to Magneco/Metrel, Inc., Ill.

Division of Ser. No. 552,865, Jul. 16, 1990. This application May 6, 1991, Ser. No. 695,666

Int. Cl.⁵ B28B 7/36; B29C 33/46

U.S. Cl. 249—112

1 Claim



1. A mold for producing cast alumina tundish baffles, which comprises an open top and mold having an open top and a bottom and having positioned on its bottom patterns for producing openings in the alumina tundish baffles and positioned around said openings and filling the bottom of the mold a layer of bubble pack for producing high surface area dimples on said alumina tundish baffle which are useful in removing inclusions from molten steel in contact with said baffle.

5,088,687

BALL VALVE SEAT FOR HIGH TEMPERATURE SERVICE

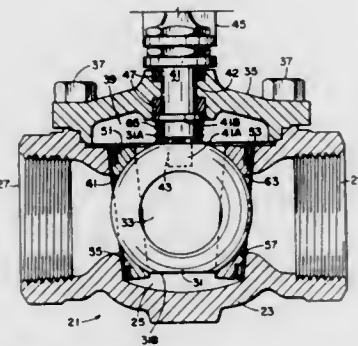
Carl H. Stender, 10709 Timbergrove Ln., Corpus Christi, Tex. 78410

Filed Sep. 19, 1990, Ser. No. 585,297

Int. Cl.⁵ F16K 5/06

U.S. Cl. 251—174

22 Claims



12. A ball valve comprising:

a valve body having a ball receiving cavity with aligned inlet and outlet passages leading to and from said cavity; a ball rotatable supported in said cavity between said inlet and outlet passages and having an opening therethrough which, in one position, is in co-axial alignment with said inlet and outlet passages;

first and second ring-shaped seats located in said valve body on opposite sides of and in sealed contact with said ball, a central inner surface of each said seats defining a portion of said inlet and outlet passages respectively, each seat defined by a front, ball side and a back, valve body side, each of said seats comprising, a concave seating surface on said ball side to sealably engage with said ball,

a groove around the outer periphery thereof between said ball side and said valve body side, a bead around the outer surface of said valve body side for contact therewith,

said valve body side having a co-axial groove between said bead and a co-axial flat portion, said bead extending beyond said coaxial groove and said flat portion whereby said bead contacts said body, and said flat portion initially being spaced from said valve body.

5,088,688

FIXED PLATE FOR A HYDRAULIC VALVE, PROVIDED WITH MEANS FOR EJECTING CHIPS

Francesco Knapp, Pavia, Italy, assignor to Studio Tecnico Sviluppo e Ricerche S.T.S.R. s.r.l., Lacchiarella, Italy

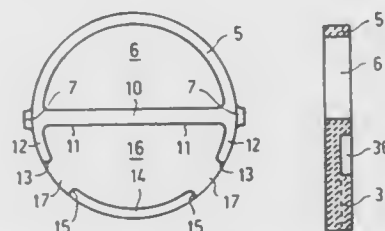
Filed Jan. 31, 1991, Ser. No. 648,368

Claims priority, application Italy, Feb. 13, 1990, 67103 A/90

Int. Cl.⁵ F16K 3/00

U.S. Cl. 251—304

7 Claims



1. In a fixed plate of a hard material for a hydraulic valve, having a plate center, a plate periphery and a lapped working face, and comprising a passage opening asymmetrically located with respect to said plate center, a portion of said lapped working face which surrounds said passage opening and a portion of said lapped working face, opposite said passage opening with respect to said plate center, which is situated at the same level as said portion surrounding the passage opening, the improvement that the fixed plate has a surface portion, spaced from said passage opening, which is recessed with respect to said lapped working face, all of this recessed surface portion being open towards said plate periphery and said fixed plate having no recessed surface portion which is not entirely open towards said plate periphery.

5,088,689

REMOVABLE DISCHARGE SLEEVE IN A DISK VALVE

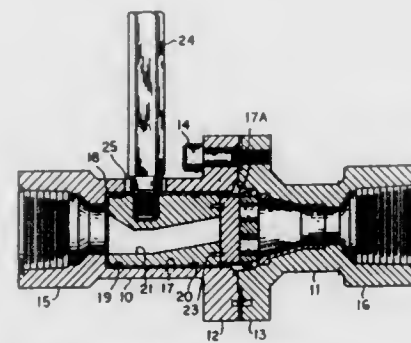
Fred W. Hendricks, Cerritos, Calif., and Bobby Brooks, Midland, Tex., assignors to Automatic Control Components, Inc., Denver, Colo.

Continuation of Ser. No. 264,900, Oct. 31, 1988, abandoned. This application Dec. 14, 1989, Ser. No. 450,549

Int. Cl.⁵ F16K 5/00

U.S. Cl. 251—304

11 Claims



1. A valve including the combination of:

5,088,691

HYDRAULIC APPARATUS INCLUDING A HYDRAULIC FLUID FLOW CONTROL CARTRIDGE

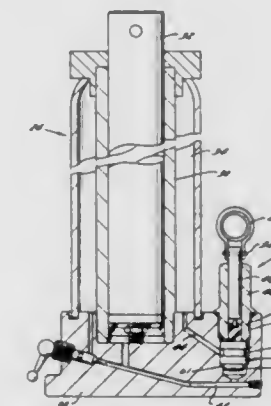
Charles E. Naber, and James B. Ballard, both of Waukesha, Wis., assignors to Hein-Werner Corporation, Waukesha, Wis.

Continuation of Ser. No. 872,200, Jun. 6, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 104,333

Int. Cl.⁵ B60P 1/48

U.S. Cl. 254—8 R

23 Claims



1. A hydraulic fluid flow control cartridge for use with a hydraulic fluid pump and for controlling flow of hydraulic fluid between a reservoir and the hydraulic fluid pump and from the hydraulic fluid pump to a fluid pressure chamber, the hydraulic fluid pump including a pump bore, a pump cylinder housed in a portion of the pump bore, the pump cylinder housing a reciprocable pump piston, and the hydraulic fluid flow control cartridge comprising:

a cartridge body adapted to be housed in a second portion of the pump bore adjacent the pump cylinder and separable from the pump cylinder, the cartridge body including a first cartridge passage having a first check valve means for selectively providing for fluid flow from the hydraulic fluid reservoir to the hydraulic fluid pump, said first check valve means including means for preventing fluid flow from said hydraulic fluid pump to the reservoir,

a second cartridge passage having second check valve means for selectively providing for hydraulic fluid flow from said hydraulic fluid pump to said fluid pressure chamber but preventing fluid flow from said fluid pressure chamber to said hydraulic fluid pump, and

means responsive to the hydraulic fluid pressure in the pump for automatically causing hydraulic fluid in the hydraulic fluid pump to be vented to the reservoir whenever the hydraulic fluid pressure in the pump exceeds a selected maximum hydraulic fluid pressure, the means for selectively venting including a third cartridge passage.

5,088,692

HEAVY DUTY STAPLE REMOVER

Raywood C. Weiler, 178 Zacharia Dr., Cathedral City, Calif. 92234

Continuation of Ser. No. 577,200, Sep. 4, 1990, abandoned. This application May 24, 1991, Ser. No. 707,273

Int. Cl.⁵ B25C 11/00

U.S. Cl. 254—28

17 Claims

1. A staple remover for disengaging embedded staples having a concealed back surface and an exposed back surface, comprising:

a handle having a working end and a manipulating end; a lever having a working end and a manipulating end; means pivotally joining the handle and the lever proximate to their respective working ends; a pair of generally parallel elongate spaced apart anvils connected to the working end of the handle, the anvils

a valve body having an internal cavity with an inlet and outlet for fluid;

a rotator spool seated for rotational movement in the cavity of said valve body at a spaced location upstream of the fluid outlet, said rotator spool having a passageway in continuous fluid receiving communication with the inlet for directing fluid to the outlet of the valve body;

an upstream disk locked to rotate with said rotator spool in the cavity of said valve body downstream of said rotator spool, said upstream disk having a fluid passageway for conducting fluid from the fluid passageway of said rotator spool;

a downstream disk arranged in a face-to-face and confronting relation with said upstream disk in the cavity of said valve body, said downstream disk having a fluid passageway for conducting fluid from the fluid passageway in said upstream disk;

a tubular insert interlocked with said downstream disk while supported in said valve body for conducting fluid from the fluid passageway in the downstream disk to said outlet said tubular insert including a cylindrical fluid discharge portion and upstream thereof a truncated right circular conical portion for receiving fluid from said downstream disk, said truncated right circular conical portion having protruding lug sections extending outwardly from an outside surface thereof and forming anchor sites for interlocking said tubular insert with said valve body; and

means for rotating said rotator spool while said rotator spool is seated in the cavity of the valve body to bring the passageway in the upstream disk and the passageway in the downstream disk into and out of fluid conducting relationship.

5,088,690

ELECTRODE HOLDER FOR IMMERSION-TYPE, FLOW-TYPE AND ATTACHMENT-TYPE MEASURING SYSTEMS IN ANALYTICAL CHEMISTRY

Klaus Stellmacher, Oberreichenbach, and Hans J. Oppermann, Gemmrigheim, both of Fed. Rep. of Germany, assignors to Conducta Gesellschaft Fur Meß-Und Regeltechnik MBH & Co., Gerlingen, Fed. Rep. of Germany

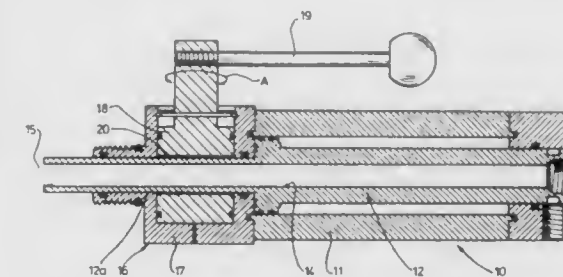
Filed Aug. 9, 1990, Ser. No. 565,375

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1989, 3927282

Int. Cl.⁵ G01N 27/28; F16K 3/24

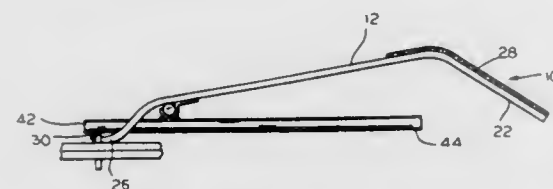
U.S. Cl. 251—309

6 Claims



1. An electrode holder for immersion-type measuring systems for measuring the parameter of an agent comprising an outer pipe, an inner pipe adapted to carry a measuring probe supported in axially sliding relationship to said outer pipe for movement toward and away from the agent, and a stopcock operable to block the supply of agent when the inner pipe is retracted from the agent, said stopcock comprising a plug having a channel receiving said inner pipe in sliding engagement therethrough, and a passage extending from said channel to the surface of said plug positioned to receive the retracted inner pipe when said stopcock is moved to the blocking position.

being spaced apart to engage substantially the lateral extremes of the concealed back surface of an embedded staple;
a rod-like tongue having a rounded surface adapted to engage the exposed back surface of a staple integral with the working end of the lever;



the tongue being disposed between the anvils and substantially parallel thereto, the tongue, in its normal position, being disposed above a plane formed by the anvils, the tongue being pivotable through the plane formed by the anvils when the lever is drawn towards the handle.

5,088,693

SELF-TAILING WINCH WITH PIVOTING TEETH

Claude Brenot, 36, Chemin de la Cybellerie, 86280 Saint-Benoît, France

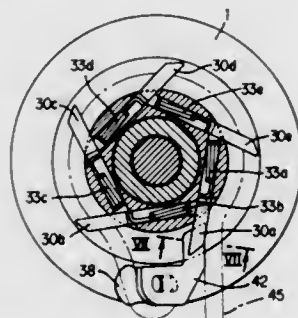
Filed Mar. 28, 1990, Ser. No. 501,808

Claims priority, application France, Apr. 5, 1989, 89 04487

Int. Cl.⁵ B66D 1/22, 1/30

U.S. Cl. 254—344

10 Claims



1. A self-tailing winch with pivoting teeth comprising a fixed support constituting a base, a drum mounted to rotate about the fixed support, a vertical shaft for driving the drum in rotation and connected thereto via a transmission including a step-down gear train, and automatic clamping means for clamping cable or rope wound around the winch, which clamping means are mounted at the top of the drum in order to form a self-tailing head for the rope, wherein the automatic cable or rope clamping means comprise a plurality of pivoting teeth distributed at the periphery of the bottom portion of a block superimposed on the top portion of the drum and constrained to rotate therewith, the top portion of the drum being provided with a groove accommodating the bottom portion of said block, said pivoting teeth being pivoted about horizontal pins imprisoned in said groove formed in the top portion of the drum, the bottom portion of said block having an outer cylindrical portion whose diameter is substantially equal to the diameter of a drive zone of the drum, said pivoting teeth being guided laterally in slots provided in said block, and springs being mounted in said block in order to exert downward pressure individually on each of the pivoting teeth which themselves exert pressure individually on the rope in order to pinch the rope against the top end of the drum, wherein a fixed casing is mounted on the fixed support and surrounds the head of the winch in such a manner as to protect the rotary portions thereof, and wherein a guide for passing rope from the drum to the self-tailing head is fixed on said fixed casing.

5,088,694

LEVER TYPE HOIST

Yosaku Nishimura, Hirakata, Japan, assignor to Vital Kogyo Kabushiki Kaisha, Osaka, Japan

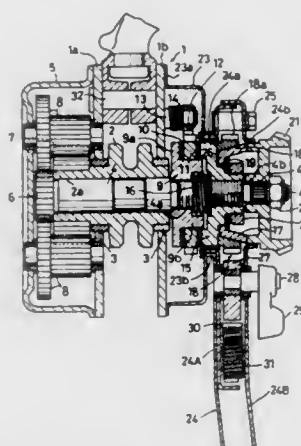
Filed Mar. 19, 1991, Ser. No. 672,109

Claims priority, application Japan, Oct. 19, 1990, 2-282669

Int. Cl.⁵ B66D 1/14

U.S. Cl. 254—352

8 Claims



1. A lever type hoist comprising a drive shaft connected to a load sheave through a geared transmission system, a pressure receiving member fixed on the drive shaft, a presser drive member threaded on the drive shaft for movement in the axial direction when rotated relative to said drive shaft, driving force transmission means between the presser drive member and the pressure receiving member for transmitting rotational force in the lifting direction of the load sheave from the presser drive member to the pressure receiving member, a conical frictional member comprising means for connection thereof with the presser drive member in the axial movement thereof and having an external conical face, a rotational force transmission member having a conical hole for selective frictional contact with the external conical face of the conical frictional member and having means for connection with an operating lever, an operating wheel non-rotationally connected by splines to the drive shaft and being close to the conical frictional member, the operating wheel and the conical frictional member comprising means for rotational connection thereof in the direction of rotation in a first axial position of said conical friction member and for disconnection thereof in a second axial position of said conical friction member, and means for causing, when the load sheave is rotating freely, rotational connection of said operating wheel and said conical friction member before the rotational force transmitting member moves in the axial direction to engage other component members of said hoist.

5,088,695

IRON RUNNER

Jacobus Van Laar, Drieheuis, Netherlands, assignor to Hoogovens Groep BV, IJuiden, Netherlands

Filed Mar. 5, 1991, Ser. No. 664,680

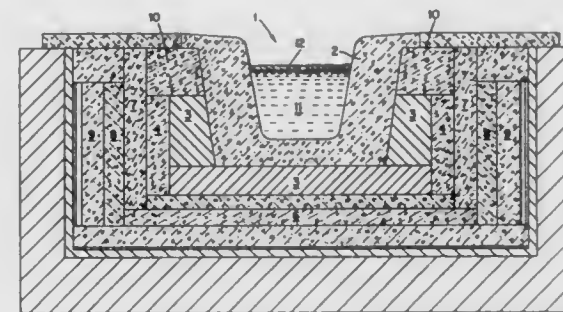
Int. Cl.⁵ C21B 7/14

U.S. Cl. 266—196

2 Claims

1. Iron runner for tapping molten crude iron from a blast furnace, comprising at least a wear lining which forms a boundary carrying the iron during operation and a permanent lining in which the wear lining is contained, an outer boundary and at least an outer lining of carbon, graphite or semi-graphite with a high coefficient of thermal conductivity which lining is

provided between the outer boundary and the permanent lining, said outer lining being provided with a thickening in the direction of the wear lining, which thickening is applied at the



level of the interface-layer being present during operation between the iron being carried through the runner and a slag layer floating on the iron.

5,088,696

MULTI-TUBE BLOWING LANCE

René Desaar, Grâce-Hollogne, Belgium, assignor to Recherches et Developpements Desaar, Belgium

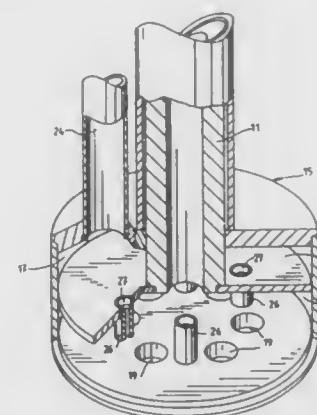
Filed Oct. 5, 1990, Ser. No. 593,431

Claims priority, application Belgium, Sep. 10, 1989, 08901082

Int. Cl.⁵ C21C 5/32

U.S. Cl. 266—225

2 Claims



1. A blowing lance for injecting a gas into liquid steel, comprising a first metal supply tube, fixing means at one end of said metal tube for connecting the latter to a first gas supply source, a distributor into which said supply tube opens at its other end, a plurality of first injection tubes arranged parallel to and concentrically with respect to the longitudinal axis of the lance and connected to and extending from said distributor, and a sheath of refractory material in which said first injection tubes are embedded; and further comprising a second supply tube and a plurality of second injection tubes, and wherein said distributor defines first and second chambers which are separate from each other, said first chamber communicating with said first supply tube and with said plurality of first injection tubes, said second chamber communicating with said second supply tube and with said plurality of second injection tubes, said second supply tube being provided with a fixing device for connection to a second gas supply source, and said second injection tubes also being embedded in the sheath of refractory material.

5,088,697

HEAT TREATING APPARATUS

Seishi Murakami, Yamanashi; Kozo Kai, Fuchu, and Susumu Kato, Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

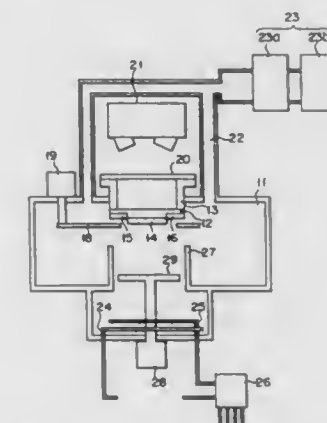
Filed Jul. 16, 1990, Ser. No. 552,897

Claims priority, application Japan, Jul. 26, 1989, 1-193409

Int. Cl.⁵ C21D 1/74

U.S. Cl. 266—250

13 Claims



1. A heat treating apparatus comprising:
means for defining a treating space for surrounding a substrate to be heat-treated;
means for reducing a pressure in the treating space;
a susceptor having a first surface, in the treating space, contacting with a minor surface of the substrate and adapted to impart heat to the substrate through the first surface;
heating means for heating the susceptor; and
a guard ring having a rear surface contacting with a second surface of the susceptor which is formed around the first surface of the susceptor, the guard ring being heated by the susceptor, whereby the surface of the susceptor is substantially entirely covered by the guard ring and the substrate.

5,088,698

SEALING CONSTRUCTION FOR A GAS SPRING

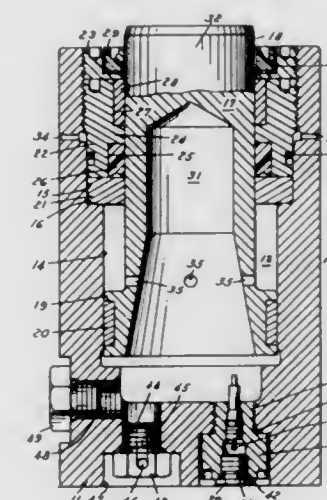
Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Filed Nov. 8, 1989, Ser. No. 433,363

Int. Cl.⁵ F16F 9/02

U.S. Cl. 267—119

8 Claims



1. A gas spring comprising

a cylindrical body having a base wall and an integral side wall defining a bore, said bore including a lower cylindrical portion and an upper cylindrical portion of greater diameter than the lower cylindrical portion defining a shoulder between the junction of said upper cylindrical portion and said lower cylindrical portion,

a piston having a rod portion, said rod portion having constant diameter positioned in the bore and having a flange with a bearing engaging the lower portion of the bore, an annular retainer engaging said shoulder, an annular end cap being threaded into said upper portion of said bore and engaging said retainer, and an annular lock nut threaded into the upper portion of said bore and engaging said end cap, sealing means between the inner surface of the upper portion of the bore and the end cap, openings through the side wall of the cylinder at a point spaced upwardly and extending outwardly from said sealing means for venting the pressure within the cylinder.

5,088,699

ELECTRORHEOPECTIC FLUID FILLED VIBRATION DAMPING MOUNT FOR USE WITH AUTOMOTIVE ENGINES AND THE LIKE

Kazuhiro Doi, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

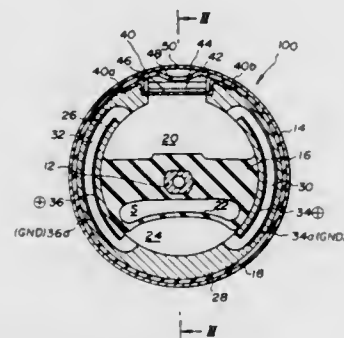
Filed Jun. 28, 1990, Ser. No. 545,085

Claims priority, application Japan, Jul. 5, 1989, 1-173288

Int. Cl.⁵ F16F 13/00, 6/00

U.S. Cl. 267—140.1 E

3 Claims



1. A mounting device comprising:

- an elastomeric body, said elastomeric body being connected between first and second rigid connection members;
- means defining a main working chamber, said main working chamber undergoing a change in volume when said elastomeric body is subject to distortion due to relative movement between said first and second rigid members;
- means defining an expansion chamber, said expansion chamber being fluidly communicated with said main working chamber by way of at least one orifice passage, said main working chamber, said expansion chamber and said orifice passage being filled with a first electrorheopectic fluid which exhibits first voltage/viscosity characteristics;
- a first set of electrodes disposed in said at least one orifice passage for selectively applying a voltage to said first electrorheopectic fluid occupying in said at least one orifice passage; and
- diaphragm means, said diaphragm means including:
 - a flexible partition member which is exposed to said main working chamber in a manner to be exposed to the changes in pressure occurring therein,
 - a diaphragm exposed to the atmospheric air;
 - a space defined between said flexible partition and said diaphragm, said space being hermetically separated from said main working chamber and filled with a second electrorheopectic fluid which exhibits second voltage/viscosity characteristics, which develops a

higher viscosity than said first electrorheopectic fluid for a given applied voltage, and

a second set of electrodes disposed in said space for selectively applying a voltage to said second electrorheopectic fluid occupied in said space.

5,088,700

FLUID-FILLED ELASTIC MOUNT HAVING ELASTIC BODY PRE-COMPRESSED BY STOPPER MEMBER

Ryouji Kanda, Komaki, and Kiyohiko Yosida, Kasugai, both of Japan, assignors to Tokai Rubber Industries, Ltd., Komaki, Japan

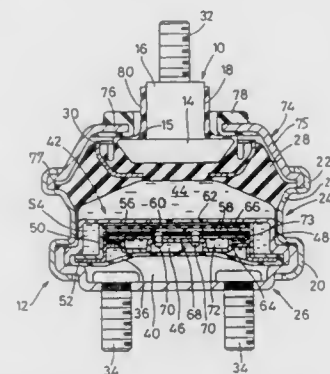
Continuation of Ser. No. 301,875, Jan. 26, 1989, abandoned. This application Feb. 6, 1991, Ser. No. 652,248

Claims priority, application Japan, Jan. 30, 1988, 63-11631

Int. Cl.⁵ F16F 13/00

U.S. Cl. 267—140.1 A

13 Claims



1. A fluid filled elastic mount for flexible connection of two members, comprising:

- first support means and second support means which are disposed opposite to each other and spaced apart from each other in a load-receiving direction in which a major vibrational load is applied to the elastic mount.
- an elastic body interposed between said first and second support means, for elastic connection of said first and second support means;
- a closure member secured to said second support means and cooperating with at least said elastic body to define a fluid chamber filled with a non-compressible fluid, said closure member including a flexible portion;
- partition means for dividing said fluid chamber into a pressure-receiving chamber formed on the side of said first support means, and an equilibrium chamber formed on the side of said second support means;
- means for defining a restricted passage for restricted fluid communication between said pressure-receiving equilibrium chambers;
- one of said first and second support means having a first abutting surface which extends substantially perpendicularly to said load-receiving direction, and a second abutting surface which is substantially perpendicular to said first abutting surface;
- a stopper member secured to the other of said first and second support means, and including a stop portion which is spaced apart a predetermined distance from said second abutting surface in a direction perpendicular to said load-receiving direction; and
- means for holding said stop portion in pressed abutting contact with said first abutting surface in said load-receiving direction so that the first and second support means approach each other, whereby the entire length of said elastic body located between the first and second support means is precompressed in said load receiving direction, wherein the precompression of said elastic body does not cause an increase in fluid pressure of said fluid chamber, whereby said precompression of the elastic body causes

no deflection of the flexible portion of said closure member.

5,088,701

FLUID-FILLED CYLINDRICAL ELASTIC MOUNT HAVING GROOVED MOVABLE BLOCK(S) IN FLUID CHAMBER(S)

Takanobu Nanno, Kasugai, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

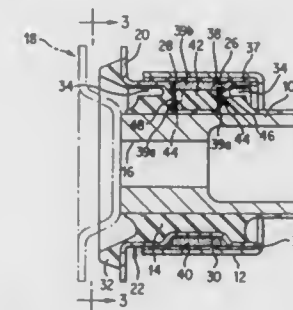
Continuation-in-part of Ser. No. 565,333, Aug. 10, 1990, abandoned. This application Jan. 29, 1991, Ser. No. 647,265

Claims priority, application Japan, Aug. 21, 1989, 1-97386

Int. Cl.⁵ F16F 13/00

U.S. Cl. 267—140.1 C

12 Claims



1. A fluid-filled cylindrical elastic mount comprising:

- an inner sleeve and an outer sleeve disposed radially outwardly of said inner sleeve with a predetermined radial distance therebetween;
- an elastic body interposed between said inner and outer sleeves for elastically connecting the inner and outer sleeves;
- said elastic body at least partially defining at least one fluid chamber between said inner and outer sleeves, said elastic body including a pair of axially opposite walls which face each other in an axial direction of the elastic mount so as to partially define each of said at least one fluid chamber, said each fluid chamber being filled with a non-compressible fluid;
- means for defining a pair of radially opposite walls which face each other in a radial direction of the elastic mount so as to partially define said each fluid chamber;
- a flow-restricting member freely movably accommodated in said each fluid chamber, said flow-restricting member being movable in said axial direction so as to be brought into abutting contact with said axially opposite walls, and in said radial direction so as to be brought into abutting contact with said radially opposite walls, said flow-restricting member having dimensions smaller than internal dimensions of the corresponding fluid chamber, so as to provide a flow-restricting portion around said flow-restricting member, so that said fluid is forced to flow through said flow-restricting portion upon application of a vibrational load between said inner and outer sleeves;
- said flow-restricting member having a pair of opposite end faces which face said axially opposite walls, respectively, in said axial direction, said flow-restricting portion including a pair of axially spaced-apart sections which are defined by said axially opposite walls and said opposite end faces of said flow-restricting member, and a pair of radially spaced-apart sections which are defined by said radially opposite walls and said flow-restricting member, a sum of respective axial dimensions of said pair of axially spaced-apart sections as measured in said axial direction being not more than 4 mm, a sum of respective radial dimensions of said pair of radially spaced-apart sections as measured in said radial direction being not more than 4 mm; and
- at least one of said pair of opposite end faces of said flow-restricting member having a plurality of grooves formed therein so as to extend substantially in said radial direc-

tion, said plurality of grooves being spaced apart from each other in a circumferential direction of the elastic mount, said plurality of grooves communicating with a corresponding one of said axially spaced-apart sections in said axial direction, and with said radially spaced-apart sections in said radial direction.

5,088,702

HYDRAULIC ANTIVIBRATORY SLEEVES

Jean Thelamon, Douy; Jean-Luc Salaud, Conflans Sainte Honorine, and Daniel Dubos, Asnieres, all of France, assignors to Hutchinson, France

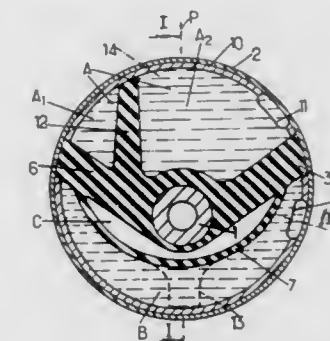
Filed Jul. 27, 1990, Ser. No. 558,500

Claims priority, application France, Jul. 31, 1989, 89 10302

Int. Cl.⁵ B60K 5/13; F16F 13/00

U.S. Cl. 267—140.1 C

6 Claims



1. A hydraulic antivibratory sleeve comprising two rigid tubular frames, one surrounding the other, and joined together by an elastomer body shaped so as to form therewith first and second diametrically opposite sealed pockets which communicate with each other through narrow channel means, said first sealed pocket being under a load, the assembly of said pockets and said narrow channel means being filled with a damping liquid, the portion of the elastomer body which defines the first pocket having in axial section the general form of a radially outwards open U or V, the second pocket being diametrically opposite to said first pocket and being defined by a flexible membrane, said flexible membrane being capable of deforming in response to pressure from damping liquid in said second sealed pocket, the narrow channel means being formed of at least two narrow distinct channels, at least a part of each channel extending along a transverse arc of a circle having at its axis the axis of the external tubular frame, each arc being situated close to said external tubular frame and close to an axial end of said external tubular frame, wherein the first pocket is divided into two independent compartments, into which the two narrow distinct channels open, respectively, and wherein the dimensions of each of these two channels, which dimensions correspond to optimum damping of oscillations of a given frequency, are such that the values of these frequencies are different for the two narrow distinct channels.

5,088,703

VIBRATION ISOLATING APPARATUS

Kazuya Takano, Kamakura, and Hiroshi Kojima, Yokohama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 14, 1990, Ser. No. 627,577

Claims priority, application Japan, Dec. 26, 1989, 1-336959

Int. Cl.⁵ F16F 5/00

U.S. Cl. 267—140.1 C

8 Claims

1. A vibration isolating apparatus comprising:

- a first cylindrical member supported by one of a vibration producing portion and a vibration receiving portion;
- a second cylindrical member supported by the other of said

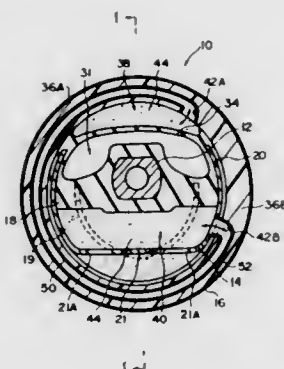
vibration producing portion and said vibration receiving portion;

said first cylindrical member disposed inside said second cylindrical member in such a manner that its axis is substantially parallel with an axis of said second cylindrical member;

a liquid chamber provided between said first cylindrical member and said cylindrical member and partitioned into a main liquid chamber and an auxiliary liquid chamber;

a resilient diaphragm serving as a partition wall of said auxiliary liquid chamber and adapted to expand or shrink said auxiliary liquid chamber;

an orifice member interposed between said first cylindrical member and said second cylindrical member, said orifice



member having therein an orifice constituted by a passage which has a rectangular cross section with its long side portion formed to be not less than two times a short side portion thereof, said orifice allowing said main liquid chamber and said auxiliary liquid chamber to communicate with each other;

said orifice member comprising a two-piece annular member disposed on the inner side of said second cylindrical member, each of said two pieces being semi-circular arc-shaped, and entirely defining said passage;

a pair of electrode plates provided in opposing long side portions of said passage, respectively; and an electrorheological fluid which is filled in said liquid chamber and whose viscosity changes with the magnitude of an electric field applied thereto.

5,088,704

FLUID-FILLED UPPER SUPPORT FOR SHOCK ABSORBER HAVING A PAIR OF TRUNCATED CONICAL ELASTIC MEMBERS

Ryouji Kanda, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

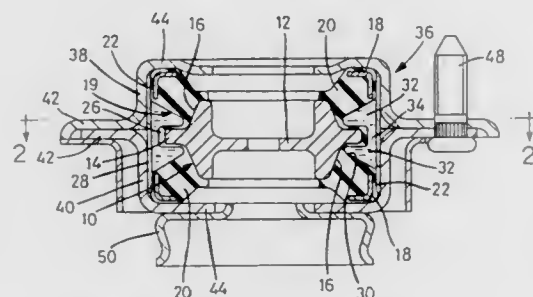
Filed Aug. 16, 1990, Ser. No. 568,226

Claims priority, application Japan, Aug. 24, 1989, 1-99012[U]

Int. Cl.⁵ B60G 13/08; F16F 5/00

U.S. Cl. 267—220

8 Claims



1. An upper support for a suspension system, which is interposed between a body of a vehicle and a shock absorber of the

vehicle, for elastically connecting the vehicle body and the shock absorber, comprising:

a generally cylindrical inner rigid member to which said shock absorber is fixed, said inner rigid member including an annular wing portion which protrudes radially outward from an axially intermediate portion, said inner rigid member having an outer circumferential surface which includes a pair of coned faces that are tapered from said annular wing portion to axially opposite ends of the inner rigid member, respectively, such that one of opposite ends of each of said coned faces which is adjacent to said wing portion has a larger diameter than the other end;

a pair of annular rigid members which are disposed radially and axially outwardly of said inner rigid member with a predetermined radial spacing therebetween, such that inner surfaces of said annular rigid members are opposed to said pair of coned faces of said inner rigid member, respectively, each of said annular rigid members having a cylindrical portion, and an inward flange portion which extends radially inwards from an axially outer end of the cylindrical portion;

a pair of annular sealing rubber members fixed to respective outer circumferential surfaces of said cylindrical portions of said pair of annular rigid members;

a pair of connecting rubber members each having a generally truncated conical shape, which are respectively interposed between and secured to said coned faces of said inner rigid member and said inner surfaces of the annular rigid members, for elastically connecting said inner rigid member and said pair of annular rigid members, said connecting rubber members at least partially defining a generally annular pocket between axially facing surfaces thereof, said pocket being open radially outward through an axial spacing between said pair of annular rigid members, said wing portion of the inner rigid member protruding into said pocket; and

an outer rigid member which is disposed radially outwardly of said inner rigid member and fixed to said body of the vehicle, said outer rigid member being fitted on said pair of annular sealing rubber members on the respective outer circumferential surfaces of said cylindrical portions of said annular rigid members, so that an opening of said pocket is fluid-tightly closed by said outer rigid member with the pocket being fitted with a non-compressible fluid, whereby said pocket is substantially divided into a pair of fluid chambers located on axially opposite sides of said wing portion of the inner rigid member, said wing portion having an outer circumferential surface which cooperates with an inner circumferential surface of said outer rigid member to define an annular resonance portion through which said pair of fluid chambers are held in fluid communication with each other,

said outer rigid member having at axially opposite ends thereof axially opposite inward flange portions which are disposed axially outwardly of said inward flange portions of said annular rigid members, to apply axially gripping forces on said annular rigid members.

5,088,705

BICYCLE SHOCK-ABSORBING APPARATUS

Chin S. Tsai, Hsin Chuang, Taiwan, assignor to Dan Ken Industrial Co., Ltd., Taipei, Taiwan

Filed Apr. 5, 1991, Ser. No. 680,885

Int. Cl.⁵ F16F 3/07, 13/00

U.S. Cl. 267—226

1 Claim

1. A bicycle shock absorbing apparatus including an inner tube and an outer tube, said inner tube being inserted into said outer tube and said outer tube being filled with oil, the improvement comprising:

an annular protrusion protruding inward from an inner surface of a lower portion of said inner tube;

an upper spring socket being disposed inside a lower portion of said inner tube, having an annular groove therein for

accommodating said protrusion of said inner tube, thereby fixing said inner tube to said upper spring socket;

a lower spring socket being disposed inside a lower portion of said outer tube;

a compression spring being disposed between said upper spring socket and said lower spring socket, an upper end of said compression spring being mounted on said upper spring socket, and a lower end of said compression spring being mounted on said lower spring socket, thereby en-



gaging and correlatedly actuating said spring with said inner tube;

a hole being formed in the middle of said upper spring socket for enabling oil to flow therethrough;

an oil seal being disposed at a top of said outer tube for preventing the spillage of oil;

an air inlet socket and an air inlet valve being located at an upper wall of said inner tube for inflating air therein; and a pressure meter being disposed at a top portion of said inner tube for showing air pressure inside said inner tube.

5,088,706

SPINAL SURGERY TABLE

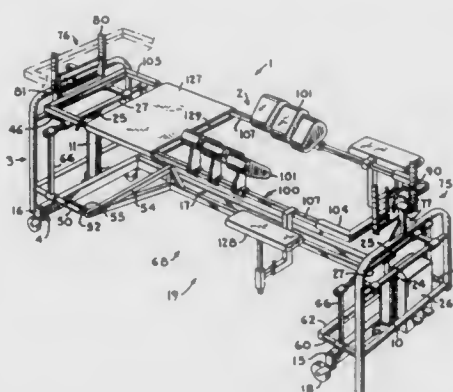
Roger P. Jackson, 4706 W. 86th St., Prairie Village, Kans. 66207

Filed Aug. 30, 1990, Ser. No. 575,138

Int. Cl.⁵ A61G 13/00

U.S. Cl. 269—323

21 Claims



1. An apparatus for use in supporting a patient during surgery comprising:

(a) an elongate base;

(b) an upright foot framework and an upright head frame-

work with each of said frameworks movably connected to said base respectively near opposite ends of said base;

(c) first and second framework positioning means operably connecting said foot and head frameworks respectively to said base and operable to independently and selectively position said foot framework and said head framework between respective high and low positions thereof with respect to said base;

(d) first and second rotatable mounts pivotally connecting said first and second framework positioning means to said foot and head frameworks respectively; said first and second mounts being rotatable about first and second axes; said first and second axes being generally parallel to one another and spaced; said first and second mounts allowing said foot and head frameworks to raise the lower relative to each other;

(e) third and fourth rotatable mounts positioned on upper ends of said foot and head frameworks respectively; said third and fourth mounts allowing rotation about a generally coaxial third axis extending between said foot and head frameworks and generally perpendicular to said first and second axes of rotation; and

(f) a patient support frame having patient support means mounted therealong; said frame being removably attachable to said third and fourth rotatable mounts such that opposed sides of said frame generally extend parallel to said third axis of rotation in spaced relation to and on opposite sides of said third axis of rotation, such that said support structure is rotatable at least 180 degrees about said third axis of rotation.

5,088,707

METHOD AND APPARATUS FOR THE PRODUCTION OF NUMERICALLY CORRECT STACKS

Kurt Stemmler, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebir Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany

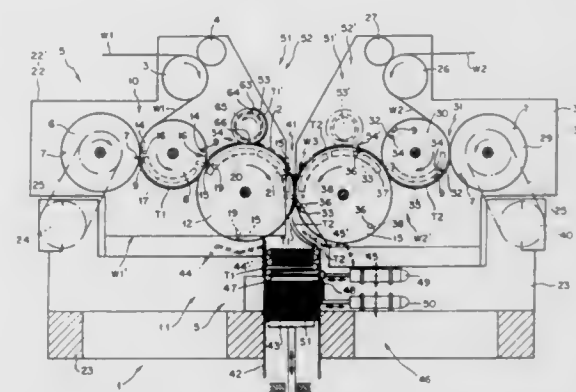
Filed Aug. 9, 1990, Ser. No. 565,231

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1989, 3927422

Int. Cl.⁵ B41L 1/32

U.S. Cl. 270—39

19 Claims



1. A method of producing numerically correct partial stacks of individual sheets which are of U-shape or zigzag-shape and which are interfolded so as to overlap, comprising:

providing at least one continuously moving length of material;

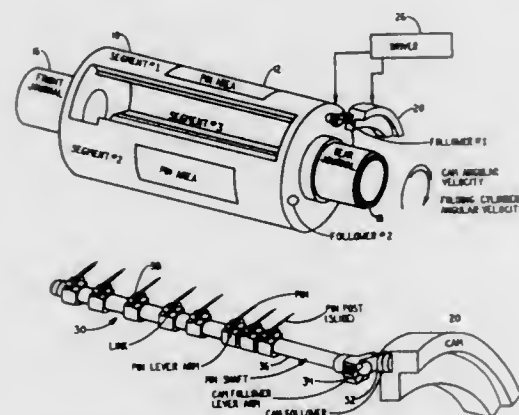
producing at least one continuously produced stream of neighboring sheets of equal length from said at least one continuously moving length of material by cross-separation or cross-perforation;

providing a first produced stream and a second produced stream;

said double stream being guided together and staggered, so

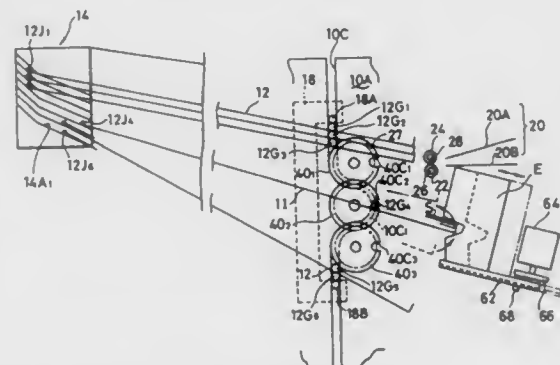
that neighboring sheets lying opposite to one another are offset with respect to one another;
forming a gap in one of the streams by removing at least one removable sheet;
temporarily storing sheets which have been removed from the continuously produced stream;
afterwards returning said removed sheets to the stream by placing the removed sheets on the sheets of the first produced stream or on the sheets of the second produced stream in such a way that the first neighboring and first removed sheets or the second neighboring and second removed sheets are aligned congruently with respect to one another;
continuously folding said double stream in U-shape or zig-zag shape;
piling up said double stream in the form of a stack;
dividing the stack which is continuously being formed into numerically correct partial stacks; and
separating off said partial stacks from said stack by the introduction of separating elements in a separating zone of the stack.

5,088,708
FOLDING CYLINDER ASSEMBLY HAVING ONE PIECE CAM
Brent M. T. Nowak, Seabrook, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Dec. 5, 1990, Ser. No. 622,896
Int. Cl.⁵ B42C 1/00
U.S. Cl. 270—47 13 Claims



1. A folding cylinder assembly having at least first and second modes of operation, comprising:
rotatable folding cylinder having at least one pin lever shaft assembly, said pin lever shaft assembly having at least one pin and a cam follower positioned on a first end of the folding cylinder;
one piece cam for interfacing with said cam follower, said one piece cam rotationally mounted on said first end of said folding cylinder, said one piece cam having at least one lobe which periodically contacts said cam follower as said cam rotates;
means for rotating said folding cylinder and said cam such that said cam and said folding cylinder have a first relative angular velocity for the first mode of operation and a second relative angular velocity for the second mode of operation, the rotation of said cam imparting to said at least one pin on said pin lever shaft assembly via said cam follower a predetermined motion profile in both said first and second modes of operation, said predetermined motion profile being a modified sine-harmonic motion profile.

5,088,709
SORTER
Hiroshi Yamamoto, Ibaraki, Japan, assignor to Ikegami Tsushinki Co., Ltd., Tokyo, Japan
Filed Oct. 22, 1990, Ser. No. 600,920
Claims priority, application Japan, Oct. 31, 1989, 1-284195
Int. Cl.⁵ B42B 2/00
U.S. Cl. 270—53 10 Claims

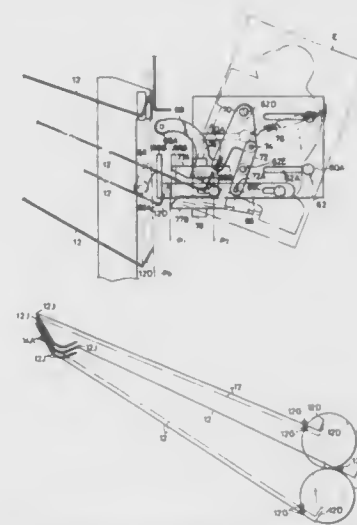


1. A sorter comprising:
a plurality of vertically movable trays;
means for vertically shifting said plurality of trays and for maintaining a tray in a predetermined position in which sheets can be received thereon, said shifting and maintaining means including a frame in which a pair of guide slots, including first and second guide slots, each having vertical portions and a curved portion at its center, are formed and a pair of Geneva wheel arrangements each having three Geneva wheels vertically arranged and rotatably supported in a predetermined relationship with one another, each of said Geneva wheels having at least a recess formed therein;
means for ejecting a sheet onto a tray which is maintained in said predetermined position;
means associated with said pair of Geneva wheel arrangements and said first and second guide slots for inducing one of said trays to undergo lateral displacement; and
fastening means for fastening a stack of sheets accumulated on said laterally displaced tray together.

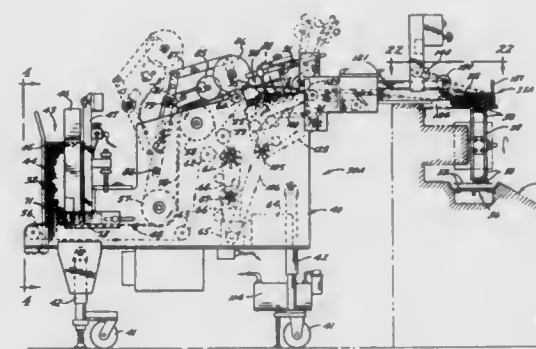
5,088,710
SORTER
Akihiro Suzuki, Ibaraki; Hiroshi Yamamoto, Mito, and Hiroshi Tobita, Ohmiya, all of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan
Filed Feb. 26, 1991, Ser. No. 661,111
Claims priority, application Japan, Jul. 10, 1990, 2-180504
Int. Cl.⁵ B65H 39/11
U.S. Cl. 270—53 10 Claims

1. A sorter which comprising:
a plurality of receptacles arranged vertically movable and being capable of receiving articles to be treated;
means for sequentially shifting and drawing out each of said receptacles to a predetermined treatment position, the receptacles each having a front portion remote from the treatment position;
means for applying predetermined treatments to the articles on respective receptacles drawn out to the treatment position;
means for discharging one of the articles to a lower adjacent receptacle positioned just below the receptacle drawn out; and

means for guiding the front portion of each receptacle diagonally upwardly to enlarge a space between said lower



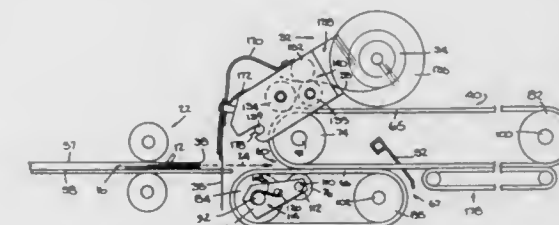
5,088,711
MACHINE FOR TRANSPORTING AND LOADING SIGNATURES
John R. Newsome, c/o Sim Products, R.R. #1 P.O. Box 58A, Shumway, Ill. 62461
Filed Aug. 27, 1990, Ser. No. 572,765
Int. Cl.⁵ B65H 39/02
U.S. Cl. 270—54 11 Claims



1. A machine for supplying signatures to a receiver having an upper entrance end spaced a predetermined distance above a floor, said machine comprising a hopper into which an upright stack of signatures is initially loaded, said hopper being located upstream of said receiver and having a lower end which is located a substantial distance below the entrance end of said receiver, first conveyor means for stripping said signatures one-by-one from the lower end of said stack and for advancing said signatures downstream from said hopper as a running shingle, said signatures being elevated from a low level at the bottom of said stack to a higher level by said first conveyor means as the signatures are advanced downstream from said hopper, means located between said hopper and said receiver for collecting the signatures from said first conveyor means after the signatures have been elevated and for forming said signatures into a second upright stack, means for driving said first conveyor means intermittently, said first conveyor means being idle during at least part of the time that the top of said second stack is above a predetermined level, means responsive to the height of said second stack for starting said first conveyor means when the top of the second stack falls below said predetermined level, second conveyor means for stripping

said signatures one-by-one from the lower end of said second stack and for advancing said signatures toward said receiver, said second conveyor means having a discharge end located at least as high as the entrance end of said receiver and discharging the signatures one-by-one into said receiver, means for driving said second conveyor means at a substantially constant speed, means for disabling said second conveyor means for stripping signatures from said second stack during at least part of the time that the height of the signatures in said receiver is above a preselected level, and means for causing said second conveyor means to start stripping signatures from said second stack when the height of the signatures in said receiver falls below said preselected level.

5,088,712
SHEET SET SEPARATION USING WIDE FOLDED STRIPS
Harry E. Lupert, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Dec. 31, 1990, Ser. No. 636,342
Int. Cl.⁵ B65H 33/04
U.S. Cl. 270—95 14 Claims



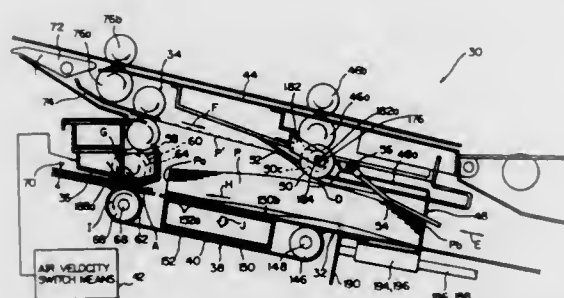
1. Apparatus for applying a strip of material to a set of stacked sheets for separating that set from other sets, comprising:
means for holding a strip of material in a path along which a set of stacked sheets is being advanced;
first and second belt conveyors disposed opposite and aligned with each other to define a run therebetween, said first belt conveyor comprising a first rolling means and a first belt passing adjacent thereto and said second belt conveyor comprising a second rolling means and a second belt passing adjacent thereto, said first and said second rolling means being positioned to form with said first and second belts a nip, said nip defining an entrance to said run, said strip being wider than said nip;
means for driving said belts in synchronism;
means for advancing said sheet set towards said strip and said composite nip, past said strip and into and through said nip such that the downstream edge of said sheet set engages said strip with portions of said strip extending beyond first and second opposed major sides of said sheet set and advances into said nip; and
means disposed adjacent said first and second rolling means for folding a portion of said strip not passing into said nip; whereby said strip is folded about said downstream edge of said sheet set portions of said folded strip extending generally parallel to and adjacent said major sides as said sheet set.

5,088,713
PAPER REFEEDING DEVICE FOR AN IMAGE FORMING APPARATUS
Shoji Hayashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 6, 1990, Ser. No. 505,366
Claims priority, application Japan, Apr. 7, 1989, 1-88968
Int. Cl.⁵ B65H 3/12
U.S. Cl. 271—3.1 9 Claims

1. A paper refeeding device incorporated in an image form-

ing apparatus for temporarily stacking paper sheets each coming out of an image forming section and carrying an image on one side on a refeed tray and, then, refeeding said paper sheets to said image forming section, said device comprising:

discharging means for discharging the paper sheets one by one onto the refeed tray by transporting said paper sheets; air blowing means for blowing air at a low velocity, intermediate velocity and a high velocity against an end portion of the paper sheets discharged by said discharging means onto the refeed tray to lift the paper sheets overlying the lowermost paper sheet away from at least said lowermost paper sheet;



transporting means for refeeding the paper sheets stacked on the refeed tray to the image forming section; sucking means for urging the lowermost paper sheet on the refeed tray against said transporting means by suction; and air velocity switching means for causing said air blowing means to blow air at a breeze velocity which is lower than said low velocity but greater than a zero velocity which does not lift the paper sheets, until more than a predetermined number of paper sheets have been discharged by said discharging means and stacked on the refeed tray.

5,088,714

RECIRCULATING SHEET FEEDER

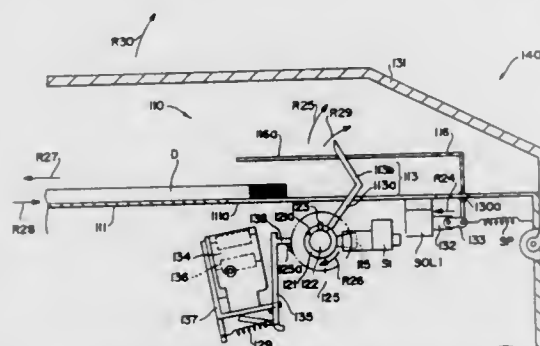
Tamami Nagasawa, Osaka, and Kozo Takahashi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 20, 1990, Ser. No. 585,794

Claims priority, application Japan, Sep. 21, 1989, 1-246852; Dec. 29, 1989, 1-342502

Int. Cl.⁵ B65H 5/22

U.S. Cl. 271—3.1

18 Claims



9. A recirculating sheet feeder including a placing member for placing sheets contained in stack so that, a sheet on top of the sheets stacked on the placing member can be fed and returned to the bottom of the stacked sheets, comprising:

a detecting protrusion member for contacting the bottom of the sheets on the placing member, and urging them in an upward direction, and
a contacting member formed with a contacting surface which contacts to the end face, on an upstream side in the feeding direction, of the stacked sheets, when the sheets are urged upward by the detecting protrusion.

5,088,715
MANUAL PAPER FEED APPARATUS HAVING A
YIELDABLE SEPARATING MEMBER

Akihiro Shibata, and Kenichi Okayama, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

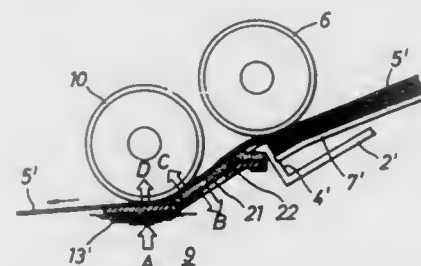
Filed Jul. 16, 1990, Ser. No. 552,937

Claims priority, application Japan, Jul. 18, 1989, 1-185666; May 24, 1990, 2-132531

Int. Cl.⁵ B65H 5/26, 1/24

U.S. Cl. 271—9

6 Claims



1. In a sheet feeding apparatus for alternatively feeding individual sheets manually or from a cassette contained stack, the apparatus including a cassette pickup roller, means for normally biasing said stack into engagement with said pickup roller, and a sheet receiving plate movable between a rearward cassette feed position and a forward manual feed position, said plate having a forwardly disposed slip piece positioned between said stack and said cassette pickup roller to space said stack from said pickup roller when said plate is in said forward position, and a separating member to contact said pickup roller when said plate is in said forward position to separate a manually fed sheet, the improvement wherein said separating member is yieldably displaceable relative to said plate.

5,088,716

DEVICE FOR SCANNING THE LENGTH OF A SHEET IN
A SHEET PROCESSING MACHINE, SUCH AS A
SHEET-FED ROTARY PRINTING PRESS
PARTICULARLY

Arno Wirz, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

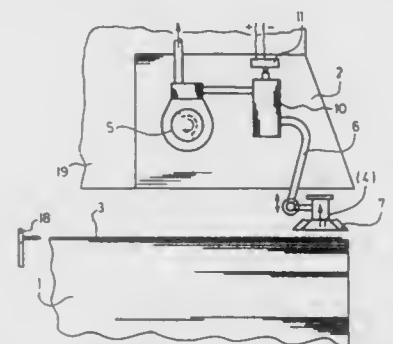
Filed Mar. 5, 1990, Ser. No. 488,633

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3906960

Int. Cl.⁵ B65H 5/08

U.S. Cl. 271—90

6 Claims



1. Device for scanning lengths of sheets in a sheet-processing machine, wherein the sheets travel with a leading and trailing edge, including suction-air measuring nozzles alignable with the trailing edges of the sheets and connected to a suction-air source, and a feeder for aligning the sheets to be processed at stops for the leading edges of the sheets including lift-type suckers for lifting the sheets individually off a pile of sheets,

comprising means defining a scanning hole in at least one of the suction-air measuring nozzles, said one nozzle being disposed on the feeder and being directed towards the trailing edge of an uppermost sheet disposed on a pile of sheets, a suction-air connecting line connecting said one nozzle to the suction-air source, and a differential pressure-measuring valve connected in said line, said one suction-air measuring nozzle being swivelable about an axis extending vertically to the plane of the sheets, and said scanning hole being disposed eccentrically to said axis.

5,088,717

PAPER FEEDING APPARATUS HAVING A THREE
CYLINDER VACUUM MEMBER

Izumi Hamanaka, and Kazuhiro Hirota, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

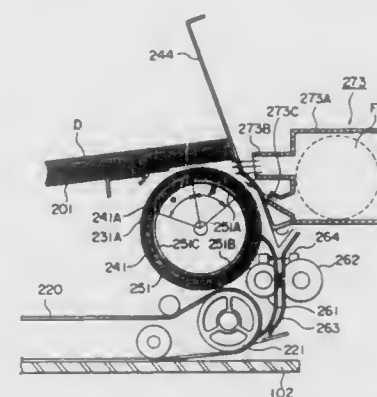
Filed Jul. 30, 1990, Ser. No. 559,637

Claims priority, application Japan, Aug. 12, 1989, 1-208189; Aug. 21, 1989, 1-215318; Aug. 25, 1989, 1-220018; Aug. 29, 1989, 1-223476

Int. Cl.⁵ B65H 3/10

U.S. Cl. 271—98

22 Claims



1. An apparatus for feeding a paper, said apparatus comprising:

a stacker for holding a stack of papers;
a vacuum-type feed for separating a lowermost paper, by vacuum suction, from the stack of papers placed on the stacker, and sequentially feeding the separated papers, one by one, by vacuum suction to a set of rollers downstream from the vacuum feed, said vacuum-type feed being disposed below said stacker adjacent a leading edge of said stacker in relation to a feeding direction, said vacuum-type feed including,
an outer cylinder rotatable and provided with a number of through holes along the entire circumferential surface thereof,
an inner cylinder, inside the outer cylinder, provided with an opening on a circumferential surface thereof, wherein the inner and outer cylinders are arranged on a single axis and circumferential surfaces thereof are concentric therewith, vacuum suction connected to said inner cylinder, and, an air blast for blowing compressed air to separate the lowermost paper from said stack of papers.

5,088,718

HIGH CAPACITY SHEET FEEDER

Constance R. Stepan, and James A. Spiers, both of Derby, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 6, 1990, Ser. No. 622,906

Int. Cl.⁵ B65H 1/00

U.S. Cl. 271—161

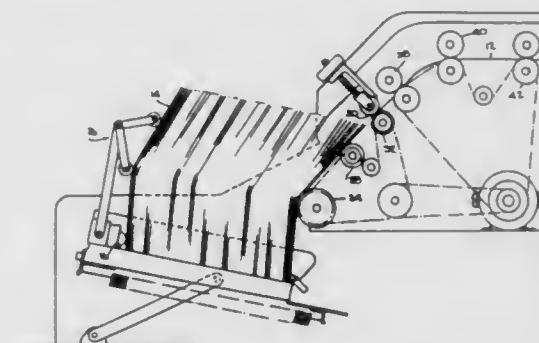
7 Claims

1. Apparatus for feeding and separating seriatim a sheet of paper from a stack of sheets, comprising:

a deck having a receiving end and a feeding end for supporting said stack of sheets on edge, said deck oriented at an angle between about 10 and 20 degrees to a horizontal

plane and wherein said feeding end is lower than said receiving end;

a main urge roller situated above said feeding end of said deck at about midway between the top and bottom edges of said stack of sheets, whereby said stack is bent at a point in the sheets about midway between the top and bottom edges of said sheets;
a secondary feed roller parallel to and situated above said main urge roller near the top edge of said stack of sheets,



wherein a line of tangency joining the peripheries of said urge roller and said feed roller adjacent said stack of sheets is disposed at an angle between about 40 and 50 degrees to a horizontal plane;
means for urging said stack against said main urge roller as said stack is reduced in the course of said feeding of said sheets seriatim; and
means downstream of said secondary feed roller for separating the bottom sheet from said stack of sheets at the top edge of said stack.

5,088,719

PAPER DELIVERY FOR WEB OFFSET PRINTING
PRESS

Hirohisa Kiyota, Tomoo Kanetsu, Masaaki Nakajima, and Masakazu Kurihara, all of Chiba, Japan, assignors to Komori Corporation, Tokyo, Japan

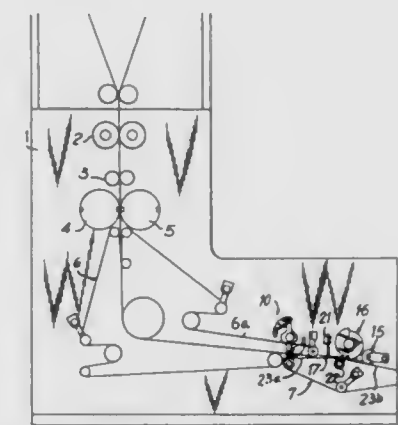
Filed Sep. 5, 1990, Ser. No. 579,070

Claims priority, application Japan, Sep. 12, 1989, 1-234716; Oct. 13, 1989, 1-265124

Int. Cl.⁵ B65H 29/68

U.S. Cl. 271—182

6 Claims



1. A paper delivery for a web offset printing press comprising a low-speed belt for transporting paper, a pair of upper and lower high-speed belts with the outlet side of said upper high-speed belt overlapped above the inlet side for supplying paper to said low-speed belt, a snubber disposed above the inlet side of said low-speed belt for maintaining a constant relation between a preceding paper and a next paper, and a braking roller

disposed above the outlet side of said low-speed belt for shiftably stacking paper on said low-speed belt, characterized by a slowdown pulley disposed above said low-speed belt between said snubber and said braking roller for making primary retardation of paper, and guide means for guiding paper to said slowdown pulley, wherein said slowdown pulley includes semicircular rings placed opposite one another on the outer periphery of a rotary shaft with an offset in the radial direction of said rotary shaft, protruding portions of said semicircular rings providing claws for engagement by a leading edge of said paper.

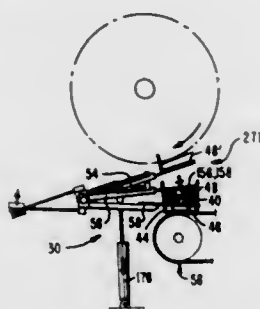
5,088,720

ENVELOPE HANDLING SYSTEM

John A. Beeman, Dayton, Ohio; Floyd R. Solt, Garland, Tex.; James L. Leep, Martin, Mich.; Wayne S. Marvin, and Troy F. Smith, both of Kalamazoo, Mich., assignors to The Mead Corporation, Dayton, Ohio
Continuation of Ser. No. 4,365, Jan. 16, 1987, Pat. No. 4,930,977. This application Jun. 5, 1990, Ser. No. 533,563
Int. Cl.⁵ B65H 31/32

U.S. Cl. 271-189

2 Claims



1. A method for stacking sheet-like articles in stacks of predetermined number in a stacking zone comprising, in order, the steps of:

- continuously releasing said articles from an upper level conveyor to fall, seriatim, into said stacking zone;
- collecting said articles in a first stack on a first pivotal, counterbalanced collecting surface in said stacking zone, whereby said first surface pivots downwardly in response to increasing weight of said first stack such that said articles thereof are collected at substantially the same elevation;
- interrupting said fall of articles to said first stack by projecting a second pivotal, counterbalanced collecting surface into said stacking zone, whereby said second surface pivots downwardly in response to increasing weight of said first stack such that said articles thereof are collected at substantially the same elevation;
- urging said first stack and said first collecting surface to pivot downwardly below said stacking zone to lower level conveying zone and displacing said first stack sideways therefrom, whereby said first surface pivots upwardly to said stacking zone to coincide with said second surface;
- withdrawing said second collecting surface from said stacking zone whereby said second stack continues to collect, uninterrupted, on said first surface; and
- continuing to collect articles in said second stack by repeating steps (a) and (b) as for said first stack, and forming a third stack by repeating steps (c), (d) and (e) as for said second stack.

5,088,721
TRANSPORTING DEVICE AND SORTER WITH THE SAME

Akihiro Suzuki, Ibaraki; Hiroshi Yamamoto, Mito, and Hiroshi Tobita, Ohmiya, all of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

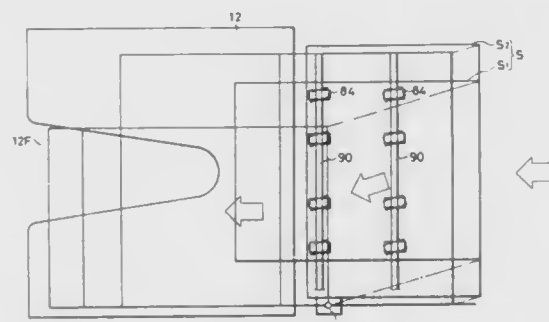
Filed Feb. 26, 1991, Ser. No. 660,874

Claims priority, application Japan, Jul. 10, 1990, 2-180503; Jul. 10, 1990, 2-180506

Int. Cl.⁵ B65H 31/24

U.S. Cl. 271-293

20 Claims



1. A transporting device comprising:

- means for defining a transportation passage for articles to be transported from a discharge position of the articles to a reception position of the articles in a forward direction, the transportation passage means including at least a side wall provided in the reception position of the articles and arranged in the forward direction;
- means for transporting the articles to be transported, the transporting means comprising transporting rollers arranged in the transportation passage to contact the article for transportation, and means for rotatably supporting the transporting rollers about an axis which is swingable in a substantially horizontal plane;
- means for selectively changing the axis of each transporting roller between one direction to transport the articles in the forward direction in parallel with said side wall and another direction to obliquely transport the articles toward the side wall;
- first detection means for detecting the arrival of the article at the transporting rollers and for generating a first detection signal;
- first controlling means, responsive to the first detection signal of the first detection means, for controlling said direction changing means to change the axis of each transporting roller in the one direction;
- second detection means for detecting the arrival of the article at a position where the article comes into abutment with said side wall and for generating a second detection signal; and
- second controlling means, responsive to the second detection signal of said second detection means, for controlling said direction changing means to change the axis of each transporting roller in the another direction.

5,088,722

DIVERTER ASSEMBLY

Anthony M. Olexy, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1990, Ser. No. 625,237

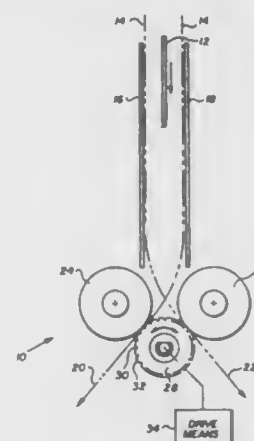
Int. Cl.⁵ B65H 39/10

U.S. Cl. 271-304

2 Claims

1. An assembly for diverting a sheet from an entrance path to either of two exit paths, the assembly comprising:
- a pair of idler rollers located in spaced relation with the axes of the rollers being substantially parallel to each other, the rollers being located with respect to the entrance path so

that a sheet traveling along the entrance path passes between the rollers, a diverter roller having an axis located between the axes of the idler rollers and offset from a plane passing through the axes of the idler rollers, the diverter roller having an outer surface with a plurality of spaced grooves extending along the surface in an axial direction, the grooved outer surface being in contact with both of the idler rollers, drive means coupled to the diverter roller for rotating the diverter roller about its axis in (1) a first direction to deflect a sheet traveling along the entrance path between the idler rollers into a first nip between the diverter roller



and a first one of the idler rollers and into one of the exit paths or (2) a second direction to deflect a sheet traveling along the entrance path between the idler rollers into a second nip between the diverter roller and a second one of the idler rollers and into the other of the exit paths, and a pair of spaced guides defining the entrance path, the guides being located on one side of a plane passing through the axes of the idler rollers, the diverter roller being on the opposite side of such plane, and the entrance path being free of deflectors between the guides so that a sheet is deflected into the first nip or the second nip by the diverter roller.

5,088,723

SUBMERGIBLE AQUATIC FLOTATION DEVICE

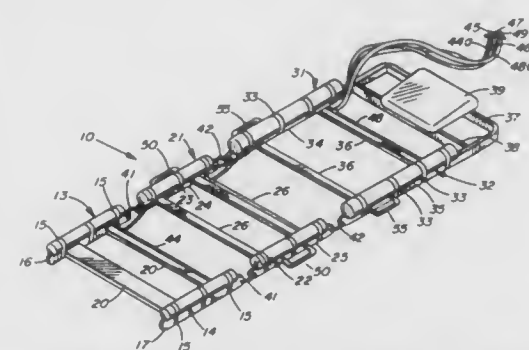
Thomas R. Simmons, 3510 Lobit, Dickinson, Tex. 77539-4310

Filed Dec. 3, 1990, Ser. No. 620,559

Int. Cl.⁵ A63G 19/00

U.S. Cl. 272-1 B

11 Claims



1. An inflatable aquatic device of a length and configuration adapted to support a person in reclined position thereon when inflated, said device comprising:
- at least one pair of elongate inflatable tubular members of flexible pliant material and substantially equal length and configuration;
 - a plurality of pliant spacer members interconnecting the inflatable tubular members of each said pair for maintain-

ing the interconnected tubular members in spaced relationship substantially symmetrical about the longitudinal axis of the aquatic device, and wherein said spacer members provide minimal areal contact with the body of a person reclined thereon such that when said device is placed in a spa or other pool of water, the person's body is predominantly exposed to water and the bubbling, massaging jets which may be provided therein;

said aquatic device including said tubular members and spacer members being comprised of a torso support section for supporting the torso of a person, a thigh support section adjoining the torso support section for supporting the thighs of a person, and a leg support section adjoining the thigh section for supporting the lower legs of a person, each said section being flexibly connected to the next adjoining section;

buoyancy adjustment means controllable by a person reclined on said aquatic exerciser device for adjusting the degree of inflation of each said inflatable tubular member and thereby the level of buoyancy of each said support section in correspondence with the weight of the portion of the person's body supported thereon when said device is floated in a body of water whereby a person reclined on the aquatic device can submerge said support sections at relatively inclined angles and different levels of submergence to assume partially submerged position which is preferred for an attitude of rest or as an initial position suitable for commencement of exercise.

5,088,724

GROUND SURFACE MATERIAL

Paul Hawkins, Leicester, and Robert J. Blythe, Birmingham, both of England, assignors to En-Tout-Cas Plc., Leicester, United Kingdom

Filed Sep. 19, 1990, Ser. No. 585,223

Claims priority, application United Kingdom, Sep. 21, 1989, 8921367; Jul. 19, 1990, 9015870

The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl.⁵ A63J 3/00

U.S. Cl. 272-3

17 Claims

1. A substitute ground surface material comprising sand or similar particulate or granular material treated with a binder comprising an extender oil having a polymeric material dissolved or dispersed therein, the oil being free flowing at ambient temperatures so as to produce an inert discrete material capable of being raked when laid in a layer upon a substrate, wherein the material comprises between approximately 2% and 6.5% of binder.

5,088,725

EXERCISE DEVICES

Gene W. Arnold, 204 Seventh Ave., S., Greenwood, Mo. 64034
Filed Sep. 10, 1990, Ser. No. 580,168

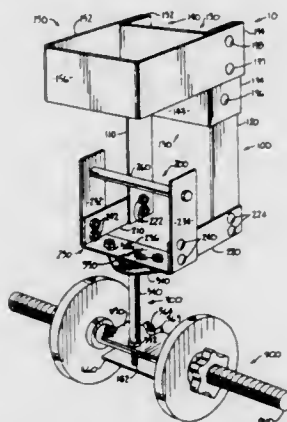
Int. Cl.⁵ A63B 21/06

U.S. Cl. 272-117

7 Claims

1. An exercise device for use with a weight of a user-selectable size comprising:
- support means having a front end and a rear end for a forearm of said user;
 - a handle for grasping by the user;
 - means for connecting said handle to said support means generally adjacent said front end thereof;
 - clamping means for releasably receiving the weight therein, said clamping means comprising:
 - an elongated bolt having first and second ends;
 - a first clamping plate attached to said second bolt end;
 - a second clamping plate positioned about said bolt and displaceable from said first clamping plate; and
 - means for connecting said first clamping plate to said second clamping plate, a portion of the weight being fixable therebetween;

means for associating said clamping means with said handle in movement therewith, said associating means including structure for joining said first end of said bolt to said



handle with said elongated bolt extending said clamping plates away from the user and beyond said front end of said support means, the weight resisting movement of said device by the user.

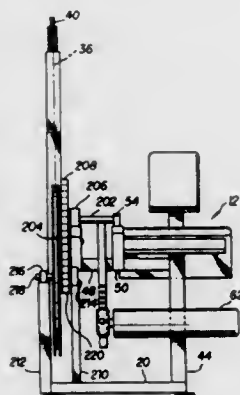
5,088,726

VARIABLE RESISTANCE EXERCISE APPARATUS
Thomas G. Lapcevie, 1411 Grandview Ave., Pittsburgh, Pa. 15211

Continuation of Ser. No. 332,836, Apr. 3, 1989, Pat. No. 4,982,956. This application Dec. 20, 1990, Ser. No. 630,510
Int. Cl.⁵ A63B 21/06

U.S. Cl. 272—117

22 Claims



1. An exercise apparatus comprising:

- a support frame;
- a first shaft rotatably supported on said support frame;
- a second shaft rotatably supported on said support frame;
- a displaceable user interface member operably connected to said first shaft which when displaced by a user causes said first shaft to rotate;
- a first resistance generator;
- a first transfer assembly for transferring force from said first resistance generator to said shafts;
- a second resistance generator for selectively providing a plurality of patterns of variable resistance force;
- a second transfer assembly for transferring force from said resistance generator to said second shaft; and
- a conversion mechanism coupling said first and second shafts and enabling a converted variable resistance force relating to a selected pattern of variable resistance force established by said second resistance generator to be transferred by said first and second shafts to said user interface member during displacement of said user interface member by said user.

5,088,727

APPARATUS FOR EXERCISING OR TESTING ROTARY TORSO MUSCLES

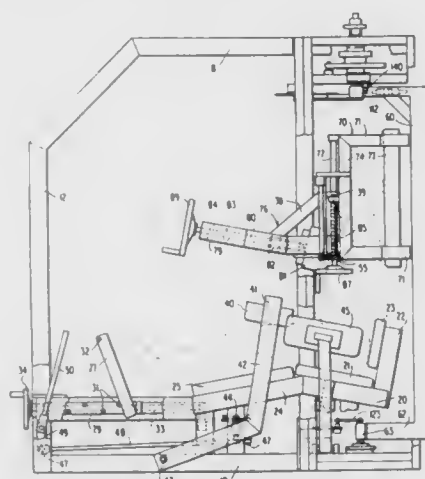
Arthur A. Jones, 1155 NE. 77th St., Ocala, Fla. 32670
Division of Ser. No. 451,129, Dec. 15, 1989, Pat. No. 5,004,230, which is a continuation-in-part of Ser. No. 361,055, Jun. 5, 1989, Pat. No. 5,007,634, and a continuation-in-part of Ser. No. 307,706, Feb. 8, 1989, Pat. No. 4,989,859, and a continuation-in-part of Ser. No. 307,473, Feb. 8, 1989, Pat. No. 5,002,269, and a continuation-in-part of Ser. No. 236,367, Aug. 25, 1988, Pat. No. 4,902,009, which is a continuation-in-part of Ser. No. 60,679, Jun. 11, 1987, Pat. No. 4,836,536. This application Dec. 26, 1990, Ser. No. 633,662

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.⁵ A63B 21/00

U.S. Cl. 272—134

9 Claims



1. In combination with a machine for exercising muscles of the human body, the apparatus comprising in combination, a movement arm mounted for movement about an axis in response to forces generated by said muscles, and means for securing the pelvis against movement including a seat for receiving a human body in seated position and a pelvic pad at the rear of the seat, a footrest for supporting the feet with the legs extending generally horizontally while bent at the knees, and thigh engaging means engageable on upper portions of the high areas such that the legs are held against movement with the femurs extending downwardly and rearwardly from the knees to the pelvis to anchor the pelvis against the seat and pelvic pad and wherein the footrest together with the pelvic pad and thigh engaging means prevents movement of the legs in a generally horizontal plane during exercise of the muscles, and means mounting the footrest for movement in a generally horizontal plane towards or away from the feet of a subject for adjustment purposes.

5,088,728

EXERCISE HARNESS

Mike J. Deden, 1530 Maurice Ave., Missoula, Mont. 59801

Filed Apr. 17, 1990, Ser. No. 510,050

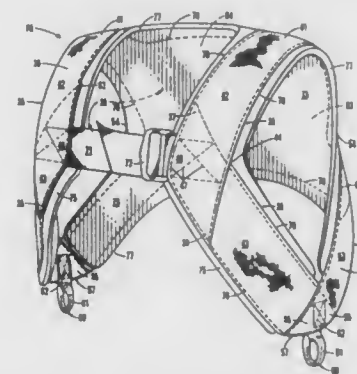
Int. Cl.⁵ A63B 21/00

U.S. Cl. 272—143

6 Claims

1. A thoracic exercise harness for distributing forces about a person's thoracic region comprising:
a pair of shoulder scyes for engaging and encircling a person's thoracic shoulder regions, each shoulder scye including:
a posterior portion;
an anterior portion;
said posterior and anterior portions joined at the apex and nadir thereof forming an integral shoulder scye; and,
an axilla portion integral with said posterior and anterior

portions at the nadir thereof, the anterior and posterior portion extending a substantially equidistant length from said apex to said axilla portion, wherein the axilla portion is positioned directly below the axillae;
said posterior portions of said shoulder scyes having upper trapezius portions downwardly converging towards one another and lower latissimus portions downwardly diverging away from one another, said converging upper trapezius portions and diverging lower latissimus portions avoiding the person's shoulders, axillae, neck and waist;
a posterior support portion joining said posterior portions for maintaining the positioning of said posterior portions;



said anterior portions of said shoulder scyes having superior pectoral portions downwardly converging towards one another and inferior pectoral portions downwardly diverging away from one another, said converging superior pectoral portions and diverging inferior pectoral portions avoiding the person's shoulders, axillae, neck, waist and abdomen;
an anterior support portion joining said anterior portions for maintaining the positioning of said anterior portions; and
a resistance engaging means mounted on each said axilla portion.

5,088,729

TREADMILL FRAME AND ROLLER BRACKET ASSEMBLY

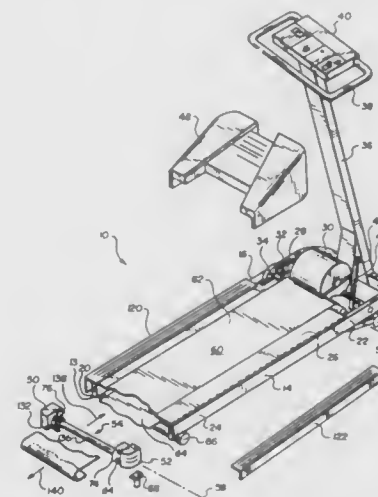
William T. Dalebout, Logan, Utah, assignor to Weslo, Inc., Logan, Utah

Filed Feb. 14, 1990, Ser. No. 479,835

Int. Cl.⁵ A63B 23/06

U.S. Cl. 272—69

1 Claim



1. A rear roller assembly for an exercise treadmill with an endless belt having parallel elongated left and right tubular

frame members with spaced apart free ends, said roller assembly comprising:

- a left and a right end cap each having a plug portion sized to fit snugly within the distal ends of said left tubular frame member and said right tubular frame member, respectively;
- left and right bearing slots formed in said left and said right end caps respectively;
- an elongated roller member having one end rotatably secured in and between said left and right bearing slots, the length of said roller being selected to space said left and said right end caps and to receive and support the endless belt about said elongated roller; and
- left adjusting means and right adjusting means adapted to said left and right end caps, respectively, each for adjusting the position of said left and said right bearing blocks in relation to said end caps respectively.

5,088,730

SWING WITH LOWER SUPPORT STRUCTURE

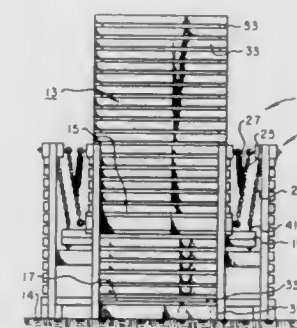
Richard E. Appleton, 303 S. 9th St., Midlothian, Tex. 76065

Filed Sep. 13, 1990, Ser. No. 581,808

Int. Cl.⁵ A63G 9/16

U.S. Cl. 272—85

7 Claims



1. A balanced, tiltable swing suspended from a support structure and above a lower support, comprising:

- a main body portion having a seat portion for supporting at least one person;
- a foot support portion connected with said main body portion such that said foot support portion will contact the lower support when the swing is tilted forwardly;
- a main tilt beam traversing laterally of said main body portion and disposed near the center of gravity of said main body portion with said main body portion substantially balanced thereover when unoccupied and operationally hung and such that said main body portion can be tilted forwardly and backwardly with little unbalancing force;
- a plurality of main lineal support members with at least one main lineal support member being disposed at each end of said main tilt beam, said respective main lineal support members being respectively connected with the support structure;
- a back support means connected with said main body portion, including a back beam, and extending a predetermined distance above said seat portion;
- a plurality of auxiliary lineal supporting members, disposed at least one at each end of said main body portion; connected with respective said lineal support members and with said back support means;
- a biasing means connected with at least said auxiliary support lineal member for controlling the force required to tilt said swing backwardly by an occupant person in the degree of tilt; and
- a safety tilt limit connected with said swing for preventing tilting beyond a predetermined degree of tilt;

such that an occupant person can step on a said foot rest and be seated in said main body portion, tilt said main body portion

backwardly easily and swing by simple oscillating movement of the head at the proper frequency.

5,088,731

ARM EXERCISE MACHINE

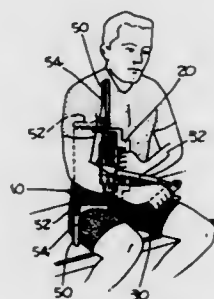
David P. Carpenter, Dunkirk, Md., assignor to M. Michael Carpenter, Los Angeles, Calif.

Filed Oct. 29, 1990, Ser. No. 605,990

Int. Cl.⁵ A63B 23/04; A61H 1/02

U.S. Cl. 272—131

15 Claims



1. An arm exercise machine, comprising:
 - a housing having a pivot therein;
 - a first brace extending from said housing in a first direction;
 - a second brace extending from said housing in a second direction generally opposite to said first direction with said pivot in said housing generally therebetween;
 - said first and second braces having hook-like portions for engagement under a user's armpit and against the user's upper leg; and
 - a pivot rod rotatably attached to said housing by said pivot therein which is grasped and pivoted by the user to exercise the user's arm while said first and second braces support said housing.

5,088,732

COME BACK SOLO TENNIS

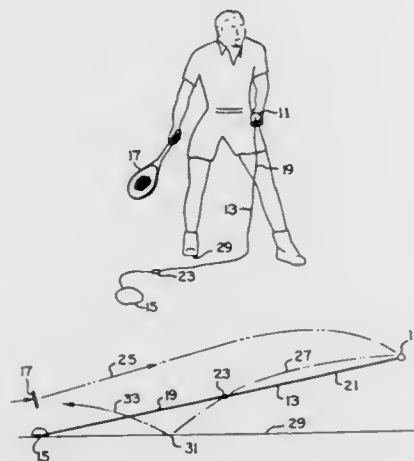
Ji K. Kim, 690 Wilshire Pl., Los Angeles, Calif. 90005

Filed Feb. 11, 1991, Ser. No. 653,502

Int. Cl.⁵ A63B 61/00

U.S. Cl. 273—29 A

1 Claim



1. A game apparatus comprising a tennis ball; an anchorage device locatable at a fixed point on a pavement surface; said anchorage device defining a ball-hitting zone directly thereabove; an elongated flexible cable means having one end attached to said anchorage device and its other end attached to the tennis ball; and a tennis racket; said elongated cable means comprising a flexible non-extensible line and an interconnected flexible elastic cord section; said cable means having

a length of several feet, whereby a person standing adjacent the anchorage device can swing the tennis racket through said ball-hitting zone to drive the tennis ball away from the anchorage device above the pavement surface, such that the flexible elastic cord section is stretched to exert a force for returning the tennis ball towards the anchorage device; the length of the cable means being such that gravitational forces cause the tennis ball to bounce at least once on the pavement surface before reaching the ball-hitting zone; said anchorage device comprising a flat bag having a flat flexible bottom wall and a flat flexible top wall joined together along their edges, and a weighty granular material filling the space between said walls; said top wall having a zippered opening therein for placement of said weighty granular material into the bag.

5,088,733

BASEBALL BAT WITH OVAL HANDLE

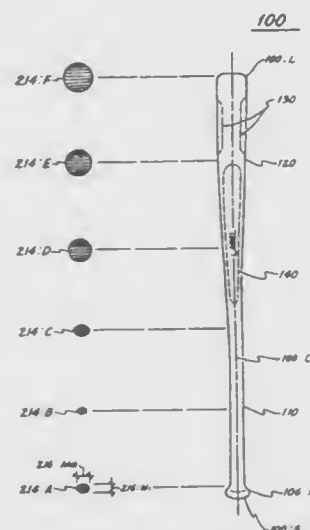
Jeffrey M. Barnea, 2090 William, Palo Alto, Calif. 94306; Joseph A. Barnea, deceased, late of Manchester, and by Catherine C. Barnea, administrator, 747 Lake Ave., both of Manchester, N.H. 03103

Filed Apr. 1, 1988, Ser. No. 176,711

Int. Cl.⁵ A63B 59/06

U.S. Cl. 273—72 R

3 Claims



1. A baseball bat made of wood to be held by a batter with his bottom hand closely positioned on the bat relative to the batter's body and by his top hand remotely positioned on the bat relative to the batter's body, for striking a baseball, comprising:

an elongated body formed of a hard rigid material with a small end and a large end and a center axis extending therethrough;

an oval handle portion formed of the hard rigid body material at the small end thereof by which the batter grips the bat with his bottom hand and his top hand, the oval handle portion having a small oval cross-section traverse to the center axis formed by a major dimension and a minor dimension for defining a locked in position of the batter's bottom hand and top hand relative to each other and relative to the bat;

a round barrel portion formed of the hard rigid body material at the large end thereof for striking the baseball, the barrel portion having a large round cross-section traverse to the center axis;

a middle portion formed of the hard rigid body material extending between the oval handle portion and the barrel portion, which tapers in cross-section from the small oval cross-section of the oval handle portion to the large round cross-section of the barrel portion; and

the grain of the wood extends through the bat from the oval handle portion to the barrel portion and is tilted from the major dimension of the oval handle portion.

5,088,734

ATTENUATING HANDLE FOR RECREATIONAL AND WORK IMPLEMENTS

Gary L. Glava, 6025 E. Donna Cir., Paradise Valley, Ariz. 85253

Continuation-in-part of Ser. No. 550,791, Jul. 9, 1990,

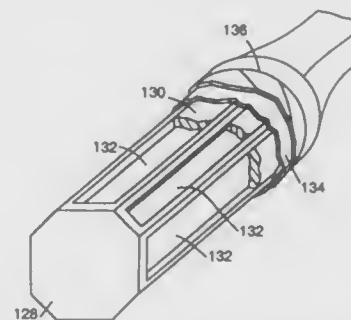
abandoned, which is a continuation of Ser. No. 133,923, Dec. 16,

1987, abandoned. This application Jan. 9, 1991, Ser. No. 639,240

Int. Cl.⁵ A63B 49/08

U.S. Cl. 273—73 J

31 Claims



1. A hand-operated implement, which is a shock-producing or vibration-producing implement, comprising:

a handle attached to the implement, the handle having:

a central core;

a flexible outer gripping surface; and

a gel shock- or vibration-absorbing material positioned between the core and the flexible outer gripping surface thereby substantially encircling the core and whereby a depression in the flexible outer gripping surface is capable of causing a corresponding depression in the gel material, wherein the gel shock- or vibration-absorbing material comprises a gel having a cone penetration between about 100 and 350(10⁻³ mm) and an ultimate elongation of at least about 100% and wherein the thickness of the gel shock- or vibration-absorbing material is sufficient to substantially maintain a shock- or vibration-absorbing separation between the core and at least a portion of the gripping surface, provided that the thickness of the gel shock- or vibration-absorbing material is less than that which interferes with the use or control of the implement, thereby absorbing the shock or vibration produced by the implement without significantly changing the operating control characteristics of the implement.

5,088,735

SHAFT STRUCTURE OF GOLF CLUB AND PRODUCTION METHOD OF THE SHAFT

Hidetoshi Shigetoh, Fuchu, Japan, assignor to Ryobi Limited, Japan

Continuation of Ser. No. 402,527, Sep. 5, 1989, abandoned. This application Mar. 29, 1991, Ser. No. 678,186

Claims priority, application Japan, Sep. 5, 1988, 63-223306

Int. Cl.⁵ A63B 53/10

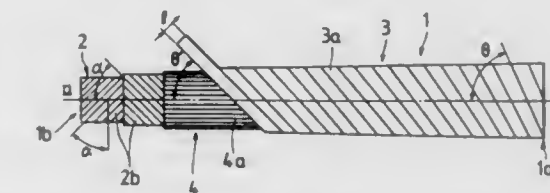
U.S. Cl. 273—80 B

17 Claims

1. A golf club shaft formed by winding a plurality of material layers around a mandrel which is finally removed comprising:
 - an inner layer formed of a cloth prepreg cut out so that its fibers have a predetermined oblique angle with respect to an axial direction of the mandrel and wound around the mandrel;

an intermediate layer formed of a uni-directional prepreg sheet of high strength and high modulus fibers wound around an outer periphery of said inner layer in a state

wherein fibers of the sheet are extended in parallel with the axial direction of the mandrel; and
an outer layer wound around an outer periphery of said intermediate layer, said outer layer being formed of a cloth tape prepreg having generally parallel side edges with a predetermined width equal to or smaller than 20 mm by weaving warps formed of graphite yarns with



other material yarns and wefts formed of graphite yarns, said cloth tape prepreg being wound around the intermediate layer with respect to the axial direction of the mandrel with an angle greater than 45° at a butt of the mandrel, an angle of about 45° at a tip thereof and decreasing angles along an intermediate portion between the butt and the tip.

5,088,736

TOY PINBALL MACHINE

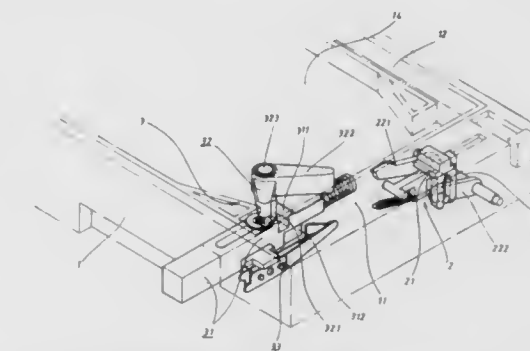
Chuan-Tien Chuang, No. 40, Lane 174, Ta Hsing Street, Tainan, Taiwan

Filed Jan. 16, 1991, Ser. No. 642,000

Int. Cl.⁵ A63F 7/02

U.S. Cl. 273—121 R

5 Claims



1. A toy pinball machine comprising:
 - a machine body having an inclined board, a ball-storing room, a ball path, and a propelling medium;
 - a ball feeding device mounted between said room and said path for feeding from said room to said path a ball to be propelled by said medium through said path to said board;
 - a striking device mounted on said body and capable of striking said ball on said board to delay and/or prevent said ball from falling into said room; and
 - a plurality of springing devices disposed on said board and capable of back springing said ball bumping thereagainst, said ball feeding device including:
 - an actuating piece mounted on said body; and
 - a crank shaft having a ball-feeding handle mounted between said room and said path, and a connector slidably connected to said actuating piece in a manner that when said actuating piece is translated, said ball-feeding handle will feed said ball from said room into said path.

5,088,737

PLAYER OPERABLE LOTTERY MACHINE WITH SYSTEM FOR AUTOMATICALLY IDENTIFYING SPHERES

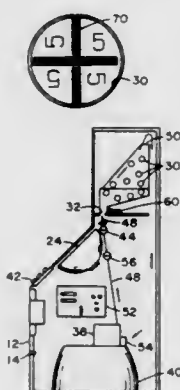
Alan Frank, 886 Hillgate Pl.; Cindy B. Schiavon, 316 Camelot Dr., and Diane Frank, 886 Hillgate Pl., all of Pittsburgh, Pa. 15220

Filed Sep. 12, 1990, Ser. No. 581,051

Int. Cl.⁵ A63F 7/00

U.S. Cl. 273—138 A

13 Claims



5. Random number generating and opto-electronic identification means comprising:

an enclosure containing a plurality of indicia bearing fluid suspendable balls which are visible from outside said enclosure, said balls being marked with light reflective patterns of lines and spaces, the light reflectivity of said lines differing from the light reflectivity of the spaces between said lines;

means for mixing said balls by upward flowing streams of fluid;

stationary means located adjacent said enclosure for emitting light to and for receiving light reflected from said patterns of lines and spaces;

means for causing a randomly selected number of said balls in said enclosure to come to rest in proximity to said stationary means, said means stationary further including means for being responsive to said patterns of lines and spaces and generating electronic signals therefrom corresponding to said indicia; and

means comprising non-coaxial streams of fluid directed generally tangentially against said randomly selected balls, for rotating said randomly selected balls upon coming to rest in said enclosure, whereby said indicia can be readily identified irrespective of the manner in which said balls come to rest in said enclosure.

5,088,738

PENDULUM PUTTING DEVICE

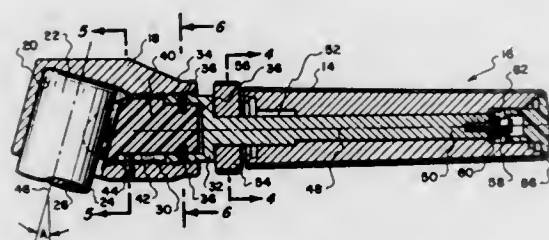
Henry W. Mundt, and Virginia C. Mundt, both of 2640 W. Camino Del Grijalva, Tucson, Ariz. 85741

Filed Aug. 27, 1991, Ser. No. 750,461

Int. Cl.⁵ A63B 69/36, 53/14

U.S. Cl. 273—193 B

5 Claims



1. In combination with an elongated implement where it is desired for said implement to be manually swung in a precise

repeating pendulum movement, said elongated implement having a first elongated center axis, said implement having an operating end and a grasping end which is opposite said operating end, an attachment comprising:

a clamp housing, an elongated clamping member longitudinally movably mounted on said clamp housing, said grasping end of said implement being adapted to tightly engage when said clamp housing with said clamping member is longitudinally moved into tight engagement with said grasping end thereby fixing said clamp housing to said implement;

a mounting shaft fixed to said clamping member, said mounting shaft having a second longitudinal center axis, said second longitudinal center axis being located transverse to said first longitudinal center axis; and

a handle freely pivotally mounted on said mounting shaft, said handle to be grasped by the user and said implement to be swung in a pendulum motion with pivoting occurring between said mounting shaft and said handle.

5,088,739

GAME HAVING AN ENVIRONMENTAL THEME Lu-Anne Mitchell, Hillsborough, Calif., assignor to Chez L.A. Salon Ltd., Saskatoon, Canada

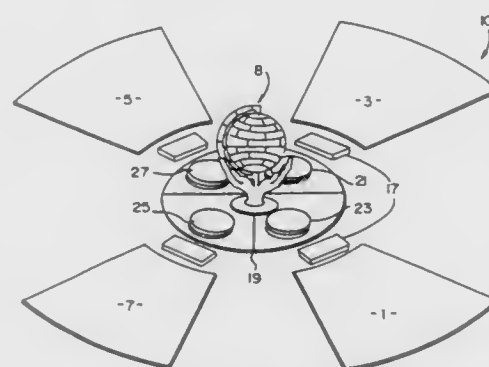
Continuation-in-part of Ser. No. 528,538, May 5, 1990. This

application Sep. 5, 1990, Ser. No. 577,537

Int. Cl.⁵ A63F 3/00, 9/18, 9/00

U.S. Cl. 273—248

15 Claims



1. An improved board game having an environmental problem solving theme for a plurality of players comprising:

(a) a plurality of tokens for movement during play, each player having three tokens during play;

(b) a plurality of pie-shaped game boards, each said pie-shaped game board including:

(i) a plurality of passageways thereon, at least two of said passageways including spaces thereon for travel by said tokens during playing of the game, and a further one of said passageways for travel by said tokens when a given environmental problem has been solved; and

(ii) a final play portion adjacent one end of said further of said passageways;

(c) a first set of instruction means containing a plurality of problems, means corresponding to each problem for indicating a given number of turns to be taken by said players and a second set of instruction means containing corresponding solutions to said environmental problem information;

(d) a third set of instruction means for directing movement of a said player on a said game board,

(e) a plurality of counting devices for recording turns completed by said players during playing of the game,

(f) whereby, at the beginning of play, players select a predetermined number of said instruction means containing environmental problems, players take turns moving said tokens along said at least two passageways and, during movement thereon, each player attempts to seek and

obtain said corresponding solutions to each of their said selected problems within said given number of turns to be taken as indicated on their said selected problems, and whereby matching of an instruction means containing a corresponding solution to a said environmental problem permits travel along a said further one of said passageways and completing travel along a said further one of said passageway resulting in reaching said game board final play portion and winning of said game.

5,088,740

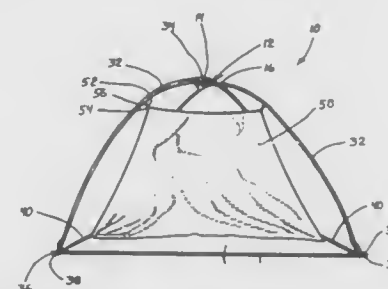
PRACTICE BACKSTOP FOR BALL PLAYING SPORTS Leroy L. Peterson, Omaha, Nebr., assignor to Sportsstuff, Inc., Omaha, Nebr.

Filed May 24, 1990, Ser. No. 527,817

Int. Cl.⁵ A63B 63/00

U.S. Cl. 273—410

9 Claims



1. A practice backstop for ball playing sports, comprising, a support frame including a pair of crossed arcuate poles, each pole having opposite front and rear ends adapted for support on a support surface,

a three sided enclosure open at the front and including a rear wall and right and left side walls, said enclosure being supported on said frame and substantially filling the space between said poles on three sides of said frame, and

a flexible target sheet, means for supporting said target sheet in upright forwardly facing relation within said enclosure,

said target sheet spanning a substantial portion of the interior of said enclosure thereby to be struck by and absorb the impact of balls directed into said enclosure.

5,088,741

MODULAR FIRING GROUND

Andrea Simonetti, No. 21, Via Carlo Zucchi, 00165 Roma, Italy PCT No. PCT/IT89/00034, § 371 Date Nov. 5, 1990, § 102(e)

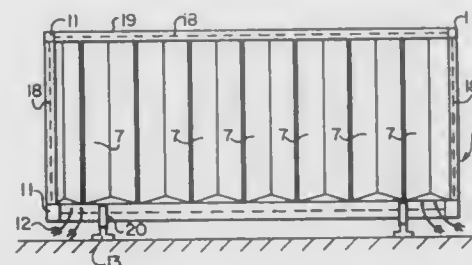
Date Nov. 5, 1990, PCT Pub. No. WO89/11076, PCT Pub. Date Nov. 16, 1989

PCT Filed May 9, 1989, Ser. No. 474,855

Claims priority, application Italy, May 10, 1988, 47939 A/88 Int. Cl.⁵ F41J 1/12, 1/18

U.S. Cl. 273—410

19 Claims



1. A shooting range comprising:

a bullet-arresting module for arresting bullets fired therein; a firing position module for accommodating at least one marksman;

at least one intermediate module positioned intermediate

said bullet-arresting module and said firing position module; and

a firing controller module for controlling operation of said shooting range, said firing controller module being adjacent said firing position module;

wherein each of said modules includes:

rapid connection means for rapidly connecting said module to an adjacent one of said modules;

electric lines, hydraulic lines, and ducts and service connection means for connecting at least one of said electric and hydraulic lines and ducts of one of said modules

to a respective one of said electric and hydraulic lines and ducts of an adjacent one of said modules;

at least one connecting wall for connecting said module to a connecting wall of an adjacent one of said modules

and sealing means for sealingly connecting adjacent connecting walls;

moving means for moving said module when said shooting range is being assembled; and

sound insulation and heat insulation means; and

wherein each of said modules complies with ISO standards.

5,088,742

HYDRAULIC SEAL AND METHOD OF ASSEMBLY Ronald Catlow, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Mar. 11, 1991, Ser. No. 666,908

Claims priority, application United Kingdom, Apr. 28, 1990, 9009588

Int. Cl.⁵ F01D 11/02

U.S. Cl. 277—56

12 Claims



1. A hydraulic seal comprising an inner annular member and an outer annular member, the outer annular member being positioned coaxially around the inner annular member, at least the outer annular member being rotatable, the outer annular member having an integral annular flange extending radially inwardly to define in operation, a lubricant weir, the inner annular member including an annular sealing member extending radially outwardly to define, in operation, a lubricant seal, the outer diameter of the annular sealing member being greater than the inner diameter of the annular flange, the annular sealing member is a spiral ring defining axially adjacent portions, means to bias the axially adjacent portions of the spiral ring together, the axially adjacent portions of the spiral ring are axially partable to allow the annular sealing member to be introduced into or removed from the hydraulic seal past the annular flange on the outer annular member.

5,088,743

COMBINED OIL RING ASSEMBLY

Sumio Ono, Kashiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Japan

Continuation of Ser. No. 438,071, Nov. 20, 1989, abandoned.

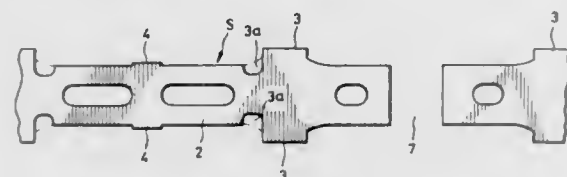
This application Feb. 4, 1991, Ser. No. 650,995

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.⁵ F16J 9/06

U.S. Cl. 277—141

1 Claim



1. In a combined oil ring assembly comprising an annular expander and a pair of annular side rails, with the expander having a base portion extending in a circumferential direction and terminating in a pair of abutting end portions, said base portion having a plurality of corrugations formed in a radial direction and a plurality of rail engaging ear portions spaced from each other in a circumferential direction on upper and lower sides thereof, said base portion further having rail seat portions on upper and lower sides thereof located between said ear portions, said side rails engaging said rail seat portions and abutting against said ear portions at an inner peripheral surface of said rail seat portion, and a plurality of oil releasing bores provided in the base portion of said expander; the improvement comprising cut-out portions formed only on the upper and lower sides of the expander at one side of said upper and lower ear portions nearest to said abutting end portions, with said one side being the side nearer to next adjacent ear portions, and further cut-out portions formed on upper and lower sides of the expander at both sides of said next adjacent ear portions.

5,088,744

RESILIENT SEALING ELEMENT HAVING T-SHAPED CROSS SECTION

Gavin S. Oseman, Worcestershire, England, assignor to Dowty Seals Limited, Tewkesbury, England

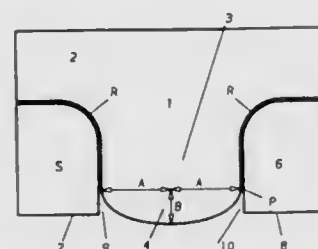
Continuation of Ser. No. 296,122, Jan. 12, 1989, abandoned. This application Jun. 25, 1990, Ser. No. 544,822

Claims priority, application United Kingdom, Jan. 21, 1988, 8801359

Int. Cl.⁵ F16J 15/32, 9/20, 15/16

U.S. Cl. 277—188 R

5 Claims



1. A sealing assembly which comprises a resilient sealing element having a T-shaped cross section having an axially extending portion and a radially extending portion that extends radially from the axially extending portion and has opposed sides and a rounded sealing lip at an end remote from the axially extending portion which meets said opposed sides at turning points, the assembly also comprising supporting elements of substantially non-resilient material positioned one adjacent each of said opposed sides of the radially extending portion, wherein the improvement comprises the surface of the rounded sealing lip between the turning points being substan-

tially elliptical in form when the sealing element is undeformed, the surface of the sealing lip projecting radially from said turning points a distance 15 to 40% of the axial distance between said turning points when the sealing element is undeformed.

5,088,745

SEALS AND SEAL ASSEMBLIES

Nicholas A. Peppiatt, Lightwater, and Paul C. Chambers, Church Crookham, both of England, assignors to Hallite Seals International Limited, England

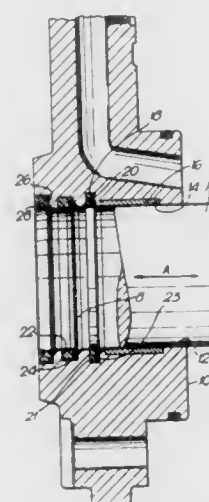
Filed Nov. 2, 1990, Ser. No. 608,270

Claims priority, application United Kingdom, Nov. 9, 1989, 8925358

Int. Cl.⁵ F16J 15/16; F16K 41/00

U.S. Cl. 277—214

20 Claims



1. An elastomeric, circumferentially continuous buffer sealing ring for, in use, acting between a bore defining an axial direction and a part relatively axially movable therein, with the sealing ring seated in an axially oversized annular housing groove in the bore, said sealing ring having an inner periphery defining a sealing lip for sealingly engaging said axial part; an outer periphery for pressing radially outwardly against the housing groove; two opposite axially directed sides extending radially between the inner and outer peripheries, one said side being a sealing side and the other a pressure side; an axially projecting annular sealing portion formed on the sealing side; and at least one axially-directed driving surface on the sealing side, said at least one driving surface being recessed axially relative to the annular sealing portion and communicating inwardly to the inner periphery of the sealing ring at the sealing side thereof, in relation to the sealing lip, through at least one axially recessed communication opening, to, in use, admit fluid from a space on the sealing side of the seal between said at least one driving surface and an axially-facing wall of the housing groove, said annular sealing portion extending continuously around the ring radially outwardly of said at least one driving surface so as to sealingly abut against said axially-facing wall of the housing groove such as to prevent radially-outward escape of the fluid from between said at least one driving surface and said axially-facing wall.

5,088,746

ZERO-DEFLECTION SUPPORT CHUCK

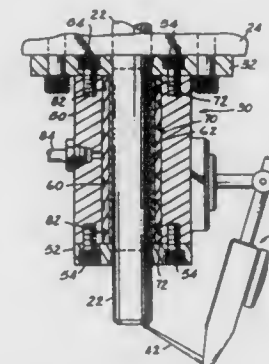
Richard A. Dietz, Utica; Robert Laube, Mt. Clemens, and Eugene R. Andre, Sr., Huntington Woods, all of Mich., assignors to Hydra-Lock Corporation, Warren, Mich.

Filed May 17, 1991, Ser. No. 702,584

Int. Cl.⁵ B23B 31/30

U.S. Cl. 279—4

4 Claims



1. A zero-deflection gripping device for supporting an axially loaded shaft which comprises:
(a) a body to be independently supported having an axial bore for receiving a loaded shaft to be gripped;
(b) a gripping sleeve in said bore of said body to embrace a loaded shaft passing through said bore;
(c) a pressure sleeve positioned in said bore between the inner surface of said bore and the outer surface of the gripping sleeve, said pressure sleeve having an inner surface to contact said gripping sleeve and an outer surface facing the inside surface of said bore, said outer surface having a spiral groove extending from end to end of said pressure sleeve forming lands between said grooves;
(d) land means at the end of said spiral grooves in said pressure sleeve to seal the ends of said pressure sleeve; and
(e) means to introduce a pressure medium into said spiral grooves to force said gripping sleeve against a loaded shaft in said body.

5,088,747

WHEELCHAIR SEATING SYSTEM

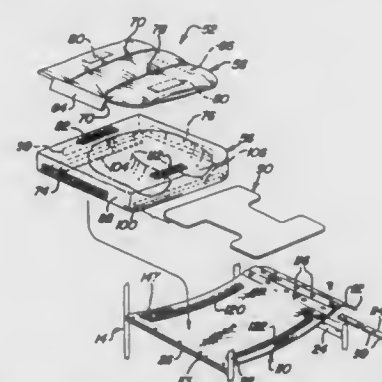
Clark Morrison, Southfield, and Charles F. Stoyka, Troy, both of Mich., assignors to International Marketing and Design Seating System, Inc., Birmingham, Mich.

Filed Sep. 12, 1990, Ser. No. 581,043

Int. Cl.⁵ A47K 27/00

U.S. Cl. 297—219

16 Claims



1. A seating system for a collapsible wheelchair having a pair of supports defining a horizontal seat sling and vertical back sling seating area, said seating system comprising:
a first removable cushion adapted for positioning adjacent said seat sling providing a cushioned horizontal seat, said cushion having a removable board member with a width

for enabling said board member to be positioned between the pair of supports for providing a firm support surface exhibiting hard support surface characteristics, and a foam pad means for providing a cushioned seating surface;
a second removable cushion adapted for positioning adjacent the vertical back sling to provide a cushioned vertical back, said second cushion including removable means for providing a firm or hard support surface exhibiting fixed or hard support surface characteristics, and a foam pad means for providing a cushioned back surface.

5,088,748

ANTI-LOCK BRAKING SYSTEM FOR SKATES

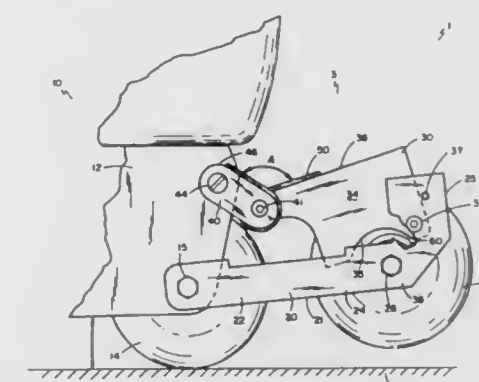
Harvey Koselka, Somerville, and Andrew R. Jones, Roslindale, both of Mass., assignors to Design Continuum Inc., Boston, Mass.

Filed Dec. 28, 1990, Ser. No. 635,232

Int. Cl.⁵ A63C 17/14

U.S. Cl. 280—11.2

4 Claims



1. In a wheeled skating device having a frame, at least one rear wheel attached to the frame, and a braking system attached to the rear of the skating device, said braking system comprising:
a braking wheel with load bearing hubs; and
a four bar linkage arrangement comprised of a first linkage bar formed by the rear portion of said frame, a second linkage bar having a front portion pivotally connected to a lower portion of said first linkage bar and a rear portion, means for rotatably supporting the hubs of said braking wheel to a lower end of said rear portion of said second linkage bar, a third linkage bar having a downwardly facing lower surface for engaging the hubs of said braking wheel, said third linkage bar having a rear portion with a lower end pivotally connected to an upper end of the rear portion of said second linkage bar, and a fourth linkage bar having a rear portion pivotally connected to a front portion of said third linkage bar and a front portion pivotally connected to an upper portion of said first linkage bar, a spring connected between said third linkage bar and said fourth linkage bar for biasing the pivotal connection between said third and fourth linkage bars in an upward direction, and a stop member mounted on an upper end of the rear portion of said second linkage bar for engaging a rear edge of said third linkage bar at a location above the pivotal connection between said second and third linkage bars.

5,088,749

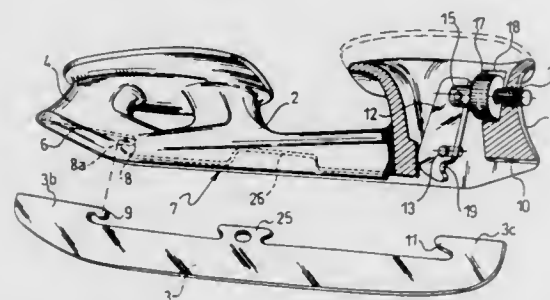
ICE SKATE WITH INTERCHANGEABLE SKID BLADE
Oliviero Olivieri, Treviso, Italy, assignor to Icaro Olivieri & C.
S.p.A. Minuterie, Metalliche, Italy

Filed Jul. 26, 1990, Ser. No. 557,835

Claims priority, application Italy, Nov. 10, 1989, 22347 A/89
Int. Cl.⁵ A63C 1/30

U.S. Cl. 280—11.18

6 Claims



1. An ice skate with an interchangeable skid blade, said ice skate comprising:

a support on which there are defined at least one toe sole portion and at least one heel portion which extend from a common side of said support; and

a skid blade secured to said support and extending longitudinally thereof on an opposite side from said toe sole and heel portions, wherein the support includes at least one seat for receiving a corresponding portion of said skid blade in a press-fit relationship;

said ice skate further comprising a bayonet locking means for locking said skid blade to said support; and means for preventing release of said locking means being disposed in said support and actuatable from an exterior of said support,

wherein said heel portion of said support includes a hollow portion, said means for preventing release of said locking means being housed within said hollow portion, and further wherein said means for preventing release of said locking means comprises a plate-like lever journaled on a pivot pin mounted on said support within said hollow portion of said heel portion, said lever having opposite ends with one end acted upon by a screw accessible from the exterior of said heel portion of said support and the other end contoured to engage with a corresponding dog formed on a trailing portion of said skid blade.

5,088,750

MULTI-FUNCTIONAL WASTE CONTAINER
Ulrich Beese, Wenden-Husborn; Martin Schmidt, Breidenbach-Achenbach, and Eberhard Sturm, Kreuztal, all of Fed. Rep. of Germany, assignors to Otto Industries, Inc., Charlotte, N.C.

Filed Apr. 30, 1990, Ser. No. 516,198

Int. Cl.⁵ B62B 1/00

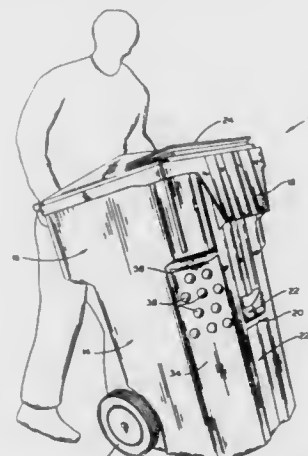
U.S. Cl. 280—47.26

16 Claims

1. A waste container comprising:

a container body for waste including a lower portion and an upper portion, the upper portion having a greater horizontal cross section than that of the lower portion; the lower portion of the container body extending upwardly more than half the height of the container body and having front, rear and opposite side wall portions, the lower portion of the container body further including four beveled corner portions defining four vertical exterior faces extending between the front and the side wall portions and the rear and the side wall portions of the lower container body, and wherein each of the four vertical exterior faces comprises an irregular and interrupted gripping surface for engagement by a lift apparatus clamping onto the lower portion of the container body, the irregular and interrupted gripping surface comprising a plurality of

hemispherically-shaped knobs extending from the four vertical exterior faces, the wall thickness of the container



body being greater at the hemispherically-shaped knobs than in the remainder of the four vertical exterior faces.

5,088,751
GARDEN CART

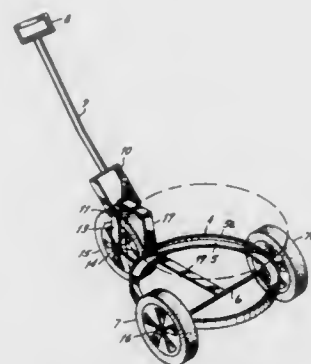
Jerry A. Zint, 16 Sherman Ave., Ft. Thomas, Ky. 41075

Filed May 7, 1990, Ser. No. 520,099

Int. Cl.⁵ B62B 3/10

U.S. Cl. 280—47.34

11 Claims



1. A garden or lawn cart for transporting a separable receptacle comprising:

a frame having circular means for receiving and retaining the receptacle, said frame having a frame member which extends forwardly from said circular means and angulated upwardly and over to receive a front wheel;

a pair of rear wheels mounted on said frame for rotation;

a single front wheel mounted on said forwardly extending frame member for pivotal movement about a vertical axis; and

a handle for controlling the pivotal movement of said single front wheel for moving and directing the movement of said cart, said handle extending outwardly from said frame member and having a sufficient length for gripping by a user while in a standing position for movement of said cart with said rear and front wheels in constant contact with a ground surface during such movement.

5,088,752

HIGH STRENGTH DIE SUPPORT CART HAVING AN ARCHED FRAME

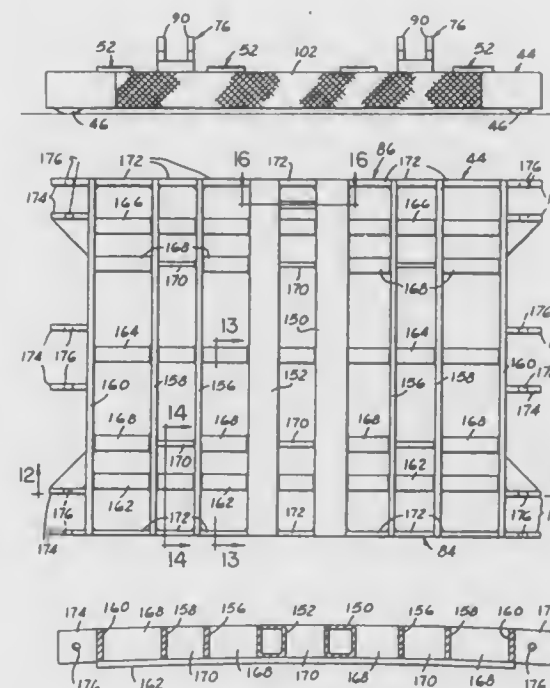
Robert E. Henderson, East Detroit, and Richard L. Sanders, Mt. Clemens, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1990, Ser. No. 606,685

Int. Cl.⁵ B62D 21/02, 21/09; B60K 17/342, 17/356

U.S. Cl. 280—79.11

3 Claims



1. For supporting and transporting a heavy die set outside a stamping press, a movable die cart, comprising: a high strength fabricated frame structure with opposite end edge portions and opposite side edge portions; means for movably supporting the frame structure, the means including a pair of axles, one extending along each of the opposite end edge portions of the frame structure, the axles being attached to the frame structure in a manner permitting rotation of the axles, the means further including a pair of wheels connected to either end of both axles; the frame structure including a pair of tubular beams extending continuously from one side edge portion of the die cart to the other opposite side edge portion and extending parallel to the axles, each tubular beam being slightly outwardly offset from the center of the cart; additional continuous beams positioned outwardly on either side of the tubular beams thus located between a tubular beam and an axle and extending in substantial parallelism with the tubular beams and additional beams; flat cross-members extending continuously beneath the tubular and additional beams from one end edge portion of the frame structure to the other end edge portion substantially normal to the tubular beams and additional beams; the vertical dimension of the flat cross-members being relatively thin as compared to the vertical dimension of the tubular and additional beams to permit forming an arched configuration with central portions elevated relative to opposite end portions; weldments attaching the beams and the flat cross-members together at edge juncture locations thereby forming a strong frame with an upwardly curved central portion between the end edge portions when the frame is unloaded, whereby the frame is distorted by the weight of a die set placed thereon between the end edge portions so that a loaded cart frame is substantially flat.

5,088,753

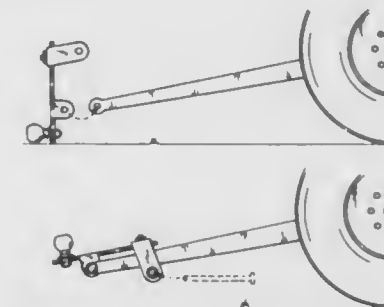
THREE-POINT HITCH WHICH IS CONVERTIBLE TO A BALL HITCH

Clarence Granata, 4055 Bristol Valle, Canandaigua, N.Y. 14224
Filed Apr. 12, 1991, Ser. No. 684,195

Int. Cl.⁵ B60D 1/01

U.S. Cl. 280—416.2

11 Claims



1. A coupling device for converting a three-point hitch to either a ball or pin type hitch comprising:

a main longitudinally extending support member having a forward end and a rearward end, said forward end having means for securing a ball or pin thereto and means for securing the forward ends of two side arms of a three-point hitch thereto;

a locking member secured at the rear section of said main support member, said locking member comprising a cross support member which terminates in a pair of lateral spaced ends, said lateral spaced ends each having a projection extending therefrom in the same direction away from said cross support member, each of said projections having a hole, said holes in said projections being in axial alignment so as to receive a first locking pin therethrough, said projections each having a length such that when said device is mounted on two arms of a three-point hitch said first locking pin passes through said aligned holes in said projections so as to capture said two arms between said cross support member and said pin.

5,088,754

SIDE FOLDING FRONT TOW BAR

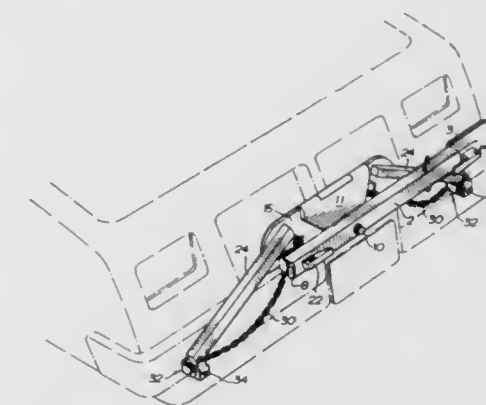
Harold M. Skelton, 16814 Hwy 160, Rio Vista, Calif. 94571

Filed Jan. 28, 1991, Ser. No. 646,236

Int. Cl.⁵ B60D 1/52, 1/167

U.S. Cl. 280—491.3

3 Claims



1. A tow bar assembly adapted to be attached to the front portion of a towed vehicle for towing by a vehicle having a draft hitch member comprising:

a. a tubing member adapted at a first leading end to detachably couple with said draft hitch in a tow position and having a knuckle at the opposite trailing end;

b. the tubing member having a rotating means for rotatable

- attachment to a forward plate to rotate between a tow position, a slot position and a stow position;
- c. the forward plate being hinged to a base plate;
- d. the base plate having a curved perimeter having a slot therein for receiving the knuckle when the member is in a lock position relative to the forward plate;
- e. a hole in the base plate;
- f. a pin as part of the tubing member to move into the hole when the tubing member is in the tow position relative to the forward plate; and
- g. two draft arms each attached at one end to the bumper of the towed vehicle and the respective opposite end of each draft arm attached to the base plate.

5,088,755

SNOW SKI, PROCEDURE FOR ITS MANUFACTURE AND DEVICE FOR THE IMPLEMENTATION OF THIS PROCEDURE

Francois Jodelet, Voiron, France, assignor to Skis Rossignol S.A., Voiron, France

Filed Sep. 11, 1990, Ser. No. 580,528

Claims priority, application France, Sep. 29, 1989, 89 13228

Int. Cl.⁵ B27M 3/00; A63C 5/04

U.S. Cl. 280—609

8 Claims



4. A procedure for manufacturing a ski having sides which have an inclination that is variable in relation to a plane of a sole of the ski along a length of the ski, which comprises the steps of:

positioning and clamping a rough ski in a mount; machining the lateral parts of the ski with the aid of a rotary tool having a rotary axis substantially perpendicular to a plane of the upper surface of the ski and an active surface which is generated by a continuous monotonic curve, the machining being carried out by a relative movement of the tool and of the ski simultaneously in a direction of the length of the ski, in a direction of a width of the ski and in a direction substantially perpendicular to the plane of the upper surface of the ski.

5,088,756

LATERAL GUIDE APPARATUS FOR A CROSS COUNTRY SKI, AND A SKI SHOE COOPERABLE THEREWITH

Jean Hue, Saint Jorioz, and Gerard Graillat, Annecy, both of France, assignors to Salomon S.A., Annecy, France

Continuation of Ser. No. 271,515, Nov. 15, 1988, abandoned.

This application Sep. 11, 1990, Ser. No. 581,198

Claims priority, application France, Nov. 18, 1987, 87 15950

Int. Cl.⁵ A63C 9/00, 5/00

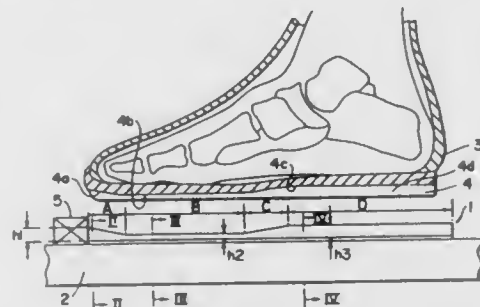
U.S. Cl. 280—615

47 Claims

1. Apparatus for a cross-country ski having a longitudinal median plane for laterally guiding a ski shoe having a sole, a

toe which is attached to the ski, and a heel which is vertically movable in said plane on the ski, said apparatus comprising:

- a) a longitudinally extending, continuous guide rib on the ski having top and lateral side surfaces and adapted to engage and cooperate with a longitudinal groove of complementary shape in the sole of the shoe so as to maintain the heel of the shoe in a predetermined lateral position when the sole of the shoe is pressed flat on the ski; and
- b) said rib, in a longitudinal direction from front to rear, successively including a first section having a height that



decreases in the rearward direction and which is adapted to cooperate with an area of the sole of the shoe corresponding to the toes of the wearer, a second section connected to the first section by a junction, and being of substantially constant height adapted to cooperate with a portion of the sole of the shoe corresponding substantially to the head of the metatarsus of the foot of the wearer, and a third section connected to the second section by a junction, the height of said third section increasing in the rearward direction.

5,088,757

LATERAL GUIDE DEVICE FOR A SKI BOOT

Bernt-Otto Hauglin, Oslo, Norway, assignor to Witco A-S, Norway

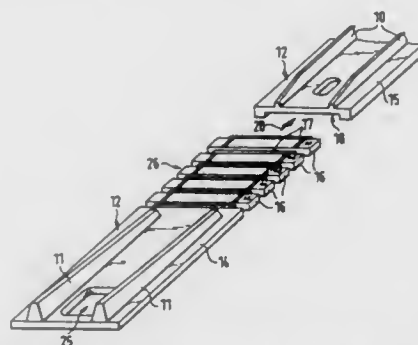
Filed Sep. 4, 1990, Ser. No. 578,872

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1989, 3929352

Int. Cl.⁵ A63C 9/20

U.S. Cl. 280—615

12 Claims



1. A lateral guide device for a ski boot having a sole and having means adapted to be connected to a binding unit (13) attached on a ski such that the heel may be tilted upwards relative to the ski, comprising a ski boot support having a securement unit for attachment to the top surface of a ski, said support having a rear heel section and having a front section and a plantar arch section between said heel section and said front section, said plantar arch section being attached to said rear heel section, said heel section and said front section each having at least one raised longitudinal guide rib unit (12) extending parallel to the front and to the back of the ski and adapted to mate with a complementing longitudinal groove in the underside of the sole of the ski boot, said guide rib unit

providing lateral guidance of the ski boot in a rolling movement of the ski boot from an upwardly tilted position downwardly to a position approximately parallel to the ski, said plantar arch section (26) including at least one breakable segment (16), each said breakable segment including a front locking element of reduced cross-sectional area, said front section having a rearwardmost recessed locking element, one of said locking elements being a projecting element and the other of said elements being a recessed element adapted to matingly receive said projecting element and establishing said rearwardmost locking element in locking engagement with said front locking element of the forwardmost breakable segment (16) for connecting said plantar arch section to said front section and thereby to said ski.

5,088,758

SUSPENSION SYSTEM FOR SEMI TRAILERS

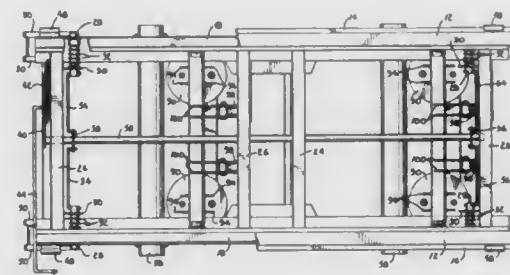
Kenneth Wall, Springfield, and Ray Mueller, Walnut Grove, both of Mo., assignors to Reyco Industries, Inc., Springfield, Mo.

Filed Aug. 16, 1990, Ser. No. 568,013

Int. Cl.⁵ B60G 5/00

U.S. Cl. 280—683

11 Claims



1. A suspension for an over-the-road semi-trailer having frame rails and plural axles, said suspension comprising:
- a rigid frame having opposite sides;
- means for mounting said frame on said rails;
- rigid hanger means on opposite sides of the frame at a location forwardly from each axle;
- a pair of spring beams for each axle, each spring beam having front and back end portions and being connected with the corresponding axle between said end portions;
- means for supporting the front end portion of each spring beam on the hanger means on one side of the frame;
- a pair of rigid torque arms each connected at one end with one of said hanger means and at another end with the axle;
- an air cushion assembly for each spring beam interposed between the spring beam and frame at a location behind the axle to provide air cushioning for the suspension;
- shock absorber means connected between each axle and frame to dampen motion; and
- a transverse track rod for each axle pivoted at one end to the back end portion of one spring beam on one side of the frame and at another end to the opposite side of the frame to accept transverse loads, each track rod being located behind the corresponding axle.

5,088,759

VEHICLE SUSPENSION SYSTEM

Shin Takehara, and Toshiki Morita, both of Higashi-Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 14, 1990, Ser. No. 522,785

Claims priority, application Japan, May 17, 1989, 1-124061

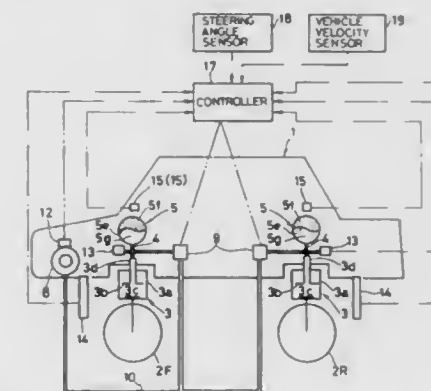
Int. Cl.⁵ B60G 11/26

U.S. Cl. 280—707

9 Claims

1. A vehicle suspension system comprising:
- a cylinder device provided between a vehicle body member and a vehicle wheel member for the vehicle body member

in which suspension characteristics are changed by controlling hydraulic fluid supplied to the cylinder device, vehicle height detecting means for detecting a vehicle height displacement, vehicle height change rate detecting means for detecting a rate at which the vehicle height displacement changes, and control means for receiving signals from both the vehicle height detecting means and the vehicle height change rate detecting means to determine vehicle height change rate



gain coefficients and control the hydraulic fluid supplied to the cylinder device in accordance with said vehicle height change rate gain coefficients so that the rate at which the vehicle height displacement is changed is suppressed, said control means changing the vehicle height change rate gain coefficients in accordance with a vehicle operating condition so as to change the control of the hydraulic fluid supplied to the cylinder device by increasing at least one of said vehicle height change rate gain coefficients when the vehicle is stopped and starts running.

5,088,760

SEMI-ACTIVE SUSPENSION CONTROL SYSTEM WITH REDUCED SWITCHING FREQUENCY IN HARD AND SOFT SUSPENSION CHARACTERISTICS

Shinobu Kakizaki, Fumiyuki Yamaoka, Mitsuo Sasaki, Hiroyuki Shimizu, and Junichi Emura, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

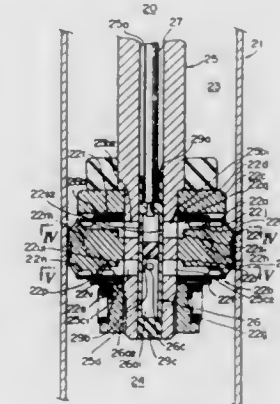
Filed Jul. 5, 1990, Ser. No. 548,222

Claims priority, application Japan, Jul. 10, 1989, 1-177792

Int. Cl.⁵ B60G 17/015

U.S. Cl. 280—707

12 Claims



1. A suspension control system for an automotive vehicle comprising:
- a suspension system disposed between a vehicular body and

a bumping member for preventing the dash upper panel from damaging the air bag unit and interfering with a proper operation of the air bag unit, said bumping member being an extension of said defroster nozzle and disposed between said dash upper panel and said casing so as to be deformed by said dash upper panel and said casing when said dash upper panel is moved into contact with said bumping member during the collision, the air bag unit thereby being unaffected by movement of said dash upper panel during said collision.

5,088,766

STEERING SYSTEM FOR VEHICLE

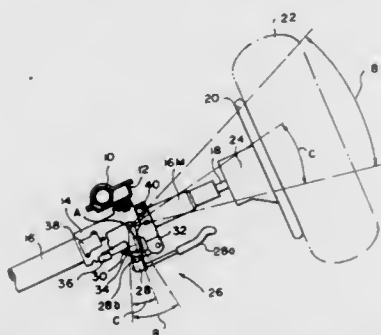
Hiroshi Nakatsuka; Isao Hirashima; Masatoshi Takayama, and Shigefumi Kohno, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 12, 1990, Ser. No. 596,284

Claims priority, application Japan, Oct. 13, 1989, 1-267663
Int. Cl.⁵ B62D 1/18

U.S. Cl. 280—775

28 Claims



1. A steering system for a vehicle comprising a tilt mechanism for adjusting the height of a steering wheel, wherein said tilt mechanism comprises:

- a lock means which locks the steering wheel in a plurality of desired positions within a larger angular range,
- a lock release means which releases the lock means to permit the steering wheel to be tilted within the larger angular range, and
- a tilt limit means which inhibits the steering wheel from being tilted out of a smaller angular range while the vehicle is running, the smaller angular range being included in the larger angular range;

wherein said lock means comprises a fixed engagement member which is held stationary relative to the vehicle body and a movable engagement member which is movable together with the steering wheel relative to the fixed engagement member, the fixed engagement member and the movable engagement member being adapted to be engaged with each other in a plurality of positions to lock the steering wheel in a plurality of desired positions within said larger angular range, and said lock release means comprises a third engagement member which is movable between a first position in which it urges the movable engagement member to be engaged with the fixed engagement member and a second position in which it releases the movable engagement member and permits the movable engagement member to move relative to the fixed engagement member, said tilt limit means preventing the movable engagement member from being moved relative to the fixed engagement member out of a predetermined range which corresponds to said smaller angular range even if the third engagement member is in the second position while the vehicle is running.

5,088,767
DEVICE FOR SECURING A TUBULAR MEMBER, IN PARTICULAR A MOTOR VEHICLE STEERING COLUMN

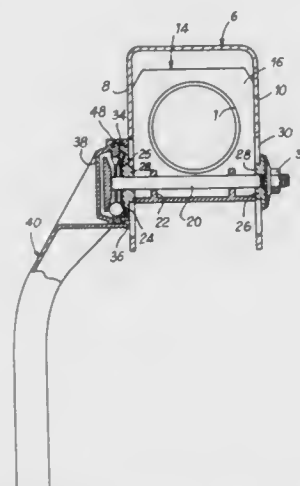
André Hoblingre, Valentigney; Patrick Courvoisier, Montbéliard, and Jean-Marie Bertrand, Valentigney, all of France, assignors to ECIA, France

Filed Oct. 30, 1990, Ser. No. 605,333

Claims priority, application France, Nov. 9, 1989, 89 14708
Int. Cl.⁵ B62D 1/18

U.S. Cl. 280—775

9 Claims



1. A securing device for securing a tubular member, and in particular a motor vehicle steering column, which can be adjusted continuously by pivoting and/or by axial displacement, said device comprising: a fitting (6) fixed onto bodywork of the vehicle and forming an inverted-U-shaped structure in which the tubular member can be displaced; an assembly member (14) which is integral with the tubular member and which has two opposite faces (15, 16) in contact with side walls (8, 10) of the fitting; and locking means, for locking the tubular member by bringing the side walls (8, 10) of the fitting (6) closer together; said locking means comprising:

- a longitudinally-extending tie bolt (20) which traverses, parallel to a pivot axis of the tubular member, the side walls (8, 10) of the fitting (6) in curved slots (30) of the side walls (8, 10), between two outer bearing stops (24, 26) carried by the tie bolt;
 - a control lever (40); and
 - at least one spacer member (52);
- wherein facing surfaces of a widened head (42) of the tie bolt (20) and of a corresponding one of said bearing stops (24) define a space with a substantially V-shaped cross-section; and
- wherein said one spacer member (52) is disposed in said space and is displaceable radially by rotation of the control lever (40) about the longitudinal axis of the tie bolt (20).

5,088,768

STRUCTURE OF IMPACT ABSORBING STEERING APPARATUS

Tomoyuki Maruyama, and Yoshiyuki Shimizu, both of Shizuoka, Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,696

Claims priority, application Japan, Jun. 27, 1989, 1-75333[U];
Aug. 31, 1989, 1-102335[U]

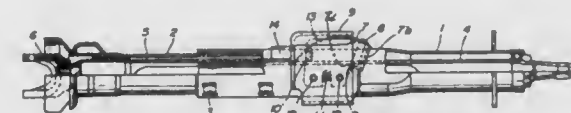
Int. Cl.⁵ B62D 1/11

U.S. Cl. 280—777

9 Claims

1. A structure for a steering apparatus comprising: a clamp portion fixed to a vehicle body; a bracket body which is substantially C-shaped in horizontal cross section fixed to the

clamp portion and having a wall portion through which a column jacket is linked and into which a steering shaft is coaxially housed, wherein the bracket body includes side walls having spot welded portions respectively so as to link to the clamp portion, a cut out portion, and projecting portions located below the cut out portion, the projecting portion being penetrated through elongated holes of step portions formed on the clamp portion; wherein the wall portion includes curl



portions located adjacent to the side walls, into which rollers are inserted, and the clamp portion includes pawl portions engaged with the side walls of the bracket body; an enclosing body enclosing an upper surface of the bracket body so that no foreign matter is received; and wherein the enclosing body has end portions inserted into a lower portion of a stop portion of the column jacket and includes holes through which the rollers are inserted into the curl portions.

5,088,769

CONTROL APPARATUS OF PASSIVE SEAT BELT

Hiroshi Furuhashi, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

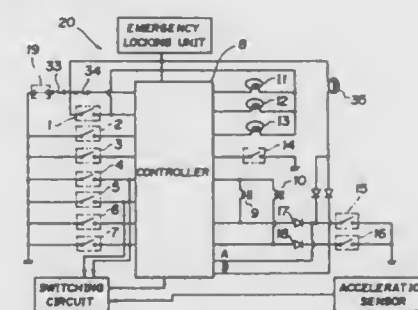
Filed Jun. 7, 1990, Ser. No. 534,461

Claims priority, application Japan, Jun. 30, 1989, 1-168706;
Jan. 30, 1989, 1-168707; Jul. 11, 1989, 1-178234

Int. Cl.⁵ B60R 22/08

U.S. Cl. 280—803

3 Claims



1. In a vehicle passive seat belt apparatus including a seat belt, a retractor for housing part of the seat belt, said retractor including means for permitting withdrawal of said seat belt therefrom and means for retracting said seat belt thereinto, sensing means for sensing acceleration of a door of the vehicle and for sensing withdrawal of the seat belt from the retractor, emergency bolt locking means responsive to said sensing means for selectively locking said seat belt against withdrawal from said retractor, and a belt lock cancelling solenoid which selectively prevents operation of said emergency belt lock means in response to opening and closing of the vehicle door, the improvement comprising:

- a door switch means provided adjacent an opening edge of the vehicle door for detecting the opening and closing of the vehicle door, a releasable latch mechanism for positively retaining the vehicle door latched in a closed position, said latch mechanism having latch switch means provided therein for detecting whether the vehicle door has been positively latched in said closed position by said latch mechanism, and control means responsive to said door switch means and said latch switch means for effecting actuation of the belt lock cancelling solenoid only when both said door switch means and said latch switch means have detected that the door is open, said control means including delay means for maintaining the actua-

tion of said solenoid for a predetermined period of time immediately after one of said door switch means and said latch switch means has detected that the vehicle door is closed, each of said door switch means and said latch switch means including an electrical switch having respective open and closed positions, said control means including electric current supply means for selectively supplying electric current for actuation of said solenoid, one of said electrical switches being arranged in series circuit with said electric current supply means and said solenoid for permitting electric current from said electric current supply means to flow through said solenoid when said one electrical switch is in said closed position, and said one electrical switch coacting with the vehicle door to be switched into said open position whenever the vehicle door is closed, thereby electrically preventing erroneous actuation of said solenoid while the vehicle door is closed.

5,088,770

RECORD SYSTEM FOR BOOKS AND OTHER LOANED ARTICLES

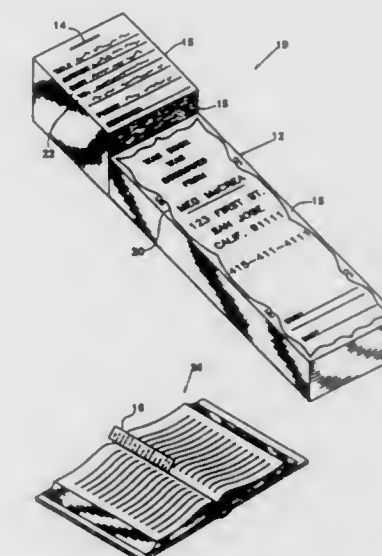
Marguerite J. McCrea, 1571 Dry Creek Rd., San Jose, Calif. 95125

Filed Oct. 29, 1990, Ser. No. 604,978

Int. Cl.⁵ B42D 9/00

U.S. Cl. 283—105

7 Claims



1. A record keeping device for use by a lender in keeping a record of loaned articles, comprising:

- a bound stack of sheets each having a first portion with a writing surface capable of receiving written information thereon, including information identifying a borrower of an article, the identity of the article and the date on which the article was borrowed, and with printed indicia and dedicated blank spaces prompting the lender to enter such information,
- the bound together sheets being bound in such a way as to enable access to sheets below,
- a second portion attached to each first portion on each of the bound together sheets, with means permitting easy removal of the second portion from the first portion while maintaining the first portion in the bound stack,
- and the second portion including a surface with information receiving means for enabling the entry of information relating to the loan of the article, including at least the name of the owner, whereby the second portion when removed from the first portion and secured to the loaned article serves as a constant reminder to the borrower.

5,088,771

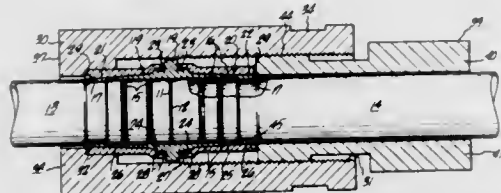
TUBE UNION

Amir P. Hosseinian, Beverly Hills, and John L. Binford, Lake Elsinor, both of Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Feb. 6, 1990, Ser. No. 479,648
Int. Cl.⁵ F16L 35/00

U.S. Cl. 285—39

21 Claims



1. A union assembly for coupling the ends of a pair of tubes comprising a sleeve for positioning centrally over butting ends of a pair of tubes, the sleeve having an internal surface with a spaced series of circumferential lands and grooves, and an external surface having a pair of tapered external faces decreasing in diameter from a central portion of the sleeve towards opposite ends of the sleeve, and a swaging collar positioned in abutting relationship with each respective end of the sleeve such that as each collar is urged axially towards the central portion of the sleeve, the sleeve is compressed inwardly to deform the wall of the tubes into engagement in the grooves between the lands such that the tubes form a series of ring joints corresponding to the lands and grooves, wherein the tapered portion from each end of the sleeve ends in a raised lip spaced from the central portion of the sleeve, and wherein an indented circular slot is provided adjacently between each lip and the central portion, such that the central portion forms at least part of a wall for the slot, and each collar having means for engagement with the slot and wherein the coupling is effective to withstand pressures of several thousand pounds per square inch, and wherein the means for engagement in the collar includes a ring and also includes a slot, the ring and the slot in the collar accommodating the lip in the sleeve.

5,088,772

JOINING INSULATED ELONGATE CONDUIT MEMBERS

Frans S. J. Van Dijk, Swindon, United Kingdom, assignor to N. V. Raychem S. A., Kessel-Lo, Belgium

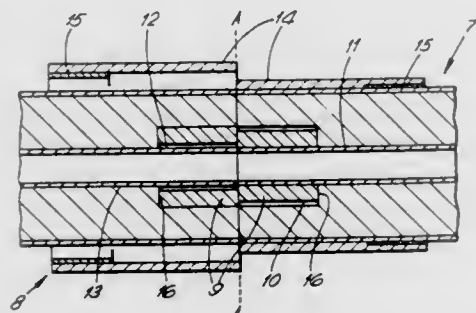
Continuation of Ser. No. 349,886, May 5, 1989, Pat. No. 5,002,716, which is a continuation of Ser. No. 112,005, Oct. 20, 1987, abandoned, which is a continuation of Ser. No. 797,608, Nov. 13, 1985, abandoned. This application Jun. 15, 1990, Ser. No. 538,633

Claims priority, application United Kingdom, Nov. 14, 1984, 3428815; Jun. 28, 1985, 8516476

Int. Cl.⁵ F16L 59/00

U.S. Cl. 285—47

17 Claims



1. An assembly comprising
(a) an elongate conduit member surrounded by insulating material which is provided with an annular recess extending radially and longitudinally along a section of the con-

duit member at one end thereof such that the insulating material surrounds but is radially spaced from the conduit member in that section thereby forming said recess;
(b) a second member for connection to said end of said elongate conduit member; and
(c) a radially shrinkable tubular connecting collar in its preshrinkage configuration located at least partially within said recess so that it at least partially is surrounded by said insulating material and positioned so that when it has been shrunk it connects the members.

5,088,773

ELECTRICALLY INSULATING PIPE COUPLING APPARATUS

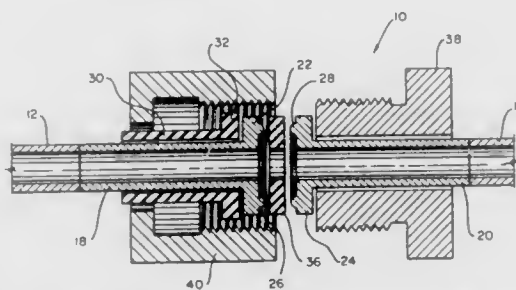
Nicholas M. Gralski, Santa Cruz County, Calif., assignor to Watkins Johnson Company, Palo Alto, Calif.

Filed Aug. 17, 1990, Ser. No. 570,122

Int. Cl.⁵ F16L 19/02

U.S. Cl. 285—52

2 Claims



1. A coupling apparatus for securing together and electrically isolating pipe sections comprising:

- first and second extension members each having first and second ends, said first end being adapted for attachment to said pipe section and said second end having an integral flange extending radially outward from said pipe section, said integral flange of said first extension member being positioned facing said integral flange of said second extension member, said first and second integral flanges each having an annular sealing bead protruding from the surface thereof;
- an electrically insulating sleeve mounted around said first extension member and having an insulating flange which extends radially outward from said insulating sleeve formed at one end such that, when said insulating sleeve is positioned on said first extension member, said insulating flange abuts said integral flange;
- a nonconductive spacer positioned between said first and second integral flanges and formed to receive said sealing beads of said first and second extension members, said spacer being of substantially uniform thickness in the direction of said facing flanges and being of sufficient thickness to form a seal with said sealing beads and to electrically isolate said first extension member from said second extension member; and
- first and second complementary separable coupling members, said first coupling member being slidably mounted on said insulating sleeve on said first extension member, said second coupling member being slidably mounted on said second extension member, said first and second coupling members each being individually movable about a corresponding one of said extension members, said coupling members joining together to move each of said sealing beads into compressive contact with said spacer to deform said spacer and thereby form a seal along the area of engagement, thereby sealingly engaging said first extension member to said second extension member.

5,088,774

COUPLING FOR INTERCONNECTION OF COAXIAL TUBING

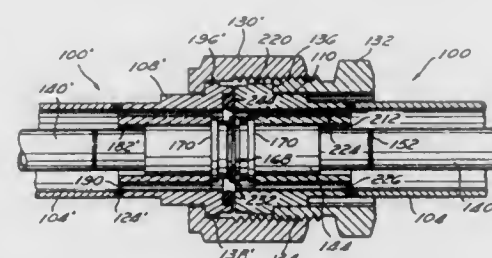
Jeffrey J. Spiegelman, San Diego, Calif., assignor to Tylan General, Inc., San Diego, Calif.

Filed May 7, 1990, Ser. No. 519,874

Int. Cl.⁵ F16L 39/00

U.S. Cl. 285—133.1

13 Claims



1. A connector system for interconnecting first and second coaxial pipes having respective inner and outer tubes, said first connector system comprising:

- first and second inner fittings attached to said inner tubes of said first and second coaxial pipes, respectively, each of said first and second inner fittings having a facing surface with a circular ridge formed thereon and having a shoulder proximate to said facing surface;
- first and second outer fittings attached to said outer tubes of said first and second coaxial pipes, respectively, each of said first and second outer fittings having a facing surface and having an annular recess formed in said facing surface, said annular recess being sized to receive said shoulder to a respective one of said first and second inner fittings, each of said first and second outer fittings having a shoulder disposed opposite said facing surface;
- a first coupler to fit over said first outer fitting, said first coupler having a facing surface that engages with said shoulder of said first outer fitting, said first coupler having external threads on a portion thereof;
- a second coupler sized to fit over said second outer fitting, with second coupler having a facing surface that engages with said shoulder of said second outer fitting, said second coupler having internal threads to engage said external threads of said first coupler;
- a metallic gasket positioned between said circular ridge on said facing surface of said first inner fitting and said circular ridge on said facing surface of said second inner fitting; and
- a pliable seal positioned between said facing surface of said first outer fitting and said facing surface of said second outer fitting, said pliable seal having a diameter sufficient to encompass said annular recesses in said facing surfaces of said first and second outer fittings, said pliable seal having a thickness selected so that said pliable seal starts compressing when said first and second couplers are threadingly engaged prior to engagement of said metallic gasket by said circular ridges and continues to compress after engagement of said metallic gasket by said circular ridges so that said metallic gasket provides fluid-tight contact with said circular ridges and said pliable seal provides fluid-tight contact between said first and second outer fittings.

5,088,775

SEAL RING WITH FLANGED END PORTIONS

Donald M. Corsmeier, Wyoming, and Nicholas P. Poccia, Oxford, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 27, 1990, Ser. No. 559,113

Int. Cl.⁵ F16L 21/00, 23/00

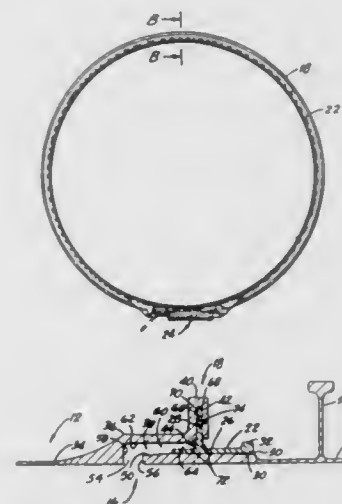
U.S. Cl. 285—374

13 Claims

1. A sealing ring apparatus for forming a sealed joint be-

tween a pair of axially-aligned conduits or ducts, said sealing ring apparatus comprising:

- a large seal ring segment comprising a first free end portion and a second free end portion, said first and second free end portions defining a circumferentially extending gap therebetween; and
- a small seal ring segment extending circumferentially across said gap so as to form a substantially continuous 360° seal



ring, said small seal ring segment comprising a first end portion overlapping said first end portion of said large seal ring segment with a sliding fit and a second end portion circumferentially fixed with a tongue and groove fit to said second end portion of said large seal ring segment such that radial expansion and contraction of said seal ring effects circumferential sliding movement between said first free end portion of said large seal ring segment and said first end portion of said small ring segment.

5,088,776

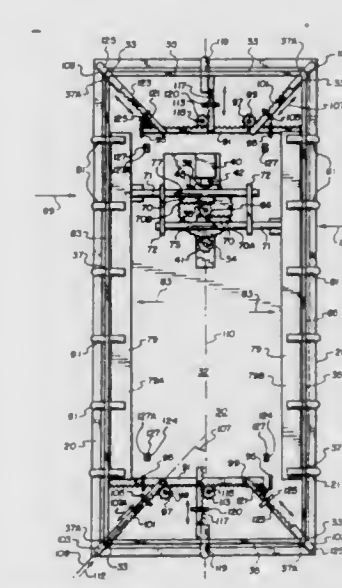
LOCKING MECHANISM FOR A SAFE DOOR

C. Thomas James, 460 N. 880 East, Springville, Utah 84663
Continuation-in-part of Ser. No. 607,996, Nov. 1, 1990, which is a continuation-in-part of Ser. No. 374,257, Jun. 30, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 614,625

Int. Cl.⁵ E05C 9/12

U.S. Cl. 292—33

9 Claims



1. A locking mechanism for use with a door having an inte-

rior surface, an exterior surface, a plurality of sides and a plurality of corners, each corner being defined by an intersection of a pair of said sides, said door being enclosed in a frame having corners corresponding to said corners of said door, said frame defining an inwardly facing side, said locking mechanism comprising:

- a drive gear rotatably mounted on said interior surface of said door;
- an extension having a first gear fitted thereon, said extension being displaceably mounted along said door's interior surface to extend outwardly from a respective corner of said door, said first gear being mechanically inter-cooperated within said drive gear;
- a drive means mechanically associated with said drive gear adapted for permitting a user to rotate said drive gear from said exterior surface, said drive means comprising:
 - a drive shaft journaled through said door;
 - a handle mounted on said drive shaft adapted to be grasped and turned by a user;
 - a primary gear mounted on said drive shaft and positioned on said door's interior surface;
 - at least one first rack gear mechanically cooperated with said primary gear, said first rack gear being displaceable along said door's interior face;
 - an elongate shaft fitted with a plurality of studs configured to form a securement engagement with said frame, said elongate shaft being mounted on said first rack gear;
 - a second rack gear mounted on said elongate shaft, said second rack gear being mechanically cooperated with said drive gear, said second rack gear being adapted to rotate said drive gear upon a user's rotation of said drive shaft;
- wherein a drive means induced rotation of said drive gear effects a displacement of said extension outwardly from said door corner into a securement-producing engagement with said aperture defined with said frame corner.

5,088,777

LOCK DEVICE FOR DETACHABLE ROOF

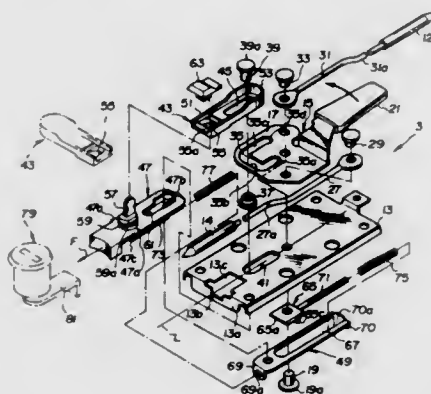
Tomio Ono, Ryo Tsuruo, Hiromi Koyama, all of Kanagawa, and Ryoji Fujihara, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisakusho Co., Ltd., both of Japan
Filed Jan. 8, 1991, Ser. No. 638,579

Claims priority, application Japan, Jan. 9, 1990, 2-1021

Int. Cl.⁵ E05C 13/00

U.S. Cl. 292-40

14 Claims



1. A lock device for locking a detachable roof to a car body, comprising:
 - a housing mounted to said detachable roof, said housing defining a certain clearance through which the interior of said housing is exposed to the outside of the housing;
 - a handle lever including a base portion pivotally arranged in said housing and a grip portion projected into the outside of said housing, said base portion being formed with a curved guide slot which has at least a locking part;
 - a lock member linked to said handle lever in such a manner

that, when said handle lever is pivoted to a lock position, said lock member becomes operative and, when said handle lever is pivoted to an unlock position, said lock member becomes inoperative;

- a guide pin movably received in said housing and slidably engaged with said curved guide slot of said handle lever, said guide pin suppressing said handle lever from pivoting from said lock position toward said unlock position when received in said locking part of said guide slot;
- a slide member incorporated with said guide pin, said slide member being movable in a given direction to disengage said guide pin from said locking part;
- a lockable stopper which can assume a locking position to suppress the movement of said slide member in said given direction; and
- a wall member raised from said slide member in a manner to conceal said guide pin from said certain clearance.

5,088,778

HANDLE LOCK WITH IMPROVED ENGAGEMENT AND LINKING-UP

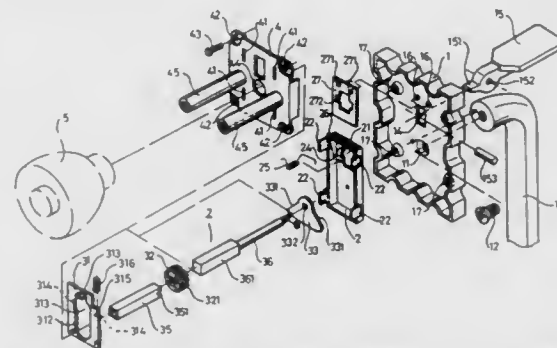
Jui C. Lin, No. 55-10, Been Chou Rd., Kangshan, Kaohsiung Hsien, Taiwan

Filed Apr. 9, 1991, Ser. No. 682,311

Int. Cl.⁵ E05B 63/14

U.S. Cl. 292-336.3

5 Claims



1. A lock structure for operating a dead bolt in a door and the like comprising a moving tube adapted to be rotated in order to operate the dead bolt, a rotary knob on one side of the structure, a pivotal pressure plate on an opposite side of the structure and a drive mechanism for rotating the moving tube both by rotation of the knob and by pivotal movement of the pressure plate, the drive mechanism comprising a turning shaft having a first portion received rotatably in the moving tube, a second portion at one end of the first portion non-rotatably coupled to the rotary knob and a third portion at an opposite end of the first portion projecting from the moving tube, a sector plate non-rotatably mounted on the third portion of the turning shaft, a gear plate formed with linear gear teeth and with protrusions engaging opposite sides of the sector plate whereby rotation of the sector plate by the rotary knob through the turning shaft is effective to move the gear plate in a direction lengthwise of the gear teeth, a gear in mesh with said gear teeth and drivingly engaged with said moving tube whereby movement of the gear plate in said direction is effective to rotate the moving tube for operating the deadbolt, the structure further including an abutment on the said gear plate, a plate assembly providing a pivotal support for said pressure plate, and a tongue extending from the pressure plate engaging said abutment for moving the gear plate in said direction independently of the sector plate by pivotal movement of the pressure plate thereby rotating the moving tube for operating the deadbolt by pressure applied to the pressure plate.

5,088,779

DOOR LATCH RELEASE MECHANISM

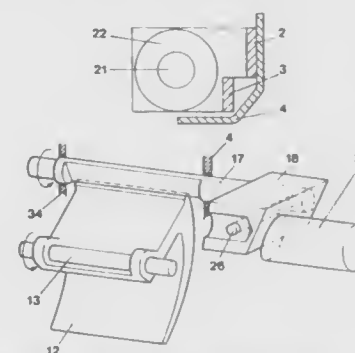
Frank Weiss, New South Wales, Australia, assignor to Harcor Security Seals Pty Limited, New South Wales, Australia
Filed Aug. 27, 1990, Ser. No. 573,981

Claims priority, application Australia, Aug. 28, 1989, PJ5973

Int. Cl.⁵ E05B 15/02

U.S. Cl. 292-341.16

7 Claims



1. A door latch release mechanism having:
 - a housing adapted for mounting in a door jamb;
 - a striker mounted on a shaft in the housing for pivotal movement between a door lock tongue engagement position and a door lock tongue release position; and
 - a longitudinally extending stop mounted in the housing and having a portion capable of contacting the striker so as to latch the striker and prevent pivoting thereof from the door lock tongue engagement position, the stop is rotated by electromagnetic means on its longitudinal axis, the shaft having its axis parallel to the axis of the stop and the striker having an elongated edge parallel to each axis, said portion of the stop being generally semi-circular in cross section, wherein said portion of the stop is adapted to engage substantially the whole of the elongated edge in a tangential manner, so that rotation of the stop to an effective extent releases the striker.

5,088,780

LOCK-KEEPER SECURITY SHIELD PLATE

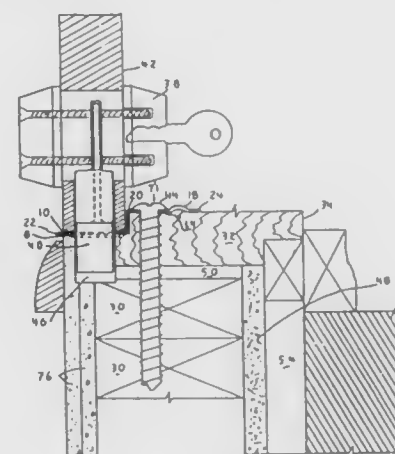
William Doherty, 938 Westview Dr., Louisville, Ky. 40214

Filed Jun. 27, 1991, Ser. No. 722,207

Int. Cl.⁵ E05C 21/00

U.S. Cl. 292-346

8 Claims



7. An improved lock-keeper reinforcing security shield plate assembly mounted on a door jamb structure adjacent a door-stop thereof; a door-bolt means mounted on an adjacent door for reception in a bolt opening means formed in the door jamb; said shield plate being formed being formed of two laterally offset plate portions joined at adjacent edges by a central plate portion; one of said offset plate portions having an opening

formed to overly said bolt opening means and shaped to receive said door bolt means; the other of said offset plate portions having an aperture receiving a headed screw fastener of length sufficient that it penetrates two adjacent studs which form a part of said door jamb structure; the aperture and screw fastener being located so that the head of said screw fastener lies adjacent a rim part of said door-bolt means mounted on said door when said door is in closed position and said door bolt is in position of entry into said bolt opening means, so that effective removal of said screw by an intruder is prevented.

5,088,781

HANDLE STRUCTURE

Tomio Ono, and Hiromi Koyama, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Japan

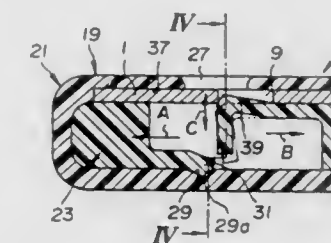
Filed Jan. 8, 1991, Ser. No. 638,671

Claims priority, application Japan, Jan. 10, 1990, 2-1558

Int. Cl.⁵ E05B 3/04

U.S. Cl. 292-347

12 Claims



1. A handle structure comprising:
 - a handle lever;
 - a grip member having a recess formed therein and comprising:
 - a sleeve-like outer member and an inner member received in said outer member;
 - first means for achieving a latched engagement between said inner and outer members when said inner member is received in said outer member;
 - a latch opening formed in said handle lever;
 - an upper latch pawl defined by said inner member, said upper latch pawl falling into said latch opening to achieve a latched engagement between said grip member and said handle lever when said handle lever assumes a given position in said recess; and
 - a window opening formed in said outer member and together with said latch opening exposing said upper latch pawl to the outside of said member when said upper latch pawl falls into said latch opening, wherein said upper latch pawl can be manipulated through said window opening to disengage said upper latch pawl from said latch opening.

5,088,782

CORN COB HOLDER AND METHOD

Douglas Scott, 7081 Great Oaks Rd., Germantown, Tenn. 38138

Filed Feb. 26, 1991, Ser. No. 661,423

Int. Cl.⁵ A47G 21/00

U.S. Cl. 294-5

8 Claims



1. A corn cob holder for use with and to retain in a secure, non-rotatable position, an ear of corn having a one and an other end and having outer kernels and a soft inner pith sur-

rounded by a woody ring of lignified tissue, which corn holder comprises:

- a handle means having a one and other end and adapted to be grasped by a user;
- a penetrating means to penetrate the soft inner pith of the corn cob and having one end and an other end, one end having a sharp point and the penetrating means having substantially parallel sides extending from the one end to the other end; and
- a generally oval-shaped retaining means integral with and between the other end of the penetrating means and the one end of the handle means the oval-shaped means having a major and minor axis and extending substantially outward from the parallel sides of the penetrating means, the major axis generally aligned with the axis of the penetrating means, the oval-shaped retaining means having opposite knife-like edges, and the minor axis having a width slightly greater than the diameter of the soft inner pith of the corn cob to be held whereby in use the user grasping the handle means inserts the penetrating means into the soft inner pith of the corn cob a sufficient distance so that the knife-like edges of the retaining means then cuts into the inner surface of the woody ring of the corn cob so as to retain the corn cob in a secure position.

5,088,783

LOAD HANDLING APPARATUS

Michael Squires, Weathertrees, Gretton Road, Harringworth, Corby Northants NN17, Great Britain

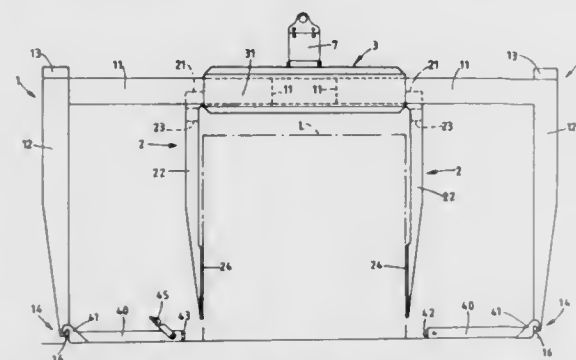
Filed Oct. 19, 1990, Ser. No. 599,857

Claims priority, application United Kingdom, Oct. 27, 1989, #924222

Int. Cl.⁵ B65G 57/03

U.S. Cl. 294—81.54

14 Claims



1. Load handling apparatus comprising:

- a suspension structure adapted to be raised or lowered by a hoisting means for raising or lowering said suspension structure;
- opposed limbs depending from said suspension structure and movably carried thereby, said limbs thus having lower ends;
- power operation means carried by the suspension structure for effecting lateral extension apart of the opposed limbs or their retraction towards one another;
- a split pallet assembly providing two substantially rectangular load bearing portions adapted to be detachably engaged by the lower ends of the opposed depending limbs when the latter are retracted towards one another in order to enable lifting and lowering of said pallet portions when closed together to take place in a load supporting condition with the suspension structure, lateral extension of the opposed limbs apart from one another effecting withdrawal of the pallet portions apart from under a load thereon in order to gravitationally deposit the load and whereby the withdrawn and separated pallet portions can be subsequently lifted and moved clear of the deposited load.

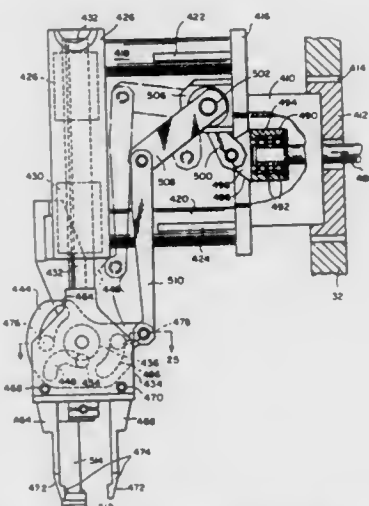
5,088,784
APPARATUS AND METHOD FOR TRANSFERRING A SPOOL OF WEB MATERIAL
James C. Foote, Jr., York, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 6, 1990, Ser. No. 622,990

Int. Cl.⁵ B66C 1/42; B25J 15/08

U.S. Cl. 294—116

4 Claims



1. Apparatus for acquiring, transferring and releasing an object, said apparatus comprising:

- a movable frame;
- a mounting block slidably mounted on said movable frame;
- a pair of gripping fingers pivotally mounted to said mounting block, said gripping fingers comprising surfaces for engaging and holding such an object;
- a cam plate mounted for rotation about an axis on said mounting block, said cam plate including first and second arcuate slots whose centerline distance from said axis is larger at one end than the other of said slots; and a third sinuous slot having a first portion whose centerline distance from said axis is constant and a second portion whose centerline extends away from said axis;
- first and second cam followers, one mounted on each of said gripping fingers and extended into one of said first and second arcuate slots;
- a third cam follower mounted on said movable frame and extended into said third sinuous slot; and
- means for rotating said cam plate to cause said gripping fingers to open or close as said first and second cam followers move through said first and second arcuate slots; and to cause said mounting block to dwell as said first portion of said third sinuous slot moves past said third cam follower and to translate relative to said movable frame as said second portion of said third sinuous slot moves past said third cam follower.

5,088,785

VOLUME-CHANGEABLE VAN COMPARTMENT

Shenq-Hwa Lee, No. 38-1, Taa-Jzyy-Jyue, Taa-Jyue Tsuen, Guan-In Country, TAOR-Yuarn County, Taiwan

Filed Oct. 25, 1990, Ser. No. 604,046

Int. Cl.⁵ B62D 33/08

U.S. Cl. 296—26

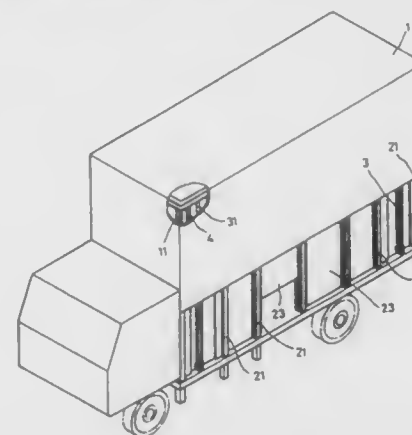
2 Claims

1. A volume-changeable van compartment comprising:

- an outer wall and an inner wall wherein four hydraulic cylinders are disposed on said inner wall to life/lower said outer wall;
- an equilibration mechanism for keeping said hydraulic cylinders performing extending/retracting function at the same speed; and

a locking mechanism for locking up said outer wall at a certain height;

said equilibration mechanism including four vertical racks and three horizontal gear rods, upper ends of said four racks being pivotally connected with said outer wall, and three gear rods being disposed on two lateral surfaces and front surface of said inner wall, respectively; said front surface gear rod being disposed with a bevel gear at each of two ends of said front surface gear rod, one end of each lateral surface gear rod being disposed with a bevel gear which meshes respectively with each said bevel gear of said front surface gear rod, each end of each lateral surface gear rod being disposed with a gear which meshes with one of said four racks;



said locking mechanism including four locking devices corresponding to said four racks, and pneumatic cylinder being used to drive a toothed block which engages with said rack;

- a plurality of vertical male rails evenly disposed on said outer wall and a plurality of corresponding female rails disposed on said inner wall;
- a groove on each of two sides of each said female rail whereby a wall board can be disposed between two adjacent female rails to form a portion of said inner wall;
- a beam member connected to an upper edge of each said wall board of said inner wall; and
- two hydraulic cylinders connected to two ends of said beam member to lift/lower said beam member and said wall board.

5,088,786

PANIC EXIT DOOR MECHANISM

John P. Linder, Anaheim, Calif., assignor to International Door Closers, Inc., Anaheim, Calif.

Filed May 21, 1991, Ser. No. 703,674

Int. Cl.⁵ E05C 9/14

U.S. Cl. 292—92

3 Claims

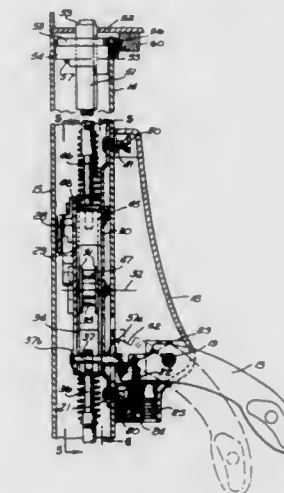
1. In a panic bar mechanism for an exit door having a frame with a stile, upper and lower lock rods vertically sliding in said stile, and a panic bar carried on levers pivotally mounted on said door frame, the improvement including in combination: a plate mounted in said stile for rotation about a horizontal axis;

upper and lower connectors each having a first end attached to said plate on opposing sides of said horizontal axis and each having a second end attached to said upper and lower lock rods, respectively;

a drive pin carried in said lower connector parallel to said horizontal axis and projecting outward from said stile through a slot in said stile and perpendicular to the plane of said door, with one of said levers having an inner end positioned underneath and directly engaging said drive pin for moving said drive pin upward only and rotating said plate about said horizontal axis and moving said lock

rods vertically, with said inner end terminating externally of the stile;

with said connector second ends attached to said respective lock rods by horizontal lock rod pins, with said drive pin one of said lock rod pins; and



spring means connected between said lever inner end and said frame for urging said lever inner end away from said drive pin.

5,088,787

AUTO WINDOW MOLDING

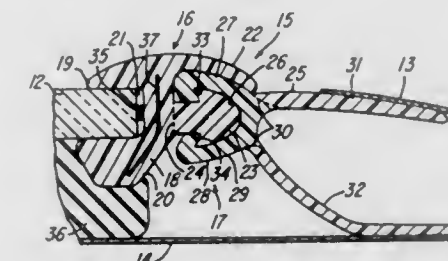
Michael G. Gross, Tipp City, Ohio, assignor to Creative Extruded Products, Inc., Ohio

Filed Jan. 30, 1991, Ser. No. 633,019

Int. Cl.⁵ B60R 13/06

U.S. Cl. 296—93

20 Claims



1. In an automobile having a body panel, a window adjacent one end of said panel, an access member mounted adjacent the other end of said panel and a molding for sealing and closing out said window and said access member; the improvement wherein said molding comprises first and second members, said first member retaining an edge of said window and concealing the space between said window edge and said panel, and said second member providing a seal and close-out between said access member and said panel, said first and second members having mutually interengaging means to lock said members together.

5,088,788

VEHICLE COVER APPARATUS

Lee A. Moulton, 5081 Keane Dr., Carmichael, Calif. 95608

Filed Mar. 22, 1991, Ser. No. 673,355

Int. Cl.⁵ B60J 7/20

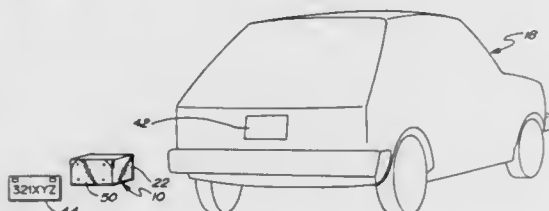
U.S. Cl. 296—136

11 Claims

1. Vehicle cover apparatus, said apparatus comprising, in combination:

- a cover for covering said vehicle; and
- storage means for attachment to said vehicle and for storing

said cover when said cover is not covering said vehicle, said storage means including housing means defining an interior for accommodating said cover during storage and securement means cooperable with said cover when said cover covers said vehicle to tighten said cover relative to said vehicle, said securement means includes closure means connected to said housing means and movable



relative thereto between a first position wherein the interior is substantially closed and a second position wherein interior is open, said cover being connected to said closure means and said closure means exerting a pulling force on said cover when said closure means moves from said second position to said first position to tighten said cover relative to said vehicle.

5,088,789

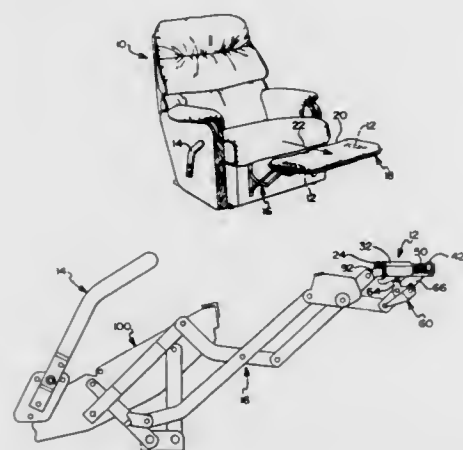
RETRO-FITTABLE EXTENDABLE LEG REST APPARATUS

Larry P. LaPointe, Temperance, and Raymond E. Seigle, Jr.,
Monroe, both of Mich., assignors to La-Z-Boy Chair Co.,
Monroe, Mich.

Filed Nov. 13, 1990, Ser. No. 612,206
Int. Cl.⁵ A47C 1/022

U.S. Cl. 297—69

11 Claims



1. A retro-fittable, extendable leg rest apparatus, said apparatus comprising:

an elongated frame bracket operable to be retrofittably secured to a scissor linkage assembly, said elongated frame bracket having a shoulder portion extending therefrom;
a mounting bracket having first and second bracket portions, said first bracket portion being operable to be secured to a leg rest member, said second bracket portion having forward and rearward end portions, said forward end portion including a shoulder portion and said rearward end portion having a latching edge surface, said second bracket portion further including an elongated channel formed therein;

securing means extending through said elongated channel of said mounting bracket for slidably securing said mounting bracket to said elongated frame bracket, thereby enabling said mounting bracket to be slidably extended and re-

tracted along said channel relative to said elongated frame bracket;

biasing means coupled between said shoulder portion of said elongated frame bracket and said shoulder portion at said forward end portion of said mounting bracket for maintaining said mounting bracket in a normally retracted position relative to said elongated frame bracket; and
latching means pivotally coupled to a portion of said scissor linkage assembly for releasably latching with said latching edge surface of said mounting bracket when said mounting bracket is extended forwardly relative to said elongated frame bracket, to thereby releasably maintain said mounting bracket in a forwardly extended position, said latching means further being operable to pivotally unlatch with said latching edge surface of said mounting bracket as said scissor linkage assembly is urged into a retracted position.

5,088,790

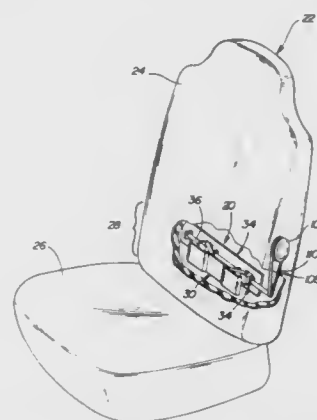
ADJUSTABLE LUMBAR SUPPORT MECHANISM FOR A VEHICULAR SEAT

John C. Wainwright, Riverview, and Arduino Colasanti, East
Detroit, both of Mich., assignors to Lear Seating Corporation,
Southfield, Mich.

Filed May 21, 1990, Ser. No. 526,454
Int. Cl.⁵ A47C 3/00, 25/00

U.S. Cl. 297—284 C

22 Claims



1. An adjustable lumbar support assembly (20) of the type disposed within a seat backrest (24) for altering the contour of the backrest (24) to provide lumbar support, said assembly (20) comprising: lumbar adjustor means (20) adapted for inclusion within a seat backrest (24) for incrementally adjusting the contour of the backrest (24) to provide variable lumbar support; support means (32, 32') for attachment to the backrest (24) for supporting said lumbar adjustor means (30) on the backrest (24); and characterized by mechanical locking means (34) for forcibly receiving said lumbar adjustor means (30) on said support means (32, 32') as said lumbar adjustor means (30) is moved into a mechanical interlocked position with said support means (32, 32') to allow rapid assembly of said lumbar adjustor means (30) and said support means (32, 32') to allow rapid assembly of said lumbar adjustor means (30) and said support means (32, 32') as an operational unit to be installed within a seat backrest (24), said mechanical locking means (34) including at least one resilient prong member (82) extending from said support means (32, 32').

5,088,791

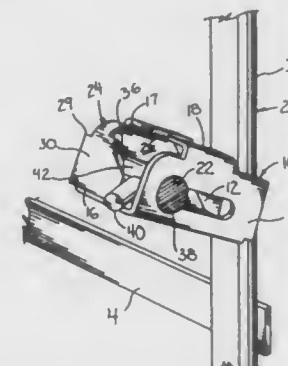
SEAT FRAME ARM REST BRACKET

John Conley, and Alan Neterer, both of Goshen, Ind., assignors
to Goshen Cushion, Inc., Goshen, Ind.

Filed Dec. 3, 1990, Ser. No. 620,660
Int. Cl.⁵ A47C 7/54

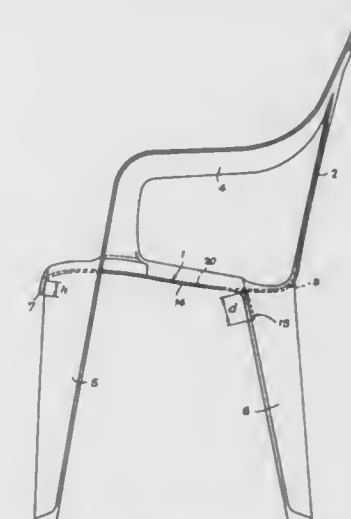
U.S. Cl. 297—417

2 Claims



1. A bracket for shiftable connection of an arm rest to a seat frame, said arm rest including a connecting rod having a stop member laterally extending from said rod, said bracket comprising a generally U-shaped bracket having a pair of spaced side walls interconnected by an integral bottom wall, aligned openings being formed in said side walls for accommodating said rod, at least one of said openings accommodating passage of said stop member through said one of said side walls, first and second abutment means carried by said bracket for engaging said stop member as said rod is rotated relative to said bracket, said abutment means defining rotational limits of said rod, and insert means carried by bracket frictionally engaging said rod and stop member for reducing vibration of said rod relative to said bracket, said insert means including a camming surface for engaging said stop member as said rod is shifted toward said first abutment means to urge said stop member into frictional engagement with said insert means and one of said bracket side walls.

hollow element adapted to receive the projecting element of the chair or chairs stacked thereabove,



the lowermost part of said projecting element being remote from the seat element.

5,088,793

CUSHION CONSTRUCTION FOR SEAT

Kazuo Mithuhiro, Hiroshima, Japan, assignor to Delta Kogyo
Co., Ltd., Hiroshima, Japan

Continuation of Ser. No. 397,653, Aug. 23, 1989, abandoned.

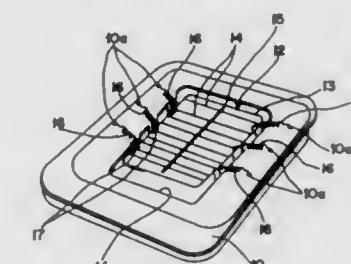
This application Jan. 17, 1991, Ser. No. 642,542

Claims priority, application Japan, Aug. 23, 1988, 63-110559;
Aug. 23, 1988, 63-110560; Aug. 23, 1988, 63-110561

Int. Cl.⁵ A47C 7/02

U.S. Cl. 297—452

6 Claims



1. A seat cushion construction, comprising:

a cushion frame having a central opening and longitudinal and lateral sides and an inner peripheral edge;
a mesh frame disposed within the central opening of said cushion frame;
a plurality of elongatable tension springs connected between said cushion frame and said mesh frame and supporting said mesh frame in the central opening of said cushion frame;
a cushion pad on said mesh frame and said cushion frame and a trim material covering the upper surface of said cushion; projecting portions on said inner peripheral edge along at least one side of said cushion frame and extending downwardly and inwardly into said central opening below the level of the bottom of said cushion frame and having free ends thereon within said central opening; and
said mesh frame being engaged under the free ends of said projecting portions for, when there is no load on said cushion pad, being held in a lowered position in said central opening below the level of the bottom of said cushion frame with said elongatable tension springs stretched and extending obliquely downwardly from said cushion frame.

5,088,792

MONOLITHIC SEAT MADE OF INJECTED PLASTICS MATERIAL

Jean-Paul Guilchon, Saint Lupicin, France, assignor to Grosfillex S.A.R.L., Oyonnax, France

Filed Feb. 26, 1990, Ser. No. 485,293

Claims priority, application France, Mar. 1, 1989, 89 02679
Int. Cl.⁵ A47C 3/04

U.S. Cl. 297—445

12 Claims

1. In a monolithic stackable seat made of injected plastics material, such as a chair or an armchair, mouldable without visible defects and comprising a seat element with subjacent strengthening ribs, integral with four legs and a backrest, the seat having a rounded part joining with the backrest, the seat comprises:

in the central area of its lower face and up to the vicinity of the rounded part joining with the backrest, a projecting element having a slope oriented for stacking, and in its upper face opposite this projecting element, a

5,088,794

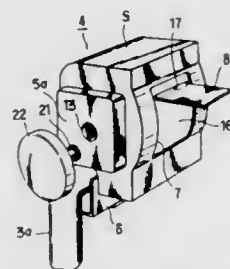
SEAT BELT DRAWING ANGLE ADJUSTMENT DEVICE
Mashahide Iwami; Shigeomi Murakami; Fumitaka Saito; Takao Watanabe, and Masami Akiyama, all of Akishima, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 611,907

Int. Cl.⁵ B60R 22/26, 22/34

U.S. Cl. 297—483

5 Claims



1. A seat belt drawing angle adjusting device which is provided in an upper end part of a seat back of a seat, comprising: a seat belt; a housing in which a seat belt retractor is disposed, said housing including a forward surface having therein an opened area which extends an appreciable distance in the vertical direction; a seat belt guide member which is arranged in said housing such as to be movable vertically in such a way as to keep closed said opened area of said housing, said seat belt guide member having formed therein a slit through which a seat belt passes from said seat belt retractor; and a lock means for locking and unlocking said seat belt guide member so as to permit for setting said seat belt guide means at a desired point in vertical direction.

5,088,795

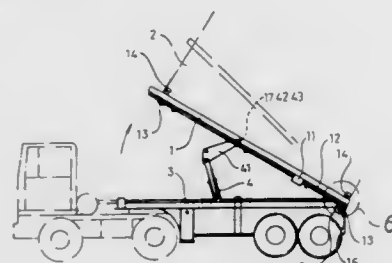
DUMPING TRAILER AND TRUCK FOR A CONTAINER
Junny Chen, No. 6-1, I Shin 2nd Rd., and Charles Chen, No. 18, Lane 13 Tai-Leu, Chyan Jenn Dist., both of Kaoshiung, Taiwan

Filed May 8, 1990, Ser. No. 520,803

Int. Cl.⁵ B60P 1/64

U.S. Cl. 298—22 J

1 Claim



1. A dumping trailer and truck for containers comprising: a container having a bottom surface and a rectangular hole in each of four corners of the bottom surface; a frame made of metal for mounting and keeping firmly said container thereon; a trailer body; two air pressure cylinders being provided under the frame at both the lengthwise sides, having a rotatable lengthwise extending shaft having on both front and rear ends a worm to engage with a worm gear having a rectangular block vertically extending up from said gear, said block being insertable in one of said rectangular holes of said container; two downwardly protruding ears being provided respectively at both rear lengthwise sides of the frame, having a shaft hole for a fulcrum shaft to pass through so as to combine the frame with the trailer body; and an oil pressure cylinder being provided at nearly the middle

section of the trailer body, having an extensible piston rod and two arms connected at the end of the piston rod, the arms having a hole at their ends for a rod to be inserted and kept therein with a bolt to combine the arms with the frame by means of the rod which also passes through a hole in the frame, the piston rod of said pressure cylinder being extendable to lift the arms combined with the frame so that the front of the frame can be inclinedly raised up and pivoted about the fulcrum shaft.

5,088,796

SEAM-MINING APPARATUS

Kurt Plaga, Herne, Fed. Rep. of Germany, assignor to Bockumer Eisenhütte Heintzmann GmbH & Co KG, Bochum, Fed. Rep. of Germany

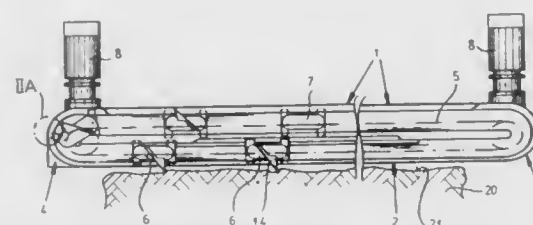
Filed Feb. 7, 1991, Ser. No. 652,032

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1990, 4004488

Int. Cl.⁵ F21C 25/56

U.S. Cl. 299—34

6 Claims



1. A seam-mining apparatus, comprising: a conveyor trough having a substantially horizontal bottom and tool-guide channels on opposite longitudinal sides of said conveyor trough; a substantially upright excavating trough ahead of said conveyor trough in a direction of advance of the apparatus toward a seam and extending along said conveyor trough, said excavating trough having at least one tool-guide channel extending therealong; means for angularly adjusting orientation of said excavating trough about a horizontal axis relative to said conveying trough; an excavating and conveying chain extending along said troughs; direction-change devices at opposite ends of said troughs guiding said chain from said conveyor trough to said excavating trough and from said excavating trough to said conveying trough; a multiplicity of tools spaced along said chain and coupled thereto for entraining excavated material along said conveyor trough, at least some of said tools being formed with planing formations for excavating material from said seam as said tools are displaced along said excavating trough, said tools comprising: a head portion formed with a pair of laterally oppositely extending guide formations engageable in and guidable by said channels, an end portion spaced from said head portion and formed with a pair of laterally oppositely extending guide formations engageable in and guidable by said channels, an intermediate portion between said head portion and said end portion, respective first pivot means connecting said intermediate portion with said head portion and said end portion for relative pivotal movement about axes substantially perpendicular to a direction of travel of said chain and to said bottom as said tools travel along said conveyor trough, respective second pivot means connecting said intermediate portion with said head portion and said end portion

for relative pivotal movement about axes substantially orthogonal to said axes of said first pivot means; and further guide channels formed in regions of said direction-change devices and receiving at least one of said guide formations of each of said head portion and end portion of each tool as each tool is guided respectively from said conveyor trough to said excavating trough and from said excavating trough to said conveying trough.

5,088,797

METHOD AND APPARATUS FOR HOLDING A CUTTING BIT

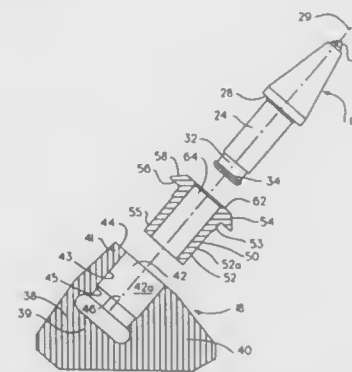
Michael L. O'Neill, Lucinda, Pa., assignor to Joy Technologies Inc., Pittsburgh, Pa.

Filed Sep. 7, 1990, Ser. No. 578,908

Int. Cl.⁵ F21C 35/18

U.S. Cl. 299—91

28 Claims



26. A method of cutting a material to be mined, comprising: providing a cutting apparatus, said cutting apparatus including a moveable cutting element which is moveable in a cutting direction, and a plurality of apparatuses mounted on said cutting element each supporting a cutting bit, each bit having an elongated shank and a shoulder, each of said support apparatuses including a bit holder having a base portion and a body portion, said base portion constructed for attachment to said cutting element, said body portion having a trailing end facing away from the cutting direction and a leading end facing in the cutting direction, said body portion further having a contact face and an aperture coaxial with the cutting bit and extending from said trailing end to said leading end and defining an inner surface, a sleeve member having a body member constructed to be received in said aperture through said leading end of said body portion, said body member defining an outer surface, said sleeve member having an abutment surface adapted for engagement with said contact face to prevent axial movement of said sleeve member in a direction toward said trailing end, said sleeve member further having a bore therein for coaxially rotatably receiving the shank of the cutting bit and an engagement surface adapted to be engaged by the shoulder on the bit, and means for retaining said sleeve member relative to said body portion comprising an area of interference fit between said inner surface and said outer surface adapted to prevent rotation and axial movement of the sleeve while in use without the application of independent means for urging said sleeve member toward said trailing end of said bit holder and to allow the removal of said sleeve from said aperture of said body portion by the manual application of force to said sleeve member; moving said cutting element in said cutting direction; and

moving said cutting apparatus into the material to be mined such that the cutting bits contact and cut the material.

5,088,798

COMPOSITE METAL-ELASTOMER STYLED WHEELS AND METHOD AND APPARATUS FOR MOLDING THE SAME

Robert J. Stalter, Sr., Bowling Green, and A. Prueter, Perrysburg, both of Ohio, assignors to Motor Wheel Corporation, Lansing, Mich.

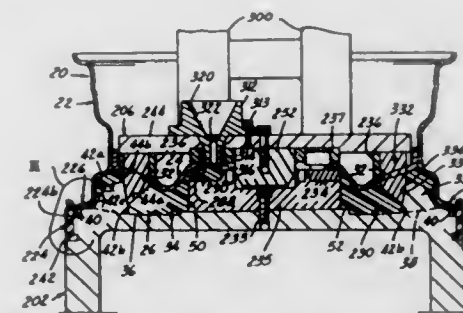
Division of Ser. No. 285,634, Dec. 16, 1988, Pat. No. 4,963,083.

This application Sep. 19, 1990, Ser. No. 584,810

Int. Cl.⁵ B60B 7/00

U.S. Cl. 301—37 P

4 Claims



1. In a composite styled wheel including in combination a metallic portion comprising a wheel mounting disc and a rim secured to said disc and adapted to receive a tire thereon, said disc having a circular row of air vent openings therethrough, and a plastic portion comprising an ornamental overlay disposed adjacent and covering at least part of the outboard face of said metallic portion, said overlay comprising a body of plastic material permanently affixed to said metallic portion, the outboard face of said body being exposed to view from the outboard side of said wheel having a contour differing from the contour of the covered part of the outboard face of said metallic portion comprising said disc and said disc having a central aperture and wheel mounting fastener holes therein, said overlay having aperture means registering coaxially with said central aperture and holes in said disc and defining a central cavity in said body adapted to receive wheel hub and mounting parts therein, the improvement wherein said overlay body has a circular row of outboard pockets spaced radially outwardly from said overlay aperture means and opening at the outboard face of said overlay body, and a circular row of inboard pockets individually registering at their inboard ends with associated ones of said disc vent openings for air flow communication therebetween and individually juxtaposed in axial offset and radial overlapping relation to associated ones of said outboard pockets, said overlay body having window openings providing air flow communication between associated airs of said inboard and outboard pockets, each of said outboard and inboard pockets terminating, in a direction axially of said wheel, in a generally radially extending blind bottom wall, said bottom wall of each of said outboard pockets being disposed axially inboard of said wheel relative to said bottom wall of the associated one of said inboard pockets.

5,088,799

ATTACHMENT WHEELS FOR CONCRETE FINISHING MACHINES

Gerald W. Redmon, and Tina L. Redmon, both of 2000 W. Arkansas La., Lot 77, Arlington, Tex. 76013

Filed Jul. 9, 1990, Ser. No. 550,184

Int. Cl.⁵ B60B 33/00

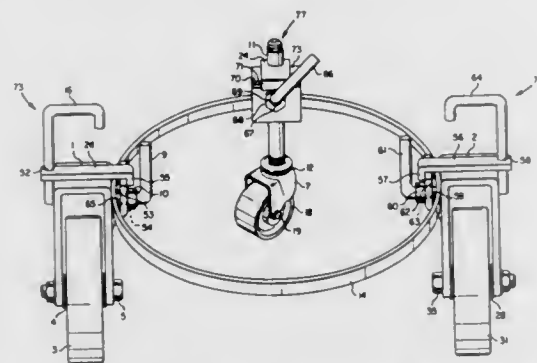
U.S. Cl. 301—111

2 Claims

1. A wheel assembly for attachment to a finishing machine,

said finishing machine including moving parts and a guard ring encircling said moving parts, the wheel assembly comprising: at least one wheel mounted for rotational movement on an axle;

- a U-shaped bracket having first and second legs connected by a cross member, said U-shaped bracket being supported in an inverted position with said leg depending downwardly from said crossmember, each leg having a hole therethrough, said holes being axially aligned with one another with said axle being supported in said holes; a cover plate overlying the crossmember of said U-shaped bracket;
- a rod means extending downwardly from said cover plate along said first leg of said U-shaped bracket.



an L-shaped member having first and second arms, the end of said first arm engaging said cover plate and the end of said second arm engaging said second leg of said U-shaped bracket;

said first arm of said L-shaped member having a threaded aperture therein for receiving a threaded end of an L-bolt and oriented such that the distal end of said second arm meets said second leg of said U-shaped bracket forming a space therebetween, an L-bolt having an end extending through said aperture;

such that when said wheel assembly is attached to said finishing machine, a portion of said guard ring is received in said space and held against said second leg of said U-shaped bracket by the portion of said L-bolt extending through said aperture, whereby said wheel assembly can be releasably secured to said finishing machine.

5,088,800 VEHICLE BRAKE SYSTEM HAVING ANTI-SKID APPARATUS

Roland Holzmann, Oettingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Aug. 17, 1990, Ser. No. 568,819

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1989, 3936217

Int. Cl.⁵ B60T 8/32

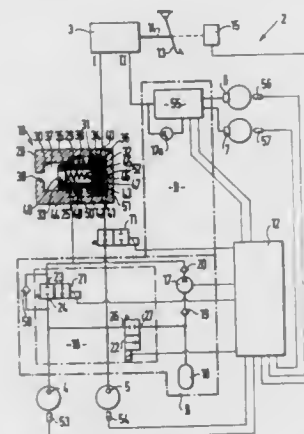
U.S. Cl. 303—113 AP

3 Claims

1. A vehicle brake system comprising a brake pressure source, front and rear wheel brakes; at least one anti-skid apparatus disposed between the brake pressure source and the wheel brakes, said at least one anti-skid apparatus has at least one electrically controllable anti-skid valve assembly for lowering and raising brake pressures in the wheel brakes, at least one return pump that communicates with the anti-skid valve assembly; at least one rear wheel brake booster, which is supplied with a brake fluid from the brake pressure source; a stepped cylinder, a stepped piston, a stepped piston restoring spring and a first chamber of cylindrical cross section defined by the stepped piston, a second chamber of smaller cylindrical cross section compared with the first chamber, a third chamber of annular cross section located between the first and second chamber, an inlet which is supplied from the brake pressure source, and an outlet which communicates with the anti-skid

valve assembly; an electrically controllable switchover device; an electronic control unit, said electric control unit arranged to control the anti-skid valve assembly and the return pump as a function of the rotational behavior of at least one associated wheel, said control unit further causes the rear wheel brake booster to come into action upon initiation of braking whenever the at least one anti-skid apparatus is in an operative functional condition, in which

- a) the anti-skid valve assembly (16) connected with the rear wheel brake booster (10) has a brake pressure raising valve (21), which is connected to the outlet (25) of the rear wheel brake booster (10) and is closed when in its basic position, and a brake pressure lowering valve (22) connected to the rear wheel brake;
- b) the outlet (25) of the rear wheel brake booster (10) communicates with the third chamber (39);



- c) the inlet (40) of the rear wheel brake booster (10) communicates permanently with the brake pressure source (3);
- d) the switchover device (11) has an electrically controllable 2/2-way valve, which is open in the basic position and is disposed between the brake pressure source (3) and the at least one rear wheel brake (4, 5);
- e) a 2/2-way valve (43) is disposed between the inlet (40) and the outlet (25) of the rear wheel brake booster (10) and is controllable by the stepped piston (31), which valve is open in the basic position of the stepped piston (31) and is closable by displacement of the stepped piston (31); and
- f) the control unit (12) is controlled such that upon initiation of braking, in an anti-skid control mode, the control unit (2) opens the brake pressure raising valve (21) and closes the 2/2-way valve of the switchover device (11).

5,088,801 FILE HOLDERS AND BRIEFCASE THEREFOR

A. Brooks Rorke, Fairfield, Conn., and Wallace C. Bullwinkle, Norristown, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 12, 1990, Ser. No. 536,871

Int. Cl.⁵ A47B 63/00

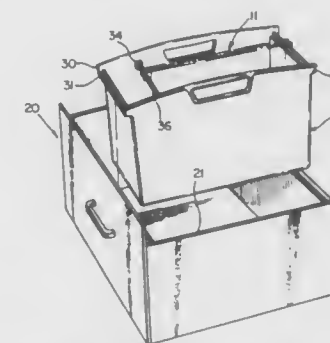
U.S. Cl. 312—184

31 Claims

1. A hanging holder removably hangingly received by a drawer, the drawer including a front panel, two parallel side walls spaced a predetermined distance D from each other and secured perpendicular to said front panel, an end panel parallel to said front panel and secured perpendicular to said parallel side walls, said holder comprising:

- (a) a box including a rectangular floor, two opposed side walls each having a top edge and each having a bottom edge, said bottom edges being connected to opposed sides of said floor, two opposed end walls separated by a predetermined distance that is less than distance D, said end walls having bottom edges connected to opposed sides of said floor, and an open top; and

- (b) said side walls each having opposed outwardly extending arms at said top edge and said end walls each having an outwardly extending shoulder at said upper edge, said shoulders each having side edges, said arms having top edges coextensive with said top edges of said side walls



and bottom edges coextensive with said side edges of said shoulders, and said arms together with said shoulders defining two ledges extending outwardly respectively from said side wall top edges, said ledges being separated by said distance D, and said ledges each including hanger means for supporting standard hanging file folders.

5,088,802 DESK APPARATUS

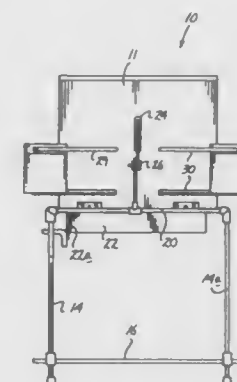
Daniel E. House, 235 Canford Dr., Hampton, Va. 23669

Filed Mar. 12, 1991, Ser. No. 668,226

Int. Cl.⁵ A47B 88/00

U.S. Cl. 312—327

4 Claims



1. A desk apparatus comprising, in combination, a desk plate, the desk plate including a forward edge, a rear edge, a right side edge, and a left side edge defining a rectangular configuration, and a right forward support leg and a left forward support leg, and a right rear support leg and a left rear support leg, the support legs arranged parallel relative to one another, and a right side bar orthogonally and fixedly mounted between the right forward support leg and the right rear support leg, and a left side bar mounted between the left forward support leg and the left rear support leg, wherein the side bars are arranged parallel relative to one another, and a foot rest plate mounted fixedly overlying the side bars adjacent the right forward support leg and the left forward support leg, and a forward mounting bar orthogonally and fixedly mounted between upper terminal ends of the respective right forward support leg and left forward support leg, and a desk hinge, the desk hinge mounted to the bottom surface of the desk plate, and the desk hinge hingedly mounting the desk plate to the forward mounting bar, with the

forward mounting bar positioned adjacent the forward edge of the desk plate, and

a rear mounting bar orthogonally mounted to upper terminal ends of the right rear support leg and the left rear support leg, with the rear mounting bar arranged parallel to the forward mounting bar, and the rear mounting bar including a telescoping support leg medially and pivotally mounted to the rear mounting bar, with the telescoping leg including a first leg telescopically receiving a second leg, and the first leg including a friction clamp to selectively secure the second leg within the first leg at preselected positions, and

a multi-toothed rack fixedly and medially mounted to the rear surface of the desk plate receiving an upper terminal end of the second leg selectively therewithin.

5,088,803 TECHNIQUE FOR COUPLING LASER DIODE TO OPTICAL FIBER

David M. Buzawa, San Jose, Calif., assignor to Iris Medical Instruments, Inc., Mountain View, Calif.

Filed Mar. 23, 1990, Ser. No. 498,861

Int. Cl.⁵ G02B 6/32

U.S. Cl. 385—33

15 Claims



1. Apparatus for coupling a source of angularly diverging light to an optical fiber comprising: an optical train disposed between the source of angularly diverging light and the fiber, said optical train being characterized by an entrance pupil; and means associated with said optical train for imaging said entrance pupil on an input end of the fiber.

5,088,804 METHOD AND APPARATUS FOR TERMINATING A FIBER-OPTIC CABLE WITHOUT ADHESIVE

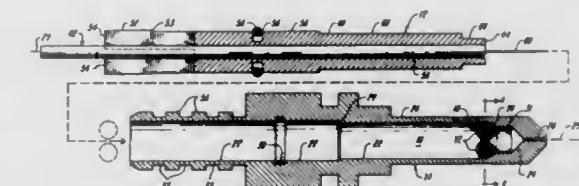
Soren Grinderslev, Shelton, Conn., assignor to Optical Fiber Technologies, Inc., Westford, Mass.

Filed Jul. 12, 1989, Ser. No. 378,930

Int. Cl.⁵ G02B 6/36

U.S. Cl. 385—81

35 Claims

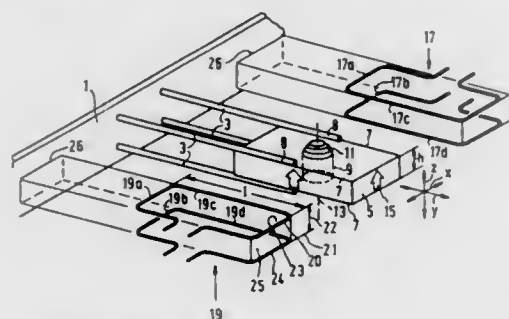


19. Apparatus for terminating a fiber optic cable by mechanical engagement and comprising:

- A. an inner element having an axially extending tubular passage therethrough concentrically within a tubular outer surface, said inner passage being adapted for receiving a buffered optical fiber and having a compressively acting surface at a first forward end,
- B. an outer terminating element having an axially extending tubular passage therethrough with radial constriction means between a first forward passage section for receiving an optical fiber and a second passage section, said inner element being telescopically received in said second passage section and being axially slidable therein, and

C. a compressive system disposed in said section passage section of said outer terminating element axially forward of said compressively-acting surface for encircling an optical fiber received in said passage of said inner terminating element, said compressive system being elastically deformable, upon compression between said constriction means and said compressively-acting surface, from a first shape to a different second shape for compressively engaging the optical fiber.

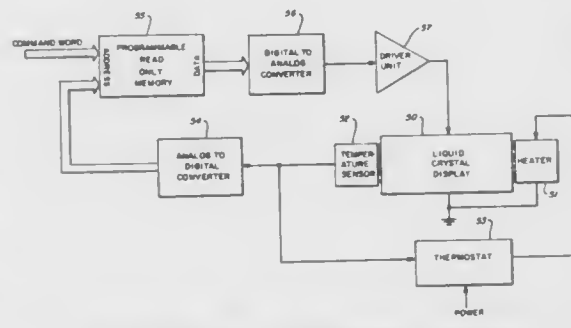
5,088,805
ELECTRODYNAMIC ACTUATOR FOR AN OPTICAL WRITE-IN OR READ-OUT UNIT
Karl-Hanns Meyer, and Leo Honds, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 395,129, Aug. 17, 1989, abandoned.
This application Jan. 29, 1991, Ser. No. 649,136
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828146
Int. Cl.⁵ G11B 7/08; G02B 7/02
U.S. Cl. 359—814



1. An electrodynamic actuator for an optical write-in and/or read-out unit, for aligning the unit with respect to signal tracks of a storage medium to direct a focussed beam of light onto a work position, comprising:
a support
resilient means for mounting said unit to said support, arranged to allow movement of said unit with respect to said support in a focusing direction and a radial direction,
a permanent magnet arrangement fixed to said unit for movement therewith, and
a plurality of stationary coils fixed with respect to said support for moving the unit at least in selected directions, characterized in that said coils have respective coil axes parallel to the focusing direction, and are spaced from each other in the radial direction, and are spaced from a largest dimension of said magnet arrangement in the radial direction,
said resilient means comprise spring rods having respective free ends to which the permanent magnet arrangement with the optical unit is secured, and respective opposing ends fixed to said support, said rods positioning the unit and the permanent magnet arrangement such that the permanent magnet arrangement is disposed between said coils and is movable in the focusing and radial directions, and
said permanent magnet arrangement provides a magnetic field in a region near parts of the coils to produce, in response to currents in the coils, movements of the permanent magnet arrangement in the focusing direction and/or radial direction.

5,088,806
APPARATUS AND METHOD FOR TEMPERATURE COMPENSATION OF LIQUID CRYSTAL MATRIX DISPLAYS
Richard I. McCartney, Scottsdale, and John A. Rupp, Glendale, both of Ariz., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 16, 1990, Ser. No. 465,796
Int. Cl.⁵ G02F 1/13
U.S. Cl. 359—84 17 Claims

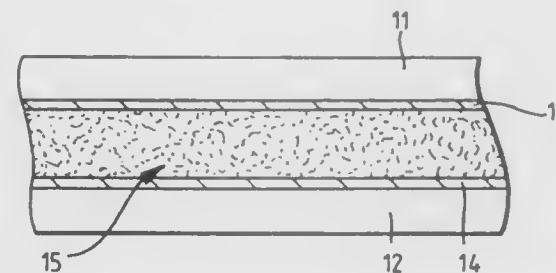


1. A compensated liquid crystal display comprising:
at least one cell having a liquid crystal material enclosed between two electrodes;
a temperature sensing element thermally coupled to said cell for providing a temperature signal;
a heater unit thermally coupled to said cell;
a thermostat coupled to said temperature sensing element and to said heater unit, said thermostat activating said heater unit in response to said temperature signal when a temperature of said cell is below a predetermined range;
an analog to digital converter responsive to said temperature signal for providing a first digital signal group determined by said temperature signal;
conversion means responsive to a combination of said first digital signal group and a second digital signal group for providing a third digital signal group, said second digital signal group determined by a desired optical transmission through said cell, said third digital signal group determining a desired voltage for application to said electrodes, said desired voltage resulting in said desired transmission; and
a digital to analog converter coupled to said electrodes for converting said third signal group to said desired voltage, said desired voltage compensating for properties of said liquid crystal material.

5,088,807
LIQUID CRYSTAL DEVICES
Colin M. Waters, Tattingstone; Timothy J. Noakes, Selbourne; Ian Pavey, Fernhurst, all of England, and Chiyoji Hitomi, Tsokuba, Japan, assignors to Imperial Chemical Industries PLC, London, England
Filed May 23, 1989, Ser. No. 359,471
Claims priority, application United Kingdom, May 23, 1988, 8812135; Nov. 22, 1988, 8827277
Int. Cl.⁵ G02F 1/13
U.S. Cl. 359—94 20 Claims

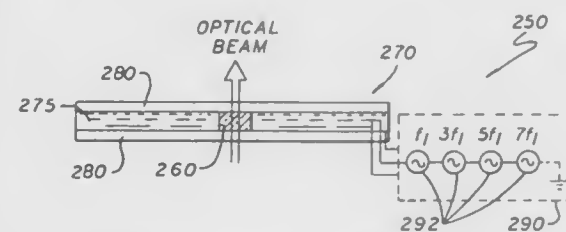
1. A liquid crystal device comprising:
means for containing liquid crystal material,
means for applying one of an electric and magnetic field across the liquid crystal material, and
a permeable body of optically non-absorbing material permeated by the liquid crystal material such that light transmission through a composite, comprising said body and

the liquid crystal material, is reduced in an off state of said field-applying means,



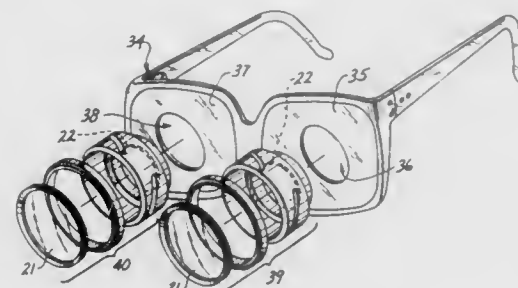
wherein said permeable body comprises at least one of fibers and filaments deposited to form a layer.

5,088,808
RANGE DOPPLER SELF-REFERENCING IMAGING SYSTEM
Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Division of Ser. No. 245,608, Sep. 19, 1988, This application Nov. 14, 1989, Ser. No. 436,562
Int. Cl.⁵ G02F 1/03, 1/13; G02B 6/10, 5/30
U.S. Cl. 359—276 9 Claims



1. A high speed optical switch comprising:
a transmission line;
an electro-optic crystal embedded in said transmission line; and
means for driving said transmission line at a plurality of harmonic of a fundamental resonant frequency f_1 of said transmission line.

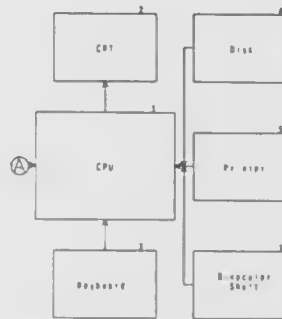
5,088,809
TELEIDIOPTIC LENS SYSTEM
Valdemar Portney, Irvine, Calif., assignor to Allergan, Inc., Irvine, Calif.
Division of Ser. No. 141,482, Jan. 5, 1988, Pat. No. 5,030,231.
This application Apr. 23, 1991, Ser. No. 690,814
Int. Cl.⁵ G02C 1/00
U.S. Cl. 351—158 5 Claims



1. Spectacles comprising:
a spectacle frame;

a tubular outer case coupled to the spectacle frame;
a posterior lens carried by said outer case in axially fixed relationship to the outer case;
an inner sleeve within the outer case anteriorly of the posterior lens;
an anterior lens carried by the inner sleeve in axial alignment with the posterior lens;
a ring receiving the outer case; and
said outer case having an opening adjacent the ring which extends both circumferentially and axially, said ring being coupled to the inner sleeve through the opening and being rotatable relative to the outer case whereby rotation of the ring relative to the outer case moves the inner sleeve and the anterior lens axially.

5,088,810
VISION TRAINING METHOD AND APPARATUS
Stephen M. Galanter, 1732 Riverview Rd., Gladwyne, Pa. 19035, and Barry G. Millis, 352 Gribbel Rd., Wyncote, Pa. 19095
Filed Jan. 23, 1989, Ser. No. 299,680
Int. Cl.⁵ A61B 3/02
U.S. Cl. 351—203 16 Claims



1. Method of treating near point visual stress comprising the steps of:
(A) automatically and interactively, on a computer, directing a subject in performance of:
(i) a plurality of self advancing, self directing diagnostic tests each relating to a visual function of the the subject; and,
(ii) a plurality of self advancing, self directing therapeutic exercises each relating to a visual function of the subject; said plurality of diagnostic tests and therapeutic exercises employing computer generated displays that are provided on a CRT coupled to the computer and employing input means coupled to the computer for registering a response of the subject;
(B) automatically creating a performance profile for the subject based upon the subject's responses;
(C) automatically recording the performance profile and data representing the subject's performance in a memory associated with the computer;
(D) automatically retrieving the data stored in step (C) on demand.

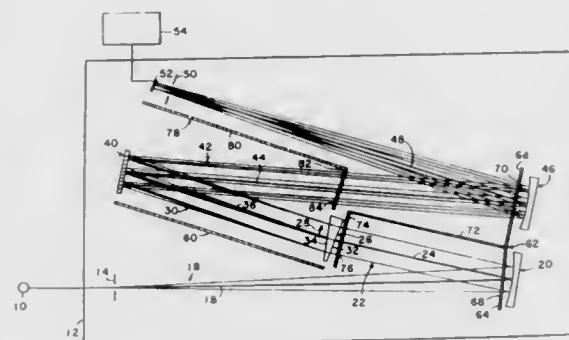
5,088,811
LASER BEAM SCANNING TYPE EYE FUNDUS OBSERVING DEVICE
Masayuki Hideshima; Shinji Wada, and Akihiko Sekine, all of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo, Japan
Continuation of Ser. No. 262,638, Oct. 26, 1988, abandoned.
This application Apr. 8, 1991, Ser. No. 682,405
Claims priority, application Japan, Oct. 26, 1987, 62-270002
Int. Cl.⁵ A61B 3/10 4 Claims

1. A laser beam scanning type eye fundus observing device for generating a level-adjusted detected image signal from

1. An apparatus for optically detecting a biological object based on changes in the color of a specified surface of the biological object due to a change in the pressure exerted on the

1. A spectroanalytical system comprising:
entrance aperture defining structure for receiving radiation to be analyzed along a first path;
collimating structure in said first path for collimating radiation in said first path and directing said collimated radiation along a second path;
first refraction structure in said second path of said radiation for spatially separating (refracting) said collimated radiation in said second path as a function of wavelength in a first direction generally parallel to a plane defined by said first and second paths;
echelle grating structure in said second path for spatially separating said refracted radiation from said first refraction structure in a second direction orthogonal to said first

direction and directing said orthogonally refracted radiation in a beam along a third path that does not pass through said first refraction structure, wherein, an angle is



formed between the first and second paths and an angle is formed between the second and third paths; and detector structure for detecting said beam of orthogonally refracted radiation.

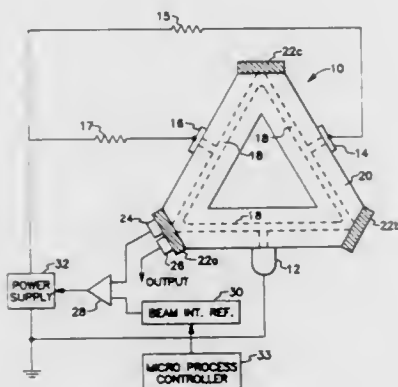
5,088,824

LASER BEAM CONTROL FOR A RING-LASER GYRO
Joseph Killpatrick, Minneapolis, and Lloyd W. Priddy, Mahomet, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 31, 1990, Ser. No. 560,406
Int. Cl.⁵ G01C 19/64

U.S. Cl. 356—350

12 Claims



1. In a ring laser angular rate sensor wherein a substantially thermally and mechanically stable block provides a plurality of interconnected cavities therein, selected ones of said plurality of interconnected cavities being interconnected to form a closed-loop path to permit light to travel along said closed-loop path, wherein said plurality of interconnected cavities

contain an active gas which can freely communicate within said plurality of cavities, wherein a portion of an anode is in communication with said gas in one of said plurality of interconnected cavities, wherein a portion of a cathode is in communication with said gas in one of said plurality of cavities, said cathode and said anode each being electrically connected to at least a first electric potential of sufficient magnitude to establish an electric potential to maintain an electrical current, once established by ionization of said gas, between said anode and said cathode through said gas to cause two laser beams to travel in opposite directions through said selected ones of said cavities forming said closed-loop path, a combination comprising:

monitor means to generate a signal indicative of the intensity of said beams;
power supply means coupled to said anode and said cathode to supply said electric current; and
means responsive to said monitor signal to control said electric current to maintain constant said intensity of said beams.

5,088,825

HOUSING AND SUPPORT ASSEMBLY FOR RING LASER GYROSCOPE

Robert W. Derry, Stacy; Timothy J. Callaghan, Roseville; Joseph E. Killpatrick, Minneapolis, and Bruce A. Seiber, Arden Hills, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1989, Ser. No. 457,911
Int. Cl.⁵ G01C 19/66

U.S. Cl. 356—350

14 Claims



1. A ring laser gyro comprising:
a block having a ring laser cavity containing a lasing gas, said cavity being substantially in the shape of a polygon having at least three sides and at least three vertices formed by the intersection of sides of said polygon, said block further including a central aperture therethrough, and said block having an annular shaped aperture surface defined by said aperture;

at least three mirrors, equal in number to the number of said vertices and positioned at said vertices to create a resonant ring laser having a polygonal ring path in the shape of said polygon thereby establishing a primary lasing plane;
a suspension mechanism having a central member with first and second end surfaces and a central axis passing through said central member first and second end surfaces, and an annular outer rim member concentric with said central axis and having an outer mounting surface secured to said aperture surface of said block, and resilient coupling means between said central member and said outer rim member;
a cup-shaped housing having an outer rim member and an inner bottom surface;
a support plate having at least one planar surface;
means for rigidly fixing a central portion of said support plate to said first end surface of said suspension mechanism;
means for rigidly fixing a central portion of said housing bottom surface to said second end surface of said suspension mechanism;
means for rigidly fixing outer portions of said support plate to said housing outer rim member; and
said housing including mounting means for securing said housing to an inertial platform.

5,088,826

Patent Not Issued For This Number

5,088,827

MEASURING APPARATUS FOR DETERMINING THE DIMENSION AND POSITION OF AN ELONGATE OBJECT

John Kyriakis, London, England, assignor to Beta Instrument Co., Ltd., High Wycombe, England

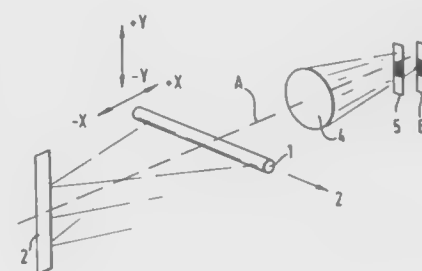
Filed Dec. 14, 1989, Ser. No. 450,544

Claims priority, application United Kingdom, Dec. 15, 1988, 8829250

Int. Cl.⁵ G01B 11/10

U.S. Cl. 356—372

6 Claims



1. Apparatus for monitoring an elongate object travelling freely in space to determine its dimension and position in space comprising,
optical means for providing an image of said object,
first scanning means positioned to receive a first image of said object and providing output signals representative of

movement of said image corresponding to positional movement of said object and/or variation in size,
second scanning means positioned to receive a second image of said object at a different focus than said first image and providing output signals representative of movements of said image corresponding to positional movement of said object and/or variation in size,
first comparison means for comparing said signals from each of said first and said second scanning means with preset signals representative of an invariant position and size and functioning as a reference signal to enable determination of whether said signals are representative of movement of the position of the object and/or variation in size thereof when said signals are compared to said reference signal and providing output signals representative of change of size of the object and its position in space,
second comparison means for comparing said last mentioned output signals with said preset signals representative of a nominal size of said object and position in space to provide

a measure of the dimension of said object and its spacial position relative to said invariant position and size,
said first and said second scanning means being opposite said optical means,
means for generating a beam of light directed across said object,
said object being positioned between said optical means and said means for generating a beam of light,
said first scanning means and said second scanning means not being equidistant from said object,
a focal point of said image of said object provided by said optical means between said first scanning means and said second scanning means,
said first and said second scanning means including charged coupled devices,
said object being positioned in the horizontal plane of a X-axis and the vertical plane of a Y-axis,
said X-axis and said Y-axis forming X-Y coordinate axes, and
said first and said second scanning means being in the same horizontal plane.

5,088,828
METHOD AND APPARATUS FOR THREE-DIMENSIONAL TESTING OF PRINTED CIRCUITBOARDS

Gunter Doemens, Holzkirchen, and Richard Schneider, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1990, Ser. No. 468,218

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906288

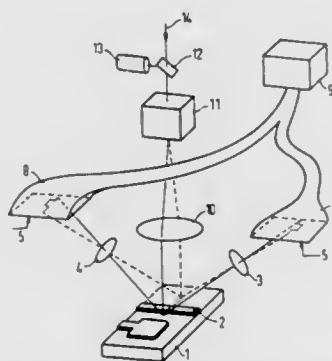
Int. Cl.⁵ G01B 11/24; H01J 5/16

U.S. Cl. 356—376

5 Claims

1. A method for three-dimensional testing of printed circuit boards on the basis of identified, spatial surface coordinates for recognizing defects at interconnects in the microscopic domain carried spaced on a surface of a printed circuit board on the basis of a local evaluation window, comprising the steps of:
scanning the surface of a printed circuit board, including interconnects, point-by-point to define cross-sectional areas of an interconnect partially limited and defined by

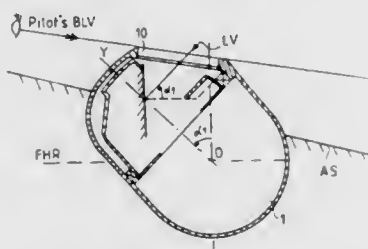
two successive scan points and by the perpendicular extending through the successive scan points; forming an evaluation window on the interconnect-carrying surface of the printed circuit board about scan point and wider than a scanned interconnect and over a portion of the length of the interconnect to further limit and define the cross-sectional areas and define a zero datum;



calculating the cross-sectional areas by summing differential areas of the defined cross-sectional areas; comparing the summed areas with prescribed interconnect width and height; and checking the spacings between interconnects by identifying the widths of areas having a height value of zero.

5,088,829
SELF-RETRACTABLE SIGHTING DEVICE FOR ONBOARD OPTOELECTRONIC LOCALIZATION AND IDENTIFICATION SYSTEM
Olivier Dez, Issy-les-moulineaux, and Vincent Vilbois, Montigny le bretonneux, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 31, 1990, Ser. No. 636,100
Claims priority, application France, Jan. 16, 1990, 90 00427
Int. Cl.⁵ B64C 7/00; G02B 7/198, 23/08, 23/16
U.S. Cl. 359—396 8 Claims



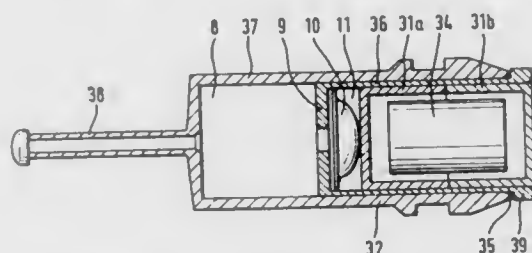
1. A self-retractable sighting device for an onboard optoelectronic localizing and identification system including, for the orientation of the line of sight, an elevation structure and a relative bearing structure borne by the elevation structure to which it is connected by bearings, these two structures being capable of rotating respectively about an elevation axis and a relative bearing axis, wherein the device has an input pupil off-centered with respect to the elevation axis of the device, itself located at a position lower than that of the fuselage of the carrier, the device having an elongated shape with its large dimension close to the vertical with respect to the carrier for the bottom-most line of sight where the elevation angle is negative with respect to the horizontal fuselage reference, and with its large dimension close to the horizontal with respect to the carrier for the topmost line of sight, the sighting device being in a state of maximum protrusion for the bottom line of sight and then self-retracting as and when the elevation angle increases by rotation about the elevation axis.

5,088,830
ARRANGEMENT FOR OPERATING A MULTI-COMPONENT MIXING CAPSULE, IN PARTICULAR FOR DENTAL PURPOSES, BY MEANS OF A VIBRATORY MIXING DEVICE

Ernst Mühlbauer, Elbgastrasse 248, 2000 Hamburg 53, Fed. Rep. of Germany, assignor to Ernst Mühlbauer, Hamburg, Fed. Rep. of Germany

Filed Sep. 5, 1989, Ser. No. 402,826
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 3832757

Int. Cl.⁵ B01F 11/00 20 Claims
U.S. Cl. 366—108



1. Arrangement for operating a multi-component mixing capsule by means of a vibratory mixing device having a vibration drive, the mixing capsule comprising:
a mixing space defined by a capsule part and a perforated first wall rigidly formed on the capsule part;
a chamber proximate the mixing space, the chamber being defined by the first wall, and a second wall which can be moved toward the first wall,
a bursting closure disposed in the chamber, the closure capable of being opened by movement of the second wall toward the first wall as a result of the operation of said mixing device,
a guide connected to the mixing device,
a first striking body disposed outside the mixing space, the first striking body being movable in relation to the first wall of the chamber, and
a second striking body defined at least in part by the capsule part,
at least one of the first and second striking bodies being connected to the vibration drive, and either the first or the second striking body being at least partially contained within the guide.

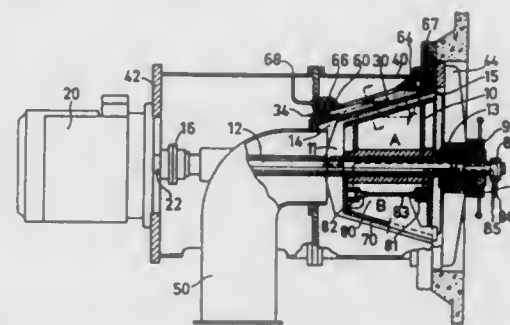
5,088,831
DEVICE FOR TREATING MATERIAL MIXTURES
Rolf B. Reinball, Bellevue, Wash., assignor to Sunds Defibrator Industries Aktiebolag, Sweden

PCT No. PCT/SE89/00003, § 371 Date Jul. 6, 1990, § 102(e) Date Jul. 6, 1990, PCT Pub. No. WO89/07486, PCT Pub. Date Aug. 24, 1989

PCT Filed Jan. 11, 1988, Ser. No. 536,666
Claims priority, application Sweden, Feb. 9, 1988, 8800416-3
Int. Cl.⁵ B01F 7/02, 15/00 11 Claims

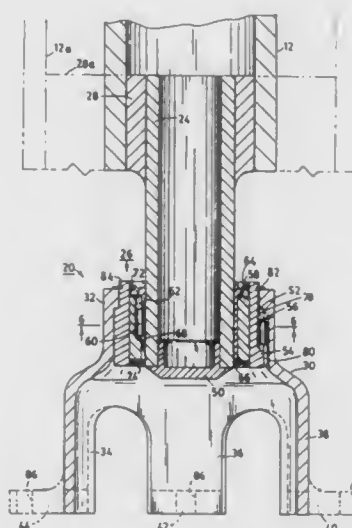
U.S. Cl. 366—171
1. Apparatus for the treatment of material mixtures comprising an inner treating member having an outer treating surface, a corresponding outer treating member having an inner treating surface and surrounding said inner treating member so as to provide a gap therebetween whereby said material mixture can be fed through said gap for treatment between said inner and outer treating surfaces, said inner and outer treating members being relatively rotatable with respect to each other, at least one of said inner and outer treating surfaces including a plurality of longitudinally extending grooves, and cleaning means for cleaning said plurality of longitudinally extending grooves,

said cleaning means comprising projection means extending into said longitudinally extending grooves and being movable along said longitudinally extending grooves so as to clean said material mixture therefrom.



5,088,832
STEADY BEARING APPARATUS FOR THE FREE END OF THE IMPELLER SHAFT OF A MIXER
Jeffrey S. Gambrell, Hilton, and Dominic Borraiccia, Spencerport, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

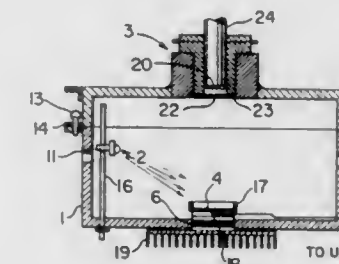
Filed Aug. 10, 1990, Ser. No. 565,539
Int. Cl.⁵ B01F 7/00 11 Claims
U.S. Cl. 366—314



1. Apparatus for supporting, in a vessel, a shaft, which carries an impeller of a mixer at one end of the shaft while the shaft is rotatably driven from the end thereof opposite to said one end which comprises a body having a tubular neck, a sleeve having an outer periphery, said sleeve being removably attached in fixed relationship with said neck along its outer periphery, said sleeve having an inner periphery presenting a first bearing surface, a bushing having an outer periphery presenting a second bearing surface and an inner periphery, said bushing being removably attached in fixed relationship with said mixer shaft along its inner periphery adjacent to said one end of said shaft, said first and second bearing surfaces being disposed in contact for steadying said shaft while it rotates while said mixer mixes material in said vessel, and further comprising keyways extending axially of said shaft in said shaft and in said bushing, said keyways each having closed and open ends, a key in said keyways, said open and closed ends being disposed in axially overlapping relationship capturing said key therein and enabling removal of said bushing when axially displaced in a direction toward said closed end thereof, and a retaining ring removably disposed in said shaft in block-

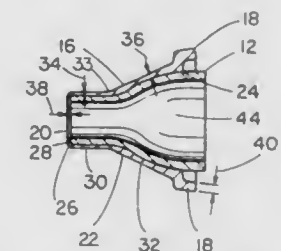
5,088,833
METHOD AND APPARATUS FOR MONITORING CLOUD POINT OR LIKE TRANSITION TEMPERATURE
Charles Y. Tsang, and Victoria S. Ker, both of Calgary, Canada, assignors to Nova Husky Research Corporation, Calgary, Canada

Continuation-in-part of Ser. No. 307,502, Feb. 8, 1989, abandoned. This application Dec. 21, 1989, Ser. No. 454,270
Claims priority, application Canada, Feb. 10, 1988, 558566
Int. Cl.⁵ G01N 25/04, 25/12 18 Claims
U.S. Cl. 374—17



1. Apparatus for measuring the temperature at which a transition occurs in a material between a non-light scattering, transparent or translucent liquid phase and a light scattering phase, and capable of measuring cloud point, freezing point and melting point of a liquid, comprising:
a substantially light proof chamber having light-absorbing internal surfaces, gas purge inlet, said bottom temperature corresponding to the transition temperature of the sample when a change in scattered light is detected;
a light beam source located to direct a beam of light towards said upper surface at an incident angle of from 20° to 80° measured between the light beam and the surface so that light from the beam is largely reflected or absorbed by said upper surface; and
scattered light detection means carried by said top part and arranged perpendicularly above said receptacle so as to detect light scattered by said sample and changes in intensity of the scattered light and connected into circuit means capable of registering change in light scattered from the said sample as said bottom is heated or cooled, said detection means including a lens which concentrates the light from the sample onto at least one light detecting element.

5,088,834
UNITARY PROBE COVER
Randall R. Howe, Greeley, Colo., and Joseph P. Brown, Valley Center, Calif., assignors to Thermoscan Inc., Tucker, Ga.
Continuation of Ser. No. 573,382, Aug. 24, 1990, abandoned.
This application Aug. 30, 1991, Ser. No. 752,932
Int. Cl.⁵ G01K 1/08 14 Claims
U.S. Cl. 374—158



1. A unitary cover for the hollow probe on a radiation detecting thermometer with said probe having a proximal portion

at said thermometer and a distal opening at its opposite end, which cover comprises:

a one-piece hollow sheath having a side wall composed of a proximal portion followed by a distal portion, an open end of said proximal portion integral with which is a base engaged therewith for mounting said sheath on said probe and a closed end integral with said distal portion and in use disposed across said distal opening as a window, said closed end and said distal portion being of the same thickness which is substantially thinner than said proximal portion and said base and sufficiently thin to be effectively transparent for transmission of infrared radiation through said distal opening.

5,088,835

REUSABLE PROBE CONNECTOR APPARATUS

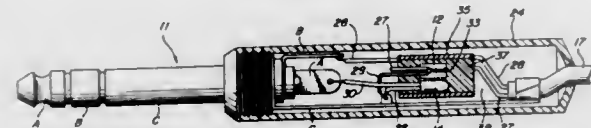
Gordon Shigezawa, 34 Cresthaven, Irvine, Calif. 92714, and Anthony V. Beran, 3118 Alpine, Santa Ana, Calif. 92704

Filed Dec. 31, 1990, Ser. No. 636,928

Int. Cl.³ G01K 7/12

U.S. Cl. 374—181

13 Claims



1. A reusable interconnection cable apparatus for interconnecting a thermocouple probe sensor to a temperature monitoring apparatus comprising:

- a constantan wire;
- a copper wire;
- a copper lead having first and second ends;
- a cold junction formed between said constantan wire and the first end of said copper lead;
- cold junction compensation means for canceling the voltage developed by said cold junction, said compensation means being connected to the second end of said copper lead within said connector housing, said cold junction compensation means providing a third lead;
- a first connector means having a housing for housing said constantan and copper wires, said cold junction, said cold junction compensation means, and said third lead;
- said first connector means further including means for electrically connecting said third lead and said copper wire with said temperature monitoring apparatus;
- a cable means for conducting said constantan wire and said copper wire out of said first connector means; and
- a second connector means located at said second end of said cable means for connecting said constantan wire and copper wire with said thermocouple probe sensor.

5,088,836

APPARATUS FOR TEMPERATURE MEASUREMENT

Takeo Yamada, Mitsuya Otonari, Masaru Yoshida, Naoki Harada, Shuichi Takano, and Shinichi Ohtaka, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Apr. 12, 1990, Ser. No. 508,800

Claims priority, application Japan, Aug. 21, 1989, 1-213058; Ser. 27, 1989, 1-249278

Int. Cl.³ G01K 7/04; H01L 35/28

U.S. Cl. 374—183

19 Claims

1. A temperature measurement apparatus comprising:
- sensing means for detecting a temperature of a surface of a body to be measured, said sensing means being placed adjacent to said body to be measured;
 - retaining means for retaining said sensing means, said retaining means comprising a thermally conductive and electrically insulative material, at least a portion of said retaining means comprising elastic material;
 - holding means for holding said retaining means, at least a

portion of said holding means comprising elastic material; and

a contact mechanism coupled to said retaining means and to said holding means for causing a contact zone of said retaining means to elastically contact said surface of said body to be measured through elasticity of said elastic



material of said retaining means and through the elastic material of said holding means;

wherein said retaining means comprises a polyimide film and a flexible copper leading foil formed on said polyimide film, said flexible copper leading foil being connected to electrodes of said sensing means.

5,088,837

TEMPERATURE MEASURING PROBE AND ELECTRONIC CLINICAL THERMOMETER EQUIPPED WITH SAME

Masahiro Shiokawa, Makoto Ikeda, Kiyoshi Sohma, all of Kanagawa; Masami Iriki, Koufu; Kinji Uchino, Yokohama; Yoshikatsu Kawashima, Yokosuka, and Masahiro Kusakabe, Yokohama, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1989, Ser. No. 396,540

Claims priority, application Japan, Aug. 25, 1988, 63-209457

Int. Cl.³ G01K 7/22, 7/18; H01C 1/01, 1/02

U.S. Cl. 374—185

7 Claims



1. A temperature measuring probe comprising:
- a flat, flexible strip-shaped base member;
 - a core member secured on said base member and including at least one cavity therein;
 - a temperature measuring circuit including a temperature sensing body positioned within said at least one cavity of the core member, the thickness of said core member being approximately the same as that of said temperature sensing body;
 - a conductor coupled to said temperature sensing body;
 - a connector formed on one end of said base member; and
 - a coating member on said core member for sealing the interior of said probe from the outside.

5,088,838

FOLDABLE WATER CONTAINER

Yun-Hui Yeh, 2F, No. 11-15, Lane 22, Kuang Fu S. Rd., Taipei, Taiwan

Filed Apr. 22, 1991, Ser. No. 688,430

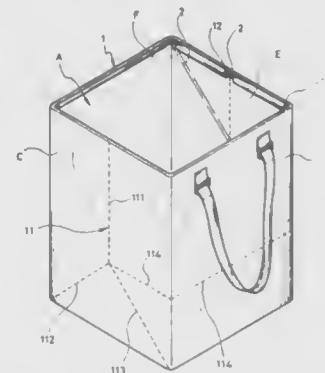
Int. Cl.³ B65D 30/20, 33/02

U.S. Cl. 383—33

2 Claims

1. A foldable water container, comprising:
- a tetragonal body having a top opening, a bottom panel and four side panels, said four side panels including a first side panel, a second side panel connected to said first side panel at one side, a third side panel connected to said first side panel at an opposite side and a fourth side panel connected between said second and third side panels opposite to said first side panel;

two fold lines respectively made on said second and third side panels, each of said fold lines including a first segment vertically extending downward from the top edge of said second or third side panel, a second and a third segment respectively extending from the bottom end of said first segment to the two opposite ends of the bottom edge of said second or third side panel, and a fourth segment transversely extending from the point of intersection between said first, second and third segments through said fourth side panel;



- a quadrilateral supporting frame set in said tetragonal body, having one side pivotably secured to said first side panel; a channel member secured to said tetragonal body on an inner surface thereof at the top edge of said second, third and fourth side panels; and wherein said quadrilateral supporting frame is releaseably engageable with said channel member to stretch open said body; said quadrilateral supporting frame being removable from said channel member to permit said body to be folded up through said fold lines into a flat structure.

5,088,839

OVERRUN PREVENTING DEVICE OF A LINEAR GUIDE APPARATUS

Toru Tsukada, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

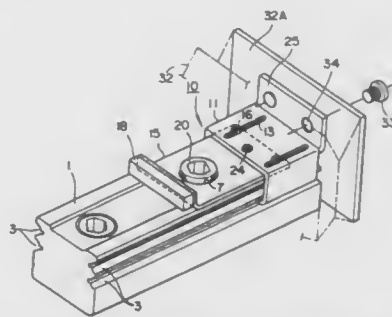
Filed May 17, 1991, Ser. No. 702,786

Claims priority, application Japan, May 18, 1990, 2-52035[U]

Int. Cl.³ F16C 29/06

U.S. Cl. 384—45

7 Claims



1. An overrun preventing device of a linear guide apparatus wherein the linear guide apparatus includes a guide rail having rolling member rolling grooves formed in both sides and a slider movably and loosely fitted about the guide rail and having rolling member rolling grooves respectively opposing the rolling member rolling grooves of the guide rail so that the slider and the guide rail are movable relative to each other in an axial direction through rolling movement of a plurality of rolling members fitted into the opposing rolling member rolling grooves,

the overrun preventing device comprising:

- a main body straddling an upper surface of the guide rail and

having an inverted U-shaped cross section, the main body having lift preventing plate portions respectively formed at lower edges of both side walls of the main body so as to be engaged with the rolling member rolling grooves of the guide rail to prevent lifting of the main body, the main body having a pair of position adjusting slots formed in an upper plate portion and extending axially for adjusting the axial position of the main body with respect to the guide rail;

a slide plate having one end inserted into a gap between the main body and the upper surface of the guide rail so as to be expandably coupled to the main body by positioning fasteners inserted into the position adjusting slots, the slide plate further having an impulse absorbing member at the other end and having a fitting aperture at an intermediate position between both ends of the slide plate for inserting a guide rail fixing fastener therethrough; and

a pressing means for pressing the slide plate against the guide rail.

5,088,840

DASHPOT DAMPER

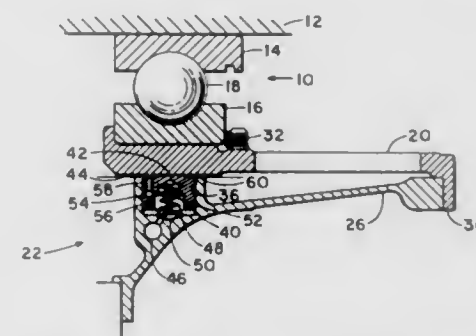
Lee Radtke, Gatlinburg, Tenn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1990, Ser. No. 560,985

Int. Cl.³ F16C 27/00

U.S. Cl. 384—535

5 Claims



1. For a bearing rotatably supporting a shaft having an outer race, a bearing support housing including an annular surface concentrically mounted relative to said outer race, spring means having one end supported to said bearing support housing, a plurality of dashpot dampers circumferentially spaced around said outer race disposed in cylinders formed in said bearing support housing and including a piston having one end bearing against said spring and the other end defining with said cylinder a cavity for receiving pressurized fluid, an inlet passageway for admitting pressurized fluid into said cylinder and an outlet passageway for discharging fluid from said cylinder whereby vibratory energy exited from said shaft is transferred to said cylinder through said piston to flow fluid into and out of said cylinder to dissipate said vibratory energy.

5,088,841

SEAT ARRANGEMENT FOR AUTOMOTIVE VEHICLE WITH SEAT POSITION ADJUSTING SYSTEM

Isao Ikegaya, and Tadashi Matsumoto, both of Shizuoka, Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,679

Claims priority, application Japan, Nov. 30, 1988, 63-303274; Feb. 27, 1989, 1-45717

Int. Cl.³ A47C 1/02

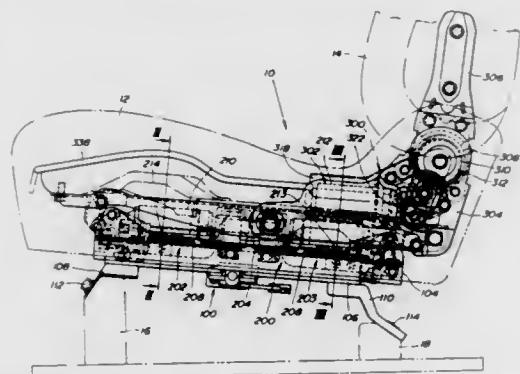
U.S. Cl. 297—344

7 Claims

1. An adjustable automotive seat arrangement including a seat cushion and a seat back comprising:
- a seat slide mechanism associated with said seat cushion for permitting axial shifting in forward and rearward direc-

tions, said seat slide mechanism including seat slide rail structure having a stationary rail secured to a vehicular body structural member and a movable rail slidably engaged with said stationary rail and secured to a structural member of said seat cushion, said movable rail being associated with a first driving means for driving said movable rail relative to said stationary rail;

a seat lifter mechanism associated with said seat cushion for adjusting the height position of said seat cushion, said seat lifter mechanism including a stationary framework connected to a seat cushion frame of said seat cushion via a link mechanism, said seat lifter mechanism including a second driving means associated with said link mechanism for driving the link mechanism for causing vertical move-



ment of said seat cushion frame relative to said stationary framework;

a reclining mechanism associated with said seat back for adjusting a reclining angle thereof, said reclining mechanism having a pivotal base associated with the rear end portion of said seat cushion frame for pivotal movement thereabout, said reclining mechanism including a third driving means associated with said pivotal base for pivotally driving the latter; and

said seat arrangement defining a space along one lateral side of said seat cushion and defined by said seat cushion and said seat slide rail structure for concentrically receiving two electric motors, said two motors comprising said second driving means, for compact layout thereof.

5,088,842 DOT MATRIX PRINTER HAVING A PRINT HEAD POSITION ADJUSTING FEATURE DEPENDENT ON AN ECCENTRICITY OF A PLATEN

Noritugu Ito, Chita, and Yuuji Kawahara, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

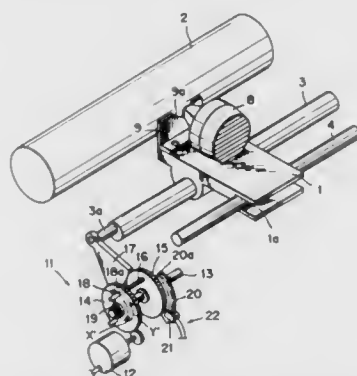
Filed Jan. 30, 1991, Ser. No. 647,820
Claims priority, application Japan, Jan. 31, 1990, 2-21406
Int. Cl.⁵ B41J 11/20

U.S. Cl. 400—59

17 Claims

1. A printer comprising:
 - a power supply switch for actuating the printer when said power supply switch is turned on;
 - a platen rotatable about its own axis for supporting a sheet of print paper on a circumference thereof;
 - a guide rod extending in parallel to the axis of said platen;
 - a carriage slidably movable along said guide rod and also movable toward and away from said platen in a direction substantially perpendicular to the axis of said platen, said carriage having a distal end portion confronting said platen;
 - a print head mounted on said carriage for carrying out printing on the sheet of print paper while said carriage is moving along said guide rod;
 - a pressing/releasing mechanism for moving said carriage toward and away from said platen;
 - reference position detecting means for detecting a plurality

of reference positions of said carriage in the direction perpendicular to the axis of said platen under a condition where no sheet of print paper is supported on said platen, the plurality of reference positions being defined by positions of the distal end portion of said carriage when pressed against a plurality of locations on the circumference of said platen by said pressing/releasing mechanism, said platen being angularly rotated about its own axis when the plurality of reference positions are detected, said reference position detecting means producing a plurality of reference position data each indicative of the detected reference position of said carriage;



averaging means for averaging the plurality of reference position data produced by said reference position detecting means and producing average reference position data indicative of an averaged reference position of said carriage;

memory means for storing the average reference position data; and

adjusting means for adjusting a position of said carriage by actuating said pressing/releasing mechanism based on the average reference position data stored in said memory means.

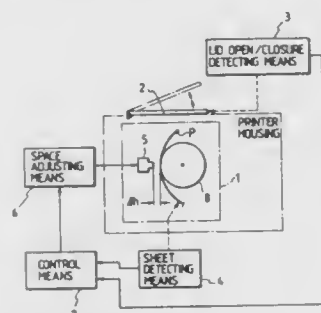
5,088,843 PRINTER CAPABLE OF CORRECTING DISTANCE BETWEEN PRINT HEAD AND PRINT PAPER AFTER LID IS OPENED

Masaaki Hori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 14, 1989, Ser. No. 393,634
Claims priority, application Japan, Aug. 16, 1988, 63-203357
Int. Cl.⁵ B41J 25/308

U.S. Cl. 400—59

13 Claims



1. A printer comprising:

a printer housing;

a print mechanism housed in said printer housing, said print mechanism including a print head and a platen, said print head being disposed in spaced apart relation to a sheet of print paper set on said platen and performing printing operation on the sheet of print paper set thereon, said

platen being rotatably supported to said printer housing, and the sheet of print paper having a thickness;

a lid member openably attached to said printer housing for normally covering said print mechanism;

lid open/closure detecting means for detecting opening and closing of said lid member and producing a first signal when said lid member is opened in the course of the printing operation and a second signal when said lid member is closed;

sheet detecting means for detecting presence of the sheet of paper on said platen and producing a third signal when the sheet of print paper is present on said platen and a fourth signal when the sheet of print paper is absent from said platen;

distance adjusting means for adjusting a distance between the sheet of paper set on said platen and said print head; and

control means for controlling said distance adjusting means so that the distance between the print paper and print head is adjusted when the second signal is produced subsequent to the production of the first signal and when the third signal has been produced when the second signal is produced.

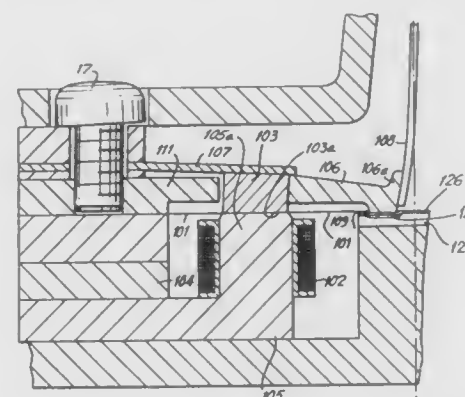
5,088,844 IMPACT DOT PRINT HEAD AND PRINTER INCLUDING SAME

Takashi Takeuchi, and Toshio Kuriyama, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Feb. 14, 1990, Ser. No. 479,901
Claims priority, application Japan, Feb. 16, 1989, 1-36620
Int. Cl.⁵ B41J 2/24

U.S. Cl. 400—124

4 Claims



1. An impact dot printer, comprising an impact dot print head including a plurality of lever means mounted in the print head biased towards a print position, a print wire mounted on the free end of each lever means, a plunger mounted to said lever means, a permanent magnet for attracting said plunger to a stand-by position, electromagnetic means associated with a respective lever means to cancel the attractive force of the permanent magnet to permit the print wire to be displaced towards said print position and stopper means for restricting the displacement of said lever means as it returns to the at rest position so that the lever means impacts the stopper means before the plunger contacts the electromagnet means, said stopper means including a metallic layer, a resin film layer on one surface of the metallic layer, and a rubber layer on the opposite surface of the metallic layer.

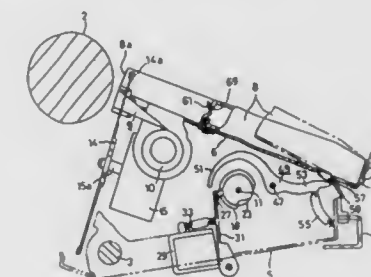
5,088,845 RIBBON CASSETTE FOR MECHANICALLY UNLOCKING A PRINTING MECHANISM UPON INSERTION OF THE RIBBON CASSETTE INTO A PRINTING DEVICE

Hisao Kurachi, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Feb. 27, 1990, Ser. No. 485,518
Claims priority, application Japan, Oct. 6, 1989, 1-262649
Int. Cl.⁵ B41J 35/28

U.S. Cl. 400—208

15 Claims



1. A ribbon cassette selectively mounted in a printing device having: an operating mechanism cooperating with the ribbon cassette for printing characters; locking means movable between retracted and projected positions for selectively unlocking and locking the operating mechanism in operative and inoperative states, respectively; and a mechanical linkage movable between a released position for unlocking the locking means for movement between the retracted and projected positions and an engaged position for locking the locking means in the projected position to lock the operating mechanism in the inoperative state; the ribbon cassette comprising: a casing for housing a ribbon supply and a ribbon take-up; a ribbon in the housing exposed to the operating mechanism between the ribbon supply and ribbon take-up; and actuating means on the casing for mechanically moving the mechanical linkage to the released position upon insertion of the casing into the printing device.

5,088,846 PRINTER OF RIBBON CASSETTE FIXED TYPE

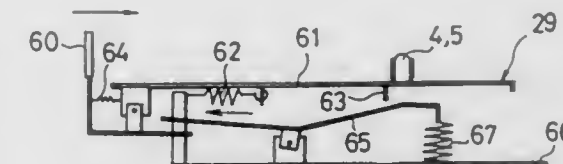
Kouzou Yamaguchi, Kashiwara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 415,594, Oct. 2, 1989, abandoned, which is a division of Ser. No. 181,315, Apr. 13, 1988, abandoned. This application May 31, 1990, Ser. No. 531,239

Claims priority, application Japan, Apr. 13, 1987, 62-90412
Int. Cl.⁵ B41J 35/28

U.S. Cl. 400—208

8 Claims



1. A printer comprising:

a main body;

a cassette mounting portions provided on said main body and having a cassette loading plate;

a ribbon cassette detachably mounted on said loading plate, and including two spools generally in parallel winding an ink ribbon therebetween;

a feed reel disposed at said loading plate and adapted to engage with one of said spools for feeding said ribbon;

a take-up reel disposed at said loading plate and adapted to engage with the other of said spools for taking-up said ribbon;
 a carriage mounted in said main body movably along a platen;
 a print head disposed on said carriage and adapted to pivot on said carriage away from and toward said platen, to which a portion of said ribbon is positioned, for printing by using said ribbon discharged from said cassette by a movement of said carriage along said platen; and
 moving means provided on said mounting portion for moving said loading plate to a loading position near said platen, in which said cassette is positioned in the vicinity of said carriage so as to position said portion of said ribbon to said head along with a loading motion of said cassette while said head is away from said platen, and an operating position far from said platen, in which said cassette is positioned away from said carriage so as not to disturb said movement of said carriage.

5,088,847

SETTING VARIABLE CHARACTER WIDTH IN MATRIX PRINTER

Akira Oda, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 310,590, Feb. 15, 1989, abandoned.

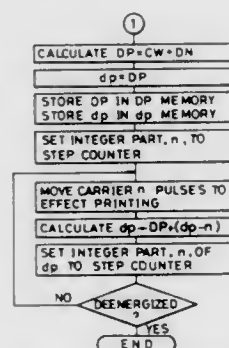
This application Aug. 24, 1990, Ser. No. 571,828

Claims priority, application Japan, Feb. 18, 1988, 63-35516

Int. Cl.⁵ B41J 19/32

U.S. Cl. 400—306

2 Claims



1. A character width setting apparatus in a printer, comprising:

- a CPU;
- a ROM for the storage of fixed data;
- a RAM for the storage of modifiable data, said RAM is provided with a step counter, said RAM having a region for a head energizing pulse interval memory storage including a decimal fraction storage and a region for storing a variable value and an accumulated variable value;
- a printing head;
- a printing head driving circuit connected to said printing head;
- an input/output port;
- a carrier motor driving circuit connected to said input/output port;
- a carrier motor connected to said carrier motor driving circuit;
- a carrier, driven by said carrier motor, for carrying the printing head;
- a paper feed motor driving circuit connected to said input/output port;
- a paper feed motor connected to said paper feed motor driving circuit;
- a platen connected to said paper feed motor;
- a data bus connected to said CPU, said ROM, and said RAM;
- an address bus connected to said CPU, said RAM, said

printing head driving circuit, and said input/output port; and
 means for energizing the printing head at an interval of n pulses, for a predetermined sequence of intervals of n pulses and wherein an accumulation of decimal fractions remaining is stored and such that when said accumulation of decimal fractions remaining exceeds one said printing head is energized for n+1 pulses further whereupon said predetermined sequence is repeated with the accumulation being set to any portion of a decimal fraction over one remaining in said decimal fraction memory after one has been subtracted therefrom.

5,088,848

PRINTING SHEET FEED AND ALIGNING SYSTEM FOR A PRINTER

Gianfranco De Falco, Samone, and Antonio Brunero, Cossano, both of Italy, assignors to Ing. Olivetti & C., S.p.A., Aver, Italy

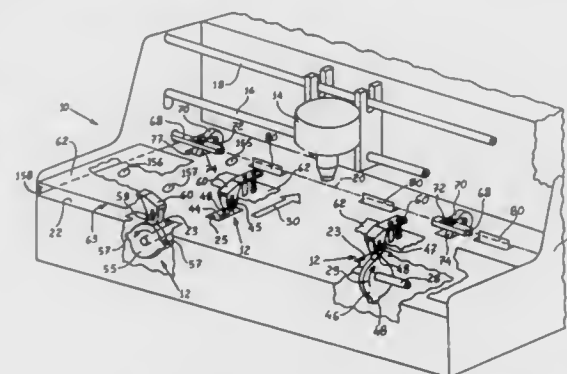
Filed Mar. 19, 1991, Ser. No. 671,469

Claims priority, application Italy, Mar. 20, 1990, 67200 A/90

Int. Cl.⁵ B41J 13/26

U.S. Cl. 400—630

17 Claims



1. A printing sheet feed and aligning system for a printer, said system comprising:

- a printing head movable along a printing line;
- a plane bearing surface for receiving a sheet to be printed on and having movable stop means aligned in a direction parallel to said printing line;
- at least one first feed roller rotatable to feed said sheet on said plane surface against said stop means;
- lateral guide means at the side of said plane surface and perpendicular to said printing line; and
- a second feed roller rotatable to feed said sheet in a direction of alignment parallel to said printing line against said lateral guide means, said second roller being coupled to said first roller for rotation therewith;
- said first and second rollers each comprising a pair of substantially diametrically-opposed radial projections, the pair of projections on said first roller being relatively offset with reference to the pair of projections on said second roller by about 90°.

5,088,849

APPLICATOR FOR APPLYING LIQUIDS TO THE HUMAN BODY

Jeff H. Johnson, 1545-J Terrell Mill Pl., Marietta, Ga. 30067, and Tom D. Bowers, Atlanta, Ga., assignors to Jeff H. Johnson, Marietta, Ga.

Filed Aug. 1, 1990, Ser. No. 561,345

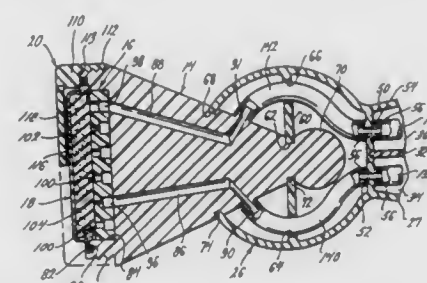
Int. Cl.⁵ A45D 34/00; A47L 13/16

U.S. Cl. 401—44

17 Claims

1. An applicator for applying a plurality of liquids, such as for tanning, at the same time to the human body comprising:
 a handle;
 an applicator head at the top of the handle, said head receiv-

ing a pad for contact with the body where the liquids are to be applied;
 at least two chambers within said handle for separately containing said liquids; and
 means for feeding each liquid separately from a chamber to the applicator pad for application to the body upon contact with the pad; and
 a distributor at the outer end of the head, said pad overlying



said distributor, said distributor having a first distribution means for distributing one of the liquids at multiple locations substantially throughout the pad, and a second distribution means for distributing the other of the liquids at multiple locations substantially throughout the pad, said first and second distribution means distributing each liquid separately to said pad, whereby mixture of said liquids first occurs in said pad at multiple locations substantially throughout the pad.

5,088,850

COMBINED PASTE-DISPENSING AND CLEANING UNIT

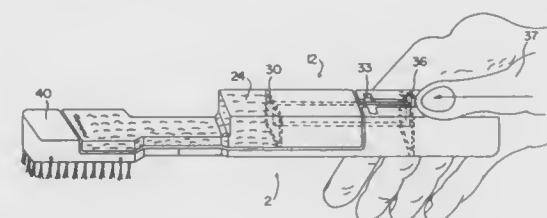
Jeremy Taichman, 11/6 Yohanan Hasandlar St., Rishon Lezion, and Manuel Schwartzman, 1363/20 Ezor Het, Ashdod, both of Israel

Filed Dec. 3, 1990, Ser. No. 621,575

Int. Cl.⁵ A46B 11/02

U.S. Cl. 401—176

13 Claims



1. A unit for cleaning, brushing, scouring, polishing and the like, comprising a handle terminating at its forward end with a head, said head having a cleaning body extending from an interior surface thereof and a throughgoing aperture, and said unit further comprising an external paste-containing holder having a paste-containing section and a paste-dispensing section having an outwardly-projecting paste-dispensing nozzle, said handle comprising a recessed section intermediate to its forward and rear ends sized to receive and retain said holder with said paste-containing section adjacent the rear end thereof and said paste-dispensing section adjacent the front end thereof, said paste-containing section of said holder being of enlarged tubular cross-section relative to said paste-dispensing section and comprising piston means having a piston rod terminating in a first surface of outer dimensions complementary to the inner dimensions of said tubular section and slidable therein to urge said paste towards said paste-dispensing nozzle, said handle and said paste-containing holder having means for releasable interlocking engagement to position said dispensing nozzle in said throughgoing aperture provided

in said head for release of paste from said paste-containing section through said paste-dispensing section to said nozzle, said nozzle dispensing the paste to said throughgoing aperture of said head and into said cleaning body.

5,088,851

DOWEL FASTENING DEVICE

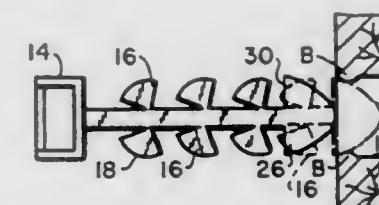
Gerhard Hutter, 993 Lake Ave., Greenwich, Conn. 06830

Filed Oct. 1, 1990, Ser. No. 591,262

Int. Cl.⁵ B25G 3/00

U.S. Cl. 403—14

4 Claims



1. A dowel fastening support device for insertion in a board opening in a structural element comprising a support end portion and a shank portion, a plurality of triangular-shaped members each having a curved gripping surface and two straight side surfaces, a hinge joint for each member connecting the adjacent ends of said two straight side surfaces to said shank portion whereby said members are pivotable in one direction when said shank is inserted in said opening, and when force is applied to said dowel fastening support in a direction away from said structural element said curved surfaces pivot in the opposite direction to frictionally grip the interior surfaces of said opening to thereby prevent the dowel fastening support from being dislodged from said structural element, each of said curved gripping surfaces having a configuration whereby the forward edge thereof at the junction of said curved gripping surfaces and adjacent straight side is spaced from said interior surface when said device is inserted in said bored opening, and a spade-shaped element having forward curved surfaces and a rear linear surface connected to the forward end of said shank portion, the distance between the junctions of the forward and rear surfaces on said spade-shaped element corresponding substantially to the interior diameter of said bored opening whereby said dowel is automatically centered when inserted in said bored opening.

5,088,852

PINNED TYPE CONNECTOR MEANS FOR LATTICE SPACE STRUCTURES

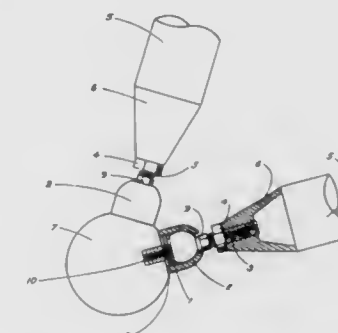
Michael D. Davister, 4708 Carterwood Dr., Fairfax, Va. 22032

Filed Oct. 13, 1989, Ser. No. 421,084

Int. Cl.⁵ B25G 3/00

U.S. Cl. 403—19

15 Claims



1. A pin connector means comprising:
 (a) a ball-ended bolt, said ball-ended bolt having: a spherical

- ball at one end, surface of said spherical ball is finished to be of low friction, and a threaded rod extending from said spherical ball, said threaded rod screwably affixes into an endpiece of a structural member;
- (b) a bearing seat for receiving said spherical ball of said ball-ended bolt, surface of said bearing seat is finished to be of low friction, said bearing seat being affixed to a central node, said bearing seat has a concave bearing surface for receiving said spherical ball of said ball-ended bolt and a threaded member, said threaded member screwably affixes said bearing seat to said central node, said concave bearing surface has a wrenching socket enabling said bearing seat to be affixed to said central node; and
- (c) a means for coupling said spherical ball of said ball-ended bolt to said bearing seat; whereby said ball-ended bolt when affixed to said structural member is enabled to rotate about an axis transverse to the longitudinal axis of said structural member.

5,088,853

CONNECTOR

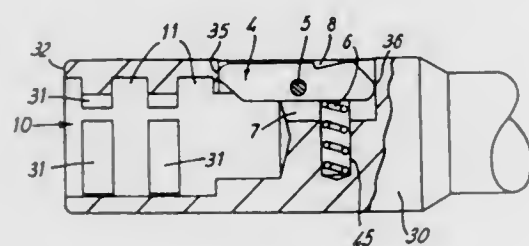
Michael A. Reid, Aberdeen, United Kingdom, assignor to Well-Equip Limited, Aberdeen, United Kingdom
Filed Jan. 7, 1991, Ser. No. 638,064

Claims priority, application United Kingdom, Jan. 10, 1990, 900555

Int. Cl.⁵ B25G 3/18

U.S. Cl. 403—330

4 Claims



1. A connector comprising:
a female member;
a circumferentially extending recess formed on the inside of said female member;
a male member;
a flange formed on the outside of said male member;
said male member being adapted to be inserted into said female member and rotated relative to said female member from a first position through a predetermined angle of rotation to a second position in which said flange on said male member engages with said recess formed on said female member to prevent axial separation of said female member and said male member;
latch means movable from a release position permitting relative rotation of said male member and said female member to a locking position where relative rotation of said male member and said female member is prevented; and, biasing means acting on said latch means in a direction transverse to the longitudinal axes of said male and female members to bias said latch means into said locking position to prevent relative rotation of said male member and said female member.

5,088,854

PAVING JOINTS

Robert A. Sovik, Clifton Park, N.Y., assignor to AW-2R, Inc., N.Y.

Filed Aug. 13, 1990, Ser. No. 565,972
Int. Cl.⁵ E01C 3/06, 11/24, 23/02, 19/24

U.S. Cl. 404—72

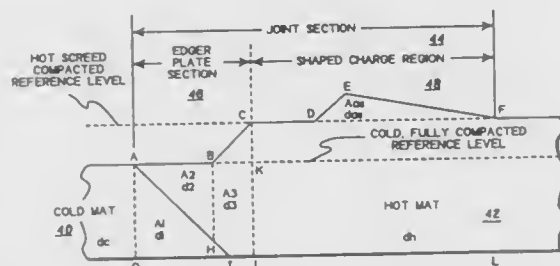
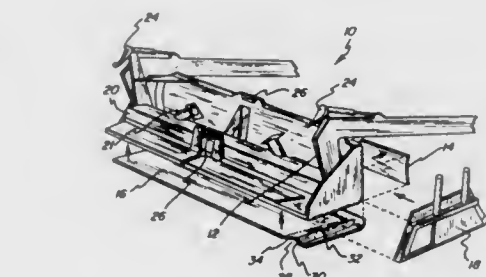
22 Claims

1. In a pavement-laying machine adapted to move longitudinally alongside a first mat section of previously laid, rolled and

compacted paving material and lay a second mat section of fresh paving material adjacent the edge of said first mat section, means for forming a longitudinal joint between said first and second mat sections, comprising:

means operatively associated with said pavement-laying machine for laying said second mat section of fresh paving material having a shaped charge region of predetermined profile formed thereon and containing additional fresh paving material,

one end of the profile of said shaped charge region commencing near the top level of the edge of said first mat section and extending angularly upwardly and away from said top level of the edge of said first mat section and in the direction toward the center of said second mat section for a predetermined distance toward a summit and then angularly extending downwardly from said summit toward a blending point with the top level of the fresh paving material of said second mat section, and the summit of said profile being biased in the direction toward said first mat section whereby when said second mat section and the shaped charge region thereof is rolled, lateral and transverse compaction forces are generated and a full density compacted, substantially fused longitudi-



dinal joint is provided between said first and second mat sections and with any excess fresh paving material being vented away from the joint to the fresh paving material of said second mat section.

19. A screed plate for use with a paver finisher machine, comprising:

a channel disposed near one end of said screed plate and extending continuously from front to back thereof, said channel being defined by a first wall commencing from the bottom surface of said screed plate near said one end and extending upwardly and away from said one end at an angle less than 90 degrees to a summit, and a second wall which extends angularly downwardly from said summit to a blending point with the bottom surface of said screed plate, said summit being nearer said one end than it is to said blending point,

said channel being arranged and constructed to lay a shaped charge region containing a predetermined quantity of fresh paving material along the top surface of a mat section of fresh, hot paving material and which shaped charge region is laid down with the paving material of said mat section as said paver finisher machine is moved during a paving pass.

5,088,855

VEHICLE FOR COMPACTING SURFACES

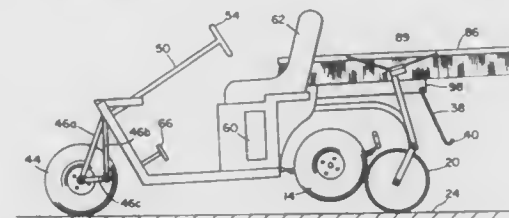
John Gillberti, West Palm Beach, Fla., assignor to Electronic Tug International, Inc., W. Palm Beach, Fla.

Filed May 7, 1990, Ser. No. 520,264

Int. Cl.⁵ E01C 19/26

U.S. Cl. 404—103

6 Claims



1. Apparatus for compacting a surface which comprises a vehicle comprising a frame having at least three wheels rotatably mounted to the frame, motor means driving at least two driven wheels mounted at a rearward position on said frame, at least two compacting cylinders positioned contiguous to each other and pivotally mounted on said frame rearward of said driven wheels and adapted to rotate about an axis, said compacting cylinders having a pivotal position in an operative position rearwardly of and in contact with said driven wheels and adapted to rotate about said axis and a pivotal position in an inoperative position free of contact from said driven wheels, each of said compacting cylinders comprising a rotatable axle, at least two solid disks mounted on said rotatable axle and a cylindrical sleeve having a smooth cylindrical interior surface bonded to said solid disks and in the operative position the portion of the cylindrical sleeve opposite said interior bonded surface contacts said driven wheels.

5,088,856

RADIANT HEAT ROTARY VOLATILIZER

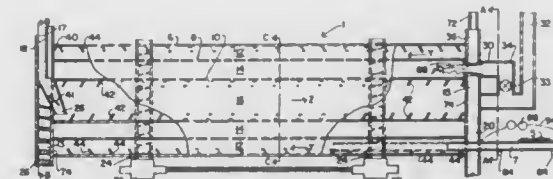
Gene H. Yocum, Rockville, Md., assignor to Soils, Inc., Clifton, Va.

Continuation of Ser. No. 495,415, Mar. 19, 1990. This application Dec. 27, 1990, Ser. No. 634,537

Int. Cl.⁵ B09B 3/00

U.S. Cl. 405—128

16 Claims



1. An apparatus for heating material which is comprised of: a rotary cylindrical drum, having first, second and third concentric cylinders of decreasing diameters; means to introduce said material into said drum, such that said material is introduced into one of said first and third cylinders; a heating means interacting with said second cylinder to create an atmosphere in said first and third cylinders which will heat said materials required; transporting means for transporting said material along a length of said first and third cylinders; a transfer means to transfer said material from said one to the other of said first and said third cylinders; and an exhaust means to substantially ventilate gases evolved from said material away from said material as said gases are evolved.

5,088,857

SCAVENGING APPARATUS FOR EMBEDDING CABLES OR THE LIKE INTO THE SOIL OF WATERS

Rudolf Harmstorf, Kösterbergstrasse 40F, 2000 Hamburg 55, Fed. Rep. of Germany

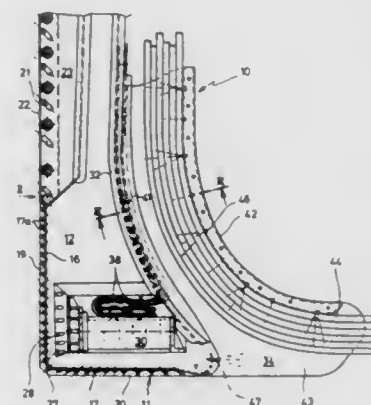
Filed Jul. 2, 1990, Ser. No. 547,653

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922349

Int. Cl.⁵ F16L 1/04

U.S. Cl. 405—159

6 Claims



1. A scavenging apparatus for embedding cable or the like into the soil of waters, comprising an elongated scavenging sword being adapted to be attached at different heights to an embedding vessel movable on said soil of waters or to a surface water vessel, said sword having a guide channel extending through said sword from the top to the bottom in the rear area thereof for the guidance of said cable and its depositing on the bottom of said trench scavenged free, said sword further including a water channel extending through from the top to the bottom in the front region thereof and connected to a pressurized water supply at the upper end and to a first set of scavenging nozzles located at the front side of said scavenging sword, and a vibrator for said scavenging sword, said vibrator being connected by energy supply lines to an energy source located on said vessels, characterized in that said vibrator is located within an enlargement of said scavenging sword near the sole of said sword, second and third sets of nozzle are provided, with the axes of said second and third sets of nozzles directed towards said guide channel, and said energy supply lines for said vibrator extend inside said sword.

5,088,858

METHOD AND APPARATUS FOR CONSTRUCTING A COLUMN-SHAPED MARINE STRUCTURE AND STRUCTURE PRODUCED THEREBY

Ahmad Massoudi, Tehran, Iran, assignor to Darya Paye Jetty Co., Ltd., London, Great Britain

Filed Nov. 7, 1990, Ser. No. 610,360

Claims priority, application Netherlands, Nov. 7, 1989, 8902752

Int. Cl.⁵ E02B 17/02; E02D 5/18

U.S. Cl. 405—203

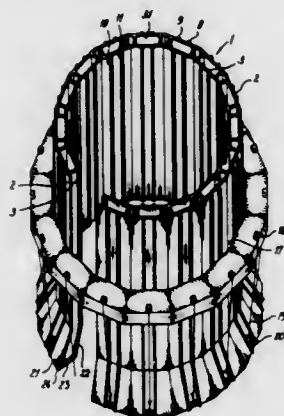
13 Claims

1. A method of constructing a column-like marine structure including a column which extends upwardly from a base portion adapted to rest on the water bottom, comprising the steps of:

- (1) constructing an arrangement of floats;
- (2) placing the arrangement of floats on a working area which can be flooded;
- (3) placing upon the arrangement of floats a first column part comprising at least the base portion, which base portion is constructed to have buoyancy;
- (4) flooding said working area to thereby float the arrangement of floats and said first column part carried thereby;

- (5) moving the arrangement of floats and said first column part to deeper water;
- (6) ballasting the floats to sink them while maintaining the buoyancy of said first column part;
- (7) removing the arrangement of floats from beneath the first column part;
- (8) ballasting said first column part to thereby sink it to the bottom of the deeper water, which is of a depth such that said first column part extends above the water surface;
- (9) assembling the floats around and coupling them to said first column part;
- (10) constructing at least one further column part on the top of said first column part;
- (11) lifting the column from the water bottom by buoyancy of said floats; and
- (12) floating the assembly of floats and column to its destination and there ballasting the column to sink it onto the water bottom.

9. Apparatus for use in the manufacture of a column-like marine structure having a base portion adapted to rest on the water bottom at a selected site, a large part of which structure



is manufactured in an area remote from the site, floated to the site and there lowered onto the bottom of a body of water, said apparatus comprising:

- a plurality of floats adapted to be assembled to form an annular arrangement of floats on which the base of said structure may be supported and which surrounds an area which substantially corresponds to the contour of the outer surface of the column portion of the structure to be manufactured, so that they can be assembled around the column of a partly manufactured structure, said floats including guide means adapted to cooperate with the contour of the outer surface of the column to limit relative movement between the arrangement of floats and the column structure to movement in a vertical direction, and coupling means supported on said float assembly and adapted when surrounding the column of a partly manufactured structure to be coupled to the structure for displacing said float assembly and said structure either upwardly or downwardly relative to each other in a vertical direction and for locking the float assembly to the column at an adjusted vertical position.

5,088,859

RISER AND TENDON MANAGEMENT SYSTEM

Paul V. Devlin, Pearland, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,674

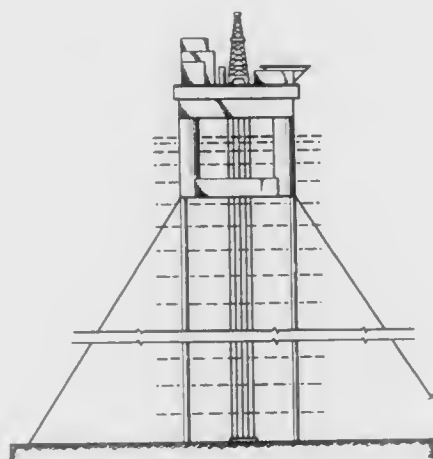
Int. Cl.⁵ B63B 35/44

U.S. Cl. 405—211

13 Claims

1. A riser and tendon management system comprising:
means to set nominal conditions for said risers and tendons;
means to measure actual riser and tendon conditions;

means to compare said actual and nominal conditions of said risers and tendons; and
means responsive to a differential between said actual and



nominal riser and tendon conditions, which difference exceeds specified limits, and recommending corrective action to bring said risers and tendons back to within nominal conditions.

5,088,860

PROCESS AND APPARATUS FOR SELECTIVELY GATHERING LIGHTWEIGHT LOW DENSITY OBJECTS

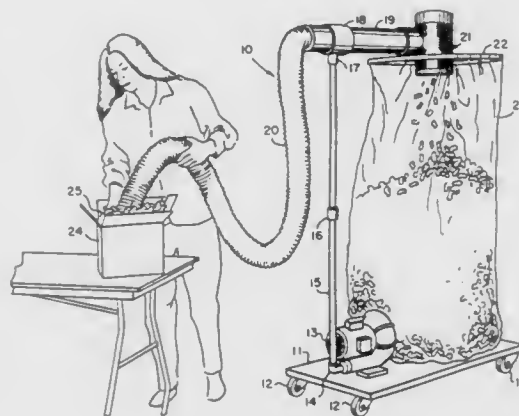
Clyde E. Stockdale, Canton, and Steven E. Archer, New Philadelphia, both of Ohio, assignors to Poly-Vac Co., Canton, Ohio

Filed Mar. 8, 1991, Ser. No. 666,727

Int. Cl.⁵ B65G 53/14

U.S. Cl. 406—153

15 Claims



6. An apparatus for selectively gathering lightweight low density objects comprising:

- (A) a conduit of substantially uniform cross section having a cylindrical wall surrounding a longitudinal axis and defining a hollow interior, the wall having a plurality of holes therethrough, said holes being spaced circumferentially from each other around at least part of the cylindrical wall;
(B) plenum chamber means at least partly surrounding the cylindrical wall in such a location as to be in communication with the holes therethrough;
(C) an air pressure source
(D) means connecting the air pressure source to the plenum chamber means to permit air pressure to flow from the air pressure source to the plenum chamber means, creating air pressure therein which in turn flows through the holes in

the conduit into the interior thereof thereby causing an induced directional airflow through the conduit from an intake end to an outlet end thereof; and
(E) a flexible elongated intake member having one end connected to the intake end of the conduit and another end inserted into a group of the lightweight objects to be gathered, when the apparatus is in use, to draw the lightweight objects into the input end of the conduit and eject them from the outlet end thereof into a collection container.

5,088,861

THREADMILLING TOOL

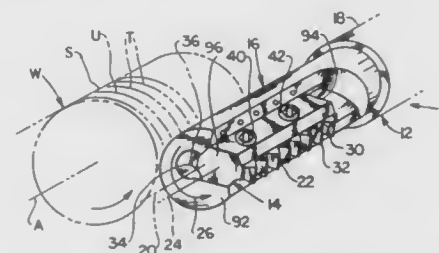
Roger W. Little, Santa Fe, Tex., assignor to Threading Systems, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 468,564, Jan. 23, 1990, Pat. No. 5,004,379. This application Mar. 25, 1991, Ser. No. 675,571

Int. Cl.⁵ B23G 5/18; B23C 5/28

U.S. Cl. 407—11

11 Claims



9. A threading apparatus comprising:

- a thread cutting insert having a mount portion with an axis and only two arms that project in opposite directions from said mount portion, each arm having an outer border and a pair of opposite sides extending largely radially away from said axis, said outer border having a plurality of thread cutting teeth spaced parallel to said axis to cut a plurality of thread turns at the same time;
said mount portion having six substantially flat locating surfaces, including two primary locating surfaces that extend parallel to each other and four secondary locating surfaces that each extends at least about 90° to one of said primary locating surfaces, with each secondary locating surface extending parallel to another locating surface;
an elongated insert holder having an axis of rotation, said holder having first and second positioning surfaces for respectively engaging a primary and secondary locating surface of said insert while one of said arms projects largely radially from said holder axis, said holder having a recess extending along said holder axis and one of said insert arms lies in said recess but out of contact with the walls of said recess.

5,088,862

CUTTING INSERT WITH CHIP CONTROL

Kenneth L. Niebauer, and Thomas A. Lockard, both of Raleigh, N.C., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 329,146, Mar. 27, 1989, Pat. No. 4,963,060, which is a division of Ser. No. 93,348, Sep. 4, 1987, Pat. No. 4,834,592. This application Sep. 13, 1990, Ser. No. 582,458

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

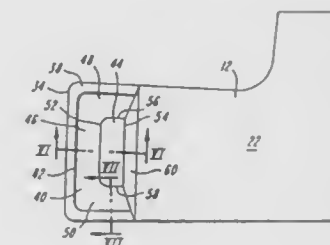
Int. Cl.⁵ B23P 15/28

U.S. Cl. 407—114

10 Claims

1. An improved cutting insert with chip control features for grooving applications comprising an insert body having peripheral end wall regions having a predetermined width and defining in part a cutting edge and sides with first and second walls generally perpendicular to said sides, said insert body being indexable about an axis perpendicular to said sides thereof, said insert body having cutting edges at said end wall

regions, whereby in each indexed position of said insert body a respective cutting edge is presented uppermost at the same end of said insert body, said insert body adapted for engagement by a toolholder assembly; a land region extending rearwardly and generally parallel to the respective first or second wall from each said end wall region cutting edge and defining a surface region of a predetermined width; a descending wall having a



forward portion and opposed side portions, initiating in a portion of said land and terminating in a planer floor region having a forward, a rearward and opposed side edges and wherein said descending wall terminates at said planer floor's forward and opposed side edges; and a back ramp extending upwardly from said planer floor rearward edge, intersecting said descending wall opposed side portions and terminating at said respective first or second wall.

5,088,863

TWIST DRILL

Koujiro Imanaga; Shinichi Nakamura; Hideji Hosono, and Yoshiyuki Yanase, all of Gifu, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Division of Ser. No. 283,916, Dec. 13, 1988, Pat. No. 4,983,079.

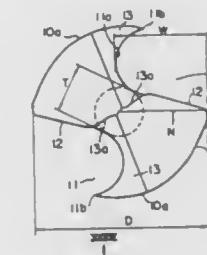
This application Oct. 30, 1990, Ser. No. 605,353

Claims priority, application Japan, Dec. 14, 1987, 62-315501; Dec. 14, 1987, 62-315502; Dec. 17, 1987, 62-319509; Dec. 22, 1987, 62-324589; Jul. 19, 1988, 63-180005; Jul. 20, 1988, 63-180494; Jul. 22, 1988, 63-183275; Jul. 22, 1988, 63-183277; Jul. 25, 1988, 63-184818; Jul. 28, 1988, 63-188650; Jul. 28, 1988, 63-188651

Int. Cl.⁵ B23B 51/02

U.S. Cl. 408—230

21 Claims



1. A twist drill comprising: a cylindrical body including: an axis of rotation longitudinally therethrough; a forward end which contacts a workpiece; a web thickness of 0.2 D to 0.35 D, D being a diameter of said body; and a spiral flute formed in an outer peripheral surface of said body so as to extend spirally along a longitudinal length thereof to said forward end and a land disposed adjacent to said flute, said flute having: a first wall facing in a direction of rotation of said body and a second wall extending from an inner end of said first wall to the outer periphery of said body, said first wall terminating at said forward end in a first cutting lip having a radially outermost end disposed on the outer periphery of said body, said second wall being concavely shaped when viewed from said forward end formed so that, assuming a first line extending from said outermost end

perpendicular to a second line connecting said outermost end and said axis of said body, the maximum distance between said first line and said second wall being set in a range between from 0.45 D to 0.65 D, the ratio of arc length of said flute to arc length of said land at a cross-section taken perpendicular to the axis of said body being 0.9 to 1.2, the wall of said flute having an arcuately shaped portion which contacts an imaginary cylinder inscribing a web portion of the drill, and said arcuately shaped portion, at a cross-section taken perpendicular to the axis of said body, having a radius of curvature of between 0.15 D and 0.2 D.

5,088,864

AUTOMATIC ENGRAVING SYSTEM

Jun Yanagida, Tokyo, Japan, assignor to Gojigen Kikaku Co. and Petio Co., Ltd., both of Japan

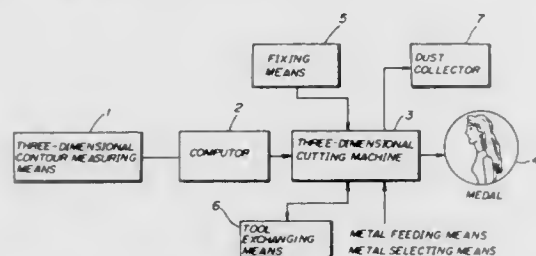
Filed May 18, 1990, Ser. No. 525,534

Claims priority, application Japan, May 19, 1989, 1-124189

Int. Cl.³ B23C 3/13; G05B 19/00

U.S. Cl. 409—96

5 Claims



1. A system for automatically engraving medals each having the contour of a person's face as seen in the lateral direction on one surface thereof, comprising: three-dimensional contour measuring means for three-dimensionally measuring the lateral contour of the person's face by using light beam or laser light beam, a computer for processing the dimensional data derived from said three-dimensional contour measuring means to determine the lateral contour of the person's face, at least one three-dimensional cutting machine for engraving the lateral contour of the person's face on one surface of a metal as a raw material based on the data derived from said computer, and monitoring means for locating the center point of the person in correct alignment with the center line of said monitoring means.

5,088,865

DEPTH OF CUT ADJUSTMENT MECHANISM FOR A ROUTER

David E. Beth; Robert E. McCracken, both of Easley, S.C., and James B. Watson, Conyers, Ga., assignors to Ryobi Motor Products Corp., Pickens, S.C.

Filed Feb. 28, 1991, Ser. No. 661,618

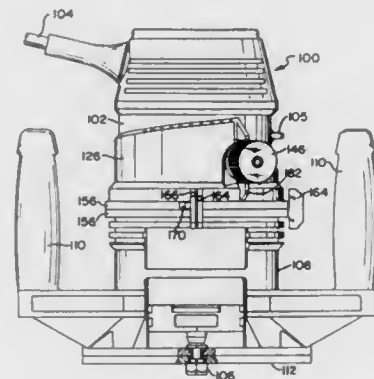
Int. Cl.³ B27C 5/10

U.S. Cl. 409—182

15 Claims

1. A router comprising: a motor housing having an external cylindrical portion, said cylindrical portion having a first longitudinal region with a substantially smooth surface and a second longitudinal region having an external screw thread; a base having a cylindrical bore for slidably receiving therein said first longitudinal region of said motor housing cylindrical portion; an adjustment ring including means for engaging said screw thread on said motor housing and means for rotationally engaging said base, said adjustment ring comprising two hingedly joined substantially semi-cylindrical portions with each of said adjustment ring portions having a com-

plemental screw thread segment for engaging said motor housing external screw thread; and



means for preventing relative rotation between said motor housing and said base.

5,088,866

INDICATOR-NUT THREADED COUPLING WITH LOAD-INDICATING DEVICE ADAPTED TO BE ARRANGED ON ANCHORS, IN PARTICULAR GROUTED ANCHORS FOR MINING OR THE LIKE

Ernst F. Ischebeck, and Joachim Isenberg, both of Ennepetal, Fed. Rep. of Germany, assignors to Friedr. Ischebeck GmbH, Ennepetal, Fed. Rep. of Germany

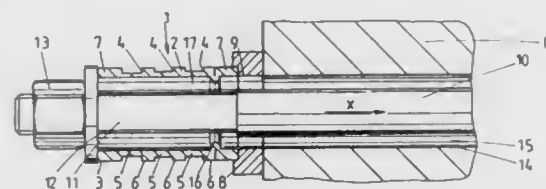
Filed Feb. 14, 1991, Ser. No. 655,728

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010476

Int. Cl.³ F16D 31/02; E21D 20/02

U.S. Cl. 411—10

2 Claims



1. In an indicator-nut threaded coupling comprising a load-indicating device adapted to be arranged on an anchor, particularly a grouted anchor for mining or the like, wherein said load-indicating device defines a free space on an outer surface thereof, and wherein said space is narrowed and possibly closes upon exceeding a given limit load, the improvement in the indicator-nut threaded coupling comprising a nut engageable with the anchor, said free space is formed by a plurality of grooves, each of said grooves being formed with a fold bottom, and wherein said load-indicating device comprises a bushing associated with said nut and extending spaced from an outer surface of the anchor, said grooves being arranged in an outer wall of said bushing, and wherein resistance to folding of individual of the fold bottoms differs from each other.

5,088,867

FASTENERS THAT BLEED FLUID UPON FAILURE

Kam C. Mun, 9532 Ralph St., Rosemead, Calif. 91770

Filed Nov. 26, 1990, Ser. No. 618,392

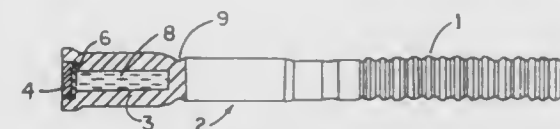
Int. Cl.³ F16B 31/02; G01L 5/00

U.S. Cl. 411—13

28 Claims

1. A failure indicating device comprising: a. a load bearing fastener subject to stress-strain;

b. a groove on an external surface of said fastener, said groove is not part of any thread, if any, on said fastener; c. said fastener is used to join structural members so that after joining, a surface on said fastener is exposed;



d. means to encase a fluid within the body of said fastener; e. whereby upon failure of said fastener, said fluid will leak out and travel along said groove onto said exposed surface of said fastener.

5,088,868

LOCKING BEAM NUT

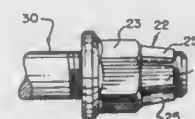
Frank J. Cosenza, Rolling Hills, and Roy L. Warkentin, Lomita, both of Calif., assignors to Fairchild Fastener Group, Carson, Calif.

Continuation of Ser. No. 880,869, Jul. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 644,417, Aug. 27, 1984, abandoned. This application Nov. 13, 1990, Ser. No. 613,961

Int. Cl.³ F16B 39/284

U.S. Cl. 411—280

22 Claims



1. A locking beam nut adapted to receive an externally-threaded member, the locking beam nut comprising: a substantially rigid body having a circular opening extending through it; and a plurality of resilient, circumferentially-spaced locking beams integral with the rigid body and projecting outwardly from one end thereof, the locking beams having inner surfaces that define a circular opening aligned with the circular opening in the body, the locking beams tapering radially inwardly such that the circular opening they define has a uniformly-decreasing diameter, wherein the aligned circular openings defined by the respective rigid body and plurality of locking beams contain continuous threads, uninterrupted along their entire axial length, for receiving an externally threaded member, the locking beams resiliently deflecting radially outwardly to lock the member in place, wherein the plurality of locking beams each have side walls arranged in spaced, confronting relationship with the side walls of circumferentially-adjacent locking beams, each side wall being continuous, from the beam's inner, threaded surface to the beam's outer surface, wherein the inner surfaces of the plurality of locking beams all have a radius of curvature greater than that of the circular opening in the rigid body and that of the externally-threaded member, such that when the locking beam nut receives the externally-threaded member the member is tangent with each locking beam only at a midpoint between its two side walls, thereby reducing resistance to rotation of the member relative to the locking beam nut, and wherein the plurality of locking beams are all config-

ured such that the entire confronting side walls of adjacent beams diverge from each other, with increasing radial distance, such that any rigid debris located in the space between the confronting side walls of adjacent beams does not inhibit a resilient return of the beams to their undeflected locations when the externally-threaded member is removed from the locking beam nut.

5,088,869

THREAD ROLLING SCREW

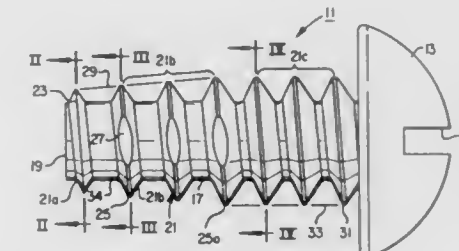
Joe E. Greenslade, P.O. Box 330865, Ft. Worth, Tex. 76163

Filed Jan. 24, 1991, Ser. No. 645,240

Int. Cl.³ F16B 25/00

U.S. Cl. 411—386

1 Claim



1. A thread rolling screw, comprising in combination: a body having a head on one end; a continuous helical set of threads formed on the body and divided into tip, intermediate, and final sections; the tip section having at least one thread located on an end opposite the head which has a crest that is continuously sharp and has a major diameter; the intermediate section having a plurality of threads which have intermediate section crests having major diameters that are greater than the major diameter of the crest of the tip section and which progressively increase from the tip section to the final section, the intermediate section crests being circular but interrupted by circumferentially spaced apart relieved areas of lesser diameter than the major diameters of the intermediate section crests; the final section having a plurality of threads which have final section crests having major diameters that are continuously circular and constant in major diameter, the intermediate section crest that adjoins the final section having a major diameter that is the same as the major diameter of the final section crests; and the body having a minor diameter that is constant throughout its length.

5,088,870

METHOD FOR FORMING A TWO CHAMBERED CAN

Akio Fukuhara, Kanagawa; Kazuo Iyama, Chiba; Kazuo Suzuki, and Ken Iwase, both of Tokyo, all of Japan, assignors to Daiwa Can Company, Tokyo, Japan

Division of Ser. No. 237,249, Aug. 26, 1988. This application Dec. 7, 1989, Ser. No. 447,037

Claims priority, application Japan, Aug. 27, 1987, 62-129162[U]; Apr. 28, 1988, 63-108698

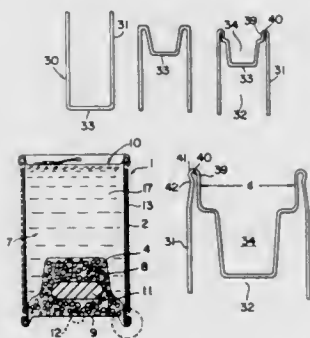
Int. Cl.³ B21D 51/26, 51/32

U.S. Cl. 413—4

3 Claims

1. A method of forming a two chambered can having a first chamber and a second chamber axially aligned with one another, said first chamber defined by a seamless hollow can cylinder having a cylindrical wall and having an integrally formed end wall closing one end of the cylindrical wall, said second chamber being defined by a recess formed opposite to the said first chamber; said method comprising the following steps: forming the seamless hollow can cylinder as the first chamber by drawing and ironing a thin sheet of aluminum alloy

such that the can cylinder consists of a cylindrical wall and an integral end wall closing one end of that cylindrical wall, reverse-drawing a part of the can cylinder such that the end wall is displaced toward the interior of the cylindrical wall to form a recess as said second chamber, forming a generally axially and radially outwardly extending



swelled flange portion on the open end of the second chamber by depressing an annular portion of the cylindrical wall adjacent to the open end of the second chamber, mounting a can lid on the swelled flange portion, displacing the swelled flange portion radially outwardly to flatten said swelled portion, and double winding up a flange of the can lid over the flattened flange portion by utilizing a seamer.

5,088,871

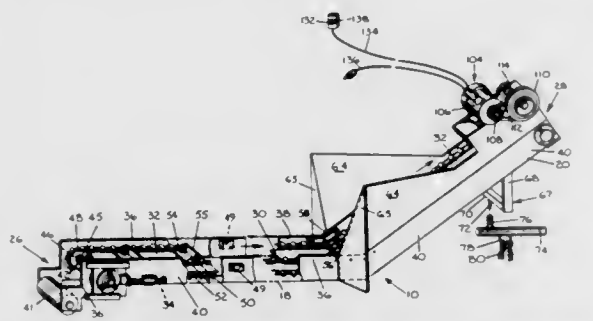
GRAIN STORAGE UNLOADING APPARATUS

Richard L. Mellish, R.D. #1, East Brady, Pa. 16028
Filed Jul. 5, 1990, Ser. No. 548,678

Int. Cl.⁵ B65G 65/30

U.S. Cl. 414—327

19 Claims



1. A movable corn unloading apparatus for the conveyance of corn thereon comprising:
 - a elongated horizontal frame section, having a length substantially equal to the diameter of a silo, and culminating at a lower reach, the full length of said frame section being insertable in an interior floor of the silo;
 - a generally upwardly-inclined frame section attached to the horizontal frame section having an upper reach from which material is unloaded into a container;
 - a flat, rigid, non-moving conveyor bed, extending from the lower reach of the horizontal frame section to the upper reach of the upwardly-inclined frame section, having an upper surface and a lower surface, the upper surface facilitating the conveyance of material thereon;
 - a pair of oppositely-disposed, vertically-projecting conveyor support sides having an inner support surface and an outer support surface, the support sides secured to the conveyor bed and extending from the upper reach to the lower reach, for containing material on the upper surface of the conveyor bed;
 - a pair of spaced-apart, parallel endless linked chains adjacent the upper surface and lower surface of the conveyor bed

- and slidably moving thereon in a lower to upper manner, to convey the corn along the said conveyor bed;
- a pair of vertically and laterally-extending containment guards secured to the support sides of the upwardly-inclined frame section for adjacent positioning to an entrance way of the corn silo to prevent spillage of corn through the entrance way;
- a pair of vertically-extending flange members, each flange member integrally attached to the containment guards, and abutting an exterior sidewall of the silo when the apparatus is disposed in an operative position;
- a downwardly-projecting alignment member secured to the support sides and positioned substantially toward the upper reach of the conveyor bed and adjacent the lower surface for facilitating insertion of the horizontal frame section within the silo; and
- a pair of roller members located generally at the lower reach and the upper reach, respectively, the roller members transversely extending between the support sides and secured to the support sides and rotatably integrated with the endless linked chain for facilitating the slidable movement of the linked chain upon the conveyor bed.

5,088,872

AUTOMATIC EQUIPMENT FOR COLLECTING AND SETTING UP CHAIRS

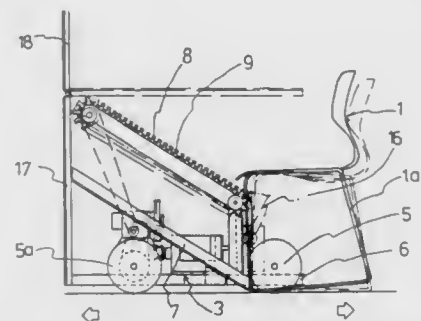
Makoto Asawa, Aichi; Kenji Matuzaki, and Kazuo Bando, both of Tokyo, all of Japan, assignors to Kajima Corporation, Tokyo and Auto Works, Ltd. Kanto, Kanagawa, both of Japan

Filed Oct. 3, 1989, Ser. No. 416,715

Int. Cl.⁵ B60P 3/42; B65G 57/14, 57/32, 59/10

U.S. Cl. 414—352

2 Claims



1. An apparatus for automatically collecting and setting up chairs comprising:
 - a truck;
 - a horizontal guide frame projected rearward from a chassis of said truck said guide frame being able to enter between legs of chairs to be collected;
 - a pair of parallel guide rails provided in said truck, said guide rails rising upward from one end thereof which is near a base of said guide frame to the other end thereof;
 - a pair of parallel lift chains provided between guide rollers and drive rollers, said lift chains being parallel to and above said guide rails and made up of endless link chains which are comprised of links having hooks, said hooks projecting outwardly so that spaces between hooks become larger when said link chains are around said drive rollers and guide rollers and the tip end of each of said hooks being bent like gaffs; and
 - pickup arms provided in front of said lift chains so that said pickup arms engage with the crossmember of said chair.

5,088,873

MANIPULATOR MIXED FREIGHT HANDLING SYSTEM

Carl J. Ruder; Ronald J. Haney, both of Overland Park, Kans.; Richard J. Chutorash, Portland; Wayne W. Bostad, Forest Grove, both of Oreg.; Arnold A. Zweig, Olympia, Wash., and Lyle B. Payne, Stilwell, Kans., assignors to Yellow Freight System, Inc., Overland Park, Kans.

Division of Ser. No. 280,720, Dec. 6, 1988, Pat. No. 5,009,560.

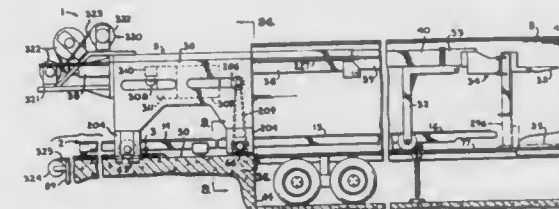
This application Jan. 14, 1991, Ser. No. 640,995

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.⁵ E02F 3/36

U.S. Cl. 414—392

16 Claims



1. An article manipulator system for transferring articles between spaced apart first and second locations, said second location being within an elongated article transporting vehicle and said first location being external to said vehicle, said system comprising:

- (a) a fixed, elongated manipulator rail means extending from said first location toward said second location and terminating at a guide end between said locations;
- (b) a self-propelled manipulator chassis supported and guided on said rail means and movable therealong;
- (c) a first conveyor mounted substantially between said rail means and orientated in substantially the same direction thereof;
- (d) elongated boom means supported by said chassis at a proximal end and extending toward said second location with a distal end;
- (e) an article manipulator tool mounted on said distal end of said boom means and movable with respect thereto and operable to releasably engage an article to transfer same and means for moving the article manipulator tool with respect to said boom means;
- (f) manipulator motor means drivingly engaged between said chassis and said rail means and operable to propel said chassis on said rail means between a retracted condition at said first location and an extended condition at said guide end, said tool and said boom means invading said second location with said chassis in said extended condition;
- (g) whereby said manipulator travels along said rail means and over said first conveyor in a straddling relationship.

5,088,874

HIGHWAY BARRIER TRANSPORTER

John P. Quittner, Castle Cove, Australia, assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Filed May 8, 1990, Ser. No. 520,671

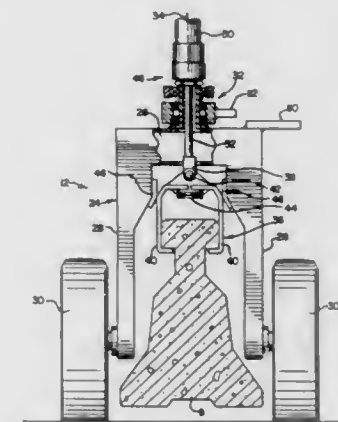
Int. Cl.⁵ E01F 13/00

U.S. Cl. 414—460

39 Claims

1. A transporter for a length of highway barriers of the type having a lifting surface, said transporter comprising:
 - a plurality of barrier transporting units, each comprising a longitudinal element, at least one pair of wheels coupled to the longitudinal element and positioned to straddle a length of highway barriers, at least one engaging device configured to engage one of the barriers at the respective lifting surface, and at least one lifting device coupled to the longitudinal element and the engaging device to lift the engaging device and engaged barriers;
 - a plurality of articulating couplings, each mounted to a respective end of a respective longitudinal element and interconnecting axially adjacent transporting units to form

a train configured to straddle the length of highway barriers such that the train can be moved over a length of highway barriers to be transported;



a set of at least one automotive tractor, each positioned at and coupled to a respective end of the train in line with the train to move the train; and means for powering the lifting devices and the engaging devices.

5,088,875

ROLL-OFF HOIST FOR VARIABLE POSITIONING OF CONTAINERS

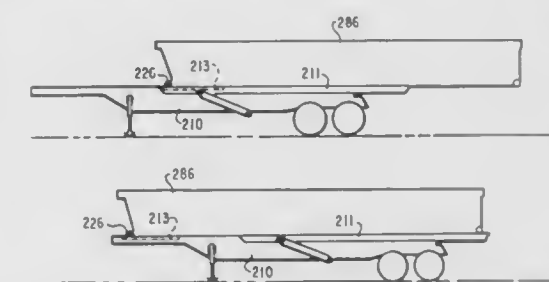
Donald E. Galbreath, Winamac, and Kent Kruzick, Knox, both of Ind., assignors to Galbreath Incorporated, Winamac, Ind. Continuation-in-part of Ser. No. 512,128, Apr. 20, 1990, Pat. No. 4,986,719, which is a continuation of Ser. No. 303,570, Jan. 27, 1989, Pat. No. 4,934,898, which is a division of Ser. No. 896,759,

Aug. 14, 1986, Pat. No. 4,840,532, which is a continuation-in-part of Ser. No. 835,186, Mar. 3, 1986, abandoned. This application May 1, 1990, Ser. No. 517,226

Int. Cl.⁵ B65G 67/02; B60P 1/28

U.S. Cl. 414—478

26 Claims



11. A vehicle mounted roll-off hoist for loading, transporting and unloading containers of various sizes, each container having container stop means, said hoist comprising:
 - a trailer main frame having first tracks;
 - a hoist frame having second tracks and being hingedly connected to said main frame to pivot between a horizontal transport position wherein said first and second tracks are aligned and an inclined loading position;
 - a trolley adapted to releasably connect with a container and adapted to slide generally horizontally between a rear-most position in said second tracks and a forwardmost position in said first tracks;
 - container moving means anchored to said hoist frame for moving the container from ground, up along said hoist frame, and into engagement with said trolley; and actuator means for moving said trolley between said rear-most and forwardmost positions.

5,088,876

**ARTICULATED TRACTOR-TRAILER HAVING
ADJUSTABLE TRAILER LENGTH AND A TIPPABLE
PLATFORM**Veikko Lifflander, Kanervantie 4 as 18, SF-58200 Kerimäki,
Finland

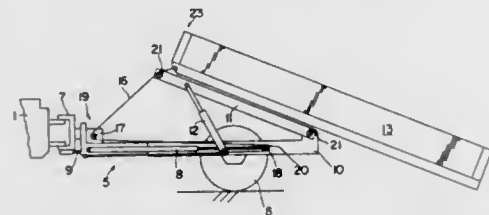
Filed Jun. 19, 1990, Ser. No. 540,569

Claims priority, application Finland, Jun. 19, 1989, 892999

Int. Cl.⁵ B60P 1/28

U.S. Cl. 414—479

1 Claim



1. Tractor comprising a front frame which has a first pair of wheels, an engine and an operator's control cabin, and a rear frame which has a second pair of wheels, the front and rear frames being linked to each other by a hinge with a vertical pivot and by a steering power means for the steering of the tractor, wherein the rear frame consists of an interior body and an exterior body which are telescopically movable relative to each other using a sliding power means, the hinge being attached to the interior body while the second pair of wheels are mounted to the exterior body, the exterior body being provided with a tipping device and a tipping power means for tipping a platform body placed on the tipping device, the platform body being connected to the interior body by flexible pulling means passing over a first guide mounted on the interior body and a second guide mounted on the exterior body, wherein said sliding power means is a hydraulic cylinder and piston unit attached to the interior body and the exterior body, said cylinder and piston unit attached to the exterior body at a fulcrum, said second guide being a roller mounted near said fulcrum.

5,088,877

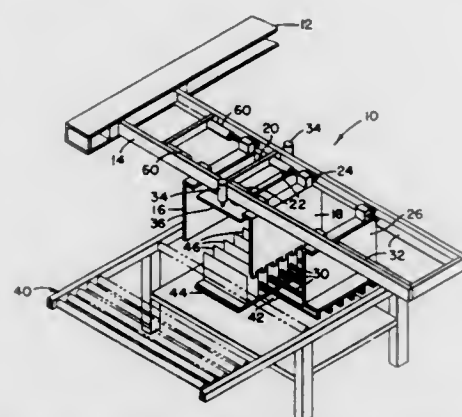
BOTTOM SUPPORT GRASPING DEVICEBill H. Henk, Hoopston, Ill., assignor to FMC Corporation,
Chicago, Ill.

Filed Aug. 31, 1990, Ser. No. 575,728

Int. Cl.⁵ B65G 57/03

U.S. Cl. 414—626

9 Claims



1. In a robotic palletizer of the type used to transport an item having at least two opposed sides, a top, and a bottom, from a support surface at a first location to a second location, an improved grasping device comprising:
a movable roller carriage attached to and part of said robotic palletizer, said movable roller carriage movable to a posi-

tion above said first location and to a position above said second location;

- a first palm carried by said movable roller carriage, said first palm including a substantially flat vertical plate extending downwardly from said movable roller carriage for contacting a first side of said item;
- a second palm carried by said movable roller carriage, said second palm including a substantially flat vertical plate extending downwardly from said movable roller carriage for contacting a second opposed side of said item;
- at least one of said palms being movable mounted for movement toward and away from the other of said palms to claim the item therebetween;
- a bottom support palm carried by and movable generally horizontally along said movable roller carriage for contacting and supporting said bottom of said item, said bottom support palm having a plurality of fingers emanating from a lower edge of said bottom support palm at generally right angles to a vertical component of said bottom support palm toward said second palm, said bottom support palm toward said second palm, said bottom support palm mounted for inboard movement to a location under said item with said fingers extending under one of said palms when said grasping device is in said first location;
- a clamping plate carried by said movable roller carriage between said first and said second palms, said clamping plate movable vertically to contact said top of said item at said first location; and
- elevating means mounted at said first location independent of said movable roller carriage, said elevating means capable of lifting and supporting said item above said support surface so that said fingers of said bottom support palm can be positioned below said item as said bottom support palm is moved inboard along said movable roller carriage.

5,088,878

APPARATUS FOR THE LIFTING OF TRAY PACKS
Heinz Focke, Verden, and Johannes Holloch, Langwedel, both
of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH &
Co), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 374,022, Jun. 30, 1989, abandoned.

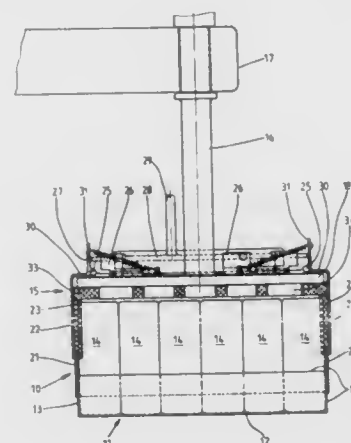
This application Jan. 9, 1991, Ser. No. 637,967

Claims priority, application Fed. Rep. of Germany, Jul. 16,
1988, 3824155

U.S. Cl. 414—627

Int. Cl.⁵ B66F 9/18

8 Claims



1. In an apparatus for the lifting and transportation of cuboidal articles, said apparatus comprising a raisable and lowerable, downwardly open suction box (15) which is mounted on a lifting and conveying member, and which is placeable over a article (10) to grasp the article as a result of a vacuum in said suction box (15); said suction box (15) having a horizontally directed upper supporting plate (18) and movable side walls

(22) which are movable out of an initial inclined open position, in which a cross-section of the suction box (15) is widened to be larger than that of an article, into a vertical upright closed position corresponding to dimensions of the article (10) to be lifted, said side walls (22) being provided with elastic sealing strips (21) movable against upright side faces of the article (10); the improvement comprising:

- a plurality of hinge means (25), mounted on said supporting plate, for pivotably mounting said side walls (22) on said supporting plate (18); and actuating means (26), coupled to said walls (22), for pivoting said side walls (22) about said hinge means (25) between said initial open position and said vertical closed position; wherein said hinge means (25) and said actuating means (26) are arranged wholly on a top of said supporting plate (18) and wholly within horizontal extremities thereof.

5,088,879

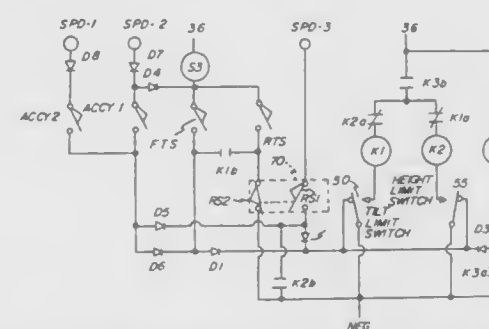
FORWARD TILT LIMIT SYSTEM FOR LIFT TRUCKS
Matthew P. Ranly, Minster, Ohio, assignor to Crown Equipment
Corporation, New Bremen, Ohio

Filed Oct. 31, 1990, Ser. No. 606,236

Int. Cl.⁵ B66F 9/20

U.S. Cl. 414—636

5 Claims



1. In a materials handling vehicle that includes a mast assembly capable of tilting in a forward direction, a tilt fork assembly capable of lifting a load, a single motor driven pump for providing hydraulic pressure for controlling the tilt of the mast assembly and the lifting of the forks, tilt limit switch means for limiting the forward tilting of the mast beyond a predetermined angle under certain conditions, and height limit switch means for limiting the raising of the forks above a predetermined height under certain conditions, the improvement comprising

- circuit means for sensing whether the tilt limit was reached before the height limit for permitting the continued uninterrupted operation of the tilting function when the tilt limit is thereafter reached, and
- circuit means for sensing whether the height limit was reached before the tilt limit for permitting the continued uninterrupted operation of the lifting function when the forward tilt limit is thereafter reached.

5,088,880

**FLUID OPERATED FORK POSITIONING CONTROL
SYSTEM**Jesse L. Field, Jr., Concord, Ohio, assignor to Caterpillar Indus-
trial Inc., Mentor, Ohio

Filed Dec. 3, 1990, Ser. No. 621,493

Int. Cl.⁵ B66F 9/12

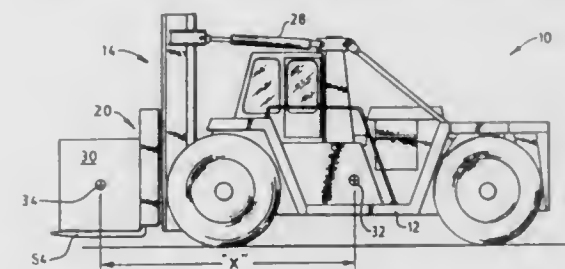
U.S. Cl. 414—667

24 Claims

- 1. A control system for selectively moving first and second load engaging forks along a carriage frame, comprising:
a first fluid operated jack connected to the first load engaging fork and the carriage frame;
- a second fluid operated jack connected to the second load engaging fork and the carriage frame, said first and second fluid operated jacks each having head and rod end por-

tions and being adapted to move the first and second load engaging forks respectively, along the carriage frame;

- a reservoir;
- a source of pressurized fluid flow connected to said reservoir;
- a main control valve having first and second positions and being movable between said first and second positions, said main control valve having first and second outlets and being connected to the source of pressurized fluid flow and said reservoir, said main control valve connecting the source to the first outlet and the reservoir to the second outlet at the first position, and the reservoir to the first outlet and the source to the second outlet at the second position;
- a first selector valve having first and second positions and being movable between said first and second positions, said first selector valve having first and second inlets and first and second outlets, said first selector valve first inlet being connected to the first selector valve second outlet and said first selector valve second inlet being connected to the first selector valve first outlet at the first position of the first selector valve, said first and second inlets and outlets of the first selector valve being blocked from each other at the second position of the first selector valve;
- a second selector valve having first and second positions and being movable between said first and second positions, said second selector valve having first and second inlets and first and second outlets, said second selector valve first inlet being connected to the first selector valve second outlet and said second selector valve second inlet being connected to the second selector valve first outlet at



the first position of the second selector valve, said first and second inlets and outlets of the second selector valve being blocked from each other at the second position of the second selector valve;

- a third selector valve having first and second positions and being movable between said first and second positions, said third selector valve having first and second inlets and first and second outlets, said third selector valve first and second inlets being blocked from the third selector valve first and second outlets at the first position of the third selector valve, said the third selector valve first and second outlets being connected to each other at the first position of the third selector valve, and said third selector valve first inlet being connected to the third selector valve second outlet and said third selector valve second inlet being connected to the third selector valve first outlet at the second position of the third selector valve;
- means for connecting the first outlet of the main control valve to the first inlet of the first and second selector valves, the second outlet of the main control valve to the second inlet of the first and second selector valves, the first outlet of the first selector valve to one of the rod and head end portions of the second jack, the second outlet of the first selector valve to the first inlet of the third selector valve, the first outlet of the second selector valve to the second inlet of the third selector valve, the first outlet of the third selector valve to the other of the rod and head end portions of the first jack, and the second

outlet of the third selector valve to a corresponding other one of the rod and head end portions of the second jack; control means for selectively moving said main control valve between said first and second positions, said first and third selector valves together between said first and second positions, and said second and third selector valves together between said first and second positions, said control means being connected to said main control valve means and said first, second, and third selector valves, said first and second jacks being movable in unison and in the same direction in response to said third selector valve being at the first position, the main control valve being at one of the first and second positions, and the first and second selector valves being at the first position, and said one of the first and second jacks being movable independently of the other in response to said main control valve being at one of the first and second positions, the third selector valve being at the second position, and one of the first and second selector valves being at the second position;

said first, second and third selector valves being electro-hydraulic valves and said control means including a pivotally movable hand lever and first and second normally open switches, said first and second switches being connected to a source of electrical energy, the third selector valve, and the first and second selector valves, respectively, said first and third selector valves being movable to the second position in response to closing of the first switch and said second and third selector valves being movable to the second position in response to closing of the second switch, said main control valve being movable between the first and second positions in response to pivotal movement of the control lever.

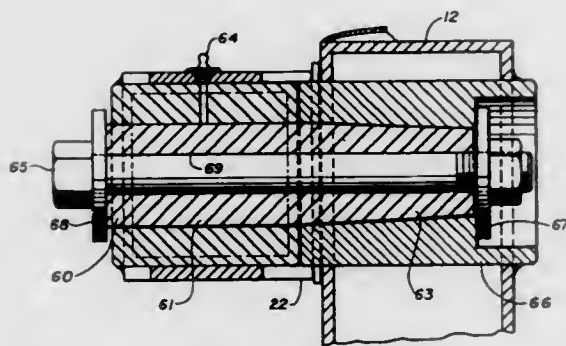
5,088,881

TAPERED PIN MOUNTING FOR LOADERS

Garry L. Ball, Lancaster, Pa.; Russell I. Johnson, Leonard, Mich., and Daniel D. Radke, Antwerp, Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.
Division of Ser. No. 440,936, Nov. 22, 1989, Pat. No. 4,997,333.
This application Feb. 19, 1991, Ser. No. 658,265
Int. Cl.⁵ E02F 3/627

U.S. Cl. 414—686

3 Claims



1. In a front end loader having a prime mover including a wheeled frame movable over the ground; a loader mechanism pivotally connected to said frame for operation forwardly thereof, said loader mechanism having a pair of fore-and-aft extending loader arms pivotally connected to said frame by a pivot means and extending forwardly therefrom for detachable connection to a working tool positioned forwardly of said prime mover; and power means interconnecting said frame and said loader arms to effect pivotal movement of said loader mechanism relative to said frame, an improved pivot means comprising:

a rigid tapered sleeve inserted through aligned openings in each respective said loader arm and in said frame, said tapered sleeve having a straight portion registered with the corresponding said loader arm and a tapered portion

registered with said frame, said tapered sleeve having an opening extending axially therethrough; and a fastener positioned within said opening and being seated against said straight portion of said tapered sleeve, said fastener being cooperable with a retaining means seated against said frame to draw said fastener and said rigid tapered sleeve toward said frame.

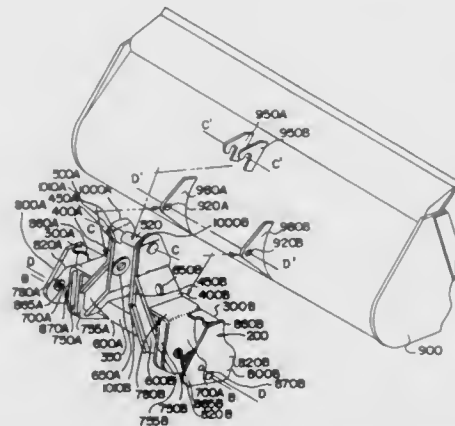
5,088,882

UNIVERSAL COUPLING

Estel L. Lovitt, Jr., 5102 Brendon Way, Sylvania, Ohio 43560
Filed May 31, 1988, Ser. No. 200,356
Int. Cl.⁵ E02F 9/00

U.S. Cl. 414—723

2 Claims



1. A universal coupling device attached to the front end of a motor vehicle for attachment of various work implements to said work vehicle, said device coupling drive comprising:

- a longitudinally extending base member having a longitudinal central axis;
- first main support member and second main support member, each said main support members having an upper portion and a lower portion, both said support members being vertically disposed members being parallel to one another in tandem fashion, both said main support members diverging downwardly from substantially their mid-points and being integrally affixed on their respective lower portions to said base member, said first main support member and said second main support member each having a transverse opening in the upper portion wherein said transverse opening in the upper portions of said first and second main support members are coaxially aligned along a common axis, and wherein said first main support member and said second main support member each having a second transverse opening disposed in that portion of the vertical main support members at a portion thereof above the base support member, said second transverse openings in such respective main support members being coaxially aligned along a common axis;
- a first secondary vertical support member and a second secondary vertical support member with the first such secondary vertical support member being integrally affixed in a position immediately outboard of said first main vertical support member, and said second secondary vertical support member being integrally affixed in a position immediately outboard of said second main vertical support member, said first and second main vertical support members each having three sets of openings therein, each set aligned along a common axis, with one such set being adapted to hold a connecting pin for attaching the coupling member to the front end of the motor vehicle, with said first and second main vertical support members each having outwardly turned upper portions, each said first and second secondary support members comprising at least one opening aligned with one set of said openings in

said first and second main support members for co-operation therewith for securing one of said vehicle and attachment to said coupling device;

- a longitudinally extending bar member affixed between said first and second main vertical support members, said bar member being affixed in the first transverse openings of said first main vertical support member and said second main vertical support member, said bar member being adapted to connect to a pair of hook-like ears on the rear portion of the attached work implement.

5,088,883

APPARATUS FOR LIFTING ARTICLES, ESPECIALLY PACKS, FOR FORMING DISCHARGEABLE STACKS

Heinz Focke, Verden, and Uwe Dreyer, Wuppertal, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

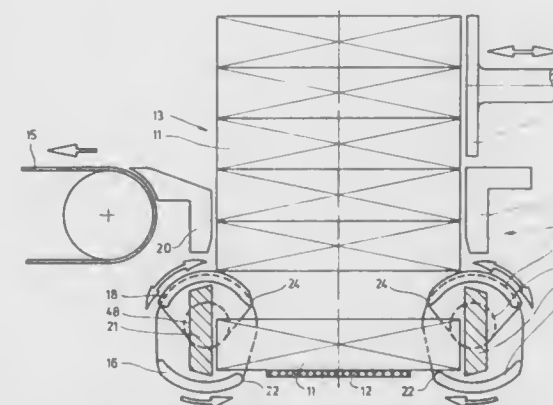
Filed May 1, 1990, Ser. No. 519,986

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915600

U.S. Cl. 414—795

Int. Cl.⁵ B65G 57/30

9 Claims



1. An apparatus for lifting from a conveyor (12) packs delivered on the conveyor (12) and for forming dischargeable stacks (13) from the packs (11), said apparatus comprising:

- a pair of rotating conveying segments (16, 17) each conveying segment of the pair being rotatably mounted on opposite sides of the conveyor (12), for lifting a pack (11) from the conveyor (12) and adding the pack to a stack (13), each conveying segment (16, 17) revolving about an individual axis; and
 - a pair of oscillating holding segments (18, 19), each holding segment of the pair also being rotatably mounted on said opposite sides of said conveyor (12), for holding a stack (13) of the packs (11), each holding element being associated with a corresponding one of said conveying segments (16, 17) and oscillating about said individual axis of said corresponding conveying segment at a lesser radial distance from said individual axis than said corresponding conveying segment;
- wherein said conveying segments (16, 17) are arranged on tubular shafts (33) which are driven directly by a rotating main shaft (27) of the apparatus (10), and wherein said holding segments (18, 19) are arranged on shafts (48, 50) arranged coaxially within said tubular shafts (33), said shafts (48, 50) being driven for oscillation by said main shaft (27).

5,088,884

ROTOR ASSEMBLY FOR FLUID DRIVEN ENGINE

Frank D. Bergstein, 11464 Lippelman Rd., Ste. 200, Cincinnati, Ohio 45246

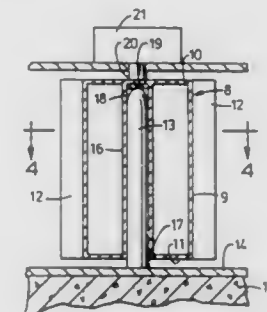
Continuation-in-part of Ser. No. 397,519, Aug. 23, 1989, Pat. No. 4,960,363. This application Sep. 24, 1990, Ser. No. 586,893

The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.

Int. Cl.⁵ F03D 7/00

U.S. Cl. 415—3.1

10 Claims



1. A rotor assembly for a fluid driven engine, said rotor assembly comprising:

- a base;
- a vertical bearing shaft fixedly secured at its lowermost end to said base;
- a rotor having an elongated cylindrical body surrounding said bearing shaft with its longitudinal axis coinciding with the longitudinal axis of said bearing shaft, and a plurality of circumferentially spaced impellers projecting radially outwardly from said cylindrical body;
- a bearing pad mounted on said rotor, said bearing pad being positioned to seat on the upper end of said bearing shaft, whereby said rotor is rotatably journaled on said bearing shaft by means of said bearing pad; and
- stabilizing means on said rotor surrounding said bearing shaft.

5,088,885

METHOD FOR PROTECTING GAS TURBINE ENGINE SEALS

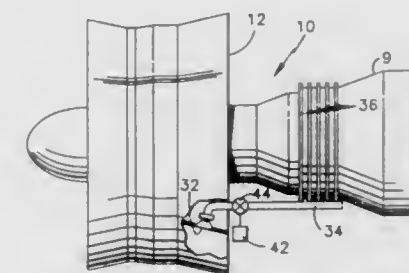
Fred M. Schwarz, Glastonbury, and Ken R. Lagueux, Berlin, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 12, 1989, Ser. No. 420,196

Int. Cl.⁵ F01D 5/08

U.S. Cl. 415—115

4 Claims



1. A method for controlling a flow of cooling air to a turbine case for controlling the radial clearance between the case and an internally disposed rotor, comprising the steps of:

- providing a schedule of cooling airflow as a function of steady state angular velocity;
- measuring the angular velocity of the rotor;
- positioning an airflow control valve responsive to the provided schedule and measured angular velocity;

- (d) monitoring the rate of change of the rotor angular velocity; and
 (e) closing the valve, responsive to a monitored decrease in the rotor angular velocity greater than a preselected value, the valve remaining closed for a preselected period of time following the monitor decrease.

5,088,886

INLET AIR FLOW CONDITIONING FOR CENTRIFUGAL FANS

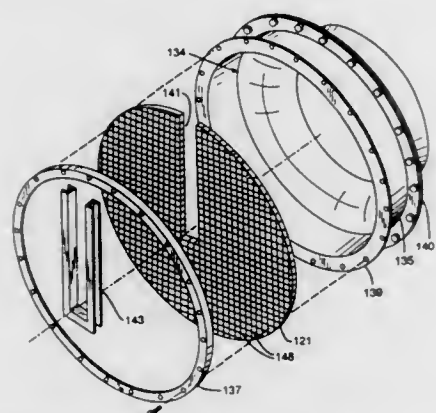
Lawrence D. Hopkins, Happy Valley, Oreg., assignor to Sinko Kogyo Co., Ltd., Japan

Filed Aug. 28, 1990, Ser. No. 574,202

Int. Cl.⁵ F01D 25/00

U.S. Cl. 415—119

6 Claims



1. An apparatus for diffusing the flow of air to the inlet cone of a fan, comprising a substantially flat grate of intersecting strips of rigid material, the strips defining a multitude of discrete air flow passages through the grate, and a reinforcing part attached to the grate and defining an opening through the grate, the opening being substantially larger than the discrete passages.

5,088,887

TURBINE WITH SPUR GEARING

Werner Bosen, Cologne, and Hans-Dieter Denz, Weilerswist-Metternich, both of Fed. Rep. of Germany, assignors to Atlas Copco Energas GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 483,511

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3907068

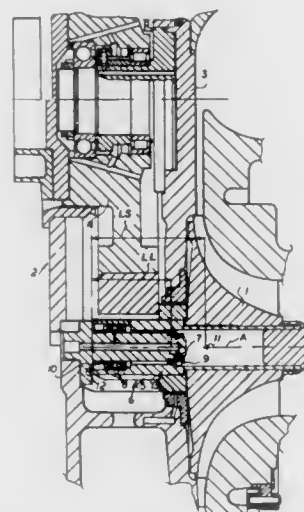
Int. Cl.⁵ F01D 15/00

U.S. Cl. 415—124.1

5 Claims

1. A turbine comprising:
 a housing;
 a cantilevered impeller centered on and rotatable about an axis in the housing;
 a small-diameter bearing stem centered on the axis, axially and rotationally fixed on the housing, and extending from an attachment location on the housing toward the impeller;
 a pinion traversed by the bearing stem, fixed to the impeller, and forming with the impeller a rotor having a center of mass spaced axially a predetermined distance from the attachment location, the stem projecting axially into and at least partially through the rotor;
 a spur-transmission spur gear rotatable on the housing adjacent the axis and meshing with the pinion;
 an inner bearing engaged between the pinion and the stem and rotatably supporting the pinion on the stem; and
 an outer bearing supporting the rotor rotatably on the stem at a bearing location spaced from the attachment location by a distance equal to between 0.4 and 1.2 times the pre-

terminated distance between the center of mass and the attachment location, the distance being such that the



critical rotation speed of the turbine is different from the drive speed of the turbine.

5,088,888

SHROUD SEAL

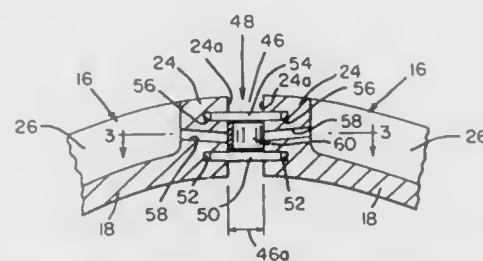
Melvin Bobo, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 3, 1990, Ser. No. 621,149

Int. Cl.⁵ F04D 29/08

U.S. Cl. 415—170.1

13 Claims



1. In a segmented annular shroud for confining the axial flow of hot working gas in a gas turbine engine, a seal for blocking radial leakage flow of working gas through a gap between adjacent shroud segments, and seal comprising, in combination:

- A. a first axially elongated strip sealing element spanning the gap and having lateral edges received in opposed first slots formed in confronting, gap-defining, radial surfaces of adjacent shroud segments;
 B. a second, axially elongated strip sealing element spanning the gap and having lateral edges received in opposed second slots formed in said confronting, gap-defining, radial surfaces of the adjacent shroud segments, said second sealing element being in radially spaced relation with said first sealing element; and
 C. a flow restricting element disposed between said first and second sealing elements to restrict the axial flow of hot working gas in the gap between said first and second sealing elements.

5,088,889

SEAL FOR A FLOW MACHINE

Karl-Heinz Wolff, Riedenzhofen, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

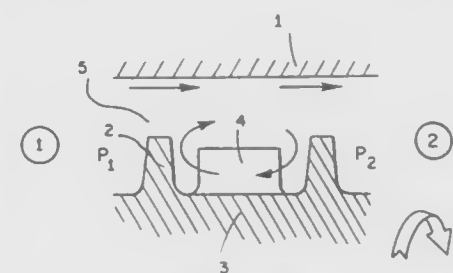
Continuation-in-part of Ser. No. 925,801, Dec. 15, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 253,011

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505491

Int. Cl.⁵ F01D 11/08

U.S. Cl. 415—171.1

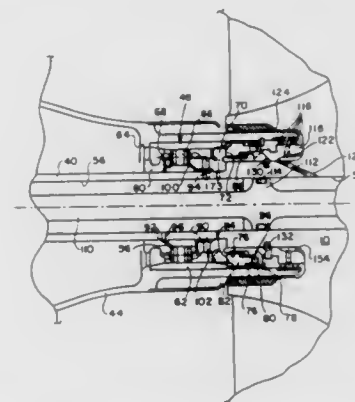
10 Claims



1. Flow machine sealing arrangement for the clearance space between a rotor and stator of a flow machine such as an axial flow turbine, compressor, blower, charger or the like, said sealing arrangement separating high and low pressure chambers and comprising

- a pair of axially spaced sealing points defining narrow flow path points between the stator and rotor, said sealing points being formed by a pair of radially outwardly protruding sections carried on the outer circumference of the rotor, and
 auxiliary blade means distributed around the circumference of the rotor and extending radially outwardly of the rotor axis, said auxiliary blade means being disposed between the pair of sealing points and including means for generating turbulent flow in response to relative rotation of the stator and rotor to thereby improve the sealing in the region of the sealing points, wherein the auxiliary blade means extend radially outwardly of the outer circumference of the rotor and are configured to induce an axial flow in the direction of the high pressure chamber, and wherein the auxiliary blades are selected in a number that increases with the size of the rotor diameter.

a seal holder carried by said housing in adjacency to said sealing surface;



5,088,891

PUMP WITH SEAL COOLING MEANS

Robert W. Brown, and John M. Taylor, both of Cathcart, Glasgow, Scotland, assignors to Weir Pumps Ltd., Glasgow, Scotland

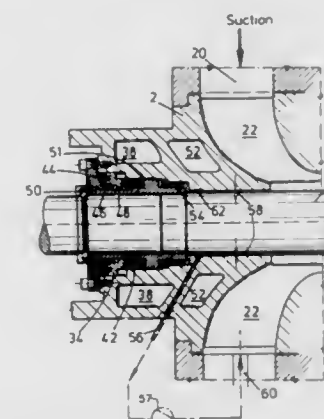
Filed Apr. 25, 1990, Ser. No. 514,625

Claims priority, application United Kingdom, Apr. 26, 1989, 8909504

Int. Cl.⁵ F04D 29/58

U.S. Cl. 415—176

12 Claims



1. A pump suitable for high temperature liquid, comprising:
 a pressure housing having a suction inlet and a discharge outlet for the liquid being pumped;
 a driven shaft supported by bearings in the housing;
 an impeller means mounted on the shaft for pumping liquid and generating a liquid head between the inlet and the outlet;
 a rotary seal mounted on at least one end of the shaft, sealing the shaft with respect to the pressure housing and having a cooling jacket around it, whereby the seal is cooled;
 a liquid reservoir space within the pressure housing and located inboard of the rotary seal, the pressure within the reservoir in use being substantially equal to the suction inlet pressure;
 an annular clearance space between the shaft and the pressure housing communicating at one end with the reservoir space and extending towards the seal at its other end;
 duct means connecting the reservoir space and the annular clearance space immediately adjacent to the seal, such that when the pump is not running but contains high tempera-

5,088,890

SEAL CONSTRUCTION FOR USE IN A TURBINE ENGINE

Gordon Jewess, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1989, Ser. No. 448,255

Int. Cl.⁵ F01D 11/00

U.S. Cl. 415—112

9 Claims

1. A turbine seal and lubrication construction comprising:
 a housing;
 a hollow shaft extending through said housing and adapted to receive lubricant in its interior;
 a bearing journaling said shaft for rotation within said housing and including an inner race mounted on said shaft, an outer race mounted within said housing and movable bearing elements located between said races;
 aligned passages in said inner race and said shaft;
 a sealing surface on said inner race and axially spaced from said passages;

ture liquid in the reservoir, a thermosyphon driven by a temperature difference between the high temperature liquid within the reservoir and the cooled seal is established, circulating said high temperature liquid from the reservoir space via the annular clearance space and the duct means to the reservoir again.

5,088,892

BOWED AIRFOIL FOR THE COMPRESSION SECTION OF A ROTARY MACHINE

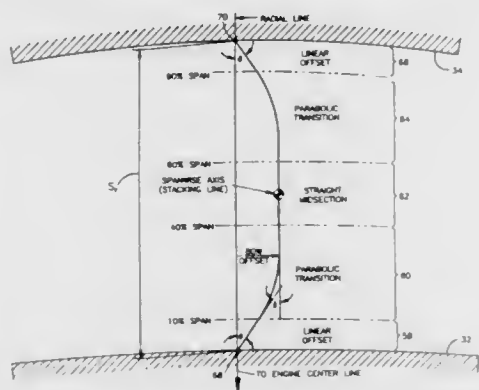
Harris D. Weingold, West Hartford; Robert J. Neubert, Amston; John G. Andy, Hamden; Roy F. Behlke, Manchester, and Glen E. Potter, Vernon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 7, 1990, Ser. No. 476,921

Int. Cl. F01D 9/00

U.S. Cl. 415-193

12 Claims



1. A compressor airfoil for the compression section of a rotary machine having an axis R which comprises: a spanwise axis having a plurality of airfoil sections disposed about the spanwise axis, each airfoil section having a pressure surface and a suction surface which form aerodynamic surfaces for the airfoil, the airfoil having an inner end wall region, an outer end wall region and a midspan region disposed spanwisely between the inner and outer end wall regions, the spanwise axis extending straight over the midspan region and extending straight in the end wall region and at an acute angle to the spanwise axis in the midspan region so that the pressure surface faces outwardly away from the midspan region in the end wall regions of the airfoil, and so that a first airfoil section in an end wall region has a spanwisely extending portion of the first airfoil section which is displaced circumferentially from the stacking line at another airfoil section by an amount which is the same for said entire spanwisely extending portion of the airfoil section.

5,088,893

MOLTEN METAL PUMP

Ronald E. Gilbert, Chardon, and George S. Mordue, Ravenna, both of Ohio, assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 315,619, Feb. 24, 1989, abandoned.

This application Jan. 25, 1991, Ser. No. 649,221

Int. Cl. F04D 17/08

U.S. Cl. 415-200

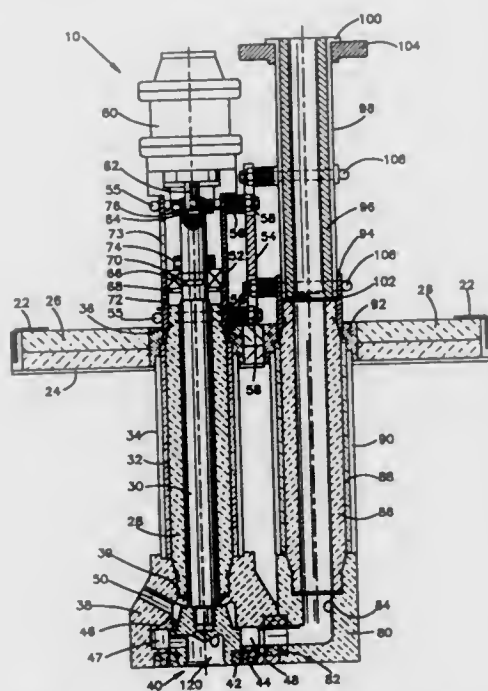
23 Claims

1. A molten metal pump, comprising: an elongate, hollow, refractory post having first and second ends, the first end adapted to extend out of the molten metal and the second end adapted to extend into the molten metal; an elongate drive shaft disposed within the post for rotation therein, the drive shaft having first and second ends, the first end adapted to extend out of the first end of the post

and the second and adapted to be disposed adjacent the second end of the post; an impeller connected to the second end of the drive shaft; a stator connected to the second end of the post, the stator including a cavity within which the impeller is disposed, an inlet into which molten metal can be drawn, an outlet through which molten metal can be discharged, and an opening through which gas can be discharged into the molten metal, the impeller being spaced from the stator; and

means for conveying gas between the outer surface of the drive shaft and the inner surface of the post, through the space between the impeller and the stator, and through the opening in the stator.

21. A method of protecting a drive shaft used in a molten metal pump, comprising the steps of: providing an elongate, hollow, refractory post having first and second ends; providing an elongate drive shaft having first and second ends; providing an impeller and attaching the impeller to the second end of the drive shaft;



5,088,897

SWASH PLATE TYPE COMPRESSOR WITH INTERNAL REFRIGERANT AND LUBRICANT SEPARATING SYSTEM

Katsunori Kawai; Hayato Ikeda; Shlnichi Ishihara; Kazuhiro Tanikawa; Naoya Yokomachi, and Toshihiro Kawai, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

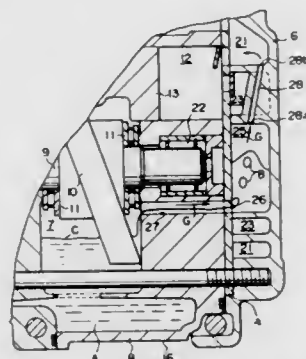
Filed Feb. 28, 1990, Ser. No. 486,154

Claims priority, application Japan, Mar. 2, 1989, 1-50491

Int. Cl.⁵ F04B 1/12

U.S. Cl. 417—269

7 Claims



1. A swash plate type compressor having an internal refrigerant and lubricant separating system comprising:

a compressor casing defining a plurality of axially extended cylinder bores circumferentially arranged around a predetermined horizontal axis thereof, and a refrigerant circulating circuit independent of said compressor casing having a refrigerant suction side and a refrigerant discharge side;

a swash plate chamber provided in an axially central position of said compressor casing;

an oil sump provided in said compressor casing at a lower position with respect to said predetermined horizontal axis of said compressor casing, said oil sump being arranged under and communicated with said swash plate chamber for reserving a given amount of lubricant oil;

pistons fitted respectively in said cylinder bores for sliding reciprocation to compress a refrigerant gas brought from the refrigerant suction side of said refrigerant circulating circuit and to discharge the compressed gas toward the refrigerant discharge side of said refrigerant circulating circuit;

a drive shaft rotatably supported by said compressor casing via bearing means, and having a rotating axis thereof in registration with said predetermined horizontal axis of said compressor casing;

a swash plate mounted on said drive shaft in said swash plate chamber to be rotatable with said drive shaft to thereby reciprocate said pistons for suction and compression;

a refrigerant and lubricant separating chamber provided in said compressor casing and having the lowest bottom level thereof located at a level higher than that of a surface of the given amount lubricant oil reserved in said oil sump and said swash plate chamber;

a communication passageway having a reduced cross-sectional area and provided with first and second ports, the first port opening toward said swash plate chamber and the second port opening toward said refrigerant and lubricant separating chamber to thereby provide a fluid communication between said swash plate chamber and said refrigerant and lubricant separating chamber;

a refrigerant evacuation passageway having a reduced cross-sectional area and extending from said refrigerant and lubricant separating chamber to the refrigerant suction side of said refrigerant circulating circuit, said refrigerant evacuation passageway having a first port opening toward said refrigerant and lubricant separating chamber and a

second port opening toward said refrigerant suction side of said refrigerant circulating circuit; and, an arrangement in which the first opening of said refrigerant evacuation passageway is located at a position higher than the first opening of said communication passageway.

5,088,898

RECIPROCATING PUMP

Toshiyuki Fukumoto, Osaka, and Ryo Imanishi, Hyogo, both of Japan, assignors to Nippon Pillar Packing Co., Ltd., Osaka, Japan

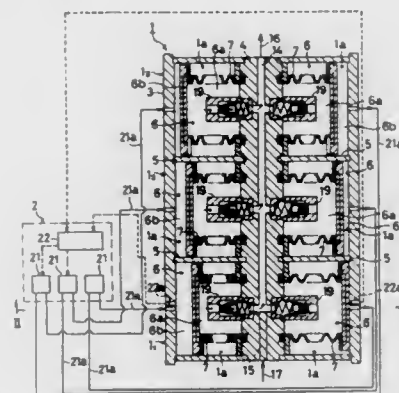
Filed Oct. 10, 1990, Ser. No. 596,718

Claims priority, application Japan, Dec. 5, 1989, 1-317206

Int. Cl.⁵ F04B 35/02

U.S. Cl. 417—347

2 Claims



1. In a reciprocating pump having a plurality of pump sections, each of said pump sections including a reciprocating action element repeatedly movable in first and second directions to define suction and discharge strokes of the pump section, each stroke being separated from a following stroke by a change-over interval, each said pump section having a discharge outlet connected to a common discharge passageway for the pump and a suction inlet connected to a common supply passageway for the pump, drive control means for driving said action elements so that when at least one of said pump sections is in a suction stroke or a change-over interval at least one other of the pump sections is in a discharge stroke, wherein said drive control means includes means for driving said action elements to initiate said strokes at intervals t where $T/n \leq t < T$ is the time it takes a pump section to complete a stroke and n is the number of pump sections, the improvement comprising: said drive means comprise pneumatic means for pneumatically moving said reciprocating action element, and further including sensor means disposed at both limits of motion of said action element in said first and second direction of at least one pump section for repeatedly providing start and end signals indicating both the start and end of a stroke and delay means responsive to said start and end signals for producing a plurality of $n-1$ pump actuating signals delayed with respect to one another.

5,088,899

PUMP WITH DRIVE MOTOR

Armin Blecker, Asslar-Werdorf; Heinrich Lotz, Wetzlar; Helmut Ochs, Löhnberg, and Horst Reuschling, Giessen-K.L.L., all of Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Fed. Rep. of Germany

Filed Nov. 9, 1990, Ser. No. 611,915

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937345

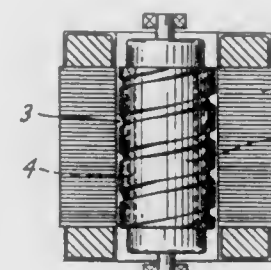
Int. Cl.⁵ F04B 35/04

U.S. Cl. 417—356

4 Claims

1. A pump with a drive motor for conveying liquids and gases, said pump comprising an axially extending shaft (2)

having an outer surface, at least one helically extending groove (3) for conveying liquid and gas formed in the outer surface of said shaft (2), said drive motor comprising an axially extending



stator (1) and an axially extending rotor (2) located within said stator, and said shaft (2) forms said rotor with said groove (3) extending around the outer surface of said rotor (2) for the axial extent thereof.

5,088,900

MOTOR-OPERATED PUMP HAVING A PROJECTION FOR PROTECTING A COMMUTATOR

Hiroshi Yoshioka, and Shingo Iwai, both of Hiroshima, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

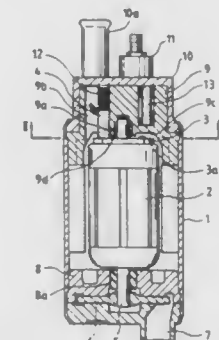
Filed May 25, 1990, Ser. No. 528,505

Claims priority, application Japan, May 31, 1989, 1-135857

Int. Cl.⁵ F04D 13/08

U.S. Cl. 417—366

4 Claims



1. A motor-operated pump of the in-tank type comprising a motor for driving the pump, said motor having a commutator; a bracket covering one end of said motor disposed adjacent to said commutator; a brush held against said commutator through a through hole formed in said bracket; and a bearing for supporting a shaft of said motor; wherein an annular projection is formed on a center portion of a surface of said bracket disposed in opposed relation to said commutator, is formed integrally with said bracket, and prevents contact of said commutator with said bracket.

5,088,901

MEMBRANE PUMP WITH A FREELY OSCILLATING METAL MEMBRANE

Rüdiger Bräuer, Hamburg, Fed. Rep. of Germany, assignor to Bran & Luebbe GmbH, Norderstedt, Fed. Rep. of Germany

Filed Mar. 12, 1990, Ser. No. 492,593

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907753

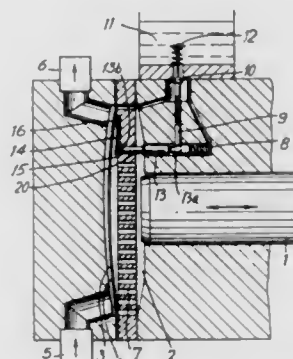
Int. Cl.⁵ F04B 9/10, 38/02

U.S. Cl. 417—386

21 Claims

1. In a piston membrane pump having a feed chamber and a piston working chamber, comprising a membrane hermetically separating said feed chamber and said piston working chamber, a piston oscillating back and forth in said piston working chamber, said piston working chamber being completely fillable

with a hydraulic medium, a supply container for said hydraulic medium, a refill valve through which said piston working chamber is connected with said supply container, said refill valve having a sliding control element acted on by a control spring and a moving force-transmitting element, which is displaced against said sliding control element acted on by said



control spring so as to open said refill valve, the improvement wherein the force-transmitting element comprises a resilient platelike piece opposing the action of the control spring of the sliding control element, the membrane has no contact surfaces on its feed chamber side in said feed chamber, a perforated supporting plate is fixedly arranged between said membrane and said piston.

5,088,902

PISTON TYPE METERING PUMP

Elio Marioni, Dueville, Italy, assignor to Askoll S.p.A., Povolaro Dueville, Italy

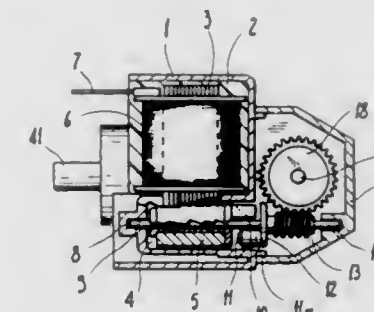
Filed Nov. 14, 1990, Ser. No. 612,378

Claims priority, application Italy, Nov. 17, 1989, 41748 A/89; May 14, 1990, 41600 A/90

Int. Cl.⁵ F04B 35/04, 39/10

U.S. Cl. 417—415

20 Claims



3. Piston type metering pump, comprising a synchronous electric motor which is suitable for transmitting rotary motion to speed reduction means which are associated, by virtue of means suitable for converting rotary motion into reciprocating motion, with a piston element which is slidable in a hollow body in which it defines a variable-volume chamber which is associated with valve means for the intake and discharge of fluid, said body defining a first chamber and a second chamber, said electric motor comprising a stator arranged in said first chamber and a rotor arranged in said second chamber, said speed reduction means being constituted by a worm screw which is associated with a gearwheel which meshes therewith, said worm screw being rigidly associated with a shaft which freely supports said rotor of said motor, said shaft furthermore having its ends freely inserted in respective seats, a first one of said seats extending axially from said second chamber of said body, a second one extending inside a housing which is fixed to said body.

5,088,903
COMPRESSOR, SPRAY APPARATUS USING THE
COMPRESSOR, AND AIR BRUSH FOR THE SPRAY
APPARATUS

Tsutomu Tomatsu, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan

Continuation of Ser. No. 327,051, Mar. 22, 1989, abandoned.

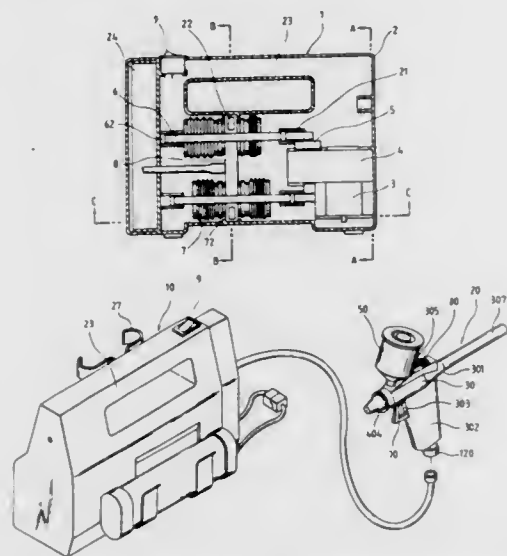
This application Mar. 29, 1991, Ser. No. 680,047

Claims priority, application Japan, Mar. 25, 1988, 63-72863

Int. Cl.⁵ F04B 45/02

U.S. Cl. 417-473

7 Claims



1. In a spray apparatus having a compressor for generating and discharging compressed air, and an air brush for receiving the compressed air and creating suction using the compressed air to spray the liquid out of a nozzle, an means for supplying the discharged compressed air to the air brush, said compressor comprising:

a casing;
 a small DC motor having an output power of between 1 W and 80 W, said DC motor being mounted in said casing and having an output shaft;
 reduction gears mounted in said casing and connected to said output shaft of said motor;
 conversion means mounted in said casing for converting the rotary force from said reduction gears into reciprocable motion;

guide portions provided in said casing;
 actuator members mounted in said casing, said actuator members being connected to said conversion means and reciprocably disposed in said guide portions;
 a valve block mounted in said casing;

at least three air compressing members mounted in said casing, one end of each of said compressing members being attached to one of said actuator members and the other open end being coupled with said valve block in a closely-sealed state;

pairs of a suction valve and an exhaust valve disposed in said valve block for controlling suction and exhaust operation of said air compressing members, a number of said pairs being equal to that of said air compressing members;
 a discharging hole disposed in said valve block; and
 an air collection path disposed in said valve block for communicating compressed air exhausted from each of said exhaust valves with said discharging hole;
 wherein said air compressing members are successively actuated with a phase difference therebetween to continuously discharge said compressed air out of said discharge hole in response to the rotational drive of said motor.

5,088,904
TRANSFUSION PUMP

Shigeru Okada, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

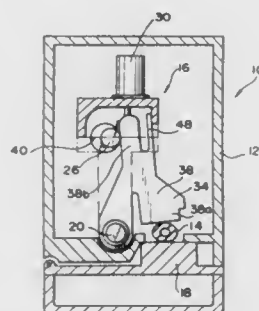
Filed Jul. 20, 1990, Ser. No. 554,866

Claims priority, application Japan, Jul. 24, 1989, 1-188907

Int. Cl.⁵ F04B 43/12

U.S. Cl. 417-474

6 Claims



1. A transfusion pump which comprises:
 a housing disposed to oppose a tube that is to be filled with a liquid;
 a plurality of fingers mounted on said housing along a liquid supply direction for urging said tube;
 pivoting means for pivotally supporting said fingers so as to reciprocate in a direction wherein said fingers are capable of urging said tube;
 cam engaged with said fingers;
 driving means for sequentially driving said cams so that said fingers which are engaged with the corresponding cams sequentially urge said tube in the liquid supply direction; and
 a biasing member, arranged to be engaged with said fingers, for biasing said fingers to be in contact with the corresponding cams, said biasing member comprising elastic pieces integrally formed with said fingers, respectively, distal ends of said elastic pieces being in elastic contact with said housing.

5,088,905
CHECK VALVE FOR SCROLL COMPRESSOR

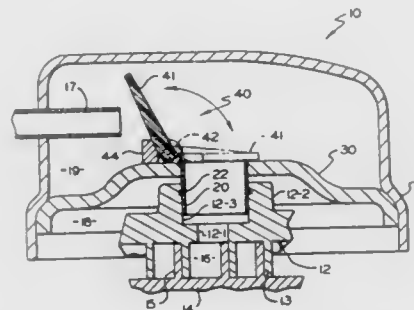
Wayne P. Beagle, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 27, 1990, Ser. No. 588,778

Int. Cl.⁵ F04C 18/04; F16K 15/03

U.S. Cl. 418-55.1

6 Claims



1. In a hermetic scroll compressor having a discharge plenum fluidly connected to a discharge port and a discharge tube, a check valve assembly comprising:
 support means fixedly located in said discharge plenum;
 valve means freely pivotably mounted in said support means so as to be movable over a range of 90° to 135° between two stable positions due solely to gravity corresponding to a first extreme position blocking said discharge port and a second extreme position in proximity to said discharge

tube whereby refrigerant discharged from said discharge port moves said valve means from said first to said second position and when said compressor is stopped, refrigerant entering said discharge plenum from said discharge tube impinges on said valve means and causes said valve means to move from said second to said first position thereby blocking said discharge port.

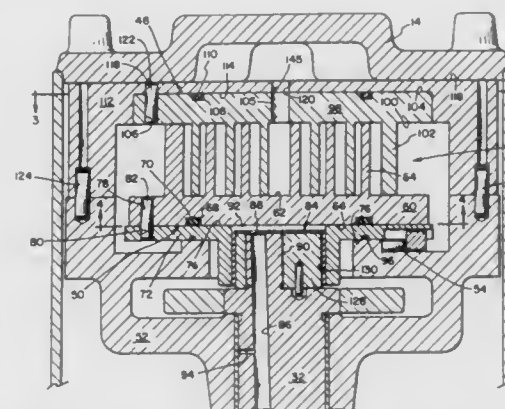
5,088,906
AXIALLY FLOATING SCROLL MEMBER ASSEMBLY
 Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Feb. 4, 1991, Ser. No. 650,055

Int. Cl.⁵ F04C 18/04, 27/00

U.S. Cl. 418-55.2

20 Claims



1. A floating scroll assembly for use as a fluid displacement apparatus in a hermetic scroll-type compressor, comprising:
 a hermetically sealed housing;
 a fixed scroll frame in said housing including an attaching surface;
 a drive plate including a mounting surface axially opposing said attaching surface;
 a fixed scroll plate coupled to said fixed scroll frame in a manner permitting axial movement of the entire fixed scroll plate relative to said attaching surface, including a back surface facing said attaching surface and an opposite front surface having an involute wrap thereon;
 an orbiting scroll plate coupled to said mounting surface, including a hind surface facing said mounting surface and an opposite face surface having an involute wrap thereon, said involute wrap of said fixed scroll plate and said involute wrap of said orbiting scroll plate being operably intermeshed axially intermediate said fixed scroll frame and said drive plate;
 axial compliance means between said attaching surface and said back surface and between said mounting surface and said hind surface for biasing said fixed scroll plate and said orbiting scroll plate toward one another to form an axially compliant scroll assembly that is axially movable relative said fixed scroll frame and said drive plate.

5,088,907
SCREW ROTOR FOR OIL FLOODED SCREW COMPRESSORS

Shoji Yoshimura, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 6, 1990, Ser. No. 549,106

Int. Cl.⁵ F04C 18/16

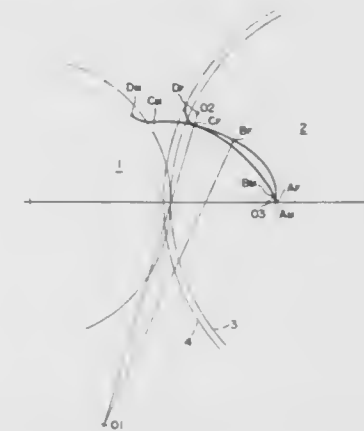
U.S. Cl. 418-201.3

1 Claim

1. A tooth profile for the trailing side of a female rotor tooth for an oil flooded compressor or the like, said tooth profile comprising:

a first tooth surface expressed by a function $f(x)$, generated by a tip end portion located on the trailing side of an

opposing male rotor tooth and expressed by an arbitrary function $F(x)$, and a second tooth surface expressed by a function $G(x)$ and extending from said first tooth surface of the function $f(x)$ to an addendum circle of said female rotor tooth, said second tooth surface being profiled in a



different shape from said first tooth surface $f(x)$, and said second tooth surface having a portion with a center of curvature located outward of the addendum circle of said female rotor tooth and on an anterior side of said tooth profile.

5,088,908
CONTINUOUS VACUUM PROCESSING APPARATUS
 Shinobu Ezaki, Ibaraki; Yukishige Kamino, Tsuchiura, and Masae Tohkai, Ryugasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

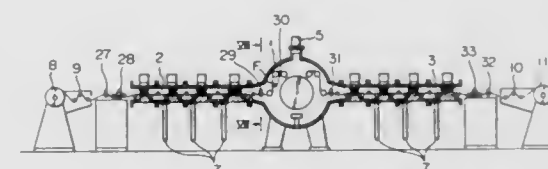
Filed Mar. 19, 1990, Ser. No. 495,120

Claims priority, application Japan, Mar. 20, 1989, 1-66213

Int. Cl.⁵ B29C 71/00; C23C 14/24, 14/56

U.S. Cl. 425-73

5 Claims



1. A continuous vacuum processing apparatus of the type having a vacuum processing chamber and at least an upstream auxiliary vacuum chamber connected to the upstream end of said vacuum processing chamber as view in the direction of flow of a material to be processed, said apparatus comprising:
 a slit-type seal device provided in said upstream auxiliary vacuum chamber and capable of conveying the material to be processed while sealing said vacuum processing chamber from the exterior of said vacuum processing chamber, said seal device being provided with a guide member for guiding said material;
 independent tensioning means provided in said vacuum processing chamber and said upstream auxiliary vacuum chamber for independently applying tensions to the portions of said material in said vacuum processing chamber and said upstream auxiliary vacuum chamber, said independent tensioning means including first tensioning means provided in said vacuum processing chamber for applying tension to the portion of said material in said vacuum processing chamber, second tensioning means provided in said upstream auxiliary vacuum chamber for applying tension to the portion of said material in said auxiliary upstream vacuum chamber, and tension interrupting means including a pair of opposed rotatable rollers disposed along the direction of flow of the material

between said first and second tensioning means and means to vary the position of one of said opposed rollers relative to the other roller whereby said material is freed from tension applied thereto by pinching said material between said rollers.

5,088,909

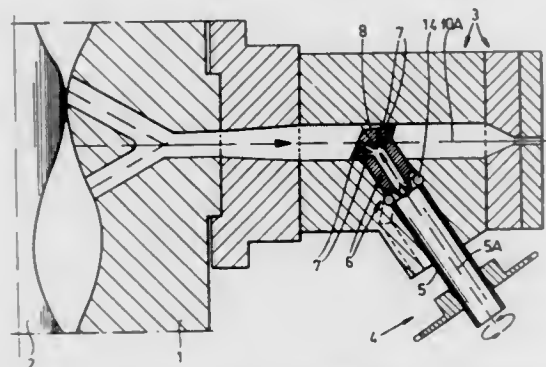
APPARATUS FOR EXTRUDING A MARBLEIZED SYNTHETIC-RESIN STRAND

Willi Laarmann, Essen, Fed. Rep. of Germany, assignor to W. Dollken & Co. GmbH, Essen, Fed. Rep. of Germany
Filed Feb. 19, 1991, Ser. No. 657,731
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1990, 4007234

Int. Cl.⁵ B29C 47/12

U.S. Cl. 425—131.1

5 Claims



1. An apparatus for making a marbleized thermoplastic-resin strand from a matrix resin and an inlay resin, the apparatus comprising:

- a die forming a passage extending along an axis and having an upstream inlet end and a downstream outlet end;
- means including an extruder for injecting the matrix resin in hot liquefied condition into the passage at the upstream end thereof such that the resin emerges from the downstream end;
- an inlay nozzle opening into the passage between its ends and extending through the die along a nozzle axis forming an acute angle with the passage axis, the nozzle having a shaft journaled in the die and extending along the nozzle axis, and
- an inner end carried on the shaft, formed with an outlet opening, and projecting into the passage;
- means for feeding the inlay resin in hot liquefied condition through the nozzle into the passage such that the inlay resin mixes with the matrix resin; and
- drive means for rotating the inlay nozzle substantially continuously about its nozzle axis, whereby the patterning of the inlay resin in the matrix resin is a function of the rotation speed of the inlay nozzle.

5,088,910

SYSTEM FOR MAKING SYNTHETIC WOOD PRODUCTS FROM RECYCLED MATERIALS

Billy D. Goforth, Fayetteville; Charles L. Goforth, Lowell, both of Ark., and Joe G. Brooks, Junction, Tex., assignors to Advanced Environmental Recycling Technologies, Inc., Junction, Tex.

Filed Mar. 14, 1990, Ser. No. 491,061

Int. Cl.⁵ B29C 47/34, 47/92

U.S. Cl. 425—142

4 Claims

1. A system for making dimensionally stable and moisture resistant synthetic wood products from recycled materials comprising:

- means for removing contaminants from wood fiber materials and for conveying the decontaminated wood fiber material to
- means for processing the decontaminated wood fiber mate-

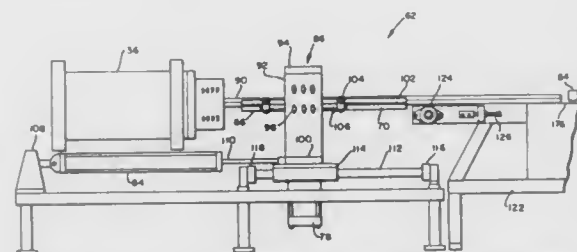
rial to yield wood fiber particles having a maximum diameter size of about one-eighth inch;

means for conveying the wood fiber particles to a holding container;

means for weighting plastic material and the wood fiber particles to achieve a predetermined mix ratio and to produce a plastic/wood mix;

means to convey the plastic/wood mix to

means for heating, kneading and further mixing the plastic/wood mix to a temperature high enough to melt the plastic material and encapsulate the wood fiber particles within the melted plastic material so that moisture absorption by the wood fiber is reduced and to form a substantially homogeneous mass;



means to produce a plurality of relatively small, relatively uniformly sized portions of extruder feed from the substantially homogeneous mass;

a compounding extruder adapted to receive the extruder feed and to extrude the feed through a predetermined die to form a product having a predetermined configuration;

means for receiving the product from the extruder and means for periodically moving a cutting means with and at the same speed as the product for cutting the product into pieces of predetermined lengths while the product is continuously flowing from the extruder so that an upstream side of the product is not rammed into the means for cutting.

5,088,911

INJECTION MOLDING APPARATUS FOR CONTROLLING MOLDING OPTIMUM CONDITION IN RESPONSE TO TEMPERATURE

Hiroshi Kumazaki, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

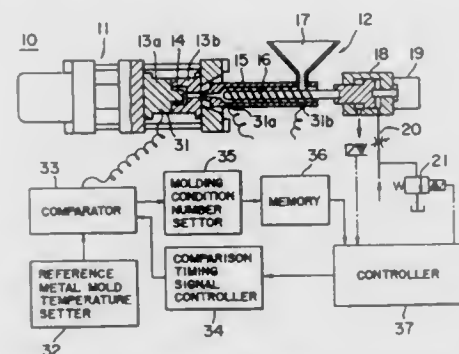
Filed Jan. 23, 1990, Ser. No. 468,708

Claims priority, application Japan, Feb. 2, 1989, 1-24371

Int. Cl.⁵ B29C 45/77

U.S. Cl. 425—145

3 Claims



1. Apparatus for operating an injection molding machine controlled by an electric control system comprising:

a reference metal mold temperature setter for setting metal mold temperatures from start of an injection molding operation to a point at which a stable molding operation can be made;

a means for sensing a temperature of said metal mold;

a comparator which compares a signal representing a temperature of a metal mold of said injection molding machine with a reference metal mold temperature set by said reference metal mold temperature setter;

a comparison timing signal controller which controls operation of said comparator;

a molding condition setter which sets a molding condition in response to an output signal of said comparator;

memory means which stores a reference metal mold temperature during a building up interval, and an optimum molding condition for said reference metal mold temperature; and

a controller for controlling the operation of said injection molding machine so as to set a degree of opening of a flow quantity adjusting valve to obtain an injection speed according to an optimum molding condition set by said molding condition setter, and to operate said comparison timing signal controller.

5,088,912

DOUGH PROCESSING AND CONVEYOR SYSTEM

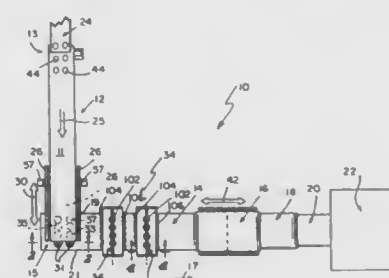
Glen F. Raque; Edward A. Robinson; Jesse McLeod, and Shirley W. Sample, all of Louisville, Ky., assignors to Raque Food Systems, Inc., Louisville, Ky.

Filed Jun. 1, 1990, Ser. No. 532,052

Int. Cl.⁵ B29C 31/00, 43/02; A21C 11/00

U.S. Cl. 425—155

35 Claims



1. A dough ball processing apparatus comprising means for simultaneously forming at least two dough balls aligned in a predetermined pattern into predetermined shapes,

an intermittently moving forming conveyor including an input region for receiving dough balls aligned in the predetermined pattern and for transporting the dough balls to a predetermined position below the forming means and an output region for transporting formed dough balls away from the forming means,

a continuously moving delivery conveyor including an output end situated above the input region of the forming conveyor for supplying a continuous stream of dough balls to the input region of the forming conveyor, and alignment means located between the delivery conveyor and the forming conveyor for positioning the dough balls received from the output end of the delivery conveyor in the predetermined pattern on the forming conveyor.

5,088,913

APPARATUS TO DISPOSE OF GASEOUS MONOMER

John E. Chambers, P.O. Box 6747, Greenville, S.C. 29606

Filed Jun. 21, 1990, Ser. No. 541,614

Int. Cl.⁵ D01F 13/04

U.S. Cl. 425—182

3 Claims

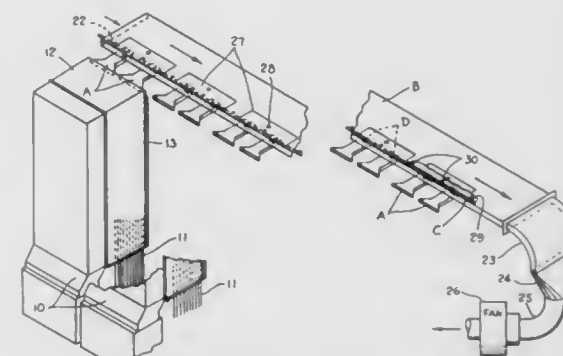
1. Apparatus for disposing of gaseous monomer contained in the fumes emitted in the area adjacent the spinnerets in the manufacture of synthetic fibers comprising:

- a plurality of laterally spaced suction nozzles, each of said nozzles drawing in fumes containing gaseous monomer from the area adjacent the spinnerets at an enlarged open end;

a transport duct having sufficient air flow to remove fumes from said nozzles and into the transport duct;

a portion of said nozzles opposite said enlarged open end extending across said transport duct;

apparatus for injecting water into said fumes in said transport duct in sufficient quantity to carry off said monomer therein;



a plurality of junctions carried by a bottom portion of said transport duct and disposed between said portions of corresponding nozzles and said bottom portion delivering said fumes to the transport duct avoiding the back flow of water containing monomer from the transport duct into the nozzles; and

said suction nozzles being insertably received for drawing in said fumes at said enlarged open end and by said duct for ready removal for cleaning.

5,088,914

DOUBLE FLIGHTED EXTRUSION SCREW

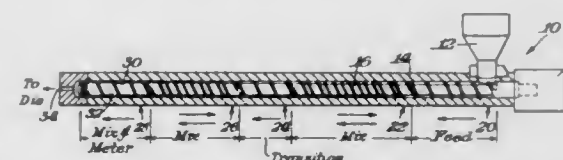
Romano Brambilla, Via Rua Muro 86, 41100 Modena, Italy

Filed May 11, 1990, Ser. No. 522,140

Int. Cl.⁵ B29B 7/42

U.S. Cl. 425—208

22 Claims



1. An extrusion screw for extruding plastic material in an extruder including a feed hopper having a discharge opening, a heatable cylinder having a feed end and a discharge end, said extrusion screw being mounted for longitudinally rotating in the cylinder, said extrusion screw having a plurality of sections including a feed section at the feed end of said screw, a first mix section adjacent said feed section, a transition section adjacent said first mix section, a second mix section adjacent said transition section, a mix and meter section adjacent from said second mix section for conveying the material to a discharge orifice in the cylinder to a die, said extrusion screw including a single primary flight which extends the length of said screw from said feed end of said feed section to the discharge end of said mix and meter section and through all of said plurality of sections, said primary flight extending around said screw in said transition section a plurality of times, said primary flight having a constant step in each of said first mix section and said second mix section, a secondary flight in each of said first mix section and said second mix section with the thread of said secondary flight being between the thread of said primary flight without any other flight in either of said first mix section and said second mix section, said secondary flight being of a constant step which differs from said constant step of said primary flight, said secondary flight being of lesser diameter than said primary flight.

primary flight, said secondary flight being joined to said primary flight at the upstream end of each of said mix sections, a channel formed by the distance between the thread of said secondary flight and the thread of its adjacent downstream primary flight, said distance decreasing from said upstream end of each of said mix sections where said distance is greatest to the downstream end of each of said mix sections where said distance is the least, and said primary flight being joined to said secondary flight at said discharge end of each of said mix sections to cause the material to reciprocate back and forth as it is conveyed therethrough.

5,088,915

COATED-CORE PRESS

Wolfgang Korsch, and Michael Schmett, both of Berlin, Fed. Rep. of Germany, assignors to Korsch oHG Maschinenfabrik, Berlin, Fed. Rep. of Germany

PCT No. PCT/DE89/00375, § 371 Date Mar. 9, 1990, § 102(e) Date Mar. 9, 1990, PCT Pub. No. WO89/11968, PCT Pub. Date Dec. 14, 1989

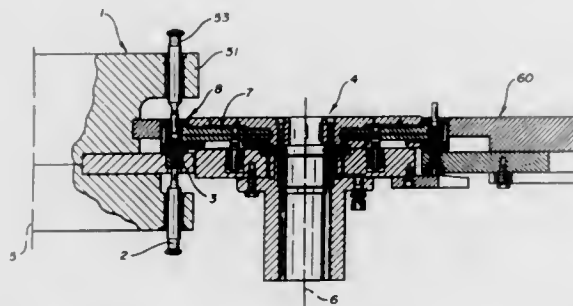
PCT Filed Jun. 7, 1987, Ser. No. 466,260

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819821

Int. Cl. B29C 43/20; B30B 11/08

U.S. Cl. 425—345

22 Claims



1. An apparatus for producing a coated tablet from a core and an outer powdered covering which is positioned in a receiving die, the apparatus comprising:

- a rotary die table having a plurality of circumferentially spaced receiving dies arranged on a circular die axis;
- a core transfer mechanism including a rotor having a plurality of radially extending arms, said rotor being rotatable about a transfer axis parallel to the axis of said die table, said arms having a transfer head with a core punch engageable and movable with the core, said core punch of said arms includes a bore therethrough, said core punches comprising guide pistons guided in said bores, a compression spring loading said core punches into said dies to urge and to position the core in a selected position in respect to the powder therein, said guide pistons are provided with cam pins and including a stationary groove cam disc acting on said pins to guide said pistons with said punches in respect to the die;
- a gripping device associated with each of said arms being positionable to move each punch with a core into alignment with the respective die, said die table being movable with said punches to register with said dies, the passive movement of said punches and the axis of said dies being in overlapping relationship.

5,088,916

GAS-AIR RATIO CONTROL VALVE DEVICE FOR GAS BURNERS

Toshio Furuhashi, and Mokoto Hasegawa, both of Shizuoka, Japan, assignors to EIKEN Kougyo Kabushiki Kaisha, Shizuoka, Japan

PCT No. PCT/JP88/00518, § 371 Date Mar. 27, 1989, § 102(e) Date Mar. 27, 1989, PCT Pub. No. WO89/09463, PCT Pub. Date Dec. 1, 1988

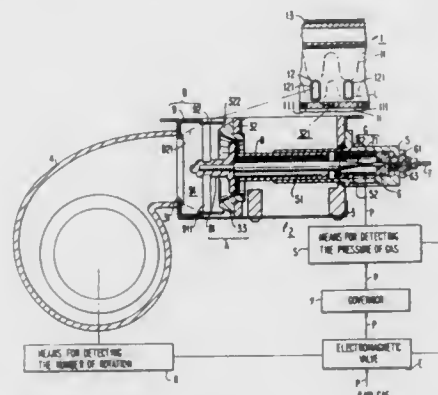
PCT Filed May 27, 1988, Ser. No. 335,662

Claims priority, application Japan, May 28, 1987, 62-132635; Nov. 2, 1987, 62-277772; Nov. 24, 1987, 62-296844; Nov. 24, 1987, 62-296848; Dec. 14, 1987, 62-316573; Jan. 17, 1988, 63-7341; May 2, 1988, 63-109577

Int. Cl. F23N 1/02

U.S. Cl. 431—90

6 Claims



1. A gas-air ratio control valve for gas burners comprising a burner portion and a control portion for controlling a raw gas flow rate, a primary air flow rate and a secondary air flow rate; said control portion including a primary air chamber, a secondary air chamber and a raw gas chamber, said primary air chamber, secondary air chamber and raw gas chamber each communicating with said burner portion; said control portion having an operating rod movable between inner and outer positions, said control portion further including a raw gas flow rate control valve portion, a primary air flow rate control valve portion and a secondary air flow rate control valve portion which are opened and closed according to the movement of the operating rod; an actuator for moving said operating rod, said valve portions being opened and closed by movement of the operating rod, so that the primary air flow rate into said primary air chamber, the secondary air flow rate into said secondary air chamber and the raw gas flow rate into said raw gas chamber are controlled.

5,088,917

GAS ELECTROBURNER WITH ELECTRIC POWER SUPPLY AND ASSISTED IGNITION

Serge Leleu, La Grande Paroisse; Jean-Luc Aschard, Moret-Sur-Loing, and Alain Bouvier, Fontainebleau, all of France, assignors to Electricite De France, Paris, France

Filed Jun. 1, 1990, Ser. No. 531,387

Int. Cl. F23Q 7/06

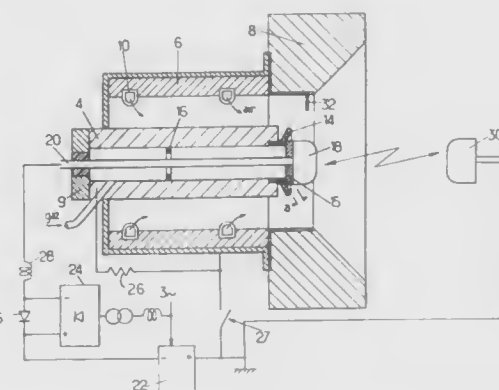
U.S. Cl. 431—266

7 Claims

1. Gas burner comprising: annular air delivery means having an axis and being connected to an air supply for delivering a swirling air stream at an outlet thereof to a combustion chamber, a device for injecting fuel gas into said combustion chamber along the axis of said annular delivery means, means for striking an arc across gases resulting from combustion of said fuel gas, said striking means having an upstream electrode along the axis of the annular delivery

means and a counter electrode placed downstream of the upstream electrode, said upstream electrode and counter electrode being connected to a main electrical current source,

a deflector plate placed in the path of the air stream at a location close to the upstream electrode,



means providing an arc ignition voltage across said upstream electrode and said deflector plate, and at least one relay electrode located between said deflector plate and said counter electrode.

5,088,918

VAPORIZATION BURNER FOR A HEATER OPERATED WITH LIQUID FUEL

Klaus Schaale, Krailling, and Wolfgang Engelhardt, Munich, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

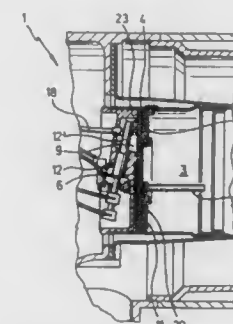
Filed Feb. 4, 1991, Ser. No. 650,015

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003090

Int. Cl. F23C 11/00

U.S. Cl. 431—326

20 Claims



1. Vaporization burner for a heater operated with liquid fuel comprising a support that projects into a combustion chamber, a front side of the support facing the combustion chamber carrying an absorbent body that can be acted on with fuel supplied by a fuel feed pipe and an ignition chamber having an igniter being located at a back side of the support, a passage in the support leading from the ignition chamber to the combustion chamber; wherein a perforated disk is located between the support and the absorbent body, said perforated disk having a through-hole in the area of said passage; and wherein a slot-shaped notch runs from said through-hole up to an edge of the perforated disk.

5,088,919

BURNER MEMBRANE

Roger De Bruyne, Zulte, and Ronny Losfeld, Waregem, both of Belgium, assignors to N. V. Bekaert S.A., Zvevegem, Belgium

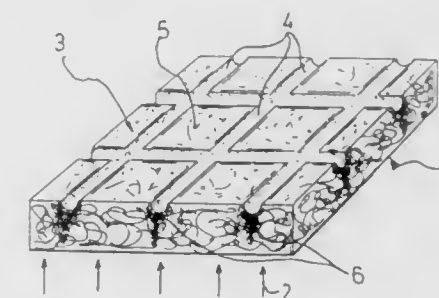
Filed Mar. 15, 1990, Ser. No. 493,737

Claims priority, application Belgium, Mar. 29, 1989, 8900345

Int. Cl. F23D 14/12

U.S. Cl. 431—328

26 Claims



19. A radiant surface combustion burner comprising: a housing with inlet means for the supply of a fuel gas mixture and outlet means for the gas mixture to be burned, and a porous burner membrane which closes said outlet means of the burner housing, wherein said porous burner membrane includes a porous sintered web of inorganic fibers that are resistant to high temperatures, wherein at least the membrane surface opposite from the fuel supply side is provided with intersecting grooves in the shape of a grid such that said grooves bound meshes of the grid to establish a surface area of each said bounded mesh of at least 20 mm², and wherein said intersecting grooves form a barrier against crack propagation between said bounded mesh surface areas.

5,088,920

DRIVE MECHANISM FOR GLASS SHEET ROLLER CONVEYOR OF FURNACE

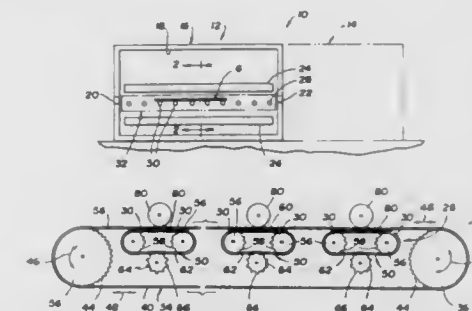
Pauli T. Reunamaki, Tampere, Finland, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Nov. 30, 1990, Ser. No. 621,025

Int. Cl. F27B 9/28

U.S. Cl. 432—59

9 Claims



1. A furnace for heating flat glass sheets comprising: a housing defining a heating chamber; a roller conveyor located within the housing and including horizontal rolls for conveying a flat glass sheet to be heated; and a drive mechanism including a primary drive loop and a pair of primary drive wheels that receive the primary drive loop which extends therebetween with substantially straight driving and return reaches, said primary drive loop having internal teeth and said pair of primary drive wheels having external teeth that mesh with the internal teeth of the primary drive loop, said primary drive wheels

alternately driving the primary drive loop in opposite directions, said drive mechanism also including a plurality of secondary drive loops each of which has external and internal teeth and each of which is associated with a pair of conveyor rolls, drive gears each of which is secured to an associated conveyor roll, each drive gear including external teeth that mesh with the internal teeth of the associated secondary drive loop which has driving and return reaches extending therebetween, the external teeth of each secondary drive loop along the driving reach thereof meshing with the internal teeth of the primary drive loop along the driving reach of the primary drive loop to drive the conveyor rolls in opposite directions as the primary drive loop is driven in opposite directions, and a plurality of idler gears respectively associated with the secondary drive loops and having external teeth that mesh with the external teeth along the return reaches of the secondary drive loops to maintain tensioning that prevents backlash and provides uniform reversal of all of the conveyor rolls as the driving changes from one direction to the other as well as allowing the conveyor rolls to be positioned with their high sides aligned so as to maintain planarity during the conveyance.

5,088,921

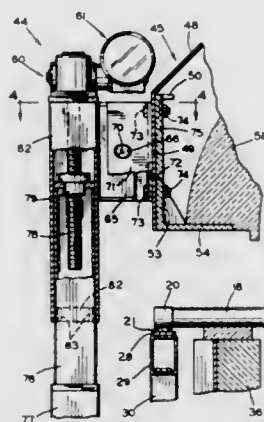
HEAT TREATMENT FURNACE

Dennis M. Csehi, Oregon, and James A. Meeker, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio
Filed Nov. 14, 1990, Ser. No. 613,312

Int. Cl.⁵ F27D 23/00; F27B 9/26

U.S. Cl. 432—121

15 Claims



1. A furnace for heating a workpiece comprising, an upper furnace enclosure section and a lower furnace enclosure section together defining an elongated, generally horizontally extending heating chamber, a conveyor disposed between said upper and said lower furnace enclosure sections for transporting a workpiece through the heating chamber, a carrier mechanism for supporting said upper furnace enclosure section independently from said lower enclosure section and the conveyor, said carrier mechanism including a stationary column disposed on one side of the heating chamber, a movable column, means for connecting said movable column to said upper furnace enclosure section, and jack means interconnecting said movable column to said stationary column.

5,088,922
HEAT-TREATMENT APPARATUS HAVING EXHAUST SYSTEM

Jyunichi Kakizaki, Fujisawa, and Kenichi Yamaga, Sagami, both of Japan, assignors to Tokyo Electron Sagami Limited, Kanagawa, Japan

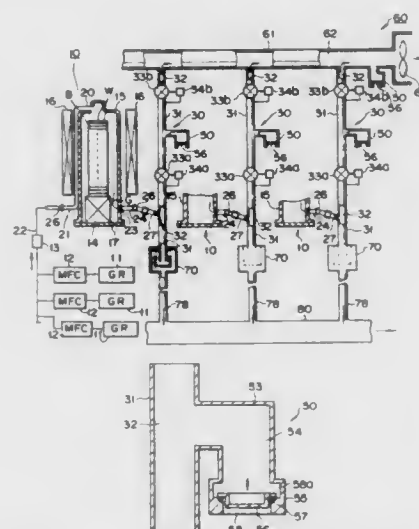
Filed Jan. 23, 1991, Ser. No. 644,565

Claims priority, application Japan, Jan. 23, 1990, 2-13295; Feb. 5, 1990, 2-25672; Jul. 4, 1990, 2-177184

Int. Cl.⁵ F27B 9/04

U.S. Cl. 432—152

12 Claims



1. A heat-treatment apparatus arranged in a room in which a clean atmosphere is held, comprising:
collective exhaust means for performing gas exhaust the room to keep the room in a clean atmosphere;
heat-treatment vessel means for receiving a gas and/or liquid for forming a desired film on a surface of an object to be treated in a heating atmosphere;
an exhaust path, communicating with said collective exhaust means and said heat-treatment vessel means, for introducing a gas filling said heat-treatment vessel means into said collective exhaust means; and
outer air intake means including a float which is moved upward due to a difference in pressure between an internal pressure of said exhaust path and an atmospheric pressure, for taking in outer air in said exhaust path to adjust an exhaust pressure of said exhaust path.

5,088,923

ALLOY FOR ATTACHING ORTHODONTIC BRACKET TO ORTHODONTIC PAD

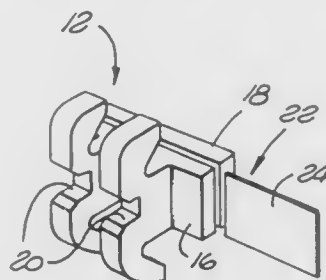
Craig A. Andreiko, Alta Loma, Calif., assignor to Ormco Corporation, Glendora, Calif.

Filed Jan. 19, 1990, Ser. No. 467,161

Int. Cl.⁵ A61C 7/00

U.S. Cl. 433—9

20 Claims



4. In combination in an orthodontic bracket,

an orthodontic support member,
an orthodontic pad, and
a metallic glass alloy disposed between the orthodontic support member and the orthodontic pad in a thin layer and bonding the orthodontic support member to the orthodontic pad.

5,088,924

DENTAL FIBEROPTIC HANDPIECE HOSE ASSEMBLY AND METHOD

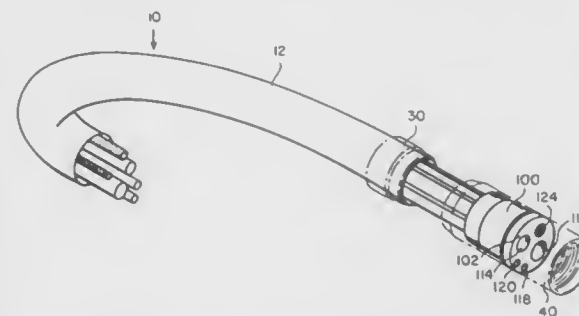
Gary Woodward, 9301 S.W. Sagert, Apt. 29, Tualatin, Ore. 97062

Continuation of Ser. No. 317,833, Mar. 1, 1989, Pat. No. 4,975,058. This application Aug. 31, 1990, Ser. No. 576,272

Int. Cl.⁵ A61C 1/08

U.S. Cl. 433—126

17 Claims



1. A dental handpiece assembly comprising:
a) a smooth-walled, aseptic outer tubing having a plurality of integral inner passageways, said inner passageways including a first passageway providing drive air, a second passageway providing an exhaust line, a third passageway providing chip air and a fourth passageway providing coolant water,
b) a fiberoptic bundle carried within a fifth passageway in the outer tubing, the diameter of the fifth passageway being smaller than an uncompressed diameter of the fiberoptic bundle so that the fiberoptic bundle is compressed and deformed within the fifth passageway to inhibit the twisting of the fiberoptic bundle during use of the handpiece assembly,
c) a sensing cable carried within a sixth passageway in the outer tubing, and
d) an adapter for connecting an end of each inner passageway and the fiberoptic bundle to a dental handpiece.

5,088,925

INSTRUMENT AND METHOD FOR ADMINISTERING AN INJECTABLE ANESTHETIC

William E. Mason, 100 Harrow La., Saginaw, Mich. 48603
Filed Dec. 6, 1990, Ser. No. 622,970

Int. Cl.⁵ A61C 3/00; A61M 5/00

U.S. Cl. 433—141

20 Claims



8. A specialized instrument for assisting in administering an injectable anesthetic to the palatal tissue immediately adjacent one of the foramina of the palate in cooperation with a hypodermic syringe containing an anesthetic drug comprising:
a. a handle with an instrument end having an angularly turned part connected to a ring extending flatwise relative to the angularly turned part;
b. the ring having an inner target opening and being configured to present a blunted bottom to the palatal tissue substantially immediately adjacent to one of the foramina;
c. the ring further having a through slit therein for passing it past a hypodermic needle; and
d. said handle having a second angularly turned part on its opposite end connected to a ring extending flatwise to the angularly turned part, the second angularly turned part being extended at an angle 180° removed from said first mentioned angularly turned part.

ured to present a blunted bottom to the palatal tissue substantially immediately adjacent to one of the foramina;
c. the ring further having a through slit therein for passing it past a hypodermic needle; and
d. said handle having a second angularly turned part on its opposite end connected to a ring extending flatwise to the angularly turned part, the second angularly turned part being extended at an angle 180° removed from said first mentioned angularly turned part.

5,088,926

IMPLANT FOR THE JAWBONE

Manfred Lang, Kaiserstrasse 18-20, 8500 Nuremberg 1, Fed. Rep. of Germany

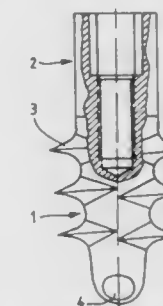
Filed Dec. 14, 1990, Ser. No. 627,719

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1990, 9000076

Int. Cl.⁵ A61C 8/00, 5/08

U.S. Cl. 433—173

3 Claims



1. An implant for the human jawbone, the implant including a shaft portion and a conical retention portion, the retention portion having a plurality of displacement projections, the improvement comprising the displacement projections being individual wedge members, the wedge members being located in pairs on the retention portion opposite each other, wherein each wedge member is sickle-shaped such that the radial dimension of an outer edge of the wedge member from the circumference of the retention portion increases in circumferential direction from zero to a maximum value and then decreases to zero, whereby each pair of wedge members has together with the retention portion an oval shape in transverse cross-section, and wherein each wedge member is conically shaped in radial direction with increasing width from the outer edge of the wedge member to the circumference of the retention portion, and each wedge member is conically-shaped in circumferential direction with increasing width from one end thereof at the retention portion to another end thereof at the retention portion.

5,088,927

RADIO OPAQUE PLASTICS AND PROCESS OF MAKING

Howard G. Lee, 721 32 Ave., Hudson, Wis. 54016

Filed Jun. 18, 1990, Ser. No. 539,807

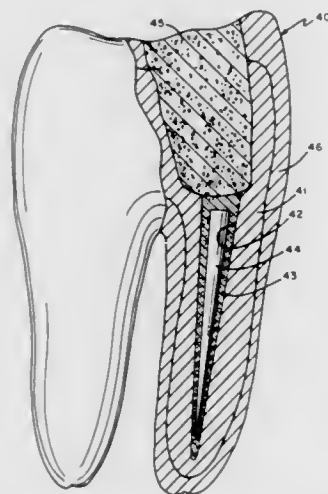
Int. Cl.⁵ A61C 5/02

U.S. Cl. 433—224

15 Claims

1. An implant for a body part comprising:
a solid rigid material for insertion into an artificially formed body cavity, said solid rigid material comprising a polymer plastic, said solid rigid material having an interior region and an exterior shape, said polymer plastic comprising polysulfone having tungsten particles uniformly distributed therethrough so that an x-ray image of a body part containing said solid rigid material shows the the interior region and the exterior shape of said solid rigid

material in the body part to enable a person viewing an x-ray of the body part containing the implant to determine



the shape and boundaries of said solid rigid material implanted in the artificially formed body cavity.

5,088,928

EDUCATIONAL/BOARD GAME APPARATUS

James K. Chan, 2342 Colt Rd., Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 273,704, Nov. 15, 1988, abandoned, which is a continuation of Ser. No. 97,094, Sep. 16, 1987, abandoned. This application Mar. 16, 1990, Ser. No. 494,972

Int. Cl.⁵ A63B 67/00; G09B 7/00

U.S. Cl. 434-339

2 Claims



1. An educational game apparatus for use by one or more players that incorporates: a plurality of printed sheets; a low-cost touch pad with interface cable to a personal computer system having a game port, said touch pad interfaced directly to said game port;

where the printed sheet contains a multiplicity of answer regions;

where said answer sheet lies over the low-cost touch pad; where said touch pad comprises

a. a first sheet of insulating material with one surface coated with a first plurality of parallel conductive strips which are connected at one end with a resistive coating strip, which has a terminal resistance value in the range compatible with that of a joystick potentiometer;

b. a second sheet of insulating material with one surface coated with a second plurality of parallel conductive strips which are connected at one end with a resistive coating strip, which has a terminal resistance value in

the range compatible with that of a joystick potentiometer;

c. a ground return network of a plurality of parallel conductive strips coated on either the conductor coating surface of said first sheet or said second sheet of the insulating material, each strip of said network interleaved with said plurality of conductive strips such that each conductive strip of said ground return network is in closer proximity to an associated sensing conductive strip than the separation distance between any two adjacent sensing conductors;

d. a spacer pattern of a plurality of dots/bumps coated on either the conductor coating surface of said first sheet or said second sheet of the insulating material, each dot/bump of said pattern printed in-between the printed conductors;

e. means for orienting said first sheet of insulating material and said second sheet of insulating material such that the conductive strips of the two sheets are facing each other in orthogonal orientation forming a touch position sensing region, and such that by pressing a selected point on the oriented sheets, a selected on or two of said plurality of conductive strips on one sheet come into contact with the interleaved conductive strips of the other sheet, thereby changing the terminal resistance values proportionally to the touched position in the said touch position sensing region;

f. means for implementing two separate touch switches on the said two insulating sheets outside the said touch position sensing region;

g. means for interfacing the resistive coating strips and the two said separate touch switches directly to the game port of said personal computer system with the same pin configuration as the commonly known joystick device connector pin allocation;

h. means for the resistance between the last position sensing conductor and the common ground return much larger than the resistance between any other position sensing conductors by lengthening and/or narrowing the corresponding portion of the resistive coatings;

and where said personal computer system calibrates the touch pad, displays questions, decodes the touched position, checks for the correctness or incorrectness of the player's selection, and provides video and sound feedback to the player.

5,088,929

BOARD-TO-BOARD CONNECTION TYPE ELECTRIC CONNECTOR

Masahiro Enomoto, Inagi, Japan, assignor to Molex Incorporated, Lisle, Ill.

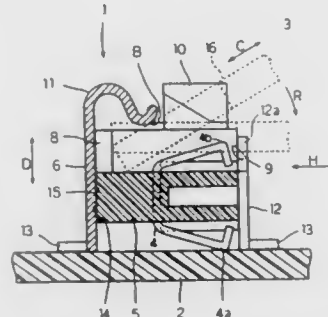
Filed Jun. 13, 1991, Ser. No. 714,484

Claims priority, application Japan, Jun. 22, 1990, 2-66546[U]

Int. Cl.⁵ H01R 9/09

U.S. Cl. 439-66

4 Claims



1. An electrical connector for connecting circuit patterns on two printed boards, comprising:
an insulative terminal housing having a plurality of terminals

laterally arranged and fixed at regular intervals each said terminals having two leg contacts extending from the housing;

a connector casing to accommodate said terminal housing, permitting said terminal housing to slide within said connector casing, said connector casing having attachment extensions integrally connected thereto for fixing said connector casing to one printed board whereby when said connector is fixed to said one printed board one leg contact of each terminal is brought into electric contact with the circuit pattern on said one printed board; and means on said connector casing to permit the other printed board to come into contact with the other leg contacts of said terminals and to retain resiliently the other printed board in contact with the other leg contact of each terminal, and, at the same time, retain resiliently said one printed board in contact with one leg contact of each terminal thereby forcing said terminals into resilient contact with said circuit patterns on said two printed boards.

5,088,930

INTEGRATED CIRCUIT SOCKET WITH REED-SHAPED LEADS

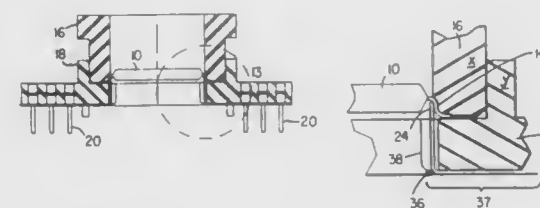
James V. Murphy, Warwick, R.I., assignor to Advanced Interconnections Corporation, Warwick, R.I.

Filed Nov. 20, 1990, Ser. No. 616,180

Int. Cl.⁵ H01R 23/72

U.S. Cl. 439-70

27 Claims



1. A socket for connection to the leads of a quad flat pack type integrated circuit package, said package having a body and each said lead having a downwardly extending section proximate a side of said body, said socket comprising:

a plurality of socket leads for connection to a circuit bearing element such as a printed circuit board, a supporting section for supporting said socket leads, and a plurality of vertically extending resilient single-reed-shaped contacts supported by said supporting section at positions that allow said contacts to bend when coming into contact with the downwardly extending sections of corresponding package leads, so that said contacts press outwardly against said package leads between said package leads and said side of said body, said contacts maintaining contact with the downwardly extending sections of said package leads when the package and the socket are in a mater position, said contacts being lead frame elements, a plurality of which having been separated from a single lead frame and remain in the same relative positions as they were in said lead frame, and each of said contacts being electrically connected to one of said socket leads.

5,088,931

APPARATUS FOR SEQUENCING SIGNALS IN CONJUNCTION WITH SHORTING CONTACTS

Lawrence J. Nicolo, and James A. Thompson, both of Red Bank, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 24, 1990, Ser. No. 642,248

Int. Cl.⁵ H01R 23/70, 33/96

U.S. Cl. 439-188

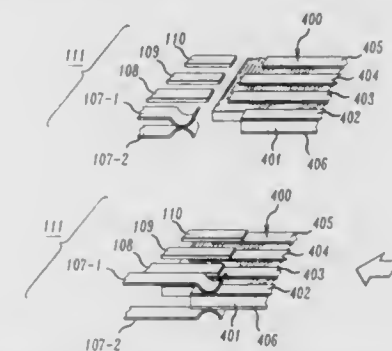
13 Claims

1. A first connector of a first type adapted for electrical interconnection with a second connector of a second type

opposite to said first type, said first connector having at least one edge, said second connector having a plurality of conductive contacts and at least one pair of shorting contacts, each contact of said shorting contacts electrically interconnected to its corresponding opposing contact while said contacts remain unseparated, said first connector comprising:

a plurality of conductive terminal elements, each element having first and second ends, at least one of said ends of each element lying within a predetermined one of a plurality of parallel planes along said at least one edge of said first connector, said planes being arranged such that a predetermined sequence of interconnections between said conductive terminal elements and corresponding ones of said conductive contacts and said shorting contacts of said second connector occurs at predetermined time instants should said first and second connectors be interconnected and all of said planes recessed a predetermined non-zero distance from a further plane parallel to said planes that intercepts a point on said at least one edge that is closest to the edgemost one of said parallel planes;

at least one of said plurality of conductive terminal elements



adapted and intended for interconnection with at least one of said contacts of said shorting contacts and having said at least one end within a predetermined plane of said plurality of planes not nearest said edge; and

at least one means for delaying said shorting contacts of said second connector from ceasing to electrically interconnect to each other as said first and second connectors are interconnected to each other substantially until at least one contact of said at least one pair of shorting contacts interconnects with at least one of said conductive terminal elements adapted and intended for interconnection with said at least one pair of shorting contacts,

said first connector being a male edge connector of a circuit pack formed from at least a portion of an insulating circuit board having mounted thereon said conductive terminal elements which are conductive fingers and said means for delaying is formed by said insulating circuit board having a notch of predetermined width cut therein from said edge of said first connector parallel to said planes of said first connector substantially until said plane in which said end of said at least one conductive terminal element intended for interconnection with at least one of said contacts of said shorting contacts lies.

5,088,932

ELECTRICAL CONNECTOR

Masahiko Nakamura, Kitakatsuragun, Japan, assignor to Hosiden Corporation, Yao, Japan

Filed Nov. 29, 1990, Ser. No. 619,413

Claims priority, application Japan, Dec. 4, 1989, 1-141020[U]

Int. Cl.⁵ H01R 13/627

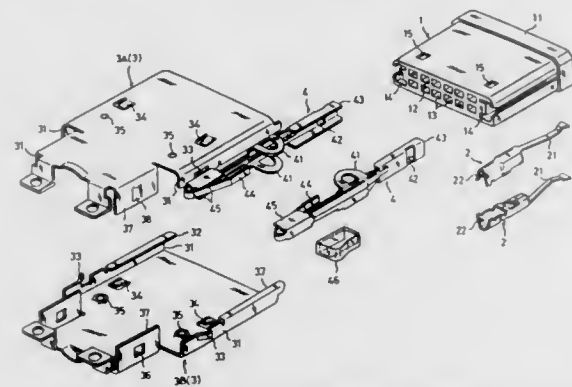
U.S. Cl. 439-350

5 Claims

1. An electrical connector, comprising:

a main body which houses and holds a plurality of contact pieces in parallel with one another, said main body having a rear portion and lateral sides, both lateral sides being

provided with longitudinally extending engagement grooves;
a shield frame unit surrounding the rear portion of said main body, said shield frame unit being divided into an upper frame and a lower frame, each with a left- and right-hand leg portion and with the end edges of each of the left- and right-hand leg portions being provided with inwardly turned engagement pieces which are inserted into respective engagement grooves of said main body when the upper frame and lower frame overlap each other, said upper frame and lower frame forming an inside space when they overlap, in which projections formed on said upper frame and lower frame are located;
locking levers housed in said inside space at lateral sides of said shield frame unit arranged in the parallel direction of said contact pieces, said locking levers being rotatably



supported by said projections, said locking levers having operating portions formed at one end and engagement pieces formed at their other end, said engagement pieces being adapted to be engaged with an disengaged from engagement portions formed at a counter electrical connector when said locking levers are forwardly and reversely rotated around said projections; and
biasing means disposed between said locking levers and said shield frame unit and adapted to resiliently bias said locking levers in the forward rotation direction where said engagement pieces of said locking levers are engaged with said engagement portions;
wherein said operating portions are adapted to displace said locking levers in the reverse rotation direction where said engagement pieces of said locking levers are disengaged from said engagement portions against the resilient biasing forces of said biasing means.

5,088,933

ELECTRICAL CONTACT ELEMENT

Horst Ribbeck, Wuppertal, Fed. Rep. of Germany, assignor to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Sep. 7, 1990, Ser. No. 578,878

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929928

Int. Cl.⁵ H01R 4/24

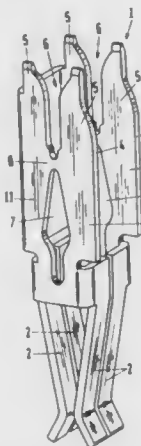
U.S. Cl. 439—395

3 Claims

1. An electrical contact element, which contacts by a cutting and clamping action, which electrical contact element is to be arranged in a chamber of a plastic casing and is formed from a flat stamped sheet metal piece, so as to have at least one flat forked spring, which has defined between two spring flanks thereof, which spring flanks are elastic and deflect in the plane of said forked spring, an introduction slot for the cutting and clamping contact of an electrical wire, which consists of an electrical lead coated by insulation; said electrical contact element further comprising:

a perforation in said flat forked spring for increasing a length of said flat forked spring, which perforation extends,

spaced at a distance from said introduction slot, in a longitudinal direction of said electrical contact element, with an intermediate cross-piece being formed between said introduction slot and said perforation, whereby said perforation extends close up to said introduction slot so that said intermediate cross-piece is narrow, and with said perforation being essentially an elongated slot;



with said elongated slot being pointedly shaped with its pointed end facing in the direction of said introduction slot; and
with said elongated slot being tapered at its other end facing away from said introduction slot.

5,088,934

ELECTRICAL TERMINAL

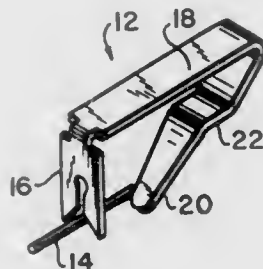
Hsiu-Shen Chow, Taiwan, China, and Leonard Ellentuch, Wallkill, N.Y., assignors to Chian Chyun Enterprise Co. Ltd., Taipei Hsien, Taiwan and Resco Inc., Newburgh, N.Y.

Filed Feb. 20, 1991, Ser. No. 657,914

Int. Cl.⁵ H01R 4/24

U.S. Cl. 439—395

19 Claims



1. In an electrical terminal for mechanically holding and electrically contacting an electrically insulated wire or cable, said terminal comprising an electrically conductive, elongate, resilient, flat strip having a free end and a slot, extending in the longitudinal direction from said free end, for receiving an insulated wire or cable with an electrical conductor surrounded by insulation, the improvement comprising an opening in said strip at the end of said slot for receipt of the electrical conductor of said wire or cable, said opening having an internal diameter which is greater than the narrowest width of said slot; wherein said free end of said strip is V-shaped and said slot commences at the vertex of the V; and wherein the internal edges of the V portion of the strip are sharp, cutting edges for slicing into the insulation of said wire or cable when said wire or cable is pressed into the slot;

whereby the insulation may be separated from the electrical conductor when said wire or cable is pressed into said slot and passed through said slot into said opening.

5,088,935

ELECTRICAL CONNECTOR PANEL

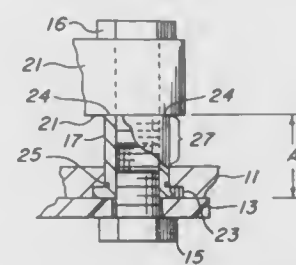
Ronald S. Dise, Perkasi, and Ronald W. Phillips, II, Sellersville, both of Pa., assignors to Penn Engineering & Manufacturing Corp., Danboro, Pa.

Filed Apr. 5, 1991, Ser. No. 681,006

Int. Cl.⁵ H01R 13/623

U.S. Cl. 439—573

12 Claims



1. An electrical equipment chassis having a cable connector panel with inside and outside opposing faces, comprising:
(a) a panel affixed to said chassis having a receptacle cutout and fastener mounting holes;
(b) a standoff clinch-type fastener installed into the inside face of said panel, said fastener including a standoff portion extending beyond the outside face of said panel and without any portion which abuts the outside face of said panel;
(c) a pin-type electrical receptacle mounted by said fastener to the inside face of said panel and extending through said cutout;
(d) a standoff shoulder located at the end of said standoff portion of said fastener; and
(e) an electrical plug mated with said receptacle and releasably affixed to and abutting said standoff shoulder of said fastener.

5,088,936

STRUCTURE OF MULTIPLE CONNECTOR

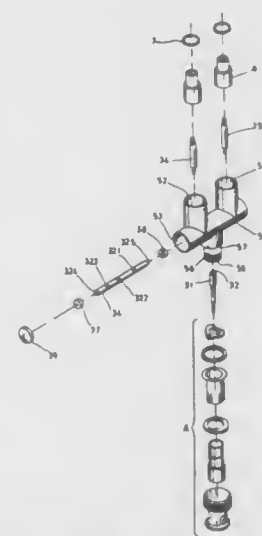
Tsan-Chi Wang, No. 13, Lane 312, Chungcheng Rd., Hsin Tien City, Taipei Hsien, Taiwan

Filed Jan. 18, 1991, Ser. No. 643,246

Int. Cl.⁵ H01R 9/05, 17/04

U.S. Cl. 439—578

2 Claims



1. For connecting multiple telecommunication circuits in parallel, a multiple connector comprising a cast iron pipe having a first outlet and a second outlet respectively disposed in parallel with each other at one side thereof and a third outlet disposed at an opposite side thereof, a plurality of terminals set inside said cast iron pipe and respectively connection into said

first, second and third outlets through screw joints, two stepped sockets respectively fastened in said first and second outlets for holding said terminals in position, two toothed retainer rings respectively fastened in said first and second outlets for holding said two stepped sockets in position, and a cylindrical receptacle assembly fastened in said third outlet.

5,088,937

RIGHT ANGLE COAXIAL JACK CONNECTOR

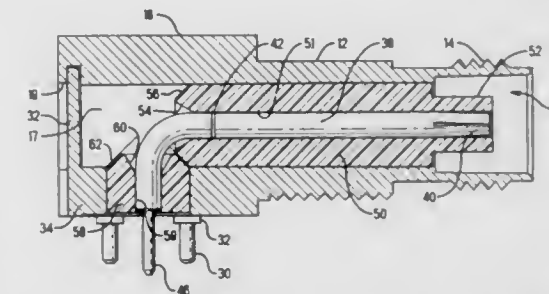
Andrew J. Gabany, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 19, 1991, Ser. No. 687,820

Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—581

8 Claims



1. A right angle coaxial jack connector for intermating ground and signal paths of a coaxial plug connector to a printed circuit board including a metallic shell having a plurality of metallic grounding pins protruding from the shell bottom surface adapted to fit within holes of printed circuit board to electrically ground said shell to the ground circuit of said board and to mechanically hold said jack to said board through being soldered thereto, said shell further including a central bore leading to a rear face, an insulating sleeve fitted in said bore including a sleeve bore coaxially positioning a connector signal contact within said shell, a keyway in the said rear face of said shell adapted to receive the insulating sleeve carrying the said signal contact inserted along the shell bore axis into position within said shell, the said signal contact having a forward end adapted to mate with a coaxial plug connector and a rear end at right angles to the axis of the said shell bore adapted to extend into a printed circuit board to be connected to a signal trace thereof, the said rear end of said signal contact extending between the said ground pins, an insulating disc surrounding the rear end of said signal contact to hold said contact coaxially positioned within said shell, a metallic cap fitted into the rear face of said shell to close off the said keyway and seal the said shell in conjunction with the said insulating sleeve and disc against entry of contamination within the said shell and reduce radiation emitted from the said plug connector or transmitted from the exterior of said shell to provide improved RF characteristics.

5,088,938

TERMINAL LOCKING BLOCK FOR ELECTRICAL CONNECTORS

Yoshihiro Murakami, and Takayuki Yamamoto, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 11, 1990, Ser. No. 522,002

Claims priority, application Japan, May 29, 1989, 1-132796

Int. Cl.⁵ H01R 13/422, 13/436

U.S. Cl. 439—595

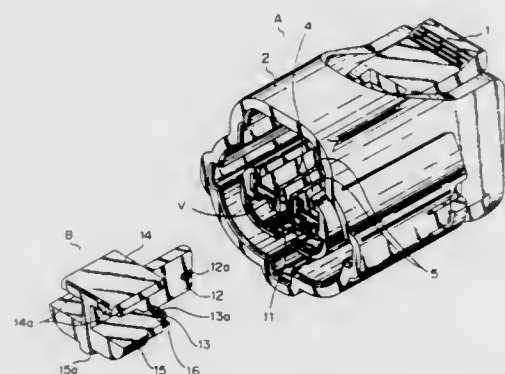
2 Claims

1. An electrical connector having a terminal locking block, comprising:

terminals adapted to be inserted into a connector housing from the rear thereof, said terminals each having a base portion and an engagement hole in the base portion;
said connector housing having terminal accommodating cavities, each of said cavities having a first engagement

projection formed on one of opposing wall surfaces of the cavity, the first engagement projection being adapted to engage said terminal fully inserted in a correct position; and

a terminal locking block adapted to be inserted into and locked to a front part of said connector housing at a preliminary locked position and at a full locked position, said terminal locking block having a preliminary locking plate and a flexible terminal locking plate, these two plates extending rearwardly in the terminal accommodating cavities, said preliminary locking plate having locking means for engagement with said connector housing, said flexible terminal locking plate having second engagement projections to engage the engagement holes of said terminals,



whereby when said terminals are not inserted into the terminal accommodating cavities said terminal locking block is attached to said connector housing by the locking means, and when said terminals are inserted into the cavities, front ends of said terminals abut an end of the flexible terminal locking plate to push said terminal locking block partly out of the terminal accommodating cavities, and when said terminals are fully inserted to the correct position a space is formed in the terminal accommodating cavities so as to allow the flexible terminal locking plate to be received rearwardly therein, and as said terminal locking block is pushed again into the terminal accommodating cavities the second engagement projections of the flexible terminal locking plate engage the engagement holes of said terminals, thus fully locking said terminal locking block into said connector housing.

5,088,939

ELECTRICAL ASSEMBLIES

Brian Shepherd, Wendover, England, assignor to Smiths Industries Public Limited Company, London, England
Filed May 31, 1990, Ser. No. 531,314

Claims priority, application United Kingdom, Jun. 30, 1989, 89 15060

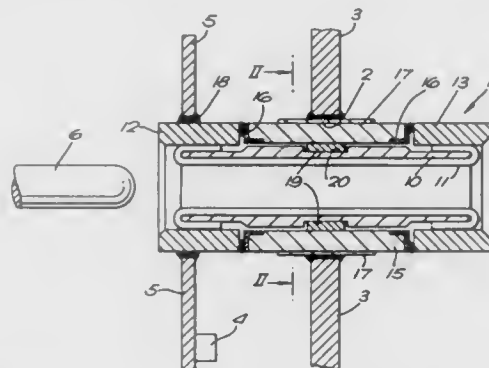
Int. Cl.⁵ H01R 13/66

U.S. Cl. 439—620

6 Claims

1. An electrical assembly for making connection with a plurality of pin elements, the assembly comprising: a ground plane member, a plurality of socket members, and means mounting each socket member with and extending through the ground plane member, each socket member being shaped to receive a respective one of the pin elements, each socket member including within it capacitor means, an inductive element, and a plurality of spring wire elements disposed around the socket member and extending obliquely of the axis of the socket member, the spring wire elements making resilient sliding contact around a surface of a respective pin element inserted in the socket member at least at opposite ends of the socket member, and the spring wire elements making electrical contact with opposite ends of the capacitor means, the ground plane member making electrical connection with the capacitor means intermediate its ends so as to form two capacitor ele-

ments of a π filter circuit, the inductive element being located between opposite ends of the capacitor means, and each pin



element being so shaped that it can be slid into and out of the assembly without disturbing others of the pin elements.

5,088,940

ELECTRICAL JUNCTION DEVICE

Takahiro Saito, Kosai, Japan, assignor to Yazaki Corporation, Tokyo, Japan

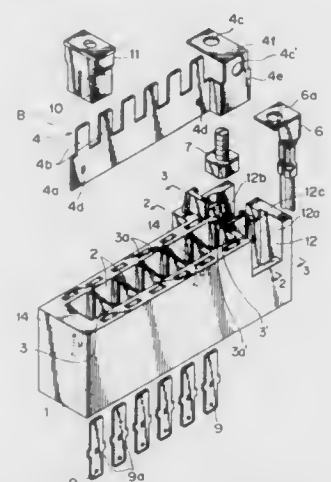
Filed Oct. 12, 1990, Ser. No. 596,187

Claims priority, application Japan, Oct. 24, 1989, 1-123588[U]

Int. Cl.⁵ H01R 13/68

U.S. Cl. 439—621

5 Claims



1. An electrical junction device comprising:
a joint terminal member having an elongate and vertically extending common base, a plurality of terminals extending vertically from said common base to be connected to mating terminals, and a connecting portion formed integrally with said common base at a longitudinal end thereof and having a first terminal receiving portion extending transversely to the common base and a second terminal receiving portion extending in parallel to the common base to be connected to an external wire;
an electrical insulating housing having a plurality of terminal receiving chambers opening at tops thereof to accommodate said joint terminal member vertically therein and partitioned by partition walls each having a slit to receive said common base vertically therein at the top of the housing, said terminal receiving chambers being arranged in a row in correspondence with said plurality of terminals of said joint terminal member;
said electrical insulating housing provided further with a connecting portion receiving portion formed at a longitudinal end of said row to receive said connecting portion of said joint terminal member, said connecting portion re-

ceiving portion having a recess extending vertically thereto to receive therein a substantial part of fastening means for connecting said first terminal receiving portion to the external wire and another recess extending horizontally thereto to receive therein a substantial part of fastening means for connecting said second terminal receiving portion to the external wire; and

means to secure said joint terminal member within said terminal receiving chambers of said electrical insulating housing when the joint terminal member is insertedly fitted into the housing from its top, securement produced by said means to secure also effecting the fixing of the above-mentioned fastening means to the connecting portion receiving portion via the joint terminal member being fixed to the housing.

5,088,941

DEVICE FOR CONNECTING CONDUCTORS TO BATTERY POSTS AND THE LIKE

Günther Nölle, Lörrach-Hausingen, Fed. Rep. of Germany, assignor to Auto-Kabel Hausen GmbH & Co. Betriebs - KG, Hausen im Wiesental, Fed. Rep. of Germany

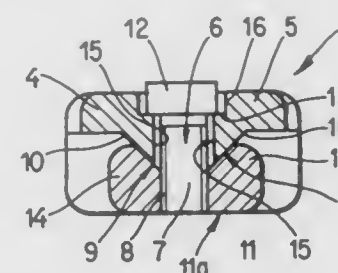
Filed Apr. 3, 1991, Ser. No. 679,744

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1990, 4011378

Int. Cl.⁵ H01R 11/26

U.S. Cl. 439—762

25 Claims



1. A connector for separably securing at least one conductor to a terminal, particularly for securing at least one electric cable to a battery post, comprising two jaws having neighboring first portions, second portions movable relative to each other and defining a gap of variable width, and third portions disposed between the respective first and second portions and being movable relative to each other and defining a variable-size terminal-receiving opening having a first axis and communicating with said gap; and means for varying the size of said opening and the width of said gap, including a cam member and a follower member, said members cooperating with the second portions of said jaws, and means for moving said members relative to each other including a threaded element having a second axis which is substantially parallel to said first axis, said members having complementary surfaces which make with said second axis an oblique angle and move said members relative to each other in response to rotation of said threaded element to thereby move the second and third portions of said jaws relative to each other with attendant changes of the width of said gap and the size of said opening.

5,088,942

CLOSED ENTRY SOCKET CONTACT ASSEMBLY

David E. Welsb, Tustin, and David Rofer, Fountain Valley, both of Calif., assignors to ITT Corporation, New York, N.Y.
Continuation of Ser. No. 578,981, Sep. 7, 1990, abandoned. This application Jul. 15, 1991, Ser. No. 729,916

Int. Cl.⁵ H01R 13/187

U.S. Cl. 439—843

11 Claims

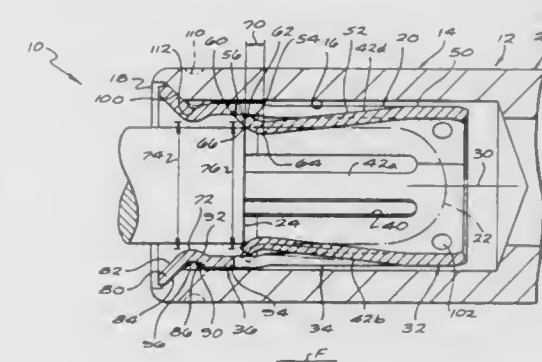
1. A socket contact assembly comprising:
an electrically conductive seamless barrel having a wire-terminating rear portion and having a front portion with a

front end, said front portion having walls forming a cylindrical cavity that is open at said front end;

a clip formed of a sheet of metal rolled into a cylindrical shape about an axis and lying in said cavity, said clip having a rearward portion, a plurality of tines extending forwardly from said rearward portion with said tines having free forward tips, and a forward portion lying forward of said tine tips;

each tine having a middle part extending primarily forward but with a radially inward-forward directional component, and each tine having a forward part extending with a radially outward-forward directional component and ending in one of said tips, said tips having radially inner and outer edges, and said tip inner edges lie on a first imaginary circle centered on said axis;

said barrel cavity walls being seamless and lying closely around said clip forward portion to prevent its expansion and to protect said clip during handling of said contact



assembly, and said clip forward portion presses against said cavity walls to securely hold said clip in said cavity; said clip forward portion forming a closed entry region that has an inside diameter at least as small as said first imaginary circle on which said tip inner edges lie as said clip forward portion presses against said barrel cavity walls; said sheet metal clip forward portion includes a flared front part with radially inner and outer surfaces that are both tapered in a radially inward-rearward direction, and said flared front part has a rear end with a smaller inside diameter than the diameter of said first imaginary circle which lies on said tip inner edges; said clip forward portion also including a middle part extending rearwardly from said rear end of said flared front part with said middle part having radially inner and outer surfaces that are both tapered in a radially inward-rearward direction, the inner surface of said forward portion forming said closed entry region at an intersection between said flared front part and said tapered middle part.

5,088,943

PARK FUNCTION FOR A STEERED TROLLING MOTOR

William A. Henderson, Starkville, Miss., assignor to Zebco Corporation, Tulsa, Okla.

Filed Jul. 24, 1990, Ser. No. 557,476

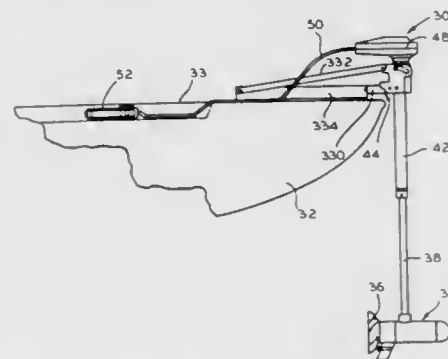
Int. Cl.⁵ B60L 11/02

U.S. Cl. 440—6

18 Claims

1. A trolling motor system comprising:
a trolling motor including a propeller;
means for mounting the trolling motor to a boat for rotation about an axis to effect steering of the boat, said mounting means including a means for moving said trolling motor between an operative position and a stowed position;
means for sensing position of said trolling motor;
electrically operable steering means coupled to said sensing means and mounted to said mounting means for steering

said trolling motor and including park control means for automatically operating said steering means to rotate said



trolling motor to a select stowed steering position if said motor is not in the operative position.

5,088,944

COLLAPSIBLE WATER BIKE

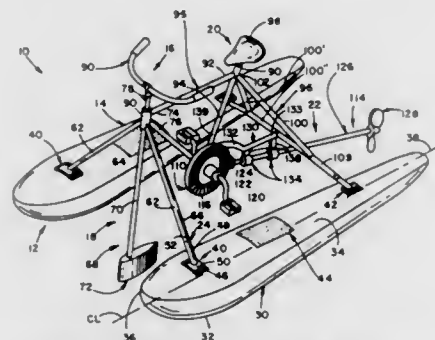
Simon Kats, 46 Hapalmach St., G'Vataim, Israel 53406

Filed Nov. 5, 1990, Ser. No. 608,982

Int. Cl.⁵ B63H 16/20

U.S. Cl. 440—26

1 Claim



1. A collapsible water bike consisting entirely of:
 - A) a pontoon assembly which includes
 - (1) two identical pontoons, each having a top surface and a bottom surface, sides and a longitudinal centerline which extends between a fore and an aft end, with the bottom surface being curved,
 - (2) a forward mounting bracket and a rear mounting bracket mounted on said top surface near said fore end and said aft end respectively, each mounting bracket being located on said pontoon longitudinal centerline and including
 - (a) a mounting base fixed to said pontoon top surface,
 - (b) an upstanding tubular body having a first end fixed to said mounting base and a female end spaced above said mounting base,
 - (c) said forward mounting bracket tubular body being angled toward one of said pontoon sides and said rear mounting bracket tubular body being angled toward said pontoon fore end, and
 - (d) a non-skid pad mounted on said pontoon top surface between said forward and rear mounting brackets;
 - B) a front frame assembly which includes
 - (1) a head tube,
 - (2) two identical support tubes, each having one end attached to said head tube and being angled to diverge away from each other away from said head tube and each having a male end connected to the female end of one of said forward mounting brackets,
 - (3) a cross bar receiving element mounted at one end on said head tube and extending toward said pontoon aft ends and having a female end spaced from said head tube,
 - (4) a downtube mounting bracket mounted at one end

thereof on said head tube and having a male end spaced from said head tube toward the aft end of said pontoons, and

- (5) a cross bar having a first male end connected to the female end of said cross bar receiving element and a second male end spaced from said cross bar receiving element toward said pontoon aft ends;
- C) a steering assembly mounted on said head tube and including
 - (1) a rod attached at one end to said head tube and a rudder attached at the other end of said rod, and
 - (2) a handle bar assembly mounted on said head tube and including
 - (a) a handle bar mounting rod mounted on said head tube and connected to said steering assembly rod, and
 - (b) a handle bar unit mounted on said handle bar mounting rod to rotate said steering assembly rod when said handle bar unit is rotated;
- D) a seat assembly which includes
 - (1) a seat post having a cross bar receiving element attached at one end thereof to said seat post and having a female end attached to said cross bar second male end,
 - (2) a seat mounted on said seat post,
 - (3) a unitary seat tube connected at one end thereof to said seat post and having a male end spaced from said seat post,
 - (4) a triangular seat supporting frame which includes
 - (a) three identical legs which are connected together to form an equilateral triangle with a top apex connected to said seat post, said triangular seat supporting frame being in a plane that extends downwardly from said seat post and rearwardly towards said pontoon aft ends,
 - (b) an extension tube on each of the other two apexes of said triangle, with each extension tube extending outwardly of said triangle and which having a male end thereon attached to the female end of one of said rear mounting brackets, and
 - (c) a bracket arm attached at one end thereof to one of said triangle legs and extending toward said pontoon fore end and having a female end spaced from said triangle leg, said bracket arm having a first bearing element attached thereto;
- E) a propulsion assembly which includes
 - (1) a support element attached at a male end thereof to the female end of said bracket arm,
 - (2) a mounting bracket attached at one end to said support element and having a female end connected to the male end of said seat tube,
 - (3) a second bearing element dependently connected to said support element,
 - (4) a driver gear rotatably attached to said down tube mounting bracket and to said propulsion assembly mounting bracket, and having two identical L-shaped crank arms attached thereto and foot pedals attached to each of said L-shaped crank arms to rotate said driver gear, said driver gear having gear teeth thereon,
 - (5) a driven gear meshed with said driver gear teeth to be rotated by said driver gear, and
 - (6) a drive shaft connected at one end to said driven gear and being supported by said first and second bearings and having a propeller attached at a second end thereof to rotate as said driven gear rotates; and
- F) a connecting assembly connecting each male end to an associated female end, each connecting assembly including
 - (1) an annular shoulder on the male end,
 - (2) a projection on the male end extending out of said annular shoulder,
 - (3) a longitudinal bore defined in the female end, said longitudinal bore being sized to snugly receive said male end projection,
 - (4) a male end transverse bore in the male end and extending through said projection,
 - (5) a female end transverse bore intersecting said female end longitudinal bore on diametrically opposite sides thereof,

said male end transverse bore being located and sized to be aligned with said female end transverse bore when said projection is received in said female end longitudinal bore, and

- (6) a chain connecting cotter pin to said female end.

5,088,945

MARINE PROPULSION UNIT

Akibiro Onoue, Hamamatsu, Japan, assignor to Sanshin Kogyo

Kabushiki Kaisha, Hamamatsu, Japan

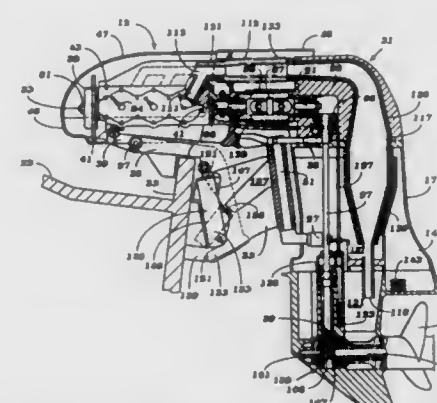
Filed Oct. 25, 1990, Ser. No. 604,583

Claims priority, application Japan, Oct. 25, 1989, 1-276074

Int. Cl.⁵ B63H 5/12

U.S. Cl. 440—61

24 Claims



1. A marine propulsion unit for attachment as a unit to the transom of watercraft comprising: clamping means for affixing said unit to the transom, a swivel bracket pivotally connected to said clamping means for pivotal movement about a horizontal axis disposed forwardly of the transom when attached thereto, an internal combustion engine carried by said swivel bracket and extending in substantial part forwardly of the transom, said engine driving a horizontally disposed first driveshaft extending rearwardly from the transom, a driveshaft housing carried by said swivel bracket for pivotal movement about said horizontal axis and journaling a second driveshaft for rotation about a generally vertically extending axis and positioned a substantial distance aft of the transom, means for driving said second driveshaft from said first driveshaft, and propulsion means at the lower end of said driveshaft housing and driven by said second driveshaft for propelling the watercraft.

5,088,946

MARINE PROPULSION UNIT

Manabu Nakayama, Hamamatsu, Japan, assignor to Sanshin

Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 25, 1990, Ser. No. 604,584

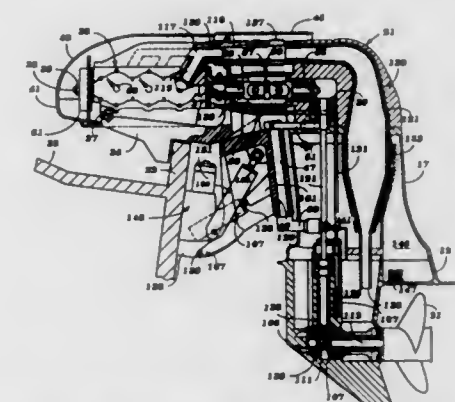
Claims priority, application Japan, Oct. 25, 1989, 1-276073

Int. Cl.⁵ B63H 5/12

U.S. Cl. 440—61

18 Claims

1. A marine propulsion unit for attachment as a unit to the transom of a watercraft comprising: clamping means for affixing said unit to the transom, an internal combustion engine carried by said clamping means and positioned substantially entirely forwardly of the transom when attached thereto, a first driveshaft driven by said engine and extending rearwardly from the transom, a driveshaft housing pivotally connected to said clamping means rearwardly of said transom for movement about a horizontal axis disposed rearwardly of said transom and journaling a second driveshaft for rotation about a gener-



ally vertically extending axis, means for driving said second driveshaft from said first driveshaft, and propulsion means at

5,088,947

FUEL TANK VENT

Warwick M. Whitley, II, Lynn Haven, Fla., and Clifton J.

Ratza, Grand Rapids, Mich., assignors to Attwood Corpora-

tion, Lowell, Mich.

Continuation-in-part of Ser. No. 308,558, Feb. 2, 1989, Pat. No.

4,877,152. This application Oct. 26, 1989, Ser. No. 427,750

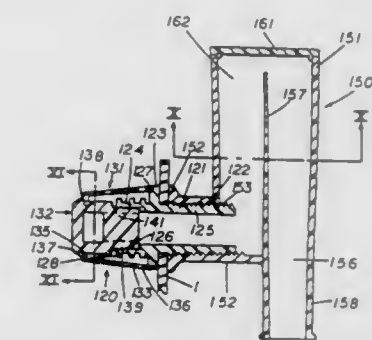
The portion of the term of this patent subsequent to Oct. 31,

2006, has been disclaimed.

Int. Cl.⁵ B65D 25/02

U.S. Cl. 440—88

13 Claims



1. In a fuel tank for a marine vessel in which a member is provided to extend through an opening in the hull of said vessel; said member having an inner end adapted to be located inside said hull and an outer end adapted to be located outside said hull and an opening extending therethrough providing communication between the inner and outer ends of said member with means for securing said member to said hull in said opening, the improvement comprising:

a housing adapted to be located inside said hull and having an open lower end and a closed upper end and a first chamber communicating with said opening in said member; said housing being arranged at an angle to said member; and said housing having a second chamber open at both of its ends communicating with said first chamber at a position short of said closed upper end; means associated with said second chamber for connection to a hose leading to a fuel tank; and means at the lower end of said housing for providing said communication between said first chamber and said opening in said member whereby air and fumes vented from said tank are required to pass upwardly through said second chamber and then downwardly through said first chamber and into the opening of said member.

5,088,948

BUOYANT BEVERAGE CONTAINER FOR SWIMMING POOL USE

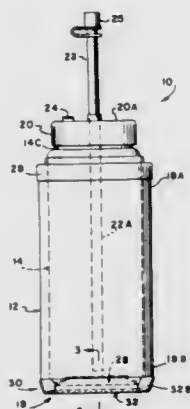
Robert S. Scheurer, 1627 Midwestern Pkwy., Wichita Falls, Tex. 76302

Filed Sep. 5, 1990, Ser. No. 577,868

Int. Cl.⁵ B63B 22/00

U.S. Cl. 441-1

41 Claims



1. A beverage container assembly which is adapted to float upright in a swimming pool comprising, in combination:
 - a tubular sidewall of buoyant material;
 - a beverage container having a tubular sidewall, a closed bottom panel and a closure cap adapted for dispensing a beverage, said beverage container being received within said tubular sidewall;
 - a ballast housing assembly including a bottom cap and a retainer cap;
 - said bottom cap having a base plate and a collar attached to said base plate, said collar projecting transversely with respect to said base plate;
 - said retainer cap being secured to said bottom cap and having a retainer plate axially spaced with respect to the base plate thereby defining a ballast chamber, said retainer cap having an annular flange attached to the base plate, said annular flange being radially spaced with respect to said collar, thereby defining an annular pocket therebetween;
 - a ballast body disposed in the ballast chamber; and,
 - the tubular sidewall of buoyant material being received within the annular pocket and secured to said ballast housing assembly.

5,088,949

OSCILLATION-DRIVEN VEHICLE

Virgil Atkinson, 605 S. Derrick St.; William G. Owens, Jr., and William G. Owens, III, both of Box 325, all of Dahlonega, Ga. 30533

Filed Jan. 11, 1991, Ser. No. 639,875

Int. Cl.⁵ A63H 11/02, 1/00, 17/00, 33/00

U.S. Cl. 446-3

22 Claims



1. A vehicle, comprising:
 - a) a rigid longitudinal body having a bottom surface engaging the ground and having spaced first and second ends along a longitudinal axis;
 - b) said bottom surface is convex as viewed along a direction substantially transverse to a longitudinal axis of the vehi-

cle and establishing an essentially localized contact area between said body and the ground to thereby permit said body to rotate about said contact area; and

- c) means mounted adjacent one of said first and second ends and connected to said body for generating vibratory motions having horizontal and vertical force components, thereby vibrating said body and causing said body to rotate about said contact area;
- d) whereby the vibratory motions generated by said generating means periodically rotate and propel the vehicle forward.

5,088,950

HIGH FLUID CAPACITY BRUSHES AND BUBBLE BLOWING SYSTEM

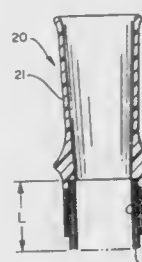
John E. LaFata, Oxnard, Calif., assignor to Toy Orginators, Inc., Oxnard, Calif.

Filed May 14, 1990, Ser. No. 522,742

Int. Cl.⁵ A63H 33/28; A46B 11/00

U.S. Cl. 446-19

3 Claims



1. A brush for attracting and retaining high volumes of bubble-forming solution and for permitting said retained bubble-forming solution to be separated therefrom by an air stream blown through said brush to form a plurality of bubbles, said brush comprising, in combination:

- (a) a base member comprising an elongate, hollow, open-ended, generally tubular member whose cross-sectional configuration defines an endless wall;
- (b) a plurality of closely spaced, generally parallel, flexible bristles of substantially equal length secured at one end to said base member and projecting therefrom in a hollow tubular array of substantially constant external diameter and comprising a coaxial extension of said tubular base member, said bristles having their free ends terminating in a common first plane substantially normal to said bristles and spaced from said base member; and,
- c) a hollow tubular sleeve having an inside diameter greater than said substantially constant external diameter of said hollow tubular array of bristles, said hollow tubular sleeve having one end secured to said base member and its opposite free end spaced from said base member and terminating in a second plane substantially parallel to said first plane and intermediate said base member and said first plane so that said free ends of said bristles project slightly beyond said free end of said sleeve, said sleeve substantially surrounding the portions of said bristles proximate to said base member and being slightly spaced from said bristles throughout the entire length of said sleeve;

whereby, when the free ends of said bristles projecting beyond said free end of said sleeve are dipped into a fluid body of bubble-forming solution, the bubble-forming solution is drawn upwardly between said bristles by capillary action and is retained therein and in the region between the inner surface of said sleeve and the outermost ones of said bristles most proximate to said sleeve, and whereby an air stream projected axially through said tubular base member, said tubular bristle array and said tubular sleeve serves to separate at least a portion of the bubble-forming solution retained by said bristles from said bristles so as to permit formation and projection of a plurality of bubbles.

5,088,951

BUILDING BLOCK SYSTEM MAGNETIC

Joel Majurinen, Espoo, Finland, assignor to Insinööri Oy, Helsinki, Finland

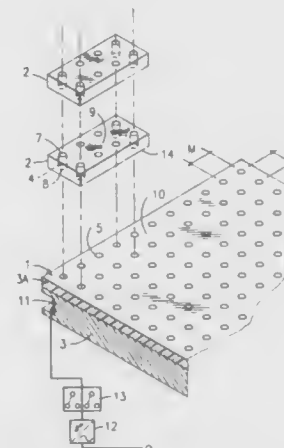
Filed Nov. 7, 1990, Ser. No. 610,411

Claims priority, application Finland, Nov. 8, 1989, 895317

Int. Cl.⁵ A63H 33/04, 33/06, 33/26

U.S. Cl. 446-91

9 Claims



1. A building block system comprising:

- a base plate comprising;
- a magnetizable metal core;
- a plurality of joining elements comprised of metallic material attached to said core and disposed from one another by a modular measure, said joining elements having a surface which lies farthest from said core,
- non-magnetic isolating material attached to and covering said core, said isolating material having a surface distal said core, such that said surface of said joining elements of said base plate is flush with said surface of said isolating material and said surface of said joining elements of said base plate create a smooth surface throughout;
- a means for electrically magnetizing said core and said joining elements of said base plate; and
- a plurality of building blocks, each block having a first surface and at least one joining element that extends to said first surface of said building block.

5,088,952

INFLATABLE AIR-HOVERABLE TOY HAVING STEMS FOR SPINNING

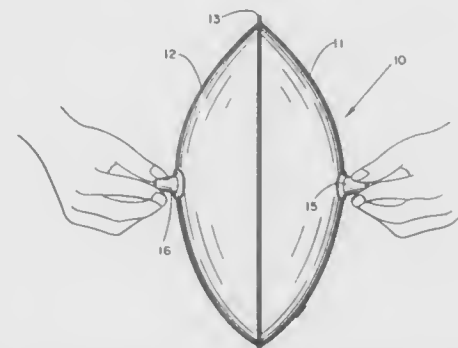
Robert L. Goldblatt, 1831 Selby #201, Los Angeles, Calif. 90025

Filed Jun. 6, 1991, Ser. No. 711,206

Int. Cl.⁵ A63H 3/06, 1/00

U.S. Cl. 446-220

4 Claims



1. For a lighter-than-air gas inflatable hoverable toy having a pair of substantially identical silvered Mylar panels, each

panel having a center, said panels sealed together along their edges to form an envelope for receiving lighter-than-air gas in the interior of the envelope, the improvement comprising:

- a pair of rigid lightweight stems, each stem having two ends and attached at one end to and extending outward from the center of each of said panels, said stems being lightweight to allow the toy to be buoyant when the envelope is filled with lighter-than-air gas and to provide ballast, said stems being grasped by a user's fingers for spinning the toy about an axis defined by a line between the center of said stems to cause the toy to freely move aerodynamically in response to the spinning action when the stems are released.

5,088,953

GRAVITY ACTIVATED WALKING TOY

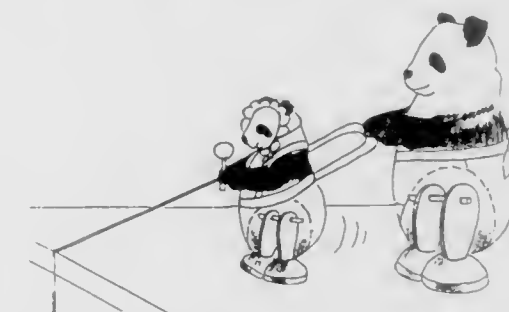
Robert Richman, 2625 S. Atlantic Ave., 8 N. E., Daytona Beach, Fla. 32118

Filed Jan. 10, 1991, Ser. No. 639,346

Int. Cl.⁵ A63H 13/00, 15/02

U.S. Cl. 446-351

6 Claims



1. A gravity actuated walking toy for use on an elevated flat horizontal surface comprising:

- a) at least one simulated animal and an object comprising a walking unit, said walking unit further comprising a smaller animal with arms holding onto an element and
- b) an elongated cord affixed at one end to said walking unit at said element so that the cord will hang over one edge of said elevated flat horizontal surface, and
- c) said object comprising a simulated conveyance with a walking assembly contained therein, said walking assembly comprising a horizontal shaft with a pair of depending legs, the legs in contact with the surface thereby supporting the simulated conveyance, the object connected to the simulated animal so that the animal appears to be pushing the object,
- d) a weight affixed to another end of said elongated cord to be pulled by gravity, causing said walking unit to move said toy across said elevated flat horizontal surface, until an edge of said elevated flat horizontal surface is reached, in which case the angle of said cord will be changed from a generally horizontal angle into a generally vertical angle stopping the walking movement of said toy.

5,088,954

MANUALLY ASSISTED AND CONTROLLED WALKING DOLL

Rouben T. Terzian, Chicago, and Donald A. Rosenwinkel, Oak Park, both of Ill., assignors to Breslow, Morrison, Terzian & Associates, Inc., Chicago, Ill.

Filed Jan. 25, 1991, Ser. No. 646,167

Int. Cl.⁵ A63H 11/18

U.S. Cl. 446-355

8 Claims

1. A doll comprising in combination:
 - a torso having an upper neck end and a lower pelvic end;
 - the torso having a central axis extending through the upper neck end and the lower pelvic end;
 - a head carried by the torso adjacent the upper neck end;

a pair of legs carried by the torso adjacent the pelvic end; each of the pair of legs being connected for a walking simulating, alternating pivotal movement about an axis that intersects the central axis of the torso;

a pair of arms carried by the torso;

each of the pair of arms having a shoulder end and a hand end;

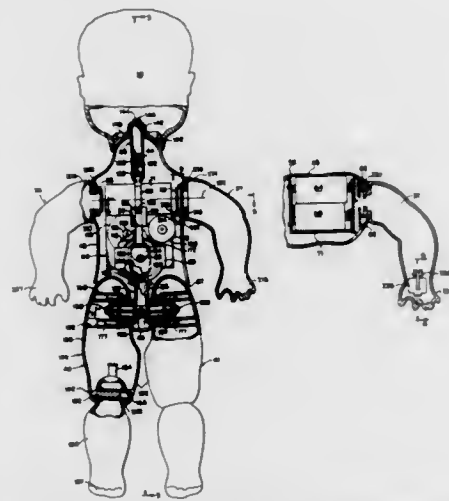
the shoulder end of each of the arms being mounted to the torso adjacent the upper neck end of the torso;

an electrically powered motor carried by the torso;

a battery power source for the motor carried within a doll;

a circuit between the battery powered source and the motor;

means within the torso connecting the motor and the legs for driving the legs in a walking simulating, alternating pivotal movement;



means for control of the driven movement of the legs actuable by user manipulation of the hand end of one of the arms, the control means operating to open and/or close the circuit between the battery power source and the motor;

means mounting the arms for rotational movement about an axis extending through the torso and shoulders, generally transverse to the central axis of the torso;

the control means being actuable upon rotation of one of the arms about the axis extending through the torso and shoulders; and

the control means including a switch carried by one of the hands.

5,088,955 SOUND EFFECT DEVICE FOR RADIO CONTROLLABLE TOY VEHICLE

Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1991, Ser. No. 669,505

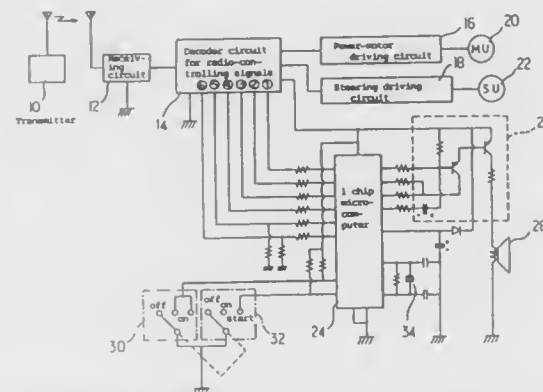
Claims priority, application Japan, Mar. 15, 1990, 2-62733
Int. Cl.⁵ A63H 17/34, 5/00

U.S. Cl. 446—409

4 Claims

1. A sound effect device built in a radio controllable toy vehicle which includes a receiver circuit for receiving radio control signals, a decoder circuit for decoding the received signals, a power-motor drive circuit and a steering drive circuit which respectively actuate a motor unit and a steering unit depending upon a signal delivered from said decoder circuit, said receiver circuit being electrically connected through said decoder circuit to said power-motor drive circuit and said steering drive circuit, and engine sound on/off switch, a starting switch for generating a starting signal, an amplifier, a speaker electrically connected to said amplifier, and a microcomputer; said engine sound on/off switch, said starting switch and said amplifier being electrically connected to said microcomputer; said microcomputer performing a processing

responsive to said starting signal for generating, in said speaker, various realistic sounds including engine sounds depending upon a driving condition of the toy vehicle on the basis of signals delivered from said decoder circuit and a posi-



tion of each of said switches, wherein said microcomputer generates a first engine sound responsive to said starting signal and varies said first engine sound responsive to said signals delivered from said decoder circuit.

5,088,956 METHOD AND DEVICE FOR THE FORMATION OF AN END CLOSURE ON A HOSE-TYPE PACKING WRAPPER

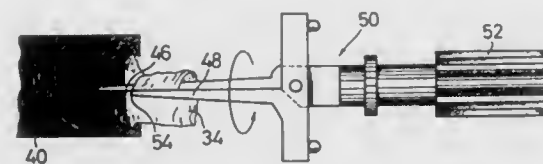
Günter Kollross, Am Wallerstädter Weg 20, W-6080 Gross Gerau-Dornheim, Fed. Rep. of Germany

Filed May 2, 1991, Ser. No. 694,303

Int. Cl.⁵ A22C 13/00, 11/12

U.S. Cl. 452—32

18 Claims



1. A method for forming a vent hole in a twisted plait of a hose-type packing wrapper such as a sausage skin which has been shirred to form a caterpillar comprising the steps of:

forming on an end of a shirred section of the packing wrapper to be closed an unshirred wrapper section extending axially outside of the shirred section;

introducing a first elongated winding element through the unshirred wrapper section into the shirred section;

seizing the unshirred wrapper section along an axial portion thereof with a second elongated winding element which moves in a radial direction toward the first winding element, the second winding element having a length less than the first winding element;

rotating the winding elements relative to the shirred section to form the twisted plait;

advancing the winding elements during the rotating step into the shirred section such that the twisted plait is generated within the shirred section in a manner progressing from a free end of the second winding element rearwardly; and

withdrawing of the winding elements from the shirred section and the twisted plait whereby the vent hole is formed by an opening left by the withdrawing of the first winding element.

5,088,957 METHOD FOR BUTCHERING A POULTRY CARCASS AND CUTS RESULTING THEREFROM

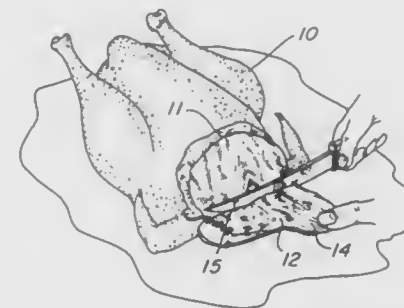
Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Designer Foods, Inc., Wilmington, Del.

Filed Sep. 24, 1990, Ser. No. 586,658

Int. Cl.⁵ A22C 21/00

U.S. Cl. 452—149

3 Claims



1. A method for butchering a poultry carcass to provide a wishbone cut comprising:

locating the breastbone on the outer surface of the poultry carcass;

making a first cut into the poultry carcass along a line generally perpendicular to the breastbone and between the breastbone and the wishbone to a depth sufficient to provide a desired thickness of the wishbone cut;

making a second cut into the poultry carcass along a line extending from the first cut generally parallel to the wishbone toward a point at which the wings join the wishbone while pulling the cut portion of the poultry carcass in a direction away from the breastbone;

cutting through said wing/wishbone joints; and

removing the severed portion of the chicken carcass which contains the wishbone.

5,088,958 APPARATUS FOR FILLETING FISH

Reinhard Evers, Jahnstr. 5, 2406 Stockelsdorf, and Werner Wenzel, Doberanweg 8, 2400 Lübeck, both of Fed. Rep. of Germany

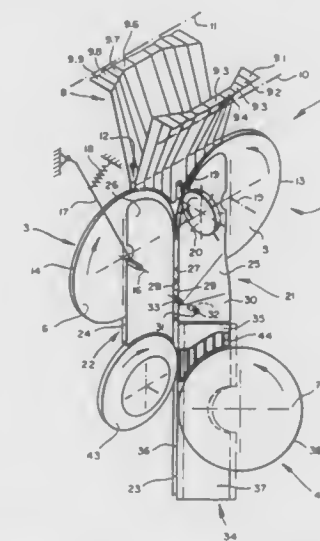
Filed Sep. 4, 1990, Ser. No. 577,681

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930195

Int. Cl.⁵ A22C 11/02

U.S. Cl. 452—162

15 Claims



1. An apparatus for severing muscle meat from the skeleton

of decapitated fish, conveyed against their normal swimming direction through said apparatus along a path of movement and having a vertebral column as well as belly spokes, back spokes and at least one of ribs and vertebral appendages extending from said vertebral column, said apparatus comprising

a) cutting tools provided with cutting edges for carrying out said muscle meat severing including

aa) at least first and second pairs of essentially parallel circular knives, each, for cutting free said belly spokes and said back spokes, respectively;

ab) at least one pair of third circular knives with cutting edges for cutting free said at least one of said ribs and said lateral vertebral appendages and arranged in a roof-like manner relative to each other to define a summit portion in the area of closest approximation of said cutting edges; and

b) guide means, which intrude into the incisions produced by said first and second pairs of knives, respectively, and wherein said guide means which include

ba) first guides penetrating into the incisions produced by said first pair of knives to cut free said belly spokes, and

bb) second guides penetrating into the incisions produced by said second pair of knives at both sides of said back spokes;

said cutting tools and said guide means being arranged along said path of movement such as to leave a gap for the passage of said vertebral column with said first pair of knives and said first guides positioned on a first side of said gap and with said second pair of knives and said second guides positioned on a second side of said gap;

wherein

c) said apparatus further comprises displacer means for controlling the position of said vertebral column with regard to said gap, which displacer means are arranged to follow said second guides on said second side of said gap a short distance upstream of said summit of said third knives, and to lie essentially flush with said second guides and, with their points closest to said passage, essentially at the level of said summit portions of said third knives lying adjacent to said gap; and

d) said guide means further include third guides arranged in the region of said third circular knives to oppose said displacer means and comprising guiding elements, which have guiding faces arranged parallel to respective inner faces of said third circular knives, said guiding faces being arranged to be displaced, in a first movement, parallel to the respective neighboring one of said third circular knives against spring force and to be controlled, in a second movement, to approach each other in a direction perpendicular to said inner faces of third circular knives.

5,088,959 METHOD FOR CAUSING SITTING POULTRY TO STAND UP AND APPARATUS FOR CARRYING OUT THIS METHOD

Wilhelmus J. C. Heemskerk, Leiderdorp, Netherlands, assignor to Meyn Machinefabriek B.V., Netherlands

Filed Jul. 10, 1989, Ser. No. 377,553

Claims priority, application Netherlands, Aug. 8, 1988, 8801969

Int. Cl.⁵ A22C 21/00

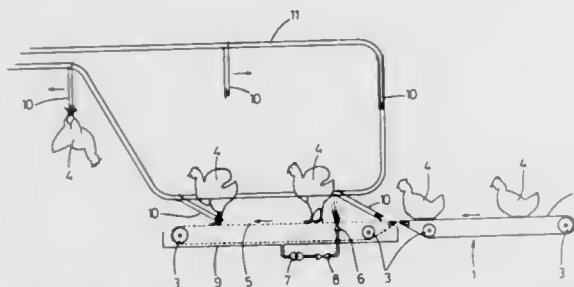
U.S. Cl. 452—183

16 Claims

1. A method for causing sitting poultry to stand for further processing thereof, said method comprising:

bringing the abdomen of a bird into contact with a liquid in

a fluid contacting area, and with a shallow liquid basin received therebeneath; and



inverting poultry so caused to stand, including gripping the legs of such poultry which become exposed whenever such poultry stands.

5,088,960

AIR BLAST FOR CLEANING AXIAL SEPARATOR

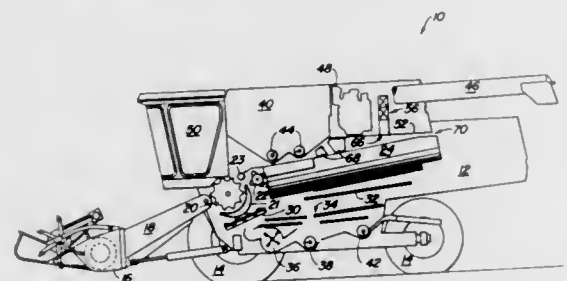
Mark F. Stickler, Silvis, and Michael D. Benhart, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 15, 1991, Ser. No. 669,787

Int. Cl.⁵ A01F 7/06, 12/54, 12/00

U.S. Cl. 460—80

12 Claims



1. An agricultural combine for harvesting a crop from a field, for threshing and separating the grain contained in that crop from straw and chaff, the combine comprising:
 - a supporting structure having ground engaging means for supporting and propelling the supporting structure;
 - a threshing means mounted on the supporting structure for threshing a harvested crop;
 - an axial separating unit that extends longitudinally within the supporting structure for separating the grain contained in a harvested and threshed crop from straw;
 - fan means for forming an air stream is located on the supporting structure;
 - duct work for directed the air stream to the top of the axial separator unit; and
 - apertures in the supporting structure for venting the top of the axial separator unit.

5,088,961

PATTERN PRESSURE-SENSITIVE BUSINESS FORM CONSTRUCTION

Kenneth S. Sprain, Sun Prairie, Wis., assignor to Uarco Incorporated, Barrington, Ill.

Filed Oct. 31, 1990, Ser. No. 607,247

Int. Cl.⁵ B32B 7/10; B42D 15/00

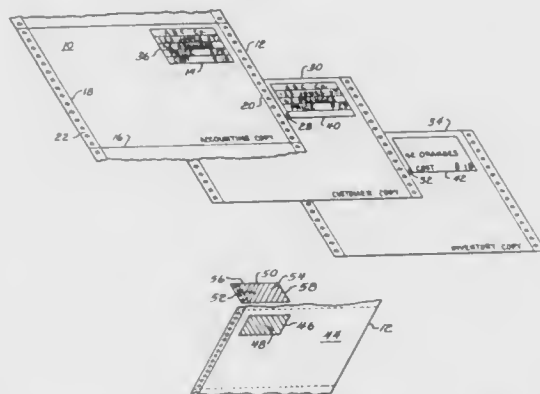
U.S. Cl. 462—2

10 Claims

1. A business form construction comprising:
 - a top sheet of face stock having a top surface with a portion thereof adapted to receive printed information and an opposed bottom surface having a pressure-sensitive adhesive applied to a section thereof, the portion of the top surface of the sheet having a first shape;
 - a sheet of release liner having a first surface and an opposed second surface, the first surface being removably adhered

to the pressure-sensitive adhesive on the bottom surface of the top sheet;

a bottom sheet of face stock having a top surface and an opposed bottom surface;



a marking means located between the second surface of the sheet of release liner and the top surface of the bottom sheet for creating a visible image on the top surface of the bottom sheet when the printed information is inscribed on the portion of the top surface of the top sheet, the marking means having a second shape.

5,088,962

CREDIT CARD TRANSACTION FORM SET

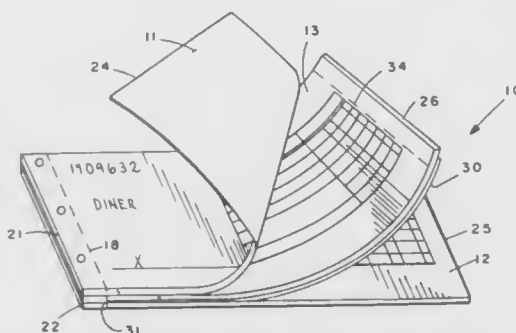
Larry G. McCartney, Buckhannon, W. Va., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,171

Int. Cl.⁵ B41L 1/20

U.S. Cl. 462—18

21 Claims



1. A credit card transaction form set comprising at least top, bottom, and a first middle transaction forms each having edges, including first and second opposite edges;
 - first attachment means for operatively attaching said forms together adjacent said first, overlying, edges of each;
 - first ready detachment means formed in each form on the opposite side of said first attachment means from said first edge thereof;
 - a transfer sheet disposed between said first middle and bottom forms for transferring information impressed on said top form to said bottom form;
 - second attachment means for attaching said transfer sheet to said first middle form adjacent said second edge thereof; and
 - second ready detachment means for allowing ready detachment of said transfer sheet from said first middle form, when desired.

5,088,963

DOCUMENT PREPARATION KIT

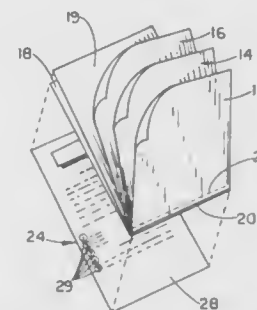
Sidney Goldston, 60 NW. 3rd St., Miami, Fla. 33101

Filed Apr. 18, 1991, Ser. No. 687,221

Int. Cl.⁵ B41L 1/20

U.S. Cl. 162—56

5 Claims



1. A document preparation kit, comprising:
 - a cover sheet including advertising indicia printed thereon, and further including instructional material thereon relating to the preparation and completion of the document;
 - a plurality of bound document forms disposed in overlying, stacked relation and attached along a common binding, each of said plurality of forms being individually detachable from said binding along a perforated seam,
 - said plurality of forms including a complete sample document having example entries printed in blank spaces thereon,
 - said plurality of forms further including a practice form having blank spaces thereon, wherein practice entries are made thereon by a user in accordance with said instructional material on said cover sheet,
 - said blank spaces on said practice form including reference numerals corresponding with matching numerals in said instructional material so as to identify each of said practice entries, and
 - said plurality of forms further including an original document form disposed in overlying relation to a duplicate form with a carbon transfer sheet disposed therebetween, wherein final entries are made in blank spaces on said original document with reference to said practice entries on said practice form, said final entries being transferred onto said duplicate form in corresponding locations thereon, thereby completing preparation of the document.

5,088,964

VISCOUS DAMPER ASSEMBLY FOR A FLYWHEEL ASSEMBLY INCLUDING FRICTION PLATES

Viktor Kuhne, Bopfingen, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 15, 1989, Ser. No. 452,687

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842154; Nov. 15, 1989, 3937957

Int. Cl.⁵ F16D 3/14, 3/66, 3/80

U.S. Cl. 464—68

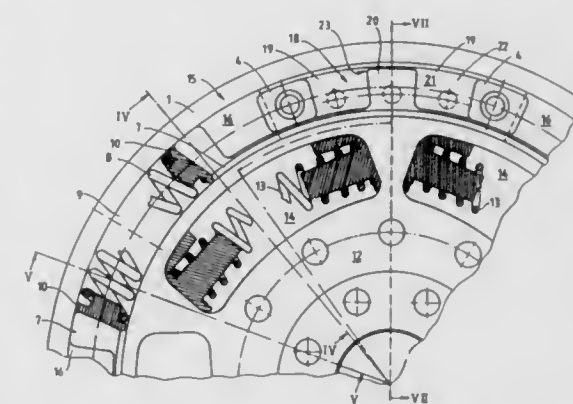
9 Claims

1. A disk-type elastic coupling usable in a multi-mass flywheel in the drive train of a motor vehicle with an internal combustion engine, wherein:

- (a) a first elastic coupling half constitutes a first mass and has at least two mutually opposing side disks which have a common axis defining an axial direction, and which form a liquid-tight inner space which can be filled with a damping fluid;
- (b) within the inner space is a second mass which is guided against axial displacement by the side disks and is connected to the first mass via first elastic means;
- (c) within the inner space is a third mass representing a second elastic coupling half and being connected to the second mass via second elastic means;
- (d) the three masses are connected in series in the direction of transmission of the engine force via the first and second

elastic means and are turnable to a limited extent with respect to each other;

- (e) at least one damping means for damping relative movement of said first and second masses comprises a plurality of fluid displacement chambers for said damping fluid which are arranged circumferentially in said inner space and said damping means is connected in parallel with the first elastic means;
- (f) the second mass has projections fixed thereon for rotation with it, each of them extending into one of the fluid displacement chambers;
- (g) said first elastic means comprises a plurality of elastic elements and each two adjacent projections form a pair of projections and enclose between them one of the elastic elements;
- (h) each two adjacent displacement chambers enclose between them a spring chamber;
- (i) each spring chamber has a greater inside diameter than the two adjoining displacement chambers in order to form an axial shoulder at each end of said spring chamber;



- (j) each elastic element is retained in its respective spring chamber by a pair of spring plates which rest against the axial shoulders so as to be movable into the spring chamber by respective adjacent projections, whereby said elastic elements retained between said spring plates are compressed by relative rotation of said first and second masses in a first direction; and said projections and fluid displacement chambers provide damping of relative rotation of said first and second masses in a second direction opposite said first direction; and
- (k) an additional damping means comprises an additional fluid displacement chamber, said additional fluid displacement chamber being at least partially defined by friction means comprising a pair of friction jaws secured to said first means, and means for applying an axial force to the two friction jaws within the additional fluid displacement chamber, which force presses said jaws against axial side surface of an additional projection on the outer region of the second mass for generating a frictional damping force.

5,088,965

RADIAL TENSIONER

R. Todd Swinderman, Kewanee, Ill., and Reinhard Brandl, Nieder-OLM, Fed. Rep. of Germany, assignors to Martin Engineering Company, Neponset, Ill.

Filed Apr. 23, 1991, Ser. No. 690,544

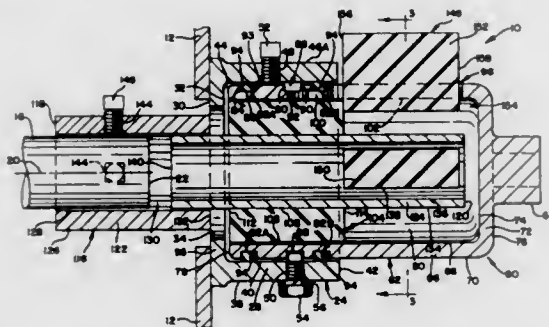
Int. Cl.⁵ F16H 7/08

U.S. Cl. 474—101

11 Claims

1. A tensioning device for imparting torsional bias to a support shaft which is rotatable with respect to a fixed frame including means for imparting torsional bias to the shaft, said biasing means including a first end, a second end and a center section, said center section extending radially between said first end and said second end; means for connecting said first end of said biasing means to the shaft for conjoint rotation

therewith; an actuator member selectively connectable to the fixed frame such that said actuator member is relatively repositionable with respect to the fixed frame; means for connecting said second end of said biasing means to said actuator member;



and means associated with said actuator member and the fixed frame for connecting said actuator member to the fixed frame after the torsional biasing force is imparted to the shaft, whereby repositioning of said actuator member is effective to impart a torsional bias to the shaft through said biasing means.

5,088,966

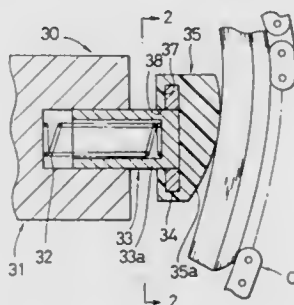
TENSIONER HAVING PAD MADE OF PLASTICS
Tadasu Suzuki, Kawagoe; Atsushi Kumakura, Tokorozawa, and Yuichi Futami, Iruma, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Oct. 29, 1990, Ser. No. 604,912

Claims priority, application Japan, Oct. 27, 1989, 1-125105[U] Int. Cl.⁵ F16H 7/08

U.S. Cl. 474-111

16 Claims



1. A tensioner for applying tension to an endless power transmission in the form of a chain, belt or the like comprising: a transmission-engaging element for directly contacting said transmission and applying tension thereto while permitting said transmission to move past said transmission-engaging element; a sliding element mounted for longitudinal movement along a line of movement extending toward said transmission-engaging element, said sliding element having an end located near said transmission-engaging element; means urging said sliding element along said line of movement in a direction toward said transmission-engaging element; and a pad made of plastics, secured to said end of the sliding element and urged into engagement with said transmission-engaging element by said urging means whereby said transmission-engaging element is urged against said transmission by said pad, in which the sliding element has a plate secured to said end located near the transmission-engaging element, the plate having front and rear faces, both substantially perpendicular to said line of movement, and in which said pad has a front face engageable with said transmission-engaging element, a rear face having an opening capable of receiving a portion of said sliding element, and a hollow interior space between said front and rear faces, said interior space having an opening facing in a lateral direction relative to said line of movement and being capable of receiving the plate so that the plate can be moved into said

interior space through said opening, whereby said pad can be attached to said plate by sliding the plate into said interior space.

5,088,967

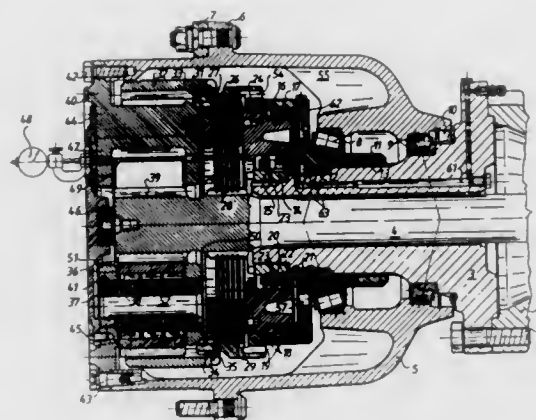
PLANETARY ASSEMBLY WITH WET DISK BRAKE
Andor Opitz, and Lóránt Tar, both of Győr, Hungary, assignors to Magyar Vagon- és Gépgyár, Győr, Hungary
Filed Jan. 3, 1991, Ser. No. 462,689

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1989, 3900075

Int. Cl.⁵ F16H 57/10; B60K 41/26

U.S. Cl. 475-107

15 Claims



1. A planetary assembly with wet disk brake, comprising a hollow spindle rigidly fixed to an axle housing of a running gear of a vehicle, a hollow wheel hub carrying a wheel of said vehicle, said wheel hub being rotatably supported in a roller bearing mounted to said spindle, an input axle-shaft passing through a bore in said spindle, a hollow ring gear support member arranged on a periphery of said spindle and being secured against angular displacement relative to said spindle; the ring gear support member having external and internal splines, a planetary mechanism including planetary gears connected to a sun gear, said planetary mechanism being linked with said input axle-shaft on an input side thereof and with said wheel hub on an output side thereof, said planetary mechanism further including a ring gear coupled in a torque transmitting way to said external splines of said ring gear support member, a retainer ring received in the ring gear and cooperating with a part of said ring gear support member for limiting a displacement of the ring gear relative to the ring gear support member in a first axial direction, a shoulder forming part of said ring gear and cooperating with a part of said ring gear support member for limiting a displacement of the ring gear relative to the ring gear support member in a second axial direction; said first and second axial directions being oppositely oriented, a wet disk brake assembly fully accommodated in said ring gear support member as a self-contained unit, said wet disk brake assembly comprising external splined disks, internal splined disks, a thrust disk, and a brake piston, said wet disk brake assembly being arranged so that said external splined disks and said thrust disk mesh with said internal splines of said ring gear support member, wherein said thrust disk bears axially against said ring gear support member, and said brake piston is guided in said ring gear support member in an axially displaceable and sealed way.

5,088,968

POWER TRANSMISSION FOR DRIVING VEHICLE
Yasuyuki Horii; Seiichi Takahashi, and Takeshi Imamura, all of Osaka, Japan, assignors to Knobota Ltd., Osaka, Japan

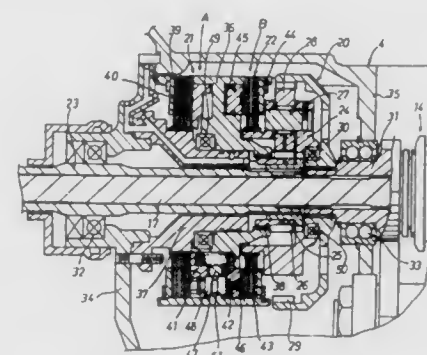
Filed Apr. 5, 1990, Ser. No. 505,727

Claims priority, application Japan, Apr. 14, 1989, 1-95488; Oct. 18, 1989, 1-272671; Nov. 13, 1989, 1-295697

Int. Cl.⁵ F16H 47/00

U.S. Cl. 475-124

12 Claims



1. Vehicular power transmission system comprising: a high/low speed change means (13) operatively positioned between an engine (2) and a speed change mechanism (14); said high/low speed change means (13) including a speed up line (A) having a speed up clutch (21) for transmitting overdriven engine rotations to the speed change mechanism (14) and a direct connection line (B) having a direct connection clutch (22) for transmitting unchanged engine rotations to the speed change mechanism (14); said speed up clutch (21) and direct connection clutch (22) being arranged axially at opposite sides of a partition wall (47) formed in a clutch body (36) rotatably positioned on a support case (37) for surrounding an input shaft (23); a pressure plate (41) of the speed up clutch (21) and a piston (46) of the direct connection clutch (22) operatively connected by an axially slidable connector (48) which penetrates through a through bore (51) formed in the partition wall (47); a spring (42) disposed between said partition wall (47) and said pressure plate (41) for urging the pressure plate (41) to be accessible to engage the speed up clutch (21); an oil chamber (45) formed in the clutch body (36) for effecting an oil pressure on the piston (46) to be accessible to engage the direct clutch (22), wherein the oil pressure exerts a force on the piston in an opposite direction as the force exerted by said spring on the pressure plate with; and a drain port (60) being formed in the clutch body (36) for releasing oil pressure in the oil chamber (45) to the exterior of the oil chamber.

5,088,969

BIFURCATED TRANSMISSION DRIVE
Heinrich Arndt, Augsburg, Fed. Rep. of Germany, assignor to Renk Tacke GmbH, Augsburg, Fed. Rep. of Germany
Filed Jan. 22, 1991, Ser. No. 644,256

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003173

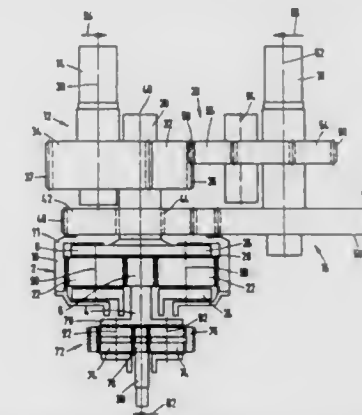
Int. Cl.⁵ F16H 1/42

U.S. Cl. 475-201

18 Claims

1. A bifurcated transmission drive, the drive including an input shaft, a first output shaft and a second output shaft, the drive further including a differential gear, the differential gear having an input element, a first output element and a second output element, the bifurcated transmission drive further including a first gear train drivingly interconnecting the first output element and the first output shaft and a second gear train drivingly interconnecting the second output element and

the second output shaft, the first gear train including a shaft, means fixing the first gear train shaft to the first output element, the second gear train including a first gear, means for positioning the first gear concentric with the first gear train shaft and for rotation relative to the first gear train shaft, means drivingly interconnecting the first gear with the second output



element, the bifurcated transmission drive further including a third gear train mutually interconnecting the first gear train with the second gear train whereby the first output shaft and the second output shaft may be driven without speed variations regardless of variations in the loads on the respective output shafts.

5,088,970

TIMING OF MULTIPLE GEAR TRAIN DIFFERENTIAL
James S. Dye, Walworth, N.Y., assignor to Zexel-Gleason USA, Inc., Rochester, N.Y.

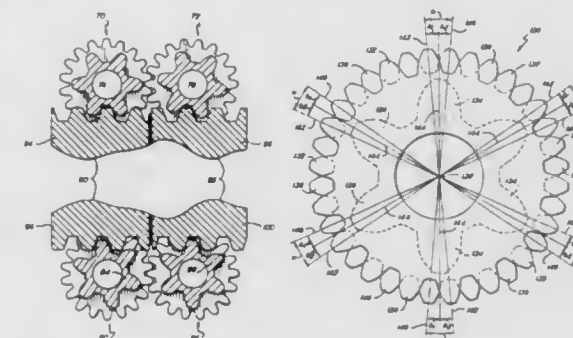
PCT No. PCT/US88/00853, § 371 Date May 25, 1990, § 102(e) Date May 25, 1990, PCT Pub. No. WO89/05933, PCT Pub. Dated Jun. 29, 1989, continuation-in-part of PCT/US87/03320, Dec. 18, 1987

PCT Filed Mar. 21, 1988, Ser. No. 460,131

Int. Cl.⁵ F16H 1/38, 1/44

U.S. Cl. 475-227

20 Claims



1. A differential gear assembly comprising: a rotatable gear housing (10) having means (16) for receiving axle ends (20 and 22); side gears (26 and 28) disposed within said housing (10) for respective rotation with said axle ends (20 and 22) about a common axis (15); pairs of combination gears (30, 120, or 130) rotatable about respective axes (112 and 114, or 138) that extend perpendicular to said common axis (15); each of said combination gears (30, 120, or 130) including a middle gear portion (32) with end gear portions (34) formed at either end thereof; the middle gear portion (42) of one member (40) of each combination gear pair in mesh with one of said side gears (26), the middle gear portion (52) of the other member (50) of each combination gear pair in mesh with the other side gear (28).

gear (28), and the end gear portions (44 and 46) of said one combination gear (40) of each pair operatively connected to the end gear portions (54 and 56) of said other members (50) of each pair;

each of said pairs of combination gears (30, 120, or 130), in part, defining a separate gear train for operatively connecting said side gears (26 and 28); and said middle gear portion (32) of each combination gear (30, 120, or 130) including "n" number of teeth, said end gear portions (34) of each combination gear (30) including "n_s" number of teeth, and said "n_a" number of teeth of said end gear portions (34) being equal to an integer multiple "k" of said "n" number of teeth of said middle gear portion (32) in accordance with the following mathematical expression:

$$n_s = k \cdot n$$

wherein "k" is an integer greater than one.

5,088,971

METHOD OF MAKING PROTRUDING END STOPS FOR PLASTIC RECLOSABLE FASTENER

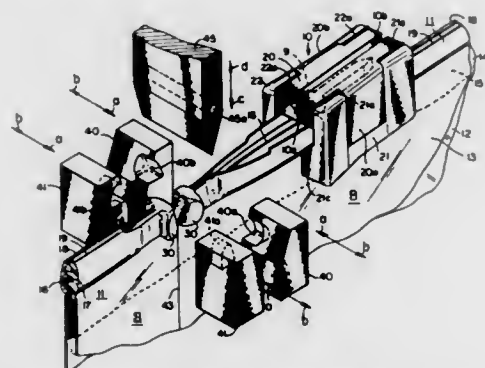
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 22, 1991, Ser. No. 674,649

Int. Cl.⁵ B31B 1/64, 49/04

U.S. Cl. 493—203

5 Claims



4. In the manufacture of thermoplastic bags from thermoplastic sheets having an opening with a reclosable fastener extending therealong including a slider for straddling the fastener for opening and closing the fastener, the fastener comprising a pair of flexible plastic strips connected to the walls of the bag and having reclosable interlocking male and female profile elements on the respective strips, the method of forming end stops for the slider comprising clamping together a pair of the flexible plastic strips between clamps at a seal area at the ends of the bag, the clamps having pockets therein adjacent the profile elements of the seal area, severing and heating the profile elements at the seal area with a heated knife to transform the severed ends of the profile elements into molten material and pressing the molten material into the pocket in the clamps thereby increasing the thickness of an area of the reclosable fastener adjacent the seal area to provide protruding end stops for preventing movement of the slider past the ends of the bag, wherein the pair of flexible plastic strips is clamped between two pairs of clamps and the heated knife comprises a two-piece knife moved transversely to the axis of the reclosable fastener in severing the profile elements, each piece of the knife thereafter being moved parallel to the axis of the reclosable fastener in opposite directions for pressing the molten material into the pockets in the respective clamps concurrently to form adjacent end stops.

5,088,972

FOLDING AND CRIMPING APPARATUS

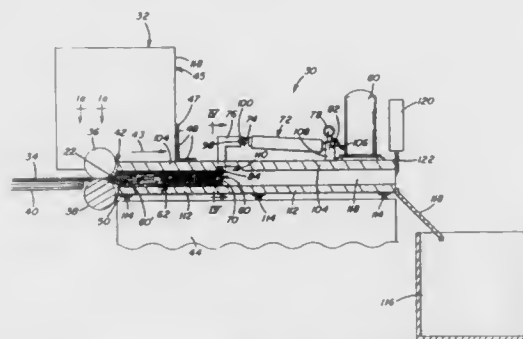
Johnny M. Parker, Vashon, Wash., assignee: Eco-Pack Industries, Inc., Kent, Wash.

Filed Nov. 2, 1989, Ser. No. 430,861

Int. Cl.⁵ B31F 1/00, 5/02, 1/12; B30B 15/08

U.S. Cl. 493—352

25 Claims



13. An improved apparatus for folding and crimping each elongate strip of a plurality of said elongate strips cut by a shredding device from sheet material, said shredding device comprising the type feeding means for simultaneously feeding said plurality of said elongate strips in a longitudinal direction when said elongate strips are extending in said longitudinal direction and adjacent said elongate strips are separated by a longitudinally extending gap therebetween, wherein the improved apparatus comprises:

- wall means for confining said elongate strips in an area adjacent to said feeding means;
- barrier means located adjacent to said feeding means for restricting movement of said elongate strips from said feeding means;
- said feeding means urging successive portions of said elongate strips against prior portions of said elongate strips restricted by said barrier means to cause folding and crimping of the cut sheet material into a resilient packing product; and
- means providing for movement of said barrier means to automatically provide and control metered release of said elongate strips having said succession of said folds from said area.

5,088,973

METHOD AND APPARATUS FOR FOLDING PRINTED/COATED SHEET MATERIAL

Wayne H. Bruce, 110 Whispering Water Way, Edgewater, Md. 21037; Howard A. Lewis, New Carrollton, and James R. Smith, Rockville, both of Md., assignors to Wayne H. Bruce, Edgewater, Md.

Filed Oct. 23, 1989, Ser. No. 424,751

Int. Cl.⁵ B31F 1/10; B31B 1/25

U.S. Cl. 493—396

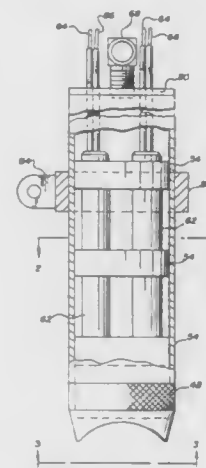
9 Claims

1. A web folding apparatus for coated webs in the form of sheet material having a coating thereon, scoring means for embossing said coated web along an intended line of fold, said scoring means being in the form of a rotary rule, the improvement comprising heating means for heating said rotary rule for tempering said coating on said sheet material for substantially preventing cracking of said coating, wherein said rule com-

prises an annular rule carried by a rotating collar, said heating means including a housing having a heat applying end, and said

to form successive stacks of manufactured articles from the folded pieces, said apparatus having:

longitudinal cutting means (9;109) for cutting the web into a plurality of longitudinal strips (S) lying in a feeding plane and moving in a feeding direction, said strips each having a width corresponding to one of the dimensions of the manufactured articles to be produced; said folding means including a plurality of devices (12;112) for longitudinally folding the respective strip;



heat applying end being shaped to clear said collar and to provide a slot for receiving said annular rule.

5,088,974

PROCESS FOR FACILITATING REMOVAL OF CLASSIFIED POWDERS

Bruce E. Novich, Lexington, Mass., assignor to Ceramics Process Systems Corporation, Milford, Mass.

Division of Ser. No. 36,325, Apr. 9, 1987, Pat. No. 4,882,088, which is a continuation-in-part of Ser. No. 28,891, Mar. 23, 1987, Pat. No. 4,781,671. This application Nov. 21, 1989, Ser. No. 439,793

Int. Cl.⁵ B01D 21/26

U.S. Cl. 494—37

6 Claims



1. A process for classifying colloidal material comprising:
 - (a) preparing a slurry comprising particles selected from the group consisting of metallic particles and ceramic particles and a polymeric dispersant employing a quantity of dispersant in substantial excess of that amount necessary for dispersion of the particles;
 - (b) introducing the slurry into a centrifuge means for classifying the particles, the centrifuge means including a bowl means for receiving classified particles; and
 - (c) removing the classified particles from the bowl means.

5,088,975

APPARATUS FOR THE PRODUCTION OF PAPER NAPKINS AND SIMILAR PRODUCTS

Mauro Ghilardi, Lucca, Italy, assignor to Pablo Perini S.p.A., Lucca, Italy

Filed Jun. 7, 1990, Ser. No. 536,155

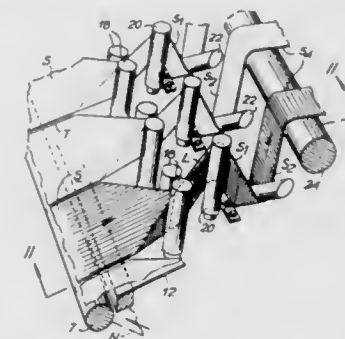
Claims priority, application Italy, Jun. 8, 1989, 9449 A/89

Int. Cl.⁵ B65H 45/08

U.S. Cl. 493—359

13 Claims

1. Apparatus for the production of paper napkins or other similar manufactured articles, including means for continuously feeding web material having undetermined length, folding means to longitudinally fold the web, transverse cutting means for cutting discrete pieces from the longitudinally folded web, means to fold said pieces transversely, and means



driving roller means (18,18,20; 118,118,120) downstream of said folding means (12;112) to align the two edges of the longitudinally folded strips; and inclined turning bars (22;122) downstream of said driving roller means (18, 18, 20; 118, 118, 120) to twist the longitudinally folded strips so that they lie on a common geometric plane intersecting the feeding plane along a line extending transversely to the feeding direction, with the directions of motion of the strips in parallel relationship to each other.

5,088,976

DEFORMABLE MAGNETIC FIELD AIDING COILS FOR USE IN CONTROLLING TISSUE GROWTH

Abraham R. Liboff, Birmingham, Mich., Stephen D. Smith, Lexington, Ky; Bruce R. McLeod, Bozeman, Mo., assignor to Life Resonances, Inc., Bozeman, Mo.

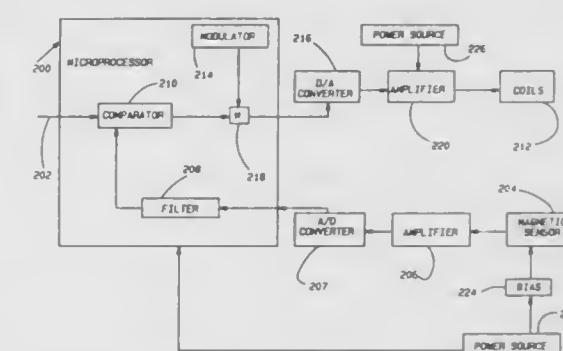
Continuation-in-part of Ser. No. 172,268, Mar. 23, 1988, Pat. No. 4,932,951. This application Dec. 5, 1988, Ser. No. 280,395

The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.

Int. Cl.⁵ A61N 2/04

U.S. Cl. 600—13

10 Claims



1. An apparatus for the regulation of in vivo tissue development, comprising:
 - a pair of deformable field coils for generating an applied magnetic flux in a predetermined space and parallel to a predetermined axis which projects through said predetermined space, said predetermined space being occupied by a portion of living tissue of a subject;
 - a field-sensing device for measuring both AC and DC mag-

netic flux density parallel to said predetermined axis in said predetermined space;
microprocessing means including means for oscillating said applied magnetic flux in communication with said field coils and said field-sensing device for creating and maintaining a predetermined relationship between the frequency of said magnetic flux and the intensity of said magnetic flux density to provide a fluctuating magnetic field which regulates the development of said living tissue; and
each of said field coils being enclosed in separate housings of deformable non-magnetic material, and said housings being shaped to correspond to the individual shape of the subject.

5,088,977

ELECTRICAL TRANSDERMAL DRUG APPLICATOR WITH COUNTERACTOR AND METHOD OF DRUG DELIVERY

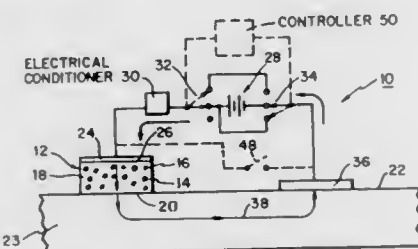
Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Filed Dec. 21, 1988, Ser. No. 287,348

Int. Cl.⁵ A61N 1/30

U.S. Cl. 604—20

7 Claims



1. A transdermal drug patch for delivering at least one drug to the bloodstream of a patient over an extended period of time comprising:

reservoir means for containing one or more therapeutic drugs to be applied to the bloodstream of a patient through the skin thereof, a source of DC potential having a return electrode connected to one polarity terminal thereof and said reservoir means connected to an opposite polarity terminal thereof forming an electrical series circuit when the reservoir means and return electrode are applied to the skin of the patient and interface therewith, means for operating the electrical circuit in different operational cycles to effect application of the therapeutic drug or drugs into the bloodstream of the patient through the skin by electrokinetic processes including electrophoresis and electro-osmosis in dependence upon the drug to be administered to the patient, and for at the same time electrically and electrochemically maintaining the negative surface charge density of the blood vessel walls and blood cells of the patient and effecting vasodilation of the vascular system of the patient at least in a region where the transdermal patch is attached to the skin of the patient.

5,088,978

APPARATUS AND METHOD FOR IONTOPHORETIC TRANSFER

Robert S. Hillman, and John M. Pawelchak, both of San Diego, Calif., assignors to Gensia Pharmaceuticals, Inc., San Diego, Calif.

Filed Jan. 26, 1990, Ser. No. 471,296

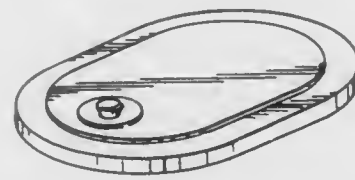
Int. Cl.⁵ A61N 1/30

U.S. Cl. 604—20

10 Claims

1. A transdermal iontophoretic drug delivery system for delivering an exercise stimulating agent comprising:
an electrode including
a metallic conductive element, and a gel reservoir, the gel

reservoir being disposed adjacent to the metallic conductive element, and
a gel disposed in the gel reservoir including a catecholamine



analog as an exercise stimulating agent, a viscosity-control agent comprising hydroxypropyl methylcellulose dispersed to form an aqueous sol with an antioxidant, a preservative, a chelator and a buffer.

5,088,979

METHOD FOR ESOPHAGEAL INVAGINATION AND DEVICES USEFUL THEREIN

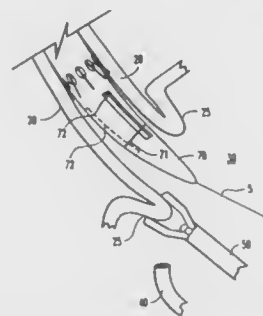
Charles J. Filipi, Marshalltown, Iowa; Tom R. DeMeester, San Marino, Calif.; Rebecca C. Gibbs, Burlington, N.C., and Ronald A. Hinder, Omaha, Nebr., assignors to Wilson-Cook Medical Inc., Winston-Salem, N.C.

Continuation-in-part of Ser. No. 595,977, Oct. 11, 1990. This application Nov. 2, 1990, Ser. No. 608,339

Int. Cl.⁵ A61M 37/00

U.S. Cl. 604—26

39 Claims



1. A method for invaginating the gastroesophageal junction of a patient, said method comprising the steps of:
introducing an invagination device transorally into the esophagus, the invagination device including an introducer guide and an engagement assembly; the introducer guide having an outside diameter approximating that of the esophagus; the engagement assembly including a plurality of needles, the needles having a retracted position in which the needles lie within the introducer guide, and an extended position in which the needles extend out of the introducer guide, projecting radially therefrom, the engagement assembly further including means for projecting the needles out of the introducer guide and into engagement with the esophagus in the vicinity of the gastroesophageal junction;

activating the engagement assembly to place the needles in their extended position in engagement with the esophagus in the vicinity of the gastroesophageal junction;
advancing the engaged invagination device toward the stomach to invaginate the gastroesophageal junction into the stomach, involuting the surrounding fundic wall;
introducing a remotely operable fastening assembly into the stomach and operating the fastening assembly to secure the invaginated gastroesophageal junction to the surrounding involuted fundic wall;
deactivating the engagement assembly to retract the extended needles from engagement and back into the needle-receiving lumens of the introducer guide; and

removing the invagination device and the fastening assembly from the body of the patient.

5,088,980

INTRA-URETHRAL VALVE WITH INTEGRAL SPRING

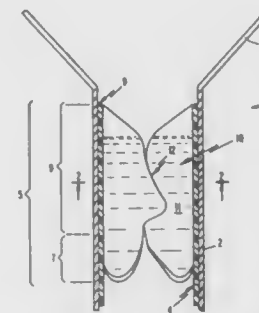
Stephen B. Leighton, Maplewood, N.J., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 31, 1990, Ser. No. 530,585

Int. Cl.⁵ A61F 2/02

U.S. Cl. 600—30

16 Claims



1. A prosthetic urethral sphincter valve comprising:
a rigid tubular casing means for positioning in a patient's urethra, said rigid tubular casing means having a longitudinal axis and a top end means for location adjacent and exposure to the patient's bladder; and
an elastic valve member located within said rigid tubular casing means which comprises an upper means which forms a central tubular passage which extends along the length of said rigid tubular casing means and is opened or closed depending on the alignment thereof, and a lower diaphragm means comprising a rolling diaphragm, for providing a stored potential energy which normally provides enough upward force to cause the upper means to deform so as to align the central tubular passage to be closed, but which force may be overcome by the patient voluntarily raising bladder pressure for a predetermined duration so that the upper means aligns the central tubular passage to be open.

5,088,981

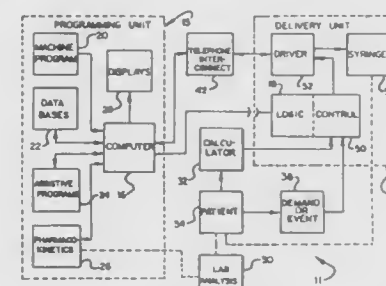
SAFETY ENHANCED DEVICE AND METHOD FOR EFFECTING APPLICATION OF A THERAPEUTIC AGENT

David C. Howson, 253 S. Adams St., Denver, Colo. 80206; Andrew D. Smith, 1570 Quince Ave., and Richard A. Simonelli, 279 Green Meadow La., both of Boulder, Colo. 80302
Continuation-in-part of Ser. No. 68,032, Jun. 29, 1987, Pat. No. 4,810,243, which is a continuation of Ser. No. 692,895, Jan. 18, 1985, Pat. No. 4,676,776. This application Jul. 31, 1987, Ser. No. 80,405

Int. Cl.⁵ A61M 1/00

U.S. Cl. 604—31

25 Claims



1. A device for effecting application of a therapeutic agent to a patient, said device comprising:
application means including delivery means adapted to de-

liver a preselected therapeutic agent to a patient with said delivery means having flow control means for controlling the flow of said therapeutic agent from said delivery means, and said application means also including electronic control means for controlling said flow control means with said electronic control means including removable programmable means for establishing a flow profile for said delivery means when said programmable means is programmed and operatively positioned at said application means; and

programming means operationally independent of said application means for establishing a then selected flow profile program and programming said program into said programmable means while said programmable means is removed from said application means, said programming means also simulating operation of said delivery means according to said then selected flow profile program.

5,088,982

SAFETY WINGED NEEDLE MEDICAL DEVICES

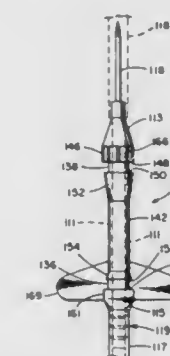
Dana W. Ryan, Franklin, Tenn., assignor to Ryan Medical, Inc., Brentwood, Tenn.

Continuation-in-part of Ser. No. 162,569, Mar. 1, 1988, Pat. No. 5,059,185, and a continuation-in-part of Ser. No. 224,920, Jul. 27, 1988, Pat. No. 4,923,445. This application Oct. 13, 1988, Ser. No. 257,407

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—110

18 Claims



1. A medical device for assembly with a hollow needle, comprising:

- a) an inner tube member having a passageway therethrough, a front end adapted to have the hollow needle secured thereto, a rear end adapted to receive at least one of a fluid conduit means and a fluid container means, and an outer surface having first and second circumferential grooves, said first groove being rearward of said second groove, wherein said outer surface of said tube member subscribes a larger cross-section area through said inner tube member at the forward end of said second circumferential groove than at the rearward end of said second circumferential groove; and
- b) a resiliently flexible hollow outer winged shield member having an inner surface subscribing a slightly larger cross-section than said outer surface of said inner tube member, a front end having an opening therein, an open rear end, and at least one protrusion extending inwardly from said inner surface of said hollow outer member, the inner surface of said at least one protrusion subscribing a smaller cross-section than said outer surface of said inner tube member at the forward end of said second circumferential groove.

tial groove of said inner tube member, said at least one protrusion engaging said first circumferential groove to maintain said shield member in a first retracted position in which the hollow needle is exposed, and engaging said second circumferential groove to maintain said shield member in a second extended position in which the needle is covered by said shield member, wherein said at least one protrusion is disengageable from said first circumferential groove and said shield member is slidable relative to said inner tube member between said first position and said second position.

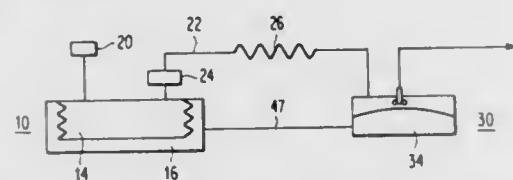
5,088,983

PRESSURE REGULATOR FOR IMPLANTABLE PUMP
Paul Burke, Woonsocket, R.I., assignor to Infusaid, Inc., Norwood, Mass.

Division of Ser. No. 412,376, Sep. 26, 1989. This application Jul. 1, 1991, Ser. No. 724,032
Int. Cl.⁵ A61M 37/00

U.S. Cl. 604—141

16 Claims



1. An implantable drug delivery system comprising:
 - a pressure actuated drug dispensing device having a sealed body, said sealed body having a flexible drug reservoir containing a fluid, an outlet from said flexible drug reservoir and a propellant chamber in said sealed body pressurized to a pressure to urge said fluid from said flexible drug reservoir into said outlet, and
 - a flow regulating device having a regulator chamber and a sensing chamber, said regulator chamber and said sensing chamber separated and maintained in isolation from each other by a flexible diaphragm, said outlet supplying said fluid into said regulator chamber, an outlet catheter coupling said regulator chamber to a drug delivery site and, means not using said fluid to establish a reference pressure in said sensing chamber that is substantially equal to said pressure in said propellant chamber comprising a fluid coupling between said propellant chamber and said sensing chamber.

5,088,984

MEDICAL CONNECTOR

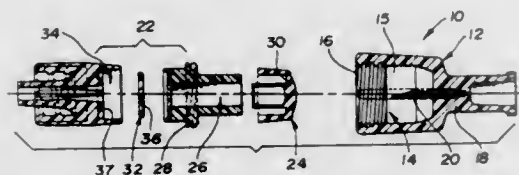
Charlie B. Fields, Ypsilanti, Mich., assignor to Tri-State Hospital Supply Corporation, Howell, Mich.

Filed Oct. 3, 1990, Ser. No. 592,134

Int. Cl.⁵ A61M 5/178

U.S. Cl. 604—167

7 Claims



1. A medical connector for connecting a fluid carrying tube to a patient, the medical connector comprising:
 - a first connector member having a first recessed open end defining a cavity including internal threads therein and a second closed end supporting a needle therein for communicating the fluid from the fluid carrying tube through said closed end to said cavity; and
 - a second connector member having a distal end partially

defining a flashback chamber and adapted to pass through the open end of said first connector member; said second connector member including external threads thereon corresponding to said internal threads of said first connector member for joining both connector members; said second connector member including a rubber septum on said distal end partially defining said flashback chamber and having a yieldable portion adapted to be penetrated by said needle when said first and second members are joined, whereby to establish fluid communication through said needle to said flashback chamber without spillage therefrom and for spontaneous closing when said first and second connectors are separated; said flashback chamber also having a one way valve completing the definition of said flashback chamber and spaced from said needle when said first and second connectors are joined, whereby to prevent the patient's blood from entering said chamber and establishing fluid communication through said needle.

5,088,985

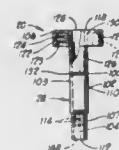
SAFETY SYRINGE

Marco A. Deras, 4820 SE. 41st, Del City, Okla. 73115
Filed Aug. 1, 1990, Ser. No. 561,080

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—192

18 Claims



1. A safety syringes comprising:
 - a syringe body including an exterior surface, first and second opposing ends and an interior cavity extending from said first end to said second end;
 - a needle removably attached to said syringe body and including a proximal end attached to said second end of said syringe body, a distal pointed end spaced from and opposing said proximal end, and an interior passage extending from said proximal end to said distal end, said interior passage being in fluid communication with said interior cavity of said syringe body;
 - a piston member slidably disposed in said interior cavity of said syringe body between said first and second ends of said syringe body;
 - an extension arm extending from said piston member through said first end of said syringe body, said extension arm including a first end portion attached to said piston member, a second end portion opposing said first end portion, and an elongated arm portion connecting said first and second end portions together;
 - a needle shield attached to said syringe body and movable with respect to said syringe body from a retracted position away from said distal end of said needle whereby said distal end of said needle is exposed to an extended position

over said distal end of said needle whereby said distal end of said needle is shielded, said needle shield including a first end part attached to said exterior surface of said syringe body, a second end part opposing said first end part and spaced from said first end part toward said distal end of said needle, and a middle part extending around said syringe body and connecting said first and second end parts together; and

- a needle remover removably attached to said extension arm adapted for grasping said needle and removing said needle from said syringe body, said needle remover being an elongated member including a first end section, a second end section opposing said first end section, an arm section connecting said first and second end sections together and a grasp member attached to said second end section for grasping said needle, and being of a length sufficient to grasp said needle when said needle shield is moved to said extended position over said distal end of said needle without extending completely within said needle shield.

5,088,986

SAFETY SYRINGE

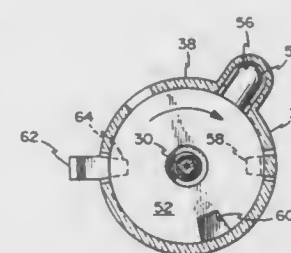
Michael J. Nusbaum, Livingston, N.J.

Filed Nov. 29, 1990, Ser. No. 619,460

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—195

12 Claims



1. A safety device for preventing accidental contact with a hypodermic needle, said device comprising:
 - a) needle shield means connectable to a syringe in a surrounding relationship to the needle;
 - b) said needle shield means having an outer tubular member and a retractable needle sheath;
 - c) said needle sheath being retractable within said tubular member to expose the needle;
 - d) means for selectively releasably locking said sheath in the retracted position; and,
 - e) whereby, the needle sheath may be retracted without being locked in the retracted position;
 - f) said tubular member has a slot therein forming a track;
 - g) a needle sheath retraction means having a handle slidably positioned in said track; and,
 - h) said track is shaped so that said handle is movable in a continuous path about a perimeter of a section of the tubular member to return to the original starting position.

5,088,987

SYRINGE

Thomas J. Noonan, Jr., 20-8 Rice La., Worcester, Mass. 01604
Continuation-in-part of Ser. No. 221,294, Jul. 19, 1988, Pat. No. 4,915,700. This application Feb. 2, 1990, Ser. No. 474,447

Int. Cl.⁵ A61M 5/32

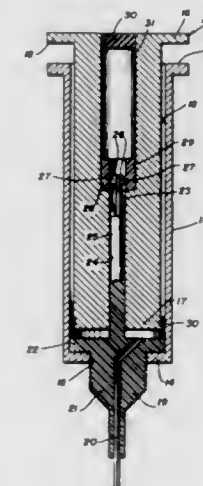
U.S. Cl. 604—195

11 Claims

1. Syringe comprising:
 - (a) an elongated cylinder having a first bore extending into one end and terminating in a closure at the other end and having a second bore extending through the closure coaxially of the first bore,
 - (b) a plunger extends into the cylinder in the first bore and has a section fitting tightly in the bore,
 - (c) a needle assembly having a main body that fits snugly and slidably in the second bore and having a flange that fits

snugly and slidably in the first bore, the plunger having a passage extending therethrough and the needle assembly having a rod fitting slidably in the passage,

- (d) detent means is associated with the needle assembly to lock the needle assembly to the plunger when the plunger



has been initially completely depressed, so that the needle assembly is caused to retract into the cylinder when the plunger is once subsequently retracted, and
(e) means causing the needle assembly to remain in the cylinder when the plunger has once been so subsequently retracted.

5,088,988

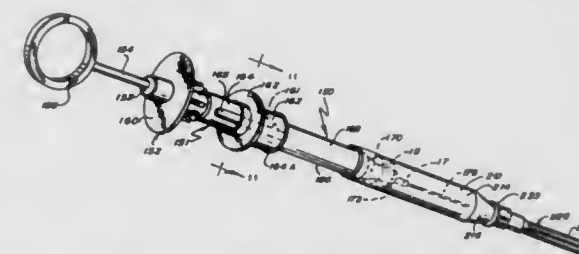
COMBINED DENTAL SYRINGE AND NEEDLE SHIELD
Daniel A. Talonn, University City, and Alan B. Ranford, St. Louis, Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 212,528, Jun. 28, 1988, Pat. No. 5,053,018. This application Jan. 29, 1990, Ser. No. 471,995

Int. Cl.⁵ A61M 5/32

U.S. Cl. 604—198

35 Claims



1. A medication containing syringe comprising:
 - a first tubular member having distal and proximal ends and adapted to receive a medication cartridge therein,
 - a plunger rod assembly including a reciprocally mounted plunger rod mounted adjacent said proximal end of said first tubular member and adapted to contact a portion of the medication cartridge;
 - a double ended hollow needle assembly including a needle hub thereon, said needle hub being operatively mounted on said distal end of said first tubular member, said needle assembly having a needle point on the distal and proximal ends thereof whereby said proximal needle point of said needle assembly is adapted to pierce the medication cartridge for fluid communication with the medication contained therein and said distal needle point of said needle assembly extends distally beyond said distal end of said first tubular member;
 - collar means operatively associated with said first tubular member, said collar means including recessed keyway thereon; and

a second tubular member positioned about said first tubular member and said collar means, said second tubular member having distal and proximal ends and an inwardly directed and elongate key thereon and wherein the length of said key is greater than the length of said keyway and said key slidably contacts said collar means, said second tubular member being longitudinally movable over said first tubular member and said collar means between a retracted position wherein said distal needle point is exposed and an extended position wherein said distal needle point is protected.

5,088,989

Patent Not Issued For This Number

5,088,990

I.V. ALERT SYSTEM

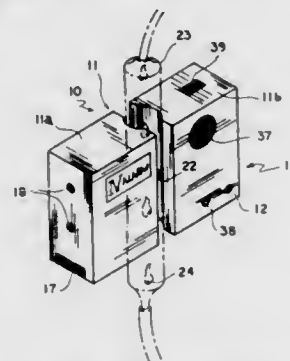
Ronald S. Hivale, and Almary M. Hivale, both of 192 Valley View Dr., Paradise, Calif. 95969

Filed Aug. 30, 1989, Ser. No. 400,885

Int. Cl.⁵ A61M 5/14

U.S. Cl. 604—253

10 Claims



1. An intravenous alert system comprising: infrared photovoltaic sensing means, placed on either side of an intravenous drip chamber to detect drops as they pass by; comparator means to detect a change in an output voltage that is sent by said drop sensing means, said comparator means sending a trigger signal when said drop sensing means detects a drop; counter means to time the interval between drops in said drip chamber, said counter means receiving and being restarted by each new trigger signal from said comparator means, said counter means sending a signal when said counter means reaches a predetermined value; audio frequency oscillator means to receive said signal from said counter means, said audio frequency oscillator means sending out an audio frequency oscillator signal upon receiving said signal from said counter means; astable modulating oscillator means to receive said audio frequency oscillator signal from said audio frequency oscillator means, said astable modulating oscillator means sending an astable modulated oscillator signal; audio alarm means to receive said astable modulated oscillator signal and to signal discontinuance of intravenous dripping; containment means for said drop sensing means, comparator means, counter means, audio frequency oscillator means, astable modulating oscillator means and said alarm means; power means to provide current to said intravenous alert system; switch means to switch said power means on or off; and CMOS circuitry being used to construct said comparator means, counter means, audio frequency oscillator means and astable modulating oscillator means, said CMOS circuitry providing a small size to the intravenous alert system allowing ease of use and portability.

5,088,991
FUSELESS SOFT TIP ANGIOGRAPHIC CATHETER
Thomas D. Weldon, Aguadilla, P.R., assignor to Novoste Corporation, Aguadilla, P.R.
Division of Ser. No. 219,583, Jul. 14, 1988, Pat. No. 4,963,306.
This application Feb. 26, 1990, Ser. No. 484,512
Int. Cl.⁵ A61M 25/00

U.S. Cl. 604—280

20 Claims



8. A catheter comprising an elongated fuseless polymeric tube having a lumen therein and including an elongated body portion and proximal and distal end portions; means cooperatively associated with the proximal end of said tube for introducing fluid into or for receiving fluid from the lumen; the polymeric material of said body portion having a degree of solid state polymerization; the polymeric material of said distal end portion having a lesser degree of polymerization than said body portion whereby said distal end portion is more pliable than said body portion

5,088,992

OSTOMY DEVICE WITH IMPROVED COUPLING SYSTEM

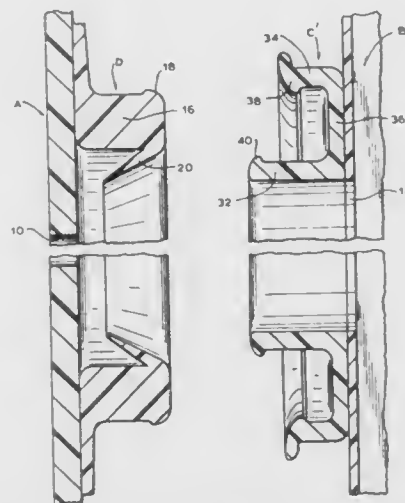
John V. Edwards, 25 Furzefield Crescent, Reigate, Surrey, England RH2 7HQ; Walter F. Leise, Jr., 19 S. Homestead Dr., Yardley, Pa. 19067, and John B. Cline, 20 Dix St., New Brunswick, N.J. 08901

Filed May 30, 1990, Ser. No. 530,635

Int. Cl.⁵ A61F 5/44

U.S. Cl. 604—338

7 Claims



1. An ostomy device comprising waste collection means, faceplate means attachable to a peristomal surface and means for detachably mounting said collection means on said faceplate means, said mounting means comprising first and second coupling means affixed to said collection means and said faceplate means, respectively, one of said coupling means comprising substantially axially extending rib means, substantially radially outwardly extending rim means and substantially inwardly extending sealing strip means, said other of said coupling means comprising channel means for removably

receiving said rib means, said channel means comprising spaced inner and outer walls, each having an interior surface, said inner wall and said outer wall comprising first and second protrusions extending on said interior surfaces from points proximate the ends of said walls, said first protrusion cooperating with said strip means to securely retain said rib means within said channel means.

5,088,993

SANITARY NAPKIN WITH INDIVIDUAL SELF WRAPPING MEANS

Umesh Gaur, North Brunswick, N.J., assignor to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 238,372, Aug. 30, 1988, abandoned.

This application Nov. 21, 1990, Ser. No. 617,460

Int. Cl.⁵ A61F 13/15

U.S. Cl. 604—385.1

4 Claims



1. A method for individually wrapping a folded, sanitary napkin comprising:
(a) providing an elongated absorbent element having a body-facing side and an adhesive-bearing side;
(b) applying an elongated wrapping sheet to at least a portion of said adhesive-bearing side of said absorbent element, said wrapping sheet being provided with pressure-sensitive adhesive means disposed thereon, said wrapping sheet further being selected to extend beyond an end of said elongated absorbent element to define a flap thereof;
(c) folding said napkin along a transverse axis such that portions of said body-facing side of said absorbent element are in contact with each other to form a folded portion of said napkin; and
(d) wrapping said flap around said folded portion of said napkin, said adhesive means on said wrapping sheet being selected to releasably adhere said flap to an underlying portion of said wrapping sheet to retain the napkin in a folded position prior to use.

5,088,994

DRIP-FEED BAG AND METHOD FOR MANUFACTURING SAME

Michael Porat, 52 Hamitnadev Street, Tel Aviv, Israel, and Amir Porat, 18 Highland Dr., North Caldwell, N.J. 07006

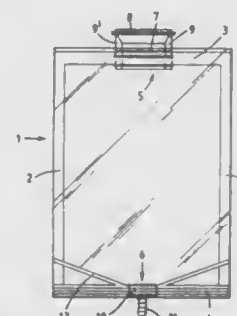
Filed Nov. 15, 1989, Ser. No. 436,716

Claims priority, application Israel, Nov. 16, 1988, 88399

Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—408

17 Claims



1. A medical drip-feed bag for dispensing fluids made of polyolefin polymer having flexible walls defining therein a collapsible space for storing said fluids, said bag comprising a sealable inlet for introducing fluids into the bag and an outlet

for dispensing said fluids, said outlet comprising hermetically sealed connector means sandwiched between said walls, said connector means comprising a substantially lenticularly shaped body with integral nipple, said connector means further comprising a bore going through the body and nipple and forming a channel for fluid to flow out of the bag, said connector means consisting essentially of a polyolefin polymer and being heat sealed directly to said walls without an intermediate adhesive layer therebetween.

5,088,995

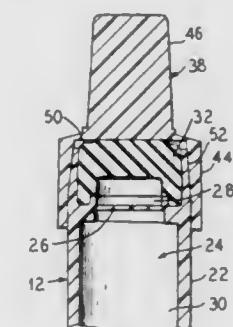
PORT AND CLOSURE ASSEMBLY INCLUDING A RESEALING INJECTION SITE FOR A CONTAINER
Jeffrey Packard, Grayslake; William J. Schnell, Libertyville, and Michael W. Scharf, McHenry, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jun. 22, 1990, Ser. No. 542,385

Int. Cl.⁵ B65D 41/50

U.S. Cl. 604—415

16 Claims



1. A port and closure assembly for a container comprising: a port including a tubular portion that extends from a base and terminates at an end including an opening, the tubular portion being divided into an upper and lower section by a pierceable membrane, the upper section including the end that terminates in the opening and including a resealing injection site; and a closure member for removably covering at least a portion of the end including the opening and including a lower sleeve that circumscribes at least a portion of an outer surface of the upper section of the tubular portion, the lower sleeve causing portions of the upper section to contact the resealing injection site during a sterilization step that softens the upper section and causing the portions of the upper section to retain the resealing injection site within the tubular portion after the upper section hardens.

5,088,996

ANTI-AERSOLING DRUG RECONSTITUTION DEVICE
Rudolph J. Kopfer, 1321 S. Eliseo Dr., Ste. 1, Greenbrae, Calif. 94904, and Robert E. Smith, P.O. Box 2999, Ketchum, Id. 83350

Continuation of Ser. No. 600,504, Apr. 16, 1984, abandoned.

This application May 18, 1987, Ser. No. 52,175

Int. Cl.⁵ A61M 5/32, 5/00, 37/00; B65D 8/32

U.S. Cl. 604—415

23 Claims



1. A shield structure for preventing exposure to a solution aspirating from a chamber in a vial that has a septum which is

penetrable by a cannula on a syringe which is usable to withdraw solution from a vial and deliver withdrawn solution to a patient, said cannula being attached to a barrel of a syringe to establish communication through a puncture opening in the septum made by said cannula between the inside of the vial and a fluid retaining reservoir defined by the syringe barrel, said shield structure comprising:

a body portion having a vial end, a syringe end, and a surface between the ends of the body portion defining an internal fluid holding chamber, said body portion having an opening in the vial end in communication with said chamber; means for connecting the body portion to a vial so that a vial septum sealingly closes the opening in the body portion and the surface of the body portion and septum cooperatively bound and make fluid tight the holding chamber; and

second means at the syringe end of the body portion for removably, sealingly admitting the cannula with the attached barrel into said fluid tight internal holding chamber and for resealing the holding chamber upon the removal of the cannula from the fluid tight internal holding chamber and separation of the cannula from the body portion so that said cannula with the attached barrel can be moved relative to the body portion and vial for passage through said second means, the fluid tight internal holding chamber, the septum and into the vial, the passage of the cannula through the septum forming a puncture opening in the septum to establish communication between the barrel and vial,

whereby said cannula with the attached barrel can be removably directed into the vial to reconstitute in and withdraw medicament in the vial from the vial and into the barrel;

said syringe being separable as a unit consisting of the barrel and cannula from the vial and entire shield structure for administration of the solution to a patient in conventional manner so that any solution remaining in the vial that aspirates through the puncture opening upon the cannula withdrawing from the septum is substantially confined in the fluid tight internal holding chamber, thereby protecting the user of the syringe from exposure to the aspirating solution.

5,088,997

GAS COAGULATION DEVICE

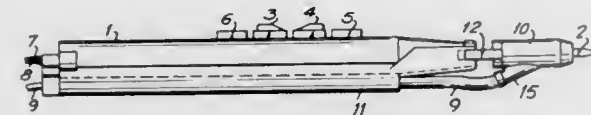
Louis Delahuer, Louisville; Robert B. Stoddard, and Michael S. Klicek, both of Boulder, all of Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Mar. 15, 1990, Ser. No. 494,249

Int. Cl.⁵ A61B 17/39

U.S. Cl. 606—42

40 Claims



1. A device for enhancing the safety and efficiency of a hand-operated electrosurgical pencil having an electrode with a distal end defining a tip for cutting or coagulating biological tissue, which device comprises a nose piece having a central axis and a hollow portion extending longitudinally about said axis, which hollow portion is adapted to accommodate said electrode, said nose piece containing conduit means defining at least one pathway for gas, which at least one pathway is disposed at an angle to said central axis so that gas passing there-through impinges obliquely on said electrode at or near to the tip thereof and means for passing inert gas at a predetermined pressure and flow rate through said at least one pathway.

5,088,998

RESECTOSCOPE APPARATUS

Kiyotoshi Sakashita, Hachioji; Shinichi Nishigaki, Tokyo, and Shiro Bito, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

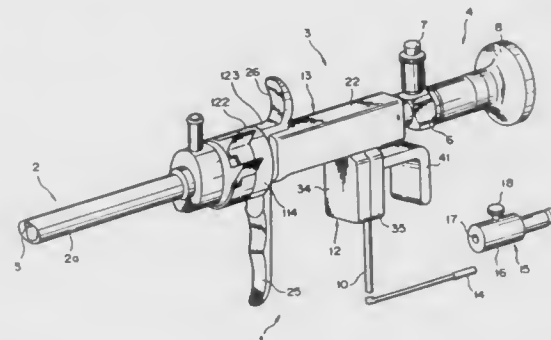
Filed May 23, 1989, Ser. No. 355,725

Claims priority, application Japan, Sep. 16, 1988, 63-231871; Feb. 28, 1989, 1-49041

Int. Cl.⁵ A61B 17/36

U.S. Cl. 606—46

18 Claims



7. A resectoscope apparatus comprising: an electrode for resecting or coagulating tissues within a body cavity by using a high frequency current; a sheath having a hollow part which is made of an electric insulation, a part of said electrode inserted through said hollow tube part; an operating part making said electrode operable from outside the body cavity, said operating part made of electric insulation, a remaining part of said electrode inserted through said operating part wherein said hollow tube part and said operating part enclose said electrode within said electric insulation; and an endoscope inserted through said sheath and making the body cavity interior observable, wherein said sheath is formed of said hollow tube part internally inserting an insertable part of said endoscope and sheath body part provided in a base end part of said hollow tube part and removably connected to a sheath connecting part provided in a front end part of said operating part and said hollow tube part and sheath body part are made of electric insulation, and wherein said operating part is formed of a) said sheath connecting part having a guide tube inserting the insertable part of said endoscope, b) a slider fixing said electrode and provided slidably in forward and rearward directions on said guide tube and c) a cover part having a groove part containing said slides, and inserting through said groove part said electrode leading to said slider through said sheath connecting part, said sheath connecting part and cover part are integrally molded, and said guide tube, sheath connecting part slider and cover part are made of electric insulation.

5,088,999

DEPILATION APPARATUS

Romuald L. Bukoschek, Klagenfurt, and Norbert Schneider, Ebental, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 359,469, May 31, 1989, abandoned.

This application Mar. 22, 1991, Ser. No. 674,420

Claims priority, application Austria, Jun. 7, 1988, A1474/88; Feb. 10, 1989, A288/89

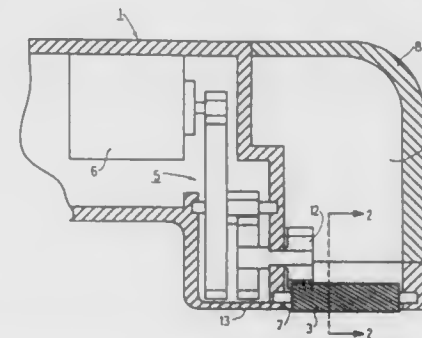
Int. Cl.⁵ A61B 17/50

U.S. Cl. 606—133

19 Claims

1. A depilation apparatus comprising at least one pair of depilation rollers which are rotatable in opposite directions and whose circumferential surfaces have an undulatory cross-sectional profile with a maximum and a minimum diameter and

at least four crests, which rollers interengage circumferentially with their cross-sectional profiles, one of said rollers being adapted to be driven by means of a motor, the depilation rollers performing a rotary movement which at the location where they interengage circumferentially is directed into the interior of the apparatus, wherein the undulatory cross-sectional profile extends linearly over the whole length of each depilation roller, the maximum diameter of the depilation rollers is se-



lected to be of the order of magnitude of 4.5 mm, and the number of crests of the cross-sectional profile is selected to be of the order of magnitude of 10, a skin-tautening roller being arranged at either side adjacent the depilation rollers, said skin-tautening roller having a diameter larger than the maximum diameter of the depilation rollers and being driven in a direction of rotation which is directed away from the apparatus at the location of the adjacent depilation rollers.

5,089,000

SURGICAL METHOD AND INSTRUMENT THEREFOR
John M. Agee, 3980 Bartley Dr., Sacramento, Calif. 95822, and Francis King, Shingle Springs, Calif., assignors to John M. Agee, Sacramento, Calif.

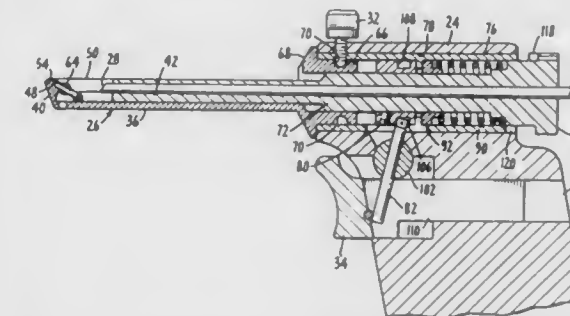
Continuation of Ser. No. 380,624, Jul. 14, 1989, Pat. No. 4,963,147, which is a continuation of Ser. No. 98,610, Sep. 18, 1987, abandoned. This application Aug. 20, 1990, Ser. No. 569,835

The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

Int. Cl.⁵ A61B 17/32

U.S. Cl. 606—170

30 Claims



13. A surgical instrument for manipulating selected tissue in a body cavity under visual inspection, comprising:

(a) a probe having an upper surface, a generally closed distal end, and a lateral aperture in said upper surface and adjacent said closed distal end; wherein the upper surface adjacent to the lateral aperture is configured generally as a flat or concave surface; wherein said distal end slopes away from said upper surface in a manner such that said distal end diverts displaceable tissue it contacts away from the region of the lateral aperture and said upper surface; an optical system disposed at least partially within the probe, said system having a distal portion terminating adjacent the lateral aperture, thereby defining a viewing space between the distal portion of the optical system, and

the distal end and the lateral aperture, said viewing space located within the field-of-view of the optical system; (c) a working tool mounted within said probe and capable of being extended from the viewing space; and (d) means for extending the working tool outwardly from the viewing space; (e) a grip handle rotatably connected to said probe; and (f) adjustment means for adjusting the rotational orientation between said lateral aperture of said probe and said grip handle; wherein said adjustment means is adapted to temporarily fix said rotational orientation.

5,089,001

INJECTION MOLDING ACUPUNCTURE ACUS WITH DOUBLE SAFETY DEVICE

C. H. Hwang, 14, Nung 6, Lane 315, Chung-shan N. Rd., San-chung City, Taiwan

Filed Nov. 8, 1989, Ser. No. 433,236

Int. Cl.⁵ A61B 17/34

U.S. Cl. 606—189

2 Claims



1. An acupuncture acup device having multiple safety protection features, comprising:

a) an acupuncture acup having an acup head; b) a grip having a cone flange, the grip being operatively connected to the acupuncture acup; c) protective means engageable by the acup head when the acup head is not being used for acupuncture treatment, the protective means including a soft plastic block means such that the acup head is insertable into the soft plastic block means; and d) means connecting the cone flange with the protective means, the connecting means including a fine thread formed from plastic.

5,089,002

DISPOSABLE BIPOLAR COAGULATOR

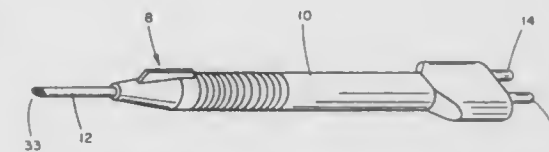
Lawrence T. Kirwan, Jr., Kingston, Mass., assignor to Kirwan Surgical Products, Inc., Rockland, Mass.

Continuation of Ser. No. 344,607, Apr. 6, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 603,257

Int. Cl.⁵ A61B 17/36

U.S. Cl. 606—50

4 Claims



1. A disposable bipolar coagulator comprising a coaxial conductor and an insulating housing; the insulating housing being formed of a deformable plastic in one unitary body which circumscribes a portion of the coaxial conductor; the coaxial conductor including an inner and an outer conductor; the outer conductor having a prime end; the inner conductor having a secondary end; the prime end having a first terminal

end and the secondary end has a terminal end, the prime end has a first bend formed therein directed away from the inner conductor and the prime end has a second bend formed therein which positions the first terminal end in spaced parallel relation to the remaining major portion of the outer conductor; the secondary end of the inner conductor is also bent twice to place its terminal end in spaced parallel relation to the first terminal end; a through aperture is formed in the outer conductor in close proximity to the first bend and through which the inner conductor is passed, the first and second ends being in spaced parallel relation to each other; the inner and outer conductors formed of an electrically conductive material; a circumferential insulating material being formed over a portion of the inner conductor; the insulating housing having first and second free terminal ends; a portion of the coaxial conductor extending from the second free terminal end.

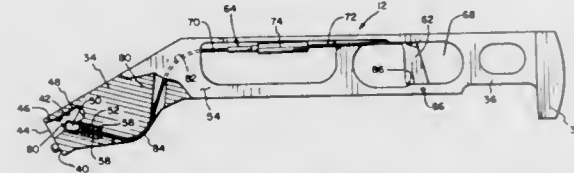
5,089,003

RASP TOOL INCLUDING DETACHABLE HANDLE MEMBER

Thomas W. Fallin, Cordova, and Joseph H. Kang, Memphis, both of Tenn., assignors to Zimmer, Inc., Warsaw, Ind.
Filed Dec. 22, 1989, Ser. No. 455,536
Int. Cl.⁵ A61B 17/16

U.S. Cl. 606—85

19 Claims



1. A rasp tool for use by a surgeon to contour bone or the like, comprising:
cutting means for contouring the bone, said cutting means including an axially extending locking post;
handle means, selectively connectable to said cutting means and operable by the surgeon, for imparting movement to said cutting means, said handle means comprising an elongated handle member connectable at one end thereof to said cutting means and having a head portion at the other end thereof, said handle means including a post-receiving bore adapted to axially receive said locking post therein; releasable locking means associated with said handle means for selectively interconnecting said handle means and said cutting means against axial separation when said locking post is received within said bore, said locking means including key means for engaging said locking post within said bore in response to introduction of said locking post into said bore, said locking post includes a generally V-shaped transverse notch and said key means includes an elongate locking key having one end that extends into said notch at an acute angle relative to the axially extending locking post to operatively engage said locking post, and said elongate locking key intersecting said post receiving bore at an acute angle relative thereto; and
disengaging means, associated with said handle means and manually actuable by the surgeon, said disengaging means including a manually actuable trigger located toward said other end of said handle member spaced from said cutter means for disengaging said key means from said locking post, thereby permitting removal of said locking post from said bore.

5,089,004 PROSTHETIC IMPLANT PROCEDURE AND FEMORAL BROACH THEREFOR

Robert G. Averill, Ringwood, and Robert C. Cohen, Denville, both of N.J., assignors to Osteonics Corp., Allendale, N.J.
Filed Jan. 19, 1988, Ser. No. 145,793
Int. Cl.⁵ A61B 17/00; A61F 2/32, 2/36
U.S. Cl. 606—85

21 Claims



1. A femoral broach for advancement into a passage placed within a femur in preparation for the implant of a femoral stem to contour the wall of a femoral cavity in the femur for the reception of a femoral stem to be seated within the femoral cavity in proper position relative to the femur, the femoral stem having an outer surface configuration which will be essentially contiguous with the wall of the femoral cavity upon seating of the femoral stem in proper position in the cavity, the femoral broach comprising:

a blade having a proximal end, a distal end and an outer surface portion extending peripherally around the blade and longitudinally along the blade between the proximal end and the distal end;

cutting teeth on the blade, the cutting teeth being aligned along longitudinal rows of teeth spaced apart along the periphery of the blade such that the longitudinal rows of teeth establish an outer profile configuration which includes a multiplicity of alternating longitudinal ribs and grooves generally parallel to one another and spaced apart peripherally along the outer surface portion of the blade, with the longitudinal ribs including apices lying along an outer envelope defined by said apices, the longitudinal ribs occupying a sufficient part of the periphery of the outer surface portion and being placed sufficiently closely adjacent one another so that the outer envelope defined by the apices of the ribs has a configuration which emulates the outer surface configuration of the femoral stem for the subsequent establishment of a seating surface in the femoral cavity for the femoral stem, which seating surface will be at least partially contiguous with harder portions of the bone of the femur, such that upon longitudinal movement of the blade into the femoral cavity, the wall of the cavity will be cut by the cutting teeth to be contoured provided with grooves and ribs complementary to the corresponding ribs and grooves along the outer surface portion of the blade, with the grooves of the contoured femoral cavity having roots lying along an inner envelope corresponding to the outer envelope of the blade and emulating the outer surface configuration of the femoral stem for providing said seating surface, the inner envelope being at least partially contiguous with the harder portions of the bone of the femur while the ribs in the wall of the cavity provide softer portions of the bone of the femur which extend into the inner envelope for compression between the femoral stem and the harder portions of the bone of the femur when the femoral stem subsequently is seated upon

said seating surface within the cavity, in proper position relative to the femur.

5,089,005

CATHETER FOR THE INTRODUCTION OF AN EXPANDABLE MEMBER

Fumiaki Harada, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 8, 1990, Ser. No. 465,179
Claims priority, application Japan, Aug. 13, 1987, 62-202397
Int. Cl.⁵ A61M 29/00
U.S. Cl. 606—194

7 Claims



1. A catheter comprising:

a catheter tube having:

an open proximal end and an open distal end;
first and second catheter tube portions, respectively having first and second outer diameters, said first and second catheter tube portions being positioned adjacent to each other with said first tube portion being positioned adjacent said distal end of said catheter tube, said first outer diameter of said first catheter tube portion being smaller than the second outer diameter of said second catheter tube portion; and
at least one side opening in said first catheter tube portion, said at least one side opening being in communication with said open proximal end of said catheter tube;
a hub portion communicating with said open proximal end of said catheter tube;
a check valve coupled to said hub portion; and
an expansion holder for holding open an inner diameter portion of an internal cavity of a tubular organ of a patient, said expansion holder comprising a shape memory alloy having a substantially cylindrical shape which radially expands and contracts with changes in temperature; said expansion holder covering at least a portion of said first catheter tube portion adjacent said at least one side opening; and
said expansion holder when unexpanded, having an outer diameter which does not exceed said second outer diameter of said second catheter tube portion.

5,089,006

BIOLOGICAL DUCT LINER AND INSTALLATION CATHETER

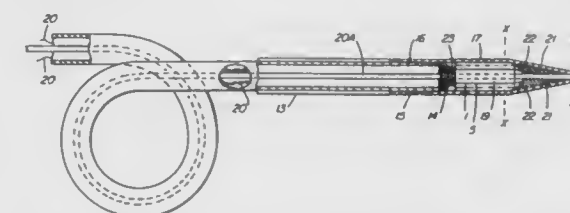
Frank B. Stiles, P.O. Box 25, Northport, Nova Scotia, Canada B0L 1E0

Filed Nov. 29, 1989, Ser. No. 443,002

Int. Cl.⁵ A61M 29/00

U.S. Cl. 606—198

7 Claims



1. A biological fluid vessel liner forming a sleeve comprised of a radially compressible tube having an elongated split along one side thereof, the sides of the tube on each side of the split overlapping each other, a tube being covered on all surfaces

with polytetrafluoroethylene, the cross-section of the tube being circular, the tube containing annular corrugations therein over a predetermined length, for providing a region allowing the tube to be permanently bent away from a linear axis.

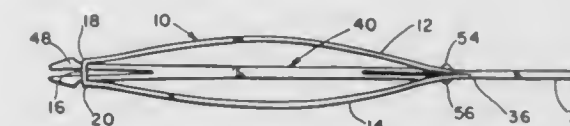
5,089,007

MULTIPURPOSE SURGICAL TOOL

Wolff M. Kirsch, Redlands, Calif.; Yong H. Zhu, and Robert B. Cushman, Cedar Crest, both of N. Mex., assignors to The University of New Mexico, Albuquerque, N. Mex.
Filed Feb. 14, 1990, Ser. No. 479,567
Int. Cl.⁵ A61B 17/28

U.S. Cl. 606—205

21 Claims



1. A tool comprising:

a body portion comprising a pair of resiliently flexible leaves joined at their forward ends by a bridge having an aperture therein, said leaves also being joined face-to-face at their rearward ends, and being normally bowed outward from one another; and
an elongated collet having a rearward end affixed to the rearward ends of said leaves, and a bifurcated forward end comprising a pair of resiliently flexible tines, each tine having thereon a jaw protruding through said aperture, each jaw including an inwardly facing working surface and an outwardly facing oblique cam surface in a position to engage a side of said aperture, so that relative longitudinal movement between the bridge and the jaws, produced by squeezing the leaves together, causes interaction between the sides of the aperture and the cam surfaces to drive the jaws together, wherein said aperture has the form of a slot, widened at its center.

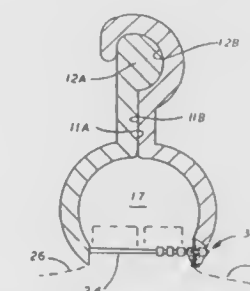
5,089,008

SURGICAL CLOSURE MEANS FOR ANASTOMOTIC DEVICE

Fusen H. Chen, 240 Thompson Rd., Webster, Mass. 01570
Continuation-in-part of Ser. No. 472,209, Jan. 26, 1990, Pat. No. 4,997,439, which is a continuation-in-part of Ser. No. 303,326, Jan. 26, 1989, Pat. No. 4,930,502. This application Dec. 18, 1990, Ser. No. 629,608
Int. Cl.⁵ A61B 17/00

U.S. Cl. 606—216

15 Claims



1. Surgical closure means comprising:

a pair of flexible members;
means for locking said members into functional association; said members being configured to have operatively associated free ends that are removed from said means for locking and are adapted to clamp organ or body parts to be

surgically joined for said closure when said members are in said functional association;
 pin means projecting freely from at least one of said free ends and adapted for suturing said organ or body parts for said closure;
 a plurality of longitudinally spaced annular slots formed at the free end portion of said pin means;
 relatively thinned wall means formed in a section of the second of said free ends of the flexible members and adapted to receive said slotted pin portion therethrough when the members are in said functional association;
 means operatively associated with said slot means for securing the pin means with respect to the organ or body parts being sutured and with respect to said second member; said securing means being formed in said thinned wall section; and
 said securing means and at least a selected one of the slot means comprising means to control the extent of pressure exerted on the surgically joined organ or body parts by said associated operatively free ends of the flexible members.

5,089,009

INWARDLY BIASED SKIN FASTENER

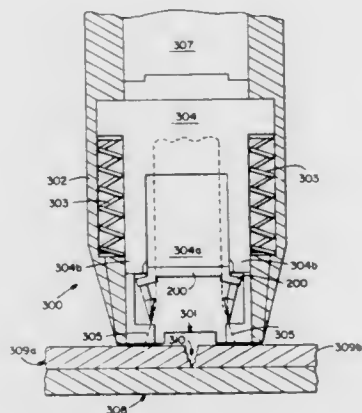
David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jun. 27, 1989, Ser. No. 372,025

Int. Cl.⁵ A61B 17/00; F16B 15/00

U.S. Cl. 606—219

17 Claims



1. A surgical fastener for joining body tissue, said surgical fastener comprising:

- a backspan comprising a bridge member, said backspan additionally having at least two arms extending substantially horizontally from said backspan in substantially parallel orientation to each other; and
- at least two prongs depending from the backspan, said prongs being in oblique orientation to each other in which the distal ends of said prongs are inclined towards each other, said prongs being movable in response to pressure to a substantially parallel orientation to each other, and being resiliently returnable to said oblique orientation when said pressure is removed.

5,089,010

SURGICAL NEEDLE-SUTURE ATTACHMENT POSSESSING WEAKENED SUTURE SEGMENT FOR CONTROLLED SUTURE RELEASE

Herbert W. Korthoff, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

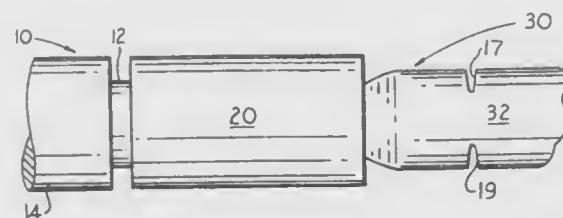
Continuation-in-part of Ser. No. 413,240, Sep. 27, 1989. This application Jun. 4, 1990, Ser. No. 532,953

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.⁵ A61B 17/00

U.S. Cl. 606—224

28 Claims



1. A method for attaching a surgical needle to a suture to provide a combined surgical needle-suture device which comprises:

- providing a surgical needle possessing a shank end of reduced cross-section and a suture possessing a weakened segment adjacent its tip region;
- placing a shrinkable tubing around the reduced diameter shank end of the needle and the tip of the suture such that the weakened segment of the suture is positioned beyond, but proximate to, the tubing; and,
- applying energy to the shrinkable tubing to bring the tubing into engagement with the needle shank and the tip of suture thereby providing the combined surgical needle-suture device.

5,089,011

COMBINED SURGICAL NEEDLE-SUTURE DEVICE POSSESSING AN INTEGRATED SUTURE CUT-OFF FEATURE

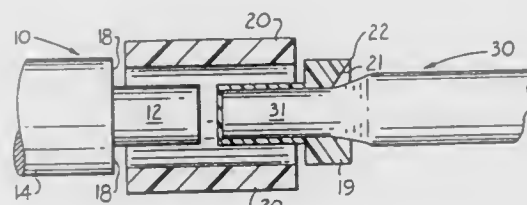
Herbert W. Korthoff, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 413,240, Sep. 27, 1989. This application Jun. 21, 1990, Ser. No. 541,632

Int. Cl.⁵ A61B 17/00

U.S. Cl. 606—224

20 Claims



8. A combined surgical needle-suture device possessing an integrated suture cut-off feature which comprises:

- a needle possessing a shank end of reduced cross section;
- a suture possessing a tip region for attachment to the shank end of the needle;
- a suture cap attached to the tip region of the suture to provide a capped suture, the suture cap possessing a suture cutting edge on its rear edge; and,
- a tubing fabricated from a shrinkable material engaging the shank end of the needle and the suture cap such that attachment of the needle to the capped suture is effected.

5,089,012

SURGICAL SUTURE, IN PARTICULAR FOR STERNOTOMY CLOSURE

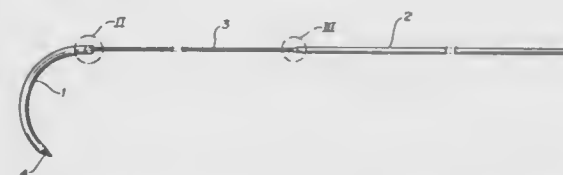
Philippe Prou, Roinville Sous Auneau, France, assignor to Ethicon, Inc., Somerville, N.J.

Filed Sep. 6, 1990, Ser. No. 578,171

Int. Cl.⁵ A61B 17/00

U.S. Cl. 606—224

11 Claims



1. A surgical suture for sternotomy closure, comprising an essentially rigid needle connected to a monofilament which is essentially plastically deformable in flexion, wherein the needle (1) and the monofilament (2) are joined by means of a filiform intermediate element (3) which is essentially elastically deformable in flexion and consists of a twisted multi-strand cord, the diameter of the twisted multi-strand cord being smaller than that of the monofilament.

5,089,013

SUTURE COATED WITH A POLYVINYL ESTER

Rao S. Bezawada, Whitehouse Station, and Alastair W. Hunter, Bridgewater, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 1, 1990, Ser. No. 473,505

Int. Cl.⁵ A61L 17/00; A01N 1/02; A61K 1/02

U.S. Cl. 606—228

4 Claims

1. A method of improving the knot tiedown performance of a suture comprising the steps of:

- coating an outer surface of the suture with a solution of at least one homopolymer of a vinyl ester monomer in an organic solvent, and then
- removing the solvent from the coated suture so as to coat the suture with an amount of the homopolymer from 0.3 to 20 percent of the weight of the coated suture.

5,089,014

TUBULAR INTERCONNECT DEVICE FOR USE WITHIN THE CIRCULATORY SYSTEM

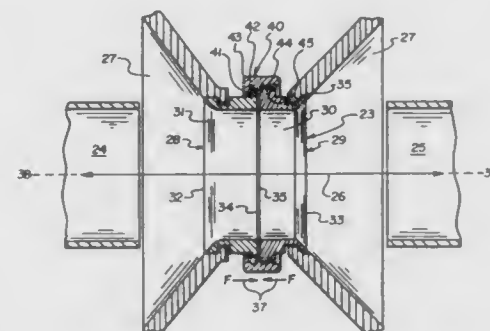
John W. Holfert, 109 W. 2700 So., Bountiful, Utah 84010

Filed May 18, 1987, Ser. No. 51,578

Int. Cl.⁵ A61F 1/24

U.S. Cl. 623—2

13 Claims



1. A tubular interconnective device for coupling open ends of a flow line as part of a circulatory system of a living being, said device comprising:

- first and second separable rigid tubular connective members, each of said connective members having continuous interior surfaces of biocompatible material suitable for contact with blood;

pliable attachment means connected to a distal end of at least one of said connective members,
 valve means coupled with at least one of said connective members for providing directional control of blood flow within the device,
 said first connective member having a first sealing edge at a proximal end thereof and said second connective member having a second sealing edge at a proximal end thereof, and
 means for aligning and locking said first and second sealing edges in a coaxial configuration thereby forming a smooth continuous and biocompatible interior surface extending from each end of the valve means to the interior surfaces of the respective first and second connective members.

5,089,015

METHOD FOR IMPLANTING UNSTENTED XENOGRAPHS AND ALLOGRAFTS

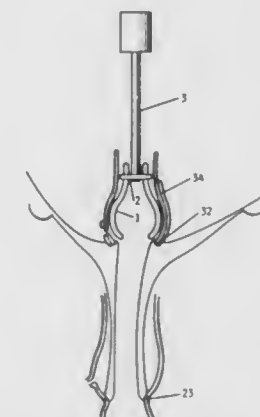
Donald N. Ross, London, England, assignor to Promedica International, Newport Beach, Calif.

Filed Nov. 28, 1989, Ser. No. 442,951

Int. Cl.⁵ A61F 2/00

U.S. Cl. 623—2

1 Claim



1. A method of surgically implanting an unstented pulmonary or aortic valve into a human patient to replace the patient's aortic valve, using a holder having an elongated handle, a base, three generally spoon shaped support members extending in a first direction from the base to outwardly convex enlarged ends of the support members such that the support members can provide physiologic support for the valve sinuses, and a receptacle on the base which can releasably engage an end of the handle such that the handle extends in a direction opposite the support members, comprising:

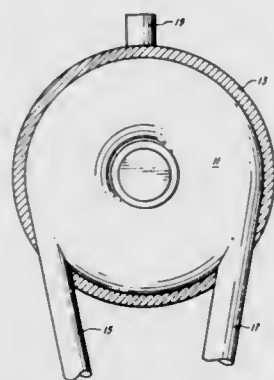
- excising the patient's aortic valve while leaving the aortic root in place;
- inserting the support members of the holder into the unstented valve to be implanted, such that the support members provide physiologic support for the valve sinuses;
- releasably engaging an end of the handle in the base such that the handle extends outwardly through a pulmonary or aortic artery segment of the valve;
- inserting the supported valve temporarily into the patient's aortic root to confirm correct size;
- suturing the implanted valve in place in the patient's aortic root; and
- removing the holder by pulling on the handle.

5,089,016 BLOOD PUMP

Alan R. Millner, Lexington; Meir Rosenberg, Salem, and Fredric L. Milder, Brookline, all of Mass., assignors to ABIOMED Cardiovascular, Inc., Danvers, Mass.
Filed Jun. 15, 1989, Ser. No. 366,860
Int. Cl.⁵ A61F 2/22

U.S. Cl. 623—3

13 Claims



1. A fluid driven blood pump apparatus comprising, a fluid pump having an outlet port, a toroidal shaped blood pumping chamber having a major and minor axis divided into first and second axial toroidal shaped portions by a plane perpendicular to the major axis, said first axial toroidal shaped portion comprising a rigid wall and said second axial toroidal shaped portion being formed of a flexible membrane in sealed relation to said first axial toroidal portion, said toroidal chamber having an inlet port positioned to couple blood into said toroidal chamber and an outlet port positioned to couple blood out of said toroidal chamber, a pressure chamber surrounding at least said second toroidal shaped portion of said toroidal chamber, the outlet port of said fluid pump being fluidically coupled to said pressure chamber such that increases in fluid pressure from fluid pumped from said fluid pump into said pressure chamber flex said membrane to decrease the blood volume within said toroidal chamber, and decreases in fluid pressure within said pressure chamber flex said membrane to increase the blood volume in said toroidal chamber, said fluid increases and decreases within said chamber being substantially evenly applied around said toroidal chamber so that said flexible membrane is flexed only substantially along one axis parallel to the major axis of said toroid.

5,089,017

DRIVE SYSTEM FOR ARTIFICIAL HEARTS AND LEFT-VENTRICULAR ASSIST DEVICES

David B. Young, 1730 Bellewood Rd., Jackson, Miss. 39211-5701, and Andrzej M. Pawlak, 4839 Gamber Drive, Troy, Mich. 48098

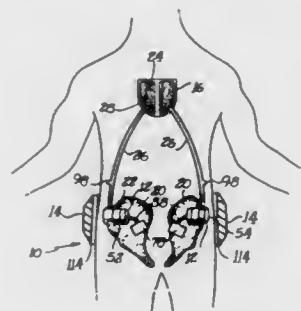
Filed Jan. 17, 1989, Ser. No. 298,119
Int. Cl.⁵ A61F 2/22

U.S. Cl. 623—3

8 Claims

1. Apparatus for driving an implanted blood-pumping mechanism which is powered by fluid pressure, said apparatus comprising: an implantable drive pump for mounting internally of the human body, comprising a housing defining a pump chamber, and a movable element supported in said housing to effect pumping of fluid into and out of said pumping chamber, said movable element including a permanent magnet; a conduit communicating with said pumping chamber to permit flow of fluid between said drive pump and said implanted blood pumping mechanism; an electromagnet for mounting externally of the human

body to apply magnetomotive force to said permanent magnet and thereby drive said movable element; a source of electrical power for said electromagnet; and control means connected to said source of electrical power and to said electromagnet, to regulate said magnetomotive



force in such a manner as to effect pumping of said fluid by said drive pump so as to drive said implanted blood-pumping mechanism; whereby said implanted blood-pumping mechanism may be driven and controlled without transcutaneous connections.

5,089,018

TOTAL HEAT PROSTHESIS

Didier Lapeyre, Chaignes, 27120 Pacy-sur-Eure, and René Veragen, Chatou, both of France, assignors to Didier Lapeyre, Pacy-sur-Eure, France

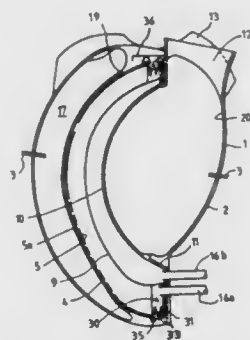
PCT No. PCT/FR88/00043, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/05313, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 27, 1988, Ser. No. 264,951

Claims priority, application France, Jan. 27, 1987, 87 000908
Int. Cl.⁵ A61M 1/10

U.S. Cl. 623—3

11 Claims



1. A total heart prosthesis comprising: a case implantable in the pericardial cavity and the geometry of which is very similar to that of the natural heart; a motor device disposed inside the case, said motor device comprising first and second membranes, said first membrane working during an elongation stroke within a space defining the right ventricle and said second membrane working during a deformation stroke within a space defining the left ventricle; blood bags enclosed in the right and left ventricular spaces, adapted to be connected to the vessels of the circulatory system of a patient by valves mounted in valvular orifices formed in the case of the prosthesis; means for activating the motor device comprising a pneumatic energy source including servo loop means for regulating the blood flow, said activating means actuating said prosthesis; wherein the first membrane and a movable support which is associated therewith are mounted in the case of the pros-

thesis by means for breaking down the movement of said first membrane into two phases, one of which is a displacement without elongation including displacement of said support and the other is accompanied only by an elongation whereas return movement of said first membrane comprises first a retraction phase followed by a displacement without modification of the shape of said first membrane and of the support associated therewith.

5,089,019

MUSCLE WORK OUTPUT MONITOR BY INTRAMUSCULAR TEMPERATURE VARIATION MEASUREMENT

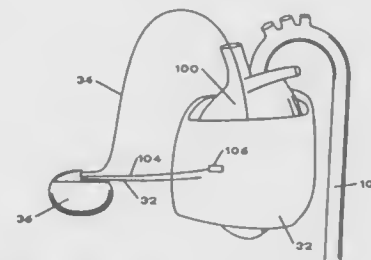
Pierre A. Grandjean, Bassenge, Belgium, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 6, 1989, Ser. No. 446,592

Int. Cl.⁵ A61M 1/10

U.S. Cl. 623—3

6 Claims



1. Apparatus comprising: a. a surgically prepared skeletal muscle adapted to be mechanically coupled to a natural human heart having ventricles which contract at a ventricular rate such that contraction of said surgically prepared skeletal muscle assists said natural human heart; b. means adapted to be responsively coupled to said natural human heart and said surgically prepared skeletal muscle for stimulating said skeletal muscle in synchrony with contraction of said ventricles to assist said natural human heart; and c. means responsively coupled to said stimulating means for measuring a parameter indicative of the efficiency of contraction of said skeletal muscle.

5,089,020

MONOSEPTAL, BI-VENTRICULAR ARTIFICIAL HEART

Erik Koppert, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Jul. 24, 1989, Ser. No. 383,668

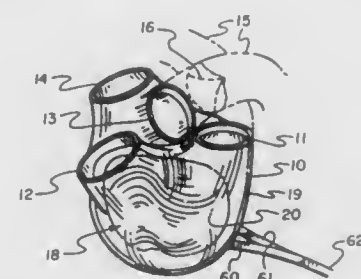
The portion of the term of this patent subsequent to Jan. 18,

2007, has been disclaimed.

Int. Cl.⁵ A61Z 1/10

U.S. Cl. 623—3

11 Claims



1. An artificial heart or biventricular assist device, comprising: a heart enclosure approximately configured in the shape of a natural heart and having a blood compatible interior surface; a rigid septum attached at its periphery to the interior sur-

face of the heart enclosure and operable to divide the enclosure into two separate pumping chambers corresponding to left and right ventricles, said chambers being respectively defined by an exposed face on each side of the septum and that portion of the interior surface of the heart enclosure which connects at a junction with the septum and extends in a continuous manner to enclose the respective chambers;

said exposed faces of the septum having vertical and horizontal axes and a nonplanar configuration along said axes including a curved wave form with an "S" configuration to increase surface area of each septum face to be almost equal to the surface area of the interior surface of the heart enclosure within the corresponding chamber;

each chamber including a pumping diaphragm attached at its periphery near the juncture of the septum and heart enclosure to divide each chamber into (i) a pumping compartment formed between the face of the septum and the adjacent diaphragm, and (ii) a blood compartment formed by the diaphragm and the remaining interior surface of the heart enclosure;

said diaphragm being geometrically configured with a wave form corresponding to the wave form of the corresponding septum face sufficient to permit the diaphragm to nest without an overlapping fold on the face of the septum and develop substantial maximum volume for the blood chamber when in nonextended condition, yet to extend to a domed configuration within the respective compartments and force blood from the blood chamber;

first and second drive lines coupled to the respective pumping compartments to enable delivery of fluid pressure to extend and retract the diaphragm to thereby operate the pumping chambers; and

valved inlet and outlet means coupled through the heart enclosure to each blood chamber to control inflow and outflow of blood.

5,089,021

INTRA-ORBITAL IMPLANT MANUFACTURING METHOD AND INTRA-ORBITAL IMPLANT

Jean-Marc Vachet, 15 rue de Buci, 75006 Paris, France

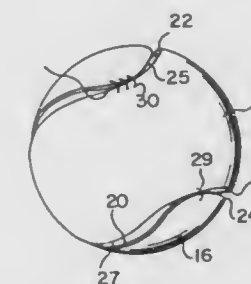
Continuation of Ser. No. 96,863, Sep. 15, 1987, abandoned. This application Jan. 2, 1990, Ser. No. 459,877

Claims priority, application France, Sep. 15, 1986, 86 12880

Int. Cl.⁵ A61F 2/14

U.S. Cl. 623—4

15 Claims

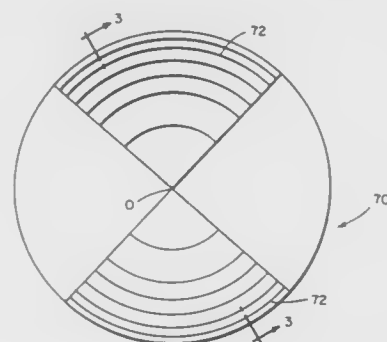


1. Method of manufacturing an intra-orbital implant intended to be accommodated in an orbital cavity after enucleation or evisceration and to be joined to oculo-motor muscles, using a spherical core of predetermined circumference in a bio-compatible flexible, suturable, synthetic material, said method comprising the steps of

- (a) making two uniform identical flat strips from a micro-porous bio-compatible suturable flexible synthetic material capable of plastic deformation, each of said strips having a longitudinal plane of symmetry and two longitudinal edges the length of which is approximately equal to one-half of said predetermined circumference, mutually spaced by a width approximately equal to one-quarter of

said predetermined circumference and joined to each other by two convex semi-circular transverse edges having a diameter approximately equal to one-quarter of said predetermined circumference;

- (b) placing said strips one on each side of the spherical core in a position in which their longitudinal planes of symmetry contain a spherical center of said core and are mutually perpendicular;
- (c) folding said strips around the spherical core into a conformation in which they are mutually joined edge-to-edge and complement each other so as to envelop all of the spherical core; and
- (d) rendering said conformation of said strips around said spherical core permanent.



lens profile covering about half the effective lens area of said lens.

5,089,022

RECTIFIED INTRAOCULAR LENS

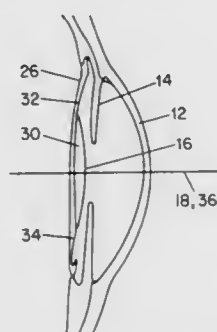
Charles J. Koester, Glen Rock, N.J., and James D. Auran, New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Apr. 26, 1989, Ser. No. 344,099

Int. Cl.⁵ A61F 2/16

U.S. Cl. 623—6

19 Claims



1. An intraocular lens for mounting in an aphakic eye, the lens having refractive means defining an optical zone and haptic means extending out from the refractive means, the refractive means and haptic means having a combined structure that exhibits handedness, whereby, when the haptic means engages the eye in a predetermined manner, ocular characteristics that affect the position of the lens in the eye and that are statistically different in the case of implantation in right and left eyes, respectively, are compensated for so that the optical zone is centered on the pupil.

5,089,023

DIFFRACTIVE/REFRACTIVE LENS IMPLANT

Gary J. Swanson, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 22, 1990, Ser. No. 497,860

Int. Cl.⁵ A61F 2/16

U.S. Cl. 623—6

9 Claims

1. An intraocular optical implant comprising a refractive/diffractive lens having an anterior surface and a posterior

5,089,024
MULTI-FOCAL INTRAOCULAR LENS

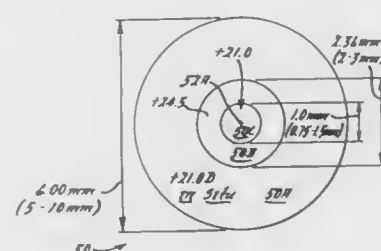
Bruce A. Christie, Newport-Richey; Gary L. Guenther, Largo, both of Fla., and J. Warren Blaker, Bronx, N.Y., assignors to Storz Instrument Company, St. Louis, Mo.

Filed Apr. 19, 1988, Ser. No. 183,202

Int. Cl.⁵ A61F 2/16

U.S. Cl. 623—6

2 Claims



1. An intraocular lens comprising:

- a) a first region, of long focal length, located near the center of the lens, and having a maximum diameter less than the average minimum diameter of a contracted pupil;
- b) a second region, of short focal length, which is substantially concentric about the first region, and having an inner diameter less than the average minimum diameter of a contracted pupil;
- c) a third region, of substantially the same focal length as the first region, and which is substantially concentric about the second region, and having an inner diameter not less than the average minimum diameter of a contracted pupil;
- d) the product of a first predetermined light intensity and the total area of said first region of long focal length located near the center of the lens being substantially equal to the product of a second predetermined light intensity and the total area of said second region of short focal length;
- e) said first predetermined light intensity being greater than said second predetermined light intensity and being about 100 lux; and
- f) said second predetermined light intensity being about 6 lux.

CHEMICAL

5,089,025

HAIR DYE COMPOSITIONS AND CERTAIN 1,2,3,4-TETRAHYDROQUINOLINES USEFUL THEREIN

David Rose, Hilden; Edgar Lieske, and Horst Hoeffkes, both of Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP89/00834, § 371 Date Jan. 25, 1991, § 102(e) Date Jan. 25, 1991, PCT Pub. No. WO90/01050, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 17, 1989, Ser. No. 640,372

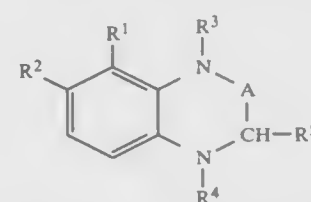
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825212

Int. Cl.⁵ A61K 7/13

U.S. Cl. 8—405

20 Claims

1. Hair-dyeing compositions comprising suitable cosmetic carriers and substantive dyes, wherein the improvement comprises the presence in the compositions of one or more compounds, or water-soluble salts of compounds, corresponding to formula (I):



in which one of the substituents R^1 or R^2 is a nitro group while the other is selected from the group consisting of hydrogen, halogen, amino, a mono- and di-alkylamino containing C_{1-4} alkyl groups, C_{1-4} alkyl and alkoxy group; R^3 and R^4 independently of one another represent hydrogen or a C_{1-4} alkyl group; A is a $>CHR^6$ or a $>C=O$ group, where R^6 is hydrogen or a C_{1-4} alkyl group; and R^5 is hydrogen or a C_{1-4} alkyl group, as substantive dyes.

5,089,026

DYEING COMPOSITION FOR KERATIN FIBER

Hidetoshi Tagami, Chiba, and Jiro Kawase, Funabashi, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,285

Claims priority, application Japan, Apr. 27, 1990, 2-112594

Int. Cl.⁵ A61K 7/13

U.S. Cl. 8—435

11 Claims

1. A dyeing composition for a keratin fiber, which comprises 1,5-dihydroxynaphthalene, 2-amino-5-hydroxybenzoic acid or a cosmetically acceptable salt thereof and a cosmetically acceptable base.

5,089,027

METHOD FOR PRODUCING A SOLID ELECTROLYTE CELL

Mary P. Rossoll, Willoughby, and Alan J. Revilock, Middleburgh Heights, both of Ohio, assignors to Gould Inc., Eastlake, Ohio

Filed Nov. 26, 1990, Ser. No. 617,993

Int. Cl.⁵ H01M 6/00

U.S. Cl. 29—623.2

15 Claims

1. A method for producing a cell comprising the steps:

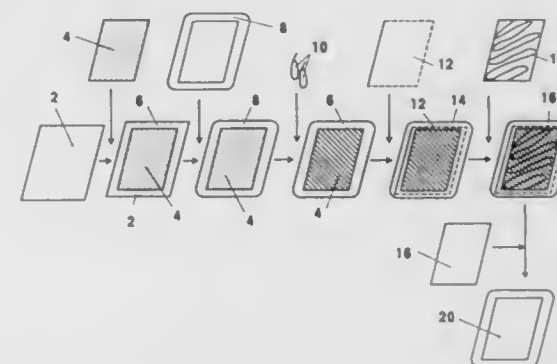
- (a) depositing an active cathode material containing at least ethylene carbonate and propylene carbonate onto a first conductive current collector sheet and within an adhesive coated frame positioned at the peripheral area of the current collector sheet;
- (b) depositing on the cathode material propylene carbonate or ethylene carbonate and propylene carbonate and allowing said deposit to be absorbed into the cathode material
- (c) preparing a separator strip as follows:

(a') dissolving ethylene carbonate in propylene carbonate to form a solution;

(b') dissolving poly(ethylene oxide) in a solvent;

(c') adding a metal salt and a solvent along with the solution of step (a') to the dissolved poly(ethylene oxide) solution of step (b') to form a mix and mixing the mixture to form a homogeneous mixture and drying said mixture to less than about 30 ppm water and then forming a separator strip from said mixture;

(d) placing the separator strip onto the cathode material, said separator strip being smaller than the area of the cathode collector sheet and larger than the exposed area of the cathode material thereby leaving a portion of the adhesive coated frame area exposed;



(e) placing an anode strip onto the separator and within the frame thereby leaving an exposed portion of the area of the adhesive coated frame;

(f) placing a second conductive current collector substantially the size of the first conductive current collector onto the anode and exposed area of the adhesive coated frame; and

(g) heating at least the frame of the cell assembly at a pressure and temperature for a period of time sufficient to secure the first current collector to the adhesive coated frame on one side and the opposite side of the adhesive coated frame to the second current collector thereby producing a sealed cell.

5,089,028

DEPOSIT CONTROL ADDITIVES AND FUEL COMPOSITIONS CONTAINING THE SAME

Guy P. Abramo, Herndon, Va.; Noyes L. Avery, Bryn Mawr, Pa., and Jeffrey C. Trewella, Flemington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 9, 1990, Ser. No. 564,909

Int. Cl.⁵ C10L 1/10

U.S. Cl. 44—347

12 Claims

1. A fuel composition comprising a major amount of a fuel and an additive which imparts intake valve deposit inhibiting properties to the fuel comprising a combination of

- i. a polyisobutenyl succinimide which is the reaction product of a polyisobutenyl succinic anhydride and a polyalkylene polyamine;
- ii. a polymer of isobutylene;
- iii. an ester which is an adipate, phthalate, isophthalate, terephthalate and trimellitate of iso-octanol, iso-nonanol, iso-decanol, or iso-tridecanol or mixture thereof, polyol ester of neopentyl glycol, pentaerythritol or trimethylolpropane with corresponding monocarboxylic acid, oligomer and polymer ester of dicarboxylic acid, polyol and monoalcohol; and
- iv. a polyether which is a polymer or copolymer of ethylene oxide, propylene oxide, butylene oxide, pentene oxide, hexene oxide, octene oxide, decene oxide or isomer thereof.

5,089,029
FUEL OIL ADDITIVE AND FUEL OIL ADDITIVE
COMPOSITION

Jiro Hashimoto; Shogo Nomoto, both of Wakayama; Masanori Nozawa, Osaka, and Makoto Kubo, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Jan. 28, 1991, Ser. No. 646,276

Claims priority, application Japan, Feb. 2, 1990, 2-24191
Int. Cl.⁵ C10L 1/18

U.S. Cl. 44—432

1. A fuel oil composition which comprises
(a) fuel oil;
(b) 1 to 20,000 ppm of an additive compound having the formula



wherein R is a hydrocarbyl radical having 10 to 50 carbon atoms, A is an alkylene group having 2 to 6 carbon atoms, m is an integer of 10 to 50 and n is an integer of 1 to 3; and
(c) 0.05 to 20 parts by weight, per 1 part of said additive compound, of a mineral or synthetic oil.

5,089,030
APPARATUS FOR PRODUCING GENERATOR GAS AND
ACTIVATED CARBON FROM SOLID FUELS

Herwig Michel-Kim, Bamberger Strasse 41, D-1000 Berlin 30, Fed. Rep. of Germany

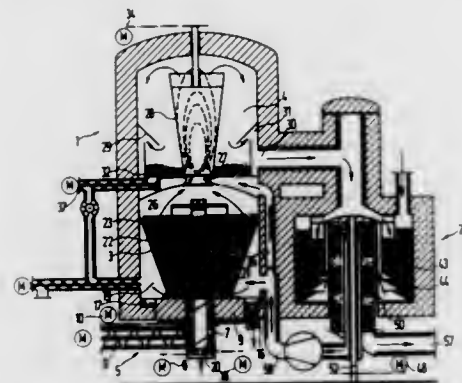
Division of Ser. No. 248,808, Sep. 23, 1988, Pat. No. 4,987,115.

This application Sep. 26, 1990, Ser. No. 588,605
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732867

Int. Cl.⁵ C10J 3/20

U.S. Cl. 48—76

16 Claims



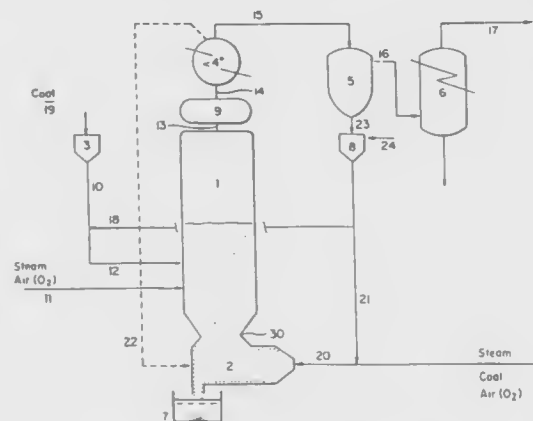
1. A reactor apparatus for producing generator gas and activated carbon from solid fuels, the apparatus comprising: means for achieving a first gasification, the first gasification means having means for supplying air, a bottom formed of a turntable, and an underfeed charging means, in communication with the turntable, for rotationally symmetric supplying of fuel into the bottom; means for achieving an intermediate gasification, the intermediate gasification means having a Venturi tube connected to a diffuser, the Venturi tube having a throat connected to and in fluid communication with the first gasification means, and rotary valve means for returning a portion of the fuel to the Venturi tube; and means for achieving a third gasification, the third gasification means in fluid communication with the intermediate means.

5,089,031
COAL GASIFICATION APPARATUS USING COAL
POWDER

Kenichi Kikuchi, Yokohama; Akio Suzuki, Kawasaki, and Tetsuro Mochizuki, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 14, 1990, Ser. No. 582,008

Claims priority, application Japan, Oct. 31, 1980, 55-152144
Int. Cl.⁵ C10J 3/56

4 Claims



1. A coal gasification apparatus comprising:
(a) a gasification furnace consisting essentially of a combustion chamber means for burning combustible materials, a reaction chamber means for reacting coal powder, steam and oxygen or air located above said combustion chamber means, and a throat means having a reduced cross-sectional area relative to each of said combustion chamber and said reaction chamber means for interconnecting said combustion and reaction chamber means;
(b) an ash receiver;
(c) separation means for separating product gas and char produced in said reaction chamber means;
(d) fuel supply means for supplying the separated char to said combustion chamber means;
wherein said reaction chamber means consists essentially of:
(1) first inlet means for introducing into a middle portion of said reaction chamber means, raw coal powder having a particle diameter not greater than 3 mm;
(2) second inlet means for introducing into a middle portion of said reaction chamber means, steam and oxygen or air, wherein the second means is at a point below the first means; and
(3) first outlet means for discharging gas and char produced in said reaction chamber means;
wherein said combustion chamber means consists essentially of:
(1) third inlet means for introducing combustible materials together with oxygen or air and steam into said combustion chamber means, for providing a temperature of about 1600° C. within said combustion chamber means and for producing a hot gas stream that passes upwardly through said throat means and into said reaction chamber means; and
(2) fourth inlet means for introducing steam into said combustion chamber means; and
(3) second outlet means for discharging ash to the ash receiver;
wherein said reaction chamber means reacts said coal powder, steam and oxygen or air at a temperature of from about 900° C. to about 1300° C. under fluidized bed gasification conditions to produce the product gas, char and ash and for agglomerating said ash until said ash attains sufficient size and weight to drop into said combustion chamber means against the velocity of the gas stream passing from said combustion chamber means; and

wherein further due to the reduced cross section of said throat means, the hot gas stream accelerates to a gas velocity of at least 20–24 m/s to thereby act as a fluidizing gas to establish the fluidized bed gasification conditions in the reaction chamber means.

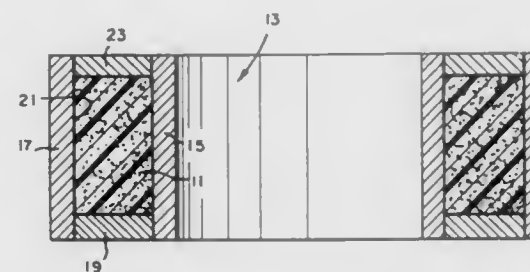
5,089,032
GRINDING WHEEL

Joseph F. Moran, 510 Carmarthen Dr., Exton, Pa. 19431
Filed Jul. 5, 1990, Ser. No. 548,099

Int. Cl.⁵ B24D 3/00

U.S. Cl. 51—293

23 Claims



1. A method comprising the steps of
reducing epoxy resin chips of low molecular weight in the range of 500 to 875 to a powder of less than 60 mesh in a hammer mill,
batch mixing the epoxy resin powder with a powdered curing agent and a powdered accelerator to form a mixed powder,
heating the mixed powder to the softening point of the epoxy resin,
kneading the softened mixed powder while the heat is being applied and forcing the powder particles into close and uniform distribution in the mix to form a hot doughy mix, continuing this kneading action on the hot doughy mix and transporting it through a mixing chamber to a discharge section,
discharging the hot doughy mix in the form of a ribbon mix, cooling the ribbon mix,
breaking the cooled ribbon mix into thin mix chips, cooling the mix chips,
pulverizing the cooled mix chips into a binder mix powder, coating abrasive grains with a wetting agent, mixing the coated grains with the binder mix powder to form a grinding wheel mixture, weighing the grinding wheel mixture to obtain a desired weight,
pouring the weighed grinding wheel mixture into a steel mold spinning on a vertical axis,
leveling the grinding wheel mixture in the mold, shutting off the spinning of the mold,
compacting the grinding wheel mixture to form a green wheel by applying hydraulic pressure for about one minute as it sits in the mold to form a green wheel, stripping the green wheel from the mold and placing the green wheel in an oven,
curing the green wheel to form a grinding wheel by applying heat to the green wheel in the oven, and
cooling the grinding wheel to room temperature.

5,089,033
PROCESS FOR REMOVING CONDENSABLE
COMPONENTS FROM GAS STREAMS

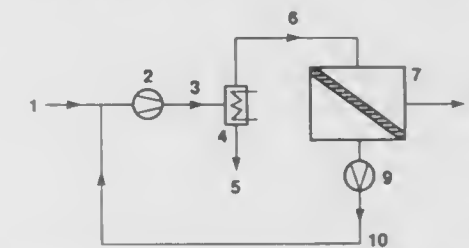
Johannes G. Wijmans, Menlo Park, Calif., assignor to Membrane Technology & Research, Inc., Menlo Park, Calif.

Continuation of Ser. No. 432,592, Nov. 2, 1989, abandoned. This application Jan. 30, 1991, Ser. No. 649,305

Int. Cl.⁵ B01D 53/22, 71/24

U.S. Cl. 55—16

45 Claims



1. A process for recovering a condensable component from a gas stream, comprising the steps of:
(a) providing an incoming gas stream containing a condensable component, characterized by a boiling point higher than $-100^{\circ}\text{C}.$;
(b) performing a condensation step, comprising:
bringing said incoming gas stream to a condition characterized in that the concentration of said condensable component is greater than its saturation concentration at said condition, so that condensation of a portion of said condensable component occurs;
withdrawing a condensed stream comprising said condensable component in liquid form;
withdrawing a non-condensed stream depleted in said condensable component compared with said incoming gas stream;
(c) performing a membrane separation step, comprising:
providing a membrane having a feed side and a permeate side;
providing a pressure difference between the permeate and feed sides of the membrane, such that the ratio of the pressure on the permeate side to the pressure on the feed side is in the range 0.005–0.5;
contacting said feed side with said non-condensed stream from said condensation step;
withdrawing from said permeate side a permeate stream enriched in said condensable component compared with said non-condensed stream;
wherein the membrane separation step is characterized by a stage cut less than about 40%;
(d) recycling said permeate stream to said condensation step (b).

5,089,034
PROCESS FOR PURIFYING NATURAL GAS

John Markovs, Yorktown Heights, N.Y., and Frederick E. James, Jr., Stamford, Conn., assignors to UOP, Des Plaines, Ill.

Filed Nov. 13, 1990, Ser. No. 612,934

Int. Cl.⁵ B01D 53/04

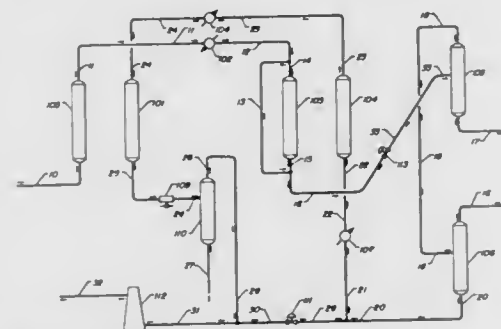
U.S. Cl. 55—28

26 Claims

1. A process for separating water and carbon dioxide from a feedstream comprising hydrocarbons, water and carbon dioxide, said process comprising the steps of:
(a) passing the feedstream to a first adsorption zone containing a solid adsorbent having selectivity for water at a first zone adsorption temperature effective to adsorb water and a first zone adsorption pressure and withdrawing a first zone adsorption effluent stream having a reduced concentration of water relative to the feedstream;
(b) passing at least a portion of the first zone adsorption effluent stream to a second adsorption zone containing a

solid adsorbent having selectivity for carbon dioxide at a second zone adsorption temperature effective to adsorb carbon dioxide and a second zone adsorption pressure, said second zone adsorption temperature being lower than said first zone adsorption temperature, and withdrawing a second zone adsorption effluent stream having a reduced concentration of carbon dioxide relative to the first effluent stream;

(c) passing a first purge gas through the first adsorption zone at a first zone regeneration temperature effective to desorb



water from the first adsorption zone and a first zone regeneration pressure and withdrawing a first zone desorption effluent stream comprising water; and

(d) passing a second purge gas through the second adsorption zone at a second zone regeneration temperature of at least 250° F. and effective to desorb carbon dioxide from the second adsorption zone and a second zone regeneration pressure, said second zone regeneration pressure being not lower than about 50 psia, and withdrawing a second zone desorption effluent stream comprising carbon dioxide.

5,089,035 DEHUMIDIFIER

Toshihiko Kaneko, Tokyo, Japan, assignor to Esute Chemical Corporation, Tokyo, Japan

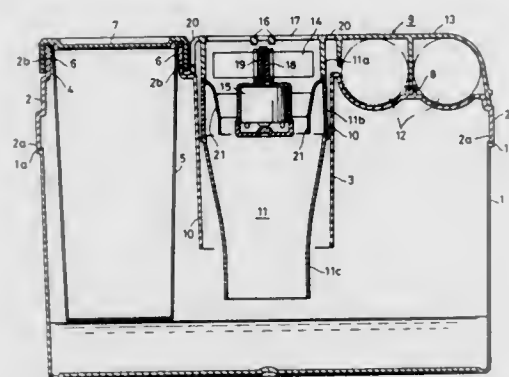
Filed Dec. 27, 1989, Ser. No. 457,279

Claims priority, application Japan, Jan. 31, 1989, 1-9315

Int. Cl.⁵ B01D 53/14

U.S. Cl. 55—221

7 Claims



1. A dehumidifier for removing moisture contained in air upon discharging said air which has been introduced from outside, comprising: a container body, a deliquescent moisture absorbent disposed within said container body, a fan for introducing said air from outside, a driving source capable of reversely rotating for driving said fan, and a cover for covering a part of the top end of said container body, said top end of said container body which is not covered by said cover being provided with a receiving mouth, said receiving mouth being provided with a meshed receptacle for accommodating therein said deliquescent moisture absorbent, said meshed receptacle being mounted in suspension within said container body; said

container body having a receiving tube provided integrally therewith, said receiving tube being suspended from a part of the top end of the container body, whereas said cover is provided with an air sending tube which is located within said receiving tube of said container body and forming an arrangement therewith and is suspended further than said receiving mouth, said receiving tube and said air sending tube forming a vent passage therebetween; said meshed receptacle and arrangement of receiving tube and air sending tube being adjacent to each other.

5,089,036 AIR SCRUBBER FOR ORGANIC SOLVENT REMOVAL

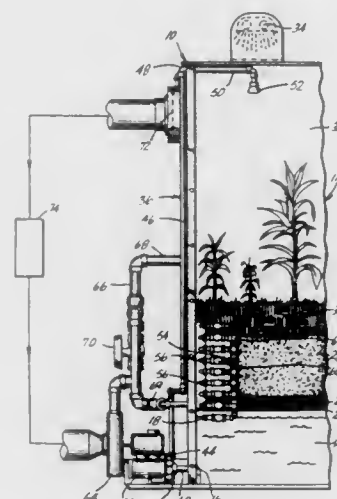
Philip B. Hawes, Oracle, Ariz., assignor to Space Biospheres Venture, Oracle, Ariz.

Filed Sep. 24, 1990, Ser. No. 587,228

Int. Cl.⁵ B01D 47/14

U.S. Cl. 55—227

16 Claims



1. An air scrubber comprising: a closed air loop; a cabinet within the air loop; a layer of permeable growth medium near the bottom of the cabinet containing aerobic microorganisms and plants; means for maintaining a portion of the growth medium submerged in water; an air space above the growth medium to accommodate the plants; and means for passing air upwardly through at least a portion of the submerged growth medium.
5. An air scrubber as recited in claim 1 comprising a plurality of water outlets at differing elevations for adjusting the depth of water in the cabinet.

5,089,037 INDUSTRIAL VACUUM CLEANING APPARATUS

Guy H. Marsolais, 1038, Chemin du Lac Maurice, Ste-Julienne, QC., Canada J0K 2T0

Filed May 28, 1991, Ser. No. 705,959

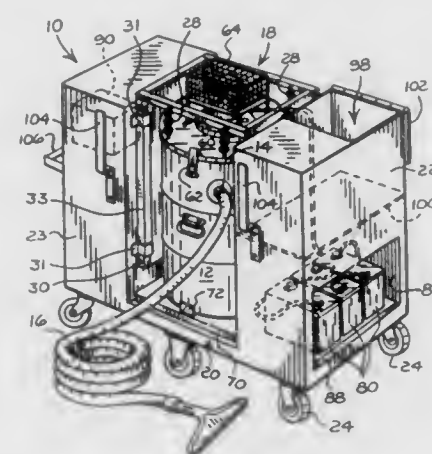
Int. Cl.⁵ B01D 29/05, 29/15

U.S. Cl. 55—357

6 Claims

1. A vacuum cleaning device comprising, a wheeled cart having a platform, a dust receiving container opened at its upper end and provided with an aperture for connecting a suction hose, said container being freely mounted on said platform, a motor-fan unit mounted over said upper end of said container and removably fixed thereon, said unit adapted to create a suction in said container, said unit comprising a dust filtering cover adapted to retain the dust entering from said suction hose,

an upstanding frame fixed to said platform and laterally disposed relative to said container, said frame comprising four upstanding guiding sleeve members peripherally disposed around said container and fixed to said platform, a structure fixed to said frame for supporting said motor-fan unit, said structure having a set of four vertical beams slidably mounted relative to said guiding sleeve members,



and a set of horizontal beams connecting said vertical beams for supporting said motor-fan unit at a level suitable for sealingly lock said cover on said container, and means slidably mounted on said structure for raising said motor-fan unit above said upper end of said container at a distance sufficient to clear the container, said container being adapted to slide on said platform adjacent said frame.

5,089,038 BAG MOUNT ASSEMBLY FOR A VACUUM CLEANER

James J. Kopco, Richmond Heights, and Craig M. Saunders, Rocky River, both of Ohio, assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

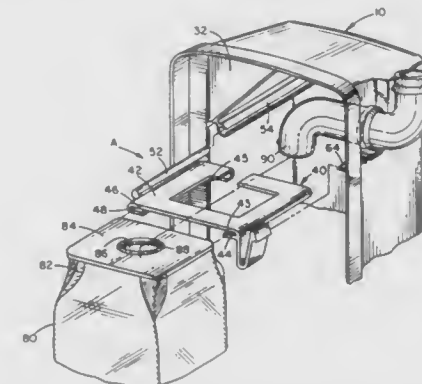
Continuation of Ser. No. 441,708, Nov. 27, 1989, abandoned.

This application Jun. 12, 1991, Ser. No. 714,356

Int. Cl.⁵ B01D 46/00

U.S. Cl. 55—374

18 Claims



1. A bag mount assembly for a vacuum cleaner comprising: a rigid vacuum cleaner housing forming a chamber for holding an associated vacuum cleaner bag, said housing having an air inlet wherein said air inlet comprises a pipe extending through a stationary portion of said housing; a mounting plate comprising: a planar body, and a channel extending from one edge of said body, said

channel selectively holding a reinforced collar of the associated vacuum cleaner bag; and, a pivot means for pivotably mounting said mounting plate in said chamber to a stationary portion of said housing adjacent said pipe to enable the associated vacuum cleaner bag to cooperate with said pipe in one end position of said mounting plate.

5,089,039 METHOD FOR PYROLYTICALLY FORMING A SILICON OXIDE COATING ON A HOT GLASS SUBSTRATE

Robert Terneu, Thiméon, and Jean-François Thomas, Ottignies, both of Belgium, assignors to Glaverbel, Brussels, Belgium

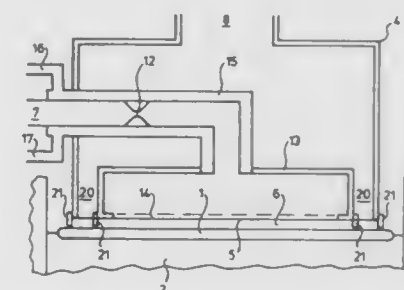
Filed Jun. 14, 1990, Ser. No. 537,814

Claims priority, application United Kingdom, Jun. 19, 1989, 8914047

Int. Cl.⁵ C03C 25/02

U.S. Cl. 65—60.5

19 Claims



1. A method of pyrolytically forming a silicon oxide coating on a hot glass substrate as it travels through a coating chamber along a substrate path, the method comprising:

- a. intimately mixing a coating precursor material which contains silane and which is in vapor phase, and gaseous oxygen to form a gaseous mixture before introduction thereof into the coating chamber;
- b. introducing the gaseous mixture into the coating chamber; and
- c. contacting the hot glass substrate as it travels through the coating chamber with the gaseous mixture to pyrolytically form the silicon oxide coating thereon.

5,089,040 IRON COMPLEX SYNTHESIS

Roger A. Brown, Chino Hills; Donald C. Young, Fullerton, and Alex E. Miller, Placentia, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 24, 1989, Ser. No. 315,519

Int. Cl.⁵ C05D 9/00, 9/02; C01G 49/14

U.S. Cl. 71—63

36 Claims

1. A method for producing a water-soluble iron complex, the method comprising the step of reacting a ferric source with a sulfate source in an aqueous reaction medium substantially devoid of ferrous ions, the reaction medium having a pH and SO_4^{2-} to Fe^{+3} molar ratio sufficient to produce the water-soluble iron complex.

5,089,041 ENCAPSULATED SLOW RELEASE FERTILIZERS

Harold E. Thompson, and Richard A. Kelch, both of Columbus, Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Filed Mar. 22, 1990, Ser. No. 497,442

Int. Cl.⁵ A01N 25/26; C05G 5/00

U.S. Cl. 71—64.11

15 Claims

1. A process for the preparation of a controlled release fertilizer product comprising coating a water soluble fertilizer core composition in particulate form with a water insoluble

polymeric coating in a manner such that agglomeration of said particles is avoided, said coating comprising a water-borne, polyvinylidene chloride-based latex composition having a solids content, a glass transition temperature and a blocking temperature sufficient to promote said coating without causing agglomeration and having moisture barrier properties enabling slow, controlled release of the fertilizer core particles, said glass transition temperature being in the range of about 15-35° C. and said blocking temperature being at least about 32° C.

5,089,042
N-PHENYLTETRAHYDROPHthalIMIDE
COMPOUNDS

Lothar Rueb, Speyer; Karl Eicken, Wachenheim; Barbara Schwalge, Ludwigshafen; Peter Plath, Frankenthal; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

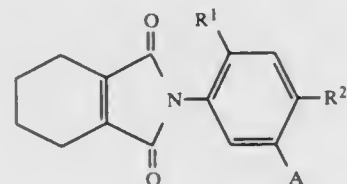
Continuation of Ser. No. 279,518, Dec. 5, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 511,940

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741273.6

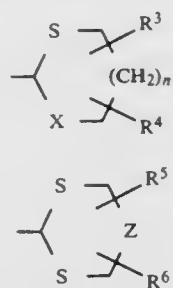
Int. Cl.⁵ A01N 43/34, 43/36, 43/38; C07D 209/48

U.S. Cl. 71-74 18 Claims

1. An N-phenyltetrahydrophthalimide of the formula I:



wherein R¹ is hydrogen or halogen, R² is halogen, A is a substituent of the formula:



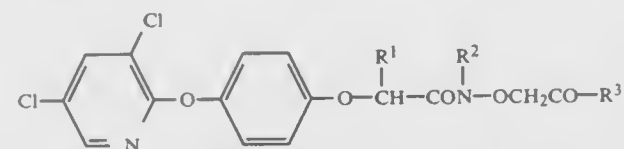
wherein X is oxygen or sulfur; n is 0 or 1; R³ is hydrogen or C₁-C₆-alkoxycarbonyl or C₁-C₃-alkyl which is unsubstituted or substituted by halogen, cyano, hydroxy, mercapto, C₁-C₆-alkoxycarbonyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, C₃-C₆-alkenylthio, C₃-C₆-alkenylthio, C₃-C₆-alkynylthio, C₃-C₆-alkynylthio or C₁-C₄-acyloxy, or is hydroxy or carboxy or is C₁-C₄-alkoxy-C₁-C₂-alkyl or C₁-C₄-alkylthio-C₁-C₂-alkyl which is unsubstituted or substituted in the alkylether or thioether moiety by C₁-C₆-alkoxycarbonyl; R⁴ is hydrogen or C₁-C₃-alkyl; Z is methyleneoxymethylene, methylenethiomethylene or ethenylene; R⁵ is hydrogen or C₁-C₃-alkyl; and R⁶ is hydrogen or C₁-C₃-alkyl, independently of the steric configuration, with the proviso that n is 1 when R³ and R⁴ are both hydrogen.

5,089,043
HETEROCYCLIC OXY-PHENOXYACETIC ACID
DERIVATIVES AND THEIR USE AS HERBICIDES
Yoshio Hayase, Kameyama; Kohei Matsumoto, Kusatsu; Kazuo Kamei, Tokyo; Kinya Ide, Kusatsu, and Toshio Takahashi, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 6, 1990, Ser. No. 610,048
Claims priority, application Japan, Nov. 9, 1989, 1-291858
Int. Cl.⁵ H01N 43/48, 43/40; C07D 241/52, 213/643

U.S. Cl. 71-90 6 Claims

1. A heterocyclic oxy-phenoxyacetic acid derivative of the formula:



wherein R¹ and R² are each hydrogen or lower alkyl and R³ is —NR⁴R⁵, or —OR⁷ wherein R⁴ and R⁵ are each hydrogen or lower alkyl or, when taken together with the adjacent nitrogen atom, represent a piperidino group, a morpholino group, a thiamorpholino group or a piperazino group, which groups are unsubstituted or are substituted by one or two lower alkyl groups; R⁶ is lower cycloalkyl, phenyl, pyridyl, piperidino or morpholino, or a group of the formula: —NR⁸R⁹ wherein R⁸ and R⁹ are each hydrogen or lower alkyl or, when taken together, represent a lower alkylidene group; and R⁷ is hydrogen, lower alkyl, phenyl(lower)alkyl, phenoxy(lower)alkyl, halo(lower)alkyl, hydroxy(lower)alkyl or lower alkoxy(lower)alkyl or an agriculturally acceptable salt thereof.

I

5,089,044
SUBSTITUTED PYRIMIDINYL(THIO)- AND
TRIAZINYL(THIO)ACRYLIC ACID DERIVATIVES,
PROCESSES FOR THEIR PREPARATION AND THEIR
USE AS HERBICIDES, FUNGICIDES AND PLANT
GROWTH REGULATORS

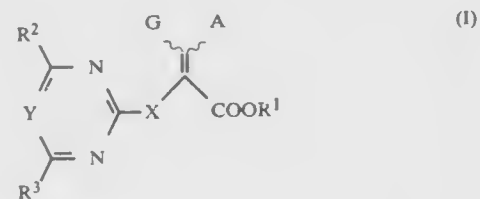
Christoph Harde; Erhard Nordhoff; Anita Krüger; Gabriele Krüger; Gerhard Tarara; Peter Wegner; Nikolaus Heinrich; Clemens Kötter; Gerhard Johann, and Richard Rees, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1990, Ser. No. 555,585
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1989, 3924260

Int. Cl.⁵ A01N 43/54, 43/66; C07D 239/60, 251/38

U.S. Cl. 71-90 17 Claims

1. Substituted pyrimidinyl(thio) acrylic acid compound of formula I



in which
A is one of the groups A-1 to A-6 of formula

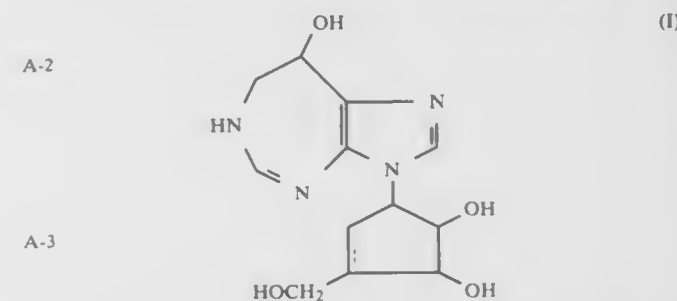
5,089,045
SUBSTITUTED
3,6,7,8-TETRAHYDROIMIDAZO[4,5-d][1,3]DIAZEPINE-
8-OL HERBICIDES

Brian D. Bush, Cherry Hinton; Duncan A. Gates, Saffron Walden, and David Langley, London, all of England, assignors to Schering Agrochemicals Limited, England

Filed May 11, 1990, Ser. No. 522,517
Claims priority, application United Kingdom, May 13, 1989, 8911029

Int. Cl.⁵ C07D 487/04; A01N 43/64, 43/48
U.S. Cl. 71-92 6 Claims

1. A herbicidal composition which comprises from 0.01 to 99% by weight of one or more 3,6,7,8-tetrahydroimidazo[4,5-d][1,3]diazepin-8-ol derivatives of the formula:



where the dotted line indicates that the bond between the two carbon atoms may be either a single or a double bond, in association with a suitable agricultural carrier and/or surface active agent.

2. 3-[2,3-Dihydroxy-4-(hydroxymethyl)cyclopentyl]-3,6,7,8-tetrahydroimidazo[4,5-d][1,3]diazepin-8-ol.
3. 8R-3-[(1R,2R,3R,4R)-2,3-Dihydroxy-4-(hydroxymethyl)-cyclopentyl]-3,6,7,8-tetrahydroimidazo[4,5-d][1,3]diazepin-8-ol.

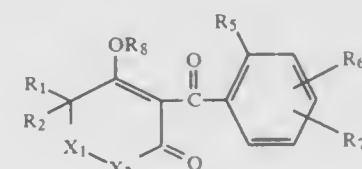
5,089,046
ARYL AND HETEROARYL DIONES

Shy-Fuh Lee, Sunnyvale; Richard J. Anderson, Palo Alto; Gary W. Luehr, Sacramento; G. Wayne Craig, Mountain View, all of Calif.; Joel L. Kirkpatrick, Barrington, Ill.; Takashi Nishizaka, and Kenichi Komatsubara, both of Kawasaki, Japan, assignors to Sandoz Ltd., Basel, Switzerland

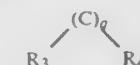
Continuation-in-part of Ser. No. 177,192, Apr. 4, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 416,173
Int. Cl.⁵ A01N 41/04, 41/06; C07C 303/65, 311/08

U.S. Cl. 71-103 14 Claims

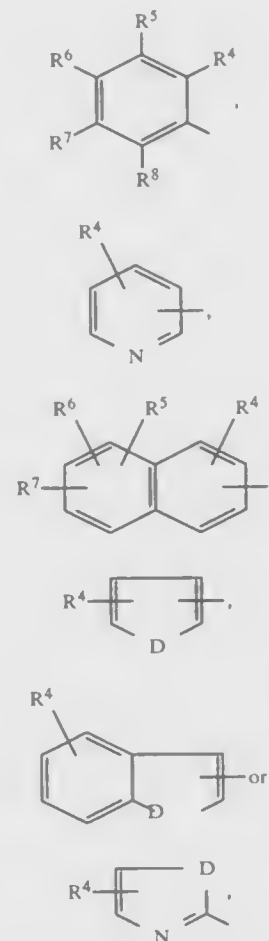
1. A compound having the formula Ia



wherein
one of X₁, X₂ represents CR₁'R₂' and the other represents



R₁, R₁', R₂, R₂', R₃ and R₄ are independently hydrogen, C₁-alkyl, C₁-alkoxy, C₁-alkylthio or COOR₁₆ and R₄ may additionally represent hydroxy;
R₅ is C₁-alkyl, optionally substituted with one to six halogen atoms; C₁-alkoxy, optionally substituted with one to six



a C₁-C₁₀-alkyl, C₂-C₁₀-alkenyl or C₂-C₁₀-alkynyl group (each of which is optionally substituted by one or more of the same or different C₁-C₄-alkoxy, C₁-C₄-alkylthio, amino, C₁-C₄-alkylamino, di-C₁-C₄-alkylamino, nitro, trifluoromethyl, halogen or phenyl), or a C₃-C₈-cycloalkyl or C₄-C₈-cycloalkenyl group (each of which is optionally substituted by one or more of the same or different C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, amino, C₁-C₄-alkylamino, di-C₁-C₄-alkylamino, nitro, trifluoromethyl, halogen or phenyl);

D is oxygen, sulphur or the group —NR⁹—;

G is hydrogen or C₁-C₆-alkyl;

R¹ is hydrogen, C₁-C₄-alkyl or benzyl;

R² and R³, which may be the same or different, are C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylamino, di-C₁-C₄-alkylamino or halogen;

R⁴, R⁵, R⁶, R⁷ and R⁸, which may be the same or different, are hydrogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, amino, di-C₁-C₄-alkylamino, nitro, halogen, trifluoromethyl or phenyl;

R⁹ is hydrogen, C₁-C₄-alkyl or phenyl;

X is oxygen or sulphur; and

Y is methine;

as well as their alkali metal, alkaline earth metal and organic ammonium salts, and their E- and Z-isomers.

halogen atoms; $-(O)_nS(O)_nR_{12}$; $-NR_{15}SO_2R_{12}$; halogen; cyano; or nitro; each of R_6 and R_7 is independently hydrogen or selected from the values of R_5 ; with the proviso that at least one of R_5 , R_6 and R_7 is a group $-OSO_2R_{12}$ or $-NR_{15}SO_2R_{12}$; R_8 is hydrogen or a salt forming moiety; R_{12} is C_{1-8} alkyl, optionally substituted with one to six halogen atoms; or phenyl optionally substituted with one to three members selected from C_{1-8} alkyl, C_{1-8} alkylcarbonyl, C_{1-8} alkoxycarbonyl, C_{1-8} alkylsulfonyl, $C(O)NR_{13}R_{14}$, $P(O)(OR_{11})_2$ and $R_{13}P(O)OR_{11}$; R_{11} , R_{11}' , R_{13} , R_{14} , R_{15} and R_{16} are independently hydrogen or C_{1-8} alkyl; n is 0 or 1; n' is 0, 1 or 2; q is 0 or 1.

13. A method for the control of weeds or acari which comprises applying to the weed or the acari or their locus an herbicidally or acaricidally effective amount of a compound according to claim 1.

5,089,047

CERAMIC-METAL ARTICLES AND METHODS OF MANUFACTURE

Sergej T. Buljan, Acton; Helmut Lingertat, Dorchester, and Steven F. Wayne, Scituate, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 576,241, Aug. 31, 1990, abandoned. This application Dec. 20, 1990, Ser. No. 632,238. The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl. C22C 29/02

U.S. Cl. 75—236

12 Claims

1. A ceramic-metal article comprising: about 80–95% by volume of a granular hard phase consisting essentially of a ceramic material selected from the group consisting of hard refractory carbides, nitrides, carbonitrides, oxycarbides, oxynitrides, carboxynitrides, and borides of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, boron, and mixtures thereof; and about 5–20% by volume of a metal phase, wherein said metal phase consists essentially of a combination of nickel and aluminum having a weight ratio of nickel to aluminum of from about 90:10 to about 70:30 and 0–5% by weight of an additive selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, cobalt, boron, carbon, and combinations thereof; wherein said article has a density of at least about 95% of theoretical and has a hardness gradated from a greater hardness at its surface to a lesser hardness at its core.

5,089,048

PROCESS FOR HELIUM ENRICHMENT

Karl Knoblauch, Essen; Erwin Pilarczyk, Bottrop; Klaus Giessler, Gelsenkirchen; Hans Bukowski, Essen, all of Fed. Rep. of Germany; Joseph S. D'Amico, Baltimore, and Herbert Reinhold, Annapolis, both of Md., assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

PCT No. PCT/EP88/00441, § 371 Date Nov. 17, 1989, § 102(e) Date Nov. 17, 1989, PCT Pub. No. WO89/10810, PCT Pub. Date Nov. 16, 1989

PCT Filed May 19, 1988, Ser. No. 445,716

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716898

Int. Cl. B01D 53/04

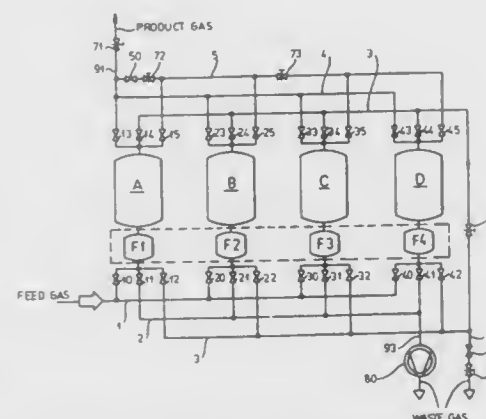
U.S. Cl. 55—25

13 Claims

1. Method of helium enrichment, according to a pressure swing adsorption process, from a gas mixture comprising helium, nitrogen and methane, passed through carbon molecular sieves which adsorb nitrogen and methane where the gas mixture is fed cyclically to four adsorber vessels arranged in

parallel which successively pass through a pressure build-up, an adsorptive and a pressure relief phase, with pressure build-up and relief being in part brought about by pressure compensation with anyone of the other adsorbers wherein;

- a) the pressure build-up phase comprises the three steps of:
 1. pressure increase from a final vacuum pressure (P_1) to a medium pressure (P_3);
 2. pressure increase from the medium pressure (P_3) to a higher pressure (P_4);
 3. pressure increase from the higher level (P_4) to a highest pressure level (P_5) representing an adsorption pressure;
- b) the pressure relief phase comprises the four steps of:
 1. pressure relief from the highest level (P_5) down to the higher level (P_4);
 2. pressure relief from the higher level (P_4) down to the medium level (P_3);



3. pressure relief from the medium level (P_3) down to an ambient pressure (P_2);
4. pressure relief from the ambient pressure (P_2) down to the final vacuum pressure (P_1);
- c) pressure compensation is brought about in two compensation steps with the first compensation step taking place between an outlet of a second adsorber where the second pressure build-up step (from P_3 to P_4) happens and with the second compensation step taking place between an outlet of a first adsorber where the second pressure relief step (from P_4 down to P_3) happens and an inlet of a third adsorber where the first pressure build-up step (from P_1 to P_3) happens and
- d) the third as well as the fourth pressure relief steps are effected by counter-flow whereby a waste gas low in helium is yielded, whereas the third pressure increase is effected using product gas.

5,089,049

PASSIVATION OF PYROPHORIC METALS

Helmut Lischka, Trostberg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 482,793

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908815

Int. Cl. C23F 11/02

U.S. Cl. 75—328

21 Claims

1. Process for the passivation of the pyrophoric metals magnesium, calcium and alloys of these metals by coating with a passivation agent, wherein there is used 0.5 to 5% by weight of a passivation agent selected from the group consisting of an s-triazine derivative and a guanidine, referred to the weight of the metal.

5,089,050

INKS CONTAINING A WATER SOLUBLE COMPOUND AS A STABILIZER PARTICULARLY FOR INK JET PRINTING

Eric Vieira, Basel; David G. Leppard, Marly; Hugh S. Laver, Fribourg, and Vien V. Toan, Leutigny, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1991, Ser. No. 695,857

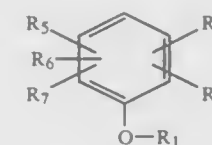
Claims priority, application Switzerland, May 10, 1990, 1587/90

Int. Cl. C09D 11/02

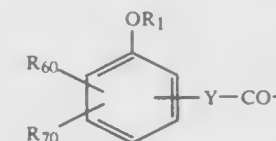
U.S. Cl. 106—20

6 Claims

1. An ink which contains a water soluble dye and at least one water-soluble compound of the formula



in which R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, allyl or $-CO-CH_3$, R_3 and R_4 , independently of one another, are hydrogen or $-CO_2M^+$, and R_5 , R_6 and R_7 , independently of one another, are hydrogen, alkyl having 1 to 8 carbon atoms which is unsubstituted or substituted by $-CO_2R_8$, $-CO_2M^+$ or phenyl, or are $-CO_2R_8$ where R_8 is a group of the formula $-(CH_2CH_2O)_nR_{11}$ in which R_{11} is hydrogen, alkyl having 1 to 4 carbon atoms or a group of the formula



in which R_1 is as defined above, Y is a direct bond or alkylene having 1 to 8 carbon atoms, and R_{60} and R_{70} , independently of one another, are hydrogen or alkyl having 1 to 8 carbon atoms, M^+ is a monovalent, divalent or trivalent metal cation, H^+ or a group of the formula $N(R_{17})(R_{12})(R_{13})(R_{14})$ in which R_{17} , R_{12} , R_{13} and R_{14} , independently of one another, are hydrogen, alkyl having 1 to 8 carbon atoms, alkyl having 2 to 8 carbon atoms which is substituted by 1 to 3 hydroxyl groups or is interrupted by oxygen, alkenyl having 3 to 5 carbon atoms or benzyl, at least one of the substituents R_3 to R_7 being $-CO_2M^+$ or $-CO_2R_8$.

5,089,051

ADHESION-PROMOTING DENTAL COMPOSITION

Bernhard Eppinger; Regina Eppinger, both of Weilburg, and Roland Schaefer, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Heraeus Kulzer GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 11, 1990, Ser. No. 596,099

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1989, 3934849

Int. Cl. A61K 6/02, 6/08; C09J 3/14

U.S. Cl. 106—35

24 Claims

1. A dental adhesion-promoting composition comprising from 1 to 25% by weight of at least one acryloyloxyalkyl hydrogen phosphate selected from the group consisting of (meth)acryloyloxyalkyl dihydrogen phosphate with the alkyl group of which having 2 to 6 carbon atoms and di(meth)acryloyloxyalkyl hydrogen phosphate with the alkyl group of which having 2 to 6 carbon atoms; 3 to 40% by weight of at least one acidic carboxylic acid ester selected from the group consisting of dicarboxylic acid mono(meth)acryloyloxyethyl ester, o-trimellitic acid

mono(meth)acryloyloxyethyl ester, and pyromellitic acid di(meth)acryloyloxyethyl ester; 0.05 to 5% by weight of a photopolymerization catalyst; and the remainder being an organic solvent.

5,089,052

EMULSIFICATION OF ROCK ASPHALT

Allen C. Ludwig, 5914 Brenda Ln., San Antonio, Tex. 78240

Filed Aug. 10, 1989, Ser. No. 392,105

Int. Cl. C08L 95/00

U.S. Cl. 106—276

22 Claims

1. A method for emulsification of rock asphalt ore containing at least 4% by weight asphalt comprising; wetting a fine mesh rock asphalt ore with a hydrocarbon fluxing agent in sufficient volume to produce a fluid mix; adding from about 25 to about 150% by volume water to the fluid mix; adding from 0.1 to about 5.0% by weight based on the fluid mix of a surfactant; adding from 0.1 to about 10% by weight of an inorganic asphalt and comprising salt; and heating the admixture from about 170° F. to about 225° F. with agitation.

5,089,053

CONTACT LENS CLEANING MATERIAL AND METHOD

Maylee H. Chou, Lexington, and Edward J. Ellis, Lynnfield, both of MA, assignors to Polymer Technology Corporation, Wilmington, Mass.

Filed Nov. 9, 1989, Ser. No. 434,412

Int. Cl. B08B 3/08

U.S. Cl. 134—7

10 Claims

1. A contact lens cleaning material designed for cleaning hard contact lenses formed of silicon and fluorine containing polymers, after said lenses have been used in the eye, said cleaning material comprising,

- (a) an anionic surface active agent selected to have good cleaning action with respect to protein and mucous like material deposits,
- (b) an alkylphenyl polyether alcohol surfactant,
- (c) an aqueous suspending vehicle,
- (d) an inorganic abrasive having an average particle size of no more than about 20 microns,
- (e) separate means to maintain a, b and d in substantially uniform suspension, so that said suspension is capable of cleaning a contact lens without adversely affecting or scratching said lens, and,
- (f) a preservative and surfactant quaternary phosphate ester.

5,089,054

FLAT PLATE ALKALI METAL THERMOELECTRIC CONVERTER MODULE

Robert K. Sievers, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1990, Ser. No. 619,354

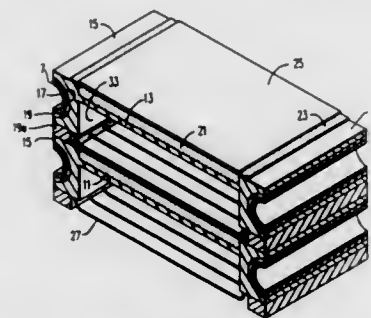
Int. Cl. H01L 37/00

U.S. Cl. 136—202

19 Claims

1. A flat plate alkali metal thermo-electric converter module comprising an enclosure; a plurality of cells, a condenser, heating conduits for heating each cell and a quantity of alkali metal disposed within said enclosure; each cell having a bed plate with a generally flat portion, means for containing alkali metal adjacent the generally flat portion of the bed plate, and an alkali metal and electron barrier capable of conducting alkali metal ions; the barrier cooperating with the generally flat portion of the bed plate to form the alkali metal containing means adjacent each generally flat portion of the bed plate; each bed plate cooperating with an adjacent bed plate to form a duct for transporting vaporized alkali metal to the condenser; insulation disposed to electrically isolate adjacent bed plates;

means for transferring liquid alkali metal from the condenser to the alkali metal containing means and a current collector dis-



posed in electrical contact with the barrier to collect electrical energy produced by each cell.

5,089,055

SURVIVABLE SOLAR POWER-GENERATING SYSTEMS FOR USE WITH SPACECRAFT

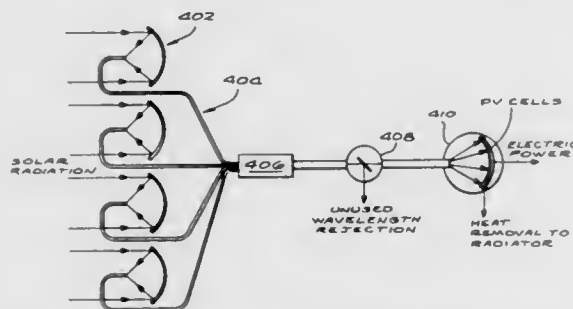
Takashi Nakamura, 5964 Harbord Dr., Oakland, Calif. 94611

Filed Dec. 12, 1989, Ser. No. 448,943

Int. Cl.⁵ H01L 31/052, 31/058

U.S. Cl. 136—248

20 Claims



1. A solar power-generating system for use on board spacecraft comprising:
optical means positioned to collect and concentrate solar energy flux;
a flexible solar energy flux transmission line for conducting the concentrated solar energy flux towards a solar energy converter,
solar energy conversion means including an array of photovoltaic cells for converting the solar energy flux to electrical power to be applied to on-board equipment of the spacecraft;
a protective enclosure positioned about the photovoltaic cells for substantially shielding the photovoltaic cells from destructive radiation and particulate matter,
wherein the transmission line includes a plurality of optical fiber waveguides having respective input and output end portions, the input end portions being respectively positioned to receive concentrated solar energy flux, the output end portions being respectively positioned to direct concentrated solar energy flux towards the conversion means; and
means for moving the input ends of the optical fiber waveguides with respect to the optical means to generally optimize the quantity of concentrated solar flux entering the waveguides.

14. The system of claim 1 wherein the energy conversion means further includes a plurality of devices for converting solar energy flux into other forms of energy, and wherein the system includes

optical switch means for selectively distributing the gathered solar energy flux to various ones of the devices in accordance with the needs of the on-board equipment.

OPACIFYING KAOLIN PIGMENTS AND PROCESS FOR MAKING SAME BY REACTING WITH SODIUM HYDROXIDE IN WATER

Joseph C. S. Shi, Bartow; Jerry L. Curtis, Milledgeville, and Timothy L. Salter, Sandersville, all of Ga., assignors to Thiele Kaolin Company, Sandersville, Ga.

Filed Apr. 21, 1989, Ser. No. 341,723

Int. Cl.⁵ C04B 14/04, 33/04

U.S. Cl. 106—486

12 Claims

1. A process of making an opacifying Kaolin pigment wherein hydrous kaolin is reacted in the presence of water with sodium hydroxide or potassium hydroxide to produce a substantially white pigment that exhibits a higher light scattering characteristic than kaolin unreacted with the hydroxide exhibits, wherein (a) the hydroxide is present in sufficient concentration to produce a molality of at least 0.1, (b) the reaction temperature is at least 60° C. and (c) the kaolin is present in a concentration of between 5 percent and 70 percent, by weight, with respect to the water.

5,089,057

METHOD FOR TREATING COPPER-BASED ALLOYS AND ARTICLES PRODUCED THEREFROM

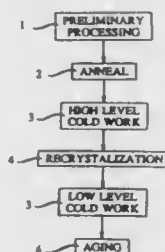
John T. Plewes, Chatham, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 408,443, Sep. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 70,010, Jul. 2, 1987, abandoned. This application Sep. 17, 1990, Ser. No. 584,392

Int. Cl.⁵ C22C 9/02; C22F 1/08

U.S. Cl. 148—12.7 C

16 Claims



14. A method for forming an article of manufacture from a copper-based metallic alloy comprising 3–20 wt. % Ni, 3.5–7 wt. % Sn and 0.15–0.3 wt. % Si comprising the steps of:

- homogenizing the alloy to form an essentially uniform fine grain structure of a supersaturated solid solution of single phase α alloy having an average grain size of no more than 0.2 mm;
- cold working the homogenized alloy to obtain an area reduction of at least 60% without intermediate anneals;
- recrystallizing the alloy at a temperature of $\pm 25^\circ$ C. from the two phase equilibrium boundary for a time sufficient to develop a metastable recrystallization texture and essentially eliminate any brass texture formed during cold work;
- quenching immediately after recrystallization;
- aging the alloy to obtain spinodal transformation such that said alloy is essentially isotropically formable.

5,089,058

METHOD AND APPARATUS FOR HIGH FREQUENCY HEAT-TREATMENT OF LONG CONTINUOUS METAL BLANKS

Fumihiko Shimura, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed May 3, 1989, Ser. No. 346,671

Claims priority, application Japan, May 13, 1988, 63-116172

Int. Cl.⁵ C21D 1/74

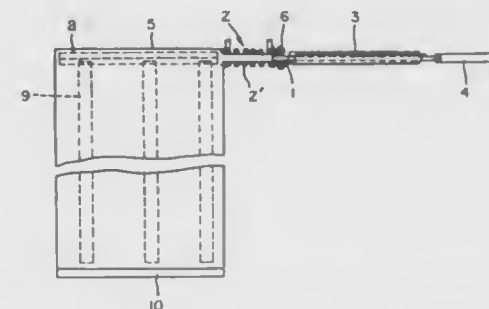
U.S. Cl. 148—16

18 Claims

1. A method for heat-treatment of long continuous metal

blanks wherein the long continuous metal blanks are rapidly heated by high frequency heating in a predetermined atmosphere and then cooled rapidly in said atmosphere, the improvement of which comprises the steps of:

- pushing the long continuous metal blank laid on a guide means into a cooling chamber connected in series with a



heating furnace after passing through the heating furnace at a predetermined speed by a pushing rod which is insensitive to the high frequency; and

- cooling said long continuous metal blank in said cooling chamber while transferring it in a direction substantially perpendicular to the pushing direction thereof.

5,089,059

METHOD AND DEVICE FOR THE HEAT TREATMENT OF METAL STRAPS

Andre Reiniche, Clermont-Ferrand; Philippe Sauvage, and Paul Van Den Bergh, both of Chateaugay, all of France, assignors to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand Cedex, France

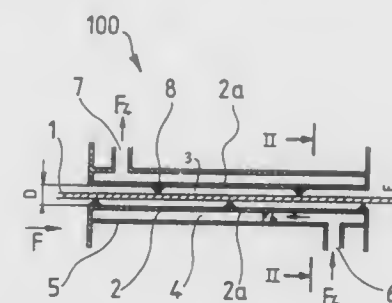
Filed Jul. 24, 1990, Ser. No. 557,573

Claims priority, application France, Jul. 26, 1989, 89 10323

Int. Cl.⁵ C21D 9/52

U.S. Cl. 148—16

13 Claims



1. A method for the heat treatment of at least one metal strap, wherein the strap is passed through an enclosure containing a gas which is practically without forced ventilation, in such a manner that a transfer of heat takes place between the strap and the walls of the enclosure by means of the gas contained in the enclosure, wherein the coefficient K_T defined by the equation:

$$K_T = \frac{J}{C} \times E^2$$

is selected as a function of the heat treatment to be carried out, J being the thickness of the layer of gas between the strap and the enclosure, expressed in millimeters; E being the thickness of the strap, expressed in millimeters, and C being the thermal conductivity of the gas determined at 600° C., expressed in $\text{watts} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$ and wherein there is the relationship $0.01 \leq K_T \leq 100$.

5,089,060

THERMOMAGNETICALLY PATTERNED MAGNETS AND METHOD OF MAKING SAME

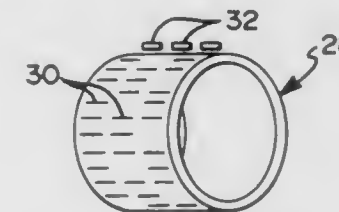
John R. Bradley, Centerline; Thomas A. Perry, Washington, and Thaddeus Schroeder, Rochester Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 28, 1990, Ser. No. 589,352

Int. Cl.⁵ H01F 1/02

U.S. Cl. 148—103

11 Claims



1. A method of imparting a magnetic pattern to a magnetized bulk permanent magnet material comprising the steps of:
directing energy in a pattern onto base permanent magnet bulk material to heat a volume of the material to a threshold temperature to lower the coercivity thereof;
imposing a magnetic field on the heated pattern greater than the coercivity of the heated volume, wherein the field imposed on the heated pattern emanates at least partially from the magnetized base material, whereby the treated pattern generates a lower flux density than the base material; and
allowing the material to cool in the imposed field, whereby the treated pattern has a magnetic characteristic sufficiently different from the base material to be readily detected by a magnetic sensor.

5,089,061

METHOD FOR PRODUCING HIGH SILICON STEEL STRIP IN A CONTINUOUSLY TREATING LINE

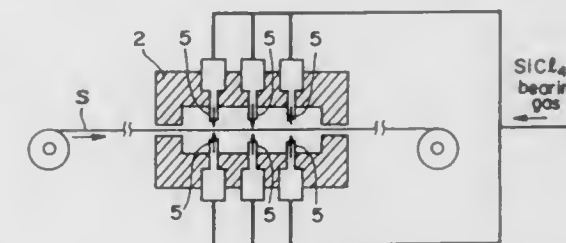
Masahiro Abe; Kazuhisa Okada; Shuzo Fukuda; Yasushi Tanaka; Masayuki Yamato, and Yoshikazu Takada, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,954

Int. Cl.⁵ H01F 1/04

U.S. Cl. 148—110

36 Claims



1. A method of producing high silicon steel strip in a continuous line, comprising continuously siliconizing a steel strip by a chemical vapor deposition at temperatures between 1023° and 1200° C. in a non-oxidizing gas atmosphere containing SiCl_4 to 35% in molar fraction, and subsequently subjecting the strip to a diffusion treatment so as to uniformly diffuse Si in the steel strip in a non-oxidizing gas atmosphere not containing SiCl_4 , in which diffusion treatment, increasing the temperature of the steel strip to an extent that the steel strip is not molten, cooling after the diffusion treatment, and coiling.

5,089,062

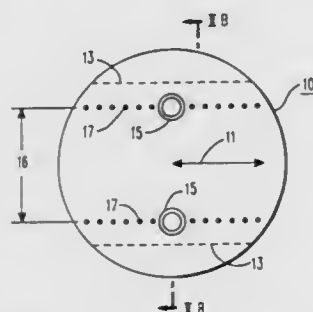
DRILLING OF STEEL SHEET

Norman M. Pavlik, Wilkinsburg; John Sefko, Monroeville, and Richard A. Miller, N. Huntingdon, all of Pa., assignors to ABB Power T&D Company, Inc., Pa.
Division of Ser. No. 582,250, Sep. 14, 1990, which is a division of Ser. No. 257,915, Oct. 14, 1988, Pat. No. 4,963,199. This application Mar. 1, 1991, Ser. No. 663,571

Int. Cl.⁵ H01F 1/04

U.S. Cl. 148—111

9 Claims



1. A method of treating steel sheet having a plurality of magnetic domains, characterized in drilling a plurality of closely spaced, small holes through the entire thickness of the steel sheet, to form additional domain walls and subdivide said magnetic domains wherein the holes are drilled by a laser and the drilled steel sheet is subsequently annealed at a temperature over 700° C. without substantially affecting the domain subdivision or the flatness of the sheet.

5,089,063

METHOD FOR PROVIDING ADHESION TO A METAL SURFACE

Larry A. Harrah; Ronald E. Allred, and Kennard V. Wilson, Jr., all of Albuquerque, N. Mex., assignors to PDA Engineering, Inc., Costa Mesa, Calif.

Filed Jan. 8, 1990, Ser. No. 461,922

Int. Cl.⁵ B05D 3/00; C23C 8/06, 22/00

U.S. Cl. 148—241

29 Claims

1. A method of bonding an adhesive composition to a metal surface, comprising the steps of:

- oxidizing the metal surface with a halogen to form a layer of halide ions on the metal surface;
- exchanging the halide ions on the metal surface with azide ions by exposing the metal surface to a solution of an azide so as to form a layer of azide ions on the metal surface;
- contacting the metal surface having the layer of azide ions thereon with an adhesive composition; and
- causing the azide ions to decompose so as to form nitrenes which bond the metal surface to the adhesive composition.

5,089,064

PROCESS FOR CORROSION RESISTING TREATMENTS FOR ALUMINUM SURFACES

Gary A. Reghi, Rochester Hills, Mich., assignor to Henkel Corporation, Ambler, Pa.

Filed Nov. 2, 1990, Ser. No. 608,519

Int. Cl.⁵ C23F 11/18, 11/14, 11/00

U.S. Cl. 148—247

10 Claims

1. A process for improving the corrosion resistance of an article having an aluminum surface, comprising steps of:

- containing the aluminous surface with an aqueous liquid composition of matter comprising water and:
 - from about 0.01 to about 18 w/o of H_2ZrF_6 ;
 - from about 0.01 to about 10 w/o of a water soluble or dispersible polymer of 3-(N-C₁₋₄ alkyl-N-2-hydroxyethylaminomethyl)-4-hydroxystyrene; and

(C) from about 0.05 to about 10 w/o of dispersed silica; and, optionally

(D) from 0.06 to 0.06 w/o of a solvent other than water that (i) can dissolve at a temperature not greater than 50° C. a sufficient amount of a homopolymer of 4-hydroxy-styrene having an average molecular weight in the range of 3000–6000 to produce a solution containing at least 20 grams of polymer per liter of solution and (ii) is itself sufficiently soluble in water at a temperature not greater than 50° C. to produce a solution containing at least 1 grams of solvent per liter of aqueous solution; and, optionally,

(E) surfactant in an amount effective to reduce the surface tension of the composition; and

(II) drying without rinsing the surface contacted in step (I).

5,089,065

MELT-QUENCHED THIN-FILM ALLOY FOR BONDED MAGNETS

Masaaki Hamano, Sendai; Hiroshi Yamamoto, Tokyo; Mitsuru Nagakura, Yokohama, and Yoshiaki Ozawa, Tokyo, all of Japan, assignors to MG Company Ltd., Miyagi, Japan

Filed Aug. 22, 1989, Ser. No. 396,674

Claims priority, application Japan, Aug. 23, 1988, 63-207312

Int. Cl.⁵ H01F 1/053

U.S. Cl. 148—302

11 Claims

1. A melt-quenched thin-film alloy indicated by the alloy composition formula:



wherein R represents Nd alone or a composite rare earth element containing at least 50 atomic % of Nd, and wherein the atomic percentages satisfy the following relationships $9 \leq X \leq 12$, $6 \leq Y \leq 10$, $0.5 \leq Z \leq 1.5$ and $5 \leq W \leq 16$, said alloy having a residual flux density of $Br \geq 9$ KG, a coercive force of $iH_c \geq 8$ HOe and a magnetic energy of $(BH)_{max} \geq 17$ MGOe.

5,089,066

MAGNETS HAVING IMPROVED CORROSION RESISTANCE

Takaki Hamada; Tetsuji Hayakawa, and Yutaka Matsuura, all of Osaka, Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Division of Ser. No. 818,238, Jan. 13, 1986, Pat. No. 4,837,114, which is a continuation-in-part of Ser. No. 812,992, Dec. 24, 1985, abandoned. This application Jun. 1, 1989, Ser. No. 360,101

Claims priority, application Japan, Dec. 24, 1984, 59-278489; Jan. 18, 1985, 60-7949; Jan. 18, 1985, 60-7950; Jan. 18, 1985, 60-7951; May 23, 1985, 60-110793; May 23, 1985, 60-110794; Sep. 10, 1985, 60-200890; Nov. 20, 1985, 60-260769; Nov. 20, 1985, 60-260770; Nov. 20, 1985, 60-260771

Int. Cl.⁵ G11B 5/70

U.S. Cl. 148—302

12 Claims

1. A permanent magnet which has been produced by the process comprising:

providing a sintered permanent magnet body consisting essentially of 10–30 at % R, wherein R is at least one element selected from the group consisting of Nd, Pr, Dy, Ho and Tb or a mixture of at least one said element and at least one other element selected from the group consisting of La, Ce, Sm, Gd, Er, Eu, Tm, Yb, Lu, Pm and Y, 2–28 at % B and at least 42 at % Fe, and wherein at least 50 vol % of the entire permanent magnet material body consists of Fe-B-R type tetragonal crystal structure;

providing an interdiffusion layer on the permanent magnet material body; and

forming a low gas permeability anticorrosive coating film layer on the interdiffusion layer on the permanent magnet material body by means of vapor deposition so that corrosive substances do not remain in the resultant permanent

magnet, thereby improving the corrosion resistance of the resultant permanent magnet.

5,089,067

MARTENSITIC STAINLESS STEEL

William J. Schumacher, Monroe, Ohio, assignor to Armeo Inc., Middletown, Ohio

Filed Jan. 24, 1991, Ser. No. 645,517

Int. Cl.⁵ C22C 38/40

U.S. Cl. 148—325

16 Claims

1. A substantially martensitic stainless steel composition consisting essentially of, by weight percent, up to about 0.08% carbon, about 1% to 4% manganese, about 13.0% to about 17% chromium, about 1.5% to 4.0% copper, about 0.04% up to about 0.12% nitrogen, less than about 1.0% silicon, less than about 1.0% molybdenum, less than 1.0% nickel, less than about 0.03% phosphorus, less than about 0.5% sulfur, up to about 0.005% boron, and balance essentially iron.

5,089,068

COLD ROLLED STEEL SHEETS HAVING IMPROVED SPOT WELDABILITY

Susumu Okada; Makoto Imanaka; Susumu Masui; Takashi Ohara; Masatoshi Shinozaki, and Kozo Tsunoyama, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan Division of Ser. No. 204,619, Jun. 9, 1988, Pat. No. 4,889,566.

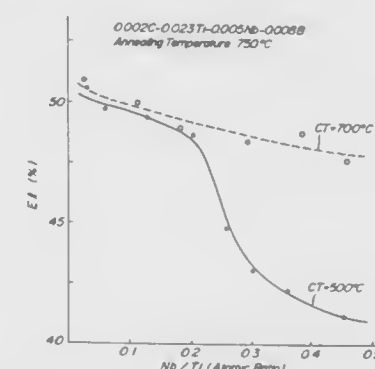
This application Sep. 21, 1989, Ser. No. 410,414

Claims priority, application Japan, Jun. 18, 1987, 62-150313; Jun. 19, 1987, 62-152977; Jun. 19, 1987, 62-152978; Jun. 19, 1987, 62-152979

Int. Cl.⁵ C22C 38/06, 38/14, 38/12

U.S. Cl. 148—328

6 Claims



1. A cold rolled steel sheet comprising:

not more than 0.004 wt % C, not more than 0.1 wt % Si, not more than 0.5 wt % Mn, not more than 0.025 wt % P, not more than 0.025 wt % S, not more than 0.0040 wt % N, 0.01–0.04 wt % Ti, 0.003–0.008 wt % Nb, 0.0001–0.001 wt % B, 0.01–0.1 wt % Al and the remainder being substantially Fe; and

fine precipitates of Ti having a grain size of not more than 0.05 μ m uniformly dispersed in said steel in an amount of not less than 30 ppm as a Ti conversion amount.

5,089,069

GAS GENERATING COMPOSITION FOR AIR BAGS

Coodly P. Ramaswamy, Christiana, Pa., and Francis Souriraja, Parsippany, N.J., assignors to Breed Automotive Technology, Inc., Boonton Township, Morris County, N.J.

Filed Jun. 22, 1990, Ser. No. 542,313

Int. Cl.⁵ C06B 45/02

U.S. Cl. 149—21

3 Claims

1. A gas generating composition comprising sodium azide, potassium nitrate, and silicon dioxide where the particle size of the sodium azide and potassium nitrate are between 10 and 20 microns and the particle size of the silicon dioxide is between 5 and 10 microns and wherein the ratios of sodium azide potas-

5,089,070

POLY(PROPYLENE CARBONATE)-CONTAINING CERAMIC TAPE FORMULATIONS AND THE GREEN TAPES RESULTING THEREFROM

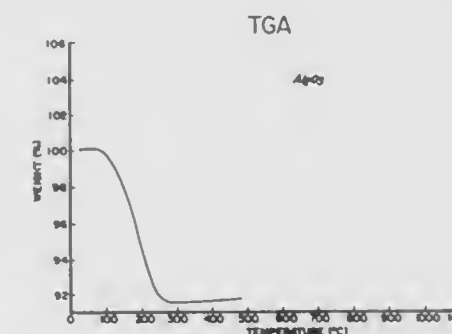
Thomas P. McAndrew, 941 Vine St., Macungie, Pa. 18062

Filed Dec. 7, 1989, Ser. No. 447,452

Int. Cl.⁵ C04B 35/64

U.S. Cl. 156—89

11 Claims



1. A method for producing a ceramic green tape which comprises:

- admixing amounts consisting essentially of 15 to 30 volumes of ceramic powder, 5 to 15 volumes of poly(propylene carbonate); 60 to 75 volumes of a solvent mixture, and 0.2 to 2 volumes of a plasticizer to form a slurry having a Brookfield viscosity in the range of 500 to 4500 cps at 25° C.;
- casting a thin film of said slurry onto a substrate;
- removing the solvent from said slurry; and
- removing the resulting green tape having a tensile strength of greater than 35 psi from said substrate; and then firing the resulting ceramic green tape at temperatures in the range of 200° to 400° C. to substantially remove all of the poly(propylene carbonate) and the plasticizer.

5,089,071

PROCESS FOR PRODUCING A MULTILAYERED CERAMIC STRUCTURE USING AN ADHESIVE FILM

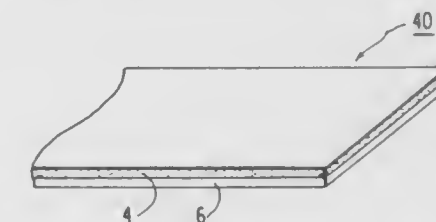
Takashi Tominaga; Takahumi Sakuramoto; Souji Nishiyama; Kiyohiro Kamei; Yoshiki Kohayashi, and Gosei Uemura, all of Osaka, Japan, assignors to Nitto Electrical Industrial, Osaka, Japan

Continuation of Ser. No. 431,729, Nov. 3, 1989, abandoned, which is a continuation of Ser. No. 237,197, Aug. 29, 1988, abandoned. This application May 1, 1990, Ser. No. 522,396

Int. Cl.⁵ B32B 18/00

U.S. Cl. 156—89

4 Claims



1. A process for producing a multilayer ceramic laminate structure comprising the steps of:

- forming at least two ceramic green molded sheets containing ceramic powder and a binder which are dispersed in an organic solvent, and wherein said green molded sheets have a thickness of about 0.3 mm to 2.0 mm;

- (2) applying a preformed pressure sensitive adhesive film consisting essentially of the same ceramic powder as said ceramic green molded sheets and an adhesive composition having pressure sensitive properties at room temperature to said first ceramic green molded sheet and pattern, and wherein the ceramic powder in said adhesive film is from 20 to 80 wt% and said adhesive film has a thickness of about 30 μm or less;
- (3) laminating a second ceramic green molded sheet with said first ceramic green molded sheet, and wherein said adhesive film is interposed therebetween; and
- (4) burning the formed laminate to produce said multilayered ceramic structure.

5,089,072

METHOD OF PROTECTING A CATALYTIC CONVERTER BLOCK WITH A FIBROUS MATERIAL PACKING

John E. Carson, Clwyd, United Kingdom, assignor to Fibre Techniques Limited, United Kingdom

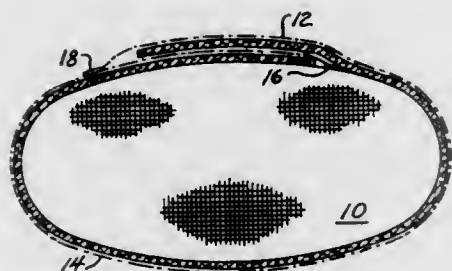
Filed Jun. 17, 1988, Ser. No. 208,353

Claims priority, application United Kingdom, Jun. 18, 1987, 8714285; Feb. 25, 1988, 8804403

Int. Cl.³ B65C 3/00

U.S. Cl. 156—212

12 Claims



1. A method for protecting and insulating a catalytic converter block prior to placement in a protective metallic shell, comprising the steps of wrapping a catalytic converter block in a mat of fibrous material and an associated covering layer of combustible plastics material, said mat overlapping itself and said covering layer extending beyond the associated mat so that the covering layer makes overlapping contact with itself and completely covers the mat, said wrapping step including the step of applying tension to the covering layer being wrapped while the fibrous material mat is being wrapped on the converter block whereby a compressed layer of fibrous material is positioned around the converter block thereby permitting the protected and insulated block to thereafter be positioned within a metallic shell.

12. A method of protecting and insulating a catalytic converter block prior to placement in a protective metallic shell including the steps of positioning at least one wrapping around said block, each wrapping comprising a mat of fibrous material and an associated covering layer of combustible plastics material; placing at least one mat in overlapping orientation whereby said one mat overlaps itself or another mat; placing tension on the plastics material during wrapping; extending the plastics material beyond its associated mat whereby the plastics material makes contact with a plastics material of one of the wrappings thereby completely covering the fibrous material with the plastics material.

5,089,073 HIGH STRENGTH LAMINATED FILM FOR CHUB PACKAGING

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

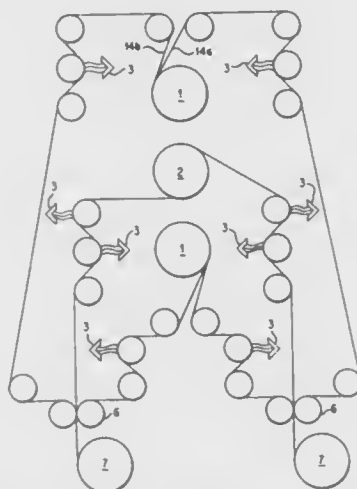
Division of Ser. No. 249,631, Sep. 26, 1988, Pat. No. 5,037,683.

This application Jan. 10, 1991, Ser. No. 639,602

Int. Cl.³ B29C 47/06

U.S. Cl. 156—244.11

4 Claims



1. A method of making a multilayer laminate useful in chub packaging comprising:
- a) melt extruding a first film;
 - b) biaxially orienting said film;
 - c) ply separating the first film into two plies, each ply having two outer surfaces;
 - d) corona treating the two outer surfaces of one of the plies of the first film;
 - e) melt extruding a second film by a hot blown method;
 - f) ply separating the second film into two plies, each ply having two outer surfaces;
 - g) corona treating an outer surface of one of the plies of the second film;
 - h) melt extruding a third film by a hot blown method;
 - i) ply separating the third film into two plies, each ply having two outer surfaces;
 - j) corona treating an outer surface of one of the plies of the third film; and
 - k) passing the corona treated plies between a pair of nip rolls such that the corona treated ply of the first film is sandwiched between and in communication with corona treated surfaces of the plies of the second and third films respectively to cause bonding thereof.

5,089,074

FLEXIBLE HOSE CONSTRUCTION AND METHOD OF MAKING THE SAME

Jeffrey J. Winter, Ocala, Fla.; Homer N. Holden, Sylva, N.C., and James L. Lawrence, Ocala, Fla., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Sep. 11, 1989, Ser. No. 405,487

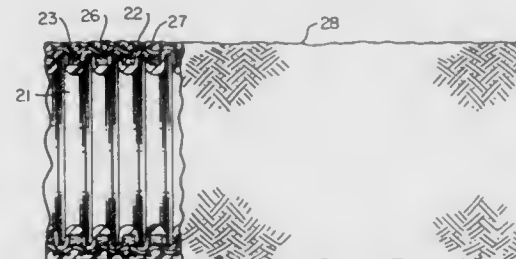
Int. Cl.³ B29C 47/06, 47/20

U.S. Cl. 156—244.13

3 Claims

1. In a method of making a flexible hose construction comprising the steps of forming an inner corrugated hose of polymeric material to have a plurality of outwardly convex projections with recesses therebetween, disposing an outer sleeve of reinforcing material in telescoping relation on said inner hose, and disposing an outer sleeve of polymeric material in telescoping relation on said sleeve of reinforcing material, the improvement comprising the steps of disposing a tube of polymeric material between said sleeve of reinforcing material and

said inner hose by extruding said tube onto said inner hose before disposing said sleeve of reinforcing material thereon, the step of extruding causing said tube to have substantially constant inner and outer diameters whereby said tube extends in a generally straight-line manner from projection to projection of said inner hose so as to prevent said sleeve of reinforcing material from thereafter entering into said recesses of said inner hose an amount that would tend to substantially reduce the flexibility characteristics of said inner hose, forming said inner hose with an outer layer of one thermoplastic material and an inner layer of a different thermoplastic material, form-



ing said tube of polymeric material from the same thermoplastic material that forms said outer layer of said inner hose, forming said outer sleeve of polymeric material of the same thermoplastic material that forms said tube of polymeric material, the step of extruding causing said tube of polymeric material to be bonded to said projections of said inner hose, and bonding said sleeve of polymeric material to said tube of polymeric material through said sleeve of reinforcing material by extruding said sleeve of polymeric material onto said sleeve of reinforcing material whereby said tube of polymeric material holds said sleeves and said hose together.

5,089,075

PRODUCTION OF BREATHING COMPOSITE SHEET

Takefumi Sonoda, Mie, Japan, assignor to Tosoh Corporation, Yamaguchi, Japan

Filed Apr. 27, 1990, Ser. No. 515,396

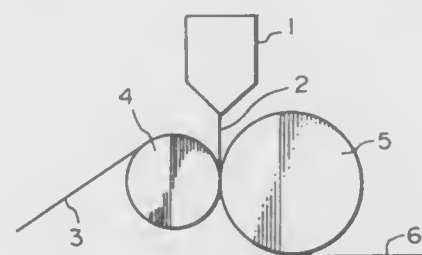
Claims priority, application Japan, Apr. 28, 1989, 1-107374;

Jul. 18, 1989, 1-183797; Aug. 11, 1989, 1-206651

Int. Cl.³ B32B 31/00

U.S. Cl. 156—244.18

4 Claims



1. A method for preparing a breathing composite sheet from a thermoplastic resin and a porous substrate by extrusion-laminating technique, wherein a modified roll having a smooth surface is employed to perforate an extruded molten thermoplastic film which has just been extruded onto the porous substrate, at least part of the surface of the roll with which the extruded molten thermoplastic film is brought into direct contact being formed of a material having a thermal conductivity within the range of from 0.03 kcal/m-hr°C. to 5 kcal/m-hr°C. and a hardness of not less than HDA 60 as measured in accordance with the method of JIS K7215.

5,089,076

METHOD OF MANUFACTURING ARTICLE INCLUDING MELTING THERMOSETTING-POWDER

Roger J. Leach, East Molesey, and James F. Lindsay, Tamworth, both of England, assignors to Chelsea Artisans PLC, Surrey and Imperial Chemical Industries PLC, London, both of, England

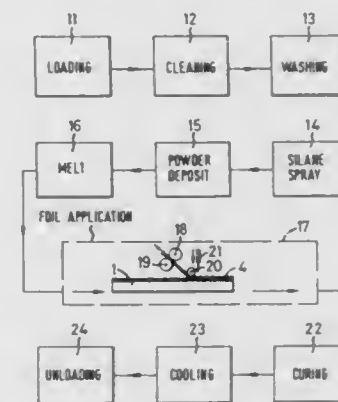
Filed Jul. 11, 1988, Ser. No. 217,230

Claims priority, application United Kingdom, Jul. 10, 1987, 8716242; Jun. 30, 1988, 8815638

Int. Cl.³ B29C 65/02

U.S. Cl. 156—283

19 Claims



1. In a method of manufacturing a panel for architectural purposes, in which a thermosetting organic powder-coating material applied to a surface of a facing sheet of the panel in the form of powder, is heated to melt and cure the powder and thereby form a coating bonded to the surface, the improvement wherein the facing sheet is a sheet consisting of glass having planar front and back surfaces, the powder is applied to the back surface of the glass sheet, contact is established between the melted powder and a surface of a metal sheet prior to curing and while the powder is in the melted condition, and such contact is maintained during curing so that said metal sheet is thereby bonded, as a thermally-conductive backing, by the cured powder coating to said back surface of the glass sheet, the thermosetting material being clear so that at least part of the coating-bonded surface of the backing sheet is viewable in the glass when viewing into said front surface of the glass sheet, through the coating.

5,089,077

APPARATUS FOR MANUFACTURING MULTIPLE-PLY TIRE CARCASSES

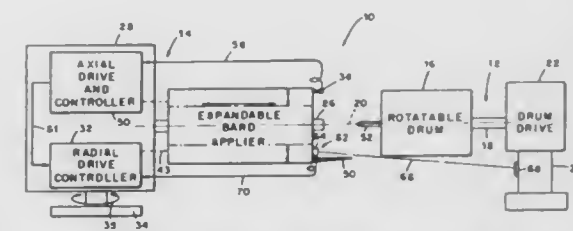
Mark S. Byerley, Greenback, Tenn., assignor to WYKO, Incorporated, Greenback, Tenn.

Filed Mar. 8, 1990, Ser. No. 490,366

Int. Cl.³ B32B 01/08; B29D 30/30

U.S. Cl. 156—351

17 Claims



1. Apparatus for building a multiple-ply tire carcass incorporating a plurality of tire bands and employed in combination with an elongated cylindrical drum means rotatable about a longitudinal axis for sequentially receiving about the periph-

eral surface thereof a plurality of concentrically disposed cylindrical tire bands, comprising an elongated radially expandable and collapsible band applying means positionable along the longitudinal axis for supporting thereabout a tire band of an elongated cylindrical configuration and for displacing the tire band therefrom over the peripheral surface of the cylindrical drum means and any tire band thereon, first drive means for radially expanding the band applying means circumferentially away from the longitudinal axis, second drive means for displacing the band applying means towards said drum means along said longitudinal axis for positioning an end of the band applying means at a location contiguous to one end of the drum means, sensing means coupled to said second drive means for stopping the displacement of the band applying means along said longitudinal axis when said end of the band applying means is at a said location contiguous to said one end of the drum means, and signal beam sensing means disposed at said end of the band applying means and radially expandable therewith and coupled to the first drive means for providing signals thereto in response to a signal beam oriented at a preselected angle with respect to the longitudinal axis of said drum means such that during the axial displacement of the band applying means towards the drum means the signal beam is periodically interrupted by the peripheral surface of the drum means and any tire band thereon for controlling the radial expansion of the band applying means during the displacement of the band applying means towards said drum means.

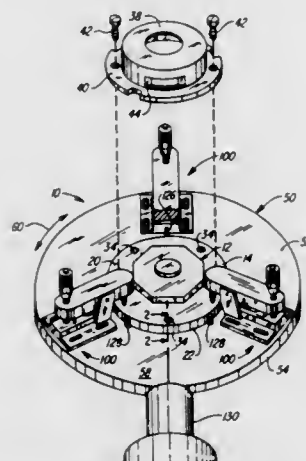
5,089,078

APPARATUS FOR ALIGNING AN OPTICAL DEVICE
Mark D. Bedzyk, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1990, Ser. No. 628,979
Int. Cl.⁵ G01D 21/00

U.S. Cl. 156—378

6 Claims



1. Apparatus for aligning an optical device supported by a housing, the apparatus comprising:
 - a fixture having a base mounted for rotation about an axis,
 - a plurality of adjustable pad assemblies, each of the assemblies comprising (a) a mounting plate removably positioned on the base of the fixture, (b) a bushing secured to the housing of the optical device, and (c) a compressible member supported by the mounting plate with a portion of the compressible member projecting from the plate to form an area on the plate for receiving an adhesive, the housing of the optical device being located on the base by positioning the mounting plates of the assemblies in spaced relation on the base and securing the bushings of the assemblies to the housing and then bringing the bushings into engagement with the compressible members of the assemblies,
 - a plurality of pushers carried by the fixture base and engageable with the housing for urging the housing toward the

base, the pushers being independently adjustable to control the position of the housing relative to the fixture base about a plurality of axes, the pushers being effective to urge the bushings toward the mounting plates and squeeze the compressible members so that the bushings are in contact with the adhesive, and means for measuring the angular position of the optical device on the housing.

5,089,079

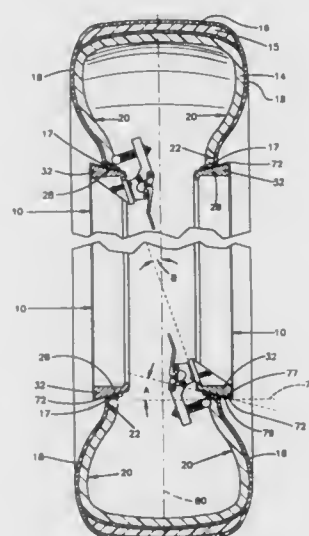
RETREAD RING

Robert H. Majewski, Findlay, Ohio, assignor to The Hercules Tire & Rubber Company, Findlay, Ohio

Filed Jun. 1, 1990, Ser. No. 531,781
Int. Cl.⁵ B29D 30/54

U.S. Cl. 156—394.1

24 Claims



1. A retread curing ring for mounting on a tire retread assembly, the tire retread assembly including a tire carcass defining a retread area and having integral sidewalls that form a circumferential bead along each sidewall's inner edge, each circumferential bead including an exterior edge, and an inner edge that defines a bead angle, a preformed tread strip positioned on the retread area, and a flexible envelope surrounding the tread strip and the sidewalls and extending on each side of the tire carcass over the inner edge of the bead so that a portion of each edge of the envelope is captured between the inner edge of one circumferential bead and said retread curing ring, said retread curing ring comprising:

means for holding clamping means;
a conical seat capable of being insertable within one opening of the tire carcass the conical seat having a complementary shape and angle relative to the circumferential bead so that one edge portion of the flexible envelope is captured and sealed exclusively between the inner edge of one circumferential bead and a surface of said conical seat, said means for holding said clamping means being joined to said conical seat;
clamping means comprising a clamping arm movable between an open and a closed position, said clamping arm when in the closed position capable of engaging the interior of one sidewall and urging the circumferential bead toward said conical seat so that the edge portion of the flexible envelope is tightly exclusively captured between the inner edge of the circumferential bead and the surface of said conical seat.

5,089,080

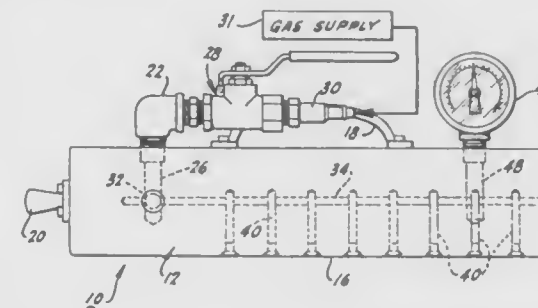
COLD CARPET IRON

Andrew Ramirez, and Simon Ramirez, both of 788 Sequoia Blvd., Tracy, Calif. 95376

Filed Mar. 5, 1990, Ser. No. 488,231
Int. Cl.⁵ B29C 35/00

U.S. Cl. 156—498

7 Claims



1. A cold carpet iron for cooling and curing hot melt carpet tape comprising:
 - a weighty body member having a flat bottom surface;
 - a handle member wherein the body member has a top surface with the handle member attached to the top surface;
 - a plurality of orifices in the flat bottom surface with connected gas passages;
 - at least one gas inlet, communicating with the gas passages, the inlet having a connected fitting; and
 - a gas supply means connected to the inlet fitting for supplying a cooling gas to the gas inlet.

5,089,081

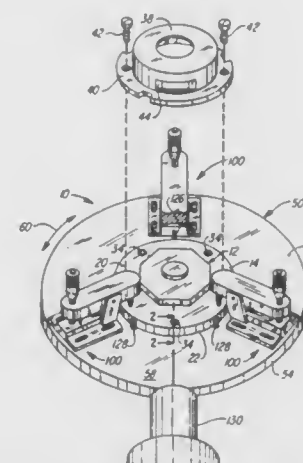
ADJUSTABLE PAD ASSEMBLY

Mark D. Bedzyk, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1990, Ser. No. 628,289
Int. Cl.⁵ G01D 21/00

U.S. Cl. 156—556

4 Claims



1. An adjustable pad assembly for aligning a housing relative to a base, the assembly comprising a) a mounting plate, b) a ring of compressible material, and c) a bushing, the mounting plate having a first surface and a shoulder surrounding and offset from the first surface, the ring being seated above an outer edge of the surface so that part of the ring surrounds the first surface, and the bushing having a surface engagement with the ring and overlying the first surface of the plate to form a space between the surfaces for an adhesive, the plate and the bushing having holes therethrough communicating with the space for the adhesive so that excess adhesive in the space can escape into the holes.

5,089,082

PROCESS AND APPARATUS FOR PRODUCING SILICON INGOTS HAVING HIGH OXYGEN CONTENT BY CRUCIBLE-FREE ZONE PULLING, SILICON INGOTS OBTAINABLE THEREBY AND SILICON WAFERS PRODUCED THEREFROM

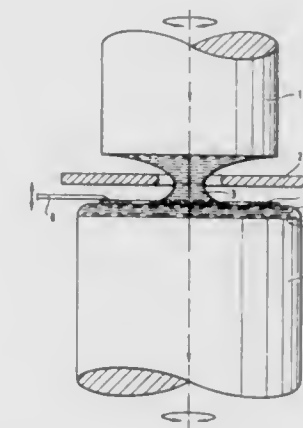
Peter Dreier, Wilfried von Ammon, and Heinz Winterer, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Oct. 2, 1990, Ser. No. 591,703
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938937

Int. Cl.⁵ C30B 13/00

U.S. Cl. 156—620.4

9 Claims



1. A process for producing silicon ingots having a high oxygen content by crucible-free zone pulling comprising the steps of:
 - producing a molten zone between a feed ingot and a product ingot by means of a surrounding induction heating coil having a generally annular hole, said molten zone, starting from the feed ingot, passing through the annular hole of the coil in the form of a relatively narrow molten neck and then expands to form a molten cap covering the product ingot;
 - subjecting said ingot to a crucible-free zone pulling by effecting relative movement between said ingots and said coil, so that said molten zone traverses said feed ingot; contacting said molten cap with at least one flat quartz element during said zone pulling step; and wherein a substantially constant oxygen incorporation over the entire ingot length is achieved.

5,089,083

PLASMA ETCHING METHOD

Hiroshi Kojima, Machida; Yoshifumi Tahara, Yamato, and Izumi Arai, Yokohama, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

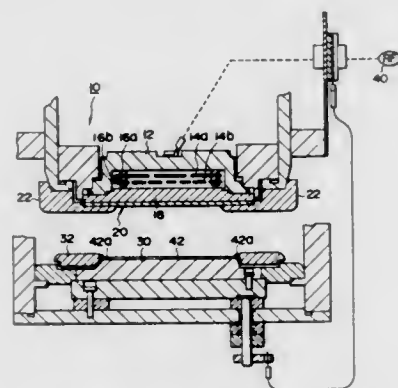
Filed Apr. 20, 1990, Ser. No. 512,151
Claims priority, application Japan, Apr. 25, 1989, 1-106931
Int. Cl.⁵ H01L 21/00

U.S. Cl. 156—643

8 Claims

1. A plasma etching method, comprising the steps of:
 - mounting an object to be processed, having at least a material to be etched and a primary material, in a region formed between one electrode and another electrode;
 - introducing an etching gas into said region;
 - setting an area of the contact surface of said other electrode, which is in contact with said etching gas, to a predetermined value in accordance with a predetermined selection ratio used in etching said object to be processed, wherein said selection ratio denotes a ratio of the etching rate of said material to be etched to the etching rate of said pri-

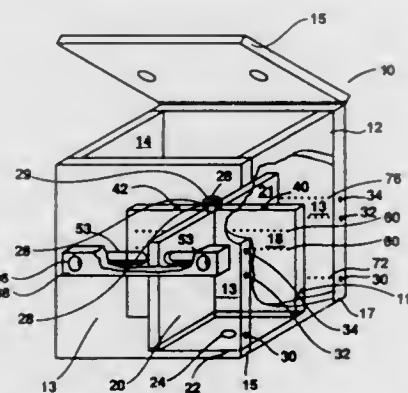
mary material beneath said material to be etched; generating plasma of said etching gas by applying a predetermined electric power between said electrodes after setting the area of the contact surface of said other electrode,



which is in contact with said etching gas, to the predetermined value; and etching said object to be processed by said plasma; wherein the material to be etched is a SiO₂ layer and the primary material is a Si layer.

5,089,084 HYDROFLUORIC ACID ETCHER AND CASCADE RINSER

Navjot Chhabra, and Loyal Gibbons, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Dec. 3, 1990, Ser. No. 620,744
Int. Cl.⁵ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156-646 13 Claims

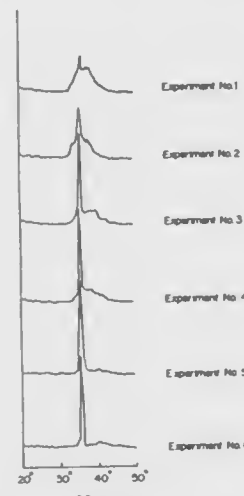


11. A method of etching and washing a plurality of integrated circuit (IC) wafers comprising: loading the wafers into a plurality of wafer carriers; placing the wafer carriers within the etch chamber which is contained in a plenum; activating an automatic controller that controls an etch cycle; purging the etch chamber with nitrogen; turning on a nitrogen, water, and hydrogen fluoride (HF) supply means to provide a moisturized etch vapor to an etch chamber section; etching a layer of silicon oxide from the IC wafers; stopping the HF and water supply means to terminate the etch; opening a plenum drain valve and a DI cascade rinse water supply valve to supply water to the chamber; rinsing the wafer carriers and wafers; securing the rinse; initiating a chamber cleaning rinse; stopping the cycle;

removing the wafer carrier from the chamber; draining the water from the chamber and plenum; purging the chamber with nitrogen; closing the drains; and stopping the nitrogen purge.

5,089,085 SILICON CARBIDE MEMBRANE FOR X-RAY LITHOGRAPHY AND METHOD FOR THE PREPARATION THEREOF

Meguru Kashida; Yoshihiro Kubota, and Yoshihiko Nagata, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Dec. 21, 1990, Ser. No. 633,047
Claims priority, application Japan, Dec. 26, 1989, 1-339092
Int. Cl.⁵ B44C 1/22; H01L 21/306; C03C 15/00, 25/06
U.S. Cl. 156-659.1 6 Claims



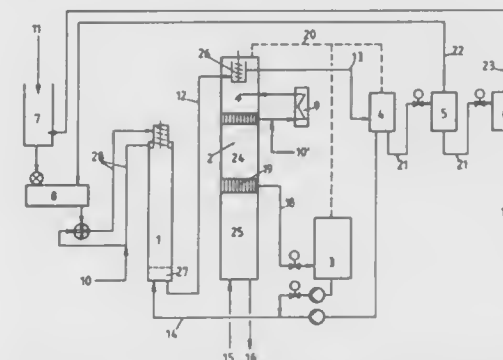
1. A method for the preparation of a silicon carbide membrane for X-ray lithography which comprises the steps of:
 - (a) depositing silicon carbide by the sputtering method employing a target of silicon carbide on a substrate of silicon kept at a temperature higher than 500° C. to form a film of silicon carbide supported on the surface of the substrate; and
 - (b) removing the substrate partly from the film of silicon carbide leaving a portion which serves as a frame of the unsupported silicon carbide membrane.

5,089,086 PROCESS FOR CONTINUOUS COOKING OF CELLULOSE

Risto Silander, Helsinki, Finland, assignor to Jaakko Pöyry Oy, Helsinki, Finland
Filed Apr. 25, 1990, Ser. No. 514,160
Claims priority, application Finland, Apr. 27, 1989, 892019
Int. Cl.⁵ D21C 3/24 5 Claims

1. A process for continuous cooking of cellulose initially contained in wood chips, comprising the steps of:
 - a) impregnating wood chips (11) with cooking liquor (10);
 - b) mixing (27) the wood chips impregnated with cooking liquor from step a) with spent liquor (18) and transferring the resulting mixture to an upper portion of a pressurized digester (2);
 - c) separating, in the upper portion of the pressurized digester (2), the liquor from the impregnated wood chips of the mixture formed in step b) and recycling (13,14) part of the separated liquor as spent liquor to step b);
 - d) conducting the wood chips separated in step c), together

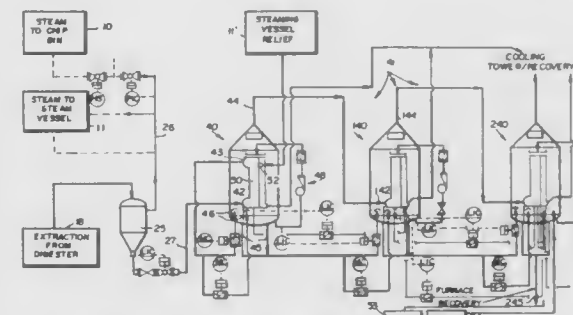
- with liquor, downwardly through the digester (2) to a cooking zone (24) and then into a washing zone (25);
- e) removing liquor from a region between the cooling and washing zones as spent liquor; and
- f) expansion evaporating part of the liquor separated from the wood chips in step c) in order to recover heat in the form of steam; wherein



- g) steps e) and f) are performed so that the liquor removed in step e) constitutes liquor conducted to step b) and is equal in amount to the liquor evaporated in step f), and further comprising conducting the liquor evaporated in step f), after evaporation, to a chemical recovery system.

5,089,087 MAKE-UP LIQUOR AND BLACK LIQUOR EVAPORATING PROCESS DURING PULP PRODUCTION

Carl L. Elmore; Mark A. Mullen, both of Glens Falls; George D. Emery, Fort Miller, and Timothy R. Carter, Lake George, all of N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.
Division of Ser. No. 170,077, Mar. 15, 1988, Pat. No. 4,897,157, which is a continuation of Ser. No. 883,315, Jul. 8, 1986, abandoned. This application Sep. 18, 1989, Ser. No. 409,945
Int. Cl.⁵ B01D 1/26; D21C 11/06, 11/10
U.S. Cl. 162-46 5 Claims



1. A method of evaporating liquid during the production of paper pulp from fibrous comminuted cellulosic material, comprising:
 - providing a continuous digester having a black liquor extraction outlet and a first discrete flash tank having a steam outlet and a concentrated black liquor outlet;
 - connecting said black liquor extraction outlet and said flash tank;
 - providing at least one discrete evaporator having a first inlet for the black liquor and a first outlet thereof, with a first conduit therebetween, a second inlet for black liquor and a second conduit connected said first outlet and said second inlet, a second outlet and a third conduit connecting said second inlet and said second outlet;
 - flowing black liquor in said evaporator from said first inlet to said first outlet;

flowing black liquor from said first outlet of said evaporator through said second conduit to said second inlet thereof; flowing black liquor from said second inlet of said evaporator through said third conduit to said second outlet thereof; effecting heat exchange in said evaporation between the black liquor flowing in said first conduit from said first inlet to said first outlet and the black liquor flowing in said third conduit from said second inlet to said second outlet; and directly connecting said concentrated black liquor outlet from said first flash tank without intervening heat exchange and said first inlet so that the heat content of the black liquor flowing in said first conduit from said first inlet to said first outlet in heat exchange relation with the black liquor flowing in said third conduit effects evaporation of the black liquor in said third conduit to produce vapor which is discharged from a vapor outlet of the evaporator.

5,089,088 LOW-DENSITY, HIGH STRENGTH ARAMID BOARDS

Gary L. Hendren, Richmond, and Danny R. Ratliff, Powhatan, both of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

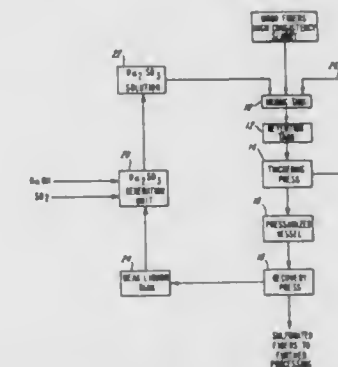
Filed Feb. 28, 1991, Ser. No. 662,210
Int. Cl.⁵ D21H 13/26 6 Claims

1. A low density, high strength, board of multiple layers, each layer comprising from 5-80% by weight of a floc which is non-melting below 340° C. and is bonded by from 20 to 90% by weight of poly(m-phenylene isophthalamide) fibrils, and with each layer being fusion bonded to adjacent layers at spaced contact areas randomly disposed throughout the thickness of the board, the major surfaces of the board being substantially smooth and continuous, and the said board having a density of from 0.14 to 0.45 g/cc and a tensile strength greater than 9650 kPa.

5,089,089 SYSTEM FOR SULFONATING MECHANICAL PULP FIBERS

Serge B. Beaulieu, Mechanicsville, Va., assignor to Bear Island Paper Company, Ashland, Va.
Continuation of Ser. No. 105,651, Oct. 5, 1987, abandoned, which is a division of Ser. No. 687,877, Dec. 31, 1984, Pat. No. 4,708,771. This application Nov. 3, 1989, Ser. No. 431,650
Int. Cl.⁵ D21C 3/04 6 Claims

U.S. Cl. 162-234



1. A system for use in producing mechanical pulp suited for newsprint and other specialty grade papers obviating need for addition thereto of chemical pulp as practiced in the prior art comprising a first receptacle, means interconnecting said first receptacle with plural sources of supply operative to provide a delivery and introduction to said first vessel of quantities of a sulfite solution and fibrous solids in a relatively high consis-

tency slurry form in amounts proportioned to produce in said first receptacle a composite slurry the consistency of which does not materially exceed 7%, means conditioned on delivery of said proportioned amounts of said slurry and sulfite solution to said first vessel to subject them to a brief interval of mixing in said first receptacle sufficient only to place a limited portion of the sulfite in said composite slurry in surface contact with portions of the fibers exposed at the surfaces of its solids to initiate a sulfonation thereof, a second receptacle defining a dwell chamber interconnected with said first receptacle to receive therefrom the composite slurry produced therein and hold it in a relatively quiescent state for a limited predetermined interval of time sufficient for the sulfonation initiated in said first receptacle to self propagate and complete a first stage sulfonation of the fiber content of its solids the level of which is the range of about 0.5 to 0.9%, means connected to said second receptacle to receive and extract from said composite slurry, the sulfonation level of the fiber content of which is in the range of about 0.5 to 0.9%, an amount of the liquid thereof including a major portion of the sulfite in solution originally applied to form part of said composite slurry, thereby to provide a remainder of said composite slurry having a substantially increased consistency the sulfonation level of the fiber content of which is in the range of about 0.5 to 0.9%, means interconnecting said extracting means with said first receptacle to deliver said extracted liquid back to said first receptacle for reuse on a further portion of the sulfite in solution originally applied to form part of said composite slurry, thereby to provide a remainder of said composite slurry having a substantially increased consistency the sulfonation level of the fiber content of which is in the range of about 0.5 to 0.9%, means to subject said remainder to an environment of highly elevated temperature and corresponding above atmospheric pressure to cause the sulfite in said remainder of said pulp slurry to further react on and provide the fiber content of said remainder with a sulfonate level in excess of 0.9% and produce thereby a quality of mechanical pulp rendering it eminently suited for use in producing newsprint and other specialty grade papers without need for addition thereto of chemical pulp as practiced in the prior art.

5,089,090

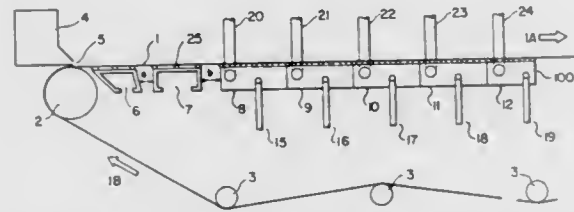
CONTINUOUS CONTROLLED DRAINAGE

Victor E. Hansen, Jacksonville, Fla., assignor to JWI Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 362,926, Jun. 8, 1989, abandoned. This application Feb. 26, 1991, Ser. No. 661,017 Int. Cl.⁵ D21F 1/52, 1/54

U.S. Cl. 162—351

13 Claims



1. In a paper making machine having an open surface forming section, including at least a travelling continuous forming fabric, which passes over a breast roll adjacent a head box having a head box slice through which aqueous stock is deposited onto the forming fabric, in which forming section the solids content rises from an initial low value as deposited from the head box through the head box slice onto the forming fabric to a value of from about 2% to about 4%, an apparatus for improving paper formation consisting essentially of in combination:

(a) a suction means located beneath the forming fabric and

extending from a point adjacent the head box slice to the end of the forming section;

(b) a foraminous support surface for the forming fabric on the suction means; and

(c) a vacuum pump means including vacuum control means, whereby the level of vacuum in the suction means is controlled; wherein:

(i) the suction means comprises either a single suction box divided into a plurality of separate chambers by a plurality of vacuum tight divisions extending across the width of the suction box, and each chamber is provided with both a separate vacuum control means and a separate drainage means, or a plurality of contiguously adjacent suction boxes each of which is provided separately with both a vacuum control means and a drainage means;

(ii) the foraminous support comprises a series of spaced apart forming fabric supporting blades having a generally planar top surface transverse to the direction of travel of the forming fabric in a common essentially horizontal plane providing therebetween suction accessible gaps in which the forming fabric is substantially unsupported and is drawn downward to form stock agitating undulations in the gaps, the surface including water seal forming blades disposed intermediately in the gaps between the fabric supporting blades, and having a top surface transverse to the direction of travel of the forming fabric at a lower level than the top surface of the forming fabric supporting blades and at least forming water seals at the downward undulations in the forming fabric, together with sealing strips interposed between the ends of the blades adjacent the lateral edges of the forming fabric;

(iii) the fabric supporting blades in the foraminous support surface are regularly spaced to generate a continuous controlled level of agitation at a pulse frequency of at least 40 Hz in the stock on the forming fabric, and wherein the blades are provided with mounting means, the mounting means being structured and arranged to provide for a pulse frequency of up to at least 120 Hz, so that the blades can be spaced to provide a pulse frequency of from at least 40 Hz to up to at least 120 Hz, and

(iv) a forming fabric supporting blade in the foraminous support surface is located substantially above both either a transverse vacuum tight division, or a pair of contiguous transverse walls in the suction means, and each of the first and the last, walls in the suction means in the forming section, thereby providing a vacuum tight seal across the width of the forming fabric between the evacuated parts of the suction means in the forming section.

5,089,091

ODOR REMOVAL FROM POLYPHENYLENE ETHER RESINS BY STEAM DISTILLATION

Daniel W. Fox, deceased, late of Pittsfield, Mass. by Joyce S. Fox, heir, and Louis M. Maresca, Schenectady, N.Y., assignors to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 291,706, Dec. 29, 1988, abandoned.

This application May 4, 1990, Ser. No. 518,316

Int. Cl.⁵ B01D 3/38

U.S. Cl. 203—47

11 Claims

1. A method for preparing a polyphenylene ether resin substantially free from odoriferous impurities comprising by-products of monomer and polymer synthesis, said process consisting essentially of:

(a) mixing

(i) a polyphenylene ether in particulate form having a content of said odoriferous by-products; and

(ii) water; to form an aqueous suspension;

(b) distilling the aqueous suspension obtained in (a) to boil off a portion of said water to remove substantially all of said

content of odoriferous by-products from the particulate polyphenylene ether resin; and

(c) recovering said polyphenylene ether resin substantially free of said content of odoriferous by-products, from the residue of step (b).

5,089,092

POROUS ALUMINUM OXIDE FILM AND METHOD OF FORMING OF THE SAME

Kazuhiro Wada, Kyoto; Nobuyoshi Baba, Kawasaki; Sachiko Ono, and Takako Yoshino, both of Tokyo, all of Japan, assignors to Kyoto University, Kyoto, Japan

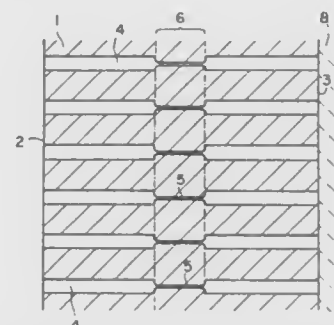
Division of Ser. No. 412,721, Sep. 26, 1989. This application Jan.

28, 1991, Ser. No. 646,297

Int. Cl.⁵ C25D 1/08

U.S. Cl. 205—75

21 Claims



1. A method of forming a porous aluminum oxide film, comprising the steps of:

anodizing an aluminum substrate so as to form an aluminum oxide film upon said aluminum substrate;

changing the voltage applied to said aluminum substrate during said anodizing step so as to form a plurality of pores passing through said aluminum oxide film such that each pore comprises a smaller diameter pore located at a central portion of said aluminum oxide film with respect to the thickness of said aluminum oxide film, and a pair of larger diameter pores extending from opposite faces of said aluminum oxide film to opposite ends of said smaller diameter pore so as to communicate with said smaller diameter pore; and

separating said aluminum oxide film from said aluminum substrate.

5,089,093

PROCESS FOR CONTROLLING ALUMINUM SMELTING CELLS

Geoffrey I. Blatch, Westgarth; Mark P. Taylor, Greensborough, and Mark Fyfe, Slengarry, all of Australia, assignors to Comalco Aluminum Ltd., Georgetown, Australia

Filed Feb. 20, 1990, Ser. No. 481,845

Claims priority, application Australia, Feb. 24, 1989, PJ2938

Int. Cl.⁵ C25C 3/06, 3/20

U.S. Cl. 204—67

32 Claims

1. A process for controlling the operation of an aluminum smelting cell, comprising the steps of:

(i) continuously monitoring cell voltage and current,

(ii) calculating the resistance of the cell from the monitored cell voltage and current,

(iii) calculating the rate of change of cell resistance (resistance slope) and a smoothed value of resistance slope, by calculating a raw resistance slope, checking to determine whether the raw slope value falls within predetermined limits, rejecting any values falling outside such limits, and calculating a filtered resistance slope;

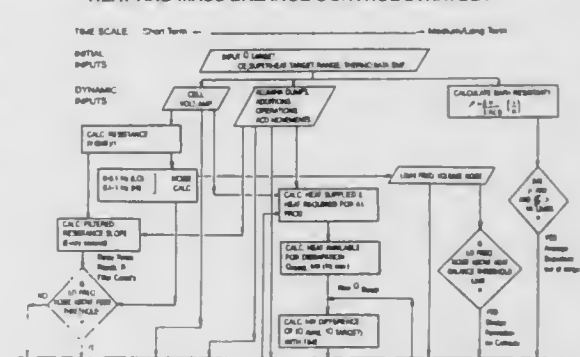
(iv) maintaining the mass balance in the cell by utilizing the smoothed resistance slope values,

(v) monitoring cell process operations, including alumina

additions, electrolyte bath additions, anode changes, tapping, beam raising and anode beam movement,

(vi) delaying the calculation of resistance slope and smoothed resistance slope for a predetermined time when any one of said monitored cell process operations occurs, and

HEAT AND MASS BALANCE CONTROL STRATEGY



(vii) recalculating said cell resistance slope and smoothed resistance slope after said predetermined time delay so that the smoothed slope is unaffected by process changes with the exception of alumina depletion.

5,089,094

PROCESS FOR THE ELECTROLYTIC PRODUCTION OF MAGNESIUM

Tadashi Ogasawara, Nishinomiya; Yoshitake Natsume, Kawashi, and Kenji Fujita, Nishinomiya, all of Japan, assignors to Osaka Titanium Company Limited, Amagasaki, Japan

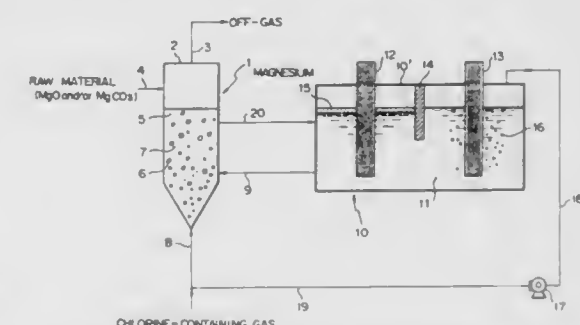
Filed Mar. 15, 1990, Ser. No. 493,733

Claims priority, application Japan, Mar. 16, 1989, 1-64289; Mar. 16, 1989, 1-64290; Apr. 17, 1989, 1-97014; Apr. 26, 1989, 1-106558; Aug. 23, 1989, 1-216927

Int. Cl.⁵ C25C 3/04

U.S. Cl. 204—70

51 Claims



17. A process for the electrolytic production of magnesium comprising:

producing magnesium in an electrolytic cell by electrolysis of magnesium chloride in a molten salt bath comprised mainly of one or more salts selected from alkali metal chlorides and alkaline earth metal chlorides;

withdrawing at least part of the molten salt bath having a decreased content of magnesium chloride from the electrolytic cell;

suspending a magnesium oxide or magnesium carbonate or magnesium oxide and magnesium carbonate powder in the withdrawn molten salt to form a molten suspension having a magnesium oxide content in the range of 5-40 wt. %; passing a chlorine-containing gas through the molten suspension at a temperature of 600°-900° C. and reacting the suspended powder with chlorine to form magnesium chloride in a magnesium chloride enriched salt bath; and recycling the magnesium chloride enriched salt bath to the

electrolytic cell without atmospheric exposure of the magnesium chloride enriched salt bath.

5,089,095

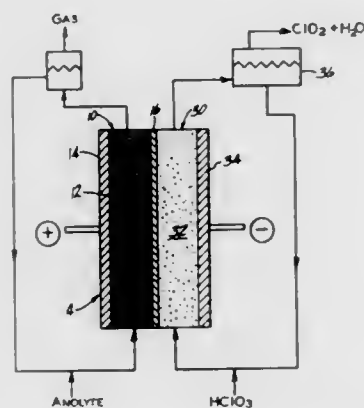
ELECTROCHEMICAL PROCESS FOR PRODUCING CHLORINE DIOXIDE FROM CHLORIC ACID

David W. Cawfield; Jerry J. Kaczur, both of Cleveland; Budd L. Duncan, McMinn; Sudhir K. Mendiratta, Cleveland; Ronald L. Dotson, Cleveland, and Kenneth E. Woodard, Jr., Cleveland, all of Tenn., assignors to Olin Corporation, Chesire, Conn.

Filed Mar. 30, 1990, Ser. No. 502,206
Int. Cl.⁵ C25B 1/26

U.S. Cl. 204—101

17 Claims



1. A process for producing chlorine dioxide which comprises:

- oxidizing a hypochlorous acid solution substantially free of ionic impurities to produce a chloric acid solution, and,
- electrolyzing the chloric acid solution to produce chlorine dioxide.

5,089,096

PREPARATION OF QUATERNARY AMMONIUM HYDROXIDES

Evert J. Rijkhof, Soest; Johannes P. P. Tholen, Bussum; Hendricus J. H. Van Der Maas, Hedel, and Gosse Boxhoorn, Tricht, all of Netherlands, assignors to Shell Research Limited, United Kingdom

Filed Aug. 31, 1990, Ser. No. 575,902

Claims priority, application United Kingdom, Aug. 31, 1989, 8919682

Int. Cl.⁵ C25B 1/00

U.S. Cl. 204—102

15 Claims

1. A process for the preparation of a quaternary ammonium hydroxide, which process comprises electrolyzing a quaternary ammonium halide in an electrolysis cell having an anode and a cathode, said cell being divided into compartments by at least an anion exchange membrane, and wherein said anode is comprised of a material selected from the group consisting of iron, nickel, zinc, molybdenum and manganese.

5,089,097

ELECTROLYTIC METHOD FOR RECOVERING SILVER FROM WASTE PHOTOGRAPHIC PROCESSING SOLUTIONS

Nobutaka Goto; Shigeharu Koboshi; Naoki Takabayashi, all of Hino, and Yoshiyuki Makida, Gifu, all of Japan, assignors to Konica Corporation, Tokyo, Japan

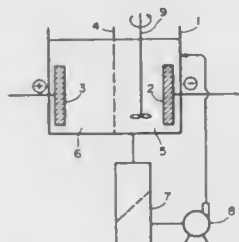
Filed Mar. 12, 1990, Ser. No. 491,509

Claims priority, application Japan, Mar. 17, 1989, 1-66995; Mar. 17, 1989, 1-66996

Int. Cl.⁵ C25C 1/20

U.S. Cl. 204—109

11 Claims



1. A method of recovering silver from a waste photographic processing solution, which comprises supplying the waste photographic process solution into a cathode compartment of an electrolytic cell which has a cathode and is separated from an anode compartment by a diaphragm, performing electrolysis with a current density at the cathode of at least 1 A/dm² and a current concentration in the cathode compartment of at least 10 A/L, said current density and said current concentration being controlled in such a way that silver ions are reduced in said waste photographic processing solution with the hydrogen bubbles evolved by electrolytic reaction, and precipitating the reduced silver ions as silver grains in the waste photographic processing solution.

5,089,098

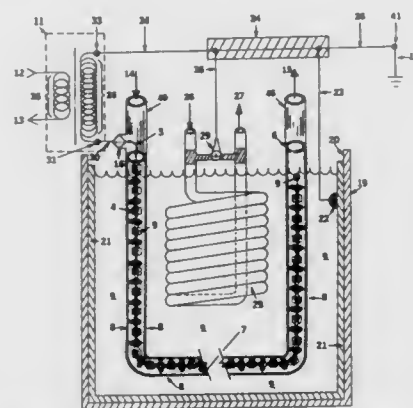
APPARATUS AND METHOD FOR OZONE PRODUCTION

Ernest J. Tacchi, 413 Hounds Run W., Mobile, Ala. 36608
Division of Ser. No. 475,432, Feb. 5, 1990, Pat. No. 5,004,587.
This application Jan. 10, 1991, Ser. No. 639,703

Int. Cl.⁵ C01B 13/10; B01J 19/12

U.S. Cl. 204—176

2 Claims



1. A method of ozone gas generation consisting of, constructing a corona discharge chamber so that a thermoelectret process is used to form an electrostatic charge across its dielectric shield member so as to enhance the period of corona activation; incorporating said corona discharge chamber into a parallel resonance impedance matched drive circuit; generating ozone gas within a flexible linear corona dis-

charge chamber in order to simultaneously expose the gas contained therein;

regulating the capacitive reactance of said corona discharge chamber by altering its physical length so as to change the intrinsic frequency of resonance common to said corona discharge chamber and a transformer; and
utilizing a fluid counter-electrode to act as an electrical connection means as well as a means of thermal dissipation of reaction heat generated with said corona discharge chamber.

5,089,099

FIELD AMPLIFIED POLARITY SWITCHING SAMPLE INJECTION IN CAPILLARY ZONE ELECTROPHORESIS

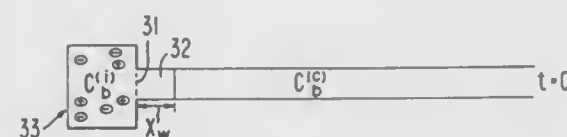
Ring-Ling Chien, San Jose, and Dean S. Burgi, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 30, 1990, Ser. No. 621,169

Int. Cl.⁵ B01D 57/02

U.S. Cl. 204—180.1

43 Claims



1. A method of introducing a sample into a capillary column in capillary zone electrophoresis comprising the steps of: diluting said sample in a first buffer; substantially filling a capillary column with a second buffer of higher conductivity than the first buffer, said capillary column having an inlet and outlet end; loading a plug of a third buffer of conductivity lower than the second buffer through said inlet end of said capillary column into said capillary column next to and in contact with said second buffer; injecting said sample dissolved in said first buffer into said capillary column.

5,089,100

METHOD OF INCORPORATING POLYAMINE INTO A CATIONIC RESIN

Tapan K. Debroy, Shelby Township, Macomb County, and Ding Y. Chung, Rochester Hills, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1990, Ser. No. 563,837

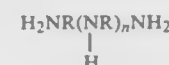
Int. Cl.⁵ C25D 13/00

U.S. Cl. 204—181.7

3 Claims

1. In a method of electrocoating an electrically conductive surface serving as a cathode comprising passing an electric current between said cathode and an anode in electrical contact with an aqueous electrodepositable composition wherein the aqueous electrodepositable composition comprises an epoxy amine adduct which is water solubilized with an acid and a blocked polyisocyanate crosslinker; wherein the improvement comprises the epoxy amine adduct is formed by the following steps:

- reacting an epoxy resin with an amount of secondary amine so that unreacted epoxy functional groups remain; and
- further reacting the reaction product of a) with a polyamine so that there is a minimum of one equivalent of epoxy for every mole of polyamine; wherein the polyamine has the formula:



wherein n is a integer of 0 to 4 and R is an alkylene group containing 2 to 6 carbon atoms.

5,089,101

CATIONIC ELECTRODEPOSITION COATING COMPOSITION

Hirokazu Hayashi, Hiratsuka; Tetsuo Aihara, Isehara; Haruo Nagaoka, Hiratsuka; Koji Kamikado, Yokohama, and Eisaku Nakatani, Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 293,005, Jan. 3, 1989, abandoned. This application May 15, 1991, Ser. No. 701,632

Claims priority, application Japan, Jan. 8, 1988, 63-1189

Int. Cl.⁵ C25D 13/00; C08L 63/00

U.S. Cl. 204—181.7

20 Claims

1. A cationic electrodeposition coating composition comprising

- a neutralization product or a quaternary ammonium salt of a comb-shaped copolymer obtained by copolymerizing (a) 3 to 90 parts by weight of an ethylenically unsaturated monomer having a hydrocarbon chain with at least 8 carbon atoms at the molecular ends, (b) 1 to 50 parts by weight of at least one cationic (meth)acrylic monomer selected from the group consisting of aminoalkyl (meth)acrylates, aminoalkyl (meth)acrylamides, (meth)acrylates containing a quaternary ammonium salt group and (meth)acrylamides containing a quaternary ammonium salt group, (c) 1 to 60 parts by weight of an 1-vinyl-2-pyrrolidone and (d) 0 to 95 parts by weight of an alpha, beta-ethylenically unsaturated monomer other than the monomers (a), (b) and (c),
- a cationic epoxy resin capable of being dissolved or dispersed in water, and
- a pigment.

5,089,102

REMOVAL OF SALTS BY ELECTRODIALYSIS

Hartwig Voss, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 401,872, Sep. 1, 1989, abandoned. This application Jul. 11, 1991, Ser. No. 729,854

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831848

Int. Cl.⁵ B01D 13/02

U.S. Cl. 204—182.3

12 Claims

1. A process for removing a sulfate salt from an aqueous solution containing an anionic organic compound, comprising the steps of:

- removing said salt from said solution by electrodialysis, and
- acidifying said solution by adding an acidifying acid thereto, before or during said removing step (i).

5,089,103

ELECTROPHORESIS CAPILLARY WITH AGAROSE

Sally A. Swedberg, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 1, 1989, Ser. No. 444,229

Int. Cl.⁵ G01N 27/26

U.S. Cl. 204—182.8

12 Claims

1. A method for preparing a narrow-bore capillary tube for use in electrophoretic separations comprising the steps of: contacting a dilute agarose phase with the bore of the tube to form a precoat thereon; and adherently filling the bore with an agarose-based analytical gel along at least a portion of the tube which is precoated with the dilute agarose phase.

5,089,104

METHOD AND APPARATUS FOR FORMING A MULTIPLE-ELEMENT THIN FILM BASED ON ION BEAM SPUTTERING

Naoya Kanda, Yokosuka; Yasushi Ishikawa, Hitachi; Kunio Matsumoto, and Hiroshi Asano, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

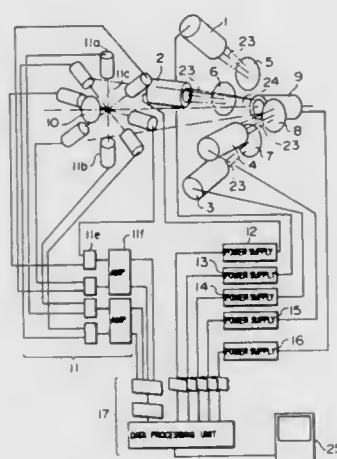
Filed Dec. 3, 1990, Ser. No. 620,611

Claims priority, application Japan, Dec. 4, 1989, 1-313370

Int. Cl.⁵ C23C 14/34

U.S. Cl. 204—192.11

9 Claims



1. A method of forming a multiple-element thin film based on ion beam sputtering comprising:

- a step of producing ion beams or neutral beams which are neutralized ion beams with a plurality of ion beam sources;
- a step of projecting said ion beams or neutral beams to a plurality of targets for sputtering so that said targets discharge sputtered particles;
- a step of projecting said sputtered particles onto a substrate;
- a step of measuring a ratio of composition of said sputtered particles, which pass by the surface of said substrate, based on the atomic absorption method;
- a step of comparing the measured composition ratio of sputtered particles with a predetermined reference composition ratio of sputtered particles and controlling said ion beam sources so that the measured composition ratio of sputtered particles is adjusted to coincide with the predetermined reference composition ratio; and
- a step of depositing the sputtered particles, with the measured composition ratio thereof being adjusted, on said substrate thereby to form a thin film.

5,089,105

COLOR-BEARING TEXTILE PRODUCT

Masatoshi Tsutsui, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Division of Ser. No. 122,437, Nov. 19, 1987. This application May 21, 1990, Ser. No. 525,649

Claims priority, application Japan, Dec. 13, 1986, 61-297240

Int. Cl.⁵ C23C 14/06, 14/34

U.S. Cl. 204—192.14

6 Claims



1. A process for producing a color-bearing textile product

comprising the following sequential steps performed without opening a closed chamber:

- evacuating the interior of the closed chamber which contains a textile product and a target made of titanium;
- introducing a nitrogen-free inactive gas into the chamber;
- sputtering the target in an atmosphere of the inactive gas to form a titanium layer on the surface of the textile product;
- introducing nitrogen gas into the chamber; and
- sputtering the target in an atmosphere of both the inactive gas and nitrogen to form a titanium nitride layer on the titanium layer.

5,089,106

HIGH PERFORMANCE CAPILLARY GEL ELECTROPHORESIS

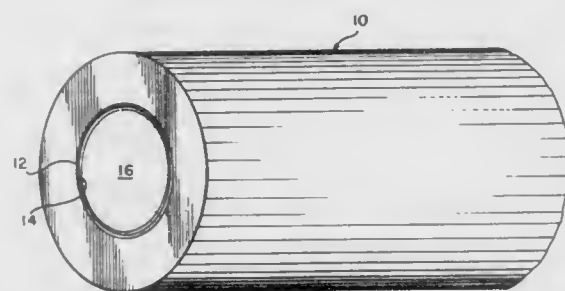
Barry L. Karger, Newton; Roger W. Giese, Quincy, and Eva Szoko, Malden, all of Mass., assignors to Northeastern University, Boston, Mass.

Continuation-in-part of Ser. No. 406,080, Sep. 9, 1989, which is a continuation-in-part of Ser. No. 359,728, May 31, 1989, which is a continuation of Ser. No. 921,311, Oct. 21, 1986, Pat. No. 4,865,706. This application Feb. 1, 1991, Ser. No. 649,673

Int. Cl.⁵ G01N 27/26; B01D 57/02

U.S. Cl. 204—299 R

18 Claims



1. An improved, highly stable capillary column for high performance capillary electrophoresis comprising:

- a capillary having an interior cavity and a wall with an inner surface;
- a highly stable coating matrix on said inner surface of said wall, said coating matrix comprising:
- an intermediate layer hydrophobic phase covalently bonded to said inner surface of said wall;
- a detergent physically adsorbed to said hydrophobic phase; and
- a polymerized monomer covalently attached to said detergent thereby forming a hydrophilic outer layer of said coating matrix.

5,089,107

BI-POLAR AUTO ELECTROLYTIC HYDROGEN GENERATOR

Francisco Pacheco, 60 Princeton Rd., P.O. Box 169, Hewitt, N.J. 07421

Filed Jul. 18, 1990, Ser. No. 555,037

Int. Cl.⁵ C25B 9/00, 11/04, 15/02, 15/08

U.S. Cl. 204—228

7 Claims

1. A bi-polar auto electrolytic hydrogen generating system comprising:

- (a) at least one voltaic cell comprising:
 - (i) a non conductive air-impermeable tank comprising a stainless steel inner tank lining adapted for containing a salt-water electrolyte selected from the group consisting of sea water, brine, and an aqueous solution of sodium chloride, and a cover portion having a hydrogen outlet located above said tank lining,
 - (ii) a first electrode portion located within the tank and comprising the stainless steel inner tank lining and a plurality of pairs of stainless steel plates permanently affixed to the inner tank lining, wherein said first electrode por-

5,089,109

ELECTRODE PROTECTOR

Yoshiaki Suganuma, and Kuniaki Yamada, both of Kanagawa, Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Sep. 14, 1990, Ser. No. 582,312

Claims priority, application Japan, Sep. 14, 1989, 1-236894

Int. Cl.⁵ C25D 17/10, 17/00

U.S. Cl. 204—290 R

6 Claims

6. An electrode structure which comprises an insoluble electrode and an electrically insulating electrode protector attached to the surface of the electrode, said electrode protector comprising a mesh substrate made of a corrosion-resistant metal and, provided on the surfaces of the mesh substrate, a corrosion-resistant electrically insulating coating.

5,089,110

DATA STORAGE DISK AND PLUG

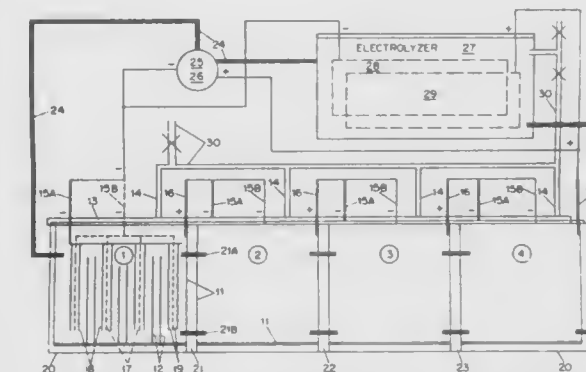
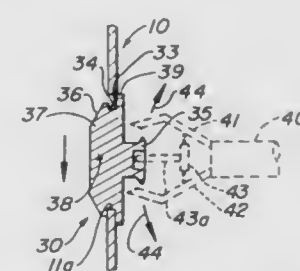
Ronald Allen, San Jose; Peter S. Bac, Sunnyvale, and Steven Miura, San Jose, all of Calif., assignors to Komag, Incorporated, Milpitas, Calif.

Filed Jul. 30, 1990, Ser. No. 559,357

Int. Cl.⁵ C23C 14/34

U.S. Cl. 204—298.15

15 Claims



(b) a variable load resistor external to the cell which may be connected, at will, across the positive (+) and negative (−) terminals of the system to develop a voltage and a controlled current in the cell, inversely proportional to the resistance of said variable load resistor, thereby evolving hydrogen, auto-electrolytically and electrochemically from the electrolyte, on demand at said first and second electrode portions, in a volume directly proportional to the current produced by the total surface area of the electrodes.

5,089,108

STRAINER

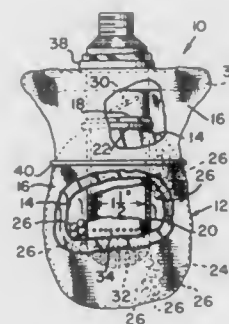
Robert M. Small, Apt. 6A, 1480 Route 46, Parsippany, N.J. 07054

Filed Jun. 25, 1990, Ser. No. 542,535

Int. Cl.⁵ B01D 24/16

U.S. Cl. 210—287

12 Claims



1. A strainer, comprising: a compliant foraminous container; a pipe having one end thereof confined, generally centrally, in said container; and means surrounding said one end of said pipe, and confined within said container, the same means both: (a) weighting said strainer, and (b) filtering fluids.

5,089,111

ELECTROPHORETIC SIEVING IN GEL-FREE MEDIA WITH DISSOLVED POLYMERS

Ming D. Zhu, Berkeley; Jeng-Chyh Chen, Alameda, both of Calif., and Stellan Hjerten, Uppsala, Sweden, assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Continuation-in-part of Ser. No. 303,174, Jan. 27, 1989,

abandoned. This application Sep. 27, 1990, Ser. No. 589,915

Int. Cl.⁵ G01N 27/26; B01D 57/02

U.S. Cl. 204—180.1

19 Claims

1. A method of separating a mixture of sample ions of varying molecular weights in a sample into components, said method comprising electrophoretically passing said sample through a separation column containing a gel-free aqueous solution of a water-soluble polymer selected from the group consisting of cellulose derivatives, saccharide-based and substi-

tuted saccharide-based polymers, polysilanes, polyvinylalcohol and polyvinylpyrrolidone, said polymer having a molecular weight of about 10,000 to about 2,000,000, said molecular weight being within a range of about 0.1 to about 200 times the average molecular weight of said sample ions in said mixture, the concentration of said polymer in said solution being sufficient to retard the flow of said species through said separation column to degrees which vary with the molecular weights of said species.

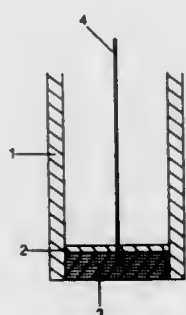
5,089,112

ELECTROCHEMICAL BIOSENSOR BASED ON IMMOBILIZED ENZYMES AND REDOX POLYMERS
Terje A. Skotheim, Shoreham, N.Y.; Yoshiyuki Okamoto, Fort Lee, N.J., and Paul D. Hale, Northport, N.Y., assignors to Associated Universities, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 325,389, Mar. 20, 1989, abandoned. This application Jan. 11, 1990, Ser. No. 463,540
Int. Cl.⁵ G01N 27/26

U.S. Cl. 204—403

10 Claims



1. An enzyme electrode for sensing the presence of at least one component of a mixture of components, said enzyme electrode comprising:

- (a) an enzyme, the catalytic activity of said enzyme being indicative of said component,
 - (b) a non-physiological electron transfer mediator between the enzyme and electron collector, said mediator being covalently attached to an insoluble, flexible siloxane polymer backbone in sufficient number to form an electron relay system,
 - (c) and an electron collector,
- said enzyme and said mediator-containing siloxane polymer backbone being in an immobilized state in contact with said electron collector.

5,089,113

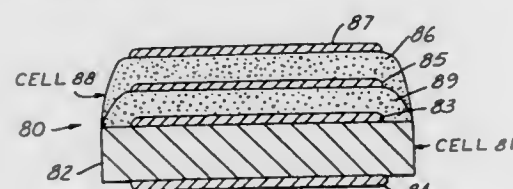
MEASUREMENT AND CONTROL OF EXHAUST GAS RECIRCULATION WITH AN OXYGEN PUMPING DEVICE

Eleftherios M. Logothetis, Birmingham, and Richard E. Soltis, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 443,537, Nov. 30, 1989, Pat. No. 5,010,762, which is a division of Ser. No. 222,864, Jul. 22, 1988, Pat. No. 4,909,072. This application Mar. 18, 1991, Ser. No. 670,632
Int. Cl.⁵ G01N 27/26

U.S. Cl. 204—425

8 Claims



1. An electrochemical device for measuring the percentage

of exhaust gas recirculation (EGR) in an intake air and exhaust gas mixture of an internal combustion engine, said electrochemical device including:

- a generally planar first electrochemical pump cell including a relatively dense ZrO₂ platelet with porous platinum electrodes on two sides of said platelet;
- a first porous ZrO₂ layer deposited on one electrode of said first pump cell;
- a generally planar second electrochemical pump cell including a first porous platinum electrode, a second porous ZrO₂ layer and a second porous platinum electrode deposited successively on said first porous ZrO₂ layer;
- a second cell external circuit means coupled to said second pump cell for passing a constant current through said second pump cell so that said second electrode is biased positively causing a portion of the oxygen molecules inside said first porous ZrO₂ layer to be pumped out by said current flowing through said second pump cell;
- a first cell external circuit means coupled to said first pump cell for applying a constant voltage across said first pump cell so that the exposed electrode is biased positively, said constant voltage across said first pump cell being sufficient to cause substantially all of the remainder of the oxygen molecules inside said first porous ZrO₂ layer to be pumped out by a current flowing through said first porous ZrO₂ layer but less than that capable of disassociating CO₂ or H₂O molecules; and
- a third external circuit means coupled to said first pump cell for measuring the current flowing through said first pump cell, said current being proportional to the percentage of O₂ inside said first porous ZrO₂ layer not pumped out by said second pump cell and also proportional to the percentage of O₂ in said intake air and exhaust gas mixture.

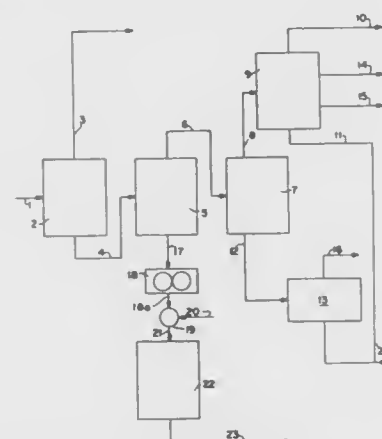
5,089,114

METHOD FOR PROCESSING HEAVY CRUDE OILS
Abel M. Tovar, Tlalnepantla; Oscar H. B. Mendizabal, Satélite; Leonardo M. Olmos, Portales; Carlos G. A. Sanchez, Florida; Roberto L. Lorenzo, La Escalera; Roldofo C. Barba, Río Blanco, and René H. Pérez, Tlalnepantla, all of Mexico, assignors to Instituto Mexicano Del Petroleo, Mexico
Continuation-in-part of Ser. No. 274,687, Nov. 22, 1988, abandoned, which is a continuation of Ser. No. 679,368, Dec. 7, 1984, abandoned. This application Nov. 22, 1989, Ser. No. 439,670

Int. Cl.⁵ C10G 1/00

U.S. Cl. 208—50

10 Claims



1. A method for processing heavy crude oils, which comprises distilling a 100% heavy crude oil feedstock containing at least 7 weight percent n-pentane insolubles under atmospheric pressure to obtain an atmospheric distillation residue,

contacting said atmospheric distillation residue with a selective solvent comprising C₄ to C₇ aliphatic hydrocarbon or mixtures thereof in an extraction column to extract asphaltenes, carbon, sulfur and metals from said atmospheric distillation residue, said extraction column having a top temperature of 50°–250° C., and a bottom temperature of 40°–230° C. while being operated under a pressure 3–40 kg/cm² with a solvent-hydrocarbon volume ratio of 2:1 to 10:1,

withdrawing an extract fraction and a raffinate fraction rich in asphaltenes from said extraction column, said extract fraction having an API gravity of 10–18, an SSF viscosity at 50° C. of 100 to 3,500, 1.0–75 weight percent insolubles in n-pentane and 0.20–5.0 weight percent insolubles in n-heptane, a Ramsbottom carbon of 4.0–12.0 weight percent, 2.0 to 5.0 weight percent sulfur and 75 to 250 ppm metals comprising nickel and vanadium, subjecting said extract fraction to vacuum distillation in a vacuum distillation column at a temperature of 300° C. to 540° C. to recover a gas oil stream and a residue stream, catalytically cracking said gas oil stream and feeding said residue to a viscosity breaking unit and viscosity breaking the residue stream, and admixing said asphaltene-rich raffinate fraction with coking coal and coke fines and subjecting the resulting mixture to coking under conditions to produce metallurgical coke.

5,089,115

DOWNWARDLY FORCED PARTICLE BED FOR GAS CONTACTING

William J. Koves, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Division of Ser. No. 426,907, Oct. 26, 1989, Pat. No. 4,959,198. This application Jul. 20, 1990, Ser. No. 555,285

Int. Cl.⁵ B01J 8/12

U.S. Cl. 208—146

5 Claims

1. A method for contacting a fluid with particles said method comprising:

- a) periodically passing said particles into the top of a vertically-elongated bed of particles;
- b) periodically withdrawing particles from the bottom of the bed, thereby causing particles to move downward within the bed by gravity; and,
- c) passing said fluid through said bed of particles from a vertically-extended inlet side of said bed to a vertically-extended outlet side of said bed such that the uppermost point of fluid flow from said inlet side is above the uppermost point of fluid flow to said outlet side, the lowermost point of fluid flow from said inlet side is above the lowermost point of fluid flow to said outlet side and the fluid flow through the bed is downwardly sloping at an angle to the horizontal.

5,089,116

PROCESS OF FROTH FLOTATION USING A 5-ALKYL, 5-ALKENYL, OR 5-ARYL-1,3,5-DITHIAZINE AS A COLLECTOR REAGENT

Arturo G. Gleisner, Vina del Mar, and Juan C. Vega, Santiago, both of Chile, assignors to Establecimientos Industriales Quimicos Oxiquim S.A., Vina del Mar, Chile

Filed Dec. 31, 1990, Ser. No. 635,967

Int. Cl.⁵ B03D 1/012, 1/02

U.S. Cl. 209—166

13 Claims

1. A process of froth flotation for the recovery of a sulfide mineral or a sulfidized oxide mineral from an ore, comprising subjecting said ore in the form of an aqueous pulp to froth flotation in the presence of a sufficient amount of a 5-substituted-dithiazine, wherein the substitution is selected from the group consisting of an alkyl of one to eight carbon atoms; an alkenyl of 2 to 8 carbon atoms; and an aryl substituent of six to eight carbon atoms, to act as a collector reagent for said sulfide

mineral or sulfidized oxide mineral; and recovering the resulting froth as a concentrate of the desired minerals.

5,089,117

APPARATUS FOR SEQUENTIALLY BACKWASHING A PLURALITY OF SERIATE FILTER BEDS

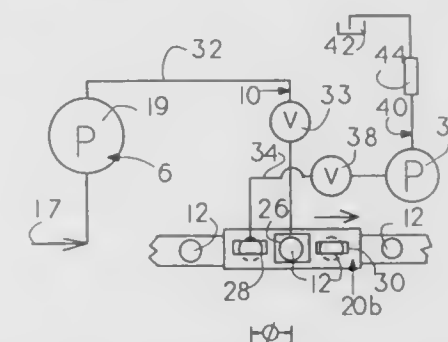
William R. Nichols, Richmond, Va., assignor to Infilco Degremont Inc., Richmond, Va.

Filed Aug. 1, 1990, Ser. No. 561,335

Int. Cl.⁵ B01D 24/46

U.S. Cl. 210—93

3 Claims



3. In a filter cleansing system having a filter tank divided into a plurality of juxtaposed seriate cells, a layer of filter media in each said cell, influent means for delivering liquid into each said cell to be filtered through said layer of filter media contained therein, a separate port in each said cell beneath said layer of filter media in said cell for discharging liquid from and charging liquid to said cell, an effluent channel common to all said separate ports that all communicate with said effluent channel through a longitudinal planar surface in which said separate ports are substantially equally spaced apart a predetermined distance ϕ along a longitudinal axis, backwashing means including a pump for forcing backwashing liquid through said separate ports one at a time to flow upwardly through said cell associated with the respective said separate port, a backwash shoe that slides along said planar surface to access said separate ports, motor means for sliding said backwash shoe along said planar surface and purging means to remove liquid from said cells via their respective said separate ports following backwash, the improvement which comprises:

said backwash shoe comprising a sliding surface for longitudinal movement along said planar surface in a selected direction in fluid tight contact therewith, said sliding surface having first, second and third openings therein the centers of which are spaced apart about said distance ϕ , said first opening being central, first conduit means connecting said backwashing means pump to said first opening, a waste water pump, second conduit means connecting said waste water pump to said second and third openings via a valve that permits only whichever of said second opening or said third opening is downstream the direction of sliding of said backwash shoe along said planar surface to communicate with said second conduit means, third conduit means for conveying liquid from said waste water pump to waste and monitor means for monitoring turbidity of said waste water being conveyed in said third conduit means.

5,089,118

SETTLING TANK SPRAY SYSTEM

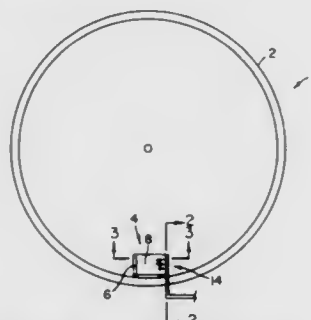
John Mahoney, R.D. #2, Box 6, Schohaire Plank Rd., Altamont, N.Y. 12099

Filed Sep. 24, 1990, Ser. No. 586,795

Int. Cl.⁵ B01D 21/28

U.S. Cl. 210—153

14 Claims



1. A liquid settling structure and skimming system comprising:

- a drain means operatively connected to a circular liquid settling structure wherein said drain means includes an inlet at least partially in contact with an upper layer of a volume of liquid contained within said structure;
- a spray means located proximate said drain inlet and connected to a source of pressurized liquid whereby liquid spraying from said spray means impinges on said drain inlet and acts to draw at least a portion of said upper layer of contained liquid into said drain means;
- wherein said spray means comprises an elongated tubular body having a plurality of outlet ports that sprays said pressurized liquid in a direction toward a rear portion of said drain means; and
- wherein said drain inlet includes two spaced vertically extending walls and an angled bottom portion connecting said walls and wherein said tubular body of said spray means is mounted atop said walls and extends in a direction substantially perpendicular to said walls and wherein said outlet ports are spacedly located along said tubular body and spray liquid onto said angled bottom portion in a direction toward said rear portion of said drain means.

5,089,119

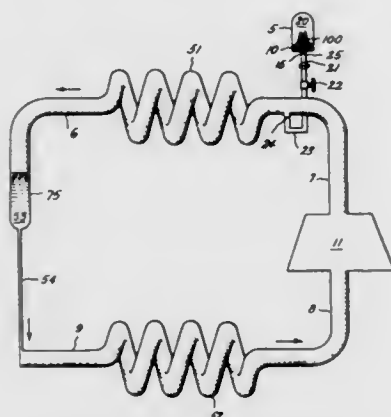
FILTER FOR A VAPOR COMPRESSION CYCLE DEVICE
James Day; Arnold Factor, both of Scotia, and Charles E. Baumgartner, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1989, Ser. No. 419,556

Int. Cl.⁵ B01D 39/14, 35/02

U.S. Cl. 210—167

30 Claims



18. A filter for filtering fluorocarbon refrigerant within a refrigerator comprising a housing having only one orifice for

the transfer of said fluorocarbon refrigerant in and out of said housing, a porous absorbent material being disposed within said housing for separating impurities and wherein said porous absorbent material contains an absorbed additive in sufficient quantity to release said additive into the fluorocarbon refrigerant which passes therethrough and a means for connecting said housing to a conduit which transfers said fluorocarbon refrigerant to said orifice from a location between a compressor and a condenser of the refrigerator.

5,089,120

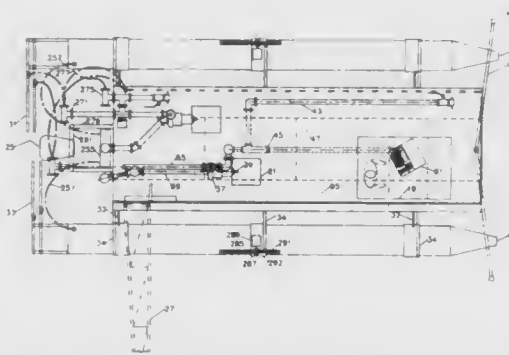
TREATMENT VESSEL FOR BODIES OF WATER WITH LATERALLY ADJUSTABLE PONTOONS

Thomas E. Eberhardt, 20 Blenheim Dr., Easton, Pa. 18042
Continuation-in-part of Ser. No. 310,208, Feb. 13, 1989, Pat. No. 4,877,524, which is a division of Ser. No. 199,314, May 26, 1988, Pat. No. 4,818,416, which is a continuation-in-part of Ser. No. 075,114, Jul. 20, 1987, Pat. No. 4,747,958. This application Jun. 14, 1989, Ser. No. 365,946

Int. Cl.⁵ B63B 35/00

U.S. Cl. 210—170

41 Claims



27. A treatment agent dispensing vessel for applying a fluent treatment agent to a body of water comprising:

- (a) a central hull incorporating at least one fluent supply tank,
- (b) a pair of side pontoon means adjustably secured to said central hull for providing lateral stability to the vessel,
- (c) means for moving the pontoons laterally outwardly away from the central hull into extended position to increase lateral stability and inwardly toward the central hull to decrease the lateral dimensions of the vessel in conditions where lateral clearance may be required,
- (d) each of the pontoon means having a fluent treatment agent supply tank means,
- (e) pumping circuit means for pumping a fluent treatment agent from one or more of the supply tanks to application means for applying a treatment agent to the body of water.

5,089,121

APPARATUS FOR RECOVERING RESIDUAL TAR OR OIL FROM A FLUID MEDIUM

Robert McWhinnie, Stonehaven, Scotland, assignor to Alba International Limited, Aberdeen, Scotland

Filed Aug. 4, 1989, Ser. No. 389,483

Claims priority, application United Kingdom, Aug. 5, 1988, 8818616

Int. Cl.⁵ E02B 15/04

U.S. Cl. 210—175

13 Claims

1. Apparatus for recovering tar or heavy oil from a fluid medium, the apparatus comprising means for substantially separating the tar or oil from said medium, conveyor means for conveying the separated tar or oil, scraper means for removing the tar or oil from the conveyor means, heating means arranged to present a heated solid surface with which the conveyed tar or oil comes into contact for applying intense heat to the tar or oil at the position of its removal from the conveyor

5,089,123

APPARATUS FOR CONTINUOUS REMOVAL OF MATERIALS FROM A LIQUID

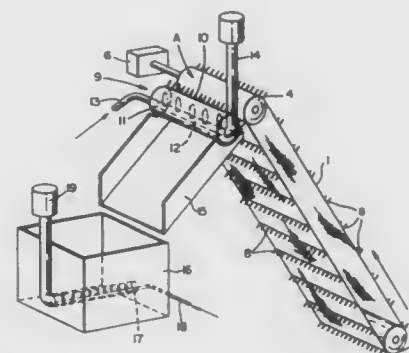
Irving W. DeVoe, Camarillo, Calif., assignor to Metanetix, Inc., Camarillo, Calif.

Filed Sep. 14, 1989, Ser. No. 408,156

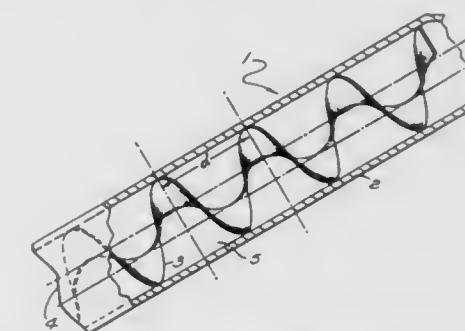
Int. Cl.⁵ B01D 15/02

U.S. Cl. 210—189

8 Claims



diately passes onto the heated surface, where it is liquified, and means for receiving the liquified tar or oil from said heating means.



1. Apparatus for removal of at least one contaminant from a liquid, comprising:

- helicoidal screw means for moving a contaminant affinity medium in a first direction;
- liquid conduit means comprising a tube enclosing said helicoidal screw means for moving said liquid in a second, opposite direction from a first end of said tube to a second, opposite end thereof while in contact with said contaminant affinity medium, said contact being sufficient to permit formation of an association between said solid contaminant affinity medium and said at least one contaminant, movement of contaminant affinity medium from said second end of said tube to said first end in a direction countercurrent to flow of liquid being effected by relative rotation of said helicoidal screw means and said liquid conduit means;
- means for separating said contaminant affinity medium from said liquid at said first end of said tube; and
- feedback pump means for returning liquid separated from contaminant affinity medium at said first end of said tube back into said tube at said first end thereof, said feedback pump means having a rate matching or exceeding a rate of initial liquid introduction into said tube.

5,089,122

DEVICE FOR THE SEPARATION OF FLUID MIXTURES
Horst Chmiel, Leonberg-Ramtel, Fed. Rep. of Germany, assignor to Fraunhofer Gesellschaft, Munich, Fed. Rep. of Germany

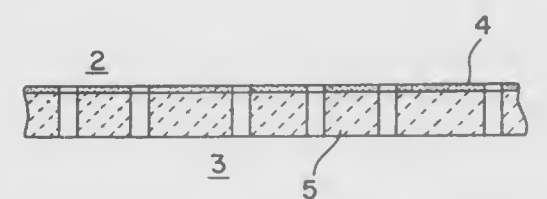
Continuation of Ser. No. 380,773, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 110,030, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 872,665, filed as PCT/DE85/00304 Sep. 2, 1985, abandoned. This application Jan. 28, 1991, Ser. No. 649,223

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432002; May 24, 1985, 3518871

Int. Cl.⁵ B01D 61/36

U.S. Cl. 210—185

11 Claims



1. Device providing means for separating a fluid mixture comprising at least one membrane having a fluid mixture side along which the mixture passes for separation and having an opposite, permeate side providing a separated constituent of the fluid at which side partial pressure is maintained on the separated constituent, each said membrane comprises at least one selective porous portion consisting of current conducting material which is itself a heatable element providing means for heating the membrane selective portion either by direct passage of current through the current conducting material or inductively, said membrane and means for heating being constructed and arranged to heat only the membrane and a fluid layer surrounding the membrane without heating of the complete mixture.

5,089,124

GRADIENT GENERATION CONTROL FOR LARGE SCALE LIQUID CHROMATOGRAPHY

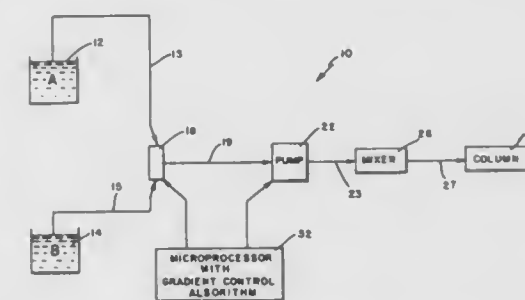
Jeffrey T. Mahar, New Haven; Thomas C. Ransohoff, Fairfield; Adam H. Levin, Brookfield, and Theodore Kettler, Ridgefield, all of Conn., assignors to Biotage Inc., Charlottesville, Va.

Filed Jul. 18, 1990, Ser. No. 554,301

Int. Cl.⁵ B01D 15/08

U.S. Cl. 210—198.2

5 Claims



5. A large scale liquid chromatography system comprising: a column,

a pair of reservoirs each containing a liquid to be mixed together in desired proportions to form a mobile phase, a single three-way gradient valve means with a C_v value greater than 1.0 having a pair of inlets and a single outlet, flow conduits connecting each reservoir to one of said valve inlets,

a pump having an inlet and an outlet for conveying liquid over a range of flow rates in excess of 100 ml/min to said column,

a delivery flow conduit connecting said single valve outlet to said pump inlet,

said valve having an air-actuated initial position in which a first valve inlet is open to a first of said reservoirs and a second spring return position which opens a second valve inlet to a second of said reservoirs while closing said first valve inlet,

said valve exhibiting a significant lag time for return to said initial position associated with the spring return and release of air pressure,

a microprocessor having a timer chip wherein control of said gradient valve means is hardware or software interrupt driven by the microprocessor to allow gradient control while other system functions are controlled simultaneously said microprocessor,

said microprocessor selectively activating said valve to said air-actuated open position to admit liquid from one of said reservoirs to said pump inlet and for venting air from said valve actuator to facilitate spring return of said valve means to open said second valve inlet to allow flow from said second reservoir in a desired proportion,

said microprocessor means correcting for the lag time error by decreasing signal duration time for said second reservoir,

said microprocessor adjusting pump speed and cycle time to avoid wave-like proportioning in accordance with the formula

$$C = (\text{pump speed, \%}) (\text{valve cycle time, seconds})$$

the value C having been determined empirically by observation and

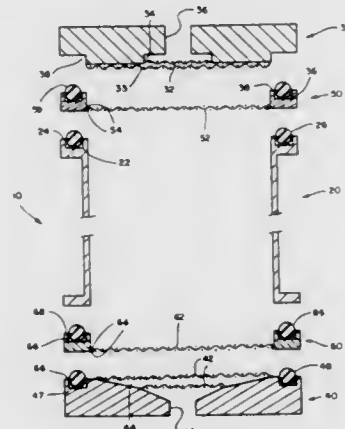
said microprocessor simultaneously controlling other system functions of said liquid chromatography system.

5,089,125 CHROMATOGRAPHY COLUMN WITH SEALING ARRANGEMENT

Robert L. Hart, 1817 Evergreen St., Alton, Ill. 62002, and David M. Wong, 14416 White Birch Valley La., Chester, Mo. 63017
Filed Feb. 20, 1990, Ser. No. 481,937
Int. Cl.⁵ B01D 15/08

U.S. Cl. 210—198.2

10 Claims



1. A chromatography column comprising:
a main column section having a generally cylindrical cross-

section with an internal diameter selected to correspond to a predetermined operating capacity, said main column section having a groove formed in an upper surface for accommodating a first sealing O-ring;

an upper sealing section having a generally ring-shaped configuration with an internal diameter corresponding to said internal diameter of said main column section, said upper sealing section including a first frit disposed within and extending throughout the entire internal diameter of said upper sealing section and further including a groove formed in an upper surface for accommodating a second sealing O-ring, wherein said upper sealing section is disposed on said main column section with said first O-ring disposed therebetween;

an upper column section having a generally ring-shaped configuration and having a centrally located first indented portion in a lower surface which communicates with an centrally located access port formed through said upper column section, said upper column section further including a second indented portion in said lower surface which extends around the periphery of said upper column section from side walls of said upper column section to a position corresponding to said internal diameter of said main column section, said upper column section having a lower surface between said first and second indented portions, said lower surface being inclined so as to have the least thickness adjacent said second indented portion and the greatest thickness adjacent said first indented portion, said upper column section including a first distribution screen disposed within said first indented portion and a second distribution screen disposed along said lower surface of said upper column section, wherein said upper column section is disposed on said upper sealing section with said second O-ring disposed therebetween;

a lower sealing section having a generally ring-shaped configuration with an internal diameter corresponding to said internal diameter of said main column section, said lower sealing section including a second frit disposed within and extending throughout the entire internal diameter of said lower sealing section and further including a groove formed in an upper surface for accommodating a third sealing O-ring, wherein said lower sealing section is disposed below said main column section with said third O-ring disposed therebetween; and

a lower column section having a generally ring-shaped configuration with a centrally located outflow port, said lower column section having a sloping indented portion formed in an upper surface, said sloping indented portion extending from a position corresponding to said internal diameter of said main column section and sloping downward to said outflow port, said lower column section further including at least one distribution screen disposed within said sloping indented portion and also including a groove in an upper surface for accommodating a fourth sealing O-ring, wherein said lower column section is disposed below said lower sealing section with said fourth O-ring disposed therebetween.

5,089,126 METHOD AND APPARATUS FOR CAPILLARY HYDRODYNAMIC FRACTIONATION

Cesar A. Silebi, Lower Gwynedd, and Jose D. Ramos, Milford, both of Pa., assignors to Lehigh University, Bethlehem, Pa.
Filed Mar. 31, 1989, Ser. No. 332,021
Int. Cl.⁵ B01D 15/08

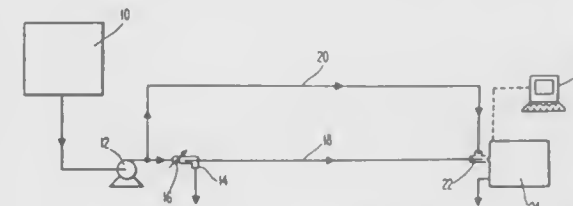
U.S. Cl. 210—198.20

9 Claims

1. An apparatus for separating particles by size comprising:
a) means for forming a liquid dispersion of said particles to be separated;
b) means for splitting said liquid dispersion into major and minor fractions;
c) means for introducing said minor fraction of the liquid dispersion of particles to be separated into and through at

least one capillary tube to produce a distribution of particles of differing size exiting said capillary tube at different times after said introduction;

d) means for introducing the separated dispersion into a



liquid diluent stream as said separated dispersion exits said capillary tube to facilitate collection and measurement thereof by maintaining said distribution of particles;

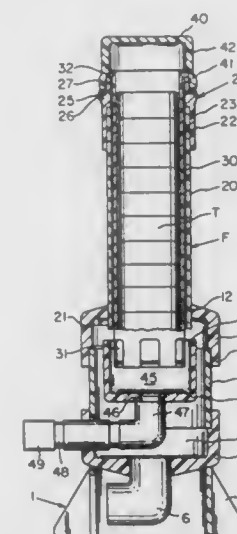
e) means for collecting the diluted, separated liquid dispersion and measuring the particle size distribution thereof.

5,089,127 CHEMICAL FEED APPARATUS

David M. Junker, Monroeville; Charles R. Wiedrich, Murrysville, and Robert B. Simmons, Jeannette, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 19, 1990, Ser. No. 600,461
Int. Cl.⁵ C02F 1/76

U.S. Cl. 210—206

20 Claims



1. A chemical feeder including a base, a collection reservoir having a closed upper end and a closed lower end supported on said base, an elongated cylinder supported in said upper end member of said collection reservoir and extending upwardly therefrom, a cup-shaped member having an annular side wall that forms an annular rim, said cup-shaped member forming an open top erosion reservoir located within and substantially concentric with said collection reservoir, outlet means for removing liquid from said collection reservoir, inlet means for supplying liquid to said erosion reservoir, control means connected to said inlet means for controlling the flow rate of liquid supplied to said erosion reservoir, an elongated canister adapted to contain solid dry chemical sanitizing element located with said cylinder, means for supporting said canister within said cylinder with the lower end portion of said canister located in the open top of said erosion reservoir, a plurality of openings located in the lower end portion of said canister whereby said chemical sanitizing element located in the lower end portion of said canister may be contacted by liquid charged to said erosion reservoir to erode and dissolve said solid sanitizing chemical in the lower end portion of said canister whereby liquid containing sanitizing chemical flows over

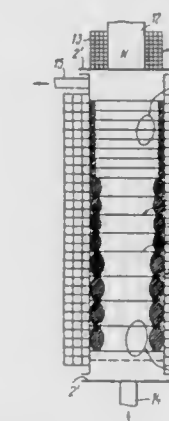
the rim of said open top erosion reservoir into said collection reservoir and out of said outlet means in said collection reservoir.

5,089,128 APPARATUS FOR SEPARATION OF FERROMAGNETIC MATERIALS FROM FLUID MEDIA

Vyacheslav I. Garaschenko; Alexandr V. Sandulyak, and Igor V. Volkov, all of Rovno, U.S.S.R., assignors to Ukrainsky Institute Inzhenerov Vodnogo Khozyaistva, Rovno, U.S.S.R.
PCT No. PCT/SU88/00121, § 371 Date Feb. 8, 1990, § 102(e) Date Feb. 8, 1990, PCT Pub. No. WO89/11324, PCT Pub. Date Nov. 30, 1989
PCT Filed May 25, 1988, Ser. No. 460,907
Int. Cl.⁵ B01D 35/06

U.S. Cl. 210—222

23 Claims



1. An apparatus for separation of ferromagnetic materials from fluid media, comprising:
a working chamber internally accommodating a ferromagnetic attachment comprising a multitude of parallel stacked plates with through openings, and elastic liners disposed between the adjacent stacked plates, said through openings having a circumference, said circumference being provided with shaped projections oriented at an angle to a plane of the plates, the shaped projections having ends;
a magnetizing system for magnetization of the ferromagnetic attachment;
an inlet means for delivery of a fluid medium in the working chamber for purification;
an outlet means for receiving purified fluid medium after passing through the attachment; and
means for varying the distance between adjacent said stacked plates, between an open position and a closed position, whereby the density of the plates in the stacking direction may be varied, said means for varying the distance between the plates comprising at least one additional magnetic field source disposed outside the working chamber so that a vector of a magnetic field of said source is oriented along a center line of the working chamber.

5,089,129 FLUID CONTAMINATE FILTRATION SYSTEM INCLUDING A FILTER, A CONTAMINATE PARTICLE TRAP, AND A COLD START FLUID CIRCULATION SYSTEM

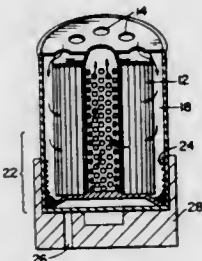
Bernard B. Brigman, 6816 W. Lake Anne Dr., Raleigh, N.C. 27612

U.S. Cl. 210—223

19 Claims

1. In a filter for removal of particulate matter from a fluid, having a housing, an entrance opening for ingress of said fluid,

an exit opening for egress of said fluid after filtering and a microporous barrier for separating said housing into a first outer chamber in fluid communication with said entrance opening and a second inner chamber in fluid communication with said exit opening and linking said chambers in fluid communication through said barrier, the improvement comprising:



means for magnetically attracting and retaining said particulate matter, including a magnetic end cap member providing a magnetically attractive force adapted to surround one end of said filter remote from said entrance and exit openings and adjacent an exterior wall of said first chamber for attracting said particles toward said exterior wall of said first chamber remote from said barrier.

5,089,130

FILTER CELL SHEET INSTALLATIONS

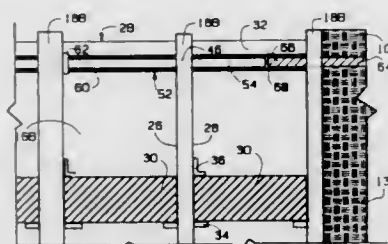
William R. Nichols, Richmond, Va., assignor to Inflico Degremont Inc., Richmond, Va.

Filed Nov. 26, 1990, Ser. No. 617,587

Int. Cl.⁵ B01D 24/22

U.S. Cl. 210—232

5 Claims



1. In an automatic backwash filter system including a filter tank defined by a bottom, first and second opposed, parallel side walls, and third and fourth opposed parallel side walls divided into a multiplicity of seriate cells of substantially the same width W by a plurality of substantially vertical rectangular cell sheets defined by a top edge, a bottom edge, a pair of side edges, a first exposed surface on one side and a second exposed surface on the other side of each said cell sheet, said cell sheets running parallel to said first and second side walls, each of said cells containing a horizontal rigid porous filter plate located between said exposed surfaces of its said respective cell sheets at a position above said tank bottom, filter media contained in said cells and supported on said porous plates, influent means for delivering liquid to be filtered to the top of said filter media and effluent means for discharging liquid filtered through said media and said plates from said filter system at a level below said plates the improvement which comprises:

spacer means for mitigating bowing of said cell sheets, said spacer means including:

bore extending through each cell sheet from said first exposed surface to said second exposed surface thereof, all said bores being horizontally aligned and located substantially the same distance below said top edges of said cell sheets,

at least one flexible stringer extending through said bores, and

a plurality of rigid tubes of approximately the same length substantially equal to said same width W, each said tube

being positioned coaxially over said stringer within one of said cells and forming a spacer element between the exposed surfaces of an adjacent pair of said cell sheets defining the filter cell.

5,089,131

CORROSION RESISTANT FILTER UNIT

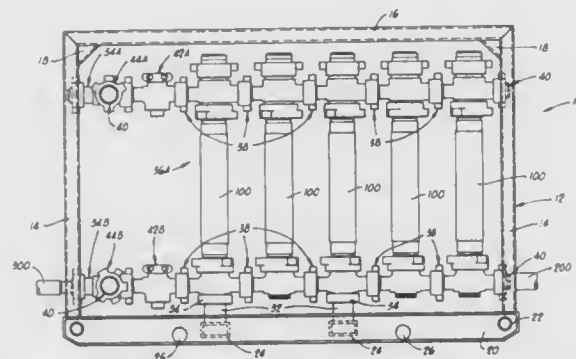
J. Michael Gentry, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 8, 1988, Ser. No. 268,820

Int. Cl.⁵ B01D 35/153

U.S. Cl. 210—253

10 Claims



1. A fluid filter assembly adapted for the filtration of corrosive fluid to be injected into a well bore at pressure levels which may exceed 10,000 pounds per square, said filter assembly comprising:

a frame assembly for the mounting of a portion of said fluid filter assembly therein, the frame assembly including:

a plurality of longitudinally extending sole plates;

a plurality of struts laterally linking the plurality of longitudinally extending sole plates at least two of the plurality of struts having a rectangular cross-section being adapted for use in lifting said fluid filter assembly by inserting a lifting member therein;

a plurality of vertical corner support columns, each vertical corner support column of the plurality of vertical corner support columns having one end thereof secured to a longitudinally extending sole plate of the plurality of longitudinally extending sole plates;

a plurality of longitudinally extending members, each member having the ends thereof secured to a vertical corner support column of the plurality of vertical corner support columns;

a plurality of laterally extending members, each member having the ends thereof secured to a vertical corner support column of the plurality of vertical corner support columns; and

a plurality of supports extending upwardly from and secured to selected struts of the plurality of struts laterally linking the plurality of longitudinally extending sole plates, each support of the plurality of supports having a collar formed on the upper end thereof;

a plurality of filter pods, the plurality of filter pods forming at least two banks of filter pods, each bank having at least two filter pods therein, each bank of the filter pods being supported by one or more the supports of the plurality of supports secured to selected struts of the plurality of struts of the frame assembly;

an inlet manifold to direct said corrosive fluid to the plurality of filter pods, the inlet manifold being interconnected to the banks of filter pods formed by the plurality of filter pods whereby flow of said corrosive fluid can be directed to each bank of the filter pods;

an outlet manifold to direct said corrosive fluid from the plurality of filter pods, the outlet manifold being intercon-

nected to the banks of filter pods formed by the plurality of filter pods whereby the flow of said corrosive fluid can be directed to each bank of the filter pods and being interconnected to the inlet manifold whereby said corrosive fluid can be directed from the inlet manifold to the outlet manifold;

a first valve means to control the flow of said corrosive fluid between banks of filter pods formed by the plurality of filter pods whereby the flow of said corrosive fluid can be selectively directed to each bank of the filter pods;

a second valve means to selectively control the flow of said corrosive fluid between the inlet manifold and the outlet manifold; and

union means for interconnecting the filter pods, inlet manifold and outlet manifold, each of the union means including mechanical connection means and internal seal means for isolating said corrosive fluids from the mechanical connection means;

wherein said fluid filter assembly is adapted for use in the filtration of corrosive fluid to be injected into a well bore at pressure levels which may exceed 10,000 pounds per square inch or more while said filter unit comprises a plurality of filter pods, an inlet manifold, an outlet manifold, first valve means and second valve means interconnected by union means to eliminate any welded connections therebetween and facilitate the operation and maintenance of the filter pods.

5,089,132

FILTER ASSEMBLY

Marino R. Sussich, North Altona, and Paul Sussich, Werribee, both of Australia, assignors to Kagisho Pty. Ltd., Australia

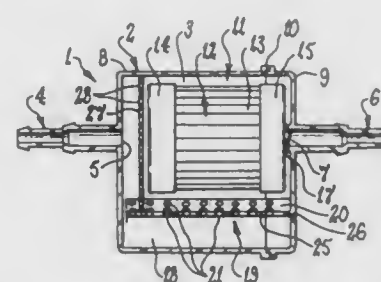
Filed Sep. 21, 1989, Ser. No. 410,601

Claims priority, application Australia, Apr. 20, 1989, PJ3788

Int. Cl.⁵ B01D 21/28

U.S. Cl. 210—298

2 Claims



1. A filter assembly for filtering contaminants from liquid, including:

a housing providing a filtering chamber and having an inlet port and an outlet port communicating with the chamber for flow of liquid therethrough;

filter media in the filtering chamber for filtering contaminants from liquid flowing through the filter media to the outlet port;

a sump region in the filtering chamber at the bottom thereof below the inlet port and toward which contaminants in the liquid entering through the inlet port tend to gravitate for collection; and

a separator member located in the filtering chamber and substantially separating the filter media and sump region, the separator member comprising a separator plate extending across the filtering chamber between the filter media and sump region, the separator plate having an edge portion through which the separator plate is hingedly connected to the housing, the separator member being arranged within the filtering chamber so as to vibrate relative to the housing during use of the filter assembly, vibration facilitating separation of the contaminants from the liquid entering through the inlet port and collection of the contaminants in the sump region, the separator plate providing for communication of the contaminants into the

sump region and tending to trap the contaminants received in the sump region.

5,089,133

WATERPROOF TYPE OXYGEN SENSOR

Nobuhide Kato, and Masanori Katsu, both of Aichi Pref., Japan, assignors to NGK Insulators, Ltd., Japan

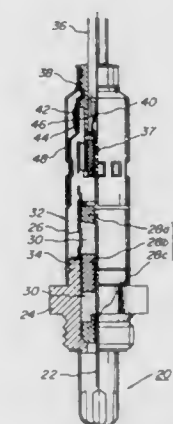
Filed Mar. 1, 1990, Ser. No. 486,923

Claims priority, application Japan, Mar. 13, 1989, 1-58022

Int. Cl.⁵ G01N 27/409

U.S. Cl. 204—427

3 Claims



1. A waterproof type oxygen sensor comprising:

a sensor element having electrodes disposed at inner and outer portions thereof, the inner and outer electrodes being adapted to contact air and exhaust gases, respectively;

a housing for containing the sensor element;

a gas-tight sealed section arranged inside the housing and separating the exhaust gases from air; and

a water-repelling section for communicating the air inside the gas-tight sealed section with surrounding air;

wherein a relationship $Y \geq 10X^{0.35}$ between the gas-tight sealed section and the communicating section is maintained to prevent drops in electromotive forces of the oxygen sensor during operation thereof, in which X is a value (cc/min) of 0.01 to 1.0 cc/min obtained by measuring an amount of compressed air passed through the gas-tight sealed section at 4.0 kg/cm² pressure, and Y is a value (cc/min) obtained by measuring an amount of compressed air passed through the communicating section at 0.1 kg/cm² pressure, converted to a value of 4.0 kg/cm² pressure.

5,089,134

SILICA GLASS FILTER

Kuniko Ando, Koichi Shiraishi, both of Hadano; Masaru Shimbo, Yokohama, and Shunzo Shimai, Tougane, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

Filed Dec. 26, 1990, Ser. No. 633,624

Claims priority, application Japan, Dec. 28, 1989, 1-343701; Dec. 28, 1989, 1-343702; Dec. 28, 1989, 1-343707

Int. Cl.⁵ B01D 24/00, 39/06

U.S. Cl. 210—496

10 Claims

1. A silica glass filter comprising:

a porous sintered support body composed of first amorphous silica particles and having a purity of 99.9% or more, containing 150 ppm or less total impurities of the group consisting of alkali, alkali metal, heavy metal and elements of III B group of the periodic table; and

a filtration layer formed on the support, said filtration layer being a sintered body composed of second amorphous silica particles having substantially the same purity as that of the support body.

5,089,143

METHOD OF FILTERING INDUSTRIAL LIQUIDS AND APPARATUS THEREFOR

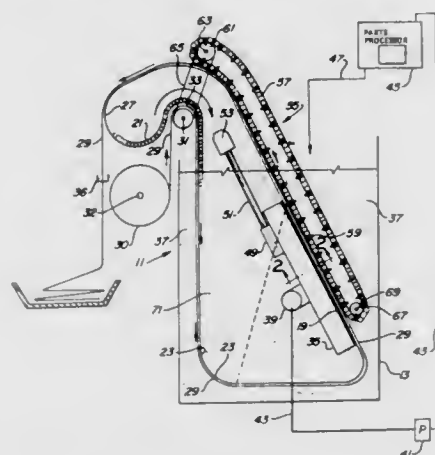
Raymond L. Anderson, Walled Lake, Mich., assignor to H. R. Black Company, Inc., Warren, Mich.

Filed Apr. 17, 1989, Ser. No. 338,944

Int. Cl.⁵ B01D 29/09

U.S. Cl. 210—741

2 Claims



1. In the method of filtering industrial process liquids including conduit means for feeding unfiltered wash liquids from a wash area into a tank;
 - guidably and movably supporting and immersing a portion of a continuous conveyor screen within and in engagement with the tank;
 - positioning a filter media having inner and outer surface portions with said inner surface portion upon, coextensive with and along the length of an outer surface of the screen for frictional engagement and movement therewith;
 - with the filter media providing a loop within the tank defining a clean liquid reservoir upon the interior of the loop and an unfiltered liquid reservoir upon its exterior for receiving said unfiltered liquid;
 - providing an open-top vacuum chamber within said clean liquid reservoir with an inner surface portion of said screen sealed over, extending along and covering the length and width of the vacuum chamber;
 - said vacuum chamber having an outlet connected to a pump for delivering filtered liquids to a wash area, said media at said vacuum chamber stopping liquid flow when blocked by sludge and creating a vacuum within said vacuum chamber for effecting an automatic advance of the screen and filter media; and
 - positioning a power-operated tractor chain sludge elevator upon said tank opposite the open top of said vacuum chamber to longitudinally overlie and frictionally engage the outer surface portion of said media effecting positive upward lift movements of adjacent portions of the filter media with accumulated sludge thereon.

5,089,144

FILTER CONDITION INDICATOR HAVING MOVEABLE SENSOR AND AGGREGATE FLOW COUNTER

Aysegul Ozkahyaoglu, and Marty M. Zoerner, both of Reed City, Mich., assignors to Nartron Corporation, Reed City, Mich.

Filed Dec. 8, 1989, Ser. No. 447,794

Int. Cl.⁵ B01D 35/143

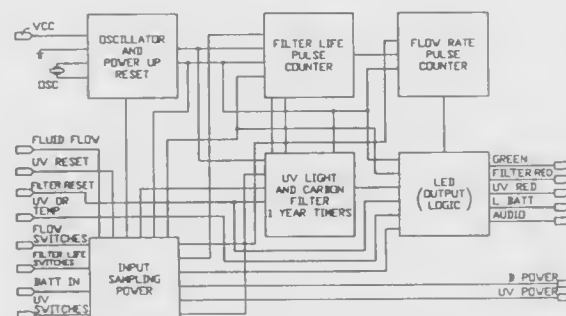
U.S. Cl. 210—767

18 Claims

7. A method for monitoring fluid flow through a fluid treatment filter placed in a fluid flow path leading to a faucet by use of circuitry and comprising the steps of:
 - a) positioning a fluid flow responsive, movable sensor in the

fluid flow path adapted to move in response to fluid flow in the fluid flow path;

- b) monitoring a position of the moveably sensor as a user opens and closes the faucet and providing a two-state signal output based on the position of a moveable member in the fluid flow path, one state of the two state signal output indicating that the fluid flow in the fluid flow path exceeds a threshold rate;
- c) initializing a timer when the filter is installed in the flow path;



- d) energizing said timer whenever said one state of the two state signal output is present; said timer providing a timer output related to an aggregate time of fluid flow through the filter of at least the threshold rate since installation of said filter;
- e) comparing the timer output with a predetermined value corresponding to a predetermined amount of filter use; and
- f) when the timer output reaches the predetermined value activating an indicator to indicate that a predetermined amount of filter use has occurred.

5,089,145

WATER TREATMENT APPARATUS AND METHOD

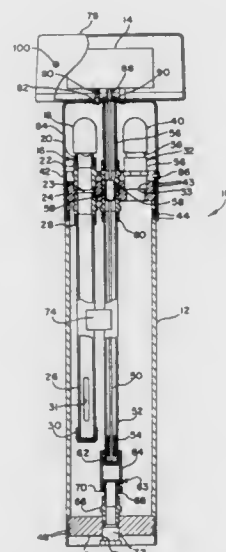
Charles S. Fern, 3306 N. Kentwood Ct., Peoria, Ill. 61604-1526

Filed Oct. 22, 1990, Ser. No. 601,908

Int. Cl.⁵ C02F 1/46

U.S. Cl. 210—748

16 Claims



14. A method for treating water to reduce the effects of hardness comprising:
 - establishing a high electrical potential between an anode and a cathode;
 - isolating the anode electrically from the water by position-

ing the anode in a hollow sealed non-conductive shaft spaced from an inner wall thereof; and passing the water to be treated between the anode and the cathode whereby the effects of the hardness of the water can be reduced.

5,089,146

PRE-STORAGE FILTRATION OF PLATELETS

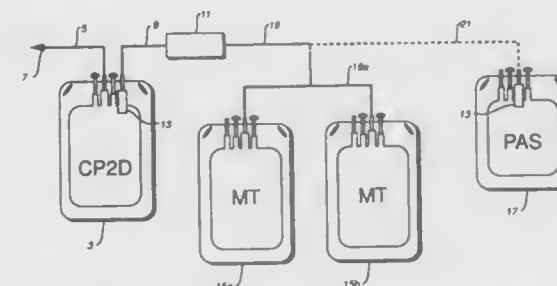
Raleigh A. Carmen, Concord, and Edward J. Nelson, San Rafael, both of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed Feb. 12, 1990, Ser. No. 478,853

Int. Cl.⁵ B01D 33/15

U.S. Cl. 210—782

8 Claims



1. A method of preparing platelets for long term storage comprising the steps of (a) obtaining whole blood from a human; (b) preparing platelet rich plasma from the whole blood; and (c) then passing the platelet rich plasma through a filter under conditions sufficient to remove substantially all white blood cells from the plasma, with steps (b) and (c) occurring in a closed blood bag system within eight hours of step (a).

5,089,147

UNDERDRAIN FOR GRANULAR MEDIUM FILTER

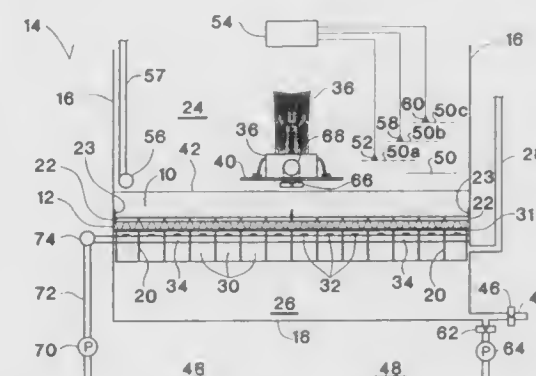
David S. Ross, Lorain, Ohio, assignor to Zimpro Passavant Environmental Systems, Inc., Rothschild, Wis.

Filed May 1, 1991, Ser. No. 694,180

Int. Cl.⁵ B01D 24/46

U.S. Cl. 210—793

16 Claims



16. A method of backwashing a liquid effluent filter having a filter bed with an upper surface and formed of particulate material, an underdrain cavity below said bed, and a perforated bed support element over said cavity to allow generally free flow of liquid in both directions through said support element, said method comprising the steps:
 - (a) allowing said liquid to filter through said bed and support member in a first direction and into said underdrain cavity;
 - (b) backwashing said bed by passing a backwashing liquid in a second direction opposite to said first direction; and
 - (c) causing said backwashing liquid to flow through a plurality of open-ended compartment disposed below said sup-

port element, each of said compartments having an open inner cavity and communicating by an upper open end with said bed and support element and communicating by a lower open end with said underdrain cavity and providing a cleansing flow of backwashing liquid in a generally vertical direction through said support element and into said bed to remove particulate matter and sheet-like material therefrom, and simultaneously causing said backwashing liquid to flow as separate high velocity jets passing in a generally straight vertical direction through said support member and into said bed from positions below said bed, said jets being closely spaced to provide energy to disintegrate adhering bed medium particles and counteract size discrimination within said bed during backwashing.

5,089,148

LIQUID FABRIC CONDITIONER CONTAINING FABRIC SOFTENER AND PEACH COLORANT

David Van Blarcom, West Milford, and Donna E. Johnson, Hackensack, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Nov. 27, 1990, Ser. No. 618,442

Int. Cl.⁵ D06M 13/34, 13/40

U.S. Cl. 252—8.6

19 Claims

1. A liquid fabric conditioning composition comprising:
 - a) about 1% to about 40% by weight of said composition of a fabric softening component comprising a cationic fabric softening compound; and
 - b) about 2 ppm to about 1,000 ppm of a colorant system comprising a yellow colorant selected from the group consisting of C.I. Acid Yellow #17, C.I. Acid Yellow #3, C.I. Solvent Yellow #33 and mixtures thereof and a red colorant selected from the group consisting of C.I. Reactive Red #56, C.I. Reactive Red #147, C.I. Acid Red #52 and mixtures thereof, the pH of the composition being less than about 7.

5,089,149

ORGANO-METALLIC COMPOUNDS

John Ridland, Wingate, and David A. Brown, Cleveland, both of England, assignors to Tioxide Group plc, London, England

Filed Dec. 1, 1989, Ser. No. 444,812

Claims priority, application United Kingdom, Dec. 16, 1988, 8829401

Int. Cl.⁵ C09K 3/00; C07F 7/00

U.S. Cl. 252—8.551

26 Claims

1. An organo-metallic compound comprising a reaction product of (a) a zirconium compound selected from the class consisting of zirconium halides and zirconium oxyhalides, (b) at least one selected from the group consisting of polyhydroxy alcohols and monosaccharides and (c) at least one alpha-hydroxy carboxylic acid.

5,089,150

METHOD OF INCREASING RETENTION OF SCALE INHIBITORS IN SUBTERRANEAN FORMATIONS

John Hen, Skillman, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed May 29, 1990, Ser. No. 529,805

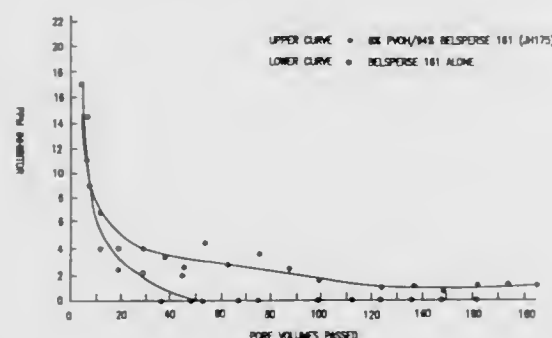
Int. Cl.⁵ E21B 43/28, 41/02

U.S. Cl. 252—8.552

29 Claims

1. A method for increasing the retention of a scale inhibitor in a subterranean formation consisting essentially of:
 - a) reacting an esterifiable scale inhibitor under esterification conditions in the presence of a strong acid with a polyalcohol thereby cross-linking said inhibitor which results in a substantial increase in the inhibitor's viscosity; and
 - b) mixing the cross-linked inhibitor of increased viscosity

into water and injecting the resultant mixture into a subterranean formation whereupon said cross-linked inhibitor



is retained in the formation for a substantially greater period of time than the inhibitor in its uncross-linked state.

5,089,151

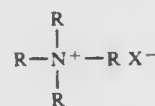
FLUID ADDITIVE AND METHOD FOR TREATMENT OF SUBTERRANEAN FORMATIONS

Bobby E. Hall, Richmond, and Clarita A. Szemeyi, The Woodlands, both of Tex., assignors to The Western Company of North America, Houston, Tex.

Filed Oct. 29, 1990, Ser. No. 605,573

Int. Cl.⁵ E21B 43/26, 43/22; C09K 7/02

U.S. Cl. 252—8.551 25 Claims
1. A formation treatment fluid comprising: an aqueous fluid, a selected gelling agent and a formation control additive of the general formula:



wherein R is independently a C₁ to C₄ alkyl, halogen substituted alkyl or hydroxyl substituted alkyl and at least one R is a C₁ to C₄ halogen substituted alkyl, and X⁻ is selected from the group consisting of chloride fluoride, bromide, iodide, nitrate, nitrite, hydroxide and sulfate.

22. A method of treating a subterranean formation comprising contacting the formation with an aqueous solution treatment fluid wherein the formation control additive comprises at least one of (2-chloroethyl) trimethylammonium chloride or (2-bromoethyl) trimethylammonium chloride.

5,089,152

WATER DISPLACEMENT COMPOSITION

Richard M. Flynn, White Bear Lake; Douglas A. Johnson, Stillwater, and John G. Owens, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 19, 1991, Ser. No. 688,906

Int. Cl.⁵ C09K 3/00

U.S. Cl. 252—194 10 Claims

1. A liquid composition comprising (a) predominantly by weight, a normally liquid, perfluorinated, chlorine-free, inert solvent and (b) a nonionic, fluoroaliphatic surface active agent where in said surface active agent is selected from the group consisting of perfluoroaliphatic amidoalkanols, perfluoroaliphatic carboxamidoalkanols and perfluoroaliphatic sulfonamidoalkanols, soluble in said solvent wherein said surface active agent is selected from the group consisting of perfluoroaliphatic amidoalkanols, perfluoroaliphatic carboximidoalkanols, and perfluoroaliphatic sulfonamidoalkanols.

5,089,153

METHOD OF INHIBITING CORROSION IN ACIDIZING WELLS

Dennis A. Williams, 204 Heathgate, Houston, Tex. 77062; Phyllis K. Holifield, 8203 Glencrest, Houston, Tex. 77061; James R. Looney, 5005 Georgi La. #95, Houston, Tex. 77092, and Lee A. McDougall, 6202 Rollingbrook, Houston, Tex. 77096

Filed Mar. 16, 1990, Ser. No. 494,673

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.⁵ E21B 43/27; C11D 7/48; C23F 11/16

U.S. Cl. 252—8.555 7 Claims

1. In a method of acidizing a subterranean formation penetrated by a borehole which has metal pipe positioned therein wherein an aqueous acid solution is pumped down said pipe and into the formation, the improvement comprising introducing components of a nonacetylenic corrosion inhibitor directly into the aqueous acid solution to form the corrosion inhibitor in the acid solution at a concentration to inhibit corrosion of the metal, said components consisting essentially of:

- (a) an antimony compound which provides from 0.04 to 2.0 wt % of antimony ions in the aqueous acid;
- (b) from 0.2 to 10 wt % of a quaternary ammonium compound capable of forming a complex with the antimony ions; and
- (c) from 0.1 to 25 wt % of a surfactant capable of water wetting the pipe.

5,089,154

RECIRCULATING POWDER LUBRICANT DELIVERY SYSTEMS USING THERMALLY AND OXIDATIVELY STABLE SOLID LUBRICANTS

James P. King, Lansdale, Pa., assignor to Desilube Technology, Inc., Lansdale, Pa.

Filed Oct. 16, 1990, Ser. No. 598,205

Int. Cl.⁵ C10M 103/02

U.S. Cl. 252—28 16 Claims

1. A solid lubricant having oxidative stability to about 1500° F. comprising a solid lubricant selected from the group of molybdenum disulfide, graphite and a graphite fluoride of the formula (CF_x)_n where x is from about 0.25 to greater than 1 and n is unknown, wherein said solid lubricant is microencapsulated from an aqueous system with an alkali metal silicate.

5,089,155

OVERBASED MAGNESIUM SULPHONATE COMPOSITION

John F. Marsh, Abingdon, United Kingdom; Marc R. M. Vernet, Andresy, France, and Graham W. Hamey, Bradley, United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 255,885, Oct. 11, 1988, abandoned.

This application Dec. 11, 1990, Ser. No. 627,610

Claims priority, application United Kingdom, Oct. 12, 1987, 87-23907; Mar. 23, 1988, 88-06972

Int. Cl.⁵ C10M 135/10

U.S. Cl. 252—33.4 12 Claims

1. A lubricating oil meeting the SG quality level in the American Petroleum Institute Engine Service Categories for service station oils and/or providing American Petroleum Institute Tier II fuel economy performance, which lubricating oil comprises an overbased magnesium sulphonate composition comprising:

- (A) at least one magnesium alkyl aryl sulphonate containing 1 to 3 alkyl groups, one of which alkyl groups contains an average number of carbon atoms of at least 40 therefor while any remaining alkyl groups contain less than 10 carbon atoms, and
- (B) at least one magnesium alkyl aryl sulphonate containing 1 to 3 alkyl groups, one of which alkyl groups contains an average number of carbon atoms of 10 to 33 while any remaining alkyl groups contain less than 10 carbon atoms.

5,089,156

ASHLESS OR LOW-ASH SYNTHETIC BASE COMPOSITIONS AND ADDITIVES THEREFOR

Douglas R. Chrisope, and Rolfe J. Hartley, both of St. Louis, Mo., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed Oct. 10, 1990, Ser. No. 597,493

Int. Cl.⁵ C10M 133/44

U.S. Cl. 252—49.9 20 Claims

1. An oleaginous liquid composition comprising a major amount of hydrogenated poly- α -olefin oligomer fluid having a viscosity in the range of about 2 to about 10 cSt at 100° C., said oligomer fluid being formed by oligomerization of 1-alkene hydrocarbon having 6 to 20 carbon atoms in the molecule, and hydrogenation of the resultant oligomer, and minor amounts of at least the following:

- A) hydrogenated poly- α -olefin oligomer fluid having a viscosity in the range of about 40 to about 120 cSt at 100° C., said oligomer fluid being formed by oligomerization of 1-alkene hydrocarbon having 6 to 20 carbon atoms in the molecule, and hydrogenation of the resultant oligomer; and
 - B) antiwear/extreme pressure agent selected from phospho-dispersant, and phosphorus- and boron-containing ashless dispersant;
- said oleaginous liquid composition being characterized by being devoid or essentially devoid of metal-containing components and by having:
- (i) a kinematic viscosity of at least 5.5 cSt at 100° C. and a Brookfield viscosity of less than 20,000 cP at -40° C.; or
 - (ii) a kinematic viscosity of at least 6.8 cSt at 100° C. and a Brookfield viscosity of less than 50,000 cP at -40° C.

5,089,157

HOT MELT LUBRICANT HAVING GOOD WASHABILITY

Robert L. Trivett, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Mar. 18, 1991, Ser. No. 670,660

Int. Cl.⁵ C10M 173/02

U.S. Cl. 252—51.5 R 2 Claims

1. A hot melt prelubricant especially adapted for lubricating and protecting sheet metal used in the manufacture of automobiles and appliances and having the property of being easily removed by alkaline cleaners used in such industries consisting essentially of:

Ingredients	% by weight
A. C ₁₄ -C ₂₂ saturated fatty acid ester of a polyhydric alcohol lubricant	60.0-65.0
B. Aspartic acid diester of a 1-(2-hydroxy ethyl)-2-C ₁₁ -C ₂₁ imidazoline lubricant	8.0-15.0
C. Ethylene acrylic copolymer	0.5-2.0
D. Amide formed from 2 moles of stearic acid with 1 mole of diethanol amine	20.0-25.0
E. Antioxidant	0.5-2.0

5,089,158

ADDITIVES FOR LUBRICATING OILS AND PROCESSES FOR PRODUCING THEM

Eugene M. G. A. Van Kruchten, and Gerardus W. J. Heimerikx, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 5, 1990, Ser. No. 577,985

Claims priority, application United Kingdom, Sep. 5, 1989, 8920041

Int. Cl.⁵ C07C 63/00; C10M 129/59

U.S. Cl. 252—51.5 A 2 Claims

1. An oil soluble trivalent, or higher valence, metal ion salt

of a compound of the formula XNR¹R², in which R¹ and R² are the same or different and each are selected from hydrocarbon based radicals having from 1 to 30 carbon atoms, X is an acyl radical of an aromatic ortho-hydroxy carboxylic acid having a ring substituent which is a hydrocarbon based radical having at least 4 carbon atoms.

5,089,159

MAGNETIC SUBSTANCE HAVING SHARP PERMEABILITY TRANSITION TEMPERATURE, PROCESS FOR MAKING, AND APPARATUS

Dimitar I. Tchernev, 3905 Sierra Dr., Austin, Tex. 78731

Continuation of Ser. No. 684,870, Dec. 21, 1984, abandoned, which is a division of Ser. No. 161,689, Jun. 23, 1990, Pat. No. 4,490,268, which is a division of Ser. No. 881,592, Feb. 27, 1978, Pat. No. 4,208,911, which is a continuation of Ser. No. 781,952, Mar. 28, 1977, abandoned, which is a continuation of Ser. No. 293,596, Sep. 29, 1972, abandoned. This application Oct. 28, 1988, Ser. No. 266,231

Int. Cl.⁵ C04B 35/26

U.S. Cl. 252—62.62 11 Claims

1. In a method of producing a composition which in its crystalline state is magnetic and has a substantially constant permeability at temperatures up to its transition temperature and an abrupt reduction in permeability at a predetermined transition temperature for use in detecting with a high degree of accuracy whether the ambient temperature is above or below a predetermined transition temperature of the composition in said crystalline state, the process of producing a magnetic material which has constant permeability at temperatures within about 0.1 degrees centigrade of a known transition temperature that closely approximates said predetermined transition temperature, said process including a step which performs the function of equalizing the temperature dependency of said material's magnetically anisotropy with that of its magnetostatic energy when it is in its crystalline state.

5,089,160

AEROSOL PREPARATIONS FOR REMOVING LINT, HAIR AND OTHER PARTICULATE MATTER FROM FABRIC

Thomas J. Pallone, South Barrington; Larry J. Alanis; William C. Weber, Jr., both of Naperville, and Robert F. Farmer, Barrington, all of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Filed Oct. 16, 1989, Ser. No. 421,961

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.⁵ C11D 17/00; C09K 3/22; B01J 3/00; C08J 9/00

U.S. Cl. 252—90 3 Claims

1. A packaged aerosol preparation for applying to sheet materials to be used for removing lint, hair and other particulate matter from fabrics, comprising a valve-equipped aerosol container having a sprayable liquid composition therein, said aerosol container being adapted to dispense said composition as a globular spray, said composition on a parts by weight basis containing from 1 to 12 parts of film-forming resin selected from the group consisting of acrylic polymer and acrylic copolymer resins, 1 to 7 parts of a tackifier selected from the group consisting of acrylic and resin tackifiers effective with said resin, the amount of said tackifier being sufficient in relation to said resin to impart residual tackiness to the resin in propellant-free, solid condition, thereby making the resin effective for removal of lint, hair and other particulate matter from fabrics, from 0.3 to 3 parts of a surfactant effective to provide washability to said resin, and from 78 to 99 parts of a liquefied propellant selected from the group consisting of dimethyl ether and mixtures of dimethyl ether with a hydrocarbon propellant having a vapor pressure at 70° F. of at least 10 psig, said film-forming resin, tackifier and surfactant in propellant-free admixture providing a spray deposition of tacky, adherent globules.

5,089,161

THIXOTROPIC AQUEOUS LIQUID AUTOMATIC DISHWASHING DETERGENT COMPOSITION

Fahim U. Ahmed, Dayton, and Charles E. Buck, Caldwell, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J. Continuation-in-part of Ser. No. 323,134, Jan. 10, 1990, Pat. No. 4,970,016, which is a continuation of Ser. No. 114,911, Oct. 30, 1987, abandoned. This application Aug. 21, 1990, Ser. No. 570,454

The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl.⁵ C11D 7/20, 3/12

U.S. Cl. 252—99

16 Claims

1. A gel-like thixotropic aqueous liquid automatic dishwashing detergent composition comprising water, at least one ingredient selected from the group consisting of organic detergent, bleach, detergent builder, sequestering agent, foam inhibitors, and mixtures thereof, from about 0.5 to 5% of an alumina or titanium dioxide or mixture thereof non-abrasive anti-filming agent and a sufficient amount of a thixotropic thickener to provide a thixotropic index of about 2.5 to 10 said anti-filming agent having a particle size of about 0.01 to about 0.5 microns.

5,089,162

CLEANING COMPOSITIONS WITH BLEACH-STABLE COLORANT

Anthony A. Rapisarda, Elmhurst, N.Y., and Carlene M. Mantell, Palisades Park, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed May 8, 1989, Ser. No. 348,549

Int. Cl.⁵ C11D 3/28, 3/395, 3/40, 3/50

U.S. Cl. 252—102

14 Claims

1. A cleaning composition comprising:

- a) chlorine bleach is an amount providing 0.01–5% available chlorine to the composition; and
- b) 0.0005–0.2% of a relatively water-soluble or water-dispersible colorant which is color stable to chlorine bleach, which colorant is selected from the group consisting of Pigment Yellow 14, Pigment Yellow 74, Pigment Yellow 108, Pigment Yellow 109, Direct Yellow 28, Direct Yellow 29, Direct Dye Colour Index Number 19550 and zinc chromate.

14. A cleaning composition comprising:

- a) 0.5–20% of an oxygen bleach;
- b) 0.0005–0.2% of a colorant selected from the group consisting of Pigment Yellow 14, Pigment Yellow 74, Pigment Yellow 108, Pigment Yellow 109, Direct Yellow 28, Direct Yellow 29, Direct Dye Colour Index Number 19550 and zinc chromate; and
- c) 0.5–2% enzyme,

the composition being substantially free from chlorine bleach agent.

5,089,163

ENZYMATIC LIQUID DETERGENT COMPOSITION

Michael P. Aronson, West Nyack, N.Y.; Martin S. Cardinali, Millington, and Jack T. McCown, Cresskill, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 304,394, Jan. 30, 1989, Pat. No. 4,959,179. This application Aug. 30, 1990, Ser. No. 575,270

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.⁵ C11D 3/386, 7/42

U.S. Cl. 252—135

2 Claims

1. An enzymatic liquid detergent and cleaning composition comprising, in a liquid medium, from 0–90% by weight of a detergent-active compound, wherein the detergent active compound includes 0 to 40% of an anionic surfactant selected from the group consisting of alkyl benzene sulfonates, alkyl sulfates, and alkyl ethoxy sulfates in combination with 0 to 40% of a nonionic surfactant selected from the group consisting of alcohol

alkoxylates, alkyl phenol alkoxylates, alkyl polyglucosides, and alkyl glycerol ethers;

0.1 to 50 GU/mg of the final composition of a proteolytic enzyme and 0.005 to 100 LU/mg of the final composition of a lipolytic enzyme, said lipolytic enzyme being selected from the group consisting of fungal lipases obtainable from *Humicola lanuginosa* and *Thermomyces lanuginosus*, and bacterial lipases which show a positive immunological cross-reaction with the antibody of the lipase, produced by *Chromobacter viscosum* var. *lipolyticum* NRRL-B3673; from 0 to 30% of a detergent builder selected from the group consisting of alkali metal salts of citric acid, copolymers of acrylic and maleic acid, oxydisuccinate, tartrate monosuccinate/tartrate disuccinate, C8 to C18 carboxylic acids, zeolites, and combinations thereof;

a lipolytic enzyme stabilizing system comprising a mixture of 1 to 20% of a first polyol containing only C, H and O atoms and containing at least two hydroxyl groups, and 1 to 10% of a boron compound which is capable of reacting with said first polyol, wherein said first polyol has a first binding constant with said boron compound of at least 500 l/mole and a second binding constant of at least 1,000 l²/mole²; and

0.1 to 10% of a proteolytic enzyme stabilizing system selected from the group consisting of i) a second polyol being selected from the group consisting of glycerol, propylene glycol and mixtures thereof combined with sodium tetraborate; ii) alkali metal salts of C₁₋₄ carboxylic acids; iii) calcium salts and combinations thereof.

5,089,164

MULTI-PURPOSE PAINT AND VARNISH STRIPPER

Donald E. Stanley, 2435 Wheeler Rd., Bay City, Mich. 48706

Filed Dec. 26, 1990, Ser. No. 633,778

Int. Cl.⁵ C11D 7/22, 7/50; B08B 7/00

U.S. Cl. 252—162

8 Claims

1. A composition for stripping paint and varnish free from acid and caustic and consisting essentially of from 5–15 weight percent of N-methyl-2-pyrrolidone, 10–20 weight percent of toluene, 5–15 weight percent of methyl alcohol, 5–10 weight percent of propylene glycol, 3–10 weight percent of at least one surfactant, 1–5 weight percent of dibasic esters, and 2–5 weight percent of a thickener, all percentages being based on the total weight of the stripping composition.

5,089,165

COMPOSITIONS OF WATER-DISPERSED DIPRIMARY AMINE TERMINATED POLYMERS

Carl S. Nichols, Pineville, N.C., assignor to The BFGoodrich Company, Akron, Ohio

Continuation of Ser. No. 498,472, Mar. 22, 1990, Pat. No.

4,988,461, which is a continuation of Ser. No. 134,385, Dec. 17,

1987, abandoned. This application Oct. 15, 1990, Ser. No.

597,610

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.⁵ C09K 3/00

U.S. Cl. 252—182.18

6 Claims

1. A water-dispersed toughening agent composition for castable elastomeric systems, said composition comprising: (1) 100 parts by weight of an amine-containing liquid polymer having an average molecular weight of from about 1000 to about 10,000, (2) at least 25 parts by weight of an organic solvent which is both water and organic soluble and has a normal boiling point above about 100° C., (3) at least about 0.8 carboxyl equivalent of an organic acid for each 1.0 amine equivalent, said acid having a pK_a value of less than about 5, and (4) from about 50 to about 750 parts by weight of water, wherein said amine-containing liquid polymer is represented by the following general formula:



wherein Y is a univalent radical obtained by removing hydrogen from an amine group of an aliphatic, alicyclic, heterocyclic or aromatic amine which has at least two primary amine groups; n is an integer from 1 to about 10; X is Y; and B is a polymeric backbone comprising carbon-carbon or carbon-oxygen linkages.

5,089,166

BLEACHING AND DETERGENT COMPOSITIONS

Anthony H. Clements, Cefyn y Bedd, near Wrexham, Great Britain, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 12, 1989, Ser. No. 420,208

Claims priority, application United Kingdom, Oct. 14, 1988, 8824108

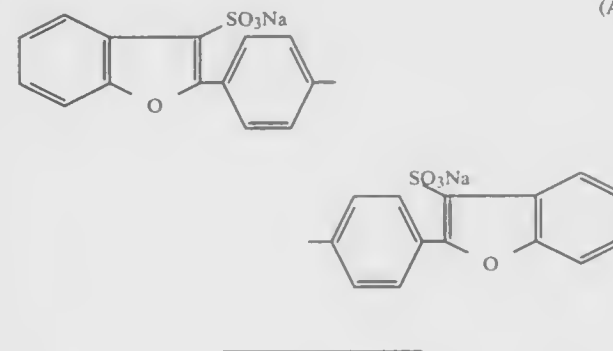
Int. Cl.⁵ C01B 15/055; C09K 11/06

U.S. Cl. 252—186.1

3 Claims

1. A bleaching composition comprising:

- (i) a bleaching compound selected from the group consisting of peroxyacids, peroxyacid yielding compounds, persalts and mixtures thereof present in effective amounts to bleach a substrate; and
- (ii) an optical brightening compound present in an effective amount to optically brighten a substrate, selected from the group consisting of sulphonated benzofuranyl biphenyl compounds of formula:



5,089,167

STABLE PERACID BLEACHING COMPOSITIONS: ORGANIC PERACID, MAGNESIUM SULFATE AND CONTROLLED AMOUNTS OF WATER

Thomas S. Coyne; Blanca L. Haendler, both of Livermore; Daniel H. Klapprott, Brentwood; Frances E. Mitchell, Pleasanton; Dale S. Steichen, Livermore, all of Calif., and Suzanne M. Thompson, Rochester, N.Y., assignors to The Clorox Company, Oakland, Calif.

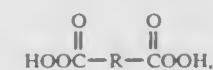
Continuation-in-part of Ser. No. 767,980, Aug. 21, 1985, abandoned, and a continuation-in-part of Ser. No. 792,344, Oct. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 767,980, Aug. 21, 1985, abandoned. This application Aug. 22, 1986, Ser. No. 899,461

Int. Cl.⁵ C11D 3/39, 7/60

U.S. Cl. 252—186.26

23 Claims

1. A hydrated magnesium sulfate/sodium sulfate stabilized organic peracid bleaching composition, said peracid and said magnesium sulfate/sodium sulfate being combined in a plurality of discrete granules wherein peracid decomposition is stabilized by controlling the total water content in said granules to between about 50 to 70% by weight of said magnesium sulfate; wherein the weight ratio of said magnesium sulfate:peracid is less than 1:1 in order to achieve maximum peracid solubility; and wherein the mole ratio of sodium sulfate to magnesium sulfate is greater than about 1:1; wherein said peracid has the general structure



wherein R is C₄₋₂₀ alkyl.

5,089,168

NITROGEN-CONTAINING HETEROCYCLES

Joachim Krause, Dieburg; Rudolf Eidenschink, Münster; Klaus Boffinger, Mühlthal; Reinhard Hopf, Berlin; Volker Reiffenrath, Darmstadt; Eike Poetsch, Mühlthal, all of Fed. Rep. of Germany; Bernhard Scheuble, Yokohama, Japan, and Thomas Geelhaar, Mainz, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 34,182, Dec. 24, 1986, Pat. No. 4,834,904. This application May 16, 1989, Ser. No. 352,308

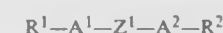
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515373

Int. Cl.⁵ C09K 19/34, 19/52; C07D 239/02, 239/26, 241/12, 213/79, 521/00

U.S. Cl. 252—299.61

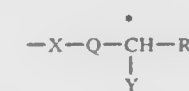
9 Claims

1. A nitrogen-containing heterocycle of the formula I



in which

one of the radicals R¹ and R² is an alkyl group of 1–15 carbon atoms, in which one or two non-adjacent CH₂ groups can be replaced by —O—; the other radical R¹ or R² is an optically active organic radical with an asymmetric carbon atom of the formula



wherein

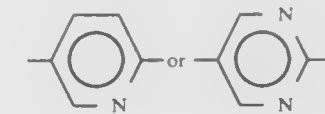
X is —O—, —CO—O, or —O—CO—,

Q is —CH₂— or a single bond,

Y is CH₃,

R is straight-chain alkyl of 1 to 7 C atoms, in which the CH₂ group linked to the asymmetric C atom is replaced by —O—, —CO—O—, or —O—CO—,

A¹ is



A² is 1,4-phenylene which is unsubstituted or substituted by one or two F atoms, and

Z¹ is a single bond; with the proviso that when A¹ is pyrimidine-2,5-diyl then X is —O—.

5,089,169

LIQUID CRYSTAL MATERIAL AND DISPLAY DEVICE USING SAME

Akihiro Mochizuki, Atsugi, and Masayuki Iwasaki, Zama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 17, 1990, Ser. No. 466,663

Claims priority, application Japan, Jan. 17, 1989, 1-008119

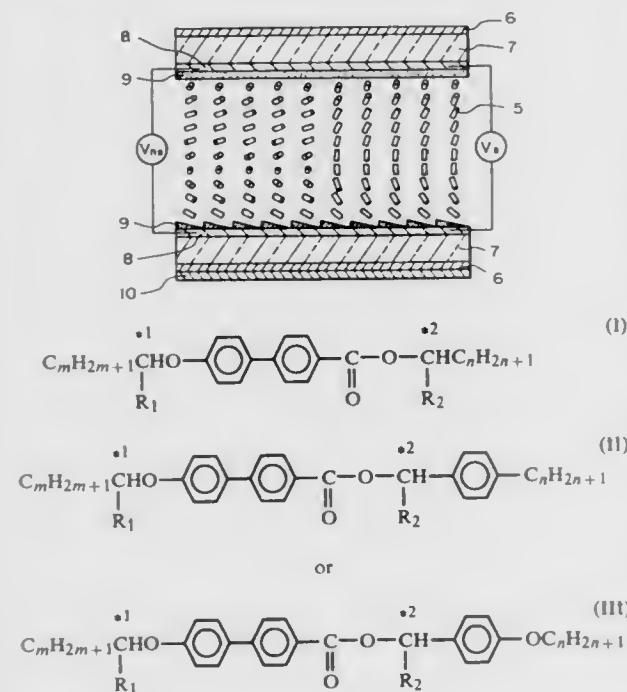
Int. Cl.⁵ C09K 19/12, 19/20; C07C 69/76

U.S. Cl. 252—299.65

11 Claims

1. A liquid crystal material for use in a super twisted nematic mode display, in which a cholesteric phase liquid crystal is added to a mixture of nematic liquid crystals to induce a spiral structure therein, and the cholesteric phase liquid crystal is at

least one double chiral nematic liquid crystal compound of the following general formula:



in which

R₁ and R₂ may be the same or different and each represents a methyl group or an ethoxy group, m is an integer of 2 to 12, n is an integer of 2 to 12, and the symbols •1 and •2 each denote a chiral center of an (S)- or (R)-modification of the compound.

5,089,170 PHOSPHOR

Chiyuki Umemoto, and Kenji Takahashi, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan. Continuation of Ser. No. 256,173, Oct. 11, 1988, abandoned, which is a continuation of Ser. No. 134,562, Dec. 8, 1987, abandoned, which is a continuation of Ser. No. 20,229, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 841,044, Mar. 17, 1986, abandoned, which is a continuation of Ser. No. 741,020, Jun. 3, 1985, abandoned, which is a continuation of Ser. No. 497,805, May 25, 1983, abandoned. This application Jul. 28, 1989, Ser. No. 387,427.

Claims priority, application Japan, May 28, 1982, 57-89875 Int. Cl.⁵ C09K 11/85

U.S. Cl. 252—301.4 H 3 Claims
1. A divalent europium activated barium fluorohalide phosphor wherein a portion of barium is replaced with an alkali metal and a trivalent metal, having the formula:



in which M is at least one alkali metal selected from the group consisting of Na, and Cs; L is Gd; X is at least one halogen selected from the group consisting of Cl, Br and I; and x and y are numbers satisfying the conditions of $10^{-2} \leq x \leq 0.2$ and $0 < y \leq 0.1$, respectively.

5,089,171 PARTIALLY DEBRANCHED STARCH CLOUDS

Chung-Wai Chiu, Westfield, N.J., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 258,231, Oct. 14, 1988, Pat. No. 4,972,723. This application May 10, 1989, Ser. No. 350,057 Int. Cl.⁵ B01J 13/00; C12P 19/16; A23L 1/522, 2/26

U.S. Cl. 252—315.3 18 Claims

1. A method for preparing a stable, opaque cloud, which comprises dispersing in a fluid a partially debranched starch, in an amount effective to form the cloud, up to 1%, by weight, which starch has been enzymatically debranched to yield about 3 to 65%, by weight, short chain amylose.

5,089,172 THICK FILM CONDUCTOR COMPOSITIONS FOR USE WITH AN ALUMINUM NITRIDE SUBSTRATE

Kevin W. Allison, Goleta; Dana L. Hankey, Santa Barbara, both of Calif.; Edward Stadnicar, Jr., and Gordon J. Roberts, both of Parma, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed Aug. 31, 1987, Ser. No. 91,081 Int. Cl.⁵ H01B 1/06

U.S. Cl. 252—512 16 Claims

1. A thick film conductor composition adapted to be bonded to an aluminum nitride substrate comprising, in weight percent,

- from about 80 percent to about 99 percent of conductive metallic material to render said conductor composition electrically conductive when bonded to said substrate, said metallic material comprising a conductive metal selected from a group consisting of Au, Cu, Ag, and Pt;
- from about a trace amount to about 10 percent of a glass frit binder for said metallic material capable of being bonded to said substrate, said glass frit comprising from about 27.0 to about 56.5 percent silicon dioxide, from about 0 to about 47.0 percent barium oxide, from about 4.5 to about 25.0 percent boron oxide, from about 0 to about 18.0 percent lead oxide, from about 0 to about 15.0 percent zinc oxide, from about 0 to about 14.0 percent aluminum oxide, from about 0 to about 9.0 percent magnesium oxide, from about 0 to about 12.0 percent calcium oxide, from about 0 to about 3.0 percent fluorine, from about 0 to about 3.0 percent potassium oxide, from about 0 to about 3.0 percent sodium oxide, from about 0 to about 4.0 percent tungsten oxide, and from about 0 to about 4.0 percent lithium oxide, wherein barium oxide plus lead oxide is present in an amount at least equal to about 15.0 percent, zinc oxide plus calcium oxide plus aluminum oxide is present in an amount at least equal to about 5.0 percent, calcium oxide plus magnesium oxide plus barium oxide is present in an amount at least equal to 7.0 percent, calcium oxide plus magnesium oxide plus zirconium oxide is present in an amount at least equal to about 1.0 percent, zirconium oxide plus calcium oxide plus barium oxide is present in an amount at least equal to about 7.0 percent, and potassium oxide plus sodium oxide plus lead oxide or barium oxide is present in an amount at least equal to 10.0 percent; and
- from about a trace amount to about 4.0 percent of a lithium containing compound capable of reacting with said substrate upon heating so as to promote the adhesion of said conductor composition to said aluminum nitride substrate, said lithium containing compound including at least one compound selected from the group consisting of lithium carbonate, lithium hydroxide, lithium fluoride, lithium metaborate, lithium fluoride, lithium nitride, lithium peroxide, lithium benzoate, lithium oxalate, lithium amide, lithium methoxide, lithium hydride, lithium oxide and lithium nitrate.

5,089,173 HIGHLY CONDUCTIVE POLYMER THICK FILM COMPOSITIONS

Richard L. Frentzel, Chino Hills, and Andrew Chen, Covina, both of Calif., assignors to Advanced Products Inc., Cheshire, Conn.

Filed May 2, 1990, Ser. No. 518,052 Int. Cl.⁵ H01B 1/06

U.S. Cl. 252—514 19 Claims

1. A thermally curable conductive polymer thick film composition comprising, by weight:

- about 3–15 parts of at least one thermoplastic vinyl acetate/vinyl chloride/dicarboxylic acid multipolymer resin;
- a second thermoplastic resin selected from the group consisting of:
 - about 1–6 parts of at least one thermoplastic polyurethane resin;
 - about 2–10 parts of at least one thermoplastic polyester resin; and
 - about 1–10 parts of a mixture of at least one thermoplastic polyurethane and at least one thermoplastic polyester resin;
- about 0.05–1 parts of a tertiary amine;
- an effective dissolving amount of at least one organic solvent capable of dissolving (a), (b), and (c) ingredients; and
- about 50–80 parts of silver flake.

5,089,174 LAUNDRY DETERGENT BARS FREE OF C₁₂–C₁₈ FATTY ACIDS AND CONTAINING AN ALKYL BENZENE SULFONATE, AN ALKYL SULFONATE AND A FATTY ALCOHOL

James U. Kaw, Taipei, Taiwan, and Laurie B. Steuri, Oxshott, United Kingdom, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 299,367, Jan. 19, 1989, abandoned. This application Aug. 2, 1990, Ser. No. 562,066 Int. Cl.⁵ C11D 1/22

U.S. Cl. 252—553 13 Claims

1. A laundry detergent bar comprising:
- from about 10% to about 60% by weight anionic surfactant,
 - from about 5% to about 60% by weight detergent builder, and
 - from about 0.75% to about 10% by weight fatty alcohol having an alkyl chain containing from 10 to 22 carbon atoms,
- wherein said anionic surfactant comprises:
- alkylbenzene sulfonate having a linear or branched alkyl chain of from 10 to 22 carbon atoms, and
 - alkyl sulfate having an alkyl chain of from 10 to 20 carbon atoms,
- wherein the weight ratio of (1):(2) is from about 1:9 to about 9:1, and wherein said bar is free of C₁₂–C₁₈ fatty acid.

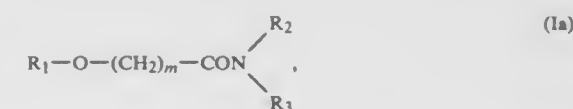
5,089,175 HYDROXYALKANE CARBOXYLIC ACID DERIVATIVES AND THEIR PRODUCTION

Christopher G. Earnshaw, Cambridge, United Kingdom; Gerald Kirsch, Berlin, Fed. Rep. of Germany; Petra Rach, Berlin, Fed. Rep. of Germany; Ruth Thieroff-Ekerdt, Berlin, Fed. Rep. of Germany, and Michael Töpert, Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 480,497 Claims priority, application Fed. Rep. of Germany, Feb. 17, 1989, 3905325

Int. Cl.⁵ C09F 5/08 7 Claims

U.S. Cl. 260—404 7 Claims
1. A hydroxyalkane carboxylic acid derivative of the formula Ia



wherein

R₁ is a hydrogen atom or C₁–16-acyl group, and R₂ and R₃ are each independently C₁–8-alkyl, or together are C₄–8-alkylene or C₄–8-alkylene interrupted by oxygen and/or nitrogen, and m is 11 to 14.

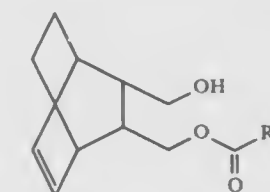
5,089,176 OPTICALLY ACTIVE MONOESTER COMPOUNDS AND PRODUCING

Tetsuya Ogawa, Futsu; Naoyuki Yoshida, Ichihara; Selichi Takano, and Kunio Ogasawara, both of Sendai, all of Japan, assignors to Chisso Corporation, Osaka, Japan

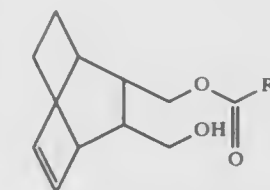
Filed Aug. 17, 1990, Ser. No. 569,284 Claims priority, application Japan, Oct. 9, 1989, 1-263409 Int. Cl.⁵ C09F 5/08, 7/10

U.S. Cl. 260—410 2 Claims

1. An optically active cis-endo-2-acyloxymethyl-3-hydroxymethylbicyclo[2.2.2]oct-5-ene of the formula (I) or (I')



or



where R is an alkyl group of 1 to 15 carbon atoms.

5,089,177 1,3-SELECTIVE ESTERIFICATION OF SOFT PALM OIL AND LAURIN FATS/OILS

Hiroshi Hidaka, and Nobuo Sagi, both of Sakai, Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Dec. 13, 1989, Ser. No. 450,152 Claims priority, application Japan, Oct. 15, 1988, 63-318199 Int. Cl.⁵ C09F 5/08

U.S. Cl. 260—410.6 5 Claims

1. A process for production of fats and oils which comprises subjecting a mixed oil containing soft palm oil having an iodine value of not less than 55 and a laurin fat or oil in an amount of 1/10 to 3/2 times that of the palm oil to 1,3-selective ester interchange.

5,089,178

HOUSEHOLD APPARATUS FOR WHIPPING CREAM
Gianfranco Passoni, Turnweg 27b, Bern, Switzerland CH-3001
PCT No. PCT/CH88/00110, § 371 Date Apr. 6, 1989, § 102(e)
Date Apr. 6, 1989, PCT Pub. No. WO88/10085, PCT Pub.
Date Dec. 29, 1988

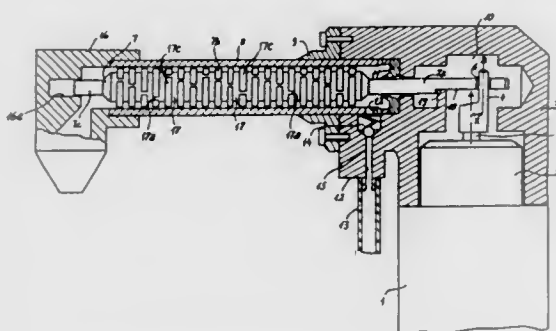
PCT Filed Jun. 21, 1988, Ser. No. 353,628

Claims priority, application Switzerland, Jun. 22, 1987,
2348/87

Int. Cl.⁵ B01F 3/04

U.S. Cl. 261—59

12 Claims



1. Household apparatus for whipping cream, comprising a base (1) and a system of passages (12) and cutouts (17), through which a mixture of cream and air is pumped, said cutouts (17) being formed in an external face of a piston (7) mounted for oscillation along a longitudinal axis thereof and being slidably mounted within a tube (8) between a cream and air inlet and an outlet, said cutouts being separated from one another by lands of said piston which slidably engage said tube, said lands having short passages fluidly connecting adjacent cutouts such that within the tube (8), oscillations of said piston cause a drawing-in action from said inlet followed by a compression action toward said outlet, whereby a mixture of cream and air may be drawn through said inlet and pumped through the cutouts (17) and short passages, in order to progressively whip the cream in the direction of a nozzle (16) at said outlet for delivery of the whipped cream.

5,089,179

FLOATING AERATOR ARRANGEMENT

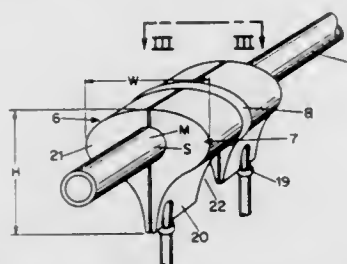
Reinhardt von Nordenskjöld, Killistrasse 3, W-8011 Eggingen-Münster, Fed. Rep. of Germany
Filed Jan. 9, 1991, Ser. No. 639,028

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1990, 4001201

Int. Cl.⁵ B01F 3/04

U.S. Cl. 261—81

14 Claims



1. Apparatus for aerating a body of water comprising air supply line means disposed adjacent to the surface of the water, aerator means suspended from the air supply line means below the surface of the water, float means affixed to the air supply line means and branch air line means leading from the air supply line means to the aerator means, wherein the float means comprises at least two preformed buoyant sections

assembled to provide a through passage, and the air supply line means includes a continuous air line member extending through the through passage in the float means.

5,089,180

METHOD OF PREPARING COMPOSITE SINGLE-PIECE INTRAOCULAR LENSES WITH COLORED HAPTICS

Gary B. Dunks, Upland; Akira Yamada, Claremont, both of Calif.; Oh-Seung Kwon, Woodburg, Minn., and Andrea Borgelt, Riverside, Calif., assignors to Iolab Corporation, Claremont, Calif.

Filed Aug. 31, 1989, Ser. No. 401,368

Int. Cl.⁵ B29D 11/00

U.S. Cl. 264—1.7

15 Claims

1. A method of preparing an intraocular lens having a central lens body and positioning loops extending radially therefrom, said positioning loops being of a different color than said central lens body, comprising the steps of:

- surrounding a rod of a first clear acrylic polymer with a flowable solution having a viscosity between about 1500 and 10,000 cps comprising acrylic monomer, dye and a second acrylic polymer substantially dissolved therein,
- subjecting the product of step (a) to conditions to induce polymerization of said acrylic monomer so as to form a composite rod having a clear central region and a dyed peripheral region, and
- lathing said lens from said composite rod so that said loops are lathed from said dyed peripheral region of said composite rod and said central lens body is lathed from said central region of said composite rod.

9. A method of preparing an intraocular lens having a central lens body and positioning loops extending radially therefrom, said positioning loops being of a different color than said central lens body, comprising the steps of:

- surrounding a rod of a clear acrylic polymer with a flowable mixture having a viscosity between about 1500 and 10,000 cps comprising partially polymerized acrylic monomer and dye,
- subjecting the product of step (a) to conditions to induce polymerization of said acrylic monomer so as to form a composite rod having a clear central region and a dyed peripheral region, and
- lathing said lens from said composite rod so that said loops are lathed from said dyed peripheral region of said composite rod and said central lens body is lathed from said central region of said composite rod.

5,089,181

METHOD OF DEHYDRATING VESICLE PREPARATIONS FOR LONG TERM STORAGE

Helmut O. Hauser, Zürich, Switzerland, assignor to Vestar, Inc., Pasadena, Calif.

Continuation of Ser. No. 18,190, Feb. 23, 1987, abandoned. This application Oct. 30, 1989, Ser. No. 430,905

Int. Cl.⁵ A61K 9/127, 9/133; B01J 13/02

U.S. Cl. 264—4.3

17 Claims

1. A method of dehydrating a liposome preparation, comprising spray drying liposomes suspended in an aqueous dispersion medium in the presence of a preserving additive at a temperature of 60° C. to 150° C., to produce a liposome preparation, which when reconstituted, maintains substantially the size, size distribution and integrity of the liposomes.

17. The method according to claim 1 wherein the liposomes are subsequently reconstituted in an aqueous solution and upon reconstitution include therapeutic and/or diagnostic agents.

5,089,182

PROCESS OF MANUFACTURING CAST TUNGSTEN CARBIDE SPHERES

Eberhard Findeisen; Klaus Frank; Wilfried Becker, and Fritz Müller, all of WOKA Schweissttechnik GmbH, P.O. Box 12 17, 4156 Willich 1, Fed. Rep. of Germany

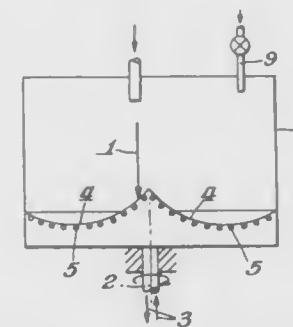
Filed Oct. 16, 1989, Ser. No. 421,670

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835234

Int. Cl.⁵ B29B 9/10; B22F 9/04

U.S. Cl. 264—8

13 Claims



13. Process for manufacturing cast tungsten carbide spheres with a granular distribution of 40 μm to 2,000 μm, comprising: melting tungsten carbide obtained from tungsten powder and carbon in a carbon-free crucible under inert gas by an arc, heating the cast tungsten carbide to 150°–300° C. above the melting point and casting the molten tungsten carbide onto a rotating cooled surface to granulate it, wherein the tungsten carbide is melted and granulated under stationary inert gas.

5,089,183

METHOD OF MANUFACTURING APPLIANCES FOR USE IN FILLING ENDODONTICALLY PREPARED ROOT CANALS

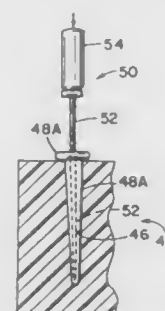
William B. Johnson, 5010 E. 68th St., Suite 104, Tulsa, Okla. 74136

Filed Jan. 9, 1991, Ser. No. 640,045

Int. Cl.⁵ A61C 13/00

U.S. Cl. 264—16

5 Claims



1. A method of manufacturing appliances for use in filling endodontically prepared root canals comprising:

- forming a mold having a plurality of spaced apart elongated tapered cavities of selected shape and length, each cavity having a closed bottom and an open top;
- filling each of said cavities with uncured endodontic filler material through said open top;
- then inserting into each said cavity the shaft portion of a filler carrier, the carrier having a handle portion that remains exterior of the mold;
- placing said mold having said uncured filler material and filler carriers therein in an oven;
- heating said mold with said uncured filler material and

filler carriers therein to cure said filler material and to cause said filler material to adhere to said filler carrier shaft portions; and

(f) removing said filler carriers having said filler material cured on the shaft portions thereof, each of which is ready for use as an appliance to fill an endodontically prepared root canal.

5,089,184

OPTICAL MOLDING METHOD

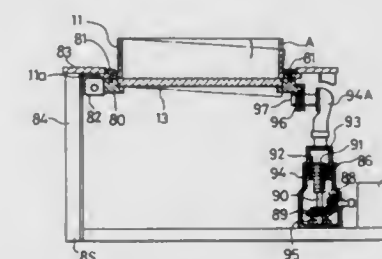
Yoshinao Hirano; Shigeru Nagamori; Katsumi Sato, and Katsuhide Murata, all of Chiba, Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1989, Ser. No. 451,890

Claims priority, application Japan, Jan. 18, 1989, 1-9178; Jan. 18, 1989, 1-9179

Int. Cl.⁵ B29C 35/08, 41/02

U.S. Cl. 264—22

2 Claims



1. An optical molding method comprising the steps of:

- moving a base away from a horizontally-disposed aperture by a predetermined distance;
- irradiating light through said aperture to cure a photo-curable resin and form a first cured layer on said base;
- inclining said aperture relative to said base from a horizontally-disposed position so that said first cured layer is separated from said aperture;
- moving said base away from said aperture by a distance corresponding to a thickness of a second layer;
- returning said aperture to said horizontally-disposed position;
- irradiating light through said aperture to cure a photocurable resin and form a second cured layer on said first cured layer;
- inclining said aperture relative to said base from said horizontally-disposed position so that said second cured layer is separated from said aperture; and
- repeating steps (d)–(g) to form third and later cured layer in series, thereby obtaining a cured object.

5,089,185

OPTICAL MOLDING METHOD

Yoshinao Hirano; Katsumi Sato, both of Chiba; Junji Shirai, Okayama, and Shigeru Nagamori, Chiba, all of Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1989, Ser. No. 451,999

Claims priority, application Japan, Jul. 7, 1989, 1-176481

Int. Cl.⁵ B29C 35/08

U.S. Cl. 264—22

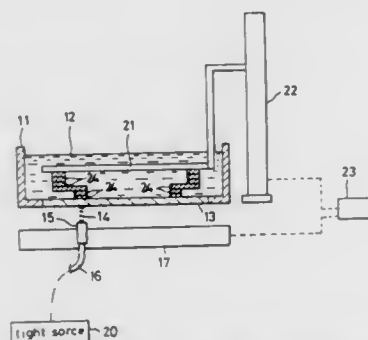
13 Claims

1. An optical molding method for making a target object comprising the steps of:

- radiating a light flux onto a photocurable fluid substance while moving said light flux to form and cure a layer of a target object;
- then supplying a photocurable fluid substance on a side of the cured portion;
- then radiating a light flux onto said supplied photocurable fluid substance while moving said light flux to form and cure another layer of said target object;
- repeating steps (a)–(c) to successively laminate said lay-

ers and form said target object; the improvement comprising:

providing at least one light flux having a large diameter light and at least one light flux having a small diameter; and radiating the large diameter light flux and the small diameter light flux onto the photocurable fluid substance to form and cure a target object, said target object having a main



part, detailed portions and surface portions, wherein said large diameter light flux is radiated onto the photocurable substance to form and cure the main part and said small diameter light flux is radiated onto the photocurable substance to form and cure the detailed and surface portions so that said target object is formed and cured by combinations of the large diameter light flux and the small diameter light flux.

5,089,186

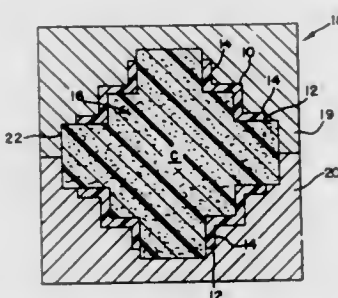
PROCESS FOR CORE REMOVAL FROM MOLDED PRODUCTS

Timothy M. Moore, Silvis, and Gerbrig W. Van Der Woude, Rock Island, both of Ill., assignors to Advanced Plastics Partnership, Moline, Ill.

Filed Jul. 11, 1990, Ser. No. 551,769
Int. Cl.⁵ B29C 33/48

U.S. Cl. 264-25

30 Claims



1. A method of removing a molding core from a molded product wherein said core comprises a particulate inert material which is formed into a discrete configuration conforming to the configuration of at least a portion of the molded product and the particulate inert material is bound in said configuration by a cured binder comprising a water soluble carbohydrate, said method comprising exposing said bound core with said water soluble carbohydrate therein and said molded product to water after the product has been molded to disintegrate and remove the core from the molded product.

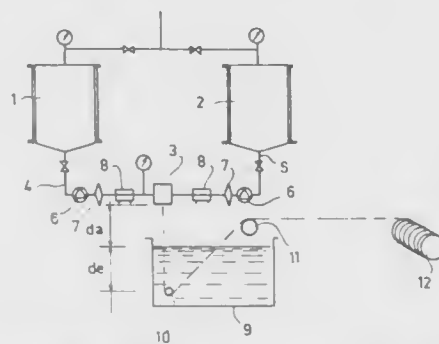
5,089,187 PROCESS FOR PRODUCING A SEMI-PERMEABLE MEMBRANE BY EXTRUSION

Philippe Aptel, and Jean-Michel Espenan, both of Toulouse, France, assignors to Societe Lyonnaise des Eaux, S.A., Paris, France

Filed Dec. 22, 1989, Ser. No. 456,096
Claims priority, application France, Dec. 22, 1988, 88 17371
Int. Cl.⁵ D01D 5/247

U.S. Cl. 264-41

8 Claims



1. A process for the production of a porous organic semi-permeable membrane comprising providing a drawplate (3) having a plurality of separate extrusion openings (13) and a plurality of needles in said openings, dissolving a polymer in a solvent to form a solution of said polymer, extruding said solution essentially vertically through said openings while injecting a centering fluid through said needles in such a manner as to form an extrudate having a plurality of longitudinal passageways, recovering the extrudate at the outlet of the drawplate in a medium which is a non-solvent with respect to the polymer and able to precipitate the polymeric solution after allowing said extrudate to travel in said medium a distance d_e such that $900 \times e < d_e < 3$, where e represents the maximum distance of travel in meters of a precipitating fluid flowing on the interior of the extrudate, for obtaining a complete precipitation of said extrudate,

said needles (13) having a shape conjugate with said openings and external dimensions between 0.7 and 1.2 times those of said openings, and said openings having a shape conjugate to that of the extrudate and internal dimensions between 0.8 and 1.2 times those of said extrudate, said solution having a viscosity greater than 500 millipascal seconds ("Contraves" Rheomat 115, rate of shear of 28 s^{-1}) and a flow rate adjusted so as to obtain an average speed of extrusion V_s at the outlet of the drawplate, and taking up the precipitated extrudate at a linear take-up speed V_e such that $V_e/V_s < 1.2$, whereby the operative conditions of the process precisely control the stretching phenomena of the extrudate.

5,089,188

SPINNING OF SOL GEL SILICEOUS-CONTAINING FIBERS WITH WET COAGULATION

Desaraju V. Varaprasad, Holland, Mich.; Agaram S. Abbiraman, Stone Mountain, Ga., and Ernest L. Lawton, Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 293,402, Jan. 4, 1989, abandoned. This application Jun. 22, 1989, Ser. No. 370,205
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

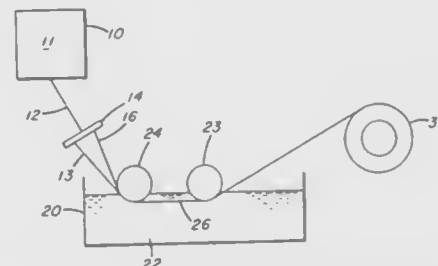
Int. Cl.⁵ D01F 9/08

U.S. Cl. 264-41

40 Claims

1. The process for producing at least one amorphous siliceous-containing fiber, comprising:
a. forming at least a partial hydrolyzate of at least one metallic type compound selected from the group consisting of: silicon alkoxide, and colloidal dispersions of hydrous siliceous oxides and mixtures thereof with and without

metal type compounds selected from the group consisting of metal alkoxides and colloidal dispersions of hydrous oxides of alumina, titania, and zirconia by acid catalyzed hydrolysis in the presence of an organic solvent at a temperature in the range of around ambient to elevated temperatures less than 100° C. and with a ratio of water to silicon alkoxide in the range of around 1.5 to 1 up to less than 4 to 1, so that ungelled polymerization results in a spinnable viscosity in the range of around 50 to greater than 1000 poise,



b. passing the at least partial hydrolyzate through a spinnerette having at least one orifice to produce at least one fiber having a continuous length from the spinnerette,
c. contacting the at least one fiber from the spinnerette with a nonsolvent liquid at a temperature and for a time for effective coagulation to produce cohesive fiber with a continuous length from the spinnerette, and
d. removing the fiber as a continuous length from the nonsolvent liquid, where the fiber is a continuous length from the spinnerette through contact with the liquid nonsolvent and to removal.

5,089,189

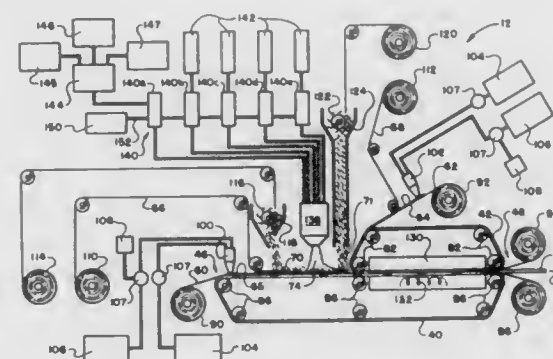
PROCESS FOR REINFORCED POLYMERIC COMPOSITES

James M. Staneluis, and Donald L. Rodenbeck, both of Bowling Green, Ohio, assignors to Centrite Corp., Bowling Green, Ohio

Division of Ser. No. 149,479, Apr. 8, 1988, Pat. No. 4,828,897.
This application May 5, 1989, Ser. No. 348,061
Int. Cl.⁵ B29C 67/22

U.S. Cl. 264-45.3

5 Claims



1. A process for the continuous manufacture of a reinforced polymeric composite comprising the steps of:

a. providing a pair of cojointly longitudinally moving upper and lower mold means having opposed interior surfaces defining in cross section an open ended cavity having a predetermined cross section corresponding to said composite;
b. providing upper and lower flexible means substantially non-adherent to said upper and lower mold means, respectively;

c. applying a coating of a first thermoset reactant composition to said flexible means;
d. longitudinally applying continuous strands of a high modulus material onto said coating while said coating is in a viscous state with pressure sufficient to at least partially wet said continuous strands with said coating;
e. depositing chopped strands of high modulus material onto said continuous strands in a random array;
f. applying a foamable thermoset reactant composition over said continuous strands and said chopped strands;
g. transferring said flexible means with said coating, said chopped and said continuous strands, and said thermoset reactant compositions thereon onto said mold means into said cavity;
h. controlling the reactions of said thermoset reactant compositions in said cavity such that the foaming pressure of said foamable thermoset reactant composition occurs substantially within said cavity and is effective to (1) at least partially wet said chopped and continuous strands with both thermoset reactant compositions, (2) embed portions of said chopped strands into both of said reactant compositions to thereby establish a three dimensional high modulus interface bridging both said thermoset reactant compositions, and (3) completely fill said cavity forcing said flexible means into conformity with said opposed interior surfaces, thereby forming a composite; and
i. curing said reactants prior to exiting said cavity sufficient to maintain the dimensional integrity of said composite.

5,089,190

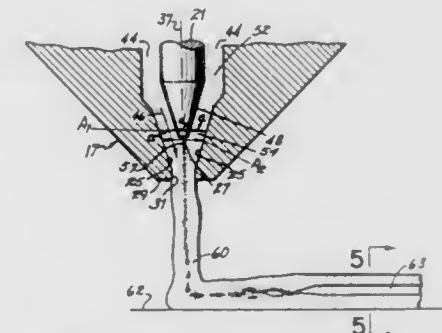
METHOD AND APPARATUS FOR HOLLOW CORE EXTRUSION OF HIGH VISCOSITY MATERIALS

Larry C. Trevathan, Avon Lake; Scott C. Hoover, Elyria, and James C. Smith, Lorain, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Nov. 13, 1989, Ser. No. 434,357
Int. Cl.⁵ C08J 9/00; B29C 47/00

U.S. Cl. 264-45.9

25 Claims



1. A method of forming a substantially hollow tube of foamed material comprising the steps of:
mixing a gas with a high viscosity material under pressure to form a foamable solution;
extruding a bead of said solution; and
causing said gas to initially come out of said solution at a center portion of said bead and thereafter to come out of solution from said bead exteriorly of said center portion.

5,089,191

PROCESS FOR MANUFACTURING A PADDED ELEMENT

Ian L. Hughes, Windsor, Canada, assignor to Woodbridge Foam Corporation, Ontario, Canada

Continuation-in-part of Ser. No. 500,080, Mar. 28, 1990, abandoned. This application Aug. 6, 1990, Ser. No. 562,924
Int. Cl.⁵ B29C 67/22

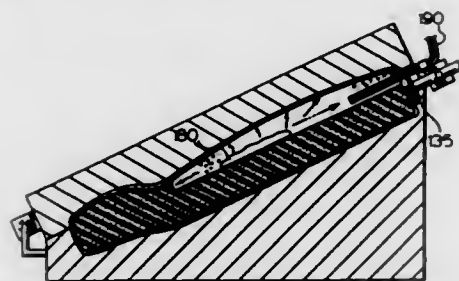
U.S. Cl. 264-46.5

20 Claims

1. A process for manufacturing a padded element in a mold

having an upper mold and a lower mold, the process comprising the steps of:

- (i) providing in said lower mold a cushion member comprising a first portion having an open recess therein, said open recess having a lower surface, the cushion member being enveloped by a trim cover comprising a finished upper outer surface and an inner surface, the trim cover having at least one aperture therein, said open recess and trim cover defining a cavity;
- (ii) closing said upper mold and said lower mold so that said upper mold is in contact with the upper outer surface of said trim cover;



- (iii) dispensing a liquid foamable polymeric composition in said cavity and onto said lower surface of said open recess via the aperture in the trim cover; and
- (iv) then allowing the polymeric composition to expand to fill substantially the cavity and come into contact with said inner surface of said trim cover such that the first portion corresponds proportionally to the finished surface of the padded element, the expanded polymeric composition adhering to the first portion of the cushion member and to the inner surface of the trim cover.

5,089,192

ASYMMETRIC SEMIPERMEABLE POLY(ARYLETHETERKETONE)MEMBRANES AND METHOD OF PRODUCING SAME

Lawrence C. Costa, Mansfield, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

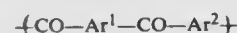
Filed Oct. 22, 1990, Ser. No. 600,633
Int. Cl.⁵ B01D 67/00

U.S. Cl. 264-49

14 Claims



1. A process of forming an asymmetric semipermeable membrane by casting a solution comprising a poly(aryletherketone)(PAEK) or mixtures of poly(aryletherketones) dissolved in strongly protic non-reactive acids, said PAEK having repeating units of the formula:



wherein Ar^1 and Ar^2 are aromatic moieties, wherein at least one aromatic moiety contains a diaryl ether functional group which is a part of the polymer backbone, and wherein both Ar^1 and Ar^2 are covalently linked to the carbonyl groups through aromatic carbon atoms.

METHOD FOR EXTRUDING A THERMOPLASTIC PLASTICS MATERIAL FOAM

Friedrich-Otto Behrens, Garbsen, and Ulrich Prossler, Uetz-Krätze, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

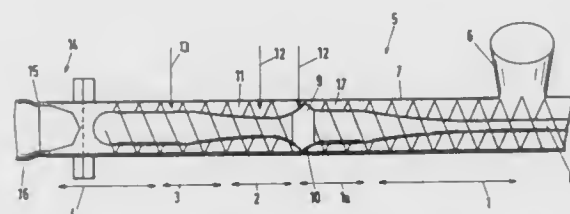
Filed Jun. 21, 1990, Ser. No. 541,379

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921108

Int. Cl.⁵ B29C 47/00

U.S. Cl. 264-50

10 Claims



1. A method of extruding a thermoplastic plastics material to produce a foamed structure having uniform cell size, comprising the steps of:

- feeding plastics material and a pore regulating substance into a screw extrusion device to form a mixture, said extrusion device including a rotatably mounted screw,
- fusing the mixture to form a fused mass,
- increasing the pressure of the fused mass,
- passing the pressurized fused mass past an obstruction disposed in said screw extrusion device to increase the free surface area of said fused mass and correspondingly reduce the pressure just past said obstruction,
- injecting steam at a desired temperature into said fused mass downstream of said obstruction thereby producing a vapor pressure, the pressure of said fused mass upstream of said obstruction being higher than the vapor pressure of the injected steam downstream of said obstruction, and the temperature of said injected steam corresponding substantially to the temperature of said fused mass in the injection area,
- mixing said fused mass with the steam by said screw so that the pressure is again built up,
- injecting a propellant into said mixture of said fused mass and steam,
- maintaining the pressure of said mixture of said fused mass and said steam during said injection of said propellant at a level above the condensation pressure of said steam,
- cooling said injected fused mass, and
- discharging said injected fused mass at atmospheric pressure to cause said steam to expand and said mass to foam.

5,089,194

PROCESS FOR PRODUCING CERAMIC FILM CASTING MIXTURES FOR THIN-FILM CIRCUITS

Carl Hoffmann, and Dieter Grote, both of Marktreidwitz, Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany

Division of Ser. No. 326,650, Mar. 21, 1989, abandoned. This application May 25, 1990, Ser. No. 537,840

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809693

Int. Cl.⁵ C04B 35/10

U.S. Cl. 264-63

15 Claims

1. A process for production of an Al_2O_3 -containing substrate for thin-film circuits, which substrate has a maximum particle size of about $4 \mu m$, a flexural breaking strength of more than about $400 N/mm^2$, and a surface roughness R_a of less than about $0.2 \mu m$, comprising the steps of:

- grinding agglomerated, calcined alumina having a primary particle size of less than $1 \mu m$ and having agglomerates

ranging up to about $100 \mu m$ in a solvent or solvent mixture, to a particle size of about 2 to $10 \mu m$;

adding at least one binder and at least one plasticizer to the ground alumina to produce a slurry;

grinding the slurry;

continuously transferring the ground slurry directly onto a continuously-circulating steel strip having a velocity of about 10 to 50 cm/min with a casting shoe to form a film having a thickness of about 0.7 to 1.4 mm;

drying the transferred slurry to a green tape in a drying path having a length of about 10 to 40 meters and a temperature gradient increasing from about $15^\circ C$. to about $80^\circ C$;

removing the green tape from the strip; and

firing the green tape which has been removed from the strip at about 1500° to $1550^\circ C$.

5,089,195

METHOD FOR PRODUCING CALCIUM PHOSPHATE-BASED MATERIAL

Takeshi Ichitsuka; Yasuhiko Hirayama, and Tetsuro Ogawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 192,552, May 11, 1988, Pat. No. 4,957,674. This application Jun. 22, 1990, Ser. No. 542,150
Claims priority, application Japan, May 12, 1987, 62-115180
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.⁵ C04B 35/64

U.S. Cl. 264-65

8 Claims

1. A method for producing a calcium phosphate-based material comprising:

- (a) molding a calcium phosphate powder;
- (b) preliminarily calcining the resulting molding until closed pores are formed; and
- (c) firing said molding in air, an inert gas, or nitrogen gas, wherein said preliminary calcining is carried out under a pressure of less than 1 Torr and at a temperature of from 950° to $1,000^\circ C$.

5,089,196

NON-MAGNETIC SUBSTRATE OF MAGNETIC HEAD, MAGNETIC HEAD AND METHOD FOR PRODUCING SUBSTRATE

Eiji Itoh; Ryuichi Nagase; Kazuhiro Saito, all of Urawa; Hiroshi Hosaka, and Hihumi Nagai, both of Toda, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

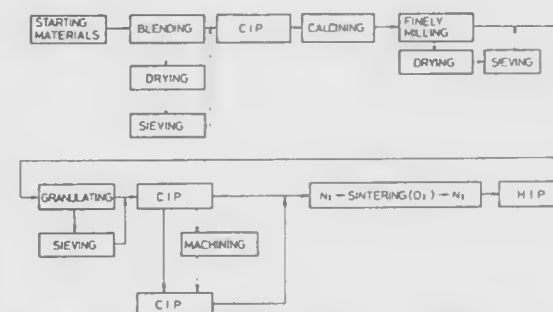
Filed Apr. 12, 1991, Ser. No. 684,073

Claims priority, application Japan, Feb. 25, 1988, 63-43028; Sep. 30, 1988, 63-243995; Sep. 30, 1988, 63-243996; Sep. 30, 1988, 63-243997

Int. Cl.⁵ C04B 35/32

U.S. Cl. 264-65

4 Claims



1. A method for forming a non-magnetic substrate for vapor-depositing, comprising the steps of: blending and then screening starting materials having a composition selected from the group consisting of (A) $Zn_xM_yCo_{2-x-y}O_2$, wherein M is selected from the group consisting of Mn, $0 \leq x \leq 0.4$, $0.4 \leq y \leq 1.0$, $0.8 \leq x+y \leq 1.0$, and (B) $Co_xNi_{2-x}O_2$, wherein $0.2 \leq x \leq 1.8$; CIP shaping the blended and, screened starting

materials to form a CIP shaped body; calcining the CIP shaped body crushing and then screening the calcined body to form calcined powder; to form a calcined body, finely milling the calcined powder to $1 \mu m$ or less to form finely milled powder; granulating the finely milled powder to a spherical shape $20 \mu m$ or more in size to form granulated powder; shaping the granulated powder by CIP to form shaped powder; sintering the CIP shaped powder at a sintering temperature to form a sintered body; and HIP treating the sintered body.

5,089,197

MANUFACTURE OF SHAPED ARTICLES FROM SINTERABLE POWDER

Nicholas D. Butler; John Woodthorpe, both of Rugby, United Kingdom; Francisco C. Fernandez, and Inigo I. Zubillaga, both of San Sebastian, Spain, assignors to T & N Technology, Warwickshire, England

Filed Nov. 23, 1990, Ser. No. 617,092

Claims priority, application United Kingdom, Nov. 23, 1989, 8926455

Int. Cl.⁵ C04B 35/64

U.S. Cl. 264-65

6 Claims

1. A method of making from a sinterable silicon nitride powder admixed with a metallic oxide sintering aid a shaped article with at least 95% theoretical density, by the hot isostatic pressing of a preshaped body of the powder while that body is encapsulated in a capsule which is plastic at the temperature of the hot gas by which the isostatic pressure is applied but which is impermeable to the hot gas, the method comprising the steps of

- (a) degassing the preshaped body before encapsulation by exposing it to a vacuum whose pressure is less than 1 mm of mercury, the exposure being at a temperature exceeding $600^\circ C$. and for a time such as to enable the formation on application of an isostatic pressure below 20 MPa, of a silicon nitride article of increased density, said density being at least 95% of theoretical density; and
- (b) subsequently hot isostatic pressing the encapsulated body at a pressure below 20 MPa.

5,089,198

METHOD FOR CURING CONCRETE ARTICLES

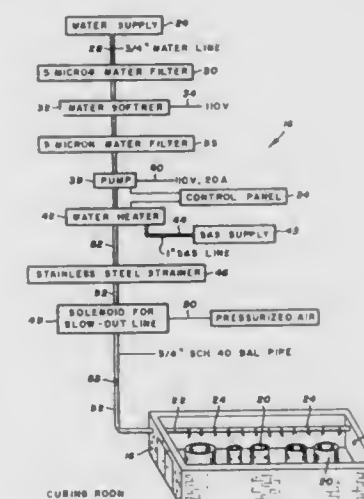
Christopher B. Leach, deceased, late of Lowell, Mich. by Audrey A. Leach, legal representative, assignor to CAM Sales, Inc., Ludington, Mich.

Filed Feb. 17, 1989, Ser. No. 312,118

Int. Cl.⁵ B29C 71/02; C04B 40/02

U.S. Cl. 264-82

18 Claims



9. A method of curing concrete articles in an enclosure while

avoiding the baking or crusting of the concrete articles by maintaining a desired temperature in the enclosure, comprising:

providing a continuous supply of water from a source to the enclosure having the concrete articles therein;
pressurizing the water to an elevated pressure;
spraying the pressurized water into the enclosure through one or more nozzles in the enclosure, the pressure on the water and the nozzle size being such that the nozzles produce a mist of fine water particles in the enclosure, which mist surrounds the concrete articles and provides the necessary humidity and temperature in the enclosure to initiate hydration of the concrete articles, wherein the water is heated after it has been pressurized but before it is sprayed into the enclosure to a temperature at which the water is superheated, the pressure on the superheated water being sufficient to prevent the water from converting into steam until it is sprayed into the enclosure, the heating being undertaken at least intermittently so as to maintain the temperature in the enclosure at the desired curing temperature while curing the concrete articles in the enclosure.

5,089,199

METHOD FOR IMPROVING ELECTRIC CONDUCTIVITY OF A RESIN MOLDING

Hidekazu Fujiwara, Yokohama; Kenji Motogami, Takatsuki, and Shigeo Mori, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd. and Kanto Jidosha Kogyo Kabushiki, both of Japan

Filed Sep. 10, 1990, Ser. No. 580,200

Claims priority, application Japan, Sep. 13, 1989, 1-238269
Int. Cl.⁵ C04B 35/00

U.S. Cl. 264—83

5 Claims

1. A method for improving electric conductivity of a resin molding, which comprises the steps of mixing with a resin a complex of a polyether and an electrolyte salt soluble in said polyether, molding the mixture, and then treating the resultant molding with plasma, said polyether being selected from the group consisting of alkylene oxide polymers and copolymers.

5,089,200

PROCESS FOR MELT EXTRUSION OF POLYMERS

George R. Chapman, Jr., Media, Pa.; Rita S. McMinn, Newark; Donnan E. Priester, and William L. Phillips, both of Wilmington, all of Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 417,947, Oct. 6, 1989, abandoned. This application Sep. 20, 1990, Ser. No. 584,336
Int. Cl.⁵ B29C 47/94

U.S. Cl. 264—127

53 Claims



1. A process comprising melt extruding through an extrusion die a composition comprising a difficultly-melt-processible polymer and 0.002–2% by weight, based on the weight of the difficultly-melt-processible polymer, of at least one melt-processible fluorocarbon polymer processing aid, said fluorocarbon polymer processing aid having a fluorine to carbon ratio of at least 1:2, wherein the die surface is coated with one or more metal oxides, M_xO_y , wherein M is a metal selected from the groups consisting of Ti, Zr, Cr, Fe, Ni, Pd, Pt, Cu, Ag, Au, Al

and Si, and x and y are selected to satisfy the valencies of M, and wherein said fluorocarbon polymer processing aid has incorporated therein an effective amount of metal oxide-reactive sites capable of reacting with or physically associating with the metal oxide die surface.

41. Polymer extrusion die wherein the polymer-contacting die surface contains metal oxide M_xO_y , wherein M is a metal selected from the group consisting of Ti, Zr, Cr, Fe, Ni, Pd, Pt, Cu, Ag, Au, Al and Si, and x and y are selected to satisfy the valencies of M, and wherein M_xO_y has bonded thereto a fluoropolymer process aid.

48. A process for treating a polymer extrusion die surface, said process comprising incorporating into the polymer-contacting die surface a metal oxide M_xO_y , wherein M is a metal selected from the group consisting of Ti, Zr, Cr, Fe, Ni, Pd, Pt, Cu, Ag, Au, Al and Si, and x and y are selected to satisfy the valence of M, and subsequently bonding thereto a fluoropolymer processing aid.

5,089,201

METHOD FOR PREPARING ELASTIC ROLLER

Masaaki Takahashi, Asaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

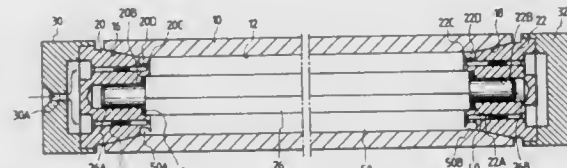
Continuation of Ser. No. 289,717, Dec. 27, 1988, abandoned.

This application Aug. 14, 1990, Ser. No. 566,897

Claims priority, application Japan, Dec. 29, 1987, 62-334795
Int. Cl.⁵ B29C 45/14, 45/38

U.S. Cl. 264—135

6 Claims



1. A method for preparing an elastic roller having a layer of elastic material disposed about and integrally molded to a shaft-shaped core metal member, comprising the steps of:
disposing the shaft-shaped core metal member in a cylindrical molding device for holding the elastic material;
coating the core metal member with an adhesive;
mounting first and second lid members at opposite ends of said molding device, each lid member holding a respective end of said core metal member so that said core metal member is disposed concentrically within said molding device;
disposing a sealing rubber between each lid member and said core metal member to prevent elastic material from entering a bearing portion of said core metal member;
injecting the elastic material into said molding device;
curing said elastic material; and
removing said lid members such that an extending portion of each lid member removes burrs formed at peripheral end portions of the roller.

5,089,202

METHOD FOR THE PRODUCTION OF A FILTER CARTRIDGE

Hans-Joachim Lippold, Wredeweg 8, D-1000 Berlin 22, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 524,541

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916838

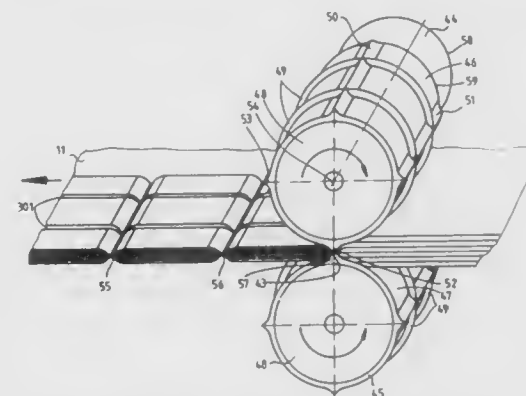
Int. Cl.⁵ B29C 53/06

U.S. Cl. 264—145

8 Claims

1. A method for the production of a filter, comprising:
providing a filter material having fibers of thermoplastic material;
heating only a subregion of the filter material;

applying pressure to the subregion of the filter material heated in said heating step;
performing said heating and applying of pressure to the subregion at levels sufficient to compact and weld together the thermoplastic fibers of the subregion for causing the subregion to have a rigidity greater than the rigidity of a region of the filter other than the subregion; said



- (d) incorporating into the material from said second selecting step an antimicrobial agent prepared by neutralizing a cationic antimicrobial agent with an anionic surfactant and solubilizing the neutralized agent with a nonionic surfactant to prevent incompatibility of said cationic antimicrobial agent in said gelled anionic natural latex;
- (e) using the material selected and modified in said second selecting and incorporation steps and forming in a second forming step the final inner surface of said device by coating said final outer surface of said device from said first forming step with the material selected from the second selecting step;
- (f) in a third forming step, treating said device obtained by said second forming step to obtain a cured device in final form; and
- (g) stripping said cured device obtained in said third forming step from a forming apparatus.

5,089,206

DUAL CHARGE COMPRESSION MOLDING METHOD

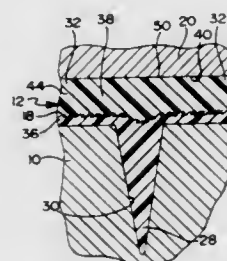
Hamid G. Kia, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1990, Ser. No. 525,006

Int. Cl.⁵ B29C 43/14

U.S. Cl. 264—255

5 Claims



1. A dual charge compression molding method for making glass fiber reinforced plastic parts having a first surface being an appearance surface and a second surface containing integral reinforcing means comprising the steps of:
- providing a set of matched mold members each having an interior mold surface defining a mold cavity having a reinforcing portion and a panel portion contained therein when the two mold members are closed together,
- loading a quantity of a first charge of glass fiber filled plastic material into said mold cavity sufficient to fill substantially the reinforcing portion of said mold cavity,
- compressing said mold members together under a pressure sufficient to fill substantially all the reinforcing portion of the mold cavity,
- opening said mold members before said first charge of plastic material is substantially cured,
- loading a second charge of glass fiber filled plastic material on top of said first charge of plastic material sufficient to fill said panel portion of said mold cavity,
- closing said mold members and compress under sufficient pressure, and
- opening said mold members and demold said molded plastic part.

5,089,207

SINGLE PLY REINFORCED THERMOPLASTIC COMPOSITE

Melody A. Hammond, and Donnie G. Brady, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1988, Ser. No. 237,708

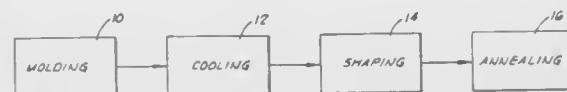
Int. Cl.⁵ B27N 3/10

U.S. Cl. 264—257

17 Claims

1. A method comprising the steps of:
- providing a roll of composite sheet, said composite sheet comprising fibrous reinforcement in a continuous matrix

of thermoplastic resin, said resin being of the type having a glass transition temperature and a softening temperature; annealing said roll at a temperature between said glass transition temperature and said softening temperature so that



said resin will acquire a more crystalline morphology, thereby setting a shape of said sheet to a configuration of a roll; and

cooling the roll below said glass transition temperature.

5,089,208

METHOD OF MOLDING A SYNTHETIC-RESIN HOLLOW CONTAINER WITH GRIP

Yoshinori Nakamura, Yoshiki Miyazawa, and Shigeo Yoshizawa, all of Nagano, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

Division of Ser. No. 11,277, Feb. 4, 1987, Pat. No. 4,727,997.

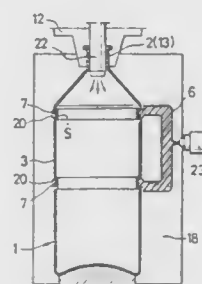
This application Nov. 16, 1987, Ser. No. 103,936

Claims priority, application Japan, Feb. 6, 1986, 61-24856

Int. Cl.⁵ B29C 49/06, 49/08, 49/18

U.S. Cl. 264—513

5 Claims



1. A method of molding a synthetic resin hollow container with a grip, said method comprising the steps of:
- A) stretch blow molding an injection molded parison to form a hollow container body having an annular groove formed in the outer periphery thereof;
- B) placing said hollow container body in a split grip mold, said grip mold having:
- 1) a molding groove surrounding said annular groove, said molding groove and annular groove defining a connecting ring molding cavity; and
- 2) a grip section communicating with said molding groove and defining a grip molding cavity;
- C) applying an internal pressure above that of the ambient pressure to said hollow container body; and thereafter
- D) injection filling said grip and connecting ring molding cavities with molten resin while said internal pressure is applied to said hollow body to form a grip which is attached to said hollow container body by a connecting ring formed integrally with said grip and extending around said hollow container body and into said annular groove.

5,089,209

METHOD OF EXTRUSION BLOW-MOLDING POLYPHENYLENE SULFIDE ARTICLES

Fay W. Bailey, Bartlesville, Okla., and Charles L. Ryan, Jr., Plainsboro, N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 332,025, Apr. 3, 1989, abandoned. This application Dec. 6, 1990, Ser. No. 628,922

Int. Cl.⁵ B29C 39/02

U.S. Cl. 264—540

23 Claims

1. A method of forming a thermoplastic article, comprising blow-molding said article from a polyphenylene sulfide resin having a melt flow in a range of from about 1 to about 10 g/10 min.

5,089,210

MOX FUEL ASSEMBLY DESIGN

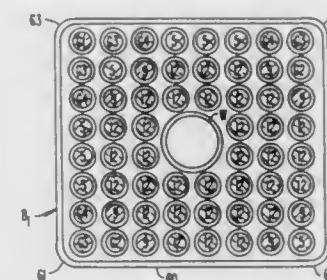
Anthony P. Reese, San Jose, and Russell L. Crowther, Jr. deceased, late of San Jose, all of Calif. by Cosette M. Crowther, Russell L. Crowther III, Eric J. Crowther, heirs, assignors to General Electric Company, San Jose, Calif.

Filed Mar. 12, 1990, Ser. No. 492,514

Int. Cl.⁵ G21C 7/30

U.S. Cl. 376—212

9 Claims



1. In a boiling water reactor core having a plurality of vertically upstanding fuel bundles; each fuel bundle containing longitudinally extending sealed rods with fissile material therein;
- a surrounding channel for containing water flow within each said fuel bundle from water exterior of said fuel bundle; water moderator flowing in the confining channel from the bottom of said fuel bundle to the top of said fuel bundle for producing steam and moderating neutrons to a thermal energy state for producing continuing nuclear reaction in said fissile material;
- said water moderator exterior of said confining channels for defining a core bypass zone having relatively high concentrations of water for moderation of neutrons from high energy state neutrons to a thermal energy state for the continuation of said nuclear reaction;
- a plurality of said fuel rods including a component of fissile material including recovered plutonium and uranium distributed over an axial extent of said fuel assembly; at least some of said fuel rods containing a component of neutron absorbing material for controlling excess reactivity imparted by said recovered plutonium; the improvement in said distribution of fissile material and neutron absorbing material comprising:
- said fissile material including a mixture of uranium and recovered plutonium in rods of said fuel bundle at locations other than the corners of said fuel bundle; and,
- neutron absorbing material being located in rods of said fuel bundle at rod locations adjacent the corners of said fuel bundles whereby said neutron absorbing material has decreased shielding from said plutonium and maximum exposure to thermal neutrons for shaping said cold reactivity shutdown zone in said fuel bundle.

5,089,211

CONTROL ROD DRIVE

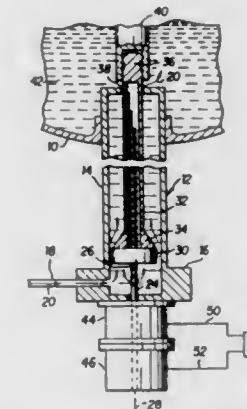
Charles W. Dillmann, Morgan Hill, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Feb. 11, 1991, Ser. No. 653,603

Int. Cl.⁵ G21C 7/14

U.S. Cl. 376—232

11 Claims



1. A drive for moving a control rod along a longitudinal axis in a reactor vessel containing a pressurized fluid comprising:
- a pressure vessel fixedly joinable in flow communication with said reactor vessel;
- a spindle disposed solely within said pressure vessel; means for moving said control rod upon rotation of said spindle;
- a driven rotor fixedly joined to said spindle within said pressure vessel for rotating said spindle; and
- means spaced from said driven rotor for selectively rotating said driven rotor in first and second opposite directions without breaching said pressure vessel between said driven rotor and said retaining means.

5,089,212

APPARATUS FOR CONTROLLING THE POWER OUTPUT OF A NUCLEAR REACTOR

Reinhardt Strobel, Nuremberg, and Jürgen Spohrer, Höchststadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

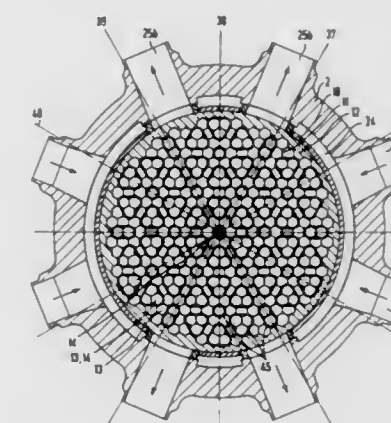
Filed Jul. 31, 1990, Ser. No. 560,450

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925617

Int. Cl.⁵ G21C 7/06

U.S. Cl. 376—237

9 Claims



1. Nuclear reactor with controlled power output, comprising a reactor core having a cross section in a given plane with

a center of area and axes of symmetry passing through the center of area,

a multiplicity of control elements disposed in groups, each of said groups having more than one of said control elements, means for joining together said control elements of each of said groups, said groups being symmetrical to at least two of the axes of symmetry,

drive mechanisms each moving a respective one of said groups of control elements,

each of said control elements having a plurality of control rods,

a support structure joining said control rods of a control element to one another,

fuel assemblies disposed in groups, each of said groups of control elements having a given number of control elements being associated with one of said groups of fuel assemblies having the given number of fuel assemblies, and

other fuel assemblies with which said control elements are not associated, said other fuel assemblies surrounding said groups of fuel assemblies.

5,089,213

NUCLEAR FUEL ASSEMBLY IDENTIFICATION CODE READER

Tatsuyuki Omote, Hitachi; Tomiharu Yoshida; Hideo Maki, both of Katsuta; Makoto Senoh, Naka; Fuminobu Takahashi, Katsuta, and Kenji Tsuchita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

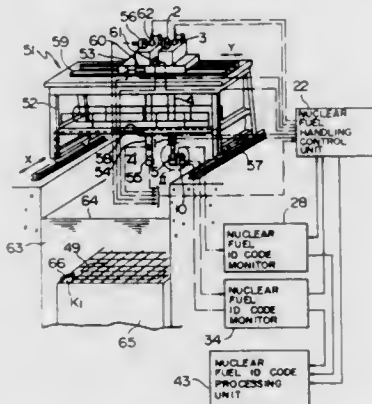
Filed May 2, 1989, Ser. No. 346,226

Claims priority, application Japan, May 2, 1988, 63-107628; May 2, 1988, 63-107629

Int. Cl.⁵ G21C 17/00

U.S. Cl. 376-248

24 Claims



19. A nuclear fuel identification code reader comprising: an optical sensor for detecting a first nuclear fuel identification code marked on a fuel assembly, for identifying said a fuel assembly;

an ultrasonic wave sensor for detecting a second nuclear fuel identification code marked on said fuel assembly at a position adjacent to said first nuclear fuel identification code and which identifies said fuel assembly, said second nuclear fuel identification code being expressed in a different form from said first nuclear fuel identification code;

determination means for determining the necessity of detection of said second nuclear fuel identification code by said ultrasonic wave sensor in accordance with a recognition result of the first nuclear fuel identification code based on information derived from said optical sensor;

means for enabling detection of said second nuclear fuel identification code by said ultrasonic wave sensor when said determination means determines that it is necessary to detect said second nuclear fuel identification code;

pick-up means for picking up a Chelencoff light generated in said fuel assembly;

means for image processing a video signal of the Chelencoff light picked up by said pick-up means; and

drive means for driving said optical sensor, ultrasonic wave sensor and said pick-up means above said fuel assembly whose codes are to be detected.

5,089,214

APPARATUS FOR MONITORING THE PRESSURE WITHIN A CASK CONTAINING RADIOACTIVE MATERIAL

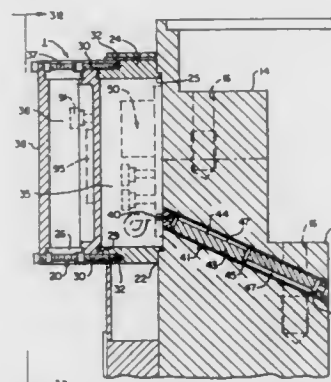
Kingsley F. Graham, Murrysville, and John B. Lipchak, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1990, Ser. No. 558,996

Int. Cl.⁵ G21C 17/00

U.S. Cl. 376-250

18 Claims



1. An apparatus for monitoring the pressure within a cask containing a potentially hazardous gas, wherein said cask includes a bore that penetrates through one of its walls, comprising:

a differential pressure sensor fluidly connected to an outer end of said bore for both monitoring the pressure of said hazardous gas and providing a first barrier between said gas and the ambient atmosphere,

a sensor chamber containing the outer end of said bore and said pressure sensor for providing a second barrier between said gas and said ambient atmosphere, said chamber being at least partially evacuated to create a pressure differential between said chamber and the ambient atmosphere, and

an absolute pressure sensor that communicates with said bore and is contained within said chamber for determining whether or not a reduction in the pressure sensed by the differential pressure sensor is the result of a leakage condition in the cask of the chamber.

5,089,215

METHOD OF SECURING A CENTERING PIN FOR A NUCLEAR FUEL ASSEMBLY

Tilo Landgraf, Erlangen; Rainer Kunz, Nürnberg; Johann Ropers, Erlangen, and Martin Zenkel, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 9, 1990, Ser. No. 507,254

Claims priority, application European Pat. Off., Apr. 12, 1989, 89106523.7

Int. Cl.⁵ G21C 5/06

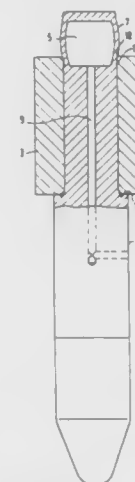
U.S. Cl. 376-260

7 Claims

1. Method for securing a cylindrical centering pin of a nuclear fuel assembly in a bore formed in a plate, which comprises:

a) introducing an end of a centering pin to be secured to the plate into the bore formed in the plate until at least part of

a radially expandable wall portion of the end to be secured protrudes beyond the plate; and



b) radially expanding the expandable wall portion until the wall portion anchors the centering pin.

5,089,216

SYSTEM FOR CHEMICAL DECONTAMINATION OF NUCLEAR REACTOR PRIMARY SYSTEMS

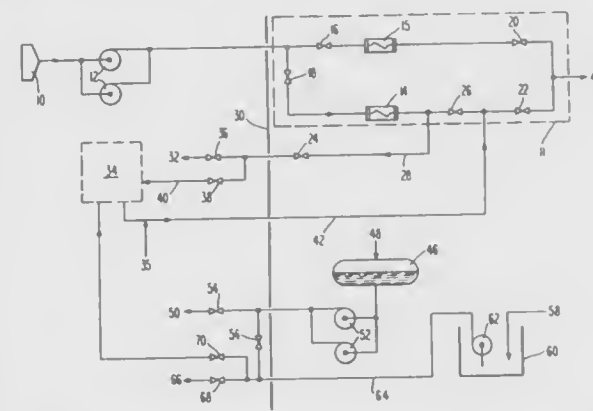
James S. Schlonski; Michael F. McGiure, and Gary J. Corpora, all of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1990, Ser. No. 621,120

Int. Cl.⁵ G21C 19/42

U.S. Cl. 376-308

20 Claims



1. A method of chemically decontaminating a nuclear reactor primary system, having a residual heat removal system with one or more residual heat removal heat exchangers, each having an upstream and a downstream side, at or above ambient pressure comprising the steps of:

injecting decontamination chemicals using an injection means into a process fluid flow that flows into the residual heat removal system at a point downstream of one of the residual heat removal heat exchangers;

circulating the injected decontamination chemicals throughout the primary system using one or more reactor coolant pumps in conjunction with one or more residual heat removal pumps;

directing the circulated decontamination chemicals and process fluids to a means for removing suspended solids and dissolved materials after said circulated chemicals and process fluids have passed through the residual heat removal heat exchanger but before they reach the point at which the process fluid flow with injected decontamina-

tion chemicals flows into the residual heat removal system;

decontaminating the process fluids by removing suspended solids or dissolved materials from the process fluids in the means for removing suspended solids and dissolved materials; and

feeding the decontaminated process fluids to the injection means.

13. A chemical decontamination system for use at, or above, ambient pressure in a nuclear reactor primary system having a residual heat removal system comprising:

means for injecting decontamination chemicals into the primary system;

means for removing dissolved and suspended materials and decontamination chemicals from the primary system located at an upstream side of the means for injecting decontamination chemicals;

one or more residual heat removal pumps for pumping primary system fluids through the residual heat removal system, which includes one or more residual heat removal heat exchangers having upstream ends and downstream ends;

means located downstream of one of the residual heat removal heat exchangers connecting the residual heat removal system to the means for removing dissolved and suspended materials and decontamination chemicals from the primary system; and

a return line connecting the means for injecting decontamination chemicals to the residual heat removal system at a point downstream of the means connecting the residual heat removal system to the means for removing dissolved and suspended materials.

5,089,217

CLEAN-UP SUB-SYSTEM FOR CHEMICAL DECONTAMINATION OF NUCLEAR REACTOR PRIMARY SYSTEMS

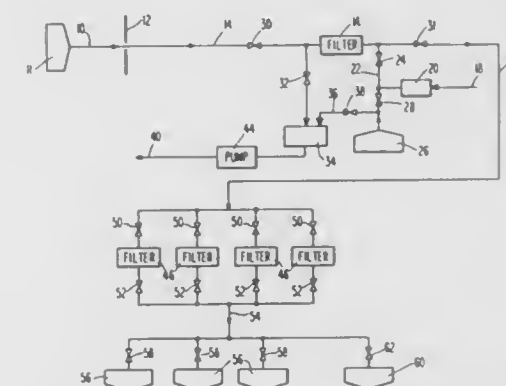
Gary J. Corpora; James S. Schlonski, both of Monroeville; Frank I. Bauer, Perry Township, Lawrence County, and Philip E. Miller, Greensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1990, Ser. No. 621,129

Int. Cl.⁵ G21C 19/42

U.S. Cl. 376-313

17 Claims



1. A chemical decontamination clean-up system for use on-line in a nuclear reactor primary system comprising:

a back-flushable filter;

means within the nuclear reactor primary system for pumping primary system fluids from the nuclear reactor primary system downstream to the back-flushable filter and thereafter through the decontamination system;

a plurality of demineralizer banks arranged in parallel, each demineralizer bank comprising one or more demineralizers arranged in parallel wherein primary system fluids are demineralized;

means for selectively directing the pumped primary system fluids from the back-flushable filter to a particular demineralizer bank; and
means for returning primary system fluids from the demineralizer banks to the primary system.

5,089,218

WATER COOLED NUCLEAR REACTOR WITH A DIAPHRAGM PRESSURIZERS FOR LOW PRESSURES AND TEMPERATURES

Frederick J. Gardner, Chaddesden, and Dewi J. Morris, Chellaston, both of England, assignors to Rolls-Royce and Associates Limited, Derby, England

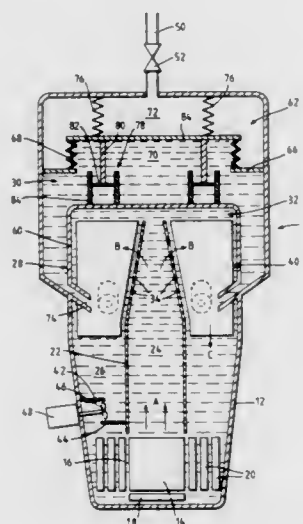
Filed Jul. 19, 1989, Ser. No. 381,976

Claims priority, application United Kingdom, Aug. 1, 1988, 3818284

Int. Cl.⁵ G21C 13/00

U.S. Cl. 376—406

33 Claims



1. A water cooled nuclear reactor comprising a pressure vessel, a reactor core, a primary water coolant circuit, a pressurizer, the reactor core and at least a portion of the primary water coolant circuit being located in a pressure vessel, the primary water coolant circuit being arranged to cool the reactor core, the pressurizer having a diaphragm and a pressurizer pressure vessel, the diaphragm being movable and being sealingly secured to the pressurizer pressure vessel to divide the pressurizer pressure vessel into a first water space and a second fluid space, the second fluid space being arranged to contain a gas, and at least one surge port means which communicates between the pressurizer and the primary water coolant circuit to connect the first space of the pressurizer with the primary water coolant circuit, the diaphragm being movable so as to allow changes in the volume or pressure of the water in the first space of the pressurizer and the primary water coolant circuit, sealing means interconnecting and securing the diaphragm to said pressurizer pressure vessel to form a seal and for allowing relative movement between said diaphragm and said pressurizer pressure vessel.

5,089,219

GAS COOLED NUCLEAR FUEL ELEMENT

John D. Malloy, III, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 22, 1991, Ser. No. 643,301

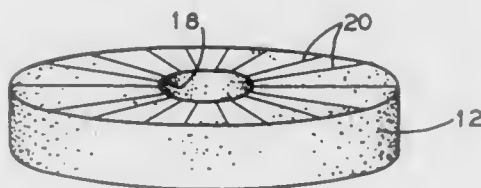
Int. Cl.⁵ G21C 3/30

U.S. Cl. 376—427

4 Claims

1. A gas cooled nuclear fuel element, comprising:
a. a cylindrical tube having one open end;
b. a plurality of nonporous nuclear fuel disks stacked inside

said cylindrical tube so as to define an annular space between said disks and said tube;
c. said nuclear fuel disks each having an axial channel there-through and grooves to provide a path for coolant flow on a surface of each disk that extend radially between said axial channel and the outer edge of said disks; and



d. an upper and a lower end fitting in said cylindrical tube that support said nuclear fuel disks in said tube, said lower end fitting having a central bore in coaxial alignment with the axial channel in said fuel disks.

5,089,220

FUEL ASSEMBLY FOR A BOILING REACTOR

Olov Nylund, Västerås, Sweden, assignor to ABB Atom AB, Västerås, Sweden

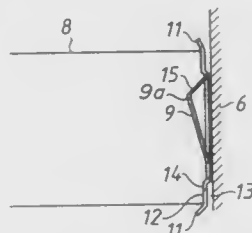
Filed Oct. 31, 1990, Ser. No. 606,454

Claims priority, application Sweden, Nov. 14, 1989, 8903817

Int. Cl.⁵ G21C 3/34

U.S. Cl. 376—439

4 Claims



1. A fuel assembly in the form of an elongated multi-corner channel having a wall, said channel being connected to a coolant intended to traverse the channel in a downstream direction, a bundle of similarly elongated fuel rods arranged in the channel and retained by a plurality of spacers placed along the bundle, each one of said spacers comprising a number of cells surrounded by an outer frame in the form of a band placed on edge, said band arranged to fit closely in the channel, said band being provided with a number of windows, wherein in at least certain of said windows a deflection fin is arranged fixed to an upstream edge of each respective window, each said fin extending in the direction of flow from said edge and including a portion which extends in a direction towards a centre of the channel in order to divert coolant flowing along an inner wall-of the channel in a direction towards the centre of the channel.

5,089,221

COMPOSITE SPACER WITH INCONEL GRID AND ZIRCALOY BAND

Eric B. Johansson; Bruce Matzner, and Gerald M. Latter, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Oct. 25, 1990, Ser. No. 603,046

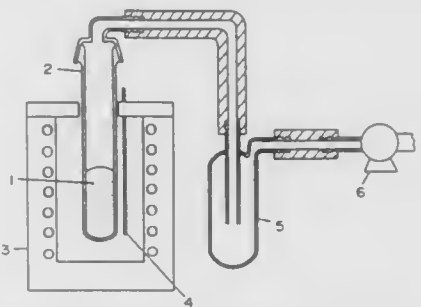
Int. Cl.⁵ G21C 3/34

U.S. Cl. 376—442

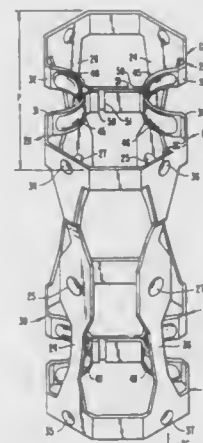
11 Claims

1. A spacer for use in a nuclear fuel bundle having a plurality of fuel rods, said spacer comprising in combination:
a plurality of spring metal spacer cells, each cell having;

at least one spring leg, said spring leg inwardly deflected at the medial portion thereof for spring contact with a fuel rod within said spacer cell;
at least two rod encircling arms affixed at remote ends of said spring legs;
each rod encircling arm defining stops for abutting a fuel rod whereby said spring leg can bias an encircled fuel rod within said cells into said stops;
said rod encircling arms having differential length including a first portion of said arms having a relatively longer length and a second portion of said arms having a relatively shorter length;
said cells confronted into cell pairs with said spring legs remote from one another;



and molybdenum sulfide in a stream of an inert gas containing a reductive gas.



said rod encircling arms affixed to one another adjacent the end of said rod encircling arms; each said arm of one cell at one end thereof fastens to a rod arm of an adjacent cell with said relatively longer rod arm of one cell of said cell pair fastening to a relatively shorter arm of the other cell of said cell pair whereby said cell pair forms a unitary rigid substructure;
a unitary grid formed from said cell pairs, each cell pair joined to adjoining cell pairs by welding at said rod encircling arms;
a continuous Zircaloy band surrounding said unitary grid, said Zircaloy band including tabs for deflection to said rod encircling arms of said cell units for inhibiting vertical movement of said band with respect to said unitary grid whereby said band is keyed to said grid against vertical movement with respect to said unitary grid.

5,089,222

MANUFACTURING PROCESS OF CHEVREL COMPOUNDS

Shigeo Kondo, and Yasuharu Yamamura, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan Division of Ser. No. 369,556, Jun. 15, 1989, Pat. No. 4,966,749.

This application Aug. 20, 1990, Ser. No. 570,079

Claims priority, application Japan, Oct. 15, 1987, 62-262120

Int. Cl.⁵ B22F 7/00

U.S. Cl. 419—10

2 Claims

1. A process for manufacturing Chevrel phase compounds comprising sintering a mixture of a sulfide of metal which metal is at least one element selected from Li, Na, Mg, Ca, Sc,

Cr, Mn, Fe, Co, Ni, Cu, Zn, Sr, Y, Pd, Ag, Cd, In, Sn, Ba, La, Pb, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu

5,089,223

FE-CR-NI-AL FERRITIC ALLOYS

Tadashi Hamada, Osaka; Shuji Yamada, Ashiya; Eiji Tsuji, Suita, and Tomoyuki Mizukoshi, Nose, all of Japan, assignors to Matsushita Electric Works, Ltd. and Osaka Prefecture, both of Osaka, Japan

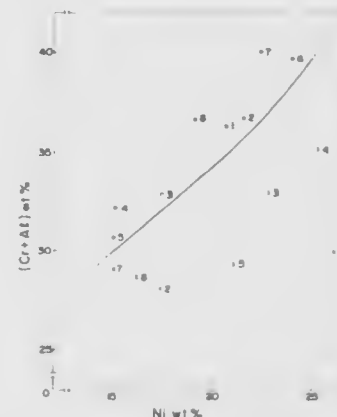
Filed Oct. 29, 1990, Ser. No. 604,231

Claims priority, application Japan, Nov. 6, 1989, 1-289658

Int. Cl.⁵ C22C 38/40, 38/06

U.S. Cl. 420—40

4 Claims



1. An Fe-Cr-Ni-Al ferritic alloy capable of forming an aluminum oxide scale in the surface thereof in hot oxidation environments, said alloy consisting essentially of by weight:

25 to 30 percent chromium;

15 to 25 percent nickel;

4 to 8 percent aluminum;

0.05 to 1.0 percent at least one element selected from the group consisting of zirconium, hafnium, cerium, lanthanum, neodymium, gadolinium; not more than 0.1 percent yttrium; and

balance iron, wherein the alloy has a content ratio (chromium and aluminum) to nickel above the solid line of FIG. 2.

5,089,224

RESULPHURIZED AUSTENITIC STAINLESS STEEL WITH IMPROVED MACHINABILITY

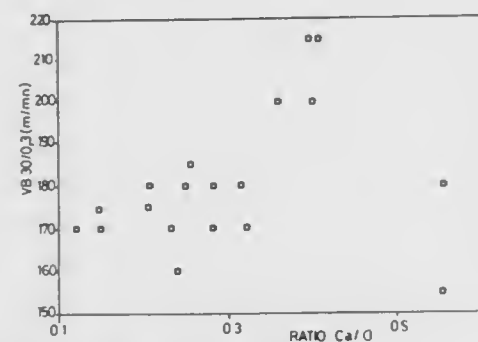
Olivier Bletton, Ugine; Roger Duet, Albertville; Marc Henry, and Jean-Yves Cogne, both of Ugine, all of France, assignors to Ugine Savoie, Ugine, France

Filed Jun. 13, 1990, Ser. No. 537,465

Claims priority, application France, Jun. 16, 1989, 89 08060
Int. Cl.⁵ C22C 38/44, 38/60

U.S. Cl. 420—41

8 Claims



1. Resulphurized austenitic stainless steel with improved machinability, wherein its weight composition is the following:
carbon lower than or equal to 0.15%
silicon lower than or equal to 2%
manganese lower than or equal to 2%
molybdenum lower than or equal to 3%
nickel between 7 and 12%
chromium between 15 and 25%
sulphur between 0.10 and 0.4%
calcium higher than $30 \times 10^{-4}\%$
oxygen higher than or equal to $70 \times 10^{-4}\%$
the ratio of the calcium content and of the oxygen content Ca/O being between 0.3 and 0.6.

5,089,225

HIGH-NIOBIUM TITANIUM ALUMINIDE ALLOYS

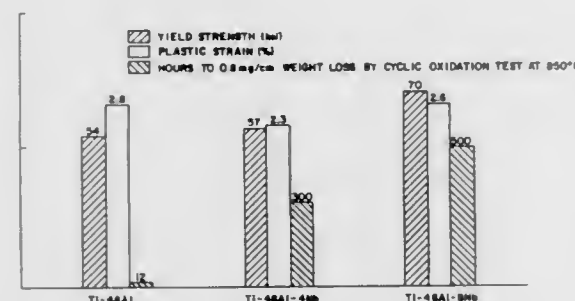
Shyh-Chin Huang, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 445,306, Dec. 4, 1989, abandoned. This application May 2, 1991, Ser. No. 695,043

Int. Cl.⁵ C22C 14/00

U.S. Cl. 420—418

10 Claims



1. An aged niobium modified titanium aluminum alloy, said alloy consisting essentially of titanium, aluminum, and niobium in the following atomic ratio:



said alloy having been prepared by ingot metallurgy.

5,089,226

METHOD FOR PROTECTING AUSTENITIC STAINLESS STEEL-MADE EQUIPMENT FROM OCCURRENCE OF STRESS-CORROSION CRACKINGMitsuhiko Ohashi, and Shuzo Mimaya, both of Okayama, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 4,946, Jan. 20, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 316,579

Claims priority, application Japan, Jan. 20, 1986, 61-8013

Int. Cl.⁵ C23F 11/14

U.S. Cl. 422—16

2 Claims

1. A method of protecting austenitic stainless steel-made equipment exposed to fluid containing sulfides and to temperatures for hydrosulfurization or hydrocracking from the occurrence of stress-corrosion cracking caused by being exposed to polythionic acid formed from sulfide scales, water and oxygen, which comprises washing the equipment with a mineral oil containing at least one compound selected from acid amide compounds, or containing at least one compound selected from acid amide compounds and at least one compound selected from organic amines, wherein the acid amide compound is one selected from acid amide compounds which are reaction products of a higher fatty acid having from 10 to 22 carbon atoms and cyclohexylamine, to prevent the formation of polythionic acid, before the sulfide scales are contacted with oxygen and moisture, said washing to occur while the operation of the equipment is temporarily stopped.

5,089,227

METHODS FOR TREATING HYDROCARBON RECOVERY OPERATIONS AND INDUSTRIAL WATERS

Neil E. S. Thompson, Creve Coeur, and Robert G. Asperger, Des Peres, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

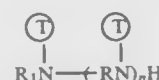
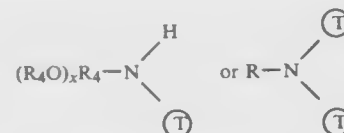
Continuation-in-part of Ser. No. 208,627, Jun. 20, 1988, Pat. No. 4,864,075, which is a continuation-in-part of Ser. No. 7,701, Jan. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 645,740, Aug. 30, 1984, abandoned. This application Jun. 30, 1989, Ser. No. 374,898

Int. Cl.⁵ C23F 11/14

U.S. Cl. 422—16

12 Claims

1. A method of inhibiting corrosion of metals in a system in a medium comprising adding thereto an effective corrosion inhibiting amount of a compound having the formula

wherein T is hydrogen, C(=S)SR₂,

with the proviso that at least two T's are C(=S)SR₂; R is an alkylene having 2–30 carbon atoms; R₁ is hydrogen or an alkyl having 1–30 carbon atoms; R₂ is an alkali metal, an alkaline earth metal, or N(R₃)₄ where R₃ is a lower alkyl; R₄ is C₂–C₄ alkylene; x is an integer of 3–200; and n is an integer of 2–10.

5,089,228

METHOD FOR STERILIZING AND DISPOSING OF INFECTIOUS WASTE

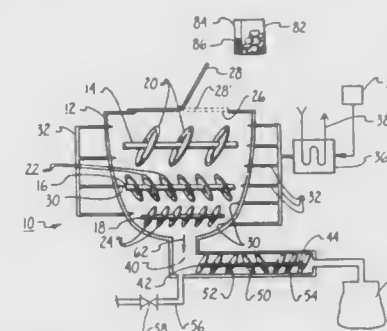
Robert S. Meijer, San Diego, Calif., assignor to Winfield Corporation, San Diego, Calif.

Filed Apr. 19, 1990, Ser. No. 511,275

Int. Cl.⁵ A61L 2/16

U.S. Cl. 422—37

6 Claims



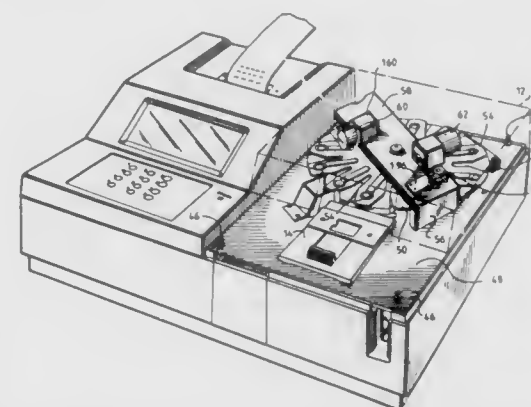
I. A method for disinfecting an infectious waste in an isolated volume, which comprises the steps of:
placing said waste in a first compartment of a mechanically destructible bag;
placing a solid medium having disinfectant constituents into a second compartment of said bag;
sealing said second compartment to prevent communication between said first and second compartments;
placing said bag into said isolated volume;
mechanically destroying said bag to commingle said medium and said waste thereby forming a treatment mixture;
wetting said treatment mixture with an aqueous solvent heated to a predetermined temperature;
dissolving said medium in said solvent to form a treatment solution; and
maintaining said waste in contact with said treatment solution for a predetermined time period.

5,089,229

CHEMICAL ANALYZERThomas Heidt, Long Valley; Henry Will, Dover; Greydon Rhodes, Chester, and Armand Placencia, Hopatcong, all of N.J., assignors to Vetest S.A., Neuchâtel, Switzerland
Filed Nov. 22, 1989, Ser. No. 441,451Int. Cl.⁵ G01N 21/00, 35/00

U.S. Cl. 422—64

5 Claims



1. A chemical analyzer for analyzing reagent test slides onto which a fluid sample is metered, which comprises:
a rotatable turntable, the rotatable turntable being adapted to hold a plurality of test slides in a circular arrangement, the rotatable turntable including a top surface and a peripheral edge, and having formed in the top surface a plurality

of recesses, the recesses being spaced apart from each other circumferentially about the turntable, each recess defining a receiving slot for receiving a test slide;
means for inserting slides onto the rotatable turntable, the slide insertion means being situated adjacent to the circumferential periphery of the rotatable turntable;
means for metering out a predetermined volume of fluid sample and for depositing the predetermined sample volume onto each test slide carried by the rotatable turntable, at least a portion of the same metering and depositing means being positioned in alignment with the test slides carried by the rotatable turntable;
a slide cover, the slide cover being positioned above the rotatable turntable and being at least partially rotatable relative to the turntable to cover and uncover test slides carried by the turntable, the slide cover being mounted on the top surface of the rotatable turntable and concentric therewith, the cover including a plurality of radially extending plate finger members, adjacent plate finger members defining a slot therebetween, each plate finger member including an opening formed through the thickness of said finger member, the slide cover further including a plurality of button members, each button member being at least partially received by a corresponding opening formed in the plate finger members, the slide cover further including means for biasing the button members, the biasing means extending a force on the button members to force the button members into the openings of the plate finger members;
a reflectometer, the reflectometer having a portion which is situated below the rotatable turntable and positioned in alignment with the test slides carried by the turntable, the reflectometer including at least one source of light of a predetermined wavelength, the light source being positioned with respect to the test slides carried by the turntable so as to direct light onto the test slides, and further including at least one light sensor, the light sensor receiving light reflected by the test slides carried by the turntable; and
means for removing test slides carried by the rotatable turntable, the slide removing means being situated in proximity to the rotatable turntable to engage the slides carried by the turntable and remove the slides.

5,089,230

REAGENT REACTOR APPARATUS

Akibiro Kondo, Mukoh; Yoshiyuki Kato, Kyoto; Ikunoshin Kato, Uji, and Hisao Tsuruta, Takatsuki, all of Japan, assignors to Takara Shuzo Co. and Irica Instruments, Inc., both of Kyoto, Japan

Filed Mar. 9, 1990, Ser. No. 491,565

Claims priority, application Japan, Mar. 15, 1989, 1-64377

Int. Cl.⁵ G01N 35/00

U.S. Cl. 422—64

5 Claims

4. A reagent reactor apparatus comprising:

(A)

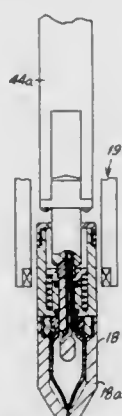
- a sample vial including,
- a containing section having an opening,
- a valve sleeve fixedly connected to the opening of said containing section, part of which consists of a magnetic material,
- a plunger valve fitting within said valve sleeve in cooperative relation therewith so as to penetrate into and withdraw from said containing section and having a fluid introducing port and a fluid discharge port each provided with an outside-connecting opening formed on the upper end face thereof and a containing section-communicating opening formed on the lower section thereof,
- each of said containing section-communicating opening being exposed to said containing section when said plunger valve has penetrated into said containing sec-

tion and the lower end section of said plunger valve engages the entrance of said containing section when said plunger valve has withdrawn, and

a retaining spring for retaining said plunger valve in the withdrawn position within said valve sleeve so as to seal said containing section by forcing said each containing section-communicating opening to be positioned outside said containing section, and within said valve sleeve and

(B)

- a movable nose assembly including,
- a downward sleeve provided with a solenoid for selectively applying a magnetic attraction to a magnetic material mounted on said valve sleeve of said sample vial,
- a nose main body held in said downward sleeve at a predetermined position thereof, the lower end of said nose main body contacting the upper end face of said plunger valve of said sample vial to such an extent as to press or said plunger valve downward slightly when said downward sleeve located directly above said sample vial is in a level from which said solenoid is capable of applying a magnetic force to said magnetic material, said nose main body being provided with a fluid supply passage and a fluid discharge passage each communicating with said respective outside-connecting openings of said fluid introducing port and said fluid discharge port



formed in said plunger valve when said bottom thereof contacts said plunger valve or the conic projecting surface thereof, and

- a movable holding member for holding said downward sleeve which holds said nose main body at said predetermined position thereof, said movable holding member allowing said downward sleeve and said nose main body to vertically move between the lowermost position in which said downward sleeve and said nose main body press downward said plunger valve of said sample vial to said position at which each of said containing section-communicating openings is exposed to said containing section when the lower end face of said nose main body contacts the top face of said plunger valve and the uppermost position in which said downward sleeve and said nose main body lift said sample vial by at least the whole length thereof with said solenoid magnetically attracting said magnetic material thereto, so that said movable nose is capable of accomplishing said lifting of said sample vial; and
- wherein said fluid supply passage of said nose is selectively connected to a reagent supply source or an inert gas source and said fluid discharge passage of said nose is connected to a fluid sucking means so as to perform a process for sequentially injecting reagents into said sample vial and allowing reactions of said reagents according to a sequence program.

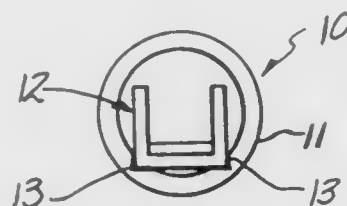
5,089,231 SAMPLE PLATFORM FOR STABILIZED TEMPERATURE PLATFORM FURNACE

Edmund D. Putnam, III, Seward, Ill., assignor to Olin Corporation, Cheshire, Conn.

Filed Mar. 5, 1990, Ser. No. 488,555
Int. Cl.⁵ G01N 31/12; G01J 3/42

U.S. Cl. 422—80

6 Claims



1. A graphite tube assembly having a sample-holding platform in combination with an atomic absorption spectroscopic furnace wherein the platform is inserted within the graphite tube atomic absorption spectroscopic furnace, the furnace having a tube with an inlet for insertion of the sample-holding platform and at least one orifice through which a liquid sample is introduced and then vaporized for analysis by atomic absorption spectroscopy, the improvement comprising the sample-holding platform having:

- an elongated base portion having a top surface constructed so as to receive a low surface tension liquid sample and an opposing bottom surface, parallel first and second longitudinally extending sides, and first and second opposing end sides the parallel first and second opposing end sides intersecting the parallel first and second longitudinally extending sides;
- the parallel first and second longitudinally extending sides comprising first and second longitudinally extending sidewalls the first and second side walls constructed so as to extend a first distance above the elongated base portion; and
- the first and second opposing end sides further comprising first and second opposing low end walls the first and second end walls constructed so as to extend a second distance above the elongated base portion such that the second distance is less than the first distance, the sidewalls, end walls and top surface of the elongated base portion forming a confined area immediately above the top surface of the elongated base portion within which is contained a concentrated atmosphere of the vaporized liquid sample for atomic absorption spectroscopy.

5,089,232 APPARATUS FOR MEASURING THE CONCENTRATION OF GASEOUS AND/OR VAPOROUS COMPONENTS OF A GAS MIXTURE

Wolfgang May, Reinfeld, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jan. 24, 1990, Ser. No. 469,394

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1989, 3902402

Int. Cl.⁵ G01N 21/00, 31/22, 1/48

U.S. Cl. 422—83

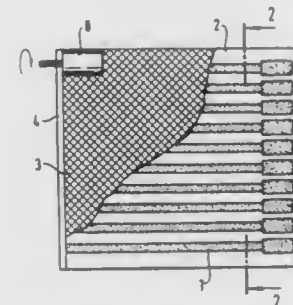
23 Claims

1. An apparatus for measuring the concentration of the gaseous and/or vaporous components of a gas mixture, the apparatus comprising:

- a carrier;
- a plurality of through-flow channels extending over substantially the entire length or width of the carrier and being formed on said carrier so as to permit parallel flows of a gas mixture therethrough;
- a substance disposed in said through-flow channels for reacting with any components to be measured to thereby define

a reaction zone which can be visually monitored for changes therein;

said through-flow channels having respective longitudinal inlet ends for admitting a gas mixture and respective longitudinal outlet ends for permitting the gas mixture to pass out of said through-flow channels;



first removable closure means for closing off said inlet ends until removed preparatory for making a measurement of a gas mixture; and,

second removable closure means for closing said outlet ends until removed preparatory for making a measurement of a gas mixture.

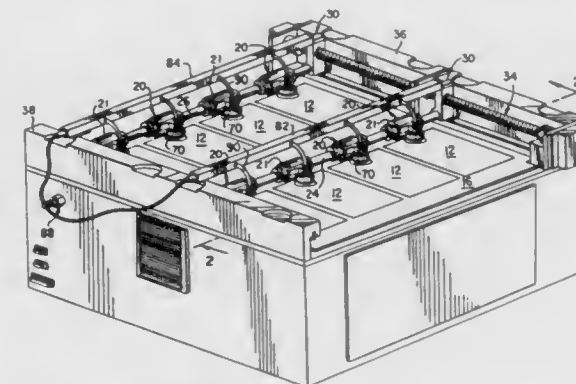
5,089,233 PROCESSING APPARATUS FOR A CHEMICAL REACTION PACK

Mark J. DeVaney, Jr.; John S. Lercher, and Jeffrey A. Wellman, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 365,079, Jun. 12, 1989, abandoned. This application Dec. 18, 1989, Ser. No. 452,666
Int. Cl.⁵ B01L 9/00

U.S. Cl. 422—99

10 Claims



1. A processing apparatus for transferring a liquid between chambers of a chemical reaction pack having blister-like chambers formed therein, comprising:

- a support surface for supporting a chemical reaction pack in a substantially horizontal plane;
- pressure applicators supported above said support surface for acting on said reaction pack to transfer fluid between adjacent chambers;
- means for operating said pressure applicators through a range of movement extending across said reaction pack, said operating means comprising a shaft having said pressure applicators arranged thereon and which advances said pressure applicators across the support surface while maintaining a substantially constant orientation between said pressure applicators and said support surface; and
- temperature-control elements movable with said pressure applicators and operable upon said reaction pack.

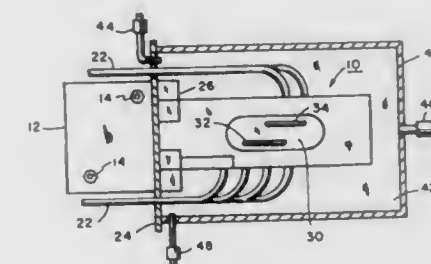
5,089,234 CONTROLLED ENVIRONMENT LIQUID DILUTING AND TRANSFER VALVE ASSEMBLY

Charles R. Preston, Quakertown, Pa., assignor to Serono-Baker Diagnostics, Inc., Allentown, Pa.

Filed Aug. 9, 1989, Ser. No. 391,878
Int. Cl.⁵ B01L 1/00

U.S. Cl. 422—103

10 Claims



1. In a liquid diluting and transfer valve assembly which includes at least a pair of valve elements with slidably engaged surfaces which are frictionally movable relative to each other with an interface therebetween, said valve elements having passageways therein for communication of liquid being measured and transferred in said assembly, wherein the passageways in one of said valve elements are capable of being selectively brought into fluid communication with the passageways in the other of said valve elements at the interface of said engaged surfaces, the improvement comprising an enclosure completely surrounding and enclosing valve elements for retaining a stabilizing fluid therein so as to inhibit evaporation of and dilute seepage of liquids between engaged surfaces to prevent buildup of contamination therebetween.

5,089,235 CATALYTIC CRACKING UNIT WITH EXTERNAL CYCLONE AND OIL QUENCH SYSTEM

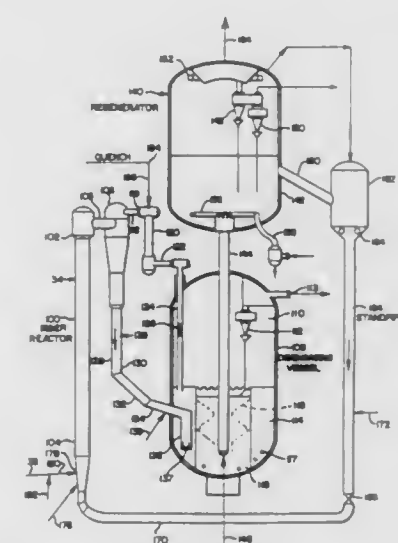
John G. Schwartz; F. William Hauschildt, both of Naperville; George E. Quinn, Winfield, and John M. Forgac, Elmhurst, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 26, 1990, Ser. No. 499,044

Int. Cl.⁵ F27B 15/12, 15/14, 15/16; B01J 8/18

U.S. Cl. 422—144

9 Claims



1. A catalytic cracking unit, comprising:
a catalytic cracker reactor for producing a stream of catalytically cracked oil containing particulates of coked catalyst;
an external gross cut separator positioned externally down-

stream, outwardly of, and communicating with said catalytic cracker for making a gross cut separation of said coked catalyst particulates from said catalytically cracked oil;

a disengager comprising an upright disengaging vessel with at least one internal cyclone for removing a substantial amount of remaining coked catalyst particulates from said catalytically cracked oil;

a product stream line extending between, connecting and in fluid communication with said external gross cut separator and said disengager for passing said catalytically cracked oil from said external gross cut separator to said disengager; and

a quench injector connected to and in fluid communication with said product stream line at a location between said gross cut separator and said disengaging vessel for injecting a quench into said catalytically cracked oil in said product stream line to substantially decrease thermal cracking of said catalytically cracked oil in said product stream line and said disengaging vessel.

5,089,236

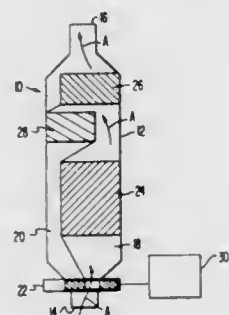
VARIABLE GEOMETRY CATALYTIC CONVERTER
James C. Clerc, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 19, 1990, Ser. No. 467,165

Int. Cl.⁵ F01N 3/10, 3/24

U.S. Cl. 422-177

19 Claims



11. A system for reducing detectable hydrocarbons in the exhaust of a diesel engine and for retarding the formation of sulfate comprising;

a housing having an inlet and an outlet;

a first exhaust gas flow passage extending from said inlet to said outlet within said housing;

a first exhaust gas treatment means positioned within said first flow passage for reducing the hydrocarbon in the exhaust gas and for retarding the formation of sulfate under low exhaust gas temperature conditions;

a second exhaust gas flow passage fluidically separate from said first exhaust gas flow passage and extending from said inlet to said outlet within said housing;

a second exhaust gas treatment means positioned within said second flow passage for reducing the hydrocarbon in the exhaust gas and for retarding the formation of sulfate under high exhaust gas temperature conditions;

an exhaust gas flow directing means for directing the flow of the exhaust gas exclusively through said first passage in a first mode of operation and for directing the flow of exhaust gas exclusively through said second flow passage in a second mode of operation; and

a control means for controlling the mode of operation of said flow directing means in response to exhaust gas temperature;

wherein said exhaust gas flow directing means is caused to operate in said first mode under low exhaust gas temperature conditions and in said second mode high exhaust gas temperature conditions.

5,089,237
GAS FILTER WITH CATALYTIC COATING AND A GASTIGHT DOWNSTREAM REGION
Hans-Dieter Schuster, Vogstweien; Friedhelm Nunnemann, Winnenden; Hans-Joachim Langer, Remseck; Erwin Strohmmer, Berglen, and Gerd Tiefenbacher, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

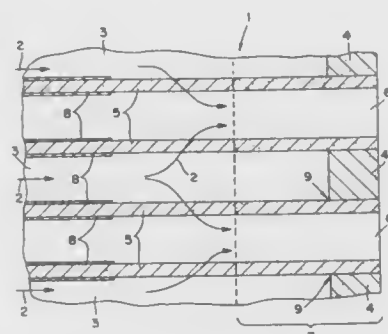
Filed Jun. 29, 1990, Ser. No. 545,710

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1989, 3923985

Int. Cl.⁵ B01D 50/00; B01J 8/02

U.S. Cl. 422-180

8 Claims



1. Soot burn-off filter comprising a monolithic filter block made of porous ceramic with a multiplicity of channels which extend in the direction of flow of the exhaust gases of a combustion engine, are sealed alternately at the ends by plugs and are separated from one another by partition walls that have an upstream region and a downstream region, the upstream region of the partition walls being porous, the partition walls being provided with a catalytic coating, wherein the downstream region of the partition walls at the downstream end of the filter are gastight such that neither a flow of exhaust gas nor abrasive particles carried along in the flow of exhaust gas occurs in the downstream region, and wherein the downstream region of the partition walls is free of the catalytic coating.

5,089,238
METHOD OF FORMING A TEMPERATURE PATTERN OF HEATER AND SILICON SINGLE CRYSTAL GROWTH CONTROL APPARATUS USING THE TEMPERATURE PATTERN

Kenji Araki; Akiho Maeda, both of Takehu, and Masahiko Baba, Annaka, all of Japan, assignors to Shin-Etsu Handotai Company, Limited, Tokyo, Japan

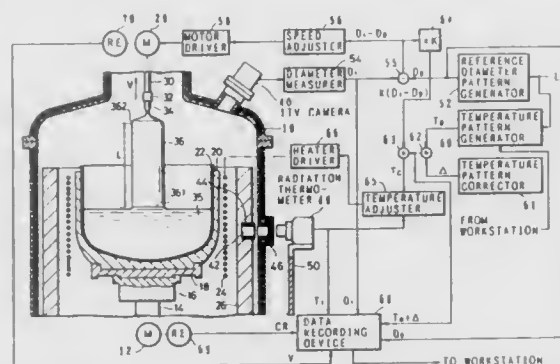
Filed Oct. 22, 1990, Ser. No. 601,096

Claims priority, application Japan, Oct. 20, 1989, 1-237517

Int. Cl.⁵ C30B 15/28

U.S. Cl. 422-249

8 Claims



1. A method of forming a temperature pattern comprising:
(1) automatically collecting operational data from a control

apparatus for pulling a Si single crystal up from Si molten liquid melt by a heater in a crucible, said apparatus comprising:

a device for taking a picture of the vicinity of a growing portion of said Si single crystal and outputting image signals;

a device for processing the image signals and measuring a diameter D_i of said growing portion;

means for setting a reference pattern $D_0(X)$ of the diameter as a function of a pull-up distance X of said Si single crystal from a certain growth point;

a motor for pulling said Si single crystal up;

means for controlling a rotational speed of said motor so that a deviation of the diameter approaches zero;

means for detecting a temperature T_1 representative of the temperature of said heater;

means for setting a temperature pattern $T_D(X)$ as a function of the pull-up distance X ;

means for outputting the sum of a value related to the diameter deviation and an output value of said temperature pattern setting means as the reference temperature;

means for controlling electric power supplied to said heater so that the detected temperature approaches to a reference temperature; and

means for detecting a rotational speed CR_1 of said crucible;

(2) storing the collected data and data related to the quality of said Si single crystal in a memory device;

(3) retrieving data similar to the quality of a Si single crystal to be produced from the stored data by using a computer;

(4) displaying the retrieved data on a screen of a display unit and selecting data which seem to be most similar from displayed data;

(5) displaying details of the selected data in a graph on the screen for setting a temperature pattern; and

(6) setting the temperature pattern while watching said setting screen.

5,089,239

WIRE VIBRATION PREVENTION MECHANISM FOR A SINGLE CRYSTAL PULLING APPARATUS

Koji Mizuishi; Isamu Harada, both of Annaka; Yasushi Nakamura, Tomioka; Michiaki Oda, Annaka; Seiichi Ohtsuka, Tomioka; Yoshihiro Hirano, Annaka, and Masahiko Urano, Takasaki, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

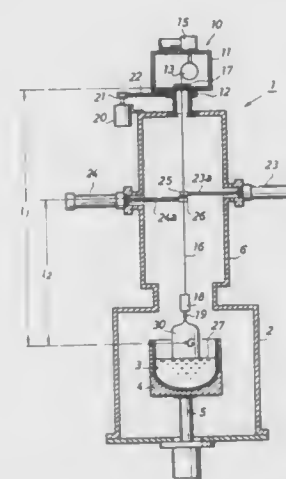
Filed Apr. 17, 1990, Ser. No. 509,846

Claims priority, application Japan, Apr. 18, 1989, 1-96304; Apr. 26, 1989, 1-48205[U]

Int. Cl.⁵ B01J 17/10

U.S. Cl. 422-249

3 Claims



1. In a Czochralski-type single crystal pulling apparatus, which has a lower heating chamber and an upper pull cham-

ber, and is adapted to obtain a single crystal ingot by pulling up a seed crystal fixed at the lower end of a wire from a polycrystalline molten liquid contained in a crucible provided in the heating chamber, an improved wire vibration prevention mechanism comprising:

at least one wire restriction means provided in the pull chamber for singly or cooperatively restricting the wire to moving in the vertical direction at the restricted portion which is about the middle of the initial free length of the wire; and

as many drive means as the wire restriction means for horizontally displacing the restrictive wire restriction means, said drive means comprising air cylinders.

5,089,240

CATALYTIC LENS STERILIZING SYSTEM

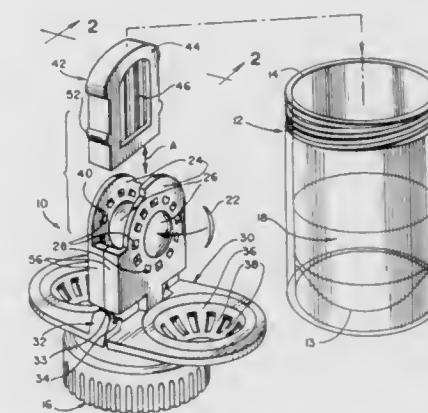
Steven C. Perlaky, Mobile, Ala., assignor to Ciba Vision Corporation, Atlanta, Ga.

Filed Aug. 22, 1990, Ser. No. 570,900

Int. Cl.⁵ A61L 02/00

U.S. Cl. 422-300

27 Claims



1. An appliance for use in sterilizing contact lenses, comprising:

a) a reaction vessel for containing contact lenses in sterilizing contact with hydrogen peroxide solution;

b) a first catalytic element for decomposing a portion of an initial concentration of a hydrogen peroxide solution during said lens sterilization;

c) a second catalytic element effective for comparatively accelerating decomposition, relative to said first catalytic element, of the reduced concentration of hydrogen peroxide in said solution resulting from said partial decomposition of said initial hydrogen peroxide concentration, in order to achieve sufficiently reduced terminal hydrogen peroxide concentration at completion of said sterilization, for safe contact by the eyes of a wearer with residues of hydrogen peroxide at said terminal concentration adhering to said sterilized contact lenses.

5,089,241

PROCESS FOR CONVERTING HEXAFLUOROARSENIC ACID OR ANY SALT THEREOF TO ARSENIC ACID OR SALT THEREOF WHICH CAN THEN BE RENDERED NONHAZARDOUS

Robert A. Smith, Kinnelon, N.J.; Douglas G. Frick; Charles L. Redmon, both of Orchard Park, N.Y., and Somanahalli N. Subbanna, East Amherst, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 20, 1990, Ser. No. 633,652

Int. Cl.⁵ C10B 7/19; C01G 28/00

U.S. Cl. 423-87

51 Claims

1. A process for converting hexafluoroarsenic acid or salts

1. A process for the production of zirconium-doped pseudoboehmite, comprising adding a zirconium salt to an aqueous aluminum sulfate solution, feeding the resulting mixture simultaneously with sodium aluminate solution into a pool of water having a temperature of 50° C. to 100° C., thereby precipitating zirconium-doped pseudoboehmite as a zirconium-doped alumina gel while maintaining a pH of 3.5 to 8 in said pool to form a suspension; adjusting the pH of the suspension after the feeding of the aluminum sulfate solution to 8.5 to 10.5 by further addition of sodium aluminate, filtering the formed pseudoboehmite to obtain a filter cake, and washing the filter cake with water.

5,089,248

PRODUCTION OF METALLIC OXIDES

Masud Akhtar, 8 Wexford Dr., Lawrenceville, N.J. 08648
Filed May 14, 1990, Ser. No. 523,326Int. Cl.⁵ C01G 1/02

U.S. Cl. 423—604

14 Claims

1. A method of preparing metallic oxides, consisting essentially of:

- providing a solution of a metallic compound with a metallic component selected from lithium, silver, zinc, indium, tin, zirconium, molybdenum, iridium and nickel in an anhydrous solvent;
- reacting said compound with an organodisiloxane; whereby said organodisiloxane reacts with the metallic compound to deposit a metallic oxide; and
- recovering said metallic oxide.

5,089,249

CONJUGATES FOR BONE IMAGING AND BONE CANCER THERAPY

Alan R. Fritzberg, Edmonds; Jean-Luc E. Vanderheyden, Seattle; Sudhakar Kasina, Kirkland, and Jeffrey N. Fitzner, Seattle, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 205,156, Jun. 10, 1988, abandoned. This application Jun. 16, 1988, Ser. No. 207,686

Int. Cl.⁵ A61K 49/02; C07F 13/00

U.S. Cl. 424—1.1

8 Claims

1. A radiometal conjugate of a chelate attached to targeting agent that is capable of associating with calcified tissue, wherein said chelate is formed from a chelating compound selected from the group consisting of N₂S₂, N₃S, N₂S₃, N₂S₄ and N₃S₃, said nitrogen and sulfur atoms as donor atoms to which a radionuclide metal or radionuclide metal oxide is bound, and wherein said chelate does not function as said targeting agent.

5,089,250

COSMETIC CONTAINING BENZOTRIAZOLE DIORGANOPOLYSILOXANES

Serge Forestier, Claye-Souilly; Gérard Lang, Saint-Gratien; Hervé Richard, Paris, and Jean C. Grognet, Montlognon Senlis, all of France, assignors to L'Oreal, Paris, France
Filed Feb. 13, 1990, Ser. No. 479,478

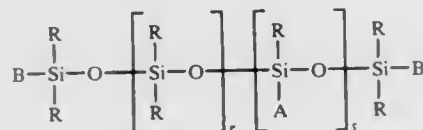
Claims priority, application France, Feb. 15, 1989, 89 01990

Int. Cl.⁵ A01N 25/02; A61K 7/42

U.S. Cl. 424—43

13 Claims

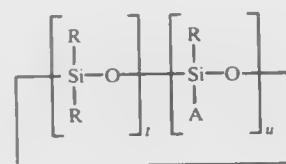
1. A cosmetic composition which comprises at least one cosmetically acceptable solvent, at least one cosmetic additive selected from thickeners, softeners, moisturizers, surfactants, preservatives, anti-foaming agents, perfumes, oils, waxes, lanolin, propellants, dyes and pigments, and an effective quantity for protecting the skin and hair against UV radiation in the range of 280 to 360 nm wavelengths of at least one benzotriazole diorganopolysiloxane having the formula:



wherein:

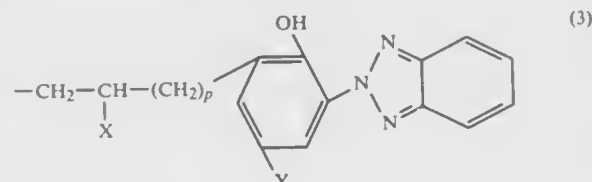
R may be the same for each occurrence or different and is selected from C₁-C₁₀ alkyl radicals, phenyl radicals and 3,3,3-trifluoropropyl radicals, at least 80% by number of the R radicals being methyl radicals,
B may be the same for each occurrence or different and is selected from radicals R and A,
r is a number between 0 and 200 inclusive,

s is a number between 0 and 50 inclusive and if s is 0 at least one of the two B radicals is A;
or the formula:



wherein:

R has the meaning defined for formula (1),
u is a number between 1 and 20 inclusive,
t is a number between 0 and 20 inclusive,
t+u is greater than or equal to 3;
and wherein in both formulae the symbol A denotes a radical having the formula:



wherein:

X represents a hydrogen atom or a C₁-C₄ alkyl radical,
p represents a whole number between 1 and 10, and
Y represents a hydrogen atom or a C₁-C₈ alkyl radical.

5,089,251

AROMATIC DERIVATIVES AND THEIR USE AS ANTIMICROBIAL AGENTS

Madeleine Mossé, Montpellier, and Vincenzo Proietto, Saint-Georges d'Orques, both of France, assignors to Sanofi, Paris, France

Division of Ser. No. 178,327, Apr. 6, 1988, Pat. No. 4,916,156.

This application Jan. 24, 1990, Ser. No. 469,166

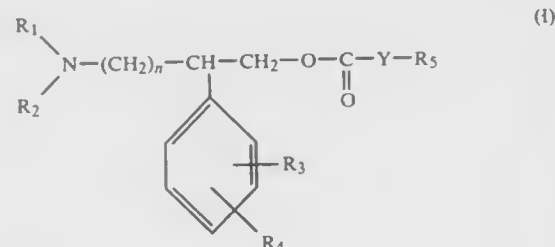
Claims priority, application France, Apr. 10, 1987, 87 05165

Int. Cl.⁵ A01N 43/84; C07D 295/108

U.S. Cl. 424—47

10 Claims

1. A compound of the formula:



(1) in which:

n is an integer between 2 and 10;

R₁ and R₂, together with the nitrogen atom to which they are bonded, form a heterocycle selected from pyrrolidin-1-yl, piperidino, azepin-1-yl, hexamethyleneimino, 4-methylpiperidino, 4-benzylpiperidino, 4-phenylpiperidino, 1,2,3,4-tetrahydroisoquinol-2-yl, morpholino and imidazol-1-yl groups;

R₃ represents a hydrogen, a halogen, a methyl or a phenyl;
R₄ represents a hydrogen, a halogen or a methyl; or R₃ and R₄, taken together with the benzene ring to which they are bonded, form a naphth-1-yl or naphth-2-yl group;

Y represents a direct bond, a methyleneoxy group, a methylenedioxy group or a vinylene group; and

R₅ represents an alkyl containing from 5 to 18 carbon atoms,

a cycloalkyl containing from 3 to 8 carbon atoms, an adamantyl, naphth-1-yl or naphth-2-yl group, an unsubstituted phenyl group or a phenyl group substituted by one or 2 substituents selected from halogen, trifluoromethyl, nitro and phenyl;

or a salt thereof with a mineral or organic acid.

5,089,252

COSMETIC COMPOSITION FOR TREATING KERATIN FIBRES, AND PROCESS FOR TREATING THE LATTER

Jean F. Grollier, Paris, and Claude Dubief, Versailles, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 902,670, Sep. 2, 1986, which is a continuation of Ser. No. 457,267, Jan. 11, 1983, abandoned. This application Aug. 30, 1989, Ser. No. 400,696

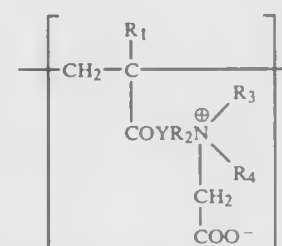
Claims priority, application Luxembourg, Jan. 15, 1982, 83876

Int. Cl.⁵ A61K 7/06, 7/15, 9/12, 31/74

U.S. Cl. 424—47

21 Claims

1. A composition for the treatment of hair to improve the liveliness, shine, body, stiffness, and combout properties of the hair and to impart softness to the hair, said composition comprising, in a solvent medium, at least one amphoteric polymer of betainised dialkylaminoalkyl (meth) acrylate or dialkylaminoalkyl (meth) acrylamide containing units of the formula:



in which R₁ denotes a hydrogen atom or a methyl group, R₂ denotes an alkylene group having 1 to 4 carbon atoms, Y denotes O or NH and R₃ and R₄ independently denote a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms and at least one cationic surface-active agent selected from the group consisting of quaternary ammonium salts, an alkylamine acetate, alkylamine hydrochloride, an alkylamidodiethylamine that is soluble on neutralisation, a fatty diamine giving rise to a soluble salt, a condensation product of a fatty acid with hydroxyethylethylenediamine, an ethylhydroxymethylalkylloxazoline and a cationic protein hydrolysate.

5,089,253

HAIR CARE COMPOSITIONS CONTAINING LOW STRENGTH ELASTOMERS

Daniel J. Halloran, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 20, 1990, Ser. No. 569,785

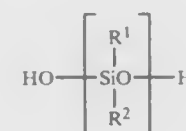
Int. Cl.⁵ A61K 7/09

U.S. Cl. 424—47

18 Claims

1. In a hair treating method for imparting curl retention to hair in which at least one film forming ingredient is applied to the hair, the improvement consisting essentially of applying to the hair a mixture of:

(A) a silanol-end-blocked polydiorganosiloxane fluid represented by the formula

wherein R¹ and R² are independently selected from the

group consisting of hydrogen, alkyl, alkenyl, aryl, alkyl-aryl, aralkyl and organo-modified alkyl and aryl groups having 1 to 22 carbon atoms; n is an integer from 5 to 15,000;

(B) an organosilicon crosslinking agent; and

(C) a low molecular weight carrier; curling the mixture by contact with moisture to form an unfilled low strength silicon elastomer and utilizing the elastomer as the film forming ingredient.

5,089,254

ORAL COMPOSITIONS

Bryony E. Coulson, Port Sunlight, Great Britain, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jan. 8, 1991, Ser. No. 638,716

Claims priority, application United Kingdom, Jan. 8, 1990, 9000354

Int. Cl.⁵ A61K 7/16, 7/18

U.S. Cl. 424—52

1 Claim

1. An oral composition in the form of an aqueous toothpaste for combating dental caries, comprising from about 50 to about 5,000 ppm of a fluorine-containing anti-caries agent selected from the group consisting of sodium fluoride and sodium monofluorophosphate and from about 1-50% by weight of a particulate hydroxyapatite abrasive material wherein the surface of said hydroxyapatite material has been pretreated prior to incorporation into the composition with compounds which block the hydroxy groups, present at the surface of said hydroxyapatite, said compounds being selected from the group consisting of sodium hydroxide, sodium fluoride, tetrasodium pyrophosphate, sodium trimetaphosphate, sodium chloride, sodium carbonate and sodium bicarbonate.

5,089,255

DENTAL REMINERALIZATION

Abdul Gaffar, Princeton; James Mellberg, Pottersville, and John Blake-Haskins, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 371,145, Jun. 26, 1989, abandoned.

This application Jan. 25, 1991, Ser. No. 649,208

Int. Cl.⁵ A61K 7/16, 7/18

U.S. Cl. 424—52

6 Claims

1. A method of remineralizing demineralized portions of tooth structures of caries-troubled consumers comprising applying to such portions a non-astringent oral dentifrice composition in the form of a toothpaste or gel containing, approximately by weight, 10% to 20% of xylitol and at least one fluoride ion-providing compound in a total amount sufficient to provide 150 ppm to 1800 ppm of fluoride ions, with sodium fluoride providing the sole or a predominant portion of such fluoride ions, said composition being free of significant amounts of astringent zinc salts which react with, complex, or precipitate xylitol and sodium fluoride, the amounts of xylitol and fluoride ion-providing compounds employed in the composition providing in combination substantially better remineralizing effects than those provided by the individually employed xylitol and fluoride ion-providing compounds.

5,089,256

PROCESS FOR PREPARING SOLID POWDER FORMULATIONS HAVING DIFFERENT COLORS

Hans U. Scheller, and Karl A. Scheller, both of Eisligen/Fils, Fed. Rep. of Germany, assignors to Württembergische Parfümerie-Fabrik GmbH, Eisligen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 388,558, Nov. 18, 1988,

abandoned. This application Jan. 12, 1989, Ser. No. 296,027

Claims priority, application European Pat. Off., Aug. 5, 1986, 86/110823

Int. Cl.⁵ A61K 7/03; B65D 81/32

U.S. Cl. 424—63

20 Claims

1. A process for preparing a container which comprises

separate compartments containing powder formulations of different colors, said process comprising:

- (I) injecting a separating bridge into the container such that said separating bridge forms a first and a second compartment in the container wherein each of said first and second compartments are separated by said separating bridge, said separating bridge comprising a paste composition which comprises:
 - (a) from 0 to % by weight of a nonhygroscopic flowable organic solid having a particle size of from 5 to 50 μm as a filler;
 - (b) a fatty acid, a derivative thereof or a wax;
 - (c) a colored or color-neutral pigment or pearlescent pigment; and
 - (d) an evaporable non-toxic hydrophobic solvent;
- (II) pouring a first powder formulation in said first compartment and a second powder formulation in said second compartment, said first powder formulation having a different color than said second powder formulation; and
- (III) evaporating the excess of said solvent.

5,089,257

PREPARATION FOR THE SIMULTANEOUS COLORING, WASHING, AND CONDITIONING OF HUMAN HAIR

Dieter Schrader, Duesseldorf, and Peter Flemming, Oberhausen-Sterkrade, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 745,599, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 581,662, Feb. 21, 1984, abandoned, which is a continuation of Ser. No. 288,768, Jul. 31, 1981, abandoned. This application Sep. 18, 1989, Ser. No. 408,986

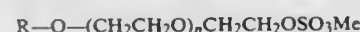
Int. Cl.⁵ A61K 7/075, 7/13

U.S. Cl. 424—70

6 Claims

1. An aqueous preparation for the simultaneous coloring, washing, and conditioning of human hair after addition of oxidizing agent, which consists essentially of:

- (a) from about 0.02 to 5 percent by weight, based upon the total weight of the preparation, of coupler-developer oxidation coloring agent comprising at least one coupler selected from the group consisting of resorcinol, 2-methylresorcinol, α -naphthol, 2,7-dihydroxynaphthalene, pyrocatechin, hydroquinone, 1,5-dihydroxynaphthalene, m-phenylenediamine and derivatives thereof, m-amino-phenyl, m-tolylene-diamine, 2,4-diaminobenzene, and 2,6-diaminopyridine and at least one developer selected from the group consisting of p-phenylene diamine, p-tolylene diamine, o-phenylene diamine, o-tolylene diamine, p-aminophenol, p-aminodiphenylamine, o-aminophenyl, 2,4,5,6-tetraamino-pyrimidine, 4-aminopyrazolone derivatives, and heterocyclic hydrazones;
- (b) from about 0.5 to 4 percent by weight, based upon the total weight of the preparation, of the reaction product of hydroxyethyl cellulose with the reaction product of equimolar amounts of epichlorohydrin and trimethylamine per substituted anhydroglucose unit;
- (c) from about 1 to 25 percent by weight, based upon the total weight of the preparation, of an anionic surfactant of the sulfonate, sulfate, or synthetic carboxylate type selected from the group consisting of alkylbenzene sulfonates (C₉₋₁₅-alkyl); mixtures of alkene and hydroxyalkene sulfonates; esters of α -sulfofatty acids; sulfuric acid monoesters of primary and secondary alcohols; sulfated fatty acid alkanolamides; sulfated fatty acid-mono-glycerides; sulfated reaction products of 1 to 4 mols of ethylene oxide with primary or secondary fatty alcohols or alkyl phenols; fatty acid esters or fatty acid amides of hydroxycarboxylic acids, aminocarboxylic acids, or aminosulfonic acids; and fatty alcohol ether sulfates of the formula



wherein R represents an alkyl of from about 10 to 16 carbon atoms, n is an integer of from 1 to 3, and Me represents a salt-forming base; and

- (d) from about 1 to 5 percent by weight, based upon the total weight of the preparation, of an amphoteric or zwitter-ionic surfactant containing both acid groups, selected from the group consisting of carboxyl, sulfo, sulfuric half ester, phosphono, and phosphonic acid ester groups, and basic groups, selected from the group consisting of amino, imino, ammonium, quaternary ammonium, quaternary phosphonium, and tertiary sulfonium compounds, the weight ratio of component (c) to component (d) being from about 5:1 to 1:1, no anionic polymer being present.

5,089,258

COMPOSITION AND METHOD FOR ABSORBING ODORS USING CITRIC ACID AND CITRATE

Najib H. Zaid, Sterling, Kans., assignor to Jacam Chemical Partners, Ltd., Sterling, Kans.

Continuation-in-part of Ser. No. 594,291, Oct. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 481,289, Feb. 2, 1990, abandoned. This application Jan. 28, 1991, Ser. No. 646,521

Int. Cl.⁵ A61K 31/19, 7/32, 9/14; A61L 9/01

U.S. Cl. 424—76.1

11 Claims

1. A method of reducing odors from a substrate or region exhibiting such odors, said method comprising the steps of providing an odor-reducing composition in particulate form and consisting essentially of from about 0.1 to 30% by weight citric acid and at least about 50% by weight of a monovalent salt of citric acid, and contacting said particulate composition with said substrate or region for odor reduction.

5,089,259

STABLE CONCENTRATES AND EMULSIONS OF WATER-INSOLUBLE ORGANIC PESTICIDES

Ritchie A. Wessling, Berkeley, Calif.; Dale M. Pickelman, Auburn, Mich., and Dennis G. Wujek, Midland, Mich., assignors to Dow Elanco, Indianapolis, Ind.

Continuation-in-part of Ser. No. 286,569, Dec. 19, 1988, abandoned. This application Aug. 30, 1989, Ser. No. 400,418

Int. Cl.⁵ A61K 31/74, 31/78; A01N 27/00, 29/00

U.S. Cl. 424—497

15 Claims

1. A stable aqueous emulsion formulation of a water-insoluble organic pesticide said emulsion comprising

- (1) from about 1 part to about 10 parts by weight of a water-insoluble organic pesticide and from about 50 parts to about 1 part by weight of
- (2) a water based structured particle latex compatible with the pesticide and which is composed of nonionic polymer particle cores to which is bound a stabilizing layer containing stabilizing pH independent ionic groups chemically bound at or near the surface of the polymer particle cores and
- (3) water.

5,089,260

METHOD OF TREATING ISCHEMIC TISSUE

Robert L. Hunter, Tucker, and Alexander Duncan, Dunwoody, both of Ga., assignors to Emory University, Atlanta, Ga.

Continuation of Ser. No. 403,017, Sep. 5, 1989, abandoned, which is a continuation of Ser. No. 303,791, Jan. 30, 1989, abandoned, which is a division of Ser. No. 45,459, May 7, 1987, Pat. No. 4,801,452, which is a continuation-in-part of Ser. No. 43,888, Apr. 29, 1987, abandoned, which is a continuation of Ser. No. 863,582, May 15, 1986, abandoned. This application May 11, 1990, Ser. No. 522,193

Int. Cl.⁵ A61K 31/745

U.S. Cl. 424—78.38

9 Claims

1. A method of treating tissue damaged by ischemia in an animal or human comprising the step of injecting into the

animal or human with the tissue damaged by ischemia an effective amount of a solution of a surface-active copolymer with the following general formula:



wherein a is an integer such that the hydrophobe represented by (C₃H₅O) has a molecular weight of approximately 950 to 4000 and b is an integer such that the hydrophile portion represented by (C₂H₄O) constitutes from approximately 50% to 90% by weight of the compound.

5,089,261

PREPARATION OF A POLYMER/INTERLEUKIN-2 CONJUGATE

Danute E. Nitecki, Berkeley; Nandini Katre, El Cerrito; Robert J. Goodson, Albany, and Lois Aldwin, San Mateo, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 299,235, Jan. 23, 1989, Pat. No. 4,902,502. This application Sep. 29, 1989, Ser. No. 415,046

Int. Cl.⁵ A61K 31/745, 45/05; C07K 17/00

U.S. Cl. 424—85.2

11 Claims

1. A pharmaceutically and therapeutically useful protein comprising a PEG or a polyoxyethylated polyol IL-2 conjugate made by contacting a PEG or a polyoxyethylated polyol, which has at least one hydroxyl group, with a chloroformate under the appropriate reaction conditions to form a PEG or a polyoxyethylated polyol active ester; and contacting the PEG or the polyoxyethylated polyol active ester with IL-2 under the appropriate reaction conditions to form a PEG/IL-2 conjugate or a polyoxyethylated polyol/IL-2 conjugate.

5,089,262

E87AG ANTIGENS OF PSEUDOMONAS AERUGINOSA AND MONOCLONAL ANTIBODIES AGAINST THEM AND HYBRIDOMAS THEREOF

Shuzo Sawada; Takashi Kawamura; Yasuhiko Masuho, and Katsuhiko Tomibe, all of Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 939,519, Nov. 12, 1986, abandoned. This application Jun. 13, 1990, Ser. No. 538,608

Claims priority, application Japan, Mar. 11, 1985, 60-46445; Mar. 11, 1985, 60-46446; PCT Int'l Appl., Mar. 10, 1986, PCT/JP86/00124

Int. Cl.⁵ A61K 39/40, 39/104; C08B 37/00; C07K 15/28

U.S. Cl. 424—87

10 Claims

1. The *P. aeruginosa* E87Ag antigen, wherein said antigen:
 - (a) is isolated from a polysaccharide fraction having a molecular weight of about 25,000 to 35,000 Daltons said fraction being obtained by hydrolyzing *P. aeruginosa* lipopolysaccharide with a weak acid, removing lipid A, and subjecting the acid treated polysaccharide void of the lipid A to gel filtration;
 - (b) has a molecular weight of approximately 27,000 Daltons when measured by a Sephacryl S-300 gel filtration chromatography;
 - (c) is a neutral polysaccharide comprised essentially of about 90% by weight of rhamnose without any detectable contamination of protein; and
 - (d) preserves its antigenic profile across different serotypes of *P. aeruginosa*.
5. A process for producing a monoclonal antibody comprising the steps of:
 - (1) preparing hybridomas and/or cell lines arising therefrom, by fusing human cells that produce said anti-*P. aeruginosa* antibody with mouse myeloma cells;
 - (2) selecting hybridomas that produces a human monoclonal antibody which specifically binds an E87Ag antigen, found in the lipopolysaccharide fraction of *P. aeruginosa* serotype M, wherein said antigen:
 - (a) is isolated from a polysaccharide fraction having a molecular weight of about 25,000 to 35,000 Daltons said fraction being obtained by hydrolyzing *P. aeruginosa* lipopolysac-

charide with a weak acid, removing lipid A, and subjecting the acid treated polysaccharide void of the lipid A to gel filtration;

- (b) has a molecular weight of approximately 27,000 Daltons when measured by a Sephacryl S-300 gel filtration chromatography;
- (c) is a neutral polysaccharide comprised essentially of about 90% by weight of rhamnose without any detectable contamination of protein; and
- (d) preserves its antigenic profile across different serotypes of *P. aeruginosa*;
- (3) culturing at least one of said hybridomas and/or said cell lines arising therefrom, and
- (4) collecting said human monoclonal antibody from the culture.

7. A hybridoma or cell line arising therefrom that produces a human monoclonal antibody which is obtained by fusing mouse myeloma cells with human cells that produce anti-*P. aeruginosa* antibodies, at least one of said antibody specifically binding an E87Ag antigen, said antigen, found in the lipopolysaccharide fraction of *P. aeruginosa* serotype M, wherein said antigen:

- (a) is isolated from a polysaccharide fraction having a molecular weight of about 25,000 to 35,000 Daltons said fraction being obtained by hydrolyzing *P. aeruginosa* lipopolysaccharide with a weak acid, removing lipid A, and subjecting the acid treated polysaccharide void of the lipid A to gel filtration;
- (b) has a molecular weight of approximately 27,000 Daltons when measured by a Sephacryl S-300 gel filtration chromatography;
- (c) is a neutral polysaccharide comprised essentially of about 90% by weight of rhamnose without any detectable contamination of protein; and
- (d) preserves its antigenic profile across different serotypes of *P. aeruginosa*.

9. A therapeutic agent for infections of *P. aeruginosa* comprising:

- (1) a therapeutically effective amount of a human monoclonal antibody which specifically binds an E87Ag antigen, found in the lipopolysaccharide fraction of *P. aeruginosa* serotype M, wherein said antigen:
 - (a) is isolated from a polysaccharide fraction having a molecular weight of about 25,000 to 35,000 Daltons said fraction being obtained by hydrolyzing *P. aeruginosa* lipopolysaccharide with a weak acid, removing lipid A, and subjecting the acid treated polysaccharide void of the lipid A to gel filtration;
 - (b) has a molecular weight of approximately 27,000 Daltons when measured by a Sephacryl S-300 gel filtration chromatography;
 - (c) is a neutral polysaccharide comprised essentially of about 90% by weight of rhamnose without any detectable contamination of protein; and
 - (d) preserves its antigenic profile across different serotypes of *P. aeruginosa*; and
- (2) a pharmaceutically acceptable carrier.

5,089,263

NEMATOCIDAL STRAIN OF PSEUDOMONAS AND ITS USE AS A BIOCONTROL AGENT

Itzhak Spiegel, Rishon-Le Zion; Ilan Chet, Nes-Ziona; Eli Cohn, Tel-Aviv, and Sergio Galper, Rehovot, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Aug. 4, 1989, Ser. No. 389,380

Claims priority, application Israel, Aug. 9, 1988, 87388; May 11, 1989, 90260

Int. Cl.⁵ A01N 63/00; C12N 1/20

U.S. Cl. 424—93

9 Claims

1. A method of combating soil nematodes comprising introducing into the soil a composition comprising nematocidally effective amount of a biologically pure culture of *Pseudomonas*

chitinolytica 20M, CNCM-I-804, or a neumatocidally active mutant thereof.

5,089,264
METHOD FOR TREATMENT OF BOVINE RETAINED PLACENTA

Hugo Eiler, Knoxville, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Apr. 27, 1990, Ser. No. 515,452

Int. Cl.⁵ A61K 37/54, 37/540

U.S. Cl. 424—94,64 12 Claims

1. A method for the treatment of a host bovine afflicted with retained placenta membrane comprising the administration to the host of an effective amount of at least one proteolytic enzyme selected from the group comprising collagenase, papain, pepsin and trypsin.

5,089,265
STABILIZED PHYTIC ACID COMPOSITIONS
Kiiichi Sawai, Funabashi; Masayasu Kurono, Mie; Hiromoto Asai, Nagoya; Takahiko Mitani, Mie, and Naohisa Ninomiya, Nagoya, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

Filed Oct. 24, 1989, Ser. No. 427,228

Claims priority, application Japan, Nov. 1, 1988, 63-276386

Int. Cl.⁵ A61K 35/00, 35/78; C12P 01/00

U.S. Cl. 424—195,1 1 Claim

1. A phytic acid composition comprising phytic acid, or a salt thereof, and a powdery, odorless, pale-yellow, water soluble and alcohol soluble substance obtained by treating rice bran with a pectinase, aerobically culturing the thus treated rice bran with a lactobacillus at 35° C. and at a pH of 9.2 to 9.5 for several days, and permitting the culture to stand for about one month, and recovering the product therefrom.

5,089,266
NON-TOXIC INSECTICIDE COMPOSITION AND METHOD FOR KILLING SPECIFIC INSECTS
Merlin Lee, 4607 S. Bradley Rd., Orcutt, Calif. 93455

Filed Oct. 10, 1989, Ser. No. 419,455

Int. Cl.⁵ A01N 25/04

U.S. Cl. 424—407 11 Claims

1. A non-toxic insecticide composition for killing aphids, leafhoppers and spider mites comprising an aqueous solution of sodium carboxymethyl cellulose having a kinetic viscosity of about 10 to about 3000 centistokes and which produces a tacky hygroscopic film.

5,089,267
TRANSDERMAL THERAPEUTICAL SYSTEM COMPRISING PHYSOSTIGMINE AS ACTIVE COMPONENT AND PROCESS FOR THE PRODUCTION THEREOF

Thomas Hille; Hans-Rainer Hoffmann, both of Neuwied; Hans-Joachim Huber; Axel Koch, both of München; Gerhard Schneider, Baldham, and Fritz Stanislaus, München, all of Fed. Rep. of Germany, assignors to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied and Klinge Pharma GmbH, Munich, both of, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 452,529

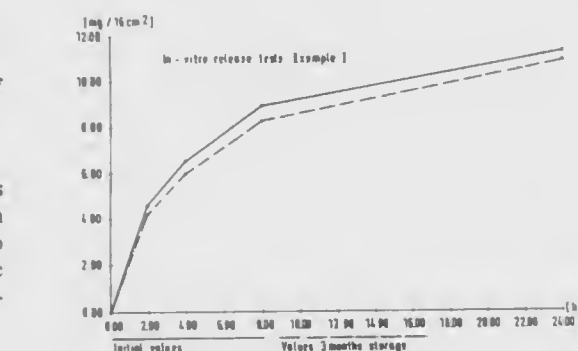
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843239

Int. Cl.⁵ A61F 13/02; A61L 15/44; A61K 9/70, 31/40

U.S. Cl. 424—449 14 Claims

1. A transdermal therapeutic system for the administration of physostigmine to the skin via a cover layer which is impermeable to active substances, a pressure-sensitive adhesive reservoir layer, and optionally a removable protective layer, the reservoir layer comprising 10-90%-wt material selected from the group consisting of block copolymers of styrene and 1,3-

dienes, polyisobutylenes, acrylate or methacrylate polymers and esters of hydrogenated colophonium, 0-30%-wt softeners



comprising hydrocarbons or esters, and 0.1-20%-wt physostigmine.

5,089,268
EGG PHOSPHATIDE LIPID EMULSIONS ALTERED FOR A SPECIFIC THERAPEUTIC FATTY ACID COMPOSITION

David P. Katz, 143-30 38th Ave., Flushing, N.Y. 11354

Continuation of Ser. No. 518,539, May 2, 1990, abandoned. This

application Jan. 15, 1991, Ser. No. 642,143

Int. Cl.⁵ A61K 37/22, 31/20; A61E 13/00

U.S. Cl. 424—450 9 Claims

1. In a sterile lipid emulsion for parenteral use, comprising:
(a) from 1 to 30% by weight of a neutral lipid mixture of fatty acid triglycerides containing omega-3 fatty acids, omega-6 fatty acids, medium chain length triglycerides or mixtures thereof;
(b) from 1 to 4% by weight of an egg yolk phosphatide emulsifier;
(c) up to 2.25% by weight of an osmolality modifier; and
(d) sterile water;
the improvement, wherein the egg yolk phosphatide is derived from the eggs of chickens whose diets have been supplemented with fish oils which are rich in eicosapentaenoic acid, docosahexaenoic acid or mixtures thereof, said egg yolk phosphatide containing from 10 to 100% higher amounts of omega-3 fatty acids than egg yolk phosphatides derived from the eggs of chickens whose diets have not been so supplemented.

5,089,269
COSMETIC CONTAINING FINE SOFT MICROCAPSULES
Akira Noda; Michihiro Yamaguchi; Masanori Aizawa, and Yoshimaru Kumano, all of Yokobama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,977

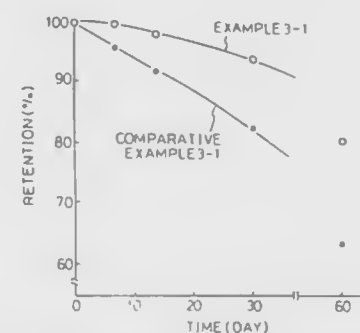
Claims priority, application Japan, Nov. 7, 1987, 62-281825; Mar. 18, 1988, 63-65318; Apr. 15, 1988, 63-93945; Apr. 15, 1988, 63-93947; Apr. 18, 1988, 63-95315; Apr. 18, 1988, 63-95316; Apr. 18, 1988, 63-95317

Int. Cl.⁵ A61K 7/02, 7/06, 9/50

U.S. Cl. 424—456 2 Claims

1. A basic make-up or hair cosmetic composition comprising microcapsules with an average particle size of 50 to 1000 μ m composed of a gelatin film swollen with water enclosing a hydrophobic cosmetic component therein, wherein a mixture of a liquid oil component and a solid oil component or a semi-solid oil component is used as the hydrophobic component, and microcapsules with a breaking strength of 10 to 300 g/cm² are formulated, wherein said liquid oil component has a melting point below room temperature and is at least one member selected from the group consisting of animal and vegetable oils, hydrocarbon oils, ester oils, silicone oils, higher fatty

acids, higher alcohols, sunscreens agents, vitamins, alpha lipoic acid, ferulic acid, and flavors and said solid or semi-solid oil component is at least one member selected from the group



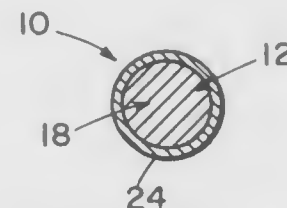
consisting of animal and vegetable oils, hydrocarbon oils, ester oils, higher fatty acids, higher alcohols, waxes, sunscreens agents and flavors.

5,089,270
CAPSULE-SHAPED TABLET
Douglas B. Hampton, Holland; George W. Tilton, Grand Haven, and Maureen L. Jordan, Allegan, all of Mich., assignors to L. Perrigo Company, Allegan, Mich.

Filed May 15, 1990, Ser. No. 523,752

Int. Cl.⁵ A61K 9/20

U.S. Cl. 424—465 27 Claims



1. A pharmaceutical capsule-shaped tablet comprising:
a blend of one or more excipients and one or more active substances compressed longitudinally into the shape of a capsule having a first and a second portion;
a first coloring agent mixed with said blend of excipients and active substances in said first portion of said capsule-shaped tablet; and
a second coloring agent distinctly different from said first coloring agent mixed with said blend of excipients and active substances in said second portion of said capsule-shaped tablet.

5,089,271
STABILIZED ANTIBIOTIC COMPOSITIONS FOR ANIMAL FEEDING
R. Richard Unangst, Havertown, Pa., assignor to SmithKline Beecham Corporation, King Prussia, Pa.

Filed Sep. 18, 1989, Ser. No. 408,825

Claims priority, application 825091899,

Int. Cl.⁵ A61K 9/16

U.S. Cl. 424—490 4 Claims

1. A method for improving the recovery of antibiotics from animal feed composition said composition having a moisture content of from about 15 to about 30% and a fat content above 5% which comprises coating the antibiotic with a coating selected from the group consisting of gelatin; waxes; polyvinyl alcohol; a cellulose derivative represented by carboxymethylcellulose, cellulose acetate phthalate, ethyl cellulose and cellulose acetate butyrate; a fatty alcohol having from 14 to 31 carbon atoms; a fatty acid having from 10 to 22 carbon atoms; mono, di and tri glyceryl esters; and copolymers of dime-

thylaminoethylmethacrylate and neutral methacrylic esters and adding said coated antibiotic to a basic animal feed.

5,089,272
PROCESS FOR PRODUCING CAPSULES HAVING A PERMEABILITY-CONTROLLABLE MEMBRANE
Toshiaki Shioya, Oume, and Ryogo Hirano, Kawagoe, both of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Filed Mar. 29, 1989, Ser. No. 330,845

Int. Cl.⁵ A61K 9/62, 37/00

U.S. Cl. 424—493 9 Claims

1. A process for producing a capsule containing, as a core, a solution (a) of a polyanionic polysaccharide, its salt or a mixture thereof and having a permeability-controllable membrane, said process comprising:
preparing a solution (b) of chitosan;
dialysing the solution (b);
adjusting the ionic strength of the solution (b); and then
bringing the solution (a) into contact with the solution (b).

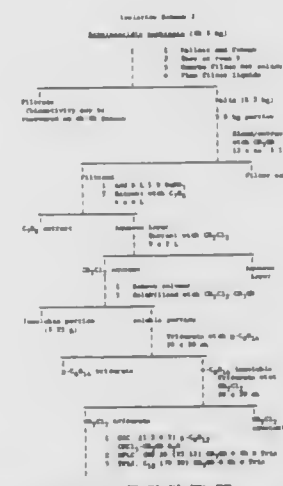
5,089,273
ECTEINASCIDINS 729, 743, 745, 759A, 759B AND 770
Kenneth L. Rinehart, Urbana, Ill., and Tom G. Holt, Westfield, N.J., assignors to Board of Trustees of the University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 278,629, Dec. 1, 1988, abandoned, which is a continuation of Ser. No. 1,226, Jun. 1, 1987, Continuation-in-part of Ser. No. 6,395, Jan. 23, 1987, abandoned, Continuation-in-part of Ser. No. 898,906, Aug. 21, 1986, abandoned, Continuation-in-part of Ser. No. 872,189, Jun. 9, 1986, abandoned. This application Jul. 5, 1990, Ser. No.

548,060

Int. Cl.⁵ A61K 35/56

U.S. Cl. 424—520 6 Claims



1. The substantially pure compound Ecteinascidin 729, free of cellular components of the marine tunicate Ecteinascidia turbinata, said compound having the following physicochemical characteristics: TLC (SiO₂) R_f 0.28 (3:1 ethyl acetate-methanol), 0.26 (9:1 chloroform-methanol); HPLC retention time, 15.7 min. [Whatman Partisil 10 ODS-3, 10×250 mm, 70:30 methanol-aqueous Tris (0.05M, pH 7.5), 2.8 mL/min.]; UV max (CH₃OH), 202 nm (ϵ 61 000), 244 (sh) (11 000), 283 (5 000), 289 (4 700), (0.1N HCl) 204 (61 000), 244 (sh) (9 600), 283 (4 800), 289 (4 500), (0.1N KOH) 215 (33 800), 258 (8 200), 290 (6 400); IR (CCl₄), 3555, 3535, 2953, 2927, 2855, 1770, 1742, 1504, 1466, 1462, 1454, 1432, 1369, 1239, 1196, 1168, 1122, 1100, 1086, 1054, 1032, 997, 960 cm⁻¹; ¹H NMR (360 MHz, CDCl₃) δ 6.63 (s, 1H), 6.48 (s, 1H), 6.44 (s, 1H), 6.04 (d, J=0.7 Hz, 1H), 5.95 (d, J=0.9 Hz, 1H), 5.15 (d, J=10.7 Hz, 1H), 4.84 (bs,

1H), 4.52 (d, J-3.5 Hz, 1H), 4.48 (bs, 1H), 4.38 (d, J-4.9 Hz, 1H), 4.04 (d, J-11 Hz, 1H), 3.78 (s, 3H), 3.62 (s, 3H), 3.61 (m, 2H), 3.10 (m, 1H), 3.02 (d, J-18 Hz, 1H), 2.90 (dd, J-9, 18 Hz, 1H), 2.80 (m, 1H), 2.60 (m, 1H), 2.50 (m, 1H), 2.35 (m, 1H), 2.31 (s, 3H), 2.27 (s, 3H), 2.20 (m, 1H), 2.03 (s, 3H); FABMS m/z (rel. intensity) 730.2493 (30), 495 (2), 493 (2), 481 (2), 479 (2), 463 (4), 461 (2), 449 (4), 205 (8), 204 (8), 190 (8); B/E linked scan on m/z 729, m/z 711, 696, 683, 509, 495, 481, 479, 461, 449; optical rotation $[\alpha]_D^{25} + 112^\circ$ (c 0.01, CH₃OH).

5,089,274

USE OF BACTERICIDAL/PERMEABILITY INCREASING PROTEIN OR BIOLOGICALLY ACTIVE ANALOGS THEREOF TO TREAT ENDOTOXIN-RELATED DISORDERS

Marian N. Marra, San Mateo, and Randal W. Scott, Sunnyvale, both of Calif., assignors to INCYTE Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 310,842, Feb. 14, 1989, abandoned. This application Jan. 22, 1990, Ser. No. 468,696
Int. Cl.⁵ A61K 35/14

U.S. Cl. 424—534 25 Claims

4. A method of treating a subject suffering from a disorder selected from the group consisting of endotoxin-related shock, endotoxin-related disseminated intravascular coagulation, endotoxin-related anemia, endotoxin-related thrombocytopenia, endotoxin-related adult respiratory distress syndrome, and endotoxin-related renal failure which comprises administering to the subject a purified, endotoxin-free, human Bactericidal/Permeability Increasing Protein under conditions such that the Bactericidal/Permeability Increasing Protein binds to endotoxin-associated lipopolysaccharide and thereby inhibits lipopolysaccharide stimulation of neutrophils and mononuclear cells so as to thereby treat the subject.

5,089,275

STABILIZED DIVALENT SILVER BACTERICIDES

Marvin S. Antelman, Rehovot, Israel, assignor to N. Jonas & Co., Inc., Bensalem, Pa.

Filed May 9, 1991, Ser. No. 697,781
Int. Cl.⁵ C02F 1/50

U.S. Cl. 424—602 3 Claims

1. A solid bactericidal composition for sanitizing the water of swimming pools, hot tubs and industrial cooling installations which comprises a liquid acid divalent silver complex that has been reacted with anhydrous calcium sulfate so as to form a hydrated solid matrix.

5,089,276

CALCIUM PANTOTHENATE COMPOSITE

Junzou Yamashita, Toyonaka; Yasuo Ono, and Kunihiro Sumimura, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1990, Ser. No. 510,686

Claims priority, application Japan, Apr. 19, 1989, 1-099637; Jul. 11, 1989, 1-179440

Int. Cl.⁵ A61K 33/10, 31/19, 31/195

U.S. Cl. 424—686 8 Claims

1. A composite which is obtained by mixing calcium pantothenate with a salt selected from the group consisting of calcium lactate, magnesium carbonate and calcium carbonate in the presence of water and/or lower alcohol, and drying the resulting mixture, the amount of the said salt employed being sufficient to constitute 40 to 75 weight % of the total amount of the composite, and the amount of water and/or lower alcohol employed being 10 to 200 volume parts per 100 weight parts of the mixture of calcium pantothenate and the said salt.

5,089,277

FISH BAIT AND METHOD OF MAKING SAME

John A. Prochnow, Spirit Lake, Iowa, assignor to Berkley, Inc., Spirit Lake, Iowa

Continuation of Ser. No. 358,067, May 26, 1989, abandoned.

This application Nov. 16, 1990, Ser. No. 614,999

Int. Cl.⁵ A01K 85/00

U.S. Cl. 426—1 18 Claims

1. A bait comprising a water soluble moldable body having a controlled rate of dispersion in water with the slimy feel of live bait and a reshapable or reformable consistency capable of being formed about a hook, said body comprising a water soluble cellulose either having a molecular weight between about 100,000 to 500,000 and a polyalkylene glycol in which the alkylene group contains 2 or 3 carbon atoms, said polyalkylene glycol having a molecular weight between about 10,000 to 6 million, blended with an amount of water sufficient to form a moldable body of consistency capable of being formed about a hook.

5,089,278

MICROWAVE BROWNING COMPOSITION

Lynn C. Haynes; Harry Levine, both of Morris Plains; Michael S. Otterburn, Randolph, and Paul Mathewson, Whippany, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jun. 2, 1989, Ser. No. 360,582

Int. Cl.⁵ A23L 1/272

U.S. Cl. 426—98 65 Claims

1. A heat-activated and heat-released browning composition for coating a food product to produce surface browning on exposure to heat or microwave energy, said composition including components comprising:

- (a) at least one amino acid source capable of reacting with a reducing sugar;
- (b) at least one reducing sugar; and
- (c) at least one pH-adjusting agent,

wherein at least one of said components is encapsulated in liposomes to produce a browning composition that is stable at room temperature, provided that the amino acid source and the reducing sugar are not encapsulated in the same liposomes, said liposomes being subject to rupture when exposed to heat or microwave energy, whereby said components encapsulated in said liposomes are released to said composition to promote a chemical browning reaction between said reducing sugar and said amino acid source.

5,089,279

METHOD OF MAKING A GRANULAR BEVERAGE MATERIAL BY MEANS OF SINTERING AND THEN GRANULATING

Adrianus van Rooijen, Hellevoetsluis, Netherlands, assignor to Conopco, Inc., N.J.

Continuation of Ser. No. 448,756, Dec. 11, 1989, abandoned.

This application Jan. 25, 1991, Ser. No. 649,215

Claims priority, application United Kingdom, Dec. 16, 1988, 8829461

Int. Cl.⁵ A23L 2/00; A23F 3/30, 5/12

U.S. Cl. 426—285 6 Claims

1. A method for forming a readily soluble or dispersible granular beverage material from a powdered extract of the beverage comprising the steps of sintering the essentially dry powdered extract by heating in a closed environment to form an agglomerate thereof and then granulating the agglomerate.

5,089,280

PROCESS FOR DECAFFINATING GREEN COFFEE BEANS

Hedi Ben-Nasr, and Friedrich W. H. Coeneu, both of Essen, Fed. Rep. of Germany, assignors to Kohlensäure-Werke Rud. Buse GmbH & Co., Bad Hönningen, Fed. Rep. of Germany
Filed Jun. 18, 1987, Ser. No. 63,372

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620622; Apr. 25, 1987, 3713953

Int. Cl.⁵ A23F 5/20

U.S. Cl. 426—427 15 Claims

1. Process for decaffeinating green coffee beans, comprising:

- a. wetting green coffee beans comprised of caffeine with water to provide wetted beans having a water content ranging from 35 to 50 percent by weight and having bean cells containing an aqueous caffeine solution;
- b. compressing the wetted beans positioned in a pressure chamber by subjecting the wetted beans to an atmosphere comprised of a supercritical fluid which is a gas under standard conditions of temperature and pressure, under a pressure ranging from 75 to 300 bar and a temperature ranging from 20° to 80° C. for a period ranging from a few minutes to several hours;
- c. decompressing the wetted beans in the pressure chamber to a pressure p for which critical pressure $p_c \leq p \leq 1$ bar to provide decompressed beans over a period ranging from abruptly to a few minutes under conditions controlled so that expansion cooling of the atmosphere does not freeze the wetted beans;
- d. washing the decompressed beans with water one or more times to remove the aqueous caffeine solution therefrom as wash water and provide washed beans;
- e. repeating the steps of compressing, decompressing and washing as a process cycle one or more times;
- f. centrifuging the washed beans in a centrifuge to remove residual aqueous caffeine solution therefrom and provide pre-dried beans;
- g. collecting the wash water and the residual aqueous caffeine solution from centrifuging, and recovering the caffeine therefrom in a recovery means;
- h. drying the pre-dried beans to provide dried beans having a water content suitable for subsequent roasting; and
- i. roasting the dried beans.

5,089,281

PREPARATION OF QUICK COOKING RICE

Affif A. Baz, Waterbury; Jau Y. Hsu, Brookfield, and Eugene Scoville, New Milford, all of Conn., assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 303,533, Jan. 27, 1989, abandoned. This application Nov. 30, 1990, Ser. No. 622,387

Int. Cl.⁵ A23B 4/03

U.S. Cl. 426—461 14 Claims

1. A process for preparing a quick cooking rice comprising: cooking rice under atmospheric pressure in an amount of water at least sufficient to hydrate the rice to a moisture content of from about 60% to 75% by weight and at a temperature of from about 90° C. to 100° C. for from about 1 min to 10 mins for hydrating the rice to a moisture content of from about 30% to 60% by weight; steam pressure cooking the water-cooked rice in water under a pressure of from about 250 mm Hg to 2500 mm Hg above atmospheric pressure for from about 1 min to 50 mins while agitating the rice and water for obtaining a cooked rice having a moisture content of from about 60% to 75% by weight and which is about 85% to 100% gelatinized; gradually releasing the pressure from the cooked rice for avoiding substantially puffing the cooked rice; and drying the cooked rice at a temperature of from about 140° C. to 205° C. to a stable moisture content.

5,089,282

WHEAT MILLING PROCESS

Warner Wellman, Omaha, Nebr., assignor to ConAgra Inc., Omaha, Nebr.

Filed Jul. 24, 1990, Ser. No. 557,631

Int. Cl.⁵ A23P 1/00

U.S. Cl. 426—483 34 Claims

1. A process of milling wheat comprising the following steps:

- a) providing a quantity of milling quality wheat having an endosperm and germ surrounded by a plurality of bran layers, said endosperm comprising an aleurone layer;
 - b) removing portions of the germ and the outer bran layers weighing at least about 5% of the initial weight of the wheat without substantially reducing the average size of the endosperm by passing the wheat between at least two sets of abrasive elements while flowing air through the wheat and moving to two sets of abrasive elements with respect to one another, thereby forming a reduced bran pearled wheat;
 - c) tempering the wheat for at least about one hour prior to completion of step (b); then
 - d) progressively reducing the average size of the pearled wheat by passing the pearled wheat through a sequence of multiple roller mills to form a finely divided final product at a plurality of roller mills in the sequence; and
 - e) removing additional portions of the remaining bran layers during step (d);
- wherein step (b) is operative to retain a substantial portion of the aleurone layer with the endosperm after step (b).

5,089,283

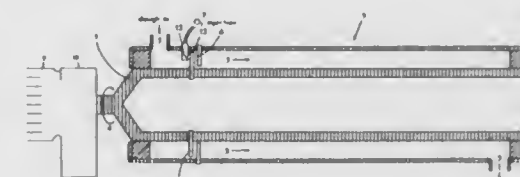
CONTINUOUS DOUGH DEVELOPING PROCESS AND APPARATUS

Arran Wilson, Christchurch, New Zealand, assignor to Her Majesty the Queen in right of New Zealand of Dsir Christchurch Wheat Research Institute, Christchurch, New Zealand
Continuation of Ser. No. 427,949, Oct. 25, 1989, abandoned, which is a continuation of Ser. No. 228,272, Aug. 4, 1988, abandoned. This application Dec. 19, 1990, Ser. No. 629,034

Claims priority, application New Zealand, Aug. 4, 1987, 221326

Int. Cl.⁵ A21D 8/02, 10/00

U.S. Cl. 426—498 11 Claims



1. A continuous process for the production of bread dough comprising the steps of:

- feeding to a continuous developing apparatus dough including ingredients of flour, water, yeast, a reduction/oxidation reagent selected from a group including ascorbic acid, and other substances which have been mixed sufficiently prior to said feeding to combine the ingredients;
- feeding oxygen gas at a rate on the order of about 0.9 liters per kilogram of dough to the dough as the dough is fed to the developing apparatus;
- mixing within the developing apparatus the oxygen and the dough with a mixing rotor which imparts a high shearing action between mixing means and the dough to thereby develop the dough and distribute the oxygen evenly throughout the dough to enable the oxygen to react with the reduction/oxidation reagent, flour and other substances;
- extruding the dough without gelatinization of the dough from the developing apparatus; and

immediately as the dough leaves the developing apparatus dividing the dough to form individual pieces in preparation for baking.

5,089,284

METHOD FOR MAKING EXTRUDED PASTA SHAPES

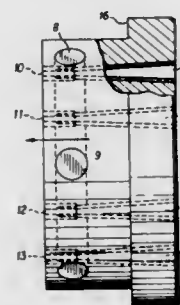
Scot A. Irvin, Baldwinville; Carleton G. Merritt, Phoenix, and Raymond G. Kowalski, Weedsport, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Jun. 18, 1990, Ser. No. 539,185

Int. Cl.⁵ A23L 1/00

U.S. Cl. 426—557

3 Claims



1. In a method of forming shaped alimentary pastes by feeding to an extruder that is equipped with a die plate having a plurality of holes whose cross sections decrease in the direction of extrusion a feedstock comprised of glutinous flour and water and extruding said alimentary paste through said holes in the extruder die plate in such a manner that the extruded alimentary paste remains substantially uncooked and less than about 20% of its starch content is gelatinized, the improvement comprising

heating the die plate to a temperature of at least about 130° F. (about 54° C.) and

providing a coating on a portion of the interior of said holes through the die plate such that heat transfer to the paste being extruded is substantially inhibited until the cross section of the hole has reached its smallest value.

5,089,285

JELLY RESEMBLING THE FLESH OF FRUIT

Hisashi Nozaki, and Seiya Sakurai, both of Saitama, Japan, assignors to Kabushikikaisha Kibun, Tokyo and Kabushikikaisha Kyowashokuin, Saitama, both of, Japan

Continuation-in-part of Ser. No. 287,868, Dec. 21, 1988, Pat. No. 4,943,444. This application Dec. 14, 1989, Ser. No. 450,487

Claims priority, application Japan, Dec. 22, 1987, 62-322808 The portion of the term of this patent subsequent to Jul. 24, 2007, has been disclaimed.

Int. Cl.⁵ A23L 1/0528

U.S. Cl. 426—573

16 Claims

1. A thermally-irreversible firm fruit gel having fibrous tissues that resemble those of the peach, which contains fruit juice and a substantially unheated gelling agent consisting essentially of a konjak flour, konjak mannan, or a mixture thereof with an alkaline agent.

5,089,286

APPLIANCE FOR SPIRALLY SLICING FRUITS AND VEGETABLES

Richard L. Geissler, Chippewa Falls; Rodger L. Kelly, Eau Claire, both of Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.

Filed Jul. 18, 1990, Ser. No. 555,042

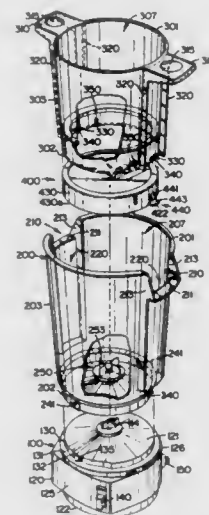
Int. Cl.⁵ A47J 17/00; A23L 1/212; A23P 1/00

U.S. Cl. 426—615

15 Claims

12. A method of slicing a vegetable, comprising the steps of: placing a vegetable with a sleeve so as to delineate a top and a bottom of the vegetable,

mounting the bottom of the vegetable upon a drive shaft retained within the sleeve, rotating the mounted vegetable about a vertical axis, contacting the top of the rotating vegetable with a blade assembly attached to a container which is telescopically receivable within the sleeve,



slicing the rotating vegetable with the blade assembly in a downwardly spiralling fashion starting from the top of the vegetable, transporting the sliced vegetable into the container positioned immediately above the rotating vegetable as the vegetable is being sliced.

5,089,287

ANIMAL AND FOWL FEED SUPPLEMENT AND METHOD OF MANUFACTURE

Joseph B. Michaelson, Los Angeles, Calif., assignor to Control Feeds, Inc., Parker, Colo.

Filed Oct. 10, 1989, Ser. No. 419,470

Int. Cl.⁵ A23K 1/04

U.S. Cl. 426—647

11 Claims

1. A method of converting slaughterhouse blood into an animal and fowl food supplement comprising the steps of: dewatering by centrifugal force a predetermined quantity of raw mammal blood to approximately 40 to 50 percent of its volume forming a moist coagulated blood concentrate of a predetermined moisture content and a remaining first liquid blood serum,

mixing the moist blood coagulated concentrate in a mixer, treating the moist blood coagulated concentrate in the mixer with an acid solution comprising at least a part of said first blood serum to control its pH value to approximately 2, thereby forming an acidified product,

said acidified product comprising a given solid particle content of approximately 40 to 70 percent and a second liquid blood serum formed by the treating of said first blood serum with said acid solution, and mixing together with the acidified product diatomaceous earth comprising diatoms in a predetermined ratio by weight with the acidified product until the diatomaceous earth adsorbs said concentrate and the second liquid blood serum is at least partially adsorbed into the diatoms with the pH value of a resulting food supplement approximately 2.

5,089,288

METHOD FOR IMPREGNATING TISSUE SAMPLES IN PARAFFIN

Hermann J. Berger, Dahlienweg 39c 8400, Regensburg, Fed. Rep. of Germany

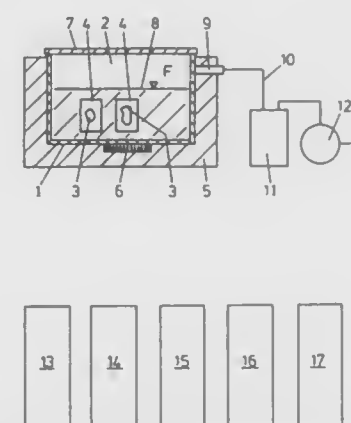
Filed Jun. 1, 1990, Ser. No. 532,051

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1989, 3920819

Int. Cl.⁵ A01G 5/06

U.S. Cl. 427—4

11 Claims



1. In a method for impregnating a tissue sample with paraffin, the improvement comprising:

fixing the tissue sample with a fixing agent; dewatering the tissue sample by using alcohol; treating the tissue sample in isopropyl-alcohol; and soaking the tissue sample in liquid paraffin by the tissue sample being placed into the paraffin in a working chamber at a pregiven operating temperature, the operating temperature being in the range of about 52° to 60° C. in order to keep the paraffin in a liquid state and therefore lower than the boiling temperature of isopropyl alcohol at a normal atmospheric pressure; the tissue sample being soaked in a closed, evacuated working chamber under the influence of ultrasound on the tissue sample and on the liquid paraffin enclosing the tissue sample; and the vacuum in the working chamber being chosen such that the boiling point of the isopropyl alcohol equals the operating temperature at the pressure existing in the working chamber.

5,089,289

METHOD OF FORMING THIN FILMS

Naoki Ito, Yokosuka, Japan, assignor to Fuji Electric Co., Ltd., Japan

Continuation of Ser. No. 21,259, Mar. 3, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 311,094

Claims priority, application Japan, Mar. 5, 1986, 61-47525

Int. Cl.⁵ C23C 16/50, 16/24, 14/32

U.S. Cl. 427—38

7 Claims

1. A method of forming, a material consisting essentially of a substrate and a thin film disposed on a major surface thereof by enhanced chemical vapor deposition consisting essentially of the steps of

(a) placing the substrate on a support member within a reaction chamber capable of being evacuated;

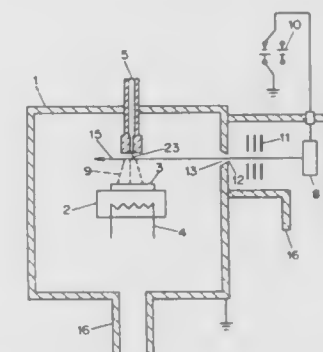
(b) introducing a flow of material gas into the reaction chamber such that the material gas flows toward the substrate;

(c) accelerating charged particles from a charged particle source selected from the group consisting of an ion beam and an electron beam to a predetermined energy level;

(d) introducing the accelerated charged particles as a beam into the reaction chamber such that the beam intersects with the flow of material gas in the vicinity of the gas inlet port whereby substantially all of the material gas collides with charged particles in the beam and is decomposed to

form charged and uncharged reactive species from the material gas;

(e) applying a potential to the support member such that charged species formed by the collision of the beam and the material gas are repelled from the substrate; and



(f) allowing the uncharged reactive species to flow to and strike the substrate whereby the thin film is formed on the substrate, wherein the nature of the material gas and the energy level of the accelerated charged particles are varied to control the type of reactive species produced.

5,089,290

METHOD FOR GENERATING GLOW-POLYMERISATE LAYERS

Wolf Kleeberg, Erlangen; Johann Kammermaier, Unterhaching, and Rolf-Winfried Schulte, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

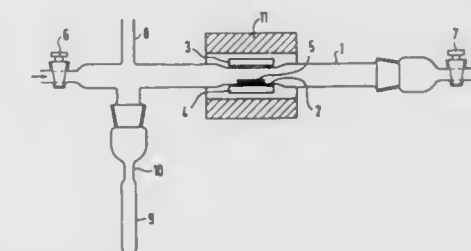
Continuation of Ser. No. 485,865, Feb. 23, 1990, abandoned, which is a continuation of Ser. No. 312,365, Feb. 14, 1989, abandoned, which is a continuation of Ser. No. 630,713, Jul. 13, 1984, abandoned. This application Nov. 30, 1990, Ser. No. 622,206

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326376

Int. Cl.⁵ B05D 3/06

U.S. Cl. 427—41

15 Claims



1. A method for the generation of polymer layers on a substrate comprising:

glow discharging monomers selected from the group consisting of hydrocarbons, fluorocarbons and mixtures of hydrocarbons and fluorocarbons at a high frequency and low pressure to form polymer layers on the substrate, and annealing the polymer layers in an atmosphere comprising at least one hydrocarbon and/or fluorocarbon monomer and in the absence of air at a temperature of between 100° and 450° C. for between 1 and 10 hours.

5,089,291 **METHOD FOR FORMING HARD COAT ON POLYOLEFIN**

Kazuhide Hayama; Noritaka Hosokawa; Takao Yazaki, and Masataka Noro, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1989, Ser. No. 295,396

Claims priority, application Japan, Jan. 12, 1988, 63-4082
Int. Cl.⁵ B05D 3/02, 3/06, 7/04

U.S. Cl. 427-54.1

5 Claims

1. A method of forming a hard coat on a polyolefin base, a composite laminate or a formed article which comprises directly coating the surface of the polyolefin base with an ultraviolet-curable resin composition comprising (a) at least one member selected from the group consisting of a polymer containing at least 80% by weight of methyl methacrylate, a modified polymer containing at least 80% by weight of methyl methacrylate having introduced into a side chain thereof up to 20% by weight acryloyl group, and a polymer mixture containing one polymer containing at least 80% by weight of methyl methacrylate and a second polymer containing at least 80% by weight methyl methacrylate and having introduced into a side chain thereof up to 20% by weight (meth)acryloyl group, (b) a polyfunctional acrylate containing at least 50% by weight of dipentaerythritol hexaacrylate, the weight ratio of components (a) to (b) being from 1 to 10, and (c) a photopolymerization initiator, drying the coating to form an ultraviolet-curable resin layer, and curing the ultraviolet-curable resin layer by irradiation with ultraviolet light.

5,089,292 **FIELD EMISSION CATHODE ARRAY COATED WITH ELECTRON WORK FUNCTION REDUCING MATERIAL, AND METHOD**

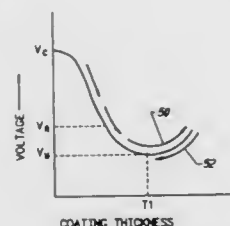
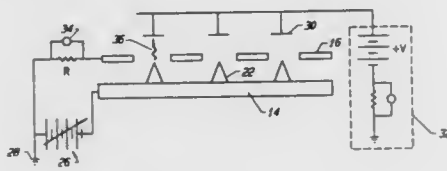
John M. McCauley; C. A. Spindt, both of Menlo Park; Christopher E. Holland, Redwood City, and Ivor Brodie, Palo Alto, all of Calif., assignors to Coloray Display Corporation, Fremont, Calif.

Filed Jul. 20, 1990, Ser. No. 556,647

Int. Cl.⁵ B05D 5/12; H01J 19/06

U.S. Cl. 427-78

21 Claims



1. A method of simultaneously coating the surfaces of an array of electron emitting cathode tips with a layer of material which reduces the electron work function of each of the tips, said method comprising the steps of:

- placing said array of cathode tips in a vacuum chamber;
- thereafter, while said array of cathode tips remains in said chamber, applying a voltage to at least one of the tips in said array sufficient to cause the one tip to emit current;
- while said tip is being caused to emit current, introducing into said vacuum chamber a vapor of said electron work function reducing materials sufficient to place a coating of said material on each of the tips in said array including said one tip such that the applied voltage/emission current

characteristics of said one tip varies to a limited extent with the thickness of its coating of said material; and
(d) establishing the thickness of said coating of said electron work function reducing material on said one tip based upon its applied voltage/emission current as said one tip is coated with said one material.

5,089,293 **METHOD FOR FORMING A PLATINUM RESISTANCE THERMOMETER**

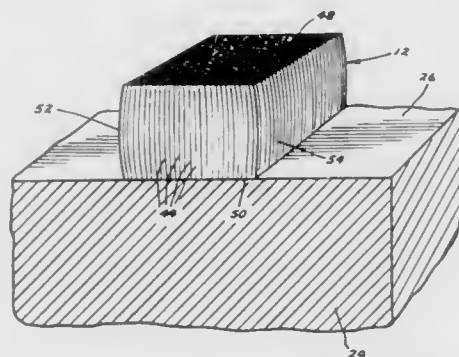
Robert C. Bohara, Eden Prairie, and James A. Ruf, Maple Grove, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 104,575, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 636,141, Jul. 31, 1984, abandoned. This application Jul. 13, 1989, Ser. No. 379,682

Int. Cl.⁵ B05D 5/12

U.S. Cl. 427-102

17 Claims



1. A process for making a thin film platinum resistance thermometer comprising the steps of:
providing a substrate substantially noncontaminating to platinum and having an upper surface; depositing a layer of lift-off medium which is substantially noncontaminating to platinum onto the substrate upper surface to leave an exposed surface of lift-off medium, the lift-off medium being chemical vapor deposited such that free atoms of the lift-off medium are at a low level, and removing portions of the lift-off medium to expose the substrate surface in a path defined through the lift-off medium comprising a negative pattern from a predetermined pattern desired for the resistance thermometer, the removing of the portions of the lift-off medium comprising etching the lift-off medium under control so as to form sharp edges at the junction of the path and the exposed surface;
depositing platinum on the exposed portions of the substrate and on the exposed surface of the lift-off medium; and
removing the lift-off medium and platinum deposited on the lift-off medium while leaving the platinum secured to the exposed substrate surface in the path, the platinum secured to the exposed substrate remaining substantially uncontaminated by the lift-off medium including free atoms of the lift-off medium.

5,089,294 **PREPARATION OF CONDUCTIVE FILMS**

Norman M. Ratcliffe, Bristol, England, assignor to British Aerospace plc, London, England

Filed Jul. 26, 1990, Ser. No. 557,749

Claims priority, application United Kingdom, Aug. 4, 1989, 8917937

Int. Cl.⁵ B05D 5/12

U.S. Cl. 427-108

18 Claims

1. A process for preparing an electrically-conductive polypyrrole film on an electrically non-conducting substrate, which comprises the steps of:

contacting the substrate with pyrrole and an oxidising agent in a solvent thereby forming a film on said substrate, and removing the substrate and film from said contact while the film is at least substantially transparent.

5,089,295 **SUSPENSION POLYMERIZATION PROCESSES AND TONER COMPOSITIONS THEREOF**

Daniel M. McNeil, Georgetown, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1990, Ser. No. 609,859

Int. Cl.⁵ C08K 3/22

U.S. Cl. 427-128

59 Claims

2. Processes for the preparation of polymers which comprises a suspension free radical polymerization of a monomer phase comprised of at least two monomers, and a polymerization initiator; and an aqueous phase comprised of water, magnetite, and an alkali metal nitrate; and wherein the magnetite functions as a stabilizer and a pigment.

5,089,296 **FOAM SATURATION AND RELEASE COATING OF A FIBROUS SUBSTRATE**

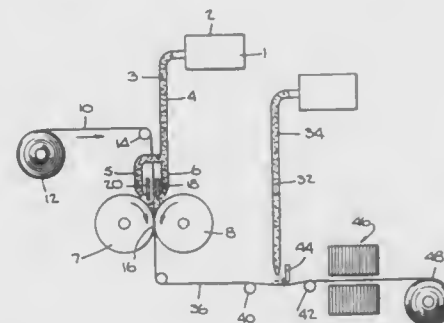
Richard A. Bafford, Aiken, S.C., and George E. Faircloth, Augusta, Ga., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 174,411, Apr. 8, 1988. This application Mar. 30, 1990, Ser. No. 489,586

Int. Cl.⁵ B05D 5/10

U.S. Cl. 427-208

22 Claims



1. A method for making a pressure sensitive adhesive tape comprising:

- forming a foam composition containing a sufficient amount of a release coating for a pressure sensitive adhesive and having a blow ratio of about 5 to 30;
- contacting the foamed release coating composition onto the surface of one side of a substrate which is a paper or a woven or non-woven fabric and collapsing the foam into a liquid in sufficient amount to coat and remain on the surface;
- drying the substrate; and
- applying a coating of a pressure sensitive adhesive to the surface of the substrate opposite to the surface coated with the release coating composition.

5,089,297 **METHOD FOR REPAIRING INTERIOR PORTIONS OF A PIPELINE**

Motoyuki Koga, Tokyo; Nobukatsu Ike, and Kenji Ohshima, both of Yamato, all of Japan, assignors to Hakko Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 310,163, Feb. 15, 1989, abandoned.

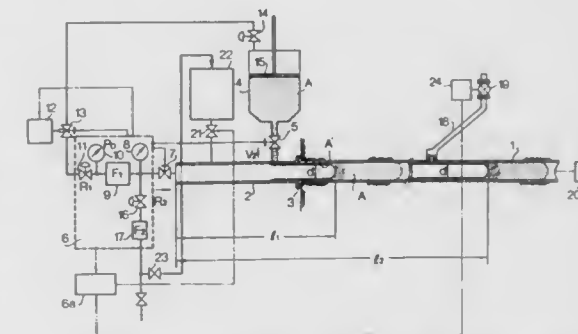
This application Nov. 2, 1990, Ser. No. 607,209

Claims priority, application Japan, Feb. 15, 1988, 63-32362; Feb. 15, 1988, 63-32363; Feb. 15, 1988, 63-32364

Int. Cl.⁵ B05D 7/22

U.S. Cl. 427-238

5 Claims



1. A method for repairing a horizontal pipeline having a branch pipe, comprising the steps of:
supplying liquefied resin into the pipeline from an end portion to charge a part of the internal portion of the pipeline with mass of the resin;
causing the difference between pressures at both sides of the mass of the resin in the internal portion of the horizontal pipeline to move the mass of the resin passing through the pipeline;
controlling the pressure difference as the amount of the moving resin reduces so as to move the mass of the resin at a substantially constant speed to line the inner wall of the pipe with the resin; and
repeating the step of supplying liquefied resin, the step of causing resin mass movement, and the step of controlling the pressure difference until lining of the pipeline is finished.

5,089,298 **SYNERGISTIC EFFECT OF AMYLOPECTIN-PERMETHRIN IN COMBINATION ON TEXTILE FABRICS**

Bartley F. McNally, North Providence, R.I., and Richard F. Lacerte, Hudson, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1990, Ser. No. 617,721

Int. Cl.⁵ B05D 3/12, 1/18, 1/38, 7/24

U.S. Cl. 427-240

8 Claims

7. A method providing enhanced retention of Permethrin in textiles over multiple laundry cycles of the textiles comprising the step of applying the Permethrin in combination with amylopectin to the textiles.

5,089,299

COMPOSITE CERAMIC MICROPERMEABLE MEMBRANE, PROCESS AND APPARATUS FOR PRODUCING SUCH MEMBRANE

Willem H. Van 'T Veen, Alkmaar; Albertus J. G. Engel, Heiloo; Benedictus C. Bonekamp, Schagen; Hubertus J. Veringa, Zwaag, and Rinse A. Terpstra, Schagen, all of Netherlands, assignors to Hoogovens Groep BV, IJmuiden, Netherlands
Division of Ser. No. 271,667, Nov. 16, 1988, Pat. No. 4,981,590.
This application May 17, 1990, Ser. No. 524,588
Claims priority, application Netherlands, Nov. 19, 1987, 8702759

Int. Cl.⁵ B05D 5/00

U.S. Cl. 427—245 9 Claims
1. A process of producing a microporous membrane by coating a porous ceramic support with a microporous layer forming suspension, comprising the steps of:

- lowering the affinity between said porous support and said microporous layer forming suspension by pretreating said porous support with a silane composition;
- coating the pretreated porous ceramic support with a microporous layer forming suspension comprising an aqueous suspension of a member selected from the group consisting of metal oxides, metal hydroxides and precursors thereof; and
- heating the coated support.

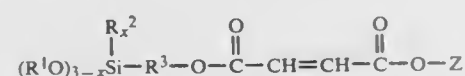
5,089,300

METHOD FOR PREPARATION OF SILYL FUNCTIONAL FUMARATES

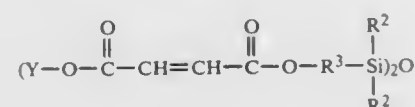
Edwin P. Plueddemann, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Division of Ser. No. 381,916, Jul. 19, 1989, Pat. No. 5,041,593.
This application Jul. 26, 1990, Ser. No. 559,117
Int. Cl.⁵ B05D 3/02

U.S. Cl. 427—299 6 Claims
1. A method for adhering polyolefins to substrates consisting essentially of

- mixing
- a) silyl functional fumurates selected from the structures having the formula



and



- wherein each R¹ is independently selected from an alkyl group having 1 to 4 carbons; each R² is independently selected from R¹ and phenyl; each R³ is independently selected from a straight or branched chain alkylene group having 1 to 10 carbons; each Z is independently selected from the hydrogen atom, R¹ and -R³SiR²_x. (OR¹)_{3-x}; each Y is independently selected from the hydrogen atom and R¹; and x has a value of 0 to 3; and
- an alcohol;
 - applying the mixture of (i) to a substrate;
 - drying the substrate;
 - applying a solid polyolefin to the substrate and,
 - melting the solid polyolefin in contact with the substrate.

5,089,301

SOLUTION FOR THE ACTIVATING OF ELECTRICALLY NONCONDUCTIVE SUBSTRATE SURFACES AND METHOD OF PREPARING THE SAID SOLUTION

Holger Kistrup, Esslingen, and Otwin Imhof, Nürtingen, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Dec. 26, 1989, Ser. No. 456,965
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843903

Int. Cl.⁵ C23C 26/00

U.S. Cl. 427—304 4 Claims
3. A method of using an activation solution for activating in one step an electrically nonconductive substrate surface for subsequent chemical metallization of the activated substrate surface, the activation solution containing an acid, a palladium-(II) compound and a tin(II) compound, the palladium being present predominantly in complexly dissolved form, wherein a molar ratio of the palladium and the tin is employed of about 1:1.5, the solution is prepared at room temperature, no further stabilizing agents or auxiliary materials are added to the solution, and the solution being mature and catalytically effective about 10 minutes after the tin(II) salt has been added to the acid palladium salt solution, the method comprising the step of: employing the solution to activate one of a needle felt and a nonwoven material having a substrate surface made of plastic.

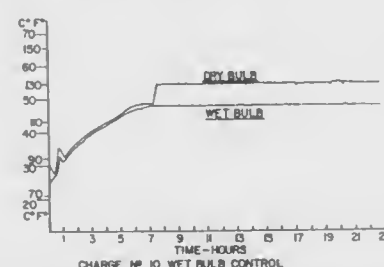
5,089,302

PROCESS FOR FIXING WOODEN ARTICLES PRESSURE TREATED WITH CHROMATED-COPPER-ARSENATE

John N. R. Ruddick; George H. Eaton, both of West Vancouver, and Douglas B. Whiting, Lumby, all of Canada, assignors to Bell Pole Co. Ltd., British Columbia, Canada
Continuation of Ser. No. 346,639, May 3, 1989, abandoned. This application Jan. 28, 1991, Ser. No. 647,690
Claims priority, application Canada, Mar. 7, 1989, 593023

Int. Cl.⁵ B05D 3/04

U.S. Cl. 427—377 15 Claims



1. A process for fixing a chromated-preservative in wood freshly treated with said preservative which comprises placing the preservative treated wood in an atmosphere which is at a temperature of at least about 110° F. wet bulb and below about 150° F. wet bulb and highly humid with water vapor, and maintaining the atmosphere about the freshly treated wood at a temperature of at least about 110° F. wet bulb and below about 150° F. wet bulb and at a controlled equilibrium moisture content level above about 10% until the preservative becomes fixed.

5,089,303

BLEND OF SOLVENT AND PHOTOCURABLE ARYLSILOXANE MATERIALS

John H. Deatcher, Lake Peekskill, and Eric W. Burkhardt, Brewster, both of N.Y., assignors to Akzo America Inc., Dobbs Ferry, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,150

Int. Cl.⁵ C08K 5/06

U.S. Cl. 427—387 9 Claims
1. A homogeneous liquid composition which comprises an

alkoxy alkanol solvent containing a photocurable arylsiloxane oligomer or polymer dissolved therein.

3. A homogeneous liquid composition which comprises an alkoxy alkanol solvent containing a photocurable arylsiloxane oligomer or polymer, which is a phospho-boro-silanol material, dissolved therein.

5,089,304

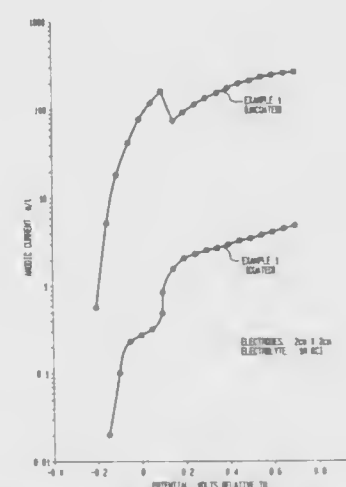
METHOD FOR PRODUCING A CORROSION RESISTANT ARTICLE BY APPLYING A POLYBENZIMIDAZOLE COATING

James E. Kuder, Fanwood, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

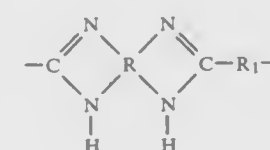
Filed Mar. 7, 1990, Ser. No. 490,030

Int. Cl.⁵ B05D 3/02

U.S. Cl. 427—388.1 17 Claims



1. A method for producing a corrosion-resistant coated article comprising the steps of:
 - providing a corrodible metallic article selected from the group consisting of copper and alloys thereof;
 - coating said article with a solution containing a polymeric composition consisting essentially of recurring units of the formula:



- wherein R is a tetravalent aromatic nucleus, with the nitrogen atoms forming the benzimidazole rings paired upon adjacent carbon atoms of said aromatic nucleus, and R₁ is selected from the group consisting of an aromatic ring, an alkylene group having from 4 to 8 carbon atoms, and a heterocyclic ring selected from the group consisting of pyridine, pyrazine, furan, quinoline, thiophene and pyran; and
- bonding said polymeric composition to the surface of said metallic article, the polymeric coating being non-peeling and being operative to inhibit corrosion of said article.

5,089,305

COATING APPARATUS AND METHOD FOR APPLYING A LIQUID TO A SEMICONDUCTOR WAFER INCLUDING SELECTING A NOZZLE ON A STAND BY STATE

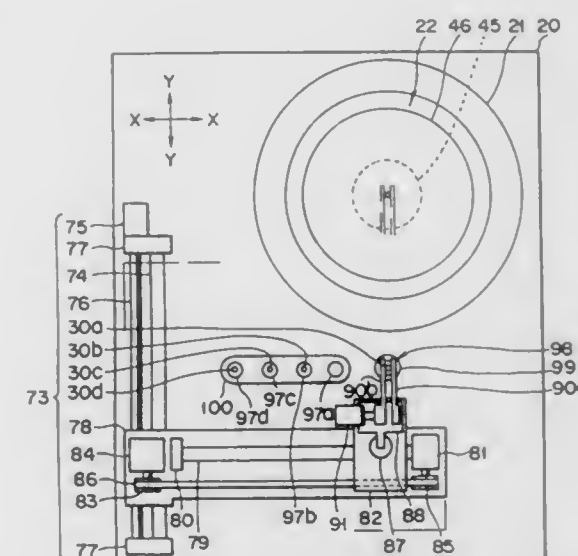
Mitsuru Ushijima, Tama; Osamu Hirakawa, Kumamoto; Masami Akimoto, Kikuyo; Yoshio Kimura, Taimel, and Noriyuki Anai, Kumamoto, all of Japan, assignors to Tokyo Electron Limited, Tokyo and Tel Kyushu Limited, Kumamoto, both of Japan

Division of Ser. No. 357,279, May 26, 1989, Pat. No. 5,002,008.
This application Sep. 20, 1990, Ser. No. 585,199

Claims priority, application Japan, May 27, 1988, 63-130723; Jul. 1, 1988, 63-164245

Int. Cl.⁵ B05D 1/30

U.S. Cl. 427—422 6 Claims



1. A treatment method for applying a number of liquids to a semiconductor wafer in a clean atmosphere, said liquids containing a solvent for coating, recoating or developing the surface of the object, comprising the steps of:
 - providing a plurality of liquid supply passages in connection with nozzle means, each of which stands by at a home position in a solvent atmosphere containing substantially the same solvent as contained in the liquid when said nozzle means is not used, said nozzle means being adapted to supply different kinds of liquids or a single kind of liquid, and said home position being located at a position other than at least an upper region of the wafer;
 - selecting one from said plurality of nozzle means, which corresponds to the kind of liquid to be supplied to the wafer;
 - picking up said selected nozzle means from the solvent atmosphere;
 - conveying the selected nozzle means to a position above the wafer from the home position;
 - supplying liquid to the liquid supply passages of said selected nozzle mean after rotating the wafer, or rotating the wafer after supplying the liquid to the liquid supply passages of said selected nozzle means; and
 - returning said selected nozzle means to said home position immediately after applying the liquid to the wafer.

5,089,306

GLAZING DENTAL CONSTRUCTS

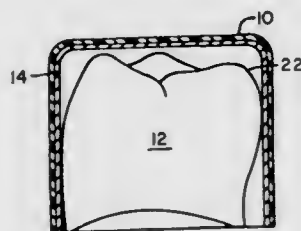
David G. Grossman, Corning, and Michael A. Karnas, Big Flats, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 550,286, Jul. 9, 1990, Pat. No. 4,964,416. This application Jan. 28, 1991, Ser. No. 646,247

Int. Cl.⁵ B65D 65/14; A61C 13/08

U.S. Cl. 428—35.1

11 Claims



1. A preformed, dental construct glazing device that comprises a dental construct glazing material carried within the body of, or on the inside wall of, a hollow, organic, shrinkable carrier having an open end and a closed end.

5,089,307

EDIBLE FILM AND METHOD OF MAKING SAME

Hirofumi Ninomiya; Shoji Suzuki, and Kazubiro Ishii, all of Toyama, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,735

Claims priority, application Japan, May 23, 1989, 1-129386; May 24, 1989, 1-131024; May 25, 1989, 1-132356; Dec. 8, 1989, 1-319440

Int. Cl.⁵ B29D 22/00; A21D 13/00

U.S. Cl. 428—35.2

11 Claims

1. A heat-sealable edible film comprising at least a film layer consisting essentially of (1) a water-soluble polysaccharide composed chiefly of carrageenan, (2) a polyhydric alcohol and (3) water, the film layer having a water content of not greater than 25% by weight, the weight ratio of the polyhydric alcohol to the water-soluble polysaccharide being in the range from 1:5 to 1:1.

5,089,308

COEXTRUDED FILM AND METHODS COMPRISING VINYLIDENE CHLORIDE METHYL ACRYLATE COPOLYMER

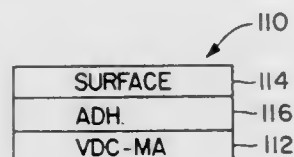
Mark E. Nordness; Frank T. Bauer; Robert J. Blemberg, all of Appleton; John P. Eckstein; David M. Banik, both of Neenah, and Grant A. Gustafson, Menasha, all of Wis., assignors to American National Can Company, Chicago, Ill.

Continuation-in-part of Ser. No. 140,096, Dec. 31, 1987, Pat. No. 4,944,972, and a continuation-in-part of Ser. No. 204,485, Jun. 9, 1988, abandoned. This application Dec. 28, 1989, Ser. No. 458,485

Int. Cl.⁵ B32B 27/08; B29C 47/00

U.S. Cl. 428—35.4

21 Claims



1. A coextruded multiple layer film, which comprises:

- (a) a first layer comprising vinylidene chloride methyl acrylate copolymer;
- (b) a second polymeric layer, the composition of said second polymeric layer comprising polyester having a melting temperature of at least 204° C. or copolyester; and
- (c) a third polymeric layer between said first and second layers, said third layer being adapted to maintain said first and second layers spaced from each other.

5,089,309

SEMITRANSSPARENT RESIN CONTAINER WITH PEARLY LUSTER

Ryoji Odate, and Tomoyuki Haga, both of Kanagawa, Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

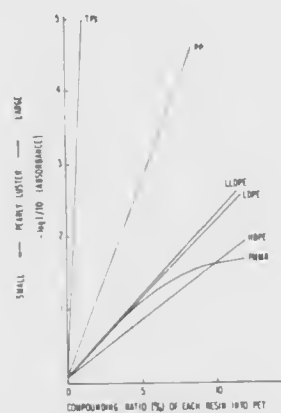
Filed Nov. 17, 1989, Ser. No. 437,563

Claims priority, application Japan, Nov. 17, 1988, 63-288809

Int. Cl.⁵ B65D 65/38; C08L 67/03, 23/20

U.S. Cl. 428—36.92

2 Claims



1. A semitransparent resin container having a pearly luster which comprises a thermoplastic resin composition comprising from 99.1 to 99.9% by weight of a polyester resin and from 0.1 to 0.9% by weight of polymethylpentene having a molecular weight in the range of 100,000 to 1,000,000, produced by preforming said composition followed by biaxial stretch blow molding.

5,089,310

IMAGE TRANSFERRING SHEET AND A METHOD FOR FABRICATING THE SAME

Shunichi Higashiyama, Yokkaichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

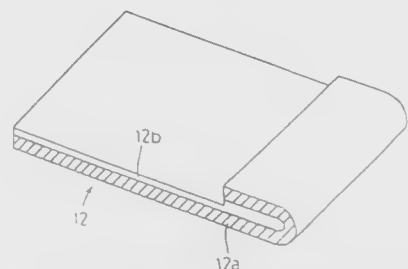
Filed Jul. 3, 1990, Ser. No. 547,178

Claims priority, application Japan, Jul. 25, 1989, 1-192212

Int. Cl.⁵ B32B 3/00

U.S. Cl. 428—40

19 Claims



1. A image transferring sheet comprising:
a thermally bonding sheet having a base sheet with a thermoplastic resin layer;
a developer medium having a support larger in surface area than a surface area of the thermoplastic resin layer of the

base sheet, with a developer layer including an image, the support and the developer layer being made of such materials that the support and the developer layer are separable from each other, an adhesive force between the base sheet and the thermoplastic resin layer being stronger than an adhesive force between the support and the developer layer;

wherein, the thermally bonding sheet and the developer medium are hot-pressed together with the thermoplastic resin layer and the developer layer in face-to-face relation such that the edges of the developer medium extend beyond the thermoplastic resin layer.

5,089,311

OPEN FACED SANDWICH BARRIER

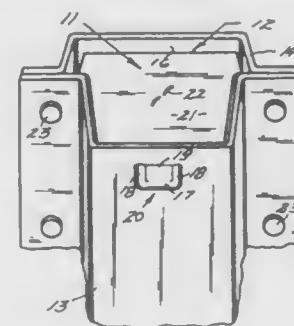
James T. Ligon, Sr., Almont, Mich., assignor to Ligon Brothers Manufacturing Company, Almont, Mich.

Filed Dec. 11, 1989, Ser. No. 448,344

Int. Cl.⁵ B32B 1/08, 5/18

U.S. Cl. 428—71

3 Claims



1. An expandable closure-barrier for transversely and selectively sealing a tubular vertical columnar opening as defined by vertically disposed and joined walls the construction comprising:

a single baffle plate having a configuration similar to the transverse cross section of the opening in said tubular vertical column and in spaced relation to the internal walls of said column and said baffle plate having attached thereto a sheet of selectively expandable heat activatable sealing material generally coextensive with said principal planar portion of said baffle plate and on the uppermost surface thereof; and

at least a single fastener and steadying means locating and steadying said baffle plate in a transverse position in respect to said opening in said vertical column.

5,089,312

CERAMIC-METAL JOINED COMPOSITE BODIES WITH A CURVED BOTTOM METAL RECESS

Hiroyuki Kawase, and Koji Kato, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

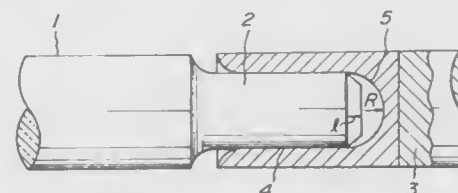
Filed Oct. 18, 1989, Ser. No. 422,903

Claims priority, application Japan, Oct. 18, 1988, 63-135003

Int. Cl.⁵ F01D 5/28

U.S. Cl. 428—139

6 Claims



1. A ceramic-metal joined composite body comprising:
a ceramic member having a projection formed thereon, said

projection being substantially cylindrical and having a diameter D;

a solid metallic member having a recess formed therein, said recess being defined by a substantially cylindrical inner surface, a bottom surface, and a curved surface between said inner surface and said bottom surface, said curved surface having a radius of curvature R;

wherein said projection of said ceramic member is fitted into said recess of said metallic member and R/D is 0.04 to 0.20; wherein said composite body is capable of repeated high speed rotation about the center line axis of said cylindrical projection, said axis being perpendicular to said diameter.

5,089,313

PROCESS FOR COATING METAL AND PLASTIC TO IMPART WOOD-LIKE APPEARANCES

Carroll W. Cope, Marion, Va., assignor to Marley Mouldings Inc., Marion, Va.

Continuation-in-part of Ser. No. 103,440, Sep. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 940,904, Dec. 10, 1986, abandoned. This application Aug. 29, 1989, Ser. No. 400,271

Int. Cl.⁵ D06N 7/04

U.S. Cl. 428—151

12 Claims

1. A coated metal product comprising a metal substrate and a coating over said substrate formed by placing a liquid coating over said substrate, said liquid comprising:

	% volume
alkyd resins	4.66-5.70
styrene-allyl alcohol copolymer	4.66-5.70
solvents	41.56-50.78
chlorinated paraffin	3.79-4.63
tripentaerythritol	4.25-5.19
ammonium polyphosphate powder	11.25-13.75
melamine resin	3.92-4.80
wetting agent	0.24-0.30
deodorant	0.25-0.31
ethyl hydroxy ethyl cellulose	8.06-9.86
pecan shell flour	1.01-1.23
resimene resins	1.80-2.20
flow agent	0.04-0.06
suspension agent	0.11-0.13
titanium oxide white pigment	1.17-1.43
vinyl resins	1.32-1.62
cellulose acetate	0.96-1.18
diethyl phthalate	0.64-0.78
inorganic yellow pigment	0.10-0.12
talc	0.06-0.08
cellulose acetate butyrate	0.14-0.18

and drying said liquid coating to remove volatile solvents.

5,089,314

CARRIER TAPE FOR ELECTRONIC CIRCUIT ELEMENTS AND METHOD OF MANUFACTURING AN ELECTRONIC CIRCUIT ELEMENT SERIES

Sho Masujima; Hiroshi Yagi; Atsuzo Tamashima, and Masakazu Kamoshida, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 154,804, Feb. 11, 1988, abandoned.

This application Feb. 15, 1990, Ser. No. 481,756

Claims priority, application Japan, Feb. 25, 1987, 62-26656[U]; Feb. 25, 1987, 62-26657[U]; Feb. 25, 1987, 62-26658[U]; Feb. 25, 1987, 62-26659[U]; Mar. 25, 1987, 62-43695[U]; Mar. 25, 1987, 62-43696[U]; Jul. 14, 1987, 62-176329

Int. Cl.⁵ B32B 9/00

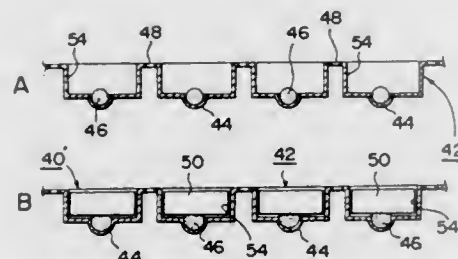
U.S. Cl. 428—156

25 Claims

1. An electronic circuit element series comprising:
a carrier tape including a continuous elongated flexible tape body;
a plurality of electronic circuit elements arranged on an

upper surface of said flexible tape body at equal intervals in a row in the direction of elongation of said tape body and adapted to be provisionally held on printed circuit boards prior to a final fixing of the circuit elements on the printed circuit boards by soldering;

said tape body having at least one recess formed at each of portions of said tape body on which the plurality of the electronic circuit elements are arranged, said at least one recess at each of said portions being open toward the



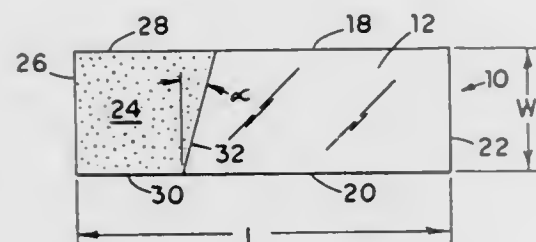
upper surface of said tape body and curved in a downward direction from said tape body; and

adhesive means contained in each of said recesses of said tape body for temporary fixing said electronic circuit elements on said printed circuit boards, said adhesive means being formed of a material having the property of exhibiting adhesion upon being heated;

said electronic circuit elements being held on said tape body by said adhesive means contained in said recesses.

5,089,315 GLASS SLIDE

H. James Rosenberg, Wellesley, Mass., assignor to Erie Scientific Company, Portsmouth, N.H.
Filed Oct. 3, 1989, Ser. No. 416,521
Int. Cl.⁵ B32B 23/02; G02B 21/34
U.S. Cl. 428—192 9 Claims



1. A glass slide having a top surface, a bottom surface, a left edge, a top edge, a right edge and a bottom edge, said slide having a marking surface located at one end of said top surface, said marking surface having a substantially trapezoidal configuration such that when viewed from the top surface provides a first visual appearance and when viewed from the bottom surface provides a different visual appearance such that the top surface and bottom surface of the slide can be readily determined.

7. A glass slide having a top surface, a bottom surface, a left edge, a top edge, a right edge and a bottom edge, said slide having a marking surface located at one end of said top surface, said marking surface having a configuration which has three sides that are substantially parallel with three of said edges of said glass slide, said marking surface having a right side having a non-linear asymmetrical configuration such that when viewed from the top surface provides a first visual appearance and when viewed from the bottom surface provides a different visual appearance so that the top surface and the bottom surface of the slide can be readily determined.

9. A glass slide having a top surface, a bottom surface, a left

edge, a top edge, a right edge, and a bottom edge, said slide having a marking surface located at one end of said top surface, said marking surface having an outer peripheral configuration which is substantially asymmetrical such that when viewed from the top surface provides a first visual appearance and when viewed from the bottom surface provides a different visual appearance such that the top surface and the bottom surface of the slide can be readily determined.

5,089,316 PLASTICS PRINTING MATERIAL AND IMAGE FIXING METHOD FOR ELECTROSTATIC PRINTING WITH USE OF SAME

Hiromi Sasaki, Suita; Masao Tojima, Amagasaki; Satsuko Konishi, Kobe, and Hiroyuki Takana, Suita, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan
Division of Ser. No. 257,616, Oct. 14, 1988. This application Sep. 24, 1990, Ser. No. 587,148

Claims priority, application Japan, Oct. 16, 1987, 62-262309; Mar. 23, 1988, 63-70310
Int. Cl.⁵ B32B 3/00 5 Claims

1. A printing material comprising a film or sheet prepared from a chlorinated polyethylene containing 10 to 50 wt. % of chlorine and obtained by chlorinating a polyethylene having a molecular weight of 10,000 to 200,000, by a solution method or aqueous suspension method, or from a polymer mixture containing the chlorinated polyethylene.

5,089,317 MAGNETIC RECORDING MEDIUM

Hitoshi Noguchi; Shinji Saito; Hiroo Inaba, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 22, 1990, Ser. No. 468,327
Claims priority, application Japan, Jan. 20, 1989, 1-10036; Jan. 25, 1989, 1-14012
Int. Cl.⁵ G11B 23/00 8 Claims

1. A magnetic recording medium comprising two or more magnetic layers containing ferromagnetic particles dispersed in a binder provided on a non-magnetic substrate, characterized in that ferromagnetic particles having an adsorption moisture adjusted to not lower than 0.4 wt %, but not higher than 2.0 wt % by moisture conditioning are used in the upper layer of said magnetic layers and ferromagnetic particles having an adsorption moisture less than by at least 0.1 wt % than that of the ferromagnetic particles used in said upper layer are used in the lower layer of said magnetic layers.

5,089,318 IRIDESCENT FILM WITH THERMOPLASTIC ELASTOMERIC COMPONENTS

Ramakrishna S. Shetty, Pelham, and Scott A. Cooper, Yorktown Heights, both of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.
Filed Oct. 31, 1989, Ser. No. 429,785
Int. Cl.⁵ B32B 7/02, 27/08, 27/36 16 Claims

1. A transparent thermoplastic resinous laminate film of at least 10 very thin layers of substantially uniform thickness, said layers being generally parallel, the contiguous adjacent layers being of different transparent thermoplastic resinous materials of which one is a thermoplastic elastomer, the contiguous adjacent layers differing in refractive index by at least about 0.03.

5,089,319 BIAXIALLY-ORIENTED POLYOLEFIN MULTI-LAYER FILM WHICH CAN BE SEALED ON BOTH SIDES AND THE PREPARATION AND USE OF THE SAME

Lothar Bothe, Mainz-Gonsenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 5, 1990, Ser. No. 622,785
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1989, 3940197
Int. Cl.⁵ B32B 7/02, 27/18, 27/32 14 Claims

1. A three layer, biaxially-oriented polyolefin film having two exterior surfaces which can be sealed, comprising a base layer comprised of propylene and having a first and second surface, and first and second sealing layers comprised of a sealable olefin polymer and disposed on said first and second surfaces, respectively, of said base layer, wherein said base layer includes about 0.5 to 2.0% by weight of a polydialkylsiloxane which has a viscosity of less than about 500 mm²/s.

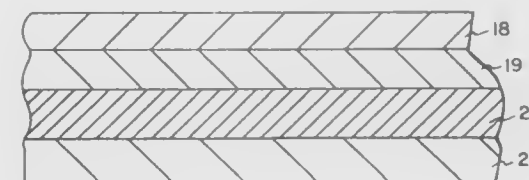
5,089,320 RESEALABLE PACKAGING MATERIAL

Steven J. Straus, Concord; Edward J. Zuscik, Oakland; William B. Bower, Palo Alto, and Apostol Yanidis, Berkeley, all of Calif., assignors to James River II, Inc., Cincinnati, Ohio
PCT No. PCT/US90/00101, § 371 Date Nov. 9, 1990, § 102(e) Date Nov. 9, 1990
Continuation-in-part of Ser. No. 295,077, Jan. 9, 1989, abandoned. This PCT application Jan. 5, 1990, Ser. No. 603,760
Int. Cl.⁵ B32B 19/00 19 Claims

1. A flexible packaging material comprising a substrate layer, a layer of tacky adhesive adjacent the substrate layer, and a skin layer covering the layer of tacky adhesive, the skin layer having a thickness between about 0.05 and 0.5 mil, each surface of the packaging material having a coefficient of friction such that the material is machinable in a packaging machine, the material being capable of being sealed to itself by the sealing jaws of the packaging machine to form a package having a seal which has an initial bond strength such that the package remains closed during normal handling but which can be readily pulled apart manually to open the package, the skin layer being fractured when the seal is pulled apart such that the tacky adhesive is exposed at the surface of the seal area, whereby the packaging material may be resealed to itself at the area of the seal by the application of manual pressure alone to reclose the package.

5,089,321 MULTILAYER POLYOLEFINIC FILM STRUCTURES HAVING IMPROVED HEAT SEAL CHARACTERISTICS

Pak-Wing S. Chum, and Kaelyn C. Koch, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jan. 10, 1991, Ser. No. 639,648
Int. Cl.⁵ B32B 27/08, 7/02 23 Claims



1. A multilayer heat-sealable thermoplastic film structure having improved heat seal performance after electron beam

irradiation, said film structure comprising at least one heat-sealable outer layer (A) and at least one core layer (B), wherein layer (A) comprises a first linear polyethylene having:

- (a) a density from about 0.88 g/cc to about 0.92 g/cc,
- (b) a melt index, measured as I₂, from about 2 g/10 minutes to about 20 g/10 minutes,
- (c) a molecular weight distribution, measured as I₁₀/I₂, from about 5 to about 8, and wherein
- (d) 15% by weight or less of said first linear polyethylene has a degree of branching less than or equal to 2 methyls/1000 carbons, and
- (e) 25% by weight or less of said first linear polyethylene has a degree of branching equal to or greater than 25 methyls/1000 carbons, and wherein layer (B) comprises a second linear polyethylene having:
- (f) a density from about 0.88 g/cc to about 0.94 g/cc,
- (g) a melt index, measured as I₂, from about 0.05 g/10 minutes to about 5 g/10 minutes, and
- (h) a molecular weight distribution, measured as I₁₀/I₂, from about 8 to about 30.

5,089,322 POLYETHYLENE RESIN COMPOSITION AND FILM THEREOF

Takasi Matsunaga, and Toshihiro Nisimura, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Aug. 24, 1989, Ser. No. 399,071
Claims priority, application Japan, Sep. 1, 1988, 63-219431
Int. Cl.⁵ C08L 23/06, 23/18, 23/08; C08J 5/18 13 Claims

1. A polyethylene resin composition comprising:

(A) 30 to 50% by weight of a linear low density polyethylene resin having (i) an MFR_{190° C.} of 0.3 to 3.0 g/10 min, (ii) a density of 0.900 to 0.915 g/cc, (iii) an M₁₂₀/M₁₂ of 40 or less, and (iv) one or more endothermic peaks of the melting point determined by a differential scanning calorimeter, wherein, when there are two or more peaks, the highest melting point (T_{m1}) is 118° to 125° C. and the ratio T_{m1}H/T_{m2}H between the endothermic peak height (T_{m1}H) of the highest melting point and the next low temperature side endothermic peak height (T_{m2}H) is 1.2 or less, and containing (v) an α -olefin having 4 or more carbon atoms as a comonomer;

(B) 20 to 40% by weight of a high density polyethylene resin having (i) an MFR_{190° C.} of 0.01 to 0.2 g/10 min, (ii) a density of 0.935 to 0.950 g/cc, and (iii) an M₁₂₀/M₁₂ of 80 or more; and

(C) 10 to 40% by weight of a high pressure low density polyethylene resin having (i) an MFR_{190° C.} of 0.1 to 2.0 g/10 min, (ii) a density of 0.915 to 0.924 g/cc, and (iii) a melt tension of 5 g or more,

said polyethylene resin composition having (i) an MFR_{190° C.} of 0.2 to 1.0 g/10 min, (ii) a density of 0.918 to 0.935 g/cc, and (iii) a melt tension of 5 g or more.

5,089,323 OXYGEN ABSORBING SHEET

Kiyohiko Nakae, Tokyo; Toshio Kawakita, Osaka; Takanori Kume, Osaka, and Masashi Sugiyama, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan
Filed Nov. 24, 1989, Ser. No. 440,925
Claims priority, application Japan, Nov. 24, 1988, 63-297921
Int. Cl.⁵ B32B 9/00 7 Claims

1. An oxygen absorbing sheet obtained by molding a resin composition comprising:

(a) from 15 to 70% by weight of a thermoplastic resin comprising a copolymer of ethylene and an α -olefin having from 4 to 12 carbon atoms, said copolymer having a density of from 0.870 to 0.915 g/cm³, containing from 18 to 45% by weight of xylene extractable content at 25° C.,

and having a weight average molecular chain length from 1000 to 9000 Å; and
 (b) from 30 to 85% by weight of an oxygen absorbent comprising from 90 to 99.9% by weight of an iron powder having a particle size of from 0.1 to 100 µm, a specific surface area of 1000 cm²/g or more, and from 0.1 to 10% by weight of an electrolyte, in which the electrolyte is adhered on the surface of the iron powder; into a sheet having a thickness of from 10 µm to 5 mm, and stretching the sheet at least uniaxially at a stretch ratio of from 1.5 to 8.0.

5,089,324

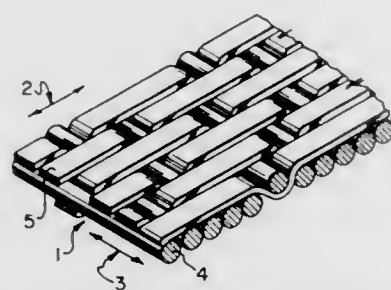
PRESS SECTION DEWATERING FABRIC

Graham W. Jackson, Carleton Place, Canada, assignor to JWI Ltd., Kanata, Canada

Filed Sep. 18, 1990, Ser. No. 584,096
 Int. Cl.⁵ B32B 5/02

U.S. Cl. 428—234

31 Claims



1. A woven dewatering fabric for the press section of a paper making machine having a paper side, a machine side, opposed side edges, the fabric having a cross-machine direction extending between the side edges and a machine direction extending perpendicularly to the cross-machine direction, and having a fabric weave pattern that provides long exposed floats on the paper side of the fabric of a monofilament warp yarn having a flattened cross-section with an aspect ratio of at least 1.5:1, having a fill factor for the flattened monofilament of at least 45%, and having a float ratio for the exposed floats of the flattened monofilaments expressed by the formula of a/b wherein:

- (i) "a" represents the number of paper side surface layer weft yarns in a single weave pattern repeat of a flattened monofilament warp which are underneath and in contact with that warp;
- (ii) "b" represents the total number of paper side surface layer weft yarns in the single weave pattern repeat; and further wherein for a majority of the long exposed floats:
- (iii) "a" is greater than 1; and
- (iv) "a" is greater than one half of "b".

5,089,325

PARTIALLY COATED FABRIC SHEET

James F. Covey, Snohomish, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 146,418, Jan. 21, 1988, Pat. No. 4,892,626, and a continuation of Ser. No. 422,570, Oct. 17, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 651,047

Int. Cl.⁵ B32B 7/00

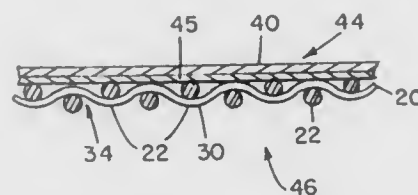
U.S. Cl. 428—246

18 Claims

1. An electrical discharge resistant multi-layer composite material laminate structure for external use on an aircraft, comprising:

- an outermost laminate layer having a plurality of woven fibers having intersects therebetween and having a thin coating of electrically conductive material only on one

side thereof wherein the interstices are not coated with the electrically conductive material; and



a plurality of additional uncoated layers bonded together and bonded with the outermost layer so as to form the composite material laminate structure.

5,089,326

EMI SHIELDED COMPOSITES AND PROCESS OF MAKING SAME

Benedict R. Bonazza, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 55,383, May 29, 1987, abandoned. This application Sep. 8, 1989, Ser. No. 404,381

Int. Cl.⁵ B32B 5/06, 9/00, 15/00, 27/00

U.S. Cl. 428—284

16 Claims

1. An electromagnetic interference (EMI) shielded composite comprising:

- (a) a support having a first surface and a second surface, said first surface being separated by said support from said second surface;
- (b) a first layer of conductive fibers in a continuous polymer matrix laminated to said first surface said conductive fibers having an aspect ratio sufficiently high in relation to the amount of fibers present to provide EMI shielding; and
- (c) a second layer of conductive fibers in a continuous polymer matrix laminated to said second surface said conductive fibers having an aspect ratio sufficiently high in relation to the amount of fibers present to provide EMI shielding.

5,089,327

ANTI-STATIC SHEET FOR USE IN HIGH PRESSURE LAMINATES

Frank L. Cessna, Middletown, Ohio, assignor to The Sorg Paper Company, Middletown, Ohio

Continuation-in-part of Ser. No. 50,076, May 15, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,093

Int. Cl.⁵ B32B 27/04, 27/18, 29/06

U.S. Cl. 428—288

5 Claims

5. An anti-static laminating sheet consisting essentially of:
 47%–53% Pontiac hardwood
 37%–39% high alpha hardwood
 8%–16% cotton linters

said sheet containing a wet strength resin in a sufficiently small quantity such that said sheet is impregnated with a water soluble polycationic quaternary ammonium polymer which is free from metallic salts, said polymer being present in a quantity sufficient to produce a resistivity of from 10^7 – 10^8 ohms/square at relative humidities of from 5% to 50%.

5,089,328

PANEL AND METHOD OF MAKING THE SAME

Richard P. Doerer, Grosse Pointe, Mich., and Edward J. Bihun, Huron, Ohio, assignors to Van Dresser Corporation, Troy, Mich.

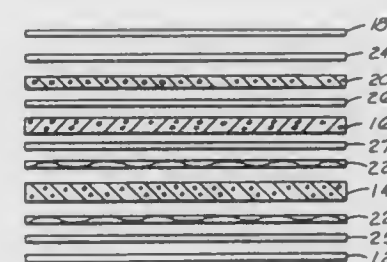
Filed Feb. 26, 1988, Ser. No. 160,676
 Int. Cl.⁵ B32B 5/14, 33/00

U.S. Cl. 428—308.4

14 Claims

1. A method of making a lightweight panel such as an automotive liner panel having a cover sheet attached to a self-sup-

porting core, comprising the steps of providing a plurality of components including a core-forming foam layer, a second foam layer, and a cover sheet, impregnating said core-forming layer with a compound which sets when activated to stiffen the impregnated layer, arranging said components into an assembly with said second layer over said core-forming layer, and said cover sheet over said second layer, and activating said compound and bonding said assembly together under heat and



pressure in a compression molding operation at a temperature at which activation of said compound is accelerated and said core-forming layer is rendered self-supporting and less compressible than said second layer, said second layer and said core-forming layer being arranged in interfacial relation, whereby said compound migrates across the interface between said layers, producing after activation a gradual transition in hardness from one said layer to the other of the bonded assembly.

5,089,329

EXPANDABLE TAPE FOR CABLES, THE USE THEREOF, AND CABLES

Roelf R. A. de Vrieze, Veenendaal, and Petrus G. J. Vogel, Arnhem, both of Netherlands, assignors to Union Industrial Y. A., RG Venendel, Netherlands

Filed Dec. 9, 1987, Ser. No. 130,496

Claims priority, application Netherlands, Dec. 11, 1986, 8603154; Jul. 3, 1987, 8701570

Int. Cl.⁵ B32B 3/26; C08J 9/00; H01B 7/00

U.S. Cl. 428—313.5

12 Claims

1. An expandable tape for use in the manufacture of cables comprising a carrier material carrying two types of thermally expandable microcapsules therein, which begin to expand at different temperatures, the difference in initial expansion temperature between the two types of microcapsules being at least 5° C.

5,089,330

ABRASIVE TAPE IN WHICH A SINGLE COMPOUND SERVES TO IMPROVE DISPERSION OF ABRASIVE PARTICLES AND ALSO AS ANTISTATIC AND LUBRICANT FOR THE TAPE

Masami Sato, Masaaki Fujiyama, Yasuo Nishikawa, and Takashi Iwasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

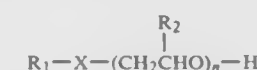
Continuation of Ser. No. 414,346, Sep. 29, 1989, abandoned. This application Jan. 17, 1991, Ser. No. 642,156

Claims priority, application Japan, Sep. 30, 1988, 63-247220
 Int. Cl.⁵ G11B 5/71

U.S. Cl. 428—323

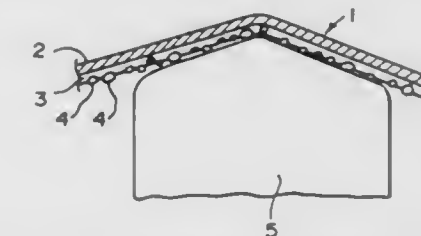
11 Claims

1. An abrasive tape comprising a flexible substrate and an abrasive layer which is overlaid on said flexible substrate and which consists essentially of abrasive grains, a binder, and an additive, wherein said additive contains at least one kind of a compound represented by the general formula of

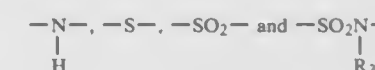


where R_1 represents a monovalent hydrocarbon group having

six to 30 carbon atoms, or a fluorine-substituted alkyl group having one to 17 carbon atoms, R_2 represents H or a monova-



lent alkyl group having one to three carbon atoms, X represents either one of



where R_3 is C_3F_7 , and n is an integer of 1 to 30.

5,089,331

MAGNETIC RECORDING MEDIUM

Katsumi Ryoike, Masatoshi Takahashi, Tsugio Izaki, and Masaki Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1989, Ser. No. 421,434

Claims priority, application Japan, Oct. 14, 1988, 63-257282; Oct. 14, 1988, 63-257283; Oct. 17, 1988, 63-259405

Int. Cl.⁵ G11B 23/00

U.S. Cl. 428—323

19 Claims

1. A magnetic recording medium comprising a non-magnetic support having thereon at least one magnetic layer containing a ferromagnetic powder dispersed in a binder, wherein (a) the magnetic layer further comprises at least one of (i) carbon black having a sodium content of at most 100 ppm, (ii) carbon black having a chlorine content of less than 400 ppm, and (iii) an abrasive having a Mohs' hardness of at least 8 and a mean particle size of 0.05 to 0.5 µm and a sodium content of at most 100 ppm; (b) the ferromagnetic powder comprises a magnetic metal powder having a sodium content of at most 200 ppm; and/or (c) the magnetic recording medium further comprises a back layer provided on the side of the non-magnetic support opposite to the magnetic layer, containing carbon black having a chlorine content of at most 300 ppm dispersed in a binder.

5,089,332

LAMINATES WITH ADHESIVE LAYER OF WHITE-PIGMENTED, MELT-STABLE ETHYLENE/CARBOXYLIC ACID COPOLYMER COMPOSITIONS

Stewart C. Feinberg, Exton, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 436,467, Nov. 14, 1989, Pat. No. 4,992,486. This application Oct. 29, 1990, Ser. No. 604,984

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.⁵ B32B 5/16

U.S. Cl. 428—328

15 Claims

1. A laminated structure comprising at least one nonadhesive layer and at least one white-pigmented adhesive layer, in which the white-pigmented adhesive layer is made of a composition stabilized against thermal crosslinking and consequent reduction of its melt index, consisting essentially of a uniform dispersion of alumina-coated titanium dioxide pigment in a blend of a matrix polymer with a stabilizing polymer, the matrix polymer being a copolymer represented by the formula $E/X/Y$, where E stands for ethylene; X stands for a C_3 – C_7 alpha, beta-unsaturated carboxylic acid; and Y,

which is optional, stands for another copolymerizable comonomer selected from the group consisting of C₃-C₇ alpha, beta-unsaturated carboxylic acids, C₁-C₁₀ alkyl esters of such acids, vinyl esters, vinyl ethers, acrylonitrile, methacrylonitrile, carbon monoxide, and sulfur dioxide; the respective relative weight ratios of the monomers in said E/X/Y copolymer being about 96:4:0 to 40:30:30, and the melt index of said copolymer, determined according to ASTM D1238, Condition E, being about 0.1-100 dg/min; and

the stabilizing polymer being a high melt index copolymer of ethylene with an unsaturated carboxylic acid selected from the group consisting of acrylic acid (E/AA copolymer) and methacrylic acid (E/MAA copolymer), said high melt index copolymer having a melt index of at least about 5,000 dg/min, determined according to ASTM D1238, condition E, and containing at least about 5 weight percent of carboxylic acid monomer;

the relative weight ratio of matrix polymer to stabilizing polymer being about 95:5 to 80:20, and the amount of titanium dioxide in the blend being about 5 to 20 weight percent.

5,089,333

MAGNETIC RECORDING MEDIUM

Setsuko Kawahara; Noboru Koyama; Yasushi Nakano, and Noboru Nakajima, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Division of Ser. No. 448,667, Dec. 11, 1989, Pat. No. 4,992,330.

This application Dec. 4, 1990, Ser. No. 621,782

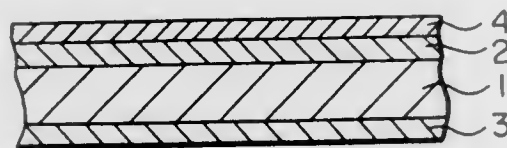
Claims priority, application Japan, Dec. 12, 1988, 63-314490; Feb. 14, 1989, 1-35545

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.⁵ G11B 23/00

U.S. Cl. 428-329

2 Claims



1. A magnetic recording medium comprising a plurality of magnetic layers on a support, said plurality including a first magnetic layer and a second magnetic layer, said first magnetic layer being farthest of all said magnetic layers from said support and comprising a metal powder and 0.2 to 0.8 parts of carbon black per 100 parts of said metal powder, at least one of said magnetic layers containing a fatty acid and a fatty acid ester in a ratio of from 10:90 to 90:10, said metal powder comprising a ferromagnetic metal containing aluminum and/or nickel, said second magnetic layer having a thickness of not more than 2.5 μm, and said medium having a light transmittance at 900 nm of not more than 0.1%.

5,089,334

FLUX SPREADING THIN FILM MAGNETIC DEVICES
Michael Mallary, Berlin, and Harold B. Shukovsky, Framingham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 3, 1988, Ser. No. 227,808

Int. Cl.⁵ G11B 23/00; H01F 10/08

U.S. Cl. 428-336

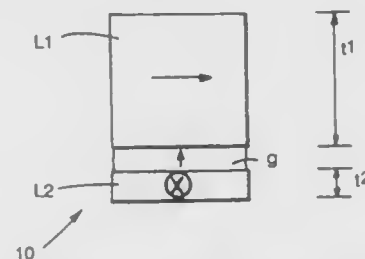
83 Claims

1. A magnetic device for conducting signal flux there-through, comprising:

a first region for conducting said signal flux in a first direction, said first region including a first plurality of magnetic

domains oriented transversely to said first direction to cause said signal flux to conduct by rotation in said first direction,

a second region for conducting said signal flux in a second direction different from said first direction, said second region including a second plurality of magnetic domains



oriented transversely to said second direction to cause said signal flux to conduct by rotation in said second direction, and

said first and second regions being coupled to each other to allow said signal flux to pass between said regions and follow said first and second directions so that said signal flux conducts by rotation through said device.

5,089,335

CROSSLINKING PRIMER FOR FLEXIBLE PACKAGING FILM

Lewis E. Patton, Charlotte, N.C., and Dennis E. McGee, LaVerne, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

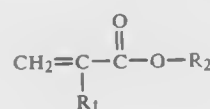
Filed Nov. 14, 1989, Ser. No. 436,377

Int. Cl.⁵ B32B 7/12, 27/08

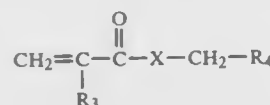
U.S. Cl. 428-341

24 Claims

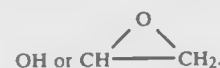
1. An article comprising
 - (a) a thermoplastic polymeric substrate;
 - (b) a first layer comprising a vinylidene chloride polymer; and
 - (c) a second layer between said substrate and said first layer, consists essentially of the product of copolymerization of a mixture of (i) one or more acrylic comonomers of the formula



wherein R₁ is H or an aliphatic radical having 1 to 6 carbon atoms, and R₂ is an aliphatic radical containing 1 to 20 carbon atoms; and (ii) a crosslinking comonomer having the formula



wherein R₃ is H or an aliphatic radical containing 1 to 6 carbon atoms, X is N or O and R₄ is



5,089,336

GENERAL PURPOSE SILOXANE RELEASE COATINGS
Ramesh C. Kumar, Maplewood, and Steven S. Kantner, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

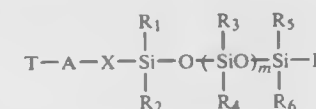
Filed Aug. 14, 1989, Ser. No. 393,557

Int. Cl.⁵ B32B 7/06, 7/12

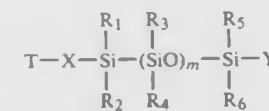
U.S. Cl. 428-352

16 Claims

1. A coated sheet material comprising:
 - (a) a flexible sheet; and
 - (b) a release coating covering at least a portion of one major surface of said flexible sheet wherein said release coating comprises a block copolymer having a formula selected from the group consisting of AB and ABA, wherein A comprises at least one vinyl polymeric block, wherein each polymeric block consists essentially of polymerized free radically polymerizable monomer, wherein each polymeric block has a T_g or T_m above about -20° C. and wherein A comprises at least about 40 weight percent of said block copolymer, wherein B is a siloxane polymeric block having a number average molecular weight above about 1000, and wherein the weight percent of the siloxane polymeric block is great enough to provide said block copolymer with a surface release value not greater than about 50 Newtons/dm; wherein said block polymer has the formula

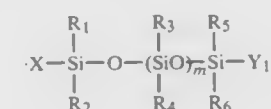


and is made by the utilization of an iniferter represented by the formula



wherein:

T and X are organic groups selected so that the T-X bond is capable of dissociating upon being subject to a radiant energy source to form a terminator free radical on the formula T and an initiator free radical of the formula



said initiator free radical being sufficiently reactive to initiate free radical polymerization of free radically polymerizable monomer and said terminator free radical being insufficiently capable of initiating free radical polymerization of free radically polymerizable monomer but capable of rejoining with said initiator free radical or a free radical polymer segment free radically polymerized with said initiator free radical;

R₁, R₂, R₅ and R₆ are monovalent moieties selected from the group consisting of hydrogen, C₁₋₄ alkyl, C₁₋₄ alkoxy and aryl which can be the same or are different;

R₃ and R₄ are monovalent moieties which can be the same or different selected from the group consisting of C₁₋₄ alkyl, C₁₋₄ fluoroalkyl including at least one fluorine atom and aryl;

R₁, R₂, R₃, R₄, R₅ and R₆ are selected so that they do not prevent said initiator free radical from initiating free radical polymerization or the combining of said terminator free radical with said initiator free radical or a polymer free radical segment including said initiator free radical; Y is selected from the group consisting of -X-T and -Z

wherein X and T are defined above and Z is an organic moiety that will not dissociate to form free radicals when subjected to said energy source;

L is selected from the group consisting of -X-A-T and -Z wherein X and T are defined above and Z is an organic moiety that will not dissociate to form free radicals when subjected to said energy source;

Y₁ is selected from the group consisting of -X and Z; and m is an integer of at least 10.

5,089,337

BUSINESS CARD SECURING DEVICE

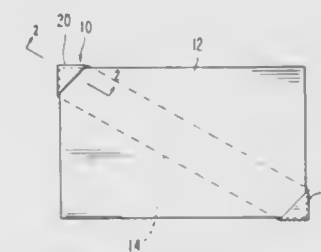
Stanley Hochfeld, Howard Beach, N.Y., assignor to Leonard Holtz, Oceanside and Charles Mutterperl, Valley Stream, both of N.Y.

Filed Nov. 13, 1989, Ser. No. 436,260

Int. Cl.⁵ B32B 7/12; G09F 3/20, 1/10

U.S. Cl. 428-352

6 Claims



1. A device for removably securing a card-like object to a paper mounting surface, comprising:
 - an elongated strip having a front surface and a rear surface, said elongated strip having a substantially rectangular configuration with two ends which are opposite each other and with two sides;
 - securing means for removably securing different peripheral corner portions of said card-like object to said strip, said securing means being formed at at least two spaced apart positions of said strip at at least said front surface of said strip, said securing means being arranged at opposite ends of said elongated strip; and
 - an adhesive on said rear surface of said strip to adhere said strip to the mounting surface, said adhesive having release characteristics so that said strip is removably adhered to the mounting surface and can be removed from the mounting surface without damaging the mounting surface; and
 - said securing means including a first pocket formed at one end of said elongated strip and a second pocket formed at an opposite end of said elongated strip, each pocket being adapted to removably receive a corner portion of a card; and
 - wherein each said pocket has a substantially triangular configuration with a hypotenuse extending substantially in a widthwise direction of said elongated strip.

5,089,338

SECURITY AEROWRAP

Brooke Anderson, Salem, and John W. Smith, Sebring, both of Ohio, assignors to Salem Label Company, Inc., Salem, Ohio

Filed Sep. 17, 1990, Ser. No. 583,329

Int. Cl.⁵ B32B 7/12

U.S. Cl. 428-354

8 Claims

1. A label comprising:
 - a base construction comprising a polypropylene core to which one extruded skin of polypropylene is bonded to each face of the polypropylene core, an opaques agent layer is bonded to one polypropylene skin to provide opacity to block out preprinted graphics and printing in an information containing pattern on any object to which the label is secured, printing or graphics in an information

- (a) coating a surface of at least one of the material bodies with a heat resistant adhesive composition, the heat resistant adhesive composition comprising
 - (A) a polyamic acid solution comprising a polyamic acid and a solvent, the polyamic acid being capable of being converted into a polyimide having a glass transition temperature not higher than 260° C. by heating the polyamic acid to dehydrate the polyamic acid and
 - (B) a bis-maleimide compound in an amount of from 20 to 60 parts by weight per 100 parts by weight of the polyamic acid,
- (b) heating the heat resistant adhesive composition coating the surface of the at least one of the material bodies so that the solvent is removed from the heat resistant adhesive composition and conversion of the polyamic acid into the polyimide starts and proceeds,
- (c) bringing the coated surface of the at least one of the material bodies into contact with a surface of the other material body to form a composite, and
- (d) thermopressing the composite by simultaneously pressing the composite and heating the composite at a temperature not lower than the temperature for thermosetting of the bis-maleimide compound to convert the bis-maleimide compound into a poly-bis-maleimide.

5,089,347

METALLIZED COMPOSITE POLYMER FILMS

Charles R. Hart, Yarm, England, assignor to Imperial Chemical Industries PLC, London, England

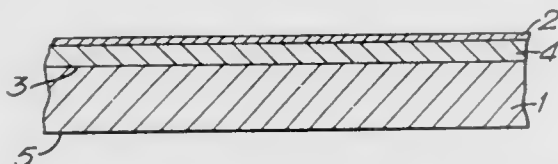
Filed Jul. 20, 1989, Ser. No. 382,221

Claims priority, application United Kingdom, Jul. 25, 1988, 8817664

Int. Cl.⁵ B32B 15/08, 27/36; B05D 1/36

U.S. Cl. 428—461

9 Claims



1. A metallized film comprising a substrate layer of a synthetic polymeric material having on at least one surface thereof an adherent layer and a metallic layer on the surface of the at least one adherent layer remote from the substrate, wherein the adherent layer comprises a homopolymer and/or copolymer comprising styrene and/or a styrene derivative, the copolymer comprising a material selected from the group consisting of acrylic acids, acrylic acid esters, acrylic acid amides, methacrylic acids, methacrylic acid esters, and methacrylic acid amides, copolymerisable with the styrene and/or styrene derivative and not including butadiene.

5,089,348

PRECURED LAMINATE OVERLAY

Lauren G. Louderback, 9431 N.E. Eric, P.O. Box 10398, Bainbridge Island, Wash. 98110

Filed Jul. 3, 1989, Ser. No. 375,392

Int. Cl.⁵ B32B 15/10, 27/10, 31/00

U.S. Cl. 428—464

19 Claims



1. A composite having a smooth, abrasion resistant surface substantially free of surface irregularities, said composite comprising:

- a solid substrate having surface irregularities; and,
- a precured bonded laminate overlay adhered to said solid substrate so as to substantially bridge the irregularities, said precured bonded laminate overlay being separately formed by contacting, substantially curing, and thereby bonding at least two sheets each comprising cellulose impregnated with a thermoset resin, wherein at least one of said sheets initially comprises substantially cured thermoset resin and at least one of said sheets initially comprises uncured thermoset resin at the time of formation of said precured bonded laminate overlay.

5,089,349

COMPOSITIONS AND METHOD FOR APPLYING COATINGS TO METALLIC SURFACES

Herbert J. Kaiser, St. Louis, Mo., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 5, 1989, Ser. No. 361,087

Int. Cl.⁵ C23C 22/07

U.S. Cl. 428—472.1

4 Claims

1. A composition for applying a coating to a metallic surface comprising:

- water;
 - about 0.1 to about 400,000 ppm, based on the weight of a), of an acid;
 - about 0.1 to about 400,000 ppm, based on the weight of a), of phosphate ions; and
 - a tellurium ion source, wherein said tellurium ion source is selected from the group consisting of oxides of tellurium, salts of telluric acid and salts of tellurous acid, and wherein said tellurium ion source causes at least about 0.1 ppm of tellurium ions to be present in said composition, based on the weight of a).
2. An article comprising:
- a metallic substrate; and
 - a coating containing tellurium, wherein said coating is applied to said substrate by contacting said substrate with an effective amount of the composition of claim 1.

5,089,350

THERMAL TRANSFER RIBBON

Shashi G. Talvalkar, Kettering; Thomas J. Obringer, Vandalia, and Richard D. Puckett, Miamisburg, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

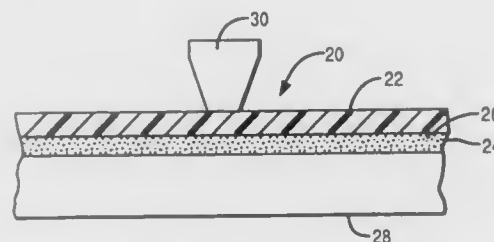
Continuation of Ser. No. 187,138, Apr. 28, 1988, abandoned.

This application Nov. 3, 1989, Ser. No. 431,692

Int. Cl.⁵ B41M 5/26

U.S. Cl. 428—484

15 Claims



1. A thermal transfer ribbon for use in nonimpact printing comprising a substrate and a thermal transfer layer which is formed from a mixture comprising the combination of a wax emulsion containing as essential ingredients about 20 to 45% oxidized, isocyanated hydrocarbon wax, about 35 to 65% paraffin wax mixture of solid crystalline hydrocarbons of the methane series derived from the paraffin distillate portion of crude petroleum, about 5 to 30% carnauba wax and about 3 to 15% ethylene vinyl acetate copolymer resin in a solvent solution and a fluorescent color coating containing as essential ingredients about 5 to 15% orange fluorescent pigment, about 1 to 10% white fluorescent pigment, and about 15 to 30% color toning pigment, the fluorescent pigments in the thermal transfer ribbon having a fluorescence greater than 10 postage meter units, the thermal transfer layer providing a transferred image of a color having a measure of lightness (L) in the range of 40 to 50, a measure (a) on the red-green axis and a measure (b) on the blue-yellow axis, and a total color difference value (Δ) of the transferred image not to exceed 10 when using the formula $\Delta = \sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}$ as measured on the Hunter Color Meter.

5,089,351

PROCESS FOR CREATING ARTWORKS BY APPLICATION OF CRAYON AND INK

Antoinette W. Baarns, 1521 44th St., NW., Washington, D.C. 20007

Filed Jun. 27, 1990, Ser. No. 544,861

Int. Cl.⁵ B05D 5/06; B41M 5/10

U.S. Cl. 428—488.1

4 Claims

1. A process for creating a work of art from a base medium, crayon and ink that comprises

- selecting a base medium that affords a surface to which crayon and ink can adhere,
 - applying at least one crayon to the surface of said base medium with sufficient pressure to cause a portion of the crayon to adhere to the surface of said base medium to produce the appearance of stippling from areas of crayon and areas free of crayon,
 - removing from the surface of said base medium any excess crumbs of crayon that failed to firmly adhere to the surface of said base medium,
 - applying ink over the surface of the areas of crayon and at least a portion of the surface of the areas of the base medium that are free of crayon,
 - removing substantially all the ink other than a thin film of ink from the surface of the areas of crayon and surface of the areas of the base medium that are free of crayon before the ink is allowed to dry,
 - allowing the thin film of ink to dry on the surface of the areas of crayon and the surface of the areas of base medium that are free of crayon, and
 - rubbing the surface of the areas of crayon and the surface of the areas of the base medium that are free of crayon to remove a portion of the dried ink and produce a sheen to the work of art.
3. A work of art created by the process defined in claim 1.

5,089,352

CROSS-LINKED MULTILAYER HEAT-SHRINKABLE ORIENTED POLYMERIC FILM

Steven B. Garland, Simpsonville, and Thomas C. Warren, Greer, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 197,013, May 20, 1988, abandoned, which is a division of Ser. No. 39,551, Apr. 16, 1987, Pat. No. 4,797,235. This application Dec. 18, 1990, Ser. No. 630,395

Int. Cl.⁵ B32B 27/08; B65D 11/00

U.S. Cl. 428—516

11 Claims

1. In a multilayer extruded film having at least one cross-linked layer of cross-linkable polyolefin, the improvement comprising said film is a heat-shrinkable oriented film comprising a barrier layer and at least one cross-linked layer of cross-linkable polyolefin, said extruded polyolefin film layer (1) originally containing a chemical cross-linking agent added into the polyolefin resin feed for the extruded polyolefin film layer, and (2) being irradiated, whereby said polyolefin layer of said heat-shrinkable film is cross-linked by both a chemical cross-linking agent and by irradiation, both being to an extent sufficient to provide an amount of cross-linking effective to accomplish an increased orientation rate during processing of the films as compared with the orientation rate of the corresponding polyolefinic film where said polyolefinic film layer (A) is only irradiated; (B) only contains a chemical cross-linking agent; or (C) is both (i) free of a chemical cross-linking agent and (ii) not irradiated.

5,089,353

MULTI-LAYER MATERIAL HAVING GAS BARRIER PROPERTIES

Taichi Negi, Kurashiki; Akira Mochizuki, Tsukuba; Shiro Nagata, Kurashiki; Komei Yamasaki, Ichihara; Keisuke Funaki, Ichihara, and Takashi Sumitomo, Ichihara, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,997

Claims priority, application Japan, Oct. 14, 1988, 63-260235; Oct. 21, 1988, 63-266898

Int. Cl.⁵ B32B 27/08; C08L 29/04

U.S. Cl. 428—518

26 Claims

1. A multi-layer material comprising at least one layer (A) of a first saponified product of an ethylene-vinyl acetate copolymer having an ethylene content of 20 to 60 mol % and a degree of saponification of at least 90% and at least one layer (B) of a styrene-based polymer having a syndiotactic configuration such that the proportion in a racemic pentad is at least 35%.

5,089,354

WEAR-RESISTANT, ANTI-SEIZING COPPER ALLOY COMPOSITE MATERIALS

Kunio Nakashima; Ryouchi Ishigane; Takayuki Tanaka, and Ken-ichi Ichida, all of Toyama, Japan, assignors to Chuetsu Metal Works, Co., Ltd., Toyama, Japan

Filed Dec. 11, 1990, Ser. No. 625,951

Int. Cl.⁵ G22F 3/00

U.S. Cl. 428—552

18 Claims



1. A shaped, copper alloy material which has been prepared by hot working a mixture of powders encapsulated in a hermetically sealed metal jacket so as to apply compression and stretching actions on said mixture to effect uniform dispersion thereof, said mixture of powders consisting essentially of from about 0.1 to 10 wt% of additive material powder and the balance is copper alloy powder, said additive material powder being selected from the group consisting of solid materials having self-lubricating properties, solid materials having wear-resistant properties and mixtures thereof.

5,089,355

FLEXIBLE METAL CLAD LAMINATE, PRODUCTION METHOD THEREOF AND APPARATUS FOR THE METHOD

Moritsugu Morita, Yokosuka; Takushi Sato, Yokohama; Shusuke Yamanaka, Yokosuka; Shuichi Yoshida; Kenji Tanabe, both of Yokohama; Mitsuyuki Naito, Tokyo, and Shigeyuki Shishido, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP88/00958, § 371 Date May 3, 1989, § 102(e) Date May 3, 1989, PCT Pub. No. WO89/02822, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 22, 1988, Ser. No. 360,909

Claims priority, application Japan, Sep. 24, 1987, 62-237494; Sep. 25, 1987, 62-238864; Sep. 25, 1987, 62-238865; Sep. 25, 1987, 62-238867; Sep. 25, 1987, 62-239003

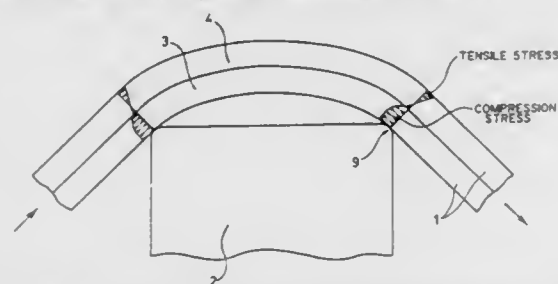
Int. Cl.⁵ B32B 15/08; B21D 1/00

U.S. Cl. 428—607

16 Claims

1. A flexible metal clad laminate formed of at least one plastic layer and at least one metal layer laminated together, characterized in that the flexural rigidity of the metal layer is at

most 20 g.cm, the flexural rigidity of the plastic layer is at least 1/500 of the flexural rigidity of the metal layer, and the metal



layer has been subjected to compression plastic deformation in its plane direction to an extent of at least 0.01 percent but at most 5 percent.

5,089,356

CARBON FIBER REINFORCED TIN-LEAD ALLOY AS A LOW THERMAL EXPANSION SOLDER PREFORM

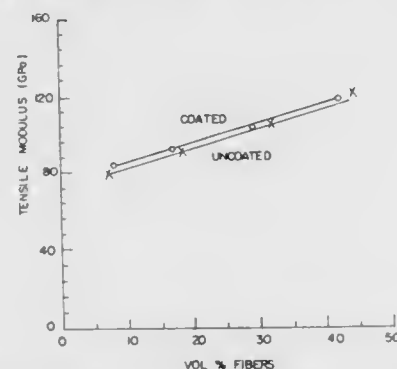
Deborah D. L. Chung, Pittsburgh, Pa., assignor to The Research Foundation of State Univ. of New York, Albany, N.Y.

Filed Sep. 17, 1990, Ser. No. 583,284

Int. Cl.⁵ B32B 5/02; C22C 1/09; B23K 35/28

U.S. Cl. 428—608

38 Claims



1. A solder joint between two surfaces comprising an intermediate composite solder preform, said preform comprising metal coated carbon fibers contained in a metal matrix, said fibers comprising from 2 to 80 percent by volume of the composite, said metal matrix melting at a temperature below 600° C. and containing at least 15 weight percent tin.

5,089,357

Patent Not Issued For This Number

5,089,358

OPTICAL RECORDING MEDIUM

Kazunari Taki, Nagoya; Hideo Maruyama, Kuwana; Yumiko Ohashi, Hajima, and Riki Matsuda, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 6, 1989, Ser. No. 432,457

Claims priority, application Japan, Nov. 5, 1988, 63-279910; Jul. 5, 1989, 1-173751; Jul. 5, 1989, 1-173752; Jul. 5, 1989, 1-173753; Jul. 5, 1989, 1-173754; Jul. 6, 1989, 1-174776; Aug. 18, 1989, 1-213276

Int. Cl.⁵ B32B 5/66

U.S. Cl. 428—694

48 Claims

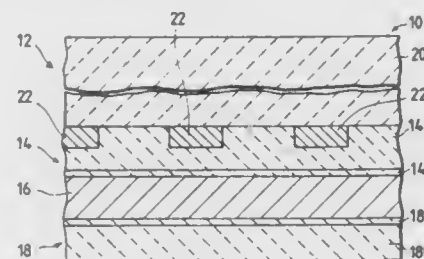
1. An optical recording medium for recording information therein and reproducing the information therefrom with irradiation of light thereto, comprising:

a base plate;

a tracking guide member formed on a surface of said base plate and having an uneven surface for generating a tracking signal;

a flat layer covering said uneven surface of said tracking guide member and having a substantially flat surface at the

opposite side to said base plate for smoothing said uneven surface on said base plate; and



a recording layer formed on said flat layer and having a substantially uniform thickness and a substantially flat surface.

5,089,359

ORGANIC SECONDARY BATTERY

Toshiyuki Obsawa, Tokyo; Tsutomu Matsuda, Shizuoka; Koji Uji-Ie, Hino, and Hiroshi Nishihara, Tokyo, all of Japan, assignors to Ricoh Company, LTD., Tokyo, Japan

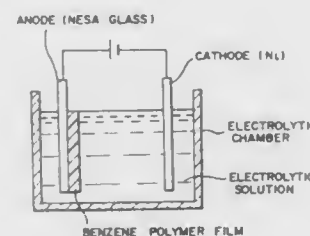
Division of Ser. No. 219,869, Jul. 12, 1988, Pat. No. 4,935,319, which is a continuation of Ser. No. 866,927, May 27, 1986, abandoned. This application Apr. 18, 1990, Ser. No. 510,877

Claims priority, application Japan, May 27, 1985, 60-113894; Aug. 5, 1985, 60-172035; Dec. 2, 1985, 60-271078; Feb. 25, 1986, 61-38193

Int. Cl.⁵ H01M 4/60

U.S. Cl. 204—78

13 Claims



1. A method of producing a benzene polymer by electrolytic polymerization comprising anodically oxidizing benzene or a benzene derivative monomer selected from the group consisting of halogenated benzene, diphenyl and halogenated diphenyl in an electrolytic solution comprising an electrolyte and a solvent.

5,089,360

HIGH-STRENGTH NON-WOVEN FABRIC, METHOD OF PRODUCING SAME AND BATTERY SEPARATOR CONSTITUTED THEREBY

Tomoaki Kanno, Hadano; Yoshibisa Matsushima, and Makoto Suzuki, both of Yokohama, all of Japan, assignors to Tonen Chemical Corporation, Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 651,832

Claims priority, application Japan, Feb. 8, 1990, 2-29034; Feb. 8, 1990, 2-29035

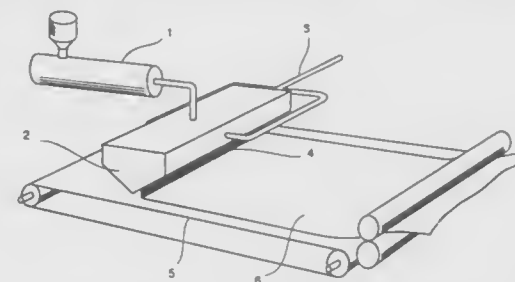
Int. Cl.⁵ H01M 2/16

U.S. Cl. 429—254

10 Claims

1. A high-strength non-woven fabric comprising 100 parts by weight of a non-woven fabric having an apparent fiber

diameter of 0.1–15 μm ; and 0.3–10 parts by weight of an N-methylol or N-alkoxymethyl nylon resin applied to said non-



woven fabric, said N-methylol or N-alkoxymethyl nylon resin being cross-linked.

5,089,361

MASK MAKING PROCESS

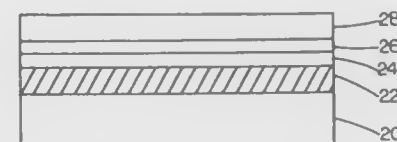
Dong T. Huang, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Aug. 17, 1990, Ser. No. 568,946

Int. Cl.⁵ G03F 1/00, 7/26

U.S. Cl. 430—5

14 Claims



1. A method for manufacturing a lithographic mask supported upon a soda lime glass substrate useful in the manufacture of narrow line widths integrated circuits comprising:

preparing a soda lime glass substrate for subsequent processing;

depositing a thin layer of chromium metal upon said substrate;

forming a thin chromium oxide layer upon the said chromium metal;

applying a very thin coating of a high molecular weight material of the group consisting of poly (glycidyl methacrylate) Co poly (ethyl acrylate) and poly butyl sulfone in the order of hundreds of Angstroms in thickness over the chromium oxide layer;

drying the coating;

applying a layer of resist material over said thin coating and drying said layer of resist material;

exposing said layer of resist material and said very thin coating to radiant energy in the desired pattern of said lithographic mask and developing pattern;

using the said pattern in the developed said resist to etch said very thin coating and said layers of said chromium oxide and chromium metal to form said lithographic mask; and removing said resist material and said thin coating to complete the said lithographic mask.

5,089,362

METALLIC TONER FLUID COMPOSITION

Hsin H. Chou; Wu-Shyong Li, and Robin E. Wright, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1991, Ser. No. 648,913

Int. Cl.⁵ G03G 13/10

U.S. Cl. 430—16

17 Claims

1. A metallic toner fluid composition, which comprises:

(A) electrostatically charged, colloidal, elemental metal particles dispersed in an organic carrier liquid having a

dielectric constant of less than about 3.5 and a volume resistivity greater than about 10^{12} ohm-cm;

(B) a soluble surfactant in an amount sufficient to charge and stabilize the colloidal metal dispersion; and

(C) an effective amount of organosol particles, at least one soluble polymer other than a soluble surfactant (B), or a mixture thereof.

5,089,363

TONER FIXING METHOD AND APPARATUS AND IMAGE BEARING RECEIVING SHEET

Donald S. Rimai, Webster; Muhammad Aslam, Rochester; Carlton D. Baxter, Rochester; Kevin M. Johnson, Rochester; Ernest J. Tamary, Brighton; Joseph F. Laukaitis, Rochester; Hal E. Wright, Rochester; Tsang J. Chen, Rochester, and William J. Staudenmayer, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 11, 1989, Ser. No. 405,258

Int. Cl.⁵ G03G 13/16

U.S. Cl. 430—45

18 Claims

1. A method of treating a multicolor toner image carried on the outer surface of a thermoplastic outer layer of a receiving sheet, said toner image including a plurality of layers of heat softenable dry toner, which toner is made up of toner particles having an average diameter of 8 microns or less, and which layers have been adhered together and partially embedded in said thermoplastic layer by a heat transfer process, but which layers extend above the surface of said thermoplastic layer in a relief image which varies according to the image, said method comprising:

placing said image carrying surface in contact with a surface of a material which latter surface is smooth, hard and has low surface energy,

with said thermoplastic layer at a temperature at or above its glass transition temperature, applying a force urging said surfaces together to provide a pressure of at least 100 pounds per square inch between the surfaces to further embed said toner image in said thermoplastic layer and reduce the relief image,

allowing said thermoplastic layer to cool below its glass transition temperature while still in contact with said smooth, hard surface, and separating said cooled thermoplastic layer from said web.

5,089,364

ELECTROPHOTOGRAPHIC IMAGING MEMBERS CONTAINING A POLYURETHANE ADHESIVE LAYER

Lieng-Huang Lee, Webster, N.Y.; Diane C. Lincoln, Andover, Mass., and Christine J. Tarnawskyj, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1990, Ser. No. 605,063

Int. Cl.⁵ G03G 5/47

U.S. Cl. 430—58

20 Claims

1. A process for fabricating an electrophotographic imaging member comprising providing a substrate having an electrically conductive surface, applying an aqueous dispersion or aqueous latex comprising a non-self-crosslinkable polyurethane and a self-crosslinkable polyurethane, solidifying said polyurethanes to form a continuous adhesive layer having a semi-interpenetrating network structure, forming a thin homogeneous charge generating layer on said adhesive layer, applying a coating of a solution of a charge transport layer forming composition comprising a film forming polymer dissolved in an organic solvent and solidifying said polymer to form a charge transport layer.

14. An electrophotographic imaging member comprising a substrate having an electrically conductive surface, a dried continuous adhesive layer comprising a semi-interpenetrating network derived from a coating mixture comprising a blend of a self-crosslinkable polyurethane and a non-self-crosslinkable polyurethane, a thin homogeneous charge generating layer,

and a charge transport layer comprising a film forming polymer.

5,089,365
PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY WITH THIOPHENE CONTAINING MOIETY ON CHARGE TRANSPORT COMPOUND

Masami Kuroda; Youichi Nakamura, and Noboru Furusho, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

PCT No. PCT/JP88/01016, § 371 Date Jun. 6, 1989, § 102(e) Date Jun. 6, 1989, PCT Pub. No. WO89/03546, PCT Pub. Date Apr. 2, 1989

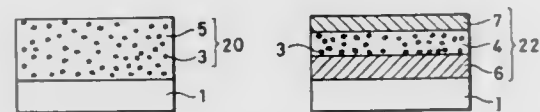
PCT Filed Oct. 6, 1988, Ser. No. 368,333

Claims priority, application Japan, Oct. 7, 1987, 62-253080; Dec. 9, 1987, 62-311311; Dec. 21, 1987, 62-323236

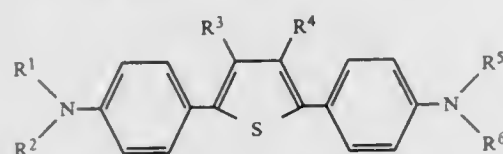
Int. Cl.⁵ G03G 5/047, 5/06

U.S. Cl. 430—59

12 Claims



1. A photosensitive member for electrophotography, comprising:
an electroconductive substrate; and
a photosensitive layer formed on said electroconductive substrate and containing a charge generating substance and a charge transporting substance, said charge transporting substance being at least one compound selected from among derivatives of thiophene represented by the following general formula (I):



wherein R1, R2, R3, R4, R5 and R6 each stand for a substituted or unsubstituted alkyl, aryl, or aralkyl group.

3. The photosensitive member for electrophotography as claimed in claim 1, wherein said photosensitive layer has laminated layers, one of which is a charge generating layer containing said charge generating substance, and another of which is a charge transporting layer containing said charge transporting substance.

5,089,366
HYDRAZONE COMPOUND IN AN ELECTROPHOTOGRAPHIC RECEPTOR

Kozo Haino; Akira Itoh; Makoto Okaji; Kazubiro Emoto; Tatsuya Kodaera; Kazuchiyo Takaoka, all of Tsukuba, Japan assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jan. 3, 1990, Ser. No. 463,033

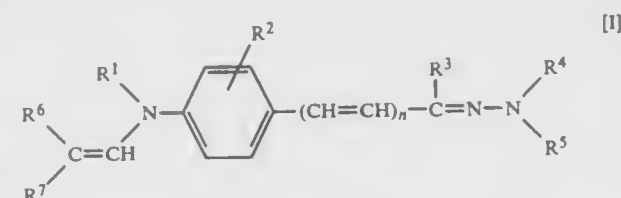
Claims priority, application Japan, Jan. 9, 1989, 1-003345; Jan. 10, 1989, 1-003966; Jan. 10, 1989, 1-003969; Jan. 11, 1989, 1-005193; Jan. 13, 1989, 1-006648; Mar. 31, 1989, 1-081269

Int. Cl.⁵ G03G 5/047

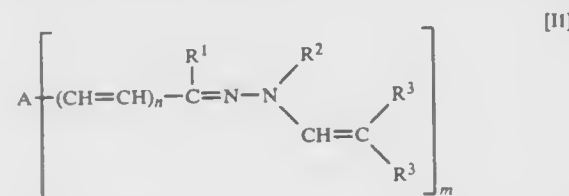
U.S. Cl. 430—59

9 Claims

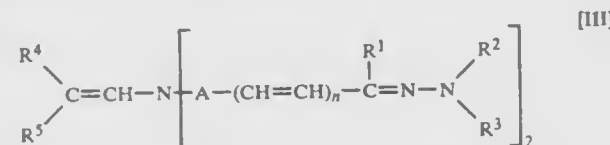
1. An electrophotographic photoreceptor which comprises an electroconductive support and, provided thereon, a photosensitive layer which contains a hydrazone compound represented by the following formula [I], [II], or [III]:



wherein R¹ represents an alkyl group which may have substituent, an aralkyl group which may have substituent, an aryl group which may have substituent, a heterocyclic ring group which may have substituent or a group of atoms necessary to form a ring together with nitrogen atom carrying R¹ and carbon atom in the ortho position of the benzene ring in respect to said nitrogen atom; R² represents a hydrogen atom, an alkyl group which may have substituent, or an alkoxy group which may have substituent; R³ represents a hydrogen atom, an alkyl group which may have substituent or an aryl group which may have substituent; R⁴ represents an alkyl group which may have substituent, an aralkyl group which may have substituent, an aryl group which may have substituent or an alkenyl group which may have substituent; R⁶ and R⁷ which may be identical or different each represents a hydrogen atom, an alkyl group which may have substituent or aryl group which may have substituent and R⁶ and R⁷ may link to each other to form a ring; and n represents 0 or 1,



wherein A represents an aromatic ring or a heterocyclic ring, R¹ represents a hydrogen atom, an alkyl group which may have substituent or an aryl group which may have substituent; R² represents an alkyl group which may have substituent, an aralkyl group which may have substituent or an aryl group which may have substituent; R³ and R⁴ which may be identical or different each represents a hydrogen atom, an alkyl group which may have substituent, an aralkyl group which may have substituent or aryl group which may have substituent and R³ and R⁴ may link to each other to form a ring; m represents 1 or 2; and n represents 0 or 1,



wherein A represents an aromatic ring and the two A may link through a bond, an atom or a group of atoms to form a heterocyclic ring together with nitrogen atom, R¹ represents a hydrogen atom, an alkyl group which may have substituent or an aryl group which may have substituent; R² and R³ which may be identical or different each represents an alkyl group which may have substituent, an aralkyl group which may have substituent or an aryl group which may have substituent; R⁴ and R⁵ which may be identical or different each represents a hydrogen atom, an alkyl group which may have substituent, an aralkyl group which may have substituent or aryl group which may have substituent and R⁴ and R⁵ may link to each other to form a ring; and n represents 0 or 1.

5,089,367
ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING TITANIUM DIOXIDE

Sadao Murasawa, Itami; Yoshio Hirobe, and Hitoshi Ando, both of Moriyama, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jan. 29, 1990, Ser. No. 471,798

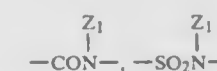
Claims priority, application Japan, Feb. 2, 1989, 1-24584

Int. Cl.⁵ G03G 5/08

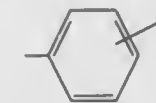
U.S. Cl. 430—84

8 Claims

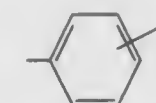
1. An electrophotographic photoreceptor which comprises an electroconductive support and, provided thereon, a photosensitive layer containing a titanium dioxide sensitive to light of longer wavelengths which is obtained by treating the surface of titanium dioxide particles with a mineral acid and then supporting on the surface of the particles a cyanine dye sensitizer and a hydrophobic organic compound selected from the group consisting of aromatic organic acids, esters thereof, acid anhydrides thereof and metal salts thereof; aliphatic organic acids having 8 or more carbon atoms, esters thereof, acid anhydrides thereof and metal salts thereof; and alicyclic organic acids, esters thereof, acid anhydrides thereof and metal salts thereof.



(wherein Z₁ represent a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH—, or



and R₁ represents a hydrocarbon group, provided that when V₁ represents



R₁ represents a hydrogen atom or a hydrocarbon group.

5,089,368
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1991, Ser. No. 642,955

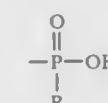
Claims priority, application Japan, Jan. 19, 1990, 2-8494; Jan. 30, 1990, 2-17974; Jun. 12, 1990, 2-151725

Int. Cl.⁵ G03G 5/00

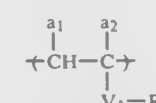
U.S. Cl. 430—96

11 Claims

1. An electrophotographic light-sensitive material comprising a support having provided thereon a photoconductive layer containing an inorganic photoconductive substance and a binder resin, wherein the binder resin contains at least one graft type copolymer containing, as a copolymerizable component, at least one mono-functional macromonomer (M) having a weight average molecular weight of from 1 × 10³ to 2 × 10⁴ and comprising an AB block copolymer being composed of an A block comprising at least one polymerizable component containing at least one acidic group selected from —PO₃H₂, —COOH, —SO₃H, a phenolic hydroxyl group,



(wherein R represents a hydrocarbon group or —OR' (wherein R' represents a hydrocarbon group)) and a cyclic acid anhydride-containing group, and a B block containing at least one polymerizable component represented by the general formula (I) described below and having a polymerizable double bond group bonded to the terminal of the main chain of the B block polymer



wherein a₁ and a₂ each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COOZ₂ or —COOZ₂ bonded via a hydrocarbon group (wherein Z₂ represents a hydrogen atom or a hydrocarbon group); V₁ represents —COO—, —OCO—, CH₂OCO—, CH₂COO— (wherein l₁ and l₂ each represents an integer of from 1 to 3), —O—, —SO₂—, —CO—,

5,089,369

STRESS/STRAIN-FREE ELECTROPHOTOGRAPHIC DEVICE AND METHOD OF MAKING SAME

Robert C. U. Yu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1990, Ser. No. 545,817

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.⁵ G03G 5/047, 5/10

U.S. Cl. 430—96

24 Claims

1. An electrophotographic imaging member, comprising:
a charge generating layer and a supporting substrate, the supporting substrate being comprised of a material having a thermal contraction which is substantially the same as a thermal contraction of said charge generating layer.

5,089,370

LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER PROVIDED ON SUPPORT

Shigehisa Tamagawa, Shizuoka, and Masayuki Kuroishi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 207,974, Jun. 17, 1988, abandoned.

This application Jan. 16, 1991, Ser. No. 641,612

Claims priority, application Japan, Jun. 17, 1987, 62-150975 The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.⁵ G03C 1/72

U.S. Cl. 430—138

16 Claims

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and an ethylenic unsaturated polymerizable compound provided on a paper support, said silver halide and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, wherein the paper support employs a base paper sheet having a void volume of 20 to 40%, wherein the base paper sheet contains at least one pulp selected from the group consisting of a laubholz bleached sulfite pulp and a laubholz dissolving pulp in an amount of 5 to 60 weight % based on the total amount of pulp contained in the base paper sheet.

5,089,371

HEAT DEVELOPMENT TYPE DIAZO COPYING MATERIAL CONTAINING A LIGHT INSENSITIVE INTERMEDIATE LAYER PROVIDED BETWEEN THE SUPPORT AND THE PHOTORESISTIVE LAYER

Kotaro Nakamura, Toshiharu Tanaka, and Hirokazu Shimada, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1989, Ser. No. 382,369

Claims priority, application Japan, Jul. 21, 1988, 63-182678
Int. Cl.⁵ G03C 1/91, 1/775, 1/54, 1/56

U.S. Cl. 430—160

3 Claims

1. A heat development copying material, comprising:
 - a support having provided thereon a photo-sensitive layer containing a diazo compound, a coupling component, a color-forming assistant, and a film-forming high polymeric binder; and
 - a light-insensitive intermediate layer containing a film-forming high polymeric binder, and at least one member selected from the group consisting of a coupling component and a color-forming assistant,
 wherein said light-insensitive intermediate layer is provided between said support and said photo-sensitive layer.

5,089,372

TRANSFER RECORDING MEDIUM UTILIZING DIAZO OR AZIDE COMPOUNDS WHEREIN LIGHT ENERGY IS CONVERTED TO HEAT ENERGY

Yoshihiro Kiriha; Chikara Murata, both of Shizuoka; Masahide Tsukamoto, and Yutaka Nishimura, both of Osaka, all of Japan, assignors to Tomogawa Paper Co., Ltd., Tokyo and Matsushita Electric Industrial Co., Ltd., Kadoma, both of Japan

Continuation of Ser. No. 91,966, Sep. 1, 1987, abandoned. This application Nov. 20, 1989, Ser. No. 439,014

Claims priority, application Japan, Sep. 1, 1986, 61-205608; Sep. 1, 1986, 61-205609; Dec. 25, 1986, 61-307838; Jun. 16, 1987, 62-147940

Int. Cl.⁵ G03C 1/695, 1/52, 5/18

U.S. Cl. 430—167

13 Claims

1. A transfer recording medium for transferring an image onto an image receiving sheet wherein light energy is converted to heat energy comprising:
 - a) a light transmitting support;
 - b) an interlayer provided on a first surface of said light transmitting support for converting light energy to heat energy, said interlayer containing a photolabile compound uniformly disposed therein;
 - c) a light reflecting layer provided on a second surface of said light transmitting support opposite said interlayer which is removable by electrical discharge destruction recording; and
 - d) a heat transfer solid ink layer provided on said interlayer.
7. A transfer recording medium for transferring an image onto an image receiving sheet wherein light energy is converted to heat energy comprising:
 - a) a light transmitting support;
 - b) an interlayer provided on a surface of said light transmitting support, said interlayer containing a photolabile compound uniformly disposed therein;
 - c) a heat transfer solid ink layer provided on said interlayer; and
 - d) a light-heat converting layer provided between said interlayer and said heat transfer solid ink layer.

5,089,373

POSITIVE PHOTORESIST COMPOSITION UTILIZING O-QUINONEDIAZIDE AND NOVOLAK RESIN

Kazuya Uenishi; Yasumasa Kawabe, and Tadayoshi Kokubo, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

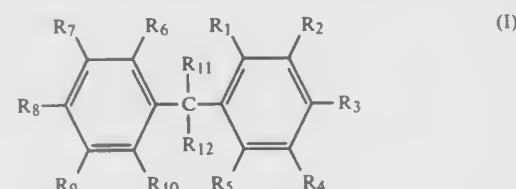
Filed Jun. 7, 1989, Ser. No. 363,568

Claims priority, application Japan, Jun. 7, 1988, 63-139904
Int. Cl.⁵ G03C 1/61; G03F 7/023, 7/022

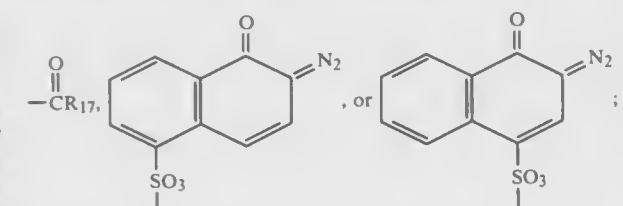
U.S. Cl. 430—191

9 Claims

1. A positive photoresist composition comprising in admixture at least one alkali-soluble novolak resin and at least one light-sensitive compound represented by formula (I):



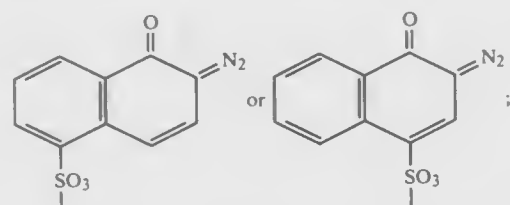
wherein each of R₁ to R₁₀, which may be the same or different, represents hydrogen, —OH, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted alkylester group, a substituted or unsubstituted arylester group, a substituted or unsubstituted aralkylester group, a substituted or unsubstituted alkylsulfonylester group, a substituted or unsubstituted arylsulfonylester group,



provided that at least one of R₁ to R₁₀ represents



where R₁₇ represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted aralkyl group; and at least two of R₁ to R₁₀ represent



and R₁₁ and R₁₂, which may be the same or different, each represents hydrogen, —OH, —COOH, —CN, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aralkyl group, —COOR₁₃, —R₁₄—COOH, or —R₁₅—COOR₁₆; where R₁₃ and R₁₆, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted aralkyl group; and R₁₄ and R₁₅ each

represents a substituted or unsubstituted alkylene group, or a substituted or unsubstituted arylene group; provided that at least one of R₁₁ represents a group other than hydrogen; wherein from 5 to 100 parts by weight of said light-sensitive compound represented by formula (I) are present per 100 parts by weight of said novolak resin.

5,089,374

BIS-ONIUM SALTS AND THE USE THEREOF AS PHOTOINITIATORS

Franklin D. Saeva, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

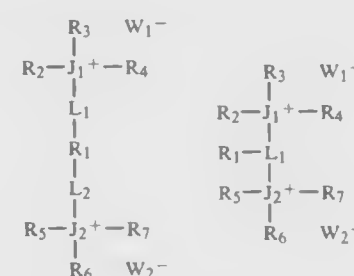
Continuation-in-part of Ser. No. 570,448, Aug. 20, 1990,

abandoned. This application Nov. 13, 1990, Ser. No. 611,631
Int. Cl.⁵ G03C 1/795; G03F 7/029

U.S. Cl. 430—271

5 Claims

1. A composition of matter comprising a material curable by a Bronsted acid, and a bis-sulfonium, -selenonium, -arsonium, -ammonium, or -phosphonium salt comprising:
 - an aromatic or heterocyclic aromatic group which absorbs UV or visible radiation and which exhibits a higher energy occupied molecular orbital than at least one substituent attached to each of the S, Se, As, N or P atoms of said salt;
 - at least one substituent, attached to each of the S, Se, As, N or P atoms of said salt, which comprises an electron-withdrawing group which causes the lowest unoccupied molecular orbital to be localized on the substituent and the S, Se, As, N or P atom of the salt;
 - an insulating group which links said aromatic or heterocyclic aromatic group to each of the S, Se, As, N, or P atoms of said salt, said insulating group essentially preventing a resonance between said aromatic or heterocyclic aromatic group and the other substituents in said salt; and
 - two anions;
 said salt being capable, upon exposure to UV or visible radiation absorbed by said aromatic or heterocyclic aromatic group, of forming a Bronsted acid.
5. A polyester support having thereon a coating comprising a material curable by a Bronsted acid and a compound having one of the following formulas:



wherein:

- R₁ represents an electron donating aromatic or heterocyclic aromatic group which absorbs UV or visible radiation and which exhibits a higher energy occupied molecular orbital greater than R₃ and R₆;
- R₂ and R₅ each, independently, represent the same substituent as R₃ or R₆ or an alkyl group having from 1 to 18 carbon atoms;
- L₁ and L₂ each, independently, represent a linking group which essentially prevents a resonance between R₁ and the remainder of the compound;
- R₃ and R₆ each, independently, represent an electron withdrawing alkyl, aryl or heterocyclic group, which electron withdrawing group causes the lowest unoccupied molecular orbital to be localized on R₃, R₆ and the S, Se, As, N or P atom of the salt;
- J₁ and J₂ each, independently, represent an S, Se, As, N or P atom, and,
- when J₁ or J₂ represents As, N or P, R₄ and R₇, respectively, represent the same substituent as R₃, R₄, R₅ or R₆ and,

when J₁ or J₂ represents an S or Se atom, R₄ and R₇ each, independently, represent O or an electron pair; and, W₁⁻ and W₂⁻ each, independently, represents an anion capable of forming a Bronsted acid having a pK_a of less than 7, said compound being capable, upon exposure to UV or visible radiation absorbed by R₁, of forming a Bronsted acid.

5,089,375

OPTICAL INFORMATION RECORDING MEDIUM AND PRODUCTION METHOD THEREOF

Akira Gotoh; Yukinobu Yamazaki, and Naoyuki Kikuchi, all of Toride, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 114,844, Oct. 30, 1987, abandoned.

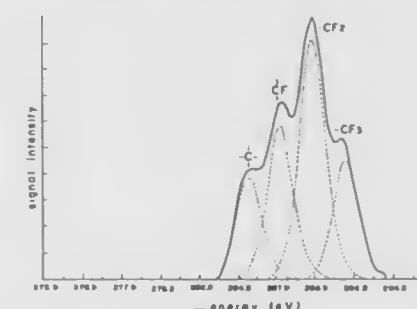
This application Nov. 30, 1989, Ser. No. 443,397

Claims priority, application Japan, Oct. 30, 1986, 61-257047; Feb. 18, 1987, 62-33504

Int. Cl.⁵ G03C 1/76

U.S. Cl. 430—271

11 Claims



1. A method of producing an optical recording medium comprising:
 - providing a vacuum film forming device comprising a vacuum tank and a cathode and a substrate holder accommodated in said vacuum tank;
 - securing a polytetrafluoroethylene (PTFE) target plate to said cathode opposite to said substrate holder having a substrate attached thereto, said substrate being provided with a surface of uneven patterns for recording information;
 - creating a vacuum of about 6×10⁻⁶ Torr in said vacuum tank; providing a gas mixture comprising a carbon fluoride gas and an inert gas in said vacuum tank so as to establish a plasma of said gas mixture having an internal gas pressure within said vacuum tank of about 4.5×10⁻³ Torr;
 - gradually applying high frequency power to said cathode such that said gas plasma is ignited and said target plate is sputtered thereby forming an underlayer of a light permeable material of at least fluorine and carbon on the uneven pattern surface of said substrate such that a ratio of the number of fluorine atoms to carbon atoms is in a range of more than 1.0 but less than 1.8; and
 - thereafter forming a recording layer on the surface of said under layer.

5,089,376

PHOTOIMAGABLE SOLDER MASK COATING

Songvit Setthachayanon, Elizabethtown, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Continuation-in-part of Ser. No. 256,638, Oct. 12, 1988, which is a continuation of Ser. No. 45,464, May 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 939,604, Dec. 8, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 365,328
Int. Cl.⁵ G03F 7/028, 7/033

U.S. Cl. 430—284

16 Claims

1. A solder mask coating composition comprising: 1) a resin binder, 2) a crosslinker, 3) a UV sensitive polymer which has a carboxyl moiety and 4) an acid functional acrylate ester of a bisphenol A epoxy resin in an amount of from about 7 to about 28% by weight of the total solids wt., further providing that the UV sensitive polymer was made by condensing a reaction mixture of component (A), a diisocyanate having from 6 to 18 carbon atoms; component (B) a carboxylic acid polyol having the formula: $(OH)_x-R_6-COOH$, wherein x can be an integer from 2 to 5, and wherein R₆ is a linear or branched, saturated, unsaturated, or aromatic hydrocarbon moiety having from 2 to 29 carbon atoms; and component (C) a hydroxy alkyl(meth)acrylate wherein its alkyl group has from 2 to 28 carbon atoms; provided that component (A) is present in an amount of from about 30 to about 80% by weight of the total amount of the reaction mixture; component (B) is present in an amount of from about 5 to about 45% by weight of the total amount of the reaction mixture and has a minimum of about 0.3 milliequivalents of acid per gram of the total amount of the reaction mixture; and component (C) is present in an amount of from about 5 to about 50% by weight of the total amount of the reaction mixture with a minimum amount of 0.5 milliequivalents of acrylate per gram of the total amount of the reaction mixture; wherein the UV sensitive polymer is characterized by its hydrophilic nature; further providing that a solder mask coat prepared from the coating composition is soluble or swellable in aqueous solutions having a pH in excess of 7.5 until exposure to UV light.

13. A solder mask composition specifically formulated for coating techniques in silk screen printing apparatus comprises:

- 1) a styrene/maleic anhydride copolymer resin binder in an amount of from about 17 to about 45% by weight of the total solids;
- 2) a UV sensitive polymer having a carboxyl moiety, the polymer having been made by condensing a reaction mixture of component (A), a diisocyanate having from 6 to 18 carbon atoms; component (B) a carboxylic acid polyol having the formula: $(OH)_x-R_6-COOH$; wherein x can be an integer from 2 to 5, and wherein R₆ is a linear or branched, saturated, unsaturated or aromatic hydrocarbon moiety having from 2 to 29 carbon atoms; and component (C), a hydroxy alkyl(meth)acrylate wherein its alkyl group has from 2 to 28 carbon atoms; provided that component (A) is present in an amount of from about 30 to about 80% by weight of the total amount of the reaction mixture; component (B) is present in an amount of from about 5 to about 45% by weight of the total amount of the reaction mixture and has from about 0.8 to about 2.6 milliequivalents of acid per gram of the total reaction mixture, and component (C) is present in an amount of 0.5 milliequivalents of acrylate per gram of the total amount of the reaction mixture, wherein the UV sensitive polymer has a molecular weight in the range of from about 6,500 to about 20,000 and is present in an amount of from about 15 to about 35% by weight of the total solids;
- 3) An acid functional acrylate ester of a bisphenol A epoxy resin which has an acid value in the range of from about 13 to about 27 and is present at an amount in the range of from about 7 to about 28% by weight of the total solids;
- 4) a polyfunctional (meth)acrylate monomer crosslinking agent in an amount of from about 3 to about 15% by weight of the total solids;
- 5) a photopolymerization initiator in an amount less than 10% by weight of the total solids;

- 6) a thermopolymerization inhibitor in an amount up to about 1.1% by weight of the total solids;
- 7) a flow leveling agent in an amount up to about 2.6% by weight of the total solids;
- 8) a solvent in an amount of from about 30 to about 42% by weight; and
- 9) a thixotrope in an amount effective to adjust the viscosity of the formulation to a level in the range of from about 55,000 to about 65,000 CPS.

5,089,377

PHOTOPOLYMERIZABLE COMPOSITION AND PROCESSES USING ACRIDINE PHOTOINITIATORS

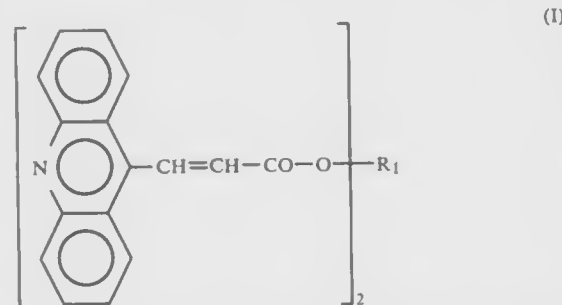
Hajime Kakumaru; Yoshitaka Minami, both of Hitachi; Naohiro Kubota, and Shinya Mashimo, both of Urawa, all of Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan
Division of Ser. No. 401,794, Sep. 1, 1989, Pat. No. 4,985,564.
This application Dec. 12, 1990, Ser. No. 626,069
Claims priority, application Japan, Sep. 3, 1988, 63-221138; Apr. 28, 1989, 1-111193

Int. Cl.⁵ G03C 5/00

U.S. Cl. 430—325

6 Claims

1. A photopolymerizable composition comprising (A) 100 parts by weight of a compound having a boiling point of 100° C. or higher under a normal pressure and at least one ethylenic unsaturated group,
- (B) 0 to 400 parts by weight of a thermoplastic organic polymer, and
- (C) 0.01 to 10 parts by weight of an acridine compound of the formula:



wherein R₁ is a hydrocarbon group having 2 to 20 carbon atoms or $-(R_2O)_nR_2$; R₂ is an alkylene group having 2 to 4 carbon atoms; and n is an integer of 1 to 10.

5,089,378

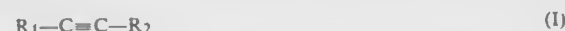
METHOD FOR FORMING AN IMAGE

Hirofumi Ozaki; Ken Kawata, and Hideki Ohmatsu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 290,223, Dec. 27, 1988, abandoned, Continuation-in-part of Ser. No. 917,642, Oct. 10, 1986, abandoned. This application Mar. 20, 1991, Ser. No. 671,635
Claims priority, application Japan, Oct. 14, 1985, 60-228267
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.⁵ G03C 1/00, 5/26

U.S. Cl. 430—351

14 Claims

1. A method for forming an image comprising heating a heat-developable light-sensitive material comprising a support having thereon at least a light-sensitive silver halide and a binder, simultaneously with or after imagewise exposure thereof in the presence of water, at least one of a base and a base precursor, and an acetylene compound represented by formula (I):



wherein R₁ and R₂ each represents a hydrogen atom,

5,089,380

METHODS OF PREPARATION OF PRECIPITATED COUPLER DISPERSIONS WITH INCREASED PHOTOGRAPHIC ACTIVITY

Pranab Bagchi, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 416,205, Oct. 2, 1989, Pat. No. 4,970,139.
This application Aug. 23, 1990, Ser. No. 571,395
Int. Cl.⁵ G03C 5/00

U.S. Cl. 430—449

9 Claims

1. A stable composition consisting of water and particles wherein said particles comprise photographically active component, surfactant, and water immiscible permanent solvent, and wherein said particles have an average diameter of between about 5 and about 100 nanometers.

5,089,381

SILVER HALIDE RECORDING MATERIAL

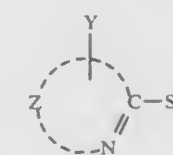
Manfred Becker, Leverkusen, and Hans Öhlschlager, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 435,565, Nov. 13, 1989, abandoned.
This application Mar. 4, 1991, Ser. No. 664,482
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 3838634

Int. Cl.⁵ G03C 1/34

U.S. Cl. 430—611

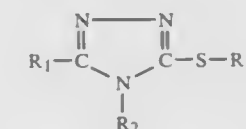
3 Claims

1. A photosensitive silver halide material comprising a support and at least one photosensitive silver halide emulsion layer of which the emulsion contains 10^{-5} to 10^{-2} mol per mol of silver halide of a compound corresponding to the general formula B:



or tautomers thereof, in which

- Z represents the atoms required to complete an oxazole or oxazine ring, and
Y represents a fused aromatic ring system comprising at least one aromatic ring substituted by at least one acidic group, and 10^{-5} to 10^{-2} mol per mol of silver halide of a compound corresponding to the general formula A:



in which

- R₁ is hydrogen, alkyl containing up to 9 carbon atoms which may be substituted, aryl, aralkyl, cycloalkyl or a heterocycle,
R₂ represents hydrogen, alkyl which may be substituted or unsubstituted, alkenyl, aryl or $-NR_4R_5$,
R₃ represents hydrogen or a group releasable during development,
R₄ and R₅ have the same meaning as R₁ or represent $-COR_6$, $-CONHR_7$ or $-COOR_8$,
R₆ represents alkyl or cycloalkyl containing up to 8 carbon atoms which may be substituted or unsubstituted,
R₇ represents hydrogen or R₆,
R₈, R₉ and R₁₀ represent alkyl or cycloalkyl, which may be substituted or unsubstituted, containing up to 8 carbon atoms or aryl, such as phenyl;
and 10^{-6} to 10^{-3} mol per mol of silver halide of one com-

—COOH, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted alkoxy carbonyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, or a substituted or unsubstituted carboamoyl group; provided that both R₁ and R₂ do not represent hydrogen atoms at the same time, wherein said water is supplied to the light-sensitive material or to the light-sensitive material and a dye fixing material, the water being supplied in an amount of from 1/10 of the total weight of the coated layers of the light-sensitive material when water is supplied to the light-sensitive material or in an amount of from 1/10 of the total weight of the coated layers of the light sensitive material and the dye fixing material to the maximum swelling volume of the coated layers of the light-sensitive material and dye fixing material when water is supplied to the light-sensitive material and dye fixing material, wherein said water is supplied to the light-sensitive material or said light-sensitive material and said dye fixing material from a source outside said light-sensitive material or said light-sensitive material and said dye fixing material.

5,089,379

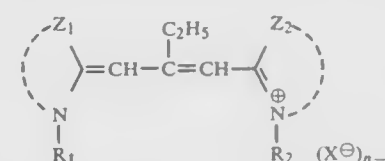
IMAGE FORMING METHOD

Naoko Yatsuyanagi, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan
Filed Apr. 16, 1990, Ser. No. 509,968
Claims priority, application Japan, Apr. 25, 1989, 1-106277
Int. Cl.⁵ G03C 5/26, 1/035

U.S. Cl. 430—434

11 Claims

1. An image forming method comprising the steps of subjecting to imagewise exposure a light-sensitive silver halide photographic material which comprises a support and a silver halide emulsion layer provided on said support, wherein said silver halide emulsion layer contains a silver halide grain having an area ratio of (100) face to (111) face of not less than 5 and being spectrally sensitized with a sensitizing dye represented by the following Formula (I); and at least one layer including in said light-sensitive silver halide photographic material contains a fluorine-containing surface active agent; and processing said exposed light-sensitive silver halide photographic material with processes comprising developing with a developing solution, for a period of time of from 20 seconds to 60 seconds in total

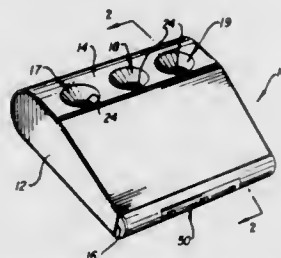


Formula (I)

wherein Z₁ and Z₂ each represent a group of non-metallic atoms necessary to complete a benzothiazole nucleus, benzoselenazole nucleus, naphthothiazole nucleus or naphthoselenazole nucleus that may have a substituent; R₁ and R₂ each represent a lower alkyl group of up to 4 carbon atoms, a substituted lower alkyl group of up to 4 carbon atoms; X[⊖] represents an anion; and n represents an integer of 1 or 2, provided that n is 1 when an intramolecular salt is formed.

5,089,389
BUFFERED COMPOSITION, COATED ARTICLE TEST DEVICE AND A METHOD FOR THEIR USE
 Geraldine A. Pelanek, Webster; Robert W. Zercie, Rochester, and James D. Kanaley, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
 Filed Aug. 25, 1989, Ser. No. 398,565
 Int. Cl.⁵ G01N 35/571; C12Q 1/00
 U.S. Cl. 435—7.36

18 Claims



13. A method for the determination of a chlamydial or gonococcal antigen in a biological specimen carried out in a disposable test device while simultaneously providing a positive control test,

said test device having a first test well being suited for the determination of the unknown antigen, and a second test well being suited as a positive control by having coated therein a buffered composition comprising a mixture of whole chlamydial or gonococcal organisms or an extracted antigen thereof as control antigen, respectively, and a nonionic fluorinated surfactant in an amount of at least about 0.05 weight percent, each of said test wells having a nonionic polyamide microporous membrane located at the bottom thereof, said method comprising the steps of:

- adding an aqueous solution containing unknown amounts of a chlamydial or gonococcal antigen extracted from a biological specimen suspected of containing chlamydial or gonococcal organisms, respectively, to said first and second test wells,
 - bind both unknown and control antigen to the respective membranes in said first and second test wells,
 - contacting chlamydial or gonococcal antigen bound to said membrane in each test well with chlamydial or gonococcal antibody, respectively, so as to form an immunological complex on each of said membranes, and
 - detecting the presence of complex on the membrane in said first test well as an indication of the presence of unknown chlamydial or gonococcal organisms in said biological specimen, and detecting the presence of complex on the membrane in said second test well as a positive control,
- the complexes being detected from a signal provided by either:
- a label on said chlamydial or gonococcal antibody, or
 - unlabeled chlamydial or gonococcal antibody, and a labeled antibody specific to said unlabeled chlamydial or gonococcal antibody.

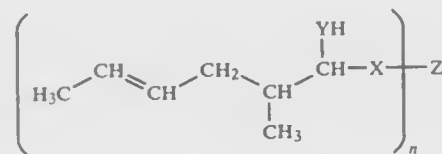
5,089,390
2-METHYL-4-HEPTENE- AND 2-METHYL-4-HEPTENE-1,2-DIOL DERIVATIVES
 Dariush Davalian; Cheng-I Lin, both of San Jose, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
 Filed Sep. 4, 1987, Ser. No. 93,454
 Int. Cl.⁵ G01N 33/533, 33/535, 33/543

U.S. Cl. 435—7.93

7 Claims

1. In an assay for the determination of cyclosporin in a sample suspected of containing cyclosporin wherein the assay comprises the steps of (1) contacting the sample with antibodies for cyclosporin and a conjugate of a label and a compound recognized by said antibodies and (2) detecting immune com-

plexes of said label conjugate and said antibodies, the improvement which comprises employing as said label conjugate a compound of the formula:



wherein:

X is a linking group of 0–65 atoms other than hydrogen;
 Z is a luminescent label selected from the group consisting of fluorogenic substrates, fluorescers, chemiluminescers, and fluorescent particles, or is an enzyme;
 Y is oxygen or sulfur; and
 n is a number from 1 up to the molecular weight of Z divided by 1000;
 and including the optically active isomers thereof.

5,089,391
THRESHOLD LIGAND-RECEPTOR ASSAY
 Kenneth F. Buechler, Santee; Gunars E. Valkirs, Escondido, and Richard R. Anderson, Encinitas, all of Calif., assignors to Biosite Diagnostics, Inc., San Diego, Calif.
 Continuation-in-part of Ser. No. 295,568, Jan. 10, 1989, Pat. No. 5,028,535. This application Jan. 10, 1990, Ser. No. 463,150
 The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.
 Int. Cl.⁵ G01N 33/53

U.S. Cl. 435—7.1

79 Claims

1. Method for determining the amount of at least one target ligand, capable of competing with a ligand analogue conjugate for binding sites available on a ligand receptor, said ligand analogue conjugate comprising at least one ligand analogue coupled to a signal development element capable of emitting a detectable signal, in a fluid sample suspected of containing said target ligand, comprising the steps of:

- contacting said fluid sample with said ligand analogue conjugate and said ligand receptor to form a homogeneous reaction mixture, the relative amounts of said ligand analogue conjugate and said ligand receptor being selected such that in the absence of said target ligand and subsequent to substantially equilibrium binding in said reaction mixture, substantially all of said ligand analogue conjugate is bound to said ligand receptor such that no unbound ligand analogue conjugate is detected as a result of the assay method;
- detecting unbound ligand analogue conjugate in said reaction mixture;
- relating the detectable signal to the amount of said target ligand in said fluid sample.

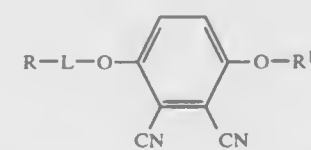
5,089,392
FLUOROGENIC SUBSTRATES FOR MEASUREMENT OF LYSOSOMAL ENZYME ACTIVITIES WITHIN INTACT CELLS

Stephen P. F. Miller, and Roscoe O. Brady, both of Rockville, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
 Filed Mar. 30, 1990, Ser. No. 501,797
 Int. Cl.⁵ C12Q 1/42, 1/02; G01N 31/00, 35/08

U.S. Cl. 435—21

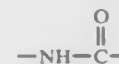
30 Claims

1. Compounds of the formula:



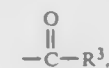
wherein R is a moderately basic acyclic, cyclic or aromatic amino group having a pKa of from about 4 to 9;

L is —R²— which is a suitable linker that is stable to hydrolysis under enzyme assay conditions wherein R² is a straight or branched C₂–C₂₀ alkyl group which is substituted or unsubstituted, a C₄–C₂₀ alkenyl group or a C₄–C₂₀ alkynyl group and R² may contain —O—, —S— or



provided that there are at least two carbon atoms or a carbonyl group between any pair of heteroatoms; and

R¹ is an enzyme substrate group which is a glycosyl group, glycosyl group containing one or more protecting groups, phosphorylcholine ester group, phosphate monoester group, sulfuric acid monoester group, or



wherein R³ is an alkyl group or an alkenyl group or R³ is



wherein R⁴ is an amino acid side chain, and R⁵ is hydrogen, an amino acid group bound through its α-carboxy group to form an aldehyde linkage, a protecting group or a peptidyl group bound through its α-carboxy end to form an amide linkage.

5,089,393
ASSAY METHOD FOR PHOSPHATIDYL ETHANOLAMINE

Shigeyuki Imamura, and Hideo Misaki, both of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 865,584, May 21, 1986, Pat. No. 4,788,147, which is a continuation of Ser. No. 675,241, Nov. 26, 1984, abandoned, which is a continuation of Ser. No. 447,539, Dec. 7, 1982, abandoned. This application Mar. 31, 1988, Ser. No. 176,235

Claims priority, application Japan, Dec. 7, 1981, 56-197554
 Int. Cl.⁵ C12N 9/06

U.S. Cl. 435—28

2 Claims

1. An assay method for phosphatidyl ethanolamine in a sample, which comprises treating a sample containing phosphatidyl ethanolamine in a single step with a mixture of phospholipase D an ethanolamine oxidase whose optimum pH is 7–7.5 and whose pH stability is pH 6–8, in a weakly alkaline buffer solution, said ethanolamine oxidase being obtained by culturing *Bacillus* sp. B-0783 FERM-P No. 5798, said phospholipase D liberating ethanolamine from said phosphatidyl ethanolamine and said oxidase catalyzing a reaction consuming ethanolamine, oxygen and water to form glycolaldehyde, ammonia and hydrogen peroxide, and measuring the amount of consumed oxygen or generated ammonia or hydrogen peroxide in the reaction system.

5,089,394
NEISSERIA DETECTION SYSTEM
 Peter K. Chun, South San Francisco, and Albert E. Chu, Hillsborough, both of Calif., assignors to E-Y Laboratories, Inc., San Mateo, Calif.
 Continuation of Ser. No. 922,755, Oct. 24, 1986, abandoned, which is a continuation of Ser. No. 572,523, Jan. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 472,663, Mar. 7, 1983, abandoned, and a continuation-in-part of Ser. No. 472,664, Mar. 7, 1983, abandoned. This application Sep. 13, 1989, Ser. No. 406,778

Int. Cl.⁵ C12Q 1/04, 1/54, 1/37; G01N 33/571
 U.S. Cl. 435—34

20 Claims

1. A method for the detection of a *Neisseria* in a biologically derived specimen including a *Neisseria* selected from the group consisting of *N. lactamica*, *N. meningitidis*, *N. gonorrhoea*, and *B. catarrhalis*, said specimen having been prescreened so that it presumptively contains no *Neisseria* other than ones in said group, said method comprising the steps of

- simultaneously incubating the specimen with (1) a first substrate specific for betagalactosidase in *N. lactamica*, but not specific for gamma-glutamyl aminopeptidase, to form a betagalactosidase reaction product with said first substrate, if *N. lactamica* is present in the specimen, (2) a second substrate specific for gamma-glutamyl aminopeptidase in *N. meningitidis*, but not specific for beta-galactosidase, to form a gamma-glutamyl aminopeptidase reaction product with said second substrate, if *N. meningitidis* is present in the specimen, and (3) a third substrate specific for prolyliminopeptidase capable of forming a prolyliminopeptidase reaction product with said third substrate, if prolyliminopeptidase is present in the specimen, said prolyliminopeptidase reaction product being undetectable, (b) forming detectable first or second signals distinct from each other in response to the presence of detectable quantities of said *N. lactamica* or *N. meningitidis* reaction products, respectively, as presumptive evidence of the presence of *N. lactamica* or *N. meningitidis* in the specimen,
- detecting said first or second signals, if formed,
- if neither said first nor second signals are formed in step (c), adding a signal producing reagent capable of reacting with said prolyliminopeptidase reaction product to form a detectable third signal, as presumptive evidence of the presence of *N. gonorrhoea* in the specimen, the absence of said detectable third signal being presumptive evidence of the presence of *B. catarrhalis* in the specimen, and
- then detecting said third signal.

5,089,395
VIALE MICROORGANISM DETECTION BY INDUCED FLUORESCENCE

A. Peter Snyder, Bel Air, Md.; David B. Greenberg, and Pasquale V. Scarpino, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Continuation-in-part of Ser. No. 917,258, Oct. 8, 1986, abandoned, which is a continuation of Ser. No. 706,160, Feb. 27, 1985, abandoned. This application Jul. 21, 1988, Ser. No. 222,258

Int. Cl.⁵ C12Q 1/06

6 Claims

U.S. Cl. 435—39

1. A process for the detection, identification, and quantification of viable microorganisms of a minimum concentration not less than 10³ cells per ml within a time period of sixty minutes, comprising the steps of:

- obtaining a plurality of samples suspected of containing viable microorganisms, preparing therefrom an array of separate samples each having different cellular concentrations by a magnitude of at least about 10;
- adding the same non-fluorescent dye to a plurality of said array of separate samples, said dye being capable of being catalyzed by said suspected viable microorganisms;
- reacting said dye with an enzyme produced by said viable

microorganisms to yield a product which can be induced to fluoresce; inducing fluorescence; and detecting the rate of product fluorescence of the reaction of each of said array of separate samples at different concentrations and identifying and quantifying the microorganisms based upon the particular dye employed and the rate of fluorescence of said produced product by comparison with a standardized series of curves constituting a pattern recognition set of fluorescent response rates.

5,089,396

NUCLEIC ACID ENCODING BETA CHAIN PRODOMAINS OF INHIBIN AND METHOD FOR SYNTHESIZING POLYPEPTIDES USING SUCH NUCLEIC ACID

Anthony J. Mason, and Peter H. Seeburg, both of San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 906,729, Dec. 31, 1986, Pat. No. 4,798,885, which is a continuation-in-part of Ser. No. 827,710, Feb. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 783,910, Oct. 3, 1985, abandoned. This application Jul. 5, 1988, Ser. No. 215,466

Int. Cl.⁵ C12P 21/02; C12N 15/11, 01/21, 05/10

U.S. Cl. 435—69.1

16 Claims

1. A method for producing an inhibin beta b chain prodomain polypeptide, said prodomain comprising the sequence Cys Thr Ser Cys Gly Gly Phe Arg Arg Pro Glu Glu Leu Gly Arg Val Asp Gly Asp Phe Leu Glu Ala Val or the sequence Arg Ala Ala Gly Ala Glu Glu Glu Leu Gly Arg Leu Asp Gly Asp Phe Leu Glu Ala Val, said method comprising (a) constructing a vector that comprises a nucleic acid encoding said prodomain, (b) transforming a host cell with said vector, and (c) culturing the transformed cell under conditions appropriate for expression of said polypeptide.

5,089,397

SUPERIOR MAMMALIAN EXPRESSION SYSTEM

Peter J. Kushner, San Francisco; Claire L. Cofer, Fremont; Jeffrey S. Friedman, and Karen D. Talmadge, both of Palo Alto, all of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.

Continuation of Ser. No. 801,674, Nov. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 701,296, Feb. 13, 1985, abandoned. This application Jun. 14, 1989, Ser. No. 366,342

Int. Cl.⁵ C12P 21/00; C12N 15/06, 15/00, 15/11

U.S. Cl. 435—69.1

37 Claims

1. A regulatable expression system for a desired coding sequence, which system comprise Chinese Hamster Ovary (CHO) host cells in defined medium, which cells have been transformed with a DNA sequence comprising the metallothionein II (MT-II) promoter operably linked to said desired coding sequence, said medium being free of serum and further containing non-toxic metal ions and an induction mediator selected from the group consisting of iron ion and an iron-containing protein which is not a protein supplement.

5,089,398

ENHANCED YEAST TRANSCRIPTION EMPLOYING HYBRID GAPDH PROMOTER REGION CONSTRUCTS

Steven Rosenberg, Oakland, and Patricia Tekamp-Olson, San Francisco, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 73,381, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 609,540, May 11, 1984, abandoned. This application Jul. 18, 1989, Ser. No. 380,783

Int. Cl.⁵ C12P 21/00, 7/00; C07H 15/12

U.S. Cl. 435—69.1

8 Claims

1. A DNA construct useful for enhanced constitutive expression of foreign DNA in a yeast host, said DNA construct comprising the following domains which are operably linked in the direction of transcription and directly fused without intervening sequences:

- a distal enhancing domain comprising a portion of the 4 Kb EcoRI-BamHI fragment of pBR322 wherein aid fragment is capable of enhancing constitutive expression of a downstream segment of foreign DNA;
- a proximal promoting domain of less than 600 bp comprising the RNA polymerase binding site and transcription initiation site of the Saccharomyces-derived glyceraldehyde-3-phosphate dehydrogenase (GAPDH) gene promoter;
- an insertion domain having at least one restriction site; and
- a termination domain comprising a transcriptional terminator recognized by said yeast host.

5,089,399

Patent Not Issued For This Number

5,089,400

POLYPEPTIDES AND PROCESS FOR THE PRODUCTION THEREOF

François Meyer, Zurich, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 787,892, Oct. 16, 1985, abandoned, and a continuation-in-part of Ser. No. 422,112, Sep. 23, 1982, abandoned. This application Mar. 7, 1989, Ser. No. 320,185 Claims priority, application United Kingdom, Oct. 3, 1981, 8129937; Mar. 26, 1982, 8208988; Sep. 1, 1982, 8224871

Int. Cl.⁵ C12P 21/02; C12N 15/00, 15/20, 15/21, 15/70

U.S. Cl. 435—69.51

27 Claims

1. A method for producing a polypeptide selected from HLylfN-1'b, HLylfN-5t, LyfN-α-1, and LyfN-α-2 which comprises:

- preparing from HuLyfN-mRNA a single-stranded complementary DNA and, if required, therefrom a double-stranded cDNA coding for any of said polypeptides; or
- partially cleaving the chromosomal DNA of human lymphoblastoid cells and selecting DNA fragments which contain chromosomal LyfN genes coding for any of said polypeptides;
- introducing into a vector DNA the complementary DNA from step (a) or the DNA fragments which contain chromosomal LyfN genes from step (b);
- transforming a host cell with the vector from step (c);
- culturing the transformed host; and
- recovering said polypeptide.

5,089,401

METHOD FOR THE PREPARATION OF FRUCTOSE-CONTAINING OLIGOSACCHARIDE

Koki Fujita, Osaka; Kozo Hara, Yokohama; Hitoshi Hashimoto, Kamakura, and Sumio Kitahata, Sennan, all of Japan, assignors to Ensuiko Sugar Refining Co., Ltd., Yokohama, Japan Filed Mar. 20, 1991, Ser. No. 672,388

Claims priority, application Japan, Aug. 7, 1990, 2-207582

Int. Cl.⁵ C12P 19/04, 19/12, 19/18

U.S. Cl. 435—97

15 Claims

1. A method for the preparation of a fructose-containing oligosaccharide having a fructosyl group bonded to sugar through a β-2,1-linkage which comprises: reacting a β-fructofuranosidase on a saccharide selected from the group consisting of sucrose, raffinose and stachyose as a donor in the presence of a receptor selected from the group consisting of xylose, lactose and galactose, said β-fructofuranosidase being characterized by:

- activity on sucrose in the presence of a receptor selected from the group consisting of monosaccharides, sugar alcohols, alkyl alcohols, glycosides and oligosaccharides for the transglycosidation of the fructosyl group to the receptor molecule;
- activity for the decomposition of a saccharide selected from the group consisting of sucrose, elrose, neokestose, xylsucrose, raffinose and stachyose with inactivity on a

- saccharide selected from the group consisting of 1-kestose, nistose, inulobiose and levan biose;
- an optimum pH value in the range from 6.5 to 6.8 at 40° C. and stability in the pH range from 5.5 to 10;
- an optimum temperature of 55° C. at a pH of 6.5 exhibiting at least 70% of residual activity at 60° C.;
- susceptibility to inhibition by the ions of a metal selected from the group consisting of silver, mercury, zinc, copper and tin;
- two molecular weights of 52,000±32,500 and 58,000±2,500 as determined by the methods of SDS-disc gel electrophoresis and gel filtration; and
- two isoelectric points at a pH of 4.3 and a pH of 4.6 as determined by the method of ampholine electrophoresis.

5,089,402

EXO-TYPE HYDROLASE CAPABLE OF HYDROLYZING A FRUCTAN ONLY EVERY 3 OR 4 SUGAR UNITS

Takao Uchiyama, Minoo; Mishio Kawamura, Toyonaka; Reiko Sashida, Kawasaki; Makoto Ueda, Tokyo; Sachiko Ohba, Yokohama, and Haruyuki Obkishi, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan Filed Feb. 26, 1990, Ser. No. 484,243

Claims priority, application Japan, Feb. 28, 1989, 1-47361; Dec. 20, 1989, 1-330257

Int. Cl.⁵ C12P 19/20; C12N 1/00, 1/20, 1/12

U.S. Cl. 435—96

5 Claims

1. An exo-type hydrolase capable of hydrolyzing a fructan only every 3 or 4 sugar units from a terminal fructose thereof to produce inulotriose and/or inulotetose.

5,089,403

PROCESS FOR ENZYMATIC HYDROLYSIS OF FATTY ACID TRIGLYCERIDES WITH OAT CARYOPSES

Earl G. Hammond, and Inmok Lee, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 5, 1989, Ser. No. 361,125

Int. Cl.⁵ C12P 7/64

U.S. Cl. 435—134

10 Claims

1. The process for enzymatic hydrolysis of fatty acid triglycerides to obtain free fatty acids and glycerol, comprising the steps of:

- increasing the water content of dehulled whole oat caryopses to a total water content of 17 to 44%, the thus moistened caryopses having active oat lipase associated with the outer surfaces thereof;
- contacting the moistened whole caryopses with a liquid medium composed essentially of an oil phase containing a fatty acid triglyceride reactant as the principal component, said contacting being carried out at a temperature at which the oat lipase is enzymatically active;
- continuing said contacting until at least 20% by volume of the triglyceride reactant has been hydrolyzed to free fatty acids and glycerol, most of the free fatty acids dissolving in the oil phase external to the caryopses and most of the glycerol being absorbed into the water within the caryopses; and
- separating the glycerol-containing caryopses from the fatty acid-containing oil phase.

5,089,404

PROCESS FOR THE TRANSESTERIFICATION OF FAT AND OIL

Wataru Matsumoto; Eiji Nakai, both of Tokyo; Toru Nezu, Chiba, and Kazuaki Suzuki, Nishi, all of Japan, assignors to The Japanese Research and Development Association for Bioreactor System in Food Industry, Tokyo, Japan Filed Oct. 21, 1988, Ser. No. 261,162

Claims priority, application Japan, Dec. 22, 1987, 62-324559

Int. Cl.⁵ C12P 7/64

U.S. Cl. 435—134

16 Claims

1. A process for producing a triglyceride by the transesterifi-

cation of a substrate, said substrate comprising (a) a first fat or oil and (b) one or more compounds selected from the group consisting of a fatty acid, a fatty acid ester and a second fat or oil, the process comprising contacting said substrate with a lipase in the presence of 0.1% by weight to 2% by weight of ethanol, based on the substrate and the moisture content in the resultant reaction system is from 0% by weight to 0.18% by weight, based on the substrate.

5,089,405

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-ARYLPROPIONIC ACIDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Edith Cerbelaud, and Dominique Petre, both of Lyons, France, assignors to Rhone-Poulenc Sante, Antony Cedex, France Continuation-in-part of Ser. No. 302,192, Jan. 27, 1989, abandoned. This application Jul. 26, 1989, Ser. No. 385,084

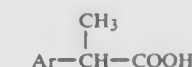
Claims priority, application France, Jan. 27, 1988, 88 00923 The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.⁵ C12P 7/40

U.S. Cl. 435—136

9 Claims

1. A process for the preparation of an S enantiomer of 2-arylpropionic acid of formula:



in which Ar represents a phenyl radical substituted by 3-benzoyl, which comprises hydrolyzing enantioselectively a corresponding racemic 2-arylpropionamide, which may be prepared in situ, in the presence of a microorganism, or an enzyme derived therefrom, able selectively to hydrolyze racemic α-phenylpropionamide to S α-phenylpropionic acid with an enantiomeric excess greater than 65%, and then separating S 2-arylpropionic acid obtained from R 2-arylpropionamide.

5,089,406

METHOD OF PRODUCING A GENE CASSETTE CODING FOR POLYPEPTIDES WITH REPEATING AMINO ACID SEQUENCES

Jon I. Williams, Montclair; Anthony J. Salerno, Millington; Ina Goldberg, Gillette, and William T. McAllister, Metuchen, all of N.J., assignors to Allied-Signal Inc., Morristownship, Morris County, N.J.

Continuation of Ser. No. 1,292, Jan. 7, 1987, abandoned. This application Jan. 29, 1990, Ser. No. 476,112

Int. Cl.⁵ C12N 15/00, 15/10; C12P 21/02; C07K 13/00

U.S. Cl. 435—172.3

18 Claims

1. A method of producing a gene cassette coding for polypeptides comprised of one or more repeating amino acid sequences, said method comprising the steps of

- annealing at least one mixture of complementary but circularly permuted oligodeoxynucleotides which have phosphorylated 5' ends and which code for one or more repeating amino acid sequences, to form DNA₁ fragments, each having (i) an internal double stranded sequence of paired bases and (ii) a single-stranded sequence of unpaired bases of both ends of the double stranded internal sequence, said mixture being annealed by heating said mixture and thereafter cooling said heated mixture to allow formation of said DNA₁ fragments;
- annealing a mixture of complementary but circularly permuted oligodeoxynucleotides which have phosphorylated 5' ends to form DNA₂ linker fragments, each having at least one restriction enzyme recognition site which does not occur within said DNA₁ fragments but occurs within the DNA of a plasmid vector, said DNA₂ linker fragments having (i) a single-stranded sequence of unpaired bases at

both ends thereof which is complementary to a single-stranded sequence of a corresponding DNA₁ fragment and (ii) an internal double stranded sequence of paired bases, said linker DNA₂ fragments adapted to maintain the reading frame and to maintain the repeating amino acid sequence of the internal sequence of the DNA₁ fragments when said DNA₂ linker fragments and said DNA₁ fragments are attached enzymatically in tandem in said plasmid vector, said mixture of oligodeoxynucleotides being annealed by heating said mixture and thereafter cooling said heated mixture to allow formation of said DNA₂ fragments;

- (c) combining all or a portion of said mixture of DNA₁ fragments and all or a portion of said mixture of DNA₂ linker fragments to form a combined mixture and further cooling said combined mixture to allow oligomerization, by annealing of complementary single-stranded sequences, of said DNA₂ linker fragments and of said DNA₁ fragments with themselves and with each other to form nicked DNA₃ fragments consisting of DNA₁ fragments interspersed DNA₂ linker fragments;
- (d) treating said cooled combined mixture with an enzyme to covalently join adjacent oligodeoxynucleotides in said nicked DNA₃ fragments to form DNA₄ fragments;
- (e) treating said DNA₄ fragments with a restriction endonuclease to cleave said fragments at said restriction site to form gene cassettes which code for polypeptides having one or more repeating amino acid sequences.

5,089,407

ENCAPSULATION OF BIOLOGICAL MATERIAL IN NON-IONIC POLYMER BEADS

Carol A. Baker, Albert A. Brooks, both of St. Louis; Robert Z. Greenley, Frontenac, and Jay M. Henis, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 131,965, Dec. 11, 1987, abandoned.

This application Nov. 17, 1989, Ser. No. 438,655

Int. Cl.⁵ C12N 11/12, 11/04; C07K 17/04, 17/12

U.S. Cl. 435—179

23 Claims

1. A method for producing a viable biological material in the form of free flowing beads comprising the steps of:

- admixing a viable biological material having bound water with an aqueous nonionic polymer solution in which the polymer is present at a concentration of at least 3% w/v;
- forming a plurality of polymeric by spraying the resulting mixture of Step a) into a circulating water-immiscible nonsolvent for said polymer, said nonsolvent being maintained at a temperature sufficient to freeze the beads but not so low as to cause freeze fracture of the beads;
- recovering the frozen beads of Step b) under conditions wherein the beads are kept frozen; and
- drying the frozen beads of Step c) until essentially all unbound water is removed whereby a water level is provided sufficiently low to prevent clumping and loss of bead integrity but sufficiently high to maintain the viability of the biological material.

5,089,408

GLUTATHIONE PEROXIDASE GENE AND PROCESS FOR PRODUCTION OF THE GENE PRODUCT

Masami Akasaka; Akiko Kubota; Junzo Mizoguchi, Japan, and Sakae Satoh, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 15, 1989, Ser. No. 368,982

Claims priority, application Japan, Jun. 15, 1988, 63-147884

Int. Cl.⁵ C12N 15/53, 9/08, 15/00

U.S. Cl. 435—192

8 Claims

1. A recombinant DNA molecule which encodes at least a polypeptide containing glutathione peroxidase activity and having an amino acid sequence from the N-terminal to the C-terminal of the formula:

Ala—Phe—Ile—Ala—Lys—Ser—Phe—Tyr—Asp—Leu—Ser—
—Ala—Ile—Ser—Leu—Asp—Gly—Glu—Lys—Val—Asp—
—Phe—Asn—Thr—Phe—Arg—Gly—Arg—Ala—Val—Leu—
—Ile—Glu—Asn—Val—Arg—Ser—Leu—***—Gly—Thr—Thr—
—Thr—Arg—Asp—Phe—Thr—Gln—Leu—Asn—Glu—Leu—
—Gln—Cys—Arg—Phe—Pro—Arg—Arg—Leu—Val—Val—
—Leu—Gly—Phe—Pro—Cys—Asn—Gln—Phe—Gly—His—
—Gln—Glu—Asn—Cys—Gln—Asn—Glu—Glu—Ile—Leu—
—Asn—Ser—Leu—Lys—Tyr—Val—Arg—Pro—Gly—Gly—
—Gly—Tyr—Gln—Pro—Thr—Phe—Thr—Leu—Val—Gln—
—Lys—Cys—Glu—Val—Asn—Gly—Gln—Asn—Glu—His—
—Pro—Val—Phe—Ala—Tyr—Leu—Lys—Asp—Lys—Leu—
—Pro—Tyr—Pro—Tyr—Asp—Asp—Pro—Phe—Ser—Leu—
—Met—Thr—Asp—Pro—Lys—Leu—Ile—Ile—Trp—Ser—Pro—
—Val—Arg—Arg—Ser—Asp—Val—Ala—Trp—Asn—Phe—
—Glu—Lys—Phe—Leu—Ile—Gly—Pro—Glu—Gly—Glu—
—Pro—Phe—Arg—Arg—Tyr—Ser—Arg—Thr—Phe—Pro—
—Thr—Ile—Asn—Ile—Glu—Pro—Asp—Ile—Lys—Arg—Leu—
—Leu—Lys—Val—Ala—Ile

wherein *** is selenocystein.

7. A process for the production of glutathione peroxidase which comprises culturing transformant host cells which comprise heterologous DNA according to claim 1, said DNA encoding a polypeptide with glutathione peroxidase activity in a medium containing selenium, and separating a thus-produced polypeptide with glutathione peroxidase activity from the cultured mass.

5,089,409

METHOD OF INCREASING SPECIFIC ACTIVITY OF T-PA

Susan C. Howard, Fenton; Joseph K. Welply, St. Peters, and Arthur J. Wittwer, Ellisville, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 28, 1989, Ser. No. 413,806

Int. Cl.⁵ C12N 5/06, 15/58, 9/48

U.S. Cl. 435—240.2

3 Claims

1. The method of increasing the specific activity of human tissue plasminogen activator glycoprotein as evaluated by a stimulated indirect amidolytic assay which comprises increasing the proportion of neutral oligosaccharides relative to other oligosaccharides in said tissue plasminogen activator glycoprotein by producing said tissue plasminogen activator glycoprotein under in vitro mammalian cell culture conditions in the presence of deoxymannojirimycin.

2. The method of increasing the specific activity of human tissue plasminogen activator glycoproteins evaluated by a stimulated indirect amidolytic assay which comprises increasing the proportion of neutral oligosaccharides relative to other oligosaccharides in said tissue plasminogen activator glycoprotein by producing said tissue plasminogen activator glycoprotein under in vitro mammalian cell culture conditions and then cleaving sialic acid residues from the tissue plasminogen activator glycoprotein by treatment with neuraminidase.

5,089,410

PROCESS FOR THE PRODUCTION OF BETACYANIN PIGMENTS

Yumiko Murata, Ageo; Masako Otsuka, Soka; Hiroshi Saimoto, Misato, and Masao Kawashima, Warabi, all of Japan, assignors to Somar Corporation, Japan

Filed Mar. 8, 1990, Ser. No. 490,427

Claims priority, application Japan, Mar. 14, 1989, 1-61470

Int. Cl.⁵ C12N 5/00

U.S. Cl. 435—240.45

7 Claims

1. A process for the production of betacyanin pigments, wherein calli induced from a plant which belong to *Beta vulgaris* L. and which is capable of producing betacyanin pigments are incubated in a liquid culture medium to produce betacyanin pigments, characterized in that said liquid culture medium contains a reducing agent selected from the group consisting of glutathione, ascorbic acid, isoscorbic acid, cysteine, diethyl dithiocarbamate, catechin, quercetin, sodium sulfite, sodium metabisulfite and sodium thiosulfite.

5,089,411

METHOD OF CULTURING A STRAIN OF RHODOCOCCLUS RHODOCHROUS HAVING NITRILE HYDRATASE ACTIVITY

Hideaki Yamada, and Toru Nagasawa, both of Kyoto, Japan, assignors to Hideaki Yamada, Kyoto and Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Oct. 5, 1989, Ser. No. 417,259

Claims priority, application Japan, Oct. 6, 1988, 63-252645; Feb. 28, 1989, 64-046818

Int. Cl.⁵ C12N 1/38, 1/20; C12P 13/02

U.S. Cl. 435—244

2 Claims

1. A method of culturing the strain *Rhodococcus rhodochrous* J-1 (Ferm BP-1478) comprising cultivating *Rhodococcus rhodochrous* strain J-1 in a culture medium essentially free of crotonamide and essentially free of iron ions and during the cultivation adding to said culture medium cobalt ion in a concentration of 5 to 15 mg/l calculated as CoCl₂, and at least one compound selected from urea and a urea derivative of the following formulae I, II and III:



wherein R₁, R₂, R₃ and R₄ are each —H, —CH₃ or —C₂H₅, except that all substituents are not —H;



wherein R₅ and R₆ are each —H, —CH₃ or —C₂H₅ and



wherein the overall concentration in the culture medium of urea or a urea derivative of formulae I to III is 1–30 g/l in order to prepare cells of bacteria having nitrile hydratase activity.

5,089,412

BACTERIA FOR OXIDIZING MULTIMETALLIC SULPHIDE ORES

Ralph P. Hackl; Frank R. Wright, and Albert Bruynesteyn, all of North Vancouver, Canada, assignors to GB Biotech Inc., Burnaby, Canada

Division of Ser. No. 172,278, Mar. 23, 1988, Pat. No. 4,987,081, which is a division of Ser. No. 71,968, Jul. 10, 1987, Pat. No. 4,888,293. This application Nov. 7, 1989, Ser. No. 432,899

Int. Cl.⁵ C12N 1/20

U.S. Cl. 435—252.4

2 Claims

1. A mixed culture of acidophilic bacteria; coded GBB-IRON, identified as deposit ATCC No. 53625; and containing principally *L. ferrooxidans*-like bacteria.

2. A mixed culture of acidophilic arsenic resistant bacteria;

coded GBB-SULFUR, identified as deposit ATCC No. 53,619; and containing principally *T. thiooxidans*.

5,089,413

METHOD AND APPARATUS FOR CULTURING WITH MICROBIOLOGICAL DRY CULTURE MEDIUM

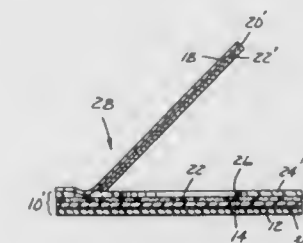
Robert L. Nelson, Bloomington, and Paul E.L. Hansen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1989, Ser. No. 354,627

Int. Cl.⁵ C12N 1/00; C12M 1/16

U.S. Cl. 435—254

18 Claims



1. A device for growing microorganisms, which device comprises a body member, which body member comprises (1) a waterproof substrate having a top surface and a bottom surface;

(2) an air-permeable membrane, having its peripheral edge(s) substantially uncovered, and having a top surface and a bottom surface, the bottom surface being fixed to and covering at least a portion of the top surface of the substrate; and

(3) cold-water-reconstitutable dry medium fixed to and covering at least a portion of the top surface of the membrane so as to define a growth region and comprising at least one ingredient selected from the group consisting of one or more gelling agents and one or more nutrients for growing microorganisms.

9. A device according to claim 1, further comprising cover means disposed adjacent to the dry medium and having a surface facing the dry medium, which cover means is substantially impermeable to microorganisms and water vapor and configured so as to cover at least the growth region.

5,089,414

ENZYMATIC SOAKING METHOD

Juergen Christner, Seeheim-Jugenheim; Ernst Pfeleiderer, Darmstadt, and Tilman Taeger, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 24, 1990, Ser. No. 528,717

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1989, 3922748

Int. Cl.⁵ C14C 1/04

U.S. Cl. 435—265

4 Claims

1. A method for soaking hides and skins which comprising soaking said skins and hides in a soak float having a pH from 9 to 11 and comprising

- a lipase having an activity optimum in the pH region from 9 to 11,
- a protease which is effective in the pH region from 9 to 11, and
- a surface active agent.

5,089,415

METHOD FOR CLOTTING HEPARINIZED BLOOD BY THE ADDITION OF PROTAMINE, THROMBIN AND SNAKE VENOM

Frank M. La Duca, East Brunswick, N.J., assignor to International Technidyne Corp., Edison, N.J.

Filed Sep. 17, 1990, Ser. No. 583,164

Int. Cl.⁵ G01N 33/86

U.S. Cl. 435—269

5 Claims

1. A method for the rapid production of serum from a highly heparinized patient, said serum to be chemically tested to provide blood chemistry results, comprising:
 - collecting a blood sample from said highly heparinized patient;
 - mixing a sufficiently small quantity of a clot promoting cocktail with said blood sample such that said cocktail does not alter said blood chemistry results, said cocktail comprising thrombin in a concentration range of about 0.2–3.0 units per milliliter, a protamine salt in a concentration range of about 0.02–0.08 milligrams per milliliter and a snake venom in a concentration range of about 0.005–0.2 milligrams per milliliter which snake venom is capable of converting fibrinogen to fibrin and is unaffected by the presence of heparin;
 - waiting approximately five minutes during which time said blood sample clots;
 - centrifuging said clotted blood sample to form a serum supernatant; and
 - isolating said serum supernatant for blood chemical testing.

5,089,416

METHOD OF USE OF NON-FLUORESCENT PARTICLES TO DETERMINE FLUORESCENCE THRESHOLD OF A FLOW CYTOMETER RELATIVE TO THE AUTOFLUORESCENCE OF SAMPLES

Abraham Schwartz, and Emma Fernandez-Repollet, both of Hato Rey, P.R., assignors to Caribbean Microparticles Corporation, Hato Rey, P.R.

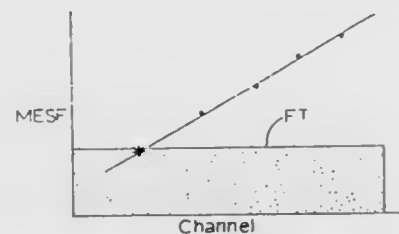
Continuation-in-part of Ser. No. 374,435, Jun. 30, 1989, which is a continuation-in-part of Ser. No. 128,786, Dec. 4, 1987, Pat. No. 4,857,451, which is a continuation-in-part of Ser. No. 805,654, Dec. 11, 1985, Pat. No. 4,774,189, which is a

continuation-in-part of Ser. No. 685,464, Dec. 24, 1984, Pat. No. 4,767,206. This application Nov. 21, 1990, Ser. No. 620,530

Int. Cl.⁵ G01N 31/00, 33/48; G01J 1/02

U.S. Cl. 436—8

10 Claims



1. A method of determining fluorescence threshold of a flow cytometer, comprising:
 - (a) running a selected autofluorescent sample on said flow cytometer;
 - (b) determining a flow cytometer setting where sample autofluorescence is observable;
 - (c) providing a population of non-fluorescent particles;
 - (d) running said population of non-fluorescent particles on said flow cytometer at the flow cytometer setting where autofluorescence of the selected sample is observable;
 - (e) determining a peak channel position of said population on said flow cytometer; and
 - (f) using said peak channel position as a fluorescence threshold for determining whether the sample autofluorescence is real.

5,089,417

FLUID SEPARATION AND PROCESSING DEVICE

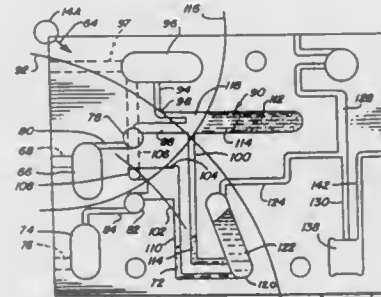
Frank W. Wogoman, South Bend, Ind., assignor to Miles Inc., Elkhart, Ind.

Division of Ser. No. 68,451, Jul. 1, 1987, Pat. No. 4,892,702. This application Jan. 5, 1990, Ser. No. 461,495

Int. Cl.⁵ G20L 31/00, 21/00

U.S. Cl. 436—45

3 Claims



3. A method for metring and centrifugation of whole blood and analyzing diluted plasma in a processing member, comprising the steps of:
 - applying centrifugal force in a first direction on a processing member in a first position to move said processing member to a second position and cause whole blood to move from a first reservoir to a first chamber and buffer to move from a second reservoir into a third chamber;
 - centrifuging said whole blood in said first chamber to separate red blood cells from plasma;
 - decelerating said processing member thereby causing said processing member to move to said first position angularly spaced from said second position and thereby move said plasma from said first chamber to a second chamber and move said buffer from said third chamber to said second chamber;
 - applying centrifugal force on said processing member to again move said processing member to said second position and effect the mixing of said plasma with said buffer thereby diluting said plasma; and
 - decelerating said processing member causing diluted plasma to move into a fourth chamber containing reagent and analyzing the resulting mixture in the fourth chamber.

5,089,418

ANALYZER FEATURING A CIRCULAR TRACK OF CARTRIDGES CENTERED ON AN INCUBATOR AND METHOD OF USE

James D. Shaw, Hilton; Martio F. Muszak, and Nicholas Want, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 500,651, Mar. 28, 1990, abandoned. This application Jul. 20, 1990, Ser. No. 556,693

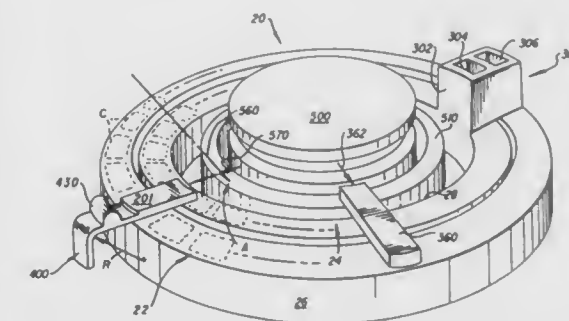
Int. Cl.⁵ G01N 21/00, 35/00

U.S. Cl. 436—46

37 Claims

1. In an analyzer for assaying for analytes of a body liquid on dried test elements, said analyzer comprising means for temporarily storing a plurality of stacks of dried test elements, the test elements in any one stack being for the same assay while each stack is generally for a different assay selected from any one of three different types selected from potentiometric, colorimetric or rate-type test elements, an incubator for test elements taken from a stack, and means for detecting a change in a test element after incubation in said incubator; the improvement wherein, to move said stacks of elements, said analyzer further comprises means defining at least one generally circular, horizontal path generally centered on said incubator,

first moving means for moving said stack-storing means around said at least one path, means for temporarily holding a stack on said first moving means, said holding means being capable of at least two alternate states, one which holds a stack on said path and the other which releases a stack from said path, means for alternating said holding means between said two states,



and means for transferring a test element to said incubator from any stack held on said path, and wherein said incubator is constructed to receive all the types of said test element, whereby said incubator can be used to incubate all three types of test elements.

5,089,419

DETECTION OF PREGNANCY BY IDENTIFICATION OF THE C PEPTIDE OF RELAXIN IN THE URINE OF ANIMALS

Andrew H. Kuniyuki, Berwyn, Pa., assignor to International Canine Genetics, Malvern, Pa.

Filed Aug. 7, 1989, Ser. No. 390,626

Int. Cl.⁵ G01N 33/493

U.S. Cl. 436—65

15 Claims

1. A method for detecting pregnancy in a mammal comprising identifying the presence in urine of the C peptide of relaxin, said method comprising the steps of (a) contacting the urine sample with an antibody specific for an antigenic site on the C peptide; (b) incubating the mixture for a sufficient period of time and in appropriate conditions to allow complexing of the antibody and the antigen in the sample; (c) detecting the complex; and (d) correlating the complex to a standard to determine the presence or absence of a pregnancy.

5,089,420

COMPOSITION, DEVICE AND METHOD OF ASSAYING FOR A PEROXIDATIVELY ACTIVE SUBSTANCE UTILIZING AMINE BORATE COMPOUNDS

James P. Albarella, and Michael J. Pugia, both of Granger, Ind., assignors to Miles Inc., Elkhart, Ind.

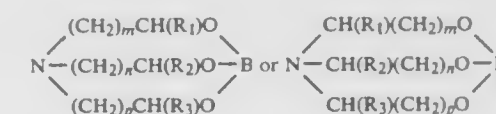
Filed Jan. 30, 1990, Ser. No. 472,282

Int. Cl.⁵ G01N 21/78, 33/72

U.S. Cl. 436—66

50 Claims

1. A composition capable of exhibiting a sufficient color transition upon contacting a test sample to demonstrate the presence or concentration of a peroxidatively active substance in the test sample comprising:
 - (a) an indicator dye;
 - (b) a hydroperoxide;
 - (c) a buffer;
 - (d) an amine borate compound having the formula



wherein R₁, R₂ and R₃ are, independently, a methyl group or an ethyl group, and m, n, and p are numerals ranging from one to about three; and (e) a suitable carrier vehicle.

5,089,421

METHOD AND APPARATUS FOR ANALYZING BLOOD

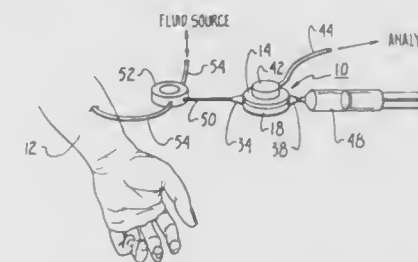
Susan Dieffenbach, 6082 Irongate Cir., Huntington Beach, Calif. 92648

Continuation-in-part of Ser. No. 307,227, Feb. 6, 1989, abandoned, which is a continuation of Ser. No. 110,972, Oct. 20, 1987, abandoned. This application Mar. 30, 1990, Ser. No. 502,251

Int. Cl.⁵ G01N 33/48, 33/50

U.S. Cl. 436—68

6 Claims



5. A method for analyzing blood, which comprises:
 - (a) engaging a syringe with a blood collecting chamber which comprises an annular shaped adapter defining a periphery, said periphery comprising a threaded inner surface and a threaded outer surface and forming an opening therethrough, a replaceable electrically conductive membrane to removably cover said opening; a conduit forming said chamber and comprising a fluid passageway therethrough, said conduit further comprising an inlet constructed so as to provide blood flow from a patient to said passageway, an outlet, and a seating surface defining an aperture therethrough, said conduit threadably engaged with the outer surface of said adapter removably holding said membrane between said periphery of said adapter and said seating surface of said conduit to define part of said chamber; and an electrode electrically connected to a blood gas analyzer, said analyzer having means threadably engaged with the inner surface of said adapter to hold said electrode against said membrane to establish electro-chemical contact with said membrane;
 - (b) manipulating said syringe to draw blood into said passageway through said inlet; and
 - (c) energizing said analyzer to analyze the blood in said passageway.

5,089,422

VITRO BLEEDING TIME DETERMINATION

Daniel B. Brubaker, Redondo Beach, Calif., assignor to Research and Education Institute, Inc., Torrance, Calif.

Continuation of Ser. No. 458,308, Dec. 28, 1989, abandoned, which is a continuation of Ser. No. 155,953, Feb. 12, 1988, abandoned. This application May 25, 1990, Ser. No. 529,112

Int. Cl.⁵ G01N 11/04, 33/48

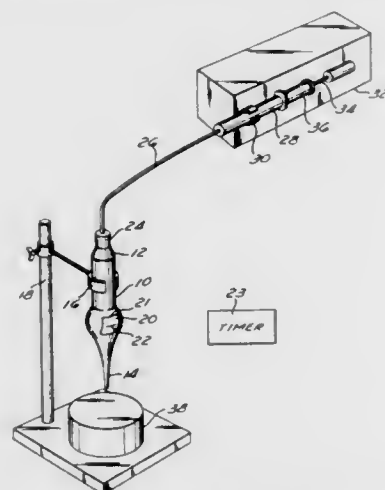
U.S. Cl. 436—69

17 Claims

1. An apparatus for measuring in vitro bleeding time comprising:
 - a container for blood having an upstream portion communicating with a source of blood providing blood access to

the interior of the container, sidewalls having at least one side opening, and a downstream opening downstream of the side opening having a relatively smaller cross-sectional area than that of said upstream portion, said downstream opening allowing blood to flow out of the interior of the container without clotting said downstream opening;

a clot-promoting material covering said side opening and defining at least one slit, said slit constructed so as to allow



blood to pass therethrough and out of the interior of the container until it is clogged, the arrangement of the container having a downstream opening with a relatively smaller cross-sectional area than that of the upstream portion causing an increased shear stress of the blood as the blood flows out of the container; and means to measure a period of time for blood to clot in the vicinity of said slit, wherein said period of time is correlatable to the period of time required for the patient's blood to clot in an in vivo bleeding time test.

5,089,423

IMMUNOASSAY METHODS AND REAGENTS AND METHODS FOR PRODUCING THE LATTER

Eleftherios P. Diamandis, and J. Alexander Lowden, both of Toronto, Canada, assignors to CyberFluor Inc., Toronto, Canada

Filed May 6, 1988, Ser. No. 190,926

Claims priority, application Canada, May 6, 1987, 536511
Int. Cl.³ G01N 33/543

U.S. Cl. 436—518

11 Claims

1. An immunoassay method to determine the quantity of immunoreactive substances immobilized on a solid phase comprising:

- reacting immobilized immunoreactive substances with complementary immunoreactive substances to which are connected moieties of a ligand forming with lanthanide metal ion a fluorescent chelate label wherein the metal ion is stably retained by said ligand, said complementary immunoreactive substances being in amount effective for binding with said immobilized immunoreactive substances, said ligand being a moiety of a 4,7-diphenyl-1,10-phenanthroline-2,9-dicarboxylic acid capable of fluorescing in the presence of said lanthanide metal ion;
- removing an excess complementary immunoreactive substances which are not bound to said immobilized substances by washing said solid phase with a washing solution, said fluorescent chelate label stably retaining said lanthanide metal ion with said ligand during said washing of said solid phase, said chelate label being capable of fluorescing after said washing;
- measuring the fluorescence of the chelate label on bound complementary immunoreactive substances in the pres-

ence of said metal ion which is stably retained with said chelate, and

- obtaining a value indicative of the quantity of said complementary immunoreactive substances bound to said immobilized immunoreactive substances.

5,089,424

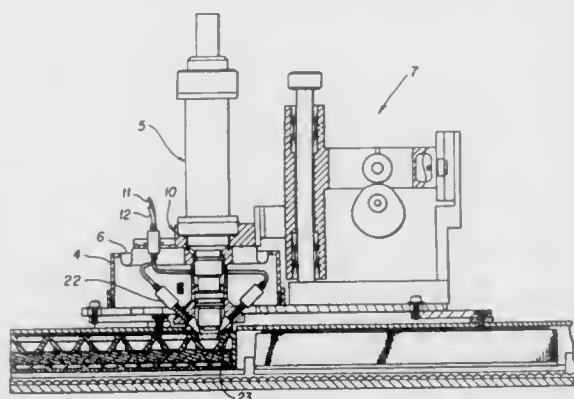
METHOD AND APPARATUS FOR HETEROGENEOUS CHEMILUMINESCENCE ASSAY

Omar S. Khalil, Libertyville; Thomas F. Zurek, River Forest; Kevin R. Genger, Chicago; Curtis J. Pepe, McHenry; Yi-Her Jou, Vernon Hills, and Stephen M. Cotter, Fox Lake, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 206,645, Jun. 14, 1988, abandoned. This application Oct. 23, 1989, Ser. No. 425,643
Int. Cl.³ G01N 33/543

U.S. Cl. 436—518

21 Claims



7. A method for performing a chemiluminescent assay to determine the amount of analyte which may be present in a test sample, said method comprising the steps of:

- forming a reaction mixture comprising an analyte from a test sample with a chemiluminescent moiety in an incubation chamber, said chemiluminescent moiety capable of binding to said analyte as a function of the amount of analyte present in said test sample;
- transferring said reaction mixture from said incubation chamber to a container having a solid, porous element in said container, said porous element having an interactive property with said chemiluminescent moiety wherein said analyte bound to said chemiluminescent moiety is immobilized by said interactive property between said chemiluminescent moiety and said porous element to thereby prevent said chemiluminescent moiety from migrating from said porous element;
- distributing a chemiluminescent activating solution onto said porous element by means of a plurality of ports disposed toward an inclined interior surface of said container, said activating solution capable of reacting with said chemiluminescent moiety immobilized to said porous element to provide a chemiluminescent signal therefrom;
- light-sealing around said container; and
- measuring said chemiluminescent signal from said porous element.

5,089,425

PHOTOELECTRIC CONVERTING DEVICE HAVING AN ELECTRODE FORMED ACROSS AN INSULATING LAYER ON A CONTROL ELECTRODE AND METHOD FOR PRODUCING THE SAME

Junichi Hoshi, Atsugi; Tamotsu Satoh, Yokohama, and Shiro Arikawa, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

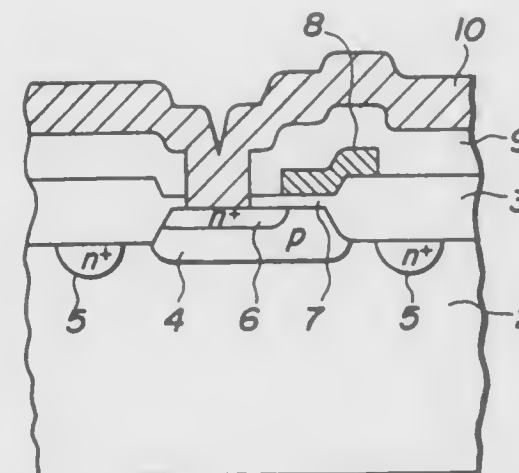
Division of Ser. No. 241,836, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 9,923, Feb. 2, 1987, abandoned. This application Sep. 22, 1989, Ser. No. 411,219

Claims priority, application Japan, Feb. 4, 1986, 61-023282; Jun. 2, 1986, 61-125937; Jul. 4, 1986, 61-156266

Int. Cl.³ H01L 31/18

U.S. Cl. 437—3

3 Claims



1. A method for producing a photoelectric conversion device comprising a phototransistor cell including a first and a second main electrode region of a first conductivity-type semiconductor material and a control electrode region of a second conductivity-type semiconductor material different from said first conductivity-type semiconductor material in which an electrode for controlling a potential of said control electrode region is formed on a portion of said control electrode region, comprising the steps of:

- preparing a substrate provided with a first semiconductor region of said first conductivity-type semiconductor material so as to form said first main electrode region;
- forming a field insulating layer region on said first semiconductor region so as to define the cell;
- forming a second semiconductor region of the second conductivity-type semiconductor material within said first semiconductor region by a self-alignment process utilizing said field insulating layer region as a mask, so as to form said control electrode region;
- forming an electrode on a portion of said second semiconductor region and a portion of said field insulating layer region;
- forming a third semiconductor region of the first conductivity-type semiconductor material within said second semiconductor region by a self-alignment process utilizing said field insulating layer region and said electrode as a mask, so as to form said second main electrode region;
- forming an insulating layer on said third semiconductor region;
- forming a contact hole in said insulating layer; and
- forming an electrode connected to said third semiconductor region via said contact hole.

5,089,426

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE FREE FROM ELECTRICAL SHORTAGE DUE TO PIN-HOLE FORMATION

Shunpei Yamazaki; Kunio Suzuki, both of Tokyo; Masato Susukida, Chiba; Mikio Kinka, Ishikawa; Takeshi Fukada, Kanagawa; Masayoshi Abe, Tokyo; Ipppei Kobayashi, Hyogo; Katsuhiko Shibata, Shizuoka; Kaoru Koyanagi, Nagano, and Susumu Nagayama, Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

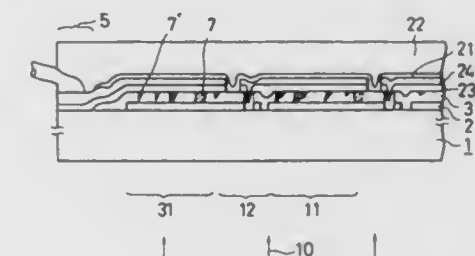
Continuation-in-part of Ser. No. 287,660, Dec. 21, 1988, abandoned, which is a continuation of Ser. No. 909,202, Sep. 19, 1986, abandoned. This application Jan. 16, 1990, Ser. No. 464,567

Claims priority, application Japan, Sep. 21, 1985, 60-209595; Sep. 21, 1985, 60-209596; Nov. 6, 1985, 60-248640

Int. Cl.³ H01L 21/00, 21/02, 21/47

U.S. Cl. 437—3

3 Claims



1. A method of producing a solar cell consisting of a plurality of photoconversion devices which are connected in series with each other, each device consisting of a lower electrode, an upper electrode and a photosensitive layer sandwiched therebetween, said method comprising the steps of:

- forming a lower electrode pattern on a substrate to provide a lower electrode for each device;
- forming a photosensitive semiconductor layer on said substrate over said lower electrode pattern;
- filling defects occurring in said semiconductor layer with an insulating material;
- patterning said semiconductor layer by means of laser scribing to form grooves through said semiconductor layer in order to provide access to said lower electrode pattern;
- removing residue of the laser scribing by etching with an etchant;
- rinsing the etchant to remove it from the patterned semiconductor layer; and
- forming an upper electrode pattern on said patterned semiconductor layer in order to provide an upper electrode of each photoelectric conversion device comprising said upper electrode, said lower electrode and the semiconductor layer located therebetween.

5,089,427

SEMICONDUCTOR DEVICE AND METHOD

Mark Schoenberg, Chandler, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 3, 1990, Ser. No. 620,698

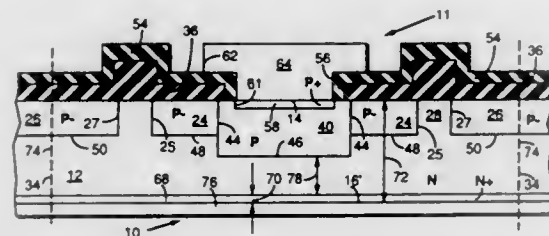
Int. Cl.³ H01L 21/04

U.S. Cl. 437—15

12 Claims

1. A process for forming a Zener diode having a Zener junction removed from the diode surface, comprising: providing a semiconductor substrate of a first conductivity type; forming in a first surface of the substrate first and second spaced-apart doped regions of a second conductivity type opposite the first type and to a first depth from the first surface; forming a third doped region of the second conductivity

type in the second doped region and extending to a second depth greater than the first depth; forming a fourth doped region of the second conductivity type in the second doped region and extending to a third depth less than the first depth; and



providing an electrical contact to the fourth doped region which does not extend over any portion of the substrate lying between the first and second doped regions, wherein the steps of forming the third and fourth doped regions comprises forming the third doped region laterally within the second doped region and forming the fourth doped region laterally within the third doped region.

5,089,428

METHOD FOR FORMING A GERMANIUM LAYER AND A HETEROJUNCTION BIPOLAR TRANSISTOR

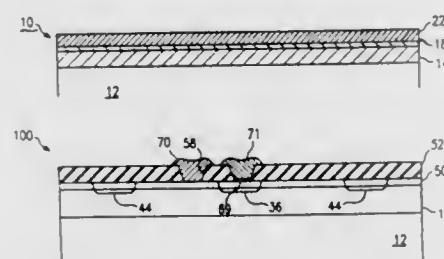
Douglas P. Verret, Sugar Land, and Kenneth E. Bean, Celina, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1989, Ser. No. 457,673

Int. Cl.⁵ H01L 21/20, 21/328

U.S. Cl. 437—31

30 Claims



1. A process for forming a P-germanium layer on a layer of silicon:

depositing a first N-germanium silicon layer on the silicon layer;
depositing a P-germanium silicon layer on the first N-germanium silicon layer; and
heating the wafer in an oxidizing ambient until said P-germanium silicon layer transforms into the P-germanium layer under a layer of formed silicon dioxide.

30. A process for forming a P-germanium base for use in a heterojunction bipolar transistor (HBT) on a wafer which comprises the steps of:

forming an N-germanium silicon buffer layer onto a silicon N-substrate;
depositing a first P-germanium silicon on said buffer layer;
depositing an oxide layer on said P-germanium silicon layer;
depositing a photoresist layer on said oxide layer;
selectively implanting boron into said deposited layers to form P⁺ contacts;
depositing a second photoresist layer;
implanting phosphorous to form N⁺ contacts;
selectively stripping said second photoresist and said oxide layer from said P-germanium silicon layer;
heating the wafer by steam oxidation to approximately 1000 degrees Centigrade to cause said P-germanium silicon layer to form a P-germanium layer selectively isolated

from said N-germanium silicon layer, said heating forms a silicon dioxide layer on said P-germanium layer;
selectively depositing a third photoresist layer;
etching the wafer to form an exposed region;
depositing a conductive layer in said exposed region;
selectively etching the wafer to expose said P⁺ region;
depositing aluminum over the P⁺ region to form the transistor of the present invention.

5,089,429

SELF-ALIGNED EMITTER BICMOS PROCESS

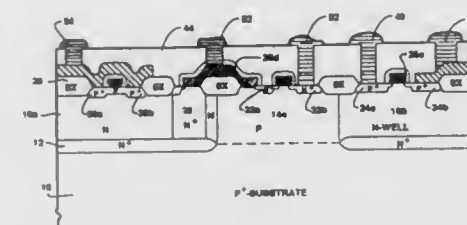
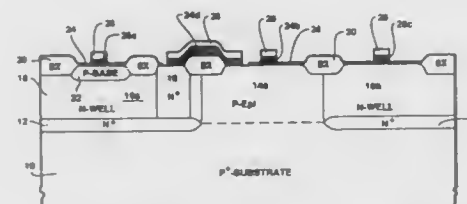
Sheng T. Hsu, Lawrenceville, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Jun. 22, 1989, Ser. No. 370,413

Int. Cl.⁵ H01L 21/331, 21/336

U.S. Cl. 437—31

5 Claims



1. A method of forming a BiCMOS integrated circuit comprising the steps of:

- forming a first semiconductor layer of one conductivity type on a substrate;
- forming spaced well regions of the opposite conductivity type in said first semiconductor layer;
- forming a thin oxide layer on the surface of the first semiconductor layer between the well regions and on one of said well regions;
- simultaneously forming an emitter electrode on the surface of the first semiconductor layer in the other well region and gates on the thin oxide layer over the one well region and the surface of the first semiconductor layer between the well regions, said emitter electrode and each of said gates comprising a second semiconductor layer containing dopants of the second conductivity type and each having a first oxide layer over the top surface thereof;
- diffusing the dopant from the emitter electrode into the other well region to form an emitter region;
- depositing by chemical vapor deposition a second oxide layer over the first oxide layer, the side walls of the emitter electrode and gates and the surface of the first semiconductor layer immediately surrounding the emitter electrode and on opposite sides of the gates;
- removing the second oxide layer from the first oxide layer and the surface of the first semiconductor layer immediately surrounding the emitter region and the opposite sides of the gates to leave side wall masking regions on the emitter electrode and the gates;
- implanting dopants of the one conductivity type into each of the well regions immediately surrounding the emitter electrode to form a base region and on each side of the gate to form source and drain regions; and
- implanting dopants of the opposite conductivity type into the surface of the first semiconductor between the well

regions and at opposite sides of the gate to form source and drain regions.

5,089,430

METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT BIPOLAR TRANSISTOR DEVICE

Nobuo Owada, Ohme, and Hizuru Uda, Fussa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

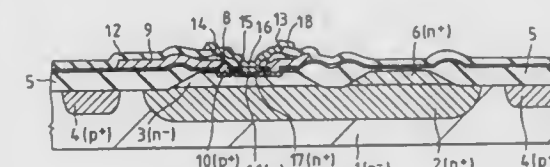
Filed Apr. 16, 1990, Ser. No. 509,223

Claims priority, application Japan, Apr. 21, 1989, 1-101943

Int. Cl.⁵ H01L 21/328

U.S. Cl. 437—31

41 Claims



1. A method of manufacturing a semiconductor integrated circuit device having a bipolar transistor comprising the steps of:

- preparing a semiconductor substrate having a main surface and an emitter-forming region at which an emitter is to be formed;
- forming a base lead-out electrode of said bipolar transistor on said main surface so that said base lead-out electrode surrounds said emitter forming region;
- selectively depositing a first polycrystalline silicon layer on said emitter forming region;
- introducing impurities of a first conductivity type into said first polycrystalline silicon layer;
- after step (d), diffusing said impurities of said first conductivity type from said first polycrystalline silicon layer into said emitter-forming region of said substrate to form a diffused semiconductor layer used as said emitter region of said bipolar transistor; and
- forming a second polycrystalline silicon layer on said first polycrystalline silicon layer so that said first and second polycrystalline silicon layers together form an emitter lead-out electrode of said bipolar transistor.

5,089,431

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING A STATIC INDUCTION TRANSISTOR

John A. G. Slatter, Crawley Down; Henry E. Brockman, Horley, both of England, and Jan Haisma, Valkenswaard, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

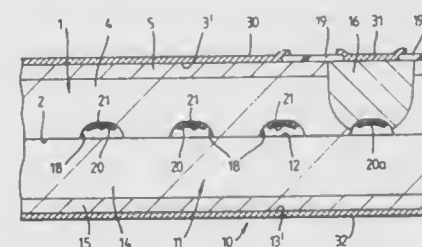
Filed Sep. 19, 1990, Ser. No. 585,340

Claims priority, application United Kingdom, Oct. 23, 1989, 8923806

Int. Cl.⁵ H01L 21/283

U.S. Cl. 437—39

5 Claims



1. A method of manufacturing a semiconductor device comprising the steps of providing first and second semiconductor bodies having first and second major surfaces, defining a recti-

fying junction pattern adjacent to at least one of the first major surfaces and bonding the first major surfaces together to join the two semiconductor bodies to form a structure in which the rectifying junction pattern defines a path for the flow of charge carriers between the second major surfaces, characterized by defining the rectifying junction pattern by forming at the one first major surface an electrically conductive pattern forming a Schottky junction with at least one of the first and second semiconductor bodies, further characterized by defining the electrically conductive pattern by forming one or more grooves in the one first major surface and providing electrically conductive material in at least one of the grooves, further characterized by defining the electrically conductive pattern as an electrically conductive grid, and further characterized by providing the first and second semiconductor bodies of one conductivity type, and by providing electrical contact to the electrically conductive pattern by forming a highly doped region of the opposite conductivity type extending through one of the first and second semiconductor bodies to form an ohmic contact with the electrically conductive pattern.

5,089,432

POLYCIDAL GATE MOSFET PROCESS FOR INTEGRATED CIRCUITS

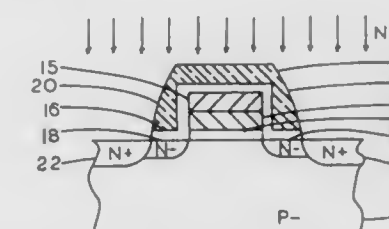
Chue-San Yoo, Hsin-Chuang, Taipei, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Aug. 17, 1990, Ser. No. 568,948

Int. Cl.⁵ H01L 21/264

U.S. Cl. 437—40

13 Claims



1. The method for fabricating a lightly doped drain MOS FET integrated circuit device comprising:

- forming a pattern of gate electrode structures upon a semiconductor substrate which structures each includes a gate oxide, a polysilicon layer and an amorphous refractory metal silicide;
- forming a pattern of lightly doped regions in said substrate by ion implantation using said structures as the mask;
- blanket depositing a low temperature silicon dioxide layer over the surfaces of the structure;
- lithographically forming a mask over each refractory metal silicide of said pattern of gate electrode structure;
- etching the said blanket layer to form a dielectric spacer structure upon the sidewalls of each of said structures and over the adjacent portions of said substrate, and a cover silicon dioxide layer over said each refractory metal silicide structure;
- removing the said mask over each refractory metal silicide of said pattern leaving said cover layer in tact;
- wherein the mask that is used to form the said pattern of gate electrode structures is the same mask used to form the said cover layer and dielectric spacer structure;
- forming a pattern of heavily doped regions in said substrate by ion implantation using the said structures with spacer structures as the mask to produce the lightly doped drain source/drain structures of an MOS FET device; and
- forming a passivation layer over the said structures and appropriate electrical connecting structures thereover to electrically connect the said gate electrode structures and source/drain elements to form said integrated circuit device.

5,089,433

BIPOLAR FIELD-EFFECT ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY CELL AND METHOD OF MANUFACTURE

Kranti V. Anand, and Madhu Anand, both of Sunnyvale, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

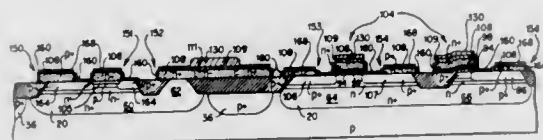
Division of Ser. No. 489,759, Feb. 27, 1990, abandoned, which is a continuation of Ser. No. 229,940, Aug. 8, 1988, abandoned.

This application Jan. 24, 1991, Ser. No. 647,185

Int. Cl.⁵ H01L 21/265

U.S. Cl. 437—40

19 Claims



1. In an MOS transistor comprising a silicon substrate, including source and drain regions formed of a semiconductor material having one conductivity type and a channel region formed of a semiconductor material having a conductivity type opposite the conductivity type of the semiconductor material forming the source and drain regions, the channel region being disposed between and contacting the source and drain regions, a method of making a floating gate electrically erasable MOS transistor comprising the steps of:

- forming a control gate region in the substrate generally coplanar with and spaced apart from the channel region, the source region, and the drain region;
- growing a layer of silicon dioxide over the channel and control gate regions;
- blanket depositing a first polysilicon layer over the substrate; and
- etching the polysilicon layer and the silicon dioxide layer from the substrate except for a continuous portion of the polysilicon layer extending from the control gate region to the channel region.

5,089,434

MASK SURROGATE SEMICONDUCTOR PROCESS EMPLOYING DOPANT-OPAQUE REGION

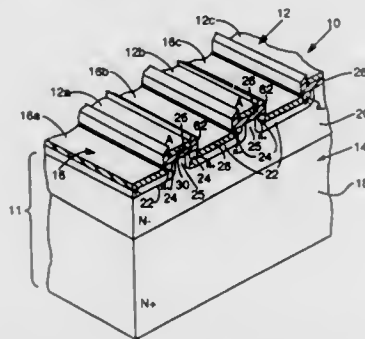
Theodore G. Hollinger, Redmond, Oreg., assignor to Advanced Power Technology, Inc., Bend, Oreg.

Division of Ser. No. 194,874, May 17, 1988, Pat. No. 4,895,810, which is a continuation-in-part of Ser. No. 842,771, Mar. 21, 1986, Pat. No. 4,748,103. This application Jan. 22, 1990, Ser. No. 467,947

Int. Cl.⁵ H01L 21/335

U.S. Cl. 437—41

14 Claims



1. A method, employing no more than one independent mask, of producing an MOS semiconductor device in a substrate structure including a gate oxide layer on an upper sur-

face of a semiconductor substrate, the method comprising: forming over the gate oxide layer a dopant protective layer; creating a mask-surrogate pattern-definer having a defined outline characteristic in the protective layer; exposing a portion of the upper surface of the substrate within a region bounded by the defined outline characteristic;

performing a first coping step to introduce dopant into said exposed upper surface portion of the substrate so as to form a first region of a first conductivity type, opposite a second conductivity type which is the conductivity type of a second region in said substrate, said first region including said exposed under surface of the substrate and extending to a location under peripheral edges of the protective layer providing the defined outline characteristic, said first region being wholly contained in said second region; and

after the first doping step, forming a trench in the exposed upper surface of the substrate, the trench being formed to a trench depth greater than a depth of the first region but less than a depth of the second region, and being formed of a width less than a width of the first region such that separated regions of the first conductivity type are provided at sidewalls of the trench, the separated regions constituting source regions of the MOS semiconductor device,

the trench sidewalls being formed to protrude laterally toward one another within the trench so that a portion of the silicon substrate containing the first region of said first conductivity type is vertically exposed along the trench sidewalls.

5,089,435

METHOD OF MAKING A FIELD EFFECT TRANSISTOR WITH SHORT CHANNEL LENGTH

Hiroaki Akiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

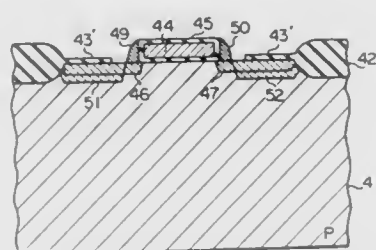
Division of Ser. No. 456,195, Dec. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 199,653, May 27, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 607,342

Claims priority, application Japan, May 27, 1987, 62-130742

Int. Cl.⁵ H01L 21/265, 21/225

U.S. Cl. 437—44

1 Claim



1. A process of fabricating a field effect transistor on a semiconductor substrate of a first conductivity type, comprising the steps of:

- a) forming a gate insulating film overlain by a gate electrode on an area of a surface of said semiconductor substrate, other areas of said surface of said semiconductor substrate on both sides of said gate insulating film being exposed, respectively;
- b) covering the entire surface of said gate electrode and said other areas with an insulating film;
- c) removing said insulating film on said other areas for exposing said other areas for forming lightly doped source and drain regions;
- d) depositing a polysilicon film on the entire surface so as to cover said insulating film at least left on said gate electrode and said other areas of said surface of said semiconductor substrate;

- e) doping said polysilicon film with impurity atoms of a second conductivity type opposite to said first conductivity type, said impurity atoms being diffused from said polysilicon film into said other areas so that said lightly doped source and drain region are formed in said semiconductor substrate;
- f) anisotropically etching said polysilicon film so as to form side walls covering said lightly doped source and drain regions, respectively; and
- g) ion implanting impurity atoms of said second conductivity type into said semiconductor substrate for forming heavily doped source and drain region, said gate electrode and said side walls serving as a mask.

5,089,436

METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE BY SLOPE ETCHING A POLYSILOX LAYER

Jung-In Hong, Suwon; Byung-Deok Yoo, Seoul, and Tae-Hyuk Ahn, Taegu, all of Rep. of Korea, assignors to Samsung Semiconductor and Telecommunications Co., Ltd., Suwon, Rep. of Korea

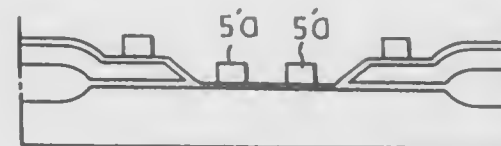
Continuation-in-part of Ser. No. 241,972, Sep. 8, 1988, abandoned. This application May 2, 1990, Ser. No. 519,261

Claims priority, application Rep. of Korea, Sep. 21, 1987, 87-10445

Int. Cl.⁵ H01L 21/70

U.S. Cl. 437—60

2 Claims



1. A method of fabricating a semiconductor device, comprising the steps of:

- (a) growing a barrier layer over a surface of a poly-silicon layer;
 - (b) implanting ions in said poly-silicon layer through said barrier layer;
 - (c) removing said barrier layer;
 - (d) slope etching said poly-silicon layer using a photoresist mask; and,
- in the step (a) of growing the barrier layer, growing said barrier layer to a thickness sufficient to cause the point of maximum density of the ions implanted in step (b) to be located within said barrier layer.

5,089,437

SEMICONDUCTOR LASER MANUFACTURING METHOD

Akibiro Shima, and Kunihiko Isshiki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1990, Ser. No. 586,197

Claims priority, application Japan, Oct. 17, 1989, 1-271027

Int. Cl.⁵ H01L 21/203

U.S. Cl. 437—129

10 Claims

1. A method of manufacturing a semiconductor laser comprising:

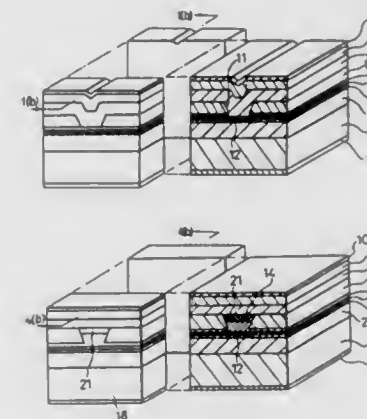
- successively growing a semiconductor first cladding layer of the first conductivity type, a semiconductor active layer, a semiconductor third cladding layer of a second conductivity type opposite the first conductivity type, and a semiconductor cap layer of the first conductivity type on a semiconductor substrate of a first conductivity type;
- diffusing a dopant producing the second conductivity type into said cap layer except at portions where each of two opposed facets of the semiconductor layer will be formed,

thereby converting the cap layer in the diffused portion to the second conductivity type;

removing portions of said third cladding layer and said cap layer to leave a mesa including portions of said third cladding layer and said cap layer projecting from a remaining portion of said third cladding layer;

heating said substrate, first cladding layer, active layer, and mesa to diffuse the dopant from said cap layer through said mesa and into said active and third cladding layers adjacent said mesa;

growing a semiconductor first conductivity type current



blocking layer on said third cladding layer abutting said mesa;

successively growing a semiconductor fourth cladding layer of the second conductivity type and a semiconductor contacting layer of the second conductivity type on said current blocking and cap layers;

depositing first and second electrodes on said substrate and said contacting layer, respectively; and

forming a pair of generally parallel opposed facets generally transverse to said first and second electrodes and spaced from the portions of said cap layer into which the dopant was diffused.

5,089,438

METHOD OF MAKING AN ARTICLE COMPRISING A TiN_x LAYER

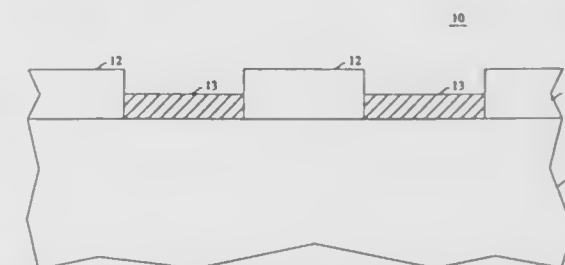
Avishay Katz, Westfield, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 26, 1991, Ser. No. 691,956

Int. Cl.⁵ H01L 21/283

U.S. Cl. 437—184

8 Claims



1. Method of making an article comprising a semiconductor device, the method comprising

- a) providing a semiconductor body having a major surface;
 - b) forming on the surface a patterned titanium nitride (TiN_x, 0.9 ≤ x ≤ 1.1) layer;
 - c) carrying out one or more further steps towards completion of the article;
- CHARACTERIZED IN THAT
- d) the semiconductor body is a III-V compound semiconductor body; and

e) step b) comprises forming a patterned first material layer on the surface, such that a predetermined portion of the surface is not covered by the first material layer; and further comprises contacting the major surface with an atmosphere that comprises a Ti- and N-containing metal-organic gaseous precursor, heating at least a portion of the semiconductor body to a temperature in the range 250°-500° C. for at most 300 seconds, the atmosphere, temperature and heating time selected such that said TiN_x is deposited on the predetermined portion of the surface, and substantially no TiN_x is deposited on the first material layer.

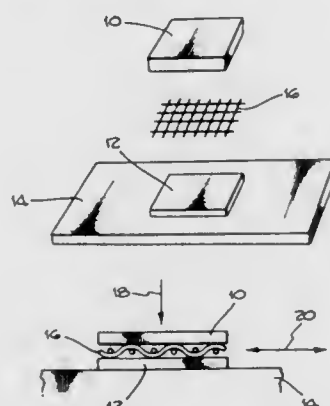
5,089,439
PROCESS FOR ATTACHING LARGE AREA SILICON-BACKED CHIPS TO GOLD-COATED SURFACES

Barret Lippey, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 2, 1990, Ser. No. 474,578
Int. Cl.⁵ H01L 23/6

U.S. Cl. 437-209

17 Claims



1. A method for attaching a silicon chip to a substrate wherein said silicon chip has a bottom surface having a surface area and said substrate has a gold top surface, said method comprising the steps of:

- placing a gold lattice structure between said silicon chip bottom surface and said gold top surface so that said silicon chip bottom surface and said gold top surface are in contact with said gold lattice structure, said gold lattice structure having a contact area with said silicon chip which is less than ten percent of the surface area of said silicon chip bottom;
- scrubbing said silicon chip bottom surface against said gold lattice structure with sufficient pressure and at a sufficient temperature to form a gold/silicon eutectic liquid between said gold lattice structure and said silicon chip bottom surface; and
- continuing to scrub said silicon chip bottom surface against said gold lattice structure and said gold top surface for a sufficient time to form a gold/silicon eutectic attachment between substantially all of said silicon chip bottom surface and said gold top surface.

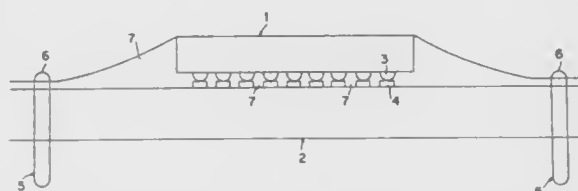
5,089,440
SOLDER INTERCONNECTION STRUCTURE AND PROCESS FOR MAKING

Frederick R. Christie; Kostas I. Papathomas, both of Endicott, and David W. Wang, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 493,126, Mar. 14, 1990, Pat. No. 4,999,699.
This application Dec. 10, 1990, Ser. No. 624,973
Int. Cl.⁵ H01L 23/50

U.S. Cl. 437-209

20 Claims



1. A method of increasing the fatigue life of solder interconnections between a semiconductor device and a supporting substrate comprising attaching said device to said substrate by a plurality of solder connections that extend from the supporting substrate to electrodes on said semiconductor device to form a gap between said supporting substrate and said semiconductor device;

filling said gap with a composition that contains:

- binder selected from the group of a cycloaliphatic epoxide, cyanate ester, prepolymer of cyanate ester and mixtures thereof, said binder having a viscosity at room temperature of no greater than about 1,000 centipoise;
- filler having a maximum particle size of 31 microns and being free of alpha particle emissions; wherein the amount of A is about 60 to about 25 percent by weight of the total of A and B, and correspondingly the amount of B is about 40 to about 75 percent by weight based upon the amount of A and B; and curing said composition.

5,089,441
LOW-TEMPERATURE IN-SITU DRY CLEANING PROCESS FOR SEMICONDUCTOR WAFERS

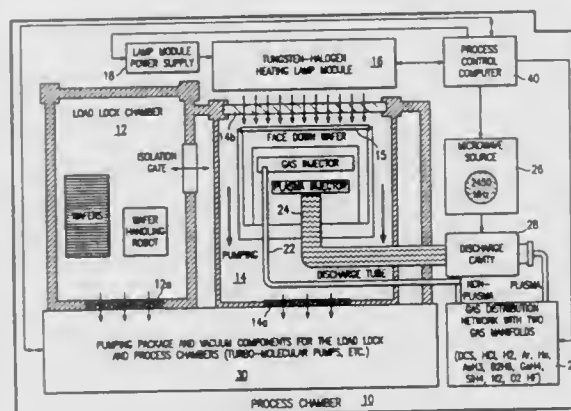
Mehrdad M. Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1990, Ser. No. 509,251

Int. Cl.⁵ H01L 21/306

U.S. Cl. 437-225

7 Claims



1. A method off semiconductor multiprocessing for fabricating a semiconductor wafer in a sequence of more than one process step, comprising the steps of:
during each transition between process steps, maintaining wafer temperature at a level high enough to substantially

reduce temperature swings on the wafer and the adsorption of residual process environment impurities;
during each transition between process steps in which at least one of the process gases is a common process gas used in each of the steps, maintaining the gas flow for such common process gas at substantially the same flow rate; and
during each such transition, maintaining the process chamber pressure substantially the same.

5,089,442
SILICON DIOXIDE DEPOSITION METHOD USING A MAGNETIC FIELD AND BOTH SPUTTER DEPOSITION AND PLASMA-ENHANCED CVD

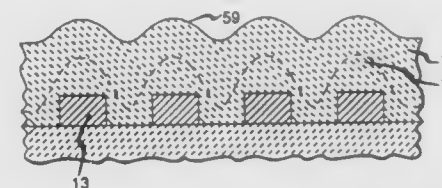
Leonard J. Olmer, Orlando, Fla., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 20, 1990, Ser. No. 584,986

Int. Cl.⁵ H01L 21/00, 21/02, 21/28, 21/88

U.S. Cl. 432-235

11 Claims



1. A method for making integrated circuits comprising the steps of:
forming a first conductive pattern over a semiconductor substrate, cross-sectional areas of component conductors of the pattern each having two upper corners;
placing the substrate on a first electrode of a first chamber, the chamber including a second electrode;
introducing into the first chamber inert gas and gas including silicon and oxygen components;
causing first silicon dioxide to deposit on a first surface of the substrate comprising the step of producing a first rf electric field between the first and second electrodes;
during the first silicon dioxide deposition, causing the sputtering of certain silicon dioxide predominantly from the upper corners of component conductors comprising the step of producing, along the first surface of the substrate, a magnetic field that is substantially perpendicular to the rf field;
withdrawing the substrate from the first chamber and placing it on a first electrode of a second chamber, the second chamber including a second electrode;
introducing into the second reaction chamber gas including silicon and oxygen components;
causing second silicon dioxide to deposit over the first silicon dioxide comprising the step of producing a second rf electric field between the first and second electrodes of the second chamber, said last mentioned deposition being in the absence of any magnetic field and at a higher deposition rate than the first silicon dioxide deposition.

5,089,443
METHOD OF MAKING A SEMICONDUCTOR HEAT SINK

Apor Kerey, Marlborough, and Peter Delivouras, Peabody, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed May 30, 1990, Ser. No. 530,830

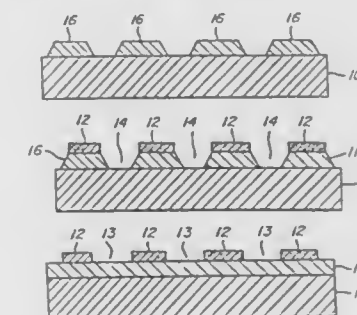
Int. Cl.⁵ H01L 21/461

U.S. Cl. 437-246

25 Claims

1. A method of fabricating a heat sink device adapted for coupling to a semiconductor circuit device for heat transfer therefrom, said method comprising the steps of:
providing a thermally conductive substrate,
selecting a metal alloy that is thermally conductive,
depositing a layer of said metal alloy on said substrate, and to

a selected thickness, said thickness selected with regard to the ultimate heat sink topography desired,
selectively and controllably forming cavities in said alloy layer defining a plurality of heat dissipation members having heat dissipation surfaces covering an area greater



than the surface area of the substrate covered by said members, and
oxidizing the resulting exposed substrate and heat dissipation members thereby forming an electrically insulating surface layer on said exposed substrate and heat dissipation members.

5,089,444
METHOD OF PRODUCING COLORED CRYSTALLIZED GLASS

Masateru Hattori; Takashi Okamura, and Kazuo Kondo, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 359,295, May 31, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 593,530
Claims priority, application Japan, May 31, 1988, 63-133859
Int. Cl.⁵ C03C 10/04, 10/08

U.S. Cl. 501-9

11 Claims

1. Colored crystallized glass prepared by:
(a) adding to a crystallized glass material from 0.1 to 10 parts by weight of a coloring agent per 100 parts by weight of the crystallized glass material, said coloring agent having been prepared by preliminary burning in an oxidizing atmosphere at a temperature of from 1,000° to 1,400° C. for at least 1 hour from 0.05 to 7 parts by weight of Fe_2O_3 , from 0.03 to 5 parts by weight of CoO , and at least one oxide selected from the group consisting of from 0.01 to 2.5 parts by weight of NiO and from 0.01 to 2.8 parts by weight of Cr_2O_3 , the amounts of the components of the coloring agent being given in parts by weight per 100 parts by weight of the crystallized glass material;
(b) molding the resulting mixture under a pressure of from 500 to 3,000 kg/cm²; and
(c) calcining the molded mixture to effect crystallization heat treatment.

5,089,445
FUSION SEALING MATERIALS

Gaylord L. Francis, Painted Post, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Oct. 9, 1990, Ser. No. 594,629

Int. Cl.⁵ C03C 8/14, 8/18, 8/24, 14/00

U.S. Cl. 501-15

36 Claims

1. A sealing material comprising a lead sealing glass and a mill addition of a pyrophosphate crystalline material selected from the group consisting of magnesium pyrophosphate, a magnesium pyrophosphate with at least a portion of the magnesium ions replaced by at least one cation selected from the group composed of cobalt, arsenic, zinc, iron, aluminum and zirconium, and a crystallized phosphate glass composed essentially of P_2O_5 and one or more cations selected from the group composed of magnesium, cobalt, arsenic, zinc, iron, aluminum and zirconium.

5,089,446

SEALING MATERIALS AND GLASSES

Lauren K. Cornelius; Gaylord L. Francis, both of Painted Post, and Paul A. Tick, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 9, 1990, Ser. No. 598,001

Int. Cl.⁵ C03C 8/14, 8/18, 8/24, 14/00

U.S. Cl. 501—15

45 Claims

1. A fusion sealing material composed of a tin-phosphorus oxyfluoride glass having a low transition temperature and a mill addition selected from the group consisting of Invar, molybdenum, tungsten, lead orthophosphate, magnesium pyrophosphate, a magnesium pyrophosphate with at least a portion of the magnesium ions replaced by at least one cation selected from the group composed of cobalt, arsenic, zinc, iron, aluminum and zirconium, and a crystallized phosphate glass composed essentially of P_2O_5 and one or more cations selected from the group composed of magnesium, cobalt, arsenic, zinc, iron, aluminum and zirconium.

5,089,447

HIGH HARDNESS, WEAR RESISTANT MATERIALS
Edward E. Timm, and Ann M. McCombs, both of Traverse City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1990, Ser. No. 594,884

Int. Cl.⁵ C04B 35/56

U.S. Cl. 501—87

7 Claims

1. A material having a high degree of hardness or wear resistance and comprising at least one product of an incomplete reaction between AX, A, and, optionally, an amount of X, said incomplete reaction product comprising an amount of unreacted AX and at least one compound AX', each compound AX' having a stoichiometry which differs from that of AX, wherein A is selected from the group consisting of titanium, manganese, zirconium, hafnium, vanadium, niobium, tantalum, iron, chromium, molybdenum and tungsten and X is selected from the group consisting of boron, carbon, silicon and nitrogen.

5,089,448

SILICON NITRIDE SINTERED BODY HAVING
EXCELLENT HIGH-TEMPERATURE STRENGTH AND
METHOD OF PRODUCING SAME

Yasunobu Kawakami; Kagehisa Hamazaki, both of Saitama; Toshihiko Arakawa, and Toshiyuki Mori, both of Yokohama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Tosoh Corporation, Yamaguchi, both of Japan

Continuation of Ser. No. 398,478, Aug. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 393,381, Aug. 14, 1989, abandoned. This application Dec. 24, 1990, Ser. No. 632,423

Claims priority, application Japan, Aug. 25, 1988, 63-211117
Int. Cl.⁵ C04B 35/58

U.S. Cl. 501—97

4 Claims



1. A silicon nitride body having a composition consisting essentially of 2.0–2.8 weight % of Y_2O_3 , 0.4–1.0 weight % of Al_2O_3 and balance substantially Si_3N_4 , the weight ratio of Y_2O_3/Al_2O_3 being 2.5–7, said Si_3N_4 being added as silicon nitride powder having an oxygen content of 0.8–1.1 weight %, a specific surface area of 9 ± 11 m²/g, and metal impurity

content of 200 ppm or less, said sintered body having a density of 3.0 g/cm³ or more, a structure in which the minor axes of grains are substantially 6 μ m or less, and a high-temperature strength of about 80 kg/mm² or more.

5,089,449

SILICON NITRIDE SINTERED BODIES

Shinichi Miwa, Nagoya; Seiichi Asami, Okazaki; Takehiro Kajihara, Komaki, and Kouichi Imao, Kagamihara, all of Japan, assignors to NGK Insulators, Ltd., Japan

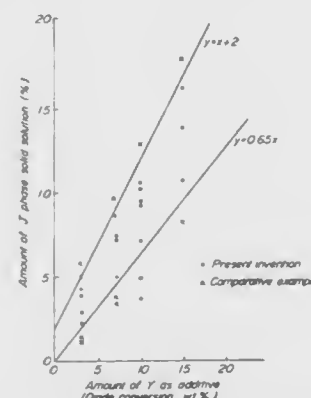
Filed Mar. 1, 1990, Ser. No. 486,922

Claims priority, application Japan, Mar. 1, 1989, 1-46567

Int. Cl.⁵ C04B 35/58; F27B 9/10

U.S. Cl. 501—98

7 Claims



1. A silicon nitride sintered body consisting essentially of Si_3N_4 as a main ingredient and about 3–15 wt.% Y_2O_3 , about 1–7 wt.% MgO and about 0.5–1.00/g wt.% ZrO_2 comprising an intergranular phase consisting essentially of a J phase solid solution, wherein an amount of J phase solid solution: y, satisfies the following formula with respect to an amount of Y_2O_3 : x, as an additive;

$$0.65x \leq y \leq x + 2.$$

5,089,450

CATALYST FOR POLYMERIZATION OF
ORGANOSILOXANES

Isao Watanuki; Nobuhiko Kodana, and Makoto Sato, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,354

Claims priority, application Japan, Jan. 30, 1990, 2-20296

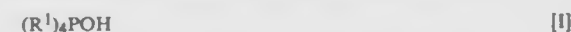
Int. Cl.⁵ C08F 4/00

U.S. Cl. 502—158

10 Claims

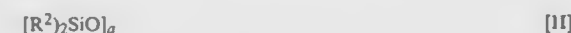
1. A process of producing a catalyst for polymerization of an organosiloxane, which comprises the step of heat-treating at a temperature of from 35 to 80° C. a mixture comprising:

(A) an aqueous solution of a quaternary phosphonium hydroxide having the following general formula [I]:



wherein R^1 is an alkyl, cycloalkyl, aryl, alkaryl, or aralkyl group, and the four R^1 groups are the same or different, and

(B) at least one member selected from the group consisting of a cyclosiloxane having the following general formula [II]:



wherein R^2 is the same or different and are each an alkyl, cycloalkyl, vinyl, aryl, alkaryl, haloalkyl or haloaryl

group, and n is an integer of 3 or above, a siloxane having the following general formula [III]:



wherein R^2 is as defined above, R^3 is the same or different and are each an alkyl, cycloalkyl, vinyl, aryl, alkaryl, haloalkyl, haloaryl or hydroxyl group, and m is 0 or a positive integer, and controlling the water content of the system so that the molar ratio of the amount of water in the system to the amount of the quaternary phosphonium hydroxide component in the system is from 3.0:1 to 4.0:1.

5,089,451

HARDENED CATALYST PARTICLES AND METHOD
FOR HARDENING THE CATALYST PARTICLES

James H. Edwards; Ashit M. Maitra, and Ralph J. Tyler, all of New South Wales, Australia, assignors to The Broken Hill Proprietary Company, Ltd., Melbourne and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

Filed Jul. 2, 1990, Ser. No. 545,957

Claims priority, application Australia, Jun. 30, 1989, PJ5021; Aug. 16, 1989, PJ5806

Int. Cl.⁵ B01J 27/232, 23/02, 23/04

U.S. Cl. 502—174

8 Claims

1. A method for hardening particles of a catalyst containing a compound that is capable, under the hardening conditions, of existing at least partly in the form of a carbonate, comprising heating the catalyst particles to a temperature of at least 700° C. but below the melting point of the carbonate compound in an atmosphere containing carbon dioxide so as to retain that compound at least partly in the carbonate form for a period of time effective to sinter said catalyst particles.

5,089,452

METHOD FOR PREPARING CATALYST PRECURSOR
FOR METHANOL SYNTHESIS

Tadasi Nakamura; Kinya Tsuji, and Yoriko Obata, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 607,842, Nov. 1, 1990, abandoned, which is a continuation of Ser. No. 448,066, Dec. 8, 1989, abandoned. This application May 9, 1991, Ser. No. 698,364

Claims priority, application Japan, Feb. 9, 1989, 1-28774

Int. Cl.⁵ B01J 21/02, 23/02

U.S. Cl. 502—202

26 Claims

1. A method of preparing a catalyst precursor from a copper compound, a zinc compound, an aluminum compound and a boron compound, for methanol synthesis, the method comprising

- precipitating from an aqueous reaction mixture comprising a copper sulfate which is recovered from a copper etching waste solution mother liquor, the copper sulfate comprising up to 10% by weight of said mother liquor, with a precipitant, said precipitant being in an amount of 1- to 2-fold equivalent to the copper sulfate, said precipitating being conducted in the presence of the boron compound, the boron compound being a water soluble boron compound, and mixing therewith the zinc compound, without separation, to form a precipitate in said reaction mixture,
 - filtering said reaction mixture from step (a) to form a cake,
 - washing said cake from step (b) with an aqueous alkali solution in a concentration of 0.01 to 0.5% by weight and then washing with water,
 - adding said aluminum compound to said washed cake of step (c),
 - kneading the resulting mixture from step (d) and
 - drying the resulting kneaded mixture from (e).
14. A method of preparing a catalyst precursor from a cop-

per compound, a zinc compound, an aluminum compound and a boron compound, for methanol synthesis, the method comprising

- precipitating from an aqueous reaction mixture comprising a copper sulfate which is recovered from a copper etching waste solution mother liquor, the copper sulfate comprising up to 10% by weight of said mother liquor, with a precipitant, said precipitant being in an amount of 1- to 2-fold equivalent of the copper sulfate, said precipitating being conducted in the presence of the boron compound, the boron compound being a water soluble boron compound, and mixing therewith said zinc compound and said aluminum compound, without separation, to form a precipitate in said reaction mixture,
- filtering said reaction mixture from step (a) to form a cake,
- washing said cake from step (b) with an aqueous alkali solution in a concentration of 0.01 to 0.5% by weight and then washing with water and
- drying the resulting material from step (c).

5,089,453

HYDROCONVERSION CATALYST AND METHOD FOR
MAKING THE CATALYST

Charles R. Wilson, San Francisco; Kirk R. Gibson, El Cerrito, and Chi-Wen Hung, San Rafael, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Jun. 25, 1990, Ser. No. 543,005

Int. Cl.⁵ B01J 21/06, 23/85, 23/88, 27/185

U.S. Cl. 502—211

20 Claims

1. A method for making a catalyst comprising:

- peptizing alumina with an aqueous acidic solution containing a soluble Group IVB metal compound and a soluble Group VIII metal compound;
- neutralizing said aqueous acidic mixture containing the peptized alumina with an aqueous solution containing a basic compound and a soluble Group VIB metal compound while mixing; and
- shaping, drying and calcining the catalyst particles.

5,089,454

CATALYTIC COMPOSITION FOR HYDROGENATION
OF CHLOROFLUOROALKENES

Luc Lerot; Jean-Louis Costa, both of Brussels; Vincent Wilmet, Louvain-La-Neuve, and Joseph Pirotton, Brussels, all of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed May 5, 1989, Ser. No. 347,926

Claims priority, application France, May 24, 1988, 88 06991
Int. Cl.⁵ B01J 21/10, 27/10, 27/12, 27/138

U.S. Cl. 502—226

7 Claims

1. A catalytic composition for the hydrogenation of a chlorofluoroalkene to fluoroalkene comprising a magnesium oxide porous carrier, a palladium or platinum metal, and at least two compounds chosen from among potassium, caesium, or barium chlorides or fluorides.

5,089,455

THIN FLEXIBLE SINTERED STRUCTURES

Thomas D. Ketcham, Big Flats; Wayne B. Sanderson, deceased, late of, Corning by Stuart R. Sanderson, administrator; Dell J. St. Julien, Watkins Glen, and Kathleen A. Wexell, Corning, all of N.Y., assignor to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 393,532, Aug. 11, 1989, abandoned. This application Feb. 1, 1990, Ser. No. 473,343

Int. Cl.⁵ C04B 35/64

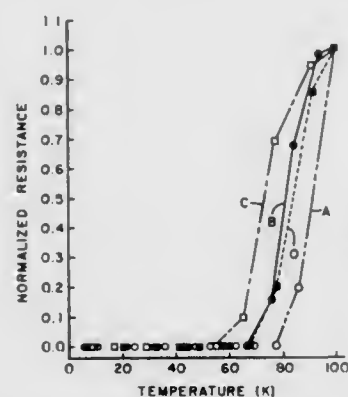
U.S. Cl. 501—104

22 Claims

15. A thin flexible sintered structure having a flexibility at least sufficient to permit bending in one or more directions to a radius of curvature of less than 20 centimeters without breakage, the sintered structure comprising a ceramic alloy compris-

ing a zirconia (hafnia) alloy and, optionally, a hard refractory ceramic, the ceramic alloy containing at least 5 volume percent of the zirconia (hafnia) alloy, wherein the zirconia (hafnia) alloy consists essentially of:

- 35-99.75 mole % of one or more oxides selected from the group consisting of zirconia, hafnia, and zirconia-hafnia solid solution, and
- 0.25-45 mole % of additives selected from the following groups:
 - 5-45 mole % of titania and/or tin oxide,
 - 0.25-20 mole % total of one or more oxide compounds selected in the indicated proportions from the groups



consisting of (i) 0-10 mole % $MM'O_{4+\delta}$ wherein M' is selected from the group consisting of V, Nb, and Ta, M is selected from the group consisting of Mg, Ca, Ti, Sn, Sc, Y, La, and the rare earth metals, and δ is 0-1; (ii) 0-6 mole % $M''M'''O_{4+\delta}$ wherein M'' is W and/or Mo, M''' is selected from the group consisting of Mg, Ca, Ti, Sn, Sc, Y, La, and rare earth metals, and δ is 0-1; and (iii) 0-4 mole % MoO_3 and/or WO_3 ; and said alloy optionally additionally comprising 0-10 mole % of oxides of one or more metals selected from the group consisting of Mg, Ca, Sc, Y, La, and the rare earth metals, and 0-20 mole % of cerium oxide.

5,089,456

PROCESS FOR PREPARING CORDIERITE

Kazuyuki Maeda; Fujio Mizukami; Shuichi Niwa; Makoto Toba, and Kazuo Shimizu, all of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 606,281

Claims priority, application Japan, Nov. 6, 1989, 1-288432
Int. Cl.⁵ C04B 35/02; C03C 10/08

U.S. Cl. 501-119 5 Claims

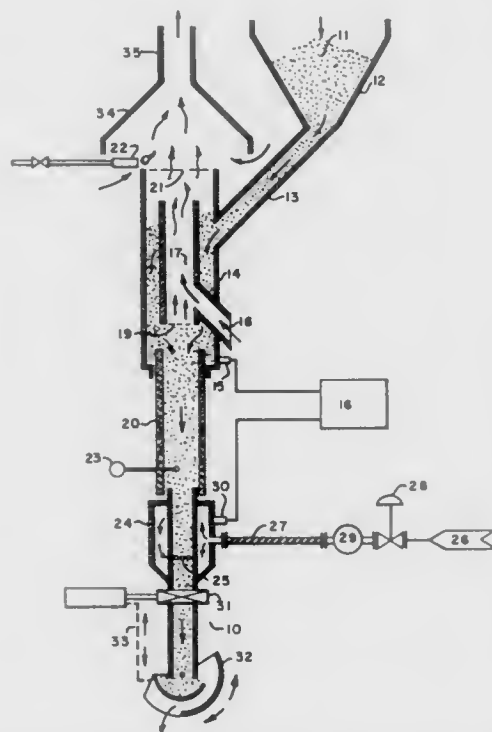
1. A process for preparing a cordierite, which comprises dissolving a silicon compound, an aluminum compound and a magnesium compound in a silicon/aluminum molar ratio of 1:0.7 to 1:1 and a silicon/magnesium molar ratio of 1:0.3 to 1:0.5 in a complexing agent represented by the formula $R(OCH_2CH_2)_nOH$, wherein R is an alkyl group and n is an integer of 1 to 4; heating the resulting solution to bring about a ligand exchange reaction of said silicon compound, aluminum compound and magnesium compound with said complexing agent; conducting hydrolysis to form a gel; drying the gel and sintering the dried gel at 800° to 1450° C.

5,089,457

PROCESS FOR ACTIVATION OF CARBON BY ELECTRICAL RESISTANCE HEATING IN THE PRESENCE OF STEAM

E. Mervyn J. Gaylard, Plot 19, Third Road, Golden Harvest, Randburg, Transvaal, and Cornelius J. DuPlessis, 82 Zebrena Crescent, Nelspruit, 1200 Transvaal, both of South Africa
Filed Jan. 4, 1991, Ser. No. 637,549

Int. Cl.⁵ B01J 37/34; C01B 31/10; F27D 3/00; C10B 1/04
U.S. Cl. 502-5 5 Claims



1. In a process for activation of carbon from carbon feedstocks by electrical resistance heating in the presence of steam, wherein

- (a) the carbon feedstock is preheated before activation;
- (b) the combustible gases exiting from the preheating vessel are ignited by a pilot burner;
- (c) the carbon flows downward by gravity through a reaction vessel in which the activation of the carbon takes place;
- (d) an electric current is passed through the carbon in the reaction vessel;
- (e) steam is passed into the bottom of and flows upward through said reaction vessel; and
- (f) the activated carbon product is discharged from the bottom of the reaction vessel; the improvement that comprises
 - (a) the use of a carbon feedstock that contains up to about 25% of volatile organic matter;
 - (b) the maintenance of the preheating temperature within the range of from about 550° C. to about 750° C. to achieve the lowest electrical resistivity of the carbon;
 - (c) the inclusion in the electric circuit between an electrode attached to the preheating vessel and an electrode attached to the reaction vessel of a portion of the carbon in the preheating vessel into which projects the uppermost part of the reaction vessel; and
 - (d) the use of a tubular reactor whose inner radius is no more than 75 times that of the size-average of the largest dimensions of the carbon feedstock particles, wherein the size-average, $L_s = \Sigma L^3 / \Sigma L$, where L is the largest dimension of any given particle.

5,089,458

SYNTHETIC SAPONITE-DERIVATIVES, A METHOD FOR PREPARING SUCH SAPONITES AND THEIR USE IN CATALYTIC (HYDRO) CONVERSIONS

Johan Breukelaar; Rutger A. Van Santen, and Andreas W. De Winter, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 7, 1990, Ser. No. 520,484

Claims priority, application United Kingdom, May 19, 1989, 8911610

Int. Cl.⁵ B01J 21/16

27 Claims

U.S. Cl. 502-63

1. A saponite-derivative according to the general formula



wherein A represents an (alkyl-substituted) ammonium ion and/or any metal having basic or amphoteric properties, M represents a bivalent metal ion having an ionic radius between 0.050 and 0.085 nm, n represents the valence of A , x represents a number between 0.05 and 1.5, y represents a number between 0.05 and 2.95 and z represents a number from 0 to 1.8.

3. The saponite-derivative according to claim 1 wherein A represents a lithium, sodium, potassium, calcium or ammonium ion.

5. The saponite-derivative according to claim 1 wherein M represents one or more of iron, nickel, cobalt, manganese, copper or zinc ions.

24. A catalytically active system based on a saponite-derivative according to claim 1 containing one or more metals and/or metal compounds according to Group VI and/or Group VIII of the Periodic Table of the Elements.

5,089,459

CATALYST COMPOSITION, PROCESS FOR CRACKING NON-AROMATIC HYDROCARBONS AND PROCESS FOR ISOMERIZING C₈ AROMATIC HYDROCARBONS

Kimihiko Sato; Ritsuke Suzuki, and Hiroshi Horiuchi, all of Matsuyama, Japan, assignors to Teijin Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 27, 1990, Ser. No. 500,248

Claims priority, application Japan, Mar. 29, 1989, 1-74874

Int. Cl.⁵ B01J 29/30

U.S. Cl. 502-66

15 Claims

1. A catalyst composition consisting essentially of

- (A) a crystalline aluminosilicate zeolite having a silica/alumina mole ratio of at least 10, at least 50% of all its cation sites being occupied by an alkali metal cation (component A), and
 - (B) a refractory inorganic oxide having (b-1) platinum and (b-2) tin and/or indium supported thereon (component B).
14. A xylene isomerization composite catalyst composition comprising a mixture of the catalyst composition of claim 1 and a catalyst composition containing a zeolite selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-21, ZSM-23, ZSM-35, ZSM-38, and ZSM-48, and having the ability to isomerize xylenes.

5,089,460

VANADIUM CATALYST SYSTEMS FOR OLEFIN POLYMERIZATION

James C. W. Chien, Amherst, Mass., assignor to Academy of Applied Science, Inc., Concord, N.H., a part interest
Continuation of Ser. No. 385,665, Jul. 26, 1989, abandoned. This application Mar. 1, 1991, Ser. No. 665,911

Int. Cl.⁵ C08F 4/68
U.S. Cl. 502-112

18 Claims

1. A catalyst system for the isotactic polymerization of alpha-olefins comprising:

- (a) a solid precursor comprising the reaction product of (i) a halogenated vanadium compound wherein the vanadium has a valence of 2 to 5; (ii) a magnesium compound; and (iii) an inside electron donor wherein the molar ratio of

inside electron donor to vanadium compound is in the range of about 0.2:1 to about 2:1; the atomic ratio of magnesium to vanadium is in the range of about 3:1 to about 40:1; and the reaction product (A) is a solid having a surface area greater than about 10 square meters per gram or (B) is adsorbed on the surface of an inert inorganic support having a surface area greater than about 10 square meters per gram;

(b) a hydrocarbyl aluminum cocatalyst wherein the atomic ratio of aluminum to vanadium is in the range of about 2:1 to about 300:1; and

(c) an outside electron donor wherein the molar ratio of outside electron donor to aluminum is in the range of about 0.02:1 to about 1:1

5,089,461

CHROMIUM/TIN MIXTURE AS SULFUR DIOXIDE OXIDATION PROMOTER FOR FCC UNITS

William A. Blanton, Jr., Woodacre, and Alan W. Klaassen, Kensington, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 197,378, May 23, 1988, Pat. No. 4,992,161, and a continuation-in-part of Ser. No. 811,867, Dec. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 447,334, Dec. 6, 1982, abandoned. This application Sep. 4, 1990, Ser. No. 578,975

Int. Cl.⁵ B01J 21/06
U.S. Cl. 502-242

4 Claims

1. A composition of matter useful for cracking a sulfur-containing hydrocarbon in the absence of added hydrogen which comprises:

- (a) a particulate cracking catalyst for cracking a hydrocarbon in the absence of added hydrogen;
- (b) a first particulate solid other than said cracking catalyst comprising a sulfur sorbent capable of sorbing sulfur trioxide; and
- (c) a second particulate solid other than said particulate cracking catalyst, said second particulate solid containing an intimate association of chromium and tin or of the compounds thereof on a titanium dioxide support.

5,089,462

HYDROCONVERSION CATALYST AND METHOD FOR MAKING THE CATALYST

Charles R. Wilson, San Francisco, and Kirk R. Gibson, El Cerrito, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Jun. 25, 1990, Ser. No. 543,257
Int. Cl.⁵ B01J 21/06, 23/85, 23/88

U.S. Cl. 502-309

18 Claims

1. A composition comprising:

- a. a supporting oxide;
- b. a Group IVB gelled promoter; and
- c. hydrogenation components including at least one component from a Group VIII metal and at least one component from a Group VIB metal.

5,089,463

HYDRODEMETHALATION AND HYDRODESULFURIZATION CATALYST OF SPECIFIED MACROPOROSITY

David R. Johnson, San Francisco, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.
Division of Ser. No. 253,010, Oct. 4, 1988, Pat. No. 4,976,848. This application Oct. 11, 1990, Ser. No. 595,524

Int. Cl.⁵ B01J 21/04, 23/85, 23/88, 32/00
U.S. Cl. 502-313

13 Claims

1. A hydrodemethalation/hydrodesulfurization catalyst comprising

- a hydrogenation component selected from Group VI and Group VIII metals, and an inorganic oxide refractory support, and wherein the catalyst has

- a. 5 to 11 percent of its pore volume in the form of macropores, and
b. a surface area greater than 75 m²/g of catalyst.

5,089,464
IMAGE-RECEIVING PAPER FOR THERMAL
SUBLIMABLE DYE TRANSFER

Masaru Ichii, Kozo Fukuda, and Kenji Morishita, all of Tokyo, Japan, assignors to Nishinbo Industries, Inc., Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 425,682
Int. Cl.⁵ B41M 5/035, 5/26

U.S. Cl. 503—227 11 Claims

1. Image-receiving paper for thermal sublimable dye transfer comprising: an image-receiving layer which is laminated on the surface of a base material so as to be dyed with a sublimable dye, said image-receiving layer containing a dyeable resin, and a releasing agent which is the product of reaction between an oxyalkylene oligomer having reactive groups and a silane coupling agent, said product of reaction comprising plural polyether chains, each having a terminal group with at least one silicon atom derived from said silane coupling agent.

5,089,465
PROCESS FOR PRODUCING OXIDE
SUPERCONDUCTING THICK FILMS BY SCREEN
PRINTING

Kenichiro Sibata, Nobuyuki Sasaki, Shuji Yazu, and Tetsuji Jodai, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 173,474, Mar. 25, 1988, abandoned.

This application Jun. 14, 1990, Ser. No. 537,866

Claims priority, application Japan, Mar. 25, 1987, 62-70970

Int. Cl.⁵ B05D 5/12, 3/02

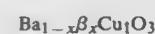
U.S. Cl. 505—1 13 Claims

1. A process for producing a superconducting thick film, comprising the steps of:

- mixing powders of oxide or carbonate of Ba, oxide or carbonate of an element "β" which is selected from a group consisting of Y, Yb, Eb, La, Nd, Gd, Dy, Ho, Er, Tm and Lu, and oxide or carbonate of Cu in such proportions that the atom ratio of said elements Ba, "β" and Cu satisfy



where x is between 0.2 and 0.8, each of said powders having an average particle size of less than 5 μm; subjecting the powder mixture to preliminary sintering at a temperature between 700° and 950° C.; pulverizing the preliminary sintered mass obtained into a powder having an average particle size of less than 10 μm; admixing the pulverized powder obtained with an organic vehicle to prepare a paste; applying said paste in a thickness between 10 and 50 μm onto a substrate by means of a screen printing technique; drying the coated paste; and then subjecting the coated paste to final sintering under an oxidative condition selected from the group consisting of air and an oxygen atmosphere having a pressure of 5 to 10 atm, at a temperature between 800° and 1,000° C., whereby a superconducting thick film of perovskite type oxide or quasi-perovskite type oxide which is represented by the formula:



wherein "β" has the same definition as above, the value of x being in the range between 0.2 and 0.8 and which has an average crystal grain size of less than 15 μm, is formed on the substrate.

5,089,466
STABLE MIXED METAL SUPERCONDUCTIVE OXIDES
CONTAINING NITROGEN

Robert E. Sievers, and Stephen A. Moatzka, both of Boulder, Colo., assignors to The University of Colorado Foundation, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 134,251, Dec. 17, 1987. This application Jul. 8, 1988, Ser. No. 216,643

Int. Cl.⁵ C01F 11/02, 17/00; C01G 3/02; H01L 39/02
U.S. Cl. 505—1 10 Claims

1. A composition of matter of the formula



wherein X is selected from the group consisting of yttrium, thallium and bismuth, Z is selected from the group consisting of barium and mixtures of barium with one or more elements selected from the group consisting of strontium, calcium and magnesium, j is from about 1 to about 3 and k is from about 9 to about 13.

5,089,467
SUPERCONDUCTOR STRUCTURES AND METHOD OF
FORMING SAME

Lawrence E. Murr, Tigard, Oreg., and Alan W. Hare, Port Angeles, Wash., assignors to Oregon Graduate Center, Beaverton, Oreg. and Northwest Technical Industries, Inc., Seaside, Wash., a part interest

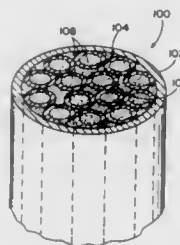
PCT No. PCT/US87/01851, § 371 Date May 15, 1989, § 102(e) Date May 15, 1989, PCT Pub. No. WO89/01240, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 29, 1987, Ser. No. 363,909

Int. Cl.⁵ B32B 9/00

U.S. Cl. 505—1

15 Claims



1. A superconductive structure comprising: a solid body characterized by the explosive shock-wave consolidation of a mass of particles having high T_c superconductive properties, having increased density of dislocations of crystalline elements, thereby enhancing superconductive qualities.

5,089,468
PROCESS FOR PRODUCING BISMUTH-BASED
SUPERCONDUCTING OXIDE

Hitoshi Yoshida, Okazaki; Hitoshi Sakai, Komaki; Shuichiro Oki, Aichi; Keiichiro Watanabe, Nagoya; Manabu Yoshida, Bisai, and Toshio Oda, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 28, 1990, Ser. No. 501,723

Claims priority, application Japan, Mar. 30, 1989, 1-79521; Sep. 28, 1989, 1-253530; Dec. 28, 1989, 1-342457; Dec. 28, 1989, 1-342458

Int. Cl.⁵ H01L 39/12

U.S. Cl. 505—1

6 Claims

1. A process for producing a Bi-based superconducting oxide, which comprises:

- molding a material powder comprising a Bi-based frit into a molded article, and
subjecting the molded article to partial melting at 880°–920° C. for 1 minute to 3 hours and then crystallizing at 750°–880° C., both on an Ag-substrate and in the presence

of oxygen to obtain (a) a Bi-based superconducting oxide represented by a molar ratio of Bi:Sr:Ca:Cu of 2:2:1:2 or (b) a superconducting oxide having a crystal structure similar to that of the superconducting oxide (a) obtained by substituting part of one of the main elements in the superconducting oxide (a) with a new element or by adding a new element to the superconducting oxide (a).

5,089,469
BISABOLENE-CONTAINING COMPOSITION, PROCESS
FOR PREPARING SAME, ORGANOLEPTIC USES
THEREOF AND USES THEREOF AS INSECT
REPELLENT

Michael J. Zampino, Roselle Park; Richard A. Wilson, Westfield, and Braja D. Mookherjee, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

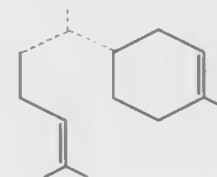
Filed Apr. 25, 1991, Ser. No. 691,372

Int. Cl.⁵ A61K 7/46

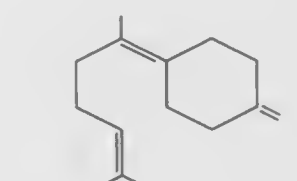
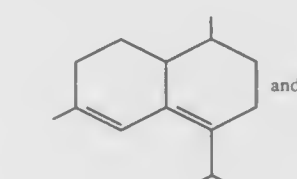
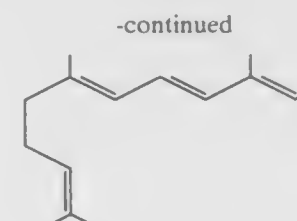
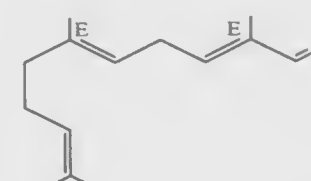
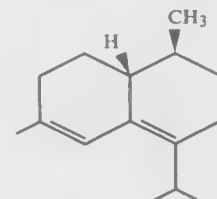
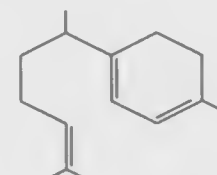
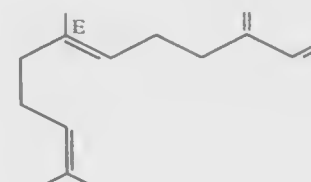
U.S. Cl. 512—22

9 Claims

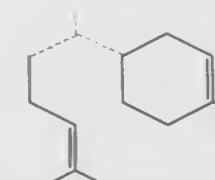
1. A process for producing a bisabolene isomer mixture containing a majority of bisabolene isomers defined according to the generic structure:



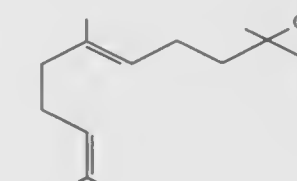
and, in addition, a minority of a mixture comprising compounds having the structures:



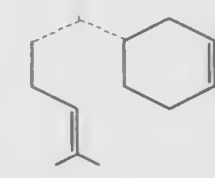
wherein, in the mixture of compounds defined according to the structure:



one of the dashed liens represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds, comprising the steps of treating nerolidol defined according to the structure:



with a catalyst selected from the group consisting of phosphoric acid and citric acid at a temperature in the range of from 155°–175° C. for a period of time to yield a composition of matter containing a majority of bisabolene isomers defined according to the generic structure:



and, in addition a minority of a mixture comprising compounds having the structures:

5,089,470

COMPOSITIONS CONTAINING
POLY(γ -GLUTAMYL-CYSTEINYL)GLYCINES

Paul J. Jackson; Emmanuel Delhaize, both of Los Alamos, N. Mex.; Nigel J. Robinson, Durham, England; Clifford J. Unkefer, Los Alamos, N. Mex., and Clement Furlong, Seattle, Wash., assignors to The United States Department of Energy, Washington, D.C.

Division of Ser. No. 237,263, Aug. 26, 1988, Pat. No. 4,909,944.

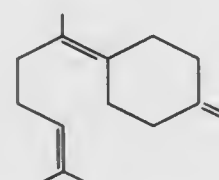
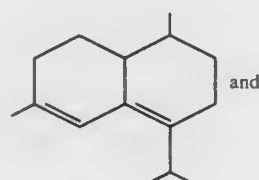
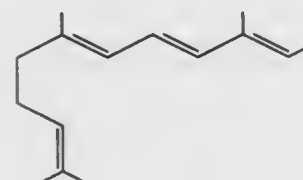
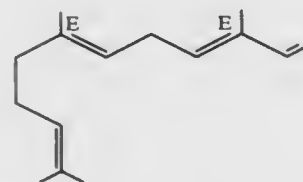
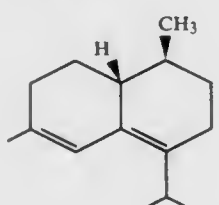
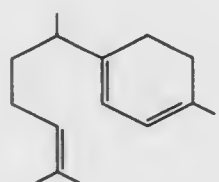
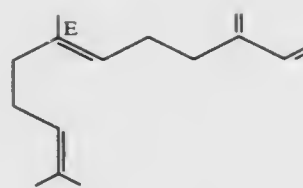
This application Dec. 18, 1989, Ser. No. 452,013

Int. Cl.⁵ C07K 9/00

U.S. Cl. 514—8

4 Claims

1. A composition comprised of a water-insoluble polymeric material to which is attached molecules of poly (γ -glutamyl-cysteinyl)glycines, where said polymeric material has sites for attachment of the free amino groups of the glutamate groups on one end of said molecules, and where the number of repeat units of said molecules is from 2 to about 10.



and fractionally distilling the resulting product at a temperature in the range of 108°–124° C. and a pressure in the range of 2.8–3.20 mm Hg.

2. The product produced according to the process of claim 1.

3. A perfume composition comprising a perfume base and intimately admixed therewith an odor augmenting, imparting or enhancing quantity of the product defined according to claim 2.

5,089,471

PEPTIDYL BETA-AMINOACYL AMINODIOL
CARBAMATES AS ANTI-HYPERTENSIVE AGENTS

Gunnar J. Hanson, Skokie, and John S. Baran, Winnetka, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

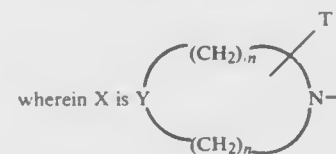
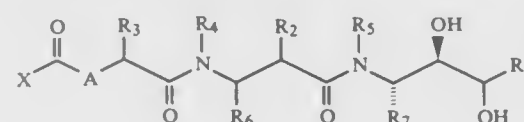
Filed Oct. 1, 1987, Ser. No. 103,632

Int. Cl.⁵ A61K 37/00, 31/415, 37/02; C07D 225/02

U.S. Cl. 514—11

12 Claims

1. A compound of the formula:



wherein A is O or S;

wherein Y is O; m is 2; n is 2; T is one or more of H or methyl; R₁ is selected from H, methyl, ethyl and isobutyl; R₂ is isobutyl; R₃ is selected from benzyl and naphthyl-methyl; R₄ is H or methyl; R₅ is H or methyl; and R₆ is H; and R₇ is cyclohexylmethyl; or a pharmacologically-acceptable salt thereof.

5,089,472

USE OF GROWTH HORMONE RELEASING FACTOR
FOR IMPROVING MENTAL FUNCTION

Francisco R. Vila; Thomas O. Alonso, both of Madrid, and Ramón Cacabelos, La Coruna, all of Spain, assignors to Laboratorios Sero S.A., Switzerland

Continuation-in-part of Ser. No. 148,667, Jan. 26, 1988, Pat. No. 4,939,124. This application Jun. 13, 1988, Ser. No. 206,100

Int. Cl.⁵ A61K 37/02, 37/24

U.S. Cl. 514—12

7 Claims

1. A method of improving the mental function of attention or short term memory in a subject in need of the treatment which comprises the administration to said subject of an effective mental function improving amount of a Growth Hormone Releasing Factor.

5,089,473

SOMATOTROPIN VARIANTS AND THEIR USE

Gwen G. Krivi; Michael R. Schlittler, both of St. Louis, and Bernard N. Violand, Glencoe, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

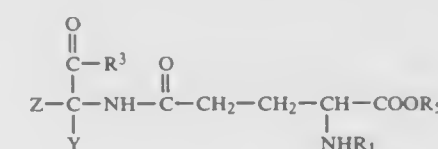
Filed Aug. 29, 1988, Ser. No. 237,358

Int. Cl.⁵ A61K 37/02, 37/36; C07K 13/00

U.S. Cl. 514—12

14 Claims

1. A variant somatotropin in which the asparagine located between positions 95–101 of a mammalian somatotropin is replaced by glutamine.



5,089,474

NOVEL MICROPOLYMER

Bertrand Castro, St. Aures; Dung Lenguyen, Montpellier; Anne Favel, Marseilles, and Maria A. Previero, Montpellier, all of France, assignors to Roussel Uclaf, Paris, France

Filed May 24, 1990, Ser. No. 528,834

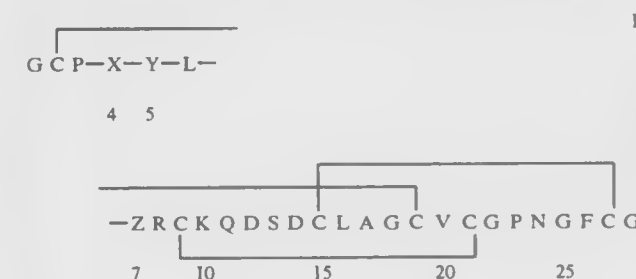
Claims priority, application France, May 31, 1989, 89 07155

Int. Cl.⁵ A61K 37/02, 37/64; C07K 1/04, 7/10

U.S. Cl. 514—12

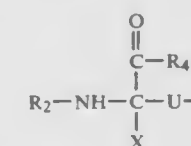
20 Claims

1. A polypeptide containing 28 amino acids of the formula

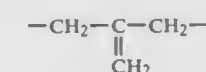


wherein the X in position 4 is a residue of a member of the group consisting of valine, leucine, isoleucine, norleucine, alanine, cyclohexylalanine, o-methylthreonine, phenylglycine or alpha-amino butyric acid, Arginine, Y in position 5 is a residue of isoleucine or serine, Z in position 7 is a residue of methionine or norleucine with the proviso that Z is a norleucine residue when X is an Arginine residue.

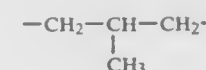
wherein the glutamic acid is of D- or L-configuration, R₁ is selected from the group consisting of hydrogen, alkyl or 1 to 5 carbon atoms and an amino acid and an amino acid in which the amine is amidified with an optionally unsaturated aliphatic carboxylic acid of 6 to 24 carbon atoms, or R₁ is selected from the group consisting of a residue of C₆–C₂₄ optionally unsaturated aliphatic acid, R₅ is selected from the group consisting of hydrogen and an alkyl of 1 to 5 carbon atoms, R₃ is selected from the group consisting of hydroxy, alkoxy of 1 to 5 carbon atoms, an amino acid with the amino optionally substituted with alkyl of 1 to 5 carbon atoms, Z is



R₂ is selected from the group consisting of hydrogen and an amino acid, R₄ is selected from the group consisting of hydroxy, alkoxy of 1 to 5 carbon atoms and an amino acid optionally substituted on the amine with alkyl of 1 to 5 carbon atoms, U is selected from the group consisting of



—CH=CH—CH₂— (E or Z isomer), —CH₂—CH=CH— (E or Z isomer) and



or U and Y together are —CH—CH₂—CH₂— (E or Z isomer) and X is hydrogen or U and X are —CH—CH₂—CH₂— (E or Z isomer) and Y is hydrogen and their salts with non-toxic, pharmaceutically acceptable acid or bases.

5,089,475

TREATMENT OF VENTILATOR DEPENDENCY WITH
GROWTH HORMONE

Douglas W. Wilmore, Brookline, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.

Filed Feb. 7, 1989, Ser. No. 306,978

Int. Cl.⁵ A61K 37/02, 37/36

U.S. Cl. 514—12

14 Claims

1. A method for decreasing ventilator dependency which results in hastening the weaning of a patient from a mechanical ventilator in a human comprising administering to a human in need of such treatment a therapeutically effective amount of growth hormone.

5,089,476

GLUTAMIC ACID DERIVATIVES

Constantin Agouridas, Paris; Patrick Fauveau, Livry-Gargan, and Chantal Damais, Paris, all of France, assignors to Roussel Uclaf, France

Filed Feb. 26, 1988, Ser. No. 161,163

Claims priority, application France, Feb. 26, 1987, 87 02547

Int. Cl.⁵ A61K 37/02; C07K 5/06, 5/08, 5/10

U.S. Cl. 514—18

18 Claims

1. A compound selected from the group consisting of all isomeric forms and mixtures of isomers of glutamic acid compounds of the formula

5,089,477

COMPOSITIONS AND METHODS FOR ACHIEVING
IMPROVED PHYSIOLOGICAL RESPONSE TO
EXERCISE

Melvin J. Fregly; R. Malcolm Privette, and Robert Cade, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Division of Ser. No. 378,582, Jul. 17, 1989, Pat. No. 4,981,687, which is a continuation-in-part of Ser. No. 226,027, Jul. 29, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 605,050

Int. Cl.⁵ A61K 31/70, 31/715, 31/045, 33/42

U.S. Cl. 514—23

3 Claims

1. A method for preventing or reducing weight loss in agricultural animals resulting from dehydration during shipment or from heat stress, said method comprising the administration to an animal of an effective amount of a fluid composition comprising

- (a) water;
- (b) sugar; and
- (c) electrolytes;

improved in that said further comprises glycerol in a concentration of from about 0.5% to about 5.0%.

5,089,478
METHOD FOR THE CONTROL OF PNEUMOCYSTIS
CARINII

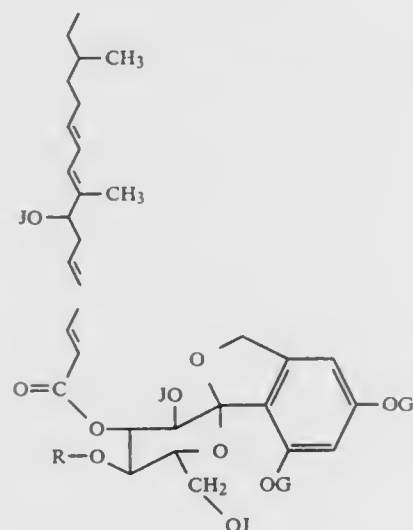
Dennis M. Schmatz, Cranford, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 17, 1988, Ser. No. 259,019
Int. Cl.⁵ A61K 31/70

U.S. Cl. 514—25

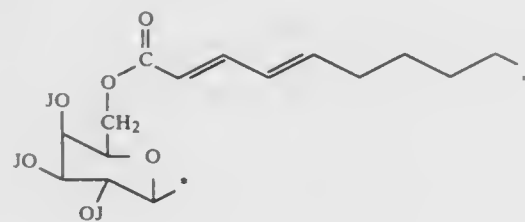
5 Claims

1. A method for treating *Pneumocystis carinii* infection in a mammalian host which comprises administering to said host an anti-infective amount of a compound represented by the formula

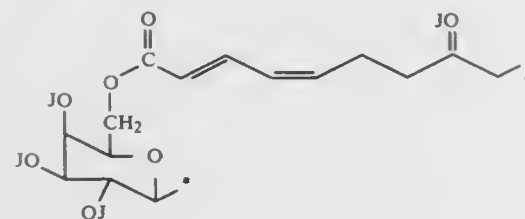


wherein R is

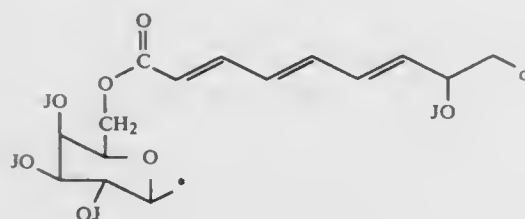
(A)



(B)



(C)



(D) -continued

H—

(ID)

wherein:

- * is the point of bonding
- G is hydrogen or lower alkyl; and
- J is hydrogen or acyl containing from 1 to 20 carbon atoms provided that at least one of J and G is hydrogen.

5,089,479
ADHESION OF MYCOPLASMA PNEUMONIAE AND
MYCOPLASMA HOMINUS TO SULFATIDE
Howard C. Krivan, 14442 Parkvale Rd., Apt. 5, Rockville, Md. 20853; Victor Ginsburg, 6905 Loch Lomond Dr., Bethesda, Md. 20817, and David D. Roberts, 13401 Tangier Pl., Rockville, Md. 20853

Filed Nov. 28, 1988, Ser. No. 277,634
Int. Cl.⁵ A61K 31/95, 31/70

U.S. Cl. 514—25

11 Claims

1. A receptor which is capable of binding to *Mycoplasma hominus* and *Mycoplasma pneumoniae* comprising a compound selected from the group consisting of compounds containing the structure SO₃⁻-Galβ1-Ceramide.

5,089,480
ANTIPARASITIC AGENTS
Stephen P. Gibson, Westbrook; Alexander C. Goudie; Kelvin S. Holdom, both of Ramsgate, and John D. Bu'lock, Manchester, all of England, assignors to Pfizer Inc., New York, N.Y.

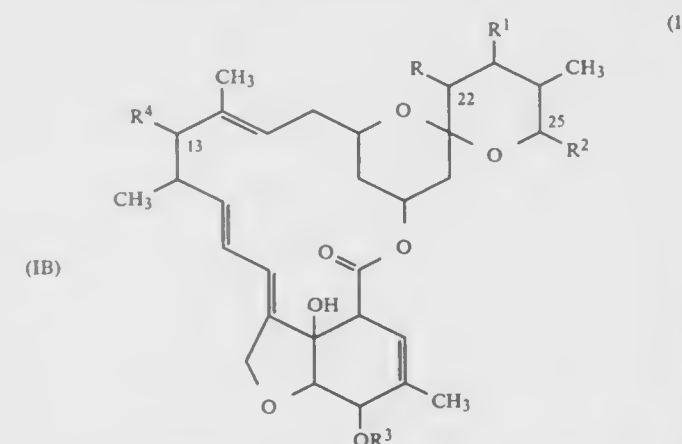
Continuation-in-part of Ser. No. 886,867, Jul. 16, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 142,888
Claims priority, application United Kingdom, Jul. 27, 1985, 8518999; Aug. 9, 1985, 8520069; Apr. 24, 1986, 8610063; May 2, 1986, 8610862

Int. Cl.⁵ A61K 31/71; C07H 17/08; C07D 493/20

U.S. Cl. 514—30

36 Claims

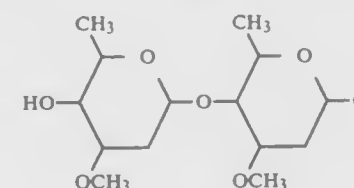
(IA) 1. A compound having the formula



wherein R when taken individually is H; R¹ when taken individually is H or OH; R and R¹ when taken together represent a double bond;

(IC) R² is an alpha-branched C₄-C₈ alkynyl, C₃-C₈ alkoxyalkyl or C₃-C₈ alkylthio group; a C₅-C₈ cycloalkylalkyl group wherein the alkyl group is an alpha-branched C₂-C₅ alkyl group; a C₃-C₈ cycloalkyl or C₅-C₈ cycloalkenyl group, either of which may be substituted by methylene or one or more C₁-C₄ alkyl groups or halo atoms; or a 3 to 6 membered oxygen or sulphur containing heterocyclic ring which may be saturated, or fully or partially unsaturated and which may be substituted by one or more C₁-C₄ alkyl groups or halo atoms;

R³ is hydrogen or methyl;
R⁴ is H or a 4'-(alpha-L-oleandrosyl)-alpha-L-oleandrosyloxy group of the formula:



5,089,481
POLYSACCHARIDES AND ANTIVIRAL DRUGS
CONTAINING THE SAME AS ACTIVE INGREDIENT
Shigeaki Muto, Tokyo; Koichi Niumura, Sayama; Minoru Oohara, Tokyo; Yoshiharu Oguchi, Tokyo; Kenichi Matsunaga, Tokorozawa; Kunitaka Hirose, Tokyo; Junji Kakuchi, Tokyo; Norifumi Sugita, Tokyo; Takao Furusho, Tokyo; Chikao Yoshikumi, Tokyo, and Masaaki Takahashi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 207,835, Jun. 17, 1988, abandoned.

This application Nov. 15, 1990, Ser. No. 613,971
Claims priority, application Japan, Jun. 18, 1987, 62-152086; Jun. 18, 1987, 62-152087; Jun. 18, 1987, 62-152089

Int. Cl.⁵ A61K 31/70; C08B 37/00

U.S. Cl. 514—54

14 Claims

1. A protein-bound polysaccharide, having antiviral activity, obtained from a marine alga belonging to the genera Nemaecystus, Kjellmaniella, Laminaria, Undaria, Hizikia, Porphyra, Gelidium, Gloiopeltis, Gracilaria, Hemineura, Ulva, Spirogyra, Codium and Acetabularia having the following properties:

- (a) positive results when subjected to the α-naphthol-sulfuric acid, indole-sulfuric acid, anthrone-sulfuric acid or phenol-sulfuric acid reaction and, after hydrochloric acid hydrolysis, a Lowry-Folin process or ninhydrin reaction;
- (b) elementary analysis: 20–55% carbon, 3–9% hydrogen and less than 16% nitrogen;
- (c) a pH of 6.0–7.5;
- (d) the sugar component comprises at least two kinds of saccharides selected from glucose, glucuronic acid, xylose and mannose, and the protein component comprises at least three kinds of amino acids selected from aspartic acid, lysine, leucine, glutamic acid and glycine;
- (e) infrared absorption spectrum peaks at 3,600–3,200 cm⁻¹ and 1,700–1,600 cm⁻¹;
- (f) a molecular weight of 10³–3×10⁶ as measured by gel filtration chromatography; and
- (g) soluble in water or aqueous solvents containing water-soluble alcohols, acids or bases but insoluble in chloroform, benzene and ether.

7. A pharmaceutical composition comprising, together with a pharmaceutically acceptable carrier or diluent, as an active ingredient, an effective amount of an antiviral protein-bound polysaccharide extracted from a marine alga belonging to genera Nemaecystus, Kjellmaniella, Laminaria, Undaria, Hizikia, Porphyra, Gelidium, Gloiopeltis, Gracilaria, Hemineura, Ulva, Spirogyra, Codium and Acetabularia, said protein-bound polysaccharide having the following properties:

- (a) positive results when subjected to the α-naphthol-sulfuric acid, indole-sulfuric acid, anthrone-sulfuric acid or phenol-sulfuric acid reaction and, after hydrochloric acid hydrolysis, a Lowry-Folin process or ninhydrin reaction;
- (b) elementary analysis: 20–55% carbon, 3–9% hydrogen and less than 16% nitrogen;
- (c) a pH of 6.0–7.5;
- (d) the sugar component comprises at least two kinds of saccharides selected from glucose, glucuronic acid, xylose and mannose, and the protein component comprises at

- least three kinds of amino acids selected from aspartic acid, lysine, leucine, glutamic acid and glycine;
- (e) infrared absorption spectrum peaks at 3,600–3,200 cm⁻¹ and 1,700–1,600 cm⁻¹;
- (f) a molecular weight of 10³–3×10⁶ as measured by gel filtration chromatography; and
- (g) soluble in water or aqueous solvents containing water-soluble alcohols, acids or bases but insoluble in chloroform, benzene and ether.

5,089,482
PHARMACEUTICAL COMPOSITIONS FOR NASAL
ADMINISTRATION CONTAINING STEROID
HORMONES AND DIMETHYL-β-CYCLODEXTRIN
Walter A. J. J. Hermens, Thorbeckestraat 80, 6136 DD Sittard, and Franciscus W. H. M. Merkus, Mozartlaan 7, 3723 JL Bithoven, both of Netherlands

Filed Jun. 28, 1989, Ser. No. 372,917
Claims priority, application Netherlands, Jul. 1, 1988, 8801670

Int. Cl.⁵ A61K 31/56, 31/57, 31/565, 31/715

U.S. Cl. 514—58

30 Claims

1. A pharmaceutical composition suitable for the nasal administration of the human female sex hormone 17β-estradiol or the sex hormones 17β-estradiol and progesterone to a woman comprising at least 0.1% (w/v) of said sex hormone and a nasal absorption enhancing amount of dimethyl-β-cyclodextrin.

15. A method for the nasal administration of the human female sex hormone 17β-estradiol or the sex hormones 17β-estradiol and progesterone to a woman which comprises nasally administering thereto a pharmaceutical composition comprising at least 0.1% (w/v) of said sex hormone and a nasal absorption enhancing amount of dimethyl-β-cyclodextrin.

5,089,483
AGENT FOR PRESERVATION OF TIMBER AGAINST
DECAY AND TERMITE DAMAGE
Kenji Tsuda, Himeji, and Shoichi Ono, Odawara, both of Japan, assignors to Daicel Chemical Industries Ltd., Sakai and Shokusan Jutaku Sogo Co., Ltd., Tokyo, both of Japan, a part interest

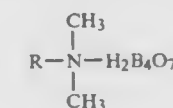
Filed Jan. 22, 1990, Ser. No. 468,128

Int. Cl.⁵ A01N 55/08, 59/14

U.S. Cl. 514—64

1 Claim

1. A method of protecting timber from decay and termites, comprising the step of:
applying thereto a protective amount of a compound having the formula alkyl dimethylamine tetraborate or hydrate thereof having the formula:



wherein R represents an alkyl group having 8 to 12 carbon atoms.

5,089,484
BIOCIDAL COMPOSITIONS AND USE THEREOF
CONTAINING A SYNERGISTIC MIXTURE OF
DIIDOMETHYL-P-TOLYLSULFONE AND
N-TRIBUTYL TETRADECYL PHOSPHONIUM
CHLORIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whiteketle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 10, 1991, Ser. No. 683,210

Int. Cl.⁵ A01N 41/10, 57/00

U.S. Cl. 514—75

7 Claims

1. A bacterial inhibiting composition comprising a synergis-

tic mixture of (a) diiodomethyl-p-tolylsulfone and (b) N-tributyl tetradecyl phosphonium chloride wherein the weight ratio of (a):(b) is from about 1:6.3 to 3.8:1.

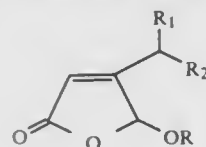
5,089,485

ANTI-INFLAMMATORY FURANONES

Gary C. M. Lee, Laguna Hille, Calif., assignor to Allergan, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 273,294, Nov. 18, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 426,243
Int. Cl.⁵ A61K 31/665, 31/365; C07F 9/655; C07D 307/60
U.S. Cl. 514—99 19 Claims

1. A compound of the formula



in which:

R is hydrogen, C₁-C₆alkanoyl, C₁-C₆ carbamoyl, phenyl carbamoyl, C₁-C₆ dialkylphosphonate or PO(OH)₂; R₁ is halo,

NHCOR₃,

NHSO₂R₈,

NHPO(OCH₃)CH₃;

OCOR₄,

OR₅ or

S(O)_mR₈;

SCOCH₃;

CONH-phenyl;

OCO-N(CH₃)CONH(CH₃)

R₂ is C₈-C₂₀ alkyl;

R₃ is C₁-C₄ alkyl, C₁-C₄ alkoxy, trifluoromethyl, —(CH₂)₃—COOH, NHR₈ or N—R₉R₁₀;

R₄ is C₁-C₄ alkoxy, phenoxy, R₆-(C₁-C₄ alkyl), or NHSO₂N(C₂H₅)₂;

R₅ is C₈-C₂₀ alkyl, phenyl, 2-methoxyethyl, 2-(methoxy)ethoxymethyl, t-butyl dimethylsilyl, PO(OR₇)₂ or PS(OR₇)₂;

R₆ is carboxy, C₁-C₄ alkoxycarbonyl, halo or CONR₁₁R₁₁;

R₇ is hydrogen or C₁-C₄ alkyl or phenyl;

R₈ is C₁-C₄ alkyl, ethoxy, hydroxy, hydroxy or C₁-C₆ alkanoyl;

R₉ is H or C₁-C₄ alkyl;

R₁₀ is H, C₁-C₄ alkyl or SO₂NR₂R₂;

R₁₁ is H or C₁-C₄ alkyl; and m is 0-2.

5,089,486

BIOCIDAL AZOPHENYL COMPOUNDS

William W. Wood; Thomas W. Naisby, both of Sittingbourne, and Andrew C. G. Gray, London, all of England, assignors to Shell Research Limited, England

Filed Jul. 27, 1990, Ser. No. 558,462
Claims priority, application United Kingdom, Aug. 4, 1989, 8917853

Int. Cl.⁵ A01N 51/00, 33/26; C07C 291/08, 245/00
U.S. Cl. 514—149 6 Claims

1. A compound of the formula:



(1)

or an N-oxide thereof, wherein R represents a phenyl group which is substituted by a group of the formula —CONR¹R² wherein each of R¹ and R² independently represents a hydrogen atom or an alkyl group, optionally substituted by a halogen atom or a phenyl, alkoxy, hydroxy, cyano or (alkyl) amino group, or a phenyl group optionally substituted by a halogen atom or a nitro, cyano, alkoxy, hydroxy, (alkyl) amino, alkyl or haloalkyl group, and X represents a cyano group, a —COOH group or a salt, ester or amido derivative thereof.

5. A method of combating a fungus at a locus, which method comprises treating said locus with an effective amount of a compound of formula (1) as claimed in claim 1.

5,089,487

CIRCULATION-ACTIVE
DIBENZO[1,5]DIOXOCIN-5-ONES

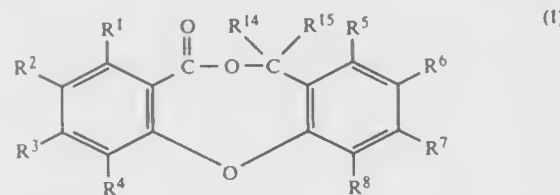
Klaus Frobels; Jan-Bernd Lenfers; Peter Fey, all of Wuppertal; Andreas Knorr, Erkrath; Johannes-Peter Stasch, Wuppertal; Hartwig Müller, Velbert; Erwin Bischoff, and Hans-Georg Dellweg, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 24, 1990, Ser. No. 528,667

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1989, 3919255

Int. Cl.⁵ A61K 31/655, 31/365; C07D 321/00
U.S. Cl. 514—150 14 Claims

1. A compound of the formula



in which

R¹, R², R³, R⁴, R⁵, R⁶, R⁷ and R⁸ are identical or different and in each case

represent hydrogen or

represent straight-chain or branched alkyl, alkylthio, alkenyl or alkynyl in each case having up to 12 carbon atoms,

which are optionally substituted by halogen, azido, imino, hydroxyl-substituted imino, hydroxyl, cyano, cycloalkyl

having 3 to 8 carbon atoms, or by phenyl or phenoxy, which in turn may be monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, nitro, phenyl, phenoxy, cyano, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, optionally substituted by hydroxyl, halogen, cycloalkyl having 3 to 8 carbon atoms, alkoxy or alkoxycarbonyl having up to 8 carbon atoms, or by phenyl, which in turn may be substituted by halogen, hydroxyl, alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, or nitro or cyano, or by a group of the formula —NR⁹R¹⁰, —COR¹¹ or —OR¹², or denotes phenyl, which is optionally substituted by halogen, hydroxyl, nitro or cyano, or

R¹, R², R³, R⁴, R⁵, R⁶, R⁷ and R⁸ are identical or different and in each case

represent halogen, cyano, hydroxyl or nitro, represent cycloalkenyl having 3 to 8 carbon atoms, represent a group of the formula —NR⁹R¹⁰, —COR¹¹ or —OR¹², in which

R⁹ and R¹⁰ are identical or different and in each case denote hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl, or a group of the formula —S(O)_pR¹³

R¹¹ denotes hydrogen, hydroxyl, straight-chain or branched alkyl or alkoxy having up to 8 carbon atoms, phenoxy, phenyl or the group —NR⁹R¹⁰,

R¹² denotes hydrogen, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, formyl, acyl having up to 6 carbon atoms, trifluoromethoxy or a group of the formula —S(O)—R¹³, in which

p denotes a number 1 or 2,

R¹³—denotes straight-chain or branched alkyl having up to 6 carbon atoms or the group —NR⁹—R¹⁰, or

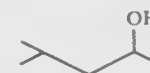
R¹² denotes straight-chain or branched alkyl or alkenyl having up to 8 carbon atoms, which is optionally monosubstituted to tetrasubstituted by identical or different radicals from the group consisting of bromine, cyclopropyl, cyclopentyl, cyclohexyl, alkoxy or alkoxycarbonyl having up to 6 carbon atoms, or by phenyl which may in turn be substituted by fluorine, chlorine, bromine, hydroxyl, alkyl, alkoxy or alkoxycarbonyl in each case having up to 6 carbon atoms, nitro or cyano, or is substituted by a group of the formula —NR⁹R¹⁰, —COR¹¹ or —OR¹²,

or R¹ or R², R² and R³, R³ and R⁴, R⁵ and R⁶, R⁶ and R⁷, or R⁷ and R⁸ in each case together form a saturated or unsaturated 5- to 7-membered carbocycle which is optionally substituted by nitro, cyano, hydroxyl, straight-chain or branched alkyl having up to 8 carbon atoms, or by a group of the formula —NR⁹R¹⁰, —COR¹¹ or —OR¹²,

R¹⁴ and R¹⁵ are identical or different and in each case denote hydrogen, or straight-chain or branched alkyl having up to 10 carbon atoms, which is optionally substituted by halogen, nitro, cyano, hydroxyl or a group of the formula —NR⁹R¹⁰, —COR¹¹ or —OR¹²,

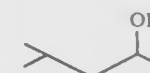
denote phenyl, which is optionally substituted by nitro, cyano, halogen, alkyl, alkoxy or alkoxycarbonyl having up to 8 carbon atoms or by a group of the formula —NR⁹R¹⁰, or a physiologically acceptable salt thereof but

a) R⁸ may not denote hydroxyl, methoxy or acetyl if R¹ represents methoxy, R³, R⁴, R⁵, R⁶, R⁷, R¹⁴ and R¹⁵ represent hydrogen, R⁶ represents methyl and R² represents the group



and

b) R⁵ and R⁷ and not denote bromine and R⁸ may not denote hydroxyl if R¹ represents methoxy, R³, R⁴, R¹⁴ and R¹⁵ represent hydrogen, R⁶ represents methyl and R² represents the group



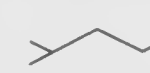
and

c) R⁸ may not denote methoxy if, R¹ represents methoxy, R³, R⁴, R⁵, R⁷, R¹⁴ and R¹⁵ represent hydrogen, R⁶ represents methyl and R² represents the group



and

d) R¹ may not denote methoxy if R³, R⁴, R⁵, R⁶, R¹⁴ and R¹⁵ represent hydrogen and R² represents the group of the formula

5,089,488
β-(4-ISOPROPENYLPHENYL)ESTRA-4,9-DIENES,
THEIR PRODUCTION, AND PHARMACEUTICAL
PREPARATIONS CONTAINING SAME

Ekkehard Ottow; Rudolf Wiebert; Günter Neef; Sybille Beier; Walter Elger, and David Henderson, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 300,890, Jan. 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 77,359, Jul. 24, 1989, Pat. No. 4,814,327. This application Oct. 11, 1990, Ser. No. 596,616

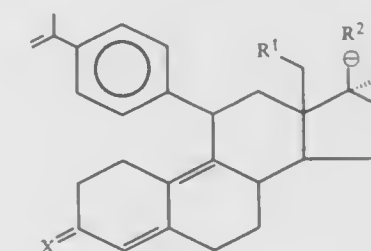
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625315

Int. Cl.⁵ A61K 31/56; C07J 1/00

U.S. Cl. 514—179

17 Claims

1. A method of treating a hormone-dependent carcinoma comprising administering to a host in need of such treatment an effective amount of a compound of the formula



wherein

X is O or

N~OH.

R¹ is hydrogen or methyl,

R² is hydrogen, C₁-10-alkanoyl or benzoyl,

R³ is hydrogen, cyanomethyl, —(CH₂)_n—CH₂Z, —CH=CH—(CH₂)_mZ or —C≡Y,

n=0 to 5,

m=1 to 4,

Z is hydrogen or OR⁴,

R⁴ is hydrogen, C₁-4-alkyl or C₁-4-alkanoyl, and

Y is hydrogen, chlorine, fluorine, iodine, bromine, C₁-4-alkyl, hydroxy-C₁-4-alkyl, C₁-4-alkoxy-C₁-4-alkyl or acyloxy-C₁-4-alkyl wherein acyl is C₁-4-alkanoyl or benzoyl.

5,089,489

6-SUBSTITUTED PENEM ESTERS AS
ANTI-INFLAMMATORY AND ANTI-DEGENERATIVE
AGENTS

Marco Alpegiani; Ettore Perrone, both of Milan; Piergiuseppe Orezzi, Genova; Paolo Carminati, Milan, and Giuseppe Casinelli, Pavia, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Division of Ser. No. 206,375, Jun. 14, 1988, Pat. No. 4,954,493. This application Apr. 5, 1990, Ser. No. 504,836

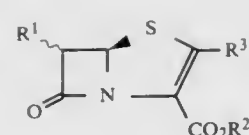
Claims priority, application United Kingdom, Jun. 19, 1987, 8714413

Int. Cl.⁵ C07D 499/00; A61K 31/425

U.S. Cl. 514—195

5 Claims

1. A method of treating or managing elastase-mediated diseases comprising the administration to mammalian species in need of such treatment an effective amount of a 6-substituted penem ester of formula (I):

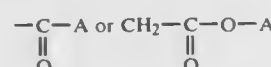


wherein
R¹ is

- (1) chloro, bromo or fluoro;
- (2) C₁-C₄ alkyl;
- (3) C₁-C₄ alkoxy;
- (4) phenyl, phenoxy or benzyl; or
- (5) sulfonyloxy RSO₂O—, wherein R is either C₁-C₄ alkyl, aryl, arylalkyl, p-aminobenzyl, or adamantyl;

R² is

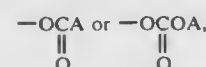
- (1) C₁-C₄ alkyl;
- (2) benzyl;
- (3) diphenylmethyl;
- (4) CH₂



wherein A represents a group selected from methyl, ethyl, isopropyl, tert-butyl, benzyl, p-nitrobenzyl and p-methoxybenzyl; or

- (5) —(CH₂)_m—COOB wherein B is a hydrogen atom or a negative charge and m is 1, 2 or 3; and

R³ is a heterocyclic ring, 5- or 6- membered, saturated or unsaturated, containing at least one heteroatom chosen from O, S and N, tetrazolo (1,5-b) pyridazine or thianaphthene linked to the penem ring through a carbon or nitrogen atom and optionally substituted by C₁-C₄ alkyl, halogen, phenyl, benzyl, amino, hydroxymethyl, carboxy, C₁-C₃ 3 alkoxy carbonyl, oxo or hydroxy; and pharmaceutically acceptable salts thereof; the C₁-C₄ alkoxy, phenyl, phenoxy, and benzyl groups in the definitions (2), (3), (4) and (5) of R¹, and (1) and (2) of R² being either unsubstituted or substituted by radicals chosen from methyl, methoxy, trifluoromethyl, fluoro, chloro, bromo, cyano, carboxy, sulfamino, amino, carbamoyl, carbamoyloxy, guanidino, C₁ or C₂ aminoalkyl, C₁-C₃ carbamoylalkyl and C₁-C₃ carbamoyloxyalkyl wherein the amino, guanidino, carbamoyl and carbamoyloxy radicals can be optionally substituted at the nitrogen atom(s) by one or two methyl or ethyl groups; methylsulfonyl, azido, C₂-C₃ alkoxy carbonyl, benzyloxy carbonyl, acetyloxymethyl, trifluoroacetyloxymethyl, carboxylmethyl, (C₁-C₄ alkoxy) carbonylmethyl, hydroxy, acylated hydroxy



wherein A is as defined above; and formyloxy.

5,089,490

CEPHEM DERIVATIVES

Walter Dürckheimer, Hattersheim am Main; Dieter Bormann, Kelkheim; Eberhard Ehlers, Hofheim am Taunus; Elmar Schrinner, Wiesbaden, all of Fed. Rep. of Germany, and René Heymes, Romainville, France, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany Division of Ser. No. 187,833, Apr. 29, 1988, which is a division of Ser. No. 891,850, Mar. 30, 1978, Pat. No. 4,758,556. This application Aug. 23, 1990, Ser. No. 572,150

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

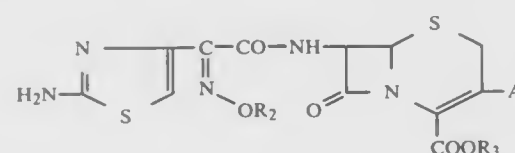
Int. Cl.⁵ C07D 501/36; A61K 31/545

U.S. Cl. 514—206

13 Claims

1. A cephem compound of the formula

(I)



wherein

R₂ is C₁-C₄-alkyl or C₁-C₄-alkyl substituted by carboxyl, and the group —OR₂ is in the syn-position;

R₃ is hydrogen, a physiologically acceptable ester group, or a physiologically acceptable cation; and

A is —CH₂Y,

Y is —SR₅, and

R₅ is a 6-membered heterocycle which is triazinyl, or triazinyl which is partially or completely hydrogenated, said triazinyl or partially or completely hydrogenated triazinyl being unsubstituted or monosubstituted or polysubstituted by lower alkyl, carboxyloweralkyl, trifluoromethyl, aminoloweralkyl, acetylaminoloweralkyl, loweralkyloxycarbonyl-loweralkylcarboxamido, hydroxy, oxo, oxido, carboxy, furyl, thienyl, thiazolyl, or pyridyl.

5,089,491

3-PROPENYLCEPHEM DERIVATIVE

Takashi Kamiya; Toshihiko Naito; Shigeto Negi; Yuuki Komatu; Yasunobu Kai, all of Ibaraki; Takaharu Nakamura, Chiba; Isao Sugiyama, Ibaraki; Yoshimasa Machida, Ibaraki; Seiichi Nomoto, Ibaraki; Kyosuke Kitoh, Ibaraki; Kanemasa Katsu, Ibaraki, and Hiroshi Yamauchi, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 107,631, Oct. 13, 1987, Pat. No. 4,921,850.

This application Jan. 11, 1990, Ser. No. 463,518

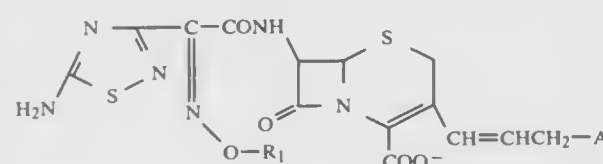
Claims priority, application Japan, Oct. 13, 1986, 61-241480; Nov. 6, 1986, 61-262799; Dec. 10, 1986, 61-292574; Feb. 3, 1987, 62-21866; Sep. 3, 1987, 62-219230; Sep. 7, 1987, 62-222147

Int. Cl.⁵ C07D 501/24; A61K 31/545

U.S. Cl. 514—206

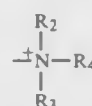
6 Claims

1. A 3-propenylcephem derivative of the formula



wherein R₁ represents a cyano-substituted lower alkyl, and A represents

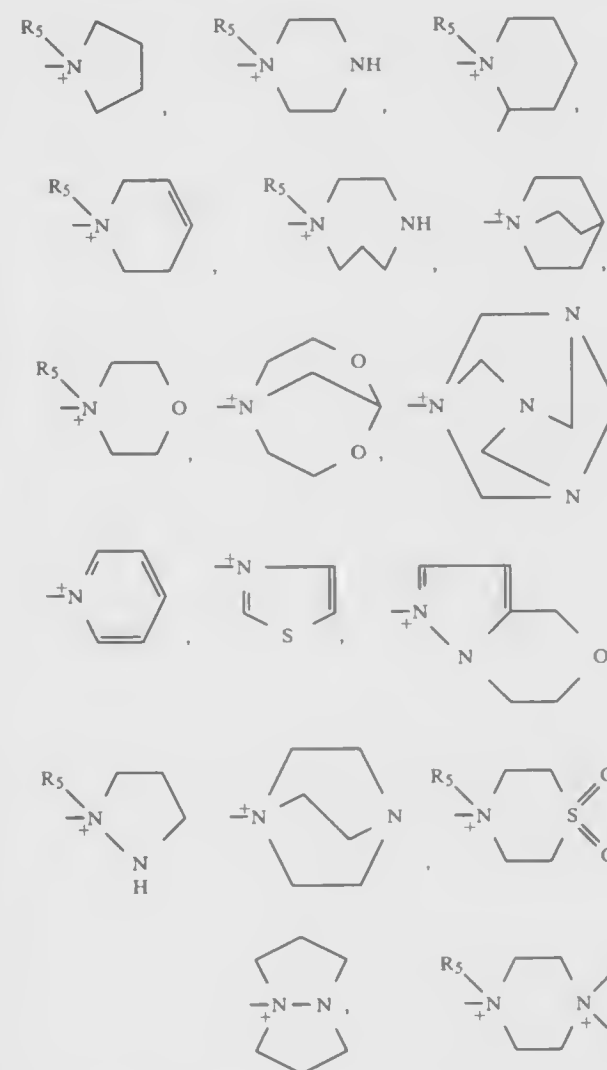
(1) an acrylic ammonio group of the formula



wherein R₂, R₃ and R₄ are the same or different and are individually a member selected from the group consisting of lower alkyl, hydroxyl-substituted lower alkyl, carbamoyl-substituted lower alkyl, cyano-substituted lower alkyl, amino, (lower alkyl)carbonylamino-substituted lower alkyl, aminosulfonylaminocarbonyl-substituted lower alkyl, (lower alkyl)sulfonylaminocarbonyl-substituted lower alkyl, (lower alkyl)amino-carbonyl-substituted lower alkyl, hydroxyl- and carbamoyl-substituted lower alkyl, hydroxyl- and hydroxyl(lower alkyl)aminocarbonyl-substituted lower alkyl, (lower alkyl)aminocarbonyl-substituted lower alkyl, hydroxylaminocarbonyl-substituted lower alkyl, car-

bamoyl(lower alkyl)aminocarbonyl-substituted lower alkyl, hydroxyl(lower alkyl)aminocarbonyl-substituted lower alkyl, (lower alkyl)amino-substituted lower alkyl, carboxylate(lower alkyl)di(lower alkyl)ammonio-substituted lower alkyl, di(lower alkyl)amino- and hydroxyl-substituted lower alkyl, ureido, hydroxyl, carboxyl-substituted lower alkyl, hydroxyl- and carbamoyl-substituted lower alkyl, lower alkoxy-substituted lower alkyl, di(lower alkyl)aminocarbonyl-substituted lower alkyl, dicarbamoyl-substituted lower alkyl, bis[hydroxyl(lower alkyl)aminocarbonyl-substituted lower alkyl, dihydroxyl-substituted lower alkyl, trihydroxyl-substituted lower alkyl, bis[hydroxyl(lower alkyl)amino-substituted lower alkyl amino-substituted lower alkyl, oxo-substituted lower alkyl, di-lower alkylamino-substituted lower alkyl, 5-membered heterocycle-substituted lower alkyl wherein said heterocycle stands for pyrazolyl, imidazolyl, oxadiazolyl or tetrazolyl, or

(2) A represents a cyclic ammonio group of one of the following formulas:



wherein R₅ is a member selected from the group consisting of lower alkyl, carbamoyl-substituted lower alkyl, amino-substituted lower alkyl, hydroxyl-substituted lower alkyl, carboxyl-substituted lower alkyl, cyano-substituted lower alkyl, dihydroxyl-substituted lower alkyl and ureido-substituted lower alkyl groups, said cyclic ammonio group optionally containing on the ring thereof one or more substituents selected from hydroxyl-substituted lower alkyl, hydroxyl, formyl, sulfonic, carboxyl-substituted lower alkyl, carbamoyl, sulfamoyl,

carboxyl, hydroxyimino-substituted lower alkyl, imino-substituted lower alkyl, bis[hydroxyl(lower alkyl)aminocarbonyl, hydroxyl(lower alkyl)aminocarbonyl, amino, morpholinocarbonyl, carboxyl(lower alkoxy)-substituted lower alkyl, carboxyl lower alkylthio, and lower alkyl groups,

or a pharmaceutically acceptable salt thereof.

5,089,492

PHARMACEUTICALS AND DIETETICS CONTAINING ACYLAMINO ACID DERIVATIVES

Klaus Gerling, Laatzen; Henning Heinemann, Lehrte OT Aligse; Andreas Meier, Hemmingen, and Klaus Langer, Erlangen, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover and Pfrimmer Kabi GmbH & Co. KG, Erlangen, both of, Fed. Rep. of Germany

Filed May 24, 1990, Ser. No. 527,844

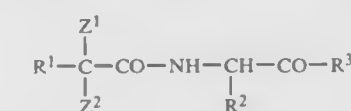
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917880

Int. Cl.⁵ A61K 31/395

U.S. Cl. 514—210

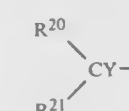
13 Claims

1. A compound corresponding to the formula 1:



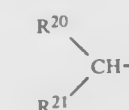
in which

R¹ represents an organic radical A



in which

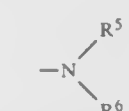
Y represents hydrogen or together with Z² another bond, R²⁰ represents hydrogen or methyl, and if R²⁰ is hydrogen, R²¹ denotes isopropyl or, if R²⁰ is methyl, R²¹ denotes methyl or ethyl, R² represents an organic radical A'



in which

R²⁰ and R²¹ have the above meanings,

R³ represents hydroxy or lower alkoxy or an amino group B



in which

R⁵ denotes hydrogen or lower alkyl, and

R⁶ denotes hydrogen, lower alkyl or, if R⁵ is hydrogen, the deamino radical of a biogenic L-α-amino carboxylic acid, or

R⁵ and R⁶ together with the N atom to which they are bonded form a saturated heterocycle selected from the group consisting of aziridine, pyrrolidine and piperidine, and

Z¹ and Z² together represent oxygen or a physiologically

acceptable alkyleneedioxy group $O-(CH_2)_n-O$ in which n is 1 to 4, or Z^1 and Z^2 each represent a physiologically acceptable R^7-O- group in which R^7 denotes lower alkyl, or Z^1 represents an R^7-O- group in which R^7 has the above meaning, and Z^2 together with Y represents a bond, or a salt thereof in which R^3 represents hydroxy with a physiologically acceptable cation.

5,089,493

TRIAZOLO(1,5-C)PYRIMIDO(1,4-AZINES AS BRONCHODILATORS

James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

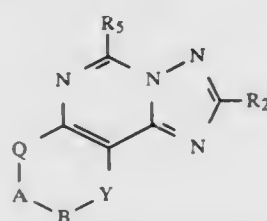
Division of Ser. No. 296,713, Jan. 17, 1989, Pat. No. 4,981,850, which is a continuation-in-part of Ser. No. 152,443, Feb. 5, 1988, abandoned. This application Nov. 8, 1990, Ser. No. 610,556

Int. Cl.⁵ C07D 498/02

U.S. Cl. 514—229.8

19 Claims

1. A compound of the formula



wherein A is methylene or carbonyl; B is methylene, carbonyl or $-CHR_9-$; Q is $N-R_7$ or O, with the proviso that when Q is O then A is methylene and B is methylene or carbonyl; Y is $N-R_{10}$ or O, with the provisos that when Y is $N-R_{10}$, Q is O, when Q is $N-R_7$, Y is O and B is methylene or $-CHR_9-$, and when Q is O, Y is $N-R_{10}$; R_2 is hydrogen or lower alkyl; R_5 is lower alkyl; R_7 is hydrogen, lower alkyl, benzyl or acetyl, R_9 is lower alkyl; R_{10} is lower alkyl or benzyl; or a pharmaceutically acceptable acid-addition salt of said compound wherein A is methylene and B is methylene or $-CHR_9-$.

5,089,494

4-PHENYLPHthalazine DERIVATIVES WHICH INHIBIT PLATELET AGGREGATION

Norimichi Iwase, Yokohama; Yasuhiro Morinaka, Tsuchiura; Yoshikuni Tamao, Machida, and Toshiji Kanayama, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,259

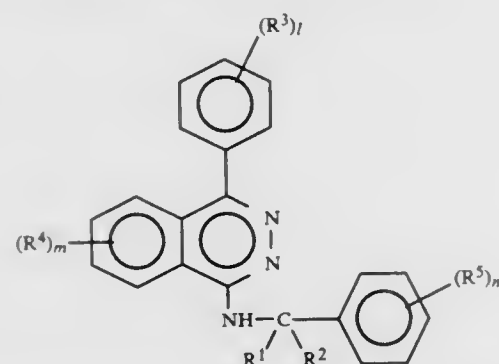
Claims priority, application Japan, Mar. 30, 1990, 2-85447

Int. Cl.⁵ A61K 31/50; C07D 237/34, 405/12, 405/14

U.S. Cl. 514—248

13 Claims

1. 4-Phenylphthalazine compound of the formula:



wherein R^1 is an alkyl or hydroxyalkyl group of 1-5 carbon atoms; R^2 is a hydrogen atom or an alkyl group of 1-5 carbon

atoms; or R^1 and R^2 , when taken together, may represent an alkylene group of 2-6 carbon atoms; R^3 and R^4 are independently a hydrogen or halogen atom, an alkyl or alkoxy group of 1-4 carbon atoms, or when two of R^3 are adjacently positioned, $(R^3)_m$ may represent a $-O-(CH_2)_p-O-$ group and/or when two of R^4 are adjacently positioned, $(R^4)_m$ may represent a $-O-(CH_2)_p-O-$ group; R^5 is a hydrogen or halogen atom, an alkyl or alkoxy group of 1-4 carbon atoms, a trifluoromethyl group or a hydroxy group, or when two of R^5 are adjacently positioned, $(R^5)_n$ may represent a $-O-(CH_2)_p-O-$ group; p is an integer of 1-3; l and m are independently an integer of 1-2; and n is an integer of 1-3, and optical isomers and pharmaceutically acceptable acid addition salts thereof.

5,089,495

HETEROCYCLIC THIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAID DERIVATIVES

Graham C. Crawley, Oak Lane, and Martin P. Edwards, Bollington, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London and ICI Pharma, Cergy Cedex, France

Filed Jan. 10, 1990, Ser. No. 463,267

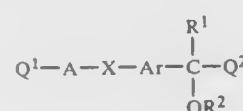
Claims priority, application France, Jan. 30, 1989, 89 4002518

Int. Cl.⁵ A01N 43/58, 43/40; C07D 401/12

U.S. Cl. 514—253

8 Claims

1. A thiazole of the formula I



wherein Q^1 is pyridyl which may optionally bear one, two or three substituents selected from halogeno, hydroxy, oxo, cyano, (1-4C)alkyl, (1-4C)alkoxy, fluoro-(1-4C)alkyl, (1-4C)alkylamino-(1-4C)alkyl and di-[(1-4C)alkyl]amino-(1-4C)alkyl; wherein A is (1-6C)alkylene, (3-6C)alkenylene, (3-6C)alkynylene or cyclo(3-6C)-alkylene;

wherein X is oxy, thio, sulphonyl, sulphonyl or imino;

wherein Ar is phenylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, nitro, carboxy, cyano, carbamoyl, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkylthio, (1-4C)alkylsulphonyl, (1-4C)alkylsulphonyl, (1-4C)alkylamino, di-[(1-4C)alkyl]amino, (1-4C)alkoxycarbonyl, N-[(1-4C)alkyl]carbamoyl, N,N-di-[(1-4C)alkyl]carbamoyl, (2-4C)alkanoylamino, hydroxy-(2-4C)alkoxy, (1-4C)alkoxy-(2-4C)alkoxy, amino-(2-4C)alkoxy, cyano-(1-4C)alkoxy, carbamoyl-(1-4C)alkoxy, N-[(1-4C)alkyl]carbamoyl-(1-4C)alkoxy, N,N-di-[(1-4C)alkyl]carbamoyl-(1-4C)alkoxy, (1-4C)alkylamino-(2-4C)alkoxy, di-[(1-4C)alkyl]amino-(2-4C)alkoxy, (1-4C)alkoxycarbonyl-(1-4C)alkoxy, fluoro-(1-4C)alkyl, hydroxy-(1-4C)alkyl, amino-(1-4C)alkyl, cyano-(1-4C)alkyl, (1-4C)alkoxy-(1-4C)alkyl, (1-4C)alkylamino-(1-4C)alkyl, di-[(1-4C)alkyl]amino-(1-4C)alkyl and (2-4C)alkanoylamino-(1-4C)alkyl, or Ar is 2,4-, 2,5-, 3,5- or 2,6-pyridylene, 2,4-, 2,5- or 4,6-pyrimidinylene, 3,5- or 3,6-pyridazinylene or 2,5- or 2,6-pyrazinylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, cyano, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkylamino and di-[(1-4C)alkyl]amino;

wherein R^1 is (1-6C)alkyl, (2-6C)alkenyl, (2-6C)alkynyl, fluoro-(1-4C)alkyl, cyano-(1-4C)alkyl, hydroxy-(1-4C)alkyl, (1-4C)alkoxy-(1-4C)alkyl and (2-4C)alkanoyloxy-(1-4C)alkyl;

wherein R^2 is hydrogen, (1-6C)alkyl, (3-6C)alkenyl, (3-6C)alkynyl, (1-4C)alkoxycarbonyl-(1-4C)alkyl, carboxy-(1-4C)alkyl, carbamoyl-(1-4C)alkyl, cyano-(1-4C)alkyl or (2-4C)alkanoyl or R^2 is benzoyl which may optionally bear

a substituent selected from halogeno, (1-4C)alkyl and (1-4C)alkoxy; and wherein Q^2 is thiazolyl which may optionally bear one or two substituents selected from halogeno, amino, nitro, cyano, carbamoyl, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)alkylamino, di-[(1-4C)alkyl]amino, (1-4C)alkoxycarbonyl, N-[(1-4C)alkyl]carbamoyl, N,N-di-[(1-4C)alkyl]carbamoyl, (2-4C)alkanoylamino, fluoro-(1-4C)alkyl and hydroxy-(1-4C)alkyl; or a pharmaceutically-acceptable salt thereof.

5,089,496

BENZO (5,6)CYCLOHEPTAPYRIDINE COMPOUNDS, COMPOSITIONS AND METHOD OF TREATING ALLERGIES

John J. Piwinski, Parsippany; Ashit K. Ganguly, Upper Montclair; Michael J. Green, Skillman; Frank J. Villani, Fairfield, and Jesse Wong, Union, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 181,860, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 925,342, Oct. 31, 1986, Pat. No. 4,826,853. This application May 1, 1989, Ser. No. 345,604

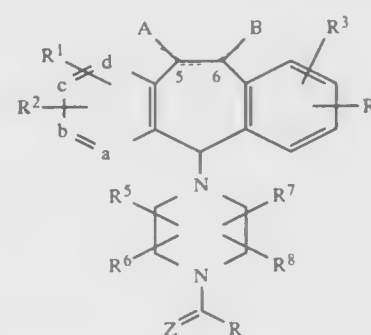
Claims priority, application European Pat. Off., Oct. 29, 1987, 87115890.3

Int. Cl.⁵ C07D 401/04; A61K 31/445

U.S. Cl. 514—253

49 Claims

1. A compound having the structural formula 1A



or a pharmaceutically acceptable salt or solvate thereof, wherein:

one of a, b, c and d represents N or NR^9 where R^9 is O^- , $-CH_3$ or $-(CH_2)_nCO_2H$ where n is 1 to 3, and the remaining a, b, c and d groups are CH, which remaining a, b, c and d groups optionally are substituted with R^1 or R^2 ; R^1 and R^2 are the same or different and each independently represents halo, $-CF_3$, $-OR^{10}$, $-COR^{10}$, $-SR^{10}$, $-N(R^{10})_2$, $-NO_2$, $-OC(O)R^{10}$, $-CO_2R^{10}$, $-O-CO_2R^{11}$, alkynyl, alkenyl or alkyl, which alkyl or alkenyl groups are optionally substituted with halo, $-OR^{10}$ or $-CO_2R^{10}$, said alkenyl group not containing $-OH$ on a carbon containing double bond;

R^3 and R^4 are the same or different and each independently represent H, any of the substituents of R^1 and R^2 , or R^3 and R^4 together may represent a saturated or unsaturated C_5-C_7 ring fused to the benzene ring;

R^5 , R^6 , R^7 and R^8 each independently represent H, $-CF_3$, $-COR^{10}$, $-CO_2R^{10}$, alkyl or aryl, which alkyl and aryl are optionally substituted with $-OR^{10}$, $-SR^{10}$, $-N(R^{10})_2$, $-NO_2$, $-COR^{10}$, $-OCOR^{10}$, $-OCO_2R^{11}$, $-CO_2R^{10}$, $-OPO_3R^{10}$, or one of R^5 , R^6 , R^7 and R^8 are taken in combination with R as defined below to represent $-(CH_2)_r-$ where r is 1 to 4 which is optionally substituted with lower alkyl, lower alkoxy, $-CF_3$ or aryl, or R^5 is combined with R^6 to represent $=O$ or $=S$, or R^7 is combined with R^8 to represent $=O$ or $=S$;

each R^{10} independently represents H, alkyl or aryl;

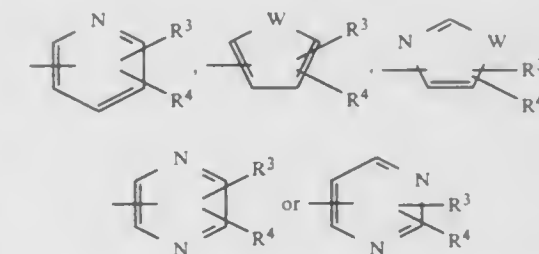
R^{11} represents alkyl or aryl;

the dotted line between carbon atoms 5 and 6 represents an optional double bond, such that when a double bond is

present, A and B independently represent H, $-R^{10}$, $-OR^{11}$ or $-OC(O)R^{10}$, and when no double bond is present between carbon atoms 5 and 6, A and B each independently represent H_2 , $-(OR^{11})_2$, alkyl and H, (alkyl)₂, $-H$ and $-OC(O)R^{10}$, H and $-OR^{10}$, H and halo, dihalo, $=O$, aryl and H, $=NOR^{10}$ or $-O-(CH_2)_p-O-$ where p is 2, 3 or 4 and R^{10} is as previously defined;

Z represents O, S or $=NR^{13}$ or wherein R^{13} represents $-CN$ or R^{10} as previously defined; and

R may be taken in combination with R^5 , R^6 , R^7 or R^8 as defined above, or R represents H, aryl, alkyl, $-SR^{11}$, $-N(R^{10})_2$, cycloalkyl, alkenyl, alkynyl or $-D$ wherein $-D$ represents heterocycloalkyl selected from the group consisting of 2- or 3-tetrahydrofuranyl, 2- or 3-tetrahydrothienyl, 2-, 3- or 4-piperidinyl, 2- or 3-pyrrolidinyl, 2- or 3-piperazinyl, or 2- or 4-dioxanyl;



wherein R^3 and R^4 are as previously defined and W is O, S or NR^{10} wherein R^{10} is as defined above, said cycloalkyl, alkyl, alkenyl and alkynyl being optionally substituted with from 1-3 groups selected from halo, $-CON(R^{10})_2$, aryl, $-CO_2R^{10}$, $-OR^{12}$, $-SR^{12}$, $-N(R^{10})_2$, $-N(R^{10})_2CO_2R^{10}$, $-COR^{12}$, $-NO_2$ or $-D$, wherein $-D$ and R^{10} are as defined above and R^{12} represents R^{10} , $-(CH_2)_mOR^{10}$ or $-(CH_2)_qCO_2R^{10}$ is as previously defined, m is 1 to 4 and q is 0 to 4, said alkenyl and alkynyl R groups not containing $-OH$, $-SH$ or $-N(R^{10})_2$ on a carbon containing a double or triple bond respectively and wherein alkyl (each occurrence) has up to 6 carbon atoms, wherein alkenyl and alkynyl (each occurrence) have up to 12 carbon atoms and wherein aryl (each occurrence) has 6 to 15 carbon atoms.

5,089,497

SUBSTITUTED PIPERAZINES AS CENTRAL NERVOUS SYSTEM AGENTS

Juan C. Jaen, Plymouth; David G. Nickell, Ann Arbor; Donna M. Reynolds, Plymouth; Sarah J. Smith, Ann Arbor; Lawrence D. Wise, Ann Arbor, and David J. Wustrow, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

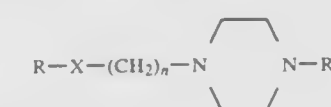
Filed Sep. 20, 1990, Ser. No. 585,742

Int. Cl.⁵ A61K 31/495; C07D 403/00, 401/00, 241/00

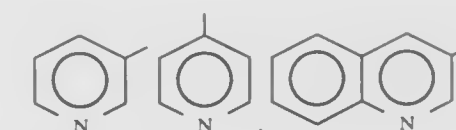
U.S. Cl. 514—253

7 Claims

1. A compound of Formula I

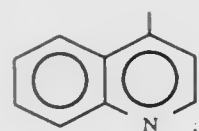


wherein R is



-continued

or

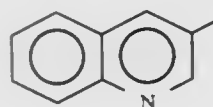


X is

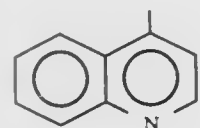
or —CH₂—;

n is an integer of 2 to 4;

R¹ is 2- or 3-1H-indolyl, or 2- or 3-1H-indolyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienyl, or 2- or 3-thienyl substituted by lower alkyl or halogen, 2- or 3-furanyl, or 2- or 3-furanyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl, or 2-, 4-, or 5-thiazolyl substituted by lower alkyl or halogen; or a pharmaceutically acceptable acid addition salt thereof with the exclusion of a compound where R is



or

and X is CH₂.

5,089,498

SUBSTITUTED 4-AMINOQUINOLINE DERIVATIVES AS GASTRIC ACID SECRETION INHIBITORS

Robert J. Iff, Aston Brook; Thomas H. Brown, Tewin, and Colin A. Leach, Stevenage, all of England, assignors to SmithKline Beckman Intecredit B.V., Rotterdam, Netherlands
Filed Feb. 23, 1989, Ser. No. 314,624

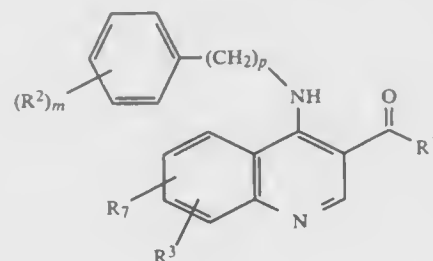
Claims priority, application United Kingdom, Feb. 25, 1988, 8804445

Int. Cl.⁵ A61K 31/47, 31/535; C07D 215/14, 295/182

U.S. Cl. 514—235.2

12 Claims

1. A compound of the structure (I):



in which

R¹ is hydrogen, C₁-alkyl, C₁-alkoxy, C₁-alkoxyC₁-6-alkyl, C₃-cycloalkyl, C₃-cycloalkylC₁-6-alkyl, phenyl, or phenylC₁-6-alkyl;

R² is hydrogen, C₁-alkyl, C₁-alkoxy, amino C₁-6-alkylthio, halogen, cyano, hydroxy, carbamoyl, carboxy, C₁-alkanoxy or trifluoromethyl;

m is 1 to 3;

p is 0 to 4;

R³ is COR⁴;

R⁴ is hydroxy, C₁-alkoxy or NR⁵R⁶;

R⁵ and R⁶ are each hydrogen or C₁-alkyl or together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of azetidino, pyrrolidino, piperidino, and morpholino; and

R⁷ is hydrogen, C₁-alkoxy or C₁-alkyl;

or a salt thereof.

5,089,499

QUINAZOLINE DERIVATIVES POSSESSING ANTI-TUMOR ACTIVITY

Andrew J. Barker; Leslie R. Hughes, both of Macclesfield; Peter R. Marsham, Poynton; John Oldfield, Wilmslow, and Stephen J. Pegg, Macclesfield, all of England, assignors to Imperial Chemical Industries PLC and National Research Development Corporation, both of London, England

Filed Dec. 14, 1989, Ser. No. 450,670

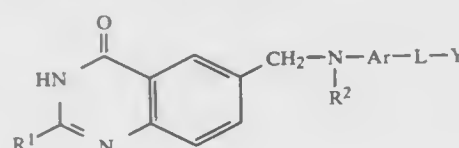
Claims priority, application United Kingdom, Dec. 15, 1988, 8829296

Int. Cl.⁵ A61K 31/505; C07D 239/72

U.S. Cl. 514—259

14 Claims

1. A quinazoline of the formula I



wherein R¹ is hydrogen or amino, or alkyl or alkoxy each of up to 6 carbon atoms;

or R¹ is alkyl of up to 3 carbon atoms which bears a hydroxy substituent, or which bears one, two or three fluoro substituents;

or R¹ is hydroxyalkoxy of up to 3 carbon atoms or alkoxyalkoxy of up to 6 carbon atoms;

wherein the quinazoline ring may bear no further substituents or may bear one further substituent selected from halogeno and from alkyl and alkoxy each of up to 3 carbon atoms;

wherein R² is hydrogen, alkyl, alkenyl, alkynyl, hydroxyalkyl, halogenoalkyl or cyanoalkyl each of up to 6 carbon atoms;

wherein Ar is phenylene which may be unsubstituted or may bear one or two substituents selected from halogeno, hydroxy, amino and nitro, and from alkyl, alkoxy and halogenoalkyl each of up to 3 carbon atoms;

wherein L is a group of the formula —CO.NH—, —CO.N—

R³—, or —CO.O—, wherein R³ is alkyl of up to 6 carbon atoms; and

wherein Y is aryl or a hydrogenated derivative thereof each of up to 10 carbon atoms, or Y is a group of the formula —A—Y¹ in which A is alkylene, of up to 6 carbon atoms, and Y¹ is aryl or a hydrogenated derivative thereof each of up to 10 carbon atoms, and wherein Y and Y¹ when it is aryl or a hydrogenated derivative thereof is selected from the group consisting of phenyl, naphthyl, tetrahydronaphthyl, indenyl and indanyl;

wherein one constituent methylene group in A may be replaced by an oxy, thio, sulphinyl, sulphonyl or imino group or an alkylimino group of up to 6 carbon atoms; and wherein each of said aryl groups, or hydrogenated derivatives thereof, may be unsubstituted or may bear up to three substituents selected from hydroxy, oxo, amino, nitro, cyano, carbamoyl, sulphamoyl, carboxy and halogeno, from alkyl, alkylamino, dialkylamino, N-alkylcarbamoyl, N,N-dialkylcarbamoyl, alkoxy, alkoxyalkyl, alkanoyloxyalkyl, alkylthio, alkylsulphanyl, alkylsulphonyl, alkoxy, halogenoalkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, carboxyalkyl, alkoxyalkyl, carbamoylalkyl, N-alkylcarbamoylalkyl and N,N-dialkylcarbamoylalkyl each of up to 6 carbon atoms and from phenyl, pyridyl and phenylalkyl of up to 10 carbon atoms, and wherein each of said phenyl or phenylalkyl groups may bear a substituent selected from halogeno and nitro, and from alkyl and alkoxy each of up to 3 carbon atoms;

or a pharmaceutically-acceptable salt thereof.

5,089,501

ANTHELMINTICS

Louis-Pierre Molleyres, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 29, 1990, Ser. No. 574,992

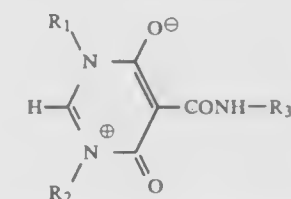
Claims priority, application Switzerland, Sep. 1, 1989, 3173/89

Int. Cl.⁵ C07D 239/54; A01N 43/54

U.S. Cl. 514—269

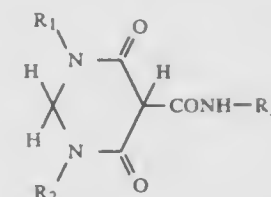
22 Claims

1. A compound of the general formula I



(I)

and, in hydrogenated form, of the formula Ia



(Ia)

in which R₁ and R₂ are each, independently of the other, C₁-C₆alkyl, allyl, C₃-C₆cycloalkyl or phenyl; and R₃ is unsubstituted or mono- or poly-substituted phenyl, biphenyl or phenoxyphenyl, the substituents being selected from the group halogen, cyano, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, C₁-C₃cyanoalkyl, nitro, amino, and C₁-C₃alkyl substituted by C₁-C₃alkoxycarbonyl, including the tautomeric forms thereof and the physiologically tolerable salts thereof.

5,089,500

THERAPEUTIC NUCLEOSIDES

Susan M. Daluge, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 455,201, Dec. 22, 1989, Pat. No. 5,034,394, which is a continuation of Ser. No. 371,870, Jun. 26, 1989, abandoned. This application May 8, 1991, Ser. No. 697,260

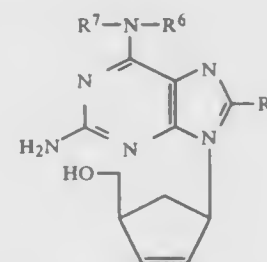
Claims priority, application United Kingdom, Jun. 27, 1988, 8815265

Int. Cl.⁵ A61K 31/52; C07D 473/30, 473/32

U.S. Cl. 514—261

17 Claims

1. A method of treatment of a viral infection in a mammal which comprises administering to said mammal an effective antiviral amount of a compound of formula I:



wherein R³ represents hydrogen or C₁-6 alkyl; R⁶ represents C₃-8 cycloalkyl, and R⁷ represents a hydrogen atom or a branched or straight chain C₁-6 alkyl; or a pharmaceutically acceptable ester or a pharmaceutically acceptable salt thereof.

5,089,502

METHOD FOR PREVENTING OR TREATING ANXIETY EMPLOYING A CALCIUM CHANNEL BLOCKER

Abraham Sudilovsky, Lawrenceville, and Zola P. Horowitz, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

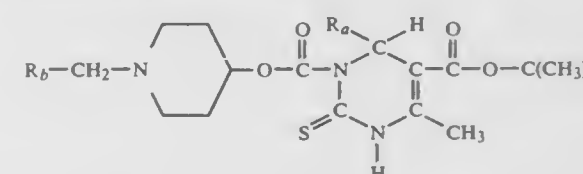
Continuation of Ser. No. 360,955, Jun. 2, 1989, abandoned. This application Aug. 9, 1990, Ser. No. 564,937

Int. Cl.⁵ A61K 31/55, 31/54, 31/535, 31/505

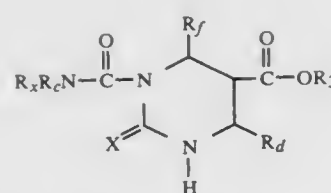
U.S. Cl. 514—274

20 Claims

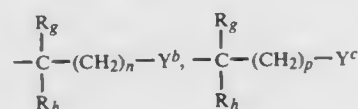
1. A method for inhibiting onset of or treating anxiety in a mammalian specie, which comprises administering to a mammalian specie in need of such treatment an anxiolytic effective amount of a calcium channel blocker which is diltiazem, a pyrimidine having the formula



including a pharmaceutically acceptable salt thereof wherein: R₄ is 2-(trifluoromethyl)phenyl, 2-chlorophenyl, 2-nitrophenyl, or 3-nitrophenyl; and R₅ is phenyl, 2-chlorophenyl, or 4-fluorophenyl or a pyrimidine having the formula

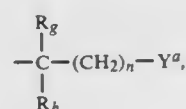


or a pharmaceutically acceptable salt thereof wherein X is oxygen or sulfur; R_x is hydrogen, alkyl, cycloalkyl, aryl, or arylalkyl and R_c is hydrogen, alkyl, cycloalkyl, aryl,

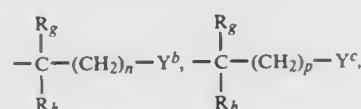


or halo substituted alkyl, or R_x and R_c taken together with the nitrogen atom to which they are attached are 1-pyrrolidinyl, 1-piperidinyl, 1-azepinyl, 4-morpholinyl, 4-thiamorpholinyl, 1-piperazinyl, 4-alkyl-1-piperazinyl, 4-arylalkyl-1-piperazinyl, 4-diarylalkyl-piperazinyl or 1-pyrrolidinyl, 1-piperidinyl, or 1-azepinyl substituted with alkyl, alkoxy, alkylthio, halo, trifluoromethyl or hydroxy;

R_d is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl,

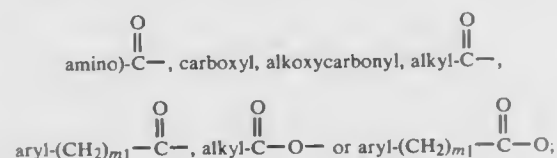


or halo substituted alkyl; R_e is hydrogen, alkyl, cycloalkyl, aryl,

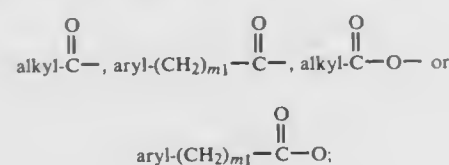


or halo substituted alkyl; R_f b is 2,1,3-benzoxadiazol-4-yl, phenyl, or phenyl substituted with one, two or three alkyl, halo, nitro, cyano, amino, dialkylamino, trifluoromethyl, isothiocyanato or isocyanato groups;

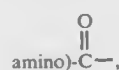
R_g and R_h are each independently hydrogen, alkyl, —(CH₂)_{q1}-aryl or —(CH₂)_{q1}-cycloalkyl; Y^a is cycloalkyl, aryl, hydroxyl, alkoxy, aryl-(CH₂)_m-O—, mercapto, alkylthio, aryl-(CH₂)_m-S—, amino, substituted amino, carbamoyl, (substituted



carboxyl, alkoxy, carbonyl,



Y^b is cycloalkyl, aryl, carbamoyl, (substituted



carboxyl, alkoxy, carbonyl,



Y^c is hydroxyl, alkoxy, aryl-(CH₂)_{m1}-O—, mercapto, alkylthio, aryl-(CH₂)_{m1}-S—,



amino, or substituted amino;

q₁ is 0, 1, 2 or 3;

m₁ is 0 or an integer of 1 to 6;

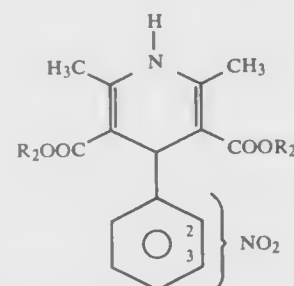
n₁ is 0 or an integer of 1 to 5; and

p₁ is an integer of 1 to 5; wherein

the term "cycloalkyl" refers to a cycloalkyl group having 3,4,5,6 or 7 carbon atoms;

the term "aryl" refers to phenyl or phenyl substituted with one, two or three alkyl, alkoxy, alkylthio, halo, nitro, cyano, hydroxy, amino, alkylamino, dialkylamino, trifluoromethyl, isothiocyanato, isocyanato, or difluoromethoxy groups;

the term "substituted amino" refers to a group of the formula —NZ₁Z₂ wherein A₁ is hydrogen, alkyl, or aryl—(CH₂)_{m1}—and Z₂ is alkyl or aryl—(CH₂)_{m1}— or a 4-phenyl-1,4-dihydropyridine having the formula structure



wherein R₁ and R₂ may be the same or different and are lower alkyl or lower alkoxy (lower alkyl) where lower alkyl and lower alkoxy contain 1 to 4 carbons.

5,089,503

TEMPERATURE STABLE 5-FLUOROURACIL COMPOSITIONS

James B. Johnson, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 57,149, Jun. 3, 1987, abandoned. This application Sep. 20, 1989, Ser. No. 409,852

Int. Cl.⁵ A61K 31/505

U.S. Cl. 514—274

7 Claims

1. A composition comprising a solution of 5-fluorouracil at a concentration of 50 mg/ml and sodium hydroxide present in an amount such that the pH of the composition is about 9.2, said composition stored in vials sealed with a sodium phosphate washed rubber closure selected from the group consisting of nitrile-butadiene rubber, halo butadiene rubber and any rubber closure which is coated with a fluorinated hydrocarbon polymer.

5,089,504

SUBSTITUTED 4-AMINOQUINOLINE DERIVATIVES AS GASTRIC ACID SECRETION INHIBITORS

Robert J. Iffe, Aston Brook; Thomas H. Brown, Tewin, and Colin A. Leach, Stevenage, all of England, assignors to SmithKline Beckman Intercredit B.V., Rotterdam, Netherlands

Filed Feb. 23, 1989, Ser. No. 314,726

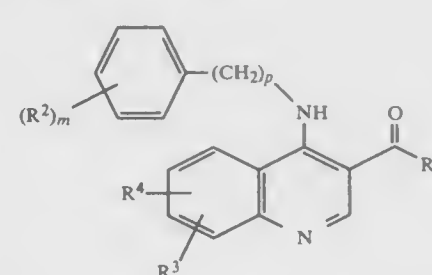
Claims priority, application United Kingdom, Feb. 25, 1988, 8804444

Int. Cl.⁵ A61K 31/47; C07D 215/42, 215/44

U.S. Cl. 514—313

34 Claims

1. A compound of structure (I):



wherein

R¹ is hydrogen, C₁₋₆alkyl, C₁₋₆alkoxy, C₁₋₆alkoxyC₁₋₆alkyl, C₃₋₆cycloalkyl, C₃₋₆cycloalkylC₁₋₆alkyl, phenyl or phenylC₁₋₆alkyl, the phenyl groups being optionally substituted by one to three substituents selected from the group consisting of hydrogen, C₁₋₆alkyl, C₁₋₆alkoxy, amino, C₁₋₆alkylthio, halogen, cyano, hydroxy, carbamoyl, carboxy, C₁₋₆alkanoyl or trifluoromethyl;

R² is hydrogen, C₁₋₆alkyl, C₁₋₆alkoxy, amino, C₁₋₆alkylthio, halogen, cyano, hydroxy, carbamoyl, carboxy, C₁₋₆alkanoyl or trifluoromethyl;

m is 1, 2 or 3;

p is 0 to 4;

R³ is hydroxy C₁₋₆alkyl, polyhydroxyC₁₋₆alkyl, C₁₋₆alkoxyC₁₋₆alkyl, hydroxyC₁₋₆alkoxy, polyhydroxyC₁₋₆alkoxy, C₁₋₆alkoxyC₁₋₆alkoxy or hydroxyC₁₋₆alkoxyC₁₋₆alkoxy;

R⁴ is hydrogen, hydroxy, C₁₋₆alkyl, or C₁₋₆alkoxy; or a salt thereof.

5,089,505

1-ARYLETHYL-3-SUBSTITUTED PIPERIDINES

David Alker, Birchington; Peter E. Cross, Canterbury, and Robert M. Wallis, Ramsgate, all of England, assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 6, 1989, Ser. No. 376,263

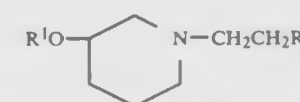
Claims priority, application United Kingdom, Jul. 8, 1988, 8816365

Int. Cl.⁵ A61K 31/445, 31/55; C07D 405/06, 405/14

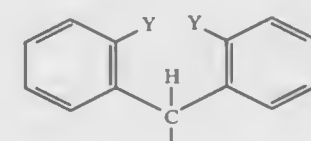
U.S. Cl. 514—321

14 Claims

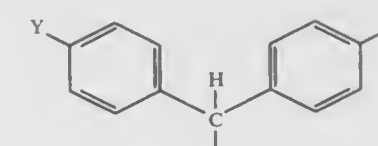
1. A compound having the (3R,S)- or (3R)-configuration of the formula:



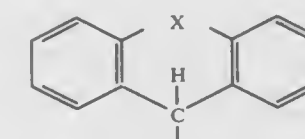
or a pharmaceutically acceptable acid addition salt thereof, wherein R¹ is a group of the formula:



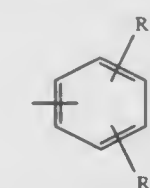
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or



where each Y, which may be the same or different, is selected from hydrogen, halogen and C₁₋₆alkyl; and X is —(CH₂)₂—, —CH=CH—, —CH₂—S—, —CH₂O—, —S— or —O—; and R is a group of the formula:



where R² and R³, taken together, and attached to adjacent carbon atoms, represent a group of the formula —O(CH₂)_mO— where m is 1, 2 or 3, —O(CH₂)₂— or —(CH₂)₃—.

5,089,506

ETHANOBICYCLIC AMINE DERIVATIVES FOR CNS DISORDERS

Nancy M. Gray, Ellisville, and Brian K. Cheng, St. Charles, both of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

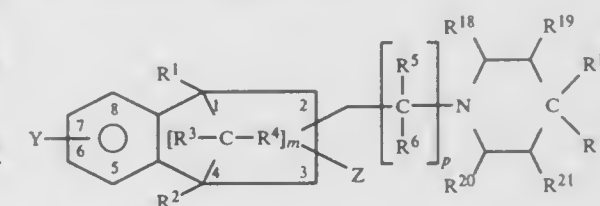
Filed Apr. 30, 1990, Ser. No. 516,364

Int. Cl.⁵ A61K 31/445, 31/495; C07D 211/06, 295/00

U.S. Cl. 514—325

13 Claims

1. A compound of the formula



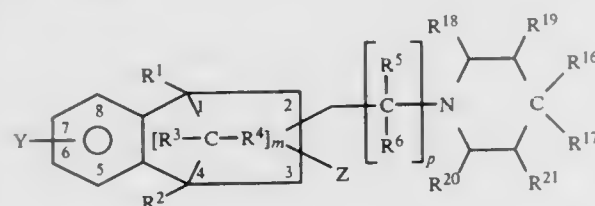
wherein each of R¹, R², R³, R⁴, Y and Z is independently selected from hydrido, hydroxy, alkyl, benzyl, phenyl, alkoxy, halo and haloalkyl; wherein each of R⁵ and R⁶ is independently selected from hydrido, alkyl, fluoroalkyl, benzyl and phenyl; wherein each of R¹⁶ through R²¹ is independently selected from hydrido, hydroxy, alkyl, benzyl, phenyl, alkoxy, fluoroalkyl and fluoro;

wherein any foregoing alkyl radical, alone or within another radical, is selected from alkyl radicals of one to ten carbon atoms;

wherein m is one or two; wherein p is zero or one; or a pharmaceutically-acceptable salt thereof.

7. A method for treating a patient afflicted with or susceptible to a psychotic disorder, a convulsive disorder, dystonia or cerebral ischemia, which method comprises administering to

the patient a therapeutically-effective amount of a compound of the formula



wherein each of R^1 , R^2 , R^3 , R^4 , Y and Z is independently selected from hydrido, hydroxy, alkyl, benzyl, phenyl, alkoxy, halo and haloalkyl; wherein each of R^5 and R^6 is independently selected from hydrido, alkyl, fluoroalkyl, benzyl and phenyl; wherein each of R^6 through R^{21} is independently selected from hydrido, hydroxy, alkyl, benzyl, phenyl, alkoxy, fluoroalkyl and fluoro; wherein any foregoing alkyl radical, alone or within another radical, is selected from alkyl radicals of one to ten carbon atoms; wherein m is one or two; wherein p is zero or one; or a pharmaceutically-acceptable salt thereof.

5,089,507

HETEROCYCLIC PIPERIDINYL COMPOUNDS HAVING ANALGESIC EFFECT

Vittorio Vecchiotti, Roberto Colle, both of Milan; Antonio Giordani, Pavia, and Giulio Dondio, Milan, all of Italy, assignors to Dr. L. Zambelletti SpA, Italy

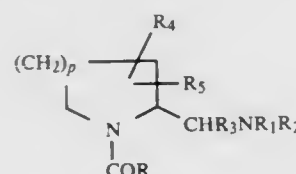
Filed Sep. 25, 1989, Ser. No. 412,133

Claims priority, application United Kingdom, Sep. 26, 1988, 8822508; Jul. 18, 1989, 8916396

Int. Cl.⁵ A61K 31/445; C07D 401/14, 417/14, 211/06

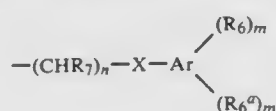
U.S. Cl. 514—326 7 Claims

1. A compound of the formula



or a solvate or salt thereof wherein

R_1 and R_2 are independently hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of 4 to 12 carbon atoms, or R_1 and R_2 together form a branched or linear polymethylene of 2 to 8 carbon atoms or alkenylene of 2 to 6 carbon atoms, optionally including a heteroatom selected from the group consisting of oxygen and sulphur, R_3 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, or R_3 together with R_1 form $-(CH_2)_3-$ or $-(CH_2)_4-$; R_4 and R_5 are independently hydrogen, hydroxyl, halogen, alkyl of 1 to 6 carbon atoms, provided both R_4 and R_5 are not simultaneously hydrogen; p is 2; and R is a moiety of the formula (II):



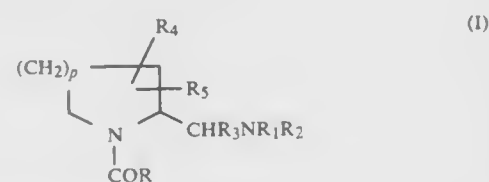
in which
 n is 0, 1 or 2;
 m is 0, 1 or 2; and
 m' is 0, 1 or 2, provided $m+m' \leq 2$;

X is a direct bond, O, S or NR_8 in which R_8 is hydrogen or alkyl of 1 to 6 carbon atoms,

Ar is phenyl,

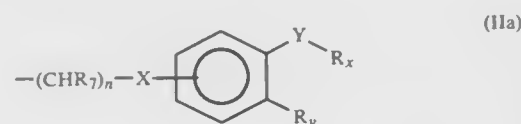
each of R_6 and R_6' is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, haloalkenyl of 2 to 6 carbon atoms, haloalkynyl of 2 to 6 carbon atoms, phenyl, phenylalkyl of 1 to 6 carbon atoms in the alkyl moiety, hydroxy, alkoxy of 1 to 6 carbon atoms, thiol, alkylthio of 1 to 6 carbon atoms, haloalkoxy of 1 to 6 carbon atoms, haloalkylthio of 1 to 6 carbon atoms, halogen, NO_2 , CN , CF_3 , $-OCF_3$, $-OCHF_2$, $-OCF_2CF_2H$, $-OCCl_2CF_3$, $-COOR_9$, $-CONR_{10}R_{11}$, $-SO_3R_{12}$, $-SO_2NR_{13}R_{14}$ or $-COR_{15}$ in which each of R_9 to R_{15} is independently hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenylalkyl of 1 to 6 carbon atoms in the alkyl moiety; or, when m is 2 and m' is 0, two R_6 's together form polymethylene of 3 to 6 carbon atoms, and R_7 is hydrogen or alkyl of 1 to 6 carbon atoms.

2. A compound of the formula (I):



or a solvate or salt thereof wherein

R_1 and R_2 are independently hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of 4 to 12 carbon atoms in each alkyl moiety, or together form a branched or linear polymethylene of 2 to 8 carbon atoms or alkenylene of 2 to 6 carbon atoms optionally including a heteroatom selected from the group consisting of oxygen and sulphur, R_3 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, or R_3 together with R_1 form $-(CH_2)_3-$ or $-(CH_2)_4-$; R_4 and R_5 are independently hydrogen, hydroxyl, halogen, alkyl of 1 to 6 carbon atoms, provided both R_4 and R_5 are not simultaneously hydrogen; p is 2; and R is a moiety of the formula (IIa)



in which

$-(CHR_7)_n-X-$ is in the meta- or para- position with respect to YR_x or R_y , n is 0, 1 or 2, X is a direct bond or O, S, or NR_5 , wherein R_5 is hydrogen or C_{1-6} alkyl; Y is $>C=O$, $>CHOH$, $-S=O$ or $-SO_2$; each of R_x and R_y is alkyl of 1 to 6 carbon atoms, or R_x and R_y are linked together and R_z is $-(Z)_j-$ wherein j is 0 or 1 and Z is O, S or NR_x wherein R_x is hydrogen or alkyl of 1 to 6 carbon atoms, and R_y is $-(CH_2)_q-$ where q is an integer of from 1 to 4.

5,089,508

METHODS FOR TREATING AIDS

Stanislaw R. Burzynski, 20 W. Rivercrest, Houston, Tex. 77042

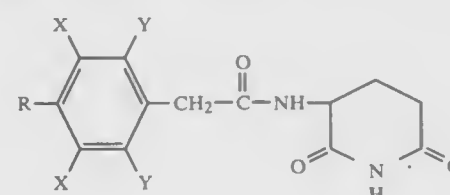
Filed Sep. 4, 1990, Ser. No. 577,464

Int. Cl.⁵ A61K 31/445

U.S. Cl. 514—328 4 Claims

1. A method of treating AIDS in an afflicted host comprising:
administering to the host a pharmaceutical composition

containing a therapeutically effective amount of an active compound of the formula:



wherein R is OH, NH_2 , OW, or H;

X is H, F, Cl, Br, I, OH, OW, NO_2 , or NH_2 ;

Y is H, F, Cl, Br, or I;

W is



or a C_1 to C_{12} aliphatic group;

Z is an aliphatic or aromatic group of C_1 to C_{12} ; pharmaceutically acceptable salts thereof.

5,089,509

DISUBSTITUTED ACETYLENES BEARING HETEROAROMATIC AND HETEROBICYCLIC GROUPS HAVING RETINOID LIKE ACTIVITY

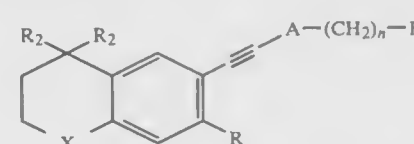
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 246,037, Sep. 15, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 326,191

Int. Cl.⁵ A61K 31/335, 31/38; C07D 413/06, 413/12

U.S. Cl. 514—337 19 Claims

1. A compound of the formula



where X is S or O; R is hydrogen or lower alkyl; R_2 is methyl; A is pyridyl; n is 0-2; and B is H, $-COOH$ or a pharmaceutically acceptable salt thereof, or an ester thereof with a saturated aliphatic alcohol of ten or fewer carbon atoms, or with a cyclic or saturated aliphatic cyclic alcohol of 5 to 10 carbon atoms, or with phenol or with a lower alkylphenol, or an amide or a mono or disubstituted amide thereof, the substituents on the amide being selected from a group consisting of saturated aliphatic radicals of ten or fewer carbon atoms, cyclic or saturated aliphatic cyclic radicals of 5 to 10 carbon atoms, and phenyl or lower alkylphenyl radicals, or B is CH_2OH or an ester derivative thereof derived from a saturated aliphatic acid of ten or fewer carbon atoms, or from a cyclic or saturated aliphatic cyclic acid of 5 to 10 carbon atoms, or from benzoic acid, or an ether derivative thereof derived from a saturated aliphatic radical of ten or fewer carbon atoms, or from a cyclic or saturated aliphatic cyclic radical of 5 to 10 carbon atoms, or from phenyl or lower alkylphenyl radical, or B is $-CHO$ or a lower alkyl acetal derivative thereof, or an acetal derivative thereof formed with a lower alkyl diol, or B is $-COR_1$ or a lower alkyl ketal derivative thereof, or a ketal derivative thereof formed with a lower alkyl diol, where R_1 is $-(CH_2)_mCH_3$ where m is 0-4, or a pharmaceutically acceptable salt of the compound defined in said formula.

5,089,510

INSECTICIDES

David J. Tapoczay, Lower Early Reading; Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow; Christopher R. A. Godfrey, Bracknell, and Paul J. de Fraine, Wokingham, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

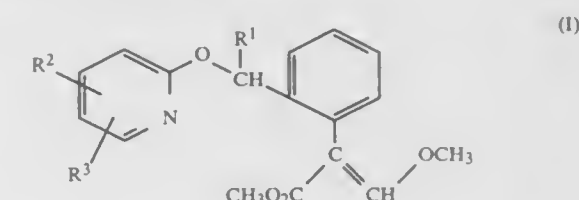
Filed Dec. 6, 1989, Ser. No. 446,607

Claims priority, application United Kingdom, Dec. 7, 1988, 8828543

Int. Cl.⁵ A01N 43/40

U.S. Cl. 514—345 4 Claims

1. A method of killing or controlling insect or mite pests which comprises applying to the pest or to the infested locus thereof an insecticidally or miticidally effective amount of a compound of formula (I):



wherein the compound of formula (I) is in the form of the (E)-isomer; and R^1 is hydrogen; R^2 is hydrogen, halogen, C_{1-4} alkyl, C_{1-4} haloalkyl or $-CO_2R^4$; R^3 is hydrogen, halogen or C_{1-4} haloalkyl; and R^4 is C_{1-4} alkyl.

5,089,511

INSECTICIDES AND NEMATOCIDES

Werner Bonin, Kelkheim, Fed. Rep. of Germany; Jean-Pierre Demoute, Neuilly Plaisance, and Jean Tessier, Vincennes, both of France, assignors to Roussel Uclaf, France

Division of Ser. No. 331,732, Mar. 30, 1989, Pat. No. 4,920,231.

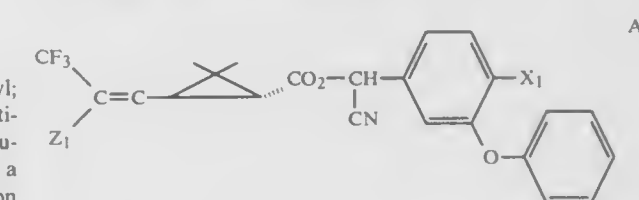
This application Jan. 18, 1990, Ser. No. 467,040

Claims priority, application France, Mar. 31, 1988, 88 04260

Int. Cl.⁵ A01N 43/40, 37/34; C07D 211/72; C07C 255/00

U.S. Cl. 514—357 11 Claims

1. All possible stereoisomeric forms and mixtures thereof of a 1R, trans compound of the formula



wherein Z_1 is phenyl or halosubstituted phenyl aryl and X_1 is hydrogen or fluorine.

8. A method of combating insects comprising contacting insects with an insecticidally effective amount of a compound of claim 1 or 3.

5,089,512

THIAZOLE DERIVATIVES

John R. H. Wilson, Rainham, and Indu Sawhney, Mainstone, both of England, assignors to Shell Research Limited, United Kingdom

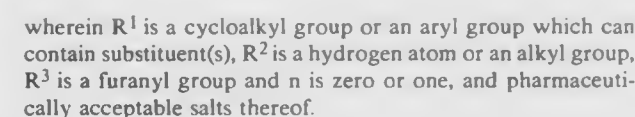
Filed Apr. 23, 1990, Ser. No. 513,239

Claims priority, application United Kingdom, Apr. 27, 1989, 8909735; Apr. 27, 1989, 8909736; Apr. 27, 1989, 8909739

Int. Cl.⁵ C07D 277/30; A61K 31/415

U.S. Cl. 514—365 10 Claims

1. A compound of the formula



5,089,518

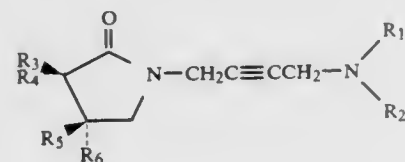
3- OR 4-SUBSTITUTED OXOTREMORINE
DERIVATIVES AND A METHOD OF TREATING
CHOLINERGIC DYSFUNCTION THEREWITH

Eugene J. Trybulski, Park Ridge, N.J.; Richard H. Kramss, Newburgh, and Herbert J. Brabander, Nanuet, both of N.Y., assignors to American Cyanamid Company, Wayne, N.J.
Division of Ser. No. 481,924, Feb. 20, 1990, Pat. No. 4,952,600, which is a division of Ser. No. 300,447, Jan. 23, 1989, Pat. No. 4,937,235. This application Aug. 22, 1990, Ser. No. 570,950
Int. Cl.⁵ C07D 207/38, 403/06, 31/40

U.S. Cl. 514—422

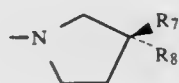
5 Claims

1. A compound selected from the oxidative dimers of a compound of the formula:



wherein

R₁ and R₂, which may be identical or different, denote a linear or branched chain alkyl of 1 to 6 carbon atoms each, R₁ and R₃ can also form, together with the nitrogen atom to which they are attached, an azetidine, aziridine, pyrrolidine, or piperidine ring or moieties of the formula:

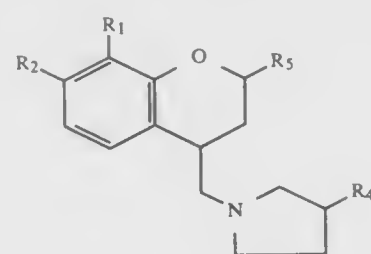


where R₇ and R₈ are independently selected from the group consisting of (C₁-C₆)acyloxy, aroyloxy, substituted aroyloxy, (C₁-C₆)alkoxy, hydroxy, thio, (C₁-C₆)alkylthio, (C₁-C₆)alkyldithio, acylthio and hydrogen with the proviso that one of R₇ and R₈ may be hydrogen;

R₃, R₄, R₅ and R₆, are selected from the group consisting of hydrogen, hydroxy, (C₁-C₆)acyloxy, aroyloxy, substituted aroyloxy, (C₁-C₆)alkoxy, thio, (C₁-C₆)alkylthio, (C₁-C₆)alkyldithio, (C₁-C₆)acylthio and alkylsilyloxy;

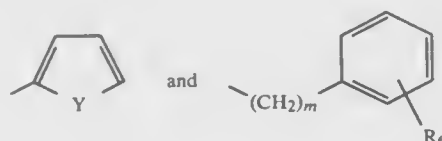
provided that, in all cases, at least one of R₃, R₄, R₅, R₆, R₇ and R₈ must be taken from the group consisting of hydroxy, (C₁-C₆)acyloxy, aroyloxy, substituted aroyloxy, (C₁-C₆)alkoxy, thio, (C₁-C₆)alkylthio, (C₁-C₆)alkyldithio, (C₁-C₆)acylthio and alkylsilyloxy;

and wherein any two of R₃ through R₈ are thio; and the pharmaceutically acceptable salts thereof.



R₁ and R₂ taken together form a methylenedioxy or ethylenedioxy bridge;

R₄ is selected from



wherein Y is O or S, R₆ is hydrogen, methoxy or halo and m is 0 or 1;

R₅ is hydrogen, loweralkyl, phenyl or substituted phenyl wherein the phenyl ring is substituted with one, two or three substituents independently selected from loweralkyl, halo, hydroxy, loweralkoxy, amino and thioalkoxy; or a pharmaceutically acceptable salt thereof.

5,089,520

METHOD OF INHIBITING VIRUS

George W. J. Fleet; Thomas W. Rademacher, and Raymond A. Dwek, all of Oxford, United Kingdom, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 249,144, Sep. 26, 1988, Pat. No. 4,999,360, which is a continuation-in-part of Ser. No. 136,219, Dec. 21, 1987, abandoned. This application Sep. 20, 1990, Ser. No. 584,982

Int. Cl.⁵ A61K 31/40

U.S. Cl. 514—425

3 Claims

1. The method of inhibiting human immunodeficiency virus in a patient infected with said virus comprising administering to said patient a virally inhibitory effective amount of a 5-member heterocyclic compound selected from the group consisting of 1,4-dideoxy-1,4-imino-L-arabinitol, 1,4-dideoxy-1,4-imino-D-ribitol, and their pharmaceutically acceptable salt derivatives.

5,089,521

10-MEMBERED RING LACTONES, A PROCESS FOR
THE PREPARATION THEREOF, AND THE USE
THEREOF

Joachim Wink, Offenbach; Susanne Grabley, Königstein/-Taunus; Gerhard Seibert, Darmstadt; Klaus Hütter, Bad Soden am Taunus, and Axel Zeeck, Göttingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 322,461, Mar. 13, 1989, abandoned.

This application Aug. 3, 1990, Ser. No. 563,682

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808492

Int. Cl.⁵ A61K 31/335; C07D 315/00

U.S. Cl. 514—450

5 Claims

1. A compound of the formula I:

5,089,519

AMINOMETHYL-CHROMAN COMPOUNDS

John F. DeBernardis, Lake Villa; David L. Arendsen, Libertyville, and Robert E. Zelle, Grayslake, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

PCT No. PCT/US89/00141, § 371 Date Jul. 8, 1990, § 102(e) Date Jul. 8, 1990, PCT Pub. No. WO89/06534, PCT Pub. Date Jul. 27, 1989

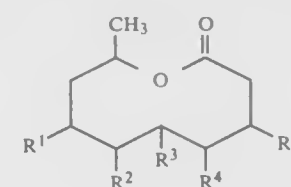
PCT Filed Jan. 13, 1989, Ser. No. 543,782

Int. Cl.⁵ C07D 407/06; A61K 31/40

U.S. Cl. 514—422

6 Claims

1. A compound of the formula



in which, independently of one another,

R₁ is hydrogen, hydroxyl, or together with R₂ and the carrying carbon atoms forms an oxirane ring;

R₂ is hydroxyl, or together with R₃ forms a double bond, or together with R₁ and the carrying carbon atoms forms an oxirane ring;

R₃ is hydroxyl, or together with R₂ forms a double bond, or together with R₄ forms a double bond;

R₄ is hydrogen, hydroxyl, or together with R₃ forms a double bond; and

R₅ is hydrogen, hydroxyl or an oxogroup.

5,089,522

ANTITUMOR ANTIBIOTIC BU-3285T

Hiroaki Ohkuma; Koji Tomita, both of Tokyo; Masataka Koniishi, Kawasaki, and Hideo Kamei, Tokyo, all of Japan, assignors to Bristol-Myers Squibb Co., New York, N.Y.

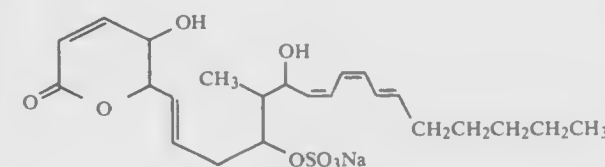
Division of Ser. No. 507,543, Apr. 11, 1990, Pat. No. 5,036,008, which is a division of Ser. No. 431,423, Nov. 3, 1990, Pat. No. 4,952,709, which is a continuation-in-part of Ser. No. 378,677, Jul. 12, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 620,991

Int. Cl.⁵ A61K 31/35

U.S. Cl. 514—460

5 Claims

1. A method for therapeutically treating an animal host affected by a fungal infection which comprises parenterally administering to said host an antifungal effective amount of BU-3285T of the formula



5,089,523

FLUORINATED DERIVATIVES OF MEVINIC ACIDS

Ravi K. Varma, Belle Mead, and Sam T. Chao, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

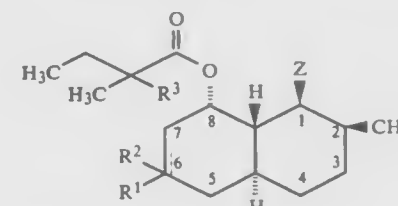
Filed May 11, 1990, Ser. No. 521,880

Int. Cl.⁵ A61K 31/365; C07D 309/30

U.S. Cl. 514—460

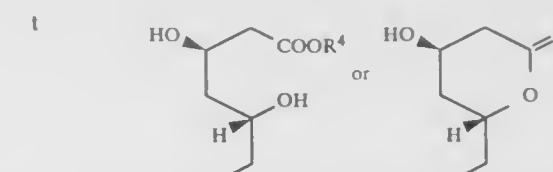
10 Claims

1. A compound of the formula



and pharmaceutically acceptable salts and tautomeric mixtures thereof, wherein:

Z is



R¹ and R² are each independently fluoro or hydrogen, except that at least one of R¹ and R² is fluoro;

R³ is hydrogen, C₁₋₁₂ alkyl, C₆₋₁₀ aryl which is a monocyclic or a bicyclic aromatic group containign 6 or 10 carbon atoms in the ring portion wherein the ring can be substituted by 1 to 2 lower alkyl groups, 1 to 2 halogen atoms, or 1 or 2 lower alkoxy groups, or C₆₋₁₀ aryl C₁₋₁₂ alkyl; and

R⁴ is hydrogen, C₁₋₁₂ alkyl, ammonium, C₁₋₁₂ alkyl ammonium, or alkali metal;

and wherein carbons 5 to 6 are single- or double-bonded and carbons 6 to 7 are single- or double-bonded, except that carbons 5 to 6 and 6 to 7 are not both double-bonded.

5,089,524

TETRAENYL PROSTANOIC ACID DERIVATIVES AS
PRODRUGS FOR THE TREATMENT OF PEPTIC ULCER
DISEASE

Paul W. Collins, Deerfield, and Alan F. Gasielki, Vernon Hills, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

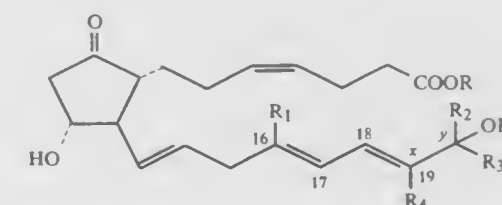
Filed Jun. 28, 1990, Ser. No. 546,218

Int. Cl.⁵ C07C 177/00; A61K 31/557

U.S. Cl. 514—530

11 Claims

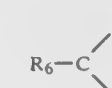
1. A compound of the general formula:



or a pharmaceutically acceptable base addition salt when R is hydrogen thereof;

wherein R is hydrogen or alkyl having 1 to 6 carbon atoms; R₁ is alkyl having 1 to 6 carbon atoms; R₂, R₃ and R₄ are each independently hydrogen or alkyl having 1 to 4 carbon atoms or R₃ and R₄ together with carbons X and Y form a cycloalkyl having 4 to 6 carbon atoms;

wherein R₅ is hydrogen, alkyl having 1 to 4 carbon atoms or acyl which is represented by the following formula



wherein R₆ is alkyl having 1 to 6 carbon atoms.

5,089,525

N-(HALOBENZOYL)-N'-2-HALO-4-(1,1,2-TRIFLUORO-2-(TRIFLUORO-METHOXY)ETHOXY)-PHENYL-UREAS WITH INSECTICIDAL ACTIVITY

Pietro Massardo, Milan; Giovanni Meazza, Saronno; Franco Bettarini, Novara; Paolo Castoro, Vercelli, and Vincenzo Caprioli, Pavia, all of Italy, assignors to Istituto Guido Donegani S.p.A., Milan, Italy

Filed Sep. 2, 1988, Ser. No. 239,996

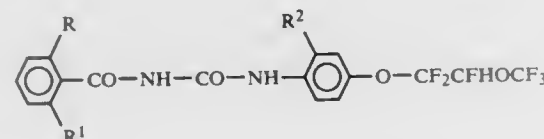
Claims priority, application Italy, Sep. 4, 1987, 21794 A/87

Int. Cl.⁵ C07C 273/00; A01N 47/28

U.S. Cl. 514—594

8 Claims

1. N-(halobenzoil)-N'-2-halo-4-[1,1,2-trifluoro-2-(trifluoromethoxy)ethoxy]-phenyl-ureas having the formula:



wherein:

R, R¹, which can be either equal to or different from each other, are H, F or Cl; at least one of R and R¹ being either F or Cl; and R² is either F or Cl.

5,089,526

ANTIARRHYTHMIC CLASS III PROCESS

Arthur Simon, Pomona, N.Y., and Jeff A. Thomis, Liederkerke, Belgium, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 716,528, Mar. 17, 1985, abandoned, which is a continuation of Ser. No. 497,368, May 23, 1983, abandoned. This application Dec. 23, 1986, Ser. No. 945,915

Int. Cl.⁵ A61K 31/18

U.S. Cl. 514—605

5 Claims

1. An antiarrhythmic process comprising administering an effective dose of d-sotalol essentially free of l-sotalol or a pharmaceutically acceptable acid addition salt thereof to a human having or susceptible to arrhythmia to lengthen the action potential duration of cardiac cell sufficiently to produce an antiarrhythmic effect without blocking beta-adrenergic receptor sites.

5,089,527

PENTAMIDINE SOLUTIONS

John D. Lord, London, England, assignor to Rhone-Poulenc Sante, Antony Cedex, France

Filed Feb. 12, 1990, Ser. No. 478,488

Claims priority, application United Kingdom, Feb. 15, 1989, 8903438; Oct. 9, 1989, 8922707

Int. Cl.⁵ A61K 31/155

U.S. Cl. 514—636

12 Claims

1. An aqueous solution of a water soluble pentamidine salt comprising an acetate buffer, and having a total acetate concentration of 0.01–0.06M, a pentamidine salt concentration from 1% w/v to 10% w/v, and a pH of about 4.6 at room temperature.

5,089,528

SULFUR-CONTAINING OXIME ETHERS AND FUNGICIDES CONTAINING THEM

Horst Wingert, Mannheim; Siegfert Brand, Weinheim; Bernd Wenderoth, Lampertheim; Franz Schuetz, Ludwigshafen; Hubert Santer, Mannheim; Franz Roehl, Ludwigshafen; Gisela Lorenz, Neustadt, and Eberhard Ammermann, Ludwigshafen, all of, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 15, 1989, Ser. No. 436,804

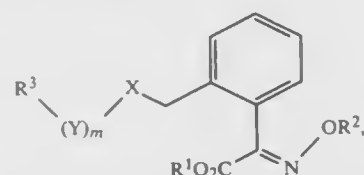
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843439

Int. Cl.⁵ A01N 33/24; C07C 749/01

U.S. Cl. 514—640

7 Claims

2. A process for combating fungi, wherein the fungi, or the materials, plants, seed or soil threatened by fungus attack are treated with a fungicidally effective amount of an oxime ether derivative of the formula



where R¹ and R² are each hydrogen or C₁–C₅-alkyl, X is S, SO or SO₂, R³ is hydrogen, or a C₃–C₈-cycloalkyl, phenyl, naphthyl, or phenanthrenyl radical, these radicals being unsubstituted or substituted by halogen, cyano, nitro, formyl, C₁–C₁₀-alkyl, C₁–C₄-alkoxy, C₁–C₂-halo-alkyl, aryl or C₁–C₄-alkoxycarbonyl, Y is a straight-chain or branched alkylene, alkenylene or alkynylene radical and m is 0 or 1.

5,089,529

BUTANOL DERIVATIVES

Kiyoshi Kimura; Takeshi Yamaguchi, both of Takatsuki; Iwao Morita, and Tetsuo Murakami, both of Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Nov. 21, 1984, Ser. No. 673,947

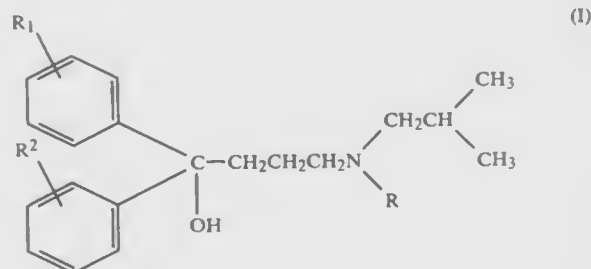
Claims priority, application Japan, Nov. 21, 1983, 58-220342

Int. Cl.⁵ A61K 31/135; C07C 215/08

U.S. Cl. 514—648

7 Claims

1. A method of treating arrhythmias in humans and animals which comprises administering to a human or animal in need thereof an anti-arrhythmic amount of a compound of the formula (I):



or a pharmaceutically acceptable salt thereof wherein R¹ and R² are the same or different and each is selected from the group consisting of hydrogen, halo, hydroxyl, alkyl of 1 to 4 carbon atoms and alkoxy of 1 to 4 carbon atoms and R is hydrogen or isobutyl, in combination with a pharmaceutically acceptable carrier.

5,089,530

FERMENTATION PRODUCT WITH ANTIPARASITIC ACTIVITY

Athanasios Tsipouras, Rahway; Dan A. Ostlind, Watchung; Otto D. Hensens, Red Bank, and Deborah L. Zink, Manalapan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

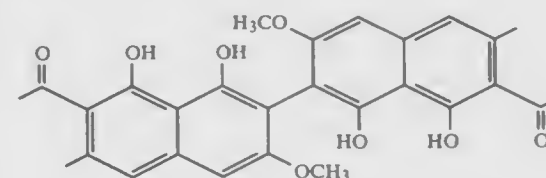
Filed Aug. 3, 1990, Ser. No. 562,353

Int. Cl.⁵ A61K 31/12

U.S. Cl. 514—682

4 Claims

1. A compound having the formula:



in substantially pure form.

5,089,531

COMPOSITIONS INCORPORATING A SALT OF MONOESTER OF CITRIC ACID AND A METHOD FOR SYNTHESIZING THE MONOESTER

Ira Weil, New York, N.Y., assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Jul. 7, 1989, Ser. No. 376,797

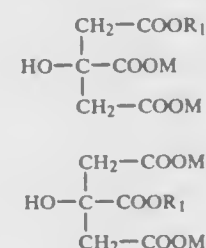
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.⁵ A61K 47/00

U.S. Cl. 519—785

30 Claims

1. A skin treatment composition comprising from about 1% to about 35% by weight of a dication salt of a monoester of citric acid having one of the following formulae:



where R₁ has the structure of a moiety derived from R₁-OH, which alcohol is selected from the group consisting of alkanols, alkenols and arylalkanols having from 10 to 18 carbon atoms; each M is a cation selected from the group consisting of the alkali metals, the alkaline earth metals, ammonium, substituted ammonium and a mixture thereof; and a physiologically acceptable carrier for said monoester.

5,089,532

CATALYST, METHOD OF PRODUCING AND USING SAME FOR PRODUCTION OF METHANOL AND HIGHER ALCOHOLS

Terry S. King, Ames, Iowa, and Gordon R. Sheffer, South Charleston, W. Va., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Mar. 28, 1989, Ser. No. 329,860

Int. Cl.⁵ C07C 27/06

U.S. Cl. 518—713

4 Claims

1. In a process for manufacturing primary linear alcohols by contacting a gaseous mixture comprising carbon monoxide and hydrogen with a catalyst, the improvement comprising: conducting the process in the presence of a catalyst consisting of a catalytically effective amount of copper and a lithium promoter; said process being conducted at a temperature of from about

550° K. to about 600° K. at a ratio of carbon monoxide to hydrogen of from about 0.5:1 to 1:1 and at a pressure of from 40 atmospheres to 400 atmospheres thus making the process selective for manufacturing a mixture of methanol and higher alcohols.

5,089,533

OLEFIN POLYMER COMPOSITIONS COMPRISING GLYCEROL MONOESTERS OF C₂₀₋₂₄ FATTY ACIDS AND FOAMED ARTICLES PREPARED THEREFROM

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 26, 1990, Ser. No. 484,745

Int. Cl.⁵ C08J 9/14

U.S. Cl. 521—79

11 Claims

1. An expandable olefin polymer composition comprising an olefin polymer, a volatile organic blowing agent and from about 0.1 to about 10 weight percent based upon the weight of said olefin polymer of glycerol monoester of a C₂₀₋₂₄ fatty acid.

5,089,534

PROCESS FOR PREPARING FLEXIBLE POLYURETHANE FOAM

Johan A. Thoen; Robert A. Sewell, both of Terneuzen, Netherlands, and Ulrich Muller, Aachen, Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

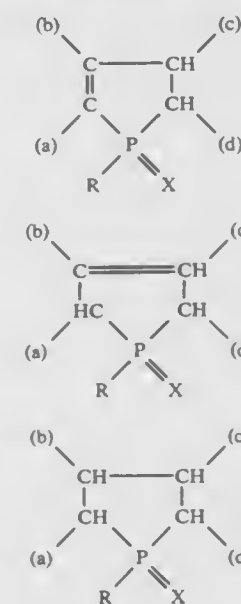
Filed Mar. 23, 1990, Ser. No. 498,160

Int. Cl.⁵ C08G 18/14, 18/16; C08J 9/14

U.S. Cl. 521—106

14 Claims

1. A process for preparing a flexible polyurethane foam comprising contacting under reaction conditions an organic polyisocyanate with a polyol in the presence of water and a catalyst characterized in that the catalyst comprises at least one component that is a phosphorus-containing compound present in from at least 0.05 and up to about 5.0 weight percent based on the total weight of polyol reacting with the polyisocyanate and represented by at least one of the formulae



wherein a, b, c and d each independently represent hydrogen, a halogen, a C₁₋₆ alkyl radical, a C₁₋₆ alkyl radical, phenyl, a cycloalkyl radical, or a polymethylene group which together with two neighboring carbon atoms of the heterocyclic phosphorus-containing ring forms a cycloaliphatic ring; wherein X is oxygen and wherein R is hydrogen or a C₁₋₆ alkyl radical.

5,089,535

THERMOPLASTIC COMPOSITIONS FOR WATER SOLUBLE FOAMS

Nelson E. Malwitz, Brookfield, Conn., and Shau-Tang Lee, Oakland, N.J., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Oct. 22, 1990, Ser. No. 601,260
Int. Cl.⁵ C08F 16/06; C08J 9/14

- U.S. Cl. 521—141 25 Claims
18. A thermoplastic foamable composition comprising:
- a resin mixture comprising
 - from about 95 to about 100% by weight of a polyvinyl alcohol material,
 - from 0 to about 2% by weight of a nucleating agent, and
 - from 0 to about 3% by weight of an aging modifier; and
 - a blowing agent comprising a low molecular weight alcohol, said alcohol present in an amount from about 0.5 parts per part resin mixture; wherein said composition is extrudable into a foam that entirely dissolves in water.

5,089,536

ENERGY POLMERIZABLE COMPOSITIONS CONTAINING ORGANOMETALLIC INITIATORS

Michael C. Palazzotto, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 22, 1982, Ser. No. 443,660

Int. Cl.⁵ C08F 2/50, 4/42, 16/32, 16/18, 26/10, 59/24, 59/68, 59/72

- U.S. Cl. 522—16 21 Claims
1. An energy polymerizable composition comprising a cationically polymerizable material selected from the group consisting of cyclic ethers, vinyl ethers, N-vinyl compounds, cyclic formals, and cyclic organosiloxanes, and a catalytically effective amount of an ionic salt of an organometallic complex cation and a halogen containing complex anion of a metal or metalloid, said ionic salt being capable of adding an intermediate strength nucleophile or upon photolysis capable of liberating at least one coordination site, the metal in said organometallic complex cation being selected from elements of Periodic Groups IV, VI, VIB, VIIIB, and VIIIIB, the total charge on said metal in said cation resulting in a net residual positive charge to said complex.

5,089,537

UV CURABLE SILICONE EMULSIONS

Donald T. Liles, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 22, 1989, Ser. No. 355,223

Int. Cl.⁵ C08L 83/07; C08G 77/12, 77/20; C08F 2/24

- U.S. Cl. 522—84 3 Claims
1. An aqueous silicone emulsion comprising a continuous water phase, a dispersed phase, and sufficient surfactant to form a stable emulsion; the dispersed phase consisting essentially of a hydroxyl endblocked polydiorganosiloxane having a molecular weight above 50,000 and containing both non-conjugated unsaturated hydrocarbon group substituted siloxane units, in which said unsaturated hydrocarbon groups there are from 2 to 6 carbon atoms, selected from the group consisting of vinyl, allyl, and hexenyl radicals; and either hydrogen on silicon substituted siloxane units or mercaptoalkylsiloxane units; and a photoinitiator, in the same dispersed particles; which emulsion, when crosslinked by exposure to ultraviolet light, produces an elastomer upon removal of the water at room temperature.

5,089,538

COMPOSITION SUITED FOR ADDITION TO GROUND EXCAVATION STABILIZING LIQUID, STABILIZING LIQUID COMPOSITION, AND GROUND EXCAVATION METHOD

Yoshio Iizuka; Yoshiyuki Oothuka, both of Tokyo; Satoshi Tanaka, and Manabu Yamamoto, both of Kyoto, all of Japan, assignors to Shimizu Construction Co., Ltd., Tokyo and Sanyo Chemical Industries, Ltd., Kyoto, both of Japan

PCT No. PCT/JP87/00887, § 371 Date Jul. 14, 1989, § 102(e) Date Jul. 14, 1989

PCT Filed Nov. 16, 1987, Ser. No. 381,399

Int. Cl.⁵ C09K 17/00

- U.S. Cl. 523—132 14 Claims
1. A composition suitable for addition to a excavation stabilizing liquid, comprising:
- a monovalent salt of an unsaturated carboxylic acid (co)polymer having a polymerization degree of 5,000 or less and (b) a compound selected from the group consisting of (i) a monovalent aluminate, (ii) a group II or III metal oxide and (iii) a higher order compound salt.

5,089,539

FILLERS

John G. Carey, Warrington; Martin B. Evans, Tarporley, and Roger N. Rother, Guilden Sutton, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 20, 1988, Ser. No. 196,491

Claims priority, application United Kingdom, May 22, 1987, 8712106; Jun. 25, 1987, 8714905

Int. Cl.⁵ C08K 9/12, 9/04, 9/08

- U.S. Cl. 523—202 10 Claims
1. A cohesive polymer matrix comprising a matrix polymer and a coated particulate filler dispersed therein, characterized in that the matrix polymer is a crosslinked or non-crosslinked emulsion rubber, and the filler is coated at least in part with a composition comprising an organic coating polymer of number average molecular weight in the range 7,500 to 15,000, which contains a carboxylic acid or diacid group or its salt, imide or anhydride and olefinic unsaturated groups either bonded or non-bonded to the matrix polymer.

5,089,540

PROCESSES AND COMPOSITIONS TO ENHANCE THE TENSILE STRENGTH OF RECLAIMED SAND BONDED WITH ALKALINE RESINS

David R. Armbruster, Forest Park; S. Raja Iyer, Naperville, and Merlyn C. Pasion, Carol Stream, all of Ill., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 538,588, Jun. 15, 1990, which is a continuation of Ser. No. 179,392, Apr. 8, 1988, abandoned.

This application Oct. 12, 1990, Ser. No. 596,546

Int. Cl.⁵ C08K 9/06, 3/36

- U.S. Cl. 523—213 39 Claims
1. A method for treating free-flowing granular foundry sand to improve the tensile strength of a resin-bonded shape produced therefrom with an ester curable alkaline phenolic resin binder over the tensile strength that would otherwise be achieved if said granular foundry sand were untreated, at least a portion of said sand having been reclaimed after having previously been formed into a resin-bonded shape with an alkaline resin binder, then separated from said shape into free-flowing granules, said method comprising placing said free-flowing granular foundry sand in contact with a sufficient quantity of a solution comprising aqueous solvent, silane, and amine, wherein the amounts of silane, amine, and solvent, respectively, are chosen to be effective to improve the tensile strength of a resin-bonded shape produced from free-flowing granular foundry sand to which said solution has been applied,

5,089,543

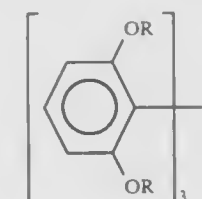
EPOXY RESIN ELECTRICAL ENCAPSULATION COMPOSITION

Takuya Kurio, Yokkaichi; Yoshinori Nakanishi, Suzuka; Takuya Kurio, Yokkaichi, and Yoshinori Nakanishi, Suzuka, all of Japan, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 15, 1991, Ser. No. 656,399

Int. Cl.⁵ C08G 59/14

- U.S. Cl. 523—466 7 Claims
1. A composition comprising:
- an epoxy resin;
 - a phenolic curing agent for the epoxy resin;
 - from about 0.1 to about 5 weight percent, based on the weight of component (a), of a tris(dialkoxyphenyl)phosphine which can be represented by the formula:



- in which each R is independently selected from C₁₋₄ alkyl, and
- from about 50 to about 90 weight percent, based on the weight of the composition, of an inorganic filler.

5,089,544

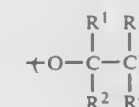
UNSATURATED POLYESTER RESIN COMPOSITIONS CONTAINING COMPATIBLE COMPOUNDS

Louis R. Ross, Newark; Paul R. Krumlauf, Thornville; Edward L. Wilson, and Kuang-Hong Hsu, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 30, 1989, Ser. No. 428,548

Int. Cl.⁵ C08K 5/01

- U.S. Cl. 523—511 37 Claims
1. A four component resinous system for a sheet molding composition comprising:
- an unsaturated polyester comprising a polycondensation product of one or more dihydric alcohols and one or more ethylenically unsaturated polycarboxylic acids;
 - one or more low-profile thermoplastic polymers which cause phase separation and porosity during a curing reaction;
 - one or more olefinically unsaturated monomers which copolymerizes with the unsaturated polyester, and,
 - one or more compatible components containing one or more polyoxyethane substituents having a general structure;



wherein R¹, R², R³ and R⁴ are selected from the group consisting of hydrogen, cycloalkyl, lower alkyl, phenyl, phenyl substituted by halogen, lower alkyl, acyl or lower alkoxy and phenyl lower alkyl wherein phenyl may be substituted by halogen, lower alkyl or lower alkoxy; R¹, R², R³ and R⁴ may be the same or different; a is an integer between 1 and about 200; and wherein the compatible component remains compatible with the unsaturated polyester and monomer.

wherein said silane comprises compounds conforming the formula R'Si(OR)₃, wherein R' is a C₂-C₆ alkylene group bonded to an amino, epoxy, mercapto, glycidoxo, ureido, hydroxy, hydroxy-C₁-C₆ alkylamino, amino-C₁-C₆ alkylamino, C₂-C₆ alkenyl, or C₂-C₆ alkenyl-carboxy group, and the "R" groups may be the same or different and are selected from C₁-C₆ alkyl and C₁-C₆ alkoxy-substituted C₁-C₆ alkyl groups,

wherein said silane is a separate compound from said amine, and

wherein said amine has a boiling point of about 115° C. or more.

5,089,541

REMOVAL OF HYDROGENATION CATALYST FROM POLYMER SOLUTIONS BY CONTACT WITH ACTIVATED CARBON

Ajay M. Madgavkar, Edwardsville, Ill.; David W. Daum, Seabrook, and Carma J. Gibler, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 23, 1990, Ser. No. 617,225

Int. Cl.⁵ C08G 63/91

- U.S. Cl. 523—310 22 Claims
1. A process comprising the steps of:
- contacting a polymer solution which contains Group VIII metal hydrogenation catalyst residue with molecular oxygen to form an oxidized solution;
 - contacting the oxidized solution with activated carbon; and
 - recovering a polymer solution comprising less than 5 ppm by weight, based on the polymer solution, of Group VIII metal.

5,089,542

CATIONICALLY ELECTRODEPOSITABLE RESIN COMPOSITION FROM VINYL CYCLOHEXENE OXIDE BASED EPOXY RESINS

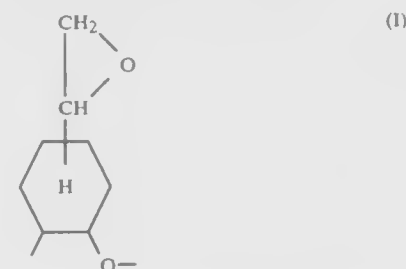
Reiziro Nishida, and Akira Tominaga, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Apr. 5, 1990, Ser. No. 504,905

Claims priority, application Japan, Apr. 7, 1989, 1-86933

Int. Cl.⁵ C08G 59/64; C09D 5/44

- U.S. Cl. 523—410 8 Claims
1. A cationically electrodeposable resin composition containing as main component a primary hydroxyl group-containing cationic resin (Y) obtained by reacting an epoxy resin (A) having at least three epoxy group-containing functional groups represented by the following structural formula (I)



with a primary or secondary amine compound (B) containing primary hydroxyl group, and a phenol compound (C) having at least one phenolic hydroxyl group.

5,089,545

SWITCHING AND MEMORY ELEMENTS FROM POLYAMINO ACIDS AND THE METHOD OF THEIR ASSEMBLY

Alexander T. Pol, Miami, Fla., assignor to Biotech International, Inc., Miami, Fla.

Filed Feb. 12, 1989, Ser. No. 310,364
Int. Cl.³ H01L 31/04

U.S. Cl. 524—17

7 Claims

1. A method of directed chemical self-assembly of electronic switching and memory elements from polyamino acids exclusive of flavin and pterin pigments and mono amino dicarboxylic acids consisting of:

the process of amino acid polymerization by a hybrid sequential synthesis and thermal condensation, mixing the polymer with lipids and dyes, dissolving said compounds in a solvent containing ions, evaporation of the excess of external solvent and formation of planar, spherical and tubular membrane structures.

5,089,546

OLIGOMER DERIVED FROM A POLYETHOXYLATED FATTY AMINE, PROCESS FOR PRODUCING SAME, AND ITS USE TO MODIFY THE SURFACE PROPERTIES OF POLYMERS

Roland Parsy, Le Havre; Daniel Augustin, Bernay, and Christian Collette, Paris, all of France, assignors to Atochem, Paris, France

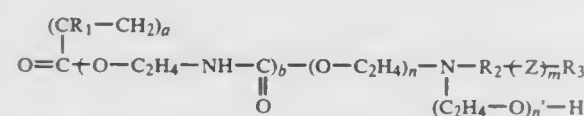
Division of Ser. No. 335,736, Apr. 10, 1989, Pat. No. 4,980,438.
This application Aug. 15, 1990, Ser. No. 567,773

Claims priority, application France, Apr. 29, 1988, 88 05801
Int. Cl.³ C08F 20/36

U.S. Cl. 524—198

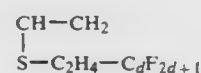
8 Claims

1. The process for making antifogging thermoplastic polymer films comprising admixing an oligomer or a mixture of oligomers with a thermoplastic resin and then forming said admixture into a film, the oligomer or mixture of oligomers being present in an amount sufficient to impart antifogging properties to said film and such oligomer or mixture of oligomers having the formula:



in which

R₁=H or CH₃;
R₂=C₂H₂, in which 0 ≤ t ≤ 18;
Z is selected from C₂H₄, C₂H₂ and



in which 2 ≤ d ≤ 16;

m is an integer such that 1 ≤ m ≤ 3;

R₃=C₂H₂t+1 in which t' ≥ 1 and 8 ≤ t'+2m ≤ 22

n and n' are identical or different integers, such that 2 ≤ n+n' ≤ 20;

b is an integer equal to 0 or 1; and

a is an integer ranging from 2 to 500.

5,089,547

CROSS-LINKED LOW SURFACE ADHESION ADDITIVES FOR TONER COMPOSITIONS

John M. McCabe, Pittsford, and John C. Wilson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,002
Int. Cl.³ C08L 75/04

U.S. Cl. 524—262

9 Claims

1. A cross-linked low surface adhesion composition comprising a silicone resin and a polyester resin cross-linked with a multifunctional epoxy novolac resin.

5,089,548

HOT-MELT MOISTURE INDICATOR MATERIAL FOR DISPOSABLE ARTICLES

John M. Zimmer, St. Paul; Mark G. Katsaros, Mahtomedi, and William L. Bunnelle, Hugo, all of Minn., assignors to H. B. Fuller Company, Saint Paul, Minn.

Division of Ser. No. 546,022, Jun. 28, 1990, Pat. No. 5,035,691.
This application Mar. 22, 1991, Ser. No. 673,743

Int. Cl.³ C08L 23/00

U.S. Cl. 524—272

13 Claims

1. A hot-melt moisture indicator composition that is stable during conditions of manufacture, application, and use, and can detect the presence of moisture in a disposable article during use, which composition comprises:

- about 50 to 90 wt-% of a polyester reaction product of a vinyl polymer containing random units of an ethylenically unsaturated monomer, having pendant carboxylic acid groups and a hydrophilic hydroxy group containing compound;
- about 10 to 50 wt-% of a carboxylic acid compound containing about 5–35 carbon atoms having an acid number of at least about 140; and
- an effective amount of an acid-base indicator that can change color at a pH of about 2 to 5.6.

5,089,549

POLYIMIDE RESIN SOLUTION COMPOSITIONS

Hideto Kato, Takasaki, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 427,367

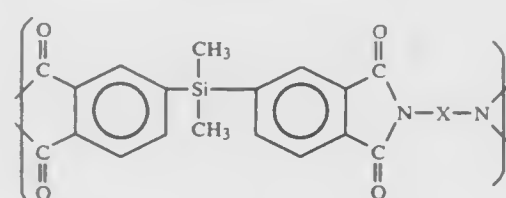
Claims priority, application Japan, Nov. 2, 1988, 63-276310

Int. Cl.³ C08K 5/09

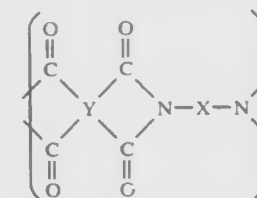
U.S. Cl. 524—287

20 Claims

1. A polyimide resin solution composition comprising a polyimide resin consisting essentially of 100 to 30 mol% of recurring units having formula (I):



wherein X is a divalent organic group, and 0 to 70 mol% of recurring units having formula (2):



wherein X is as defined above and Y is a tetravalent organic group containing an aromatic ring, and a solvent in which said polyimide resin is soluble.

5,089,550

BLOCK COPOLYMER COMPOSITION

Toshinori Sakagami; Yasuo Toyama; Hisaharu Ito, and Takumi Miyachi, all of Tokyo, Japan, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

PCT No. PCT/EP88/00176, § 371 Date Oct. 2, 1989, § 102(e)
Date Oct. 2, 1989, PCT Pub. No. WO89/08128, PCT Pub. Date Sep. 8, 1989

PCT Filed Mar. 4, 1988, Ser. No. 427,090

Int. Cl.³ C08F 297/04; C08L 53/02, 93/04

U.S. Cl. 525—314

7 Claims

1. A block copolymer composition comprising
(1) in the range of from 50 to 85% by weight of a block copolymer of the formula (I)



(I)

wherein A₁ and B₁ represent a polymer block of an aromatic vinyl compound and a conjugated diene, respectively, said block copolymer (I) containing said polymer block of the aromatic vinyl compound A₁ in an amount of less than 20% by weight of the total weight of A₁ and B₁, and said A₁ and B₁ having a weight average molecular weight of greater than 12,000 and greater than 150,000, respectively; and

(2) in the range of from 15 to 50% by weight of a block copolymer of the formula (II)



(II)

wherein A₂ and A₃ each represent a polymer block of an aromatic vinyl compound and B₂ represents a polymer block of a conjugated diene, which block copolymer (II) has a total content of the polymer blocks of the aromatic vinyl compound A₂ and A₃ of more than 20% by weight of the total weight of A₂, B₂ and A₃, with A₂ and A₃ each having a weight average molecular weight of greater than 12,000, and wherein (weight average molecular weight of B₂) ≤ (weight average molecular weight of B₁)/1.5.

5,089,551

CORROSION-RESISTANT ALKYD COATINGS

Charles R. Hegedus, Warrington, Pa.; Donald J. Hirst, Mt. Laurel; William J. Green, Clementon, both of N.J., and Anthony T. Eng, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 593,416, Sep. 28, 1990, Pat. No. 5,059,640, which is a continuation-in-part of Ser. No. 442,085, Nov. 28, 1989, Pat. No. 5,043,373, which is a

continuation-in-part of Ser. No. 331,200, Mar. 28, 1989, Pat. No. 4,885,324, which is a continuation of Ser. No. 211,026, Jun. 16, 1988, abandoned. This application Dec. 14, 1990, Ser. No. 627,670

Int. Cl.³ C08L 75/00

U.S. Cl. 524—396

15 Claims

1. A coating composition comprising about 100 parts by weight of an alkyd resin from about 0 to 1000 parts by weight of at least one organic solvent, from about 0–140 parts by

weight of a TiO₂ pigment, and from about 0.01 to 300 parts by weight of a combination of corrosion-inhibiting pigments consisting essentially of about:

- 10–120 parts by weight of a zinc phosphate,
- 40–260 parts by weight of zinc molybdate, and
- 1–30 parts by weight of at least one zinc salt of a benzoic acid.

5,089,552

HIGH CHAR YIELD SILAZANE-MODIFIED PHENOLIC RESINS

Ronald E. Myers, Strongsville, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

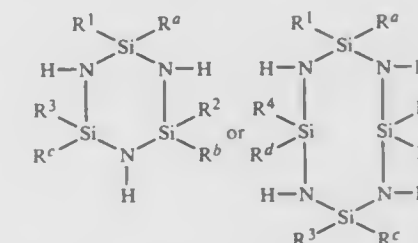
Filed Dec. 8, 1989, Ser. No. 447,751

Int. Cl.³ C08K 3/38

U.S. Cl. 524—404

24 Claims

1. A composition, comprising:
a modified phenolic resin prepared by the hydrolytic polycondensation in the presence or absence of initiators of a monomer of



wherein R¹, R², R³, and R⁴ are independently alkyl groups containing from 1 to 4 carbon atoms, R^a, R^b, R^c, and R^d are independently alkenyl or alkyl groups containing from 2 to 6 carbon atoms with the proviso that at least one of R^a, R^b, R^c, or R^d group is an alkenyl group; with

a phenolic resin containing from about 1 up to about 20 percent by weight water.

5,089,553

COPOLYMERIZED POLYESTER COMPOSITIONS

Takashi Umeda; Seiichi Zemba, both of Ichihara; Kazuo Hara, Kurashiki; Katsunori Takamoto, Kurashiki, and Shinichi Yokota, Kurashiki, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo and Kuraray Company Limited, Kurashiki, both of Japan

Filed Aug. 21, 1989, Ser. No. 397,034

Claims priority, application Japan, Aug. 30, 1988, 63-213745; Aug. 30, 1988, 63-213746

Int. Cl.³ C08F 8/00; C08L 67/02

U.S. Cl. 524—424

14 Claims

1. A copolymerized polyester composition which comprises (A) 100 parts by weight of a copolymerized polyester comprising

- an aromatic dicarboxylic acid unit comprising mainly a terephthalic acid unit,
 - a glycol unit comprising mainly an ethylene glycol unit,
 - a polytetramethylene glycol unit,
 - a polyethylene glycol unit and
 - an aliphatic dicarboxylic acid unit having 9 or more carbon atoms,
- wherein 0.3 to 10 parts by weight of said unit (c), 0.5 to 20 parts by weight of said unit (d) and 0.3 to 10 parts by weight of said unit (e) are contained per a total of 100 parts by weight of said units (a) and (b),
(B) 5 to 150 parts by weight of a reinforcing substance and
(C) 1 to 10 parts by weight of a metal salt of an ionic copolymer.

5,089,554

SILICA REINFORCED ELASTOMERS

Francis Bomo, Lyon; Yvonick Chevallier, Decines; Patrick Lamy, Lyon, and Jean-Claude Morawski, Chassieu, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Continuation of Ser. No. 186,740, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 907,314, Sep. 15, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 366,306 Claims priority, application France, Sep. 15, 1985, 85 13579 Int. Cl.⁵ C08K 3/34

U.S. Cl. 524—493 8 Claims

1. An elastomeric shaped article having improved tensile strength and tear strength which comprises a reinforcing amount of a particulate silica filler material for said elastomeric shaped article, said silica filler material comprising at least one precipitated silica having (i) a CTAB surface area of from 20 to 200 m²/g, (ii) a mean projected area of aggregates of greater than about 10,000 nm², and (iii) an inter-aggregate volume of at least 1 cm³/g and (iv) a DPB oil absorption capacity no greater than 300 ml/100 g, and an essentially homogeneous inter-aggregate pore population wherein:

- a) for a CTAB surface area of from 20 to 70 m²/g, the mean projected area of aggregates is at least about 30,000 nm²;
- b) for a CTAB surface area of from 70 to 120 m²/g, the mean projected area of aggregates is at least about 25,000 nm²; and
- c) for a CTAB surface area of from 120 to 200 m²/g, the mean projected area of aggregates is at least about 15,000 nm².

5,089,555

THERMOSETTING POWDER COMPOSITION

Katsuji Kitagawa, Kasukabe; Hideki Tashima, Fukuoka, and Kunimitsu Matsuzaki, Yono, all of Japan, assignors to Somar Corporation, Japan

Filed Sep. 8, 1989, Ser. No. 404,806

Claims priority, application Japan, Mar. 10, 1989, 1-59142 Int. Cl.⁵ C08F 8/30

U.S. Cl. 524—503 18 Claims

1. A thermosetting powder composition comprising: 100 parts by weight of a functional thermoplastic resin capable of reacting with a cyanate group, said functional thermoplastic resin having a molecular weight of at least 10,000 and having one or more functional groups selected from hydroxyl, carboxyl, amino and amide wherein said functional thermoplastic resin is selected from the group consisting of partially saponified polyvinyl acetates, polyvinyl alcohols, partially saponified ethylene/vinyl acetate copolymers, butyral resins, polyacrylic acid, copolymers of acrylic acid, polymethacrylic acid, copolymers of methacrylic acid, saturated polyester resins, polyamide resins and polyamideamine resins;

10-100 parts by weight of a polyfunctional cyanate compound selected from the group consisting of benzene dicyanate, benzene, tricyanate, naphthalene dicyanate, 4,4'-dicyanatobiphenyl, bis(4-cyanatophenyl)methane, 2,2-bis(4-cyanatophenyl)propane, 2,2-bis(3,5-dichloro-4-cyanatophenyl)propane, bis(4-cyanatophenyl)ether, bis(4-cyanatophenyl)sulfone, tris(4-cyanatophenyl)phosphite, tris(4-cyanatophenyl)phosphate, cyanic acid esters obtained by reaction of a novolak resin with a halogenated cyan compound and prepolymers thereof; and 5-100 parts by weight of a viscosity controlling agent which is a compound having at least one function group capable of reacting with said functional thermoplastic resin and/or said polyfunctional cyanate compound when heated at a temperature sufficient to melt a mixture of the thermoplastic resin, the cyanate compound and the viscosity controlling agent, said viscosity controlling agent being selected from the group consisting of:

ether-containing diols having the following general formula:



wherein m is a positive integer and n is an integer of 2-150, ester-containing diols having the following general formula:



wherein R stands for an alkylene having 2-10 carbon atoms and g stands for an integer of 1-40, saturated hydrocarbons having 1.5-3 terminal hydroxyl groups and a molecular weight of 1000-5000, and diamines having the formula:



wherein n is an integer of 20-150.

5,089,556

ADHESIVE, RF HEATABLE GRAFTED POLYMERS AND BLENDS

Ricky L. Tabor; Chad A. Strait, both of Lake Jackson, and Gerald M. Lancaster, Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 229,078, Aug. 5, 1988, Pat. No. 4,927,888, which is a continuation-in-part of Ser. No. 905,099, Sep. 5, 1986, Pat. No. 4,762,890. This application Dec. 28, 1989, Ser. No. 458,113

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed. Int. Cl.⁵ C08L 51/00

U.S. Cl. 525—64 26 Claims

1. An adhesive, RF heatable polymer blend, comprising: (a) an ethylene-carbon monoxide copolymer blended with; (b) a grafted ethylene polymer, said grafted ethylene polymer obtained by grafting an ethylene polymer with a graft monomer selected from the group consisting of α , β -ethylenically unsaturated dicarboxylic acids and anhydrides thereof.

5,089,557

RUBBER MODIFIED BLEND OF NYLON AND STYRENE/ACRYLONITRILE MALEIC ANHYDRIDE TERPOLYMER

David E. Henton, and Michael N. Mang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 492,047, Mar. 12, 1990, abandoned. This application Mar. 11, 1991, Ser. No. 670,454 Int. Cl.⁵ C08L 77/00

U.S. Cl. 525—66 9 Claims

1. A composition comprising a blend of components: (a) 5 to 60 weight percent of a graft rubber composition consisting essentially of 5 to 80 weight percent of a rubber having a glass transition temperature below 0° C. and 95 to 20 weight percent of a copolymer consisting essentially of from 90 to 70 parts by weight of a vinyl aromatic monomer and from 10 to 30 parts by weight of acrylonitrile, said vinyl aromatic and acrylonitrile monomers having been polymerized in the presence of and grafted onto the rubber; (b) 85 to 30 weight percent of a polyamide resin; (c) 0.5 to 40 weight percent of a copolymer compatibilizer consisting essentially of styrene, acrylonitrile, and a copolymerized functionalized monomer capable of reaction with the polyamide resin, wherein the concentration of functional groups of the copolymer compatibilizer is in the range of 0.1 to 10 weight percent; and (d) 0.5 to 20 weight percent of a core/shell grafted elastomer having an acid functionalized shell,

said weight percentages being based on the total weight of components (a), (b), (c), and (d) in the blend.

5,089,558

THERMOFORMABLE BLENDS OF MULTIBLOCK POLYMER COMPOSITIONS WITH POLYSTYRENE

James E. Hall, Mogadore, and Daniel F. Graves, Clinton, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation of Ser. No. 343,922, Apr. 26, 1989, abandoned.

This application Jan. 28, 1991, Ser. No. 646,485

Int. Cl.⁵ C08L 25/06, 53/02

U.S. Cl. 525—89 15 Claims

1. A thermoformable resin blend for use in the production of thermoformed products having high clarity consisting essentially of the following components:

- 20 to 75% by weight of at least one homopolymer of a polyvinylaromatic resin prepared from monomers selected from the group consisting of styrene, alpha-methylstyrene, methyl substituted styrene and methyl substituted alpha-methylstyrene;
- 20 to 75% by weight of a S₁-(B/S₂)_n block copolymer prepared in a batch process wherein S₁ and S₂ represent vinylaromatic resin blocks contributing a total of 65 to 95% by weight to the block copolymer, B represents a diene block, (B/S₂) represents a block copolymer, and n \geq 1, and
- 0.5 to 2.25 by weight of a diene/vinylaromatic block copolymer containing 10% to 60% by weight of vinylaromatic monomer contributed units.

5,089,559

FIRE-RETARDANT ORGANIC-PHOSPHORUS SALTS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 309,236, Feb. 13, 1989, Pat. No.

5,002,690, and Ser. No. 360,152, Jun. 1, 1989, Pat. No.

5,010,113. This application Nov. 6, 1990, Ser. No. 609,637

Int. Cl.⁵ C08F 8/40, 85/02, 85/04

U.S. Cl. 525—107 9 Claims

1. A fire retardant plastic comprising a plastic resin composition combined with a salt of an organic-phosphorus acid compound, wherein the said salt is produced by mixing and reacting the following components:

- organic compound that will react with a phosphorus acid compound in the amount of 100 parts by weight and selected from the group consisting of polyols, polyester, polyamides, polyepoxy, alcohols, polyethers, polycarbonate, phenoplasts, aminoplasts, amines, polyamines, polythioesters, polyacetals, polycarbonates, silicones, vegetable oils, ketones, aldehydes, epoxides, organic acids, cellulose, vinyl polymers, vinyl co-polymers, vinyl-diene co-polymers, diene polymers, polyimides, polyesteramides, organic borates and mixtures thereof;
- acidic salt forming compound of phosphorus in the amount of 5 to 100 parts by weight;
- salt forming basic compound in the amount of 1 to 200 parts by weight; the said mixing is carried in such a way that component A and B are reacted first to produce an organic-phosphorus acid compound then component C is reacted with the organic-phosphorus acid compound.

5,089,560

EXOPY RESIN WITH AROMATIC OLIGOMER AND RUBBER PARTICLES

Hugh C. Gardner, and Richard H. Newman-Evans, both of Somerville, N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 248,623, Sep. 23, 1980, abandoned. This application Jan. 5, 1990, Ser. No. 461,232

Int. Cl.⁵ C08L 63/02, 63/04, 63/08

U.S. Cl. 525—109 9 Claims

1. A curable matrix resin formulation comprising (a) from 99 to about 75 wt % of a mixture of 100 pbw of an epoxy resin,

from 10 to 200 pbw of a terminally reactive, amine-terminated aromatic oligomer having a number average molecular weight greater than about 1000, and from 6 to 150 pbw of at least one aromatic diamine hardener; and (b) from 1 to about 25 wt % of cross-linked carboxylated rubber particles having a T_g above about 15° C. and a smallest dimension in the range of from about 1 to about 75 microns, said particles formed by spray drying a carboxylated rubber having from 0.1 to 5 wt % carboxyl functionality selected from the group consisting of carboxylated diene rubbers, carboxylated acrylic rubbers, and mixtures thereof.

5,089,561

ALKYL CARBAMYL METHYLATED AMINOTRIAZINE CROSSLINKING AGENTS AND CURABLE COMPOSITIONS CONTAINING THE SAME

Peter S. Forgione, and Balwant Singh, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn. Division of Ser. No. 120,285, Nov. 12, 1987, Pat. No. 5,006,653, which is a division of Ser. No. 864,627, May 16, 1986, Pat. No. 4,710,542. This application Mar. 11, 1991, Ser. No. 667,740

Int. Cl.⁵ C08F 8/30

U.S. Cl. 525—127 7 Claims

1. An article of manufacture comprising a filler, a cure catalyst, and active hydrogen-containing material; and a triazine compound, wherein the triazine compound is as follows:

a triazine compound selected from

- a triaminotriazine compound of the formula C₃N₆(CH₂OR)_{6-x}(CH₂NHCOOR¹)_x, or;
- a benzoguanamine compound of the formula C₃N₅(C₆H₅)(CH₂OR)_{4-y}(CH₂NHCOOR¹)_y, or;
- an oligomer of (i) or (ii), wherein the R groups are, independently, hydrogen or alkyl from 1 to 12 carbon atoms, the R¹ groups are, independently, alkyl from 1 to 12 carbon atoms, x is in the range of from about 2 to about 6, and y is in the range of from about 2 to about 4.

5,089,562

POLYMER MIXTURE COMPRISING POLYPHENYLENE ETHERS AND POLYOCTENYLENE AND ARTICLES FORMED THEREFROM

Roelof van de Meer, Halsteren, Netherlands, and Marinus E. J. Dekkers, Schenectady, N.Y., assignors to General Electric Co., Selkirk, N.Y.

Filed Sep. 13, 1989, Ser. No. 406,936

Claims priority, application Netherlands, Sep. 14, 1988, 8802258

Int. Cl.⁵ C08L 71/12

U.S. Cl. 525—132 5 Claims

1. A polymer mixture, which comprises: A. a mixture of (1.) a first polyphenylene ether having an intrinsic viscosity of at least 38 ml/g, and (2.) a second polyphenylene ether having an intrinsic viscosity of not more than 33 ml/g; and B. from 0.5 to 50 parts by weight of the polyphenylene ether mixture (A.) of a polyoctenylene.

5,089,563

HIGH VINYL POLYBUTADIENE RUBBER CONTAINING HALOGEN HAVING ENHANCED CURE CHARACTERISTICS

Lawson G. Wideman, Tallmadge, and Kenneth F. Castner, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 174,562, Mar. 29, 1988, abandoned.

This application Nov. 13, 1989, Ser. No. 435,132

Int. Cl.⁵ C08C 19/14

U.S. Cl. 525—332.3 12 Claims

1. A high vinyl polybutadiene rubber having enhanced cure characteristics which is comprised of polybutadiene rubber

having a vinyl content of at least about 60% wherein the polybutadiene rubber contains about 0.2 to about 2 percent halogen atoms based upon the weight of the polybutadiene rubber and wherein the polybutadiene rubber has a number average molecular weight which is within the range of about 100,000 to about 400,000.

5,089,564

CROSSLINKABLE SILYL POLYMER COMPOSITION
David J. Bullock, Hackettstown, N.J., assignor to BP Chemicals Limited, London, England

Division of Ser. No. 375,819, Jul. 5, 1989, Pat. No. 5,025,071.

This application Feb. 5, 1991, Ser. No. 650,780

Claims priority, application United Kingdom, Jul. 13, 1988, 8816657

Int. Cl.⁵ C08F 8/12

U.S. Cl. 525—370

2 Claims

1. A process for preparing a composition capable of being crosslinked by the action of water comprising blending together;

(A) components which react together to form a silyl polymer which is an ethylene polymer containing hydrolyzable silane groups

(B) an ester of a linear dibasic acid having from 4 to 14 carbon atoms and a branched alcohol having from 1 to 14 carbon atoms, and

(C) an organometallic silanol condensation catalyst and subjecting the blend to conditions such that the components (A) react to form a silyl polymer.

5,089,565

PROCESS FOR THE PREPARATION OF CURABLE BINDER COMBINATIONS, THE COMBINATIONS OBTAINABLE BY THIS PROCESS AND THE USE THEREOF

Harald Blum, Wachtendonk; Christian Wamprecht, Neuss; Josef Pedain, Cologne, and Michael Sonntag, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,448

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819942

Int. Cl.⁵ C08C 19/22; C08F 8/32

U.S. Cl. 525—375

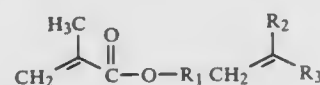
13 Claims

1. Moisture-curing binder composition comprising a moisture-free mixture of A) and B) or reaction product obtained in the absence of moisture of A) and B) wherein:

A) is 30 to 99 parts by weight of copolymers of

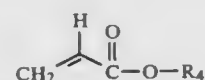
a) 4.5 to 19 parts by weight of maleic anhydride;

b) 45 to 85 parts by weight of at least one monomer of the formulae



or both; and

c) 5 to 65 parts by weight of at least one monomer of the formula



wherein

R₁ and R₄ are the same or different and each represents an aliphatic or cycloaliphatic hydrocarbon radical having 1 to 18 carbon atoms with or without an interrupting oxygen, sulphur or nitrogen hetero atom,

R₂ represents hydrogen, methyl, ethyl, chloro or fluoro and

R₃ represents an aliphatic hydrocarbon radical having 2 to 15 carbon atoms, a cycloaliphatic hydrocarbon radical having 5 to 10 carbon atoms, an araliphatic hydrocarbon radical having 7 to 18 carbon atoms, an aromatic hydrocarbon radical having 6 to 12 carbon atoms, chloro, fluoro, nitrile or a hydrocarbon radical having 2 to 18 carbon atoms and containing one or more hetero atoms comprising oxygen, sulphur and nitrogen in the form of ether, ester, amide, urethane, urea, thioester, thioether, oxirane, ketone, lactam or lactone groups

said copolymers having a molecular weight of 1500 to 75,000, determined by gel permeation chromatography and

B) is 1 to 70 parts by weight of organic compounds having blocked amino groups, wherein B)

comprises organic compounds containing hydrogen atoms which are reactive to acid anhydride groups and contain bicyclic amide aminal groups, but do not contain bicyclic amide acetal groups wherein the ratios of the amounts of the individual components are chosen such that, by taking into account reaction which occurs spontaneously between components A) and B) in the absence of moisture, in the resulting mixture 0.25 to 50 anhydride groups are present per bicyclic amide aminal group.

5,089,566

COMPOSITIONS COMPRISING POLYPHENYLENE ETHER-POLYESTER COPOLYMERS FROM EPOXYTRIAZINE-CAPPED POLYPHENYLENE ETHERS

Sterling B. Brown, Schenectady, and Richard C. Lowry, Saratoga, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 210,266, Jun. 23, 1988,

abandoned. This application May 15, 1989, Ser. No. 351,903

Int. Cl.⁵ C08L 71/12, 77/12

U.S. Cl. 525—396

11 Claims

1. A composition comprising polyphenylene etherpolyester copolymers prepared by the reaction of an epoxytriazine-capped polyphenylene ether with at least one condensation polymer containing carboxy end groups.

5,089,567

COPOLYMER-CONTAINING COMPOSITIONS FROM SUBSTITUTED TRIAZINE-CAPPED POLYPHENYLENE ETHERS

Otto Phanstiel, Clifton Park, and Sterling B. Brown, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 534,573, Jun. 7, 1990, Pat. No. 5,010,144. This application Feb. 11, 1991, Ser. No. 654,443

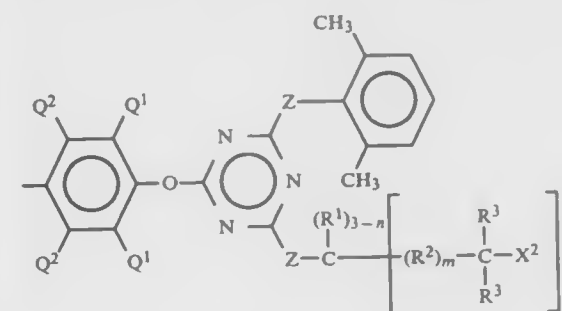
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.⁵ C08G 65/38; C08L 71/12, 67/00, 77/00

U.S. Cl. 525—397

31 Claims

1. A composition comprising copolymers prepared by the reaction of a polymer containing reactive groups with a substituted alkoxy- or alkylthiotriazine-capped polyphenylene ether having end groups of the formula



wherein:

each Q¹ is independently halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein two or more carbon atoms separate the halogen and oxygen atoms;

each Q² is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for Q¹;

X² is a group displaceable by nucleophilic aliphatic substitution;

each X is independently oxygen or sulfur;

each R¹ is independently hydrogen, C₁₋₄ primary or secondary alkyl or a non-hydrocarbon substituent substantially inert to displacement by nucleophilic moieties;

R² is a C₁₋₃ alkylene radical which is unsubstituted or is substituted with moieties selected from the group consisting of C₁₋₄ primary or secondary alkyl radicals and non-hydrocarbon substituents as defined for R¹;

each R³ is independently R¹ or X²;

m is 0 or 1; and

n is 1-3.

5,089,568

PROCESS OF MAKING THERMOPLASTIC COPOLYMERS CONTAINING POLYBENZOXAZOLE, POLYBENZOTHAZOLE AND POLYBENZIMIDAZOLE MOIETIES

William J. Harris, and Wen-Fang Hwang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 11, 1988, Ser. No. 256,338

Int. Cl.⁵ C08G 75/32, 73/22, 73/18

U.S. Cl. 525—410

37 Claims

1. A process for forming a block copolymer comprising the step of contacting:

(a) a first polymer containing a block of PBZ polymer selected from the group consisting of polybenzoxazoles (PBO), polybenzobisoxazoles (PBO), polybenzothiazoles (PBT), polybenzobisthiazoles (PBT), polybenzimidazoles (PBI) and polybenzobisimidazoles (PBI) and a first active end group, linked to the block of PBZ polymer, which contains either:

(1) an azole-forming moiety chosen from the class consisting of electron-deficient carbon groups and o-amino-basic moieties, or

(2) a decoupling group bonded to the block of PBZ polymer and an acylation reactive group, bonded to the decoupling group, chosen from the class consisting of acid groups and aromatic groups,

in mineral acid capable of dissolving it, with either

(1) a thermoplastic polymer containing a polyamide, polyimide, polyquinoxaline, polyquinoline, poly(aromatic ketone), poly(aromatic sulfone) or poly(aromatic ether) or a copolymer of one of those polymers, which thermoplastic polymer is soluble in the mineral acid and is terminated by a second active end group that can react to form a link with the first active end group or

(2) at least one monomer which can react in the mineral acid to form a link with first active end group and to form a

thermoplastic polymer containing poly(aromatic ketone), poly(aromatic sulfone) or poly(aromatic ether) or a copolymer of one of those polymers, under conditions such that a copolymer having a PBZ polymer block and thermoplastic polymer block is formed.

5,089,569

PRIMER COMPOSITIONS

Shosaku Yamamoto, and Kazuo Kakinuma, both of Yokohama, Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan Division of Ser. No. 197,149, May 23, 1988, Pat. No. 4,985,500, which is a continuation of Ser. No. 3,238, Jan. 14, 1987, Pat. No. 4,830,778. This application Nov. 9, 1990, Ser. No. 611,715

Claims priority, application Japan, Jan. 23, 1986, 61-11152

Int. Cl.⁵ C08L 75/04; C08G 18/00

U.S. Cl. 525—452

4 Claims

1. A primer composition consisting essentially of

(A) at least one polyurethane having a glass transition temperature of not higher than -20° C. and an elongation at break of not less than 400% at 20° C., and

(B) at least one crosslinking resin selected from the group consisting of melamine resin, urea resin, and blocked isocyanate resin,

wherein the weight ratio as a solid resin content off component (A) to component (B) is 70-99:30-1.

5,089,570

ORGANIC DISPERSION POLYMERS BASED ON ETHYLENICALLY UNSATURATED MONOMERS WHICH CONTAIN WATER-SOLUBLE GRAFT POLYMERS CONTAINING VINYL ALCOHOL UNITS HAVING A POLYURETHANE GRAFTING BASE, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Karl J. Rauterkus; Matthias Kroggel, both of Kelkheim, and Hans-Ulrich Huth, Egelsbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 26, 1989, Ser. No. 412,845

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1988, 3832877

Int. Cl.⁵ C08F 283/04, 2/20

U.S. Cl. 525—455

5 Claims

1. An organic dispersion polymer based on ethylenically unsaturated, polymerizable or copolymerizable monomers which has been prepared in the presence of protective colloids or protective colloids and emulsifiers by emulsion, suspension or bead polymerization or copolymerization, initiated by free radicals in an aqueous medium and are in aqueous dispersion form or in finely dispersed dry powder form, which contain, as protective colloids, water-soluble graft polymers containing vinyl alcohol units on a polyurethane grafting base, the polyurethane grafting bases containing at least 2 urethane groups in the molecule prepared by reacting diisocyanates and optionally small amounts of monofunctional isocyanates, with diols and optionally half-esterified or half-etherified diol radicals, and grafted thereon polymer radicals or polymeric chains of units of carboxylic acid vinyl esters having 3 to 20 carbon atoms and hydrolysis products thereof and optionally units of at least one other ethylenically unsaturated polymerizable and optionally hydrolyzable monomers and hydrolysis products thereof, the amount of vinyl alcohol units in the water-soluble graft polymers being at least 20% by weight, based on the water-soluble graft polymer, and the degree of hydrolysis of the monomer units originally grafted onto the polyurethane grafting base being at least 50 mol %.

5,089,571

REGENERATED, HIGH MOLECULAR WEIGHT, THERMOPLASTIC RESINS AND PROCESS FOR REGENERATING THERMOPLASTIC RESINS

Henry W. Bonk, Wallingford; Augustin T. Chen, Cheshire, both of Conn., and Benjamin S. Ehrlich, League City, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 4, 1990, Ser. No. 623,487
Int. Cl.⁵ C08L 75/04

U.S. Cl. 525—457 4 Claims

1. A physical blend of thermoplastic polyurethane resins comprising

- 1) a thermoplastic polyurethane resin having free isocyanate groups and a molecular weight of from about 100,000 to about 200,000 with
- 2a) an off-grade thermoplastic polyurethane resin having free active hydrogen groups and having a molecular weight of from about 30,000 to about 150,000; and/or
- 2b) a degraded thermoplastic polyurethane resin having a molecular weight of from about 30,000 to about 150,000, wherein the ratio between ingredient 1) to 2) is from about 0.25:1 to about 5:1.

5,089,572

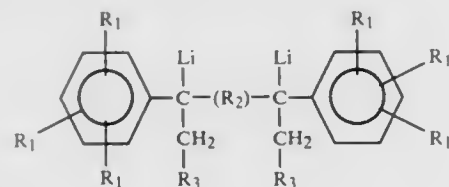
BLANKING PROCESS FOR REACTION MIXTURE

Gary R. Marchand; Joseph G. Schell, Jr.; Brian W. Walther, all of Baton Rouge, La., and Corwin J. Bredeweg, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 157,761, Feb. 19, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 395,176
Int. Cl.⁵ C07B 63/00

U.S. Cl. 526—77 11 Claims

1. A process for blanking a reaction mixture comprising contaminating amounts of a proton donating reactive impurity in order to remove such proton donating reactive impurity but not to initiate reaction of the reaction mixture the steps of the process comprising: adding to the reaction mixture in a reactor wherein the ensuing reaction is to be conducted, at a temperature from 20° C. to 90° C., a sufficient amount to remove the proton donating impurity of a blanking agent comprising a composition corresponding to the formula:



wherein:

- R₁ is independently each occurrence hydrogen or an inert radical having from 0 to 16 carbon atoms;
R₂ is a divalent organic radical having at least 6 carbon atoms, R₂ having at least one aromatic ring and the aromatic ring being directly attached to a carbon which is attached to an aromatic ring of the above formula; and
R₃ is selected from the group consisting of alkyl, cycloalkyl, and aromatic radicals containing from 1 to 20 carbon atoms.

5,089,573

PROCESS FOR THE PRODUCTION OF ELASTOMERIC, PRIMARILY ISOTACTIC POLYOLEFINS AND CATALYSTS FOR USE IN SAID PROCESS

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 26, 1990, Ser. No. 484,314
Int. Cl.⁵ C08F 4/654, 4/649, 10/06

U.S. Cl. 526—124 8 Claims

1. A process for the production of elastomeric, primarily

isotactic polyolefins characterized by short average block lengths which comprises polymerizing olefins in the presence of a catalyst which comprises:

- (a) the reaction product of a magnesium alkoxide and a tetravalent titanium halide wherein the reaction takes place in the presence of an electron donor,
- (b) an organoaluminum compound, and
- (c) a selectivity control agent which is selected from the group consisting of 2,6-dichloropyridine, 2-chloroquinoline, 2-chloro-6-methoxy pyridine, 2,3-dichloroquinoline, 2,4,6-trichloropyrimidine, 2,4,5,6-tetrachloropyrimidine, 2-chlorolepidine and 6-chloro-2-picoline.

5,089,574

TRANS-1,4-POLYBUTADIENE SYNTHESIS

Kenneth F. Castner, Uniontown, Ohio, assignor to The Good-year Tire & Rubber Company, Akron, Ohio

Filed Oct. 22, 1990, Ser. No. 601,100
Int. Cl.⁵ C08F 4/70

U.S. Cl. 526—142 18 Claims

1. In a process for the synthesis of trans-1,4-polybutadiene by polymerizing 1,3-butadiene monomer in the presence of a catalyst system which includes an organocobalt compound, an organoaluminum compound, and a para-alkyl substituted phenol wherein the organocobalt compound is present at a level which is within the range of about 0.01 phm to about 0.5 phm, the improvement which comprises conducting the polymerization in the presence of carbon disulfide as a gel inhibitor wherein the molar ratio of the carbon disulfide to the organocobalt compound is within the range of about 0.05 to about 1.

5,089,575

METHOD FOR THE PREPARATION OF A COPOLYMER OF VINYL CHLORIDE AND AN N-SUBSTITUTED MALEIMIDE COMPOUND

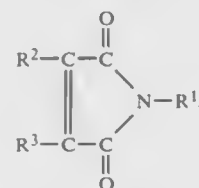
Sadaichi Arima; Kouzou Kuwabara, and Shigehiro Hoshida, all of Ibaraki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 411,845

Claims priority, application Japan, Sep. 28, 1988, 63-243266
Int. Cl.⁵ C08F 2/18

U.S. Cl. 526—200 3 Claims

1. A method for the preparation of a copolymer of vinyl chloride and an N-substituted maleimide compound comprises: suspension-polymerizing a binary monomeric mixture composed of from 50 to 99% by weight of vinyl chloride monomer and from 50 to 1% by weight of an N-substituted maleimide compound represented by the general formula



in which R¹ is an unsubstituted or substituted aliphatic, alicyclic or aromatic monovalent hydrocarbon group having 1 to 30 carbon atoms and R² and R³ are each, independently from the other, an atom of hydrogen, fluorine, chlorine or bromine, a cyano group or an alkyl group having 1 to 3 carbon atoms, in an aqueous polymerization medium containing, as a suspending agent in combination:

- (a) from 0.01 to 0.1 part by weight of a first partially saponified polyvinyl alcohol having an average degree of polymerization in the range from 700 to 3000 and a degree of saponification in the range from 70 to 95%;
- (b) from 0.001 to 0.2 part by weight of a second partially saponified polyvinyl alcohol having an average degree of

polymerization in the range from 300 to 600 and a degree of saponification in the range from 35 to 55%; and
(c) from 0.001 to 0.2 part by weight of a water-soluble cellulose derivative of which a 0.2% by weight aqueous solution has a surface tension not exceeding 55 dyn/cm at 25° C., each amount in parts by weight being per 100 parts by weight of the monomeric mixture.

5,089,576

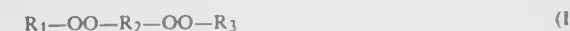
PROCESS FOR PRODUCING CONJUGATED DIENE COPOLYMER

Suguru Tsuji, Tokyo; Toshiaki Saya, Kamakura; Shinji Komiya; Hayato Furusho, both of Yokohama; Tetsu Obishi, Tokyo, and Mitsuhiro Tamura, Sagami, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Filed Mar. 30, 1990, Ser. No. 501,553

Claims priority, application Japan, Apr. 7, 1989, 1-88313
Int. Cl.⁵ C08F 4/36

U.S. Cl. 526—228 14 Claims

1. In a process for producing a conjugated diene copolymer, the improvement in which comprises copolymerizing a conjugated diene monomer with an ethylenically unsaturated nitrile monomer using as a polymerization initiator, at least one compound selected from a bifunctional peroxide represented by formula



wherein R₁ and R₃ are each an alkyl group having 1 to 12 carbon atoms, an acyl group selected from the group consisting of 2-ethylhexanoyl, 3,5,5-trimethylhexanoyl, benzoyl and toluoyl, or a phenyl group, and R₂ is an alkylene group, a phenylene group, a cyclohexenylene group or an ethynylene group, said bifunctional peroxide being soluble in said monomers.

5,089,577

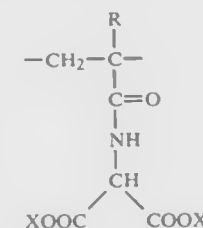
POLYMERS AND COPOLYMERS CONTAINING MALONIC (METH)ACRYLAMIDE UNITS

Fabrizio Bonaccorsi, Livorno; Rosario Pappa; Mario Riocci, both of Monterotondo; Arnaldo Roggero, and Thomas P. Lockhart, both of San Donato Milanese, all of Italy, assignors to Eniricerche S.p.A. and AGIP S.p.A., Milan, Italy
Filed Dec. 18, 1990, Ser. No. 629,409

Claims priority, application Italy, Dec. 21, 1989, 22799 A/89
Int. Cl.⁵ C08F 22/38

U.S. Cl. 526—240 10 Claims

5. A copolymer formed from (I) monomer units of the following general formula:



wherein R is H or CH₃; X is H or an alkaline metal, or NH₄⁺; and (II) units of acrylamide or methacrylamide, the molar ratio of units (I) to units (II) ranging from between 1:99 to 99:1.

5,089,578

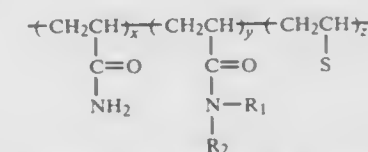
HYDROPHOBICALLY ASSOCIATING TERPOLYMERS CONTAINING SULFONATE FUNCTIONALITY

Paul L. Valint, Asbury, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 845,197, Mar. 28, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,331
Int. Cl.⁵ C08F 228/02

U.S. Cl. 526—240 5 Claims

1. A water-soluble terpolymer having the formula:



wherein S is SO₃M, phenylSO₃M or CONHC(CH₃)₂CH₂SO₃M; R₁ is a C₄ to C₁₈ alkyl cycloalkyl or aralkyl group; R₂ is hydrogen, a C₄ to C₁₈ alkyl, cycloalkyl or aralkyl group; x is about 10 mole percent to about 90 mole percent; y is about 0.1 mole percent to about 10 mole percent and z is about 5 to about 80 mole percent.

5,089,579

PROCESS FOR THE PRODUCTION OF ETHYLENE-VINYL ACETATE COPOLYMERS, NEW ETHYLENE/VINYL ACETATE COPOLYMERS AND THEIR USE

Hubert Sutter, Leverkusen; Alois Kolwert, Roesrath, and Werner Obrecht, Moers, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,543
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843562

Int. Cl.⁵ C08F 20/10

U.S. Cl. 526—323.2 2 Claims

1. Ethylene/vinyl acetate copolymers having a gel content of not more than 0.5% by weight (determined by 24 hours extraction with dichloromethane in a Soxhlet extractor) and containing from 30 to 80% by weight copolymerized vinyl acetate and 50 ppm to 2% by weight of a copolymerized (meth)acryloyl compound containing at least two acryloyl or methacryloyl groups per molecule produced by bulk polymerization of the monomers by the high-pressure method under pressures of 500 to 5,000 bar wherein the polymerization is carried out in the presence of from 50 ppm to 2% by weight, based on the polymerization monomers used, of a (meth)acryloyl compound containing at least two acryloyl or methacryloyl groups per molecule.

5,089,580

Patent Not Issued For This Number

5,089,581

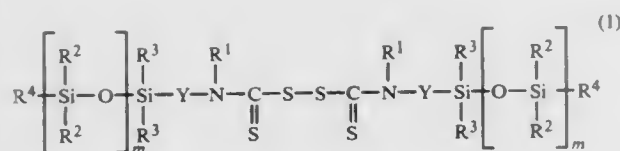
POLYDIORGANOSILOXYLATED THIURAM DISULFIDES AND RADICAL POLYMERIZATION OF VINYL MONOMERS THEREWITH

Gilbert Clouet, La Wantzenau, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 2, 1990, Ser. No. 591,824
Claims priority, application France, Oct. 2, 1989, 89 13056
Int. Cl.⁵ C08G 77/06

U.S. Cl. 528—12 4 Claims

1. A polydiorganosiloxane substituted thiuram disulfide having the formula:



in which the symbols R^1 , which may be identical or different, are each a linear or branched chain C_1 - C_{12} alkyl radical optionally interrupted by an O or N heteroatom and optionally substituted by a tertiary amine group, a C_3 - C_8 cycloalkyl radical, or an aryl, aralkyl or alkylaryl radical; the symbols Y, which may be identical or different, are each a divalent organic radical bonded to the silicon atom by an Si-c bond; the symbols R^2 , which may be identical or different, are each a linear or branched chain C_1 - C_{12} alkyl radical, a 3,3,3-trifluoropropyl radical, or a phenyl radical; the symbols R^3 , which may be identical or different, are each a radical R^2 or an alkoxy radical having from 1 to 8 carbon atoms; the symbols R^4 , which may be identical or different, are each a radical R^3 or a hydroxyl radical; and m is an integer ranging from 1 to 500.

5,089,582

ENCAPSULATED PALLADIUM COMPLEXES AND ONE PART HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Larry N. Lewis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 26, 1990, Ser. No. 484,286

Int. Cl.⁵ C08G 77/06

U.S. Cl. 528-15

4 Claims

1. A one part heat curable organopolysiloxane compositions comprising by weight:

- (A) 100 parts of a vinyl-substituted organopolysiloxane fluid,
(B) 1 to 20 parts of a siloxane hydride and
(C) an amount of an inclusion compound of a cyclodextrin with a complex of a palladium halide and a member selected from the class consisting of cyclooctadiene and nonbornadiene which inclusion compound is effective as a latent palladium catalyst.

5,089,583

HETEROCYCLIC DIORGANOTIN CATALYSTS FOR USE IN POLYURETHANE SYSTEMS

James D. Nichols, and John B. Dickenson, both of Fogelsville, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

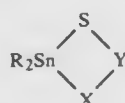
Filed Oct. 20, 1989, Ser. No. 424,778

Int. Cl.⁵ C08G 18/14, 18/22, 18/24; C08F 2/50

U.S. Cl. 528-58

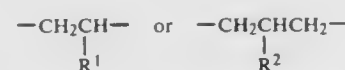
9 Claims

1. In a method for catalyzing the reaction of a polyisocyanate or an at least partially blocked polyisocyanate with a hydroxy-containing compound in the presence of a urethane catalyst, the improvement which comprises as the urethane catalyst an organotin compound of the formula



where

R is a C_1 - C_8 alkyl or an aryl group,
Y is



R^1 is H, $-CH_3$ or $-CH_2OH$ and R^2 is H or $-OH$, and

X is $-S-$ or $-O-$.

5,089,584

POLYMERIC DIORGANOTIN CATALYSTS FOR USE IN POLYURETHANE SYSTEMS

James D. Nichols, and John B. Dickenson, both of Fogelsville, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 20, 1989, Ser. No. 424,855

Int. Cl.⁵ C08G 18/14, 18/22, 18/24; C08F 2/50

U.S. Cl. 528-58

7 Claims

1. In a method for catalyzing the reaction of an isocyanate or blocked isocyanate with a reactive hydrogen-containing compound, the improvement which comprises as the catalyst a composition prepared by reacting about 0.5 to 1 moles $HSCH_2CH(OH)CH_2XH$, where X is $-S-$ or $-O-$, per mole diorganotin oxide or diorganotin dichloride.

5,089,585

TRANSITION METAL BIS(DITHIOLENE) COMPLEX POLYMERS

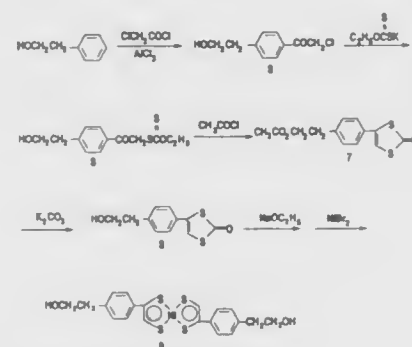
John R. Reynolds, Arlington, Tex., and Fei Wang, Beijing, China, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 1, 1990, Ser. No. 517,677

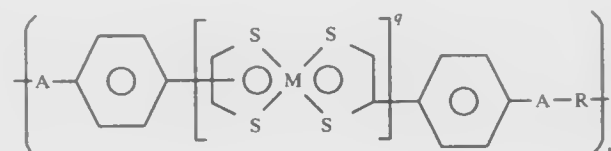
Int. Cl.⁵ C08G 18/32

U.S. Cl. 528-73

46 Claims



1. A polymer having the formula:



wherein:

- A— is derived from a reactive functional group;
—R— is an organic substituent derived from a bifunctional molecule capable of reacting with the reactive functional group;
M is a transition metal;
q is the oxidation state of the transition metal complex; and
n is the chain length of the polymer.

5,089,586

WATER-DISPERSIBLE ALLYL URETHANES AND THEIR USE FOR THE PRODUCTION OF PAINTS

Michael Piepho, Elze; Lutz Hoppe, Walsrode, and Erhard Lüthmann, Bomlitz, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Aug. 16, 1989, Ser. No. 394,601

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829588

Int. Cl.⁵ C08G 18/68; C08L 75/68

U.S. Cl. 528-75

10 Claims

1. Water-dispersible allyl urethanes prepared from an allyl compound, a polyol and an isocyanate, characterized in that they are obtainable by reaction of

- A) a polyglycol mixture I or its reaction product with a polycarboxylic acid II or a derivative IIa thereof with
B) a hydroxyallyl compound III and an isocyanate IV containing at least two isocyanate groups,
the allyl urethanes being nonionic.

5,089,588

HYDROXY-FUNCTIONAL POLY(AMIDE ETHERS) AS THERMOPLASTIC BARRIER RESINS

Jerry E. White; David J. Brennan, both of Midland, Mich., and Steven Pikulin, Somerville, N.J., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 599,212, Oct. 17, 1990, abandoned. This application Feb. 26, 1991, Ser. No. 660,381

Int. Cl.⁵ C08G 59/00, 65/08, 65/14

U.S. Cl. 528-99

9 Claims

1. A thermoplastic polymer having excellent barrier to oxygen in both dry and moist environments and having repeating units represented by the formula:



wherein each Ar^1 is independently a divalent aromatic moiety, each R^1 is a predominantly hydrocarbylene moiety, each R^2 is independently hydrogen or a monovalent hydrocarbyl or substituted hydrocarbyl moiety, and each R^3 is independently a predominantly hydrocarbylene moiety.

5,089,589

PROCESS FOR THE PREPARATION OF NOVOLAKS AND THEIR USE

Wolfgang Hesse, Taunusstein; Klaus Hofmann, Ingelheim, and Erhard Leicht, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 22, 1990, Ser. No. 467,851

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1989, 3901930

Int. Cl.⁵ C08G 8/04, 14/02, 8/20; C08F 6/00

U.S. Cl. 528-129

8 Claims

1. A process for the preparation of novolaks from a phenol or a plurality of phenols an oxo compound or a plurality of oxo compounds by condensation of the phenol and oxo-compound reactants in a water-containing medium consisting essentially of condensing the reactants in a medium having a low water content in homogeneous phase at temperatures of $\geq 110^\circ\text{C}$, in the presence of water-immiscible or only partially water-miscible inert organic solvents and of acids as a catalyst, with removal of water by distillation, and preparing or maintaining the medium having a low water content by azeotropically distilling off water from the reaction mixture and recycling of the organic solvent.

5,089,590

LIQUID CRYSTALLINE COMPOUNDS, THEIR PRODUCTION AND THEIR USE AS MODIFIERS FOR POLYCARBONATES, POLYESTER CARBONATES AND POLYESTERS

Harald Pielartzik; Rolf-Volker Meyer; Ralf Dujardin, all of Krefeld; Axel Schnitzler, Langenfeld, and Hans-Joachim Traenckner, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 377,320, Jul. 10, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 643,442

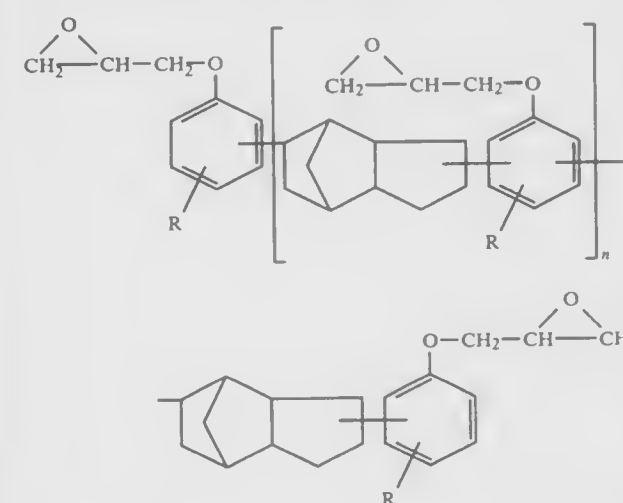
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824365

Int. Cl.⁵ C08G 63/64

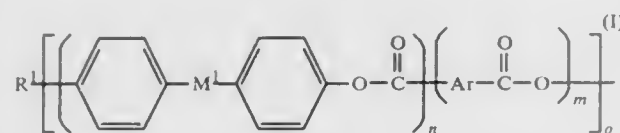
U.S. Cl. 528-176

3 Claims

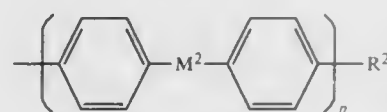
1. Compounds corresponding to formula (1):



wherein R is a hydrogen atom or a methyl group, and n is an integer of 0 to 15, and wherein said resin has an epoxy equivalent in the range of 320-345g/eq.



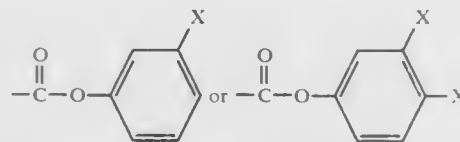
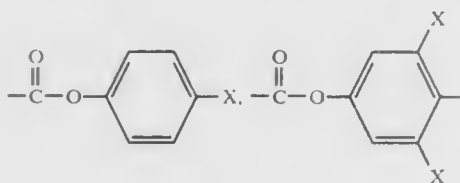
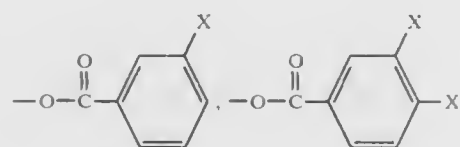
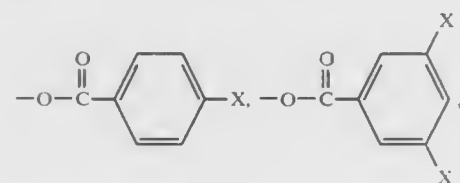
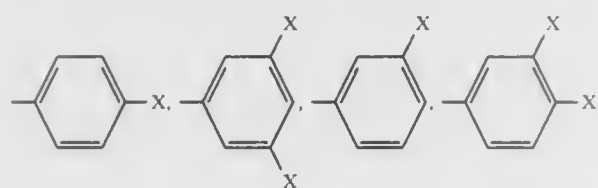
m is 1 or 2,
n is 1 or 2,
o is 1 or 2, and
p is 1.



in which

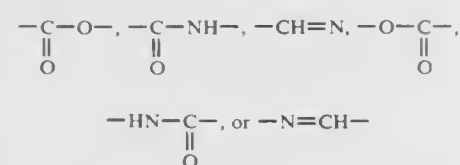
-Ar is an aromatic group which may be mononuclear or polynuclear; the polynuclear radical may be attached by one bond or annellated,

R¹ and R² may be the same or different and represent a group corresponding to one of the following formulae:



where X represents the substituents chlorine, O-C₁₄-alkyl, C₃₋₆-cycloalkyl, O-C₆₋₁₄-aryl, C₁₋₄-alkyl, C₃₋₆-cycloalkyl, C₆₋₁₄-aryl, fluorinated C₁₋₄-alkyl, fluorinated C₃₋₆-cycloalkyl and fluorinated C₆₋₁₄-aryl,

M¹ and M² may be the same or different and represent groups with two bonds corresponding to one of the following formulae:



5,089,591 RAPID ADVANCEMENT OF MOLECULAR WEIGHT IN POLYBENZAZOLE OLIGOMER DOPES

Thomas Gregory, Midland; Carl W. Hurtig, Stade, Fed. Rep. of Germany; Harvey D. Ledbetter, Midland, Mich.; Kenneth J. Quackenbush, Saginaw, Mich., and Steven Rosenberg, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

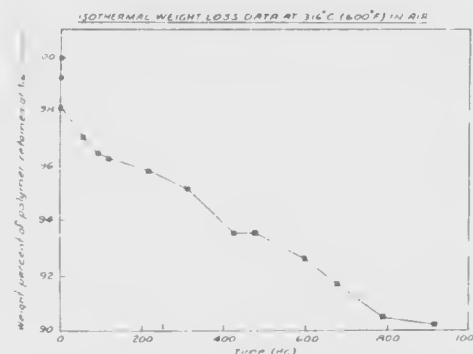
Filed Oct. 19, 1990, Ser. No. 600,549
Int. Cl.⁵ C08G 75/00, 63/00, 63/06

U.S. Cl. 528—185 35 Claims
1. A process for synthesizing a polybenzazole polymer comprising the step of maintaining a liquid crystal mixture containing solvent acid and functionally terminated polybenzazole oligomers at a temperature of at least about 150° C. under shear of at least about 10 sec.⁻¹ under conditions such that a polybenzazole polymer is formed in no more than about 1 hour.

5,089,592 BISCYCLOBUTARENE MONOMER COMPRISING TWO CYCLOBUTARENE MOIETIES BRIDGED BY A DIVALENT RADICAL COMPRISING AT LEAST ONE BENZOTHAZOLE OR BENZIMIDAZOLE LINKAGE

Alan K. Schrock, Lake Jackson, Tex.; William J. Harris, and Norman L. Madison, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 205,141, Jun. 9, 1988, Pat. No. 4,864,010. This application May 25, 1989, Ser. No. 355,767
Int. Cl.⁵ C08F 38/00, 132/08; C08G 63/00
U.S. Cl. 528—185 7 Claims



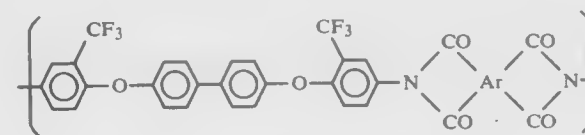
1. A biscyclobutarene monomer comprising two cyclobutarene moieties bridged by a divalent radical comprising at least one benzothiazole or benzimidazole linkage.

5,089,593 POLYIMIDE CONTAINING 4,4'-BIS(4-AMINO-2-TRIFLUOROMETHYLPHENOXY)-BIPHENYL MOIETIES

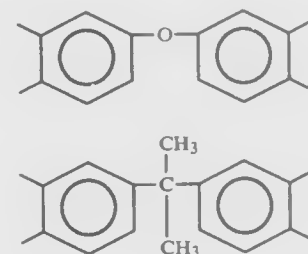
Douglas E. Fjare, Naperville, and Neal R. Nowicki, St. Charles, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 212,511, Jun. 28, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 463,147
Int. Cl.⁵ C08G 63/00, 69/26, 8/02, 14/04
U.S. Cl. 528—188 9 Claims

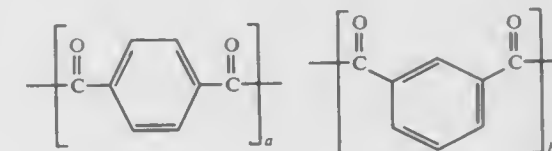
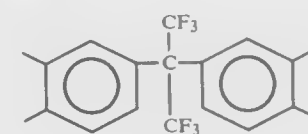
1. A polyimide composition comprising recurring units of



wherein Ar is selected from the group consisting of

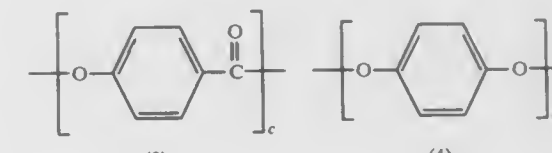


and



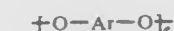
(1)

(2)



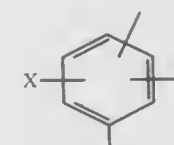
(3)

(4)

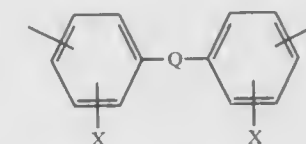


(5)

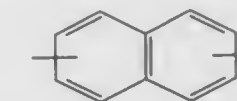
wherein Ar comprises at least one member selected from the group consisting of I, a divalent substituted mononuclear aromatic radical of the formula



wherein X is independently hydrogen, a C₁ to C₅ alkyl group, a halide atom or an aryl group; with the proviso that when the valence bonds are para to each other at least one group X must be other than hydrogen; and II, a divalent dinuclear aromatic radical of the formula



wherein X is as previously defined, and Q is selected from the group consisting of O, S, SO, S—S, SO₂, CO or Q represents a chemical bond; and III, a divalent naphthalene radical of the formula



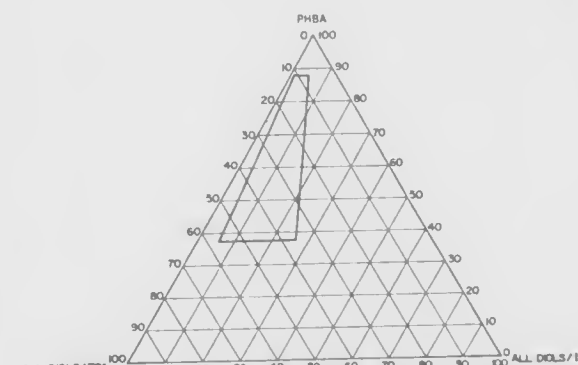
or isomers thereof, and wherein a+b is approximately equal to d+e; the ratio of a to b being in the range of from about 0.42:1 to about 2.33:1; the ratio of d to e being in the range of from about 5:1 to about 99:1; and c being in the range of from about 0.15 to about 0.8 moles per each mole of monomers corresponding to the sum of units (1) and (2).

5,089,594 WHOLLY AROMATIC POLYESTER OF ISOPHTHALIC ACID, TEREPHTHALIC ACID, P-HYDROXYBENZOIC ACID, HYDROQUINONE AND AN ARYLENE DIOL

Brian A. Stern, Evans, Ga.; Markus Matzner, Edison, N.J., and Richard Layton, Augusta, Ga., assignors to Amoco Corporation, Chicago, Ill.

PCT No. PCT/US89/04329, § 371 Date Jun. 4, 1990, § 102(e)
Date Jun. 4, 1990, PCT Pub. No. WO90/03992, PCT Pub. Date Apr. 19, 1990
Continuation-in-part of Ser. No. 255,670, Oct. 11, 1988, abandoned, and a continuation-in-part of Ser. No. 317,525, Mar. 1, 1989, abandoned. This PCT application Oct. 10, 1989, Ser. No. 499,481

Int. Cl.⁵ C08G 63/02, 63/18; C08J 1/00
U.S. Cl. 528—194 9 Claims



1. A wholly aromatic polyester comprising the units (1), (2), (3), (4) and (5)

5,089,595

FLAME-PROOF POLYCARBONATE CONTAINING UNITS DERIVING FROM HALOGENATED MACROCYCLIC COMPOUNDS

Alberto Petri, Milan, Italy, assignor to Enichem Tecnorefine S.p.A., Palermo, Italy

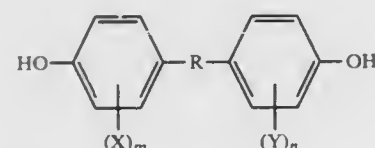
Division of Ser. No. 371,513, Jun. 26, 1989, Pat. No. 4,987,269. This application Aug. 28, 1990, Ser. No. 573,875

Claims priority, application Italy, Jul. 8, 1988, 21284 A/88 Int. Cl.⁵ C08G 64/04

U.S. Cl. 528—204

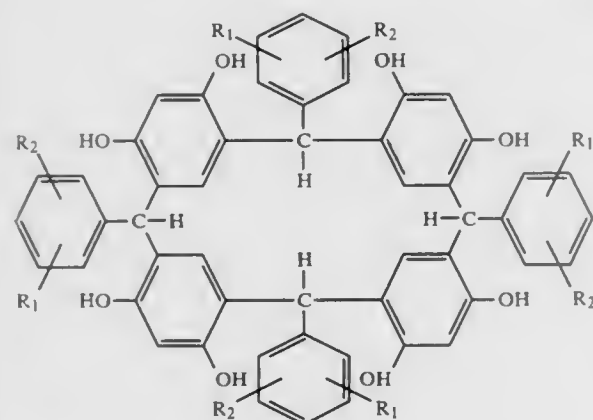
5 Claims

1. A thermoplastic, branched high-molecular-weight polycarbonate having flame-proof properties comprising units from a di-hydroxy-aromatic compound having the formula:



wherein:

R is a single bond; or
R is a linear or branched, either substituted or non-substituted, alkylene radical of from 1 to 5 carbon atoms; or
R is selected from the group consisting of O, S, SO₂, CO; X, Y which are either equal to, or different from, each other, are either H or CH₃;
m, n which are either equal to, or different from, each other, are integers comprised within the range of from 1 to 4; and units from a halogenated macrocyclic compound having the formula:



wherein:

R₁ is hydrogen or OH or chlorine or bromine, and
R₂ is chlorine or bromine.

5,089,596

PRODUCTION OF AROMATIC SULFIDE/KETONE POLYMERS WITH SEPARATION AGENT

Michael D. Clifton, Kingsport, Tenn.; Jerry O. Reed, Bartlesville, Okla.; Rex L. Bobsein, Bartlesville, Okla., and Jon F. Geibel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 22, 1990, Ser. No. 527,233
Int. Cl.⁵ C08G 2/18, 75/16

U.S. Cl. 528—222

16 Claims

1. A method for preparing aromatic sulfide/ketone polymer comprising the steps of

a) charging to a polymerization reaction vessel, and thereby contacting at least one polar organic compound, at least one dihaloaromatic ketone, at least one alkali metal sul-

fide, and water under polymerization conditions effective for producing a first polymerization reaction mixture;

b) heating said first polymerization reaction mixture to an elevated temperature of about 280° C. to about 350° C. and maintaining said first polymerization reaction mixture at said elevated temperature for about 10 seconds to about 1 hour thereby producing a second polymerization reaction mixture;

c) adding at least one separation agent to said second polymerization reaction mixture wherein the amount of separation agent added is about 50 to about 500 mL per g-mole of said dihaloaromatic ketone charged in step a); wherein said at least one separation agent is added at a rate of about 10 to about 150 mL/minute per g-mole of said dihaloaromatic ketone charged in step a);

d) cooling the mixture obtained from step c) to a temperature below the polymer solidification temperature thereby producing a mixture comprising particles of said aromatic sulfide/ketone polymer; and wherein said separation agent is a non-solvent for said aromatic sulfide/ketone polymer.

5,089,597

METHOD TO RECOVER GRANULAR POLY(ARYLENE SULFIDE KETONE) AND POLY(ARYLENE SULFIDE DIKETONE)

Aff M. Nesheiwat, Madison, N.J., and John E. Geibel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 187,756, Apr. 28, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 458,919 Int. Cl.⁵ C08G 2/00

U.S. Cl. 528—226

26 Claims

1. A process for treating a first solid particulate resin selected from the group consisting of poly(arylene sulfide ketone)s and poly(arylene sulfide diketone)s in a first slurry, wherein said first resin is dispersed in a liquid component comprising a polar organic compound, said process comprising:

(a) liquifying said first solid particulate resin to form a first mixture comprising said liquified resin and said polar organic compound;

(b) adding, to said first mixture, an amount of at least one separation agent effective to produce a second mixture;

(c) reducing the temperature of said second mixture sufficiently to solidify said liquified resin and form a second slurry comprising a second particulate resin dispersed in said polar organic compound, wherein said second resin has a bulk density greater than that of said first solid particulate resin.

5,089,598

ENDCAPPED, CHAIN-EXTENDED AND BRANCHED POLYESTERS

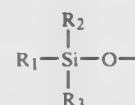
Christopher M. Hawkins, Sehenectady, N.Y.; Edgar E. Bostick, and James L. Derudder, both of Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 5, 1990, Ser. No. 594,599
Int. Cl.⁵ C08G 63/91

U.S. Cl. 528—272

10 Claims

1. A resin which comprises a polyester resin, end-capped with a monovalent moiety of the formula:



wherein R₁, R₂ and R₃ are each independently selected from the group consisting of hydrocarbyl, halogen-substituted hydrocarbyl and hydrocarbyloxy.

5,089,599

THERMOSETTING RESIN COMPOSITION COMPRISING BIS-IMIDE AND BIS-OXAZOLINE

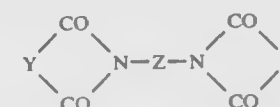
Larry S. Corley, and Kenneth C. Dewhurst, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1990, Ser. No. 589,838
Int. Cl.⁵ C08G 73/12

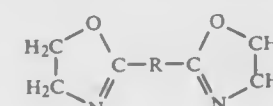
U.S. Cl. 528—322

24 Claims

1. A composition comprising:
(a) a bisimide of an unsaturated dicarboxylic acid which can be represented by the formula



which Y is a substituted or unsubstituted divalent group containing at least 2 carbon atoms and a carbon-carbon double bond, and Z is a divalent linking group; and
(b) a bisoxazoline compound represented by the formula



in which R is a divalent linking group.

5,089,600

AMIDE-UREA COPOLYMER AND PROCESS FOR THE PREPARATION THEREOF

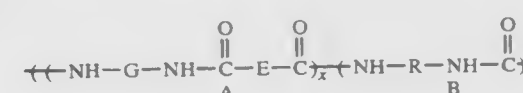
Kenneth P. Blackmon, Mobile, Ala.; Donald C. Clagett, Pittsfield, Mass.; Daniel W. Fox, Pittsfield, Mass.; Louis M. Maresca, Pittsfield, Mass., and Sheldon J. Shafer, Phoenix, Ariz., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 139,482, Dec. 30, 1987, Pat. No. 4,876,317. This application Aug. 16, 1989, Ser. No. 394,581
Int. Cl.⁵ C08G 69/26, 71/02

U.S. Cl. 528—335

14 Claims

1. A copolymer having recurring units of the general formula



wherein units A comprise from about 1 to about 99 percent by weight of said copolymer and units B comprise from about 99 to about 1 part by weight of said copolymer, where E is selected from the group consisting of divalent alkyl, aryl, cycloalkyl, arylalkyl and alkylaryl groups of from 2 to 30 carbon atoms or a mixture of any of the foregoing, optionally substituted with at least one chlorine, bromine, fluorine, nitro, nitrile, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms or aryl of from 6 to 20 carbon atoms; G is a divalent alkyl, aryl, cycloalkyl, arylalkyl or alkylaryl group of from about 2 to 30 carbon atoms, or a mixture of any of the foregoing, optionally interrupted with alkylene, arylene, carbonyl, ether, amino or sulfur-containing groups, optionally substituted with at least one of chlorine, bromine, fluorine, nitro, nitrile, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms or aryl of from 6 to 20 carbon atoms; R is as defined for G and x and y are each integers of from 1 to 100,000.

5,089,601

CHLOROPRENE POLYMER

Shinji Ozoe, Shinnanyo, and Hiroshi Yamakawa, Kudamatsu, both of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

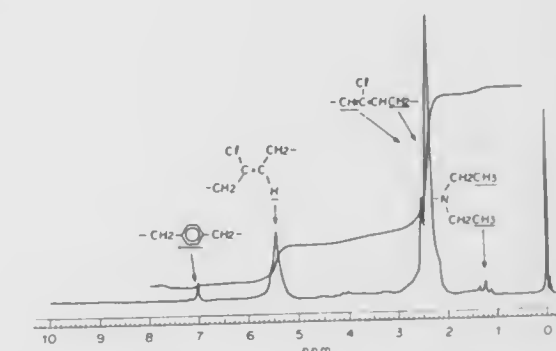
Filed Sep. 7, 1990, Ser. No. 578,535

Claims priority, application Japan, Sep. 7, 1989, 1-230386; Jan. 18, 1990, 2-7214; Apr. 5, 1990, 2-89241
Int. Cl.⁵ C08G 75/26

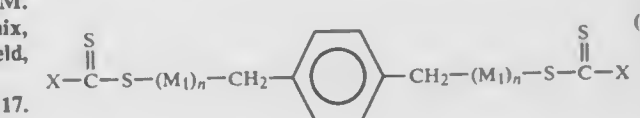
U.S. Cl. 528—390

9 Claims

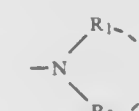
1. A chloroprene polymer having dithiocarbamate groups at both terminals, represented by the following formula (I):



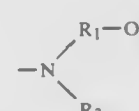
1. A chloroprene polymer having dithiocarbamate groups at both terminals, represented by the following formula (I):



wherein M₁ is a chloroprene monomer residue; X is a group represented by the following formula (II):



wherein R₁ is a C₁-C₈ alkyl group, R₂ is a C₁-C₈ alkyl group or a hydrogen atom, R₁ and R₂ may be the same or different, or R₁ and R₂ together form a C₃-C₈ methylene group so that they form a cyclic group together with the adjacent nitrogen atom, or a group represented by the following formula (III):



wherein R₁ is a C₁-C₈ alkyl group, and R₂ is a C₁-C₈ alkyl group or a hydrogen atom; and n is a natural number of from 10 to 5,000 when X is the group of the formula (II) or a natural number of from 5 to 100 when X is the group of the formula (III).

5,089,602

PROCESS FOR THE MANUFACTURE OF
APOLIPOPROTEINS FROM HUMAN BLOOD PLASMA
OR SERUM

Henri Isliker, Lausanne, Switzerland; Manuel C. Peitsch, Frederick, Md.; Hans J. Heiniger; Peter G. Lerch, both of Bern, Switzerland, and Jean J. Morgenthaler, Boll, Switzerland, assignors to Rotkreuzstiftung Zentrallaboratorium Blutspendedienst SRK, Bern, Switzerland

Continuation of Ser. No. 307,289, Feb. 7, 1989, abandoned. This application Mar. 11, 1991, Ser. No. 670,473

Claims priority, application Switzerland, Feb. 8, 1988, 431/88
Int. Cl.⁵ C07K 3/02, 3/12; A61K 35/6, 37/00

U.S. Cl. 530—359 16 Claims

1. A process of preparing apolipoproteins, which comprises the following steps:

- providing an apolipoprotein-containing fraction resulting from subjecting human blood plasma or serum to an ethanol precipitation process;
- suspending said fraction in an aqueous buffer solution having a pH of 3 to 9 to obtain a suspension;
- adding a lower aliphatic alcohol to said suspension and incubating the resulting mixture to precipitate undesirable contaminants from said mixture and form an apolipoprotein-containing phase;
- separating said apolipoprotein-containing phase from the precipitated contaminants; and
- concentrating the separated apolipoprotein-containing phase to a higher concentration of apolipoproteins to obtain a product which contains mostly apolipoprotein A-I.

5,089,603

ANTIGENIC EPITOPES PRESENT ON
MEMBRANE-BOUND BUT NOT SECRETED IGA

Tse-wen Chang; and Nancy T. Chang, both of Houston, Tex., assignors to Tanox Biosystems, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 369,479, Jun. 21, 1989. This application Dec. 22, 1989, Ser. No. 455,080

The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.

Int. Cl.⁵ C07K 15/28; C12N 5/00

U.S. Cl. 530—387 2 Claims

1. A chimeric antibody which binds specifically to human IgA on the surface of B-cells, but does not bind to secreted, soluble IgA, the antibody having a murine antigen binding region and a human heavy chain constant region.

5,089,604

ASIALOGLYCOPROTEIN ACCEPTOR-DIRECTING
COMPOUND HAVING CHELATEFORMING
COMPOUND CHEMICALLY BONDED THERETO

Komei Washino; Miki Kurami, and Nobuo Ueda, all of Chiba, Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Division of Ser. No. 139,558, Dec. 30, 1987, Pat. No. 5,032,678. This application Oct. 18, 1989, Ser. No. 423,212

Claims priority, application Japan, Dec. 30, 1986, 61-312434; Dec. 30, 1986, 61-312435; Dec. 30, 1986, 61-312436

Int. Cl.⁵ C07K 15/14

U.S. Cl. 530—395 2 Claims

1. A compound useful as a carrier for a radioactive metallic element, which consists of at least one unit of (1) an asialoglycoprotein acceptor-directing compound selected from the group consisting of neogalactalbumin, asialooromucoid, asialofetuin, asialocelluloplasmin, asialohaptoglobin, galactose-bonded polylysine and galactose-bonded polyglycosamine, and at least one unit of (2) diethylenetriaminepentaacetic acid chemically bonded thereto.

5,089,605

IMMOBILIZED IMMUNOGLOBULIN-BINDING
PROTEINS

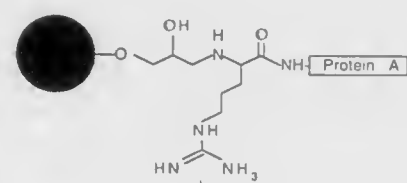
Albert T. Profy, Cambridge; Margaret A. Belew, Medford, and Walter C. Herlihy, Beverly, all of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed Mar. 13, 1987, Ser. No. 25,466

Int. Cl.⁵ C07K 17/06, 3/18

U.S. Cl. 530—402

31 Claims



7. An immobilized immunoglobulin-binding protein material comprising an immobilization support material covalently joined through a linker to an immunoglobulin-binding protein wherein said linker comprises arginine, and wherein said immunoglobulin-binding protein is selected from the group consisting of protein A, any of domains A, B, C, D, and E of protein A, and any combination of domains A, B, C, D, and E of protein A, and said immunoglobulin-binding protein is directly covalently joined to a terminal arginine of said linker.

5,089,606

WATER-INSOLUBLE POLYSACCHARIDE HYDROGEL
FOAM FOR MEDICAL APPLICATIONS

Susan M. Cole, Minneapolis; James E. Garbe, Inver Grove Heights, and Lewis P. Woodson, Eagan, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 301,164, Jan. 24, 1989, and Ser. No. 301,312, Jan. 24, 1989, Pat. No. 4,948,575. This application Aug. 13, 1990, Ser. No. 566,269

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.⁵ A61M 5/08; A61L 15/42, 25/00; A61K 31/715

U.S. Cl. 536—54 25 Claims

1. A water-insoluble polysaccharide hydrogel foam comprising:
(a) about 0.02 to 60 percent by weight of one or more polysaccharides complexed with a di- or trivalent metal salt;
(b) the gaseous reaction product of an effervescent compound and a biocompatible, water-soluble acid in a concentration sufficient to provide the cured hydrogel foam with a density of from about 0.1 to 1 g/cm³; and
(c) from about 50 to 98 percent by weight of an aqueous medium.

5,089,607

PROCEDURE FOR THE SEPARATION OF STARCH
FROM A RESIDUAL FLOW OF THE STARCH
PREPARATION AND STARCH THUS OBTAINED

Luc E. Boni, Buggenhout, and Frank R. Van Lancker, Ghent, both of Belgium, assignors to Amylum, naamloze vennootschap, Brussels, Belgium

Filed Dec. 21, 1989, Ser. No. 454,621

Claims priority, application Belgium, Jan. 9, 1989, 8900020
Int. Cl.⁵ C08B 30/00, 31/00

U.S. Cl. 536—102 9 Claims

1. Procedure for the separation of starch from a residual flow of the starch preparation from grain from the group of wheat, rye, barley and oats, according to which procedure an enzyme preparation that shows pentosanase activity is added and allowed to react on the residual flow and this residual flow

is afterward separated into a starch fraction and a shunt flow, characterized in that prior to adding the enzyme preparation, the residual flow is thickened to a dry material content of 17 to 25 weight % and the enzyme preparation is allowed to react for 0.5 to 4 hours with a pH of 2.6 to 3.7 and at a temperature between 30° and 50° C.

5,089,608

SELECTIVE 6-ACYLATION OF SUCROSE MEDIATED
BY CYCLIC ADDUCTS OF DIALKYL TIN OXIDES AND
DIOLS

Robert E. Walkup, Watkinsville; Nicholas M. Vernon, and Robert E. Wingard, Jr., both of Athens, all of Ga., assignors to McNeil-PPC, Inc., Milltown, N.J.

Filed Mar. 23, 1990, Ser. No. 499,731

Int. Cl.⁵ C07H 1/00, 13/02; G08B 37/00

U.S. Cl. 536—124

16 Claims

1. Process which comprises the steps of:

- (a) reacting a di(hydrocarbyl)tin oxide with a compound selected from the group consisting of dihydric alcohols, alkanolamines, and enolizable α -hydroxyketones, in an inert organic reaction vehicle with removal of water and at a temperature and for a period of time sufficient to produce a cyclic adduct of said di(hydrocarbyl)tin oxide and said dihydric alcohol, alkanolamine, or enolizable α -hydroxyketone;
- (b) reacting said cyclic adduct product of Step (a) with sucrose in an inert organic reaction vehicle at a temperature and for a period of time sufficient to produce a 6-O-[di(hydrocarbyl)(hydroxyhydrocarbyl)stannoxyl]sucrose, a 6-O-[di(hydrocarbyl)(aminohydrocarbyl)stannoxyl]sucrose, or a 6-O-[di(hydrocarbyl)(oxohydrocarbyl)stannoxyl]sucrose; and
- (c) reacting the product of Step (b) with an acylating agent to produce a sucrose-6-ester.

5,089,609

4-BENZOYL AZETIDINONES

Samuel Chackalamannil, W. Paterson, N.J., assignor to Schering Corporation, Kenilworth, N.J.

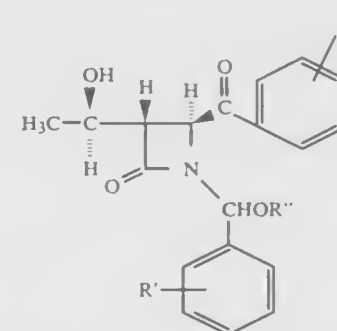
Division of Ser. No. 496,468, Mar. 20, 1990, Pat. No. 5,008,404, which is a division of Ser. No. 227,084, Nov. 28, 1988, Pat. No. 4,963,670, which is a division of Ser. No. 127,844, Dec. 2, 1987, Pat. No. 4,827,006, which is a division of Ser. No. 839,307, Mar. 13, 1986, Pat. No. 4,740,595. This application Nov. 30, 1990, Ser. No. 621,158

Int. Cl.⁵ C07D 205/08

U.S. Cl. 540—200

2 Claims

1. A compound represented by the formula



wherein each R' is independently hydrogen, one, two or three of halogen, lower alkyl or lower alkoxy and R'' is methyl, ethyl, allyl or a phenyl.

5,089,610

RING-CLOSURE METHOD FOR
1-CARBACEPHALOSPORIN SIX-MEMBERED RING

Robert J. Ternansky, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

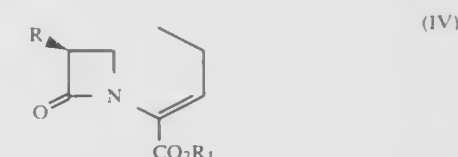
Filed Apr. 25, 1991, Ser. No. 691,257

Int. Cl.⁵ C07D 463/00; C07B 37/10

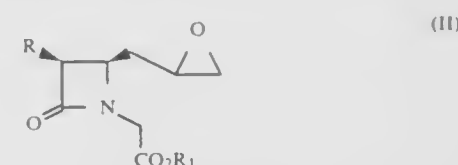
U.S. Cl. 540—205

9 Claims

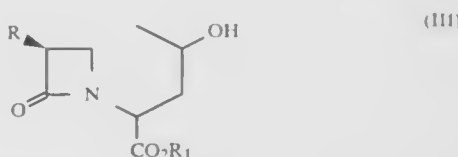
1. A process for the preparation of compounds of the formula (IV)



wherein R is a protected amino group and R₁ is a carboxy-protecting group, which includes the step of reacting a compound of formula (II)



with a strong base under substantially anhydrous conditions in the presence of an inert organic solvent for a time and at a temperature sufficient to form a compound of the formula (III)



and thereafter dehydrating the compound of formula (III) to form a compound of formula (IV).

5,089,611

ALKYL-2-THIOSUBSTITUTED-3-SUBSTITUTED-2-
BUTENOATES AND THEIR SYNTHESIS

Jacob Mathew, Fenton, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

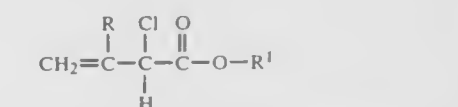
Filed Mar. 12, 1990, Ser. No. 492,511

Int. Cl.⁵ C07D 279/02; C07C 67/30, 323/14, 323/19

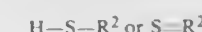
U.S. Cl. 544—3

9 Claims

1. A method of preparing an alkyl 2-thiosubstituted-3-substituted-2-butenate comprising reacting
a. an alkyl 2-chloro-3-substituted-3-butenate of the formula



wherein R is a C₁ to C₁₂ hydrocarbon moiety and R¹ is a C₁ to C₁₂ alkyl moiety; and
b. a thio compound of the formula:



wherein R² is a phenyl or a thiazine moiety; under phase transfer alkylation conditions.

5,089,612

THIADIAZINE COMPOUND AND METHOD FOR PREPARING SAME

Masahiko Yasumoto, Toride; Tohru Tsuchiya; Isao Shibuya, both of Tsukuba, and Midori Goto, Abiko, all of Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,401

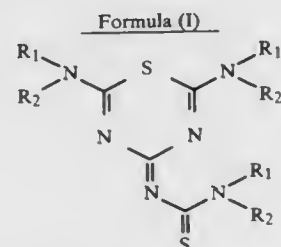
Claims priority, application Japan, Mar. 8, 1989, 1-55880

Int. Cl.⁵ C07D 285/34, 417/04, 417/14, 417/12

U.S. Cl. 544—8

9 Claims

1. A 2,6-bis(disubstituted amino)-4-dialkyl-thiocarbamoylimino-1,3,5-thiadiazine compound represented by the following formula (I):



wherein R₁ and R₂, which may be the same or different, each represent a C₁₋₈ alkyl group, or R₁ and R₂ may bond together to form a 3- to 8-membered ring.

5,089,613

PROCESS FOR THE DIRECT AND REGIOSELECTIVE FUNCTIONALIZATION IN POSITION 2 OF PHENOTHIAZINE

Mariano Meneghin, Revine-Lago, Italy, assignor to Zambon Group S.p.A., Vicenza, Italy

Filed Apr. 5, 1991, Ser. No. 680,942

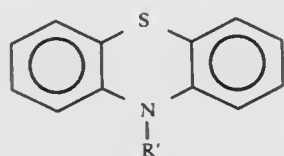
Claims priority, application Italy, Apr. 9, 1990, 19976 A/90; Jul. 26, 1990, 21073 A/90

Int. Cl.⁵ C07D 279/20, 279/30, 45/06

U.S. Cl. 544—35

7 Claims

1. A process for the preparation of 2-alkylthiophenothiazines by direct functionalization of phenothiazine which comprises reacting a phenothiazine N-protected by an acyl group having the formula



wherein R' is an acyl group of a C₁₋₆ aliphatic carboxylic acid or of benzoic acid, with a sulfonating agent selected from the class consisting of sulfuric acid, sulfuric anhydride, chlorosulfonic acid, and oleum in order to obtain, after work-up of the reaction mixture, a phenothiazine-2-sulfonic acid, reducing this or, optionally, its acyl chloride derivative, to obtain 2-mercapto-phenothiazine, and subsequently S-alkylating this last to thereby obtain the desired target compound.

5,089,614

POLYSUBSTITUTED 2-MORPHOLONES

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

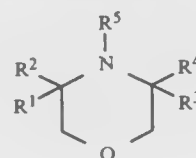
Division of Ser. No. 101,523, Sep. 28, 1987, Pat. No. 4,914,232, which is a continuation-in-part of Ser. No. 750,438, Jul. 1, 1985, abandoned, which is a division of Ser. No. 367,631, Apr. 12, 1982, Pat. No. 4,528,370. This application Mar. 29, 1990, Ser. No. 501,455

Int. Cl.⁵ C07D 295/04, 295/08, 265/32

U.S. Cl. 544—71

6 Claims

1. A polysubstituted morpholine having the structure:



wherein,

R¹, R², R³ and R⁴ are independently selected from the group consisting of aryl, alkyl each having from 1 to 24 carbon atoms, cycloalkyl having from 5 to 7 carbon atoms, aralkyl having from 7 to 20 carbon atoms, cyanoalkyl having from 2 to 12 carbon atoms, ether having from 4 to 18 carbon atoms, and hydroxyalkyl having from 1 to 18 carbon atoms, so that each C atom on either side of the N atom is disubstituted;

R¹ and R² together, or R³ and R⁴ together, or each pair, may be cyclized forming a ring having from 5 to 8 carbon atoms;

R⁵ is selected from hydrogen, oxygen, and alkyl having from 1 to 24 carbon atoms, and hydroxyl; except that not more than three of R¹, R², R³ or R⁴ may be cyclic.

5,089,615

COMPOUND,

5,6,7,8-TETRAHYDRO-1-(1,2,3,4-ACRIDIN-9-YL)-2H-3,1-BENZOXAZINE-2,4-(1H)DIONE

Lawrence L. Martin, Lebanon; Joseph F. Payack, Somerset, and Helen H. Ong, Whippany, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 371,228, Jun. 26, 1989, Pat. No. 4,999,358. This application Jan. 11, 1991, Ser. No. 640,348

Int. Cl.⁵ C07D 265/26

U.S. Cl. 544—94

1 Claim

1. The compound 5,6,7,8-tetrahydro-1-(1,2,3,4-tetrahydroacridin-9-yl)-2H-3,1-benzoxazine-2,4(1H)-dione.

5,089,616

PROCESS FOR THE PREPARATION OF (1S-(1R*,2S*,3R*))-(4-MORPHOLINYL-SULFONYL)-L-PHENYLALANYL-3-(2-AMINO-4-THIAZOLYL-N-(1-CYCLOHEXYLMETHYL)-2,3-DIHYDROXY-5-METHYL-HEXYL)-L-ALANINAMIDE

Daniel T. Belmont, Holland; Valerie Hendrickson, Grandville, and Mark J. Hoekman, Holland, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

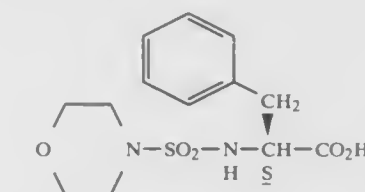
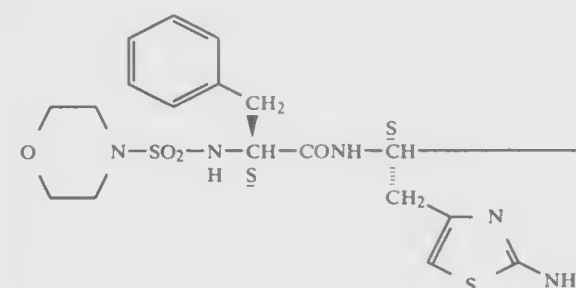
Filed Apr. 23, 1991, Ser. No. 690,012

Int. Cl.⁵ C07D 417/12

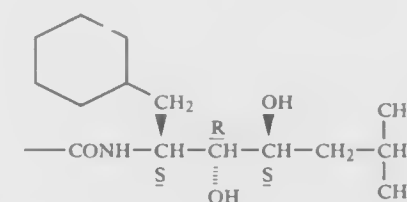
U.S. Cl. 544—133

15 Claims

1. A process for the preparation of the compound of Formula I

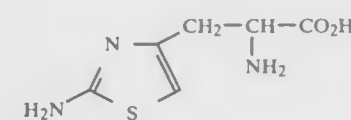


in the presence of a coupling reagent and a solvent to afford the compound of Formula IV wherein R is as defined above;

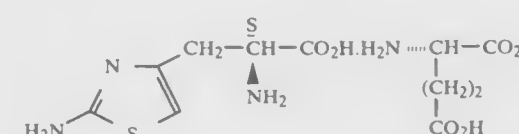


and pharmaceutically acceptable acid addition salts thereof which comprises:

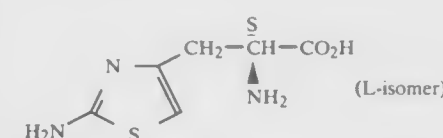
Step (a) treating the racemic compound of Formula VIII



with L-glutamic acid in a solvent to afford the compound of Formula VII;



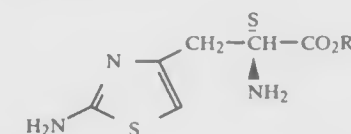
Step (b) treating the compound of Formula VII with a base in solvent to afford the compound of Formula VIIIa;



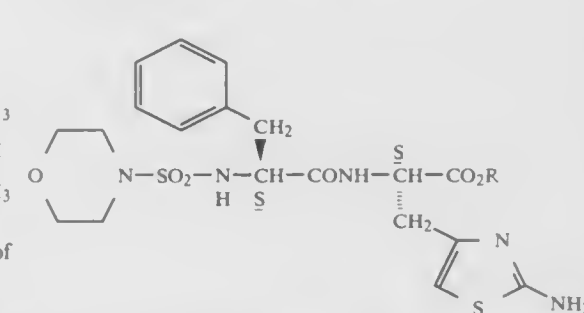
Step (c) treating the compound of Formula VIIIa with a compound of Formula

R—OH

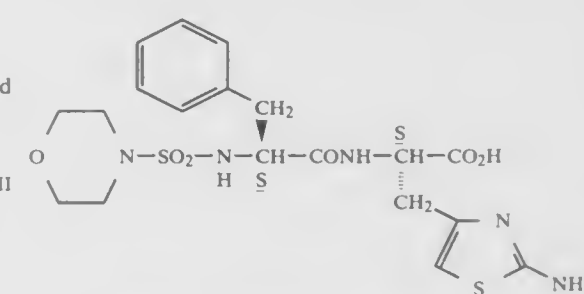
wherein R is alkyl or benzyl in the presence of an acid to afford the compound of Formula VI wherein R is as defined above;



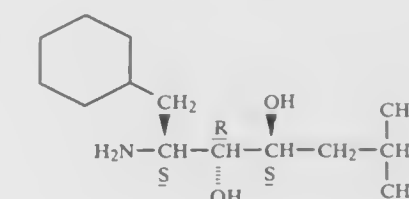
Step (d) treating the compound of Formula VI with the compound of Formula V



Step (e) treating the compound of Formula IV with a base in a solvent to afford the compound of Formula III;



Step (f) treating the compound of Formula III with the compound of Formula II



in the presence of a coupling reagent and a solvent to afford the compound of Formula I; Step (g) and, if desired, converting the resulting compound of Formula I to a corresponding pharmaceutically acceptable acid addition salt.

5,089,617

BETA-HYDROXYALKYLCARBAMYL-METHYLATED AMINOTRIAZINES

Peter S. Forgione, and Balwant Singh, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn. Division of Ser. No. 864,626, May 16, 1986, Pat. No. 4,708,984.

This application Nov. 13, 1987, Ser. No. 120,570

Int. Cl.⁵ C07D 251/18, 251/70

U.S. Cl. 544—196

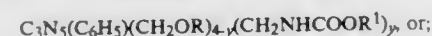
8 Claims

1. A triazine compound selected from

(i) a triaminotriazine compound of the formula



(ii) a benzoguanamine compound of the formula



(iii) an oligomer of (i) or (ii),

wherein the R groups are, independently, hydrogen or alkyl of from 1 to 12 carbon atoms, the R¹ groups are, independently, beta-hydroxyalkyl of from 2 to 18 carbon atoms or alkyl of from 1 to 18 carbon atoms, wherein at least one R¹ is beta-hydroxyalkyl, and

x is in the range of from about 3 to about 6, any y is in the range of from about 2 to about 4.

5,089,618

PROCESS FOR THE PURIFICATION OF ADENINE
Wilhelm Quittmann, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Filed Jul. 31, 1990, Ser. No. 560,880

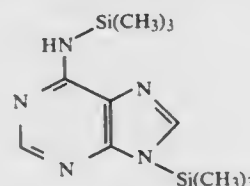
Claims priority, application Switzerland, Aug. 1, 1989, 2849/89

Int. Cl.⁵ C07F 5/02; C07D 473/00

U.S. Cl. 544—229

7 Claims

1. Process for the purification of crude adenine, which optionally contains 9-phenyladenine and/or other byproducts, consisting essentially of converting the adenine into the N,N'-bis(trimethylsilyl) derivative, having the formula:



distilling the adenine derivative, and then reacting the adenine derivative back into adenine again by solvolytic cleavage of the trimethylsilyl groups, said solvolytic cleavage being effected by hydrolysis with water.

5,089,619

METHODS FOR TREATING HYDROCARBON RECOVERY OPERATIONS AND INDUSTRIAL WATERS
Neil E. S. Thompson, Creve Coeur, and Robert G. Asperger, Des Peres, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

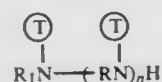
Continuation-in-part of Ser. No. 208,627, Jun. 20, 1988, Pat. No. 4,864,075, which is a continuation-in-part of Ser. No. 7,701, Jan. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 645,740, Aug. 30, 1984, abandoned. This application Jun. 30, 1989, Ser. No. 374,421

Int. Cl.⁵ C07D 241/02, 241/04; C07C 333/00, 213/00

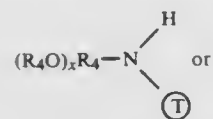
U.S. Cl. 544—357

22 Claims

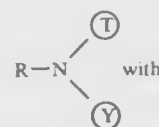
1. A method of demulsifying a reverse emulsion comprising adding thereto an effective demulsifying amount of a compound having the formula



wherein T is hydrogen, C(=S)SR₂,



-continued



the proviso that at least two T's are C(=S)SR₂; R is an alkylene having 2-30 carbon atoms; R₁ is hydrogen or an alkyl having 1-30 carbon atoms; R₂ is an alkali metal, an alkaline earth metal, or N(R₃)₄ where R₃ is a lower alkyl; R₄ is C₂-C₄ alkylene; x is an integer of 3-200; and n is an integer of 1-10, the total number to T's ranging from 2-5 inclusive.

5,089,620

CERTAIN 3-NITRO-PYRIDYL AMINO METHYL SILANES AND SILOXANES

Makoto Yoshitake, Ichihara, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Division of Ser. No. 540,668, Jun. 18, 1990, Pat. No. 5,041,589. This application May 9, 1991, Ser. No. 697,389

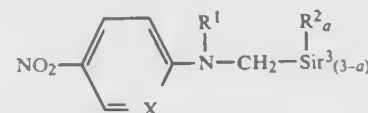
Claims priority, application Japan, Jun. 21, 1989, 1-158719

Int. Cl.⁵ C07F 7/10, 7/18

U.S. Cl. 546—14

1 Claim

1. Organosilicon compounds as represented by the following general formula



wherein R¹ is selected from the group consisting of the hydrogen atom and a monovalent hydrocarbon group having 1 to 10 carbon atoms, each R² is independently a monovalent hydrocarbon group having 1 to 10 carbon atoms, R³ is an alkoxy group having 1 to 10 carbon atoms, X is



and a is an integer with a value of zero to 3.

5,089,621

DIAZABICYCLO AMINE COMPOUNDS WHICH ARE INTERMEDIATES FOR ANTI-BACTERIAL COMPOUNDS

Wan J. Kim; Myung H. Park, both of Yuseong, and Jong H. Oh, Seo, all of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea
Filed Oct. 19, 1990, Ser. No. 598,888

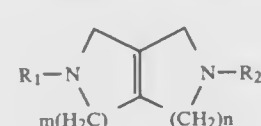
Claims priority, application Rep. of Korea, Oct. 23, 1989, 89-15204

Int. Cl.⁵ C07D 487/04, 471/04

U.S. Cl. 546—113

2 Claims

1. A diazabicycloamine of the formula I



wherein

m denotes 1 to 3,
n denotes 1 to 2 and

R₁ and R₂ denote hydrogen or lower alkyl and their salts.

5,089,622

(-)-2-PYRAZOLINE COMPOUNDS AND THERAPEUTIC AGENT FOR CEREBROVASCULAR DISORDERS CONTAINING THE SAME AS EFFECTIVE INGREDIENT

Seitaro Kajiya, Chigasaki; Hajime Iizuka, Hiratsuka; Kunio Okumura, Kamakura; Junya Fujiwara, Yokohama; Norio Ohto, Ichikawa; Hiroshi Kawazura; Yasuhiro Takahashi, both of Mobara, and Yoshio Shiga, Ichihara, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan
Filed Nov. 30, 1989, Ser. No. 443,577

Claims priority, application Japan, Dec. 12, 1988, 63-311868; Feb. 1, 1989, 1-20894

Int. Cl.⁵ C07D 213/44, 401/00

U.S. Cl. 546—262

2 Claims

1. (-)-1-(nicotinoyl)-5-methyl-2-pyrazoline.

5,089,623

CERTAIN IMIDATE INSECTICIDES

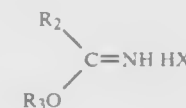
Karl J. Fisher, Fairfax, Calif., assignor to Imperial Chemical Industries Plc, London, United Kingdom

Division of Ser. No. 263,605, Oct. 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 122,877, Nov. 17, 1987, abandoned. This application Feb. 15, 1990, Ser. No. 480,686
Int. Cl.⁵ C07C 249/02; C07D 213/643, 239/34

U.S. Cl. 546—300

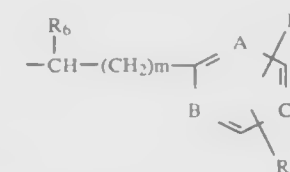
12 Claims

1. A compound having the formula



in which

R₂ is methyl; ethyl; n-propyl; C₃-C₇ branched alkyl; C₁-C₆ haloalkyl, cyclopropyl optionally substituted with up to 4 methyl groups or up to 2 halogens, cyclobutyl, C₂-C₄ alkoxyalkyl, C₂-C₆ alkenyl or C₂-C₆ haloalkenyl; and R₃ is



(a)

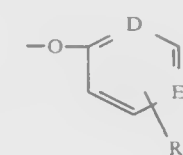
in which m is 0 or 1;

A, B and C are each carbon or nitrogen, provided that A, B and C are not all nitrogen and if two of A, B and C are nitrogen, then A and C are nitrogen;

R₄ is hydrogen or halo;

R₆ is hydrogen, methyl, fluoro or ethynyl; and

R₇ is



(b)

in which D and E are each carbon or nitrogen provided that both D and E are not nitrogen, and further provided that if any of A, B or C is nitrogen, then D and E are both carbon; and

R₅ is hydrogen, C₁-C₄ alkyl, C₁-C₄ alkoxy, trifluoromethyl,

cyano, C₁-C₄ alkylthio, C₁-C₄ alkylsulfonyl, or mono- or polyhalo.

5,089,624

DIHYDROPYRIDINE DERIVATIVES

Choong S. Kim; Jung J. Suh, both of Seoul; Bong Y. Lee; Chang S. Kim, both of Suwon; Jong W. Lee, Kwacheon; Byung C. Kim, Incheon, and Byung H. Han, Seoul, all of Rep. of Korea, assignors to Yuhan Corporation, Kyonggi-do, Rep. of Korea
Filed Oct. 6, 1989, Ser. No. 417,924

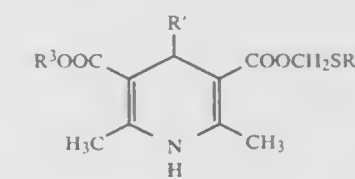
Claims priority, application Rep. of Korea, Oct. 27, 1988, 14022/1988

Int. Cl.⁵ C07D 211/86

U.S. Cl. 546—321

3 Claims

1. A dihydropyridine compound of the formula (I),



(I)

wherein R¹ represents 2,3-dichlorophenyl, difluoromethoxyphenyl, or 2,1,3-benzoxadiazole-4-yl, R² represents a lower alkyl group, and R³ represents a lower alkyl group.

5,089,625

SUBSTITUTED CYCLIC KETONES, SUBSTITUTED CYCLIC ENONES

Fumie Sato, Fujisawa; Kazutaka Arai, and Katsuaki Miyaji, both of Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 207,549, Jun. 16, 1988, Pat. No. 4,994,619.

This application Dec. 14, 1990, Ser. No. 627,504

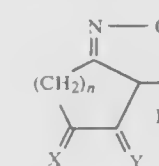
Claims priority, application Japan, Jun. 16, 1987, 62-149873; Aug. 4, 1987, 62-194947; Feb. 10, 1988, 63-29709; Feb. 25, 1988, 63-43045

Int. Cl.⁵ C07D 261/20, 261/04

U.S. Cl. 548—110

10 Claims

1. A substituted cyclopentanone or cyclohexanone derivative represented by the formula (I):



(I)

where X denotes (α-OZ, β-H) or (α-H, β-OZ); Y denotes ((α-OZ', β-H) or (α-H, β-OZ')); Z and Z' each independently denote a hydrogen atom or a protective group selected from the group consisting of a trialkylsilyl group, alkoxyalkyl group, aralkyloxyalkyl group, trityl group and tetrahydropyran-2-yl group; R¹ is a hydrogen atom, unsubstituted C₁-10 alkyl group, or a member selected from the group consisting of



5,089,628

FLUORINE-CONTAINING BISMALEAMIC ACIDS AND BISMALEIMIDES USEFUL FOR THERMOSETTING RESINS

Masamichi Maruta, Kawagoe, and Akihiro Fukui, Kamifukuoka, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Sep. 21, 1989, Ser. No. 410,494

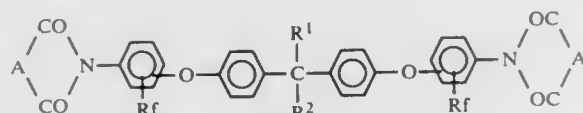
Claims priority, application Japan, Sep. 22, 1988, 63-237898; Dec. 21, 1988, 63-322538

Int. Cl.⁵ C87D 207/452

U.S. Cl. 548—521

6 Claims

1. A fluorine-containing bismaleimide represented by the formula:



wherein A represents a divalent organic group having an ethylenic unsaturated bond; Rf represents a perfluoroalkyl group wherein the alkyl contains 1 to 8 carbon atoms; R¹ and R² are the same or different and each represent hydrogen atom, methyl group, ethyl group or a halogenated methyl group; and each —N< is at the m- or p-position with respect to the aromatic ether bond —O—.

5,089,629

FLUORINE-SUBSTITUTED CYCLOHEXYLCYCLOHEXENE DERIVATIVE

Yasuyuki Tanaka, Haruyoshi Takatsu, Kiyohumi Takeuchi, all of Tokyo, and Yuuji Tamura, Saitama, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 414,234, Sep. 29, 1989, abandoned, which is a division of Ser. No. 250,283, Sep. 28, 1988, Pat. No. 4,910,350. This application Aug. 13, 1990, Ser. No. 565,790

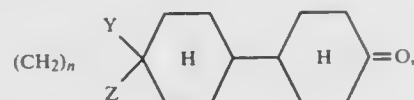
Claims priority, application Japan, Sep. 29, 1987, 62-245240; Oct. 20, 1987, 62-264532

Int. Cl.⁵ C07D 317/72, 319/08, 339/02, 339/08

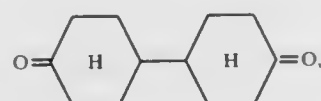
U.S. Cl. 549—14

7 Claims

1. A process for preparing a dicyclohexyl-4,4'-dione monoketal derivative of the formula

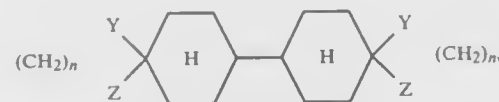


wherein Y and Z each, independently, represent an oxygen or sulfur atom and n is an integer of 2 or 3, comprising: dissolving dicyclohexyl-4,4'-dione, which has the formula



in a non-polar solvent;

subjecting the dissolved dicyclohexyl-4,4'-dione to dehydrating condensation with a ketal agent in the presence of an acidic catalyst to obtain a reaction mixture containing said dicyclohexyl-4,4'-dione monoketal derivative, said dicyclohexyl-4,4'-dione and a compound of the formula



wherein Y, Z and n are as indicated above; reacting the obtained mixture with sodium hydrogensulfite in a two-phase system of water and toluene to form a salt of said dicyclohexyl-4,4'-dione; removing the salt of said dicyclohexyl-4,4'-dione by filtration and collecting the organic layer; concentrating the organic layer to dryness under reduced pressure to form a residue; dissolving the residue in a polar organic solvent to form a solution; treating the solution with sodium hydrogensulfite to form a salt of the dicyclohexyl-4,4'-dione monoketal derivative; separating said salt of the dicyclohexyl-4,4'-dione monoketal derivative by filtration and collecting the salt crystals thereof; treating the salt crystals with a base to form said dicyclohexyl-4,4'-dione monoketal derivative.

5,089,630

DIOXETANES FOR USE IN ASSAYS

Irena Y. Bronstein, 11 Ivanhoe St., Newton, Mass. 02158; Brooks Edwards, 28 Inman St. Apt. 5, Cambridge, Mass. 02139; Larry Kricka, 880 Nathan Hale Rd., Berwyn, Pa. 19312, and John Voyta, 20 Williams Rd., North Reading, Mass. 01864

Continuation of Ser. No. 140,035, Dec. 31, 1987, abandoned.

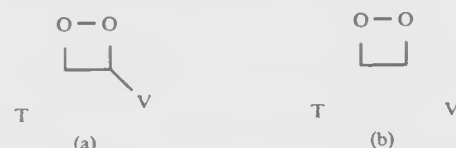
This application Apr. 13, 1990, Ser. No. 512,030

Int. Cl.⁵ C07D 493/10; C07F 9/665

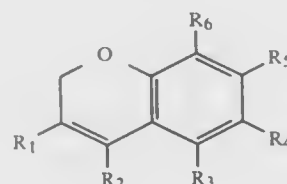
U.S. Cl. 549—220

31 Claims

1. A dioxetane compound of the formula:



wherein T is a polycycloalkylidene group having 2 or more fused rings, each ring independently having between 5 and 12 carbon atoms, spirally bound to the 3-carbon atom of the dioxetane ring; and V and V', exclusive of the bond(s) joining them to the dioxetane ring, are each a 1,2-chromenyl group of the formula:



V being non-spirally bound and V' being spirally bound via the 2-carbon atom of the 1,2-chromene ring to the 4-carbon atom of the dioxetane ring, wherein each of R₁ to R₆, inclusive, is independently hydrogen, an electron-withdrawing group, an electron-donating group, benzoxazole, benzthiazole, benzimidazole, or benztriazole, or two or more of R₁ or R₆, inclusive, together form a ring.

5,089,631

DIOXYDIPHTHALIC ANHYDRIDE

Jeffrey S. Stults, and Willis T. Schwartz, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

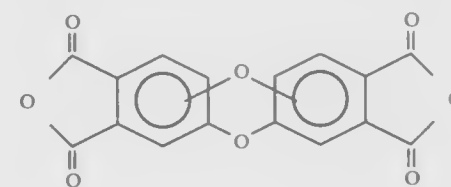
Division of Ser. No. 492,196, Mar. 13, 1990, Pat. No. 5,003,086, which is a division of Ser. No. 352,070, May 15, 1989, Pat. No. 4,943,642. This application Dec. 3, 1990, Ser. No. 621,412

Int. Cl.⁵ C07D 493/14

U.S. Cl. 549—234

2 Claims

1. A dioxydiphthalic anhydride characterized by the formula



5,089,632

PROCESS FOR PREPARING CYCLIC ESTERS USING A FLUOROCARBON

Donald C. Paul, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

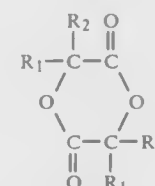
Filed Jan. 30, 1991, Ser. No. 648,003

Int. Cl.⁵ C07D 319/12

U.S. Cl. 549—274

18 Claims

1. In a process for preparing a cyclic ester having the formula:



wherein R₁ and R₂ are independently hydrogen or an aliphatic hydrocarbyl radical having 1 to 6 carbon atoms, by depolymerizing the oligomer resulting from the pyrolysis of an alpha-hydroxycarboxylic acid in a reaction zone, the improvement which comprises sweeping a gaseous fluorocarbon through the so as to create a large interfacial area with the oligomer and so as reaction zone to form a gas product stream comprising at least one member of the following group: water, cyclic ester and unpolymerized alpha-hydroxycarboxylic acid; contacting the gas product stream with a liquefied fluorocarbon, in the absence of an organic polar scrubbing solvent, to precipitate cyclic ester from the gas product stream; vaporizing at least a portion of the liquefied fluorocarbon, and; collecting the cyclic ester which precipitated.

5,089,633

SUBSTITUTED ISOCOUMARINS

James C. Powers, Atlanta; Chih-Min Kam, Roswell, both of Ga.; Josef Oleksyszyn, Westminster, Colo.; J. A. Glinski, New Fairfield, Conn., and M. A. Hernandez, Norcross, Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

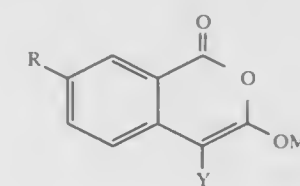
Continuation-in-part of Ser. No. 215,994, Jul. 7, 1988, abandoned, and a continuation-in-part of Ser. No. 374,980, Jul. 3, 1989, Pat. No. 4,954,519. This application Apr. 30, 1990, Ser. No. 516,786

Int. Cl.⁵ C07D 31/365

U.S. Cl. 549—285

15 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is selected from the group consisting of O=C=N—, S=C=N—, M—NH—, M—O—, wherein M represents NH₂—CO—, NH₂—CS—, NH₂—SO₂—, X—NH—CO—, X—NH—CS—, X—NH—SO₂—, X—CS—, X—SO₂—, X—O—CO—, X—O—CS—, or D—CO—, wherein X represents C₁₋₆ alkyl, C₁₋₆ fluoroalkyl, C₁₋₆ alkyl substituted with K, C₁₋₆ fluoroalkyl substituted with K, 9-fluorenylmethyl, phenyl, phenyl substituted with J, phenyl disubstituted with J, phenyl trisubstituted with J, naphthyl, naphthyl substituted with J, naphthyl disubstituted with J, naphthyl trisubstituted with J, C₁₋₆ alkyl with an attached phenyl group, C₁₋₆ alkyl with two attached phenyl groups, C₁₋₆ alkyl with an attached phenyl group substituted with J, or C₁₋₆ alkyl with two attached phenyl groups substituted with J, wherein D represents C₁₋₆ fluoroalkyl, C₁₋₆ alkyl substituted with K, C₁₋₆ fluoroalkyl substituted with K, 9-fluorenylmethyl, phenyl, phenyl substituted with J, phenyl disubstituted with J, phenyl trisubstituted with J, naphthyl, naphthyl substituted with J, naphthyl disubstituted with J, naphthyl trisubstituted with J, C₁₋₆ alkyl with an attached phenyl group substituted with J, or C₁₋₆ alkyl with two attached phenyl groups substituted with J, wherein J represents halogen, COOH, OH, CN, NO₂, NH₂, C₁₋₆ alkyl, C₁₋₆ alkoxy, C₁₋₆ alkylamine, C₁₋₆ dialkylamine, C₁₋₆ alkyl—O—CO—, C₁₋₆ alkyl—O—CO—NH—, or C₁₋₆ alkyl—S—, wherein K represents halogen, COOH, OH, CN, NO₂, NH₂, C₁₋₆ alkoxy, C₁₋₆ alkylamine, C₁₋₆ dialkylamine, C₁₋₆ alkyl—O—CO—, or C₁₋₆ alkyl—O—CO—NH—, C₁₋₆ alkyl—S—, or tosylamino, and Y is selected from the group consisting of H, halogen, trifluoromethyl, methyl, OH and methoxy.

5,089,634

ISOCOUMARINS WITH CATIONIC SUBSTITUENTS

James C. Powers, Atlanta, and Chih-Min Kam, Roswell, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

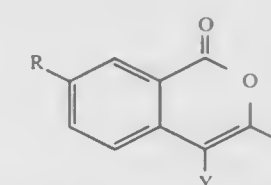
Continuation-in-part of Ser. No. 374,980, Jul. 3, 1989, Pat. No. 4,954,519, which is a continuation-in-part of Ser. No. 43,647, Apr. 28, 1987, Pat. No. 4,845,242, which is a continuation-in-part of Ser. No. 874,459, Jun. 13, 1986, abandoned, which is a continuation of Ser. No. 642,995, Aug. 20, 1984, Pat. No. 4,596,822. This application May 29, 1990, Ser. No. 530,158

Int. Cl.⁵ C07D 31/365

U.S. Cl. 549—285

4 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein Z is selected from the group consisting of C₁₋₆ alkoxy with an amino group attached to the alkoxy group, C₁₋₆ alkoxy

with an isothiureido group attached to the alkoxy group, C₁₋₆ alkoxy with a guanidino group attached to the alkoxy group, C₁₋₆ alkoxy with an amidino group attached to the alkoxy group, C₁₋₆ alkyl with an amino group attached to the alkyl group, C₁₋₆ alkyl with an isothiureido group attached to the alkyl group, C₁₋₆ alkyl with a guanidino group attached to the alkyl group, C₁₋₆ alkyl with an amidino group attached to the alkyl group,

R is selected for the group consisting of O=C=N-, S=C=N-, AA-NH-, AA-AA-NH-, AA-O-, AA-AA-O-, M-NH-, M-AA-NH-, M-AA-AA-NH-, M-O-, M-AA-O-, or M-AA-AA-O-,

wherein AA represents alanine, valine, leucine, isoleucine, methionine, phenylalanine, glucine, serine, threonine, cysteine, tyrosine, asparagine, glutamine, aspartic acid, glutamic acid, lysine, arginine, beta-alanine, norleucine, norvaline, alpha-aminobutyric acid, epsilon-aminocaproic acid, citrulline, hydroxyproline, ornithine or sarcosine,

wherein M represents NH₂-CO-, NH₂-CS-, NH₂-SO₂-, X-NH-CO-, X-NH-CS-, X-NH-SO₂-, X-CO-, X-CS-, X-SO₂-, X-O-CO-, X-O-CS-,

wherein X represents C₁₋₆ alkyl, C₁₋₆ fluoroalkyl, C₁₋₆ alkyl substituted with K, or C₁₋₆ fluoroalkyl substituted with K, wherein K represents halogen, COOH, OH, CN, NO₂, NH₂, C₁₋₆ alkoxy, C₁₋₆ alkylamine, C₁₋₆ dialkylamine, or C₁₋₆ alkyl-O-CO-,

Y is selected from the group consisting of H, halogen, trifluoromethyl, methyl, OH and methoxy.

5,089,635

11 β-PHENYL-GONANES, THEIR MANUFACTURE AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Günter Neef; Sybille Beier; Walter Elger; David Henderson; Eckard Otto; Ralph Rohde, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,050

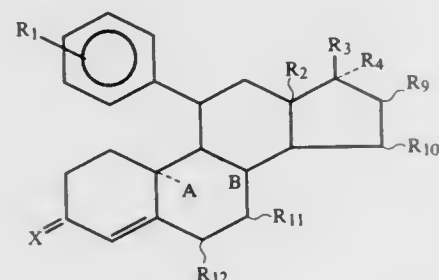
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504421; Jul. 29, 1985, 3527517

Int. Cl.⁵ C07D 307/77; A01N 45/00

U.S. Cl. 549-297

45 Claims

1. A 13-alkyl-11β-phenyl-gonane of the formula



wherein

A and B together represent oxygen, CH₂ or a second bond between carbon atoms 9 and 10,

X is oxygen or hydroxyimino, N~OH,

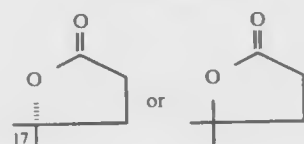
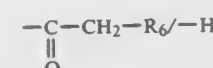
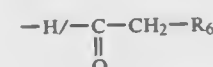
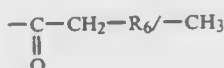
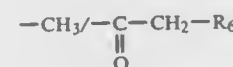
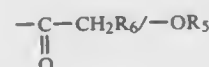
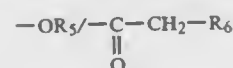
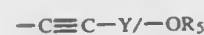
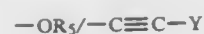
R₁ is alkyl, alkenyl or alkynyl of up to 8 carbon atoms, each of which contains the grouping



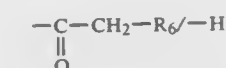
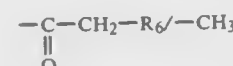
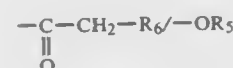
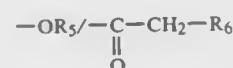
wherein X is as defined above,

R₂ is methyl or ethyl in the α or β position, in the case of R₂ methyl or ethyl in the α-position,

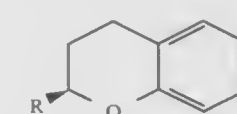
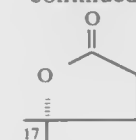
R₃/R₄ is



and in the case of R₂ methyl or ethyl in the β position R₃/R₄ is



-continued



wherein R is CH₂OSO₂CF₃ or benzyl.

R₅ is hydrogen or alkanoyl of 1 to 4 carbon atoms, Y is hydrogen, chlorine, fluorine, iodine, bromine or alkyl, hydroxyalkyl, alkoxyalkyl or acyloxyalkyl each of 1 to 4 carbon atoms in each alkyl or acyl portion,

R₆ is hydrogen, hydroxy or alkyl, O-alkyl or O-acyl each of 1 to 4 carbon atoms,

m is 0, 1, 2 or 3,

R₇ is hydroxy, cyano or O-alkyl or O-acyl each of 1 to 4 carbon atoms

k is 0, 1 or 2,

R₈ is hydrogen or alkyl or acyl each of 1 to 10 carbon atoms, each of R₉, R₁₀, R₁₁ and R₁₂ independently is hydrogen,

halogen, hydroxy or alkyl, alkoxy, acyloxy each of 1 to 4 carbon atoms,

acyl is alkanoyl,

and the substituent on the 11β-phenyl is in the 3- or 4-position.

5,089,636

METHOD OF ISOLATING GINKGOLIDES FROM THE LEAVES OF THE GINKGO TREE AND PURIFYING THEM

Wie J. Kwak, Seoul; Hwa K. Park, Kyonggi-do, and Key B. Oh, Kyongsangnam-do, all of Rep. of Korea, assignors to Sunkyong Industries Ltd., Rep. of Korea

Filed Jun. 15, 1990, Ser. No. 539,424

Claims priority, application Rep. of Korea, Jun. 16, 1989, 89-8340

Int. Cl.⁵ C07D 493/00

U.S. Cl. 547-297

13 Claims

1. A method of isolating ginkgolides from the leaves of the Ginkgo tree which is characterized by a series of steps as follows:

- adjusting the pH of an aqueous solution of an extract of the leaves of the Ginkgo tree to the range of 7 to 9 by adding an alkaline aqueous solution,
- extracting the aqueous solution treated as above with a water insoluble organic solvent selected from the group consisting of lower alkyl acetate, acetone, lower alkyl ketone, benzene and lower alkyl benzenes separating the solution into a layer of aqueous solution and a layer of organic solvent, and obtaining a powder,
- adjusting the pH of the layer of aqueous solution separated in step (b), to the range of 1 to 3.5 by adding an acidic aqueous solution, extracting the layer of aqueous solution treated as above with a water insoluble organic solvent dehydrating and drying the obtained extract,
- dissolving the dry powder obtained in the step (b) and the residue obtained in the step (c) in a lower alkyl alcohol,
- adding an aqueous solution of lead acetate to the solution obtained in the step (d), removing the precipitate, concentrating the filtrate, and obtaining a powder mixture of ginkgolides.

5,089,637

PROCESS AND INTERMEDIATES FOR 2R-BENZYL-CHROMAN-6-CARBALDEHYDE

Frank J. Urban, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

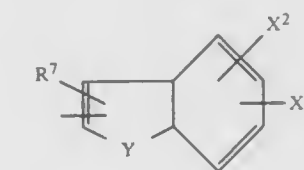
Filed Mar. 21, 1990, Ser. No. 496,737

Int. Cl.⁵ C07D 311/58

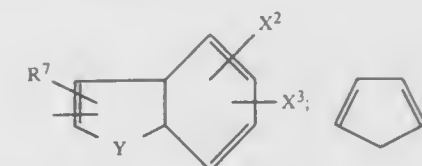
U.S. Cl. 549-407

3 Claims

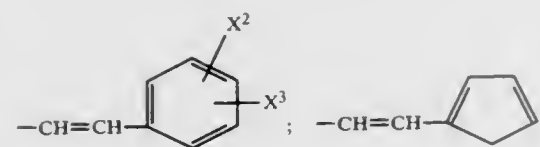
1. An optically active compound of the absolute stereochemical formula



R⁶ is α- or β-naphthyl;



mono- or di-substituted- or unsubstituted-phenyl, where the substituents are selected from halo; NO₂; OH; CF₃; CN; C₁₋₄-straight- or branched-chain-alkyl; C₁₋₄-straight- or branched-chain-alkoxy; C₁₋₄-straight- or branched-chain-alkylthio;

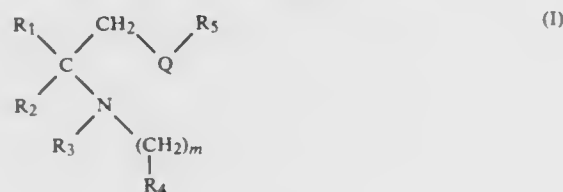


R⁷ is H; C₁-C₄-straight- or branched-chain-alkyl;
X¹ is O or NH;
X² and X³ are independently H; OH; NO₂; halo; C₁-C₄-straight- or branched-chain-alkyl; C₁-C₄-straight- or branched-chain-alkylthio; or C₁-C₄-straight- or branched-chain-alkoxy;
X⁴ is O or HH;
Y is O
n is 1 to 3;
m is 0 to 4;
halo is F, Cl, Br, or I;
or a pharmaceutically acceptable salt thereof.

5,089,639
N-CYCLOALKYLALKYLAMINES, PROCESS FOR THEIR PREPARATION, THEIR USE AS A MEDICAMENT AND THEIR SYNTHESIS INTERMEDIATES

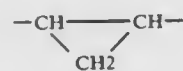
Gilbert G. Aubard, Palaiseau; Alain P. Calvet, L'Hay-Les-Roses; Jean-Pierre Defaux, Rueil Malmaison; Claude J. Gouret; Agnès M. Grouhel, both of Meudon; Henry L. Jacobelli, Paray Vieille Poste; Jean-Louis Junien, Sevres; Xavier B. Pascaud, Paris; Francois F. Roman, Courbevoie, all of France; James P. Hudspeth, Newbury Park, and Yuan Lin, Monterey Park, both of Calif., assignors to Jouveinal S.A., Paris, France Division of Ser. No. 484,403, Feb. 26, 1990, which is a continuation-in-part of Ser. No. 400,393, Aug. 30, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 645,405 Claims priority, application France, Sep. 1, 1988, 88 11450; European Pat. Off., Aug. 30, 1989, 89402366.2 Int. Cl.³ C07D 333/20, 307/02; A61K 31/38, 31/34 U.S. Cl. 549-491 7 Claims

1. N-cycloalkylalkylamine having the formula



wherein

R₁ is an aromatic heterocyclic radical selected from the group consisting of furyl and thienyl,
R₂ is lower alkyl,
R₃ is hydrogen or lower alkyl,
R₄ is cycloalkyl-CH(CH₂)_n wherein n is an integer ranging from 2 to 5 and wherein a carbon atom of R₄ optionally carries a radical R_x wherein R_x is lower alkyl or phenyl,
R₅ is phenyl optionally mono-, di- or trisubstituted by halo- gen or lower alkoxy,
Q represents ethylene-1,2-yl group -CH=CH- or cyclo- propane-1,2-diyl group

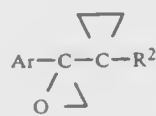


and
m has a value of 1 or 2,
the acid addition salt thereof and the optically active form thereof.

5,089,640
SUBSTITUTED AZOLYLMETHYL-CYCLOPROPYL-CARBONIAL DERIVATIVES

Klaus Böckmann, Cologne; Erik Regel, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch Gladbach; Jörg Konze, Cologne, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany Division of Ser. No. 792,088, Oct. 28, 1985, abandoned. This application Sep. 28, 1988, Ser. No. 250,574 Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440116; Jun. 22, 1985, 3522440; Sep. 26, 1985, 3534310 Int. Cl.³ C07D 303/08, 303/14 U.S. Cl. 549-563 2 Claims

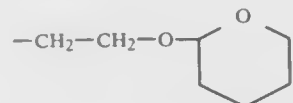
1. An aryl cyclopropyl-oxirane of the formula



in which

Ar represents phenyl which is optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, isopropyl, tert-butyl, methoxy, methylthio, trifluoro- methyl, trifluoromethoxy, trifluoromethylthio, and phenyl or phenoxy, each of which is optionally substituted by fluorine, chlorine and/or methyl;
R² represents fluorine, chlorine, bromine, -X-R³ or -NR⁴R⁵, wherein

R³ represents straight-chain or branched alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 7 carbon atoms, straight-chain or branched alkenyl having 2 to 12 carbon atoms, hydroxyalkyl having 1 to 12 carbon atoms, alkylthioalkyl having 1 to 4 carbon atoms in the alkyl- thio part and 1 to 4 carbon atoms in the alkyl part, alkoxyalkyl having 1 to 4 carbon atoms in the alkyl part, and phenyl or benzyl, each of which is optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, isopropyl, tert-butyl, methoxy, methylthio, trifluoromethyl, trifluorome- thoxy, trifluoromethylthio, and phenyl or phenoxy, each of which is optionally substituted by fluorine, chlorine and/or methyl; or
R³ represents the radical of the formula

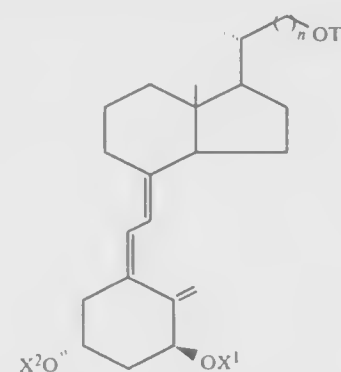


R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent piperidinyl, piperazinyl or mor- pholinyl, each of which is optionally substituted by methyl, ethyl, methylcarbonyl or ethylcarbonyl, and X represents oxygen, sulphur, an SO group or an SO₂ group.

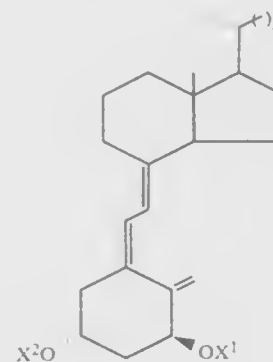
5,089,641
SYNTHESIS OF 1α-HYDROXY-SECOSTEROL COMPOUNDS

Hector F. DeLuca, Deerfield; Heinrich K. Schnoes, and Kato L. Perlman, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis. Filed Mar. 11, 1991, Ser. No. 667,440 Int. Cl.³ C07C 75/00 13 Claims

1. A method of making 1α-hydroxy-secosterol compounds comprising the steps of providing a tosylate of the formula



where n represents an integer having a value of 1 to 3, and X¹ and X² represent, independently, a hydroxy-protecting group, reducing the tosylate with LiAlH₄ to a 22-alkyl derivative of the formula



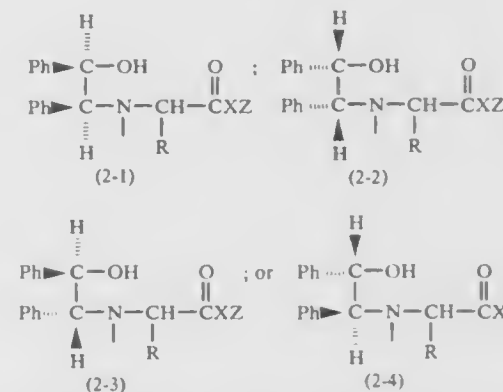
where n, X¹ and X² are as defined above and thereafter converting the 22-alkyl derivative to the desired 1α-hydroxy- secosterol wherein X¹ and X² are both hydrogen.

5,089,642
OPTICALLY ACTIVE CARBOALKYLATED AMINO ALCOHOLS AND THEIR UTILIZATION IN OPTICAL RESOLUTION

Masaki Hasegawa, Tokyo; Kazuhiko Saigo, Souka; Yoichi Yuki, and Kouzou Tachibana, both of Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan Division of Ser. No. 423,769, Oct. 18, 1989, Pat. No. 5,041,573, which is a division of Ser. No. 946,460, Dec. 24, 1986, Pat. No. 4,966,985. This application Oct. 26, 1990, Ser. No. 605,256 Claims priority, application Japan, Dec. 27, 1985, 60-293883; Dec. 27, 1985, 60-293884 Int. Cl.³ C07F 1/08, 1/04, 15/00 U.S. Cl. 556-1 1 Claim

1. In a method of optically resolving racemates by the use of a separating agent comprising a step of contacting the race- mates with the separating agent, the improvement comprising said separating agent comprising a support combined with an optically active component through a nitrogen atom in said

optically active component, said optically active component being of the following formulae:



in which Ph is a phenyl group, R is hydrogen, an alkyl group having 1 to 10 carbon atoms or an aryl group having 6 to 10 carbon atoms, X is -O- or -S- and Z is hydrogen, an alkyl group having 1 to 10 carbon atoms or a metal selected from the group consisting of copper, iron, zinc, nickel, cobalt, magne- sium, calcium, sodium and potassium.

5,089,643
METHOD OF PREPARING MONOMERIC ORGANOMETALLIC COMPOUNDS

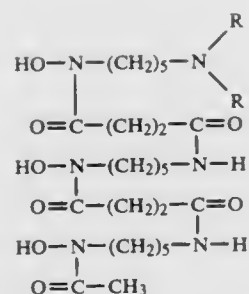
Kelvin T. Higa, Riegoceat, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C. Division of Ser. No. 534,997, Jun. 8, 1990. This application Apr. 29, 1991, Ser. No. 694,267 Int. Cl.³ C07F 5/00, 5/06 21 Claims

1. A process for preparing monomeric organometallic com- pounds which comprises: reacting (t-Bu)₂MCl and LiE(t-Bu)₂, and recovering a com- pound having the formula (t-Bu)₂ME(t-Bu)₂; where, M is selected from the group consisting of Ga, Al, and In, and E is selected from the group consisting of As, P, Sb, and N.

5,089,644
PREPARATION OF OXAMINE COMPLEXES

Steven C. Quay, Los Altos Hills, and Scott M. Rocklage, Saratoga, both of Calif., assignors to Salutar Inc., Sunnyvale, Calif. Continuation-in-part of Ser. No. 826,827, Feb. 6, 1986, Pat. No. 4,758,422, which is a continuation-in-part of Ser. No. 688,733, Jan. 4, 1985, Pat. No. 4,637,929. This application Jun. 11, 1987, Ser. No. 61,933 Int. Cl.³ C07F 15/00, 15/02 U.S. Cl. 556-40 14 Claims

1. A process for preparing an oxamine-polyvalent paramag- netic metal complex comprising reacting, in a solvent at a pH of about 3 to 8, an oxamine having the formula:



in which each R, independently, is a hydrogen atom or a C₁₋₁₈-alkyl, C₃₋₈-cycloalkyl, C₁₋₁₈-alkyl-CO- or C₃₋₈-cycloalkyl-CO-group, or a salt thereof, with the hydroxide or alkoxide of a polyvalent paramagnetic metal.

5,089,645

HYDROXYL-CONTAINING ORGANOTIN CATALYSTS FOR MAKING POLYURETHANES

James D. Nichols, and John B. Dickenson, both of Fogelsville, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 405,700, Sep. 11, 1989, Pat. No. 4,987,244, and a continuation-in-part of Ser. No. 424,778, Oct. 20, 1989, and a continuation-in-part of Ser. No. 424,855, Oct. 20, 1989. This application Dec. 17, 1990, Ser. No. 628,261

Int. Cl.⁵ C07F 7/22

U.S. Cl. 156—90

6 Claims

1. In a method for catalyzing the reaction of a polyisocyanate or an at least partially blocked polyisocyanate with a hydroxyl-containing compound in the presence of a catalyst, the improvement which comprises employing as the catalyst a hydroxyl-containing organotin compound.

5,089,646

BICYCLIC POLYSILICON COMPOUNDS

Bruce C. Berris, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 548,483, Jul. 3, 1990. This application Dec. 5, 1990, Ser. No. 622,776

Int. Cl.⁵ C07F 7/08

U.S. Cl. 556—406

7 Claims

1. A polysilane compound having an average molecular weight of about 500 or more produced by the process comprising polymerizing a monomeric or polymeric silane precursor material in the presence of an effective amount of a diphosphorus nickel chloride catalyst.

5,089,647

METHOD FOR PREPARING INTERMEDIATES FOR THE SYNTHESIS OF STEROID SIDE CHAINS IN OPTICALLY ACTIVE FORM

Hector F. DeLuca, Deerfield; Heinrich K. Schnoes, and Kato L. Perlman, both of Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

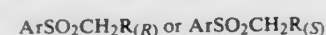
Division of Ser. No. 321,416, Mar. 9, 1989, abandoned. This application Apr. 11, 1990, Ser. No. 507,971

Int. Cl.⁵ C07C 315/02, 315/04

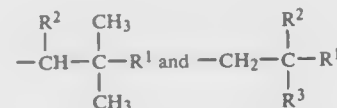
U.S. Cl. 556—428

12 Claims

1. A process for the preparation of optically active sulfone derivatives having the structure:



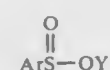
where Ar is an aryl group and R is selected from the group consisting of



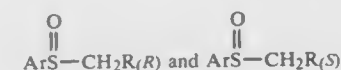
wherein R¹ is selected from the group consisting of hydrogen, hydroxy and protected hydroxy, R² and R³ are each selected from the group consisting of C₁ to C₄ alkyl, hydroxymethyl, protected-hydroxymethyl and trifluoromethyl, except that R² and R³ cannot be identical, and where the subscripts (R) and (S) signify that the chiral center in R has the (R) and (S)-stereochemical configuration, respectively, which comprises, reacting a racemic Grignard reagent of the structure,



where R is a group as defined above and X is a halogen atom, with a chiral sulfinate ester of the structure,



where Ar is a group as defined above, and Y represents an alkyl or cycloalkyl group, and where the sulfur atom is a chiral center having either the (R)- or the (S)-configuration, thereby obtaining a mixture of diastereomeric sulfoxides having the structure,



wherein Ar, R and the subscripts (R) and (S) have the meaning as defined above, and where the sulfur atom is a chiral center having either the (R)- or the (S)-configuration, separating that mixture, and oxidizing separately each of the diastereomers with an organic peracid.

5,089,648

METHOD OF PRODUCING POLYSILANE COMPOUNDS

Bruce C. Berris, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 4, 1990, Ser. No. 577,280

Int. Cl.⁵ C07F 7/08

U.S. Cl. 556—430

14 Claims

1. A method for polymerizing a monomeric or oligomeric silane precursor material to produce a polysilane compound comprising polymerizing said monomeric or oligomeric silane precursor material in the presence of an effective amount of a tetrakis(triethylphosphine)nickel(O) catalyst for producing an average molecular weight of about 500 or more for said polysilane compound.

5,089,649

ORGANOSILICON COMPOUND

Toshio Takago; Shinichi Satoh; Masayuki Oyama, all of Annaka; Koichi Yamaguchi, Takasaki, and Takashi Matsuda, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 661,381

Claims priority, application Japan, Apr. 28, 1989, 1-110197

Int. Cl.⁵ C07F 7/18

U.S. Cl. 556—482

2 Claims

1. An organosilicon compound having the general formula (I):

5,089,651

PROCESS FOR PRODUCING 3-IMINONITRILES

Masato Taniguchi; Tadahisa Sato, and Yuki Mizukawa, all of Kanagawa, Japan, assignors to Fujii Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 436,271, Nov. 14, 1989,

abandoned. This application Jan. 2, 1991, Ser. No. 636,825

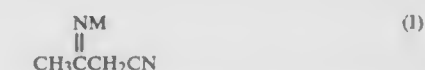
Claims priority, application Japan, Nov. 14, 1988, 63-287039

Int. Cl.⁵ C07C 253/30

U.S. Cl. 558—360

10 Claims

1. A process for producing a 3-iminonitrile represented by the following general formula (I):



wherein M represents an alkali metal, which comprises reacting acetonitrile with an alkali metal hydride in an amount of from 0.01 to 0.5 molar equivalent to acetonitrile.

5,089,650

PROCESS FOR PRODUCING CARBONIC ACID ESTER

Shigeru Yokota; Hiroshi Koyama, and Hidetaka Kojima, all of Himeji, Japan, assignors to Dalc Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 1, 1987, Ser. No. 91,884

Claims priority, application Japan, Sep. 12, 1986, 61-215178;

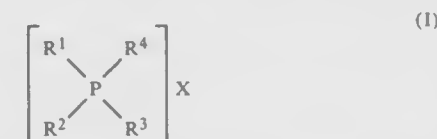
Sep. 12, 1986, 61-215179

Int. Cl.⁵ C07C 69/96, 68/00

U.S. Cl. 558—277

16 Claims

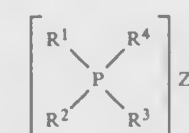
1. In a process for preparing a carbonic acid ester which comprises, in a reaction system, reacting an alcohol with carbon monoxide and oxygen in the presence of a copper compound together with a platinum group metal compound and a reaction accelerator, the improvement which comprises: employing a solvent or mixture of solvents selected from the group consisting of nitriles and amides and, optionally, a quaternary phosphonium compound for a mixture of quaternary phosphonium compounds as a reaction accelerator selected from the group consisting of quaternary phosphonium halides, quaternary phosphonium weak acid salts and quaternary phosphonium alkoxides and mixtures thereof, said quaternary phosphonium halide having the formula (1)



wherein R¹, R², R³ and R⁴ may be the same or different and denote alkyl groups, alkoxy groups, aryl groups, aryloxy groups, substituted alkyl groups, substituted alkoxy groups, substituted aryl groups and substituted aryloxy groups and X is a halogen anion; and quaternary phosphonium weak acid salt having the formula (2)



wherein R¹, R², R³ and R⁴ are as defined above, Y is an anion of a carboxylic or carbonic acid and n is a numeral equal to the valence of the anion of the carboxylic or carbonic acid; and said quaternary phosphonium alkoxide having the formula (3)



wherein R¹, R², R³ and R⁴ are as defined above and Z is an alkoxy group.

5,089,652

NITRATE ESTER PREPARATION

Joseph A. Sohar, Walnutport; Randal A. Johnson, Hamburg, and William E. Gorton, Allentown, all of Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Jan. 17, 1990, Ser. No. 466,221

Int. Cl.⁵ C07C 205/00

U.S. Cl. 558—480

31 Claims

1. A method of preparing nitrate esters by the nitration of organic hydroxy-containing compounds comprising:

- (a) contacting an organic hydroxy-containing compound having the structure of R—(OH)_x wherein R is an organic chain or ring having from about 1 to about 20 carbon atoms and not having an amine, amide or acid group or loosely attached hydrogen moiety substituent and x is in the range of about 1 to about 10 with a single nitrating agent, in the absence of an organic solvent effective to extract a partially soluble nitrate ester from the reaction mixture, under suitable reaction conditions to produce a reaction mixture of excess nitrating agent and at least one nitrate ester at least partially soluble in said reaction mixture; and
- (b) contacting said reaction mixture with a base to neutralize the excess nitrating agent to form a salt thereof such that said nitrate ester is substantially insoluble in the thus neutralized mixture.

5,089,653

PROCESS FOR THE SELECTIVE REDUCTION OF THE 4-HALOGEN IN 2,4-DIHALOANILINES

R. Garth Pews, Midland, Mich.; Richard M. Wehmeyer, Lake Jackson, Tex., and James E. Hunter, Walnut Creek, Calif., assignors to Dow Elanco, Indianapolis, Ind.

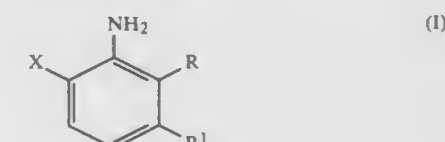
Filed Apr. 4, 1991, Ser. No. 680,712

Int. Cl.⁵ C07C 229/00

U.S. Cl. 560—47

9 Claims

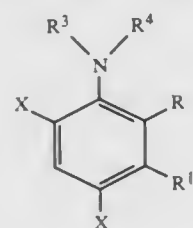
1. A process for preparing 2-haloanilines of formula (I)



wherein

X is Cl or Br,
R is X, F, C₁₋₄ alkyl, C₁₋₄ alkoxy, CF₃ or CO₂R²,
R¹ is H or C₁₋₄ alkyl, and
R² is H or C₁₋₄ alkyl
which comprises:

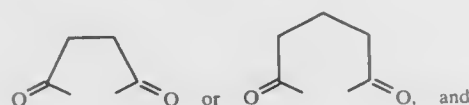
- (a) contacting an amino-protected 2,4-dichloroaniline or an amino-protected 2,4-dibromoaniline of formula (II)



wherein
R³ and R⁴ are each



where R⁵ is CH₃ or CH₂CH₃, or
R³ and R⁴ taken together are



- X, R and R¹ are as previously defined,
with a hydrogen source in the presence of a palladium
catalyst in an inert organic solvent to selectively remove
the 4-chloro or 4-bromo substituent; and
(b) hydrolyzing the protecting groups from the amino func-
tion to produce the desired aniline.

5,089,654

CHALCONE DERIVATIVES

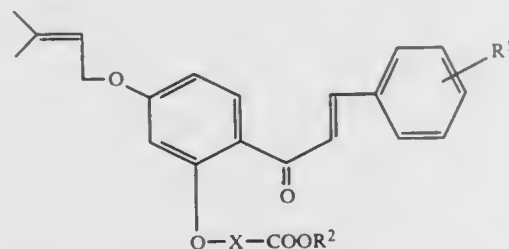
Sadakazu Yokomori, Urawa; Keiko Saijo, Saitama; Tohru Mat-
sunaga, Kuki; Yoshimoto Nakashima, Ageo, and Katsuo
Hatayama, Omiya, all of Japan, assignors to Taisho Pharma-
ceutical Co., Ltd., Japan

Filed Aug. 3, 1990, Ser. No. 562,602
Claims priority, application Japan, Aug. 8, 1989, 1-205005
Int. Cl.⁵ C07C 69/76

U.S. Cl. 560—53

8 Claims

1. A chalcone derivative represented by the formula



wherein R¹ is a straight chain, branched chain or cyclic alkyl
group having 4 to 15 carbon atoms or an alkenyl group having
3 to 15 carbon atoms, and occurs at the 2- or 4-position, R² is
a hydrogen atom, or a straight or branched chain alkyl group
having 1 to 3 carbon atoms, and X is a straight or branched
chain alkylene group having 1 to 3 carbon atoms.

5,089,655

INDIVIDUAL α -FORM PARTICLE CRYSTALS OF
TETRAKIS(3-(3,5-DI-T-BUTYL-4-HYDROXYPHENYL)-
PROPIONYLOXYMETHYL)METHANE AND PROCESS
FOR ITS PRODUCTION

Takanori Miura, Fukuoka; Masanori Kohara, and Kunihide
Oka, both of Nakatsu, all of Japan, assignors to Yoshitomi
Pharmaceutical Industries, Ltd., Osaka, Japan
Filed Sep. 6, 1989, Ser. No. 403,492

Claims priority, application Japan, Sep. 7, 1988, 63-223997;
Mar. 8, 1989, 1-57353

Int. Cl.⁵ C07C 69/76

U.S. Cl. 560—75

9 Claims

1. Tetrakis [3-(3,5-di-t-butyl-4-hydroxyphenyl)propionylox-
ymethyl]methane in individual particle crystal forms, compris-
ing individual α -form crystals in substantially cubic or rectan-
gular parallelepipedal shape and aggregates thereof.

5,089,656

PROCESS FOR THE PREPARATION OF
ARYL-SUBSTITUTED PROPIONIC ACID ESTERS

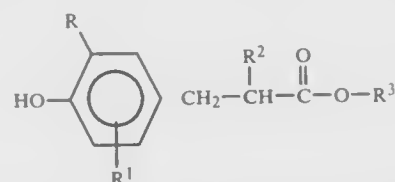
Lin-Chen Yu, Wilmington, Del., assignor to Himont Corpora-
ted, Wilmington, Del.

Filed Jul. 18, 1990, Ser. No. 555,225
Int. Cl.⁵ C07C 69/76

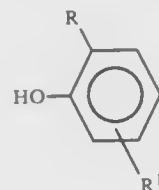
U.S. Cl. 560—75

17 Claims

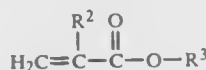
1. A process for the preparation of aryl-substituted esters of
the formula:



wherein R and R¹ are a C₁-C₁₂ linear or branched alkyl, a
C₅-C₁₂ cycloalkyl, a C₆-C₁₂ aryl or a C₇-C₁₂ alkaryl or aral-
kyl, R² is a hydrogen or a C₁-C₂₀ linear or branched alkyl and
R³ is a C₁-C₂₀ linear or branched alkyl, a C₅-C₁₂ cycloalkyl, a
C₆-C₁₂ aryl, or a C₁-C₂₀ alkaryl or aralkyl, and may be the
same or different, consisting essentially of (a) forming a reac-
tion mixture of a phenol of the formula:



wherein R and R¹ are as defined above, and at least one base
catalyst in a catalytic amount sufficient to form a reaction
product comprising a phenoxide intermediate and a side-
product and while heating said reaction mixture at a tempera-
ture sufficient to remove the side-product during the formation
of the phenoxide intermediate, (b) adding to said phenoxide
intermediate an effective amount of an aprotic solvent to in-
crease the rate of reaction and then (c) adding to (b) an acrylate
of the formula:



wherein R² and R³ are as defined above, wherein all or substan-
tially all of said acrylate is added at once.

5,089,657

NAPHTHALENE ANTI-PSORIATIC AGENTS

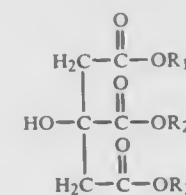
Michael C. Veouti, San Francisco, Calif., assignor to Syntex
(U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 11, 1987, Ser. No. 24,426
Int. Cl.⁵ C07C 69/00

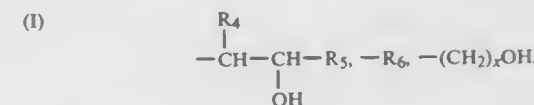
U.S. Cl. 560—139

41 Claims

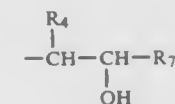
1. A composition in a form suitable for optical administration
for treating the condition of psoriasis which composition com-
prises a pharmaceutically acceptable, non-toxic carrier and a
psoriasis relieving amount of a compound of the formula



wherein R₁ and R₂ are selected from:



thereof; wherein R₃ is



wherein:

R¹ is lower alkoxy of one to six carbon atoms or phenoxy
optionally substituted by one or two substituents chosen
from lower alkyl of one to four carbon atoms, lower
alkoxy of one to four carbon atoms and halo;

R² is hydrogen, lower alkyl of one to six carbon atoms,
phenyl or phenyl-lower-alkyl, wherein the phenyl ring of
the phenyl or phenyl-lower-alkyl group is optionally
substituted by one or two substituents chosen from lower
alkyl of one to four carbon atoms, lower alkoxy of one to
four carbon atoms and halo;

R³ is hydrogen, halo, lower alkyl of one to six carbon atoms,
lower alkoxy of one to six carbon atoms, phenyl, phenyl-
lower-alkyl or phenyl-lower-alkoxy, wherein the phenyl
ring of the phenyl, phenyl-lower-alkyl or phenyl-lower-
alkoxy group is optionally substituted by one or two sub-
stituents chosen from lower alkyl of one to four carbon
atoms, lower alkoxy of one to four carbon atoms and halo;
m is 1 or 2; and

X and Y are different and are selected from the group con-
sisting of hydrogen, R⁴ and -C(O)W where if X is hydro-
gen, Y is not hydrogen, or if X is R⁴, Y is not R⁴, or if X
is -C(O)W, Y is not -C(O)W; and wherein

W is alkyl of one to seven carbon atoms, phenyl or benzyl,
wherein the phenyl ring of the phenyl or benzyl group
is optionally substituted by one or two substituents
chosen from lower alkyl of one to four carbon atoms,
lower alkoxy of one to four carbon atoms and halo; and
R⁴ is lower alkyl or phenyl-lower-alkyl, wherein the
phenyl ring is optionally substituted by one or two
substituents chosen from lower alkyl of one to four
carbon atoms, lower alkoxy of one to four carbon atoms
and halo.

wherein R₄ and R₅ are H, or an alkyl, cycloalkyl, or alkyl ester
group containing 1 to about 32 carbon atoms, wherein said
alkyl ester group is derived from epoxidized esters of unsatu-
rated acids or glycidyl esters of monocarboxylic acids, wherein
the total number of carbon atoms in R₄ and R₅ is 0 to about 32;
wherein R₆ is an alkyl group containing 1 to about 18 carbon
atoms, or a cyclo alkyl group containing 5 to about 10 carbon
atoms; wherein R₇ is an alkyl, cycloalkyl, or alkyl ester group
containing 4 to about 32 carbon atoms, wherein said alkyl ester
group is derived from epoxidized esters of unsaturated acids or
glycidyl esters of monocarboxylic acids, and wherein x has a
value of 3 to 6;

wherein R₁, R₂ and R₃ are so selected that the total number
of OH groups in R₁, R₂ and R₃ is about 1.5 to 3 and the
total number of carbon atoms in R₁, R₂ and R₃ is 8 to
about 40; and wherein the acid value of the ester is less
than about 35.

5,089,659

PREPARATION OF E7/Z9-ALKADIEN-1-OLS AND
THEIR DERIVATIVES PROTECTED AT THE
HYDROXYL GROUP

Christiane Brueckner; Ernst Buschmann, both of Ludwigsbafen;
Wolfgang Mackenroth, Bad Duerkheim; Walter Himmele,
Walldorf, and Heinz Eckhardt, Ludwigshafen, all of Fed. Rep.
of Germany, assignors to BASF Aktiengesellschaft, Ludwigs-
hafen, Fed. Rep. of Germany

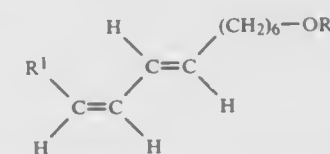
Filed May 19, 1989, Ser. No. 354,203
Claims priority, application Fed. Rep. of Germany, May 21,
1988, 3817399

Int. Cl.⁵ C07C 67/28, 27/00

U.S. Cl. 560—238

7 Claims

1. A process for the preparation of a compound of the for-
mula I



5,089,658

CITRIC ESTER DILUENTS

Jimmy D. Elmore, and Elizabeth G. Zylla, both of Louisville,
Ky., assignors to Hi-Tek Polymers, Inc., Jeffersontown, Ky.
Continuation-in-part of Ser. No. 248,732, Sep. 26, 1988,
abandoned. This application Sep. 27, 1990, Ser. No. 588,705

Int. Cl.⁵ C07C 69/66
U.S. Cl. 560—182

9 Claims

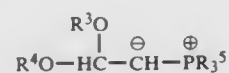
1. As a composition of matter, a citric ester having the for-
mula:



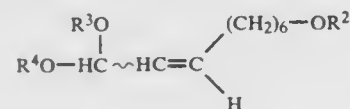
where R¹ is C₁-C₈ alkyl and R² is hydrogen or a base-stable
alcohol protective group, wherein a 7-hydroxyheptan-1-ol,
which may be protected at the OH function, of the formula II

tl

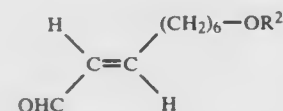
is subjected to a Wittig reaction with a phosphorylide of the formula III



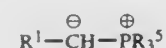
where R^3 and R^4 are each a low molecular weight alkyl group or are bonded to one another to form an unsubstituted or C_1 - C_4 -alkyl-substituted dioxan or dioxolan system and R^5 is alkyl, cycloalkyl, phenyl or substituted phenyl, to give a compound of the formula IV



which is converted by the action of an acid into a trans-2-nonal of the formula V



which is converted by a further Wittig reaction with a phosphorylide of the formula VI



where R^1 and R^5 have the above-mentioned meanings, to a compound of the formula I, wherein said base-stable alcohol protective group R^2 is C_4 - C_{12} -tert-alkyl carrying a tertiary carbon atom in the 1-position, C_3 - C_8 -trialkylsilyl, benzyl, C_2 - C_4 -alkanoyl, benzoyl, C_2 - C_9 -alkoxymethoxy, C_3 - C_{10} -1-alkoxyethoxy, 2-furanyl, 2-tetrahydrofuranyl, 2-pyranyl, 2-tetrahydropyranyl, 1,3-dioxan-2-yl or 1,4-dioxan-2-yl.

5,089,660

AROMATIC POLYCYANATE/MONOCYANATE COMONOMER COMPOSITIONS AND POLYTRIAZINES DERIVED THEREFROM

Daniel J. Murray; Mitchell G. Dibbs, and Philip C. Yang, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1988, Ser. No. 146,753
Int. Cl.⁵ C07C 261/02, 265/12

U.S. Cl. 560—301

32 Claims

1. A comonomer composition which is curable to form a cured polytriazine product, said composition comprising at least one aromatic polycyanate and at least one aromatic monocyanate having a hydrocarbyl nucleus and substituted at each position ortho to the cyanate group, said aromatic monocyanate(s) being present in an amount effective to cause the cured polytriazine product of the comonomer composition to have impact strength higher than the impact strength of a cured polytriazine product of the aromatic polycyanate alone.

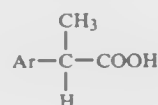
5,089,661 PROCESS FOR THE PREPARATION OF 2-ARYL-PROPIONIC ACIDS

Federico Maspero, Milan; Oreste Piccolo, Como; Ugo Romano, Milan, and Salvatore Gambino, Palermo, all of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy
Continuation of Ser. No. 180,580, Apr. 12, 1988, abandoned.
This application Sep. 10, 1990, Ser. No. 580,363
Claims priority, application Italy, Apr. 16, 1987, 20149 A/87
Int. Cl.⁵ C07C 63/04

U.S. Cl. 562—493

17 Claims

1. A process for preparing an aryl-propionic acid of general formula (I)



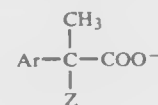
wherein

Ar designates an optionally substituted phenyl, naphthyl, or heteroaryl radical, which comprises a single step reaction of catalytically hydrogenating a complex salt of the corresponding 2-hydroxy-2-aryl-propionic acid of formula (II)



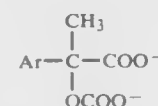
wherein

M is a bi- or tri-valent metal cation,
m is 1 or 2
X is a mono- or di-valent anion of formula (III)



wherein

Z is —OH or —O, and
Ar is as defined above, or the corresponding hypercarboxylated form of formula (IV)



wherein

Ar is defined above
X is 1, 2, or 3
Y is a mono- or di-valent organic anion,
y is 0 or an integer comprised between 1 and 4,
L is a neutral organic ligand,
l is 0 or a number between 1 and 4, and the relationship between "m", "x", and "y" are such to provide for salt electroneutrality.

5,089,662

2,2-DIFLUOROCYCLOPROPYLETHANE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS PESTICIDES

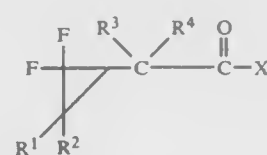
Peter Wegner; Hartmut Joppien; Günter Hömberger, and Arnim Köhn, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany
Division of Ser. No. 276,870, Nov. 28, 1988, Pat. No. 4,983,630.
This application Dec. 3, 1990, Ser. No. 621,618

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740840
Int. Cl.⁵ C07C 61/04

U.S. Cl. 562—506

5 Claims

1. Compound of formula II



in which R^{1-4} are hydrogen, and X is Cl or Br.

5,089,663

CYCLOHEXYL-TRIETHYLENETETRAAMINE HEXACETIC ACID

Ronnie C. Mease, Coram; Suresh C. Srivastava, Setauket, both of N.Y., and Jean-Francois Gustin, Oudon, France, assignors to Associated Universities, Inc., Washington, D.C.
Continuation-in-part of Ser. No. 372,905, Jun. 29, 1989, Pat. No. 5,021,571. This application Apr. 2, 1991, Ser. No. 679,258
Int. Cl.⁵ C07C 229/00

U.S. Cl. 562—507

1 Claim

1. N,N' -(2-aminoethyl)-trans-1,2-diaminocyclohexane- N,N' , N'' , N''' , N'''' , N''''' -hexaacetic acid.

5,089,664

PROCESS FOR RECOVERING LACTIC ACID FROM SOLUTIONS WHICH CONTAIN IT

Enrico Dalcanele, Pernate; Stefano Bonsignore, Novara, and Annick Du vosel, Caltignaga, all of Italy, assignors to Istituto Guido Donegani, S.p.A., Novara, Italy

Filed Dec. 19, 1989, Ser. No. 452,340

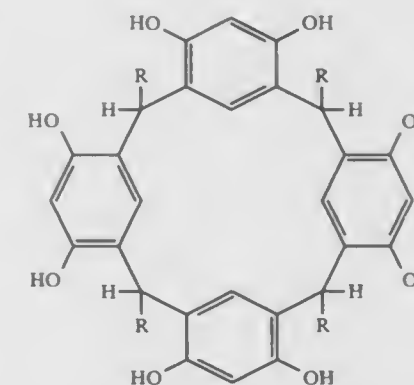
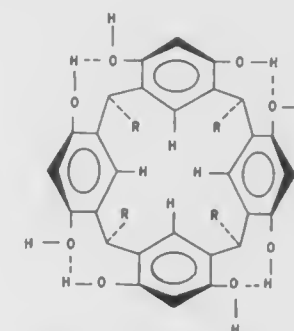
Claims priority, application Italy, Dec. 22, 1988, 23057 A/88
Int. Cl.⁵ C07C 51/42

U.S. Cl. 562—580

7 Claims

1. Process for recovering lactic acid from aqueous media which contain it, which process comprises treating said aqueous medium with a system consisting of a complexing agent and an organic extractant, selective for lactic acid, which system comprises:

a) a complexing agent consisting of at least one macrocyclic octol, the macrocyclic octol has the formula (I):



in crown configuration, in which:

the "R" symbols represent linear or branched alkyl radical of from 5 to 18 carbon atoms, in axial configuration dissolved in

b) at least one organic solvent immiscible with water, selected from among alkanes, halogenated alkanes, cycloalkanes and halogenated cycloalkanes, aromatic hydrocarbons, halogenated and/or alkylated aromatic hydrocarbons and hydrocarbon blends at a pH value within the range of from 1 to 6,

the organic phase constituted by the lactic acid-octol complex dissolved in the organic solvent is separated from the aqueous phase and the organic phase is subsequently treated with water at a pH value within the range of from 7 to 10 or with methanol, with lactic acid being thus liberated, and said lactic acid is then recovered.

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UMI

ELECTRICAL

5,089,665

METAL-CLAD ELECTRICITY LINE AND METHOD OF MANUFACTURING IT

Edmond Thuries, Meyzieu, France, assignor to GEC Alsthom SA, Paris, France

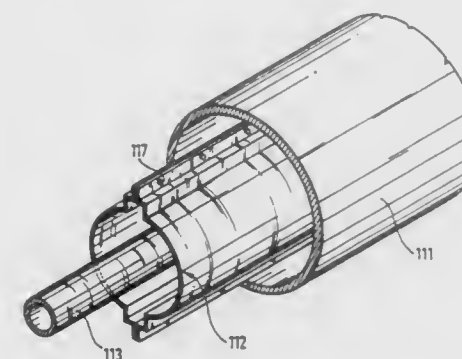
Filed Oct. 15, 1990, Ser. No. 597,128

Claims priority, application France, Oct. 16, 1989, 89 13488

Int. Cl.⁵ H01B 9/06

U.S. Cl. 174—27

35 Claims



1. A method of manufacturing a multi-phase metal-clad line comprising, for each phase of said multi-phase line, a phase conductor surrounded by an aluminum sheath, said aluminum sheaths being surrounded by at least one outer sheath which is gas-tight relative to the outside, the gas-tight outer sheath and the aluminum sheaths being filled with a gas having good dielectric properties and under pressure, wherein the method comprises the following steps:

preparing gas-tight tubes of a length lying in the range 5 meters to 20 meters for making lengths of said gas-tight sheath of length L by forming two thin strips of aluminum into two respective half-shells and assembling together progressively said two half-shells as they are being made, thereby constituting said aluminum sheath, providing said strips with stiffening members (116), holding members (120, 130) for holding the phase conductor, and running means (114);

disposing the phase conductor inside the aluminum sheath progressively while the phase conductor being fixed to said aluminum sheath by said holding member;

during the assembly of the aluminum sheath and the conductor pulling progressively the assembly into a corresponding length of gas-tight outer sheath until the opposite end of the length of gas-tight outer sheath is reached;

disposing at least one of such assembly inside a gas-tight outer sheath;

repeating the above steps to make another length of metal-clad multi-phase line following the length having just been completed;

interconnecting two following lengths of gas-tight outer sheath, the aluminum sheaths and conductors by link means;

repeating all of the above steps until each of the phases of the line has the desired length; and

filling the multi-phase line with the selected dielectric gas at the desired pressure, length by length.

2. A multi-phase metal-clad line comprising, for each phase, a phase conductor surrounded by an aluminum sheath, an outer sheath which is gas-tight relative to the outside surrounding each aluminum sheath, the insides of said gas-tight sheaths being filled with a gas having good dielectric properties, each said aluminum sheath being made from two half-shells, each half-shell being formed from a folded strip having a section in the form of a semicircle terminated at each end by a shoulder and by a flat, said two half-shells being juxtaposed and means assembling the flats of said two half-shells together.

5,089,666

CABLE AND METHOD OF MANUFACTURING THEREOF

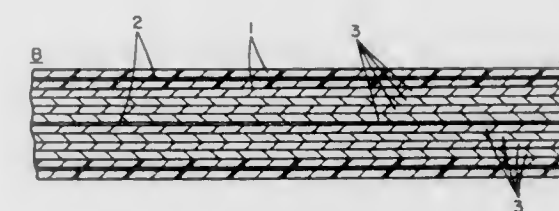
Edward C. DiVila, Rahway, N.J., assignor to Ace Electronics Inc., Carteret, N.J.

Filed May 3, 1990, Ser. No. 518,137

Int. Cl.⁵ H01B 7/00, 13/00; H02G 15/02; H01R 43/00

U.S. Cl. 174—74 R

7 Claims



1. In a cable for a computerized monitoring system wherein a cable during operation connects a tool to a computer terminal said cable having a first end to be connected to said tool and a second end to be connected to said computer terminal, the improvement which comprises a cable comprising an outer layer made of a plastic abrasion resistant material, a layer of a reinforcing material of Aramid fibers inside the outer layer said fibers having a flexibility measured in terms of modulus of 18 million lb/in² and tensile strength at least 400,000 lbs/in², a plurality of conductors through the center of said cable, a clamp for clamping said plastic material and said reinforcing material at said first end and a connector at said second end, said clamp has a diameter essentially the same as the diameter of said cable and is internally threaded, said clamp being snapped over the end of said plastic outer layer for a portion of about one inch in length whereby deformation of said portion of said plastic outer layer occurs, said clamp has a flange at the end which is snapped over said portion of the cable, said clamp has at least one longitudinal groove extending almost to said flange, said reinforcing material extending to the first end of said cable, whereby after the clamp is snapped over said portion of said outer layer, said reinforcing material enters said groove and is rigidly held thereon.

6. The method of manufacturing a cable having conductors for use in computerized monitoring systems, said cable having one first end to be connected to a tool and the opposite end is intended to be connected to a computer, which comprises the steps of:

1) preparing a cable having an outer jacket of plastic abrasion-resistant material and a central core of fibers of reinforcing flexible material;

2) placing a plurality of conductors around the central core and inside the outer jacket; and

3) snapping a clamp of about one inch in length over said first end of the cable, said clamp being a hollow cylinder, said clamp having at least one groove and being internally threaded, whereby said outer jacket of plastic material is deformed and engages with said internally threaded clamp and said reinforcing material is held in said at least one groove.

5,089,667

BASEBOARD, ARCHITECTURAL MOLDING OR THE LIKE FOR ACCOMMODATING AND PROTECTING ELECTRICAL EQUIPMENT AND ELECTRICAL CONDUCTORS CONNECTED THERETO

Vincent Goussin, Bais, and Nathalie Lajat, La Milledes, both of France, assignors to Legrand, Limoges, France

Filed Feb. 6, 1990, Ser. No. 475,949

Claims priority, application France, Feb. 7, 1989, 89 01534

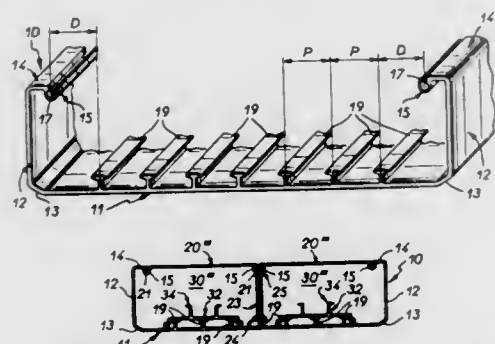
Int. Cl.⁵ H02G 3/04

U.S. Cl. 174—101

22 Claims

1. A molding unit comprising a generally U-shape cross-sec-

tion main part having a back wall and two opposed side flanges, identical parallel longitudinal ribs projecting from said back wall selectively cooperable with an accessory, at least one removable partition having foot means and head means for supporting the at least one removable partition with the molding unit, said foot means being selectively cooperable with the parallel ribs for attachment to a selected one of said ribs, said side flanges having free edges, snap-fastener members being provided on said side flanges adjacent said free edges, said at least one removable partition having back-to-back snap-fastener members adjacent said head means, said first mentioned and back-to-back snap-fastener members being of the same configuration, part covers having cooperable snap-fastener members cooperable with respective ones of the first-mentioned snap-fastener members on said side flanges and said back-to-back snap-fastener members on said at least one removable partition, said part covers being coplanar with each other in their operative position, with said cooperable and said first mentioned and back-to-back snap-fastener members in engagement with one other, whereby said at least one removable partition and said part covers define with said U-shape main part individually accessible plural compartments.



11. A molding unit comprising a generally U-shape cross-section main part having a back wall and two opposed side flanges, identical parallel longitudinal ribs projecting from said back wall selectively cooperable with an accessory, at least one removable partition having foot means and head means for supporting the at least one removable portion with the molding unit, said foot means being selectively cooperable with the parallel ribs for attachment to a selected one of said ribs, said side flanges having free edges, snap-fastener members being provided on said side flanges adjacent said free edges, a main cover having complementary snap fastener members cooperable with the first-mentioned snap-fastener members, said at least one removable partition having back-to-back snap fastener members adjacent said head means, a set of part covers having cooperable snap-fastener members cooperable with respective ones of the first-mentioned snap-fastener members on said side flanges and said back-to-back snap-fastener members on said at least one removable partition, whereby said main cover selectively defined with said U-shape main part a single compartment, and said at least one removable partition and said set of part covers together selectively define with said U-shape main part individually accessible plural compartments.

5,089,668

TOWABLE BUOYANT STREAMER FOR DATA BEARER
Anthony P. Harvey, Burwood, Australia, assignor to Plessey Australia Pty. Limited of Faraday Park, Meadowbank, Australia

Filed Nov. 17, 1989, Ser. No. 437,796
Claims priority, application Australia, Nov. 18, 1988, PJ1516
Int. Cl.⁵ H01B 7/12

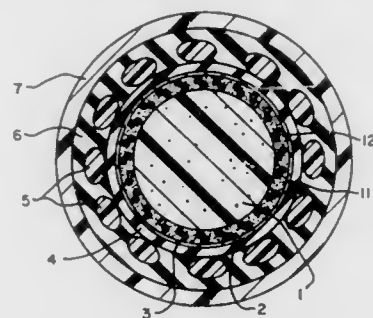
U.S. Cl. 174-101.5

19 Claims

1. A towable streamer, comprising:
a longitudinally extending buoyant core;
a longitudinally extending data bearer layer perimetrical-

surrounding said buoyant core, and thereby defining, with said buoyant core, an inner assembly;
a longitudinally extending inner jacket layer made of a resilient material, said inner jacket layer perimetricaly surrounding said inner assembly;
a longitudinally extending outer jacket layer perimetricaly surrounding said inner jacket layer;
a plurality of longitudinally extending strength members arranged in a series extending perimetricaly around said inner assembly and embedded in said inner jacket layer, for transmitting tension longitudinally of said streamer; and
spacing layer means made of resilient material; at least portions of said spacing layer means being located radially between said inner assembly and respective ones of said strength members, thereby spacing said strength members from said inner assembly.

16. A method for forming a towable streamer, comprising:
(a) providing a longitudinally extending buoyant core;



(b) perimetricaly surrounding said buoyant core with a longitudinally extending data bearer layer and thereby defining an inner assembly;
(c) positioning a plurality of longitudinally extending strength members arranged in a series extending perimetricaly around and in radially spaced relation to said inner assembly, for transmitting tension longitudinally of said streamer;
(d) while maintaining said strength members radially spaced from said inner assembly, forming a spacing layer means made of resilient material arranged so that at least portions thereof are located radially between said inner assembly and respective ones of said strength members;
(e) providing a longitudinally extending inner jacket layer perimetricaly surrounding said strength members and in which said strength members are embedded; and
(f) perimetricaly surrounding said inner jacket layer with a longitudinally extending outer jacket layer.

5,089,669

MULTI-CONDUCTOR ELECTRICAL TRANSMISSION RIBBON CABLE WITH VARIABLE CONDUCTOR SPACING

Douglas E. Piper, Greenville, and E. J. Mondor, III, Taylors, both of S.C., assignors to Woven Electronics Corporation, Mauldin, S.C.

Filed Jul. 16, 1990, Ser. No. 552,947

Int. Cl.⁵ H01B 7/08, 13/00; D03D 15/00

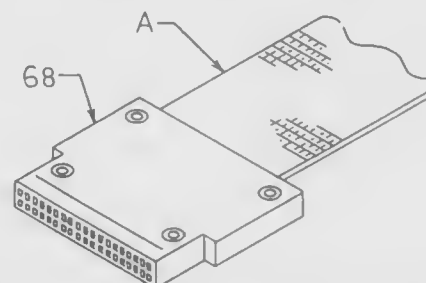
U.S. Cl. 174-117 M

29 Claims

1. A multi-conductor ribbon cable which includes a generally flat section having a plurality of signal conductors extending in a longitudinal direction in a generally side-by-side manner with a desired center spacing between said signal conductors; means for fixing said center spacing of said signal conductors; a first section of said signal conductors having a first center spacing, a second section of said signal conductors having a second center spacing, and said second center spacing being greater than said first center spacing to provide desired mechanical and electrical cable characteristics; and said means

for fixing said center spacing of said conductors comprises a woven fabric having a weave which includes a plurality of warp yarns extending in said longitudinal direction and weft yarns interwoven with said warp yarns and said signal conductors.

24. A method of matching electrical characteristics and mechanical characteristics of an electrical transmission cable to associated input and output devices and connector assemblies, respectively, said cable being of the type which includes a plurality of signal conductors extending in a longitudinal direction in a generally side-by-side manner with a prescribed center spacing between the centers of said signal conductors, said method comprising:



spacing said signal conductors in a first section of said cable to provide a first center spacing and an electrical characteristic which matches an electrical characteristic of said input device;

spacing said signal conductors in a second section of said cable to provide a second center spacing and an electrical characteristic which matches an electrical characteristic of said output device; and

fixing said first and second center spacings of said cable by weaving a plurality of warp yarns in a longitudinal direction and weft yarns in a transverse direction with said signal conductors.

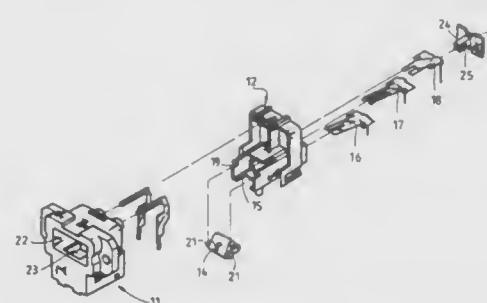
5,089,670

STRUCTURE OF SOCKET SWITCH

Chien-Jen Chen, 7th Fl. 473 Min Chuan E. Rd., Taipei, Taiwan
Filed Aug. 24, 1990, Ser. No. 571,702
Int. Cl.⁵ H01H 9/00, 19/00, 33/96

U.S. Cl. 200-1 A

1 Claim



1. A socket switch for electrically switching from a first set of contacts to a second set of contacts responsive to insertion of an electrical plug, comprising:

(a) a switch body housing having an opening for insert of said electrical plug;

(b) a contact point housing secured to said switch body housing, said contact point housing having an internal chamber;

(c) a rear clamping member insertable within said contact point housing within said internal chamber;

(d) a substantially triangularly contoured switch member rotatably coupled to said contact point housing and having a first apex extending into the path of said electrical plug when said electrical plug is inserted into said switch

body housing; said substantially triangularly contoured switch member having a second apex rotatably displaced from a first position to a second position responsive to said first apex being contacted and rotated by said insert of said electrical plug into said opening; and,

(e) a first, second, and third contact member fixedly secured to said rear clamping member and extending into said contact point housing for contact with said second apex, said first set of contacts defined by said first and second contact members and said second set of contacts being defined by said second and third contact members, said first, second and third contact members being secured to said rear clamping member and extending into said internal chamber in displaced overlying relation each with respect to the other, said first, second and third contact members being fixedly secured to a U-shaped fastening member secured to a wall of said rear clamping member, said rear clamping member being secured to said contact point housing by a pair of upper and lower pintle hook members of said contact point housing.

5,089,671

UNDERWATER ZOOM SWITCH

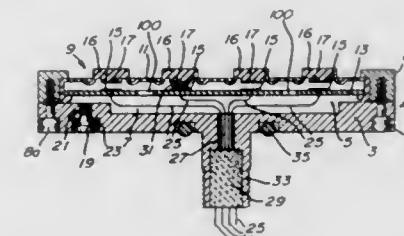
Val Ranetkins, 135 Seignior Ave., Pointe Claire, Quebec, Canada

Filed Dec. 15, 1989, Ser. No. 451,511

Int. Cl.⁵ H01H 13/70, 9/00

U.S. Cl. 200-5 A

7 Claims



1. A switch arrangement, comprising:

a housing having an open end and a closed end to define an interior chamber;

a degassed, non-compressible, electrically insulating fluid completely filling said interior chamber;

a flexible, stretchable membrane covering said open end of said housing, said flexible membrane having an inner surface, facing said closed end of said housing, and an opposed outer surface;

a push-button molding formed on said outer surface of said flexible membrane;

wherein, when said push-button molding is not depressed, said switch arrangement is in an open state, and, when said push-button molding is depressed in the direction towards said closed end of said housing, said switch arrangement is in a closed state; and

wherein, when said push-button molding is depressed in the direction toward said closed end of said housing, the fluid under said membrane in the area of said push-button molding is displaced in a direction away from the space between said push-button molding and said closed end, said flexible membrane being expanded in the area surrounding said push-button molding to provide additional volume to accommodate said displaced fluid, said additional volume being equal to the volume of said displaced fluid.

5,089,672

FLEXIBLE ELECTRICALLY CONDUCTIVE CONTACT FOR A SWITCH WHICH IS ACTUATED UPON FORCE BEING APPLIED THERETO

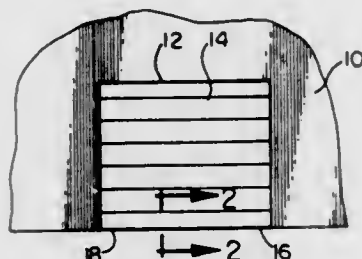
Norman K. Miller, Concordville, Pa., assignor to Miller Edge, Inc., Concordville, Pa.

Filed Sep. 19, 1990, Ser. No. 584,834

Int. Cl.⁵ H01H 3/16, 1/02

U.S. Cl. 200—61.43

30 Claims



22. A sensing edge for causing a closing door to open by actuating a device upon force being applied to said sensing edge, said sensing edge comprising:

a first sheet of resiliently compressible material having a first face and a second face;
a first flexible, electrically conductive contact having a first face and a second face, said first face of said first flexible, electrically conductive contact being in engagement with said second face of said first sheet of resiliently compressible material;

a layer of nonconductive material having a first face and a second face, said first face of said layer of nonconductive material being in engagement with said second face of said first flexible, electrically conductive contact, said layer of nonconductive material including at least one opening extending therethrough between said first and second faces thereof;

a second flexible, electrically conductive contact having a first face and a second face, said first face of said second flexible, electrically conductive contact being in engagement with said second face of said layer of nonconductive material, said first and second flexible, electrically conductive contacts each comprising:

a first plurality of generally flexible fibers, one portion of said first plurality of fibers being constructed of an electrically nonconductive material, another portion of said first plurality of fibers being constructed of an electrically conductive material;

a second plurality of generally flexible fibers, one portion of said second plurality of fibers being constructed of an electrically nonconductive material, another portion of said second plurality of fibers being constructed of an electrically conductive material, said second plurality of fibers being interwoven with said first plurality of fibers in the form of a sheet with said electrically conductive portion of the first plurality of fibers in engagement with said electrically conductive portion of the second plurality of fibers; and

a second sheet of resiliently compressible material having a first face and a second face, said first face of said second sheet of resiliently compressible material being in engagement with said second face of said second flexible, electrically conductive contact, said first and second flexible, electrically conductive contacts being spaced apart by said layer of nonconductive material and present opposed portions to each other through said opening whereby upon the application of force to at least one of said sheets of resiliently compressible material, a portion of at least one of said first and second flexible, electrically conductive contacts deflects into the opening in said layer of nonconductive material and makes electrical contact between said first and second

flexible, electrically conductive contacts to thereby actuate the device.

5,089,673

PRESSURE OPERATED ELECTRICAL SWITCHING DEVICE WITH PLURAL LEVER ACTUATED MICROSWITCHES

Hubert Strzodka, Friedberg, Fed. Rep. of Germany, assignor to Imo Industries, GmbH, Reichelsheim, Fed. Rep. of Germany

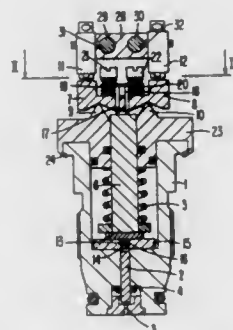
Filed Mar. 30, 1990, Ser. No. 501,285

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 3910837

Int. Cl.⁵ H01H 35/38

U.S. Cl. 200—82 C

8 Claims



1. A pressure operated electrical switching device, comprising:

a housing having two sharp edges formed on a top portion thereof on opposite sides of a longitudinal axis of the housing;

an axially movable switch plunger disposed in said housing along the longitudinal axis;

two opposing rocking levers each rockably arranged on one of said two sharp edges so that an inner end portion of each rocking lever communicates with the axially movable switch plunger; and

two microswitches each mounted on the housing so as to be switchable by an outer end portion of one of said rocking levers.

5,089,674

HYDROSTATIC PRESSURE SENSOR

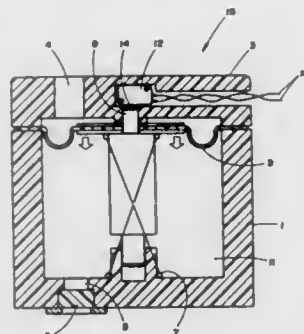
Robert F. Wilson, Vancouver, Canada, assignor to Microtel Pacific Research Limited, Burnaby, Canada

Filed Apr. 25, 1990, Ser. No. 514,436

Int. Cl.⁵ H01H 35/24

U.S. Cl. 200—83 R

21 Claims



5. A hydrostatic pressure sensor, comprising:

(a) a housing having a chamber and an opening at one end;

(b) a diaphragm covering the opening in sealing contact with said housing, at least a portion of said diaphragm being porous to gas but substantially impermeable to the passage

of water therethrough such that the pressure in the chamber is equalized to atmospheric pressure substantially instantaneously when in a gaseous atmosphere;

(c) means for affixing said diaphragm to said housing so as to cover the opening to the chamber while at the same time permitting fluid communication between an exterior surface of said diaphragm and a region exterior to said sensor; and

(d) actuator means for initiating action on an external element in response to movement inwardly of the chamber of said diaphragm beyond a predetermined position.

5,089,675

RESISTOR CARD CALIBRATION RETENTION METHOD AND FUEL PUMP SWITCH

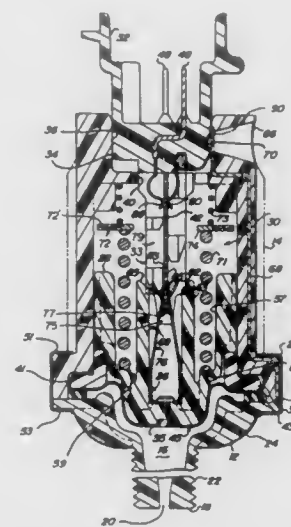
Joseph T. Betterton, Arab; Alfred H. Glover, Decatur, and Thomas S. McKee, Madison, all of Ala., assignors to Acustar, Inc., Troy, Mich.

Filed Mar. 29, 1990, Ser. No. 500,966

Int. Cl.⁵ H01H 35/34; G01L 7/08

U.S. Cl. 20—83 J

20 Claims



11. An improved pressure transducer and switching device operated in response to pressure changes of a fluid such as oil in an internal combustion engine, comprising:

elongated enclosure means defining a generally hollow interior, one end of said enclosure means being adapted to receive pressurized fluid, a second opposite of which is configured for transmitting pressure related output;

diaphragm means in said interior having a peripheral edge and a mid portion, said peripheral edge being supported by said enclosure means with said mid portion separating said enclosure interior into first and second spaces, said first space receiving pressurized fluid from said one end of said enclosure means to thereby exert a pressure force on said diaphragm, said mid portion being moved axially in said elongated enclosure in response to said pressure force;

a piston member disposed in said second space and operatively attached to said mid portion of said diaphragm and movable therewith in the axial direction of said enclosure; a switch assembly housed in second space of said enclosure means, said switch assembly being actuated in response to movement of said piston; and

a terminal support member insertably housed in a recess of said enclosure and carrying at least one electrically conductive terminal extending axially inward into said second space in circuit with said switch assembly; and said piston member including an electrical contact assembly attached thereto, said contact assembly having piston contacts formed with a compound radius for making

slidable contact with a resistor board of said terminal support member.

5,089,676

LIQUID LEVEL FLOAT SWITCH

Malcolm Duncan, Lisle, Ill., assignor to Magnetrol International Incorporated, Downers Grove, Ill.

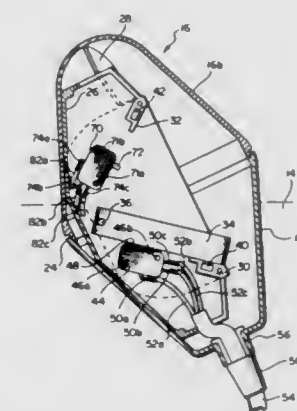
Filed May 16, 1990, Ser. No. 523,972

Claims priority, application South Africa, May 16, 1989, 89/3624

Int. Cl.⁵ H01H 35/18

U.S. Cl. 200—84 R

17 Claims



1. A liquid level detector for detecting liquid level height in a vessel, comprising:

a housing adapted to float in the liquid;

first and second spaced, fixed stops disposed in the housing;

a pendulum having an end pivotally mounted in the housing wherein the pendulum is movable between stops in response to a change in orientation of the housing due to a change in liquid level height of the vessel;

an electrical switch disposed in the housing adjacent the first stop having an actuator separate from the pendulum and actuable thereby; and

means for tethering an end of the housing.

5,089,677

SWITCHING DIAL AND FINGER REST

Kouji Satou, Shiki, Japan assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

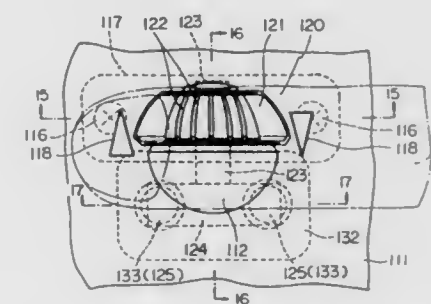
Continuation of Ser. No. 452,391, Dec. 19, 1989, abandoned, which is a division of Ser. No. 283,961, Dec. 13, 1988, Pat. No. 4,918,264. This application Feb. 15, 1991, Ser. No. 656,028

Claims priority, application Japan, Dec. 26, 1987, 62-198050; Jul. 29, 1988, 63-100695

Int. Cl.⁵ H01H 23/30

U.S. Cl. 200—339

10 Claims



1. An operating member for a switching device, said operating member comprising:

- (a) a support structure;
 (b) a dial being rotatably mounted for movement about an axis on said support structure, said dial including at least a portion of a generally convex quarter-spherical surface; and
 (c) a finger rest being fixedly mounted on said support structure adjacent to said dial, said finger rest including a generally convex quarter-spherical surface, said dial and said finger rest in combination forming a convex semi-spherical surface.

5,089,678

MECHANICAL MOMENTARY OR ALTERNATE ACTION SWITCH

Othmar Zemp, Sursee, and Albrecht Meier, Gerlafingen, both of Switzerland, assignors to Elektro-Apparatebau Olten AG, Olten, Switzerland

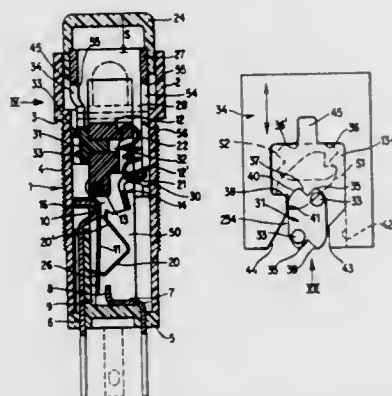
Filed Jul. 30, 1990, Ser. No. 559,664

Claims priority, application Switzerland, Jul. 28, 1989, 2820/89

Int. Cl.⁵ H01H 5/06

U.S. Cl. 200—454

14 Claims



1. A mechanical switch comprising a housing; a bearing member in said housing; a contact disposed in said housing and movable between first and second positions; and means for moving said contact between said positions, including a retainer, means for movably mounting said retainer on said bearing member, a stressed spring having a first portion reacting against said retainer and a second portion bearing against said contact, and actuator means for moving said retainer relative to said bearing member to thereby move said contact by way of said spring, said retainer including a lever and said mounting means defining for said lever a pivot axis, said lever including a first arm having a portion which is engaged by the first portion of said spring and is located at a predetermined distance from said pivot axis, said contact being pivotable relative to said housing about a second axis which is located at or close to said predetermined distance from said pivot axis and said lever further including a second arm, said actuator means comprising a depressible pushbutton, a reflector rigid with said pushbutton and means for transmitting motion from said reflector to the second arm of said lever, said motion transmitting means comprising two resilient prongs and said actuator means further comprising means for articulately connecting said prongs to said second arm, said connecting means comprising complementary first and second detents provided on said prongs and on said second arm, respectively.

5,089,679

MICROWAVE OVEN WITH STAND-BY MODE

Kenneth I. Eke, Woldingham, England, assignor to Microwave Ovens Limited, Surrey, England

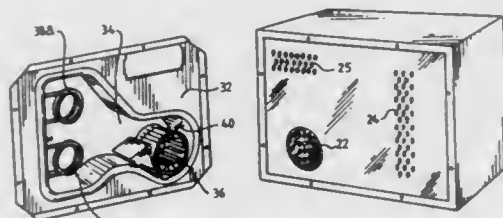
Filed Aug. 22, 1989, Ser. No. 397,003

Claims priority, application United Kingdom, Sep. 9, 1988, 8821213; Jul. 13, 1989, 8916074

Int. Cl.⁵ H05B 6/68

U.S. Cl. 219—10.55 B

8 Claims



1. A microwave oven having a food-receiving cavity, a magnetron for delivering microwave power to the cavity, electrical resistance heating means disposed within a compartment adjacent to the cavity, a fan for passing air over the heating means to provide a flow of forced hot air through the cavity, and thermostatic control means for controlling the temperature of the air heated by the heating means, wherein the oven has a stand-by mode which the oven assumes after switching on and in which the oven is ready and waiting for a food item to be loaded into the cavity, the oven being capable of occupying the stand-by mode indefinitely until a food item is loaded into the cavity to commence a cooking process, means for maintaining the fan and magnetron de-energised during the stand-by mode and means for energising the heating means at least in pulses during the stand-by mode, subject to thermostatic control by the thermostatic control means, in order to provide a reservoir of heat in the compartment at the commencement of the cooking process and in order to maintain the cavity cool, relative to cooking temperatures, during the stand-by mode.

5,089,680

INDEXED ROTATABLE CURRENT PICK-UP FOR A TRAVELLING WIRE ELECTRICAL DISCHARGE MACHINING APPARATUS

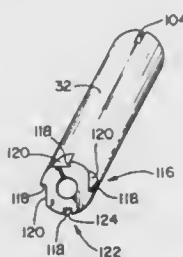
Thomas J. Truty, South Barrington, Ill., assignor to T-Star Industrial Electronics Corporation, Wheeling, Ill.

Filed May 28, 1991, Ser. No. 705,768

Int. Cl.⁵ B23H 7/10

U.S. Cl. 219—69.12

25 Claims



1. A current pick-up for an electrical discharge machining apparatus for delivering an electrical current to a wire electrode, said current pick-up comprising: a cylindrical body including a first end and a second end, a longitudinal bore in said cylindrical body extending from said first end to said second end of said body for the passage of said wire electrode, said longitudinal bore including an inner peripheral surface against at least a portion of

which said wire electrode bears while passing through said bore;
 tool receiving means at said first end of said cylindrical body for receiving a tool for rotating said cylindrical body to expose different portions of said inner peripheral surface to said wire electrode; and
 index pin receiving means at said second end of said cylindrical body for receiving an index pin for indexing said cylindrical body during rotation at discrete orientations corresponding to said different portions of said inner peripheral surface.

5,089,681

ELECTRO-DISCHARGE MACHINING APPARATUS

Mohamed F. El-Menshawy, Birmingham, England, assignor to Spark Tec Limited, Birmingham, England

Division of Ser. No. 167,268, Mar. 11, 1988, Pat. No. 4,950,860. This application Aug. 14, 1990, Ser. No. 567,076

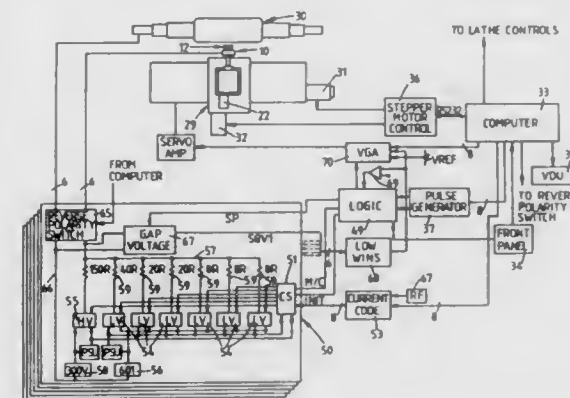
Claims priority, application United Kingdom, Mar. 14, 1987, 8706091

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.⁵ B23H 1/02, 7/26, 9/04

U.S. Cl. 219—69.16

8 Claims



4. A method of electrode discharge machining the surface of a metal roll, said method comprising the steps of: rotatably supporting said roll about a roll axis for machining; providing a roll support structure movable in a direction parallel to said roll axis; providing an electrode holder on said support structure and movable in a direction transverse to said roll axis; providing a plurality of separate electrodes mounted on said electrode holder and electrically insulated from one another; repeatedly supplying a relatively short constant duration relatively high voltage pulses to said electrodes; detecting the voltage across any gaps between said electrodes and said roll; repeatedly supplying relatively lower voltage machining pulses to said electrodes for a duration longer than said relatively short constant duration relatively high voltage pulses; interrupting the supply of machining pulses to said electrodes in the event the detecting step detects a short circuit between an electrode and said roll; and displacing said electrode holder towards or away from said roll surface in accordance with detected discharge conditions.

5,089,682

ROLLER ELECTRODES FOR ELECTRIC-RESISTANCE WELDING MACHINE

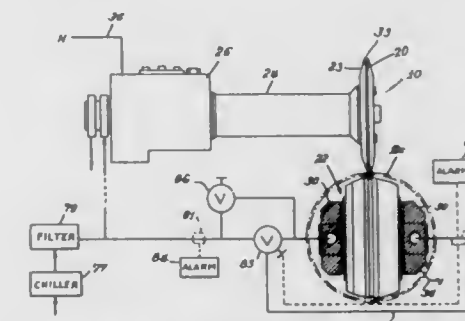
Joseph R. Davies, 220 W. Haven, New Lenox, Ill. 60451

Continuation-in-part of Ser. No. 173,764, Mar. 28, 1988, Pat. No. 4,940,873, which is a continuation-in-part of Ser. No. 53,375, May 22, 1987, Pat. No. 4,780,589. This application Oct. 20, 1989, Ser. No. 424,389

Int. Cl.⁵ B23K 11/06

U.S. Cl. 219—84

19 Claims



1. For use in electric resistance seam welding apparatus having inner and outer roller electrodes opposing one another and sandwiching therebetween overlapped edges of a metal blank curved over a full 360 degrees to a tubular configuration, the combination of the outer roller electrode comprising a member having an exterior peripheral face closely adjacent the overlapped metal edges during welding, passage means in the member adapted to direct a liquid coolant through the member, and the peripheral face and the member in the region radially between said passages and the peripheral face being formed only of a composite sintered mixture of copper (Cu) and tungsten (W), in the range of 60-70% tungsten and 40-30% copper, by weight.

5,089,683

DEVICE FOR PRODUCING A CONSTANT LENGTH LASER BEAM AND METHOD FOR PRODUCING IT

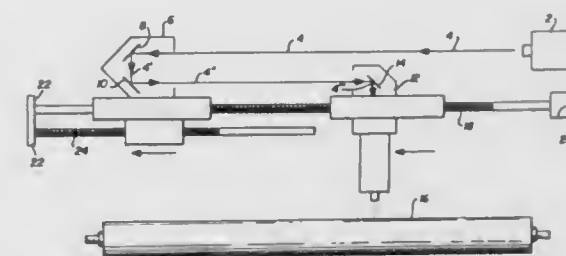
Gerald H. Stephenson, Swindon-Wiltshire, England, and Russell M. Morgan, Indianapolis, Ind., assignors to Union Carbide Coatings Service Technology Corporation, Danbury, Conn.

Filed Sep. 18, 1990, Ser. No. 584,099

Int. Cl.⁵ B23K 26/08

U.S. Cl. 219—121.78

10 Claims



1. A constant length laser device for use with laser generating means comprising a first moveable optical reflector carriage containing at least two reflective surfaces arranged to receive a laser beam and deflect and reflect the laser beam 180°; a second moveable optical carriage containing at least one reflector arranged to receive the laser beam from the first moveable optical carriage and deflect the beam onto a workpiece; and means for synchronizing the movement of the first moveable carriage and second moveable carriage in the same direction with the first moveable carriage synchronized to move at one half the speed of the second moveable carriage.

5,089,684

TOOLING FOR WORKING WITHIN A TUBULAR ELEMENT

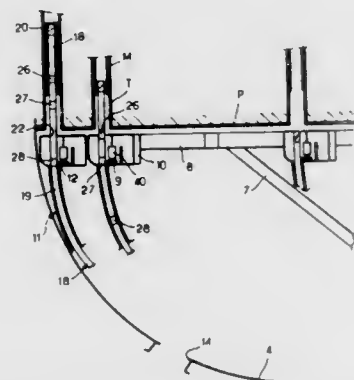
Jacques Griffaton, Chalon S/Saone, France, assignor to Framatome, Courbevoie, France

Filed Jun. 28, 1990, Ser. No. 544,940

Claims priority, application France, Jun. 28, 1989, 89 08635
Int. Cl.⁵ B23K 26/00

U.S. Cl. 219—121.63

8 Claims



1. Tooling for working within a tubular element, of the type comprising a rod (18) which comprises, at its front end, a rotary working head (20) equipped with means (24, 25) for centering within said tubular element, and a frame (9) traversed by said rod and equipped with means (8) for positioning in relation to said tubular element, said frame being equipped with means (40) for driving said rod in rotation, means for driving in rotation (40) selectively cooperating with at least two driving regions (26 to 28) of the rod axially spaced from one another and equipped with means (38, 39) for engagement-disengagement in relation to said rod, said tooling further comprising means (6) for longitudinal advance of said rod which are situated remotely, to the rear in relation to said means for driving in rotation.

5,089,685

METHOD OF AND ARRANGEMENT FOR MEASURING THE SIZE OF THROUGHGOING OPENINGS

Robert Schmidt-Hebbel, Erlangen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

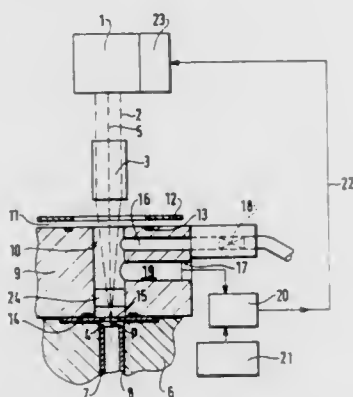
Filed Oct. 29, 1990, Ser. No. 606,067

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942299

Int. Cl.⁵ B23K 26/02

U.S. Cl. 219—121.83

8 Claims



1. An arrangement for measuring throughgoing openings produced by energy radiation, in particular laser radiation,

comprising a pressure-tightly closeable chamber for a work-piece; a supply channel and a withdrawal channel for supplying a fluid to said chamber and withdrawing the fluid from said chamber; a radiation source; a window provided adjacent to said chamber at its side facing toward said radiation source; and radiation permeable material pressure-tightly closing said window.

5,089,686

ELECTRON BEAM GENERATOR FOR AN ELECTRON BEAM GUN

Dieter Fritz, Gelnhausen, Fed. Rep. of Germany, assignor to PTR Präzisionstechnik GmbH, Maintal/Dörnigheim, Fed. Rep. of Germany

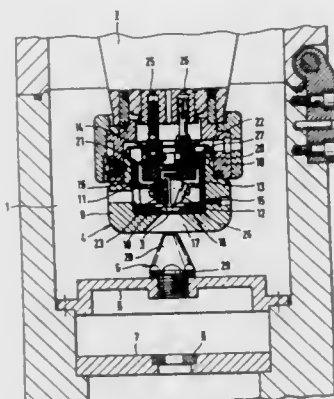
Filed Sep. 10, 1990, Ser. No. 579,794

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930202

Int. Cl.⁵ B23K 15/00

U.S. Cl. 219—121.27

10 Claims



1. Electron beam generator for an electron beam gun, comprising
a control electrode comprising a pot-shaped jacket having a cylindrical bore and a bottom with an opening for an electron beam,
a pot-shaped insert closely received in said cylindrical bore, said insert having a conical opening adapted to a cathode size,
a supporting ring which is closely received in said cylindrical bore over said pot-shaped insert,
a cathode holder received in said supporting ring,
a cathode borne by said cathode holder, and
an anode comprising anode sleeve positioned opposite said cathode and having a bore therethrough for receiving an electron beam generated by said cathode.

5,089,687

BUS BAR JUMPER FOR HEATABLE WINDSHIELD
Bruce A. Bartrug, Lower Burrell; Harry S. Koontz, and John A. Winter, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1990, Ser. No. 591,917

Int. Cl.⁵ H05B 3/26, 3/84, 3/10

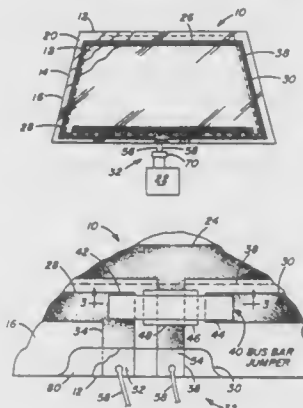
U.S. Cl. 219—203

17 Claims

1. In a transparency of the type including a pair of dielectric substrates designated as a first dielectric substrate and a second dielectric substrate, the first dielectric substrate having a transparent electroconductive member on a major surface, a first bus bar in contact with said member adjacent a first edge portion of said first substrate, a lead extending from said first bus bar to a terminal area positioned along said first edge portion, a second bus bar spaced from said first bus bar and in contact with said member, electroconductive extensions electrically insulated from said member and extending from each end of said second bus bar to said terminal area with ends of

said extensions being positioned on either side of said lead at said terminal area, and the second dielectric substrate overlaying said major surface of said first substrate while providing an exposed portion of the terminal area to provide access to said terminal area wherein each of the electroconductive extensions are capable of carrying sufficient electrical power to the second bus bar to, in cooperation with the first bus bar, power the electroconductive member in the event one of the electroconductive extensions becomes electrically non-conductive, the improvement comprising:

the end of said lead from said first bus bar and the end of one of the electroconductive extensions each terminating in



the exposed portion of the terminal area with the end of the other electroconductive extension terminating short of the exposed portion of the terminal area;
means in the unexposed portion of the terminal area positioned above said lead from said first bus bar electrically interconnecting said ends of said extensions, said electrical interconnecting means capable of carrying said sufficient electrical power in case the extensions having the end in the unexposed portion of the terminal area becomes electrically non-conductive; and
means electrically insulating said interconnecting means from said lead from said first bus bar.

5,089,688

COMPOSITE CIRCUIT PROTECTION DEVICES

Shou-Mean Fang, Union City; David A. Horsma; Guillaume Peronnet, both of Palo Alto, all of Calif.; Timothy E. Fahey, Williamsport, Pa.; Andrew N. Au, Fremont, and William D. Carlomagno, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 124,696, Nov. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 115,089, Oct. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 754,807, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 628,945, Jul. 10, 1984, abandoned. This application Dec. 22, 1989, Ser. No. 456,030

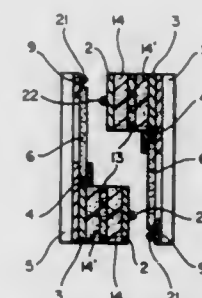
Int. Cl.⁵ H05B 1/02

U.S. Cl. 219—505

23 Claims

1. Electrical apparatus which comprises
(1) a first laminar substrate which is electrically insulating and a second laminar substrate, each of said substrates comprising a first laminar surface and a second laminar surface;
(2) a first electrical component which (i) is physically adjacent to the first laminar surface of the first laminar substrate and is mounted directly thereto, (ii) has a resistance R_1 , and (iii) comprises
(a) a laminar PTC elements composed of a conductive polymer which exhibits PTC behavior with a switching temperature T_s , and
(b) at least two laminar electrodes which can be connected to a source of electrical power so that current passes between the electrodes through the PTC element;

(3) a plurality of second electrical components, one of which (a) is physically adjacent to the first laminar surface of the first laminar substrate and is mounted directly thereto, (b) is in good thermal contact with the first component,



(c) is electrically connected in series with the first component, and
(d) has a resistance R_2 ; and
(4) an electrical lead which electrically connects the first component and the said one second component.

5,089,689

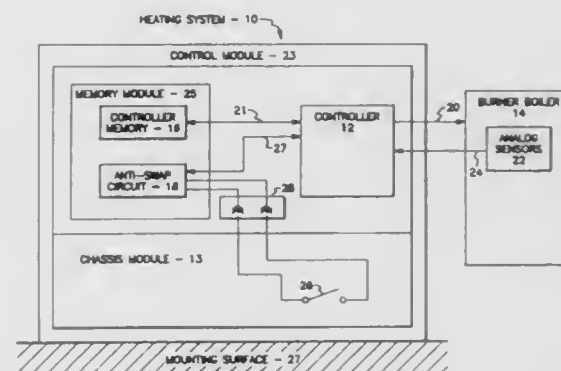
FLAME SAFEGUARD CONTROL ANTI-SWAP FEATURE
Kenneth B. Kidder, Coon Rapids, and Wilmer L. Adams, Fridley, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1989, Ser. No. 418,599

Int. Cl.⁵ H05B 1/02

U.S. Cl. 219—506

11 Claims



1. For use in a heating system having a controller and a controller memory for controlling the heating system based on input parameters provided to the controller and based on safety critical information stored in the controller memory, an apparatus for ensuring that the controller memory is programmed to store safety critical information corresponding to the heating system in which it is installed comprising:
program signal generating means for generating a program signal when the controller memory is electrically disconnected from the heating system, the program signal indicating that the controller memory must be programmed to include safety critical information corresponding to the heating system in which the controller memory is subsequently installed; and
inhibiting means for inhibiting, in response to the program signal, operation of the heating system in which the controller memory is subsequently installed.

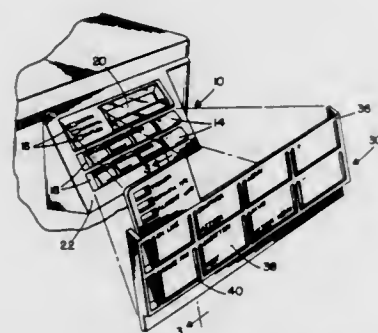
5,089,690 KEYBOARD OVERLAY

Mike H. Okamura, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 14, 1990, Ser. No. 628,300
Int. Cl.⁵ G06C 7/00, 7/02

U.S. Cl. 235—145 R

8 Claims



1. A removable overlay for a user-operable keyboard, said keyboard including a plurality of convex, depressible keys that extend above a panel surface, each said key having an associated indication of the key's function, said overlay comprising: a molded, plastic, planar member sized to cover substantially the extend of said keyboard, said planar member having keyboard and user sides, said keyboard side exhibiting a plurality of convex chambers created by orthogonal intersecting walls, each said convex chamber sized to surround and mate with a said convex key and having a resilient ceiling member positioned over said key, so that when said resilient ceiling member is depressed, said key is likewise depressed and actuated, the user side of selected ones of said resilient ceiling members having modified key function indications, whereby user selection of a said removable overlay having said modified key function indications and emplacement thereof over said keyboard enables said user to comprehend functions performed by said keys.

5,089,691 IMAGE RECORDING APPARATUS HAVING BAR CODE READER FOR READING BAR CODE ATTACHED TO LEADING END OF MICROCAPSULE SHEET

Hiroshi Morisaki, Nishikasugai, and Tokunori Kato, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

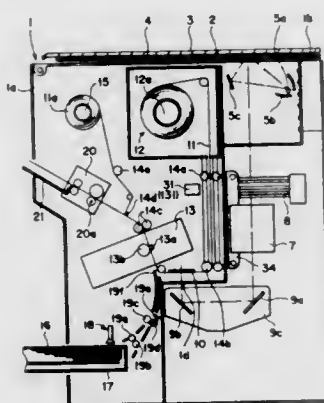
Filed Jun. 18, 1990, Ser. No. 539,194

Claims priority, application Japan, Jul. 11, 1989, 1-179797; Aug. 11, 1989, 1-95158

Int. Cl.⁵ G06F 15/20

U.S. Cl. 235—375

15 Claims



1. An image recording apparatus for recording an image on

an image recording medium, the image recording medium having a leading edge portion provided with a machine readable data inherent to the image recording medium, the apparatus comprising:

an exposure unit comprising a light source, a plurality of filters, an exposure portion, means for changing light irradiation amount from the light source, and means for changing insertion amount of filters of the filter unit with respect to an optical path extending from the light source to the exposure portion;
means for reading the machine readable data;
memory means for storing therein a correct machine readable data; and
control means connected between the reading means and the memory means for judging whether or not the reading means fails to read the machine readable data, and for controlling the exposure unit in accordance with the correct machine readable data stored in the memory means.

5,089,692 ELECTRONIC LOCK

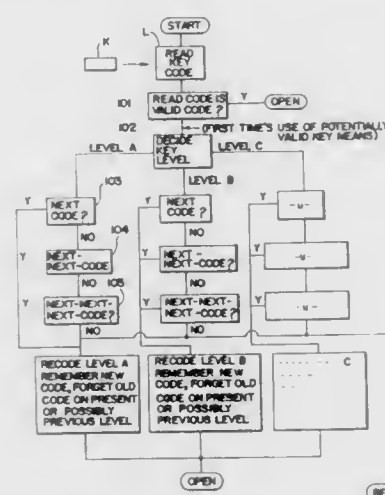
Thorstein Tonnesson, Moss, Norway, assignor to Trivving A.S., Moss, Norway

Filed Jul. 29, 1988, Ser. No. 225,757

Int. Cl.⁵ G06K 7/01, 5/00

U.S. Cl. 235—382.5

11 Claims



1. An electronic lock, comprising:
a key having a unique key code, said unique key code being equal to a value defined by an equation $N \cdot P$, wherein N is equal to a unique key code level, each unique key code level operating on a different code sequence, and P equals a code shift look ahead value for checking a validity of a key that does not currently carry a valid unique key code; and
a lock unit for receiving said key, comprising:
means for reading said unique key code on said key;
means for storing key codes in a plurality of independent unique key code levels, said key codes being arranged in a unique key code sequence, with said key code sequence in each level being uniquely defined for each level; and
means for comparing said unique key code read from said key with said key codes found in said plurality of key code levels, wherein if said key code on said key is identical to a key code found in said key code sequence in any one of said independent key code levels, said key code in said lock unit is authorized as valid and said lock will open.

5,089,693 READER/WRITER FOR ARCUATELY FLEXED DATA CARDS

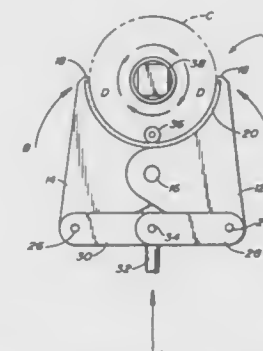
Richard Haddock, Redwood City, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 162,918, Mar. 2, 1988, Pat. No. 4,912,312, which is a continuation-in-part of Ser. No. 937,648, Dec. 2, 1986, Pat. No. 4,820,913. This application Mar. 26, 1990, Ser. No. 499,859

Int. Cl.⁵ G06K 7/10, 7/015

U.S. Cl. 235—486

23 Claims



1. A reader/writer for flexible data cards comprising, a card holder having a pair of pivotable arms being adapted to receive a flexible wallet-sized data card, the arms of the card holder being operable from an open position in which the arms are spaced apart suitably for receiving the data card to a clamped position in which the arms are brought towards each other to form a portion of a cylinder thereby bending the data card, said card being bent to conform to said portion of a cylinder thereby forming an arcuately flexed data card,
actuator means associated with the card holder for pivoting said pivotable arms and for selectively maintaining the arms in one of said clamped position and open position, transducer means in operative relation with the arcuately flexed data card for reading and writing data on the data card, and
means for providing relative rotational motion between the transducer means and the arcuately flexed data card.

5,089,694 CARD READER DEVICE HAVING AUTOMATIC MEANS FOR CLAMPING THE CARD TO BE READ AND FOR AUTOMATICALLY EJECTING THE CARD AT THE END OF THE CARD READING AND WRITING OPERATIONS

Arthur S. Zarfahs, Elk Grove Village; Kirk D. Hoffman, Yorkville, and Norman Diamond, Deerfield, all of Ill., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 7, 1990, Ser. No. 489,805

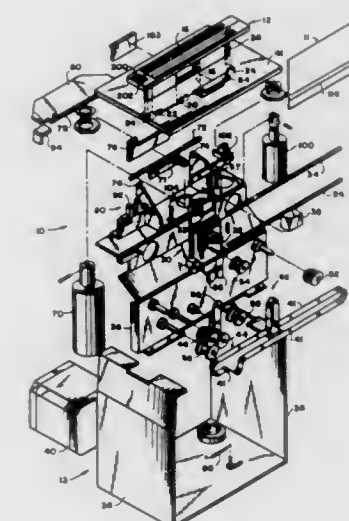
Int. Cl.⁵ G06K 7/00

U.S. Cl. 235—486

7 Claims

1. A card reader device comprising:
(a) a fare card, which contains data, adapted to be inserted into the reader device;
(b) means for clamping the card in a fixed position automatically responsive to the insertion of the card so that the card may be read and other operations performed with respect to it, said means for clamping including a clamping device and a first solenoid means for forcing said clamping device against said card; a microprocessor, and a first sensor means for sensing the presence of the card at the interior of said card reader and for feeding signals to said microprocessor for energizing said solenoid means;
(c) a card reader assembly;
(d) means for moving said card reader assembly past the card to read the data on the card, to write new data and to verify that the new data has been correctly written;

(e) means for transferring data representative of a fare amount;
(f) means for automatically releasing the clamping of said card; and



(g) a second, ejection solenoid means for lifting the card upwardly from said reader device upon release of the clamping of said card.

5,089,695 SOLID STATE SENSOR WITH DUAL RESONANT VIBRABLE MEMBERS

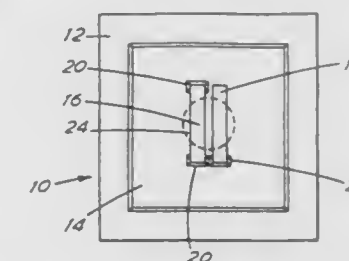
Jolyon P. Willson, Andover, and Philip Parsons, Farnham, both of England, assignors to Schlumberger Industries Limited, Farnborough, England

Continuation-in-part of Ser. No. 409,902, Sep. 20, 1989, Pat. No. 4,972,076. This application Sep. 4, 1990, Ser. No. 577,349
Claims priority, application United Kingdom, Sep. 29, 1988, 8822877; Aug. 30, 1989, 8919573

Int. Cl.⁵ H01J 5/16

U.S. Cl. 250—227.21

4 Claims



1. A solid state sensor for sensing a physical parameter, the sensor comprising:
a first resonantly vibratable member formed in a substrate and arranged such that its frequency of vibration is dependent upon the parameter to be sensed, the first vibratable member comprising a first beam anchored in the substrate at each end thereof such that the tension therein is affected by the parameter to be sensed; and
a second resonantly vibratable member which is formed in the substrate adjacent to said first member but which is arranged to be substantially insensitive to the parameter to be sensed, said second member comprising a cantilever beam which is free at one end and which is at right angles to said first member, wherein both vibratable members are arranged to be optically excited into vibration via a common optical fibre.

5,089,696

NETWORK OF SENSORS CONNECTED TO A REMOTE SUPPLY, MONITORING AND PROCESSING STATION
 Marc Turpin, Bures sur Yvette, France, assignor to Thomson-CSF, Puteaux, France

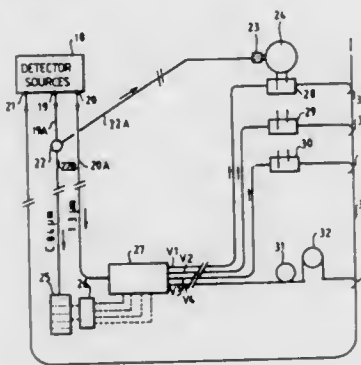
Filed Jun. 4, 1990, Ser. No. 532,683

Claims priority, application France, Jun. 6, 1989, 89 07451

Int. Cl.⁵ H01J 5/16

U.S. Cl. 250—227.21

8 Claims



1. A network for linking sensors to a remote supply, monitoring and processor station, said network comprising:
 - a plurality of sensors each requiring a supply of light energy for operation thereof and each having light modulating output means for modulating a carrier light signal with information sensed thereby;
 - a first optical fiber circuit for providing the supply of light energy to each of the plurality of sensors;
 - a second optical fiber circuit for individually addressing each of the plurality of sensors, the second optical fiber circuit including:
 - at least one integrated optical active coupler having at least one input for receiving the carrier light signal and several outputs individually connected to the light modulating output means of each of the plurality of sensors by separate optical fiber elements; and
 - an electronic multiplexer means for connecting the input of the coupler to a selected one of the several outputs of the coupler; and
 - a third optical fiber circuit having at least one optical fiber for the return of the carrier signal supplied by the selected output of the optical coupler and modulated with information, each of the plurality of sensors being coupled to this at least one optical fiber.

5,089,697

FIBER OPTIC SENSING DEVICE INCLUDING PRESSURE DETECTION AND HUMAN IMPLANTABLE CONSTRUCTION

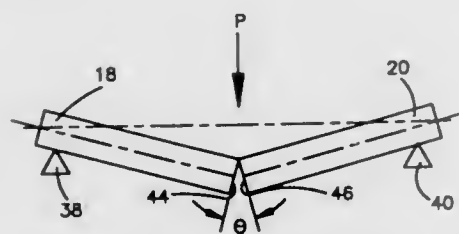
Otto J. Prohaska, 2065 Hanover Dr., Cleveland Heights, Ohio 44112

Filed Jan. 11, 1989, Ser. No. 296,060

Int. Cl.⁵ H01V 5/16

U.S. Cl. 250—227.21

22 Claims



1. A fiber optic sensing device comprising:

a light source;
 a first fiber optic waveguide for receiving light from said light source;
 a second fiber optic waveguide for receiving light from said first fiber optic waveguide;
 mounting means for mounting said first and second fiber optic waveguides in an unexcited state and for allowing relative movement between said first waveguide and said second waveguide in response to a stimuli to vary the light transmitted between said first and second fiber optic waveguides; and
 sensing means for sensing the light transmitted between said first and second fiber optic waveguides;
 wherein the light transmitted between said first and second fiber optic waveguides is a maximum at said unexcited state;
 wherein said first and second fiber optic waveguides are constructed in a manner suitable for implantation in the human body.

5,089,698

INTERFEROMETRIC OPTICAL SYSTEM FOR MEASURING LINEAR OR ANGULAR DISPLACEMENTS BY BEAT SIGNALS

Giorgio Grego, Venaria, Italy, assignor to Csele-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

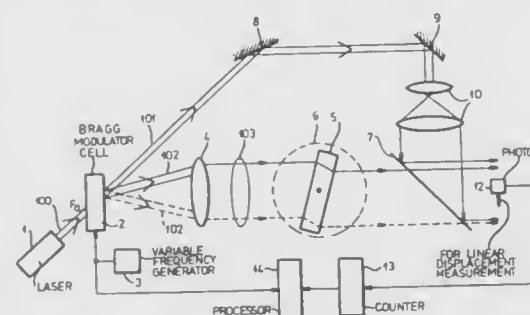
Filed Jun. 13, 1990, Ser. No. 537,476

Claims priority, application Italy, Jun. 27, 1989, 67516 A/89

Int. Cl.⁵ G01D 5/34; G01B 9/02

U.S. Cl. 250—231.13

12 Claims



1. A system for measuring a displacement of a moving device, comprising:
 - a source of a monochromatic light beam at a first wavelength;
 - an acousto-optic Bragg modulator receiving said monochromatic light beam and emitting a first beam of said first wavelength and a second light beam propagated along respective paths;
 - means for driving said acousto-optic modulator with an electric signal causing a frequency of said second beam to vary and to be emitted at an angle varying with variation of a driving frequency of said modulator;
 - an optical collimator in said path of said second beam for transforming said second beam into a collimated beam propagated in a constant direction regardless of said angle;
 - beam-recombining means for recombining said first and second beams at ends of said paths to generate a beat in a recombination of said first and second beams;
 - signal-generating means for generating an electrical beat signal representative of said beat in said recombination of said first and second beams and having a variable frequency coupled to displacement of a moving device and dependent, at any instant, upon a present position of the moving device with respect to a reference position; and
 - processor means connected with said signal-generating means for processing said beat signal and measuring a frequency thereof in a present position of said moving device, for comparing a measured frequency of the beat signal in said present position with a beat signal corre-

5,089,701

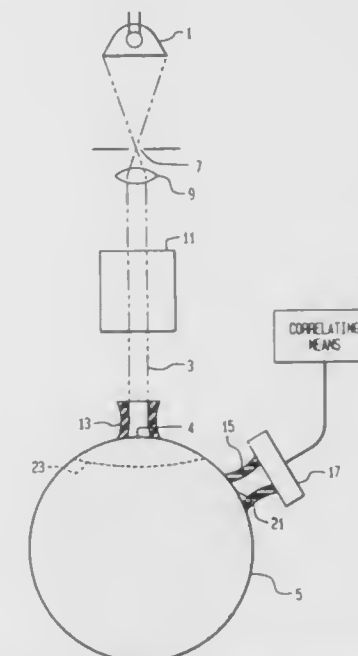
NONDESTRUCTIVE MEASUREMENT OF SOLUBLE SOLIDS IN FRUITS HAVING A RIND OR SKIN
 Gerald G. Dull, Richard G. Leffler, both of Athens, Ga., and Gerald S. Birth, Minneapolis, Minn., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 6, 1990, Ser. No. 563,170

Int. Cl.⁵ G01N 21/35

U.S. Cl. 250—341

23 Claims



1. A device for measuring in a nondestructive manner soluble solids in a fruit having a rind or skin, comprising:
 - (a) a near infrared radiation source means for providing a beam of near infrared radiation of sufficient intensity to penetrate said fruit and be scattered by the internal structure of said fruit and exit said fruit as exiting radiation through a plurality of points on said rind or skin of said fruit;
 - (b) wavelength band selection means for selecting from either: (1) said near infrared radiation from said near infrared radiation source means or, (2) said exiting radiation; a plurality of wavelength bands;
 - (c) intensity measurement means, operably associated with said wavelength band selection means, for measuring the intensity of said exiting radiation in each of said plurality of wavelength bands, said intensity measurement means having a field of detection and a center of said field of detection;
 - (d) correlating means, operably associated with said intensity measurement means, for correlating the measurements of intensities of said exiting radiation in each of said plurality of wavelength bands to a concentration of soluble solids in said fruit; and
 - (e) wherein said near infrared radiation source means and said intensity measurement means are positioned such that when a said fruit is positioned within the device, the distance measured along said rind or skin of said fruit between: (1) a first point on said rind or skin where the center of said beam intersects said rind or skin, and: (2) a second point on said rind or skin where said center of said field of detection intersects said rind or skin; is at least about 8 centimeters.

5,089,699

SECONDARY CHARGED PARTICLE ANALYZING APPARATUS AND SECONDARY CHARGED PARTICLE EXTRACTING SECTION

Yoichi Ose; Yoshiya Higuchi, both of Hitachi, and Kazuyoshi Miki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

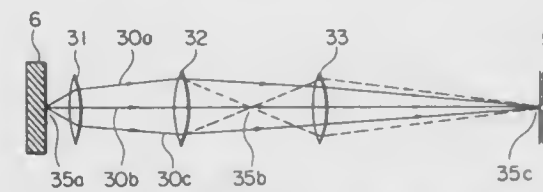
Filed Mar. 12, 1990, Ser. No. 491,820

Claims priority, application Japan, Mar. 14, 1989, 1-059690

Int. Cl.⁵ H01J 37/26

U.S. Cl. 250—306

20 Claims



1. A secondary charged particle analyzing apparatus comprising:
 - a primary charged particle generating source; means for irradiating an object to be examined with primary charged particles emitted by said primary charged particle generating source;
 - a secondary charged particle extracting section which corrects trajectories of secondary charged particles emitted from said object to be examined by means of an accelerating lens formed therein and focuses said secondary charged particles; and
 - means for analyzing said secondary charged particles thus focused.

5,089,700

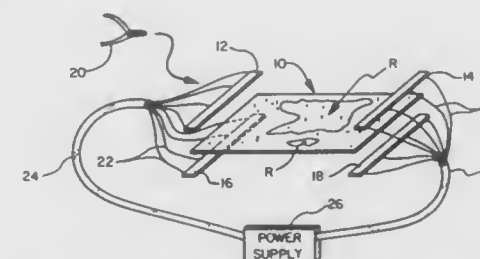
APPARATUS FOR INFRARED IMAGING INSPECTIONS
 Mark A. Sapia, Canton, and John G. Clark, Enfield, both of Conn., assignors to Amdata, Inc., Windsor, Conn.

Filed Jan. 30, 1990, Ser. No. 472,512

Int. Cl.⁵ G01J 5/20

U.S. Cl. 250—330

9 Claims



1. A method of nondestructively identifying regions of high density in a substrate of a bonded matrix of carbon fibers comprising the procedural combination of steps of:
 - connecting conductor terminals at opposite extremities of an area of a substrate of a bonded matrix of carbon fibers to be imaged;
 - connecting the conductor terminals to an electrical power supply to apply a current through the terminals and across the area of the substrate, thereby to heat and to create contrasting regions of temperature gradients which clearly distinguish regions of high and low density;
 - identifying and recording the regions of high and low density by photographing or scanning the area with infrared ray emission imaging equipment.

5,089,702

ICR ION TRAP

Martin Allemann, Hinwil, and Pablo Caravatti, Winterthur, both of Switzerland, assignors to Spectrospin AG, Switzerland
Continuation of Ser. No. 460,938, filed as PCT/EP89/00751, Jun. 28, 1989, Pat. No. 4,982,087. This application
Dec. 12, 1990, Ser. No. 612,481

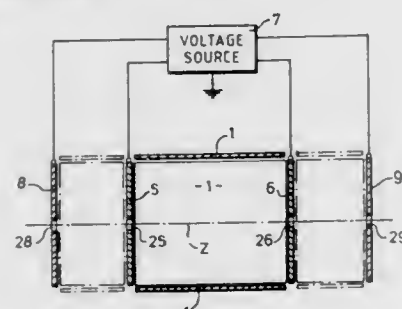
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3821998

The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.

Int. Cl.⁵ H01J 49/38

U.S. Cl. 250—291

5 Claims



1. An ICR ion trap comprising:
means defining an area bounded by a pair of spaced apart electrodes;
means for applying trapping potentials to said electrodes;
additional electrodes disposed outside said pair of spaced apart electrodes; and
means for applying potentials to said additional electrodes of opposite polarity to the trapping potentials.

5,089,703

METHOD AND APPARATUS FOR MASS ANALYSIS IN A MULTIPOLE MASS SPECTROMETER

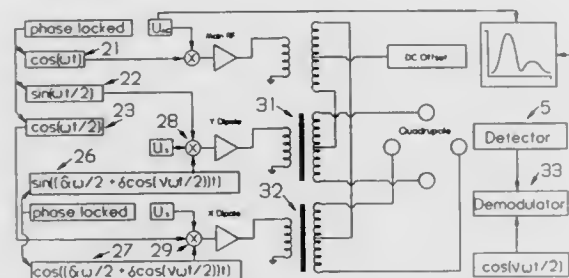
Alan E. Schoen, and John E. P. Syka, both of Santa Clara County, Calif., assignors to Finnigan Corporation, San Jose, Calif.

Filed May 16, 1991, Ser. No. 701,699

Int. Cl.⁵ H01J 49/42; B01D 59/44

U.S. Cl. 250—292

21 Claims



1. A multipole mass spectrometer apparatus having a plurality of parallel pairs of rod-like electrodes arranged about a longitudinal axis, an ion source near one end of said rod electrodes to project a beam of ions to be analyzed between said rods in the axial direction, and a detector near the other end of said rods to detect ions which are transmitted through said electrodes and generate an output current characterized in that the mass spectrometer includes

means for applying an r.f. voltage between rods of said pairs to generate an r.f. field between said rods in which a selected range of ion masses are stable and pass through the rods and other ion masses are rejected by becoming unstable, said region of stability being determined by the

r.f. voltage, its amplitude and frequency and represented by an aq stability, and

means for applying a supplemental r.f. voltage across said pairs of rods to generate an r.f. field which excites one or more frequencies of the selected ion's natural motion at high β whereby to eject selected ions from said rods by resonance instability to provide a sharp transition in the output current.

5,089,704

WIDE ANGLE CEILING MOUNTED PASSIVE INFRARED INTRUSION DETECTION SYSTEM

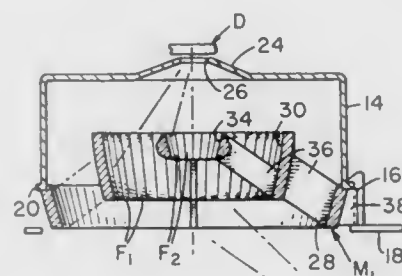
Joseph R. Perkins, Roseville, Calif., assignor to C & K Systems, Inc., Folsom, Calif.

Filed Oct. 18, 1990, Ser. No. 600,207

Int. Cl.⁵ G01J 5/08

U.S. Cl. 250—342

20 Claims



1. An infrared intrusion detection system for ceiling mounting for detecting an intruder from a volume of space beneath the housing, said system comprising:
(a) a housing adapted to be mounted on the ceiling;
(b) an infrared detector carried by the housing;
(c) at least one ring-shaped mirror means carried by the housing, each mirror means having a plurality of mirror facets disposed both to reflect infrared radiation directly from segments within said volume of space and to focus the reflected radiation on the detector.

5,089,705

INFRARED DETECTOR HAVING DEWAR WITH FILM COATINGS TO SUPPRESS REFLECTIONS

Satoshi Ueda; Koji Hirota; Makoto Itoh; Yukihiko Yoshida, all of Yokohama; Hirokazu Hukuda, Kakogawa, and Shigeki Hamashima, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

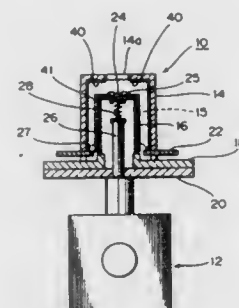
Filed Feb. 13, 1991, Ser. No. 654,591

Claims priority, application Japan, Feb. 16, 1990, 1-33709; Feb. 21, 1990, 1-38484

Int. Cl.⁵ G01J 5/08, 5/04

U.S. Cl. 250—352

7 Claims



1. An infrared detector comprising:
an outer cylinder provided with an infrared transmitting window, and having an inner surface coated with a black film;
an inner cylinder disposed within said outer cylinder, and

having an outer surface coated with an antireflection film formed by sequentially depositing films respectively having different refractive indices;
an infrared sensing element mounted on said inner cylinder; cryogenic cooling means for cooling said infrared sensing element to a low temperature; and
signal transfer means for transferring a detection signal provided by said infrared sensing element to an external device disposed outside said outer cylinder.

5,089,706

METHOD AND APPARATUS FOR PRODUCING A QUENCH CALIBRATION FUNCTION FOR A LIQUID SCINTILLATION COUNTER

Heikki Kouru, Raisio, Finland, assignor to Wallac Oy, Turku, Finland

PCT No. PCT/FI89/00160, § 371 Date Mar. 4, 1991, § 102(e) Date Mar. 4, 1991, PCT Pub. No. WO90/02959, PCT Pub. Date Mar. 22, 1990

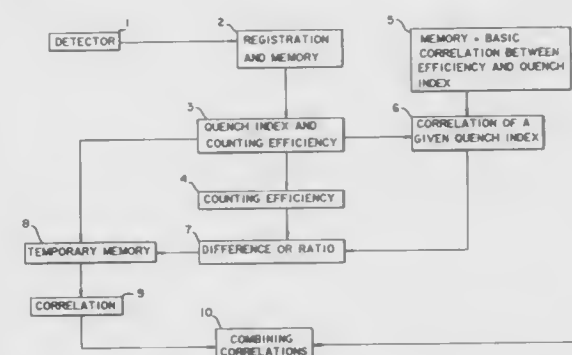
PCT Filed Aug. 29, 1989, Ser. No. 659,378

Claims priority, application Sweden, Sep. 6, 1988, 8803114

Int. Cl.⁵ G01T 1/204

U.S. Cl. 250—362

8 Claims



1. A method for producing an improved quench calibration function for the liquid scintillation counter with constant gain, said counter having stored a basic quench calibration function, said basic quench calibration function being a correlation between a quantity to be quench calibrated and a quench index, said method being characterized by
measuring at least one reference sample,
determining for each reference sample, called "a", the value of the quantity to be quench calibrated, called e_a , and the value of the quench index, called q_a ,
evaluating for each reference sample a comparison value, called d_a , from said basic quench calibration function, said d_a being the value of the quantity to be quench calibrated corresponding to said q_a or the value of the quench index corresponding to said e_a ,
producing said improved quench calibration function by using said each d_a .

5,089,707

ION BEAM GENERATING APPARATUS WITH ELECTRONIC SWITCHING BETWEEN MULTIPLE CATHODES

Gustav D. Magnuson; Joseph F. Tooker, and James R. Treglio, all of San Diego, Calif., assignors to ISM Technologies, Inc., San Diego, Calif.

Filed Nov. 14, 1990, Ser. No. 612,589

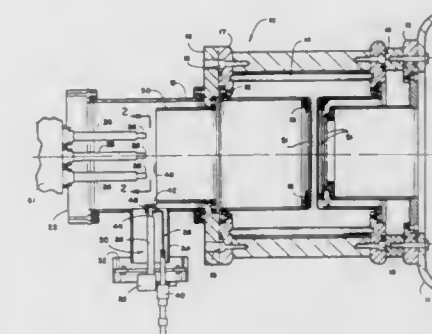
Int. Cl.⁵ H01J 3/04

U.S. Cl. 250—423 R

8 Claims

1. An ion beam generating apparatus comprising:
a generally tubular housing closed at the first end by a first plate and at the second end by a second plate;
a plurality of cathodes within said housing mounted on said first plate, said cathodes are electrically isolated in a sub-

stantially parallel array extending toward said second plate;
a high transparency screen anode mounted in an opening in said second plate, said anode lying substantially parallel to



said cathode array and substantially coextensive with said array; and
at least one trigger cathode and trigger electrode assembly positioned adjacent to said array and extending into said housing.

5,089,708

VACUUM SYSTEM COMPRISING AN EVACUATABLE HOUSING, AN OBJECT HOLDER AND AN OBJECT CARRIER WHICH IS DETACHABLY COUPLED THERETO

Peter E. S. J. Asselbergs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

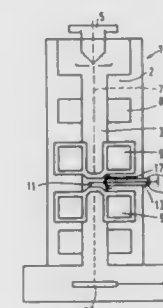
Filed Oct. 11, 1990, Ser. No. 597,925

Claims priority, application Netherlands, Oct. 17, 1989, 8902568

Int. Cl.⁵ H01J 37/20

U.S. Cl. 250—442.11

26 Claims



1. A vacuum system with interchangeable object carriers comprising:
a housing having an evacuable chamber;
an object holder including object positioning means coupled to said housing for positioning an object in the chamber;
a plurality of object carriers each including means for detachably securing that carrier to the holder, each carrier including an object supporting element having an object supporting surface rotatable about an axis relative to that carrier, the supporting surface of a first carrier's supporting element being rotatable about an axis transverse to that supporting surface and the supporting surface of a second carrier's supporting element being rotatable about an axis parallel to its supporting surface; and
drive means coupled to each of said carriers and responsive to the positioning means for rotating said supporting surfaces of said elements about their respective axes.

5,089,709

TEST SYSTEM VIEWER FOR FLUORESCENCE EVALUATION

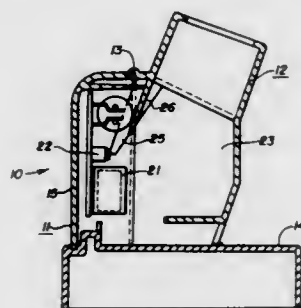
David E. Chadwick, York, Pa., assignor to Dentsply Venture Capital Associates, L.P., York, Pa.

Filed Oct. 11, 1990, Ser. No. 595,504

Int. Cl.⁵ G01N 21/64

U.S. Cl. 250—461.1

8 Claims



1. A viewer for the evaluation of fluorescence, comprising:

- a. a base having
 - (1) a fluorescent light source and
 - (2) an internal fluorescent standard and
- b. a viewing shield having
 - (1) an internal ledge and
 - (2) a viewing area with a viewing angle to the internal fluorescent standard,

wherein the internal ledge and the viewing angle cooperate to block ultraviolet rays from the fluorescent light source and to prevent an operator from directly viewing the light source during operation of the viewer.

5,089,710

ION IMPLANTATION EQUIPMENT

Shuji Kikuchi, Kumamoto; Mitsuyuki Yamaguchi, Yokohama, and Masahiko Matsudo, Kofu, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

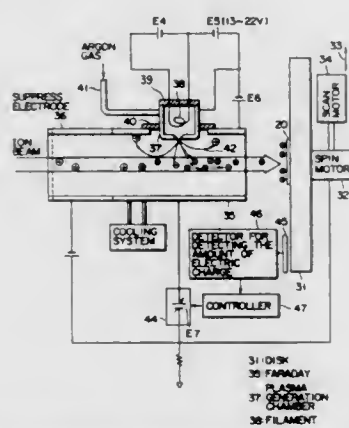
Filed Sep. 4, 1990, Ser. No. 577,001

Claims priority, application Japan, Sep. 4, 1989, 1-228942

Int. Cl.⁵ H01J 37/317

U.S. Cl. 250—492.3

11 Claims



1. An ion implantation equipment for implanting ion beam into an implanting target, wherein:
 - plasma is generated and an electron generated by said plasma is induced to said ion beam;
 - said ion implantation equipment comprises:
 - a Faraday enclosing said ion beam before said implanting target;
 - a plasma generation chamber provided in a part of a wall surface of said Faraday and projecting inward and outward from the wall surface;

an electron discharging source in said plasma generating chamber;

a through hole in said part of a wall surface of said Faraday for sending generated plasma into said Faraday from said chamber; and

a variable bias voltage supply source for applying a bias voltage to said Faraday.

5,089,711

LASER PLASMA X-RAY SOURCE

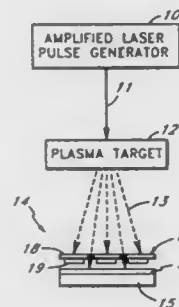
Arthur L. Morsell, Del Mar, and Henry Shields, San Diego, both of Calif., assignors to California Jamar, Incorporated, San Diego, Calif.

Continuation of Ser. No. 467,779, Jan. 19, 1990, Pat. No. 5,003,543. This application Dec. 13, 1990, Ser. No. 627,210

Int. Cl.⁵ G03B 41/16

U.S. Cl. 250—492.3

35 Claims



1. An X-ray lithography process comprising the steps of:
 - producing a laser pulse having a first time width;
 - transferring energy from a lasing medium which is excited in pulses having a duration equal to an excitation time period to said laser pulse wherein said laser pulse first time width is less than said excitation time period thereby amplifying said laser pulse;
 - bombarding a target material with said amplified laser pulse to produce a plasma from which X-rays are emitted; and
 - exposing a mask/X-ray-resist substrate combination to said X-rays to replicate a desired pattern on said substrate.

5,089,712

SHEET ADVANCEMENT CONTROL SYSTEM DETECTING FIBER PATTERN OF SHEET

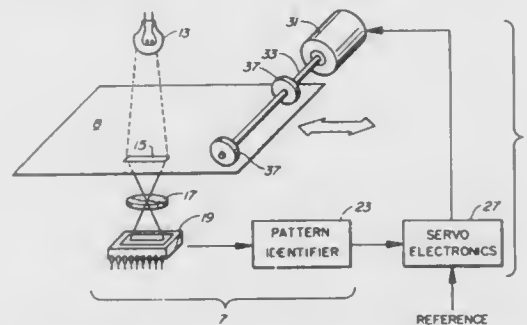
William D. Holland, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 8, 1989, Ser. No. 363,250

Int. Cl.⁵ G01N 21/86

U.S. Cl. 250—557

12 Claims



1. A sheet advancement control system for use in printers such as inkjet printers, comprising:
 - light source means for directing a beam of light onto a localized area of a sheet;
 - magnifier means for magnifying the light is incident on the localized area of the sheet;
 - photosensitive fiber pattern detecting means for detecting

the magnified light and for providing output signals that vary according to fiber patterns within the localized area of the sheet;

correlator means for determining cross-correlations between pairs of detected fiber patterns as the sheet is advanced in a printer; and

displacement detecting means connected to the correlator means for detecting displacement between correlated patterns, thereby, to detect displacements of a sheet as it advances within the printer.

5,089,713

DOCUMENT-IMAGING ILLUMINATION ARRANGEMENTS WITH INTENSITY WITH ADJUSTMENT

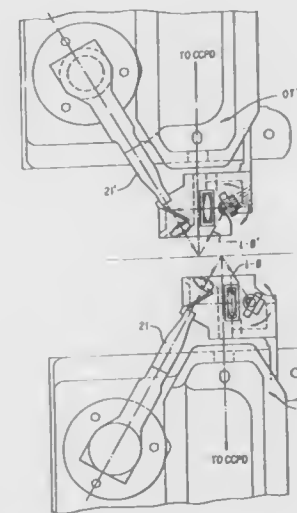
John Vala, Plymouth, and Gerald Banks, Ann Arbor, both of Mich., assignors to Unisys Corporation, Detroit, Mich.

Continuation of Ser. No. 419,572, Oct. 10, 1989, Pat. No. 5,003,189. This application Feb. 7, 1991, Ser. No. 651,887

Int. Cl.⁵ G06K 7/10; G01N 9/04

U.S. Cl. 250—566

19 Claims



1. An arrangement for illuminating checks in a check-processing system wherein a large number of checks are rapidly continuously transported past two or more imaging stations, check-processing system wherein a large number of checks are rapidly continuously transported past two or more imaging stations, each station having a prescribed source means which projects two or more illumination-beams, one to each said station; said arrangement for each said beam comprising:
 - beam-adjust means comprising focus means intercepting said beam and adapted to adjust the focal point thereof;
 - a fibre-optic array intercepting each said beam, to thereby define an input-beam thereto at or near the focal point of said focus means, said array being arranged to exhibit an entry-face of prescribed diameter D_e and an exit-face configured to illuminate the respective image-site relatively uniformly thus defining an output-beam, the fibres of the array being arranged and distributed, in uniform, random fashion completely across this exit-face;
 - said focus means operating to variably de-focus said input beam and change beam-diameter at said entry-face, sufficient to spread the beam sufficiently beyond the entry-face to thus controllably reduce the amount of the beam entering said entry-face.

5,089,714 PARTICLE ASYMMETRY ANALYSER HAVING SPHERICITY DETECTORS

Ian K. Ludlow, Welwyn Garden City, and Paul H. Kay, Kimpton, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/00975, § 371 Date Jun. 4, 1990, § 102(e) Date Jun. 4, 1990, PCT Pub. No. WO89/04471, PCT Pub. Date May 18, 1989

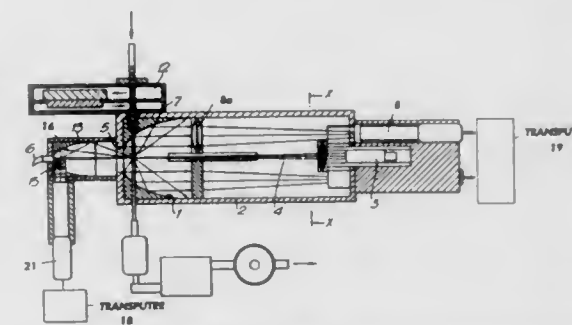
PCT Filed Nov. 10, 1988, Ser. No. 476,396

Claims priority, application United Kingdom, Nov. 10, 1987, 8726304

Int. Cl.⁵ G01N 15/06

U.S. Cl. 250—574

15 Claims



1. A particle analyser for use in determining the asymmetry of particles, said analyser includes:
 - means for providing a sample of airborne particulates in the form of a laminar flow;
 - means for illuminating the sample with a polarised laser beam;
 - at least one forward scattering detector and at least three sphericity detectors placed radially symmetrically about a central axis;
 - means for directing the radiation scattered by individual particles towards said scattering and sphericity detectors; and
 - means for deriving data from the detectors to describe the particle.

5,089,715

MULTIPOSITION SWITCH DEVICE FOR CONTROLLING A DRIVING MEANS

Sadao Kokubu, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

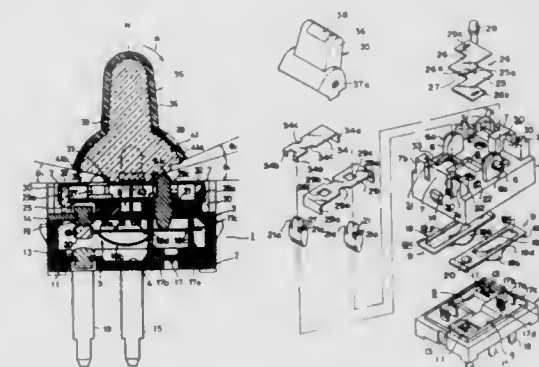
Filed Apr. 18, 1990, Ser. No. 510,680

Claims priority, application Japan, Apr. 26, 1989, 1-49241[U]

Int. Cl.⁵ H01H 9/24; B60L 1/00

U.S. Cl. 307—10.1

21 Claims



21. A switch device for controlling a driving means for

selectively performing forward or reverse driving actions, comprising:

- a pair of switches comprising first and second switches capable of operating independently of each other; and
- a control means having a control circuit for entering, when signals are input from said pair of switches, a first output state in which neither of said pair of switches is activated, a second output state in which said first switch is activated, a third output state in which said second switch is activated, and a fourth output state in which both of said pair of switches are activated.

5,089,716

SIMPLIFIED DRIVER FOR CONTROLLED FLUX FERRITE PHASE SHIFTER

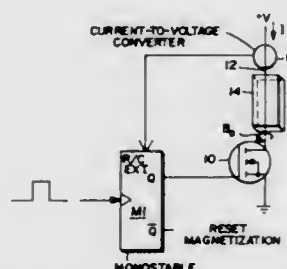
David W. Wallis, Decatur; James R. Ashworth, Norcross, and Charles G. Wier, Suwanee, all of Ga., assignors to Electro-magnetic Sciences, Inc., Norcross, Ga.

Filed Apr. 6, 1989, Ser. No. 333,961

Int. Cl.⁵ H01P 1/19

U.S. Cl. 307—101

23 Claims



1. A drive circuit for controlling electrical current flow in a conductor to a device having plural states which are selectively determined by said current flow, said circuit comprising: a control circuit comprising a monostable multivibrator circuit having an externally accessible timing control terminal, said multivibrator also having a first output state and a first input for effecting change to second output state which thereafter reverts back to said first output state when a voltage at said timing control terminal exceeds a predetermined magnitude; means coupling said conductor to said control circuit so as to cause current to flow therein when said control circuit is in said second output state; and feedback control means coupled to said timing control terminal and to said device for providing said voltage exceeding a predetermined magnitude to said timing control terminal in response to said device attaining a predetermined state.

5,089,717

INTERGRADED SEMICONDUCTOR DEVICE INCLUDING A FREQUENCY DIVIDER FOR MICROWAVE APPLICATIONS

Patrice Gamand, Yerres, and Bertrand Gabillard, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 458,925, Dec. 29, 1989, abandoned. This application May 16, 1991, Ser. No. 711,551 Claims priority, application France, Dec. 30, 1988, 88 17495

Int. Cl.⁵ H03K 21/02

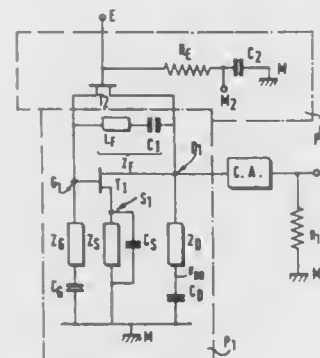
U.S. Cl. 307—219.1

20 Claims

1. A frequency divide-by-two circuit which comprises: a switching transistor which is controlled by an input signal E at a frequency f_0 , an inverter transistor coupled to tuning impedances and to a reactive impedance element operative together as a negative resistance thereby to form an oscillator, means connecting the switching transistor in parallel with the reactive impedance element, and wherein the transit time τ_0 of the switching transistor, the delay τ_1 provided by the inverter transistor and tuning impedances, and the transit time τ_2 of a

signal propagating through the reactive impedance element are chosen in accordance with the three following relations:

$$\tau_2 > \tau_0$$



$$\frac{1}{\tau_0 + \tau_1} < f_0 < \frac{1}{\tau_0 + \tau_1}$$

$$\frac{1}{\tau_1 + \tau_2} < f_0$$

5,089,718

DYNAMIC CURRENT DIVIDER CIRCUIT WITH CURRENT MEMORY

Dirk W. J. Groeneveld, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

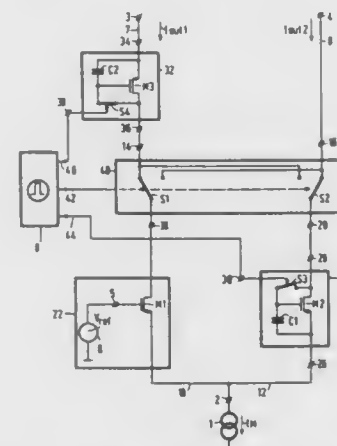
Filed Feb. 19, 1991, Ser. No. 657,712

Claims priority, application Netherlands, Feb. 26, 1990, 9000450

Int. Cl.⁵ H03K 17/56

U.S. Cl. 307—244

6 Claims



1. A current divider for splitting up an input current into substantially equal output currents, comprising: an input terminal for connecting the input current; first and second output terminals for tapping the output currents; switching means operating in response to switching signals; first and second current memory circuits, each circuit comprising first and second current terminals and a control terminal, for maintaining a current flowing through the first and second current terminals during a first control signal level on the control terminal to also flow during a second level of the control signal; and a clock generator for generating the switching signals for the switching means and the control signals for the current memory circuits, characterized in that: the input terminal is coupled through a first and a second

current branch to a first and a second connecting terminal, respectively, the first current branch comprising a first variable current source for supplying a current which is the difference between the input current and a current flowing through the second current branch, and the second current branch comprising the first current memory circuit whose first current terminal is coupled to the input terminal and whose second current terminal is coupled to the second connecting terminal;

the first and second output terminals are coupled through third and fourth current branches, respectively, to third and fourth connecting terminals, the third current branch comprising the second current memory circuit whose first current terminal is coupled to the first output terminal and whose second current terminal is coupled to the third connecting terminal;

the switching means couple, during a first phase of the switching cycle, the first to the third connecting terminal and the second to the fourth connecting terminal and couple, during a second phase of the switching cycle, the first to the fourth connecting terminal and the second to the third connecting terminal; and

the clock generator generates said control signals which are coupled to respective control terminals of the first and second current memory circuits, the control signal for the control terminal of the first and the second current memory circuit, respectively, assuming a value which corresponds to the first and the second level, respectively, during at least part of the first phase of the switching cycle and corresponds to the second and the first level, respectively, during at least part of the second phase of the switching cycle.

5,089,719

DRIVE CIRCUIT FOR A SEMICONDUCTOR DEVICE WITH HIGH VOLTAGE FOR TURNON AND LOW VOLTAGE FOR NORMAL OPERATION

Yoshio Kamei, Saitama, and Minami Takeuchi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

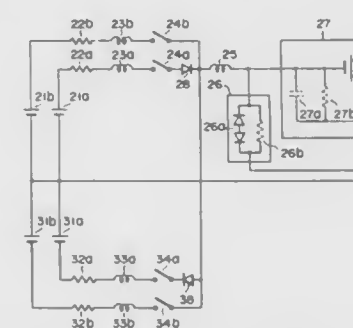
Filed Sep. 25, 1990, Ser. No. 587,807

Claims priority, application Japan, Sep. 29, 1989, 1-254882

Int. Cl.⁵ H03K 17/72

U.S. Cl. 307—270

5 Claims



1. A drive circuit for a voltage-controlled type semiconductor device, comprising:

- ON gate drive means for supplying an ON control signal to a control electrode of the semiconductor device which performs a current switching;
- OFF gate drive means for supplying an OFF control signal to the control electrode of the semiconductor device;
- high voltage power source means, connected to at least one of the ON gate drive means and OFF gate drive means, for supplying a control current of a predetermined current increase rate to the control electrode of the semiconductor device through at least one of the ON gate drive means and OFF gate drive means;
- low voltage power source means, provided in juxtaposition with the high voltage power source means, for supplying,

to the control electrode, enough control current to hold the semiconductor device in a normal state; and switch means connected to both the ON and OFF gate drive means for supplying an output of the high voltage power source means to the control electrode in an earlier portion of a turn ON or a turn OFF period, and an output of the low voltage power source means to the control electrode in a normally ON or a normally OFF state.

5,089,720

BRIDGE TYPE SWITCHING CIRCUIT HAVING A SINGLE SWITCHABLE CURRENT SOURCE

Gilbert Gloaguen, Tourville/Odon, France, assignor to U.S. Philips Corporation, New York, N.Y.

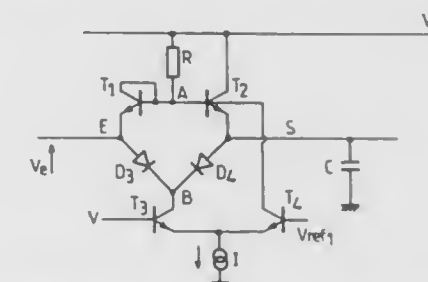
Filed Jun. 21, 1990, Ser. No. 542,219

Claims priority, application France, Jun. 23, 1989, 89 08418

Int. Cl.⁵ H03K 17/74; G11C 27/02

U.S. Cl. 307—353

25 Claims



1. A switching circuit comprising: a diode bridge that includes a first serial branch comprising first and second diodes, connected in parallel to a second serial branch comprising third and fourth diodes with at least one first end common to the two serial branches connected to a first switchable current source providing a first state in which it is coupled to the first common end and a second state in which it is uncoupled from the first common end, the first serial branch having an input terminal at a junction point of the first and second diodes for receiving an input voltage, the second serial branch having an output terminal at a junction point of the third and fourth diodes, wherein the third diode comprises the base-emitter path of a first transistor having a collector connected to a supply voltage source, a second end common to said two branches being a junction point of the first and third diodes, a first resistor connected between said second common end and said supply voltage source, and wherein the first switchable current source is coupled to the second common end in said second state.

5,089,721

GROUND BOUNCE ISOLATION AND HIGH SPEED OUTPUT CIRCUIT

Thomas M. Luich, Campbell, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Apr. 20, 1990, Ser. No. 512,786

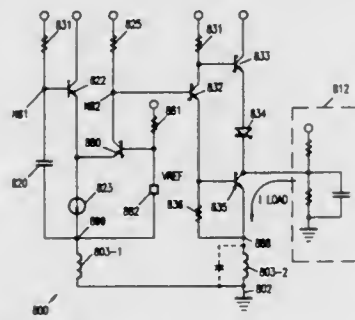
Int. Cl.⁵ H03K 19/003, 17/16

U.S. Cl. 307—443

13 Claims

1. An output circuit comprising: a first supply voltage lead for receiving an externally supplied first supply voltage; a second supply voltage lead for receiving an externally supplied second supply voltage; an input means for receiving an input signal, said input means having a relatively large time constant; an output terminal for providing an output signal in response to said input signal; an output pull down transistor having a first current lead coupled to said output terminal, a second current lead for

coupling to said externally supplied second supply voltage via said second supply voltage lead, and a control lead; driver means for providing a control signal to said control lead of said output pull down transistor in response to said input signal, said driver means including an input means having a relatively small time constant, said driver means being coupled to said first supply voltage and also being coupled to said externally supplied second supply voltage; and means for coupling said input means of said output circuit and said input means of said driver means comprising:



- a current source;
- a first transistor having an emitter coupled to said current source, a base coupled to said input means of said output circuit, and a collector coupled to said first supply voltage lead; and
- a second transistor having an emitter coupled to said current source, a base coupled to a bias voltage, and a collector coupled to said input means of said driver means.

5,089,722

HIGH SPEED OUTPUT BUFFER CIRCUIT WITH OVERLAP CURRENT CONTROL

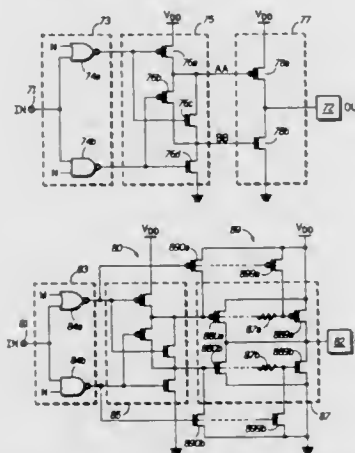
Robert J. Amedeo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1990, Ser. No. 503,012

Int. Cl.³ H03K 17/16, 19/094, 5/12, 17/687

U.S. Cl. 307-443

14 Claims



1. An output buffer circuit having a data input terminal for receiving a data signal, and an output signal terminal for providing an output signal, comprising:
 - an input stage for receiving the data signal from the data input terminal and for providing input stage outputs;
 - a pre-driver stage for receiving the input stage outputs and for providing first and second outputs in response to the input stage outputs, said first output becoming logically low after a first predetermined controlled delay period after said second output becomes logically low, and said second output becoming logically high after a second

predetermined controlled delay period after said first output becomes logically high; and an output driver stage for receiving said first and second outputs from the pre-driver stage and for providing the output signal to the output signal terminal, said output driver stage including at least one complementary pair of serially connected output transistor devices, and said output signal being derived at a node between said serially connected output transistor devices, said first and second outputs of the pre-driver stage being supplied only to said output driver stage and not to said input stage.

5,089,723

CMOS-BASED PSEUDO ECL OUTPUT BUFFER

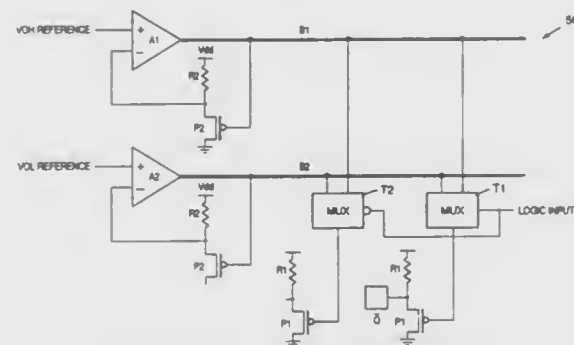
Craig M. Davis, Puyallup, Wash., and Richard R. Rasmussen, Fremont, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 15, 1990, Ser. No. 613,291

Int. Cl.³ H03K 19/094, 19/0175

U.S. Cl. 307-451

6 Claims



1. A CMOS-based ECL output buffer comprising:
 - (a) a high level bus;
 - (b) a first CMOS operational amplifier having its non-inverting input connected to receive a high ECL-level reference voltage and having its output connected to the high level bus, the first CMOS operational amplifier including a feedback path connected between the high level bus and the inverting input of the first CMOS operational amplifier such that the voltage on the high level bus corresponds to the high ECL-level reference voltage;
 - (c) a low level bus;
 - (d) a second CMOS operational amplifier having its non-inverting input connected to receive a low ECL-level reference voltage and having its output connected to the low level bus, the second CMOS operational amplifier including a feedback path connected between the low level bus and the inverting input of the second CMOS operational amplifier such that the voltage on the low level bus corresponds to the low ECL-level reference voltage;
 - (e) at least one transmission gate having first and second inputs connected to the high and low ECL-level buses, respectively, and responsive to first and second logic states of a logic input control signal for providing the high ECL-level reference voltage and the low ECL-level reference voltage, respectively, as a transmission gate output signal; and
 - (f) output switch means responsive to the transmission gate output signal for providing a corresponding buffer output signal to an output node wherein the output switch means comprises an output driver P-channel transistor having its gate connected to receive the transmission gate output signal, its drain connected to a negative supply voltage, and its source connected to the output node, the output node connected to a positive supply voltage via an output resistor.

5,089,724

HIGH-SPEED LOW-POWER ECL/NTL CIRCUITS WITH AC-COUPLED COMPLEMENTARY PUSH-PULL OUTPUT STAGE

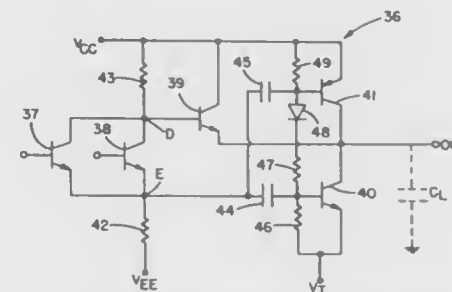
Ching-Te K. Chuang, South Salem, and Denny D. Tang, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1990, Ser. No. 620,498

Int. Cl.³ H03K 19/013

U.S. Cl. 307-454

12 Claims



1. An ac-coupled complementary pull-up and pull-down circuit comprising:
 - at least a pair of input bipolar transistors connected in parallel, the emitters of which are connected to a first circuit node and the collectors of which are connected to a second circuit node and the bases of which are circuit input terminals;
 - a pair of complementary bipolar transistors, a first of said pair of complementary transistors having an emitter terminal connected to a first voltage source, a collector terminal connected to an output terminal and a base, and a second of said pair of complementary transistors having an emitter terminal connected to a second voltage source, a collector terminal connected to said output terminal and a base; and
 - pulse coupling means connected to said first circuit node for applying simultaneously to the bases of said pair of complementary transistors an ac pulse derived from a replica of an input signal applied to said input terminal thereby rendering one of said complementary transistors momentarily conductive and the other non-conductive such that a large transient current flows in said conductive transistor.

5,089,725

SELF-REFERENCED CURRENT SWITCH LOGIC CIRCUIT WITH A PUSH-PULL OUTPUT BUFFER

Pierre Mollier, Boissise le Roi; Jean-Paul Nuez, Savigny sur Orge, and Pascal Tannhof, Cely en Biere, all of France, assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 26, 1990, Ser. No. 604,842

Claims priority, application European Pat. Off., Oct. 26, 1989, 89480169.5

Int. Cl.³ H03K 19/086, 3/01, 17/16

U.S. Cl. 307-455

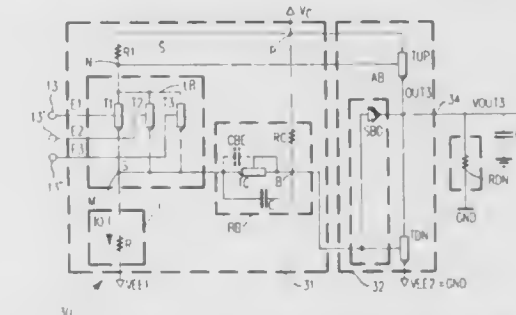
21 Claims

1. An emitter coupled logic (ECL) circuit, comprising:
 - a preamplifier means comprised of a logic block having input transistors for performing a predetermined logic function and having substantially simultaneous and complementary first and second output logic signals, said input transistors being driven by logic input signals wherein said input transistors are coupled between first and second output nodes and wherein said first and second output logic signals are available at said first and second output nodes respectively;
 - a first current source and a first supply voltage wherein said first output node is coupled to said first supply voltage through said first current source;
 - a load device and a second supply voltage, wherein said

second output node is coupled to said second power supply through said load device;

a third supply voltage;

push-pull output buffer stage means having a circuit output node, said push-pull output buffer stage means comprised of at least two active pull-up and pull-down transistors, said pull-up and pull-down transistors connected in series circuit relationship between said second and said third supply voltages wherein said circuit output node is cou-



pled therebetween, and wherein the bases of said pull-down and said pull-up transistors are respectively driven by said first and said second output logic signals; and biasing means coupled to said first, said second and said third supply voltages for biasing said first output node and said base of said pull-down transistors as a function of the levels of said logic input signals, and coupling said first output node and said bases of said pull-up and said pull-down transistors with a low impedance path.

5,089,726

FAST CYCLE TIME CLOCKED AMPLIFIER

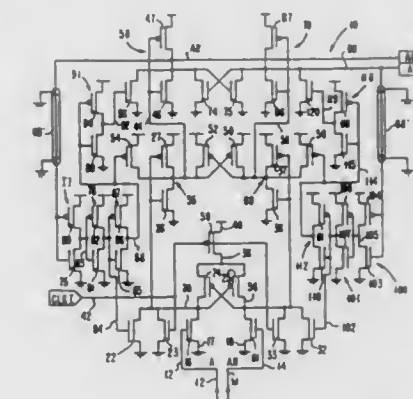
Barbara A. Chappell; Terry I. Chappell, both of Amawalk, and Stanley E. Schuster, Granite Springs, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1990, Ser. No. 620,512

Int. Cl.³ H03F 3/45; H03K 19/094

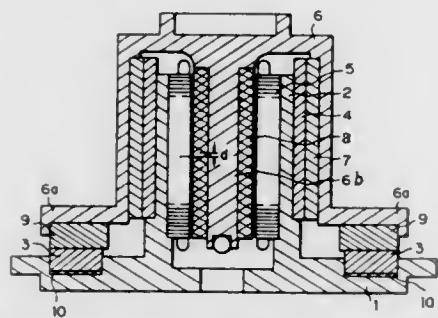
U.S. Cl. 307-530

22 Claims



1. A circuit for amplifying an input signal comprising:
 - a first transistor having a first terminal adapted for coupling to a first voltage supply, a second terminal coupled to a first output node and a third terminal adapted for coupling to said input signal;
 - a second transistor having a fourth terminal adapted for coupling to said first voltage supply, a fifth terminal coupled to a second output node and a sixth terminal adapted for coupling to a reference signal;
 - first and second means for supplying current to said first and second output nodes, respectively;
 - third means adapted for coupling to a clock signal for presetting the voltage of said first and second output nodes to a second voltage at first times and for disabling said third

cally and integrally provided on the inner peripheral surface of said rotor and a radial bearing member that is concentrically and integrally provided on the outer peripheral surface of said cylindrical support shaft in opposing relation to said radial bearing sleeve, the center, in the direction of the length of said support shaft, of said group of rotor magnets or rotor cores and the center of said group of stator coils and the center, in the direction of the length of said support shaft of said radial hydrodynamic bearing being closely adjacent; and



a thrust hydrodynamic bearing for supporting a cap-shaped collar portion of said rotor on said base, which comprises a thrust bearing collar that is provided on the lower end of said cap-shaped collar portion and having a flat face extending outwardly of the inner peripheral surface of said radial bearing sleeve a thrust bearing member that is provided on said base having a flat face in opposing relation to said thrust bearing collar, whereby said thrust hydrodynamic bearing can support a large load, and the parallelism between the faces of said bearing collar and thrust bearing member is easily maintained.

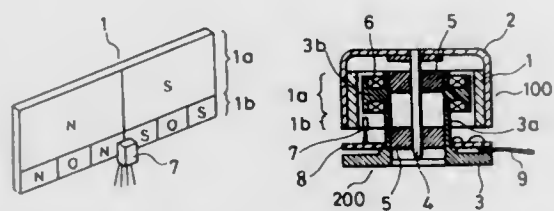
5,089,733

DRIVING APPARATUS FOR DC BRUSHLESS MOTOR
Toshiaki Fukuoka, Yonago, Japan, assignor to Matsushita Electrical Industrial Co., Japan

Filed Sep. 4, 1990, Ser. No. 576,652
Int. Cl.⁵ H02K 37/00

U.S. Cl. 310—67 R

3 Claims



1. A driving apparatus for DC brushless motor comprising: a driving magnet for causing torque and has plural number of magnetized poles; a position detecting magnet for generating a position signal and has said plural number of regions corresponding to said magnetized poles, each of said regions including a non-magnetized part and at least one magnetized pole of same kind as a corresponding pole of said driving magnet per an electric angle of 180°; a magnetic detecting element for detecting magnetic flux which is generated by said position detecting magnet; an amplifier for amplifying a position signal issued from said magnetic detecting element; a waveform shaping circuit for separating an output signal of said amplifier into plural signals corresponding to said regions of said position detecting magnet; a signal processing circuit for composing full-wave driving signals from said plural signals; and

a driving circuit for applying said full-wave driving signals to a driving coil of said DC brushless motor.

5,089,734

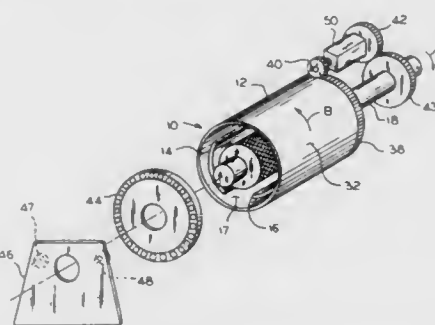
DUAL ROTARY AC GENERATOR

Ramsingh Bickraj, Enid Village, Rio Claro, Trinidad and Tobago

Filed Nov. 26, 1990, Ser. No. 618,216
Int. Cl.⁵ H02K 23/60

U.S. Cl. 310—83

7 Claims



1. A generator comprising: a tubular housing mounted for rotation including magnetic field generating means mounted to an inside surface of the tubular housing; an armature including a plurality of armature coils, said armature mounted for rotation co-axially within said housing; and means for rotating said housing simultaneously with the rotation of said armature in a direction opposite to a direction of rotation of said armature including means for selectively connecting and disconnecting rotation of the housing from the rotation of the armature.

5,089,735

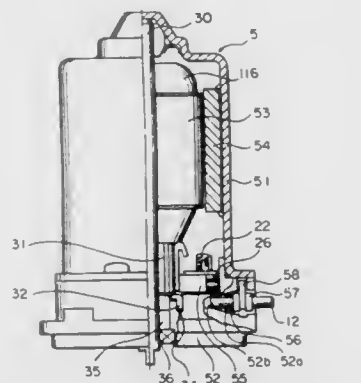
DIRECT-CURRENT MOTOR

Hideo Sawaguchi; Takeshi Muraoka, and Kazuhiro Takahashi, all of Gunma, Japan, assignors to Sawafuji Electric Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 449,604
Int. Cl.⁵ H02K 5/10

U.S. Cl. 310—88

6 Claims



1. A direct-current motor, including a motor case provided with a substantially bell shape; a front bracket connected to an opening of said motor case, said front bracket being formed of a synthetic resin and defining recesses; brushes held by said front bracket, metallic brush holders being inserted into said recesses, said metallic brush holders having open tops, said brush holders holding said brushes and each of said open tops being covered with an insulating plate; a commutator and a rotor, said commutator being disposed on a side of said rotor

and means for urging said brushes for making sliding contact with said commutator for alternatively changing over electric current; and a waterproof construction including a waterproofing bracket having a hole with a tapered inside surface formed on an interior side of said hole, a grommet having a hole through which a cord is passed, said grommet having a tapered outer surface engaging said tapered inside surface of said hole, said grommet being compressed into said hole for said grommet pressing said cord to ensure air tightness; a collar having a hole through which said cord is passed and a key groove formed on an outer surface of said hole of said collar adjacent said tapered inside surface and a holder inserted into said key groove for maintaining said grommet positioned in said bracket hole.

5,089,736

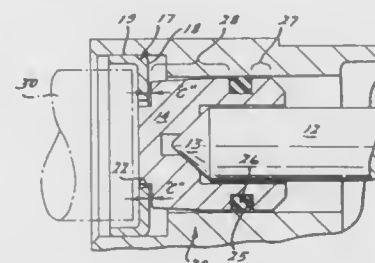
AUTOMATIC END PLAY ADJUSTMENT OF MOTOR ARMATURE ASSEMBLY

Harry H. Oyafuso, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 29, 1991, Ser. No. 692,762
Int. Cl.⁵ H02K 15/16

U.S. Cl. 310—90

9 Claims



1. An apparatus for adjusting axial and radial end play of a rotating shaft including: a thrust plug with an angled bearing surface for receiving an end of the rotating shaft, and a shoulder extending axially outward from an end of the thrust plug; a retainer cap having an opening for receiving the end of the thrust plug with the shoulder, the extension of the shoulder being greater than the thickness of the cap by an amount desired to provide an adjustment clearance; and a housing having an axial cavity with an inner diameter for fixing the position of the retainer cap and for permitting axial sliding movement of the thrust plug so as to provide for axial end play.

5,089,737

DC ROTARY ELECTRIC MACHINE OF PERMANENT MAGNET FIELD TYPE

Toshimi Abukawa, Hitachiota; Kazuo Tahara; Noriyoshi Takahashi, both of Hitachi, and Toshio Tomite, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 342,304

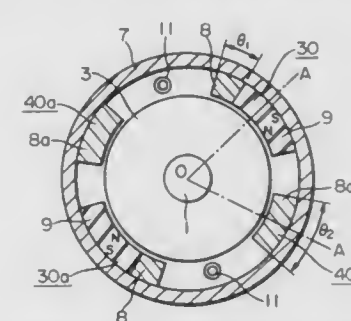
Claims priority, application Japan, Apr. 25, 1988, 63-100352
Int. Cl.⁵ H02K 23/04, 21/28, 1/10

U.S. Cl. 310—154

2 Claims

1. A DC rotary electric machine of permanent magnet type, comprising a yoke, a stator including a plurality of field magnets fixed on the inner periphery of said yoke, a rotor including an armature core arranged in opposed relationship with said field magnets and an armature coil arranged in the vicinity of the outer periphery of the armature core, and commutation means for supplying current to said rotor, wherein each of a predetermined number of the plurality of field magnets of the stator includes a permanent magnet and an auxiliary pole of magnetic material, and each of the remaining field magnets of the plurality of field magnets includes only an auxiliary pole made of a magnetic material, wherein the predetermined number of field magnets made up of a permanent magnet and an auxiliary pole have the auxiliary pole thereof arranged on a

magnetization side of an armature reaction, and a peripheral angle of said auxiliary pole is smaller than that of the remaining field magnets made up only of an auxiliary pole, and wherein a magnetization end of the remaining field magnets made up



only of an auxiliary pole is arranged more proximate to an electrically neutral axis of the rotary electric machine than a de-magnetization end of the predetermined number of field magnets including a permanent magnet and an auxiliary pole.

5,089,738

BATTERY-DRIVEN HANDTOOL

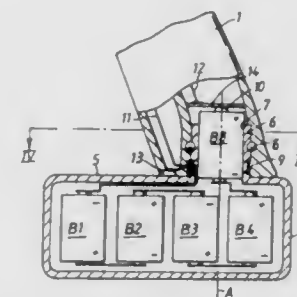
Håkan Bergqvist; Hans Himbert, both of Bromma, and Conny Jansson, Enköping, all of Sweden, assignors to AB Bahco Verktyg, Sweden

Filed Dec. 27, 1990, Ser. No. 634,617

Claims priority, application Sweden, Jan. 10, 1990, 9000080
Int. Cl.⁵ H02J 7/00

U.S. Cl. 310—50

8 Claims



1. A battery-driven tool comprising: a handgrip having a first end and an asymmetrically free end; a motor housed in a motor casing carried at the first end of the handgrip, the motor casing having a longitudinal axis, and the motor receiving electric current through a supply line; an electric switch connected in the supply line and carried by the handgrip; and an electric current source supplying electric current through the supply line and electric switch for driving the motor, characterized in that the electric current source is carried substantially at the asymmetrically free end of the handgrip by a holder, the holder being pivotally journaled for rotation around a journalling axis extending through the free end of the handgrip for adjustment so that said holder can be switched between at least two, mutually opposite positions, the holder being configured as a housing having a flanged opening, a rear half and a substantially rectangular cross-section, the housing accommodating the electric current source in the form of plural electric batteries with at least one battery extending into the handgrip through the flanged opening, and wherein the journalling axis extends from the free end of the handgrip and passes through the rear half of the housing.

5,089,739

LAMINATE TYPE PIEZOELECTRIC ACTUATOR ELEMENT

Yoshikazu Takahashi, Kasugai; Masahiko Suzuki, Nagoya, and Makoto Takeuchi, Okazaki, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

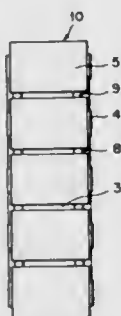
Filed Mar. 15, 1991, Ser. No. 669,982

Claims priority, application Japan, Mar. 19, 1990, 2-69504; Aug. 28, 1990, 2-227635; Sep. 26, 1990, 2-256083; Oct. 31, 1990, 2-294582

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—328

7 Claims



1. A laminate piezoelectric actuator element for generating a longitudinal electrostrictive strain through a piezoelectric/electrostrictive longitudinal effect with a voltage, comprising:

plural laminated piezoelectric subunits each comprising piezoelectric ceramic layers for generating the longitudinal electrostrictive strain therethrough with an applied voltage thereto, internal electrode layers each comprising an internal electrode and a drawing electrode for applying the voltage to said piezoelectric ceramic layers, and piezoelectrically-inactive portions for generating no longitudinal electrostrictive strain, said piezoelectric ceramic layers and said internal electrode layers being alternately laminated on each other, and said internal electrodes having an area smaller than an area of said piezoelectric ceramic layers to define said piezoelectrically-inactive portions as parts of said piezoelectric ceramic layer having no internal electrodes laminated thereon;

an adhesive member for attaching said laminated piezoelectric subunits to one another therethrough, an attaching area of said adhesive member being equal to or smaller than the area of said internal electrodes to thereby form slit portions between said laminated piezoelectric subunits in such a manner as to surround said adhesive member, wherein said plural piezoelectric element subunits are laminated through the adhesive member in a laminating direction thereof; and

external electrodes provided at both sides of said piezoelectric subunits in such a manner as to be connected to said internal electrode through said drawing electrode to apply the voltage to said internal electrode.

5,089,740

DISPLACEMENT GENERATING APPARATUS

Tomio Ono, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1990, Ser. No. 505,131

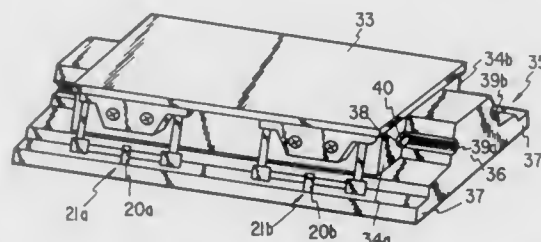
Claims priority, application Japan, Apr. 12, 1989, 1-090620 Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—328

3 Claims

1. A displacement generating apparatus comprising: a member to be moved having a linear movement bearing in substantially the center thereof; a base being slidably engaged with said bearing such that said base allows said member to be moved to move only in a prescribed linear direction; a plurality of displacement generating means provided in equal number on both sides of said member to be moved,

said both sides being parallel to the prescribed linear moving direction of said member to be moved; said plural displacement generating means being provided at symmetrical positions with respect to said bearing; each of said plural displacement generating means including a support fixed to said member to be moved, a pair of first and second means for generating a displacement in a direction substantially transverse to each longitudinal axis thereof and including plural bimorph-type piezoelectric displacement generating elements, said elements of said first and second means being identical to each other in size, shape and material and being arranged parallel to



each other such that one end of each of said elements of said first and second means is fixed to said support at positions separated from each other and the other end of each of said elements of said first and second means is fixed to a connecting block, third means for generating a displacement in a direction substantially transverse to a longitudinal axis thereof and including plural bimorph-type piezoelectric displacement generating elements, one end of each of said elements of said third means being connected to the connecting blocks connected to said first and second elements, said elements of said third means having a displacement force transmitting adapter at substantially a center of said third means.

5,089,741

PIEZOFILM IMPACT DETECTOR WITH PYRO EFFECT ELIMINATION

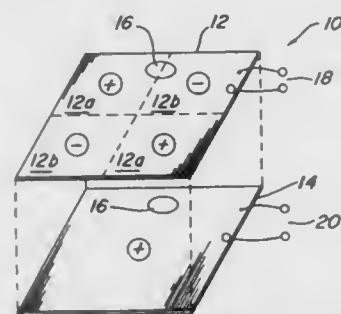
Kyung T. Park, Berwyn; R. Fredrick Gastgeb, Doylestown, and Gregory Daniels, Chester, all of Pa., assignors to Atochem North America, Inc., Philadelphia, Pa.

Filed Jul. 19, 1990, Ser. No. 555,245

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—332

62 Claims



1. Impact detector comprising first and second piezofilm sheets arranged to define a bimorph, the first sheet being defined by a plurality N of positively and negatively poled segments each for producing electrical signals of opposite polarity in response to impact thereon or changes in temperature thereof, each segment having an area, the total area of the positively poled segments being substantially equal to the total area of the negatively poled segments, the magnitude of the signal produced by each segment as a result of a change in temperature being dependent upon the area of that segment,

whereby substantially uniform changes in temperature of the first sheet result in substantially no net signal output thereof as a result of production of signals having opposite polarities that tend to cancel one another, the second sheet being of single polarity, whereby the second sheet produces a signal output when the temperature thereof changes.

5,089,742

ELECTRON BEAM SOURCE FORMED WITH BIOLOGICALLY DERIVED TUBULE MATERIALS

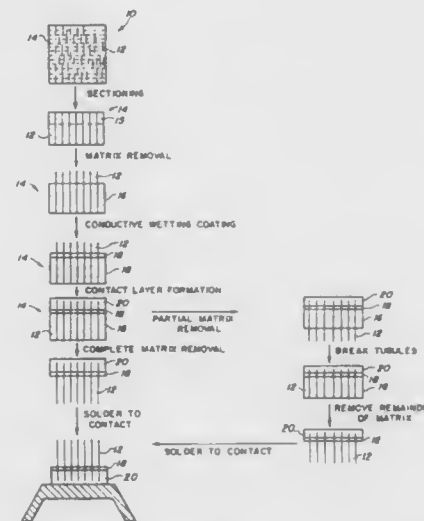
Douglas A. Kirkpatrick, Laurel, Md.; Joel M. Schnur, Burke; Paul E. Schoen, Alexandria, both of Va.; Ronald R. Price, Steventown, and Wallace M. Manheimer, Silver Springs, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 28, 1990, Ser. No. 589,757

Int. Cl.⁵ H01J 9/02

U.S. Cl. 313—351

22 Claims



1. A cathode having an emitter comprising a plurality of electrically conductive, self-assembled hollow cylinders having outer diameters of no more than about 1.0 μm .

5,089,743

PROJECTION CATHODE RAY TUBE

Hiroshi Okuda, and Yasuo Iwasaki, both of Nagakakyō, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Kyoto, Japan

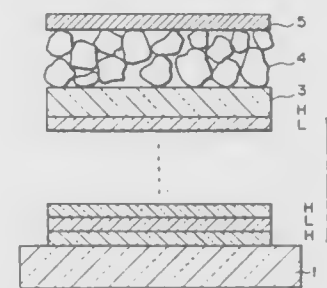
Filed Oct. 12, 1990, Ser. No. 596,922

Claims priority, application Japan, Oct. 16, 1989, 1-269763

Int. Cl.⁵ H01J 29/10; G02B 5/22

U.S. Cl. 313—474

5 Claims



1. A projection cathode ray tube comprising: a face glass; and an interference filter disposed between the face glass and a fluorescent layer on an inner surface of said face glass, said interference filter including a multi-layered structure

composed of alternately superimposed layers having a high refractive index and a low refractive index, the layer of said interference filter being innermost and in contact with said fluorescent layer, being made of a high refractive index material and having an optical distance nd expressed by the following equation:

$$nd = (2m + 1) \lambda_h / 4$$

$$\lambda_h = \lambda + \lambda_p$$

where the letter n stands for the refractive index of the layer, d stands for thickness of the layer, m stands for an integer larger than 0, λ stands for a desired central wavelength selected based on luminescent spectrum, λ_h is a cutoff wavelength of an optical spectrum transmissivity of the interference filter yielding a transmissivity of fifty percent and λ_p is a desired wavelength ranging from 20 to 100 nm.

5,089,744

MAGNETRON CHOKE FOR MICROWAVE OVEN

Seung H. Park, Suwon, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

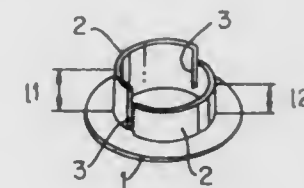
Filed May 22, 1990, Ser. No. 526,972

Claims priority, application Rep. of Korea, May 30, 1989, 7159/1989

Int. Cl.⁵ H01J 23/15

U.S. Cl. 315—39.53

8 Claims



1. A magnetron choke for a microwave oven comprising a flange and a generally tubular member extending from the flange, the generally tubular member being characterized by first and second longitudinally extending slots dividing the tubular member into two opposed walls, the two walls extending different respective distances from the flange for suppressing frequencies in two different band zones.

5,089,745

AMUSEMENT DEVICE INCORPORATING GAS DISCHARGE TUBE

Robert E. Iannini, Mont Vernon, N.H., assignor to Bertonee Inc., Canada

Continuation of Ser. No. 278,254, Nov. 30, 1988, abandoned.

This application Jul. 23, 1990, Ser. No. 559,403

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.⁵ H01K 7/00; H05B 37/00, 41/16; G08B 3/00

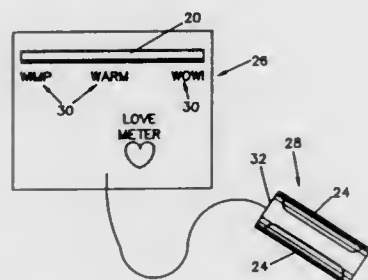
U.S. Cl. 315—76

10 Claims

1. An amusement device comprising an elongated cold cathode gas discharge tube containing an ionizable gas and having a power source to ionize the gas to cause illumination thereof wherein,

the gas discharge tube has only one cathode element disposed at one end in contact with the gas, the power source is connected to the one cathode element and produces an alternating voltage referenced to ground potential and of sufficient frequency to cause the gas to ionize through the natural surrounding capacitance between the ionized gas and ground potential, and the power source produces a variable voltage output

whereby the length of ionization of the gas along the discharge tube in a direction away from the one cathode element is varied depending upon voltage output, and control circuit means operably connected to the power



source for adjusting the voltage level of the variable voltage output therefrom between levels causing ionization of the gas in the tube to occur in differing amounts as a function of a changing stimulus connected to an input of said control circuit means.

5,089,746

PRODUCTION OF ION BEAMS BY CHEMICALLY ENHANCED SPUTTERING OF SOLIDS

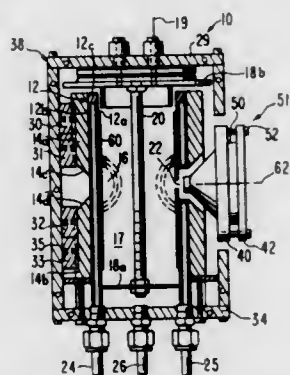
Stephen S. Rosenblum, Palo Alto, and Kenneth J. Doniger, Menlo Park, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 14, 1989, Ser. No. 311,504

Int. Cl.⁵ C23C 14/48; H01J 27/02; H05H 1/00

U.S. Cl. 315—111.81

21 Claims



1. A method for producing an ion beam comprising a selected boron containing ion species for ion implantation, said method comprising:

providing a reaction chamber having a first electrode and a second electrode, said first electrode having a portion rich in boron atoms;

introducing a feed gas into said reaction chamber, said feed gas containing a compound of fluorine, said feed gas being non-poisonous;

supplying energy to said feed gas in said reaction chamber sufficient to generate a plasma, the constituents of said plasma reacting chemically with said portion rich in boron atoms, and establishing an electrical potential between first electrode and said second electrode so that ions in said plasma bombard said portion, said boron containing ion species being produced in said plasma by said supplying and said establishing;

extracting a first ion beam comprising said boron containing species from said plasma;

and separating said boron containing ion species from said first ion beam to produce said ion beam comprising a selected boron containing ion species for ion implantation.

5,089,747
ELECTRON BEAM EXCITATION ION SOURCE
Akira Koshlshi, Kofu; Kohel Kawamura, Nirasaki, and Naoki Takayama, Kofu, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

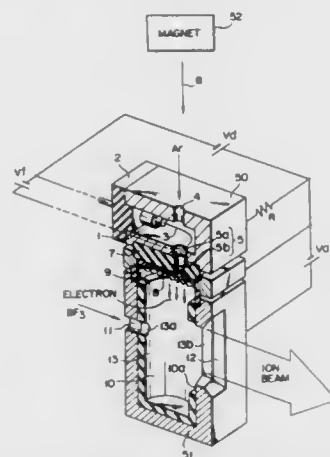
Filed Feb. 16, 1990, Ser. No. 480,765

Claims priority, application Japan, Feb. 16, 1989, 1-39016; Feb. 16, 1989, 1-39017

Int. Cl.⁵ H01J 27/02

U.S. Cl. 315—111.81

9 Claims



1. An electron beam excitation ion source comprising:
a housing having an electron generation chamber, an ion generation chamber, and a partition wall for separating the ion and electron generation chambers, the electron generation chamber including a discharge gas supply port through which a discharge gas is supplied into the electron generation chamber, and the ion generation chamber including a source gas supply port through which a source gas is supplied into the ion generation chamber;
means for generating a discharge gas plasma using the discharge gas in the electron generation chamber;
means for extracting electrons from the discharge gas plasma, and accelerating and transporting the electrons into the ion generation chamber from the electron generation chamber through the partition wall, so that the accelerated electrons collide against the source gas to generate a source gas plasma including source gas ions in the ion generation chamber;
an ion extraction port formed in said housing through which the source gas ions are extracted from the ion generation chamber outside said housing; and
means for generating in the ion generation chamber an eccentric electric field producing a local discharge around said ion extraction port so as to guide the source gas ions to said ion extraction port, the eccentric electric field having a higher intensity near the ion extraction port than other portions of the ion generation chamber to produce said local discharge around said ion extraction port.

5,089,748

PHOTO-FEEDBACK DRIVE SYSTEM

David W. Ihms, Russiaville, Ind., assignor to Deleo Electronics Corporation, Kokomo, Ind.

Filed Jun. 13, 1990, Ser. No. 537,969

Int. Cl.⁵ H05B 37/02

U.S. Cl. 315—151

1 Claim

1. A circuit for providing power to an electroluminescent lamp having an output light intensity controlled by a drive signal from a drive source, said output light intensity decreasing over a period of time when said lamp is driven at a constant voltage, comprising:

means for detecting the light intensity of the lamp and pro-

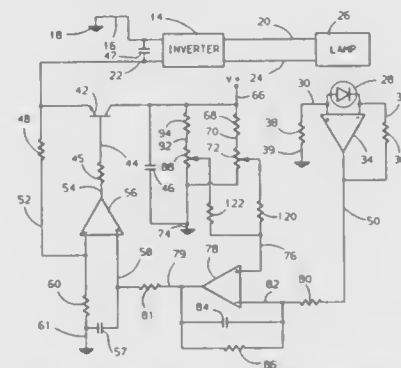
viding a light intensity signal responsive to said light intensity;

first comparison means for comparing the light intensity signal to a first reference signal and providing a first comparing output signal responsive to said first comparison;

second comparison means for comparing the first comparing output signal to a second reference signal indicative of the drive signal and providing a second comparing output signal in response to said second comparison;

means for providing the drive signal in response to the second comparing output signal;

a driver driving the electroluminescent lamp in response to the drive signal, whereby the electroluminescent lamp is driven at a constant intensity;



a first potentiometer coupled between a voltage supply and ground, with a first adjustable terminal of the first potentiometer coupled to the first comparison means, wherein adjustment of the first potentiometer affects an adjustment of the first reference signal; and

a second potentiometer coupled between the voltage supply and ground, with a second adjustable terminal of the second potentiometer coupled to the first comparison means in a parallel circuit with the first adjustable terminal of the first potentiometer, wherein adjustment of the second potentiometer also affects an adjustment of the first reference signal, whereby the first potentiometer is adjusted to restrict lamp intensity above a desired minimum intensity and the second potentiometer is adjustable by an operator to control the lamp intensity, which is restricted above the desired minimum by the first potentiometer.

5,089,749

METHOD AND APPARATUS FOR MEASURING OUTPUT OF A HEAT LAMP FOR AN OPTICAL TLD READER

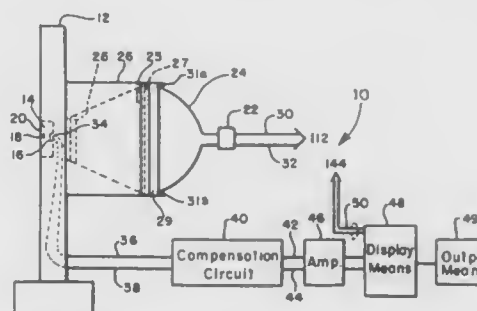
Richard Cadogan, Fulton, Ill., assignor to Commonwealth Edison Company, Chicago, Ill.

Filed Jan. 28, 1991, Ser. No. 647,448

Int. Cl.⁵ H05B 37/02; H01J 7/24; G01K 15/00

U.S. Cl. 315—151

19 Claims



1. An apparatus for measuring output of a heat lamp of the

type used in an optical TLD reader having a lamp driver circuit, said apparatus comprising:

a. an element plate comprising at least one heat absorbing substrate;

b. supporting means for supporting said element plate;

c. an optical system attached to said supporting means and configured to support a heat lamp and to direct light from said heat lamp onto said heat absorbing substrate;

d. connecting means for electrically connecting said heat lamp to a lamp driver circuit of an optical TLD reader of the type comprising means, separate from the supporting means, for supporting a radiation badge;

e. a thermocouple mounted in thermal contact with said heat absorbing substrate, wherein said thermocouple produces a first electrical signal related to temperature of said substrate;

f. data capture means responsive to said thermocouple for capturing said first electrical signal; and

g. means, responsive to a signal derived from the first electrical signal, for processing information correlated with temperature of said substrate as a heat lamp calibration aid.

5,089,750

LEAD CONNECTION STRUCTURE

Kenzo Hatada, Katano, and Koichi Nagao, Chigasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

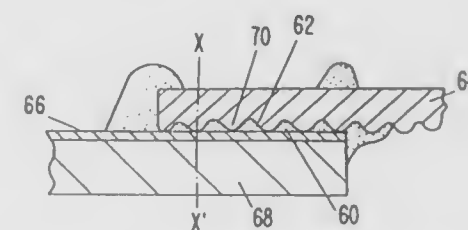
Division of Ser. No. 943,198, Dec. 18, 1986. This application Feb. 13, 1989, Ser. No. 310,594

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.⁵ G09G 3/10; B23K 31/02; G02F 1/13

U.S. Cl. 315—169.3

13 Claims



9. A method of connecting a lead and an electrode, said method comprising:

providing a wiring board having an electrode and providing a lead, one of said electrode and said lead having a contacting surface in which a plurality of recesses extend, and the other of said electrode and said lead having a contacted surface;

applying stiffenable insulating resin in an unstiffened state onto one of said surfaces;

pressing one of said surfaces toward the other of said surfaces until said resin is sufficiently squeezed from between said surfaces, into said recesses, and also into connecting areas over both a leading peripheral edge of the wiring board and a leading peripheral edge of said lead, respectively, such that said surfaces are disposed against one another thereby establishing a direct electrical connection between said electrode and said lead; and mechanically fixing said substrate and said lead to one another by causing said resin to stiffen.

5,089,751

FLUORESCENT LAMP CONTROLLERS WITH DIMMING CONTROL

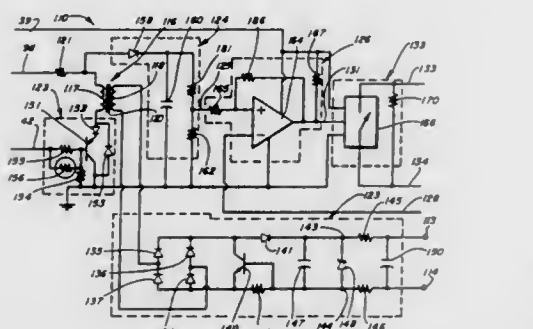
John M. Wong, Buffalo Grove, and Michael A. Kurczak, Roselle, both of Ill., assignors to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 358,257, May 26, 1989, Pat. No. 5,003,230. This application Oct. 31, 1990, Ser. No. 606,420

Int. Cl.⁵ H05B 41/00

U.S. Cl. 315—279

18 Claims



1. A lamp system including a lamp, a lamp controller connected to said lamp and a dimmer circuit connected to said lamp controller for operating in response to a control voltage from a control voltage source to control said lamp controller and to control thereby the light intensity of said lamp, said dimmer circuit comprising an isolation transformer including coupled primary and secondary winding means, high frequency current means for applying a high frequency current from said lamp controller to said primary winding means, input terminals for connection to said control voltage source, loading means coupled to said secondary winding means and to said input terminals and arranged to limit the voltage across said secondary winding means as a function of said control voltage and thereby to limit the high frequency voltage developed across said primary winding means in response to said high frequency current, and detector means for developing and applying to said lamp controller an output signal for controlling lamp intensity which corresponds to the high frequency voltage developed across said primary winding means, said lamp controller comprising DC-AC converter means having an input and an output, DC supply means coupled to said converter means input, power circuit means coupled to said converter means output and to said lamp and control means for controlling operation of said DC-AC converter means and said DC supply means, said power circuit comprising a power transformer including core means and power primary and power secondary windings on said core means, said power primary winding being coupled to said converter means output and having a tap by way of which said high frequency current is applied to said isolation transformer primary winding means and said power secondary winding including a load winding coupled in circuit with said lamp.

5,089,752

HIGH FREQUENCY LUMINOUS TUBE POWER SUPPLY WITH GROUND FAULT PROTECTION

David Pacholok, Sleepy Hollow, Ill., assignor to Everbrite, Inc., Greenfield, Wis.

Filed Sep. 28, 1990, Ser. No. 590,652

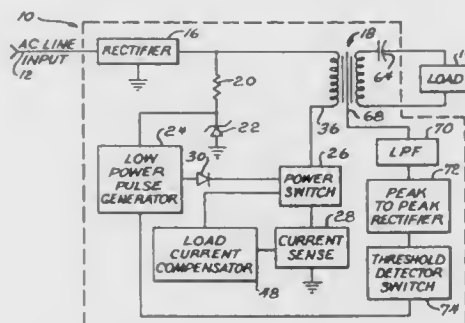
Int. Cl.⁵ H05B 41/36

U.S. Cl. 315—307

8 Claims

1. A high frequency power supply for luminous gas tubes including a step-up transformer having a high voltage secondary for operative connection to a luminous gas tube load and a low voltage primary; means for generating a dc voltage; solid-state switch means responsive to first enable and second disable signals to thereby switch between first electrically closed and second electrically open conditions; means for sensing the current through the transformer primary; the transformer

primary, switch means, and current sense means being series connected across the dc voltage generating means whereby substantially all of said dc voltage is impressed across the transformer primary in response to the switch means enable signal; pulse means for generating a periodic substantially constant frequency stream of uniform width narrow pulses,



said pulses defining the switch means first enabling signal; the current sense means generating the switch means second disabling signal in response to a predetermined current profile through the primary whereby said switch means is switched to the second open condition thereby controlling the width of the current pulse such that the primary current does not exceed said predetermined profile.

5,089,753

ARRANGEMENT FOR PREDICTING FAILURE IN FLUORESCENT LAMP SYSTEMS

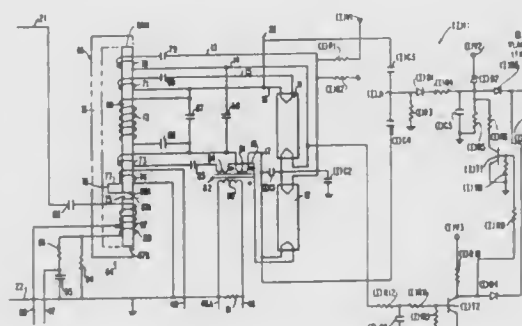
Charles B. Mattas, Glenview, Ill., assignor to North American Philips Corporation, New York, N.Y.

Filed Jul. 9, 1990, Ser. No. 549,792

Int. Cl.⁵ H05B 41/14

U.S. Cl. 315—324

8 Claims



1. A lighting arrangement including two fluorescent lamps, a ballast mean for providing power to said two lamps to illuminate them, said ballast means providing power for pre-ignition heating, for ignition and for post-ignition operation of said lamps, said ballast means being operable to attempt to ignite said lamps repeatedly should they fail to ignite and sensing means for causing said ballast means to cease trying to ignite said lamps after a predetermined time during which they have failed to ignite and wherein said ballast means provides substantially equal voltage to said lamps when they operate in a prescribed manner, said sensing means sensing that the voltage across one of said two lamps is not substantially equal to that across the other and operating in response thereto to prevent said ballast means from continuing to attempt to ignite said lamps.

5,089,754

PROTECTION CIRCUIT FOR A CATHODE RAY TUBE

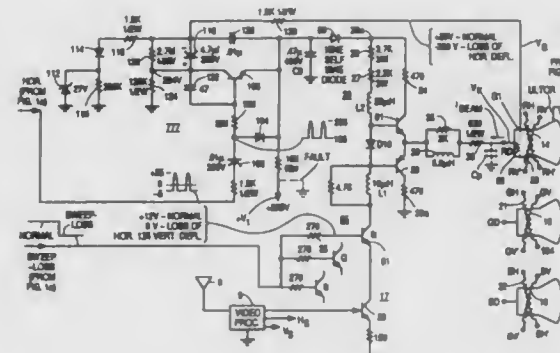
John B. George, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 30, 1990, Ser. No. 515,513

Int. Cl.⁵ H01J 29/52

U.S. Cl. 315—386

38 Claims



1. A circuit for protecting a cathode ray tube screen from damage by an electron beam emitted by the cathode of the tube, comprising:

switch means having a control input responsive to a signal that is indicative of when electron beam current cut-off is required and related to a deflection signal for the electron beam for conducting a current through said switch means when the electron beam current cut-off is not required and for disabling conduction of said current when the electron beam current cut-off is required, said switch means being coupled to a source of a voltage supply; and

charge storage means coupled to said switch means and to a control grid of said cathode ray tube for storing a charge therein to develop an electron beam blanking voltage on said charged storage means, said charge storage means being charged from said current that flows through said switch means and that is supplied by said source of said voltage supply when said deflection signal is present at the control input of said switch means;

said switch means decoupling said source of said supply voltage from said charge storage means and placing said blanking voltage developed on said charge storage means across said control grid when said signal related to said deflection signal is not present to cut-off the electron beam current in said cathode ray tube.

5,089,755

VERTICAL DEFLECTION CIRCUIT

James A. Wilber, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Feb. 19, 1991, Ser. No. 660,188

Int. Cl.⁵ G09G 1/04; H01J 29/70

U.S. Cl. 315—387

15 Claims

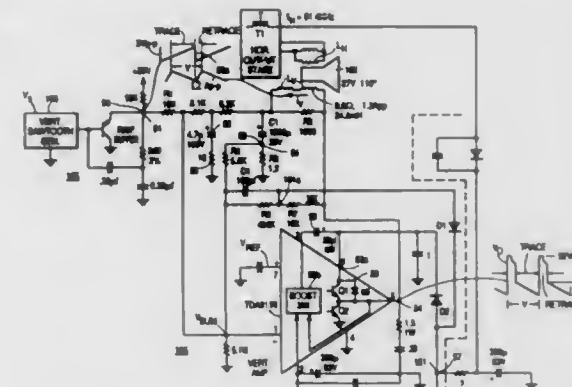
1. A deflection circuit of a video display apparatus, comprising:

a deflection winding for conducting therein a deflection current;

a source of a sawtooth input signal at a frequency that is related to a deflection frequency;

a deflection amplifier responsive to said sawtooth input signal, to a feedback signal that is indicative of a magnitude of said deflection current generated in a feedback network and to a third signal for generating an output voltage at an output terminal that is coupled to said deflection winding to generate a deflection current in said deflection winding, the operation of said amplifier in a closed-loop feedback mode being disabled during a retrace portion of said given deflection cycle, the operation of said amplifier in a closed-loop feedback mode being resumed following said retrace portion of said given de-

flexion cycle at an instant that is determined in accordance with said sawtooth input signal, said feedback signal and said third signal, each being applied to a corresponding input of said amplifier; and



switching means having a first switching state during said trace portion and a second switching state during said retrace portion of said deflection cycle for generating said third signal that varies said instant within said deflection cycle when the operation of said amplifier in said closed-loop feedback mode is resumed.

5,089,756

DEFLECTION DRIVER IN A VIDEO APPARATUS

Bruno E. Hennig, Zurich, Switzerland, assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

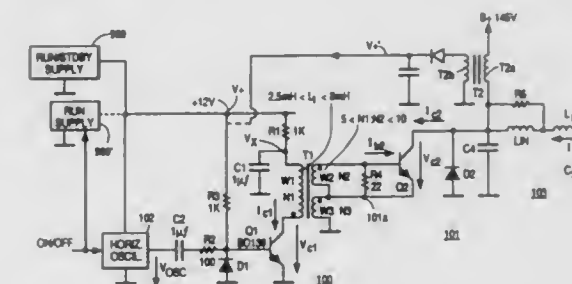
Continuation-in-part of Ser. No. 481,426, Feb. 20, 1990, abandoned. This application May 31, 1991, Ser. No. 708,278

Claims priority, application United Kingdom, Apr. 21, 1989, 8909116

Int. Cl.⁵ H09G 1/04; H01J 29/70

U.S. Cl. 315—387

21 Claims



1. A television deflection apparatus, comprising:

a deflection winding;

a first switching transistor coupled to said deflection winding and responsive to a switching control signal developed at a control terminal of said first switching transistor for generating a transistor current in a main current path of said transistor and a deflection current in said deflection winding such that, during a trace interval of a given deflection cycle, each of said deflection and transistor currents varies in a ramping manner;

a source of an input signal at a frequency that is related to a deflection frequency; and

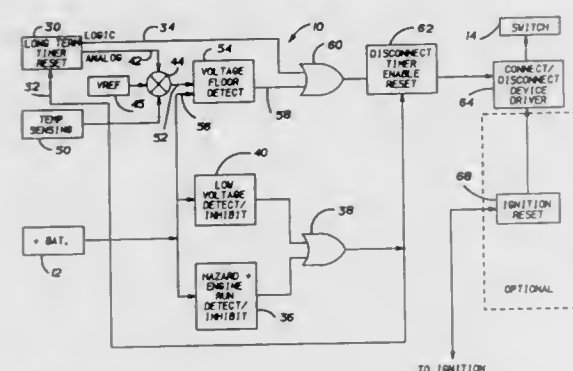
a transformer having a first winding that is responsive to said input signal, a second winding that is responsive to one of said transistor and deflection currents and a third winding having a first terminal that is coupled between said second winding and said transistor and a second terminal that is coupled to said control terminal for generating said control signal that varies in a ramping manner during said trace interval of said deflection cycle at a rate of change

U.S. Cl. 320—13 10 Claims

1. A device for use in conjunction with a battery electrically connected to an electrical system for an engine having an electrical ignition system comprising:

means for producing a reset signal indicative of engine operation,

means for generating a battery voltage signal representative of the voltage of the battery,
means for setting a cut off voltage level as a function of elapsed time from the last generated reset signal,
means for iteratively comparing said battery voltage signal with said cut off voltage level and for generating an output signal whenever said battery voltage signal is less than said cut off voltage level,



a timing means,
means responsive to said output signal for initiating said timing means, said timing means producing a battery disconnect signal a time period following initiation unless said reset signal occurs during said time period,
means responsive to said battery disconnect signal for electrically disconnecting said battery from said load.

5,089,763 BATTERY CHARGING UNIT FOR A MEDICAL APPLIANCE

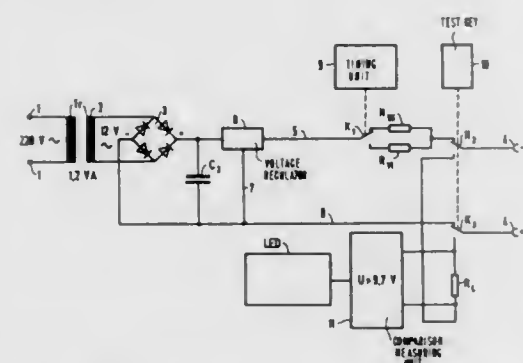
Klaus Van Der Linden, Kronach, and Siegfried Wunder, Mitwitz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Dec. 11, 1989, Ser. No. 449,704

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1988, 3841820

Int. Cl.⁵ H02J 7/00

U.S. Cl. 320—20

7 Claims



1. Battery charging unit for a medical appliance, comprising a transformer having a high-voltage side to be connected to a mains voltage and having a low-voltage side, a rectifier connected to the low-voltage side of said transformer, a charge current circuit connected to said rectifier for charging a battery with a charge current at an initially relatively high value sufficient for storing energy required for putting the appliance into operation and keeping it in operation during a given operating cycle after a charge time of approximately three minutes, a resistor connected in series with the battery, timing control means connected to said charge current circuit for switching said resistor to a different value for obtaining a relatively low charge current safe for long-term charging after a predeter-

mined period of time of approximately 1.5 hours, a test key connected to said charge current circuit for interrupting charging of the battery and loading the battery with a given maximum current requirement for a given period of time, a voltage regulator connected in said charge current circuit, means for measuring and comparing the voltage of the battery under load with a predetermined reference voltage after said test key is actuated, and a means connected to said measuring and comparing means for signalling if the reference voltage is exceeded, wherein the charge currents produce a full charge of the battery after a total of approximately 12 hours, and wherein the full charge of the battery is sufficient for inhalation purposes for approximately 25 inhalation cycles, when used in an ultrasound atomizer for liquids.

5,089,764 SOLAR PANEL DRIVEN AIR PURGING APPARATUS FOR MOTOR VEHICLES

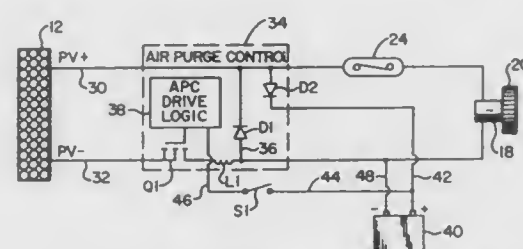
Joseph A. Bobier, St. Mary's, and Gerald E. Brown, Parkersburg, both of W. Va., assignors to Bobier Electronics, Inc., Parkersburg, W. Va.

Filed Jan. 29, 1990, Ser. No. 471,537

Int. Cl.⁵ G05F 1/56

U.S. Cl. 320—20

19 Claims



1. In a motor vehicle having an enclosable cabin, an internal combustion engine, a battery, an ignition switch having an on position for enabling said internal combustion engine and an off position, an electric motor coupled in driving relationship with an air circulating fan for circulating air through said cabin, the improvement wherein an air circulating drive apparatus is coupled with said electric motor, the air circulating drive apparatus, comprising:

a solar panel mounted upon said vehicle having a panel output exhibiting variable voltage levels including a peak voltage level and substantially constant current;
a power transfer regulator for transferring power from said panel to said motor when enabled, including:

energy storage means connectable across said panel output and chargeable by said current to variable charge levels, solid-state switch means connected in energy transfer relationship with said energy storage means and actuatable between conducting and non-conducting states when said power transfer regulator is enabled,

inductor means connected with said solid-state switch means and connectable with said electric motor for conveying current thereto from said panel and said energy storage means when said solid-state switch means is in said conducting state,

unidirectional conducting means connectable with said electric motor for conveying current thereto from said inductor means when said solid-state switch means is in said non-conducting state, and

solid-state switch control network means having a first reference network responsive to said panel output voltage level for providing a first reference output, a second reference network having a second reference output substantially corresponding with said solar panel peak voltage level, and level responsive means responsive to said first and second reference outputs for actuating said solid-state

switch means to provide effective power transfer to said electric motor; and
control switching means for selectively enabling said power transfer regulator.

5,089,765 BATTERY CHARGER AND CHARGING METHOD Katsushi Yamaguchi, Fuchu, Japan, assignor to Ryobi Limited, Hiroshima, Japan

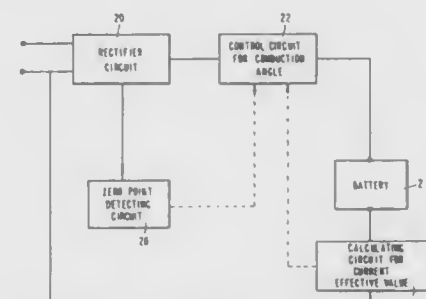
Filed Jul. 24, 1990, Ser. No. 556,499

Claims priority, application Japan, Aug. 11, 1989, 1-209213

Int. Cl.⁵ H02J 7/04

U.S. Cl. 320—32

5 Claims



1. A battery charger comprising:
a rectifier circuit for rectifying an alternating current to obtain a rectified output signal;
a control circuit for applying a controlled conduction angle portion of the rectified output signal to a battery in response to a current measurement signal and a zero-cross signal;
a current effective value calculating circuit responsive to charging current passing through the battery for calculating an effective value of said charging current to produce the current measurement signal for use by said control circuit, wherein the current effective value calculating circuit comprises a correction circuit which delivers a current measurement signal which is larger than the actual effective value of said charging current when the instantaneous value of the charging current is high; and
a zero point detecting circuit responsive to the rectified output signal for detecting a zero point of the rectified output signal to produce the zero-cross signal for use by said control circuit.

5,089,766 VEHICLE AC GENERATOR CONTROL DEVICE WITH OVERVOLTAGE LIMITER AND DUMMY LOAD UNIT Shiro Iwatani, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

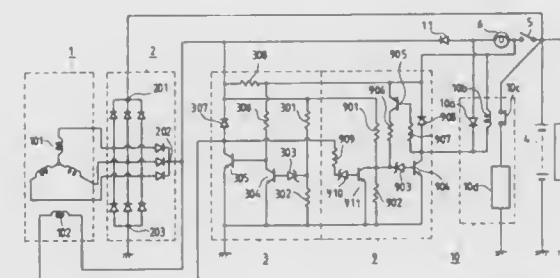
Filed Jul. 12, 1990, Ser. No. 551,344

Claims priority, application Japan, Jul. 13, 1989, 1-180954

Int. Cl.⁵ H02J 7/14

U.S. Cl. 322—25

5 Claims



1. A vehicle AC generator control device, comprising: an AC generator including a field coil,

a rectifier for rectifying an AC output of said AC generator; a battery connected to an output terminal of said rectifier; a voltage regulator including a switching element series-connected to said field coil, said voltage regulator operating said switching element to control a field current of said field coil to adjust an output voltage of said generator to a predetermined value;
a dummy load unit including a dummy load balanced with an output capacity of said AC generator; and
an overvoltage limiter which detects when said output voltage of said AC generator exceeds a set value, and energizes said dummy load unit, so that said dummy load unit is connected to an output terminal of said rectifier, to thereby suppress an abnormal rise of said output voltage.

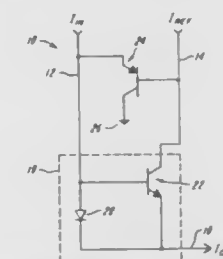
5,089,767 CURRENT SENSOR AND LIMITER Robert A. Neidorff, Bedford, N.H., assignor to Unitrode Corporation, Billerica, Mass.

Filed Apr. 9, 1990, Ser. No. 506,352

Int. Cl.⁵ G05F 3/20

U.S. Cl. 323—315

14 Claims



1. A circuit for sensing and limiting an input current as a function of a reference current, comprising:
a current mirror, responsive to said input current and to said reference current, for providing an output current which is the sum of said input current and said reference current; and
an input current diverter, responsive to said current mirror, for sensing an input current level which exceeds said reference current, and for diverting from said input current, an amount of input current which generally equals the amount of current by which said input current exceeds said reference current.

5,089,768 POWER SOURCE DEVICE WITH CONTROL OF VOLTAGE CHANGE SPEED Shoji Sato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

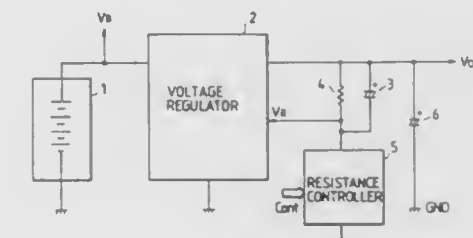
Filed Mar. 2, 1990, Ser. No. 487,433

Claims priority, application Japan, Mar. 22, 1989, 1-67469

Int. Cl.⁵ G05B 24/02

U.S. Cl. 323—318

10 Claims



1. A power source circuit supplying an output voltage which can be switched among a plurality of voltage values, comprising:
voltage regulating means having an input section connected

element at predetermined spaces by the charged particle beam radiation on the basis of the position data of the defective circuit element obtained by the defective portion locating means.

5,089,775

SENSOR MAGNET MOUNTING DEVICE HAVING AN IMPROVED MOUNTING STRUCTURE
Goro Takeda, Kyoto, Japan, assignor to Cat Eye Co., Ltd., Osaka, Japan

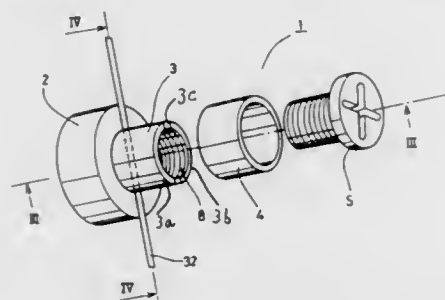
Filed Nov. 14, 1990, Ser. No. 613,278

Claims priority, application Japan, Nov. 15, 1989, 1-132694[U]

Int. Cl.⁵ G01P 3/487

U.S. Cl. 324-174

10 Claims



8. A mounting device adapted to be attached to a spoke of a rotating wheel for mounting a magnet comprising: a magnet housing containing a magnet and having a contact surface adapted to be in contact with said spoke, a generally cylindrical projecting member projecting from said magnet housing, said projecting member having an inner wall and an outer wall, a thread portion being formed on the inner wall of said projecting member, a ring engaging with the outer wall of said projecting member and detachable therefrom, a fastener engaging with the thread portion of said projecting member, said fastener having a head for engaging said ring and moving said ring toward said magnet housing for clamping a spoke between the ring and the magnet housing when the fastener is engaged with the thread portion.

5,089,776

APPARATUS FOR DETECTING DEFECTS IN A MOVING STEEL STRIP WITH A MAGNETIZING YOKE AND A SENSOR PLACED ON OPPOSITE SIDES OF THE STRIP
Takato Furukawa, Kenichi Iwanaga, and Atsuhisa Takegoshi, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

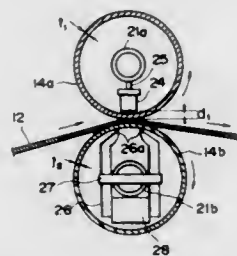
Filed Sep. 10, 1990, Ser. No. 580,138

Claims priority, application Japan, Sep. 25, 1989, 1-111755[U]

Int. Cl.⁵ G01N 27/83; G01R 33/12

U.S. Cl. 324-227

22 Claims



1. A magnetic defect detector comprising: a pair of rotatable cylinders made of nonmagnetic material which pinch a running steel strip therebetween; two pairs of bearings in said pair of cylinders, respectively; a pair of stationary shafts respectively housed in the pair of

said cylinders, respective portions of one of said pair of stationary shafts being engaged with one of said two pairs of bearings, and respective portions of the other of said pair of stationary shafts being engaged with the other of said two pairs of bearings;

- a yoke which generates a magnetic circuit in said strip housed in one of the pair of cylinders, free ends of said yoke being in the vicinity of an inner surface of a part of said one cylinder which contacts the strip;
- a magnetizing coil surrounding a part of the yoke;
- a supporting element fixing the yoke to one of the pair of shafts housed in said one cylinder so as to also be housed within said one cylinder;
- at least one sensor having means for detecting signals indicative of defects of the strip caused by a magnetic leakage flux due to said defects, said at least one sensor being housed in the other one of said pair of cylinders and arranged in the vicinity of an inner surface of a part of said other cylinder which contacts the strip; and
- a second supporting element fixing said at least one sensor to the other one of the pair of stationary shafts such as to also be housed within said other cylinder.

5,089,777

MAGNETIC RESONANCE IMAGING APPARATUS
Mitsutoshi Iino; Shirou Nakato; Seiichi Shinkai; Hideki Shimojima, all of Hino, and Hiromi Kawaguchi, Kawasaki, all of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa and FUJIFACOM Corporation, Tokyo, both of Japan

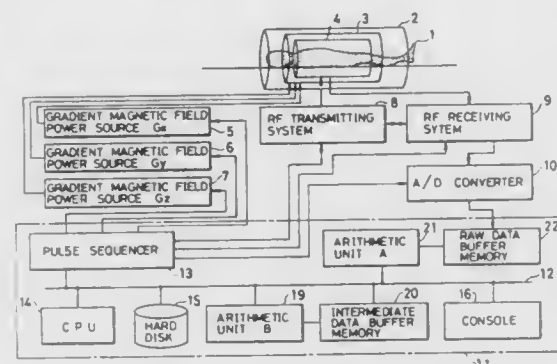
Filed Jun. 5, 1990, Ser. No. 533,593

Claims priority, application Japan, Jun. 9, 1989, 1-145075

Int. Cl.⁵ G01R 33/20

U.S. Cl. 324-309

4 Claims



1. A magnetic resonance imaging apparatus comprising: magnetostatic field applying means for applying a magnetostatic field in a magnetostatic direction to a subject; first gradient magnetic field imposing means for imposing a first gradient magnetic field on the subject, the first gradient magnetic field being oriented in the magnetostatic direction and changing in magnitude along a first direction perpendicular to the magnetostatic direction; second gradient magnetic field imposing means for imposing a phase encoded gradient magnetic field on the subject, said phase encoded gradient magnetic field being generated with a different phase at a constant repetition interval and being oriented in the magnetostatic direction and changing in magnitude along a second direction perpendicular to the first direction and the magnetostatic direction;

data acquisition means for acquiring and outputting a series of portions of nuclear magnetic resonance data required to reconstruct a two-dimensional image of the subject, each portion of nuclear magnetic resonance data being output every repetition time; and

image reconstruction computation means, coupled to said data acquisition means, for receiving the series of portions

of the nuclear magnetic resonance data and forming the two-dimensional image based on the series of portions of nuclear magnetic resonance data including:

- first computing means for executing a Fourier transform on each one of the portions of the nuclear magnetic resonance data in a first dimension every repetition time immediately after said data acquisitions means outputs said one of the portions of nuclear magnetic resonance data, and
- second computing means for executing a Fourier transform in a second dimension corresponding to the second direction after said data acquisition means has acquired the series of portions of nuclear magnetic resonance data required to reconstruct the two-dimensional image of the subject.

5,089,778

METHOD OF CANCELLING GHOSTS FROM NMR IMAGES

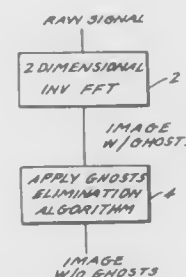
Avideh Zakhor, Encino, Calif., and Richard R. Rzedzian, Lexington, Mass., assignors to Advanced NMR Systems, Inc., Woburn, Mass.

Filed Aug. 7, 1989, Ser. No. 390,075

Int. Cl.⁵ G01R 33/20

U.S. Cl. 324-312

6 Claims



1. A method of cancelling ghosts from NMR images, comprising the steps of:

- (a) taking a two dimensional inverse Fourier transform of a raw NMR signal to obtain a ghosted image $Y(n_1, n_2)$;
- (b) computing the signal energy for each column of said Fourier transformed signal using

$$E(n_1) = \sum_{n_2=0}^{N-1} |Y(n_1, n_2)|^2$$

- (c) discarding the columns whose signal energy level are below a predetermined threshold;
- (d) estimating $\alpha(n_1)$ and $\beta(n_1)$ for each remaining column of data; i.e. $n_1=0, \dots, N_1-1$, by:
 - (i) finding the phase difference function $\Delta(n_1, n_2)$ for all ghosting pixels of the column; and
 - (ii) solving the following simultaneous equations to find linear least square estimates of $\alpha(n_1)$ and $\beta(n_1)$:

$$\Delta(n_1, n_2) = \begin{cases} \alpha(n_1) + \beta(n_1) n_2 & 0 \leq n_2 \leq \frac{N}{2} \\ \alpha(n_1) + \beta(n_1)N - \beta(n_1) n_2 & \frac{N}{2} \leq n_2 < N \end{cases} \quad (12)$$

- (e) using $\alpha(n_1)$ and $\beta(n_1)$ in the above equation to find the phase difference $\Delta(n_1, n_2)$ for $0 \leq n_2 < N$; and
- (f) using $\Delta(n_1, n_2)$ in

$$Y_{even}(n_1, n_2) = A(n_1, n_2)e^{j\Delta(n_1, n_2)} + B(n_1, n_2)e^{j\Delta(n_1, n_2 + \frac{N}{2})}$$

-continued

$$Y_{odd}(n_1, n_2) = A(n_1, n_2) - B(n_1, n_2)$$

to find $A(n_1, n_2)$ and $B(n_1, n_2)$ for $0 \leq n_2 < N$, where the dimensions of the reconstructed image are $N \times N$.

5,089,779

METHOD AND APPARATUS FOR MEASURING STRATA RESISTIVITY ADJACENT A BOREHOLE

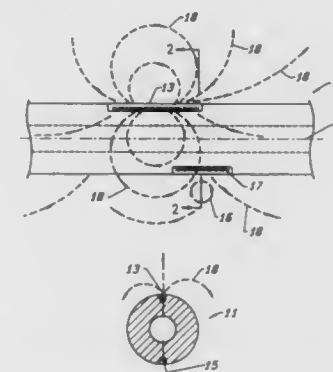
Louis H. Rorden, Los Altos, Calif., assignor to Develco, Inc., San Jose, Calif.

Filed Sep. 10, 1990, Ser. No. 581,561

Int. Cl.⁵ G01V 3/30

U.S. Cl. 324-339

36 Claims



1. In apparatus for measuring the resistivity of a formation surrounding a borehole having a central axis, the combination comprising:

- (a) a first, axially asymmetric antenna for forming a changing primary magnetic field within said formation;
- (b) a supporting structure for said antenna to be placed in said borehole, which structure has a main axis meant to be generally coincident with said borehole central axis when said structure is in said borehole;
- (c) a second detecting antenna for detecting the secondary magnetic field resulting from the electrical current induced in said formation, positioned at the location of a null in said primary magnetic field; and
- (d) said first and second antennas being supported by said support structure at positions which are radially offset from said main axis, said supporting structure being generally cylindrical, and said first and second antennas being positioned in corresponding grooves in the exterior surface thereof.

5,089,780

OIL QUALITY MONITOR SENSOR AND SYSTEM
Clifford A. Megerle, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 417,118, Oct. 4, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 663,770

Int. Cl.⁵ G01N 27/413

U.S. Cl. 324-448

10 Claims



1. A system for monitoring the accumulation of water and sulfuric acid contaminants in internal combustion engine oil, wherein said contaminants have an electrical conductivity

which is different from the electrical conductivity of said oil, said system comprising:

- an electrochemical cell comprising two electrodes which are spaced apart at a constant spacing to provide a conductivity measurement zone of constant width located between said electrodes, said electrochemical cell being capable of being immersed in said oil;
- means for applying to said electrochemical cell an alternating current voltage having a frequency within the range of 100 to 1000 hertz; and
- means for measuring the alternating current conductivity of said oil in said conductivity measurement zone when said electrochemical cell is immersed in said oil to thereby indicate the amount of said water and sulfuric acid contaminants in said oil.

5,089,781

ELECTROMAGNETIC CONDUCTIVITY METER AND A CONDUCTIVITY MEASURING METHOD

Kenji Arichika, Ebina; Mitsuru Fukamachi, Yokohama; Satoshi Higashi, Ebina, and Noboru Maruyama, Yachiyo, all of Japan, assignors to Tosoh Corporation, Tokyo and Nichiri Mfg. Co., Ltd., Chiba, both of Japan

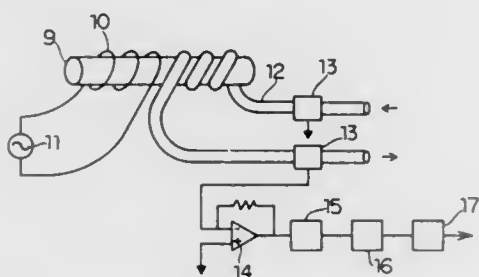
Filed Feb. 11, 1991, Ser. No. 653,772

Claims priority, application Japan, Feb. 13, 1990, 2-29455

Int. Cl.⁵ G01N 27/02

U.S. Cl. 324—445

4 Claims



1. An electromagnetic type conductivity meter comprising:
 - a core;
 - a primary coil wound around the core;
 - an alternating power source for applying an alternating voltage having a given frequency to the primary coil to excite said core;
 - a tube wound around the core through which a liquid to be measured flows;
 - induction current detecting means disposed at the opposite ends of the tube; and
 - an operational means for determining the conductivity of the liquid to be measured from a value of the induction current detected by the induction current detection means.

5,089,782

VECTOR NETWORK ANALYZER FOR SWEEP FREQUENCY HARMONIC AND MIXER CONVERSION LOSS MEASUREMENTS USING EITHER AN INTERNAL OR EXTERNAL SIGNAL SOURCE

William T. Pike, David D. Sharrit, and Barry A. Brown, all of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 327,284, Mar. 22, 1989, abandoned.

This application Jul. 2, 1990, Ser. No. 547,891

Int. Cl.⁵ G01R 27/28

U.S. Cl. 324—623

20 Claims

1. A method for detecting harmonics produced by a device under test (DUT) having at least one input and at least one output, comprising the steps of:
 - generating a stimulus;
 - applying the stimulus to the at least one input of the DUT;

applying the stimulus to a reference channel to provide a reference channel signal;

generating a local oscillator signal;

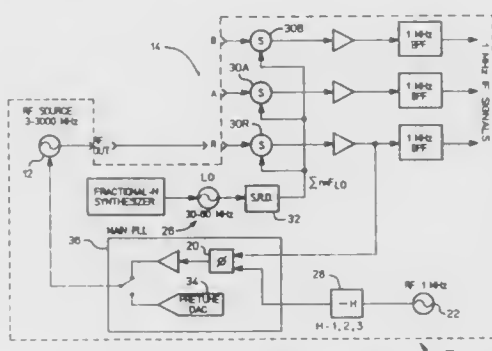
generating harmonics of the local oscillator signal frequency;

downconverting the reference channel signal to a predetermined intermediate frequency signal in response to a predetermined harmonic frequency of the local oscillator signal frequency, the predetermined harmonic frequency having a harmonic number N corresponding to the Nth harmonic of the stimulus appearing in the response at the at least one output of the DUT;

generating a reference frequency;

dividing the reference frequency by the harmonic number N;

detecting a phase of the divided reference frequency with respect to a phase of the predetermined intermediate frequency signal in the reference channel to generate an error signal;



using the error signal to accurately phase lock the stimulus to a predetermined harmonic frequency of the local oscillator frequency; and

determining the presence of an Nth harmonic appearing in the response of the DUT by downconverting the response appearing at the at least one output of the DUT in response to the Nth harmonic of the local oscillator signal to detect the presence of an intermediate frequency corresponding to:

$$F_{if} = F_r - N \cdot F_o$$

where F_{if} is the intermediate frequency of the downconverted response, F_r is the frequency of the stimulus, F_o is the local oscillator signal frequency, and N is the harmonic number of the local oscillator signal frequency being used for downconverting the response appearing at the at least one output of the DUT.

5,089,783

CAPACITIVE FUEL COMPOSITION SENSOR WITH PADDING CAPACITOR

Nick S. Kapsokavathis, Rochester, and Stephen P. Sanders, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1990, Ser. No. 614,809

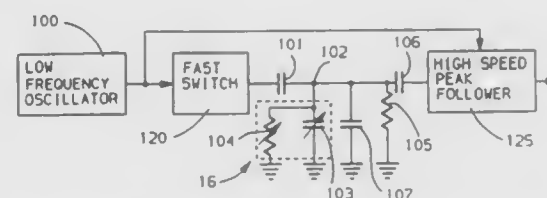
Int. Cl.⁵ G01R 27/26; G01N 27/22

U.S. Cl. 324—672

4 Claims

1. In a fuel composition sensor for a fuel mixture in a fuel supply line for a combustion engine wherein the fuel mixture comprises two fuels of different dielectric constants in unknown relative concentrations, the sensor comprising a sensor capacitor in the fuel line adapted for fuel flow therethrough so that the fuel mixture provided to the engine comprises a dielectric which determines the sensor capacitance thereof and the sensor capacitance varies in a linear manner with fuel composition, a reference capacitor with a constant reference capacitance in series with the sensor capacitor to form therewith a

voltage divider having an output junction and circuit means for producing a predetermined fast voltage change across the series combination of the reference and sensor capacitors to produce a corresponding voltage change at the output junction determined by the voltage divider ratio of the reference capacitance to the sum of the sensor and reference capacitances and thus varying in a non-linear manner with fuel composition, the improvement comprising:



a padding capacitor having a constant padding capacitance in parallel with the sensor capacitor so that the voltage change at the output junction is determined by the voltage divider ratio of the reference capacitance to the sum of the sensor, reference and padding capacitances, the padding capacitance having a value such that the maximum value of the voltage divider ratio is substantially less than one, whereby the voltage change at the output junction varies essentially linearly with fuel composition.

5,089,784

METHOD FOR RESTRICTING REGION FOR MAGNETIC RESONANCE IMAGING

Eiji Yoshibito, and Susumu Kosugi, both of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP88/01333 § Date: Jun. 22, 1990, § 102(e)

Date: Jun. 22, 1990 PCT Pub. No.: WO 89/06109 PCT Pub.

Date: Jul. 13, 1989

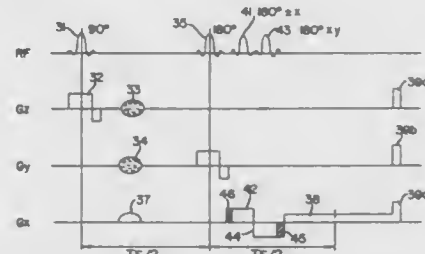
PCT filed Dec. 24, 1988, Ser. No. 499,449

Claims priority, application Japan, Dec. 25, 1987, 62-329322

Int. Cl.⁵ G01R 33/20

U.S. Cl. 324—309

4 Claims



1. In a method of magnetic resonance imaging wherein a first spin echo signal of an object is obtained by applying a first RF pulse sequence comprising 90° and 180° pulses and at least one gradient magnetic field applied along one axis; the improvement comprising the steps of

- obtaining a second spin echo signal of said object by applying a second RF pulse sequence comprising said first RF pulse sequence and after the 180° pulse of said first RF pulse sequence a selective 180°±X pulse and a selective 180°±Y pulse, and an added pair of magnetic fields applied along said one axis with an integral therebetween of zero and applied during the selectively added RF pulses; selectively combining said first and second spin echo signals; and
- reconstructing an image of said object by utilizing a Fourier transform technique and the combined first and second spin echo signals, so that a restricted region of imaging is attained.

5,089,785

SUPERCONDUCTING LINEAR ACCELERATOR LOADED WITH A SAPPHIRE CRYSTAL

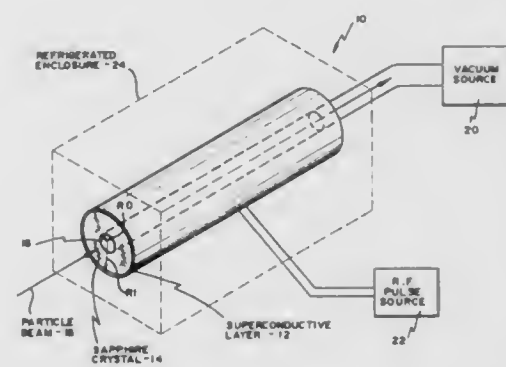
Louis N. Hand, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jul. 27, 1989, Ser. No. 386,307

Int. Cl.⁵ H01J 23/00

U.S. Cl. 328—233

7 Claims



1. An accelerating structure for a linear accelerator comprising:
 - a sapphire crystal having a passage disposed therein for reception of a particle beam to be accelerated; and,
 - a superconductive material layer surrounding and disposed on an exterior wall of said crystal.

5,089,786

OPTICAL AMPLIFIER

Yasuaki Tamura, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

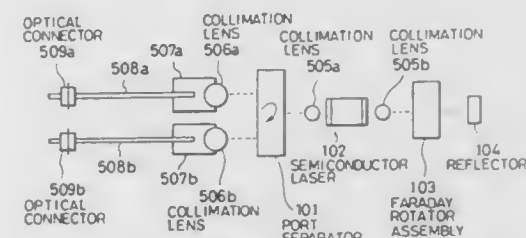
Filed Jun. 19, 1990, Ser. No. 540,498

Claims priority, application Japan, Jun. 26, 1989, 1-160925

Int. Cl.⁵ H01S 3/10; G02B 5/30, 6/28

U.S. Cl. 359—333

4 Claims



1. An optical amplifier for directly amplifying an optical signal regardless of the direction of polarization of the optical signal, said optical amplifier comprising:

a port separator including:

- a first polarization beam splitter having first, second, third and fourth ports, receiving input light at said first port, splitting the input light into a first light component having a direction of polarization and a second light component having a direction of polarization perpendicular to the direction of polarization of said first light component, and emitting said first and said second light components at said second and said third ports;
- a polarization controller having first and second ends, receiving said first and said second light components at said first end, permitting passage of said first and said second light components from said first end to said second end, imparting a first net amount of rotation to said first and said second light components as they travel from said first end to said second end, and emitting said first and said second light components from said second end; and

a second polarization beam splitter having first, second and third ports, receiving, at said first and said second ports, said first and said second components emitted from said second end of said polarization controller and merging said first and said second light components, and emitting the merged light components from the third port;

a semiconductor laser that has first and second ends, that emits outward from the second end, light which has been incident on the first end and amplified, and that emits outward, from the first end, light which has been incident on the second end and amplified;

said first end of the semiconductor laser being optically coupled with said third port of the second polarization beam splitter;

a Faraday rotator assembly that has first and second ends, that imparts a first amount of rotation to the direction of polarization of light incident on the first end and emits that light from the second end, and that imparts a second amount of rotation to the direction of polarization of light incident on the second end and emits that light from the first end;

the sum of said first amount of rotation and said second amount of rotation being 90°;

said first end of the Faraday rotator assembly being optically coupled with said second end of the semiconductor laser; and

a reflector that reflects light coming from the second end of the Faraday rotator assembly and returns it back towards the second end of the Faraday rotator assembly wherein said second polarization beam splitter receives, at said third port, reflected back light from said semiconductor laser, splits the received reflected back light into a first backward light component having a direction of polarization and a second backward light component having a direction of polarization perpendicular to the direction of polarization of said first backward light component, and emits the first and the second backward light components from said first and said second ports;

said polarization controller receives said first and said second backward light components at said second end, and permits passage of said first and said second backward light components from said second end to said first end, imparts a second net amount of rotation to said first and said second backward light components as they travel from said second end to said first end, emits the first and said second backward light at said first end, one of said first net amount of rotation and said second net amount of rotation being 0 and the other of said first and said second net amount of rotation being 90°; and said first polarization beam splitter receives at said second and said third ports, said first and said second backward light components, merges them, and emits the merged backward light components from said fourth port.

5,089,787

OPTICALLY-COUPLED HIGH FREQUENCY AMPLIFIER

Haila Wang, Founteay Aux Roses, France, and Amnon Yariv, San Marino, Calif., assignors to California Institute of Technology, Pasadena, Calif.

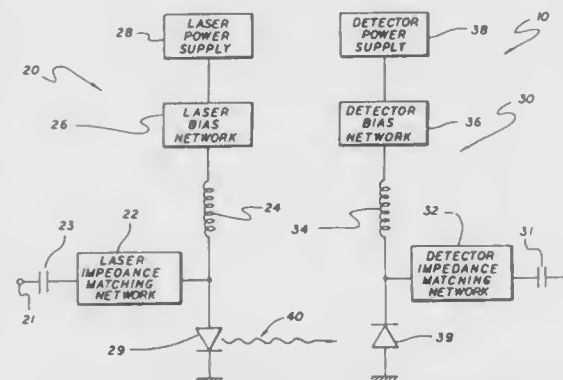
Continuation of Ser. No. 190,671, May 5, 1985, abandoned. This application Jul. 1, 1991, Ser. No. 725,398

Int. Cl.⁵ H03F 3/16; H01S 3/13; H03H 7/38

U.S. Cl. 330—4.9 14 Claims

1. A high-frequency amplifier comprising: laser means, including inherent inductive and capacitive characteristics, for generating a beam of electromagnetic energy; modulating means for modulating said beam of electromagnetic energy in response to an input signal having a modulation frequency in excess of ninety gigahertz; laser impedance matching means, coupled to said laser

means, for increasing the maximum operating frequency of said laser means and including first reactive means for compensating for said inherent inductive and capacitive characteristics of said laser means; receiving means, including inherent inductive and capacitive characteristics and electromagnetically coupled by said



beam to said laser means, for receiving said beam and for providing an output signal in response thereto; and receiver impedance matching means, coupled to said receiving means, for increasing the maximum operating frequency of said receiving means and including second reactive means for compensating for said inherent inductive and capacitive characteristics of said receiving means.

5,089,788

CIRCUIT FOR DRIVING A PHOTO-RECEIVER

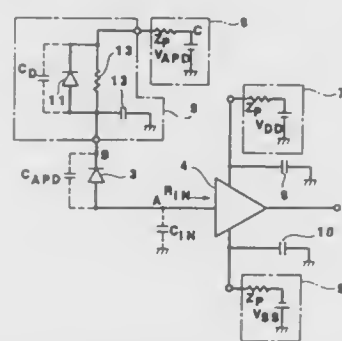
Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 9, 1990, Ser. No. 593,978

Claims priority, application Japan, Oct. 13, 1989, 1-267552 Int. Cl.⁵ H03F 3/08

U.S. Cl. 330—59

6 Claims



6. A photo-receiver comprising:

a diode having a cathode thereof adapted to be connected to a power supply; a resistor connected in parallel with said diode; a first capacitor having one end thereof connected to an anode of said diode and the other end thereof adapted to be connected to a reference potential; a photo-diode having a cathode thereof connected to the anode of said diode; an amplifier having an input thereof connected to an anode of said photo-diode and adapted to be connected to the power supply; and a second capacitor having one end thereof adapted to be connected to the power supply and the other end thereof adapted to be connected to a reference potential, characteristics of circuit components constructing said first and second supply circuits being selected such that supply of the first driving voltage to said photo-diode starts after

supply of said second driving voltage to said amplifying means and finishes prior to completion of supply of said second driving voltage to said amplifying means.

5,089,789

DIFFERENTIAL AMPLIFIER

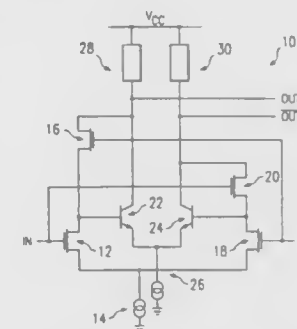
Hiep Van Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 16, 1990, Ser. No. 524,404

Int. Cl.⁵ H03F 3/45

U.S. Cl. 330—253

18 Claims



11. A method of amplifying the voltage difference between two input signals comprising the steps of: pre-amplifying the voltage difference between the input signals with a first MOS differential amplifier to generate first and second differential signals; amplifying the voltage difference between said first and second differential signals with a second bipolar differential amplifier to generate third and fourth differential signals wherein said second differential amplifier includes first and second bipolar transistors each coupled to an active load; and providing feedback to said second differential amplifier with an active load coupled to said first and second differential amplifier.

5,089,790

FIELD EFFECT TRANSISTOR AMPLIFIER

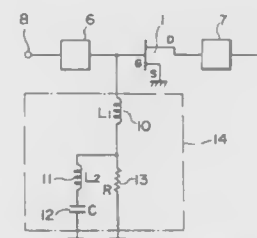
Mitsuru Mochizuki; Youji Isota; Tadashi Takagi, and Shuji Urasaki, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 575,617

Claims priority, application Japan, Sep. 13, 1989, 1-238253 Int. Cl.⁵ H03F 3/16

U.S. Cl. 330—277

10 Claims



5. A field effect transistor amplifier comprising: a field effect transistor with the source terminal thereof grounded; a matching circuit on an input side of the amplifier, which is connected to the gate terminal of said field effect transistor; a matching circuit on an output side of the amplifier, which is connected to the drain terminal of said field effect transistor; a resonance circuit, which is composed of a series circuit including a first inductor and a resistor and a series circuit

including a second inductor and a capacitor, connected in parallel to said resistor, connected between said gate terminal of said field effect transistor and ground.

5,089,791

MMIC-COMPATIBLE POWER AMPLIFIER

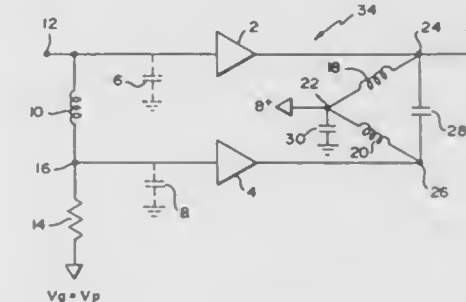
Carmino F. Vasile, Medford, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 30, 1990, Ser. No. 620,214

Int. Cl.⁵ H03F 3/68

U.S. Cl. 330—295

19 Claims



1. An amplifier circuit comprising: two low feedback amplifier means each having inherent parasitic capacitance; a quadrature circuit electrically connected to and cooperatively working with the two amplifier means for effecting, with the parasitic capacitances of the amplifier means, a high impedance load on one of the amplifier means and a low impedance load on the other amplifier means, thereby minimizing the load pull and enhancing the efficiency of the amplifier circuit.

5,089,792

PHASE LOCKED LOOP WITH PHASE DIFFERENCE SIGNAL ADJUSTMENT CIRCUIT

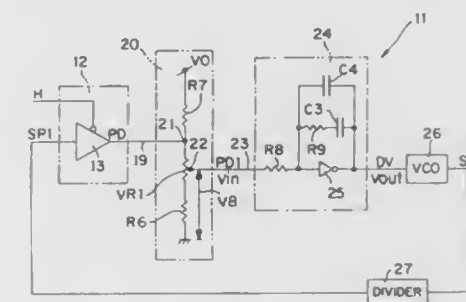
Katsuya Mizukata, Tenri; Makoto Takeda, Nara; Hiroshi Také, Ikoma, and Takafumi Kawaguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 31, 1990, Ser. No. 560,592

Claims priority, application Japan, Jul. 31, 1989, 1-199743 Int. Cl.⁵ H03L 7/93

U.S. Cl. 331—17

13 Claims



1. A phase locked loop oscillating circuit comprising: signal comparing means for comparing a plurality of different input signals with each other and for emitting a first control signal with a duty cycle related to the degree of difference of the compared signals; level converting means, operatively connected to said signal comparing means, for receiving and converting said first control signal and emitting a fixed level signal stabilized at a 50% duty cycle, independent of fluctuations in threshold voltages and noises; signal converting means, operatively connected to said level

converting means, for emitting a second control signal at a level corresponding to the duty cycle of the converted first control signal from the level converting means; and oscillating means, operatively connected to the signal converting means, for emitting an oscillating signal at a frequency corresponding to the level of the second control signal and for feeding, the oscillation signal to the signal comparing means as an input signal.

5,089,793

SEMICONDUCTOR DEVICE HAVING AN OSCILLATORY CIRCUIT

Hidehiko Nagao, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

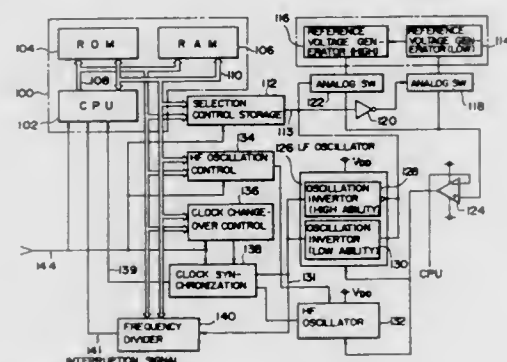
Filed Sep. 24, 1990, Ser. No. 586,677

Claims priority, application Japan, Oct. 16, 1989, 1-268621; Aug. 24, 1990, 2-221188

Int. Cl.⁵ H03B 1/00

U.S. Cl. 331-46

7 Claims



1. A semiconductor device comprising: a plurality of reference voltage generating circuits for generating reference voltages different from each other; a selection control storage circuit for storing a selection signal for selecting one of said reference voltage generating circuits in accordance with a command from a CPU; a plurality of analog switches provided respectively corresponding to said reference voltage generating circuits, each of said analog switches being arranged so as to open on the basis of said selection signal supplied thereto to thereby send out the reference voltage from said corresponding reference voltage generating circuit; and an oscillation circuit constituted by a plurality of oscillation invertors provided respectively corresponding to said reference voltage generating circuits, said oscillation invertors being provided with said reference voltages supplied through said analog switches as driving voltages, said oscillation invertors being selected on the basis of said selection signal supplied thereto so that an oscillation signal of the selected one of said oscillation invertors is supplied to a microcomputer as a system clock.

5,089,794

VIBRATION ABSORBING CASE FOR AN OSCILLATOR

Hidehiko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,391

Claims priority, application Japan, Sep. 26, 1989, 1-249463

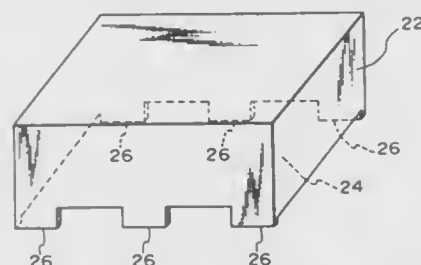
Int. Cl.⁵ H03B 1/00; H05K 5/04

U.S. Cl. 331-68

8 Claims

1. An oscillator comprising: a substrate having two surfaces on one of which a ground pattern is provided; oscillator circuitry mounted on said substrate;

a shield case for covering said circuitry, said shield case comprising a conductive member which absorbs vibrations which may be applied to said shield case from outside; and means for soldering said shield case to said ground pattern.



tions which may be applied to said shield case from outside; and means for soldering said shield case to said ground pattern.

5,089,795

COMPACT MOLDED CASE CIRCUIT BREAKER WITH MOVABLE CONTACT ARM REBOUND CUSHION

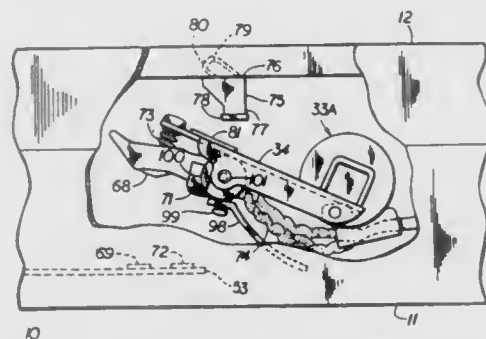
Roger J. Morgan, Simsbury; Irenaeus S. Panus, Forestville; Ronald G. Pekrul, Southington; Thomas F. Papallo, Jr., Plainville; Robert A. Morris, Burlington; Henry J. Tucholski, Terryville, and Hamon L. Craft, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 546,826, Jun. 29, 1990. This application Nov. 8, 1990, Ser. No. 610,758

Int. Cl.⁵ H01H 75/00

U.S. Cl. 335-46

4 Claims



1. A compact industrial-rated circuit breaker comprising: a plastic circuit breaker case; a plastic circuit cover attached to said case and having a slot formed on an inner surface thereof; a pair of contacts arranged for automatic separation upon occurrence of an overcurrent condition through said contacts one of said contacts being attached to one end of a movable contact arm; an operating handle extending through said cover allowing manual operation of said contacts; an arc chute proximate said contacts cooling and extinguishing an arc that occurs when said contacts become separated during said overcurrent conditions; a plurality of line terminal lugs at one end of said circuit breaker case and a corresponding plurality of load terminal lugs at an opposite end of said circuit breaker case; a rubber or plastic bumper attached to said inner surface of said circuit breaker cover to cushion said movable contact arm upon occurrence of short circuit current through said contacts; and a fiber plate on said movable contact arm to deter thermal transfer from said movable contact arm to said bumper.

5,089,796

EARTH LEAKAGE TRIP INDICATOR

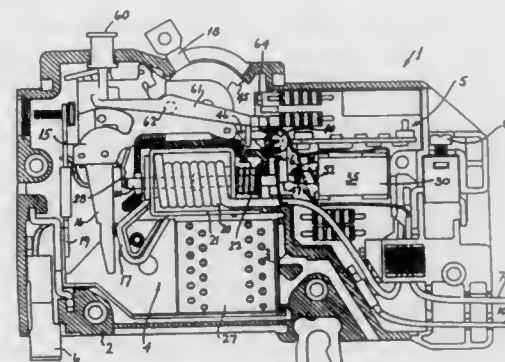
Oliver Glennon, and James Shortt, both of Ballinasloe, Ireland, assignors to Square D Company, Palatine, Ill.

Filed Sep. 19, 1990, Ser. No. 584,975

Int. Cl.⁵ H01N 75/00

U.S. Cl. 335-172

15 Claims



1. A circuit breaker for use in a system having line, neutral and ground leads, comprising: a housing; a breaker assembly in said housing for making and breaking an electrical connection between a movable contact and a stationary contact; an operating handle, having an on position with said contacts closed, an off position with said contacts open and an intermediate position with said contacts open, for the breaker assembly; means for sensing over-current and thereby tripping said breaker assembly; an additional tripping mechanism for tripping said breaker assembly; said breaker handle moving to said intermediate position for indicating when the breaker assembly has been tripped by said additional tripping mechanism; said over-current sensing means including a coil and an armature core in said coil, the armature core having an axial bore extending therethrough, said additional tripping mechanism comprising: plunger means mounted within the axial bore of the armature core; an actuating device for controlling the movement of said plunger means from a nontripping position to a tripping position; said plunger means being independently movable through the axial bore in the armature core when moving between said non-tripping and said tripping position; and means for re-setting said plunger means to said non-tripping position.

5,089,797

CIRCUIT BREAKER WITH DUAL FUNCTION ELECTROMAGNETIC TRIPPING MECHANISM

Kurt A. Grunert, Beaver; Jeffrey S. Gibson, Aliquippa, and John A. Wafer, Brighton Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1990, Ser. No. 612,380

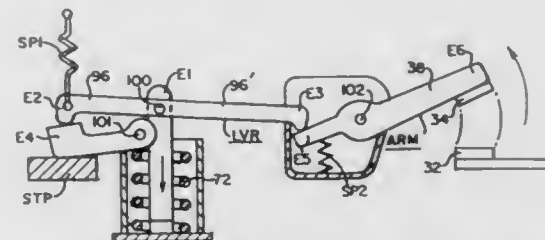
Int. Cl.⁵ H01H 9/00

U.S. Cl. 335-172

8 Claims

1. A circuit breaker having a fixed electrical contact and a movable contact carried by a movable arm, a toggle mechanism for moving the movable arm and the movable contact away from the fixed contact, a trip bar for actuating the toggle mechanism, electromagnetic means energized for taking a first position from a rest position and including a plunger operable from a large airgap at said rest position to a smaller airgap for said first position, comprising: a double-ended lever pivotably carried by said plunger, a

first end of said double-ended lever being adapted to engage said trip bar for actuation thereof and a second end of said double-ended lever being adapted to engage said movable arm for actuation thereof, said first end being operative upon said trip bar when said electromagnetic means is in said first position, said electromagnetic means being energizable to take a second position wherein said



plunger leaves a substantially zero airgap, and said second end being operative upon said movable arm when said electromagnetic means is in said second position, whereby the movable arm is moved away by said toggle mechanism upon an overcurrent causing the electromagnetic means to take the first position and directly by said double-ended lever second end upon a critical event causing the electromagnetic means to take the second position.

5,089,798

APPARATUS FOR GENERATING UNIFORM MAGNETIC FIELD USING SMALL DIAMETER SPHERICAL METALLIC MEMBERS PROVIDED ON MAGNETIC POLES

Koji Miyata, Fukui, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

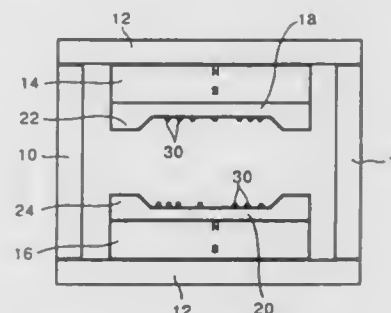
Filed Dec. 13, 1990, Ser. No. 627,145

Claims priority, application Japan, Dec. 13, 1989, 1-143987[U]

Int. Cl.⁵ H01F 3/12, 7/00, 3/00, 7/02

U.S. Cl. 335-211

6 Claims



1. In a device for producing a magnetic field, a disc shaped permanent magnet; a circular pole piece attached to said magnet, said circular pole piece having an annular projection which extends above a major surface of the pole piece; and means for correcting non-uniformity in the magnetic field produced by said magnet, said correcting means comprising at least one small diameter metallic spherical member fixed to the major surface of said pole piece.

5,089,799

THERMAL SWITCH/BREAKER

Richard W. Sorenson, 6540 SE Harbor Cir., Stuart, Fla. 34996

Filed Jan. 25, 1991, Ser. No. 646,156

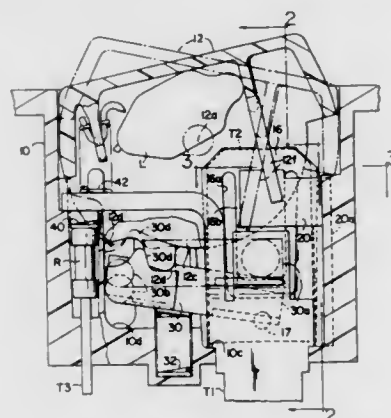
Int. Cl.⁵ H01H 71/16

U.S. Cl. 337-68

11 Claims

1. An electrical switch comprising: a housing,

an actuator supported in said housing for movement between ON and OFF positions, said actuator having a first cam surface,
 a fixed contact in said housing,
 a movable contact means in said housing and including a bimetallic temperature responsive spring element with a fixed portion and a movable portion, a movable contact on said movable portion and normally held against said fixed contact by the inherent resiliency of said spring element, said movable portion being self biased away from said fixed contact by the inherent temperature responsive characteristics of said bimetallic spring element due to an overcurrent condition,
 a trip flag supported for generally pivotal movement in said housing between a rest position wherein a portion of said



flag rests against said movable contact, and an active position wherein said flag portion lies between said movable and said fixed contacts,
 means for providing limited movement of a pivot defining portion of said flag,
 said trip flag having a cam lobe tooth defined adjacent said pivot defining portion thereof and said trip flag tooth engageable by said actuator first cam surface to cause movement of said trip flag from said rest position to a cocked position wherein said flag portion is spaced from said movable and fixed contacts as said actuator is moved from OFF toward ON, and,
 biasing means urging said trip flag tooth into contact with said actuator first cam surface and urging said flag portion toward said active position between said fixed and movable contacts.

5,089,800

STRUCTURE OF THERMOSTATIC SWITCH

Yu-Kang Yang, No 2-43, Lane 365, Chungshan Rd., Yung Kang Hsiang, Taiwan

Filed Jun. 25, 1991, Ser. No. 720,304

Int. Cl.⁵ H01H 37/04, 37/52

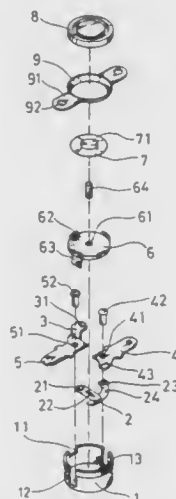
U.S. Cl. 337—380

2 Claims

1. A thermostatic switch comprised of a casing having fastened therein a beryllium plate, a contact plate, a first conductor and a second conductor, a cap attached to said casing at the top, a ceramic rod movably fastened in said cap and controlled by a bimetal element to press on said beryllium plate or release therefrom causing said beryllium plate to connect said contact plate forming into a closed circuit or disconnect therefrom forming into an opened circuit, a fastening plate secured to said cap by a top cover for fastening the thermostatic switch to a heating unit to be controlled, and characterized in that:

said casing has two small notches on the top edge thereof at two opposite locations, two elongated notches on the periphery thereof at two opposite locations and two round holes on the bottom edge thereof;

said beryllium plate has a contact point and a bearing point at one end, and two spaced round holes at an opposite end; said first conductor has a round hole at one end aligned with one round hole on said beryllium plate for fastening in one round hole on said casing by a rivet, and a raised portion on the bottom edge thereof engaged in the other round hole on said beryllium plate;
 said second conductor has a round hole at one end secured to the other round hole on said casing by a rivet;
 said contact plate has one end integrally incorporated into



said second conductor at one end and a contact point at an opposite end disposed in contact with the contact point on said beryllium plate;
 said cap has two opposite, small strips and two opposite, elongated strips raised from the periphery thereof and respectively fastened in said two small notches and said two elongated slots on said casing, and a round hole at the center to hold said ceramic rod therein permitting it to be forced by said bimetal element to press on said bearing point causing the contact point on said beryllium plate to disconnect from the contact point on said contact plate.

5,089,801

SELF-REGULATING PTC DEVICES HAVING SHAPED LAMINAR CONDUCTIVE TERMINALS

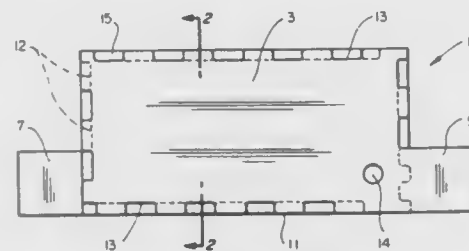
Chi-Ming Chan, Cupertino, and Shou-Mean Fang, Union City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 28, 1990, Ser. No. 590,114

Int. Cl.⁵ H01C 7/10

U.S. Cl. 338—22 R

12 Claims



1. An electrical device which comprises
 (1) a laminar resistive element which
 (a) is composed of a first material having a first resistivity at 23° C., and
 (b) has a first periphery;
 (2) a laminar conductive element which
 (a) is secured to a face of the resistive element,
 (b) is composed of a second material having a second

resistivity at 23° C. which is substantially lower than the first resistivity, and
 (c) has a second periphery which does not extend beyond the first periphery;
 (3) a conductive terminal a laminar portion which
 (a) is secured to a face of the conductive element remote from the resistive element,
 (b) is composed of a third material having a third resistivity at 23° C. which is substantially lower than the first resistivity, and
 (c) has a third periphery at least a part of which does not extend beyond the first periphery; and
 (4) a laminar electrode which
 (a) is composed of a fourth material having a fourth resistivity at 23° C. which is substantially lower than the first resistivity,
 (b) lies between the resistivity element and the conductive element and is secured to the resistive element and the conductive element, and
 (c) has a fourth periphery which coincides with the first periphery.

5,089,802

DIAMOND THERMISTOR AND MANUFACTURING METHOD FOR THE SAME

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

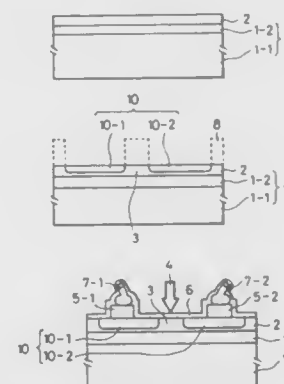
Filed Aug. 23, 1990, Ser. No. 571,265

Claims priority, application Japan, Aug. 28, 1989, 1-221215; Aug. 28, 1989, 1-221216

Int. Cl.⁵ H01C 7/10

U.S. Cl. 338—22 SD

17 Claims



1. A diamond thermistor comprising:
 a diamond substrate having an approximately intrinsic conductivity type;
 a pair of impurity regions formed within the surface of said diamond substrate with a temperature sensing region therebetween; and
 a pair of electrodes making electric contact with the impurity regions of said diamond substrate, respectively.

5,089,803

PARKING LOT CAR LOCATOR

Frank W. Bohn, 1825 Ross Ave., Scranton, Pa. 18509

Filed Apr. 23, 1990, Ser. No. 496,548

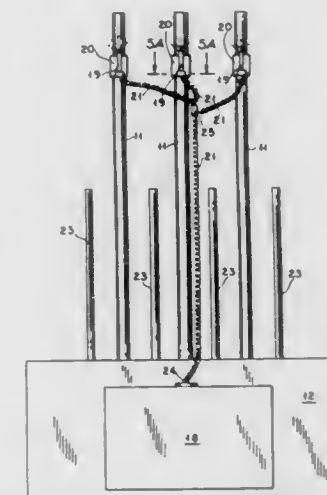
Int. Cl.⁵ B60Q 1/00

U.S. Cl. 340—425.5

11 Claims

1. A vehicle identifying apparatus, comprising:
 a base holding unit made primarily from a sheet of material having two opposing edges, a first edge being formed into vehicle mounting means and a second, opposite edge being formed into a flagstaff holding means;
 at least one flagstaff removably and securely held to said base holding unit by said flagstaff holding means; and an electric light system comprising:

a battery pack affixed to said base holding unit;
 parallel electrical wiring connecting said battery pack to at least one electric light unit comprising a socket and a bulb;



an electric light snap fit mounting means for mounting said at least one electric light unit to said at least one flagstaff; and
 an easily removable connection connecting said parallel wiring and said battery pack.

5,089,804

SHORT-CIRCUIT AND GROUND FAULT DETECTING APPARATUS FOR AUTOMOTIVE ELECTROMAGNETIC CLUTCHES

Munehiko Mimura, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

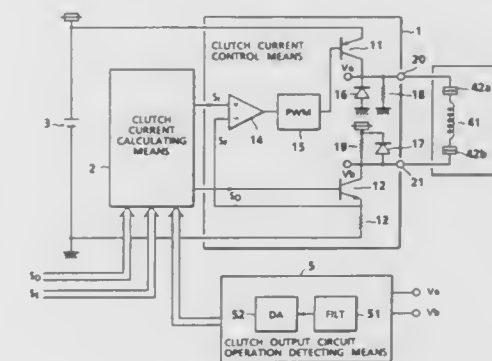
Filed Jun. 29, 1990, Ser. No. 545,736

Claims priority, application Japan, Jun. 30, 1989, 1-170248

Int. Cl.⁵ B60Q 1/00

U.S. Cl. 340—453

2 Claims



1. A short-circuit and ground fault detecting apparatus adapted for use with an automotive electromagnetic clutch, comprising:

a clutch output circuit operation detecting means for detecting a plurality of output terminal voltages of the electromagnetic clutch;
 a clutch current calculating means for producing a clutch current command signal and a clutch opening signal for the electromagnetic clutch according to driving control information and engine control information, said clutch current calculating means also being adapted to change the clutch current command signal according to said plurality of said output terminal voltages fed back from

the clutch output circuit operation detecting means and to a clutch current command signal last outputted; and a clutch current control means for controlling the current supply to the electromagnetic clutch according to the difference between the clutch current command signal and a clutch current feedback signal and to the clutch opening signal, said clutch current calculating means comprising resetting means for resetting said last outputted clutch current command signal and turning-off means for turning-off said clutch opening signal, wherein when said clutch current calculating means determines an abnormality in said clutch current control means, said resetting means resets said last outputted clutch current command signal and said turning-off means turns off said clutch opening signal to release said clutch.

5,089,805

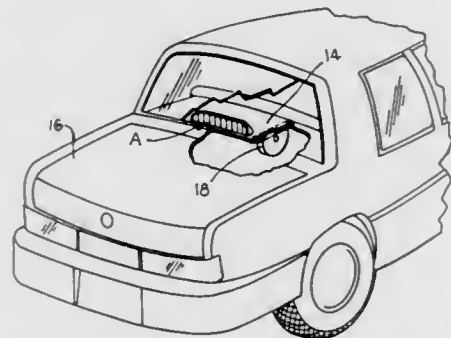
BRAKE LIGHT SYSTEM TO INDICATE INTENSITY OF SLOW DOWN

Robert K. Salsman, 1296 Carmen Ct., Conyers, Ga. 30208
Filed May 7, 1990, Ser. No. 519,801

Int. Cl.⁵ B60Q 1/50

U.S. Cl. 340—467

20 Claims



1. A deceleration indicating device for a vehicle having braking means, said indicating device including:
a light array having a plurality of lights carried by a mounting means;
said mounting means mounting said array of lights to an associated automobile structure;
an inertia activated switch mounted to a stationary portion of the vehicle, said switch including an arm pivotally mounted at a first end which causes its longitudinal axis to be maintained at true vertical, a plurality of inertia activated individual switch elements arranged substantially coextensive with the longitudinal axis of said arm, and arm latch means carried by said arm;
circuit means interconnecting said vehicle brake means, said light array, said switch elements, and said arm latch means so that upon activation of said vehicle brake means, said arm latch means is activated to maintain said arm positioned at true vertical against an inertial force;
whereby said inertial force acts upon said individual switch elements so as to sequentially activate the lights of said array to provide variable intensity brake lighting depending on the intensity of said inertial force.

5,089,806

BARRIER AND ALARM FOR BLOCKING A PASSAGEWAY

David T. Willis, North Reading, Mass., and Donald Farnsworth, Bridgewater, N.J., assignors to Carriage Trade Company, Inc., Woburn, Mass.

Filed Aug. 6, 1990, Ser. No. 563,039

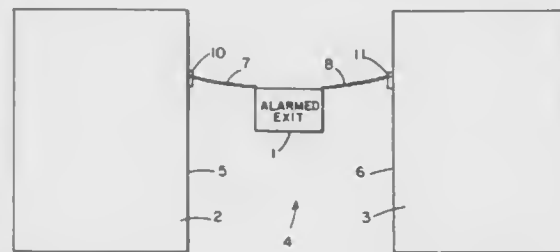
Int. Cl.⁵ G08B 13/00

U.S. Cl. 340—541

13 Claims

1. An alarm system to detect movement of a body through a narrow egress, such as a supermarket aisle and the like, comprising a removable barrier, shaped to occupy only a portion of

said egress when positioned therein, and a motion-sensitive alarm supported on said barrier, said alarm adapted to be triggered on movement thereof.



alarm supported on said barrier, said alarm adapted to be triggered on movement thereof.

5,089,807

ANTI-THEFT DEVICE

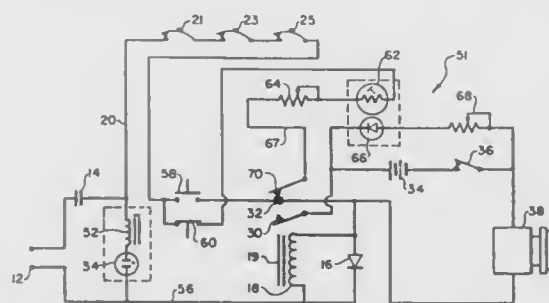
Henry H. Shim, 1124 S. Kingsley Dr., Los Angeles, Calif. 90006

Continuation-in-part of Ser. No. 84,819, Aug. 13, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 253,605

Int. Cl.⁵ G08B 13/14

U.S. Cl. 340—568

2 Claims



1. An anti-theft device for use in a motel room comprising a first circuit and a second circuit, said first circuit having a power input from a power outlet in the room, electrical components in said first circuit for reducing and rectifying the voltage coming from the conventional power outlet to prevent electric shock and to reduce the danger of fire, a coil in said first circuit, said reduced and rectified voltage in said first circuit connected across said coil, a plurality of fragile series connected wires attached to the items in the motel room to be protected from theft, said wires connected to said circuit in such a way that as long as the wires to the coil are not broken, the coil is energized by said voltage and a pair of contacts in said second circuit are kept separated from each other, a battery and a first alarm connected in series with said pair of contacts, so that when the voltage to said coil is cut off said pair of contacts come together to close the contacts actuating the alarm to warn the owner that objects in the motel room are being stolen, and an automatic indicator in the first circuit, said automatic indicator connected to the first circuit in such a way that voltage changes in the second circuit which occur when the battery becomes weakened or drained cause a second alarm to be actuated to warn the operators of the anti-theft equipment that the battery needs to be replaced.

5,089,808

DEVICE GIVING WARNING WHEN UNDESIRE LIFTING POSITION IS ASSUMED

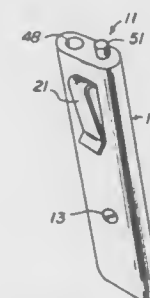
Omar S. Amirdash, Sunnyvale, Calif., assignor to Amsau Company, Inc., Sunnyvale, Calif.

Filed Oct. 26, 1990, Ser. No. 603,511

Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—573

7 Claims



1. A device adapted to be inserted into the shirt pocket of a wearer giving warning when an undesired lifting position is assumed by a worker in the bending of the worker's back in preparing to lift an object, comprising an elongate case having a longitudinal axis and having a top wall, said case being of a size so that it can be placed in the shirt pocket of the wearer, a switch mounted in the case and having operative and inoperative positions and assuming an operative position when the switch is tilted from the vertical beyond a predetermined angle, an alarm carried by the case and electronic circuitry connected to the tilt switch and to the alarm for actuating the alarm when the tilt switch is moved from the vertical beyond said predetermined position, a clip secured to the outside of the case and extending below the top wall, and adapted to be secured to the shirt pocket of the wearer to prevent the device from falling out of the shirt pocket of the wearer while the worker is bending his back and an additional switch mounted in the case and extending through the top wall so that it is readily accessible to the wearer for operation of the same while the device is in the shirt pocket of the wearer, said additional switch being connected into said electronic circuitry for turning said electronic circuitry on and off.

5,089,809

REMOTE INDICATION OF APPLIANCE STATUS

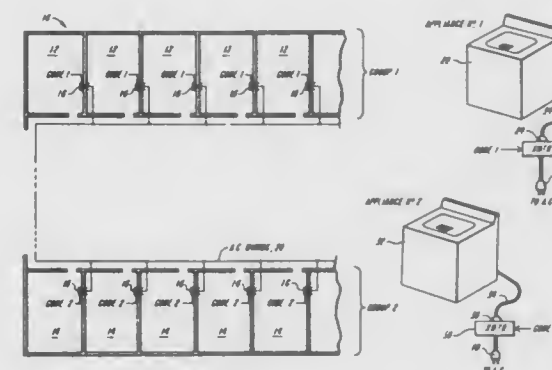
Raymond T. Carmichael, Jr., 30 South Crescent Circuit, Brighton, Mass. 02135

Filed Dec. 7, 1990, Ser. No. 623,356

Int. Cl.⁵ G08B 21/00; D06F 33/00

U.S. Cl. 340—679

11 Claims



1. A modular appliance status system coupled to A. C. wiring of a building, comprising:
means at a predetermined appliance for applying both a

signal indicative of the status of said appliance and a signal code uniquely identifying the appliance to said A.C. wiring; and

a plurality of receiver modules each adapted to be connected to said A. C. wiring at different locations within said building, a selected group of receiver modules having means responsive to both a predetermined signal code associated with said appliance and said status signal for indicating the status of said appliance, whereby groups of receiver modules can be made responsive to different appliances.

5,089,810

STACKED DISPLAY PANEL CONSTRUCTION AND METHOD OF MAKING SAME

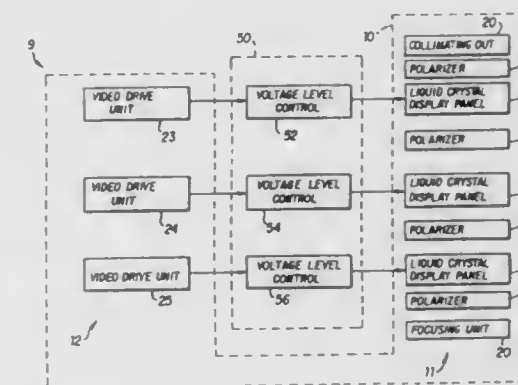
Leonid Shapiro, Lakeside; William K. Bohannon, and Randall Farwell, both of San Diego, all of Calif., assignors to Computer Accessories Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 506,429, Apr. 9, 1990, which is a continuation-in-part of Ser. No. 472,688, Jan. 30, 1990, which is a continuation-in-part of Ser. No. 222,144, Jul. 21, 1988, abandoned. This application Apr. 9, 1990, Ser. No. 506,621

Int. Cl.⁵ G09G 5/02, 3/36, 3/00; G02F 1/1347

U.S. Cl. 340—701

19 Claims



19. A method for displaying color images comprising:
using a plurality of liquid crystal display panels, each one of said panels having a plurality of electrically operable pixel elements for displaying color images;
interposing each one of said panels between a pair of polarizers that cooperate with said panel for passing a portion of the visible light spectrum to form said color images;
using direct current voltage level control means for biasing each of said panels with a direct current reference voltage; biasing each of said panels with a direct current reference voltage level to maximize substantially the luminance of pixels when fully energized;
energizing selectively said pixel elements independently of said direct current voltage level control means;
balancing color contrast between each one of said panels by causing the direct current reference voltage level for each one of said panels to be adjusted by substantially different offset direct current voltage values to substantially optimize the color contrast between each one of said panels.

5,089,811

ADVANCED VIDEO PROCESSOR HAVING A COLOR PALETTE

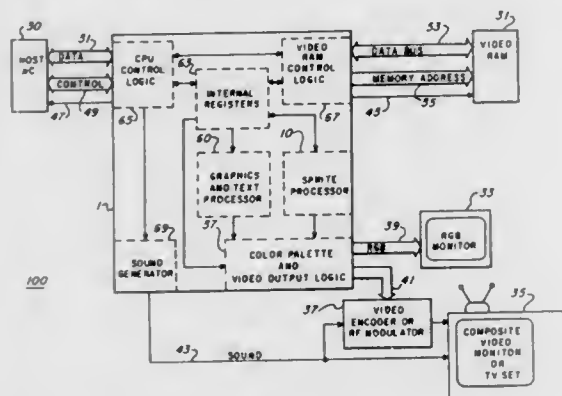
Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 262,176, Oct. 20, 1988, abandoned, which is a continuation of Ser. No. 38,476, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 600,921, Apr. 16, 1984, abandoned. This application Dec. 18, 1989, Ser. No. 455,869

Int. Cl. G09G 1/16

U.S. Cl. 340—703

13 Claims



1. A video display system comprising:
 - a memory for storing display data and a plurality of color codes;
 - a video processor coupled to said memory for reading and writing said display data and said color codes;
 - said video processor including a color palette;
 - said color palette including a plurality of color palette registers wherein the number of colors specifiable by said color codes exceed the number of said color palette registers;
 - said color palette further including logic for reading selected ones of said color codes into selected color palette registers;
 - said video processor further including a sprite processor, said sprite processor operative to control a plurality of sprites;
 - said video processor coupled to a visual display and operative to output signals to said visual display;
 - said signals representative of selected ones of said display data read from said memory and of selected ones of said sprites;
 - said selected ones of said display data each having a predetermined said color palette register associated therewith;
 - said selected ones of said sprites each having a predetermined plurality of said color palette registers associated therewith; and
 - said output signals including color information derived from the contents of said color palette registers associated with said selected ones of said display data and said selected sprites.

5,089,812

LIQUID-CRYSTAL DISPLAY

Takashi Fuse, Akira Hasegawa, both of Tokyo, and Takeshi Matsuoka, Kawasaki, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,614

Claims priority, application Japan, Feb. 26, 1988, 63-43484; May 13, 1988, 63-116359

Int. Cl. G09G 3/00

U.S. Cl. 340—793

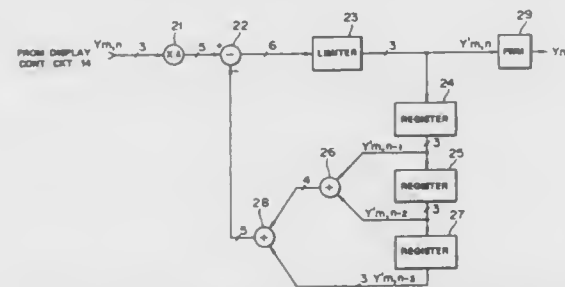
17 Claims

1. A liquid-crystal display comprising:
 - liquid-crystal display means having a plurality of common electrodes and a plurality of segment electrodes intersecting said common electrodes, the display means being

responsive to signals applied to said common and segment electrodes, to display an image comprised of a plurality of pixels;

display control means for generating gradation indicating signals for indicating a display gradation of each of said pixels of said liquid-crystal display means;

common driving means coupled to said common electrodes for simultaneously scanning k common electrodes, where k is an integer of at least 2; and



segment driving means provided for each of said segment electrodes and coupled to a corresponding segment electrode and to said display control means, for multiplying a corresponding gradation indicating signal by k, subtracting the sum of (k-1) signals applied immediately before to said corresponding segment electrode from the gradation indicating signal multiplied by k, to produce a difference signal, and for supplying the difference signal to said segment electrode.

5,089,813

METHOD OF SUPER BATTERY SAVING IN A SELECTIVE CALL RECEIVER

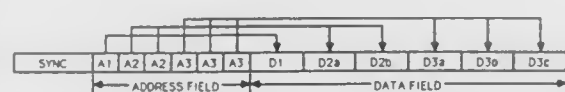
Michael J. DeLuca, Boca Raton; Leon Jasinski, Ft. Lauderdale, and David F. Willard, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 19, 1989, Ser. No. 382,165

Int. Cl. H04B 7/00

U.S. Cl. 340—825.44

12 Claims



1. In a selective call receiver having a predetermined address, a method of receiving a message from within a message signal including an address field having a multiplicity of address signals therein, the message signal further including a data field following the address field and having a multiplicity of packets therein, the position of each packet being related to the position of a corresponding address signal, each packet capable of containing a predetermined amount of information, wherein the message is included within a plurality of packets, and each of the corresponding plurality of address signals are identical address signals corresponding to said predetermined address, said method comprising the steps of:

activating a receiving means in order to receive at least a portion of the multiplicity of address signals in the address field;

deactivating the receiving means if the absence of an address signal corresponding to the predetermined address is found within a predetermined number of address signals, wherein the predetermined number is less than the number of address signals within the address field;

receiving a plurality of address signals corresponding to the predetermined address if the presence of an address signal corresponding to the predetermined address is found within the predetermined number of address signals;

5,089,815

VEHICLE COMMUNICATION SYSTEM USING EXISTING ROADWAY LOOPS

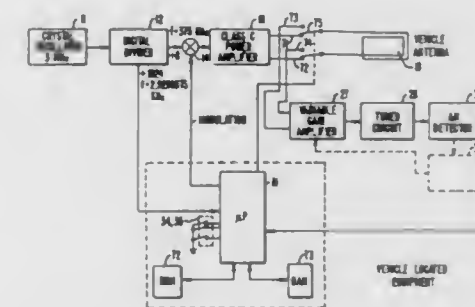
Thomas Potter, Los Alamitos, and Thomas W. Seabury, Diablo, both of Calif., assignors to Detector Systems, Inc., Stanton, Calif.

Continuation of Ser. No. 47,833, May 8, 1987, abandoned. This application Dec. 28, 1989, Ser. No. 462,890

Int. Cl. G08G 1/09

U.S. Cl. 340—905

14 Claims



1. A communication system for enabling transfer of information between a vehicle and a stationary information location having a vehicle detector loop antenna, said loop antenna comprising part of a circuit containing conventional vehicle detector signals normally lying within a given frequency range, said system comprising:

vehicle mounted transmitter means for enabling transmission of a preselected information signal over a relatively small distance range to said stationary information location for sensing by said vehicle detector loop antenna;

vehicle mounted receiver means for receiving another information signal transmitted from said stationary information location via said vehicle detector loop antenna, said receiver means including means for distinguishing said another information signal from the conventional vehicle detector signals present in said vehicle detector loop antenna which lie within said given frequency range, said another information signal being transmitted in a transmitting frequency range different from said given frequency range of said conventional vehicle detector signals; and

vehicle mounted antenna means selectively coupled to said transmitter means and said receiver means for inductive interaction with said vehicle detector loop antenna.

5,089,816

CHART INSTRUMENT FOR DISPLAYING REAL TIME VEHICLE POSITION RELATIVE TO INFORMATION ON CHARTS

Lawrence Holmes, Jr., 414 Prospect St., Midland Park, N.J. 07432

Filed Oct. 16, 1989, Ser. No. 421,972

Int. Cl. G08G 1/123

U.S. Cl. 340—995

23 Claims

1. A navigational instrument capable of displaying its position over a chart, including 2-sided charts, which corresponds to the instantaneous position of the instrument over ground depicted on the chart comprising:

a housing unit having a compartment means for holding a printed chart and a window means through which said chart in said compartment means can be viewed at all times;

a transparent liquid crystal display means incorporated in said window means operable to generate an image in said window means in response to electrical signals;

a light source means associated with said window means having a transparent plate disposed between said liquid crystal display means and said compartment means with a light source positioned to direct light into an edge of said plate so it is operable to illuminate said compartment

receiving a plurality of packets from the data field each having a position related to the position of one of the plurality of address signals corresponding to the predetermined address;

combining the information contained in the received plurality of packets to form the message, the plurality of packets reconstructed in a predetermined manner to recover the message; and

deactivating the receiving means.

5,089,814

AUTOMATIC TIME ZONE ADJUSTMENT OF PORTABLE RECEIVER

Michael J. DeLuca, and Joan S. DeLuca, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

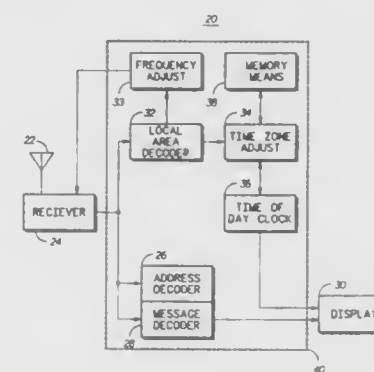
Continuation of Ser. No. 344,887, Apr. 28, 1989, abandoned.

This application Jul. 23, 1990, Ser. No. 554,958

Int. Cl. H04Q 7/00; G08B 5/22; G04C 11/00

U.S. Cl. 340—825.49

16 Claims



1. A portable receiver for receiving radio frequency (RF) signals on at least two frequencies, the portable receiver comprising:

receiving means for receiving the signals, the signals comprising a periodically transmitted location signal, the location signal comprising one of a plurality of geographic identification signals, each of said plurality of geographic identification signals uniquely identifying a geographic location corresponding to a local area RF signalling system transmitting the signals;

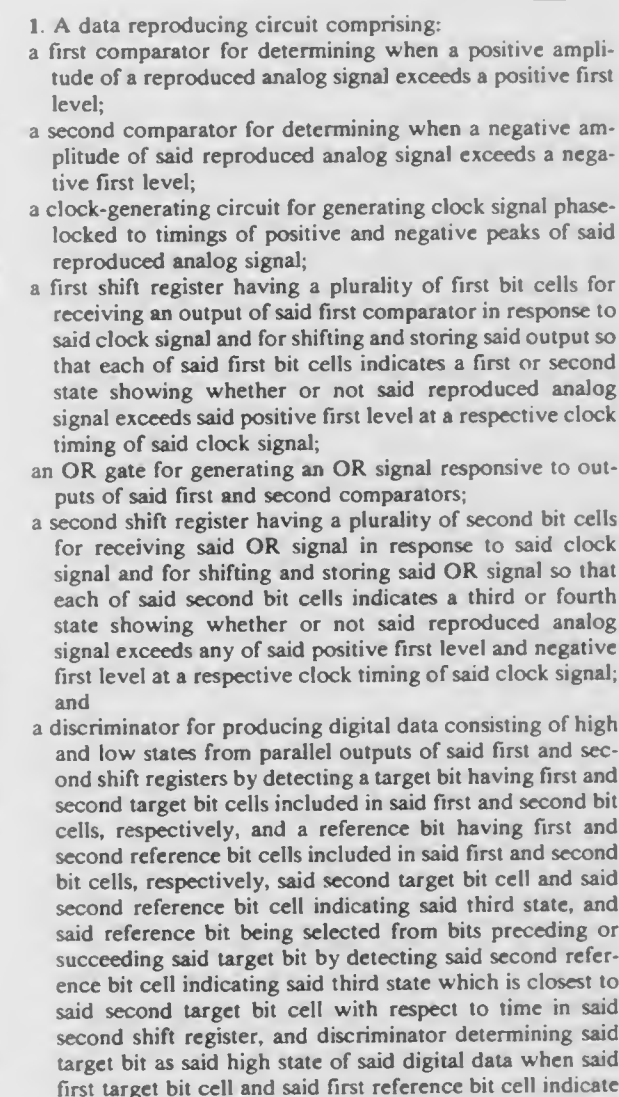
decoding means for decoding the location signal;

memory means for storing at least one predetermined location signal;

frequency adjusting means coupled to said receiving means for selecting a first of said at least two frequencies in response to said decoded location signal not being equivalent to any of said at least one predetermined location signal and for selecting one of said at least two frequencies other than said first of said at least two frequencies in response to said decoded location signal being equivalent to one of said at least one predetermined location signal;

time keeping means for keeping time of day; and

time adjusting means for adjusting said time keeping means to the time of day corresponding to the geographic location of said local area RF signalling system in response to the decoded location signal matching one of said at least one predetermined location signal and for not adjusting said time keeping means to the time of day corresponding to the geographic location of said local area RF signalling system in response to the decoded location signal not matching any of said at least one predetermined location signal.



opposite states, and determining said target bit as said low state when said first target bit cell and said first reference bit cell indicate the same state.

5,089,822

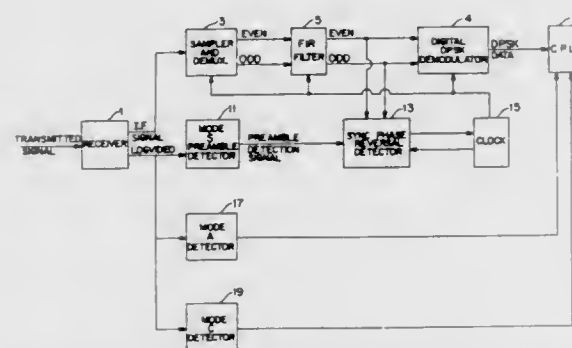
INTERROGATION SIGNAL PROCESSOR FOR AIR TRAFFIC CONTROL COMMUNICATIONS

John T. Abaunza, Goldvein, and Scott A. Merritt, Vienna, both of Va., assignors to Avion Systems, Inc., Leesburg, Va.

Filed Feb. 13, 1990, Ser. No. 479,265
Int. Cl.⁵ G01S 13/76; H04L 5/12

U.S. Cl. 342—30

66 Claims



1. A digital Mode S Interrogation Signal Processor for implementation in either a Mode S transponder or air collision avoidance system, comprising:

Mode S preamble detector means for detecting a Mode S preamble of a transmitted signal and for generating a preamble detection signal;

phase-shift reversal detection means, in response to said preamble detection signal, for detecting a phase shift reversal in the transmitted signal and for generating a Mode S verification signal; and

said phase-shift reversal detection means determining that the transmitted signal is a Mode S signal when generating said Mode S verification signal;

digital differential phase-shift keyed demodulating means, in response to said Mode S verification signal, or digitally demodulating said Mode S signal to obtain useful information for air collision avoidance.

5,089,823

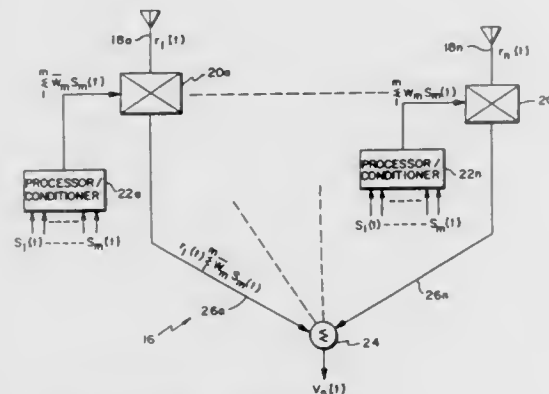
MATRIX ANTENNA ARRAY

Carmine F. Vasile, Medford, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 30, 1990, Ser. No. 620,213
Int. Cl.⁵ G01S 3/16, 3/28

U.S. Cl. 342—383

10 Claims



1. An antenna array comprising:

a plurality of antennas;

a plurality of processor means each working cooperatively with a corresponding one of the antennas, each processor means having as inputs a plurality of control signals, the control signals being effectively weighted by the each processor means;

a plurality of analog multiplier means each multiplying the weighted control signals from a corresponding processor means with signals from a corresponding antenna;

whereby a multiple beam antenna array is effected by combining the multiplied antenna and weighted signals.

5,089,824

ANTENNA APPARATUS AND ATTITUDE CONTROL METHOD

Masahiro Uematsu; Tetsumi Harakawa; Ryuichi Hiratsuka, all of Otemachi; Kenji Ohmaru, Tokyo; Shigeru Yamazaki, Tokyo; Yasuhiro Ito, Tokyo; Isao Nemoto, and Kazuro Kato, both of Yachiyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo; Nemoto Project Industry Co., Chiba and Nippon Hoso Kyokai, Tokyo, all of Japan

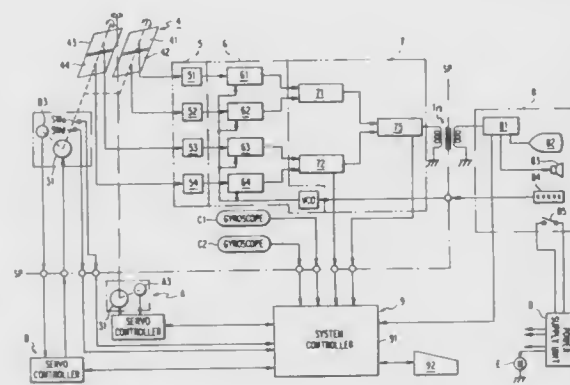
Filed Apr. 11, 1989, Ser. No. 336,991

Claims priority, application Japan, Apr. 12, 1988, 63-90060; Jun. 1, 1988, 63-135265; Jun. 1, 1988, 63-135266; Jun. 22, 1988, 63-154219

Int. Cl.⁵ H01Q 3/00

U.S. Cl. 342—359

14 Claims



1. An antenna apparatus comprising:

first, second and third receiving antennas;

support means for supporting the first, second and third receiving antennas so that the antennas are movable in a first direction and in a second direction that is orthogonal to the first direction while the radiation lobes of the antennas are maintained parallel, and a plane that includes the radiation lobes of the first and second receiving antennas is maintained perpendicular to a plane that includes the radiation lobes of the first and third receiving antennas;

first drive means for driving the first, second and third receiving antennas in the first direction;

second drive means for driving the first, second and third receiving antennas in the second direction;

first phase detection means for detecting a first phase difference signal corresponding to a phase difference between a signal received by the first receiving antenna and a signal received by the second receiving antenna;

second phase detection means for detecting a second phase difference signal corresponding to a phase difference between a signal received by the first receiving antenna and a signal received by the third receiving antenna; and

control means for obtaining the direction of a radio wave source on the basis of the first and second phase difference signals and controlling the respective energization of the first and second drive means.

5,089,825

METHOD OF, AND APPARATUS FOR CONTROLLING AN ANTENNA DEVICE

Katsuo Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Shinsangyokaiatsu, Tokyo, Japan and Aisin Seiki Kabushiki Kaisha, Kariya, Japan

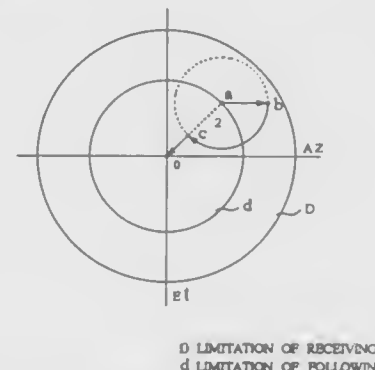
Filed Jan. 10, 1990, Ser. No. 463,173

Claims priority, application Japan, Jan. 10, 1989, 1-002034

Int. Cl.⁵ G01S 5/02, 3/56

U.S. Cl. 342—425

7 Claims



1. A method of controlling an antenna device comprising the steps of:

scanning said antenna device along a conical path and detecting a directional point at which a detected level of reception along the conical path is turned from increasing to decreasing;

scanning said antenna along a straight linear directional path defined by a center point of said conical path and said direction point, and detecting a signal source point at which a detected level of reception along the straight linear directional path is turned from increasing to decreasing; and

setting a directional aiming of said antenna device at said detected signal source point.

5,089,826

NAVIGATION SYSTEM FOR MOVABLE BODY

Haruto Yano; Yoshiaki Hirasa; Toshimichi Tokunaga, all of Hiroshima; Norihiro Naito, Hyogo; Kazuhiro Yokouchi, Hyogo, and Osamu Shimizu, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

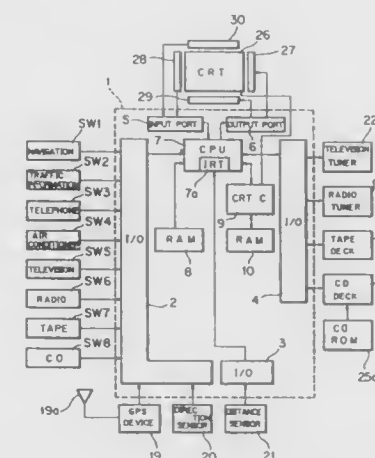
Filed Oct. 22, 1990, Ser. No. 601,122

Claims priority, application Japan, Oct. 24, 1989, 1-277545

Int. Cl.⁵ G01S 3/02

U.S. Cl. 342—457

1 Claim



1. A navigation system for a movable body, comprising map storage means in which map data representative of a map of a

predetermined area are stored, position detecting means for detecting a current position of said movable body with respect to the map, a display unit having a screen, map current position display means for causing a map based on map data read out from said map storage means and a current position mark indicative of a detected position of said movable body from said position detecting means to be displayed on said screen of said display unit, partial map display means for reading out part of the map data from said map storage means and causing said displaying means to display a partial map corresponding to the part of the map data on said screen of said display unit, map scrolling means operable in response to a map scrolling instruction signal arbitrarily transmitted thereto for reading out map data corresponding to a region adjacent to the partial map from said map storage means and causing the adjacent region to be displayed on said screen of said display unit to scroll the map on said screen of said display unit and also for moving said current position mark together with the map on said screen, correction position mark displaying means for causing a correction position mark for the current position mark to be displayed substantially at the center of said screen of said display unit after starting of scrolling movement of the map by operation of said map scrolling means, map returning means operable in response to a returning instruction signal arbitrarily transmitted thereto for returning the map and the current position mark scrolled by said map scrolling means to the respective initial positions on said screen of said display unit at which said movable body is present, and current position mark correcting means operable in response to a correcting instruction signal arbitrarily transmitted thereto for moving the scrolled current position mark to the position of the correction position mark with respect to the map scrolled by said map scrolling means.

5,089,827

RECEIVING ANTENNA FOR A MOTOR VEHICLE

Ernest Pizon, Saint-Cloud, France, assignor to Mecanoplast, Clichy, France

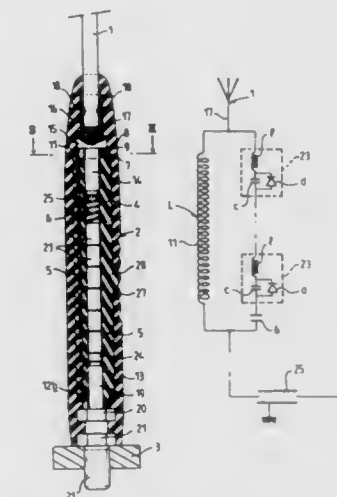
Filed Aug. 13, 1990, Ser. No. 566,042

Claims priority, application France, Aug. 31, 1989, 89 11421

Int. Cl.⁵ H01Q 1/32, 9/32

U.S. Cl. 343—715

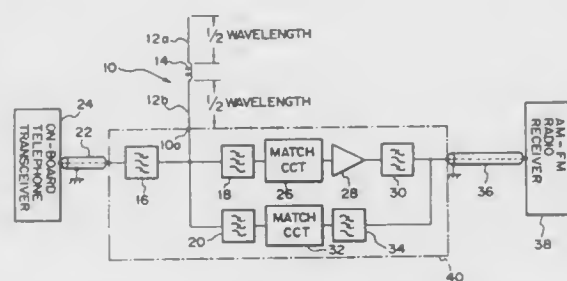
13 Claims



1. A receiving antenna for a motor vehicle comprising: a base adapted to be fixed to the body of the said motor vehicle, mounting means secured to said base, said mounting means having an internal part made of insulating material, means defining a bore in said internal part with said bore extending through said base, said mounting means having an end remote from said base

and another end with an antenna element fitted in said mounting means at said end thereof remote from said base, a first conductor element disposed at said another end and for connection to the core of a coaxial cable, said internal part having an external wall and a wire coiled about said external wall and connected to said external wall, said wire having opposite ends with one end connected to said antenna element and the opposite end connected to said first conductor element, said mounting means and said first conductor element having a cover made of insulating material with said internal part and said wire being nested within said cover, where the improvement comprises said antenna element and said first conductor element being electrically connected by electronic component means disposed in said bore and said electronic component means includes an inductor in series with a capacitor mounted in parallel with a diode, said diode being in the passing mode in the direction from said capacitor to said inductor.

5,089,829
ANTENNA DEVICE SHARED BY THREE KINDS OF WAVES
 Shinichi Haruyama, Takasaki, and Hideaki Asai, Tokyo, both of Japan, assignors to Yokowo Mfg. Co., Ltd., Tokyo, Japan
 Filed Aug. 1, 1990, Ser. No. 561,344
 Claims priority, application Japan, Dec. 22, 1989, 1-333646; Dec. 22, 1989, 1-333647; Feb. 7, 1990, 2-11423[U]
 Int. Cl.⁵ H01Q 1/32
 U.S. Cl. 343—852 6 Claims



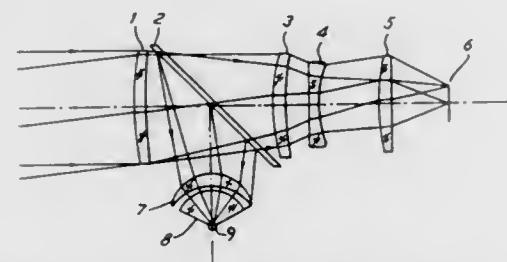
1. An antenna device for allowing an AM-FM radio receiver to receive AM and FM broadcast signals and allowing a vehicle telephone transceiver to transmit and receive a telephone signal, said antenna device comprising:

a single two-stage collinear array antenna comprising fractional-wave dipole antennas which are adapted for the telephone signal and stacked in two stages;
 a first coaxial cable for applying the AM and FM broadcast signals received by said antenna to the AM-FM receiver;
 a second coaxial cable connected between a base end of said antenna and the telephone transceiver for applying the telephone signal received by said antenna to the telephone transceiver and the telephone signal outputted by said telephone transceiver to said antenna, the impedance at said end of said antenna being substantially equal to the impedance of said second coaxial cable in response to the telephone signal;

first impedance matching circuit means connected between said base end of said antenna and said first coaxial cable for selectively matching the impedance at said base end of said antenna to the impedance of said first coaxial cable in response to the AM broadcast signal; and
 second impedance matching circuit means connected between said base end of said antenna and said first coaxial cable for selectively matching said impedance at said base end of said antenna to said impedance of said first coaxial cable in response to the FM broadcast signal;

said first and second impedance matching circuit means feeding respective AM and FM output signals thereof to the AM-FM radio receiver via said first coaxial cable;
 said first impedance matching circuit means comprising:
 a first bandpass filter for selectively passing only the AM broadcast signal therethrough; and
 a first impedance matching circuit connected to an output of the first bandpass filter for selectively matching said impedance at said base end of said antenna to said impedance of said first coaxial cable in response to the AM broadcast signal; and

said second impedance matching circuit means comprising:
 a second bandpass filter for selectively passing only the FM broadcast signal therethrough; and
 a second impedance matching circuit connected to an output of the second bandpass filter for selectively matching said impedance at said base end of said antenna to said impedance of said first coaxial cable in response to the FM broadcast signal.



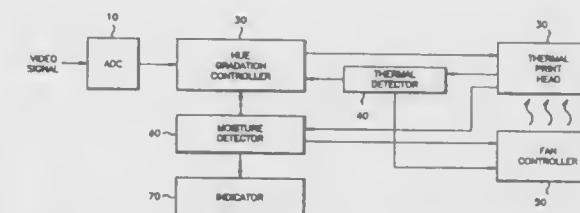
1. Apparatus for simultaneously receiving and sensing electromagnetic radiation in the infra-red and millimetric wavebands, the apparatus comprising:

aperture means for receiving and transmitting therethrough said radiation;
 beamsplitter means for receiving said radiation from the aperture means, for transmitting one of the infra-red component and the millimetric component of said radiation and for deflecting the other component;
 an infra-red radiation focussing sub-system means for receiving said infra-red component from the beamsplitter means and for imaging said infra-red component at a focal plane;
 a millimetric sub-system means for receiving said millimetric component from the beamsplitter means said millimetric sub-system means comprising a dielectric lens means having front and rear surfaces, and an array of integrated antenna/mixer circuits located on said rear surface, said dielectric lens means including an aspheric surface profile on said front surface comprising means for receiving said millimetric component at said front surface and for imaging said millimetric component on said array on said rear surface.

5,089,828
ELECTROMAGNETIC RADIATION RECEIVER
 Graham H. Moss, Stevenage, United Kingdom, assignor to British Aerospace Public Limited Company, London, England
 Filed Jun. 29, 1988, Ser. No. 218,114
 Claims priority, application United Kingdom, Jul. 2, 1987, 8715531

Int. Cl.⁵ H01Q 21/00, 15/02
 U.S. Cl. 343—725 11 Claims

5,089,830
DEVICE FOR CONTROLLING MOISTURE IN A VIDEO COLOR PRINTER AND A METHOD THEREFOR
 Dong-Il Cha, and Guen-Yong Park, both of Kyunggi, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyung, Rep. of Korea
 Filed Jul. 26, 1990, Ser. No. 557,765
 Claims priority, application Rep. of Korea, Sep. 23, 1989, 1989-13722
 Int. Cl.⁵ G01D 9/00; B41J 2/365, 29/377
 U.S. Cl. 346—1.1 9 Claims



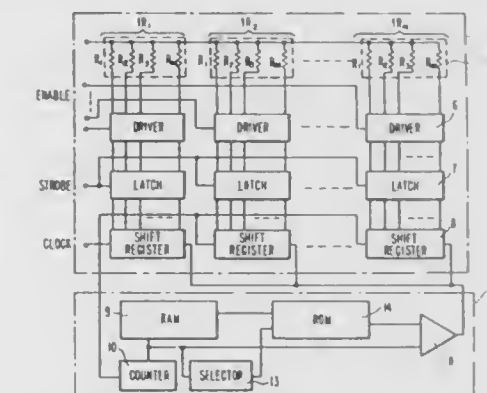
1. A device for controlling hue gradations, temperature and moisture in a video color printer having a fan, said device comprising:

means for controlling said fan;
 a thermal print head for radiating heat in response to a video signal and a moisture sensing signal;
 hue gradation control means coupled to said thermal print head, for controlling said hue gradations of said video signal in response to said video signal, said moisture sensing signal and a heat sensing signal;
 heat sensing means for detecting the temperature of said thermal print head and for providing said heat sensing signal to said hue gradation control means and to said means for controlling said fan in response to said detected temperature; and
 moisture detector means for detecting moisture within said video color printer for providing said moisture sensing signal to said means for controlling said fan to vaporize said moisture and to said hue gradation control means for controlling said hue gradations, for controlling said video color printer to stop printing when said moisture is detected to be greater than a predetermined reference value, and for controlling said thermal print head to generate a preliminary heat to vaporize said moisture.

6. A method for controlling moisture in a video color printer comprising a thermal print head and a fan, said method comprising the steps of:

monitoring temperature of said thermal print head and generating a temperature detection signal;
 monitoring said moisture in said video color printer and generating a moisture detection signal;
 determining if said moisture detection signal is indicative of said moisture exceeding a predetermined reference value; preventing said video color printer from printing if it has been determined that said moisture is greater than said reference value;
 controlling said thermal print head to generate an initial heat to vaporize said moisture when it has been determined that said moisture is greater than said reference value;
 controlling said fan to vaporize said moisture when it has been determined that said moisture is greater than said reference value; and
 driving an indicator to alert a user that said moisture is being controlled in said video color printer.

5,089,831
BLOCK-DIVIDED DRIVING APPARATUS OF GRADATION THERMAL PRINTHEAD
 Taichi Ito, Hirakata, and Masato Tsukuda, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
 Filed May 25, 1990, Ser. No. 529,063
 Claims priority, application Japan, May 26, 1989, 1-133413; Jul. 20, 1989, 1-187886
 Int. Cl.⁵ G01D 15/10, 15/16
 U.S. Cl. 346—76 PH 8 Claims

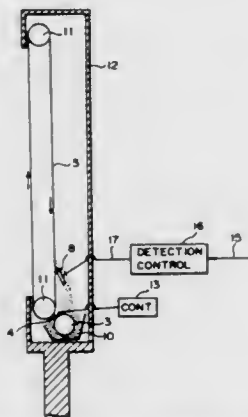


1. In a thermal recording apparatus comprising: a thermal head including a plurality of heating element groups, each of said heating element groups comprising a plurality of heating elements which are driven simultaneously and arranged in a row, said plurality of heating elements including intermediate heating elements and end heating elements located at each end of the row; and a driving unit for producing driving signals indicative of tones reflecting pixel image data to drive said heating elements, said pixels corresponding respectively to said heating elements, said heating elements being driven for a period of time which is varied in accordance with the tones, said driving unit comprises a modification means for modifying the driving signals corresponding to at least one of said heating elements which is disposed at each of both ends of each of said heating element groups, such that a greater amount of heat is generated to the end heating elements and to the intermediate heating elements, and wherein a degree of modifying said period of time by said modification means depends on a level of the tone of said at least one of said heating elements such that the degree of modification in an intermediate tone region is greater than that for a low or a high tone region.

5,089,832
IMAGE FORMING APPARATUS
 Hakaru Muto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
 Filed Jun. 29, 1990, Ser. No. 545,645
 Claims priority, application Japan, Jun. 30, 1989, 1-169408
 Int. Cl.⁵ G01D 15/06; G03G 21/00
 U.S. Cl. 346—160.1 17 Claims

1. An image forming apparatus, comprising:
 recording electrodes electrically isolated from each other;
 recording medium movable relative to said recording electrodes;
 developer supply means for supplying an electrically conductive developer into between said recording electrodes and said recording medium;
 developer removing means contactable to the recording medium to remove the developer from said recording medium;

detecting means for detecting an amount of electricity in said removing means; and

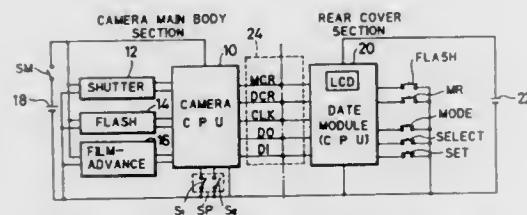


means for controlling a bias voltage applied to said removing means in accordance with an output of said detecting means.

5,089,833 CAMERA

Minoru Takahashi, and Mitsuo Yokota, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 8, 1991, Ser. No. 652,781
Claims priority, application Japan, Feb. 9, 1990, 2-29912
Int. Cl.³ G03B 1/18, 17/24
U.S. Cl. 354—105

7 Claims



1. A camera having a main body section and a rear cover section and first and second microcomputers disposed respectively in the main body and rear cover sections, wherein the microcomputers transmit data and commands to each other, said camera comprising:

- a film rewinding switch disposed in the rear cover section, by means of which a loaded film is rewound;
- means for determining whether said microcomputers can communicate with each other; and
- means for rewinding the film independently of said film rewinding switch when it is determined that said microcomputers cannot communicate with each other.

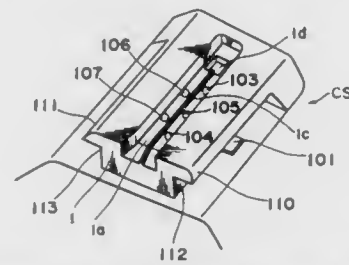
5,089,834 MOUNTING DEVICES FOR REMOVABLY MOUNTING AN ACCESSORY ON A CAMERA

Masayuki Nakasa; Norio Ishikawa; Hiroshi Hosomizu; Tatsuro Izumi; Keiji Yamazaki; Yukio Miki, and Mamoru Katsuragi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 351,177, May 12, 1989, abandoned.
This application Dec. 10, 1990, Ser. No. 625,786
Claims priority, application Japan, May 16, 1988, 63-118623; May 18, 1988, 63-122685; May 18, 1988, 63-122686; May 18, 1988, 63-122687; May 18, 1988, 63-122688; May 18, 1988, 63-122689

Int. Cl.³ G03B 17/05

U.S. Cl. 354—145.1

58 Claims

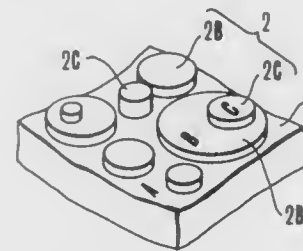


1. A mounting device of a camera for removably mounting an accessory on the camera, comprising a mounting member which fits with an accessory which is slidable onto the mounting member, wherein said mounting member includes first positioning means for determining a vertical position of the accessory relative to the camera; and second positioning means located inside said first positioning means for determining a horizontal position of the accessory relative to the camera, wherein said mounting member is fixed to the camera, and is provided with eaves-like portions which overhang from an upper portion thereof in relative opposite directions which perpendicularly intersect a mounting direction of the accessory, thus having a generally T-shaped cross section, said second positioning means being located in a top face of said eaves-like portions.

5,089,835 PHASE-TYPE DIFFUSING PLATE

Nozomu Kitagishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1990, Ser. No. 482,812
Claims priority, application Japan, Feb. 28, 1989, 1-47966; Jun. 28, 1989, 1-167901
Int. Cl.³ G03B 3/00
U.S. Cl. 354—200

16 Claims



1. A phase-type diffusing plate comprising: three plane portions of different heights in small areas, wherein the plane portion A, the plane portion B and the plane portion C are arranged in the order from the lowest height, and letting the height of said plane portion B relative to said plane portion A be denoted by d_B , the height of said plane portion C relative to said plane portion A be denoted by d_C , and the area ratios of said plane portions A, B and C by S_A , S_B and S_C to the entire area (where $S_A + S_B + S_C = 1$) respectively, the following conditions are satisfied:

tion A by d_C , and the area ratios of said plane portions A, B and C by S_A , S_B and S_C to the entire area (where $S_A + S_B + S_C = 1$) respectively, the following conditions are satisfied:

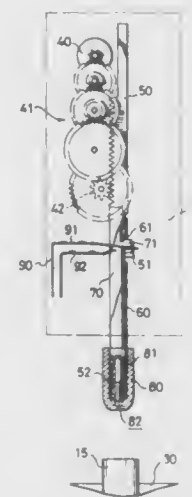
$$1.6 < d_C/d_B < 2.5$$

$$0.35 < S_B < 0.5$$

5,089,836 REMOTE CONTROL SHUTTER DEVICE FOR A CAMERA

Ming J. Chern, No. 10-1, Alley 2, Lane 290, Hsien Cheng Rd., Ling Ya District, Kaohsiung City, Taiwan
Filed Apr. 18, 1991, Ser. No. 687,297
Int. Cl.³ G03B 17/38
U.S. Cl. 354—266

4 Claims



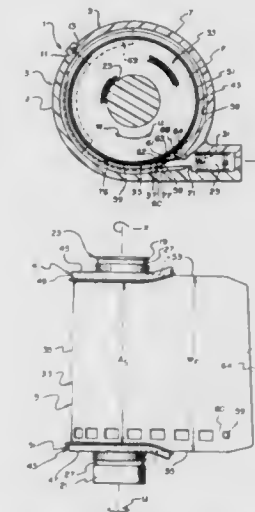
1. A shutter device comprising a housing supported above a camera by a support, a motor and a reduction gearing disposed in said housing, said reduction gearing being engaged with said motor and being driven by said motor, a rack movably disposed in said housing and engaged with said reduction gearing so that said rack can be driven to move up and down by said motor, a lower portion of said rack being extendible downward beyond said housing, a rod integrally formed on said lower portion of said rack and located above a shutter release button of said camera, a lever formed on one side portion of said rack, a first conductor slidably disposed on said lower portion of said rack, a notch formed in an upper portion of said first conductor so that an ear is formed above said notch, a portion of said lever being engaged in said notch, a second conductor fixed on said rack and having a lug extended therefrom, said lug being disposed upon said portion of said lever, a sleeve coupled to a lower end of said first conductor and having a recess formed in a bottom thereof, a lower end of said rod extendible downward beyond said first conductor and extendible into said recess of said sleeve, a spring biased between said rack and said first conductor for biasing said first conductor downward relative to said rack so that said lug of said second conductor is caused to contact with said ear of said first conductor, a switch disposed in said housing and can be actuated by said lever; said sleeve being caused to depress said shutter release button when said rack is driven to move downward by said motor, said first conductor and said sleeve being caused to move upward relative to said rack against said spring when said shutter release button is depressed so that said ear of said first conductor is caused to be separated from said lug of said second conductor, said motor being caused to move in a reverse direction when said ear of said first conductor is separated from said lug of said second conductor so that said rack

can be driven to move upward by said motor, and said motor being stopped when said switch is actuated by said lever.

5,089,837 FILM CASSETTE WITH PROTRUBERANCE ON FILM LEADER TO POSITION LEADER RELATIVE TO STRIPPER

David B. Kemp, Fairport, and Roger G. Covington, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 11, 1991, Ser. No. 691,611
Int. Cl.³ G03B 17/26
U.S. Cl. 354—275

2 Claims



1. An improved film cassette wherein (a) a spool is supported for rotation in an unwinding direction inside a cassette shell, (b) a convoluted film roll whose outermost convolution is a film leader is coiled about said spool, and (c) a film stripper is located substantially adjacent a passageway to the exterior of said shell for receipt between a leading end of said film leader and a next-inward convolution of said film roll responsive to rotation of said spool in the unwinding direction to divert said leading end into said passageway, and wherein the improvement comprises:

spacer means, projecting from an underside of said film leader to lie against an outside of said next-inward convolution of the film roll, for maintaining between said leading end of the film leader and the next-inward convolution a space which is dimensioned to receive said stripper when said spool is rotated in the unwinding direction to generally ensure the stripper will fit between said leading end and the next-inward convolution to divert the leading end into said passageway.

5,089,838 PRESSURE DEVELOPING DEVICE

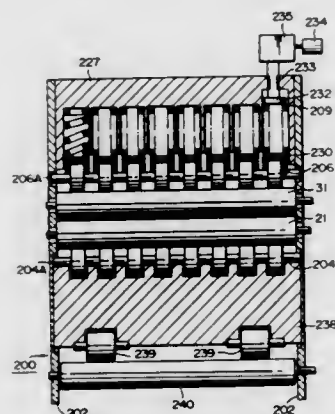
Takemi Yamamoto, Nagoya; Hiroshi Kawahara, Nishikasugai; Yumio Matsumoto, Kasugai; Shigeyuki Hayashi, Nagoya; Kiyoharu Hayakawa, Ama; Osamu Takagi, Nagoya; Yuji Asano, Nagoya; Takao Nakazawa, Nagoya, and Shunichi Higashiyama, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Continuation-in-part of Ser. No. 339,803, Apr. 18, 1989, Pat. No. 4,945,374. This application Apr. 26, 1990, Ser. No. 515,090
Claims priority, application Japan, Apr. 20, 1988, 63-97813; Aug. 9, 1988, 63-199276; Aug. 19, 1988, 63-206876
Int. Cl.³ G03B 27/52; B30B 3/04; G03D 5/02
U.S. Cl. 354—304

11 Claims

1. In combination a pressure developing device for developing an image by pressurizing a recording sheet and a develop-

ing sheet together in an overlapped state, a recording sheet and a developing sheet; said recording sheet being coated with a plurality of microcapsules each containing therein a dye precursor and a component to change the rupture strength thereof when exposed to light, and said developing sheet being coated with a developer material which is reactable with said dye precursor, said developing sheet having a thickness greater than that of said recording sheet, said pressure developing device comprising:

a pair of pressure-developing roller members, adapted to be brought into and out of contact with each other; and



a plurality of back-up roller members adapted to be brought into contact with one of said pressure developing roller members which is contacted with said developing sheet, each of said back-up roller members respectively being arranged to push said one of said pressure developing roller members with an adjustable force so as to generate a pressure force between said pair of pressure-developing roller members only in a direction from said developing sheet toward said recording sheet.

5,089,839

METHOD OF PROCESSING PRE-SENSITIZED LITHOGRAPHIC PRINTING PLATE AND APPARATUS THEREFOR

Miegi Nakano, Chofu; Minoru Seino, Hachioji; Masafumi Uehara, Kokubunji, and Akira Nogami, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

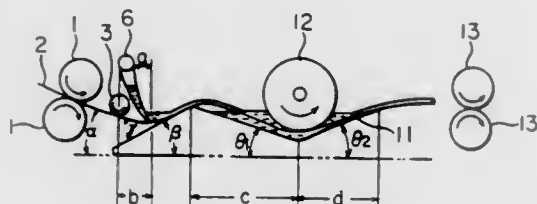
Division of Ser. No. 346,279, May 1, 1989, Pat. No. 4,963,473, which is a division of Ser. No. 53,862, May 26, 1987, abandoned.

This application Aug. 1, 1990, Ser. No. 561,456

Claims priority, application Japan, May 27, 1986, 61-121725
Int. Cl.⁵ G03D 3/08

U.S. Cl. 354—317

9 Claims



1. An apparatus for processing an imagewise exposed pre-sensitized lithographic printing plate comprising:
means for storing a first developer;
means for supplying uniformly said first developer onto a surface of said printing plate in an amount of 50 to 500 ml per square meter of said printing plate, wherein said first

developer has not been substantially used and said supply means contacts said surface of said printing plate;
means for transferring said printing plate bearing said first developer;
means for supplying a second developer onto said surface of said printing plate; and
a developer removing means positioned downstream from said supply means for said second developer.

5,089,840

WATER SUPPLY SYSTEM FOR DEVELOPING APPARATUS

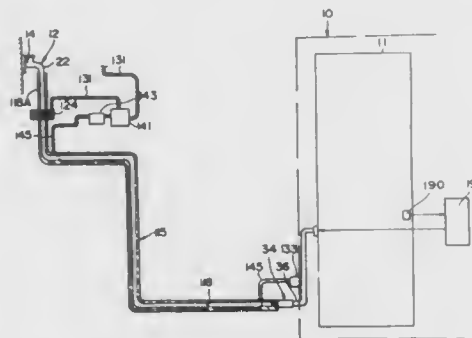
Kiichihiro Sakamoto; Haruo Takase; Kazushige Uenaka, all of Kaisei, and Junya Nakajima, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Inc., Kanagawa, Japan
Continuation-in-part of Ser. No. 318,441, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 37,672, Apr. 13, 1987, abandoned. This application Apr. 24, 1990, Ser. No. 513,138

Claims priority, application Japan, Apr. 11, 1986, 61-083934; Apr. 11, 1986, 61-083935

Int. Cl.⁵ F16K 31/02

U.S. Cl. 354—324

16 Claims



1. A rinsing water supply system for supplying rinsing water to a rinsing unit for rinsing a photosensitive material, and to water mixing means for diluting used contaminated water, said system comprising:

water supply passage means for supplying water from a water source external to said rinsing water supply system to said rinsing unit and to said water mixing means;
solenoid valve means for opening and closing said water supply passage means;

contaminated water draining passage means, disposed between said rinsing unit and said mixing means, for draining said contaminated water in said rinsing unit to said mixing means;

monitoring means for monitoring a level of contamination of said rinsing water independent of an amount of water in said rinsing unit, wherein said monitoring means comprises an electrical resistance meter for monitoring a level of electrical resistance in said rinsing water, and a microcomputer, responsive to an output of said electrical resistance meter, for operating said solenoid valve means; and

electric signal transmitting means embedded in said water supply passage means for transmitting signals from said monitoring means to said solenoid valve means to actuate said solenoid valve means in response to said level of contamination, such that, in response to said level of contamination of the water in said rinsing unit exceeding a predetermined level, said rinsing water is supplied to said rinsing unit, said used contaminated water is drained, and said rinsing water in said rinsing unit and said used contaminated water in said mixing water, respectively, are diluted.

5,089,841

DEVICE FOR AUTOMATICALLY CHANGING MAGNIFICATION OF CAMERA ZOOM LENS

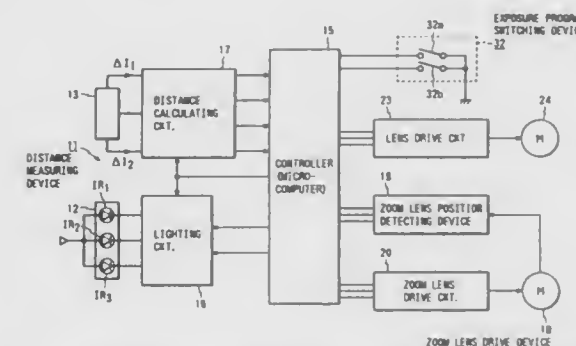
Masatoshi Yamada, Nagano, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan

Filed Sep. 19, 1990, Ser. No. 584,753

Claims priority, application Japan, Oct. 18, 1989, 1-271327
Int. Cl.⁵ G03B 13/36

U.S. Cl. 354—402

22 Claims



1. An apparatus for automatically changing a magnification of a zoom lens of a camera wherein a focal distance of the zoom lens is automatically changed in accordance with a subject of photography, comprising:

exposure program switching means for switching an exposure program between a standard program and a creative program in which a value of an aperture is set greater than that set in said standard program, said exposure program determining said aperture value and a shutter speed in a prescribed relation in accordance with a brightness of external light;

zoom lens drive means for changing the focal distance of the zoom lens;

distance measuring means for measuring a distance of the subject at each of at least three points disposed respectively at a central portion, a right side portion, and a left side portion of the subject within an angle of photographing view; and

a controller for controlling said zoom lens drive means in accordance with an output of said distance measuring means.

said controller consisting of

a first data table in which a plurality of programs for determining the focal distance of the zoom lens in accordance with distance of the subject are set in accordance with a size of the subject within said angle of photographing view, and a second data table in which based on said plurality of programs set in said first data table, focal distances of said programs are set toward a wide-angle side,

focal distance determining and program selecting means for receiving a signal indicative of a switching condition of said exposure program switching means and for selecting said first data table when a selected exposure program is said standard program and for selecting said second data table when said selected exposure program is said creative program,

means for judging which of said measured distances is shortest and for determining the corresponding point and measured distance from the distance of said points measured by said distance measuring means and for judging, in accordance with the focal distance of the zoom lens corresponding to said shorter distance and a depth of field at the corresponding focal distance, whether or not said measured distances of the other points are present within said field of depth and for outputting a judgement signal indicative thereof,

determining means for determining a zoom ratio in accordance with a selected program of said data tables based

on said shorter distance, said size of the subject and said judgement signal, and
output means for driving said zoom lens drive means in accordance with said determined zoom ratio.

5,089,842

FOCUS STATE DETECTING DEVICE

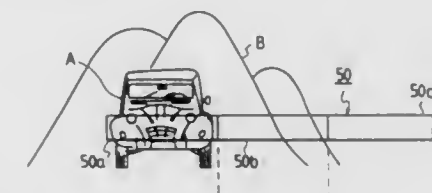
Shigeyuki Uchiyama, Tokyo, and Yosuke Kusaka, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 476,553, Feb. 7, 1990, abandoned. This application Dec. 17, 1990, Ser. No. 627,926

Claims priority, application Japan, Feb. 10, 1989, 1-32282; Jan. 18, 1990, 2-9098

Int. Cl.⁵ G03B 13/36

U.S. Cl. 354—402

12 Claims



1. A focus detecting device comprising:

light receiving means including a pair of arrays of photoelectric converting elements of charge accumulation type for respectively receiving light beams coming from different exit pupils of an objective lens, and generating an output signal in each of plural blocks formed in a distance measuring zone defined in an object field;

level discriminating means for discriminating the level of the output signal of each block from said light receiving means, and detecting a block or blocks in which the level of the output signal is outside a predetermined level range; means for regulating said signal level in such a manner that the output signal of the block or blocks detected by said level discriminating means is brought into said predetermined level range;

means for generating focus information for each block according to the output signal in said predetermined level range; and

means for selecting optimum focus information from the focus information of said plural blocks.

5,089,843

AUTO FOCUS DEVICE WITH PREDICTIVE FOCUSING

Masaki Higashihara, Yokohama; Ichiro Ohnuki, Kawasaki; Akira Akashi, and Terutake Kadohara, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 460,048, Jan. 2, 1990, abandoned. This application Mar. 20, 1991, Ser. No. 671,649

Claims priority, application Japan, Jan. 9, 1989, 1-2222; Jan. 9, 1989, 1-2223

Int. Cl.⁵ G03B 13/36

U.S. Cl. 354—402

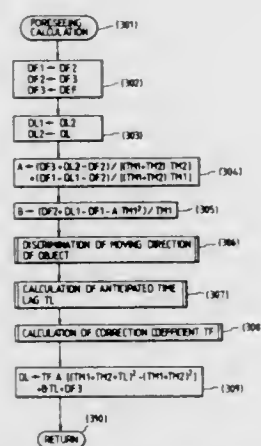
15 Claims

1. An autofocus device, comprising:

(a) a focus detection circuit for repeatedly performing a focus detection operation to an object;

(b) a calculation circuit for calculating an image plane position which is a predetermined distance closer on a near force side than a foreseen image plane for the object after expiration of a predetermined time based on a past focus detection operation, and for determining a lens driving

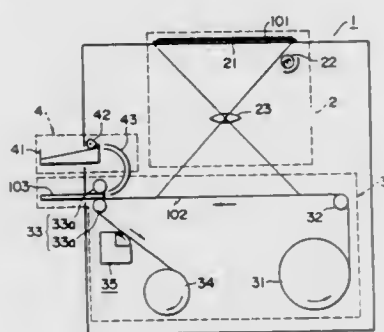
amount corresponding to the calculated image plane position; and



(c) a lens driving circuit for driving a lens by the lens driving amount obtained by said calculation circuit.

5,089,844
IMAGE RECORDING DEVICE
Jun Sakai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 12, 1989, Ser. No. 449,578
Claims priority, application Japan, Dec. 19, 1988, 63-164742[U]; Dec. 29, 1988, 63-164741[U]
Int. Cl.⁵ G03B 27/32
U.S. Cl. 355—27



1. An image recording device, utilizing a recording medium which comprises a pair of sheets, which comprises:
first image forming means for forming a latent image on a predetermined surface of one of said sheets, said one sheet comprising a continuous-form recording sheet arranged to be fed at a predetermined speed, coated with a plurality of photo and pressure sensitive microcapsules each containing at least a dye-precursor and a component to change the rupture strength thereof when exposed to light on said predetermined surface;

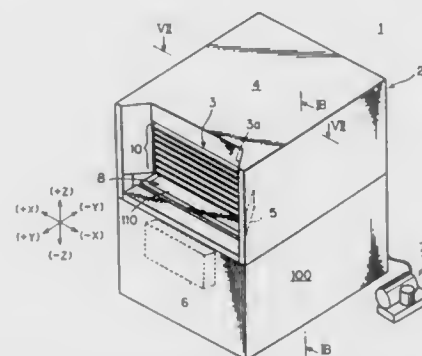
second image forming means for forming a visible image corresponding to the latent image formed by said first image forming means on a predetermined surface of the other of said sheets, said other sheet comprising a cut-form developing sheet coated with a developer material which is reactable with said dye-precursor, on said predetermined surface;

said second image forming means comprises a pair of pressure roller members for pressurizing said pair of sheets in an overlapped state, in which each of said predetermined surface of said respective sheets is close in contact with each other; and,
erase means for erasing any image remaining on said predetermined surface of said one of said sheets after the visible

image is formed on said predetermined surface of said other of said sheets.

5,089,845
PRINTING APPARATUS
Fumihiko Nishida; Makoto Urata, and Hiroyuki Fujisawa, all of Kyoto, Japan, assignors to Dainippon Screen Mfg Co. Ltd., Japan

Filed Jan. 4, 1991, Ser. No. 637,379
Claims priority, application Japan, Jan. 12, 1990, 2-4946; Mar. 30, 1990, 2-34665[U]; Mar. 30, 1990, 2-34666[U]; Mar. 30, 1990, 2-34667[U]; Mar. 30, 1990, 2-87061; Mar. 30, 1990, 2-87062; Mar. 30, 1990, 2-87063
Int. Cl.⁵ G03B 27/04
U.S. Cl. 355—85



19 Claims

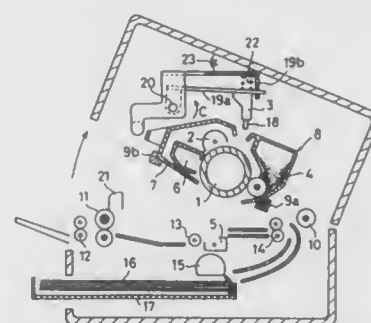
1. A printing apparatus for printing an image provided on an original film onto a photosensitive film, comprising:
a printer including a light source for emitting light and a transparent plate located above said light source;
film storage means, arranged above said transparent plate, having a supply pallet for storing a plurality of films required for printing, said films including an original film and a photosensitive film;
a carrier including vacuum suction means for applying suction to an end of said film and a nozzle for blowing air in a predetermined direction substantially in parallel with a lower surface of said film held by said vacuum suction means;
a carrier moving mechanism for moving said carrier between said transparent plate and said film storage means;
a film pocket mechanism for forming a pocket space on a downstream side with respect to said predetermined air blowing direction; and
a controller for controlling said printer, said carrier and said carrier moving mechanism,
such that said original and said photosensitive film which are stored in said supply pallet are carried onto said transparent plate by said carrier so as to be stacked in this order, and then light from said light source is directed toward said transparent plate, whereby an image provided on said original film is printed onto said photosensitive film.

5,089,846
POSITIONING MEANS FOR A PIVOTALLY MOUNTED ELECTROSTATIC IMAGE FORMING MEANS
Hiroshi Tabuchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 653,321
Claims priority, application Japan, Aug. 13, 1990, 2-214107
Int. Cl.⁵ G03G 15/00
U.S. Cl. 355—200

1. An electrophotographic apparatus which includes a corona discharger for charging a surface of a photosensitive drum uniformly, electrostatic image forming means for exposing said photosensitive drum thus charged to light to form a latent image on said photosensitive drum, and a transfer device

for transferring to record paper a developed image obtained by development of the latent image by means of a developing device, comprising a first holding member on which said electrostatic image forming means is mounted for pivotal motion toward and away from said photosensitive drum, positioning means mounted on said first holding member and having an end adapted to contact with said photosensitive drum to position said electrostatic image forming means with respect to said

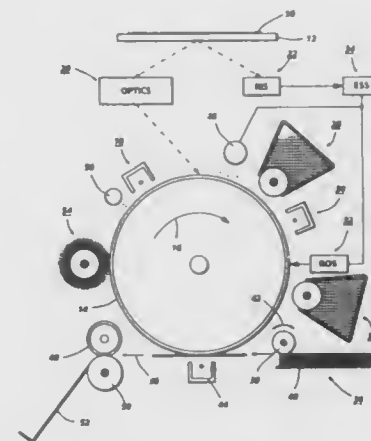


photosensitive drum, and a second holding member provided for pivotal motion on said first holding member by way of a spring, said second holding member urging said first holding member toward said photosensitive drum by way of said spring by means of a cam on the fixed side of an electrophotographic apparatus body when the opening and closing movable side of said electrophotographic apparatus body is in a closed condition.

5,089,847
HIGHLIGHT COLOR COPIER
Jeffrey J. Folkens, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1990, Ser. No. 540,051
Int. Cl.⁵ G03G 15/01
U.S. Cl. 355—202

10 Claims



1. An electrophotographic printing machine for reproducing a color highlighted original document having black indicia and non-black indicia thereon, including:
a movable photoconductive member;
means for charging a portion of said photoconductive member to a substantially uniform level;
optical exposure means comprising:

- a light source for illuminating the original document;
- lens means, positioned to receive the light rays reflected from the original document, for projecting a light image of the original document onto the charged portion of said photoconductive member to record an electrostatic latent image thereon; and
- means for illuminating the portion of the electrostatic latent image corresponding to the non-black indicia of the original document to discharge that portion of the

electrostatic latent image with the remaining portion of the electrostatic latent image forming the optical electrostatic latent image corresponding to the black indicia of the original document;

means for developing the optical electrostatic latent image recorded on said photoconductive member with marking particles;

means for recharging the portion of said photoconductive member to a substantially uniform level after developing the optical electrostatic latent image with marking particles; and

a raster exposure means comprising:

(a) raster input scanner adapted to scan the original document to form a series of raster scan lines as electrical signals;

(b) a controller, in communication with said raster input scanner, for receiving the electrical signals from said raster input scanner and, in response thereto, determining those portions of the original document having black indicia thereon and those portions of the original document having non-black indicia thereon and transmitting a control signal corresponding thereto; and

(c) a raster output scanner, responsive to the control signal from said controller, for illuminating the charged portion of said photoconductive member to record the raster electrostatic latent image thereon corresponding to the non-black regions of the original document.

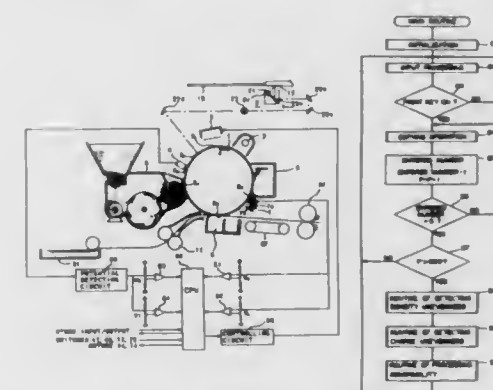
5,089,848
ABNORMAL CHARGE AND TONER DENSITY DETECTING SYSTEM AND METHOD FOR USE IN AN ELECTROSTATIC COPIER

Yasuhiro Kusuda; Masahide Ueda; Takashi Onishi, and Tadafumi Shimizu, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 500,937
Claims priority, application Japan, Mar. 31, 1989, 1-82441
Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—206

23 Claims



1. An image forming apparatus comprising:

a photoconductive member;
charging means for charging said photoconductive member;
latent image forming means for forming an electrostatic latent image on the photoconductive member charged by said charging means;

developing means for developing the formed electrostatic latent image to form a toner image;

first judging means for judging whether or not charge unevenness exists on said photoconductive member in a direction crossing the moving direction of said photoconductive member;

second judging means for judging whether or not density unevenness exists on the toner image in said direction; abnormality detecting means for detecting presence of abnormality of said charging means and said developing

means based on the results of judgments of said first and second judging means; and processing means for performing predetermined processing based on said detected results.

5,089,849

IMAGE FORMING APPARATUS, AND METHOD OF POSITIONING THE UNITS INCORPORATED IN AN IMAGE FORMING APPARATUS

Satoshi Hiraoka, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 397,977, Aug. 24, 1989, abandoned.

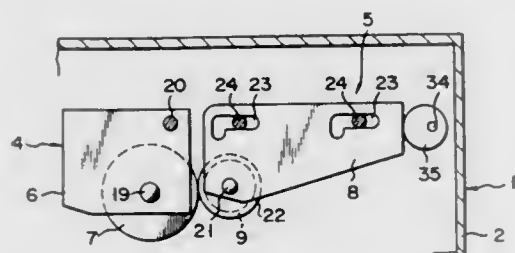
This application Oct. 11, 1990, Ser. No. 596,426

Claims priority, application Japan, Sep. 30, 1988, 63-128361[U]

Int. Cl.⁵ G03G 5/00

U.S. Cl. 355—211

10 Claims



1. An image forming apparatus comprising:
 - a photosensitive member and a first frame having first portions supporting the photosensitive member therebetween, each of said first portions extending in a predetermined direction perpendicular to a longitudinal axis of said photosensitive member;
 - a developer unit including a cylindrical developer sleeve juxtaposed to said photosensitive unit and a second frame having second portions supporting the developer sleeve therebetween, each of the second portions extending in said predetermined directions so that each of said first portions oppose corresponding ones of said second portions in a colinear manner, said photosensitive member and said developer sleeve being independently supported by the first and second frames, respectively, such that the first and second frames are separate and independent of one another;
 - support means for supporting at least one of the first and second frames of said photosensitive direction and in a direction opposite thereto to provide at least one movable frame;
 - biasing means for applying a force to the at least one movable frame directed in said predetermined direction to move said first and second frames toward one another; and
 - positioning means, including first positioning members mounted one on each of the first portions of the first frame of said photosensitive unit along said predetermined direction, and second positioning members mounted one on each of the second portions of the second frame of said developer unit along said predetermined direction, said first positioning members and said second positioning members abutting one another so as to define a gap between the photosensitive member and the developer sleeve.

5,089,850

IMAGE FORMING UNIT WITH A CHARGER WIRE AND OPTICS CLEANING MECHANISM

Mitsuru Ogura, Nara; Takeshi Yoshida, and Shoichi Yoshiura, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 274,679, Nov. 21, 1988, abandoned,

which is a continuation of Ser. No. 49,440, May 14, 1987,

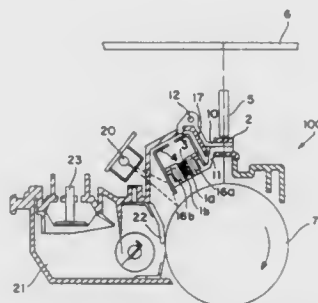
abandoned. This application Dec. 21, 1989, Ser. No. 453,262

Claims priority, application Japan, May 16, 1986, 61-74206[U]

Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—215

1 Claim



1. An image forming unit removably attached to a copier including a photosensitive drum, a toner waste unit, a charging unit including a U-shaped charger case consisting of side walls and a bottom wall and a charging wire, for charging a surface of said photosensitive drum, stretched substantially in a center of said charger case parallel to said side walls and bottom wall, a cleaning unit for simultaneously cleaning said charging wire and a convergent optical system for said copier, said cleaning unit consisting of a first cleaning member for cleaning said charging wire in said charger case, and a second cleaning member for cleaning a surface of said convergent optical system, said first and second cleaning members being commonly supported, and means for jointly moving said first and second cleaning members together in a longitudinal direction of said charging wire and said convergent optical system along a guide plate to simultaneously clean said charging wire and said convergent optical system, said first cleaning member consisting of a pair of cleaner elements for compressing said charging wire therebetween during cleaning, each cleaner element having a lateral projection juxtaposed to said side walls of said charger case, said projections being seated in notches formed in each of said side walls of said charger case such that said cleaner elements are spaced apart from said charging wire during charging of said surface of said photosensitive drum and which are pressured inwardly to become disengaged from said notches during cleaning of said charging wire and said convergent optical system to slide along said side walls and grasp said charging wire therebetween, said image forming unit inclusive of said cleaning unit and waste toner unit being removable concurrently from said copier when said waste unit becomes fully loaded with waste toner.

5,089,851

CHARGING MEMBER

Hisami Tanaka, Yokohama, and Masami Okunuki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1989, Ser. No. 310,281

Claims priority, application Japan, Feb. 19, 1988, 63-036911

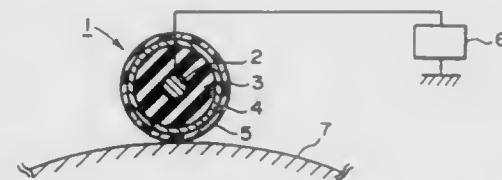
Int. Cl.⁵ G03G 15/02

U.S. Cl. 355—219

36 Claims

1. A charging member having a surface capable of contact

charging a charge-receiving member by surface contact comprising, in sequence:



an electroconductive substrate, an elastic layer, an electroconductive layer electrically connected to said electroconductive substrate and a resistance layer.

5,089,852

NEUTRAL PRESSURE MAGNET ROLL TYPE DEVELOPING UNIT

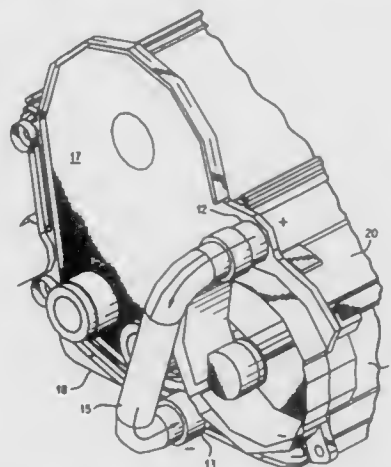
Eugene Manno, Ontario; John A. Wargo, Macedon, and Daniel L. Morris, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1990, Ser. No. 626,848

Int. Cl.⁵ G03G 15/09

U.S. Cl. 355—251

12 Claims



6. A neutral pressure magnet roll developing unit, comprising:
 - a. a substantially enclosed and rigid housing having a pair of side walls, a bottom wall, and a front portion with an opening therein, said housing having an upper half and a lower half;
 - b. a cylindrical tube extending between said side walls and being journaled thereon for rotation with respect to the side walls;
 - c. means for rotating said cylindrical tube;
 - d. a plurality of magnets located within the cylindrical tube;
 - e. a plenum located in the lower half of the housing, said plenum being connected to the remainder of the housing by an orifice in the plenum wall, and
 - f. a pair of orifices on at least one of the side walls of the developer housing, and a pneumatic duct connecting said orifices to one another.

5,089,853

ELECTROPHOTOGRAPHIC PRINTING APPARATUS WITH REPELLENT BANDS ON THE PHOTOCONDUCTIVE MEMBER AND THE DEVELOPING ROLLER TO PREVENT BUILDUP OF TONER THEREBETWEEN

Ryosuke Uematsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

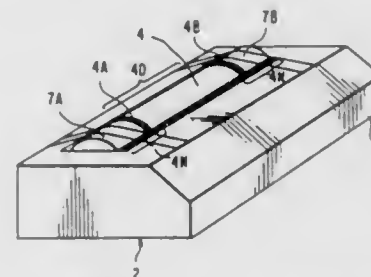
Filed Apr. 30, 1990, Ser. No. 516,586

Claims priority, application Japan, Apr. 28, 1989, 1-109456

Int. Cl.⁵ G03G 15/10

U.S. Cl. 355—256

16 Claims



1. An electrophotographic printing apparatus comprising:
 - a photoconductive member including a surface having an image forming area and a non-image forming area;
 - means for forming an electrostatic image on said image forming area of said photoconductive member;
 - a developer roller for developing said electrostatic image with a liquid developer, said developer roller including a surface facing said surface of said photoconductive member, said surface of said developer roller having a developing area facing said image forming area and a non-developing area facing said non-image forming area;
 - a spacer member for determining a gap between said surface of said photoconductive member and said surface of said developer roller, said spacer member being in contact with both said non-image forming area of said photoconductive member and said non-developing area of said developer roller; and
 - a first repellent member provided on said surface of said developer roller at a position between said developing area and the portion contacting said spacer member in said non-developing area.

5,089,854

APPARATUS FOR SUPPLEMENTING DEVELOPING AGENT INTO IMAGE FORMING MACHINE

Shozo Kaieda, 776-6 Higashiasakawa-cho, Hachioji-City, Tokyo, and Kazuaki Toyota, Center Bldg. 701, 1-8906 Fuchu-cho, Fuchu-city, Tokyo, both of Japan

Filed Feb. 1, 1991, Ser. No. 649,699

Claims priority, application Japan, Feb. 19, 1990, 2-37763

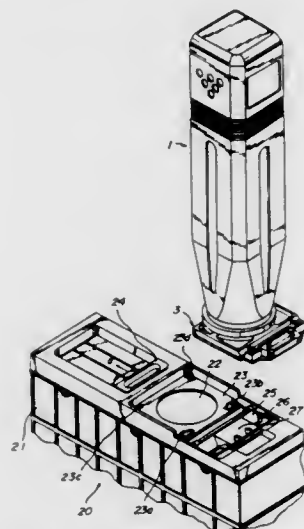
Int. Cl.⁵ G03G 15/08

U.S. Cl. 355—260

11 Claims

1. An apparatus for supplementing a developing agent into a hopper of an image forming machine using the developing agent comprising:
 - a developing agent container including a bottle for containing the developing agent to be supplemented to the image forming machine and having an opening, a shutter member arranged movably between a close position in which said opening of the bottle is closed by the shutter member and an open position in which said opening of the bottle is not closed by the shutter member, and a shutter locking means for locking the shutter member in said close position;
 - a fixing means arranged on said hopper for fixing said developing agent container onto the hopper; and
 - a container locking means arranged on the hopper movably into a locked position in which said fixing means is driven

such that said developing agent container is locked on the hopper and said shutter locking means of the developing agent container is released to allow the movement of said



shutter member of the developing agent container into said open position and an unlocked position in which said fixing means is driven such that said developing agent container can be removed from the hopper.

5,089,855

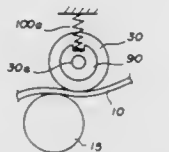
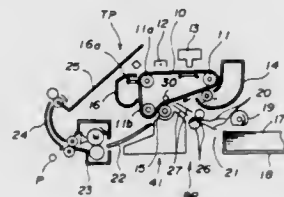
IMAGE FORMING APPARATUS WHICH FORMS IMAGE BY ELECTROPHOTOGRAPHY
Hideaki Mochimaru, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 13, 1991, Ser. No. 714,658
Claims priority, application Japan, Jun. 20, 1990, 2-161547;
Oct. 16, 1990, 2-277115; Apr. 12, 1991, 3-108564

Int. Cl.⁵ G03G 15/14

U.S. Cl. 355—271

14 Claims



1. An image forming apparatus which forms an image on a recording medium by electrophotography during a print operation, said image forming apparatus comprising:

a plurality of support rollers including at least one drive roller;

a photosensitive belt which is fit around said support rollers to form an endless loop, said photosensitive belt having a photosensitive outer surface and an inner surface which is driven by said drive roller so that said photosensitive belt circulates in one direction;

first means for forming an electrostatic image on the outer surface of said photosensitive belt;

second means for developing the electrostatic image on the

outer surface of said photosensitive belt into a toner image;

a transfer roller which is located outside the endless loop of said photosensitive belt, said transfer roller alone making contact with the outer surface of said photosensitive belt for a first angular range and bending the photosensitive belt towards the inner side of the endless loop;

third means for supplying a recording medium between said photosensitive belt and said transfer roller so that said transfer roller transfers the toner image on the outer surface of said photosensitive belt onto the recording medium; and

a receiving roller which is located inside the endless loop of said photosensitive belt, said receiving roller making contact with the inner surface of said photosensitive belt so that said transfer roller makes contact with the outer surface of said photosensitive belt for a second angular range which is greater than the first angular range through cooperation of said transfer roller and said receiving roller.

5,089,856

IMAGE TRANSFER APPARATUS INCORPORATING AN INTERNAL HEATER

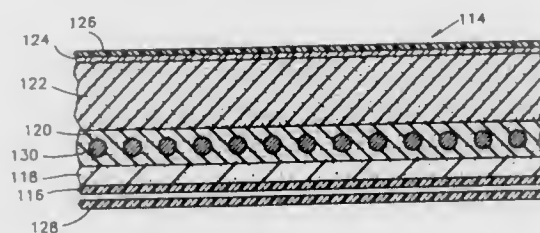
Ben Zion Landa, Edmonton, Canada; Hanna Pinhas, Holon, and Paul Fenster, Petach Tikva, both of Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands

Continuation-in-part of Ser. No. 306,065, Feb. 6, 1989. This application Aug. 14, 1989, Ser. No. 393,631

Int. Cl.⁵ G03G 15/12, 15/14

U.S. Cl. 355—279

22 Claims



I. An imaging system comprising:

an image bearing surface, and an intermediate transfer member having an image transfer surface and being operative for transfer of toner images from said image bearing surface to said image transfer surface and for subsequent transfer to a substrate, said intermediate transfer member also comprising:

a backing layer;

a compressible layer disposed intermediate said image transfer surface and said backing layer; and

a heating layer disposed intermediate said backing layer and said compressible layer.

5,089,857

ELECTROSTATOGRAPHIC APPARATUS HAVING SHEET COOLING AND TURNOVER DEVICES

Jean Xydias, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 15, 1990, Ser. No. 605,811

Int. Cl.⁵ G03G 21/00

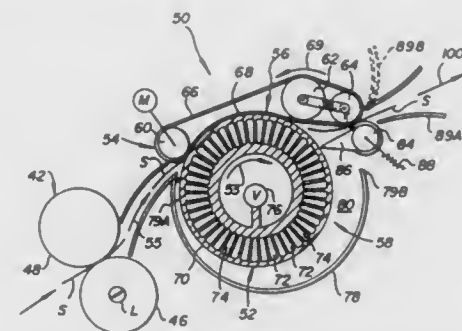
U.S. Cl. 355—318

19 Claims

1. In an electrostatographic apparatus including a heated fusing device, for producing fused toner images on a receiver sheet, a combination mechanism for both cooling and turning over such a sheet, the combination mechanism including:

(a) first means, including a rotatable drum, for transporting such a sheet coming from the heated fusing device;

(b) second means, associated with said rotatable drum, for cooling such a sheet; and



(c) third means, associated with said rotatable drum, for turning over such a sheet to reverse the lead edge thereof.

5,089,858

IMAGE FORMING APPARATUS OPERABLE WITH A TWO-SIDE UNIT

Yukihiro Ohno, Tokyo, and Fumiaki Tsuchiya, Nakatsugawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

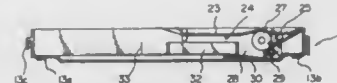
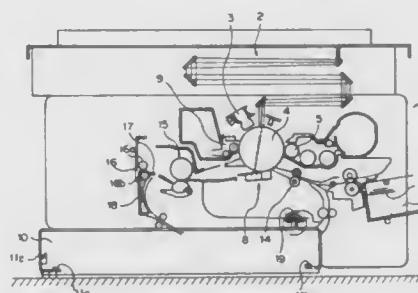
Filed May 23, 1990, Ser. No. 527,285

Claims priority, application Japan, May 25, 1989, 1-130100

Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—319

4 Claims



1. An image forming apparatus comprising:

a two-side unit fittable into said image forming apparatus; an apparatus body incorporating therein at least an image forming section, an image fixing section, a paper transporting section, and a paper discharging section;

an accommodating section provided in a predetermined portion of said apparatus body for selectively accommodating either one of said two-side unit and a paper cassette, said two-side unit including a guide path for guiding a paper sheet from the two-side unit directly to the image forming section, said two-side unit further including a temporary paper stacking space for sequentially stacking sheets to be later fed to said image forming section; and

a path selecting section for selecting either one of a path for guiding a paper sheet coming out of said image fixing section to said paper discharging section, and a path for guiding said paper sheet to the two-side unit which is loaded in said accommodating section;

wherein said image forming apparatus is selectively operable in a two-sided copy mode and a combined copy mode when said two-side unit is loaded in said accommodating section;

wherein said predetermined portion of said apparatus body

where said accommodating section is provided is located in a lower portion of said apparatus body;

wherein said accommodating section comprises a bore open at a side where said apparatus is to be operated, and a guide portion for guiding the two-side unit and the paper cassette;

wherein said accommodating section further comprises detecting means provided in said bore for detecting that one of the two-side unit and the paper cassette has been fully received in said accommodating section; and wherein the two-side unit and the paper cassette have the same external configuration.

5,089,859

MULTICOLOR IMAGE FORMING APPARATUS WHICH CONVERTS COLOR DATA INTO ERASING DATA

Keiji Kusumoto, and Kenzo Nagata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

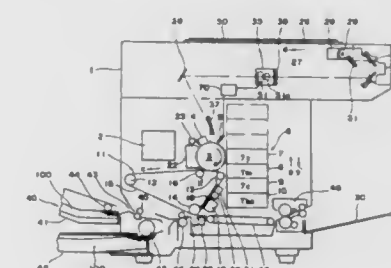
Filed Jul. 14, 1989, Ser. No. 379,828

Claims priority, application Japan, Jul. 16, 1988, 63-177550; Jul. 16, 1988, 63-177551; Jul. 16, 1988, 63-177552; Jul. 16, 1988, 63-177553; Jul. 16, 1988, 63-177554; Jul. 16, 1988, 63-177555; Jul. 16, 1988, 63-177556; Jul. 16, 1988, 63-177557; Feb. 13, 1989, 64-33103; Feb. 13, 1989, 64-33104

Int. Cl.⁵ G03G 15/01

U.S. Cl. 355—327

20 Claims



Reading unit of CCD 0.4 x 0.8 mm/row
Erasing unit of LED 1.2 x 1.2 mm/row

(Reading by) 0.4 mm
(Erasing by) 1.2 mm

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surface of the photoconductive body onto an intermediate image transfer medium;

a conversion means for converting a plurality of color data which is obtained by said image reading means and corresponds to said unit of erasing to one color data to be processed by said erasing means according to a combination of colors included in said plurality of color data;

a control means for driving said erasing means according to said converted color data;

a second transfer means for transferring said toner image on said intermediate image transfer medium to copy paper; and

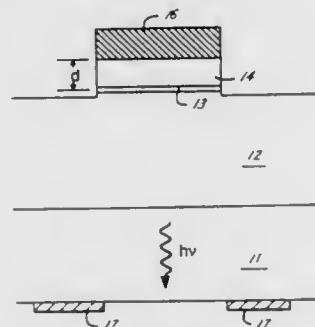
a memory means for memorizing the color data converted by said conversion means and wherein said control means control said erasing means according to said color data read from said memory means.

5,089,860

QUANTUM WELL DEVICE WITH CONTROL OF SPONTANEOUS PHOTON EMISSION, AND METHOD OF MANUFACTURING SAME

Dennis G. Deppe, 6910 Hart La. #304, Austin, Tex. 78731, and Thomas J. Rogers, 711 W. 32nd St. #138, Austin, Tex. 78705
 Filed Jun. 25, 1990, Ser. No. 543,477
 Int. Cl.⁵ H01L 29/161, 29/205, 29/64
 U.S. Cl. 357—16

14 Claims



1. A light-emitting semiconductor device with improved spontaneous photon emission, comprising:

a quantum well capable of emitting light of an optical emission wavelength, a thickness of said quantum well being much less than said optical wavelength; and

a single reflector spaced from said quantum well a distance substantially equal to one-fourth said optical emission wavelength, said reflector having means for causing phase shift of said emission wavelength, to control spontaneous photon emission of said quantum well.

5,089,861

SEMICONDUCTOR LASER DEVICE WITH MOUNTING BLOCK

Haruo Tanaka, Shiga, and Tetsuichi Inoue, Kyoto, both of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan
 Filed Apr. 16, 1991, Ser. No. 686,152
 Claims priority, application Japan, May 9, 1990, 2-120575; May 9, 1990, 2-120576

Int. Cl.⁵ H01L 33/00

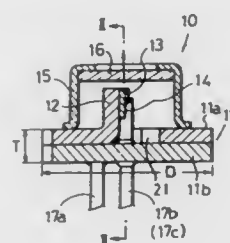
U.S. Cl. 357—17

9 Claims

1. A semiconductor laser device comprising: a metallic stem; a cap mounted to one surface of the stem; a mounting block arranged to project from said one surface of the stem into the cap; and a semiconductor laser chip carried by the mounting block; wherein:

the stem comprises a first stem member located closer to the mounting block, and a second stem member laminated to the first stem member on the side thereof away from the mounting block;

the first stem member being formed with a cutting line partially surrounding a portion of the first stem member;



the mounting block being provided by bending the partially surrounded portion into the cap to leave a corresponding perforation in the first stem member.

5,089,862

MONOCRYSTALLINE THREE-DIMENSIONAL INTEGRATED CIRCUIT

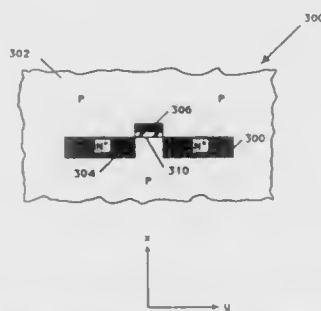
Raymond M. Warner, Jr., 6136 Sherman Cir., Edina, Minn. 55436; Ronald D. Schimpf, 5053 W. Blackbird Dr., Tucson, Ariz. 85741, and Alfons Tuszynski, 12585 Pacato Cir. North, San Diego, Calif. 92128

Continuation-in-part of Ser. No. 861,708, May 12, 1986, Pat. No. 4,885,615, which is a continuation-in-part of Ser. No. 799,652, Nov. 19, 1985, Pat. No. 4,794,443. This application Nov. 30, 1989, Ser. No. 443,175

Int. Cl.⁵ H01L 27/01, 29/68, 29/78, 27/14

U.S. Cl. 357—23.1

49 Claims



1. An electronic memory system comprising a three-dimensional array of memory cells within a monolith, said monolith being substantially monocrystalline and having parts that are substantially lattice-matched, and said array comprising at least one 3-D MOSFET.

5,089,863

FIELD EFFECT TRANSISTOR WITH T-SHAPED GATE ELECTRODE

Shinichi Satoh, Hiroji Ozaki, and Takahisa Eimori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,116

Int. Cl.⁵ H01L 29/10, 23/48, 29/04

U.S. Cl. 357—23.3

6 Claims

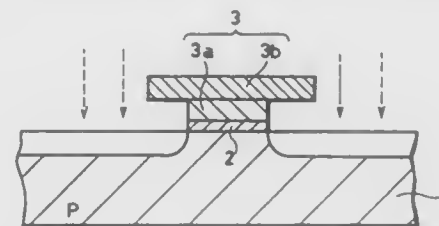
1. A field effect transistor comprising:

a semiconductor substrate having a main surface and a predetermined impurity concentration of a first conductivity type;

impurity layers of a second conductivity type formed spaced apart at the main surface of the semiconductor substrate, said impurity layers constituting source-drain regions, and a region between said impurity layers defining a channel region at said main surface; and

a T-shaped conductive layer formed on said channel region with an insulating film interposed therebetween at said

main surface, said T-shaped conductive layer having an upper layer portion longer than a lower layer portion,



wherein said upper layer portion and said lower layer portion are different materials, the material of said lower layer portion having a higher etching rate than the material of said upper layer portion.

5,089,864

INSULATED GATE TYPE SEMICONDUCTOR DEVICE

Kenya Sakurai, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

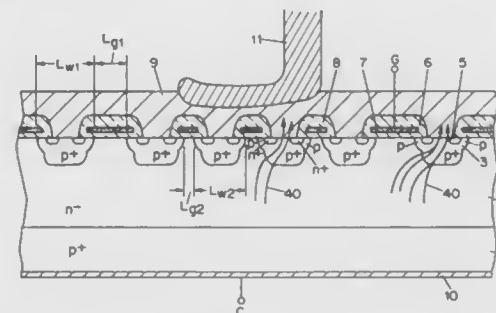
Filed Sep. 10, 1990, Ser. No. 580,644

Claims priority, application Japan, Sep. 8, 1989, 1-233619

Int. Cl.⁵ H01L 29/78

U.S. Cl. 357—23.4

17 Claims



1. An insulated gate type semiconductor device comprising (a) a plurality of spaced semiconductor cells, each such cell including limited regions formed in a surface portion of a base region formed in a surface portion of a semiconductor layer and an insulated gate electrode portion coupled to said base region and said semiconductor layer, (b) a common main electrode coupled to said limited and base regions of said plurality of spaced semiconductor cells, and (c) a conductor connected to said common main electrode so as to tend to produce during operation a higher concentration of current in the vicinity of said conductor connection than in other areas of said common main electrode, wherein the improvement comprises:

semiconductor cells, in a first region in the vicinity of said conductor connection, having base regions of adjacent semiconductor cells spaced by a distance of from 0.2 to 0.4 times the width of the base regions of said cells in said first region; and

semiconductor cells, in a second region further from said conductor connection than said first region, having base regions of adjacent semiconductor cells spaced by a distance of greater than 0.4 times the width of the base regions of said cells in said second region;

whereby breakdown characteristics are improved.

5,089,865

MIS SEMICONDUCTOR DEVICE

Katsuyoshi Mitsui, and Masahide Inuishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

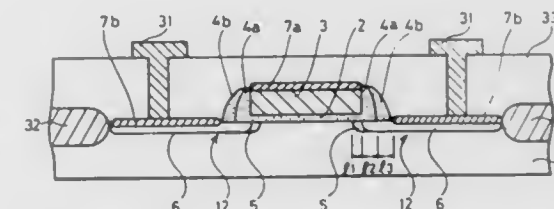
Filed Jan. 3, 1990, Ser. No. 462,536

Claims priority, application Japan, Jan. 7, 1989, 1-1602

Int. Cl.⁵ H01L 29/10, 29/78, 29/04

U.S. Cl. 357—23.4

5 Claims



1. An MIS semiconductor device having a salicide structure and an LDD structure, comprising:

a substrate formed of silicon having a first type impurity;

a gate electrode formed on the main surface of said silicon substrate with a gate insulating film interposed therebetween;

a first impurity region of a second impurity type formed on said silicon substrate and having a relatively low concentration with respect to a second impurity region;

said second impurity region of said second impurity type formed on said silicon substrate and having a relatively high concentration with respect to said first impurity region;

a first aligning means for aligning a lateral end of said second impurity region, said first aligning means including a first sidewall spacer formed on the sidewall of said gate electrode, whereby a lateral extent of said second impurity region is defined;

a silicide layer having first and second regions respectively formed on the surface of said gate electrode and on the surface of said second impurity region;

a second aligning means for cooperating with said first aligning means to align a lateral end of said second region of said silicide layer with respect to a lateral end of said first region of said silicide layer, said second aligning means including a second sidewall spacer on the sidewall of said first sidewall spacer with an interface formed therebetween;

a boundary between said first and second impurity regions located substantially under said first sidewall spacer.

5,089,866

TWO-TRANSISTOR TYPE NON-VOLATILE SEMICONDUCTOR MEMORY

Shoichi Iwasa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 27, 1990, Ser. No. 558,363

Claims priority, application Japan, Jul. 27, 1989, 1-194794

Int. Cl.⁵ H01L 29/78

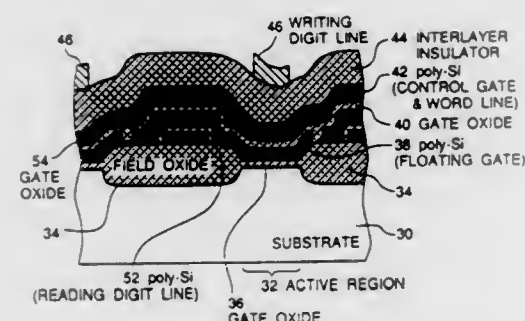
U.S. Cl. 357—23.5

7 Claims

1. A non-volatile semiconductor memory comprising a semiconductor substrate of a first conduction type having an active region defined by a field isolation region formed on a principal surface of the substrate; and a non-volatile memory cell composed of a first transistor for programming and a second transistor for reading,

said first transistor including a source region and a drain region both formed in said active region separately from each other, both of said source region and said drain region being of a second conduction type different from said first conduction type, a floating gate formed through an insulating layer above a portion of said active region

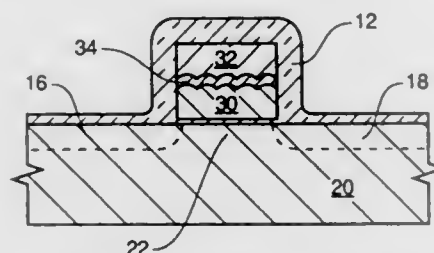
between said source region and said drain region, and a control gate formed through an insulating layer above said floating gate, and said second transistor including a source region and a drain region both formed in a conductive semiconductor layer located in said field isolation region, a floating gate formed through an insulating layer above a portion of said con-



ductive semiconductor layer between said source region and said drain region, and a control gate formed through an insulating layer above said floating gate, said floating gate of said second transistor being formed of an extension of said floating gate of said first transistor, and said control gate of said second transistor being connected commonly to said control gate of said first transistor.

5,089,867
HIGH CONTROL GATE/FLOATING GATE COUPLING FOR EPROMS, E²PROMS, AND FLASH E²PROMS
Ruoqia Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 6, 1991, Ser. No. 696,406
Int. Cl.⁵ H01L 29/68, 29/34
U.S. Cl. 357—23.5 22 Claims

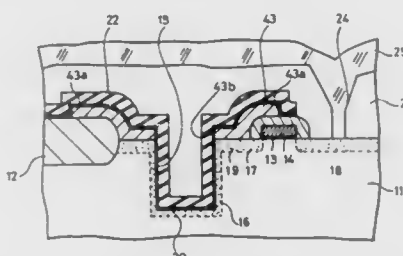


1. A transistor memory cell for an electronic device, comprising:

- a substrate having spaced source and drain regions and a channel region therebetween;
- a first insulating layer disposed on said channel region;
- a floating gate disposed on said first insulating layer, a portion of said floating gate being positioned over said channel region, to form a first capacitor having a first capacitance with said substrate, said floating gate having a surface which is texturized, wherein said texturization of said floating gate surface increases the area of said surface;
- a second insulating layer disposed on said floating gate, wherein said second insulating layer prevents the tunneling of electrons between said floating gate and said control gate; and
- a control gate disposed on said second insulating layer, said control gate forming a second capacitor having a second capacitance with said floating gate.

5,089,868
SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED GROOVE CAPACITOR

Kaoru Motonami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 410,200, Sep. 21, 1989, abandoned. This application Apr. 2, 1991, Ser. No. 680,010
Claims priority, application Japan, May 22, 1989, 1-129252
Int. Cl.⁵ H01L 29/68, 27/02, 29/06, 29/04
U.S. Cl. 357—23.6 16 Claims

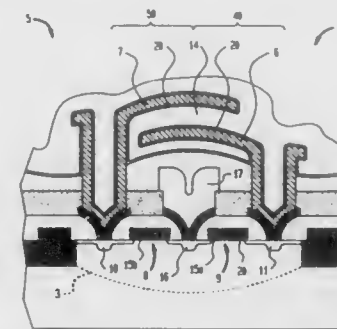


1. A semiconductor memory device for storing information as a function of the presence or absence of electric charges stored in a groove type capacitor, comprising:
a semiconductor substrate having a main surface and a groove formed in the main surface, said groove defined by a sidewall surface and a bottom wall surface,
a transistor including a gate electrode on said semiconductor substrate and a source/drain impurity diffusion layer formed at the main surface of said semiconductor substrate and at opposite sides of said gate electrode,
a first impurity diffusion layer in the sidewall surface and the bottom wall surface of said groove,
a second impurity diffusion layer in the main surface of said semiconductor substrate and electrically connecting said first impurity diffusion layer and said source/drain impurity diffusion layer, and
a conductive member on said semiconductor substrate and in electrical contact with said second impurity diffusion layer,
said conductive member having an opening portion for exposing said groove therethrough,
a wall surface defining the opening portion of said conductive member being coplanar with the side wall surface of said groove, and
a capacitor insulating film on the side wall surface of said groove and on the wall surface defining the opening portion of said conductive member and covering said conductive member, and
a cell plate electrode covering said capacitor insulating film.

5,089,869
SEMICONDUCTOR MEMORY DEVICE
Naoto Matsuo, Osaka; Shozo Okada, Kobe, and Michihiko Inoue, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan
Filed Aug. 7, 1990, Ser. No. 564,087
Claims priority, application Japan, Aug. 8, 1989, 1-203832; Aug. 9, 1989, 1-204858
Int. Cl.⁵ H01L 27/78
U.S. Cl. 357—23.6 4 Claims

1. A semiconductor memory device comprising:
a semiconductor substrate having a plurality of active regions electrically isolated from one another; and
a plurality of memory cells formed on said semiconductor substrate, each of which has a switching transistor formed on the corresponding active region, and a capacitor disposed above said switching transistor, said capacitor having a storage electrode, a cell plate, and a capacitor insulating film interposed therebetween, said storage electrode being connected to said switching transistor, and said cell

plate being common to all the memory cells on said semiconductor substrate;

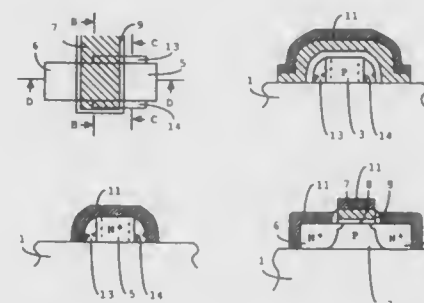


wherein the storage electrodes of at least two adjacent memory cells are partly disposed one above the other with part of said cell plate interposed therebetween.

5,089,870
SOI MOS TRANSISTOR WITH A SUBSTRATE-SOURCE CONNECTION

Michel Haond, Meylan, France, assignor to L'Etat Francais represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications), Issy-les-Moulineaux, France
Filed Jun. 7, 1990, Ser. No. 534,644

Claims priority, application France, Jun. 19, 1989, 89 08428
Int. Cl.⁵ H01L 29/78, 29/04
U.S. Cl. 357—23.7 24 Claims

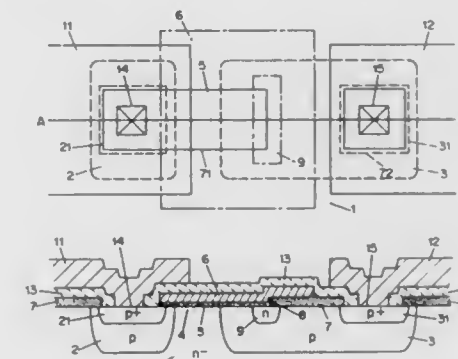


1. An MOS transistor formed in a substantially rectangular insulated portion of a thin monocrystalline silicon layer on an insulator, said transistor comprising a drain region of a first conductivity type coated with a drain conductive layer, a substrate region of a second conductivity type coated with an insulating layer overlaid by a gate conductive layer, the first and second conductivity types differing from each other, a source region of the first conductivity type coated with a source conductive layer, said drain region, substrate region and source region being successively located in a longitudinally extending direction, a pair of highly doped lateral stripes of the second conductivity type extending in said longitudinal direction along opposite parallel edges of both the substrate region and source region, said stripe contacting said substrate and source regions and being contacted by said source conductive layer, the edges of the substrate region and the source region being on the same side of the silicon layer.

5,089,871
INCREASED VOLTAGE MOS SEMICONDUCTOR DEVICE

Tatsuhiko Fujihara, Matsmoto, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Jul. 3, 1990, Ser. No. 547,828
Claims priority, application Japan, Jul. 4, 1989, 1-172740; Mar. 5, 1990, 2-53084
Int. Cl.⁵ H01L 29/10, 29/78, 29/68, 29/40
U.S. Cl. 357—23.8 7 Claims



1. An increased operating voltage metal-oxide semiconductor device comprising:
a source area of a first conductivity type semiconductor material connected to a source electrode;
a drain area, with extended length of a first conductivity type semiconductor material, connected to a drain electrode;
a second conductivity type semiconductor material between said source and drain areas, including a channel forming area within a surface layer of said material;
a gate insulating film, over said channel forming area, which extends over the drain area, said film having a first portion near the channel forming area and a second portion thicker near the drain electrode;
a gate electrode over said gate insulating film and including a portion extended over said second portion of the gate insulating film;
and a relaxation area of a second conductivity type semiconductor material within said drain area immediately below a juncture between said first and second portions of the gate insulating film and not extended laterally beyond said gate electrode;
whereby the relaxation area and the portion of said gate electrode extended over said second portion of the gate insulating film permit a greater operating voltage without breakdown by preventing an excess field concentration from existing in said drain area immediately below a juncture between said first and second portions of the gate insulating film.

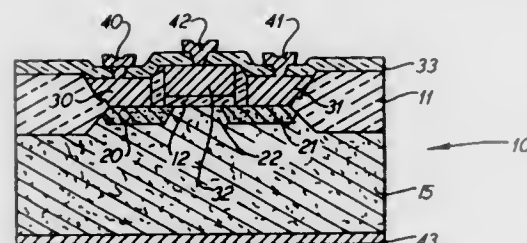
5,089,872
SELECTIVE GERMANIUM DEPOSITION ON SILICON AND RESULTING STRUCTURES

Mehmet Ozturk, Cary; Jimmie Wortman, Chapel Hill, and Douglas Grider, Raleigh, all of N.C., assignors to North Carolina State University

Filed Apr. 27, 1990, Ser. No. 515,589
Int. Cl.⁵ H01L 29/78, 23/48, 29/40, 29/44
U.S. Cl. 357—23.9 4 Claims

1. A metal oxide semiconductor field effect transistor (MOS-FET) characterized by high quality, low resistivity contacts and reduced size including shallow source and drain portions, and that can be manufactured in a low temperature, single chamber, self aligning process while avoiding unnecessary loss of silicon from a silicon containing substrate, said transistor comprising:
a silicon substrate having a first conductivity type;

an oxide layer upon a defined portion of said silicon substrate and that forms a gate oxide bordered on its sides by a silicon surface of said substrate;
a gate contact upon said gate oxide that together with said gate oxide defines an active region of a gate channel in said substrate;
respective source and drain portions in said substrate and having the opposite conductivity type from said substrate and forming respective p-n junctions with said substrate



that are defined by said borders of said gate oxide with said silicon surface so that each said p-n junction is positioned directly beneath one of said borders of said gate oxide portion with said silicon surface and wherein said source and drain portions are respectively adjacent said bordered sides of said gate oxide; and
ohmic contacts on said source and said drain selected from the group consisting of: germanium or a refractory metal germanide.

5,089,873

INTEGRATED CIRCUIT HAVING A VERTICAL TRANSISTOR

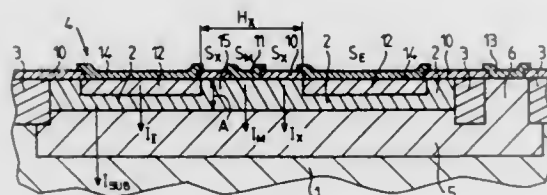
Pierre Leduc, Colleville-Montgomery, France, assignor to U.S. Philips Corp., New York, N.Y.
PCT No. PCT/NL89/00098, § 371 Date Sep. 24, 1990, § 102(e) Date Sep. 24, 1990, PCT Pub. No. WO90/07194, PCT Pub. Date Jun. 28, 1990

PCT Filed Dec. 18, 1989, Ser. No. 474,832

Claims priority, application France, Dec. 16, 1988, 88 16641
Int. Cl.³ H01L 29/06, 29/72, 27/02

U.S. Cl. 357—35

5 Claims



1. A semiconductor device comprising a semiconductor body including an integrated circuit having a vertical transistor comprising a collector region of a first conductivity type, a base region of a second conductivity type disposed on at least a part of the collector region, and an emitter region comprising at least one zone of the first conductivity type included in a part of the base region adjoining a major surface of the semiconductor body, in which the overall thickness of the base region is smaller than or equal to the diffusion length of minority charge carriers in this region, and the base region comprises at least one base contacting zone having at least one contact area adjacent to the at least one zone of the first conductivity type of the emitter region, and an isolating layer covering the base contacting zone having a window through the isolating layer, and a base contact extending through the window to the contact area, the ratio between the surface area of the base contacting zone and the surface area of the window being at least equal to 10, and in which the base contacting zone has a

surface area smaller than 5 times the total surface area of the emitter region.

5,089,874

SEMICONDUCTOR DEVICE WITH INFRARED MAPPING MARKERS

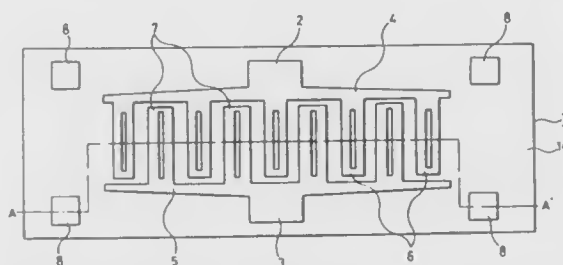
Kazuhide Deguchi, and Teruhisa Ohkawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Continuation of Ser. No. 448,503, Dec. 11, 1989, abandoned.

This application Sep. 10, 1990, Ser. No. 581,124

Claims priority, application Japan, Mar. 8, 1989, 1-56607
Int. Cl.³ H01L 27/02, 23/28, 23/42

U.S. Cl. 357—40

2 Claims



1. A semiconductor device comprising:
a semiconductor chip having a surface of a semiconductor material partially occupied by at least one semiconductor device, the semiconductor material emitting a first quantity of infrared radiation at a predetermined temperature; and
infrared mapping markers disposed at respective locations on portions of the surface not occupied by a semiconductor device for thermally identifying the respective locations on the surface, said markers comprising a material selected from the group consisting of polyimide and carbon and emitting a second quantity of infrared radiation, different from the first quantity of infrared radiation, at the predetermined temperature.

5,089,875

SEMICONDUCTOR DEVICE WITH MIS CAPACITOR

Takeshi Koyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

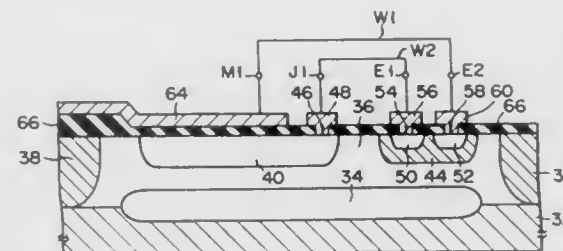
Continuation of Ser. No. 486,358, Feb. 28, 1990, abandoned.

This application Apr. 23, 1991, Ser. No. 689,668

Claims priority, application Japan, Feb. 28, 1989, 1-47221
Int. Cl.³ H01L 27/02, 29/90, 29/92

U.S. Cl. 357—51

8 Claims



1. A semiconductor device comprising:
a semiconductor substrate a first conductivity type;
a diffusion layer of the first conductivity type formed in said semiconductor substrate;
a well region of a second conductivity type formed in said semiconductor substrate;
first and second regions of the first conductivity type formed in said well region;

an insulating film formed on at least a portion of said diffusion layer;
connecting means for connecting said diffusion layer and said first region; and
an electrode connected to said second region and superposed on said diffusion layer with said insulating film disposed therebetween, said electrode, said insulating film, and said diffusion layer comprising an MIS capacitor.

5,089,876

SEMICONDUCTOR IC DEVICE CONTAINING A CONDUCTIVE PLATE

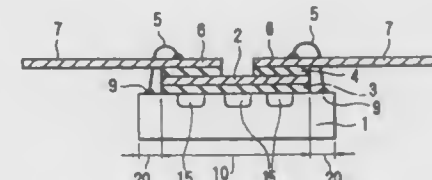
Hiroshi Ishloka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 554,652

Claims priority, application Japan, Jul. 19, 1989, 1-186600
Int. Cl.³ H01L 23/48, 29/44, 29/52, 29/60

U.S. Cl. 357—70

7 Claims



1. A lead-on chip type semiconductor IC device comprising:
a semiconductor pellet having a major surface on a first region of which is formed a plurality of active elements;
a plurality of electrodes formed on a second region of said major surface of said semiconductor pellet, said second region excluding said first region on which said active elements are formed;
a first insulating film formed on the entire said first region of said major surface on which said active elements are formed;
a conductive plate disposed on said first insulating film;
a second insulating film selectively arranged on predetermined regions of said conductive plate;
a lead frame including both a plurality of connecting terminals on said second insulating film, and also a plurality of leads laterally and independently extending from said connecting terminals, respectively; said conductive plate being the only conductive plate located between said semiconductor pellet and each of said connecting terminals; and
a plurality of conductive wires connecting said electrodes to said connecting terminals, respectively;
whereby vertical electric fields generated in said connecting terminals are blocked by said conductive plate from entering said active elements.

5,089,877

ZERO POWER IC MODULE

Daniel Queyssac, Dallas; Richard K. Robinson, Weston, and Kimi S. Husse, Keller, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 6, 1990, Ser. No. 534,151

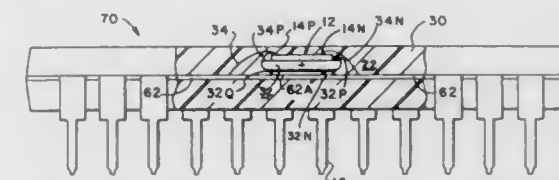
Int. Cl.³ H01L 23/48, 23/02; H05K 5/00, 5/06

U.S. Cl. 357—70

10 Claims

1. A device package for providing electrical power to an electronic circuit device comprising, in combination:
a body of non-conductive material;
a finger lead assembly encapsulated within said body of non-conductive material, said finger lead assembly including a plurality of conductive finger leads, with one of said finger leads defining a power lead;
a battery having a positive polarity power terminal and a negative polarity power terminal, one of said battery power terminals being mounted onto said power lead; wherein said power lead is offset in non-coplanar relation to

said finger lead assembly, and wherein said battery is mounted on said offset power lead; and,



an electronic circuit device encapsulated within said body of non-conductive material and mounted onto said other battery power terminal.

5,089,878

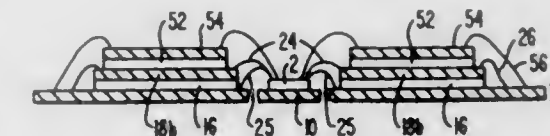
LOW IMPEDANCE PACKAGING

Jaesup N. Lee, 973 Campbell Ave., Los Altos, Calif. 94022
Filed Jun. 9, 1989, Ser. No. 364,370

Int. Cl.³ H01L 23/30, 23/48

U.S. Cl. 357—71

9 Claims



1. A low impedance integrated circuit package comprising:
a) a lead frame, said lead frame comprising a die paddle and a plurality of leads, said die paddle and said plurality of leads lying in substantially a common plane;
b) a first dielectric region above a first lead, wherein said first lead is chosen from said plurality of leads;
c) a first conductive region above said first dielectric region;
d) an electrical connection between a first end of said first lead and said first conductive region;
e) an electrical connection between a second end of said first lead and said first conductive region;
f) a second dielectric region above a second lead, wherein said second lead is chosen from said plurality of leads;
g) a second conductive region above said second dielectric region;
h) an electrical connection between a first end of said second lead and said second conductive region;
i) an electrical connection between a second end of said second lead and said second conductive region; and
j) a decoupling capacitor connected between said first conductive region and said second conductive region.

5,089,879

RESIN SEAL TYPE SEMICONDUCTOR DEVICE

Kazuichi Komenaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1991, Ser. No. 667,335

Claims priority, application Japan, Mar. 13, 1990, 2-62037
Int. Cl.³ H01L 23/28

U.S. Cl. 357—72

4 Claims

1. A resin seal type semiconductor device comprising:
a lead frame having a die support on the central portion of the lead frame and a plurality of leads arranged on the outer side of the die support;
a semiconductor chip mounted on the die support and having a plurality of pads connected to the leads;

6. A remote viewing system, comprising:
 - a) a television broadcasting device for providing a television signal for transmission to viewer remote receiving locations over a single common channel;
 - b) a control station including:
 - a) a device for providing video program material signals to said television broadcasting means;
 - b) at least one selectable source of video program materials;
 - c) a selection device for generating a video program selection signal from a viewer remote receiving location with such selection being made through a telephone system keypad; and
 - d) a first programmed data processor coupled to said at least one selectable source of video program materials and said device for providing video program signals to said television broadcasting device, said first programmed data processor being responsive to a video program selection signal transmitted from a remote location for providing control signals to said at least one selectable source of video program materials in accordance with the desired

video program material selected by a viewer such that the selected video program material is coupled by said device for providing video program signals to said television broadcasting device for transmission over the single common channel to all of the viewer remote receiving locations viewing the single common channel irrespective of whether the viewers at such locations have selected any video program material so that a viewer at a remote receiving location may tune a television receiver at that location to the single common channel in order to sequentially view all of the selected video program materials transmitted by said television broadcasting device over the single common channel; and

a remotely located monitoring and controlling device, including a second programmed data processor, for coupling to said first programmed data processor for two-way communication between said first and second programmed data processors for monitoring and controlling the operation of said control station by providing instructions for operating said control station directly to said first programmed data processor.

5,089,886

DEVICE FOR THE REMOTE TRANSMISSION OF SIGNALS AND IN PARTICULAR VIDEO SIGNALS

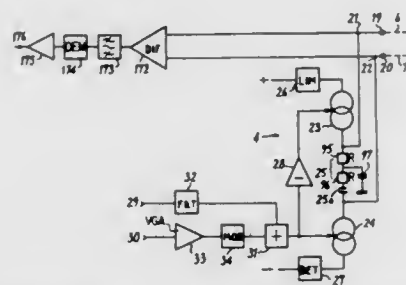
Gérard Grandmougin, Strasbourg, France, assignor to Visicable, Paris, France

Continuation of Ser. No. 243,029, filed as PCT/FR88/00046, Jan. 27, 1988, abandoned. This application May 24, 1990, Ser. No. 527,720

Claims priority, application France, Feb. 4, 1987, 87 01338 Int. Cl.⁵ H04N 7/10

U.S. Cl. 358—86

18 Claims



1. A transmission device for signals, comprising:
 - a at least one transmitter assembly including first and second current generators mounted in series with a matching impedance;
 - a at least one receiver assembly including a diode bridge;
 - a twin-wire line;
 - a symmetrical transformer having a magnetic core mounted on each end of said line connecting said line to said receiver assembly and to said transmitter assembly, the windings of said transformer made from twin-wire cable; said first generator being driven by one of said signals to be transmitted and delivering a current symmetrically into one wire of said line;
 - said second generator being driven by the inverse of said one of said signals to be transmitted and delivering a current symmetrically into the other wire of said line;
 - wherein said line is balanced at each end by an impedance of a value equal to the characteristic impedance of said line, and said matching impedance is of a value equal to the characteristic impedance of said line, and said signals are in a frequency range of 50 Hz to 30 MHz.

5,089,887

METHOD AND DEVICE FOR THE ESTIMATION OF MOTION IN A SEQUENCE OF MOVING IMAGES

Philippe Robert, Patrick Pineau, and Pascal Basset, all of Rennes, France, assignors to Thomson Consumer Electronics, Conrbevoie, France

PCT No. PCT/FR89/00482, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO90/03619, PCT Pub. Date Apr. 5, 1990

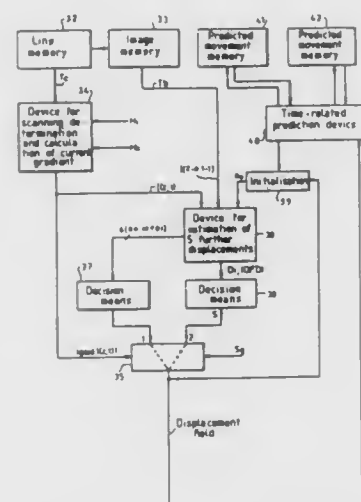
PCT Filed Sep. 22, 1989, Ser. No. 487,956

Claims priority, application France, Sep. 23, 1988, 88 12468; Jun. 9, 1989, 89 07673

Int. Cl.⁵ H04N 7/01

U.S. Cl. 358—105

38 Claims



1. A method for estimating motion in a sequence of television picture frames of moving images wherein each frame of the image is formed by a determined number of luminous points located at intersections of lines and columns, the method comprising the steps of:
 - estimating motion by execution of a gradient algorithm which minimizes a mean square deviation of local variations of luminance of a current frame of the image with respect to a homologous point homologous with the current point in a preceding frame of the image;
 - initializing the algorithm by vectors of displacements estimated in several directions within the close casual vicinity of the current point, and an initial temporal prediction vector defined for each current point of each current frame of the image by the displacement vector of the homologous point in the preceding frame for which a point of projection in a direction of a displacement vector thereof in the current frame is closest to the current point, and
 - propagating each estimation in a direction of scanning of the lines of each frame of the image.

5,089,888

MOVING-IMAGE SIGNAL ENCODING APPARATUS WITH VARIABLY SELECTED QUANTIZATION STEP SIZE

Joel W. Zdepiski, Hunterdon; Kuriacose Joseph, Middlesex, both of N.J.; Masahiro Wakamori, and Takeshi Yukitake, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 14, 1990, Ser. No. 628,697

Claims priority, application Japan, Dec. 20, 1989, 1-330622 Int. Cl.⁵ H04N 7/12

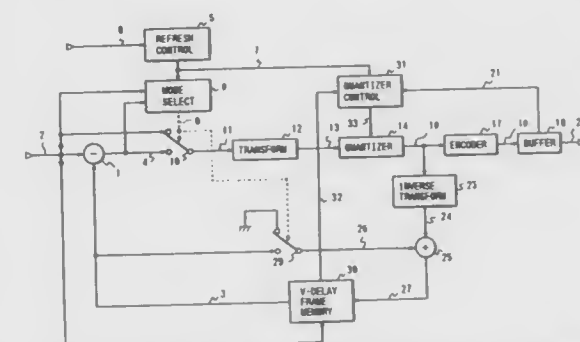
U.S. Cl. 358—133

3 Claims

1. A moving-image signal encoding apparatus comprising:
 - a transmission buffer memory;

means for determining a first quantization step size for a normal block other than a refreshed block on the basis of an occupied capacity of the buffer memory;

means for determining a second quantization step size for the refreshed block on the basis of the first quantization step size;



means for generating a refreshment instruction signal; and

means for selecting one of the first quantization step size and the second quantization step size in response to the refreshment instruction signal.

5,089,889

APPARATUS FOR INTER-FRAME PREDICTIVE ENCODING OF VIDEO SIGNAL

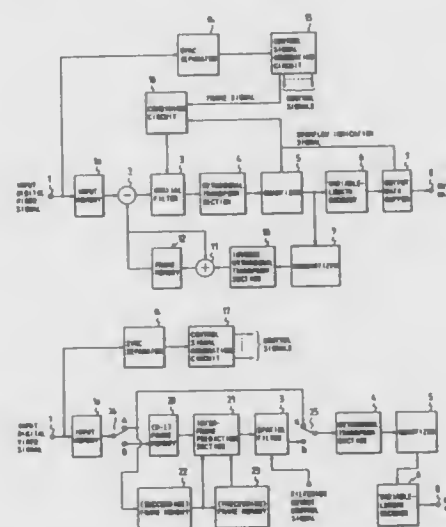
Kenji Sugiyama, Noda, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Apr. 27, 1990, Ser. No. 513,507

Claims priority, application Japan, Apr. 28, 1989, 1-111301 Int. Cl.⁵ H04N 7/13

U.S. Cl. 358—135

7 Claims



1. In an inter-frame predictive encoding apparatus for receiving a video signal formed of successive frames of pixel data, to derive, for each of said frames, a prediction error signal based on differences between pixel data of the frame and pixel data of at least one other frame, the improvement comprising:
 - spatial filter means for filtering said prediction error signal to alter a frequency characteristic thereof;
 - filter control means responsive to a filter degree control signal for varying a degree of said filtering, and
 - means for periodically varying said filter degree control signal with a period which is an integral number of frame intervals, for alternately establishing a first condition in which substantially no filtering is executed by said spatial

filter means and a second condition in which a fixed degree of filtering is executed by said spatial filter means.

5,089,890

GAMMA CORRECTION DEVICE

Tsutomu Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

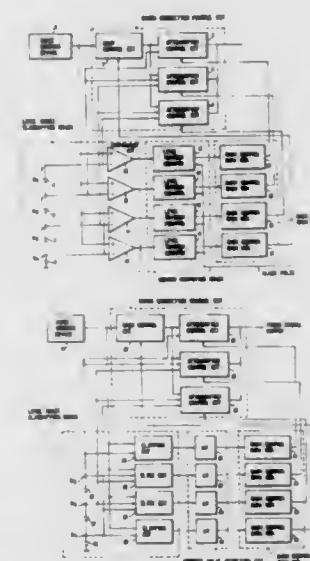
Filed Jan. 24, 1990, Ser. No. 469,144

Claims priority, application Japan, Feb. 6, 1989, 1-025819; Feb. 6, 1989, 1-025820

Int. Cl.⁵ H04N 5/202

U.S. Cl. 358—164

37 Claims



1. A gamma correction device comprising:
 - a classifying means for classifying an input video signal into a plurality of level ranges according to a plurality of signal levels;
 - b. computing means for computing a region of said input video signal within each of said plurality of level ranges obtained by said classifying means; and
 - c. gamma correction control means arranged to have a gamma correction characteristic controlled according to each region computed by said computing means, to gamma-correct said input video signal and to output the gamma-corrected video signal.

5,089,891

CIRCUIT INCLUDING CLIPPING AND NON-LINEAR PROCESSING MEANS FOR CORRECTING THE TONE OF AN IMAGE SIGNAL

Kazumi Yamamoto, Yokohama, Japan, assignor to Ikegami Tsushinki Co., Ltd., Ohta, Japan

Filed Dec. 12, 1990, Ser. No. 626,211

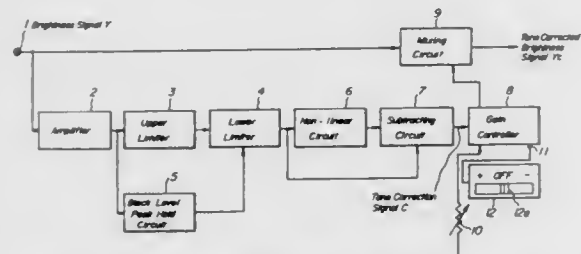
Claims priority, application Japan, Dec. 26, 1989, 1-335036 Int. Cl.⁵ H04N 5/702, 5/52

U.S. Cl. 358—164

10 Claims

1. A circuit for correcting a tone of a brightness signal comprising:
 - a means for clipping off upper and lower portions of the brightness signal to produce a middle level brightness signal;
 - a means for processing in a non-linear manner the middle level brightness signal to derive a non-linearly processed brightness signal;
 - a means for deriving a difference between the non-linearly processed brightness signal and the middle level brightness signal to generate a tone correction signal; and
 - a means for adding the tone correction signal to the brightness signal.

7. A circuit for correcting a tone of a brightness signal comprising
 a means for processing in a non-linear manner the brightness signal to derive a non-linearly processed brightness signal;
 a means for deriving a difference between the non-linearly processed brightness signal and the brightness signal to generate a tone correction signal;



a control means for controlling the polarity of said tone correction signal; and
 a means for adding, to said brightness signal, the tone correction signal whose polarity has been controlled by said control means.

5,089,892

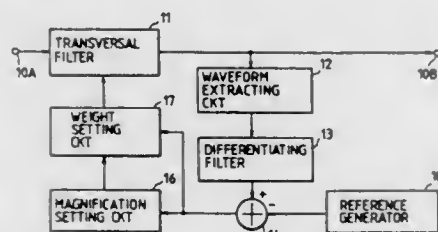
GHOST CANCELLER EMPLOYING PLURAL REFERENCE SIGNALS

Tatsushi Koguchi, Iwai, Shigehiro Ito, Kazuyuki Ebihara, both of Toride, and Yuji Nishi, Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
 Division of Ser. No. 7,506,834, Apr. 10, 1990, Pat. No. 5,025,317. This application Apr. 11, 1991, Ser. No. 683,722
 Claims priority, application Japan, Apr. 13, 1989, 1-94227; Apr. 27, 1989, 1-49948[U]

Int. Cl.⁵ H04N 9/21

U.S. Cl. 358—167

2 Claims



1. A ghost canceller comprising:
 - a transversal filter filtering an input video signal with a filtering characteristic determined by tap gains;
 - a waveform extracting circuit extracting a waveform of a first ghost cancel reference signal contained in the input video signal;
 - a reference signal generator generating a second ghost cancel reference signal synchronous with the first reference signal;
 - a subtracter deriving a difference between the waveform of the first reference signal and a waveform of the second reference signal and generating a row of error signals representing the derived difference;
 - a magnification setting circuit setting a first magnification in accordance with the row of the error signals;
 - a weight setting circuit converting an output signal from the magnification setting circuit into weighting data and feeding the weighting data into the transversal filter as the tap gains;
 - wherein the weight setting circuit comprises a first memory storing the row of the error signals which are identified by respective row numbers; means for sequentially feeding address signals of the respective row numbers to the first memory and sequentially reading out the row of the error

signals from the first memory; a magnification correcting table responsive to the address signals for correcting the first magnification into a second magnification which varies as a function of the row numbers; a multiplier multiplying the row of the error signals read out from the first memory by the second magnification; a second memory storing a row of first tap gain signals; means for sequentially feeding the address signals of the respective row numbers to the second memory and sequentially reading out the row of the first tap gain signals from the second memory; an adder adding a row of outputs signals from the multiplier and the row of the first tap gain signals read out from the second memory for the respective row numbers to generate a row of second tap gain signals; and means for replacing the first tap gain signals by the second tap gain signals in the second memory; and means for feeding the second tap gain signals to the transversal filter as the tap gains.

5,089,893

PICTURE ELEMENT NUMBER CONVERTER

Seiichi Iwase, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

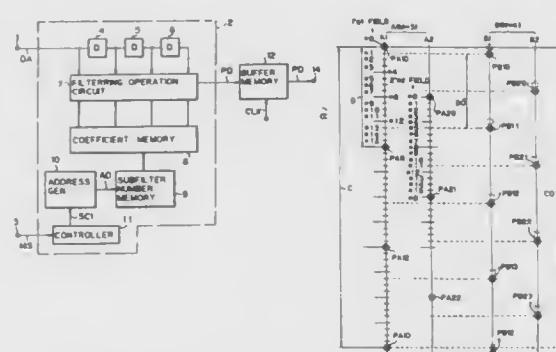
Filed Nov. 2, 1990, Ser. No. 608,372

Claims priority, application Japan, Nov. 14, 1989, 1-295766

Int. Cl.⁵ H04N 3/223, 7/01

U.S. Cl. 358—180

3 Claims



1. In a method for converting a television signal providing a picture of a first size M to a television signal providing a picture of a second size N, with M and N each being an integer, and with each television signal having odd and even fields which are interlaced with each other and which are each comprised of picture elements having a respective predetermined distance between adjacent picture elements in the vertical direction of the respective picture, the steps of:

- dividing said distance between adjacent picture elements in a vertical direction in said picture of said first size or in said picture of said second size by a number equal to said integer N or M, respectively, for producing an unit distance U,
- generating a plurality of interpolation picture data between each pair of vertically adjacent picture elements in each of said odd and even fields of said television signal providing said picture of said first size,
- extracting from each said plurality of interpolation picture data a picture element vertically spaced a distance $(M-N)/4 \cdot U$ from a position in the vertical direction that would be occupied by a picture element in the respective field of a television signal having said second size, and accumulating the extracted interpolation picture data as a converted television signal for display as said picture of said second size.

SOLID IMAGE PICKUP APPARATUS FOR ELIMINATING SMEAR

Yoshihito Higashitsutsumi, Motosu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

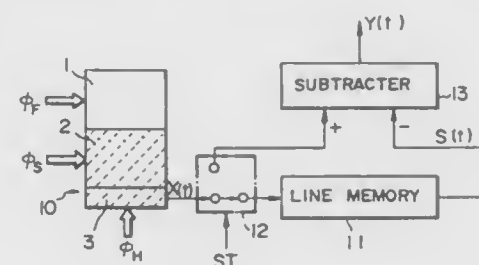
Filed May 8, 1990, Ser. No. 520,798

Claims priority, application Japan, May 15, 1989, 1-120908

Int. Cl.⁵ H04N 5/335

U.S. Cl. 358—213.24

8 Claims



1. A solid image pickup apparatus for eliminating a smear, comprising:

- (a) a picture area formed of a plurality of photoelectric converters which are arranged in a two-dimensional matrix and create information charges according to light incident on said photoelectric converters;
- (b) a store area formed of a plurality of vertical registers which are arranged in association with respective columns of said picture area;
- (c) first transfer means for transferring, to said vertical registers corresponding to said store area at each column of said picture area, said information charges created in the respective photoelectric converters of said picture area and for transferring, to said store area, smear charges by the transfer of charges, in the absence of said photoelectric converters corresponding to said picture area, by transferring more charges than the number of said photoelectric converters creating said information charges at said columns of said picture area;
- (d) a horizontal register corresponding to one horizontal line of said store area;
- (e) second transfer means for transferring the stored charges of said store area;
- (f) third transfer means for outputting a charge signal corresponding to the charges stored in said horizontal register;
- (g) storage means for fetching and storing a smear charge signal of one line when the charge signal of the one line transferred by said third transfer means is the smear charge signal; and
- (h) subtracter means to which the information charge signal outputted from said horizontal register by said third transfer means and the smear charge signal read from said storage means are to be inputted, said subtracter means being capable of performing a subtraction between the inputted two signals.

5,089,895

ENCAPSULATED TELEVISION CAMERA AND METHOD AND APPARATUS FOR FABRICATING SAME

Winford C. Fraker, and Frank W. Gilleland, both of Orlando, Fla., assignors to Cues, Inc., Orlando, Fla.

Filed May 7, 1990, Ser. No. 519,474

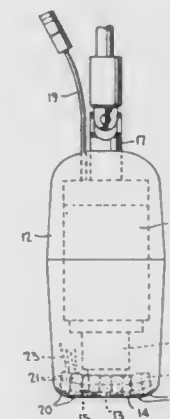
Int. Cl.⁵ H04N 5/30, 7/18; B29B 13/00

U.S. Cl. 358—229

26 Claims

1. An encapsulated television camera assembly comprising:
 - a television camera body having a forward end and a rearward end;
 - a television camera lens secured to said camera body at said forward end;
 - an electric cable secured to and extending from said body for

carrying power supply and video signals between said camera body and a remote location; and
 a housing comprising a solid mass of molded plastic encapsulate material surrounding said camera body, said housing having a viewing opening exposing said forward end to



permit light to enter said housing via said lens, said encapsulate material being chemically bonded about said electrical cable, wherein said encapsulate material fills all voids within said housing and said camera body is suspended in said encapsulate material and sealed against exposure to ambient conditions.

5,089,896

COLOR DEVIATION PREVENTION DEVICE IN PROJECTION DISPLAY WITH MINIMIZED WHITE CHROMATICITY DEVIATION

Masanori Ogino, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

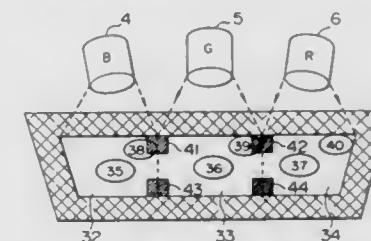
Filed Oct. 24, 1989, Ser. No. 426,048

Claims priority, application Japan, Oct. 31, 1988, 63-273121

Int. Cl.⁵ H04N 5/72, 5/74

U.S. Cl. 358—239

10 Claims



1. A projection display of the type which projects respective images emitted from a plurality of projection tubes on a rectangular display screen through lenses arranged correspondingly to the projection tubes, thereby to compose the images by overlapping, wherein the lenses are arranged so that a respective optical axis is located on a center line substantially bisecting an angle at which a pupil of each of the lenses sees both side ends of the rectangular screen with an equal field angle, thereby preventing white chromaticity deviation from occurring at said ends of the screen, said lenses being arranged so that skew-symmetric white chromaticity deviations remain at the diagonal corners of the screen and at mid-side areas of the screen, a polarity of the skew-symmetric white chromaticity deviations at the diagonal corners of the screen being opposite to a polarity of the skew-symmetric white chromaticity deviations at the mid-side areas of the screen.

1. An original reader apparatus comprising:
first means for generating a first pulse of a predetermined frequency;
reading means for reading line by line an original in synchronism with the first pulse;
second means, for generating, in synchronism with the first pulse, a second pulse of a frequency higher than that of the first pulse;
third means, for generating a third pulse in synchronism with the second pulse, the frequency of said third pulse varying from a value less than that of the first pulse to a constant value greater than that; and
moving means for moving step by step, in accordance with the frequency of the third pulse, said reading means rela-

tive to said original, along an axis perpendicular to that along which the reading means reads the original.

and said medium comprising means for tending physically to align said liquid crystal material with respect to said medium,

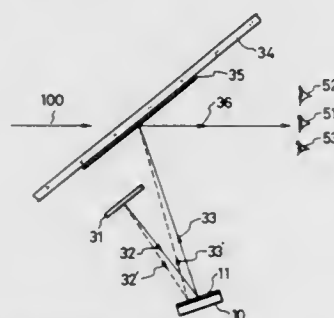
5,089,903 DISPLAY APPARATUS

Tetsuro Kawayama, Yokohama; Naosato Taniguchi, Atsugi; Yoko Yoshinaga, Machida, and Nobuo Kushibiki, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1989, Ser. No. 359,561

Claims priority, application Japan, Jun. 3, 1988, 63-135634
Int. Cl.³ G02B 27/14

U.S. Cl. 359—15

33 Claims



1. A display apparatus comprising:

- a display;
- a first diffraction grating for diffracting light emitted from said display, said first diffraction grating having a diffraction efficiency with a first wavelength spectrum and the diffracted light having a center wavelength; and
- a second diffraction grating for diffracting diffracted light from said first diffraction grating toward a pupil of an observer, with a half-width of the first wavelength spectrum of said first diffraction grating being larger than a sum of a half-width of a second wavelength spectrum of a diffraction efficiency of said second diffraction grating and a variation amount of the center wavelength of the diffracted light directed toward the pupil, wherein the variation amount varies in accordance with variation of the position of the pupil.

5,089,904

ENCAPSULATED LIQUID CRYSTAL MATERIAL, APPARATUS AND METHOD

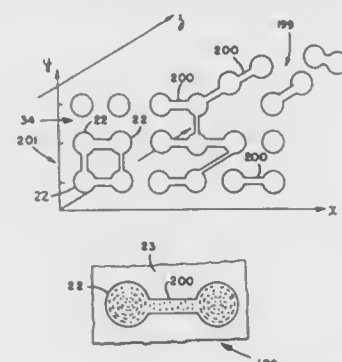
James L. Ferguson, 92 Adam Way, Atherton, Calif. 94025
Division of Ser. No. 339,072, Apr. 14, 1989, which is a division of Ser. No. 114,073, Oct. 27, 1987, Pat. No. 4,884,873, which is a division of Ser. No. 585,883, Mar. 2, 1984, Pat. No. 4,707,080, which is a continuation-in-part of Ser. No. 477,242, Mar. 21, 1983, Pat. No. 4,616,903, and a continuation-in-part of Ser. No. 477,138, Mar. 21, 1983, Pat. No. 4,606,611, and a continuation-in-part of Ser. No. 302,780, Sep. 16, 1981, Pat. No. 4,435,047. This application Oct. 31, 1990, Ser. No. 606,429
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.³ G02F 1/133

U.S. Cl. 359—52

33 Claims

26. Liquid crystal material and a medium for containing discrete quantities of such liquid crystal material in a plurality of interconnected volumes, said material comprising an operationally nematic material having positive dielectric anisotropy,



and wherein a plurality of volumes of such liquid crystal material are not interconnected to other volumes.

5,089,905

COLOR LIQUID CRYSTAL DISPLAY SYSTEM WITH SPACER-ADHESIVE AND SEPARATE RIGID SPACERS ACROSS DISPLAY SURFACE

Jun Sasaki; Akira Ogawa; Yasumasa Akimoto; Takao Minato, and Hajime Ohnishi, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Japan

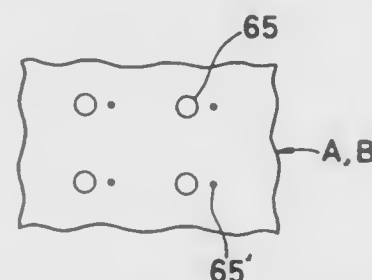
Filed Sep. 19, 1988, Ser. No. 246,318

Claims priority, application Japan, Sep. 22, 1987, 62-138489; Mar. 10, 1988, 63-57298

Int. Cl.³ G02F 1/133

U.S. Cl. 359—64

8 Claims



1. A color display system comprising at least one means for producing color-polarized light, having a specified wavelength λ , from a light image having a plurality of color components, at least one polarized surface control means which rotates said color-polarized light, a polarizing means for selectively passing light polarized in a selected direction, said polarized surface control means comprising a ferro-electric liquid crystal cell containing a liquid crystal having a refractive index anisotropy of Δn , said cell having a first panel and a second panel, a spacer-adhesive layer and a rigid auxiliary spacer layer interposed between said first panel and said second panel substantially setting a gap d between said panels, wherein

$$d = \frac{\lambda}{2 \cdot \Delta n}$$

and wherein said spacer-adhesive layer is photo-etched onto one of said panels in a pre-selected pattern and said rigid auxiliary spacer layer is separate from said spacer-adhesive layer.

5,089,906 SUPERTWISTED NEMATIC LIQUID CRYSTAL DEVICE HAVING TWO PHASE DIFFERENCE PLATES FOR PROVIDING BLACK/WHITE DISPLAY

Hiroshi Ohnishi, Nara; Toshiyuki Yoshimizu, Kyoto; Masakazu Wada; Hiroshi Kuwagaki, both of Nara, and Toshimichi Katsube, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

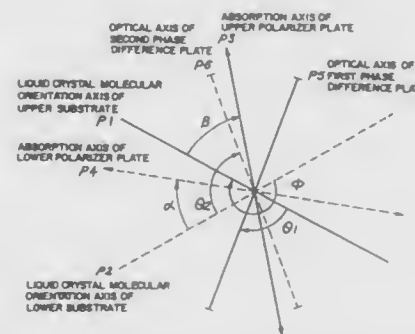
Filed Feb. 6, 1990, Ser. No. 475,901

Claims priority, application Japan, Feb. 6, 1989, 1-28387; Mar. 24, 1989, 1-72150; Apr. 29, 1989, 1-110090; Oct. 6, 1989, 1-262624

Int. Cl.³ G02F 1/13

U.S. Cl. 359—73

7 Claims



1. A liquid crystal display device, including a sequentially laminated upper polarizer plate, a first phase difference plate, a supertwisted nematic (STN) liquid crystal panel, a second phase difference plate, and a lower polarizer plate, wherein retardation values of the first phase difference plate and the second phase difference are equal, and the first phase difference plate and the second phase difference plate are symmetrically disposed in front and behind the STN liquid crystal panel, respectively, in the relation of $\theta_1 + \theta_2 = 180^\circ$, wherein θ_1 is the angle formed by a liquid crystal molecular orientation axis of an upper substrate of the STN liquid crystal panel and an optical axis of the first phase difference plate, and θ_2 is the angle formed by liquid crystal molecular orientation axis of a lower substrate of the STN liquid crystal panel and an optical axis of the second phase difference plate.

5,089,907

POST-OBJECTIVE TYPE OPTICAL SCANNER AND IMAGE FORMING APPARATUS USING THE SAME

Motonobu Yoshikawa, Nishinomiya, and Yoshiharu Yamamoto, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

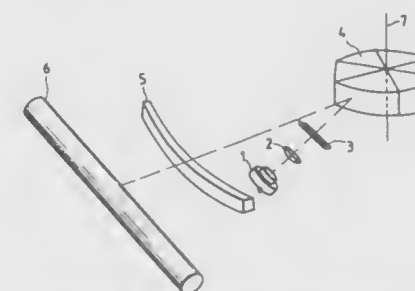
Filed Jan. 17, 1991, Ser. No. 642,419

Claims priority, application Japan, Jan. 17, 1990, 2-7418

Int. Cl.³ G02B 26/10

U.S. Cl. 359—206

3 Claims



1. A post-objective type optical scanner comprising:
a laser;

a condensing lens for converging a beam of light emitted by said laser;
a cylindrical lens for converging a light beam coming from said condensing lens, onto a reflecting surface only in a sub-scanning direction;
an optical deflector having said reflecting surface and rotatable for deflecting said light beam coming from said cylindrical lens, said reflecting surface being one of a cylindrical surface and a spherical surface; and
a compensating lens for converging said light beam onto a scanning surface after it is deflected by said optical deflector, said compensating lens having a power in said sub-scanning direction which varies in a scanning direction between a central portion and a peripheral portion of said compensating lens,
said light beam converged on said scanning surface having an intensity of $1/e^2$ and a spot size not exceeding $80\mu\text{m}$, and
said optical deflector having an axis of rotation, a deflecting point at which said light beam is reflected, and an effective scanning width Y_0 , wherein a distance r between said axis of rotation and said deflecting point, a distance L between said deflecting point and said scanning surface and said effective scanning width Y_0 are related by the relationship $r \geq -0.025 \times L + 0.1 \times Y_0 + 1.4$.

5,089,908

PLYWOOD SUPPRESSION IN ROS SYSTEMS

Ronald E. Jodoin, Pittsford; Robert P. Loce, Rochester; William L. Lama, Webster; James D. Rees, Pittsford, all of N.Y.; Abd-El-Fattah A. Ibrahim, Palos Verdes Estate, Calif., and James J. Appel, Brighton, N.Y., assignors to Xerox Corporation, Stamford, Conn.

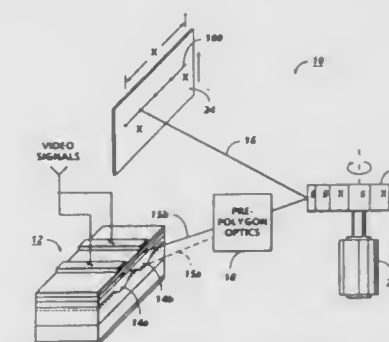
Continuation of Ser. No. 546,214, Jun. 29, 1990, abandoned.

This application Jul. 26, 1991, Ser. No. 735,664

Int. Cl.³ G02B 26/08

U.S. Cl. 359—212

4 Claims



1. A light scanning system comprising:
a photosensitive image recording member comprising at least a transparent photoconductive charge transport layer overlying a charge generator layer and a conductive ground plane,
a diode laser array including a plurality of diodes, each diode operating at a different output wavelength,
means for supplying video signal information to said diodes to provide for emission of a plurality of light beams from said array with each of said light beams being modulated in accordance with said video signal information and said different output wavelengths,
optical means for focusing said plurality of light beams to form a merged beam at the surface of said recording member, and
scanning means for scanning said merged beam across a linear portion of said image recording member surface, wherein the portion of the beam transmitted through the recording member and reflected from the ground plane back to the surface results in minimal spatial exposure variation at the surface due to the different absorption

rates of the beam passing through the charge generator layer.

5,089,909

DOCUMENTATION ILLUMINATION MODULE FOR A MICROSCOPE SYSTEM

Larry K. Kleinberg, Toluca Lake, Calif., assignor to Storz Instrument Company, St. Louis, Mo.

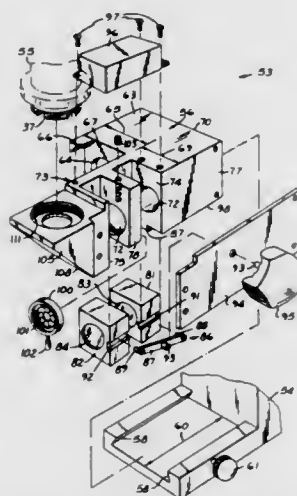
Continuation of Ser. No. 312,904, Feb. 21, 1989, Pat. No. 5,007,723, which is a division of Ser. No. 50,948, May 15, 1987, Pat. No. 4,856,873. This application Sep. 27, 1990, Ser. No. 589,082

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.⁵ G02B 21/06, 21/36

U.S. Cl. 359—363

49 Claims



27. A module for a microscope system providing illumination from a light source to a field of view and without a beam splitter providing a reflected image from the field of view to a means for recording said image, said module comprising:

- a housing for attachment to said microscope system;
- means defining an illumination channel in said housing for providing illumination to a field of view;
- means defining an image channel in said housing for receiving said reflected image and transmitting it to said means for recording said image; and
- means for attaching said housing to said microscope system.

5,089,910

INFRARED CATADIOPTRIC ZOOM RELAY TELESCOPE WITH AN ASPHERIC PRIMARY MIRROR

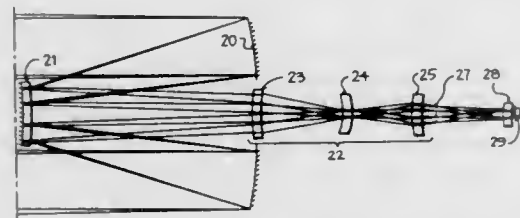
Robert D. Sigler, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 545,211, Jun. 28, 1990. This application Jul. 2, 1990, Ser. No. 546,968

Int. Cl.⁵ G02B 23/00, 5/24, 17/00

U.S. Cl. 359—399

7 Claims



1. A catadioptric zoom relay telescope capable of achieving a continuously variable focal length over a band of infrared wavelengths, said telescope comprising a primary mirror for

gathering rays in said infrared wavelength band, said primary mirror being of aspheric profile, a secondary Mangin mirror for directing said rays through an aperture in said primary mirror, said primary mirror and said secondary Mangin mirror being coaxially disposed along an optic axis, said aperture in said primary mirror being substantially symmetric about said optic axis, an imaging system consisting of only three movable lens elements disposed along said optical axis to form a real image of said primary mirror at a Lyot stop, said Lyot stop being disposed along said optic axis externally of said imaging system, and field lens means disposed along said optic axis to focus rays passing through said Lyot stop onto a detector, said field lens means being fixedly positioned relative to said primary mirror and secondary Mangin mirror.

5,089,911

TELESCOPE HAVING IMAGE FIELD STABILIZATION

Adolf Weyrauch, Aalen; Peter Teichmann, Dänischenhagen; Dieter Werblinski, Kiel, and Rudolf Rix, Heikendorf, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Dec. 21, 1989, Ser. No. 454,352

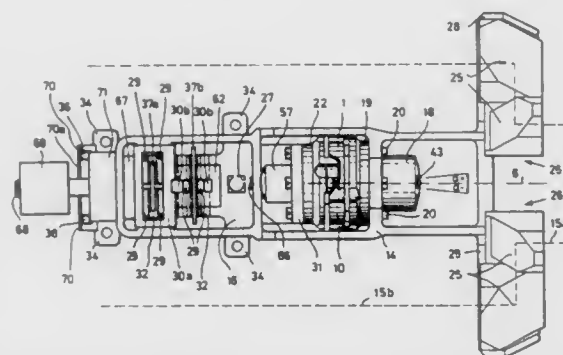
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843775

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.⁵ G02B 27/64, 23/00

U.S. Cl. 359—554

12 Claims



1. A telescope of the binocular type having two optical inverting systems defining respective optical axes, the optical axes defining an optical plane, the telescope comprising:

- a symmetrical double holder for accommodating the inverting systems thereon;
- a rigid base frame subjected to vibrations applied thereto during use of the telescope;
- a cardanic spring joint non-rigidly connecting said double holder and said base frame to each other for isolating said double holder from said vibrations, said spring joint defining a support pivot point to permit cardanic movement of said double holder about said pivot point in two axes relative to said base frame and said optical plane;
- said spring joint including a plurality of springs arranged radially of said support pivot point to cause said cardanic movement to be substantially uniform along said two axes;
- a damping device mounted on said double holder and said base frame for damping said movement; and,
- said damping device including detection means for detecting the position of said double holder relative to said base frame and damping means for influencing said position in a predetermined manner.

5,089,912

RETRACTABLE ANTIGLARE SHIELD FOR EXTERIOR REAR VIEW MIRRORS

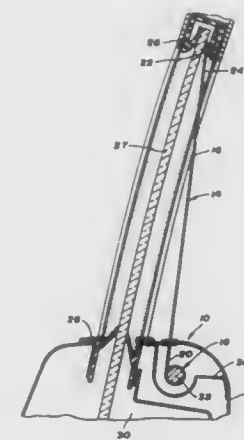
Gerald L. Simin, Holly, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 28, 1990, Ser. No. 589,350

Int. Cl.⁵ G02B 27/00

U.S. Cl. 359—608

1 Claim



1. A retractable antiglare shield for exterior rear view mirrors mounted on a door of a motor vehicle with a window glass and movable between a raised position and a stored position comprising:

- a shield made from a thin, flexible material which reduces glare from a following vehicle;
- the door having a hollow space;
- a shaft rotatably mounted along its longitudinal axis in the hollow space of the door of the motor vehicle;
- the shaft being fixedly connected to a lower end of the shield;
- a support member fixedly connected to the shield at an upper end of the shield opposite the lower end of the shield for grasping the support member when the shield is in a stored position in the hollow space of the door of the motor vehicle;
- means connected to the shaft for winding the shield around the shaft for maintaining the shield in a stored position within the hollow space;
- and means including the support member for holding the shield in the raised position so that the shield covers a portion of the window glass through which the exterior rear view mirror is visible to a driver of the motor vehicle;
- said means for holding the shield in the raised position including a forward end of the support member which is inserted between a window seal and the window glass of the door so that the support member is held in the raised position such that the support member serves as a stiffener for supporting the shield, and the shield covers a portion of the window glass through which the exterior rear view mirror is visible to a driver of the motor vehicle.

5,089,913

HIGH RESOLUTION REDUCTION CATADIOPTRIC RELAY LENS

Rama N. Singh, Bethel, Conn., and Janusz S. Wilczynski, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 11, 1990, Ser. No. 551,116

Int. Cl.⁵ G02B 17/00

U.S. Cl. 359—727

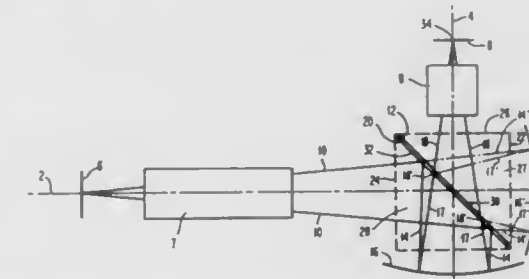
10 Claims

1. A 5× reduction catadioptric relay lens having submicron resolution in the ultra violet bandwidth comprising:

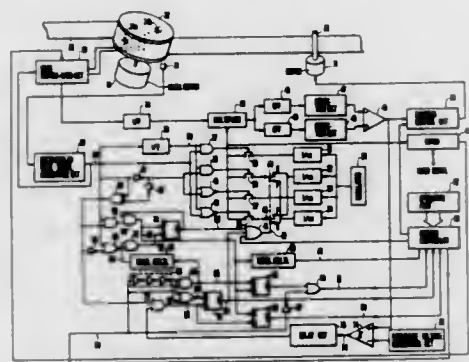
- a first surface of radius of curvature of about 416.2 mm;
- a second surface of radius of curvature of about -352.6 mm;
- the spacing and index of refraction between said second and

said first surfaces being about 15.6 mm and 1.5, respectively;

- a third surface of radius of curvature of about 216.4 mm;
- the spacing and index of refraction between said third and said second surface being about 0.1 mm and 1, respectively;
- a fourth surface of radius of curvature of about -9143 mm;
- the spacing and index of refraction between said fourth and said third surfaces being about 10 mm and 1.5, respectively;
- a fifth surface of radius of curvature of about -165.1 mm;
- the spacing and index of refraction between said fifth and said fourth surfaces being about 100 mm and 1, respectively;
- a sixth surface of radius of curvature of about -141.8 mm;
- the spacing and index of refraction between said sixth and said fifth surface being about 6 mm and 1.5, respectively;
- a seventh surface of radius of curvature of about -544.5 mm;
- the spacing and index of refraction between said seventh and said sixth surface being about 6.4 mm and 1, respectively;
- an eighth surface of radius of curvature of about 276.6 mm;
- the spacing and index of refraction between said eighth and said seventh surface being about 9 mm and 1.5, respectively;
- a ninth surface of radius of curvature of about -106.2 mm;
- the spacing and index of refraction between said ninth and said eighth surface being about 159 mm and 1, respectively;
- a tenth surface of radius of curvature of about -221 mm;
- the spacing and index of refraction between said tenth and said ninth surface being about 5 mm and 1.5, respectively;



- ing a second tracking state different from said first tracking state during reproduction;
- (B) recording means for forming the recording track on said recording medium by multiplexing either of said first control signal and said second control signal produced by said control signal generating means with said information signal and recording the multiplexed signal on said recording medium;
- (C) stop instruction signal generating means for outputting a stop instruction signal to instruct a stop of the recording track forming operation; and



- (D) control means arranged to change over said control signal generating means so that said control signal generating means outputs said second control signal, depending upon a timing of output of the stop instruction signal from said stop instruction signal generating means, in case where said stop instruction signal is outputted from said stop instruction signal generating means when said first control signal is being outputted from said control signal generating means, and to feed a stop control signal for stopping the recording track forming operation of said recording means after said second control signal has been outputted from said control signal generating means for a predetermined period.

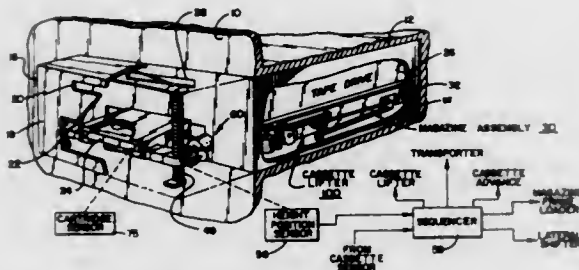
5,089,920 LOADER MECHANISM FOR TAPE CARTRIDGE SYSTEMS

Philip S. Bryer, Tarzana, and James V. Tierney, III, Costa Mesa, both of Calif., assignors to WangDAT, Inc., Costa Mesa, Calif.

Filed Nov. 13, 1989, Ser. No. 435,726
Int. Cl.⁵ G11B 15/68

U.S. Cl. 360—92

41 Claims



1. A data storage system, comprising:
a tape drive having a front loading entrance for receiving a tape cassette, the tape drive being mounted within an enclosure substantially defining a standard peripheral form factor, wherein the enclosure comprises a single cassette loading entrance in line with the front loading entrance of the tape drive, the system further comprising means for accepting a cassette through the single cassette

loading entrance, and means for loading the accepted cassette into the front loading entrance of the tape drive; a horizontally-oriented magazine removably disposed within the enclosure in a position adjacent the tape drive for storing a plurality of tape cassettes, wherein the cassettes reside on their broad faces therein to maintain a low profile; and
means, adjacent both the magazine and the tape drive, for transporting cassettes between the tape drive and the magazine.

5,089,921 INCLINED RAIL CASSETTE TAPE LOADING AND GUIDING MECHANISM

Yoshimi Kodama, Kobe, and Yoshinisa Ohnishi, Takarazuka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

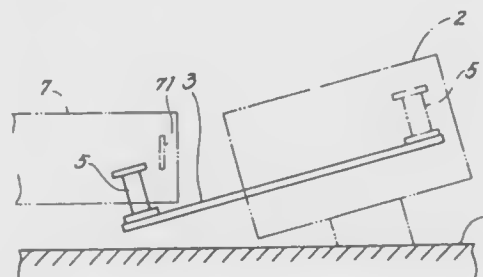
Continuation of Ser. No. 311,264, Feb. 16, 1989, abandoned.
This application Apr. 19, 1991, Ser. No. 687,093

Claims priority, application Japan, Feb. 17, 1988, 63-35650; Aug. 19, 1988, 63-206574

Int. Cl.⁵ G11B 15/665

U.S. Cl. 360—95

10 Claims



1. A tape loading mechanism including a head cylinder mounted inclined at a predetermined angle relative to a cylinder base, a pair of rails arranged around said head cylinder, a pair of tape drawing guides movable between positions inside and outside a tape cassette and a pair of tape guide assemblies each guidably movable along a tape guide assembly guide portion of a respective rail of said pair of rails for performing a tape loading operation comprising winding a magnetic tape around said head cylinder while withdrawing said tape from said tape cassette, said tape loading mechanism being characterized in that each said tape guide assembly guide portion of said respective rail of said pair of rails extends in a plane from a starting end close to said cassette to a terminal end close to said head cylinder, at least one of said rails being inclined relative to said cylinder base from said starting end positioned close to said cylinder base to said terminal end close to said head cylinder, with said starting end positioned close to said cylinder base being at a level lower than the level of tape within said cassette so as to maintain said tape guide assembly on said at least one of said rails at a lower level than said tape within said tape cassette when said tape loading operation is started, said inclined rail having said terminal end positioned away from said cylinder base so as to hold said tape guide assembly on said inclined rail at a higher level than said tape within said cassette on completion of said tape loading operation, said tape guide assembly on said inclined rail being movable into contact with said tape while moving on said inclined rail to withdraw said tape from said cassette.

5,089,922 DISC DRIVE MOTOR SPINDLE HUB FOR HOLDING A DISC AND SPACER STACK FIRMLY IN PLACE

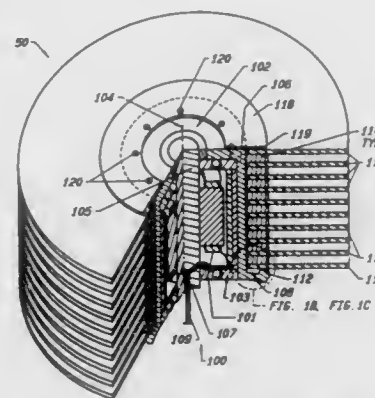
Stephen P. LeClair, Burnsville, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 31, 1990, Ser. No. 560,427

Int. Cl.⁵ G11B 17/02

U.S. Cl. 360—99.08

15 Claims



1. A disc drive motor spindle hub comprising:
a hub portion rotatably attached to a disc drive motor;
a disc mounting flange, protruding from said hub portion, and having a rounded peripherally raised area with a radius, whereby a first disc rests against said raised area and any number of discs and spacers are stacked alternately thereupon to form a disc and spacer stack; and
clamping means attached to an end of said hub portion, having a rounded raised contact area in line with and facing said rounded raised area of said disc mounting flange, and working cooperatively with said disc mounting flange for applying a clamping force to said disc and spacer stack, whereby said disc mounting flange bends due to said clamping force, causing said first disc to pivot upon said raised areas while maintaining a substantially parallel orientation with respect to said discs, and whereby a maximum of said clamping force is in line with said raised areas so that said disc and spacer stack is held firmly in a fixed position.

5,089,923 STATIC MAGNETIC READING HEAD HAVING A PLURALITY OF ELEMENTARY HEADS

Jean-Claude Lebeure, Sainte Genevieve des Bois, France, assignor to Thomson-CSF, Puteaux, France

Filed Apr. 6, 1990, Ser. No. 506,221

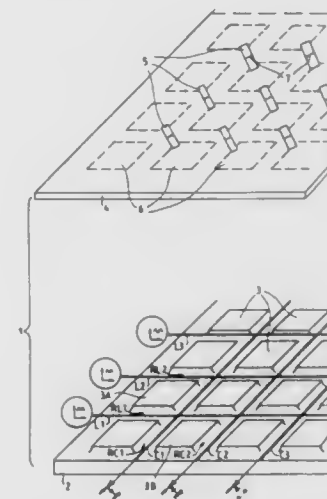
Claims priority, application France, Apr. 14, 1989, 89 04965
Int. Cl.⁵ G11B 5/17, 5/23, 5/265, 5/187

U.S. Cl. 360—121

15 Claims

1. A static magnetic recording head, comprising:
a plurality of excitation wires arranged substantially parallel to each other;
a plurality of signal wires arranged substantially parallel to each other such that said excitation and signal wires intersect to form a matrix; and
a plurality of elementary heads, each having a magnetic circuit with a substantially linear magnetization characteristic, including a non-linear magnetic element having a gap for reading a magnetic tape, each of said elementary heads being disposed at an intersection of said excitation and signal wires;
wherein said plurality of elementary head comprises:
a plurality of substantially trapezoidal blocks separated by grooves to form a matrix of said blocks;

said non-linear magnetic elements being disposed on diagonally adjacent of said blocks; and



said signal and excitation wires being disposed in said grooves.

5,089,924 TAPE CASSETTE WITH WEAR PAD COMPRISING POLYOLEFIN SHEET AND POLYAMIDE ADHESIVE LAYER

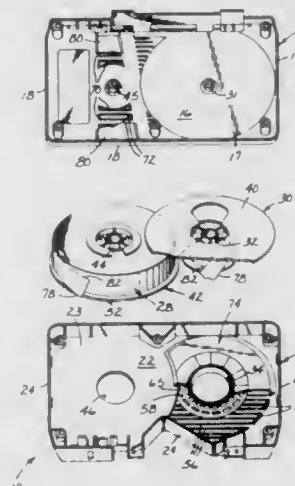
Vincent P. Teuber, and Ramon F. Hegel, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 18, 1989, Ser. No. 452,254

Int. Cl.⁵ G11B 23/04

U.S. Cl. 360—132

22 Claims



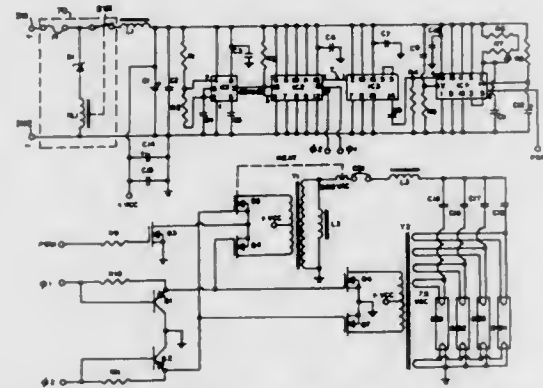
1. A magnetic recording tape cassette housing, comprising:
(a) a polymeric cassette box having an interior surface, wherein the interior surface of the cassette box has been irradiated with an amount of ultraviolet radiation sufficient to impart a priming effect to the interior surface of the cassette box; and
(b) a wear pad adhered to the interior surface of the cassette box, said wear pad comprising:
(i) a low-friction, wear-resistant, polyolefin sheet; and
(ii) a polyamide adhesive layer coated on one side of the polyolefin sheet and adhering the polyolefin sheet to the interior surface of the cassette box.

5,089,925

PROTECTION DEVICE FOR ELECTRONIC CIRCUIT
James N. Lester, Essex, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Division of Ser. No. 361,475, Jan. 5, 1989, Pat. No. 4,998,046.
This application Sep. 21, 1990, Ser. No. 586,170
Int. Cl.⁵ H02H 3/18

U.S. Cl. 361—84

2 Claims



1. A combined overvoltage and reverse voltage protection device comprising:
first and second direct current input terminals;
a relay having a coil and a normally-closed switch;
a semiconductor device connected in series with said coil, the series connection of said coil and said semiconductor device being coupled across said first and second direct current input terminals;
one end of said normally-closed switch being coupled to said first direct current input terminal, the other end of said normally-closed switch adapted to be coupled to an electronic circuit, said normally-closed switch being operative to interrupt power to the electronic circuit in response to an overvoltage or a reverse voltage detected at said first and second direct current input terminals.

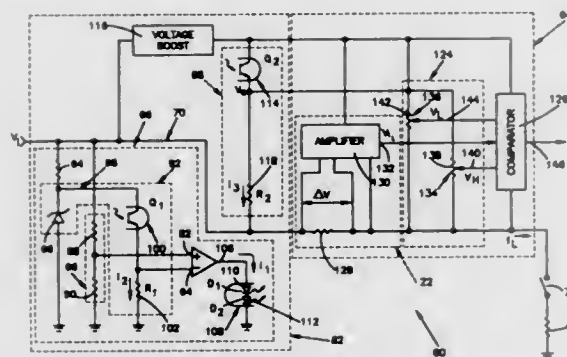
5,089,926

CURRENT MONITOR USING A DC ISOLATING AMPLIFIER CIRCUIT
Michael M. Kogelman, Akron, Ohio, assignor to B. F. Goodrich Co., Akron, Ohio

Filed Jun. 1, 1990, Ser. No. 531,589
Int. Cl.⁵ G01R 19/00, 19/165

U.S. Cl. 361—87

42 Claims



1. A DC isolating amplifier circuit, comprising:
an amplifier, the amplifier generating a first current in response to receiving an input voltage;
a signal generator connected to the amplifier, the signal generator generating a signal, the signal varying as a function of the first current;
a first signal detector, the first signal detector detecting the signal generated by the signal generator, the first signal

detector including means for generating a second current, the second current varying as a function of the signal generated by the signal generator, the ratio of the second current to the first current defining a first current transfer ratio (CTR);

a second signal detector for detecting the signal generated by the signal generator, the second signal detector including means for generating an output voltage and a third current, the third current varying as a function of the signal generated by the signal generator, the ratio of the third current to the first current defining a second CTR; and

wherein the output voltage is a function of the product of the input voltage received by the amplifier and the ratio of the first CTR to the second CTR.

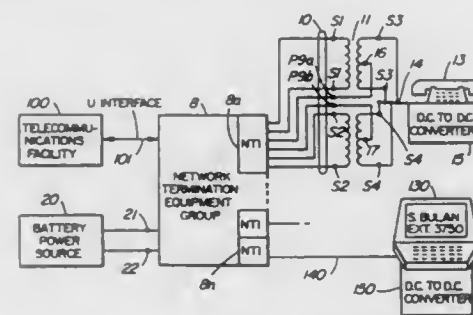
5,089,927

POWER FEED CIRCUIT FOR DIGITAL COMMUNICATIONS TERMINAL EQUIPMENT
Sergiu Bulan, Willowdale, and Johannes L. Holt, Brampton, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 12, 1989, Ser. No. 420,487
Int. Cl.⁵ H02H 3/08

U.S. Cl. 361—87

4 Claims



3. A current control means for supplying an energizing direct current flow, from a source of power via a transmission line to a telecommunications terminal apparatus, said terminal apparatus being continuously operable while drawing a load current which is exceeded by an inrush current being greater than the load current at a moment of power up, the current control apparatus being for connection in series between the power source and the transmission line and comprising:

means for generating a magnitude signal being representative of an amount of said energizing direct current flow;
means for generating a static control signal for defining a maximum limit of load current;

means for generating a momentary dynamic control signal for defining a maximum limit of the inrush current in response to the magnitude signal increasing from a level representative of less than the maximum limit of load current to a level representative of more than the maximum limit of load current;

switch means responsive to the magnitude signal and the static and dynamic control signals, to be set in an ON condition for conducting said current flow, when either one of said maximum limits is greater than the energizing direct current as is instantly represented by the magnitude signal, otherwise to be reset in an OFF condition, and while in the OFF condition being responsive to an apparent open circuit condition of the transmission line to become set in the ON condition.

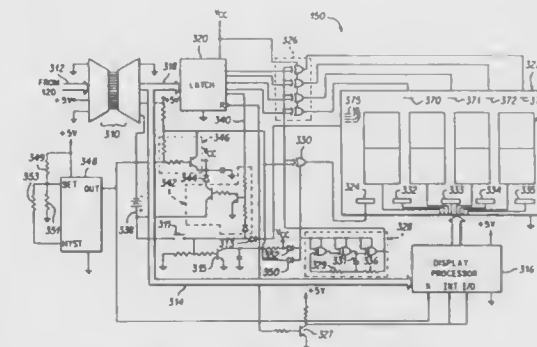
5,089,928

PROCESSOR CONTROLLED CIRCUIT BREAKER TRIP SYSTEM HAVING RELIABLE STATUS DISPLAY
Leon W. Durivage, III, Marion, and William J. Bacher, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Aug. 31, 1989, Ser. No. 403,244
Int. Cl.⁵ H02H 3/04

U.S. Cl. 361—94

13 Claims



1. A circuit breaker tripping system comprising:
a processor which analyzes current in the circuit breaker and generates a plurality of trip signals; and
a trip indicator circuit, responsive to the trip signals and operating from power provided by the tripping system, including:
a battery;
latch means, responsive to the processor, for latching at least one of the trip signals and for asserting a battery enable signal;
a display;
a driver circuit, responsive to the latch means, for driving the display;
means for arbitrating power to the latch means and the trip indicator circuit either from the tripping system or from the battery when said battery enable signal is asserted; and
switch means for permitting an operator to assert said battery enable signal independently of the trip signals from the processor.

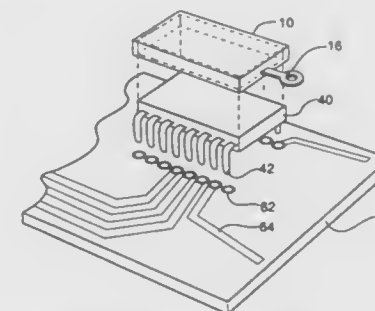
5,089,929

RETROFIT INTEGRATED CIRCUIT TERMINAL PROTECTION DEVICE
David H. Hilland, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 8, 1990, Ser. No. 491,803
Int. Cl.⁵ H02H 3/22, 9/04

U.S. Cl. 361—111

2 Claims



1. A retrofit integrated circuit terminal protection device (RICTPD) for an integrated circuit having an IC package with external leads on two opposite sides, the device being adapted

for mounting on the package to protect the integrated circuit from electrical transients during operation;

wherein said device comprises a casing of insulating material which is slightly larger than the IC package and shaped to fit over the IC package, a plurality of legs of resilient metal, each leg having a first end portion and a second end portion, the first end portion of each leg being bent in a form of a metal spring adapted to provide a friction fit on one of the leads of the IC package, each leg having said second end portion extending into said casing, a metal ground plane in said casing, the metal ground plane being separate from the legs, a plurality of transient protection devices (TPDs) built into said casing, with each transient protection device between the metal ground plane and said first end portion of one of said legs, and a ground terminal extending out of the casing from said metal ground plane for connection to ground.

5,089,930

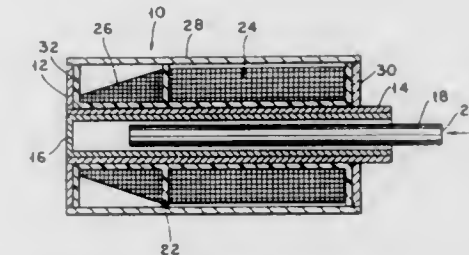
TEMPERATURE COMPENSATED LINEAR VARIABLE TRANSFORMER

Jacob Chass, Forest Hills, N.Y., assignor to Pickering Controls, Inc., Plainview, N.Y.

Filed Apr. 12, 1991, Ser. No. 684,600
Int. Cl.⁵ H01F 15/16

U.S. Cl. 361—140

8 Claims



1. A transformer comprising:
an elongated bobbin of a non-magnetic, nonconducting material, said bobbin having a hollow center core and at least one flange separating said bobbin into first and second longitudinal sections;
a primary coil of electrically conducting wire disposed about said first section;
a secondary coil of electrically conducting wire disposed about said second section;
an armature of ferromagnetic material movably disposed within said core and extending at least partially into said first and second sections; and,
a first tube within said core disposed about said armature, said first tube being formed of an electrically conducting material having resistance characteristics which vary with temperature in the same fashion as said primary coil.

5,089,931

SAFETY DEVICE FOR ELECTRICAL APPARATUS CONTAINING A DIELECTRIC GAS, IN PARTICULAR CIRCUIT BREAKERS OR VOLTAGE-DROPPERS FOR MEASUREMENT PURPOSES

Edmond Thuries, Meyzieu; Jean-Pierre Dupraz, Lyons; Jean-Paul Moncorge, Vaux en Velin; Jean-Marc Willième, La Mulatière; Joseph Martin, Meyzieu; Yves Perrusset, Vaulx en Velin, and Didier Taponat, Villeurbanne, all of France, assignors to GEC Alsthom SA, Paris, France

Filed Feb. 7, 1990, Ser. No. 476,239

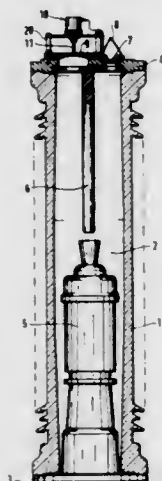
Claims priority, application France, Feb. 7, 1989, 89 01538
Int. Cl.⁵ H01H 47/24

U.S. Cl. 361—174

14 Claims

1. A safety device for an electrical apparatus comprising an enclosure filled with gas under pressure, said enclosure having a wall, the safety device comprising first means for optically

detecting the appearance of an arc inside said enclosure, and second means operatively connected to said first means to



penetrate said enclosure wall to establish a path for the gas to escape from said enclosure when the first means has optically detected an arc for a given length of time.

5,089,932

SOLID DIELECTRIC CAPACITOR AND METHOD OF MANUFACTURE

Hiroshi Saito, Gunma; Mutsumi Honda, Takasaki; Hiroshi Kishi, Fujioka; Hisamitsu Shizuno, and Hirokazu Chazono, both of Takasaki, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

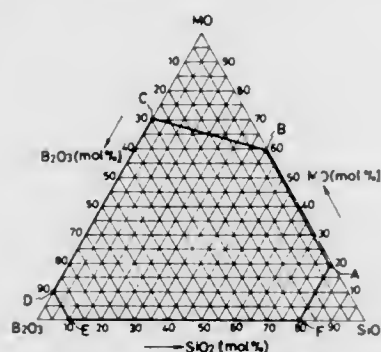
Filed Nov. 27, 1990, Ser. No. 618,649

Claims priority, application Japan, Nov. 30, 1989, 1-311094; Nov. 30, 1989, 1-311095

Int. Cl.⁵ H01G 4/10, 7/00; C04B 35/48

U.S. Cl. 361—321

11 Claims



1. A solid dielectric capacitor comprising a dielectric ceramic body and at least two electrodes in contact therewith, the dielectric ceramic body consisting essentially of:

(a) 100 parts by weight of a major ingredient expressed by the formula,

$$(1-\alpha)\{(Ba_{k-x}M_x)O_k(Ti_{1-y}R_y)O_2-(y/2)\} + \alpha CaZrO_3$$

where

M is either or both of magnesium and zinc;

R is at least one metal selected from scandium, yttrium, gadolinium, dysprosium, holmium, erbium, ytterbium, terbium, thulium and lutetium;

α is a numeral in the range of 0.005 to 0.040,

k is a numeral in the range of 1.00 to 1.05;

x is a numeral in the range of 0.01 to 0.10; and

y is a numeral greater than 0 and not greater than 0.04; and (b) from 0.2 to 5.0 parts by weight of an additive mixture of at least two members selected from the group consisting of boric oxide or lithium oxide, silicon oxide and at least one metal oxide selected from the group consisting of barium oxide, strontium oxide, calcium oxide, magnesium oxide and zinc oxide.

5,089,933

SOLID DIELECTRIC CAPACITOR AND METHOD OF MANUFACTURE

Hiroshi Saito, Gunma; Mutsumi Honda, Takasaki; Hiroshi Kishi, Fujioka; Hisamitsu Shizuno, and Hirokazu Chazono, both of Takasaki, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

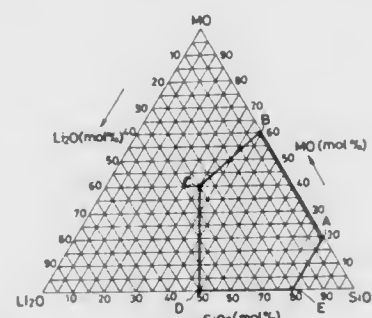
Filed Nov. 29, 1990, Ser. No. 620,840

Claims priority, application Japan, Dec. 4, 1989, 1-314755; Dec. 5, 1989, 1-315982

Int. Cl.⁵ H01G 4/12; C04B 35/46

U.S. Cl. 361—321

6 Claims



1. A solid dielectric capacitor comprising a dielectric ceramic body and at least two electrodes in contact therewith, the dielectric ceramic body consisting essentially of:

(a) 100 parts by weight of a major ingredient expressed by the formula,

$$(1-\alpha)\{(Ba_{k-x}M_x)O_k(Ti_{1-y}R_y)O_2-(y/2)\} + \alpha CaZrO_3$$

where

M is either or both of calcium and strontium;

R is at least one metal selected from scandium, yttrium, gadolinium, dysprosium, holmium, erbium, ytterbium, terbium, thulium and lutetium;

α is a numeral in the range of 0.005 to 0.040;

k is a numeral in the range of 1.00 to 1.05;

x is a numeral in the range of 0.005 to 0.050; and

y is a numeral greater than 0 and not greater than 0.04;

(b) greater than 0 and not greater than 3.00 parts by weight of chromium oxide aluminum oxide; or mixture thereof

(c) from 0.2 to 5.0 parts by weight of an additive mixture of (i) silicon oxide; (ii) boron oxide, lithium oxide, or mixtures thereof; and optionally (iii) and at least one metal oxide selected from the group consisting of barium oxide, strontium oxide, calcium oxide, magnesium oxide and zinc oxide.

5,089,934

ELECTRICAL SWITCHGEAR HAVING AN INSERTABLE AND RETRACTABLE APPARATUS RACK

Bodo Braun, Offenbach; Christian Bruszies, Ostfildern; Manfred Feuerbach, Frankfurt; Rolf-Guenter Genzel, Luetzelbach/odw; Josef Lobnig, Herzogenaurach, and Juergen Radatz, Frankfurt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

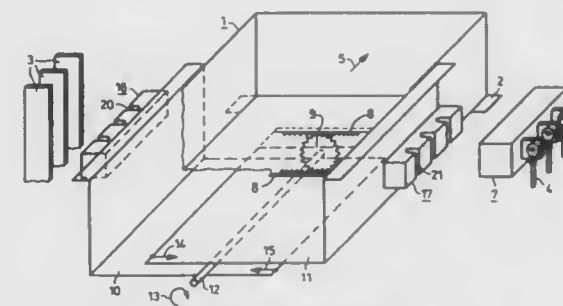
Filed Nov. 19, 1990, Ser. No. 615,591

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3939355

Int. Cl.⁵ H02B 1/10; H01H 9/20

U.S. Cl. 361—335

8 Claims



1. An electrical switchgear comprising:

a) an insertable and retractable apparatus rack for insertion into and retraction from a cabinet, said insertable and retractable apparatus rack supporting a switching device having main supply circuits;

b) a plurality of incoming supply contacts for contracting incoming supply conductors;

c) a first disconnect contact means mounted on said insertable and retractable apparatus rack for detachably connecting the main supply circuits via said plurality of incoming supply contacts to the plurality of incoming supply conductors, said first disconnect contact means having a first actuating direction which is perpendicular to a moving direction of said insertable and retractable apparatus rack during insertion and retraction in the cabinet, wherein said plurality of incoming supply contacts are mounted on said first disconnect contact means;

d) a plurality of outgoing circuit contacts for contacting outgoing circuits; and

e) a second disconnect contact means mounted on said insertable and retractable apparatus rack for connecting the switching device via said plurality of outgoing circuit contacts to the outgoing circuits, said second disconnect contact means having a second actuating direction perpendicular to said moving direction and which is parallel but opposite in direction to said first actuating direction, wherein said plurality of outgoing circuit contacts are mounted on said second disconnect contact means.

5,089,935

CONTROL DEVICE CASE

Eiji Ito, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,243

Claims priority, application Japan, Feb. 28, 1990, 2-47880

Int. Cl.⁵ H05K 7/20

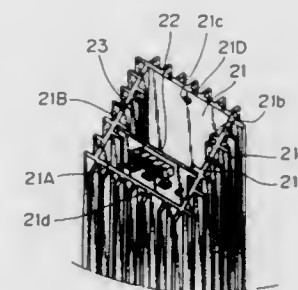
U.S. Cl. 361—383

11 Claims

1. A control device case, comprising:

a case body in the form of a rectangular hollow pipe having a substantially rectangular cross section, said case body having a printed circuit board holding structure formed on an inner periphery thereof for holding a printed circuit board on which an element which may generate heat is mounted, said case body having a plurality of cooling fins formed in an axial direction of said case body on an outer periphery thereof for radiating heat generated from the

element on the printing circuit board held on said printed circuit board holding structure of said case body, opposite ends of said case body in said axial direction being formed such that a length of a first wall of said case body is shorter than a length of an opposing second wall of said case body; and



a pair of covers mounted on opposite end portions of said case body in such a manner as to cover said opposite ends of said case body in said axial direction, each of said covers having an opening formed therein such that a member mounted on the printed circuit board may be manually operated therethrough.

5,089,936

SEMICONDUCTOR MODULE

Hiroyuki Kojima, Ushiku; Toshio Hatsuda, Ibaraki; Takahiro Daikoku, Ushiku; Shizuo Zushi, Hadano, and Fumiyuki Kobayashi, Sagami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

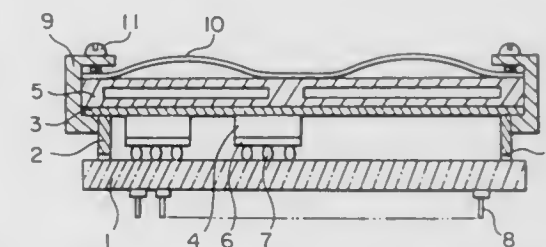
Filed Sep. 7, 1989, Ser. No. 404,341

Claims priority, application Japan, Sep. 9, 1988, 63-224646; Feb. 23, 1989, 1-044480

Int. Cl.⁵ H02B 1/00

U.S. Cl. 361—387

20 Claims



1. A semiconductor module including a wiring substrate having at least one semiconductor device electrically connected thereto; a housing including a sealing frame and ceiling board to enclose the at least one semiconductor device therein; a cooling jacket to cool said at least one semiconductor device, said cooling jacket including conduit means for enabling a flow of coolant therethrough; means for electrically connecting the semiconductor device to outside circuits; elastic means for exerting pressure on said cooling jacket to cause said cooling jacket to contact said ceiling board with equal pressure at plural locations; and means for pressing respective intermediate positions of four sides of the cooling jacket and the ceiling board through said elastic means.

5,089,937

POWER INTERFACE APPARATUS FOR A DC POWER DISTRIBUTION SYSTEM

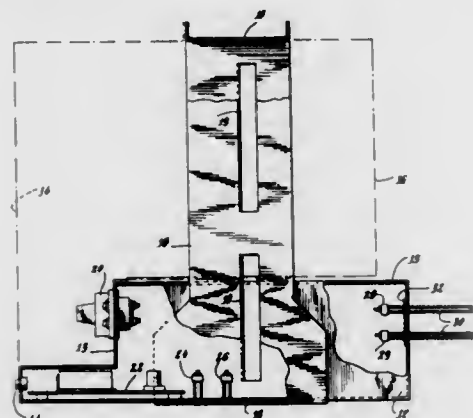
Vincent Carrubba, Norwalk, Conn.; Chris DiLeo, Brewster, and Patrick T. Campbell, North Salem, both of N.Y., assignors to V Band Corporation, Elmsford, N.Y.

Filed Jul. 20, 1990, Ser. No. 556,166

Int. Cl.⁵ H02B 1/18

U.S. Cl. 361—394

9 Claims



1. Power interface apparatus for providing a power distribution system from a plurality of separate power supply units comprising:

- a base receiving a plurality of separate power supply units; an AC bus and a DC bus in said base;
- means for applying a source of AC potential to said AC bus; a plurality of first connector means mounted in said base coupled to said AC and DC buses;
- said power supply units including a plurality of face plates each housing and covering the back of each of said power supply units;
- second connector means mounted in each of said face plates and mated with said first connector means and coupling each power supply unit positioned on said base to said AC bus and said DC bus in said base; and
- means in said base attached to said DC bus and having external access outside side base for accessing the DC power applied to said DC bus by said plurality of power supply units positioned on and coupled to said base.

5,089,938

COMPONENT MOUNTING ASSEMBLY

James S. White, Linden, and William W. Adams, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 24, 1991, Ser. No. 690,212

Int. Cl.⁵ H02B 1/01

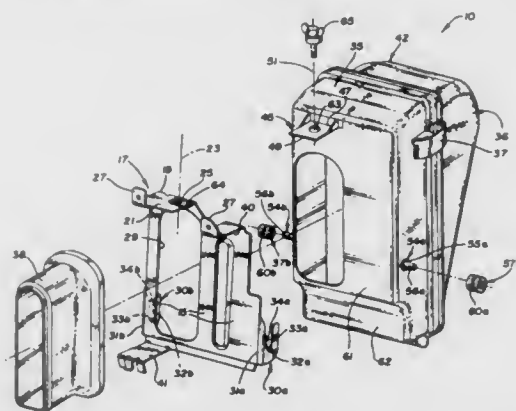
U.S. Cl. 361—427

8 Claims

1. A component mounting assembly comprising:
- a mounting bracket including a bracket member adapted to be fixed to a foundation member, a bracket flange comprising a bracket base and a bracket fastener surface, said bracket base being connected to said bracket member, said bracket fastener surface having a bracket fastener axis perpendicular thereto, said mounting bracket further including a first bracket shoulder having a first shoulder base and a first shoulder flange, said first shoulder base being connected to said bracket member so that said bracket base and first shoulder base lie in a bracket plane which is perpendicular to said bracket fastener surface and parallel to said bracket fastener axis, said first bracket shoulder extending away from said bracket plane in the opposite direction with respect to said bracket flange, said first shoulder flange having a first shoulder slot in a plane which is perpendicular to said bracket plane and an axis which is parallel to said bracket plane, said first shoulder

slot further having an end nearest said bracket flange which has a slot opening, said first shoulder flange being spaced apart from said bracket flange in a parallel direction with respect to said bracket fastener axis so that said bracket fastener surface faces away from said first bracket shoulder;

- a component support including a support member adapted to support a component, a support flange comprising a support base and a support fastener surface, said support base being connected to said support member, said support fastener surface having a support fastener axis perpendicular thereto, said component support further including a first support post having a first post base, a first post member and a first engagement portion having an outer diameter which is larger than the width of said first shoulder slot, said first engagement portion including an annular first groove having an inner diameter which is smaller than the width of said first shoulder slot, said first post base being connected to said support member so that



said first post based and support base lie in a support plane which is perpendicular with respect to said support fastener surface and parallel to said support fastener axis, said first support post extending away from said support member in a parallel direction with respect to said support plane and said support fastener surface, said first support post being spaced apart from said support flange in a parallel direction with respect to said support fastener axis so that said support fastener surface faces toward said first support post, said first support post being located with respect to said support flange so that when said support fastener surface engages said bracket fastener surface, said first groove can be inserted into said first shoulder slot with said support plane being parallel to said bracket plane; and

- a fastener means for attaching said support fastener surface to said bracket fastener surface when they are in engagement enabling said component support to be fixed to said mounting bracket.

5,089,939

SCHOOL BUS WARNING LIGHT FITTING

Joseph E. Baader, 333 Holiday Dr., Springfield, Ohio 45505

Filed Jan. 10, 1991, Ser. No. 639,439

Int. Cl.⁵ F21V 17/00

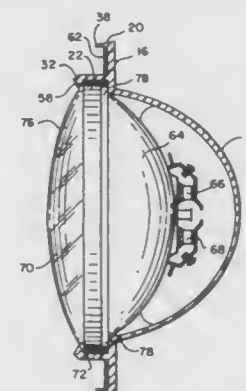
U.S. Cl. 362—61

1 Claim

1. A fitting for a vehicular warning lamp comprising in combination:

- a) an annular body defining on its top surface a circular rim adapted for supporting a lens cover superstructure and defining at its bottom a circular flange for supporting a general surface sealed beam light lamp of the type having a circumferential lamp seal defining an upper retaining flange and a lower seating plane surface; and a convex support strap extending outwardly and diametrically from the top to the bottom of said circular flange; and

- b) a lens superstructure comprising concave inner and outer surfaces terminating at an annular lens mounting surface, said lens superstructure further comprising a plurality of bosses formed extending from the periphery of said annular lens mounting surface wherein at least one of said bosses is a combination boss, including a bulb locating surface spaced apart from said circular rim, whereby when said annular lens mounting surface is held against



said lower seating plane surface said bulb locating surface is proximated said upper retaining flange, wherein said top circular rim includes a plurality of individual integrally formed tabs, each tab comprising an elongated shaft extending substantially normally away from said circular rim and with an inwardly directed projection surface on the distal end of said elongated shaft for complementary engagement with the upper retaining flange of a lens sealing rim.

5,089,940

FISH TANK AQUARIUM LIGHT HOOD

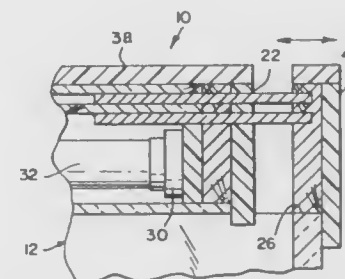
Patrick Lanzarone, 1349 80th St., Brooklyn, N.Y. 11228, and George Spector, 233 Broadway #3815, New York, N.Y. 10007

Filed Oct. 30, 1989, Ser. No. 429,133

Int. Cl.⁵ F21V 33/00

U.S. Cl. 362—101

3 Claims



1. An aquarium light hood for an aquarium tank which comprises:

- a) a box-like housing having an open back for ventilation to reduce buildup of heat and gases therein with front and two side walls having a bottom ledge to rest upon top edge of the aquarium tank;
- b) a lighting chamber in said housing with artificial lighting which projects light into the aquarium tank; wherein said housing further includes:
- c) a top portion having a channel therein for carrying electrical wiring away from said artificial lighting;
- d) internal grooves in said top portion, said grooves extended through an intermediate wall closing said chamber;
- e) a terminal box for ballast to provide power;
- f) a vented top door over said channel; wherein said housing further includes one of said side walls having tongue

means projecting slidably and sealingly into said grooves in said intermediate wall to adjust the hood size, the accommodate different sized aquarium tanks, and seal said lighting chamber in adjusted positions.

5,089,941

FLUX CONTAINMENT DEVICE

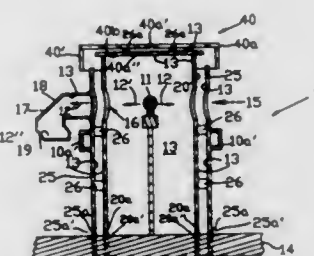
Robert F. Howarth, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1990, Ser. No. 579,004

Int. Cl.⁵ F21V 33/00

U.S. Cl. 362—154

8 Claims



1. An apparatus for containing extraneous flux radiated from a lamp projecting a reference level of energy comprising:

- a housing sized to receive said lamp therein being provided with an internal nonreflecting surface and being further provided with an optical calibration axis aperture for projecting said reference level of said energy therefrom and a light trap opening, said optical calibration axis aperture and said light trap opening being aligned with said lamp;
- a light trap mounted on said housing to enclose said light trap opening, to prevent 180 degree reflections of said extraneous flux from being projected with said reference level of said energy.

5,089,942

HEAD LAMP UNIT WITH MULTIPLE PASSING BEAM FILAMENTS PROVIDING IMPROVED PASSING BEAM

Tsunao Sekiguchi, Tokyo, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

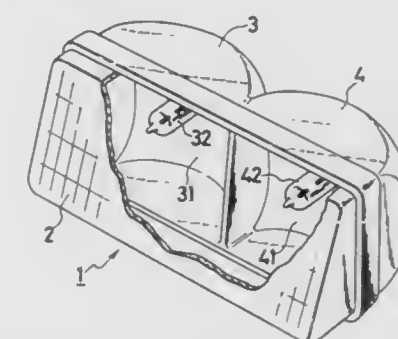
Filed Apr. 11, 1991, Ser. No. 684,046

Claims priority, application Japan, Apr. 20, 1990, 2-42143[U]

Int. Cl.⁵ F21M 3/14

U.S. Cl. 362—214

10 Claims



1. A head lamp unit comprising:

- first and second lighting fixtures arranged to form a single head lamp unit, said lighting fixtures being selectively energized to produce light beams;
- each of said lighting fixtures of said single head lamp unit comprising a running light beam filament for producing a running light beam and a passing light beam filament for producing a passing light beam;

said filament of each of said lighting fixtures of said single head lamp unit being selectively operable to selectively produce said running beam and said passing beam;
said first lighting fixture comprising light characteristic modifying means, including light directing means mounted adjacent the passing light beam filament thereof, for causing the passing light beam emitted by said passing light beam filament of said first lighting fixture to have a light distribution characteristic which is symmetrical to the left and right side directions; and
said second lighting fixture comprising light characteristic modifying means, including light directing means mounted adjacent the passing light beam filament thereof, for causing the passing light beam emitted by said passing light beam filament of said second lighting fixture to have a light distribution characteristic which is asymmetrical to the left and right side directions.

5,089,943

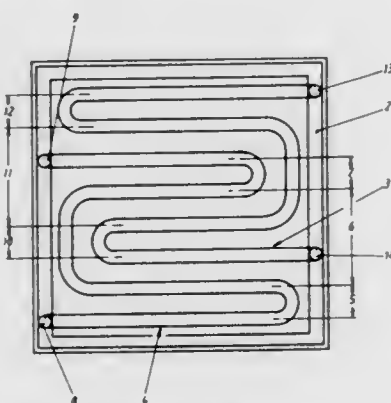
ILLUMINATING DEVICE, HAVING TWO IDENTICAL LAMPS CONNECTED IN PARALLEL

Lothar Wölfelschneider, Hattersheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 12, 1990, Ser. No. 626,102
Int. Cl.⁵ F21S 5/00; G02F 1/13

U.S. Cl. 362-216

2 Claims



1. An illuminating device for illuminating a rectangular surface, comprising
two identical lamps connected electrically in parallel; and
means for positioning the lamps in nested arrangement wherein
each lamp is developed as a gas-discharge tube of serpentine shape having at least one narrow U-shaped region and an adjoining wider U-shaped region;
each lamp has its U-shaped regions nested within the U-shaped regions of the other lamp providing for engagement of the narrow U-shaped region of one lamp into the wider U-shaped region of the other lamp; and
each of said lamps has, in sequential order, a first narrow U-shaped region, a wider U-shaped region and, adjoining same, a second narrow U-shaped region which is shorter than the first narrow U-shaped region.

5,089,944

PLANAR LIGHT-SOURCE DEVICE AND ILLUMINATION APPARATUS USING THE SAME

Makoto Oe, and Issei Chiba, both of Kawasaki, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Division of Ser. No. 512,447, Apr. 23, 1990, Pat. No. 5,034,864.

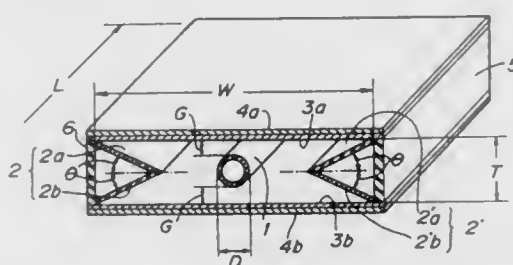
This application Feb. 7, 1991, Ser. No. 652,070

Claims priority, application Japan, Apr. 25, 1989, 1-105524; Aug. 21, 1989, 1-213023; Aug. 30, 1989, 1-221652; Oct. 19, 1989, 1-270331; Jan. 9, 1990, 2-964

Int. Cl.⁵ F21S 3/00

U.S. Cl. 362-224

4 Claims



1. A box-type planar light-source device for illuminating both sides, which has incorporated therein a linear light source or a light source arranged linearly and which is provided, at its opposite front and rear faces, with respective multi-prism sheets and, at its both side surfaces, with respective reflecting surfaces, characterized in that said reflecting surfaces have their generally wedge-like cross-section in which their forward sharp ends are oriented toward the light source, and said reflecting surfaces are so arranged as to extend in parallel relation to said light source, that each of said reflecting surfaces has such function that major portions of lights reflected respectively by a front-face side portion and a rear-face side portion of the reflecting surface are obliquely incident upon said multi-prism sheets on said front-face side and said rear-face side, that said multi-prism sheets have their inner surfaces formed respectively with groups of prisms so arranged as to extend in parallel relation to the light sources and having such function that the light incident directly or obliquely in reflection outgoes in concentration toward a predetermined direction, and that a dark-portion removing sheet for eliminating a dark portion at a location immediately above the light sources is arranged on the side of the front face of each of said multi-prism sheets.

5,089,945

HIGH-INTENSITY UNDERWATER LIGHT SOURCE

Richard Mula, Oakland, Calif., assignor to Hydroimage, Los Angeles, Calif.

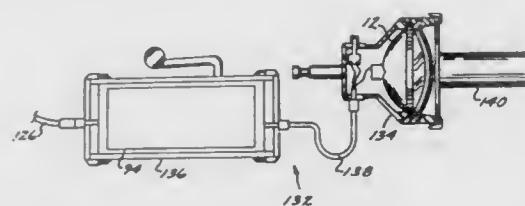
Division of Ser. No. 354,981, May 17, 1989, Pat. No. 5,016,151.

This application Mar. 18, 1991, Ser. No. 672,051

Int. Cl.⁵ F21V 31/00

U.S. Cl. 362-261

9 Claims



1. An underwater light source, comprising:
a sealed beam lamp;
a lamp shell sealed against leakage of water and made of aluminum, the shell having a front end and being sufficiently large to receive the lamp therein with the lamp positioned to direct its beam out of the front end of the lamp shell;

a retainer that holds the lamp in place within the lamp shell;
a heat resistant glass cover on the front end having a reflector formed integrally with said sealed beam lamp of the lamp shell;
an ignitor connected to the lamp; and
an ignitor shell sealed against leakage of water, the ignitor shell being sufficiently large to receive the ignitor therein, wherein the lamp shell and the ignitor shell are separate units; and
a power cable that extends between the shells from the ignitor to the lamp.

5,089,946

UNIVERSAL LIGHT BEAM MANIPULATOR

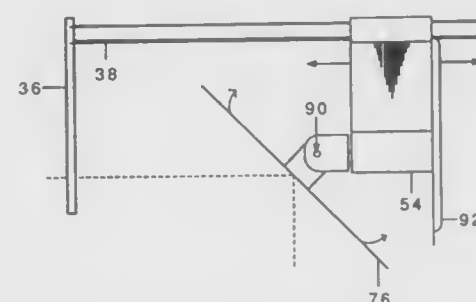
Thomas A. Mayer, 4320-B Unveristy Dr., Huntsville, Ala. 35816, and Mark W. Spivey, 4413 Grier St., Gastonia, N.C. 28054

Filed Jul. 10, 1991, Ser. No. 727,876

Int. Cl.⁵ F21V 17/02

U.S. Cl. 362-284

1 Claim



1. A light beam manipulator for converting any known lighting fixture to a remotely controllable lighting fixture, comprising:
a frame plate of sufficient size and shape to attach to the end of said lighting fixture,
a plurality of axles with attachment means to said frame plate,
a main plate,
openings in said main plate to allow said axles to support said main plate along the length of said axles,
said main plate has an opening for attachment of a universal joint,
a first body of said universal joint mounted to said main plate for rotation about a pan axis,
a second body of said universal joint mounted in said first body for rotation about a tilt axis,
a reflecting means mounted to said universal joint,
a first motor system mounted to said main plate to induce movement of said first body of said universal joint in said pan axis,
a second motor system mounted to said main plate to induce movement of said second body of said universal joint in said tilt axis,
a linkage assembly to transmit said first motor inertia to said first body of said universal joint,
a linkage assembly to transmit said second motor inertia to said second body of said universal joint,
a means for receiving, translating, and utilizing a control signal for controlling said motors and linkage assemblies.

5,089,947

POWER SUPPLY CIRCUIT FEATURING MINIMUM PARTS COUNT

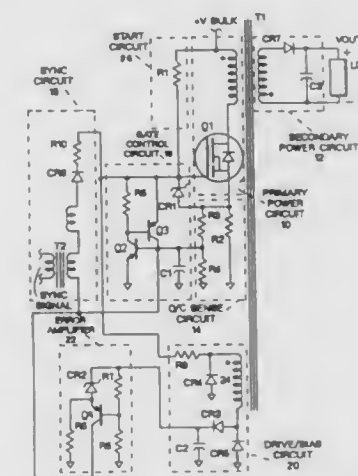
Carleton D. Driscoll, Cary; Ronald S. Jungling, Raleigh, and Elie M. Najm, Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1990, Ser. No. 546,209

Int. Cl.⁵ H02M 3/335

U.S. Cl. 363-20

10 Claims



1. In a display system having a display subsystem and a power subsystem with the power subsystem comprising:
a blocking oscillator power supply including a power transformer having a primary and a secondary winding for providing current to the display subsystem and a first switching device connect to one end of the primary winding;
a control circuit arrangement for turning off the switching device coupled to a gate electrode of the switching device;
a sync circuit arrangement for generating a "Start" pulse coupled to the gate electrode of said switching device;
a control winding disposed on a primary side of said transformer;
a first circuit arrangement interconnecting one end of the control winding to the gate electrode;
a second circuit arrangement interconnecting another end of the control winding to the control circuit arrangement;
said first and second circuit arrangements coacting so that if a voltage with a first polarity is developed on said control winding the first circuit arrangement allows current to flow into the gate electrode while the second circuit arrangement blocks current flow and if the polarity of the voltage is reversed on said control winding the first circuit arrangement blocks current while the second circuit arrangement allows current to flow into the control circuit arrangement to turn off the first switching device.

5,089,948

HIGH SPEED OPTOISOLATOR SWITCHING APPARATUS

Peter J. Brown, Springfield, Mass., and Suresh Hariharan, Orchard Park, N.Y., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,117

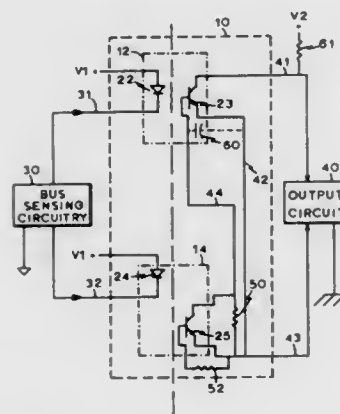
Int. Cl.⁵ H03K 5/08

U.S. Cl. 363-58

13 Claims

1. Apparatus for controlling a circuit of an electronic apparatus in response to sensing of an electrical condition, said apparatus comprising:
means for sensing the electrical condition and for providing complementary output signals;
means for effecting control of said circuit;

output means responsive to a state transition of one of said complementary signals for providing an input to said means for effecting control of said circuit; and



control means responsive to the other of said complementary signals upon said state transition for effecting instantaneous response of said means for effecting control of said circuit.

5,089,949

HIGH EFFICIENCY PASSIVE COMPONENT VOLTAGE CONVERTER

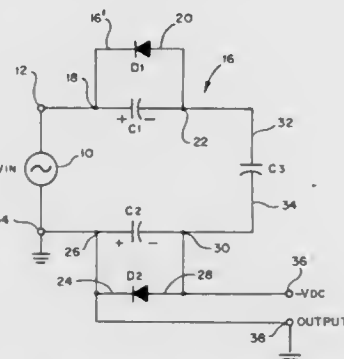
Peter D. Gentile, N. Merrick, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 27, 1990, Ser. No. 572,552

Int. Cl.⁵ H02M 7/06

U.S. Cl. 363—126

1 Claim



1. An AC-DC voltage converter free of inductive components and comprising:
first and second AC voltage input terminals;
first and second interconnected polarized capacitors having first terminals of identical polarity connected in circuit to respective input terminals;
a bi-polar capacitor having its terminals connected to second terminals, of identical opposite polarity, of the first and second polarized capacitors; and
a diode connected across each of the polarized capacitors for limiting the voltage thereacross and rectifying the voltage impressed upon a polarized capacitor in a symmetrical leg; the voltage across each polarized capacitor being a pulsating DC signal, one of which serves as an output signal.

5,089,950

PART PROFILE INPUT METHOD

Mitsuto Miyata; Teruyuki Matsumura, both of Tokyo, and Noritake Nagashima, Kanagawa, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/01260, § 371 Date Aug. 14, 1989, § 102(e) Date Aug. 14, 1989, PCT Pub. No. WO89/06004, PCT Pub. Date Jun. 29, 1989

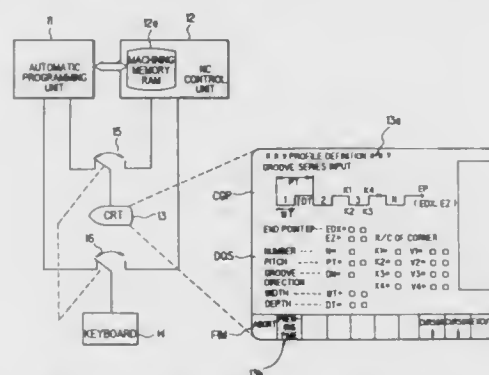
PCT Filed Dec. 13, 1988, Ser. No. 397,455

Claims priority, application Japan, Dec. 17, 1987, 62-319388

Int. Cl.⁵ G05B 19/403; G06F 3/153, 15/40

U.S. Cl. 364—191

4 Claims



1. A part profile input method in a numerical control data creating apparatus in which a part profile is specified by inputting profile elements of a part using arrow keys and inputting coordinate values for specifying each of the profile elements, and numerical control data are created to machine a blank in accordance with the part profile specified, said method comprising the steps of:

- providing a plurality of profile menus for designating a profile pattern of one of a repeating shape and a standardized shape contained in the part profile;
- selecting a desired profile pattern using the profile menus provided in step (a);
- displaying the desired profile pattern selected in step (b) on a display screen and displaying a message to request various dimensions of the desired profile pattern;
- specifying one of the repeating shape and the standardized shape based on the various dimensions entered in response to the message;
- dividing one of the repeating shape and the standardized shape selected as the desired profile pattern in step (b) into separate profile elements;
- calculating coordinate values for specifying the separate profile elements;
- storing the coordinate values; and
- displaying one of the repeating shape and the standardized shape in a form attached to the part profile previously input.

5,089,951

MICROCOMPUTER INCORPORATING MEMORY

Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 2, 1988, Ser. No. 266,006

Claims priority, application Japan, Nov. 5, 1987, 62-280210; Nov. 5, 1987, 62-280212

Int. Cl.⁵ G06F 12/14, 13/16

U.S. Cl. 395—275

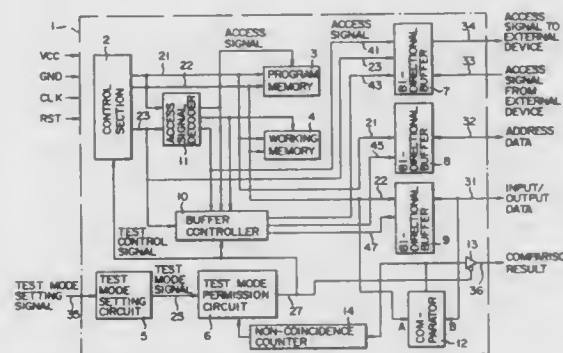
23 Claims

1. A microcomputer comprising:
memory means for storing data;
memory access means for accessing said memory means;
input/output means for inputting and outputting data from and to a device external to said microcomputer;
output inhibiting means, connected to said memory means, for inhibiting external output through said input/output

means of data derived from an access operation to said memory means;

access source determining means for determining whether access of said memory means is performed by said memory access means or is externally performed through said input/output means; and

control means for controlling said output inhibiting means to inhibit external output through said input/output means of



said data derived from the access to said memory means when said access source determining determines that the access is performed by said memory access means, and form controlling said output inhibiting means to allow external output through said input/output means of data derived from the access when said access source determining means determines that the access is externally performed.

5,089,952

METHOD FOR ALLOWING WEAK SEARCHERS TO ACCESS POINTER-CONNECTED DATA STRUCTURES WITHOUT LOCKING

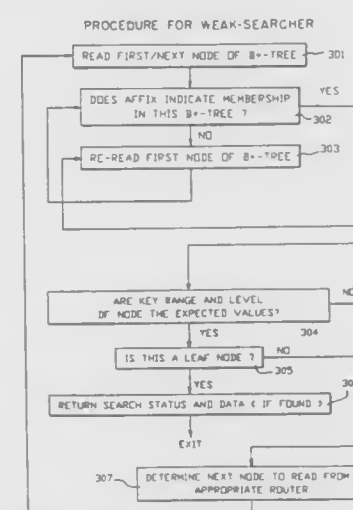
Gerald P. Bozman, Oakland, N.J., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1988, Ser. No. 255,000

Int. Cl.⁵ G06F 7/00, 9/36, 7/34

U.S. Cl. 395—725

11 Claims



1. A computer implemented method for performing an update to a data structure of nodes connected by address pointers while permitting weak searcher processes including processes which seek to read data values with no intent to update them and which can accept data values which were valid at some-time between beginning and end of the search, to read the data structure without locking, comprising, the steps of:

if the domain of said update is contained in one node, updating said data structure by updating said one node in place; if the domain of said update exceeds one node, updating said data structure by updating the deepest safe node in said domain in place and shadow-writing updated nodes in said domain other than said deepest safe node;

giving weak searcher processes read access to said data structure without placing locks on nodes in said data structure; and

providing a procedure for reusing storage occupied by nodes that become disconnected from said data structure as a result of said shadow-writing of updated nodes, said procedure for reusing storage also allowing weak searcher processes that may be searching in said nodes which become disconnected to successfully complete their search.

5,089,953

CONTROL AND ARBITRATION UNIT

Frank J. Ludicky, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

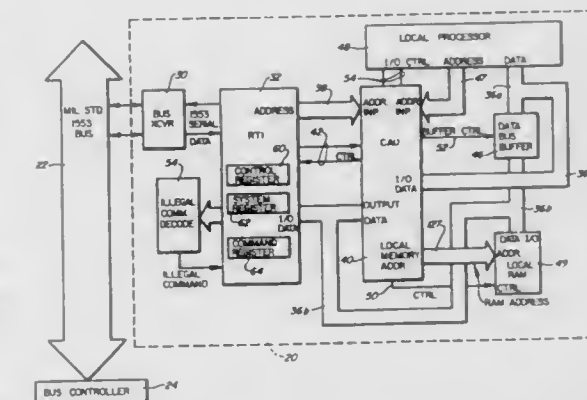
Continuation of Ser. No. 138,202, Dec. 28, 1987, abandoned.

This application Aug. 3, 1990, Ser. No. 563,833

Int. Cl.⁵ G06F 13/36

U.S. Cl. 395—425

13 Claims



1. In a remote terminal coupled to a system bus wherein the remote terminal includes a remote terminal interface (RTI) which communicates with the bus, a local processor and a local memory, the improvement comprising:

- a bus buffer; and
- a control and arbitration unit (CAU) coupled to the bus buffer for managing data flow between the RTI, the local processor and the local memory, including memory address inputs for receiving an address signal from either of the RTI and the local processor representing a memory location of the local memory to be accessed, memory address outputs coupled to the local memory for transmitting the address signal to the local memory which causes accessing of the memory location in response to the signals at the memory inputs, CAU data inputs coupled to data input/output lines of the local processor for receiving data therefrom over a first, bidirectional local bus and CAU data outputs coupled to a second, bidirectional local bus wherein the second local bus is also coupled to the local memory and to a series of data input/output (I/O) lines of the RTI whereby a first path for data is established between the system bus and the local memory via the RTI data I/O lines and the second local bus, a second path for data is established from the local processor to the local memory via the first local bus, the CAU data inputs, the CAU data outputs and the second local bus and a third path for data is established from the local memory to the local processor over the second and first local buses via the bus buffer under control of the CAU.

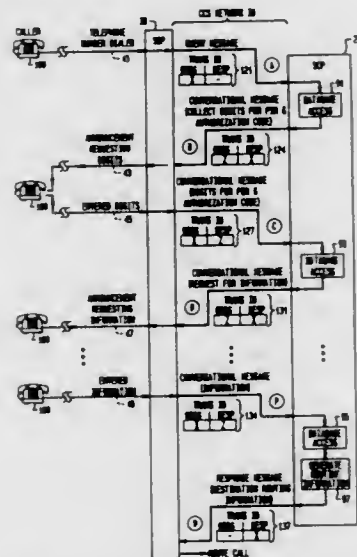
5,089,954
METHOD FOR HANDLING CONVERSATIONAL
TRANSACTIONS IN A DISTRIBUTED PROCESSING
ENVIRONMENT

Vito Rago, Brooklyn, N.Y., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 8, 1988, Ser. No. 229,241
 Int. Cl.³ G06F 13/14

U.S. Cl. 395—600

22 Claims



1. In a distributed processing system having at least an originating and a responding node connected through a communication path wherein the responding node comprises a plurality of processors and a memory device, wherein each of said processors has a corresponding database associated therewith and residing within said memory device, a method for use in processing successive portions of a conversational transaction using different ones of said processors comprising the steps of:

- in a first one of the processors in said responding node:
 - processing a first portion of a conversational transaction as specified by a first record, wherein the first record defines a manner in which the conversational transaction is to be completely processed and is located within a first database residing within the memory device and associated with the first processor;
 - storing context information for the conversational transaction as a second record at a pre-defined address in the first database, wherein the context information defines a current state of the conversational transaction; and
 - producing a first message, as part of the conversational transaction for transmission from said responding node over said communication path to said originating node wherein the first message contains a request for application information from the originating node, and a first transaction identifier field having a value that corresponds to said pre-defined address, said application information being defined by the first record and required for processing a second portion of the conversational transaction subsequent to said first portion;
- in said originating node:
 - generating a second message, as part of said conversational transaction and in response to said first message, for transmission over said communication path to said responding node, wherein said second message contains the application information, furnished in response to said request, and a second transaction identifier field having the same value as the first transaction identifier field; and
- in a second one of said processors in said responding node and different from the first one of said processors:
 - receiving said second message;
 - generating the pre-defined address from the value of the

second transaction identifier field contained in the second message;

accessing, in response to said pre-defined address generating step, the context information from said first database; and

processing the second portion of the conversational transaction using the application information contained in said second message and commencing at a point in the first record defined by the context information.

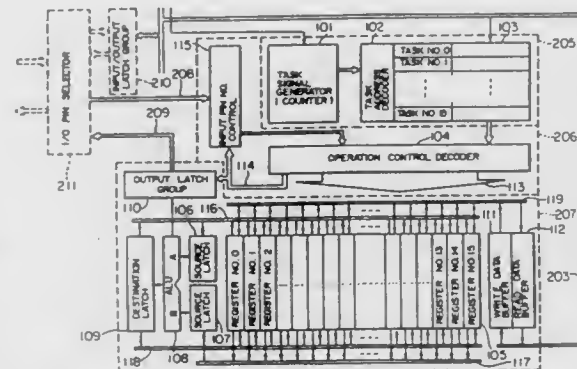
5,089,955
PROGRAMMABLE COUNTER/TIMER DEVICE WITH
PROGRAMMABLE REGISTERS HAVING
PROGRAMMABLE FUNCTIONS

Shigeki Morinaga, and Mitsuru Watabe, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
 Continuation of Ser. No. 284,388, Dec. 14, 1988, Pat. No. 4,930,100, which is a continuation of Ser. No. 793,350, Oct. 31, 1985, abandoned. This application Feb. 26, 1990, Ser. No. 484,909

Claims priority, application Japan, Nov. 2, 1984, 59-230202
 Int. Cl.³ G06F 7/02; H03K 21/00

U.S. Cl. 395—800

8 Claims



- 1. A programmable pulse input/output processing system, comprising:
 - a microcomputer including a central processing unit; and
 - a programmable pulse input/output processing unit connected to said microcomputer through a system bus, said programmable pulse input/output processing unit comprising:
 - (a) task instruction generating means for generating task instructions corresponding to pulse processing operations;
 - (b) operation means for performing pulse processing operations, and including (a) a register group made up of a plurality of registers each being selectively programmable to perform any of a plurality of register functions necessary for said pulse processing operations, said plurality of register functions including a counter/timer function, a compare function and a capture function, such that the number of counter/timer function registers, compare function registers and capture function registers can be freely changed to control various operations of said microcomputer, (b) an arithmetic unit for performing an arithmetic/logic operation on the basis of data from said register group, and (c) bus means for transferring data between said register group and said arithmetic unit;
 - (c) interface bus means for transferring data between said register group and said central processing unit through said system bus; and
 - (d) task instruction control means connected to said task instruction generating means and said operation means, and being responsive to a task instruction generated by said task instruction generating means, for specifying at

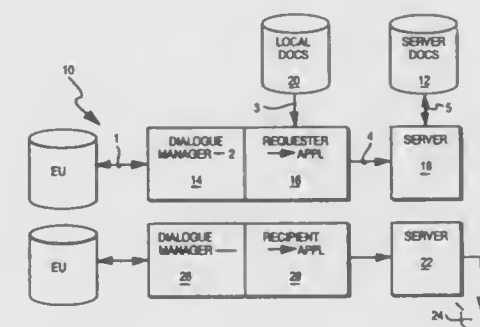
least one of said plurality of registers included in said register group of said operation means to be used for a particular pulse processing operation, and for causing said arithmetic unit to perform an arithmetic/logic operation corresponding to said task instruction on the basis of data contained in said at least one of said plurality of registers.

5,089,956
METHOD OF DISTRIBUTING RELATED DOCUMENTS
TO IDENTIFIED END USERS IN AN INFORMATION
PROCESSING SYSTEM

Margaret G. MacPhail, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
 Filed Nov. 29, 1988, Ser. No. 277,390
 Int. Cl.³ G06F 15/40, 15/403

U.S. Cl. 395—600

5 Claims



1. In an information processing system having a plurality of documents stored therein, a method of distributing stapled documents to at least one end user of said system, said method comprising the steps of:

- identifying by a first one of said end users, at least one of said plurality of documents having a directed relationship, said documents within said directed relationship are stapled documents, and at least one end user, other than said first end user to receive said identified document having a directed relationship and defining the stapled documents by indicating that a first of at least two of said plurality of documents is stapled by another of said plurality of documents and by indicating the physical location of said at least two of said plurality of documents to be distributed; and
- processing, by said information processing system to transmit an electronic representation of said identified at least one of said plurality of documents and other documents in said directed relationship associated with said identified at least one document to said at least one of said identified end users.

5,089,957
RAM BASED EVENTS COUNTER APPARATUS AND
METHOD

Perry S. Stultz, Gorham, Me., and James R. Hamstra, Shorewood, Minn., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 14, 1989, Ser. No. 436,212
 Int. Cl.³ G06F 9/34, 11/34

U.S. Cl. 395—425

10 Claims

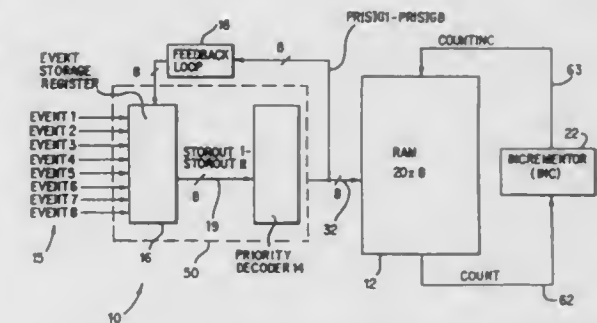
1. A prioritized memory-based event counter for counting the number of occurrences of each of a plurality of events in accordance with a preselected priority assigned to each of the events, the event counter responsive to a parallel, multi-bit data input signal comprising a plurality of data bits, each data bit being associated with a corresponding one of the events such that said data bit having a first logic state indicates the occurrence of said corresponding event and said data bit having a second logic state indicates the non-occurrence of said corresponding event, the event counter comprising:

- (a) a memory element that includes a plurality of count value

storage locations, each storage location storing a corresponding count value indicating the number of occurrences of one of the events, each storage location having a corresponding access address associated therewith such that the memory element responds to receipt of said access address by providing the count value stored in said storage location as a memory element output signal;

(b) a storage register that stores the plurality of data bits and responds to a clock signal by providing a parallel storage register output signal that includes the plurality of data bits;

(c) a priority decoder that decodes the storage register output signal based on the logic state of each of the plurality



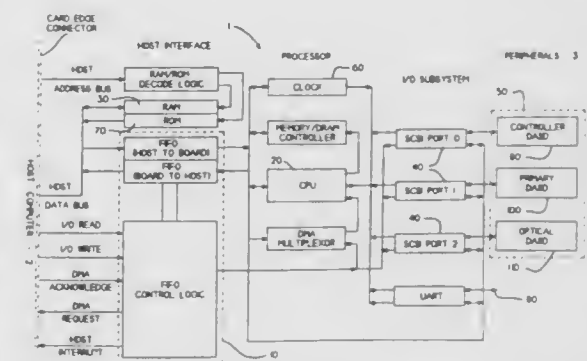
of data bits to provide a priority decoder output signal that includes the access address of the memory element storage location that stores the count value of the event corresponding to a priority data bit included in the plurality of data bits and having the first logic state and having the highest assigned priority of all data bits having the first logic state, the memory element being responsive to said access address for providing said count value as the memory element output signal; and

(d) incrementing means responsive to said count value for incrementing said count value and storing said incremented count value to said accessed memory element storage location.

5,089,958
FAULT TOLERANT COMPUTER BACKUP SYSTEM
 James A. Horton, Bethlehem, and Stephen M. Getz, Pittsburgh, both of Pa., assignors to Vortex Systems, Inc., Pittsburgh, Pa.
 Filed Jan. 23, 1989, Ser. No. 300,469
 Int. Cl.³ G06F 11/16

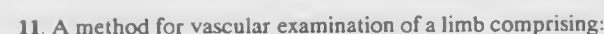
U.S. Cl. 395—575

19 Claims

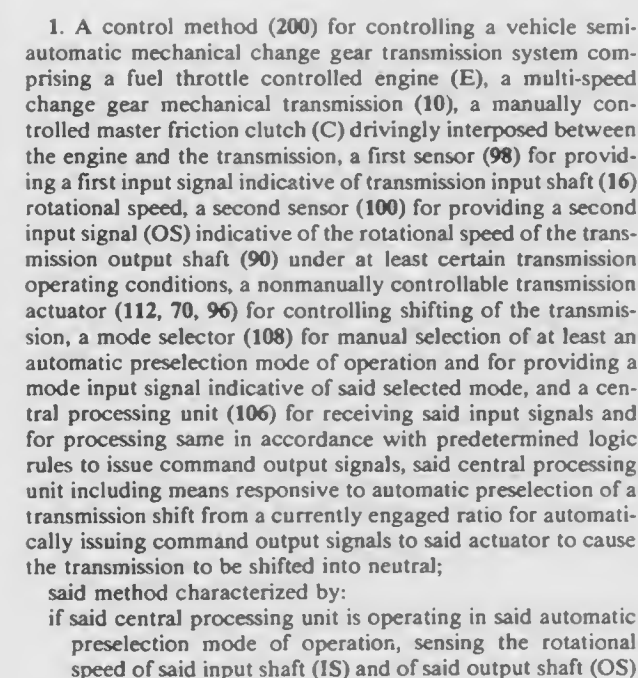
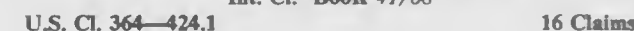


1. A method for storing and retrieving any state of a computer system which has occurred within a time period between a point in time at which the computer system contains at least one of a program and data in an initial state and some later point in time and during the time period data is transferred and

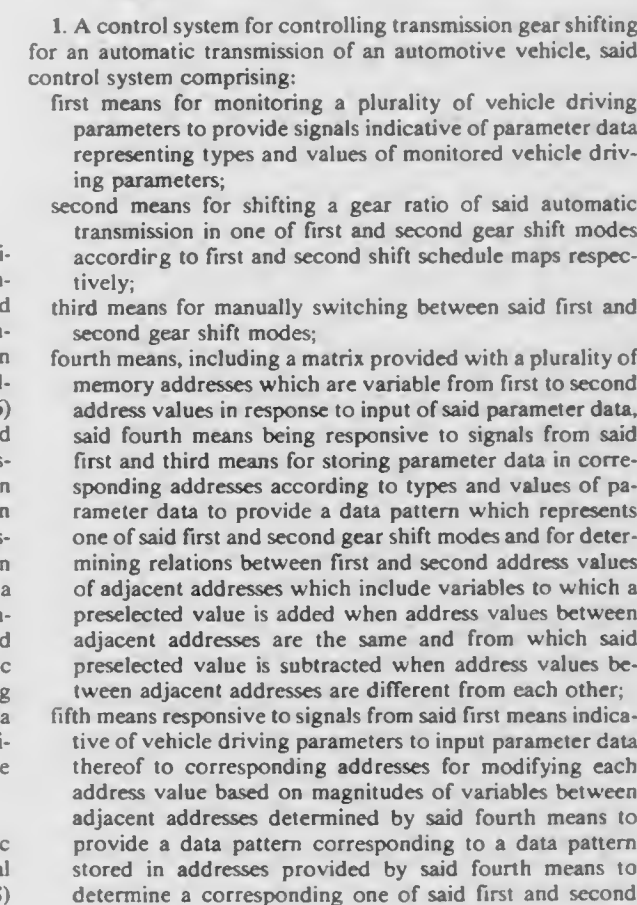
U.S. Cl. 364-410 25 Claims



U.S. Cl. 364-406 59 Claims



U.S. Cl. 364—424.1 10 Claims



gear shift modes and for providing a signal indicative thereof; and
sixth means associated with said second means for changing between said first and second shift modes based on said signal from said fifth means.

5,089,964

HYDRAULIC TRANSMISSION CONTROL SYSTEM
Chitoshi Morishige, and Tomoo Sawasaki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

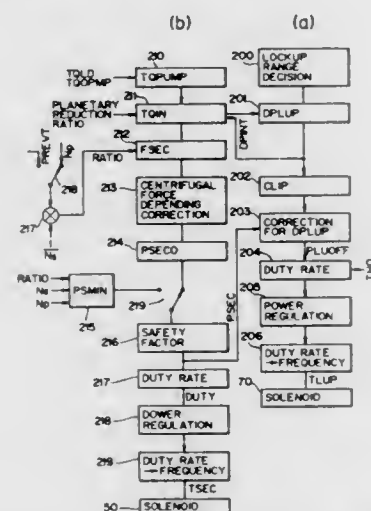
Filed Jan. 19, 1990, Ser. No. 466,231

Claims priority, application Japan, Jan. 19, 1989, 1-10430

Int. Cl. B60K 41/12

U.S. Cl. 364-424.1

9 Claims



1. A control system for a hydraulically controlled steplessly variable transmission having primary and secondary pulley assemblies operationally coupled to each other by means of a belt and variable in effective diameter to steplessly vary a transmission ratio of the hydraulically controlled steplessly variable transmission comprising:

- a hydraulic pump for developing a basic line pressure in the control system according to an engine output transmitted to the primary pulley from an engine;
- a regulator valve for regulating said basic line pressure;
- a duty solenoid for regulating a pilot pressure for said regulator valve so that said regulator valve regulates the basic line pressure; and
- a control unit for calculating a minimum line pressure according to the centrifugal force of the primary and secondary pulley assemblies and a ratio of thrusts exerted on the primary and secondary pulley assemblies, and a desired line pressure necessary to cause the hydraulically controlled steplessly variable transmission to operate at a desired transmission ratio thereof according to a thrust, acting on one of the primary and secondary pulley assemblies and decreased according to a centrifugal force of the one of the primary and secondary pulley assemblies, selecting the higher of the minimum line pressure and the desired line pressure, and operating said duty solenoid so that said regulator valve produces the selected pressure as said basic line pressure.

5,089,965

**SHIFT PROHIBITING FOR AUTOMATIC SHIFT
PRESELECTION MODE FOR MECHANICAL
TRANSMISSION SYSTEM WITH SEMI-AUTOMATIC
SHIFT IMPLEMENTATION**

Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

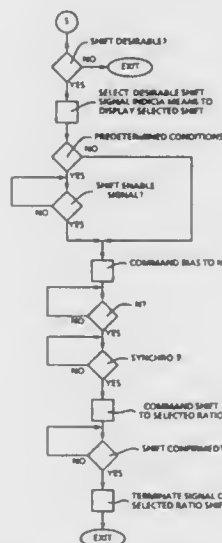
Filed Jul. 24, 1989, Ser. No. 383,686

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl. B60K 41/18

U.S. Cl. 364-424.1

49 Claims



12. A control system (104) for semi-automatic implementation of manually and automatically selected shifts of a vehicular mechanical change gear transmission system comprising a manually controlled fuel throttle controlled engine (E), a multi-speed change gear mechanical transmission (10), a manually controlled master friction clutch (C) drivingly interposed between the engine and the transmission, a first sensor (98) for providing a first input signal indicative of transmission input shaft (16) rotational speed, a second sensor (100) for providing a second input signal indicative of the rotational speed of a transmission shaft (90) independently rotatable relative to the transmission input shaft under at least certain transmission operating conditions and a non-manually controllable transmission actuator (112, 70, 96) for controlling shifting of the transmission, said control system characterized by:

a third sensor (150) for sensing operator manual issuance of a third shift enable input signal.

means (120, 122, 124/132) for manually selecting an upshift or a downshift from a currently engaged transmission ratio or from neutral to a selected ratio and for manually selecting operation in an automatic preselect mode, and providing a fourth input signal indicative of said selection; indicia means (120, 122, 124) for indicating selection of the automatic preselect mode and for indicating selection but not confirmed execution of a shift from the currently engaged transmission ratio;

a central processing unit (106) for receiving said first, second, third and fourth input signals and for processing same in accordance with predetermined logic rules to issue command output signals, said central processing unit including;

(a) means responsive to manual selection of operation in an automatic mode (i) for issuing a command output signal to said indicia means to indicate that the automatic preselect mode has been selected, (ii) for determining the desirability of a shift from the currently engaged ratio and to select such a shift if desirable and (iii) for issuing command output signals to said indicia means to provide an indica-

tion that an upshift or downshift, as appropriate, has been selected;

(b) means responsive to (i) selection of a transmission shift from a currently engaged ratio and (ii) under preselected conditions sensing manual issuance of said third input signal for issuing command output signals to said actuator to bias the transmission to be shifted into neutral;

(c) means responsive to (i) a selection of a shift from a currently engaged ratio into a selected ratio and (ii) confirmation of a transmission neutral condition for (i) sensing manual substantial synchronization of the transmission and (ii) thereafter for issuing command output signals to said actuator to cause the transmission to be shifted into the selected ratio

(d) means for confirming execution of a selected shift and for issuing command output signals to said indicia means to terminate the indication of a selected shift.

5,089,966

**ACTIVELY CONTROLLED AUTOMOTIVE SUSPENSION
SYSTEM WITH IMPROVED DAMPING
CHARACTERISTICS**

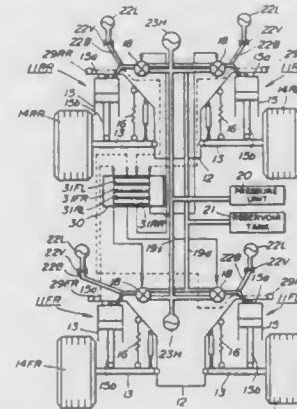
Naoto Fukushima; Hirotugu Yamaguchi; Yohsuke Akatsu; Sunao Hano, and Kazunobu Kawabata, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 449,416, Dec. 15, 1989, abandoned, which is a continuation of Ser. No. 59,888, Jun. 9, 1987, abandoned. This application Feb. 22, 1991, Ser. No. 660,231

Claims priority, application Japan, Jun. 10, 1986, 61-134218 Int. Cl. B60G 17/015

U.S. Cl. 364-424.05

11 Claims



1. An actively controlled suspension system for an automotive vehicle comprising:

- a suspension assembly including a variable pressure chamber filled with a working fluid, said variable pressure chamber including a fluid operated cylinder;
- a pressure source connected to said fluid operated cylinder for supplying pressurized working fluid;
- pressure adjusting means, interposed between said fluid operated cylinder and said pressure source, for adjusting fluid pressure in said fluid operated cylinder;
- sensor means for monitoring vehicular attitude for producing a vehicular attitude indicating signal;
- a controller, receiving said vehicular attitude indicating signal, for deriving a control signal to suppress attitude change of said vehicle for controlling said pressure adjusting means;
- said suspension assembly including a suspension member rotatably supporting a vehicular wheel, and said fluid operated cylinder being disposed between said suspension member and a corresponding section of a vehicle body, said fluid operated cylinder varying fluid pressure therein in response to relatively high frequency vibration input

from said suspension member in order to absorb vibration energy;

said sensor means being provided on said vehicle body for monitoring an acceleration of bounding and rebounding, absolute motion of said vehicle body for producing a bounding and rebounding absolute motion acceleration indicating signal as said vehicular attitude indicating signal;

said controller deriving a bounding and rebounding absolute motion speed based on said bounding and rebounding absolute motion acceleration indicating signal and detecting the vehicular attitude change based on said bounding and rebounding absolute motion acceleration and said bounding and rebounding absolute motion speed for deriving said control signal; and

said control signal from said controller being generated in a manner to linearly vary with regard to the sum of a bounding and rebounding acceleration based on said bounding and rebounding absolute motion acceleration indicating signal and a first gain and a bounding and rebounding speed based on said bounding and rebounding absolute motion speed indicating signal and a second gain, both of said acceleration and speed being monitored on a corresponding suspended section, such that damping force characteristics of said fluid operated cylinder are unaffected by a relatively high frequency vibration input from said suspension member, so as to maintain optimal vehicular attitude.

5,089,967

**AUXILIARY STEERING SYSTEM ASSOCIATED WITH
ANTI-SKID CONTROL SYSTEM FOR USE IN MOTOR
VEHICLE**

Satoshi Haseda; Shinji Hiraiwa, both of Okazaki; Youzou Majima, Kariya; Fumiaki Murakami, Kariya; Masatoshi Kuroyanagi, Kariya, and Takaji Murakawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 230,743, Aug. 10, 1988, abandoned.

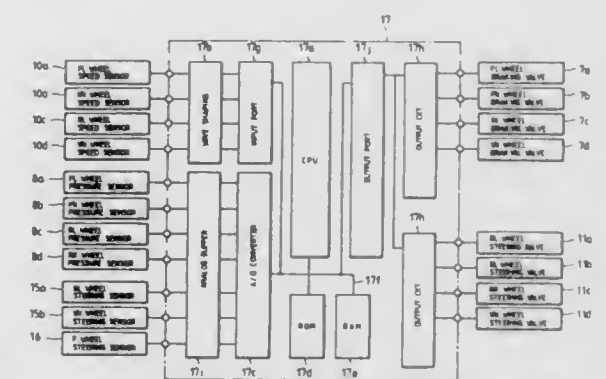
This application Aug. 20, 1990, Ser. No. 569,579

Claims priority, application Japan, Aug. 10, 1987, 62-200305; Sep. 10, 1987, 62-226991; Nov. 17, 1987, 62-290323; Dec. 26, 1987, 62-331033

Int. Cl. B60T 8/62

U.S. Cl. 364-426.02

19 Claims



1. A control system for use in a motor vehicle with two pairs of left and right wheels, comprising:

- a braking control device for independently controlling braking pressures for at least one of said pairs of left and right wheels, said braking control device including:
- braking actuator means for adjusting braking pressures to be applied to said pair of left and right wheels in response to braking control signals;
- wheel sensor means for sensing rotation speeds of said pair of left and right wheels and generating signals indicative of the sensed rotational speeds thereof;
- target braking pressure determining means for determining target braking pressures for said pair of left and right

wheels on the basis of said rotational speed signals from said wheel sensor means; and
braking pressure control means for outputting said braking control signals to said braking actuator means so that the braking pressures for said pair of left and right wheels assume the determined target braking pressures, respectively; and

a steering control device for controlling the steering of said pair of left and right wheels in connection with the braking control performed by said braking control device, said steering control device including:

steering actuator means for adjusting steering angles of said pair of left and right wheels in response to steering control signals; and

steering angle control means for determining the steering angles of said pair of left and right wheels on the basis of the braking pressures for said pair of left and right wheels and outputting said steering control signals indicative of the determined steering angles to said steering actuator means so that said pair of left and right wheels assume the determined steering angles, thereby canceling any yaw moment generated by said braking pressures applied to said pair of left and right wheels.

5,089,968

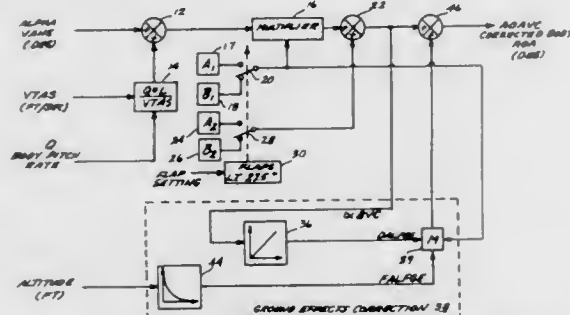
GROUND EFFECTS COMPENSATED REAL TIME AIRCRAFT BODY ANGLE OF ATTACK ESTIMATION
Munir Orgun, Woodinville; Timothy C. McRoberts, Bothell, and Tzong-Hsiu B. Wu, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1990, Ser. No. 471,102

Int. Cl.⁵ G05D 1/00

U.S. Cl. 364—435

19 Claims



13. Apparatus for supplying a ground effects compensated body angle of attack signal, said apparatus comprising:
means responsive to a signal representative of aircraft alpha vane angle of attack and a signal representative of aircraft body pitch rate for supplying a compensated alpha vane angle of attack signal;
means responsive to said compensated alpha vane angle of attack signal for supplying a signal representative of the aircraft free air body angle of attack;
means for scaling said signal representative of aircraft free air body angle of attack to supply a signal representative of the ground effects compensation required at substantially zero altitude of said aircraft;
means responsive to a signal representative of aircraft altitude for supplying an altitude scale factor representative of the amount of ground effects compensation signal required at aircraft altitudes ranging from substantially zero altitude to an altitude approximately equal to the wing-span of said aircraft;
means for multiplying said signal representative of the ground effects compensation required at substantially zero altitude of said aircraft by said altitude scale factor to supply a signal representative of the free air body angle of attack compensation required for a current altitude of said aircraft; and
means for combining said free air body angle of attack signal

with said signal representative of the free air body angle of attack compensation required for said current altitude of said aircraft.

5,089,969

SHAFT SYNCHRONOUS BALANCING APPARATUS
Charles Bradshaw, Bedworth Warks; Bill Tack, Yelvertoft; Mike Hansford, Rugby, and John Winterbottom, Eastern Green Conventry, all of Great Britain, assignors to IRD Mechanicals, Inc., Columbus, Ohio

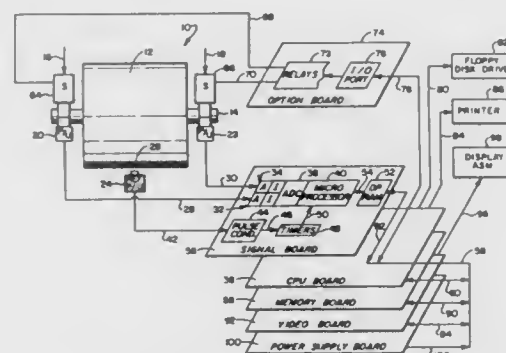
Filed Feb. 21, 1990, Ser. No. 482,550

Claims priority, application European Pat. Off., Jul. 13, 1989, 89630117.3

Int. Cl.⁵ G06F 15/20; G01M 1/16, 1/00, 7/00

U.S. Cl. 364—463

17 Claims



1. In a system for deriving balance data of a variety wherein a rotating body to be balanced is rotated at rates providing a period T for each complete revolution, wherein a transducer is provided for select balance planes which derives corresponding vibration output signals, the improved balance analysis apparatus, comprising:

- a reference device responsive to said rotating body for deriving a reference signal with respect to the revolution thereof in correspondence with each said period, T;
- signal treatment staging responsive to said vibration output signals for deriving analog balance signals in correspondence therewith;
- counter-timer means responsive to a control input for generating a sequence of a predetermined number, N, of increment sample pulses of select duration;
- a converter actuable to convert said analog balance signals to digital values; and
- a process control responsive to said reference signal with respect to a given revolution of said rotating body for deriving the value of select duration of said increment sample pulses as said control input to said counter-timer means, said select duration substantially corresponding with the value T/N, said process control effecting said actuation of said converter in correspondence with said increment sample pulses during a revolution of said rotating body subsequent to said given revolution to effect derivation of said digital values and for generating said balance data therefrom.

5,089,970

INTEGRATED MANUFACTURING SYSTEM

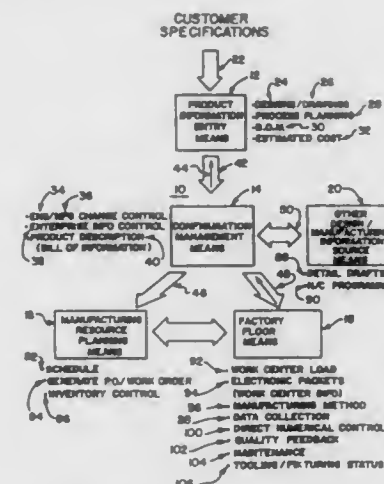
Mark S. Lee, Windsor Locks, Conn.; Cameron M. McQuaid, Middlefield, Mass.; Stephen R. Urban, West Hartford, Conn.; Donald A. Seccombe, Jr., Cheshire, Conn.; Robert T. Leo, Jr., Manchester, Conn.; Edward H. Coon, Winfield, Pa., and Olin H. Bray, Albuquerque, N.H., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 5, 1989, Ser. No. 417,626

Int. Cl.⁵ G06F 15/46, 15/16

U.S. Cl. 364—468

4 Claims



1. An integrated manufacturing system for managing the distribution to a factory floor as well as throughout a factory of the information that is necessary to effectuate the production of products on the factory floor comprising:

- a. product information entry means operative for generating from a specification furnished by a customer regarding products to be manufactured information required for purposes of effectuating the manufacture of products on the factory floor, said information generated by said product information entry means including information of a design/drawing nature, information of a process planning nature, information of a bill of materials nature and information of an estimated cost nature;
- b. configuration management means connected in operative relation to said product information means said configuration management means being a central repository for all of the shared information required for purposes of effectuating the manufacture of products on the factory floor, said shared information for which said configuration management means is a central repository including information of an engineering/manufacturing control change nature, information of an overall facility information control nature and information of a product description nature;
- c. manufacturing resource planning means connected in operative relation to said configuration management means and therethrough to said product information entry means, said manufacturing resource planning means being the source of information of a scheduling nature required for purposes of effectuating the manufacture of products on the factory floor, said information for which said manufacturing resource planning means is a source including information of a purchase order/work order nature and information of an inventory control nature; and
- d. factory floor means connected in operative relation to said manufacturing resource planning means and therethrough to both said configuration management means and said product information entry means, said factory floor means being the source of information relating to the operations that take place on the factory floor during the course of effectuating thereat the manufacture of products, said information for which said factory floor means is a source including information of a work center load nature, infor-

mation of a manufacturing method nature, information of a data collection nature, information of a direct numerical control nature and information of a tooling/fixturing status nature.

5,089,971

METHOD AND APPARATUS FOR CUTTING PARTS FROM HIDES OR SIMILAR IRREGULAR PIECES OF SHEET MATERIAL

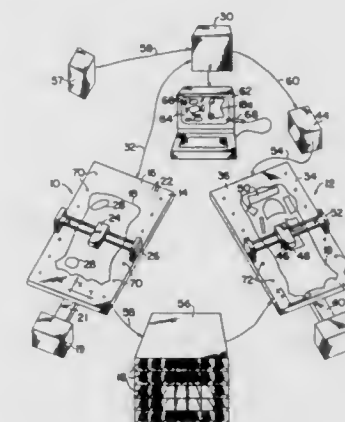
Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Apr. 9, 1990, Ser. No. 506,917

Int. Cl.⁵ G06F 15/46

U.S. Cl. 364—470

20 Claims



1. A method for cutting parts from a plurality of hides of different shapes and sizes, said method comprising:

- providing a plurality of hides of different shape and size, converting said plurality of hides into a plurality of digitized hides by for each of said hides performing the steps of placing the hide in spread condition on a digitizing table, while said hide is on said digitizing table digitizing it to obtain a digital representation thereof, storing such digital representation in a computer memory, while said hide is on said digitizing table associating with it a means establishing its shape and its position relative to said digitizing table, and subsequently removing said hide from said digitizing table,
- providing part information defining a plurality of desired parts to be produced,
- using said stored representations of said digitized hides and said part information to derive from said plurality of digitized hides a set of hides from which said parts are to be produced and to provide for each hide of said set a set of instructions usable by an automated cutter to cut from said hide at least some of said desired parts; and
- then cutting each hide of said set of hides by placing it on the table of an automatic cutter using said shape and position establishing means associated with said hide to cause it to assume on said cutting table the same shape as it had when on said digitizing table and to have a position on said cutting table of known relation to its position on said digitizing table, and thereafter controlling said cutter using the set of instructions provided for that hide to cut from it parts corresponding to said set of instructions.

5,089,972

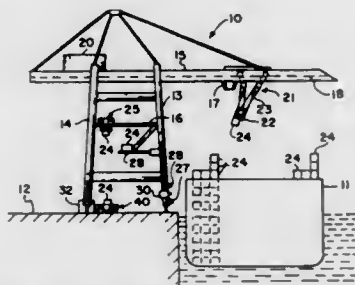
MOORED SHIP MOTION DETERMINATION SYSTEM
 Marcus Nachman, and Robert H. Overton, both of Virginia Beach, Va., assignors to Nachman Precision Systems, Inc., Virginia Beach and Daniel H. Wagner Associates, Inc., Hampton, both of Va., a part interest

Filed Dec. 13, 1990, Ser. No. 626,743

Int. Cl.⁵ B65G 67/60

U.S. Cl. 364-478

6 Claims



1. In combination, a system for measuring six degrees freedom of movement of a moored ship position relative to a fixed pier and crane on said pier after loading or unloading a container on the ship, processor mechanism for combining the measured relative position with data indicating the ship position prior to the loading or unloading of the container, and means for utilizing the combined data to enable automatic control in placement or removal of a subsequent container on the ship by said crane.

5,089,973

PROGRAMMABLE LOGIC CELL AND ARRAY
 Frederick C. Furtek, Arlington, Mass., assignor to Apple Computer Inc., Cupertino and Concurrent Logic, Inc., Sunnyvale, both of Calif.

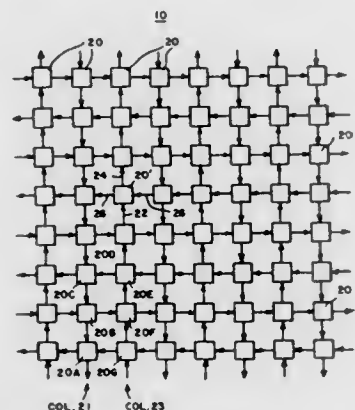
Division of Ser. No. 928,527, Nov. 7, 1986, Pat. No. 4,918,440.

This application Jul. 11, 1989, Ser. No. 378,106

Int. Cl.⁵ G06F 15/60; H03K 17/693

U.S. Cl. 364-489

5 Claims



1. A method of generating within a programming system a schematic representation of a digital circuit formed from an array of programmable logic cells each comprising:
 first and second inputs for receiving input signals and first and second signal outputs for supplying output signals, means responsive to programming signals applied thereto for programming the cell to assume one of a plurality of available states, each state uniquely defining the type of signal supplied to the signal outputs, at least one of the signal outputs supplying an output signal comprising a logical function of the input signals received by both the first and second signal inputs, said method comprising the steps of:

- displaying on the screen of a work station a template of said array of programmable logic cells;
- in response to input instructions from a user that select a state for a particular cell, modifying the image on the display screen to display graphically the selected state of the particular cell; and
- generating programming instructions for programming the corresponding cell in the array to be functionally equivalent to the selected state within the programming system.

5,089,974

BUILDING TECHNICAL MANAGEMENT CONTROLLER WITH A TWO-WIRE DATA AND POWER TRANSMISSION LINE

Pierre Demeyer, Uriage; Jean-Luc Mertz, Grenoble; Corinne Segond, Grenoble; Serge Moutet, Grenoble; Robert Chevalere, Seyssinet Pariset; Henri Lhuillier, Seyssins, and Patrick Barthelemy, St. Egreve, all of France, assignors to Merlin Gerin, France

Filed Nov. 2, 1989, Ser. No. 430,411

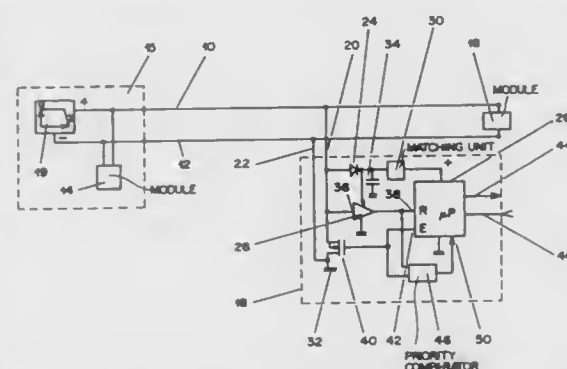
Claims priority, application France, Nov. 4, 1988, 88 15053;

Nov. 4, 1988, 88 15054; Nov. 4, 1988, 88 15058

Int. Cl.⁵ G06F 15/20; G05B 23/02

U.S. Cl. 364-492

9 Claims



- An integrated power and data transmission apparatus for controlling the operation of electrical equipment in a building comprising:
 - a two-wire bus including a first line acting as a voltage supply line and a second line acting as a return line for power and asynchronous data transmission;
 - a power supply means for providing a low level DC voltage to said two-wire bus, said power supply means including a current limiter for limiting the current supplied by said power supply means to said two-wire bus when said supply line and said return line are short-circuited;
 - a plurality of independently addressable modules coupled to said two-wire bus and powered by said power supply means, said plurality of modules including at least one module which transmits a command signal and one module which performs a preprogrammed function in response to said command signal, wherein each of said plurality of modules includes:
 - data transmission and data reception means for performing data transmission and data reception with another module;
 - a programmable microcontroller for controlling the operation of the module including performance of said preprogrammed function and said data transmission and data reception;
 - interface means coupled to said two-wire bus including means for providing uninterrupted power to the module and short-circuiting means controlled by said programmable microcontroller for short-circuiting said supply line to said return line; and
 - data communication priority means for determining a priority of data communication for the module including

mans for detecting when a difference occurs between a signal present on said two-wire bus with a data transmission signal output from the module and withdrawing from data transmission when said difference is detected; wherein data is transmitted on said two-wire bus as a binary DC signal with a logic high represented by the presence of a supply voltage of the two-wire bus and a logic low represented by a zero voltage on the two-wire bus caused by the short-circuiting of said supply line with said return line.

5,089,975

METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF PROCESS FLUIDS

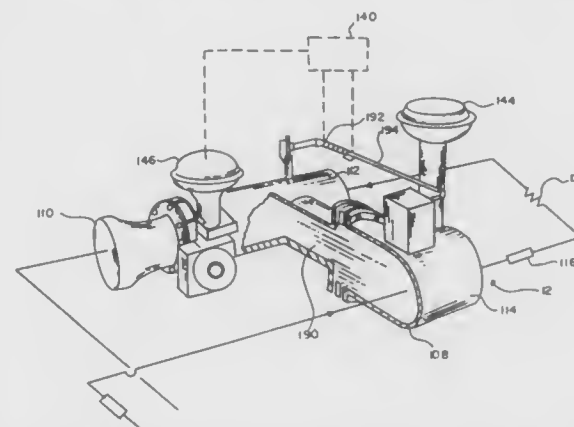
Gerald F. Mannion, Naperville, Ill., and James R. Mannion, Oconomowoc, Wis., assignors to BRDG-TNDR Corporation, Ft. Lauderdale, Fla.

Filed Jan. 12, 1990, Ser. No. 464,346

Int. Cl.⁵ G06F 3/04

U.S. Cl. 364-510

14 Claims



- Apparatus for coupling a primary loop with a secondary loop for circulating processing fluids therebetween comprising in combination:
 - a first connection for the feed line of the primary loop and a second connection for the return line of the primary loop;
 - a third connection for the feed line of the secondary loop and a fourth connection for the return of the secondary loop;
 - a crossover line coupling the four connections;
 - first valve means in the path of flow through the primary loop;
 - first sensor means located in the flow across the crossover line to control the first valve means to vary the flow therethrough;
 - second valve means located in the path of flow through the crossover line;
 - second sensor means responsive to the temperature associated with the secondary loop to control the second valve means by blending flows from the primary and secondary loops through the second valve means;
 - a common controller for the first and second sensor means adapted to control the first and second valve means as a function of the sensed temperature and flow; and
 - a host computer coupled to the common controller and couplable with other similar common controllers for two-way communications between the common controllers and host computer in systems configuration.

5,089,976

COLOR NORMALIZATION PROCESS

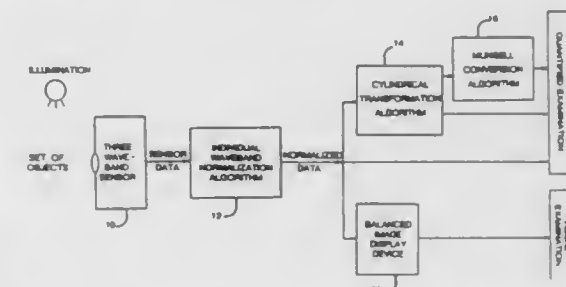
Robert B. Cate, La Jolla, and Daniel E. Wulbert, Cardiff, both of Calif., assignors to Friends of the UCSD Library, Inc., La Jolla, Calif.

Filed Jul. 18, 1990, Ser. No. 555,099

Int. Cl.⁵ G01J 3/50

U.S. Cl. 364-526

1 Claim



- A color normalization process comprising the traditional steps of
 - defining a plurality of radiation wavebands,
 - performing spatial array measurements of an object or objects in each of these wavebands to produce arrays of data,
 - normalizing said arrays to remove unwanted variation,
 - converting the normalized data to a standard color system, and
 - presenting the results as optical images and corresponding information arrays;
 the improvement comprising two elements,
 - a means in step (c) for optimizing the extraction of relational information through division of each measurement by the mean of about 10,000 surrounding measurements; and
 - a means in step (d) for converting said relational information to the MUNSELL color system.

5,089,977

PROCESS FOR CONTROLLING THE INKING OF PRINTED PRODUCTS AND APPARATUS FOR PERFORMING THE PROCESS

Jürgen Pflästerer, Dossenheim, and Norbert Freyer, Sandhausen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

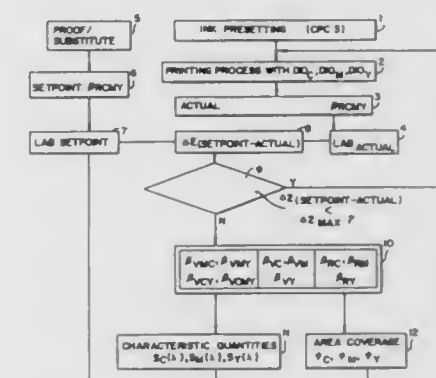
Filed Feb. 12, 1990, Ser. No. 478,445

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903981

Int. Cl.⁵ G01J 3/46

U.S. Cl. 364-526

3 Claims



- Process for controlling the inking of printed products, wherein an original provided with ink control fields, is sub-

two-dimensional video frame memory means for storing said Fourier transformed image frame; and column output means connected to said column memory means and said two-dimensional video frame memory means for receiving column transformed data point sets from said working column means and storing them in said two-dimensional video frame memory means.

5,089,983

CHARGE DOMAIN VECTOR-MATRIX PRODUCT PROCESSING SYSTEM

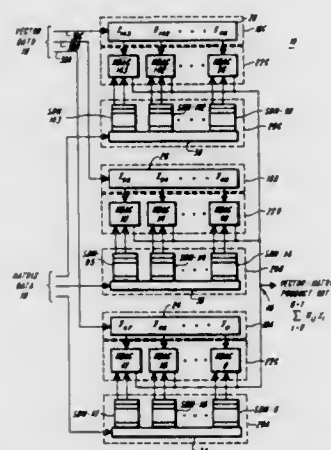
Alice M. Chiang, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 2, 1990, Ser. No. 473,870

Int. Cl.⁵ G06G 7/16; G06J 7/12

U.S. Cl. 364—844

5 Claims



1. A charge domain vector-matrix product network for generating the signals representative of the product of an N-element vector and an N×K element matrix comprising:

A. a charge coupled device (CCD) N-stage tapped delay line, including:

means for establishing a succession of N charge packets therein in response to a succession of N applied input signals, each of said packets having a magnitude corresponding to one of the elements of said vector.

means for shifting said charge packets from stage-to-stage along said delay line, and N floating gate sensing electrodes, each of said electrodes overlying one of said stages and being adapted to provide a potential thereon representative of the magnitude of a charge package currently within its underlying stage,

B. an N×K M-bit digital parallel shift register memory device adapted for storing N×K M-bit words, each of said words being representative of the value of a corresponding element of said matrix, wherein said shift register memory device includes K stages in a stack configuration, each stage including means for storing N M-bit words, and including means responsive to an applied shift signal for selectively shifting said stored words from stage-to-stage from an input stage to an output stage in said stack,

C. N M-bit charge domain digital-analog multipliers, each of said multipliers including means for generating a charge packet therein having a magnitude proportional to the product of a potential applied to an analog input port thereof and an M-bit digital signal applied to a digital input port thereof, wherein the analog input port of each of said multipliers is coupled to an associated sensing electrode of said delay line, and the digital input port of each of said multipliers is coupled to an associated M-bit portion of said output stage said shift register memory device, and

D. a controller for successively applying in parallel N words from said output stage of said shift register memory device

to the respective digital input ports of said multipliers, where each set of N words includes the words representative of the values of one of the rows of said matrix, said controller including means for generating said shift signals and for applying said shift signals to said shift register memory device whereby said N words are shifted from stage to stage therein,

E. a charge summing device operative for each set of N words applied to said multipliers, including means for generating in succession an output charge packet for each of said sets, each output charge packet having a magnitude proportional to the sum of the magnitude of the charge packets generated by said multipliers for said set, wherein the magnitudes the respective output charge packets correspond to the respective elements of said vector-matrix product.

5,089,984

ADAPTIVE ALARM CONTROLLER CHANGES MULTIPLE INPUTS TO INDUSTRIAL CONTROLLER IN ORDER FOR STATE WORD TO CONFORM WITH STORED STATE WORD

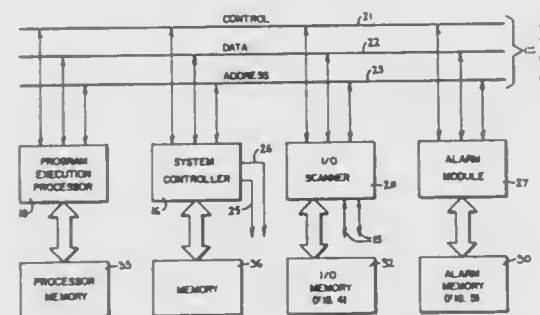
Odo J. Struger, Chagrin Falls, and Edward J. Klimas, Lyndhurst, both of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed May 15, 1989, Ser. No. 352,189

Int. Cl.⁵ G06F 11/30

U.S. Cl. 395—650

3 Claims



1. A heuristic error correction system for an industrial controller with multiple inputs and outputs for controlling a process having at least one process state comprising:

input means for receiving certain of the multiple inputs and outputs from the industrial controller as status input signals;

a transition detector means coupled to the input means for collecting the status input signal into a state word and for detecting changes in the process state as indicated by changes in the state word;

a content addressable memory receiving the state word from the transition detector and responsive to changes in the state word indicated by the transition detector and, in a learn mode, for storing the state word and, in an alarm mode, for identifying whether the state word has been previously stored and if not for producing a miss signal;

signal means for receiving the miss signal from the content addressable memory and for signalling when the heuristic error correction system is in the alarm mode and the state word cannot be identified as previously stored; and

a correcting means responsive to said signal means for changing the multiple inputs to the industrial controller so that the state word conforms to a stored state word.

5,089,985

SYSTEM AND METHOD FOR PERFORMING A SORT OPERATION IN A RELATIONAL DATABASE MANAGER TO PASS RESULTS DIRECTLY TO A USER WITHOUT WRITING TO DISK

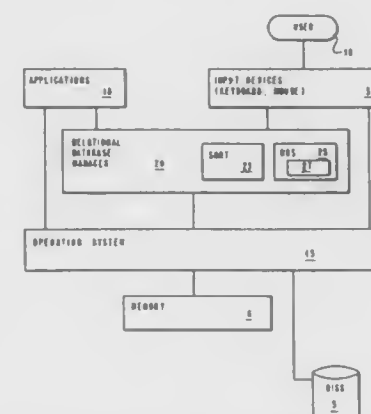
Philip Y. Chang; Daniel J. Coyle, Jr., both of Austin; Timothy R. Malkemus, Round Rock; Rebecca A. Rodriguez, Pflugerville, and Philip J. Welti, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1988, Ser. No. 179,181

Int. Cl.⁵ G06F 7/24, 15/20

U.S. Cl. 395—600

18 Claims



1. A method of processing a query statement in a relational database system, said method comprising the steps of: reading said query statement into said relational database system;

generating a plan for said processing of said query statement with said relational database system;

analyzing, by said relational database system, said plan for processing the query statement;

selecting by said relational database system a mode for directing output of a sort operation of said plan, said mode selection being responsive to said analyzing of said plan; directly passing, in a first mode, said output of said sort operation to a user of said relational database system without writing to a disk if said plan has a sort input plan to a root plan of a table access plan, and passing, in a second mode, said output of said sort operation to a disk only if said plan has no sort input plan to a root plan of a table access plan.

5,089,986

MUSHROOM DOUBLE STACKED CAPACITOR

Gurtej S. Sandhu; Pierre C. Fazan; Yauh-Ching Liu, and Hiang C. Chan, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 2, 1991, Ser. No. 637,108

Int. Cl.⁵ G11C 11/24

U.S. Cl. 365—149

3 Claims

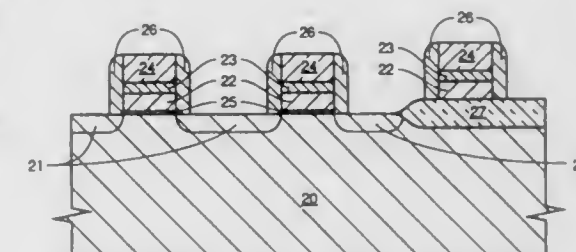
1. A DRAM memory array constructed on a silicon substrate, said memory array comprising:

a plurality of active areas arranged in parallel interdigitated rows and parallel non-interdigitated columns, said active areas separated by isolation means, each of said active areas having a digit line junction, and a storage node junction;

a plurality of parallel conductive word lines aligned along said rows such that a digit line junction and a storage node junction within each active area are bridged by a word line, each word line being insulated from associated active areas by a gate dielectric layer;

a plurality of parallel conductive digit lines, aligned along said columns such that a digit line makes electrical contact with each digit line junction within a column, said digit

lines running perpendicular to and over said word lines forming a 3-dimensional, waveform-like topology, said digit and word lines electrically separated from one another by isolation means; and at least one storage capacitor for each active area, each



capacitor having a storage node plate that is in electrical contact with its associated active area and a cell plate that is common to the entire array, each storage node plate being insulated from said cell plate by a capacitive dielectric layer and having a mushroom extended V-shaped cross-section.

5,089,987

REFRESH CONTROL CIRCUIT

Yuichi Nakao, and Hideharu Toyomoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

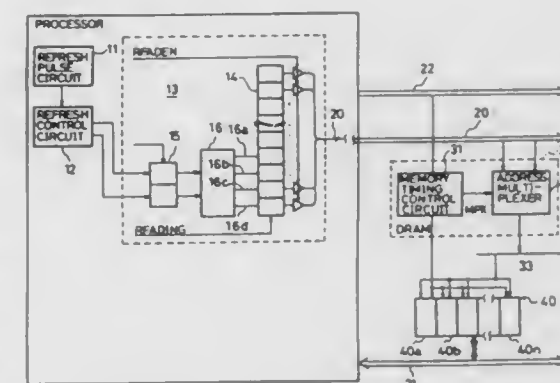
Filed Feb. 6, 1990, Ser. No. 475,665

Claims priority, application Japan, Mar. 30, 1989, 1-083184

Int. Cl.⁵ G11C 7/00, 8/00

U.S. Cl. 365—222

3 Claims



1. A refresh circuit for controlling memory refresh operations of a dynamic random access memory having 2^N memory banks, comprising:

means for periodically generating a pulse signal for triggering a refresh operation;

means receiving said pulse signal for generating, in response to said pulse signal, a predetermined value, N, of said 2^N memory banks; and

means receiving said predetermined value for generating a sequence of refresh address signals by iteratively changing a refresh address by 2^N during said refresh operation, each one refresh address signal of said sequence selecting a row in a respective memory bank.

5,089,988

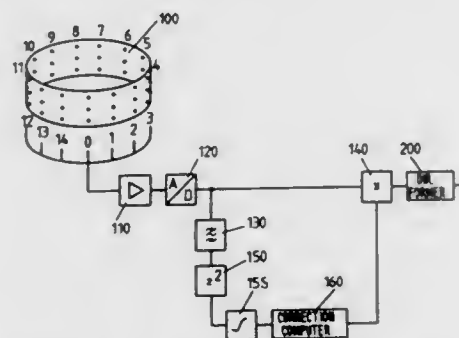
METHOD AND APPARATUS FOR COMPENSATING SENSITIVITY FLUCTUATIONS IN A HYDROPHONE TRANSDUCER ARRAY

Egidius Arens, Achim, Fed. Rep. of Germany, assignor to Krupp Atlas Elektronik GmbH, Bremen, Fed. Rep. of Germany
Filed Dec. 21, 1990, Ser. No. 631,462
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942588

Int. Cl.⁵ H04B 17/00

U.S. Cl. 367-12

17 Claims



1. A method of compensating sensitivity fluctuations in signals received from respective groups of hydrophones for the purpose of subsequent signal processing, the groups being arranged in a predetermined sequence (0, 1, 2, . . . i) to form a transducer arrangement, wherein the received signals are influenced by the sensitivity of the hydrophones or a gain of preamplifiers connected to the outputs of the hydrophones, comprising:

- determining an energy value (W_i) for the received signal of each group of hydrophones;
- determining a median energy curve ($W_m(\theta)$) from the energy values (W_i) as a function of the sequence of the groups of hydrophones;
- forming a correction value for the signal received from each group of hydrophones from a comparison of the respective energy value (W_i) with the energy curve ($W_m(\theta)$); and
- correcting each received signal with a respective one of the correction values.

5,089,989

METHOD AND APPARATUS FOR MEASURING THE QUALITY OF A CEMENT TO A CASING BOND

Mathew G. Schmidt, Houston; Peter C. Masak, Katy, and Paul B. Rhodes, Houston, all of Tex., assignors to Western Atlas International, Inc.

Continuation of Ser. No. 364,848, Jun. 12, 1989, abandoned.

This application Oct. 30, 1990, Ser. No. 609,026

Int. Cl.⁵ G01N 9/04; G01V 1/40

U.S. Cl. 367-35

1 Claim

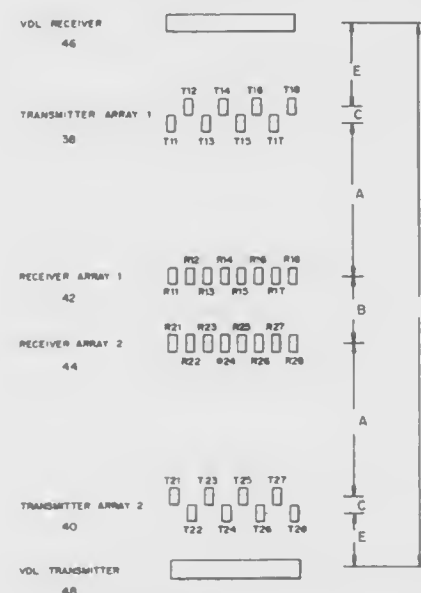
1. Apparatus for measuring the quality of a cement to casing bond in a cased cemented wellbore, comprising:
- an elongated cylindrical housing adapted for disposition into the cased cemented borehole;
 - a first array of a plurality of circumferentially spaced radially outwardly oriented acoustic transmitting transducers mounted in said housing at a first longitudinal position;
 - a second array of a plurality of circumferentially spaced radially outwardly oriented acoustic transmitting transducers mounted in said housing at a second longitudinal position axially spaced from said first array of transmitting transducers, each of said plurality of transmitting transducers in said second array being disposed circumferentially in vertical axial alignment with a corresponding one of said plurality of transmitting transducers in said first array;
 - a first array of a plurality of circumferentially spaced radially outwardly oriented acoustic receiving transducers

mounted in said housing at a first position longitudinally spaced intermediate said first and second arrays of transmitting transducers;

a second array of a plurality of circumferentially spaced radially outwardly oriented acoustic receiving transducers mounted in said housing at a second position longitudinally spaced intermediate said first array of receiving transducers and said second array of transmitting transducers;

each of said plurality of receiving transducers in said first and second arrays being disposed circumferentially in vertical axial alignment with corresponding ones of said plurality of transmitting transducers in said first and second arrays for forming a plurality of longitudinally spaced circumferentially disposed and axially aligned combinations of a pair of spaced transmitting transducers and a pair of spaced receiving transducers spaced intermediate said pair of spaced transmitting transducers;

first control circuit means for activating and pulsing said transmitting transducer pairs included in each of said plurality of axially aligned transmitting/receiving transducer combinations in a circumferential sequence and activating and pulsing each one of said pair of transmitting



transducers included in each of said axially aligned combinations of transmitting/receiving transducers in a selected sequence,

second control circuit means for activating said receiving transducer pairs included in each of said plurality of axially aligned transmitting/receiving transducer combinations in a circumferential sequence corresponding to said sequence for activating and pulsing said transmitter pairs for enabling said receiving transducer pairs to sequentially receive transmitted pulsed signals from each one of said spaced pair of transmitting transducers included in each of said axially aligned combinations of transmitting/receiving transducers,

data acquisition means for acquiring said acoustic signals from each of said pairs of receiving transducers received sequentially from each one of said spaced pairs of transmitting transducers included in each of said axially aligned combinations of transmitting/receiving transducers; and

signal processing means receiving said acquired received acoustic signal data for determining a radical compensated cement bond spatial attenuation measurement for each of said plurality of axially aligned combinations of transmitting/receiving transducer pairs.

5,089,990

WORD PROCESSOR WITH COLUMN LAYOUT FUNCTION

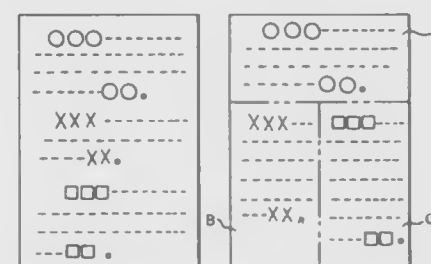
Keizo Saito, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 134,548, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 763,929, Aug. 8, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 296,363
Claims priority, application Japan, Aug. 14, 1984, 59-169566;
Aug. 14, 1984, 59-169567

Int. Cl.⁵ G06F 7/00, 3/14

U.S. Cl. 395-375

1 Claim



1. A word processor, comprising:
 - an input means for receiving commands;
 - an output means for outputting an image which output means is in the form of a CRT display device which CRT display device includes a screen having divisible regions;
 - a control means in connection with the input means and the output means;
 - a first command function means for sending a signal to the control means whereby the first command function means directs the control means to divide a region of the output means corresponding to one page into a plurality of block, specifying a sentence or sentences to be placed in each of the blocks; and
 - a second command function means for sending a signal to the control means whereby the control means is directed to specify a priority sequence among the blocks or among sentences specified through the input means.

5,089,991

NON-VOLATILE MEMORY CELL

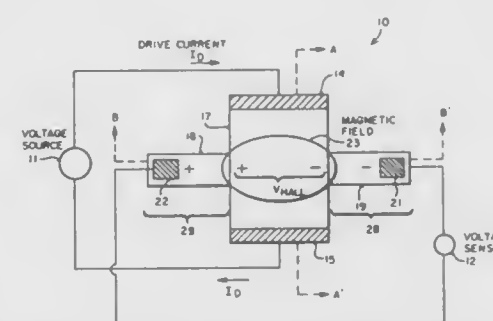
James A. Matthews, Milpitas, Calif., assignor to Micro Unity Systems Engineering, Inc., Palo Alto, Calif.

Filed Jan. 18, 1990, Ser. No. 466,787

Int. Cl.⁵ G11C 11/18

U.S. Cl. 365-9

17 Claims



1. A non-volatile, static memory cell comprising:
 - a magnetic patch for storing information in the form of a magnetic field;
 - magnetizing means for writing said information to said patch;
 - Hall effect sensor means for reading said information from said patch, said sensor means including a Hall bar; means for flowing a current through said Hall bar in the presence of said magnetic field to generate a Hall voltage

across said Hall bar in a direction transverse to said magnetic field and said current; and

wherein said Hall effect sensor means further includes a detector means coupled to said Hall bar for detecting said Hall voltage, said Hall voltage being representative of said information.

5,089,992

SEMICONDUCTOR MEMORY DEVICE AND A DATA PATH USING THE SAME

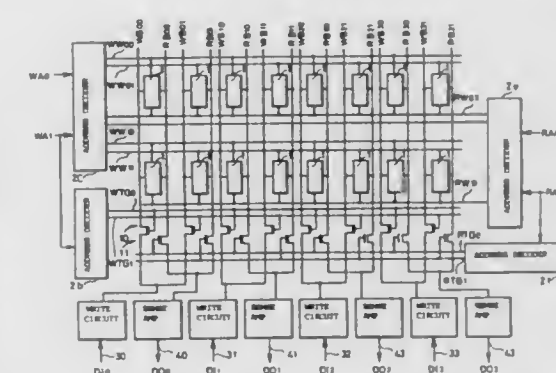
Hirofumi Shinohara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 315,377

Claims priority, application Japan, Jun. 30, 1988, 63-165647
Int. Cl.⁵ G11C 7/00, 5/02, 5/06

U.S. Cl. 365-51

21 Claims



7. A semiconductor memory device having a plurality of ports, comprising:
 - a memory cell array in which a plurality of memory cells including data storage nodes are arranged in rows and in columns,
 - write word lines and read word lines connected to the memory cells of the respective rows of said memory cell array,
 - write bit lines and read bit lines connected to the memory cells of the respective columns of said memory cell array, input terminals to which data for enabling said read bit lines are inputted, and
 - output terminals for outputting data read out from said memory cell array, wherein the corresponding read bit line is enabled according to data supplied to any of said input terminals, electric connection between the corresponding write bit line and the data storage node of the memory cell connected to said write bit line is controlled in response to a write word signal outputted to the corresponding write word line, whereby a first port is formed by said write bit line, said write word line and said input terminal,
 - the corresponding read word line is enabled to cause the corresponding read bit line to be enabled according to data corresponding to a value of the data storage node of the memory cell, data according to a signal of said read bit line is outputted to the corresponding output terminal, whereby a second port is formed by said read bit line, said read word line and said output terminal,
 - said write word lines are provided as a plurality of pairs, each pair corresponding to a row of said memory cell array, the write word lines of each pair being provided to cross each other, and each memory cell within a corresponding row being connected to only one of the write word lines of the corresponding pair of write word lines.

5,089,993

MEMORY MODULE ARRANGED FOR DATA AND PARITY BITS

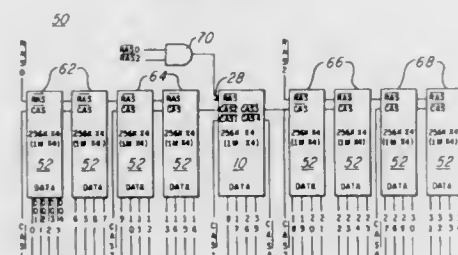
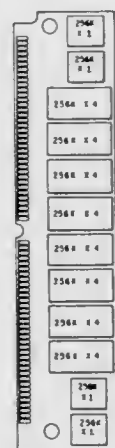
Joseph H. Neal, Missouri City, and Kenneth A. Poteet, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1989, Ser. No. 415,074

Int. Cl.³ G11C 5/06, 11/34

U.S. Cl. 365—63

9 Claims



1. A memory module comprising:
 - a plurality of discrete data memory circuits, each organized to provide an individual data string having length equal to an integer multiple of four bits, said data memory circuits arranged to provide a combined data string having a length equal to the sum of the individual data string lengths, each data memory circuit including a signal line connected to control transfer of individual data strings;
 - a plurality of data pins, each associated with a different bit of the combined data string and connected through data lines to transfer a datum, associated with one of the individual data strings, from one of the data memory circuits for output from said memory module;
 - a plurality of control pins with each signal line connected to a control pin to receive an external signal for initiating transfer of one of the individual data strings from one of the data memory circuits; and
 - an additional memory circuit having a plurality of additional signal lines to control transfer of data and a plurality of additional data lines, with
 - a first of the additional signal lines wired in common with the signal line of a first of the data memory circuits to render said additional memory circuit responsive to transfer a bit of data along one of the additional data lines when an individual data string is transferred from the first data memory circuit; and
 - a second of the additional signal lines wired in common with the signal line of a second of the data memory circuits to render said additional memory circuit responsive to transfer a bit of data along one of the additional data lines when an individual data string is transferred from the second data memory circuit.

5,089,994

TOMOGRAPHIC ESTIMATION OF SEISMIC TRANSMISSION VELOCITIES FROM CONSTANT OFFSET DEPTH MIGRATIONS

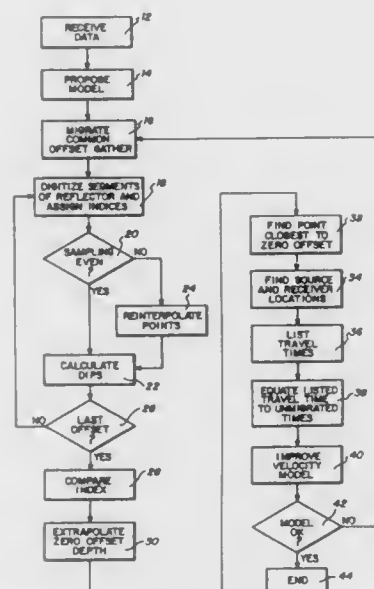
William S. Harlan; Douglas W. Hanson, and Shein-Shion Wang, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 14, 1991, Ser. No. 656,546

Int. Cl.³ G01V 1/28, 1/36

U.S. Cl. 367—73

5 Claims



3. A method for tomographic estimation of seismic transmission velocities comprising the steps of:
 - receiving seismic data;
 - constructing an interval velocity model;
 - migrating common offset gathers in depth and creating images of reflectors from each gather;
 - digitizing segments of migrated constant-offset reflectors in depth z and over horizontal position x for a predetermined number of offsets;
 - determining whether the digitized reflection points provide an even and dense sampling over x ;
 - re-interpolating the digitized reflection points to provide an even and dense sampling over x ;
 - assigning an index during digitization to distinguish reflectors;
 - calculating the dip dz/dx at each point;
 - extrapolating zero offset depth for each point;
 - assembling, for each reflection point, an output list comprising said indexes for each segment, said digitized segments, said dips and said offsets, wherein whenever the lines of said list share the same index, the lines are derived from different points along the same continuous reflector;
 - determining for each line in said list, the point on the dipping migrated segment which lies closest to the zero offset image point;
 - locating source and receiver positions on the surface for each reflection point;
 - retaining the surface positions and the total traveltime t of the up and down going rays, whereby a list of traveltimes is retained;
 - equating said listed traveltimes to unmigrated multi-offset traveltimes in the original data; and
 - improving the velocity model so that traveltime along "correct" raypaths, which includes raypaths from the source to the zero-offset reflection point and up to the receiver, best resemble the listed values.

5,089,995

SWITCHING SYSTEM FOR THE ACQUISITION OF SEISMIC DATA

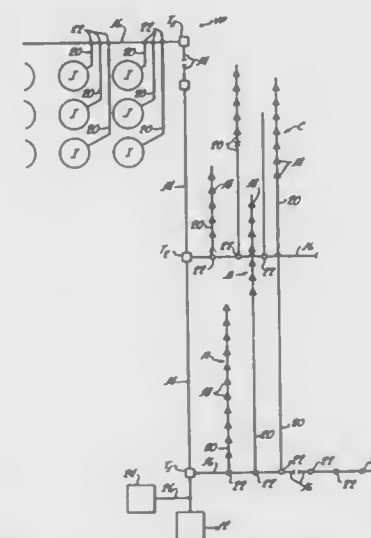
Gary K. Hackett, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 29, 1990, Ser. No. 620,354

Int. Cl.³ G01V 1/22

U.S. Cl. 367—76

21 Claims



10. A seismic recording system comprising:
 - a multichannel magnetic tape recorder;
 - a cable comprising a plurality of signal conductors, each of the signal conductors being connected to a different channel of the recorder, the cable having a plurality of takeouts located at uniformly spaced distances along the length of the cable and each of the takeouts being connected to a different signal conductor;
 - a plurality of conduits, each of which has an end operably connected to a different one of said takeouts;
 - a plurality of switch means dispersed along the length of each of said conduits and operably connected thereto;
 - a plurality of detector conduits, each of which has an end connected to a different one of said switch means;
 - an array of seismic detectors located along the length of each of said detector conduits and operably connected thereto; and
 - control means for transmitting a digital signal through selected signal conductors of said cable to said switch means for electrically interconnecting selected detector conduits and arrays of seismic detectors with said multichannel recorder.

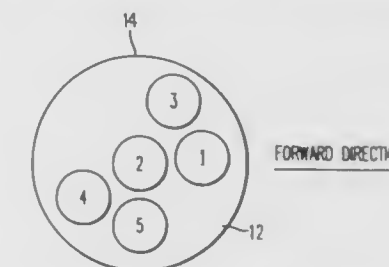
5,089,996
TRANSDUCER DEVICE FOR ACOUSTIC LOG
 Karl-Gustav Masreliez, Stockholm, Sweden, assignor to Consortium Marine AB, Stockholm, Sweden
 PCT No. PCT/SE88/00585, § 371 Date Jul. 23, 1990, § 102(e)
 Date Jul. 23, 1990, PCT Pub. No. WO89/04975, PCT Pub. Date Jun. 1, 1989
 PCT Filed Oct. 31, 1988, Ser. No. 488,039
 Claims priority, application Sweden, Nov. 24, 1987, 8704649-6
 Int. Cl.³ G01S 15/00

U.S. Cl. 367—89

5 Claims

1. A transducer device for an acoustic log, which comprises:
 - a transmitter for sending a signal within a lobe region, and
 - at least two receivers for receiving signals reflected from a reference for determining the velocity component of a vessel relative to the reference in the measuring direction determined by the two receivers, and
 - five crystals which include transmitter and receiver elements

for transmitting and receiving acoustic signals wherein said crystals are arranged such that combination of pairs



of the crystals define twelve measuring directions regularly distributed around a revolution.

5,089,997

ULTRASONIC ENERGY DETECTOR WITH FREQUENCY AND AMPLITUDE INDICATIONS AND BACKGROUND NOISE REDUCTION

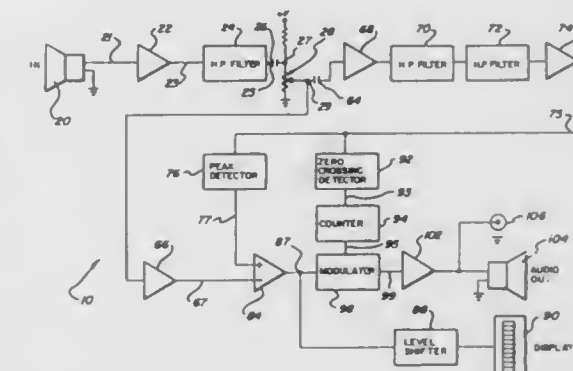
Joseph P. Pecukonis, Denver, Colo., assignor to Pasar, Inc., Denver, Colo.

Filed Nov. 2, 1990, Ser. No. 608,260

Int. Cl.³ H04B 1/06

U.S. Cl. 367—135

31 Claims



1. A detector for detecting ultrasonic energy in an ambient environment and for supplying humanly perceptible information representative of the magnitude and frequency of the detected ultrasonic energy which is significantly free of adverse influences from anticipated ambient environmental noise, comprising:
 - means receptive of the ambient ultrasonic energy and operative for supplying a detected signal representative of the frequency and amplitude of the ambient ultrasonic energy;
 - means receptive of the detected signal and operative for modifying the amplitude of the detected signal by a selected predetermined amount and for supplying the resulting signal as an adjusted ultrasonic detected signal;
 - means for supplying an offset signal of a predetermined magnitude directly related to the predetermined amount of modification of the adjusted ultrasonic detected signal relative to the detected signal, the predetermined magnitude of the offset signal representing a predetermined contribution of anticipated noise to the amplitude of the adjusted ultrasonic detected signal;
 - means receptive of the adjusted ultrasonic detected signal and operative for supplying an envelope signal having a magnitude substantially representative of the instantaneous peak amplitude of the adjusted ultrasonic detected signal;
 - means responsive to the adjusted ultrasonic detected signal and operative for supplying an audio frequency trigger signal having a predetermined frequency directly related

to the ultrasonic frequency of the adjusted ultrasonic detected signal;
means receptive of the envelope and the offset signals and operative for subtracting the offset signal from the envelope signal and for supplying the resulting signal as a compensated envelope signal; and
means receptive of the trigger signal and the compensated envelope signal for modulating the amplitude of the compensated envelope signal by the trigger signal to obtain an output signal having an audio frequency directly related to the ultrasonic frequency of the detected ultrasonic energy and an amplitude directly related to the amount of detected ultrasonic energy substantially free of predetermined degree of anticipated ambient noise.

5,089,998

VIBRATING AND AUDIBLE ALARM CLOCK

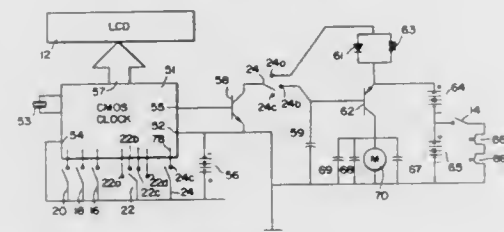
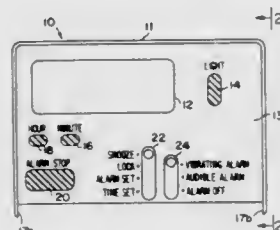
Richard Rund, 12A Four Winds, 4 Mt. Davis Road, Pokfulam, Hong Kong, Hong Kong

Filed Apr. 4, 1991, Ser. No. 680,222

Int. Cl.⁵ G04B 23/02, 19/06

U.S. Cl. 368—72

7 Claims



1. An alarm clock comprising:
a substantially flat, rectangular housing;
electronic clock means disposed in said housing, said electronic clock means including time and alarm setting means, time indicator signal means, alarm signal generating means, and alarm off signal input means, wherein the reception of an alarm off signal disables the generation of the alarm signal;
first battery means disposed in said housing and connected to said electronic clock means for supplying power to said electronic clock means;
a time display mounted in the face of said housing and connected to said time indicator signal means of said electronic clock means;
first solid state switch means disposed in said housing, said first solid state means being connected and responsive to said alarm signal generating means;
sound generating means disposed in said housing;
vibration generating means mounted to the interior of said housing;
alarm mode switch means for selectively switching between alarm off and audible and vibratory alarm modes, said alarm mode switch means mounted in said housing and having user accessible means, said alarm mode switch means being connected to said first solid state switch means, said sound generating means, said vibration generating means and said alarm off signal input means, whereby when said alarm mode switch means is set to the

alarm off mode, said alarm off signal is applied to said alarm off signal input means;
said sound generating means being selectively connected to said first solid state switch means through said alarm mode switch means, said sound generating means generating an audible alarm when said sound generating means is connected to said first solid state switch means and said alarm signal generating means generates an alarm signal; and
said vibration generating means being selectively connected to said first solid state switch means through said alarm mode switch means, said vibration generating means generating perceptible vibrations when said vibration generating means is connected to said first solid state switch means and said alarm signal generating means generates an alarm signal.

5,089,999

DISC CONTROL APPARATUS

Ryuji Ishida, and Toyoo Kiuchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

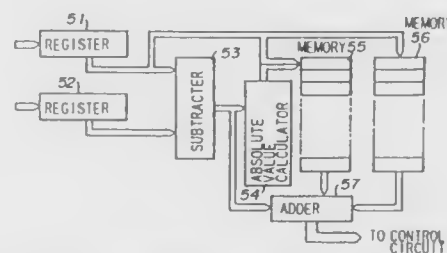
Filed Jun. 27, 1989, Ser. No. 371,931

Claims priority, application Japan, Jun. 28, 1988, 63-161466

Int. Cl.⁵ G11B 7/00

U.S. Cl. 369—32

3 Claims



1. A disc control apparatus, comprising:
a head for reading information from a disc having a spiral track;
a first means for storing first data indicating a first track position on said spiral track of said disc which is presently traced by said head;
a second means for storing second data indicating a second track position on said spiral track of said disc which is next to be traced by said head;
a first memory having a plurality of memory regions, each memory region storing a first rotating number of said disc corresponding to a relative distance between two spiral tracks of said disc, and one of said memory regions being accessed in accordance with said first and second data;
a second memory for storing a second rotating number of said disc at a settling time period; and
an address means for producing address signals in accordance with said first and second data to access said first and second memories;
a calculating means for producing a head moving signal in accordance with said first and second data, and said first and second rotating numbers; and
a control circuit for controlling said head to move from said first track position to said second track position in accordance with said head moving signal.

5,090,000

HEIGHT ADJUSTING DEVICE FOR A PICKUP

Shinsaku Nozu, Tetsuo Shimizu, and Seiji Ohmori, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,271

Claims priority, application Japan, Jul. 4, 1988, 63-166570

Int. Cl.⁵ G11B 7/00

U.S. Cl. 369—44.25

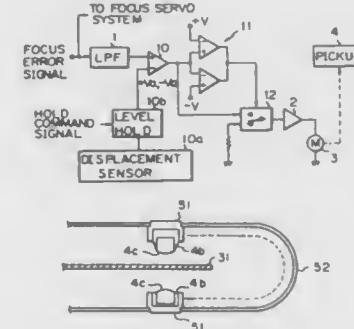
15 Claims

2. A height adjusting device for adjusting the height of a

pickup mounted on a carriage of an optical disc player, said device comprising:

- a support mechanism for supporting the pickup on a carriage in a manner that a position of the pickup along an axis of rotation of a turntable of said optical disc player is adjustable; and
an adjusting means for driving said support mechanism to adjust the position of the pickup, wherein said adjusting means comprises a positional signal generating means for generating a height position signal indicative of the position of the pickup, a signal superimposing means for superimposing a compensating signal, generated by said height positional signal generating means, indicative of a position of an optical system of the pickup relative to a housing of the pickup on the height position signal and obtaining a compensated height position signal, and a drive circuit for driving the support mechanism in response to the magnitude of the compensated height position signal.

3. A height adjusting device for adjusting the height of a



pickup mounted on a carriage of an optical disc player, said device comprising:

- a support mechanism for supporting the pickup on said carriage in a manner that a position of the pickup along an axis of rotation of a turntable of said optical disc player is adjustable; and
an adjusting means for driving the support mechanism to adjust the position of the pickup, wherein said adjusting means comprises a positional signal generating means for generating a height position signal indicative of the position of the pickup, a signal superimposing means for superimposing a compensating signal, generated by said height positional signal generating means, indicative of a position of an optical system of the pickup relative to a housing of the pickup on the height position signal and obtaining a compensated height position signal, and a drive circuit for driving the support mechanism in response to the magnitude of the compensated height position signal only when the magnitude of the compensated height position signal is greater than a predetermined level.

5,090,001

INFORMATION RECORDING/REPRODUCING APPARATUS

Kenichi Ito, and Masatoshi Kobayashi, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 360,425

Claims priority, application Japan, Jun. 6, 1988, 63-139093; Jul. 28, 1988, 63-186986; Aug. 12, 1988, 63-201146

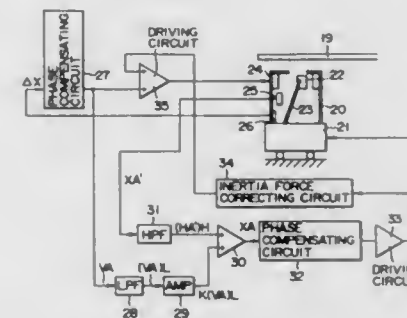
Int. Cl.⁵ G11B 7/00

U.S. Cl. 369—44.28

20 Claims

1. An information recording/reproducing apparatus comprising:
optical means for projecting a light spot on a recording medium having a track;
first driving means for causing the light spot to finely track the track within a limited range of said recording medium;
second driving means capable of moving the light spot over said recording medium for more than said limited range,

said second driving means having a positioning accuracy lower than that of said first driving means;
detecting means for detecting a moving distance of said first driving means and outputting a detection signal;
first drive signal outputting means for outputting a drive signal for driving said first driving means;
first compensating means for extracting a first frequency signal of a first frequency range from the drive signal output from said first drive signal outputting means, and for outputting said first frequency signal as a first compensation signal;



second compensating means for extracting a second frequency signal of a second frequency range from the detection signal output from said detecting means, and for outputting said second frequency signal as a second compensation signal; and
second drive signal outputting means for adding said first compensation signal and said second compensation signal to form a drive signal for driving said second driving means.

5,090,002

POSITIONING SYSTEMS EMPLOYING VELOCITY AND POSITION CONTROL LOOPS WITH POSITION CONTROL LOOP HAVING AN EXTENDED RANGE

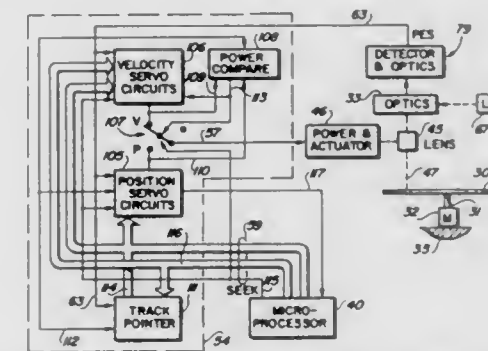
William W. Chow, Alan A. Fennema, Ian E. Henderson, and Ronald J. Kadlec, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1989, Ser. No. 320,197

Int. Cl.⁵ G11B 7/085

U.S. Cl. 369—44.28

59 Claims



1. In a position servo system having an actuator movably mounted on a support and carrying a transducer to be positioned over a predetermined travel path with respect to a signal storing member and being disposed in operative relationship to the signal storing element, the signal storing member having a plurality of spaced-apart position-indicating indicia along said travel path and being sensible by the transducer such that the transducer supplies a local position indication of the positional relationship of the transducer to any indicium currently being sensed, position error means being operatively connected to the transducer for receiving said indication and

of said particular class which completes or updates said standard information in whole or in part.

5,090,008

ERASABLE RECORDING MEDIA

Bryan K. Clark; Sheryl L. Johnson, both of Sunnyvale, and Robert Guerra, Santa Clara, all of Calif., assignors to Tandy Corporation, Ft. Worth, Tex.

Continuation-in-part of Ser. No. 357,377, May 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 294,723, Jan. 10, 1989, which is a continuation-in-part of Ser. No. 153,288, Feb. 5, 1988, abandoned, and a continuation-in-part of Ser. No. 414,041, Sep. 28, 1989, and a continuation-in-part of Ser. No. 414,044, Sep. 28, 1989. This application Apr. 30, 1990, Ser. No. 516,509

Int. Cl.³ G11B 7/24, 7/00; G01D 15/34
U.S. Cl. 369—284 35 Claims



1. A recording medium comprising:
 - a) a substrate;
 - b) an expansion region adjacent said substrate, said expansion region expanding in the presence of radiation in a write beam of light at a write wavelength to form a detectable bump thereon; and
 - c) means for receiving a volume induced by expansion from said expansion region, said means for receiving comprising a liquid or vapor layer at an operating temperature of said recording medium.

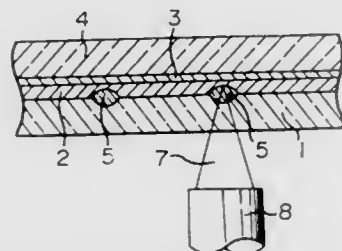
5,090,009

OPTICAL INFORMATION RECORDING MEDIUM

Emiko Hamada; Yuji Arai; Yuaki Shin, and Takashi Ishiguro, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 340,528
Claims priority, application Japan, Jul. 30, 1988, 63-191714; Aug. 29, 1988, 63-214470; Sep. 22, 1988, 63-238456; Sep. 24, 1988, 63-239163; Sep. 24, 1988, 63-239164; Sep. 24, 1988, 63-239166; Sep. 24, 1988, 63-239167

Int. Cl.³ G11B 7/24
U.S. Cl. 369—284 9 Claims



1. An optical information recording medium comprising a light transmitting substrate, a light absorptive layer having a complex refractive index comprised of a real part of said complex refractive index (n_{abs}) and an imaginary part of said complex refractive index (k_{abs}), said absorptive layer having a thickness (d_{abs}), said light absorptive layer overlaying the substrate to absorb a laser beam and a light reflective layer overlaying the light absorptive layer, wherein an optical parameter represented by $\rho = n_{abs}d_{abs}/\lambda$ where λ is the wavelength of a reading laser beam, meets the inequality

$0.05 \leq \rho \leq 0.6$, and the imaginary part k_{abs} of the complex refractive index of the light absorptive layer is at most 0.3.

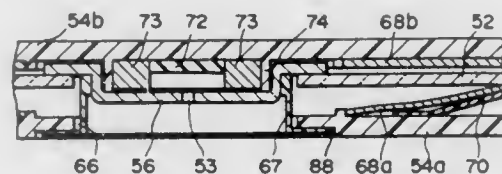
5,090,010

DISC CARTRIDGE

Yoshinori Takahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 26, 1990, Ser. No. 514,887
Claims priority, application Japan, Apr. 27, 1989, 1-48878[U]; Jun. 8, 1989, 1-144103

Int. Cl.³ G11B 3/58, 7/00
U.S. Cl. 369—291 14 Claims



1. A disc cartridge comprising:
 - disc-shaped information recording means;
 - driving force transmitting means, provided in a center of said information recording means, for rotating said information recording means when said driving force transmitting means is influenced by a driving force;
 - means for housing said information recording means, said housing means comprising first and second portions, said first and second portions having inner surfaces adjacent to said information recording means, said first portion having an opening to expose said driving force transmitting means;
 - means, provided on said inner surface of each of said first and second portions of said housing means, for removing dust from said information recording means;
 - pressing means, provided only between said inner surface of said first portion of said housing means and said dust removing means on said first portion of said housing means, for applying a force in a direction from said first portion of said housing means toward said information recording means; and
 - magnetic means for moving said information recording means in a direction towards said second portion.

5,090,011

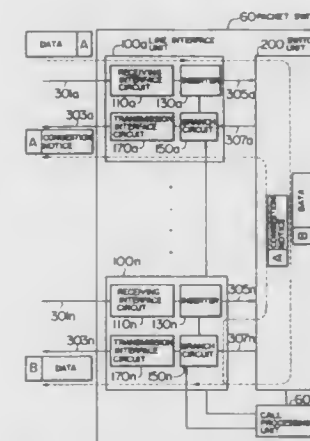
PACKET CONGESTION CONTROL METHOD AND PACKET SWITCHING EQUIPMENT

Isao Fukuta; Kenji Kawakita, both of Yokohama; Jiro Kashio, Kawasaki; Yutaka Torii; Shinobu Gohara, both of Yokohama, and Noboru Endo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 455,135
Claims priority, application Japan, Dec. 23, 1988, 63-323300
Int. Cl.³ H04J 3/26 15 Claims

1. A packet switching system comprising:
 - a plurality of input lines;
 - a plurality of output lines;
 - switch means for selectively outputting to said output lines input packets from said input lines;
 - means for detecting an occurrence of congestion and a cease of congestion of packets in association with each of said output lines; and
 - means for generating a congestion control packet by adding a congestion indicator for indicating an occurrence of congestion or cease of congestion to a replica of an input packet to be sent out from an output line on which the occurrence of congestion or cease of congestion is detected by said detecting means and for returning said

congestion control packet to an output line associated with a transmission source of said input packet; said transmission source operating to control packet flow rate of packets sent to said switch means after having



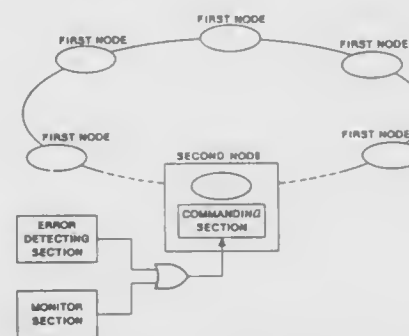
received said congestion control packet thereby controlling the number of input packets to be newly sent on said output line on which congestion or cease of congestion was detected.

5,090,012

MULTIPLEX TRANSMISSION SYSTEM FOR USE IN A VEHICLE

Hiroshi Kajiyama; Osamu Michihira, and Toshimichi Tokunaga, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 21, 1990, Ser. No. 525,840
Claims priority, application Japan, May 22, 1989, 1-126714
Int. Cl.³ H04J 03/14
U.S. Cl. 370—85.3 20 Claims



1. A multiplex transmission system for use in a vehicle wherein a plurality of multiplex communication nodes are connected to a common multiplex transmission path, the system comprising:
 - (a) detection means for detecting transmission errors at said plurality of multiplex communication nodes and/or in the transmission path; and
 - (b) wherein said plurality of multiplex communication nodes include

- (b1) a plurality of first communication nodes, each first communication node having a communication control unit for controlling communication between said first communication nodes based on a decentralized multiplex protocol; and
- (b2) a second communication node including at least a communication control unit for controlling communication through the overall system, said second communication node having
 - (b2-1) command means for commanding each of said plurality of first communication nodes to supply infor-

mation on the status of the corresponding node to said transmission path, when said detection means detects an error.

5,090,013

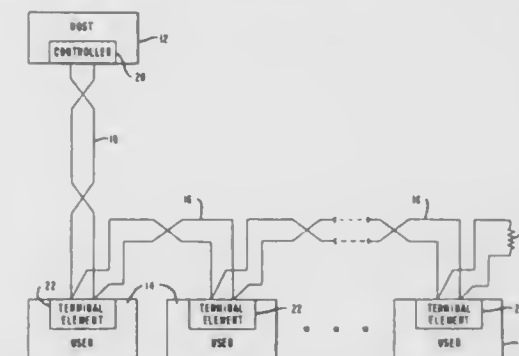
TIME SLOT PROTOCOL IN THE TRANSMISSION OF DATA IN A DATA PROCESSING NETWORK

Richard J. Fadem, Roslyn Heights, N.Y., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 893,510, Aug. 5, 1986, abandoned. This application Apr. 26, 1990, Ser. No. 515,528

The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.³ H04J 3/02 20 Claims

U.S. Cl. 370—85.8 20 Claims



1. A data processing network comprising:
 - a host computer;
 - a plurality of terminals, each terminal having an assigned identification;
 - a cable means for transmitting data between said host computer and said plurality of terminals;
 - a controller means connected solely to one end of said cable means between said host computer and said cable means, said controller means for receiving character data from said host computer and placing said character data on said cable means for transmission to said plurality of terminals, and for receiving keystroke data from each of said terminals over said cable means and transmitting said keystroke data to said host computer, said controller means having means for transmitting a cycle of time frames, each time frame having a plurality of time slots, with one time slot allocated for sending a single character to an associated terminal, each time frame further having a time slot for transmission of a single keystroke from a specified terminal to said host computer; and
 - a plurality of terminal element means, each of said terminal element means connected to a respective one of said terminals and to said cable means, each of said terminal element means for receiving character data transmitted from said host computer over said cable means, and for receiving keystroke data from its associated terminal for transmission over said cable means to said host computer.

5,090,014

IDENTIFYING LIKELY FAILURE POINTS IN A DIGITAL DATA PROCESSING SYSTEM

Herman Polich, Monument; James Nicholson, and Larry Emlich, both of Colorado Springs, all of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 175,485, Mar. 30, 1988. This application Nov. 1, 1989, Ser. No. 430,168
Int. Cl.³ G06F 11/00 20 Claims

11. A system for detecting one of a plurality of likely failures of components in a digital data processing system, comprising

high temperature gas-purifier and the source of clean laser gaseous material to control the gaseous material of the laser.

5,090,021

DISCHARGE EXCITING PULSE LASER DEVICE

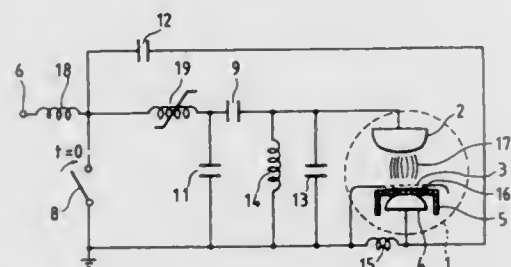
Hajime Nakatani, and Atrushi Sugitatsu, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed May 15, 1990, Ser. No. 523,688

Claims priority, application Japan, May 17, 1989, 1-123345
Int. Cl.⁵ H01S 3/097

U.S. Cl. 372—86

5 Claims



1. A discharge exciting pulse laser device, comprising; first and second main electrodes across which is generated a main discharge, an auxiliary electrode cooperating with said second main electrode to generate a corona discharge, a switch having a first terminal connected to said second main electrode, a series circuit of a saturable reactor and a first charge capacitor connected between a second terminal of said switch and said first main electrode, a first charge circuit element connected between said main electrodes, a second charge capacitor for facilitating said corona discharge connected between the second terminal of said switch and said auxiliary electrode, and a second charge circuit element connected between said second main electrode and said auxiliary electrode, said first and second charge capacitors being charged with said switch turned-off, such that when said switch is turned-on after completion of charging said first and second charge capacitors a corona discharge is generated between said auxiliary electrode and said second main electrode and said corona discharge preliminarily ionizes a space between said main electrodes to cause said main discharge therebetween.

5,090,022

COLD CRUCIBLE INDUCTION FURNACE

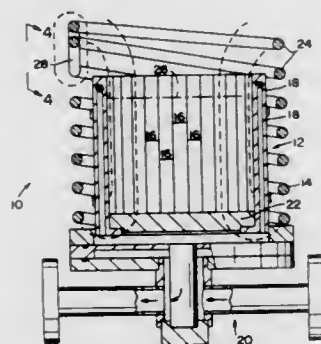
John H. Mortimer, Medford, N.J., assignor to Inductotherm Corp., Rancocas, N.J.

Filed May 21, 1990, Ser. No. 526,344

Int. Cl.⁵ H05B 6/22

U.S. Cl. 373—156

20 Claims



1. A coreless induction furnace comprising:
(a) a crucible for holding a quantity of metal to be heated by said furnace, said crucible having an open top for permitting access to a top surface of metal in said crucible, side

walls and a closed bottom, and having means for permitting a cooling fluid to circulate therethrough;

(b) induction coil means operatively associated with said crucible for generating a time-varying magnetic induction field; and

(c) coupling means for coupling at least a portion of the induction field to the center portion of the top surface of the metal to be heated, said coupling means extending above the top of said crucible.

5,090,023

SPREAD SPECTRUM COMMUNICATION SYSTEM

Shintaro Watanabe; Yasushi Yamaguchi; Shigeyuki Nakayama; Hirotaka Namioka, and Hisashi Terada, all of Tokyo, Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Continuation of Ser. No. 920,606, Oct. 20, 1986, abandoned.

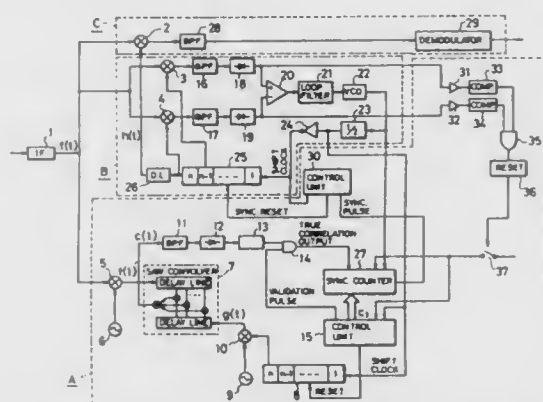
This application Oct. 27, 1989, Ser. No. 428,005

Claims priority, application Japan, Sep. 29, 1986, 61-228291; Sep. 29, 1986, 61-228292; Sep. 29, 1986, 61-228293

Int. Cl.⁵ H04L 27/30

U.S. Cl. 375—1

17 Claims



1. A demodulation method for a spread spectrum signal including a preamble of a PN code pattern and PN code modulated data subsequent to the preamble, the method comprising the steps of:

applying the spread spectrum signal and a reference PN code signal, which is in a series of reference PN code patterns, to a SAW convolver having a processing length less than half of the preamble in said spread spectrum signal;

detecting a correlation output generated from said SAW convolver during a preselected validation interval in each of the reference PN code patterns;

determining an initial synchronization time point by referring to a detection time of the correlation output; and

synchronizing a demodulation PN code signal, which is in a series of demodulation PN code patterns, with the initial synchronization time point determined, whereby the spread spectrum signal is demodulated by the synchronized demodulation PN code signal.

5,090,024

SPREAD SPECTRUM COMMUNICATIONS SYSTEM FOR NETWORKS

James E. Vander Mey, and Timothy J. Vander Mey, both of Ocala, Fla., assignors to Intellon Corporation, Ocala, Fla.

Filed Aug. 23, 1989, Ser. No. 397,803

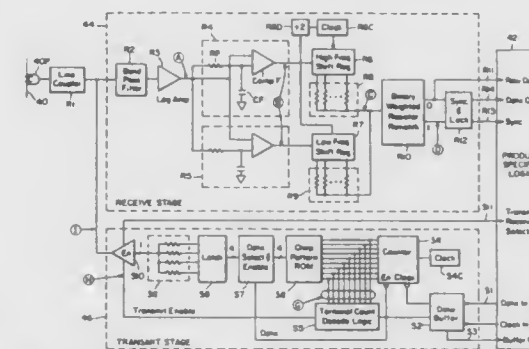
Int. Cl.⁵ H04L 27/30

U.S. Cl. 375—1

37 Claims

1. A communication system comprising:
a plurality of transmitters each generating a plurality of signals, each signal being a chirp and being generated at a plurality of frequencies over a time interval;
a communications channel for carrying the signals;
each said transmitter including means for sensing a presence

on the communications channel of a carrier signal prior to initiating a generation of signals, said carrier signal including a sequence of at least one chirp, and having timing which is asynchronous relative to that of at least one other of the plurality of transmitters; and



means for receiving the signals from the communications channel, wherein the means for receiving includes means for self synchronizing on each signal of the plurality of signals.

5,090,025

TOKEN RING SYNCHRONIZATION

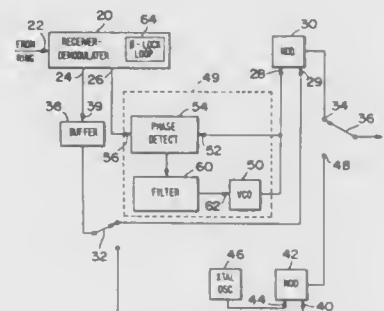
Alan C. Marshall, Framingham; Stuart P. MacEachern, Uxbridge, and Howard C. Salwen, Newtonville, all of Mass., assignors to Proteon, Inc., Westboro, Mass.

Filed Jul. 24, 1990, Ser. No. 558,197

Int. Cl.⁵ H04L 25/60

U.S. Cl. 375—4

6 Claims



1. In a local network of the type described in ANSI/IEEE Standard 802.5, a node having a ring monitor circuit and a reclocking circuit operably alternatively to one another, said network node including a receiver-demodulator incorporated a first phase locked loop and having an input connectable to the network and having an output providing received data and an output providing a received clock, an elasticity buffer connected to the received data output of said receiver-demodulator, and means for modulating said received data onto a clock signal extracted from said received clock, an improvement wherein said reclocking circuit includes:

a second phase-locked loop connected in a transmission line between said received clock output of said receiver-demodulator and a received data input to said means for modulating, the bandwidth of said second phase-locked loop being narrower than the bandwidth of said first phase-locked loop.

5,090,026

GMSK NARROWBAND MODEM

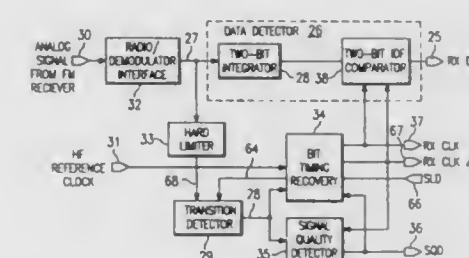
Harold P. Stern, Arlington, Tex., and Mohammed S. El-Tanany, Quebec, Canada, assignors to ElectroCom Automation, Inc., Arlington, Tex.

Filed Sep. 11, 1989, Ser. No. 405,423

Int. Cl.⁵ H04L 27/12, 27/14

U.S. Cl. 375—47

12 Claims



1. A GMSK modem in a communications system for data transmission, comprising:

a modulator including:

a premodulation filter coupled to a data source for filtering the data from said source, said premodulation filter having a Gaussian impulse response and a normalized noised bandwidth B_r between 0.25 and 0.45, and generating a GMSK modulated baseband signal output; and

means for controlling the gain of said premodulation filter such that an RF frequency signal modulated by the GMSK modulated baseband signal has a modulation index "h" of between 0.5 and 0.7; and

a demodulator including:

a data detector including a two-bit integrate-and-dump filter coupled to the analog output signal of an FM receiver; and

bit timing recovery means including a binary quantized loop coupled between the analog signal output of the FM receiver and the two-bit integrate-and-dump filter a clock signal phase aligned with the data bit transmission of the GMSK modulated baseband signal in the analog output signal of the FM receiver.

5,090,027

COHERENT PSK DEMODULATOR WITH ADAPTIVE LINE ENHANCER

Tomoki Ohsawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

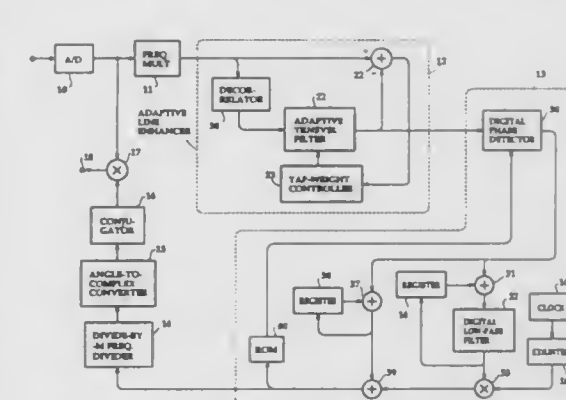
Filed Jan. 25, 1990, Ser. No. 470,215

Claims priority, application Japan, Jan. 26, 1989, 1-19045; Apr. 21, 1989, 1-102487

Int. Cl.⁵ H03D 3/22; H04L 27/22

U.S. Cl. 375—80

4 Claims



1. A coherent demodulator for demodulating an incoming

M-ary PSK (phase-shift keying) signal, said coherent demodulator comprising:

- frequency multiplier means for multiplying the frequency of said M-ary PSK signal by a factor M to produce a carrier having a line spectrum;
- delay means coupled to said frequency multiplier means for delaying said carrier for a predetermined duration;
- an adaptive transversal filter having a tapped-delay line coupled to said delay means to produce successively delayed carrier components, and a plurality of tap-weight multipliers connected respectively to successive taps of said tapped-delay line for weighting said carrier components with tap-weight coefficients to produce weighted carrier components, and for summing said weighted carrier components to produce an adaptively filtered signal;
- detector means coupled to said frequency multiplier means and to said adaptive transversal filter for detecting a difference between said carrier and said filtered signal;
- tap-weight control means coupled to said detector means for generating said tap-weight coefficients in accordance with said difference;
- frequency divider means for dividing the frequency of said filtered signal from said adaptive transversal filter by M; and
- product demodulator means for demodulating said incoming M-ary PSK signal with an output signal of said frequency divider means.

5,090,028

METHOD OF AND APPARATUS FOR SYNCHRONIZATION BY MEANS OF CORRELATION
Jean-Luc Crebouv, Saint Remy les Chevreuse, France, assignor to U.S. Philips Corporation, New York, N.Y.

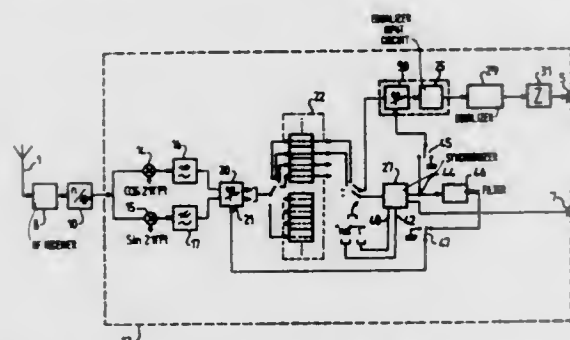
Filed Jul. 27, 1990, Ser. No. 558,715

Claims priority, application France, Jul. 28, 1989, 89 10188

Int. Cl.⁵ H04L 7/00

U.S. Cl. 375-106

3 Claims



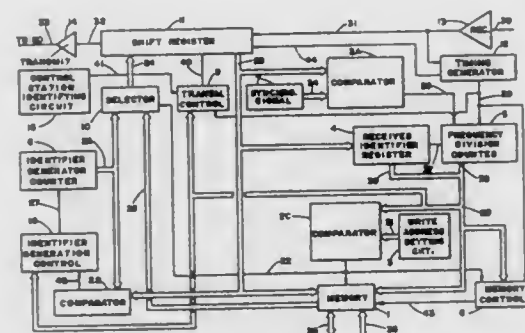
1. A method for synchronizing user data, comprising the following steps:

- receiving a plurality of N sub-samples of synchronizing data representing a synchronization sequence centered around a carrier frequency,
- effecting N first correlations of the received user data with one part of a locally generated sync sequence,
- determining the sub-sample i_{opt} having the best correlation among the N first correlations,
- effecting a second correlation of said sub-sample i_{opt} with the remaining part of the locally generated sync sequence, and
- producing an error indication using the results of the best correlation and the second correlation.

5,090,029
DATA COMMUNICATION METHOD AND APPARATUS
Toshifumi Yamamoto, Hitachi; Mitsuro Takakura, Katsuta; Hiromasa Yamaoka, Hitachi, and Masakazu Okada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 92,448, Sep. 3, 1987, abandoned. This application May 1, 1989, Ser. No. 345,580
Claims priority, application Japan, Sep. 5, 1986, 61-207904
Int. Cl.⁵ H04J 3/26

U.S. Cl. 375-107

20 Claims



1. A data communication apparatus comprising:
first generator means for generating data for a plurality of data frames, each data frame including a frame header section and a data field section;
the frame header section including a synchronization field portion for transmission of synchronization data generated by the first generator means, and a frame identification field portion for transmission of frame identification data generated by the first generator means which provides respective data frames with unique identifiers representative of at least a portion of a remote memory address to which access is desired;
means for supplying frame identification data to a plurality of successive frame identification field portions, wherein frame identification data of each successive data frame is distinguishable from frame identification data of a next preceding data frame and a next succeeding data frame; and
means for transmitting the plurality of data frames.

5,090,030

INTEGRAL LAP COUNTER FOR RADIO-CONTROLLED MODELS

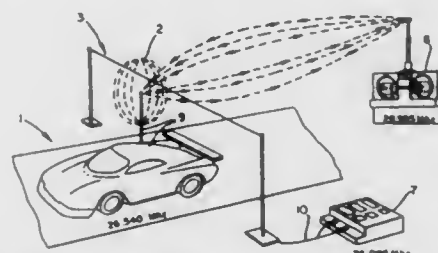
Jimmy R. Jenkins, 12150 Shiloh Rd., Dallas, Tex. 75228

Filed Jul. 16, 1990, Ser. No. 552,824

Int. Cl.⁵ H04B 1/12, 1/034

U.S. Cl. 377-5

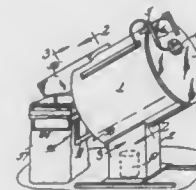
6 Claims



1. A method for counting the number of laps a radio controlled vehicle makes around a race course by providing radio controlled vehicles in which the receiver thereof inherently generates a lower power band of spurious frequencies, each having an individual characteristic or signature, and then detecting spurious radio-frequency electromagnetic signals spontaneously generated by, and individually characteristic of the radio receiver in each of said vehicles.

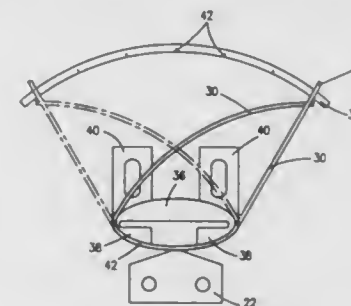
5,090,031
CAN COUNTING MACHINE
Melvin L. Pyne, P.O. Box 997, Brookings, Ore. 97415, and Robert B. Allsup, Box 2053, Harbor, Ore. 97415
Filed Oct. 9, 1990, Ser. No. 597,676
Int. Cl.⁵ B65G 47/14; G06M 7/00
U.S. Cl. 377-6

9 Claims



7. A machine for counting empty elongate containers comprising,
a base,
a housing on said base and having an inclined major axis for the reception of a mass of containers to be counted,
a rotor in said housing including an inclined circular disk defining openings spaced about its periphery into which containers in said housing may gravitate, a rim projecting axially from the disk,
a support structure in said housing and including a backing plate having an outlet for the passage of containers gravitating from the disk openings,
motor and transmission means carried by said support structure for driving said disk,
displacement means on said backing plate and spaced from the rotor axis to engage an end of an incorrectly positioned container in one of said openings and to displace same from said opening for return back into the mass of containers,
detection means on said support structure actuated by a container subsequent to passage through said outlet, counter means actuated by said detection means and a display unit driven by said counter means.

band is said selected portion; said selected portion being operative to urge a document towards the reading head whereby



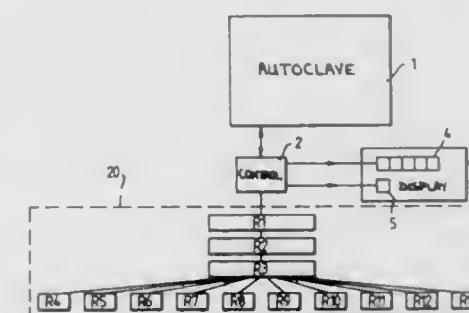
excessive wear of said band is avoided by periodically repositioning said band with said positioning means.

5,090,033
ELECTRICAL COUNTER HAVING PLURAL UNIT VALUE REGISTERS
Richard Murray-Shelley, Pontypridd, Wales, assignor to Smiths Industries Public Limited Company, London, England
Filed Oct. 22, 1990, Ser. No. 600,699
Claims priority, application United Kingdom, Oct. 20, 1989, 8923672

Int. Cl.⁵ H03K 21/40

U.S. Cl. 377-28

10 Claims



1. An electrical counter for storing a count comprising: a first set of a plurality of registers dedicated solely to the storage of information associated with unit value of the count; and at least one further register for containing the tens value of the count, said further register being operative to control into which of the registers of the first set the unit value is entered in accordance with the tens value in the further register such that only one of the registers of the first set contains the unit value of the count and the others of the registers of the first set contain no information on the count.

5,090,034

DUAL CHANNEL IONIZATION COUNTER
K. Peter Ganza, 2497 Nikanna Road, Mississauga, Ontario, Canada L5C 2W8

Filed Sep. 25, 1990, Ser. No. 587,747

Int. Cl.⁵ H03K 21/02, 21/08

U.S. Cl. 377-55

5 Claims

1. An event counter comprising a source of counts, first and second counters receiving counts from said source, each counter comprising input gate means operable to cut off counts from said source and means to reset the counter, and each counter also being associated with a latch having first control means selectively enabled to receive a count state from the counter and to hold said count state, and second control means selectively enabled to present said count state to an output, an output bus connected to the outputs of both latches, and a clock generator for generating symmetrical square wave outputs of opposite phases and a predetermined periodicity much

5,090,032
MOVABLE PRESSURE SPRING BAND TO AVOID EXCESSIVE WEAR FROM CARD FEEDING APPARATUS
Hugh Gill, Livingston, and Mark McCorry, Glasgow, both of United Kingdom, assignors to Unisys, Blue Bell, Pa.
Filed Jun. 14, 1990, Ser. No. 537,801
Claims priority, application United Kingdom, Nov. 24, 1989, 8926636

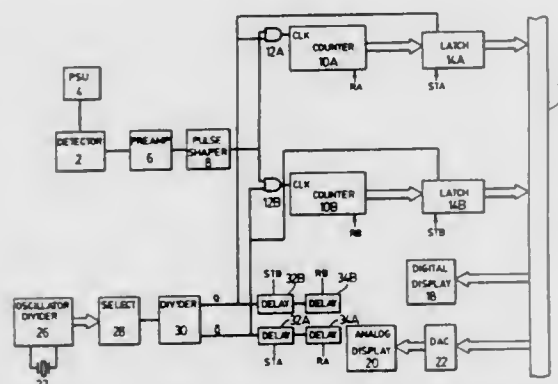
Int. Cl.⁵ G06M 7/06, 3/02

U.S. Cl. 377-18

8 Claims

1. An apparatus for urging a document against a reading head by a resilient band, said apparatus comprising: a band support; a moveable resilient band, said band including a plurality of spaced portions along the length thereof, a selected portion being held on said support; and positioning means, operable to position said band to select which portion of said

greater than that of events to be counted, said outputs of opposite phase being applied to said input gate means of the two counters and to the second control means of their associated latches so that counting of one counter is enabled while a previous count state of that counter held by the associated latch is presented to the output bus, whilst counting of the



other counter is disabled, said clock generator further generating control signals delayed relative to transitions of said square wave signal firstly to enable said first control means of a latch associated with that counter whose counting is disabled to receive the count state from that counter, and secondly to enable said means to reset that counter.

5,090,035

LINEAR FEEDBACK SHIFT REGISTER

Makoto Murase, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

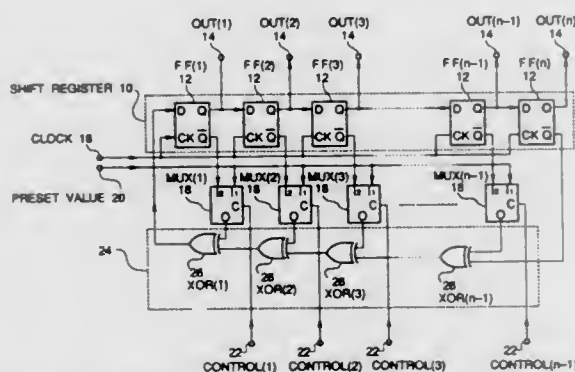
Filed Jan. 22, 1991, Ser. No. 644,259

Claims priority, application Japan, Jan. 19, 1990, 2-9673

Int. Cl.⁵ G01R 31/28

U.S. Cl. 377-72

8 Claims



1. A linear feedback shift register comprising a shift register formed of first to (n)th flipflops cascaded in such a manner that an output of a (i)th flipflop is connected to an input of a (i+1)th flipflop, where $2 \leq n$ and $1 \leq i \leq (n-1)$, first to (n)th output terminals connected to outputs of said first to (n)th flipflops, respectively, a clock terminal connected to a clock input of each of said flipflops, first to (n-1)th multiplexers of a "1-out-of-2" type each having a first input connected to a common preset value input terminal, said first to (n-1)th multiplexers having a second input connected to the outputs of said first to (n-1)th flipflops, respectively, to an individual control terminal, and a first set of exclusive-OR gates composed of first to (n-1)th exclusive-OR gates cascaded in such a manner that a first input of a (n-1)th exclusive-OR gate is connected to the output of the (n)th flipflop, a first input of an (i)th exclusive-OR gate is connected to an output of an (i+1)th exclusive-OR gate, and an output of the first exclusive-OR gate is connected to an input of the first flipflop, a second input of the (i)th exclusive-OR gate being connected to an output of the (i)th

multiplexor, whereby a generator polynomial generated by the linear feedback shift register can be modified by controlling said multiplexors through said individual control terminals.

5,090,036

TWO-PHASE-CLOCKED SHIFT REGISTER IS BIPOLAR TECHNOLOGY

Wolfgang Hoehn, Märgen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

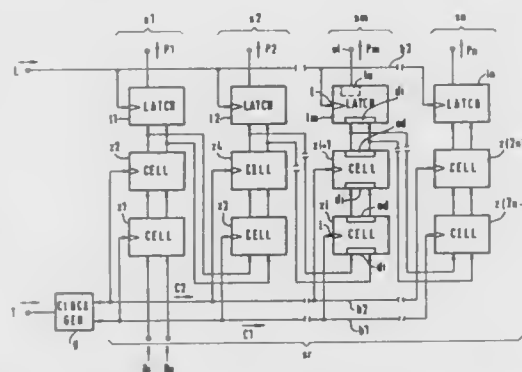
Filed Jul. 16, 1990, Ser. No. 553,022

Claims priority, application European Pat. Off., Aug. 16, 1989, 89 11 5059

Int. Cl.⁵ G11C 11/41, 5/06; H03K 23/42

U.S. Cl. 377-78

20 Claims



1. Two-phase-controlled shift register in bipolar technology, comprising:

a clock generator which provides a first shift clock and a second shift clock, said clock generator including an emitter coupled differential amplifier for providing said first shift clock at a first output and said second shift clock at a second output;

an n-stage shift register chain having 2n series-connected cells defined as alternately odd- and even-numbered cells, wherein each cell has a clock input, a pair of input terminals for receiving antiphase data input, and a pair of output terminals for providing antiphase data output, and n latch cells each having a latch-clock input, a pair of input terminals for receiving antiphase data input, and an output stage for providing a data output based upon at least one of said antiphase data input;

wherein each stage of said n-stage shift register chain is formed by an odd-numbered cell, an even-numbered cell, and a latch cell, the odd-numbered cell having said first shift clock applied to its clock input and its output terminals connected to the input terminals of the even-numbered cell, the even numbered cell having said second shift clock applied to its clock input and its output terminals connected to the input terminals of the latch cell and to the input terminals of the odd-numbered cell of the next stage in sequence of said n-stage shift register chain, and the latch cell having said latch clock applied to its latch-clock input for providing the data output latched therein via its output stage; and

wherein each of the odd-numbered, even-numbered, and latch cells of said n stages of said shift register chain is formed by a basic cell circuit including a current bank for providing a current-bank current I_s at a pair of output terminals thereof, a first transistor and a second transistor of a first type having their emitter terminals coupled together and each having its collector terminal connected to the base terminal of the respective other transistor and to a respective output terminal of the current bank, and a third transistor and a fourth transistor of the first type having their emitter terminals coupled to the respective pair of input terminals for the cell and their collector

terminals connected to the collector terminals of the first and second transistors, respectively, and wherein the base terminal of the third transistor and the emitter terminal of the first transistor and the base terminal of the fourth transistor and the emitter terminal of the second transistor are connected to the clock input for the cell with the clock input for even-numbered cells connected to said second output of said differential amplifier and with the clock input of odd-numbered cells connected to said first output of said differential amplifier.

5,090,038

STEREOSCOPIC X-RAY APPARATUS

Hiroshi Asahina, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

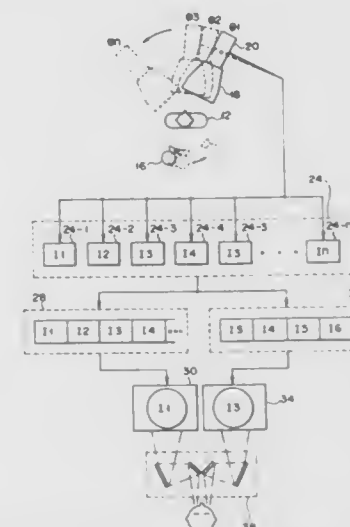
Filed Oct. 3, 1990, Ser. No. 592,375

Claims priority, application Japan, Oct. 9, 1989, 1-262060

Int. Cl.⁵ A61B 6/02

U.S. Cl. 378-41

26 Claims

5,090,037
HELICAL SCANNING COMPUTED TOMOGRAPHY WITH TRACKING X-RAY SOURCE

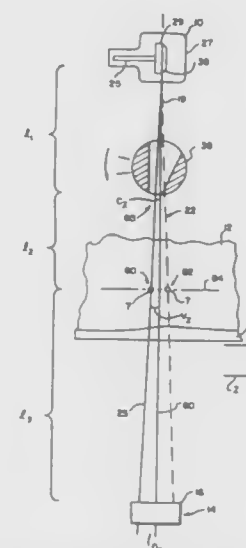
Thomas L. Toth, Brookfield; Kevin F. King, New Berlin, and Carl R. Crawford, Milwaukee, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 19, 1990, Ser. No. 615,514

Int. Cl.⁵ G21K 1/04

U.S. Cl. 378-4

14 Claims



1. A method of acquiring tomographic projection data of an imaged object comprising:

supporting and translating the imaged object concurrently along a translation axis;

projecting a beam of x-rays from an x-ray generator through the imaged object and alternately sweeping the beam along the translation axis in a first direction with translation of the imaged object during a first period, and in a second direction along the translation axis but counter to the translation of the imaged object during a second period;

receiving the beam from the x-ray generator with an x-ray detector array after it passes through the imaged object; and

holding the x-ray generator and x-ray detector in opposition around the imaged body and concurrently rotating the same around a center of rotation and the imaged object, in an gantry plane substantially perpendicular to the translation axis.

5,090,039

INSPECTING COILED TUBING FOR WELL OPERATIONS

Michael F. Gard; Eric S. Pasternack, both of Plano, and Lonnie J. Smith, Allen, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 2, 1988, Ser. No. 163,332

Int. Cl.⁵ G01N 23/02

U.S. Cl. 378-59

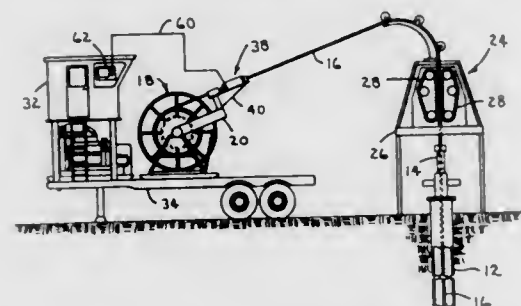
1 Claim

1. In a coiled tubing system for insertion of a substantially continuous bendable length of metal tubing into and withdrawal from a wellbore, said system including a tubing injection unit disposed for injecting said length of tubing into said wellbore and storage means for dispensing said length of tubing and receiving said length of tubing from said injection unit, the improvement characterized by:

tubing inspection apparatus for substantially continuously inspecting the wall section of said tubing to detect cracks and structural defects which may lead to tubing failure, said apparatus comprising:

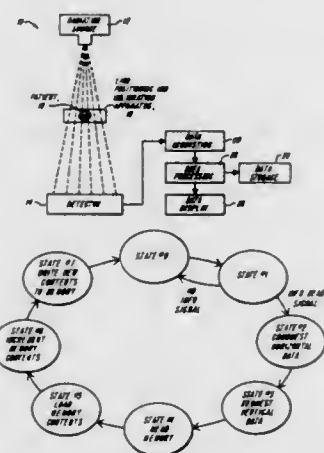
a source of electromagnetic radiation mounted in proximity

to said tubing between said injection unit and a wellhead into which said tubing is injected;
 a radiation detector unit for receiving signals from said source which have been projected through the wall of said tubing;
 means for receiving signals from said detector unit for monitoring the structural integrity of the wall of said tubing during one of injecting and withdrawing said tubing with respect to said wellhead; and
 housing means supported for rotation about a longitudinal axis of said tubing, said source of radiation and said detec-



tor unit being mounted on said housing means for rotation therewith about the circumference of said tubing in such a way that said tubing is longitudinally extended through said housing means while said source of radiation and said detector unit are rotated to scan the wall of said tubing about substantially the entire circumference of said tubing during said one of injection and withdrawal of said tubing with respect to said wellhead so that said tubing is inspected while under one of compressive or tensile stress associated with said one of injection and withdrawal of said tubing with respect to said wellhead.

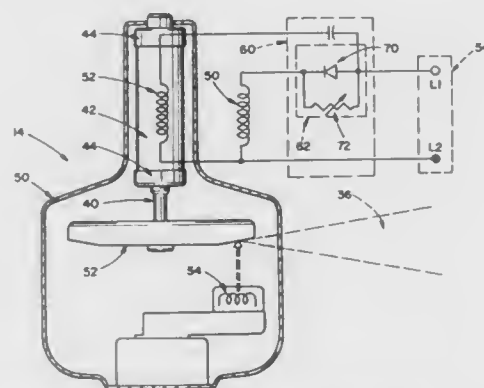
5,090,040
DATA ACQUISITION SYSTEM FOR RADIOGRAPHIC IMAGING
 Richard C. Lanza, Brookline; Joseph R. Votano, Tewksbury, and Tomas Russ, Brookline, all of Mass., assignors to Expert Image Systems, Inc., Somerville, Mass.
 Filed Mar. 10, 1989, Ser. No. 321,996
 Int. Cl.⁵ G01N 23/04; H05G 1/64; G06F 15/00
 U.S. Cl. 378—62 8 Claims



1. A continuous data acquisition system for radiographic imaging, without interrupting acquisition activity the acquisition system comprising:
 at least two memory means for storing radiographic data from a radiation detector wherein each of the memory means having a plurality of addressable memory locations and each of the memory means are such that said locations

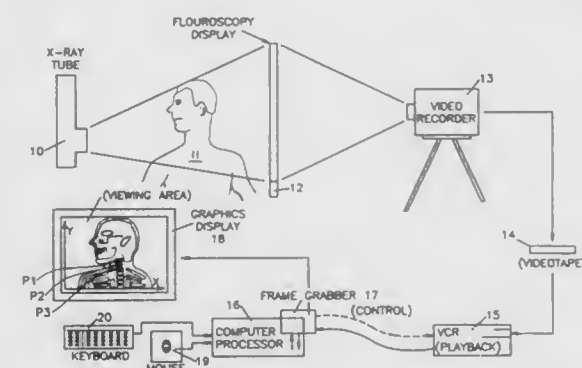
of the memory means correspond to spatial locations in the radiation detector;
 logic control means for sensing radiographic data transmitted by the radiation detector, for selecting one of said memory means for storage of said data, for transferring data to the selected memory means, and for switching from one memory means to another memory means according to a predefined schedule and according to memory capacity level, said logic control means further comprising a logic device which receives data and increments the contents of locations in a memory means in response to such data; and
 interface control means for reading data from one or the other memory means when such memory means is not actively acquiring data such that data can be acquired continuously by the system.

5,090,041
X-RAY TUBE ANODE SPEED REDUCER
 Avery D. Furbee, Elmhurst, Ill., assignor to Picker International, Inc., Highland Hts., Ohio
 Filed Sep. 20, 1990, Ser. No. 585,603
 Int. Cl.⁵ H05G 1/66
 U.S. Cl. 378—93 10 Claims



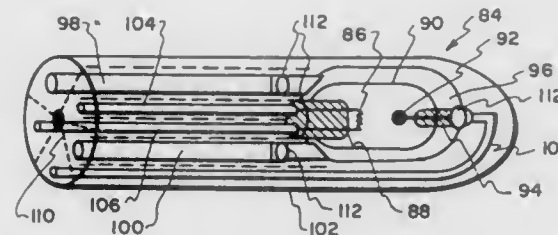
1. An x-ray diagnostic apparatus comprising:
 an x-ray tube including a rotatably mounted anode and rotor combination and at least main and auxiliary stator windings electromagnetically coupled with the rotor;
 an AC power source interconnected with the main and auxiliary windings for providing AC electrical power signals of the same frequency to the main and auxiliary windings of the stator with a phase lag between cycles of the AC electrical power supplied to the main and auxiliary windings;
 a circuit connected between the AC source and one of the stator windings for cyclically applying a DC magnetic brake component during only a fractional portion of each cycle of the AC electrical power signal supplied to the one of the stator windings to shift a controlled steady state rotational speed of the anode and rotor combination;
 an examination region disposed adjacent the x-ray tube such that x-rays from the x-ray tube generated while the anode is rotating at the controlled shifted steady state rotational speed irradiate a subject in the examination region;
 an x-ray detecting means disposed opposite the subject receiving region from the x-ray tube for detecting radiation which has passed through the examination region.

5,090,042
VIDEOFLUOROSCOPY SYSTEM FOR IN VIVO MOTION ANALYSIS
 Fadi J. Bejjani, 35 W. 4 St., New York; Ricky Lockett, 100 E. 92 St. 5J, Brooklyn, and Lazaros Pavlidis, 93-21 71st Dr., Forest Hills, all of N.Y.
 Filed Dec. 24, 1990, Ser. No. 632,919
 Int. Cl.⁵ H05G 1/64
 U.S. Cl. 378—99 20 Claims



11. A videofluoroscopy method for performing in vivo motion analysis comprising the steps of:
 (a) irradiating a subject in motion and producing a series of x-ray images of the subject;
 (b) recording the series of x-ray images as video image frames on a video recording medium;
 (c) providing a playback output of the video image frames recorded on the video recording medium;
 (d) receiving a playback of video image frames from the video recording medium and providing an output of individual image frames one frame at a time;
 (e) displaying within a viewing area each individual image frame provided at a time;
 (f) marking selected points within the viewing area of each individual image frame displayed; and
 (g) defining X-Y dimensions for the viewing area displayed, detecting X-Y coordinates for each of the selected marking points within the defined viewing area, and storing the X-Y coordinates of the selected marking points for each image frame thus marked as motion data.

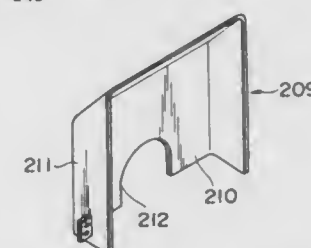
5,090,043
X-RAY MICRO-TUBE AND METHOD OF USE IN RADIATION ONCOLOGY
 William J. Parker, West Hills, and Earl R. Parker, San Mateo, both of Calif., assignors to Parker Micro-Tubes, Inc., San Mateo, Calif.
 Filed Nov. 21, 1990, Ser. No. 616,397
 Int. Cl.⁵ H01J 35/32
 U.S. Cl. 378—121 16 Claims



1. An apparatus for the treatment of a patient having a tumor, comprising:
 an X-ray generating source insertable into the body of said patient to a location in close proximity to said tumor, said X-ray generating source comprising a substantially cylindrical glass X-ray tube having a length on the order of

one-quarter to two inches and a diameter less than one inch and being operable at a voltage level in the range of approximately 10-60 KeV, thereby enhancing absorption of the generated X-rays by said tumor and minimizing the side effects of radiation therapy on the patient's normal tissue.

5,090,044
X-RAY EXAMINATION APPARATUS
 Tohru Kobayashi, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
 Filed Oct. 26, 1990, Ser. No. 603,365
 Claims priority, application Japan, Oct. 30, 1989, 1-279873
 Int. Cl.⁵ G21K 1/00
 U.S. Cl. 378—145 13 Claims



1. An X-ray examination apparatus comprising:
 a bed;
 means for radiating X-rays to a patient lying on the bed;
 means for converting the X-rays radiated to the patient into an image;
 an arm rest, connected to one side of the bed, for platforming an arm of the patient thereon when a catheter is inserted into a blood vessel of the patient from the arm; and
 X-ray shield means, mounted on the arm rest, for shielding scattered X-rays to protect arms/hands of an operator handling the catheter, the X-ray shield means having a front wall facing a carcass of the patient, edge walls disposed at sides of the front wall in a manner to surround the operator's hands, and an opening formed in the front wall to platform the patient's arm on the arm rest.

5,090,045
 Patent Not Issued For This Number

5,090,046
ANALYZER DETECTOR WINDOW AND A METHOD FOR MANUFACTURING THE SAME
 John J. Friel, Furlong, Pa., assignor to Outokumpu Oy, Helsinki, Finland
 Filed Nov. 21, 1989, Ser. No. 439,476
 Claims priority, application Finland, Nov. 30, 1988, 885554
 Int. Cl.⁵ H01J 5/18
 U.S. Cl. 378—161 18 Claims

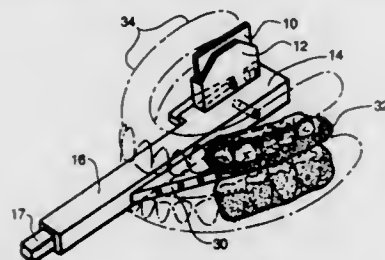
1. A window member for an X-ray analyzer, for penetration by soft X-rays, said window member including polymer material, wherein the polymer material is present in the window member in the form of a single layer of polymer material about 0.5 micrometers thick.

5,090,047
APPARATUS FOR REPRODUCIBLY POSITIONING AN IMAGE RECEPTOR FOR INTRAORAL DIAGNOSTICS
 Marshall A. Angotti, New Salem Borough; Frank J. Lopez, Hanover Borough, and Richard C. Margraf, Upper Moreland Township, Montgomery County, all of Pa., assignors to Applied Research Company, Hanover, Pa.
 Filed Oct. 23, 1990, Ser. No. 601,867
 Int. Cl.⁵ G03B 42/04; A61B 6/14
 U.S. Cl. 378—170 8 Claims

1. In apparatus for positioning an image receptor within a patient's mouth in predetermined relation to an energy beam generated by means located externally of the patient's mouth,

whereby the energy beam passes through a target comprising a portion of the patient's alveolar ridge and such teeth as are supported thereby, is altered by predetermined characteristics of the target and as so altered strikes the image receptor to cause production of an image which facilitates diagnostic studies of the target, the improvement comprising, in combination:

- a. image receptor support means;
- b. connecting means rigidly connecting the image receptor support means to the energy beam generating means;



- c. a rigid bite block having upper and lower bite surfaces adapted to be held between the patient's maxilla and mandible when the patient bites down thereon; and
- d. means removably attaching the bite block to the connecting means in a position such that the bite block can be held between the maxilla and the mandible of the patient at a location removed from the target, the attachment means further providing for attachment of the bite block at any of a plurality of discrete sites relative to the image receptor, whereby a plurality of targets can be studied using one bite block position within the patient's mouth.

5,090,048

SHIELDED ENCLOSURE WITH AN ISOLATION TRANSFORMER

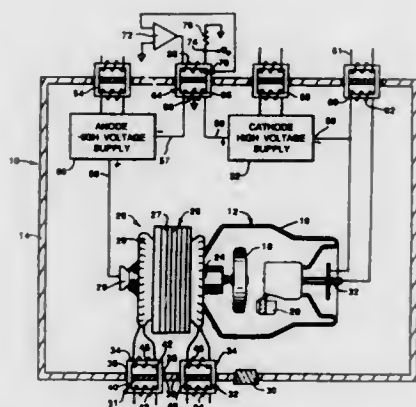
James A. Blake, Franklin, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed May 22, 1991, Ser. No. 703,948

Int. Cl.⁵ H05G 1/04

U.S. Cl. 378—202

14 Claims



8. An X-ray tube assembly comprising:
 - a vacuum tube for emitting X-rays and including a cathode, an anode and a filament;
 - an electrically conductive case enclosing said vacuum tube; and
 - a first transformer extending through an aperture in said case and attached thereto in a manner that hermetically seals the aperture, said first transformer having a magnetically conductive annular first core, a first winding magnetically coupled to the first core outside said case, and a second winding magnetically coupled to the first core inside said case for supplying voltage to said vacuum tube.

5,090,049 FAX MESSAGE RECORDER AND RELAY SYSTEM AND METHOD

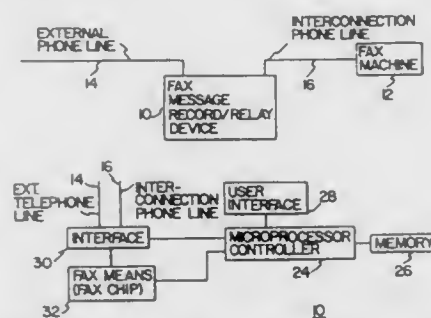
Thomas N. Chen, 7507 Shadywood Rd., Bethesda, Md. 20817

Filed May 22, 1990, Ser. No. 526,641

Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—100

20 Claims



1. A fax message recorder and relay system comprising:
 - an interface with a first connection means connectable to an external phone line, a second connection means connectable to an interconnection phone line extending from said system to an external, local fax machine, a ring detector to detect an incoming telephone call on the external phone line, and a switching means;
 - a fax means integral to the system and operably connected to said interface such that the fax means is operable to send and receive fax messages over the external phone line depending on the position of the switching means, said fax means operable to send fax messages over the external phone line independent of the external, local fax machine; a storage means operably connected to said fax means to receive and store incoming fax messages from a remote fax machine even with the local fax machine receiving the incoming fax messages; and
 - a controller operably connected to said interface, said storage means, and said fax means, and wherein said controller controls said switching means to allow said storage means to store incoming fax messages sent over the external phone line and intended for the local fax machine and to allow retransmission of the incoming fax messages over the external phone line to a phone number remotely set by an authorized person independently, and after reception, of any incoming fax message.

5,090,050

METHOD AND APPARATUS FOR COMMUNICATING WITH RADIO TELEPHONES

Stuart D. Heffernan, Marietta, Ga., assignor to Contel Cellular Inc., Atlanta, Ga.

Continuation of Ser. No. 407,346, Sep. 14, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,054

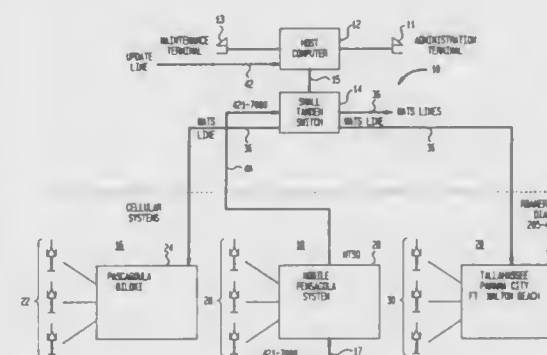
Int. Cl.⁵ H04Q 7/04

U.S. Cl. 379—60

37 Claims

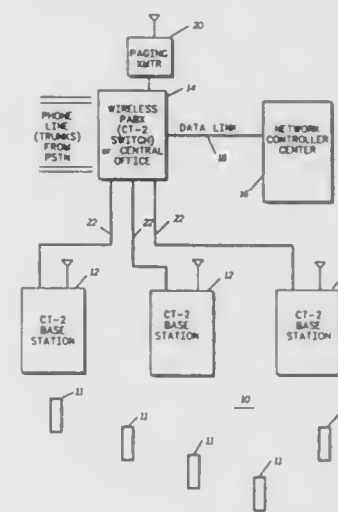
27. An apparatus for completing telephone calls to radio telephones, comprising:
 - a first radio telephone system for receiving telephone calls for radio telephones associated with said system and for completing said calls by radio communication with said radio telephones;
 - means for receiving through telephone communication from a user of one of said radio telephones a coded signal for said radio telephones;
 - means for directing, after receipt of said coded signal, telephone calls for said radio telephone to a telephone switch associated with said first radio telephone system;
 - computer means associated with said telephone switch for identifying, from said coded signal, said radio telephone and for identifying a second radio telephone system having a roamer access telephone number to which said di-

rected telephone calls should be switched, said first and second radio telephone systems each comprising one or more MTSO's and a plurality of fixed transmitters in radio telephone communication with a plurality of radio telephones through said transmitters and providing radio telephone communication service to radio telephones within different geographic areas;



- means for making a telephone connection between said switch and the roamer access telephone number for said second radio telephone system; and
- means for completing said directed telephone calls through said telephone connection and said second radio telephone system using radio communication between said radio telephone and said second radio telephone system.

ting a call to the called wireless telephone on said voice channel; and



5,090,052 TELEPHONE SYSTEM WITH MULTIPLE EXTENSION TELEPHONES

Ryuichi Nakajima, and Koji Yamana, both of Tokyo, Japan, assignors to Tandy Corporation, Fort Worth, Tex.

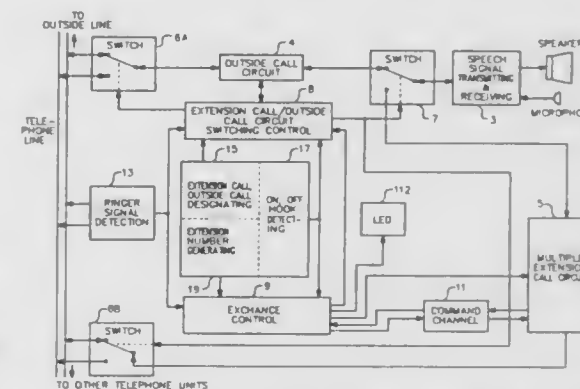
Continuation of Ser. No. 353,601, May 18, 1989, abandoned.

This application Apr. 9, 1991, Ser. No. 683,085

Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—98

27 Claims



5. A telephone extension system for connection to an outside telephone line comprising:
 - at least first and second telephones;
 - at least a first telephone extension line directly connected to said outside line and extending between at least said first and second telephones;
 - means for connecting said first telephone to said extension line to establish a first communication at a first average signal level using said outside line; and
 - means for connecting said second telephone to said first extension line to permit a second communication, said second communication occurring without using said outside telephone line,
 - means for limiting said second communication to a maximum average signal level less than said first average signal level to permit said second communication to occur simultaneously with said first communication substantially without interference with said first communication.

5,090,051 RADIO COMMUNICATION SYSTEM AND METHOD FOR CONNECTING AN INCOMING CALL TO A WIRELESS TELEPHONE

Prabhakar Muppidi; Gary S. Lobel, both of Boynton Beach, and Steven C. Shapiro, Lake Worth, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 484,097, Feb. 22, 1990, abandoned.

This application Mar. 18, 1991, Ser. No. 671,183

Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—61

2 Claims

1. A method of connecting an incoming telephone call to a wireless telephone comprising the steps of:
 - at a central system:
 - receiving an incoming telephone call for a particular wireless telephone; and
 - transmitting a radio paging signal including ID information for the called wireless telephone and further including telephone line ID information; and
 - at a plurality of base stations:
 - receiving the transmitted radio paging signal ID information;
 - if a telephone line is available at the individual base station, selecting an available voice channel and transmit-

VOL

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DESIGN PATENTS

GRANTED Feb. 18, 1992

ERRATA

For
CLASS

D21-086

See
PATENT NO.

324,114

VOL
1135

ISS
3

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18

1992

UMI

DESIGNS

FEBRUARY 18, 1992

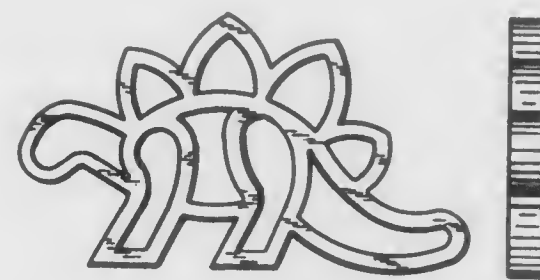
323,918
PASTA

Edward J. Meyers, Jr., Roselle Park, N.J., and Deborah L. Bernardini, Mahopac, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 5, 1990, Ser. No. 488,793

Term of patent 14 years

U.S. Cl. D1—106



323,919
PASTA

Edward J. Meyers, Jr., Roselle Park, N.J.; Deborah L. Bernardini, Mahopac, N.Y.; Frank Ceglia, and Eileen Fogarty, both of New York, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 5, 1990, Ser. No. 488,791

Term of patent 14 years

U.S. Cl. D1—106



323,920

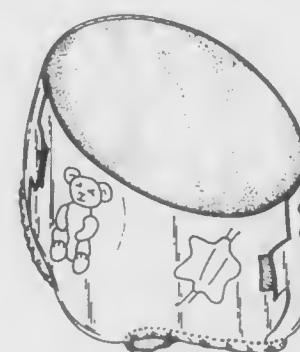
PAIR OF TRAINING PANTS OR THE LIKE

Barbara Pitts, 3328 Blair Ave., Fort Smith, Ark. 72904-3614

Filed Mar. 19, 1990, Ser. No. 495,206

Term of patent 14 years

U.S. Cl. D2—11



323,921

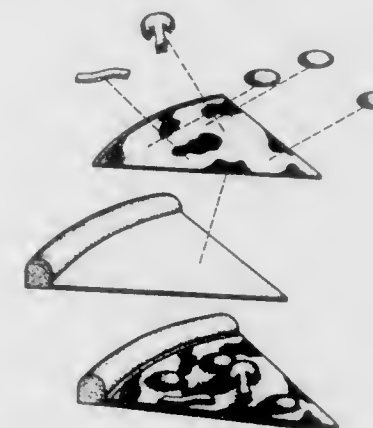
SLEEPING BAG

David B. Kawchak, 1120 Wales Ave., Johnstown, Pa. 15904

Filed Aug. 2, 1989, Ser. No. 388,365

Term of patent 14 years

U.S. Cl. D2—25



323,922

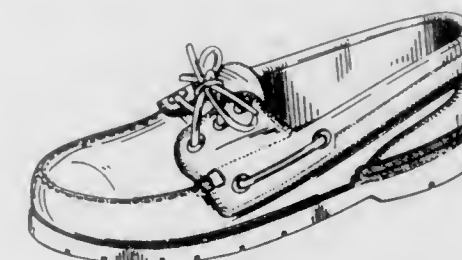
BOAT SHOE

Donald G. Emmert, 21 Crystal Cir., Burlington, Mass. 01803

Filed May 31, 1990, Ser. No. 530,977

Term of patent 14 years

U.S. Cl. D2—268



323,923

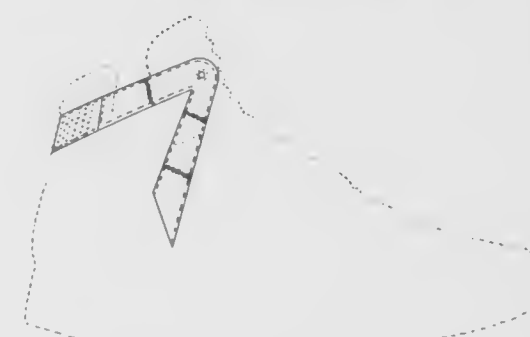
ANKLE ELEMENT OF A SHOE UPPER

Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.

Continuation-in-part of Ser. No. 559,572, Jul. 27, 1990, abandoned. This application Dec. 7, 1990, Ser. No. 624,664

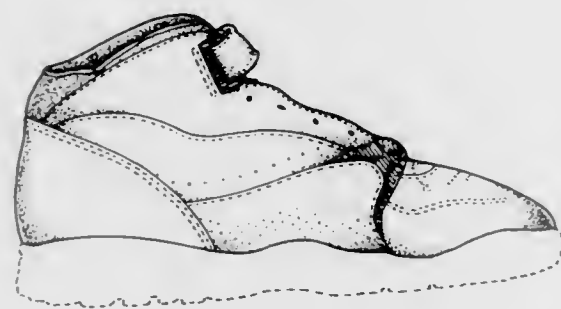
Term of patent 14 years

U.S. Cl. D2—314



323,924
SHOE UPPER

John S. Earle, Tigard, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 12, 1991, Ser. No. 654,564
Term of patent 14 years
U.S. Cl. D2—314



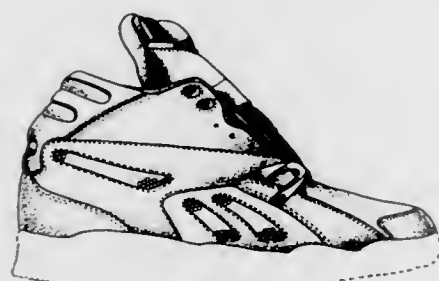
323,925
SHOE UPPER

Paul D. Brown, Hingham, Mass., and Jonathan R. Morris, Cranston, R.I., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 12, 1991, Ser. No. 684,359
Term of patent 14 years
U.S. Cl. D2—314



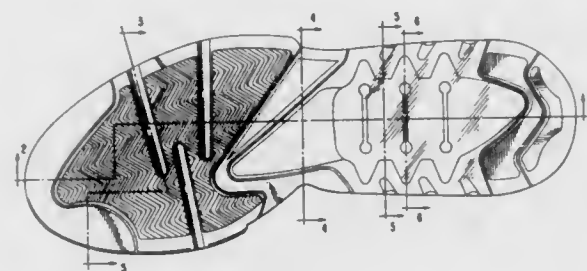
323,926
SHOE UPPER

Paul D. Brown, and Ralph Serna, both of Hingham, Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 12, 1991, Ser. No. 684,348
Term of patent 14 years
U.S. Cl. D2—314



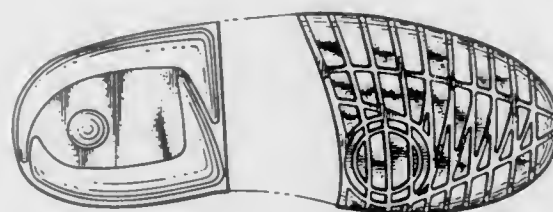
323,927
OUTSOLE BOTTOM

Bruce E. Rogers, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jul. 27, 1990, Ser. No. 558,414
Term of patent 14 years
U.S. Cl. D2—320



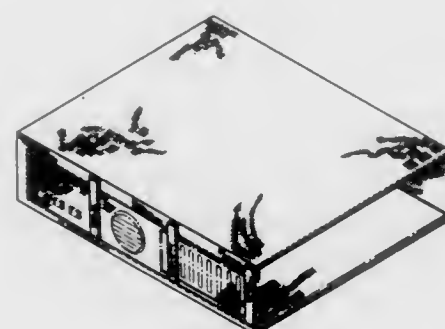
323,928
ELEMENT OF A SHOE OUTSOLE

Ric Claveria, Loma Linda, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Division of Ser. No. 505,003, Apr. 5, 1990, Pat. No. Des. 319,725. This application Sep. 14, 1990, Ser. No. 583,702
Term of patent 14 years
U.S. Cl. D2—320



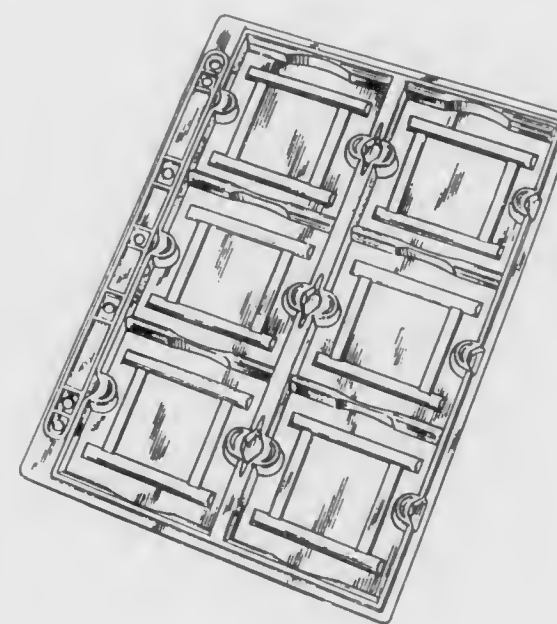
323,929
COMPUTER COVER

Richard H. Hodson, 900 W. Balboa Blvd., Newport Beach, Calif. 92661
Filed Apr. 27, 1989, Ser. No. 344,042
Term of patent 14 years
U.S. Cl. D3—30.1



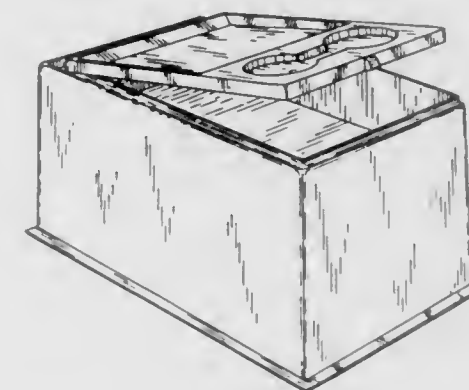
323,930
FILE SHEET FOR COMPACT DISCS

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Oct. 31, 1989, Ser. No. 430,233
Claims priority, application Japan, Jun. 19, 1989, 1-22339
Term of patent 14 years
U.S. Cl. D3—35



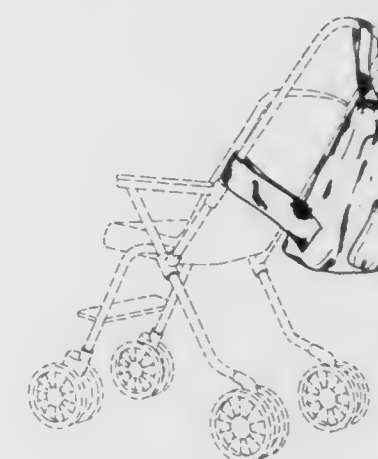
323,932
UTILITY CONSOLE FOR A TRUCK

Ronald E. Hudgens, Rte. 3, Box 158A, Lenoir City, Tenn. 37771
Filed Aug. 11, 1988, Ser. No. 230,990
Term of patent 14 years
U.S. Cl. D3—40



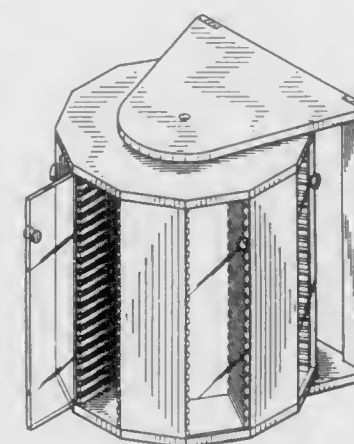
323,933
DUFFEL BAG FOR A STROLLER OR THE LIKE

Angela Johnston, 128 Second St., Fanwood, N.J. 07023
Filed Jun. 27, 1989, Ser. No. 372,037
Term of patent 14 years
U.S. Cl. D3—41



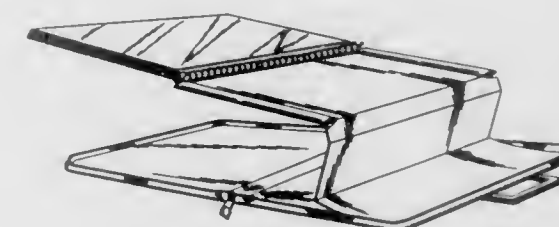
323,931
COMPACT DISC FILE

Michael W. Haynes, 855 Old Stratfield Rd., Fairfield, Conn. 06430
Filed Sep. 2, 1988, Ser. No. 240,117
Term of patent 14 years
U.S. Cl. D3—35



323,934
DISPLAY BRIEFCASE

Dominique Prat, Neuilly Sur Seine, France, assignor to Fabrications PRAT/EUROPA, Paris, France
Filed Nov. 3, 1989, Ser. No. 431,134
Term of patent 14 years
U.S. Cl. D3—71



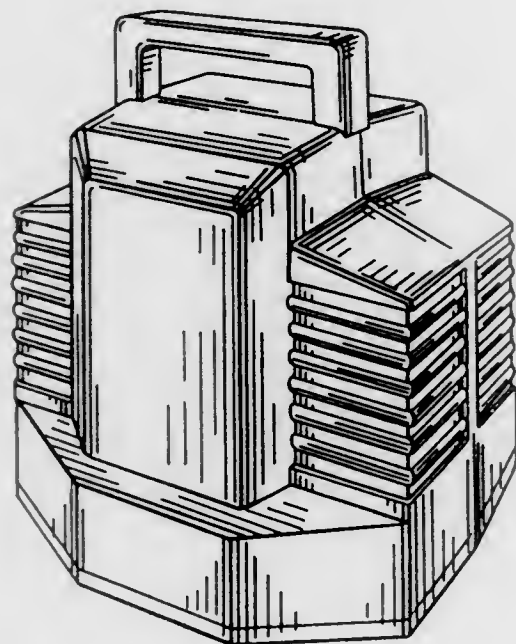
323,935

CASE FOR ROUTER POWER TOOL

William W. Ward, Clayton, N.C., assignor to Southern Case, Janet Solomon, P.O. Box 309, Bausman, Pa. 17504
Inc., Raleigh, N.C.

Filed Jun. 30, 1989, Ser. No. 373,485
Term of patent 14 years

U.S. Cl. D3—73

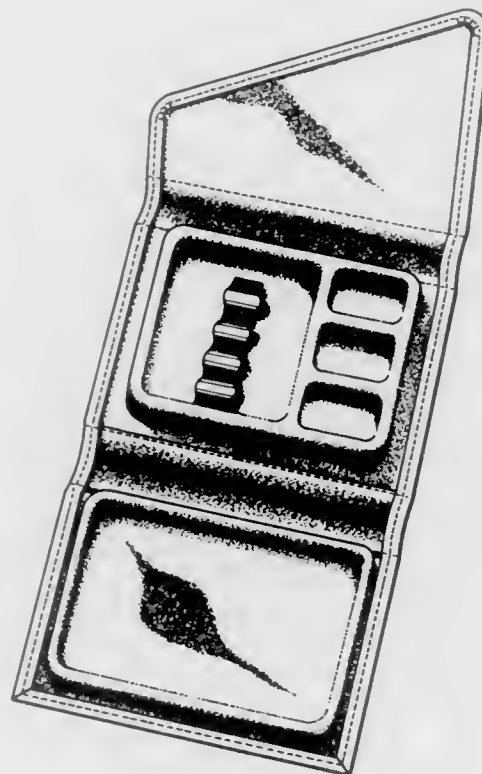


323,937

TRAVEL JEWEL CASE

Filed Jun. 11, 1990, Ser. No. 536,225
Term of patent 14 years

U.S. Cl. D3—75



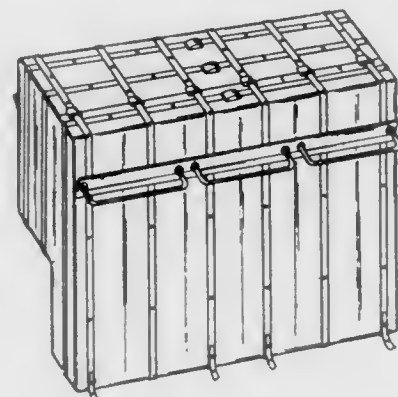
323,938

AIRPLANE SEAT ATTACHABLE BAG

John R. Bennetts, 54 Solomon St., Palmyra, Western Australia
6157, Australia

Filed Sep. 13, 1988, Ser. No. 243,762
Term of patent 14 years

U.S. Cl. D3—78



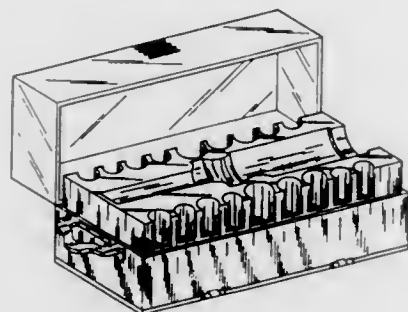
323,936

TOOL BOX

Yee-Chang Feng, 2F., No. 166-5, Hsi Twen Rd. Sec. 3, Tai
Chung City, Taiwan

Filed May 25, 1990, Ser. No. 530,936
Term of patent 14 years

U.S. Cl. D3—74



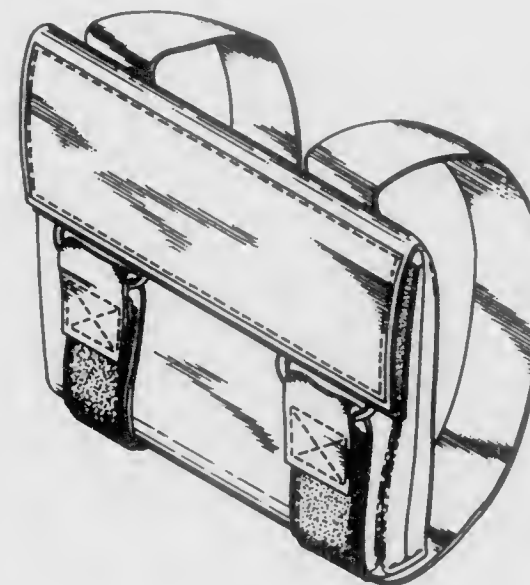
323,939

WRIST POUCH

Linda B. Mok, 1533 S. Kelton Ave., Los Angeles, Calif. 90024
Filed Sep. 6, 1989, Ser. No. 403,332

Term of patent 14 years

U.S. Cl. D3—106



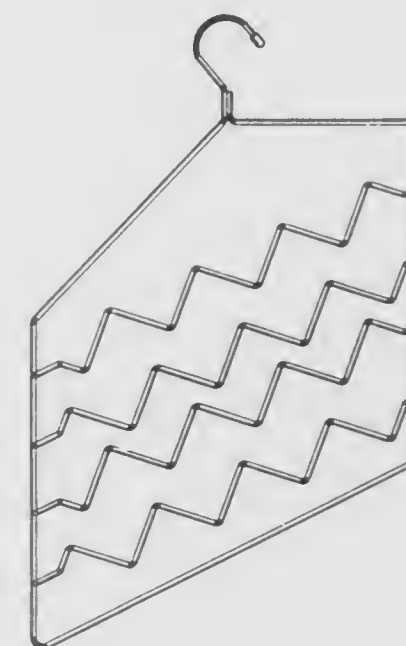
323,941

PRE-KNOTTED NECKTIE HANGER

Donald C. Schwartz, 27 Lawn St., Dayton, Ohio 45405
Filed Jan. 17, 1989, Ser. No. 298,037

Term of patent 14 years

U.S. Cl. D6—317



323,940

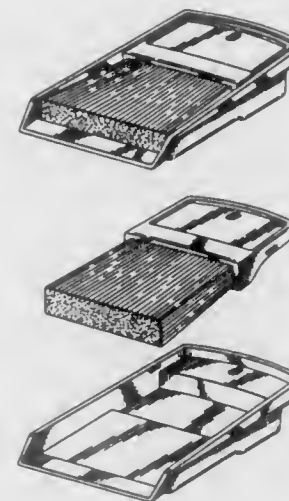
COMBINED WHISK BROOM AND DUST PAN

Kent W. Murphy, Wooster, Ohio, and Joseph Lapin, Montreal,
Canada, assignors to Rubbermaid Incorporated, Wooster,
Ohio

Filed Jul. 2, 1990, Ser. No. 548,726

Term of patent 14 years

U.S. Cl. D4—116



323,942

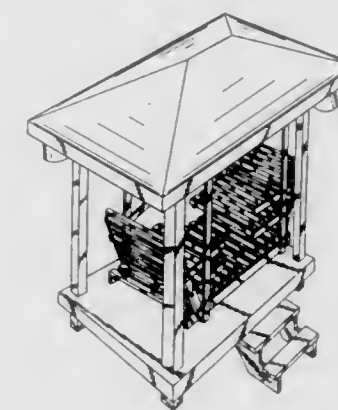
SWING APPARATUS

Wendell Tatarchuk, 121 Merry Mark Dr., Lumberton, Tex.
77656

Filed Aug. 14, 1987, Ser. No. 85,608

Term of patent 14 years

U.S. Cl. D6—347



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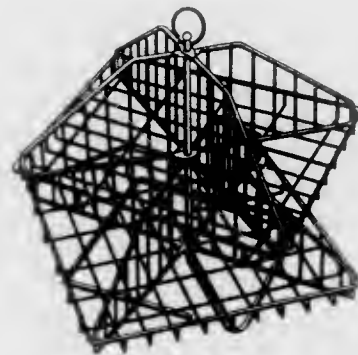
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323,943
CHAIR

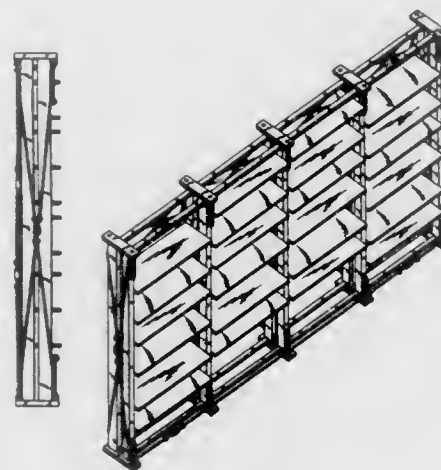
Giancarlo Piretti, Piazza Trento e Trieste 2/2, Bologna, Italy
Filed Oct. 24, 1988, Ser. No. 261,825
Claims priority, application Italy, Jun. 10, 1988, 53222-B/88
Term of patent 14 years
U.S. Cl. D6—380

323,945
ROTATABLE STORAGE RACK

Shahriar Dardashti, 141 N. Clark Dr., Ste. 2, Los Angeles, Calif. 90048
Filed Jun. 26, 1989, Ser. No. 371,304
Term of patent 14 years
U.S. Cl. D6—458

323,946
SHELVING UNIT

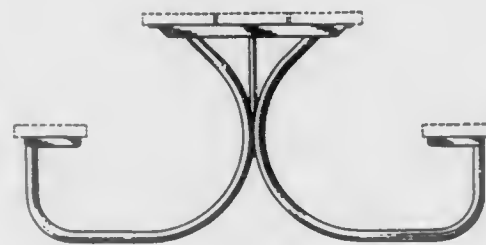
Michael E. Plottel, 200 E. 72nd St., New York, N.Y. 10021
Filed Jun. 9, 1989, Ser. No. 365,031
Term of patent 14 years
U.S. Cl. D6—478

323,944
COMBINED FOLDABLE ROOM DIVIDER AND
STORAGE CABINET

Paul Maas, 1387 Woodland La., Riverwoods, Ill. 60015
Filed Oct. 31, 1989, Ser. No. 429,904
Term of patent 14 years
U.S. Cl. D6—436

323,947
END STANDARD FOR A PICNIC TABLE

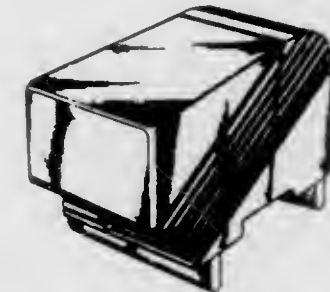
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Dec. 3, 1986, Ser. No. 937,247
Term of patent 14 years
U.S. Cl. D6—495

323,948
MOIST TOWELETTE DISPENSER

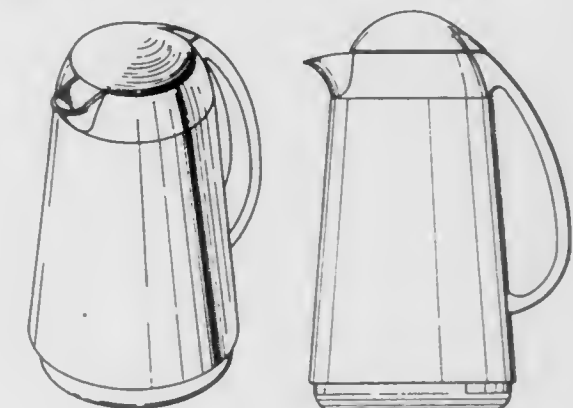
Joyce Cooper, 1524 Shasta Dr., Colorado Springs, Colo. 80910
Filed Feb. 2, 1990, Ser. No. 473,711
Term of patent 14 years
U.S. Cl. D6—518

323,950
COUNTERTOP WATER COOLER

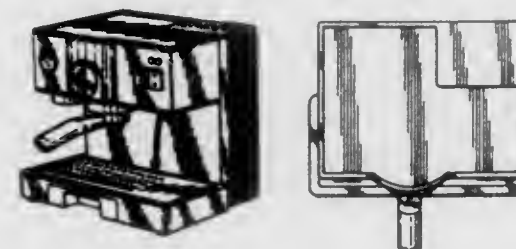
Lawrence Pleet, Bell Canyon, Calif., and James J. Costello, Houston, Tex., assignors to Igloo Products Corporation, Houston, Tex.
Filed Jun. 21, 1989, Ser. No. 369,904
Term of patent 14 years
U.S. Cl. D7—313

323,951
VACUUM BOTTLE

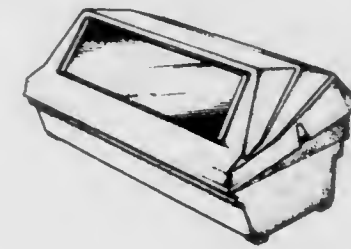
Tsunemichi Inoue, Osaka, Japan, assignor to Zojirushi Corporation, Osaka, Japan
Filed May 8, 1989, Ser. No. 348,934
Claims priority, application Japan, Dec. 28, 1988 1-4230
Term of patent 14 years
U.S. Cl. D7—317

323,949
ESPRESSO MACHINE

Hartwig Kahleke, Krounberg, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Oct. 13, 1989, Ser. No. 421,714
Claims priority, application Fed. Rep. of Germany, May 22, 1989, 8903580
Term of patent 14 years
U.S. Cl. D7—309

323,952
BARBECUE GRILL BODY

Wesley J. Wagner, Columbus, Ga., and John Seal, Auburn, Ala., assignors to W.C. Bradley Company, Columbus, Ga.
Filed Aug. 11, 1989, Ser. No. 393,452
Term of patent 14 years
U.S. Cl. D7—332



323,953

MICROWAVE OVEN

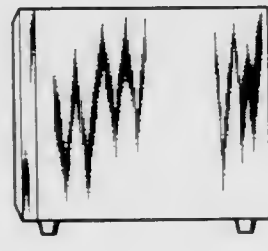
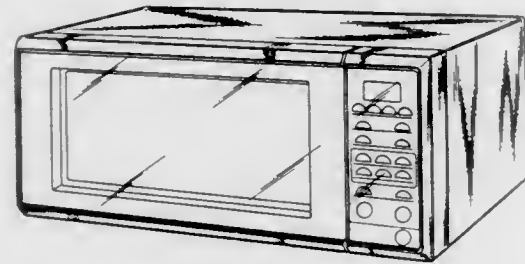
Masayoshi Kubo, Nara; Masuo Ichihara, Souraku, and Hisayoshi Matoba, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 8, 1990, Ser. No. 535,455

Claims priority, application Japan, Jan. 5, 1990, 2-23

Term of patent 14 years

U.S. Cl. D7—351



323,955

ELECTRICALLY OPERATED FOOD MIXER OR SIMILAR ARTICLE

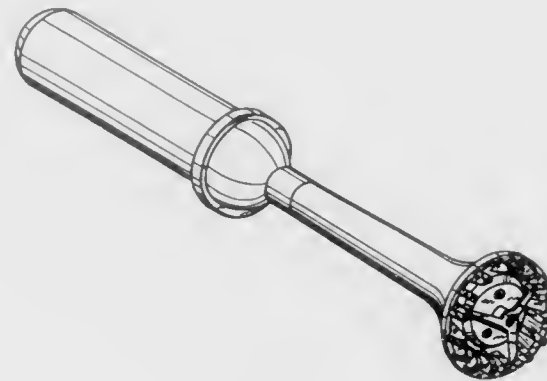
Edgar Rixen, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 275,262

Claims priority, application Fed. Rep. of Germany, May 26, 1988, 9858

Term of patent 14 years

U.S. Cl. D7—376



323,956

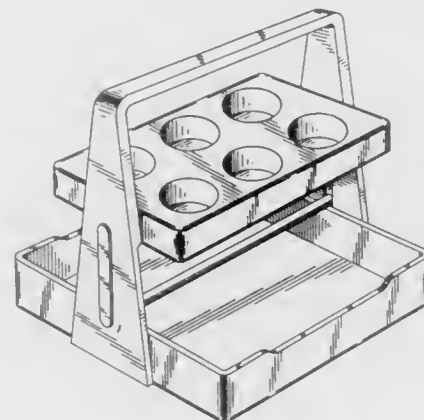
COMBINED NAPKIN HOLDER AND CONDIMENT CADDY

Hyman Abrams, 17 Brown Cir., Paramus, N.J. 07652

Filed Jan. 22, 1990, Ser. No. 468,782

Term of patent 14 years

U.S. Cl. D7—632



323,954

ELECTRIC DEEP FAT FRYER

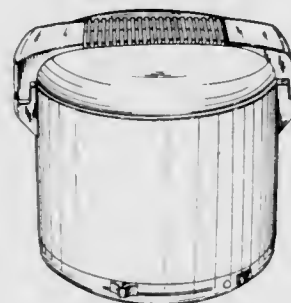
Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France

Filed Nov. 30, 1989, Ser. No. 443,384

Claims priority, application France, Jun. 15, 1989, 893946

Term of patent 14 years

U.S. Cl. D7—354



323,957

HANDLE FOR AN ARTICLE OF FLATWARE

Henri Bouilhet, Paris, France, assignor to Orfeverrie Christoffe, Paris, France

Filed Nov. 2, 1989, Ser. No. 430,349

Term of patent 14 years

U.S. Cl. D7—653



323,958

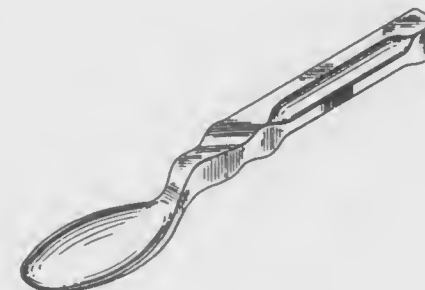
TRAINING SPOON

Patricia Everett, P.O. Box 652, Frankston, Tex. 75763

Filed Sep. 19, 1989, Ser. No. 409,444

Term of patent 14 years

U.S. Cl. D7—663



323,959

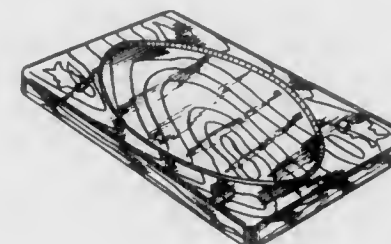
BAKING BOARD

Louisa B. Ciampi, 2314 N. Lincoln Park W., Chicago, Ill. 60614, and Anabel B. Bean, 2506 Ocean Dr. Surf Pines, Warrenton, Oreg. 97146

Filed Apr. 20, 1989, Ser. No. 341,059

Term of patent 14 years

U.S. Cl. D7—699



323,960

HIGH LEVERAGE SHEARS

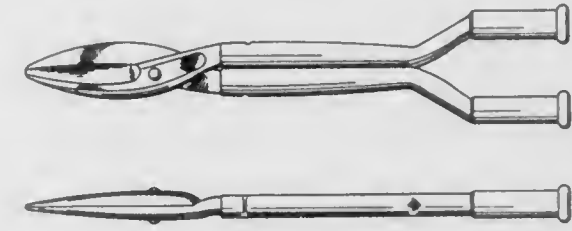
Gary L. Wilhelm, Statesboro, and Mel C. Mock, Rocky Ford, both of Ga., assignors to Cooper Industries, Houston, Tex.

Continuation of Ser. No. 453,840, Dec. 20, 1989. This application

Jul. 3, 1990, Ser. No. 547,446

Term of patent 14 years

U.S. Cl. D8—5



323,961

PORTABLE ELECTRIC DRILL

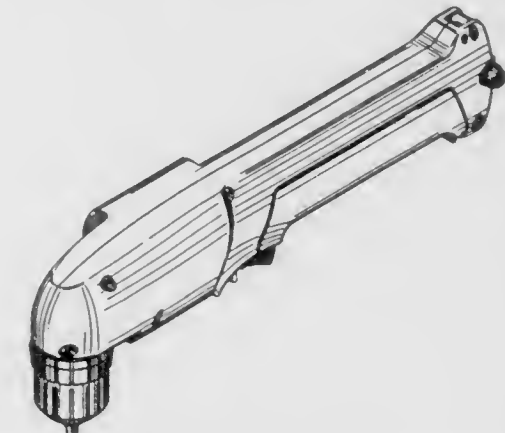
Fusao Fushiya, and Michio Okumura, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Aug. 2, 1989, Ser. No. 388,351

Claims priority, application Japan, Feb. 7, 1989, 1-4230

Term of patent 14 years

U.S. Cl. D8—61



323,962

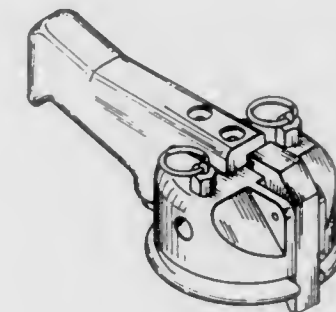
PNEUMATIC GUN

David W. Casella, Wanneroo, Australia, assignor to Compri Technic Pty. Ltd., Maylands, Australia

Filed Aug. 29, 1989, Ser. No. 400,046

Term of patent 14 years

U.S. Cl. D8—61

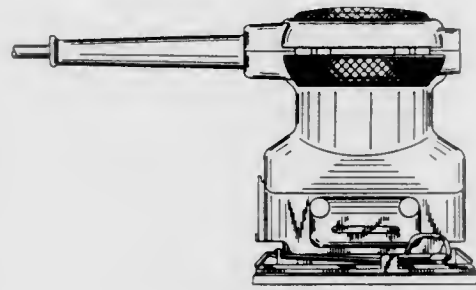


323,963

FINISHING SANDER OR SIMILAR ARTICLE

Roderick F. Banyea, Westminster, Md., assignor to Black & Decker Inc., Newark, Del.
Division of Ser. No. 231,574, Aug. 11, 1988, Pat. No. Des. 317,244. This application Feb. 7, 1991, Ser. No. 652,896
Term of patent 14 years

U.S. Cl. D8—62



323,964

PNEUMATIC NAILER

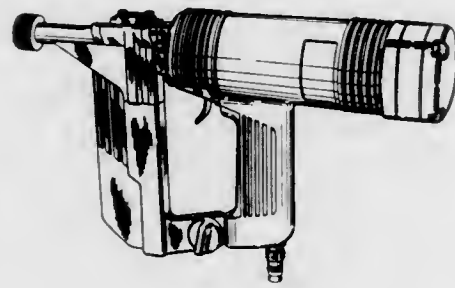
Yasunori Ogawa, Mito; Akira Uno, Hitachioota, and Isamu Tanji, Katsuta, all of Japan, assignors to Hitachi Koki Company, Limited, Japan

Filed May 31, 1989, Ser. No. 361,001

Claims priority, application Japan, Dec. 2, 1988, 63-47293

Term of patent 14 years

U.S. Cl. D8—69



323,965

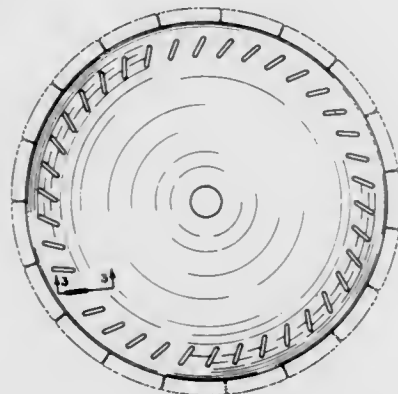
INNER DRIVE PORTION OF A CIRCULAR SAW BLADE

Karl H. Moller, Westlake, and Andrew L. Jedick, Avonlake, both of Ohio, assignors to Diamond Products, Inc., Elyria, Ohio

Filed May 8, 1989, Ser. No. 348,764

Term of patent 14 years

U.S. Cl. D8—70



323,966

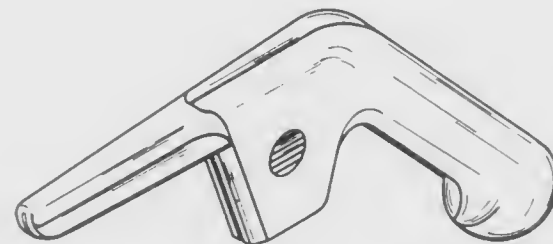
SAW HANDLE

Yuji Tanabe, Sanjyo, Japan, assignor to Takagi Co., Ltd., Sanjyo, Japan

Filed Jun. 29, 1989, Ser. No. 372,798

Term of patent 14 years

U.S. Cl. D8—97



323,967

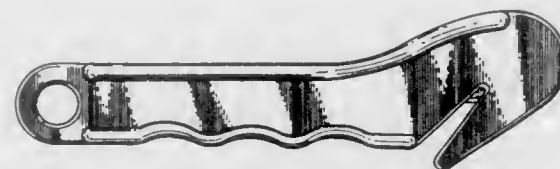
SAFETY KNIFE

James E. Talbot, Wynnewood, Pa., assignor to FPM, Inc., Springfield, Pa.

Filed Dec. 27, 1989, Ser. No. 461,477

Term of patent 14 years

U.S. Cl. D8—98



323,968

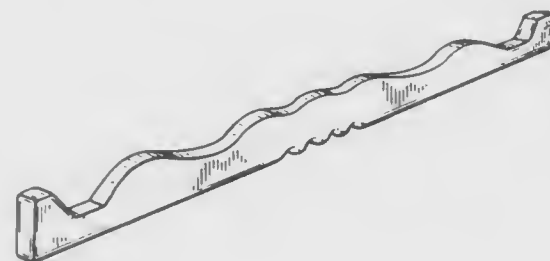
GROCERY BAG CARRIER

James S. Blocker, and Elizabeth T. Donan, both of 4042 Oak Forest Cir., Marietta, Ga. 30062

Filed Apr. 10, 1990, Ser. No. 507,179

Term of patent 14 years

U.S. Cl. D8—315



323,969

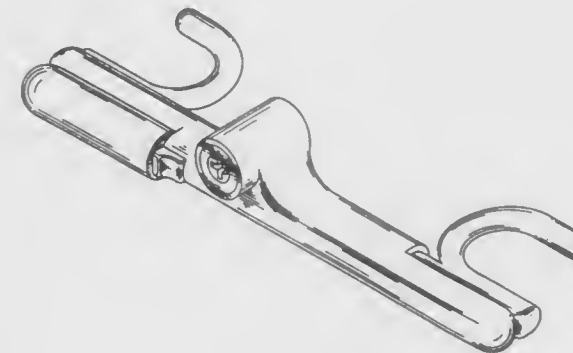
AUTOMOBILE STEERING WHEEL LOCK

Song M. Wang, No. 61, Lane 668, Yuh-Nung Road, Tainan, Taiwan

Filed Apr. 4, 1990, Ser. No. 504,283

Term of patent 14 years

U.S. Cl. D8—331



323,972

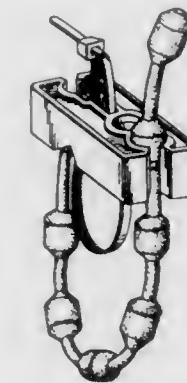
FLEXIBLE ELEMENT HOLDER

David E. Rowland, Booita, Calif., assignor to Janice L. Rowland, Imperial Beach, Calif.

Continuation-in-part of Ser. No. 176,670, Apr. 1, 1988, abandoned. This application Jun. 8, 1989, Ser. No. 363,609

Term of patent 14 years

U.S. Cl. D8—394



323,973

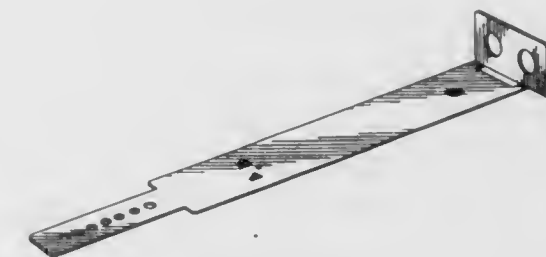
GROUND CONNECTOR STRAP

Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3

Filed Jun. 15, 1989, Ser. No. 366,414

Term of patent 14 years

U.S. Cl. D8—394



323,970

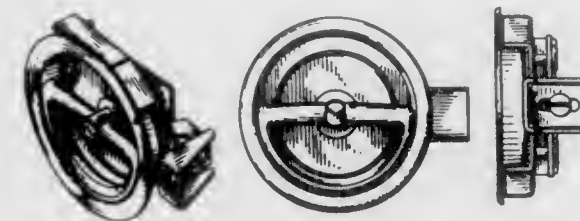
BAIL HANDLE FLUSH CUP LATCH

Richard E. Schlack, Unionville, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Feb. 7, 1990, Ser. No. 476,621

Term of patent 14 years

U.S. Cl. D8—341



323,974

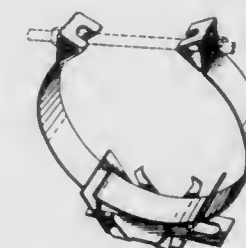
SUPPORT BRACKET FOR POLES OF CIRCULAR CROSS-SECTION

Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3

Filed Jun. 15, 1989, Ser. No. 366,412

Term of patent 14 years

U.S. Cl. D8—396



323,971

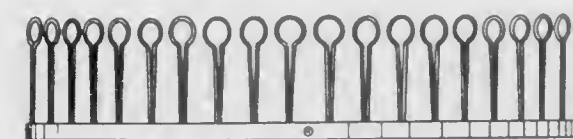
DRAPERY BRACKET

Johnie E. Williams, 1190 Highway, 85N, Fayetteville, Ga. 30214

Filed Apr. 17, 1991, Ser. No. 686,568

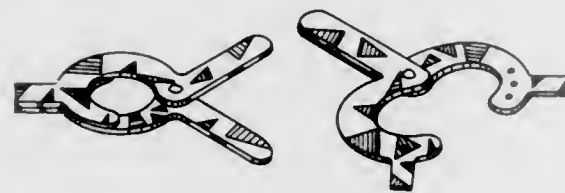
Term of patent 14 years

U.S. Cl. D8—369

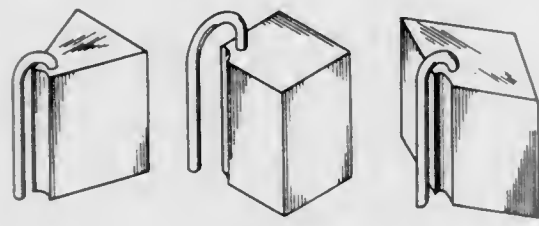


323,975
BAG CLIP

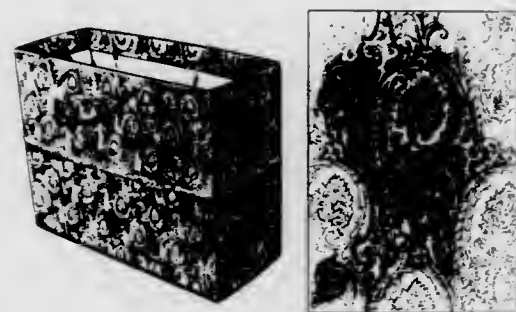
Max R. Wise, Rte. #1, Box 27A, Cowerz, Okla. 74429
Filed May 14, 1990, Ser. No. 522,870
Term of patent 14 years
U.S. Cl. D8—396

323,976
DOOR PROP

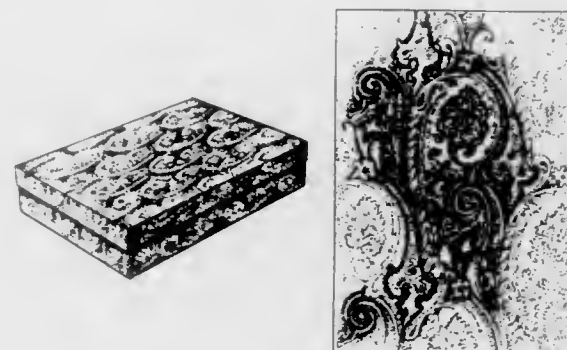
Larry Barnes, 344 Main St., Apt. D, Imperial, Pa. 15126
Filed Jul. 31, 1990, Ser. No. 560,894
Term of patent 14 years
U.S. Cl. D8—402

323,977
SHOPPING BAG

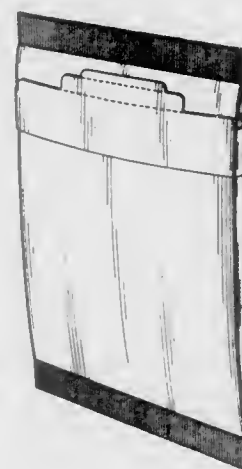
Gerolamo Etro, Milan, Italy, assignor to Etro S.p.A., Milan, Italy
Filed Jan. 18, 1989, Ser. No. 298,731
Claims priority, application Italy, Jul. 18, 1988, 21614-B/88
Term of patent 14 years
U.S. Cl. D9—305

323,978
BOX

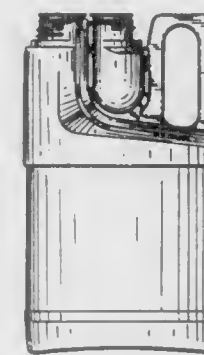
Gerolamo Etro, Milan, Italy, assignor to Etro S.p.A., Milan, Italy
Filed Jan. 18, 1989, Ser. No. 298,732
Claims priority, application Italy, Jul. 18, 1988, 21614-B/88
Term of patent 14 years
U.S. Cl. D9—307

323,979
TAMPER EVIDENT, RESEALABLE BAG

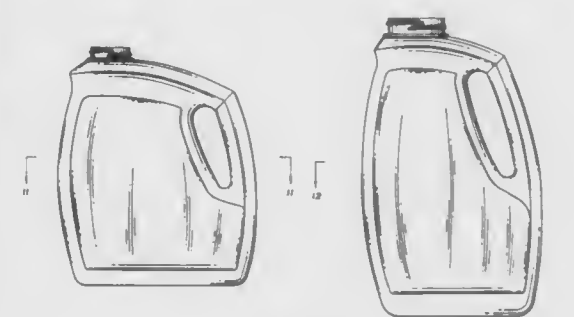
Harold M. Forman, Concord 1006, 251 W. Dekalb Pike, King of Prussia, Pa. 19406; Stephen R. Gally, 3009 Chestnut St., Lafayette Hill, Pa. 19444; Jo A. Hartman, Concord 1006, 251 Dekalb Pike, King of Prussia, Pa. 19406, and Harry J. Cappa, Jr., 135 W. 3rd Ave., Conshohocken, Pa. 19428
Filed Sep. 14, 1989, Ser. No. 407,021
Term of patent 14 years
U.S. Cl. D9—305

323,980
DUAL COMPARTMENT BOTTLE

Jean Perrin, Orsay, France, assignor to Du Pont de Nemours (France) S.A., Paris, France
Filed Jun. 12, 1989, Ser. No. 365,265
Claims priority, application France, Dec. 19, 1988, 887,787
Term of patent 14 years
U.S. Cl. D9—347

323,981
PLASTIC CONTAINER

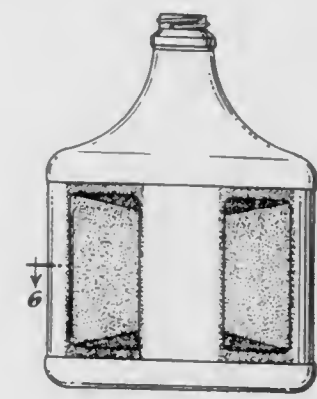
Ralph D. Satterfield, Ashland, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.
Continuation-in-part of Ser. No. 348,891, May 8, 1989, abandoned. This application Aug. 10, 1989, Ser. No. 392,037
Term of patent 14 years
U.S. Cl. D9—376



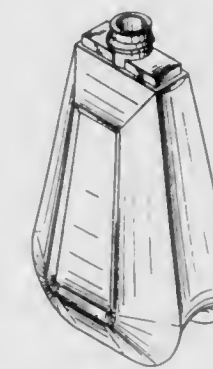
323,982
COMBINED PERFUME BOTTLE AND CAP
Reinold Geiger, Saint-Germain-En-Laye, France, assignor to AMS Packaging, Saint-Ouen-L'Aumone, France
Filed Dec. 5, 1988, Ser. No. 279,651
Claims priority, application France, Jun. 3, 1988, 88 3625
Term of patent 14 years
U.S. Cl. D9—377

323,983
BOTTLE

Hugo Bastidos, 6510 Elmquist, Whittier, Calif. 90601
Filed Dec. 15, 1989, Ser. No. 451,035
Term of patent 14 years
U.S. Cl. D9—378



323,984
COLLAPSIBLE BOTTLE
Michael Hamilton, Sherman Oaks, Calif., and Nick Petschek, New York, N.Y., assignors to ReSeal International Limited Partnership, New York, N.Y.
Filed May 1, 1990, Ser. No. 517,073
Term of patent 14 years
U.S. Cl. D9—403

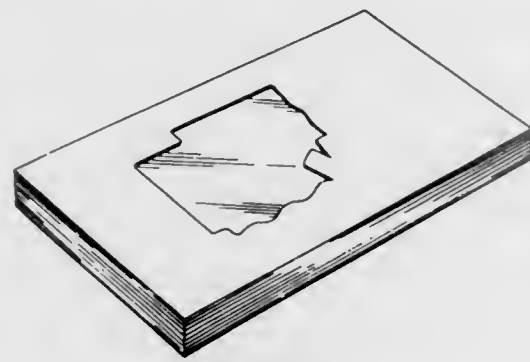


323,985
BOTTLE
Pier L. Bormioli, Mariano, Italy, assignor to Vetreria Parmense Bormioli, Parma, Italy
Filed Jun. 4, 1990, Ser. No. 533,047
Claims priority, application Italy, Dec. 7, 1989, 28996/89[U]
Term of patent 14 years
U.S. Cl. D9—403

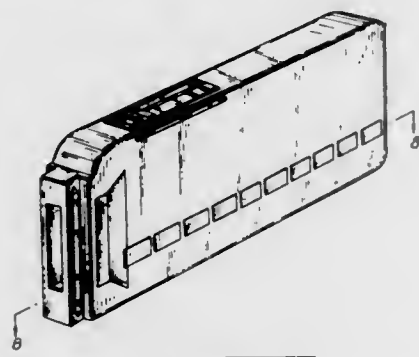


323,986
PACKAGE FOR CONFECTIONERY PRODUCTS OR THE LIKE
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy

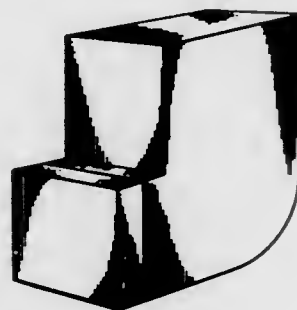
Filed May 5, 1989, Ser. No. 347,794
Claims priority, application Italy, Nov. 9, 1988, 53518/88[U]
Term of patent 14 years
U.S. Cl. D9—418



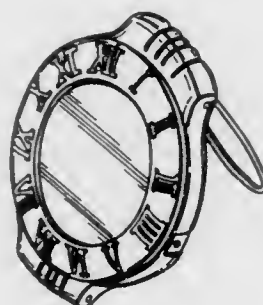
323,987
CONTAINER
Shinya Yamamoto, and Koichi Saito, both of Kyoto, Japan, assignors to Murata Mfg. Co., Ltd., Japan
Filed Jun. 16, 1989, Ser. No. 367,228
Claims priority, application Japan, Dec. 21, 1988, 63-49894
Term of patent 14 years
U.S. Cl. D9—418



323,988
DISPENSING CONTAINER
Wolf Ruck, 1720 Lincolnshire Blvd., Mississauga, Ontario, Canada L5E 2S7
Filed Mar. 7, 1990, Ser. No. 490,992
Claims priority, application Canada, Sep. 7, 1989, 0709894
Term of patent 14 years
U.S. Cl. D9—431



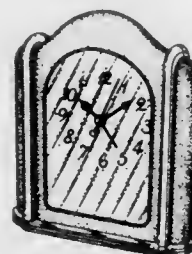
323,989
TABLECLOCK CASE
Eddy Burgener, Moutier, Switzerland, assignor to Boventa-Henex SA, Bienne, Switzerland
Filed Oct. 27, 1989, Ser. No. 427,356
Claims priority, application World Int. Prop. O., Apr. 28, 1989, DMA/001'000
Term of patent 14 years
U.S. Cl. D10—18



323,990
CLOCK
Yasuo Inora, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Dec. 29, 1989, Ser. No. 458,820
Term of patent 14 years
U.S. Cl. D10—22



323,991
CLOCK
Mitsuo Wada, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 3, 1989, Ser. No. 389,105
Term of patent 14 years
U.S. Cl. D10—28



323,992
WATCH
Enrico Coveri, 19, Lungarno Guicciardini, Florence, Italy
Filed Feb. 26, 1988, Ser. No. 160,857
Claims priority, application Italy, Sep. 4, 1987, 11732/87[U]
Term of patent 14 years
U.S. Cl. D10—32



323,993
WRISTWATCH
Hwa J. Lee, Incheon, Rep. of Korea, assignor to Timex Corporation, Middlebury, Conn.
Filed Aug. 10, 1989, Ser. No. 392,241
Term of patent 14 years
U.S. Cl. D10—32



323,994
WRISTWATCH
Kenji Tanikawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 419,064
Claims priority, application Japan, Apr. 10, 1989, 1-13069
Term of patent 14 years
U.S. Cl. D10—32



323,995
WRISTWATCH
Benjamin E. Woomer, 1597 E. 30th St., Cleveland, Ohio 44114
Filed May 19, 1989, Ser. No. 354,087
Term of patent 14 years
U.S. Cl. D10—39



323,996
WRISTWATCH
Tasuku Nakazawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Mar. 6, 1989, Ser. No. 319,445
Claims priority, application Japan, Sep. 6, 1988, 63-35190
Term of patent 14 years
U.S. Cl. D10—39

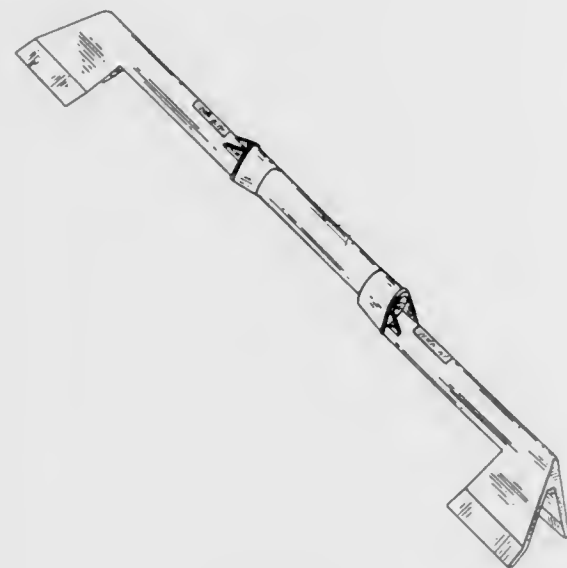


323,997

VERTICAL PLUMB TOOL

James C. Masters, Walnut Creek, Calif., and Thomas K. Stevens, 904 Kearney St., El Cerrito, Calif. 94530, assignors to Thomas K. Stevens, El Cerrito, Calif.
Filed Oct. 3, 1988, Ser. No. 251,872
Term of patent 14 years

U.S. Cl. D10—69



323,999

HIGHWAY DELINEATOR GUIDEPOST

Layne S. Leishman, Huntington Beach, Calif., assignor to Product Research and Development, Santa Ana, Calif.
Filed Nov. 17, 1989, Ser. No. 438,896
Term of patent 14 years

U.S. Cl. D10—113



324,000

WINDCHIMES

Garry M. Kvistad, Rte. 1, Box 381A, W. Hurley, N.Y. 12491
Filed Dec. 26, 1989, Ser. No. 456,256
Term of patent 14 years

U.S. Cl. D10—118

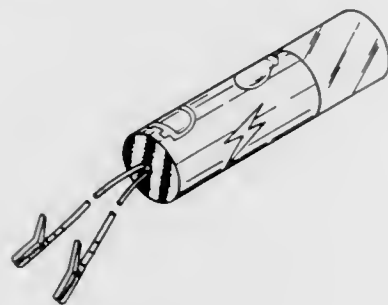


323,998

CIRCUIT BREAKER LOCATOR

James L. Edge, 136 Harmon Rd., Moore, S.C. 29369
Filed Jan. 5, 1989, Ser. No. 294,258
Term of patent 14 years

U.S. Cl. D10—78

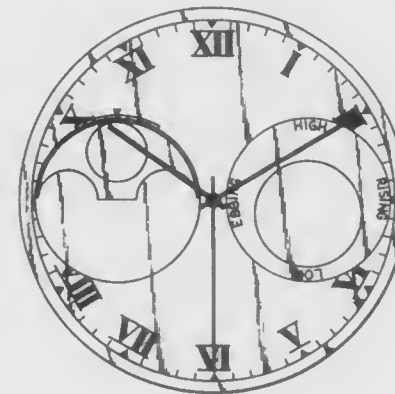


324,001

COMBINED CLOCK FACE AND HANDS THEREFOR

Breene M. Kerr, 1200 Davinbrook, Oklahoma City, Okla. 73118
Filed May 11, 1989, Ser. No. 350,337
Term of patent 14 years

U.S. Cl. D10—126

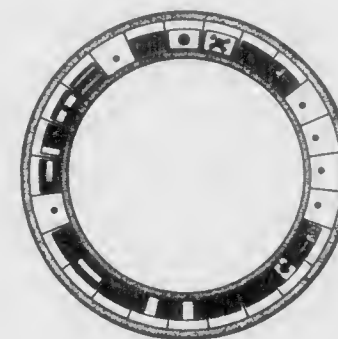


324,002

BEZEL FOR A CLOCK

Mitsuo Wada, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 5, 1989, Ser. No. 361,094
Claims priority, application Japan, Dec. 6, 1988, 63-47593
Term of patent 14 years

U.S. Cl. D10—128

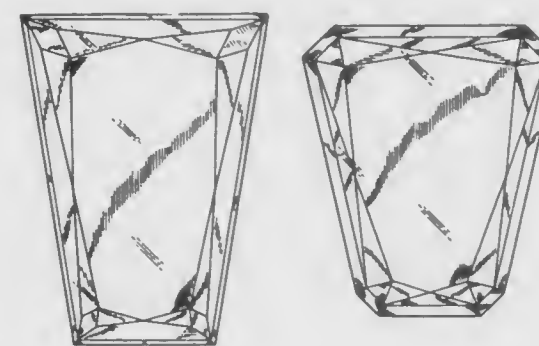


324,003

GEMSTONE

Shalom Baranes, Netanya, Israel, assignor to A.M. Weiss (A Partnership), San Francisco, Calif.
Filed Jul. 18, 1989, Ser. No. 381,166
Term of patent 14 years

U.S. Cl. D11—90

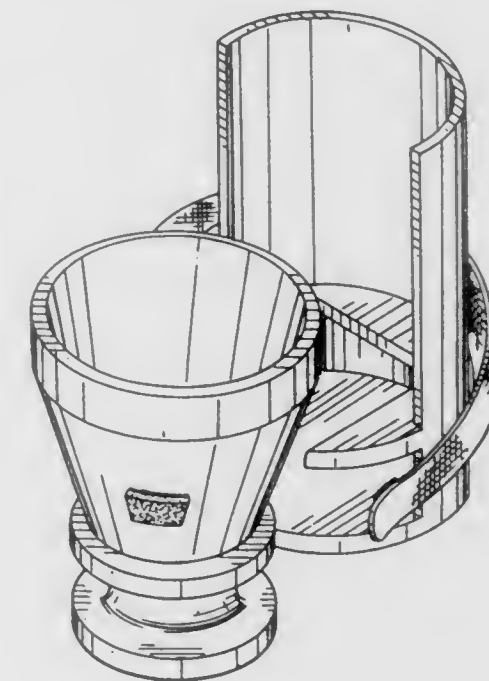


324,004

COMBINED PLANTER AND HOLDER FOR USE WITHIN AUTOMOTIVE VEHICLES

James A. Neill, P.O. Box 3213, Tustin, Calif. 92681-3213
Filed Feb. 21, 1989, Ser. No. 313,152
Term of patent 14 years

U.S. Cl. D11—144

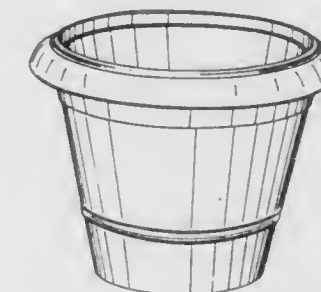


324,005

PLANT POT

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France
Filed Oct. 16, 1989, Ser. No. 421,735
Claims priority, application World Int. Prop. O., Apr. 17, 1989, DMA000989
Term of patent 14 years

U.S. Cl. D11—152

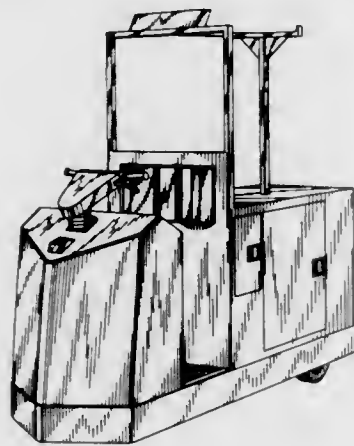


324,006

ELECTRIC MAINTENANCE VEHICLE

Arunas P. Oslapas, Park Township, Ottawa County; Scott D. Van Antwerp, Overisel Township, Allegan County, and Wayne A. Laarman, Park Township, Ottawa County, all of Mich., assignors to JWI, Inc., Holland, Mich.
Filed Jan. 4, 1990, Ser. No. 461,104
Term of patent 14 years

U.S. Cl. D12—85



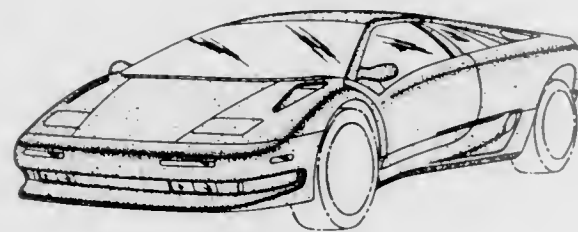
324,007

AUTOMOBILE BODY

Marcello Gandini, Almese, Italy, and Thomas C. Gale, Rochester, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 11, 1989, Ser. No. 405,921
Term of patent 14 years

U.S. Cl. D12—90



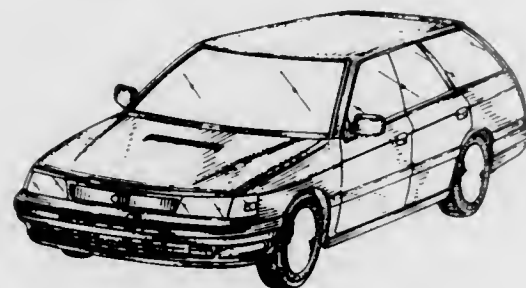
324,008

PASSENGER CAR

Tetsuya Hayashi, Ohmiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 19, 1989, Ser. No. 354,071
Claims priority, application Japan, Nov. 25, 1988, 63-045968

Term of patent 14 years

U.S. Cl. D12—91



324,009

BICYCLE RACK

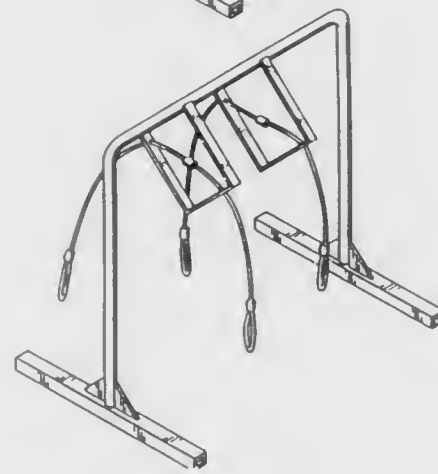
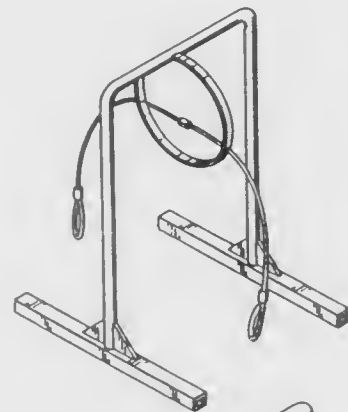
Terrance R. Smith, Nepean, Canada, assignor to Bike-Up Canada Inc., Nepean, Canada

Filed Jun. 7, 1990, Ser. No. 534,666

Claims priority, application Canada, Dec. 22, 1989, 22-12-89-10

Term of patent 14 years

U.S. Cl. D12—115



324,010

HARNESS STRAP

John P. Russell, Center Point, and Sam Miller, Birmingham, both of Ala., assignors to Infection Control Products, Inc., Gardendale, Ala.

Filed Apr. 23, 1990, Ser. No. 513,168

Term of patent 14 years

U.S. Cl. D12—133



324,011

TIRE

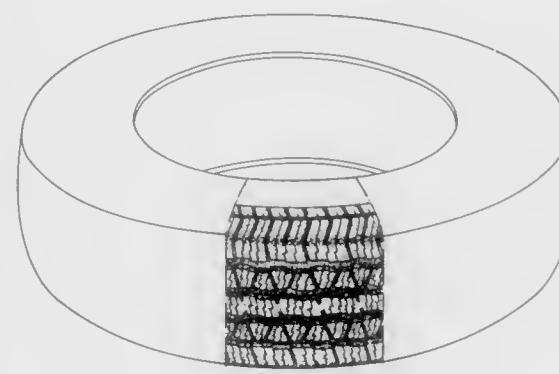
Ronald L. Messer, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland

Filed Feb. 7, 1990, Ser. No. 476,295

The portion of the term of this patent subsequent to Feb. 18, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D12—147



324,013

BICYCLE TIRE

Kohei Marui, Kobe, Japan, assignor to Marui Ltd., Japan

Filed Apr. 24, 1989, Ser. No. 342,395

Term of patent 14 years

U.S. Cl. D12—151



324,014

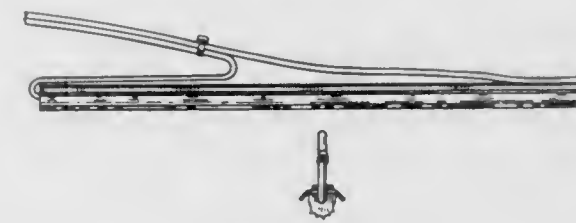
HEATED WINDSHIELD WIPER

B. J. Ruminer, Rte. 12, Box 12608, Tyler, Tex. 75708

Filed Jul. 13, 1989, Ser. No. 379,165

Term of patent 14 years

U.S. Cl. D12—155



324,012

TIRE

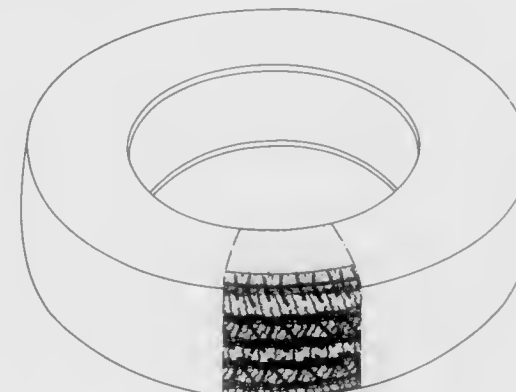
Richard T. Janczak, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland

Filed Feb. 7, 1990, Ser. No. 476,294

The portion of the term of this patent subsequent to Feb. 18, 2006 has been disclaimed.

Term of patent 14 years

U.S. Cl. D12—147



324,015

COVER FOR THE BED OF A PICKUP TRUCK

Armando Quiniones, Condibar, Carrera 2 con Calle 4, Barquisimeto, Estado Lara, Venezuela

Filed Aug. 30, 1989, Ser. No. 400,964

Term of patent 14 years

U.S. Cl. D12—156



324,016

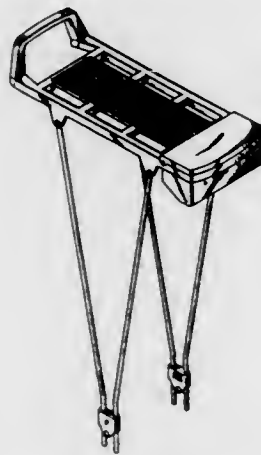
ARTICLE CARRIER FOR A BICYCLE

Jack Hsu, No. 16, Fu Kun Rd., Fu Shing Industry District, Fu Shing Hsiang, Chang Hua Hsien, Taiwan

Filed Jan. 19, 1990, Ser. No. 467,759

Term of patent 14 years

U.S. Cl. D12—158



324,017

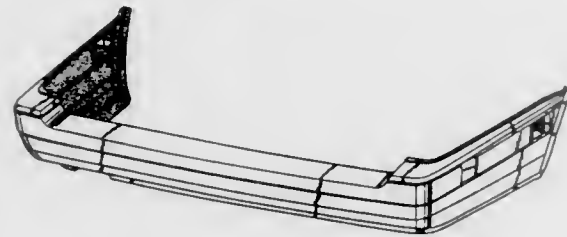
REAR BUMPER FOR AN AUTOMOBILE

Rolf A. Malmgren, Västra Frölunda, and Frans G. Falck, Torshälla, both of Sweden, assignors to Aktiebolaget Volvo, Göteborg, Sweden

Filed Jun. 20, 1989, Ser. No. 368,535

Term of patent 14 years

U.S. Cl. D12—169



324,018

COMBINED RADIATOR GRILL AND BUMPER UNIT FOR AUTOMOBILE

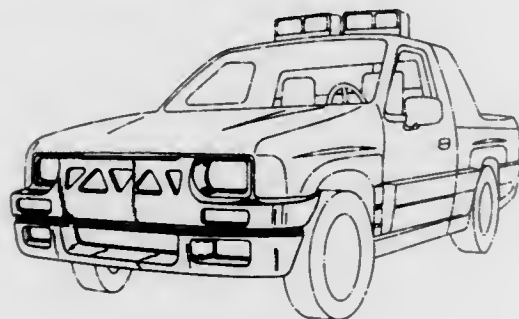
Toshiro Ueno, Fujisawa, Japan, assignor to Isuzu Motors Limited, Japan

Filed Jun. 6, 1989, Ser. No. 361,964

Claims priority, application Japan, Dec. 15, 1988, 63-48649

Term of patent 14 years

U.S. Cl. D12—170



324,019

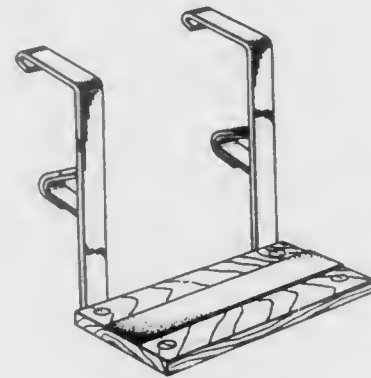
BUMPER STEP

Mansel M. Bailey, 208 N. Willow, Sugar Creek, Mo. 64053

Filed May 20, 1988, Ser. No. 196,456

Term of patent 14 years

U.S. Cl. D12—203



324,020

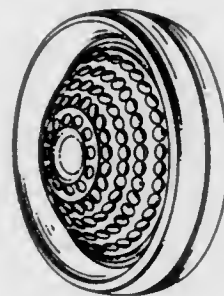
GOLF CART WHEEL

Ching-Chang Wu, No. 35-1, Jih Hsin Street, Tu Cheng Hsiang, Taipei, Taiwan

Filed Dec. 18, 1990, Ser. No. 631,075

Term of patent 14 years

U.S. Cl. D12—212



324,021

SAIL BOAT

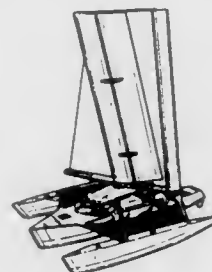
John G. Walker, Tipwell House, St. Mellion, Cornwall, PL12 6RS, United Kingdom

Filed Jul. 25, 1990, Ser. No. 558,202

Claims priority, application United Kingdom, Jan. 29, 1990, 2004393

Term of patent 14 years

U.S. Cl. D12—304



324,022

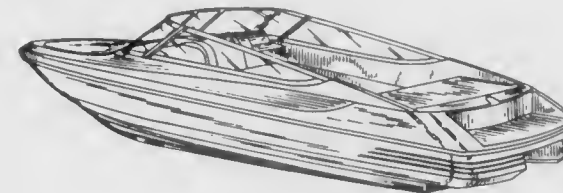
RECREATIONAL BOAT

H. Neal Hart, Joelton, Tenn., and Michael J. Connell, Oneida, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 13, 1990, Ser. No. 553,136

Term of patent 14 years

U.S. Cl. D12—314



324,023

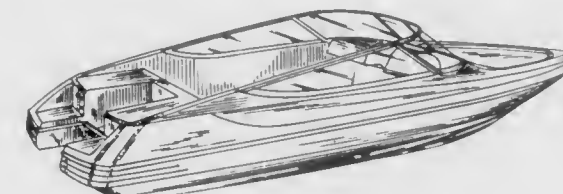
RECREATIONAL BOAT

H. Neal Hart, Joelton, Tenn., and Michael J. Connell, Oneida, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 13, 1990, Ser. No. 553,091

Term of patent 14 years

U.S. Cl. D12—314



324,024

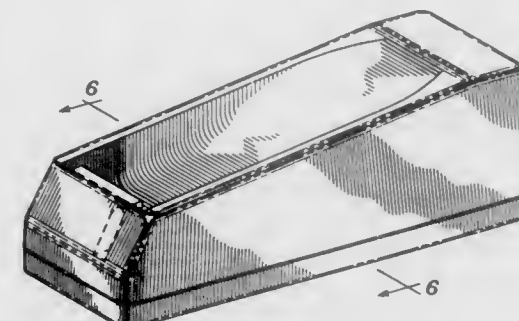
HOUSING FOR A BATTERY CHARGER OR SIMILAR ARTICLE

Albert L. Nagele, Wilmette, and Nicholas Mischenko, Mount Prospect, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 9, 1989, Ser. No. 390,999

Term of patent 14 years

U.S. Cl. D13—108



324,025

ELECTRICAL CONNECTOR HOUSING

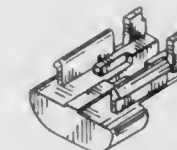
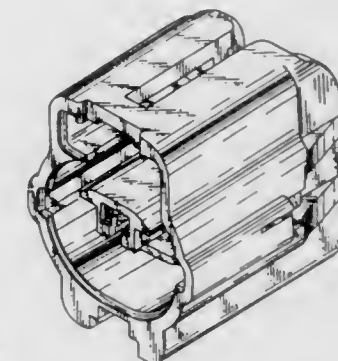
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,561

Claims priority, application Japan, Jul. 31, 1989, 1-28071

Term of patent 14 years

U.S. Cl. D13—133



324,026

HOUSING FOR ELECTRICAL CONNECTOR

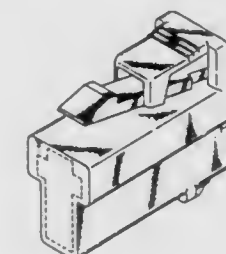
Kiyofumi Ichida, Utsunomiya, and Sadao Kubo, Kanuma, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Nov. 22, 1989, Ser. No. 441,399

Claims priority, application Japan, Jun. 14, 1989, 1-21931

Term of patent 14 years

U.S. Cl. D13—133



324,027

ELECTRICAL CONNECTOR HOUSING

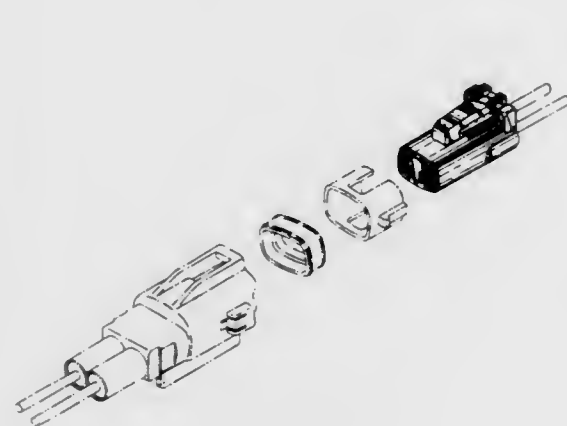
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,567

Claims priority, application Japan, Jul. 31, 1989, 1-28074

Term of patent 14 years

U.S. Cl. D13—133



324,029

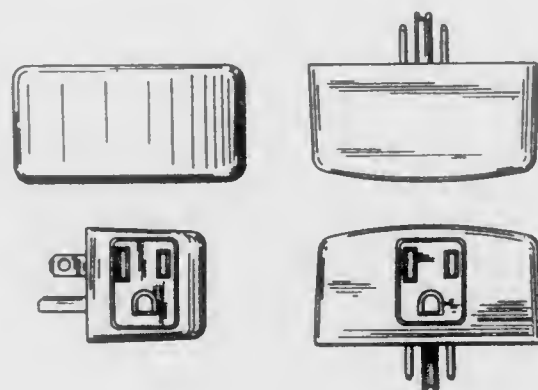
MULTIPLE ELECTRICAL OUTLET ADAPTER

Daniel H. V. Lau, Carmel, Ind., assignor to Pacomex Industries, Inc., Indianapolis, Ind.

Filed Mar. 23, 1989, Ser. No. 327,571

Term of patent 14 years

U.S. Cl. D13—139



324,028

ELECTRICAL CONNECTOR HOUSING

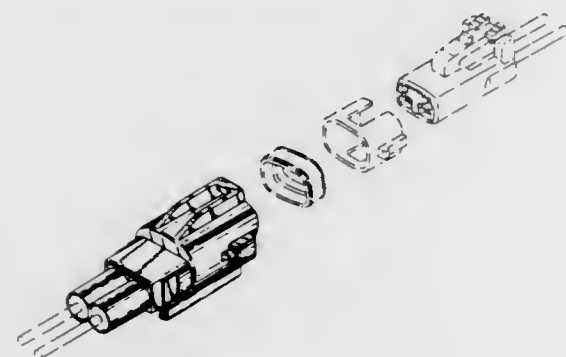
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,557

Claims priority, application Japan, Jul. 31, 1989, 1-28075

Term of patent 14 years

U.S. Cl. D13—133



324,030

ELECTRICAL CONNECTOR HOUSING

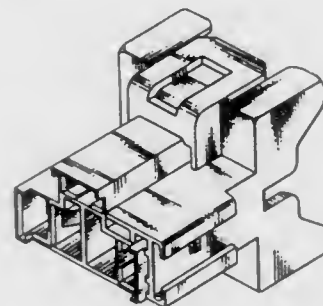
Tatsuya Oka, Mie, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Oct. 11, 1989, Ser. No. 419,786

Claims priority, application Japan, Apr. 11, 1989, 1-13193

Term of patent 14 years

U.S. Cl. D13—146



324,031

ELECTRICAL CONNECTOR HOUSING

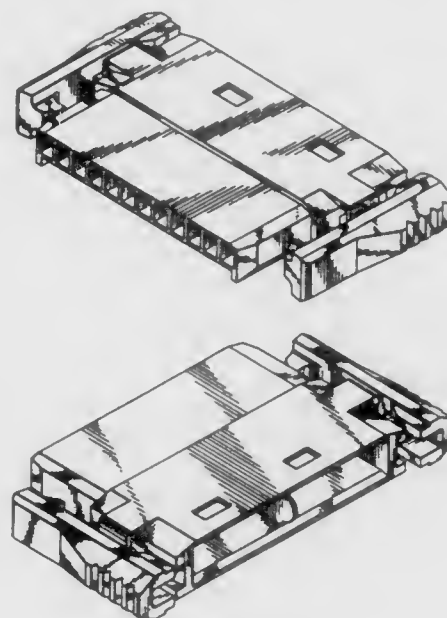
Lahman D. Lambert, II, Mechanicsburg, Pa., and Dean A. Puerner, Maicopa, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 386,536, Jul. 28, 1929, Pat. No. 4,421,442, which is a continuation-in-part of Ser. No. 338,790, Apr. 14, 1989, abandoned, and a continuation-in-part of Ser. No. 433,412, Nov. 7, 1989, Pat. No. 4,944,693, which is a

continuation-in-part of Ser. No. 387,203, Jul. 28, 1989. This application Feb. 9, 1990, Ser. No. 478,178

Term of patent 14 years

U.S. Cl. D13—147



324,033

ELECTRICAL CONNECTOR HOUSING

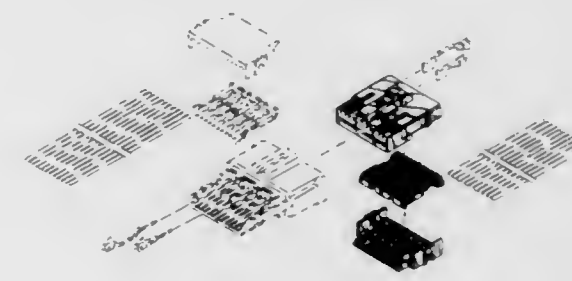
Katsutoshi Kuzuno; Shigeo Ishizuka, and Masayuki Yamamoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,807

Claims priority, application Japan, Dec. 5, 1989, 1-43989

Term of patent 14 years

U.S. Cl. D13—147



324,034

COMBINED PROTECTIVE TUBING AND ANCHOR FOR A PAYPHONE HANDSET CABLE

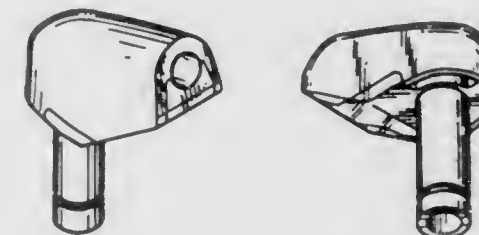
John K. Williams, Ipswich, England, assignor to British Telecommunications public limited company, United Kingdom

Filed Apr. 9, 1990, Ser. No. 507,055

Claims priority, application United Kingdom, Oct. 11, 1989, 2001641

Term of patent 14 years

U.S. Cl. D13—156



324,032

ELECTRICAL CONNECTOR HOUSING

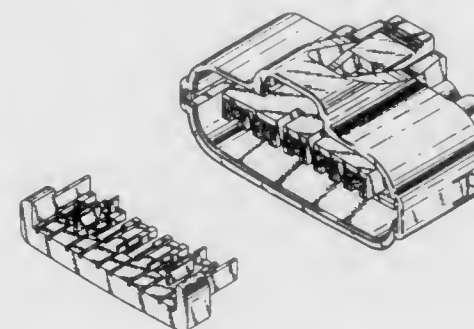
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 26, 1990, Ser. No. 470,560

Claims priority, application Japan, Jul. 31, 1989, 1-28080

Term of patent 14 years

U.S. Cl. D13—147



324,035

ELECTRONIC COMPUTER

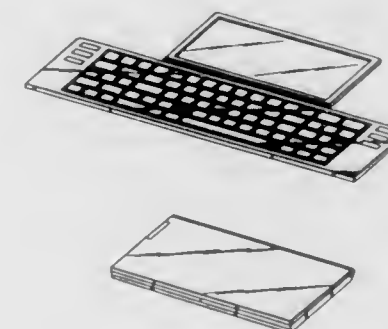
Kenzo Izaki, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 6, 1989, Ser. No. 446,711

Claims priority, application Japan, Jun. 6, 1989, 1-20669

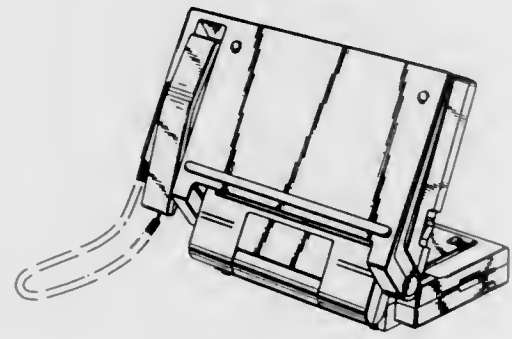
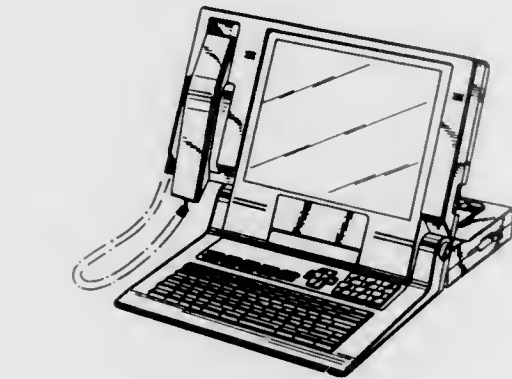
Term of patent 14 years

U.S. Cl. D14—100



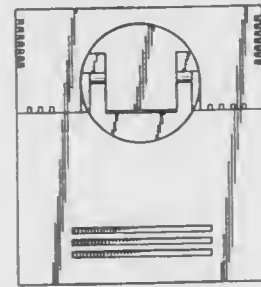
324,036
COMBINED ELECTRONIC COMPUTER AND
TELEPHONE

Masamichi Wakasa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 6, 1989, Ser. No. 446,708
Term of patent 14 years
U.S. Cl. D14—101



324,038
ELECTRONIC COMPUTER

Kenzo Izaki, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 19, 1989, Ser. No. 452,326
Claims priority, application Japan, Jun. 20, 1989, 1-22488; Jun. 20, 1989, 1-22489
Term of patent 14 years
U.S. Cl. D14—106



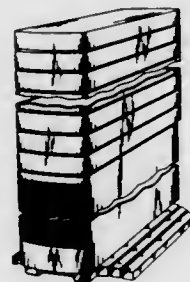
324,039
SLIMLINE TAPE DRIVE BEZEL

Daniel F. Ansell, Coral Springs; Vincent S. Garmon, Boynton Beach; Ruth A. Mayer, and Graham M. White, both of Boca Raton, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.
Filed May 18, 1990, Ser. No. 524,996
Term of patent 14 years
U.S. Cl. D14—115

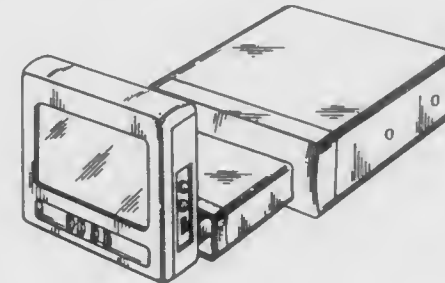


324,037
COMPUTER HOUSING

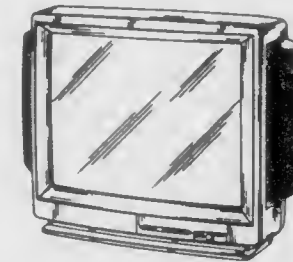
Hanumaiah L. Gowda, Lakewood; John Kowalik, Jr., Freehold, both of N.J.; Henry J. Mack, Jr., Levittown, Pa.; David J. Mayer, New York, N.Y., and Stephen G. Miggels, Wyckoff, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 21, 1990, Ser. No. 496,823
Term of patent 14 years
U.S. Cl. D14—102



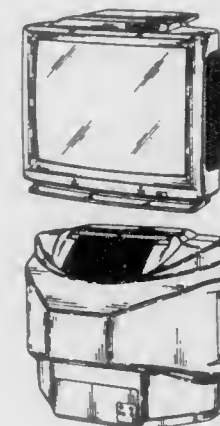
324,040
TELEVISION RECEIVER FOR AUTOMOBILES
Shinji Saito, Kawasaki; Kazuharu Yamamoto; Masahiko Kashiwabara, both of Yokohama; Kazuya Fujita, Kawasaki, and Iwao Ohya, Kumagaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 18, 1989, Ser. No. 453,453
Claims priority, application Japan, Jun. 20, 1989, 1-22487
Term of patent 14 years
U.S. Cl. D14—126



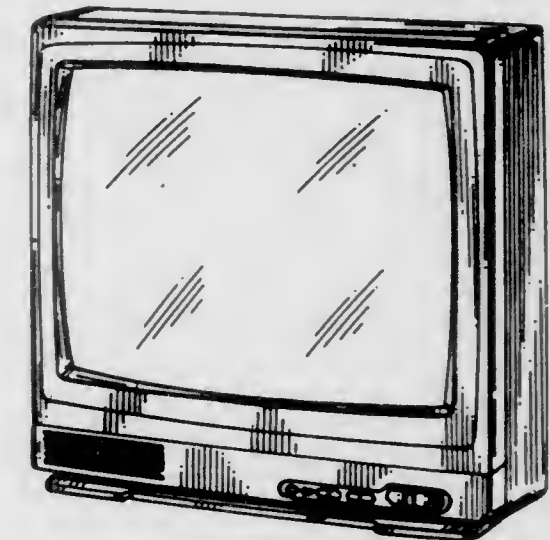
324,041
TELEVISION RECEIVER
Michihiro Nakahara, Koshigaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 6, 1990, Ser. No. 488,847
Claims priority, application Japan, Sep. 8, 1989, 1-32760
Term of patent 14 years
U.S. Cl. D14—126



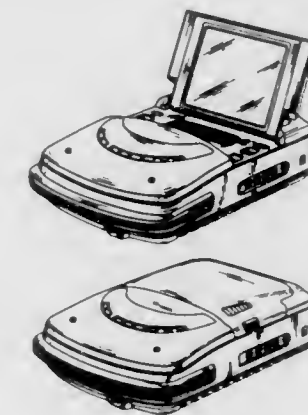
324,042
TELEVISION RECEIVER
Michihiro Nakahara, Koshigaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 22, 1990, Ser. No. 497,247
Claims priority, application Japan, Sep. 28, 1989, 1-35112
Term of patent 14 years
U.S. Cl. D14—126



324,043
TELEVISION RECEIVER
Michihiro Nakahara, Koshigaya, and Takashi Abe, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 9, 1990, Ser. No. 594,192
Claims priority, application Japan, Apr. 16, 1990, 2-12661
Term of patent 14 years
U.S. Cl. D14—126

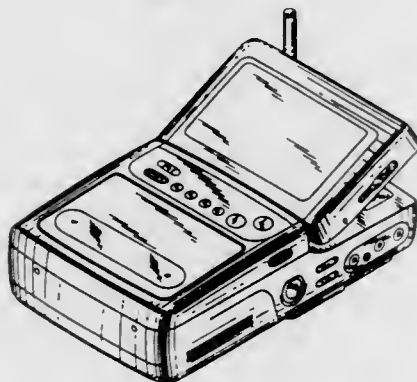
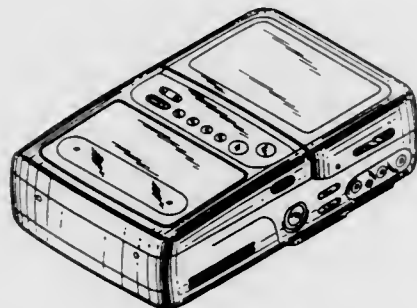


324,044
COMBINED TELEVISION RECEIVER AND VIDEO TAPE RECORDER
Yuji Katayama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 6, 1990, Ser. No. 488,859
Claims priority, application Japan, Sep. 7, 1989, 1-32506
Term of patent 14 years
U.S. Cl. D14—129



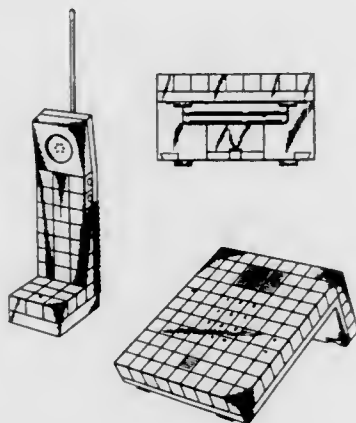
324,045
COMBINED TELEVISION RECEIVER AND VIDEO TAPE
RECORDER

Takeshi Iwama, and Takashi Sogabe, both of Tokyo, Japan,
assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 31, 1990, Ser. No. 560,341
Claims priority, application Japan, Feb. 5, 1990, 2-3186
Term of patent 14 years
U.S. Cl. D14—129

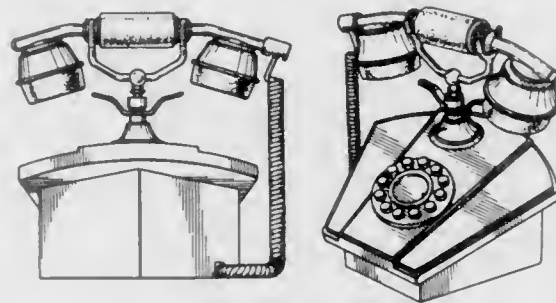


324,046
VOICE CONTROLLED TELEPHONE WITH
LOUDSPEAKER

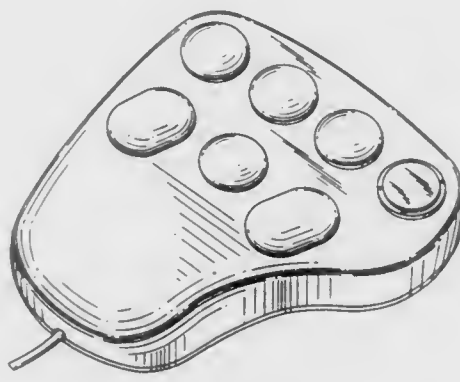
Kazunobu Yoneyama, and Michiharu Sakamoto, both of Kawa-
saki, Japan, assignors to Nitsuko Corporation & Folmer Com-
pany Limited, Japan
Filed Dec. 8, 1989, Ser. No. 447,704
Claims priority, application Japan, Sep. 22, 1989, 1-34341
Term of patent 14 years
U.S. Cl. D14—150



324,047
TELEPHONE SET OR SIMILAR ARTICLE
Shu-Wen Tung, 3F, No. 2, Alley 11, Lane 203, Fu-Der 1 Rd.,
Hsichih, Taipei Hsien, Taiwan
Filed Sep. 3, 1991, Ser. No. 753,693
Term of patent 14 years
U.S. Cl. D14—150



324,048
TONE GENERATOR FOR AN AUDIO SYSTEM
Shinkichi Tanaka, Tokyo, Japan, assignor to Sony Corporation,
Tokyo, Japan
Filed Mar. 13, 1989, Ser. No. 322,227
Claims priority, application Japan, Sep. 12, 1988, 63-36062
Term of patent 14 years
U.S. Cl. D14—217



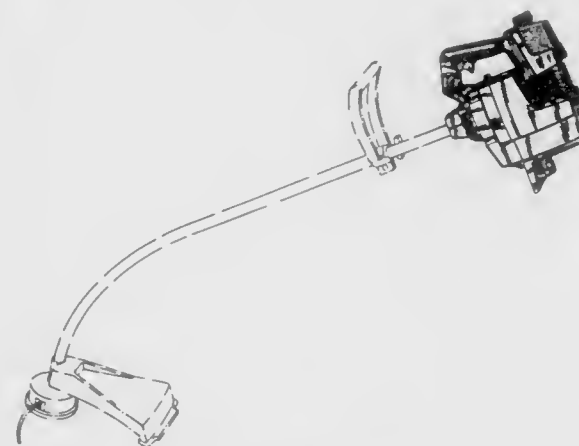
324,049
MICROPHONE
Akira Endo, Tokyo, Japan, assignor to Sony Corporation, To-
kyo, Japan
Filed Mar. 1, 1989, Ser. No. 317,347
Claims priority, application Japan, Sep. 1, 1988, 63-34594
Term of patent 14 years
U.S. Cl. D14—228



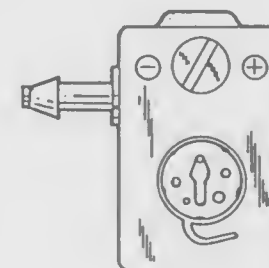
324,050
DIGITAL ELECTRONIC BRANCH EXCHANGE UNIT
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kai-
sha Toshiba, Kawasaki, Japan
Filed Feb. 20, 1990, Ser. No. 482,668
Claims priority, application Japan, Aug. 30, 1989, 1-31310
Term of patent 14 years
U.S. Cl. D14—240



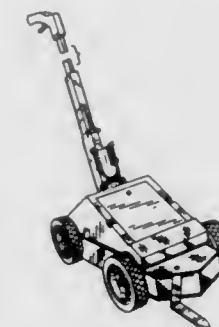
324,051
POWER HEAD FOR A VEGETATION CUTTER
Lloyd H. Tuggle, and Jeffery G. Sadler, both of Shreveport, La.,
assignors to White Consolidated Industries, Inc., Cleveland,
Ohio
Filed Aug. 8, 1989, Ser. No. 391,370
Term of patent 14 years
U.S. Cl. D15—1



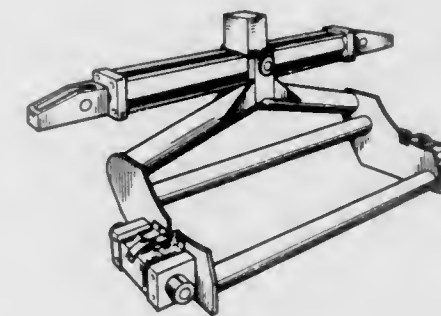
324,052
CARBURETOR ENHANCEMENT PUMP
Dennis Dean, 3964 Nile Ave., Groveport, Ohio 43125
Filed Jan. 23, 1989, Ser. No. 299,994
Term of patent 14 years
U.S. Cl. D15—5



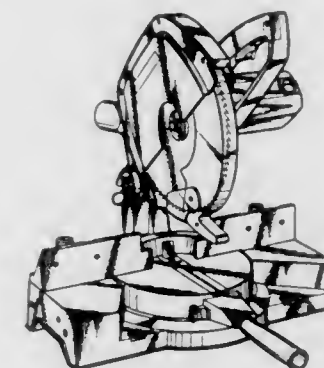
324,053
COMBINED SPRAYING AND MARKING MACHINE
Thomas J. Smrt, Cary, Ill., assignor to Fox Valley Systems, Inc.,
Cary, Ill.
Filed Mar. 30, 1989, Ser. No. 330,717
Term of patent 14 years
U.S. Cl. D15—13



324,054
BUCKET HOLDER
Carl S. R. Smith, Stockholm, Sweden, assignor to Nordiska
Industrimaskiner AB, Stockholm, Sweden
Filed Jan. 9, 1989, Ser. No. 295,179
Claims priority, application Sweden, Jul. 8, 1988, 881655
Term of patent 14 years
U.S. Cl. D15—32



324,055
CIRCULAR SAW
Kenji Sakai, and Shigeharu Ushiwata, both of Fukushima, Ja-
pan, assignors to Hitachi Koki Haramachi Co., Ltd., Fuku-
shima, Japan
Filed Aug. 9, 1989, Ser. No. 390,994
Claims priority, application Japan, Feb. 10, 1989, 1-4868
Term of patent 14 years
U.S. Cl. D15—133



324,068

WRITING INSTRUMENT BARREL

Walter B. Herbst, Evanston, Ill.; Paul D. Hurley, Huntington Woods, Mich., and Norman D. Poisson, Andover, Mass., assignors to Diesel Kiki Co. Ltd., Tokyo, Japan
Filed Aug. 14, 1989, Ser. No. 393,204
Term of patent 14 years

U.S. Cl. D19—50

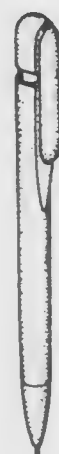


324,070

MECHANICAL PENCIL

Kazuhiko Suzuki, Tokyo, Japan, assignor to Tombow Pencil Co. Ltd., Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 508,012
Claims priority, application Japan, Oct. 19, 1989, 1-38259
Term of patent 14 years

U.S. Cl. D19—51



324,071

WRITING INSTRUMENT

Xavier Rousseau, Paris, France, assignor to S.T. Dupont, Paris, France
Filed Jan. 15, 1988, Ser. No. 144,864
Claims priority, application France, Jul. 24, 1987, 87 4387
Term of patent 14 years

U.S. Cl. D19—51



324,069

LEAD HOLDER

Kazunori Katami, Tokyo, Japan, assignor to Tombow Pencil Co., Ltd., Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 507,343
Claims priority, application Japan, Oct. 19, 1989, 1-38237
Term of patent 14 years

U.S. Cl. D19—50



324,072

WRITING INSTRUMENT

Jens E. von Edler, Oranston, and Stephen V. Boyce, North Scituate, both of R.I., assignors to A. T. Cross Company, Lincoln, R.I.
Filed Mar. 30, 1989, Ser. No. 330,714
Term of patent 14 years

U.S. Cl. D19—51

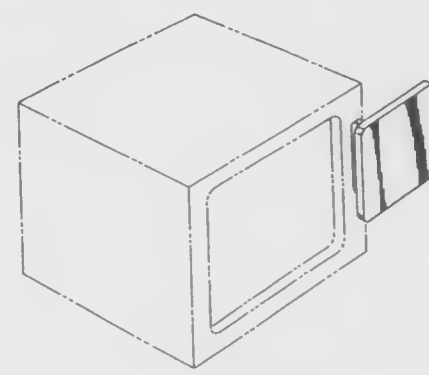


324,073

COMBINED MOUNTABLE SLATE AND WRITING INSTRUMENT CLIP

Richard Pinkos, 3220 Greentree, Bloomfield Hills, Mich. 48013, and James L. Acker, 3927 Woodland, Royal Oak, Mich. 48073
Filed Aug. 1, 1988, Ser. No. 226,964
Term of patent 14 years

U.S. Cl. D19—52

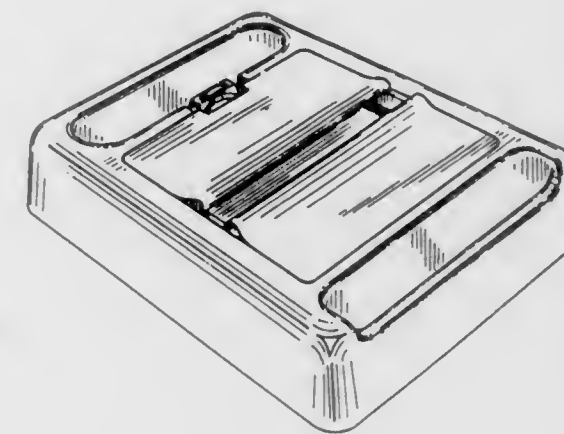


324,076

COMBINED ADHESIVE NOTE DISPENSER AND DESK CADDY

L. Wayne Freitag, Oak Ridge, N.J., assignor to The Bates Manufacturing Company, Hackettstown, N.J.
Filed Nov. 13, 1989, Ser. No. 435,791
Term of patent 14 years

U.S. Cl. D19—78

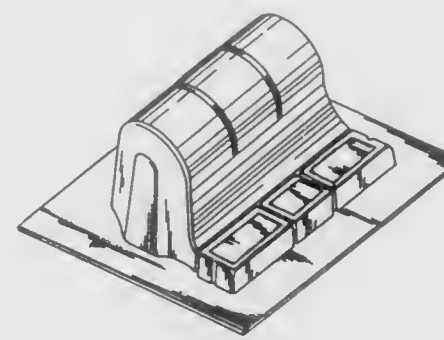


324,074

RIBBON DISPENSER

Arnold M. DeJaynes, R.R. #1, Box 168, New London, Iowa 52645
Filed Oct. 20, 1988, Ser. No. 260,368
Term of patent 14 years

U.S. Cl. D19—69



324,077

PENCIL CUP

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Oct. 24, 1989, Ser. No. 425,985
Term of patent 14 years

U.S. Cl. D19—85

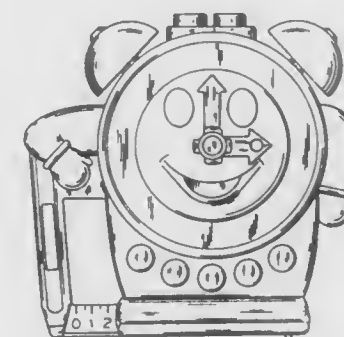


324,075

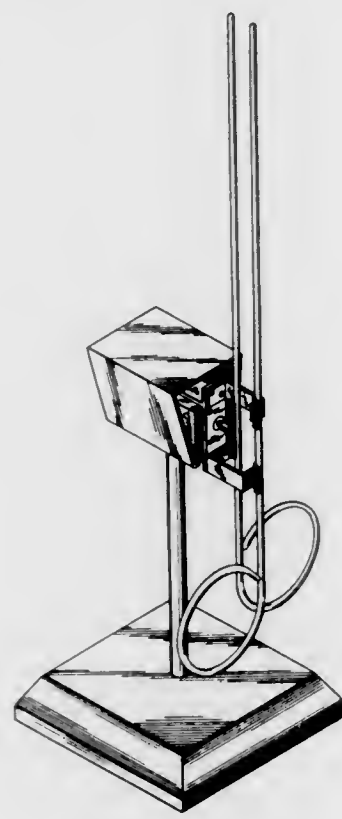
TALKING-TEACHING CLOCK TOY

Chi K. Leung, Tai Koo Shing, Hong Kong, assignor to Video Technology Industries, Inc., Wheeling, Ill.
Filed Feb. 6, 1990, Ser. No. 476,007
Term of patent 14 years

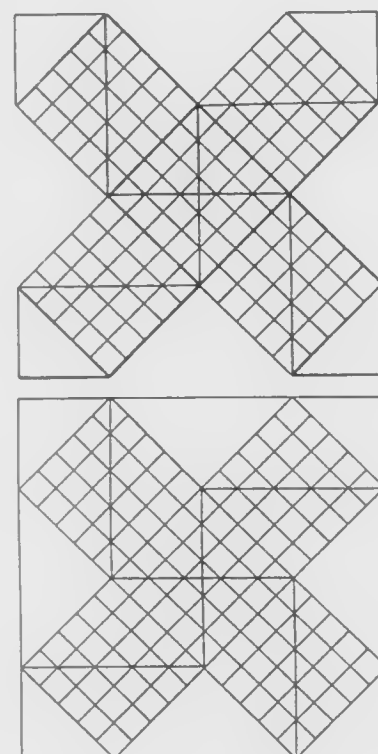
U.S. Cl. D19—64



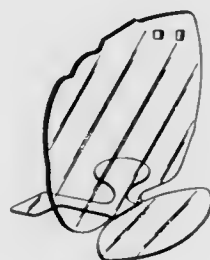
324,078
ADVERTISING DISPLAY FOR BARBER SHOPS OR THE LIKE
 William J. Kinney, 6520 Woodland Dr., Dallas, Tex. 75225
 Filed Sep. 20, 1989, Ser. No. 410,530
 Term of patent 14 years
 U.S. Cl. D20—16



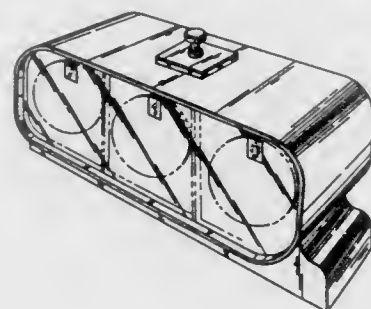
324,080
GAME BOARD
 Gordon Galenza, 503 - 19th Street N.W., Calgary, Alberta, Canada T2N 2J4
 Filed Feb. 6, 1990, Ser. No. 475,814
 Term of patent 14 years
 U.S. Cl. D21—33



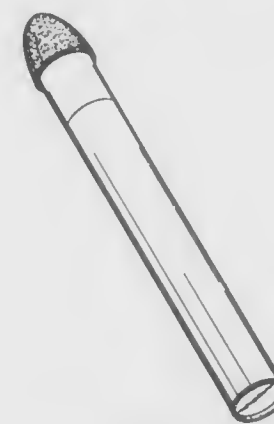
324,079
FOOD AND BEVERAGE MENU HOLDER FOR RESTAURANT TABLES OR THE LIKE
 Karen E. Burgess, Branford, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.
 Filed Mar. 20, 1991, Ser. No. 672,624
 Term of patent 14 years
 U.S. Cl. D20—40



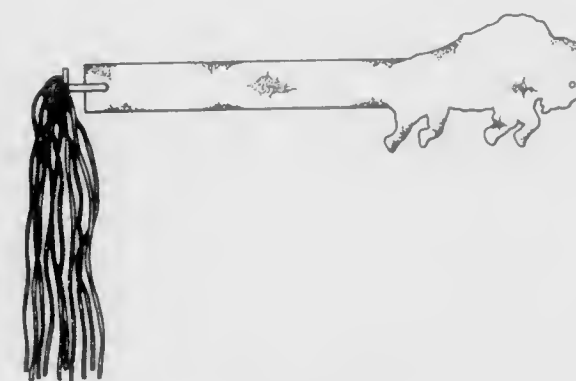
324,081
RANDOM NUMBER GENERATOR
 Loren R. Albrechtson, Columbus; Lloyd Barnhart; Robert Hugins, both of Hilliard, and Sandra D. Morey, Blacklick, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio
 Filed May 22, 1989, Ser. No. 354,675
 Term of patent 14 years
 U.S. Cl. D21—37



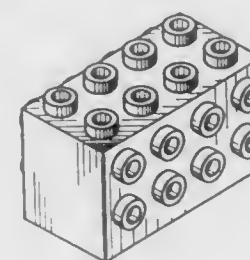
324,082
ROCKET TOY
 Thomas G. Howard, 16220 N. 7th St., - #1080, Phoenix, Ariz. 85022
 Filed Nov. 17, 1989, Ser. No. 438,672
 Term of patent 14 years
 U.S. Cl. D21—87



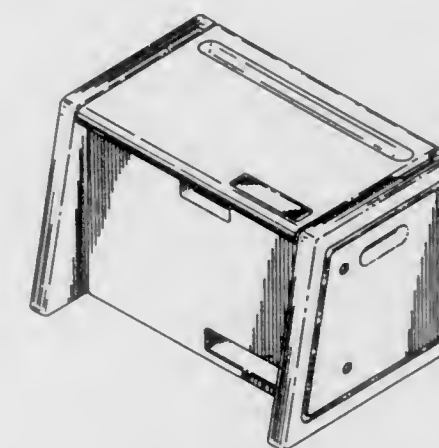
324,083
BUFFALO POM POM
 Michael Gelen, Buffalo, N.Y., assignor to Mark Alvut, Penfield, N.Y.
 Filed Feb. 7, 1990, Ser. No. 476,287
 Term of patent 14 years
 U.S. Cl. D21—100



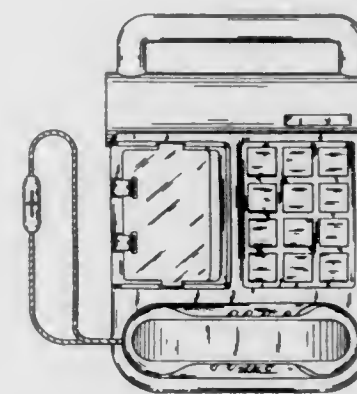
324,084
TOY BUILDING ELEMENT
 Jens N. Knudsen, Billund, Denmark, assignor to INTERLEGO A.G., Baar, Switzerland
 Filed Nov. 29, 1989, Ser. No. 443,272
 Term of patent 14 years
 U.S. Cl. D21—108



324,085
TOY BOX
 Kenneth P. Morton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
 Filed Sep. 14, 1989, Ser. No. 407,458
 Term of patent 14 years
 U.S. Cl. D21—109



324,086
TOY TELEPHONE
 Kin O. Woo, Kowloon, Hong Kong, assignor to Video Technology Industries, Inc., Wheeling, Ill.
 Filed Feb. 6, 1990, Ser. No. 476,005
 Term of patent 14 years
 U.S. Cl. D21—111



324,087
DOLL OR SIMILAR ARTICLE
 Gary Crider, 5805 N. Highway 61, Hutchinson, Kans. 67502
 Filed Jan. 5, 1990, Ser. No. 461,438
 Term of patent 14 years
 U.S. Cl. D21—166



324,088

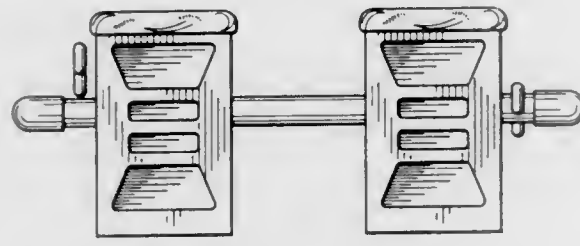
ADJUSTABLE PUSH-UP BENCH

Vincent E. Van Note, 4750 Gibson Cir. Lot #5E, Tile, Fla. 33905

Filed Oct. 12, 1989, Ser. No. 420,222

Term of patent 14 years

U.S. Cl. D21—191



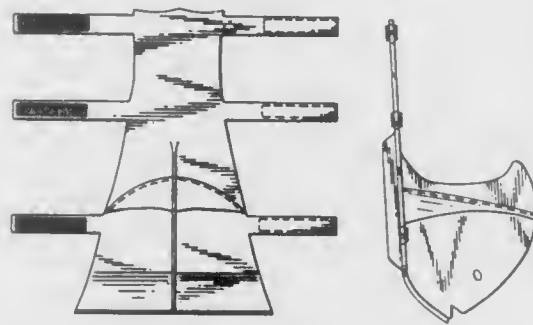
324,091

AQUATIC EXERCISE FLOAT

Peter A. Ciolino, 561 Cherry Tree Ln., Kinnelon, N.J. 07405
Filed May 24, 1989, Ser. No. 356,285

Term of patent 14 years

U.S. Cl. D21—238



324,089

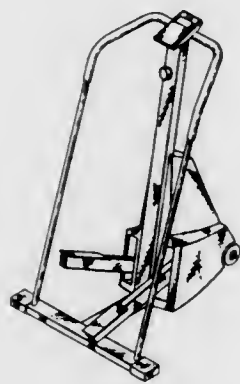
CLIMBER TYPE PHYSICAL EXERCISER

Randolph F. Miller, Mount Vernon, Wash., assignor to Tunturi, Inc., Redmond, Wash.

Filed May 23, 1990, Ser. No. 527,261

Term of patent 14 years

U.S. Cl. D21—191



324,092

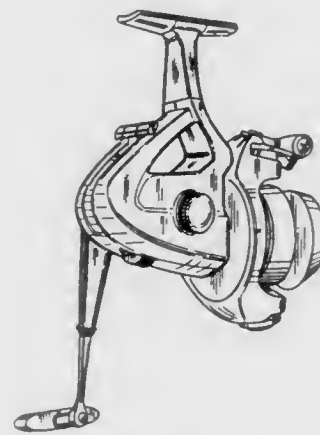
SPINNING FISHING REEL

Ben Baugh, Wichita, Kans., and Richard J. Feehan, Pawnee, Okla., assignors to Zebco Corporation, Tulsa, Okla.

Filed Sep. 5, 1989, Ser. No. 402,434

Term of patent 14 years

U.S. Cl. D22—141



324,090

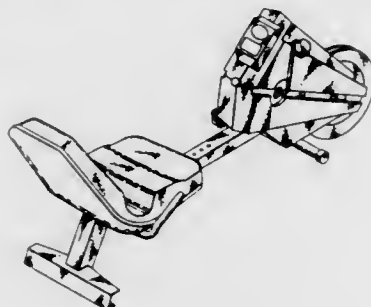
RECUMBENT EXERCISE CYCLE

Randolph F. Miller, Mount Vernon, Wash., assignor to Tunturi, Inc., Redmond, Wash.

Filed May 22, 1990, Ser. No. 527,262

Term of patent 14 years

U.S. Cl. D21—194



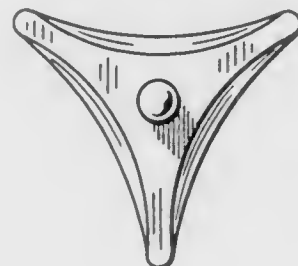
324,093

FISHHOOK PROTECTOR

Hannah C. Wilson, 7453 E. 3rd St., Tulsa, Okla. 74112
Filed Jan. 13, 1989, Ser. No. 298,005

Term of patent 14 years

U.S. Cl. D22—144



324,094

COMBINED HAND-HELD SHOWER HEAD AND SUPPORT THEREFOR

Jean-Jacques Rodriguez, Douvaine, France, assignor to Kugler, Fonderie et Robinetterie SA, Geneva, Switzerland
Filed Aug. 7, 1990, Ser. No. 563,983

Claims priority, application Int'l Pat. Institute, Feb. 14, 1990, DMA/001189

Term of patent 14 years

U.S. Cl. D23—223



324,096

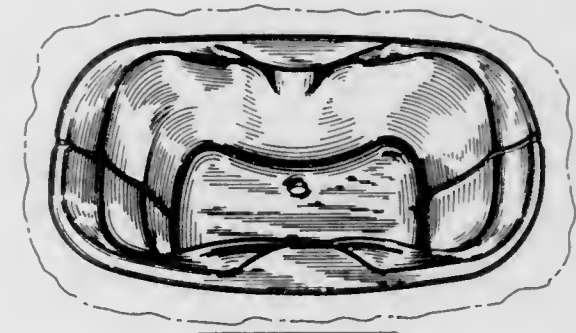
TUB SHELL OR THE LIKE

Herbert V. Kohler, Jr., Kohler; Mary J. Reid, and Robert C. Giese, both of Sheboygan, all of Wis., assignors to Kohler Co., Kohler, Wis.

Continuation-in-part of Ser. No. 300,623, Nov. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 332,665, Mar. 30, 1989, abandoned. This application Jul. 17, 1989, Ser. No. 383,302

Term of patent 14 years

U.S. Cl. D23—280



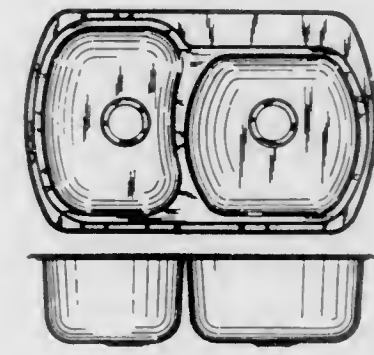
324,097

DOUBLE BOWL SINK

Michaela Evatt, Annandale; Reynolds P. Monaghan, Castle Hill, and Alan E. Kay, Moorebank, all of Australia, assignors to McIlwraith-Davey Pty Ltd., New South Wales, Australia
Filed Apr. 27, 1989, Ser. No. 344,815

Term of patent 14 years

U.S. Cl. D23—290



324,095

FAUCET

Klaus Grohe, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed May 11, 1989, Ser. No. 350,535

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1989, 8900394

Term of patent 14 years

U.S. Cl. D23—238



324,098

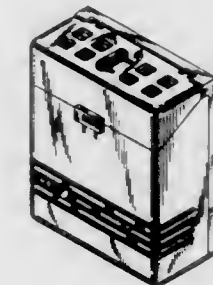
DEODORIZING UNIT

Mary L. Ragonesi, New York, N.Y., assignor to Montrose Products, Inc., New York, N.Y.

Filed Jul. 5, 1990, Ser. No. 548,639

Term of patent 14 years

U.S. Cl. D23—366



324,099
AIR FRESHENER

Heinz H. Weick, 94, rue de la Servette, Geneva, Switzerland CH-1202

Filed Nov. 21, 1990, Ser. No. 617,055

Claims priority, application Switzerland, May 23, 1990, 118223/90

Term of patent 14 years

U.S. Cl. D23—367



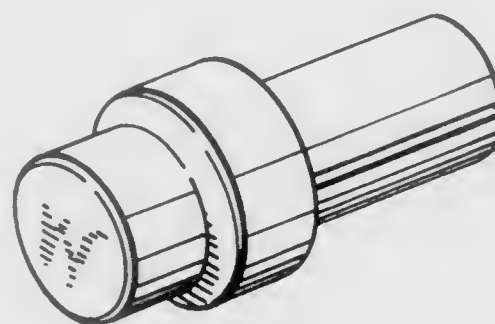
324,101
URINARY CATHETER

Thomas H. Reif, 7616 Hemann Cir., Milton, Fla. 32570; Louis E. Warnken, 197 Lindall Dr., Germantown, Ohio 45327, and Roy A. Snyder, 8705 Cheshire Ct., Jessup, Md. 20794

Division of Ser. No. 167,438, Mar. 14, 1988, Pat. No. Des. 315,411. This application Feb. 25, 1991, Ser. No. 660,592

Term of patent 14 years

U.S. Cl. D24—112



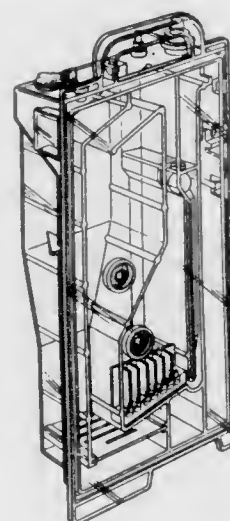
324,102
DRAINAGE DEVICE FOR DRAINING BODILY FLUIDS FROM A PATIENT

Quinton J. Farrar; Frederick A. Everett, Jr., both of Lakeville, Mass., and Richard H. Heimann, Flushing, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Sep. 27, 1988, Ser. No. 250,034

Term of patent 14 years

U.S. Cl. D24—118



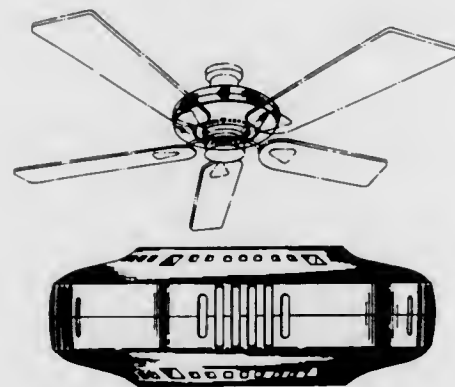
324,100
CEILING FAN MOTOR HOUSING

Richard M. Holbrook, Redondo Beach, Calif., assignor to Casa-blanca Fan Company, Inc., City of Industry, Calif.

Filed Apr. 30, 1990, Ser. No. 516,829

Term of patent 14 years

U.S. Cl. D23—411



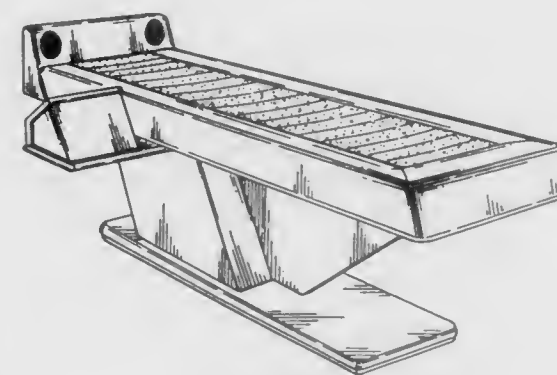
324,103
TABLE FOR MASSAGING AND CHIROPRACTIC THERAPY

Teruo Masuda, Itsukaichi; Kazuyuki Yamaguchi, Sayama, and Bunzo Koga, Chofu, all of Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,275

Term of patent 14 years

U.S. Cl. D24—183



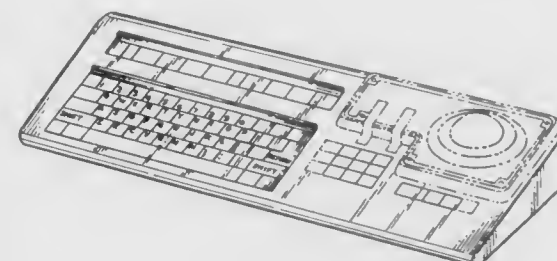
324,104
COMPUTERIZED TOMOGRAPHIC SCANNER CONTROL KEYBOARD

Robert A. Cecil, Solon; Nicholas C. Wislocki, Cleveland, and Robert Grisar, Richmond Hts., all of Ohio, assignors to Picker International Inc., Highland Heights

Filed Nov. 23, 1988, Ser. No. 276,441

Term of patent 14 years

U.S. Cl. D24—158



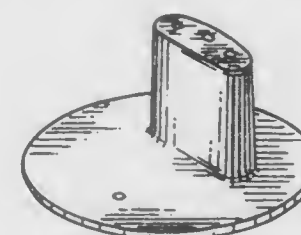
324,105
NIPPLE

Scott M. Forrer, 1238 Lizbeth La., Cedarburg, Wis. 53012

Filed May 12, 1989, Ser. No. 350,831

Term of patent 14 years

U.S. Cl. D24—196



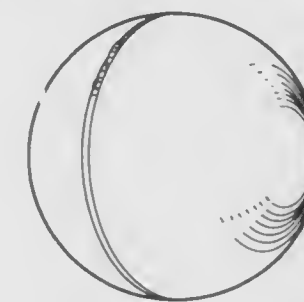
324,106
TRANSCUTANEOUS ELECTRICAL NERVE STIMULATOR

Eliot M. Greenblatt, 5533 N. Third St., Phoenix, Ariz. 85012

Filed Oct. 5, 1989, Ser. No. 417,819

Term of patent 14 years

U.S. Cl. D24—200



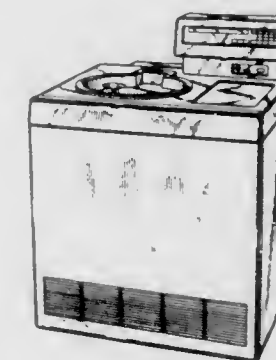
324,107
CENTRIFUGE

Masakuni Koreeda; Sadamoto Tachihara; Daijiro Shiraishi; Hiroshi Hayasaka, all of Katsuta, and Mikio Shimizu, Tokyo, all of Japan, assignors to Hitachi Koki Company, Limited, Japan

Filed Nov. 8, 1989, Ser. No. 433,317

Term of patent 14 years

U.S. Cl. D24—219



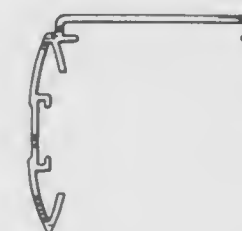
324,108
PLEAT SHAPED VERTICAL SUPPORT FOR WINDOW COVERINGS

Wendell Colson, Boulder, Colo., assignor to Hunter Douglas Inc., Upper Saddle River, N.J.

Filed Oct. 7, 1987, Ser. No. 105,845

Term of patent 14 years

U.S. Cl. D25—119



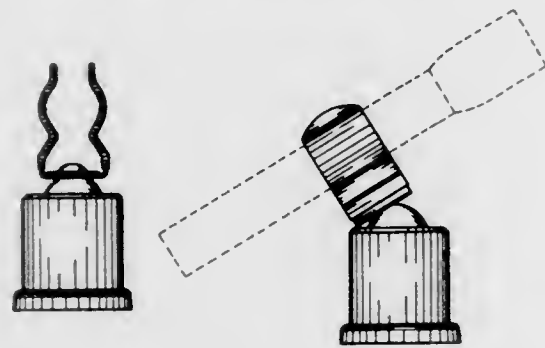
324,109

MAGNETIC FLASHLIGHT HOLDER

William Caridi, 811 High St., Redlands, Calif. 92374
Filed May 30, 1989, Ser. No. 358,187

Term of patent 14 years

U.S. Cl. D26—140



324,110

DIRECT PLUG-IN RECHARGEABLE LIGHT

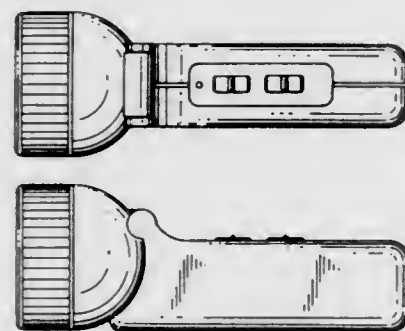
John S. Yuen, Kwun Tong, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Apr. 4, 1990, Ser. No. 504,989

Claims priority, application United Kingdom, Nov. 13, 1989, 2002423

Term of patent 14 years

U.S. Cl. D26—44



324,111

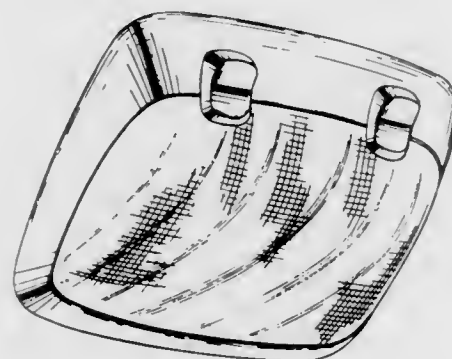
VEHICLE INTERIOR LIGHT

Thomas E. Arbisi, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Nov. 7, 1989, Ser. No. 434,971

Term of patent 14 years

U.S. Cl. D26—28



324,112

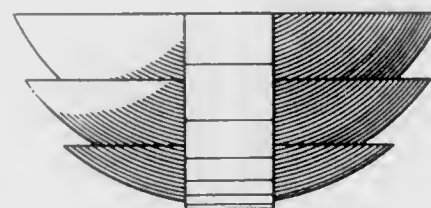
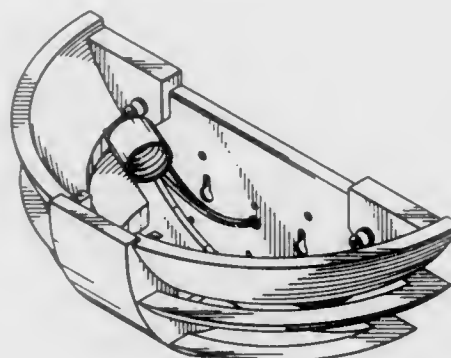
WALL SCONCE

Kevin Von Kluck, Western Springs, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 21, 1990, Ser. No. 483,427

Term of patent 14 years

U.S. Cl. D26—86



324,113

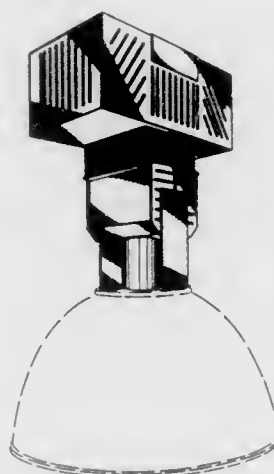
LIGHT FIXTURE

Richard D. Morrison, West Lafayette, Ohio, assignor to LSI Industries Inc., Cincinnati, Ohio

Filed May 9, 1991, Ser. No. 697,470

Term of patent 14 years

U.S. Cl. D26—88



324,114

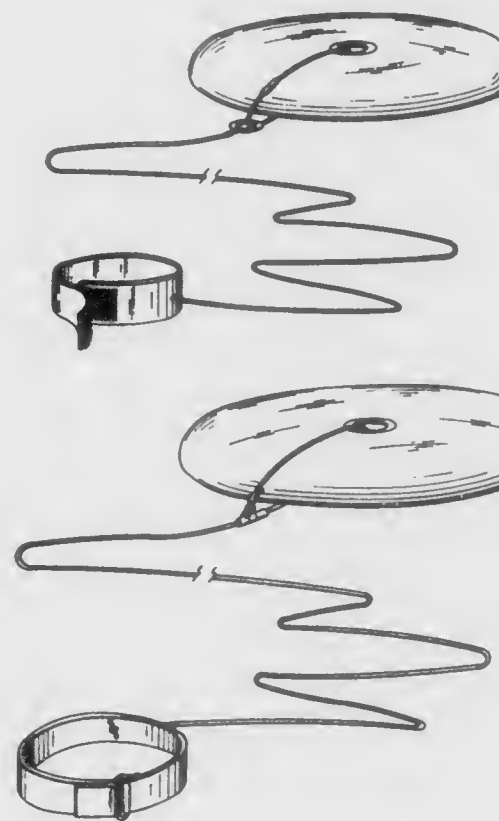
COMBINED AERIAL TOY AND TETHER THEREFOR

David Batrick, and Chris Corley, both of 300 Plaza Alicante, No. 1140, Garden Grove, Calif. 92640

Filed Aug. 14, 1990, Ser. No. 567,900

Term of patent 14 years

U.S. Cl. D21—86



324,116

ANIMAL WATERER

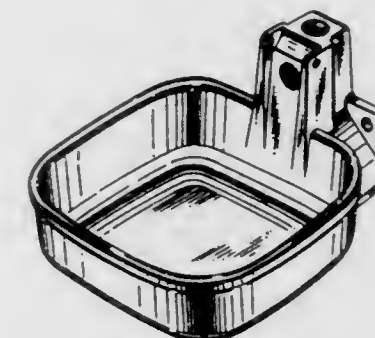
Hans Skillius, Halmstad, Sweden, assignor to Alfa-Laval Agriculture International AB, Tumba, Sweden

Filed Jun. 12, 1989, Ser. No. 364,212

Claims priority, application Sweden, Dec. 16, 1988, 88-2907

Term of patent 14 years

U.S. Cl. D30—132



324,117

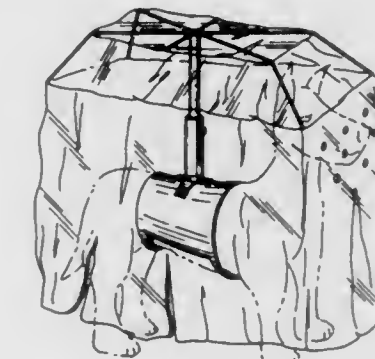
DOG UMBRELLA

Ceas Antoine, 5084 Silverhill Ct., T-3, Forestville, Md. 20747

Filed Oct. 10, 1989, Ser. No. 418,441

Term of patent 14 years

U.S. Cl. D30—144



324,118

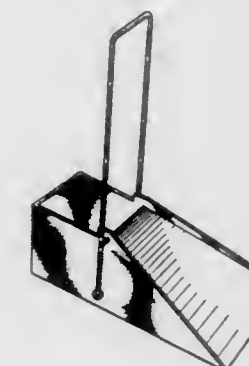
BUCKET FOR COLLECTING LIQUID FROM A FLOOR SURFACE

James S. Martin, 2607 Kennedy Rd., Janesville, Wis. 53545

Filed Jul. 28, 1988, Ser. No. 225,140

Term of patent 14 years

U.S. Cl. D32—53



324,115

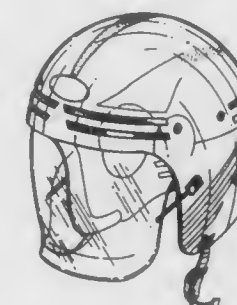
HELMET

Hershel Brooks, 216 Emerling Dr., Cool Valley, Mo. 63121

Filed Jul. 5, 1989, Ser. No. 375,719

Term of patent 14 years

U.S. Cl. D29—15



324,119

MULTIPLE COMPARTMENT TRASH CONTAINER
Arthur D. McKalsen, Jr., Rd #3 Co #14 Box 340A, Fulton,
N.Y. 13069

Filed Nov. 1, 1990, Ser. No. 607,492
Term of patent 14 years

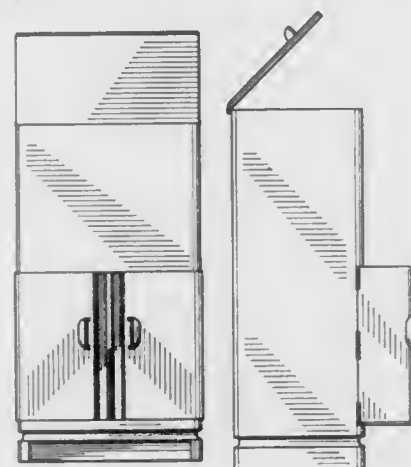
U.S. Cl. D34—7

324,120

COMPARTMENTALIZED REFUSE RECEPTACLE
Eric J. Ingram, 156 Ross Hill Rd., Charlestown, R.I. 02813, and
Joseph A. Robidoux, 23 Quality Ave., Sommers, Conn. 06071

Filed Oct. 12, 1989, Ser. No. 420,216
Term of patent 14 years

U.S. Cl. D34—7

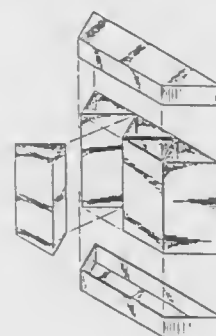


324,121

MULTIPLE COMPARTMENT REFUSE CONTAINER
Margaret A. Schierlinger, 16334 Mill Point, Houston, Tex.
77059

Filed Dec. 19, 1990, Ser. No. 629,979
Term of patent 14 years

U.S. Cl. D34—7



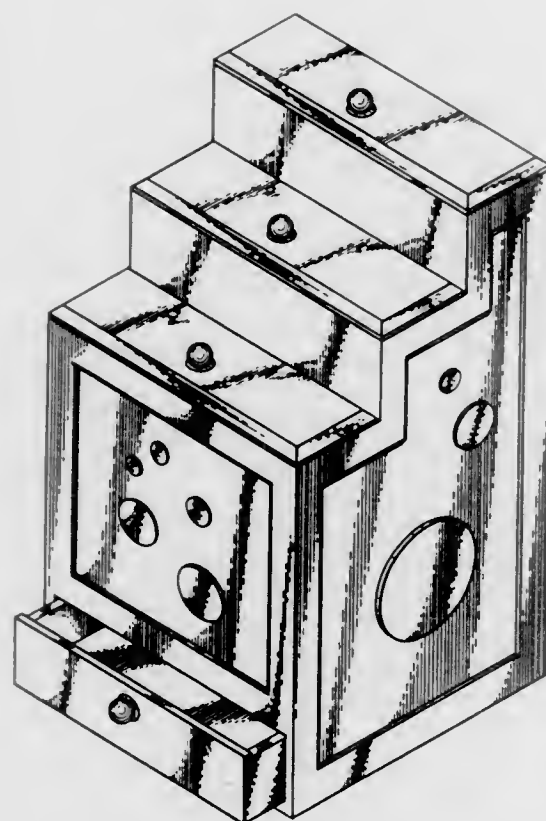
324,122

INSERT FOR TRASH CONTAINERS
Bernd Brüßing, Ulm/Donau, Fed. Rep. of Germany, assignor to
Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 523,643
Claims priority, application Fed. Rep. of Germany, Nov. 14,
1989, M 89 08011.4

Term of patent 14 years

U.S. Cl. D34—10



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TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF FEBRUARY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

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Bergqvist, Hakan; Himbert, Hans; and Jansson, Conny, 5,089,738, Cl. 310-50.000.
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5,089,822, Cl. 342-30.000.
- ABB Atom AB: See—
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- Akagawa, Keiichi: See—
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Hano, Sunao; and Kawabata, Kazunobu, 5,089,966, Cl.
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Ando, Kuniko; Shiraishi, Koichi; Shimbo, Masaru; and Shimai, Shunzo, to Toshiba Ceramics Co., Ltd. Silica glass filter. 5,089,134, Cl. 210-496.000.

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Fukuda, Yutaka; Higushi, Yukio; Imoto, Yukihiro; and Nakano, Noriyoshi, 5,088,320, Cl. 73-118.100.

Aoki, Hiroshi: See—
Gorai, Yuji; and Aoki, Hiroshi, 5,089,820, Cl. 341-139.000.

Appel, James J.: See—
Jodoin, Ronald E.; Loce, Robert P.; Lama, William L.; Rees, James D.; Ibrahim, Abd-El-Fattah A.; and Appel, James J., 5,089,908, Cl. 359-212.000.

Appeldorn, Roger H.: See—
Wilson, Shari J.; Appeldorn, Roger H.; and Hamlin, Robert N., 5,088,164, Cl. 24-576.000.

Apple Computer Inc.: See—
Furtek, Frederick C., 5,089,973, Cl. 364-489.000.

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Appleton, Richard E. Swing with lower support structure. 5,088,730, Cl. 272-85.000.

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Angotti, Marshall A.; Lopez, Frank J.; and Margraf, Richard C., 5,090,047, Cl. 378-170.000.

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Aqua Systems, Inc.: See—
Dempsey, Jack C., 5,088,192, Cl. 29-890.037.

Arai, Izumi: See—
Kojima, Hiroshi; Tahara, Yoshifumi; and Arai, Izumi, 5,089,083, Cl. 156-643.000.

Arai, Kazutaka: See—
Sato, Fumie; Arai, Kazutaka; and Miyaji, Katsuaki, 5,089,625, Cl. 548-110.000.

Arai, Yuji: See—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 5,090,009, Cl. 369-284.000.

Arakawa, Toshihiko: See—
Kawakami, Yasunobu; Hamazaki, Kagehisa; Arakawa, Toshihiko; and Mori, Toshiyuki, 5,089,448, Cl. 501-97.000.

Araki, Kenji; Maeda, Akiho; and Baba, Masahiko, to Shin-Etsu Handotai Company Limited. Method of forming a temperature pattern of heater and silicon single crystal growth control apparatus using the temperature pattern. 5,089,238, Cl. 422-249.000.

Arch, Edward D.; and Schmitt, Heinz M., to Dow Corning S.A. Sealant cartridge with resilient bellows. 5,088,630, Cl. 222-326.000.

Archer, Steven E.: See—
Stockdale, Clyde E.; and Archer, Steven E., 5,088,860, Cl. 406-153.000.

Arco Chemical Company: See—
McAndrew, Thomas P., 5,089,070, Cl. 156-89.000.

Arendsen, David L.: See—
DeBernardis, John F.; Arendsen, David L.; and Zelle, Robert E., 5,089,519, Cl. 514-422.000.

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Arima, Sadaichi; Kuwabara, Kouzou; and Hoshida, Shigeiro, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a copolymer

of vinyl chloride and an n-substituted maleimide compound. 5,089,575, Cl. 526-200.000.

Arita, Koji: See—
Tomizawa, Takeshi; and Arita, Koji, 5,088,302, Cl. 62-480.000.

Arkans, Edward J.: See—
Coble, Stephen J.; and Arkans, Edward J., 5,089,961, Cl. 364-413.020.

Armbruster, David R.; Iyer, S. Raja; and Pasion, Merlyn C., to Borden, Inc. Processes and compositions to enhance the tensile strength of reclaimed sand bonded with alkaline resins. 5,089,540, Cl. 523-213.000.

Armco Inc.: See—
Schumacher, William J., 5,089,067, Cl. 148-325.000.

Armstrong World Industries, Inc.: See—
Sethachayanon, Songvit, 5,089,376, Cl. 430-284.000.

Arndt, Heinrich, to Renk Tacke GmbH. Bifurcated transmission drive. 5,088,969, Cl. 475-201.000.

Arnold, Gene W. Exercise devices. 5,088,725, Cl. 272-117.000.

Aranson, Michael P.; Cardinali, Martin S.; and McCown, Jack T., to Lever Brothers Company, Division of Conopco, Inc. Enzymatic liquid detergent composition. 5,089,163, Cl. 252-135.000.

Arterbury, Bryant A.; and Spangler, James E., to Otis Engineering Corporation. Sintered metal sand screen. 5,088,554, Cl. 166-228.000.

Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH: See—
Blecker, Armin; Lotz, Heinrich; Ochs, Helmut; and Reuschling, Horst, 5,088,899, Cl. 417-356.000.

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Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 5,089,377, Cl. 430-325.000.

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Yoshimura, Isao; Ohno, Toshiaki; and Hata, Hideo, 5,089,341, Cl. 428-412.000.

Asahi Kogaku Kogyo K.K.: See—
Ichitsuka, Takeshi; Hirayama, Yasuhiko; and Ogawa, Tetsuro, 5,089,195, Cl. 264-65.000.

Yamamoto, Masato; Nakajima, Masahiro; Yamanaka, Toshimasa; and Satou, Kouji, 5,089,677, Cl. 200-339.000.

Asahina, Hiroshi, to Kabushiki Kaisha Toshiba. Stereoscopic X-ray apparatus. 5,090,038, Cl. 378-41.000.

Asai, Hideaki: See—
Haruyama, Shinichi; and Asai, Hideaki, 5,089,829, Cl. 343-852.000.

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Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromoto; Mitani, Takahiko; and Ninomiya, Naohisa, 5,089,265, Cl. 424-195.100.

Asami, Seiichi: See—
Miwa, Shinichi; Asami, Seiichi; Kajihara, Takehiro; and Imao, Kouichi, 5,089,449, Cl. 501-98.000.

Asano, Yuji: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeoyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.

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Kanda, Naoya; Ishikawa, Yasushi; Matsumoto, Kunio; and Asao, Hiroshi, 5,089,104, Cl. 204-192.110.

Asawa, Makoto; Matuzaki, Kenji; and Bando, Kazuo, to Kajima Corporation; and Kanto, Auto Works, Ltd. Automatic equipment for collecting and setting up chairs. 5,088,872, Cl. 414-352.000.

Asbeck, Lutz S., to Van den Bergh Foods Co., Division of Conopco, Inc. Method for refining virgin olive oil by membrane filtration. 5,089,139, Cl. 210-650.000.

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Leleu, Serge; Aschard, Jean-Luc; and Bouvier, Alain, 5,088,917, Cl. 431-266.000.

Ashworth, James R.: See—
Wallis, David W.; Ashworth, James R.; and Wier, Charles G., 5,089,716, Cl. 307-101.000.

Askoll S.p.A.: See—
Marioni, Elio, 5,088,902, Cl. 417-415.000.

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Asperger, Robert G.: See—
Thompson, Neil E. S.; and Asperger, Robert G., 5,089,227, Cl. 422-16.000.

Thompson, Neil E. S.; and Asperger, Robert G., 5,089,619, Cl. 544-357.000.

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Mease, Ronnie C.; Srivastava, Suresh C.; and Gestin, Jean-Francois, 5,089,663, Cl. 562-507.000.

Skothheim, Terje A.; Okamoto, Yoshiyuki; and Hale, Paul D., 5,089,112, Cl. 204-403.000.

Astra Plastique: See—
Odet, Philippe; and Rognard, Jean Y., 5,088,632, Cl. 222-529.000.

- AT&T Bell Laboratories: See—
Goodrich, Robert R.; and York, James D., 5,088,587, Cl. 194-345.000.
Katz, Avishay, 5,089,438, Cl. 437-184.000.
Niciolo, Lawrence J.; and Thompson, James A., 5,088,931, Cl. 439-188.000.
Olmer, Leonard J., 5,089,442, Cl. 432-235.000.
Plewes, John T., 5,089,057, Cl. 148-12.70C.
Seefeldt, Roger L., 5,088,601, Cl. 206-334.000.
Atkinson, Virgil; Owens, William G., Jr.; and Owens, William G., III, Oscillation-driven vehicle, 5,088,949, Cl. 446-3.000.
Atlantic Richfield Company: See—
Gard, Michael F.; Pasternack, Eric S.; and Smith, Lonnie J., 5,090,039, Cl. 378-59.000.
Atlas Copco Energas GmbH: See—
Bosen, Werner; and Denz, Hans-Dieter, 5,088,887, Cl. 415-124.100.
Atlas Powder Company: See—
Sohara, Joseph A.; Johnson, Randal A.; and Gorton, William E., 5,089,652, Cl. 558-480.000.
Atochem: See—
Parsy, Roland; Augustin, Daniel; and Collette, Christian, 5,089,546, Cl. 524-198.000.
Atochem North America, Inc.: See—
Park, Kyung T.; Gastgeb, R. Fredrick; and Daniels, Gregory, 5,089,741, Cl. 310-332.000.
Schatz, George R., 5,089,246, Cl. 423-563.000.
Atsugi Unisia Corporation: See—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Sasaki, Mitsuo; Shimizu, Hiroyuki; and Emura, Junichi, 5,088,760, Cl. 280-707.000.
Suga, Seiji, 5,088,456, Cl. 123-90.170.
Attinger, Thomas: See—
Kleineberg, Wolfgang; Schaal, Hans; and Attinger, Thomas, 5,088,453, Cl. 123-41.540.
Attwood Corporation: See—
Whitley, Warwick M., II; and Ratza, Clifton J., 5,088,947, Cl. 440-88.000.
Au, Andrew N.: See—
Fang, Shou-Mean; Horsma, David A.; Peronnet, Guillaume; Fahey, Timothy E.; Au, Andrew N.; and Carlomagno, William D., 5,089,688, Cl. 219-505.000.
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, to Jouveinal S.A. N-cycloalkylalkylamines, process for their preparation, their use as a medicament and their synthesis intermediates, 5,089,639, Cl. 549-491.000.
Audio Precision, Inc.: See—
Cabot, Richard C., 5,089,981, Cl. 364-724.170.
Augustin, Daniel: See—
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Augustitus, James A.; Lecznar, Mark T.; and Wipusuramontom, Pongdet, to TRW Vehicle Safety Systems Inc. Air bag module construction and assembly technique, 5,088,764, Cl. 280-731.000.
Auran, James D.: See—
Koester, Charles J.; and Auran, James D., 5,089,022, Cl. 623-6.000.
Aurness, Harold O.; and Saufferer, Daniel R. Water and fertilizer applicator for lawn and shrubs, 5,088,232, Cl. 47-1.500.
Auto-Kabel Hausen GmbH & Co. Betriebs - KG: See—
Nolle, Gunther, 5,088,941, Cl. 439-762.000.
Auto-Vation Inc.: See—
Wanlass, Bert R., 5,088,347, Cl. 74-625.000.
Automatic Control Components, Inc.: See—
Hendricks, Fred W.; and Brooks, Bobby, 5,088,689, Cl. 251-304.000.
Avakian, Emilia V.: See—
Karaev, Islam K. O.; Shikhinsky, Talat M. O.; Polikhronov, Konstantin P.; Sutovsky, Pavel M.; Avakian, Emilia V.; Semkin, Nikolai V.; Rabinovich, Avraam M.; and Dzhabarov, Rauf D., 5,088,638, Cl. 228-112.000.
Averill, Robert G.; and Cohen, Robert C., to Osteonics Corp. Prosthetic implant procedure and femoral broach therefor, 5,089,004, Cl. 606-85.000.
Avery, Noyes L.: See—
Abramo, Guy P.; Avery, Noyes L.; and Trewella, Jeffrey C., 5,089,028, Cl. 44-347.000.
Avion Systems, Inc.: See—
Abanza, John T.; and Merritt, Scott A., 5,089,822, Cl. 342-30.000.
Avon Inflatables Limited: See—
Harding, Richard J. A., 5,088,434, Cl. 114-85.000.
AW-2R, Inc.: See—
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Azegami, Hitoshi: See—
Tamazaki, Kazunori; Azegami, Hitoshi; and Kuroda, Kazuhiro, 5,089,344, Cl. 428-425.900.
B. Braun Melsungen AG: See—
Rath, Dieter; von der Haar, Friedrich; Gerlach, Hans-Josef; and Knuth, Reinhard, 5,088,522, Cl. 138-119.000.
B. F. Goodrich Company, The: See—
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Kugelman, Michael M., 5,089,926, Cl. 361-87.000.
Lai, John T., 5,089,614, Cl. 544-71.000.
Myers, Ronald E., 5,089,552, Cl. 524-404.000.
Baader, Joseph E. School bus warning light fitting, 5,089,939, Cl. 362-61.000.
Baarns, Antoinette W. Process for creating artworks by application of crayon and ink, 5,089,351, Cl. 428-488.100.
Baba, Kenji, to Murata Kikai Kabushiki Kaisha. Yarn traversing method and a device for carrying out the same, 5,088,653, Cl. 242-43.00R.
Baba, Masahiko: See—
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Baba, Nobuyoshi: See—
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,089,092, Cl. 205-75.000.
Baba, Yasuhiro: See—
Hashibe, Yoshio; Matano, Takahiro; Shibuya, Takehiro; Sakane, Takashi; Baba, Yasuhiro; and Moritake, Masanori, 5,089,345, Cl. 428-428.000.
Babcock & Wilcox Company, The: See—
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Babczinski, Peter: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.
Bacher, William J.: See—
Durivage, Leon W., III; and Bacher, William J., 5,089,928, Cl. 361-94.000.
Backer, Lothar: See—
Dhein, Rolf; Scholl, Thomas; Wellner, Wolfgang; and Backer, Lothar, 5,089,342, Cl. 428-413.000.
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Allen, Ronald; Bae, Peter S.; and Miura, Steven, 5,089,110, Cl. 204-298.150.
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Bagchi, Pranab, to Eastman Kodak Company. Methods of preparation of precipitated coupler dispersions with increased photographic activity, 5,089,380, Cl. 430-449.000.
Bailey, Fay W.; and Ryan, Charles L., Jr., to Phillips Petroleum Company. Method of extrusion blow-molding polyphenylene sulfide articles, 5,089,209, Cl. 264-540.000.
Bain, G. William. Apparatus for protecting ceiling work area from dispersal of asbestos fibers, 5,088,511, Cl. 134-200.000.
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Baker, Max N.; and Clark, Douglas C., to R. J. Reynolds Tobacco Company. Apparatus for assembling components of a smoking article, 5,088,507, Cl. 131-280.000.
Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., to Ford New Holland, Inc. Tapered pin mounting for loaders, 5,088,881, Cl. 414-686.000.
Ballard, James B.: See—
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Bando, Kazuo: See—
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Bando, Thoru: See—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 5,089,340, Cl. 428-411.100.
Banik, David M.: See—
Nordness, Mark E.; Bauer, Frank T.; Blemberg, Robert J.; Eckstein, John P.; Banik, David M.; and Gustafson, Grant A., 5,089,308, Cl. 428-35.400.
Banks, Gerald: See—
Vala, John; and Banks, Gerald, 5,089,713, Cl. 250-566.000.
Bannon, John H. Ultrasonic parts cleaning container, 5,088,510, Cl. 134-105.000.
Barajas, Antonio J. Rolling tool box, 5,088,636, Cl. 224-281.000.
Baran, John S.: See—
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Barba, Roldofo C.: See—
Tovar, Abel M.; Mendizabal, Oscar H. B.; Olmos, Leonardo M.; Sanchez, Carlos G. A.; Lorenzo, Roberto L.; Barba, Roldofo C.; and Perez, Rene H., 5,089,114, Cl. 208-50.000.
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Baur, Rolf, deceased; Linser, Joerg; Grau, Herbert; Bareis, Manfred; and Basteck, Wolfgang, 5,088,604, Cl. 211-1.500.
Barker, Andrew J.; Hughes, Leslie R.; Marsham, Peter R.; Oldfield, John; and Pegg, Stephen J., to Imperial Chemical Industries PLC; and National Research Development Corporation. Quinazoline derivatives possessing anti-tumor activity, 5,089,499, Cl. 514-259.000.
Barmag AG: See—
Bartkowiak, Klaus, 5,088,264, Cl. 57-280.000.
Berger, Hans-Peter; Burkhardt, Klaus; Gerhards, Klaus; and Eck, Hans-Peter, 5,088,168, Cl. 28-249.000.
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Barnea, Jeffrey M.; Barnea, Joseph A., deceased; and Barnea, Catherine C., administrator, 5,088,733, Cl. 273-72.00R.
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Barnea, Jeffrey M.; Barnea, Joseph A., deceased; and Barnea, Catherine C., administrator, 5,088,733, Cl. 273-72.00R.

- Barthelemy, Patrick: See—
Demeyer, Pierre; Mertz, Jean-Luc; Segond, Corinne; Moutet, Serge; Chevalere, Robert; Lhuillier, Henri; and Barthelemy, Patrick, 5,089,974, Cl. 364-492.000.
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Barton, James J.; and Skelly, Bonnie L. System and method for joining structural panels, 5,088,260, Cl. 52-416.000.
Barton, John A.: See—
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Bartow, Richard J.: See—
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Bartrum, Bruce A.; Koontz, Harry S.; and Winter, John A., to PPG Industries, Inc. Bus bar jumper for heatable windshield, 5,089,687, Cl. 219-203.000.
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Brueckner, Christiane; Buschmann, Ernst; Mackenroth, Wolfgang; Himmele, Walter; and Eckhardt, Heinz, 5,089,659, Cl. 560-238.000.
Rueb, Lothar; Eicken, arl; Schwabge, Barbara; Plath, Peter; Wuerzler, Bruno; and Meyer, Norbert, 5,089,042, Cl. 71-74.000.
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Wingert, Horst; Brand, Siegfried; Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Lorenz, Gisela; and Ammermann, Eberhard, 5,089,528, Cl. 514-640.000.
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Basset, Pascal: See—
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Bastek, Wolfgang: See—
Baur, Rolf, deceased; Linser, Joerg; Grau, Herbert; Bareis, Manfred; and Bastek, Wolfgang, 5,088,604, Cl. 211-1.500.
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Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.
Baxter International Inc.: See—
Dutchik, Robert A., 5,088,124, Cl. 2-163.000.
Packard, Jeffrey; Schnell, William J.; and Scharf, Michael W., 5,088,995, Cl. 604-415.000.
Bayer Aktiengesellschaft: See—
Blum, Harald; Wamprecht, Christian; Pedain, Josef; and Sonntag, Michael, 5,089,565, Cl. 525-375.000.
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 5,089,640, Cl. 549-563.000.
Dhein, Rolf; Scholl, Thomas; Wellner, Wolfgang; and Backer, Lothar, 5,089,342, Cl. 428-413.000.
Frobel, Klaus; Lenfers, Jan-Bernd; Fey, Peter; Knorr, Andreas; Stasch, Johannes-Peter; Muller, Hartwig; Bischoff, Erwin; and Dellweg, Hans-Georg, 5,089,487, Cl. 514-150.000.
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.
Pielartzik, Harald; Meyer, Rolf-Volker; Dujardin, Ralf; Schnitzler, Axel; and Traenckner, Hans-Joachim, 5,089,590, Cl. 528-176.000.
Sutter, Hubert; Kolwert, Alois; and Obrecht, Werner, 5,089,579, Cl. 526-323.200.
Baz, Afif A.; Hsu, Jau Y.; and Scoville, Eugene, to Nestec S.A. Preparation of quick cooking rice, 5,089,281, Cl. 426-461.000.
Bazin, Norman L. Fishing lure with rotational lateral fins, 5,088,226, Cl. 43-42.030.
Beach, Kirk W.; Phillips, David J.; and Kinsky, John, to University of Washington. The Board of Regents of the. Ultrasonic plethysmograph, 5,088,498, Cl. 128-661.070.
Beagle, Wayne P., to Carrier Corporation. Check valve for scroll compressor, 5,088,905, Cl. 418-55.100.
Bean, Kenneth E.: See—
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Beaulieu, Serge B., to Bear Island Paper Company. System for sulfonating mechanical pulp fibers, 5,089,089, Cl. 162-234.000.
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Belcher, Bryan L.: See—
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Rago, Vito, 5,089,954, Cl. 395-600.000.
Bell, Ian. Self-programmable temperature control system for a heating and cooling system, 5,088,645, Cl. 236-46.00R.
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- Berger, Hermann J. Method for impregnating tissue samples in paraffin. 5,089,288, Cl. 427-4.000.
- Bergqvist, Hakan; Himbert, Hans; and Jansson, Conny, to AB Baheco Verktyg. Battery-driven handtool. 5,089,738, Cl. 310-50.000.
- Bergstein, Frank D. Rotor assembly for fluid driven engine. 5,088,884, Cl. 415-3.100.
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- Berkenkamp, Wolfgang: See—
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- Berkley, Inc.: See—
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- Berris, Bruce C., to Ethyl Corporation. Bicyclic polysilicon compounds. 5,089,646, Cl. 556-406.000.
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- Berrong, David B.: See—
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- Bersch, Friedrich. Apparatus for admitting flowable additive to a liquid. 5,088,517, Cl. 137-101.110.
- Bertonee Inc.: See—
Iannini, Robert E., 5,089,745, Cl. 315-76.000.
- Bertrand, Jean M.; and Joannic, Jean V., to Botalam (S.A.R.L.). Binding device with improved twisting head and binder equipped with such devices, in particular for binding coils of wire. 5,088,394, Cl. 100-12.000.
- Bertrand, Jean-Marie: See—
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- Bessho, Hironori: See—
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- Beta Instrument Co., Ltd.: See—
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- Beth, David E.; McCracken, Robert E.; and Watson, James B., to Ryobi Motor Products Corp. Depth of cut adjustment mechanism for a router. 5,088,865, Cl. 409-182.000.
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- Betz Laboratories, Inc.: See—
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- Turunc, Umit, 5,089,142, Cl. 210-728.000.
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- Biba, Scott I.; and Sommerfeld, Dean R., to Graber Industries, Inc. Vertical blind apparatus. 5,088,542, Cl. 160-168.100.
- Bickraj, Ramsingh. Dual rotary ac generator. 5,089,734, Cl. 310-83.000.
- Bieffeld, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH & Co. Continuously working press. 5,088,398, Cl. 100-154.000.
- Biggerstaff, Ronald D.: See—
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- Bindicator Company: See—
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- Binford, John L.: See—
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- Bio-Rad Laboratories, Inc.: See—
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- Biosite Diagnostics, Inc.: See—
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- Bischoff, Erwin: See—
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- Bitan, Nachum. Multi-station easel. 5,088,678, Cl. 248-460.000.
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- Black & Decker Inc.: See—
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- Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., to General Electric Company. Amide-urea copolymer and process for the preparation thereof. 5,089,600, Cl. 528-335.000.
- Blake-Haskins, John: See—
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- Blake, James A., to General Electric Company. Shielded enclosure with an isolation transformer. 5,090,048, Cl. 378-202.000.
- Blaker, J. Warren: See—
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- Blanton, William A., Jr.; and Klaassen, Alan W., to Chevron Research Company. Chromium/tin mixture as sulfur dioxide oxidation promoter for FCC units. 5,089,461, Cl. 502-242.000.
- Blatch, Geoffrey I.; Taylor, Mark P.; and Fyfe, Mark, to Comalco Aluminum Ltd. Process for controlling aluminum smelting cells. 5,089,093, Cl. 204-67.000.
- Blecker, Armin; Lotz, Heinrich; Ochs, Helmut; and Reuschling, Horst, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH. Pump with drive motor. 5,088,899, Cl. 417-356.000.
- Blemborg, Robert J.: See—
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- Bleton, Olivier; Duet, Roger; Henry, Marc; and Cogne, Jean-Yves, to Ugine Savoie. Resulphurized austenitic stainless steel with improved machinability. 5,089,224, Cl. 420-41.000.
- Bloom, Stuart J., to Pockets of Learning. Portable infant's play mat with integral carrying case. 5,088,139, Cl. 5-420.000.
- Blount, David H. Fire-retardant organic-phosphorus salts. 5,089,559, Cl. 525-107.000.
- Blum, Harald; Wamprecht, Christian; Pedain, Josef; and Sonntag, Michael, to Bayer Aktiengesellschaft. Process for the preparation of curable binder combinations, the combinations obtainable by this process and the use thereof. 5,089,565, Cl. 525-375.000.
- Blythe, Robert J.: See—
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- Board of Regents, The University of Texas System: See—
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- Boas, Barry, to Boas Investments Limited. Elongate display prong. 5,088,606, Cl. 211-571.000.
- Boas Investments Limited: See—
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- Bobier Electronics, Inc.: See—
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- Bobier, Joseph A.; and Brown, Gerald E., to Bobier Electronics, Inc. Solar panel driven air purging apparatus for motor vehicles. 5,089,764, Cl. 320-20.000.
- Bobo, Melvin, to General Electric Company. Shroud seal. 5,088,888, Cl. 415-170.100.
- Bobsein, Rex L.: See—
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- Bock, Jan: See—
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- Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Substituted azolymethyl-cyclopropyl-carbionol derivatives. 5,089,640, Cl. 549-563.000.
- Boeing Company, The: See—
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- Fryc, Oldrich, 5,088,609, Cl. 211-117.000.
- Jeppsson, Jan, 5,088,181, Cl. 29-563.000.
- Lazaro, Luis J., Jr.; and Harsch, Franklin D., 5,088,191, Cl. 29-867.000.

- Orgun, Munir; McRoberts, Timothy C.; and Wu, Tzong-Hsiu B., 5,089,968, Cl. 364-435.000.
- Whitener, Philip C., 5,088,661, Cl. 244-76.00R.
- Boesel, Robert P., to Valentine Engineering, Inc. Method of making a high efficiency encapsulated power transformer. 5,088,186, Cl. 29-605.000.
- Bofinger, Klaus: See—
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- Bogert, Steven T.: See—
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- Bohannon, William K.: See—
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- Bohara, Robert C.; and Ruf, James A., to Rosemount Inc. Method for forming a platinum resistance thermometer. 5,089,293, Cl. 427-102.000.
- Bohn, Frank W. Parking lot car locator. 5,089,803, Cl. 340-425.500.
- Boland, Ross F.; Hultman, Carl A.; Vreeland, William E.; and Williams, Peter S., to Warner-Lambert Company. Shaving razors. 5,088,202, Cl. 30-346.540.
- Boles, Glenn M.: See—
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- Bomo, Francis; Chevallier, Yvonick; Lamy, Patrick; and Morawski, Jean-Claude, to Rhone-Poulenc Chimie de Base. Silica reinforced elastomers. 5,089,534, Cl. 524-493.000.
- Bonaccorsi, Fabrizio; Pappa, Rosario; Riocci, Mario; Roggero, Arnaldo; and Lockhart, Thomas P., to Eniricerche S.p.A. and AGIP S.p.A. Polymers and copolymers containing malonic (meth)acrylamide units. 5,089,577, Cl. 526-240.000.
- Bonazza, Benedict R., to Phillips Petroleum Company. EMI shielded composites and process of making same. 5,089,326, Cl. 428-284.000.
- Bond, Alan: See—
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- Bonekamp, Benedictus C.: See—
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- Bonin, Werner; Demoute, Jean-Pierre; and Tessier, Jean, to Roussel Uclaf. Insecticides and nematocides. 5,089,511, Cl. 514-357.000.
- Bonk, Henry W.; Chen, Augustin T.; and Ehrlich, Benjamin S., to Dow Chemical Company, The. Regenerated, high molecular weight, thermoplastic resins and process for regenerating thermoplastic resins. 5,089,571, Cl. 525-457.000.
- Bonsignore, Stefano: See—
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- Borden, Inc.: See—
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- Irvin, Scott A.; Merritt, Carleton G.; and Kowalski, Raymond G., 5,089,284, Cl. 426-557.000.
- Borgelt, Andrea: See—
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- Durckheimer, Walter; Bormann, Dieter; Ehlers, Eberhard; Schriener, Elmar; and Heymes, Rene, 5,089,490, Cl. 514-206.000.
- Borraccia, Dominic: See—
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- Bosch-Siemens Hausgerate GmbH: See—
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- Bosen, Werner; and Denz, Hans-Dieter, to Atlas Copco Energas GmbH. Turbine with spur gearing. 5,088,887, Cl. 415-124.100.
- Bosniac, Deian, to Mannesmann Rexroth GmbH. Valve device for actuating the telescopic cylinder of a tipper. 5,088,283, Cl. 60-468.000.
- Bostad, Wayne W.: See—
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- Bostick, Edgar E.: See—
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- Bothe, Lothar, to Hoechst Aktiengesellschaft. Biaxially-oriented polyolefin multi-layer film which can be sealed on both sides and the preparation and use of the same. 5,089,319, Cl. 428-216.000.
- Bottom, Edward W. Solar heating structure. 5,088,471, Cl. 126-436.000.
- Bouvier, Alain: See—
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- Bower, William B.: See—
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- Bowers, Tom D.: See—
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- Boxhoorn, Gosse: See—
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- Bozman, Gerald P., to International Business Machines Corporation. Method for allowing weak searchers to access pointer-connected data structures without locking. 5,089,952, Cl. 395-725.000.
- BP Chemicals Limited: See—
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- Brabander, Herbert J.: See—
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- Bradley, John R.; Perry, Thomas A.; and Schroeder, Thaddeus, to General Motors Corporation. Thermomagnetically patterned magnets and method of making same. 5,089,060, Cl. 148-103.000.
- Bradshaw, Charles; Tack, Bill; Hansford, Mike; and Winterbottom, John, to IRD Mechanalysis, Inc. Shaft synchronous balancing apparatus. 5,089,969, Cl. 364-463.000.
- Brady, Donnie G.: See—
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- Brady, Roscoe O.: See—
Miller, Stephen P. F.; and Brady, Roscoe O., 5,089,392, Cl. 435-21.000.
- Brambilla, Romano. Double flighted extrusion screw. 5,088,914, Cl. 425-208.000.
- Bran & Luebbe GmbH: See—
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- Brand, Siegfert: See—
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- Brandes, Wilhelm: See—
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- Brandl, Reinhard: See—
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- Brane, Earl P.; and Tucker, David L., to Wm. R. Hague, Inc. Comprehensive water treatment system. 5,089,140, Cl. 210-678.000.
- Brauer, Michael C.: See—
Santos, A. John; and Brauer, Michael C., 5,089,817, Cl. 341-15.000.
- Brauer, Rudiger, to Bran & Luebbe GmbH. Membrane pump with a freely oscillating metal membrane. 5,088,901, Cl. 417-386.000.
- Braun, Bodo; Bruszie, Christian; Feuerbach, Manfred; Genzel, Rolf-Guenter; Lobnig, Josef; and Raddatz, Juergen, to Siemens Aktiengesellschaft. Electrical switchgear having an insertable and retractable apparatus rack. 5,089,934, Cl. 361-335.000.
- Braun, Daniel E.; Mitchell, Robert K.; and Laska, Casimir F., to Briggs & Stratton Corporation. Lawnmower handle assembly. 5,088,273, Cl. 56-10.500.
- Braun, Eugene R., to Eaton Corporation. Shift prohibiting for automatic shift preselection mode for mechanical transmission system with semi-automatic shift implementation. 5,089,965, Cl. 364-424.100.
- Braun, Howard E.: See—
Hu, Min H.; Smith, Allen C., Jr.; Wilson, Robert M.; Wepfer, Robert M.; and Braun, Howard E., 5,088,451, Cl. 122-388.000.
- Bray, Olin H.: See—
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- BRDG-TNDR Corporation: See—
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- Breckenfeld, Paul W.: See—
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 Rodriguez, Rebecca A.; and Welti, Philip J., 5,089,985, Cl.
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 ganic peracid, magnesium sulfate and controlled amounts of water,
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 Fassbinder, Hans-Georg, 5,088,331, Cl. 73-861.370.
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 David D.; and Stuben, Frank S., to Zerand-Bernal Group, Inc.
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 Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and
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 Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komat-
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 indicator, 5,088,623, Cl. 222-40.000.
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 Bird, Thomas G. C.; Crawley, Graham C.; Edwards, Philip N.;
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 S.A. - Embraco. Migration blocking valve in a refrigerating system,
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 Dalebout, William T., to Weslo, Inc. Treadmill frame and roller bracket
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de Resmini, Amilcare C.: See—
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Doi, Kazuhiro, to Nissan Motor Company, Limited. Electrorheopectic fluid filled vibration damping mount for use with automotive engines and the like. 5,088,699, Cl. 267-140.10E.

Domoto, Takeshi: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Aiki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.

Dondio, Giulio: See—
Vecchiotti, Vittorio; Colle, Roberto; Giordani, Antonio; and Donadio, Giulio, 5,089,507, Cl. 514-326.000.

Doniger, Kenneth J.: See—
Rosenblum, Stephen S.; and Doniger, Kenneth J., 5,089,746, Cl. 315-111.810.

Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of diodomethyl-p-tolylsulfone and n-tributyl tetradecyl phosphonium chloride. 5,089,484, Cl. 514-75.000.

Dotson, Ronald L.: See—
Cawfield, David W.; Kaczur, Jerry J.; Duncan, Budd L.; Mendiratta, Sudhir K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 5,089,095, Cl. 204-101.000.

Douglas, Ian F. Portable non-flushing toilet. 5,088,134, Cl. 4-484.000.

Dow Chemical Company, The: See—
Bonk, Henry W.; Chen, Augustin T.; and Ehrlich, Benjamin S., 5,089,571, Cl. 525-457.000.

Chum, Pak-Wing S.; and Koch, Kaelyn C., 5,089,321, Cl. 428-218.000.

Gregory, Thomas; Hurtig, Carl W.; Ledbetter, Harvey D.; Quackenbush, Kenneth J.; and Rosenberg, Steven, 5,089,591, Cl. 528-185.000.

Harris, William J.; and Hwang, Wen-Fang, 5,089,568, Cl. 525-410.000.

Henton, David E.; and Mang, Michael N., 5,089,557, Cl. 525-66.000.

LaFreniere, Bryant R.; Zaranski, Mark T.; and Miller, Marvin P., 5,088,335, Cl. 73-864.620.

Marchand, Gary R.; Schell, Joseph G., Jr.; Walther, Brian W.; and Bredeweg, Corwin J., 5,089,572, Cl. 526-77.000.

Murray, Daniel J.; Dibbs, Mitchell G.; and Yang, Philip C., 5,089,660, Cl. 560-301.000.

Park, Chung P., 5,089,533, Cl. 521-79.000.

Schrock, Alan K.; Harris, William J.; and Madison, Norman L., 5,089,592, Cl. 528-185.000.

Tabor, Ricky L.; Strait, Chad A.; and Lancaster, Gerald M., 5,089,556, Cl. 525-64.000.

Thoen, Johan A.; Sewell, Robert A.; and Muller, Ulrich, 5,089,534, Cl. 521-106.000.

Timm, Edward E.; and McCombs, Ann M., 5,089,447, Cl. 501-87.000.

White, Jerry E.; Brennan, David J.; and Pikulin, Steven, 5,089,588, Cl. 528-99.000.

Dow Corning Corporation: See—
Holloran, Daniel J., 5,089,253, Cl. 424-47.000.

Liles, Donald T., 5,089,537, Cl. 522-84.000.

Plueddemann, Edwin P., 5,089,300, Cl. 427-299.000.

Dow Corning S.A.: See—
Arch, Edward D.; and Schmitt, Heinz M., 5,088,630, Cl. 222-326.000.

Dow Corning Toray Silicone Company, Ltd.: See—
Yoshitake, Makoto, 5,089,620, Cl. 546-14.000.

Dow Elanco: See—
Pews, R. Garth; Wehmeyer, Richard M.; and Hunter, James E., 5,089,653, Cl. 560-47.000.

Dowden, Patrick N.: See—
Hull, Harold L.; and Dowden, Patrick N., 5,088,174, Cl. 29-254.000.

DowElanco: See—
Wessling, Ritchie A.; Pickelman, Dale M.; and Wujek, Dennis G., 5,089,259, Cl. 424-497.000.

Downey, William L., to Schlage Lock Company. Door security track. 5,088,152, Cl. 16-80.000.

Dowty Seals Limited: See—
Oseman, Gavin S., 5,088,744, Cl. 277-188.00R.

Dragerwerk Aktiengesellschaft: See—
May, Wolfgang, 5,089,232, Cl. 422-83.000.

Dreier, Peter; von Ammon, Wilfried; and Winterer, Heinz, to Wacker-Chemtronik Gesellschaft fur Elektronik-Grundstoffe mbH. Process and apparatus for producing silicon ingots having high oxygen content by crucible-free zone pulling, silicon ingots obtainable thereby and silicon wafers produced therefrom. 5,089,082, Cl. 156-620.400.

Dresser Industries, Inc.: See—
Loga, Thomas H.; and Biggerstaff, Ronald D., 5,088,257, Cl. 52-397.000.

Ricles, Thomas D.; and Barton, John A., 5,088,557, Cl. 166-297.000.

Drexler Technology Corporation: See—
Haddock, Richard, 5,089,693, Cl. 235-486.000.

Dreyer, Uwe: See—
Focke, Heinz; and Dreyer, Uwe, 5,088,883, Cl. 414-795.000.

Driscoll, Carleton D.; Jungling, Ronald S.; and Najm, Elie M., to International Business Machines Corporation. Power supply circuit featuring minimum parts count. 5,089,947, Cl. 363-20.000.

Drug Delivery Systems Inc.: See—
Sibalis, Dan, 5,088,977, Cl. 604-20.000.

Drusiani, Franco, to M.A.I.Bo S.r.l. Device for the disinfection of pruned branches or vine-shoots, applied or applicable to pneumatic shears. 5,088,198, Cl. 30-123.300.

Dubief, Claude: See—
Grollier, Jean F.; and Dubief, Claude, 5,089,252, Cl. 424-47.000.

Dubos, Daniel: See—
Thelamon, Jean; Salaud, Jean-Luc; and Dubos, Daniel, 5,088,702, Cl. 267-140.10C.

Duet, Roger: See—
Bletton, Olivier; Duet, Roger; Henry, Marc; and Cogne, Jean-Yves, 5,089,224, Cl. 420-41.000.

Dujardin, Ralf: See—
Pielartzik, Harald; Meyer, Rolf-Volker; Dujardin, Ralf; Schnitzler, Axel; and Traenckner, Hans-Joachim, 5,089,590, Cl. 528-176.000.

Dull, Gerald G.; Leffler, Richard G.; and Birth, Gerald S., to United States of America, Agriculture. Nondestructive measurement of soluble solids in fruits having a rind or skin. 5,089,701, Cl. 250-341.000.

Dumestre, Camille. Canned drink cover apparatus. 5,088,614, Cl. 220-713.000.

Duncan, Alexander: See—
Hunter, Robert L.; and Duncan, Alexander, 5,089,260, Cl. 424-78.380.

Duncan, Budd L.: See—
Cawfield, David W.; Kaczur, Jerry J.; Duncan, Budd L.; Mendiratta, Sudhir K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 5,089,095, Cl. 204-101.000.

Duncan, Malcolm, to Magnetro International Incorporated. Liquid level float switch. 5,089,676, Cl. 200-84.00R.

Duncan, Steven A. Apparatus and method for eliminating cigarette sidestream smoke. 5,088,508, Cl. 131-330.000.

Dunki, Umerto: See—
Bucher, Robert; and Dunki, Umerto, 5,088,523, Cl. 139-35.000.

Dunks, Gary B.; Yamada, Akira; Kwon, Oh-Seung; and Borgelt, Andrea, to Iolab Corporation. Method of preparing composite single-piece intraocular lenses with colored haptics. 5,089,180, Cl. 264-1.700.

DuPlessis, Cornelius J.: See—
Gaylard, E. Mervyn J.; and DuPlessis, Cornelius J., 5,089,457, Cl. 502-5.000.

Du Pont de Nemours, E. I., and Company: See—
Belcher, Wilbur D.; and Grindstaff, Teddy H., 5,088,140, Cl. 5-636.000.

Chapman, George R., Jr.; McMinn, Rita S.; Priester, Donnan E.; and Phillips, William L., 5,089,200, Cl. 264-127.000.

Debroy, Tapan K.; and Chung, Ding Y., 5,089,100, Cl. 204-181.700.

Feinberg, Stewart C., 5,089,332, Cl. 428-328.000.

Hendren, Gary L.; and Ratliff, Danny R., 5,089,088, Cl. 162-123.000.

Paul, Donald C., 5,089,632, Cl. 549-274.000.

Dupps Co., The: See—
Mansfield, Peter W.; and Dupps, Frank N., 5,088,397, Cl. 100-145.000.

Dupps, Frank N.: See—
Mansfield, Peter W.; and Dupps, Frank N., 5,088,397, Cl. 100-145.000.

Dupraz, Jean -Pierre: See—
Thurmes, Edmond; Dupraz, Jean -Pierre; Moncorge, Jean-Paul; Williams, Jean-Marc; Martin, Joseph; Ferrusset, Yves; and Taponnat, Didier, 5,089,931, Cl. 361-174.000.

Durckheimer, Walter; Bormann, Dieter; Ehlers, Eberhard; Schrinner, Elmar; and Heymes, Rene , to Hoechst Aktiengesellschaft. Cephem derivatives. 5,089,490, Cl. 514-206.000.

Durivage, Leon W., III; and Bacher, William J., to Square D Company. Processor controlled circuit breaker trip system having reliable status display. 5,089,928, Cl. 361-94.000.

Dutchik, Robert A., to Baxter International Inc. Glove and form for making same. 5,088,124, Cl. 2-163.000.

Dutt, Herbert V.; and Hudak, Thomas F., to Continental Plastics, Inc. Tamper evident closure. 5,088,613, Cl. 215-250.000.

Duve, John P., to Eaton Corporation. One-way clutch. 5,088,581, Cl. 192-46.000.

Du vosel, Annick: See—
Dalcanele, Enrico; Bonsignore, Stefano; and Du vosel, Annick, 5,089,664, Cl. 562-580.000.

Dwek, Raymond A.: See—
Fleet, George W. J.; Rademacher, Thomas W., and Dwek, Raymond A., 5,089,520, Cl. 514-425.000.

Dye, James S., to Zexel-Gleason USA, Inc. Timing of multiple gear train differential. 5,088,970, Cl. 475-227.000.

Dzhabarov, Rauf D.: See—
Karaev, Islam K. O.; Shikhinsky, Talat M. O.; Polikhronov, Konstantin P.; Sutovsky, Pavel M.; Avakian, Emilia V.; Semkin, Nikolai V.; Rabinovich, Avraam M.; and Dzhabarov, Rauf D., 5,088,638, Cl. 228-112.000.

E. A. P. Akustik GmbH: See—
Pothoff, Hans-Hermann; Scheffler, Ingolf; Ruch, Klaus; and Joessel, Rainer, 5,088,576, Cl. 181-290.000.

E. D. Bullard Company: See—
Napolitano, Michael L., 5,088,115, Cl. 2-69.000.

- E. R. Squibb & Sons, Inc.: See—
Sudilovsky, Abraham; and Horovitz, Zola P., 5,089,502, Cl. 514-274.000.
Varma, Ravi K.; and Chao, Sam T., 5,089,523, Cl. 514-460.000.
- E-Y Laboratories, Inc.: See—
Chun, Peter K.; and Chu, Albert E., 5,089,394, Cl. 435-34.000.
- Earnshaw, Christopher G.; Kirsch, Gerald; Rach, Petra; Thieroff-Ekerdt, Ruth; and Topert, Michael, to Schering Aktiengesellschaft. Hydroxyalkane carboxylic acid derivatives and their production. 5,089,175, Cl. 260-404.000.
- Eastman Kodak Company: See—
Bagehi, Pranab, 5,089,380, Cl. 430-449.000.
Bedzyk, Mark D., 5,089,078, Cl. 156-378.000.
Bedzyk, Mark D., 5,089,081, Cl. 156-556.000.
DeVane, Mark J., Jr.; Lercher, John S.; and Wellman, Jeffrey A., 5,089,233, Cl. 422-99.000.
Foote, James C., Jr., 5,088,784, Cl. 294-116.000.
Kemp, David B.; and Covington, Roger G., 5,089,837, Cl. 354-275.000.
McCabe, John M.; and Wilson, John C., 5,089,547, Cl. 524-262.000.
Olexy, Anthony M., 5,088,722, Cl. 271-304.000.
Pelanek, Geraldine A.; Zercie, Robert W.; and Kanaley, James D., 5,089,389, Cl. 435-7.360.
Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.
Saeva, Franklin D., 5,089,374, Cl. 430-271.000.
Shaw, James D.; Muszak, Martin F.; and Want, Nicholas, 5,089,418, Cl. 436-46.000.
Wakefield, Edward H., 5,088,813, Cl. 352-183.000.
Xydias, Jean, 5,089,857, Cl. 355-318.000.
- Eaton Corporation: See—
Braun, Eugene R., 5,089,965, Cl. 364-424.100.
Duve, John P., 5,088,581, Cl. 192-46.000.
Steeby, Jon A., 5,089,962, Cl. 364-424.100.
- Eaton, George H.: See—
Ruddick, John N. R.; Eaton, George H.; and Whiting, Douglas B., 5,089,302, Cl. 427-377.000.
- Ebara Corporation: See—
Konno, Daisuke; Miwa, Sachihiko; Aiyoshizawa, Shunichi; Kasahara, Kazuyuki; Sato, Yoshio; and Hirokawa, Kazuto, 5,089,732, Cl. 310-67.00R.
- Eberhardt, Thomas E. Treatment vessel for bodies of water with laterally adjustable pontoons. 5,089,120, Cl. 210-170.000.
- Ebihara, Kazuyuki: See—
Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazuyuki; and Nishi, Yuji, 5,089,892, Cl. 358-167.000.
- Echeverria, Gregorio J. Engine brake system for all types of diesel and gasoline engines. 5,088,460, Cl. 123-322.000.
- Echlin, Inc.: See—
Meaney, John D., 5,088,464, Cl. 123-478.000.
- ECIA: See—
Hoblingre, Andre; Courvoisier, Patrick; and Bertrand, Jean-Marie, 5,088,767, Cl. 280-775.000.
- Eck, Hans-Peter: See—
Berger, Hans-Peter; Burkhardt, Klaus; Gerhards, Klaus; and Eck, Hans-Peter, 5,088,168, Cl. 28-249.000.
- Eckhardt, Heinz: See—
Brueckner, Christiane; Buschmann, Ernst; Mackenroth, Wolfgang; Himmele, Walter; and Eckhardt, Heinz, 5,089,659, Cl. 560-238.000.
- Eckstein, John P.: See—
Nordness, Mark E.; Bauer, Frank T.; Blemberg, Robert J.; Eckstein, John P.; Banik, David M.; and Gustafson, Grant A., 5,089,308, Cl. 428-35.400.
- Edakubo, Hiroo: See—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Unichi; and Takayama, Nobutoshi, 5,089,919, Cl. 360-74.400.
- Edmondson, Wayne L., to Joy Technologies Inc. Chain and flight conveyor. 5,088,594, Cl. 198-731.000.
- Edwards, Arnold G.: See—
Huber, Klaus B.; Lerche, Nolan C.; Edwards, Arnold G.; Rozek, Kenneth E.; and Smith, Edward G., Jr., 5,088,413, Cl. 102-202.500.
- Edwards, Brooks: See—
Bronstein, Irena Y.; Edwards, Brooks; Kricka, Larry; and Voyta, John, 5,089,630, Cl. 549-220.000.
- Edwards, James H.; Maitra, Ashit M.; and Tyler, Ralph J., to Broken Hill Proprietary Company, Ltd., The; and Commonwealth Scientific and Industrial Research Organization. Hardened catalyst particles and method for hardening the catalyst particles. 5,089,451, Cl. 502-174.000.
- Edwards, John V.; Leise, Walter F., Jr.; and Cline, John B. Ostomy device with improved coupling system. 5,088,992, Cl. 604-338.000.
- Edwards, Martin P.: See—
Crawley, Graham C.; and Edwards, Martin P., 5,089,495, Cl. 514-253.000.
- Edwards, Philip N.: See—
Bird, Thomas G. C.; Crawley, Graham C.; Edwards, Philip N.; Girodeau, Jean-Marc M. M.; and Kingston, John F., 5,089,513, Cl. 514-365.000.
- EEV Limited: See—
Prescott, John A., 5,089,914, Cl. 359-815.000.
- Egbert, Jeffrey T. Apparatus for attaching levels to studs and other objects. 5,088,205, Cl. 33-371.000.
- Eggers, Thomas A.; and Yoder, Alan J., to Vermeer Manufacturing Company. Material feed control method and apparatus for a wood or brush chipping machine. 5,088,532, Cl. 144-356.000.
- Ehlers, Eberhard: See—
Durekheimer, Walter; Bormann, Dieter; Ehlers, Eberhard; Schrinner, Elmar; and Heymes, Rene, 5,089,490, Cl. 514-206.000.
- Ehrlich, Benjamin S.: See—
Bonk, Henry W.; Chen, Augustin T.; and Ehrlich, Benjamin S., 5,089,571, Cl. 525-457.000.
- Eichberger, Robert T.; and Hewelt, Scott M., to Bindicator Company. System for indicating a condition of material. 5,088,325, Cl. 73-304.00C.
- Eicken, arl: See—
Rueb, Lothar; Eicken, arl; Schwalge, Barbara; Plath, Peter; Wuerzer, Bruno; and Meyer, Norbert, 5,089,042, Cl. 71-74.000.
- Eidenschink, Rudolf: See—
Krause, Joachim; Eidenschink, Rudolf; Bofinger, Klaus; Hopf, Reinhard; Reiffenrath, Volker; Poetsch, Eike; Scheuble, Bernhard; and Geelhaar, Thomas, 5,089,168, Cl. 252-299.610.
- EIKEN Kougyo Kabushiki Kaisha: See—
Furuhashi, Toshio; and Hasegawa, Mokoto, 5,088,916, Cl. 431-90.000.
- Eiler, Hugo, to University of Tennessee Research Corporation, The. Method for treatment of bovine retained placenta. 5,089,264, Cl. 424-94.640.
- Eimori, Takahisa: See—
Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, 5,089,863, Cl. 357-23.300.
- Eisai Co., Ltd.: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kito, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
- Eke, Kenneth I., to Microwave Ovens Limited. Microwave oven with stand-by mode. 5,089,679, Cl. 219-10.55B.
- Electricite De France: See—
Leleu, Serge; Aschard, Jean-Luc; and Bouvier, Alain, 5,088,917, Cl. 431-266.000.
- ElectroCom Automation, Inc.: See—
Stern, Harold P.; and El-Tanany, Mohammed S., 5,090,026, Cl. 375-47.000.
- Electromagnetic Sciences, Inc.: See—
Wallis, David W.; Ashworth, James R.; and Wier, Charles G., 5,089,716, Cl. 307-101.000.
- Electronic Tag International, Inc.: See—
Gilbert, John, 5,088,855, Cl. 404-103.000.
- Elektro-Apparatebau Olten AG: See—
Zemp, Othmar; and Meier, Albrecht, 5,089,678, Cl. 200-454.000.
- Elger, Walter: See—
Neef, Gunter; Beier, Sybille; and Elger, Walter, 5,089,635, Cl. 549-297.000.
- Ottow, Eckhard; Wiechert, Rudolf; Neef, Gunter; Beier, Sybille; Elger, Walter; and Henderson, David, 5,089,488, Cl. 514-179.000.
- Eli Lilly and Company: See—
Ternansky, Robert J., 5,089,610, Cl. 540-205.000.
- Ellentuch, Leonard: See—
Chow, Hsiu-Shen; and Ellentuch, Leonard, 5,088,934, Cl. 439-395.000.
- Ellis, Edward J.: See—
Chou, Maylee H.; and Ellis, Edward J., 5,089,053, Cl. 134-7.000.
- Ellis, Larry G.; and Carter, William R., to Teleflex Incorporated. Ordnance ejector system for an aircraft. 5,088,664, Cl. 244-137.400.
- El-Menshaw, Mohamed F., to Spark Tec Limited. Electro-discharge machining apparatus. 5,089,681, Cl. 219-69.160.
- Elmore, Carl L.; Mullen, Mark A.; Emery, George D.; and Carter, Timothy R., to Kamy, Inc. Make-up liquor and black liquor evaporating process during pulp production. 5,089,087, Cl. 162-46.000.
- Elmore, Jimmy D.; and Zylla, Elizabeth G., to Hi-Tek Polymers, Inc. Citric ester diluents. 5,089,658, Cl. 560-182.000.
- El-Tanany, Mohammed S.: See—
Stern, Harold P.; and El-Tanany, Mohammed S., 5,090,026, Cl. 375-47.000.
- Emanuel, Brian A., to Lincoln Wood Products, Inc. Window and door glazing system. 5,088,255, Cl. 52-395.000.
- Emery, George D.: See—
Elmore, Carl L.; Mullen, Mark A.; Emery, George D.; and Carter, Timothy R., 5,089,087, Cl. 162-46.000.
- Emi, Tetsuro: See—
Nomura, Satoru; Nagai, Yoshihisa; Emi, Tetsuro; Miyashita, Koji; Higuchi, Hiroyuki; and Hijikata, Makoto, 5,089,899, Cl. 358-335.000.
- Emlich, Larry: See—
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- Emory University: See—
Hunter, Robert L.; and Duncan, Alexander, 5,089,260, Cl. 424-78.380.
- Emoto, Kazuhiro: See—
Kodera, Tatsuya; Takaoka, Kazuchiyo; Haino, Kojo; Itoh, Akira; Okaji, Makoto; and Emoto, Kazuhiro, 5,089,366, Cl. 430-59.000.
- Empresa Brasileira de Compressores S.A. - Embraco: See—
Da Costa, Caio Mario F. N., 5,088,303, Cl. 62-498.000.
- Emter, James. Automatic dual-side saw blade grinder having common blade advancement and clamp actuator and method of using same. 5,088,358, Cl. 76-75.000.

- Emura, Junichi: See—
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- En-Tout-Cas plc.: See—
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- Endo, Noboru: See—
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- Energy Absorption Systems, Inc.: See—
Quittner, John P., 5,088,874, Cl. 414-460.000.
- Eng, Anthony T.: See—
Hegedus, Charles R.; Hirst, Donald J.; Green, William J.; and Eng, Anthony T., 5,089,551, Cl. 524-396.000.
- Engel, Albertus J. G.: See—
Van T Veen, Willem H.; Engel, Albertus J. G.; Bonekamp, Benedictus C.; Veringa, Hubertus J.; and Terpstra, Rinse A., 5,089,299, Cl. 427-245.000.
- Engel, Rudolf. Traction device having projecting ribs which fit into grooves of a tire tread. 5,088,534, Cl. 152-208.000.
- Engelhardt, Wolfgang: See—
Schaele, Klaus; and Engelhardt, Wolfgang, 5,088,918, Cl. 431-326.000.
- Enichem Synthesis S.p.A.: See—
Maspero, Federico; Piccolo, Oreste; Romano, Ugo; and Gambino, Salvatore, 5,089,661, Cl. 562-493.000.
- Enichem Tecnorefine S.p.A.: See—
Petri, Alberto, 5,089,595, Cl. 528-204.000.
- Eniricerche S.p.A. and AGIP S.p.A.: See—
Bonaccorsi, Fabrizio; Pappa, Rosano; Riocci, Mario; Roggero, Arnaldo; and Lockhart, Thomas P., 5,089,577, Cl. 526-240.000.
- Enomoto, Masahiro, to Molex Incorporated. Board-to-board connection type electric connector. 5,088,929, Cl. 439-66.000.
- Enseki, Fred K.: See—
Fitzpatrick, James; and Enseki, Fred K., 5,088,322, Cl. 73-197.000.
- Ensuiko Sugar Refining Co., Ltd.: See—
Fujita, Koki; Hara, Kojo; Hashimoto, Hitoshi; and Kitahata, Sumio, 5,089,401, Cl. 435-97.000.
- Eppinger, Bernhard; Eppinger, Regina; and Schaefer, Roland, to Heraeus Kulzer GmbH. Adhesion-promoting dental composition. 5,089,051, Cl. 106-35.000.
- Eppinger, Regina: See—
Eppinger, Bernhard; Eppinger, Regina; and Schaefer, Roland, 5,089,051, Cl. 106-35.000.
- Equimeter, Inc.: See—
Fitzpatrick, James; and Enseki, Fred K., 5,088,322, Cl. 73-197.000.
- ERCA Holding: See—
Tortorotot, Roland, 5,088,631, Cl. 222-389.000.
- Erdmann, Klaus: See—
Farber, Karlheinz; Erdmann, Klaus; Niess, Willi; and Lindenmaier, Willi, 5,088,625, Cl. 222-129.100.
- Ergodyne Corporation: See—
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- Erie Scientific Company: See—
Rosenberg, H. James, 5,089,315, Cl. 428-192.000.
- Eriksson, Larry J., to Nelson Industries, Inc. Acoustic system with transducer and venturi. 5,088,575, Cl. 181-206.000.
- Erwin, David N.: See—
Kiel, Johnathan L.; Erwin, David N.; and Simmons, David M., 5,089,385, Cl. 435-3.000.
- ESCO Corporation: See—
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- Eskelinen, Kari: See—
Merilainen, Pekka T.; Eskelinen, Kari; and Hanninen, Hannu E., 5,088,332, Cl. 73-861.650.
- Espanan, Jean-Michel: See—
Aptel, Philippe; and Espanan, Jean-Michel, 5,089,187, Cl. 264-41.000.
- Establecimientos Industriales Quimicos Oxiquim S.A.: See—
Gleisner, Arturo G.; and Vega, Juan C., 5,089,116, Cl. 209-166.000.
- Esute Chemical Corporation: See—
Kaneko, Toshihiko, 5,089,035, Cl. 55-221.000.
- Ethicon, Inc.: See—
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- Prou, Philippe, 5,089,012, Cl. 606-224.000.
- Ethyl Corporation: See—
Berris, Bruce C., 5,089,646, Cl. 556-406.000.
- Berris, Bruce C., 5,089,648, Cl. 556-430.000.
- Ethyl Petroleum Additives, Inc.: See—
Chrisope, Douglas R.; and Hartley, Rolfe J., 5,089,156, Cl. 252-49.900.
- Evans, Martin B.: See—
Carey, John G.; Evans, Martin B.; and Rothern, Roger N., 5,089,539, Cl. 523-202.000.
- Evarts, Kingsley S., to J & M Hydraulic Systems, Inc. Vibratory pile driver. 5,088,565, Cl. 173-49.000.
- Everbrite, Inc.: See—
Pacholok, David, 5,089,752, Cl. 315-307.000.
- Evers, Reinhard; and Wenzel, Werner. Apparatus for filleting fish. 5,088,958, Cl. 452-162.000.
- Exclusive Design Company, Inc.: See—
Ruble, Frank D.; Walsh, John N.; and Smith, Robert A., 5,088,240, Cl. 51-165.710.
- Expert Image Systems, Inc.: See—
Lanza, Richard C.; Votano, Joseph R.; and Russ, Tomas, 5,090,040, Cl. 378-62.000.
- Exxon Chemical Patents Inc.: See—
Marsh, John F.; Vernet, Marc R. M.; and Hamey, Graham W., 5,089,155, Cl. 252-33.400.
- Exxon Research and Engineering Company: See—
Valint, Paul L.; and Bock, Jan, 5,089,578, Cl. 526-240.000.
- Eyman, Darrell P.; Gloer, Katherine B.; and Schmitz, Andrew D., to Accel Catalysis, Inc. Catalyst for supported molten salt catalytic dehydrogenation of methanol. 5,089,245, Cl. 423-415.00A.
- Ezaki, Shinobu; Kamino, Yukishige; and Tohka, Masae, to Hitachi, Ltd. Continuous vacuum processing apparatus. 5,088,908, Cl. 425-73.000.
- F. L. Smith Machine Company, Inc.: See—
Helm, Herbert W.; Hornung, William R.; Khravovsky, Ilya D.; and Steinbeiser, Fredrick L., 5,088,407, Cl. 101-350.000.
- Fabinski, Walter; Taubitz, George; Franck, Gerhard; and Nevole, Josef, to Hartmann & Braun. Monitoring pressure interference in gas analyzers. 5,088,313, Cl. 73-1.00G.
- Face Construction Technologies, Inc.: See—
Face, Samuel A., Jr., 5,088,256, Cl. 52-396.000.
- Face, Samuel A., Jr., to Face Construction Technologies, Inc. Concrete joint with spring clip retained insert and bottom seal. 5,088,256, Cl. 52-396.000.
- Factor, Arnold: See—
Day, James; Factor, Arnold; and Baumgartner, Charles E., 5,089,119, Cl. 210-167.000.
- Fadem, Richard J., to NCR Corporation. Time slot protocol in the transmission of data in a data processing network. 5,090,013, Cl. 370-85.800.
- Fahey, Timothy E.: See—
Fang, Shou-Mean; Horsma, David A.; Peronnet, Guillaume; Fahey, Timothy E.; Au, Andrew N.; and Carlomagno, William D., 5,089,688, Cl. 219-505.000.
- Fairchild Fastener Group: See—
Cosenza, Frank J.; and Warkentin, Roy L., 5,088,868, Cl. 411-280.000.
- Faircloth, George E.: See—
Bafford, Richard A.; and Faircloth, George E., 5,089,296, Cl. 427-208.000.
- Fakhrai, Mehdi. Retractor. 5,088,472, Cl. 128-20.000.
- Fallin, Thomas W.; and Kang, Joseph H., to Zimmer, Inc. Rasp tool including detachable handle member. 5,089,003, Cl. 606-85.000.
- Fang, Shou-Mean; Horsma, David A.; Peronnet, Guillaume; Fahey, Timothy E.; Au, Andrew N.; and Carlomagno, William D., to Raychem Corporation. Composite circuit protection devices. 5,089,688, Cl. 219-505.000.
- Fang, Shou-Mean: See—
Chan, Chi-Ming; and Fang, Shou-Mean, 5,089,801, Cl. 338-22.00R.
- Fanuc Ltd.: See—
Miyata, Mitsuo; Matsumura, Teruyuki; and Nagashima, Noritake, 5,089,950, Cl. 364-191.000.
- Farber, Jürgen, to PKL Verpackungssysteme GmbH. Container for liquids and bulk materials. 5,088,642, Cl. 229-125.140.
- Farber, Karlheinz; Erdmann, Klaus; Niess, Willi; and Lindenmaier, Willi, to Coca-Cola Company, The; and Bosch-Siemens Hausgeräte GmbH. Drive mechanism for the measured dispensing of liquids out of a storage container. 5,088,625, Cl. 222-129.100.
- Farmer, Kenneth R. Weighted sign base. 5,088,680, Cl. 248-523.000.
- Farmer, Robert F.: See—
Pallone, Thomas J.; Alania, Larry J.; Weber, William C., Jr.; and Farmer, Robert F., 5,089,160, Cl. 252-90.000.
- Farmitalia Carlo Erba S.r.l.: See—
Alpegiani, Marco; Perrone, Ettore; Orezzi, Piergiuseppe; Carminati, Paolo; and Cassinelli, Giuseppe, 5,089,489, Cl. 514-195.000.
- Farnsworth, Donald: See—
Willis, David T.; and Farnsworth, Donald, 5,089,806, Cl. 340-541.000.
- Farwell, Randall: See—
Shapiro, Leonid; Bohannon, William K.; and Farwell, Randall, 5,089,810, Cl. 340-701.000.
- Fasella, Paolo: See—
Giannini, Ivo; Ferrari, Marco; de Resmini, Amilcare C.; and Fasella, Paolo, 5,088,493, Cl. 128-633.000.
- Fassbinder, Hans-Georg, to CRA Services Limited. Apparatus for measuring a mass stream. 5,088,331, Cl. 73-861.370.
- Fauveau, Patrick: See—
Agouridas, Constantin; Fauveau, Patrick; and Damais, Chantal, 5,089,476, Cl. 514-18.000.
- Favel, Anne: See—
Castro, Bertrand; Lenguyen, Dung; Favel, Anne; and Previero, Maria A., 5,089,474, Cl. 514-12.000.
- Fawal, Omar M., to Systron Donner Corporation. Zero force fire extinguisher. 5,088,560, Cl. 169-28.000.
- Fazan, Pierre C.: See—
Sandhu, Gurtej S.; Fazan, Pierre C.; Liu, Yau-Ching; and Chan, Hiang C., 5,089,986, Cl. 365-149.000.
- Federated Fry Metals: See—
Brown, John E., 5,088,189, Cl. 29-840.000.
- Feinberg, Stewart C., to Du Pont de Nemours, E. I., and Company. Laminates with adhesive layer of white-pigmented, melt-stable ethylene/carboxylic acid copolymer compositions. 5,089,332, Cl. 428-328.000.
- Fennema, Alan A.: See—
Chow, William W.; Fennema, Alan A.; Henderson, Ian E.; and Kadlec, Ronald J., 5,090,002, Cl. 369-44.280.

Fenster, Paul: See—
Landa, Benzon; Pinhas, Hanna; and Fenster, Paul, 5,089,856, Cl. 355-279.000.

Ferguson, James L.: Encapsulated liquid crystal material, apparatus and method. 5,089,904, Cl. 359-52.000.

Ferguson, Andrew, to John T. Hepburn, Limited. Adjusting press platen clearance. 5,088,400, Cl. 100-257.000.

Fern, Charles S.: Water treatment apparatus and method. 5,089,145, Cl. 210-748.000.

Fernandes Co., Ltd.: See—
Saijo, Yatsuse, 5,088,374, Cl. 84-313.000.
Saijo, Yatsuse, 5,088,375, Cl. 84-313.000.

Fernandez, Francisco C.: See—
Butler, Nicholas D.; Woodthorpe, John; Fernandez, Francisco C.; and Zubillaga, Inigo I., 5,089,197, Cl. 264-65.000.

Fernandez-Repollet, Emma: See—
Schwartz, Abraham; and Fernandez-Repollet, Emma, 5,089,416, Cl. 436-8.000.

Ferrari, Carl M.: See—
Suchoski, Paul G., Jr.; Findakly, Talal K.; Ferrari, Carl M.; and Leonberger, Frederick J., 5,088,826, Cl. 356-350.000.

Ferrari, Marco: See—
Giannini, Ivo; Ferrari, Marco; de Resmini, Amilcare C.; and Fasella, Paolo, 5,088,493, Cl. 128-633.000.

Ferrazzi, Francesco, to Fiat Auto SpA. Internal combustion engine with a tensioner for the transmission chain between two overhead camshafts. 5,088,457, Cl. 123-90.310.

Ferro Corporation: See—
Allison, Kevin W.; Hankey, Dana L.; Stadnicar, Edward, Jr.; and Roberts, Gordon J., 5,089,172, Cl. 252-512.000.

Feuerbach, Manfred: See—
Braun, Bodo; Bruszies, Christian; Feuerbach, Manfred; Genzel, Rolf-Guenter; Lobnig, Josef; and Raddatz, Juergen, 5,089,934, Cl. 361-335.000.

Fey, Peter: See—
Frobel, Klaus; Lenfers, Jan-Bernd; Fey, Peter; Knorr, Andreas; Stasch, Johannes-Peter; Muller, Hartwig; Bischoff, Erwin; and Dellweg, Hans-Georg, 5,089,487, Cl. 514-150.000.

Fiat Auto SpA: See—
Ferrazzi, Francesco, 5,088,457, Cl. 123-90.310.

Fibre Techniques Limited: See—
Carson, John E., 5,089,072, Cl. 156-212.000.

Field, Jesse L., Jr., to Caterpillar Industrial Inc. Fluid operated fork positioning control system. 5,088,880, Cl. 414-667.000.

Field, Peter H., to Medeco Security Locks, Inc. Cylinder lock with changeable keyway. 5,088,306, Cl. 70-375.000.

Fields, Charlie B., to Tri-State Hospital Supply Corporation. Medical connector. 5,088,984, Cl. 604-167.000.

Figaro Engineering, Inc.: See—
Takashi, Yamaguchi, 5,088,314, Cl. 73-23.210.

Figgie International, Inc.: See—
Monnig, Len W., 5,088,527, Cl. 141-39.000.

Filipi, Charles J.; DeMeester, Tom R.; Gibbs, Rebecca C.; and Hinder, Ronald A., to Wilson-Cook Medical Inc. Method for esophageal invagination and devices useful therein. 5,088,979, Cl. 604-26.000.

Findakly, Talal K.: See—
Suchoski, Paul G., Jr.; Findakly, Talal K.; Ferrari, Carl M.; and Leonberger, Frederick J., 5,088,826, Cl. 356-350.000.

Findeisen, Eberhard; Frank, Klaus; Becker, Wilfried; and Muller, Fritz. Process of manufacturing cast tungsten carbide spheres. 5,089,182, Cl. 264-8.000.

Finnigan Corporation: See—
Schoen, Alan E.; and Syka, John E. P., 5,089,703, Cl. 250-292.000.

Fisher, Brian K.: See—
Orchard, Anthony R.; and Fisher, Brian K., 5,088,676, Cl. 248-421.000.

Fisher, John M., to B. F. Goodrich Company, The. Temperature compensator for pressure regulator. 5,088,516, Cl. 137-80.000.

Fisher, Karl J.: See—
Broadhurst, Michael D.; Cromartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter Michael R., 5,089,623, Cl. 546-300.000.

Fitzner, Jeffrey N.: See—
Fritzberg, Alan R.; Vanderheyden, Jean-Luc E.; Kasina, Sudhakar; and Fitzner, Jeffrey N., 5,089,249, Cl. 424-1.100.

Fitzpatrick, James; and Ensek, Fred K., to Equimeter, Inc. Extended range flow meter. 5,088,322, Cl. 73-197.000.

Fjare, Douglas E.; and Nowicki, Neal R., to Amoco Corporation. Polyimide containing 4,4'-bis(4-amino-2-trifluoromethylphenoxy)-biphenyl moieties. 5,089,593, Cl. 528-188.000.

Fleet, George W. J.; Rademacher, Thomas W.; and Dwek, Raymond A., to Monsanto Company. Method of inhibiting virus. 5,089,520, Cl. 514-425.000.

Flemming, Peter: See—
Schradner, Dieter; and Flemming, Peter, 5,089,257, Cl. 424-70.000.

Fletcher, James A.: See—
Mieyal, David F.; and Fletcher, James A., 5,088,261, Cl. 52-729.000.

Flynn, Richard M.; Johnson, Douglas A.; and Owens, John G., to Minnesota Mining and Manufacturing Company. Water displacement composition. 5,089,152, Cl. 252-194.000.

FMC Corporation: See—
Henk, Bill H., 5,088,877, Cl. 414-626.000.
Mannen, Bryce; Calico, Gregory M.; and Vijay, Tumkur R., 5,088,539, Cl. 157-1.170.
Short, David E.; and Valka, William A., 5,088,556, Cl. 166-339.000.

Focke & Co. (GmbH & Co.): See—
Focke, Heinz; and Holloch, Johannes, 5,088,878, Cl. 414-627.000.
Focke, Heinz; and Dreyer, Uwe, 5,088,883, Cl. 414-795.000.

Focke, Heinz; and Holloch, Johannes, to Focke & Co. (GmbH & Co.). Apparatus for the lifting of tray packs. 5,088,878, Cl. 414-627.000.

Focke, Heinz; and Dreyer, Uwe, to Focke & Co. (GmbH & Co.). Apparatus for lifting articles, especially packs, for forming dischargeable stacks. 5,088,883, Cl. 414-795.000.

Folkins, Jeffrey J., to Xerox Corporation. Highlight color copier. 5,089,847, Cl. 355-202.000.

Foot, James C., Jr., to Eastman Kodak Company. Apparatus and method for transferring a spool of web material. 5,088,784, Cl. 294-116.000.

Ford Motor Company: See—
DeBiasi, Charles J.; Merchant, Viren B.; Maurer, James B.; and Hardy, Larry A., 5,088,465, Cl. 123-491.000.
Logothetis, Eleftherios M.; and Soltis, Richard E., 5,089,113, Cl. 204-425.000.
Oyafuso, Harry H., 5,089,736, Cl. 310-90.000.

Ford New Holland, Inc.: See—
Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., 5,088,881, Cl. 414-686.000.

Forestier, Serge; Lang, Geard; Richard, Herve; and Grognet, Jean C., to L'Oreal. Cosmetic containing benzotriazole diorganopolysiloxanes. 5,089,250, Cl. 424-43.000.

Forgac, John M.: See—
Schwartz, John G.; Hauschildt, F. William; Quinn, George E.; and Forgac, John M., 5,089,235, Cl. 422-144.000.

Forgione, Peter S.; and Singh, Balwant, to American Cyanamid Company. Alkylcarbamylmethylated aminotriazine crosslinking agents and curable compositions containing the same. 5,089,561, Cl. 525-127.000.

Forgione, Peter S.; and Singh, Balwant, to American Cyanamid Company. Beta-hydroxyalkylcarbamyl-methylated aminotriazines. 5,089,617, Cl. 544-196.000.

Forsman, Bruce W.: See—
Berg, David W.; Brenner, David J.; Lehman, Ronald W.; and Forsman, Bruce W., 5,088,149, Cl. 15-322.000.

Forsmo, Dennes P., to Raytheon Company. Fin command mixing method. 5,088,658, Cl. 244-3.210.

Fort Lock Corporation: See—
Myers, Gary L., 5,088,305, Cl. 70-369.000.

Fortier, Robert A. Necktie having a knot portion, display portion and tail portion with an aligned design when tied. 5,088,119, Cl. 2-146.000.

Foster, Ruth E.: See—
Anderson, Robert K.; and Foster, Ruth E., 5,088,272, Cl. 54-24.000.

Fox, Daniel W.: See—
Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., 5,089,600, Cl. 528-335.000.

Fox, Daniel W., deceased (by Fox, Joyce S., heir); and Maresca, Louis M., to General Electric Company. Odor removal from polyphenylene ether resins by steam distillation. 5,089,091, Cl. 203-47.000.

Fox, Joyce S., heir: See—
Fox, Daniel W., deceased; and Maresca, Louis M., 5,089,091, Cl. 203-47.000.

Fraker, Winford C.; and Gilleland, Frank W., to Cues, Inc. Encapsulated television camera and method and apparatus for fabricating same. 5,089,895, Cl. 358-229.000.

Framatome: See—
Griffaton, Jacques, 5,089,684, Cl. 219-121.630.

Francis, Gaylord L., to Corning Incorporated. Fusion sealing materials. 5,089,445, Cl. 501-15.000.

Francis, Gaylord L.: See—
Cornelius, Lauren K.; Francis, Gaylord L.; and Tick, Paul A., 5,089,446, Cl. 501-15.000.

Franck, Gerhard: See—
Fabinski, Walter; Taubitz, Georg; Franck, Gerhard; and Nevole, Josef, 5,088,313, Cl. 73-1.00G.

Frank, Alan; Schiavon, Cindy B.; and Frank, Diane. Player operable lottery machine with system for automatically identifying spheres. 5,088,737, Cl. 273-138.00A.

Frank, Diane: See—
Frank, Alan; Schiavon, Cindy B.; and Frank, Diane, 5,088,737, Cl. 273-138.00A.

Frank, Klaus: See—
Findeisen, Eberhard; Frank, Klaus; Becker, Wilfried; and Muller, Fritz, 5,089,182, Cl. 264-8.000.

Frankenbery, Lee R. Gypsy moth larvae barrier apparatus. 5,088,233, Cl. 47-24.000.

Franz, Warren Locke: See—
Schneider, Mark, 5,088,549, Cl. 165-46.000.

Fraunhofer Gesellschaft: See—
Chmiel, Horst, 5,089,122, Cl. 210-185.000.

Frazier, Stephen L.; and Hiller, James A., to Westvaco Company. Method for bonding pour spouts to containers. 5,088,643, Cl. 229-125.150.

Freeman, Horace L.; and Yoon, Hee K., to Carolina Narrow Fabric Company. Orthopedic casting bandage. 5,088,484, Cl. 602-44.000.

Fregly, Melvin J.; Privette, R. Malcolm; and Cade, Robert, to University of Florida. Compositions and methods for achieving improved physiological response to exercise. 5,089,477, Cl. 514-23.000.

Freidinger, Roger M., to Merck & Co., Inc. Amino acid analogs as CCK-antagonists. 5,089,638, Cl. 549-468.000.

French State, represented by the Minister of Post, Telecommunications and Space (Centre National D'Etudes Des Telecommunications: See—
Mahieux, Yannick; and Charbonnier, Alain, 5,089,818, Cl. 341-76.000.

Frentzel, Richard L.; and Chen, Andrew, to Advanced Products Inc. Highly conductive polymer thick film compositions. 5,089,173, Cl. 252-514.000.

Freyer, Norbert: See—
Pfisterer, Jurgen; and Freyer, Norbert, 5,089,977, Cl. 364-526.000.

Frick, Douglas G.: See—
Smith, Robert A.; Frick, Douglas G.; Redmon, Charles L.; and Subbanna, Somanahalli N., 5,089,241, Cl. 423-87.000.

Friedman, Jeffrey S.: See—
Kushner, Peter J.; Cofer, Claire L.; Friedman, Jeffrey S.; and Talmadge, Karen D., 5,089,397, Cl. 435-69.100.

Friedr. Ischebeck GmbH: See—
Ischebeck, Ernst F.; and Isenberg, Joachim, 5,088,866, Cl. 411-10.000.

Friel, John J., to Outokumpu Oy. Analyzer detector window and a method for manufacturing the same. 5,090,046, Cl. 378-161.000.

Friends of the UCSD Library, Inc.: See—
Cate, Robert B.; and Wulbert, Daniel E., 5,089,976, Cl. 364-526.000.

Fritz, Dieter, to PTR Prazisionstechnik GmbH. Electron beam generator for an electron beam gun. 5,089,686, Cl. 219-121.270.

Fritzberg, Alan R.; Vanderheyden, Jean-Luc E.; Kasina, Sudhakar; and Fitzner, Jeffrey N., to NeoRx Corporation. Conjugates for bone imaging and bone cancer therapy. 5,089,249, Cl. 424-1.100.

Frobel, Klaus; Lenfers, Jan-Bernd; Fey, Peter; Knorr, Andreas; Stasch, Johannes-Peter; Muller, Hartwig; Bischoff, Erwin; and Dellweg, Hans-Georg, to Bayer Aktiengesellschaft. Circulation-active dibenzol[1,5]dioxocin-5-ones. 5,089,487, Cl. 514-150.000.

Fryc, Oldrich, to Boeing Company, The. Apparatus for supporting workpieces of different sizes and configurations. 5,088,609, Cl. 211-117.000.

Frye, Ricky J., to MIM Industries, Inc. Button attaching machine and method. 5,088,428, Cl. 112-265.100.

Fuji Electric Co., Ltd.: See—
Fujihara, Tatsuhiko, 5,089,871, Cl. 357-23.800.
Iino, Mitsutoshi; Nakato, Shiro; Shinkai, Seiichi; Shimojima, Hideki; and Kawaguchi, Hiromi, 5,089,777, Cl. 324-309.000.
Ito, Naoki, 5,089,289, Cl. 427-38.000.
Kuroda, Masami; Nakamura, Youichi; and Furusho, Noboru, 5,089,365, Cl. 430-59.000.
Sakurai, Kenya, 5,089,864, Cl. 357-23.400.

Fuji Kogyo Kabushiki Kaisha: See—
Koga, Michitaka, 5,088,176, Cl. 29-430.000.
Kurihara, Masaru; and Saito, Yoichi, 5,088,350, Cl. 74-861.000.
Suzuki, Takashi, 5,088,171, Cl. 29-26.00A.

Fuji Kiko Company, Limited: See—
Ikegaya, Isao; and Matsumoto, Tadashi, 5,088,841, Cl. 297-344.000.
Maruyama, Tomoyuki; and Shimizu, Yoshiyuki, 5,088,768, Cl. 280-777.000.

Fuji Oil Company, Limited: See—
Hidaka, Hiroshi; and Sagi, Nobuo, 5,089,177, Cl. 260-410.600.

Fuji Photo Film Co., Inc.: See—
Sakamoto, Kiichiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, 5,089,840, Cl. 354-324.000.

Fuji Photo Film Co., Ltd.: See—
Kato, Eiichi; and Ishii, Kazuo, 5,089,368, Cl. 430-96.000.
Nakamura, Kotaro; Tanaka, Toshiharu; and Shimada, Hirokazu, 5,089,371, Cl. 430-160.000.
Noguchi, Hitoshi; Saito, Shinji; Inaba, Hiroo; and Ogawa, Hiroshi, 5,089,317, Cl. 428-212.000.
Ozaki, Hiroyuki; Kawata, Ken; and Ohmatsu, Hideki, 5,089,378, Cl. 430-351.000.
Ryoke, Katsumi; Takahashi, Masatoshi; Izaki, Tsugio; and Suzuki, Masaki, 5,089,331, Cl. 428-323.000.
Sakai, Nobuo, 5,089,382, Cl. 430-546.000.
Sato, Masami; Fujiyama, Masaaki; Nishikawa, Yasuo; and Iwasaki, Takashi, 5,089,330, Cl. 428-323.000.
Takahashi, Minoru; and Yokota, Mitsuo, 5,089,833, Cl. 354-105.000.
Tamagawa, Shigehisa; and Kuroishi, Masayuki, 5,089,370, Cl. 430-138.000.
Taniguchi, Masato; Sato, Tadahisa; and Mizukawa, Yuki, 5,089,651, Cl. 558-360.000.
Uenishi, Kazuya; Kawabe, Yasumasa; and Kokubo, Tadayoshi, 5,089,373, Cl. 430-191.000.
Umemoto, Chiuyuki; and Takahashi, Kenji, 5,089,170, Cl. 252-301.40H.

Fujifacom Corporation: See—
Iino, Mitsutoshi; Nakato, Shiro; Shinkai, Seiichi; Shimojima, Hideki; and Kawaguchi, Hiromi, 5,089,777, Cl. 324-309.000.

Fujihara, Ryoji: See—
Ono, Tomio; Tsuruo, Ryo; Koyama, Hiromi; and Fujihara, Ryoji, 5,088,777, Cl. 292-40.000.

Fujihara, Tatsuhiko, to Fuji Electric Co., Ltd. Increased voltage MOS semiconductor device. 5,089,871, Cl. 357-23.800.

Fujii, Kazuo, to Diesel Kiki Co., Ltd. Apparatus for controlling compressor of automobile air-conditioner. 5,088,298, Cl. 62-228.500.

Fujii, Nobuo: See—
Katagishi, Yoshihiro; Miyazawa, Takeshi; Kiyota, Hiroyuki; and Fujii, Nobuo, 5,088,288, Cl. 62-6.000.

Fujimura, Itaru: See—
Fukuyama, Kensuke; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Sato, Masaharu, 5,088,762, Cl. 280-707.000.

Fujino, Noboru; and Takamura, Tohru, to Kabushiki Kaisha Shinkawa. Marking method and apparatus. 5,088,401, Cl. 101-41.000.

Fujisawa, Hiroyuki: See—
Nishida, Fumihiko; Urata, Makoto; and Fujisawa, Hiroyuki, 5,089,845, Cl. 355-85.000.

Fujita, Kenji: See—
Ogasawara, Tadashi; Natsume, Yoshitake; and Fujita, Kenji, 5,089,094, Cl. 204-70.000.

Fujita, Koki; Hara, Kozo; Hashimoto, Hitoshi; and Kitahata, Sumio, to Ensuiko Sugar Refining Co., Ltd. Method for the preparation of fructose-containing oligosaccharide. 5,089,401, Cl. 435-97.000.

Fujitsu Limited: See—
Mochizuki, Akihiro; and Iwasaki, Masayuki, 5,089,169, Cl. 252-299.650.
Ueda, Satoshi; Hirota, Koji; Itoh, Makoto; Yoshida, Yukihiro, Hukuda, Hirokazu; and Hamashima, Shigeki, 5,089,705, Cl. 250-352.000.

Fujiwara, Hidekazu; Motogami, Kenji; and Mori, Shigeo, to Dai-Ichi Kogyo Seiyaku Co., Ltd.; and Kanto Jidosha Kogyo Kabushiki. Method for improving electric conductivity of a resin molding. 5,089,199, Cl. 264-83.000.

Fujiwara, Junya: See—
Kajiyu, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.

Fujiyama, Masaaki: See—
Sato, Masami; Fujiyama, Masaaki; Nishikawa, Yasuo; and Iwasaki, Takashi, 5,089,330, Cl. 428-323.000.

Fukada, Takeshi: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippai; Shibata, Katsuhiko; Koyanagi, Kaori; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.

Fukamachi, Mitsuru: See—
Arichika, Kenji; Fukamachi, Mitsuru; Higashi, Satoshi; and Maruyama, Noboru, 5,089,781, Cl. 324-445.000.

Fukuda, Kenji, to Nitto Kohki Co., Ltd. Pipe cutter. 5,088,196, Cl. 30-102.000.

Fukuda, Kozo: See—
Ichii, Masaru; Fukuda, Kozo; and Morishita, Kenji, 5,089,464, Cl. 503-227.000.

Fukuda, Shuzo: See—
Abe, Masahiro; Okada, Kazuhisa; Fukuda, Shuzo; Tanaka, Yasushi; Yamato, Masayuki; and Takada, Yoshikazu, 5,089,061, Cl. 148-110.000.

Fukuda, Yutaka; Higushi, Yukio; Imoto, Yukihiro; and Nakano, Noriyoshi, to Anzen Motor Co., Ltd. Vehicle composite test apparatus. 5,088,320, Cl. 73-118.100.

Fukuhara, Akio; Iyama, Kazuo; Suzuki, Kazuo; and Iwase, Ken, to Daiwa Can Company. Method for forming a two chambered can. 5,088,870, Cl. 413-4.000.

Fukui, Akihiro: See—
Maruta, Masamichi; and Fukui, Akihiro, 5,089,628, Cl. 548-521.000.

Fukumoto, Atsushi: See—
Ohsato, Kiyoshi; and Fukumoto, Atsushi, 5,090,004, Cl. 369-44.370.

Fukumoto, Toshiyuki; and Imanishi, Ryo, to Nippon Pillar Packing Co., Ltd. Reciprocating pump. 5,088,898, Cl. 417-347.000.

Fukuoka, Toshiaki, to Matsushita Electrical Industrial Co. Driving apparatus for DC brushless motor. 5,089,733, Cl. 310-67.00R.

Fukushima, Naoto; Yamaguchi, Hirotugu; Akatsu, Yohsuke; Hano, Sunao; and Kawabata, Kazunobu, to Nissan Motor Company, Limited. Actively controlled automotive suspension system with improved damping characteristics. 5,089,966, Cl. 364-424.050.

Fukushima, Naoto: See—
Fukuyama, Kensuke; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Sato, Masaharu, 5,088,762, Cl. 280-707.000.

Fukushima, Nobuko: See—
Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, 5,089,515, Cl. 514-404.000.

Fukuta, Isao; Kawakita, Kenji; Kashio, Jiro; Torii, Yutaka; Gohara, Shinobu; and Endo, Noboru, to Hitachi, Ltd. Packet congestion control method and packet switching equipment. 5,090,011, Cl. 370-60.000.

Fukuyama, Kensuke; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Sato, Masaharu, to Nissan Motor Company, Limited. Control system for active suspension which distributes load according to lateral acceleration. 5,088,762, Cl. 280-707.000.

Fulmer, Dorothy A. Versatile hospital and out-patient gown. 5,088,117, Cl. 2-114.000.

Funada, Masahiro: See—
Suzuki, Yoshiyuki; and Funada, Masahiro, 5,089,884, Cl. 358-80.000.

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Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.

Fung, Sek C.: See—
Chang, Tse-wen; Fung, Sek C.; Sun, Cecily R.; Sun, Bill N.; and Chang, Nancy T., 5,089,603, Cl. 530-387.000.

Furbee, Avery D., to Picker International, Inc. X-ray tube anode speed reducer. 5,090,041, Cl. 378-93.000.

Furlong, Clement: See—
Jackson, Paul J.; Delhaize, Emmanuel; Robinson, Nigel J.; Unkefer, Clifford J.; and Furlong, Clement, 5,089,470, Cl. 514-8.000.

Furtek, Frederick C., to Apple Computer Inc.; and Concurrent Logic, Inc. Programmable logic cell and array. 5,089,973, Cl. 364-489.000.

Furuhashi, Hiroshi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Control apparatus of passive seat belt. 5,088,769, Cl. 280-803.000.

Furuhashi, Michio: See—
Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiko; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, 5,088,281, Cl. 60-274.000.

Furuhashi, Toshio; and Hasegawa, Mokoto, to EIKEN Kogyo Kabushiki Kaisha. Gas-air ratio control valve device for gas burners. 5,088,916, Cl. 431-90.000.

Furukawa, Takato; Iwanaga, Kenichi; and Takegoshi, Atsuhisa, to NKK Corporation. Apparatus for detecting defects in a moving steel strip with a magnetizing yoke and a sensor placed on opposite sides of the strip. 5,089,776, Cl. 324-227.000.

Furusho, Hayato: See—
Tsuji, Suguru; Saya, Toshiaki; Komiyama, Shinji; Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, 5,089,576, Cl. 526-228.000.

Furusho, Noboru: See—
Kuroda, Masami; Nakamura, Youichi; and Furusho, Noboru, 5,089,365, Cl. 430-59.000.

Furusho, Takao: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.

Fuse, Eiichi: See—
Takayama, Shuichi; Hayashi, Masaaki; Fuse, Eiichi; Ishiura, Koichi; Yoshikawa, Mutsumi; Tagawa, Motoyuki; and Inaba, Makoto, 5,088,492, Cl. 128-654.000.

Fuse, Takahiro; Hasegawa, Akira; and Matsuoka, Takeshi, to Casio Computer Co., Ltd. Liquid-crystal display. 5,089,812, Cl. 340-793.000.

Futami, Yuichi: See—
Suzuki, Tadasu; Kumakura, Atsushi; and Futami, Yuichi, 5,088,966, Cl. 474-111.000.

Fyfe, Mark: See—
Blatch, Geoffrey I.; Taylor, Mark P.; and Fyfe, Mark, 5,089,093, Cl. 204-67.000.

G. D. Searle & Co.: See—
Collins, Paul W.; and Gasielki, Alan F., 5,089,524, Cl. 514-530.000.

Gray, Nancy M.; and Cheng, Brian K., 5,089,506, Cl. 514-325.000.

Hanson, Gunnar J.; and Baran, John S., 5,089,471, Cl. 514-11.000.

Gabany, Andrew J., to AMP Incorporated. Right angle coaxial jack connector. 5,088,937, Cl. 439-581.000.

Gabillard, Bertrand: See—
Gamand, Patrice; and Gabillard, Bertrand, 5,089,717, Cl. 307-219.100.

Gaffar, Abdul; Mellberg, James; and Blake-Haskins, John, to Colgate-Palmolive Company. Dental remineralization. 5,089,255, Cl. 424-52.000.

Gagliardi, Eugene D., Jr., to Designer Foods, Inc. Method for butchering a poultry carcass and cuts resulting therefrom. 5,088,957, Cl. 452-149.000.

Gaines, Jed: See—
Colombo, Michael J., 5,088,618, Cl. 220-408.000.

Galanter, Stephen M.; and Millis, Barry G. Vision training method and apparatus. 5,088,810, Cl. 351-203.000.

Galazin, Gregory T.; and Pierce, William C., to Neway Corp. Apparatus for mounting a trailing arm air suspension to a sliding frame. 5,088,763, Cl. 280-713.000.

Galbreath, Donald E.; and Kruzick, Kent, to Galbreath Incorporated. Roll-off hoist for variable positioning of containers. 5,088,875, Cl. 414-478.000.

Galbreath Incorporated: See—
Galbreath, Donald E.; and Kruzick, Kent, 5,088,875, Cl. 414-478.000.

Galper, Sergio: See—
Spiegel, Itzhak; Chet, Ilan; Cohn, Eli; and Galper, Sergio, 5,089,263, Cl. 424-93.000.

Galsten Trading, Inc.: See—
Nottingham, John R.; Spirk, John W.; Kalman, Jeffrey M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,088,180, Cl. 29-525.000.

Gamand, Patrice; and Gabillard, Bertrand, to U.S. Philips Corporation. Integrated semiconductor device including a frequency divider for microwave applications. 5,089,717, Cl. 307-219.100.

Gambino, Salvatore: See—
Maspero, Federico; Piccolo, Oreste; Romano, Ugo; and Gambino, Salvatore, 5,089,661, Cl. 562-493.000.

Gambrill, Jeffrey S.; and Borraica, Dominic, to General Signal Corporation. Steady bearing apparatus for the free end of the impeller shaft of a mixer. 5,088,832, Cl. 366-314.000.

Gammell, Paul M., to United States of America, Navy. Phase cancellation enhancement of ultrasonic evaluation of metal-to-elastomer bonding. 5,088,327, Cl. 73-588.000.

Ganguly, Ashit K.: See—
Piwinski, John J.; Ganguly, Ashit K.; Green, Michael J.; Villani, Frank J.; and Wong, Jesse, 5,089,496, Cl. 514-253.000.

Ganza, K. Peter. Dual channel ionization counter. 5,090,034, Cl. 377-55.000.

Garaschenko, Vyacheslav I.; Sandulyak, Alexandr V.; and Volkov, Igor V., to Ukrainsky Institute Inzhenerov Vodnogo Khozyaistva. Apparatus for separation of ferromagnetic materials from fluid media. 5,089,128, Cl. 210-222.000.

Garat, Michel, to Aluminium Pechiney. Process for the lost-foam casting, under controlled pressure, of metal articles. 5,088,544, Cl. 164-34.000.

Garbe, James E.: See—
Cole, Susan M.; Garbe, James E.; and Woodson, Lewis P., 5,089,606, Cl. 536-54.000.

Gard, Michael F.; Pasternack, Eric S.; and Smith, Lonnie J., to Atlantic Richfield Company. Inspecting coiled tubing for well operations. 5,090,039, Cl. 378-59.000.

Gardner, Frederick J.; and Morris, Dewi J., to Rolls-Royce and Associates Limited. Water cooled nuclear reactor with a diaphragm pressurizers for low pressures and temperatures. 5,089,218, Cl. 376-406.000.

Gardner, Hugh C.; and Newman-Evans, Richard H., to Amoco Corporation. Exopy resin with aromatic oligomer and rubber particles. 5,089,560, Cl. 525-109.000.

Garland, Steven B.; and Warren, Thomas C., to W. R. Grace & Co.-Conn. Cross-linked multilayer heat-shrinkable oriented polymeric film. 5,089,352, Cl. 428-516.000.

Garnier, Andre, to SIT (Societe d'Innovations Techniques). Handling machine to be suspended from a lifting unit. 5,088,610, Cl. 212-196.000.

Garnier, Anne; Chanin, Marie L.; Hauchecorne, Alain; and Porteneuve, Jacques C., to Centre National de la Recherche Scientifique. Laser device for measuring wind speeds at medium altitudes by using a Doppler effect. 5,088,815, Cl. 356-28.500.

Garter, Lee F.; and Covington, Michael J., to J. I. Case Company. Cotton conveying structure for a cotton harvester. 5,088,274, Cl. 56-30.000.

Gasielki, Alan F.: See—
Collins, Paul W.; and Gasielki, Alan F., 5,089,524, Cl. 514-530.000.

Gastgeb, R. Fredrick: See—
Park, Kyung T.; Gastgeb, R. Fredrick; and Daniels, Gregory, 5,089,741, Cl. 310-332.000.

Gates, Duncan A.: See—
Bush, Brian D.; Gates, Duncan A.; and Langley, David, 5,089,045, Cl. 71-92.000.

Gates, H. Gordon, to Gates & Sons, Inc. Movable support mechanism for construction of elevator shafts and the like. 5,088,578, Cl. 182-128.000.

Gates & Sons, Inc.: See—
Gates, H. Gordon, 5,088,578, Cl. 182-128.000.

Gaur, Umesh, to McNeil-PPC, Inc. Sanitary napkin with individual self wrapping means. 5,088,993, Cl. 604-385.100.

Gautier, Jean-Pierre; Verbo, Ulysse; and Perez, Miguel, to Bendix Europe Services Techniques. Pneumatic brake booster. 5,088,386, Cl. 92-161.000.

Gaylard, E. Mervyn J.; and DuPlessis, Cornelius J. Process for activation of carbon by electrical resistance heating in the presence of steam. 5,089,457, Cl. 502-5.000.

GB Biotech Inc.: See—
Hackl, Ralph P.; Wright, Frank R.; and Bruynesteyn, Albert, 5,089,412, Cl. 435-252.400.

GEC Alsthom SA: See—
Thurles, Edmond, 5,089,665, Cl. 174-27.000.

Thurles, Edmond; Dupraz, Jean-Pierre; Moncorge, Jean-Paul; Williams, Jean-Marc; Martin, Joseph; Perrusset, Yves; and Taponat, Didier, 5,089,931, Cl. 361-174.000.

Gee, Anthony L. Apparatus and methods for placing an object inside an inflated balloon. 5,088,267, Cl. 53-86.000.

Geelhaar, Thomas: See—
Krause, Joachim; Eidenschink, Rudolf; Bofinger, Klaus; Hopf, Reinhard; Reiffenrath, Volker; Poetsch, Eike; Scheuble, Bernhard; and Geelhaar, Thomas, 5,089,168, Cl. 252-299.610.

Geerts, Johannes G. C. Conveyor system, conveyor or buffer and distribution system, and process for transforming a goods flow. 5,088,589, Cl. 198-457.000.

Geibel, John E.: See—
Nesheiwat, Afif M.; and Geibel, John E., 5,089,597, Cl. 528-226.000.

Geibel, Jon F.: See—
Clifford, Michael D.; Reed, Jerry O.; Bobsein, Rex L.; and Geibel, Jon F., 5,089,596, Cl. 528-222.000.

Geissler, Richard L., to National Presto Industries, Inc. Appliance for spirally slicing fruits and vegetables. 5,089,286, Cl. 426-615.000.

Gene-Trak Systems: See—
Stackebrandt, Erko; and Curiale, Michael, 5,089,386, Cl. 435-6.000.

Genentech, Inc.: See—
Mason, Anthony J.; and Seeburg, Peter H., 5,089,396, Cl. 435-69.100.

General Electric Company: See—
Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., 5,089,600, Cl. 528-335.000.

Blake, James A., 5,090,048, Cl. 378-202.000.

Bobo, Melvin, 5,088,888, Cl. 415-170.100.

Brown, Sterling B.; and Lowry, Richard C., 5,089,566, Cl. 525-396.000.

Colborn, Robert E.; and Presley, James R., 5,089,343, Cl. 428-416.000.

Corsmeier, Donald M.; and Poccia, Nicholas P., 5,088,775, Cl. 285-374.000.

Day, James; Factor, Arnold; and Baumgartner, Charles E., 5,089,119, Cl. 210-167.000.

Dillmann, Charles W., 5,089,211, Cl. 376-232.000.

Fox, Daniel W., deceased; and Maresca, Louis M., 5,089,091, Cl. 203-47.000.

Hawkins, Christopher M.; Bostick, Edgar E.; and Derudder, James L., 5,089,598, Cl. 528-272.000.

Huang, Shyh-Chin, 5,089,225, Cl. 420-418.000.

Johansson, Eric B.; Matzner, Bruce; and Latter, Gerald M., 5,089,221, Cl. 376-442.000.

Lewis, Larry N., 5,089,582, Cl. 528-15.000.

MacGee, Andrew, 5,088,279, Cl. 60-226.100.

Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,089,795, Cl. 335-46.000.

Phanstiel, Otto; and Brown, Sterling B., 5,089,567, Cl. 525-397.000.

Reese, Anthony P.; and Crowther, Russell L., Jr. deceased, 5,089,210, Cl. 376-212.000.

Schulze, Wallace M., 5,088,277, Cl. 60-39.093.

Toth, Thomas L.; King, Kevin F.; and Crawford, Carl R., 5,090,037, Cl. 378-4.000.

van de Meer, Roelof; and Dekkers, Marinus E. J., 5,089,562, Cl. 525-132.000.

General Motors Corporation: See—
Bradley, John R.; Perry, Thomas A.; and Schroeder, Thaddeus, 5,089,060, Cl. 148-103.000.

Burry, Donald L.; and Pilato, Leonard J., 5,088,571, Cl. 180-90.000.

Grzaniak, Anthony C.; Kubisch, John G.; Mercer, James B.; and Schaeff, Wilmer G., 5,088,546, Cl. 164-255.000.

Jones, Daniel G.; and Cole, James A., 5,088,529, Cl. 141-59.000.

Kapsokavathis, Nick S.; and Sanders, Stephen P., 5,089,783, Cl. 324-672.000.

Kia, Hamid Q., 5,089,206, Cl. 264-255.000.

Simin, Gerald L., 5,089,912, Cl. 359-608.000.

White, James S.; and Adams, William W., 5,089,938, Cl. 361-427.000.

General Signal Corporation: See—
Gambrill, Jeffrey S.; and Borraica, Dominic, 5,088,832, Cl. 366-314.000.

Zerfahs, Arthur S.; Hoffman, Kirk D.; and Diamond, Norman, 5,089,694, Cl. 235-486.000.

Genger, Kevin R.: See—
Khalil, Omar S.; Zurek, Thomas F.; Genger, Kevin R.; Pepe, Curtis J.; Jou, Yi-Her; and Cotter, Stephen M., 5,089,424, Cl. 436-518.000.

Gensia Pharmaceuticals, Inc.: See—
Hillman, Robert S.; and Pawelchak, John M., 5,088,978, Cl. 604-20.000.

Gentile, Peter D., to Grumman Aerospace Corporation. High efficiency passive component voltage converter. 5,089,949, Cl. 363-126.000.

Gentry, J. Michael, to Halliburton Company. Corrosion resistant filter unit. 5,089,131, Cl. 210-253.000.

Genzel, Rolf-Guenter: See—
Braun, Bodo; Bruszies, Christian; Feuerbach, Manfred; Genzel, Rolf-Guenter; Lobnig, Josef; and Raddatz, Juergen, 5,089,934, Cl. 361-335.000.

George, John B., to Thomson Consumer Electronics, Inc. Protection circuit for a cathode ray tube. 5,089,754, Cl. 315-386.000.

Georgia Tech Research Corporation: See—
Powers, James C.; Kam, Chih-Min; Oleksyszyn, Josef; Glinski, J. A.; and Hernandez, M. A., 5,089,633, Cl. 549-285.000.

Powers, James C.; and Kam, Chih-Min, 5,089,634, Cl. 549-285.000.

Gerber Garment Technology, Inc.: See—
Gerber, Heinz J., 5,089,971, Cl. 364-470.000.

Gerber, Heinz J., to Gerber Garment Technology, Inc. Method and apparatus for cutting parts from hides or similar irregular pieces of sheet material. 5,089,971, Cl. 364-470.000.

Gerhards, Klaus: See—
Berger, Hans-Peter; Burkhardt, Klaus; Gerhards, Klaus; and Eck, Hans-Peter, 5,088,168, Cl. 28-249.000.

Gerlach, Hans-Josef: See—
Rath, Dieter; von der Haar, Friedrich; Gerlach, Hans-Josef; and Knuth, Reinhard, 5,088,522, Cl. 138-119.000.

Gerling, Klaus; Heinemann, Henning; Meier, Andreas; and Langer, Klaus, to Kali-Chemie AG; and Pfimmer Kabi GmbH & Co. KG. Pharmaceuticals and dietetics containing acylamino acid derivatives. 5,089,492, Cl. 514-210.000.

Gestin, Jean-Francois: See—
Mease, Ronnie C.; Srivastava, Suresh C.; and Gestin, Jean-Francois, 5,089,663, Cl. 562-507.000.

Getz, Stephen M.: See—
Horton, James A.; and Getz, Stephen M., 5,089,958, Cl. 395-575.000.

Ghilardi, Mauro, to Pablo Perini S.p.A. Apparatus for the production of paper napkins and similar products. 5,088,975, Cl. 493-359.000.

Giannini, Ivo; Ferrari, Marco; de Resmini, Amilcare C.; and Fasella, Paolo, to Sclavo, S.p.A. Multiple wavelength light photometer for non-invasive monitoring. 5,088,493, Cl. 128-633.000.

Gibbon, Robert M., to JMK International, Inc. Method of forming a microwaveable container. 5,088,179, Cl. 29-458.000.

Gibbons, Loyal: See—
Chhabra, Navjot; and Gibbons, Loyal, 5,089,084, Cl. 156-646.000.

Gibbs, Rebecca C.: See—
Filipi, Charles J.; DeMeester, Tom R.; Gibbs, Rebecca C.; and Hinder, Ronald A., 5,088,979, Cl. 604-26.000.

Gibbs, Ronald F. Facia installation holder. 5,088,682, Cl. 248-542.000.

Gibler, Carma J.: See—
Madgavkar, Ajay M.; Daum, David W.; and Gibler, Carma J., 5,089,541, Cl. 523-310.000.

Gibson, Jeffrey S.: See—
Grunert, Kurt A.; Gibson, Jeffrey S.; and Wafer, John A., 5,089,797, Cl. 335-172.000.

Gibson, Kirk R.: See—
Wilson, Charles R.; Gibson, Kirk R.; and Hung, Chi-Wen, 5,089,453, Cl. 502-211.000.

Wilson, Charles R.; and Gibson, Kirk R., 5,089,462, Cl. 502-309.000.

Gibson, Stephen P.; Goudie, Alexander C.; Holdom, Kelvin S.; and Bu'lock, John D., to Pfizer Inc. Antiparasitic agents. 5,089,480, Cl. 514-30.000.

Giese, Roger W.: See—
Karger, Barry L.; Giese, Roger W.; and Szoko, Eva, 5,089,106, Cl. 204-299.00R.

Giessler, Klaus: See—
Knoblauch, Karl; Pilarczyk, Erwin; Giessler, Klaus; Bukowski, Hans; D'Amico, Joseph S.; and Reinhold, Herbert, 5,089,048, Cl. 55-25.000.

Gilbert, Ronald E.; and Mordue, George S., to Carborundum Company, The. Molten metal pump. 5,088,893, Cl. 415-200.000.

Gildemeister Aktiengesellschaft: See—
Schalles, Erhard, 5,088,362, Cl. 82-142.060.

Giliberti, John, to Electronic Tug International, Inc. Vehicle for compacting surfaces. 5,088,855, Cl. 404-103.000.

Gill, Hugh; and McCorry, Mark, to Unisys. Movable pressure spring band to avoid excessive wear from card feeding apparatus. 5,090,032, Cl. 377-18.000.

Gilleland, Frank W.: See—
Fraker, Winford C.; and Gilleland, Frank W., 5,089,895, Cl. 358-229.000.

Ginsburg, Victor: See—
Kriwan, Howard C.; Ginsburg, Victor; and Roberts, David D., 5,089,479, Cl. 514-25.000.

Giordani, Antonio: See—
Vecchiotti, Vittorio; Colle, Roberto; Giordani, Antonio; and Donadio, Giulio, 5,089,507, Cl. 514-326.000.

Girodeau, Jean-Marc M. M.: See—
Bird, Thomas G. C.; Crawley, Graham C.; Edwards, Philip N.; Girodeau, Jean-Marc M. M.; and Kingston, John F., 5,089,513, Cl. 514-365.000.

Giroux, Patrice; and Rey, Jean-Christophe, to Sames S.A. Device for connecting two conduit parts. 5,088,519, Cl. 137-240.000.

Glauding, Mary A. Combined pet hitching post and storage device. 5,088,448, Cl. 119-121.000.

Glass Partners, Inc.: See—
Richardson, Jay, Jr.; and Decker, Dolores, 5,088,438, Cl. 114-361.000.

Glasstech, Inc.: See—
Reunamaki, Pauli T., 5,088,920, Cl. 432-59.000.

Glava, Gary L. Attenuating handle for recreational and work implements. 5,088,734, Cl. 273-73.00J.

Glavertel: See—
Terneu, Robert; and Thomas, Jean-Francois, 5,089,039, Cl. 65-60.500.

Gleason Works, The: See—
Krenzer, Theodore J., 5,088,243, Cl. 51-287.000.

Gleisner, Arturo G.; and Vega, Juan C., to Establecimientos Industriales Quimicos Oxiquim S.A. Process of froth floatation using a 5-alkyl-, 5-alkenyl-, or 5-aryl-1,3,5-dithiazine as a collector reagent. 5,089,116, Cl. 209-166.000.

Glennon, Oliver; and Shortt, James, to Square D Company. Earth leakage trip indicator. 5,089,796, Cl. 335-172.000.

Glinski, J. A.: See—
Powers, James C.; Kam, Chih-Min; Oleksyszyn, Josef; Glinski, J. A.; and Hernandez, M. A., 5,089,633, Cl. 549-285.000.

Gloaguen, Gilbert, to U.S. Philips Corporation. Bridge type switching circuit having a single switchable current source. 5,089,720, Cl. 307-353.000.

Gloer, Katherine B.: See—
Eyman, Darrell P.; Gloer, Katherine B.; and Schmitz, Andrew D., 5,089,245, Cl. 423-415.00A.

Glotz, Gerhard: See—
Neff, Helmut; Heinrich, Jurgen; and Glotz, Gerhard, 5,088,659, Cl. 244-3.160.

Glover, Alfred H.: See—
Betterton, Joseph T.; Glover, Alfred H.; and McKee, Thomas S., 5,089,675, Cl. 20-83.00J.

Gobel, Garth W., to Chromex, Inc. Fabrication of aspheric surfaces through controlled deformation of the figure of spherical reflective surfaces. 5,089,915, Cl. 359-846.000.

Godfrey, Christopher R. A.: See—
Tapolczay, David J.; Anthony, Vivienne M.; Clough, John M.; Godfrey, Christopher R. A.; and de Fraine, Paul J., 5,089,510, Cl. 514-345.000.

Goe, Simon S. Method and apparatus for drying brine shrimp cysts. 5,088,210, Cl. 34-130.000.

Goedecke, Wolf-Dieter; and Cohanciu, Victor, to Mannesmann Aktiengesellschaft. Linear unit. 5,088,382, Cl. 91-275.000.

Goforth, Billy D.; Goforth, Charles L.; and Brooks, Joe G., to Advanced Environmental Recycling Technologies, Inc. System for making synthetic wood products from recycled materials. 5,088,910, Cl. 425-142.000.

Goforth, Charles L.: See—
Goforth, Billy D.; Goforth, Charles L.; and Brooks, Joe G., 5,088,910, Cl. 425-142.000.

Gohara, Shinobu: See—
Fukuta, Isao; Kawakita, Kenji; Kashio, Jiro; Torii, Yutaka; Gohara, Shinobu; and Endo, Noboru, 5,090,011, Cl. 370-60.000.

Gojigen Kikaku Co.: See—
Yanagida, Jun, 5,088,864, Cl. 409-96.000.

Goldberg, Ina: See—
Williams, Jon I.; Salerno, Anthony J.; Goldberg, Ina; and McAllister, William T., 5,089,406, Cl. 435-172.300.

Goldblatt, Robert L.: Inflatable air-hoverable toy having stems for spinning, 5,088,952, Cl. 446-220.000.

Goldstar Co., Ltd.: See—
Park, Seung H., 5,089,744, Cl. 315-39.530.

Goldston, Sidney: Document preparation kit, 5,088,963, Cl. 162-56.000.

Golinelli, Guido, to Marposs Societa' per Azioni: Apparatus and method for checking mechanical parts, 5,088,206, Cl. 33-550.000.

Gondotra, Vinay; Gore, Kiron P.; and Bogert, Steven T., to Motorola, Inc.: Soldering process, 5,088,639, Cl. 228-180.100.

Goodrich, Robert R.; and York, James D., to AT&T Bell Laboratories: Clear-out apparatus for a coin chute, 5,088,587, Cl. 194-345.000.

Goodson, Robert J.: See—
Nitecki, Danute E.; Katre, Nandini; Goodson, Robert J.; and Aldwin, Lois, 5,089,261, Cl. 424-85.200.

Goodyear Tire & Rubber Company, The: See—
Castner, Kenneth F., 5,089,574, Cl. 526-142.000.

Graas, Maurice; and Constant, Michel, 5,088,536, Cl. 152-209.00R.

Navaux, Stanley, 5,088,538, Cl. 152-528.000.

Wideman, Lawson G.; and Castner, Kenneth F., 5,089,563, Cl. 525-332.300.

Gorai, Yuji; and Aoki, Hiroshi, to Seikosha Co., Ltd.: Recording and reproducing methods and recording and reproducing apparatus, 5,089,820, Cl. 341-139.000.

Gore, Kiron P.: See—
Gondotra, Vinay; Gore, Kiron P.; and Bogert, Steven T., 5,088,639, Cl. 228-180.100.

Gorton, William E.: See—
Sohara, Joseph A.; Johnson, Randal A.; and Gorton, William E., 5,089,652, Cl. 558-480.000.

Goshen Cushion, Inc.: See—
Conley, John; and Neterer, Alan, 5,088,791, Cl. 297-417.000.

Goto, Midori: See—
Yasumoto, Masahiko; Tsuchiya, Tohru; Shibuya, Isao; and Goto, Midori, 5,089,612, Cl. 544-8.000.

Goto, Nobutaka; Koboshi, Shigeharu; Takabayashi, Naoki; and Makida, Yoshiyuki, to Konica Corporation: Electrolytic method for recovering silver from waste photographic processing solutions, 5,089,097, Cl. 204-109.000.

Gotoh, Akira; Yamazaki, Yukinobu; and Kikuchi, Naoyuki, to Hitachi Maxell, Ltd.: Optical information recording medium and production method thereof, 5,089,375, Cl. 430-271.000.

Goudie, Alexander C.: See—
Gibson, Stephen P.; Goudie, Alexander C.; Holdom, Kelvin S.; and Bullock, John D., 5,089,480, Cl. 514-30.000.

Gould Inc.: See—
Rossoll, Mary P.; and Revilock, Alan J., 5,089,027, Cl. 29-623.200.

Gould, Russell P.: All weather garment system, 5,088,116, Cl. 2-82.000.

Gouret, Claude J.: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.

Goussin, Vincent; and Lajat, Nathalie, to Legrand: Baseboard, architectural molding or the like for accommodating and protecting electrical equipment and electrical conductors connected thereto, 5,089,667, Cl. 174-101.000.

Graas, Maurice; and Constant, Michel, to Goodyear Tire & Rubber Company, The: All season type tire tread, 5,088,536, Cl. 152-209.00R.

Graber Industries, Inc.: See—
Biba, Scott I.; and Sommerfeld, Dean R., 5,088,542, Cl. 160-168.100.

Grabley, Susanne: See—
Wink, Joachim; Grabley, Susanne; Seibert, Gerhard; Hutter, Klaus, and Zecek, Axel, 5,089,521, Cl. 514-450.000.

Graham, Kingsley F.; and Lipchak, John B., to Westinghouse Electric Corp.: Apparatus for monitoring the pressure within a cask containing radioactive material, 5,089,214, Cl. 376-250.000.

Graillat, Gerard: See—
Hue, Jean; and Graillat, Gerard, 5,088,756, Cl. 280-615.000.

Gralenski, Nicholas M., to Watkins Johnson Company: Electrically insulating pipe coupling apparatus, 5,088,773, Cl. 285-52.000.

Gran, Richard J.; Berde, Dennis W.; and Ritucci, Hugo D., to Grumman Aerospace Corporation: Two dimensional fast Fourier transform converter, 5,089,982, Cl. 364-726.000.

Granata, Clarence: Three-point hitch which is convertible to a ball hitch, 5,088,753, Cl. 280-416.200.

Grandjean, Pierre A., to Medtronic, Inc.: Muscle work output monitor by intramuscular temperature variation measurement, 5,089,019, Cl. 623-3.000.

Grandmougin, Gerard, to Visicable: Device for the remote transmission of signals and in particular video signals, 5,089,886, Cl. 358-86.000.

Grantham, Rodger P., to Dayco Products, Inc.: Hose assembly and method of making the same, 5,088,528, Cl. 141-44.000.

Grass AG: See—
Grass, Alfred, 5,088,155, Cl. 16-257.000.

Grass, Alfred, to Grass AG: Door hinge with resiliently biased retaining means, 5,088,155, Cl. 16-257.000.

Grau GmbH & Co.: See—
Baur, Rolf, deceased; Linser, Joerg; Grau, Herbert; Bareis, Manfred; and Bastek, Wolfgang, 5,088,604, Cl. 211-1.500.

Grau, Herbert: See—
Baur, Rolf, deceased; Linser, Joerg; Grau, Herbert; Bareis, Manfred; and Bastek, Wolfgang, 5,088,604, Cl. 211-1.500.

Graves, Daniel F.: See—
Hall, James E.; and Graves, Daniel F., 5,089,558, Cl. 525-89.000.

Gray, Andrew C. G.: See—
Wood, William W.; Naisby, Thomas W.; and Gray, Andrew C. G., 5,089,486, Cl. 514-149.000.

Gray, Nancy M.; and Cheng, Brian K., to G. D. Searle & Co.: Ethanobicyclic amine derivatives for CNS disorders, 5,089,506, Cl. 514-325.000.

Greanias, Anthony C.; Kubisch, John G.; Mercer, James B.; and Schaeff, Wilmer G., to General Motors Corporation: Vacuum-assisted counter gravity casting apparatus with valve to prevent flow of melt from mold, 5,088,546, Cl. 164-255.000.

Grecksch, Hans; and Spinnen, Dieter, to W. Schlafhorst AG & Co.: Tube transport assembly for transporting yarn packages on a textile machine including a vertical transport component, 5,088,591, Cl. 198-465.100.

Green, David T., to United States Surgical Corporation: Inwardly biased skin fastener, 5,089,009, Cl. 606-219.000.

Green, Michael J.: See—
Piwinski, John J.; Ganguly, Ashit K.; Green, Michael J.; Villani, Frank J.; and Wong, Jesse, 5,089,496, Cl. 514-253.000.

Green, William J.: See—
Hegedus, Charles R.; Hirst, Donald J.; Green, William J.; and Eng, Anthony T., 5,089,551, Cl. 524-396.000.

Greenberg, David B.: See—
Snyder, A. Peter; Greenberg, David B.; and Scarpino, Pasquale V., 5,089,395, Cl. 435-39.000.

Greenley, Robert Z.: See—
Baker, Carol A.; Brooks, Albert A.; Greenley, Robert Z.; and Henis, Jay M., 5,089,407, Cl. 435-179.000.

Greenslade, Joe E.: Thread rolling screw, 5,088,869, Cl. 411-386.000.

Grego, Giorgio, to Csele-Centro Studi e Laboratori Telecomunicazioni S.p.A.: Interferometric optical system for measuring linear or angular displacements by beat signals, 5,089,698, Cl. 250-231.130.

Gregoire, Jean-Pierre: See—
Joson, Michel; and Gregoire, Jean-Pierre, 5,088,442, Cl. 118-238.000.

Gregory, Ralph R., deceased: See—
Benesh, Peter; and Gregory, Ralph R., deceased, 5,088,504, Cl. 128-781.000.

Gregory, Thomas; Hurtig, Carl W.; Ledbetter, Harvey D.; Quackenbush, Kenneth J.; and Rosenberg, Steven, to Dow Chemical Company, The: Rapid advancement of molecular weight in polybenzazole oligomer dopes, 5,089,591, Cl. 528-185.000.

Grider, Douglas: See—
Ozturk, Mehmet; Wortman, Jimmie; and Grider, Douglas, 5,089,872, Cl. 357-23.900.

Griffaton, Jacques, to Framatome: Tooling for working within a tubular element, 5,089,684, Cl. 219-121.630.

Grim, Tracy E., to Royce Medical Company: Gel and air cushion ankle brace, 5,088,478, Cl. 602-27.000.

Grimm, Thomas M., to Ergodyne Corporation: Wrist rest, 5,088,668, Cl. 248-118.300.

Grinderslev, Soren, to Optical Fiber Technologies, Inc.: Method and apparatus for terminating a fiber-optic cable without adhesive, 5,088,804, Cl. 385-81.000.

Grindstaff, Teddy H.: See—
Belcher, Wilbur D.; and Grindstaff, Teddy H., 5,088,140, Cl. 5-636.000.

Groeneveld, Dirk W. J., to U.S. Philips Corp.: Dynamic current divider circuit with current memory, 5,089,718, Cl. 307-244.000.

Grognet, Jean C.: See—
Forestier, Serge; Lang, Geard; Richard, Herve; and Grognet, Jean C., 5,089,250, Cl. 424-43.000.

Grollier, Jean F.; and Dubief, Claude, to L'Oreal: Cosmetic composition for treating keratin fibres, and process for treating the latter, 5,089,252, Cl. 424-47.000.

Grosfillex S.A.R.L.: See—
Guichon, Jean-Paul, 5,088,792, Cl. 297-445.000.

Gross, Michael G., to Creative Extruded Products, Inc.: Auto window molding, 5,088,787, Cl. 296-93.000.

Grossman, David G.; and Karnas, Michael A., to Corning Incorporated: Glazing dental constructs, 5,089,306, Cl. 428-35.100.

Grote, Dieter: See—
Hoffmann, Carl; and Grote, Dieter, 5,089,194, Cl. 264-63.000.

Grothe, Manfred; and Hartel, Volker, to Metzeler GmbH: Hydraulically acting damping element, 5,088,580, Cl. 188-298.000.

Grouhel, Agnes M.: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.

Grum-Schwensen, Jens C., to Dansk Industri Syndikat A/S: Locking and holding device, principally for holding and handling of pattern plates, core masks, and the like, 5,088,608, Cl. 211-70.600.

Grumman Aerospace Corporation: See—
Gentile, Peter D., 5,089,949, Cl. 363-126.000.

Gran, Richard J.; Berde, Dennis W.; and Ritucci, Hugo D., 5,089,982, Cl. 364-726.000.

Vasile, Carmine F., 5,089,791, Cl. 330-295.000.

Vasile, Carmine F., 5,089,823, Cl. 342-383.000.

Grunert, Kurt A.; Gibson, Jeffrey S.; and Wafer, John A., to Westinghouse Electric Corp.: Circuit breaker with dual function electromagnetic tripping mechanism, 5,089,797, Cl. 335-172.000.

GTE Laboratories Incorporated: See—
Buljan, Sergej T.; Lingertat, Helmut; and Wayne, Steven F., 5,089,047, Cl. 75-236.000.

GTE Products Corporation: See—
Lester, James N., 5,089,925, Cl. 361-84.000.

Guenther, Gary L.: See—
Christie, Bruce A.; Guenther, Gary L.; and Blaker, J. Warren, 5,089,024, Cl. 623-6.000.

Guerra, Robert: See—
Clark, Bryan K.; Johnson, Sheryl L.; and Guerra, Robert, 5,090,008, Cl. 369-284.000.

Guichon, Jean-Paul, to Grosfillex S.A.R.L.: Monolithic seat made of injected plastics material, 5,088,792, Cl. 297-445.000.

Gunter, Werner, to W. R. Grace & Co.-Conn.: Vacuum packaging apparatus, 5,088,268, Cl. 53-86.000.

Gustafson, Eric K.: See—
Tsay, Yuh-Geng; Calenoff, Emanuel; Gustafson, Eric K.; Trebino, Rick; and Lee, John, 5,089,387, Cl. 435-6.000.

Gustafson, Grant A.: See—
Nordness, Mark E.; Bauer, Frank T.; Blemberg, Robert J.; Eckstein, John P.; Bank, David M.; and Gustafson, Grant A., 5,089,308, Cl. 428-35.400.

Gustafsson, Klas R. L.; and Lagne, Ulf J., to Berema Aktiebolag: Hand held hammer machine, 5,088,566, Cl. 173-116.000.

Guthrie, Kenneth R.: See—
Ralston, Trent H.; Guthrie, Kenneth R.; and Veatch, James C., 5,088,553, Cl. 166-55.700.

Gutierrez, Manuel: Fishing rod holder and stand, 5,088,224, Cl. 43-21.200.

H. B. Fuller Company: See—
Zimmel, John M.; Katsaros, Mark G.; and Bunnelle, William L., 5,089,548, Cl. 524-272.000.

H. R. Black Company, Inc.: See—
Anderson, Raymond L., 5,089,143, Cl. 210-741.000.

Haag, William G.: See—
Broadhurst, Michael D.; Cromartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter Michael R., 5,089,623, Cl. 546-300.000.

Hackett, Gary K., to Union Oil Company of California: Switching system for the acquisition of seismic data, 5,089,995, Cl. 367-76.000.

Hackett, Hugh; Stade, James H.; and Hattis, Russell E.: Attack-repellent device, 5,088,624, Cl. 222-78.000.

Hackl, Ralph P.; Wright, Frank R.; and Bruynesteyn, Albert, to GB Biotech Inc.: Bacteria for oxidizing multimetallic sulphide ores, 5,089,412, Cl. 435-252.400.

Haddock, Richard, to Drexler Technology Corporation: Reader/writer for arcuately flexed data cards, 5,089,693, Cl. 235-486.000.

Haendler, Blanca L.: See—
Coyne, Thomas S.; Haendler, Blanca L.; Klapprott, Daniel H.; Mitchell, Frances E.; Steichen, Dale S.; and Thompson, Suzanne M., 5,089,167, Cl. 252-186.260.

Haga, Tomoyuki: See—
Odate, Ryoji; and Haga, Tomoyuki, 5,089,309, Cl. 428-36.920.

Haino, Kozo: See—
Kodera, Tatsuya; Takaoka, Kazuchiyo; Haino, Kozo; Itoh, Akira; Okaji, Makoto; and Emoto, Kazuhiro, 5,089,366, Cl. 430-59.000.

Haisma, Jan: See—
Slatten, John A. G.; Brockman, Henry E.; and Haisma, Jan, 5,089,431, Cl. 437-39.000.

Hakko Co., Ltd.: See—
Koga, Motoyuki; Ike, Nobukatsu; and Ohshima, Kenji, 5,089,297, Cl. 427-238.000.

Hale, Michael O., to AMOCO Corporation: Method and apparatus for selective cell destruction using amplified immunofluorescence, 5,089,384, Cl. 435-2.000.

Hale, Paul D.: See—
Skotheim, Terje A.; Okamoto, Yoshiyuki; and Hale, Paul D., 5,089,112, Cl. 204-403.000.

Hall, Bobby E.; and Szememeyi, Clarita A., to Western Company of Subterranean Formations, 5,089,151, Cl. 252-8.551.

Hall, James E.; and Graves, Daniel F., to Bridgestone/Firestone, Inc.: Thermoflexible blends of multiblock polymer compositions with polystyrene, 5,089,558, Cl. 525-89.000.

Halliburton Company: See—
Gentry, J. Michael, 5,089,131, Cl. 210-253.000.

Hallite Seals International Limited: See—
Peppiatt, Nicholas A.; and Chambers, Paul C., 5,088,745, Cl. 277-214.000.

Halloran, Daniel J., to Dow Corning Corporation: Hair care compositions containing low strength elastomers, 5,089,253, Cl. 424-47.000.

Hallstrom, Olof A., Jr.: Waterproof reciprocating conveyor, 5,088,595, Cl. 198-750.000.

Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, to Taiyo Yuden Co., Ltd.: Optical information recording medium, 5,090,009, Cl. 369-284.000.

Hamada, Tadashi; Yamada, Shuji; Tsuji, Eiji; and Mizukoshi, Tomoyuki, to Matsushita Electric Works, Ltd.; and Osaka Prefecture, Fe-Cr-Ni-Al ferritic alloys, 5,089,223, Cl. 420-40.000.

Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, to Sumitomo Special Metals Co., Ltd.: Magnets having improved corrosion resistance, 5,089,066, Cl. 148-302.000.

Hamanaka, Izumi; and Hirota, Kazuhiro, to Konica Corporation: Paper feeding apparatus having a three cylinder vacuum member, 5,088,717, Cl. 271-98.000.

Hamano, Masaaki; Yamamoto, Hiroshi; Nagakura, Mitsuru; and Ozawa, Yoshiaki, to MG Company Ltd.: Melt-quenched thin-film alloy for bonded magnets, 5,089,065, Cl. 148-302.000.

Hamaoka, Makoto, to Kabushiki Kaisha Toshiba: Air conditioner system with refrigerant condition detection for refrigerant recovering operation, 5,088,296, Cl. 62-174.000.

Hamashima, Shigeki: See—
Ueda, Satoshi; Hirota, Koji; Itoh, Makoto; Yoshida, Yukihiko; Hukuda, Hirokazu; and Hamashima, Shigeki, 5,089,705, Cl. 250-352.000.

Hamazaki, Kagechisa: See—
Kawakami, Yasunobu; Hamazaki, Kagechisa; Arakawa, Toshihiko; and Mori, Toshiyuki, 5,089,448, Cl. 501-97.000.

Hamey, Graham W.: See—
Marsh, John F.; Vernet, Marc R. M.; and Hamey, Graham W., 5,089,155, Cl. 252-33.400.

Hamlin, Robert N.: See—
Wilson, Shari J.; Appeldorn, Roger H.; and Hamlin, Robert N., 5,088,164, Cl. 24-576.000.

Hammond, Earl G.; and Lee, Innok, to Iowa State University Research Foundation, Inc.: Process for enzymatic hydrolysis of fatty acid triglycerides with oat caryopses, 5,089,403, Cl. 435-134.000.

Hammond, Melody A.; and Brady, Donnie G., to Phillips Petroleum Company: Single ply reinforced thermoplastic composite, 5,089,207, Cl. 264-257.000.

Hampton, Douglas B.; Tilton, George W.; and Jordan, Maureen L., to L. Perrigo Company: Capsule-shaped tablet, 5,089,270, Cl. 424-465.000.

Hamstra, James R.: See—
Stultz, Perry S.; and Hamstra, James R., 5,089,957, Cl. 395-425.000.

Han, Byung H.: See—
Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., 5,089,624, Cl. 546-321.000.

Hand, Louis N., to Cornell Research Foundation, Inc.: Superconducting linear accelerator loaded with a sapphire crystal, 5,089,785, Cl. 328-233.000.

Haney, Ronald J.: See—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arold A.; and Payne, Lyle B., 5,088,873, Cl. 414-392.000.

Hankey, Dana L.: See—
Allison, Kevin W.; Hankey, Dana L.; Stadnicar, Edward, Jr.; and Roberts, Gordon J., 5,089,172, Cl. 252-512.000.

Hanninen, Hannu E.: See—
Merilainen, Pekka T.; Eskelinen, Kari; and Hanninen, Hannu E., 5,088,332, Cl. 73-861.650.

Hano, Sunao: See—
Fukushima, Naoto; Yamaguchi, Hirotsugu; Akatsu, Yohsuke; Hano, Sunao; and Kawabata, Kazunobu, 5,089,966, Cl. 364-424.050.

Hansberry, Mitchell L., to Charles Stark Draper Laboratory, Inc.: The Limp material segment coupler for a sewing machine to transport fabric workpieces, 5,088,430, Cl. 112-320.000.

Hansen, Paul E.L.: See—
Nelson, Robert L.; and Hansen, Paul E.L., 5,089,413, Cl. 435-254.000.

Hansen, Victor E., to JWI Ltd.: Continuous controlled drainage, 5,089,090, Cl. 162-351.000.

Hansford, Mike: See—
Bradshaw, Charles; Tack, Bill; Hansford, Mike; and Winterbottom, John, 5,089,969, Cl. 364-463.000.

Hanson, Douglas W.: See—
Harlan, William S.; Hanson, Douglas W.; and Wang, Shein-Shion, 5,089,994, Cl. 367-73.000.

Hanson, Gunnar J.; and Baran, John S., to G. D. Searle & Co.: Peptidyl beta-aminoacyl aminodiol carbamates as anti-hypertensive agents, 5,089,471, Cl. 514-11.000.

Hanson, H. Wayne; and Doering, Beauford C., to Par-Way Group: Pump sprayable dispensing system for vegetable oil based pan coatings, 5,088,649, Cl. 239-329.000.

Haond, Michel, to L'Etat Francaise represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications): SOI MOS transistor with a substrate-source connection, 5,089,870, Cl. 357-23.700.

Hara, Fumio; Mita, Seiichi; Izumita, Morishi; and Tsuchinaga, Hiroyuki, to Hitachi, Ltd.: Tape recorder with means for sampling and holding focusing and tracking error signals during discontinuity of tape on surface of rotating drum, 5,090,005, Cl. 369-97.000.

Hara, Kazuo: See—
Umeda, Takashi; Zemba, Seiichi; Hara, Kazuo; Takamoto, Katsumori; and Yokota, Shinichi, 5,089,553, Cl. 524-424.000.

Hara, Kozo: See—
Fujita, Koki; Hara, Kozo; Hashimoto, Hitoshi; and Kitahata, Sumio, 5,089,401, Cl. 435-97.000.

Harada, Fumiaki, to Terumo Kabushiki Kaisha: Catheter for the introduction of an expandable member, 5,089,005, Cl. 606-194.000.

Harada, Isamu: See—
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichi; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.

Harada, Naoki: See—
Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichiro, 5,088,836, Cl. 374-183.000.

Harakawa, Tetsumi: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.

Harcor Security Seals Pty Limited: See—
Weiss, Frank, 5,088,779, Cl. 292-341.160.

Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, to Schering Aktiengesellschaft. Substituted pyrimidinyloxy(thio)- and triazinylloxy (thio)acrylic acid derivatives, processes for their preparation and their use as herbicides, fungicides and plant growth regulators, 5,089,044, Cl. 71-90.000.

Harding, Richard J. A., to Avon Inflatable Limited. Inflatable boat and deck therefor, 5,088,434, Cl. 114-85.000.

Hardy, Larry A.: See—
DeBiasi, Charles J.; Merchant, Viren B.; Maurer, James B.; and Hardy, Larry A., 5,088,465, Cl. 123-491.000.

Hare, Alan W.: See—
Murr, Lawrence E.; and Hare, Alan W., 5,089,467, Cl. 505-1.000.

Hargrave, Fred M. Plastic lid launcher, 5,088,469, Cl. 124-5.000.

Hariharan, Suresh: See—
Brown, Peter J.; and Hariharan, Suresh, 5,089,948, Cl. 363-58.000.

Harlan, William S.; Hanson, Douglas W.; and Wang, Shein-Shion, to Conoco Inc. Tomographic estimation of seismic transmission velocities from constant offset depth migrations, 5,089,994, Cl. 367-73.000.

Harmstorf, Rudolf. Scavenging apparatus for embedding cables or the like into the soil of waters, 5,088,857, Cl. 405-159.000.

Harp, Robert W., to Industrial Environmental Supply, Inc. Secondary containment of above-ground tanks, 5,088,530, Cl. 141-86.000.

Harper, William H. Boat hull construction method and product thereof, 5,088,437, Cl. 114-355.000.

Harrah, Larry A.; Allred, Ronald E.; and Wilson, Kennard V., Jr., to PDA Engineering, Inc. Method for providing adhesion to a metal surface, 5,089,063, Cl. 148-241.000.

Harrick, Nicolas J.: See—
Milosevic, Milan, 5,088,821, Cl. 356-319.000.

Harris, Shirley J. Window rainshield apparatus, 5,088,540, Cl. 454-220.000.

Harris, William J.; and Hwang, Wen-Fang, to Dow Chemical Company. The Process of making thermoplastic copolymers containing polybenzoxazole, polybenzothiazole and polybenzimidazole moieties, 5,089,568, Cl. 525-410.000.

Harris, William J.: See—
Schrock, Alan K.; Harris, William J.; and Madison, Norman L., 5,089,592, Cl. 528-185.000.

Harrisburg, Inc.: See—
Johnson, Jerry E., 5,088,521, Cl. 137-516.290.

Harsch, Franklin D.: See—
Lazaro, Luis J., Jr.; and Harsch, Franklin D., 5,088,191, Cl. 29-867.000.

Hart, Charles R., to Imperial Chemical Industries PLC. Metallized composite polymer films, 5,089,347, Cl. 428-461.000.

Hart, Robert L.; and Wong, David M. Chromatography column with sealing arrangement, 5,089,125, Cl. 210-198.200.

Hartel, Volker: See—
Grothe, Manfred; and Hartel, Volker, 5,088,580, Cl. 188-298.000.

Hartley, Dean M.: See—
Choi, Dennis W.; and Hartley, Dean M., 5,089,517, Cl. 514-411.000.

Hartley, Rolfe J.: See—
Chrisope, Douglas R.; and Hartley, Rolfe J., 5,089,156, Cl. 252-49.900.

Hartmann & Braun: See—
Fabinski, Walter; Taubitz, Georg; Franck, Gerhard; and Nevole, Josef, 5,088,313, Cl. 73-1.00G.

Hartwell, Clive R.; and Hartwell, David W. Tables, 5,088,419, Cl. 108-66.000.

Hartwell, David W.: See—
Hartwell, Clive R.; and Hartwell, David W., 5,088,419, Cl. 108-66.000.

Haruyama, Shinichi; and Asai, Hideaki, to Yokowo Mfg. Co., Ltd. Antenna device shared by three kinds of waves, 5,089,829, Cl. 343-852.000.

Harvey, Anthony P., to Plessey Australia Pty. Limited of Faraday Park. Towable buoyant streamer for data bearer, 5,089,668, Cl. 174-101.500.

Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, to Nippondenso Co., Ltd. Auxiliary steering system associated with anti-skid control system for use in motor vehicle, 5,089,967, Cl. 364-426.020.

Hasegawa, Akira: See—
Fuse, Takahiro; Hasegawa, Akira; and Matsuoka, Takeshi, 5,089,812, Cl. 340-793.000.

Hasegawa, Masaki; Saigo, Kazuhiko; Yuki, Yoichi; and Tachibana, Kouzou, to Daicel Chemical Industries, Ltd. Optically active carbokylated amino alcohols and their utilization in optical resolution, 5,089,642, Cl. 556-1.000.

Hasegawa, Mokoto: See—
Furushashi, Toshio; and Hasegawa, Mokoto, 5,088,916, Cl. 431-90.000.

Hashibe, Yoshio; Matano, Takahiro; Shibuya, Takehiro; Sakane, Takashi; Baba, Yasuhiro; and Moritake, Masanori, to Nippon Electric Glass Co., Ltd. Crystallized glass article having an irregular rough

surface pattern and a method for producing the same, 5,089,345, Cl. 428-428.000.

Hashimoto, Hitoshi: See—
Fujita, Koki; Hara, Kozo; Hashimoto, Hitoshi; and Kitahata, Sumio, 5,089,401, Cl. 435-97.000.

Hashimoto, Jiro; Nomoto, Shogo; Nozawa, Masanori; and Kubo, Makoto, to Kao Corporation. Fuel oil additive and fuel oil additive composition, 5,089,029, Cl. 44-432.000.

Hastings, Donald R.; and Hendricks, John A., to Nordson Corporation. Method and apparatus for spraying a liquid coating containing supercritical fluid or liquified gas, 5,088,443, Cl. 118-314.000.

Hata, Hideo: See—
Yoshimura, Isao; Ohno, Toshiaki; and Hata, Hideo, 5,089,341, Cl. 428-412.000.

Hatada, Kenzo; and Nagao, Koichi, to Matsushita Electric Industrial Co., Ltd. Lead connection structure, 5,089,750, Cl. 315-169.300.

Hatada, Kenzo; Ishihara, Takeshi; Suzuki, Nobuaki; and Kuroda, Satowaka, to Matsushita Electric Industrial Co. Ltd.; and Martec Corporation. Device for testing semiconductor integrated circuits and method of testing the same, 5,089,772, Cl. 324-158.00F.

Hayatama, Katsuo: See—
Yokomori, Sadakazu; Saijo, Keiko; Matsunaga, Tohru; Nakashima, Yoshimoto; and Hayatama, Katsuo, 5,089,654, Cl. 560-53.000.

Hatsuda, Toshio: See—
Kojima, Hiroyuki; Hatsuda, Toshio; Daikoku, Takahiro; Zushi, Shizuo; and Kobayashi, Fumiuyuki, 5,089,936, Cl. 361-387.000.

Hattis, Russell E.: See—
Hackett, Hugh; Stadel, James H.; and Hattis, Russell E., 5,088,624, Cl. 222-78.000.

Hattori, Masateru; Okamura, Takashi; and Kondo, Kazuo, to NGK Spark Plug Co., Ltd. Method of producing colored crystallized glass, 5,089,444, Cl. 501-9.000.

Hauchecorne, Alain: See—
Garnier, Anne; Chanin, Marie L.; Hauchecorne, Alain; and Porteneuve, Jacques C., 5,088,815, Cl. 356-28.500.

Hauglin, Berni-Otto, to Witco A-S. Lateral guide device for a ski boot, 5,088,757, Cl. 280-615.000.

Hauschildt, F. William: See—
Schwartz, John G.; Hauschildt, F. William; Quinn, George E.; and Forgac, John M., 5,089,235, Cl. 422-144.000.

Hauser, Helmut O., to Vestar, Inc. Method of dehydrating vesicle preparations for long term storage, 5,089,181, Cl. 264-4.300.

Hawes, Philip B., to Space Biospheres Venture. Air scrubber for organic solvent removal, 5,089,036, Cl. 55-227.000.

Hawkins, Christopher M.; Bostick, Edgar E.; and Derudder, James L., to General Electric Company. Endcapped, chain-extended and branched polyesters, 5,089,598, Cl. 528-272.000.

Hawkins, Paul; and Blythe, Robert J., to En-Tout-Cas plc. Ground surface material, 5,088,724, Cl. 272-3.000.

Hawley, Terry L.: See—
Cracchiolo, Vincenzo; Hawley, Terry L.; Moore, Robert E.; Radlick, David D.; and Stuben, Frank S., 5,088,367, Cl. 83-345.000.

Hayakawa, Kiyoharu: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.

Hayakawa, Tetsuji: See—
Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 5,089,066, Cl. 148-302.000.

Hayama, Kazuhide; Hosokawa, Noritaka; Yazaki, Takao; and Noro, Masataka, to Mitsubishi Petrochemical Co., Ltd. Method for forming hard coat on polyolefin, 5,089,291, Cl. 427-54.100.

Hayase, Yoshio; Matsumoto, Kohei; Kamei, Kazuo; Ide, Kinya; and Takahashi, Toshio, to Shionogi & Co., Ltd. Heterocyclic oxyphenoxycetic acid derivatives and their use as herbicides, 5,089,043, Cl. 71-90.000.

Hayashi, Hirokazu; Aihara, Tetsuo; Nagaoka, Haruo; Kamikado, Koji; and Nakatani, Eisaku, to Kansai Paint Co., Ltd. Cationic electrodeposition coating composition, 5,089,101, Cl. 204-181.700.

Hayashi, Masaaki: See—
Takayama, Shuichi; Hayashi, Masaaki; Fuse, Eiichi; Ishiura, Koichiro; Yoshikawa, Mutsumi; Tagawa, Motoyuki; and Inaba, Makoto, 5,088,492, Cl. 128-654.000.

Hayashi, Shigeyuki: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.

Hayashi, Shoji, to Ricoh Company, Ltd. Paper refeeding device for an image forming apparatus, 5,088,713, Cl. 271-3.100.

Hayashi, Yoshio: See—
Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, 5,089,515, Cl. 514-404.000.

Haynes, Andrew S.; and Zakreski, Charles T., to South Bend Controls, Inc. Modular solenoid valve, 5,088,520, Cl. 137-270.000.

Haynes, Lynn C.; Levine, Harry; Otterburn, Michael S.; and Mathewson, Paul, to Nabisco Brands, Inc. Microwave browning composition, 5,089,278, Cl. 426-98.000.

Hazard, Michel, to Bull S.A. Method and system for management of an electronic memory representing predetermined homogeneous units, 5,089,959, Cl. 364-406.000.

Hazeldine, Albert, to Tate Access Floors Limited. Access flooring, 5,088,251, Cl. 52-263.000.

Hedstrom Corp.: See—
Cunrad, Joel C.; and Prescott, Paula W., 5,088,633, Cl. 224-30.00A.

Heemskerck, Wilhelmus J. C., to Meyn Machinefabriek B.V. Method for causing sitting poultry to stand up and apparatus for carrying out this method, 5,088,959, Cl. 452-183.000.

Heffernan, Stuart D., to Contel Cellular Inc. Method and apparatus for communicating with radio telephones, 5,090,050, Cl. 379-60.000.

Hegedus, Charles R.; Hirst, Donald J.; Green, William J.; and Eng, Anthony T., to United States of America, Navy. Corrosion-resistant alkyd coatings, 5,089,551, Cl. 524-396.000.

Hegel, Ramon F.: See—
Teuber, Vincent P.; and Hegel, Ramon F., 5,089,924, Cl. 360-132.000.

Heidelberger Druckmaschinen AG: See—
Pflasterer, Jürgen; and Freyer, Norbert, 5,089,977, Cl. 364-526.000.

Roskosch, Bernhard, 5,088,409, Cl. 101-415.100.

Wirz, Arno, 5,088,716, Cl. 271-90.000.

Heidt, Thomas; Will, Henry; Rhodes, Greydon; and Placencia, Armando, to Vettes S.A. Chemical analyzer, 5,089,229, Cl. 422-64.000.

Heimerikx, Gerardus W. J.: See—
Van Kruchten, Eugene M. G. A.; and Heimerikx, Gerardus W. J., 5,089,158, Cl. 252-51.50A.

Hein-Werner Corporation: See—
Naber, Charles E.; and Ballard, James B., 5,088,691, Cl. 254-8.00R.

Heinecke, Steven B., to Minnesota Mining and Manufacturing Co. Adhesive frame bandage, 5,088,483, Cl. 602-46.000.

Heinemann, Henning: See—
Gerling, Klaus; Heinemann, Henning; Meier, Andreas; and Langer, Klaus, 5,089,492, Cl. 514-210.000.

Heiniger, Hans J.: See—
Isliker, Henri; Peitsch, Manuel C.; Heiniger, Hans J.; Lerch, Peter G.; and Morgenthaler, Jean J., 5,089,602, Cl. 530-359.000.

Heinrich, Jürgen: See—
Neff, Helmut; Heinrich, Jürgen; and Grotz, Gerhard, 5,088,659, Cl. 244-3.160.

Heinrich, Nikolaus: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.

Helm, Herbert W.; Hornung, William R.; Khrakovsky, Ilya D.; and Steinbeiser, Fredrick L., to F. L. Smith Machine Company, Inc. Rotary printer for an envelope machine, 5,088,407, Cl. 101-350.000.

Hen, John, to Mobil Oil Corporation. Method of increasing retention of scale inhibitors in subterranean formations, 5,089,150, Cl. 252-8.552.

Henderson, David: See—
Ottow, Eckhard; Wiechert, Rudolf; Neef, Gunter; Beier, Sybille; Elger, Walter; and Henderson, David, 5,089,488, Cl. 514-179.000.

Henderson, Ian E.: See—
Chow, William W.; Fennema, Alan A.; Henderson, Ian E.; and Kadlec, Ronald J., 5,090,002, Cl. 369-44.280.

Henderson, Robert E.; and Sanders, Richard L., to Chrysler Corporation. High strength die support cart having an arched frame, 5,088,752, Cl. 280-79.110.

Henderson, William A., to Zebco Corporation. Park function for a steered trolling motor, 5,088,943, Cl. 440-6.000.

Hendren, Gary L.; and Ratliff, Danny R., to Du Pont de Nemours & E. I., and Company. Low-density, high strength aramid boards, 5,089,088, Cl. 162-123.000.

Hendricks, Fred W.; and Brooks, Bobby, to Automatic Control Components, Inc. Removable discharge sleeve in a disk valve, 5,088,689, Cl. 251-304.000.

Hendricks, John A.: See—
Hastings, Donald R.; and Hendricks, John A., 5,088,443, Cl. 118-314.000.

Hendrickson, Valerie: See—
Belmont, Daniel T.; Hendrickson, Valerie; and Hoekman, Mark J., 5,089,616, Cl. 544-133.000.

Henis, Jay M.: See—
Baker, Carol A.; Brooks, Albert A.; Greenley, Robert Z.; and Henis, Jay M., 5,089,407, Cl. 435-179.000.

Henk, Bill H., to FMC Corporation. Bottom support grasping device, 5,088,877, Cl. 414-626.000.

Henkel Corporation: See—
Reghi, Gary A., 5,089,064, Cl. 148-247.000.

Henkel Kommanditgesellschaft auf Aktien: See—
Rose, David; Lieske, Edgar; and Hoeflkes, Horst, 5,089,025, Cl. 8-405.000.

Schrader, Dieter; and Flemming, Peter, 5,089,257, Cl. 424-70.000.

Hennig, Bruno E., to RCA Thomson Licensing Corporation. Deflection driver in a video apparatus, 5,089,756, Cl. 315-387.000.

Henning, Brian C. R.: See—
Lummes, Stephen E.; Morrison, Robert B.; and Henning, Brian C. R., 5,088,209, Cl. 33-707.000.

Henry, Marc: See—
Bletton, Olivier; Duet, Roger; Henry, Marc; and Cogne, Jean-Yves, 5,089,224, Cl. 420-41.000.

Hensens, Otto D.: See—
Tsiouras, Athanasios; Ostlund, Dan A.; Hensens, Otto D.; and Zink, Deborah L., 5,089,530, Cl. 514-682.000.

Henson, Keith. Method of launching payloads, 5,088,663, Cl. 244-137.400.

Henton, David E.; and Mang, Michael N., to Dow Chemical Company. The Rubber modified blend of nylon and styrene/acrylonitrile maleic anhydride terpolymer, 5,089,557, Cl. 525-66.000.

Her Majesty the Queen in right of New Zealand of Dsir Christchurch Wheat Research Institute: See—
Wilson, Arran, 5,089,283, Cl. 426-498.000.

Heraeus Kulzer GmbH: See—
Eppinger, Bernhard; Eppinger, Regina; and Schaefer, Roland, 5,089,051, Cl. 106-35.000.

Hercules Tire & Rubber Company, The: See—
Majewski, Robert H., 5,089,079, Cl. 156-394.100.

Herlihy, Walter C.: See—
Profy, Albert T.; Belew, Margaret A.; and Herlihy, Walter C., 5,089,605, Cl. 530-402.000.

Hermann Berstorff Maschinenbau GmbH: See—
Behrens, Friedrich-Otto; and Prossler, Ulrich, 5,089,193, Cl. 264-50.000.

Hermens, Walter A. J. J.; and Merkus, Franciscus W. G. M. Pharmaceutical compositions for nasal administration containing steroid hormones and dimethyl- β -cyclodextrin, 5,089,482, Cl. 514-58.000.

Hernandez, Luis R. Cleaning mop apparatus, 5,088,148, Cl. 15-228.000.

Hernandez, M. A.: See—
Powers, James C.; Kam, Chih-Min; Oleksyszyn, Josef; Glinski, J. A.; and Hernandez, M. A., 5,089,633, Cl. 549-285.000.

Herrington, Fox J., to Mobil Oil Corporation. Method of making protruding end stops for plastic reclosable fastener, 5,088,971, Cl. 493-203.000.

Hertweck, Gernot; and Bender, Franz, to Mercedes-Benz AG. Method of actuating a butterfly valve arranged in the intake system of an air-compressing fuel-injected internal combustion engine, 5,088,462, Cl. 123-399.000.

Hesse, Wolfgang; Hofmann, Klaus; and Leicht, Erhard, to Hoechst Aktiengesellschaft. Process for the preparation of novolaks and their use, 5,089,589, Cl. 528-129.000.

Hewlett, Scott M.: See—
Eichberger, Robert T.; and Hewlett, Scott M., 5,088,325, Cl. 73-304.00C.

Hewlett-Packard Company: See—
Bunsen, Chris M.; and Stephens, Bruce A., 5,089,980, Cl. 364-709.070.

Holland, William D., 5,089,712, Cl. 250-557.000.

Okamura, Mike H., 5,089,690, Cl. 235-145.00R.

Pike, William T.; Sharrit, David D.; and Brown, Barry A., 5,089,782, Cl. 324-623.000.

Swedberg, Sally A., 5,089,103, Cl. 204-182.800.

Heyderman, Mark B.; and Sloves, Melvyn M. Book-like storage container for a videocassette or the like, 5,088,602, Cl. 206-387.000.

Heymes, Rene: See—
Dureckheimer, Walter; Bormann, Dieter; Ehlers, Eberhard; Schriener, Elmar; and Heymes, Rene, 5,089,490, Cl. 514-206.000.

Hi-Tek Polymers, Inc.: See—
Elmore, Jimmy D.; and Zylla, Elizabeth G., 5,089,658, Cl. 560-182.000.

Hibsch, Susan, to Lehigh Press, Inc., The. Pop-out slide, 5,088,220, Cl. 40-488.000.

Hidaka, Hiroshi; and Sagi, Nobuo, to Fuji Oil Company, Limited. 1,3-selective esterification of soft palm oil and laurin fats/oils, 5,089,177, Cl. 260-410.600.

Hidaka, Takayoshi: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Aiki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.

Hideaki Yamada: See—
Yamada, Hideaki; and Nagasawa, Toru, 5,089,411, Cl. 435-244.000.

Hideshima, Masayuki; Wada, Shinji; and Sekine, Akihiko, to Kabushiki Kaisha Topcon. Laser beam scanning type eye fundus observing device, 5,088,811, Cl. 351-221.000.

Higa, Kelvin T., to United States of America, Navy. Method of preparing monomeric organometallic compounds, 5,089,643, Cl. 556-1.000.

Higashi, Satoshi: See—
Arichika, Kenji; Fukamachi, Mitsuru; Higashi, Satoshi; and Maruyama, Noboru, 5,089,781, Cl. 324-445.000.

Higashihara, Masaki; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, to Canon Kabushiki Kaisha. Auto focus device with predictive focussing, 5,089,843, Cl. 354-402.000.

Higashitsutsumi, Yoshihito, to Sanyo Electric Co., Ltd. Solid image pickup apparatus for eliminating smear, 5,089,894, Cl. 358-213.240.

Higashiyama, Shunichi, to Brother Kogyo Kabushiki Kaisha. Image transferring sheet and a method for fabricating the same, 5,089,310, Cl. 428-40.000.

Higashiyama, Shunichi: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.

Higuchi, Hiroyuki: See—
Nomura, Satoru; Nagai, Yoshihisa; Emi, Tetsuro; Miyashita, Koji; Higuchi, Hiroyuki; and Hiyakata, Makoto, 5,089,899, Cl. 358-335.000.

Higuchi, Yoshiya: See—
Ose, Yoichi; Higuchi, Yoshiya; and Miki, Kazuyoshi, 5,089,699, Cl. 250-306.000.

Higuchi, Yukio: See—
Fukuda, Yutaka; Higuchi, Yukio; Imoto, Yukihiro; and Nakano, Noriyoshi, 5,088,320, Cl. 73-118.100.

- Hijkata, Makoto: See—
Nomura, Satoru; Nagai, Yoshihisa; Emi, Tetsuro; Miyashita, Koji; Higuchi, Hiroyuki; and Hijkata, Makoto, 5,089,899, Cl. 358-335.000.
- Hilland, David H., to United States of America, Air Force. Retrofit integrated circuit terminal protection device. 5,089,929, Cl. 361-111.000.
- Hille, Thomas; Hoffmann, Hans-Rainer; Huber, Hans-Joachim; Koch, Axel; Schneider, Gerhard; and Stanislaus, Fritz, to LTS Lohmann Therapie-Systeme GmbH & Co. KG; and Klinge Pharma GmbH. Transdermal therapeutical system comprising physostigmine as active component and process for the production thereof. 5,089,267, Cl. 424-449.000.
- Hiller, James A.: See—
Frazier, Stephen L.; and Hiller, James A., 5,088,643, Cl. 229-125.150.
- Hilliard Corporation, The: See—
Webb, Paul D., 5,088,895, Cl. 417-53.000.
- Hillman, Robert S.; and Pawelchak, John M., to Gensia Pharmaceuticals, Inc. Apparatus and method for iontophoretic transfer. 5,088,978, Cl. 604-20.000.
- Himbert, Hans: See—
Bergqvist, Hakan; Himbert, Hans; and Jansson, Conny, 5,089,738, Cl. 310-50.000.
- Himmele, Walter: See—
Brueckner, Christiane; Buschmann, Ernst; Mackenroth, Wolfgang; Himmele, Walter; and Eckhardt, Heinz, 5,089,659, Cl. 560-238.000.
- Himont Incorporated: See—
Yu, Lin-Chen, 5,089,656, Cl. 560-75.000.
- Hinder, Ronald A.: See—
Filipi, Charles J.; DeMeester, Tom R.; Gibbs, Rebecca C.; and Hinder, Ronald A., 5,088,979, Cl. 604-26.000.
- Hirabayashi, Yuji; and Kanetoshi, Kazuhiko, to Nissan Motor Co., Ltd. Power plant structure for motor vehicle. 5,088,346, Cl. 74-606.00R.
- Hiraiwa, Shinji: See—
Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, 5,089,967, Cl. 364-426.020.
- Hirakawa, Osamu: See—
Ushijima, Mitsuru; Hirakawa, Osamu; Akimoto, Masami; Kimura, Yoshio; and Anai, Noriyuki, 5,089,305, Cl. 427-422.000.
- Hiramaki, Michiaki, to Jatco Corporation. Exhaust brake control of motor vehicle with automatic transmission. 5,088,348, Cl. 74-859.000.
- Hirano, Akiyoshi: See—
Mita, Hideo; Hirano, Akiyoshi; and Shiroshita, Yoshihira, 5,088,289, Cl. 62-6.000.
- Hirano, Ryogo: See—
Shioya, Toshiaki; and Hirano, Ryogo, 5,089,272, Cl. 424-493.000.
- Hirano, Yoshihiro: See—
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichi; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.
- Hirano, Yoshinao; Nagamori, Shigeru; Sato, Katsumi; and Murata, Katsuhide, to Mitsui Engineering and Shipbuilding Co., Ltd. Optical molding method. 5,089,184, Cl. 264-22.000.
- Hirano, Yoshinao; Sato, Katsumi; Shirai, Junji; and Nagamori, Shigeru, to Mitsui Engineering and Shipbuilding Co., Ltd. Optical molding method. 5,089,185, Cl. 264-22.000.
- Hiraoka, Satoshi, to Kabushiki Kaisha Toshiba. Image forming apparatus, and method of positioning the units incorporated in an image forming apparatus. 5,089,849, Cl. 355-211.000.
- Hirasa, Yoshiaki: See—
Yano, Haruto; Hirasa, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, 5,089,826, Cl. 342-457.000.
- Hirashima, Isao; and Iwamoto, Yasunori, to Mazda Motor Corporation. Air bag system for vehicle. 5,088,765, Cl. 280-732.000.
- Hirashima, Isao: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, 5,088,766, Cl. 280-775.000.
- Hiratsuka, Ryuichi: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuo, 5,089,824, Cl. 342-359.000.
- Hirayama, Ryuichi; Takashima, Susumu; Kanda, Masako; and Murata, Noriyasu, to Casio Computer Co., Ltd. Magnetic recording and/or reproducing apparatus having single head with two gaps and providing different lead angles in different operating states. 5,089,918, Cl. 360-70.000.
- Hirayama, Yasuhiko: See—
Ichitsuka, Takeshi; Hirayama, Yasuhiko; and Ogawa, Tetsuro, 5,089,195, Cl. 264-65.000.
- Hirobe, Yoshio: See—
Murasawa, Sadao; Hirobe, Yoshio; and Ando, Hitoshi, 5,089,367, Cl. 430-84.000.
- Hirokawa, Kazuto: See—
Konno, Daisuke; Miwa, Sachihiko; Aiyoshizawa, Shunichi; Kasahara, Kazuyuki; Sato, Yoshio; and Hirokawa, Kazuto, 5,089,732, Cl. 310-67.00R.
- Hirose, Hisashi; and Kouno, Kazuo, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Steering angle sensor. 5,088,319, Cl. 73-118.100.
- Hirose, Kunitaka: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji;

Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.

Hirota, Kazuhiro: See—
Hamanaka, Izumi; and Hirota, Kazuhiro, 5,088,717, Cl. 271-98.000.

Hirota, Koji: See—
Ueda, Satoshi; Hirota, Koji; Itoh, Makoto; Yoshida, Yukihiko; Hukuda, Hirokazu; and Hamashima, Shigeki, 5,089,705, Cl. 250-352.000.

Hirst, Donald J.: See—
Hegedus, Charles R.; Hirst, Donald J.; Green, William J.; and Eng, Anthony T., 5,089,551, Cl. 524-396.000.

Hishinuma, Minoru: See—
Namba, Hiroaki; and Hishinuma, Minoru, 5,089,587, Cl. 528-97.000.

Hitachi Chemical Company, Ltd.: See—
Imazumi, Junichi; Nomura, Hiroshi; Nagao, Kouichi; Suzuki, Masakatsu; Sakai, Kouichi; and Satou, Eikichi, 5,089,346, Cl. 428-458.000.

Hitachi, Ltd.: See—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; and Tomite, Toshio, 5,089,737, Cl. 310-154.000.

Ezaki, Shinobu; Kamino, Yukishige; and Tohka, Masaie, 5,088,908, Cl. 425-73.000.

Fukuta, Isao; Kawakita, Kenji; Kashio, Jiro; Torii, Yutaka; Gohara, Shinobu; and Endo, Noboru, 5,090,011, Cl. 370-60.000.

Hara, Fumio; Mita, Seiichi; Izumita, Morishi; and Tsuchinaga, Hiroyuki, 5,090,005, Cl. 369-97.000.

Kanda, Naoya; Ishikawa, Yasushi; Matsumoto, Kunio; and Asao, Hiroshi, 5,089,104, Cl. 204-192.110.

Kojima, Hiroyuki; Hatsuda, Toshio; Daikoku, Takahiro; Zushi, Shizuo; and Kobayashi, Fumiyuki, 5,089,936, Cl. 361-387.000.

Maruyama, Hiroshi; Kato, Takashi; and Taniguchi, Masaya, 5,088,297, Cl. 62-228.400.

Morinaga, Shigeki; and Watabe, Mitsuru, 5,089,955, Cl. 395-800.000.

Ogino, Masanori, 5,089,896, Cl. 358-239.000.

Omote, Tatsuyuki; Yoshida, Tomiharu; Maki, Hideo; Senoh, Makoto; Takahashi, Fuminobu; and Tsuchita, Kenji, 5,089,213, Cl. 376-248.000.

Ose, Yoichi; Higuchi, Yoshiya; and Miki, Kazuyoshi, 5,089,699, Cl. 250-306.000.

Owada, Nobuo; and Uda, Hizuru, 5,089,430, Cl. 437-31.000.

Yamamoto, Toshifumi; Takakura, Mitsuro; Yamaoka, Hiromasa; and Okada, Masakazu, 5,090,029, Cl. 375-107.000.

Yokosuka, Hirobumi; and Sakai, Yasuo, 5,089,819, Cl. 341-101.000.

Hitachi Maxell, Ltd.: See—
Gotoh, Akira; Yamazaki, Yukinobu; and Kikuchi, Naoyuki, 5,089,375, Cl. 430-271.000.

Yamamoto, Osamu; Sato, Akihiko; and Shiba, Hitoshi, 5,088,656, Cl. 242-199.000.

Hitachi Metals Ltd.: See—
Kondo, Takajiro, 5,088,370, Cl. 83-528.000.

Hitomi, Chiyoji: See—
Waters, Colin M.; Noakes, Timothy J.; Pavey, Ian; and Hitomi, Chiyoji, 5,088,807, Cl. 359-94.000.

Hivale, Almary M.: See—
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Kuder, James E., 5,089,304, Cl. 427-388.100.

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Johnson, James B., 5,089,503, Cl. 514-274.000.

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Williams, Dennis A.; Holfield, Phyllis K.; Looney, James R.; and McDougall, Lee A., 5,089,153, Cl. 252-8.555.

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Kawakami, Yasunobu; Hamazaki, Kagehisa; Arakawa, Toshihiko; and Mori, Toshiyuki, 5,089,448, Cl. 501-97.000.

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Honds, Leo: See—
Meyer, Karl-Hanns; and Honds, Leo, 5,088,805, Cl. 359-814.000.

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Derry, Robert W.; Callaghan, Timothy J.; Killpatrick, Joseph E.; and Seiber, Bruce A., 5,088,825, Cl. 356-350.000.

Kidder, Kenneth B.; and Adams, Wilmer L., 5,089,689, Cl. 219-506.000.

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Dijkhuis, Job; and Van Sandwijk, Anthonie, 5,089,242, Cl. 423-109.000.

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Hoover, Scott C.: See—
Trevathan, Larry C.; Hoover, Scott C.; and Smith, James C., 5,089,190, Cl. 264-45.900.

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Sato, Kimihiko; Suzuki, Risuke; and Horiuchi, Hiroshi, 5,089,459, Cl. 502-66.000.

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Helm, Herbert W.; Hornung, William R.; Khrakovsky, Ilya D.; and Steinbeiser, Fredrick L., 5,088,407, Cl. 101-350.000.

Horowitz, Zola P.: See—
Sudilovsky, Abraham; and Horowitz, Zola P., 5,089,502, Cl. 514-274.000.

Horsma, David A.: See—
Fang, Shou-Mean; Horsma, David A.; Peronnet, Guillaume; Fahy, Timothy E.; Au, Andrew N.; and Carlomagno, William D., 5,089,688, Cl. 219-505.000.

Horton, James A.; and Getz, Stephen M., to Vortex Systems, Inc. Fault tolerant computer backup system. 5,089,958, Cl. 395-575.000.

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Hoshi, Junichi; Satoh, Tamotsu; and Arikawa, Shiro, to Canon Kabushiki Kaisha. Photoelectric converting device having an electrode formed across an insulating layer on a control electrode and method for producing the same. 5,089,425, Cl. 437-3.000.

Hoshi, Kouichi: See—
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Hosoi, Takashi, to Kabushiki Kaisha Toshiba. Shaft lock device and portable information processing apparatus with shaft lock device. 5,088,156, Cl. 16-342.000.

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Hayama, Kazuhide; Hosokawa, Noritaka; Yazaki, Takao; and Noro, Masataka, 5,089,291, Cl. 427-54.100.

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House, J. C.; and House, Jonathan C., 5,088,514, Cl. 135-107.000.

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Yasuda, Hironori; and Tomoto, Yoshiharu, 5,088,157, Cl. 19-263.000.

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Howard, Vincent M.: See—
Jones, Aaron U.; Howard, Vincent M.; Kohler, Edward A.; Carter, Mark L.; Komori, Edward A.; Wijesinghe, Ralph; and McGeehee, Ronald W., 5,088,363, Cl. 83-35.000.

Howarth, Robert F., to United States of America, Navy. Flux containment device. 5,089,941, Cl. 362-154.000.

Howe, Randall R.; and Brown, Joseph P., to Thermoscan Inc. Unitary probe cover. 5,088,834, Cl. 374-158.000.

Howson, David C.; Smith, Andrew D.; and Simonelli, Richard A. Safety enhanced device and method for effecting

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Ross, Louis R.; Krumlauf, Paul R.; Wilson, Edward L.; and Hsu, Kuang-Hong, 5,089,544, Cl. 523-511.000.
- Hsu, Sheng T., to David Sarnoff Research Center, Inc. Self-aligned emitter BiCMOS process. 5,089,429, Cl. 437-31.000.
- Hu, Min H.; Smith, Allen C., Jr.; Wilson, Robert M.; Wepfer, Robert M.; and Braun, Howard E., to Westinghouse Electric Corp. Sludge removal system for removing sludge from heat exchangers. 5,088,451, Cl. 122-388.000.
- Huai-Xue Zhu, Judy C., heir: See—
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- Huang, Dong T., to Industrial Technology Research Institute. Mask making process. 5,089,361, Cl. 430-5.000.
- Huang, Shyh-Chin, to General Electric Company. High-niobium titanium aluminide alloys. 5,089,225, Cl. 420-418.000.
- Huang, Wu-Nan; Manwill, Niles R.; and Chen, Fung-Bor, to Becton, Dickinson and Company. Process for producing medical devices having antimicrobial properties. 5,089,205, Cl. 264-255.000.
- Huber, Hans-Joachim: See—
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- Huber, Klaus B.; Lerche, Nolan C.; Edwards, Arnold G.; Rozek, Kenneth E.; and Smith, Edward G., Jr., to Schlumberger Technology Corporation. Method and apparatus for safe transport handling arming and firing of perforating guns using a bubble activated detonator. 5,088,413, Cl. 102-202.500.
- Hudak, Thomas F.: See—
Dutt, Herbert V.; and Hudak, Thomas F., 5,088,613, Cl. 215-250.000.
- Hudspeth, James P.: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.
- Hue, Jean; and Graillat, Gerard, to Salomon S.A. Lateral guide apparatus for a cross country ski, and a ski shoe cooperable therewith. 5,088,756, Cl. 280-615.000.
- Huffman, John; and Shannon, John, to Safety Shot Limited Partnership. Environmentally improved shot. 5,088,415, Cl. 102-515.000.
- Hughes Aircraft Company: See—
Dewhirst, Donald R.; and Stultz, Robert D., 5,090,016, Cl. 372-3.000.
- Lippey, Barret, 5,089,439, Cl. 437-209.000.
- Megerle, Clifford A., 5,089,780, Cl. 324-448.000.
- O'Meara, Thomas R., 5,088,808, Cl. 359-276.000.
- Hughes, Ian L., to Woodbridge Foam Corporation. Process for manufacturing a padded element. 5,089,191, Cl. 264-46.500.
- Hughes, Leslie R.: See—
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- Hukuda, Hirokazu: See—
Ueda, Satoshi; Hirota, Koji; Itoh, Makoto; Yoshida, Yukihiko; Hukuda, Hirokazu; and Hamashima, Shigeki, 5,089,705, Cl. 250-352.000.
- Hulin, Bernard, to Pfizer Inc. 3-coxazolyl [phenyl, chromanyl or benzofuranyl]-2-hydroxypropionic acid derivatives and analogs as hypoglycemic agents. 5,089,514, Cl. 514-374.000.
- Hull, Harold L.; and Dowden, Patrick N. Forceful entry tool. 5,088,174, Cl. 29-254.000.
- Hultman, Carl A.: See—
Boland, Ross F.; Hultman, Carl A.; Vreeland, William E.; and Williams, Peter S., 5,088,202, Cl. 30-346.540.
- Hung, Chi-Wen: See—
Wilson, Charles R.; Gibson, Kirk R.; and Hung, Chi-Wen, 5,089,453, Cl. 502-211.000.
- Hunter, Alastair W.: See—
Bezawada, Rao S.; and Hunter, Alastair W., 5,089,013, Cl. 606-228.000.
- Hunter, James E.: See—
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- Hunter, Robert L.; and Duncan, Alexander, to Emory University. Method of treating ischemic tissue. 5,089,260, Cl. 424-78.380.
- Hurtig, Carl W.: See—
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Queyssac, Daniel; Robinson, Richard K.; and Husse, Kimi S., 5,089,877, Cl. 357-70.000.
- Hutchinson: See—
Thelamon, Jean; Saud, Jean-Luc; and Dubos, Daniel, 5,088,702, Cl. 267-140.10C.
- Huth, Hans-Ulrich: See—
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- Hutter, Gerhard. Dowel fastening device. 5,088,851, Cl. 403-14.000.
- Hutter, Klaus: See—
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- Hwang, C. H. Injection molding acupuncture acupoints with double safety device. 5,089,001, Cl. 606-189.000.
- Hwang, Wen-Fang: See—
Harris, William J.; and Hwang, Wen-Fang, 5,089,568, Cl. 525-410.000.
- Hycner, Stanley H.; Tupek, Garry F.; and Pelczarski, Walter J., to Rockwell International Corporation. Pressurized printing fluid input system for keyless lithographic printing. 5,088,402, Cl. 101-142.000.
- Hyde, Gilbert F.; and Berrong, David B., to Westinghouse Electric Corp. Engaging lever lock for rotor turning gear. 5,088,341, Cl. 74-405.000.
- Hydra-Lock Corporation: See—
Dietz, Richard A.; Laube, Robert; and Andre, Eugene R., Sr., 5,088,746, Cl. 279-4.000.
- Hydroimage: See—
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- Hygrade Metal Moulding Manufacturing Corp.: See—
Cole, Richard D.; and Anger, Howard T., 5,088,308, Cl. 72-46.000.
- Hyun-Bo Shim, Henry. Anti-theft device. 5,089,807, Cl. 340-568.000.
- Iannini, Robert E., to Bertone Inc. Amusement device incorporating gas discharge tube. 5,089,745, Cl. 315-76.000.
- Ibrahim, Abd-El-Fattah A.: See—
Jodoin, Ronald E.; Loce, Robert P.; Lama, William L.; Rees, James D.; Ibrahim, Abd-El-Fattah A.; and Appel, James J., 5,089,908, Cl. 359-212.000.
- Icaro Olivieri & C. S.p.A. Minuterie: See—
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- Ichida, Ken-ichi: See—
Nakashima, Kunio; Ishigane, Ryouichi; Tanaka, Takayuki; and Ichida, Ken-ichi, 5,089,354, Cl. 428-552.000.
- Ichii, Masaru; Fukuda, Kozo; and Morishita, Kenji, to Nissinbo Industries, Inc. Image-receiving paper for thermal sublimable dye transfer. 5,089,464, Cl. 503-227.000.
- Ichitsuka, Takeshi; Hirayama, Yasuhiko; and Ogawa, Tetsuro, to Asahi Kogaku Kogyo K.K. Method for producing calcium phosphate-based material. 5,089,195, Cl. 264-65.000.
- ICI Pharma: See—
Bird, Thomas G. C.; Crawley, Graham C.; Edwards, Philip N.; Girondeau, Jean-Marc M. M.; and Kingston, John F., 5,089,513, Cl. 514-365.000.
- Crawley, Graham C.; and Edwards, Martin P., 5,089,495, Cl. 514-253.000.
- Ide, Kinya: See—
Hayase, Yoshio; Matsumoto, Kohei; Kamei, Kazuo; Ide, Kinya; and Takahashi, Toshio, 5,089,043, Cl. 71-90.000.
- Idemitsu Kosan Company Limited: See—
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- Idemitsu Petrochemical Co., Ltd.: See—
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.
- Umeda, Takashi; Zemba, Seiichi; Hara, Kazuo; Takamoto, Katsunori; and Yokota, Shinichi, 5,089,553, Cl. 524-424.000.
- Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., to SmithKline Beckman Intercredit B.V. Substituted 4-aminoquinoline derivatives as gastric acid secretion inhibitors. 5,089,498, Cl. 514-235.200.
- Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., to SmithKline Beckman Intercredit B.V. Substituted 4-aminoquinoline derivatives as gastric acid secretion inhibitors. 5,089,504, Cl. 514-313.000.
- Igaki, Seigo; Shinzaki, Takashi; Yamagishi, Fumio; and Ikeda, Hiroyuki. Biological object detection apparatus. 5,088,817, Cl. 356-71.000.
- Iguchi, Yuji, to Daicel Chemical Industries, Ltd. Plastic-model kit. 5,088,598, Cl. 206-223.000.
- Imhe, Peter: See—
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- Ihms, David W., to Delco Electronics Corporation. Photo-feedback drive system. 5,089,748, Cl. 315-151.000.
- Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Microcomputer incorporating memory. 5,089,951, Cl. 395-275.000.
- Iino, Mitsutoshi; Nakato, Shirou; Shinkai, Seiichi; Shimojima, Hideki; and Kawaguchi, Hiromi, to Fuji Electric Co., Ltd.; and Fujifacom Corporation. Magnetic resonance imaging apparatus. 5,089,777, Cl. 324-309.000.
- Iizuka, Hajime: See—
Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.
- Iizuka, Yoshio; Oothuka, Yoshiyuki; Tanaka, Satoshi; and Yamamoto, Manabu, to Shimizu Construction Co., Ltd.; and Sanyo Chemical Industries, Ltd. Composition suited for addition to ground excavation stabilizing liquid, stabilizing liquid composition, and ground excavation method. 5,089,538, Cl. 523-132.000.
- Ike, Nobukatsu: See—
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- Ikeda, Hayato: See—
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- Ikeda, Hiroyuki: See—
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- Ikeda, Hitoshi: See—
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- Ikeda, Makoto, to Terumo Kabushiki Kaisha. Fetus monitoring apparatus. 5,088,497, Cl. 128-661.070.
- Ikeda, Makoto: See—
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- Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,088,721, Cl. 271-293.000.
- Yamamoto, Hiroshi, 5,088,709, Cl. 270-53.000.
- Yamamoto, Kazumi, 5,089,891, Cl. 358-164.000.
- Ikegaya, Isao; and Matsumoto, Tadashi, to Fuji Kiko Company, Limited. Seat arrangement for automotive vehicle with seat position adjusting system. 5,088,841, Cl. 297-344.000.
- Imaeda, Hirofumi, to Sanshin Kogyo Kabushiki Kaisha. Interlinking mechanism for multiple carburetor system. 5,088,468, Cl. 123-583.000.
- Imai, Naohiro: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Arik, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.
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- Imanishi, Ryo: See—
Fukumoto, Toshiyuki; and Imanishi, Ryo, 5,088,898, Cl. 417-347.000.
- Imao, Kouichi: See—
Miwa, Shinichi; Asami, Seiichi; Kajihara, Takehiro; and Imao, Kouichi, 5,089,449, Cl. 501-98.000.
- Imhof, Otwin: See—
Kistrup, Holger; and Imhof, Otwin, 5,089,301, Cl. 427-304.000.
- Imo Industries, GmbH: See—
Strzodka, Hubert, 5,089,673, Cl. 200-82.00C.
- Imo Industries, Inc.: See—
Nemeth, Frank A., 5,088,324, Cl. 73-291.000.
- Imoto, Yukihiko: See—
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- Imperial Chemical Industries PLC: See—
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- Bird, Thomas G. C.; Crawley, Graham C.; Edwards, Philip N.; Girondeau, Jean-Marc M. M.; and Kingston, John F., 5,089,513, Cl. 514-365.000.
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- Carey, John G.; Evans, Martin B.; and Rothon, Roger N., 5,089,539, Cl. 523-202.000.
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- Hart, Charles R., 5,089,347, Cl. 428-461.000.
- Leach, Roger J.; and Lindsay, James F., 5,089,076, Cl. 156-283.000.
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- Waters, Colin M.; Noakes, Timothy J.; Pavey, Ian; and Hitomi, Chiyoji, 5,088,807, Cl. 359-94.000.
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- Inaba, Makoto: See—
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- Inductotherm Corp.: See—
Mortimer, John H., 5,090,022, Cl. 373-156.000.
- Industrial Environmental Supply, Inc.: See—
Harp, Robert W., 5,088,530, Cl. 141-86.000.
- Industrial Insulations, Inc.: See—
Miller, Thomas M.; and Schraff, Raymond J., 5,088,262, Cl. 52-745.000.
- Industrial Technology Research Institute: See—
Huang, Dong T., 5,089,361, Cl. 430-5.000.
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Nichols, William R., 5,089,117, Cl. 210-93.000.
- Nichols, William R., 5,089,130, Cl. 210-232.000.
- Infusaid, Inc.: See—
Burke, Paul, 5,088,983, Cl. 604-141.000.
- Ing. Olivetti & C., S.p.A.: See—
De Falco, Gianfranco; and Brunero, Antonio, 5,088,848, Cl. 400-630.000.
- Inoue, Hajime: See—
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- Institutet for Verkstadsteknik: See—
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Tovar, Abel M.; Mendizabal, Oscar H. B.; Olmos, Leonardo M.; Sanchez, Carlos G. A.; Lorenzo, Roberto L.; Barba, Roldofo C.; and Perez, Rene H., 5,089,114, Cl. 208-50.000.
- Instrumentarium Corporation: See—
Merilainen, Pekka T.; Eskelinen, Kari; and Hanninen, Hannu E., 5,088,332, Cl. 73-861.650.
- Intellon Corporation: See—
Vander Mey, James E.; and Vander Mey, Timothy J., 5,090,024, Cl. 375-1.000.
- International Business Machines Corporation: See—
Bozman, Gerald P., 5,089,952, Cl. 395-725.000.
- Chang, Philip Y.; Coyle, Daniel J., Jr.; Malkemus, Timothy R.; Rodriguez, Rebecca A.; and Welti, Philip J., 5,089,985, Cl. 395-600.000.
- Chappell, Barbara A.; Chappell, Terry I.; and Schuster, Stanley E., 5,089,726, Cl. 307-530.000.
- Chow, William W.; Fennema, Alan A.; Henderson, Ian E.; and Kadlec, Ronald J., 5,090,002, Cl. 369-44.280.
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- Singh, Rama N.; and Wilczynski, Janusz S., 5,089,913, Cl. 359-727.000.
- International Canine Genetics: See—
Kuniyuki, Andrew H., 5,089,419, Cl. 436-65.000.
- International Door Closers, Inc.: See—
Linder, John P., 5,088,786, Cl. 292-92.000.
- International Flavors & Fragrances Inc.: See—
Zampino, Michael J.; Wilson, Richard A.; and Mookherjee, Braja D., 5,089,469, Cl. 512-22.000.
- International Marketing and Design Seating System, Inc.: See—
Morrison, Clark; and Stoyka, Charles F., 5,088,747, Cl. 297-219.000.
- International Technidyne Corp.: See—
La Duca, Frank M., 5,089,415, Cl. 435-269.000.
- Interroll Holding A. G.: See—
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- Inuishi, Masahide: See—
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- Iolab Corporation: See—
Dunks, Gary B.; Yamada, Akira; Kwon, Oh-Seung; and Borgelt, Andrea, 5,089,180, Cl. 264-1.700.
- Ionics, Incorporated: See—
Costa, Lawrence C., 5,089,192, Cl. 264-49.000.
- Iowa State University Research Foundation, Inc.: See—
Hammond, Earl G.; and Lee, Innok, 5,089,403, Cl. 435-134.000.
- King, Terry S.; and Sheffer, Gordon R., 5,089,532, Cl. 518-713.000.
- IRD Mechanalysis, Inc.: See—
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- Irica Instruments, Inc.: See—
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- Iriki, Masami: See—
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- Irvin, Scot A.; Merritt, Carleton G.; and Kowalski, Raymond G., to Borden, Inc. Method for making extruded pasta shapes. 5,089,284, Cl. 426-557.000.
- Isaji, Norifumi: See—
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- Isenberg, Joachim: See—
Ischebeck, Ernst F.; and Isenberg, Joachim, 5,088,866, Cl. 411-10.000.
- Ishida, Ryuji; and Kiuchi, Toyoo, to NEC Corporation. Disc control apparatus. 5,089,999, Cl. 369-32.000.
- Ishigane, Ryouichi: See—
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- Ishiguro, Takashi: See—
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- Ishihara Sangyo Kaisha, Ltd.: See—
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- Ishihara, Shinichi: See—
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- Ishihara, Takeshi: See—
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- Ishii, Kazuhiro: See—
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- Ishii, Kazuo: See—
Kato, Eiichi; and Ishii, Kazuo, 5,089,368, Cl. 430-96.000.
- Ishikawa, Masayoshi, to Yoshida Kogyo K.K. Door hinge system. 5,088,154, Cl. 16-252.000.
- Ishikawa, Norio: See—
Nakasa, Masayuki; Ishikawa, Norio; Hosomizu, Hiroshi; Izumi, Tatsuhiro; Yamazaki, Keiji; Miki, Yukio; and Katsuragi, Mamoru, 5,089,834, Cl. 354-145.100.
- Ishikawa, Yasushi: See—
Kanda, Naoya; Ishikawa, Yasushi; Matsumoto, Kunio; and Asao, Hiroshi, 5,089,104, Cl. 204-192.110.
- Ishimaru, Wataru, to Nissan Motor Co., Ltd. System for controlling hydraulic fluid pressure for V-belt type automatic transmission. 5,088,352, Cl. 74-867.000.
- Ishimoto, Zenichi, to Nikko Co., Ltd. Sound effect device for radio controllable toy vehicle. 5,088,955, Cl. 446-409.000.
- Ishioka, Hiroshi, to NEC Corporation. Semiconductor IC device containing a conductive plate. 5,089,876, Cl. 357-70.000.
- Ishiwara, Koichiro: See—
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- ISM Technologies, Inc.: See—
Magnuson, Gustav D.; Tooker, Joseph F.; and Treglio, James R., 5,089,707, Cl. 250-423.00R.
- Isobe, Minoru; Kimura, Haruo; and Suto, Shin-ichi, to Oki Electric Industry Co., Ltd. Automatic renting apparatus. 5,088,586, Cl. 194-205.000.
- Isono, Jun: See—
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- Isono, Nobuyuki: See—
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- Isota, Youji: See—
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- Isshiki, Kunihiko: See—
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- Istituto Guido Donegani S.p.A.: See—
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- Massardo, Pietro; Meazza, Giovanni; Bettarini, Franco; Castoro, Paolo; and Caprioli, Vincenzo, 5,089,525, Cl. 514-594.000.
- Isuzu Motors Limited: See—
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- Ito, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Control device case. 5,089,935, Cl. 361-383.000.
- Ito, Hisaharu: See—
Sakagami, Toshinori; Toyama, Yasuo; Ito, Hisaharu; and Miyachi, Takumi, 5,089,550, Cl. 525-314.000.
- Ito, Kenichi; and Kobayashi, Masatoshi, to Olympus Optical Co., Ltd. Information recording/reproducing apparatus. 5,090,001, Cl. 369-44.280.
- Ito, Naoki, to Fuji Electric Co., Ltd. Method of forming thin films. 5,089,289, Cl. 427-38.000.
- Ito, Noritugu; and Kawahara, Yuuji, to Brother Kogyo Kabushiki Kaisha. Dot matrix printer having a print head position adjusting feature dependent on an eccentricity of a platen. 5,088,842, Cl. 400-59.000.
- Ito, Shigehiro: See—
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- Ito, Taichi; and Tsukuda, Masato, to Matsushita Electric Industrial Co., Ltd. Block-divided driving apparatus of gradation thermal printhead. 5,089,831, Cl. 346-76.0PH.
- Ito, Yasuhiro: See—
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- Itoh, Akira: See—
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- Itoh, Eiichi; Nagase, Ryuichi; Saito, Kazuhiro; Hosaka, Hiroshi; and Nagai, Hihumi, to Nippon Mining Co., Ltd. Non-magnetic substrate of magnetic head, magnetic head and method for producing substrate. 5,089,196, Cl. 264-65.000.
- Itoh, Makoto: See—
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- Ito, Kazunori: See—
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- Ito, Shunji, to Japan Steel Works, Ltd., The. Vacuum cooling method and apparatus. 5,088,293, Cl. 62-100.000.
- ITT Corporation: See—
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- Iwai, Shingo: See—
Yoshioka, Hiroshi; and Iwai, Shingo, 5,088,900, Cl. 417-366.000.
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- Iwami, Mashahide; Murakami, Shigeomi; Saito, Fumitaka; Watanabe, Takao; and Akiyama, Masami, to Tachi-S Co., Ltd. Seat belt drawing angle adjustment device. 5,088,794, Cl. 297-483.000.
- Iwamoto, Yasunori: See—
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- Iwanaga, Kenichi: See—
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- Iwasa, Shoichi, to NEC Corporation. Two-transistor type non-volatile semiconductor memory. 5,089,866, Cl. 357-23.500.
- Iwasaki, Masayuki: See—
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- Iwasaki, Takashi: See—
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- Iwase, Ken: See—
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- Iwase, Masahiko: See—
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- Iwase, Seiichi, to Sony Corporation. Picture element number converter. 5,089,893, Cl. 358-180.000.
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- Iyer, S. Raja: See—
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- Izaki, Tsugio: See—
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- Izumi, Tatsuhiro: See—
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- Izumita, Morishi: See—
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- Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiko; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for determining deterioration of three-way catalysts in double air-fuel ratio sensor system. 5,088,281, Cl. 60-274.000.
- J. I. Case Company: See—
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- J & M Hydraulic Systems, Inc.: See—
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- J. M. Voith GmbH: See—
Kuhne, Viktor, 5,088,964, Cl. 464-68.000.
- Jaakko Poyry Oy: See—
Silander, Risto, 5,089,086, Cl. 162-19.000.
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Zaid, Najib H., 5,089,258, Cl. 424-76.100.
- Jackson, Cecil R.: See—
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- Jackson, Graham W., to JWI Ltd. Press section dewatering fabric. 5,089,324, Cl. 428-234.000.
- Jackson, Paul J.; Delhaize, Emmanuel; Robinson, Nigel J.; Unkefer, Clifford J.; and Furlong, Clement, to United States of America, Energy. Compositions containing poly (γ-glutamylcysteinyl)glycines. 5,089,470, Cl. 514-8.000.
- Jackson, Roger P. Spinal surgery table. 5,088,706, Cl. 269-323.000.
- Jacobelli, Henry L.: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.
- Jaen, Juan C.; Nickell, David G.; Reynolds, Donna M.; Smith, Sarah J.; Wise, Lawrence D.; and Wustrow, David J., to Warner-Lambert Company. Substituted piperazines as central nervous system agents. 5,089,497, Cl. 514-253.000.
- Jager, Arnold. Method and apparatus for producing conveyor belts having rigid carrier means. 5,088,177, Cl. 29-450.000.
- James, C. Thomas. Locking mechanism for a safe door. 5,088,776, Cl. 292-33.000.
- James, Charles W., Jr.; Carden, James R.; and Kirkland, William E., to W.C. Bradley Company. Access window for barbecue grills. 5,088,470, Cl. 126-41.00R.
- James, Frederick E., Jr.: See—
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- James River Corporation of Virginia: See—
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- James River II, Inc.: See—
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- Jansson, Conny: See—
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- Japanese Research and Development Association for Bioreactor System in Food Industry, The: See—
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- Jatco Corporation: See—
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- Jenssen, Jimmy R. Integral lap counter for radio-controlled models. 5,090,030, Cl. 377-5.000.
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- Joannic, Jean V.: See—
Bertrand, Jean M.; and Joannic, Jean V., 5,088,394, Cl. 100-12.000.
- Job, Robert C., to Shell Oil Company. Process for the production of elastomeric, primarily isotactic polyolefins and catalysts for use in said process. 5,089,573, Cl. 526-124.000.
- Jodai, Tetsuji: See—
Sibata, Kenichiro; Sasaki, Nobuyuki; Yazu, Shuji; and Jodai, Tetsuji, 5,089,465, Cl. 505-1.000.
- Jodelet, Francois, to Skis Rossignol S.A. Snow ski, procedure for its manufacture and device for the implementation of this procedure. 5,088,755, Cl. 280-609.000.
- Jodoin, Ronald E.; Loce, Robert P.; Lama, William L.; Rees, James D.; Ibrahim, Abd-El-Fattah A.; and Appel, James J., to Xerox Corporation. Plywood suppression in ROS systems. 5,089,908, Cl. 359-212.000.
- Joessel, Rainer: See—
Potthoff, Hans-Hermann; Scheffler, Ingolf; Ruch, Klaus; and Joessel, Rainer, 5,088,576, Cl. 181-290.000.
- Johann, Gerhard: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.
- Johansson, Eric B.; Matzner, Bruce; and Latter, Gerald M., to General Electric Company. Composite spacer with Inconel grid and Zircaloy band. 5,089,221, Cl. 376-442.000.
- John, Clarence D., Jr.; and Wengiewicz, Richard S., to Westinghouse Electric Corp. Rapid changeover multi-diameter ultrasonic tube inspection system. 5,088,328, Cl. 73-622.000.
- John T. Hepburn, Limited: See—
Ferguson, Andrew, 5,088,400, Cl. 100-257.000.
- Johnson, David R., to Chevron Research and Technology Company. Hydrodemetalation and hydrodesulfurization catalyst of specified macroporosity. 5,089,463, Cl. 502-313.000.
- Johnson, Donna E.: See—
Van Blarcom, David; and Johnson, Donna E., 5,089,148, Cl. 252-8.600.
- Johnson, Douglas A.: See—
Flynn, Richard M.; Johnson, Douglas A.; and Owens, John G., 5,089,152, Cl. 252-194.000.
- Johnson, Graham F.: See—
Smith, Trevor S.; Binns, John M.; Johnson, Graham F.; and Maker, Paul M., 5,088,278, Cl. 60-39.281.
- Johnson, James B., to Hoffmann-La Roche Inc. Temperature stable 5-fluorouracil compositions. 5,089,503, Cl. 514-274.000.
- Johnson, Jeff H.; and Bowers, Tom D., to Johnson, Jeff H. Applicator for applying liquids to the human body. 5,088,849, Cl. 401-44.000.
- Johnson, Jerry E., to Harrisburg, Inc. Mud pump valve. 5,088,521, Cl. 137-516.290.
- Johnson, Kevin M.: See—
Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.
- Johnson, Leonard W.; and Johnson, Thomas C., to LTJ Enterprises, Inc. Actuator for visual indicator. 5,088,323, Cl. 73-290.00R.
- Johnson, Randal A.: See—
Sohara, Joseph A.; Johnson, Randal A.; and Gorton, William E., 5,089,652, Cl. 558-480.000.
- Johnson, Russell I.: See—
Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., 5,088,881, Cl. 414-686.000.
- Johnson, Sheryl L.: See—
Clark, Bryan K.; Johnson, Sheryl L.; and Guerra, Robert, 5,090,008, Cl. 369-284.000.
- Johnson, Thomas C.: See—
Johnson, Leonard W.; and Johnson, Thomas C., 5,088,323, Cl. 73-290.00R.
- Johnson, Walter A. Gas purity analyzer and method. 5,088,315, Cl. 73-23.200.
- Johnson, William B. Method of manufacturing appliances for use in filling endodontically prepared root canals. 5,089,183, Cl. 264-16.000.
- Jones, Aaron U.; Howard, Vincent M.; Kohler, Edward A.; Carter, Mark L.; Komori, Edward A.; Wijesinghe, Ralph; and McGeehee, Ronald W., to Jones, Aaron U. Method and apparatus for an automatic sawmill. 5,088,363, Cl. 83-35.000.
- Jones, Andrew R.: See—
Koselka, Harvey; and Jones, Andrew R., 5,088,748, Cl. 280-11.200.
- Jones, Arthur A. Apparatus for exercising or testing rotary torso muscles. 5,088,727, Cl. 272-134.000.
- Jones, Daniel G.; and Cole, James A., to General Motors Corporation. Vehicle brake vacuum evacuation and brake fluid fill machine. 5,088,529, Cl. 141-59.000.
- Jones, Larren F., to ESCO Corporation. Excavator wear edge. 5,088,214, Cl. 37-141.00R.
- Joppien, Hartmut: See—
Wegner, Peter; Joppien, Hartmut; Homberger, Gunter; and Kohn, Armin, 5,089,662, Cl. 562-506.000.
- Jordan, Maureen L.: See—
Hampton, Douglas B.; Tilton, George W.; and Jordan, Maureen L., 5,089,270, Cl. 424-465.000.
- Joseph, Kuriacose: See—
Zdepski, Joel W.; Joseph, Kuriacose; Wakamori, Masahiro; and Yukitake, Takeshi, 5,089,888, Cl. 358-133.000.
- Joson, Michel; and Gregoire, Jean-Pierre, to Societe Anonyme dite: ALCATEL SATMAM. Device for selectively moistening envelope flaps. 5,088,442, Cl. 118-238.000.
- Jou, Yi-Her: See—
Khalil, Omar S.; Zurek, Thomas F.; Genger, Kevin R.; Pepe, Curtis J.; Jou, Yi-Her; and Cotter, Stephen M., 5,089,424, Cl. 436-518.000.
- Jouveinal S.A.: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.
- Joy Technologies Inc.: See—
Edmondson, Wayne L., 5,088,594, Cl. 198-731.000.
- O'Neill, Michael L., 5,088,797, Cl. 299-91.000.

Joyner, F. Carl, Jr., to Square D Company. DC bus voltage regulation by controlling the frequency in a variable frequency inverter. 5,089,760, Cl. 318-798.000.

Jungling, Ronald S.: See—
Driscoll, Carleton D.; Jungling, Ronald S.; and Najm, Elie M., 5,089,947, Cl. 363-20.000.

Junien, Jean-Louis: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gouret, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.

Junker, David M.; Wiedrich, Charles R.; and Simmons, Robert B., to PPG Industries, Inc. Chemical feed apparatus. 5,089,127, Cl. 210-206.000.

Jurgena, Larry F., to Sukup Manufacturing Company. Sensing apparatus for a guidance system. 5,088,561, Cl. 172-5.000.

JWI Ltd.: See—
Hansen, Victor E., 5,089,090, Cl. 162-351.000.

Jackson, Graham W., 5,089,324, Cl. 428-234.000.

Kabushiki Kaisha Daiken Seisakusho: See—
Inaba, Masakazu; Takenaka, Mitsuhiro; and Takeuchi, Hiroshi, 5,088,584, Cl. 192-89.00B.

Kabushiki Kaisha Daikin Seisakusho: See—
Takeuchi, Hiroshi; Iwase, Masahiko; Tojima, Hiromi; Murata, Ikuo; and Uenohara, Norihisa, 5,088,583, Cl. 192-70.270.

Kabushiki Kaisha Honda Rokku: See—
Nakamura, Hiroshi; Saita, Yoshinobu; and Ikeda, Hitoshi, 5,088,175, Cl. 29-430.000.

Kabushiki Kaisha Kenwood: See—
Watanabe, Shintaro; Yamaguchi, Yasushi; Nakayama, Shigeyuki; Namioka, Hirotsuka; and Terada, Hisashi, 5,090,023, Cl. 375-1.000.

Kabushiki Kaisha Kobe Seiko Sho: See—
Yoshimura, Shoji, 5,088,907, Cl. 418-201.300.

Kabushiki Kaisha Riken: See—
Ono, Sumio, 5,088,743, Cl. 277-141.000.

Kabushiki Kaisha Shinkawa: See—
Fujino, Noboru; and Takamura, Tooru, 5,088,401, Cl. 101-41.000.

Kabushiki Kaisha Shinsangyokaihsu: See—
Suzuki, Katsuo, 5,089,825, Cl. 342-425.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: See—
Hirose, Hisashi; and Kouno, Kazuo, 5,088,319, Cl. 73-118.100.

Kokuba, Sadao, 5,089,715, Cl. 307-10.100.

Ogasawara, Morihiko, 5,088,679, Cl. 248-479.000.

Kabushiki Kaisha Topcon: See—
Hideshima, Masayuki; Wada, Shinji; and Sekine, Akihiko, 5,088,811, Cl. 351-221.000.

Kabushiki Kaisha Toshiba: See—
Asahina, Hiroshi, 5,090,038, Cl. 378-41.000.

Hamaoka, Makoto, 5,088,296, Cl. 62-174.000.

Hiraoka, Satoshi, 5,089,849, Cl. 355-211.000.

Hosoi, Takashi, 5,088,156, Cl. 16-342.000.

Iijima, Yasuo, 5,089,951, Cl. 395-275.000.

Kamei, Yoshio; and Takeuchi, Minami, 5,089,719, Cl. 307-270.000.

Kobayashi, Tooru, 5,090,044, Cl. 378-145.000.

Komenaka, Kazuichi, 5,089,879, Cl. 357-72.000.

Koyama, Takeshi, 5,089,875, Cl. 357-51.000.

Miyagawa, Toyomi, 5,088,495, Cl. 128-660.100.

Ohmine, Toshimitsu; and Akagawa, Keiichi, 5,088,444, Cl. 118-719.000.

Ono, Tomio, 5,089,740, Cl. 310-328.000.

Takahashi, Yoshinori, 5,090,010, Cl. 369-291.000.

Tsubota, Junichi, 5,089,902, Cl. 358-497.000.

Yamagishi, Katsuki; Kashima, Koji; and Kubo, Toru, 5,088,646, Cl. 237-2.00B.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: See—
Iwaki, Takashi; Ito, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,088,452, Cl. 123-3.000.

Kawai, Katsunori; Ikeda, Hayato; Ishihara, Shinichi; Tanikawa, Kazuhiro; Yokomachi, Naoya; and Kawai, Toshihiro, 5,088,897, Cl. 417-269.000.

Kabushikikaisha Kibun: See—
Nozaki, Hisashi; and Sakurai, Seiya, 5,089,285, Cl. 426-573.000.

Kabushikikaisha Kyowashokuin: See—
Nozaki, Hisashi; and Sakurai, Seiya, 5,089,285, Cl. 426-573.000.

Kaczur, Jerry J.: See—
Cawfield, David W.; Kaczur, Jerry J.; Duncan, Budd L.; Mendiratta, Sudhir K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 5,089,095, Cl. 204-101.000.

Kadlec, Ronald J.: See—
Chow, William W.; Fennema, Alan A.; Henderson, Ian E.; and Kadlec, Ronald J., 5,090,002, Cl. 369-44.280.

Kadohara, Terutake: See—
Higashihara, Masaki; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, 5,089,843, Cl. 354-402.000.

Kagisho Pty. Ltd.: See—
Sussich, Marino R.; and Sussich, Paul, 5,089,132, Cl. 210-298.000.

Kai, Kozo: See—
Murakami, Seishi; Kai, Kozo; and Kato, Susumu, 5,088,697, Cl. 266-250.000.

Kai, Yasunobu: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.

Kaieda, Shozo; and Toyota, Kazuaki. Apparatus for supplementing developing agent into image forming machine. 5,089,854, Cl. 355-260.000.

Kaiser, Herbert J., to Calgon Corporation. Compositions and method for applying coatings to metallic surfaces. 5,089,349, Cl. 428-472.100.

Kajihara, Takehiro: See—
Miwa, Shinichi; Asami, Seiichi; Kajihara, Takehiro; and Imao, Kouichi, 5,089,449, Cl. 501-98.000.

Kajikawa, Akira; and Saito, Kenji, to Sumitomo Rubber Industries, Ltd. Apparatus and method for observing the ground contact patch of a tire. 5,088,321, Cl. 73-146.000.

Kajima Corporation: See—
Asawa, Makoto; Matuzaki, Kenji; and Bando, Kazuo, 5,088,872, Cl. 414-352.000.

Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, to Mitsui Toatsu Chemicals Incorporated. (—)-2-pyrazoline compounds and therapeutic agent for cerebrovascular disorders containing the same as effective ingredient. 5,089,622, Cl. 546-262.000.

Kajiyama, Hiroshi; Michihira, Osamu; and Tokunaga, Toshimichi, to Mazda Motor Corporation. Multiplex transmission system for use in a vehicle. 5,090,012, Cl. 370-85.300.

Kakinuma, Kazuo: See—
Yamamoto, Shosaku; and Kakinuma, Kazuo, 5,089,569, Cl. 525-452.000.

Kakizaki, Junichi; and Yamaga, Kenichi, to Tokyo Electron Sagami Limited. Heat-treatment apparatus having exhaust system. 5,088,922, Cl. 432-152.000.

Kakizaki, Shinobu; Yamaoka, Fumiyuki; Sasaki, Mitsuo; Shimizu, Hiroyuki; and Emura, Junichi, to Atsugi Unisia Corporation. Semi-active suspension control system with reduced switching frequency in hard and soft suspension characteristics. 5,088,760, Cl. 280-707.000.

Kakuchi, Junji: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.

Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, to Asahi Denka Kogyo K.K. Photopolymerizable composition and processes using acridine photoinitiators. 5,089,377, Cl. 430-325.000.

Kali-Chemie AG: See—
Gerling, Klaus; Heinemann, Henning; Meier, Andreas; and Langger, Klaus, 5,089,492, Cl. 514-210.000.

Kalkbrenner, Ralph W.: See—
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,088,184, Cl. 29-599.000.

Kalman, Jeffrey M.: See—
Nottingham, John R.; Spirk, John W.; Kalman, Jeffrey M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,088,180, Cl. 29-525.000.

Kam, Chih-Min: See—
Powers, James C.; Kam, Chih-Min; Oleksyszyn, Josef; Glinski, J. A.; and Hernandez, M. A., 5,089,633, Cl. 549-285.000.

Powers, James C.; and Kam, Chih-Min, 5,089,634, Cl. 549-285.000.

Kamada, Shinya; and Mishima, Hidehiko, to Mazda Motor Corporation. Automatic transmission control system. 5,088,357, Cl. 74-868.000.

Kamata, Eitaro, to Shoei Kako Kabushiki Kaisha. Helmet. 5,088,129, Cl. 2411.000.

Kamata, Eitaro, to Shoei Kako Kabushiki Kaisha. Helmet with locking portion for holding shield plate in closed position. 5,088,131, Cl. 2424.000.

Kamei, Hideo: See—
Ohkuma, Hiroaki; Tomita, Koji; Konishi, Masataka; and Kamei, Hideo, 5,089,522, Cl. 514-460.000.

Kamei, Kazuo: See—
Hayase, Yoshio; Matsumoto, Kohei; Kamei, Kazuo; Ide, Kinya; and Takahashi, Toshio, 5,089,043, Cl. 71-90.000.

Kamei, Kiyohiro: See—
Tominaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, 5,089,071, Cl. 156-89.000.

Kamei, Yoshio; and Takeuchi, Minami, to Kabushiki Kaisha Toshiba. Drive circuit for a semiconductor device with high voltage for turn-on and low voltage for normal operation. 5,089,719, Cl. 307-270.000.

Kamen, Dean L. Valve system with removable fluid interface. 5,088,515, Cl. 137-15.000.

Kameyama, Keiji: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Ariki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.

Kamikado, Koji: See—
Hayashi, Hirokazu; Aihara, Tetsuo; Nagaoka, Haruo; Kamikado, Koji; and Nakatani, Eisaku, 5,089,101, Cl. 204-181.700.

Kamino, Yukishige: See—
Ezaki, Shinobu; Kamino, Yukishige; and Tohkai, Masaie, 5,088,908, Cl. 425-73.000.

Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, to Eisai Co., Ltd. 3-propenylcephem derivative. 5,089,491, Cl. 514-206.000.

Kammermaier, Johann: See—
Kleeberg, Wolf; Kammermaier, Johann; and Schulte, Rolf-Winfried, 5,089,290, Cl. 427-41.000.

Kamoshida, Masakazu: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Kamoshida, Masakazu, 5,089,314, Cl. 428-156.000.

Kamyr, Inc.: See—
Elmore, Carl L.; Mullen, Mark A.; Emery, George D.; and Carter, Timothy R., 5,089,087, Cl. 162-46.000.

Kan, Masanori; and Oda, Keiji, to Toyo Tire & Rubber Co., Ltd. Radial tire with a sidewall having a three-layer structure. 5,088,537, Cl. 152-525.000.

Kanaley, James D.: See—
Pelaneck, Geraldine A.; Zercie, Robert W.; and Kanaley, James D., 5,089,389, Cl. 435-7.360.

Kanayama, Toshiji: See—
Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; and Kanayama, Toshiji, 5,089,494, Cl. 514-248.000.

Kanda, Masahiko, to Sumitomo Electric Industries, Ltd. Meat freshness measuring apparatus. 5,088,822, Cl. 356-326.000.

Kanda, Masako: See—
Hirayama, Ryuichi; Takashima, Susumu; Kanda, Masako; and Murata, Noriyasu, 5,089,918, Cl. 360-70.000.

Kanda, Naoya; Ishikawa, Yasushi; Matsumoto, Kunio; and Asao, Hiroshi, to Hitachi, Ltd. Method and apparatus for forming a multiple-element thin film based on ion beam sputtering. 5,089,104, Cl. 204-192.110.

Kanda, Ryouji; and Yosida, Kiyohiko, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having elastic body pre-compressed by stopper member. 5,088,700, Cl. 267-140.10A.

Kanda, Ryouji, to Tokai Rubber Industries, Ltd. Fluid-filled upper support for shock absorber having a pair of truncated conical elastic members. 5,088,704, Cl. 267-220.000.

Kanegae, Takahiro, to Brother Kogyo Kabushiki Kaisha. Sewing machine individually driving needle bar and looper. 5,088,429, Cl. 112-275.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Ariki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.

Kaneko, Toshihiko, to Esute Chemical Corporation. Dehumidifier. 5,089,035, Cl. 55-221.000.

Kaneko, Yutaka, to Ricoh Company, Ltd. Image reading apparatus. 5,089,901, Cl. 358-474.000.

Kaneta, Tomoo: See—
Kiyota, Hirotaka; Kaneta, Tomoo; Nakajima, Masaaki; and Kurihara, Masakazu, 5,088,719, Cl. 271-182.000.

Kanetoshi, Kazuhiko: See—
Hirabayashi, Yuji; and Kanetoshi, Kazuhiko, 5,088,346, Cl. 74-606.00R.

Kang, Joseph H.: See—
Fallin, Thomas W.; and Kang, Joseph H., 5,089,003, Cl. 606-85.000.

Kanithi, Hem C. Process for producing fine and ultrafine filament superconductor wire. 5,088,183, Cl. 29-599.000.

Kanne, David B.: See—
Broadhurst, Michael D.; Cromartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter Michael R., 5,089,623, Cl. 546-300.000.

Kanno, Tomoaki; Matsushima, Yoshihisa; and Suzuki, Makoto, to Tonen Chemical Corporation. High-strength non-woven fabric, method of producing same and battery separator constituted thereby. 5,089,360, Cl. 429-254.000.

Kanota, Keiji; Inoue, Hajime; and Seki, Takahito, to Sony Corporation. Digital signal recovery apparatus with minimized high frequency noise. 5,089,917, Cl. 360-45.000.

Kansai Paint Co., Ltd.: See—
Hayashi, Hirokazu; Aihara, Tetsuo; Nagaoka, Haruo; Kamikado, Koji; and Nakatani, Eisaku, 5,089,101, Cl. 204-181.700.

Nishida, Reiziro; and Tominaga, Akira, 5,089,542, Cl. 523-410.000.

Kansky, John: See—
Beach, Kirk W.; Phillips, David J.; and Kansky, John, 5,088,498, Cl. 128-661.070.

Kantner, Steven S.: See—
Kumar, Ramesh C.; and Kantner, Steven S., 5,089,336, Cl. 428-352.000.

Kanto, Auto Works, Ltd.: See—
Asawa, Makoto; Matuzaki, Kenji; and Bando, Kazuo, 5,088,872, Cl. 414-352.000.

Kanto Jidosha Kogyo Kabushiki: See—
Fujiwara, Hidekazu; Motogami, Kenji; and Mori, Shigeo, 5,089,199, Cl. 264-83.000.

Kao Corporation: See—
Hashimoto, Jiro; Nomoto, Shogo; Nozawa, Masanori; and Kubo, Makoto, 5,089,029, Cl. 44-432.000.

Tagami, Hidetoshi; and Kawase, Jiro, 5,089,026, Cl. 8-435.000.

Kape, Sandy N. Drop down cuff arrangement for pant legs or sleeves. 5,088,128, Cl. 2-269.000.

Kapsokavathis, Nick S.; and Sanders, Stephen P., to General Motors Corporation. Capacitive fuel composition sensor with padding capacitor. 5,089,783, Cl. 324-672.000.

Karav, Islam K. O.; Shikhilinsky, Talat M. O.; Polikhronov, Konstantin P.; Sutovsky, Pavel M.; Avakian, Emilia V.; Semkin, Nikolai V.; Rabinovich, Avraam M.; and Dzhabarov, Rauf D. Method for making sucker rods. 5,088,638, Cl. 228-112.000.

Karmanian, Arthur J., to United Technologies Corporation. Bleed stability door. 5,088,660, Cl. 244-53.00B.

Karger, Barry L.; Giese, Roger W.; and Szoko, Eva, to Northeastern University. High performance capillary gel electrophoresis. 5,089,106, Cl. 204-299.00R.

Karhu, Niilo, to Lemminkainen OY. Pivotal glazing for a balcony. 5,088,236, Cl. 49-127.000.

Karnas, Michael A.: See—
Grossman, David G.; and Karnas, Michael A., 5,089,306, Cl. 428-35.100.

Karrasch, Wallace R.: See—
Anderson, Philip A.; Bernau, William A.; Breckenfeld, Paul W.; Broughton, George L.; and Karrasch, Wallace R., 5,088,344, Cl. 74-572.000.

Kasahara, Kazuyuki: See—
Konno, Daisuke; Miwa, Sachihiko; Aiyoshizawa, Shunichi; Kasahara, Kazuyuki; Sato, Yoshio; and Hirokawa, Kazuto, 5,089,732, Cl. 310-67.00R.

Kashida, Meguru; Kubota, Yoshihiro; and Nagata, Yoshihiko, to Shin-Etsu Chemical Co., Ltd. Silicon carbide membrane for X-ray lithography and method for the preparation thereof. 5,089,085, Cl. 156-659.100.

Kashima, Koji: See—
Yamagishi, Katsuki; Kashima, Koji; and Kubo, Toru, 5,088,646, Cl. 237-2.00B.

Kashio, Jiro: See—
Fukuta, Isao; Kawakita, Kenji; Kashio, Jiro; Torii, Yutaka; Gohara, Shinobu; and Endo, Noboru, 5,090,011, Cl. 370-60.000.

Kasina, Sudhakar: See—
Fritzberg, Alan R.; Vanderheyden, Jean-Luc E.; Kasina, Sudhakar; and Fitzner, Jeffrey N., 5,089,249, Cl. 424-1.100.

Kastner, Arnold. Portable manually operable cigarette making machine. 5,088,506, Cl. 131-70.000.

Katagishi, Yoshihiro; Miyazawa, Takeshi; Kiyota, Hiroyuki; and Fujii, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Refrigerator. 5,088,288, Cl. 62-6.000.

Katimex-Cielker GmbH: See—
Cielker, Werner, 5,088,654, Cl. 242-85.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,089,368, Cl. 430-96.000.

Kato, Hideto, to Shin-Etsu Chemical Co., Ltd. Polyimide resin solution compositions. 5,089,549, Cl. 524-287.000.

Kato, Ikunoshin: See—
Kondo, Akihiro; Kato, Yoshiyuki; Kato, Ikunoshin; and Tsuruta, Hisao, 5,089,230, Cl. 422-64.000.

Kato, Kazuro: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Iiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.

Kato, Koji: See—
Kawase, Hiroyuki; and Kato, Koji, 5,089,312, Cl. 428-139.000.

Kato, Nobuhide; and Katsu, Masanori, to NGK Insulators, Ltd. Waterproof type oxygen sensor. 5,089,133, Cl. 204-427.000.

Kato, Susumu: See—
Murakami, Seishi; Kai, Kozo; and Kato, Susumu, 5,088,697, Cl. 266-250.000.

Kato, Takashi: See—
Maruyama, Hiroshi; Kato, Takashi; and Taniguchi, Masaya, 5,088,297, Cl. 62-228.400.

Kato, Tokunori: See—
Morisaki, Hiroshi; and Kato, Tokunori, 5,089,691, Cl. 235-375.000.

Kato, Yoshiyuki: See—
Kondo, Akihiro; Kato, Yoshiyuki; Kato, Ikunoshin; and Tsuruta, Hisao, 5,089,230, Cl. 422-64.000.

Katre, Nandini: See—
Nitecki, Danute E.; Katre, Nandini; Goodson, Robert J.; and Aldwin, Lois, 5,089,261, Cl. 424-85.200.

Kats, Simon. Collapsible water bike. 5,088,944, Cl. 440-26.000.

Katsaros, Mark G.: See—
Zimmel, John M.; Katsaros, Mark G.; and Bunnelle, William L., 5,089,548, Cl. 524-272.000.

Katsu, Kanemasa: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.

Katsu, Masanori: See—
Kato, Nobuhide; and Katsu, Masanori, 5,089,133, Cl. 204-427.000.

Katsube, Toshimichi: See—
Ohnishi, Hiroshi; Yoshimizu, Toshiyuki; Wada, Masakazu; Kuwagaki, Hiroshi; and Katsube, Toshimichi, 5,089,906, Cl. 359-73.000.

Katsumi, Ikuo: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Ariki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.

Katsunuma, Tatsuo: See—
Mabuchi, Seiya; and Katsunuma, Tatsuo, 5,088,474, Cl. 128-52.000.

Katsuragi, Mamoru: See—
Nakasa, Masayuki; Ishikawa, Norio; Hosomizu, Hiroshi; Izumi, Tatsuro; Yamazaki, Keiji; Miki, Yukio; and Katsuragi, Mamoru, 5,089,834, Cl. 354-145.100.

Katz, Avishay, to AT&T Bell Laboratories. Method of making an article comprising a TiN_x layer. 5,089,438, Cl. 437-184.000.

- Katz, David P. Egg phosphatide lipid emulsions altered for a specific therapeutic fatty acid composition. 5,089,268, Cl. 424-450.000.
- Katz, Philip R., to Cosrich Incorporated. Container overcap seal. 5,088,611, Cl. 215-230.000.
- Kaw, James U.; and Steuri, Laurie B., to Procter & Gamble Company, The. Laundry detergent bars free of C₁₂-C₁₈ fatty acids and containing an alkylbenzene sulfonate, an alkyl sulfonate and a fatty alcohol. 5,089,174, Cl. 252-553.000.
- Kawabata, Kazunobu: See—
Fukushima, Naoto; Yamaguchi, Hirotosugu; Akatsu, Yohsuke; Hano, Sunao; and Kawabata, Kazunobu, 5,089,966, Cl. 364-424.050.
- Kawabe, Yasumasa: See—
Uenishi, Kazuya; Kawabe, Yasumasa; and Kokubo, Tadayoshi, 5,089,373, Cl. 430-191.000.
- Kawaguchi, Hiromi: See—
Iino, Mitsutoshi; Nakato, Shirou; Shinkai, Seiichi; Shimojima, Hideki; and Kawaguchi, Hiromi, 5,089,777, Cl. 324-309.000.
- Kawaguchi, Takafumi: See—
Mizukata, Katsuya; Takeda, Makoto; Take, Hiroshi; and Kawaguchi, Takafumi, 5,089,792, Cl. 331-17.000.
- Kawahara, Hiroshi: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.
- Kawahara, Setsuko; Koyama, Noboru; Nakano, Yasushi; and Nakajima, Noboru, to Konica Corporation. Magnetic recording medium. 5,089,333, Cl. 428-329.000.
- Kawahara, Yuuji: See—
Ito, Noritugu; and Kawahara, Yuuji, 5,088,842, Cl. 400-59.000.
- Kawai, Katsunori; Ikeda, Hayato; Ishihara, Shinichi; Tanikawa, Kazuhiro; Yokomachi, Naoya; and Kawai, Toshihiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor with internal refrigerant and lubricant separating system. 5,088,897, Cl. 417-269.000.
- Kawai, Toshihiro: See—
Kawai, Katsunori; Ikeda, Hayato; Ishihara, Shinichi; Tanikawa, Kazuhiro; Yokomachi, Naoya; and Kawai, Toshihiro, 5,088,897, Cl. 417-269.000.
- Kawakami, Yasunobu; Hamazaki, Kagehisa; Arakawa, Toshihiko; and Mori, Toshiyuki, to Honda Giken Kogyo Kabushiki Kaisha; and Tosoh Corporation. Silicon nitride sintered body having excellent high-temperature strength and method of producing same. 5,089,448, Cl. 501-97.000.
- Kawakita, Kenji: See—
Fukuta, Isao; Kawakita, Kenji; Kashio, Jiro; Torii, Yutaka; Gohara, Shinobu; and Endo, Noboru, 5,090,011, Cl. 370-60.000.
- Kawakita, Toshio: See—
Nakae, Kiyohiko; Kawakita, Toshio; Kume, Takanori; and Sugiyama, Masashi, 5,089,323, Cl. 428-220.000.
- Kawamura, Kohei: See—
Koshiishi, Akira; Kawamura, Kohei; and Takayama, Naoki, 5,089,747, Cl. 315-111.810.
- Kawamura, Mishio: See—
Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Masamoto; Ohba, Sachiko; and Ohkishi, Haruyuki, 5,089,402, Cl. 435-96.000.
- Kawamura, Takashi: See—
Sawada, Shuzo; Kawamura, Takashi; Masuho, Yasuhiko; and Tomibe, Katsuhiko, 5,089,262, Cl. 424-87.000.
- Kawasaki Steel Corporation: See—
Okada, Susumu; Imanaka, Makoto; Masui, Susumu; Obara, Takashi; Shinozaki, Masatoshi; and Tsunoyama, Kozo, 5,089,068, Cl. 148-328.000.
- Kawase, Hiroyuki; and Kato, Koji, to NGK Insulators, Ltd. Ceramic-metal joined composite bodies with a curved bottom metal recess. 5,089,312, Cl. 428-139.000.
- Kawase, Jiro: See—
Tagami, Hidetoshi; and Kawase, Jiro, 5,089,026, Cl. 8-435.000.
- Kawashima, Masao: See—
Murata, Yumiko; Otsuka, Masako; Saimoto, Hiroshi; and Kawashima, Masao, 5,089,410, Cl. 435-240.450.
- Kawashima, Yoshikatsu: See—
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,088,837, Cl. 374-185.000.
- Kawata, Ken: See—
Ozaki, Hiroyuki; Kawata, Ken; and Ohmatsu, Hideki, 5,089,378, Cl. 430-351.000.
- Kawata, Shoji: See—
Miyake, Osamu; Suzumura, Nobuyasu; and Kawata, Shoji, 5,088,351, Cl. 74-866.000.
- Kawatsu, Hiroyuki: See—
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Aiki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.
- Kawazura, Hiroshi: See—
Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.
- Kayanuma, Nobuaki: See—
Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiro; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, 5,088,281, Cl. 60-274.000.
- Kaye, Michael C.; and Bemanian, Majid, to MSCL, Inc. Processor for color video signals. 5,089,882, Cl. 358-28.000.
- Kaye, Paul H.: See—
Ludlow, Ian; and Kaye, Paul H., 5,089,714, Cl. 250-574.000.
- Keaney, Carl J. Indicator for an indicating device. 5,088,440, Cl. 116-298.000.
- Keenan, Thad: See—
Stritmatter, Ronald L., 5,088,436, Cl. 141-234.000.
- Keener, Richard: See—
Rice, Verle L.; and Keener, Richard, 5,088,369, Cl. 83-783.000.
- Kehrer, Wolfgang: See—
Brucher, Peter; Kehrer, Wolfgang; and Bormann, Dieter, 5,088,551, Cl. 165-134.100.
- Kelch, Richard A.: See—
Thompson, Harold E.; and Kelch, Richard A., 5,089,041, Cl. 71-64.110.
- Kelliher, Richard; and Schutt, Martin. Glove dispenser. 5,088,620, Cl. 221-59.000.
- Kemmler, Ralf-Rainer; Stehle, Hans P.; and Decool, Andreas, to Andreas, Stihl. Composite crankshaft for a two-stroke engine. 5,088,345, Cl. 74-598.000.
- Kemp, David B.; and Covington, Roger G., to Eastman Kodak Company. Film cassette with protruberance on film leader to position leader relative to stripper. 5,089,837, Cl. 354-275.000.
- Kenmotsu, Isami: See—
Takahashi, Junji; and Kenmotsu, Isami, 5,090,006, Cl. 369-258.000.
- Kennametal Inc.: See—
Niebauer, Kenneth L.; and Lockard, Thomas A., 5,088,862, Cl. 407-114.000.
- Ker, Victoria S.: See—
Tsang, Charles Y.; and Ker, Victoria S., 5,088,833, Cl. 374-17.000.
- Kerey, Apor; and Deliverias, Peter, to Prime Computer, Inc. Method of making a semiconductor heat sink. 5,089,443, Cl. 437-246.000.
- Kertesz, Emery, III. Ceiling speaker system. 5,088,574, Cl. 181-150.000.
- Kertz, Malcolm G., to Agnitar, Inc. Automated system for micro-propagation and culturing organic material. 5,088,231, Cl. 47-1.010.
- Keicham, Thomas D.; Sanderson, Wayne B., deceased (by Sanderson, Stuart R., administrator); St. Julien, Dell J.; and Wexell, Kathleen A., to Corning Incorporated. Thin flexible sintered structures. 5,089,455, Cl. 501-104.000.
- Kettler, Theodore: See—
Mahar, Jeffrey T.; Ransohoff, Thomas C.; Levin, Adam H.; and Kettler, Theodore, 5,089,124, Cl. 210-198.200.
- Keuro Maschinenbau GmbH & Co. KG: See—
Stolzer, Armin, 5,088,364, Cl. 83-43.000.
- Khalil, Omar S.; Zurek, Thomas F.; Genger, Kevin R.; Pepe, Curtis J.; Jou, Yi-Her; and Cotter, Stephen M., to Abbott Laboratories. Method and apparatus for heterogeneous chemiluminescence assay. 5,089,424, Cl. 436-518.000.
- Khrakovsky, Ilya D.: See—
Helm, Herbert W.; Hornung, William R.; Khrakovsky, Ilya D.; and Steinbeiser, Fredrick L., 5,088,407, Cl. 101-350.000.
- Kia, Hamid Q., to General Motors Corporation. Dual charge compression molding method. 5,089,206, Cl. 264-255.000.
- Kidder, Kenneth B.; and Adams, Wilmer L., to Honeywell Inc. Flame safeguard control anti-swap feature. 5,089,689, Cl. 219-506.000.
- Kiel, Johnathan L.; Erwin, David N.; and Simmons, David M., to United States of America, Air Force. Method of culturing cells in a flow-through cell cultivation system. 5,089,385, Cl. 435-3.000.
- Kiely, John; and Van Kruistum, Peter. System for testing elastic components and methods of using same. 5,088,333, Cl. 73-862.530.
- Kikuchi, Kenichi; Suzuki, Akio; and Mochizuki, Tetsuro, to Nippon Kokan Kabushiki Kaisha. Coal gasification apparatus using coal powder. 5,089,031, Cl. 48-77.000.
- Kikuchi, Naoyuki: See—
Gotoh, Akira; Yamazaki, Yukinobu; and Kikuchi, Naoyuki, 5,089,375, Cl. 430-271.000.
- Kikuchi, Shuji; Yamaguchi, Mitsuyuki; and Matsudo, Masahiko, to Tokyo Electron Limited. Ion implantation equipment. 5,089,710, Cl. 250-492.300.
- Killpatrick, Joseph; and Priddy, Lloyd W., to Honeywell Inc. Laser beam control for a ring-laser gyro. 5,088,824, Cl. 356-350.000.
- Killpatrick, Joseph E.: See—
Derry, Robert W.; Callaghan, Timothy J.; Killpatrick, Joseph E.; and Seiber, Bruce A., 5,088,825, Cl. 356-350.000.
- Kim, Byung C.: See—
Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., 5,089,624, Cl. 546-321.000.
- Kim, Chang S.: See—
Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., 5,089,624, Cl. 546-321.000.
- Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., to Yuhan Corporation. Dihydropyridine derivatives. 5,089,624, Cl. 546-321.000.
- Kim, Dong Young, to Samsung Electronics Co., Ltd. Video blanking system for a video cassette recorder combined with a video camera. 5,089,898, Cl. 358-335.000.
- Kim, Gyu D.: See—
Kim, Ki M.; and Kim, Gyu D., 5,088,579, Cl. 184-6.160.
- Kim, Ji K. Come back solo tennis. 5,088,732, Cl. 273-29.00A.
- Kim, Ki M.; and Kim, Gyu D., to Samsung Electronics Co., Ltd. Oil pickup structure of a compressor. 5,088,579, Cl. 184-6.160.
- Kim, Wan J.; Park, Myung H.; and Oh, Jong H., to Korea Research Institute of Chemical Technology. Diazabicyclo amine compounds

- which are intermediates for anti-bacterial compounds. 5,089,621, Cl. 546-113.000.
- Kimura, Haruo: See—
Isobe, Minoru; Kimura, Haruo; and Suto, Shin-ichi, 5,088,586, Cl. 194-205.000.
- Kimura, Kiyoshi; Yamaguchi, Takeshi; Morita, Iwao; and Murakami, Tetsuo, to Nippon Shinyaku Co., Ltd. Butanol derivatives. 5,089,529, Cl. 514-648.000.
- Kimura, Yoshio: See—
Ushijima, Mitsuru; Hirakawa, Osamu; Akimoto, Masami; Kimura, Yoshio; and Anai, Noriyuki, 5,089,305, Cl. 427-422.000.
- King, Anthony O., to Merck & Co., Inc. Process for preparing an angiotensin II antagonist. 5,089,626, Cl. 548-253.000.
- King, Francis: See—
Agee, John M.; and King, Francis, 5,089,000, Cl. 606-170.000.
- King, James P., to Desilube Technology, Inc. Recirculating powder lubricant delivery systems using thermally and oxidatively stable solid lubricants. 5,089,154, Cl. 252-28.000.
- King, Kevin F.: See—
Toth, Thomas L.; King, Kevin F.; and Crawford, Carl R., 5,090,037, Cl. 378-4.000.
- King, Terry S.; and Sheffer, Gordon R., to Iowa State University Research Foundation, Inc. Catalyst, method of producing and using same for production of methanol and higher alcohols. 5,089,532, Cl. 518-713.000.
- Kingston, John F.: See—
Bird, Thomas G. C.; Crawley, Graham C.; Edwards, Philip N.; Girodeau, Jean-Marc M. M.; and Kingston, John F., 5,089,513, Cl. 514-365.000.
- Kinka, Mikio: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ipepi; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.
- Kirihata, Yoshihiro; Murata, Chikara; Tsukamoto, Masahide; and Nishimura, Yutaka, to Tomoe-gawa Paper Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Transfer recording medium utilizing diazo or azide compounds wherein light energy is converted to heat energy. 5,089,372, Cl. 430-167.000.
- Kirkland, William E.: See—
James, Charles W., Jr.; Carden, James R.; and Kirkland, William E., 5,088,470, Cl. 126-41.00R.
- Kirkpatrick, Douglas A.; Schnur, Joel M.; Schoen, Paul E.; Price, Ronald R.; and Manheimer, Wallace M., to United States of America, Navy. Electron beam source formed with biologically derived tubule materials. 5,089,742, Cl. 313-351.000.
- Kirkpatrick, Jack H., to Sharp Packaging. Tear-opening caplet blister foil package. 5,088,603, Cl. 206-530.000.
- Kirkpatrick, Joel L.: See—
Lee, Shy-Fuh; Anderson, Richard J.; Luehr, Gary W.; Craig, G. Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komatsubara, Kenichi, 5,089,046, Cl. 71-103.000.
- Kirsch, Gerald: See—
Earnshaw, Christopher G.; Kirsch, Gerald; Rach, Petra; Thieroff-Ekerdt, Ruth; and Topert, Michael, 5,089,175, Cl. 260-404.000.
- Kirsch, Wolff M.; Zhu, Yong H.; and Cushman, Robert B., to University of New Mexico, The. Multipurpose surgical tool. 5,089,007, Cl. 606-205.000.
- Kirsten, Rolf: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.
- Kirwan, Lawrence T., Jr., to Kirwan Surgical Products, Inc. Disposable bipolar coagulator. 5,089,002, Cl. 606-50.000.
- Kirwan Surgical Products, Inc.: See—
Kirwan, Lawrence T., Jr., 5,089,002, Cl. 606-50.000.
- Kishi, Hiroshi: See—
Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, 5,089,932, Cl. 361-321.000.
- Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, 5,089,933, Cl. 361-321.000.
- Kistrup, Holger; and Imhof, Otwin, to Mercedes-Benz AG. Solution for the activating of electrically nonconductive substrate surfaces and method of preparing the said solution. 5,089,301, Cl. 427-304.000.
- Kitagawa, Katsuji; Tashima, Hideki; and Matsuzaki, Kunimitsu, to Somar Corporation. Thermosetting powder composition. 5,089,555, Cl. 524-503.000.
- Kitagishi, Nozomu, to Canon Kabushiki Kaisha. Phase-type diffusing plate. 5,089,835, Cl. 354-200.000.
- Kitahata, Sumio: See—
Fujita, Koki; Hara, Kozo; Hashimoto, Hitoshi; and Kitahata, Sumio, 5,089,401, Cl. 435-97.000.
- Kitao, Koichi; and Misaka, Nozomu, to NKK Corporation. Method of extruding thermoplastic resin pipe. 5,089,204, Cl. 264-209.400.
- Kitoh, Kyosuke: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
- Kiuchi, Toyoo: See—
Ishida, Ryuji; and Kiuchi, Toyoo, 5,089,999, Cl. 369-32.000.
- Kiyota, Hirotaka; Kaneta, Tomoo; Nakajima, Masaaki; and Kurihara, Masakazu, to Komori Corporation. Paper delivery for web offset printing press. 5,088,719, Cl. 271-182.000.
- Kiyota, Hiroyuki: See—
Katagishi, Yoshihiro; Miyazawa, Takeshi; Kiyota, Hiroyuki; and Fujii, Nobuo, 5,088,288, Cl. 62-6.000.
- Klaassen, Alan W.: See—
Blanton, William A., Jr.; and Klaassen, Alan W., 5,089,461, Cl. 502-242.000.
- Klapprott, Daniel H.: See—
Coyne, Thomas S.; Haendler, Blanca L.; Klapprott, Daniel H.; Mitchell, Frances E.; Steichen, Dale S.; and Thompson, Suzanne M., 5,089,167, Cl. 252-186.260.
- Kleeberg, Wolf; Kammermaier, Johann; and Schulte, Rolf-Winfried, to Siemens Aktiengesellschaft. Method for generating glow-polymerizable layers. 5,089,290, Cl. 427-41.000.
- Kleinberg, Larry K., to Storz Instrument Company. Documentation illumination module for a microscope system. 5,089,909, Cl. 359-363.000.
- Kleineberg, Wolfgang; Schaal, Hans; and Attinger, Thomas, to Mercedes-Benz AG. Delivery valve unit on a compensating tank. 5,088,453, Cl. 123-41.540.
- Kleinschmit, Peter: See—
Liu, Anh T.; Schwarz, Rudolf; and Kleinschmit, Peter, 5,089,247, Cl. 423-600.000.
- Kliceck, Michael S.: See—
Delahuerge, Louis; Stoddard, Robert B.; and Kliceck, Michael S., 5,088,997, Cl. 606-42.000.
- Klimas, Edward J.: See—
Struger, Odo J.; and Klimas, Edward J., 5,089,984, Cl. 395-650.000.
- Klinge Pharma GmbH: See—
Hille, Thomas; Hoffmann, Hans-Rainer; Huber, Hans-Joachim; Koch, Axel; Schneider, Gerhard; and Stanislaus, Fritz, 5,089,267, Cl. 424-449.000.
- Kluth, Hans-Jurgen, to Deutsche Thomson-Brandt GmbH. Arrangement for suppressing edge noise during playback of frequency modulated video signals recorded on tape. 5,089,916, Cl. 360-33.100.
- Kluth, Joachim: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.
- Knapp, Francesco, to Studio Tecnico Sviluppo e Ricerche S.T.S.R. S.r.l. Fixed plate for a hydraulic valve, provided with means for ejecting chips. 5,088,688, Cl. 251-304.000.
- Knickerbocker, Michael G., to Calmar Inc. Dispenser having child-resistant nozzle assembly. 5,088,628, Cl. 222-153.000.
- Knoblauch, Karl; Pilarczyk, Erwin; Giessler, Klaus; Bukowski, Hans; D'Amico, Joseph S.; and Reinhold, Herbert, to Bergwerksverband GmbH. Process for helium enrichment. 5,089,048, Cl. 55-25.000.
- Knogo Corporation: See—
Minasy, Arthur J.; and Nicolette, Thomas A., 5,088,165, Cl. 24-704.100.
- Knorr, Andreas: See—
Frobel, Klaus; Lenfers, Jan-Bernd; Fey, Peter; Knorr, Andreas; Stasch, Johannes-Peter; Muller, Hartwig; Bischoff, Erwin; and Dellweg, Hans-Georg, 5,089,487, Cl. 514-150.000.
- Knudson, Gary A. Rotary punch. 5,088,309, Cl. 72-129.000.
- Knuth, Reinhard: See—
Rath, Dieter; von der Haar, Friedrich; Gerlach, Hans-Josef; and Knuth, Reinhard, 5,088,522, Cl. 138-119.000.
- Kobayashi Construction Co., Ltd.: See—
Kobayashi, Yoshiaki, 5,088,564, Cl. 173-1.000.
- Kobayashi, Fumiyuki: See—
Kojima, Hiroyuki; Hatsuda, Toshio; Darkoku, Takahiro; Zushi, Shizuo; and Kobayashi, Fumiyuki, 5,089,936, Cl. 361-387.000.
- Kobayashi, Ipepi: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ipepi; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.
- Kobayashi, Masatoshi: See—
Ito, Kenichi; and Kobayashi, Masatoshi, 5,090,001, Cl. 369-44.280.
- Kobayashi, Tohru, to Kabushiki Kaisha Toshiba. X-ray examination apparatus. 5,090,044, Cl. 378-145.000.
- Kobayashi, Yoshiaki, to Kobayashi Construction Co., Ltd. Method of and apparatus for driving piles. 5,088,564, Cl. 173-1.000.
- Kobayashi, Yoshiki: See—
Tomimaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, 5,089,071, Cl. 156-89.000.
- Koboshi, Shigeharu: See—
Goto, Nobutaka; Koboshi, Shigeharu; Takabayashi, Naoki; and Makida, Yoshiyuki, 5,089,097, Cl. 204-109.000.
- Koch, Axel: See—
Hille, Thomas; Hoffmann, Hans-Rainer; Huber, Hans-Joachim; Koch, Axel; Schneider, Gerhard; and Stanislaus, Fritz, 5,089,267, Cl. 424-449.000.
- Koch, Kaelyn C.: See—
Chum, Pak-Wing S., and Koch, Kaelyn C., 5,089,321, Cl. 428-218.000.
- Kodama, Yoshimi; and Ohnishi, Yoshinisa, to Sanyo Electric Co., Ltd. Inclined rail cassette tape loading and guiding mechanism. 5,089,921, Cl. 360-95.000.
- Kodana, Nobuhiko: See—
Watanuki, Isao; Kodana, Nobuhiko; and Sato, Makoto, 5,089,450, Cl. 502-158.000.
- Kodera, Tatsuya; Takaoka, Kazuchiyu; Haino, Kozo; Itoh, Akira; Okaji, Makoto; and Emoto, Kazuhiro, to Mitsubishi Paper Mills

Limited. Novel hydrazone compound in an electrophotographic receptor. 5,089,366, Cl. 430-59.000.

Koenig, Larry E. Rotary isolation door. 5,088,422, Cl. 110-173.00R.

Koester, Charles J.; and Auran, James D., to Columbia University in the City of New York, The Trustees of. Rectified intraocular lens. 5,089,022, Cl. 623-6.000.

Koflach Sport Gesellschaft m.b.H. & Co. KG: See—
Trinkaus, Gerhard; and Locker, Josef, 5,088,212, Cl. 36-120.000.

Koga, Michitaka, to Fuji Jukogyo Kabushiki Kaisha. Apparatus for aid in attaching work. 5,088,176, Cl. 29-430.000.

Koga, Motoyuki; Ike, Nobukatsu; and Ohshima, Kenji, to Hakko Co., Ltd. Method for repairing interior portions of a pipeline. 5,089,297, Cl. 427-238.000.

Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazuyuki; and Nishi, Yuji, to Victor Company of Japan, Ltd. Ghost canceller employing plural reference signals. 5,089,892, Cl. 358-167.000.

Kohara, Masanori: See—
Miura, Takanori; Kohara, Masanori; and Oka, Kunihide, 5,089,655, Cl. 560-75.000.

Kohlensauer-Werke Rud. Buse GmbH & Co.: See—
Ben-Nasr, Hedi; and Coenen, Friedrich W. H., 5,089,280, Cl. 426-427.000.

Kohler, Edward A.: See—
Jones, Aaron U.; Howard, Vincent M.; Kohler, Edward A.; Carter, Mark L.; Komori, Edward A.; Wijesinghe, Ralph; and McGeehee, Ronald W., 5,088,363, Cl. 83-35.000.

Kohn, Armin: See—
Wegner, Peter; Joppien, Hartmut; Homberger, Gunter; and Kohn, Armin, 5,089,662, Cl. 562-506.000.

Kohno, Shigefumi: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, 5,088,766, Cl. 280-775.000.

Kojima, Hidetaka: See—
Yokota, Shigeru; Koyama, Hiroshi; and Kojima, Hidetaka, 5,089,650, Cl. 558-277.000.

Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; and Mitsukuchi, Yukio, to Yamazaki Mazak Kabushiki Kaisha. Machining control apparatus in a machine tool. 5,088,361, Cl. 82-127.000.

Kojima, Hiroshi; Tahara, Yoshifumi; and Arai, Izumi, to Tokyo Electron Limited. Plasma etching method. 5,089,083, Cl. 156-643.000.

Kojima, Hiroshi: See—
Takano, Kazuya; and Kojima, Hiroshi, 5,088,703, Cl. 267-140.10C.

Kojima, Hiroyuki; Hatsuda, Toshio; Daikoku, Takahiro; Zushi, Shizuo; and Kobayashi, Fumiyuki, to Hitachi, Ltd. Semiconductor module. 5,089,936, Cl. 361-387.000.

Kokuba, Sadao, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Multiposition switch device for controlling a driving means. 5,089,715, Cl. 307-10.100.

Kokubo, Tadayoshi: See—
Uenishi, Kazuya; Kawabe, Yasumasa; and Kokubo, Tadayoshi, 5,089,373, Cl. 430-191.000.

Kollross, Gunter. Method and device for the formation of an end closure on a hose-type packing wrapper. 5,088,956, Cl. 452-32.000.

Kolwert, Alois: See—
Sutter, Hubert; Kolwert, Alois; and Obrecht, Werner, 5,089,579, Cl. 526-323.200.

Komag, Incorporated: See—
Allen, Ronald; Bae, Peter S.; and Miura, Steven, 5,089,110, Cl. 204-298.150.

Komatsubara, Kenichi: See—
Lee, Shy-Fuh; Anderson, Richard J.; Luehr, Gary W.; Craig, G. Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komatsubara, Kenichi, 5,089,046, Cl. 71-103.000.

Komatsu, Yuuki: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.

Komenaka, Kazuichi, to Kabushiki Kaisha Toshiba. Resin seal type semiconductor device. 5,089,879, Cl. 357-72.000.

Komiyama, Manabu, to Yamaha Corporation. Electronic melody generating system having memory separated from melody generating unit. 5,088,379, Cl. 84-609.000.

Komiyama, Shinji: See—
Tsuiji, Suguru; Saya, Toshiaki; Komiyama, Shinji; Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, 5,089,576, Cl. 526-228.000.

Komori Corporation: See—
Kiyota, Hirotaka; Kaneta, Tomoo; Nakajima, Masaaki; and Kurihara, Masakazu, 5,088,719, Cl. 271-182.000.

Murakami, Toshiyuki, 5,088,410, Cl. 101-415.100.

Komori, Edward A.: See—
Jones, Aaron U.; Howard, Vincent M.; Kohler, Edward A.; Carter, Mark L.; Komori, Edward A.; Wijesinghe, Ralph; and McGeehee, Ronald W., 5,088,363, Cl. 83-35.000.

Kondo, Akihiro; Kato, Yoshiyuki; Kato, Ikunoshin; and Tsuruta, Hisao, to Takara Shuzo Co.; and Irica Instruments, Inc. Reagent reactor apparatus. 5,089,230, Cl. 422-64.000.

Kondo, Kazuo: See—
Hattori, Masateru; Okamura, Takashi; and Kondo, Kazuo, 5,089,444, Cl. 501-9.000.

Kondo, Shigeo; and Yamamura, Yasuharu, to Matsushita Electric Industrial Co., Ltd. Manufacturing process of Chevrel compounds. 5,089,222, Cl. 419-10.000.

Kondo, Takajiro, to Hitachi Metals Ltd.; and Yasugi Seimitsu, Ltd. Sheet material cutting apparatus. 5,088,370, Cl. 83-528.000.

Konica Corporation: See—
Goto, Nobutaka; Koboshi, Shigeharu; Takabayashi, Naoki; and Makida, Yoshiyuki, 5,089,097, Cl. 204-109.000.

Hamanaka, Izumi; and Hirota, Kazuhiro, 5,088,717, Cl. 271-98.000.

Kawahara, Setsuko; Koyama, Noboru; Nakano, Yasushi; and Nakajima, Noboru, 5,089,333, Cl. 428-329.000.

Shibata, Akihiro; and Okayama, Kenichi, 5,088,715, Cl. 271-9.000.

Yatsuyanagi, Naoko, 5,089,379, Cl. 430-434.000.

Konig, Klaus: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babezinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.

Konishi, Kenichi, to Mitsubishi Denki K.K. Planet gear type reduction gear device. 5,088,338, Cl. 74-7.00E.

Konishi, Masataka: See—
Ohkuma, Hiroaki; Tomita, Koji; Konishi, Masataka; and Kamei, Hideo, 5,089,522, Cl. 514-460.000.

Konishi, Satsuko: See—
Sasaki, Hiromi; Tojima, Masao; Konishi, Satsuko; and Takana, Hiroyuki, 5,089,316, Cl. 428-195.000.

Konishiroku Photo Industry Co., Ltd.: See—
Nakano, Miegi; Seino, Minoru; Uehara, Masafumi; and Nogami, Akira, 5,089,839, Cl. 354-317.000.

Konno, Daisuke; Miwa, Sachihiko; Aiyoshizawa, Shunichi; Kasahara, Kazuyuki; Sato, Yoshio; and Hirokawa, Kazuto, to Ebara Corporation. Spindle motor. 5,089,732, Cl. 310-67.00R.

Konze, Jorg: See—
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 5,089,640, Cl. 549-563.000.

Koontz, Harry S.: See—
Bartrug, Bruce A.; Koontz, Harry S.; and Winter, John A., 5,089,687, Cl. 219-203.000.

Koorn, Maarten; and Sikkema, Sape, to C. van der Lely N.V. Implement for processing mown crop. 5,088,275, Cl. 56-364.000.

Kopco, James J.; and Saunders, Craig M., to Royal Appliance Mfg. Co. Bag mount assembly for a vacuum cleaner. 5,089,038, Cl. 55-374.000.

Kopfer, Rudolph J.; and Smith, Robert E. Anti-aerosoling drug reconstitution device. 5,088,996, Cl. 604-415.000.

Kopp, Fred H., Jr. Golf club shaft protector tube. 5,088,600, Cl. 206-315.200.

Koppert, Erik, to University of Utah Research Foundation. Monoseptal, bi-ventricular artificial heart. 5,089,020, Cl. 623-3.000.

Korea Research Institute of Chemical Technology: See—
Kim, Wan J.; Park, Myung H.; and Oh, Jong H., 5,089,621, Cl. 546-113.000.

Korsch oHG Maschinenfabrik: See—
Korsch, Wolfgang; and Schmett, Michael, 5,088,915, Cl. 425-345.000.

Korsch, Wolfgang; and Schmett, Michael, to Korsch oHG Maschinenfabrik. Coated-core press. 5,088,915, Cl. 425-345.000.

Korthoff, Herbert W., to United States Surgical Corporation. Surgical needle-suture attachment possessing weakened suture segment for controlled suture release. 5,089,010, Cl. 606-224.000.

Korthoff, Herbert W., to United States Surgical Corporation. Combined surgical needle-suture device possessing an integrated suture cut-off feature. 5,089,011, Cl. 606-224.000.

Koselka, Harvey; and Jones, Andrew R., to Design Continuum Inc. Anti-lock braking system for skates. 5,088,748, Cl. 280-11.200.

Koshiishi, Akira; Kawamura, Kohei; and Takayama, Naoki, to Tokyo Electron Limited. Electron beam excitation ion source. 5,089,747, Cl. 315-111.810.

Kosugi, Susumu: See—
Yoshitome, Eiji; and Kosugi, Susumu, 5,089,784, Cl. 324-309.000.

Kotter, Clemens: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.

Kouno, Kazuo: See—
Hirose, Hisashi; and Kouno, Kazuo, 5,088,319, Cl. 73-118.100.

Kouru, Heikki, to Oy, Wallace. Method and apparatus for producing a quench calibration function for a liquid scintillation counter. 5,089,706, Cl. 250-362.000.

Koves, William J., to UOP. Downwardly forced particle bed for gas contacting. 5,089,115, Cl. 208-146.000.

Kowalski, Raymond G.: See—
Irvin, Scot A.; Merritt, Carleton G.; and Kowalski, Raymond G., 5,089,284, Cl. 426-557.000.

Koyama, Hiromi: See—
Ono, Tomio; Tsuruo, Ryo; Koyama, Hiromi; and Fujiwara, Ryoji, 5,088,777, Cl. 292-40.000.

Ono, Tomio; and Koyama, Hiromi, 5,088,781, Cl. 292-347.000.

Koyama, Hiroshi: See—
Yokota, Shigeru; Koyama, Hiroshi; and Kojima, Hidetaka, 5,089,650, Cl. 558-277.000.

Koyama, Noboru: See—
Kawahara, Setsuko; Koyama, Noboru; Nakano, Yasushi; and Nakajima, Noboru, 5,089,333, Cl. 428-329.000.

Koyama, Takeshi, to Kabushiki Kaisha Toshiba. Semiconductor device with MIS capacitor. 5,089,875, Cl. 357-51.000.

Koyanagi, Kaoru: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ipppei; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.

Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Unichi; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Tracking control information signal recording device. 5,089,919, Cl. 360-74.400.

Kragle, Harry A., to Corning Incorporated. Method and apparatus for forming an outer skin or honeycomb structures. 5,089,203, Cl. 264-177.110.

Kramb, Jan, to Kramb Mothermik GmbH & Co. KG. Process and apparatus for the removal of soot and condensable matter from diesel exhaust gases. 5,088,282, Cl. 60-274.000.

Kramb Mothermik GmbH & Co. KG: See—
Kramb, Jan, 5,088,282, Cl. 60-274.000.

Kramer, Lee: See—
Williams, Roger S.; and Kramer, Lee, 5,088,617, Cl. 220-403.000.

Kramis, Richard H.: See—
Trybulski, Eugene J.; Kramis, Richard H.; and Brabander, Herbert J., 5,089,518, Cl. 514-422.000.

Krause, Joachim; Eidenschink, Rudolf; Bofinger, Klaus; Hopf, Reinhard; Reiffenrath, Volker; Pötsch, Eike; Scheuble, Bernhard; and Geelhaar, Thomas, to Merck Patent Gesellschaft mit beschränkter Haftung. Nitrogen-containing heterocycles. 5,089,168, Cl. 252-299.610.

Krenzer, Theodore J., to Gleason Works, The. Method of forming the teeth of longitudinally curved tooth gears. 5,088,243, Cl. 51-287.000.

Kricka, Larry: See—
Bronstein, Irena Y.; Edwards, Brooks; Kricka, Larry; and Voyta, John, 5,089,630, Cl. 549-220.000.

Krivan, Howard C.; Ginsburg, Victor; and Roberts, David D. Adhesion of *Mycoplasma pneumoniae* and *Mycoplasma hominis* to sulfate. 5,089,479, Cl. 514-25.000.

Krivi, Gwen G.; Schlittler, Michael R.; and Vieland, Bernard N., to Monsanto Company. Somatotropin variants and their use. 5,089,473, Cl. 514-12.000.

Kroggel, Matthias: See—
Rauterkus, Karl J.; Kroggel, Matthias; and Huth, Hans-Ullrich, 5,089,570, Cl. 525-455.000.

Kromer, Martin W.; and Seneski, William W. One-time-use precision-blade-bending scalpel blade remover-receptacle. 5,088,173, Cl. 29-239.000.

Kruger, Anita: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.

Kruger, Gabriele: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.

Krumlauf, Paul R.: See—
Ross, Louis R.; Krumlauf, Paul R.; Wilson, Edward L.; and Hsu, Kuang-Hong, 5,089,544, Cl. 523-511.000.

Krupp Atlas Elektronik GmbH: See—
Arens, Egidius, 5,089,988, Cl. 367-12.000.

Kruzick, Kent: See—
Galbreath, Donald E.; and Kruzick, Kent, 5,088,875, Cl. 414-478.000.

Kubisch, John G.: See—
Greanias, Anthony C.; Kubisch, John G.; Mercer, James B.; and Schaeff, Wilmer G., 5,088,546, Cl. 164-255.000.

Kubo, Makoto: See—
Hashimoto, Jiro; Nomoto, Shogo; Nozawa, Masanori; and Kubo, Makoto, 5,089,029, Cl. 44-432.000.

Kubo, Toru: See—
Yamagishi, Katsuaki; Kashima, Koji; and Kubo, Toru, 5,088,646, Cl. 237-2.00B.

Kubota, Akiko: See—
Akasaka, Masami; Kubota, Akiko; Mizoguchi, Junzo; and Satoh, Sakae, 5,089,408, Cl. 435-192.000.

Kubota Ltd.: See—
Horii, Yasuyuki; Takahashi, Seiichi; and Imanura, Takeshi, 5,088,968, Cl. 475-124.000.

Kubota, Naohiro: See—
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 5,089,377, Cl. 430-325.000.

Kubota, Yoshihiro: See—
Kashida, Meguru; Kubota, Yoshihiro; and Nagata, Yoshihiko, 5,089,085, Cl. 156-659.100.

Kuder, James E., to Hoechst Celanese Corp. Method for producing a corrosion resistant article by applying a polybenzimidazole coating. 5,089,304, Cl. 427-388.100.

Kugelman, Michael M., to B. F. Goodrich Co. Current monitor using a DC isolating amplifier circuit. 5,089,926, Cl. 361-87.000.

Kuhn, Hans: See—
Schnell, Hans; Kuhn, Hans; and Rusen, Jochen, 5,088,567, Cl. 173-122.000.

Kuhne, Viktor, to J. M. Voith GmbH. Viscous damper assembly for a flywheel assembly including friction plates. 5,088,964, Cl. 464-68.000.

Kumakura, Atsushi: See—
Suzuki, Tadasu; Kumakura, Atsushi; and Futami, Yuichi, 5,088,966, Cl. 474-111.000.

Kumano, Yoshimaru: See—
Noda, Akira; Yamaguchi, Michihiro; Aizawa, Masanori; and Kumano, Yoshimaru, 5,089,269, Cl. 424-456.000.

Kumar, Ramesh C.; and Kantner, Steven S., to Minnesota Mining and Manufacturing Company. General purpose siloxane release coatings. 5,089,336, Cl. 428-352.000.

Kumazaki, Hiroshi, to Toshiba Kikai Kabushiki Kaisha. Injection molding apparatus for controlling molding optimum condition in response to temperature. 5,088,911, Cl. 425-145.000.

Kume, Takanori: See—
Nakae, Kiyohiko; Kawakita, Toshio; Kume, Takanori; and Sugiyama, Masashi, 5,089,323, Cl. 428-220.000.

Kunimitsu, Toshiyuki, to Mitsubishi Denki K.K.; and Nissan Kohki Co., Ltd. Distributor for igniting combustion engine. 5,088,459, Cl. 123-146.50A.

Kuniyuki, Andrew H., to International Canine Genetics. Detection of pregnancy by identification of the C peptide of relaxin in the urine of animals. 5,089,419, Cl. 436-65.000.

Kunz, Rainer: See—
Landgraf, Tilo; Kunz, Rainer; Ropers, Johann; and Zenkel, Martin, 5,089,215, Cl. 376-260.000.

Kurachi, Hisao, to Brother Kogyo Kabushiki Kaisha. Ribbon cassette for mechanically unlocking a printing mechanism upon insertion of the ribbon cassette into a printing device. 5,088,845, Cl. 400-208.000.

Kurami, Miki: See—
Washino, Komei; Kurami, Miki; and Ueda, Nobuo, 5,089,604, Cl. 530-395.000.

Kuraray Co., Ltd.: See—
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.

Umeda, Takashi; Zemba, Seiichi; Hara, Kazuo; Takamoto, Katsunori; and Yokota, Shinichi, 5,089,553, Cl. 524-424.000.

Kurczak, Michael A.: See—
Wong, John M.; and Kurczak, Michael A., 5,089,751, Cl. 315-279.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: See—
Muto, Shigeki; Niimura, Koichi; Ohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.

Kurihara, Masakazu: See—
Kiyota, Hirotaka; Kaneta, Tomoo; Nakajima, Masaaki; and Kurihara, Masakazu, 5,088,719, Cl. 271-182.000.

Kurihara, Masaru; and Saito, Yoichi, to Fuji Jukogyo Kabushiki Kaisha. Automatic transmission system for an alcohol engine. 5,088,350, Cl. 74-861.000.

Kurio, Takuya; Nakanishi, Yoshinori; Kurio, Takuya; and Nakanishi, Yoshinori, to Shell Oil Company. Epoxy resin electrical encapsulation composition. 5,089,543, Cl. 523-466.000.

Kurio, Takuya: See—
Kurio, Takuya; Nakanishi, Yoshinori; Kurio, Takuya; and Nakanishi, Yoshinori, 5,089,543, Cl. 523-466.000.

Kurita, Kenji: See—
Takagi, Takaaki; Makimura, Toshiro; and Kurita, Kenji, 5,088,650, Cl. 239-575.000.

Kuriyama, Toshio: See—
Takeuchi, Takashi; and Kuriyama, Toshio, 5,088,844, Cl. 400-124.000.

Kuroda, Kazuhiro: See—
Tamazaki, Kazunori; Azegami, Hitoshi; and Kuroda, Kazuhiro, 5,089,344, Cl. 428-425.900.

Kuroda, Masami; Nakamura, Youichi; and Furusho, Noboru, to Fuji Electric Co., Ltd. Photosensitive member for electrophotography with thiophene containing moiety on charge transport compound. 5,089,365, Cl. 430-59.000.

Kuroda, Satowaka: See—
Hatada, Kenzo; Ishihara, Takeshi; Suzuki, Nobuaki; and Kuroda, Satowaka, 5,089,772, Cl. 324-158.00F.

Kuroishi, Masayuki: See—
Tamagawa, Shigehisa; and Kuroishi, Masayuki, 5,089,370, Cl. 430-138.000.

Kurokawa, Kouichi; and Tasaki, Youji, to Nippon Oil and Fats Company. Apparatus for igniting detonating primer with the aid of electromagnetic wave. 5,088,411, Cl. 102-200.000.

Kurono, Masayasu: See—
Sawai, Kiuchi; Kurono, Masayasu; Asai, Hiromoto; Mitani, Takahiko; and Ninomiya, Naohisa, 5,089,265, Cl. 424-195.100.

Kuroyanagi, Masatoshi: See—
Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, 5,089,967, Cl. 364-426.020.

Kusaka, Yosuke: See—
Uchiyama, Shigeyuki; and Kusaka, Yosuke, 5,089,842, Cl. 354-402.000.

Kusakabe, Masahiro: See—
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,088,837, Cl. 374-185.000.

Kushibiki, Nobuo: See—
Kuwayama, Tetsuro; Taniguchi, Naosato; Yoshinaga, Yoko; and Kushibiki, Nobuo, 5,089,903, Cl. 359-15.000.

Kushner, Peter J.; Cofer, Claire L.; Friedman, Jeffrey S.; and Talmadge, Karen D., to California Biotechnology Inc. Superior mammalian expression system. 5,089,397, Cl. 435-69.100.

Kusuda, Yasuhiro; Ueda, Masahide; Onishi, Takashi; and Shimizu, Tadafumi, to Minolta Camera Kabushiki Kaisha. Abnormal charge and toner density detecting system and method for use in an electrostatic copier. 5,089,848, Cl. 355-206.000.

Kusumoto, Keiji; and Nagata, Kenzo, to Minolta Camera Kabushiki Kaisha. Multicolor image forming apparatus which converts color data into erasing data. 5,089,859, Cl. 355-327.000.

Kuwabara, Kouzou: See—
Arima, Sadaichi; Kuwabara, Kouzou; and Hoshida, Shigehiro, 5,089,575, Cl. 526-200.000.

Kuwagaki, Hiroshi: See—
Ohnishi, Hiroshi; Yoshimizu, Toshiyuki; Wada, Masakazu; Kuwagaki, Hiroshi; and Katsube, Toshimichi, 5,089,906, Cl. 359-73.000.

Kuwayama, Tetsuro; Taniguchi, Naosato; Yoshinaga, Yoko; and Kishibiki, Nobuo, to Canon Kabushiki Kaisha. Display apparatus. 5,089,903, Cl. 359-15.000.

Kwak, Wie J.; Park, Hwa K.; and Oh, Key B., to Sunkyoung Industries Ltd. Method of isolating ginkgolides from the leaves of the ginkgo tree and purifying them. 5,089,636, Cl. 547-297.000.

Kwon, Oh-Kyong: See—
Malhi, Satwinder; and Kwon, Oh-Kyong, 5,088,190, Cl. 29-843.000.

Kwon, Oh-Seung: See—
Dunks, Gary B.; Yamada, Akira; Kwon, Oh-Seung; and Borgelt, Andrea, 5,089,180, Cl. 264-1.700.

Kyoto University: See—
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,089,092, Cl. 205-75.000.

Kyriakis, John, to Beta Instrument Co., Ltd. Measuring apparatus for determining the dimension and position of an elongate object. 5,088,827, Cl. 356-372.000.

L. Perigo Company: See—
Hampton, Douglas B.; Tilton, George W.; and Jordan, Maureen L., 5,089,270, Cl. 424-465.000.

La-Z-Boy Chair Co.: See—
LaPointe, Larry P.; and Seigle, Raymond E., Jr., 5,088,789, Cl. 297-69.000.

Laarmann, Willi, to W. Dollken & Co. GmbH. Apparatus for extruding a marbleized synthetic-resin strand. 5,088,909, Cl. 425-131.100.

Labadia del Fresno, Miguel. Household toasters. 5,088,389, Cl. 99-327.000.

Laboratorios Serono S.A.: See—
Vila, Francisco R.; Alonso, Thomas O.; and Cacabelos, Ramon, 5,089,472, Cl. 514-12.000.

Lacerte, Richard F.: See—
McNally, Bartley F.; and Lacerte, Richard F., 5,089,298, Cl. 427-240.000.

La Duca, Frank M., to International Technidyne Corp. Method for clotting heparinized blood by the addition of protamine, thrombin and snake venom. 5,089,415, Cl. 435-269.000.

LaFata, John E., to Toy Orginators, Inc. High fluid capacity brushes and bubble blowing system. 5,088,950, Cl. 446-19.000.

Lafleur, Serge. Security seal bracelet. 5,088,159, Cl. 24-16.0PB.

LaFreniere, Bryant R.; Zaranski, Mark T.; and Miller, Marvin P., to Dow Chemical Company. The. Periodically activated constant pressure maintaining piston chamber liquid sampler. 5,088,335, Cl. 73-864.620.

Lagne, Ulf J.: See—
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Lagueux, Ken R.: See—
Schwarz, Fred M.; and Lagueux, Ken R., 5,088,885, Cl. 415-115.000.

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Sweeney, James S., Jr., 5,089,960, Cl. 364-410.000.

Lai, John T., to B. F. Goodrich Company. The. Polysubstituted 2-morpholones. 5,089,614, Cl. 544-71.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—
Parent, Jean-Claude; and Renaudin, Marie-Helene, 5,089,244, Cl. 423-347.000.

Lajat, Nathalie: See—
Goussin, Vincent; and Lajat, Nathalie, 5,089,667, Cl. 174-101.000.

Lama, William L.: See—
Jodoin, Ronald E.; Locce, Robert P.; Lama, William L.; Rees, James D.; Ibrahim, Abd-El-Fattah A.; and Appel, James J., 5,089,908, Cl. 359-212.000.

Lamarque, Etienne; Rabuel, Jacques, deceased (by Rabuel, Jean, Marcelle Jacquemin, legal representatives); and Sikora, Jean, to Thomson-Brandt Armements. Projectile-launcher actuated by induction. 5,088,381, Cl. 89-1.814.

Lamb, Lloyd E., Sr.; and Alm, Norman E. Calf catching and holding device. 5,088,449, Cl. 119-153.000.

Lambert, William S. Retractable roller ball cargo floor surface. 5,088,585, Cl. 193-35.0SS.

Lamy, Patrick: See—
Bomo, Francis; Chevallier, Yvonick; Lamy, Patrick; and Morawski, Jean-Claude, 5,089,554, Cl. 524-493.000.

Lancaster, Gerald M.: See—
Tabor, Ricky L.; Strait, Chad A.; and Lancaster, Gerald M., 5,089,556, Cl. 525-64.000.

Landa, Benzion; Pinhas, Hanna; and Fenster, Paul, to Spectrum Sciences B.V. Image transfer apparatus incorporating an internal heater. 5,089,856, Cl. 355-279.000.

Landgraf, Tilo; Kunz, Rainer; Ropers, Johann; and Zenkel, Martin, to Siemens Aktiengesellschaft. Method of securing a centering pin for a nuclear fuel assembly. 5,089,215, Cl. 376-260.000.

Lang, Geard: See—
Forestier, Serge; Lang, Geard; Richard, Herve; and Grognet, Jean C., 5,089,250, Cl. 424-43.000.

Lang, Manfred. Implant for the jawbone. 5,088,926, Cl. 433-173.000.

Lang, Paul A. Hose anchors. 5,088,666, Cl. 248-87.000.

Lange, Gerhard, to WAFIOS Maschinenfabrik GmbH & Co. Upsetting device for upsetting the ends of elongated workpieces such as wire pieces. 5,088,312, Cl. 72-420.000.

Langer, Hans-Joachim: See—
Schuster, Hans-Dieter; Nunnemann, Friedhelm; Langer, Hans-Joachim; Strohmer, Erwin; and Tiefenbacher, Gerd, 5,089,237, Cl. 422-180.000.

Langer, Klaus: See—
Gerling, Klaus; Heinemann, Henning; Meier, Andreas; and Langer, Klaus, 5,089,492, Cl. 514-210.000.

Langley, David: See—
Bush, Brian D.; Gates, Duncan A.; and Langley, David, 5,089,045, Cl. 71-92.000.

Lanza, Richard C.; Votano, Joseph R.; and Russ, Tomas, to Expert Image Systems, Inc. Data acquisition system for radiographic imaging. 5,090,040, Cl. 378-62.000.

Lanzarone, Patrick; and Spector, George. Fish tank aquarium light hood. 5,089,940, Cl. 362-101.000.

Lapevie, Thomas G. Variable resistance exercise apparatus. 5,088,726, Cl. 272-117.000.

Lapeyre, Didier; and Veragen, Rene, to Lapeyre, Didier. Total heat prosthesis. 5,089,018, Cl. 623-3.000.

LaPointe, Larry P.; and Seigle, Raymond E., Jr., to La-Z-Boy Chair Co. Retro-fittable extendable leg rest apparatus. 5,088,789, Cl. 297-69.000.

Larson, Mark S., to Springfield Armory, Inc. Firearm safety. 5,088,222, Cl. 42-70.040.

Laska, Casimir F.: See—
Braun, Daniel E.; Mitchell, Robert K.; and Laska, Casimir F., 5,088,273, Cl. 56-10.500.

Lasko, John A. Fluid distribution system, and apparatus and method for making same. 5,088,194, Cl. 29-890.148.

Lathers, Michael W., to Outboard Marine Corporation. Recreational boat with improved companionway hatch. 5,088,435, Cl. 114-177.000.

Latter, Gerald M.: See—
Johansson, Eric B.; Matzner, Bruce; and Latter, Gerald M., 5,089,221, Cl. 376-442.000.

Laube, Robert: See—
Dietz, Richard A.; Laube, Robert; and Andre, Eugene R., Sr., 5,088,746, Cl. 279-4.000.

Laukaitis, Joseph F.: See—
Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.

Laver, Hugh S.: See—
Vieira, Eric; Leppard, David G.; Laver, Hugh S.; and Toan, Vien V., 5,089,050, Cl. 106-20.000.

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Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., 5,089,074, Cl. 156-244.130.

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Varaprasad, Desaraju V.; Abhiraman, Agaram S.; and Lawton, Ernest L., 5,089,188, Cl. 264-41.000.

Layton, Richard: See—
Stern, Brian A.; Matzner, Markus; and Layton, Richard, 5,089,594, Cl. 528-194.000.

Lazaro, Luis J., Jr.; and Harsch, Franklin D., to Boeing Company. The. Modular, circular, environment resistant electrical connector assembly having retention clips for manually or automatically loading of electrical contacts. 5,088,191, Cl. 29-867.000.

Lazarshik, Daniel B.; and Chylinski, Henryk J. Shaving system. 5,088,195, Cl. 30-49.000.

Leach, Audrey A., legal representative: See—
Leach, Christopher B., deceased, 5,089,198, Cl. 264-82.000.

Leach, Christopher B., deceased (by Leach, Audrey A., legal representative), to CAM Sales, Inc. Method for curing concrete articles. 5,089,198, Cl. 264-82.000.

Leach, Colin A.: See—
Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., 5,089,498, Cl. 514-235.200.

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Leach, Jerald G., to Texas Instruments Incorporated. Advanced video processor having a color palette. 5,089,811, Cl. 340-703.000.

Leach, Roger J.; and Lindsay, James F., to Chelsea Artisans PLC; and Imperial Chemical Industries PLC. Method of manufacturing article including melting thermosetting-powder. 5,089,076, Cl. 156-283.000.

Leadbetter Michael R.: See—
Broadhurst, Michael D.; Cromartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter Michael R., 5,089,623, Cl. 546-300.000.

Lear Seating Corporation: See—
Wainwright, John C.; and Colasanti, Arduino, 5,088,790, Cl. 297-284.00C.

LeClair, Stephen P., to Seagate Technology, Inc. Disc drive motor spindle hub for holding a disc and spacer stack firmly in place. 5,089,922, Cl. 360-99.080.

Lecznar, Mark T.: See—
Augustitus, James A.; Lecznar, Mark T.; and Wipusuramontom, Pongdet, 5,088,764, Cl. 280-731.000.

Ledbetter, Harvey D.: See—
Gregory, Thomas; Hurtig, Carl W.; Ledbetter, Harvey D.; Quack-enbush, Kenneth J.; and Rosenberg, Steven, 5,089,591, Cl. 528-185.000.

Ledin, Ann L.: See—
Markowitz, Harold T.; and Ledin, Ann L., 5,088,488, Cl. 128-419.0PG.

Leduc, Pierre, to U.S. Philips Corp. Integrated circuit having a vertical transistor. 5,089,873, Cl. 357-35.000.

Lee, Bong Y.: See—
Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., 5,089,624, Cl. 546-321.000.

Lee, Gary C. M., to Allergan, Inc. Anti-inflammatory furanones. 5,089,485, Cl. 514-99.000.

Lee, Howard G. Radio opaque plastics and process of making. 5,088,927, Cl. 433-224.000.

Lee, Inmok: See—
Hammond, Earl G.; and Lee, Inmok, 5,089,403, Cl. 435-134.000.

Lee, Jaesup N. Low impedance packaging. 5,089,878, Cl. 357-71.000.

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Tsay, Yuh-Geng; Calenoff, Emanuel; Gustafson, Eric K.; Trebino, Rick; and Lee, John, 5,089,387, Cl. 435-6.000.

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Lee, Lieng-Huang; Lincoln, Diane C.; and Tarnawskyj, Christine J., to Xerox Corporation. Electrophotographic imaging members containing a polyurethane adhesive layer. 5,089,364, Cl. 430-58.000.

Lee, Mark S.; McQuaid, Cameron M.; Urban, Stephen R.; Seccombe, Donald A., Jr.; Leo, Robert T., Jr.; Coon, Edward H.; and Bray, Olin H., to Combustion Engineering, Inc. Integrated manufacturing system. 5,089,970, Cl. 364-488.000.

Lee, Merlin. Non-toxic insecticide composition and method for killing specific insects. 5,089,266, Cl. 424-407.000.

Lee, Ruojia, to Micron Technology, Inc. High control gate/floating gate coupling for EPROMs, E²PROMs, and Flash E²PROMs. 5,089,867, Cl. 357-23.500.

Lee, Shau-Tarn: See—
Malwitz, Nelson E.; and Lee, Shau-Tarn, 5,089,535, Cl. 521-141.000.

Lee, Shenq-Hwa. Volume-changeable van compartment. 5,088,785, Cl. 296-26.000.

Lee, Shy-Fuh; Anderson, Richard J.; Luehr, Gary W.; Craig, G. Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komatsubara, Kenichi, to Sandoz Ltd. Aryl and heteroaryl diones. 5,089,046, Cl. 71-103.000.

Lee, Xiaoyang; and Boles, Glenn M., to Lunayach Communications Consultants. Frequency measuring system. 5,089,770, Cl. 324-78.00D.

Leeder, Sydney; and Zuk, Robert F., to Syntex (U.S.A.) Inc. Heterogeneous assay having delayed signal production. 5,089,383, Cl. 435-7.900.

Leep, James L.: See—
Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 5,088,720, Cl. 271-189.000.

Leeson, Plato J.: See—
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Leffler, Richard G.: See—
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Legatt, Donald J., to Advance Machine Company. Collection system for a floor polishing machine. 5,088,151, Cl. 15-385.000.

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Lehigh Press, Inc.: See—
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Silebi, Cesar A.; and Ramos, Jose D., 5,089,126, Cl. 210-198.200.

Lehman, Ronald W.: See—
Berg, David W.; Brenner, David J.; Lehman, Ronald W.; and Forsman, Bruce W., 5,088,149, Cl. 15-322.000.

Lehureau, Jean-Claude, to Thomson-CSF. Static magnetic reading head having a plurality of elementary heads. 5,089,923, Cl. 360-121.000.

Leicht, Erhard: See—
Hesse, Wolfgang; Hofmann, Klaus; and Leicht, Erhard, 5,089,589, Cl. 528-129.000.

Leicht, James V.: See—
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Leighton, Stephen B., to United States of America, Health and Human Services. Intra-urethral valve with integral spring. 5,088,980, Cl. 600-30.000.

Leise, Walter F., Jr.: See—
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Leland Stanford Junior University, The Board of Trustees of the: See—
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Leleu, Serge; Aschard, Jean-Luc; and Bouvier, Alain, to Electricite De France. Gas electroburner with electric power supply and assisted ignition. 5,088,917, Cl. 431-266.000.

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Lenguyen, Dung: See—
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Leo, Robert T., Jr.: See—
Lee, Mark S.; McQuaid, Cameron M.; Urban, Stephen R.; Seccombe, Donald A., Jr.; Leo, Robert T., Jr.; Coon, Edward H.; and Bray, Olin H., 5,089,970, Cl. 364-468.000.

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Lerch, Peter G.: See—
Isliker, Henri; Peitsch, Manuel C.; Heiniger, Hans J.; Lerch, Peter G.; and Morgenthaler, Jean J., 5,089,602, Cl. 530-359.000.

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Lerman, Bruce B. Current-based defibrillating method. 5,088,489, Cl. 128-419.000.

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Lester, James N., to GTE Products Corporation. Protection device for electronic circuit. 5,089,925, Cl. 361-84.000.

L'Etat Francais represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications): See—
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Aronson, Michael P.; Cardinali, Martin S.; and McCown, Jack T., 5,089,163, Cl. 252-135.000.

Clements, Anthony H., 5,089,166, Cl. 252-186.100.

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Haynes, Lynn C.; Levine, Harry; Otterburn, Michael S.; and Mathewson, Paul, 5,089,278, Cl. 426-98.000.

Lewin, Heinz-Ulrich. Conveyor belt with built-in magnetic-motor linear drive. 5,088,593, Cl. 198-619.000.

Lewis Berkman Company, The: See—
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Lewis, Howard A.: See—
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Lewis, Larry N., to General Electric Company. Encapsulated palladium complexes and one part heat curable organopolysiloxane compositions. 5,089,582, Cl. 528-15.000.

Lewis, Richard H.: See—
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Lhuillier, Henri: See—
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Li, Wu-Shyong: See—
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Liboff, Abraham R., to Life Resonances, Inc. Deformable magnetic field aiding coils for use in controlling tissue growth. 5,088,976, Cl. 600-13.000.

Lieske, Edgar: See—
Rose, David; Lieske, Edgar; and Hoeffkes, Horst, 5,089,025, Cl. 8-405.000.

Life Resonances, Inc.: See—
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Lifflander, Veikko. Articulated tractor-trailer having adjustable trailer length and a tippable platform. 5,088,876, Cl. 414-479.000.

Ligon Brothers Manufacturing Company: See—
Ligon, James T., Sr., 5,089,311, Cl. 428-71.000.

Ligon, James T., Sr., to Ligon Brothers Manufacturing Company. Open faced sandwich barrier. 5,089,311, Cl. 428-71.000.

Liles, Donald T., to Dow Corning Corporation. UV curable silicone emulsions. 5,089,537, Cl. 522-84.000.

Lin, Chao-Tong. Polishing grinder with turbulent flow of grinding solution for grinding. 5,088,238, Cl. 51-163.100.

- Lin, Cheng-I: See—
Davalian, Dariush; Lin, Cheng-I; and Ullman, Edwin F., 5,089,390, Cl. 435-7.930.
- Lin, Jui C. Handle lock with improved engagement and linking-up. 5,088,778, Cl. 292-336.300.
- Lin, Yuan: See—
Aubard, Gilbert G.; Calvet, Alain P.; Defaux, Jean-Pierre; Gourcet, Claude J.; Grouhel, Agnes M.; Jacobelli, Henry L.; Junien, Jean-Louis; Pascaud, Xavier B.; Roman, Francois F.; Hudspeth, James P.; and Lin, Yuan, 5,089,639, Cl. 549-491.000.
- Lincoln, Diane C.: See—
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- Lincoln Wood Products, Inc.: See—
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- Lindauer Dornier GmbH: See—
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- Lindenmaier, Willi: See—
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- Linder, Friedrich; Staehle, Hans-Joerg; and Tattermusch, Peter, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V. Heat accumulator with expansion recesses. 5,088,548, Cl. 165-10.000.
- Linder, John P., to International Door Closers, Inc. Panic exit door mechanism. 5,088,786, Cl. 292-92.000.
- Lindop, Christopher M.: See—
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- Lindsay, James F.: See—
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- Lingertat, Helmut: See—
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- Linser, Joerg: See—
Baur, Rolf, deceased; Linser, Joerg; Grau, Herbert; Bareis, Manfred; and Bastek, Wolfgang, 5,088,604, Cl. 211-1.500.
- Lipchak, John B.: See—
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- Lipner, Melvin H.; and Impink, Albert J., Jr., to Westinghouse Electric Corp. Automatic plant state diagnosis system including a display selection system for selecting displays responsive to the diagnosis. 5,089,978, Cl. 364-551.010.
- Lippey, Barret, to Hughes Aircraft Company. Process for attaching large area silicon-backed chips to gold-coated surfaces. 5,089,439, Cl. 437-209.000.
- Lippold, Hans-Joachim. Method for the production of a filter cartridge. 5,089,202, Cl. 264-145.000.
- Lischka, Helmut, to SKW Trostbert Aktiengesellschaft. Passivation of pyrophoric metals. 5,089,049, Cl. 75-328.000.
- Lish, Dennis N. Universal lock-on wrench. 5,088,360, Cl. 81-180.100.
- Little, Roger W., to Threading Systems, Inc. Threading tool. 5,088,861, Cl. 407-11.000.
- Littlejohn, Mark B., to James River Corporation of Virginia. Rigid four radii rim paper plate. 5,088,640, Cl. 229-2.50R.
- Liu, Anh T.; Schwarz, Rudolf; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Process for producing zirconium-doped pseudo-boehmite. 5,089,247, Cl. 423-600.000.
- Liu, J. H. Structure of the rotary type crystal ball. 5,088,218, Cl. 40-411.000.
- Liu, Yauh-Ching: See—
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- Lobel, Gary S.: See—
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- Lobnig, Josef: See—
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- Loce, Robert P.: See—
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- Lochmoeller, Stephen A., to Roton Products, Inc. Limit stop assembly for a screw and nut linear actuator. 5,088,339, Cl. 74-89.150.
- Lockard, Thomas A.: See—
Niebauer, Kenneth L.; and Lockard, Thomas A., 5,088,862, Cl. 407-114.000.
- Locker, Josef: See—
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- Lockett, Ricky: See—
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- Lockhart, Thomas P.: See—
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- Lockyear, Kevin W.: See—
Rosenberg, Jeffrey S.; and Lockyear, Kevin W., 5,088,336, Cl. 73-865.800.
- Loeber, Frederick W., to Terex Corporation. Steerable rear dual axle system for large trucks. 5,088,570, Cl. 180-24.010.
- Loga, Thomas H.; and Biggerstaff, Ronald D., to Dresser Industries, Inc. Accessory window seal assembly. 5,088,257, Cl. 52-397.000.
- Logothetis, Eleftherios M.; and Soltis, Richard E., to Ford Motor Company. Measurement and control of exhaust gas recirculation with an oxygen pumping device. 5,089,113, Cl. 204-425.000.
- Lonnemo, Kuri R., to Vickers, Incorporated. Hydraulic actuator controlled by meter-in valves and variable pressure relief valves. 5,088,384, Cl. 91-461.000.
- Lonza Ltd.: See—
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- Lookheed Missiles & Space Company, Inc.: See—
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- Looney, James R.: See—
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- Lopez, Frank J.: See—
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- Lord, John D., to Rhone-Poulenc Sante. Pentamidine solutions. 5,089,527, Cl. 514-636.000.
- L'Oreal: See—
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- Grollier, Jean F.; and Dubief, Claude, 5,089,252, Cl. 424-47.000.
- Lorenz, Gisela: See—
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- Lorenzo, Roberto L.: See—
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- Losfeld, Ronny: See—
De Bruyne, Roger; and Losfeld, Ronny, 5,088,919, Cl. 431-328.000.
- Lotz, Heinrich: See—
Blecker, Armin; Lotz, Heinrich; Ochs, Helmut; and Reuschling, Horst, 5,088,899, Cl. 417-356.000.
- Louderback, Lauren G. Precured laminate overlay. 5,089,348, Cl. 428-464.000.
- Lovitt, Estel L., Jr. Universal coupling. 5,088,882, Cl. 414-723.000.
- Lowden, J. Alexander: See—
Diamandis, Eleftherios P.; and Lowden, J. Alexander, 5,089,423, Cl. 436-518.000.
- Lowry, Richard C.: See—
Brown, Sterling B.; and Lowry, Richard C., 5,089,566, Cl. 525-396.000.
- LTI Enterprises, Inc.: See—
Johnson, Leonard W.; and Johnson, Thomas C., 5,088,323, Cl. 73-290.00R.
- LTS Lohmann Therapie-Systeme GmbH & Co. KG: See—
Hille, Thomas; Hoffmann, Hans-Rainer; Huber, Hans-Joachim; Koch, Axel; Schneider, Gerhard; and Stanislaus, Fritz, 5,089,267, Cl. 424-449.000.
- Lubbering, Johannes; Ihme, Peter; Busse, Jurgen; Schmitz, Erwin; and Volker, Wolfgang, to MG. Polishing device. 5,088,241, Cl. 51-266.000.
- Lubbering, Johannes; Ihme, Peter; Busse, Jurgen; Schmitz, Erwin; and Volker, Wolfgang, to Messer Griesheim. Polishing device. 5,088,242, Cl. 51-266.000.
- Lucas Industries Public Limited Company: See—
Smith, Trevor S.; Binns, John M.; Johnson, Graham F.; and Maker, Paul M., 5,088,278, Cl. 60-39.281.
- Ludicky, Frank J., to Sundstrand Corporation. Control and arbitration unit. 5,089,953, Cl. 395-425.000.
- Ludlow, Ian; and Kaye, Paul H., to United Kingdom of Great Britain and Northern Ireland. The Secretary of State for Defence in Her Britannic Majesty's Government of the Particle asymmetry analyzer having sphericity detectors. 5,089,714, Cl. 250-574.000.
- Ludwig, Allen C. Emulsification of rock asphalt. 5,089,052, Cl. 106-276.000.
- Luehr, Gary W.: See—
Lee, Shy-Fuh; Anderson, Richard J.; Luehr, Gary W.; Craig, G. Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komatsubara, Kenichi, 5,089,046, Cl. 71-103.000.
- Luhmann, Erhard: See—
Piepho, Michael; Hoppe, Lutz; and Luhmann, Erhard, 5,089,586, Cl. 528-75.000.
- Luich, Thomas M., to National Semiconductor Corp. Ground bounce isolation and high speed output circuit. 5,089,721, Cl. 307-443.000.
- Lummes, Stephen E.; Morrison, Robert B.; and Henning, Brian C. R., to Renishaw plc. Metrological scale. 5,088,209, Cl. 33-707.000.
- Lunayach Communications Consultants: See—
Lee, Xiaoyang; and Boles, Glenn M., 5,089,770, Cl. 324-78.00D.
- Lund, Michael E.; and Sharrar, William L. Slicer blade for cylindrical potato strips. 5,088,372, Cl. 83-858.000.
- Luperti, Harry E., to Pitney Bowes Inc. Sheet set separation using wide folded strips. 5,088,712, Cl. 270-95.000.
- Lurssen, Klaus: See—
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 5,089,640, Cl. 549-563.000.
- M.A.I.Bo S.r.l.: See—
Drusiani, Franco, 5,088,198, Cl. 30-123.300.
- M. Kamenstein, Inc.: See—
Ancona, Bruce; and Ancona, Jane, 5,088,392, Cl. 99-499.000.
- Mabuchi, Seiya; and Katsunuma, Tatsuo, to Bio Pit Co., Ltd. Massager. 5,088,474, Cl. 128-52.000.
- MacCaulay, John M.; Spindt, C. A.; Holland, Christopher E.; and Brodie, Ivor, to Coloray Display Corporation. Field emission cathode

- array coated with electron work function reducing material, and method. 5,089,292, Cl. 427-78.000.
- MacConnell, Edward P.; and Matsukawa, Shigeki. Delivery apparatus for printing press. 5,088,404, Cl. 101-232.000.
- MacDonald, Ross E., to Whiting and Davis Company, Inc. Protective garment. 5,088,123, Cl. 2-162.000.
- MacEachern, Stuart P.: See—
Marshall, Alan C.; MacEachern, Stuart P.; and Salwen, Howard C., 5,090,025, Cl. 375-4.000.
- MacGee, Andrew, to General Electric Company. Duct support assembly. 5,088,279, Cl. 60-226.100.
- Machida, Yoshimasa: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kito, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
- Mackenroth, Wolfgang: See—
Brueckner, Christiane; Buschmann, Ernst; Mackenroth, Wolfgang; Himmele, Walter; and Eckhardt, Heinz, 5,089,659, Cl. 560-238.000.
- MacLaren, Terrence R. Mailbag support harness. 5,088,634, Cl. 224-252.000.
- MacLennan, Charles D. Saw tooth and holder. 5,088,371, Cl. 83-840.000.
- MacMillan, Donald M., to Concorde Tool Corp. Adjustable length handle for flat finishers. 5,088,147, Cl. 15-144.00B.
- Macon, Catheryn L.: See—
Turner, Ronald L., 5,088,487, Cl. 128-402.000.
- MacPhail, Margaret G., to International Business Machines Corporation. Method of distributing related documents to identified end users in an information processing system. 5,089,956, Cl. 395-600.000.
- Madeley, Robert: See—
Cacace, Antonino G.; and Madeley, Robert, 5,088,399, Cl. 100-218.000.
- Madgavkar, Ajay M.; Daum, David W.; and Gible, Carma J., to Shell Oil Company. Removal of hydrogenation catalyst from polymer solutions by contact with activated carbon. 5,089,541, Cl. 523-310.000.
- Madison, Norman L.: See—
Schrock, Alan K.; Harris, William J.; and Madison, Norman L., 5,089,592, Cl. 528-185.000.
- Maeda, Akiho: See—
Araki, Kenji; Maeda, Akiho; and Baba, Masahiko, 5,089,238, Cl. 422-249.000.
- Maeda, Kazuyuki; Mizukami Fujio; Niwa, Shuichi; Toba, Makoto; and Shimizu, Kazuo, to Agency of Industrial Science & Technology. Process for preparing cordierite. 5,089,456, Cl. 501-119.000.
- Maeda, Tadashi: See—
Tomioka, Atsuo; Nakagawa, Masayuki; and Maeda, Tadashi, 5,088,816, Cl. 356-39.000.
- Magneco/Metrel, Inc.: See—
Soofi, Madjid, 5,088,686, Cl. 249-112.000.
- Magnetrol International Incorporated: See—
Duncan, Malcolm, 5,089,676, Cl. 200-84.00R.
- Magnuson, Gustav D.; Tooker, Joseph F.; and Treglio, James R., to ISM Technologies, Inc. Ion beam generating apparatus with electronic switching between multiple cathodes. 5,089,707, Cl. 250-423.00R.
- Magyar Vagon-es Gepgyar: See—
Opitz, Andor; and Tar, Lorant, 5,088,967, Cl. 475-107.000.
- Mahar, Jeffrey T.; Ransohoff, Thomas C.; Levin, Adam H.; and Kettler, Theodore, to Biotage Inc. Gradient generation control for large scale liquid chromatography. 5,089,124, Cl. 210-198.200.
- Mahieux, Yannick; and Charbonnier, Alain, to French State, represented by the Minister of Post, Telecommunications and Space (Centre National D'Etudes Des Telecommunications. Method of transmitting or storing sound signals in digital form through predictive and adaptive coding and installation therefore. 5,089,818, Cl. 341-76.000.
- Mahler, Steven, to Shorewood Technologies, Inc. Jacket for a compact disc. 5,088,599, Cl. 206-313.000.
- Mahoney, John. Settling tank spray system. 5,089,118, Cl. 210-153.000.
- Maitra, Ashit M.: See—
Edwards, James H.; Maitra, Ashit M.; and Tyler, Ralph J., 5,089,451, Cl. 502-174.000.
- Majewski, Robert H., to Hercules Tire & Rubber Company, The. Retread ring. 5,089,079, Cl. 156-394.100.
- Majima, Youzou: See—
Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, 5,089,967, Cl. 364-426.020.
- Majurinen, Joel, to Insinööri Seppo Joel Majurinen KY. Building block system magnetic. 5,088,951, Cl. 446-91.000.
- Maker, Paul M.: See—
Smith, Trevor S.; Binns, John M.; Johnson, Graham F.; and Maker, Paul M., 5,088,278, Cl. 60-39.281.
- Maki, Hideo: See—
Omote, Tatsuyuki; Yoshida, Tomiharu; Maki, Hideo; Senoh, Makoto; Takahashi, Fuminobu; and Tsuchita, Kenji, 5,089,213, Cl. 376-248.000.
- Makida, Yoshiyuki: See—
Goto, Nobutaka; Koboshi, Shigeharu; Takabayashi, Naoki; and Makida, Yoshiyuki, 5,089,097, Cl. 204-109.000.
- Makimura, Toshiro: See—
Takagi, Takaki; Makimura, Toshiro; and Kurita, Kenji, 5,088,650, Cl. 239-575.000.
- Malhi, Satwinder; and Kwon, Oh-Kyong, to Texas Instruments Incorporated. Method of forming an apparatus for burn in testing of integrated circuit chip. 5,088,190, Cl. 29-843.000.
- Malkemus, Timothy R.: See—
Chang, Philip Y.; Coyle, Daniel J., Jr.; Malkemus, Timothy R.; Rodriguez, Rebecca A.; and Welti, Philip J., 5,089,985, Cl. 395-600.000.
- Mallory, Michael; and Shukovsky, Harold B., to Digital Equipment Corporation. Flux spreading thin film magnetic devices. 5,089,334, Cl. 428-336.000.
- Malloy, John D., III, to Babcock & Wilcox Company, The. Gas cooled nuclear fuel element. 5,089,219, Cl. 376-427.000.
- Malwitz, Nelson E.; and Lee, Shau-Tarn, to Sealed Air Corporation. Thermoplastic compositions for water soluble foams. 5,089,535, Cl. 521-141.000.
- Manera, David A.: See—
Storar, James R.; and Manera, David A., 5,088,612, Cl. 215-247.000.
- Mang, Michael N.: See—
Henton, David E.; and Mang, Michael N., 5,089,557, Cl. 525-66.000.
- Manheimer, Wallace M.: See—
Kirkpatrick, Douglas A.; Schnur, Joel M.; Schoen, Paul E.; Price, Ronald R.; and Manheimer, Wallace M., 5,089,742, Cl. 313-351.000.
- Manna, Joseph P., to Paul, Edwin H.; Leicht, James V.; and Manna, Joseph P. Stairtread with positioning and locking mechanism. 5,088,248, Cl. 52-187.000.
- Mannen, Bryce; Calico, Gregory M.; and Vijay, Tumkur R., to FMC Corporation. Tire changing apparatus. 5,088,539, Cl. 157-1.170.
- Mannesmann Aktiengesellschaft: See—
Goedecke, Wolf-Dieter; and Cohanciu, Victor, 5,088,382, Cl. 91-275.000.
- Mannesmann Rexroth GmbH: See—
Bosniac, Dejan, 5,088,283, Cl. 60-468.000.
- Mannion, Gerald F.; and Mannion, James R., to BRDG-TNDR Corporation. Method and apparatus for controlling the flow of process fluids. 5,089,975, Cl. 364-510.000.
- Mannion, James R.: See—
Mannion, Gerald F.; and Mannion, James R., 5,089,975, Cl. 364-510.000.
- Manno, Eugene; Wargo, John A.; and Morris, Daniel L., to Xerox Corporation. Neutral pressure magnet roll type developing unit. 5,089,852, Cl. 355-251.000.
- Mansfield, Peter W.; and Dupps, Frank N., to Dupps Co., The. Cast formed bi-metallic worm assembly. 5,088,397, Cl. 100-145.000.
- Mantell, Carlene M.: See—
Rapisarda, Anthony A.; and Mantell, Carlene M., 5,089,162, Cl. 252-102.000.
- Manwill, Niles R.: See—
Huang, Wu-Nan; Manwill, Niles R.; and Chen, Fung-Bor, 5,089,205, Cl. 264-255.000.
- Mar Planet, S.A.: See—
Torras, Gabriel; and Camacho, Felipe, 5,088,684, Cl. 248-682.000.
- Marchand, Gary R.; Schell, Joseph G., Jr.; Walther, Brian W.; and Bredeweg, Corwin J., to Dow Chemical Company, The. Blanking process for reaction mixture. 5,089,572, Cl. 526-77.000.
- Maresca, Louis M.: See—
Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., 5,089,600, Cl. 528-335.000.
- Fox, Daniel W., deceased; and Maresca, Louis M., 5,089,091, Cl. 203-47.000.
- Margraf, Richard C.: See—
Angotti, Marshall A.; Lopez, Frank J.; and Margraf, Richard C., 5,090,047, Cl. 378-170.000.
- Marion, Louis. Cutting device for materials such as gauze. 5,088,368, Cl. 83-348.000.
- Marioni, Elio, to Askoll S.p.A. Piston type metering pump. 5,088,902, Cl. 417-415.000.
- Markovs, John; and James, Frederick E., Jr., to UOP. Process for purifying natural gas. 5,089,034, Cl. 55-28.000.
- Markowitz, Harold T.; and Ledin, Ann L., to Medtronic, Inc. Method and apparatus for implementing histogram storage and trend analysis in a medical stimulator. 5,088,488, Cl. 128-419.0PG.
- Marley Company, The: See—
Nielsen, Darryl M.; and McDaniel, Dorothy D., 5,088,896, Cl. 417-178.000.
- Marley Mouldings Inc.: See—
Cope, Carroll W., 5,089,313, Cl. 428-151.000.
- Marposs Societa' per Azioni: See—
Golinelli, Guido, 5,088,206, Cl. 33-550.000.
- Marquip, Inc.: See—
Marschke, Carl R., 5,088,590, Cl. 198-461.000.
- Marra, Marian N.; and Scott, Randal W., to INCYTE Pharmaceuticals, Inc. Use of bactericidal/permeability increasing protein or biologically active analogs thereof to treat endotoxin-related disorders. 5,089,274, Cl. 424-534.000.
- Marschke, Carl R., to Marquip, Inc. System for changing the speed of conveyed sheets while holding register. 5,088,590, Cl. 198-461.000.
- Marsh, John F.; Vernet, Marc R. M.; and Hamey, Graham W., to Exxon Chemical Patents Inc. Overbased magnesium sulphate composition. 5,089,155, Cl. 252-33.400.
- Marshall, Alan C.; MacEachern, Stuart P.; and Salwen, Howard C., to Proteon, Inc. Token ring synchronization. 5,090,025, Cl. 375-4.000.
- Marshall, Peter R.: See—
Barker, Andrew J.; Hughes, Leslie R.; Marshall, Peter R.; Oldfield, John; and Pegg, Stephen J., 5,089,499, Cl. 514-259.000.

Marsolais, Guy H. Industrial vacuum cleaning apparatus. 5,089,037, Cl. 55-357.000.
Martec Corporation: See—
Hatada, Kenzo; Ishihara, Takeshi; Suzuki, Nobuaki; and Kuroda, Satowaka, 5,089,772, Cl. 324-158.00F.
Martin Engineering Company: See—
Swinderman, R. Todd; and Brandl, Reinhard, 5,088,965, Cl. 474-101.000.
Martin, Joseph: See—
Thurles, Edmond; Dupraz, Jean -Pierre; Moncorge, Jean-Paul; Williams, Jean-Marc; Martin, Joseph; Perrusset, Yves; and Tapo-nat, Didier, 5,089,931, Cl. 361-174.000.
Martin, Lawrence L.; Payack, Joseph F.; and Ong, Helen H., to Ho-chst-Roussel Pharmaceuticals Inc. Compound, 5,6,7,8-tetrahydro-1-(1,2,3,4-acridin-9-yl)-2H-3,1-benzoxazine-2,4-(1H)dione. 5,089,615, Cl. 544-94.000.
Maruta, Masamichi; and Fukui, Akihiro, to Central Glass Company, Limited. Fluorine-containing bismaleamic acids and bismaleimides useful for thermosetting resins. 5,089,628, Cl. 548-521.000.
Maruyama, Hideo: See—
Taki, Kazunari; Maruyama, Hideo; Ohashi, Yumiko; and Matsuda, Riki, 5,089,358, Cl. 428-694.000.
Maruyama, Hiroshi; Kato, Takashi; and Taniguchi, Masaya, to Hitachi, Ltd. Air conditioning apparatus. 5,088,297, Cl. 62-228.400.
Maruyama, Noboru: See—
Arichika, Kenji; Fukamachi, Mitsuru; Higashi, Satoshi; and Maruyama, Noboru, 5,089,781, Cl. 324-445.000.
Maruyama, Tomoyuki; and Shimizu, Yoshiyuki, to Fuji Kiko Com-pany, Limited. Structure of impact absorbing steering apparatus. 5,088,768, Cl. 280-777.000.
Marvin, Wayne S.: See—
Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 5,088,720, Cl. 271-189.000.
Marzouki, Taieb, to Roland-Werke Dachbaustoffe und Bauchemie GmbH & Co. KG. Roof covering or wall covering. 5,088,249, Cl. 52-232.000.
Masak, Peter C.: See—
Schmidt, Mathew G.; Masak, Peter C.; and Rhodes, Paul B., 5,089,989, Cl. 367-35.000.
Maschinenfabrik J. Dieffenbacher GmbH & Co.: See—
Bieffeldt, Friedrich B., 5,088,398, Cl. 100-154.000.
Mashimo, Shinya: See—
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 5,089,377, Cl. 430-325.000.
Mason, Anthony J.; and Seeburg, Peter H., to Genentech, Inc. Nucleic acid encoding β chain prodormains of inhibin and method for synthe-sizing polypeptides using such nucleic acid. 5,089,396, Cl. 435-69.100.
Mason, William E. Instrument and method for administering an injecta-ble anesthetic. 5,088,925, Cl. 433-141.000.
Maspero, Federico; Piccolo, Oreste; Romano, Ugo; and Gambino, Salvatore, to Enichem Synthesis S.p.A. New process for the prepara-tion of 2-aryl-propionic acids. 5,089,661, Cl. 562-493.000.
Masreliez, Karl-Gustav, to Consilium Marine AB. Transducer device for acoustic log. 5,089,996, Cl. 367-89.000.
Massachusetts Institute of Technology: See—
Chiang, Alice M., 5,089,983, Cl. 364-844.000.
Swanson, Gary J., 5,089,023, Cl. 623-6.000.
Massardo, Pietro; Meazza, Giovanni; Bettarini, Franco; Castoro, Paolo; and Caprioli, Vincenzo, to Istituto Guido Donegani S.p.A. N-(halobenzoyle)-N'-2-halo-4-[1,1,2-trifluoro-2-(trifluoro-methoxy)je-thoxy]-phenyl-ureas with insecticidal activity. 5,089,525, Cl. 514-594.000.
Massoudi, Ahmad, to Darya Paye Jetty Co., Ltd. Method and apparatus for constructing a column-shaped marine structure and structure produced thereby. 5,088,858, Cl. 405-203.000.
Masuho, Yasuhiko: See—
Sawada, Shuzo; Kawamura, Takashi; Masuho, Yasuhiko; and Tomibe, Katsuhiko, 5,089,262, Cl. 424-87.000.
Masui, Susumu: See—
Okada, Susumu; Imanaka, Makoto; Masui, Susumu; Obara, Taka-shi; Shinozaki, Masatoshi; and Tsunoyama, Kozo, 5,089,068, Cl. 148-328.000.
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Kamoshida, Masakazu, to TDK Corporation. Carrier tape for electronic circuit elements and method of manufacturing an electronic circuit element series. 5,089,314, Cl. 428-156.000.
Matano, Takahiro: See—
Hashibe, Yoshio; Matano, Takahiro; Shibuya, Takehiro; Sakane, Takashi; Baba, Yasuhiro; and Moritake, Masanori, 5,089,345, Cl. 428-428.000.
Mathew, Jacob, to Petrolite Corporation. Alkyl-2-thiosubstituted-3-substituted-2-butenates and their synthesis. 5,089,611, Cl. 544-3.000.
Mathewson, Paul: See—
Haynes, Lynn C.; Levine, Harry; Otterburn, Michael S.; and Math-ewson, Paul, 5,089,278, Cl. 426-98.000.
Mathis, Richard M. Disposable liner for protective head coverings. 5,088,126, Cl. 2-181.000.
Matsuda, Riki: See—
Taki, Kazunari; Maruyama, Hideo; Ohashi, Yumiko; and Matsuda, Riki, 5,089,358, Cl. 428-694.000.
Matsuda, Takashi: See—
Takago, Toshio; Satoh, Shinichi; Oyama, Masayuki; Yamaguchi, Koichi; and Matsuda, Takashi, 5,089,649, Cl. 556-482.000.
Matsuda, Tsutomu: See—
Ohsawa, Toshiyuki; Matsuda, Tsutomu; Uji-Ie, Koji; and Ni-shihara, Hiroshi, 5,089,359, Cl. 204-78.000.

Matsudo, Masahiko: See—
Kikuchi, Shuji; Yamaguchi, Mitsuyuki; and Matsudo, Masahiko, 5,089,710, Cl. 250-492.300.
Matsukawa, Shigeki: See—
MacConnell, Edward P.; and Matsukawa, Shigeki, 5,088,404, Cl. 101-232.000.
Matsumoto, Hiroshi: See—
Iwaki, Takashi; Ito, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,088,452, Cl. 123-3.000.
Matsumoto, Kohei: See—
Hayase, Yoshio; Matsumoto, Kohei; Kamei, Kazuo; Ide, Kinya; and Takahashi, Toshio, 5,089,043, Cl. 71-90.000.
Matsumoto, Kunio: See—
Kanda, Naoya; Ishikawa, Yasushi; Matsumoto, Kunio; and Asao, Hiroshi, 5,089,104, Cl. 204-192.110.
Matsumoto, Tadashi: See—
Ikegaya, Isao; and Matsumoto, Tadashi, 5,088,841, Cl. 297-344.000.
Matsumoto, Wataru; Nakai, Eiji; Nezu, Toru; and Suzuki, Kazuaki, to Japanese Research and Development Association for Bioreactor System in Food Industry. The Process for the transesterification of fat and oil. 5,089,404, Cl. 435-134.000.
Matsumoto, Yumio: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.
Matsumura, Teruyuki: See—
Miyata, Mitsuo; Matsumura, Teruyuki; and Nagashima, Noritake, 5,089,950, Cl. 364-191.000.
Matsunaga, Kenichi: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yo-shiharu; Matsunaga, Kenichi; Hirse, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.
Matsunaga, Takasi; and Nisimura, Toshihiro, to Mitsui Petrochemical Industries, Ltd. Polyethylene resin composition and film thereof. 5,089,322, Cl. 428-220.000.
Matsunaga, Tohru: See—
Yokomori, Sadakazu; Saijo, Keiko; Matsunaga, Tohru; Nakashima, Yoshimoto; and Hatayama, Katsuo, 5,089,654, Cl. 560-53.000.
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, to Matsushita Electric Industrial Co. Ltd. Semiconductor memory device. 5,089,869, Cl. 357-23.600.
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagato-shi, Kikuo, to Idemitsu Kosan Company Limited. Polycanoaryl ether laminate. 5,089,340, Cl. 428-411.000.
Matsuoka, Takeshi: See—
Fuse, Takahiro; Hasegawa, Akira; and Matsuoka, Takeshi, 5,089,812, Cl. 340-793.000.
Matsushima, Yoshihisa: See—
Kanno, Tomoaki; Matsushima, Yoshihisa, and Suzuki, Makoto, 5,089,360, Cl. 429-254.000.
Matsushita Electric Industrial Co., Ltd.: See—
Hatada, Kenzo; and Nagao, Koichi, 5,089,750, Cl. 315-169.300.
Hatada, Kenzo; Ishihara, Takeshi; Suzuki, Nobuaki; and Kuroda, Satowaka, 5,089,772, Cl. 324-158.00F.
Ito, Taichi; and Tsukuda, Masato, 5,089,831, Cl. 346-76.0PH.
Kirihaata, Yoshihiro; Murata, Chikara; Tsukamoto, Masahide; and Nishimura, Yutaka, 5,089,372, Cl. 430-167.000.
Kondo, Shigeo; and Yamamura, Yasuharu, 5,089,222, Cl. 419-10.000.
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, 5,089,869, Cl. 357-23.600.
Nakazawa, Koichi, 5,089,761, Cl. 318-811.000.
Sogawa, Kenji, 5,089,758, Cl. 318-603.000.
Tomizawa, Takeshi; and Anita, Koji, 5,088,302, Cl. 62-480.000.
Watanabe, Katsuya; Moriya, Mitsuro; Yamada, Shinichi; and Shin-bano, Masayuki, 5,090,003, Cl. 369-44.340.
Yoshikawa, Motonobu; and Yamamoto, Yoshiharu, 5,089,907, Cl. 359-206.000.
Zdepski, Joel W.; Joseph, Kuriacose; Wakamori, Masahiro; and Yukitake, Takeshi, 5,089,888, Cl. 358-133.000.
Matsushita Electrical Industrial Co.: See—
Fukuoka, Toshiaki, 5,089,733, Cl. 310-67.00R.
Matsushita, Izumi: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,088,405, Cl. 101-240.000.
Matsushita Electric Works, Ltd.: See—
Hamada, Tadashi; Yamada, Shuji; Tsuji, Eiji; and Mizukoshi, Tomoyuki, 5,089,223, Cl. 420-40.000.
Matsuura, Yutaka: See—
Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 5,089,066, Cl. 148-302.000.
Matsuzaki, Kunimitsu: See—
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Mitsui Katsuyoshi; and Inuishi, Masahide, 5,089,865, Cl. 357-23.400.

Mochizuki, Mitsuru; Isota, Youji; Takagi, Tadashi; and Urasaki, Shuji, 5,089,790, Cl. 330-277.000.

Motonami, Kaoru, 5,089,868, Cl. 357-23.600.

Nakanishi, Yasuyuki, 5,088,655, Cl. 242-198.000.

Nakao, Yuichi; and Toyomoto, Hideharu, 5,089,987, Cl. 365-222.000.

Okuda, Hiroshi; and Iwasaki, Yasuo, 5,089,743, Cl. 313-474.000.

Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, 5,089,863, Cl. 357-23.300.

Shima, Akihiro; and Ishiki, Kunihiko, 5,089,437, Cl. 437-129.000.

Shinohara, Hirofumi, 5,089,992, Cl. 365-51.000.

Tabuchi, Hiroshi, 5,089,846, Cl. 355-200.000.

Yano, Haruto; Hirasu, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, 5,089,826, Cl. 342-457.000.

Yasue, Takao, 5,088,290, Cl. 62-51.100.

Mitsubishi Gas Chemical Company, Inc.: See—
Nakamura, Tadasi; Tsuji, Kinya; and Obata, Yoriko, 5,089,452, Cl. 502-202.000.

Mitsubishi Jukogyo Kabushiki Kaisha: See—
Usami, Masahiro; Ueda, Kenji; Tomoshige, Kiyomi; Ohta, Shozo; Horiguchi, Tsutomu; and Yamazaki, Hiroshi, 5,088,432, Cl. 114-67.00R.

Mitsubishi Kasei Corporation: See—
Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; and Kanayama, Toshiro, 5,089,494, Cl. 514-248.000.

Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, 5,089,515, Cl. 514-404.000.

Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Makoto; Ohba, Sachiko; and Ohkishi, Haruyuki, 5,089,402, Cl. 435-96.000.

Mitsubishi Materials Corporation: See—
Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yanase, Yoshiyuki, 5,088,863, Cl. 408-230.000.

Mitsubishi Paper Mills Limited: See—
Kodera, Tatsuya; Takaoka, Kazuchiyo; Haino, Kozo; Itoh, Akira; Okaji, Makoto; and Emoto, Kazuhiro, 5,089,366, Cl. 430-59.000.

Mitsubishi Petrochemical Co., Ltd.: See—
Hayama, Kazuhide; Hosokawa, Noritaka; Yazaki, Takao; and Noro, Masataka, 5,089,291, Cl. 427-54.100.

Mitsubishi Rayon Co., Ltd.: See—
Ninomiya, Hirofumi; Suzuki, Shoji; and Ishii, Kazuhiro, 5,089,307, Cl. 428-35.200.

Oe, Makoto; and Chiba, Issei, 5,089,944, Cl. 362-224.000.

Yoneyama, Hiroaki; and Nishihara, Yoshihiro, 5,089,135, Cl. 210-500.230.

Mitsui Engineering and Shipbuilding Co., Ltd.: See—
Hirano, Yoshinao; Nagamori, Shigeru; Sato, Katsumi; and Murata, Katsuhide, 5,089,184, Cl. 264-22.000.

Hirano, Yoshinao; Sato, Katsumi; Shirai, Junji; and Nagamori, Shigeru, 5,089,185, Cl. 264-22.000.

Mitsui, Katsuyoshi; and Inuishi, Masahide, to Mitsubishi Denki Kabushiki Kaisha. MIS semiconductor device. 5,089,865, Cl. 357-23.400.

Mitsui Petrochemical Industries, Ltd.: See—
Matsunaga, Takasi; and Nisimura, Toshihiro, 5,089,322, Cl. 428-220.000.

McAndrew, Thomas P., 5,089,070, Cl. 156-89.000.

Mitsui Toatsu Chemicals Incorporated: See—
Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.

Morita, Moritsugu; Sato, Takashi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeyuki, 5,089,355, Cl. 428-607.000.

Mitsukuchi, Yukio: See—
Kojima, Hiroshi; Sakata, Keiichi; Watanabe, Seigo; and Mitsukuchi, Yukio, 5,088,361, Cl. 82-127.000.

Miura, Steven: See—
Allen, Ronald; Bae, Peter S.; and Miura, Steven, 5,089,110, Cl. 204-298.150.

Miura, Takanori; Kohara, Masanori; and Ōka, Kunihide, to Yoshitomi Pharmaceutical Industries, Ltd. Individual α -form particle crystals of tetrakis[3-(3,5-di-*t*-butyl-4-hydroxyphenyl)propionyloxymethyl]methane and process for its production. 5,089,655, Cl. 560-75.000.

Miwa, Sachihiko: See—
Konno, Daisuke; Miwa, Sachihiko; Aiyoshizawa, Shunichi; Kasahara, Kazuyuki; Sato, Yoshio; and Hirokawa, Kazuo, 5,089,732, Cl. 310-67.00R.

Miwa, Shinichi; Asami, Seiichi; Kajihara, Takehiro; and Imao, Kouichi, to NGK Insulators, Ltd. Silicon nitride sintered bodies. 5,089,449, Cl. 501-98.000.

Miyachi, Takumi: See—
Sakagami, Toshinori; Toyama, Yasuo; Ito, Hisaharu; and Miyachi, Takumi, 5,089,550, Cl. 525-314.000.

Miyagawa, Toyomi, to Kabushiki Kaisha Toshiba. Mechanical ultrasonic scanner. 5,088,495, Cl. 128-660.100.

Miyaji, Katsuaki: See—
Sato, Fumie; Arai, Kazutaka; and Miyaji, Katsuaki, 5,089,625, Cl. 548-110.000.

Miyake, Osamu; Suzumura, Nobuyasu; and Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha. Vehicle speed control system for motor vehicle having an automatic transmission control system. 5,088,351, Cl. 74-866.000.

Miyashita, Koji: See—
Nomura, Satoru; Nagai, Yoshihisa; Emi, Tetsuro; Miyashita, Koji; Higuchi, Hiroyuki; and Hijikata, Makoto, 5,089,899, Cl. 358-335.000.

Miyata, Koji, to Shin-Etsu Chemical Co., Ltd. Apparatus for generating uniform magnetic field using small diameter spherical metallic members provided on magnetic poles. 5,089,798, Cl. 335-211.000.

Miyata, Mitsuto; Matsumura, Teruyuki; and Nagashima, Noritake, to Fanuc Ltd. Part profile input method. 5,089,950, Cl. 364-191.000.

Miyazawa, Takeshi: See—
Katagishi, Yoshihiro; Miyazawa, Takeshi; Kiyota, Hiroyuki; and Fujii, Nobuo, 5,088,288, Cl. 62-6.000.

Miyazawa, Yoshiki: See—
Nakamura, Yoshinori; Miyazawa, Yoshiki; and Yoshizawa, Shigeo, 5,089,208, Cl. 264-513.000.

Mizoguchi, Junzo: See—
Akasaka, Masami; Kubota, Akiko; Mizoguchi, Junzo; and Satoh, Sakae, 5,089,408, Cl. 435-192.000.

Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichi; Hirano, Yoshihiro; and Urano, Masahiko, to Shin-Etsu Handotai Company Limited. Wire vibration prevention mechanism for a single crystal pulling apparatus. 5,089,239, Cl. 422-249.000.

Mizukami, Fujio: See—
Maeda, Kazuyuki; Mizukami, Fujio; Niwa, Shuichi; Toba, Makoto; and Shimizu, Kazuo, 5,089,456, Cl. 501-119.000.

Mizukata, Katsuya; Takeda, Makoto; Take, Hiroshi; and Kawaguchi, Takafumi, to Sharp Kabushiki Kaisha. Phase locked loop with phase difference signal adjustment circuit. 5,089,792, Cl. 331-17.000.

Mizukawa, Yuki: See—
Taniguchi, Masato; Sato, Tadahisa; and Mizukawa, Yuki, 5,089,651, Cl. 558-360.000.

Mizukoshi, Tomoyuki: See—
Hamada, Tadashi; Yamada, Shuji; Tsuji, Eiji; and Mizukoshi, Tomoyuki, 5,089,223, Cl. 420-40.000.

- Mobil Oil Corporation: See—
Abramo, Guy P.; Avery, Noyes L.; and Trewella, Jeffrey C., 5,089,028, Cl. 44-347.000.
Hen, John, 5,089,150, Cl. 252-8.552.
Herrington, Fox J., 5,088,971, Cl. 493-203.000.
Jensen, Jay E., 5,088,317, Cl. 73-49.200.
Shu, Paul, 5,088,555, Cl. 166-292.000.
Mochimaru, Hideaki, to Ricoh Company, Ltd. Image forming apparatus which forms image by electrophotography. 5,089,855, Cl. 355-271.000.
Mochizuki, Akihiro; and Iwasaki, Masayuki, to Fujitsu Limited. Liquid crystal material and display device using same. 5,089,169, Cl. 252-299.650.
Mochizuki, Akira: See—
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.
Mochizuki, Mitsuru; Isota, Youji; Takagi, Tadashi; and Urasaki, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Field effect transistor amplifier. 5,089,790, Cl. 330-277.000.
Mochizuki, Tetsuro: See—
Kikuchi, Kenichi; Suzuki, Akio; and Mochizuki, Tetsuro, 5,089,031, Cl. 48-77.000.
Mohara, Masayuki: See—
Takata, Kazunori; Akaishi, Tsuneshi; and Mohara, Masayuki, 5,088,187, Cl. 29-705.000.
Mohn, Frank. Undersea package and installation system. 5,088,558, Cl. 166-339.000.
Molex Incorporated: See—
Enomoto, Masahiro, 5,088,929, Cl. 439-66.000.
Molitor, Lawrence H.; and Stearns, Edward J., to Motorola, Inc. Pulsed driver circuit. 5,089,727, Cl. 307-570.000.
Moll, Patrick, to Dr. Ing. h.c.F. Porsche AG. Four-wheel steering arrangement for motor vehicles. 5,088,573, Cl. 180-140.000.
Molloy, Louis-Pierre, to Ciba-Geigy Corporation. Anthelmintics. 5,089,501, Cl. 514-269.000.
Mollier, Pierre; Nuez, Jean-Paul; and Tannhof, Pascal, to International Business Machines Corporation. Self-referenced current switch logic circuit with a push-pull output buffer. 5,089,725, Cl. 307-455.000.
Momose, Yutaka, to Aisin Seiki Kabushiki Kaisha. Compressor integral with Stirling engine. 5,088,284, Cl. 60-517.000.
Monarch Machine Tool Company, The: See—
Wagner, Ted R.; and Sanderson, Christopher D., 5,088,182, Cl. 29-568.000.
Moncorge, Jean-Paul: See—
Thurles, Edmond; Dupraz, Jean -Pierre; Moncorge, Jean-Paul; Williams, Jean-Marc; Martin, Joseph; Perras, Yves; and Tapinat, Didier, 5,089,931, Cl. 361-174.000.
Mondor, E. J., III: See—
Piper, Douglas E.; and Mondor, E. J., III, 5,089,669, Cl. 174-117.000.
Monnig, Len W., to Figgie International, Inc. Choke valve for bottle filling device. 5,088,527, Cl. 141-39.000.
Monsanto Company: See—
Baker, Carol A.; Brooks, Albert A.; Greenley, Robert Z.; and Henis, Jay M., 5,089,407, Cl. 435-179.000.
Fleet, George W. J.; Rademacher, Thomas W.; and Dwek, Raymond A., 5,089,520, Cl. 514-425.000.
Howard, Susan C.; Welpy, Joseph K.; and Wittwer, Arthur J., 5,089,409, Cl. 435-240.200.
Krivi, Gwen G.; Schlittler, Michael R.; and Violand, Bernard N., 5,089,473, Cl. 514-12.000.
Montzka, Stephen A.: See—
Sievers, Robert E.; and Montzka, Stephen A., 5,089,466, Cl. 505-1.000.
Mookherjee, Braja D.: See—
Zampino, Michael J.; Wilson, Richard A.; and Mookherjee, Braja D., 5,089,469, Cl. 512-22.000.
Moore, Boyd B.: See—
Wicks, Moye, III; and Moore, Boyd B., 5,088,387, Cl. 34-15.000.
Moore Business Forms, Inc.: See—
McCartney, Larry G., 5,088,962, Cl. 462-18.000.
Moore, Robert E.: See—
Cracchiolo, Vincenzo; Hawley, Terry L.; Moore, Robert E.; Radlick, David D.; and Stuben, Frank S., 5,088,367, Cl. 83-345.000.
Moore, Timothy M.; and Van Der Woude, Gerbrig W., to Advanced Plastics Partnership. Process for core removal from molded products. 5,089,186, Cl. 264-25.000.
Moore, Robert G., Jr., to Black & Decker Inc. Power tool with brush shifting and reversing switch assembly. 5,089,729, Cl. 310-50.000.
Moran, Joseph F. Grinding wheel. 5,089,032, Cl. 51-293.000.
Morawski, Jean-Claude: See—
Bomo, Francis; Chevallier, Yvonick; Lamy, Patrick; and Morawski, Jean-Claude, 5,089,554, Cl. 524-493.000.
Mordue, George S.: See—
Gilbert, Ronald E.; and Mordue, George S., 5,088,893, Cl. 415-200.000.
Moretz, Ralph D., to Mid-American Products, Inc. Roller valve lifter anti-rotation guide. 5,088,455, Cl. 123-90.500.
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., to General Electric Company. Compact molded case circuit breaker with movable contact arm rebound cushion. 5,089,795, Cl. 335-46.000.
Morgan, Russell M.: See—
Stephenson, Gerald H.; and Morgan, Russell M., 5,089,683, Cl. 219-121.780.
Morgenthaler, Jean J.: See—
Isliker, Henri; Peitsch, Manuel C.; Heiniger, Hans J.; Lerch, Peter G.; and Morgenthaler, Jean J., 5,089,602, Cl. 530-359.000.
Mori, Kunitaka, to NEC Corporation. Digital data reproducing circuit for a magnetic recording apparatus of reproducing digital data without being affected by capable external noise, drop-ins, and drop-outs. 5,089,821, Cl. 341-155.000.
Mori, Shigeo: See—
Fujiwara, Hidekazu; Motogami, Kenji; and Mori, Shigeo, 5,089,199, Cl. 264-83.000.
Mori, Toshiyuki: See—
Kawakami, Yasunobu; Hamazaki, Kagehisa; Arakawa, Toshihiko; and Mori, Toshiyuki, 5,089,448, Cl. 501-97.000.
Morinaga, Shigeki; and Watabe, Mitsuru, to Hitachi, Ltd. Programmable counter/timer device with programmable registers having programmable functions. 5,089,955, Cl. 395-800.000.
Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, to Mitsubishi Kasei Corporation. Lipid-peroxide formation inhibiting composition and novel compounds useful therefor. 5,089,515, Cl. 514-404.000.
Morinaka, Yasuhiro: See—
Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; and Kanayama, Toshiji, 5,089,494, Cl. 514-248.000.
Morisaki, Hiroshi; and Kato, Tokunori, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus having bar code reader for reading bar code attached to leading end of microcapsule sheet. 5,089,691, Cl. 235-375.000.
Morishige, Chitoshi; and Sawasaki, Tomoo, to Mazda Motor Corporation. Hydraulic transmission control system. 5,089,964, Cl. 364-424.100.
Morishita, Kenji: See—
Ichii, Masaru; Fukuda, Kojo; and Morishita, Kenji, 5,089,464, Cl. 503-227.000.
Morita, Iwao: See—
Kimura, Kiyoshi; Yamaguchi, Takeshi; Morita, Iwao; and Murakami, Tetsuo, 5,089,529, Cl. 514-648.000.
Morita, Moritsugu; Sato, Takashi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeoyuki, to Mitsui Toatsu Chemicals, Incorporated. Flexible metal clad laminate, production method thereof and apparatus for the method. 5,089,355, Cl. 428-607.000.
Morita, Toshiaki: See—
Takehara, Shin; and Morita, Toshiaki, 5,088,759, Cl. 280-707.000.
Takehara, Shin; and Morita, Toshiaki, 5,088,761, Cl. 280-707.000.
Moritake, Masanori: See—
Hashibe, Yoshio; Matano, Takahiro; Shibuya, Takehiro; Sakane, Takashi; Baba, Yasuhiro; and Moritake, Masanori, 5,089,345, Cl. 428-428.000.
Moritz, Andrew J. Crab trap. 5,088,230, Cl. 43-100.000.
Moriya, Mitsuru: See—
Watanabe, Katsuya; Moriya, Mitsuru; Yamada, Shinichi; and Shinbano, Masayuki, 5,090,003, Cl. 369-44.340.
Morris, Daniel L.: See—
Manno, Eugene; Wargo, John A.; and Morris, Daniel L., 5,089,852, Cl. 355-251.000.
Morris, Dewi J.: See—
Gardner, Frederick J.; and Morris, Dewi J., 5,089,218, Cl. 376-406.000.
Morris, Robert A.: See—
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,089,795, Cl. 335-46.000.
Morrison, Clark; and Stoyka, Charles F., to International Marketing and Design Seating System, Inc. Wheelchair seating system. 5,088,747, Cl. 297-219.000.
Morrison, Robert B.: See—
Lummes, Stephen E.; Morrison, Robert B.; and Henning, Brian C. R., 5,088,209, Cl. 33-707.000.
Morsell, Arthur L.; and Shields, Henry, to California Jamar, Incorporated. Laser plasma X-ray source. 5,089,711, Cl. 250-492.300.
Mortimer, John H., to Inductotherm Corp. Cold crucible induction furnace. 5,090,022, Cl. 373-156.000.
Moslehi, Mehrdad M., to Texas Instruments Incorporated. Low-temperature in-situ dry cleaning process for semiconductor wafers. 5,089,441, Cl. 437-225.000.
Moss, Graham H., to British Aerospace Public Limited Company. Electromagnetic radiation receiver. 5,089,828, Cl. 343-725.000.
Mosse, Madeleine; and Proietto, Vincenzo, to Sanofi. Aromatic derivatives and their use as antimicrobial agents. 5,089,251, Cl. 424-47.000.
Motogami, Kenji: See—
Fujiwara, Hidekazu; Motogami, Kenji; and Mori, Shigeo, 5,089,199, Cl. 264-83.000.
Motonami, Kaoru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with improved groove capacitor. 5,089,868, Cl. 357-23.600.
Motor Wheel Corporation: See—
Stalter, Robert J., Sr.; and Prueter, A., 5,088,798, Cl. 301-37.00P.
Motorola, Inc.: See—
Amedeo, Robert J., 5,089,722, Cl. 307-443.000.
Dabbish, Ezzat A.; Puhl, Larry C.; and Brendle, William L., 5,090,015, Cl. 371-22.500.

- DeLuca, Michael J.; Jasinski, Leon; and Willard, David F., 5,089,813, Cl. 340-825.440.
DeLuca, Michael J.; and DeLuca, Joan S., 5,089,814, Cl. 340-825.490.
Gondotra, Vinay; Gore, Kiron P.; and Bogert, Steven T., 5,088,639, Cl. 228-180.100.
Molitor, Lawrence H.; and Stearns, Edward J., 5,089,727, Cl. 307-570.000.
Muppidi, Prabhakar; Lobel, Gary S.; and Shapiro, Steven C., 5,090,051, Cl. 379-61.000.
Petty, Thomas D.; and Vyne, Robert L., 5,089,769, Cl. 323-316.000.
Schoenberg, Mark, 5,089,427, Cl. 437-15.000.
Moulton, Lee A. Vehicle cover apparatus. 5,088,788, Cl. 296-136.000.
Moutet, Serge: See—
Demeyer, Pierre; Mertz, Jean-Luc; Segond, Corinne; Moutet, Serge; Chevalleyre, Robert; Lhuillier, Henri; and Barthelemy, Patrick, 5,089,974, Cl. 364-492.000.
MSCL, Inc.: See—
Kaye, Michael C.; and Bermanian, Majid, 5,089,882, Cl. 358-28.000.
MTU Motoren-und Turbinen-Union Muenchen GmbH: See—
Wolff, Karl-Heinz, 5,088,889, Cl. 415-171.100.
Mueller, Ray: See—
Wall, Kenneth; and Mueller, Ray, 5,088,758, Cl. 280-683.000.
Muhlauer, Ernst; to Muhlauer, Ernst. Arrangement for operating a multi-component mixing capsule, in particular for dental purposes, by means of a vibratory mixing device. 5,088,830, Cl. 366-108.000.
Mula, Richard, to Hydroimage. High-intensity underwater light source. 5,089,945, Cl. 362-261.000.
Mullen, Mark A.: See—
Elmore, Carl L.; Mullen, Mark A.; Emery, George D.; and Carter, Timothy R., 5,089,087, Cl. 162-46.000.
Muller, Fritz: See—
Findelsen, Eberhard; Frank, Klaus; Becker, Wilfried; and Muller, Fritz, 5,089,182, Cl. 264-8.000.
Muller, Hartwig: See—
Frobel, Klaus; Lenfers, Jan-Bernd; Fey, Peter; Knorr, Andreas; Stasch, Johannes-Peter; Muller, Hartwig; Bischoff, Erwin; and Dellweg, Hans-Georg, 5,089,487, Cl. 514-150.000.
Muller, Jean, to Societe Anonyme Dite Societe Centrale d'Etudes et de Realisations Routieres. Device for securing a cable to the concrete platform of a bridge, and bridge equipped with such devices. 5,088,142, Cl. 14-22.000.
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal substituted 4-sulphonylamino-2-aziny-2,4-triazol-3-ones. 5,089,627, Cl. 548-263.000.
Muller, Ulrich: See—
Thoen, Johan A.; Sewell, Robert A.; and Muller, Ulrich, 5,089,534, Cl. 521-106.000.
Mun, Kam C. Fasteners that bleed fluid upon failure. 5,088,867, Cl. 411-13.000.
Mundt, Henry W.; and Mundt, Virginia C. Pendulum putting device. 5,088,738, Cl. 273-193.00B.
Mundt, Virginia C.: See—
Mundt, Henry W.; and Mundt, Virginia C., 5,088,738, Cl. 273-193.00B.
Munster, Candice W. Cry responsive baby crib. 5,088,138, Cl. 5-109.000.
Muppidi, Prabhakar; Lobel, Gary S.; and Shapiro, Steven C., to Motorola, Inc. Radio communication system and method for connecting an incoming call to a wireless telephone. 5,090,051, Cl. 379-61.000.
Muraji, Hiroshi, to Isuzu Motors Limited. Control system for turbo-charger with rotary electric machine. 5,088,286, Cl. 60-608.000.
Murakami, Fumiaki: See—
Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, 5,089,967, Cl. 364-426.020.
Murakami, Seishi; Kai, Kojo; and Kato, Susumu, to Tokyo Electron Limited. Heat treating apparatus. 5,088,697, Cl. 266-250.000.
Murakami, Shigeomi: See—
Iwami, Masahide; Murakami, Shigeomi; Saito, Fumitaka; Watanabe, Takao; and Akiyama, Masami, 5,088,794, Cl. 297-483.000.
Murakami, Tetsuo: See—
Kimura, Kiyoshi; Yamaguchi, Takeshi; Morita, Iwao; and Murakami, Tetsuo, 5,089,529, Cl. 514-648.000.
Murakami, Tomoyoshi: See—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 5,089,340, Cl. 428-411.100.
Murakami, Toshiyuki, to Komori Corporation. Plate lockup apparatus for printing press. 5,088,410, Cl. 101-415.100.
Murakami, Yoshihiro; and Yamamoto, Takayuki, to Yazaki Corporation. Terminal locking block for electrical connectors. 5,088,938, Cl. 439-595.000.
Murakawa, Takaji: See—
Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, 5,089,967, Cl. 364-426.020.
Muraoka, Takeshi: See—
Sawaguchi, Hideo; Muraoka, Takeshi; and Takahashi, Kazuhiro, 5,089,735, Cl. 310-88.000.
Murasawa, Sadao; Hirobe, Yoshio; and Ando, Hitoshi, to Ishihara Sangyo Kaisha, Ltd. Electrophotographic photoreceptor containing titanium dioxide. 5,089,367, Cl. 430-84.000.
Murase, Makoto, to NEC Corporation. Linear feedback shift register. 5,090,035, Cl. 377-72.000.
Murata, Chikara: See—
Kiriata, Yoshihiro; Murata, Chikara; Tsukamoto, Masahide; and Nishimura, Yutaka, 5,089,372, Cl. 430-167.000.
Murata, Ikuo: See—
Takeuchi, Hiroshi; Iwase, Masahiko; Tojima, Hiromi; Murata, Ikuo; and Uenohara, Norihisa, 5,088,583, Cl. 192-70.270.
Murata, Katsuhide: See—
Hirano, Yoshinao; Nagamori, Shigeru; Sato, Katsumi; and Murata, Katsuhide, 5,089,184, Cl. 264-22.000.
Murata Kikai Kabushiki Kaisha: See—
Baba, Kenji, 5,088,653, Cl. 242-43.00R.
Suganuma, Buro; Nishimura, Shinichi; and Takeshita, Akihiko, 5,088,265, Cl. 57-328.000.
Murata, Noriyasu: See—
Hirayama, Ryuichi; Takashima, Susumu; Kanda, Masako; and Murata, Noriyasu, 5,089,918, Cl. 360-70.000.
Murata, Yumiko; Otsuka, Masako; Saimoto, Hiroshi; and Kawashima, Masao, to Somar Corporation. Process for the production of betacyanin pigments. 5,089,410, Cl. 435-240.450.
Murphy, Andrew P., to United States of America, Interior. Chemical process for removing selenium from water. 5,089,141, Cl. 210-719.000.
Murphy, Cary R.; and Bridges, Mark K., to Siemens Aktiengesellschaft. Pulsed laser system for visually detecting faults in optical waveguides. 5,090,018, Cl. 372-30.000.
Murphy, James V., to Advanced Interconnections Corporation. Integrated circuit socket with reed-shaped leads. 5,088,930, Cl. 439-70.000.
Murr, Lawrence E.; and Hare, Alan W., to Oregon Graduate Center; and Northwest Technical Industries, Inc., a part interest. Superconductor structures and method of forming same. 5,089,467, Cl. 505-1.000.
Murray, Daniel J.; Dibbs, Mitchell G.; and Yang, Philip C., to Dow Chemical Company, The. Aromatic polycyanate/monocyanate comonomer compositions and polytriazines derived therefrom. 5,089,660, Cl. 560-301.000.
Murray-Shelley, Richard, to Smiths Industries Public Limited Company. Electrical counter having plural unit value registers. 5,090,033, Cl. 377-28.000.
Musel, Robert J., to Wheaton Industries. Multi-chamber package for mixing and dispensing. 5,088,627, Cl. 222-145.000.
Muszak, Martin F.: See—
Shaw, James D.; Muszak, Martin F.; and Want, Nicholas, 5,089,418, Cl. 436-46.000.
Muto, Hakaru, to Canon Kabushiki Kaisha. Image forming apparatus. 5,089,832, Cl. 346-160.100.
Muto, Mitsuru: See—
Takagi, Atsuhiko; Muto, Mitsuru; and Isono, Jun, 5,088,427, Cl. 112-256.000.
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polysaccharides and antiviral drugs containing the same as active ingredient. 5,089,481, Cl. 514-54.000.
Mutterperl, Charles: See—
Hochfeld, Stanley, 5,089,337, Cl. 428-352.000.
Myers, Gary L., to Fort Lock Corporation. Snap-in self holding disc tumbler construction. 5,088,305, Cl. 70-369.000.
Myers, J. Milton. Roof construction system. 5,088,259, Cl. 52-410.000.
Myers, Ronald E., to B. F. Goodrich Company, The. High char yield silazane-modified phenolic resins. 5,089,552, Cl. 524-404.000.
N. Jonas & Co., Inc.: See—
Antelman, Marvin S., 5,089,275, Cl. 424-602.000.
N. V. Bekaert S.A.: See—
De Bruyne, Roger; and Losfeld, Ronny, 5,088,919, Cl. 431-328.000.
N. V. Raychem S.A.: See—
Van Dijk, Frans S. J., 5,088,772, Cl. 285-47.000.
Naber, Charles E.; and Ballard, James B., to Hein-Werner Corporation. Hydraulic apparatus including a hydraulic fluid flow control cartridge. 5,088,691, Cl. 254-8.00R.
Nabisco Brands, Inc.: See—
Haynes, Lynn C.; Levine, Harry; Otterburn, Michael S.; and Mathewson, Paul, 5,089,278, Cl. 426-98.000.
Nachman, Marcus; and Overton, Robert H., to Nachman Precision Systems, Inc.; and Daniel H. Wagner Associates, Inc., a part interest. Moored ship motion determination system. 5,089,972, Cl. 364-478.000.
Nachman Precision Systems, Inc.: See—
Nachman, Marcus; and Overton, Robert H., 5,089,972, Cl. 364-478.000.
Nagai, Hihumi: See—
Itoh, Eiji; Nagase, Ryuichi; Saito, Kazuhiro; Hosaka, Hiroshi; and Nagai, Hihumi, 5,089,196, Cl. 264-65.000.
Nagai, Yoshihisa: See—
Nomura, Satoru; Nagai, Yoshihisa; Emi, Tetsuro; Miyashita, Koji; Higuchi, Hiroyuki; and Hijikata, Makoto, 5,089,899, Cl. 358-335.000.
Nagakura, Mitsuru: See—
Hamano, Masaaki; Yamamoto, Hiroshi; Nagakura, Mitsuru; and Ozawa, Yoshiaki, 5,089,065, Cl. 148-302.000.
Nagamatsu, Tsutomu: See—
Washizu, Takehiro; and Nagamatsu, Tsutomu, 5,088,454, Cl. 123-52.00MB.

- Nagamori, Shigeru: See—
Hirano, Yoshinao; Nagamori, Shigeru; Sato, Katsumi; and Murata, Katsuhide, 5,089,184, Cl. 264-22.000.
Hirano, Yoshinao; Sato, Katsumi; Shirai, Junji; and Nagamori, Shigeru, 5,089,185, Cl. 264-22.000.
Nagao, Hidenori, to Seiko Epson Corporation. Semiconductor device having an oscillatory circuit. 5,089,793, Cl. 331-46.000.
Nagao, Koichi: See—
Hatada, Kenzo; and Nagao, Koichi, 5,089,750, Cl. 315-169.300.
Nagao, Kouichi: See—
Imaizumi, Junichi; Nomura, Hiroshi; Nagao, Kouichi; Suzuki, Masakatsu; Sakairi, Koushi; and Satou, Eikichi, 5,089,346, Cl. 428-458.000.
Nagaoka, Haruo: See—
Hayashi, Hirokazu; Aihara, Tetsuo; Nagaoka, Haruo; Kamikado, Koji; and Nakatani, Eisaku, 5,089,101, Cl. 204-181.700.
Nagasawa, Kenichi: See—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Unichi; and Takayama, Nobutoshi, 5,089,919, Cl. 360-74.400.
Nagasawa, Tamami; and Takahashi, Kozo, to Sharp Kabushiki Kaisha. Recirculating sheet feeder. 5,088,714, Cl. 271-3.100.
Nagasawa, Toru: See—
Yamada, Hideaki; and Nagasawa, Toru, 5,089,411, Cl. 435-244.000.
Nagase, Ryuichi: See—
Itoh, Eiji; Nagase, Ryuichi; Saito, Kazuhiro; Hosaka, Hiroshi; and Nagai, Hihumi, 5,089,196, Cl. 264-65.000.
Nagashima, Noritake: See—
Miyata, Mitsuo; Matsumura, Teruyuki; and Nagashima, Noritake, 5,089,950, Cl. 364-191.000.
Nagata, Kenzo: See—
Kusumoto, Keiji; and Nagata, Kenzo, 5,089,859, Cl. 355-327.000.
Nagata, Shiro: See—
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.
Nagata, Yoshihiko: See—
Kashida, Meguru; Kubota, Yoshihiro; and Nagata, Yoshihiko, 5,089,085, Cl. 156-659.100.
Nagatoshi, Kikuo: See—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 5,089,340, Cl. 428-411.100.
Nagayama, Susumu: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ipppei; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.
Nagel Maschinen-und Werkzeugfabrik GmbH: See—
Nagel, Peter; and Nagel, Wolf, 5,088,237, Cl. 51-34.00J.
Nagel, Peter; and Nagel, Wolf, to Nagel Maschinen-und Werkzeugfabrik GmbH. Method, machine and tool for the honing of workpieces. 5,088,237, Cl. 51-34.00J.
Nagel, Wolf: See—
Nagel, Peter; and Nagel, Wolf, 5,088,237, Cl. 51-34.00J.
Nahir, David; and Ronen, Binyamin, to State of Israel-Ministry of Agriculture. Apparatus for removing pulp from fruit. 5,088,393, Cl. 99-516.000.
Naisby, Thomas W.: See—
Wood, William W.; Naisby, Thomas W.; and Gray, Andrew C. G., 5,089,486, Cl. 514-149.000.
Naito, Mitsuuyuki: See—
Morita, Moritsugu; Sato, Takush; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuuyuki; and Shishido, Shigeyuki, 5,089,355, Cl. 428-607.000.
Naito, Norihiro: See—
Yano, Haruto; Hirasu, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, 5,089,826, Cl. 342-457.000.
Naito, Toshihiko: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
Najm, Elie M.: See—
Driscoll, Carleton D.; Jungling, Ronald S.; and Najm, Elie M., 5,089,947, Cl. 363-20.000.
Nakai, Kiyohiko; Kawakita, Toshio; Kume, Takanori; and Sugiyama, Masashi, to Sumitomo Chemical Co., Ltd. Oxygen absorbing sheet. 5,089,323, Cl. 428-220.000.
Nakagawa, Masayuki: See—
Tomioaka, Atuo; Nakagawa, Masayuki; and Maeda, Tadashi, 5,088,816, Cl. 356-39.000.
Nakai, Eiji: See—
Matsumoto, Wataru; Nakai, Eiji; Nezu, Toru; and Suzuki, Kazuaki, 5,089,404, Cl. 435-134.000.
Nakajima, Junya: See—
Sakamoto, Kiichiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, 5,089,840, Cl. 354-324.000.
Nakajima, Masaaki: See—
Kiyota, Hirokazu; Kaneta, Tomoo; Nakajima, Masaaki; and Kurihara, Masakazu, 5,088,719, Cl. 271-182.000.
Nakajima, Masahiro: See—
Yamamoto, Masato; Nakajima, Masahiro; Yamanaka, Toshimasa; and Satou, Kouji, 5,089,677, Cl. 200-339.000.
Nakajima, Noboru: See—
Kawahara, Setsuko; Koyama, Noboru; Nakano, Yasushi; and Nakajima, Noboru, 5,089,333, Cl. 428-329.000.
Nakajima, Ryuichi; and Yamana, Koji, to Tandy Corporation. Telephone system with multiple extension telephones. 5,090,052, Cl. 379-98.000.
Nakamura, Hiroshi; Saita, Yoshinobu; and Ikeda, Hitoshi, to Kabushiki Kaisha Honda Rokku. Cylinder lock manufacturing method. 5,088,175, Cl. 29-430.000.
Nakamura, Kotaro; Tanaka, Toshiharu; and Shimada, Hirokazu, to Fuji Photo Film Co., Ltd. Heat development type diazo copying material containing a light insensitive intermediate layer provided between the support and the photosensitive layer. 5,089,371, Cl. 430-160.000.
Nakamura, Masahiko, to Hosiden Corporation. Electrical connector. 5,088,932, Cl. 439-350.000.
Nakamura, Shinichi: See—
Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yana-se, Yoshiyuki, 5,088,863, Cl. 408-230.000.
Nakamura, Tadasi; Tsuji, Kinya; and Obata, Yoriko, to Mitsubishi Gas Chemical Company, Inc. Method for preparing catalyst precursor for methanol synthesis. 5,089,452, Cl. 502-202.000.
Nakamura, Takaharu: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
Nakamura, Takashi. Survivable solar power-generating systems for use with spacecraft. 5,089,055, Cl. 136-248.000.
Nakamura, Yasushi: See—
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichi; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.
Nakamura, Yoshinori; Miyazawa, Yoshiki; and Yoshizawa, Shigeo, to Nissei ASB Machine Co., Ltd. Method of molding a synthetic-resin hollow container with grip. 5,089,208, Cl. 264-513.000.
Nakamura, Youichi: See—
Kuroda, Masami; Nakamura, Youichi; and Furusho, Noboru, 5,089,365, Cl. 430-59.000.
Nakanishi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Cassette loading device. 5,088,655, Cl. 242-198.000.
Nakanishi, Yoshinori: See—
Kurio, Takuya; Nakanishi, Yoshinori; Kurio, Takuya; and Nakamishi, Yoshinori, 5,089,543, Cl. 523-466.000.
Kurio, Takuya; Nakanishi, Yoshinori; Kurio, Takuya; and Nakamishi, Yoshinori, 5,089,543, Cl. 523-466.000.
Nakano, Akihiko, to Sharp Kabushiki Kaisha. Apparatus and a method for checking a semiconductor. 5,089,774, Cl. 324-158.00R.
Nakano, Miegi; Seino, Minoru; Uehara, Masafumi; and Nogami, Akira, to Konishiroku Photo Industry Co., Ltd. Method of processing pre-sensitized lithographic printing plate and apparatus therefor. 5,089,839, Cl. 354-317.000.
Nakano, Noriyoshi: See—
Fukuda, Yutaka; Higuchi, Yukio; Imoto, Yukihiro; and Nakano, Noriyoshi, 5,088,320, Cl. 73-118.100.
Nakano, Yasushi: See—
Kawahara, Setsuko; Koyama, Noboru; Nakano, Yasushi; and Nakajima, Noboru, 5,089,333, Cl. 428-329.000.
Nakao, Yuichi; and Toyomoto, Hideharu, to Mitsubishi Denki Kabushiki Kaisha. Refresh control circuit. 5,089,987, Cl. 365-222.000.
Nakasa, Masayuki; Ishikawa, Norio; Hosomizu, Hiroshi; Izumi, Tatsu-uro; Yamazaki, Keiji; Miki, Yukio; and Katsuragi, Mamoru, to Minolta Camera Kabushiki Kaisha. Mounting devices for removably mounting an accessory on a camera. 5,089,834, Cl. 354-145.100.
Nakashima, Kunio; Ishigane, Ryouichi; Tanaka, Takayuki; and Ichida, Ken-ichi, to Chuetsu Metal Works, Co., Ltd. Wear-resistant, anti-seizing copper alloy composite materials. 5,089,354, Cl. 428-552.000.
Nakashima, Yoshimoto: See—
Yokomori, Sadakazu; Saijo, Keiko; Matsunaga, Tohru; Nakashima, Yoshimoto; and Hatayama, Katsuo, 5,089,654, Cl. 560-53.000.
Nakatani, Eisaku: See—
Hayashi, Hirokazu; Aihara, Tetsuo; Nagaoka, Haruo; Kamikado, Koji; and Nakatani, Eisaku, 5,089,101, Cl. 204-181.700.
Nakatani, Hajime; and Sugitatsu, Atsushi, to Mitsubishi Denki K.K. Discharge exciting pulse laser device. 5,090,021, Cl. 372-86.000.
Nakato, Shirou: See—
Iino, Mitsutoshi; Nakato, Shirou; Shinkai, Seiichi; Shimojima, Hideki; and Kawaguchi, Hiromi, 5,089,777, Cl. 324-309.000.
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, to Mazda Motor Corporation. Steering system for vehicle. 5,088,766, Cl. 280-775.000.
Nakayama, Manabu, to Sanshin Kogyo Kabushiki Kaisha. Marine propulsion unit. 5,088,946, Cl. 440-61.000.
Nakayama, Shigeyuki: See—
Watanabe, Shintaro; Yamaguchi, Yasushi; Nakayama, Shigeyuki; Namioka, Hirotaka; and Terada, Hisashi, 5,090,023, Cl. 375-1.000.
Nakazawa, Koichi, to Matsushita Electric Industrial Co., Ltd. Motor control system. 5,089,761, Cl. 318-811.000.
Nakazawa, Takao: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.
Nalco Chemical Company: See—
Trivett, Robert L., 5,089,157, Cl. 252-51.50R.
Nales, Arnoldus T. B. M. Device for storing dish-type containers. 5,088,605, Cl. 211-41.000.

- Namba, Hiroaki; and Hishinuma, Minoru, to Sanyo-Kokusaku Pulp Co., Ltd. Novel epoxy resins and manufacturing method thereof based on phenoldicyclopentadiene adducts. 5,089,587, Cl. 528-97.000.
Namikoshi, Hajime: See—
Shibata, Tohru; Namikoshi, Hajime; and Okamoto, Ichiro, 5,089,138, Cl. 210-635.000.
Namioka, Hirotaka: See—
Watanabe, Shintaro; Yamaguchi, Yasushi; Nakayama, Shigeyuki; Namioka, Hirotaka; and Terada, Hisashi, 5,090,023, Cl. 375-1.000.
Nanno, Takanobu, to Tokai Rubber Industries, Ltd. Fluid-filled cylindrical elastic mount having grooved movable block(s) in fluid chamber(s). 5,088,701, Cl. 267-140.10C.
Napolitano, Michael L., to E. D. Bullard Company. Ventilated full body protective garment. 5,088,115, Cl. 2-69.000.
Narttron Corporation: See—
Ozkahyaoglu, Aysegul; and Zoerner, Marty M., 5,089,144, Cl. 210-767.000.
Nash, John P. Method for disposal of aerosol spray containers. 5,088,526, Cl. 141-1.000.
National Presto Industries, Inc.: See—
Geissler, Richard L., 5,089,286, Cl. 426-615.000.
National Research Development Corporation: See—
Barker, Andrew J.; Hughes, Leslie R.; Marsham, Peter R.; Oldfield, John; and Pegg, Stephen J., 5,089,499, Cl. 514-259.000.
National Semiconductor Corporation: See—
Anand, Kranti V.; and Anand, Madhu, 5,089,433, Cl. 437-40.000.
Davis, Craig M.; and Rasmussen, Richard R., 5,089,723, Cl. 307-451.000.
Luich, Thomas M., 5,089,721, Cl. 307-443.000.
Nguyen, Thai M., 5,089,728, Cl. 307-572.000.
Stultz, Perry S.; and Hamstra, James R., 5,089,957, Cl. 395-425.000.
National Starch and Chemical Investment Holding Corporation: See—
Chiu, Chung-Wai, 5,089,171, Cl. 252-315.300.
National Upper Cervical Chiropractic Research Assn.: See—
Benesh, Peter; and Gregory, Ralph R., deceased, 5,088,504, Cl. 128-781.000.
Natsume, Yoshitake: See—
Ogasawara, Tadashi; Natsume, Yoshitake; and Fujita, Kenji, 5,089,094, Cl. 204-70.000.
Navaux, Stanley, to Goodyear Tire & Rubber Company, The. Radial ply tire with shoulder reinforcement between belt and carcass. 5,088,538, Cl. 152-528.000.
Navistar International Transportation Corp.: See—
Schroeder, Ronald C.; and Pedersen, Kjell, 5,088,572, Cl. 180-300.000.
NCR Corporation: See—
Fadem, Richard J., 5,090,013, Cl. 370-85.800.
Orchard, Anthony R.; and Fisher, Brian K., 5,088,676, Cl. 248-421.000.
Talvalkar, Shashi G.; Obringer, Thomas J.; and Puckett, Richard D., 5,089,350, Cl. 428-484.000.
Neal, Joseph H.; and Potet, Kenneth A., to Texas Instruments Incorporated. Memory module arranged for data and parity bits. 5,089,993, Cl. 365-63.000.
NEC Corporation: See—
Akiyama, Hiroaki, 5,089,435, Cl. 437-44.000.
Ishida, Ryuji; and Kiuchi, Toyoo, 5,089,999, Cl. 369-32.000.
Ishioaka, Hiroshi, 5,089,876, Cl. 357-70.000.
Iwasa, Shoichi, 5,089,866, Cl. 357-23.500.
Mori, Kunitaka, 5,089,821, Cl. 341-155.000.
Murase, Makoto, 5,090,035, Cl. 377-72.000.
Norimatsu, Hidehiko, 5,089,794, Cl. 331-68.000.
Onsawa, Tomoki, 5,090,027, Cl. 375-80.000.
Uematsu, Ryosuke, 5,089,853, Cl. 355-256.000.
Neef, Gunter; Beier, Sybille; and Elger, Walter, to Schering Aktien-gesellschaft. 11 β -phenyl-gonanes, their manufacture and pharmaceutical preparations containing them. 5,089,635, Cl. 549-297.000.
Neef, Gunter: See—
Ottow, Eckhard; Wiechert, Rudolf; Neef, Gunter; Beier, Sybille; Elger, Walter; and Hendersont, David, 5,089,488, Cl. 514-179.000.
Neff, Helmut; Heinrich, Jurgen; and Glotz, Gerhard, to TZN Forschungs-und Entwicklungszentrum Untlerluss GmbH. Projectile equipped with an infrared search system at its bow. 5,088,659, Cl. 244-3.160.
Negi, Shigeto: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichi; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, to Kuraray Co., Ltd.; and Idemitsu Petrochemical Co., Ltd. Multi-layer material having gas barrier properties. 5,089,353, Cl. 428-518.000.
Neidoff, Robert A., to Unirode Corporation. Current sensor and limiter. 5,089,767, Cl. 323-315.000.
Neiswander, Leonard E. Method and apparatus for eye glasses position measurement system and/or for vertex measurement system. 5,088,203, Cl. 33-200.000.
Nelson, Edward J.: See—
Carmen, Raleigh A.; and Nelson, Edward J., 5,089,146, Cl. 210-782.000.
Nelson Industries, Inc.: See—
Eriksson, Larry J., 5,088,575, Cl. 181-206.000.
Nelson, Robert L.; and Hansen, Paul E.L., to Minnesota Mining and Manufacturing Company. Method and apparatus for culturing with microbiological dry culture medium. 5,089,413, Cl. 435-254.000.
Nemeth, Frank A., to Imo Industries, Inc. Combined liquid-level and conductivity sensor. 5,088,324, Cl. 73-291.000.
Nemoto, Isao: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.
Nemoto Project Industry Co.: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.
NeoRx Corporation: See—
Fritzberg, Alan R.; Vanderheyden, Jean-Luc E.; Kasina, Sudhakar; and Fitzer, Jeffrey N., 5,089,249, Cl. 424-1.100.
Nertec Design: See—
Tanguay, Francois; and Allard, Benoit, 5,089,771, Cl. 324-142.000.
Nesheiwat, Afif M.; and Geibel, John E., to Phillips Petroleum Company. Method to recover granular poly(arylene sulfide ketone) and poly(arylene sulfide diketone). 5,089,597, Cl. 528-226.000.
Nestec S.A.: See—
Baz, Afif A.; Hsu, Jau Y.; and Scoville, Eugene, 5,089,281, Cl. 426-461.000.
Neterer, Alan: See—
Conley, John; and Neterer, Alan, 5,088,791, Cl. 297-417.000.
Networks Electronic Corp.: See—
Patrichi, Mihai D., 5,088,412, Cl. 102-202.130.
Neubert, Robert J.: See—
Weingold, Harris D.; Neubert, Robert J.; Andy, John G.; Behlke, Roy F.; and Potter, Glen E., 5,088,892, Cl. 415-193.000.
Neuendorf, Paul A.; and Petrie, John A. Circumscribing sign clamp and method of fabrication. 5,088,672, Cl. 248-230.000.
Neuman, Clayton L., to Schwan's Sales Enterprises, Inc. Pail having an improved bail. 5,088,615, Cl. 220-95.000.
Nevole, Josef: See—
Fabinski, Walter; Taubitz, Georg; Franck, Gerhard; and Nevole, Josef, 5,088,313, Cl. 73-1.00G.
Neway Corp.: See—
Galazin, Gregory T.; and Pierce, William C., 5,088,763, Cl. 280-713.000.
Newman-Evans, Richard H.: See—
Gardner, Hugh C.; and Newman-Evans, Richard H., 5,089,560, Cl. 525-109.000.
Newsome, John R. Machine for transporting and loading signatures. 5,088,711, Cl. 270-54.000.
Nezu, Toru: See—
Matsumoto, Wataru; Nakai, Eiji; Nezu, Toru; and Suzuki, Kazuaki, 5,089,404, Cl. 435-134.000.
NGK Insulators, Ltd.: See—
Kato, Nobuhide; and Katsu, Masanori, 5,089,133, Cl. 204-427.000.
Kawase, Hiroyuki; and Kato, Koji, 5,089,312, Cl. 428-139.000.
Miwa, Shinichi; Asami, Seiichi; Kajihara, Takehiro; and Imao, Kouichi, 5,089,449, Cl. 501-98.000.
Ogura, Kouji; and Yamaguchi, Makio, 5,088,423, Cl. 110-182.500.
Yoshida, Hitoshi; Sakai, Hitoshi; Oki, Shuichiro; Watanabe, Kei-chiro; Yoshida, Manabu; and Oda, Toshio, 5,089,468, Cl. 505-1.000.
NGK Spark Plug Co., Ltd.: See—
Hattori, Masateru; Okamura, Takashi; and Kondo, Kazuo, 5,089,444, Cl. 501-9.000.
Inoue, Kiyoshi, 5,088,311, Cl. 72-333.000.
Nguyen, Thai M., to National Semiconductor Corporation. Spike current reduction in CMOS switch drivers. 5,089,728, Cl. 307-572.000.
Nichiri Mfg. Co., Ltd.: See—
Arichika, Kenji; Fukamachi, Mitsuru; Higashi, Satoshi; and Maruyama, Noboru, 5,089,781, Cl. 324-445.000.
Nichols, Carl S., to BFGoodrich Company, The. Compositions of water-dispersed diprimary amine terminated polymers. 5,089,165, Cl. 252-182.180.
Nichols, James D.; and Dickenson, John B., to Air Products and Chemicals, Inc. Heterocyclic diorganotin catalysts for use in polyurethane systems. 5,089,583, Cl. 528-58.000.
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Nichols, William R., to Inflico Degremont Inc. Filter cell sheet installations. 5,089,130, Cl. 210-232.000.
Nicholson, Eric, to Short Brothers plc. Optical aiming device. 5,088,818, Cl. 356-152.000.
Nicholson, James: See—
Polich, Herman; Nicholson, James; and Emlich, Larry, 5,090,014, Cl. 371-15.100.
Nicholson, Robert B.: See—
Stamatakis, E. M.; and Nicholson, Robert B., 5,088,518, Cl. 137-171.000.
Niciolo, Lawrence J.; and Thompson, James A., to AT&T Bell Laboratories. Apparatus for sequencing signals in conjunction with shorting contacts. 5,088,931, Cl. 439-188.000.

- Nickell, David G.: See—
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- Nicolette, Thomas A.: See—
Minasy, Arthur J.; and Nicolette, Thomas A., 5,088,165, Cl. 24-704.100.
- Niebauer, Kenneth L.; and Lockard, Thomas A., to Kennametal Inc. Cutting insert with chip control. 5,088,862, Cl. 407-114.000.
- Nielsen, Darryl M.; and McDaniel, Dorothy D., to Marley Company, The. Jet pump with rotatable venturi cartridge. 5,088,896, Cl. 417-178.000.
- Niess, Willi: See—
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- Niewisch, Joachim, to Siemens Aktiengesellschaft. Measurement arrangement for acquiring a signal corresponding to respiratory motion. 5,088,501, Cl. 128-721.000.
- Nigrelli Systems, Inc.: See—
Thelen, Brian L., 5,088,269, Cl. 53-398.000.
- Nihon Medi-Physics Co., Ltd.: See—
Washino, Komei; Kurami, Miki; and Ueda, Nobuo, 5,089,604, Cl. 530-395.000.
- Niimura, Koichi: See—
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- Nikko Co., Ltd.: See—
Ishimoto, Zenichi, 5,088,955, Cl. 446-409.000.
- Nikon Corporation: See—
Uchiyama, Shigeyuki; and Kusaka, Yosuke, 5,089,842, Cl. 354-402.000.
- Ninomiya, Hirofumi; Suzuki, Shoji; and Ishii, Kazuhiro, to Mitsubishi Rayon Co., Ltd. Edible film and method of making same. 5,089,307, Cl. 428-35.200.
- Ninomiya, Naohisa: See—
Sawai, Kiichi; Kuroono, Masayasu; Asai, Hiromoto; Mitani, Takahiko; and Ninomiya, Naohisa, 5,089,265, Cl. 424-195.100.
- Nippon Electric Glass Co., Ltd.: See—
Hashibe, Yoshio; Matano, Takahiro; Shibuya, Takehiro; Sakane, Takashi; Baba, Yasuhiro; and Moritake, Masanori, 5,089,345, Cl. 428-428.000.
- Nippon Kokan Kabushiki Kaisha: See—
Kikuchi, Kenichi; Suzuki, Akio; and Mochizuki, Tetsuro, 5,089,031, Cl. 48-77.000.
- Nippon Mining Co., Ltd.: See—
Itoh, Eiji; Nagase, Ryuichi; Saito, Kazuhiro; Hosaka, Hiroshi; and Nagai, Hihumi, 5,089,196, Cl. 264-65.000.
- Ohashi, Mitsuhiro; and Mimaya, Shuzo, 5,089,226, Cl. 422-16.000.
- Nippon Oil and Fats Company: See—
Kurokawa, Kouichi; and Tasaki, Youji, 5,088,411, Cl. 102-200.000.
- Nippon Oil and Fats Co., Ltd.: See—
Yamamoto, Shosaku; and Kakinuma, Kazuo, 5,089,569, Cl. 525-452.000.
- Nippon Pillar Packing Co., Ltd.: See—
Fukumoto, Toshiyuki; and Imanishi, Ryo, 5,088,898, Cl. 417-347.000.
- Nippon Seiko Kabushiki Kaisha: See—
Tsukada, Toru, 5,088,839, Cl. 384-45.000.
- Nippon Shinyaku Co., Ltd.: See—
Kimura, Kiyoshi; Yamaguchi, Takeshi; Morita, Iwao; and Murakami, Tetsuo, 5,089,529, Cl. 514-648.000.
- Nippon Steel Corporation: See—
Iwaki, Takashi; Ito, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,088,452, Cl. 123-3.000.
- Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.
- Nippon Zeon Co., Ltd.: See—
Tsuji, Suguru; Saya, Toshiaki; Komiyama, Shinji; Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, 5,089,576, Cl. 526-228.000.
- Nippondenso Co., Ltd.: See—
Haseda, Satoshi; Hiraiwa, Shinji; Majima, Youzou; Murakami, Fumiaki; Kuroyanagi, Masatoshi; and Murakawa, Takaji, 5,089,967, Cl. 364-426.020.
- Nippon Hoso Kyokai: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.
- Nishi, Hiroyoshi: See—
Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, 5,089,515, Cl. 514-404.000.
- Nishi, Yuji: See—
Koguchi, Tatsushi; Ito, Shigeiro; Ebihara, Kazuyuki; and Nishi, Yuji, 5,089,892, Cl. 358-167.000.
- Nishida, Fumihiko; Urata, Makoto; and Fujisawa, Hiroyuki, to Dainippon Screen Mfg Co. Ltd. Printing apparatus. 5,089,845, Cl. 355-85.000.
- Nishida, Reiziro; and Tominaga, Akira, to Kansai Paint Co., Ltd. Cationically electrodepositable resin composition from vinylcyclohexeneoxide based epoxy resins. 5,089,542, Cl. 523-410.000.
- Nishigaki, Shinichi: See—
Sakashita, Kiyotoshi; Nishigaki, Shinichi; and Bito, Shiro, 5,088,998, Cl. 606-46.000.
- Nishihara, Hiroshi: See—
Ohsawa, Toshiyuki; Matsuda, Tsutomu; Uji-Ie, Koji; and Nishihara, Hiroshi, 5,089,359, Cl. 204-78.000.
- Nishihara, Yoshihiro: See—
Yoneyama, Hiroaki; and Nishihara, Yoshihiro, 5,089,135, Cl. 210-500.230.
- Nishijima, Tomio: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,088,405, Cl. 101-240.000.
- Nishikawa, Yasuo: See—
Sato, Masami; Fujiyama, Masaaki; Nishikawa, Yasuo; and Iwasaki, Takashi, 5,089,330, Cl. 428-323.000.
- Nishimoto, Takashi: See—
Shirakura, Takeo; Terasaki, Fumitoshi; and Nishimoto, Takashi, 5,088,244, Cl. 51-288.000.
- Nishimura, Shinichi: See—
Suganuma, Buro; Nishimura, Shinichi; and Takeshita, Akihiko, 5,088,265, Cl. 57-328.000.
- Nishimura, Yosaku, to Vital Kogyo Kabushiki Kaisha. Lever type hoist. 5,088,694, Cl. 254-352.000.
- Nishimura, Yutaka: See—
Kiriha, Yoshihiro; Murata, Chikara; Tsukamoto, Masahide; and Nishimura, Yutaka, 5,089,372, Cl. 430-167.000.
- Nishiyama, Souji: See—
Tominaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, 5,089,071, Cl. 156-89.000.
- Nishizaka, Takashi: See—
Lee, Shy-Fuh; Anderson, Richard J.; Luehr, Gary W.; Craig, G Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komatsubara, Kenichi, 5,089,046, Cl. 71-103.000.
- Nisimura, Toshihiro: See—
Matsunaga, Takasi; and Nisimura, Toshihiro, 5,089,322, Cl. 428-220.000.
- Nissan Chemical Industries, Ltd.: See—
Sato, Fumie; Arai, Kazutaka; and Miyaji, Katsuaki, 5,089,625, Cl. 548-110.000.
- Nissan Kohki Co., Ltd.: See—
Kunimitsu, Toshiyuki, 5,088,459, Cl. 123-146.50A.
- Nissan Motor Company, Limited: See—
Doi, Kazuhiro, 5,088,699, Cl. 267-140.10E.
- Fukushima, Naoto; Yamaguchi, Hirotosugu; Akatsu, Yohsuke; Hano, Sunao; and Kawabata, Kazunobu, 5,089,966, Cl. 364-424.050.
- Fukuyama, Kensuke; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Sato, Masaharu, 5,088,762, Cl. 280-707.000.
- Hirabayashi, Yuji; and Kanetoshi, Kazuhiko, 5,088,346, Cl. 74-606.00R.
- Ishimaru, Wataru, 5,088,352, Cl. 74-867.000.
- Ohashi, Shinji; Isaji, Norifumi; and Satoh, Hajime, 5,088,461, Cl. 123-399.000.
- Ono, Tomio; Tsuruo, Ryo; Koyama, Hiromi; and Fujihara, Ryoji, 5,088,777, Cl. 292-40.000.
- Ono, Tomio; and Koyama, Hiromi, 5,088,781, Cl. 292-347.000.
- Takahashi, Hiroshi, 5,089,963, Cl. 364-424.100.
- Yokoyama, Hiroshi, 5,088,343, Cl. 74-560.000.
- Nissei ASB Machine Co., Ltd.: See—
Nakamura, Yoshinori; Miyazawa, Yoshiki; and Yoshizawa, Shigeo, 5,089,208, Cl. 264-513.000.
- Nisshinbo Industries, Inc.: See—
Ichii, Masaru; Fukuda, Kozo; and Morishita, Kenji, 5,089,464, Cl. 503-227.000.
- Nitecki, Danute E.; Katre, Nandini; Goodson, Robert J.; and Aldwin, Lois, to Cetus Corporation. Preparation of a polymer/interleukin-2 conjugate. 5,089,261, Cl. 424-85.200.
- Nittetsu Mining Co., Ltd.: See—
Takahashi, Nobuhiro; and Takagi, Fumio, 5,088,651, Cl. 241-30.000.
- Nitto Electrical Industrial: See—
Tominaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, 5,089,071, Cl. 156-89.000.
- Nitto Kagaku Kogyo Kabushiki Kaisha: See—
Yamada, Hideaki; and Nagasawa, Toru, 5,089,411, Cl. 435-244.000.
- Nitto Kohki Co., Ltd.: See—
Fukuda, Kenji, 5,088,196, Cl. 30-102.000.
- Nitz, Frederic W.: See—
McEachern, Alexander; Nitz, Frederic W.; and Terry, Scott C., 5,089,979, Cl. 364-571.040.
- Niwa, Shuichi: See—
Maeda, Kazuyuki; Mizukami, Fujio; Niwa, Shuichi; Toba, Makoto; and Shimizu, Kazuo, 5,089,456, Cl. 501-119.000.
- NKK Corporation: See—
Abe, Masahiro; Okada, Kazuhisa; Fukuda, Shuzo; Tanaka, Yasushi; Yamato, Masayuki; and Takada, Yoshikazu, 5,089,061, Cl. 148-110.000.
- Furukawa, Takato; Iwanaga, Kenichi; and Takegoshi, Atsuhisa, 5,089,776, Cl. 324-227.000.
- Kitao, Koichi; and Misaka, Nozomu, 5,089,204, Cl. 264-209.400.
- Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichiro, 5,088,836, Cl. 374-183.000.

- Noakes, Timothy J.: See—
Waters, Colin M.; Noakes, Timothy J.; Pavey, Ian; and Hitomi, Chiyoji, 5,088,807, Cl. 359-94.000.
- Noda, Akira; Yamaguchi, Michihiro; Aizawa, Masanori; and Kumano, Yoshimaru, to Shiseido Company Ltd. Cosmetic containing fine soft microcapsules. 5,089,269, Cl. 424-456.000.
- Nogami, Akira: See—
Nakano, Miegi; Seino, Minoru; Uehara, Masafumi; and Nogami, Akira, 5,089,839, Cl. 354-317.000.
- Noguchi, Hitoshi; Saito, Shinji; Inaba, Hiroo; and Ogawa, Hiroshi, to Fuji Photo Film Co. Ltd. Magnetic recording medium. 5,089,317, Cl. 428-212.000.
- Nolan, John H., to Alpha Industries, Inc. Notching apparatus for a double cut die set. 5,088,365, Cl. 83-300.000.
- Nolle, Gunther, to Auto-Kabel Hausen GmbH & Co. Betriebs - K.G. Device for connecting conductors to battery posts and the like. 5,088,941, Cl. 439-762.000.
- Nomoto, Seiichiro: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
- Nomoto, Shogo: See—
Hashimoto, Jiro; Nomoto, Shogo; Nozawa, Masanori; and Kubo, Makoto, 5,089,029, Cl. 44-432.000.
- Nomura, Hiroshi: See—
Imaizumi, Junichi; Nomura, Hiroshi; Nagao, Kouichi; Suzuki, Masakatsu; Sakurai, Koushi; and Satou, Eikichi, 5,089,346, Cl. 428-458.000.
- Nomura, Satoru; Nagai, Yoshihisa; Emi, Tetsuro; Miyashita, Koji; Higuchi, Hiroyuki; and Hijikata, Makoto, to Pioneer Electronic Corporation. Recording medium playing apparatus which permits changes in the display position of a reproduced image. 5,089,899, Cl. 358-335.000.
- Noonan, Thomas J., Jr. Syringe. 5,088,987, Cl. 604-195.000.
- Nordhoff, Erhard: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.
- Nordness, Mark E.; Bauer, Frank T.; Blemberg, Robert J.; Eckstein, John P.; Banik, David M.; and Gustafson, Grant A., to American National Can Company. Coextruded film and methods comprising vinylidene chloride methyl acrylate copolymer. 5,089,308, Cl. 428-35.400.
- Nordson Corporation: See—
Hastings, Donald R.; and Hendricks, John A., 5,088,443, Cl. 118-314.000.
- Trevathan, Larry C.; Hoover, Scott C.; and Smith, James C., 5,089,190, Cl. 264-45.900.
- Norimitsu, Hidehiko, to NEC Corporation. Vibration absorbing case for an oscillator. 5,089,794, Cl. 331-68.000.
- Noro, Masataka: See—
Hayama, Kazuhide; Hosokawa, Noritaka; Yazaki, Takao; and Noro, Masataka, 5,089,291, Cl. 427-54.100.
- North American Philips Corporation: See—
Mattas, Charles B., 5,089,753, Cl. 315-324.000.
- O'Connor, Edward M.; and Riggs, William D., 5,089,730, Cl. 310-51.000.
- Wong, John M.; and Kurczak, Michael A., 5,089,751, Cl. 315-279.000.
- North Carolina State University: See—
Ozturk, Mehmet; Wortman, Jimmie; and Grider, Douglas, 5,089,872, Cl. 357-23.900.
- Northeastern University: See—
Karger, Barry L.; Giese, Roger W.; and Szoko, Eva, 5,089,106, Cl. 204-299.00R.
- Northern Telecom Limited: See—
Bulan, Sergiu; and Holt, Johannes L., 5,089,927, Cl. 361-87.000.
- Northwest Technical Industries, Inc.: See—
Murr, Lawrence E.; and Hare, Alan W., 5,089,467, Cl. 505-1.000.
- Nottingham, John R.; Spirk, John W.; Kalman, Jeffrey M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., to Galsten Trading, Inc. Method for assembling a multi-part article of furniture. 5,088,180, Cl. 29-525.000.
- Nova Husky Research Corporation: See—
Tsang, Charles Y.; and Ker, Victoria S., 5,088,833, Cl. 374-17.000.
- Novich, Bruce E., to Ceramics Process Systems Corporation. Process for facilitating removal of classified powders. 5,088,974, Cl. 494-37.000.
- Novoste Corporation: See—
Weldon, Thomas D., 5,088,991, Cl. 604-280.000.
- Nowak, Brent M. T., to Rockwell International Corporation. Folding cylinder assembly having one piece cam. 5,088,708, Cl. 270-47.000.
- Nowicki, Neal R.: See—
Fjare, Douglas E.; and Nowicki, Neal R., 5,089,593, Cl. 528-188.000.
- Nozaki, Hisashi; and Sakurai, Seiya, to Kabushikikaisha Kibun; and Kabushikikaisha Kyowashokun Jelly resembling the flesh of fruit. 5,089,285, Cl. 426-573.000.
- Nozawa, Masanori: See—
Hashimoto, Jiro; Nomoto, Shogo; Nozawa, Masanori; and Kubo, Makoto, 5,089,029, Cl. 44-432.000.
- Nozu, Shinsaku; Shimizu, Tetsuo; and Ohmori, Seiji, to Pioneer Electronic Corporation. Height adjusting device for a pickup. 5,090,000, Cl. 369-44.250.
- Nuez, Jean-Paul: See—
Mollier, Pierre; Nuez, Jean-Paul; and Tannhof, Pascal, 5,089,725, Cl. 307-455.000.
- Nunnemann, Friedhelm: See—
Schuster, Hans-Dieter; Nunnemann, Friedhelm; Langer, Hans-Joachim; Strohmer, Erwin; and Tiefenbacher, Gerd, 5,089,237, Cl. 422-180.000.
- Nusbaum, Michael J. Safety syringe. 5,088,986, Cl. 604-195.000.
- Nylund, Olov, to ABB Atom AB. Fuel assembly for a boiling reactor. 5,089,220, Cl. 376-439.000.
- O.M. Scott & Sons Company, The: See—
Thompson, Harold E.; and Kelch, Richard A., 5,089,041, Cl. 71-64.110.
- Obara, Takashi: See—
Okada, Susumu; Imanaka, Makoto; Masui, Susumu; Obara, Takashi; Shinozaki, Masatoshi; and Tsunoyama, Kozo, 5,089,068, Cl. 148-328.000.
- Obata, Yoriko: See—
Nakamura, Tadasi; Tsuji, Kinya; and Obata, Yoriko, 5,089,452, Cl. 502-202.000.
- Obermeyer, Jeff E.: See—
Crage, Scott F.; and Obermeyer, Jeff E., 5,088,376, Cl. 84-411.00M.
- Ohrecht, Werner: See—
Sutter, Hubert; Kolwert, Alois; and Obrecht, Werner, 5,089,579, Cl. 526-323.200.
- Obringer, Thomas J.: See—
Talvalkar, Shashi G.; Obringer, Thomas J., and Puckett, Richard D., 5,089,350, Cl. 428-484.000.
- Occidental Chemical Corporation: See—
Stults, Jeffrey S.; and Schwartz, Willis T., 5,089,631, Cl. 549-234.000.
- Ochs, Helmut: See—
Blecker, Armin; Lotz, Heinrich; Ochs, Helmut; and Reuschling, Horst, 5,088,899, Cl. 417-356.000.
- O'Connor, Edward M.; and Riggs, William D., to North American Philips Corporation. Low noise DC electric motor. 5,089,730, Cl. 310-51.000.
- Oda, Akira, to Tokyo Electric Co., Ltd. Setting variable character width in matrix printer. 5,088,847, Cl. 400-306.000.
- Oda, Keiji: See—
Kan, Masanori; and Oda, Keiji, 5,088,537, Cl. 152-525.000.
- Oda, Michiaki: See—
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichiro; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.
- Oda, Toshio: See—
Yoshida, Hitoshi; Sakai, Hitoshi; Oki, Shuichiro; Watanabe, Kenchiro; Yoshida, Manabu; and Oda, Toshio, 5,089,468, Cl. 505-1.000.
- Odate, Ryoji; and Haga, Tomoyuki, to Shiseido Co., Ltd. Semitransparent resin container with pearly luster. 5,089,309, Cl. 428-36.920.
- Odet, Philippe; and Rognard, Jean Y., to Astra Plastique. Liquid-tight closure assembly with multidirectional orientation and retractable pourer tube. 5,088,632, Cl. 272-529.000.
- Oe, Makoto; and Chiba, Issei, to Mitsubishi Rayon Co., Ltd. Planar light-source device and illumination apparatus using the same. 5,089,944, Cl. 362-224.000.
- Ogasawara, Kunio: See—
Ogawa, Tetsuya; Yoshida, Naoyuki; Takano, Seiichi; and Ogasawara, Kunio, 5,089,176, Cl. 260-410.000.
- Ogasawara, Morihiko, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Mirror case positioning device for door mirror of automobile. 5,088,679, Cl. 248-479.000.
- Ogasawara, Tadashi; Natsume, Yoshitake; and Fujita, Kenji, to Osaka Titanium Company Limited. Process for the electrolytic production of magnesium. 5,089,094, Cl. 204-70.000.
- Ogawa, Akira: See—
Sasaki, Jun; Ogawa, Akira; Akimoto, Yasumasa; Minato, Takao; and Ohnishi, Hajime, 5,089,905, Cl. 359-64.000.
- Ogawa, Hiroshi: See—
Noguchi, Hitoshi; Saito, Shinji; Inaba, Hiroo; and Ogawa, Hiroshi, 5,089,317, Cl. 428-212.000.
- Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Sewing machine with automatic thread take-up and threading. 5,088,426, Cl. 112-225.000.
- Ogawa, Tetsuro: See—
Ichitsuka, Takeshi; Hirayama, Yasuhiko; and Ogawa, Tetsuro, 5,089,195, Cl. 264-65.000.
- Ogawa, Tetsuya; Yoshida, Naoyuki; Takano, Seiichi; and Ogasawara, Kunio, to Chisso Corporation. Optically active monoester compounds and producing. 5,089,176, Cl. 260-410.000.
- Ogino, Masanori, to Hitachi, Ltd. Color deviation prevention device in projection display with minimized white chromaticity deviation. 5,089,896, Cl. 358-239.000.
- Oguchi, Yoshiharu: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.
- Ogura, Kouji; and Yamaguchi, Makio, to NGK Insulators, Ltd. Burner tile assembly. 5,088,423, Cl. 110-182.500.
- Ogura, Mitsuru; Yoshida, Takeshi; and Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Image forming unit with a charger wire and optics cleaning mechanism. 5,089,850, Cl. 355-215.000.

- Oh, Jong H.: *See—*
Kim, Wan J.; Park, Myung H.; and Oh, Jong H., 5,089,621, Cl. 546-113.000.
- Oh, Key B.: *See—*
Kwak, Wie J.; Park, Hwa K.; and Oh, Key B., 5,089,636, Cl. 547-297.000.
- Ohashi, Mitsuhiro; and Mimaya, Shuzo, to Nippon Mining Co., Ltd. Method for protecting austenitic stainless steel-made equipment from occurrence of stress-corrosion cracking. 5,089,226, Cl. 422-16.000.
- Ohashi, Shinji; Isaji, Norifumi; and Satoh, Hajime, to Nissan Motor Co., Ltd. Throttle valve control system and the method therefor. 5,088,461, Cl. 123-399.000.
- Ohashi, Yumiko: *See—*
Taki, Kazunari; Maruyama, Hideo; Ohashi, Yumiko; and Matsuda, Riki, 5,089,358, Cl. 428-694.000.
- Ohba, Sachiko: *See—*
Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Makoto; Ohba, Sachiko; and Ohkishi, Haruyuki, 5,089,402, Cl. 435-96.000.
- Ohbayashi Corporation: *See—*
Hori, Shuji; and Teraoka, Hiroshi, 5,088,263, Cl. 52-745.000.
- Ohio Seisakusho Co., Ltd.: *See—*
Ono, Tomio; Tsuruo, Ryo; Koyama, Hiromi; and Fujihara, Ryoji, 5,088,777, Cl. 292-40.000.
- Ohishi, Tetsu: *See—*
Tsuiji, Suguru; Saya, Toshiaki; Komiya, Shinji; Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, 5,089,576, Cl. 526-228.000.
- Ohkawa, Teruhisa: *See—*
Deguchi, Kazuhide; and Ohkawa, Teruhisa, 5,089,874, Cl. 357-40.000.
- Ohkishi, Haruyuki: *See—*
Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Makoto; Ohba, Sachiko; and Ohkishi, Haruyuki, 5,089,402, Cl. 435-96.000.
- Ohkuma, Hiroaki; Tomita, Koji; Konishi, Masataka; and Kamei, Hideo, to Bristol-Myers Squibb Co. Antitumor antibiotic BU-3285T. 5,089,522, Cl. 514-460.000.
- Ohlschlager, Hans: *See—*
Becker, Manfred; and Ohlschlager, Hans, 5,089,381, Cl. 430-611.000.
- Ohmaru, Kenji: *See—*
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuo, 5,089,824, Cl. 342-359.000.
- Ohmatsu, Hideki: *See—*
Ozaki, Hiroyuki; Kawata, Ken; and Ohmatsu, Hideki, 5,089,378, Cl. 430-351.000.
- Ohmine, Toshimitsu; and Akagawa, Keiichi, to Kabushiki Kaisha Toshiba. Vapor deposition system. 5,088,444, Cl. 118-719.000.
- Ohmori, Seiji: *See—*
Nozu, Shinsaku; Shimizu, Tetsuo; and Ohmori, Seiji, 5,090,000, Cl. 369-44.250.
- Ohnishi, Hajime: *See—*
Sasaki, Jun; Ogawa, Akira; Akimoto, Yasumasa; Minato, Takao; and Ohnishi, Hajime, 5,089,905, Cl. 359-64.000.
- Ohnishi, Hiroshi; Yoshimizu, Toshiyuki; Wada, Masakazu; Kuwakagi, Hiroshi; and Katsube, Toshimichi, to Sharp Kabushiki Kaisha. Super-twisted nematic liquid crystal device having two phase difference plates for providing black/white display. 5,089,906, Cl. 359-73.000.
- Ohnishi, Yoshinisa: *See—*
Kodama, Yoshimi; and Ohnishi, Yoshinisa, 5,089,921, Cl. 360-95.000.
- Ohno, Toshiaki: *See—*
Yoshimura, Isao; Ohno, Toshiaki; and Hata, Hideo, 5,089,341, Cl. 428-142.000.
- Ohno, Yukihiro; and Tsuchiya, Fumiaki, to Ricoh Company, Ltd. Image forming apparatus operable with a two-side unit. 5,089,858, Cl. 355-319.000.
- Ohnuki, Ichiro: *See—*
Higashihara, Masaki; Ohnuki, Ichiro; Akashi, Akira; and Kadohara, Terutake, 5,089,843, Cl. 354-402.000.
- Ohsato, Kiyoshi; and Fukumoto, Atsushi, to Sony Corporation. Tracking system for optical recording and/or reproducing apparatus employing a main light beam and a plurality of auxiliary light beams. 5,090,004, Cl. 369-44.370.
- Ohsawa, Tomoki, to NEC Corporation. Coherent PSK demodulator with adaptive line enhancer. 5,090,027, Cl. 375-80.000.
- Ohsawa, Toshiyuki; Matsuda, Tsutomu; Uji-Ie, Koji; and Nishihara, Hiroshi, to Ricoh Company, Ltd. Organic secondary battery. 5,089,359, Cl. 204-78.000.
- Ohshima, Kenji: *See—*
Koga, Motoyuki; Ike, Nobukatsu; and Ohshima, Kenji, 5,089,297, Cl. 427-238.000.
- Ohta, Shozo: *See—*
Usami, Masahiro; Ueda, Kenji; Tomoshige, Kiyomi; Ohta, Shozo; Horiguchi, Tsutomu; and Yamazaki, Hiroshi, 5,088,432, Cl. 114-67.00R.
- Ohtaka, Shinichiro: *See—*
Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichiro, 5,088,836, Cl. 374-183.000.
- Ohto, Norio: *See—*
Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.
- Ohtsuka, Seiichiro: *See—*
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichiro; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.
- Oka, Kunihide: *See—*
Miura, Takanori; Kohara, Masanori; and Oka, Kunihide, 5,089,655, Cl. 560-75.000.
- Okada, Kazuhisa: *See—*
Abe, Masahiro; Okada, Kazuhisa; Fukuda, Shuzo; Tanaka, Yasushi; Yamato, Masayuki; and Takada, Yoshikazu, 5,089,061, Cl. 148-110.000.
- Okada, Masakazu: *See—*
Yamamoto, Toshifumi; Takakura, Mitsuro; Yamaoka, Hiromasa; and Okada, Masakazu, 5,090,029, Cl. 375-107.000.
- Okada, Shigeru; and Ando, Nobuyasu, to Sanden Corporation. Method for manufacturing a heat exchanger. 5,088,193, Cl. 29-890.043.
- Okada, Shigeru, to Terumo Kabushiki Kaisha. Transfusion pump. 5,088,904, Cl. 417-474.000.
- Okada, Shozo: *See—*
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, 5,089,869, Cl. 357-23.600.
- Okada, Susumu; Imanaka, Makoto; Masui, Susumu; Obara, Takashi; Shinozaki, Masatoshi; and Tsunoyama, Kozo, to Kawasaki Steel Corporation. Cold rolled steel sheets having improved spot weldability. 5,089,068, Cl. 148-328.000.
- Okada, Takahiro: *See—*
Sugaya, Masami; Soga, Yoshinobu; and Okada, Takahiro, 5,088,355, Cl. 74-868.000.
- Okaji, Makoto: *See—*
Kodera, Tatsuya; Takaoka, Kazuchiyo; Haino, Kozo; Itoh, Akira; Okaji, Makoto; and Emoto, Kazuhiro, 5,089,366, Cl. 430-59.000.
- Okamoto, Ichiro: *See—*
Shibata, Tohru; Namikoshi, Hajime; and Okamoto, Ichiro, 5,089,138, Cl. 210-635.000.
- Okamoto, Yoshiyuki: *See—*
Skotheim, Terje A.; Okamoto, Yoshiyuki; and Hale, Paul D., 5,089,112, Cl. 204-403.000.
- Okamura, Mike H., to Hewlett-Packard Company. Keyboard overlay. 5,089,690, Cl. 235-145.00R.
- Okamura, Takashi: *See—*
Hattori, Masateru; Okamura, Takashi; and Kondo, Kazuo, 5,089,444, Cl. 501-9.000.
- Okayama, Kenichi: *See—*
Shibata, Akihiro; and Okayama, Kenichi, 5,088,715, Cl. 271-9.000.
- Oki Electric Industry Co., Ltd.: *See—*
Isobe, Minoru; Kimura, Haruo; and Suto, Shin-ichi, 5,088,586, Cl. 194-205.000.
- Tamura, Yasuaki, 5,089,786, Cl. 359-333.000.
- Oki, Shuichi: *See—*
Yoshida, Hitoshi; Sakai, Hitoshi; Oki, Shuichi; Watanabe, Keiichi; Yoshida, Manabu; and Oda, Toshio, 5,089,468, Cl. 505-1.000.
- Okuda, Hiroshi; and Iwasaki, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Projection cathode ray tube. 5,089,743, Cl. 313-474.000.
- Okuma Machinery Works Ltd.: *See—*
Shirakura, Takeo; Terasaki, Fumitoshi; and Nishimoto, Takashi, 5,088,244, Cl. 51-288.000.
- Okumura, Kunio: *See—*
Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.
- Okunuki, Masami: *See—*
Tanaka, Hisami; and Okunuki, Masami, 5,089,851, Cl. 355-219.000.
- Oldfield, John: *See—*
Barker, Andrew J.; Hughes, Leslie R.; Marsham, Peter R.; Oldfield, John; and Pegg, Stephen J., 5,089,499, Cl. 514-259.000.
- Oleksyszyn, Josef: *See—*
Powers, James C.; Kam, Chih-Min; Oleksyszyn, Josef; Glinski, J. A.; and Hernandez, M. A., 5,089,633, Cl. 549-285.000.
- Olexy, Anthony M., to Eastman Kodak Company. Diverter assembly. 5,088,722, Cl. 271-304.000.
- Olin Corporation: *See—*
Cawfield, David W.; Kaczur, Jerry J.; Duncan, Budd L.; Mendiratta, Sudhir K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 5,089,095, Cl. 204-101.000.
- Putnam, Edmund D., III, 5,089,231, Cl. 422-80.000.
- Olivieri, Oliviero, to Icaro Olivieri & C. S.p.A. Minutene. Ice skate with interchangeable skid blade. 5,088,749, Cl. 280-11.180.
- Olmer, Leonard J., to AT&T Bell Laboratories. Silicon dioxide deposition method using a magnetic field and both sputter deposition and plasma-enhanced CVD. 5,089,442, Cl. 432-235.000.
- Olmos, Leonardo M.: *See—*
Tovar, Abel M.; Mendizabal, Oscar H. B.; Olmos, Leonardo M.; Sanchez, Carlos G. A.; Lorenzo, Roberto L.; Barba, Roldofo C.; and Perez, Rene H., 5,089,114, Cl. 208-50.000.
- Olson, Ralph C. Trash bag holding and spreading device. 5,088,667, Cl. 248-101.000.
- Olympus Optical Co., Ltd.: *See—*
Ito, Kenichi; and Kobayashi, Masatoshi, 5,090,001, Cl. 369-44.280.
- Sakashita, Kiyotoshi; Nishigaki, Shinichi; and Bito, Shiro, 5,088,998, Cl. 606-46.000.
- Takayama, Shuichi; Hayashi, Masaaki; Fuse, Eiichi; Ishiwara, Koichiro; Yoshikawa, Mutsumi; Tagawa, Motoyuki; and Inaba, Makoto, 5,088,492, Cl. 128-654.000.
- O'Meara, Thomas R., to Hughes Aircraft Company. Range Doppler self-referencing imaging system. 5,088,808, Cl. 359-276.000.

- Omer, Abdul W.; and Omer, Khalid, to Omer, Khalid. Double left dobbie. 5,088,524, Cl. 139-71.000.
- Omer, Khalid: *See—*
Omer, Abdul W.; and Omer, Khalid, 5,088,524, Cl. 139-71.000.
- Omote, Tatsuyuki; Yoshida, Tomiharu; Maki, Hideo; Senoh, Makoto; Takahashi, Fuminobu; and Tsuchita, Kenji, to Hitachi, Ltd. Nuclear fuel assembly identification code reader. 5,089,213, Cl. 376-248.000.
- O'Neill, Michael L., to Joy Technologies Inc. Method and apparatus for holding a cutting bit. 5,088,797, Cl. 299-91.000.
- O'Neill, Richard K. Pressure build-up pump sprayer having improved valving means. 5,088,629, Cl. 222-321.000.
- Ong, Helen H.: *See—*
Martin, Lawrence L.; Payack, Joseph F.; and Ong, Helen H., 5,089,615, Cl. 544-94.000.
- Onishi, Takashi: *See—*
Kusuda, Yasuhiro; Ueda, Masahide; Onishi, Takashi; and Shimizu, Tadafumi, 5,089,848, Cl. 355-206.000.
- Ono, Sachiko: *See—*
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,089,092, Cl. 205-75.000.
- Ono, Shoichi: *See—*
Tsuda, Kenji; and Ono, Shoichi, 5,089,483, Cl. 514-64.000.
- Ono, Sumio, to Kabushiki Kaisha Riken. Combined oil ring assembly. 5,088,743, Cl. 277-141.000.
- Ono, Tomio; Tsuruo, Ryo; Koyama, Hiromi; and Fujihara, Ryoji, to Nissan Motor Co., Ltd.; and Ohio Seisakusho Co., Ltd. Lock device for detachable roof. 5,088,777, Cl. 292-40.000.
- Ono, Tomio; and Koyama, Hiromi, to Nissan Motor Co., Ltd. Handle structure. 5,088,781, Cl. 292-347.000.
- Ono, Tomio, to Kabushiki Kaisha Toshiba. Displacement generating apparatus. 5,089,740, Cl. 310-328.000.
- Ono, Yasuo: *See—*
Yamashita, Junzou; Ono, Yasuo; and Sumimura, Kunihiko, 5,089,276, Cl. 424-686.000.
- Onoue, Akihiro, to Sanshin Kogyo Kabushiki Kaisha. Marine propulsion unit. 5,088,945, Cl. 440-61.000.
- Oohara, Minoru: *See—*
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.
- Oothuka, Yoshiyuki: *See—*
Iizuka, Yoshio; Oothuka, Yoshiyuki; Tanaka, Satoshi; and Yamamoto, Manabu, 5,089,538, Cl. 523-132.000.
- Opitz, Andor; and Tar, Lorant, to Magyar Vagon- es Gepgyar. Planetary assembly with wet disk brake. 5,088,967, Cl. 475-107.000.
- Oppermann, Hans J.: *See—*
Stellmacher, Klaus; and Oppermann, Hans J., 5,088,690, Cl. 251-309.000.
- Optical Fiber Technologies, Inc.: *See—*
Grinderslev, Soren, 5,088,804, Cl. 385-81.000.
- Orchard, Anthony R.; and Fisher, Brian K., to NCR Corporation. Compact height adjustable base for a display. 5,088,676, Cl. 248-421.000.
- Oregon Graduate Center: *See—*
Murr, Lawrence E.; and Hare, Alan W., 5,089,467, Cl. 505-1.000.
- Orezzi, Piergiuseppe: *See—*
Alpegiani, Marco; Perrone, Ettore; Orezzi, Piergiuseppe; Carminati, Paolo; and Cassinelli, Giuseppe, 5,089,489, Cl. 514-195.000.
- Orgun, Munir; McRoberts, Timothy C.; and Wu, Tzong-Hsiu B., to Boeing Company, The. Ground effects compensated real time aircraft body angle of attack estimation. 5,089,968, Cl. 364-435.000.
- Ormo Corporation: *See—*
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- Osaka Prefecture: *See—*
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- Osaka Soda Co., Ltd.: *See—*
Sasaki, Hiromi; Tojima, Masao; Konishi, Satsuko; and Takana, Hiroyuki, 5,089,316, Cl. 428-195.000.
- Osaka Titanium Company Limited: *See—*
Ogasawara, Tadashi; Natsume, Yoshitake; and Fujita, Kenji, 5,089,094, Cl. 204-70.000.
- Osawa, Hidemori: *See—*
Osawa, Masakazu; and Osawa, Hidemori, 5,088,433, Cl. 114-67.00R.
- Osawa, Kouichi, to Toyota Jidosha Kabushiki Kaisha. Determining device for determining a failure in an engine cylinder. 5,088,318, Cl. 73-117.300.
- Osawa, Kouichi: *See—*
Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiro; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, 5,088,281, Cl. 60-274.000.
- Osawa, Masakazu; and Osawa, Hidemori. Wave-making resistance suppressing means in ship and ship provided therewith. 5,088,433, Cl. 114-67.00R.
- Ose, Yoichi; Higuchi, Yoshiya; and Miki, Kazuyoshi, to Hitachi, Ltd. Secondary charged particle analyzing apparatus and secondary charged particle extracting section. 5,089,699, Cl. 250-306.000.
- Oseman, Gavin S., to Dowty Seals Limited. Resilient sealing element having T-shaped cross section. 5,088,744, Cl. 277-188.00R.
- Osman, John M., to Rolls-Royce plc. Monitoring a machining operation. 5,088,239, Cl. 51-165.710.
- Osteonics Corp.: *See—*
Averill, Robert G.; and Cohen, Robert C., 5,089,004, Cl. 606-85.000.
- Ostermeyer, Thomas, to Schilling-Ostermeyer Maschinenbau GmbH. Support leg for stick-shaped walking aids. 5,088,513, Cl. 135-82.000.
- Ostlund, Dan A.: *See—*
Tsipouras, Athanasios; Ostlund, Dan A.; Hensens, Otto D.; and Zink, Deborah L., 5,089,530, Cl. 514-682.000.
- Otis Engineering Corporation: *See—*
Arterbury, Bryant A.; and Spangler, James E., 5,088,554, Cl. 166-228.000.
- Otonari, Mitsuya: *See—*
Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichiro, 5,088,836, Cl. 374-183.000.
- O'Toole, Martin R. Golf swing training glove. 5,088,122, Cl. 2-161.00A.
- Otsuka, Masako: *See—*
Murata, Yumiko; Otsuka, Masako; Saimoto, Hiroshi; and Kawashima, Masao, 5,089,410, Cl. 435-240.450.
- Otterburn, Michael S.: *See—*
Haynes, Lynn C.; Levine, Harry; Otterburn, Michael S.; and Mathewson, Paul, 5,089,278, Cl. 426-98.000.
- Otto Industries, Inc.: *See—*
Beese, Ulrich; Schmidt, Martin; and Sturm, Eberhard, 5,088,750, Cl. 280-47.260.
- Ottow, Eckhard; Wiechert, Rudolf; Neef, Gunter; Beier, Sybille; Elger, Walter; and Henderson, David, to Schering Aktiengesellschaft. β -(4-isopropenylphenyl)estra-4,9-dienes, their production, and pharmaceutical preparations containing same. 5,089,488, Cl. 514-179.000.
- Outboard Marine Corporation: *See—*
Anderson, Philip A.; Bernau, William A.; Breckenfeld, Paul W.; Broughton, George L.; and Karrasch, Wallace R., 5,088,344, Cl. 74-572.000.
- Lathers, Michael W., 5,088,435, Cl. 114-177.000.
- Outokumpu Oy: *See—*
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- Overton, Robert H.: *See—*
Nachman, Marcus; and Overton, Robert H., 5,089,972, Cl. 364-478.000.
- Owada, Nobuo; and Uda, Hizuru, to Hitachi, Ltd. Method of manufacturing semiconductor integrated circuit bipolar transistor device. 5,089,430, Cl. 437-31.000.
- Owens-Corning Fiberglass Corporation: *See—*
Ross, Louis R.; Krumlauf, Paul R.; Wilson, Edward L.; and Hsu, Kuang-Hong, 5,089,544, Cl. 523-511.000.
- Owens, John G.: *See—*
Flynn, Richard M.; Johnson, Douglas A.; and Owens, John G., 5,089,152, Cl. 252-194.000.
- Owens, William G., Jr.: *See—*
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- Owens, William G., III: *See—*
Atkinson, Virgil; Owens, William G., Jr.; and Owens, William G., III, 5,088,949, Cl. 446-3.000.
- Oy, Wallac: *See—*
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- Oyafuso, Harry H., to Ford Motor Company. Automatic end play adjustment of motor armature assembly. 5,089,736, Cl. 310-90.000.
- Oyama, Masayuki: *See—*
Takago, Toshio; Satoh, Shinichi; Oyama, Masayuki; Yamaguchi, Koichi; and Matsuda, Takashi, 5,089,649, Cl. 556-482.000.
- Ozaki, Hiroji: *See—*
Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, 5,089,863, Cl. 357-23.300.
- Ozaki, Hiroyuki; Kawata, Ken; and Ohmatsu, Hideki, to Fuji Photo Film Co., Ltd. Method for forming an image. 5,089,378, Cl. 430-351.000.
- Ozawa, Yoshiaki: *See—*
Hamano, Masaaki; Yamamoto, Hiroshi; Nagakura, Mitsuru; and Ozawa, Yoshiaki, 5,089,065, Cl. 148-302.000.
- Ozkahyaoglu, Aysegul; and Zoerner, Marty M., to Nartron Corporation. Filter condition indicator having moveable sensor and aggregate flow counter. 5,089,144, Cl. 210-767.000.
- Ozoe, Shinji; and Yamakawa, Hiroshi, to Tosoh Corporation. Chloroprene polymer. 5,089,601, Cl. 528-390.000.
- Ozturk, Mehmet; Wortman, Jimmie; and Grider, Douglas, to North Carolina State University. Selective germanium deposition on silicon and resulting structures. 5,089,872, Cl. 357-23.900.
- Pablo Perini S.p.A.: *See—*
Ghildardi, Mauro, 5,088,975, Cl. 493-359.000.
- PAC Polymers Inc.: *See—*
McAndrew, Thomas P., 5,089,070, Cl. 156-89.000.
- Pacheco, Francisco. Bi-polar auto electrolytic hydrogen generator. 5,089,107, Cl. 204-228.000.
- Pacholok, David, to Everbrite, Inc. High frequency luminous tube power supply with ground fault protection. 5,089,752, Cl. 315-307.000.
- Packard, Jeffrey; Schnell, William J.; and Scharf, Michael W., to Baxter International Inc. Port and closure assembly including a resealing injection site for a container. 5,088,995, Cl. 604-415.000.
- Pagholo, Joseph P.; Anderson, Russell E.; Weispfenning, Richard F.; and Betzold, Robert A., to Medtronic, Inc. Bandpass filter clock control. 5,088,490, Cl. 128-419.0PG.
- Palazzotto, Michael C., to Minnesota Mining and Manufacturing Company. Energy polymerizable compositions containing organometallic initiators. 5,089,536, Cl. 522-16.000.

- Pallone, Thomas J.; Alania, Larry J.; Weber, William C., Jr.; and Farmer, Robert F., to Alberto-Culver Company. Aerosol preparations for removing lint, hair and other particulate matter from fabric. 5,089,160, Cl. 252-90.000.
- Palmbos, Allen L.: See—
DeLong, Ronald B.; and Palmbos, Allen L., 5,088,250, Cl. 52-239.000.
- Palmers, Goran, to Institutet for Verkstadsteknisk. Method for conveying and depositing adhesive, flexible material and a device for performing the method. 5,088,592, Cl. 198-465.300.
- Pamcker, Ramachandra M. P., to Micro Substrates, Inc. Fine-pitch chip carrier. 5,089,881, Cl. 357-80.000.
- Panus, Irenaeus S.: See—
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,089,795, Cl. 335-46.000.
- Papallo, Thomas F., Jr.: See—
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,089,795, Cl. 335-46.000.
- Papathomas, Kostas I.: See—
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- Pappa, Rosario: See—
Bonaccorsi, Fabrizio; Pappa, Rosario; Riocci, Mario; Roggero, Arnaldo; and Lockhart, Thomas P., 5,089,577, Cl. 526-240.000.
- Par-Way Group: See—
Hanson, H. Wayne; and Doering, Beauford C., 5,088,649, Cl. 239-329.000.
- Parent, Jean-Claude; and Renaudin, Marie-Helene, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude. Process for preparing disilane by using molecular sieves. 5,089,244, Cl. 423-347.000.
- Park, Chung P., to Dow Chemical Company. The Olefin polymer compositions comprising glycerol monoesters of C₂₀₋₂₄ fatty acids and foamed articles prepared therefrom. 5,089,533, Cl. 521-79.000.
- Park, Guen-Yong: See—
Chai, Dong-Ill; and Park, Guen-Yong, 5,089,830, Cl. 346-1.100.
- Park, Hwa K.: See—
Kwak, Wie J.; Park, Hwa K.; and Oh, Key B., 5,089,636, Cl. 547-297.000.
- Park, Kyung T.; Gastgeb, R. Fredrick; and Daniels, Gregory, to Atochem North America, Inc. Piezofilm impact detector with pyro effect elimination. 5,089,741, Cl. 310-332.000.
- Park, Myung H.: See—
Kim, Wan J.; Park, Myung H.; and Oh, Jong H., 5,089,621, Cl. 546-113.000.
- Park, Seung H., to Goldstar Co., Ltd. Magnetron choke for microwave oven. 5,089,744, Cl. 315-39.530.
- Parker, Earl R.: See—
Parker, William J.; and Parker, Earl R., 5,090,043, Cl. 378-121.000.
- Parker, Johnny M. Folding and crimping apparatus. 5,088,972, Cl. 493-352.000.
- Parker Micro-Tubes, Inc.: See—
Parker, William J.; and Parker, Earl R., 5,090,043, Cl. 378-121.000.
- Parker, William J.; and Parker, Earl R., to Parker Micro-Tubes, Inc. X-ray micro-tube and method of use in radiation oncology. 5,090,043, Cl. 378-121.000.
- Parks, Howard L.: See—
Meyer, James A.; Mikalauskas, Frank; and Parks, Howard L., 5,089,880, Cl. 357-75.000.
- Parsons, Philip: See—
Willson, Jolyon P.; and Parsons, Philip, 5,089,695, Cl. 250-227.210.
- Parsy, Roland; Augustin, Daniel; and Collette, Christian, to Atochem. Oligomer derived from a polyethoxylated fatty amine, process for producing same, and its use to modify the surface properties of polymers. 5,089,546, Cl. 524-198.000.
- Parylo, Gerald A.: See—
Susko, Thomas J.; Constantino, James P.; and Parylo, Gerald A., 5,088,616, Cl. 220-343.000.
- Pasar, Inc.: See—
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- Pascaud, Xavier B.: See—
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- R. J. Reynolds Tobacco Company: See—
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- Raddatz, Juergen: See—
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- Rademacher, Thomas W.: See—
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- Radke, Daniel D.: See—
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- Rago, Vito, to Bell Communications Research, Inc. Method for handling conversational transactions in a distributed processing environment. 5,089,954, Cl. 395-600.000.

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- Ramirez, Simon: See—
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- Ransohoff, Thomas C.: See—
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- Ratcliffe, Norman M., to British Aerospace Public Limited Company. Preparation of conductive films. 5,089,294, Cl. 427-108.000.
- Rath, Dieter; von der Haar, Friedrich; Gerlach, Hans-Josef; and Knuth, Reinhard, to B. Braun Melsungen AG. Pump hose for a peristaltic pump. 5,088,522, Cl. 138-119.000.
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- Ratza, Clifton J.: See—
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- Rauterkus, Karl J.; Kroggel, Matthias; and Huth, Hans-Ullrich, to Hoechst Aktiengesellschaft. Organic dispersion polymers based on ethylenically unsaturated monomers which contain water-soluble graft polymers containing vinyl alcohol units having a polyurethane grafting base, processes for their preparation and their use. 5,089,570, Cl. 525-455.000.
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- Rees, Richard: See—
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- Reghi, Gary A., to Henkel Corporation. Process for corrosion resisting treatments for aluminum surfaces. 5,089,064, Cl. 148-247.000.
- Reid, Michael A., to Well-Equip Limited. Connector. 5,088,853, Cl. 403-330.000.
- Reiffenrath, Volker: See—
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- Reinhall, Rolf B., to Sunds Defibrator Industries Aktiebolag. Device for treating material mixtures. 5,088,831, Cl. 366-171.000.
- Reinhold, Herbert: See—
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- Renk Tacke GmbH: See—
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- Resco Inc.: See—
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- Research and Education Institute, Inc.: See—
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- Research Foundation of State Univ. of New York, The: See—
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- Reunamaki, Pauli T., to Glasstech, Inc. Drive mechanism for glass sheet roller conveyor of furnace. 5,088,920, Cl. 432-59.000.
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- Reynolds, Francis D.: See—
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- Rhodes, Paul B.: See—
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Ruch, Klaus: See—
Potthoff, Hans-Hermann; Scheffler, Ingolf; Ruch, Klaus; and Joessel, Rainer, 5,088,576, Cl. 181-290.000.

Ruddick, John N. R.; Eaton, George H.; and Whiting, Douglas B., to Bell Pole Co. Ltd. Process for fixing wooden articles pressure treated with chromated-copper-arsenate. 5,089,302, Cl. 427-377.000.

Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., to Yellow Freight System, Inc. Manipulator mixed freight handling system. 5,088,873, Cl. 414-392.000.

Rueb, Lothar; Eicken, arl; Schwalge, Barbara; Plath, Peter; Wuerzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. N-phenyl-tetrahydrophthalimide compounds. 5,089,042, Cl. 71-74.000.

Ruf, James A.: See—
Bohara, Robert C.; and Ruf, James A., 5,089,293, Cl. 427-102.000.

Rund, Richard. Vibrating and audible alarm clock. 5,089,998, Cl. 368-72.000.

Rupp, John A.: See—
McCartney, Richard I.; and Rupp, John A., 5,088,806, Cl. 359-84.000.

Rusen, Jochen: See—
Schnell, Hans; Kuhn, Hans; and Rusen, Jochen, 5,088,567, Cl. 173-122.000.

Russ, Tomas: See—
Lanza, Richard C.; Votano, Joseph R.; and Russ, Tomas, 5,090,040, Cl. 378-62.000.

Russell, Edwin R. Work station. 5,088,420, Cl. 108-106.000.

Ryan, Charles L., Jr.: See—
Bailey, Fay W.; and Ryan, Charles L., Jr., 5,089,209, Cl. 264-540.000.

Ryan, Dana W., to Ryan Medical, Inc. Safety winged needle medical devices. 5,088,982, Cl. 604-110.000.

Ryan Medical, Inc.: See—
Ryan, Dana W., 5,088,982, Cl. 604-110.000.

Ryobi Limited: See—
Shigetoh, Hidetoshi, 5,088,735, Cl. 273-80.00B.

Yamaguchi, Katsushi, 5,089,765, Cl. 320-32.000.

Ryobi Motor Products Corp.: See—
Beth, David E.; McCracken, Robert E.; and Watson, James B., 5,088,865, Cl. 409-182.000.

Ryoke, Katsumi; Takahashi, Masatoshi; Izaki, Tsugio; and Suzuki, Masaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,089,331, Cl. 428-323.000.

Rzedzian, Richard R.: See—
Zakhor, Avideh; and Rzedzian, Richard R., 5,089,778, Cl. 324-312.000.

Sabranski, Udo, to Rheinmetall GmbH. Impact projectile. 5,088,416, Cl. 102-517.000.

Saeva, Franklin D., to Eastman Kodak Company. Novel bis-onium salts and the use thereof as photoinitiators. 5,089,374, Cl. 430-271.000.

Safety Shot Limited Partnership: See—
Huffman, John; and Shannon, John, 5,088,415, Cl. 102-515.000.

Sagi, Nobuo: See—
Hidaka, Hiroshi; and Sagi, Nobuo, 5,089,177, Cl. 260-410.600.

Sahagen, Armen N. Piezoresistive pressure transducer. 5,088,329, Cl. 73-727.000.

Saigo, Kazuhiko: See—
Hasegawa, Masaki; Saigo, Kazuhiko; Yuki, Yoichi; and Tachibana, Kouzou, 5,089,642, Cl. 556-1.000.

Saijo, Keiko: See—
Yokomori, Sadakazu; Saijo, Keiko; Matsunaga, Tohru; Nakashima, Yoshimoto; and Hatayama, Katsuo, 5,089,654, Cl. 560-53.000.

Saijo, Yatsuse, to Fernandes Co., Ltd. Tremolo device for a guitar. 5,088,374, Cl. 84-313.000.

Saijo, Yatsuse, to Fernandes Co., Ltd. Tremolo device for string musical instrument. 5,088,375, Cl. 84-313.000.

Saimoto, Hiroshi: See—
Murata, Yumiko; Otsuka, Masako; Saimoto, Hiroshi; and Kawashima, Masao, 5,089,410, Cl. 435-240.450.

St. Julien, Dell J.: See—
Ketcham, Thomas D.; Sanderson, Wayne B., deceased; St. Julien, Dell J.; and Wexell, Kathleen A., 5,089,455, Cl. 501-104.000.

Saita, Yoshinobu: See—
Nakamura, Hiroshi; Saita, Yoshinobu; and Ikeda, Hitoshi, 5,088,175, Cl. 29-430.000.

Saito, Fumitaka: See—
Iwami, Mashahide; Murakami, Shigeomi; Saito, Fumitaka; Watanabe, Takao; and Akiyama, Masami, 5,088,794, Cl. 297-483.000.

Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, to Taiyo Yuden Co., Ltd. Solid dielectric capacitor and method of manufacture. 5,089,932, Cl. 361-321.000.

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Saito, Kazuhiro: See—
Itoh, Eiji; Nagase, Ryuichi; Saito, Kazuhiro; Hosaka, Hiroshi; and Nagai, Hihumi, 5,089,196, Cl. 264-65.000.

Saito, Keizo, to Sharp Kabushiki Kaisha. Word processor with column layout function. 5,089,990, Cl. 395-375.000.

Saito, Kenji: See—
Kajikawa, Akira; and Saito, Kenji, 5,088,321, Cl. 73-146.000.

Saito, Shinji: See—
Noguchi, Hitoshi; Saito, Shinji; Inaba, Hiroo; and Ogawa, Hiroshi, 5,089,317, Cl. 428-212.000.

Saito, Takahiro, to Yazaki Corporation. Electrical junction device. 5,088,940, Cl. 439-621.000.

Saito, Yoichi: See—
Kurihara, Masaru; and Saito, Yoichi, 5,088,350, Cl. 74-861.000.

Saitou, Yoshitami; Isono, Nobuyuki; and Suzumura, Nobuyasu, to Aisin Seiki K.K. Engine brake controlling apparatus using a lock-up system. 5,088,582, Cl. 192-0.055.

Sakagami, Toshinori; Toyama, Yasuo; Ito, Hisaharu; and Miyachi, Takumi, to Shell Internationale Research Maatschappij B.V. Block copolymer composition. 5,089,550, Cl. 525-314.000.

Sakai, Hitoshi: See—
Yoshida, Hitoshi; Sakai, Hitoshi; Oki, Shuichiro; Watanabe, Keiichiro; Yoshida, Manabu; and Oda, Toshio, 5,089,468, Cl. 505-1.000.

Sakai, Jun, to Brother Kogyo Kabushiki Kaisha. Image recording device. 5,089,844, Cl. 355-27.000.

Sakai, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,089,382, Cl. 430-546.000.

Sakai, Yasuo: See—
Yokosuka, Hirobumi; and Sakai, Yasuo, 5,089,819, Cl. 341-101.000.

Sakairi, Koushi: See—
Imazumi, Junichi; Nomura, Hiroshi; Nagao, Kouichi; Suzuki, Masakatsu; Sakairi, Koushi; and Satou, Eikichi, 5,089,346, Cl. 428-458.000.

Sakamoto, Kiichiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, to Fuji Photo Film Co., Inc. Water supply system for developing apparatus. 5,089,840, Cl. 354-324.000.

Sakane, Takashi: See—
Hashibe, Yoshio; Matano, Takahiro; Shibuya, Takehiro; Sakane, Takashi; Baba, Yasuhiro; and Moritake, Masanori, 5,089,345, Cl. 428-428.000.

Sakashita, Kiyotoshi; Nishigaki, Shinichi; and Bito, Shiro, to Olympus Optical Co., Ltd. Resectoscope apparatus. 5,088,998, Cl. 606-46.000.

Sakata, Keikichi: See—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; and Mitsukuchi, Yukio, 5,088,361, Cl. 82-127.000.

Sakurai, Hiroko: See—
Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, 5,089,515, Cl. 514-404.000.

Sakurai, Kenya, to Fuji Electric Co., Ltd. Insulated gate type semiconductor device. 5,089,864, Cl. 357-23.400.

Sakurai, Seiya: See—
Nozaki, Hisashi; and Sakurai, Seiya, 5,089,285, Cl. 426-573.000.

Sakuramoto, Takahumi: See—
Tominaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, 5,089,071, Cl. 156-89.000.

Salaud, Jean-Luc: See—
Thelamon, Jean; Salaud, Jean-Luc; and Dubos, Daniel, 5,088,702, Cl. 267-140.10C.

Salce, Arthur J.; and Metcalfe, Richard T., to Cabot Safety Corporation. Disposable faceshield and method of manufacture thereof. 5,088,114, Cl. 2-9.000.

Salem Label Company, Inc.: See—
Anderson, Brooke; and Smith, John W., 5,089,338, Cl. 428-354.000.

- Salerno, Anthony J.: See—
Williams, Jon I.; Salerno, Anthony J.; Goldberg, Ina; and McAllister, William T., 5,089,406, Cl. 435-172.300.
- Salomon S.A.: See—
Hue, Jean; and Graillat, Gerard, 5,088,756, Cl. 280-615.000.
- Salsman, Robert K. Brake light system to indicate intensity of slow down. 5,089,805, Cl. 340-467.000.
- Salter, Timothy L.: See—
Shi, Joseph C. S.; Curtis, Jerry L.; and Salter, Timothy L., 5,089,056, Cl. 106-486.000.
- Salutar Inc.: See—
Quay, Steven C.; and Rocklage, Scott M., 5,089,644, Cl. 556-40.000.
- Salvucci, Frank S., Sr. Gas cylinder ring assembly. 5,088,685, Cl. 248-682.000.
- Salwen, Howard C.: See—
Marshall, Alan C.; MacEachern, Stuart P.; and Salwen, Howard C., 5,090,025, Cl. 375-4.000.
- Sames S.A.: See—
Giroux, Patrice; and Rey, Jean-Christophe, 5,088,519, Cl. 137-240.000.
- Sample, Sherley W.: See—
Raue, Glen F.; Robinson, Edward A.; McLeod, Jesse; and Sample, Sherley W., 5,088,912, Cl. 425-155.000.
- Samsung Electronics Co., Ltd.: See—
Cha, Dong-III; and Park, Guen-Yong, 5,089,830, Cl. 346-1.100.
Kim, Dong Young, 5,089,898, Cl. 358-335.000.
Kim, Ki M.; and Kim, Gyu D., 5,088,579, Cl. 184-6.160.
- Samsung Semiconductor and Telecommunications Co., Ltd.: See—
Hong, Jung-In; Yoo, Byung-Deok; and Ahn, Tae-Hyuk, 5,089,436, Cl. 437-60.000.
- Sanchez, Carlos G. A.: See—
Tovar, Abel M.; Mendizabal, Oscar H. B.; Olmos, Leonardo M.; Sanchez, Carlos G. A.; Lorenzo, Roberto L.; Barba, Roldofo C.; and Perez, Rene H., 5,089,114, Cl. 208-50.000.
- Sanden Corporation: See—
Ando, Nobuyasu, 5,088,294, Cl. 62-119.000.
Okada, Shigeru; and Ando, Nobuyasu, 5,088,193, Cl. 29-890.043.
- Sanders, Richard L.: See—
Henderson, Robert E.; and Sanders, Richard L., 5,088,752, Cl. 280-79.110.
- Sanders, Stephen P.: See—
Kapsokavathis, Nick S.; and Sanders, Stephen P., 5,089,783, Cl. 324-672.000.
- Sanderson, Christopher D.: See—
Wagner, Ted R.; and Sanderson, Christopher D., 5,088,182, Cl. 29-568.000.
- Sanderson, Stuart R., administrator: See—
Ketcham, Thomas D.; Sanderson, Wayne B., deceased; St. Julien, Dell J.; and Wexell, Kathleen A., 5,089,455, Cl. 501-104.000.
- Sanderson, Wayne B., deceased: See—
Ketcham, Thomas D.; Sanderson, Wayne B., deceased; St. Julien, Dell J.; and Wexell, Kathleen A., 5,089,455, Cl. 501-104.000.
- Sandhu, Gurtej S.; Fazan, Pierre C.; Liu, Yau-Ching; and Chan, Hiang C., to Micron Technology, Inc. Mushroom double stacked capacitor. 5,089,986, Cl. 365-149.000.
- Sandoz Ltd.: See—
Lee, Shy-Fuh; Anderson, Richard J.; Luehr, Gary W.; Craig, G. Wayne; Kirkpatrick, Joel L.; Nishizaka, Takashi; and Komatsubara, Kenichi, 5,089,046, Cl. 71-103.000.
- Sandulyak, Alexandr V.: See—
Garaschenko, Vyacheslav I.; Sandulyak, Alexandr V.; and Volkov, Igor V., 5,089,128, Cl. 210-222.000.
- Sanofi: See—
Mosse, Madeleine; and Proietto, Vincenzo, 5,089,251, Cl. 424-47.000.
- Sanshin Kogyo Kabushiki Kaisha: See—
Imaeda, Hirofumi, 5,088,468, Cl. 123-583.000.
Nakayama, Manabu, 5,088,946, Cl. 440-61.000.
Onoue, Akihiro, 5,088,945, Cl. 440-61.000.
- Santel, Hans-Joachim: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.
- Santos, A. John; and Brauer, Michael C., to Torrington Company, The. High resolution encoder. 5,089,817, Cl. 341-15.000.
- Sanwa Kagaku Kenkyusho Co., Ltd.: See—
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromoto; Mitani, Takahiko; and Ninomiya, Naohisa, 5,089,265, Cl. 424-195.100.
- Sanyo Chemical Industries, Ltd.: See—
Iizuka, Yoshio; Oothuka, Yoshiyuki; Tanaka, Satoshi; and Yamamoto, Manabu, 5,089,538, Cl. 523-132.000.
- Sanyo Electric Co., Ltd.: See—
Higashitsutsumi, Yoshihito, 5,089,894, Cl. 358-213.240.
Kodama, Yoshimi; and Ohnishi, Yoshinisa, 5,089,921, Cl. 360-95.000.
Takata, Kazunori; Akaishi, Tsuneshi; and Mohara, Masayuki, 5,088,187, Cl. 29-705.000.
- Sanyo-Kokusaku Pulp Co., Ltd.: See—
Namba, Hiroaki; and Hishinuma, Minoru, 5,089,587, Cl. 528-97.000.
- Sapia, Mark A.; and Clark, John G., to Amdata, Inc. Apparatus for infrared imaging inspections. 5,089,700, Cl. 250-330.000.
- Sara Lee Corporation: See—
Risafi, Chris; and Howard, Fred, 5,088,607, Cl. 211-59.300.
Williams, Roger S.; and Kramer, Lee, 5,088,617, Cl. 220-403.000.
- Sardari, Abbas; and Von Bargen, John D., to White Horse Technologies, Inc. Pollution control apparatus and method for pollution control. 5,088,424, Cl. 110-344.000.
- Sargeant, John B., to Westinghouse Electric Corp. Stator core vent structures. 5,089,731, Cl. 310-65.000.
- Sasaki, Hiromi; Tojima, Masao; Konishi, Satsuko; and Takana, Hiroyuki, to Osaka Soda Co., Ltd. Plastics printing material and image fixing method for electrostatic printing with use of same. 5,089,316, Cl. 428-195.000.
- Sasaki, Jun; Ogawa, Akira; Akimoto, Yasumasa; Minato, Takao; and Ohnishi, Hajime, to Toppan Printing Co., Ltd. Color liquid crystal display system with spacer-adhesive and separate rigid spacers across display surface. 5,089,905, Cl. 359-64.000.
- Sasaki, Mitsuo: See—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Sasaki, Mitsuo; Shimizu, Hiroyuki; and Emura, Junichi, 5,088,760, Cl. 280-707.000.
- Sasaki, Nobuyuki: See—
Sibata, Kenichiro; Sasaki, Nobuyuki; Yazu, Shuji; and Jodai, Tetsuji, 5,089,465, Cl. 505-1.000.
- Sashida, Reiko: See—
Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Makoto; Ohba, Sachiko; and Ohkishi, Haruyuki, 5,089,402, Cl. 435-96.000.
- Sata-Farbspritztechnik GmbH & Co.: See—
Schmon, Ewald, 5,088,648, Cl. 239-296.000.
- Sato, Akihiko: See—
Yamamoto, Osamu; Sato, Akihiko; and Shiba, Hitoshi, 5,088,656, Cl. 242-199.000.
- Sato, Fumie; Arai, Kazutaka; and Miyaji, Katsuaki, to Nissan Chemical Industries, Ltd. Substituted cyclic ketones, substituted cyclic enones. 5,089,625, Cl. 548-110.000.
- Sato, Katsumi: See—
Hirano, Yoshinao; Nagamori, Shigeru; Sato, Katsumi; and Murata, Katsuhide, 5,089,184, Cl. 264-22.000.
Hirano, Yoshinao; Sato, Katsumi; Shirai, Junji; and Nagamori, Shigeru, 5,089,185, Cl. 264-22.000.
- Sato, Kimihiko; Suzuki, Risuke; and Horiuchi, Hiroshi, to Teijin Petrochemical Industries, Ltd. Catalyst composition, process for cracking non-aromatic hydrocarbons and process for isomerizing C₈ aromatic hydrocarbons. 5,089,459, Cl. 502-66.000.
- Sato, Makoto: See—
Watanuki, Isao; Kodana, Nobuhiko; and Sato, Makoto, 5,089,450, Cl. 502-158.000.
- Sato, Masaharu: See—
Fukuyama, Kensuke; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Sato, Masaharu, 5,088,762, Cl. 280-707.000.
- Sato, Masami; Fujiyama, Masaaki; Nishikawa, Yasuo; and Iwasaki, Takashi, to Fuji Photo Film Co., Ltd. Abrasive tape in which a single compound serves to improve dispersion of abrasive particles and also as antistatic and lubricant for the tape. 5,089,330, Cl. 428-323.000.
- Sato, Shoji, to Canon Kabushiki Kaisha. Power source device with control of voltage change speed. 5,089,768, Cl. 323-318.000.
- Sato, Tadahisa: See—
Taniguchi, Masato; Sato, Tadahisa; and Mizukawa, Yuki, 5,089,651, Cl. 558-360.000.
- Sato, Takushi: See—
Morita, Moritsugu; Sato, Takushi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeyuki, 5,089,355, Cl. 428-607.000.
- Sato, Unichi: See—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Unichi; and Takayama, Nobutoshi, 5,089,919, Cl. 360-74.400.
- Sato, Yoshio: See—
Konno, Daisuke; Miwa, Sachihiko; Aiyoshizawa, Shunichi; Kasahara, Kazuyuki; Sato, Yoshio; and Hirokawa, Kazuto, 5,089,732, Cl. 310-67.00R.
- Satoh, Hajime: See—
Ohashi, Shinji; Isaji, Norifumi; and Satoh, Hajime, 5,088,461, Cl. 123-399.000.
- Satoh, Sakae: See—
Akasaka, Masami; Kubota, Akiko; Mizoguchi, Junzo; and Satoh, Sakae, 5,089,408, Cl. 435-192.000.
- Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, to Mitsubishi Denki Kabushiki Kaisha. Field effect transistor with T-shaped gate electrode. 5,089,863, Cl. 357-23.300.
- Satoh, Shinichi: See—
Takago, Toshio; Satoh, Shinichi; Oyama, Masayuki; Yamaguchi, Koichi; and Matsuda, Takashi, 5,089,649, Cl. 556-482.000.
- Satoh, Tamotsu: See—
Hoshi, Junichi; Satoh, Tamotsu; and Arikawa, Shiro, 5,089,425, Cl. 437-3.000.
- Satou, Eikichi: See—
Imaizumi, Junichi; Nomura, Hiroshi; Nagao, Kouichi; Suzuki, Masakatsu; Sakurai, Kouichi; and Satou, Eikichi, 5,089,346, Cl. 428-458.000.
- Satou, Kouji: See—
Yamamoto, Masato; Nakajima, Masahiro; Yamanaka, Toshimasa; and Satou, Kouji, 5,089,677, Cl. 200-339.000.
- Saufferer, Daniel R.: See—
Aurness, Harold O.; and Saufferer, Daniel R., 5,088,232, Cl. 47-1.500.
- Saunders, Craig M.: See—
Kopco, James J.; and Saunders, Craig M., 5,089,038, Cl. 55-374.000.

- Sauter, Hubert: See—
Wingert, Horst; Brand, Siegfert; Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Lorenz, Gisela; and Ammermann, Eberhard, 5,089,528, Cl. 514-640.000.
- Sauvage, Philippe: See—
Reiniche, Andre; Sauvage, Philippe; and Van Den Berghe, Paul, 5,089,059, Cl. 148-16.000.
- Savage, Arthur H., III. Manicure file kit. 5,088,509, Cl. 132-76.500.
- Sawada, Shuzo; Kawamura, Takashi; Masuho, Yasuhiko; and Tomibe, Katsuhiko, to Teijin Limited. E87Ag antigens of *Pseudomonas aeruginosa* and monoclonal antibodies against them and hybridomas thereof. 5,089,262, Cl. 424-87.000.
- Sawafuji Electric Co., Ltd.: See—
Sawaguchi, Hideo; Muraoka, Takeshi; and Takahashi, Kazuhiro, 5,089,735, Cl. 310-88.000.
- Sawaguchi, Hideo; Muraoka, Takeshi; and Takahashi, Kazuhiro, to Sawafuji Electric Co., Ltd. Direct-current motor. 5,089,735, Cl. 310-88.000.
- Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromoto; Mitani, Takahiko; and Ninomiya, Naohisa, to Sanwa Kagaku Kenkyusho Co., Ltd. Stabilized phytic acid compositions. 5,089,265, Cl. 424-195.100.
- Sawamoto, Hiroyuki: See—
Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiro; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, 5,088,281, Cl. 60-274.000.
- Sawasaki, Tomoo: See—
Morishige, Chitoshi; and Sawasaki, Tomoo, 5,089,964, Cl. 364-424.100.
- Sawhney, Indu: See—
Wilson, John R. H.; and Sawhney, Indu, 5,089,512, Cl. 514-365.000.
- Saya, Toshiaki: See—
Tsuiji, Suguru; Saya, Toshiaki; Komiya, Shinji, Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, 5,089,576, Cl. 526-228.000.
- Scarpino, Pasquale V.: See—
Snyder, A. Peter; Greenberg, David B.; and Scarpino, Pasquale V., 5,089,395, Cl. 435-39.000.
- Schaal, Hans: See—
Kleineberg, Wolfgang; Schaal, Hans; and Attinger, Thomas, 5,088,453, Cl. 123-41.540.
- Schaale, Klaus; and Engelhardt, Wolfgang, to Webasto AG Fahrzeugtechnik. Vaporization burner for a heater operated with liquid fuel. 5,088,918, Cl. 431-326.000.
- Schaefer, Roland: See—
Eppinger, Bernhard; Eppinger, Regina; and Schaefer, Roland, 5,089,051, Cl. 106-35.000.
- Schaefer, Ronald E. Fresh-air intake with adjustable air deflectors. 5,088,388, Cl. 454-271.000.
- Schaeff, Wilmer G.: See—
Greanias, Anthony C.; Kubisch, John G.; Mercer, James B.; and Schaeff, Wilmer G., 5,088,546, Cl. 164-255.000.
- Schalldach, Max, to Biotronik Mess- und Therapiegeräte GmbH & Co. Heart pacemaker. 5,088,491, Cl. 128-419.0PG.
- Schalles, Erhard, to Gildemeister Aktiengesellschaft. Drive for work-piece spindle of machine tool. 5,088,362, Cl. 82-142.000.
- Scharf, Michael W.: See—
Packard, Jeffrey; Schnell, William J.; and Scharf, Michael W., 5,088,995, Cl. 604-415.000.
- Schatz, George R., to Atochem North America, Inc. Process for converting carbon disulfide to hydrogen sulfide in hydrogen sulfide/carbon disulfide mixtures. 5,089,246, Cl. 423-563.000.
- Scheffler, Ingolf: See—
Potthoff, Hans-Hermann; Scheffler, Ingolf; Ruch, Klaus; and Joessel, Rainer, 5,088,576, Cl. 181-290.000.
- Schell, Joseph G., Jr.: See—
Marchand, Gary R.; Schell, Joseph G., Jr.; Walther, Brian W.; and Bredeweg, Corwin J., 5,089,572, Cl. 526-77.000.
- Scheller, Hans U.; and Scheller, Karl A., to Württembergische Parfümerie-Fabrik GmbH. Process for preparing solid powder formulations having different colors. 5,089,256, Cl. 424-63.000.
- Scheller, Karl A.: See—
Scheller, Hans U.; and Scheller, Karl A., 5,089,256, Cl. 424-63.000.
- Scheps, Richard, to United States of America, Navy. Laser diode-pumped tunable solid state laser. 5,090,019, Cl. 372-39.000.
- Schering Agrochemicals Limited: See—
Bush, Brian D.; Gates, Duncan A.; and Langley, David, 5,089,045, Cl. 71-92.000.
- Schering Aktiengesellschaft: See—
Eamshaw, Christopher G.; Kirsch, Gerald; Rach, Petra; Thieroff-Ekerdt, Ruth; and Topert, Michael, 5,089,175, Cl. 260-404.000.
- Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.
- Neef, Gunter; Beier, Sybille; and Elger, Walter, 5,089,635, Cl. 549-297.000.
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- Nagasawa, Tamami; and Takahashi, Kozo, 5,088,714, Cl. 271-3.100.
- Nakano, Akihiko, 5,089,774, Cl. 324-158.00R.
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- Corley, Larry S.; and Dewhurst, Kenneth C., 5,089,599, Cl. 528-322.000.
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- Wilson, John R. H.; and Sawhney, Indu, 5,089,512, Cl. 514-365.000.
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- Shepherd, Brian, to Smiths Industries Public Limited Company. Electrical assemblies. 5,088,939, Cl. 439-620.000.
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Nakamura, Kotaro; Tanaka, Toshiharu; and Shimada, Hirokazu, 5,089,371, Cl. 430-160.000.
- Shimada, Yoshio: *See—*
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Arik, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, 5,089,516, Cl. 514-404.000.
- Shimai, Shunzo: *See—*
Ando, Kuniko; Shiraishi, Koichi; Shimbo, Masaru; and Shimai, Shunzo, 5,089,134, Cl. 210-496.000.
- Shimbo, Masaru: *See—*
Ando, Kuniko; Shiraishi, Koichi; Shimbo, Masaru; and Shimai, Shunzo, 5,089,134, Cl. 210-496.000.
- Shimizu Construction Co., Ltd.: *See—*
Iizuka, Yoshio; Oothuka, Yoshiyuki; Tanaka, Satoshi; and Yamamoto, Manabu, 5,089,538, Cl. 523-132.000.
- Shimizu, Hiroyuki: *See—*
Kakizaki, Shinobu; Yamaoka, Fumiaki; Sasaki, Mitsuo; Shimizu, Hiroyuki; and Emura, Junichi, 5,088,760, Cl. 280-707.000.
- Shimizu, Kazuo: *See—*
Maeda, Kazuyuki; Mizukami, Fujio; Niwa, Shuichi; Toba, Makoto; and Shimizu, Kazuo, 5,089,456, Cl. 501-119.000.
- Shimizu, Osamu: *See—*
Yano, Haruto; Hirasa, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, 5,089,826, Cl. 342-457.000.
- Shimizu, Tadaaki: *See—*
Kusuda, Yasuhiro; Ueda, Masahide; Onishi, Takashi; and Shimizu, Tadaaki, 5,089,848, Cl. 355-206.000.
- Shimizu, Tetsuo: *See—*
Nozu, Shinsaku; Shimizu, Tetsuo; and Ohmori, Seiji, 5,090,000, Cl. 369-44.250.
- Shimizu, Yoshiyuki: *See—*
Maruyama, Tomoyuki; and Shimizu, Yoshiyuki, 5,088,768, Cl. 280-777.000.
- Shimozima, Hideki: *See—*
Iino, Mitsutoshi; Nakato, Shiro; Shinkai, Seichi; Shimozima, Hideki; and Kawaguchi, Hiromi, 5,089,777, Cl. 324-309.000.
- Shimura, Fumihiko, to Usui Kokusai Sangyo Kaisha Ltd. Method and apparatus for high frequency heat-treatment of long continuous metal blanks. 5,089,058, Cl. 148-16.000.
- Shin-Etsu Chemical Co., Ltd.: *See—*
Arima, Sadaichi; Kuwabara, Kouzou; and Hoshida, Shigehiro, 5,089,575, Cl. 526-200.000.
- Kashida, Meguru; Kubota, Yoshihiro; and Nagata, Yoshihiko, 5,089,085, Cl. 156-659.100.
- Kato, Hideto, 5,089,549, Cl. 524-287.000.
- Miyata, Koji, 5,089,798, Cl. 335-211.000.
- Takago, Toshio; Satoh, Shinichi; Oyama, Masayuki; Yamaguchi, Koichi; and Matsuda, Takashi, 5,089,649, Cl. 556-482.000.
- Watanuki, Isao; Kodana, Nobuhiko; and Sato, Makoto, 5,089,450, Cl. 502-158.000.

- Shin-Etsu Handotai Company Limited: See—
Araki, Kenji; Maeda Akiho; and Baba, Masahiko, 5,089,238, Cl. 422-249.000.
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seichiro; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.
Shin, Yuaki: See—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 5,090,009, Cl. 369-284.000.
Shinbano, Masayuki: See—
Watanabe, Katsuya; Moriya, Mitsuro; Yamada, Shinichi; and Shinbano, Masayuki, 5,090,003, Cl. 369-44.340.
Shinkai, Seiichi: See—
Iino, Mitsutoshi; Nakato, Shirou; Shinkai, Seiichi; Shimajima, Hideki; and Kawaguchi, Hiromi, 5,089,777, Cl. 324-309.000.
Shinohara, Hiroyumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device and a data path using the same. 5,089,992, Cl. 365-51.000.
Shinozaki, Masatoshi: See—
Okada, Susumu; Imanaka, Makoto; Masui, Susumu; Obara, Takashi; Shinozaki, Masatoshi; and Tsunoyama, Kozo, 5,089,068, Cl. 148-328.000.
Shinzaki, Takashi: See—
Igaki, Seigo; Shinzaki, Takashi; Yamagishi, Fumio; and Ikeda, Hiroyuki, 5,088,817, Cl. 356-71.000.
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, to Terumo Kabushiki Kaisha. Temperature measuring probe and electronic clinical thermometer equipped with same. 5,088,837, Cl. 374-185.000.
Shionogi & Co., Ltd.: See—
Hayase, Yoshio; Matsumoto, Kohei; Kamei, Kazuo; Ide, Kinya; and Takahashi, Toshio, 5,089,043, Cl. 71-90.000.
Shioya, Toshiaki; and Hirano, Ryogo, to Snow Brand Milk Products Co., Ltd. Process for producing capsules having a permeability-controllable membrane. 5,089,272, Cl. 424-493.000.
Shirai, Junji: See—
Hirano, Yoshinao; Sato, Katsumi; Shirai, Junji; and Nagamori, Shigeru, 5,089,185, Cl. 264-22.000.
Shiraishi, Koichi: See—
Ando, Kuniko; Shiraishi, Koichi; Shimbo, Masaru; and Shimai, Shunzo, 5,089,134, Cl. 210-496.000.
Shiraishi, Tadayoshi; Kameyama, Keiji; Domoto, Takeshi; Imai, Naohiro; Shimada, Yoshio; Aiki, Yutaka; Hosoe, Kazunori; Kawatsu, Masaji; Katsumi, Ikuo; Hidaka, Takayoshi; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. 1-phenyl-3,5-pyrazolidinedione hydroxystyrene compounds which have tyrosine kinase inhibiting activity. 5,089,516, Cl. 514-404.000.
Shirakura, Takeo; Terasaki, Fumitoshi; and Nishimoto, Takashi, to Okuma Machinery Works Ltd. Machining method for member included screw-shaped portion. 5,088,244, Cl. 51-288.000.
Shiroshita, Yoshihira: See—
Mita, Hideo; Hirano, Akiyoshi; and Shiroshita, Yoshihira, 5,088,289, Cl. 62-6.000.
Shiseido Company Ltd.: See—
Noda, Akira; Yamaguchi, Michihiro; Aizawa, Masanori; and Kumano, Yoshimaru, 5,089,269, Cl. 424-456.000.
Odate, Ryoji; and Haga, Tomoyuki, 5,089,309, Cl. 428-36.920.
Shishido, Shigeyuki: See—
Morita, Moritsugu; Sato, Takushi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeyuki, 5,089,355, Cl. 428-607.000.
Shizuno, Hisamitsu: See—
Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, 5,089,932, Cl. 361-321.000.
Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, 5,089,933, Cl. 361-321.000.
Shoji, Koki Kabushiki Kaisha: See—
Kamata, Eitaro, 5,088,129, Cl. 2-411.000.
Kamata, Eitaro, 5,088,131, Cl. 2-424.000.
Shoji, Akihiro; and Shiba, Noriyuki, to Tokyo Kikai Seisakusho, Ltd. Marker for confirmation of paper web-threaded paths and paper web-threaded path confirming apparatus for rotary presses. 5,088,403, Cl. 101-227.000.
Shokusan Jutaku Sogo Co., Ltd.: See—
Tsuda, Kenji; and Ono, Shoichi, 5,089,483, Cl. 514-64.000.
Shorewood Technologies, Inc.: See—
Mahler, Steven, 5,088,599, Cl. 206-313.000.
Short Brothers plc: See—
Nicholson, Eric, 5,088,818, Cl. 356-152.000.
Short, David E.; and Valka, William A., to FMC Corporation. Subsea well guide base running tool. 5,088,556, Cl. 166-339.000.
Shortt, James: See—
Glennon, Oliver; and Shortt, James, 5,089,796, Cl. 335-172.000.
Shu, Paul, to Mobil Oil Corporation. Consolidation agent and method. 5,088,555, Cl. 166-292.000.
Shukovsky, Harold B.: See—
Mallory, Michael; and Shukovsky, Harold B., 5,089,334, Cl. 428-336.000.
Sibalis, Dan, to Drug Delivery Systems Inc. Electrical transdermal drug applicator with counteractor and method of drug delivery. 5,088,977, Cl. 604-20.000.
Sibata, Kenichiro; Sasaki, Nobuyuki; Yazu, Shuji; and Jodai, Tetsuji, to Sumitomo Electric Industries, Ltd. Process for producing oxide superconducting thick films by screen printing. 5,089,465, Cl. 505-1.000.

Siebold, Horst; and Meier, Konrad, to Siemens Aktiengesellschaft. Method for manufacturing gradient coil system for a nuclear magnetic resonance tomography apparatus. 5,088,185, Cl. 29-605.000.

Siemens Aktiengesellschaft: See—

Braun, Bodo; Bruszies, Christian; Feuerbach, Manfred; Genzel, Rolf-Guenter; Lobnig, Josef; and Raddatz, Juergen, 5,089,934, Cl. 361-335.000.

Doemens, Guenter; and Schneider, Richard, 5,088,828, Cl. 356-376.000.

Kleeberg, Wolf; Kammermaier, Johann; and Schulte, Rolf-Winfried, 5,089,290, Cl. 427-41.000.

Landgraf, Tilo; Kunz, Rainer; Ropers, Johann; and Zenkel, Martin, 5,089,215, Cl. 376-260.000.

Murphy, Cary R.; and Bridges, Mark K., 5,090,018, Cl. 372-30.000.

Niewisch, Joachim, 5,088,501, Cl. 128-721.000.

Siebold, Horst; and Meier, Konrad, 5,088,185, Cl. 29-605.000.

Strobel, Reinhardt; and Spohrer, Jurgen, 5,089,212, Cl. 376-237.000.

Van Der Linden, Klaus; and Wunder, Siegfried, 5,089,763, Cl. 320-20.000.

Siemens Automotive L.P.: See—

Wakeman, Russell J.; and Shea, Stephen F., 5,088,458, Cl. 123-90.550.

Sierracin Corporation: See—

Hosseini, Amir P.; and Binford, John L., 5,088,771, Cl. 285-39.000.

Sievers, Robert E.; and Montzka, Stephen A., to University of Colorado Foundation, Inc., The. Stable mixed metal superconductive oxides containing nitrogen. 5,089,466, Cl. 505-1.000.

Sievers, Robert K., to Westinghouse Electric Corp. Flat plate alkali metal thermoelectric converter module. 5,089,054, Cl. 136-202.000.

Sievert, Dale W.: See—

Wardle, John W.; Leeson, Plato J.; Clay, David G.; and Sievert, Dale W., 5,088,383, Cl. 91-361.000.

Sigler, Robert D., to Lockheed Missiles & Space Company, Inc. Infra-red catadioptric zoom relay telescope with an aspheric primary mirror. 5,089,910, Cl. 359-399.000.

Sikkema, Sape: See—

Koorn, Maarten; and Sikkema, Sape, 5,088,275, Cl. 56-364.000.

Sikora, Jean: See—

Lamarque, Etienne; Rabuel, Jacques, deceased; and Sikora, Jean, 5,088,381, Cl. 89-1.814.

Silander, Risto, to Jaakko Poyry Oy. Process for continuous cooking of cellulose. 5,089,086, Cl. 162-19.000.

Silebi, Cesar A.; and Ramos, Jose D., to Lehigh University. Method and apparatus for capillary hydrodynamic fractionation. 5,089,126, Cl. 210-198.200.

Simin, Gerald L., to General Motors Corporation. Retractable antiglare shield for exterior rear view mirrors. 5,089,912, Cl. 359-608.000.

Simmons, David M.: See—

Kiel, Johnathan L.; Erwin, David N.; and Simmons, David M., 5,089,385, Cl. 435-3.000.

Simmons, Robert B.: See—

Junker, David M.; Wiedrich, Charles R.; and Simmons, Robert B., 5,089,127, Cl. 210-206.000.

Simmons, Thomas R. Submersible aquatic flotation device. 5,088,723, Cl. 272-1.00B.

Simon, Arthur; and Thomis, Jeff A., to Bristol-Myers Company. Anti-arrhythmic class III process. 5,089,526, Cl. 514-605.000.

Simonelli, Richard A.: See—

Howson, David C.; Smith, Andrew D.; and Simonelli, Richard A., 5,088,981, Cl. 604-31.000.

Simonetti, Andrea. Modular firing ground. 5,088,741, Cl. 273-410.000.

Simuni, Leonid. Hydro-mechanical device for underground drilling. 5,088,568, Cl. 175-14.000.

Singh, Balwant: See—

Forgione, Peter S.; and Singh, Balwant, 5,089,561, Cl. 525-127.000.

Forgione, Peter S.; and Singh, Balwant, 5,089,617, Cl. 544-196.000.

Singh, Prithipal; and Prisbylla, Michael, to Syntex (U.S.A.) Inc. Antibodies for salicylate and their preparation. 5,089,388, Cl. 435-7.600.

Singh, Rama N.; and Wilczynski, Janusz S., to International Business Machines Corporation. High resolution reduction catadioptric relay lens. 5,089,913, Cl. 359-727.000.

Sinko Kogyo Co., Ltd.: See—

Hopkins, Lawrence D., 5,088,886, Cl. 415-119.000.

SIT (Societe d'Innovations Techniques): See—

Garnier, Andre, 5,088,610, Cl. 212-196.000.

Skelly, Bonnie L.: See—

Barton, James J.; and Skelly, Bonnie L., 5,088,260, Cl. 52-416.000.

Skelton, Harold M. Side folding front tow bar. 5,088,754, Cl. 280-491.300.

Skis Rossignol S.A.: See—

Jodelet, Francois, 5,088,755, Cl. 280-609.000.

Skotheim, Terje A.; Okamoto, Yoshiyuki; and Hale, Paul D., to Associated Universities, Inc. Electrochemical biosensor based on immobilized enzymes and redox polymers. 5,089,112, Cl. 204-403.000.

SKW Trosibert Aktiengesellschaft: See—

Lischka, Helmut, 5,089,049, Cl. 75-328.000.

Slate, Mark J.: See—

Potts, Stephen M.; Slate, Mark J.; Cunningham, Charles B.; and Merz, James H., 5,088,535, Cl. 152-209.00B.

Slatter, John A. G.; Brockman, Henry E.; and Haisma, Jan, to U.S. Philips Corporation. Method of manufacturing a semiconductor device including a static induction transistor. 5,089,431, Cl. 437-39.000.

Sloan, Jeffrey M. Battery disconnect device. 5,089,762, Cl. 320-13.000.

- Sloves, Melvyn M.: See—
Heyderman, Mark B.; and Sloves, Melvyn M., 5,088,602, Cl. 206-387.000.
Small, Robert M. Strainer. 5,089,108, Cl. 210-287.000.
Smith, Allen C., Jr.: See—
Hu, Min H.; Smith, Allen C., Jr.; Wilson, Robert M.; Wepfer, Robert M.; and Braun, Howard E., 5,088,451, Cl. 122-388.000.
Smith, Andrew D.: See—
Howson, David C.; Smith, Andrew D.; and Simonelli, Richard A., 5,088,981, Cl. 604-31.000.
Smith, Benjamin W.: See—
Winefordner, James D.; and Smith, Benjamin W., 5,088,820, Cl. 356-301.000.
Smith Corona Corporation: See—
Curley, Charles M., 5,089,897, Cl. 358-296.000.
Smith, Edward G., Jr.: See—
Huber, Klaus B.; Lerche, Nolan C.; Edwards, Arnold G.; Rozek, Kenneth E.; and Smith, Edward G., Jr., 5,088,413, Cl. 102-202.500.
Smith, Francis X.; Wrobel, Stanley J.; and Raheja, Manohar K., to Polymer Technology Corporation. Contact lens cleaning and conditioning pouch and method of use. 5,088,146, Cl. 15-104.940.
Smith, James C.: See—
Trevathan, Larry C.; Hoover, Scott C.; and Smith, James C., 5,089,190, Cl. 264-45.900.
Smith, James R.: See—
Bruce, Wayne H.; Lewis, Howard A.; and Smith, James R., 5,088,973, Cl. 493-396.000.
Smith, John W.: See—
Anderson, Brooke; and Smith, John W., 5,089,338, Cl. 428-354.000.
Smith, Lonnie J.: See—
Gard, Michael F.; Pasternack, Eric S.; and Smith, Lonnie J., 5,090,039, Cl. 378-59.000.
Smith & Nephew Associated Companies plc: See—
Ansell, Christopher W.; Medcalf, Nicholas; and Williams, Peter W., 5,088,125, Cl. 2-167.000.
Smith, Robert A.; Frick, Douglas G.; Redmon, Charles L.; and Subbanna, Somanahalli N., to Allied-Signal Inc. Process for converting hexafluoroarsenic acid or any salt thereof to arsenic acid or salt thereof which can then be rendered nonhazardous. 5,089,241, Cl. 423-87.000.
Smith, Robert A.: See—
Ruble, Frank D.; Walsh, John N.; and Smith, Robert A., 5,088,240, Cl. 51-165.710.
Smith, Robert E.: See—
Kopfer, Rudolph J.; and Smith, Robert E., 5,088,996, Cl. 604-415.000.
Smith, Sarah J.: See—
Jaen, Juan C.; Nickell, David G.; Reynolds, Donna M.; Smith, Sarah J.; Wise, Lawrence D.; and Wustrow, David J., 5,089,497, Cl. 514-235.000.
Smith, Stanley B., Jr.; and Schleicher, Robert G., to Thermo Jarrell Ash Corporation. Spectroanalytical systems. 5,088,823, Cl. 356-328.000.
Smith, Trevor S.; Binns, John M.; Johnson, Graham F.; and Maker, Paul M., to Lucas Industries Public Limited Company. Fuel control system for a gas turbine engine. 5,088,278, Cl. 60-39.281.
Smith, Troy F.: See—
Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 5,088,720, Cl. 271-189.000.
SmithKline Beckman Intercredit B.V.: See—
Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., 5,089,498, Cl. 514-235.200.
Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., 5,089,504, Cl. 514-313.000.
SmithKline Beecham Corporation: See—
Unangst, R. Richard, 5,089,271, Cl. 424-490.000.
Smiths Industries Public Limited Company: See—
Murray-Shelley, Richard, 5,090,033, Cl. 377-28.000.
Shepherd, Brian, 5,088,939, Cl. 439-620.000.
Snow Brand Milk Products Co., Ltd.: See—
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Snyder, A. Peter; Greenberg, David B.; and Scarpino, Pasquale V., to University of Cincinnati. Viable microorganism detection by induced fluorescence. 5,089,395, Cl. 435-39.000.
Societe Anonyme dite: Aérospatiale Societe Nationale Industrielle: See—
Vally, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, 5,088,622, Cl. 222-3.000.
Societe Anonyme dite: ALCATEL SATMAM: See—
Joson, Michel; and Gregoire, Jean-Pierre, 5,088,442, Cl. 118-238.000.
Societe Anonyme Dite Societe Centrale d'Etudes et de Realisations Routieres: See—
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Societe Lyonnaise des Eaux, S.A.: See—
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Sohara, Joseph A.; Johnson, Randal A.; and Gorton, William E., to Atlas Powder Company. Nitrate ester preparation. 5,089,652, Cl. 558-480.000.

Sohma, Kiyoshi: See—
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,088,837, Cl. 374-185.000.

Soils, Inc.: See—

Yocum, Gene H., 5,088,856, Cl. 405-128.000.

Solt, Floyd R.: See—

Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 5,088,720, Cl. 271-189.000.

Soltis, Richard E.: See—

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Solvay & Cie (Societe Anonyme): See—

Lerot, Luc; Costa, Jean-Louis; Wilmet, Vincent; and Piroton, Joseph, 5,089,454, Cl. 502-226.000.

Somar Corporation: See—

Kitagawa, Katsuji; Tashima, Hideki; and Matsuzaki, Kunimitsu, 5,089,555, Cl. 524-503.000.

Murata, Yumiko; Otsuka, Masako; Saimoto, Hiroshi; and Kawashima, Masao, 5,089,410, Cl. 435-240.450.

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Biba, Scott I.; and Sommerfeld, Dean R., 5,088,542, Cl. 160-168.100.

Sonntag, Michael: See—

Blum, Harald; Wamprecht, Christian; Pedain, Josef; and Sonntag, Michael, 5,089,565, Cl. 525-375.000.

Sonoda, Takefumi, to Tosoh Corporation. Production of breathing composite sheet. 5,089,075, Cl. 156-244.180.

Sonoda, Yukihiro: See—

Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiro; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, 5,088,281, Cl. 60-274.000.

Sony Corporation: See—

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Kanota, Keiji; Inoue, Hajime; and Seki, Takahito, 5,089,917, Cl. 360-45.000.

Ohsato, Kiyoshi; and Fukumoto, Atsushi, 5,090,004, Cl. 369-44.370.

Soofi, Madjid, to Magneco/Metrel, Inc. Bubble pack plastic films as patterns for producing dimpled effects in cast ceramic pieces. 5,088,686, Cl. 249-112.000.

Sorenson, Richard W. Thermal switch/breaker. 5,089,799, Cl. 337-68.000.

Sorg Paper Company, The: See—

Cessna, Frank L., 5,089,327, Cl. 428-288.000.

Souriraja, Francis: See—

Ramaswamy, Coodly P.; and Souriraja, Francis, 5,089,069, Cl. 149-21.000.

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Haynes, Andrew S.; and Zakreski, Charles T., 5,088,520, Cl. 137-270.000.

Sovik, Robert A., to AW-2R, Inc. Paving joints. 5,088,854, Cl. 404-72.000.

Space Biospheres Venture: See—

Hawes, Philip B., 5,089,036, Cl. 55-227.000.

Spangler, James E.: See—

Arterbury, Bryant A.; and Spangler, James E., 5,088,554, Cl. 166-228.000.

Spark Tec Limited: See—

El-Menshawly, Mohamed F., 5,089,681, Cl. 219-69.160.

Spath, Michael M. Device for manufacturing expanded material. 5,088,170, Cl. 29-6.100.

Specialized Bicycle Components, Inc.: See—

Potts, Stephen M.; Slate, Mark J.; Cunningham, Charles B., and Merz, James H., 5,088,535, Cl. 152-209.00B.

Spector, George: See—

Lanzarone, Patrick; and Spector, George, 5,089,940, Cl. 362-101.000.

Spectrospin AG: See—

Allemann, Martin; and Caravatti, Pablo, 5,089,702, Cl. 250-291.000.

Spectrum Sciences B.V.: See—

Landa, Benzion; Pinhas, Hanna; and Fenster, Paul, 5,089,856, Cl. 355-279.000.

Spencer, William E.; and Chowdhury, Mofazzal H., to Alfa-Laval Agri, Inc. Transponder reader arm assembly. 5,088,447, Cl. 119-51.020.

Spiegel, Itzhak; Chet, Ilan; Cohn, Eli; and Galper, Sergio, to Yissum Research Development Company of the Hebrew University of Jerusalem. Nematicidal strain of pseudomonas and its use as a biocontrol agent. 5,089,263, Cl. 424-93.000.

Spiegelman, Jeffrey J., to Tylan General, Inc. Coupling for interconnection of coaxial tubing. 5,088,774, Cl. 285-133.100.

Spiers, James A.: See—

Stepan, Constance R.; and Spiers, James A., 5,088,718, Cl. 271-161.000.

Spinal Designs International, Inc.: See—

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Spindt, C. A.: See—

MacCaulay, John M.; Spindt, C. A.; Holland, Christopher E., and Brodie, Ivor, 5,089,292, Cl. 427-78.000.

Spinnen, Dieter: See—

Grecksch, Hans; and Spinnen, Dieter, 5,088,591, Cl. 198-465.100.

Spirk, John W.: See—

Nottingham, John R.; Spirk, John W.; Kalman, Jeffrey M.; Taylor, Robert G.; Stenta, Roland A., and Stenta, Emily P., 5,088,180, Cl. 29-525.000.

- Spivey, Mark W.: See—
Mayer, Thomas A.; and Spivey, Mark W., 5,089,946, Cl. 362-284.000.
- Spohrer, Jurgen: See—
Strobel, Reinhardt; and Spohrer, Jurgen, 5,089,212, Cl. 376-237.000.
- Sportsstuff, Inc.: See—
Peterson, Leroy L., 5,088,740, Cl. 273-410.000.
- Sprain, Kenneth S., to Uarco Incorporated. Pattern pressure-sensitive business form construction. 5,088,961, Cl. 462-2.000.
- Springfield Armory, Inc.: See—
Larson, Mark S., 5,088,222, Cl. 42-70.040.
- Square D Company: See—
Durivage, Leon W., III; and Bacher, William J., 5,089,928, Cl. 361-94.000.
Glennon, Oliver; and Shortt, James, 5,089,796, Cl. 335-172.000.
Joyner, F. Carl, Jr., 5,089,760, Cl. 318-798.000.
- Squires, David C., to Squires Enterprises. Apparatus for passive refrigerant retrieval and storage. 5,088,961, Cl. 462-2.000.
- Squires Enterprises: See—
Squires, David C., 5,088,291, Cl. 62-77.000.
- Squires, Michael. Load handling apparatus. 5,088,783, Cl. 294-81.540.
- Srivastava, Suresh C.: See—
Mease, Ronnie C.; Srivastava, Suresh C.; and Gustin, Jean-Francois, 5,089,663, Cl. 562-507.000.
- Stackebrandt, Erko; and Curiale, Michael, to Gene-Trak Systems. Test for listeria. 5,089,386, Cl. 435-6.000.
- Stade, James H.: See—
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- Stadnicar, Edward, Jr.: See—
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- Staehele, Hans-Joerg: See—
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- Stafsudd, Oscar M.: See—
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- Stalter, Robert J., Sr.; and Prueter, A., to Motor Wheel Corporation. Composite metal-elastomer styled wheels and method and apparatus for molding the same. 5,088,798, Cl. 301-37.00P.
- Stamatakis, E. M.; and Nicholson, Robert B., to Steam Tech, Inc. Steam restrictor device. 5,088,518, Cl. 137-171.000.
- Stancluis, James M.; and Rodenbeck, Donald L., to Centrite Corp. Process for reinforced polymeric composites. 5,089,189, Cl. 264-45.300.
- Stanislaus, Fritz: See—
Hille, Thomas; Hoffmann, Hans-Rainer; Huber, Hans-Joachim; Koch, Axel; Schneider, Gerhard; and Stanislaus, Fritz, 5,089,267, Cl. 424-449.000.
- Stanley, Donald E. Multi-purpose paint and varnish stripper. 5,089,164, Cl. 252-162.000.
- Stanley Electric Co., Ltd.: See—
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- Stasch, Johannes-Peter: See—
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- State of Israel-Ministry of Agriculture: See—
Nahri, David; and Ronen, Binyamin, 5,088,393, Cl. 99-516.000.
- Staudenmayer, William J.: See—
Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.
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- Steeby, Jon A., to Eaton Corporation. Unexpected N logic. 5,089,962, Cl. 364-424.100.
- Steffensmeier, Lloyd A. Chiropractic massage table. 5,088,475, Cl. 128-52.000.
- Stehle, Hans P.: See—
Kemmler, Ralf-Rainer; Stehle, Hans P.; and Decool, Andreas, 5,088,345, Cl. 74-598.000.
- Steichen, Dale S.: See—
Coyne, Thomas S.; Haendler, Blanca L.; Klapprott, Daniel H.; Mitchell, Frances E.; Steichen, Dale S.; and Thompson, Suzanne M., 5,089,167, Cl. 252-186.260.
- Steinbeiser, Fredrick L.: See—
Helm, Herbert W.; Hornung, William R.; Khrakovsky, Ilya D.; and Steinbeiser, Fredrick L., 5,088,407, Cl. 101-350.000.
- Stellmacher, Klaus; and Oppermann, Hans J., to Conducta Gesellschaft fur MeB-und Regeltechnik mbH & Co. Electrode holder for immersion-type, flow-type and attachment-type measuring systems in analytical chemistry. 5,088,690, Cl. 251-309.000.
- Stemmler, Kurt; to Winkler & Dunnebie Maschinenfabrik und Eisen-gesellschaft KG. Method and apparatus for the production of numerically correct stacks. 5,088,707, Cl. 270-39.000.
- Stender, Carl H. Ball valve seat for high temperature service. 5,088,687, Cl. 251-174.000.
- Stenta, Emily P.: See—
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- Stenta, Roland A.: See—
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- Stepan, Constance R.; and Spiers, James A., to Pitney Bowes Inc. High capacity sheet feeder. 5,088,718, Cl. 271-161.000.
- Stephens, Bruce A.: See—
Bunsen, Chris M.; and Stephens, Bruce A., 5,089,980, Cl. 364-709.070.
- Stephenson, Gerald H.; and Morgan, Russell M., to Union Carbide Coatings Service Technology Corporation. Device for producing a constant length laser beam and method for producing it. 5,089,683, Cl. 219-121.780.
- Stern, Brian A.; Matzner, Markus; and Layton, Richard, to Amoco Corporation. Wholly aromatic polyester of isophthalic acid, terephthalic acid, p-hydroxybenzoic acid, hydroquinone and an arylene diol. 5,089,594, Cl. 528-194.000.
- Stern, Harold P.; and El-Tanany, Mohammed S., to ElectroCom Automation, Inc. GMSK narrowband modem. 5,090,026, Cl. 375-47.000.
- Sternfeld, Hans; Wolfmueller, Karlheinz; and Brunn, Alfred, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V. Steam generator. 5,088,450, Cl. 122-31.100.
- Steuri, Laurie B.: See—
Kaw, James U.; and Steuri, Laurie B., 5,089,174, Cl. 252-553.000.
- Stevenson, Gregory S., to Wagner & Middlebrook, a part interest. Internal combustion engine. 5,088,285, Cl. 60-605.100.
- Stewart Systems, Inc.: See—
Davis, Bill E.; Meyers, Eugene W.; and Podsiad, Paul, 5,088,588, Cl. 198-347.300.
- Stickler, Mark F.; and Benhart, Michael D., to Deere & Company. Air blast for cleaning axial separator. 5,088,960, Cl. 460-80.000.
- Stiles, Frank B. Biological duct liner and installation catheter. 5,089,006, Cl. 606-198.000.
- Stockdale, Clyde E.; and Archer, Steven E., to Poly-Vac Co. Process and apparatus for selectively gathering lightweight low density objects. 5,088,860, Cl. 406-153.000.
- Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co.: See—
Ribbeck, Horst, 5,088,933, Cl. 439-395.000.
- Stoddard, Robert B.: See—
Delahueriga, Louis; Stoddard, Robert B.; and Klicek, Michael S., 5,088,997, Cl. 606-42.000.
- Stolk, Albert F., to bv Optische Industrie. Ultrasonic endoscope provided with protective sheath. 5,088,178, Cl. 29-453.000.
- Stolzer, Armin, to Keuro Maschinenbau GmbH & Co. KG. Workpiece handling system, particularly cut-off pieces from rod or rail-shaped stock material, and method. 5,088,364, Cl. 83-43.000.
- Storar, James R.; and Manera, David A., to Comar, Inc. Vial cap. 5,088,612, Cl. 215-247.000.
- Storz Instrument Company: See—
Christie, Bruce A.; Guenther, Gary L.; and Blaker, J. Warren, 5,089,024, Cl. 623-6.000.
Kleinberg, Larry K., 5,089,909, Cl. 359-363.000.
- Storz, Karl. Endoscope, particularly industrial endoscope. 5,088,819, Cl. 356-241.000.
- Stoyka, Charles F.: See—
Morrison, Clark; and Stoyka, Charles F., 5,088,747, Cl. 297-219.000.
- Strait, Chad A.: See—
Tabor, Ricky L.; Strait, Chad A.; and Lancaster, Gerald M., 5,089,556, Cl. 525-64.000.
- Strang, Harry: See—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,089,627, Cl. 548-263.600.
- Straus, Steven J.; Zuscik, Edward J.; Bower, William B.; and Yanidis, Apostol, to James River II, Inc. Resealable packaging material. 5,089,320, Cl. 428-216.000.
- Strittmatter, Ronald L., to Keenan, Thad. Apparatus for charging gas pressurized beverage storage and dispensing systems. 5,088,436, Cl. 141-234.000.
- Strobel, Reinhardt; and Spohrer, Jurgen, to Siemens Aktiengesellschaft. Apparatus for controlling the power output of a nuclear reactor. 5,089,212, Cl. 376-237.000.
- Strohmer, Erwin: See—
Schuster, Hans-Dieter; Nunnemann, Friedhelm; Langer, Hans-Joachim; Strohmer, Erwin; and Tiefenbacher, Gerd, 5,089,237, Cl. 422-180.000.
- Struger, Odo J.; and Klimas, Edward J., to Allen-Bradley Company, Inc. Adaptive alarm controller changes multiple inputs to industrial controller in order for state word to conform with stored state word. 5,089,984, Cl. 395-650.000.
- Stryker Corporation: See—
Stryker, Martin W.; and Bartow, Richard J., 5,088,136, Cl. 5-81.100.
- Stryker, Martin W.; and Bartow, Richard J., to Stryker Corporation. Patient transfer mattress surface. 5,088,136, Cl. 5-81.100.
- Szrodka, Hubert, to Imo Industries, GmbH. Pressure operated electrical switching device with plural lever actuated microswitches. 5,089,673, Cl. 200-82.00C.

- Stuben, Frank S.: See—
Cracchiolo, Vincenzo; Hawley, Terry L.; Moore, Robert E.; Radlick, David D.; and Stuben, Frank S., 5,088,367, Cl. 83-345.000.
- Studio Tecnico Sviluppo e Ricerche S.T.S.R. S.r.l.: See—
Knapp, Francesco, 5,088,688, Cl. 251-304.000.
- Stults, Jeffrey S.; and Schwartz, Willis T., to Occidental Chemical Corporation. Dioxidiphthalic anhydride. 5,089,631, Cl. 549-234.000.
- Stultz, Perry S.; and Hamstra, James R., to National Semiconductor Corporation. RAM based events counter apparatus and method. 5,089,957, Cl. 395-425.000.
- Stultz, Robert D.: See—
Dewhurst, Donald R.; and Stultz, Robert D., 5,090,016, Cl. 372-3.000.
- Sturm, Eberhard: See—
Beese, Ulrich; Schmidt, Martin; and Sturm, Eberhard, 5,088,750, Cl. 280-47.260.
- Subbanna, Somanahalli N.: See—
Smith, Robert A.; Frick, Douglas G.; Redmon, Charles L.; and Subbanna, Somanahalli N., 5,089,241, Cl. 423-87.000.
- Subrini, Louis. Penile filling implant. 5,088,477, Cl. 600-40.000.
- Suchoski, Paul G., Jr.; Findakly, Talal K.; Ferrar, Carl M.; and Leonberger, Frederick J., to United Technologies Corporation. Single-polarization, integrated optical components for optical gyroscopes. 5,088,826, Cl. 356-350.000.
- Sudilovsky, Abraham; and Horovitz, Zola P., to E. R. Squibb & Sons, Inc. Method for preventing or treating anxiety employing a calcium channel blocker. 5,089,502, Cl. 514-274.000.
- Suga, Seiji, to Atsugi-Unisia Corporation. Valve timing control system to adjust phase relationship between maximum, intermediate, and minimum advance position. 5,088,456, Cl. 123-90.170.
- Suganuma, Buro; Nishimura, Shinichi; and Takeshita, Akihiko, to Murata Kikai Kabushiki Kaisha. Apparatus for producing spun yarn. 5,088,265, Cl. 57-328.000.
- Suganuma, Yoshiaki; and Yamada, Kuniaki, to Permelec Electrode Ltd. Electrode protector. 5,089,109, Cl. 204-290.00R.
- Sugaya, Masami; Soga, Yoshinobu; and Okada, Takahiro, to Toyota Jidosha Kabushiki Kaisha. Vehicle power transmitting system with continuously variable transmission and hydraulic control apparatus, capable of producing adequate engine braking during low-speed reverse running of vehicle. 5,088,355, Cl. 74-868.000.
- Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiro; Suzuki, Masashi; and Matsushita, Izumi, to Tokyo Electric Co., Ltd. Printer with sheet feeding apparatus. 5,088,405, Cl. 101-240.000.
- Sugimoto, Yoshihiro: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiro; Suzuki, Masashi; and Matsushita, Izumi, 5,088,405, Cl. 101-240.000.
- Sugita, Norifumi: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.
- Sugitatsu, Atsushi: See—
Nakatani, Hajime; and Sugitatsu, Atsushi, 5,090,021, Cl. 372-86.000.
- Sugiyama, Isao: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigetomo; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seichiro; Kito, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
- Sugiyama, Kenji, to Victor Company of Japan, Ltd. Apparatus for inter-frame predictive encoding of video signal. 5,089,889, Cl. 358-135.000.
- Sugiyama, Masashi: See—
Nakae, Kiyohiko; Kawakita, Toshio; Kume, Takanori; and Sugiyama, Masashi, 5,089,323, Cl. 428-220.000.
- Suh, Jung J.: See—
Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., 5,089,624, Cl. 546-321.000.
- Sukow, Daniel L.: See—
Piwaron, John M.; Sukow, Daniel L.; and Andis, Matthew L., 5,088,200, Cl. 30-216.000.
- Sukup Manufacturing Company: See—
Jurgena, Larry F., 5,088,561, Cl. 172-5.000.
- Sulzer Brothers Limited: See—
Bucher, Robert; and Dunki, Umerto, 5,088,523, Cl. 139-35.000.
- Sumimura, Kunihiro: See—
Yamashita, Junzou; Ono, Yasuo; and Sumimura, Kunihiro, 5,089,276, Cl. 424-686.000.
- Sumitomo Chemical Co., Ltd.: See—
Nakae, Kiyohiko; Kawakita, Toshio; Kume, Takanori; and Sugiyama, Masashi, 5,089,323, Cl. 428-220.000.
- Sumitomo Electric Industries, Ltd.: See—
Kanda, Masahiko, 5,088,822, Cl. 356-326.000.
- Shiga, Nobuo, 5,089,788, Cl. 330-59.000.
- Sibata, Kenichihiro; Sasaki, Nobuyuki; Yazu, Shuji; and Jodai, Tet-suji, 5,089,465, Cl. 505-1.000.
- Sumitomo Rubber Industries, Ltd.: See—
Kajikawa, Akira; and Saito, Kenji, 5,088,321, Cl. 73-146.000.
- Sumitomo Special Metals Co., Ltd.: See—
Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 5,089,066, Cl. 148-302.000.
- Sumitomo, Takashi: See—
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.
- Sun, Bill N.: See—
Chang, Tse-wen; Fung, Sek C.; Sun, Cecily R.; Sun, Bill N.; and Chang, Nancy T., 5,089,603, Cl. 530-387.000.
- Sun, Cecily R.: See—
Chang, Tse-wen; Fung, Sek C.; Sun, Cecily R.; Sun, Bill N.; and Chang, Nancy T., 5,089,603, Cl. 530-387.000.
- Sunderman, Wallace H.: See—
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,088,184, Cl. 29-599.000.
- Sunds Defibrator Industries Aktiebolag: See—
Reinhall, Rolf B., 5,088,831, Cl. 366-171.000.
- Sundstrand Corporation: See—
Champagne, John M.; and Waters, Peter D., 5,088,292, Cl. 62-84.000.
- Jewess, Gordon, 5,088,890, Cl. 415-112.000.
- Ludicky, Frank J., 5,089,953, Cl. 395-425.000.
- Shekleton, Jack R., 5,088,287, Cl. 60-740.000.
- Sunkyoung Industries Ltd.: See—
Kwak, Wie J.; Park, Hwa K.; and Oh, Key B., 5,089,636, Cl. 547-297.000.
- Susko, Thomas J.; Constantino, James P.; and Parylo, Gerald A., to Cadillac Products, Inc. Cover for use with a receptacle. 5,088,616, Cl. 220-343.000.
- Sussich, Marino R.; and Sussich, Paul, to Kagischo Pty. Ltd. Filter assembly. 5,089,132, Cl. 210-298.000.
- Sussich, Paul: See—
Sussich, Marino R.; and Sussich, Paul, 5,089,132, Cl. 210-298.000.
- Susukida, Masato: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ipppei; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.
- Suto, Shin-ichi: See—
Isobe, Minoru; Kimura, Haruo; and Suto, Shin-ichi, 5,088,586, Cl. 194-205.000.
- Sutovsky, Pavel M.: See—
Karaev, Islam K. O.; Shikhlin, Talat M. O.; Polikhronov, Konstantin P.; Sutovsky, Pavel M.; Avakian, Emilia V.; Semkin, Nikolai V.; Rabinovich, Avraam M.; and Dzhabarov, Rauf D., 5,088,638, Cl. 228-112.000.
- Sutter, Hubert; Kolwert, Alois; and Obrecht, Werner, to Bayer Aktiengesellschaft. Process for the production of ethylene-vinyl acetate copolymers, new ethylene/vinyl acetate copolymers and their use. 5,089,579, Cl. 526-323.200.
- Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, to Ikegami Tsushinki Co., Ltd. Sorter. 5,088,710, Cl. 270-53.000.
- Suzuki, Akihiro; Yamamoto, Hiroshi; and Tohita, Hiroshi, to Ikegami Tsushinki Co., Ltd. Transporting device and sorter with the same. 5,088,721, Cl. 271-293.000.
- Suzuki, Akio: See—
Kikuchi, Kenichi; Suzuki, Akio; and Mochizuki, Tetsuro, 5,089,031, Cl. 48-77.000.
- Suzuki, Hiroyuki: See—
Iwaki, Takashi; Itou, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,088,452, Cl. 123-3.000.
- Suzuki Jidosha Kogyo Kabushiki Kaisha: See—
Furuhashi, Hiroshi, 5,088,769, Cl. 280-803.000.
- Suzuki, Katsuo, to Kabushiki Kaisha Shinsangyokaihatu; and Aisin Seiki Kabushiki Kaisha. Method of, and apparatus for controlling an antenna device. 5,089,825, Cl. 342-425.000.
- Suzuki, Kazuaki: See—
Matsumoto, Wataru; Nakai, Eiji; Nezu, Toru; and Suzuki, Kazuaki, 5,089,404, Cl. 435-134.000.
- Suzuki, Kazuo: See—
Fukuhara, Akio; Iyama, Kazuo; Suzuki, Kazuo; and Iwase, Ken, 5,088,870, Cl. 413-4.000.
- Suzuki, Kunio: See—
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ipppei; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, 5,089,426, Cl. 437-3.000.
- Suzuki, Makoto: See—
Kanno, Tomoaki; Matsushima, Yoshihisa; and Suzuki, Makoto, 5,089,360, Cl. 429-254.000.
- Suzuki, Masahiko: See—
Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, 5,089,739, Cl. 310-328.000.
- Suzuki, Masakatsu: See—
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- Suzuki, Masaki: See—
Ryoke, Katsumi; Takahashi, Masatoshi; Izaki, Tsugio; and Suzuki, Masaki, 5,089,331, Cl. 428-323.000.
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- Suzuki, Minoru: See—
Yoshida, Takeo; and Suzuki, Minoru, 5,088,647, Cl. 239-96.000.

- Suzuki, Nobuaki: See—
Hataeda, Kenzo; Ishihara, Takeshi; Suzuki, Nobuaki; and Kuroda, Satowaka, 5,089,772, Cl. 324-158.00F.
- Suzuki, Ritsuke: See—
Sato, Kimihiko; Suzuki, Ritsuke; and Horiuchi, Hiroshi, 5,089,459, Cl. 502-66.000.
- Suzuki, Shoji: See—
Ninomiya, Hirofumi; Suzuki, Shoji; and Ishii, Kazuhiro, 5,089,307, Cl. 428-35.200.
- Suzuki, Tadasu; Kumakura, Atsushi; and Futami, Yuichi, to Tsubakimoto Chain Co. Tensioner having pad made of plastics, 5,088,966, Cl. 474-111.000.
- Suzuki, Takashi, to Fuji Jukogyo Kabushiki Kaisha. Assembly robot with drilling unit, 5,088,171, Cl. 29-26.00A.
- Suzuki, Yoshiyuki; and Funada, Masahiro, to Canon Kabushiki Kaisha. Method of expanding compressed color image data, 5,089,884, Cl. 358-80.000.
- Suzumura, Nobuyasu: See—
Miyake, Osamu; Suzumura, Nobuyasu; and Kawata, Shoji, 5,088,351, Cl. 74-866.000.
- Saitou, Yoshitami; Isono, Nobuyuki; and Suzumura, Nobuyasu, 5,088,582, Cl. 192-0.055.
- Swanson, Gary J., to Massachusetts Institute of Technology. Diffractive/refractive lens implant, 5,089,023, Cl. 623-6.000.
- Swedberg, Sally A., to Hewlett-Packard Company. Electrophoresis capillary with agarose, 5,089,103, Cl. 204-182.800.
- Sweeney, James S., Jr., to Laguna Tectrix, Inc. Racing system for exercise machines, 5,089,960, Cl. 364-410.000.
- Swinderman, R. Todd; and Brandl, Reinhard, to Martin Engineering Company. Radial tensioner, 5,088,965, Cl. 474-101.000.
- Syka, John E. P.: See—
Schoen, Alan E.; and Syka, John E. P., 5,089,703, Cl. 250-292.000.
- Syntex (U.S.A.) Inc.: See—
Davalian, Dariush; Lin, Cheng-I; and Ullman, Edwin F., 5,089,390, Cl. 435-7.930.
- Leeder, Sydney; and Zuk, Robert F., 5,089,383, Cl. 435-7.900.
- Singh, Prithipal; and Prisbylla, Michael, 5,089,388, Cl. 435-7.600.
- Venuti, Michael C., 5,089,657, Cl. 560-139.000.
- Syston Donner Corporation: See—
Fawal, Omar M., 5,088,560, Cl. 169-28.000.
- Szemeyei, Clarita A.: See—
Hall, Bobby E.; and Szemeyei, Clarita A., 5,089,151, Cl. 252-8.551.
- Szoko, Eva: See—
Karger, Barry L.; Giese, Roger W.; and Szoko, Eva, 5,089,106, Cl. 204-299.00R.
- T & N Technology: See—
Butler, Nicholas D.; Woodthorpe, John; Fernandez, Francisco C.; and Zubillaga, Inigo I., 5,089,197, Cl. 264-65.000.
- T-Star Industrial Electronics Corporation: See—
Truty, Thomas J., 5,089,680, Cl. 219-69.120.
- Tabor, Ricky L.; Strait, Chad A.; and Lancaster, Gerald M., to Dow Chemical Company. The Adhesive, RF heatable grafted polymers and blends, 5,089,556, Cl. 525-64.000.
- Tabuchi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Positioning means for a pivotally mounted electrostatic image forming means, 5,089,846, Cl. 355-200.000.
- Tacchi, Ernest J. Apparatus and method for ozone production, 5,089,098, Cl. 204-176.000.
- Tachi-S Co., Ltd.: See—
Iwami, Mashahide; Murakami, Shigeomi; Saito, Fumitaka; Watanabe, Takao; and Akiyama, Masami, 5,088,794, Cl. 297-483.000.
- Tachibana, Kouzou: See—
Hasegawa, Masaki; Saigo, Kazuhiko; Yuki, Yoichi; and Tachibana, Kouzou, 5,089,642, Cl. 556-1.000.
- Tack, Bill: See—
Bradshaw, Charles; Tack, Bill; Hansford, Mike; and Winterbottom, John, 5,089,969, Cl. 364-463.000.
- Tada, Yasuo, to Mitsubishi Denki K.K. Evaporated fuel gas purging system, 5,088,466, Cl. 123-519.000.
- Taeger, Tilman: See—
Christner, Juergen; Pfeiderer, Ernst; and Taeger, Tilman, 5,089,414, Cl. 435-265.000.
- Tagami, Hidetoshi; and Kawase, Jiro, to Kao Corporation. Dyeing composition for keratin fiber, 5,089,026, Cl. 8-435.000.
- Tagawa, Motoyuki: See—
Takayama, Shuichi; Hayashi, Masaaki; Fuse, Eiichi; Ishiwara, Koichiro; Yoshikawa, Mutsumi; Tagawa, Motoyuki; and Inaba, Makoto, 5,088,492, Cl. 128-654.000.
- Tahara, Kazuo: See—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; and Tomite, Toshio, 5,089,737, Cl. 310-154.000.
- Tahara, Yoshifumi: See—
Kojima, Hiroshi; Tahara, Yoshifumi; and Arai, Izumi, 5,089,083, Cl. 156-643.000.
- Taichman, Jeremy; and Schwartzman, Manuel. Combined paste-dispensing and cleaning unit, 5,088,850, Cl. 401-176.000.
- Tailored Label Products, Inc.: See—
Weiss, Marvin E., 5,088,366, Cl. 83-326.000.
- Taisho Pharmaceutical Co., Ltd.: See—
Yokomori, Sadakazu; Saijo, Keiko; Matsunaga, Tohru; Nakashima, Yoshimoto; and Hatayama, Katsuo, 5,089,654, Cl. 560-53.000.
- Taiwan Semiconductor Manufacturing Company: See—
Yoo, Chue-San, 5,089,432, Cl. 437-40.000.
- Taiyo Yuden Co., Ltd.: See—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 5,090,009, Cl. 369-284.000.
- Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, 5,089,932, Cl. 361-321.000.
- Saito, Hiroshi; Honda, Mutsumi; Kishi, Hiroshi; Shizuno, Hisamitsu; and Chazono, Hirokazu, 5,089,933, Cl. 361-321.000.
- Takabayashi, Naoki: See—
Goto, Nobutaka; Koboshi, Shigeharu; Takabayashi, Naoki; and Makida, Yoshiyuki, 5,089,097, Cl. 204-109.000.
- Takada, Yoshikazu: See—
Abe, Masahiro; Okada, Kazuhisa; Fukuda, Shuzo; Tanaka, Yasushi; Yamato, Masayuki; and Takada, Yoshikazu, 5,089,061, Cl. 148-110.000.
- Takagi, Atsuhiko; Muto, Mitsuru; and Isono, Jun, to Brother Kogyo Kabushiki Kaisha. Relatively sliding arrangement for use in sewing machine, 5,088,427, Cl. 112-256.000.
- Takagi, Fumio: See—
Takahashi, Nobuhiro; and Takagi, Fumio, 5,088,651, Cl. 241-30.000.
- Takagi, Osamu: See—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 5,089,838, Cl. 354-304.000.
- Takagi, Tadashi: See—
Mochizuki, Mitsuru; Isota, Youji; Takagi, Tadashi; and Urasaki, Shuji, 5,089,790, Cl. 330-277.000.
- Takagi, Takaaki; Makimura, Toshiro; and Kurita, Kenji, to Aisan Kogyo Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Fuel injector with strainer, 5,088,650, Cl. 239-575.000.
- Takago, Toshio; Satoh, Shinichi; Oyama, Masayuki; Yamaguchi, Koichi; and Matsuda, Takashi, to Shin-Etsu Chemical Co., Ltd. Organosilicon compound, 5,089,649, Cl. 556-482.000.
- Takahashi, Fuminobu: See—
Omote, Tatsuyuki; Yoshida, Tomiharu; Maki, Hideo; Senoh, Makoto; Takahashi, Fuminobu; and Tsuchita, Kenji, 5,089,213, Cl. 376-248.000.
- Takahashi, Hiroshi, to Nissan Motor Company, Limited. Shifting control for automatic power transmission with learning shifting pattern model and selecting shifting pattern model from closed vehicle driving pattern, 5,089,963, Cl. 364-424.100.
- Takahashi, Junji; and Kenmotsu, Isami, to Pioneer Electronic Corporation. Disk record/playback machine with disk rest movable to an intermediate position between the disk discharge and record/playback positions during stand-by mode, 5,090,006, Cl. 369-258.000.
- Takahashi, Kazuhiro: See—
Sawaguchi, Hideo; Muraoka, Takeshi; and Takahashi, Kazuhiro, 5,089,735, Cl. 310-88.000.
- Takahashi, Kenji: See—
Umemoto, Chiuyuki; and Takahashi, Kenji, 5,089,170, Cl. 252-301.40H.
- Takahashi, Kozo: See—
Nagasawa, Tamami; and Takahashi, Kozo, 5,088,714, Cl. 271-3.100.
- Takahashi, Masaaki, to Canon Kabushiki Kaisha. Method for preparing elastic roller, 5,089,201, Cl. 264-135.000.
- Takahashi, Masaaki: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.
- Takahashi, Masatoshi: See—
Ryoke, Katsumi; Takahashi, Masatoshi; Izaki, Tsugio; and Suzuki, Masaki, 5,089,331, Cl. 428-323.000.
- Takahashi, Minoru; and Yokota, Mitsuo, to Fuji Photo Film Co., Ltd. Camera, 5,089,833, Cl. 354-105.000.
- Takahashi, Nobuhiro; and Takagi, Fumio, to Nittetsu Mining Co., Ltd. Roll crusher and crushing method in use for the roll crusher, 5,088,651, Cl. 241-30.000.
- Takahashi, Noriyoshi: See—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; and Tomite, Toshio, 5,089,737, Cl. 310-154.000.
- Takahashi, Seiichi: See—
Horii, Yasuyuki; Takahashi, Seiichi; and Imamura, Takeshi, 5,088,968, Cl. 475-124.000.
- Takahashi, Shigeo, to Aisin Seiki Kabushiki Kaisha. Automatic transmission hydraulic control system, 5,088,356, Cl. 74-868.000.
- Takahashi, Toshio: See—
Hayase, Yoshio; Matsumoto, Kohei; Kamei, Kazuo; Ide, Kinya; and Takahashi, Toshio, 5,089,043, Cl. 71-90.000.
- Takahashi, Yasuhiro: See—
Kajiya, Seitaro; Iizuka, Hajime; Okumura, Kunio; Fujiwara, Junya; Ohto, Norio; Kawazura, Hiroshi; Takahashi, Yasuhiro; and Shiga, Yoshio, 5,089,622, Cl. 546-262.000.
- Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, to Brother Kogyo Kabushiki Kaisha. Laminated type piezoelectric actuator element, 5,089,739, Cl. 310-328.000.
- Takahashi, Yoshinori, to Kabushiki Kaisha Toshiba. Disc cartridge, 5,090,010, Cl. 369-291.000.
- Takakura, Mitsuru: See—
Yamamoto, Toshifumi; Takakura, Mitsuru; Yamaoka, Hiromasa; and Okada, Masakazu, 5,090,029, Cl. 375-107.000.
- Takamoto, Katsunori: See—
Umeda, Takashi; Zemba, Seiichi; Hara, Kazuo; Takamoto, Katsunori; and Yokota, Shinichi, 5,089,553, Cl. 524-424.000.

- Takamura, Tohru: See—
Fujino, Noboru; and Takamura, Tohru, 5,088,401, Cl. 101-41.000.
- Takana, Hiroyuki: See—
Sasaki, Hiromi; Tojima, Masao; Konishi, Satsuko; and Takana, Hiroyuki, 5,089,316, Cl. 428-195.000.
- Takano, Kazuya; and Kojima, Hiroshi, to Bridgestone Corporation. Vibration isolating apparatus, 5,088,703, Cl. 267-140.10C.
- Takano, Seiichi: See—
Ogawa, Tetsuya; Yoshida, Naoyuki; Takano, Seiichi; and Ogawara, Kunio, 5,089,176, Cl. 260-410.000.
- Takano, Shuichi: See—
Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichiro, 5,088,836, Cl. 374-183.000.
- Takaoka, Kazuchio: See—
Kodera, Tatsuya; Takaoka, Kazuchio; Haino, Kozo; Itoh, Akira; Okaji, Makoto; and Emoto, Kazuhiro, 5,089,366, Cl. 430-59.000.
- Takara Shuzo Co.: See—
Kondo, Akihiro; Kato, Yoshiyuki; Kato, Ikunoshin; and Tsuruta, Hisao, 5,089,230, Cl. 422-64.000.
- Takase, Haruo: See—
Sakamoto, Kiichiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, 5,089,840, Cl. 354-324.000.
- Takashi, Yamaguchi, to Figaro Engineering, Inc. Gas detecting method and system, 5,088,314, Cl. 73-23.210.
- Takashima, Susumu: See—
Hirayama, Ryueichi; Takashima, Susumu; Kanda, Masako; and Murata, Noriyasu, 5,089,918, Cl. 360-70.000.
- Takata, Kazunori; Akashi, Tsuneshi; and Mohara, Masayuki, to Sanyo Electric Co., Ltd. Apparatus for automatically mounting electronic components, 5,088,187, Cl. 29-705.000.
- Takatsu, Haruyoshi: See—
Tanaka, Yasuyuki; Takatsu, Haruyoshi; Takeuchi, Kiyohumi; and Tamura, Yuuji, 5,089,629, Cl. 549-14.000.
- Takayama, Masatoshi: See—
Nakatsuka, Hiroshi; Hirashima, Isao; Takayama, Masatoshi; and Kohno, Shigefumi, 5,088,766, Cl. 280-775.000.
- Takayama, Naoki: See—
Koshiishi, Akira; Kawamura, Kohei; and Takayama, Naoki, 5,089,747, Cl. 315-111.810.
- Takayama, Nobutoshi: See—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Unichi; and Takayama, Nobutoshi, 5,089,919, Cl. 360-74.400.
- Takayama, Shuichi; Hayashi, Masaaki; Fuse, Eiichi; Ishiwara, Koichi; Yoshikawa, Mutsumi; Tagawa, Motoyuki; and Inaba, Makoto, to Olympus Optical Co., Ltd. Radioactive ray detecting endoscope, 5,088,492, Cl. 128-654.000.
- Takayama, Tsutomu, to Canon Kabushiki Kaisha. Gamma correction device, 5,089,890, Cl. 358-164.000.
- Take, Hiroshi: See—
Mizukata, Katsuya; Takeda, Makoto; Take, Hiroshi; and Kawaguchi, Takafumi, 5,089,792, Cl. 331-17.000.
- Takeda Chemical Industries, Ltd.: See—
Yamashita, Junzou; Ono, Yasuo; and Sumimura, Kunihiko, 5,089,276, Cl. 424-686.000.
- Takeda, Goro, to Cat Eye Co., Ltd. Sensor magnet mounting device having an improved mounting structure, 5,089,775, Cl. 324-174.000.
- Takeda, Makoto: See—
Mizukata, Katsuya; Takeda, Makoto; Take, Hiroshi; and Kawaguchi, Takafumi, 5,089,792, Cl. 331-17.000.
- Takeda, Mamoru: See—
Iwaki, Takashi; Ito, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,088,452, Cl. 123-3.000.
- Takegoshi, Atsuhisa: See—
Furukawa, Takato; Iwanaga, Kenichi; and Takegoshi, Atsuhisa, 5,089,776, Cl. 324-227.000.
- Takehara, Shin; and Morita, Toshiki, to Mazda Motor Corporation. Vehicle suspension system, 5,088,759, Cl. 280-707.000.
- Takehara, Shin; and Morita, Toshiki, to Mazda Motor Corporation. Vehicle suspension system, 5,088,761, Cl. 280-707.000.
- Takenaka, Mitsuhiro: See—
Inaba, Masakazu; Takenaka, Mitsuhiro; and Takeuchi, Hiroshi, 5,088,584, Cl. 192-89.00B.
- Takeshita, Akihiko: See—
Suganuma, Buro; Nishimura, Shinichi; and Takeshita, Akihiko, 5,088,265, Cl. 57-328.000.
- Takeuchi, Hiroshi; Iwase, Masahiko; Tojima, Hiromi; Murata, Ikuo; and Uenohara, Norihiro, to Kabushiki Kaisha Daikin Seisakusho. Clutch cover assembly with spring biased release assembly, 5,088,583, Cl. 192-70.270.
- Takeuchi, Hiroshi: See—
Inaba, Masakazu; Takenaka, Mitsuhiro; and Takeuchi, Hiroshi, 5,088,584, Cl. 192-89.00B.
- Takeuchi, Kiyohumi: See—
Tanaka, Yasuyuki; Takatsu, Haruyoshi; Takeuchi, Kiyohumi; and Tamura, Yuuji, 5,089,629, Cl. 549-14.000.
- Takeuchi, Makoto: See—
Takahashi, Yoshikazu; Suzuki, Masahiko; and Takeuchi, Makoto, 5,089,739, Cl. 310-328.000.
- Takeuchi, Minami: See—
Kamei, Yoshio; and Takeuchi, Minami, 5,089,719, Cl. 307-270.000.
- Takeuchi, Takashi; and Kuriyama, Toshio, to Seiko Epson Corporation. Impact dot print head and printer including same, 5,088,844, Cl. 400-124.000.
- Taki, Kazunari; Maruyama, Hideo; Ohashi, Yumiko; and Matsuda, Riki, to Brother Kogyo Kabushiki Kaisha. Optical recording medium, 5,089,358, Cl. 428-694.000.
- Taliaferro, William D. Method and apparatus for running wireline and reeled tubing into a wellbore and stuffing box used in connection therewith, 5,088,559, Cl. 166-379.000.
- Talmadge, Karen D.: See—
Kushner, Peter J.; Cofer, Claire L.; Friedman, Jeffrey S.; and Talmadge, Karen D., 5,089,397, Cl. 435-69.100.
- Talmadge, Paul C., to Pitney Bowes Inc. Square wave excitation of a transducer, 5,088,330, Cl. 73-769.000.
- Talonn, Daniel A.; and Ranford, Alan B., to Sherwood Medical Company. Combined dental syringe and needle shield, 5,088,988, Cl. 604-198.000.
- Talvalkar, Shashi G.; Obringer, Thomas J.; and Puckett, Richard D., to NCR Corporation. Thermal transfer ribbon, 5,089,350, Cl. 428-484.000.
- Tamagawa, Shigehisa; and Kuroishi, Masayuki, to Fuji Photo Film Co., Ltd. Light-sensitive material comprising light-sensitive layer provided on support, 5,089,370, Cl. 430-138.000.
- Tamao, Yoshikuni: See—
Iwase, Norimichi; Morinaka, Yasuhiro; Tamao, Yoshikuni; and Kanayama, Toshiji, 5,089,494, Cl. 514-248.000.
- Tamary, Ernest J.: See—
Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.
- Tamashima, Atsuzo: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Kamoshida, Masakazu, 5,089,314, Cl. 428-156.000.
- Tamazaki, Kazunori; Azegami, Hitoshi; and Kuroda, Kazuhiro, to TDK Corporation. Magnetic recording medium, 5,089,344, Cl. 428-425.900.
- Tamura, Mitsuhiro: See—
Tsuji, Suguru; Saya, Toshiaki; Komiyama, Shinji; Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, 5,089,576, Cl. 526-228.000.
- Tamura, Yasuaki, to Oki Electric Industry Co., Ltd. Optical amplifier, 5,089,786, Cl. 359-333.000.
- Tamura, Yuuji: See—
Tanaka, Yasuyuki; Takatsu, Haruyoshi; Takeuchi, Kiyohumi; and Tamura, Yuuji, 5,089,629, Cl. 549-14.000.
- Tanabe, Kenji: See—
Morita, Moritsugu; Sato, Takashi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeyuki, 5,089,355, Cl. 428-607.000.
- Tanaka, Haruo; and Inoue, Tetsuichi, to Rohm Co., Ltd. Semiconductor laser device with mounting block, 5,089,861, Cl. 357-17.000.
- Tanaka, Hisami; and Okunuki, Masami, to Canon Kabushiki Kaisha. Charging member, 5,089,851, Cl. 355-219.000.
- Tanaka, Satoshi: See—
Iizuka, Yoshio; Oothuka, Yoshiyuki; Tanaka, Satoshi; and Yamamoto, Manabu, 5,089,538, Cl. 523-132.000.
- Tanaka, Takayuki: See—
Nakashima, Kunio; Ishigane, Ryouichi; Tanaka, Takayuki; and Ichida, Ken-ichi, 5,089,354, Cl. 428-552.000.
- Tanaka, Toshiharu: See—
Nakamura, Kotaro; Tanaka, Toshiharu; and Shimada, Hirokazu, 5,089,371, Cl. 430-160.000.
- Tanaka, Yasushi: See—
Abe, Masahiro; Okada, Kazuhisa; Fukuda, Shuzo; Tanaka, Yasushi; Yamato, Masayuki; and Takada, Yoshikazu, 5,089,061, Cl. 148-110.000.
- Tanaka, Yasuyuki; Takatsu, Haruyoshi; Takeuchi, Kiyohumi; and Tamura, Yuuji, to Dainippon Ink and Chemicals, Inc. Fluorine-substituted cyclohexylcyclohexene derivative, 5,089,629, Cl. 549-14.000.
- Tandy Corporation: See—
Clark, Bryan K.; Johnson, Sheryl L.; and Guerra, Robert, 5,090,008, Cl. 369-284.000.
- Nakajima, Ryueichi; and Yamana, Koji, 5,090,052, Cl. 379-98.000.
- Tang, Denny D.: See—
Chuang, Ching-Te K.; and Tang, Denny D., 5,089,724, Cl. 307-454.000.
- Tanguay, Francois; and Allard, Benoit, to Nertec Design Reading device for a watt-hour meter, 5,089,771, Cl. 324-142.000.
- Taniguchi, Masato; Sato, Tadahisa; and Mizukawa, Yuki, to Fuji Photo Film Co., Ltd. Process for producing 3-minonitriles, 5,089,651, Cl. 558-360.000.
- Taniguchi, Masaya: See—
Maruyama, Hiroshi; Kato, Takashi; and Taniguchi, Masaya, 5,088,297, Cl. 62-228.400.
- Taniguchi, Naosato: See—
Kuwayama, Tetsuro; Taniguchi, Naosato; Yoshinaga, Yoko; and Kushibiki, Nobuo, 5,089,903, Cl. 359-15.000.
- Tanikawa, Kazuhiro: See—
Kawai, Katsunori; Ikeda, Hayato; Ishihara, Shinichi; Tanikawa, Kazuhiro; Yokomachi, Naoya; and Kawai, Toshihiro, 5,088,897, Cl. 417-269.000.
- Tannhof, Pascal: See—
Mollier, Pierre; Nuez, Jean-Paul; and Tannhof, Pascal, 5,089,725, Cl. 307-455.000.
- Tanox Biosystems, Inc.: See—
Chang, Tse-wen; Fung, Sek C.; Sun, Cecily R.; Sun, Bill N.; and Chang, Nancy T., 5,089,603, Cl. 530-387.000.

- Tapolczay, David J.; Anthony, Vivienne M.; Clough, John M.; Godfrey, Christopher R. A.; and de Fraine, Paul J., to Imperial Chemical Industries PLC. Insecticides. 5,089,510, Cl. 514-345.000.
- Taponat, Didier: See—
Thurles, Edmond; Dupraz, Jean -Pierre; Moncorge, Jean-Paul; Williams, Jean-Marc; Martin, Joseph; Perrusset, Yves; and Taponat, Didier, 5,089,931, Cl. 361-174.000.
- Tar, Lorant: See—
Opitz, Andor; and Tar, Lorant, 5,088,967, Cl. 475-107.000.
- Tarara, Gerhard: See—
Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kotter, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.
- Tarnawskyj, Christine J.: See—
Lee, Lieng-Huang; Lincoln, Diane C.; and Tarnawskyj, Christine J., 5,089,364, Cl. 430-58.000.
- Tasaki, Youji: See—
Kurokawa, Kouichi; and Tasaki, Youji, 5,088,411, Cl. 102-200.000.
- Tashima, Hideki: See—
Kitagawa, Katsuji; Tashima, Hideki; and Matsuzaki, Kunimitsu, 5,089,555, Cl. 524-503.000.
- Tate Access Floors Limited: See—
Hazelidine, Albert, 5,088,251, Cl. 52-263.000.
- Tattermusch, Peter: See—
Linder, Friedrich; Staehle, Hans-Joerg; and Tattermusch, Peter, 5,088,548, Cl. 165-10.000.
- Taubitz, Georg: See—
Fabinski, Walter; Taubitz, Georg; Franck, Gerhard; and Nevolet, Josef, 5,088,313, Cl. 73-1.00G.
- Taylor, Graham W. Clip for securing lens elements in light fixtures. 5,088,670, Cl. 248-225.100.
- Taylor, John M.: See—
Brown, Robert W.; and Taylor, John M., 5,088,891, Cl. 415-176.000.
- Taylor, Mansell M.; and Ross, Kevin J. Golf bag rack. 5,088,635, Cl. 224-274.000.
- Taylor, Mark P.: See—
Blatch, Geoffrey I.; Taylor, Mark P.; and Fyfe, Mark, 5,089,093, Cl. 204-67.000.
- Taylor, Robert G.: See—
Nottingham, John R.; Spirk, John W.; Kalman, Jeffrey M.; Taylor, Robert G.; Stenta, Roland A.; and Stenta, Emily P., 5,088,180, Cl. 29-52.000.
- Tchernev, Dimiter I. Magnetic substance having sharp permeability transition temperature, process for making, and apparatus. 5,089,159, Cl. 252-62.620.
- TDK Corporation: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Kamoshida, Masakazu, 5,089,314, Cl. 428-156.000.
- Tamazaki, Kazunori; Azegami, Hitoshi; and Kuroda, Kazuhiro, 5,089,344, Cl. 428-425.900.
- TDW Delaware, Inc.: See—
Rosenberg, Jeffrey S.; and Lockyear, Kevin W., 5,088,336, Cl. 73-865.800.
- Technimark, Inc.: See—
Zinnbauer, Jerry, 5,088,669, Cl. 248-188.900.
- Techniplast S.a.r.l.: See—
Campiotti, Alfredo, 5,088,446, Cl. 119-17.000.
- Tecno Europa Elettromeccanica S.r.l.: See—
Checcucci, Tommaso M., 5,088,569, Cl. 177-145.000.
- Tecumseh Products Company: See—
Richardson, Hubert, Jr., 5,088,906, Cl. 418-55.200.
- Teichmann, Peter: See—
Weyrauch, Adolf; Teichmann, Peter; Werblinski, Dieter; and Rix, Rudolf, 5,089,911, Cl. 359-554.000.
- Teijin Limited: See—
Sawada, Shuzo; Kawamura, Takashi; Masuho, Yasuhiko; and Tomibe, Katsuhiko, 5,089,262, Cl. 424-87.000.
- Teijin Petrochemical Industries, Ltd.: See—
Sato, Kimihiko; Suzuki, Risuke; and Horiuchi, Hiroshi, 5,089,459, Cl. 502-66.000.
- Tekamp-Olson, Patricia: See—
Rosenberg, Steven; and Tekamp-Olson, Patricia, 5,089,398, Cl. 435-69.100.
- Tel Kyushu Limited: See—
Ushijima, Mitsuru; Hirakawa, Osamu; Akimoto, Masami; Kimura, Yoshio; and Anai, Noriyuki, 5,089,305, Cl. 427-422.000.
- Teleflex Incorporated: See—
Ellis, Larry G.; and Carter, William R., 5,088,664, Cl. 244-137.400.
- Tennant Company: See—
Berg, David W.; Brenner, David J.; Lehman, Ronald W.; and Forsman, Bruce W., 5,088,149, Cl. 15-322.000.
- Terada, Hisashi: See—
Watanabe, Shintaro; Yamaguchi, Yasushi; Nakayama, Shigeyuki; Namio, Hirokazu; and Terada, Hisashi, 5,090,023, Cl. 375-1.000.
- Teraoku, Hiroshi: See—
Hori, Shuji; and Teraoku, Hiroshi, 5,088,263, Cl. 52-745.000.
- Terasaki, Fumitoshi: See—
Shirakura, Takeo; Terasaki, Fumitoshi; and Nishimoto, Takashi, 5,088,244, Cl. 51-288.000.
- Terex Corporation: See—
Loeber, Frederick W., 5,088,570, Cl. 180-24.010.
- Termsky, Robert J., to Eli Lilly and Company. Ring-closure method for 1-carbacephalosporin six-membered ring. 5,089,610, Cl. 540-205.000.
- Terneu, Robert; and Thomas, Jean-Francois, to Glaverbel. Method for pyrolytically forming a silicon oxide coating on a hot glass substrate. 5,089,039, Cl. 65-60.500.
- Terpstra, Rinse A.: See—
Van 'T Veen, Willem H.; Engel, Albertus J. G.; Bonekamp, Benedictus C.; Veringa, Hubertus J.; and Terpstra, Rinse A., 5,089,299, Cl. 427-245.000.
- Terry, Scott C.: See—
McEachern, Alexander; Nitz, Frederic W.; and Terry, Scott C., 5,089,979, Cl. 364-571.040.
- Terumo Kabushiki Kaisha: See—
Harada, Fumiaki, 5,089,005, Cl. 606-194.000.
- Ikedo, Makoto, 5,088,497, Cl. 128-661.070.
- Okada, Shigeru, 5,088,904, Cl. 417-474.000.
- Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,088,837, Cl. 374-185.000.
- Terzian, Rouben T.; and Rosenwinkel, Donald A., to Breslow, Morrison, Terzian & Associates, Inc. Manually assisted and controlled walking doll. 5,088,954, Cl. 446-355.000.
- Tessenske, Dean J.: See—
Benning, Curtis R.; and Tessenske, Dean J., 5,088,342, Cl. 74-493.000.
- Tessier, Jean: See—
Bonin, Werner; Demoute, Jean-Pierre; and Tessier, Jean, 5,089,511, Cl. 514-357.000.
- Teuber, Vincent P.; and Hegel, Ramon F., to Minnesota Mining and Manufacturing Company. Tape cassette with wear pad comprising polyolefin sheet and polyamide adhesive layer. 5,089,924, Cl. 360-132.000.
- Teurlings, Lucas G. C., to AMP Incorporated. Method of, and apparatus for, breaking an optical fiber. 5,088,637, Cl. 225-1.000.
- Texaco Inc.: See—
Devlin, Paul V., 5,088,859, Cl. 405-211.000.
- Texas Instruments Incorporated: See—
Leach, Jerald G., 5,089,811, Cl. 340-703.000.
- Malhi, Satwinder; and Kwon, Oh-Kyong, 5,088,190, Cl. 29-843.000.
- Mosleh, Mehrdad M., 5,089,441, Cl. 437-225.000.
- Neal, Joseph H.; and Potet, Kenneth A., 5,089,993, Cl. 365-63.000.
- Van Tran, Hiep, 5,089,789, Cl. 330-253.000.
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- Thiele Kaolin Company: See—
Shi, Joseph C. S.; Curtis, Jerry L.; and Salter, Timothy L., 5,089,056, Cl. 106-486.000.
- Thieroff-Ekerdt, Ruth: See—
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- Thomson-Brandt Armements: See—
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- Thomson Consumer Electronics: See—
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- Thomson Consumer Electronics, Inc.: See—
George, John B., 5,089,754, Cl. 315-386.000.
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Dez, Olivier; and Vilbois, Vincent, 5,088,829, Cl. 359-396.000.
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- Thurles, Edmond, to GEC Alsthom SA. Metal-clad electricity line and method of manufacturing it. 5,089,665, Cl. 174-27.000.
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- Tick, Paul A.: See—
Cornelius, Lauren K.; Francis, Gaylord L.; and Tick, Paul A., 5,089,446, Cl. 501-15.000.
- Tiefenbacher, Gerd: See—
Schuster, Hans-Dieter; Nunnemann, Friedhelm; Langer, Hans-Joachim; Strohm, Erwin; and Tiefenbacher, Gerd, 5,089,237, Cl. 422-180.000.
- Tierney, James V., III: See—
Bryer, Philip S.; and Tierney, James V., III, 5,089,920, Cl. 360-92.000.
- Tilton, George W.: See—
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- Timm, Edward E.; and McCombs, Ann M., to Dow Chemical Company, The. High hardness, wear resistant materials. 5,089,447, Cl. 501-87.000.
- Tioxide Group plc: See—
Ridland, John; and Brown, David A., 5,089,149, Cl. 252-8.551.
- Tippmann, Joseph R.; and Tippmann, Vincent P. Radial flow heat exchanger. 5,088,550, Cl. 165-117.000.
- Tippmann, Vincent P.: See—
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Thome, Roland; Schmidt, Hubertus; Tisser, Arno; and Prescher, Dieter, 5,089,243, Cl. 423-328.000.
- TOA Medical Electronics Co., Ltd.: See—
Tomioaka, Atuo; Nakagawa, Masayuki; and Maeda, Tadashi, 5,088,816, Cl. 356-39.000.
- Toan, Vien V.: See—
Vieira, Eric; Leppard, David G.; Laver, Hugh S.; and Toan, Vien V., 5,089,050, Cl. 106-20.000.
- Toba, Makoto: See—
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- Tobita, Hiroshi: See—
Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,088,710, Cl. 270-53.000.
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- Tohka, Masaie: See—
Ezaki, Shinobu; Kamino, Yukishige; and Tohka, Masaie, 5,088,908, Cl. 425-73.000.
- Tojima, Hiromi: See—
Takeuchi, Hiroshi; Iwase, Masahiko; Tojima, Hiromi; Murata, Ikuo; and Uenohara, Norihisa, 5,088,583, Cl. 192-70.270.
- Tojima, Masao: See—
Sasaki, Hiromi; Tojima, Masao; Konishi, Satsuko; and Takana, Hiroyuki, 5,089,316, Cl. 428-195.000.
- Tokai Rubber Industries, Ltd.: See—
Kanda, Ryouji; and Yosida, Kiyohiko, 5,088,700, Cl. 267-140.10A.
- Kanda, Ryouji, 5,088,704, Cl. 267-220.000.
- Nanno, Takanobu, 5,088,701, Cl. 267-140.10C.
- Tokunaga, Toshimichi: See—
Kajiyama, Hiroshi; Michihira, Osamu; and Tokunaga, Toshimichi, 5,090,012, Cl. 370-85.300.
- Yano, Haruto; Hirasa, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, 5,089,826, Cl. 342-457.000.
- Tokyo Electric Co., Ltd.: See—
Oda, Akira, 5,088,847, Cl. 400-306.000.
- Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshiko; Suzuki, Masashi; and Matsushita, Izumi, 5,088,405, Cl. 101-240.000.
- Tokyo Electron Limited: See—
Kikuchi, Shuji; Yamaguchi, Mitsuyuki; and Matsudo, Masahiko, 5,089,710, Cl. 250-492.300.
- Kojima, Hiroshi; Tahara, Yoshifumi; and Arai, Izumi, 5,089,083, Cl. 156-643.000.
- Koshiishi, Akira; Kawamura, Kohei; and Takayama, Naoki, 5,089,747, Cl. 315-111.810.
- Murakami, Seishi; Kai, Kozo; and Kato, Susumu, 5,088,697, Cl. 266-250.000.
- Ushijima, Mitsuru; Hirakawa, Osamu; Akimoto, Masami; Kimura, Yoshio; and Anai, Noriyuki, 5,089,305, Cl. 427-422.000.
- Tokyo Electron Sagami Limited: See—
Kakizaki, Jyumichi; and Yamaga, Kenichi, 5,088,922, Cl. 432-152.000.
- Tokyo Kikai Seisakusho, Ltd.: See—
Shoji, Akihiro; and Shiba, Noriyuki, 5,088,403, Cl. 101-227.000.
- Tomatsu, Tsutomu, to Pilot Ink Co., Ltd. Compressor, spray apparatus using the compressor, and air brush for the spray apparatus. 5,088,903, Cl. 417-473.000.
- Tomibe, Katsuhiko: See—
Sawada, Shuzo; Kawamura, Takashi; Masuho, Yasuhiko; and Tomibe, Katsuhiko, 5,089,262, Cl. 424-87.000.
- Tominaga, Akira: See—
Nishida, Reiziro; and Tominaga, Akira, 5,089,542, Cl. 523-410.000.
- Tominaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, to Nitto Electrical Industrial. Process for producing a multilayered ceramic structure using an adhesive film. 5,089,071, Cl. 156-89.000.
- Tomioaka, Atuo; Nakagawa, Masayuki; and Maeda, Tadashi, to TOA Medical Electronics Co., Ltd. Process and apparatus for analyzing cells. 5,088,816, Cl. 356-39.000.
- Tomita, Koji: See—
Ohkuma, Hiroaki; Tomita, Koji; Konishi, Masataka; and Kamei, Hideo, 5,089,522, Cl. 514-460.000.
- Tomite, Toshio: See—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; and Tomite, Toshio, 5,089,737, Cl. 310-154.000.
- Tomizawa, Takeshi; and Arita, Koji, to Matsushita Electric Industrial Co., Ltd. Portable cooler using chemical reaction. 5,088,302, Cl. 62-480.000.
- Tomogawa Paper Co., Ltd.: See—
Kiriha, Yoshihiro; Murata, Chikara; Tsukamoto, Masahide; and Nishimura, Yutaka, 5,089,372, Cl. 430-167.000.
- Tomoshige, Kiyomi: See—
Usami, Masahiro; Ueda, Kenji; Tomoshige, Kiyomi; Ohta, Shozo; Horiguchi, Tsutomu; and Yamazaki, Hiroshi, 5,088,432, Cl. 114-67.00R.
- Tomoto, Yoshiharu: See—
Yasuda, Hironori; and Tomoto, Yoshiharu, 5,088,157, Cl. 19-263.000.
- Tonen Chemical Corporation: See—
Kanno, Tomoaki; Matsushima, Yoshihisa; and Suzuki, Makoto, 5,089,360, Cl. 429-254.000.
- Toner, Jeffrey T.; and Winterroll, Christopher. Simulated frog fishing lure. 5,088,227, Cl. 43-42.300.
- Tonnesson, Thorstein, to Trivring A.S. Electronic lock. 5,089,692, Cl. 235-382.500.
- Tooker, Joseph F.: See—
Magnuson, Gustav D.; Tooker, Joseph F.; and Treglio, James R., 5,089,707, Cl. 250-423.00R.
- Topert, Michael: See—
Earnshaw, Christopher G.; Kirsch, Gerald; Rach, Petra; Thieroff-Ekerdt, Ruth; and Topert, Michael, 5,089,175, Cl. 260-404.000.
- Toppan Printing Co., Ltd.: See—
Sasaki, Jun; Ogawa, Akira; Akimoto, Yasumasa; Minato, Takao; and Ohnishi, Hajime, 5,089,905, Cl. 359-64.000.
- Toraby-Payhan, Reza. Scrolling display device. 5,088,219, Cl. 40-471.000.
- Torii, Yutaka: See—
Fukuta, Isao; Kawakita, Kenji; Kashio, Jiro; Torii, Yutaka; Gohara, Shinobu; and Endo, Noboru, 5,090,011, Cl. 370-60.000.
- Torras, Gabriel; and Camacho, Felipe, to Mar Planet, S.A. Lighter-holder for cigarette packet. 5,088,684, Cl. 248-682.000.
- Torrington Company, The: See—
Santos, A. John; and Brauer, Michael C., 5,089,817, Cl. 341-15.000.
- Torterotot, Roland, to ERCA Holding. Doser-dispenser and process for dosing a paste and/or liquid product. 5,088,631, Cl. 222-389.000.
- Toshiba Ceramics Co., Ltd.: See—
Ando, Kuniko; Shirashi, Koichi; Shimbo, Masaru; and Shimai, Shunzo, 5,089,134, Cl. 210-496.000.
- Toshiba Kikai Kabushiki Kaisha: See—
Kumazaki, Hiroshi, 5,088,911, Cl. 425-145.000.
- Tosoh Corporation: See—
Arichika, Kenji; Fukamachi, Mitsuru; Higashi, Satoshi; and Maruyama, Noboru, 5,089,781, Cl. 324-445.000.
- Kawakami, Yasunobu; Hamazaki, Kagehisa; Arakawa, Toshitoku; and Mori, Toshiyuki, 5,089,448, Cl. 501-97.000.
- Ozoe, Shinji; and Yamakawa, Hiroshi, 5,089,601, Cl. 528-390.000.
- Sonoda, Takefumi, 5,089,075, Cl. 156-244.180.
- Toth, Thomas L.; King, Kevin F.; and Crawford, Carl R., to General Electric Company. Helical scanning computed tomography with tracking x-ray source. 5,090,037, Cl. 378-4.000.
- Touzet, Lorenzo J. Shotgun shell trimmer. 5,088,169, Cl. 29-1.320.
- Tovar, Abel M.; Mendizabal, Oscar H. B.; Olmos, Leonardo M.; Sanchez, Carlos G. A.; Lorenzo, Roberto L.; Barba, Roldofo C.; and

- Perez, Rene H., to Instituto Mexicano Del Petroleo. Method for processing heavy crude oils. 5,089,114, Cl. 208-50.000.
- Toy Originators, Inc.: See—
LaFata, John E., 5,088,950, Cl. 446-19.000.
- Toyama, Yasuo: See—
Sakagami, Toshinori; Toyama, Yasuo; Ito, Hisaharu; and Miyachi, Takumi, 5,089,550, Cl. 525-314.000.
- Toyoko Kabushiki Kaisha: See—
Akasaka, Masami; Kubota, Akiko; Mizoguchi, Junzo; and Satoh, Sakae, 5,089,408, Cl. 435-192.000.
- Imamura, Shigeyuki; and Misaki, Hideo, 5,089,393, Cl. 435-28.000.
- Toy Tire & Rubber Co., Ltd.: See—
Kan, Masanori; and Oda, Keiichi, 5,088,537, Cl. 152-525.000.
- Toyoda Gosei Co., Ltd.: See—
Tsutsui, Masatoshi, 5,089,105, Cl. 204-192.140.
- Toyomoto, Hideharu: See—
Nakao, Yuichi; and Toyomoto, Hideharu, 5,089,987, Cl. 365-222.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Asada, Toshiyuki, 5,088,349, Cl. 74-861.000.
- Asada, Toshiyuki, 5,088,354, Cl. 74-866.000.
- Izutani, Takahide; Kayanuma, Nobuaki; Furuhashi, Michio; Sonoda, Yukihiko; Sawamoto, Hiroyuki; Hoshi, Kouichi; Osawa, Kouichi; and Bessho, Hironori, 5,088,281, Cl. 60-274.000.
- Osawa, Kouichi, 5,088,318, Cl. 73-117.300.
- Sugaya, Masami; Soga, Yoshinobu; and Okada, Takahiro, 5,088,355, Cl. 74-868.000.
- Takagi, Takaaki; Makimura, Toshiro; and Kurita, Kenji, 5,088,650, Cl. 239-575.000.
- Toyota, Kazuaki: See—
Kaieda, Shozo; and Toyota, Kazuaki, 5,089,854, Cl. 355-260.000.
- Traenckner, Hans-Joachim: See—
Pielartzik, Harald; Meyer, Rolf-Volker; Dujardin, Ralf; Schnitzler, Axel; and Traenckner, Hans-Joachim, 5,089,590, Cl. 528-176.000.
- TRB Specialty Rehabilitation, Inc.: See—
Ralston, Trent H.; Guthrie, Kenneth R.; and Veatch, James C., 5,088,553, Cl. 166-57.000.
- Trebino, Rick: See—
Tsay, Yuh-Geng; Calenoff, Emanuel; Gustafson, Eric K.; Trebino, Rick; and Lee, John, 5,089,387, Cl. 435-6.000.
- Treglio, James R.: See—
Magnuson, Gustav D.; Tooker, Joseph F.; and Treglio, James R., 5,089,707, Cl. 250-423.000.
- Trevathan, Larry C.; Hoover, Scott C.; and Smith, James C., to Nordson Corporation. Method and apparatus for hollow core extrusion of high viscosity materials. 5,089,190, Cl. 264-45.900.
- Trewella, Jeffrey C.: See—
Abramo, Guy P.; Avery, Noyes L.; and Trewella, Jeffrey C., 5,089,028, Cl. 44-347.000.
- Tri-State Hospital Supply Corporation: See—
Fields, Charlie B., 5,088,984, Cl. 604-167.000.
- Trikilis, Emmanuel M. Turnstile control system. 5,088,235, Cl. 49-42.000.
- Trinkaus, Gerhard; and Locker, Josef, to Koflach Sport Gesellschaft m.b.H. & Co. KG. Ski boot having a movable front flap member uninhibited by tightening forces. 5,088,212, Cl. 36-120.000.
- Trioving A.S.: See—
Tonnesson, Thorstein, 5,089,692, Cl. 235-382.500.
- Trivett, Robert L., to Nalco Chemical Company. Hot melt lubricant having good washability. 5,089,157, Cl. 252-51.50R.
- Truty, Thomas J., to T-Star Industrial Electronics Corporation. Indexed rotatable current pick-up for a travelling wire electrical discharge machining apparatus. 5,089,680, Cl. 219-69.120.
- TRW Vehicle Safety Systems Inc.: See—
Augustinus, James A.; Lecznar, Mark T.; and Wipasuramontorn, Pongdet, 5,088,764, Cl. 280-731.000.
- Trybulski, Eugene J.; Kramss, Richard H.; and Brabander, Herbert J., to American Cyanamid Company. 3- or 4-substituted oxotremorine derivatives and a method of treating cholinergic dysfunction therewith. 5,089,518, Cl. 514-422.000.
- Tsai, Chin S., to Dan Ken Industrial Co., Ltd. Bicycle shock-absorbing apparatus. 5,088,705, Cl. 267-226.000.
- Tsang, Charles Y.; and Ker, Victoria S., to Nova Husky Research Corporation. Method and apparatus for monitoring cloud point or like transition temperature. 5,088,833, Cl. 374-17.000.
- Tsay, Yuh-Geng; Calenoff, Emanuel; Gustafson, Eric K.; Trebino, Rick; and Lee, John, to Adeza Biomedical Corporation. DNA probe diffraction assay and reagents. 5,089,387, Cl. 435-6.000.
- Tsipouras, Athanasios; Ostlund, Dan A.; Hensens, Otto D.; and Zink, Deborah L., to Merck & Co., Inc. Novel fermentation product with antiparasitic activity. 5,089,530, Cl. 514-682.000.
- Tsubakimoto Chain Co.: See—
Suzuki, Tadasu; Kumakura, Atsushi; and Futami, Yuichi, 5,088,966, Cl. 474-111.000.
- Tsubota, Junichi, to Kabushiki Kaisha Toshiba. Reader apparatus for reading an image formed on an original placed on an original table. 5,089,902, Cl. 358-497.000.
- Tsuchinaga, Hiroyuki: See—
Hara, Fumio; Mita, Seiichi; Izumita, Morishi; and Tsuchinaga, Hiroyuki, 5,090,005, Cl. 369-97.000.
- Tsuchita, Kenji: See—
Omote, Tatsuyuki; Yoshida, Tomiharu; Maki, Hideo; Senoh, Makoto; Takahashi, Fuminobu; and Tsuchita, Kenji, 5,089,213, Cl. 376-248.000.
- Tsuchiya, Fumiaki: See—
Ohno, Yukihiko; and Tsuchiya, Fumiaki, 5,089,858, Cl. 355-319.000.
- Tsuchiya, Tohru: See—
Yasumoto, Masahiko; Tsuchiya, Tohru; Shibuya, Isao; and Goto, Midori, 5,089,612, Cl. 544-8.000.
- Tsuda, Kenji; and Ono, Shoichi, to Daicel Chemical Industries Ltd.; and Shokusan Jutaku Sogo Co., Ltd., a part interest. Agent for preservation of timber against decay and termite damage. 5,089,483, Cl. 514-64.000.
- Tsuji, Eiji: See—
Hamada, Tadashi; Yamada, Shuji; Tsuji, Eiji; and Mizukoshi, Tomoyuki, 5,089,223, Cl. 420-40.000.
- Tsuji, Kinya: See—
Nakamura, Tadasi; Tsuji, Kinya; and Obata, Yoriko, 5,089,452, Cl. 502-202.000.
- Tsuji, Suguru; Saya, Toshiaki; Komiyama, Shinji; Furusho, Hayato; Ohishi, Tetsu; and Tamura, Mitsuhiro, to Nippon Zeon Co., Ltd. Process for producing conjugated diene copolymer. 5,089,576, Cl. 526-228.000.
- Tsukada, Toru, to Nippon Seiko Kabushiki Kaisha. Overrun preventing device of a linear guide apparatus. 5,088,839, Cl. 384-45.000.
- Tsukamoto, Masahide: See—
Kinhata, Yoshihiro; Murata, Chikara; Tsukamoto, Masahide; and Nishimura, Yutaka, 5,089,372, Cl. 430-167.000.
- Tsukuda, Masato: See—
Ito, Taichi; and Tsukuda, Masato, 5,089,831, Cl. 346-76.0PH.
- Tsunoyama, Kozo: See—
Okada, Susumu; Imanaka, Makoto; Masui, Susumu; Obara, Takashi; Shinozaki, Masatoshi; and Tsunoyama, Kozo, 5,089,068, Cl. 148-328.000.
- Tsuruo, Ryo: See—
Ono, Tomio; Tsuruo, Ryo; Koyama, Hiromi; and Fujihara, Ryoji, 5,088,777, Cl. 292-40.000.
- Tsuruta, Hisao: See—
Kondo, Akihiro; Kato, Yoshiyuki; Kato, Ikunoshin; and Tsuruta, Hisao, 5,089,230, Cl. 422-64.000.
- Tsutsui, Masatoshi, to Toyoda Gosei Co., Ltd. Color-bearing textile product. 5,089,105, Cl. 204-192.140.
- Tucholski, Henry J.: See—
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,089,795, Cl. 335-46.000.
- Tucker, David L.: See—
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- Tupek, Garry F.: See—
Hycner, Stanley H.; Tupek, Garry F.; and Pelczarski, Walter J., 5,088,402, Cl. 101-142.000.
- Turner, Ronald L., to Jackson, Cecil R.; Collard, Gerald L.; and Maccon, Catheryn L. Body wrap with pocket for pliable frozen composition. 5,088,487, Cl. 128-402.000.
- Turpin, Marc, to Thomson-CSF. Network of sensors connected to a remote supply, monitoring and processing station. 5,089,696, Cl. 250-227.210.
- Turunc, Umit, to Betz Laboratories, Inc. Methods for dewatering coal and mineral concentrates. 5,089,142, Cl. 210-728.000.
- Tuszynski, Alfons: See—
Warner, Raymond M., Jr.; Schrimpf, Ronald D.; and Tuszynski, Alfons, 5,089,862, Cl. 357-23.100.
- Tylan General, Inc.: See—
Spiegelman, Jeffrey J., 5,088,774, Cl. 285-133.100.
- Tyler, Ralph J.: See—
Edwards, James H.; Maitra, Ashit M.; and Tyler, Ralph J., 5,089,451, Cl. 502-174.000.
- TZN Forschungs-und Entwicklungszentrum Unterlöss GmbH: See—
Neff, Helmut; Heinrich, Jürgen; and Glotz, Gerhard, 5,088,659, Cl. 244-3.160.
- Uarco Incorporated: See—
Sprain, Kenneth S., 5,088,961, Cl. 462-2.000.
- Uchino, Kinji: See—
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,088,837, Cl. 374-185.000.
- Uchiyama, Shigeyuki; and Kusaka, Yosuke, to Nikon Corporation. Focus state detecting device. 5,089,842, Cl. 354-402.000.
- Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Makoto; Ohba, Sachiko; and Ohkishi, Haruyuki, to Mitsubishi Kasei Corporation. Exo-type hydrolase capable of hydrolyzing a fructan only every 3 or 4 sugar units. 5,089,402, Cl. 435-96.000.
- Uda, Hizuru: See—
Owada, Nobuo; and Uda, Hizuru, 5,089,430, Cl. 437-31.000.
- Ueda, Kenji: See—
Usami, Masahiro; Ueda, Kenji; Tomoshige, Kiyomi; Ohta, Shozo; Honguchi, Tsutomu; and Yamazaki, Hiroshi, 5,088,432, Cl. 114-67.00R.
- Ueda, Makoto: See—
Uchiyama, Takao; Kawamura, Mishio; Sashida, Reiko; Ueda, Makoto; Ohba, Sachiko; and Ohkishi, Haruyuki, 5,089,402, Cl. 435-96.000.
- Ueda, Masahide: See—
Kusuda, Yasuhiro; Ueda, Masahide; Onishi, Takashi; and Shimizu, Tadafumi, 5,089,848, Cl. 355-206.000.
- Ueda, Nobuo: See—
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- Ueda, Satoshi; Hirota, Koji; Itoh, Makoto; Yoshida, Yukihiko; Hukuda, Hirokazu; and Hamashima, Shigeki, to Fujitsu Limited. Infrared detector having dewar with film coatings to suppress reflections. 5,089,705, Cl. 250-352.000.

- Uehara, Masafumi: See—
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- Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, to Nippon Steel Corporation; Nemoto Project Industry Co.; and Nippon Hoso Kyokai. Antenna apparatus and attitude control method. 5,089,824, Cl. 342-359.000.
- Uematsu, Nobuyuki: See—
Iwaki, Takashi; Ito, Kazunori; Matsumoto, Hiroshi; Watanabe, Kunitoshi; Suzuki, Hiroyuki; Shibata, Juzo; Uematsu, Nobuyuki; and Takeda, Mamoru, 5,088,452, Cl. 123-3.000.
- Uematsu, Ryosuke, to NEC Corporation. Electrophotographic printing apparatus with repellent bands on the photoconductive member and the developing roller to prevent buildup of toner therebetween. 5,089,853, Cl. 355-256.000.
- Uemura, Gosei: See—
Tomimaga, Takashi; Sakuramoto, Takahumi; Nishiyama, Souji; Kamei, Kiyohiro; Kobayashi, Yoshiki; and Uemura, Gosei, 5,089,071, Cl. 156-89.000.
- Uenaka, Kazushige: See—
Sakamoto, Kuchiro; Takase, Haruo; Uenaka, Kazushige; and Nakajima, Junya, 5,089,840, Cl. 354-324.000.
- Uenishi, Kazuya; Kawabe, Yasumasu; and Kokubo, Tadayoshi, to Fuji Photo Film Co., Ltd. Positive photoresist composition utilizing O-quinonediazide and novolak resin. 5,089,373, Cl. 430-191.000.
- Uenohara, Norihisa: See—
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- Ugine Savoie: See—
Bletton, Olivier; Duet, Roger; Henry, Marc; and Cogne, Jean-Yves, 5,089,224, Cl. 420-41.000.
- Uji-Te, Koji: See—
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- Ukrainsky Institute Inzhenerov Vodnogo Khozyaistva: See—
Garaschenko, Vyacheslav I.; Sandulyak, Alexandr V.; and Volkov, Igor V., 5,089,128, Cl. 210-222.000.
- Ullman, Edwin F.: See—
Davalian, Dariush; Lin, Cheng-I; and Ullman, Edwin F., 5,089,390, Cl. 435-7.930.
- Umeda, Takashi; Zemba, Seiichi; Hara, Kazuo; Takamoto, Katsunori; and Yokota, Shinichi, to Idemitsu Petrochemical Co., Ltd.; and Kuraray Company Limited. Copolymerized polyester compositions. 5,089,553, Cl. 524-424.000.
- Umemoto, Chiuyuki; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Phosphor. 5,089,170, Cl. 252-301.40H.
- Unangst, R. Richard, to SmithKline Beecham Corporation. Stabilized antibiotic compositions for animal feeding. 5,089,271, Cl. 424-490.000.
- Unger, Evan C. Liposomes as contrast agents for ultrasonic imaging and methods for preparing the same. 5,088,499, Cl. 128-662.020.
- Union Carbide Coatings Service Technology Corporation: See—
Stephenson, Gerald H.; and Morgan, Russell M., 5,089,683, Cl. 219-121.780.
- Union Industrial Y. A.: See—
de Vrieze, Roelf R. A.; and Vogel, Petrus G. J., 5,089,329, Cl. 428-313.500.
- Union Oil Company of California: See—
Brown, Roger A.; Young, Donald C.; and Miller, Alex E., 5,089,040, Cl. 71-63.000.
- Hackett, Gary K., 5,089,995, Cl. 367-76.000.
- Patton, Lewis E.; and McGee, Dennis E., 5,089,335, Cl. 428-341.000.
- Unisys: See—
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- Unisys Corporation: See—
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- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—
Ludlow, Ian; and Kaye, Paul H., 5,089,714, Cl. 250-574.000.
- United States of America: See—
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Dull, Gerald G.; Leffler, Richard G.; and Birth, Gerald S., 5,089,701, Cl. 250-341.000.
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- Kiel, Johnathan L.; Erwin, David N.; and Simmons, David M., 5,089,385, Cl. 435-3.000.
- Army: See—
McNally, Bartley F.; and Lacerte, Richard F., 5,089,298, Cl. 427-240.000.
- Energy: See—
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- Health and Human Services: See—
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- Miller, Stephen P. F.; and Brady, Roscoe O., 5,089,392, Cl. 435-21.000.
- Interior: See—
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- Gammell, Paul M., 5,088,327, Cl. 73-588.000.
- Hegedus, Charles R.; Hirst, Donald J.; Green, William J.; and Eng, Anthony T., 5,089,551, Cl. 524-396.000.
- Higa, Kelvin T., 5,089,643, Cl. 556-1.000.
- Howarth, Robert F., 5,089,941, Cl. 362-154.000.
- Kirkpatrick, Douglas A.; Schnur, Joel M.; Schoen, Paul E.; Price, Ronald R.; and Manheimer, Wallace M., 5,089,742, Cl. 313-351.000.
- Scheps, Richard, 5,090,019, Cl. 372-39.000.
- U.S. Philips Corporation: See—
Asselbergs, Peter E. S. J., 5,089,708, Cl. 250-442.110.
- Bernard, Xavier, 5,088,496, Cl. 128-660.070.
- Bukoschek, Romuald L.; and Schneider, Norbert, 5,088,999, Cl. 606-133.000.
- Bulthuis, Kornelis, 5,090,007, Cl. 369-275.400.
- Crebroux, Jean-Luc, 5,090,028, Cl. 375-106.000.
- Gamand, Patrice; and Gabillard, Bertrand, 5,089,717, Cl. 307-219.100.
- Gloaguen, Gilbert, 5,089,720, Cl. 307-353.000.
- Groeneveld, Dirk W. J., 5,089,718, Cl. 307-244.000.
- Leduc, Pierre, 5,089,873, Cl. 357-35.000.
- Meyer, Karl-Hanns; and Honds, Leo, 5,088,805, Cl. 359-814.000.
- Slatter, John A. G.; Brockman, Henry E.; and Haisma, Jan, 5,089,431, Cl. 437-39.000.
- Welker, Thomas; and Zaengel, Thomas, 5,089,883, Cl. 358-60.000.
- United States Surgical Corporation: See—
Green, David T., 5,089,009, Cl. 606-219.000.
- Korthoff, Herbert W., 5,089,010, Cl. 606-224.000.
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- United Technologies Corporation: See—
Karanian, Arthur J., 5,088,660, Cl. 244-53.00B.
- Radtke, Lee, 5,088,840, Cl. 384-535.000.
- Schwarz, Fred M.; and Lagueux, Ken R., 5,088,885, Cl. 415-115.000.
- Suchoski, Paul G., Jr.; Findakly, Talal K.; Ferrar, Carl M.; and Leonberger, Frederick J., 5,088,826, Cl. 356-350.000.
- Weingold, Harris D.; Neubert, Robert J.; Andy, John G.; Behlke, Roy F.; and Potter, Glen E., 5,088,892, Cl. 415-193.000.
- Unitrode Corporation: See—
Neidoff, Robert A., 5,089,767, Cl. 323-315.000.
- University of California, The Regents of the: See—
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- University of Cincinnati: See—
Snyder, A. Peter; Greenberg, David B.; and Scarpino, Pasquale V., 5,089,395, Cl. 435-39.000.
- University of Colorado Foundation, Inc., The: See—
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- University of Florida: See—
Fregly, Melvin J.; Privette, R. Malcolm; and Cade, Robert, 5,089,477, Cl. 514-23.000.
- Winefordner, James D.; and Smith, Benjamin W., 5,088,820, Cl. 356-301.000.
- University of Illinois, Board of Trustees of the: See—
Rinehart, Kenneth L.; and Holt, Tom G., 5,089,273, Cl. 424-520.000.
- University of Minnesota, Regents of the: See—
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- University of New Mexico, The: See—
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- University of Tennessee Research Corporation, The: See—
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- University of Utah Research Foundation: See—
Koppert, Erik, 5,089,020, Cl. 623-3.000.
- University of Washington, The Board of Regents of the: See—
Beach, Kirk W.; Phillips, David J.; and Kansky, John, 5,088,498, Cl. 128-661.070.
- Unkefer, Clifford J.: See—
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- UOP: See—
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- Markovs, John; and James, Frederick E., Jr., 5,089,034, Cl. 55-28.000.
- Urano, Masahiko: See—
Mizuishi, Koji; Harada, Isamu; Nakamura, Yasushi; Oda, Michiaki; Ohtsuka, Seiichi; Hirano, Yoshihiro; and Urano, Masahiko, 5,089,239, Cl. 422-249.000.
- Urasaki, Shuji: See—
Mochizuki, Mitsuru; Isota, Youji; Takagi, Tadashi; and Urasaki, Shuji, 5,089,790, Cl. 330-277.000.
- Urata, Makoto: See—
Nishida, Fumihiko; Urata, Makoto; and Fujisawa, Hiroyuki, 5,089,845, Cl. 355-85.000.
- Urban, Frank J., to Pfizer Inc. Process and intermediates for 2R-benzyl-chroman-6-carbaldehyde. 5,089,637, Cl. 549-407.000.
- Urban, Stephen R.: See—
Lee, Mark S.; McQuaid, Cameron M.; Urban, Stephen R.; Secombe, Donald A., Jr.; Leo, Robert T., Jr.; Coon, Edward H.; and Bray, Olin H., 5,089,970, Cl. 364-468.000.
- Urbanek, Edward A., Jr.: See—
Affeldt, Roger D.; Powell, Alvin; and Urbanek, Edward A., Jr., 5,088,463, Cl. 123-459.000.

Usami, Masahiro; Ueda, Kenji; Tomoshige, Kiyomi; Ohta, Shozo; Horiguchi, Tsutomu; and Yamazaki, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Anti-fouling system for substances in contact with seawater. 5,088,432, Cl. 114-67.00R.

USG Interiors, Inc.: See—
Mieyal, David F.; and Fletterick, James A., 5,088,261, Cl. 52-729.000.

Ushijima, Mitsuru; Hirakawa, Osamu; Akimoto, Masami; Kimura, Yoshio; and Anai, Noriyuki, to Tokyo Electron Limited; and Tel Kyushu Limited. Coating apparatus and method for applying a liquid to a semiconductor wafer including selecting a nozzle on a stand by state. 5,089,305, Cl. 427-422.000.

Usui Kokusai Sangyo Kaisha Ltd.: See—
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V Band Corporation: See—
Carrubba, Vincent; DiLeo, Chris; and Campbell, Patrick T., 5,089,937, Cl. 361-394.000.

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Miotke, Mark D.; and Chynoweth, Lawrence L., 5,089,759, Cl. 318-568.110.

Vachet, Jean-Marc. Intra-orbital implant manufacturing method and intra-orbital implant. 5,089,021, Cl. 623-4.000.

Vala, John; and Banks, Gerald, to Unisys Corporation. Document-imaging illumination arrangements with intensity with adjustment. 5,089,713, Cl. 250-566.000.

Valentine Engineering, Inc.: See—
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Valint, Paul L.; and Bock, Jan, to Exxon Research and Engineering Company. Gydrophobically associating terpolymers containing sulfonate functionality. 5,089,578, Cl. 526-240.000.

Valka, William A.: See—
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Valkirs, Gunars E.: See—
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Valleylab, Inc.: See—
Delahuerger, Louis; Stoddard, Robert B.; and Klicek, Michael S., 5,088,997, Cl. 606-42.000.

Valy, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, to Societe Anonyme d'ite: Aerospatiale Societe Nationale Industrielle. Under pressure gas tank with control of delivered gas flow. 5,088,622, Cl. 222-3.000.

Van den Bergh Foods Co., Division of Conopco, Inc.: See—
Asbeck, Lutz S., 5,089,139, Cl. 210-650.000.

Van Dresser Corporation: See—
Doerer, Richard P.; and Bihun, Edward J., 5,089,328, Cl. 428-308.400.

Van Blarcom, David; and Johnson, Donna E., to Lever Brothers Company, Division of Conopco, Inc. Liquid fabric conditioner containing fabric softener and peach colorant. 5,089,148, Cl. 252-8.600.

van de Meer, Roelof; and Dekkers, Marinus E. J., to General Electric Co. Polymer mixture comprising polyphenylene ethers and polyoctenylene and articles formed therefrom. 5,089,562, Cl. 525-132.000.

Van Den Berghe, Paul: See—
Reinicke, Andre; Sauvage, Philippe; and Van Den Berghe, Paul, 5,089,059, Cl. 148-16.000.

Vanderheyden, Jean-Luc E.: See—
Fritzberg, Alan R.; Vanderheyden, Jean-Luc E.; Kasina, Sudhakar; and Fitzer, Jeffrey N., 5,089,249, Cl. 424-1.100.

Van Der Linden, Klaus; and Wundt, Siegfried, to Siemens Aktiengesellschaft. Battery charging unit for a medical appliance. 5,089,763, Cl. 320-20.000.

Van Der Maas, Hendricus J. H.: See—
Rijkhof, Evert J.; Tholen, Johannes P. P.; Van Der Maas, Hendricus J. H.; and Boxhoorn, Gosse, 5,089,096, Cl. 204-102.000.

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Vander Mey, Timothy J.: See—
Vander Mey, James E.; and Vander Mey, Timothy J., 5,090,024, Cl. 375-1.000.

Van Der Woude, Gerbrig W.: See—
Moore, Timothy M.; and Van Der Woude, Gerbrig W., 5,089,186, Cl. 264-25.000.

Van Dijk, Frans S. J., to N. V. Raychem S.A. Joining insulated elongate conduit members. 5,088,772, Cl. 285-47.000.

Van Kruchten, Eugene M. G. A.; and Heimerikx, Gerardus W. J., to Shell Oil Company. Additives for lubricating oils and processes for producing them. 5,089,158, Cl. 252-51.50A.

Van Krustum, Peter: See—
Kiely, John; and Van Krustum, Peter, 5,088,333, Cl. 73-862.530.

Van Laar, Jacobus, to Hoogovens Groep BV. Iron runner. 5,088,695, Cl. 266-196.000.

Van Lancker, Frank R.: See—
Boni, Luc E.; and Van Lancker, Frank R., 5,089,607, Cl. 536-102.000.

Van Manen, John. Spaghetti cutting device. 5,088,201, Cl. 30-305.000.

van Riesen, Reiner. Belt lock. 5,088,163, Cl. 24-573.500.

van Rooijen, Adrianus, to Conopco, Inc. Method of making a granular beverage material by means of sintering and then granulating. 5,089,279, Cl. 426-285.000.

Van Sandwijk, Anthony: See—
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Van Santen, Rutger A.: See—
Breukelaar, Johan; Van Santen, Rutger A.; and De Winter, Andreas W., 5,089,458, Cl. 502-63.000.

Van 'T Veen, Willem H.; Engel, Albertus J. G.; Bonckamp, Benedictus C.; Veringa, Hubertus J.; and Terpstra, Rinse A., to Hoogovens Groep BV. Composite ceramic microporous membrane, process and apparatus for producing such membrane. 5,089,299, Cl. 427-245.000.

Van Tran, Hiep, to Texas Instruments Incorporated. Differential amplifier. 5,089,789, Cl. 330-253.000.

Varaprasad, Desaraju V.; Abhiraman, Agaram S.; and Lawton, Ernest L., to PPG Industries, Inc. Spinning of sol gel siliceous-containing fibers with wet coagulation. 5,089,188, Cl. 264-41.000.

Varian Associates, Inc.: See—
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Rosenblum, Stephen S.; and Doniger, Kenneth J., 5,089,746, Cl. 315-111.810.

Varma, Ravi K.; and Chao, Sam T., to E. R. Squibb & Sons, Inc. Fluorinated derivatives of mevinic acids. 5,089,523, Cl. 514-460.000.

Vasile, Carmine F., to Grumman Aerospace Corporation. MMIC-compatible power amplifier. 5,089,791, Cl. 330-295.000.

Vasile, Carmine F., to Grumman Aerospace Corporation. Matrix antenna array. 5,089,823, Cl. 342-383.000.

VDO Adolf Schindling AG: See—
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Vecchiotti, Vittorio; Colle, Roberto; Giordani, Antonio; and Dondio, Giulio, to Dr. L. Zambetti SpA. Heterocyclic piperidiny compounds having analgesic effect. 5,089,507, Cl. 514-326.000.

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Verbo, Ulysse: See—
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Vermeer Manufacturing Company: See—
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Vernet, Marc R. M.: See—
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Vernon, Nicholas M.: See—
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Vertical Designs, Inc.: See—
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Vesa, Reijo, to Aktiebolaget Bofors. Subwarhead. 5,088,414, Cl. 102-388.000.

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Vettst S.A.: See—
Heidt, Thomas; Will, Henry; Rhodes, Greydon; and Placencia, Armand, 5,089,229, Cl. 422-64.000.

Vickers, Incorporated: See—
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Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazuyuki; and Nishi, Yuji, 5,089,892, Cl. 358-167.000.

Sugiyama, Kenji, 5,089,889, Cl. 358-135.000.

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Vieira, Eric; Leppard, David G.; Laver, Hugh S.; and Toan, Vien V., to Ciba-Geigy Corporation. Inks containing a water soluble compound as a stabilizer particularly for ink jet printing. 5,089,050, Cl. 106-20.000.

Vijay, Tumkur R.: See—
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Vijgen, Paul M. H. W.; Howard, Floyd G.; Bushnell, Dennis M.; and Holmes, Bruce J., to United States of America, National Aeronautics and Space Administration. Serrated trailing edges for improving lift and drag characteristics of lifting surfaces. 5,088,665, Cl. 244-200.000.

Vila, Francisco R.; Alonso, Thomas O.; and Cacabelos, Ramon, to Laboratorios Serono S.A. Use of growth hormone releasing factor for improving mental function. 5,089,472, Cl. 514-12.000.

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Violette, Dennis G. Convertible sofa, bed and table assembly. 5,088,135, Cl. 5-2.100.

Visicable: See—
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Volker, Wolfgang: See—
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Vyne, Robert L.: See—
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W. Dollken & Co. GmbH: See—
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Schirmer, Henry G., 5,089,073, Cl. 156-244.110.

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Grecksch, Hans; and Spinnen, Dieter, 5,088,591, Cl. 198-465.100.

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Wall, Kenneth; and Mueller, Ray, to Reyco Industries, Inc. Suspension system for semi trailers. 5,088,758, Cl. 280-683.000.

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Wallis, Bernard J. Sealing construction for a gas spring. 5,088,698, Cl. 267-119.000.

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Marchand, Gary R.; Schell, Joseph G., Jr.; Walther, Brian W.; and Bredeweg, Corwin J., 5,089,572, Cl. 526-77.000.

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Bryer, Philip S.; and Tierney, James V., III, 5,089,920, Cl. 360-92.000.

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Champagne, John M.; and Waters, Peter D., 5,088,292, Cl. 62-84.000.

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Buljan, Sergej T.; Lingertat, Helmut; and Wayne, Steven F., 5,089,047, Cl. 75-236.000.

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Schield, Edward L.; and Reeves, Myron D., 5,088,258, Cl. 52-398.000.

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Harde, Christoph; Nordhoff, Erhard; Kruger, Anita; Kruger, Gabriele; Tarara, Gerhard; Wegner, Peter; Heinrich, Nikolaus; Kottler, Clemens; Johann, Gerhard; and Rees, Richard, 5,089,044, Cl. 71-90.000.

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Pews, R. Garth; Wehmeyer, Richard M.; and Hunter, James E., 5,089,653, Cl. 560-47.000.

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Brown, Robert W.; and Taylor, John M., 5,088,891, Cl. 415-176.000.

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Chang, Philip Y.; Coyle, Daniel J., Jr.; Malkemus, Timothy R.; Rodriguez, Rebecca A.; and Welti, Philip J., 5,089,985, Cl. 395-600.000.

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Hall, Bobby E.; and Szememeyi, Clarita A., 5,089,151, Cl. 252-8.551.

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DeLong, Ronald B.; and Palmbo, Allen L., 5,088,250, Cl. 52-239.000.

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Willson, Jolyon P.; and Parsons, Philip, to Schlumberger Industries Limited. Solid state sensor with dual resonant vibratable members. 5,089,695, Cl. 250-227.210.

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DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,089,641, Cl. 552-653.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; and Perlman, Kato L., 5,089,647, Cl. 556-428.000.

Wise, Lawrence D.: See—
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Witco A-S: See—
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Wogoman, Frank W., to Miles Inc. Fluid separation and processing device. 5,089,417, Cl. 436-45.000.
Wolf, Kenneth E. Level sensing unit and a level indicating device based thereon. 5,088,204, Cl. 33-366.000.
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Wolff, Karl-Heinz, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Seal for a flow machine. 5,088,889, Cl. 415-171.100.
Wolff Walsrode Aktiengesellschaft: See—
Piepho, Michael; Hoppe, Lutz; and Luhmann, Erhard, 5,089,586, Cl. 528-75.000.
Wolfmueller, Karlheinz: See—
Sternfeld, Hans; Wolfmueller, Karlheinz; and Brunn, Alfred, 5,088,450, Cl. 122-31.100.
Wong, David M.: See—
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Wood, William W.; Naisby, Thomas W.; and Gray, Andrew C. G., to Shell Research Limited. Biocidal azophenyl compounds. 5,089,486, Cl. 514-149.000.
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Woodbridge Foam Corporation: See—
Hughes, Ian L., 5,089,191, Cl. 264-46.500.
Woodson, Lewis P.: See—
Cole, Susan M.; Garbe, James E.; and Woodson, Lewis P., 5,089,606, Cl. 536-54.000.
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Woodward, Gary. Dental fiberoptic handpiece hose assembly and method. 5,088,924, Cl. 433-126.000.
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Wardle, John W.; Leeson, Plato J.; Clay, David G.; and Sievert, Dale W., 5,088,383, Cl. 91-361.000.
Wortman, Jimmie: See—
Ozturk, Mehmet; Wortman, Jimmie; and Grider, Douglas, 5,089,872, Cl. 357-23.900.
Woven Electronics Corporation: See—
Piper, Douglas E.; and Mondor, E. J., III, 5,089,669, Cl. 174-117.00M.
Wright, Frank R.: See—
Hackl, Ralph P.; Wright, Frank R.; and Bruynesteyn, Albert, 5,089,412, Cl. 435-252.400.
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Rimai, Donald S.; Aslam, Muhammad; Baxter, Carlton D.; Johnson, Kevin M.; Tamary, Ernest J.; Laukaitis, Joseph F.; Wright, Hal E.; Chen, Tsang J.; and Staudenmayer, William J., 5,089,363, Cl. 430-45.000.
Wright, Robin E.: See—
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Orgun, Munir; McRoberts, Timothy C.; and Wu, Tzong-Hsiu B., 5,089,968, Cl. 364-435.000.
Wuerzer, Bruno: See—
Rueb, Lothar; Eicken, arl; Schwalge, Barbara; Plath, Peter; Wuerzer, Bruno; and Meyer, Norbert, 5,089,042, Cl. 71-74.000.
Wujek, Dennis G.: See—
Wessling, Ritchie A.; Pickelman, Dale M.; and Wujek, Dennis G., 5,089,259, Cl. 424-497.000.
Wulbert, Daniel E.: See—
Cate, Robert B.; and Wulbert, Daniel E., 5,089,976, Cl. 364-526.000.
Wunder, Siegfried: See—
Van Der Linden, Klaus; and Wunder, Siegfried, 5,089,763, Cl. 320-20.000.
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Scheller, Hans U.; and Scheller, Karl A., 5,089,256, Cl. 424-63.000.
Wustrow, David J.: See—
Jaen, Juan C.; Nickell, David G.; Reynolds, Donna M.; Smith, Sarah J.; Wise, Lawrence D.; and Wustrow, David J., 5,089,497, Cl. 514-253.000.
WYKO, Incorporated: See—
Byerley, Mark S., 5,089,077, Cl. 156-351.000.

Xerox Corporation: See—
Folkins, Jeffrey J., 5,089,847, Cl. 355-202.000.
Jodoin, Ronald E.; Loce, Robert P.; Lama, William L.; Rees, James D.; Ibrahim, Abd-El-Fattah A.; and Appel, James J., 5,089,908, Cl. 359-212.000.
Lee, Lieng-Huang; Lincoln, Diane C.; and Tarnawskij, Christine J., 5,089,364, Cl. 430-58.000.
Manno, Eugene; Wargo, John A.; and Morris, Daniel L., 5,089,852, Cl. 355-251.000.
McNeil, Daniel M., 5,089,295, Cl. 427-128.000.
Yu, Robert C. U., 5,089,369, Cl. 430-96.000.
Xydias, Jean, to Eastman Kodak Company. Electrostatographic apparatus having sheet cooling and turnover devices. 5,089,857, Cl. 355-318.000.
Yagi, Hiroshi: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Kamoshida, Masakazu, 5,089,314, Cl. 428-156.000.
Yamada, Akira: See—
Dunks, Gary B.; Yamada, Akira; Kwon, Oh-Seung; and Borgelt, Andrea, 5,089,180, Cl. 264-1.700.
Yamada, Hideaki; and Nagasawa, Toru, to Hideaki Yamada; and Nitto Kagaku Kogyo Kabushiki Kaisha. Method of culturing a strain of *Rhodococcus rhodochrous* having nitrile hydratase activity. 5,089,411, Cl. 435-244.000.
Yamada, Kuniaki: See—
Suganuma, Yoshiaki; and Yamada, Kuniaki, 5,089,109, Cl. 204-290.00R.
Yamada, Masatoshi, to Chion Kabushiki Kaisha. Device for automatically changing magnification of camera zoom lens. 5,089,841, Cl. 354-402.000.
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Yamada, Shuji: See—
Hamada, Tadashi; Yamada, Shuji; Tsuji, Eiji; and Mizukoshi, Tomoyuki, 5,089,223, Cl. 420-40.000.
Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichiro, to NKK Corporation. Apparatus for temperature measurement. 5,088,836, Cl. 374-183.000.
Yamaga, Kenichi: See—
Kakizaki, Jyunichi; and Yamaga, Kenichi, 5,088,922, Cl. 432-152.000.
Yamagishi, Fumio: See—
Igaki, Seigo; Shinzaki, Takashi; Yamagishi, Fumio; and Ikeda, Hiroyuki, 5,088,817, Cl. 356-71.000.
Yamagishi, Katsuaki; Kashima, Koji; and Kubo, Toru, to Kabushiki Kaisha Toshiba. Heat pump type heating apparatus and control method thereof. 5,088,646, Cl. 237-2.00B.
Yamaguchi, Hirotosugu: See—
Fukushima, Naoto; Yamaguchi, Hirotosugu; Akatsu, Yohsuke; Hano, Sunao; and Kawabata, Kazunobu, 5,089,966, Cl. 364-424.050.
Yamaguchi, Katsushi, to Ryobi Limited. Battery charger and charging method. 5,089,765, Cl. 320-32.000.
Yamaguchi, Koichi: See—
Takago, Toshio; Satoh, Shinichi; Oyama, Masayuki; Yamaguchi, Koichi; and Matsuda, Takashi, 5,089,649, Cl. 556-482.000.
Yamaguchi, Kouzou, to Sharp Kabushiki Kaisha. Printer of ribbon cassette fixed type. 5,088,846, Cl. 400-208.000.
Yamaguchi, Makio: See—
Ogura, Kouji; and Yamaguchi, Makio, 5,088,423, Cl. 110-182.500.
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Noda, Akira; Yamaguchi, Michihiro; Aizawa, Masanori; and Kumano, Yoshimaru, 5,089,269, Cl. 424-456.000.
Yamaguchi, Mitsuyuki: See—
Kikuchi, Shuji; Yamaguchi, Mitsuyuki; and Matsudo, Masahiko, 5,089,710, Cl. 250-492.300.
Yamaguchi, Takeshi: See—
Kimura, Kiyoshi; Yamaguchi, Takeshi; Morita, Iwao; and Murakami, Tetsuo, 5,089,529, Cl. 514-648.000.
Yamaguchi, Yasushi: See—
Watanabe, Shintaro; Yamaguchi, Yasushi; Nakayama, Shigeoyuki; Namioka, Hirotaka; and Terada, Hisashi, 5,090,023, Cl. 375-1.000.
Yamaha Corporation: See—
Komiya, Manabu, 5,088,379, Cl. 84-609.000.
Yamaha Hatsudoki Kabushiki Kaisha: See—
Washizu, Takehiro; and Nagamatsu, Tsutomu, 5,088,454, Cl. 123-52.0MB.
Yoshida, Takeo; and Suzuki, Minoru, 5,088,647, Cl. 239-96.000.
Yamakawa, Hiroshi: See—
Ozoe, Shinji; and Yamakawa, Hiroshi, 5,089,601, Cl. 528-390.000.
Yamamoto, Hiroshi, to Ikegami Tsushinki Co., Ltd. Sorter. 5,088,709, Cl. 270-53.000.
Yamamoto, Hiroshi: See—
Hamano, Masaaki; Yamamoto, Hiroshi; Nagakura, Mitsuru; and Ozawa, Yoshiaki, 5,089,065, Cl. 148-302.000.
Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,088,710, Cl. 270-53.000.
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Yamamoto, Kazumi, to Ikegami Tsushinki Co., Ltd. Circuit including clipping and non-linear processing means for correcting the tone of an image signal. 5,089,891, Cl. 358-164.000.

Yamamoto, Manabu: See—
Iizuka, Yoshio; Oothuka, Yoshiyuki; Tanaka, Satoshi; and Yamamoto, Manabu, 5,089,538, Cl. 523-132.000.
Yamamoto, Masato; Nakajima, Masahiro; Yamanaka, Toshimasa; and Satou, Kouji, to Asahi Kogaku Kogyo K.K. Switching dial and finger rest. 5,089,677, Cl. 200-339.000.
Yamamoto, Osamu; Sato, Akihiko; and Shiba, Hitoshi, to Hitachi Maxell, Ltd. Tape cartridge using metal and plastic resin. 5,088,656, Cl. 242-199.000.
Yamamoto, Shigeru, to Daiwa Seiko, Inc. Reel locking device. 5,088,225, Cl. 43-22.000.
Yamamoto, Shosaku; and Kakinuma, Kazuo, to Nippon Oil and Fats Co., Ltd. Primer compositions. 5,089,569, Cl. 525-452.000.
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeoyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, to Brother Kogyo Kabushiki Kaisha. Pressure developing device. 5,089,838, Cl. 354-304.000.
Yamamoto, Toshifumi; Takakura, Mitsuro; Yamaoka, Hiromasa; and Okada, Masakazu, to Hitachi, Ltd. Data communication method and apparatus. 5,090,029, Cl. 375-107.000.
Yamamoto, Yoshiharu: See—
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Yamamura, Yasuharu: See—
Kondo, Shigeo; and Yamamura, Yasuharu, 5,089,222, Cl. 419-10.000.
Yamana, Koji: See—
Nakajima, Ryuichi; and Yamana, Koji, 5,090,052, Cl. 379-98.000.
Yamanaka, Shusuke: See—
Morita, Moritsugu; Sato, Takushi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeoyuki, 5,089,355, Cl. 428-607.000.
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Yamaoka, Fumiyuki: See—
Kakizaki, Shinobu; Yamaoka, Fumiyuki; Sasaki, Mitsuo; Shimizu, Hiroyuki; and Emura, Junichi, 5,088,760, Cl. 280-707.000.
Yamaoka, Hiromasa: See—
Yamamoto, Toshifumi; Takakura, Mitsuro; Yamaoka, Hiromasa; and Okada, Masakazu, 5,090,029, Cl. 375-107.000.
Yamasaki, Komei: See—
Negi, Taichi; Mochizuki, Akira; Nagata, Shiro; Yamasaki, Komei; Funaki, Keisuke; and Sumitomo, Takashi, 5,089,353, Cl. 428-518.000.
Yamashita, Junzou; Ono, Yasuo; and Sumimura, Kunihiro, to Takeda Chemical Industries, Ltd. Calcium pantothenate composite. 5,089,276, Cl. 424-686.000.
Yamato, Masayuki: See—
Abe, Masahiro; Okada, Kazuhisa; Fukuda, Shuzo; Tanaka, Yasushi; Yamato, Masayuki; and Takada, Yoshikazu, 5,089,061, Cl. 148-110.000.
Yamauchi, Hiroshi: See—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatsu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seichiro; Kito, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 5,089,491, Cl. 514-206.000.
Yamazaki, Hiroshi: See—
Usami, Masahiro; Ueda, Kenji; Tomoshige, Kiyomi; Ohta, Shozo; Horiguchi, Tsutomu; and Yamazaki, Hiroshi, 5,088,432, Cl. 114-67.00R.
Yamazaki, Keiji: See—
Nakasa, Masayuki; Ishikawa, Norio; Hosomizu, Hiroshi; Izumi, Tatsuro; Yamazaki, Keiji; Miki, Yukio; and Katsuragi, Mamoru, 5,089,834, Cl. 354-145.100.
Yamazaki Mazak Kabushiki Kaisha: See—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; and Mitsukuchi, Yukio, 5,088,361, Cl. 82-127.000.
Yamazaki, Shigeru: See—
Uematsu, Masahiro; Harakawa, Tetsumi; Hiratsuka, Ryuichi; Ohmaru, Kenji; Yamazaki, Shigeru; Ito, Yasuhiro; Nemoto, Isao; and Kato, Kazuro, 5,089,824, Cl. 342-359.000.
Yamazaki, Shunpei; Suzuki, Kunio; Susukida, Masato; Kinka, Mikio; Fukuda, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Koyanagi, Kaoru; and Nagayama, Susumu, to Semiconductor Energy Laboratory Co., Ltd. Method for manufacturing a semiconductor device free from electrical shortage due to pin-hole formation. 5,089,426, Cl. 437-3.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Diamond thermistor and manufacturing method for the same. 5,089,802, Cl. 338-22.0SD.
Yamazaki, Yukinobu: See—
Gotoh, Akira; Yamazaki, Yukinobu; and Kikuchi, Naoyuki, 5,089,375, Cl. 430-271.000.
Yamamoto, Takayuki: See—
Murakami, Yoshihiro; and Yamamoto, Takayuki, 5,088,938, Cl. 439-595.000.
Yanagida, Jun, to Gojigen Kikaku Co.; and Petio Co., Ltd. Automatic engraving system. 5,088,864, Cl. 409-96.000.
Yanase, Yoshiyuki: See—
Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yanase, Yoshiyuki, 5,088,863, Cl. 408-230.000.
Yang, Philip C.: See—
Murray, Daniel J.; Dibbs, Mitchell G.; and Yang, Philip C., 5,089,660, Cl. 560-301.000.

Yang, Yu-Kang. Structure of thermostatic switch. 5,089,800, Cl. 337-380.000.
Yanidis, Apostol: See—
Strauss, Steven J.; Zuscik, Edward J.; Bower, William B.; and Yanidis, Apostol, 5,089,320, Cl. 428-216.000.
Yano, Haruto; Hirasu, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Navigation system for movable body. 5,089,826, Cl. 342-457.000.
Yano, Masayuki: See—
Wada, Shunichi; and Yano, Masayuki, 5,088,326, Cl. 73-517.00R.
Yariv, Amnon: See—
Wang, Haila; and Yariv, Amnon, 5,089,787, Cl. 330-4.900.
Yasuda, Hironori; and Tomoto, Yoshiharu, to Howa Machinery, Ltd. Unit drafting mechanism having air jet apertured slide metals and rollers. 5,088,157, Cl. 19-263.000.
Yasue, Takao, to Mitsubishi Denki Kabushiki Kaisha. Transfer vessel apparatus and method of storing samples. 5,088,290, Cl. 62-51.100.
Yasugi Seimitsu, Ltd.: See—
Kondo, Takajiro, 5,088,370, Cl. 83-528.000.
Yasumoto, Masahiko; Tsuchiya, Tohru; Shibuya, Isao; and Goto, Midori, to Director General of Agency of Industrial Science and Technology. Thiadiazine compound and method for preparing same. 5,089,612, Cl. 544-8.000.
Yatsuyanagi, Naoko, to Konica Corporation. Image forming method. 5,089,379, Cl. 430-434.000.
Yazaki Corporation: See—
Murakami, Yoshihiro; and Yamamoto, Takayuki, 5,088,938, Cl. 439-595.000.
Saito, Takahiro, 5,088,940, Cl. 439-621.000.
Yazaki, Takao: See—
Hayama, Kazuhide; Hosokawa, Noritaka; Yazaki, Takao; and Noro, Masataka, 5,089,291, Cl. 427-54.100.
Yazu, Shuji: See—
Sibata, Kenichiro; Sasaki, Nobuyuki; Yazu, Shuji; and Jodai, Tetsuji, 5,089,465, Cl. 505-1.000.
Yeh, Yun-Hui. Foldable water container. 5,088,838, Cl. 383-33.000.
Yellow Freight System, Inc.: See—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arold A.; and Payne, Lyle B., 5,088,873, Cl. 414-392.000.
Yen, Chen-Chou, to Ching Yang Necktie Co., Ltd. Combined and fixed necktie. 5,088,120, Cl. 2-152.00R.
Yissum Research Development Company of the Hebrew University of Jerusalem: See—
Spiegel, Itzhak; Chet, Ilan; Cohn, Eli; and Galper, Sergio, 5,089,263, Cl. 424-93.000.
Yocum, Gene H., to Soils, Inc. Radiant heat rotary volatilizer. 5,088,856, Cl. 405-128.000.
Yoder, Alan J.: See—
Eggers, Thomas A.; and Yoder, Alan J., 5,088,532, Cl. 144-356.000.
Yokogawa, Fumihiko, to Pioneer Electric Corporation. Spindle control device in optical disk recording/reproducing apparatus. 5,089,900, Cl. 358-338.000.
Yokogawa Medical Systems, Limited: See—
Yoshitome, Eiji; and Kosugi, Susumu, 5,089,784, Cl. 324-309.000.
Yokomachi, Naoya: See—
Kawai, Katsunori; Ikeda, Hayato; Ishihara, Shinichi; Tanikawa, Kazuhiro; Yokomachi, Naoya; and Kawai, Toshihiro, 5,088,897, Cl. 417-269.000.
Yokomori, Sadakazu; Saijo, Keiko; Matsunaga, Tohru; Nakashima, Yoshimoto; and Hatayama, Katsuo, to Taisho Pharmaceutical Co., Ltd. Chalcone derivatives. 5,089,654, Cl. 560-53.000.
Yokosuka, Hirobumi; and Sakai, Yasuo, to Hitachi, Ltd. Parallel-to-serial signal converting apparatus and image displaying system using the same. 5,089,819, Cl. 341-101.000.
Yokota, Mitsuo: See—
Takahashi, Minoru; and Yokota, Mitsuo, 5,089,833, Cl. 354-105.000.
Yokota, Shigeru; Koyama, Hiroshi; and Kojima, Hidetaka, to Darcel Chemical Industries, Ltd. Process for producing carbonic acid ester. 5,089,650, Cl. 558-277.000.
Yokota, Shinichi: See—
Umeda, Takashi; Zemba, Seichi; Hara, Kazuo; Takamoto, Katsunori; and Yokota, Shinichi, 5,089,553, Cl. 524-424.000.
Yokouchi, Kazuhiro: See—
Yano, Haruto; Hirasu, Yoshiaki; Tokunaga, Toshimichi; Naito, Norihiro; Yokouchi, Kazuhiro; and Shimizu, Osamu, 5,089,826, Cl. 342-457.000.
Yokowo Mfg. Co., Ltd. See—
Haruyama, Shinichi; and Asai, Hideaki, 5,089,829, Cl. 343-852.000.
Yokoyama, Hiroshi, to Nissan Motor Co., Ltd. Accelerator pedal assembly. 5,088,343, Cl. 74-560.000.
Yoneyama, Hiroaki; and Nishihara, Yoshihiro, to Mitsubishi Rayon Co., Ltd. Carbon based porous hollow fiber membrane and method for producing same. 5,089,135, Cl. 210-500.230.
Yoo, Byung-Deok: See—
Hong, Jung-In; Yoo, Byung-Deok; and Ahn, Tae-Hyuk, 5,089,436, Cl. 437-60.000.
Yoo, Chue-San, to Taiwan Semiconductor Manufacturing Company. Polycide gate MOSFET process for integrated circuits. 5,089,432, Cl. 437-40.000.
Yoon, Hee K.: See—
Freeman, Horace L.; and Yoon, Hee K., 5,088,484, Cl. 602-44.000.
York, James D.: See—
Goodrich, Robert R.; and York, James D., 5,088,587, Cl. 194-345.000.

- Yoshida, Hitoshi; Sakai, Hitoshi; Oki, Shuichi; Watanabe, Keiichi; Yoshida, Manabu; and Oda, Toshio, to NGK Insulators, Ltd. Process for producing bismuth-based superconducting oxide. 5,089,468, Cl. 505-1.000.
- Yoshida Kogyo K.K.: See—
Ishikawa, Masayoshi, 5,088,154, Cl. 16-252.000.
- Yoshida, Manabu: See—
Yoshida, Hitoshi; Sakai, Hitoshi; Oki, Shuichi; Watanabe, Keiichi; Yoshida, Manabu; and Oda, Toshio, 5,089,468, Cl. 505-1.000.
- Yoshida, Masaru: See—
Yamada, Takeo; Otonari, Mitsuya; Yoshida, Masaru; Harada, Naoki; Takano, Shuichi; and Ohtaka, Shinichi, 5,088,836, Cl. 374-183.000.
- Yoshida, Naoyuki: See—
Ogawa, Tetsuya; Yoshida, Naoyuki; Takano, Seiichi; and Ogawara, Kunio, 5,089,176, Cl. 260-410.000.
- Yoshida, Shunji: See—
Morita, Moritsugu; Sato, Takushi; Yamanaka, Shusuke; Yoshida, Shunji; Tanabe, Kenji; Naito, Mitsuyuki; and Shishido, Shigeyuki, 5,089,355, Cl. 428-607.000.
- Yoshida, Takeo; and Suzuki, Minoru, to Yamaha Hatsudoki Kabushiki Kaisha. Feeder wire structure for high pressure fuel injection unit. 5,088,647, Cl. 239-96.000.
- Yoshida, Takeshi: See—
Ogura, Mitsuru; Yoshida, Takeshi; and Yoshiura, Shoichiro, 5,089,850, Cl. 355-215.000.
- Yoshida, Tomiharu: See—
Omote, Tatsuyuki; Yoshida, Tomiharu; Maki, Hideo; Senoh, Makoto; Takahashi, Fuminobu; and Tsuchita, Kenji, 5,089,213, Cl. 376-248.000.
- Yoshida, Toshiyasu, to Jatco Corporation. Failure detecting system for automatic power transmission. 5,088,353, Cl. 74-866.000.
- Yoshida, Yukihiro: See—
Ueda, Satoshi; Hirota, Koji; Itoh, Makoto; Yoshida, Yukihiro; Hukuda, Hirokazu; and Hamashima, Shigeki, 5,089,705, Cl. 250-352.000.
- Yoshikawa, Motonobu; and Yamamoto, Yoshiharu, to Matsushita Electric Industrial Co., Ltd. Post-objective type optical scanner and image forming apparatus using the same. 5,089,907, Cl. 359-206.000.
- Yoshikawa, Mutsumi: See—
Takayama, Shuichi; Hayashi, Masaaki; Fuse, Eiichi; Ishiura, Koichi; Yoshikawa, Mutsumi; Tagawa, Motoyuki; and Inaba, Makoto, 5,088,492, Cl. 128-654.000.
- Yoshikumi, Chikao: See—
Muto, Shigeaki; Niimura, Koichi; Oohara, Minoru; Oguchi, Yoshiharu; Matsunaga, Kenichi; Hirose, Kunitaka; Kakuchi, Junji; Sugita, Norifumi; Furusho, Takao; Yoshikumi, Chikao; and Takahashi, Masaaki, 5,089,481, Cl. 514-54.000.
- Yoshimizu, Toshiyuki: See—
Ohnishi, Hiroshi; Yoshimizu, Toshiyuki; Wada, Masakazu; Kuwagaki, Hiroshi; and Katsube, Toshimichi, 5,089,906, Cl. 359-73.000.
- Yoshimura, Isao; Ohno, Toshiaki; and Hata, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. High-sensitivity thermosensitive multilayer film and method for production of plate-making stencil sheet. 5,089,341, Cl. 428-412.000.
- Yoshimura, Shoji, to Kabushiki Kaisha Kobe Seiko Sho. Screw rotor for oil flooded screw compressors. 5,088,907, Cl. 418-201.300.
- Yoshinaga, Yoko: See—
Kuwayama, Tetsuro; Taniguchi, Naosato; Yoshinaga, Yoko; and Kushibiki, Nobuo, 5,089,903, Cl. 359-15.000.
- Yoshino, Takako: See—
Wada, Kazuhiro; Baba, Nobuyoshi; Ono, Sachiko; and Yoshino, Takako, 5,089,092, Cl. 205-75.000.
- Yoshioka, Hiroshi; and Iwai, Shingo, to Mitsubishi Denki K.K. Motor-operated pump having a projection for protecting a commutator. 5,088,900, Cl. 417-366.000.
- Yoshitake, Makoto, to Dow Corning Toray Silicone Company, Ltd. Certain 3-nitro-pyridyl amino methyl silanes and siloxanes. 5,089,620, Cl. 546-14.000.
- Yoshitome, Eiji; and Kosugi, Susumu, to Yokogawa Medical Systems, Limited. Method for restricting region for magnetic resonance imaging. 5,089,784, Cl. 324-309.000.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—
Miura, Takanori; Kohara, Masanori; and Oka, Kunihide, 5,089,655, Cl. 560-75.000.
- Yoshiura, Shoichiro: See—
Ogura, Mitsuru; Yoshida, Takeshi; and Yoshiura, Shoichiro, 5,089,850, Cl. 355-215.000.
- Yoshizawa, Shigeo: See—
Nakamura, Yoshinori; Miyazawa, Yoshiki; and Yoshizawa, Shigeo, 5,089,208, Cl. 264-513.000.
- Yosida, Kiyohiko: See—
Kanda, Ryouji; and Yosida, Kiyohiko, 5,088,700, Cl. 267-140.10A.
- Young, David B.; and Pawlak, Andrzej M. Drive system for artificial hearts and left-ventricular assist devices. 5,089,017, Cl. 623-3.000.
- Young, Donald C.: See—
Brown, Roger A.; Young, Donald C.; and Miller, Alex E., 5,089,040, Cl. 71-63.000.
- Young, Robert H. Returned stair tread having moisture compensated joint. 5,088,247, Cl. 52-182.000.
- Yu, Lin-Chen, to Himont Incorporated. Process for the preparation of aryl-substituted propionic acid esters. 5,089,656, Cl. 560-75.000.
- Yu, Robert C. U., to Xerox Corporation. Stress/strain-free electrophotographic device and method of making same. 5,089,369, Cl. 430-96.000.
- Yuhan Corporation: See—
Kim, Choong S.; Suh, Jung J.; Lee, Bong Y.; Kim, Chang S.; Lee, Jong W.; Kim, Byung C.; and Han, Byung H., 5,089,624, Cl. 546-321.000.
- Yuki, Satoshi: See—
Morinaka, Yasuhiro; Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Sakurai, Hiroko; Hayashi, Yoshio; and Fukushima, Nobuko, 5,089,515, Cl. 514-404.000.
- Yuki, Yoichi: See—
Hasegawa, Masaki; Saigo, Kazuhiko; Yuki, Yoichi; and Tachibana, Kouzou, 5,089,642, Cl. 556-1.000.
- Yukitake, Takeshi: See—
Zdepski, Joel W.; Joseph, Kuriacose; Wakamori, Masahiro; and Yukitake, Takeshi, 5,089,888, Cl. 358-133.000.
- Zaengel, Thomas: See—
Welker, Thomas; and Zaengel, Thomas, 5,089,883, Cl. 358-60.000.
- Zaid, Najib H., to Jacam Chemical Partners, Ltd. Composition and method for absorbing odors using citric acid and citrate. 5,089,258, Cl. 424-76.100.
- Zakhor, Avideh; and Rzedzian, Richard R., to Advanced NMR Systems, Inc. Method of cancelling ghosts from NMR images. 5,089,778, Cl. 324-312.000.
- Zakreski, Charles T.: See—
Haynes, Andrew S.; and Zakreski, Charles T., 5,088,520, Cl. 137-270.000.
- Zambon Group S.p.A.: See—
Meneghin, Mariano, 5,089,613, Cl. 544-35.000.
- Zampino, Michael J.; Wilson, Richard A.; and Mookherjee, Braja D., to International Flavors & Fragrances Inc. Bisabolene-containing composition, process for preparing same, organoleptic uses thereof and uses thereof as insect repellent. 5,089,469, Cl. 512-22.000.
- Zaranski, Mark T.: See—
LaFreniere, Bryant R.; Zaranski, Mark T.; and Miller, Marvin P., 5,088,335, Cl. 73-864.620.
- Zdepski, Joel W.; Joseph, Kuriacose; Wakamori, Masahiro; and Yukitake, Takeshi, to Matsushita Electric Industrial Co., Ltd. Moving-image signal encoding apparatus with variably selected quantization step size. 5,089,888, Cl. 358-133.000.
- Zebco Corporation: See—
Henderson, William A., 5,088,943, Cl. 440-6.000.
- Zeeck, Axel: See—
Wink, Joachim; Grabley, Susanne; Seibert, Gerhard; Hutter, Klaus; and Zeeck, Axel, 5,089,521, Cl. 514-450.000.
- Zelle, Robert E.: See—
DeBernardis, John F.; Arendsen, David L.; and Zelle, Robert E., 5,089,519, Cl. 514-422.000.
- Zemba, Seiichi: See—
Umeda, Takashi; Zemba, Seiichi; Hara, Kazuo; Takamoto, Katsunori; and Yokota, Shinichi, 5,089,553, Cl. 524-424.000.
- Zemp, Othmar; and Meier, Albrecht, to Elektro-Apparatebau Olten AG. Mechanical momentary or alternate action switch. 5,089,678, Cl. 200-454.000.
- Zenkel, Martin: See—
Landgraf, Tilo; Kunz, Rainer; Ropers, Johann; and Zenkel, Martin, 5,089,215, Cl. 376-260.000.
- Zerand-Bernal Group, Inc.: See—
Cracchiolo, Vincenzo; Hawley, Terry L.; Moore, Robert E.; Radlick, David D.; and Stuben, Frank S., 5,088,367, Cl. 83-345.000.
- Zercie, Robert W.: See—
Pelanc, Geraldine A.; Zercie, Robert W.; and Kanaley, James D., 5,089,389, Cl. 435-7.360.
- Zerfahs, Arthur S.; Hoffman, Kirk D.; and Diamond, Norman, to General Signal Corporation. Card reader device having automatic means for clamping the card to be read and for automatically ejecting the card at the end of the card reading and writing operations. 5,089,694, Cl. 235-486.000.
- Zexel-Gleason USA, Inc.: See—
Dye, James S., 5,088,970, Cl. 475-227.000.
- Zhou, Peng W.: See—
Wong, Henry; and Zhou, Peng W., 5,088,390, Cl. 99-327.000.
- Zhu, Ming D.; Chen, Jeng-Chyh; and Hjerten, Stellan, to Bio-Rad Laboratories, Inc. Electrophoretic sieving in gel-free media with dissolved polymers. 5,089,111, Cl. 204-180.100.
- Zhu, Yong H.: See—
Kirsch, Wolff M.; Zhu, Yong H.; and Cushman, Robert B., 5,089,007, Cl. 606-205.000.
- Zimmel, John M.; Katsaros, Mark G.; and Bunnelle, William L., to H. B. Fuller Company. Hot-melt moisture indicator material for disposable articles. 5,089,548, Cl. 524-272.000.
- Zimmer, Inc.: See—
Fallin, Thomas W.; and Kang, Joseph H., 5,089,003, Cl. 606-85.000.
- Zimmermann, Ewald, to Lindauer Dornier GmbH. Reed beam construction with adjustable gripper rod guide surfaces. 5,088,525, Cl. 139-188.00R.
- Zimpro Passavant Environmental Systems, Inc.: See—
Ross, David S., 5,089,147, Cl. 210-793.000.
- Zink, Deborah L.: See—
Tsiouras, Athanasios; Ostlind, Dan A.; Hensens, Otto D.; and Zink, Deborah L., 5,089,530, Cl. 514-682.000.
- Zinnbauer, Jerry, to Technimark, Inc. Furniture extremity. 5,088,669, Cl. 248-188.900.
- Zint, Jerry A. Garden cart. 5,088,751, Cl. 280-47.340.

- Zoerner, Marty M.: See—
Ozkahyaoglu, Aysegul; and Zoerner, Marty M., 5,089,144, Cl. 210-767.000.
- Zubillaga, Inigo I.: See—
Butler, Nicholas D.; Woodthorpe, John; Fernandez, Francisco C.; and Zubillaga, Inigo I., 5,089,197, Cl. 264-65.000.
- Zuk, Robert F.: See—
Leeder, Sydney; and Zuk, Robert F., 5,089,383, Cl. 435-7.900.
- Zurek, Thomas F.: See—
Khalil, Omar S.; Zurek, Thomas F.; Genger, Kevin R.; Pepe, Curtis J.; Jou, Yi-Her; and Cotter, Stephen M., 5,089,424, Cl. 436-518.000.
- Zuscik, Edward J.: See—
Straus, Steven J.; Zuscik, Edward J.; Bower, William B.; and Yanidis, Apostol, 5,089,320, Cl. 428-216.000.
- Zushi, Shizuo: See—
Kojima, Hiroyuki; Hatsuda, Toshio; Daikoku, Takahiro; Zushi, Shizuo; and Kobayashi, Fumiyuki, 5,089,936, Cl. 361-387.000.
- Zweig, Arold A.: See—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arold A.; and Payne, Lyle B., 5,088,873, Cl. 414-392.000.
- Zylla, Elizabeth G.: See—
Elmore, Jimmy D.; and Zylla, Elizabeth G., 5,089,658, Cl. 560-182.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF FEBRUARY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Coughran, Samuel J., Jr., to Rome Industries, Inc. Hinge-type offset wheel harrow. Re. 33,822, Cl. 172-240.000.
Hycor Biomedical, Inc.: See—
Mitchell, Vance C., Re. 33,826, Cl. 359-398.000.
International Business Machines Corporation: See—
Stammely, Thomas E., Re. 33,825, Cl. 361-156.000.
Johnson, Richard A. Fault detecting intrusion detection device. Re. 33,824, Cl. 340-522.000.
Meyer, Larry P.: See—
Nelson, Barton R.; Meyer, Larry P.; and Sesser, George L., Re. 33,823, Cl. 239-222.170.
Mitchell, Vance C., to Hycor Biomedical, Inc. Microscope inspection slide. Re. 33,826, Cl. 359-398.000.
Nelson, Barton R.; Meyer, Larry P.; and Sesser, George L., to Nelson Irrigation Corporation. Rotary sprinkler head. Re. 33,823, Cl. 239-222.170.
Nelson Irrigation Corporation: See—
Nelson, Barton R.; Meyer, Larry P.; and Sesser, George L., Re. 33,823, Cl. 239-222.170.
Rome Industries, Inc.: See—
Coughran, Samuel J., Jr., Re. 33,822, Cl. 172-240.000.
Sesser, George L.: See—
Nelson, Barton R.; Meyer, Larry P.; and Sesser, George L., Re. 33,823, Cl. 239-222.170.
Stammely, Thomas E., to International Business Machines Corporation. Sub-milliamp mechanical relay control. Re. 33,825, Cl. 361-156.000.
Terry, Sydney L. Locking fastener. Re. 33,827, Cl. 411-149.000.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Ensminger, Robert P.; McCleary, Robert E.; and Wenzlow-Lukasch, Ludwig, to United States Gypsum Company. Cement board having reinforced edges. B1 4,916,004, 2-18-92, Cl. 428-192.000.
Matsumoto, Hisashi; and Niimi, Hiroji. Grafted polyolefin composition having improved adhesiveness. B1 4,198,327, 2-18-92, Cl. 525-73.000.
McCleary, Robert E.: See—
Ensminger, Robert P.; McCleary, Robert E.; and Wenzlow-Lukasch, Ludwig, B1 4,916,004, Cl. 428-192.000.
Niimi, Hiroji: See—
Matsumoto, Hisashi; and Niimi, Hiroji, B1 4,198,327, Cl. 525-73.000.
Spalding & Evenflo Companies, Inc.: See—
Sullivan, Michael J., B1 4,884,814, Cl. 273-235.00R.
Sullivan, Michael J., to Spalding & Evenflo Companies, Inc. Golf ball. B1 4,884,814, 2-18-92, Cl. 273-235.00R.
United States Gypsum Company: See—
Ensminger, Robert P.; McCleary, Robert E.; and Wenzlow-Lukasch, Ludwig, B1 4,916,004, Cl. 428-192.000.
Wenzlow-Lukasch, Ludwig: See—
Ensminger, Robert P.; McCleary, Robert E.; and Wenzlow-Lukasch, Ludwig, B1 4,916,004, Cl. 428-192.000.

LIST OF DESIGN PATENTEEES

- A.M. Weiss (A Partnership): See—
Baranes, Shalom, 324,003, Cl. D11-90.000.
A. T. Cross Company: See—
von Edler, Jens E.; and Boyce, Stephen V., 324,072, Cl. D19-51.000.
Abe, Takashi: See—
Nakahara, Michihiro; and Abe, Takashi, 324,043, Cl. D14-126.000.
Abrams, Hyman. Combined napkin holder and condiment caddy. 323,956, 2-18-92, Cl. D7-632.000.
Acker, James L.: See—
Pinkos, Richard; and Acker, James L., 324,073, Cl. D19-52.000.
Adobe Systems Incorporated: See—
Slimbach, Robert J., 324,063, Cl. D18-24.000.
Aktiebolaget Volvo: See—
Malmgren, Rolf A.; and Falck, Frans G., 324,017, Cl. D12-169.000.
Albrechtson, Loren R.; Barnhart, Lloyd; Huggins, Robert; and Morey, Sandra D., to Battelle Memorial Institute. Random number generator. 324,081, 2-18-92, Cl. D21-37.000.
Alfa-Laval Agriculture International AB: See—
Skilius, Hans, 324,116, Cl. D30-132.000.
Alvut, Mark: See—
Gelen, Michael, 324,083, Cl. D21-100.000.
AMP Incorporated: See—
Lambert, Lahman D., II; and Puerner, Dean A., 324,031, Cl. D13-147.000.
AMS Packaging: See—
Geiger, Reinold, 323,982, Cl. D9-377.000.
Ando, Takaharu, to Kabushiki Kaisha Toshiba. Digital electronic branch exchange unit. 324,050, 2-18-92, Cl. D14-240.000.
Ansell, Daniel F.; Garmon, Vincent S.; Mayer, Ruth A.; and White, Graham M., to International Business Machines Corporation. Slim-line tape drive bezel. 324,039, 2-18-92, Cl. D14-115.000.
Antoine, Celess. Dog umbrella. 324,117, 2-18-92, Cl. D30-144.000.
Arbisi, Thomas E., to Prince Corporation. Vehicle interior light. 324,111, 2-18-92, Cl. D26-28.000.
Arnold & Richter Cline Technik GmbH & Co.: See—
Popp, Thomas; and Segers, Reinhard, 324,061, Cl. D16-225.000.
AT&T Bell Laboratories: See—
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggeles, Stephen G., 324,037, Cl. D14-102.000.
Avia Group International, Inc.: See—
Earle, John S., 323,924, Cl. D2-314.000.
Bailey, Mansel M. Bumper step. 324,019, 2-18-92, Cl. D12-203.000.
Baranes, Shalom, to A.M. Weiss (A Partnership). Gemstone. 324,003, 2-18-92, Cl. D11-90.000.
Barnes, Larry. Door prop. 323,976, 2-18-92, Cl. D8-402.000.
Barnhart, Lloyd: See—
Albrechtson, Loren R.; Barnhart, Lloyd; Huggins, Robert; and Morey, Sandra D., 324,081, Cl. D21-37.000.
Barrault, Jean-Louis, to Moulinex (Societe Anonyme). Electric deep fat fryer. 323,954, 2-18-92, Cl. D7-354.000.
Bastidos, Hugo. Bottle. 323,983, 2-18-92, Cl. D9-378.000.
Bates Manufacturing Company, The: See—
Freitag, L. Wayne, 324,076, Cl. D19-78.000.
Batrack, David; and Corley, Chris. Combined aerial toy and tether therefor. 324,114, 2-18-92, Cl. D21-86.000.

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- Battelle Memorial Institute: See—
Albrechtson, Loren R.; Barnhart, Lloyd; Huggins, Robert; and Morey, Sandra D., 324,081, Cl. D21-37.000.
Baugh, Ben; and Feehan, Richard J., to Zebco Corporation. Spinning fishing reel. 324,092, 2-18-92, Cl. D22-141.000.
Bean, Anabel B.: See—
Ciampi, Louisa B.; and Bean, Anabel B., 323,959, Cl. D7-699.000.
Bengtsson, Lars, to Boras Stampelfabrik AB. Stamp. 324,062, 2-18-92, Cl. D18-15.000.
Bennetts, John R. Airplane seat attachable bag. 323,938, 2-18-92, Cl. D3-78.000.
Bernardini, Deborah L.: See—
Meyers, Edward J., Jr.; and Bernardini, Deborah L., 323,918, Cl. D1-106.000.
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 323,919, Cl. D1-106.000.
Bike-Up Canada Inc.: See—
Smith, Terrance R., 324,009, Cl. D12-115.000.
Black & Decker Inc.: See—
Bunyea, Roderick F., 323,963, Cl. D8-62.000.
Blocker, James S.; and Donan, Elizabeth T. Grocery bag carrier. 323,968, 2-18-92, Cl. D8-315.000.
Boras Stampelfabrik AB: See—
Bengtsson, Lars, 324,062, Cl. D18-15.000.
Bormioli, Pier L., to Vetteria Parmense Bormioli. Bottle. 323,985, 2-18-92, Cl. D9-403.000.
Bouilhet, Henri, to Orfeverrie Christofle. Handle for an article of flatware. 323,957, 2-18-92, Cl. D7-653.000.
Boventa-Henex SA: See—
Burgener, Eddy, 323,989, Cl. D10-18.000.
Boyce, Stephen V.: See—
von Edler, Jens E.; and Boyce, Stephen V., 324,072, Cl. D19-51.000.
British Telecommunications public limited company: See—
Williams, John K., 324,034, Cl. D13-156.000.
Brooks, Hershell. Helmet. 324,115, 2-18-92, Cl. D29-15.000.
Brown, Paul D.; and Morris, Jonathan R., to Reebok International Ltd. Shoe upper. 323,925, 2-18-92, Cl. D2-314.000.
Brown, Paul D.; and Serna, Ralph, to Reebok International Ltd. Shoe upper. 323,926, 2-18-92, Cl. D2-314.000.
Brussing, Bernd, to Hefendehl, Hans Friedrich. Insert for trash containers. 324,122, 2-18-92, Cl. D34-10.000.
Bunyea, Roderick F., to Black & Decker Inc. Finishing sander or similar article. 323,963, 2-18-92, Cl. D8-62.000.
Burgener, Eddy, to Boventa-Henex SA. Tableclock case. 323,989, 2-18-92, Cl. D10-18.000.
Burgess, Karen E., to Gastro-Gnomes, Inc. Food and beverage menu holder for restaurant tables or the like. 324,079, 2-18-92, Cl. D20-40.000.
Bycraft, John T.: See—
Pomeroy, Charles; and Bycraft, John T., 323,947, Cl. D6-495.000.
Cabot Safety Corporation: See—
Cantor, Michael A.; and Desy, Raoul O., 324,059, Cl. D16-102.000.
Cantor, Michael A.; and Desy, Raoul O., to Cabot Safety Corporation. Eyeglass safety frame. 324,059, 2-18-92, Cl. D16-102.000.
Cappa, Harry J., Jr.: See—
Forman, Harold M.; Gally, Stephen R.; Hartman, Jo A.; and Cappa, Harry J., Jr., 323,979, Cl. D9-305.000.
Caridi, William. Magnetic flashlight holder. 324,109, 2-18-92, Cl. D26-140.000.
Casablanca Fan Company, Inc.: See—
Holbrook, Richard M., 324,100, Cl. D23-411.000.
Casella, David W., to Compri Technic Pty. Ltd. Pneumatic gun. 323,962, 2-18-92, Cl. D8-61.000.
Cecil, Robert A.; Wislocki, Nicholas C.; and Grisar, Robert, to Pikcer International Inc. Computerized tomographic scanner control keyboard. 324,104, 2-18-92, Cl. D24-158.000.
Ceglia, Frank: See—
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 323,919, Cl. D1-106.000.
Chrysler Corporation: See—
Gandini, Marcello; and Gale, Thomas C., 324,007, Cl. D12-90.000.
Ciampi, Louisa B.; and Bean, Anabel B. Baking board. 323,959, 2-18-92, Cl. D7-699.000.
Ciolino, Peter A. Aquatic exercise float. 324,091, 2-18-92, Cl. D21-238.000.
Claveria, Ric, to L.A. Gear, Inc. Element of a shoe outsole. 323,928, 2-18-92, Cl. D2-320.000.
Colson, Wendell, to Hunter Douglas Inc. Pleat shaped vertical support for window coverings. 324,108, 2-18-92, Cl. D25-119.000.
Compri Technic Pty. Ltd.: See—
Casella, David W., 323,962, Cl. D8-61.000.
Connell, Michael J.: See—
Hart, H. Neal; and Connell, Michael J., 324,022, Cl. D12-314.000.
Hart, H. Neal; and Connell, Michael J., 324,023, Cl. D12-314.000.
Cooper Industries: See—
Wilhelm, Gary L.; and Mock, Mel C., 323,960, Cl. D8-5.000.
Cooper Industries, Inc.: See—
Von Kluck, Kevin, 324,112, Cl. D26-86.000.
Cooper, Joyce. Moist towelette dispenser. 323,948, 2-18-92, Cl. D6-518.000.
Corley, Chris: See—
Batrack, David; and Corley, Chris, 324,114, Cl. D21-86.000.
Costello, James J.: See—
Pleet, Lawrence; and Costello, James J., 323,950, Cl. D7-313.000.
Coveri, Enrico. Watch. 323,992, 2-18-92, Cl. D10-32.000.
CPC International Inc.: See—
Meyers, Edward J., Jr.; and Bernardini, Deborah L., 323,918, Cl. D1-106.000.
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 323,919, Cl. D1-106.000.
Crider, Gary. Doll or similar article. 324,087, 2-18-92, Cl. D21-166.000.
Dardashti, Shahriar. Rotatable storage rack. 323,945, 2-18-92, Cl. D6-458.000.
Dean, Dennis. Carburetor enhancement pump. 324,052, 2-18-92, Cl. D15-5.000.
DeJaynes, Arnold M. Ribbon dispenser. 324,074, 2-18-92, Cl. D19-69.000.
Desy, Raoul O.: See—
Cantor, Michael A.; and Desy, Raoul O., 324,059, Cl. D16-102.000.
Diamond Products, Inc.: See—
Moller, Karl H.; and Jedick, Andrew L., 323,965, Cl. D8-70.000.
Diesel Kiki Co. Ltd.: See—
Herbst, Walter B.; Hurley, Paul D.; and Poisson, Norman D., 324,068, Cl. D19-50.000.
Donan, Elizabeth T.: See—
Blocker, James S.; and Donan, Elizabeth T., 323,968, Cl. D8-315.000.
Du Pont de Nemours (France) S.A.: See—
Perrin, Jean, 323,980, Cl. D9-347.000.
Earle, John S., to Avia Group International, Inc. Shoe upper. 323,924, 2-18-92, Cl. D2-314.000.
Edge, James L. Circuit breaker locator. 323,998, 2-18-92, Cl. D10-78.000.
Eldon Industries, Inc.: See—
Evenson, Mel, 324,077, Cl. D19-85.000.
Emmert, Donald G. Boat shoe. 323,922, 2-18-92, Cl. D2-268.000.
Endo, Akira, to Sony Corporation. Microphone. 324,049, 2-18-92, Cl. D14-228.000.
Etro, Gerolamo, to Etro S.p.A. Shopping bag. 323,977, 2-18-92, Cl. D9-305.000.
Etro, Gerolamo, to Etro S.p.A. Box. 323,978, 2-18-92, Cl. D9-307.000.
Etro S.p.A.: See—
Etro, Gerolamo, 323,977, Cl. D9-305.000.
Etro, Gerolamo, 323,978, Cl. D9-307.000.
Evatt, Michaela; Monaghan, Reynolds P.; and Kay, Alan E., to McIlwraith-Davey Pty Ltd. Double bowl sink. 324,097, 2-18-92, Cl. D23-290.000.
Evenson, Mel, to Eldon Industries, Inc. Pencil cup. 324,077, 2-18-92, Cl. D19-85.000.
Everett, Frederick A., Jr.: See—
Farrar, Quinton J.; Everett, Frederick A., Jr.; and Heimann, Richard H., 324,102, Cl. D24-118.000.
Everett, Patricia. Training spoon. 323,958, 2-18-92, Cl. D7-663.000.
Fabrications PRAT/EUROPA: See—
Prat, Dominique, 323,934, Cl. D3-71.000.
Falck, Frans G.: See—
Malmgren, Rolf A.; and Falck, Frans G., 324,017, Cl. D12-169.000.
Farrar, Quinton J.; Everett, Frederick A., Jr.; and Heimann, Richard H., to Pfizer Hospital Products Group, Inc. Drainage device for draining bodily fluids from a patient. 324,102, 2-18-92, Cl. D24-118.000.
Feehan, Richard J.: See—
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- Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,028, Cl. D13-133.000.
- Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,032, Cl. D13-147.000.

Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,032, Cl. D13-147.000.
 Yazaki Corporation: See—
 Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 324,033, Cl. D13-147.000.
 Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,025, Cl. D13-133.000.
 Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,027, Cl. D13-133.000.

Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,028, Cl. D13-133.000.
 Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,032, Cl. D13-147.000.
 Yoneyama, Kazunobu; and Sakamoto, Michiharu, to Nitsuko Corporation & Folmer Company Limited. Voice controlled telephone with loudspeaker. 324,046, 2-18-92, Cl. D14-150.000.
 Yuen, John S., to John Manufacturing Limited. Direct plug-in rechargeable light. 324,110, 2-18-92, Cl. D26-44.000.
 Zebco Corporation: See—
 Baugh, Ben; and Feehan, Richard J., 324,092, Cl. D22-141.000.
 Zojirushi Corporation: See—
 Inoue, Tsunemichi, 323,951, Cl. D7-317.000.

LIST OF PLANT PATENTEEES

Ball Seed Co.: See—
 White, James, 7,799, Cl. 68.000.
 White, James, 7,800, Cl. 68.000.
 White, James, 7,801, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Rosetta. 7,791, 2-18-92, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Splendor. 7,792, 2-18-92, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Blazon. 7,793, 2-18-92, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Majestic. 7,794, 2-18-92, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Revelry. 7,795, 2-18-92, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Illusion. 7,796, 2-18-92, Cl. 68.000.
 Drewlow, Lyndon W., to Mikkelsen, Inc. Impatiens plant named Heathermist. 7,797, 2-18-92, Cl. 68.000.

Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Keepsake. 7,798, 2-18-92, Cl. 68.000.
 Mikkelsen, Inc.: See—
 Drewlow, Lyndon W., 7,791, Cl. 68.000.
 Drewlow, Lyndon W., 7,792, Cl. 68.000.
 Drewlow, Lyndon W., 7,793, Cl. 68.000.
 Drewlow, Lyndon W., 7,794, Cl. 68.000.
 Drewlow, Lyndon W., 7,795, Cl. 68.000.
 Drewlow, Lyndon W., 7,796, Cl. 68.000.
 Drewlow, Lyndon W., 7,797, Cl. 68.000.
 Drewlow, Lyndon W., 7,798, Cl. 68.000.
 Van Staavern, B.V.: See—
 van Andel, Jacob, 7,802, Cl. 70.000.
 van Andel, Jacob, to Van Staavern, B.V. Carnation named 'Stadia'. 7,802, 2-18-92, Cl. 70.000.
 White, James, to Ball Seed Co. Poinsettia plant named Marjo Charm. 7,799, 2-18-92, Cl. 68.000.
 White, James, to Ball Seed Co. Poinsettia plant named Marjo Rose. 7,800, 2-18-92, Cl. 68.000.
 White, James, to Ball Seed Co. Poinsettia plant named Marjo White. 7,801, 2-18-92, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 18, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	525	5,088,180	287	5,088,243	64.11	5,089,041	5,088,375	298	5,088,440
9	5,088,114	563	5,088,181	288	5,088,244	74	5,089,042	411 M	5,088,376
69	5,088,115	568	5,088,182	289	5,089,032	90	5,089,043	422.3	5,088,377
82	5,088,116	599	5,088,183	CLASS 52			5,089,044	470 R	5,088,378
114	5,088,117		5,088,184			92	5,089,045	609	5,088,379
144	5,088,118	605	5,088,185	82	5,088,245	103	5,089,046	637	5,088,380
146	5,088,119	623.2	5,088,186	127.8	5,088,246	CLASS 72		1.814	5,088,381
152 R	5,088,120	705	5,089,027	182	5,088,247	46	5,088,307	CLASS 89	
160	5,088,121	787	5,088,187	187	5,088,248	129	5,088,308	CLASS 91	
161 A	5,088,122	840	5,088,188	232	5,088,249	306	5,088,309	275	5,088,382
162	5,088,123	843	5,088,189	239	5,088,251	333	5,088,310	361	5,088,383
163	5,088,124	867	5,088,190	263	5,088,252	420	5,088,311	461	5,088,384
167	5,088,125	890.037	5,088,191	288	5,088,253	CLASS 73		130 R	5,088,385
181	5,088,126	890.043	5,088,192	309.7	5,088,254	1 G	5,088,313	161	5,088,386
199	5,088,127	890.148	5,088,193	395	5,088,255	23.2	5,088,314	CLASS 99	
269	5,088,128		5,088,194	396	5,088,256	23.21	5,088,315	327	5,088,389
411	5,088,129			397	5,088,257	38	5,088,316	423	5,088,390
424	5,088,130			398	5,088,258	49.2	5,088,317	499	5,088,391
CLASS 4				399	5,088,259	117.3	5,088,318	516	5,088,392
300.3	5,088,132	102	5,088,195	410	5,088,260	118.1	5,088,319	CLASS 100	
390	5,088,133	122	5,088,196	416	5,088,261	146	5,088,320	12	5,088,393
484	5,088,134	123.3	5,088,197	417	5,088,262	197	5,088,321	30	5,088,394
CLASS 5				418	5,088,263	290 R	5,088,322	35	5,088,395
2.1	5,088,135	346.54	5,088,200	86	5,088,267	304 C	5,088,323	145	5,088,396
81.1	5,088,136		5,088,201	398	5,088,268	517 R	5,088,324	154	5,088,397
109	5,088,138		5,088,202	399	5,088,269	588	5,088,325	218	5,088,398
420	5,088,139		5,088,203	515	5,088,270	622	5,088,326	257	5,088,399
464	5,088,141		5,088,204	515	5,088,271	727	5,088,327	CLASS 101	
625	5,088,137		5,088,205	CLASS 54		769	5,088,328	41	5,088,401
636	5,088,140		5,088,206	24	5,088,272	861.37	5,088,329	142	5,088,402
CLASS 8			5,088,207	16	5,089,033	866.5	5,088,330	227	5,088,403
405	5,089,025		5,088,208	25	5,089,034	866.5	5,088,331	232	5,088,404
435	5,089,026		5,088,209	28	5,089,035	866.5	5,088,332	240	5,088,405
CLASS 14			5,088,210	221	5,089,036	866.5	5,088,333	332	5,088,406
22	5,088,142		5,088,211	357	5,089,037	7 E	5,088,334	350	5,088,407
69.5	5,088,143		5,088,212	374	5,089,038	89.15	5,088,335	415.1	5,088,408
CLASS 15				CLASS 56		143	5,088,336	5,088,409	
1.51	5,088,144			10.5	5,088,273	405	5,088,337	5,088,410	
22.1	5,088,145			30	5,088,274	493	5,088,338	CLASS 102	
104.94	5,088,146			364	5,088,275	560	5,088,339	200	5,088,411
144 B	5,088,147			CLASS 57		572	5,088,340	202.13	5,088,412
228	5,088,148			280	5,088,264	598	5,088,341	202.5	5,088,413
322	5,088,149			328	5,088,265	606 R	5,088,342	388	5,088,414
377	5,088,150			408	5,088,266	625	5,088,343	515	5,088,415
385	5,088,151			CLASS 60		859	5,088,344	517	5,088,416
80	5,088,152			39.093	5,088,277	861	5,088,345	411	5,088,417
108	5,088,153			39.21	5,088,278	866	5,088,346	CLASS 105	
252	5,088,154			39.41	5,088,279	866	5,088,347	20	5,089,050
257	5,088,155			226.1	5,088,280	867	5,088,348	35	5,089,051
342	5,088,156			257	5,088,281	868	5,088,349	276	5,089,052
CLASS 16				274	5,088,282	CLASS 75		486	5,089,056
263	5,088,157			CLASS 40		236	5,089,047	51.1	5,088,418
CLASS 20				17	5,088,223	328	5,089,049	66	5,088,419
83 J	5,089,675			21.2	5,088,224	75	5,088,358	106	5,088,420
CLASS 24				22	5,088,225	CLASS 81		144	5,088,421
16 PB	5,088,158			42.03	5,088,226	57.37	5,088,359	173 R	5,088,422
196	5,088,159			42.3	5,088,227	180.1	5,088,360	182.5	5,088,423
305	5,088,160			43.12	5,088,228	CLASS 82		344	5,088,424
377	5,088,161			50	5,088,229	127	5,088,361	117	5,088,425
442	5,088,162			57	5,088,230	142	5,088,362	225	5,088,426
573.5	5,088,163			101	5,088,231	35	5,088,363	256	5,088,427
576	5,088,164			1.5	5,088,232	43	5,088,364	265.1	5,088,428
704.1	5,088,165			24	5,088,233	300	5,088,365	275	5,088,429
712	5,088,166			67	5,088,234	326	5,088,366	320	5,088,430
CLASS 27				347	5,089,028	345	5,088,367	CLASS 114	
CLASS 28				432	5,089,029	348	5,088,368	39.1	5,088,431
CLASS 29				1.01	5,088,231	528	5,088,369	67 R	5,088,432
1.32	5,088,169			1.5	5,088,232	783	5,088,370	85	5,088,433
6.1	5,088,170			24	5,088,233	840	5,088,371	177	5,088,434
26 A	5,088,171			67	5,088,234	858	5,088,372	355	5,088,435
121.4	5,088,172			298	5,088,299	CLASS 84		361	5,088,436
239	5,088,173			340	5,088,300	95.2	5,088,373	CLASS 116	
254	5,088,174			457.6	5,088,301	313	5,088,374	30	5,088,437
430	5,088,175			480	5,088,302	CLASS 88		202	5,089,054
450	5,088,176			498	5,088,303	CLASS 92		248	5,089,055
453	5,088,177			510	5,088,304	CLASS 96		388	5,089,056
458	5,088,178			CLASS 65		CLASS 100		388	5,089,057
				510	5,089,039	CLASS 104		388	5,089,058
				CLASS 70		CLASS 108		388	5,089,059
				369	5,089,040	CLASS 112		388	5,089,060
				375	5,089,041	CLASS 116		388	5,089,061
				CLASS 71		CLASS 120		388	5,089,062
				63	5,089,042	CLASS 124		388	5,089,063
				CLASS 72		CLASS 128		388	5,089,064
				63	5,089,043	CLASS 132		388	5,089,065
				CLASS 73		CLASS 136		388	5,089,066
				63	5,089,044	CLASS 140		388	5,089,067
				63	5,089,045	CLASS 144		388	5,089,068
				63	5,089,046	CLASS 148		388	5,089,069
				63	5,089,047	CLASS 152		388	5,089,070
				63	5,089,048	CLASS 156		388	5,089,071
				63	5,089,049	CLASS 160		388	5,089,072
				63	5,089,050	CLASS 164		388	5,089,073
				63	5,089,051	CLASS 168		388	5,089,074
				63	5,089,052	CLASS 172		388	5,089,075
				63	5,089,053	CLASS 176		388	5,089,076
				63	5,089,054	CLASS 180		388	5,089,077
				63	5,089,055	CLASS 184		388	5,089,078
				63	5,089,056	CLASS 188		388	5,089,079
				63	5,089,057	CLASS 192		388	5,089,080
				63	5,089,058	CLASS 196		388	5,089,081
				63	5,089,059	CLASS 200		388	5,089,082
				63	5,089,060	CLASS 204		388	5,089,083
				63	5,089,061	CLASS 208		388	5,089,084
				63	5,089,062	CLASS 212		388	5,089,085
				63	5,089,063	CLASS 216		388	5,089,086
				63	5,089,064	CLASS 220		388	5,089,087
				63	5,089,065	CLASS 224		388	5,089,088
				63	5,089,066	CLASS 228		388	5,089,089
				63	5,089,067	CLASS 232		388	5,089,090
				63	5,089,068	CLASS 236		388	5,089,091
				63	5,089,069	CLASS 240		388	5,089,092
				63	5,089,070	CLASS 244		388	5,089,093
				63	5,089,071	CLASS 248		388	5,089,094
				63	5,089,072	CLASS 252		388	5,089,095
				63	5,089,073	CLASS 256		388	5,089,096
				63	5,089,074	CLASS 260		388	5,089,097
				63	5,089,075	CLASS 264		388	5,089,098
				63	5,089,076	CLASS 268		388	5,089,099
				63	5,089,077	CLASS 272		388	5,089,100
				63	5,089,078	CLASS 276		388	5,089,101
				63	5,089,079	CLASS 280		388	5,089,102
				63	5,089,080	CLASS 284		388	5,089,103
				63	5,089,081	CLASS 288		388	5,089,104
				63	5,089,082	CLASS 292		388	5,089,105
				63	5,089,083	CLASS 296		388	5,089,106
				63	5,089,084	CLASS 300		388	5,089,107
				63	5,089,085	CLASS 304		388	5,089,108
				63	5,089,086	CLASS 308		388	5,089,109
				63	5,089,087	CLASS 312		388	5,089,110
				63	5,089,088	CLASS 316		388	5,089,111
				63	5,089,089	CLASS 320		388	5,089,112
				63	5,089,090	CLASS 324		388	5,089,113
				63	5,089,091	CLASS 328		388	5,089,114
				63	5,089,092	CLASS 332		388	5,089,115
				63	5,089,093	CLASS 336		388	5,089,116
				63	5,089,094	CLASS 340		38	

CLASS 137	5,088,558	299 R	5,089,106	529	5,088,632	557	5,089,712	54	5,088,710
15	5,088,515	403	5,089,112	566	5,089,713	566	5,089,713	95	5,088,712
80	5,088,516	425	5,089,113	574	5,089,714	574	5,089,714		
101.11	5,088,517	427	5,089,133	30 A	5,088,633	174	5,088,687	3.1	5,088,713
171	5,088,518	28	5,088,560	252	5,088,634	304	5,088,688	9	5,088,715
240	5,088,519	CLASS 172	5,089,092	281	5,088,635	309	5,088,689	90	5,088,716
270	5,088,520	5	5,088,561	1	5,088,636	1	5,088,690	98	5,088,717
516.29	5,088,521	22	5,088,562	CLASS 206	5,088,637	8.551	5,089,149	161	5,088,718
CLASS 138	5,088,522	240	5,088,563	223	5,088,598	8.552	5,089,151	182	5,088,719
119	5,088,522	456	5,088,563	313	5,088,599	8.555	5,089,153	189	5,088,720
CLASS 139	5,088,523	1	5,088,564	315.2	5,088,600	8.6	5,089,148	293	5,088,721
35	5,088,523	49	5,088,565	334	5,088,601	28	5,089,154	304	5,088,722
71	5,088,524	116	5,088,566	387	5,088,602	33.4	5,089,155	1 B	5,088,723
183 R	5,088,525	122	5,088,567	530	5,088,603	49.9	5,089,156	3	5,088,724
CLASS 141	5,088,526	50	5,089,114	CLASS 208	5,089,115	51.5 A	5,089,157	69	5,088,729
1	5,088,527	146	5,089,115	CLASS 209	5,089,116	51.5 R	5,089,158	85	5,088,730
33	5,088,527	166	5,089,116	CLASS 210	5,089,117	62.62	5,089,159	117	5,088,732
44	5,088,528	93	5,089,117	CLASS 211	5,089,118	90	5,089,160	131	5,088,733
53	5,088,529	153	5,089,118	CLASS 212	5,089,119	102	5,089,161	134	5,088,734
86	5,088,530	167	5,089,119	CLASS 213	5,089,120	135	5,089,162	143	5,088,728
103	5,088,531	170	5,089,120	CLASS 214	5,089,121	162	5,089,163	29 A	5,088,732
234	5,088,532	175	5,089,121	CLASS 215	5,089,122	182.18	5,089,165	72 R	5,088,733
CLASS 144	5,088,533	185	5,089,122	CLASS 216	5,089,123	186.26	5,089,167	73 J	5,088,734
356	5,088,532	189	5,089,123	CLASS 217	5,089,124	194	5,089,168	80 B	5,088,735
364	5,088,533	198.2	5,089,124	CLASS 218	5,089,125	299.65	5,089,169	121 R	5,088,736
CLASS 148	5,089,057	198.20	5,089,125	CLASS 219	5,089,126	301.4 H	5,089,170	138 A	5,088,737
12.7 C	5,089,058	206	5,089,126	CLASS 220	5,089,127	313.3	5,089,171	193 B	5,088,738
16	5,089,059	222	5,089,127	CLASS 221	5,089,128	512	5,089,172	235 R	5,088,739
103	5,089,060	223	5,089,128	CLASS 222	5,089,129	514	5,089,173	248	5,088,740
110	5,089,061	232	5,089,130	CLASS 223	5,089,131	553	5,089,174	410	5,088,741
111	5,089,062	233	5,089,131	CLASS 224	5,089,132	8 R	5,088,691	56	5,088,742
241	5,089,063	235	5,089,132	CLASS 225	5,089,133	28	5,088,692	141	5,088,743
247	5,089,064	287	5,089,134	CLASS 226	5,089,134	344	5,088,693	188 R	5,088,744
302	5,089,065	298	5,089,135	CLASS 227	5,089,135	352	5,088,694	214	5,088,745
325	5,089,066	496	5,089,136	CLASS 228	5,089,136	404	5,089,175	4	5,088,746
328	5,089,068	519	5,089,137	CLASS 229	5,089,137	410.6	5,089,176	11.18	5,088,749
CLASS 149	5,089,069	615	5,089,138	CLASS 230	5,089,138	59	5,089,178	47.26	5,088,750
21	5,089,069	635	5,089,139	CLASS 231	5,089,139	81	5,089,179	47.34	5,088,751
CLASS 152	5,089,070	650	5,089,140	CLASS 232	5,089,140	1.7	5,089,180	79.11	5,088,752
208	5,088,534	678	5,089,141	CLASS 233	5,089,141	4.3	5,089,181	416.2	5,088,753
209 B	5,088,535	719	5,089,142	CLASS 234	5,089,142	8	5,089,182	491.3	5,088,754
209 R	5,088,536	728	5,089,143	CLASS 235	5,089,143	16	5,089,183	609	5,088,755
525	5,088,537	741	5,089,144	CLASS 236	5,089,144	22	5,089,184	615	5,088,756
528	5,088,538	748	5,089,145	CLASS 237	5,089,145	25	5,089,185	683	5,088,758
CLASS 156	5,089,070	767	5,089,146	CLASS 238	5,089,146	41	5,089,186	707	5,088,759
89	5,089,071	773	5,089,147	CLASS 239	5,089,147	45.3	5,089,188		5,088,760
90	5,089,072	793	5,089,148	CLASS 240	5,089,148	45.9	5,089,189		5,088,761
212	5,089,073	84	5,089,149	CLASS 241	5,089,149	46.5	5,089,190		5,088,762
244.11	5,089,074	85	5,089,150	CLASS 242	5,089,150	49	5,089,191		5,088,763
244.13	5,089,075	86	5,089,151	CLASS 243	5,089,151	50	5,089,192		5,088,764
244.18	5,089,076	87	5,089,152	CLASS 244	5,089,152	50	5,089,193		5,088,765
283	5,089,077	88	5,089,153	CLASS 245	5,089,153	51	5,089,194		5,088,766
351	5,089,078	89	5,089,154	CLASS 246	5,089,154	53	5,089,195		5,088,767
378	5,089,079	90	5,089,155	CLASS 247	5,089,155	55	5,089,196		5,088,768
394.1	5,089,080	91	5,089,156	CLASS 248	5,089,156	57	5,089,197		5,088,769
498	5,089,081	92	5,089,157	CLASS 249	5,089,157	82	5,089,198		5,088,770
556	5,089,082	93	5,089,158	CLASS 250	5,089,158	83	5,089,199		5,088,771
620.4	5,089,083	94	5,089,159	CLASS 251	5,089,159	127	5,089,200		5,088,772
643	5,089,084	95	5,089,160	CLASS 252	5,089,160	135	5,089,201		5,088,773
646	5,089,085	96	5,089,161	CLASS 253	5,089,161	145	5,089,202		5,088,774
659.1	5,089,086	97	5,089,162	CLASS 254	5,089,162	177.11	5,089,203		5,088,775
CLASS 157	5,089,087	98	5,089,163	CLASS 255	5,089,163	209.4	5,089,204		5,088,776
1.17	5,088,539	99	5,089,164	CLASS 256	5,089,164	255	5,089,205		5,088,777
CLASS 160	5,088,540	100	5,089,165	CLASS 257	5,089,165	257	5,089,206		5,088,778
135	5,088,541	101	5,089,166	CLASS 258	5,089,166	513	5,089,208		5,088,779
168.1	5,088,542	102	5,089,167	CLASS 259	5,089,167	540	5,089,209		5,088,780
310	5,088,543	103	5,089,168	CLASS 260	5,089,168	196	5,088,695		5,088,781
CLASS 162	5,089,086	104	5,089,169	CLASS 261	5,089,169	225	5,088,696		5,088,782
19	5,089,087	105	5,089,170	CLASS 262	5,089,170	250	5,088,697		5,088,783
46	5,089,088	106	5,089,171	CLASS 263	5,089,171	341.16	5,088,779		5,088,784
56	5,089,089	107	5,089,172	CLASS 264	5,089,172	346	5,088,780		5,088,785
123	5,089,090	108	5,089,173	CLASS 265	5,089,173	347	5,088,781		5,088,786
234	5,089,091	109	5,089,174	CLASS 266	5,089,174	119	5,088,698		5,088,787
351	5,089,092	110	5,089,175	CLASS 267	5,089,175	140.1 A	5,088,700		5,088,788
CLASS 164	5,088,544	111	5,089,176	CLASS 268	5,089,176	140.1 C	5,088,701		5,088,789
34	5,088,545	112	5,089,177	CLASS 269	5,089,177	140.1 E	5,088,702		5,088,790
246	5,088,546	113	5,089,178	CLASS 270	5,089,178	220	5,088,703		5,088,791
255	5,088,547	114	5,089,179	CLASS 271	5,089,179	226	5,088,704		5,088,792
504	5,088,548	115	5,089,180	CLASS 272	5,089,180	257	5,088,705		5,088,793
CLASS 165	5,088,549	116	5,089,181	CLASS 273	5,089,181	323	5,088,706		5,088,794
10	5,088,550	117	5,089,182	CLASS 274	5,089,182	39	5,088,707		5,088,795
117	5,088,551	118	5,089,183	CLASS 275	5,089,183	47	5,088,708		5,088,796
134.1	5,088,552	119	5,089,184	CLASS 276	5,089,184	53	5,088,709		5,088,797
166	5,088,553	120	5,089,185	CLASS 277	5,089,185				5,088,841
CLASS 166	5,088,554	121	5,089,186	CLASS 278	5,089,186				
55.7	5,088,555	122	5,089,187	CLASS 279	5,089,187				
228	5,088,556	123	5,089,188	CLASS 280	5,089,188				
292	5,088,557	124	5,089,189	CLASS 281	5,089,189				
297	5,088,558	125	5,089,190	CLASS 282	5,089,190				
339	5,088,559	126	5,089,191	CLASS 283	5,089,191				

417	5,088,791	672	5,089,783	271	5,089,855	111	5,089,929	86	5,090,021	CLASS 405		
445	5,088,792			279	5,089,856	140	5,089,930					
452	5,088,793	CLASS 328		318	5,089,857	156	Re.33,825	CLASS 373	128	5,088,856		
483	5,088,794	233	5,089,785	319	5,089,858	174	5,089,931	156	5,090,022	159	5,088,857	
		CLASS 298	CLASS 330	327	5,089,859	321	5,089,932	CLASS 374	203	5,088,858		
22 J	5,088,795	4.9	5,089,787				5,089,933	17	5,088,833	211	5,088,859	
		59	5,089,788	28.5	5,088,815	335	5,089,934	158	5,088,834	CLASS 406		
	CLASS 299	253	5,089,789	39	5,088,816	383	5,089,935	181	5,088,835	153	5,088,860	
34	5,088,796	277	5,089,790	71	5,088,817	394	5,089,936	183	5,088,836	CLASS 407		
91	5,088,797	295	5,089,791	152	5,088,818	427	5,089,937	185	5,088,837			
	CLASS 301		CLASS 331	241	5,088,819		5,089,938			11	5,088,861	
37 P	5,088,798	17	5,089,792	301	5,088,820			CLASS 375	114	5,088,862	CLASS 408	
111	5,088,799	46	5,089,793	319	5,088,821	61	5,089,939	1	5,090,023			
		68	5,089,794	326	5,088,822	101	5,089,940		5,090,024	230	5,088,863	
	CLASS 303		CLASS 335	328	5,088,823	134	5,089,941	4	5,090,025			
113 AP	5,088,800	46	5,089,795	350	5,088,824	214	5,089,942	47	5,090,026	CLASS 409		
	CLASS 307	172	5,089,796		5,088,826	216	5,089,943	80	5,090,027			
10.1	5,089,715	211	5,089,797	372	5,088,827	224	5,089,944	106	5,090,028	96	5,088,864	
101	5,089,716		5,089,798	376	5,088,828	261	5,089,945	107	5,090,029	182	5,088,865	
219.1	5,089,717					284	5,089,946			CLASS 411		
244	5,089,718	68	5,089,799	16	5,089,860			CLASS 376	212	5,089,210	10	5,088,866
270	5,089,719	380	5,089,800	17	5,089,861	20	5,089,947	232	5,089,211	13	5,088,867	
353	5,089,720			23.1	5,089,862	58	5,089,948	237	5,089,212	149	Re.33,827	
443	5,089,721	CLASS 338		23.3	5,089,863	126	5,089,949	248	5,089,213	280	5,088,868	
	5,089,722		22 R	23.4	5,089,864			250	5,089,214	386	5,088,869	
451	5,089,723		22 SD		5,089,865			260	5,089,215	CLASS 413		
454	5,089,724	425.5	5,089,803	23.5	5,089,866	191	5,089,950	308	5,089,216	4	5,088,870	
455	5,089,725	453	5,089,804		5,089,867	406	5,089,951	313	5,089,217	CLASS 414		
530	5,089,726	467	5,089,805	23.6	5,089,868	410	5,089,960	406	5,089,218			
570	5,089,727	522	Re.33,824	23.7	5,089,869	413.02	5,089,961	427	5,089,219	327	5,088,871	
572	5,089,728	541	5,089,806	23.8	5,089,870	424.05	5,089,962	439	5,089,220	352	5,088,872	
		568	5,089,807	23.9	5,089,871	424.1	5,089,963	442	5,089,221	392	5,088,873	
50	5,089,729	573	5,089,808		5,089,872		5,089,964			460	5,088,874	
51	5,089,730	679	5,089,809	40	5,089,873	426.02	5,089,965	5	5,090,030	478	5,088,875	
65	5,089,731	701	5,089,810	50	5,089,874	435	5,089,966	6	5,090,031	479	5,088,876	
67 R	5,089,732	703	5,089,811	70	5,089,875	463	5,089,967	18	5,090,032	626	5,088,877	
	5,089,733	793	5,089,812	71	5,089,876	478	5,089,968	28	5,090,033	627	5,088,878	
83	5,089,734	825.44	5,089,813	72	5,089,877	460	5,089,971	55	5,090,034	636	5,088,879	
88	5,089,735	825.49	5,089,814	75	5,089,879	478	5,089,972	72	5,090,035	667	5,088,880	
90	5,089,736	905	5,089,815	80	5,089,880	489	5,089,973	78	5,090,036	686	5,088,881	
154	5,089,737	995	5,089,816		5,089,881	492	5,089,974			723	5,088,882	
328	5,089,739			CLASS 358		510	5,089,975	4	5,090,037	795	5,088,883	
	5,089,740	15	5,089,817	28	5,089,882	526	5,089,976	41	5,090,038	CLASS 415		
332	5,089,741	76	5,089,818	60	5,089,883		5,089,977	59	5,090,039	3.1	5,088,884	
	CLASS 312	101	5,089,819	80	5,089,884	551.01	5,089,978	62	5,090,040	112	5,088,890	
184	5,088,801	139	5,089,820	86	5,089,885	571.04	5,089,979	93	5,090,041	115	5,088,885	
327	5,088,802	155	5,089,821	105	5,089,886	709.07	5,089,980	99	5,090,042	119	5,088,886	
	CLASS 313		CLASS 342	133	5,089,887	724.17	5,089,981	121	5,090,043	124.1	5,088,887	
351	5,089,742	30	5,089,822	135	5,089,888	726	5,089,982	145	5,090,044	170.1	5,088,888	
474	5,089,743	359	5,089,824	164	5,089,889	844	5,089,983	161	5,090,046	171.1	5,088,889	
	CLASS 315	383	5,089,823	167	5,089,890			170	5,090,047	176	5,088,891	
39.53	5,089,744	425	5,089,825	180	5,089,891		CLASS 365	202	5,090,048	193	5,088,892	
76	5,089,745	457	5,089,826	187	5,089,892	9	5,089,991			200	5,088,893	
111.81	5,089,746			160	5,089,893	51	5,089,992	60	5,090,050	CLASS 416		
	5,089,747	CLASS 343		213.24	5,089,894	63	5,089,993	61	5,090,051	219 R	5,088,894	
151	5,089,748	229	5,089,895	222	5,089,896	149	5,089,986	98	5,090,052	CLASS 417		
169.3	5,089,750	239	5,089,896	222	5,089,897	222	5,089,987	100	5,090,049	53	5,088,895	
279	5,089,751	296	5,089,897		5,089,898					178	5,088,896	
307	5,089,752	335	5,089,898		5,089,899		CLASS 366		CLASS 383	269	5,088,897	
324	5,089,753		5,089,899		5,089,900	108	5,088,830	33	5,088,838	347	5,088,898	
386	5,089,754	338	5,089,900		5,089,901	171	5,088,831		CLASS 384	356	5,088,899	
387	5,089,755	474	5,089,901		5,089,902	314	5,088,832	45	5,088,839	366	5,088,900	
	5,089,756	497	5,089,902	CLASS 359		12	5,089,988	535	5,088,840	386	5,088,901	
	CLASS 318	15	5,089,903			35	5,089,989			415	5,088,902	
560	5,089,757	52	5,089,904			73	5,089,994		CLASS 385	473	5,088,903	
568.11	5,089,759	64	5,089,905			86	5,089,995	33	5,088,803	474	5,088,904	
603	5,089,758	73	5,089,906			135	5,089,996	81	5,088,804	CLASS 418		
798	5,089,760	84	5,088,806				5,089,997			55.1	5,088,905	
811	5,089,761	94	5,088,807						CLASS 395	55.2	5,088,906	
		206	5,089,907			72	5,089,998	275	5,089,951	201.3	5,088,907	
	CLASS 320	212	5,089,908					375	5,089,952			
13	5,089,762	276	5,088,808				CLASS 369	425	5,089,953	CLASS 419		
20	5,089,763	333	5,089,786			32	5,089,999	575	5,089,954	10	5,089,222	
	5,089,764	363	5,089,909			44.25	5,090,000	600	5,089,955	CLASS 420		
32	5,089,765	396	5,088,829			44.28	5,090,001		5,089,956			
	5,089,766	398	Re.33,826				5,090,002	650	5,089,957	40	5,089,223	
	CLASS 322	399	5,089,910			44.34	5,090,003	725	5,089,958	41	5,089,224	
25	5,089,766	554	5,089,911			44.37	5,090,004	800	5,089,959	418	5,089,225	
	5,089,767	608	5,089,912			97	5,090,005			CLASS 422		
315	5,089,767	727	5,089,913			258	5,090,006		CLASS 400	16	5,089,226	
316	5,089,768	814	5,088,805			275.400	5,090,007	59	5,088,842		5,089,227	
318	5,089,768	815	5,089,914			284	5,090,008	124	5,088,843	37	5,089,228	
	CLASS 324	846	5,089,915	CLASS 360		291	5,090,009	208	5,088,844	64	5,089,229	
							5,090,010		5,088,845		5,089,230	
78 D	5,089,770	33.1	5,089,916				CLASS 370		5,088,846	80	5,089,231	
142	5,089,771	45	5,089,917			60	5,090,011	306	5,088,847	83	5,089,232	
158 F	5,089,772	70	5,089,918			85.3	5,090,012	630	5,088,848	99	5,089,233	
158 R	5,089,773	74.4	5,089,919			85.8	5,090,013			103	5,089,234	
174	5,089,774	92	5,089,920					44	5,088,849	144	5,089,235	
227	5,089,775	95	5,089,921				CLASS 371	176	5,088,850	177	5,089,236	
309	5,089,776	99.08	5,089,922			15.1	5,090,014			180	5,089,237	
	5,089,777	121	5,089,923			22.5	5,090,015		CLASS 403	249	5,089,238	
	5,089,778	132	5,089,924				CLASS 372	14	5,088,851	300	5,089,239	
312	5,089,778			CLASS 361		3	5,090,016	19	5,088,852		5,089,240	
339	5,089,779					6	5,090,017	330	5,088,853	CLASS 423		
445	5,089,781	84	5,089,925			30	5,090,018			87	5,089,241	
448	5,089,780	87	5,089,926			39	5,090,019		CLASS 404	109	5,089,242	
623	5,089,782	256	5,089,927			59	5,090,020	72	5,088,854	328	5,089,243	
		94	5,089,928					103	5,088,855	347	5,089,244	

415 A	5,089,245	352	5,089,336	66	5,089,420	63	5,089,458	511	5,089,544	220	5,089,630
563	5,089,246		5,089,337	68	5,089,421	66	5,089,459		CLASS 524	234	5,089,631
600	5,089,247	354	5,089,338	69	5,089,422	112	5,089,460	17	5,089,545	274	5,089,632
604	5,089,248	402.21	5,089,339	518	5,089,423	158	5,089,450	198	5,089,546	285	5,089,633
		411.1	5,089,340		5,089,424	174	5,089,451	262	5,089,547		5,089,634
	CLASS 424	412	5,089,341			202	5,089,452	272	5,089,548		5,089,635
1.1	5,089,249	413	5,089,342		CLASS 437	211	5,089,453	287	5,089,549		5,089,636
43	5,089,250	416	5,089,343	3	5,089,425	226	5,089,454	396	5,089,551		5,089,637
47	5,089,251	425.9	5,089,344		5,089,426	242	5,089,461	407	5,089,552		5,089,638
	5,089,252	428	5,089,345	15	5,089,427	309	5,089,462	424	5,089,553		5,089,639
	5,089,253	458	5,089,346	31	5,089,428	313	5,089,463	493	5,089,554		5,089,640
52	5,089,254	461	5,089,347					503	5,089,555		
	5,089,255	464	5,089,348		CLASS 503				CLASS 552	653	5,089,641
63	5,089,256	472.1	5,089,349	39	5,089,430				CLASS 556		
70	5,089,257	484	5,089,350	40	5,089,431						
76.1	5,089,258	488.1	5,089,351		5,089,432						
78.38	5,089,260	516	5,089,352	41	5,089,433						
85.2	5,089,261	518	5,089,353	44	5,089,434						
87	5,089,262	552	5,089,354	60	5,089,435						
93	5,089,263	607	5,089,355	129	5,089,436						
94.64	5,089,264	608	5,089,356	184	5,089,437						
195.1	5,089,265	694	5,089,358	209	5,089,438						
	5,089,266				5,089,439						
407	5,089,267		CLASS 429	225	5,089,440						
449	5,089,268	254	5,089,360	246	5,089,441						
450	5,089,269				5,089,443						
456	5,089,270		CLASS 430								
465	5,089,271	5	5,089,361	66	5,088,929						
490	5,089,272	16	5,089,362	70	5,088,930						
493	5,089,273	45	5,089,363	188	5,088,931						
497	5,089,274	58	5,089,364	350	5,088,932						
520	5,089,275	59	5,089,365	395	5,088,933						
534	5,089,276		5,089,366		5,088,934						
602		84	5,089,367	573	5,088,935						
686		96	5,089,368	578	5,088,936						
	CLASS 425		5,089,369	581	5,088,937						
73	5,088,908	138	5,089,370	595	5,088,938						
131.1	5,088,909	160	5,089,371	620	5,088,939						
142	5,088,910	167	5,089,372	621	5,088,940						
145	5,088,911	191	5,089,373	762	5,088,941						
155	5,088,912	271	5,089,374	843	5,088,942						
182	5,088,913		5,089,375								
208	5,088,914	284	5,089,376								
345	5,088,915	325	5,089,377								
	CLASS 426	351	5,089,378								
1	5,089,277	434	5,089,379								
98	5,089,278	449	5,089,380								
285	5,089,279	546	5,089,382								
427	5,089,280	611	5,089,381								
461	5,089,281										
483	5,089,282	90	5,088,916								
498	5,089,283	266	5,088,917								
557	5,089,284	326	5,088,918								
573	5,089,285	328	5,088,919								
615	5,089,286										
647	5,089,287										
	CLASS 427	59	5,088,920								
4	5,089,288	121	5,088,921								
38	5,089,289	152	5,088,922								
41	5,089,290	235	5,089,442								
54.1	5,089,291										
78	5,089,292	9	5,088,923								
102	5,089,293	126	5,088,924								
108	5,089,294	141	5,088,925								
128	5,089,295	173	5,088,926								
208	5,089,296	224	5,088,927								
238	5,089,297										
240	5,089,298										
245	5,089,299	339	5,088,928								
299	5,089,300										
304	5,089,301	2	5,089,384								
377	5,089,302	3	5,089,385								
387	5,089,303	6	5,089,386								
388.1	5,089,304		5,089,387								
422	5,089,305	7.1	5,089,391								
	CLASS 428	7.6	5,089,389								
35.1	5,089,306	7.6	5,089,388								
35.2	5,089,307	7.9	5,089,383								
35.4	5,089,308	21	5,089,392								
36.92	5,089,309	28	5,089,393								
40	5,089,310	34	5,089,394								
71	5,089,311	39	5,089,395								
139	5,089,312	69.1	5,089,396								
151	5,089,313		5,089,397								
156	5,089,314		5,089,398								
192	5,089,315		5,089,399								
	BI 4,916,004	69.51	5,089,400								
195	5,089,316	96	5,089,402								
212	5,089,317	134	5,089,403								
	5,089,318		5,089,404								
216	5,089,319	136	5,089,405								
	5,089,320	172.3	5,089,406								
218	5,089,321	179	5,089,407								
220	5,089,322	192	5,089,408								
	5,089,323	240.2	5,089,409								
234	5,089,324	240.45	5,089,410								
246	5,089,325	244	5,089,411								
284	5,089,326	252.4	5,089,412								
288	5,089,327	254	5,089,413								
308.4	5,089,328	265	5,089,414								
313.5	5,089,329	269	5,089,415								
323	5,089,330										
	5,089,331										
328	5,089,332	8	5,089,416								
329	5,089,333	45	5,089,417								
336	5,089,334	46	5,089,418								
341	5,089,335	65	5,089,419								

D1—	106	323,918	351	323,953		323,987	304	324,021	133	324,055	191	324,088	
		323,919	354	323,954		323,988	314	324,022	139	324,056		324,089	
D2—	11	323,920	376	323,955	D10—	18	323,989		144.1	324,057	194	324,090	
	25	323,921	632	323,956		22	323,990	D13—	108	324,024	238	324,091	
	268	323,922	653	323,957		28	323,991		133	324,025	241	324,092	
	314	323,923	663	323,958		32	323,992			324,026	144	324,093	
		323,924	699	323,959			323,993			324,027	223	324,094	
		323,925	5	323,960			323,994			324,028	238	324,095	
		323,926	61	323,961		39	323,995		D18—	15	324,062	280	324,096
	320	323,927		323,962			323,996	139		24	324,063	290	324,097
		323,928	62	323,963		69	323,997	146		36	324,064	366	324,098
D3—	30.1	323,929	69	323,964		78	323,998	147		50	324,065	390	324,099
	35	323,930	70	323,965		113	323,999			54	324,066	367	324,099
		323,931	97	323,966		118	324,000	D14—	156	48	324,067	411	324,100
	40	323,932	98	323,967		126	324,001		100	324,035	50	324,101	
	41	323,933	315	323,968	D11—	128	324,002		101	324,036	51	324,102	
	71	323,934	331	323,969		90	324,003		102	324,037	118	324,102	
	73	323,935	341	323,970		144	324,004		106	324,038	158	324,104	
	74	323,936	369	323,971	D12—	152	324,005		115	324,039	183	324,105	
	75	323,937	394	323,972		85	324,006		126	324,040	200	324,106	
	78	323,938		323,973		90	324,007			324,041	219	324,107	
D4—	106	323,939	396	323,974		91	324,008			324,042	219	324,107	
D6—	116	323,940		323,975		115	324,009			324,043	119	324,108	
	317	323,941	402	323,976	D9—	133	324,010	129		324,044	28	324,111	
	347	323,942	305	323,977		147	324,011		D20—	16	324,078	44	324,110
	380	323,943		323,979			324,012	150		40	324,079	86	324,112
	436	323,944	307	323,978		151	324,013		D21—	33	324,080	88	324,113
	458	323,945	347	323,980		155	324,014			37	324,081	140	324,109
	478	323,946	376	323,981		156	324,015	217		86	324,114	15	324,115
	495	323,947	377	323,982		158	324,016	228		87	324,082	132	324,116
	518	323,948		323,983		169	324,017	240		100	324,083	144	324,117
D7—	309	323,949	403	323,984		170	324,018	D15—	1	324,051	108	324,084	
	313	323,950		323,985		203	324,019		5	324,052	109	324,085	
	317	323,951	418	323,986		212	324,020		13	324,053	111	324,086	
	332	323,952							32	324,054	166	324,087	

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UMI

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PATENTS

01	5,089,098	5,088,662	5,089,259	5,089,880	5,089,561	5,088,849
	5,089,240	5,088,663	5,089,261	5,089,881	5,089,571	5,088,949
	5,089,600	5,088,674	5,089,266	5,089,882	5,089,617	5,089,056
	5,089,675	5,088,675	5,089,274	5,089,904	5,089,637	5,089,260
	5,089,946	5,088,685	5,089,287	5,089,909	5,089,700	5,089,594
04	5,088,160	5,088,689	5,089,292	5,089,910	5,089,730	5,089,608
	5,088,378	5,088,692	5,089,320	5,089,920	5,089,795	5,089,633
	5,088,499	5,088,732	5,089,383	5,089,941	5,089,817	5,089,634
	5,088,543	5,088,733	5,089,387	5,089,945	5,089,913	5,089,701
	5,088,734	5,088,739	5,089,388	5,089,960	5,089,937	5,089,716
	5,088,738	5,088,754	5,089,390	5,089,961	5,089,970	5,089,805
	5,088,806	5,088,770	5,089,391	5,089,976	5,089,971	5,090,050
	5,089,036	5,088,771	5,089,394	5,089,979	5,088,140	5,088,618
	5,089,427	5,088,773	5,089,396	5,089,991	5,089,656	5,089,084
	5,089,727	5,088,774	5,089,397	5,089,995	5,089,351	5,089,690
	5,089,769	5,088,786	5,089,398	5,090,008	5,088,119	5,089,867
	5,090,002	5,088,788	5,089,421	5,090,016	5,088,128	5,089,986
05	5,088,539	5,088,803	5,089,422	5,090,017	5,088,158	5,088,152
	5,088,540	5,088,808	5,089,433	5,090,019	5,088,169	5,088,204
	5,088,910	5,088,809	5,089,439	5,090,043	5,088,246	5,088,220
	5,088,910	5,088,835	5,089,453	5,088,224	5,088,222	5,088,222
06	Re. 33,824	5,088,867	5,089,461	5,088,309	5,088,341	5,088,253
	Re. 33,826	5,088,868	5,089,462	5,088,487	5,088,397	5,088,274
	5,088,124	5,088,890	5,089,463	5,088,578	5,088,438	5,088,301
	5,088,127	5,088,923	5,089,485	5,088,834	5,088,549	5,088,305
	5,088,137	5,088,928	5,089,509	5,088,981	5,088,619	5,088,344
	5,088,162	5,088,942	5,089,517	5,088,997	5,088,639	5,088,383
	5,088,173	5,088,950	5,089,559	5,089,141	5,088,727	5,088,402
	5,088,229	5,088,952	5,089,623	5,089,466	5,088,820	5,088,417
	5,088,234	5,088,978	5,089,643	5,089,997	5,088,823	5,088,563
	5,088,240	5,088,990	5,089,644	5,090,014	5,088,855	5,088,581
	5,088,262	5,088,996	5,089,657	5,088,183	5,088,894	5,088,686
	5,088,285	5,089,000	5,089,688	5,088,194	5,088,947	5,088,711
	5,088,287	5,089,007	5,089,693	5,088,202	5,088,953	5,088,877
	5,088,329	5,089,033	5,089,703	5,088,324	5,088,963	5,088,954
	5,088,360	5,089,040	5,089,704	5,088,330	5,089,024	5,088,960
	5,088,376	5,089,046	5,089,707	5,088,660	5,089,074	5,088,965
	5,088,385	5,089,055	5,089,711	5,088,712	5,089,090	5,088,995
	5,088,412	5,089,080	5,089,712	5,088,718	5,089,442	5,089,115
	5,088,421	5,089,099	5,089,721	5,088,801	5,089,477	5,089,125
	5,088,424	5,089,103	5,089,728	5,088,804	5,089,545	5,089,145
	5,088,441	5,089,110	5,089,746	5,088,826	5,089,731	5,089,157
	5,088,472	5,089,111	5,089,757	5,088,851	5,089,799	5,089,160
	5,088,510	5,089,123	5,089,778	5,088,885	5,089,813	5,089,186
	5,088,511	5,089,146	5,089,779	5,088,892	5,089,814	5,089,231
	5,088,526	5,089,167	5,089,780	5,089,008	5,089,885	5,089,235
	5,088,535	5,089,172	5,089,782	5,089,009	5,089,895	5,089,273
	5,088,560	5,089,173	5,089,801	5,089,010	5,090,024	5,089,424
	5,088,565	5,089,180	5,089,807	5,089,011	5,090,051	5,089,471
	5,088,620	5,089,210	5,089,808	5,089,124	Re. 33,822	5,089,519
	5,088,628	5,089,211	5,089,810	5,089,281	5,088,470	5,089,524
	5,088,629	5,089,221	5,089,815	5,089,514	5,088,617	5,089,540
	5,088,649	5,089,228	5,089,878	5,089,535	5,088,680	5,089,541

5,089,593	5,090,040	5,089,548	5,088,482	5,088,775	5,089,419
5,089,676	4,884,814	5,089,606	5,088,568	5,088,787	5,089,551
5,089,680	Re.33,827	5,089,689	5,088,599	5,088,788	5,089,583
5,089,682	5,088,136	5,089,862	5,088,600	5,088,814	5,089,584
5,089,694	5,088,192	5,089,922	5,088,602	5,088,860	5,089,632
5,089,749	5,088,197	5,089,924	5,088,623	5,088,879	5,089,638
5,089,751	5,088,245	5,088,943	5,088,676	5,088,880	5,089,645
5,089,752	5,088,250	5,089,017	5,088,682	5,088,882	5,089,652
5,089,753	5,088,252	5,088,118	5,088,722	5,088,884	5,089,672
5,089,953	5,088,259	5,088,339	5,088,753	5,088,888	5,089,687
5,089,975	5,088,291	5,088,369	5,088,784	5,088,893	5,089,709
5,090,015	5,088,325	5,088,377	5,088,813	5,088,921	5,089,741
5,090,041	5,088,335	5,088,447	5,088,821	5,089,027	5,089,797
4,916,004	5,088,359	5,088,509	5,088,832	5,089,038	5,089,803
5,088,448	5,088,365	5,088,518	5,088,854	5,089,041	5,089,958
5,088,469	5,088,367	5,088,528	5,088,895	5,089,067	5,089,978
5,088,520	5,088,384	5,088,725	5,088,970	5,089,079	5,090,046
5,088,572	5,088,435	5,088,758	5,088,971	5,089,140	5,090,047
5,088,587	5,088,445	5,088,988	5,088,977	5,089,147	5,088,991
5,088,791	5,088,455	5,089,156	5,089,034	5,089,189	5,089,416
5,088,875	5,088,463	5,089,227	5,089,078	5,089,190	5,088,248
5,089,236	5,088,464	5,089,349	5,089,081	5,088,681	5,088,930
5,089,417	5,088,465	5,089,407	5,089,087	5,088,933	5,088,983
5,089,420	5,088,471	5,089,409	5,089,112	5,089,350	5,089,298
5,089,610	5,088,504	5,089,473	5,089,118	5,089,533	5,088,527
5,089,748	5,088,529	5,089,506	5,089,119	5,089,544	5,088,865
5,089,754	5,088,541	5,089,611	5,089,163	5,089,552	5,088,913
5,089,755	5,088,546	5,089,619	5,089,203	5,089,558	5,088,073
5,088,475	5,088,571	5,088,449	5,089,225	5,089,563	5,089,205
5,088,500	5,088,616	5,088,728	5,089,233	5,089,574	5,089,296
5,088,532	5,088,641	5,088,167	5,089,268	5,089,614	5,089,352
5,088,561	5,088,644	5,088,425	5,089,284	5,089,697	5,089,669
5,088,979	5,088,698	5,088,740	5,089,303	5,089,926	5,089,760
5,089,245	5,088,746	5,089,282	5,089,306	5,089,939	5,088,984
5,089,277	5,088,747	5,088,174	5,089,318	5,089,984	5,088,550
5,089,403	5,088,752	5,088,146	5,089,337	5,088,219	5,088,203
5,089,532	5,088,763	5,088,515	5,089,343	5,088,336	5,088,217
5,089,928	5,088,764	5,089,745	5,089,363	5,088,478	5,088,415
5,088,706	5,088,789	5,089,767	5,089,364	5,088,570	5,088,440
5,088,873	5,088,790	5,088,276	5,089,369	5,088,601	5,088,531
5,088,896	5,088,806	5,088,317	5,089,374	5,088,985	5,088,782
5,089,258	5,088,925	5,088,486	5,089,380	5,089,131	5,088,840
5,088,115	5,088,976	5,088,555	5,089,389	5,089,183	5,088,982
5,088,150	5,088,984	5,088,607	5,089,418	5,089,207	5,089,003
5,088,247	5,089,060	5,088,611	5,089,440	5,089,077	5,089,077
5,088,751	5,089,064	5,088,612	5,089,445	5,089,326	5,089,095
5,088,780	5,089,100	5,088,627	5,089,446	5,089,994	5,089,264
5,088,912	5,089,113	5,088,678	5,089,455	5,089,596	5,089,596
5,089,658	5,089,143	5,088,683	5,089,526	5,088,132	5,088,132
5,088,585	5,089,144	5,088,931	5,089,531	5,088,138	5,088,138
5,088,614	5,089,164	5,088,980	5,089,547	5,088,179	5,088,179
5,088,673	5,089,188	5,088,986	5,089,566	5,088,595	5,088,190
5,089,572	5,089,198	5,088,993	5,089,567	5,088,886	5,088,231
5,089,646	5,089,206	5,089,004	5,089,582	5,088,924	5,088,257
5,089,648	5,089,253	5,089,013	5,089,598	5,089,434	5,088,387
5,088,635	5,089,270	5,089,022	5,089,631	5,089,467	5,088,396
5,089,957	5,089,300	5,089,057	5,089,663	5,089,980	5,088,404
5,088,207	5,089,311	5,089,107	5,089,724	5,089,981	5,088,408
5,088,216	5,089,328	5,089,108	5,089,726	5,090,031	5,088,413
5,088,327	5,089,447	5,089,148	5,089,770	5,088,116	5,088,436
5,088,390	5,089,497	5,089,150	5,089,785	5,088,117	5,088,439
5,088,553	5,089,537	5,089,161	5,089,791	5,088,184	5,088,473
5,088,667	5,089,557	5,089,162	5,089,823	5,088,199	5,088,480
5,088,731	5,089,568	5,089,171	5,089,837	5,088,213	5,088,502
5,088,856	5,089,588	5,089,229	5,089,847	5,088,233	5,088,508
5,088,973	5,089,591	5,089,241	5,089,852	5,088,316	5,088,514
5,089,392	5,089,616	5,089,248	5,089,857	5,088,322	5,088,521
5,089,395	5,089,653	5,089,255	5,089,897	5,088,328	5,088,554
5,089,479	5,089,660	5,089,278	5,089,908	5,088,407	5,088,556
5,089,729	5,089,713	5,089,304	5,089,930	5,088,451	5,088,557
5,089,742	5,089,736	5,089,406	5,089,940	5,088,574	5,088,559
5,090,049	5,089,759	5,089,415	5,089,949	5,088,594	5,088,588
5,088,114	5,089,762	5,089,429	5,089,954	5,088,603	5,088,636
5,088,122	5,089,783	5,089,438	5,089,982	5,088,613	5,088,687
5,088,123	5,089,912	5,089,469	5,090,013	5,088,633	5,088,708
5,088,139	5,089,938	5,089,478	5,090,042	5,088,726	5,088,723
5,088,166	5,089,962	5,089,496	Re.33,825	5,088,737	5,088,730
5,088,172	5,089,965	5,089,502	5,088,484	5,088,797	5,088,799
5,088,195	5,088,141	5,089,503	5,088,507	5,088,810	5,088,859
5,088,430	5,088,149	5,089,518	5,088,530	5,088,871	5,088,861
5,088,658	5,088,151	5,089,523	5,088,596	5,088,881	5,088,869
5,088,748	5,088,164	5,089,530	5,088,669	5,088,895	5,088,948
5,088,974	5,088,186	5,089,560	5,088,862	5,088,935	5,089,052
5,088,987	5,088,232	5,089,564	5,089,129	5,088,937	5,089,151
5,089,002	5,088,272	5,089,578	5,089,165	5,088,957	5,089,153
5,089,016	5,088,299	5,089,597	5,089,335	5,089,032	5,089,159
5,089,023	5,088,323	5,089,609	5,089,500	5,089,054	5,089,321
5,089,047	5,088,388	5,089,615	5,089,872	5,089,062	5,089,385
5,089,053	5,088,391	5,089,626	5,089,947	5,089,069	5,089,428
5,089,091	5,088,476	5,089,666	5,089,974	5,089,070	5,089,441
5,089,106	5,088,488	5,089,816	5,090,018	5,089,120	5,089,484
5,089,192	5,088,490	5,089,888	5,088,180	5,089,126	5,089,508
5,089,315	5,088,562	5,089,952	5,088,182	5,089,127	5,089,556
5,089,334	5,088,577	5,090,022	5,088,189	5,089,137	5,089,573
5,089,443	5,088,615	5,089,063	5,088,215	5,089,142	5,089,585
5,089,460	5,088,666	5,089,470	5,088,228	5,089,154	5,089,592
5,089,475	5,088,668	5,089,915	5,088,235	5,089,200	5,089,599
5,089,605	5,088,824	5,089,929	5,088,261	5,089,214	5,089,603
5,089,630	5,088,825	5,088,121	5,088,277	5,089,216	5,089,722
5,089,806	5,089,152	5,088,165	5,088,279	5,089,217	5,089,789
5,089,809	5,089,293	5,088,227	5,088,422	5,089,234	5,089,811
5,089,925	5,089,336	5,088,243	5,088,428	5,089,246	5,089,860
5,089,948	5,089,362	5,088,295	5,088,443	5,089,271	5,089,877
5,089,973	5,089,413	5,088,307	5,088,479	5,089,332	5,089,956
5,089,983	5,089,493	5,088,308	5,088,516	5,089,356	5,089,985
5,090,025	5,089,536	5,088,392	5,088,720	5,089,376	5,089,989

5,089,993	51 : 5,088,256	5,089,219	5,088,498	5,088,962	5,088,575
5,090,026	5,088,306	5,089,313	5,088,609	5,089,764	5,088,590
5,090,030	5,088,458	5,089,822	5,088,661	5,088,200	5,088,597
5,090,039	5,088,489	5,089,972	5,088,677	5,088,255	5,088,640
5,088,126	5,088,626	Re.33,823	5,088,145	5,088,831	5,088,691
5,088,205	5,088,643	5,088,181	5,088,972	5,088,269	5,088,927
5,088,210	5,088,665	5,088,207	5,088,191	5,089,249	5,088,961
5,088,267	5,088,802	5,088,230	5,088,292	5,089,325	5,089,286
5,088,347	5,088,852	5,088,348	5,089,384	5,088,342	5,089,308
5,088,664	5,089,028	5,088,304	5,089,384	5,088,366	5,089,641
5,088,729	5,089,088	5,088,358	5,089,723	5,088,483	5,089,647
5,088,776	5,089,089	5,088,437	5,089,968	5,088,542	5,090,037
5,089,014	5,089,117	5,088,485	5,088,481	5,088,545	5,090,048
5,089,020	5,089,130				

DESIGN PATENTS

01	324,010		324,114		324,112		323,919		324,052	44	324,072
04	323,920	08	323,948	18	323,947		323,933		324,056		324,120
06	323,928		324,108		324,029		323,956		324,081	45	323,998
	323,929	09	323,931	19	324,074		324,037		324,104		324,011
	323,939		324,059	20	324,087		324,076		324,113		324,012
	323,945		324,079		324,092		324,091		324,113		324,012
	323,950	12	324,039	22	324,051	36	323,946	40	323,975	47	323,932
	323,972		324,082	24	323,963		324,000		324,001		324,022
	323,983		324,088		324,117		324,083		324,093		324,023
	323,984		324,101	25	323,922		324,085	41	323,923	48	323,942
	323,997	13	323,952		323,925		324,098		323,924		323,958
	323,999		323,960		323,926		324,119		323,927		324,014
	324,004		323,968		324,102	37	323,935	42	323,921		324,078
	324,058		323,971	26	324,006		324,066		323,937		324,121
	324,063	17	323,944		324,073	39	323,940		323,967	53	324,089
	324,077		323,959		324,111		323,941		323,970		324,090
	324,100		324,024	29	324,019		323,965		323,976	55	324,096
	324,106		324,053		324,115		323,981		323,979		324,105
	324,109		324,068	34	323,918		323,995		324,031		324,118

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Harry F. MacBuck, Jr., *Commissioner*

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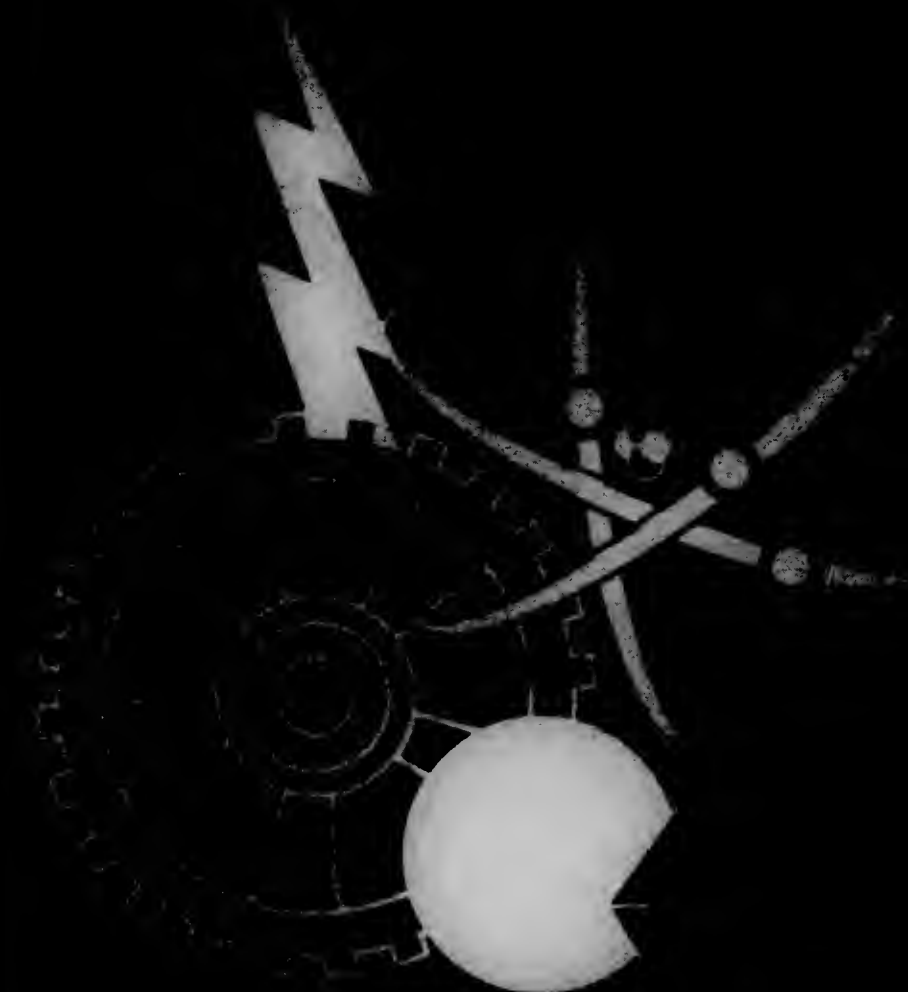
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OFFICIAL GAZETTE

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PATENTS
February 25, 1992



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O.G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees		Small Entity	Regular
USPTO	was IPEA	310.00	620.00

USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 21, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,805,238 through 4,807,300
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 19, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,499,611 through 4,501,022
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 29, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

FEBRUARY 25, 1992

U. S. PATENT AND TRADEMARK OFFICE

1135 OG 65

37 CFR § 1.20 Post-issuance fees	4,420,939	06/399,050	12/20/83
	4,420,941	06/493,229	12/20/83
(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,420,962	06/298,451	12/20/83
	4,420,968	06/322,224	12/20/83
	4,420,969	06/269,755	12/20/83
	4,420,972	06/337,819	12/20/83
	4,420,975	06/497,396	12/20/83
	4,420,977	06/358,089	12/20/83
By a small entity (\$1.9f)	\$450.00	06/297,747	12/20/83
By other than a small entity	\$900.00	06/238,481	12/20/83
	4,421,001	06/324,848	12/20/83
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,421,003	06/434,564	12/20/83
	4,421,009	06/283,456	12/20/83
	4,421,010	06/299,325	12/20/83
	4,421,011	06/371,251	12/20/83
	4,421,016	06/356,841	12/20/83
By a small entity (\$1.9f)	\$905.00	06/333,091	12/20/83
By other than a small entity	\$1,810.00	06/254,456	12/20/83
	4,421,026	06/360,068	12/20/83
(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:	4,421,027	06/287,473	12/20/83
	4,421,029	06/311,907	12/20/83
	4,421,030	06/254,124	12/20/83
	4,421,035	06/309,296	12/20/83
	4,421,041	06/313,557	12/20/83
By a small entity (\$1.9f)	\$1,365.00	06/399,497	12/20/83
By other than a small entity	\$2,730.00	06/357,246	12/20/83
	4,421,056	06/304,843	12/20/83
The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:	4,421,060	06/323,630	12/20/83
	4,421,065	06/415,624	12/20/83
	4,421,069	06/336,018	12/20/83
	4,421,072	06/330,080	12/20/83
	4,421,073	06/444,399	12/20/83
(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980	4,421,079	06/377,387	12/20/83
	4,421,083	06/229,264	12/20/83
	4,421,086	06/382,601	12/20/83
	4,421,093	06/302,801	12/20/83
	4,421,097	06/414,106	12/20/83
	4,421,109	06/269,782	12/20/83
By a small entity (\$1.9f)	\$65.00	06/292,053	12/20/83
By other than a small entity	\$130.00	06/420,367	12/20/83
	4,421,127	06/340,736	12/20/83
(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable	4,421,131	06/304,681	12/20/83
	4,421,133	06/331,833	12/20/83
	4,421,140	06/316,138	12/20/83
	4,421,148	06/282,454	12/20/83
	4,421,150	06/239,470	12/20/83
	4,421,152	06/310,080	12/20/83
	4,421,177	06/238,002	12/20/83
	4,421,180	06/327,525	12/20/83
	4,421,184	06/245,903	12/20/83
	4,421,202	06/411,264	12/20/83
	4,421,203	06/316,524	12/20/83
	4,421,213	06/216,945	12/20/83
	4,421,214	06/439,822	12/20/83
	4,421,220	06/325,748	12/20/83
	4,421,224	06/299,933	12/20/83
	4,421,225	06/278,213	12/20/83
	4,421,229	06/421,881	12/20/83
	4,421,231	06/408,210	12/20/83
	4,421,233	06/291,593	12/20/83
	4,421,237	06/332,147	12/20/83
	4,421,239	06/374,914	12/20/83
	4,421,243	06/374,464	12/20/83
	4,421,247	06/249,325	12/20/83
	4,421,249	06/269,738	12/20/83
	4,421,260	06/225,586	12/20/83
	4,421,261	06/277,575	12/20/83
	4,421,264	06/323,320	12/20/83
	4,421,276	06/294,405	12/20/83
	4,421,284	06/350,868	12/20/83
	4,421,289	06/255,464	12/20/83
	4,421,290	06/249,387	12/20/83
	4,421,292	06/291,948	12/20/83
	4,421,296	06/326,413	12/20/83
	4,421,303	06/331,118	12/20/83
	4,421,313	06/455,072	12/20/83
	4,421,315	06/246,395	12/20/83
	4,421,316	06/222,839	12/20/83
	4,421,317	06/474,026	12/20/83
	4,421,321		

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid. According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 22, 1991 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,420,848	06/368,764	12/20/83
4,420,851	06/328,373	12/20/83
4,420,866	06/342,252	12/20/83
4,420,874	06/340,286	12/20/83
4,420,886	06/321,698	12/20/83
4,420,891	06/290,351	12/20/83
4,420,892	06/343,791	12/20/83
4,420,898	06/353,390	12/20/83
4,420,916	06/323,291	12/20/83
4,420,923	06/313,513	12/20/83
4,420,924	06/298,607	12/20/83
4,420,926	06/390,703	12/20/83
4,420,927	06/311,404	12/20/83
4,420,930	06/232,997	12/20/83
4,420,932	06/353,984	12/20/83

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Patent Number	Serial Number	Issue Date	4,421,692	06/318,661	12/20/83
4,421,328	06/428,215	12/20/83	4,421,694	06/340,901	12/20/83
4,421,331	06/414,461	12/20/83	4,421,700	06/361,711	12/20/83
4,421,337	06/338,050	12/20/83	4,421,706	06/359,644	12/20/83
4,421,338	06/309,017	12/20/83	4,421,713	06/247,420	12/20/83
4,421,339	06/287,294	12/20/83	4,421,715	06/270,458	12/20/83
4,421,349	06/335,224	12/20/83	4,421,718	06/423,421	12/20/83
4,421,351	06/313,505	12/20/83	4,421,734	06/377,124	12/20/83
4,421,356	06/332,371	12/20/83	4,421,741	06/386,745	12/20/83
4,421,359	06/268,133	12/20/83	4,421,742	06/240,447	12/20/83
4,421,362	06/316,276	12/20/83	4,421,743	06/337,177	12/20/83
4,421,363	06/245,518	12/20/83	4,421,744	06/379,614	12/20/83
4,421,364	06/312,048	12/20/83	4,421,750	06/353,927	12/20/83
4,421,369	06/285,062	12/20/83	4,421,758	06/329,995	12/20/83
4,421,373	06/334,869	12/20/83	4,421,759	06/286,728	12/20/83
4,421,378	06/373,906	12/20/83	4,421,764	06/398,298	12/20/83
4,421,379	06/224,279	12/20/83	4,421,775	06/385,172	12/20/83
4,421,393	06/257,683	12/20/83	4,421,776	06/319,142	12/20/83
4,421,408	06/237,021	12/20/83	4,421,788	06/351,027	12/20/83
4,421,418	06/364,678	12/20/83	4,421,790	06/421,343	12/20/83
4,421,435	06/244,625	12/20/83	4,421,793	06/375,464	12/20/83
4,421,436	06/395,385	12/20/83	4,421,795	06/359,660	12/20/83
4,421,440	06/260,184	12/20/83	4,421,798	06/447,139	12/20/83
4,421,445	06/332,447	12/20/83	4,421,801	06/442,119	12/20/83
4,421,449	06/315,511	12/20/83	4,421,808	06/365,991	12/20/83
4,421,451	06/361,858	12/20/83	4,421,814	06/362,949	12/20/83
4,421,458	06/309,105	12/20/83	4,421,817	06/342,598	12/20/83
4,421,463	06/290,835	12/20/83	4,421,820	06/441,899	12/20/83
4,421,466	06/278,173	12/20/83	4,421,824	06/325,702	12/20/83
4,421,471	06/421,951	12/20/83	4,421,830	06/384,914	12/20/83
4,421,475	06/241,976	12/20/83	4,421,835	06/256,547	12/20/83
4,421,476	06/376,569	12/20/83	4,421,836	06/438,562	12/20/83
4,421,479	06/481,206	12/20/83	4,421,840	06/329,111	12/20/83
4,421,485	06/240,188	12/20/83	4,421,847	06/329,731	12/20/83
4,421,486	06/362,829	12/20/83	4,421,849	06/385,116	12/20/83
4,421,488	06/321,170	12/20/83	4,421,850	06/237,637	12/20/83
4,421,491	06/275,722	12/20/83	4,421,852	06/406,178	12/20/83
4,421,493	06/353,302	12/20/83	4,421,860	06/310,746	12/20/83
4,421,495	06/360,544	12/20/83	4,421,864	06/328,964	12/20/83
4,421,496	06/399,191	12/20/83	4,421,868	06/425,396	12/20/83
4,421,499	06/285,435	12/20/83	4,421,873	06/411,202	12/20/83
4,421,503	06/281,655	12/20/83	4,421,881	06/369,379	12/20/83
4,421,507	06/324,040	12/20/83	4,421,886	06/269,895	12/20/83
4,421,546	06/403,209	12/20/83	4,421,890	06/336,241	12/20/83
4,421,547	06/364,397	12/20/83	4,421,900	06/369,283	12/20/83
4,421,548	06/334,861	12/20/83	4,421,913	06/329,869	12/20/83
4,421,552	06/369,074	12/20/83	4,421,914	06/311,329	12/20/83
4,421,562	06/478,006	12/20/83	4,421,918	06/339,704	12/20/83
4,421,563	06/370,540	12/20/83	4,421,919	06/281,243	12/20/83
4,421,566	06/419,397	12/20/83	4,421,920	06/339,722	12/20/83
4,421,569	06/376,549	12/20/83	4,421,921	06/434,562	12/20/83
4,421,572	06/359,549	12/20/83	4,421,939	06/350,507	12/20/83
4,421,575	06/223,924	12/20/83	4,421,943	06/305,124	12/20/83
4,421,576	06/302,196	12/20/83	4,421,951	06/306,926	12/20/83
4,421,581	06/368,120	12/20/83	4,421,956	06/271,041	12/20/83
4,421,586	06/419,907	12/20/83	4,421,958	06/271,041	12/20/83
4,421,589	06/397,824	12/20/83	4,421,959	06/369,762	12/20/83
4,421,594	06/291,489	12/20/83	4,421,961	06/235,023	12/20/83
4,421,595	06/344,624	12/20/83	4,421,963	06/276,174	12/20/83
4,421,596	06/359,491	12/20/83	4,421,969	06/285,498	12/20/83
4,421,599	06/326,055	12/20/83	4,421,990	06/412,894	12/20/83
4,421,600	06/280,752	12/20/83	4,422,001	06/270,940	12/20/83
4,421,604	06/314,259	12/20/83	4,422,004	06/276,878	12/20/83
4,421,605	06/359,924	12/20/83	4,422,007	06/274,362	12/20/83
4,421,620	06/347,844	12/20/83	4,422,012	06/251,009	12/20/83
4,421,629	06/271,570	12/20/83	4,422,013	06/285,690	12/20/83
4,421,636	06/366,951	12/20/83	4,422,014	06/320,325	12/20/83
4,421,641	06/336,451	12/20/83	4,422,015	06/246,006	12/20/83
4,421,642	06/343,761	12/20/83	4,422,021	06/318,458	12/20/83
4,421,659	06/393,899	12/20/83	4,422,022	06/376,288	12/20/83
4,421,663	06/264,979	12/20/83	4,422,024	06/337,715	12/20/83
4,421,666	06/357,574	12/20/83	4,422,026	06/336,469	12/20/83
4,421,670	06/302,287	12/20/83	4,442,029	06/379,921	12/20/83
4,421,679	06/345,665	12/20/83	4,442,030	06/301,423	12/20/83
4,421,680	06/303,467	12/20/83	4,422,031	06/413,344	12/20/83
4,421,682	06/251,667	12/20/83	4,422,033	06/330,811	12/20/83
4,421,690	06/379,387	12/20/83	4,422,044	06/322,145	12/20/83
4,421,691	06/270,851	12/20/83	4,422,048	06/401,108	12/20/83
			4,422,053	06/300,280	12/20/83
			4,422,068	06/275,734	12/20/83

Patent Number	Serial Number	Issue Date	4,714,043	06/895,461	12/22/87
			4,714,048	06/798,687	12/22/87
4,420,073	06/315,684	12/20/83	4,714,050	06/770,569	12/22/87
4,422,078	06/412,177	12/20/83	4,714,056	06/760,306	12/22/87
4,422,082	06/314,931	12/20/83	4,714,070	06/889,475	12/22/87
4,422,091	06/225,899	12/20/83	4,714,073	06/892,090	12/22/87
4,422,099	06/345,492	12/20/83	4,714,074	06/750,414	12/22/87
4,422,104	06/256,683	12/20/83	4,714,078	06/884,775	12/22/87
4,422,109	06/390,884	12/20/83	4,714,084	06/788,197	12/22/87
4,422,113	06/263,039	12/20/83	4,714,087	07/031,510	12/22/87
4,422,116	06/286,550	12/20/83	4,714,088	07/055,357	12/22/87
4,422,121	06/383,278	12/20/83	4,714,098	06/501,991	12/22/87
4,422,123	06/343,705	12/20/83	4,714,103	06/917,705	12/22/87
4,422,128	06/290,692	12/20/83	4,714,105	07/034,897	12/22/87
4,422,134	06/276,043	12/20/83	4,714,108	06/897,322	12/22/87
4,422,135	06/329,411	12/20/83	4,714,110	06/893,991	12/22/87
4,422,136	06/361,587	12/20/83	4,714,111	06/891,704	12/22/87
4,422,137	06/402,097	12/20/83	4,714,112	07/065,198	12/22/87
4,422,152	06/323,073	12/20/83	4,714,113	06/938,496	12/22/87
4,422,161	06/309,694	12/20/83	4,714,114	06/944,739	12/22/87
4,422,165	06/233,541	12/20/83	4,714,131	06/853,192	12/22/87
4,422,172	06/342,870	12/20/83	4,714,134	06/872,655	12/22/87
4,713,843	07/009,726	12/22/87	4,714,137	06/857,094	12/22/87
4,713,845	06/931,554	12/22/87	4,714,140	06/840,591	12/22/87
4,713,846	06/872,669	12/22/87	4,714,141	06/905,783	12/22/87
4,713,857	06/937,826	12/22/87	4,714,143	06/859,483	12/22/87
4,713,864	07/028,798	12/22/87	4,714,148	06/739,366	12/22/87
4,713,866	06/824,097	12/22/87	4,714,154	06/942,486	12/22/87
4,713,870	06/943,832	12/22/87	4,714,159	06/901,538	12/22/87
4,713,881	06/838,652	12/22/87	4,714,161	06/794,088	12/22/87
4,713,884	06/904,208	12/22/87	4,714,162	06/942,601	12/22/87
4,713,886	06/840,903	12/22/87	4,714,163	07/011,295	12/22/87
4,713,891	07/023,358	12/22/87	4,714,168	06/879,953	12/22/87
4,713,892	06/910,123	12/22/87	4,714,180	06/914,073	12/22/87
4,713,894	06/638,416	12/22/87	4,714,181	06/898,618	12/22/87
4,713,895	06/883,370	12/22/87	4,714,184	07/025,356	12/22/87
4,713,897	06/725,434	12/22/87	4,714,190	06/905,955	12/22/87
4,713,900	06/680,326	12/22/87	4,714,191	07/024,428	12/22/87
4,713,902	06/790,399	12/22/87	4,714,198	06/937,246	12/22/87
4,713,906	06/806,452	12/22/87	4,714,199	06/861,548	12/22/87
4,713,911	06/933,857	12/22/87	4,714,204	06/918,674	12/22/87
4,713,912	06/840,930	12/22/87	4,714,208	06/776,488	12/22/87
4,713,915	06/867,899	12/22/87	4,714,209	06/921,734	12/22/87
4,713,916	06/924,950	12/22/87	4,714,227	06/931,286	12/22/87
4,713,918	06/824,150	12/22/87	4,714,228	07/010,505	12/22/87
4,713,925	06/872,819	12/22/87	4,714,230	06/781,914	12/22/87
4,713,926	06/878,634	12/22/87	4,714,231	06/850,909	12/22/87
4,713,928	06/905,705	12/22/87	4,714,233	07/005,533	12/22/87
4,713,930	06/862,873	12/22/87	4,714,235	06/873,005	12/22/87
4,713,935	06/849,492	12/22/87	4,714,238	07/022,033	12/22/87
4,713,937	06/854,048	12/22/87	4,714,240	06/823,765	12/22/87
4,713,940	06/927,986	12/22/87	4,714,243	06/823,472	12/22/87
4,713,944	06/904,649	12/22/87	4,714,249	07/046,778	12/22/87
4,713,947	07/025,373	12/22/87	4,714,254	06/807,443	12/22/87
4,713,950	06/891,769	12/22/87	4,714,255	06/872,602	12/22/87
4,713,951	06/794,725	12/22/87	4,714,256	06/889,876	12/22/87
4,713,959	06/868,686	12/22/87	4,714,261	06/899,809	12/22/87
4,713,967	06/846,248	12/22/87	4,714,265	07/035,177	12/22/87
4,713,972	06/876,225	12/22/87	4,714,266	06/785,568	12/22/87
4,713,976	06/734,347	12/22/87	4,714,273	06/816,239	12/22/87
4,713,983	07/003,452	12/22/87	4,714,277	06/855,354	12/22/87
4,713,990	06/886,684	12/22/87	4,714,278	06/852,385	12/22/87
4,713,991	06/425,374	12/22/87	4,714,279	06/925,963	12/22/87
4,713,995	06/783,677	12/22/87	4,714,280	06/863,859	12/22/87
4,713,998	07/030,331	12/22/87	4,714,300	06/888,659	12/22/87
4,713,999	06/870,798	12/22/87	4,714,305	06/897,018	12/22/87
4,714,002	06/838,328	12/22/87	4,714,310	06/854,222	12/22/87
4,714,006	06/403,012	12/22/87	4,714,311	06/631,401	12/22/87
4,714,007	06/841,091	12/22/87	4,714,314	06/698,721	12/22/87
4,714,008	06/800,448	12/22/87	4,714,315	06/787,112	12/22/87
4,714,011	06/920,376	12/22/87	4,714,316	06/767,492	12/22/87
4,714,012	06/906,930	12/22/87	4,714,322	06/835,751	12/22/87
4,714,016	06/929,742	12/22/87	4,714,325	06/775,190	12/22/87
4,714,018	06/880,020	12/22/87	4,714,334	06/935,639	12/22/87
4,714,023	06/844,519	12/22/87	4,714,340	07/018,597	12/22/87
4,714,024	06/874,048	12/22/87	4,714,342	06/684,925	12/22/87
4,714,025	06/803,760	12/22/87	4,714,353	06/893,695	12/22/87
4,714,030	06/677,219	12/22/87	4,714,358	06/823,260	12/22/87
4,714,035	06/889,317	12/22/87	4,714,360	06/915,720	12/22/87

Patent Number	Serial Number	Issue Date	4,714,700	06/700,478	12/22/87
4,714,362	06/387,501	12/22/87	4,714,703	06/846,841	12/22/87
4,714,366	06/863,574	12/22/87	4,714,709	06/653,707	12/22/87
4,714,373	06/875,922	12/22/87	4,714,710	06/905,275	12/22/87
4,714,393	06/689,682	12/22/87	4,714,721	06/842,259	12/22/87
4,714,395	06/816,763	12/22/87	4,714,723	06/810,450	12/22/87
4,714,409	06/914,626	12/22/87	4,714,726	06/870,416	12/22/87
4,714,415	06/893,177	12/22/87	4,714,740	06/892,625	12/22/87
4,714,419	06/866,460	12/22/87	4,714,743	06/877,639	12/22/87
4,714,421	07/013,641	12/22/87	4,714,744	06/877,908	12/22/87
4,714,432	06/804,921	12/22/87	4,714,751	06/810,191	12/22/87
4,714,437	07/005,066	12/22/87	4,714,775	06/913,938	12/22/87
4,714,438	06/880,030	12/22/87	4,714,777	06/817,762	12/22/87
4,714,442	07/002,101	12/22/87	4,714,781	06/844,641	12/22/87
4,714,444	06/862,265	12/22/87	4,714,792	06/773,168	12/22/87
4,714,445	06/909,587	12/22/87	4,714,799	06/805,819	12/22/87
4,714,447	06/850,445	12/22/87	4,714,802	06/896,499	12/22/87
4,714,451	06/748,401	12/22/87	4,714,807	07/021,364	12/22/87
4,714,452	06/871,254	12/22/87	4,714,813	06/823,870	12/22/87
4,714,455	06/871,238	12/22/87	4,714,817	06/916,025	12/22/87
4,714,456	06/860,713	12/22/87	4,714,819	06/884,956	12/22/87
4,714,474	06/861,892	12/22/87	4,714,832	06/753,659	12/22/87
4,714,484	06/858,395	12/22/87	4,714,835	06/795,742	12/22/87
4,714,491	06/539,784	12/22/87	4,714,857	06/854,324	12/22/87
4,714,508	06/843,509	12/22/87	4,714,859	06/842,318	12/22/87
4,714,510	06/900,055	12/22/87	4,714,860	06/696,460	12/22/87
4,714,513	06/598,154	12/22/87	4,714,861	06/913,955	12/22/87
4,714,525	06/815,783	12/22/87	4,714,865	06/873,619	12/22/87
4,714,529	06/809,126	12/22/87	4,714,873	06/897,800	12/22/87
4,714,548	06/393,355	12/22/87	4,714,879	06/908,238	12/22/87
4,714,557	06/873,361	12/22/87	4,714,880	06/870,872	12/22/87
4,714,564	06/370,236	12/22/87	4,714,894	06/843,165	12/22/87
4,714,567	06/793,281	12/22/87	4,714,902	06/745,044	12/22/87
4,714,581	06/883,857	12/22/87	4,714,906	06/737,161	12/22/87
4,714,587	07/013,818	12/22/87	4,714,912	06/948,180	12/22/87
4,714,590	06/840,614	12/22/87	4,714,914	06/853,379	12/22/87
4,714,596	06/795,410	12/22/87	4,714,925	06/811,479	12/22/87
4,714,602	06/886,014	12/22/87	4,714,927	06/617,510	12/22/87
4,714,608	06/879,229	12/22/87	4,714,929	06/904,109	12/22/87
4,714,611	06/693,669	12/22/87	4,714,930	06/901,374	12/22/87
4,714,614	06/665,096	12/22/87	4,714,956	06/806,673	12/22/87
4,714,619	06/893,551	12/22/87	4,714,960	06/740,829	12/22/87
4,714,621	06/946,512	12/22/87	4,714,967	06/798,043	12/22/87
4,714,626	06/819,224	12/22/87	4,714,972	06/696,203	12/22/87
4,714,627	06/810,322	12/22/87	4,714,985	07/030,506	12/22/87
4,714,629	06/854,972	12/22/87	4,715,003	06/758,068	12/22/87
4,714,640	06/826,165	12/22/87	4,715,008	06/450,845	12/22/87
4,714,659	06/645,742	12/22/87	4,715,016	06/784,773	12/22/87
4,714,662	07/027,061	12/22/87	4,715,018	06/819,076	12/22/87
4,714,676	06/476,955	12/22/87	4,715,023	07/027,369	12/22/87
4,714,677	06/477,553	12/22/87	4,715,026	06/860,580	12/22/87
4,714,685	06/939,183	12/22/87	4,715,029	06/881,432	12/22/87
4,714,689	06/894,581	12/22/87	4,715,041	06/746,882	12/22/87
4,714,691	06/900,304	12/22/87	4,715,045	06/840,497	12/22/87
4,714,699	07/027,350	12/22/87	4,715,048	06/858,915	12/22/87
			4,715,055	06/900,042	12/22/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Application Patent Date	Delayed Payment Filing Date	Acceptance Date
4,612,926	06/786,554	9/23/86	10/11/85	11/07/91
4,632,103	06/797,985	12/30/86	11/14/85	8/27/91
4,649,593	06/765,543	3/17/87	8/14/85	7/19/91
4,654,926	06/721,061	4/07/87	4/08/85	10/10/91
4,688,686	06/847,182	8/27/87	4/02/86	10/21/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,677,980, Re. S.N. 07/804,433, Filed Dec. 10, 1991, Cl. 128/655, ANGIOGRAPHIC INJECTOR AND ANGIOGRAPHIC SYRINGE FOR USE THEREWITH, David M. Reilly, et. al., Owner of Record: *Medrad, Inc., Pittsburgh, Pa.*, Attorney or Agent: Ronald D. Cohn, Ex. Gp.: 336

4,708,338, Re. S.N. 07/789,789, Filed Nov. 8, 1991, Cl. 272, STAIR-CLIMBING EXERCISE APPARATUS, Lanny L. Potts, Owner of Record: *Tri-Tech, Inc., Tulsa, Okla.*, Attorney or Agent: Richard L. Hughes, Ex. Gp.: 332

4,779,252, Re. S.N. 07/821,348, Filed Jan. 14, 1992, Cl. 369, APPARATUS FOR AUTOMATICALLY REDUCING PREFERRED SELECTION FROM A RECORD CARRIER AUTOMATICALLY, Pieter H. Custers, et. al., Owner of Record: *U.S. Philips Corp., New York, N.Y.*, Attorney or Agent: Leroy Eason, Ex. Gp.: 233

4,844,884, Re. S.N. 07/725,035, Filed July 3, 1991, Cl. 424/59, COSMETIC SUNSCREEN PRODUCT FOR THE FACE AND BODY, Wladimir Tur, Owner of Record: *Induchem AG, Dubendorf, Switzerland*, Attorney or Agent: Anthony Lagani, Ex. Gp.: 129

4,871,614, Re. S.N. 07/770,362, Filed Oct. 3, 1991, Cl. 428/336, OPTO MAGNETIC RECORDING MEDIUM HAVING THREE EXCHANGE-COUPLED MAGNETIC LAYERS, Tadashi Kobayashi, Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Richard P. Bauer, Ex. Gp.: 159

4,874,253, Re. S.N. 07/778,046, Filed Oct. 16, 1991, Cl. 374/121, RADIATION DETECTOR WITH TEMPERATURE DISPLAY, Francesco Pompei, et. al., Owner of Record: *Exergen Corp., Natick, Mass.*, Attorney or Agent: James M. Smith, Ex. Gp.: 246

4,937,653, Re. S.N. 07/820,730, Filed Jan. 14, 1992, Cl. 357/68, SEMICONDUCTOR INTEGRATED CIRCUIT CHIP-TO-CHIP INTERCONNECTION SCHEME, Greg E. Blonder, et. al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.*, Attorney or Agent: David J. Caplan, Ex. Gp.: 258

4,951,510, Re. S.N. 07/741,242, Filed Aug. 1, 1991, Cl. 73/862.04, MULTIDIMENSIONAL FORCE SENSOR, James W. Holm-Kennedy, Owner of Record: *University of Hawaii, Honolulu, Hawaii*, Attorney or Agent: Martin E. Hsia, Ex. Gp.: 267

4,958,493, Re. S.N. 07/822,245, Filed Jan. 17, 1992, Cl. 60/384, OPEN-CENTER STEERING CONTROL UNIT WITH THE FLOW AMPLIFICATION, Herman P. Schutten, et. al., Owner of Record: *Eaton Corp., Cleveland, Ohio*, Attorney or Agent: L. J. Kasper, Ex. Gp.: 341

4,962,754, Re. S.N. 07/821,744, Filed Jan. 13, 1992, Cl. 128/024, SHOCK WAVE TREATMENT APPARATUS, Kiyoshi Okazaki, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki, Japan*, Attorney or Agent: Wilford L. Wisner, Ex. Gp.: 335

4,989,620, Re. S.N. 07/823,001, Filed Dec. 13, 1991, Cl. 131/371, METHOD AND APPARATUS FOR COATING EXTRUDED TOBACCO-COATING MATERIAL, Gus D. Keritsis, et. al., Owner of Record: *Phillip Morris Inc., New York, N.Y.*, Attorney or Agent: Charles B. Smith, Ex. Gp.: 332

5,007,755, Re. S.N. 07/819,824, Filed Jan. 13, 1992, Cl. 401/175, COSMETIC PRODUCT, Harold R. Thompson, Owner of Record: *The Gillette Co., Boston, Mass.*, Attorney or Agent: Willis M. Ertman, Ex. Gp.: 331

5,020,866, Re. S.N. 07/822,052, Filed Jan. 14, 1992, Cl. 312/265.4, ENCLOSURE FOR HOUSING ELECTRONIC COMPONENTS, George McIlwraith, Owner of Record: *Gichner System Group, Inc., Dallastown, Pa.*, Attorney or Agent: Jeffrey E. Young, Ex. Gp.: 357

5,061,300, Re. S.N. 07/808,188, Filed Dec. 13, 1991, Cl. 55/30, COALESCER FILTER AND METHOD, William J. Alexander, III, Owner of Record: *Inventor*, Attorney or Agent: Ralph Bailey, Ex. Gp.: 135

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated

Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 298,986, Reexam No. 90/002,619, Requested Jan. 22, 1992, Cl. D6/356, ADJUSTABLE VEHICLE SEAT, John W. Carter, Owner of Record: *The Wise Co. Inc., Memphis, Tenn.*, Attorney or Agent: Glenn H. Austin, Davenport, Iowa, Ex. Gp.: 293, Requester: David B. Smith, Michael, Best & Friedrich, Milwaukee, Wis.

4,425,481, Reexam No. 90/002,614, Requested Jan. 8, 1992, Cl. 381/068.2, PROGRAMMABLE SIGNAL PROCESSING DEVICE, Stephan Mangold, et. al., Owner of Record: *Stephen Mangold, Molnlycke, Sweden; Arne Leijon, Goteborg, Sweden; Bjorn Israelsson, Goteborg, Sweden*, Attorney or Agent: Jack Frank Kramer, New York, N.Y., Ex. Gp.: 268, Requester: Minnesota Mining and Manufacturing Co., St. Paul, Minn.

4,508,500, Reexam No. 90/002,617, Requested Jan. 17, 1992, Cl. 425/388, ELECTRICAL DUET EXTENSION APPARATUS, Terry M. French, Owner of Record: *Tamaqua Cable Products Corp., Schuylkill Haven Pa.*, Attorney or Agent: Robert B. Washburn, Woodcock, Washburn, et. al., Philadelphia, Pa., Ex. Gp.: 135, Requester: Owner

4,659,309, Reexam No. 90/002,615, Requested Dec. 23, 1991, Cl. 433/009, ORTHODONTIC BRACKET WITH RHOMBOIDAL PROFILE, Daniel A. Merkel, Owner of Record: *American Orthodontics Corp., Sheboygan, Wis.*, Attorney or Agent: Llyod L. Zickert, Chicago, Ill., Ex. Gp.: 333, Requester: Owner

4,770,674, Reexam No. 90/002,621, Requested Jan. 21, 1992, Cl. 055/005, GAS CONDITIONING FOR AN ELECTROSTATIC PRECIPITATOR, Marco G. Tellini, et. al., Owner of Record: *Wilhelm Environmental Technologies, Inc., Ind.*, Attorney or Agent: Marvin Naigur, Foster Wheeler Corp., Clinton, N.J., Ex. Gp.: 135, Requester: Lab S. A. Lyon Cedex, France

4,844,723, Reexam No. 90/002,622, Requested Jan. 21, 1992, Cl. 055/106.5, GAS CONDITION FOR AN ELECTROSTATIC PRECIPITATOR, Marco G. Tellini, et. al., Owner of Record: *Wilhelm Environmental Technologies, Inc., Ind.*, Attorney or Agent: Marvin Naigur, Foster Wheeler Corp., Clinton, N.J., Ex. Gp.: 135, Requester: Lab S. A. Lyon Cedex, France

4,899,544, Reexam No. 90/002,618, Requested Jan. 21, 1992, Cl. 060/618, COGENERATION/CO₂ PRODUCTION AND PLANT, Randall T. Boyd, et. al., Owner of Record: *Neco Licensing Co., Sugar Land, Tex.*, Attorney or Agent: David L. Moseley, Dodge, Bush & Moseley, Houston, Tex., Ex. Gp.: 343, Requester: Anonymous, Correspondance Address: Watson T. Scott, Cushman, Darby & Cushman, Washington, DC

4,925,445, Reexam No. 90/002,620, Requested Jan. 23, 1992, Cl. 604/095, GUIDE WIRE FOR CATHETER, Hidetoshi Sakamoto, et. al., Owner of Record: *Terumo Corp., Kanagawa-Ken, Japan*, Attorney Or Agent: Barry E. Breitschneider, Fish & Richardson, Washington DC, Ex. Gp.: 333, Requester: Owner

4,956,219, Reexam No. 90/002,610, Requested Jan. 16, 1992, Cl. 428/137, METHOD OF PRODUCING PERFORATIONS IN A SOLID MATERIAL IN SHEET FORM, AN IRRADIATION DEVICE FOR WORKING THE METHOD, AND THE RESULTING PERFORATED MATERIAL, Roger Legras, et. al., Owner of Record: *Universite Catholique De Louvain B13 Louvain La Neuve, France*, Attorney or Agent: Allen S. Melsner, Mason, Fenwick & Lawrence, Washington, DC, Ex. Gp.: 158, Requester: Gregory J. Maier, Oblon, Spivak, McClelland, et. al., Arlington, Va.

5,059,649, Reexam No. 90/002,616, Requested Jan. 21, 1992, Cl. 524/398, STORAGE STABLE ONE-PART FLUOROSILICONE GEL COMPOSITIONS EXHIBITING IMPROVED THERMAL STABILITY, Myron T. Maxson, et. al., Owner of Record: *Dow Corning Corp., Midland, Mich.*

Attorney or Agent: Robert Spector, Midland, Mich., Ex. Gp.: 150, Requester: Owner

Removal from Register

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on Nov. 29, 1991 to James Bartholomew, 7312 Independence Ave., #8, Canoga Park, Ca. 91303, the last

post office address furnished by him to the Office of Enrollment and Discipline. No reply was received within the period of forty-five (45) days therein set.

Accordingly, his name is being removed from the Register of Attorneys and Agents.

Jan. 31, 1992

CAMERON WEIFFENBACH
*Director, Office of
Enrollment and Discipline*

Patent Interference Practice Series

In view of the great interest shown in attending the series of Patent Interference Practice discussions announced in the Jan. 28, 1992, Official Gazette at 1134 OG 683, three additional sessions are scheduled as follows:

1. February 20, 1992 - Declaration and Preliminary Statement;
2. March 12, 1992 - Preliminary Motions, including Duty of Disclosures;
3. April 15, 1992 - Testimony, Discovery, Briefs and Final Hearing.

TIME: 12:00 - 1:30 P.M.

PLACE: Classroom "J"
Patent and Trademark Office Academy
Suite 501
Crystal Park 1, 2011 Crystal Drive
Arlington, Va.

There is no charge for the program. Lunch is not provided. Since space is limited, it is imperative that reservations be made in advance. Reservations should be made by using the Registration Form below. Once the capacity for each meeting has been reached reservations will no longer be accepted and requests for reservations will be returned.

Feb. 3, 1992

SAUL I. SEROTA
*Chairman, Board of Patent
Appeals and Interferences*

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D.C. Bar, Sections Office
1707 L St., N.W., 6th Floor
Washington, D.C. 20036-4203

Or:

Transmit by Facsimile to:

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Practice Series
D.C. Bar, Sections Office
202-828-8572

Please reserve _____ space(s) for me at the following program(s) in the series: () February 20, 1992
() March 12, 1992 () April 15, 1992

NAME(S) _____

(Include all names. Use back if necessary).

D.C. BAR NO.(S) _____

PHONE NO. _____

FAX NO. _____

Status of PTO Services

The following is an update of the status of PTO services for Jan. 1992:

Service Item	FY 1991 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	17
Trademarks	30	37
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	1
Mail Coupons	12	6
Letter Orders	16	26
Electronic Ordering Service (EOS)	11	1
Certified Copies:		
Trademark Registrations	21	21
Applications-As-Filed	17	22
File-Wrapper/Contents	N/A	33
Patent Application Expedited	7	7
TM Applications-As-Filed	17	13
TM Applications Expedited	7	6
TM File Wrapper/Contents	N/A	40
Trademark Search Library:		
Filing Pending Marks	23	45
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	17
Assignments:		
Recording Patent-New Applications	20	16
Recording Patent-Mail Room Recpts.	20	19
Return Patents-New Applications	34	36
Return Patents-Mail Room Recpts.	34	37
Recording Trademarks	20	23
Returning Trademark Documents	34	40
Avg. Days from Issue Fee Payment to Issue Date	90-100	110
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	98% on Issue Date
Trademark Copies Available	95% on Issue Date	98% on Issue Date

*Unless otherwise noted.

Jan. 31, 1992

THERESA A. BRELSFORD
*Assistant Commissioner for
Public Services and
Administration*

PATENT NOTICES

Certificates of Correction For Week of February 25, 1992

B1. 4,877,077	4,885,755	4,933,495	4,955,866	4,859,037	4,915,455	4,948,117	4,967,754
B2. 4,189,834	4,885,863	4,934,422	4,956,102	4,861,965	4,916,049	4,949,625	4,967,779
Re. 33,283	4,886,977	4,934,885	4,956,152	4,863,819	4,916,510	4,949,693	4,967,814
D. 306,839	4,889,919	4,935,126	4,956,302	4,864,501	4,917,737	4,950,600	4,968,022
D. 307,562	4,890,037	4,937,084	4,956,461	4,866,247	4,917,823	4,950,694	4,968,105
D. 311,260	4,890,146	4,937,987	4,959,054	4,867,973	4,917,959	4,950,769	4,968,151
D. 311,669	4,890,373	4,938,363	4,959,133	4,869,130	4,920,497	4,951,172	4,970,425
4,516,510	4,892,606	4,938,556	4,959,175	4,869,981	4,920,635	4,951,530	4,972,232
4,595,390	4,892,896	4,938,767	4,959,673	4,870,585	4,921,587	4,951,917	4,974,334
4,672,407	4,892,935	4,938,879	4,960,034	4,871,240	4,922,409	4,952,036	4,974,428
4,704,876	4,895,722	4,939,176	4,960,585	4,871,814	4,923,828	4,952,130	4,983,633
4,716,301	4,895,810	4,939,493	4,960,605	4,871,848	4,924,786	4,952,667	4,987,453
4,730,069	4,896,160	4,939,653	4,961,082	4,872,689	4,924,816	4,952,748	5,051,302
4,741,481	4,897,113	4,939,883	4,961,470	4,874,750	4,925,114	4,952,888	5,054,041
4,770,349	4,897,846	4,940,196	4,961,691	4,875,484	4,926,680	4,954,034	5,058,718
4,776,105	4,899,303	4,940,633	4,961,857	4,876,497	4,927,299	4,955,006	5,060,517
4,791,128	4,900,591	4,942,032	4,962,244	4,877,077	4,927,832	4,955,119	5,068,719
4,796,169	4,900,694	4,942,106	4,962,825	4,878,291	4,929,645	4,955,292	5,069,765
4,804,363	4,900,898	4,942,126	4,963,371	4,879,931	4,930,347	4,955,419	
4,805,221	4,903,067	4,942,779	4,963,808	4,880,439	4,932,922	4,955,738	
4,806,424	4,903,689	4,943,557	4,964,250	4,881,951	4,933,215	4,955,771	
4,816,238	4,905,079	4,943,683	4,964,315				
4,817,887	4,905,609	4,944,388	4,964,576				
4,821,330	4,907,283	4,944,488	4,964,580				
4,829,968	4,907,353	4,944,496	4,964,797				
4,835,491	4,908,072	4,944,647	4,965,410				
4,837,495	4,910,078	4,944,849	4,965,448				
4,839,203	4,910,523	4,945,032	4,965,454				
4,843,070	4,911,239	4,945,751	4,965,516				
4,844,514	4,911,784	4,945,986	4,965,677				
4,844,837	4,911,811	4,946,443	4,965,691				
4,846,264	4,912,104	4,946,863	4,965,925				
4,846,897	4,912,274	4,947,012	4,966,218				
4,850,343	4,912,583	4,947,185	4,966,693				
4,852,984	4,914,159	4,947,687	4,967,400				

Erratum

IN THE NOTICE OF CERTIFICATE OF CORRECTION APPEARING AT 1114 OG 63, dated May 22, 1990, delete all reference to Patent No. 4,618,622, since no Certificate of Correction was granted.

IN THE NOTICE OF CERTIFICATE OF CORRECTION APPEARING AT 1118 OG 46, dated Sept. 25, 1990, delete all reference to Patent No. 4,860,010, since no Certificate of Correction was granted.

1135 OG 72

FEBRUARY 25, 1992

U. S. PATENT AND TRADEMARK OFFICE

1135 OG 73

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 17	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
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Box Assignment	All assignment documents except those filed with new applications.
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	San Diego Public Library	(619) 236-5813
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	Minneapolis Public Library and Information Center	(612) 372-6570
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PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	11/17/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	4/26/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — DONALD CZAJA, Acting Director	308-0651	2/8/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/27/90
BIOTECHNOLOGY, GROUP 180 — BARRY S. RICHMAN, Acting Director	308-0196	7/21/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	7/3/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	7/3/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	11/2/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS, GROUP 240 — CARLTON CROYLE, Director	308-0771	1/15/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	1/7/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	7/28/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	5/2/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	3/25/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	3/4/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	12/3/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	2/26/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	12/19/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during January 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,858,241 to 3,863,270 inclusive
Plant Patents	3,674 to 3,677

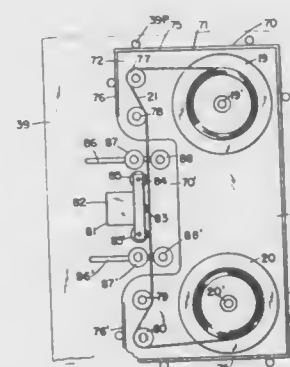
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REEXAMINATIONS

FEBRUARY 25, 1992

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 28,461 (1643rd)
TAPE CARTRIDGE AND READER
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Reexamination Request No. 90/001,923, Jan. 16, 1990.
Reexamination Certificate for Reissue Patent Re. 28,461, issued
Jul. 1, 1975, Ser. No. 468,132, May 8, 1974.
Original No. 3,555,245, dated Jan. 12, 1971, Ser. No. 463,097,
Jun. 11, 1965. Continuation-in-part of Ser. No. 152,702, Oct.
17, 1961, abandoned, which is a division of Ser. No. 449,874,
Jul. 28, 1954, abandoned, which is a division of Ser. No.
142,748, Aug. 28, 1961. Request filed Jan. 16, 1990, Ser. No.
468,132
Int. Cl.³ G06K 7/10; G11B 15/32
U.S. Cl. 250—570

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

The patentability of claims 1-7, 9-12 and 18 is confirmed.

Claims 8 and 13-17 are cancelled.

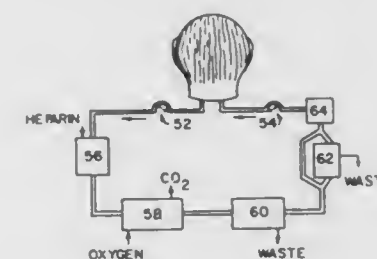
1. Tape transducing apparatus comprising in combination with a cartridge containing recording tape and means therein for supplying and taking up tape, an opening in said cartridge, means for guiding said tape past said opening, a support for said cartridge including tape transducing means and means operative to longitudinally drive said tape past said transducing means, tape engaging means operative after mounting said cartridge on said support for engaging the portion of the tape extending across the opening therein and drawing said portion away from said cartridge, a tape tensioning means mounted on said support, means moving said tape engaging means to carry tape engaged thereby into alignment with said tape tensioning means to couple said tape and said tape tensioning means, means for driving said tape in a path defined in part by said tape tensioning means and operating said tensioning means to control the tension of said tape.

B1 4,666,425 (1644th)
DEVICE FOR PERFUSING AN ANIMAL HEAD
Chet Fleming, St. Louis, Mo., assignor to The Dis Corporation, St. Louis, Mo.
Reexamination Request No. 90/001,249, Jun. 1, 1987.
Reexamination Certificate for Patent No. 4,666,425, issued May 19, 1987, Ser. No. 809,949, Dec. 17, 1985.
Int. Cl.³ A61M 37/00
U.S. Cl. 604—4

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

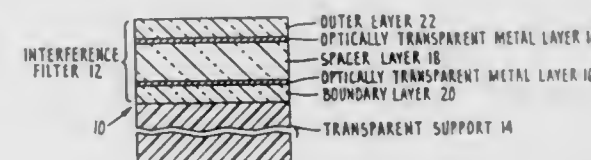
Claims 1-20 are cancelled.

[1. A device for maintaining metabolic activity in a mammalian head which has been severed from its body at its neck, comprising the following components:
a. venous cannulae which are capable of being attached to veins which pass through the neck and receiving blood from the veins;
b. arterial cannulae which are capable of being attached to arteries which pass through the neck and transporting blood into the arteries;
c. an oxygenation device which is in fluid communication with the venous and arterial cannulae, and which is capa-



ble of displacing carbon dioxide contained in the blood with oxygen;
d. one or more pumps of a selected type which causes relatively low levels of damage to blood components;
e. fluid conduits which are attached to each of the components listed above in a manner such that the components, when coupled to the veins and arteries of a severed head by means of the cannulae of parts (a) and (b), will form a system capable of circulating blood through the oxygenation device and through the head after the head has been severed from the body; and,
f. means for securely mounting the head upon the device after the head has been severed from the body, in a position such that the veins and arteries which emerge from the head can be connected to the venous and arterial cannulae.]

B1 4,799,745 (1645th)
HEAT REFLECTING COMPOSITE FILMS AND GLAZING PRODUCTS CONTAINING THE SAME
Stephen F. Meyer, Los Altos, and Thomas G. Hood, San Francisco, both of Calif., assignors to Southwall Technologies, Inc., Palo Alto, Calif.
Reexamination Request No. 90/002,223, Dec. 6, 1990.
Reexamination Certificate for Patent No. 4,799,745, issued Jan. 24, 1989, Ser. No. 880,797, Jun. 30, 1986.
Int. Cl.³ G02B 5/28
U.S. Cl. 359—360



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 5 is confirmed.

Claims 1-4, 6-13 and 17-25 are cancelled.

Claim 14 is determined to be patentable as amended.

Claims 15 and 16, dependent on an amended claim, are determined to be patentable.

New claims 26-40 are added and determined to be patentable.

14. [The] A visually transparent, infrared reflecting The composite film [of claim 13] comprising a transparent support having adhered to one surface thereof an interference filter having a plurality of continuous directly contiguous stacked layers, said layers comprising:

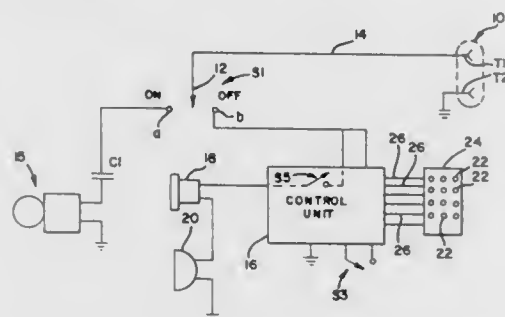
- a dielectric layer,
 - A discrete sputter-deposited transparent metal layer,
 - one or more pairs of layers, each pair comprising a dielectric spacer layer and a discrete sputter-deposited transparent metal layer, and
 - a dielectric outer layer,
- wherein the dielectric is a sputter-deposited dielectric; the metal layers each comprise silver and each are from 4 to 17 nm in thickness and the dielectric layers each have an index of refraction of from about 1.75 to about 2.25 with the spacer layers having a thickness of from 70 to 100 nm and outer layers having a thickness of from about 30 nm to about 70 nm.

**B1 4,881,259 (1646th)
ANSWERING MACHINE WITH CORDLESS
TELEPHONE**

James Scordato, Elmhurst, Ill., assignor to Dynascan Corporation

Reexamination Request No. 90/002,214, Nov. 30, 1990.
Reexamination Certificate for Patent No. 4,881,259, issued Nov. 14, 1989, Ser. No. 294,439, Jan. 6, 1989.

Int. Cl.⁵ H04B 7/20; H04M 1/64
U.S. Cl. 379-58



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 3-11 is confirmed.

Claim 1 is determined to be patentable as amended.

Claim 2, dependent on an amended claim, is determined to be patentable.

New claims 12-16 are added and determined to be patentable.

1. In combination with a telephone answering machine having connector means for making connection to telephone lines, said answering machine including recording and playing means operable to a playing mode for sending out onto telephone lines a recorded announcement and to a recording mode

for recording incoming messages thereafter, and system control means operable between an active mode establishing two-way communication between said telephone lines and telephone means and a passive mode, establishing communication between said telephone lines and said recording and playing means;

telephone means in the form of a cordless telephone means including a base unit and a portable handset each having transmitter and receiver means []; said handset having a user operable screening mode-producing switch means operable from an initial dormant condition to a screening condition and other separate user operable switch means operable to talk and standby conditions, said base unit [transmitter] and handset including respective means for transmitting by the base unit transmitter means to said handset receiver means ringing signals heard by the user when said other switch means is operated to said standby condition, and incoming messages received from said telephone lines [] heard by the user when said other switch means is operated to said talk condition or when said screening mode-producing switch means is operated to said screening condition; said handset [transmitter means having] including means for [transmitting] effecting the transmission by the handset transmitter means to [said telephone lines through] said base unit receiver means of a user chosen command signal when said other switch means is operated to said talk condition and for effecting the transmission through the handset transmitter means and said base unit receiver means to said telephone lines of voice communications from the user [and command means for transmitting to said base unit receiver means user-chosen control signal conditions,] when said other switch means is operated to said talk condition but not when said screening mode-producing switch means is operated to said screening condition, said system control means including means responsive to receipt of said [control signal conditions by said base unit receiver means] user chosen command signal for operating said system control means [between] from said [active and passive modes.] passive to said active mode to effect said two-way communication; and said recording and playing means, said system control means, and said base unit [are] being contained within a common housing.

**B1 4,959,101 (1647th)
PROCESS FOR DEGASSING ALUMINUM MELTS WITH
SULFUR HEXAFLUORIDE**

James R. MacNeal, Painesville; Timothy P. Rack, Solon, and Ronald R. Corns, Maumee, all of Ohio, assignors to AGA A.B., Cleveland, Ohio

Reexamination Request No. 90/002,231, Dec. 12, 1990.
Reexamination Certificate for Patent No. 4,959,101, issued Sep. 25, 1990, Ser. No. 251,959, Sep. 28, 1988.

Continuation of Ser. No. 67,949, Jun. 29, 1987, abandoned
Int. Cl.⁵ C22B 21/06

U.S. Cl. 75-685

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 6 and 9 to 11 is confirmed.

Claims 7 and 8 are cancelled.

1. A process for purifying melts of aluminum alloys containing magnesium by removing solid particle impurities including aluminum oxides and gaseous impurities from the melt without substantially altering the concentration of the magnesium in the melt, comprising the step of bubbling through the melt a treating gas consisting of an inert gas containing gaseous sulfur hexafluoride in a concentration up to about 10 percent by volume sulfur hexafluoride in order to remove the gaseous impurities and the solid particle impurities from the melt to a surface thereof, thus leaving the melt in the purified condition.

REISSUES

FEBRUARY 25, 1992

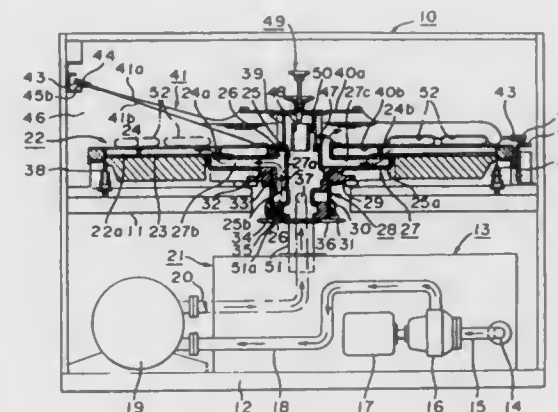
Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,828
FREEZING APPARATUS
Masahide Hashimoto; Yoshitaka Kurisu; Hiroshi Suenaga, and Akio Katou, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Original No. 4,807,448, dated Feb. 28, 1989, Ser. No. 168,383, Mar. 15, 1988. Application for reissue Mar. 14, 1990, Ser. No. 495,657

Claims priority, application Japan, Mar. 18, 1987, 62-61151; Mar. 18, 1987, 62-61152; Mar. 18, 1987, 62-61153; Mar. 18, 1987, 62-61154; Mar. 18, 1987, 62-61155; Mar. 18, 1987, 62-61156; Mar. 18, 1987, 62-61160

Int. Cl.⁵ F25D 17/02
U.S. Cl. 62-376

20 Claims



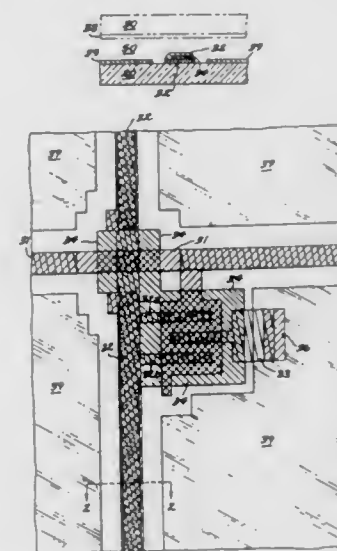
1. A freezing apparatus which comprises;
a cooling hollow body adapted to receive thereon products to be frozen and adapted to be driven for rotation;
a flexible container made of a flexible sheet material which is arranged on the upper surface of said cooling hollow body so as to cover said products placed on said upper surface;
a cold brine circulating path including the hollow portion of said cooling hollow body and the interior of said flexible container which are mutually communicated to feed cold brine;
an adapter means comprising a plurality of adapters which are attached to the outer periphery of said flexible container; and
a guide means provided around the outer periphery of said flexible container to slidably support said adapters, whereby said flexible container is moved synchronously with said cooling hollow body due to a frictional force resulted between said flexible container and said cooling hollow body.

20. The freezing apparatus according to claim [19] 1, wherein [the upper sheet portion of] said flexible container [is] includes an upper sheet portion constituted by plural sheets of cloth in at least a semi-circular form [or a circular form] in which [the network] networks of [them is] threads in all of the plural sheets have the same orientation, and an elastic sheet material covering said sheets of cloth [in one] to form the upper sheet portion as a single piece.

Re. 33,829
REDUNDANT CONDUCTOR STRUCTURES FOR THIN FILM FET DRIVEN LIQUID CRYSTAL DISPLAYS
Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Original No. 4,804,953, dated Feb. 14, 1989, Ser. No. 97,247, Sep. 16, 1987. Continuation of Ser. No. 756,640, Jul. 19, 1985, abandoned. Application for reissue Mar. 2, 1990, Ser. No. 487,482

Int. Cl.⁵ G09G 3/36
U.S. Cl. 340-784

56 Claims



35. A liquid crystal display, comprising:
a plurality of pixel cells arranged substantially in rows and columns;
a plurality of switch element means for turning on and off individual pixel cells, each switch element means having an interdigitated electrode structure and each coupled to a different one of said plurality of pixel cells;
a plurality of electrically conductive data lines, each of said data lines having a multilayer structure; and
a plurality of electrically conductive gate lines;
said switch element means, said data lines and said gate lines being electrically connected to permit voltages appearing on said data lines to be applied to selected pixel cells in accordance with signals present on said gate lines.

Re. 33,830
AUTO-FOCUS SYSTEM FOR VIDEO CAMERA
Kentaro Hanma, 241-79, Fukayacho, and Toshio Murakami, 4208-10 Totsukacho, both of Totsuka-ku, Yokohama, Japan
Original No. 4,611,244, dated Sep. 9, 1986, Ser. No. 623,082, Jun. 21, 1984. Continuation of Ser. No. 242,316, Sep. 9, 1988, abandoned, which is a continuation of Ser. No. 377,438, May 12, 1982, abandoned. Application for reissue Apr. 2, 1990, Ser. No. 502,813

Claims priority, application Japan, May 13, 1981, 56-70720
Int. Cl.⁵ H04N 3/26

U.S. Cl. 358-227

23 Claims

1. An auto-focus system for a video camera having a lens system comprising an objective lens located at the front of a [zoom lens system] varifocal lens means to receive an optical image from an object being photographed and a master lens located between said [zoom lens system] varifocal lens means

and an image pickup unit of said video camera, said auto-focus system comprising:

means for generating an auto-focus signal in accordance with the fineness of said optical image for said video camera;

a motor for moving at least a part of the master lens of said lens system;

motor control means for performing an auto-focus operation by controlling said motor to move the position of said master lens to focus the lens system in accordance with said auto-focus signal;

switch means being changeable selectively between a first and a second mode for instructing photographing over a normal distance range and over a macroscopic range respectively; and

master lens movable range control means for controlling said motor control means to decide a movable range of said master lens in accordance with the selected mode of said switch means and to thereby control said motor control means to limit the movement of said master lens to be within the decided movable range.

Re. 33,831

NON-SHORTING PIN SYSTEM

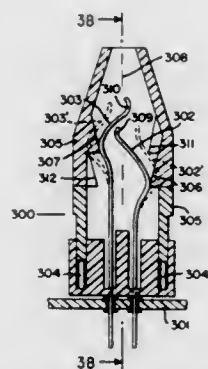
Lawrence J. Boland, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,598,966, dated Jul. 8, 1986, Ser. No. 471,955, Mar. 3, 1983, Application for reissue Nov. 30, 1987, Ser. No. 126,646

Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—260

3 Claims



1. In a zero insertion force type electrical connector for receiving an electrical component type having a plurality of rows of contact pads disposed on opposite sides of a flat surface thereof, said contact pads including a first row of pads on a given side of said electrical component offset and interleaved with respect to pads in an adjacent second row and on the same side of said electrical component, insulating gaps separating said pads in said first row narrower than the width of the contacting region of said pads in said second row to provide a high density contact pad pattern, an electrical connector comprising:

a housing of electrically insulating material having a base and two side walls together defining an elongated opening at the top of said housing for receiving therein said electrical component;

upper inclined surfaces on the inside of each side wall of said housing facing the elongated opening in said housing;

lower inclined surfaces on the inside of each side wall of said housing facing the elongated opening in said housing;

a first row of spring-like contact pins having alternating long and short pins on one side of said elongated opening;

a second row of spring-like contact pins having alternating long and short pins on the other side of said elongated opening in staggered relation to said first row of contact pins wherein the long pins of said first row are opposite said short pins of said second row and the short pins of

said first row are opposite said long pins of said second row;

contact regions of said short contact pins for contacting the interleaved contact pads located in the row of pads nearest to the edge of the electrical component;

contact regions of said long contact pins for contacting the interleaved contact pads located in the row of pads farthest from the edge of the electrical component;

actuating means for moving said side walls of said housing away from said base in a vertical plane wherein said lower inclined surfaces urge said short contact pins and said upper inclined surfaces urge said long contact pins in a direction toward the center of said elongated opening;

said contact regions of said short pins passing through said centerline of said elongated opening wherein the contact region of each short pin is below said contact region of said opposite long pin thereby precluding opposite facing contact pins from contacting and short circuiting when the contact pins are actuated in the absence of an electrical component within the connector; and

said contact regions of said long pins passing through said centerline of said elongated opening wherein the contact region of each long pin is above said contact region of said opposite short pin thereby precluding opposite facing contact pins from contacting and short circuiting when the contact pins are actuated in the absence of an electrical component within the connector [1].

[Upon insertion of an electrical component vertically into said elongated opening of said housing through a vertical plane oriented substantially parallel with the longitudinal dimension of said elongated opening, electrical connection is completed.]

Re. 33,832

COMPOSITION FOR DRAWN FILM, COLD FILM MADE OF SAID COMPOSITION AND PROCESS FOR MANUFACTURING OF SAID FILM

Isao Yoshimura, Fujisawa; Hideo Hata, Suzuka, and Takashi Kaneko, Obama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Original No. 4,835,218, dated May 30, 1989, Ser. No. 109,659, Oct. 19, 1987, Continuation-in-part of Ser. No. 825,774, Feb. 3, 1986, Pat. No. 4,701,496, which is a continuation of Ser. No. 670,678, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 457,362, Jan. 12, 1983, abandoned, which is a division of Ser. No. 213,461, Dec. 5, 1980, Pat. No. 4,449,241, which is a division of Ser. No. 949,253, Oct. 6, 1978, Pat. No. 4,277,578, Application for reissue Jul. 25, 1990, Ser. No. 557,113

Claims priority, application Japan, Oct. 11, 1977, 52-120917; Nov. 22, 1977, 52-139431; May 30, 1978, 53-63870; May 30, 1978, 53-63872

Int. Cl.⁵ C08L 53/02, 23/16, 23/12, 23/08

U.S. Cl. 525—98

11 Claims

1. A composition comprising a homogeneous blend of one of the specific combinations of components, namely the combination of (A)+(B)+(C); wherein

(A) is at least one selected from the group consisting of copolymers of ethylene with unsaturated aliphatic monocarboxylic acids and alkyl esters of said acids which are all copolymerizable with ethylene.

(B) is a mixed elastomer consists of an elastomer having a density of not more than 0.91 g/cm³ and made of an ethylene- α -olefin copolymer and an elastomer consisting of block copolymer having at least one monovinyl substituted aromatic hydrocarbon polymer block and at least one polyolefin polymer block selected from at least one saturated polymer or unsaturated polymer made from mainly aliphatic conjugate diene derivative, and

(C) is at least crystalline polymer selected from the group consisting of crystalline polypropylene, high-density polyethylene and crystalline polybutene-1, wherein the components of the composition are in amounts such as to

satisfy $[0.05 < B/(A+B) < 0.90$ and $0.05 < C/(A+B) < 2.0]$ $0.05 \leq B/(A+B) \leq 0.90$ and $0.05 \leq C/(A+B) \leq$ in terms of weight ratio.

Re. 33,833

NOVEL N-(BICYCLIC HETEROCYCLYL)-4-PIPERIDINAMINES

Frans E. Janssens, Bonheiden; Joseph L. G. Torremans, Beerse; Jozef F. Heus, Nijlen, and Theophilus T. J. M. Van Offewert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

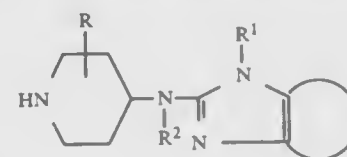
Original No. 4,820,822, dated Apr. 11, 1989, Ser. No. 115,272, Nov. 2, 1987, Continuation of Ser. No. 800,587, Nov. 21, 1985, Pat. No. 4,760,074, which is a division of Ser. No. 487,774, Apr. 22, 1983, Pat. No. 4,556,660, which is a continuation-in-part of Ser. No. 397,626, Jul. 12, 1982, abandoned. Application for reissue Nov. 29, 1990, Ser. No. 619,558

Int. Cl.⁵ C07D 401/14

U.S. Cl. 546—118

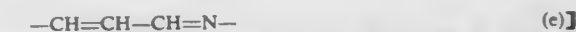
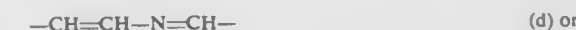
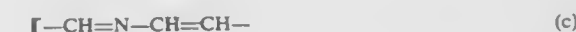
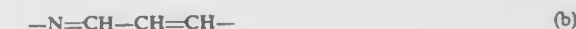
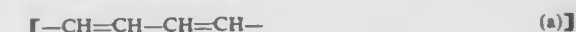
1. A piperidine of the following formula (III-a):

4 Claims



wherein

A is a bivalent radical having the formula (III-a):



wherein one or two hydrogen atoms in said [radicals (a)-(e)] radical (b) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R¹ is a lower alkyl substituted with methyl substituted furanyl;

R² is a member selected from the group consisting of hydrogen, lower alkyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, $[-CO-]$ (lower alkyl)-CO- and Ar²-lower alkyl;

and wherein Ar² is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)-CO.

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PLANT PATENTS

GRANTED FEBRUARY 25, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,803

RED MAPLE TREE NAMED AUTUMN SPIRE

Harold M. Pellett, Mound, Minn., assignor to Regents of the University of Minn., Minneapolis, Minn.

Filed May 22, 1990, Ser. No. 527,031

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—51

1 Claim

1. A new and distinct variety of red maple tree, substantially as shown and described herein, characterized particularly as to novelty by the unique combination of an upright broad-columnar form, early autumn maturity, good winter hardiness, excellent red autumn leaf color, and absence of seeds.

7,806

KALANCHOE PLANT NAMED PINK GLORY

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 31, 1990, Ser. No. 606,842

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct Kalanchoe plant named Pink Glory, as described and illustrated.

7,807

KALANCHOE PLANT NAMED MANDARIN

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 31, 1990, Ser. No. 606,843

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct Kalanchoe plant named Mandarin, as described and illustrated.

7,804

ALSTROEMERIA NAMED ELENA

Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Incorporated, Salt Lake City, Utah

Filed Apr. 20, 1990, Ser. No. 512,159

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large predominately pale purple colored flowers, which are borne in attractive inflorescences on relatively dwarf flower stalks.

7,808

KALANCHOE PLANT NAMED SPARKLER

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 31, 1990, Ser. No. 606,844

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct Kalanchoe plant named Sparkler, as described and illustrated.

7,809

KALANCHOE PLANT NAMED PIONEER

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 31, 1990, Ser. No. 607,375

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct Kalanchoe plant named Pioneer, as described and illustrated.

7,805

KALANCHOE PLANT NAMED BEACON

Margaret M. Fleming, Soquel, Calif., assignor to The Plant Company, Soquel, Calif.

Filed Oct. 31, 1990, Ser. No. 606,302

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct Kalanchoe plant named Beacon, as described and illustrated.

7,810

KALANCHOE PLANT NAMED HEIRLOOM

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 31, 1990, Ser. No. 607,441

Int. Cl.⁵ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Heirloom, as illustrated and described.

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PATENTS

GRANTED Feb. 25, 1992

ERRATA

For CLASS	See PATENT NO.
241-038	5,090,093
454-370	5,090,300
454-159	5,090,301
454-205	5,090,302
454-058	5,090,303
454-059	5,090,304
116-063	5,090,348
116-063	5,090,349
118-050	5,090,350
119-005	5,090,357
119-005	5,090,358
119-014	5,090,359
123-073	5,090,363
123-090	5,090,364
123-090	5,090,365
123-090	5,090,366
123-146	5,090,367
602-065	5,090,404
602-008	5,090,405
602-047	5,090,406
177-211	5,090,493
177-229	5,090,494
180-024	5,090,495
182-005	5,090,503
182-134	5,090,504
182-187	5,090,505
182-187	5,090,506
182-234	5,090,507
187-008	5,090,508
193-031	5,090,544
228-219	5,090,651
270-052	5,090,678
220-485	5,090,721
296-171	5,090,749
296-188	5,090,774
215-252	5,090,788
359-010	5,090,789
385-130	5,090,790
385-018	5,090,791
385-032	5,090,792
385-100	5,090,793
359-053	5,090,794
359-240	5,090,795

405-003	5,090,841
410-118	5,090,856
417-310	5,090,880
435-188	5,090,914
205-135	5,091,061
205-138	5,091,062
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502-412	5,091,358
521-033	5,091,424
424-665	5,091,443
560-115	5,091,575
235-441	5,091,618
333-024	5,091,703
395-425	5,091,845
395-250	5,091,846
395-575	5,091,847
395-800	5,091,848
395-100	5,091,849
395-400	5,091,850
395-425	5,091,851
395-600	5,091,852
395-375	5,091,853
395-027	5,091,864
395-153	5,091,865
395-158	5,091,866
395-162	5,091,867
395-148	5,091,868
395-200	5,091,877
385-048	5,091,970

PATENTS

GRANTED FEBRUARY 25, 1992

GENERAL AND MECHANICAL

5,090,053

COMPOSITE SHOCK ABSORBING GARMENT

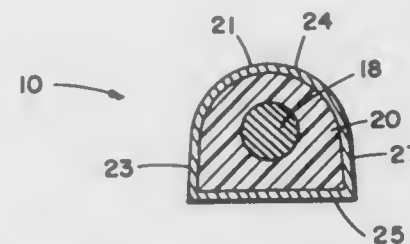
Harry D. Hayes, Chippewa Falls, Wis., assignor to Dalton Enterprises, Chippewa Falls, Wis.

Filed Jan. 3, 1991, Ser. No. 637,166

Int. Cl.⁵ A41D 13/00; F41H 1/02

U.S. Cl. 2—2

16 Claims



1. A composite shock absorbing material for use in protective garments, comprising:
an open mesh array formed by a plurality of intersecting interconnected strands;
wherein each of said strands has a core surrounded by a visco-elastic polymer material, the cores of said strands being formed by a liquid material.

5,090,054

VENTILATED HOOD FOR FIREFIGHTER

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

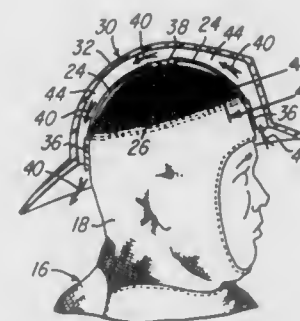
Continuation of Ser. No. 358,155, May 26, 1989. This application Nov. 21, 1990, Ser. No. 616,617

The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.

Int. Cl.⁵ A42B 3/28

U.S. Cl. 2—5

8 Claims



1. A firefighter's hood and helmet combination for the head of a firefighter who wears a firefighter's helmet, the firefighter's helmet including a rigid shell, the rigid shell having an internal portion, spacer means within the internal portion of the rigid shell and attached to the rigid shell, the spacer means including an annular part within the internal portion of the rigid shell and spaced from the rigid shell, the spacer means including a cross member within the internal portion of the rigid shell and spaced from the rigid shell and extending between opposed portions of the annular part, the annular part being adapted to encompass the head of the firefighter who wears the firefighter's hood and helmet combination, the cross member being adapted to extend over the head of the firefighter who wears the hood and helmet combination, whereby the spacer means provide a space between the rigid shell and all portions of the head of the firefighter who wears the fire-

fighter's helmet, whereby the rigid shell is spaced from the head of the firefighter who wears the firefighter's helmet and whereby a channel is provided between the head of the firefighter and the rigid shell, the firefighter's hood comprising thermal barrier material having given thermal insulation qualities to protect the firefighter against environmental heat, the firefighter's hood including an enclosure section which closely encompasses the head of the firefighter who wears the firefighter's hood, the enclosure section having a facial exposure portion, the firefighter's hood also including an upper section which is positioned at the upper part of the head of the firefighter who wears the firefighter's hood and whose head is encompassed by the enclosure section of the firefighter's hood, the upper section of the firefighter's hood having thermal insulation qualities which are significantly less than the given thermal insulation qualities, whereby the head of the firefighter has thermal insulation protection and whereby heat escapes from the upper part of the head of the firefighter who wears the firefighter's hood as the heat flows through the upper section of the firefighter's hood, the heat escaping into the channel between the rigid shell and the head of the firefighter, whereby the heat flows from the head of the firefighter and from the firefighter's helmet, and whereby stress upon the firefighter which results from heat is minimal.

5,090,055

AIR CUSHION KNEELING PAD

Philip J. R. McElroy, 107 Compton Crescent, London, Ontario, Canada N6C 4E9

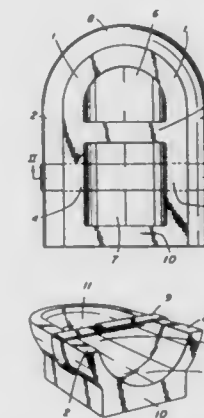
Filed Oct. 18, 1990, Ser. No. 599,569

Claims priority, application Canada, Oct. 31, 1989, 2001893

Int. Cl.⁵ A41D 13/06

U.S. Cl. 2—24

2 Claims



1. A knee protector pad adapted for use in an industrial workplace comprising a one-piece resilient, flexible polyurethane foam pad and an adjustable strap which is adapted to encircle the calf of the wearer and thereby fixedly secure the pad to the wearer's leg;
said pad including a concave upper portion with a rounded front end and an open, squared rear end;
said upper portion is adapted to receive the knee and upper portion of the shin of the wearer;
said pad further comprising a lower U-shaped sole with a rounded front and a squared back;
said sole having a lower surface facing away from said upper portion, a front semi-circular cavity and a rear rectangular cavity extending into said sole from said lower surface, said cavities separated by a transverse bar;
said front cavity being located immediately beneath the patella of the wearer when the pad is in an operating

position and said transverse bar supports the portion of the shin of the wearer immediately behind said patella; whereby said cavities are adapted to entrap air when the wearer is in the kneeling position with said lower surface in contact with a support surface thereby providing a cushioning effect.

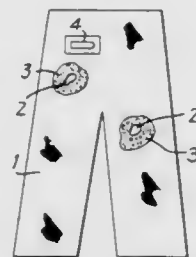
5,090,056

ARTICLE OF CLOTHING AND METHOD OF PRODUCING THE SAME

Aaron Z. Stoner, 320 W. 87th St., New York, N.Y. 10024, and Alan E. Murakami, 252 W. 76th St., New York, N.Y. 10023
Continuation of Ser. No. 473,876, Feb. 2, 1990. This application
Jul. 18, 1991, Ser. No. 732,500
Int. Cl.⁵ A41D 27/00

U.S. Cl. 2—69

12 Claims



1. An article of clothing, comprising a piece formed for covering at least a part of a human body; and an additional relatively small piece attached to said first mentioned piece and provided with at least one bullet-hole-like opening formed in said additional piece by shooting said additional piece from a close range with a bullet propelled by a powder propellant from a fire arm so that the bullet produces said opening without a person being in said additional piece during the shooting.

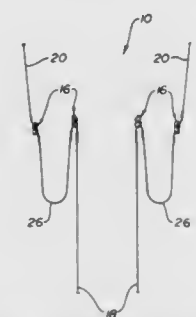
5,090,057

COMBINED BOOTS/TURNOUT PANT

Donald Aldridge, New Carlisle, Ohio, assignor to Lion Apparel, Inc., Dayton, Ohio
Filed Aug. 9, 1990, Ser. No. 565,038
Int. Cl.⁵ A41B 7/00

U.S. Cl. 2—82

20 Claims



1. Firefighter turnout apparel comprising:
a lower body portion including full length pant legs, each of said pant legs having a liner terminating in a first cuff;
a foot portion including a pair of firefighter boots, said boots each having a top opening;
a second cuff for each of said legs, said second cuffs each having a top portion and a bottom portion; and
connecting means for continuously connecting said first cuffs and said second cuffs to said liner and said boots whereby a substantially continuous moisture barrier is formed from said boots to said liner.

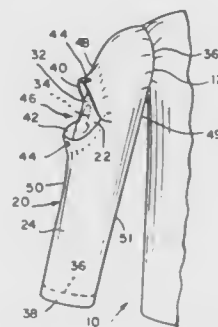
5,090,058

JACKET OR SIMILAR GARMENT

Terry L. Gerber, South Bend, Ind., assignor to Ashley Worldwide, Inc., Mishawaka, Ind.
Filed Mar. 6, 1989, Ser. No. 320,105
Int. Cl.⁵ A41D 1/00

U.S. Cl. 2—97

24 Claims



1. A jacket or similar garment, comprising:
body portion including at least one arm hole opening therein;
sleeve portion including outer fabric and fixed lining, said sleeve portion extending from said arm hole opening;
said outer fabric including exterior surface and interior surface;
first means for permanently affixing said fixed lining to said outer fabric so access to said interior surface of said outer fabric is precluded from the interior of said jacket or similar garment; and
second means for providing access to said interior surface of said outer fabric through said fixed lining to permit stitching of patch or other insignia to said exterior of said outer fabric without removal of said fixed lining from said sleeve portion and without penetrating said fixed lining.

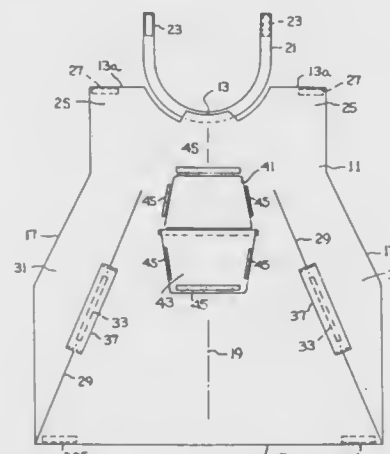
5,090,059

MOTHER'S NURSING COVER

Clody L. Kahl, 4201 Horry St., Apt. B-6, Columbia, S.C. 29203
Filed Feb. 19, 1991, Ser. No. 656,830
Int. Cl.⁵ A41D 1/20

U.S. Cl. 2—104

1 Claim



1. A detachable covering for a mother while nursing a baby; said covering comprising a flexible fabric sheet having an upper edge, two side edges, and a lower edge; said fabric sheet having an imaginary vertical axis (19) extending midway between said side edges; a neck strap attached to the upper edge of said fabric sheet at a central point therealong; a two dimensional sight opening in said sheet directly below the neck strap

attachment point, whereby the mother can look downwardly through the sight opening to view the baby carried against the mother's body behind the fabric sheet; said sight opening being centrally located in an upper portion of the sheet for disposition on the upper chest area of the mother; said sight opening having an area of at least five square inches for ensuring adequate ventilation of the area behind the fabric sheet, and for enabling the mother to obtain an adequate view of the baby; said fabric sheet having two laterally spaced dart seams (29) diverging downwardly and away from the sheet vertical axis, said dart seams extending from points along side said sight opening to the lower edge of the fabric sheet, whereby areas of the sheet adjacent the sheet side edges tend to wrap around the mother's torso underneath the arm pit areas; and a slit opening (33) extending along each dart seam at an intermediate point therealong, each slit opening having a sufficient length that the mother can pass either hand therethrough to directly hold the baby behind the fabric sheet in a nursing position.

5,090,060

SPORT SHIFT SLEEVES HAVING PERSPIRATION ABSORBING ELEMENTS

Victor G. Gates, 1007 20th St., Apt. 9, Santa Monica, Calif. 90401

Filed Dec. 9, 1987, Ser. No. 130,762

Int. Cl.⁵ A41B 1/08

U.S. Cl. 2—115

1 Claim



1. An improved sport shirt which an individual wears during his work, recreational or athletic activities, said improved sport shirt comprising:

- a front panel and a rear panel each of which is formed from a moisture-absorbing fabric material and each of which has edge portions which define a pair of sleeve holes near one end thereof;
- a pair of sleeves each of which is formed from a lightweight stretch fabric material and is secured to one of said sleeve holes; and
- a pair of perspiration-absorbing elements each of which is formed from a moisture-absorbing fabric material and each of which is fixedly coupled to one of said sleeves whereby the individual utilizes one of said perspiration-absorbing elements to conveniently wipe perspiration from his face and forehead.

5,090,061

HELMET WITH EAR PADS

Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kako Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 607,399

Claims priority, application Japan, Aug. 15, 1990, 2-215203

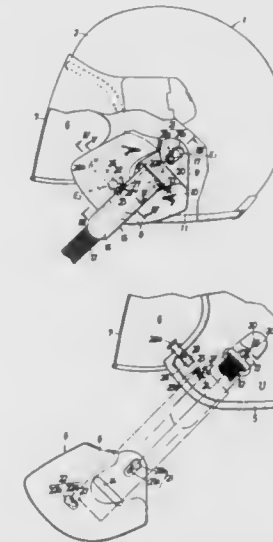
Int. Cl.⁵ A42B 1/08

U.S. Cl. 2—423

5 Claims

1. A helmet comprising:
a cap body including ear cover portions at opposite sides of a window provided in a front face;
supporting plates;
ear pads arranged inwardly of said ear cover portions,

wherein each of said ear pads is secured to an inner surface of a respective supporting plate;
first retaining means located between said cap body and each said supporting plate, said first retaining means for separating and for engaging the cap body and the supporting plate away from and with each other by a relative sliding movement between mating surfaces of said cap body and the supporting plate performed in a first direction between a first separating position and a first engaging position;



an operating member located between said cap body and each said supporting plate, said operating member performing a sliding movement, between mating surfaces, between a second separating position and a second engaging position in a second direction which is substantially perpendicular to said first direction; and
second retaining means located between said cap body and each said supporting plates, said second retaining means for separating and for engaging the cap body and the supporting plate away from and with each other by said sliding movement of said operating member.

5,090,062

SANITARY FITTING

Ferdinand Hochstrasser, Auenstein, Switzerland, assignor to KWC AG, Unterkulm, Switzerland

Filed Dec. 13, 1990, Ser. No. 627,195

Claims priority, application Switzerland, Dec. 13, 1989, 04481/89

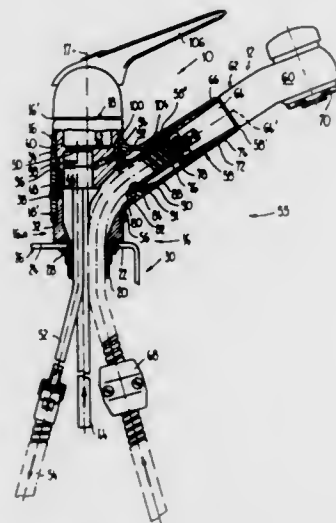
Int. Cl.⁵ E03C 1/04; F16K 21/00

U.S. Cl. 4—192

12 Claims

1. A sanitary fitting which comprises:
a fitting housing having a front portion;
a nozzle projecting substantially toward the front portion of the housing and having an outlet line extending through the nozzle to an outlet;
a control cartridge positioned in the fitting housing and connected on an inlet side to at least one feed line for controlling water flow from the control cartridge through said outlet line;
safeguard means provided in the fitting housing for preventing backflow of water into the feed line with an aeration aperture formed therein which is closed in the case of normal outflow and open under conditions permitting backflow;
aeration channel means for connecting said aeration aperture to surroundings and said aeration channel means opening out from said fitting housing on the front;
the fitting housing having a first, fixed housing part and a

second, swivelable housing part including the nozzle and being mounted on said fixed housing part;
the control cartridge and the safeguard being arranged in the fixed housing part;
the aeration channel means including an aeration line, a channel and a channel element;



said channel being bounded jointly by the fixed housing part and by the swivelable housing part and extending substantially in a swivel direction of the swivelable housing part; and
said channel being connected via said aeration line provided in the fixed housing part with said aeration aperture and to surroundings via said channel element provided in the swivelable housing part.

5,090,063

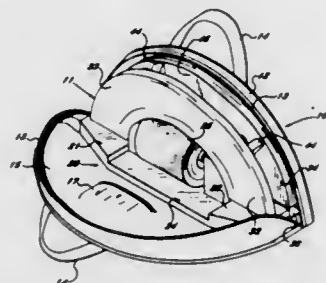
PACKAGED TOILET SEAT

Richard T. Edwards, and Marilyn C. Edwards, both of 14512 Harbor Estate Rd., Charlotte, N.C. 28278
Filed Nov. 19, 1990, Ser. No. 615,239

Int. Cl.⁵ A47K 13/14

U.S. Cl. 4—239

5 Claims



1. A packaged toilet seat including a an openable carrier enclosure, a rigid elongated base secured within the carrier, the rigid base including end portions and a center portion, means for supporting a roll of toilet paper on the center portion of the rigid base, a foldable toilet seat, and hinge means for allowing the toilet seat to be folded in half with the halves being in juxtaposition with each other, said hinge means including means for supporting the toilet seat in folded condition on the end portions of the rigid base and in partially encircling relation to the means for supporting a roll of toilet paper.

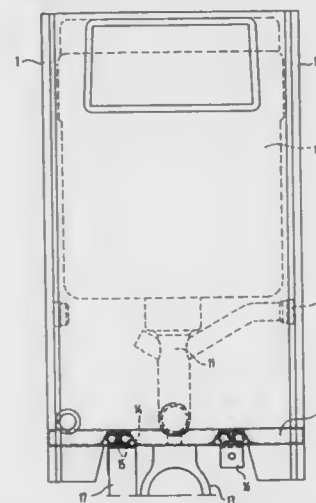
5,090,064
INSTALLATION MODULE FOR SANITARY EQUIPMENT

Konrad Brettenberger, Weilheim, Fed. Rep. of Germany, assignor to Geberit AG, Rapperswil, Switzerland
Filed Oct. 16, 1990, Ser. No. 598,207
Claims priority, application European Pat. Off., Oct. 24, 1989, 89119778.2

Int. Cl.⁵ E03D 1/012, 11/00

U.S. Cl. 4—252 R

15 Claims



1. An installation module for sanitary equipment, comprising:
a support structure composed of longitudinal and transverse profiled sections in plugged relationship and foamed material by which the longitudinal and transverse profiled sections are held securely together,
plumbing components for at least one of supply to and discharge from the sanitary equipment, said plumbing components being embedded in the foamed material,
first fastening means attached to the support structure for mounting the installation module, and
second fastening means attached to the support structure for attaching the sanitary equipment to the installation module.

5,090,065

Patent Not Issued For This Number

5,090,066

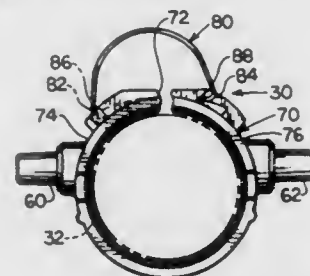
ADAPTER FOR TOILET FITTING

Adolf Schoepe, Fullerton, and Kabir Siddiqui, Yorba Linda, both of Calif., assignors to Fluidmaster, Inc., Anaheim, Calif.
Filed Aug. 10, 1990, Ser. No. 565,640

Int. Cl.⁵ E03D 1/34, 1/35

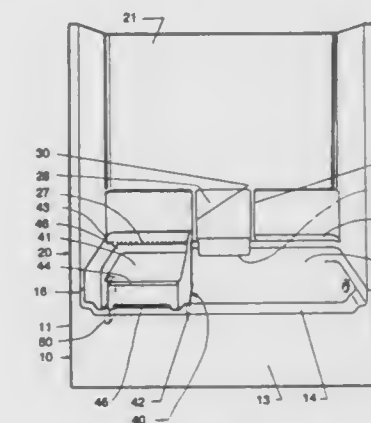
U.S. Cl. 4—378

5 Claims



1. An adapter for use on a toilet fitting of the type that has an overflow tube and that has a bottom part forming a valve seat, comprising:
a ring member constructed to closely surround said overflow tube and having opposite sides and a pair of mounting posts projecting from said opposite sides for pivotally

supporting a valve member, said ring member having a gap and first and second opposite sides of said gap, said ring member also having a first spring retainer on said first side and first and second teeth on said second side with said second tooth lying further from said gap than said first tooth;
a spring extending across said gap and having first and second spring end portions mounted respectively on said first spring retainer and on one of said teeth;
said spring comprises a leaf spring whose second end portion forms a hook, said leaf spring being curved sufficiently and having a middle which is spaced far enough from said ring member, that said middle can be pressed by hand largely toward said ring member to cause said second spring end to slide from said first tooth onto said second tooth.



5,090,067

BIDET APPARATUS

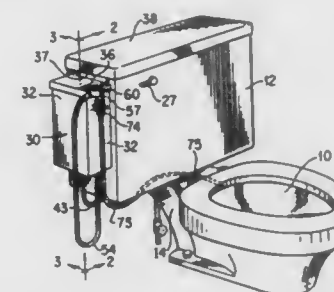
Cletus V. Cogdill, 18140 Gallineta St., Rowland Heights, Calif. 91748

Continuation-in-part of Ser. No. 484,408, Feb. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 236,607, Aug. 25, 1988, abandoned. This application Feb. 5, 1991, Ser. No. 650,750

Int. Cl.⁵ A47K 3/00

U.S. Cl. 4—420.2

33 Claims



1. In association with a toilet bowl and water tank, the improvement comprising:
an upstanding water chamber positioned alongside the tank, passage means from the tank to the chamber, whereby a predetermined water level is maintained in the chamber,
electric means for heating the water in the chamber,
a pump for pumping heated water out of the chamber,
a flexible conduit having one end thereof connected to the pump to receive the pump output,
a spray head connected to the other end of the flexible conduit, a manual valve in the spray head, and
means for recirculating heated water from the spray head back through the flexible conduit into the water chamber.

5,090,068

BATH WITH INTERFITTING SEAT

John R. Zellner, 1610 King Ave., Kings Mills, Ohio 45034
Filed Dec. 19, 1990, Ser. No. 631,089

Int. Cl.⁵ A47K 3/12

U.S. Cl. 4—578.1

6 Claims

1. A bath comprising a tub and a surround, said tub being defined by a head end wall, a foot end wall, a dam wall in front and a wall in the rear, said surround having a panel above and substantially parallel to the tub rear wall, said panel having a sill above said rear wall, a stop on said panel above said sill and extending toward the dam wall, an interfitting seat having a base supported on the top of the dam wall and the sill and

between the head end wall and the stop, at least a portion of the base extending into the tub and in contact with the rear wall

and the inside of the dam wall, whereby said stop and said base retain said seat in a desired position.

5,090,069

SELF-CLEANING SANITATION MODULE
INCORPORATING A TILTING BACK

Jean-Claude Decaux, 88, boulevard Maurice Barres, 92200 Neuilly, France

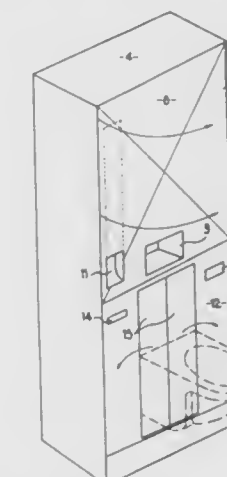
Filed Aug. 4, 1989, Ser. No. 389,837

Claims priority, application France, Aug. 8, 1988, 88 10686

Int. Cl.⁵ A47K 4/00; E03C 1/01

U.S. Cl. 4—662

9 Claims



1. Self-cleaning sanitation module comprising a closed enclosure, a vertical wall in said enclosure dividing it into a user area and a technical area, an opening in said wall, an open-top toilet pan having a top surface lying in a first plane and disposed along said vertical wall and adapted to rotate about an axis parallel to said vertical wall between a use position in which said top surface is rotated through said opening and into said user area such that said top surface lies in a plane substantially normal with respect to said vertical wall and a cleaning position in which said top surface is rotated through said opening and into said technical area such that said top surface is substantially vertical and faces toward said technical area, a back plate having upper, lower and side edges and being movably mounted in said enclosure between a use position in which it covers said opening above said toilet pan when said pan is in its use position and a cleaning position in which it is vertically above said pan and coplanar with said top surface of said pan when said pan is in said cleaning position, and cleaning means in said enclosure for cleaning said pan and said back plate when

in their cleaning position, said back plate being adapted to rotate about horizontal axes parallel to said vertical wall on moving from its use position to its cleaning position, said back plate being articulated so that it performs a first rotation from its use position about a first horizontal axis located at the rear of said back plate when in its use position, said first horizontal axis being in a substantially median plane of said back plane and at a distance from the latter substantially equal to half the height of said back plate so that said lower edge of said back plate remains near said top surface of said pan during rotation of said pan from its use position toward its cleaning position, said back plate then proceeding to an intermediate position in which said back plate is substantially horizontal with respect to said vertical wall, and said back plate performing a second rotation about a second horizontal axis near its upper edge from said intermediate position to its cleaning position.

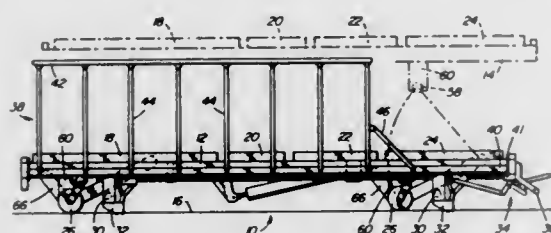
5,090,070

VARIABLE HEIGHT BED

David S. Heinz, Hay Lakes, Canada, assignor to University of Alberta Hospitals, Alberta, Canada
Filed Oct. 11, 1990, Ser. No. 596,079
Claims priority, application Canada, Jul. 11, 1990, 2020880
Int. Cl.⁵ A61G 7/00

U.S. Cl. 5-611

19 Claims



11. A variable height bed for use in hospitals and like facilities; said bed comprising:

- a stationary frame having a castor foot adjacent each corner thereof;
- an elevating frame interconnected with said stationary frame and moveable in elevation with respect to said stationary frame;
- frame elevating means for effecting vertical movement of said elevating frame relative to said stationary frame and including linking means operable by said frame elevating means and interconnecting said stationary frame and said elevating frame, said elevating means providing movement of said elevating frame and a lowermost elevation position of approximately ten inches above a supporting surface to an uppermost elevation position of approximately twenty nine inches above said supporting surface;
- means operable at any elevation of said elevating frame for immobilizing said bed against movement on said supporting surface;
- head and knee gatch members detachably secured to the upper surface of said elevating frame and means for actuating said head and knee gatch members to angularly elevated or flat positions with respect to said upper surface;
- a guard rail assembly secured along each side of said elevating frame, each guard rail assembly comprising a lower rail secured to said elevating frame and an upper rail spaced therefrom and parallel thereto, with a plurality of upright members interconnecting said upper and lower rails;
- means for diagonally collapsing said upper rail and upright members down onto said lower rail member; and means for pivoting said collapsed guard rail assembly from a position adjacent the side edge of said elevating frame to a position beneath said side edge;
- said stationary frame and said elevating frame each having longitudinal, parallel side rails and end rails; the side rails of said elevating frame being spaced inwardly of the

side rails of the stationary frame; and a pair of strut members extending downwardly from said elevating frame adjacent each end thereof; said frame elevating means comprising two pairs of lifting arm units, one pair adjacent each end of said bed; each lifting unit comprising:

- a torsion tube extending transversely of the longitudinal axis of said bed and mounted for rotation in a pair of said strut members;
- a pair of lift arms, one at each end of said torsion tube, said arms extending angularly upwardly and means at their upper ends for engaging the side rails of said stationary bed frame;
- at least one torque arm mounted on said torsion tube and extending angularly upwardly therefrom; and
- actuating means mounted to said elevating frame at one of its ends and longitudinally extending rod means connecting its other end to said torque arm of said lifting units, whereby, operation of said actuating means in one direction causes said torsion tube and its associated torque arm and lifting arms to rotate in said strut members, raising said elevating frame above said stationary frame; and operating said actuator in the opposite direction lowers said elevating frame;
- said connecting rod means extending centrally of said elevating frame and passing through the cross members thereof whereby nesting of said stationary and elevating frames are substantially enhanced.

5,090,071

TRANSPORTABLE AND FOLDABLE ARTICULATED BED

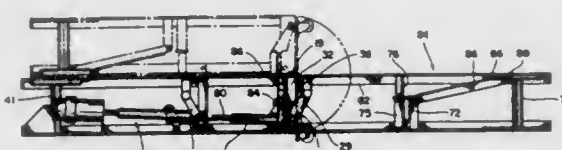
Leeland M. Bathrick, Crystal Lake, and Glenn Brittain, McHenry, both of Ill., assignors to C. E. B. Enterprises, Inc., Mundelein, Ill.

Filed Nov. 7, 1990, Ser. No. 610,097

Int. Cl.⁵ A61G 7/00; A47C 19/12

U.S. Cl. 5-618

12 Claims



2. A transportable and foldable articulated bed, comprising: a frame, a head and back platform mounted on one end of the frame, a leg platform mounted on the other end of the frame, at least one of the platforms being pivotally mounted on the frame for upward movement therefrom, said frame being relatively movable approximately at its center defining head and leg sections that can be reoriented with respect to one another for transport and storage, and motor means mounted on one of the frame sections for activating the pivotally mounted platform carried by the other frame section through an extendable drive, said pivotally mounted section having a pivot arm engageable with but completely unconnected to the extendable drive so that the frame can be separated without disconnecting the extendable drive from the pivot arm, the head and back platform being pivotally mounted to the frame head section and the leg platform is pivotally mounted on the frame leg section so the platforms are folded onto one another as the frame is folded, said motor means including a first motor carried by the frame head section connected to pivot the leg platform through the extendable drive, said pivot arm being connected to the leg platform.

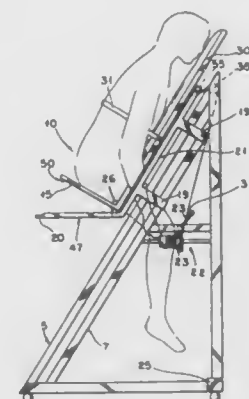
5,090,072

PATIENT LIFTING DEVICE

Irwin Gray, Flushing, N.Y., assignor to Edward H. Gray and James M. Gray, both of Flushing, N.Y.
Filed May 2, 1991, Ser. No. 694,790
Int. Cl.⁵ A61G 7/14

U.S. Cl. 5-81.1

10 Claims



1. A lifting device for elevating a person from a lower position to a higher position comprising
a frame having an upright back member and a slanted front member,
a support member slidably connected to said front member,
a carrying member pivotally connected to said support member and including a seat on which the person to be raised may be positioned, and a rest portion extending upwardly from said seat, and
a drive means connected to said frame for moving said carrying member against said support member and for raising said support member along said front member.

5,090,073

SURGICAL HEADREST

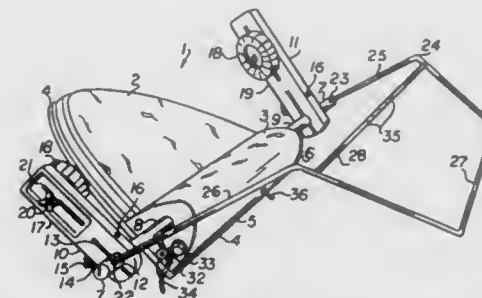
Lee T. Nordan, 5144 Triple Crown Row, Rancho Santa Fe, Calif. 92067, and Roger J. Malcolm, 920-C Calle Negocio, San Clemente, Calif. 92672

Filed Aug. 22, 1991, Ser. No. 748,537

Int. Cl.⁵ A61G 7/06, 13/00

U.S. Cl. 5-640

10 Claims



1. An apparatus for immobilizing the head of a patient during eye surgery and the like, which comprises:
cushioned headrest defining a cervical bulge shaped and dimensioned to nest under the nucha of the patient;
a shaft extending horizontally and laterally from opposite sides of said headrest;
first and second arms pivotally and slidably mounted on said shaft on opposite sides of said headrest;
each of said arms having a pad mounted on a side facing said headrest; and
adjustable means for radially and axially positioning and immobilizing each arm on said shaft.

5,090,074

SUPPORT APPLIANCES

John T. Scales, 17, Brockley Avenue, Stanmore, Middlesex, HA7 4LX HA7 4LX, and John Barton, 16 Cobbetts Way, Wilmslow, Fulshaw Park, Cheshire, SK9 6HN, both of England SK9 6HN

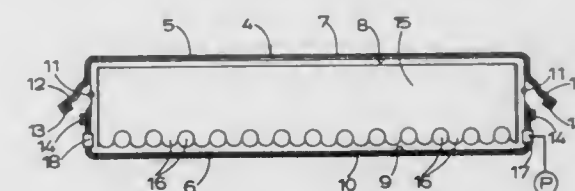
Filed Sep. 11, 1990, Ser. No. 580,838

Claims priority, application United Kingdom, Sep. 12, 1989, 8922059

Int. Cl.⁵ A47C 27/14

U.S. Cl. 5-448

24 Claims



24. A support appliance comprising a resilient and gas permeable support body and a cover enclosing said support body, said cover comprising a support portion and a discharge portion, said support portion comprising a first area of a first vapor-permeable substance, said first vapor-permeable substance having a first permeability coefficient, said discharge portion comprising a second area of a second vapor-permeable substance, said second substance having a second permeability coefficient, said first and second areas and said first and second substances being such that a product of said second area and said second permeability coefficient is greater than a product of said first area and said first permeability coefficient, said support portion and said discharge each comprising a sheet of textile fabric supporting a vapour-permeable film.

5,090,075

WATERBED DRAINING SYSTEM INCLUDING VACUUM RELIEF VALVE

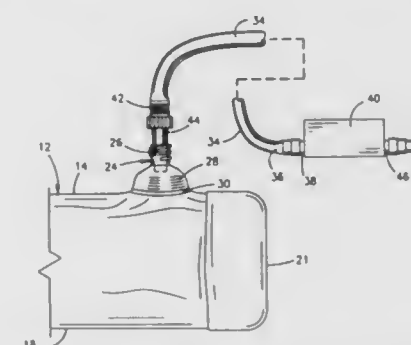
Lynn D. Larson, 1052 N. Lakeshore Dr., Lincoln, Nebr. 68528

Filed Apr. 29, 1991, Ser. No. 693,149

Int. Cl.⁵ A47C 27/08

U.S. Cl. 5-451

18 Claims

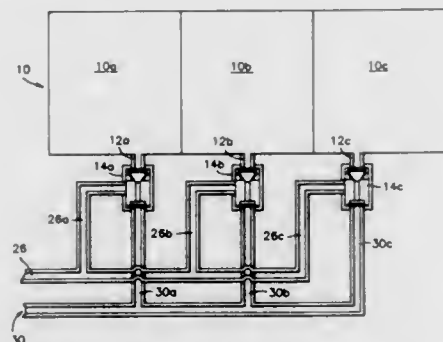


1. In combination,
a waterbed mattress bladder having top, bottom and peripheral side walls and a filler opening in one wall thereof,
a water pump having inlet and outlet ports,
a drain hose operatively connected to and extending between said filler opening and said inlet port of said water pump whereby operation of said pump causes water to be drawn from said bladder through said hose and pump,
a vacuum relief valve closed in its inactive mode, operatively associated with at least one of said bladder or hose to automatically provide air flow into said bladder upon the vacuum pressure within said bladder exceeding a predetermined level.

5,090,076
MULTIPLE CELL INFLATION ELEMENT
 Hans Guldager, Hejrevang 1-3, Allerød, Denmark 3450
 Filed Oct. 31, 1990, Ser. No. 606,095
 Int. Cl.³ A47C 27/10

U.S. Cl. 5-453

5 Claims



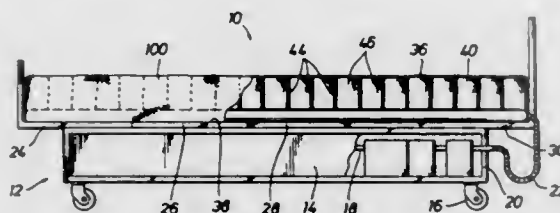
1. A multiple cell inflation structure comprising plural inflatable cells with flexible walls, a separate air inlet-outlet passage leading into each cell, a separate valve chamber connected with each of said passages outside the respective cell, each valve chamber including therein a valve seat and a movable valve element for sealing engagement with and disengagement from said seat, an inflation duct having branch ducts leading into the respective valve chambers for inflating the respective cells with air under pressure received from said inflation duct and by movement of the respective valve elements off the respective seats thereby providing communication between the respective branch ducts and air passages, the configuration of each valve element and seat being such that air pressure in the respective cell when inflated urges the valve element into engagement with the seat, and further including air pressure means for disengaging the respective elements from the respective seats when the structure is inflated so as to provide communication between the respective cells through the respective air passages, valve chambers and branch ducts wherein the air pressure means comprises respective air ducts leading into the respective valve chambers, the respective air ducts being connected to a common source of air pressure.

5,090,077
CELLULAR PATIENT SUPPORT FOR THERAPEUTIC AIR BEDS

John J. Caden; Linda C. Caden, both of Miami, Fla.; Norman B. Eads, and Jack H. Hess, both of Houston, Tex., assignors to Health Products, Inc., Houston, Tex.
 Continuation of Ser. No. 638,028, Jan. 7, 1991, abandoned, which is a continuation of Ser. No. 413,248, Sep. 27, 1989, abandoned. This application Sep. 9, 1991, Ser. No. 758,354
 Int. Cl.³ A47C 27/08

U.S. Cl. 5-456

17 Claims



1. A cellular patient support for adjustable, hospital type therapeutic air beds for use by convalescing patients and which have a plurality of platform sections that are relatively movable to provide angular adjustment of said platform sections as desired for the comfort comprising:

(a) upper and lower generally rectangular panels of flexible sheet material having a plurality of transverse partitions

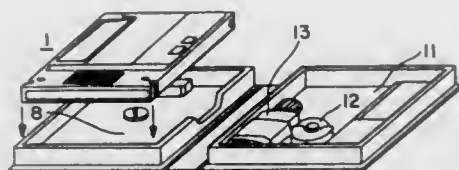
interconnected therebetween and disposed in parallel relation with one another and thus defining a flexible air cell container defining opposed sides and forming a plurality of air cell receptacles disposed in side-by-side relation, said air cell container adapted to rest upon a patient support bed structure;

- (b) a plurality of air cells being removably positioned in respective ones of said air cell receptacles;
- (c) an elongate tubular, non-jointed air supply manifold being positioned along one side of said air cell container and extending along the length of said air cell container, said elongate air supply manifold being composed of air impervious flexible material along its entire length and thus said tubular air supply manifold being continuously flexible along the entire length thereof so as to flex as the angular relationships of said platform sections are adjusted;
- (d) a plurality of air supply connections positioned in spaced relation along the length of said air supply manifold;
- (e) a plurality of corresponding air supply receptacles being provided one on each of said air cells and adapted for assembly with respective ones of said air supply connectors, thus forming air supply connector and receptacle assemblies placing said elongate air supply manifold in air supply communication with each said air cells;
- (f) a plurality of replaceable pressure control orifices being disposed in respective air supply receptacle and connector assemblies for selectively controlling respectively the volume of air flow through each of said air supply connector and receptacle assemblies and thus controlling the respective air pressure of said air cells; and
- (g) an air supply being disposed in air supplying communication with said elongate air supply manifold air supply manifold and through said pressure control orifices to said air cells to maintain said air cells inflated to pressures determined by the pressure of said compressed air and the dimension of said replaceable pressure control orifices.

5,090,078
OPTICAL DISK STORAGE CONTAINER AND CLEANER
 Kunihito Kamakura; Seichi Ohta; Chihiro Aoki, all of Hyogo; Seitaro Hamano, Osaka, and Yasushi Hiramatsu, Hyogo, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed May 25, 1990, Ser. No. 528,376
 Claims priority, application Japan, Sep. 12, 1989, 1-107098[U]; Sep. 13, 1989, 1-107645[U]
 Int. Cl.³ G11B 3/58; B08B 11/02
 U.S. Cl. 15-97.1

7 Claims



1. A book case type optical disk container for housing a cartridge type optical disk, the optical disk having a movable shutter and a rotatable optical disk base, said storage container comprising first and second storage portions pivotally connected to one another, the first and second storage portions being movable relative to one another to open and close the storage container, the cartridge type optical disk being positionable in the storage container and being completely enclosed by the first and second storage portions when the storage container is closed, the first storage portion having a rigid, nonmovable shutter stopper and a projection provided on the first storage portion, the shutter stopper maintaining the shutter of the optical disk in an open position and the projection rotatably supporting the optical disk base when the optical disk

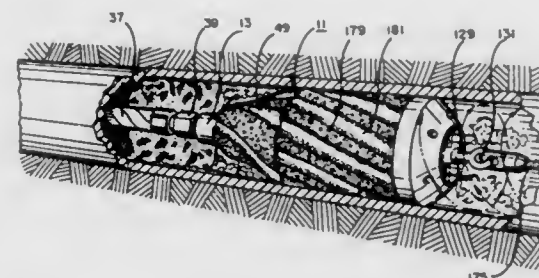
is in the storage container, the optical disk base being exposed when the shutter is in the open position, the shutter stopper comprising an elongated projection affixed to the first storage portion and an opening being provided in the optical disk having a predetermined length when the shutter is in the open position, the elongated projection having a length which is slightly less than the length of the opening of the optical disk.

5,090,079
APPARATUS FOR CLEANING PIPE
 Arlie Allison, Houston; Simon Tarsha, Fort Worth, and James S. McMillan, Benbrook, all of Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jul. 13, 1990, Ser. No. 553,732
 Int. Cl.³ B08B 9/02

U.S. Cl. 15-104.31

11 Claims



- 1. An apparatus for cleaning pipe having a pipe interior, the apparatus comprising:
 - a rigid, longitudinally extending stem;
 - a motor stationarily mounted on the stem;
 - an outer body which surrounds the motor, the outer body being rotatably mounted on the longitudinally extending stem and including hardened regions on the exterior thereof, the outer diameter of the hardened regions on the outer body being selectively sized to ream the pipe interior as the apparatus is moved through the pipe interior;
 - drive means for connecting the motor to the outer body;
 - a power coupling connected to the stem for supplying power to the motor, the power coupling also being connected to a pulling unit for pulling the apparatus through the pipe to be cleaned;
 - whereby power supplied through the power coupling and through the stem to the motor provides rotational propulsion to turn the outer body as the apparatus is moved through the pipe to be cleaned.

5,090,080
BRUSH HANDLE
 Lars-Erik Thuresson, Vasagatan 12, and Per-Gunnar Thuresson, Tulpangatan 10, both of, S-742 00 Östhammar, Sweden
 PCT No. PCT/SE89/00021, § 371 Date Jul. 20, 1990, § 102(e)
 Date Jul. 20, 1990, PCT Pub. No. WO89/06919, PCT Pub. Date Aug. 10, 1989
 PCT Filed Jan. 26, 1989, Ser. No. 543,772
 Claims priority, application Sweden, Feb. 2, 1988, 8800330
 Int. Cl.³ A46B 5/02; B25G 3/38

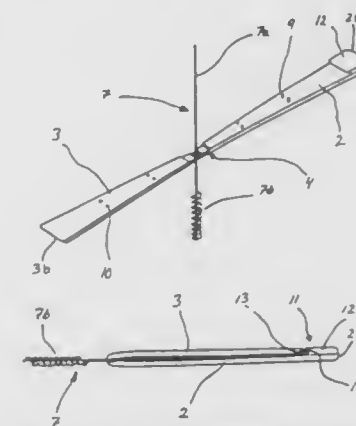
U.S. Cl. 15-143 R

9 Claims

- 1. A handle for receiving a replaceable brush which brush consists of a single elongated shaft portion and an opposite brush portion, comprising:
 - a relatively stiff first handle portion having a first surface extending along a first axis between a first end and an opposite second end;
 - a relatively stiff second handle portion having a first surface extending along a second axis between a first end and an opposite second end;
 - a folding joint including a joint surface which extends from said first end of said first handle portion to said first end of said second handle portion, said first surface of said first

handle portion and said first surface of said second handle portion being foldable towards and away from each other about said folding joint to a closed and an open position, respectively, said joint surface being relatively flexible and having an aperture extending therethrough dimensioned for receiving said single elongated shaft portion of said brush; and

means associated with said folding joint for gripping said elongated shaft portion, when said elongated shaft portion is inserted through said aperture, to prevent movement of said brush in the direction of said first axis and said second axis when said first surface of said first handle and said



first surface of said second handle are folded in said closed position, said means being formed by a terminal edge of said aperture and including upwardly from said aperture towards said first surface and a second set of steps extending upwardly from said aperture towards said second surface, said elongated shaft portion being gripped between corresponding edges of corresponding steps of said first set of steps and said second set of steps when said elongated shaft portion is inserted through said aperture and said first surface of said first handle and said first surface of said second handle are folded in said closed position.

5,090,081
WINDSHIELD WIPER WITH VARIABLE ARCuate PATTERN

Tokihiko Yamamoto, Kariya; Ryoichi Fukumoto, Nagoya; Masao Ohhashi, Kariya; Kazuhide Itagaki, Toyota, and Kazuhiro Sumiya, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

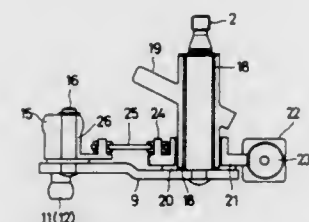
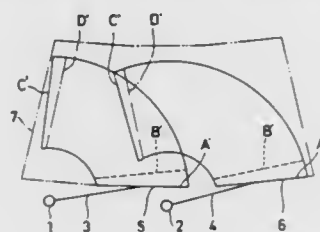
Filed Sep. 12, 1990, Ser. No. 581,348
 Claims priority, application Japan, Sep. 29, 1989, 1-252044
 Int. Cl.³ B60S 1/04, 1/06

U.S. Cl. 15-250.13

1 Claim

- 1. A windshield wiper including: a first pin having a central axis and connected to a drive mechanism; a primary lever supported by said first pin; a second pin having a central axis and mounted to said primary lever; a wiper arm fixedly mounted to said second pin; said primary lever being pivoted about said second axis pin by said drive mechanism to cause reciprocating motion of said wiper arm in an arcuate path; a first cam member having a center and rotatable about said first pin, said first cam member connecting the drive mechanism to said first pin, said first cam member defining an operating point at which the drive mechanism imparts force to said primary lever; a second cam member rotatable about said second pin; and a secondary lever for connecting said first cam member and said second cam member together such that movement imparted to said second cam member can be transmitted to said first cam member; said second cam member being so rotated as to allow the center of said first cam member to move relative to the central axis of said first pin;

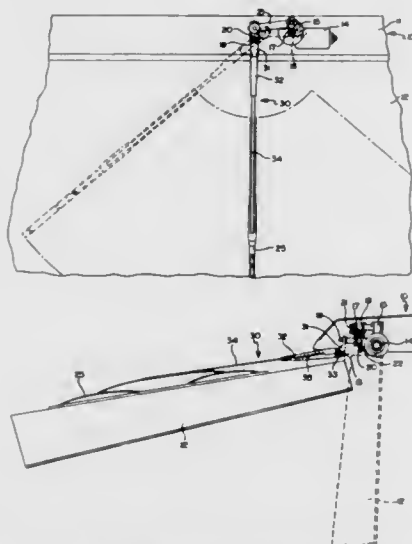
a stationary member;
a wheel gear for rotating said second cam member through a predetermined angle, said second cam member being rotatably supported by said stationary member;
a gear portion meshed with said wheel gear;



a motor for rotating said gear portion thereby moving the operating point to change the arcuate path of the wiper arm; and
a casing for housing said wheel gear and said gear portion therein, said casing being fixed to said stationary member.

5,090,082
WINDSHIELD WIPING DEVICE FOR SWIVELLING WINDSHIELD OF MOTOR VEHICLES
Paul Alber, Vaihingen-Aurich; Reinhard Edele, Bietigheim-Bissingen; Klaus Hauk, Altrip; Michael Teich, and Michael Schutze, both of Mannheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany
Filed Oct. 18, 1989, Ser. No. 423,079
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1988, 3836031
Int. Cl.⁵ B60S 1/04
U.S. Cl. 15—250.17

11 Claims

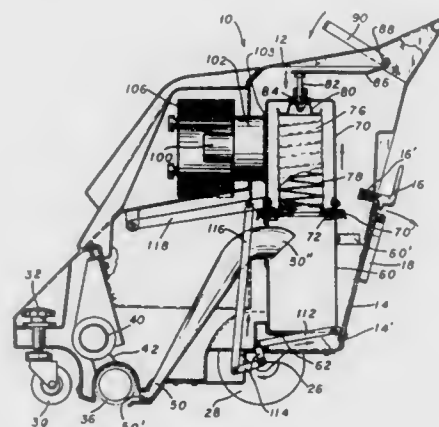


2. A windshield wiper device adapted for use with motor vehicle windshields mounted for swiveling about a windshield axis, said device comprising:
a wiper shaft disposed adjacent said axis;
a wiper arm projecting over the windshield and including an

attachment part carried by the wiper shaft and a windshield engaging pivoting part hinged to said attachment part for limited swiveling with respect thereto about a pivot axis;
means drivingly engaging said wiper shaft and energizable for reciprocating displacement of said wiper arm to define a wiping field on said windshield; and
control means in-circuit with said driving means operable to park said wiper arm in a first predetermined stopping position at an edge of said wiping field in a first mode of operation and operative to park said wiper arm in a second predetermined stopping position within said wiping field in a second mode of operation wherein in said second stopping position said windshield swivel axis is generally parallel to said pivot axis thereby allowing said windshield and said wiper arm to swivel simultaneously, said control means transitioning between said first and second modes of operation as a function of windshield angular position about said windshield axis.

5,090,083
WIDE AREA CARPET VACUUM CLEANER
Richard E. Wulff, Maple Plain, Minn., assignor to Castex Industries, Inc., Holland, Mich.
Filed May 22, 1990, Ser. No. 526,605
Int. Cl.⁵ A47L 5/30, 9/20
U.S. Cl. 15—347

9 Claims

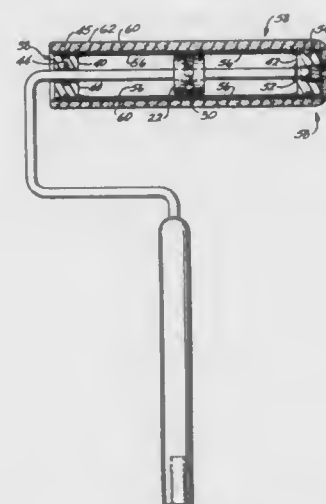


1. A carpet vacuum cleaner comprising:
a vacuum cleaner housing and support wheels thereunder;
a power brush beneath said housing for engaging the carpet surface to be swept;
an open upper end debris hopper in said vacuum cleaner housing;
a conduit having an open end adjacent said power brush, and extending from said power brush to said debris hopper for conducting air and debris from said power brush to said debris hopper;
filter means having a tubular configuration with an open bottom above said debris hopper for filtering dirt from air drawn up through said conduit and flowing up through said tubular filter means;
said filter means having a periphery, and having an upper end closed by air permeable filter materials;
a filter housing in said vacuum cleaner housing and around said filter means;
said filter housing and said filter means being sealed to said hopper upper end;
suction fan means having communication through said filter housing to said conduit for drawing dirt-laden air up into and through said conduit and said filter means;
a motor means operably connected to said suction fan means for driving said suction fan means;

filter distorting means in said housing positioned for knocking dirt from said filter means into said debris hopper by temporarily distorting said filter means;
actuator means extending from said distorting means out through said vacuum cleaner housing for manual actuation thereof;
said filter means comprising a plurality of open bottom porous tubes having compressible extension means therein for normally extending said tubes but allowing said tubes to be compressed with distortion of said tubes for dislodging dirt therefrom;
said filter distorting means comprising a depressor engageable with said upper end of said filter means for selectively depressing and releasing said filter means and said compressible extension means therein, to dislodge dirt therefrom;
said actuator means comprising handle means external of said vacuum cleaner housing for actuating and releasing said depressor;
said depressor comprising a plate, a plunger for shifting said plate and linkage between said plunger and said handle means; and
disengagement means operably connected for disengaging said filter housing from said hopper.

5,090,084
CLEANING ROLLER FOR SURFACES AND APPARATUS FOR USE THEREWITH
Joselito S. De Guzman, Hawthorne, Calif., assignor to Cleanline Corporation, Hawthorne, Calif.
Filed Aug. 30, 1989, Ser. No. 400,580
Int. Cl.⁵ B05C 1/08
U.S. Cl. 15—230.11

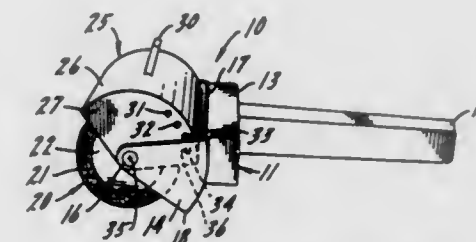
20 Claims



1. A roller for cleaning surfaces using a roller cover placed on the roller for wiping a surface, the roller comprising:
a handle for holding the roller;
a shaft segment coupled to the handle;
a roller frame for supporting a roller cover when placed on the roller frame and rotatably mounted to the shaft segment so that the roller frame can rotate about the shaft segment wherein the frame defines an interior portion of the frame;
seal means on the roller frame for substantially sealing between a roller cover, when installed on the roller frame, and the roller frame so that passage of the fluid to the interior of the roller frame is substantially prevented; and
means interior to the roller frame for allowing rotation of the roller frame in one direction only.

5,090,085
PAINT ROLLER HAVING ADJUSTABLE SPATTER SHIELD
James J. Jarecki, Greendale, Wis.; Leon C. Clouser, Jr., Lombard, and Insoon Park, Chicago, both of Ill., assignors to EZ Paint Corporation, Milwaukee, Wis.
Filed Jan. 26, 1988, Ser. No. 149,045
Int. Cl.⁵ B05C 17/02
U.S. Cl. 15—248 A

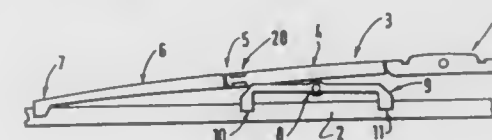
7 Claims



2. In an adjustably shielded paint roller assembly, a paint roller,
a rigid frame including a handle for carrying the roller, pivot means for mounting the paint roller for rotational movement about a fixed axis on the rigid frame, said rigid frame including a base shielding member which is located between the axis of rotation and handle and positioned so as to intercept spatter emanating from the roller during use, and
an adjustable shielding member which can be at least partially retracted into the base shielding member to a position in which a minimum degree of spatter shielding is provided, and which can be extended from the base shielding member to a position in which a maximum degree of spatter shielding is provided, said maximum degree of spatter shielding being about 180° of the circumference of the paint roller, and
position adjustment means for adjustably fixing the adjustable shielding member at intermediate positions of shielding coverage between positions of minimum and maximum spatter shielding.

5,090,086
PIVOTING DEVICE FOR CONNECTING TWO OSCILLATING ELEMENTS OF A WINDSHIELD WIPER BLADE
Maurice Journee, Reilly; Jean Duda, Villeneuve-les-Sablons; Pierre Beneteau, Gorcy, and Jean-Raymond Bru, Beauvais, all of France, assignors to Paul Journee S.A., Colombes Cedex, France
Filed Oct. 10, 1990, Ser. No. 597,359
Claims priority, application France, Oct. 13, 1989, 89 13431
Int. Cl.⁵ B60S 1/04
U.S. Cl. 15—250.42

8 Claims



1. A windshield wiper blade comprising a channel-shaped main stirrup (4) having surfaces of a general cross section in the form of an inverted U, said main stirrup having a substantially rectangular opening (14, 19) in an end portion thereof and

being adapted for oscillation, a support bar (6) pivotally mounted to said end portion (5) of said main stirrup by means of an insertable pivoted connection (20, 31), a wiping strip (2) supported by said support bar, said insertable pivoted connection comprising a U-shaped intermediate member (20) having a central web (22) and depending side wings (21), said side wings having outwardly extending detents (25) on end portions thereof, a pair of pivot pins (24) projecting from said side wings in facing relationship, said intermediate member being insertable in said rectangular opening and being secured therein by said detents, said support bar having two resilient plate elements (32) integral therewith, a pair of opposed holes (35) in said plate elements, said plate elements insertable in said U-shaped intermediate member whereby said plate elements are resiliently biased to receive said pivot pins.

5,090,087

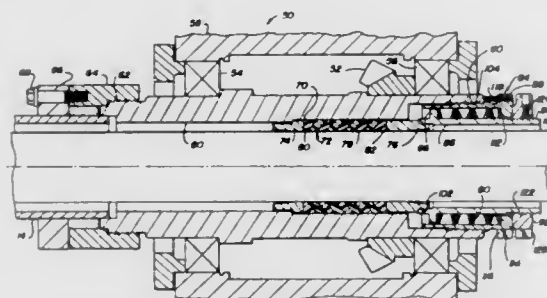
HUB ASSEMBLY FOR SOOTBLOWER

James H. Hipple; Don W. Smith; Steven P. Carpenter, all of Lancaster, and Jesse C. Johnston, Carroll, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Apr. 12, 1991, Ser. No. 685,464

Int. Cl.⁵ F23J 3/00

U.S. Cl. 15—317

15 Claims



1. A hub assembly for a sootblower having a feed tube with a lance tube overfitting said feed tube, and a carriage assembly coupled to said lance tube for causing said lance tube to move relative to said feed tube, wherein a sootblowing medium supplied to said feed tube flows into said lance tube and is ejected from one or more sootblowing nozzles carried by said lance tube for cleaning surfaces within a combustion device, comprising:

- a hub encircling said feed tube,
- packing within a stuffing box formed between said feed tube and said hub, and
- packing loading means for applying a load on said packing including a first member for coupling to said hub, a second member for coupling to said packing and a compliant element acting upon said first and second members for exerting said load on said packing, and preload maintaining means for enabling said compliant element to be maintained in a preloaded state when said first member is decoupled from said hub and said second member is decoupled from said packing and being actuatable to transfer said load onto said packing when said first member is coupled to said hub and said second member is coupled to said packing.

5,090,088

DECK-MOUNTED LEAF BLOWER

John S. Toth, 309 Mariellen Ave., Mishawaka, Ind. 46544

Filed Apr. 11, 1991, Ser. No. 683,864

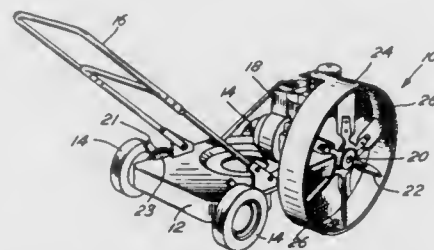
Int. Cl.⁵ E01H 1/08

U.S. Cl. 15—405

2 Claims

1. A leaf blower comprising a deck, wheels supported upon said deck for movement over the ground, a handle means connected to said deck for guiding said deck over the ground, a motor carried by said deck, said motor having a horizontal drive shaft, an axial fan secured to said drive shaft for rotation

about a horizontal axis to blow air in a direction generally parallel to said axis, said fan being located adjacent the level of said wheels, a generally cylindrical shroud extending about said fan, said wheels consisting of two pairs, each wheel pair



located on opposite sides of said deck, said fan located at one of said deck sides, one of said wheel pairs being independently adjustable relative to the other of said wheel pairs in a vertical orientation relative to said deck to incline the deck and said fan relative to the ground.

5,090,089

AUTOMATIC DOOR CLOSING DEVICE

Ernst Schulte; Werner Korling, both of Menden, and Franz Kraft, Arnsberg, all of Fed. Rep. of Germany, assignors to ECO Schulte GmbH & Co. KG, Menden, Fed. Rep. of Germany

PCT No. PCT/DE88/00347, § 371 Date Nov. 22, 1989, § 102(e) Date Nov. 22, 1989, PCT Pub. No. WO88/09860, PCT Pub. Date Dec. 15, 1988

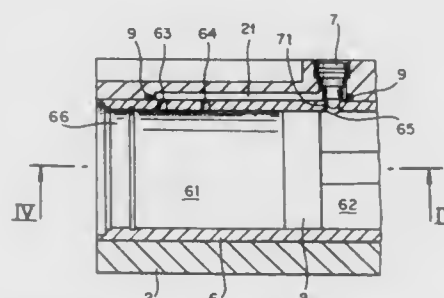
PCT Filed Jun. 10, 1988, Ser. No. 445,696

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719883; Oct. 16, 1987, 3735010

Int. Cl.⁵ E05F 3/00

U.S. Cl. 16—49

5 Claims



1. An automatic door closer comprising: a closing spring loading a closing shaft; a damping piston serving for damping the closing motion and which under external action is able to be moved in a damping cylinder between radial holes; said radial holes are connected with each other via at least one transfer duct arranged outside the damping cylinder so that a damping fluid may flow from a pressure space in the cylinder ahead of the piston into a pressure-free space behind the piston via a choke valve; said transfer duct is formed by a covering element mounted in a sealing manner directly externally on the damping cylinder; and wherein said covering element is a gutter externally welded on the damping cylinder as a covering element and with an externally pressured cavity opening towards the damping cylinder which with the damping cylinder forms the transfer duct.

5,090,090

OPENING APPARATUS FOR REMOVING FIBER FROM COMPRESSED FIBER BALES

Josef Temburg, Niersstrasse; Ferdinand Lelfeld, von-Behring-Strasse, and Ulrich Vollrath, Am Röttgen, all of Fed. Rep. of Germany, assignors to Trützschler GmbH Co. KG, Mönchengladbach, Fed. Rep. of Germany

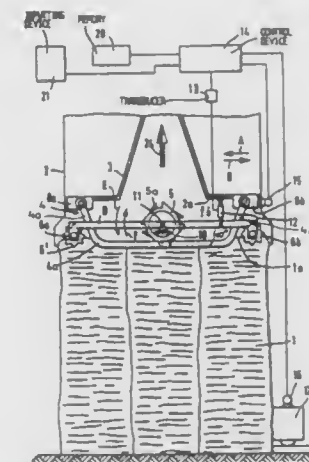
Filed Aug. 22, 1990, Ser. No. 570,877

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928835

Int. Cl.⁵ D01G 7/04

U.S. Cl. 19—80 R

16 Claims



1. In a bale opener for travel along a series of fiber bales for removing fiber tufts from top surfaces thereof, including a toothed opening roll supported in an orientation transverse to a direction of travel, a grate formed of grate bars spaced in a direction transverse to the direction of travel for engaging the top surfaces of the fiber bales; the teeth of the opening roll extending between the grate bars for penetrating into the fiber bales during travel; the improvement comprising bale pressing elements supported by the bale opener on opposite sides of the opening roll spaced therefrom parallel to the direction of travel for pressing downwardly on the fiber bales during travel of the bale opener; setting means for simultaneously vertically adjusting said bale pressing elements in opposite directions; a carriage for travelling alongside the fiber bales; a tower mounted on the carriage for travel therewith as a unit; a cantilever mounted on the tower for extending over the fiber bales in a direction transverse to the travelling direction; said opening roll, said grate and said bale pressing elements being accommodated in said cantilever; said cantilever being vertically movable relative to said tower; said rails, together with said carriage, said tower and said cantilever being horizontally movable in a direction transverse to the direction of travel.

5,090,091

BALE OPENING METHOD AND DEVICE HAVING ROLLERS AND GRATE BARS ADJUSTABLE IN HEIGHT RELATIVE TO ONE ANOTHER, FOR DETACHING FIBER TUFTS FROM THE TOP SURFACE OF A BALE

Josef Temburg, Jüchen, and Ulrich Vollrath, Neuss, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Aug. 1, 1989, Ser. No. 387,992

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1988, 3826201; Apr. 27, 1989, 3913929

Int. Cl.⁵ D01B 1/14, 1/24, 1/46; D01G 7/04

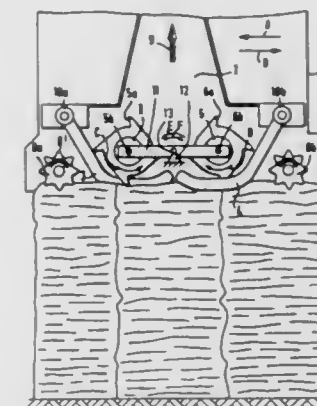
U.S. Cl. 19—80 R

18 Claims

1. In a travelling fiber tuft detaching device for removing fiber tufts from top surfaces of stationarily support fiber bales, including two parallel-mounted detaching rollers rotatable about substantially horizontal axes spaced from one another in a

travelling direction and extending transversely thereto; each detaching roller having a plurality of detaching elements in a plurality of side-by-side situated circumferential series; the two detaching rollers being supported for simultaneous penetration into a top bale surface during a fiber detaching operation; and

a grate formed of a plurality of spaced grate bars extending parallel to said travelling direction; the detaching elements of each said circumferential series projecting into spaces between respective adjoining said grate bars; the improvement comprising roller setting means for adjusting a height level of said detaching rollers relative to one



another for effecting simultaneous penetration of said detaching rollers into the top bale surface to different depths thereof during the detaching operation; said roller setting means being operatively connected to at least one of said detaching rollers for setting the height level thereof relative to another of said detaching rollers; said roller setting means including

- (a) a rocker tiltable about a horizontal axis oriented transversely to said travelling direction; said detaching rollers being mounted on said rocker;
- (b) power means connected to said rocker for pivoting said rocker about said horizontal axis; and
- (c) control means for actuating said power means.

5,090,092

CARDING FLAT ASSEMBLY

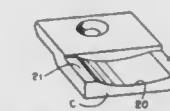
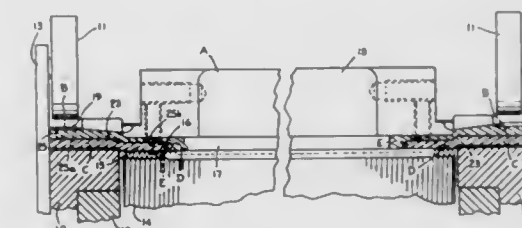
Gene A. Dempsey, Lyman, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Aug. 31, 1990, Ser. No. 575,848

Int. Cl.⁵ D01G 15/24

U.S. Cl. 19—113

1 Claim



1. A carding flat assembly disposed upon flexible bends beneath carrier disks of a carding machine comprising: a substantially T-shaped cast iron flat member including a casting having an integral flange with toothed card cloth-

ing mounted on a bottom side thereof and a web member at right angles thereto;

an end mounting extending outwardly from an end of said T-shaped cast iron flat member disposed upon said flexible bend on a bottom side and beneath said carrier disks on an upper side;

a slide having an arcuate recess defining spaced ledges for sliding upon said flexible bend supporting said flat and defining a setting for the toothed card clothing;

a projection integral with said slide for attaching said slide to said T-shaped cast iron member extending inwardly beyond a juncture of said end mounting with said T-shaped cast iron flat member and beneath said web;

said end mounting and said T-shaped cast iron flat member having a recess extending beyond said juncture and beneath said web receiving said slide and said projection; and

fastening means securing said slide and said projection within said recess including glue between engaging surfaces of said recess, said slide and said projection;

wherein said end mounting and said T-shaped cast iron flat member are reinforced against bending at said juncture and said slide and projection immovably positioned upon said assembly providing a proper setting for said toothed card clothing.

5,090,093

ORGANIC COMMUNITING APPARATUS

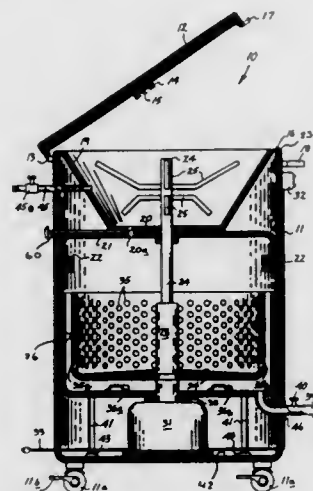
Ralph B. Kelly, 2785 Arbutus Road, Victoria, B.C., Canada V8N5X6

Filed Apr. 16, 1991, Ser. No. 685,886

Int. Cl.⁵ B02C 23/00

U.S. Cl. 24—38

6 Claims



1. A comminuting apparatus comprising, in combination, an elongate longitudinally aligned cylindrical housing, including a top annular edge coaxially aligned to the cylindrical housing, with a lid pivotally mounted to the cylindrical housing overlying the top annular edge, and a drive motor fixedly mounted to a bottom floor of the cylindrical housing, the drive motor including an intermediate shaft mounted to the drive motor, and a rotatable drive shaft separably mounted to the intermediate shaft, and

a comminuting chamber removably mounted within the cylindrical housing in a surrounding relationship to the blades, and

wherein the intermediate shaft includes a lower socket formed within a lower portion of the intermediate shaft and an upper socket formed within an upper portion of the intermediate shaft, and the drive shaft includes a lower drive end complementarily received within the upper socket, and a centrifuge bowl coaxially and integrally

mounted to the intermediate shaft, the centrifuge bowl including a matrix of apertures directed therethrough and includes a conical floor, wherein the centrifuge bowl is coaxially aligned with and underlying the comminuting chamber, the centrifuge bowl includes an annular array of further apertures directed through the centrifuge bowl adjacent the floor, the further apertures defining a second diameter greater than the first diameter defined by each of the apertures, and

including a reservoir bowl positioned in surrounding relationship relative to the centrifuge bowl, the reservoir bowl including an external diameter substantially equal to an internal diameter defined by the cylindrical housing, and the centrifuge bowl defining an external diameter substantially less than that of an internal diameter defined by the reservoir bowl to define a spacing between the reservoir bowl and the centrifuge bowl, and a fluid conduit mounted through a floor of the reservoir bowl, the fluid conduit directed through a housing opening within the cylindrical housing to direct fluid from the reservoir bowl exteriorly of the cylindrical housing, and the reservoir bowl including a floor with a plurality of handles diametrically mounted to the floor to enhance ease of removal of the reservoir bowl from the housing.

5,090,094

END CONNECTOR WITH INTEGRAL PIVOTAL CLAM SHELL

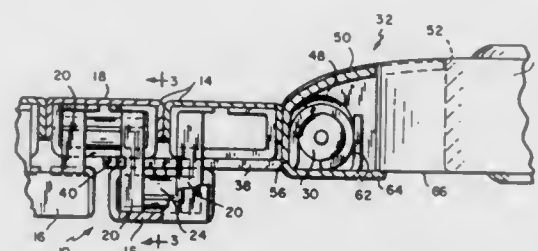
Stephen F. Bert, North Scituate, R.I., assignor to Textron Inc., Providence, R.I.

Filed Nov. 27, 1990, Ser. No. 619,122

Int. Cl.⁵ A44C 5/18

U.S. Cl. 24—265 WS

6 Claims



1. For use in connecting an end of a watchband to a watchcase, said watchcase having a pair of lugs protruding from a side thereof to define a gap therebetween, with a bar member extending between said lugs and across said gap, an end connector comprising:

a base member;

first engagement means at a rear end of said base member for connecting said base member to the said one end of said watchband;

second engagement means at a forward end of said base member for connecting said base member to said bar member for pivotal movement about the axis thereof;

a shell overlapping said second engagement means, said shell having a rear end overlying said base member and a forward end protruding beyond the forward end of said base member;

a flange at the rear end of said shell, said flange having mutually spaced legs straddling said base member;

third engagement means on said legs, said third engagement means coacting with said second engagement means to interconnect with said shell and said base member for relative pivotal movement about said axis; and

fourth engagement means on said legs, said fourth engagement means coacting with said watchcase to resist pivotal movement of said shell about said axis relative to said watchcase.

5,090,095

DRAPERY CLIP

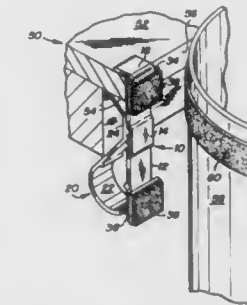
Jerry J. Lightfoot, Frisco, Tex., assignor to Display Products, Inc., Dallas, Tex.

Filed Feb. 8, 1991, Ser. No. 653,031

Int. Cl.⁵ A47H 1/00

U.S. Cl. 24—306

9 Claims



1. A clip for alternatively draping one of three structures, the first structure having a top surface, an underside surface, and a peripheral edge; the second structure having a top surface, and a peripheral edge having a downwardly extending flange member; and the third structure having a rod support member, the clip comprising:

a face portion having front and back surfaces and first and second ends, such that said back surface of said face portion contacts the peripheral edge of the first structure or the downwardly extending flange member of the second structure;

a first leg perpendicularly disposed to and extending rearwardly from said back surface at said first end of said face portion, such that said first leg contacts the top surface of the first and second structures;

a second leg having a curvilinear portion and a linear portion;

said curvilinear portion of said second leg extending rearwardly from said back surface at said second end of said face portion for engaging the rod support member of the third structure, said curvilinear portion having first and second ends, said first end connected to said back surface of said face portion and said second end being spaced apart from said back surface of said face portion;

said linear portion of said second leg includes first and second ends and said second end of said curvilinear portion includes means for hingedly receiving said first end of said linear portion of said second leg, such that said linear portion of said second leg is rotatable about said second end of said curvilinear portion for adjustably engaging the underside surface of various sized peripheral edges of the first structure and various sized flange members of the second structure;

said linear portion of said second leg extending from said second end of said curvilinear portion for engaging the underside surface of the first structure or the downwardly extending flange member of the second structure; and

fastener means attached to said face portion for detachably mating with fasteners on the drape.

5,090,096

PULL TAB FOR SLIDE FASTENER SLIDERS

Yasuharu Terada, Uozu, and Susumu Ishii, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 23, 1991, Ser. No. 704,381

Claims priority, application Japan, Jun. 7, 1990, 2-60437[U]

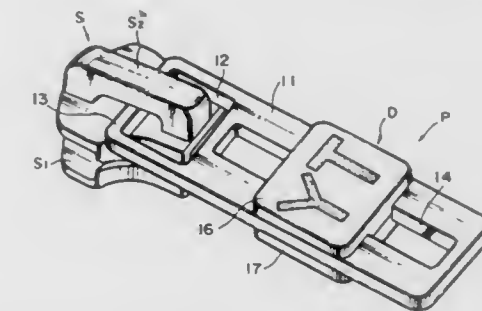
Int. Cl.⁵ A44B 19/26

U.S. Cl. 24—431

7 Claims

1. A pull tab to be pivotally connected with a slider body of a slide fastener slider for manipulation of the slider, the pull tab comprising: a pull tab body being of a flat strip and having a through hole therein; and a decorative body comprising a first decorative part having a pair of opposed clamping nails on an

inner surface and a second decorative part having an engaging ridge provided on an inner surface, the engaging ridge having a concave recess therein and a pin supported substantially axially in the concave recess; the first decorative part being



5,090,097

PLASTIC CLIP

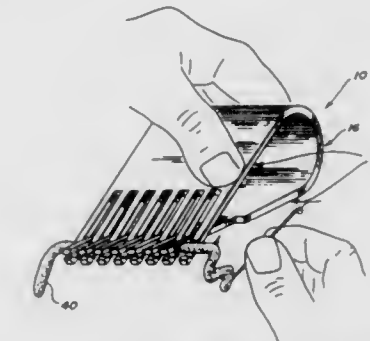
Frank A. Koester, Jr., 12142 Sage Glen, Maryland Heights, Mo. 63043, and Daniel R. Koester, 10766 Oak Ave., St. Louis, Mo. 63114

Filed May 28, 1991, Ser. No. 115,244

Int. Cl.⁵ A44B 21/00

U.S. Cl. 24—552

6 Claims



1. A one-piece plastic clip having a U-shape in cross-section in unstressed condition comprising a rectangular piece folded over to provide a pair of opposing spaced apart arms joined by an integral bight portion, said arms having free ends and upper and, lower surfaces, said free ends having a plurality of complementary offset teeth that in operative position intermesh and cross over at an angle forming broad jaws for gripping an object between the angled upper surfaces of the arms below the cross over point of the teeth whereby the compressive gripping force of said jaws is distributed across the object held therein.

5,090,098

METHOD OF MANUFACTURING A ROMAN SHADE

Thomas Seveik, Denver, and JeAnne M. Abrew, Broomfield, both of Colo., assignors to Hunter Douglas Inc., Upper Saddle River, N.J.

Division of Ser. No. 431,958, Nov. 6, 1989. This application Jul. 27, 1990, Ser. No. 559,007

Int. Cl.⁵ B23P 19/04

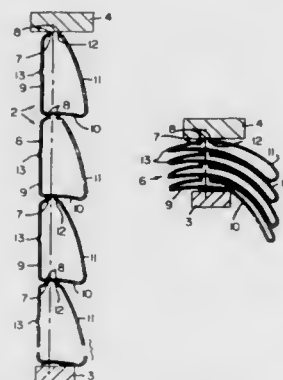
U.S. Cl. 29—24.5

19 Claims

1. A method of manufacture of an expandable and collapsible window covering from elongated, flat, flexible strip mate-

rial having longitudinal edge portions into an assembly of substantially parallel cell members with a rear wall portion, a bottom portion, a top portion and a front wall portion having a loop shaped surface, comprising the steps of:

- a) folding said strip material along longitudinal lines spaced from the edges of said longitudinal edge portions to provide temporary longitudinal creases with the longitudinal edge portions overlying the flat flexible strip material between the temporary longitudinal creases;



- b) stacking successive lengths of said material one on top of another and joining each of the folded longitudinal overlying edge portions of each of said lengths to a next successive length to form the assembly of adjacent overlying cell members; and
c) removing the temporary creases after formation of said assembly.

5,090,099

METHOD FOR MANUFACTURING MULTILAYER CERAMIC CAPACITOR

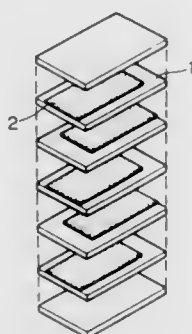
Yoon Ho Kim, Seoul; Jae Ung Ko, Changwon, and Hae Keun Shin, Seoul, all of Rep. of Korea, assignors to Korea Institute of Science & Technology, Seoul, Rep. of Korea
Filed Jan. 8, 1991, Ser. No. 639,509

Claims priority, application Rep. of Korea, Apr. 7, 1990, 4784/1990

Int. Cl.⁵ H01G 4/12, 4/30

U.S. Cl. 29—25.42

9 Claims



1. In a method for manufacturing a multilayer ceramic capacitor by injecting molten metal into pore layers produced by stacking and sintering dielectric layers applied with a quasi-electrode material, the step of subjecting said pore layers to a reducing to remove oxidation caused by said sintering whereby said molten metal permeates into said pore layers, without applying high pressure, to form interior electrodes of said multilayer ceramic capacitor.

MACHINE TOOL WITH A ROTARY TABLE AND ROTATABLE HOLDING DEVICES

Manfred Klett, Freiberg; Markus Dreimann, and Dieter Baumer, both of Leonberg, all of Fed. Rep. of Germany, assignors to Hahn & Kolb GmbH & Co., Fed. Rep. of Germany

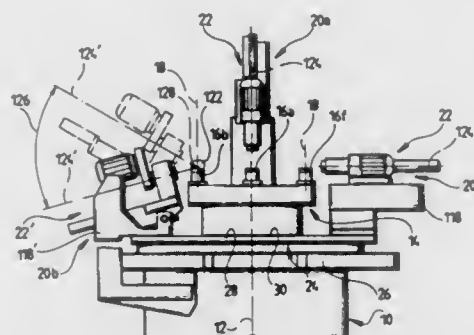
Filed Jul. 11, 1990, Ser. No. 551,530

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1989, 3923230

Int. Cl.⁵ B23B 9/12; B23Q 39/04

U.S. Cl. 29—38 C

38 Claims



1. A machine tool comprising a machine frame, a rotary table mounted on said machine frame for rotation about a center axis, machining stations arranged at angular spacings around said rotary table, at least one holding device mounted on said rotary table for rotation about an axis of rotation and adapted to be brought into said machining stations by rotation of said rotary table, and a rotary drive for rotating said holding device into various rotary positions, wherein said rotary drive comprises:

- a first and a second single sided cam track held stationarily on said machine frame, said first cam track being defined by a first surface and said second cam track being defined by a second surface, said first cam track cooperating with a first cam surface of a first cam element mounted on said rotary table and said second cam track cooperating with a second cam surface of a second cam element mounted on said rotary table, wherein said first cam track and first cam surface and said second cam track and second cam surface are, respectively, in constant contact with one another for continuous guidance of the cam surface by the cam track, said first and said second cam elements being coupled for rotating said holding device and in each of their positions along said cam tracks holding said holding device in a clearly defined rotary position with said cam elements together contacting said cam tracks in at least two points at all times to limit the free rotation of said cam elements in opposite directions, and said cam elements and said cam tracks being arranged such that each cam element has access to its cam track without coming into contact with the cam track of the other cam element or interfering with the other's access to its respective cam track.

5,090,101

DUCT CORNER INSTALLATION TOOL

Robert E. Welty, Cedar Rapids, Iowa, assignor to Iowa Precision Industries, Inc., Cedar Rapids, Iowa

Filed Sep. 18, 1990, Ser. No. 584,478

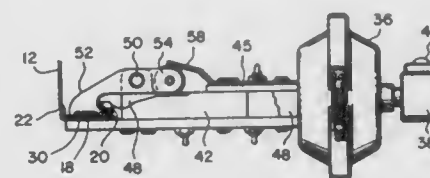
Int. Cl.⁵ B23P 11/00

U.S. Cl. 29—243.5

7 Claims

1. A tool for installing a corner piece in the flange of a sheet metal duct by pressing the corner piece into the flange and crimping the edge of the flange over the corner piece, said tool comprising: a pair of jaws moveable toward and away from each other from an open position to a closed position, operat-

ing means moveable relative to the jaws and operatively combined with the jaws to move the jaws from an open position to a closed position, and power means for moving the operating means when the power means is actuated by the user of the



tool, said operating means also having an operating tip engageable with the edge of the flange when the jaws are closed to crimp the edge over the corner piece after the corner piece has been pressed into the flange by the jaws.

5,090,102

DIESEL INJECTOR SLEEVE REMOVER

Paul H. Lovell, P.O. Box 136, Theriot, La. 70397

Continuation of Ser. No. 406,153, Sep. 12, 1989, abandoned. This application Sep. 20, 1990, Ser. No. 607,334

Int. Cl.⁵ B23P 19/04

U.S. Cl. 29—255

3 Claims



1. An apparatus for the removal of an injector sleeve from an engine block comprising:
an axial shaft having a first handle end and a second, insertion end;
said second, insertion end having an inverted, conical shape; a toothed, expansion means slidably journaled upon said shaft adjacent said insertion end;
impact hammer means slidably journaled upon said shaft between said expansion means and said handle end;
said expansion means having an impact receiving face for receiving an inserting impact from said sliding hammer; and
said handle end having an impact receiving face for receiving a withdrawing impact from said hammer.

5,090,103

METHOD OF FASTENING SCREW MEMBERS WHICH ARE SUPPORTED BY A FASTENER CARRIER

Akio Nakata; Masahiro Yoshida, and Koshiro Nakajima, all of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

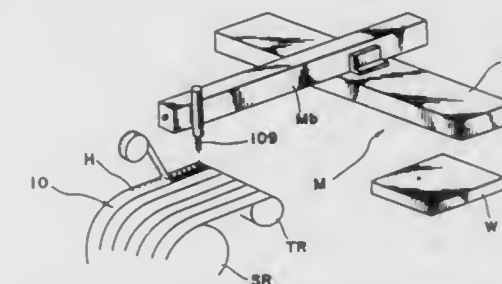
Division of Ser. No. 403,057, Sep. 1, 1989, Pat. No. 4,955,476, which is a continuation of Ser. No. 136,636, Dec. 22, 1987, abandoned. This application Jan. 22, 1990, Ser. No. 468,278

Claims priority, application Japan, Dec. 25, 1986, 61-311354; Dec. 29, 1986, 61-311011; Jan. 12, 1987, 62-4345; Jan. 12, 1987, 62-4346; Jan. 16, 1987, 62-8490

Int. Cl.⁵ B23P 17/00

U.S. Cl. 29—418

11 Claims



1. A method of fastening a screw member having a head and a stem to a workpiece disposed at a work station, said method comprising:
providing a fastener carrier comprising a carrier strip having a plurality of apertures extending therethrough and screw members supported on said carrier strip while extending through said apertures, respectively;
transporting said carrier strip in the longitudinal direction thereof until one of the screw members arrives at a fastening station disposed above the work station;
lowering a vacuum sleeve having a bit of an automatic screwdriver therein at said fastening station onto said carrier strip over the head of said one of the screw members;
generating a vacuum in the vacuum sleeve to suck said one of the screw members to the bit of the automatic screwdriver;
lowering the bit of the automatic screwdriver within said vacuum sleeve until said bit forces said one of the screw members sucked thereto through said carrier strip and toward said work station; and
subsequently screwing said one of said screw members with said bit into a workpiece disposed at said work station.

5,090,104

METHOD OF MAKING A CORE LOCK SHAFT

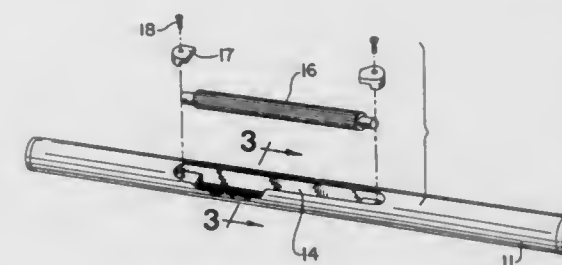
Thomas E. Dash, Aurora, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Jul. 31, 1991, Ser. No. 738,337

Int. Cl.⁵ B23P 11/02, 13/04

U.S. Cl. 29—434

4 Claims



1. A method of making a core lock shaft for supplying paper to a computer printer comprising

providing a cylindrical shaft having a diameter of about 3" and the length of about 18" with the shaft end portions being adapted to serve as journals for rotatably supporting a paper roll having a diameter of up to about 50", cutting an axially elongated recess in the shaft periphery generally midway of the shaft length, said recess having a predetermined depth to provide a chordal bottom wall and longitudinally extending sidewalls, said sidewalls extending generally perpendicularly to said bottom wall, grinding a plurality of axially-extending, transversely spaced slots in said bottom wall to develop a plurality of rack teeth, providing a length of pinion wire of a diameter slightly greater than said predetermined depth, said diameter being measured between opposed teeth of said pinion wire, drilling the ends of said pinion wire to provide axially-extending bores and inserting a dowel pin in each said bore with a portion of the dowel pin length projecting axially beyond the pinion wire ends, mounting said pinion wire in said recess with said pinion teeth in engagement with said rack teeth, and installing clip means at the ends of said recess in covering relation to the projecting portions of said dowel pins.

5,090,105

MODULAR VEHICLE CONSTRUCTION AND ASSEMBLY METHOD

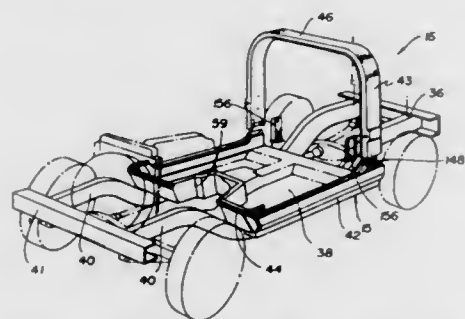
Delbert D. DeRees, Romeo, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 131,360, Dec. 10, 1987, abandoned, which is a division of Ser. No. 839,873, Mar. 14, 1986, abandoned. This application Dec. 21, 1990, Ser. No. 632,416

Int. Cl.⁵ B26D 25/00

U.S. Cl. 29—469

19 Claims



1. A method of constructing a motor vehicle comprising: fabricating a first module comprising mounting a passenger platform having upper and lower panels to a chassis frame; wherein said step of fabricating said first module further comprises securing at least two elongated rails of the chassis frame intermediate and to said upper and lower panels of the passenger platform with each of said elongated rails projecting longitudinally outwardly from said upper and lower panels of said passenger platform; fabricating a second module comprising integrally constructing a lower dash cowl having a lower dash panel frame and an upper windshield frame; fabricating a third module comprising securing two first side wall structures to opposite sides of a flooring platform and mounting at least one closure means intermediate said first side wall structures for at least selectively enclosing an area above said flooring platform; fabricating a fourth module comprising supporting a pair of second side wall structures with reinforcement means in a fixed, spaced relationship with respect to each other, supporting a hood panel on said second side wall structures, and displaceably mounting at least a portion of said fourth module with respect to said first module; installing a set of vehicle components on at least one of said

first, second, third and fourth modules, and after said installing step, mounting said second, third and fourth modules on said first module; and said mounting step comprising a plurality of sequential mounting steps for attaching each module sequentially in a final assembly line.

5,090,106

METHOD OF MANUFACTURING A SCORING BOARD

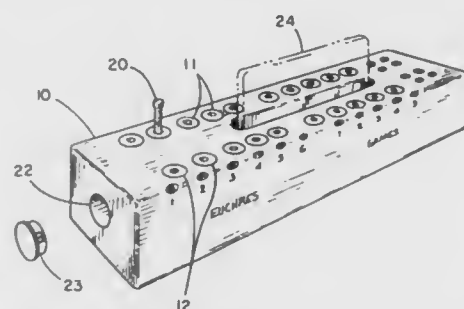
David F. Fink, 17665 Bayberry Dr., Spring Lane, Mich. 49456

Filed Mar. 25, 1991, Ser. No. 674,613

Int. Cl.⁵ B23P 19/02

U.S. Cl. 29—525

1 Claim



1. A method of manufacturing a scoring board having a plurality of peg-receiving holes, said method comprising: selecting a group of blind rivets each having a tubular portion, and also a shaft member provided with an enlarged head, said shaft member initially traversing said tubular portion up to said head, said head having a diameter exceeding the inside diameter of said tubular portion; forming a group of holes in a block of material, said holes being adapted to closely receive the outside diameter of said tubular portion; and removing said shaft members from said tubular portion, and subsequently engaging said tubular portions with said holes, respectively.

5,090,107

APPARATUS FOR INSERTING STATOR COIL LEAD WIRES INTO TERMINALS HAVING WIRE-RECEIVING CHANNELS

John M. Beakes, and Howard S. Hunter, both of Fairborn, Ohio, assignors to Globe Products Inc., Huber Heights, Ohio

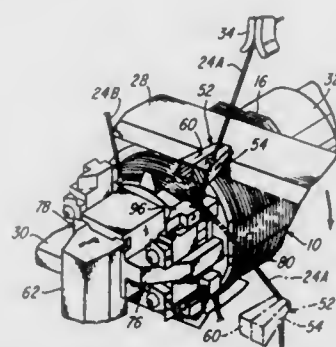
Continuation of Ser. No. 511,413, Apr. 20, 1990, abandoned.

This application Dec. 26, 1990, Ser. No. 632,637

Int. Cl.⁵ H01R 43/04

U.S. Cl. 29—566.3

4 Claims



1. Apparatus for manufacturing stators having a stator core having an end face with terminal-receiving sockets and terminals held by said sockets, each of said terminals having a trough-like, longitudinally-extending, wire-receiving channel spaced from its associated socket by a spacer portion thereof,

said stators further having plural lead wires, each said lead wire having a fixed end extending from a stator coil wound on said stator core and a free end held by a clamp so that it extends alongside its associated said socket, said apparatus comprising: a terminal support and shield member having surfaces for shielding said spacer portion and the outer surfaces of said terminals from contact by said lead wires and for preventing substantial bending of portions of said terminals that otherwise may be caused when said lead wires are inserted into said channels; a robot having an end effector that successively grips said lead wires and manipulates said lead wires to insert said lead wires into said terminal channels; and means for moving said terminal support and shield member away from said stator core to expose said spacer portion in advance of the movement of said end effector to locate each said lead wire across its associated said spacer portion.

5,090,108

STATOR COIL WINDING AND LEAD TERMINATION METHOD AND APPARATUS

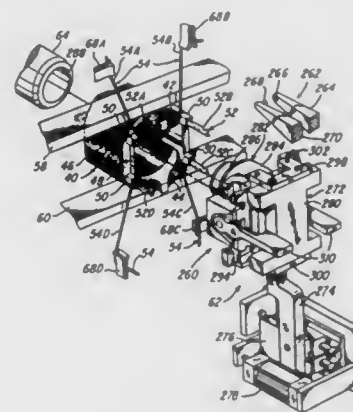
Alvin C. Banner, Montgomery County; John W. Bradfute, Green County; Patrick A. Dolgas, Clermont County, and Lawrence E. Newman, Tipp City, all of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio

Filed Oct. 17, 1990, Ser. No. 598,878

Int. Cl.⁵ H02K 15/00

U.S. Cl. 29—596

6 Claims



1. A method of manufacturing stators of the type having a stator core having an end face with terminal-receiving sockets and terminals held by said sockets, each of said terminals having a trough-like, longitudinally-extending, wire-receiving channel, a pair of coils wound on said stator core, each coil having at least one pair of lead wires extending therefrom, each said lead wire having a fixed end extending from a stator coil and a free end held by a clamp so that it extends alongside its associated said socket, said method comprising the steps of: providing a terminal crimping member operable in response to movements of a pliers-like robot end effector to crimp a portion of one of the terminals on said stator to a segment of a lead wire; relatively positioning a stator and said terminal crimping member adjacent one another to enable said crimping member to crimp a portion of one of the terminals on said stator to a segment of a lead wire; gripping said lead wire intermediate said clamp and said coil by said end effector;

moving said end effector to place said lead wire into said channel; moving said end effector to cause said terminal crimping member to crimp a portion of said terminal against said segment of said lead wire; and thereafter cutting the end of the lead wire gripped by said end effector free from said segment of said lead wire.

3. A method of manufacturing stators of the type having a stator core having an end face with terminal-receiving sockets and terminals held by said sockets, each of said terminals having a trough-like, longitudinally-extending, wire-receiving channel, a pair of coils wound on said stator core, each coil having at least one pair of lead wires extending therefrom, each said lead wire having a fixed end extending from a stator coil and a free end held by a clamp so that it extends alongside its associated said socket, said method comprising the steps of: moving at least one of said clamps between a first position wherein it holds a lead wire at a first distance from said stator core to a second position wherein it holds the lead wire at a second, greater distance from said stator core to thereby reduce slack in the lead wire; gripping said lead wire intermediate said clamp and said coil by a pliers-like robot end effector; and moving said end effector to place said lead wire into said channel.

5. Apparatus for manufacturing stators of the type having a stator core having an end face with terminal-receiving sockets and terminals held by said sockets, each of said terminals having a trough-like, longitudinally-extending, wire-receiving channel, a pair of coils wound on said stator core, each coil having at least one pair of lead wires extending therefrom, each said lead wire having a fixed end extending from a stator coil and a free end held by a clamp so that it extends alongside its associated said socket, said apparatus comprising: means positioning said stator core and said clamps at a lead wire terminating station; a terminal crimping member at said lead wire terminating station; a pliers-like robot end effector operable to successively grip said lead wires intermediate their associated clamps and coils and to move said end effector to place successive ones of said lead wires into different ones of said channels; said terminal crimping member including actuator means for causing said terminals to be crimped against said lead wires; and said end effector engaging said actuator means to cause said terminals to be crimped.

5,090,109

METHOD TO REPLACE A SOLENOID UNIT IN A STARTER MOTOR ASSEMBLY

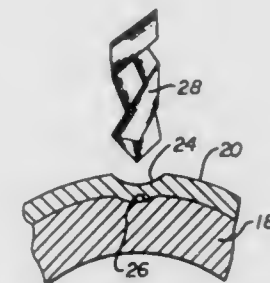
Milton Haas, 160 S. Martel Ave., Los Angeles, Calif. 90036-2714, and Joe C. Y. Hsieh, 91 E. Gainsborough Rd., Thousand Oaks, Calif. 91360-3553

Filed Feb. 12, 1991, Ser. No. 654,252

Int. Cl.⁵ H02K 15/14

U.S. Cl. 29—596

3 Claims



1. A method of removing and replacing a solenoid unit in a starter motor assembly having said solenoid unit mounted into

an open-ended lever housing cap by a plurality of radial indented crimps, comprising:

- drilling through said crimps to form a plurality of radial holes in the lever housing cap proximate to the open end thereof;
- removing said solenoid unit from the open-ended lever housing cap by pulling it apart therefrom;
- inserting one end of a replacement solenoid unit into said open end of said lever housing cap, said one end defining a plurality of radial outwardly open threaded ports which align with the radial holes of the lever housing cap; and
- inserting screws respectively through said radial holes of the lever housing cap and fastening said screws into said threaded ports of the replacement solenoid unit to mount the replacement solenoid unit in the open-ended lever housing cap.

5,090,110

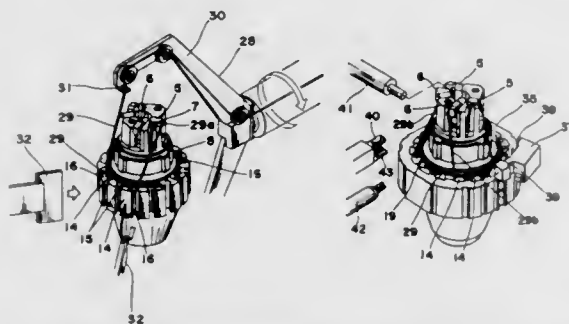
METHOD FOR MANUFACTURING STATOR FOR ROTATING MACHINE

Toshiichi Murakoshi, Neyagawa; Hiroshi Kawazoe, Hirakata; Toshihiro Takahata, Mino; Shigeo Inaki; Tatsuo Yamashita, both of Takefu, and Yoshinori Dol, Sabae, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 15, 1990, Ser. No. 596,389

Claims priority, application Japan, Oct. 13, 1989, 1-266472
Int. Cl.⁵ H02K 15/08

U.S. Cl. 29—596

5 Claims



1. A method for manufacturing a stator for use in a rotating machine provided with a core main body having a plurality of teeth projecting from an outer circumferential side of the core main body and wound with a coil, and a ring member fitted on the outer circumferential portion thereof, comprising the steps of:

- inserting a jig into the interior of the core main body;
- clamping a wind start portion of the coil on one portion of the jig, winding the coil between groups of teeth, and clamping a wind terminating portion of the coil on another portion of the jig;
- fitting the ring member over the outer circumferential portion of the core main body;
- mounting a terminal unit on the stator;
- releasing the wind start and wind terminating portions of the coil from the jig, and winding said portions around corresponding pins of said terminal unit and soldering said portions to said pins; and
- shaping the configuration of the portions of the coil positioned between the teeth.

5,090,111

PROCESS FOR PRODUCING A MAGNETIC RECORDING HEAD

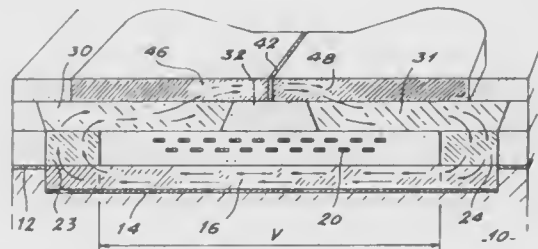
Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 21, 1990, Ser. No. 585,964

Claims priority, application France, Sep. 29, 1989, 89 12768
Int. Cl.⁵ G11B 5/42

U.S. Cl. 29—603

3 Claims



1. A process for the production of a head for magnetic recording comprising the steps of:

- forming a lower pole piece having first and second extremities on a semiconductor substrate;
- forming a double conductor coil on the lower pole piece;
- forming first and second magnetic pillars respectively at the first and second extremities, each magnetic pillar being surrounded by the coil;
- depositing a layer of an amagnetic material on the lower pole piece, the coil, and the first and second magnetic pillars, the layer of amagnetic material having a height greater than a few microns;
- etching a narrow trench in the layer of amagnetic material extending from the first magnetic pillar to the second magnetic pillar, the trench having a height equal to the height of the layer of amagnetic material, the height of the trench being much greater than a width of the trench;
- forming an amagnetic spacer at a center of the trench, the spacer extending over an entire height of the trench; and
- electrolytically growing first and second upper pole pieces within the trench so as to respectively bear on the first and second pillars and on either side of the amagnetic spacer until said first and second upper pole pieces are flush with an upper surface of the layer of amagnetic material, the first and second upper pole pieces being higher than wide.

5,090,112

METHOD AND APPARATUS FOR MANUFACTURING COILS

Günther Bensch, Stein; Markus Schneider, Herrieden; Bert Walch, Schwabach, and Martin Schmidt, Nuremberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00111, § 371 Date Sep. 14, 1990, § 102(e)
Date Sep. 14, 1990, PCT Pub. No. WO89/11155, PCT Pub. Date Nov. 16, 1989

PCT Filed Feb. 25, 1989, Ser. No. 576,387

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815676

Int. Cl.⁵ H01F 7/06

U.S. Cl. 29—605

22 Claims

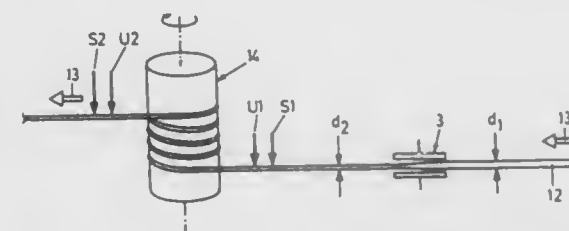
1. A method of manufacturing coils having substantially predetermined resistance characteristics from resistance wire, comprising the following steps:

- winding the resistance wire into a coil in a coil winding machine;
- applying a braking force to the wire with an electrically controlled wire braking element prior to coiling the wire in the winding machine;
- measuring the resistance value of at least one section of the wire as it is wound into a coil;

comparing the measured resistance value to a preselected desired value and, if the measured resistance value exceeds the preselected desired value, decreasing the braking force applied by the braking element to correspondingly decrease the degree to which the wire is stretched by the braking element and, in turn, correspondingly decrease the resistance of the wire, and if the measured resistance value is less than the preselected desired value, increasing the braking force applied by the braking element to correspondingly increase the degree to which the wire is stretched by the braking element and, in turn, correspondingly increase the resistance of the wire, thus producing coils having substantially predetermined electrical resistance characteristics.

16. An apparatus for winding wire coils having substantially predetermined electrical resistance characteristics, comprising:

a winding device for winding wire into coils;



a braking device for applying a braking force to a wire being wound into a coil on the winding device, to stretch the wire for adjusting the electrical resistance characteristics thereof;

first means for measuring the resistance of at least one section of a wire being wound into a coil on the winding device and for generating output signals indicative thereof; and

second means coupled to the first means and to the braking device for controlling the force applied by the braking device to a wire being wound on the winding device, wherein, the second means compares the output signals of the first means to a predetermined value based on the desired resistance value of the coil, and correspondingly adjusts the braking force applied to the wire to, in turn, adjust the resistance of the wire to obtain coils having substantially predetermined resistance characteristics.

5,090,113

APPARATUS FOR SUPPLYING ARTICLES

Sachio Umetsu, Kawasaki; Toshio Tsuda; Yusaku Azuma, both of Yokohama; Toshihiko Mlura, Kawasaki; Katsumi Ishihara, Yokohama, and Teiji Ohsaka, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1990, Ser. No. 503,745

Claims priority, application Japan, Apr. 5, 1989, 1-039597[U]; Apr. 5, 1989, 1-084881; Apr. 5, 1989, 1-084882; Apr. 5, 1989, 1-084883; Apr. 5, 1989, 1-084884; Apr. 5, 1989, 1-084885

Int. Cl.⁵ B65H 16/00; B25J 9/00

U.S. Cl. 29—714

3 Claims

1. An apparatus for transporting articles by a transporting member, comprising:

- a transporting member having plural recesses in succession for storing and transporting the articles;
- a cover tape for covering apertures of said recesses of said transporting member;

a first reel on which a first end of said transporting member and a first end of said cover tape are fixed, for simultaneously winding said transporting member and said cover tape;

a second reel on which a second end of said transporting member is fixed, for winding said transporting member only;

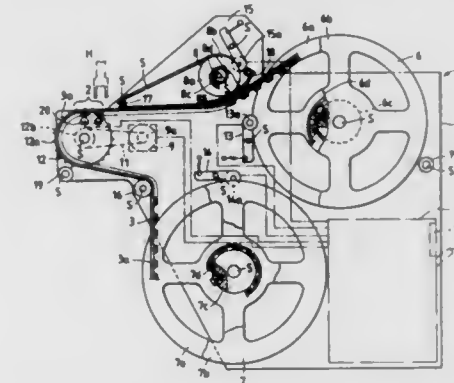
a third reel on which a second end of said cover tape is fixed, for winding said cover tape only;

drive means for rotating said first, second and third reels;

intermittent drive means for intermittently driving said transporting member, by engaging consecutive perforations formed in said transporting member;

control means for driving said drive means and said intermittent drive means;

an aperture for loading or removing said articles into or from said recesses of said transporting member; and



first article detection means provided in the vicinity of said aperture for detecting the presence or absence of the article in said recess;

and said apparatus further comprising an article manufacturing apparatus and an article assembling apparatus, each including a main control unit and a robot hand connected to said control means, wherein said drive means and said article assembling apparatus or said article manufacturing apparatus are synchronized according to the result of detection by said first detection means.

5,090,114

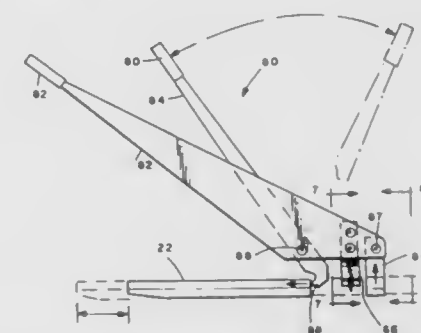
TOOL FOR APPLYING SLOT WEDGES

Duncan N. Walker, Bauston Lake, N.Y.; Vincent G. Terry, Ft. Lauderdale, Fla.; Dennis R. Ulery, Saratoga, N.Y.; Edmund E. Kazmierczak, Schenectady, N.Y.; Richard J. Keck, Clifton Park, N.Y.; James R. Pedersen, and Brian E. Gott, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 557,863, Feb. 26, 1990. This application Jul. 25, 1991, Ser. No. 735,810
Int. Cl.⁵ H02K 15/10

U.S. Cl. 29—734

4 Claims



1. A tool for applying wedges in slot keys overlying windings retaining slots in a rotor body of an electric machine wherein the slot keys have at least one spring element for biasing the wedge in the slot key into high-pressure, efficient electrical contact with the rotor body, comprising a lever having a main arm and a pair of dogs carried by said lever adjacent an end of said main arm, one of said dogs shaped for

disposition in the slot keys and the other dog shaped to overlie the slot keys whereby pressure applied to said main arm, with the one dog in a slot key and the other dog overlying the slot key, applies pressure to said dogs in opposite directions, thereby fixing the lever at a predetermined axial position along the slot key, and a second arm pivotally carried by said lever and carrying a head for engaging the wedge whereby, upon fixing the lever at a predetermined axial position along the slot key, the second arm may be pivoted to advance a wedge along the slot key.

5,090,115

GROMMET INSERTION APPARATUS

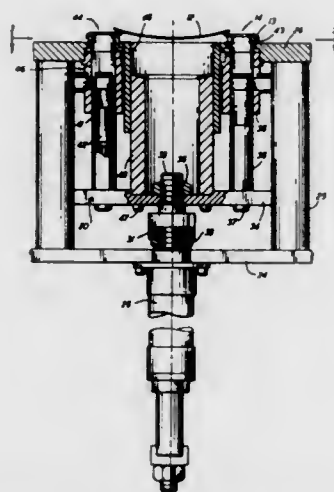
Jack J. Fuller; Joseph A. Podesta, and Daniel J. Yarnold, all of Memphis, Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 248,057, Sep. 23, 1988, Pat. No. 5,052,096. This application Jun. 17, 1991, Ser. No. 716,162

Int. Cl.⁵ B23P 21/00

U.S. Cl. 29—789

11 Claims



11. An apparatus for simultaneously installing a plurality of elastomeric grommets into respective openings in the base structure of a compressor comprising:

- a plurality of cylinders disposed in substantially parallel axis relationship with their relative spacings corresponding to those of the compressor base openings, said cylinders each having a converging portion leading to a diminished discharge opening at a cylinder discharge end;
- grommet feed means for inserting grommets with body, neck, and head portions into said cylinder with said head portions being coaxially oriented toward said cylinder discharge end;
- positioning means for positioning said compressor with its base structure engaging said cylinder discharge ends and with said base structure openings being in coaxial alignment with the respective said cylinder discharge openings;
- a piston slideably disposed in each of said cylinders; and
- power movement means for moving said pistons into engagement with said grommet bodies and further toward said cylinder discharge ends to thereby deform and force said grommet heads serially through said cylinder converging portions, cylinder discharge openings, and compressor base structure openings, after which said grommet heads are allowed to return to their undeformed conditions to thereby capture said grommets in said base structure openings.

5,090,116

METHOD OF ASSEMBLING A CONNECTOR TO A CIRCUIT ELEMENT AND SOLDERING LEAD FRAME FOR USE THEREIN

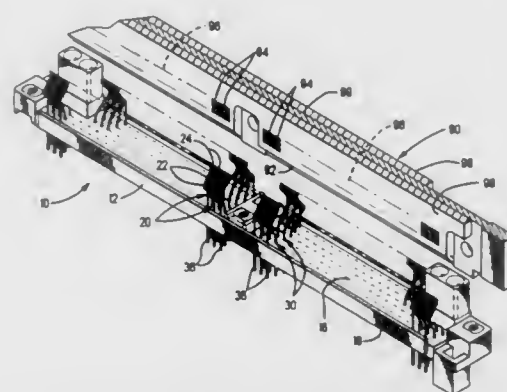
Homer E. Henschen, Carlisle; Michael J. McKee, New Cumberland; Joseph M. Pawlikowski, Lancaster; Richard L. Schaeffer, Carlisle; David T. Shaffer, Mechanicsburg, and Alexander M. Sharpe, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1990, Ser. No. 631,819

Int. Cl.⁵ H01R 43/00, 9/09

U.S. Cl. 29—827

20 Claims



1. A method of preparing an electrical connector to be soldered to a circuit element, the connector of the type having at least one array of elongate contact arms extending from a mounting face to free ends defining contact sections disposed in a common plane for being soldered to a corresponding array of conductive means defined on a common surface of the circuit element to establish a plurality of electrical and mechanical connections between the connector and the circuit element, comprising the steps of:

- providing a source for generating a constant amplitude high frequency alternating current of known frequency;
- forming a lead frame corresponding to each said array of contact arms of said connector, each said lead frame having a carrier strip section and a plurality of fingers coextending from said carrier strip section each associated with and spaced to correspond with respective ones of said free ends of said elongate contact arms of said array, said lead frame being of a first metal having low electrical resistance and minimal magnetic permeability;
- defining along said carrier strip section on a major surface thereof a second layer of a second metal having high electrical resistance and high magnetic permeability, said second layer having a thickness at least equal to one skin depth of said second metal, given said known frequency, said first metal of said carrier strip section being a first layer to which said second layer is intimately joined and said carrier strip section thereby defining a heater means integral to said lead frame;
- disposing solder material on each said finger at least on opposed major surfaces thereof at least proximate free ends thereof, defining solder preforms, said solder material having a nominal reflow temperature slightly less than the Curie temperature of said second metal;
- placing said lead frame in tooling means such that said end portions of said fingers are registered with and against respective ones of said free ends of said elongate contact arms of a corresponding said array of said connector, with said carrier strip section extending away from said connector;
- generating said constant amplitude high frequency alternating current in said carrier strip section for a selected length of time, thereby generating thermal energy transmitted along said fingers to said solder material and reflowing said solder material which will form solder joints

between said fingers and said free ends of said contact arms thus securing said lead frame to said array, whereby a connector is defined having an integral means to maintain the precise alignment and spacing of said coplanar free ends of said contact arms prior to soldering to a said circuit element, and further having an integral heater means and integral amounts of solder material at said free ends of said contact arms, all facilitating eventual soldering of said contact arms to respective said conductive means of a said circuit element whereafter said lead frame carrier strip section is removable to define discrete isolated circuits.

15. A lead frame for use in facilitating the soldering of an array of free ends of contact arms of an electrical connector to a corresponding array of conductive means of a circuit element, usable in conjunction with a source of constant amplitude high frequency alternating current of known frequency, comprising:

- an integral member formed from strip of a first metal having low electrical resistance and minimal magnetic permeability, said integral member defining a first layer having a carrier strip section and a plurality of fingers coextending from said carrier strip section each associated with and spaced to correspond with respective ones of said free ends of said contact arms of said array;
 - said carrier strip section having defined on a major surface thereof and integrally joined to said first layer thereof a second layer of a second metal having high electrical resistance and high magnetic permeability, said second layer having a thickness at least equal to one skin depth of said second metal, given said known frequency, said carrier strip section thereby defining a heater means integral to said lead frame; and
 - each said finger having solder material containing flux therein disposed at least on opposed major surfaces thereof at least proximate free ends thereof, defining solder preforms, said solder material having a nominal reflow temperature slightly less than the Curie temperature of said second metal,
- whereby a lead frame is defined securable to said contact arm free ends enabling said connector to be soldered to said circuit element without individually realigning and respacing said contact arm free ends in registration with said circuit element conductive means prior to soldering requiring tooling which must be especially adapted therefor, or for placing solder amounts at said joint sites or for subjecting the entire circuit element and connector to high temperatures necessary to otherwise reflow the solder material.

5,090,117

METHOD OF ASSEMBLING ELECTRONIC EQUIPMENT

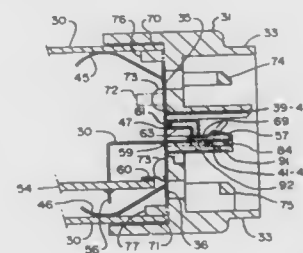
Robert G. Dickie, Newmarket, Canada, assignor to Voice Data Image Corporation Incorporated, Ontario, Canada

Division of Ser. No. 437,245, Nov. 16, 1989, Pat. No. 5,053,926. This application May 22, 1991, Ser. No. 704,155

Int. Cl.⁵ H05K 3/34

U.S. Cl. 29—840

4 Claims



1. A method for assembling electronic equipment comprising the steps of
molding a cover panel having at least one receptacle position

molded therein, each said position including shoulders for snap locking separate connector contacts onto said position, soldering one end of a plurality of said connector contacts to a printed circuit board, and snap locking said connector contacts onto said shoulders in said cover panel to form a connector assembly integral with said cover panel.

5,090,118

HIGH PERFORMANCE TEST HEAD AND METHOD OF MAKING

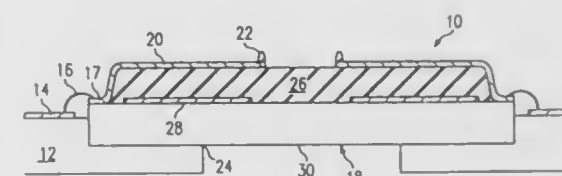
On-Kyong Kwon, Plano; Masashi Hashimoto, and Satwinder Malhi, both of Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1990, Ser. No. 560,398

Int. Cl.⁵ H01R 9/06; B01R 1/00

U.S. Cl. 29—843

3 Claims



1. A high performance test head for communicating test signals between a plurality of integrated circuit test pads and integrated circuit tester, comprising:

- a planar foundation transparent plate for providing structural support;
 - a compressible and compliant material layer covering and at least partially in contact with said foundation plate, said compliant material layer including an upper surface;
 - a ground plane below said upper surface and covered by said compliant material;
 - interconnecting conductive metal lines in contact with said upper surface of said compliant material; and
 - a plurality of metal bumps bonded to and selectively in electrical contact with said interconnecting lines for contacting test pads of an integrated circuit.
2. A method of fabricating a high performance test head for communicating test signals between a plurality of integrated circuit test pads and test circuitry, comprising the steps of:
- metallizing a structural support transparent wafer to form a metal ground plane;
 - metal etching a window area within said ground plane material;
 - spin-coating a compliant material layer over said structural support wafer and said ground plane;
 - soft-curing said compliant material layer;
 - hard-baking said compliant material layer;
 - metallizing said compliant material layer to form thereon a conductive metal layer;
 - patterning interconnection lines from said conductive metal layer; and
 - forming a plurality of metal bumps on said compliant material layer, said metal bumps associated with said interconnection lines to permit association of said metal bumps with the test pads of the integrated circuit.

5,090,119

METHOD OF FORMING AN ELECTRICAL CONTACT BUMP

Toshio Tsuda, Habikino; Yasuhiko Horio, Osaka; Yoshihiro Bessho, Kadoma, and Toru Ishida, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 279,101, Dec. 2, 1988, Pat. No. 5,014,111.

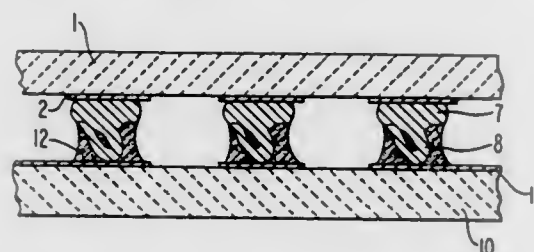
This application Oct. 30, 1990, Ser. No. 605,096

Claims priority, application Japan, Dec. 8, 1987, 62-309805; Jul. 25, 1988, 63-184936

Int. Cl.⁵ H01R 9/14

U.S. Cl. 29—843

6 Claims



1. A method of forming, on an electrode pad formed on a substrate, an electrical contact bump having a first raised portion attached to the electrode pad and a second raised portion having a shape of a loop formed on the first raised portion, said method comprising the steps of:

- fixedly attaching a ball formed at a free end of a conductive wire held by a capillary to the electrode pad by means of the capillary to form the first raised portion;
- looping the conductive wire above the first raised portion to form a looped portion of the conductive wire by means of the capillary, the looped portion having a fixed end connected to the first raised portion and a free end connected to a portion of the conductive wire extending from the capillary;
- fixedly attaching the free end of the looped portion of the conductive wire to the first raised portion by means of the capillary; and
- cutting the conductive wire extending from the capillary at the free end of the looped portion whereby the second raised portion is formed by the looped portion.

5,090,120

PROCESS FOR FORMING SOLDER LANDS IN A PRINTED WIRING BOARD MANUFACTURING METHOD

Masuo Matsumoto, Saitama, Japan, assignor to Nippon CMK Corp., Japan

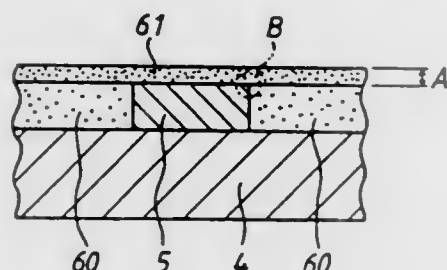
Filed Mar. 5, 1990, Ser. No. 488,632

Claims priority, application Japan, Mar. 3, 1989, 1-51594

Int. Cl.⁵ H05K 3/02

U.S. Cl. 29—846

6 Claims



1. In a process for forming solder lands in a printed wiring board manufacturing method, comprising the steps of forming a wiring circuit of a required pattern of a copper foil on an electrical insulating sheet and printing required solder resists on the wiring circuit, the improvement comprising preprinting

solder resist on the printed wiring board, before printing the required solder resists, for leveling the surface of the wiring circuit to provide a flat surface so that the step of printing required solder resists on the wiring circuit can be carried out at a lower printing pressure than would otherwise be possible.

5,090,121

APPARATUS AND METHOD FOR FABRICATING CIRCUIT PATTERN ON CONDUCTIVE SURFACE OF CIRCUIT BOARD

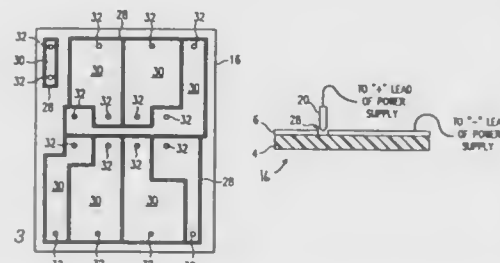
Ronald A. Gaddis, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 30, 1990, Ser. No. 603,607

Int. Cl.⁵ H05K 3/02; B23K 31/06

U.S. Cl. 29—847

11 Claims



1. A method for producing an electronic circuit comprising the steps of:

- disposing an electrode having an electrode tip in operative relationship with respect to a circuit board having a conductive surface provided thereon;
- imparting relative movement between said electrode and said circuit board for positioning the electrode tip of said electrode in contact with the conductive surface of said circuit board;
- applying voltage between said electrode and the conductive surface of the circuit board;
- drawing on the conductive surface of the circuit board with the electrode tip of said electrode in a plotting pattern while the electrode tip is disposed in contact with the conductive surface and voltage is applied between said electrode and the conductive surface of the circuit board; and
- removing conductive material from the conductive surface of said circuit board to produce a circuit pattern in the conductive surface of said circuit board corresponding to the plotting pattern when the electrode tip is in contact with the conductive surface and voltage is being applied between said electrode and the conductive surface of said circuit board.

5. Apparatus for producing a circuit pattern on a circuit board having a conductive surface provided thereon, said apparatus comprising:

- a plotting device adapted to receive the circuit board with the conductive surface thereof exposed for patterning;
- an electrode coupled to said plotting device and having an electrode tip adapted to be disposed in proximity to the conductive surface on the circuit board;
- said electrode being relatively movable in a direction substantially normal with respect to the circuit board as received by the plotting device for disposing the electrode tip thereof in contact with the conductive surface of the circuit board and for removing the electrode tip thereof from contact with the conductive surface of the circuit board;
- said electrode being further relatively movable with respect to the circuit board as received by the plotting device to enable the electrode tip of said electrode to undergo relative movement with respect to the circuit board in the plane of the conductive surface thereof;

means for applying voltage between said electrode and the conductive surface of the circuit board;

said plotting device drawing on the conductive surface of the circuit board via the electrode tip of said electrode in a plotting pattern by providing relative movement of said electrode with respect to the conductive surface of the circuit board when the electrode tip is disposed in contact with the conductive surface and said voltage-applying means is actuated to apply voltage between said electrode and the conductive surface of the circuit board; and

conductive material from the conductive surface of the circuit board being removed to produce a circuit pattern in the conductive surface of the circuit board corresponding to the plotting pattern when the electrode tip is in contact with the conductive surface and said voltage-applying means is actuated.

5,090,122

METHOD FOR MANUFACTURING A THREE-DIMENSIONAL CIRCUIT SUBSTRATE

Hiroji Kitagawa, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Japan

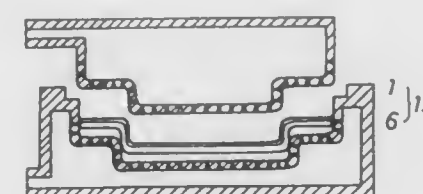
Filed Feb. 5, 1991, Ser. No. 651,277

Claims priority, application Japan, Jul. 24, 1990, 2-198352

Int. Cl.⁵ H01K 3/10

U.S. Cl. 29—852

9 Claims



1. A method of manufacturing a three-dimensional circuit substrate comprising the steps of:

- a) forming a conducting portion on a surface of a film member;
- b) placing the film member over a resin member with the conducting portion adjacent to the resin member;
- c) placing the film member and the resin member in a three-dimensional mold of the desired shape for the three-dimensional circuit substrate; and
- d) applying heat and air pressure simultaneously to the film member and the resin member to shape, overlap and heat-bond the film member and the resin member together as a three-dimensional circuit substrate.

5,090,123

METHOD OF FABRICATING A LEAD TERMINATION DEVICE

Jerome P. Hurtgen, Ft. Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 381,854, Jul. 19, 1989, Pat. No. 5,007,156, which is a division of Ser. No. 213,720, Jun. 30, 1988, Pat. No. 4,880,391. This application Feb. 7, 1991, Ser. No. 652,164

Int. Cl.⁵ H01R 43/04

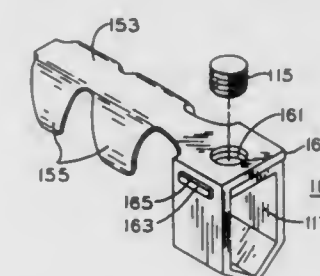
U.S. Cl. 29—882

13 Claims

1. A method of fabricating from a generally thin electrical conductive sheet material a lead termination device for connection with a winding lead of a dynamoelectric machine and a power lead therefor, the lead termination device including a generally flat body having a first generally elongate rectangular leg with a pair of generally opposite side edges interposed between a pair of generally opposite end edges, a pair of openings through the first leg and spaced adjacent the opposite end edges, respectively, a flange on one of the end edges extending therebeyond, a slot through the first leg interposed between the openings and spaced adjacent the other of the opposite end edges, a plurality of predeterminedly spaced apart embossed

lines in the first leg interposed between the openings and extending between the opposite side edges, respectively, and a second leg on the body integrally formed with one of the opposite said edges adjacent the other opposite end edge so as to extend generally perpendicularly with respect to the first leg, the second leg having a set of deformable tabs extending therefrom, the method comprising the steps of:

- bending the first leg generally at each embossed line therein;
- forming the first leg into a multi-sided closed loop in response to the bending step;
- overlying a pair of opposite end portions of the first leg located between the opposite end edges and respective ones of the embossed lines adjacent thereto during the forming step with the overlaid opposite end portions defining one of the sides of the multi-sided closed loop;



inserting the flange into the slot and abutting the one end edge with another of the sides of the multi-sided closed loop adjacent the one side thereof during the overlaying step;

aligning the openings with each other so as to extend through the one side of the multi-sided closed loop during the overlaying step; and

extending both a distal portion of the flange beyond the another side of the multi-sided closed loop and the other opposite end edge beyond a third side of the multi-sided closed loop adjacent the one side and opposite the another side thereof at least upon the occurrence of the abutting step.

5,090,124

RAZOR BLADE UNIT

Wolfgang Althaus, Wuppertal, Fed. Rep. of Germany, assignor to Wilkinson Sword Gesellschaft mit beschränkter Haftung, Solingen, Fed. Rep. of Germany

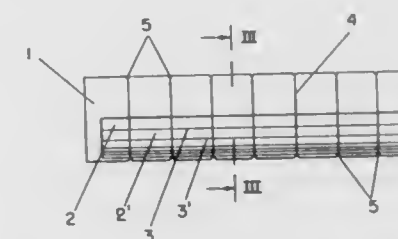
Continuation of Ser. No. 235,950, Aug. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 139,816, Dec. 30, 1987, Pat. No. 4,916,814. This application Feb. 19, 1991, Ser. No. 656,466

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 8711506[U]

Int. Cl.⁵ B26B 21/00

U.S. Cl. 30—50

6 Claims



1. A razor blade unit for a safety razor, the unit comprising: a support member having a contact surface for engaging the skin during shaving, the contact surface having a leading edge region and a trailing edge region;

at least one razor blade embedded in the support member

and having a cutting edge extending from the contact surface of the support member intermediate said leading and trailing edge regions, the leading and trailing edge regions as well as the cutting edge of the razor blade being oriented for simultaneous engagement with the skin during shaving; and

a plurality of spaced strands arranged along the contact surface and extending over the razor blade at an angle substantially perpendicular to the cutting edge, said strands covering spaced portions of the contact surface and the cutting edge of the razor blade and defining a plurality of uninterrupted exposure gaps on the contact surface that extend perpendicular to the cutting edge.

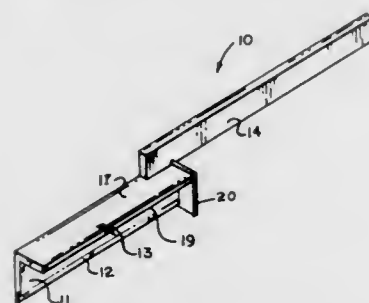
5,090,125 CUTTING TOOL

Donald J. Sogan, 305 Marlborough Turnpike, Portland, Conn. 06480

Filed Jun. 13, 1991, Ser. No. 714,558
Int. Cl.⁵ B26B 23/00; B27L 7/00

U.S. Cl. 30—308.1

5 Claims



1. A cutting tool, comprising in combination, a tool member including a planar blade member, the planar blade member including a blade member lower terminal edge, with a blade edge coextensively formed to the blade member lower terminal edge,

and the blade member including a blade member upper terminal edge, the blade member upper terminal edge including a force receiving blade plate orthogonally mounted to the blade member coextensively and integrally to the blade member upper terminal edge defining an "L" shaped configuration

and a blade handle fixedly mounted to a top surface of the blade plate, the blade handle extending rearwardly of the blade plate, with the blade handle including a blade handle exterior planar surface, and the blade member including a blade member exterior surface, wherein the blade handle exterior planar surface is coplanar with the blade member exterior surface,

and a guard plate member fixedly and orthogonally mounted to a rear terminal edge of the blade member, and fixedly mounted to a rear terminal edge of the blade plate, with the guard member extending below the blade edge, and the blade handle orthogonally oriented relative to the guard member.

5,090,126

ROTARY TOOL QUICK ACTING RETENTION DEVICE
Toney D. Higgins, Rte. 1, P.O. Box 64C, Erwin, Tenn. 37650
Filed Jul. 25, 1990, Ser. No. 556,990

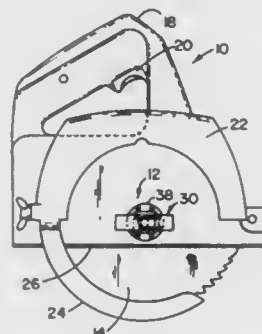
Int. Cl.⁵ B23D 45/16

U.S. Cl. 30—388

16 Claims

1. A motor driven rotary tool machine having a drive shaft, an outer end portion of said shaft having shoulder means thereon, tool means having substantially axially positioned mounting aperture means, and retention means for securely but

readily removably securing the tool means on said shaft tightly against said shoulder means, wherein said retention means comprises a threaded bore formed axially in the outer end of said shaft, bolt means mounted through said aperture means and having shank means threaded into said bore, stop means on an outer end portion of said bolt means spaced from said tool means, and substantially linearly slidable ramp means interposed between said tool means and said stop means and retentively forcing said tool means against said shoulder means, wherein said ramp means comprises a ramp block adapted for linear movement and having side wall means lying adjacent



opposite sides of said bolt means, a ramp surface on each of said side wall means and positioned adjacent the underside of said stop means on either side of said shank means and adapted to slide against and across said underside, each of said wall means having a substantially planar base surface adapted to slidably engage the outer surface of a rotary tool as said ramp block is moved generally linearly in a transverse direction with respect to the axis of said bolt means, the linear movement of said ramp block in one direction imparting generally axially directed force to said underside of said stop means and to said outer surface of said rotary tool.

5,090,127 SAFETY COMPASS

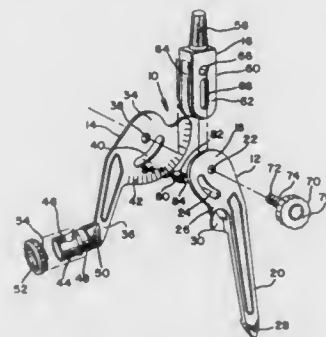
Bruce Shapiro, Northbrook, and Gunar Narubin, Chicago, both of Ill., assignors to Creative Works, L.P., Northbrook, Ill.

Filed Mar. 21, 1991, Ser. No. 672,962

Int. Cl.⁵ G01B 3/16

U.S. Cl. 33—27.02

5 Claims



1. A compass, comprising:

a first leg member having an upper end portion and a lower end portion, said upper end portion having a pivot opening and an arcuate slot formed therein, said lower end portion having a point formed therein;

a second leg member having an upper end portion and a lower end portion, said upper end portion having a pivot opening and an arcuate slot formed therein, said lower end portion having a substantially cylindrical portion having a bore formed therein for receipt of a drawing implement therethrough;

a handle member having an upper handle portion and a

lower clamping fork portion, said clamping fork portion defining a pair of spaced apart side leaves for receipt of the upper end portions of said first and second leg members therebetween, said leaves having horizontally aligned pivot openings formed therein and substantially vertical horizontally aligned elongated slots formed therein;

a pivot pin member extending through the pivot openings formed in said leaves and said leg members so as to permit the upper portions of said leg members to pivot with respect to one another;

a guide pin member that extends through and moves within the slots formed in said leg members;

and a retaining ring member received in a recess formed in said cylindrical portion extending about a portion of said bore, said retaining ring member having a cam surface associated therewith that cooperates with a cam surface of said recess to move said retaining ring member into clamping contact with said drawing implement as said cam surface associated with said retaining ring member is rotated against said cam surface of said recess.

5,090,128
DEVICE FOR MEASURING OR CONTROLLING
CHANGE OF LEVEL BETWEEN SEVERAL POINTS
Daniel Roux, Voreppe, France, assignor to Installation Européenne de Rayonnement Synchrotron (European Synchrotron Radiation Facility), Grenoble, France

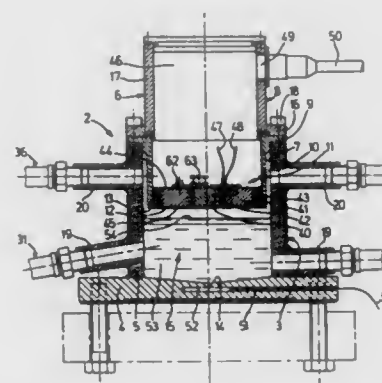
Filed Dec. 21, 1990, Ser. No. 631,849

Claims priority, application France, Dec. 21, 1989, 89 17003

Int. Cl.⁵ G01C 5/04, 9/22

U.S. Cl. 33—367

19 Claims



1. A device for measuring or controlling a change of a level between several points, comprising:

closed vessels placed respectively at each of said points, said vessels being partially filled with a liquid and being connected by liquid pipes at a lower portion to form a closed liquid circuit and connected by gas pipes at an upper portion to form a closed gas circuit;

a capacitive proximity sensor provided inside each closed vessel, each sensor has at least two electrodes which are spaced horizontally and concentrically, and a lower face of each electrode is placed above and at a distance from an upper surface of the liquid in the vessel and each sensor is adopted to provide a signal with respect to position in a vertical direction of a zone above the upper surface of the liquid in the vessel; and

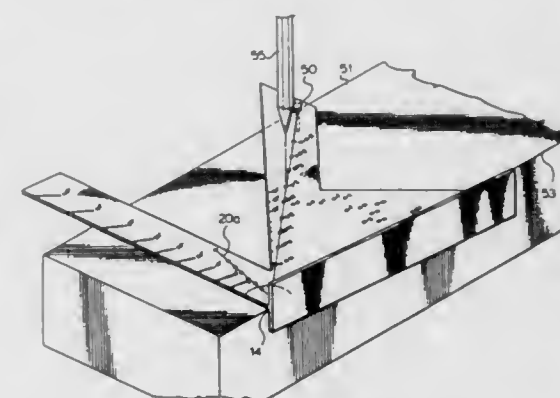
comparing means for comparing the signals provided by each said sensor to provide data with respect to the vertical position of each said vessel and about said points relative to one another or relative to a reference vertical position.

5,090,129
CARPENTER SQUARE
Philip J. Cunningham, 54 Edenmills, West Hill, Ontario, Canada

Filed Dec. 10, 1990, Ser. No. 624,617
Int. Cl.⁵ B43L 7/027

U.S. Cl. 33—481

12 Claims



1. A woodworking square comprising a planar body member having a straight aligning edge, a guide means associated with said straight aligning edge and extending perpendicularly from said planar body and positioned to be colinear with said aligning edge, a straight first scribing edge perpendicular to said aligning edge and a second straight scribing edge disposed between said first scribing edge and said aligning edge and said first edge, and wherein said second scribing edge intersects the junction point of said aligning edge and said scribing edge and wherein said planar body member includes a number of small apertures passing there through and said square includes a pin means sized to snugly pass through any of said apertures and orientate said square in a particular manner relative to a straight edge of a piece of material in contact with said pin means and a reference point on said guide means.

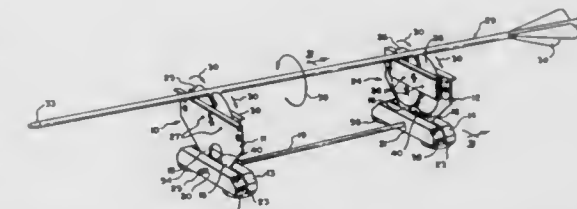
5,090,130
APPARATUS FOR TESTING THE TRUENESS OF
ARCHERY ARROWS

William V. Gudausky, Jr., 22253 Chestnutridge Rd., Kildeer, Ill. 60047

Filed Mar. 11, 1991, Ser. No. 667,539
Int. Cl.⁵ G01B 5/25

U.S. Cl. 33—533

8 Claims



1. An archery arrow testing apparatus comprising a pair of upright flat stands, a pair of pedestals, the stands each having a pair of spaced apart thin flat upright legs, vertically extending slots in said pedestals sized to receive and support said thin flat upright legs when said legs are engaged in said slots, a rod, horizontally extending holes in said pedestals with opposite ends of said rod engaged in said holes connecting said pedestals together in a supported upright position, pairs of revolving thin metal discs, and means mounting said pairs of said discs on each of said stands with said discs being rotatable relative to said pedestals enabling an archery arrow to be spun in circumferential motion.

ferential orbit on said discs for human eye scrutiny to ascertain trueness of an orbiting archery arrow.

5,090,131

POSITION DETERMINING APPARATUS

Daniel J. Deer, Chepstow, United Kingdom, assignor to Renishaw plc, Gloucestershire, England

PCT No. PCT/GB90/00629, § 371 Date Dec. 5, 1990, § 102(e)
Date Dec. 5, 1990, PCT Pub. No. WO90/12998, PCT Pub.
Date Nov. 1, 1990

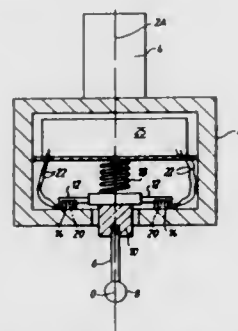
PCT Filed Apr. 24, 1990, Ser. No. 623,457

Claims priority, application United Kingdom, Apr. 25, 1989,
8909357

Int. Cl.⁵ G01B 7/00, 7/28

U.S. Cl. 33—556

12 Claims



1. Apparatus including a movable member supported on a fixed member for movement into and out of a rest position defined by support means on said fixed member, said support means including first seating elements which are arranged to confront corresponding second seating elements provided on the movable member, characterized by measuring devices positioned on at least one of said first and second seating elements, each measuring device being capable of providing a signal indicative of the strain on its respective seating elements, and means for determining from said signals the displacements in all directions of the moveable member caused by a change in the force applied by the movable member to the fixed member.

5,090,132

METHOD AND APPARATUS FOR FREEZE DRYING
Masakazu Kobayashi, and Konomi Harashima, both of Tokyo,
Japan, assignors to Kyowa Vacuum Engineering, Ltd., Tokyo,
Japan

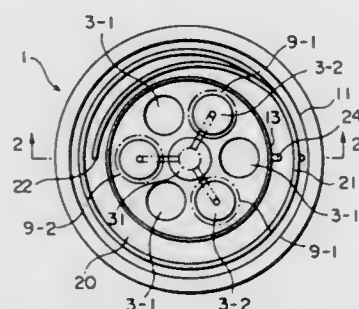
Filed May 9, 1990, Ser. No. 521,309

Claims priority, application Japan, May 12, 1989, 1-119559

Int. Cl.⁵ F26B 5/06

U.S. Cl. 34—5

7 Claims



1. A freeze drying apparatus having: a drying chamber including an upright cylindrical heat-transfer medium container having heat-transfer medium inlet/outlet pipes, a plurality of upright tubes extending through said container from a lower plate to an upper plate, a lower space formed beneath the lower plate of said heat-transfer medium container and

being in communication with the interior of said tubes and a product liquid inlet/outlet conduit, an openable bottom lid defining the bottom of said lower space, an upper space formed above said upper plate of said heat transfer medium container and being in communication with the interior of said tubes, and a trap chamber provided with a pressure regulation valve and being in communication with said upper space, wherein pressure regulation lid means is engageably provided to the upper end of said tubes to airtightly close the upper end, said tubes include one tube set not be covered with said pressure regulation lid means and another tube set to be covered with said pressure regulation lid means, and a pressure regulation conduit is provided which has a pressure regulation valve adapted to regulate pressure in the other tube set covered with said pressure regulation lid means independently of pressure in said one tube set.

5,090,133

STEAM SHOWER APPARATUS AND METHOD OF USING SAME

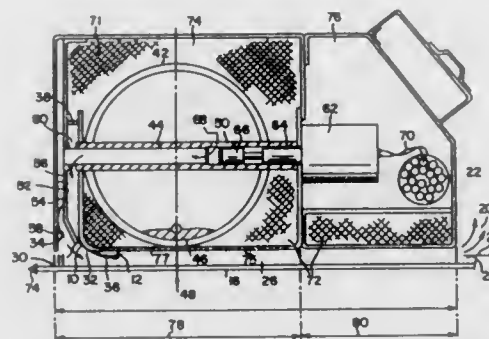
Bruce F. Taylor, San Jose, Calif., assignor to Thermo Electron Web Systems, Inc., Auburn, Mass.

Filed Aug. 23, 1989, Ser. No. 397,712

Int. Cl.⁵ F26B 13/02

U.S. Cl. 34—23

32 Claims



1. An apparatus for applying a flow of steam to a sheet for the purpose of heating the sheet which runs adjacent a surface of the apparatus, the apparatus comprising:
means for creating a supply of steam and means for housing the supply of steam in said apparatus, said means for housing the supply of steam including a bottom surface to which the sheet runs adjacent;
a Coanda nozzle positioned within the apparatus to cause a flow of steam to run between said sheet and the adjacent surface of said apparatus, said flow of steam traveling in a direction opposite to the direction of travel of the sheet;
means to provide steam from said supply to said Coanda nozzle; and
means for heating the bottom surface of the means for housing the supply of steam in said apparatus.

5,090,134

METHOD AND APPARATUS FOR CONTINUOUSLY CRYSTALLIZING POLYESTER MATERIAL

Hans Rüsse Meyer, Schwülper OT Walle; Manfred Kerl; Hans-Joachim Schmidt, both of Braunschweig, all of Fed. Rep. of Germany; Beat Häni, Zuzwil, and Werner Kägi, Niederuzwil, both of Switzerland, assignors to Bühler AG, Uzwil, Switzerland and Bühler GmbH, Braunschweig, Fed. Rep. of Germany

Filed Dec. 22, 1989, Ser. No. 456,107

Claims priority, application Switzerland, Dec. 23, 1988,
04796/88

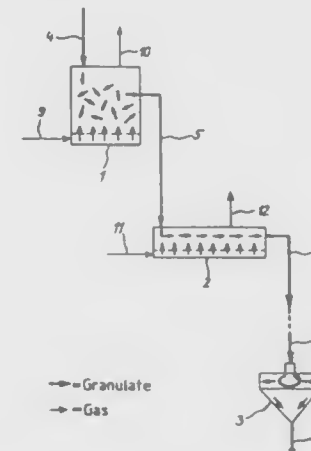
Int. Cl.⁵ F26B 17/00

U.S. Cl. 34—57 R

24 Claims

1. An apparatus for continuously crystallizing particulate polyester material, the apparatus comprising:
a first fluidized bed to impart a first end temperature to said

particulate material, said first fluidized bed having a first predetermined length and including first barrage means of a first height to ensure a layer of fluidized material at said first height, the first length being in proportion to said first height and giving a first coefficient, said first fluidized bed being formed as a whirling bed including a first zone of high gas energy of flow for conveying said particulate material upwardly, and a downwardly inclined surface providing a second zone of reduced gas energy of flow to enable said material to whirl downwardly, so as to provide a mixing characteristic of said first fluidized bed; and a second fluidized bed to impart a second end temperature to said material;



each fluidized bed having an input and an output for said material;
said second fluidized bed having a second predetermined length and including second barrage means of a second height to ensure a layer of fluidized material at said second height, there being a second length in proportion to said second height in said second fluidized bed giving a second coefficient, said second fluidized bed having a plug flow characteristic wherein said particulate material forms a fluidized layer which moves substantially uniformly from its input to its output.

5,090,135

DEVICE FOR REMOVAL OF CONDENSATE FROM A STEAM-HEATED DRYING CYLINDER

Robert Wolf, and Karl Steiner, both of Herbrechtingen, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 732,822

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 4023871

Int. Cl.⁵ F26B 13/08

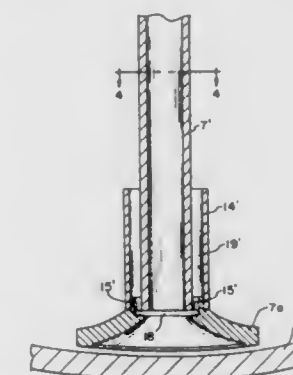
U.S. Cl. 34—124

5 Claims

1. A device for the removal of condensate from a steam-heated rotatable drying cylinder, said drying cylinder having an axis of rotation and further having an outer shell, said outer shell having an inside surface, said device comprising:

a condensate suction pipe rotatable with said drying cylinder and extending generally from said drying cylinder axis of rotation toward said inside surface of the shell, said condensate suction pipe having a radially inner portion and a radially outer portion relative to said axis of the drying cylinder, said radially outer portion terminating in a suction opening for receiving condensate mixed with steam from the interior of said drying cylinder; and
an outside pipe surrounding at least part of the exterior of said radially outer portion of the condensate suction pipe, said outside pipe being situated so that an annular channel is defined by said outside pipe and said radially outer

portion, said annular channel comprising a steam blowing line wherein said steam blowing line originates from the



interior of said drying cylinder and empties generally at said suction opening of the suction pipe.

5,090,136

PAINT BOOTH THERMAL RECLAMATION SYSTEM FOR SPACE HEATING

Thomas C. Hunt, 6045 S. Meridian St., Indianapolis, Ind. 46227,
and Ronald W. Harris, 3300 Hollywood Ave., Terre Haute,
Ind. 47805

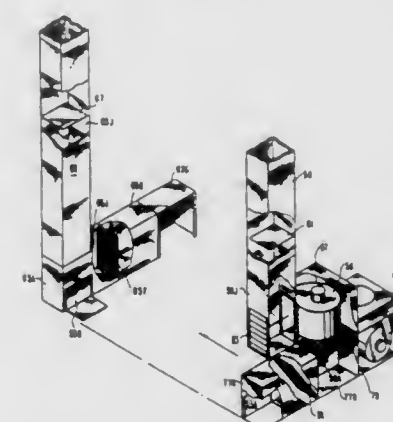
Division of Ser. No. 299,126, Jan. 23, 1989, Pat. No. 4,981,263.

This application Dec. 27, 1990, Ser. No. 635,707

Int. Cl.⁵ B05C 15/00

U.S. Cl. 34—218

6 Claims



1. A paint spraying and baking booth system comprising:
an enclosure with doors to admit a vehicle to the interior and flooring to support the vehicle;
a blower having an inlet and having an outlet supplying air to the interior of the enclosure;
an opening in the flooring;
booth air outlet ductwork extending from said opening to the exterior of the enclosure at a level below the level of the flooring and having an outlet opening at the level of the flooring;
intake ductwork from said outlet opening to said blower;
fresh air intake ductwork coupled to said intake ductwork;
first valve means at said outlet opening to selectively open and close said opening to permit air from said booth air outlet to be supplied to and taken by said blower and re-supplied to said enclosure when said valve means is open, and permit fresh air to be supplied to and taken by said blower and supplied to said enclosure when said valve means is closed; and
second valve means in said fresh air intake ductwork and closable when said first valve means is open to substan-

tially preclude supply of fresh air to said blower to impose recirculation of air through said enclosure.

5,090,137

PERIMETER SEAL FOR SPLIT ENCLOSURE DRYING HOODS

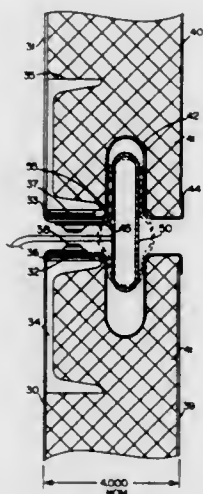
Steve J. Zagar, Green Bay, Wis., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jan. 16, 1990, Ser. No. 464,795

Int. Cl.⁵ F26B 25/00

U.S. Cl. 34—242

7 Claims



1. A dryer enclosure comprising an upper hood and a lower hood, said upper and lower hoods being retractable with respect to each other at at least one separation joint partially defined by bellows having an upper hood portion and a lower hood portion, sealing means comprising a gasket positioned in said separation joint for sealing said separation joint by substantially conforming to the perimeter interface of said bellows upper hood portion and said bellows lower hood portion to form a double contact seal.

5,090,138

SPRING SHOE DEVICE

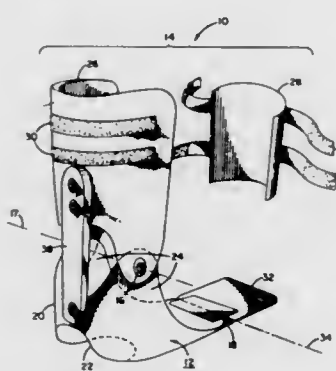
Robert Borden, 20 Cottage St., Wellesley, Mass. 02181

Filed Jun. 11, 1990, Ser. No. 535,669

Int. Cl.⁵ A43B 7/32; A61H 1/00; A63B 21/00

U.S. Cl. 36—102

25 Claims



1. An athletic shoe for aiding the extension of a user's foot such as at the end of a stride and for retarding the retraction of the user's foot such as upon ground impact, said shoe having an inner lining-insole portion for receiving said foot and a lower portion of the leg, said shoe comprising:

- a) a flexible outer covering member;
- b) a flexible sole attached to said outer covering member; and
- c) a spring device disposed between said inner portion and said outer covering member, said spring device being operatively connected both to said sole and to said inner portion adjacent to the lower portion of the user's leg, said device comprising:
 - (i) a shin socket member having a hinge defining a hinge axis, said shin socket member being dimensioned to be disposed against said lower leg portion;
 - (ii) means for anchoring said shin socket member to said lower leg portion;
 - (iii) a heel socket member dimensioned to be disposed about the heel of the foot and pivotally connected to said hinge and being pivotable about said hinge axis in a first extension direction wherein said heel socket member is rotated relative to said shin socket member in the user's foot extension direction and in a second retraction direction wherein said heel socket member is rotated relative to said shin socket member in the user's foot retraction direction; and
 - (iv) resilient means attached between said shin socket member and said heel socket member for pivotably urging the heel socket member in said first extension direction.

5,090,139

SKI BOOT WITH A HEIGHT-ADJUSTABLE FOOT-BED

Andreas Germann, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland

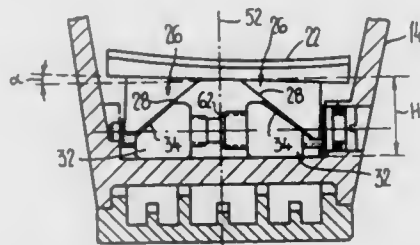
Filed Aug. 16, 1990, Ser. No. 568,250

Claims priority, application Switzerland, Aug. 18, 1989, 03019/89

Int. Cl.⁵ A43B 5/04

U.S. Cl. 36—117

15 Claims



1. A ski boot with a height-adjustable foot-bed, comprising:
- a boot body including a shaft and a sole;
 - a foot-bed; and
 - a foot-bed support means; wherein said foot-bed is arranged within the boot body to bear in a heel area thereof against said support means,
- said support means comprising camming means displaceable within the boot body by displacement means operable from outside the boot body for adjustment of the height of the foot-bed,
- said camming means comprising a first and a second support element, the two support elements mutually offset and displaceable in a direction transverse to a longitudinal direction of the boot body, each support element having a camming surface which cooperates with a corresponding camming surface attached to said foot-bed, at least one of each camming surface of the camming means and each camming surface attached to the foot-bed comprising an inclined surface attached to the boot-bed comprising an inclined surface inclined in a direction of displacement of the support elements;
- wherein the support members can be adjusted into an asymmetrical position in relation to the longitudinal center

plane of the boot for providing transverse inclination to the foot-bed.

5,090,140

FOOTWEAR WITH INTEGRATED COUNTERPOCKET SHOE HORN

Scott C. Sessa, Grand Rapids, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.

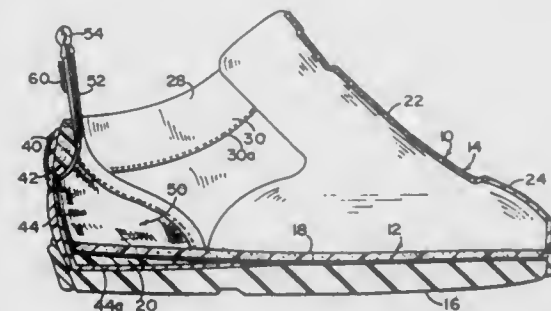
Continuation of Ser. No. 398,881, Aug. 28, 1989. This

application Nov. 15, 1990, Ser. No. 613,300

Int. Cl.⁵ A43B 11/02, 11/00

U.S. Cl. 36—138

12 Claims



1. A shoe having a heel portion and an integral pull-on shoe horn comprising:
- a sole assembly including at least an outsole and an insole extending beneath said shoe heel portion;
 - an upper attached to said sole assembly;
 - said upper having a foot entry opening defined by a peripheral rim;
 - said heel portion including quarters;
 - a semirigid, generally horseshoe-shaped heel counter inwardly of said quarters and extending adjacent said quarters above said sole assembly;
 - a counterpocket inwardly of said counter such that said counter is located between said quarters and said counterpocket, said counterpocket comprising a flexible membrane extending from side to side beneath said heel portion of said insole, and extending up the rear and both sides of said shoe heel portion and forming a heel pocket on both sides of and across the bottom of said heel portion, said membrane tending to temporarily rigidify under pulling tension to form a shoe horn, and having an elongated tab portion extending up beyond said peripheral rim;
 - said tab portion being foldable from an upwardly extending position to a lowered position down over the rear of said rim;
 - a gripping surface on the forward face of said tab portion when said tab portion is up so that pulling on said tab portion pulls on said counterpocket to enable said membrane to serve as a shoe horn as well as a pull-on aid;
 - a hook and loop type fastener material on the forward face of said tab portion when said tab portion is folded down; and
 - a cooperative hook and loop type fastener material at the rear of said shoe to engage and hold said folded down tab portion.

5,090,141

ADJUSTABLE BLADE HOLDER

Ronald H. Hall, 161 Argyle Street, Embro, Ontario, Canada N0J 1J0

Filed Oct. 24, 1990, Ser. No. 602,774

Int. Cl.⁵ A01B 3/64; E02F 5/02

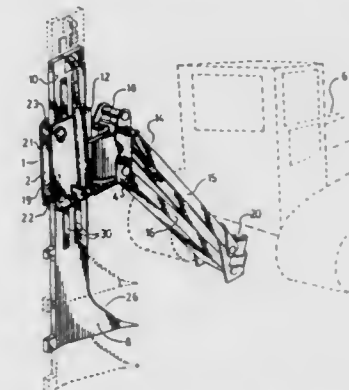
U.S. Cl. 37—98

6 Claims

1. Trenching apparatus comprising:
- a blade holder having a generally vertical channel defined therein;

support means for carrying said blade holder behind a vehicle at a height above the ground;

- a trenching blade for dragging through the ground behind said vehicle, said blade having a shank portion extending upwardly therefrom into said channel and slidably engaging in said channel for vertical movement therewithin, whereby the depth of said blade may be varied;
- actuation means connected between said blade holder and said blade shank for varying the position of said blade



shank within said blade holder and thereby varying the depth of said blade;

wherein said channel in said blade holder is defined by two generally vertical parallel plates facing each other and spaced apart at a forward aspect thereof by a rail member having a V-shaped notch therein corresponding to a V-shaped leading edge of said trenching blade, and by at least two spaced apart pin members at a rearward aspect thereof.

5,090,142

SNOWBLOWER AND LAWNMOWER APPARATUS

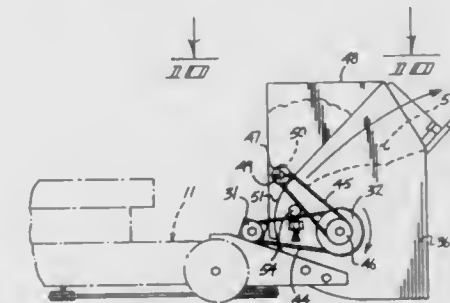
Kerry M. Peters, 8909 Yankee Clipper, Cherry Valley, Ill. 61016

Filed Aug. 28, 1991, Ser. No. 751,134

Int. Cl.⁵ E01H 5/09

U.S. Cl. 37—243

5 Claims



1. A snowblower and lawnmower apparatus for mounting to a lawnmower, wherein the lawnmower includes a lawnmower deck, the lawnmower deck mounting a lawnmower engine on the deck, with the lawnmower engine including a vertical output first shaft directed orthogonally through the deck, with the first shaft projecting below the deck, and the lawnmower deck including a perimeter skirt extending downwardly from the deck, wherein the skirt includes skirt respective right and left skirt side walls and a skirt forward wall, wherein the respective right and left skirt side walls include respective right and left wheels rotatably mounted to the respective right and left skirt side walls adjacent the skirt forward wall, wherein respective right and left skirt side walls include respective right and left wheel axles orthogonally directed into the respective right and left skirt side walls, wherein the right and left

wheel axles are coaxially aligned relative to one another, and

a drive pulley mounted at a lower terminal end of the first shaft, and

a respective right and left axle plate mounted to the respective right and left wheel axle, wherein the right and left axle plates are arranged in a parallel relationship and extend forwardly of the skirt forward wall, and

the axle plate includes a central housing integrally and orthogonally mounted between the right and left axle plates, wherein the central housing includes a second shaft arranged parallel to the first shaft extending orthogonally through the central housing and positioned below the central housing, wherein the second shaft includes a first driven pulley mounted at a lower terminal end of the second shaft, the first driven pulley and the drive pulley including a first continuous drive belt extending about the drive pulley and the first driven pulley, and

a gear drive housing mounted fixedly and orthogonally to a top surface of the central housing, with the second shaft extending through the gear drive housing, the second shaft including a first bevel gear mounted to an upper terminal end of the second shaft, and

a second bevel gear in operative association with the first bevel gear mounted within the gear drive housing, with the second bevel gear including a third shaft oriented orthogonally relative to the second shaft, with the third shaft extending parallel to and above the central housing and extending through the right axle plate, and

a third shaft including a second driven pulley mounted to a distal end of the second shaft exteriorly of the right axle plate, and

an impeller blade housing mounted forwardly of the central housing and extending fixedly and orthogonally between the right and left axle plate, and

a third driven pulley fixedly secured to an outer distal end of a fourth shaft, wherein the fourth shaft is arranged parallel to the third shaft, and the impeller blade housing including an impeller housing right side wall and impeller housing left side wall, wherein the fourth shaft extends orthogonally through the impeller housing right side wall and the impeller housing left side wall, with the third driven pulley positioned exteriorly of the impeller housing right side wall and aligned with the second driven pulley, and including a second continuous belt directed about the second driven pulley and the third driven pulley, and the fourth shaft including a plurality of impeller blades mounted fixedly to the impeller shaft, with the impeller housing including a forward wall, with the forward wall including an entrance opening aligned with the impeller blades, and

an exit conduit positioned above the impeller blades, with the exit conduit directed into an exit opening positioned above the entrance opening, wherein the impeller blades receive snow through the entrance opening and project the snow through the exit opening through the exit conduit, and a granular receiving hopper mounted to the impeller housing above the exit conduit, and the granular receiving hopper including a hopper exit slot formed at a lower end portion of the granular receiving hopper, wherein the hopper exit slot is in communication with the exit conduit, and the hopper exit slot includes a hopper impeller shaft mounted coextensively and above the hopper exit slot, the hopper impeller shaft including a plurality of hopper impeller shaft blades mounted coextensively to the impeller shaft, and the hopper impeller shaft directed laterally through the granular receiving hopper and including a fifth driven pulley mounted to an outer distal end of the hopper impeller shaft, and a fourth driven pulley mounted coaxially and forwardly of the third driven pulley, including a third continuous belt directed between the fifth driven pulley and the fourth driven pulley, wherein rotation of the fifth driven pulley effects rotation of the hopper impeller shaft and the hopper impeller shaft blades to project granular material

into the exit conduit into association with snow directed through the exit conduit.

5,090,143

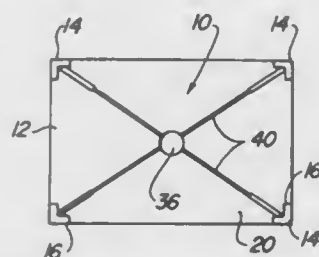
POSTER HANGING DEVICE

R. Clark Schler, 1F Quiet Stream Ct., Timonium, Md. 21093, and Sylvia A. Bethea, 341 E. Washington, Howell, Mich. 48843

Filed Feb. 22, 1988, Ser. No. 158,799
Int. Cl.³ G09F 1/12

U.S. Cl. 40—152.1

8 Claims



1. A device for mounting a flexible sheet, said flexible sheet having at least three spaced apart corners, said apparatus comprising:

a center support,

a plurality of corner pieces, each corner piece having a recess,

means for securing one corner piece to each corner of the sheet so that each corner piece is immovable with respect to its associated corner of the flexible sheet and so that the recess on each corner piece faces towards a center of the flexible sheet,

a plurality of elongated struts, said struts being separate from and unattached to said corner pieces,

means for attaching on end of each strut to said center support,

wherein the other end of each strut rests within the recess of one of said corner pieces, and

wherein said struts are dimensioned so that said struts exert an outward force on said corner pieces to thereby maintain the flexible sheet in a flat condition,

wherein each strut comprises means for adjusting the longitudinal length of said strut,

wherein each strut comprises:

an elongated tube,

an elongated rod, said rod being telescopically received in said tube, and

means for locking said rod to said tube at a user selected position,

wherein said locking means comprises a resilient ring disposed around said rod and abutting against one end of said tube, said ring being dimensioned so that it compressibly and frictionally engages said rod.

5,090,144

CRYSTAL BALL HAVING SWING DOLL WITH COLOR CHANGEABLE EYES

J. H. Liu, No. 3, alley 202, Kao-Fon Rd., Hsin-Chu City, Taiwan

Filed Aug. 7, 1990, Ser. No. 563,625
Int. Cl.³ G09F 19/02

U.S. Cl. 40—410

15 Claims

5. A crystal ball comprising

a transparent hollow ball having an open bottom;

a base on which said ball is mounted;

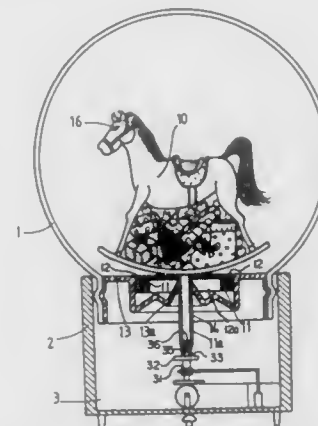
a figurine within said ball;

resilient means having a central orifice and sealingly mounted on said open bottom of said ball so as to provide a fluid tight seal, said resilient means having a top side facing said ball and an opposite, bottom side;

an elongated dancer shaft having an upper portion extending

upwardly through said central orifice, said figurine mounted thereon, and a lower portion extending downwardly into said base;

a swing plate mounted on said shaft above said resilient means;



a fixed plate mounted above said resilient means having a slot therein for pivotally mounting said swing plate;

a reciprocating means for reciprocating said dancer shaft;

and means for providing power to said reciprocating means.

5,090,145

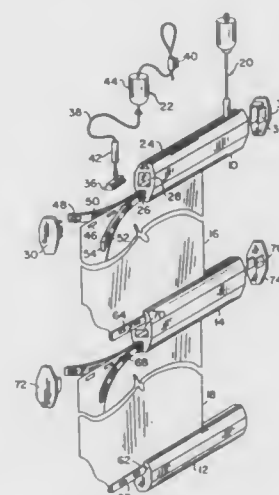
PHOTO-HANGING AND DISPLAY APPARATUS

Sai M. Chiang, 1755 Filbert, Apt. #10, San Francisco, Calif. 94123, and Don Newman, 419 Rices Mill Rd., Wyncote, Pa. 19095

Continuation-in-part of Ser. No. 163,438, Mar. 3, 1988, abandoned. This application Feb. 3, 1989, Ser. No. 306,432
Int. Cl.³ G09F 7/00

U.S. Cl. 40—605

23 Claims



1. A hanger assembly for hanging a sheet of material comprising: an elongated upper rod, the upper rod having a first slot formed in a lower portion thereof and extending along substantially its entire length, said first slot having a transverse internal width wider than the width at its opening; mating means formed in an upper portion of the upper rod means, said mating means adapted to receive means for hanging said upper rod; an elongated lower rod means having a second slot formed in its upper surface and extending substantially along its entire length, said second slot having a transverse internal width greater than the width at its opening and having dimensions substantially the same as those of the first slot; and strip means having a first portion and a second portion adapted for releasable engagement with one another on opposite sides of

the sheet of material and to engage an edge of the sheet, said strip means having a generally rectangular cross-section upon engagement between the first and second portions, the first and second slots adapted to conform and support the strip means, said sheet being thereby attached to and extending between said first and second rods.

5,090,146

REPOSITIONABLE SIGN FIGURES

Dennis L. Sandefur, 3107 S. Meridian St., Indianapolis, Ind. 46217

Continuation of Ser. No. 188,847, May 2, 1988, abandoned. This application Aug. 6, 1991, Ser. No. 742,062
Int. Cl.³ G09F 7/02

U.S. Cl. 40—618

15 Claims



1. A repositionable sign figure which may be adhesively attached to a sign backboard comprising:

a sign figure comprised of a flexible, resilient material;

the sign figure having front and back sides;

peripheral edges of said sign figure having backwardly projecting flanges whereby said flanges normally cause said front surface to be spaced from a sign backboard when the sign figure is placed on said sign backboard;

adhesive disposed on the back side of said sign figure between the peripheral edges of the sign figure, the adhesive being thinner than the height of the flanges such that the sign figure is not affixed to a sign backboard prior to the front surface of the sign figure being depressed;

whereby a portion of the front surface between the peripheral edges of said sign figure may be depressed to adhesively affixed said sign figure to said sign backboard.

5,090,147

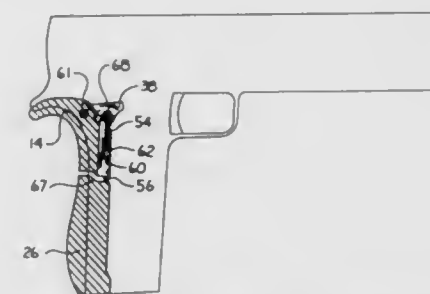
SELF-ENGAGING SAFETY

Walter Pastor, 1100 NE. 182nd St., No. Miami Beach, Fla. 33162

Filed Feb. 21, 1991, Ser. No. 658,515
Int. Cl.³ F41A 17/28

U.S. Cl. 42—70.05

17 Claims



1. A self-engaging tertiary safety for a handgun having a hammer releasable by a sear, said handgun also having a grip, thumb safety and a grip safety, said thumb safety having a cam attached thereto, said cam immobilizing a sear when said thumb safety is placed in an active position thereby preventing the hammer of said handgun from falling, said grip safety

having a slot extending along the forwardmost edge of said grip safety, said handgun also having a grip member located below said grip safety in said grip of said handgun, said tertiary safety comprising:

- a) an elongated pin having an upper and a lower end, said pin extending from a grip member aperture, said grip member aperture extending downward into said grip member from the upper surface of said grip member, said pin extending upward from said grip member aperture through a grip safety aperture in the lowermost edge of said grip safety thereby connecting said lowermost edge with said slot, said pin extending through said slot to a point above said grip safety; and,
- b) means for moving said upper end of said pin from a position below said cam to a position forward of said cam in response to forward movement of said grip safety whereby said upper end of said pin prevents said cam from moving to a position to allow said sear to allow said hammer to fall, said cam prevented from moving downward by physical contact between said upper end of said pin and said cam when said grip safety is in a position below said cam and whereby said upper end of said pin is moved forward of said cam in response to forward movement of said grip safety, thereby permitting said cam to move to a position to allow said sear to allow said hammer to fall, said cam moving to a position to allow said sear to allow said hammer to fall in response to downward movement of said thumb safety.

5,090,148

FIREARM SAFETY MECHANISM

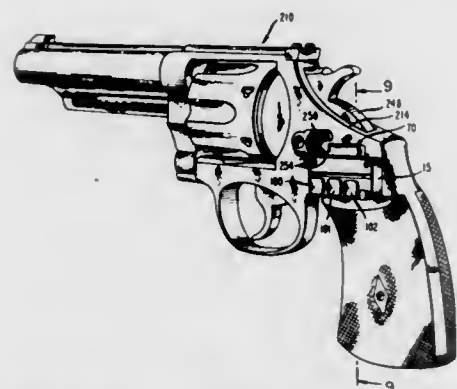
Frank Brooks, Jupiter, Fla., assignor to Saf T. Lok. Corporation, West Palm Beach, Fla.

Continuation-in-part of Ser. No. 202,988, Jun. 6, 1988, Pat. No. 4,987,693. This application Jul. 20, 1990, Ser. No. 556,016

Int. Cl.⁵ F41A 17/04

U.S. Cl. 42—70.11

12 Claims



1. A firearm safety lock, comprising: an engagement portion moveable between a locked position in which the engagement portion operatively engages a moveable portion of the firing mechanism to prevent discharge of the firearm, and an unlocked position permitting operation of the firearm; a moveable lock member operatively connected to the engagement portion and having at least one protrusion; at least one rotatable ratchet wheel having a plurality of ratchet teeth and at least one channel adapted to receive said protrusion when said ratchet wheel is related to align said channel with said protrusion; a push button adjacent to each ratchet wheel, said push button being adapted for movement substantially parallel to the axis of rotation of said ratchet wheel; at least one ratchet actuator positioned substantially adjacent to said ratchet teeth of said ratchet wheel, substantially axial movement of said push button being adapted to move said ratchet actuator so as to rotate said ratchet

wheel, whereby depression of said push button a predetermined number of times will rotate said ratchet wheel so as to align said channel with said protrusion, said alignment permitting insertion of said protrusion into said channel, and thereby movement of said engagement portion from said locked position to said unlocked position.

5,090,149

DECORATED PIPE FOR FISHING ROD AND METHOD FOR MAKING SAME

Young Muk Kim, 512-1 Gamcheon-dong, Sana-ku, Pusan, Rep. of Korea

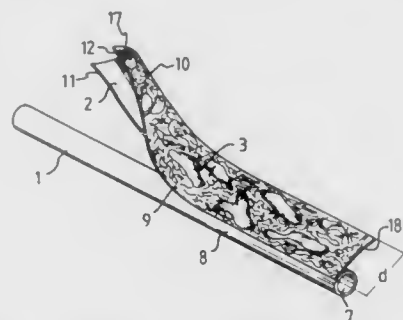
Filed May 25, 1990, Ser. No. 528,601

Claims priority, application Rep. of Korea, Jul. 4, 1989, 89-9844

Int. Cl.⁵ A01K 87/00

U.S. Cl. 43—18.1

19 Claims



1. A pipe for a fishing rod comprising a tubular rod having an inner surface and an outer surface, and a flexible rectangular wrapper positioned about the outer surface of the pipe with a predetermined design thereon and covered with a transparent preservative coating, wherein the wrapper comprises woven fibers with a predetermined design thereon.

5,090,150

FISHING ROD WITH INTERCHANGEABLE LINE GUIDES, AND THE METHOD OF EMBODYING SUCH A ROD

Luca Pirazzini, Bologna, Italy, assignor to Reglass S.p.A., Bologna, Italy

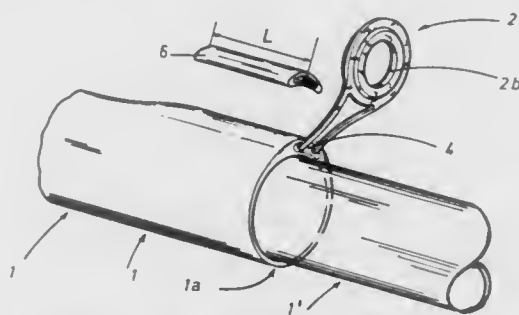
Filed Jun. 22, 1990, Ser. No. 543,681

Claims priority, application Italy, Jul. 21, 1989, 3562 A/89

Int. Cl.⁵ A01K 87/04

U.S. Cl. 43—24

6 Claims



1. A fishing rod with interchangeable line guides, comprising: a plurality of tapered tubular elements exhibiting dissimilar end diameters and insertable thus one element into the next; a plurality of line guides numbering at least one to each tubular element and disposed substantially perpendicular to the longitudinal dimension of the tubular element, each comprising a circular ring and a fixing shank disposed

substantially at right angles to the plane defined by the circular ring;

- a plurality of tubular inserts open at one end, incorporated one at least into each tubular element between the relative external and internal surfaces in such a way that its open end coincides with the frontal surface of the smaller diameter end of the element, and affording sockets to accommodate the shanks of respective line guides;
- fixing means designed to invest the shank and the tubular insert and ensure a stable association of the one with the other.

5,090,151

FISHING LURE WITH RELEASABLE HOOK

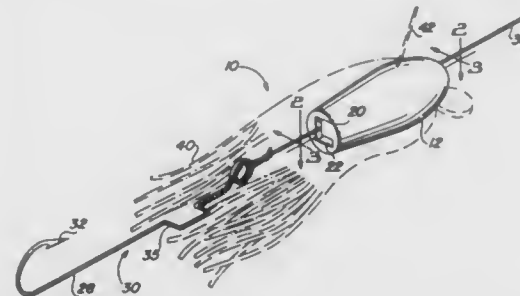
Gary Salminen, 2319 E. Laurel St., Mesa, Ariz. 85213

Filed Jun. 14, 1991, Ser. No. 715,627

Int. Cl.⁵ A01K 85/00

U.S. Cl. 43—42.05

7 Claims



1. A fishing lure comprising:

- (a) a body having a top, bottom, front and rear surfaces, said body defining an interior recess intercepting one of said top or front surfaces and extending to said bottom surface;
- (b) a hook frame releasably engageable in said recess, said hook frame having attachment means for attachment to a fishing line and opposed surfaces diverging from said attachment means and releasably engageable in said recess, said hook frame adapted for the attachment of at least one hook; and
- (c) wherein said hook frame consists of a wire member with spring-like characteristics and wherein said surfaces are formed on first and second leg members diverging from said attachment means.

5,090,152

RODENT BARRIER FOR PIPES

Rolf Ling, Gustavsberg, Sweden, assignor to Aktiebolaget Gustavsberg, Gustavsberg, Sweden

Filed Oct. 10, 1990, Ser. No. 585,077

Claims priority, application Sweden, Apr. 12, 1988, 8801346-1

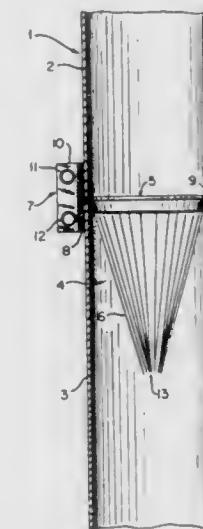
Int. Cl.⁵ A01M 23/00; E03F 7/06

U.S. Cl. 43—64

5 Claims

1. An arrangement in vertical sewage system pipes for preventing rodents from entering building structures through said sewage systems, the arrangement comprising a frame (5) which is L-shaped in cross-section, the frame (5) having an outwardly extending flange (5') sealingly inserted in a joint between two mutually adjacent pipe sections (2, 3), the frame (5) further comprising an axially extending flange (5'') having therefrom extending a plurality of springing wires or rods, forming a wire cone (6) which tapers in the direction of sewage flow, the springing wires or rods in said cone (6) terminating at the apex

of said cone in near touching relationship, and the wires or rods being made of stainless steel and having a wire gauge of



from 0.7 to 2.5 mm or being made of fiber glass having a wire gauge of from 0.8 to 2.0 mm.

5,090,153

INSECT MONITORING SYSTEM

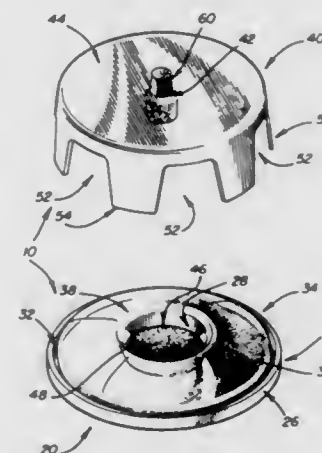
Michael A. Mullen; Henry A. Highland, both of Savannah, Ga.; Robert E. Taggart, Monterey, and Bill W. Lingren, Salinas, both of Calif., assignors to Trece, Inc., Salinas, Calif. and The United States of America as represented by the United States Department of Agriculture, Washington, D.C.

Filed Feb. 25, 1991, Ser. No. 660,668

Int. Cl.⁵ A01M 1/14, 1/02

U.S. Cl. 43—114

7 Claims



1. An insect trap and monitoring system comprising plastic top housing, a bottom section; a septa; a bottom lid; a dome; and a well, whereby the top housing holds the septa containing an insect lure and the bottom section includes the bottom lid, the dome and the well wherein the dome and the well are positioned over an adhesive pad placed in the bottom lid.

5,090,154 GROWTH-PREVENTING WEB FOR GROUND COVERING

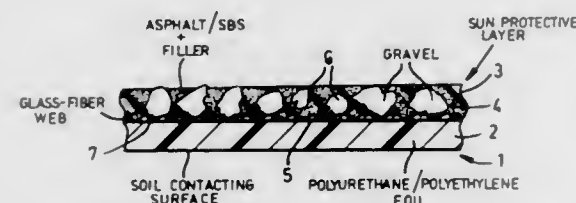
Christian Jacob, Strasbourg, France, assignor to Sotralentz S. A., Drulingen, France

Continuation-in-part of Ser. No. 412,902, Sep. 26, 1989, which is a division of Ser. No. 232,608, Aug. 15, 1988. This application Dec. 18, 1990, Ser. No. 629,366

Claims priority, application France, Aug. 17, 1987, 87 11703 Int. Cl.⁵ A01G 7/00

U.S. Cl. 47—9

5 Claims



1. A vegetation-growth-preventing web, comprising: a synthetic-resin foil layer of polyethylene or polyurethane having a ground-engaging surface and an upper surface; a sun-screening protective layer of an asphalt/styrene-butadiene-styrene mixture cast onto said upper surface and containing a meal-fine mineral filler admixed into said mixture in an amount of 15 to 25% by weight thereof, said sun-screening protective layer being applied to said foil layer in an amount of 1,750 to 2,250 g/m²; and a stone granulate consisting of stone granules of a particle size of 2 mm to 5 mm pressed into said protective layer in an amount of 3,500 to 5,000 g/m² of said web.

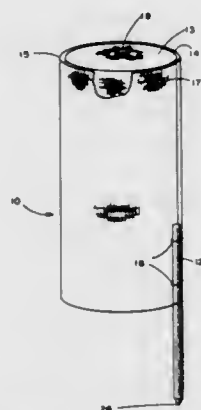
5,090,155 SEEDLING PROTECTOR

Mark Rodgers, P.O. Box 853, Fortuna, Calif. 95540
Continuation of Ser. No. 389,609, Aug. 4, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 618,512

Int. Cl.⁵ A01G 13/02

U.S. Cl. 47—30

21 Claims



13. A photodegradable seedling protector comprising a shade tube of woven material having open upper and lower ends, said tube comprising an upper section with relatively large size grid openings for effecting a relatively low degree of shade protection; an intermediate section with relatively intermediate size grid openings for effecting a relatively intermediate degree of shade protection; and a lower section with relatively small grid openings for effecting a relatively high degree of shade protection; said lower, intermediate and upper sections being secured to each other in substantially axial alignment; and

support means for holding said shade tube substantially upright, in surrounding relationship to a seedling.

5,090,156 METHOD FOR STORING BULBS

Waichirou Kawarabayashi; Yumi Ishii, and Shigeru Takahashi, all of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 555,797, Jul. 23, 1990, abandoned, and Ser. No. 301,420, Jan. 25, 1989, abandoned. This application Mar. 14, 1991, Ser. No. 671,162

Claims priority, application Japan, Feb. 3, 1988, 63-21900; Feb. 4, 1988, 63-22776

Int. Cl.⁵ A01G 7/06

U.S. Cl. 47—58

8 Claims

1. A method of storing a plant bulb comprising the successive steps of:

- (a) immersing a plant bulb to be stored in a solution of an osmoregulator at a concentration of 5 to 10 atm for a period of from one hour to one week;
- (b) rinsing the bulb to remove the osmoregulator from it;
- (c) placing the thus-treated bulb and a moisture retainer in a sealed container; and
- (d) storing the bulb in the sealed container at room temperature.

5,090,157 TREE BASKET

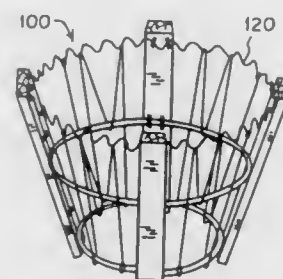
John R. Sipala, 7 Ridge Dr., Huntington Station, N.Y. 11746
Continuation of Ser. No. 422,633, Oct. 17, 1989, abandoned.

This application Jun. 11, 1991, Ser. No. 713,750

Int. Cl.⁵ A01G 23/04

U.S. Cl. 47—76

19 Claims



1. A tree basket adapted to receive a root ball having a predetermined diameter and height comprising: a plurality of horizontally disposed rigid support rings including at least one upper ring and a lower ring, said upper ring having a diameter greater than the diameter of said root ball and said lower ring having a diameter smaller than said upper ring, at least one substantially vertical, flacid support member fastened to said rigid rings to enclose a substantial portion of said predetermined height for supporting said ball, and means for supporting said rings whereby said rings are maintained in freestanding, vertically spaced relation to readily receive said ball.

5,090,158 SUPPORT FOR PREASSEMBLED AND PREADJUSTED FITTINGS FOR A MOTOR VEHICLE DOOR, AND A DOOR HAVING THIS SUPPORT

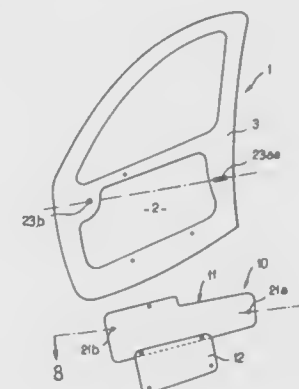
Carlo Bertolini, Paris, France, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1990, Ser. No. 484,306

Claims priority, application France, Mar. 3, 1989, 89 02801 Int. Cl.⁵ E05F 11/38

U.S. Cl. 49—348

2 Claims



1. A support for fittings and components mounted internally of a motor vehicle door comprising: a panel provided with means for fastening the fittings and components to said panel and means for fastening said panel to the door, said means for fastening said panel to the door include centering means in the form of flanges provided to the panel, corresponding holes provided to the door for receiving the flanges, and complementary holes in said panel for receiving elements for fastening said panel to the door, a separate window-lift plate provided with means for fastening the plate onto the door independently of the panel, means for fastening the panel and the plate together, and said complementary holes provide a sufficient clearance to absorb construction tolerances when said panel and plate are positioned on said door by said centering means.

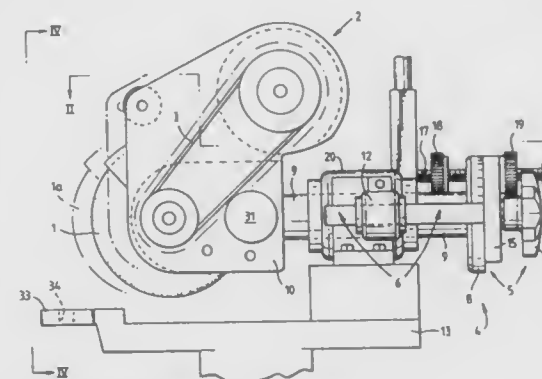
5,090,159 MULTI-PURPOSE GRINDER

James Patterson, c/o P.O., Jamieson, 3723, Australia
Filed Mar. 20, 1990, Ser. No. 495,582

Claims priority, application Australia, Mar. 20, 1989, PJ3279 Int. Cl.⁵ B24B 7/00

U.S. Cl. 51—34 R

7 Claims



1. A grinding device, comprising: a framework; a grinding wheel supported by said framework; an electric motor operatively connected to said grinding

wheel, said grinding wheel and said electric motor provided within a first housing; a second housing rigidly connected to said framework; a manually operated tilting mechanism for moving a locking said grinding wheel to any one of an infinite number of planes, lying at an angle with respect to the original plane of said grinding wheel, said tilting mechanism provided with a means for locking said grinding wheel into place, said tilting mechanism further provided with a first shaft rigidly connected to said first housing, said first shaft extending through said second housing; and a first manually adjustable grinding wheel alignment mechanism operatively connected to said grinding wheel to horizontally displace said grinding wheel within the same plane of an original position of said grinding wheel, and to lock said grinding wheel in a desired position, said first alignment mechanism provided with a second shaft rigidly connected to said second housing, a third housing rigidly connected to said framework and a third shaft operatively connected to said second shaft and rigidly connected to said third housing, said first shaft, said second shaft and said third shaft parallel with one another.

5,090,160 PLANER BLADE SHARPENING APPARATUS

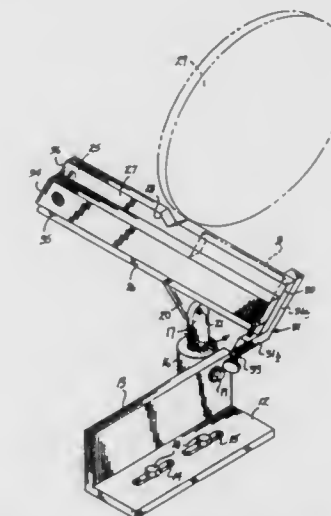
Alfred J. Paquette, 96 White St., Westfield, Mass. 01085

Filed Sep. 18, 1990, Ser. No. 585,019

Int. Cl.⁵ B24B 3/36

U.S. Cl. 51—102

7 Claims



1. A blade sharpening apparatus comprising, an "L" shaped support base, the "L" shaped support base including a horizontal base plate for securement to a support surface, and a vertical base plate integrally and orthogonally mounted to the horizontal base plate extending above the horizontal base plate, and a blade support plate cooperatively mounted to the vertical base plate, and including a rear edge, and a forward edge spaced from and parallel to the rear edge, the forward edge including a "V" shaped notch formed within the forward edge of the blade support plate medially thereof extending interiorly of the blade support plate, and the blade support plate further including a left edge spaced from and parallel to a right edge, and the blade support plate positioned for sliding securement of a planer blade for directing the blade over the forward edge and the associated "V" shaped notch, and articulating link means articulately mounting the blade support plate to the vertical base plate.

5,090,161

METHOD OF PRODUCING CURVED-TOOTHED BEVEL GEAR

Akira Nakayama, Fujisawa, Japan, assignor to Nissan Motor Company, Ltd., Japan

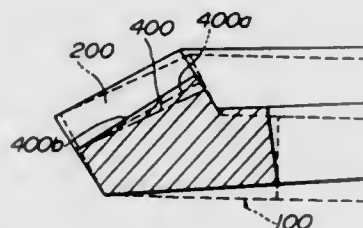
Filed Oct. 31, 1989, Ser. No. 429,095

Claims priority, application Japan, Nov. 10, 1988, 63-284302

Int. Cl.⁵ B24B 1/00

U.S. Cl. 51—287

5 Claims



1. A method of producing a curved-toothed bevel gear, comprising the steps of: providing a blank; generating teeth on said blank; processing said blank by heat treatment; and grinding said teeth of said blank; in which said generating step includes assuming an amount of deformation of a bottom land of each of said teeth caused by said heat treatment and forming said bottom land into a shape for compensating for said deformation.

5,090,162

SURFACE TREATING APPARATUS

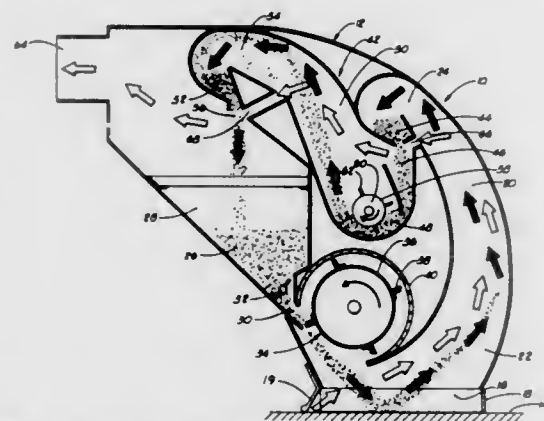
Robert T. Nelson, 12601 Arrowhead Ter., Oklahoma City, Okla. 73120

Filed Jun. 13, 1990, Ser. No. 537,409

Int. Cl.⁵ B24C 9/00

U.S. Cl. 51—425

17 Claims



14. A surface treating apparatus comprising: a housing with an opening that defines the area on the surface to be treated and a rebound corridor having a first end and a second end, the first end forming a part of the opening; a propeller supported in the housing for propelling abrasive material toward the opening so as to impact the surface, which propeller is capable of imparting sufficient kinetic energy to the abrasive material to treat the surface and to cause a substantial portion of the abrasive material impacting the surface to rebound a distance from the surface into the rebound corridor; a debris separation assembly comprising: a first debris separation means comprising a funnel which receives abrasive material from the second end of the

rebound corridor and from which the abrasive material flows in a stream;

a second debris separation means comprising a funnel which receives abrasive material from the first debris separation means and from which the abrasive material flows in a stream, the second debris separation means being nonvertically aligned relative to the first debris separation means;

a transfer corridor which connects the first and second debris separation means, the transfer corridor having a first end beneath the funnel of the first debris separation means and a second end emptying into the funnel of the second debris separation means; and

means disposed in the transfer corridor for moving abrasive material from the first debris separation means to the second debris separation means; means for adapting the apparatus for operation with means for generating a flow of air through the debris separation assembly;

aperture means for causing the flow of air through the debris separation assembly to intersect the streams of abrasive material from the first and second debris separation means and to intersect the abrasive material as it travels through the transfer corridor, so that debris is removed thereby; and

a hopper in the housing for receiving abrasive material from the debris separation assembly and for directing the abrasive material to the propeller.

5,090,163

EASILY ACCESSIBLE SMOKE CURTAIN ASSEMBLY

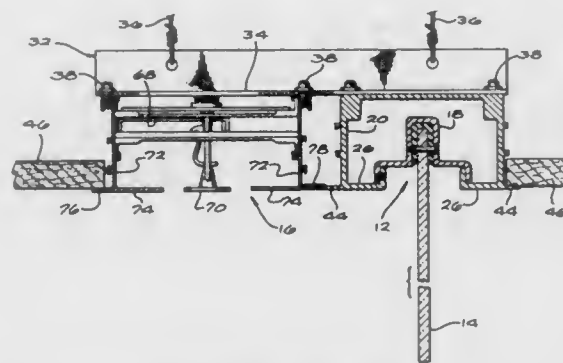
Kevin New, 1604 Walnut Ave., Escalon, Calif. 95320

Filed Feb. 23, 1990, Ser. No. 484,395

Int. Cl.⁵ E04B 5/52

U.S. Cl. 52—39

15 Claims



1. A smoke curtain assembly including:
 - a substantially planar smoke shield having an upper edge and a lower edge;
 - a shield holder secured to the upper edge only of the smoke shield for securely holding the smoke shield;
 - a main supporting member including:
 - main mounting means for securely attaching the main supporting member to a support structure in a ceiling delimited substantially by a ceiling plane; and
 - inwardly-extending holder support means for supporting the shield holder in an installed position; and
 - said shield holder including outwardly-extending support means for removably installing the smoke shield in the main supporting member and for resting on the inwardly-extending holder support means of the main supporting member when in the installed position.

5,090,164

CONSTRUCTION SET FOR A CONSTRUCTION PROJECT

Gerhard Mische, Hamelner Strasse 134 A, D-4920 Lemgo, Fed. Rep. of Germany

PCT No. PCT/EP90/00326, § 371 Date Oct. 18, 1990, § 102(e) Date Oct. 18, 1990, PCT Pub. No. WO90/10124, PCT Pub. Date Sep. 7, 1990

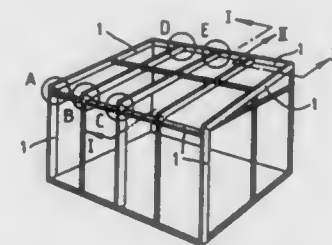
PCT Filed Feb. 29, 1990, Ser. No. 598,597

Claims priority, application Japan, Mar. 2, 1989, 3906566

Int. Cl.⁵ E04B 7/02; E06B 1/04

U.S. Cl. 52—90

11 Claims



1. A construction set for a construction project, said set comprising:
 - a basic profile (1) having two intrinsically separate and connected profile tubes (18, 19), said separate profile tubes having hollow interiors and a plurality of fastening grooves, connecting profiles which can be releasably inserted in and attached to the outsides of said basic profile, said connecting profiles comprising:
 - a covering profile (8) having a continuous U-shaped cross section, said covering profile having an abutment angle (21) formed on a first leg (8a) at a first end of said U-shaped cross section, said abutment angle (21) fitting over a corner region of a larger of said two profile tubes, formed as a first profile tube (18), an insulating angle (22) interpositionable between said corner region and said abutment angle (21), detent strips (24) formed on both a second leg (8b) at a second end of said U-shaped cross section and a rib (23) spaced from said second leg (8b), said detent strips (24) latchable in a first groove (5) of said plurality of fastening grooves, said first groove (5) located on a smaller of said two profile tubes, formed as a second profile tube (19), a first continuous support profile (6) having a U-shaped cross section including a crossbar (6a) for resting on the outside of said first profile tube (18), said first support profile (6) engageable to a second groove (4) of said plurality of fastening grooves with a suspension strip (28) formed on said crossbar (6a), said suspension strip (28) having an angular cross section protruding past a first leg (6b) of said first support profile (6), a second leg (6c) of said first support profile (6) forming respectively with said first leg (6b) support and abutment faces for a roof and wall element (15, 16), a second continuous support profile (7) having an angular cross section, said second continuous support profile (7) having a suspension strip (30) insertable into said first groove (5) of said second profile tube (19) and a stop strip (31) opposite said first support profile (6), a continuous stop profile (27) having a trapezoidal cross section, with an open side of said cross section having detent strips (33) insertable in said first groove (5) of said second profile tube (19), and wherein, said covering profile (8), said first continuous support profile (6), said second continuous support (7) and said continuous stop profile (27) are selectively

engageable to said fastening grooves of said base profile to form a variety of different building forms.

5,090,165

POLE AND POST SLEEVE OR BOOT

Loren D. Kenny, 718 Cedar St., Anaconda, Mont. 59711

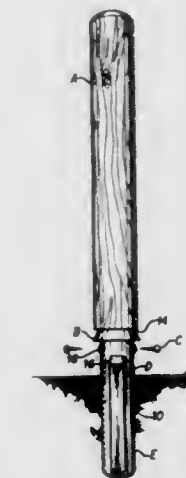
Filed Mar. 17, 1989, Ser. No. 324,772

The portion of the term of this patent subsequent to Jun. 25, 2009, has been disclaimed.

Int. Cl.⁵ E02D 5/74

U.S. Cl. 52—165

5 Claims



1. A sleeve means for providing a protective barrier for a wood post or pole set in the ground, said post or pole having an upper portion and an integral base, said base being configured to have a smaller circumference than said upper portion, thereby forming a circumferential shoulder at the juncture of said upper portion and said base, said sleeve means comprising: a central, axially aligned opening configured to receive and closely encase said base of said wood post or pole; and at least one vent means integral with said opening extending from a bottom of said sleeve means to a location near the top of said sleeve means; whereby when said base encased by said sleeve means is set in the ground said sleeve means forms a protective barrier between the ground and said base, thereby increasing the life expectancy of said base, said at least one vent means providing an expansion area for freezing of any moisture accumulated within the sleeve means.

5,090,166

RECTILINEAR BUILDING STRUCTURE

Donald L. Johnson, Independence; Roger A. LaBoube, Rolla, both of Mo., and Suresh C. Satsangi, Lenexa, Kans., assignors to Butler Manufacturing Company, Del.

Filed Oct. 23, 1990, Ser. No. 601,399

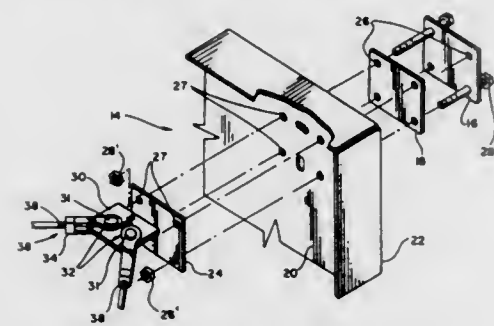
Int. Cl.⁵ E04C 3/292

U.S. Cl. 52—167 CB

8 Claims

1. A building frame formed from vertical and horizontal structural members, independent diagonal tension members for resisting racking of the building under transverse loads, and connectors for joining ends of the diagonal members to the structural members, wherein each of the connectors comprises a backing plate facing one surface of one of the structural members, an elastomeric pad between the backing plate and said surface, and means for transferring tension loads in the respective diagonal member to said backing plate so as to

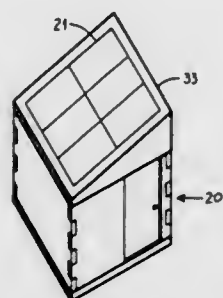
compress said elastomeric pad, whereby said pad may compress further during transitory overloading of the frame,



thereby increasing the deformability of the structure without exceeding the elastic limit of the tension members.

5,090,167 SOLAR SHED

Stephen Wassell, 8542 Mt. Vernon Hwy., Alexandria, Va. 22309
Continuation-in-part of Ser. No. 410,548, Sep. 21, 1989,
abandoned. This application Feb. 14, 1991, Ser. No. 655,633
Int. Cl.⁵ E04D 13/18; E04H 14/00
U.S. Cl. 52-173 R 4 Claims



1. A solar shed comprising a secure shelter having walls and a door through one of the walls and a pent roof, and further comprising photovoltaic cells on the pent roof of the shelter and electrical connections which extend from the cells to outlets in the interior of the shelter, for the purpose of photovoltaically recharging batteries for electric tools stored in the interior of the shelter, said shelter being assembled from prefabricated components, having a square floor plan so that the walls and the roof can be oriented with respect to each other in any of four directions, in particular, so that the slope of the roof can be oriented to allow for adequate solar exposure to the photovoltaic cells and so that the door can be positioned to allow the user to enter the shed where there is more headroom resulting from the slope of the pent roof.

5,090,168

EXTRUDED WINDOW FRAME SYSTEM

William A. Fast, and Daniel E. Friesen, both of Winnipeg, Canada, assignors to Willmar Window Industries Ltd., Winnipeg, Canada

Filed Apr. 27, 1990, Ser. No. 515,425

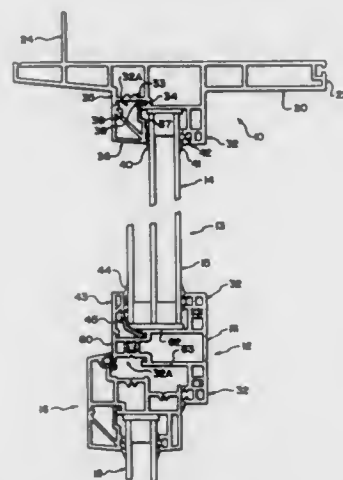
Int. Cl.⁵ E04B 1/04

U.S. Cl. 52-213

13 Claims

1. A window frame structure comprising a rectangular outer window frame formed from four outer window profile elements each cut from a common outer window profile extruded from a plastics material to define for each outer window profile element a length and two ends, each end being connected to a respective one of the other outer window profile elements to form said rectangular outer window frame structure and a window unit mounted in the outer window frame, the outer frame profile including an outer wall for engaging an opening

formed in a wall of a building, an inner wall facing inwardly of the opening, said inner wall including an inside portion extending from an inside surface, a sill portion extending from an outside surface of the profile toward the inside of the building and a central raised portion between the inside portion and the sill portion, the inside portion lying parallel to the outer wall and the sill portion being inclined from the raised portion in a direction toward the outside surface and toward the outer surface, means on the inner wall for mounting said window unit in the outer window frame including a tower portion mounted on the central raised portion at a position thereon



adjacent the inside portion and projecting inwardly against which the window unit abuts, means defining a nailing fin for abutting an outside wall surface of the building, the nailing fin being located at a position spaced from the outside surface, said inside surface facing inside the building and including means for receiving an inside facing strip at the inside wall surface of the building, and a plurality of interior connecting walls extending across the profile from the inner wall to the outer wall, that portion of the profile extending from the nailing fin to the inside surface being formed as an integral single unit and having a dimension from the nailing fin to the inside surface at least equal to 6.5 inches.

5,090,169

INTERIOR PANEL UNIT FOR PERMITTING ARRANGEMENT OF CABLES AND DEVICES ON ROOM FLOOR

Fumio Takeda, Hachioji; Yoshio Kojima, Yokohama; Tsuneo Kaneko, Narashino; Yutaka Ishibashi, Tokyo; Naoto Sasaki, Yokohama, and Isako Tsushima, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 31, 1989, Ser. No. 429,552

Claims priority, application Japan, Oct. 31, 1988, 63-142055[U]; Oct. 31, 1988, 63-275609; Oct. 31, 1988, 63-275610; Oct. 31, 1988, 63-275614; Oct. 31, 1988, 63-275617; Oct. 31, 1988, 63-275618; Oct. 31, 1988, 63-275619; Oct. 31, 1988, 63-275620

Int. Cl.⁵ E04B 5/48

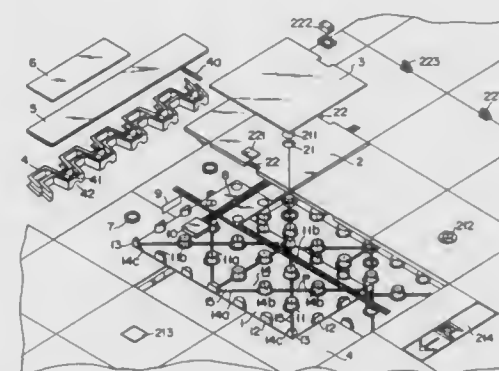
U.S. Cl. 52-220

4 Claims

1. An interior panel unit for permitting an arrangement of cables and devices on the floor of a room, for installation on a foundation floor of the room, said panel unit comprising:

- a floor base member to be installed on a foundation floor of the room;
- a plurality of fundamental support members fixed to an upper surface of each said floor base member, and having upper surfaces located at the same height from said upper surface of each floor base member;
- a plurality of connecting support members fixed to peripheral portions of each floor base member, and having upper surfaces located the same height as those of said funda-

mental support members, said plurality of connecting support members comprising first connecting support members and consisting of $\frac{1}{2}$ pieces obtained by cutting a solid body in a direction perpendicular to a surface of said floor base member, and second connecting support members and consisting of $\frac{1}{2}$ pieces obtained by cutting the solid body in a direction perpendicular to the surface of said floor base member;



base joint members for connecting said connecting support members arranged on a plurality of said floor base members in a state wherein the floor base members are installed on the same surface; and
floor panel members brought into contact with said upper surfaces of said plurality of fundamental support members and said upper surfaces of said connecting support members to form a surface of the room floor and cooperating with said floor base members to define an internal space for installing cables and devices therein.

5,090,170

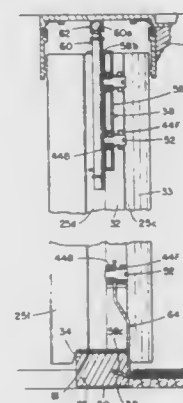
BUILDING ENCLOSURE SYSTEM

Robert L. Propst, 18845 NE 49th Pl., Redmond, Wash. 98052
Continuation-in-part of Ser. No. 208,896, Jun. 17, 1988, Pat. No. 4,899,510. This application Feb. 12, 1990, Ser. No. 478,311

Int. Cl.⁵ E04H 1/00; E04B 2/82

U.S. Cl. 52-243.1

16 Claims



1. A building structure comprising:

- a floor structure;
- a ceiling structure;
- a support structure between the floor structure and ceiling structure for supporting the latter;
- a wall structure between the ceiling structure and the floor structure which does not support the ceiling structure, said wall structure including a row of side edge-by-side edge wall panels, each of said panels being spaced by a gap beneath said ceiling structure and interfitting with the floor structure by way of a respective pivot element projecting upwardly from the floor structure into a concave seat at the bottom of the panel so that the panel is remov-

able when tilted from a vertical position, the interfit between said panels and floor structure preventing movement of said panels along said row;

slide means slidably mounted on each of said wall panels between adjacent said wall panels for interfitting with said ceiling structure to individually hold said panels in vertical position when the wall panels interfit with said floor structure, said slide means each being entirely located within the confines of a respective wall panels;

panel gripping means operably between adjacent said wall panels when engaged for holding the wall panels against movement relative to one another, said wall panels having accessways therebetween to said slide means and panel gripping means for operation thereof;

said panel gripping means being adapted to be moved through said accessways and to be engaged and disengaged by a tool inserted through said accessways, and said slide means also being adapted to be engaged and operated by a tool inserted through said accessways, whereby each of said wall panels may be individually installed and removed without moving adjacent wall panels.

5,090,171

MOVABLE PARTITIONING PANEL

Minoru Kano, Kiyoshi Negami, and Mikio Nakatani, all of Komatsu, Japan, assignors to Komatsu Wall Industry Co., Ltd., Komatsu, Japan

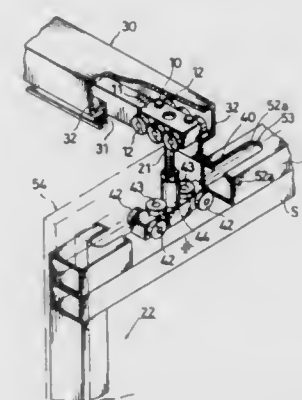
Filed Jun. 29, 1990, Ser. No. 545,826

Claims priority, application Japan, Aug. 1, 1989, 1-99904; Aug. 7, 1989, 1-92720[U]; Aug. 10, 1989, 1-207182; Feb. 15, 1990, 2-14005[U]

Int. Cl.⁵ E04B 2/82

U.S. Cl. 52-243.1

10 Claims



1. A movable partitioning panel assembly, which comprises:
a panel;
a hanger rail having a C-shape in section;
a pair of hanging bolts for movably suspending said panel from said hanger rail;
a runner device with travel rollers wherein an upper end of each of said pair of hanging bolts is rotatably supported on said runner device;
a controller device horizontally movable with respect to said panel is disposed on a lower end of at least one of said hanging bolts; and
a hanger block mounted on the panel body; and a hanging member supported by said hanger block, said hanger block being mounted on said panel by said hanging member and said hanger block being in one of a point contact and a line contact along a longitudinal direction of the panel with respect to said hanging member wherein at least two roller members are provided at said hanger block.

5,090,172

SHEARHEAD REINFORCEMENT

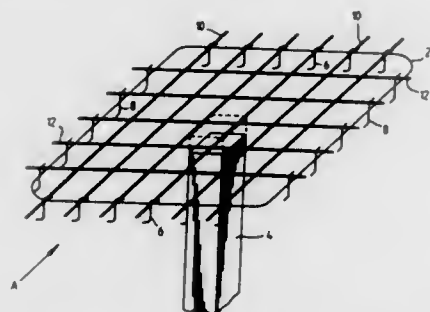
Palvinder Chana, Langley, and John D. Clapson, Allbrook, both of England, assignors to Square Grip Limited, United Kingdom

Filed Oct. 22, 1990, Ser. No. 602,102

Int. Cl.⁵ E04B 1/16

U.S. Cl. 52—252

12 Claims



1. A shearhead for casting within the body of a laterally extending slab to reinforce a junction between the slab and a supporting column, comprising a hoop bar for extending around the column with a plurality of shear legs attached thereto and depending therefrom, each shear leg including a portion extending above the hoop bar, which portion forms a hook for coupling to reinforcement in the slab.

5,090,173

LAPPED HARDBOARD PANELS AND METHOD

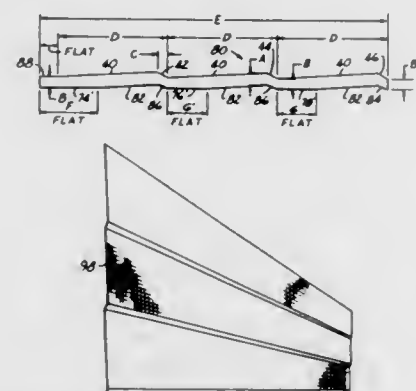
William G. Coggan, Rochester; John M. Guyette, and James A. Pozzo, both of Troy, all of Mich., assignors to Abitibi-Price Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 691,667, Jan. 15, 1985, Pat. No. 4,969,302. This application Nov. 18, 1988, Ser. No. 262,532

Int. Cl.⁵ D21J 1/18

U.S. Cl. 52—309.8

19 Claims



1. A hardboard panel molded by a wet process with heat and compression of a relatively thick mat of wet composite wood fiber material into a thinner hardboard panel between a pair of contoured upper and lower pressure plates heated to an elevated temperature; the hardboard panel having a contoured front surface, a pair of spaced apart and generally longitudinally extending side edges, and a contoured back surface generally similar to but not matching the profile of said front surface, said panel having at least two longitudinally and laterally extending wall portions each with a front face and a generally longitudinally extending offset and integral wall portion between them constructed and arranged to generally transversely offset said front faces a distance equal to at least three tenths of the maximum thickness of said hardboard panel, in cross section said hardboard panel as molded having a nonuniform density across its width with its density at said side edges being at least ten percent greater than the minimum density of

said lateral wall portions and as molded the minimum thickness of said side edges being at least ten percent less than the maximum thickness of said lateral wall portions, said maximum density being less than seventy pounds per cubic foot and said hardboard panel having an average density of less than fifty pounds per cubic foot.

5,090,174

SIDING SYSTEM INCLUDING SIDING TRIM PIECES**AND METHOD OF SIDING A STRUCTURE USING SAME**

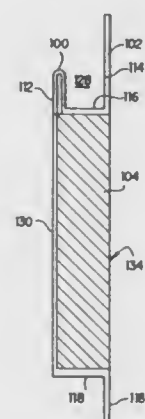
Anthony J. Fragale, 26 4th St., McMechan, W. Va. 26040

Filed Sep. 26, 1990, Ser. No. 588,466

Int. Cl.⁵ E04F 13/06

U.S. Cl. 52—309.9

22 Claims



19. A siding trim piece for siding construction using siding elements on a structure, comprising:

an elongated relatively flexible sheet defining a longitudinal axis and a transverse axis perpendicular to the longitudinal axis, and having a gauge between 0.010 and 0.013 for resisting thermal dimensional changes along the longitudinal axis relative to a stiffer heavy gauge sheet, said sheet defining a rear panel, a first transverse wall integral with the rear panel and extending outwardly therefrom, a front panel integral with the first transverse wall and extending generally parallel to the rear panel, and a second transverse wall integral with the front panel and extending inwardly therefrom in a direction parallel to the first transverse wall; the first transverse wall and the rear panel cooperating to define an external integral channel on one side of the first transverse wall for retaining a siding element; and the first and second transverse walls cooperating to define an integral internal channel on an opposite side of the first transverse wall, the internal channel enclosing a substrate material laminated to an interior surface of the first wall, the substrate material laminated to the low gauge sheet providing structural rigidity to the low gauge sheet along the longitudinal and transverse axes.

5,090,175

FREEZER APPARATUS

Horst F. Arfert, Midlothian; Roger H. Donaldson, White Stone; Thomas K. Murdock, Chester, and Barry M. Whitlock, Richmond, all of Va., assignors to Eskimo Pie Corporation, Richmond, Va.

Filed May 14, 1990, Ser. No. 522,799

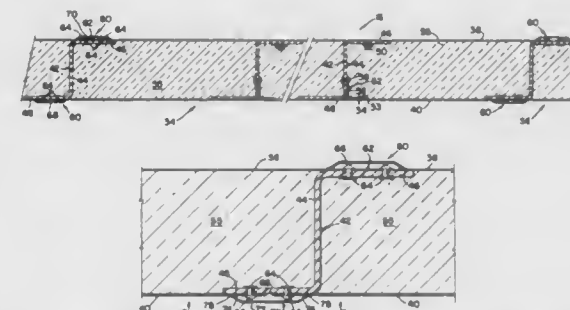
Int. Cl.⁵ E04B 2/38

U.S. Cl. 52—309.11

5 Claims

1. Freezing apparatus having wall means defining a freezing chamber, said wall means being formed by a plurality of adjacent wall units arranged side by side and adjoining each other at a joint area, each of said wall units including spaced inner and outer skins and a plurality of non-metallic, thermally non-

conductive, flexible, generally Z shaped structural members mounted between and extending along said skins, each of said structural members including an elongated web section, first flange means extending laterally from one end of said web section in one direction and connected to said inner skins and second flange means extending laterally from the other end of said web section in an opposite direction and connected to said outer skins, opposed edges of adjacent inner skins being spaced



from each other, one of said structural members being located at the joint area of adjacent wall units having its first flange means connected to and spanning the joint area of adjacent inner skins and its second flange means connected to and spanning the joint area of adjacent outer skins of adjacent wall units, resilient cover means extending along said adjacent inner skins covering said joint area, and thermal insulation means mounted between said skins.

5,090,176

METHOD OF POSITIONING CONCRETE SLABS ON GIRDERS

Hiroo Kishida, and Hirofumi Takenaka, both of Osaka, Japan, assignors to Harumoto Iron Works Co., Ltd., Osaka, Japan

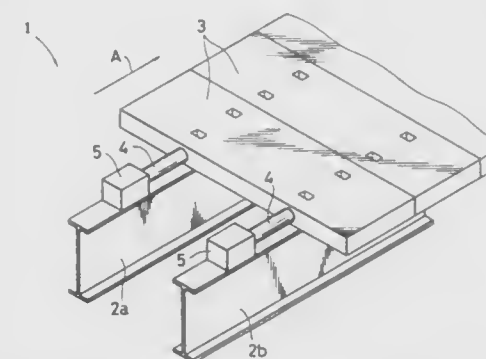
Filed May 16, 1990, Ser. No. 524,048

Claims priority, application Japan, Feb. 20, 1990, 2-40609

Int. Cl.⁵ E04B 1/06; E04C 3/20

U.S. Cl. 52—745

12 Claims



1. A method of constructing an elongated installation, such as a bridge or a tunnel, including girders extending in the elongated direction of the installation, and a plurality of precast concrete slabs forming a covering structure over said girders, each said slab extending laterally between and over said girders, and said slabs being aligned end-to-end along said elongated direction, said method comprising:

- arranging said girders to extend in said elongated direction from a first end of said installation to a second end thereof;
- providing a plurality of precast concrete slabs having holes formed therein;
- positioning at least one first precast concrete slab across said girders at a mounting position at said first end of said installation with an intervening member having a low

coefficient of friction positioned between said slab and said girders;

- moving said first slab along said girders in a moving direction away from said mounting position toward said second end of said installation by a distance at least equal to the width of said first slab in said moving direction;
- positioning at least one another precast concrete slab across said girders at said mounting position with a said intervening member therebetween;
- moving said another slab along said girders in said moving direction away from said mounting position, and thereby causing said another slab to move said first slab further in said moving direction toward said second end of said installation;
- repeating steps (e) and (f) with successive additional at least one precast concrete slabs until said first slab is moved to a final position therefor at said second end of said installation and said slabs extend entirely along said girders between said first and second ends of said installation;
- penetrating studs from said girders into said holes in said slabs; and
- charging a filler into said holes to fill said holes and to harden around said studs, thereby integrally attaching said slabs to said girders.

5,090,177

METHOD FOR UNITIZATION OF CARGO

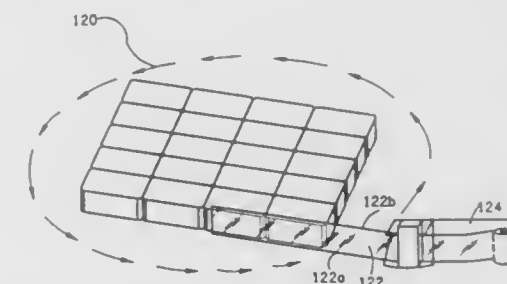
John M. Gombos, Bakersfield, and Moshe Leashno, Long Beach, both of Calif., assignors to A.C.X., Inc., Bakersfield, Calif.

Continuation of Ser. No. 526,186, May 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 353,811, May 17, 1989, Pat. No. 5,001,974. This application May 14, 1991, Ser. No. 701,604

Int. Cl.⁵ B65B 27/12, 25/02

U.S. Cl. 53—399

31 Claims



1. A method of unitizing a cargo consisting of multiple substantially identical high density hay bales into a non-palletized unit capable of being handled by direct engagement of the bottom surface thereof by the tines of a forklift truck or the like comprising the steps of:

- selecting a plurality of substantially identical high density partially compressible bales of hay;
- arranging said plurality of bales of hay into a stack of multiple coextensive layers of multiple horizontal rows forming a stack without overlapping interlocking bales having generally vertical peripheral sides and a bottom layer defining a bottom planar support surface extending to said peripheral sides; and
- binding said plurality of bales into a self-supporting unit solely by the application of a continuous inwardly directed lateral force on the peripheral sides of said stack, thereby at least partially compressing each of said bales and forcing the vertical surfaces of the bales into partially interlocking binding engagement with laterally adjacent bales for holding them against vertical movement relative to one another, said application of a continuous lateral force carried out by the steps of selecting at least one elongated sheet of pre-stretched polymeric film having a

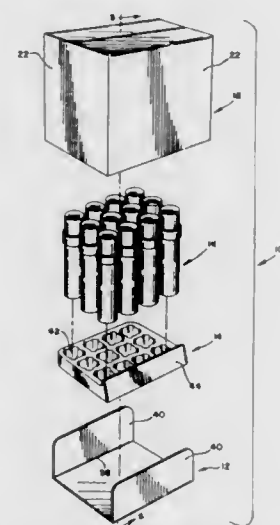
memory and applying said sheet of film into direct surface contact with said peripheral sides and wrapping said peripheral sides of said stack with sufficient multiple layers of said elongated continuous sheet of pre-stretched polymeric film solely around and in direct engagement with the peripheral sides of said stack for binding said stack as a unit without bottom engaging support while maintaining said bottom bale layer in place due to said partially interlocking of the vertical surfaces of the bales for support by direct engagement of said bottom surface on a pair of tines of a forklift truck without a pallet.

5,090,178
METHOD OF ASSEMBLY FOR SIMPLIFIED CONTAINER

Danny T. Ricchio, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Division of Ser. No. 502,152, Mar. 29, 1990. This application Jan. 7, 1991, Ser. No. 620,963
Int. Cl.⁵ B65B 5/06

U.S. Cl. 53—456

2 Claims



1. A method of assembling a separable two-part container assembly adapted for the shipment and storage of articles comprising:

providing a corrugated filler insert forming blank and a corrugated cover blank,
the corrugated filler insert forming blank having a substantially rectangular base section, defined by two edge margins in opposed spaced-apart relation, and two edge fold lines in opposed spaced-apart relation, the filler insert forming blank further having, along two of the edge margins a pair of spaced-apart end flaps unitary with the base but each end flap being separated therefrom by the corresponding edge fold-line,

the corrugated cover forming blank having an essentially rectangular shape having a bottom margin, a top margin, and first and second end margins, the essentially rectangular shape having extending across the width of the blank along one axis thereof, four sidewall fold lines, the four sidewall fold lines thus defining four essentially rectangular sidewall portions, each sidewall portion having located along the top margin of the corrugated cover forming blank and integrally formed therewith but separated therefrom by a cover top fold line, four cover top flap portions, each top flap extending above a corresponding sidewall portion, the corrugated cover forming blank further having a cover attachment flap located along and coextensive with the first end margin of the corrugated cover forming blank, the attachment flap being integrally

formed with the corrugated cover forming blank but separated therefrom by an attachment flap fold line, taking the filler insert forming blank and folding each filler insert flap upwardly along the corresponding filler insert flap fold line, taking the corrugated cover forming blank and folding the cover forming blank along each of the four sidewall fold lines and along the attachment flap fold line, so that the attachment flap located along the first end margin of the corrugated cover blank is brought into the proximity of the second end margin of the corrugated cover blank, fastening, by adhesive means, the attachment flap to the second end margin of the cover blank, forming the corrugated cover forming blank into the configuration of an essentially rectangular box open at its top and bottom ends, taking the container cover and folding inwardly and downwardly, along each top cover flap fold line, first one oppositely located pair of cover top flaps and then a second, oppositely located pair of cover top flaps, to form a top section for the cover formed from the cover forming blank, fastening the second, upper pair of top cover flaps to each other with taping means to secure the top section of the cover, placing the articles to be shipped and stored onto the base section of the filler insert and between the filler flaps of the filler insert, fitting the now assembled cover over the filler insert and the articles situated upon the filler insert in such a way that the filler insert flaps extend upwardly within the cover, and the ends of the cover sidewalls are co-extensive with the corresponding filler edge margins and filler edge fold lines, the assembled cover and filler insert container which now has the overall form of a solid essentially rectangular object, inverting the assembled cover and filler insert container assembly, and fastening with taping means the exposed base section of the filler insert to two or more sidewalls of the cover, thus forming and securing the fully enclosed essentially rectangular two-part container assembly.

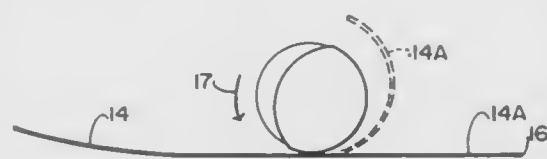
5,090,179
REUSABLE COIN COUNTER AND HOLDING DEVICE
William W. Bickle, P.O. Box 1318, The Pas, Manitoba, Canada R9A 1L2

Filed Jun. 6, 1991, Ser. No. 711,036

Int. Cl.⁵ B65B 11/56, 67/08

U.S. Cl. 53—461

5 Claims



1. A method of counting and rolling coins comprising the steps of:

- (a) filling a substantially semi-circular cross-sectional close ended trough with coins of the same denomination, from one end to the other, thereby measuring a predetermined number of said coins;
- (b) placing said trough transversely on a coin wrapper and spaced inwardly from one end thereof;
- (c) folding said one end partially around said trough; and
- (d) rolling the trough of coins within said wrapper until fully enclosed therein and then tucking the side ends of said wrapper inwardly against the closed ends of said trough.

5,090,180
METHOD AND APPARATUS FOR PRODUCING SEALED AND FILLED CONTAINERS

Erling Sørensen, Odense, Denmark, assignor to A/S Hastrup Plastic, Langeskov and A/s PLM Hastrup Holding, Odense, both of, Denmark

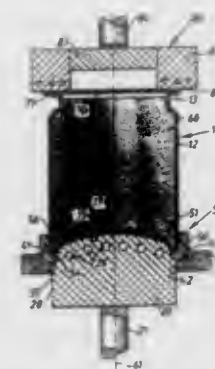
PCT No. PCT/SE89/00747, § 371 Date Oct. 3, 1990, § 102(e) Date Oct. 3, 1990, PCT Pub. No. WO90/07451, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 22, 1989, Ser. No. 571.605

Int. Cl.⁵ B65B 61/24, 43/00, 3/02, 7/28

U.S. Cl. 53—471

20 Claims



1. A method of producing a sealed and filled container comprising providing a preform of crystallizable plastic material having a body, a closed bottom portion and an open mouth portion, filling the preform with goods to be sealed therein, applying a mechanical forming and thermocrystallizing tool against the closed bottom portion of the preform, with pressure, to reshape the bottom portion of the preform by displacing at least a part of the bottom portion of the preform inwardly of the body towards the open mouth of the preform, heating the tool at the surface thereof applied against the bottom portion of the preform to raise the temperature of said bottom portion to a value greater than the glass transition temperature (T_g) of the plastic material, maintaining contact of the heated tool with the bottom portion during its reshaping for a length of time sufficient for the plastic material to obtain thermocrystallization of at least 15% at least at the surface in contact with said tool, the thermocrystallization of the bottom portion causing strengthening of said bottom portion and mechanical stability in its reshaped state to resist deformation and relatively high temperatures, and sealing said open mouth portion to produce a sealed and filled container.

5,090,181
APPARATUS FOR TRANSPORTING AND REORIENTING ENVELOPES

Dean H. Foster, Stratford, and Hans C. Mol, Wilton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 3, 1990, Ser. No. 620,870

Int. Cl.⁵ B65B 5/04

U.S. Cl. 53—569

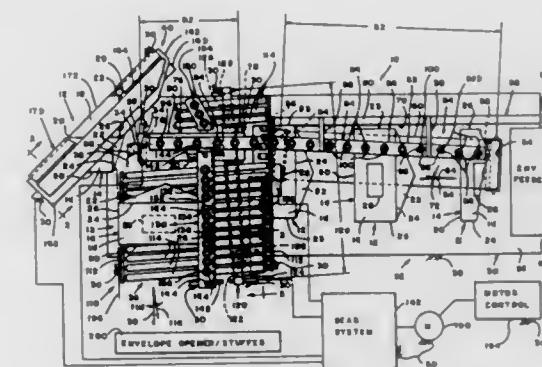
36 Claims

1. Apparatus for transporting an envelope including a body having opposed front and back wall portions defining a bottom edge, wherein the envelope includes a flap wall portion extending from the front wall portion and defining therewith a crease edge extending parallel to the bottom edge for folding the flap wall portion in overlaying relationship with the back wall portion, and wherein the front and back wall portions define parallel-spaced side edges extending between the creases and bottom edges, the apparatus comprising:

- a. first means for conveying the envelope in a first direction wherein the front and flap wall portions thereof are upwardly oriented, the first conveying means including first means for aligning one envelope side edge in the first direction;
- b. second means for conveying the envelope in a second

direction wherein the front and flap wall portions thereof are downwardly oriented, the second conveying means including second means for aligning the one envelope side edge in the second direction; and

c. means for reorienting the envelope, the reorienting means including means for guiding the envelope through a curvedly-extending path of travel wherein the upwardly oriented front and flap wall portions are progressively



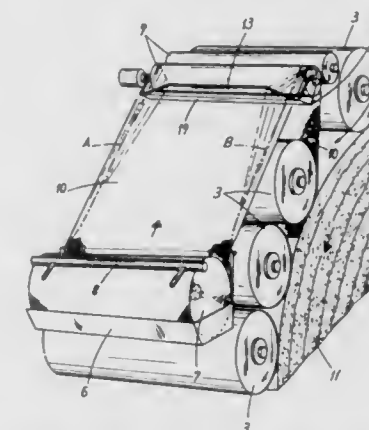
downwardly oriented, the guiding means including an elongate member having a guide surface which is arcuately-shaped in transverse cross-section, the reorienting means including first means for feeding the envelope from the first conveying means to the guiding means, and the reorienting means including second means for feeding the envelope from the guiding means to the second conveying means.

5,090,182
ROUND BALE PRESS FOR AGRICULTURAL PRODUCTS
Jörg Bethge, Harzewinkel, Fed. Rep. of Germany, assignor to Claas Ohg, Harzewinkel, Fed. Rep. of Germany
Filed Dec. 3, 1990, Ser. No. 621,263
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1989, 3940012

Int. Cl.⁵ B65B 11/04

U.S. Cl. 53—556

8 Claims



1. A round bale press, comprising means forming a winding chamber having a product supply opening and a gap spaced from said product supply opening; wrapping material supply means for supplying a material for wrapping a finished bale through said gap and including a braked material supply roller; wrapping material pulling means comprising of a pair of pulling rollers for pulling the wrapping material of a predetermined length from said wrapping material supply means and supplying the wrapping material into said winding chamber through said gap for wrapping the finished bale; said pair of pulling rollers being arranged directly in the region of said gap and having a nip therebetween facing the bale width stretching

means for stretching the pulled wrapping material before entering the winding chamber, said width stretching means being arranged transversely to the longitudinal axis of the press and having a width corresponding at least to a width of a bale to be wrapped, said width stretching means being arranged between said braked material supply roller and said pair of pulling rollers, said pair of pulling rollers guiding the wrapping material through the nip directly into said gap which is spaced from said product supply opening of said winding chamber, said width stretching means being formed as a stationary guiding shoulder operable for guiding the wrapping material in stretched condition and deviating the wrapping material from a web supply plane starting from its web edges.

5,090,183

DISCHARGE CHUTE BLOCKING DEVICE FOR A ROTARY LAWN MOWER

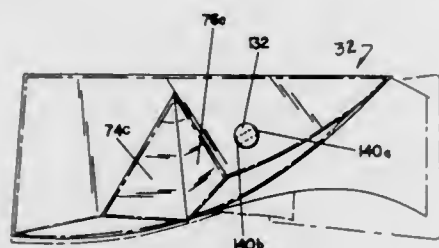
Richard A. Thorud, Bloomington, and Henry B. Tillotson, Minneapolis, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 386,054, Jul. 28, 1989, Pat. No. 4,951,449. This application Aug. 27, 1990, Ser. No. 573,939. The portion of the term of this patent subsequent to Aug. 28, 2008, has been disclaimed.

Int. Cl.⁵ A01D 34/70, 34/72, 34/73

U.S. Cl. 56—2

29 Claims



26. A wash-out system for a rotary lawn mower having a housing defining a cutting chamber and a discharge opening for allowing grass clippings to leave the cutting chamber, the wash-out system comprising:

- removable means for selectively blocking the discharge opening; and
- water passageway means carried on the removable means for allowing water to pass through the removable means and clean the cutting chamber when the removable means is in place blocking the discharge opening and when water is supplied to the water passageway from a water source.

5,090,184

HARVESTING UNIT HEIGHT CONTROL FOR A COTTON HARVESTER

Lee F. Garter, Western Springs; Jesse H. Orsborn, Hinsdale; Kevin S. Richman, Darien, and Joel Soto, Maywood, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 14, 1990, Ser. No. 628,208

Int. Cl.⁵ A01D 46/08, 46/20, 67/00, 75/28

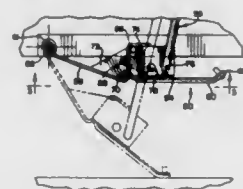
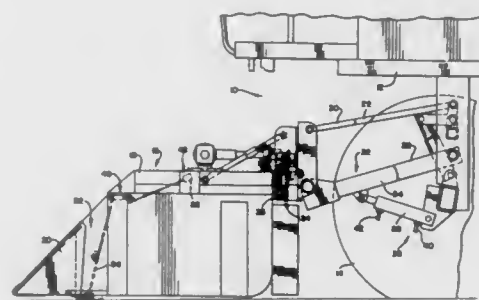
U.S. Cl. 56—10.2

9 Claims

8. Ground contour sensing assembly adapted for use with a harvesting unit of a cotton harvester, said sensing assembly comprising:

- a mounting bracket defining a first pivotal mounting arranged toward a forward end thereof to allow for vertical movement of said bracket about a first axis; and
- a ground engaging shoe which carries an interchangeable wear plate defining a ground engaging surface for said shoe, said shoe being connected to said mounting bracket at a second pivotal mount defining a second axis extending

generally normal to said first axis to allow for horizontal pivotal movement of said ground engaging surface



thereby enhancing ground contact of said surface with changing ground contours.

5,090,185

MOWER

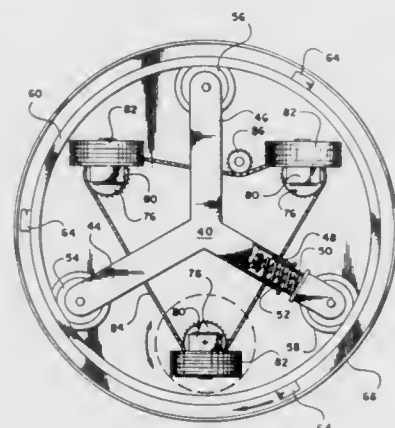
Earl L. Meeks, 134 Rockbridge Rd., Lilburn, Ga. 30247

Filed Feb. 11, 1991, Ser. No. 653,062

Int. Cl.⁵ A01D 57/12

U.S. Cl. 56—16.7

19 Claims



1. A lawn mower comprising:

- a base;
- a motor mounted upon said base;
- a rim having an outer periphery and an inner periphery, and having at least one cutting blade extending from said outer periphery;
- means for supporting and rotating said rim;
- means for transmitting power from said motor to said means for supporting and rotating said rim; and
- a plurality of wheels affixed to said base within said inner periphery of said rim.

5,090,186

ROTOR CUTTER

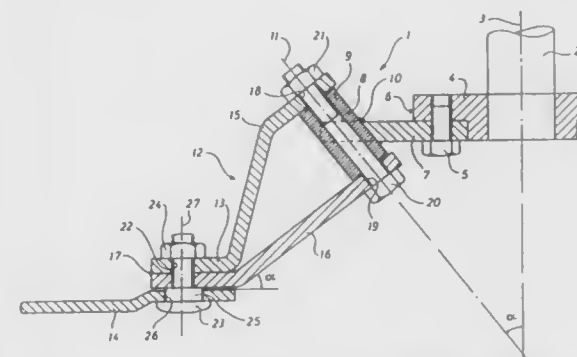
Bernt Andersen, Tollose, Denmark, assignor to Spragelse Maskinfabrik A/S, Denmark

Filed Oct. 25, 1990, Ser. No. 603,789

Int. Cl.⁵ A01D 34/82

U.S. Cl. 56—255

13 Claims



1. A rotor cutter comprising a cutting member adapted to be connected to a driving member for rotation therewith about a first axis, the cutting member comprising:

- a knife holder;
- a knife connected to and extending outward and downward from the knife holder and including
 - a knife shank having upper and lower ends,
 - a cutting blade extending outward from the lower end of the shank, wherein rotation of the cutting member rotates the cutting blade in a plane perpendicular to the first axis, and
 - means connecting the cutting blade to the lower end of the shank for rotary movement therewith about the first axis and for pivotal movement relative to the shank and about a second axis; and
- means connecting the upper end of the shank to the knife holder for rotary movement therewith about the first axis and for pivotal movement about a swivel axis, said swivel axis forming an upwardly facing acute angle with the first axis.

5,090,187

PICK-UP ASSEMBLY

Kenneth F. Mews, Box 1777, Moose Jaw, Saskatchewan, Canada S6H 7K8

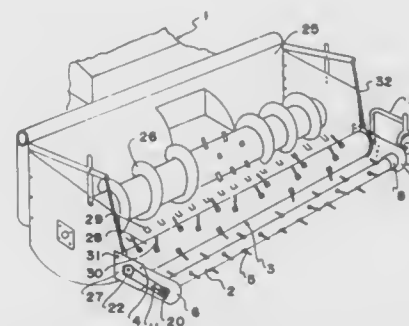
Continuation of Ser. No. 485,881, Feb. 27, 1990, abandoned.

This application May 3, 1991, Ser. No. 695,530

Int. Cl.⁵ A01D 57/04

U.S. Cl. 56—364

14 Claims



1. An auxiliary pick-up assembly used in front of and in conjunction with a conventional or main pick-up mounted on a feeder platform of a harvesting machine, said conventional pick-up including supporting end plates mounting it on the platform and carrying drum means with teeth mounted thereon and strippers, for assisting in the conveying of a

swathed crop, said auxiliary pick-up assembly comprising pivotably adjustable end plates mounted on the end plates of the conventional pick-up, drum means substantially smaller in diameter than the conventional pick-up drum means and adjustably mounted on the pivotably adjustable end plates, tooth means mounted on the smaller drum means for initial engagement of the crop, and drive means for rotating the smaller drum whereby the crop is picked up by the auxiliary pick-up and transported to the main pick-up and onto the feeder platform of the harvester in a uniform and expeditious manner.

5,090,188

RIDGED RACQUET STRING

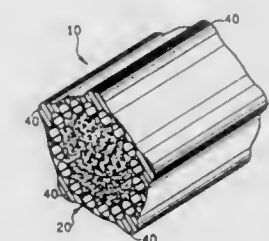
Tseng Y. Lin, No. 17 Ping Ho Road, Chung Ho City, Taiwan, and Sam H. Chen, 13947 Carriage Rd., Poway, Calif. 92064
PCT No. PCT/US90/01698, § 371 Date Jun. 20, 1990, § 102(e)
Date Jun. 20, 1990

Continuation-in-part of Ser. No. 470,706, Jan. 26, 1990. This PCT application Mar. 30, 1990, Ser. No. 555,524

Int. Cl.⁵ D02G 3/34

U.S. Cl. 57—234

21 Claims



1. A string adapted to be mounted in a frame head of a sports racquet used for striking a playing object comprising:

- an elastic, resilient string core of high tensile strength;
- a coating of synthetic material bonded to and surrounding said string core; said coating having a plurality of spaced apart, radially protruding ridges extending axially along the string core and in parallel relation to one another and a plurality of arcuate surface portions interconnecting side ridges, wherein said surface portions form a substantially circular perimeter;
- said ridges aiding in the imparting of spin to a playing object.

5,090,189

METHOD AND APPARATUS FOR PREPARING A YARN PACKAGE FOR A SUBSEQUENT YARN RESTARTING OPERATION

Edmund Wey, Nettetal; Manfred Anderheggen, and Hans Grecksch, both of Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Oct. 1, 1990, Ser. No. 591,447

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932727

Int. Cl.⁵ D01H 13/26, 9/00, 13/14

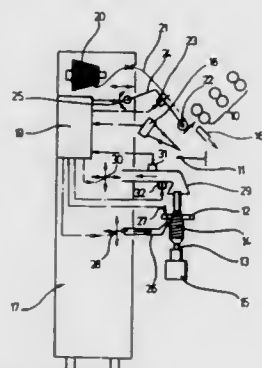
U.S. Cl. 57—261

9 Claims

1. A method for restarting the feed or yarn from a drafting device through a package building device to a yarn package supported at a spinning station of a textile machine, the restarting of the feed of yarn being performed to restart the winding of a package following a break in the yarn being fed to the package, the break in the yarn resulting in an end of unwound yarn which has been drafted through the drafting device and a trailing end of yarn which has already been wound on the package, the method comprising:

- delivering one length of auxiliary yarn to the package with the end of the one length of auxiliary yarn being freely disposed on the package independent from the trailing end of the already wound yarn;

disposing the one length of auxiliary yarn relative to the unwound yarn end for piecing therewith such that the one length of auxiliary yarn thereafter draws the unwound yarn pieced therewith onto the package as the one length of auxiliary yarn is wound on the package;
detecting the failure of the one length of auxiliary yarn to successfully piece with the unwound yarn end after a predetermined time period;
removing the one length of auxiliary yarn completely from



the package in response to the detection of the failure of the one length of auxiliary yarn to piece with the unwound yarn end; and
delivering another length of auxiliary yarn to the package in response to detection of the failure of the one length of auxiliary yarn to piece with the unwound yarn end, the delivering of the another length of auxiliary yarn to the package being coordinated with the completion of the removal of the one length of auxiliary yarn from the package.

5,090,190

DOUBLE SENSOR DOCKING SYSTEM PARTICULARLY FOR TEXTILE RING SPINNING MACHINES

Walter Slavik; Giorgio Citterio, both of Horgen, and Guido Brunecker, Oetwil, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

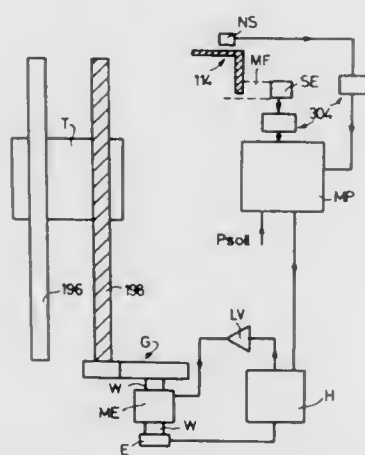
Filed Sep. 26, 1990, Ser. No. 588,165

Claims priority, application Switzerland, Oct. 3, 1989, 03596/89

Int. Cl.⁵ D01H 9/02, 15/00

U.S. Cl. 57—264

6 Claims



1. The combination of a service robot with a spinning machine comprising:
a spinning machine with a vertically reciprocating ring rail in the vicinity of a plurality of cops being wound with yarn;
a robot being movable lengthwise of said ring rail to posi-

tions opposite said cops and having working elements for carrying out tasks on the spinning machine, said robot further including:

- a vertically reciprocable carriage and a variable speed, reversible drive for said carriage;
- a first sensor having a first measuring range for sensing the vertical position of said carriage relative to said ring rail and for supplying a first signal representative of said vertical position;
- a second sensor having a second measuring range narrower than said first measuring range for sensing the vertical position of said carriage relative to said ring rail and for supplying a second signal representative of said vertical position;
- a control means operatively connected to said first sensor, said second sensor and said drive, said control means being responsive to the first signal supplied by said first sensor for controlling said drive to move said carriage vertically towards said ring rail until said second sensor is within said second measuring range, and said control means being further responsive to the second signal supplied by said second sensor when said second sensor is within said second measuring range for controlling said drive to maintain said carriage at a predetermined position vertically with respect to said ring rail.

5,090,191

TUBE GRIPPING APPARATUS FOR A TEXTILE MACHINE

Heinz Mueller, Sparwiesen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Apr. 11, 1990, Ser. No. 507,639

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911857

Int. Cl.⁵ D01H 9/00

U.S. Cl. 57—275

9 Claims



1. An apparatus for selectively gripping a tube of the type onto which yarn is built by a textile machine to form a yarn package, comprising:

- a housing;
- a tube engaging member movably supported on said housing for relative axial movement with respect to said housing along a pivot axis, said tube engaging member including a pair of gripping portions, at least one of said gripping portions being selectively movable radially inwardly with respect to said pivot axis to effect compressive gripping of a tube disposed between said gripping portions by said gripping portions;
- a gripping portion drive member movably supported on said housing for pivotal movement about said pivot axis;
- means for pivoting said gripping portion drive member about said pivot axis;
- means for moving said at least one gripping portion radially inwardly in response to relative axial movement of said tube engaging member with respect to said housing;
- pivot movement converting means for axially moving said tube engaging member with respect to said housing in response to pivoting of said gripping portion drive member about said pivot axis, whereby said at least one gripping portion moves radially inwardly to effect compressive gripping of a tube by said gripping portions; and
- said pivot movement converting means including a pair of rollers, said rollers being mounted on a selected one of

said gripping portion drive member and said tube engaging member, cam means mounted to the other of said gripping portion drive member and said tube engaging member, said cam means including a cam surface having an axially varying contour with respect to said pivot axis and means for continuously biasing said rollers into engagement with said cam surface whereby said tube engaging member moves axially relative to said housing as said rollers move along said cam surface in cam following fashion during pivoting of said gripping portion drive member.

5,090,192

PROCESS AND AN ARRANGEMENT FOR FALSE-TWIST SPINNING

Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

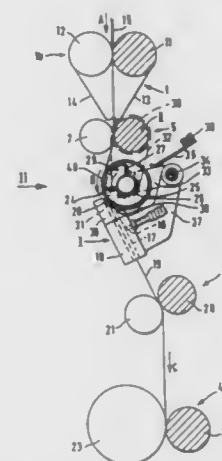
Filed Aug. 15, 1990, Ser. No. 567,787

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1989, 3927739

Int. Cl.⁵ D01H 5/28

U.S. Cl. 57—328

23 Claims



1. An arrangement for false-twist spinning comprising:
a drafting unit for drafting sliver,
at least one false-twisting nozzle arranged downstream of the drafting unit for false-twisting sliver to form a yarn,
a withdrawal device arranged downstream of the at least one false-twisting nozzle,
and a guiding element which is arranged between the drafting unit and the false-twisting nozzle, said guiding element being driven to perform rotations around an axis disposed transversely with respect to the yarn travelling direction, said guiding element forming a deflection with a yarn guiding surface moving in the travelling direction of the yarn and configured to cause relative sliding movement of the yarn on the yarn guiding surface,
wherein the guiding surface is driven at a speed which is higher than the delivery speed of the drafting unit and higher than the withdrawal speed of the withdrawal device such that yarn outer edge fibers are detached from central yarn core regions and are accelerated to a higher speed than the central yarn core regions.

5,090,193
ACTIVE CLEARANCE CONTROL WITH CRUISE MODE
Fred M. Schwarz; Clifton J. Crawley, Jr., both of Glastonbury; Anthony F. Rauseo, Middletown, and Ken R. Lagueux, Berlin, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

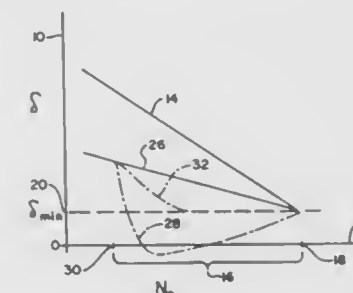
Filed Jun. 23, 1989, Ser. No. 370,434

The portion of the term of this patent subsequent to Feb. 25, 2000, has been disclaimed.

Int. Cl.⁵ F02C 7/18

U.S. Cl. 60—39.02

2 Claims



1. A method for operating an aircraft gas turbine engine having an active blade clearance control system, including means for delivering a scheduled flow of cooling air to the engine, the flow rate of cooling air scheduled responsive to an expected engine transient response to a step change in engine power level, comprising the steps of:

- selecting a cruising subrange of engine operating power levels within the permitted range of engine operating power levels,
- selectively providing an alternative cruise schedule of cooling air flow rates at corresponding current engine power levels within the cruising subrange, and
- limiting the magnitude of any step change in engine power level during operation of the engine within the cruising subrange.

5,090,194

FLUIDIC MULTIPLEXER FOR FLUID SERVOMOTORS IN A GAS TURBINE ENGINE

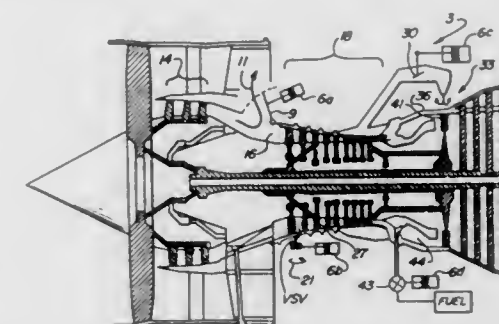
John C. Richards, Mason, and Joseph P. Smith, Jr., Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 156,688, Feb. 17, 1988, Pat. No. 4,986,305. This application May 11, 1990, Ser. No. 522,011

Int. Cl.⁵ F02C 9/16

U.S. Cl. 60—39.29

6 Claims



1. In a gas turbine engine, the improvement comprising:
(a) a plurality of fluidic motors;
(b) a plurality of fluid lines connecting the fluidic motors with a fluid multiplexer, the fluid multiplexer including:
(i) a drum;
(ii) a housing having a plurality of apertures and within

- which the drum is continuously unidirectionally rotatable;
- (iii) a conduit within the drum which sequentially connects each of the openings with a common fluid pressure source during rotation, said conduit comprising a bore and a plurality of branches; and
- (c) a servo valve means adapted to selectively connect said conduit to said common fluid pressure source.

5,090,195

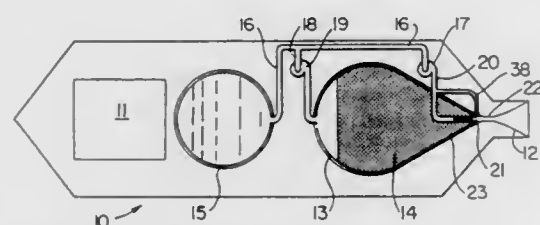
PROPULSION MOTOR USING FINE PARTICULATE MATERIAL

Jocelyn Boily, 1841 Greensacre Crescent, Gloucester, Ontario, Canada K1J 6S7

Continuation-in-part of Ser. No. 232,675, Aug. 16, 1988, abandoned. This application Oct. 23, 1990, Ser. No. 602,584
Claims priority, application Canada, Aug. 15, 1989, 608380
Int. Cl.⁵ F02B 75/00

U.S. Cl. 60—204

5 Claims



1. A method of propulsion comprising:
feeding a heated fine particulate material from a container of said heated fine particulate material to a convergent portion upstream of and adjacent to the throat of a propulsion nozzle;
feeding a fluid under pressure from a tank of said fluid to said convergent portion;
mixing said heated fine particulate material and said fluid and increasing the temperature and volume of said fluid by heat exchange between said particulate material and said fluid; and
ejecting said particulate material and said fluid at an increased speed from said nozzle.

5,090,196

DUCTED FAN TYPE GAS TURBINE ENGINE POWER PLANTS

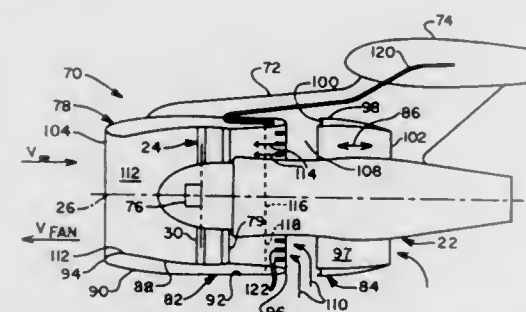
Ronald L. Balzer, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 21, 1989, Ser. No. 383,871

Int. Cl.⁵ F02K 1/70

U.S. Cl. 60—226.2

19 Claims



2. A ducted fan type power plant which is capable of generating reverse thrust and comprises:
a. a gas turbine engine;
b. a fan driven by said engine;
c. an elongated bypass duct which is open at its front and rear ends and surrounds said fan, said bypass duct having

a fixed forward section and a rear section which can be translated away from said fixed section as the pitch of the fan blades is reversed to reverse the flow of air through said bypass duct and generate a thrust directed from the front toward the rear of the power plant, thereby allowing air to be induced into said bypass duct through the downstream end thereof and also through the annular gap between the fixed and translated, rear sections of the bypass duct;

- d. means for generating a supply of high velocity fluid;
e. means for injecting the high velocity fluid into the bypass duct from a locus to the rear of said flow to:
(i) turn air induced into said bypass duct through the annular gap between the fixed and translated, rear sections of the bypass duct into paths generally paralleling the longitudinal axis of that duct, or
(ii) turn air induced into said bypass duct into parallel paths as aforesaid and promote the attachment of air to the inner surface of the fixed bypass duct section; and
f. means for delivering the high velocity fluid from said generating means to said injecting means.

5,090,197

PIVOTING DOOR CASCADE THRUST REVERSER
Claude A. G. Dubois, Honfleur, France, assignor to Societe Anonyme Dite Hispano Suiza, Saint Cloud Cedex, France

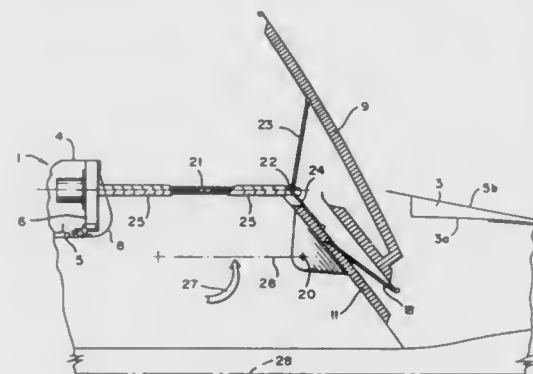
Filed Aug. 17, 1990, Ser. No. 568,885

Claims priority, application France, Aug. 23, 1989, 89 1155

Int. Cl.⁵ F02K 1/70

U.S. Cl. 60—226.2

9 Claims



1. A thrust reverser for a turbojet engine having a housing extending along a longitudinal axis and defining at least one generally laterally facing opening, an upstream outer housing surface and an upstream inner housing surface located upstream of the generally laterally facing opening, and a downstream outer housing surface and a downstream inner housing surface located downstream of the generally laterally facing opening, the upstream and downstream inner housing surfaces defining a boundary of a gas flow stream, the thrust reverser comprising:

- a) a first thrust reverser door;
b) first means pivotally attaching the first thrust reverser door to the housing so as to pivot about a fixed, first axis between a closed forward thrust position wherein the first thrust reverser door covers the generally laterally facing opening, and an open, reverse thrust position wherein the first thrust reverser door uncovers the generally laterally facing opening;
c) a second thrust reverser door located radially inwardly of the first thrust reverser door in a direction toward the longitudinal axis;
d) second means pivotally attaching the second thrust reverser door to the housing so as to pivot about a second axis extending generally parallel to the first axis, the second means enabling the second axis to move along a trans-

lational path such that the second thrust reverser door is movable between a first forward thrust position wherein the second axis is located at one end of the translational path and the second thrust reverser extends generally parallel to the gas flow stream, and a second, reverse thrust position wherein the second axis is located at an opposite end of the translational path and the second thrust reverser door deflects at least a portion of the gas flow stream toward the generally laterally facing opening;

- e) actuator means;
f) linkage means connecting the actuator means with the first and second thrust reverser doors such that the actuator means pivots the first and second thrust reverser doors in the same direction about their respective axes between their closed and open positions; and,
g) a cascade structure extending substantially over the generally laterally facing opening so as to direct the gas flow passing through the opening in a generally forward direction.

5,090,199

APPARATUS FOR CONTROLLING AIR-FUEL RATIO FOR ENGINE

Kenji Ikuta, Hekinan; Toshio Kondo, and Hiroshi Haraguchi, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

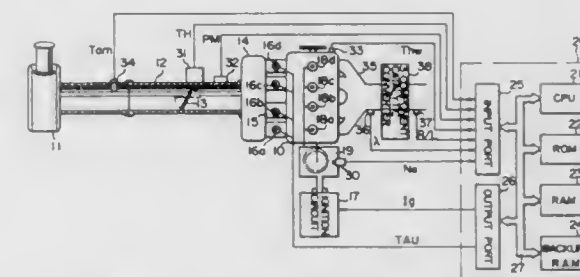
Filed Dec. 13, 1990, Ser. No. 626,829

Claims priority, application Japan, Dec. 14, 1989, 1-324291

Int. Cl.⁵ F01N 3/20

U.S. Cl. 60—276

12 Claims



1. An air-fuel ratio control apparatus for an engine, comprising:

- a catalyst, arranged in an exhaust pipe of the engine, for purifying an exhaust gas;
a first oxygen concentration sensor, arranged in an exhaust pipe of an engine, for outputting a first linear detection signal for an air-fuel ratio of a mixture gas supplied to the engine;
a second oxygen concentration sensor, arranged on a downstream side of a catalyst to purify an exhaust gas which is exhausted from the engine, for outputting a second detection signal according to whether the air-fuel ratio is rich or lean for a stoichiometric air-fuel ratio;
target air-fuel ratio setting means for setting a target air-fuel ratio in accordance with the second detection signal; and
fuel injection amount setting means for setting a fuel injection amount which is supplied to the engine in accordance with the first detection signal and the target air-fuel ratio.

5,090,200

REGENERATION SYSTEM FOR PARTICULATE TRAP
Minoru Arai, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

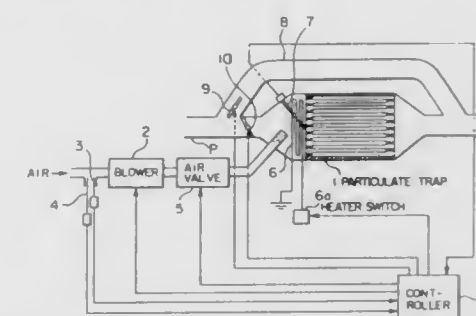
Filed Mar. 13, 1990, Ser. No. 492,136

Claims priority, application Japan, Mar. 30, 1989, 1-78998

Int. Cl.⁵ F01N 3/02

U.S. Cl. 60—286

7 Claims



1. A regeneration system for a particulate trap having an inlet and provided in an exhaust pipe of an engine, comprising:
air supplying means for supplying regenerating air for said trap, said air supplying means having an atmosphere intake portion;
sensing means for sensing atmospheric pressure provided at the atmosphere intake portion of said air supplying means;
sensing means for sensing atmospheric temperature pro-

5,090,198

MOUNTING ASSEMBLY

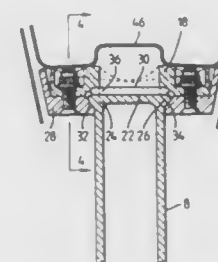
Douglas J. Nightingale, Jonesboro; Martyn G. Roberts, Roswell, both of Ga., and Paul Newman, Bristol, England, assignors to Rolls-Royce Inc. & Rolls-Royce plc, England

Filed May 4, 1990, Ser. No. 519,156

Int. Cl.⁵ F02K 3/08

U.S. Cl. 60—261

14 Claims



10. A gas turbine engine having a jet pipe containing a reheat system, said reheat system comprising:

- an annular metallic support structure mounting in the jet pipe;
a plurality of slotted members spaced apart around the structure, each of said slotted members being detachably fixed to said support structure and being formed with a slot having angled locating faces and a first end face which define a dovetail recess, said plurality of slotted members defining a plurality of dovetail fixings;
a plurality of non-metallic flameholders, each of said flameholders comprising an elongate shaped member formed at one end with a second end face and angled adjacent sides which cooperate to form a dovetail projection, which for mounting is individually received into the dovetail recess of one of said slotted members, the relative dimensions of each of said slotted members and each said dovetail projection being such that an expansion gap is defined between each of corresponding pairs of said first and second end faces; and
a resilient means interposed in each said expansion gap, between said first and second end faces of each of said corresponding pairs, operative to urge corresponding ones of said locating faces and said adjacent sides into engagement over a broad temperature range while absorbing differential thermal expansion.

vided at the atmosphere intake portion of said air supplying means;
inlet temperature sensing means for said trap provided at the inlet of said trap; and
control means for determining the flow rate of said regenerating air based on the sensed atmospheric pressure and temperature during regeneration, for correcting the determined flow rate on the basis of the sensed inlet temperature at the time of initiation of the regeneration, and for controlling said air supplying means according to the corrected flow rate.

5,090,201

FLUID PRESSURE ACTUATOR

Derek W. Smith, Wickford, England, assignor to Automotive Products plc, Warwickshire, England
PCT No. PCT/GB89/00474, § 371 Date Oct. 31, 1990, § 102(e)
Date Oct. 31, 1990, PCT Pub. No. WO89/11040, PCT Pub. Date Nov. 16, 1989

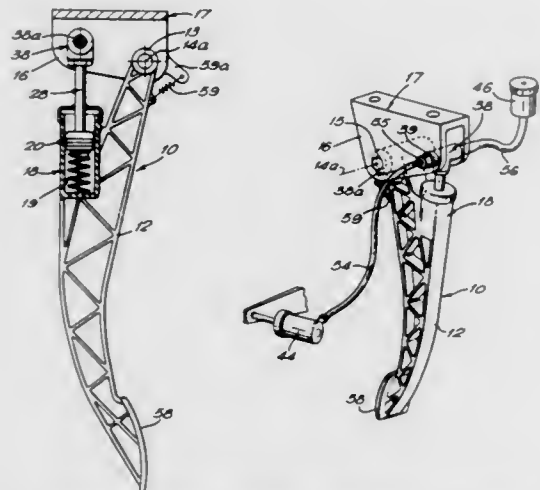
PCT Filed May 4, 1989, Ser. No. 603,685

Claims priority, application United Kingdom, May 4, 1988, 8810553

Int. Cl.⁵ B60T 11/28; B15B 7/00

U.S. Cl. 60—589

22 Claims



1. A hydraulic master cylinder comprising a lever to be mounted at one end for pivoting about a pivot axis, the other end being an operating end of the lever, a cylinder rigid with the lever and having a blind bore, the open end of said bore being adjacent the pivot axis, and the base of the bore being adjacent the operating end of the lever, a piston axially slidable in said cylinder, the piston having an operating member extending out of the open end of the bore, the operating member being mountable at a position remote from the piston for pivoting about a further pivot axis spaced from the axis of pivoting of the lever, and the operating member being generally coaxial of the bore and being arranged to tilt relative to the cylinder during pivotal movement of the lever.

5,090,202

INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH SUPERCHARGER

Mitsuo Hitomi, Fumio Hinatake, Toshio Nishikawa, and Nobuo Takeuchi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 27, 1989, Ser. No. 427,480

Claims priority, application Japan, Oct. 29, 1988, 63-274120

Int. Cl.⁵ F02B 37/00

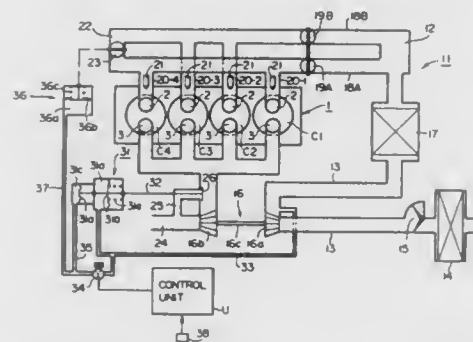
U.S. Cl. 60—602

14 Claims

1. An intake system for an internal combustion engine with a supercharger, comprising:
intake passage means for introducing intake air into each of

a plurality of cylinders of said engine, said passage means having first intake passages, each of which is individually connected with one of said cylinders, and a second intake passage which is in communication with said first intake passages;

supercharging means having a compressor which is disposed in said second intake passage for supercharging the intake air, said supercharging means providing a kinetic supercharging effect to the intake air in said passage means;



first control means for varying supercharging pressure according to operating conditions of said engine;
second control means for varying said kinetic supercharging effect so that volumetric efficiency is changed in accordance with the operating conditions of said engine; and
synchronizing means for synchronizing said first control means and said second control means so that the supercharging pressure is varied by said first control means at a time when the volumetric efficiency is changed by the second control means.

5,090,203

AIR AND FUEL SUPPLY CONTROL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Haruo Okimoto, Toshimichi Akagi, and Seiji Tashima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima

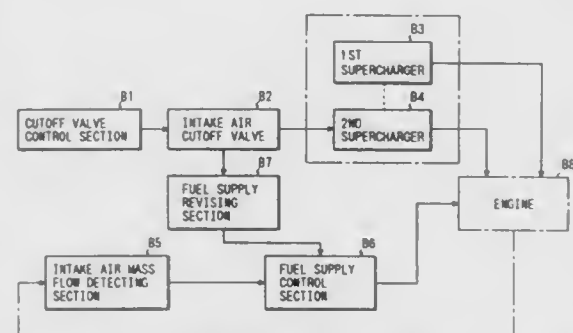
Filed Mar. 5, 1990, Ser. No. 488,228

Claims priority, application Japan, Mar. 9, 1989, 1-57285

Int. Cl.⁵ F02B 37/12

U.S. Cl. 60—612

9 Claims



1. An air and fuel supply control system for an internal combustion engine, the system comprising:

a plurality of superchargers including at least a first supercharger and a second supercharger which is constituted as a turbosupercharger having a turbine disposed in one of separated exhaust passages extending from the engine and a compressor disposed in one of separated intake passages connected with the engine,

an intake air cutoff valve for selectively opening and closing the separated intake passage in which the compressor of said second supercharger is disposed,
cutoff valve controlling means for causing said intake air

cutoff valve to be closed so that said first supercharger works for supercharging the engine but said second supercharger is restrained from supercharging the engine when intake air mass flow fed to the engine is relatively small and causing said intake air cutoff valve to be open so that both of said first and second superchargers work for supercharging the engine when the intake air mass flow fed to the engine is relatively large,

intake air mass flow detecting means disposed in an intake passage from which separated intake passages are branched for detecting intake air mass flow passing through said intake passage,

a cutoff valve state determining control which determines when said intake air cutoff valve is selectively opened and closed,

fuel supply control means for determining a quantity of fuel to be supplied to the engine, wherein said quantity of fuel is determined on the basis of a detection output obtained from said intake air mass flow detecting means, and
fuel supply revising means for revising said quantity of fuel determined by the fuel supply control means on the basis of the output from the intake air mass flow detecting means, wherein said revising means revises said quantity in response to the state of the intake air cutoff valve determined by said cutoff valve state determining control to revise said quantity of fuel during a predetermined period of time after the intake air cutoff valve is opened or closed so that an air to fuel ratio in the engine is prevented from being undesirably changed during a predetermined period of time after the intake air cutoff valve is opened or closed.

5,090,204

PROCESS AND DEVICE FOR BOOST CONTROL

Jörg Bonitz, Mühlacker; Siegfried Rohde, Oberriexingen; Bernhard Müller, Stuttgart, and Walter Künzel, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00555, § 371 Date Apr. 30, 1990, § 102(e)
Date Apr. 30, 1990, PCT Pub. No. WO90/03503, PCT Pub. Date Apr. 5, 1990

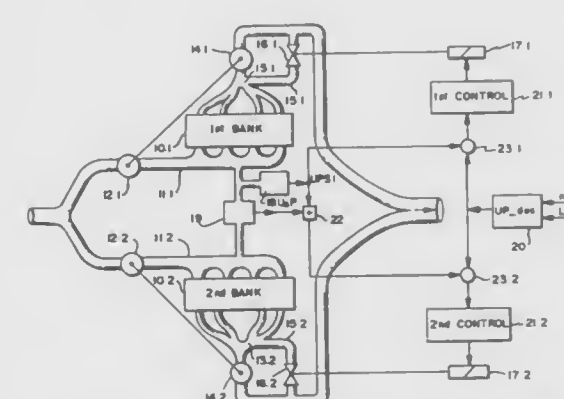
PCT Filed Aug. 24, 1989, Ser. No. 477,974

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3832965

Int. Cl.⁵ F02B 33/44

U.S. Cl. 60—612

4 Claims



1. A method for boost control in an internal combustion engine having a first suction path communicating with a first supercharger and a second suction path communicating with a second supercharger wherein the respective suction pressures are controlled, the method comprising the steps of:
measuring the boost pressure in the first suction path and regulating this boost pressure to a desired value; and,
measuring the differential pressure between the boost pressures in the first and second suction paths and regulating the boost pressure in the second suction path to the de-

sired value by utilizing both said boost pressure in the first suction path and said differential pressure.

5,090,205

METHODS AND APPARATUS FOR PERIODIC CHEMICAL CLEANINGS OF TURBINES

Charles D. Foster, Rte. 4, Box 70G, Keyser, W. Va. 26726

Continuation of Ser. No. 398,910, Sep. 28, 1989, Pat. No.

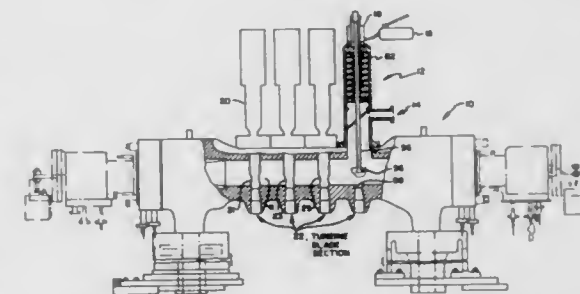
5,018,355. This application Mar. 11, 1991, Ser. No. 667,327

The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.

Int. Cl.⁵ F01K 21/00

U.S. Cl. 60—646

14 Claims



1. Apparatus for injecting cleaning material into a steam chest of a turbine, the steam chest having at least one aperture leading to the turbine and having mounting means for mounting a turbine steam inlet control valve for selectively sealing said aperture, said injection apparatus comprising:

a housing having an inlet and an outlet;
attachment means for attaching said housing to said mounting means of said steam chest so that said outlet is in communication with the interior of the steam chest; and
closure means reciprocally mounted to said housing for selectively sealing said steam chest aperture leading to said turbine,
whereby a cleaning material injected through said inlet in said housing will pass through said outlet of said housing into said steam chest and reciprocal movement of said closure means allows said cleaning material to selectively enter the turbine.

5,090,206

VIBRATION-DAMPENING ARRANGEMENT FOR A REFRIGERATOR OPERATING ACCORDING TO THE GIFFORD-McMAHON PRINCIPLE

Wilhelm Strasser, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Leybold AG, Hanau, Fed. Rep. of Germany

Filed Jan. 14, 1991, Ser. No. 641,308

Claims priority, application European Pat. Off., Jan. 18, 1990, 90101004

Int. Cl.⁵ F25B 9/00

U.S. Cl. 62—6

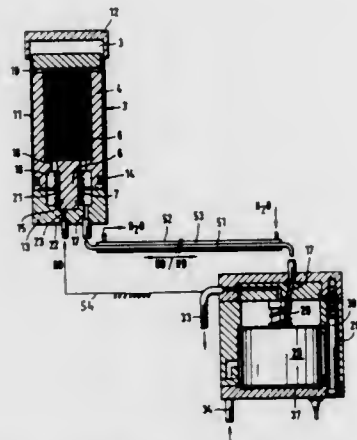
16 Claims

1. In a refrigerator operating on the Gifford-McMahon principle, including

a housing defining a work chamber;
a displacement member received in said housing and being movable back and forth between two dead center positions; said displacement member having an outer diameter, a first end bounding said work chamber and an opposite, second end oriented away from said work chamber;
a regenerator mounted in said displacement member;
a piston attached to and extending from said second end; said piston having an outer diameter smaller than the outer diameter of said displacement member;
a drive cylinder disposed in said housing and being arranged for slidably receiving said piston; and
first means for introducing a low-pressure working gas and a high-pressure working gas into said drive cylinder and

said work chamber for reciprocating said displacement member between said dead center positions; the improvement comprising

- (a) second means for exerting a continuous force on said displacement member in a direction of one of the first and second ends thereof;



- (b) a conduit, forming part of said first means, communicating with said drive cylinder for continuously maintaining one of said low-pressure gas and said high-pressure gas in said drive cylinder dependent upon the direction of said continuous force; and
(c) a throttle contained in said conduit.

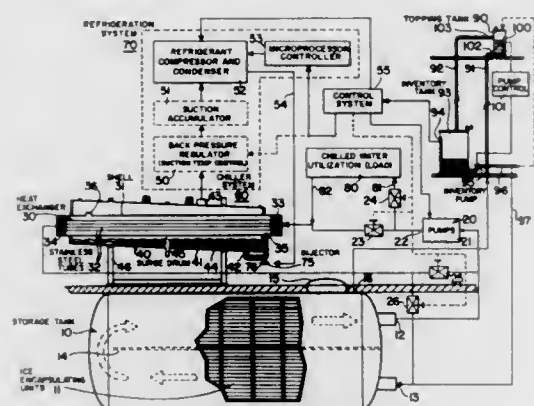
5,090,207 ICE BUILDING, CHILLED WATER SYSTEM AND METHOD

Thomas A. Gilbertson, Moraga, and Michael R. Meyers, Sonoma, both of, assignors to Reaction Thermal Systems, Inc., Napa, Calif.

Continuation of Ser. No. 284,890, Dec. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 11,617, Feb. 6, 1987, abandoned. This application Nov. 30, 1990, Ser. No. 620,276
Int. Cl.³ F25D 17/02; F28D 20/00

U.S. Cl. 62—59

22 Claims



1. In a chilled liquid system, in combination: structural means defining a first vessel means for containing a first volume of a first liquid characterized by a first freezing temperature and a second vessel means for containing a second volume of said first liquid, said second vessel means being in liquid transfer communication with said first vessel means;
a multiplicity of ice encapsulating units disposed in said first vessel means and occupying a major portion of the volume thereof, each of said ice encapsulating units comprising container means completely filled with a second liquid

characterized by a second freezing temperature higher than said first freezing temperature and volume expansion during freezing, said container means having a parallelepiped shape with major top and bottom wall portions such that said container means are stackable top to bottom, side to side, and end to end to form a three dimensional array of said container means within said first vessel means, at least one of said top and bottom wall portions having a plurality of separated protruding means formed thereon to separate a top surface of each of said container means from a bottom surface of an overlying one of said container means and thereby forming liquid flow passages therebetween, said top and bottom wall portions having deformable wall structures to permit deformation of said walls into said liquid flow passages to increase the internal volume of said container means as said second liquid freezes and expands therewithin but without any major flexing or stressing of said deformable wall structures;

a liquid chilling system operatively associated with said first vessel means for cooling said first liquid in said vessel to an ice making temperature above said first freezing temperature and below said second freezing temperature to freeze said second liquid in each of said ice encapsulating units; said first vessel means being completely filled with a combination of said ice encapsulating units and a volume of said first liquid; said second vessel means having therein a volume of said first liquid of a first value when the second liquid in said ice encapsulating units is entirely unfrozen and having therein a volume of said first liquid of a second value when the second liquid in said ice encapsulating units is entirely frozen, said second value being higher than said first value by the amount of expansion of said ice encapsulating units during freezing of said second liquid therein.

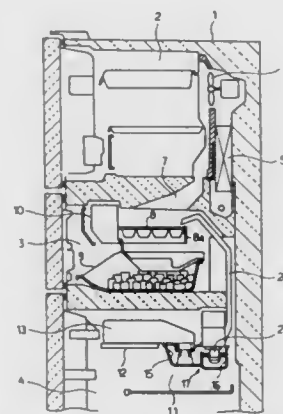
5,090,208 REFRIGERATOR WITH AN AUTOMATIC ICE MAKER

Masao Aono, Mishima, and Hiroshi Kanaoka, Suita, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 23, 1990, Ser. No. 601,389
Claims priority, application Japan, Oct. 24, 1989, 1-276399
Int. Cl.³ F25C 1/12

U.S. Cl. 62—347

3 Claims



1. a refrigerator equipped with an ice maker and having at least one ice making compartment provided therein, the ice maker comprising:

- a) an enclosed water tank;
b) a water reservoir supplied with water from the water tank by the effect of a difference between water heads, until the water reaches a predetermined water level, water being so supplied every time the level of the water reserved therein is decreased below the predetermined water level;
c) a measuring vessel communicated to the water reservoir

through a relatively small water path so that the water is supplied thereto from the water reservoir by the effect of the difference in the water heads, until the water level corresponding to the water level in the water reservoir is reached therein, the measuring vessel having a lid portion disposed so as to horizontally partition the interior of the measuring vessel at a water level position;

- d) an ice tray disposed in the ice making compartment; and
e) pump means for supplying the ice tray with the water reserved in the measuring vessel.

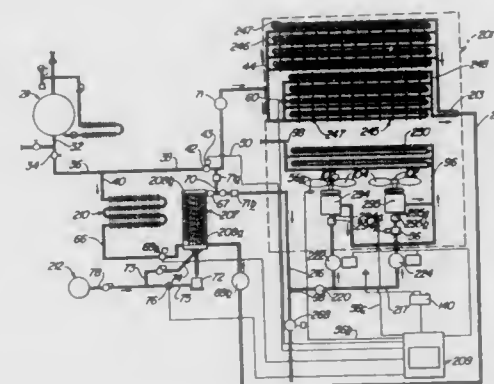
5,090,209 ENTHALPY CONTROL FOR CO₂ REFRIGERATION SYSTEM

Patrick S. Martin, Dallas, Tex., assignor to General Cryogenics Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 591,386, Oct. 1, 1990. This application Feb. 6, 1991, Ser. No. 651,206
Int. Cl.³ F25D 21/06

U.S. Cl. 62—50.3

22 Claims



1. A method of refrigerating air in a compartment comprising the steps of: delivering liquid carbon dioxide through a first heat exchanger such that sufficient heat is absorbed to evaporate the liquid carbon dioxide to form pressurized vapor; heating the vapor to a temperature to prevent solidification of the carbon dioxide when it becomes depressurized; depressurizing the vapor to provide isentropic expansion of the vapor into a second heat exchanger; delivering vapor from the second heat exchanger to maintain surfaces in a dehumidifier at a temperature below the dewpoint of air in the compartment; and circulating air in the compartment in heat exchange relation with the surfaces in the dehumidifier and subsequently in heat exchange relation with carbon dioxide in the first and second heat exchangers such that moisture in the circulating air condenses on surfaces in the dehumidifier enroute to the first and second heat exchangers.

5,090,210 CONTROL SYSTEM FOR ICE MAKING APPARATUSES

Hideyuki Katayanagi, and Hideaki Furutachi, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 8, 1991, Ser. No. 667,607
Claims priority, application Japan, Mar. 12, 1990, 2-58091; Mar. 12, 1990, 2-58092

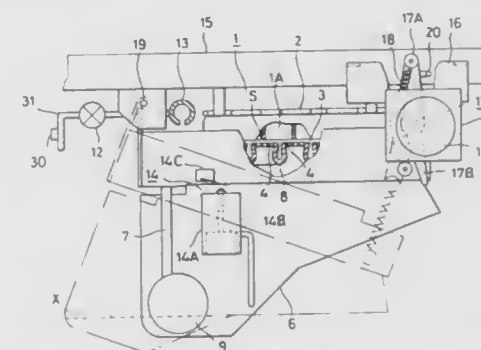
U.S. Cl. 62—135

3 Claims

1. A control system for use with an ice making apparatus of a refrigeration system having a multiplicity of ice making chambers and a refrigeration means for freezing water introduced in the ice making chambers, the refrigeration system repeating an ice making cycle which consists of a refrigeration process for freezing the water and of an ice releasing process for releasing the ice formed in the chambers, the control system comprising:

a condensation sensor for detecting the thermal conditions

of a refrigerant through a condenser in the refrigeration system;
a sensor for detecting the temperature of said refrigeration means;
instruction means having means for adjusting the time of said refrigeration process based on the output of said condensation sensor,
means for terminating said ice releasing process based on the output of said refrigeration sensor,



- counters for counting the time required for said refrigeration process and the time required for the ice releasing process for each ice making cycle,
memories for storing and updating time data corresponding to the counted times,
sensors for detecting abnormality of said condensation sensor and refrigeration sensor, and
a control means for enabling said ice making cycles based on the time data obtained in the preceding ice making cycle and stored in said memories even when said sensors malfunction.

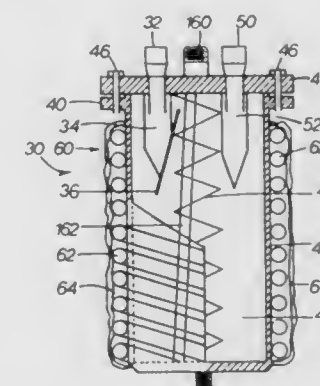
5,090,211 REFRIGERANT RECOVERY AND RECYCLING SYSTEM

Raymond L. Peters, Jefferson City, Mo., assignor to ReKlame, Inc., Jefferson City, Mo.

Filed Mar. 12, 1990, Ser. No. 491,492
Int. Cl.³ F25B 45/00

U.S. Cl. 62—149

9 Claims



1. A refrigerant recovery and recycling system comprising: a combined oil separator, moisture separator, and filtering means having an input connected to a refrigeration unit in which the refrigerant is to be recovered;
a compressor means having an output and an input which is connected to the output of the combined oil separator, moisture separator and filtering means, a condensing means having an input connected to the output of the compressor means and an output;
an expansion valve connected to the input of the combined oil separator, moisture separator and filtering means; and
a refrigerant storage means connected to the output of the

condensing means for the collection and storage of refrigerant recovered from a refrigeration unit.

5,090,212

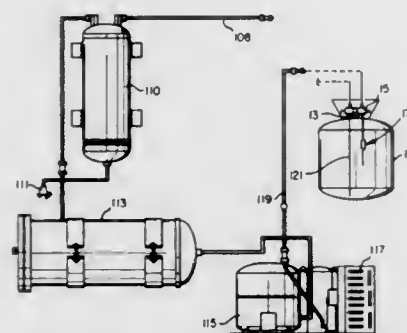
CUTOFF SWITCH FOR REFRIGERANT CONTAINER
Robert L. Keltner, Scurry, and Jim B. Ferguson, Arlington, both of Tex., assignors to Technical Chemical Company, Dallas, Tex.

Filed Dec. 17, 1990, Ser. No. 628,219

Int. Cl.⁵ F25B 45/00; H01H 35/18

U.S. Cl. 62—149

9 Claims



1. In a refrigerant recovery apparatus of the type with a compressor having a suction line adapted to be connected to a refrigerant system for withdrawing refrigerant from the system and compressing the refrigerant, a condenser for condensing the compressed refrigerant, and a storage container for receiving the condensed refrigerant, an improved means for disabling the compressor when the storage container reaches a selected maximum level, comprising in combination:

float means located in the storage container for rising in the storage container as the level of refrigerant in the storage container rises;

a magnet housing having a longitudinal axis and coupled to the storage container;

a magnet carried in the magnet housing and movable axially relative to the magnet housing;

linkage means including a longitudinally movable link extending between the float means and the magnet for moving the magnet along the longitudinal axis from an empty position to a maximum level position in response to movement of the float means during filling of the storage container;

at least one Hall Effect sensor means for providing an electrical indication when the magnet is in the maximum level position;

means for coupling the Hall Effect sensor means to the magnet housing so that the Hall Effect sensor means may sense the presence of the magnet; and

circuit means connected with the Hall Effect sensor means for detecting said electrical indication and for disabling the compressor when detecting said electrical indication.

5,090,213

CONTAINER FOR LIQUID HAVING A COOLING CAPACITY

Neil D. Glassman, 1418 Marshall La., Meadowbrook, Pa. 19046

Filed Jan. 15, 1991, Ser. No. 641,599

Int. Cl.⁵ F25D 3/08

U.S. Cl. 62—457.3

6 Claims

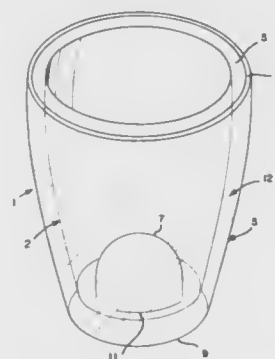
1. A container for receiving a liquid, consisting essentially of:

a cup-shaped inner portion for receiving the liquid, having a rim and a closure for receiving a means for maintaining the liquid at a desired temperature; and

a cup-shaped outer portion having a rim and a surface for grasping by a user;

wherein the rim of the inner portion is attached to the rim of the outer portion so that the only interconnection between

the inner portion and the outer portion is the attached rim of the inner portion and rim of the outer portion, separating the inner portion and the outer portion from each other to define a fully open space between surface and



base portions of the inner portion and surface and base portions of the outer portion, thereby isolating the surface for grasping by the user from the inner portion for receiving the liquid and for maintaining the liquid at the desired temperature.

5,090,214

SPRAY MATE COOLER

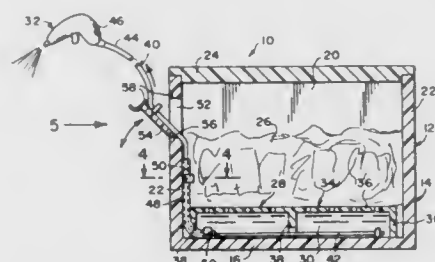
Michael J. LoGioco, 2 Inglewood Dr., Hampton, Va. 23666

Filed May 31, 1991, Ser. No. 710,744

Int. Cl.⁵ F25D 3/08; B67D 5/62

U.S. Cl. 62—457.7

8 Claims



1. A spray mate cooler which comprises:

a) a portable ice chest being a box-shaped container having bottom, front, back and side inter-connecting walls;

b) a removable lid supported on the top edges of said box-shaped container so that said box-shaped container can receive and hold a supply of ice therein for cooling;

c) means on the bottom wall of said box-shaped container, for elevating the supply of ice to permit cold water of the melted ice to collect on the bottom wall; and

d) means for spraying the cold water collected on the bottom wall out through one of the side walls of said box-shaped container.

5,090,215

APPARATUS FOR THE DISPOSAL OF COOLING AGENT OF ABSORPTION-TYPE REFRIGERATING SYSTEMS

Rolf-Dieter Giesler, Kreuztal; Volker Muller, Hilchenbach-Allenbach, and Karl-Gösta Almén, Siegen, all of Fed. Rep. of Germany, assignors to Electrolux Siegen GmbH, Siegen, Fed. Rep. of Germany

Filed Nov. 20, 1990, Ser. No. 615,895

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1989, 3939296

Int. Cl.⁵ F25B 43/04, 47/00

U.S. Cl. 62—475

9 Claims

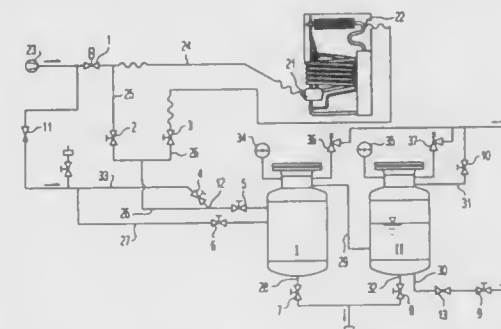
1. Apparatus for evacuating and disposing of the coolant of

absorption-type refrigerating systems, the cooling agent of which contains an auxiliary gas, water as solvent as well as a corrosion inhibitor, comprising

a first and a second adapter for connection of the refrigerating system to be emptied,

an air compressor or pressurized air connection member connected to said first adapter via a blockable pressurized air pipe and a relating valve,

a first pressure vessel being in connection with said second adapter via a blockable pressure pipe and relating valves



and comprising an outlet with a valve for the liquid collected in the vessel,

a second pressure vessel connected to said first pressure vessel via a connection pipe and comprising a fresh water supply, a waste air pipe as well as an outlet with a valve, wherein said connection pipe starting from the top end of said first pressure vessel, ends into the lower half of said second pressure vessel and

wherein for emptying the refrigerating system, said second pressure vessel is filled with water up to about one half and the valves are opened.

5,090,216

ENHANCED GEMSTONE

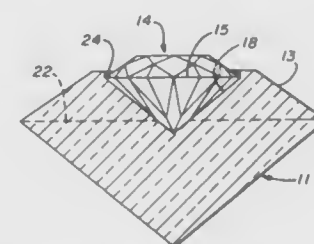
John T. Waugh, Austin, Tex., assignor to CJC Holdings, Inc., Austin, Tex.

Filed Dec. 31, 1990, Ser. No. 636,492

Int. Cl.⁵ A44C 17/02

U.S. Cl. 63—26

14 Claims



1. An enhanced gemstone comprising:

a semiprecious stone having a crown member with a table surface;

a conical seat centered in the table surface of the semiprecious stone;

a precious stone having a crown with girdle facets, a girdle with a diameter of less than the table surface width with the semiprecious stone and a pavilion member matching the angle of the conical seat;

the conical seat in the semiprecious stone having a depth such that the girdle of the precious gemstone is below the surface of the table of the semiprecious gemstone; and means for securing the precious stone in the conical seat to form an enhanced gemstone.

5,090,217

GEM MOUNTING

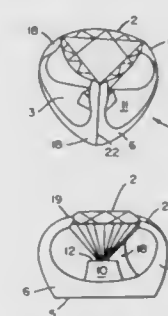
Jacque S. Beber, and Richard A. Beber, both of 2061 Mesa Dr., Santa Ana Heights, Calif. 92707

Filed Apr. 30, 1991, Ser. No. 693,604

Int. Cl.⁵ A44C 17/02

U.S. Cl. 63—27

18 Claims



1. A mounting for a gem that has a pointed tip, comprising: a base;

a raised platform extending upwardly from said base, there being a small hole in said platform for receiving said pointed tip of said gem; and

a plurality of arms projecting upwardly and directly from said base and disposed radially outwardly of said platform such that distal ends of said arms engage and hold portions of said gem above said pointed tip.

5,090,218

LATCH NEEDLE FOR MACHINES PRODUCING KNIT GOODS

Bernhard Schuler, Sonnenbühl; Kurt Wiedenböfer, Albstadt; Otto Langenstein, Albstadt, and Siegfried Wissmann, Albstadt, all of Fed. Rep. of Germany, assignors to Theodor Groz & Söhne & Ernst Beckert, Albstadt-Ebingen, Fed. Rep. of Germany

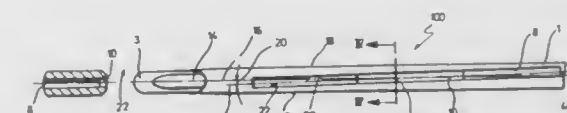
Filed Jul. 2, 1990, Ser. No. 546,938

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921458

Int. Cl.⁵ D04B 35/04

U.S. Cl. 66—121

8 Claims



1. A latch needle for machines producing knit goods, comprising:

a needle shank having a slot, said needle shank having a first longitudinal plane of symmetry and said slot having a second longitudinal plane of symmetry;

a needle head; and

a latch pivotally supported in said slot so as to be pivotable, into and out of contact with said needle head, about a latch axis extending transversely to said second longitudinal plane of symmetry; wherein said second longitudinal plane of symmetry intersects said first longitudinal plane of symmetry at an acute angle.

5,090,219

SETTING DEVICE FOR NEEDLE SELECTING APPARATUS OF A MULTISYSTEM CIRCULAR KNITTING MACHINE

Wilfried Schick, Bitz, Fed. Rep. of Germany, assignor to SIPRA Patententwicklung und Beteiligungsgesellschaft mbH, Tailfingen, Fed. Rep. of Germany

Continuation of Ser. No. 231,534, Aug. 11, 1988, abandoned.

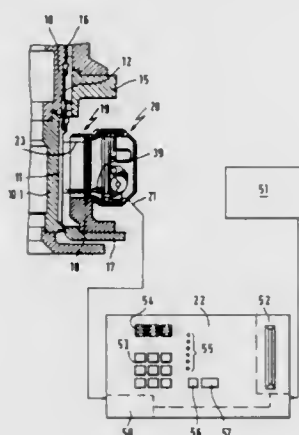
This application Dec. 22, 1989, Ser. No. 456,581

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727155

Int. Cl.⁵ D04B 37/04

U.S. Cl. 66—219

10 Claims



1. A setting device for use in connection with a multisystem circular knitting machine to selectively displace between a rest position and a working position pattern selecting blades of needle selecting apparatuses in respective systems of the machine, the machine including a plurality of selector bars coupled to jacks for controlling operative positions of needles of the machine, each selector bar having a control butt arranged at a different level and each needle selecting apparatus including at least one set of said selection blades arranged one above the other at the levels of respective control butts and means for locking said blades in either position thereof whereby during operation of the machine the blades which are locked in their working position engage the assigned control butts, the setting device comprising a removable displacement unit connected during the standstill of the machine to a needle selecting apparatus, the displacement unit including solenoid operated displacement means arranged opposite the entire set of the selecting blades to displace individual blades into a desired position when actuated, and a separate programmable electric control unit connected by a cable to said displacement unit to deliver according to a program actuation signals to said solenoid operated displacement means.

5,090,220

AUTOMATIC WASHING MACHINE HAVING TUB POSTURE TILTING MECHANISM

Sooichi Fukuzawa, Hitachi; Seiichi Hayashi, Yokohama; Et-surou Hirose, Hitachi, and Kazuo Miyashita, Tokyo, all of Japan, assignors to Hitachi, Inc., Tokyo, Japan

Filed Dec. 6, 1990, Ser. No. 623,027

Claims priority, application Japan, Dec. 18, 1989, 1-327582

Int. Cl.⁵ D06F 39/00

U.S. Cl. 68—3 R

28 Claims

16. An automatic washing machine having a tub posture tilting mechanism comprising:
a washing machine main body,
a washing tub for receiving a washing material to be washed and mounted in said washing machine main body, said washing tub is formed with a cylindrical-like shape having a bottom portion, said washing tub has a pulsator member for agitating the washing material to be washed and a

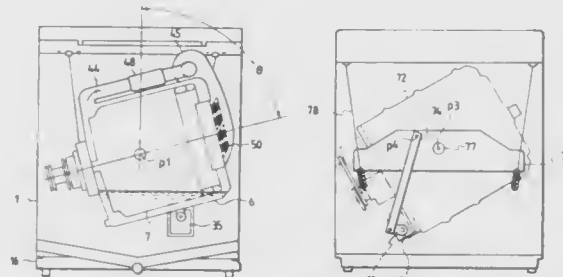
washing liquid and provided at a central portion of said bottom portion of said washing tub, said washing tub provides an opening portion for taking in or taking out the washing material to be washed at an opposite side of said bottom portion thereof and is formed a plurality of small size holes a side wall portion thereof,

an outer tub provided concentrically on an outer peripheral side of said washing tub and is formed with a cylindrical-like shape, and

a driving apparatus for driving said washing tub and said pulsator member and mounted on a bottom portion of said outer tub, wherein

a tub posture tilting mechanism for tilting postures of said washing tub and said outer tub together and mounted on an outer peripheral portion of said outer tub, and

a driving apparatus for driving said tub posture tilting mechanism,



said tub posture tilting mechanism is inclined from at a vertical state of said washing tub and said outer tub to a substantially horizontal state of said washing tub and said outer tub and positioned within an optional angle through an operation of said tub posture tilting mechanism driving apparatus,

said washing tub and said outer tub are inclined within a range between a vertical state and a horizontal state and are moved reciprocate according to said tub posture tilting mechanism, and

a triangular cross-sectional shape washing region is formed at an inner bottom portion and a side inner wall portion of said inclined washing tub, and the washing liquid is stored in said washing region of said washing tub,

thereby a delicate washing clothes is washed softly in said variable washing region of said inclined washing tub according to the reciprocate move of said washing tub.

5,090,221

CONTINUOUS CIRCULATION WATER WASH APPARATUS AND METHOD FOR CLEANING RADIOACTIVELY CONTAMINATED GARMENTS

Bruce R. Sewter, Browns Mills, N.J.; Lester Clemons, Jr., Monroeville; Joseph A. Battaglia, Forest Hills, both of Pa., and Thomas A. DeBarber, Cayucos, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,846

Int. Cl.⁵ D06F 43/08

U.S. Cl. 68—18 R

19 Claims

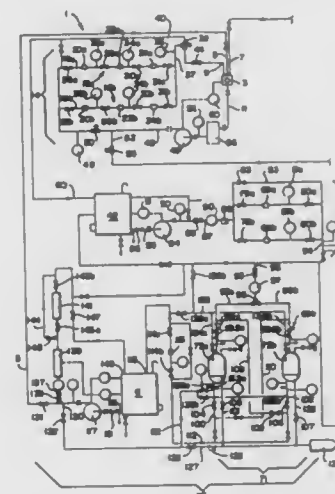
1. An apparatus for water washing fabrics and removing particulate radioactive contaminants therefrom comprising:

(a) a washing machine means for washing and rinsing said fabrics having a wash-water inlet, rinse water inlet, a circulation inlet, and a water outlet;

(b) a particulate removal system connected between the circulation inlet and the water outlet for continuously circulating water introduced into the washing machine means through a particulate removal means while said machine means washes and rinses said fabrics, and

(c) a hydraulically closed wash-water system and rinse water system connected to the wash-water inlet and the

rinse water inlet, respectively, for supplying polished wash-water and polished rinse water to the washing ma-



chine means, wherein each system includes its own separate water polisher.

5,090,222

ELECTRONIC LOCK BOX AND RETENTION MECHANISM FOR USE THEREIN

Mir A. Imran, Palo Alto, Calif., assignor to Supra Products, Inc., Salem, Oreg.

Continuation of Ser. No. 561,281, Aug. 1, 1990, abandoned,

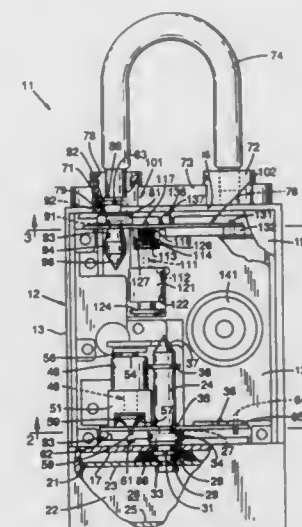
which is a continuation of Ser. No. 274,027, Nov. 21, 1988,

abandoned. This application Sep. 25, 1991, Ser. No. 765,455

Int. Cl.⁵ E05B 65/52

U.S. Cl. 70—63

12 Claims



1. In a retention mechanism, a housing, a member releasably mounted in the housing for movement between a first position and a second position, said member when disposed in said first position having a first portion within the housing, said first portion of the member having a shoulder formed thereon, spring means within the housing having first and second symmetrical leaves having free ends and movable between a shoulder engaging and latched position and a shoulder disengaging and unlatched position, said first and second leaves being adapted to yieldably engage opposite sides of said first portion of the member and said shoulder to assume said shoulder engaging and latched position to prevent movement of said member from the first position to the second position, and actuating means completely contained within the housing, having an axis

and being mounted for axial movement and including an element engaging said first and second leaves of the spring means remote from the free ends upon axial movement of the actuating means for moving substantially simultaneously said first and second leaves of said spring means in a direction substantially orthogonal to said axis and from said shoulder engaging and latched position to said shoulder disengaging and unlatched position to permit the movement of said member from the first to the second position, said member when in said second position having a second portion remaining within the housing, said symmetrical leaves of the spring means serving to render said retention mechanism substantially immune to hammer blows to the housing to prevent unauthorized movement of the member from said first position to said second position.

5,090,223

CAR THEFT DETERRENT TO DEFLATE TIRE

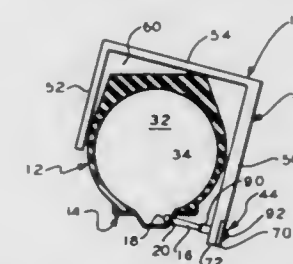
John Ruffler, 69 Hudson Ave., Irvington, N.Y. 10533

Filed Dec. 11, 1990, Ser. No. 625,432

Int. Cl.⁵ B60R 25/00; F16K 35/10

U.S. Cl. 70—175

20 Claims



1. The method of deterring movement of a vehicle that moves on air-inflated tires and for which there is an air-valve to facilitate passage of air into and out from the tires; comprising:

(a) providing an air-valve extraction device carried by a valve extraction device operating means;

(b) constructing the valve extraction device operating means of a size and configuration to be selectively positioned about at least a portion of a vehicle tire and for coaction therewith; and

(c) selectively connecting the air-valve extraction device to the vehicle tire air-valve when said valve extraction device operating means is positioned for coaction with the vehicle tire;

(d) said valve extraction device operating means coacting with a vehicle tire when positioned for coaction therewith such that said valve extraction device operating means is moved to a position underneath the vehicle tire upon predetermined movement of the vehicle tire to extract the air-valve and permit escape of the air from the vehicle tire.

5,090,224

METHOD OF DETERMINING THE SPRING CHARACTERISTIC OF A ROLL STAND

Alexander Svagr, Hilden; Georg Engel, Kaarst, and Hugo Feldmann, Alsdorf, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 632,169

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942452

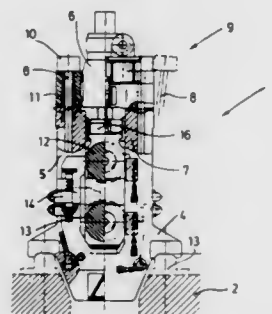
Int. Cl.⁵ B21B 31/20; G01L 5/00

U.S. Cl. 72—20

6 Claims

1. A method of determining the spring characteristic of a roughing and finishing roll stand and of adjusting a roll gap of the roll stand prior to rolling, particularly for rolling lightweight sections with narrow tolerances, the roll stand being a universal stand which is reassembled to a two-high stand with

tie rods and a hydraulic tensioning device for the tie rods, wherein at least one horizontal roll of the stand is adjustable by means of an electromechanical adjusting unit, the method comprising moving at least the upper of the horizontal rolls by means of the electromechanical adjustment unit of the rolls



toward the other roll, applying the rolling forces to be measured between the roll bodies by the hydraulic tensioning device, and adjusting by predeterminable adjustment distances the electromechanical adjustment unit in the unloaded state while maintaining roll contact.

5,090,225

METHOD FOR COOLING AND LUBRICATING CHIPLESSLY SHAPED METALS

Werner Schimion, Hilchenbach, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

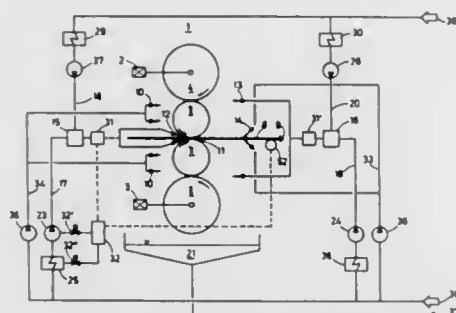
Filed Oct. 18, 1989, Ser. No. 423,795

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835460

Int. Cl.⁵ B21B 45/02

U.S. Cl. 72-45

7 Claims



1. In a method for cooling and lubricating chiplessly shaped metals and the shaping means for the metals, particularly for cooling and lubricating the rolls and/or the roller material in cold rolling of metal strips in a rolling mill stand, the method including supplying by means of emulsion nozzles emulsifiers and emulsions which contain at least one oil phase to the rolls and the rolled strip, the emulsion having characteristic properties, preparing the emulsion immediately in front of the rolls of the rolling mill stand and immediately in front of a strip inlet into a rolling gap formed by work rolls of the rolling mill stand in a dispersing unit by separately supplying the media which form the emulsion, the emulsion nozzles being directed to the rolling gap, the improvement comprising adjusting the characteristic properties of the emulsion in accordance with determined partial tensile stresses in the rolled strip and in accordance with existing bite conditions in the rolling gap as determined by the difference of the circumferential speed of the roll and the speed of the strip, and controlling the characteristic properties of the emulsion by selecting the quantity and type of the media to be emulsified and by selecting an emulsifying procedure, initially dissolving the emulsifiers in one of the fresh oil phase and the fresh water phase, spraying the oil phase

together with emulsifiers under pressure into the water phase in the dispersing unit, and, after performing the cooling and lubricating function, collecting the emulsion behind the rolling mill stand, adding emulsifiers to the used emulsion and conducting the used emulsion to a separating zone for emulsifying by means of means which avoid turbulence due to pumping and flow influences, again stabilizing the oil phase separated in the separating zone, conducting any mixed phase which still contains water back into the separating zone, and conducting the purified oil phase to the dispersing unit, and filtering the separated water phase and again stabilizing the water phase, conducting any mixed phase which still contains oil back into the separating zone and conducting the purified water phase to the dispersing unit.

5,090,226

MOTOR DRIVEN FLARING DEVICE

Katsushi Takeoka, Ikoma; Tsuyoshi Ohashi, Nagoya, and Yoshiharu Ikenaka, Higashiosaka, all of Japan, assignors to Rex Industries Co., Ltd., Osaka and Inoac Corporation, Aichi, both of Japan

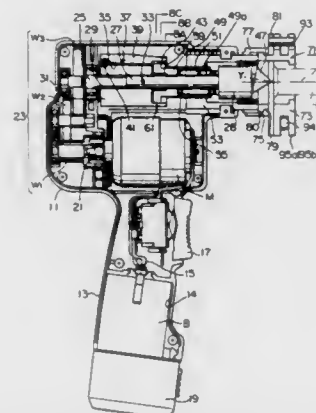
Filed Mar. 6, 1991, Ser. No. 665,461

Claims priority, application Japan, Mar. 15, 1990, 2-62714

Int. Cl.⁵ B21D 41/02

U.S. Cl. 72-117

18 Claims



1. A motor driven flaring device in which a rotatable eccentric cone an apex of which defines a fixed center of rotation is pressed, while rotating, against an end of a pipe to be flared to spread the end of the pipe into a conical shape, comprising: a body having a motor incorporated therein and having an output shaft to be connected to a drive source, said body being provided with a female threaded portion; a rotational drive shaft which is connected to the output shaft of the motor so as to relatively move in the axial direction thereof, said eccentric cone being rigidly secured to the rotational drive shaft; a feed screw shaft member which is connected to the rotational drive shaft and is screw-engaged by the female threaded portion of the body so as to rotate and move in the axial direction thereof; a one-direction rotation transmission means between the rotational drive shaft and the feed screw shaft member for transmitting the rotation of the rotational drive shaft to the feed screw shaft member only in one direction; and, an elastic means between the feed screw shaft member and the rotational drive shaft for continuously biasing the rotational drive shaft in one predetermined axial direction.

5,090,227

ROLL FORMING APPARATUS

Shin Takeda, Nagoya; Masami Ishii, Toyota; Mitsuhiro Ozawa, Hekinan, and Toshihisa Terazawa, Ichinomiya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

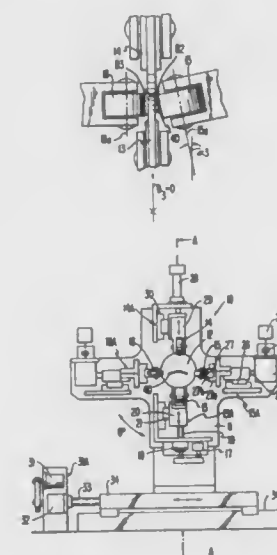
Filed Aug. 3, 1990, Ser. No. 562,625

Claims priority, application Japan, Aug. 4, 1989, 1-203646

Int. Cl.⁵ B21D 5/14

U.S. Cl. 72-178

22 Claims



1. A roll forming apparatus comprising a drivingless roll forming stand for roll forming a strip comprising: (a) a transverse slide table which is movable and positionable transverse to a feed axis of the strip fed through the roll forming stand; (b) a rotatable plate member having a central through-hole and being rotatably secured on the slide table about an axis parallel to the feed axis of the strip; (c) an upper roll unit, a lower roll unit and side roll units secured to said plate member all said roll units being nondriven said roll units disposed around the central through-hole, wherein said upper roll unit, said lower roll unit, and said side roll units rotate in unison about said through-hole as said plate member is rotated, and (d) shifting means associated with each of said rolls for independently positioning each roll at predetermined positions relative to the plate member and the feed axis of the strip.

5,090,228

WINDOW AND ROLL CHOCK ARRANGEMENT FOR A ROLLING MILL

Winfried Schmiedberg, Pittsburgh, Pa., and Dieter Daub, Hilchenbach, Fed. Rep. of Germany, assignors to SMS Engineering, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1989, Ser. No. 455,494

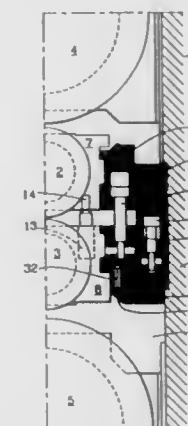
Int. Cl.⁵ B21B 31/08, 31/18, 31/32

U.S. Cl. 72-238

17 Claims

1. In a rolling mill stand comprising upright housing means, a vertical window in said housing means, a pair of upper and lower work rolls received in said window having their axes of rotation in a substantial common vertical plane and arranged to form a roll pass, each said roll having bearing chock means for rotatably supporting the opposite ends of said rolls in said window, in which similar ends of said rolls form cooperative pairs, each pair comprising an upper and lower chock means, said chock means having opposite vertical sides, said chock means for said lower roll having a side remote from said pass line, said housing means having stationary block members for

said opposite vertical sides of each chock means extending into said window at a location to lend support to said opposite sides of said chock means, intermediate means for each chock means arranged between and in contact with each said block member and an associated said vertical side of said chock means, in a manner to permit said chock means to move axially of the axis of an associated roll relative to said intermediate means and to permit said intermediate means to move vertically with respect to said window relative to an associated block member, means arranged in said window contact with and extendable between each said cooperative pair of chock means for vertically separating said rolls with respect to said window and supporting said rolls in a separated condition,



each of said opposite side of said lower chock means having carrying means, each said block member comprising a pair of rail means arranged adjacent said opposite sides of said lower chock means, for selectively engaging said carrying means thereby allowing in said separated condition said rolls as a unit with their chock means to be removed and replaced to and from said window, means carried by each said block member connected to said rail means for moving said rail means into and out of operative and inoperative positions, and said pair of rail means arranged in a generally coplanar relationship with said side of said chock means of said lower roll remote from said roll pass when in said operative and inoperative positions.

5,090,229

APPARATUS FOR SUPPORTING A WORKPIECE

Roger A. Hahn, Arvada; Ray L. Bowles; Robert H. Schultz, both of Golden; Warren R. Williams, Collins, and Michael E. Bagrosky, Arvada, all of Colo., assignors to Coors Brewing Company, Golden, Colo.

Filed Dec. 7, 1990, Ser. No. 624,351

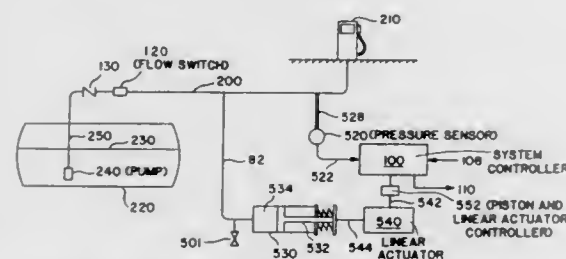
Int. Cl.⁵ B21D 22/20

U.S. Cl. 72-347

19 Claims

1. Apparatus for supporting a workpiece on a reciprocating ram for movement through a work performing operation comprising: a ram mounted for reciprocation; support means on one end portion of said reciprocating ram for supporting said workpiece; holding means for holding said support means on said one end portion of said ram and for permitting relative rotational and preventing axial movement between said support means and said one end portion of said ram; said one end portion having a first generally cylindrical outer surface and a second generally cylindrical outer

- (d) pressure adjustment means for adjusting the pressure within the pipeline system so that the apparatus can be operated at multiple pressures;
- (e) pressure regulating means for maintaining approximately constant pressure within the pipeline system at each pressure that the apparatus is operated;



- (f) sensing system means for measuring a first volume change at a first approximately constant pressure and for measuring a second volume change at a second approximately constant pressure; and
- (g) comparison means for comparing said volume changes at said first and said second pressures, whereby a leak is determined to be present if the difference between said volume changes exceeds a predetermined threshold.

5,090,235

HIGH ACCURACY WHEEL EXAMINING METHOD AND APPARATUS

Akira Hirano, Moroyama, and Masashi Kusunuki, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

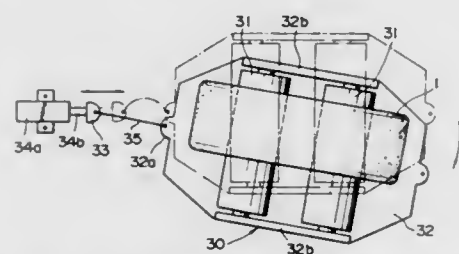
Filed Feb. 11, 1991, Ser. No. 653,607

Claims priority, application Japan, Feb. 13, 1990, 2-29698

Int. Cl.⁵ G01M 19/00

U.S. Cl. 73—117

9 Claims



1. A method for examining a wheel of a vehicle, comprising the steps of:
- placing a wheel of a vehicle on a wheel supporting means which is freely movable in a plane;
- measuring first predetermined parameters of said wheel with said wheel clamped from both sides and kept non-rotating; if measured values of said first predetermined parameters differ from first expected values, adjusting said wheel to eliminate such discrepancy; and
- measuring second predetermined parameters of said wheel with said wheel set in rotation around a rotating axis thereof.

5,090,236 PHONIC ELEMENT FOR SPEED SENSING BEARING ASSEMBLY

Angelo Vignotto, Turin, Italy, assignor to Riv-SKF Officine di Villar Persosa S.p.A., Turin, Italy

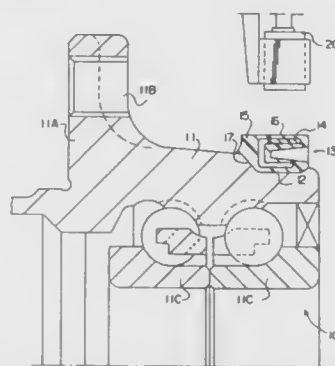
Filed Sep. 26, 1990, Ser. No. 588,348

Claims priority, application Italy, Sep. 28, 1989, 67807 A/89

Int. Cl.⁵ G01M 15/00

U.S. Cl. 73—118.1

3 Claims



1. A speed sensing bearing assembly, comprising:
- a wheel hub having a rotating ring member and a non-rotating ring member with rolling elements therebetween;
- an impulse ring mounted on one axial end of said rotating ring member;
- a sensor in operating relationship to said impulse ring;
- means defining a groove in said rotating ring member for axially positioning said impulse ring with respect to said sensor, said groove having a flat base and divergent side flanks;
- said impulse ring being enclosed in an outer cover consisting of elastomeric or rubber material and having a flat base and outwardly beveled circumferentially extending sides, said base and sides being conformed to said recess and flanks to readily facilitate precise permanent positioning of said impulse ring when said wheel is mounted on said ring.

5,090,237

PRESSURE SENSOR FOR DETERMINING TIRE PRESSURE

Hans Schrumpf, Oberasbach; Lothar Haas, Stein, and Gerhard Hettich, Dietenhofen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00141, § 371 Date Oct. 26, 1990, § 102(e)

Date Oct. 26, 1990, PCT Pub. No. WO89/10852, PCT Pub. Date Nov. 16, 1989

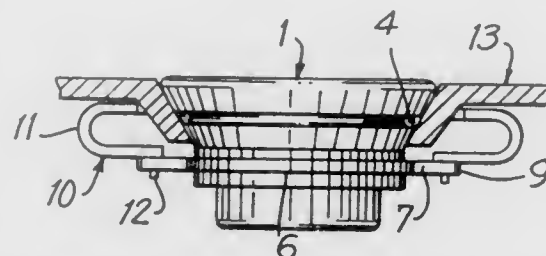
PCT Filed Mar. 8, 1989, Ser. No. 601,742

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815677

Int. Cl.⁵ B60C 23/04

U.S. Cl. 73—146.5

7 Claims



1. A pressure sensor for determining air pressure in an interior of a motor vehicle tubeless tire having a rim wall and a

recess forming an opening in the rim wall, said pressure sensor comprising a housing for extending into the rim wall recess, and having an outer flange portion for engaging a first side of the rim wall; annular flange means located on said housing in a spaced relationship relative to said rim wall and spring means supportable by said annular flange means against a second side of the rim wall for clamping said outer flange portion against the first side of the rim wall.

5,090,238

OIL WELL PRODUCTION TESTING

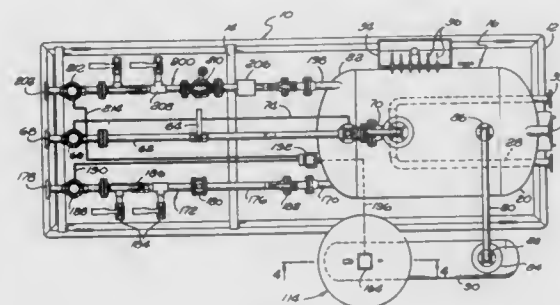
Jeffrey A. Jones, Keene, Calif., assignor to Santa Fe Energy Resources, Inc., Houston, Tex.

Filed Sep. 27, 1990, Ser. No. 588,748

Int. Cl.⁵ E21B 47/10

U.S. Cl. 73—155

17 Claims



1. An oil well tester comprising:
- a test vessel having an inlet through which oil well production fluid can be inducted into said test vessel to undergo gravity segregation of different phases of the production fluid;
- a gas removal means operatively associated with the uppermost portion of the interior of said test vessel, said gas removal means being responsive to gas pressure for removing from said test vessel any gas phase of the production fluid within said test vessel, said gas removal means having a first valve means;
- a first liquid discharge means having an upstream end in fluid communication with a lower region of said test vessel, said first discharge means having a second valve means operatively associated with a downstream end thereof;
- a second liquid discharge means having an upstream end in fluid communication with an upper region of said test vessel, said second discharge means having a third valve means operatively associated with a downstream end thereof;
- an accumulator means divided into gas and liquid chambers of mutually variable volumes such that said gas chamber is substantially hermetically sealed, said liquid chamber being operatively associated in fluid communication with the upper region of said test vessel through an opening in said liquid chamber;
- an actuator means operatively associated with said second and third valves for opening a selected one of said second and third valves;
- a selector means operatively associated with said actuator means and with an intermediate level of said test vessel for selecting one of said second and third valves for opening as a function of the specific gravity of a liquid phase present at the intermediate level of said test vessel; and
- a means operatively associated with said gas chamber of said accumulator means for energizing said actuator means to open and close a selected one of said pair of second and third valves as a function of high and low pressures, respectively, of a gas contained within said gas chamber.

5,090,239

STRAIN SENSING VALVE

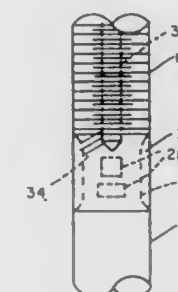
James J. Balaschak, Duxbury, and David E. Thrall, Marion, both of Mass., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 18, 1991, Ser. No. 642,929

Int. Cl.⁵ G01M 19/00

U.S. Cl. 73—168

9 Claims



1. A valve assembly comprising a stem for transferring movement to a valve element
- said stem including a threaded portion and a smooth unthreaded portion,
- said smooth unthreaded portion having a recessed mounting surface,
- strain gages permanently mounted on the recessed mounting surface of said smooth unthreaded portion, and
- said stem passing through a packing material in which said smooth unthreaded portion is received in an opening through said packing material, said opening having a diameter larger so as to permit said mounting surface to pass therein.

5,090,240

FLOWMETERS

Roger C. Baker, St. Albans, and Edward H. Higham, Reigate, both of England, assignors to National Research Development Corp., London, England

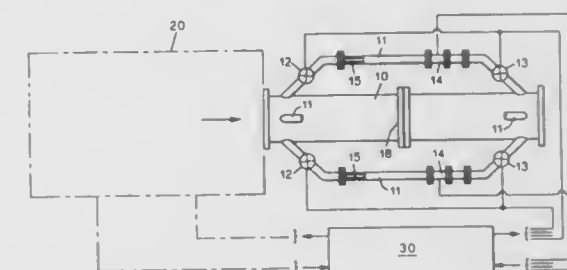
Filed May 18, 1990, Ser. No. 524,871

Claims priority, application United Kingdom, May 19, 1989, 8911597

Int. Cl.⁵ G01F 5/00

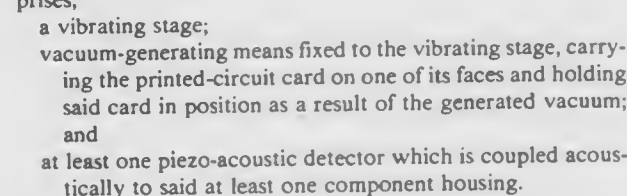
U.S. Cl. 73—197

15 Claims

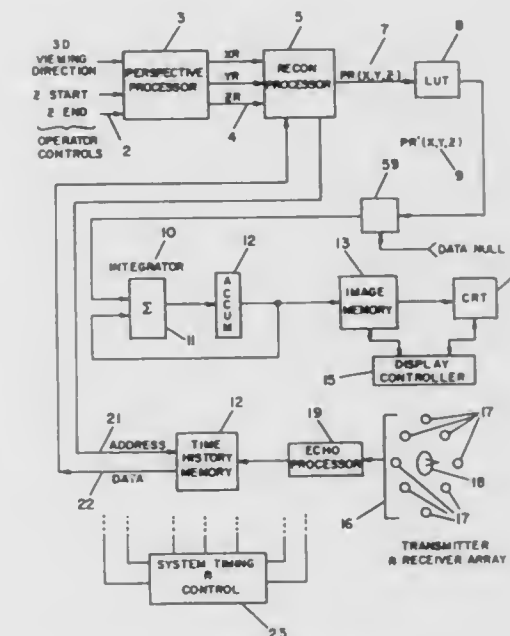


1. In or for a pipe line:
- a main pipe;
- a plurality of branch pipes each of relatively smaller diameter than and individually connected in parallel with said main pipe, and each such branch pipe having a respective flowmeter and selectively operable pipe closure means connected therewith; and
- means operable with said main pipe open to flow for providing a representation of flowrate through said main pipe in collective response to outputs from each of said flowmeters by subjecting said outputs to one of the procedures of comparison, averaging and computation therebetween.

14 Claims



32 Claims



f) a means for selecting and combining with each other, for each image of a reflecting point, one echo sample from each receiver element from each echo sample set for each transmitter, said selecting and combining means utilizing, for selection, the sum of: distance from the transmitter to the point's image divided by the known propagation velocity of the pulse of energy, and the distance from the point's image to each receiver element divided by the known propagation velocity of the echoes.

5,090,246

ELASTOMER TYPE LOW PRESSURE SENSOR

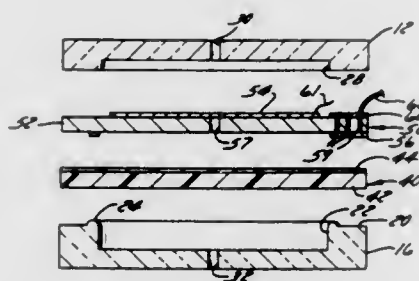
Jeannine O. Colla, Mequon; Paul E. Thoma, Cedarburg; Gary F. Oman; Carl F. Klein, both of New Berlin; Paul H. Froehling, Franklin; Scott L. Spence, Port Washington; Ivshin Yefim, Shorewood, and Arthur Barootian, Racine, all of Wis., assignors to Johnson Service Corp., Milwaukee, Wis.

Filed Sep. 19, 1990, Ser. No. 585,686

Int. Cl.⁵ G01L 7/08, 9/12

U.S. Cl. 73—718

29 Claims



23. An elastomer low pressure sensor comprising:
- a lower mounting plate having a generally circular lower plate and a generally cylindrical portion extending axially therefrom and terminating in an upper face, a recess in said upper face and a rim extending upwardly from said upper face and surrounding said recess;
 - a generally circular elastomeric electrode disposed over said rim, said elastomeric electrode comprising a lower elastomeric support layer and an upper elastomeric electrode layer, a peripheral ring being provided about said elastomeric electrode;
 - a solid electrode disposed over said elastomeric electrode, said solid electrode comprising a lower dielectric layer and an upper conductive layer, a generally annular conductive contact ring disposed on the lower surface of said solid dielectric layer;
 - an upper mounting plate having a generally circular upper plate and a generally cylindrical skirt depending from the periphery thereof;
 - an aperture through each of said mounting plates and said solid electrode;
 - means for holding said peripheral ring during assembly of said sensor; and
 - fasteners for joining said mounting plates to sandwich said electrodes therebetween and radially prestrain said elastomeric electrode over said rim.

5,090,247

SEMICONDUCTOR PRESSURE SENSOR CONNECTED TO A SUPPORT ELEMENT

Manfred H. Liebig, Bruckberg, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Fed. Rep. of Germany

Filed Nov. 6, 1990, Ser. No. 609,980

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1989, 3937522

Int. Cl.⁵ G01L 7/08, 9/06

U.S. Cl. 73—727

9 Claims

9. A pressure sensor comprising:
- a substrate of semiconductor material having first and second major surfaces;
 - said semiconductor substrate being provided with a recess in the second major surface thereof extending toward the first major surface so as to define relatively thick peripheral edge regions bounding the recess and a relatively thin pressure-sensitive diaphragm extending between said relatively thick edge regions and connected thereto;
 - a support element having an opening therethrough and providing an inner peripheral support surface in opposed

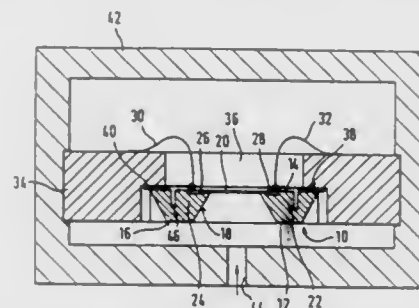
relation to the first major surface at the relatively thick peripheral edge regions of said semiconductor substrate; elastomeric means interposed between said inner peripheral support surface of said support element and the first major surface at the relatively thick peripheral edge regions of said semiconductor substrate and providing a peripheral seal between said inner peripheral support surface of said support element and the first major surface at the relatively thick peripheral edge regions of said semiconductor substrate;

at least one integrated component provided in a relatively thick edge region of said semiconductor substrate adjacent to said pressure-sensitive diaphragm and opening onto the first major surface of said semiconductor substrate;

the second major surface of said semiconductor substrate being free of obstruction and positioned for exposure to pressure introduced into the opening through said support element;

the relatively thin pressure-sensitive diaphragm of said semiconductor substrate being disposed in the opening through said support element and being responsive to pressure introduced into the opening through said support element and entering the recess provided in said semiconductor substrate to undergo mechanical deformation;

said at least one integrated component having an electrical parameter subject to variation in response to mechanical deformation of said pressure-sensitive diaphragm under the influence of pressure, the variation in the electrical parameter of said at least one integrated component being



proportional to the magnitude of the mechanical deformation of said pressure-sensitive diaphragm, thereby being indicative of a measurement of a pressure to which said relatively thin pressure-sensitive diaphragm is exposed; the sealing action of said elastomeric means between said inner peripheral support surface of said support element and the first major surface at the relatively thick peripheral edge regions of said semiconductor substrate increasing in response to the introduction of the pressure being measured into the opening through said support element and through the recess provided in said semiconductor substrate to impinge upon the relatively thin pressure-sensitive diaphragm of said semiconductor substrate;

said semiconductor substrate being provided with a depression formed in said relatively thick peripheral edge regions of said semiconductor substrate and surrounding said relatively thin pressure-sensitive diaphragm, said depression opening onto the first major surface of said semiconductor substrate and being disposed between said relatively thin pressure-sensitive diaphragm and said elastomeric means providing the peripheral seal between the first major surface at the relatively thick peripheral edge regions of said semiconductor substrate and said inner peripheral support surface of said support element; and said depression being disposed inwardly with respect to said inner peripheral support surface of said support element for isolating said relatively thin pressure-sensitive diaphragm of said semiconductor substrate from mechanical deformations in said support element caused by temperature changes in said support element.

5,090,248

ELECTRONIC TRANSDUCER

Alberto F. Cimmino, East Brighton; Anthony G. Klein, Kew, and Geoffrey I. Opat, Malvern, all of Australia, assignors to The University of Melbourne, Victoria, Australia

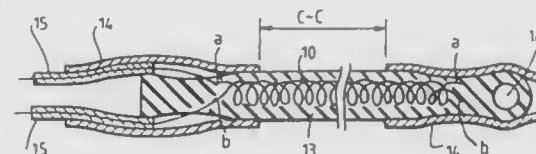
Filed Jan. 22, 1990, Ser. No. 467,916

Claims priority, application Australia, Jan. 23, 1989, PJ2378

Int. Cl.⁵ G01B 7/16

U.S. Cl. 73—780

5 Claims



1. An extensometer for measuring dimensional change, said extensometer comprising two or more adjacent electrical conductors selected and configured to allow relative positioning changes thereof to cause a change in electrical interaction between said conductors, wherein said conductors are thin, pliable, electrically conductive wires wound in the form of interposed helical coils, said coils including at least two adjacent turns that are completely encased in an elastic dielectric material as a principal means for restoring said wires to their original configuration after a positioning change thereof, wherein said configured electrically conductive wires and said restorative elastic material combinatively facilitate arcuate conformability during use and accurate measurement of small and substantial displacements, extensions, dilation, and torsions about a longitudinal extent of the extensometer.

5,090,249

APPARATUS AND METHOD FOR TESTING THE MECHANICAL PROPERTIES OF A SAMPLE

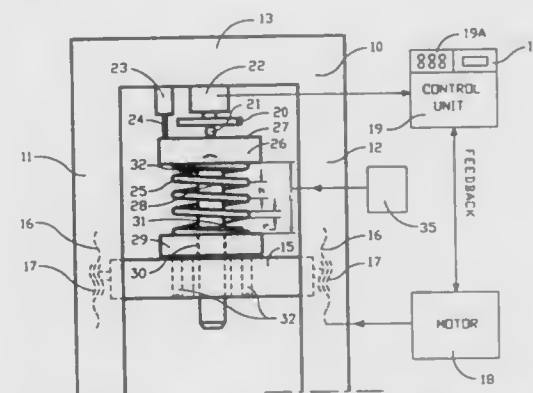
Jerzy Bielewicz, 106-99 Dalhousie Drive, Winnipeg, Manitoba, Canada R3T 3M2

Filed Aug. 8, 1990, Ser. No. 564,352

Int. Cl.⁵ G01N 11/00

U.S. Cl. 73—822

8 Claims



1. A method for testing the mechanical properties of a sample of a solid material comprising providing a first abutment member having first means thereon for engaging the sample, providing a second abutment member having second means thereon for engaging the sample, placing the sample between the abutment members for application thereto of force in a longitudinal testing direction, moving the second abutment member relative to the first abutment member in said longitudinal testing direction to apply stress to the sample to cause strain in the sample, and measuring the stress and strain for analysis of the mechanical properties of the sample, wherein the movement of the second abutment member is applied from a movable element through a spring located between the movable

element and the second abutment member so as to communicate force therebetween, the spring being elastically deformed during said movement and wherein the method includes the steps of driving the movable element with a motor in a direction to increase the force and at a rapid rate to simulate instantaneous application of the force, detecting the force with a load cell separate from the spring, automatically controlling the motor in dependence upon the detected force so as to halt the motor upon reaching a predetermined required maximum force, maintaining the motor halted for a predetermined period of time so as to provide a period for creep of the sample during which the sample is maintained under a substantially constant dead load, after said period of time driving the movable element with said motor in a direction to decrease the force and at a rapid rate to simulate instantaneous removal of the force so as to allow recovery of the sample, the spring being selected such that the amount of elastic deformation of the spring at the beginning of the creep period is greater than the amount of deformation of the sample which occurs during the creep period by a factor sufficiently large to maintain the assumption of a constant dead load during the creep period.

5,090,250

ELECTROMAGNETIC FLOWMETER UTILIZING MAGNETIC FIELDS OF A PLURALITY OF FREQUENCIES

Ichiro Wada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

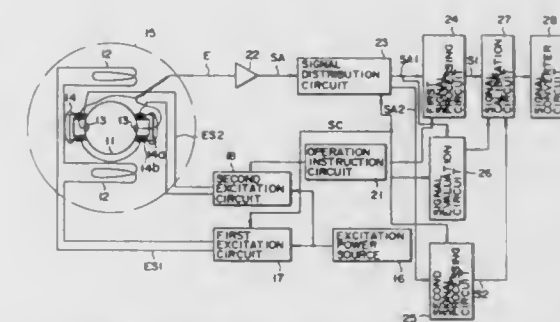
Filed Sep. 7, 1990, Ser. No. 578,439

Claims priority, application Japan, Sep. 7, 1989, 1-231896

Int. Cl.⁵ G01F 1/58

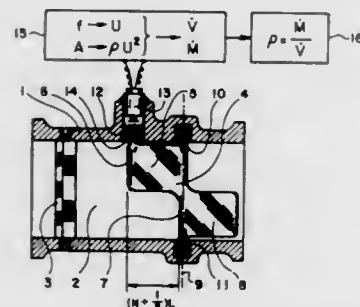
U.S. Cl. 73—861.12

21 Claims



1. An electromagnetic flowmeter, comprising:
- measuring pipe means through which a fluid to be measured flows;
 - first magnetic field generating means for forming a first magnetic field in said measuring pipe means;
 - second magnetic field generating means for forming a second magnetic field having a frequency different from that of the first magnetic field in said measuring pipe means;
 - first detecting means for detecting a first electromotive force signal induced by the first magnetic field;
 - second detecting means for detecting a second electromotive force signal induced by the second magnetic field;
 - determining means for determining whether the first electromotive force signal is normal and outputting a determination result; and
 - signal processing means for outputting a signal representing a flow rate of the fluid in accordance with the determination result and in response to the first and second electromotive force signals.

5,090,251
VORTEX FLOWMETER WITH TORSIONAL VORTEX SENSOR
 Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
 Continuation-in-part of Ser. No. 497,904, Mar. 23, 1990. This application Dec. 24, 1990, Ser. No. 633,290
 Int. Cl.⁵ G01F 1/32
 U.S. Cl. 73—861.24 20 Claims



1. An apparatus for measuring flow of fluids comprising in combination:

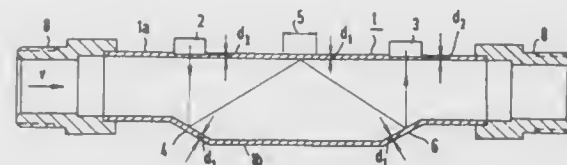
- a body including a flow passage extending therethrough;
 - a vortex generator of an elongated cylindrical shape disposed across a first cross section of the flow passage;
 - a vortex sensor including a first planar member and second planar member disposed at least partially across a second cross section of the flow passage generally parallel to a plane parallel to the longitudinal axis of the vortex generator and to the central axis of the flow passage, and connected to one another structurally in an arrangement wherein leading edges of the first and second planar members are off-set from one another in direction of fluid flow by a distance equal to a noninteger times wave length of sinuating streamlines created by vortices shed from the vortex generator, wherein the combination of the first and second planar members is supported by the body in a pivotable arrangement about a torsion axis disposed intermediate leading edge of the first planar member and trailing edge of the second planar member and generally parallel to the longitudinal axis of the vortex generator and generally perpendicular to the central axis of the flow passage; and
 - at least one transducer converting alternating torsional movement of the vortex sensor about the torsion axis into a fluctuating electrical signal;
- wherein said fluctuating electrical signal representing vortex shedding from vortex generator provides a measure of fluid flow through the flow passage.

5,090,252
ULTRASONIC FLOW MEASUREMENT INSTALLATION
 Peter Tschirner, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
 PCT No. PCT/EP88/00715, § 371 Date Feb. 9, 1990, § 102(e) Date Feb. 9, 1990, PCT Pub. No. WO89/01609, PCT Pub. Date Feb. 23, 1989
 PCT Filed Aug. 10, 1988, Ser. No. 460,915
 Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726584
 Int. Cl.⁵ G01F 1/66
 U.S. Cl. 73—861.28 5 Claims

1. An ultrasonic fluid flow measuring device that operates according to the echo-time method, comprising:
 one axially extending measuring tube having a rectangular inner cross section and a first, straight, measuring tube wall and a second measuring tube wall, the second measuring tube wall lying opposite the first measuring tube wall and being formed from three flat surface elements angled against each other;
 two ultrasonic transformers of the combined transmit and

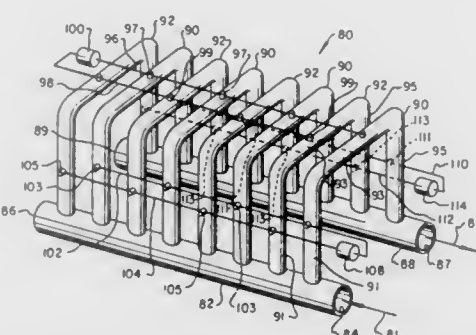
receive type, said transformers being mounted at axially spaced apart locations along the first, straight wall of the measuring tube in the direction of flow of the fluid through the measuring tube, said transformers each having a surface parallel with the first wall and being of the type that can both receive and transmit beams of ultrasonic waves orthogonally with respect to their surfaces so that the ultrasonic beams of the transmitting ultrasonic transformer are issued into the fluid perpendicular to the direction of flow;

one ultrasound reflecting inner surface located on the first measuring tube wall between the two ultrasonic transformers, and one angled ultrasound reflecting surface lying along each of two of said angled portions of the second measuring tube wall opposite each of the ultra-



sonic transformers; said angled ultrasound reflecting surfaces being tilted towards each other at a sharp angle with respect to the direction of flow of the fluid and being connected to each other by means of a straight surface element parallel to the direction of flow of the fluid; and whereby the ultrasonic beam emanating orthogonally from one of the respective transmitting ultrasonic transformers strikes the opposed angled ultrasound reflecting surface of the second measuring tube wall, and is reflected in the direction towards the ultrasound reflecting inner surface of the first measuring tube wall between the ultrasonic transformers, from which it is reflected onto the second angled ultrasound reflecting surface of the second measuring tube wall, and from which it is reflected onto the respective opposed receiving ultrasonic transformer.

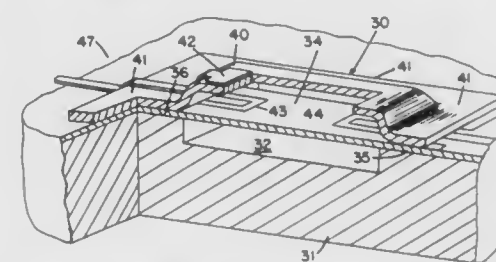
5,090,253
COROLIS TYPE FLUID FLOWMETER
 Miroslav M. Kolpak, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
 Filed May 14, 1990, Ser. No. 523,152
 Int. Cl.⁵ G01F 1/84
 U.S. Cl. 73—861.38 5 Claims



1. A Coriolis type flowmeter for measuring the flow rate of a fluid comprising a gassy liquid, said flowmeter comprising:
 an inlet manifold and a discharge manifold, each of said manifolds being configured to be connected to a plurality of fluid flow conducting tubes of a first set and a second set, respectively;
 a first set of fluid flow conducting tubes interconnecting said manifolds, said first set of tubes being configured to

change the direction of flow of fluid through said first set between said manifolds;
 a second set of fluid flow conducting tubes interconnecting said manifolds and being of a configuration similar to said first set of tubes and being spaced from said first set of tubes for conducting fluid through a change in direction of flow between said manifolds;
 said first and second sets of tubes are arranged spaced apart from each other such that alternate ones of said tubes are of said first set and said second set, respectively, said tubes of said first set are connected to tie means interconnecting said tubes of said first set with each other and said tubes of said second set are connected to tie means interconnecting said tubes of said second set with each other;
 vibrator means operably engaged with said first set of tubes and said second set of tubes for vibrating said tubes generally laterally with respect to the direction of flow of fluid through said tubes; and
 first and second sensor means operably connected to said first and second sets of tubes for sensing the vibration of said sets of tubes at a point upstream with respect to the direction of flow of fluid through said tubes from said vibrator means and at a point downstream with respect to the direction of flow of fluid through said tubes from said vibrator means, respectively.

5,090,254
POLYSILICON RESONATING BEAM TRANSDUCERS
 Henry Guckel, Madison, and Jeffrey Sniogowski, Oregon, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
 Filed Apr. 11, 1990, Ser. No. 508,001
 Int. Cl.⁵ G01L 1/10; G01H 9/00
 U.S. Cl. 73—862.59 43 Claims

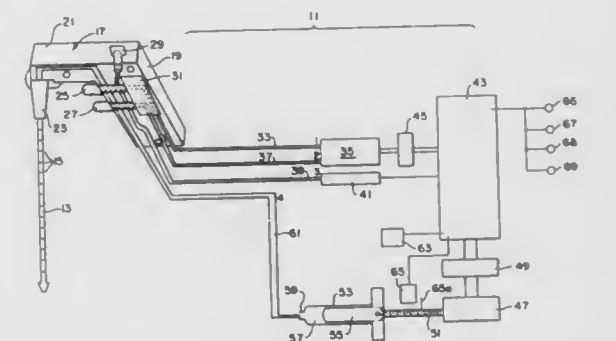


11. A resonant beam transducer structure comprising:
 (a) a substrate;
 (b) a polysilicon beam mounted to the substrate at at least one of its ends and spaced from the substrate between its ends to allow free vibration of the beam, the polysilicon beam comprising substantially undoped polysilicon treated to have built-in zero or low tensile strain;
 (c) an encapsulating shell formed of polysilicon deposited by chemical vapor deposition surrounding the beam and affixed to the substrate as deposited to define a cavity with the substrate which surrounds the beam and which is sealed off from the atmosphere, the cavity being substantially evacuated.

5,090,255
PROGRAMMABLE PIPET APPARATUS
 James W. Kenney, Broomall, Pa., assignor to Drummond Scientific Company, Broomall, Pa.
 Filed Mar. 27, 1990, Ser. No. 500,750
 Int. Cl.⁵ B01L 3/02
 U.S. Cl. 73—1 R 2 Claims

1. A method of automatically filling a pipet tube with a desired fill of liquid and automatically dispensing desired aliquots of liquid successively into the wells of a tray, comprising the steps of
 providing a programmable pipet apparatus having a microcontroller with means for receiving signals from an up

valve button means for drawing liquid into the pipet tube, a down valve button means for dispensing liquid from the pipet tube, and a mode of operation button means for selecting the mode of operation of the pipet apparatus, all of said button means being positioned in a pipet gun which draws liquid into and dispenses it from a pipet tube, said microcontroller having means for sending signals to direct the operation of a motor and its threaded shaft which has a linear movement that controls the linear movement of a piston in a syringe, the syringe being connected to the pipet gun and the linear position of the piston controlling the pressure and suction signals sent from the syringe to the pipet gun and the pipet tube,
 turning on the programmable pipet apparatus by turning on an on-off switch connected to the apparatus and setting the piston at home position and dispensing all liquid from any pipet tube connected to the pipet gun and placing the apparatus in manual mode,
 pushing down the up valve button means to draw liquid into the pipet tube and to signal the microcontroller the volume of liquid being drawn in and at what speed,
 releasing the up valve button means when the volume in the pipet tube has reached a desired fill volume,



pushing the mode button means to signal the microcontroller to switch to a programmable down mode of operation, signalling the microcontroller that the fill volume has been reached, recording the fill volume in the memory of the microcontroller,
 pushing the down valve button means to dispense liquid from the pipet tube,
 releasing the down valve button means when the desired aliquot has been dispensed from the pipet tube,
 pressing the mode button means to record the volume of the desired aliquot in the memory of the microprocessor so that the apparatus is in automatic desired aliquot when the apparatus is in automatic mode, and also to place the apparatus in automatic mode,
 successively pressing the down valve button means to successively automatically dispense aliquots of liquid from the pipet tube into a series of wells in a tray,
 pressing the up valve button means to automatically draw in liquid to the fill position, and
 successively pressing the down valve button means to successively automatically dispense aliquots of liquid from the pipet tube.

5,090,256

METHOD AND APPARATUS FOR SAMPLING THE GASEOUS CONTENT OF A LIQUID

Olivier Issenmann, Neuilly Sur Seine, France, assignor to Geoservices, Le Blanc Mesnil, France

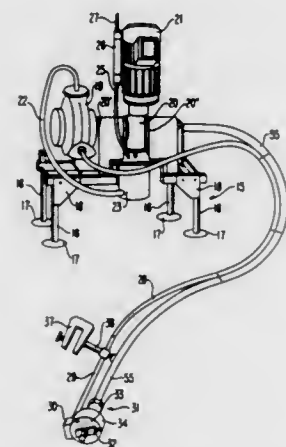
Filed Nov. 27, 1989, Ser. No. 441,546

Claims priority, application France, Apr. 26, 1989, 89 05518

Int. Cl.⁵ G01N 1/00

U.S. Cl. 73—863.23

22 Claims



1. An apparatus for sampling the gaseous content of a liquid laden with solids, comprising:

a support frame;

a degassing device mounted on said support frame for degassing sample liquid received therein to obtain a sample of gas of the sample liquid, said degassing device comprising a degassing container having an inlet connection for receiving sample liquid therethrough, a rotary degassing agitator, a discharge nozzle for discharging degassed sample liquid, and means for conducting sample gas from said degassing device for delivery to an analyzing device; and

means for collecting sample liquid from a stream of the liquid and delivering substantially all of the sample liquid to said degassing container, said means for collecting and delivering comprising a pump mounted on said support frame having an input connection and an output connection, a flexible suction tube connected to said input connection, and a motor means mounted on said support frame for driving said pump, said output connection being fluidly connected to said inlet connection of said degassing container, and said rotary degassing agitator being driven by said motor means driving said pump.

5,090,257

AUTOMATIC ISOKINETIC AEROSOL SAMPLING SYSTEM

Charles W. Bruce, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1990, Ser. No. 520,925

Int. Cl.⁵ G01N 1/24

U.S. Cl. 73—863.03

5 Claims

1. An automatic isokinetic sampling device for measuring aerosols in a fluid flow comprising:

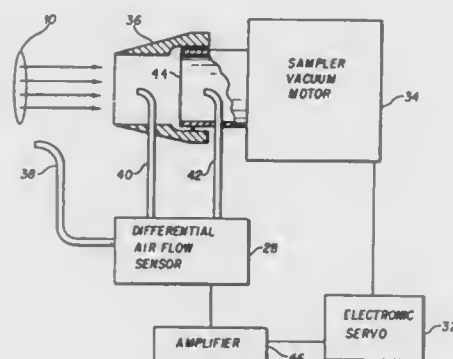
tubular means for insertion in said fluid flow for receiving a portion of said fluid flow without substantially disturbing the fluid flow upwind of said tubular means,

filter means disposed along the straight downwind path of said fluid flow and within said tubular means for collecting a sample of said aerosols from said portion of said fluid flow,

suction pressure applying means attached to said tubular

means for moving said portion of said fluid flow through said tubular means;

means responsive to said fluid flow for adjusting the velocity of said portion of said fluid flow moving through said tubular means;



a differential air flow sensor having a reference air flow data tube disposed within said fluid flow and a dynamic air flow data tube disposed within said portion of said fluid flow for determining the difference in velocity between said fluid flow and said portion of said fluid flow moving through said tubular means.

5,090,258

MULTIPLE FLOW-DIVIDING DILUTION TUNNEL SYSTEM

Akira Yamasaki, Tokyo; Yoshinaka Takeda, Yokohama; Souhei Abe, Funabashi, and Izumi Fukano, Yokohama, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

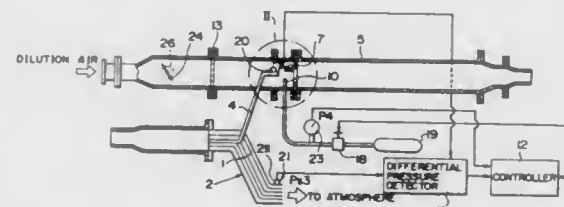
Filed Sep. 28, 1990, Ser. No. 590,132

Claims priority, application Japan, Sep. 29, 1989, 1-114649[U]; May 22, 1990, 2-53353; Sep. 20, 1990, 2-251262[U]

Int. Cl.⁵ G01N 1/00

U.S. Cl. 73—863.03

6 Claims



1. A multiple flow-dividing dilution tunnel system comprising:

a multiple pipe flow divider composed of a plurality of flow-dividing pipes having the same diameter and length as each other, for supplying a gas to be inspected therethrough;

a dilution tunnel for introducing a dilution gas from an upstream end thereof, one of said flow-dividing pipes extending out of said multiple pipe flow divider and having a downstream end portion extending as an inlet pipe into said dilution tunnel, whereby a gas divided by and introduced through said inlet pipe into said dilution tunnel is diluted by the dilution gas introduced into said dilution tunnel, so that the diluted gas can be sampled and analyzed for constituents thereof; and

a plurality of division ratio control nozzles disposed in said dilution tunnel immediately downstream of an outlet of said inlet pipe and arranged symmetrically around a central axis of said outlet of the inlet pipe, said division ratio control nozzles having respective nozzle holes for ejecting

a pressurized dilution gas toward a position downstream of the outlet of said inlet pipe.

terminated direction against the supporting means, and means for rotating the gyrostator into an orientation whereby it can

5,090,259

PIPE-INSPECTING APPARATUS HAVING A SELF PROPELLED UNIT

Yoshio Shishido, Sagami-hara; Hideyuki Adachi, Tokyo; Hiroki Hibino, Tokyo; Tsutomu Yamamoto, Tokyo; Hirofumi Miyahara, Tokyo; Syuichi Takayama, Tokyo; Yasuhiro Ueda, Tokyo; Yoshisade Aoki, Tokyo, and Seiji Yamaguchi, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 272,007, Nov. 14, 1988, abandoned.

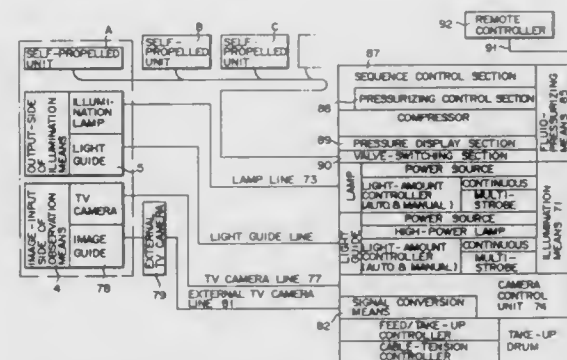
This application Mar. 2, 1990, Ser. No. 488,494

Claims priority, application Japan, Jan. 18, 1988, 63-7953; Jan. 18, 1988, 63-7954; Feb. 10, 1988, 63-27677; Feb. 10, 1988, 63-27678; Feb. 10, 1988, 63-27679; Feb. 10, 1988, 63-27681; Feb. 10, 1988, 63-29282; Feb. 10, 1988, 6-29283; Feb. 19, 1988, 63-35168; Feb. 22, 1988, 63-39302; Feb. 23, 1988, 63-40196; Feb. 24, 1988, 63-41518; Feb. 25, 1988, 63-40591; Feb. 25, 1988, 63-40592; Feb. 26, 1988, 63-43644

Int. Cl.⁵ G01M 19/00

U.S. Cl. 73—866.5

56 Claims



1. A pipe-inspecting apparatus comprising:

(a) a self-propelled unit including:

an elastic driving unit having an elastic tube, and restriction means mounted on the outer surface of said elastic tube for restricting a longitudinal expansion of said elastic tube, and

balloons, located at front and rear ends of said elastic driving unit, which are capable of expanding and contracting in a radial direction of said elastic tube; and

(b) an observation means having an elongated insertion portion which is moved in and through a pipe by said self-propelled unit;

wherein said self-propelled unit has a through hole elongated along the central axis thereof, into which the insertion portion of said observation means is inserted, and the insertion portion is connected to the self-propelled unit.

5,090,260

GYROSTAT PROPULSION SYSTEM

Mortimer S. Delroy, P.O. Box 207, R.R. #2, Nepean, Ontario, Canada K2C 3H1

Filed Aug. 6, 1990, Ser. No. 563,081

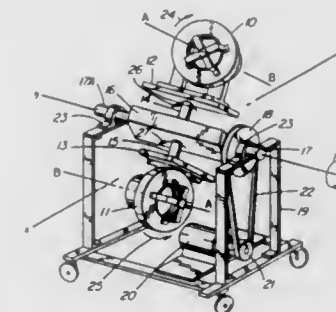
Claims priority, application Canada, Aug. 9, 1989, 607,921

Int. Cl.⁵ G01C 19/00; F16H 27/04

U.S. Cl. 74—5.37

23 Claims

1. A thrust producing apparatus comprising a gyrostator having a gyrostator wheel, means for supporting the gyrostator, means for toppling the gyrostator creating precessional force in a prede-



again be toppled while avoiding the creation of precessional force in a direction opposite to said predetermined direction.

5,090,261

GEARED MOTOR

Tetsuya Nakatsukasa, Okazaki, Japan, assignor to Asmo Co., Ltd., Shizuoka, Japan

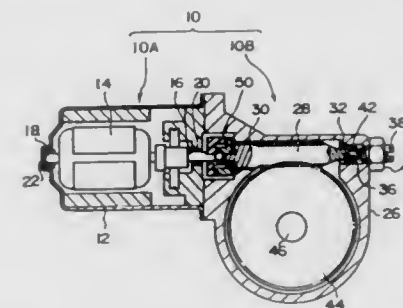
Filed Nov. 20, 1990, Ser. No. 615,843

Claims priority, application Japan, Nov. 21, 1989, 1-135206

Int. Cl.⁵ F16H 27/02; B25G 3/02; F16D 3/52

U.S. Cl. 74—89.14

23 Claims



1. A geared motor having speed reduction structure for outputting rotation which is at a speed reduced from the speed of rotation of a rotor, comprising:

a stator and a rotor;

a rotating axle coupled to said rotor and which rotates in correspondence with rotation of said rotor;

a gear rotating axle aligned with said rotating axle so that the rotational axis of the gear rotating axle is substantially the same as the rotational axis of said rotating axle;

a first coupling member disposed on said rotating axle and rotating together with said rotating axle and said rotor;

a second coupling member disposed on said gear rotating axle and rotating together with said gear rotating axle;

an elastic damping member disposed between said first coupling member and said second coupling member, for transmitting rotation of said first coupling member to said second coupling member; and

a thrust force bracing member disposed between said rotating axle and said gear rotating axle and in contact with both said rotating axle and said gear rotating axle, for bracing thrust force between said rotating axle and said gear rotating axle along an axis of thrust that substantially coincides with the rotational axis of the gear rotating axle.

5,090,262 LEVER-TYPE TRANSMISSION GEAR

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

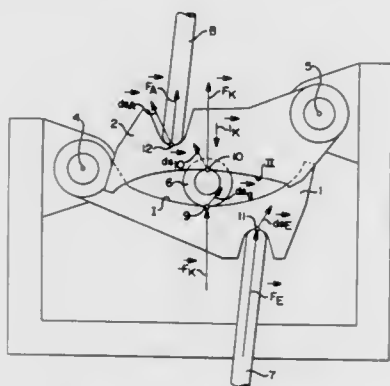
Continuation of Ser. No. 202,757, Jun. 3, 1988, abandoned. This application Jul. 22, 1991, Ser. No. 734,026

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718944

Int. Cl.⁵ F16H 21/16; G05G 7/04

U.S. Cl. 74—110

17 Claims



1. A lever-type transmission gear, comprising a pair of coupled levers pivotable about spaced-apart axes approximately in parallel, and exhibiting a variable transmission ratio dependent on the position of the pair of levers, between a driving and a driven side of the gear, wherein the two levers apply force to one another by means of a roller element disposed therebetween, with said roller element rolling on internal roll-on curves facing one another, along the flanks of the two levers, and wherein the roll-on curves, in the direction of the oppositely facing lever flank, respectively exhibit a concave curvature so that the roller element, with levers loaded relative to one another, tends to occupy a stable position and wherein the position of the roller element varies automatically when the levers pivot.

5,090,263 GEAR COUPLER

Roger M. Weyman, and John R. Barton, both of Coventry, United Kingdom, assignors to Massey Ferguson Services N.V., England

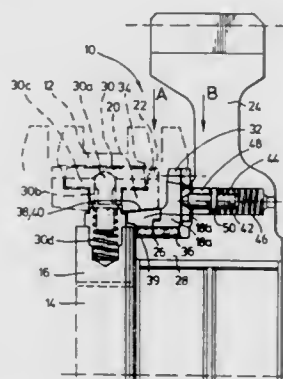
Filed Feb. 15, 1991, Ser. No. 656,997

Claims priority, application United Kingdom, Feb. 28, 1990, 9004540

Int. Cl.⁵ F16D 23/06

U.S. Cl. 74—339

9 Claims



1. A coupler for coupling a gear to a shaft comprising:

a first coupling member which is connected for rotation with the shaft; and
a second coupling member connected for rotation with the gear and being engageable by the first coupling member to couple the gear to the shaft, the second coupling member being capable of limited circumferential movement relative to the gear to allow the first and second coupling members to engage each other without the need to rotate the gear.

5,090,264

TAKING UP DEVICE OF ANGULAR CLEARANCES ON ARTICULATION MECHANISMS USED IN SEATS, PARTICULARLY OF AUTOMOBILES

Georges Droulon, Flers, and Alain Romagne, Aubusson, both of France, assignors to Ets. Cousin Freres, Orne, France

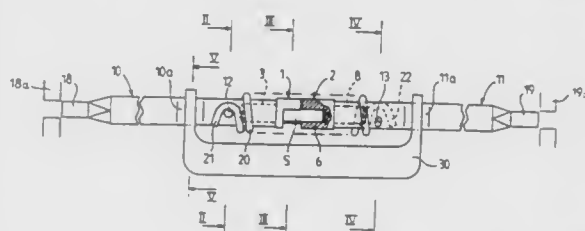
Filed Jun. 29, 1990, Ser. No. 546,399

Claims priority, application France, Jul. 3, 1989, 89-08891

Int. Cl.⁵ F16D 1/12, 3/10

U.S. Cl. 74—411

6 Claims



1. In a device for taking up angular clearances on articulation mechanisms used in seats, particularly of automobiles, that are connected to one another by a connection bar, the improvement wherein:

a portion of said connection bar is provided with toothed means that is subjected to the action of a spring, and when said connection bar is in position between two cams of said articulation mechanism, said spring causes rotation, via respective ends of said connection bar that are engaging said cams, of said cams for taking up manufacturing and mounting clearances so as to avoid untimely displacement by torsion of a seat back; and

said toothed means comprises a male and a female claw coupling, each of which is provided with a respective tooth to form a wolf-tooth-clutch, with said male claw coupling being provided on an inner side with a cylindrical element that extends into a central cavity of said female claw coupling, with ends of said male and female couplings opposite said element and cavity thereof being respectively provided with a splined cylindrical extension; and in which said device further comprises two tube segments each of which has two ends, one of which is provided with a formation for operative connection to one of said cams, while the other end of each of said tube segments engages one of said splined extensions of said male and female coupling, with each of said tube segments being provided with a trough-peg that serves as a fixation point for said spring, which is a helical spring that is concentric to said male and female couplings and upon rotation transmits its action via said through-pegs to said formations of said tube segments to effect said taking up of said clearances.

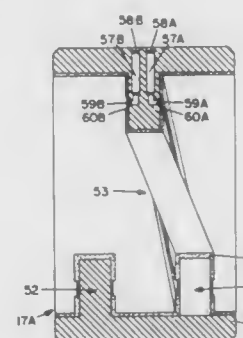
5,090,265 SYSTEM TO CONVERT ROTARY MOTION TO LINEAR MOTION

Alexander H. Slocum, 1290 Bald Hill Rd., McLean, Va. 22101
Continuation-in-part of Ser. No. 77,804, Jul. 27, 1987, Pat. No. 4,836,042. This application Nov. 14, 1988, Ser. No. 271,012

Int. Cl.⁵ F16H 25/24

U.S. Cl. 74—424.8 R

27 Claims



1. A leadscrew and nut system wherein rotation of the leadscrew about its axis effects parallel linear movement therealong of the nut, the cooperative threadforms of the leadscrew and nut being shaped to provide for a small degree of pitch and yaw and relative radial movement of the nut with respect to the leadscrew, means for continuously supplying pressurized fluid between the cooperative threads of the leadscrew and the nut, and means for controlling the fluid flow and hence pressure continuously to provide high axial stiffness with effectively zero stiffness in yaw, pitch, rotation and radial motion while inhibiting mechanical contact between the cooperative threads, the nut being supported by a linearly movable linear bearing supported carriage to allow for the linear movement of the nut essentially parallel to the leadscrew axis, each said cooperative threadform of the leadscrew and the nut having a depth that is equal to greater than the width of the threadform, and the depth of the thread being on the order of one-quarter the major diameter of the leadscrew, and the number of thread turns on the nut being optimally on the order of one to three.

5,090,266 BALL CIRCULATION PATH IN ROTATION TRANSMITTER USING BALLS

Naotoshi Otsuka, 49-7 Fujimidai, Mishima-shi, Shizuoka-ken, Japan, assignor to Yoshio Horiya, Numazu; Naotoshi Otsuka, Mishima and Nihon Seiki Co., Ltd., Numazu, all of Japan

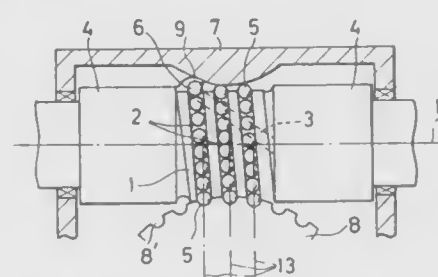
Filed Oct. 30, 1990, Ser. No. 605,276

Claims priority, application Japan, Nov. 2, 1989, 1-128917[U]; Nov. 2, 1989, 1-128918[U]

Int. Cl.⁵ F16H 1/16, 55/22

U.S. Cl. 74—425

2 Claims



1. A ball circulation path in a rotation transmitter for transmitting rotation of an hourglass-shaped worm gear to a wheel gear meshed with the worm gear via balls which roll on the ball circulation path, comprising:

a helical ball race formed on an outer surface of the worm gear;
ball ports formed by removing portions of said ball race at opposite ends thereof;
a ball circulation passage having openings at opposite ends thereof and extending diagonally through the interior of the worm gear at a position offset toward an outer surface of the worm gear from a central axis thereof so as to cause said openings to connect with said ball ports at an obtuse angle; and
ball guides of semicircular sectional configuration provided detachably from said ball ports so as to project tangentially from axial sides of a pair of ring-shaped collars fitted face to face on opposite ends of the worm gear, said ball guides covering said ball ports and having distal ends thereof formed at an angle that prevents the distal ends from contacting the balls.

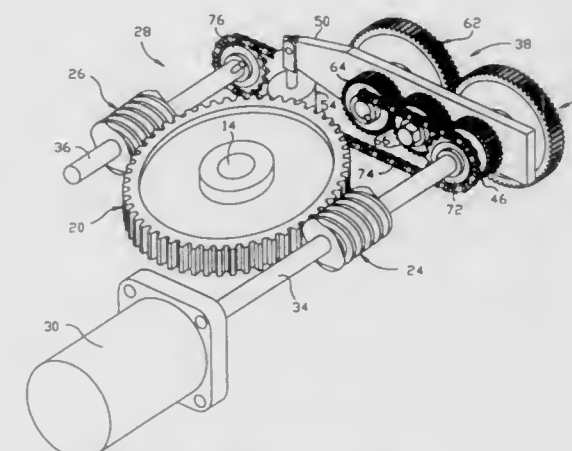
5,090,267 INDEXING APPARATUS

James T. Gramling, 1578 N. Hunter, Olathe, Kans. 66062
Filed Nov. 21, 1990, Ser. No. 616,884

Int. Cl.⁵ F16H 1/16, 55/18; B23B 29/24

U.S. Cl. 74—427

8 Claims



1. An index table apparatus comprising:
an index table having an axis about which the table is rotatable;
a shaft connected to the table and including a shaft axis coaxial with the axis of the table;
a pinion operatively connected to the shaft for rotation therewith and including a plurality of teeth;
positioning means for rotating the pinion to a preset angular position, the positioning means including first and second drive gears each including a plurality of teeth and being in driving engagement with the pinion, and drive means for rotating the drive gears;
phase shift means for changing the phase relationship between the first and second drive gears for removing backlash between the pinion and the first and second drive gears, the phase shift means including moving means for moving the second drive gear between a home position in which the first and second drive gears are in phase with one another and an actuated position in which the first and second drive gears are out of phase with one another; and
actuating means for actuating the phase shift means after operation of the positioning means to move the second drive gear to the actuated position and for deactuating the phase shift means during operation of the positioning means to move the second drive gear to the home position.

5,090,268

TWO SPEED GEARBOX

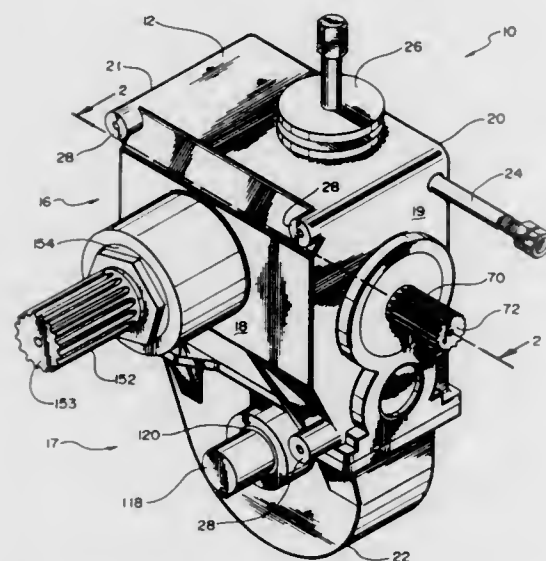
Kenneth J. Peeters, Bear Creek, Wis., assignor to H & S Manufacturing Co., Inc., Marshfield, Wis.

Filed Nov. 6, 1990, Ser. No. 609,662

Int. Cl.⁵ A01C 19/02

U.S. Cl. 74—665 GC

8 Claims



1. An apparatus for selectively coupling a power input shaft defining a power input shaft longitudinal axis to first and second power output shafts, comprising:

first gear means operably carried by said input shaft for selectively operably coupling said input shaft to said first power output shaft, including a first gear member operably, fixedly positioned along said power input shaft longitudinal axis and a second gear member shiftable between first and second positions along said power input shaft longitudinal axis;

second gear means operably carried by said power input shaft for selectively operably coupling said input shaft to said second power output shaft, including a third gear member operably, fixedly positioned along said power input shaft longitudinal axis and a fourth gear member shiftable between third and fourth positions along said power input shaft longitudinal axis;

actuating means for selectively shifting said second gear member and said fourth gear member between said first and second and said third and fourth positions respectively, comprising

an actuating shaft defining an actuating shaft longitudinal axis oriented generally parallel to said power input shaft, and means mounting said actuating shaft for shiftable motion of said actuating shaft along said actuating shaft longitudinal axis relative to said power input shaft;

first actuating member means shiftable carried along said actuating shaft longitudinal axis for operably coupling said actuating shaft to said second gear member;

second actuating member means shiftable carried along said actuating shaft longitudinal axis for operably coupling said actuating shaft to said fourth gear member; and

cam means operably carried by said actuating shaft for selective, mutually independent shifting of said first and second actuating member means relative to said power input shaft longitudinal axis for selective, mutually independent shifting of said second gear member and said fourth gear member between said first and second and said third and fourth positions respectively.

5,090,269

SYSTEM FOR AUTOMATICALLY CONTROLLING TRANSMISSION FOR VEHICLES

Masuhiro Ohtsuka, and Hiromi Kono, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

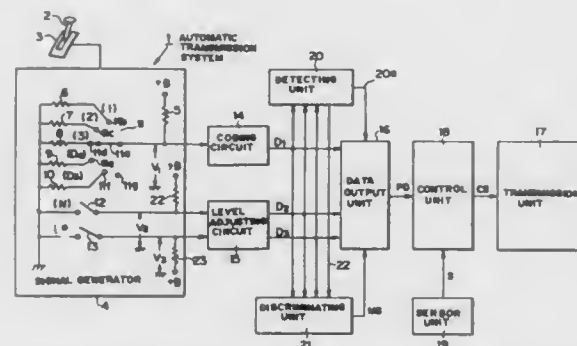
Filed Jun. 14, 1990, Ser. No. 537,599

Claims priority, application Japan, Jun. 15, 1989, 1-150509

Int. Cl.⁵ B60K 41/04

U.S. Cl. 74—861

8 Claims



1. An automatic transmission system in which a gear-shifting operation of a transmission is automatically carried out, said system comprising:

a setting member for setting a gear-shifting mode of the transmission,

generating means comprising a plurality of elements coupled with said setting member for generating electric information indicating an operation condition of said setting member, each of the elements producing a significant state of electric information only when said setting member is in a position corresponding to the element;

malfunction detecting means for detecting whether or not there is a malfunction in said generating means, said malfunction detecting means comprising determination means for determining whether or not each element is producing its significant state, first means responsive to the determination means for detecting that a plurality of the elements are producing significant electric information at the same time, and second means responsive to the determination means for detecting that none of the elements is producing significant electric information;

discriminating means for discriminating a nature of a malfunction in response to change in the electric information; output means responsive to said generating means, malfunction detecting means and discriminating means for providing a mode signal indicative of a mode of the gear-shifting operation; and

a control unit responsive to said output means for carrying out a gear-shifting operation of the transmission in a gear-shift mode according to the mode signal.

5,090,270

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Yutaka Suzuki, Atsugi City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed May 1, 1989, Ser. No. 345,255

Claims priority, application Japan, May 12, 1988, 63-113446

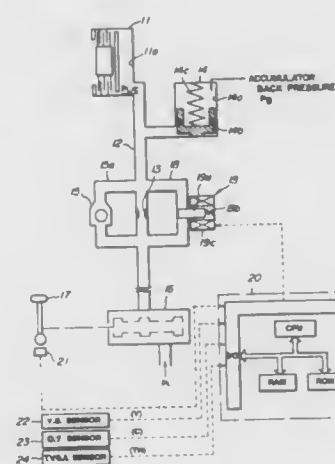
Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—866

21 Claims

1. An automatic transmission of a motor vehicle, comprising: a source of hydraulic pressure, a friction element; a conduit fluidly connecting said friction element and said hydraulic pressure source; an accumulator fluidly communicated with said conduit; a first valve fluidly interposed in said conduit at a position upstream of said accumulator;

a selectively operable arrangement connected with said first valve for selectively conditioning said first valve to supply hydraulic fluid to said friction element; a fixed orifice interposed in said conduit at a position between said accumulator and said first valve; a one-way valve arranged in parallel with said fixed orifice, said one-way valve being arranged to close when hydraulic fluid is being supplied through said conduit toward said friction element and to open when fluid is being drained from said friction element;



a by-pass device bypassing said fixed orifice, said by-pass device being responsive to said selectively operable arrangement for by-passing said fixed orifice for a given period of time following said first valve being conditioned to supply hydraulic fluid to said friction element; and electric control means for varying said given period of time in accordance with operation modes of an engine mounted on said motor vehicle.

5,090,271

SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Koichi Hayasaka, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

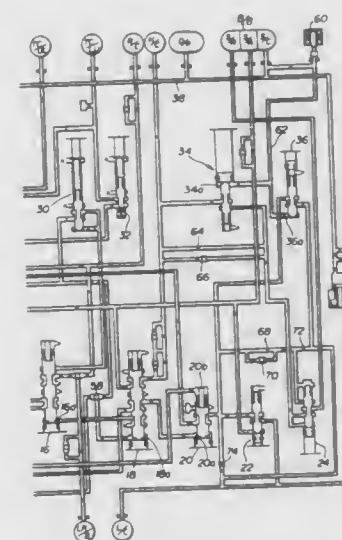
Filed Jul. 11, 1989, Ser. No. 377,940

Claims priority, application Japan, Jul. 11, 1988, 63-170790

Int. Cl.⁵ B60K 41/06

U.S. Cl. 74—869

4 Claims



1. In a shift control system for an automatic transmission:

a source of a first hydraulic fluid pressure; a plurality of valves, each having an open position wherein a fluid passage therethrough is opened and a closed position wherein said fluid passage is closed and being shiftable between said open position and said closed position, conduit means for fluidly connecting said plurality of valves to said source to allow a flow of hydraulic fluid from said source to said plurality of valves;

means including, a solenoid, for dividing said conduit means into a first section upstream thereof with respect to said flow of hydraulic fluid and a second section downstream thereof with respect to said flow of hydraulic fluid, said dividing means being operative to change said first hydraulic fluid pressure within said second section of said conduit means to a second hydraulic fluid pressure in response to said solenoid;

each of said plurality of valves having a chamber which is always in an uninterrupted communication with all elements of said dividing means through said second section of said conduit means and being shiftable between said open position and closed position in response to a change within said second section of said conduit means from said first hydraulic fluid pressure to said second hydraulic fluid pressure.

5,090,272

HAND HELD COMPRESSED AIR POWERED INSULATED WIRE STRIPPER

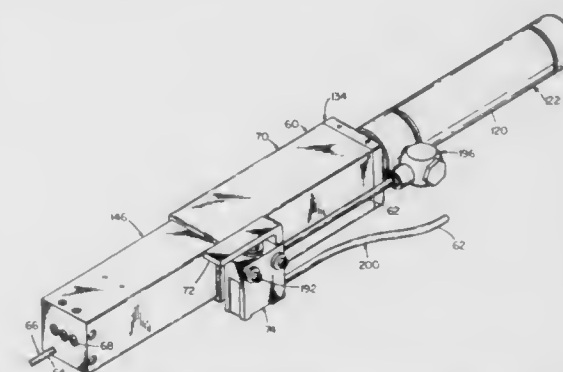
Ernst Buchmayer, 117 129th N.E. Ave., Bellevue, Wash. 98005

Filed Jun. 27, 1990, Ser. No. 545,413

Int. Cl.⁵ H02G 1/12

U.S. Cl. 81—9.41

17 Claims



5. A hand held compressed air powered insulated wire stripper, comprising:

a) a hollow outer housing;

b) a hollow inner housing, which slides inside the said hollow outer housing;

c) an open top inner slide for sliding movement within the hollow inner housing;

d) a cutter actuated lever pivotally positioned on the open top inner slide;

e) an insulation cutter subassembly mounted on both the open top inner slide and the cutter actuator lever for cutting action upon movement of the cutter actuator lever;

f) an insulated wire gripping subassembly mounted on the hollow inner housing to grip an end of insulated wire during the cutting of the insulation thereof;

g) a back plate subassembly secured to said hollow outer housing and to be secured to a cylinder of a compressed air actuator;

h) an extended portion of a piston, adapted for securement to a piston of a compressed air actuator, positioned and guided by the back plate assembly;

i) a compression coiled return spring placed about the extended portion of a piston to tend to keep this extended portion extended out from a compressed air actuator;

- j) a two piece flexible coupler assembly means for interconnecting the extended portion of the piston and the cutter actuator lever at the rear portion thereof, for subsequently moving the insulation cutter subassembly via the action of the lever arm, to cut the insulation off of an end of an insulated wire, upon the initiation of a retracting movement of the extended portion of the piston, and upon the continued retracting movement of the extended portion of the piston, to thereafter retractably move both the cutter actuator lever, while remaining in the position to keep the cutter subassembly in the cutting position, and the open top inner slide, as a subassembly, relative to the hollow inner housing, to thereby strip the cut insulation off of an end of the originally insulated wire end, while the insulated wire gripping subassembly mounted on the hollow inner housing continues to grip this inserted end of the insulated wire;
- k) a positioning cam subassembly means extending from the back plate subassembly to the insulated wire gripping subassembly on the hollow inner housing, to actuate the insulated wire gripping subassembly to grip an inserted end of insulated wire, upon the initiation of a retracting movement of the extended portion of the piston, and to continue the gripping during the entire stripping movement; and
- l) a releasable override stop subassembly means to keep the open top inner slide in a commencing position within the hollow inner housing during the gripping of an insulated wire end and the cutting of the insulation of this insulated wire end, and then to be overridden during the stripping of the insulation from the wire.

5,090,273

ADJUSTABLE RATCHET WRENCH

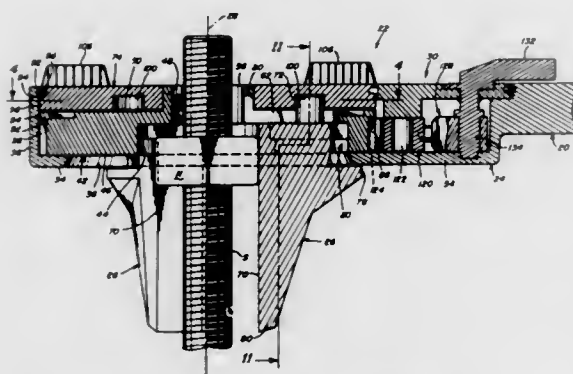
Gregory Fossella, 97 Main St., P.O. Box 838, Osterville, Mass. 02655

Continuation-in-part of Ser. No. 387,220, Jul. 28, 1989, abandoned. This application Aug. 14, 1990, Ser. No. 567,290

Int. Cl.⁵ B25B 17/00

U.S. Cl. 81—57.13

23 Claims



1. An adjustable ratchet wrench comprising
- a housing having a handle extending from one side thereof for rotating the housing, said housing having a generally cylindrical chamber therein with its axis generally perpendicular to the plane of the handle,
- a first disk mounted concentrically in the housing and rotatable with respect thereto about the axis,
- a first ratchet mechanism interconnecting the housing and the first disk enabling the first disk to be selectively locked to the housing for clockwise or counterclockwise rotation therewith about the axis,
- a plurality of radially oriented slots in the disk and a jaw slideably mounted in each slot to move radially inwardly and outwardly in the slot, each of said jaws having a gripping surface facing the axis,

- a second disk disposed concentrically in the housing and rotatable with respect to the housing and first disk, said second disk having a plurality of cam slots that correspond in number to the radial slots in the first disk, said cam slots each having an inner end that lies closest to the axis and an opposite end that lies farthest away from the axis,
- a stem carried by each of the jaws and extending into one of the cam slots whereby rotation of the second disk relative to the first disk in one direction closes the jaws and in the other direction opens the jaws,
- a second ratchet mechanism connecting the second disk with the first disk enabling the second disk to rotate selectively either clockwise or counterclockwise with respect to the first disk to open or close the jaws,
- a motor in the handle,
- a gear drive in the housing driven by the motor and connected to the first disk for rotating the first disk independent of the housing,
- and means operatively connected to the motor and gear drive for reversing the direction in which the motor rotates the first disk independent of the housing.

5,090,274

OIL FILTER WRENCH

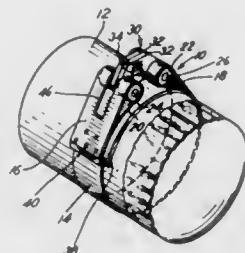
Erwin L. Schaub, Jacksonville, Fla., assignor to Epicor Industries, Inc., St. Augustine, Fla.

Filed Feb. 19, 1991, Ser. No. 657,511

Int. Cl.⁵ B25B 13/52

U.S. Cl. 81—64

6 Claims



1. An oil filter wrench comprising an elongated strap made from high tensile strength material, each end of said elongated strap being formed with a loop, the elongated strap having longitudinally extending slots therein adjacent each end, a saddle secured to said elongated strap, link-means for cooperating with a torque applicator for applying force to the link means so as to tighten the elongated strap on an oil filter, said link means being disposed within said slots at each end of said elongated strap, a first cross pin secured to said link means, a first sleeve on said first cross pin, a second cross pin secured to said link means, a second sleeve on said second cross pin, one end of said elongated strap secured to said first cross pin over said first sleeve and the other end of said elongated strap secured to said second cross pin over said second sleeve, said sleeves transferring the load from the first and second cross pins to the loops of the elongated strap.

5,090,275

RETAINER APPARATUS FOR A WRENCH UNIT

Frank McCann, Taichung Hsien, Taiwan, assignor to Chiro Tool Mfg., Corp., Taiwan

Filed Jul. 17, 1991, Ser. No. 731,801

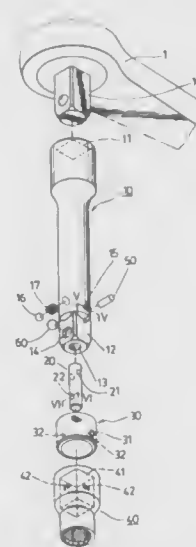
Int. Cl.⁵ B25B 23/16

U.S. Cl. 81—177.85

2 Claims

1. A retainer apparatus for retaining a socket member on a rotatable driving head, said socket member having a socket with a recess of a square cross-section defined by four inner surfaces in each of which a retaining hole is formed, said driving head including a plug of a square cross-section, said retainer apparatus comprising:

- a connecting rod having a socket portion at an end thereof, a plug portion of a generally square cross-section at the other end of said connecting rod, an intermediate portion interconnecting said socket portion and said plug portion, a bore formed in an end surface of said plug portion and extending through said plug portion and into said intermediate portion, a retaining hole formed through a side wall of said plug portion in communication with said bore, and a partially circumferentially extending in the direction of a longitudinal axis of said connecting rod position limiting hole formed through a side wall of said intermediate portion in communication with said bore and having two ends angularly spaced apart from each other at an angle of 90 degrees, said socket portion having a recess of a square cross-section in which said plug of said driving head is engaged, said plug portion of said connecting rod being engaged within said socket of said socket member;
- a control rod disposed rotatably within said bore of said connecting rod and having a pin hole formed through an upper portion thereof, a partially circumferentially extending retaining groove formed in an outer surface of a lower portion of said control rod, said retaining groove having a deep end portion and a narrow end portion and being gradually deepened from said narrow end portion to the deep end;



- a retaining ball positioned in said narrow end portion of said retaining groove of said control rod and extending through said retaining hole of said socket member, so as to retain said socket member on said connecting rod, said retaining ball having a diameter greater than that of said retaining hole of said connecting rod, so as to confine said retaining ball in said retaining groove of said control rod and said retaining hole of said connecting rod;
- a sleeving ring rotatably mounted on said intermediate portion of said connecting rod and having a pin hole formed through a side wall thereof in alignment with said pin hole of said control rod; and
- a retaining pin extending through said pin hole of said sleeving ring, said position limiting hole of said connecting rod and said pin hole of said control rod, so as to interlock said sleeving ring and said control rod while permitting rotation of said sleeving ring and said control rod relative to said connecting rod;
- whereby, when said sleeving ring and said control rod are rotated an angle of 90 degrees relative to said connecting rod so as to move said retaining ball from said narrow end portion to said deep end portion of said retaining groove, said socket member can be removed from said connecting rod due to the fact that said retaining ball disengages from said retaining hole of said socket member.

5,090,276

WRENCH FOR INSTALLING STRAINER BASE IN SINK

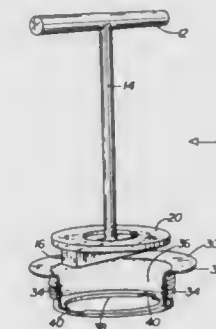
Richard E. Groskey, 2465 Stone St., Oviedo, Fla. 32765

Filed May 17, 1991, Ser. No. 701,791

Int. Cl.⁵ B25B 13/48

U.S. Cl. 81—436

17 Claims



1. A wrench to be used in engaging opposed notches in a threaded strainer base, to enable the strainer base to be installed in the operative position in the drain of a sink, the strainer base having an upper flange, a tapered throat portion, and a lower flange, with the notches being disposed in diametrically opposed locations in the lower flange, said wrench comprising a handle, an elongated shaft mounted on said handle, and an elongate drive bar of generally rectangular configuration mounted at a location remote from said handle, said drive bar extending outwardly well beyond said shaft at right angles thereto, and being several times as long as it is wide, said drive bar nevertheless being dimensioned to fit entirely through the throat of the sink base and to reside in a position in which each end of said drive bar engages one of the opposed notches, and depth limiting means on said wrench for engaging the throat of the strainer base, for preventing the ends of said drive bar from passing beyond the notches into an ineffectual position, said handle of said wrench, when the ends of said drive bar are engaging the notches of the strainer base, enabling the strainer base to be turned in rotation in either direction.

5,090,277

SKI BOOT KEY

Mildred E. Spiller, 6773 Caminito del Greco, San Diego, Calif. 92120

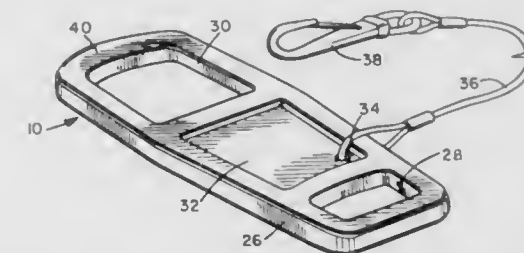
Continuation of Ser. No. 341,842, Apr. 24, 1989, abandoned.

This application Oct. 11, 1990, Ser. No. 596,559

Int. Cl.⁵ B25B 33/00

U.S. Cl. 81—488

9 Claims



1. A ski boot operating tool for operating ski boot pivotal side and rear closure latches, comprising:
- a rigid, generally flat elongate member of generally rectangular shape having a first, generally rectangular opening of predetermined dimensions at one end for fitting transversely over the end of a ski boot side closure latch, and a second, generally rectangular opening at an opposite end for fitting transversely over the end of a ski boot rear closure latch, said openings being different in size relative to each other and having rounded corners at least at their

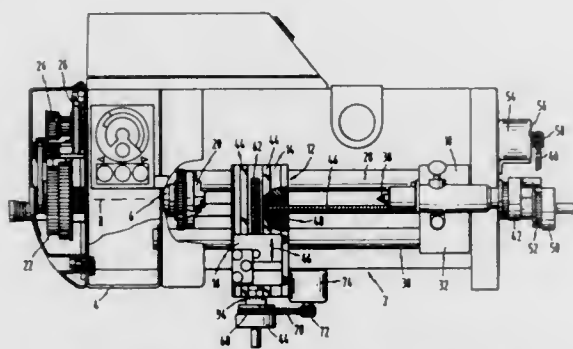
outermost ends and being oriented with opposite sides parallel with adjacent sides of said elongate member; said elongate member having a central web portion of length at least equal to the length of one of the openings and extending between said openings, said web portion being recessed relative to a surface of said member, and the remainder of said elongate member comprising a peripheral rim of substantially uniform width and having substantially uniform thickness greater than the thickness of said recessed web portion, the rim extending around the entire periphery of both openings and around said central web portion, and including transverse rib portions separating each opening from said central web portion; said peripheral rim being of predetermined thickness sufficient to apply leverage to a ski boot closure latch and slightly less than a gap between the end of the ski boot closure latch and an underlying portion of the ski boot in the closed position of the latch to enable said tool to be removed freely after closure of the latch.

5,090,278 LATHE

Hans Mair, Bischofshofen, and Johan Reiner, Ramsau, both of Austria, assignors to Emco Maier GmbH, Hallein, Austria
Filed Sep. 4, 1990, Ser. No. 577,687
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929659

Int. Cl.⁵ B23B 3/00, 21/00
U.S. Cl. 82—117

4 Claims



1. A lathe with a machine bed, a main spindle stock for a motor driven spindle fixed to the machine bed, a tail stock slidable in the direction of the main spindle axis, and a cross table including a longitudinal table moveable in the direction of the main spindle axis and a transverse table moveable transversely relative to the longitudinal table, the longitudinal table being moveable by a rotationally drivable longitudinal lead screw and the cross table being moveable by a rotationally drivable transverse lead screw, characterized in that the longitudinal lead screw and the transverse lead screw are each equipped with a hand wheel which hand wheel is rigidly connected with a drive wheel couplable to an associated positioning motor and which hand wheel is essentially of cup shape to define a cup shaped opening, with the bottom of the cup facing the lead screw transitioning into a receiving hub which is passed over an end of the lead screw and non-rotatably fixed to it by parts located in the cup shaped opening, and wherein the cup shaped opening facing away from the lead screw is closed by a cover.

5,090,279

VERTICAL SPINDLE PEDESTAL

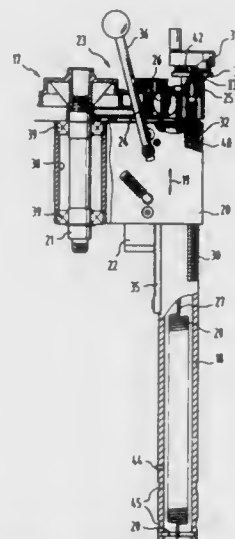
Kurt Enzioger, Mittersill, Austria, assignor to EMCO MAIER GmbH, Hallein, Austria

Filed Sep. 4, 1990, Ser. No. 578,589

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929657

Int. Cl.⁵ B23B 25/00
U.S. Cl. 82—152

10 Claims



1. A vertical spindle pedestal, especially for attachment to a lathe, which vertical spindle pedestal includes a vertical column and a motor driven vertical spindle arranged on the column for vertical adjustment relative thereto, characterized by the vertical column being hollow, a spindle housing vertically slidably supported on the column, an elongated flexible tension member fastened to the housing and guided over a reversing roll carried by the upper end of the column and having a free end connected to a tension spring located in and anchored to the hollow vertical column, and means supported by the vertical column for vertically adjusting the spindle housing along the length of the vertical column, the means for vertically adjusting the spindle housing including a rotatably drivable vertical lead screw supported at its upper end by the vertical column for rotation and against axial shifting, and a spindle nut cooperating with the lead screw and carried by the spindle housing.

5,090,280

TOOL HOLDER ASSEMBLY WITH ANGULAR ADJUSTMENT MECHANISM

Leon G. Kosker, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Filed Mar. 21, 1990, Ser. No. 497,050

Int. Cl.⁵ B23B 29/00

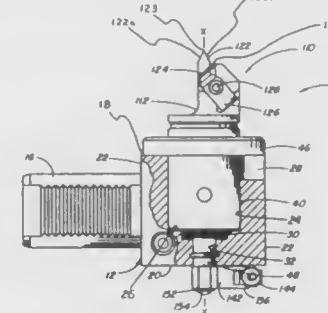
U.S. Cl. 82—158

15 Claims

1. A tool holder assembly having an adjustment mechanism for adjusting the angular orientation of a cutting insert with respect to the longitudinal axis of a tool holder comprising:

- a tool block;
- a mounting member mounted to the tool block and rotatable about the longitudinal axis of the tool holder;
- a tool holder formed with a pocket adapted to receive the cutting insert;
- means for releasably securing the tool holder to the mounting member so that the tool holder is held nonrotatable with respect to the mounting member; and

e) means for rotating the mounting member about the tool holder longitudinal axis in any rotational increment within



a range to effect rotation of the tool holder within a plane perpendicular to the longitudinal axis.

5,090,281

SLITTING APPARATUS FOR CORRUGATED PAPERBOARD AND THE LIKE

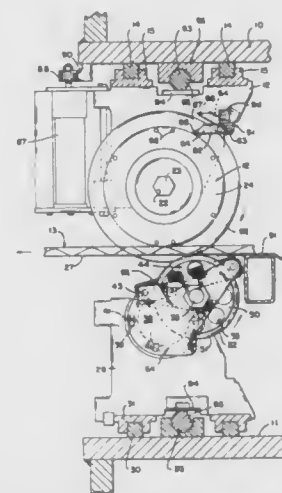
Richard F. Paulson; Kent L. Ross, both of Phillips; Timothy C. Prochnow, Schofield; David W. Dix, Phillips, all of Wis., and Luke A. Stout, Dollar Bay, Mich., assignors to Marquip, Inc., Phillips, Wis.

Continuation of Ser. No. 490,793, Mar. 8, 1990, abandoned. This application Aug. 1, 1991, Ser. No. 739,795

Int. Cl.⁵ B26D 1/22

U.S. Cl. 83—13

14 Claims



13. A method for longitudinally slitting a moving sheet of corrugated paperboard manufactured from multiple paper layers glued together with a starch-based adhesive, said method comprising the steps of:

- (1) mounting an annular blade above the sheet for rotation on an axis parallel to the sheet and transverse to the direction of movement thereof;
- (2) providing said blade with a smooth continuous peripheral cutting edge defined by similar beveled edge faces on opposite sides of said edge;
- (3) positioning said blade to extend each blade edge and edge faces beyond the bottom side of the sheet;
- (4) mounting an idler roller having a cylindrical outer surface below the sheet for rotation on an axis parallel to the axis of rotation of said blade;
- (5) positioning the cylindrical outer surface of said roller to make tangent contact with the underside of the sheet;
- (6) providing the cylindrical outer surface of said roller with

an annular circumferential slot having a width greater than the maximum width of said edge faces;

- (7) forming a nip by positioning said roller and slot to receive therein without contact said blade edge and edge faces;
- (8) rotating said blade to move the blade edge in the direction of movement of said sheet and at a speed at least about two times greater than the speed of the sheet;
- (9) placing a lubricator in direct contact with the peripheral edge and edge faces of said blade;
- (10) supplying metered amounts of a lubricant to said lubricator sufficient to prevent the adherence and build-up of adhesive on said blade; and,
- (11) sharpening the cutting edge of the blade while said blade is rotating.

5,090,282

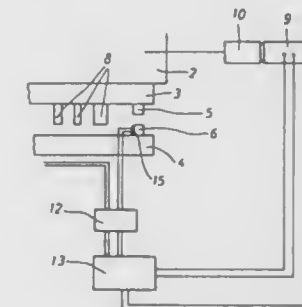
METHOD OF AND APPARATUS FOR REDUCING THE PUNCHING STRESS OF A PUNCHING MACHINE HAVING FIXED ABUTMENTS

Peter Rüesch, Rorschacherberg, Switzerland, assignor to Bruderer AG, Frasnacht, Switzerland

Continuation-in-part of Ser. No. 379,999, Jul. 14, 1989, abandoned. This application May 23, 1991, Ser. No. 707,996
Claims priority, application Switzerland, Jul. 28, 1988, 2870/88

Int. Cl.⁵ B26D 7/26; B30B 15/14
U.S. Cl. 83—13

18 Claims



1. A method of reducing the punching stress of a punching machine having a ram, a punching tool upper part and a punching tool lower part, in which a relative position of the punching tool upper part and the punching tool lower part is determined by at least one mechanical stop located substantially between said punching tool upper part and said punching tool lower part, said stop being provided for stopping a punching stroke and for directly measuring a striking force exerted on the stop, comprising the steps of:

- directly measuring by means mounted on said stop a striking force exerted in said mechanical stop by movement of said punching tool upper part with respect to said punching tool lower part in a punching operation; and
- adjusting a height position of the ram in dependence of the measured striking force whereby said striking force remains within a predetermined range.

5. Apparatus for reducing the punching stress of a punching machine having a ram, a punching tool upper part and a punching tool lower part and at least one fixed stop operative to determine a relative position of the punching tool upper part and the punching tool lower part, said at least one fixed stop being mounted in at least one of the punching tool upper part and the punching tool lower part, and a control means having an adjusting motor operative to adjust a height position of the ram during the working operation of the machine, the apparatus comprising:

- said fixed stop located substantially between said punching tool upper part and said punching tool lower part, said stop being provided for stopping a punching stroke and for directly measuring a striking force exerted on the stop;
- sensing means for directly sensing a striking force exerted on

the fixed stop by movement of said punching tool upper part with respect to said punching machine lower part in a punching operation, said sensing means being mounted on said stop;
adjusting means for adjusting the height position of the ram, said adjusting means being coupled to said sensing means, whereby an output signal of said sensing means is transmitted to said adjusting means.

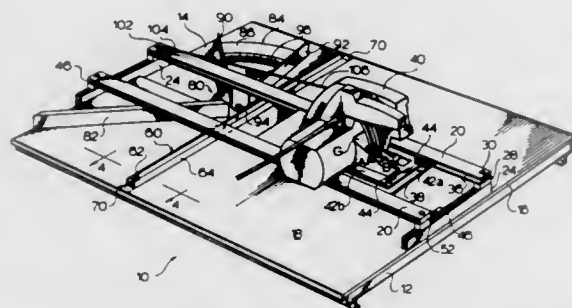
5,090,283 SAW TABLE

Walter E. Noble, 69 Prentiss Avenue, Islington, Ontario, Canada M9B 4C2

Filed May 21, 1990, Ser. No. 525,585
Int. Cl.⁵ B27B 27/10

U.S. Cl. 83—467.1

11 Claims



8. A saw table comprising a bed extending in axial and transverse directions;
said bed having an upper, generally planar surface for supporting a workpiece to be sawn thereon;
said bed having a transversely extending slot in said upper surface;
a transversely extending fence member;
means mounting said fence member to said bed for rotation about a transverse axis between first and second positions, said fence member in said first position being upstanding from said surface to form an abutment for locating said workpiece, and in said second position being substantially contained within said slot so as not to form an impediment for said workpiece.

5,090,284

MECHANISMS FOR DRIVING PUNCH PINS IN PUNCHING APPARATUS

Kiyoharu Nakajima, Yokohama, Japan, assignor to Hitachi Seiko, Ltd, Ebina, Japan

Filed Dec. 19, 1989, Ser. No. 452,356
Int. Cl.⁵ B26D 5/08

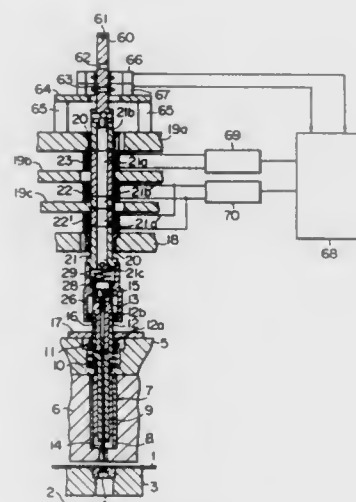
U.S. Cl. 83—577

1 Claim

1. A device for driving punch pins in a punching apparatus including a plurality of punch pins upwardly urged by a plurality of springs; an upper die part on which said punch pins are axially slidably disposed at predetermined intervals; a lower die part formed with a plurality of holes opposing said punch pins; and a die set supporting said upper die part and said lower die part in such a manner that said upper and lower die parts mutually are opposed to each other, said device for driving said punch pins comprising a plurality of drive shaft assemblies each including:

a drive shaft having two shaft portions formed of a magnetic material and the shaft portions formed of a non-magnetic material, said magnetic and non-magnetic shaft portions being disposed adjacent to each other,
three electromagnetic coils fitted around said magnetic shaft portions, control means for energizing two of said electromagnetic coils at the same time so as to advance said drive shaft and said punch pin to perform a punching operation and for energizing the remaining one of said electromag-

netic coils while at the same time stopping the energization of said two electromagnetic coils so as to return said drive shaft and said punch pin when the punching operation is completed, and



a clutch mechanism being disposed on one end of the drive shaft and capable of coupling and separating the drive shaft with and from the punch pin.

5,090,285

SHEET CUTTER

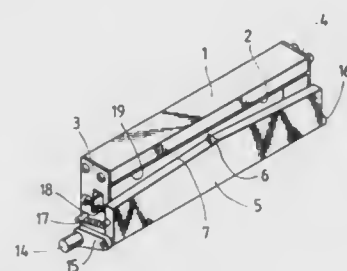
Takajirō Kondō, Tottori, Japan, assignor to Hitachi Metals, Ltd., Tokyo and Yasugi Seimitsu Co., Ltd., Shimane, both of Japan

Filed Dec. 14, 1988, Ser. No. 284,025
Claims priority, application Japan, Dec. 14, 1987, 62-315572; May 11, 1988, 63-113968; May 13, 1988, 63-116096

Int. Cl.⁵ B26D 1/09

U.S. Cl. 83—636

1 Claim



1. A sheet cutter, comprising:
a fixed cutting member having a cutting edge;
a movable cutting member having a V-shaped cutting edge;
and
a means for controlling the stroke of said movable cutting member,
wherein said movable cutting member and the respective cutting edge are movable to overlap with said fixed cutting member and the respective cutting edge to shear a sheet inserted between said cutting edges at a prescribed portion of said sheet, and wherein said cutting edge of said fixed cutting member is straight; and said movable cutting member includes a base and a cutting portion made of a thin plate having a sharp-edge projection at the center of said portion projecting from an otherwise smooth cutting edge and attached to said base so that said portion is elastically concavely curved in respect to said fixed cutting member, and a concavely curved side of said movable cutting member being brought into pressure contact with

said cutting edge of said fixed cutting member, wherein said sheet is sheared from a central portion to both ends of said sheet, and
wherein said cutting edge of said movable member has a single stairstep shaped notch formed in each end thereof and the stroke of said movable cutting member is controlled so that said sheet is sheared except for a part thereof at said ends.

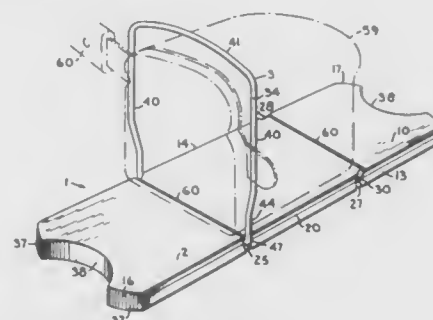
5,090,286 FOOD SLICING GUIDE

William H. Ward, 803 E. 53rd St., Kansas City, Mo. 64110

Filed Feb. 19, 1991, Ser. No. 657,660
Int. Cl.⁵ B26B 29/06

U.S. Cl. 83—761

6 Claims



3. A food-slicing guide comprising:

- a base having a planar surface for supporting an item of food thereon; said base having opposed first and second sides aligned in parallel alignment; when said guide is operational, said first opposed side and said second opposed side including a first vertical slot and a second vertical slot respectively extending into said base and being aligned; said first and said second vertical slots each including a bore extending from said first and said second vertical slots into said base perpendicular to said first and said second sides respectively such that said bores in said first and said second vertical slots are axially aligned;
- a bail comprising a pair of opposed legs connected by a cross-member; each of said opposed legs having an inwardly directed distal end rotatably receivable within said bores in said first and said second vertical slots respectively, such that said bail is selectively positionable in a perpendicular alignment with said base surface such that said opposed legs biasingly engage said opposed sides and said cross-member of said bail extends across and beyond an end of said base so as to define a suspension opening therebetween; and
- a third and a fourth vertical slot extending into said base and aligned directly opposite from each other; said third and fourth vertical slots including a bore extending from said third and fourth vertical slots into said base perpendicular to said first and said second opposed sides such that said bores in said vertical slots are linearly aligned; said bores in said third and said fourth vertical slots rotatably receiving said inwardly directed distal ends of said bail such that said bail is selectively positionable in said perpendicular alignment with said base such that a lower portion of each of said opposed legs is abuttingly received within said third and said fourth vertical slots so as to maintain said bail in said perpendicular alignment and said bail is selectively positionable in said alignment with said base such that said opposed legs biasingly engage said first and said second opposed sides and said cross-member of

said bail extends across and beyond a second end of said base so as to define a suspension opening therebetween.

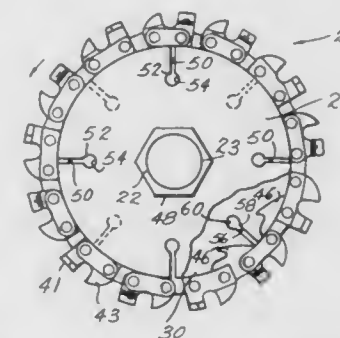
5,090,287 CIRCULAR TOOL ASSEMBLY

Jim A. Chezem, 2307 Kara Dr., Tallahassee, Fla. 32303

Filed Jan. 22, 1991, Ser. No. 644,385
Int. Cl.⁵ B27B 33/08

U.S. Cl. 83—838

18 Claims



1. A circular tool assembly to be fitted together and secured on a power-driven arbor to be rotated, thereby, said assembly comprising:

- a first circular disc defining a first medial, arbor-receiving opening and a first peripheral portion;
- a second circular disc defining a second medial, arbor-receiving opening and a second peripheral portion;
- said first disc further defining a first outer, convex surface extending continuously between said first opening and said first peripheral portion, and said first disc further defining a first inner, concave surface extending continuously between said first opening and said first peripheral portion, said discs adapted to be positioned on said arbor with said, inner surface adjacent to and facing toward said second disc; and
- a circular tool element, such as a chain saw circlet, adapted to extend about outer perimeters of said discs and including at least one flange member adapted to be positioned between and engaged by said peripheral portions to hold said element in position between said discs when said discs are forced toward each other along said arbor to tightly hold said flange member between said peripheral portions of said discs.

5,090,288

ENCLOSURE FOR LIQUID JET CUTTER

Helmut Pelzer, Neue Strasse 5, D-5804 Herdecke-Ende, Fed. Rep. of Germany

Filed Sep. 10, 1990, Ser. No. 580,836
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929909

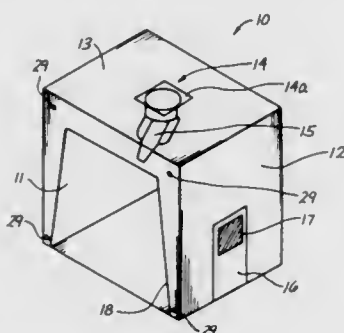
Int. Cl.⁵ B26F 3/00

U.S. Cl. 83—860

7 Claims

1. Housing for a liquid jet tool cutter, the housing being accessible from the outside for passage of workpieces comprising:
two walls facing each other and being interconnected on top by a roof in integral enclosure configuration therewith and having an overall downward facing U-shaped cross section;
said integral configuration being made of concrete;
the concrete enclosure configuration having a front end face and a rear end face, both faces being provided with fastening means, either (a) for establishing a connection to a front or a rear plate covering the respective end face of that U-shaped configuration and being provided with openings for passage of workpieces, or (b) for connection

to a similar concrete U-shaped enclosure configuration; and



cast-in holding means in an inwardly downward facing face of the roof for connection and suspension of a liquid jet cutting tool.

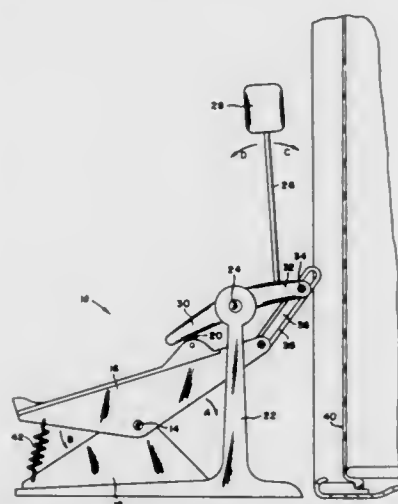
5,090,289

DOUBLE-STRIKE PERCUSSION INSTRUMENT BEATER APPARATUS

Matthew L. Holcomb, 1040 1/2 E. 4th St., Mishawaka, Ind. 46544
Filed Sep. 27, 1990, Ser. No. 588,706
Int. Cl.⁵ G10D 13/02

U.S. Cl. 84—422.1

9 Claims



1. A double action beater apparatus for striking a surface of a percussion instrument, comprising:
a support means;
a beater means rotatably mounted on said support means for striking said surface of said percussion instrument;
said beater means having an offset arm means and a cam contacting means connected thereto;
a pedal means pivotally mounted on said support means;
said pedal means having cam means associated therewith, said cam means engaging said cam contacting means and causing said beater means to rotate into a surface striking position when said pedal means is pivoted in a first pivotal direction;
a linkage means for connecting said pedal means to said offset arm means; and
said linkage means causing said beater means to rotate into said surface striking position when said pedal means is rotated in a second pivotal direction opposite to said first pivotal direction.

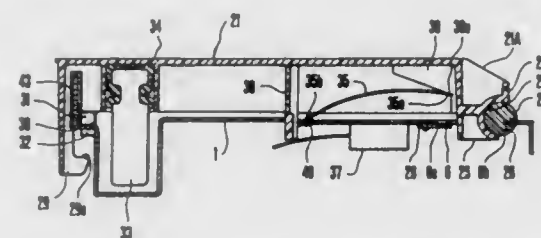
5,090,290 KEYBOARD DEVICE OF ELECTRONIC MUSICAL INSTRUMENT

Shinji Kumano, and Motoshi Murasaki, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan
Continuation of Ser. No. 358,712, May 30, 1989, abandoned, which is a continuation of Ser. No. 115,636, Oct. 26, 1987, abandoned, which is a continuation of Ser. No. 851,806, Jun. 9, 1986, abandoned, which is a division of Ser. No. 571,913, Jan. 17, 1984, Pat. No. 4,604,937. This application Jan. 22, 1991, Ser. No. 644,402

Int. Cl.⁵ G10C 3/12

U.S. Cl. 84—434

2 Claims



1. A keyboard device for an electronic musical instrument, comprising:
a keyboard frame;
a plurality of keys, each of said keys including a plurality of side walls that are spaced apart by a first width in a direction which is perpendicular to a longitudinal direction of each of said keys;
a plurality of key support members on which one of each of said keys is correspondingly disposed so as to be freely pivotable, said key support members being removably coupled to said keyboard frame, and each of said plurality of key support members including a pivotal portion having a second width that is larger than said first width, wherein said second width being disposed in a direction that is perpendicular to said side walls and having a cross section that is parallel to said side walls, said cross section including at least an arcuate segment within a range from one side to the other side of the pivotal portion; and
a pivotal contact portion disposed at one end of the key and having a predetermined radius of curvature that is substantially the same as that of the arcuate segment of said pivotal portion, for contacting said key support members.

5,090,291

MUSIC SIGNAL TIME REVERSE EFFECT APPARATUS

Louis A. Schwartz, 24 Hillside Ave., Ansonia, Conn. 06401

Filed Apr. 30, 1990, Ser. No. 516,154

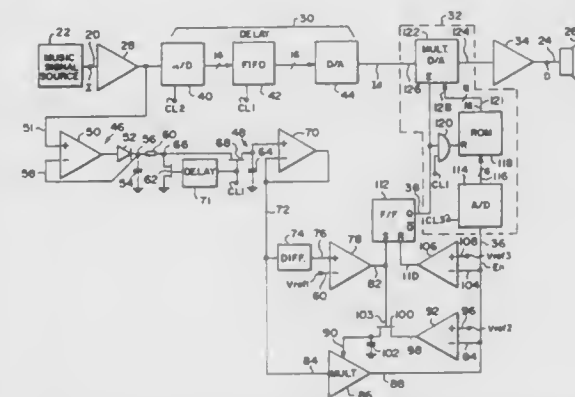
Int. Cl.⁵ G10H 1/57, 7/00

U.S. Cl. 84—603

8 Claims

1. Apparatus for converting an input music signal composed of sequential input note signals, each having an envelope with relatively rapid rise time and relatively slow fall time characteristics to an output music signal composed of sequential output note signals corresponding to said input note signals but each having an envelope with relatively slow rise time and relatively rapid fall time characteristics, said apparatus comprising:
an input port adapted to be coupled to a source for said input music signal;
an output port for said output music signal;
a music signal path directed between said input port and said output port, said music signal path having an instantaneous note signal gain defining a ratio of instantaneous amplitudes of said respective note signals of said output and input music signals;
normalized envelope forming means, fed by said input port, for, in response to each input note signal, forming a normalized envelope signal having substantially the same rise

and fall time characteristics as the envelope of said each input note signal, but having an instantaneous amplitude which varies within a predetermined amplitude dynamic range composed of a series contiguous amplitude regions; and



note signal gain modification means in said music signal path and fed by said normalized envelope forming means, for determining in which amplitude region the instantaneous amplitude of the normalized envelope signal lies and for modifying the instantaneous note signal gain of said music signal path as a function of the the amplitude region determined.

5,090,292 SHORT-CIRCUITING SWITCH AND ELECTROMAGNETIC PROJECTILE LAUNCHER INCORPORATING THE SWITCH

Paul Reip, Sevenoaks, and Melton Mowbray, Melton Mowbray, both of United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB89/00387, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO89/09998, PCT Pub. Date Oct. 19, 1989

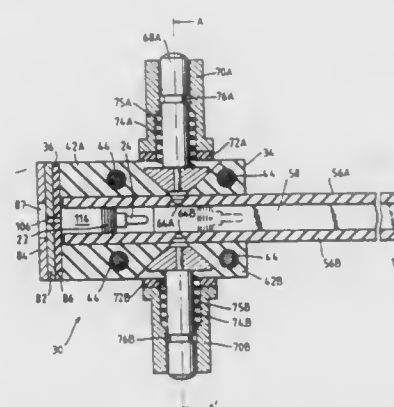
PCT Filed Apr. 12, 1989, Ser. No. 623,741

Claims priority, application United Kingdom, Apr. 13, 1988, 8808678

Int. Cl.⁵ F41B 6/00; H01H 33/14

U.S. Cl. 89—8

12 Claims



1. An electrical switch comprising a pair of terminals (32) each terminal having first (32A) and second (32B) conducting arms, a first conductive contact member (66A) demountably connected across the respective first conducting arms (32A) of the two terminals, a second conductive contact member (66B) demountably connected in parallel relationship to the first

member across the respective second conducting arms (32B) of the two terminals, the two conductive contact members being liftable in different outward directions to sever contact with the terminals, lifting means (96) for lifting at least one of the contact members (66A, 66B) off the terminals (32), and connecting means (110) for electrically connecting a direct current power supply across the terminals (32) to provide conductive paths for current flow which diverge outwards along the first and second conducting arms of one terminal, pass across the first and second contact members, and converge inwards along the first and second conducting arms of said other terminal, whereby lifting of one contact member to sever the conductive path during current flow therethrough nullifies electromagnetic forces of attraction between the contact members and provides an electromagnetic lifting force on said other contact member generated by the combined outward flow of current thereto and the inward flow of current therefrom.

5,090,293

HYDRAULIC BOOSTER WITH REACTION FORCE IMPARTING SURFACE OF EASILY MODIFIABLE FORM

Otmar Winterlik, Mainz-Weisenau, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

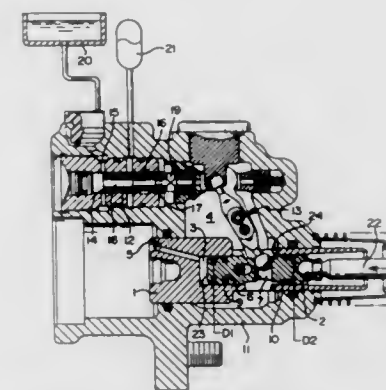
Filed May 4, 1990, Ser. No. 518,906

Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915877

Int. Cl.⁵ F15B 9/10; B60T 13/20

U.S. Cl. 91—373

2 Claims



1. A hydraulic booster for increasing a force applied by a pedal operated push rod to a master cylinder in a slip-controlled brake system including a booster housing having walls defining a booster chamber therein, a booster piston movably mounted in said booster housing, said booster piston having one end engagable with a master cylinder extending out through one of said booster housing walls from within said booster chamber, and a smaller diameter sleeve extension on said booster piston extending out from said booster chamber through another booster housing wall so that the booster piston has an area urged towards said one end by pressure in said booster chamber, a braking pressure control valve having a movable control part, means for generating an actuating force for actuating said control part including a lever mechanism, a storage reservoir of hydraulic fluid at atmospheric pressure, a source of pressurized hydraulic fluid, means for establishing a controlled communication between said booster chamber and said storage reservoir or said source of pressurized hydraulic fluid as a function of the position of said control part, an actuating piston displaceably guided in a bore in said booster piston and having one end positionable by engagement with said push rod, said actuating piston cooperating with said lever mechanism to position said control part in correspondence with the position of said actuating piston, the other end of said actuating piston remote from said push rod received in a cavity in said

booster piston, said one end sealed to said booster piston bore, means causing said cavity to be subject to atmospheric pressure, said actuating piston formed with an intermediate section coupled to said lever mechanism to cause a movement of said control part so as to cause an increase in said booster chamber pressure as said actuating piston moves in the direction of said cavity and a decrease in chamber pressure as said actuating piston moves in the direction of said push rod, said actuating piston intermediate section passing through an opening in said booster piston sleeve extension to be exposed to pressure in said booster chamber, said actuating piston being of stepped construction to form an annular surface formed on said intermediate section to be subject to booster chamber pressure and facing said cavity, said booster chamber pressure acting on said annular surface to produce a net force on said actuating piston acting to oppose the force of said piston rod on said actuating piston, whereby a ratio between the force of said piston rod and a force of said booster piston is varied in correspondence with the area of said annular surface in proportion to the area of said booster piston acted on by said booster chamber pressure.

5,090,294

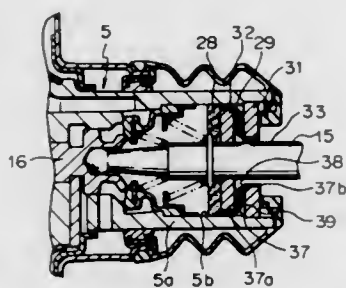
PNEUMATIC BOOSTER WITH TUBULAR PORTION FOR SEPARATELY DIRECTING AIR TO SILENCERS
Mitsubishi Endou, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Nov. 1, 1990, Ser. No. 608,485

Claims priority, application Japan, Nov. 2, 1989, 1-128483[U]
Int. Cl.⁵ F15B 9/10

U.S. Cl. 91—376 R

11 Claims



1. A pneumatic booster comprising:
a casing;

a valve body (forward and backward) movably disposed in said casing so as to be axially displaceable in forward and backward directions, said valve body having a tubular portion extending backward to the outside of said casing and open at the rear end thereof;

a set of a power piston and a diaphragm fixedly mounted at the inner circumference thereof to said valve body and partitioning the interior of said casing into a constant pressure chamber communicable with a negative pressure source and a variable pressure chamber adapted to selectively communicate with the negative pressure source and the ambient air;

a valve unit disposed in said tubular portion of the valve body for selectively placing said variable pressure chamber in communication with the negative pressure source and the ambient air;

an input rod extending into said tubular portion of the valve body for actuating said valve unit;

an output rod connected to said valve body;

a partitioning member disposed in said tubular portion of the valve body between said valve unit and the rear open end of said tubular portion, said partitioning member defining first and second air passages extending along the tubular portion; and

first and second silencers disposed in said first and second air passages, respectively,

said partitioning member being a tubular member having a large tubular portion, and a small tubular portion of a

diameter smaller than that of said large tubular portion, said first air passage including a space between the inner circumferential surface of said small tubular portion and the outer surface of said input rod, said second air passage including a space defined between the outer circumferential surface of said large tubular portion and the inner surface of the tubular portion of said valve body, said first silencer being disposed between the inner surface of said large diameter portion and the outer surface of said input rod, and said second silencer being disposed between the outer surface of said small tubular portion and the inner surface of the tubular portion of said valve body.

5,090,295

RADIAL PISTON ENGINE

Sinclair Cunningham, Kinghorn, Scotland, and Peter Wüsthof, Lohr, Fed. Rep. of Germany, assignors to Mannesman Rexroth GmbH, Lohr, Fed. Rep. of Germany

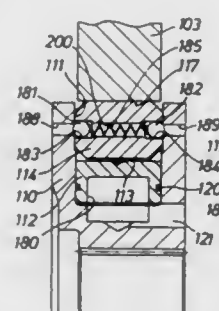
Filed Jun. 11, 1990, Ser. No. 536,274

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1989, 3919456

Int. Cl.⁵ F01B 1/06; F04B 49/02; F15B 15/26

U.S. Cl. 91—491

6 Claims



1. A radial piston motor comprising a housing having two housing halves, an annular cam disc fixedly mounted between said two housing halves,
a shaft extending into said housing,
a cylinder block mounted to said shaft and arranged for rotation together with said shaft within said housing,
a plurality of bores in said cylinder block each extending radially that with respect to the axis of rotation of said shaft,

a plurality of pistons reciprocally mounted in said bores, cylindrical rollers supported in said pistons and adapted to be in engagement with a cam path provided by said cam disc, and

snap-in means provided between said rollers and portions of the cylinder block adapted for guiding said rollers, wherein said snap-in means comprise spring biased ball means in said rollers and, cooperating therewith, recesses in said cylinder block, said recesses in said cylinder block being arranged such, that said spring biased balls will snap into said recesses when said piston is in its lower dead point position.

5,090,296

PISTON ASSEMBLY AND METHOD

William H. Todd, Winston-Salem, N.C., assignor to Todd Motion Controls Inc., Winston-Salem, N.C.

Filed Jan. 9, 1991, Ser. No. 639,117

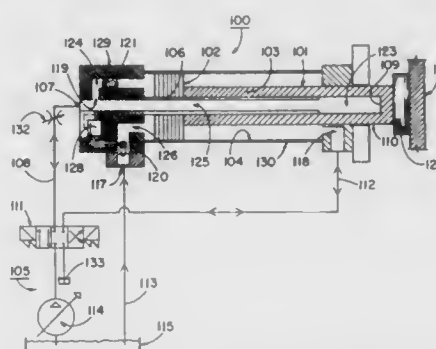
Int. Cl.⁵ F15B 13/00

U.S. Cl. 91—518

10 Claims

1. A piston assembly comprising: a piston housing, said housing defining a piston well, a piston, said piston slidably positioned within said well, said piston comprising a piston head and a piston rod joined thereto, said piston rod comprising a fluid conduit, said piston head defining an opening

therein, a fluid tube, said tube positioned within said piston head opening for fluid communication with said rod fluid conduit, a first fluid entry conduit, said first fluid entry conduit in fluid communication with said fluid tube, said first entry conduit for directing fluid therealong to initially urge said piston outwardly, a second fluid entry conduit said second fluid entry conduit in communication with said piston well,



said second fluid entry conduit for directing fluid to secondarily urge said piston outwardly, a sequence valve, said sequence valve joined to said second fluid entry conduit, whereby fluid passing through said fluid tube will enter said rod fluid conduit to drive said piston to a workload wherein said sequence valve will then direct fluids into said piston well through said second fluid entry conduit to provide additional force to said piston at said workload.

5,090,297

ALL-ELASTOMER FLUID-PRESSURE-ACTUATABLE TWISTORS AND TWISTOR DRIVE ASSEMBLIES

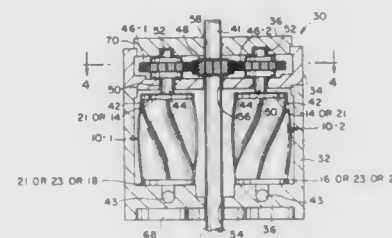
Henry M. Paynter, Pittsford, Vt., assignor to Nathaniel A. Hardin, Forsyth, Ga., a part interest

Filed May 9, 1990, Ser. No. 521,232

Int. Cl.⁵ F01B 19/00

U.S. Cl. 92—48

65 Claims



1. A twistor comprising:

an elongated all-elastomer tubular wall defining a chamber, said elongated tubular wall having first and second ends, said elongated tubular wall having a central twist axis extending longitudinally therethrough and through said first and second ends,

at least one of said ends having an axial opening communicating with said chamber,

said tubular wall having a plurality of longitudinally extending all-elastomer internal reinforcing webs projecting inwardly from the tubular wall into the chamber,

said all-elastomer internal reinforcing webs being integral with the tubular wall,
first and second mounting means at said first and second ends, respectively,

said first and second mounting means being in connected with said tubular wall,

said first mounting means being turnable around said twist axis relative to said second mounting means for twisting said all-elastomer tubular wall and said all-elastomer internal reinforcing webs from a less-twisted condition into a generally helical condition, and

said wall and webs twisted into said generally helical condition being drivable into said less-twisted condition by feeding pressurized fluid into said chamber for producing torque between said first and second mounting means.

13. A pressurized-fluid-actuable twistor comprising:
first and second twistor ends spaced from each other along a twist axis extending longitudinally of said twistor though said ends,

first and second mounting means at said first and second ends of the twistor, respectively,

an elongated tubular wall of resilient elastomeric material extending between said first and second mounting means, said tubular wall being all-elastomer and encircling said twist axis,

said tubular wall also encircling an elongated interior chamber with said twist axis extending longitudinally of said interior chamber,

a plurality of interior webs of resilient elastomeric material joined to each other and joined to said tubular wall, each of said webs extending radially from said twist axis to said tubular wall and extending longitudinally within said interior chamber separating said interior chamber into a plurality of longitudinally extending compartments, each of said compartments being accessible from at least one end of said twistor,

said first mounting means being turnable around said twist axis relative to said second mounting means for twisting said tubular wall and said webs into a generally helical condition from a less-twisted condition,

whereby said first mounting means can be turned in a predetermined rotational sense around said twist axis relative to said second mounting means for twisting said tubular wall and said webs into said generally helical condition, and

fluid passage means coupled to one of said ends of said twistor and communicating with said compartments for enabling pressurized fluid to be fed into said compartments for driving said tubular wall and said partitions toward said less-twisted condition,

thereby providing torque between said first and second mounting means for rotationally driving said first mounting means around said twist axis relative to said second mounting means in a rotational sense around said twist axis opposite to said predetermined rotational sense.

5,090,298

BRAKE BOOSTER WITH SEALED PASSAGE FOR MOUNTING

Jean-Pierre Gautier, Aulnay Sons Bois, and Miguel Perez, Argenteuil, both of France, assignors to Bendix France, Drancy, France

Filed Feb. 24, 1989, Ser. No. 315,365

Claims priority, application France, Feb. 29, 1988, 88 02488; Aug. 29, 1988, 88 11322

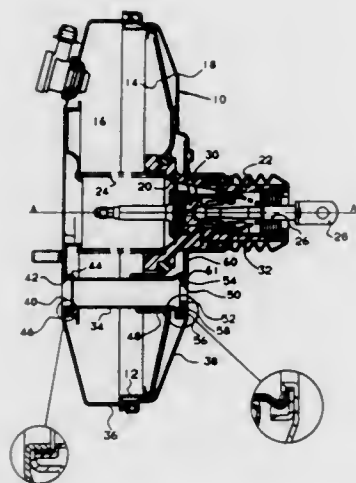
Int. Cl.⁵ F01B 19/04; F16J 15/18

U.S. Cl. 92—98 D

9 Claims

1. A brake booster comprising a casing and a flexible diaphragm which sealingly divides the interior of the casing into a front chamber and a rear chamber, a hollow piston which is movable in the casing and to which said flexible diaphragm is fastened, and at least one passage which extends sealingly through said booster from a face of the casing to an opposite face of the casing, said passage comprising a tube a first end of

which is fastened inside the casing to one of the faces of said casing and a second end of which is mounted sealingly and



slidably on an annular shoulder inside the casing and at the other face of said casing, the second end sealingly and slidably engaging the annular shoulder.

5,090,299

PISTON UNIT WITH ROLLING MEMBRANE

Franco Santi, and Giorgio Bordini, both of Modena, Italy, assignors to Tetra Dev-Co, Modena, Italy

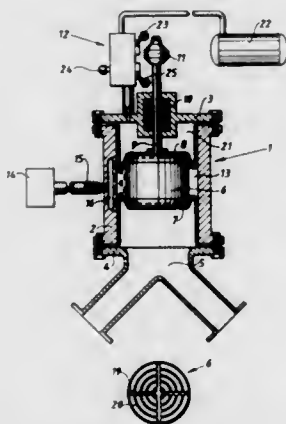
Filed Jun. 13, 1990, Ser. No. 537,121

Claims priority, application Italy, Jul. 27, 1989, 21345 A/89

Int. Cl.⁵ F16J 3/02

U.S. Cl. 92—98 D

11 Claims



1. A piston unit comprising a piston provided with vacuum ducts, a cylinder, means mounting said piston in said cylinder for reciprocating movement, a pair of rolling membranes mounted in said cylinder at opposite ends of said piston to define a space between the rolling membranes, said cylinder having a wall portion and said wall portion being in position to support said rolling membranes, and a source of vacuum, said wall portion being provided with means for communicating said source of vacuum with the space between the rolling membranes and for helping to ensure that communication between the source of vacuum and the space between the rolling membranes is continually maintained as the piston reciprocates within the cylinder.

5,090,300

PLEASURE MIRROR AND FAN UNIT

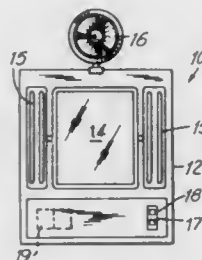
Eugenia Berenstein, 1913 E. 24th St., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 437,395, Nov. 16, 1989, abandoned. This application Jan. 22, 1991, Ser. No. 643,516

Int. Cl.⁵ F24F 13/00

U.S. Cl. 454—370

13 Claims



11. A portable pleasure mirror and fan unit, comprising: a rigid rectangular-shaped frame; a mirror mounted in said frame; dual electric lamps mounted in said frame adjacent said mirror, so as to illuminate the mirror; and an electric-powered multi-speed fan mounted onto an upper portion of said frame, said fan being directed generally forwardly from the mirror and activated by a switch located on the mirror frame so as to provide a low velocity air flow against the face of a user.

5,090,301

ARRANGEMENT FOR VENTILATING THE PASSENGER SPACE OF A MOTOR VEHICLE

Freddie Soethout, Pulheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

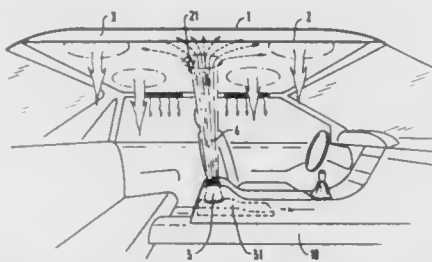
Filed Oct. 23, 1990, Ser. No. 602,009

Claims priority, application European Pat. Off., Oct. 31, 1989, 89120219.4

Int. Cl.⁵ B60H 1/34

U.S. Cl. 454—159

10 Claims



1. An arrangement for ventilating the passenger space of a motor vehicle comprising: a vehicle roof; an air-permeable roof lining; an interspace region between said vehicle roof and said roof lining; a throw nozzle providing a focused air flow to said air-permeable roof lining; where an air flow re-entering the passenger space in a distributed form, passes on rebound from the vehicle roof through the interspace and then through the roof lining wherein the air flow is distributed to all sides of said roof lining.

5,090,302

APPARATUS AND PROCESS FOR REDUCING HEAT GAIN AND LOSS FROM WINDOWS

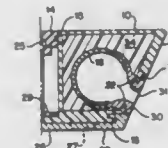
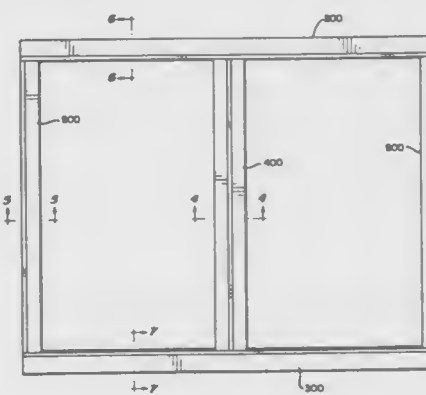
John N. Eisenbeisz, 2023-C Round Top Dr., Honolulu, HI. 96822

Filed Apr. 11, 1990, Ser. No. 510,002

Int. Cl.⁵ E06B 7/02

U.S. Cl. 454—205

16 Claims



1. An improved window for an interior space containing air at an interior temperature in a building, said window having an exterior pane with an exterior face and an interior face, and a frame having a head, a sill, and jambs, comprising:

an elongated nozzle tube having a plurality of air jet apertures spaced along its length attached to said frame, said air jet apertures being configured to direct said air onto said exterior face of said pane; an air supply tube communicating with said interior space attached to one end of said nozzle tube; ventilating means for ventilating air from said interior space into said air supply tube, whereby air from said interior space is ventilated at said interior temperature into said air supply tube and through said nozzle tube and is directed by said air jet apertures onto said exterior face to circulate air adjacent to said exterior face in a controlled circulation pattern, wherein:

said nozzle tube comprises: an elongated tube having a slot along at least a portion of its length; and an elongated nozzle strip having a plurality of substantially aligned air jet apertures spaced along its length bonded to said slotted tube with said air jet apertures aligned along said slot.

5,090,303

LABORATORY FUME HOOD CONTROL APPARATUS HAVING IMPROVED SAFETY CONSIDERATIONS

Osman Ahmed, Madison, Wis., assignor to Landis & Gyr Powers, Inc., Buffalo Grove, Ill.

Filed Sep. 28, 1990, Ser. No. 589,952

Int. Cl.⁵ B08B 15/02

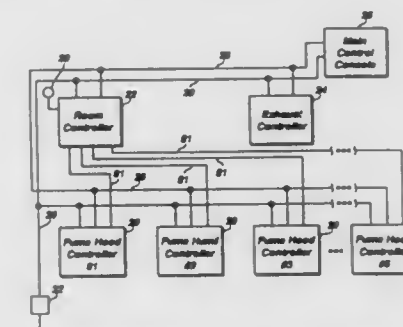
U.S. Cl. 454—58

12 Claims

6. A system for controlling the differential pressure within a room such as a laboratory or the like of the type which has one or more exit doors which can open either inwardly or outwardly of the room, the room being located in a building having a building heating and air conditioning apparatus, including a central monitoring station, the room having a plurality of fume hoods located within it, the fume hoods being of the type which have at least one moveable sash door adapted to at least partially cover the opening as the fume hood sash door is

moved, each of the fume hoods having an exhaust duct that is in communication with an exhaust apparatus for expelling air and fumes from the room, said system comprising:

a fume hood controller means for controlling a flow modulating means associated with each fume hood and its associated exhaust duct to provide the greater of the flow required to maintain a predetermined minimum flow through said exhaust duct or to maintain a desired face velocity through the uncovered portion of the opening;



said flow modulating means associated with each fume hood and adapted to control the air flow through the fume hood;

a first emergency switching means located adjacent each fume hood adapted to be activated by a person in the event of a chemical spill or the like, said switching means providing a signal to said fume hood controller means to control the flow modulating means to achieve a predetermined emergency flow rate and providing a signal to the central monitoring station indicating an emergency condition.

5,090,304

APPARATUS FOR DETERMINING THE POSITION OF A MOVEABLE STRUCTURE ALONG A TRACK

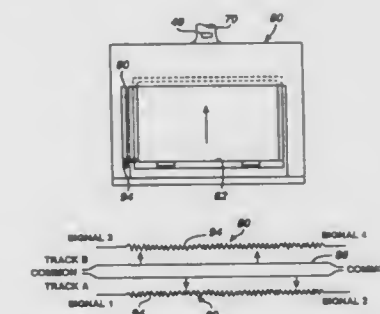
David A. Egbers, Arlington Heights, and Steven D. Jacob, Roselle, both of Ill., assignors to Landis & Gyr Powers, Inc., Buffalo Grove, Ill.

Filed Sep. 28, 1990, Ser. No. 591,102

Int. Cl.⁵ B08B 15/02

U.S. Cl. 454—59

17 Claims



1. Apparatus for use in controlling the air flow through a fume hood to maintain a relatively constant average face velocity through an uncovered portion of an opening of a fume hood of the type which has at least one moveable sash door adapted to selectively cover the opening upon movement of the sash door, said apparatus being adapted to provide position indicating signals that are indicative of the absolute positions of said sash doors, said apparatus comprising:

an electrical switching means having an elongated electrical resistance means with a predetermined resistance value per unit length located adjacent and parallel to one direction of possible movement of at least one of the sash doors; an actuator means associated with each one of the sash doors adapted to move when the sash door is moved, said actua-

tor being positioned to operate said switching means at a single discrete switch location that varies along the length of the resistance means as the sash door is moved; and, circuit means adapted to provide a substantially constant electrical current through a portion of said resistance means between an end portion of said resistance means and the nearest switch location, said circuit means thereby providing a voltage signal having a magnitude that is proportional to the distance between said end portion of said resistance means and said switch location.

5,090,305 DEEP FAT FRYER

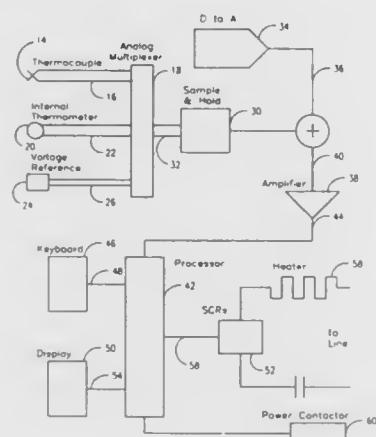
Thomas Lehman, Lee Summit, Mo., assignor to Daylight Donut Flour & Equipment Co., Tulsa, Okla.

Filed Oct. 10, 1990, Ser. No. 596,710

Int. Cl.⁵ A47J 27/00, 27/62; H05B 1/02

U.S. Cl. 99—330

2 Claims



1. A deep fryer for batch frying of foods, said fryer having a receptacle for a cooking medium, which fryer comprises:
 - a. heating element means extending into said cooking medium in said receptacle;
 - b. power source means connected to said heating element means;
 - c. thermometer means extending into said receptacle in order to measure the temperature of the cooking medium;
 - d. conversion means in connection with said thermometer means to convert analog temperature readings to digital readings;
 - e. microprocessor means in connection with said conversion means including keyboard data input means to input a set temperature and timer means;
 - f. SCR controller means in connection with said microprocessor means and said heating element means to proportionally control power to said heating element means if the actual temperature is within a proportioning band surrounding said set temperature;
 - g. display means in connection with said microprocessor means to display information generated by said microprocessor wherein the temperature of the cooking medium will be compared to the set temperature in order to calculate a slope, the slope will be multiplied by a constant and added to the actual temperature and the result will be compared against said set temperature in order to control and regulate the temperature of cooking medium in said receptacle.

5,090,306 UNIT FOR THE PREPARATION OF FRUITS, BERRIES AND/OR VEGETABLES FOR THE EXTRACTION OF LIQUID RAW PRODUCTS

Walter Gresch, Niederweningen, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland
PCT No. PCT/CH88/00140, § 371 Date Apr. 14, 1989, § 102(e)
Date Apr. 14, 1989, PCT Pub. No. WO89/01299, PCT Pub. Date Feb. 23, 1989

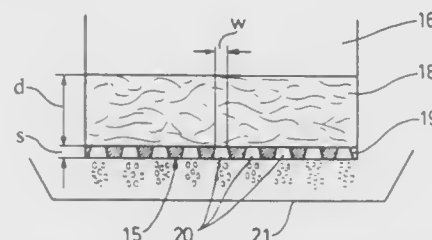
PCT Filed Aug. 17, 1988, Ser. No. 353,636

Claims priority, application Switzerland, Aug. 19, 1987, 3183/87

Int. Cl.⁵ A23L 1/02

U.S. Cl. 99—510

22 Claims



1. Unit for the preparation of fruits, berries and/or vegetables for the extraction of liquid materials therefrom comprising a comminuting device (1) into which are supplied the fruits, berries and/or vegetables as raw materials to obtain mash, a connected press (2) to receive the mash and to extract therefrom juice pulp consisting of juice and cell material, means in said press (2) for separating the juice pulp from a residue consisting of stems, seeds, cores and skin fragments such that a thin press layer (18) results to define a short juice path therethrough whereby a high portion of cell material is passed through the press layer along with the juice, and a refining device (3) to receive said extracted juice pulp, said means for separating comprising a separation wall (19) in said press (2) for the separating of said juice pulp and a residue, said separation wall (19) having openings (20) with a gap width (w), wherein said gap width (w) is more than three times the thickness (s) of separation wall (19).

5,090,307 SHEAR BOLT COUPLING AND METHOD OF REPLACING A SHEAR BOLT

Christiaan A. C. Lippens, Sint-Laureins, and Victor C. D. Demaecker, Zuienkerke, both of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

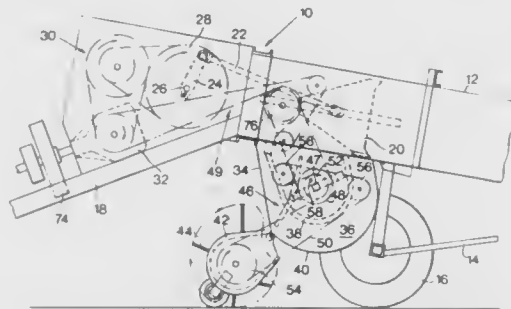
Filed Mar. 5, 1991, Ser. No. 664,909

Claims priority, application European Pat. Off., Mar. 5, 1990, 90200508.1

Int. Cl.⁵ B30B 13/00, 1/00; A01F 15/08

U.S. Cl. 100—35

11 Claims



1. A method of replacing a shear bolt in a shear bolt coupling incorporated in a drive transmission wherein said shear bolt coupling includes a first rotatable member, a second rotatable member disposed coaxial with the first rotatable member, said

shear bolt operatively interconnecting the first and second rotatable members for transmitting power therebetween during normal operation, said shear bolt being arranged to shear off under excessive load conditions in order to interrupt power transmission between the rotatable members and thereby permit the rotatable members to move relative to each other, and shear bolt introducing means operatively associated with one of the first and second rotatable members for urging said shear bolt into a drive coupling position wherein the rotatable members are drivingly coupled together, said method comprising the steps of:

positioning a new shear bolt in said one rotatable member after a used shear bolt has been sheared off;
placing the shear bolt introducing means in an operative position for urging the new shear bolt toward said drive coupling position; and
actuating the drive transmission at a location remote from the shear bolt coupling until the shear bolt introducing means urges the new shear bolt into said drive coupling position thereby drivingly coupling the rotatable members together and establishing power transmission between the rotatable members.

7. A shear bolt coupling comprising:

a first rotatable member;
a second rotatable member disposed coaxial with the first rotatable member;
a shear bolt for operatively interconnecting the first and second rotatable members and for transmitting power therebetween during normal operation, said shear bolt being arranged to shear off under excessive load conditions in order to interrupt power transmission between the rotatable members and thereby permit the rotatable members to move relative to each other; and
shear bolt introducing means operatively associated with one of the first and second rotatable members for urging said shear bolt into a drive coupling position wherein the rotatable members are drivingly coupled together, the shear bolt introducing means being movable relative to said one rotatable member between an inoperative position clear of a shear bolt introducing area of said one rotatable member for enabling insertion of said shear bolt in said one rotatable member, and an operative position for urging said shear bolt toward said drive coupling position.

5,090,308 ALUMINUM CAN COMPACTOR FED WITH BULK CANS

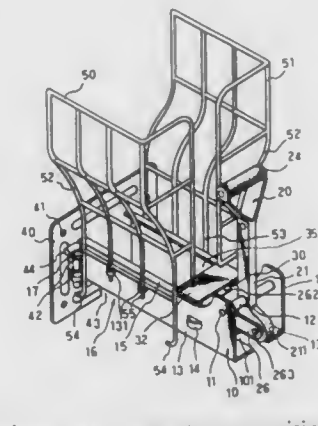
Guang-Bin Wang, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Dec. 10, 1990, Ser. No. 624,898

Int. Cl.⁵ B30B 15/30, 9/32

U.S. Cl. 100—215

1 Claim



1. An aluminum can compactor comprising:
a main body including an elongate trough having a cross-section of said trough generally U shaped, said trough perpendicularly secured to a fixing plate fixed on a wall, and having a discharge slot formed in an inner bottom

portion of said main body; a driving means including a handle bar pivotally secured on an outer end portion of said trough and a link rod pivotally secured to a biasing rod protruding downwardly outwardly from a lower portion of said handle bar;
a pressing means including a pressing member secured to an inner end portion of said linking rod and slidably held in said elongate trough; and
a hopper means mounted on said main body for receiving many cans therein and for loading said cans into said trough of said main body, having a collection bag hung under said main body, whereby upon a lowering of said handle bar to push said linking rod and said pressing member inwardly, a can loaded in said trough is squeezed and then discharged through said discharge slot into said collection bag when raising said handle bar to retract said pressing means;
said main body including two fixing collars formed on two inner end portions of said trough to be respectively coupled with two base collars formed on said fixing plate by two pivot latches for securing the main body on the fixing plate, a first pivot latch inserted in a first said fixing collar of said main body and a first said base collar of said fixing plate serving for pivotally rotating said main body about said first pivot latch for folding said main body when withdrawing a second pivot latch from a second fixing collar and a second base collar respectively formed on an opposite side of said main body and said fixing plate; and
said hopper means including an upper hopper portion diverging upwardly for receiving cans therein, an intermediate tapered portion tapered downwardly from said upper hopper portion, a lower chute portion contracted downwardly from said intermediate tapered portion communicated with a top opening of said trough, a plurality of supporting leg members formed on a lower portion of said hopper means insertably fixed on said main body, and a plurality of bottom hooks formed on a bottom portion of said hopper means for hanging said collection bag positioned under said trough.

5,090,309 WASTE CONTAINER

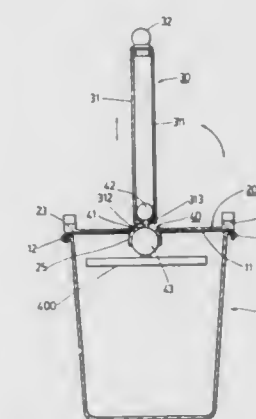
Fu-Tung Lai, No. 1, Lane 140, Sec. 1, Hsi-Tun Rd., Taichung City, Taiwan

Filed Apr. 9, 1991, Ser. No. 682,612

Int. Cl.⁵ B30B 1/00, 15/06

U.S. Cl. 100—226

5 Claims



1. A waste container, comprising:
a hollow body having an open top end;
a cover detachably provided on said open top end;
a press member movably mounted on said cover and having a plate portion disposed horizontally inside said hollow body, said press member being vertically movable inside

said hollow body to compress garbage inside said hollow body;
said cover has a through hole and an inner side provided with a plurality of inwardly curving claw projections disposed around said through hole; and
said press member has a post portion projecting upward from said plate portion and extending through said through hole, and a first ball portion being axially mounted on said post portion and removably engaging said claw projections;
whereby, said press member is pushed downward to disengage said first ball portion from said claw projections and move said plate portion downward to compress garbage inside said hollow body.

5,090,310

STENCIL DISCHARGE APPARATUS

Katsuro Motoe, Tsuchiura, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

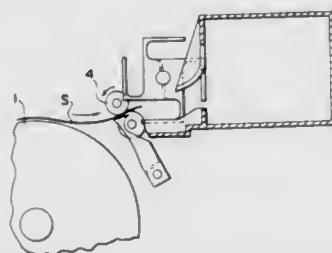
Filed Feb. 25, 1991, Ser. No. 659,946

Claims priority, application Japan, Mar. 6, 1990, 2-52776

Int. Cl.⁵ B41L 13/06

U.S. Cl. 101-114

7 Claims



1. A stencil discharge apparatus for a mimeographic printing machine having a rotary cylindrical drum for supporting a stencil on an outer circumferential surface, said apparatus comprising:

means for peeling the stencil from the outer circumferential surface of the rotary cylindrical drum,
means for transferring the stencil peeled by the peeling means in the direction away from the rotary cylindrical drum, said transferring means being situated near the peeling means,

a rotary unit rotatably situated near the transferring means at a side opposite to the peeling means, said rotary unit having a receiving portion facing the transferring means so that when the transferring means transfers the stencil, the stencil is forcibly entered into the receiving portion to thereby compress and squeeze the stencil inside the receiving portion, and

a disposal unit situated near the rotary unit and having an introducing plate, said introducing plate, when the rotary unit is rotated, engaging the compressed stencil retained in the receiving portion and guiding the compressed stencil from the receiving portion to enter into the disposal unit so that the compressed stencil is kept in the disposal unit.

5,090,311

MACHINE FOR SILK-SCREEN PRINTING, IN PARTICULAR FOR MULTI-COLOR PRINTING

Umberto Brasa, Milan, Italy, assignor to COMEC S.r.l., Italy

Continuation of Ser. No. 338,115, Apr. 14, 1989, abandoned.

This application May 10, 1990, Ser. No. 520,835

Claims priority, application Italy, May 2, 1988, 20409 A/88

Int. Cl.⁵ B41F 15/10, 15/12

U.S. Cl. 101-115

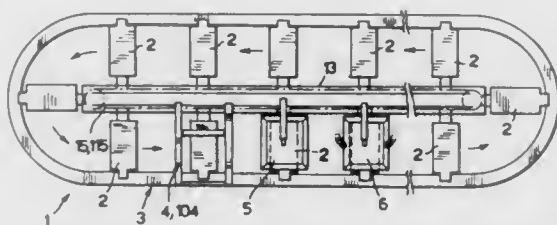
9 Claims

1. A silk-screen printing machine comprising:
a structural support chassis;
a track connected to said support chassis, said track having a plurality of fixed stations;
a plurality of support pallets for supporting articles to be

printed by the machine, said support pallets being intermittently slidable along said track such that they are positionable proximate said fixed stations;

a plurality of interchangeably mountable heads operable during the printing of the articles supported on said tables, said heads being interchangeably mounted to said support chassis proximate said fixed stations;

at least one drive shaft connected to said support chassis for supplying driving power to at least one of said heads mounted to said frame, said at least one drive shaft com-



prising a plurality of interconnected shaft elements, each on said plurality of heads including transmission means comprising a shaft element for transmitting power from said drive shaft to the head; and

a plurality of support bearings associable with said support chassis for removably securing said shaft elements to said support chassis, whereby at least one of said heads is removably mounted to said support chassis by removing a shaft element of said drive shaft and replacing it with the shaft element of a replacement head to be mounted to said support chassis.

5,090,312

MIMEOGRAPHIC PRINTING MACHINE

Yoshiharu Ohinata, Toride, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

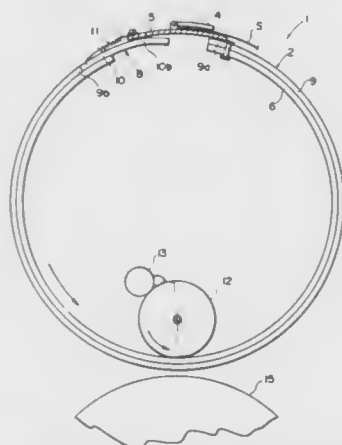
Filed Feb. 25, 1991, Ser. No. 659,945

Claims priority, application Japan, Mar. 6, 1990, 2-52775

Int. Cl.⁵ B41L 13/00

U.S. Cl. 101-120

6 Claims



1. A mimeographic printing machine using a stencil, comprising:

a rotary cylindrical drum with an outer circumferential surface, said cylindrical drum including an ink-penetrable tubular wall for supporting the stencil therearound and a rear end, said cylindrical drum being rotatable with the stencil supported thereon,

ink supply means for supplying ink inside the cylindrical drum,

means for clamping a leading end of the stencil and formed on the outer circumferential surface of the cylindrical

drum, said clamping means and the rear end of the ink-penetrable tubular wall forming therebetween an opening communicating with an interior of the cylindrical drum, and

an ink-impenetrable covering portion disposed at the rear end of the ink-penetrable tubular wall, said ink-impenetrable covering portion extending through the opening to enter into the interior of the cylindrical drum so that ink not used for printing is returned into the interior of the cylindrical drum through the ink-impenetrable covering portion.

5,090,314

INKING AND DAMPENING MECHANISM FOR A REVERSIBLE PRINTING UNIT OF A ROTARY OFFSET PRINTING PRESS

Andreas Miescher, Ittigen; Peter Gertsch, Niederscherli, and Robert Imhof, Bern, all of Switzerland, assignors to Maschinenfabrik Wifag, Bern, Switzerland

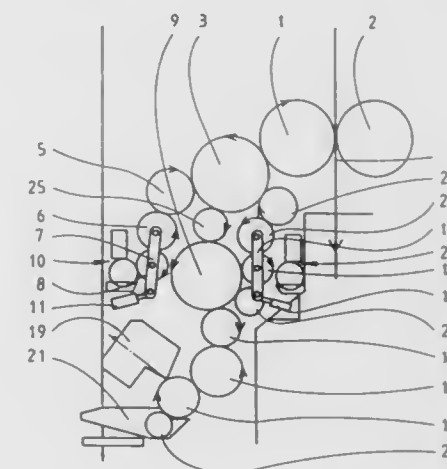
Filed Apr. 16, 1991, Ser. No. 686,416

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1990, 4012283

Int. Cl.⁵ B41F 7/26, 7/36, 7/40

U.S. Cl. 101-148

7 Claims

5,090,313
MULTI-COLOR SILK SCREEN PRINTER HAVING SEPARABLE TWO-PIECE PLATEN FOR REMOVAL AND REPLACEMENT OF PRINTED MATERIAL WITHOUT LOSS OF REGISTRY

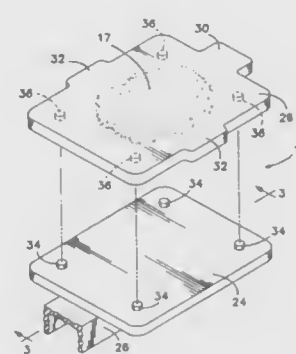
Jeffrey S. Chapman, McMinnville, Oreg., assignor to Textile Graphics Unlimited, Inc., McMinnville, Oreg.

Filed Jul. 2, 1990, Ser. No. 547,011

Int. Cl.⁵ B41M 1/12

U.S. Cl. 101-129

4 Claims



1. A method for making multi-color silk screen prints on dimensionally unstable material comprising:

- providing two or more multi-station silk screen printing apparatus each capable of printing less than the number of colors that are to be printed;
- providing one or more platens on each of said apparatus said platens each having a fixed portion and a removable portion;
- fixedly attaching the material to the removable portion of one of said platens on the first of said apparatus;
- printing all of the colors possible with said first apparatus;
- thereafter removing the removable portion containing the material from said first apparatus, with the material affixed thereto, and attaching it to the fixed portion of a second apparatus;
- printing additional colors on said material with said second apparatus; and
- repeating steps (e) and (f) on additional apparatus until the printing is completed.

1. An inking and dampening mechanism for a reversible printing unit of a rotary offset printing device, comprising:

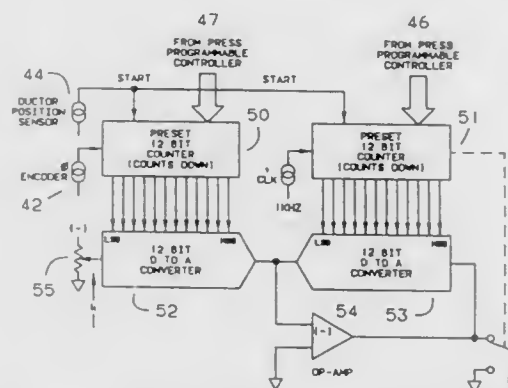
- a central distributing roller;
- an inking roller arrangement for transferring ink from a ductor roller to said central distributing roller;
- a first transfer cylinder and a second transfer cylinder;
- a first distributing roller and a second distributing roller, said first distributing roller being supported engaged with said first transfer cylinder and said second distributing roller being supported engaged with said second transfer cylinder;
- a first applicator roller and a second applicator roller, said first applicator roller being engaged with said first distributing roller and said second applicator roller being engaged with said second distributing roller;
- at least one additional applicator roller, arranged between said first and second applicator rollers, said at least one additional applicator roller being engaged with said central distributing roller;
- a plate cylinder positioned for engaging and disengaging each of said first and second applicator roller and said at least one additional applicator roller;
- a blanket cylinder positioned for cooperation with said plate cylinder;
- a first dampening agent metering means positioned adjacent said first transfer cylinder for providing a dampening agent to said first transfer cylinder;
- a second dampening agent metering means, positioned adjacent said second transfer cylinder, for providing a dampening agent to said second transfer cylinder;
- first transfer cylinder engaging and disengaging means including a first actuator, for individually engaging or disengaging said first transfer cylinder from said central distributing roller; and
- second transfer cylinder engaging and disengaging means, including a second actuator, for individually engaging and disengaging said second transfer cylinder from said central distributing roller.

5,090,315 ELECTRONICALLY CONTROLLABLE INK FOUNTAIN ROLL DRIVE SYSTEM, AND METHOD

Sung C. Lee, Bridgeport, and James N. Crum, Stonington, both of Conn., assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany
Filed Jun. 13, 1991, Ser. No. 714,916
Int. Cl.⁵ B41L 25/00

U.S. Cl. 101—148

12 Claims



1. Printing machine inker system, for controlling application of ink to a plate cylinder (10) of a printing machine (1), having an ink reservoir (18) for receiving printing ink; a fountain roll (20) receiving ink from the ink reservoir; an ink transfer roller (22); ink train means (23-32) transferring ink from the ink transfer roller to said plate cylinder; a ductor roller (21) and means (A) for cyclically alternately engaging the ductor roller with said ink transfer roller (22) and with said fountain roll (20) during predetermined dwell time periods (T/2); and means for controllably intermittently driving said fountain roll, wherein said fountain roll drive means comprises, in accordance with the invention, a high torque servo motor (40) rotationally coupled to the fountain roll (20); a sensor (44) coupled in sensing relation to the ductor roller (21) and providing a ductor position signal representative of a reference instant in a ductor roller cycle upon movement of the ductor roller (21) between the fountain roll (20) and the transfer roller (22); and a controller (45) controlling intermittent operation of the servo motor (40), said controller having first input means (46) receiving a signal representative of the duration of said dwell time periods (T/2); second input means (47) receiving an operator controllable dwell angle signal (ϕS) representative of the angle of rotation of the fountain roller during which the ductor roller is in engagement with the fountain roller; and third input means receiving the ductor position signal (START), said programmable control unit (45) providing a control output (J1) for said servo motor (40) for controlling rotation of the servo motor to drive the fountain roll (20) over an angle as determined by said dwell angle signal (OS) during the dwell time period (T/2) of engagement of the ductor roller (21) with the fountain roll (20).

5,090,316 METHOD AND DEVICE FOR DETERMINING DAMPENING-MEDIUM FEED IN AN OFFSET PRINTING MACHINE

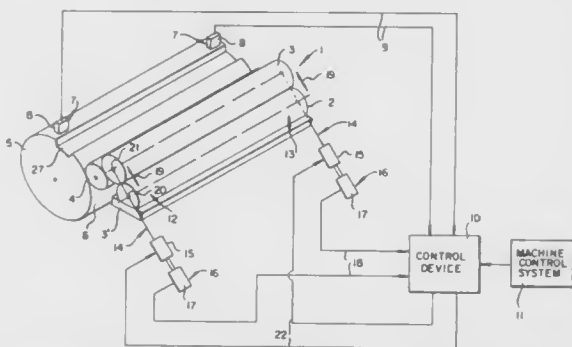
Anton Rodi, Leimen, and Hermann Kraft, Dossenheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Filed Apr. 19, 1990, Ser. No. 511,057

Claims priority, application Int'l Pat. Institute, Apr. 19, 1989, 3912811

Int. Cl.⁵ B41F 7/24

U.S. Cl. 101—148

22 Claims



1. Method of adjusting dampening-medium feed in an offset printing machine, which comprising inking a printing plate having a given width of the printing plate and a given image area of the printing machine, tinting of areas of the printing plate normally ink-free during a production-run, and feeding a defined quantity of dampening medium and increasing the dampening-medium feed, detecting ink taking from the tinted areas, and applying the ink taking as a measurement for the dampening-medium feed.

5,090,317 DOCTOR BLADE DEVICE

Herbert Lubke, Lienen; Volker Schröder, Lengerich, and Wolfgang Knappeide, Lienen, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

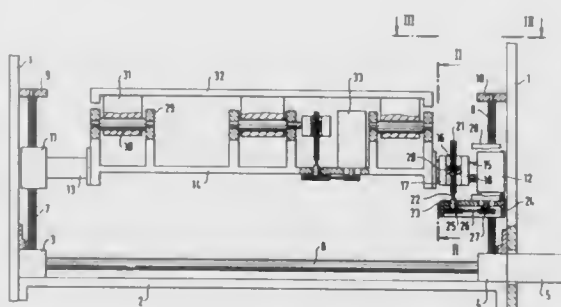
Filed Sep. 24, 1990, Ser. No. 586,780

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932232

Int. Cl.⁵ B41F 9/10, 31/04; B41L 27/06

U.S. Cl. 101—169

6 Claims



1. A doctor blade device having a doctor blade secured in a doctor blade holder for engagement at an adjusted angle with an inked roll, wherein the doctor blade holder is pivotally mounted on an elongate frame which is itself pivotally mounted at its opposite ends in respective carrying members, a further frame in which the carrying members are mounted for linear adjustment in unison, a first drive assembly including a first servo-motor for pivotally adjusting the doctor blade

holder on the elongate frame, a second drive assembly including a second servo-motor for pivotally adjusting the elongate from one the carrying members, drive means including a third servo-motor for linearly adjusting the positions of the carrying members and a central control unit for operating the first, second and third servo-motors.

5,090,319 PRINTING UNIT CYLINDER FOR A ROTARY PRINTING MACHINE

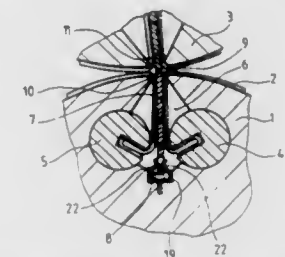
Werner Weber, and Markus Gerstenberger, both of Sandhausen, Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Filed Dec. 3, 1990, Ser. No. 621,665

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1989, 3939725; Nov. 2, 1990, 4034767

Int. Cl.⁵ B41F 1/28, 21/00

U.S. Cl. 101—483

20 Claims



5,090,318 PRINTER WITH SHEET FEEDING APPARATUS

Kazuaki Sugimoto; Tomio Nishijima; Terubisa Inoue; Yoshihiko Sugimoto; Masashi Suzuki, and Izumi Matsushita, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

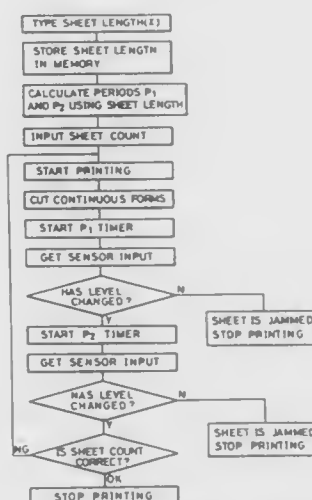
Division of Ser. No. 628,432, Dec. 17, 1990, Pat. No. 5,056,432, which is a division of Ser. No. 469,021, Jan. 23, 1990, Pat. No. 5,007,340. This application Jul. 2, 1991, Ser. No. 724,774

Claims priority, application Japan, Jan. 24, 1989, 1-14796; Jan. 25, 1989, 1-15651; Jan. 26, 1989, 1-16676; Jan. 27, 1989, 1-18574; Jan. 27, 1989, 1-18575

Int. Cl.⁵ B41F 13/56

U.S. Cl. 101—227

1 Claim



1. A printer with a sheet feeding apparatus comprising a printer body which incorporates a printing mechanism, a cutter which cuts continuous forms to a predetermined size, a sheet stacker which accommodates a stack of cut sheets, a sheet feeding path which is located between said sheet stacker and said cutter and which feeds said cut sheets at a rate higher than the feed rate of said printing mechanism, a sensor which detects the presence of said sheets in said sheet feeding path, a sheet length setting means which sets the length of each sheet to be cut, a time limiting means which sets an allowable time in which to detect a single sheet and another allowable time in which to detect a sheet-to-sheet interval, both time settings being based on the sheet length set by said sheet length setting means, and a judging means which compares the output of said time limiting means with that of said sensor to generate a judgment signal for indicating whether the sheet feed operation is normal or being jammed.

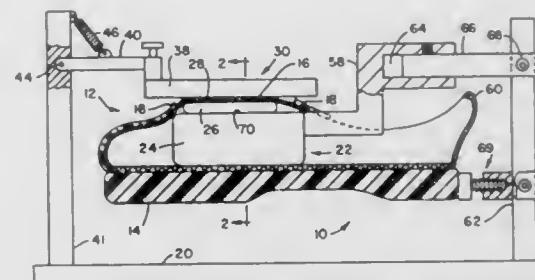
5,090,320 SHOE PRINTING PROCESS AND APPARATUS

Bart I. Nave, Rt. 16, Box 397, Gray, Tenn. 37615
Filed Mar. 26, 1990, Ser. No. 498,532

Int. Cl.⁵ B41F 17/00

U.S. Cl. 101—485

18 Claims



1. The process for applying print matter to a flexible portion of a shoe upper, said flexible portion having inner and outer surfaces, said process comprising providing mandrel means having first contact means provided with substantially flat surface means adapted to underlie and support said flexible portion under tension, said mandrel means having second contact means spaced from and, in operative position, being substantially fixed with respect to said first contact means and adapted to contact an interior portion of said shoe lying gener-

ally opposite said flexible portion, positioning said shoe on said mandrel means with said flexible portion tensioned over said flat surface means and lying substantially flat thereon, and with said second contact means contacting said interior portion of said shoe under pressure to maintain said flexible portion under tension, and applying printing ink to said outer surface of said tensioned flexible portion to leave printed matter thereon.

5,090,321

DETONATOR ACTUATOR

David M. Abouav, Glen Waverley, Australia, assignor to ICI Australia Ltd, Melbourne, Australia

Division of Ser. No. 46,918, Feb. 26, 1987, Pat. No. 4,860,653.

This application Nov. 9, 1988, Ser. No. 269,117

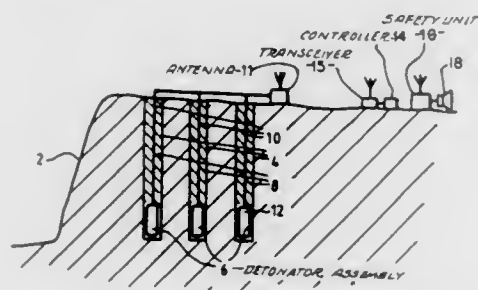
Claims priority, application Australia, Jun. 28, 1985, PH1256; Jun. 28, 1985, PH1257; Jun. 28, 1985, PH1259

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.⁵ F42C 15/40

U.S. Cl. 102—200

7 Claims



1. An actuator for a detonator that explosively actuates using stored charge and is responsive to at least one predetermined digital input signal transmitted from a remotely-located control device comprising:

- a housing adaptable to be placed in close proximity to said detonator;
- means disposed in said housing for inputting said predetermined digital input signal from said control device;
- means disposed in said housing for independently generating, on input of said predetermined digital input signal, an output arm signal that changes the state of said detonator from a disarmed state in which said detonator is incapable of being actuated regardless of stored charge used to cause explosive actuation of said detonator to an armed state; and
- means disposed in said housing for independently generating, at a predetermined period after the input of said predetermined digital input signal, an output actuate signal that causes explosive actuation of said detonator.

5,090,322

PYROTECHNIC TRAIN

Frederick G. Allford, Kent, England, assignor to The Secretary of State of Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 22, 1987, Ser. No. 68,675

Claims priority, application United Kingdom, Jun. 25, 1986, 8615457

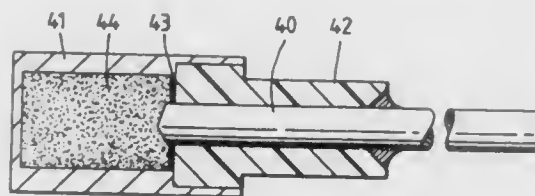
Int. Cl.⁵ F42B 3/18

U.S. Cl. 102—202.7

10 Claims

1. A pyrotechnic train including a reactive laminate com-

prised by a substrate layer of an electron acceptor material having vapour-deposited thereon a film of an electron donor



material, the said two materials being conjointly capable of exothermic reaction when subjected to heat.

5,090,323

TWO-PIECE AMMUNITION PROPELLANT CONTAINMENT BAG

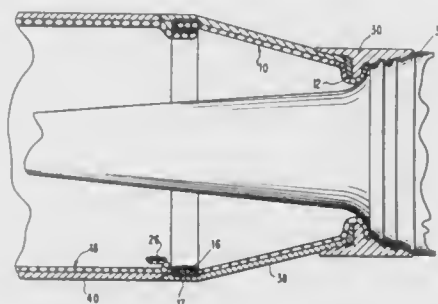
John A. Kallevig, St. Paul, and James L. Kennedy, Bloomington, both of Minn., assignors to 501 Alliant Techsystems Inc., Edina, Minn.

Filed Oct. 31, 1990, Ser. No. 606,766

Int. Cl.⁵ F42B 5/02, 5/16

U.S. Cl. 102—282

8 Claims



7. A round of ammunition comprising in combination; a sabot, an obturator, and a cartridge casing adapter secured together to form an assembly; a propellant bag; and one end of said propellant bag clamped between said obturator and said sabot in order to secure said bag to said assembly.

5,090,324
WARHEAD

Jürgen Böcker, Oberhausen; Wilfried Scheideler, Düsseldorf; Hendrik R. Lips, Düsseldorf; Hans Orth, Düsseldorf, and Herbert P. Weisshaupt, Aachen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/EP89/00645, § 371 Date May 7, 1990, § 102(e) Date May 7, 1990, PCT Pub. No. WO90/02918, PCT Pub. Date Mar. 22, 1990

PCT Filed Jun. 8, 1989, Ser. No. 466,324

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1988, 3830347

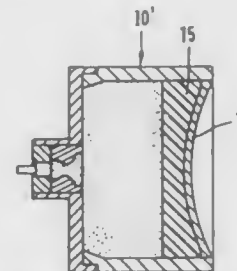
Int. Cl.⁵ F42B 1/00, 1/02

U.S. Cl. 102—307

8 Claims

1. In a warhead provided with a shaped or projectile forming charge arrangement including a casing containing an explosive and a liner of a multi-phase metallic material, with said material being a tungsten-heavy metal alloy; the improvement wherein the surface of said liner facing said explosive is disposed on a first layer which causes the shock wave front to be flattened and dampened and whose acoustic impedance is

substantially lower than that of said liner such that the shock wave will be reflected back and forth several times within said



first layer, with said first layer being composed of polyphenylene oxide (PPO).

5,090,325

TUNNEL DRIVING METHOD

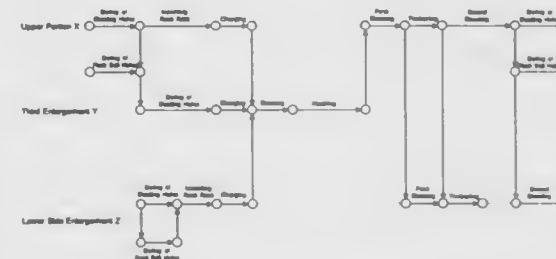
Takeo Saito, Tokyo; Yoshiaki Ishida, Saitama; Nobuyuki Fukunaga, Toyama; Mutsuhiro Kimura, Aichi, and Yasuo Metoki, Ibaraki, all of Japan, assignors to Sato Kogyo Co., Ltd., Toyama, Japan

Filed Jun. 17, 1991, Ser. No. 718,306

Int. Cl.⁵ F42B 3/00; E21B 43/116

U.S. Cl. 102—313

5 Claims



1. A tunnel driving method comprising repetitions of continuous stages [(A) to (D)] of;

- (A) placing single drill carriage, which is provided with at least two charging cages and at least two drill booms having drifters, at the center of a tunnel and before a short bench located at the foot of a facing in order that
 - (A1) said two charging cages are moved toward an upper portion so as to mark blasting holes and rock bolt holes for said upper portion and
 - (A2) said at least two drill booms are operated so as to bore said blasting holes and said rock bolt holes for said upper portion;
- (B) moving said drill carriage backward with a predetermined length in order that
 - (B1) said two charging cages are moved so as to insert rock bolts into said rock bolt holes for said upper portion, while said at least two drill booms are operated so as to bore blasting holes and rock bolt holes for a lower portion located under said bench and
 - (B2) said two charging cages are operated so as to insert rock bolts into said rock bolt holes for said lower portion and so as to charge said blasting holes for said upper portion and said blasting holes for said lower portion with dynamite;
- (C) blasting said upper portion and said lower portion so that said facing is broken and a new facing of said upper portion and a new facing of said lower portion are formed; and
- (D) carrying out after-treatments including concrete shooting.

5,090,326

LIGHTWEIGHT TRAINING BOMBLET EQUIPPED WITH AXIALLY TENSIONED HOUSING COVERS

Ernst-Wilhelm Altenau, Duisburg; Ulf Hahn, Ratingen; Siegmund Fischer, and Margret Palten, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

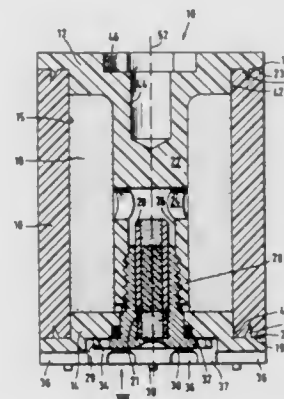
Filed Jan. 17, 1991, Ser. No. 642,463

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1990, 4001673

Int. Cl.⁵ F42B 12/36, 8/12

U.S. Cl. 102—395

18 Claims



1. A training bomblet comprising: a tubular housing shell formed of one of cardboard and plastic; first and second housing covers, each formed of one of cardboard and plastic, centered on and closing respective opposite ends of said tubular housing shell, said covers having respective abutment faces which contact respective end faces of said shell, with each said abutment face of said housing covers including a respective holding and sealing means which is pressed into a respective end face of said housing shell and comprises an annular blade member which has a cylindrical exterior surface extending substantially parallel to a longitudinal axis of said bomblet and a conical interior surface which tapers toward a cutting edge; a signature charge disposed in said shell and fixed at both end faces thereof by said covers; a delayed ignition charge accommodated by one of said housing covers; and a pretensioned connecting means for connecting said covers together and for pressing said abutment faces against respective said end faces of said tubular housing shell.

5,090,327

CARTRIDGE WITH FLASH TUBE

Elmar Bilgeri, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 11, 1991, Ser. No. 654,786

Claims priority, application Austria, Feb. 27, 1990, 451/90

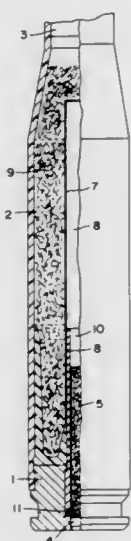
Int. Cl.⁵ F42B 5/00

U.S. Cl. 102—430

8 Claims

1. A cartridge, comprising a cartridge case having a bottom portion, a top portion, and a side wall defining a hollow interior for said cartridge case, said top portion being open and receiving a projectile therein, a propellant charge contained within said hollow interior of said cartridge case, a primer cap located on said bottom portion of said cartridge case, a hollow ignition tube contained within said cartridge case, said ignition tube having a first end in communication with said primer cap and a second end, a detonating agent contained within said ignition tube, said detonating agent filling said ignition tube from said first

end up to a distance spaced from said second end of said ignition tube, and
an empty channel formed in and surrounded by said propellant charge, said channel extending from said second end of said ignition tube to a region in proximity to said projectile,



said second end of said ignition tube being open to said channel so that a flame produced in said ignition tube passes unhindered into said channel and detonates all of said propellant charge surrounding said channel practically simultaneously.

5,090,328

SPIN STABILIZED PROJECTILE UNIT

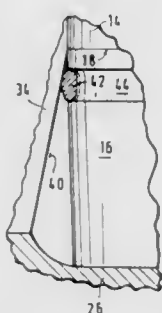
Ulrich Theis, Mülheim; H.-P. Hellmeister, Erkrath; Bernhard Bispig, Ratingen; Michael Vagedes, Düsseldorf; Siegfried Kebler, Düsseldorf; Horst Kantner, Düsseldorf, and Peter Sommer, Ratingen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 749,705

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1990, 4026902

Int. Cl.⁵ F42B 14/06

U.S. Cl. 102—522

7 Claims



1. A spin stabilized projectile unit, comprising:
 - a sub-caliber projectile having a cylindrical section with an outer diameter, a conical tail section including an external circumferential holding groove and having an outer diameter, and a transition region connecting said cylindrical section to said conical section;
 - a propelling cage casing enclosing said projectile; and
 - a propelling base including a receptacle holding said projectile and being connected with said projectile and said propelling cage casing, said receptacle including inward projecting axial webs presenting an inner diameter of said

receptacle in a region of the cylindrical section of said projectile which corresponds to the outer diameter of said cylindrical section, the inner diameter of said receptacle formed by said webs becoming increasingly larger than the respective outer diameter of said conical section beginning in said transition region to form an annular gap extending to a bottom region of said receptacle; and
a holding ring, comprising at least two segments, disposed between the inner diameter of the receptacle and the outer diameter of said conical tail section and lying in said holding groove and against the inner diameter of said receptacle for holding said projectile in the receptacle of said propelling base.

5,090,329

REFERENCE SYSTEM FOR TRACK WORKING MACHINE

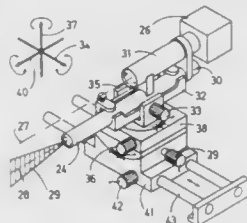
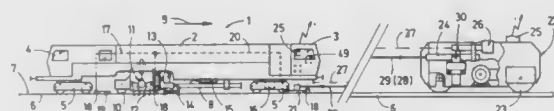
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria
Filed Oct. 3, 1990, Ser. No. 592,219

Claims priority, application Austria, Oct. 25, 1989, 2466/89

Int. Cl.⁵ E01B 33/00

U.S. Cl. 104—7.1

4 Claims



1. A reference system for a track working machine comprising a vertically and/or laterally adjustable working tool unit, which comprises

- (a) a front carriage spaced from a front end of the machine and being movable independently thereof;
- (b) wireless remote control means mounted on the machine and controlling the independent movement of the front carriage;
- (c) a television camera and an emitter of a reference guide beam pivotally mounted on the front carriage, the television camera and the emitter forming a structural unit and having optical axes extending parallel to each other;
- (d) drive means for pivoting the structural unit, the drive means comprising three drives independently controlled by the wireless remote control means for respectively pivoting the structural unit about three axes extending substantially perpendicularly to each other;
- (e) a reference means mounted on the machine and controlling the vertical and/or lateral adjustment of the working tool unit;
- (f) a reference guide beam receiver associated with the reference means and arranged on the machine for receiving the reference guide beam from the emitter; and
- (g) a monitor mounted on the machine and in communication with the television camera.

5,090,330

RUNNER FOR AIR CONVEYOR SYSTEM

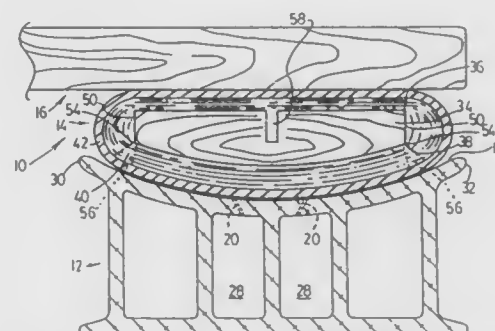
Herbert E. Gladish, Sailrail Enterprises, P.O. Box 3521, Station C, Ottawa, Ontario, K1Y 4L5, Canada

Filed Dec. 26, 1990, Ser. No. 634,077

Int. Cl.⁵ B60V 3/04

U.S. Cl. 104—23.2

17 Claims



1. A load supporting means for positioning between a load and a concave load supporting surface for supporting said load above said surface, said means including an elongated core member having an upper surface and a generally transversely convex lower surface, pad means of flexible compliant material covering at least said lower surface, and an outer cover generally enclosing said pad means and said core, said pad means and said cover being formed of material which is capable of deformation under load and at least partial recovery when the load is removed, characterized by slot means extending into said core member longitudinally thereof from said upper surface, and flat, straight side walls, each extending downwardly from said upper surface along a respective side of said core member to meet said lower surface at a generally sharp, longitudinal lower edge.

5,090,331

ALL PURPOSE CAR

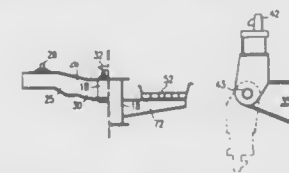
Harold E. Hesch, St. John, and Phillip G. Przybylinski, Scherville, both of Ind., assignors to Trinity Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 498,227, Mar. 23, 1990, Pat. No. 5,052,868. This application Jul. 9, 1991, Ser. No. 727,567

Int. Cl.⁵ B61D 45/00

U.S. Cl. 105—3

11 Claims



6. In a railway car comprising:
 - a longitudinal frame including a pair of longitudinal frame members and a center sill therebetween;
 - a foldable fifth wheel assembly mounted on the frame, adapted to be raised into operating position for connection to a trailer and to be lowered into a stowed position above said center sill;
 - container cross-bearers extending from opposite sides of the center sill transversely of the car and having container securing means at their ends;
 - second container cross-bearers extending from opposite

sides of the center sill transversely of the car and having container locks at their ends, said container locks pivotal on axes extending lengthwise of the car between an upright position and a folded position and in the latter position being hung from the ends of said cross-bearer; and said ends of said first-mentioned cross-bearers being located at a substantial elevation above the center sill and said first-mentioned cross-bearers having inner end portions sloping downwardly toward the center sill and defining a depression therebetween for receiving said wheel assembly therein when folded beneath a container mounted upon said car.

5,090,332

SELF-CENTERING MODEL RAILROAD CAR TRUCK ASSEMBLY

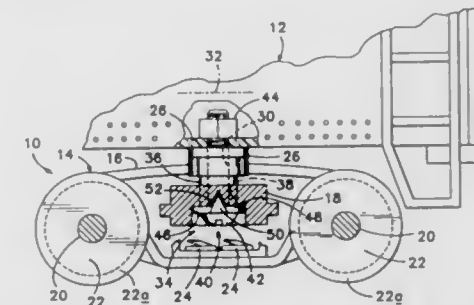
Clarence K. Edwards, Medford, and Lawrence D. Edwards, Eagle Point, both of Oreg., assignors to Kadee Metal Products Co., Medford, Oreg.

Filed Sep. 10, 1990, Ser. No. 580,202

Int. Cl.⁵ B61F 3/00

U.S. Cl. 105—157.2

7 Claims



1. A self-centering model-railroad-car-truck assembly for use on a model railroad car having a longitudinal axis and truck mounting means thereon, comprising:
 - a truck having an elongate bolster, having a cam-receiving notch therein, extending transversely between the sides thereof; and
 - a cam carrier fixed to the truck mounting means, which includes a collar which extends through said bolster, said collar having a self-centering cam for centering said truck with the car removed from tracks such that the bolster axis is oriented normal to the longitudinal axis of the car.

5,090,333

BOGIE FOR HIGH-SPEED RAILBORNE VEHICLE

Guido Bieker, Kirchhundem; Gerhard Kampmann, Netphen, and Alfred Lohmann, Siegen-Eisern, all of Fed. Rep. of Germany, assignors to Wagon Union GmbH, Siegen, Fed. Rep. of Germany

Filed Jun. 4, 1990, Ser. No. 532,604

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1989, 3918300

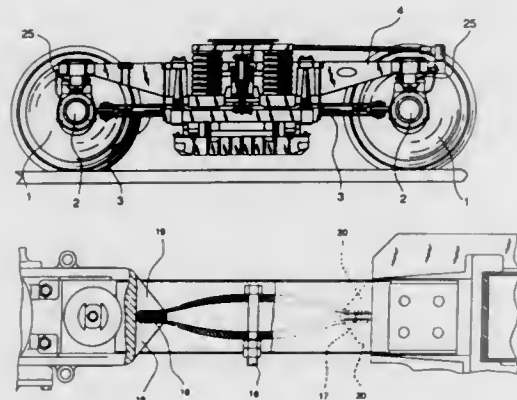
Int. Cl.⁵ B61F 5/30

U.S. Cl. 105—218.1

9 Claims

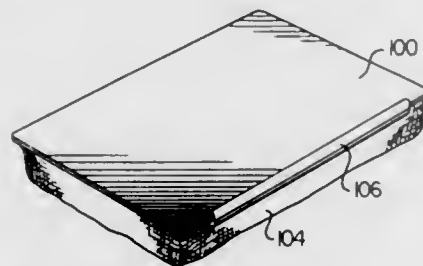
8. A bogie construction for high-speed railborne vehicles, comprising:
 - a bogie frame, wheel sets, with each wheel set including axle bearings;
 - double leaf spring wheel forks including double leaf spring wheel fork elements, connecting said wheel sets to said bogie frame;
 - intermediate rubber bearing elements positioned between each said double leaf spring wheel fork and one of said axle bearings and said bogie frame;
 - a vertical primary spring positioned between each axle bearing and said bogie frame; and,
 - roll stabilizer means positioned between each axle bearing

and said bogie frame and positioned between said leaf spring wheel fork elements of each double leaf spring wheel fork, including at least two leaf springs positioned adjusably compressed against each other, said leaf springs each having an axial bearing end including axial bearing



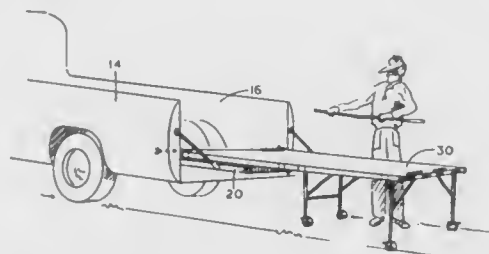
end friction element, and a bogie frame end including bogie frame end friction element, each axial bearing end of said leaf spring being in contact with said axial bearing friction element and each of said bogie frame spring ends being in contact with said bogie frame friction element.

5,090,334
METHOD AND APPARATUS FOR MANUFACTURING LAP DESKS
Lloyd M. Sutton, 4804 Eldorado, Wichita Falls, Tex. 76310
Continuation of Ser. No. 14,792, Feb. 13, 1987, abandoned. This application Nov. 14, 1990, Ser. No. 553,358
Int. Cl.⁵ A47B 23/00
U.S. Cl. 108—43 15 Claims



1. A lap desk comprising:
a rigid planar member;
a subplanar element having a port through which a granular material may pass, and air passages located about its perimeter;
a pillow-like casing sized to engage said subplanar element, said casing having a fabric border which is attached to the perimeter of said subplanar element and contacts and covers said air passages located about the perimeter of said subplanar element; and
a flowable granular material located within said pillow-like casing so as to substantially fill said casing,
means for attaching said pillow-like casing to the perimeter of said subplanar element without said granular material being positioned between said border and said subplanar element and for attaching said rigid planar element to said fabric border of the pillow-like casing and said subplanar element.

5,090,335
TABLE FOR TRUCK BED
Kenneth R. Russell, 1270 N. Fowler Dr., Deltona, Fla. 32725
Filed Aug. 23, 1988, Ser. No. 235,202
Int. Cl.⁵ A47B 23/00
U.S. Cl. 108—44 10 Claims



1. For use in the bed of a truck, a generally rectangular table approximately the size of the truck bed, and designed to normally repose in the truck bed, said table having a forward portion and a rearward portion, and locking means thereon, and a series of at least four rollers on the underside of said table, that are disposed in spaced apart, symmetrically placed locations in contact with the bed of the truck, thereby to provide a distributed support for said table, such that when the truck has been parked, the table can be rolled rearwardly to a desired extent from the bed of the truck, to a location at which the forward portion of said table can be readily caused to enter into a locking relationship, by the use of said locking means, with a rearward portion of said truck bed, such that the table can then serve, by virtue of its relationship to the truck, as a particularly stable means upon which detailed work can be conducted, said table also having a series of hingedly mounted legs on its underside, to provide ample support for said table when said table has been deployed in a position in which it is at least partially extended from the bed of the truck.

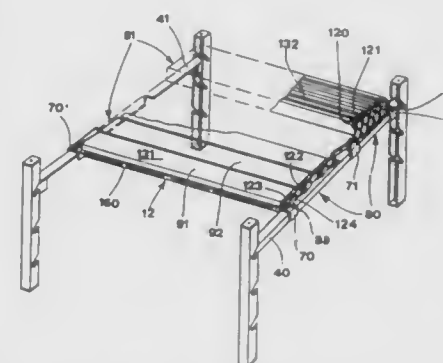
5,090,336
PLASTIC SHIPPING PLATFORM BLANK AND SHIPPING PLATFORM
William A. Longaker, Sr., Golden, and John A. Hansen, Denver, both of Colo., assignors to Golden Technologies Company, Inc., Golden, Colo.
Filed Oct. 15, 1990, Ser. No. 597,577
Int. Cl.⁵ B65D 19/00
U.S. Cl. 108—51.1 10 Claims



1. A plastic shipping platform on which articles are supported comprising:
said plastic shipping platform having a length, a width and a height;
a first sidewall extending in a widthwise direction and lying generally in a vertical plane;
a bottom support panel integral with said first sidewall and extending in a generally horizontal plane;
a second sidewall integral with said bottom support panel and located opposite and parallel to said first sidewall;
a top support panel integral with said second sidewall and located opposite and parallel to said bottom support panel;
a third sidewall integral with said top support panel and in juxtaposed relationship with said first sidewall;
a bottom surface panel integral with said third sidewall and in superposed relationship with said bottom support panel;
first securing means for securing together at least portions of said bottom support panel and said bottom surface panel;

a fourth sidewall integral with said bottom surface panel and in juxtaposed relationship with said second sidewall;
a top surface panel integral with said fourth sidewall and in superposed relationship with said top support panel; and
second securing means for securing together at least portions of said top surface panel and said top support panel.

5,090,337
SHELVING WITH ADJUSTABLE SHELVES PARTICULARLY SUITABLE FOR GOODS VANS
Maurizio Magistrelli, Via Statale 11 n.27, 20010 Vittuone (Milano), Italy
PCT No. PCT/IT88/00021, § 371 Date Jun. 29, 1990, § 102(e) Date Jun. 29, 1990, PCT Pub. No. WO89/07061, PCT Pub. Date Aug. 10, 1989
PCT Filed Mar. 25, 1988, Ser. No. 474,814
Claims priority, application Italy, Feb. 8, 1988, 20606/88[U] Int. Cl.⁵ A47B 1/06
U.S. Cl. 108—67 5 Claims



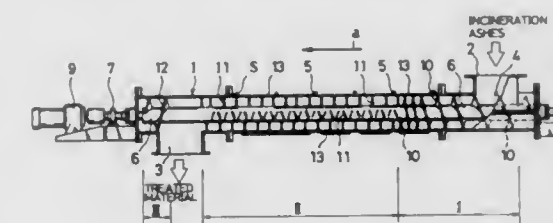
1. A shelving apparatus, especially for a goods-carrying motor vehicle, installable in a loading space into which goods are loaded and from which the goods are unloaded, said shelving apparatus comprising:

two horizontal guide rods (40,41) spaced from each other in said loading space, each of said guide rods having two ends, also having a fixed support (72) attached thereto and also having at least one slider (70,70') mounted slidably thereon slidable to and from said fixed support (72); at least one adjustable shelf (130) comprising at least one set of rectangular components (91,92), each of said rectangular components (91,92) being positioned lengthwise side-by-side and having two transverse sides and two longitudinal sides,

two parallelogram devices (80,81) for mounting said rectangular components on said horizontal guide rods (40,41), each of said parallelogram devices (80,81) comprising at least one set of X-shaped connected pairs of X-bars (82,83), (84,85), (123,124) and (134,135) including a first pair of said X-bars at one end of said set and a second pair of said X-bars at another end of said set, each of said X-bars in each of said pairs of said X-bars being pivotally connected with the other of said X-bars of said pair at a central articulation (90,90') and also being pivotally connected at each opposite end thereof by an end articulation (86,87) with another of said X-bars in an adjacent one of said pairs of X-bars, except that a lower end of an external one of said X-bars (82) of said first pair of said X-bars (82,83) is pivotally connected to one of said sliders (70,70'), while a lower end of an inner one of said X-bars (89) of said second pair of said X-bars is pivotally connected to one of said fixed supports (72) from which said one of said sliders (70,70') slides to and from, each of said rectangular components (91,92) being movably connected by each of said parallelogram devices (80,81) to each of said guide rods (40,41) and each of said transverse sides of each of said rectangular components being rigidly attached to one of said X-bars in one of said parallelogram

devices so that, when said sliders (70,70') are positioned at a minimum distance from said fixed supports (72), all of said pairs of X-shaped bars (82,83), (84,85), (123,124), (134,135), (120,120') are standing substantially vertical and said rectangular components (91,92) also stand substantially vertical, each of said rectangular components being superposed over another leaving the loading space (11) substantially free, but, when said sliders (70,70') are moved from said minimum position adjacent said fixed supports (72), said X-bars become inclined from said vertical toward a substantially horizontal orientation and, when said sliders (70,70') have been moved as far as possible from said fixed supports (72), said rectangular components (91,92) are positioned in said substantially horizontal orientation resting against each other on said guide rods (40,41) thus forming an adjustable shelf.

5,090,338
APPARATUS AND PROCESS FOR TREATING WASTE INCINERATION FLYASH
Yasuaki Harada, Kasukabe; Gentaro Takasuka, Yokohama; Tatuo Kato; Yoshimichi Hanai, both of Chigasaki; Hiroshi Kamei; Kazuya Yamada, both of Yokohama; Hiroshi Otake, Hasuda, and Mazumi Itaya, Ichihara, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan
Filed Nov. 21, 1990, Ser. No. 616,596
Claims priority, application Japan, Mar. 26, 1990, 2-75857 Int. Cl.⁵ F23J 1/00
U.S. Cl. 110—165 A 4 Claims



1. An apparatus for treating waste incineration flyash, comprising:
a cylindrical body extending in an axial direction having a feeding port for introducing waste incineration flyash in the body and a discharging port for discharging flyash contained in the body, said feeding port and discharging port being spaced from each other in the axial direction;
a rotating shaft supported within the body having an introducing screw conveyor portion adjacent said feeding port for receiving flyash through said feeding port and an agitating portion downstream of said introducing screw conveyor portion receiving flyash from said screw conveyor portion and having stirring blades for agitating and further conveying flyash through said body to the feeding port;
said introducing screw conveyor portion of said rotating shaft having a pitch that is successively reduced in the axial direction extending toward said agitating portion; and
at least one of said body and said rotating shaft having means for heating said flyash contained in said body to at least 300° C.

5,090,339

BURNER APPARATUS FOR PULVERIZED COAL

Kunio Okiura, Akira Baba, Noriyuki Oyatsu, all of Kure; Hiroyuki Kaku; Shigeki Morita, both of Hiroshima, and Hironobu Kobayashi, Katsuta, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

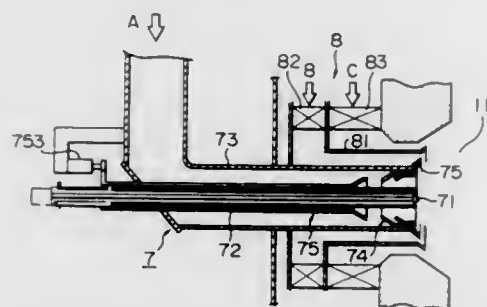
Filed Jul. 16, 1990, Ser. No. 552,455

Claims priority, application Japan, Jul. 17, 1989, 1-182500

Int. Cl.⁵ F23D 1/00; F23Q 9/00

U.S. Cl. 110—263

5 Claims



1. A burner apparatus for pulverized coal comprising: a pulverized coal supply pipe; starter means extending within said pulverized coal supply pipe to define therebetween a tubular passage through which a mixture of combustion air and pulverized coal passes into a furnace; a flame holder provided at an upper periphery of one end of said pulverized coal supply pipe facing to said furnace; means for dividing a part of said tubular passage into two coaxial passage parts, sectional areas of which differ from each other; and means for varying concentrations of pulverized coal in said passage parts including a bypass passage part for interconnecting a radially inner passage part of said coaxial passage parts and the remainder of said tubular passage, and valve means for varying an opening degree of said bypass passage part.

5,090,340

PLASMA DISINTEGRATION FOR WASTE MATERIAL

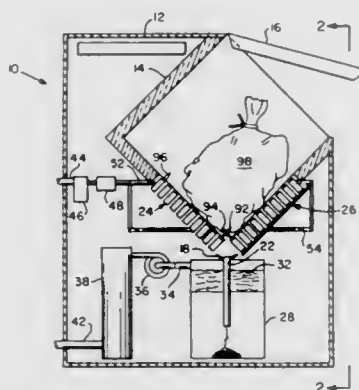
Donald A. Burgess, 5165 Keysville Ave., Spring Hill, Fla. 34608

Filed Aug. 2, 1991, Ser. No. 739,410

Int. Cl.⁵ F23G 5/00, 5/10

U.S. Cl. 110—346

12 Claims



1. Apparatus for disintegrating waste comprising: (a) chamber means for receiving said waste; (b) means comprising an array of nozzle means mounted within said chamber means for generating flame plumes of high temperature plasma extending into said chamber means to disintegrate said waste in steps;

(c) means for supplying a gas to said chamber means through said nozzle means; and

(d) means for withdrawing from said chamber means said gas containing the disintegration products of said waste produced by said plumes of plasma.

5,090,341

HAND-HELD TUFTING MENDING GUN

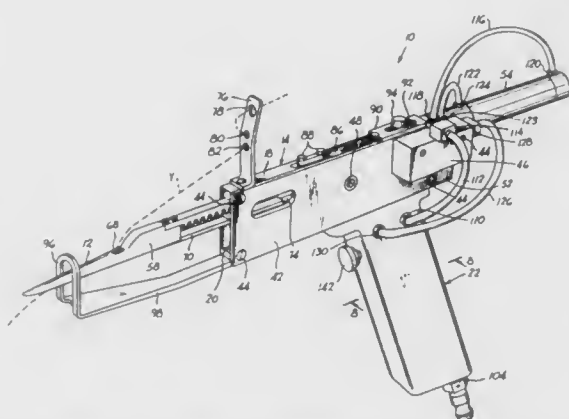
William H. Satterfield, Dalton, Ga., assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Sep. 18, 1990, Ser. No. 584,456

Int. Cl.⁵ D05C 15/08

U.S. Cl. 112—80.04

12 Claims



1. A hand-held tufting mending gun for use with a source of pressurized air for forming stitches of yarn in a backing material, said gun comprising a frame, a needle drive member mounted for reciprocation in said frame, a hollow yarn receiving needle having a point at one end through which yarn may project, means for mounting said needle to said drive member with said point extending in a first direction remote from said drive member, a yarn manipulating plunger having a yarn manipulating end, a plunger drive member mounted for reciprocation in said frame, means for mounting said plunger to said plunger drive member adjacent said needle with said yarn manipulating end of said plunger extending in said first direction for grasping a loop of yarn from said needle, power drive means for drivingly reciprocating said needle drive member, said drive means comprising a pneumatic cylinder fixed to said frame and including a piston rod operatively connected to said needle drive member for driving said needle drive member in said first direction when said piston rod is extended and for driving said needle drive member in the reverse direction when said piston rod is retracted relative to said cylinder, coupling means for interconnecting said needle drive member and said plunger drive member for driving said plunger drive member in opposite directions relative to said needle drive member when said needle drive member is driven and in timed relationship therewith such that while said needle moves in said first direction said plunger moves in said reverse direction, valve means for porting pressurized air to respective ends of said cylinder to extend and retract said piston rod from said cylinder, and operator influenced means for opening and closing passage of air to said valve means selectively.

5,090,342

SEWING MACHINE WITH A SEWING HEAD INCLUDING A ROTARY HOUSING

Robert F. I. Conte, Detmold, Fed. Rep. of Germany, assignor to Durkopp Adler Aktiengesellschaft, Fed. Rep. of Germany

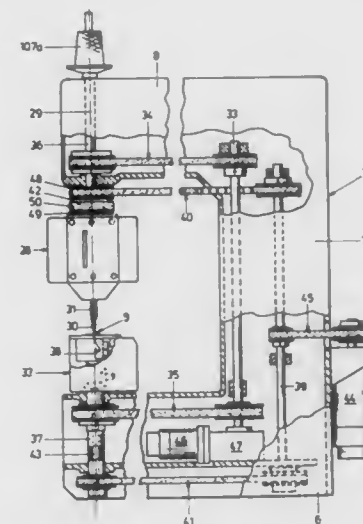
Filed Dec. 17, 1990, Ser. No. 628,606

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1989, 3943131

Int. Cl.⁵ D05B 21/00, 69/00

U.S. Cl. 112—121.15

6 Claims



1. A sewing machine with a sewing head (5) and a device for the generation of a two-axes-relative movement of a workpiece (26) to be sewn in relation to the sewing head (5), comprising: a rotary housing (28, 28') rotatably supported at the sewing head (5) about an axis (29, 29'); a first partial transmission unit (53, 53'); a second partial transmission unit (63, 63'); a needle bar drive (87, 87') drivable by way of said first and said second partial transmission unit (53, 63; 53', 63'); a needle bar (31, 31') carrying a needle (30, 30') and being slidably supported in said rotary housing (28, 28') and being in driving connection to said needle bar drive (87, 87') essentially in the direction of the axis (29, 29') to generate a needle transport movement; said first partial transmission unit (53, 53') having a first input end gear (49, 49') rotatably supported concentrically to said axis (29, 29') and a first output end gear (51, 51') directly coupled with said first input end gear (49, 49') extending axially parallel to said first input end gear (49, 49'); said second partial transmission unit (63, 63') having a second input end gear (60, 60') and a second output end gear (62, 62') directly coupled with said second input end gear (60, 60'); means (52) connecting said first output end gear (51, 51') to said second input end gear (60, 60') and said first input end gear (49, 49') of the first partial transmission unit (53, 53') and second input end gear (60, 60') of said second partial transmission unit (63, 63') being provided axially parallel to one another; and a total transmitting ratio of said first and second partial transmission unit (53, 63; 53', 63') being 1; wherein said first input end gear (49, 49') of said first partial transmission unit (53, 53') has a diameter (d49, d49') larger than a diameter (d51, d51') of said first output end gear (51, 51'), and wherein said second input end gear (60, 60') of said second partial transmission unit (63, 63') has a diameter (d60, d60') smaller than a diameter (d62, d62') of said second output end gear (62, 62').

5,090,343

CHAINING THREAD SEW-IN DEVICE

Yukio Nishiura, Kawanishi, and Yuzo Kawamoto, Suita, both of Japan, assignors to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan

Continuation of Ser. No. 184,493, Apr. 21, 1988, abandoned.

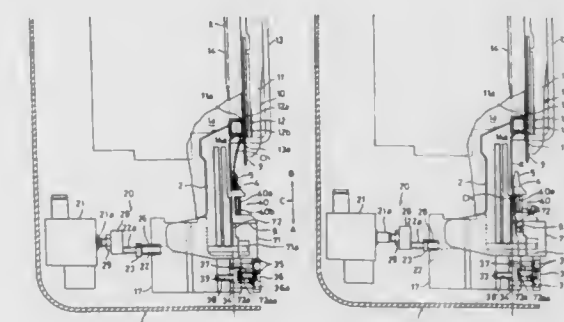
This application Aug. 7, 1990, Ser. No. 563,946

Claims priority, application Japan, Sep. 19, 1986, 61-144225; Apr. 30, 1987, 62-108358; Apr. 30, 1987, 62-108359

Int. Cl.⁵ D05B 65/06

U.S. Cl. 112—130

6 Claims



1. A chaining thread sew-in device attached to an overlock machine which forms seams by linking on the edge of a cloth and produces a chaining thread consecutive with the seams at the terminal end of the cloth, said machine having a working face and a needle location, said device comprising: a suction passage defining a suction opening into which the chaining thread is drawn; means for cutting the chaining thread, said means for cutting including a cutter located near said suction opening; air pressure conveying means for moving a free end of the chaining thread cut off from the cloth by said cutting means toward the needle location by air pressure from the air pressure conveying means; a pinching plate having an upper surface forming therewith part of the working face of the sewing machine; a sub-pinching plate forming a pinching surface located opposite to said pinching plate; a first drive mechanism for moving said pinching plate to open an insertion hole between said pinching plate and said pinching surface into which the free end of the chaining thread is transferred by the air pressure from the air pressure conveying means, and for moving the pinching plate toward said pinching surface to close the insertion hole and pinch the chaining thread; and a second drive mechanism for moving said sub-pinching plate while the chaining thread is pinched, wherein said means for cutting including a further cutter disposed in the path of movement of the pinched chaining thread to thereby cut off the pinched chaining thread as a result of the movement by said second drive mechanism is moving said sub-pinching plate while the chaining thread is pinched.

5,090,344

PRESSER OF A SEWING MACHINE

Shui-Nu Wang, No. 6, Nan Pin Road, Taichung, Taiwan

Filed Jul. 15, 1991, Ser. No. 729,074

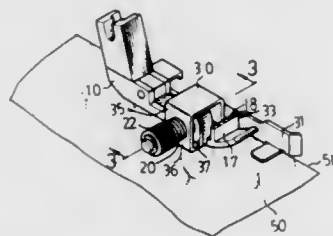
Int. Cl.⁵ D05B 35/10, 29/06

U.S. Cl. 112—151

1 Claim

1. A presser of a sewing machine comprising a body movable downward for pressing a cloth which includes one side edge, said body including a pair of wall members formed thereon; a rod laterally extended from a stay which is integrally formed on said body; a bolt rotatably supported on said rod and immovable longitudinally relative to said rod; and a guide including a platform slidably received and guided between said wall members of said body, said platform including

a first mark formed thereon, one of said wall members having a second mark formed on an upper surface thereof, a relative position between said back and said body can be determined by a relative position between said first mark of said platform and said second mark of said wall member, a back extended downward from said platform for guiding said side edge of said



cloth, and a frame which has a substantially inverted U-shape including two plates each having a screw hole formed therein for threaded engagement with said bolt, whereby, said guide can be caused to move along a longitudinal direction of said rod and said back can be adjusted relative to said body by rotation of said bolt.

5,090,345

THREADING APPARATUS ON A SEWING MACHINE
Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

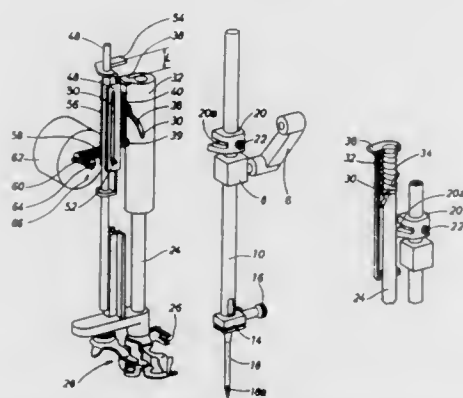
Filed Sep. 10, 1990, Ser. No. 579,961

Claims priority, application Japan, Oct. 14, 1989, 1-267857

Int. Cl.⁵ D05B 87/02

U.S. Cl. 112—225

20 Claims



1. A threading apparatus for a sewing machine comprising:
a needle bar;
a needle attached to one end of the needle;
a sewing transmission for moving the needle bar;
a threading rod mounted in parallel to the needle bar such that the threading rod is movable along and rotatable about an axis of the threading rod;
stop means mounted on the needle bar for stopping the threading rod when the threading rod is in a threading position adjacent to the needle;
threading means attached to a first end of the threading rod for extending a threading hook when the threading rod rotates about the threading rod axis;
actuating means mounted on a second end of the threading rod for rotating the threading rod about the threading rod axis when the threading rod is in the threading position;
movable member provided in parallel to the threading rod axis having a contact portion which selectively comes into contact with and is separated from the actuating means; and
drive means for moving the movable member towards the threading position, wherein the contact portion contacts

the actuating means to move the actuating means and the threading rod towards the threading position.

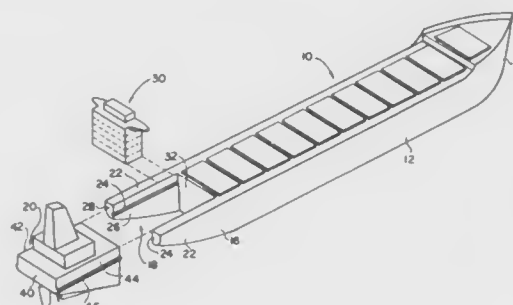
5,090,346

MULTI-PART SHIP CONSTRUCTION SYSTEM
Jerome L. Goldman, 935 Gravier St., New Orleans, La. 70112
Filed Jun. 12, 1990, Ser. No. 537,562

Int. Cl.⁵ B63B 3/04

U.S. Cl. 114—77 R

7 Claims



1. A marine vessel, comprising:

- a floatable hull unit having a streamlined side walls exterior and a stern portion with a generally U-shaped cutout extending vertically substantially through the entire stern portion of the hull unit, the U-shaped cutout being formed by a pair of opposing side arms of the stern portion and a vertical wall extending from a top deck of the hull unit to a bottom of the hull unit, each of the side arms of the stern portion having an interior vertical surface, said surface being provided with a longitudinal groove extending substantially along the entire length of the side arm;
- a propulsion unit fixedly attachable to the stern portion within the cutout, the hull unit and the propulsion unit forming an integrated unit when attached together, the propulsion unit having a pair of opposing parallel vertical propulsion unit side walls, each of said propulsion unit side walls having a protuberance extending outwardly from each of said propulsion unit side walls along substantially entire length of the propulsion unit side walls, said protuberances being sized and shaped to fit within the grooves formed in the vertical side arms of the stern portion when the propulsion unit is moved into the U-shaped cutout of the hull unit; and wherein a space gap is formed between the hull unit and the propulsion unit when the units are joined together, said space gap being filled with a self-hardening substance to facilitate secure attachment of the hull unit the propulsion unit; and
an accommodation/navigation unit fixedly attachable to the integrated unit.

5,090,347

VARIABLE SPEED TROLLING APPARATUS
Gabor L. Radi, 325 - 21st St. NE., Jamestown, N. Dak. 58401
Filed Mar. 20, 1990, Ser. No. 496,214

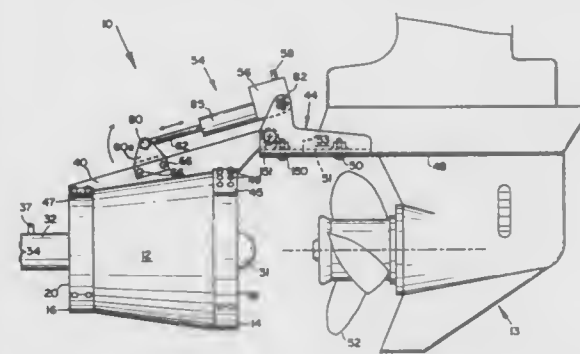
Int. Cl.⁵ B63H 25/44

U.S. Cl. 114—145 R

20 Claims

- 1. An apparatus for controlling a thrust created by a propeller of an aquatic motor, comprising:
 - (a) means for entraining the thrust connected to the motor, said entrainment means having an entrance and an exit for flow therethrough; and
 - (b) means for regulating the thrust flow through said entrainment means, said regulating means connected to said entrainment means, wherein said regulating means is

moved forward or aft within said entrainment means to regulate the thrust flow therein and wherein said regulat-



ing means is generally cone shaped wherein the apex is proximate said propeller.

5,090,348

TRAFFIC SIGNALLING POST

Denis P. Hugron, 1855, Georges, St.-Hubert, Quebec, Canada
J4T 1W2

Filed Mar. 26, 1991, Ser. No. 675,430

Int. Cl.⁵ E01F 9/01

U.S. Cl. 116—63 R

5 Claims



1. A traffic signalling post comprising a flexible rod member, a rigid shaft coaxially secured at one end of said rod member, a locking collar peripherally secured to said shaft at a location adjacent and spaced from said rod member, an anchor bore member releasably housing said shaft for maintaining said shaft in a vertical position, said bore member extending upwardly into a peripheral flange, a perforated elastic diaphragm peripherally secured on said flange for sealing said shaft at a location between said locking collar and said rod member, when the latter sits in the bore member, said diaphragm being provided with a perforation having upper extending lips sealingly surrounding said perforation, said lips being adapted to be depressed downwardly with the introduction of the shaft in the anchor bore member and to be raised upwardly by the retraction of the shaft from said anchor bore member, said rod member being characterized by a flexibility allowing it to bend upon a lateral blow on a position intermediate both ends thereof.

5,090,349

TRAFFIC SAFETY CONE

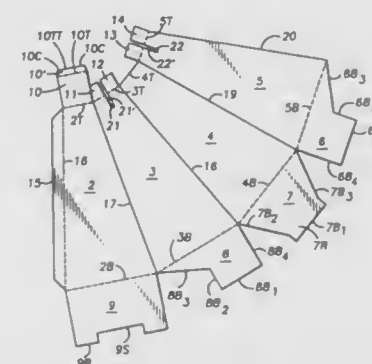
David L. Wilson, Getzville, N.Y., assignor to American Allsafe Company, Tonawanda, N.Y.

Filed Feb. 14, 1991, Ser. No. 655,059

Int. Cl.⁵ E01F 9/04, 13/00, 15/00

U.S. Cl. 116—63 C

9 Claims



- 7. A warning marker device made of a unitary flat folding sheet characterized by predetermined fold lines thereon for forming an elongate cone having a longitudinal axis extending upwardly from the floor or ground upon which said marker device is intended to rest and in which the top end of said cone is truncated, and wherein said marker device is used for alerting passers-by of risk or adverse condition in the environs of said marker device, and wherein said marker device comprises:
 - a) a plurality of major panels forming the body, and wherein each said panel is separated by said predetermined fold lines, and wherein the first and last major panels are attached;
 - b) a plurality of minor bottom panels forming the base, and wherein each said minor bottom panel begins at a fold line at the bottom edge of a corresponding major panel;
 - c) a plurality of minor top panels forming the top closure of said device, and wherein said minor top panels begin at fold lines at the top edge of said major panels forming a locking top closure; and,
 - d) two opposing said major panels, each having a vertical slot at the top end of said marker device for the insertion of a ribbon-like fencing means in said slots.

5,090,350

METHOD AND APPARATUS FOR CLEANING, COATING AND CURING RECEPTOR SUBSTRATES IN AN ENCLOSED PLANETARY ARRAY

John M. Hammond; Mark Petropoulos, both of Ontario; Stuart B. Berger, and Robert W. Nolley, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1989, Ser. No. 457,926

Int. Cl.⁵ C23C 13/08

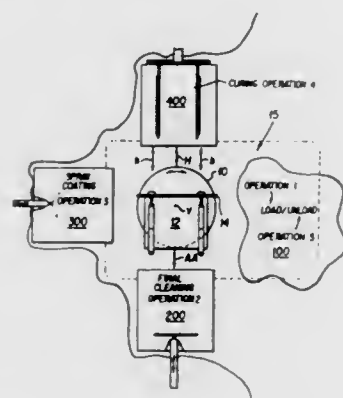
U.S. Cl. 118—50

25 Claims

- 1. An apparatus for processing cylindrical and belt-like substrates, comprising:
 - a carousel rotatable to any one of a plurality of planetary stations surrounding the carousel, the carousel having a support structure defining a central horizontal axis and at least one support arm mounted on the support structure for supporting a substrate thereon along a horizontal axis parallel to and radially offset from the central horizontal axis, the support structure reciprocating relative to any one of the plurality of stations to insert the substrate into and withdraw the substrate from any one of the plurality of stations, and the at least one support arm being rotatable about its offset horizontal axis to rotate the substrate thereon;
 - a loading station located at a first position of the carousel for placing a substrate on the support arm;
 - a cleaning station located at a second position of the carousel;

sel, the cleaning station including a cleaning chamber for receiving the at least one support arm bearing the substrate and having decontaminating means for removing contaminants from the substrate;

a coating station located at a third position of the carousel, the coating station including a coating chamber for receiving the at least one support arm bearing the substrate and



having applicator means aligned with the central horizontal axis of the support structure for applying a coating formulation radially outward onto the substrate; and
a curing station located at a fourth position of the carousel, the curing station including a curing chamber for receiving the at least one support arm bearing the substrate and having curing means for curing the coating on the substrate.

5,090,351

VESSEL HULL CONSTRUCTION AND METHOD

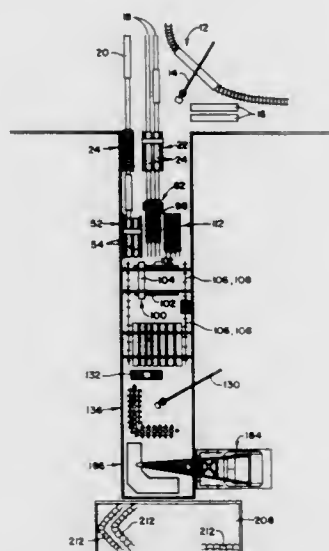
Richard A. Goldbach, Norfolk, Va.; Richard Salzer, Sugarland, Tex., and Frank E. McConnell, Norfolk, Va., assignors to Metro Machine Corporation, Norfolk, Va. and Marinex International, Inc., Hoboken, N.J.

Filed Apr. 1, 1991, Ser. No. 678,802

Int. Cl.⁵ B63B 3/02

U.S. Cl. 114—65 R

29 Claims



1. A method for fabricating a module structure for a double-hulled vessel, comprising:

(a) providing a plurality of flat plate panels, each being elongated rectangular in outer perimetrical shape so as to

have two opposite side edges, two opposite end edges, and two opposite flat faces;

(b) providing a plurality of curved plate panels, each being elongated rectangular in outer perimetrical shape so as to have two opposite side edges, two opposite end edges and two opposite correspondingly generally cylindrically arcuately curved faces, so that each curved plate panel is concave in one direction and convex in an opposite direction about an axis parallel to said side edges;

(c) mounting a longitudinally extending series of transversally extending stiffener plates to at least one face of each flat plate panel, so as to provide a plurality of stiffened flat plate panels;

(d) providing each curved plate panel and each stiffened flat plate panel with an all-over, cured coating of paint to provide respective painted panels;

(e) providing a fixture as an array of upstanding towers fixed on a foundation;

(f) vertically disposing in said fixture, among said towers, a first plurality of said painted curved plate panels, arranged in a first series, in which individual ones of these panels spacedly adjoin one another, side edge to side edge, with respective gaps between them, in a single layer;

(g) vertically disposing in said fixture, among said towers, a second plurality of said painted curved plate panels, arranged in a second series, in which individual ones of these panels spacedly adjoin one another side edge to side edge, with respective gaps between them, in a single layer, so that gaps between panels in said second series are substantially in registry with gaps between panels in said first series, thicknesswise of said fixture;

(h) vertically disposing in said fixture a plurality of said painted stiffened flat plate panels arranged in a series, in which one side edge of each painted stiffened flat plate panel adjoins a respective said gap in said first series of painted curved plate panels and an opposite side edge thereof adjoins a respective said gap in each said second series of painted curved plate panels;

(i) supporting said panels in each of said series of panels with respect to respective ones of said towers of said fixture;

(j) welding joints between and among respective ones of said panel side edges in respective ones of said gaps, thereby filling said gaps and uniting said panels in said fixture into a double-hull module subassembly having a plurality of longitudinally extending cells of generally rectangular transverse cross-sectional shape and two laterally opposite ends where side edges of respective terminal ones of said painted curved plate panels are available;

(k) removing support of said fixture from said panels of said subassembly and removing said subassembly from said fixture; and

(l) repairing damage caused in step (j) to said cured coating of paint both externally of said subassembly and internally of said cells, at internal corners of respective ones of said cells.

5,090,352

BOW FOIL

Ulf H. Stanford, San Anselmo, Calif., assignor to Corwin R. Horton, Kentfield, Calif., a part interest

Continuation-in-part of Ser. No. 17,567, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 765,791, Aug. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 232,739, filed as PCT/US87/02072, Aug. 20, 1987.

This application Dec. 13, 1988, Ser. No. 284,805

Claims priority, application European Pat. Off., Feb. 16, 1988, 88301271.8

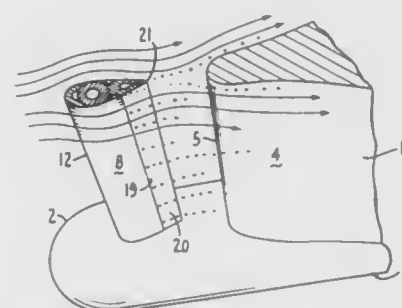
Int. Cl.⁵ B63B 1/34

U.S. Cl. 114—67 A

37 Claims

1. A vessel of improved performance capability having at least one hull with a tapered bow which comprises, in combination therewith, means positioned forward of a portion of the bowpeak of said bow below the waterline and along the verti-

cal longitudinal center plane of the hull for and capable of imparting momentum to the water forward of said bowpeak portion in the outboard direction on each side of said plane while maintaining said water in streamline flow as the bow of the hull moves therepast, said means comprising a foil spaced forwardly of said bow peak portion with the trailing edge thereof confronting said bowpeak portion in the fore-and-aft



direction of said hull, said foil being elongated generally in the direction along said bowpeak portion, in proportion to the width of the foil in the fore-and-aft direction of the vessel, and being elongated in said fore-and-aft direction, in proportion to the thickness of the foil transverse to said vertical longitudinal center plane, and an aftward portion of the trailing section of said foil being generally tapered in the fore-and-aft direction to said trailing edge.

5,090,353

OPEN CELLULAR CONTAINERSHIP AND METHOD

Wilfred Ellis, 124 Walker Street, N. Sydney, NSW, Australia 2060

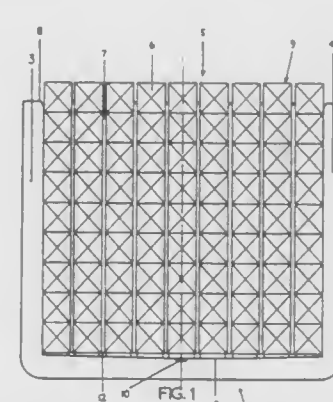
Continuation of Ser. No. 44,276, Apr. 27, 1987, abandoned. This application May 11, 1989, Ser. No. 352,709

Claims priority, application Australia, Jul. 8, 1985, Jul. 8, 1986, PCT/AU86/00195, 44673/85

Int. Cl.⁵ B63B 25/00

U.S. Cl. 114—72

1 Claim



1. A method for loading and transporting a load of containers on a voyage, comprising the following steps:

selecting a containership having a container-bearing deck normally located below a water line and sidewalls extending upwardly from said container-bearing deck, said sidewalls being constructed to provide support and weather shield protection;

situating a longitudinally disposed strength deck at a top of each sidewall substantially above said waterline, said container-bearing deck and sidewalls defining therebetween an open and uncovered hold for receiving the containers, said hold being constructed to be used without lashing devices or hatch covers;

selecting the height of the sidewalls sufficiently high so the height of the strength deck approximates the height of an

uppermost container when the containership is fully loaded;

fully loading the selected containership by loading the containers in rows and columns stacked one upon another upon said container-bearing deck such that the height of the strength deck approximates the position of the uppermost container when the hold is fully laden with containers; and

maintaining the open hold uncovered throughout a voyage between two different ports; whereby said containership may be fully loaded while improving the stability of the containership.

5,090,354

PINSTRIPE PAINTING GUIDE AND METHOD OF USE

Raymond M. Fereretti, 13890 SW. 90th Ave., No. HH207, Miami, Fla. 33176

Filed May 8, 1990, Ser. No. 520,670

Int. Cl.⁵ B05C 11/00

U.S. Cl. 118—505

33 Claims



1. A pinstripe painting guide for use in conjunction with a paint applicator, comprising in combination:

a flexible guide rail having length and having a guide edge for guiding said paint applicator along said length;

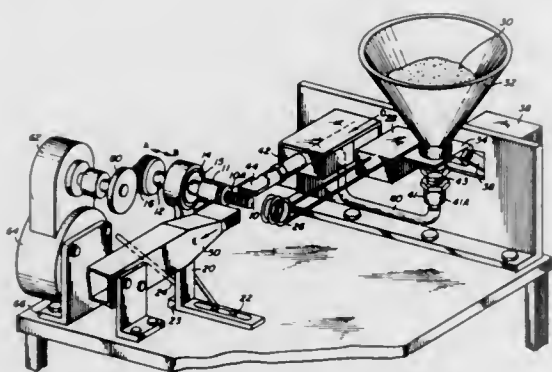
a flexible support member;

mating means for mating said guide rail and said support member to produce a mated assembly; and

stiffening means, comprising a body of hardened liquid which is flooded within a hollow portion of said flexible support member while in a liquid state and then hardened, for rendering said flexible support member substantially rigid and inflexible to provide a consistent profile along said length.

5,090,355

fastener, including means for controlling the rate of power spray; and



reciprocating movement means for reciprocatingly moving said spray means through said fixed supporting means and fastener.

5,090,356

CHEMICALLY ACTIVE ISOLATION PASSAGEWAY FOR DEPOSITION CHAMBERS

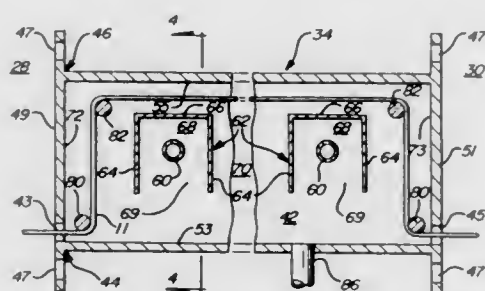
Prem Nath, Rochester Hills; Jon Call, Royal Oak; Gary M. Didio, Highland, and Kevin Hoffman, Sterling Heights, all of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Jun. 28, 1991, Ser. No. 723,042

Int. Cl.⁵ C23C 16/48

U.S. Cl. 118—718

16 Claims



1. In an isolation passageway adapted to operatively interconnect a first and second adjacent low pressure deposition chamber wherein a first semiconductor layer is deposited on a substrate in said first chamber and a second semiconductor layer is deposited on said substrate in said second chamber, to provide reduced diffusion of gases between said first and second chambers and to provide passage of said substrate therethrough; said improvement characterized by:

- a plurality of electrodes positioned in said passageway for producing a plasma from any gases in said isolation passageway;
- a plurality of grounded shields constructed and positioned to be plated by said plasma and preventing plasma within said isolation passageway from depositing on said substrate.

5,090,357

AQUARIUM

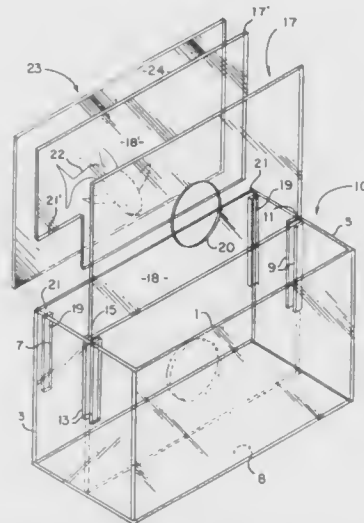
Kenneth J. Pucci, 1300 Fayette St., Apt. 53 Hopkins, Conshohocken, Pa. 19428

Filed Jan. 25, 1991, Ser. No. 645,624

Int. Cl.⁵ A01K 63/00

U.S. Cl. 119—5

6 Claims



1. An improved aquarium comprising:
- (a) a body having a front wall, back wall, bottom wall and two side walls, said body defining a chamber;
 - (b) first and second plates; and
 - (c) means for receiving said first and second plates in said aquarium between said two side walls, said first plate having a mirrored surface and said second plate dividing said chamber into two subchambers, said second plate having an enlarged opening therethrough sized to allow fish in said aquarium to swim therethrough.

5,090,358

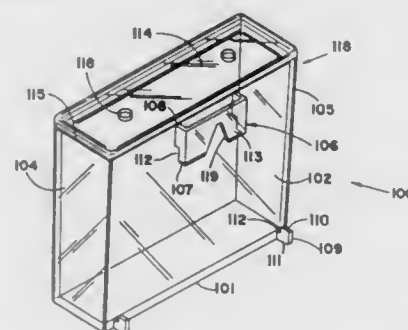
AQUARIUM OR TERRARIUM VESSEL

Martin Waldman, P.O. Box 5473, Vandenberg, Calif. 93437
Continuation-in-part of Ser. No. 422,987, Oct. 16, 1989, Pat. No. 4,967,694. This application Sep. 4, 1990, Ser. No. 577,210. The portion of the term of this patent subsequent to Nov. 6, 2007 has been disclaimed.

Int. Cl.⁵ A01K 63/00

U.S. Cl. 119—5

20 Claims



1. A vessel for housing and maintaining life comprising:
- a reservoir having a base, a rear wall, a front wall, and side walls between the rear wall, front wall, and base, the reservoir being formed of a transparent material;
 - mounting means with the rear wall whereby the reservoir is adapted for selective mounting on a vertical wall wherein the mounting means is engageable with a protrusion from the vertical wall, or is adapted for mounting with the base located on a horizontal surface; and

holder means attached to the rear wall for removably receiving a picture, a picture having a front face and the holder means positioning the front face of the picture in adjacency with the rear wall of the reservoir such that the picture is visible from the front wall through the reservoir, the holder means being between the rear wall and an extremity of the mounting means from the rear wall, and wherein the mounting means is integrally formed with the rear wall and includes part of the holder means, and including lid means for the reservoir.

5,090,359

MILKING MACHINE AND A METHOD OF MILKING BY MEANS OF THE SAME

Torbjörn Pettersson, Gnesta, and Benny Örnérors, Hägersten, both of Sweden, assignors to Alfa-Laval Agriculture International AB, Tumba, Sweden

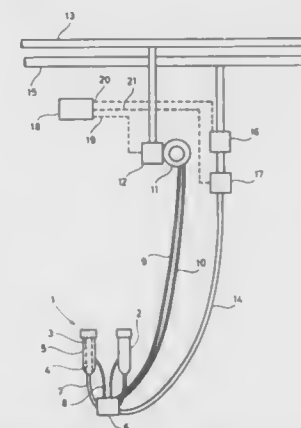
PCT No. PCT/SE89/00069, § 371 Date Aug. 31, 1990, § 102(e) Date Aug. 31, 1990, PCT Pub. No. WO89/08384, PCT Pub. Date Sep. 21, 1989

PCT Filed Feb. 17, 1989, Ser. No. 571,616

Claims priority, application Sweden, Mar. 11, 1988, 8800893 Int. Cl.⁵ A01J 5/00

U.S. Cl. 119—14.08

8 Claims



1. A milking apparatus comprising:
- at least one teat cup with a liner for receiving a teat, said liner having a milk conducting passage, a pulsation chamber being formed between the teat cup and the liner,
 - means for subjecting the milk conducting passage of the liner to a pressure lower than atmospheric pressure and the pulsation chamber to a pulsating pressure varying between a low and a high pressure, said high pressure being higher than the pressure in the milk conducting passage of the liner,
 - means for controlling the respective pressure in the milk conducting passage of the liner and the pulsation chamber, means for sensing milk flow, which during milking increases to a main flow in an initial first phase of milking, amounts to said main flow in a second phase of milking, and diminishes from said main flow in a third phase of milking, and
 - said pressure control means being adapted to control the various pressures in response to said sensing means sensing during said third milking phase that the milk flow has diminished to a predetermined portion of the main flow, such that the low pressure in the pulsation chamber is higher than the pressure in the milk conducting passage of the liner, at least during a part of the third milking phase.

5,090,360

ATOMIZED THIN FILM FORMING APPARATUS

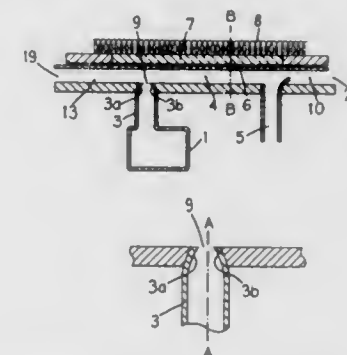
Nobuyasu Shiba; Mizuho Imai; Mikio Sekiguchi, and Hideo Iida, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1991, Ser. No. 637,069

Claims priority, application Japan, Jan. 13, 1990, 1-5787 Int. Cl.⁵ B05B 1/00, 1/34

U.S. Cl. 118—59

5 Claims



1. A thin film forming apparatus for forming a thin film on a plurality of substrates, said apparatus comprising:
- an atomizer for atomizing a source solution;
 - a film forming chamber provided above said atomizer;
 - a nozzle provided on an upper portion of said atomizer and connected to and opening into said film forming chamber so as to be able to introduce atomized source solution therein, said nozzle having an upper portion comprising a pair of inner wall surfaces which are disposed opposite to each other with respect to the longitudinal direction of the film forming chamber, said inner wall surfaces being concavely curved toward each other so as to gradually decrease the distance therebetween as the inner wall surfaces approach the nozzle opening, the rate of decrease in the distance between said inner wall surfaces gradually increasing as said inner wall surfaces approach the nozzle opening;
 - substrate feeding means for feeding said substrates into said film forming chamber in such a manner that said substrates form the ceiling in said film forming chamber; and
 - heating means for heating said substrates.

5,090,361

COATING APPARATUS

Ichiro Ishibashi; Kiyohiro Ichinose; Toru Yamamoto, and Toshikazu Kashida, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1989, Ser. No. 356,946

Claims priority, application Japan, May 26, 1988, 63-129759; May 26, 1988, 63-129760; Jun. 1, 1988, 63-73650[U]; Mar. 13, 1989, 1-60389

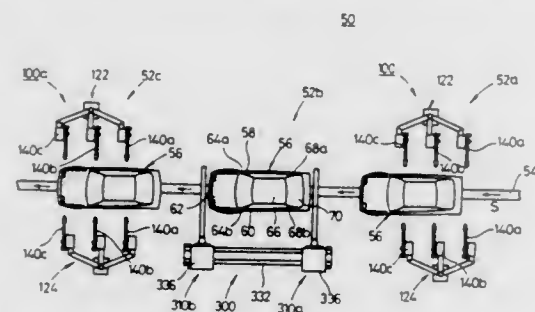
Int. Cl.⁵ B05C 5/00

U.S. Cl. 118—313

6 Claims

1. An apparatus for coating a side panel, of a workpiece, comprising:
- a unit body displaceable in a direction perpendicular to a direction in which the workpiece is delivered and also in a vertical direction with respect to the workpiece;
 - an arm mounted on said unit body for angular movement and back-and-forth movement with respect to said unit body; and

a paint spray gun mounted on said arm and movable back and forth substantially parallel to a surface of the side



panel to be coated while being directed substantially perpendicularly to the surface of the side panel.

5,090,362

ARRANGEMENT FOR GALVANIZATION OF TREATMENT GOODS IN A SERIES OF BATHS

Lorenz Kopp, Altdorf; Heinrich Knorr, and Werner Rossmann, both of Feucht, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

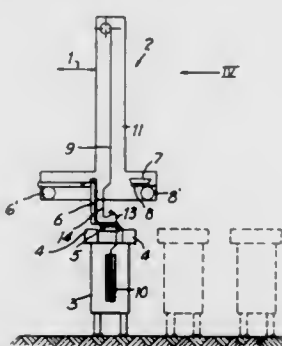
Filed Mar. 16, 1990, Ser. No. 495,466

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908778

Int. Cl.⁵ B05C 3/09

U.S. Cl. 118—423

22 Claims



1. An arrangement for galvanization of treatment goods such as electronic printed circuits, comprising a plurality of successively arranged baths accommodated in bath container units having open upper sides; covers for selectively covering the upper sides of said container units; means located in said bath container units above a liquid level of a bath liquid for aspirating vapors; means for introducing and withdrawing treatment goods into and out of a bath in said bath container units, said aspirating means including air aspiration inlets located at such a distance below an upper edge of said container units that whirling of an aspirated air is substantially eliminated and a substantial part of the vapors in a space above the liquid level is entrained by the aspirated air, said air aspiration inlets being arranged above a maximum bath height, and said covers being arranged at such a height and being dimensioned relative to said bath container units so that an air passage is produced between said covers and said bath container units.

5,090,363

TWO-CYCLE ENGINE WITH PNEUMATIC FUEL INJECTION AND FLOW RESTRICTION IN AT LEAST ONE TRANSFER PASSAGEWAY

Pierre Duret, 11, rue du Conservatoire, 75009 Paris, France

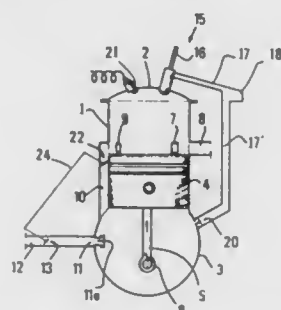
Filed Jun. 28, 1990, Ser. No. 544,882

Claims priority, application France, Jun. 28, 1989, 89 08760

Int. Cl.⁵ F02B 33/04

U.S. Cl. 123—73 PP

13 Claims



1. Two-cycle engine comprising at least one cylinder, a piston movably mounted in said cylinder, a crankcase communicating with one end of the cylinder and comprising a means for admitting air into the crankcase, at least one intake passageway for introducing non-carburetted air into the cylinder, said at least one intake passageway communicating the crankcase with a transfer opening in the cylinder, means for pneumatically injecting fuel into the cylinder including a pneumatic injector, supply and metering means for supplying and metering the pneumatic fuel injector, a passageway for supplying the pneumatic injector with compressed air to atomize the fuel, said passageway being connected to the crankcase by a valve and a container for accommodating compressed air connected to the pneumatic injector by said passageway, an exhaust passageway connected to the cylinder by an exhaust opening located in an offset position in a direction of travel of the piston relative to the transfer opening of the cylinder, means for restricting a flow in the at least one intake passageway, and means for regulating an opening and closing of said means for restricting as a function of at least one engine operating parameter.

5,090,364

TWO-STEP VALVE OPERATING MECHANISM

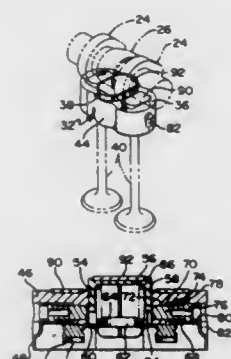
Michael E. McCarroll, Rochester; Mark J. Spath, Spencerport; Mark A. Shost, Henrietta; Timothy W. Kunz, Rochester; Guy E. Giannone, Bergen, and John Castellana, Fairport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1990, Ser. No. 628,694

Int. Cl.⁵ F01L 1/34, 1/14

U.S. Cl. 123—90.16

17 Claims



1. In a valve operating mechanism for two-step lifter operation:

support means for movably holding a valve lifter; a camshaft supported adjacent the valve lifter and including high lift and low lift cam means; and a two-step valve lifter supported by the support means for selective operation by the high lift cam means and the low lift cam means; the lifter including a first lifter element for engagement by the low lift cam means and mounted on the support means for uniform reciprocating movement along a straight path, a bore in the first lifter element, a second lifter element mounted in the said bore for reciprocating movement in the bore and for engagement by the high lift cam means, and locking means for selectively locking the second lifter element to the first lifter element whereby when the locking means is in locked condition the first lifter element is controlled by the high lift cam means, and when the locking means is in unlocked condition the first lifter element is controlled by the low lift cam means.

5,090,365

VARIABLE VALVE TIMING SYSTEM IN AN ENGINE HAVING A ROTATING CAM-SHAFT

Koji Hotta, Ama; Junichi Kano, Kariya, and Kongoh Aoki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

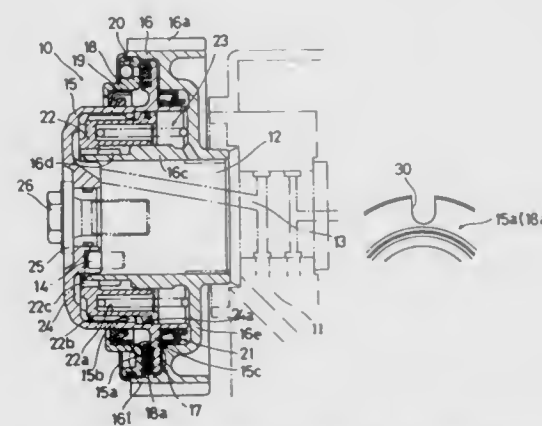
Filed Mar. 15, 1991, Ser. No. 669,938

Claims priority, application Japan, Mar. 29, 1990, 2-82457

Int. Cl.⁵ F01L 1/34

U.S. Cl. 123—90.17

6 Claims



1. A variable valve timing system in an engine having a rotating cam-shaft comprising: a first timing member driven by the engine; a second timing member rotationally fixed to the camshaft; helical means engaged between the first and second timing members and including a piston movable for adjusting an angular position between the first and second timing members; hydraulic circuit means for selectively applying a hydraulic pressure to the piston for selectively moving the piston to adjust said angular position; damper means on the first and second timing members for hydraulically damping rotational vibrations between the first timing member and the second timing member; and a notch formed on at least one of the first timing member and the second timing member in the damper means.

5,090,366

HYDRAULICALLY OPERATED ENGINE VALVE SYSTEM

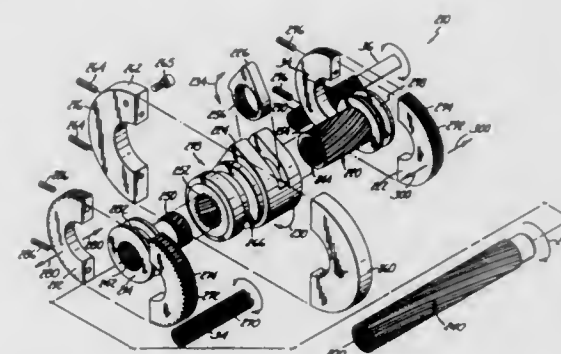
John T. Gondek, 1641 Innsbruck Cir. West, Minneapolis, Minn. 55421

Filed Mar. 23, 1990, Ser. No. 498,329

Int. Cl.⁵ F01L 1/34, 9/02

U.S. Cl. 123—90.17

35 Claims



1. An internal combustion engine comprising: an engine head having at least one cylinder; a crankshaft; a piston within each cylinder for driving the crankshaft; at least one valve assembly positioned adjacent each cylinder and having a valve with an opened position and a closed position, the valve for opening a cylinder port in the opened position and for sealing the cylinder port in the closed position; a valve controller for applying hydraulic signals to each valve assembly for actuating each valve between the opened and closed positions as a function of piston position, the valve controller comprising: a cam housing; a cam shaft for rotation within the cam housing as a function of engine speed; an intake cam and an exhaust cam coupled to the cam shaft for rotation with the cam shaft, wherein the intake and exhaust cams each have an opening cam lobe and a closing cam lobe which are coupled to the cam shaft such that each cam lobe has an angular position with respect to the cam shaft circumference which is independently adjustable; and cam following means for following a circumference of the intake cam and the exhaust cam, the cam following means being actuated between a normally extended position and a depressed position to thereby generate the hydraulic signals; and timing adjustment means for independently adjusting the angular position of each cam lobe to control actuation of each valve by the valve controller with respect to piston position as a function of engine operating parameters.

5,090,367

INTERNAL COMBUSTION ENGINE DISTRIBUTOR

Junichi Shimada, and Kazutoshi Kobayashi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1990, Ser. No. 600,197

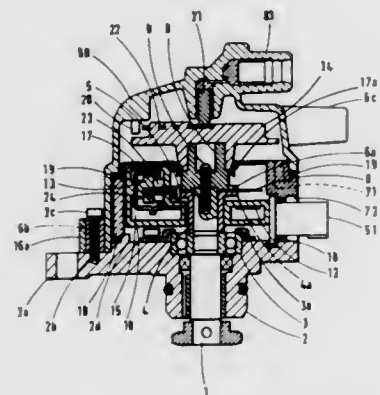
Claims priority, application Japan, Oct. 18, 1989, 1-268949

Int. Cl.⁵ F02P 7/04

U.S. Cl. 123—746.50 A 12 Claims

1. A distributor for a high tension electrical voltage in an internal combustion engine comprising a base supporting a cap, an engine crankshaft rotation signal detection means and an H.T. electrical voltage distribution means located within the cap, a connector adapted to connect output signals from the signal detection means to outside said cap, and an inverted

cup-shaped insulating cover located on the base adapted to provide a partition between the signal detection means and the



distribution means, said cover having a cut-out to permit said connector therethrough.

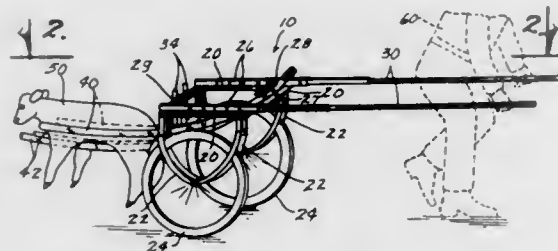
5,090,368

ANIMAL CARRIER

Leonard A. Berghoefer, R.R. 4, Box 48, Hampton, Iowa 50441
Filed Oct. 15, 1990, Ser. No. 597,397
Int. Cl.⁵ A01K 29/00

U.S. Cl. 119—96

2 Claims



1. An animal carrier, comprising:

- a frame including a ground engaging portion extending downwardly from opposing lateral sides of the frame;
- a lever attached to the frame and extending forwardly therefrom; and
- a cradle attached to the frame and extending rearwardly therefrom, said cradle including a rearwardly extending central finger, and a pair of rearwardly extending lateral fingers disposed generally parallel to and above the central finger, said cradle being movable between a lowered loading position wherein the central finger is disposed to be selectively positioned under the body of and between the rear and front legs of the animal, and a raised transport position wherein the central finger supports the animal above the ground and the lateral fingers extend along the sides of the animal to maintain the animal in an upright position;
- and further wherein the central finger is formed in an upwardly directed arc.

5,090,369

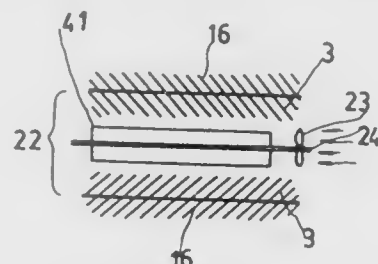
HEAT-ABSORBING/HEATING DEVICE WITH HIGH EFFICIENCY AND A SUPPORTING DEVICE THEREFOR
Yung J. Weng, 3F, NO. 77, Jenai Street, Chung Ho City, Taiwan
Filed Oct. 18, 1990, Ser. No. 600,580
Int. Cl.⁵ F22B 9/00

U.S. Cl. 122—44.2

6 Claims

1. A heat-absorbing/heating means and supporting means with high efficiency and having a heat-absorbing surface and a heating surface to be heated by a hot fluid, comprising

supporting means for supporting said heat-absorbing/heating means;
a plurality of spaced heating-absorbing members disposed on said heat-absorbing surface; and
a plurality of spaced heating members disposed on said heating surface;
wherein said heat-absorbing/heating means is a boiler having several smoke passages, and on the inner surface of



said smoke passages are disposed said plurality of spaced heat-absorbing members, and a rotary shaft provided with a fan and multiple heat-guiding members is disposed in said smoke passage so that said fan can rotate to blow hot gas and air toward said heat-absorbing members, and a fixed rod member is disposed in said smoke passage, and multiple spaced heat-guiding members are disposed on said fixed rod member to guide the hot gas and air toward said heat-absorbing members in said smoke passage.

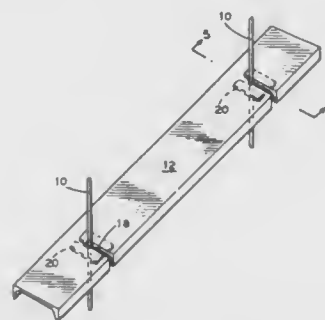
5,090,370

BOILER TOP SUPPORT CASING CHANNEL SLIT RING
Ralph E. Spada, Canal Fulton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 1, 1991, Ser. No. 724,258
Int. Cl.⁵ F22B 37/24

U.S. Cl. 122—510

8 Claims



1. A method of supporting boiler casing from rods secured to top support steel comprising the steps of:
- a) forming a slot in a bearing member, said slot being sized to accommodate the rod therein;
 - b) maneuvering said bearing member around the rod via said slot;
 - c) positioning a plate against said bearing member and against the rod, said plate overlapping or covering said slot; and,
 - d) securing said bearing member in place by attaching said plate to said bearing member and to the rod thereby providing a support for boiler casing.

5,090,371

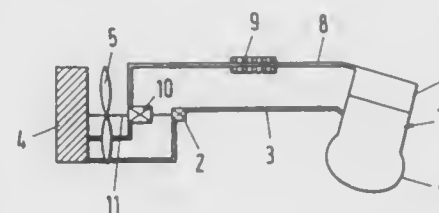
EVAPORATIVE COOLING SYSTEM

Herbert Schäpertöns, Gifhorn, and Bodo Scheibner, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Fed. Rep. of Germany
Filed May 23, 1991, Ser. No. 704,797
Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016762

Int. Cl.⁵ F01P 9/02

U.S. Cl. 123—41.21

3 Claims



1. An evaporative cooling system for an internal combustion engine comprising an engine coolant circuit including a condensate line, a coolant circulating pump, a condenser for condensing vaporized engine coolant having an associated cooling fan, a coolant vapor line leading to the condenser, and coolant vapor energy extraction means for utilizing energy from engine coolant vapor in the vapor line including a driveshaft extending in opposite directions from the extraction means for driving the coolant circulating pump and the condenser fan.

5,090,372

ROTARY INTERNAL COMBUSTION ENGINE

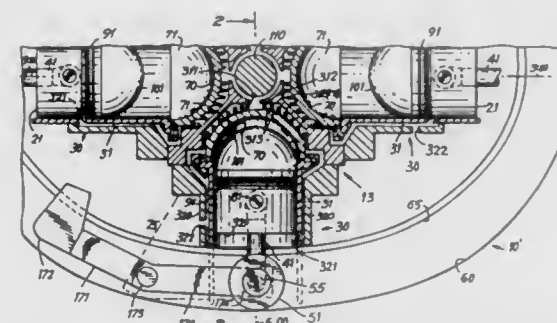
Jerome L. Murray, 12 Aldersgate Cir., Budd Lake, N.J. 07828, and Joseph O. Mosca, Landing, N.J., assignors to Jerome L. Murray, Budd Lake, N.J.

Continuation of Ser. No. 570,169, Aug. 17, 1990, abandoned, which is a division of Ser. No. 478,726, Feb. 12, 1990, Pat. No. 4,974,553, which is a division of Ser. No. 277,714, Nov. 30, 1988, abandoned. This application Jun. 26, 1991, Ser. No. 725,221

Int. Cl.⁵ F02B 57/00

U.S. Cl. 123—44 B

15 Claims



1. A rotary internal combustion engine, said engine comprising:
- a housing;
 - a cam track internally disposed within said housing and adapted to receive a cam follower;
 - an engine block disposed within said housing, said engine block being relatively rotatable within said housing about a central axis;
 - means connectable to an external drive member for translating said relative rotation of said engine block with respect to said housing into useful work;
 - at least one radially arranged cylinder assembly on said block, each cylinder assembly including
 - a cylinder having a longitudinal axis extending generally radially outwardly from the rotational axis of said

block, said cylinder including means defining an end wall,

a piston member disposed within said cylinder and adapted to reciprocate within said cylinder;
said piston, cylinder and cylinder end wall together defining a combustion chamber,
means permitting periodic introduction of air and fuel into said combustion chamber,
means for initiating combustion of a compressed mixture of air and fuel within said combustion chamber,
means permitting periodic exhaust of products of combustion of air and fuel from said combustion chamber, and
means for imparting forces and motions of said piston within said cylinder to and from said cam track, said means comprising linkage means and a cam follower operatively connected to said linkage means, said linkage means comprising a connecting rod having a first end portion pivotally connected to said piston member and a second end portion; a rocker arm having a first end portion pivotally mounted to a mounting point fixed with respect to said block and offset with respect to the longitudinal axis of its associated cylinder, a second end portion pivotally connected to said second end portion of said connecting rod, and an arm portion connecting said first and second end portions of said rocker arm; said cam follower being adapted to ride along said cam track so that said cam follower forces and motions are transmitted to and from said piston through said linkage means to and from said cam track;
said cam track including at least a first segment and at least a second segment thereof, said first segment having a generally positive slope wherein said segment has a generally increasing radial distance from the rotational axis of said engine block whereby as a piston moves outwardly in a cylinder on a power stroke while the cam follower is in radial register with said cam track segment, the reactive force of the respective cam follower through said linkage means against the cam track segment acts in a direction tending to impart rotation to said engine block in the direction of the positive slope of said cam track segment, said second segment having a generally negative slope wherein said segment has a generally decreasing radial distance from the rotational axis of said engine block whereby as a cam follower rides along said negative slope of said cam track as said engine block rotates, said cam follower will cause a geometrically defined motion of said linkage means to compel a radially inward motion of the respective piston in its respective cylinder; and
said first end portion of each respective rocker arm further including a counterweighted free end extending from said mounting point in a direction generally away from the longitudinal axis of said cylinder whereby centrifugal forces acting upon the respective piston, linkage means and cam follower will be counterbalanced to a substantial degree by centrifugal force acting upon the free end of said respective rocker arm.

5,090,373

AUXILIARY DEVICE ATTACHABLE TO A CONVENTION SPARK PLUG

Ryobei Kashiwara, Raitsu Ootori 106, 456-1, Ootorikitamachi 8-cho, Sakai-shi, Osaka-fu; Hideaki Kashiwara, 3-B-611, 151-30, Mukojima Ninomaricho, Fushimi-ku, Kyoto-shi; Hidehiko Noguchi, 7-14, Taibo 3-chome, Kananocho, Minamikawachi-gun, Osaka-fu, and Takeaki Kashiwara, 3-37-411, Nagayoshidodo 3-chome, Hirano-ku, Osaka-shi, all of Japan

Filed May 29, 1991, Ser. No. 707,090

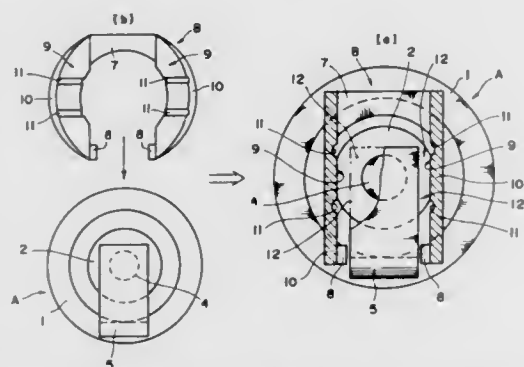
Claims priority, application Japan, Nov. 30, 1990, 2-339489
Int. Cl.⁵ F02P 1/00

U.S. Cl. 123—169 PA

14 Claims

1. An auxiliary device attachable to the top of the metal housing of a conventional spark plug, having a ground elec-

trode and a center electrode, for improving the ignition and combustion of said spark plug comprising: a pair of opposing tongues that have a plurality of parallel grooves on their opposing inside faces and flat portions supported by said tongues in between, said flat portions comprising two parts, one part being continuous in order to connect said tongues to each other and the other part being divided in order to allow the straight portion of the ground electrode and the center elec-



trode to be put therein, wherein said ground electrode and said continuous part of said flat portions are attached to each other by welding, after the straight portion of said ground electrode and said center electrode are put into said divided part of said flat portions with the center electrode ahead as far deep as the porcelain electric insulator of said center electrode and said continuous part of said flat parts come into contact with each other.

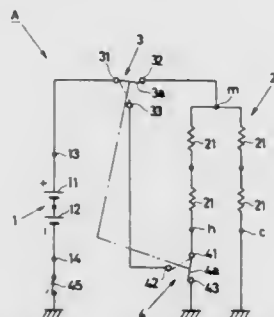
5,090,374

AUXILIARY STARTER APPARATUS FOR MULTI-CYLINDER DIESEL ENGINE BY USING 24-VOLT BATTERY CELL

Tsuneko Itoh, and Kozo Nishiwaki, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed Jun. 12, 1991, Ser. No. 714,278
Int. Cl.⁵ F02P 19/02

U.S. Cl. 123—179.6

2 Claims



1. In an auxiliary starter apparatus for four-cylinder diesel engine, each cylinder of which has a 12-volt glow plug adapted to be operated by a voltage of 12 volt, the glow plug comprising a cylindrical metallic shell in which a bar-like heater is placed which has an electrical resistor embedded into a ceramic body, the auxiliary starter apparatus comprising:

- a first state in which two pairs of electrical resistors connected in series are connected in parallel to form an electrically conductive path;
- a second state in which the four electrical resistors are connected in series to form an electrically conductive path;
- first and second electromagnetic relay placed to alternatively select the first and second state; and
- a 24-volt battery cell, a voltage of which is impressed across the electrically conductive path of the first state by the first and second electromagnetic relay when starting the diesel engine, while the voltage of the 24-volt battery cell

impressed across the electrically conductive path of the second state by the first and second electromagnetic relay once the diesel engine has started.

5,090,375

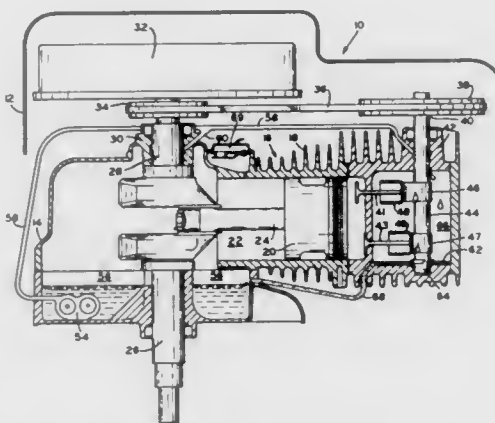
VALVE GEAR OILING SYSTEM FOR OVERHEAD CAMSHAFT ENGINE

Eric B. Hudson, Hilbert, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 26, 1990, Ser. No. 618,167
Int. Cl.⁵ F01M 1/06

U.S. Cl. 123—196 W

7 Claims



1. A single cylinder, overhead cam, internal combustion engine, comprising:

- a crankcase including a main oil sump and a cam chamber;
- an oil sump in said cam chamber;
- a vertical crankshaft rotatably supported by an upper crankshaft bearing and a lower crankshaft bearing in said crankcase;
- a vertical camshaft rotatably supported by an upper camshaft bearing and a lower camshaft bearing and extending through said cam chamber;
- intake and exhaust valves;
- valve actuating means operably connected to said valves;
- cam lobes on said camshaft operably connected with said valve actuating means; and
- lubrication means for supplying oil under pressure from said main oil sump to said upper camshaft bearing, whereby said camshaft, said cam lobes, and said valve actuating means are lubricated by oil falling from said upper camshaft bearing, adhering to said camshaft and flung radially outward by camshaft rotation, said lubrication means comprising an oil pump in fluid communication with said main oil sump, wherein said lower camshaft bearing is lubricated by oil within said cam chamber oil sump.

5,090,376

MAIN GALLERY - FILTER CONNECTION

Ram D. Bedi, Birmingham, Mich., assignor to K.J. Manufacturing Co., Wixom, Mich.

Continuation-in-part of Ser. No. 516,243, Apr. 27, 1990, Pat. No. 5,062,398. This application Feb. 21, 1991, Ser. No. 659,030

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.⁵ F01M 11/04

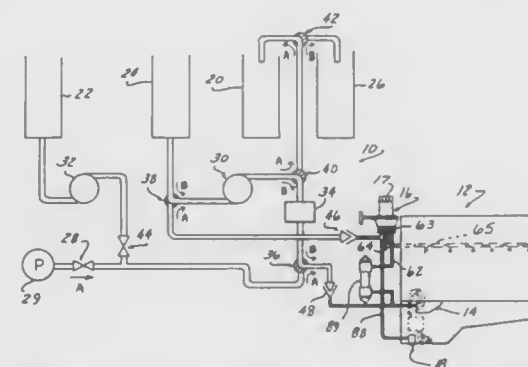
U.S. Cl. 123—196 R

22 Claims

1. An apparatus for changing oil in an internal combustion engine having an internal oil lubrication system with a main gallery passage, an oil filter and an oil reservoir, the apparatus comprising:

- means for evacuating fluid from said oil filter into said oil reservoir;
- means for removing fluid from said oil reservoir;

means for introducing fluid into said oil reservoir through said oil filter and internal oil lubrication system; and an oil filter mounting bracket means for mounting said oil



filter, said bracket means having a first fluid passage for receiving oil from said engine and a second fluid passage for delivering filtered fluid from said oil filter to said main gallery distribution passage.

5,090,377

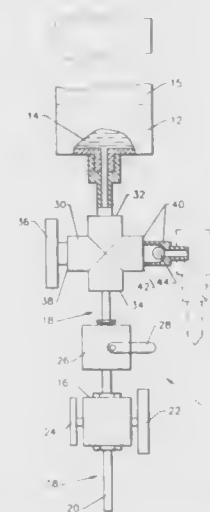
RECHARGEABLE FUEL INJECTION KIT

Burton A. Pearson, Taylor, Mich., assignor to Shrader Canada Limited, Oakville, Canada

Filed Mar. 18, 1991, Ser. No. 670,695
Int. Cl.⁵ F02B 77/04

U.S. Cl. 123—198 A

5 Claims



1. A fuel injection cleaning kit comprising a pressurizable container of cleaning fluid, a regulator to regulate the pressure of fluid discharged from said container, conduit means to connect said container and said regulator, said conduit means including an isolating valve operable to prevent flow between said container and said regulator and a charging valve to be located between said container and said isolating valve, said charging valve permitting flow into said container from a pressurized source connected thereto and inhibiting flow in the opposite direction.

5,090,378

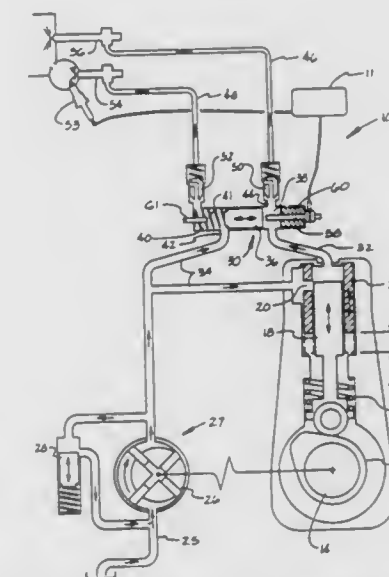
DUAL NOZZLE SINGLE PUMP FUEL INJECTION SYSTEM

Cesar Gonzalez, Wichita, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Feb. 22, 1991, Ser. No. 661,832
Int. Cl.⁵ F02B 19/10, 19/12; F02M 63/02

U.S. Cl. 123—275

6 Claims



1. A fuel injection system in a stratified charge hybrid internal combustion engine including a main combustion chamber, a precombustion chamber connected with the main chamber, fuel injectors in the main combustion chamber and precombustion chamber which open at higher and lower pressure levels respectively to sequentially inject fuel into the prechamber and the main chamber, timed spark ignition means in the prechamber for ignition of the fuel-air mixture therein, and an engine driven and timed fuel injection pump having a variable output capacity that varies with power level position, the injection pump is supplied by a low pressure charging pump, the improvement comprising:

- a shuttle valve including a bore therein;
- a shuttle spool means positioned within the bore defining a prechamber supply chamber on one side thereof and a spool activation chamber on the opposite side thereof said spool means having a first and second position;
- biasing means urging the spool towards its first position with the spool actuation chamber at its minimum volume;
- first conduit means connecting charging pressure to the prechamber supply chamber in the first position of the spool means;
- second conduit means connecting the injection pump to spool actuation chamber;
- third conduit means connecting the spool actuating chamber with the main injector;
- fourth conduit means connecting the prechamber supply chamber with the prechamber injector;
- the initial charge from the injection pump actuates the spool means from its first to its second position, valving closed the first conduit means and displacing the spool means into the prechamber supply chamber, a fuel displacement amount required in the prechamber injector until the spool means reaches its second position whereupon the fuel pressure from the injection pump rises to the opening level of the main injector flowing through the spool actuation chamber and electrical ignition trigger means in the shuttle valve which triggers the ignition means as the spool means moves from its first position.

5,090,379 FUEL INJECTION DEVICE OF AN ENGINE FOR A VEHICLE

Yasusi Ito, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

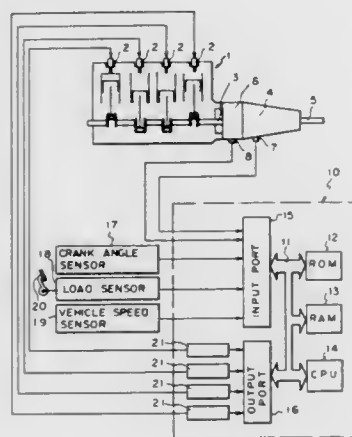
Filed May 29, 1991, Ser. No. 706,646

Claims priority, application Japan, Jun. 4, 1990, 2-144465

Int. Cl.⁵ F02D 41/04, 41/10

U.S. Cl. 123—299

16 Claims



1. A fuel injection device of an engine for a vehicle having a power transmitting system connected between the engine and a drive wheel, a relative angle of torsion between opposed ends of the power transmitting system being maintained at a converging angle of torsion determined by a required amount of fuel when the engine is driven in a cruising state, said device comprising:

calculating means for calculating a required amount of fuel, which is increased in accordance with an increase in an engine load;

fuel injection means for carrying out a pre-injection and then a main injection when the required amount of fuel is changed from a first required amount of fuel to a second required amount of fuel, the amount said main injection being equal to said second required amount of fuel; and injection control means for controlling an amount of fuel and an injection time of said pre-injection and a start time of injection of said main injection to make the relative angle of torsion substantially equal to the converging angle of torsion determined by said second required amount of fuel when said main injection is started and substantially maintain the relative angle of torsion at the converging angle of torsion determined by said second required amount of fuel after said main injection is started.

5,090,380 IDLING SPEED ADJUSTMENT SYSTEM FOR ENGINE

Kazuo Suzuki; Fusao Tachibana, both of Saitama, and Mitsugi Chonan, Ibaraki, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1990, Ser. No. 601,135

Claims priority, application Japan, Nov. 16, 1989, 1-299999

Int. Cl.⁵ F02M 3/00

U.S. Cl. 123—339

6 Claims

1. An idling speed adjustment system for an engine having a throttle valve and a fuel injector for injecting fuel into a cylinder of said engine, comprising:

idling speed adjusting means provided to be manually operated by an operator for adjusting an idling speed at an optimum speed which the operator needs and for generating an adjusting signal indicating the adjusting amount of the idling speed, which the operator sets;

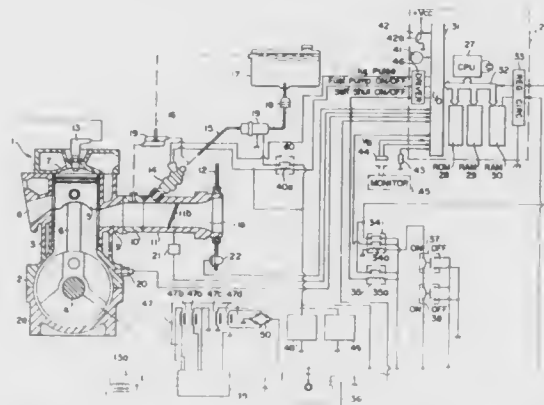
engine speed sensing means for detecting an engine speed

and for generating an engine speed signal indicative thereof;

throttle opening degree sensing means for detecting an opening degree of said throttle valve and for producing a throttle signal indicative thereof;

first setting means responsive to said engine speed signal and said throttle signal for setting a basic fuel injection pulse width;

discriminating means responsive to said engine speed signal for discriminating an idling state by comparing said engine speed with a predetermined speed;



idling correcting means for calculating a correction value based on said adjusting amount of said adjusting signal when said idling state is discriminated by said discriminating means, said correction value being adapted to correct said basic fuel injection pulse width; and

second setting means for setting a fuel injection pulse width to drive said fuel injector based on said basic fuel injection pulse width and said correction value so as to stabilize said engine speed at any idling speed manually adjusted by said idling speed adjusting means.

5,090,381 METHOD OF AND APPARATUS FOR CONTROLLING AN IDLING CONTROL VALVE OF AN INTERNAL COMBUSTION ENGINE

Yoshiyuki Tanabe, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

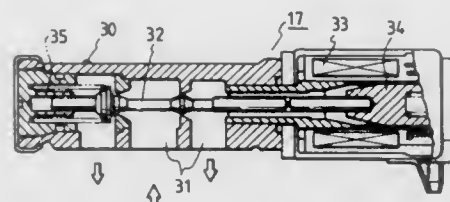
Filed Nov. 2, 1990, Ser. No. 608,349

Claims priority, application Japan, Nov. 17, 1989, 1-300157

Int. Cl.⁵ F02D 41/00

U.S. Cl. 123—339

12 Claims



1. A method of controlling an idling control valve of an internal combustion engine, which valve is mounted in a bypass air passage bypassing a throttle valve portion of an air suction passage to control a flow rate of air flowing in the bypass air passage, said method comprising the steps of:

setting an upper limit of electric current for driving the idling control valve to limit the electric current within the upper limit when the engine is under a usual operational condition; and

releasing the electric current from the upper limit for a short time in an engine operation so that the idling control valve is driven with larger electric current than the upper limit.

5,090,382 VEHICLE ENGINE IGNITION TIMING SYSTEM WITH ADAPTIVE KNOCK RETARD

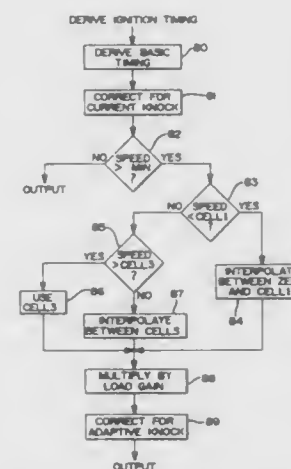
William J. Bolander, Clarkston, and Larry T. Nitz, Troy, both of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Oct. 23, 1990, Ser. No. 601,075

Int. Cl.⁵ F02P 5/14

U.S. Cl. 123—425

6 Claims



1. In a spark ignited vehicle engine having a plurality of combustion chambers with combustion ignition apparatus, an ignition timing system comprising, in combination:

means for sensing knock in the combustion chambers and determining therefrom a current knock retard;

memory means comprising a plurality of alterable cells referenced to engine speed;

means for generating ignition timing signals at least in part from the contents of the cells referenced to the current engine speed;

means for determining an engine speed at which knock is first sensed during a time period;

means for determining a maximum value of the current knock retard during the time period; and

means for updating one of the cells in a direction to retard the timing of the ignition signals, the one of the cells being updated in amount based on the maximum current knock retard in the time period and being referenced to the engine speed at which knock is first sensed during the time period.

5,090,383 IGNITION TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Akira Demizu, Himeji, and Hitoshi Inoue, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1991, Ser. No. 696,804

Claims priority, application Japan, Jun. 13, 1990, 2-154418

Int. Cl.⁵ F02P 5/15

U.S. Cl. 123—425

1 Claim

1. An ignition timing control apparatus for an internal combustion engine which comprises:

pressure detecting means for detecting a pressure in a cylinder of the internal combustion engine;

knocking detecting means for detecting a level of the knocking in the internal combustion engine based on an output of the pressure detecting means;

crank angle detecting means for detecting a crank angle;

indicated mean effective pressure calculating means for calculating an indicated mean effective pressure of the engine from the output of the pressure detecting means and an output of the crank angle detecting means;

indicated mean pressure averaging means for averaging an

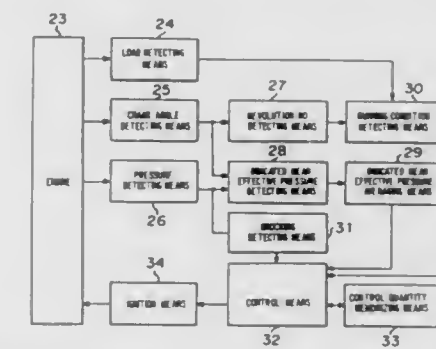
output of the indicated mean effective pressure calculating means;

load detecting means for detecting a load of the internal combustion engine;

revolution number detecting means for detecting a revolution number of the internal combustion engine from an output of the crank angle detecting means;

running condition judging means for judging a running condition of the internal combustion engine from an output of the load detecting means and an output of the revolution number detecting means;

control means for controlling an ignition timing so that an average value of the indicated mean effective pressure is



maximized, in a predetermined running condition of the engine determined by the running condition judging means; and

control quantity memorizing means for memorizing an ignition timing control quantity in case when a knocking is not generated, which maximizes the average value of the indicated mean effective pressure outputted from the control means;

said control means controlling the ignition timing, in a region in which the knocking is not generated, based on a memorized value of the control quantity memorizing means, when the knocking detecting means detects a knocking.

5,090,384 ELECTRONIC CONTROL DEVICE FOR MODULATING FUEL QUANTITIES IN AN INTERNAL COMBUSTION ENGINE

Frank Ahlborn, Milan, Italy; Volker Schäfer, Steinheimmurr, and Sieber Albrecht, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP88/00250, § 371 Date Sep. 25, 1990, § 102(e) Date Sep. 25, 1990, PCT Pub. No. WO89/09332, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 25, 1988, Ser. No. 585,112

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.⁵ F02D 41/14, 41/04

U.S. Cl. 123—436

6 Claims

1. An electronic control arrangement for modulating fuel quantities in an internal combustion engine, the arrangement comprising:

an adjusting device for controlling the supply of fuel to the engine cylinders;

speed detector means for detecting the speed of the engine and providing a speed signal (n) in the form of a plurality of pulses per revolution of the engine crankshaft or camshaft;

divider means for dividing said pulses so as to provide a measurement of engine speed over a complete combustion period of the engine or multiple thereof with said divider means having a division ratio dependent upon engine speed;

1. In combination with a compound bow having a body having a pair of ends each carrying a respective limb, with a bolt extending between each limb and the respective body end, a gauge at each body end comprising:

- a gear head on the respective bolt;
- a holder adjacent the respective bolt;
- a threaded rod rotatable in the holder about an axis generally perpendicular to the respective bolt;
- a gear on the rod meshing with the gear head on the respective bolt;
- a scale fixed on the bow along the rod; and
- a pointer threaded onto the rod and displaceable thereby along the scale.

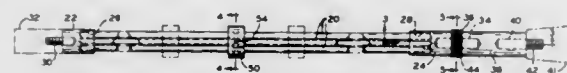
5,090,396

ADJUSTABLE ARCHERY STABILIZER

Wayne J. Bickel, Rte. 1, Box 241, Geneva, Ind. 46740, and
Richard L. White, 109 Smith St., Yorktown, Ind. 47396
Filed Nov. 27, 1990, Ser. No. 618,385
Int. Cl.⁵ F41B 5/00

U.S. Cl. 124—89

20 Claims



1. A stabilizer adapted to be attached to an archery bow comprising:
a plurality of elongated parallel rods, said rods including first ends and second ends;
first interconnecting means and second interconnecting means for respectively interconnecting said rod first ends and said rod second ends, said rods held substantially parallel and spaced apart to define an assembly; and
securing means for securing said assembly to a bow.

5,090,397

PILE CUTTER SUPPORT

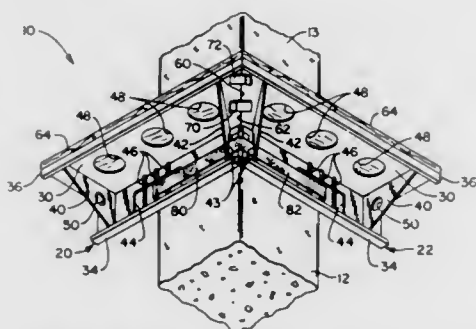
Robert H. Larsen, Glastonbury; B. Holt Whitley, East Haddam,
and William D. Glynn, Suffield, all of Conn., assignors to
Sinco, Inc., East Hampton, Conn.

Filed Apr. 30, 1990, Ser. No. 516,162

Int. Cl.⁵ B28D 1/04

U.S. Cl. 125—14

19 Claims



1. A pile cutter support comprising:
a first support section comprising first engagement means for engaging against a face of a pile and first platform means for forming a first platform;
a second support section comprising second engagement means for engaging against a face of a pile and second platform means for forming a second platform;
pivotal connector means for pivotally connecting said first and second sections wherein said first and second platforms are generally co-planar and said first and second engagement means mutually engage each other in a first pivotal position and are positioned in generally perpendicular relationship at a second pivotal position; and
mounting means mounted to said first and second sections for mounting said support to a pile so that said first and second engagement means engage adjacent faces of said pile and said platforms project outwardly generally perpendicular thereto.

5,090,398

EASILY ASSEMBLED BARBECUE GRILL WITH DETACHABLE ACCESSORY SHELF AND SIDE BURNER

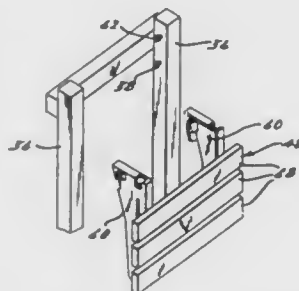
Doyle Raymer, and Dale Peacock, both of Freeport, Ill., assignors to The Thermos Company, Inc., Freeport, Ill.

Filed Jul. 2, 1990, Ser. No. 547,854

Int. Cl.⁵ F24L 3/00

U.S. Cl. 126—41 R

24 Claims



1. A barbecue grill comprising:
a frame having a generally vertical upstanding portion;
a combustion source containment member supported on said frame;
a structural means comprising at least one generally planar bracket having a plurality of side flanges angularly extending from said bracket, said bracket having a plurality of apertures formed therein and said side flanges having openings which define open ends that form part of said apertures;
a readily attachable and detachable shelf mounted on said structural means for selective movement:
(a) to a first position in which said shelf is rigidly supported in a generally horizontal position;
(b) to a second position in which said shelf is pivotally supported to permit rotation to a generally vertical position; and
(c) to a third position in which said shelf is free to be detached and fully removed from said frame.

5,090,399

SOLAR COOKER WITH A PARABOLIC REFLECTOR

Adnan Tarcici, 8 R. Des Bugnons, Geneva, Switzerland 1217

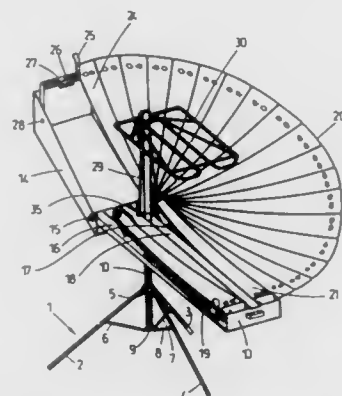
Filed Mar. 21, 1991, Ser. No. 673,147

Claims priority, application Switzerland, Jun. 25, 1990, 2105/90

Int. Cl.⁵ F24J 2/02

U.S. Cl. 126—451

2 Claims



1. A solar cooker with a foldable parabolic reflector, comprising:
a foldable mount having a longitudinal axis;
a generally hollow rectangular housing of extended length including a first part and a second part, said parts dividing

said housing lengthwise, said housing parts being articulated to each other at a pivot axis at one end respectively of said parts, said first part being connected to said mount for rotation about said longitudinal axis of said mount and for pivoting about an axis transverse to said longitudinal axis, said first part being longitudinally divided into a first compartment and a second compartment, said compartments having a space between them, said space being dimensioned to receive said mount in a folded condition of said mount;

- a first stack and a second stack of reflecting strips, each said stack being located in a respective one of said compartments, the strips in each said stack being connected to each other at one end by a common pivot for reversible unfolding of said strips about said pivot to form a portion of a parabolic reflector, the reflector portions produced by each said stack together forming a parabolic reflector, the pivoted strip ends being proximate said mount, the other ends of said strips of each said stack being connected each to the adjacent strip by a pliable band, a first strip of each said stack being fixed to said housing and a last strip of each said stack having means for connection to said second part when said reflector is unfolded;
adjustable means for connection of said last said strips to said second part, said adjustable means being fastened to said second part of the housing at the end of said second part away from said mount;
a support having at one end a bracket including two wings extending in parallel, said wings having parallel slots, said support having an engagement member attached between said wings for engaging said mount when said support is unfolded, in use, relative to said mount;
an axle passing through said slots with sliding and pivoting engagement, said support being articulated relative to said mount by said axle;
a grid for supporting a utensil to be heated at the focal point of the reflector, said grid being pivotally connected to said support at the end of said support away from said axle by a first member extended along a grid axis and a second member of said grid parallel to said grid axis and said axle, said second member abutting said support when said support and grid are positioned for operation of said reflector, said grid being maintained in position by said second member.

5,090,400

MEASURING ENDOSCOPE

Satoshi Saito, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 176,006, Mar. 31, 1988, Pat. No. 4,986,262.

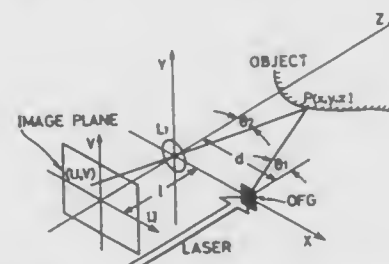
This application Dec. 10, 1990, Ser. No. 625,094

Claims priority, application Japan, Mar. 31, 1987, 62-76494; Apr. 30, 1987, 62-106921; Aug. 20, 1987, 62-205051

Int. Cl.⁵ A61B 1/04

U.S. Cl. 128—6

8 Claims



1. An endoscope for measuring the form of an inaccessibly situated object, comprising:
a fiber having an inner end to be located near said object and an outer end to be situated remote from said object, the fiber transmitting geometrical information of said object from said inner end to said outer end of said fiber;

a diffraction grating provided at the inner end of said fiber;
a laser beam source connected to said fiber, in order to transmit a laser beam through said diffraction grating to diffract the laser beam and project a diffracted pattern of said laser beam onto a surface of said object;
image pickup means provided at the inner end of said fiber for receiving the laser beam in the form of said pattern reflected by a surface of said object to obtain the geometrical information of said surface for transmission to the outer end through said fiber; and
visualizing means connected to the outer end of said fiber for visualizing means connected to the outer end of said fiber for visualizing the geometrical information transmitted to the outer end;
wherein said grating comprises two grating parts for carrying out diffraction in mutually orthogonal first and second directions, the respective grating parts having different diffraction angles.

5,090,401

METHOD OF POSITIONING A PATIENT ARRANGED ON A TABLE TOP OF A PATIENT TABLE, AND APPARATUS FOR PERFORMING THE METHOD

Horst H. Schwieker, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 400,185, Aug. 29, 1989, abandoned.

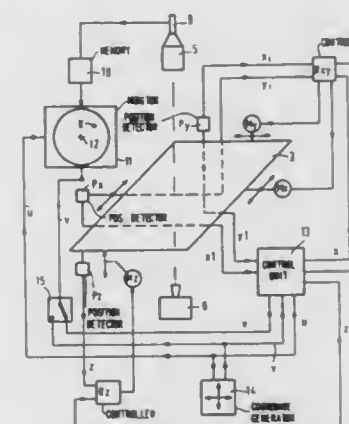
This application Jan. 11, 1991, Ser. No. 640,516

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1988, 3830183

Int. Cl.⁵ A61B 17/22

U.S. Cl. 128—24 EL

8 Claims



1. Apparatus for positioning a patient on a table top comprising:
means for forming a first x-ray image from a first orientation relative to the table top;
means for electronically storing the first image;
means for displacing the table top in first and second orthogonal directions during a first positioning operation;
means for superimposing an electronic marker over the first image, the marker and image being shifted relative to one another and in accordance with the magnitude of displacement of said first operation;
means for forming a second X-ray image from a second orientation relative to the table top;
means for electronically storing the second image;
means for displacing the table top in the first and second directions and in a third direction orthogonal to the first and second directions during a second positioning operation;
means for automatically linking the displacement in the third direction the displacements in the first and second directions of the first operation wherein the magnitude of displacement in the first and second directions of the second operation is proportional to the product of the magnitude

of displacement in the third direction with the magnitude of displacement in the first and the second directions of the first positioning operation;
means for calculating the relationship between the relative shift in displacement of the marker and the table top from the magnitudes of displacement of the table top after forming the first image; and
means for displacing the table top in accordance with said calculations.

5,090,402

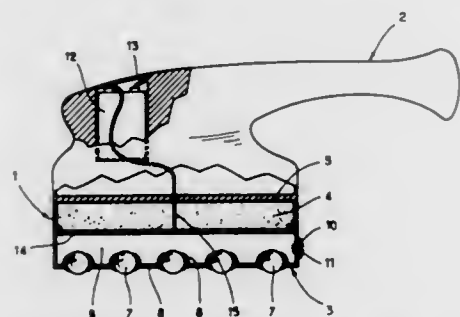
MASSAGING APPLIANCE

Roland Bazin, Vitry Sur Seine; Etienne Soudant, Antony; Gérard Obadia, Montrouge; Jean-Pierre Laugier, Antony, and Louis Marcotte, Chevilly Larue, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 231,028, Aug. 11, 1988, abandoned. This application Jul. 25, 1990, Ser. No. 559,378
Claims priority, application France, Aug. 12, 1987, 87 11461
Int. Cl.⁵ A61H 15/00

U.S. Cl. 128—57

6 Claims



1. A manual appliance for massaging a cutaneous covering comprising: a reservoir containing a product to be applied and being integral with a gripping element; and an applicator element including a sole cooperating with said reservoir and comprising a plurality of balls each held in a recess provided in said sole and which communicates with the internal volume of said reservoir through said recess, each said ball being non-conductive, a direct current source which is situated in said gripping element and having poles which are connected respectively to a first and a second electrodes, wherein the first electrode is a conductive covering which covers the wall of the gripping element, wherein the second electrode is a movable conductive sheet located in said reservoir so as to be in contact with said product situated in the reservoir, and wherein said reservoir comprises a bottom, an elastically deformable wall which is movable so as to adapt its internal volume to the quantity of the product contained and lateral side walls which are fixed and rigid, wherein said movable wall is against said bottom of said reservoir and occupies a portion of said reservoir and wherein said second electrode covers said movable wall and said applicator surmounts said reservoir.

5,090,403

AIR BUBBLE MAT FOR AIR BUBBLE MASSAGE DEVICE

Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Fed. Rep. of Germany
Filed Sep. 20, 1990, Ser. No. 585,938

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931489

Int. Cl.⁵ A61H 9/00

U.S. Cl. 128—66

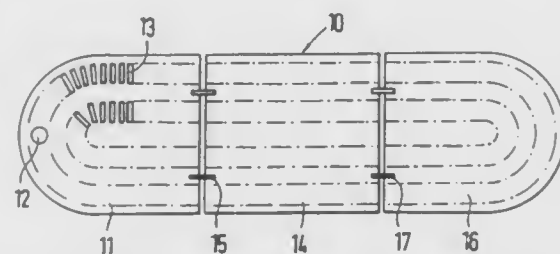
23 Claims

1. In an air bubble mat for an air bubble massage device having a mat section extending over a length of said air bubble mat and a width of said air bubble mat and provided with openings, where the mat section forms a receptacle on an underside of said mat section for receiving air feed ducts, where the air feed ducts are provided with air outlets corre-

sponding to the openings of the mat section and are connected to one of a connecting stub and a compressed air distributor connecting stub, the improvement comprising:

said mat section comprising a support element (10) having in said receptacle an interchangeable foil mat (20), said interchangeable foil mat (20) being assembled from two foils (21, 22) placed on top of one another, having said air feed ducts (23) defined by connecting means outside of said air feed ducts (23),

said air feed ducts (23) of said interchangeable foil mat (20) being connected with each other and with said connecting stub (26),



said air outlets (24) being inserted in said foil (21) of said interchangeable foil mat (20) facing the underside of said support element (10) and forming an air bubble pattern, said air bubble pattern being changeable by changing said interchangeable foil mat (20), and

said mat section forming a panel having sides extending in a longitudinal direction of said air bubble mat and forming support fins (19) from said mat which extend approximately vertically to said underside in an area of said receptacle into which said interchangeable foil mat (20) is inserted.

5,090,404

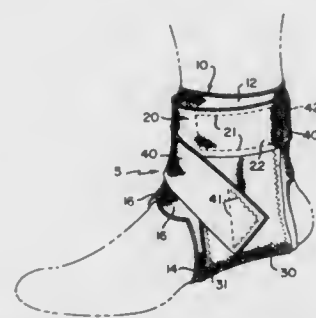
UNIVERSAL ANKLE SUPPORT

Charles Kallassy, 9655 Lakemont Dr., Dallas, Tex. 75220
Filed Feb. 7, 1990, Ser. No. 477,058

Int. Cl.⁵ A61F 5/00

U.S. Cl. 602—65

18 Claims



1. An ankle support for a wearer's leg, comprising:

an underliner defining a main body for said support, said underliner having generally a T-shape defined by a cross-piece having a forward and rear edge and an upright leg generally perpendicular to said cross-piece and positioned to be closer to said front edge than said rear edge;

a non-stretch upper strap of length sufficient to extend about the wearer's ankle secured on the exterior surface of the underliner so as to extend from a point intermediate said front and rear edges to a point beyond said rear edge to a free end of said upper strap;

first securing means for inelastically securing said upper strap about a wearer's leg so that the tension of said strap may be selectively adjusted;

a non-stretch upright strap secured to the exterior surface of

said underliner so as to be secured to a portion of said upper strap, to extend along the leg portion of said underliner, and to extend beyond said leg portion thereof to terminate in a free end;

second securing means for securing the free end of said upright strap with said upper strap so that the free end of said upright strap may be selectively positioned relative to said upper strap;

a diagonal strap secured to said upright strap and said underliner so as to be oriented diagonally relative to said upright strap and extending upwardly towards the forward edge of said cross-piece to a free end of said diagonal strap; and third securing means for securing the free end of said diagonal strap to selected position on said upper strap.

5,090,405

WATER-HARDENING POLYMER PREPARATIONS

Bernhard Jansen, Cologne; Hanns P. Müller, Bergisch-Gladbach; Roland Richter, Leverkusen, and Wolfram Mayer, Odenthal-Glöbusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Aug. 12, 1988, Ser. No. 231,738

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728396; Apr. 15, 1988, 3812481

Int. Cl.⁵ A61L 15/07; A61F 5/04, 13/04; B32B 27/40

U.S. Cl. 602—8

15 Claims

1. In an improved construction material comprising a flexible carrier substrate impregnated or coated with a water-hardening polyisocyanate, polyurethane or polyvinyl polymer preparation, the improvement comprises said preparation containing as an additive 0.1 to 10% by weight polyether polysiloxane polyurethanes of the formula



in which

R¹ is lower alkyl,

m is the average number of siloxane groups in the range from 5 to 25,

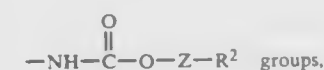
R is



in which

X is lower alkylene,

Y is an aliphatic, cycloaliphatic, aromatic or araliphatic moiety, which is unsubstituted or substituted by further



Z is a polyether moiety based on ethylene oxide, units propylene oxide units, or both with the average number of ethylene oxide and propylene oxide units being in the range from 10 to 100 and

R² is lower alkyl.

6. A medical support bandage which comprises the construction material according to claim 1.

5,090,406

VENTED ABSORBENT DRESSING

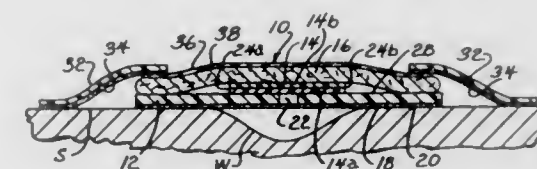
Thomas H. Gilman, Mansfield, Mass., assignor to Alvin Isaacs, Mansfield, Mass.

Continuation-in-part of Ser. No. 337,591, Apr. 13, 1989. This application Mar. 6, 1991, Ser. No. 648,067

Int. Cl.⁵ A61F 13/00, 15/00; A61L 15/00

U.S. Cl. 602—47

10 Claims



1. In a dressing for a wound of a patient, comprising: a base sheet contacting the skin of base sheet having at least one opening for placement over the wound;
means for securing the base sheet to the skin of a patient; and vent means for providing controlled leakage of fluid along a path from the wound through each said opening of the base sheet, said vent means comprising cover means covering said opening, said cover means permitting passage of wound fluid therethrough while reducing evaporation through said opening and thereby helping to insure a moist environment when excess wound fluid is removed from said wound;

the improvement wherein the cover means comprises inner and outer sheets secured together in superposition, the inner sheet comprising an elastomeric water-swelling polymeric material, the outer sheet comprising a material which provides a barrier to water evaporation.

5,090,407

CHEMICAL CARTRIDGE FOR PROTECTIVE RESPIRATORY MASK

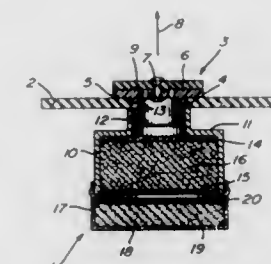
Jacques Lesage, Repentigny, and Claude Ostiguy, Chambly, both of Canada, assignors to I.S.S.T., Institute de Recherche en Sante et en Securite du Travail du Quebec, Canada

Filed Aug. 20, 1990, Ser. No. 569,562

Int. Cl.⁵ A62B 7/10

U.S. Cl. 128—205.27

7 Claims



1. A chemical device for filtering air contaminated by a target pollutant having a chemically active function and pollutants other than the target pollutant, comprising a separate active filter section and a main filter section;

said active filter section including a chemical reagent capable of capturing the target pollutant and reacting with it to convert said target pollutant into an inert, non-volatile and non-toxic matter as said contaminated air passes through said active filter section;

said active filter section being permeable to said pollutants other than the target pollutant; and said main filter section being positioned downstream said active filter section and being capable capturing said pollutants other than the target pollutant;

whereby the target pollutant is captured and derived into said inert, non-volatile and non-toxic matter by said active filter section, while said pollutant other than the target pollutant passes through said main filter section.

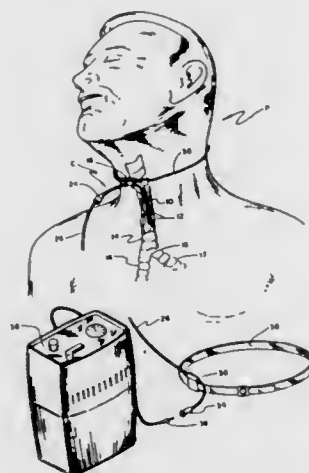
pollutant pass through said active filter section and are captured by said main filter section the chemical device further including means for enabling replacement of said active filter section, said means including a first hollow body containing said universal filter section, a second hollow body containing said active filter section, the replacement enabling means comprising means for removably mounting the second hollow body onto said first body, and said removably mounting means comprising means for snapping said second hollow body onto said first body.

5,090,408

TRANSTRACHEAL CATHETER SYSTEM AND METHOD
Bryan T. Spofford, 1470 S. Quebec Way, #227; Kent L. Christopher, 9086 E. Colorado Cir., both of Denver, Colo. 80231, and Michael E. Hovanes, Denver, Colo., assignors to Bryan T. Spofford and Kent L. Christopher, both of Denver, Colo.
Continuation-in-part of Ser. No. 788,817, Oct. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,912, Nov. 21, 1984, abandoned. This application Sep. 28, 1987, Ser. No. 101,172

Int. Cl.⁵ A61M 16/00

U.S. Cl. 128—207.14



1. A system for continuously supplying supplemental oxygen transtracheally from a portable oxygen source to supplement the spontaneous breathing of a patient suffering from chronic hypoxemia, said system comprising:

a transtracheal catheter having a subcutaneous portion and an exterior portion; said subcutaneous portion extending from said exterior portion a predetermined distance, said predetermined distance dependent upon a surgically formed opening located below the cricoid cartilage and above the manubrium of the cervical trachea in the neck of a patient for whom said system is to be used, to an area spaced above the carina in said patient;

(a) said exterior portion of said transtracheal catheter having a proximate end with means on said proximate end adapted to be connected to a portable oxygen source; said exterior portion further comprising means connected to said connecting means for extending said transtracheal catheter a sufficient length for said patient to (1) view said connecting means; (2) allow ease of manipulation of said connecting means; and (3) to move said connecting means away from a collar on an article of clothing worn by said patient;

(b) said subcutaneous portion of said transtracheal catheter providing a continuous flow rate up to about 8 liters per minute of oxygen from said portable oxygen source at a back pressure of less than about 2 psi; and

(c) said subcutaneous portion of said transtracheal catheter being formed from a medically inert material having a durometer of between about 80 to about 90 Shore A,

so as to have sufficient flexibility for long term use in said patient;

(d) said transtracheal catheter further comprising oxygen outlet means on a distal end portion of said subcutaneous portion for dispersing said oxygen uniformly into the right and left bronchus of said patient without interfering and blocking said spontaneous breathing of said patient;

means on said transtracheal catheter between said exterior portion and said subcutaneous portion adapted to locate said transtracheal catheter in position against said neck of said patient; and

means slideably engaging said locating means on said transtracheal catheter adapted to secure said transtracheal catheter around said neck of said patient to hold said locating means against said neck thereby preventing accidental movement of said transtracheal catheter from said opening, said securing means being trimmed to have a length sufficient for said securing means to snugly fit against said neck at said formed opening.

5,090,409

SINGLE BAG THERAPEUTIC PACK

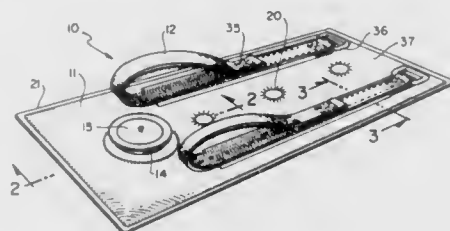
Daniel Genis, 7515 Woodrow Wilson Dr., Los Angeles, Calif. 90046

Filed Mar. 4, 1991, Ser. No. 663,606

Int. Cl.⁵ A61F 7/08

U.S. Cl. 128—402

2 Claims



1. A single bag therapeutic wrap for applying compressive thermotherapy and cryotherapy to the body, comprising the combination of:

a casing of flexible material for holding a quantity of a therapeutic medium and having two opposite sheets joined together by a peripheral heat seal defining an internal compartment between opposing inner surfaces;

releasable fastener means carried on one of said sheets of said casing for achieving a fastened condition;

said sheet other than said fastener means carried sheet having an exterior surface adapted for conduction of the temperature of said medium to a localized area of the user; said casing includes an elongated continuous and tortuous passageway between its opposite ends extending about a plurality of integral barriers defining said passageway; said barriers defined as heat-sealed spots joining the opposing inner surfaces of said sheets;

said casing composed of applicable material having a closable inlet port for introducing said medium into said internal compartment;

said casing further composed of a fabric material conducting temperature from said liquid medium;

said fastener means includes at least two straps carried across the major length of said casing sheet in parallel spaced-part relationship separated by the central longitudinal axis extending along said casing;

closure means cooperatively carried on opposite ends of said straps for effecting releasable closure;

said closure means is a hook and pile closure;

said sheets composed of a nylon fabric material coated with a vinyl material defining smooth inner surfaces and an irregular, roughened, fabric textured outer surface and further characterized as being waterproof;

said straps are sewn onto the exterior surface of said fastener means carried sheet by a plurality of stitches; and a vinyl strip covering said stitches having its peripheral edge marginal region heat-sealed directly to said fastener means carried sheet smooth inner surface.

5,090,410

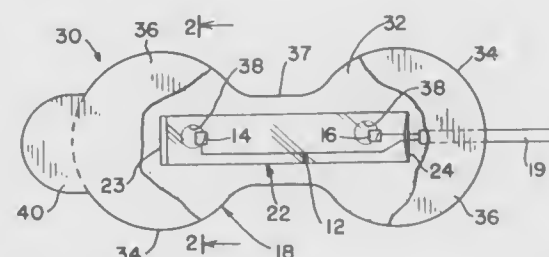
FASTENER FOR ATTACHING SENSOR TO THE BODY
Lawrence Saper, New York, N.Y., and Bruce L. Hanson, Franklin Lakes, N.J., assignors to Datascope Investment Corp., Montvale, N.J.

Filed Jun. 28, 1989, Ser. No. 372,316

Int. Cl.⁵ A61B 5/00

U.S. Cl. 128—633

16 Claims



1. A disposable sleeve and bandage for attachment to a patient wherein said sleeve is adapted to accept therein a probe, comprising:

a generally planar flexible bandage strip having adhesive on at least a portion of one face thereof;

a sleeve having an opening therein adapted to receive said probe, wherein said probe can slide through said opening into said sleeve and wherein said probe can be removed from said sleeve by sliding it therefrom;

wherein said sleeve includes means for preventing said probe from contacting said patient when said probe is resident in said sleeve and means for preventing said probe from contacting said adhesive;

locating means in the strip for positioning said probe in said sleeve.

5,090,411

ULTRASONIC DIAGNOSIS APPARATUS

Jirou Higuchi, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

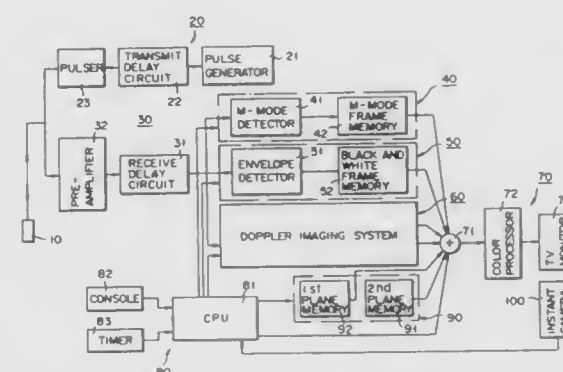
Filed Jan. 29, 1991, Ser. No. 647,231

Claims priority, application Japan, Jan. 31, 1990, 2-18925

Int. Cl.⁵ A61B 8/00

U.S. Cl. 128—660.05

7 Claims



1. An ultrasonic diagnosis apparatus, comprising:
ultrasonic image generating means for transmitting ultrasonic waves to and receiving reflected ultrasonic waves from a subject under examination to generate a B-mode

image, an M-mode image, a D-mode image, a BDF-mode image, and/or an MDF-mode image;

auxiliary information means for generating auxiliary information indicating a specific portion of said subject under examination;

display means for displaying said B-mode image, said M-mode image, said D-mode image, said BDF-mode image, and/or said MDF-mode image with said auxiliary information such that a display of said auxiliary information is superimposed upon and moveable with respect to a display of said B-mode image and/or said BDF-mode image; and

control means for controlling an intensity of said display of said auxiliary information in response to a change in position of said auxiliary information.

5,090,412

ULTRASONIC DIAGNOSIS APPARATUS

Toru Shimazaki, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP88/00872, § 371 Date Feb. 27, 1990, § 102(e) Date Feb. 27, 1990, PCT Pub. No. WO89/01761, PCT Pub. Date Sep. 3, 1989

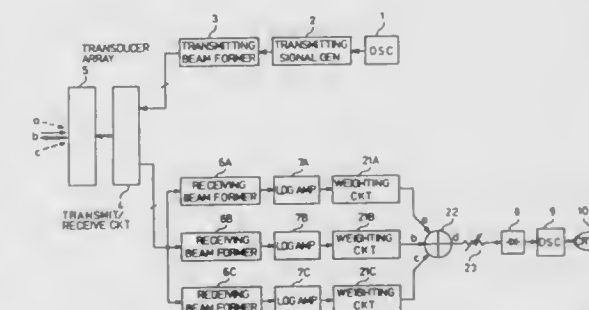
PCT Filed Aug. 31, 1988, Ser. No. 465,166

Claims priority, application Japan, Aug. 31, 1987, 62-217335; Aug. 31, 1987, 62-217336

Int. Cl.⁵ A61B 8/00

U.S. Cl. 128—660.07

5 Claims



1. In an ultrasonic diagnostic apparatus comprising means for scanning the interior of a subject's body with a plurality of beams, each of said beams comprising ultrasonic pulses; and means for receiving echo signals returning from the subject's body with respect to various sound rays of said ultrasonic pulses, the improvement comprising

means for determining a receiving signal for a portion of one of said sound rays by effecting a correlation process on the echo signals of said plurality of ultrasonic pulses each having a difference in directionality within a range of bearing resolution of the respective ultrasonic beam; and means for forming a sectional image of the subject's body on the basis of the receiving echo signal of the respective sound ray thus determined, whereby speckle noise is eliminated from the sectional image.

5,090,413

ULTRASONIC DIAGNOSTIC APPARATUS

Yoshihisa Yoshioka, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 23, 1990, Ser. No. 571,161

Claims priority, application Japan, Aug. 29, 1989, 1-222677

Int. Cl.⁵ A61B 8/00

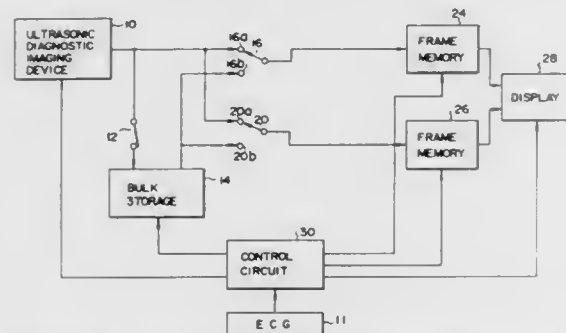
U.S. Cl. 128—660.07

14 Claims

1. An image displaying method for an ultrasonic diagnostic apparatus wherein an ultrasonic wave is transmitted to a subject, an ultrasonic echo reflected from the subject is received, and a diagnostic image of the subject is generated according to

the received ultrasonic echo, said method comprising the steps of:

- storing a first diagnostic image generated while the subject is in a resting state into a bulk storage;
- displaying as a motion picture a second diagnostic image generated in response to a subject a movement load;



- freezing the displayed second diagnostic image at a desired time; and
- displaying the first diagnostic image from said bulk storage as a motion picture simultaneously with the display of the frozen second diagnostic image.

5,090,414

INTRACAVITARY ULTRASOUND PROBE

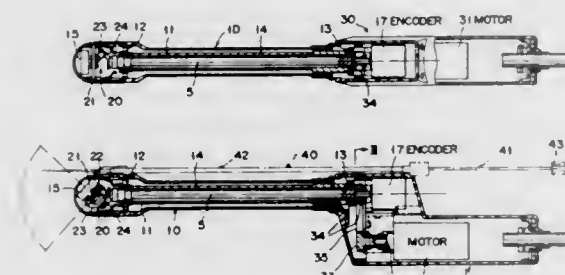
Masayuki Takano, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Aug. 21, 1989, Ser. No. 396,245

Claims priority, application Japan, Aug. 22, 1988, 63-206403
Int. Cl.⁵ A61B 8/00

U.S. Cl. 128—662.05

10 Claims



1. An intracavitary ultrasound probe, comprising: an elongated body including a distal end, a proximal end, and a rotatably-supported rotating shaft;
- a transducer element, located at the distal end of said elongated body, for scanning an object to be examined with ultrasound beams, said transducer element being movable in response to torque transmitted from the rotating shaft while simultaneously transmitting and receiving the ultrasound beams;
- a stab needle guide for guiding a stab needle, said stab needle guide being coupled to said elongated body and extending substantially in parallel to said elongated body;
- a driving source located at the proximal end of said elongated body, which is offset from the rotating shaft, said driving source including a driving shaft extending in a non coaxial manner with respect to the rotating shaft;
- means for transmitting the torque from said driving source to the rotating shaft, said transmitting means including: a first pulley coupled to said driving shaft;
- a second pulley coupled to a proximal end of the rotating shaft; and
- a belt would around the first and second pulleys;

a handle which incorporates said driving source therein, so that said handle is offset from said elongated body; and an encoder, coupled directly to the proximal end of the rotating shaft, for detecting a swinging angle of said transducer element;

wherein a space for operating said stab needle is provided between said stab needle and said handle and wherein said driving shaft is parallel to the rotating shaft, so that said handle is parallel to said elongated body.

5,090,415

EXAMINATION APPARATUS

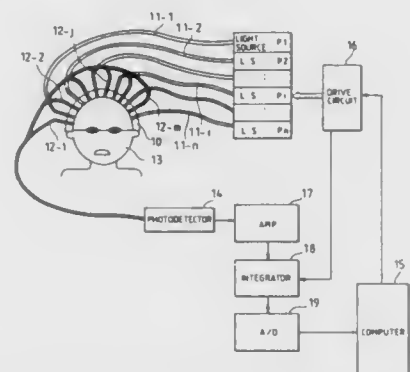
Takaji Yamashita, and Yutaka Yamashita, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 310,176, Feb. 14, 1989, abandoned.
This application Jan. 11, 1991, Ser. No. 639,377

Int. Cl.⁵ A61B 5/00

U.S. Cl. 128—665

7 Claims



1. An examination apparatus for examining an object composed of tissue employing transmission photometry, comprising:

light launching means for successively launching an incidence light beam to said object composed of tissue, said incidence light beam having a predetermined wavelength, and said light launching means comprising means for cyclically launching incidence light beams to said object at a plurality of incidence sites;

means, comprising a plurality of light-receiving means positioned at least adjacent a plurality of output sites, for picking up, in synchronism with each successive launching of said incidence light beam, light beams of said predetermined wavelength scattered in said object from said plurality of output sites as light intensity data, and for performing mathematical processing on said light intensity data for each successive launching of said incidence light beam to obtain absorption data representing a light absorption quantity at said incidence site;

wherein said means for picking up light beams and for mathematical processing picks up, in synchronism with each launching of said incidence light beam at any incidence site, said light beams scattered in said object from said plurality of output sites as said light intensity data, and performs said mathematical processing on said light intensity data for each launching of said incidence light beam at any incidence site to obtain total absorption data representing light absorption quantities at said plurality of incidence sites; and

wherein said means for performing mathematical processing adds said light intensity data picked up from said plurality of output sites.

5,090,416

OPHTHALMOLOGICAL DIAGNOSIS METHOD AND APPARATUS

Kouji Ogino, Hino, and Yoshihisa Aizu, Machida, both of Japan, assignors to Kowa Company, Ltd., Japan

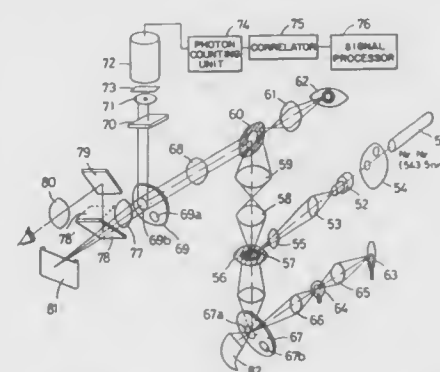
Continuation of Ser. No. 165,817, Mar. 9, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,488

Claims priority, application Japan, Mar. 27, 1987, 62-71396
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.⁵ A61B 5/02

U.S. Cl. 128—691

21 Claims



1. An ophthalmological diagnosis method comprising the steps of:

specifying one of a plurality of tissue layers in an eye fundus to be examined;

illuminating the eye fundus with only a single laser beam of coherent light having a wavelength selected for the specified tissue layer so that coherent light scattered by blood cells in the illuminated tissue layer undergoes phase modulation corresponding to the movement of the blood cells to produce a speckle light pattern representative of the blood flow state in the specified tissue layer; and

evaluating the fluctuations of the speckle light pattern to produce therefrom data representative of the blood flow state in the specified tissue layer of the eye fundus.

5,090,417

MEDICAL DIAGNOSTIC APPARATUS

Raymond A. B. Mollan, Orchard Hill, 167 Bangor Road, Craigavon, Hollywood, Co. Down BT18 0ET; Patricia E. Boyd, 52 Wheatfield Crescent, Belfast BT14 7HT, and John G. Brown, 38 Granmore Gardens, Belfast BT9 6JL, all of Ireland

Continuation of Ser. No. 261,593, Oct. 24, 1988, abandoned.
This application Mar. 5, 1991, Ser. No. 666,462

Claims priority, application United Kingdom, Oct. 22, 1987, 8724777; Oct. 29, 1987, 8725347

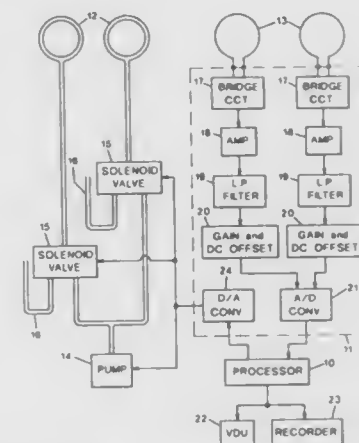
Int. Cl.⁵ A61B 5/02

U.S. Cl. 128—691

10 Claims

1. Medical diagnostic apparatus comprising: two thigh cuffs respectively applicable around the legs of a patient;
- two solenoid valves respectively connected with said cuffs and each operable in ON and OFF conditions to afford fluid communication therethrough by way of respectively different passageways;
- a pump operable to provide a pressurized air supply at adjustable regulated pressure to inflate both said cuffs in unison by way of said valve ON condition passageways;
- venting means for deflation of both said cuffs by way of said valve OFF condition passageways;
- processor means operable automatically to control operation of said valves and pump to effect inflation of said cuffs to occlude venous blood flow in said legs, and thereafter to effect simultaneous deflation of said cuffs; and
- two elongate strain gauge transducers respectively engageable around said legs distally of said cuffs and operable to

provide respective signals representing venous blood outflow in said legs following deflation of said cuffs, said transducers being connected with said processor means to collate said signals of the former with the times of control operations of the latter;



said venting means having a flow capacity allowing said deflation to effect substantially instantaneous release from said venous blood flow of the pressure of the preceding flow-occluding inflation.

5,090,418

METHOD AND APPARATUS FOR SCREENING ELECTROCARDIOGRAPHIC (ECG) DATA

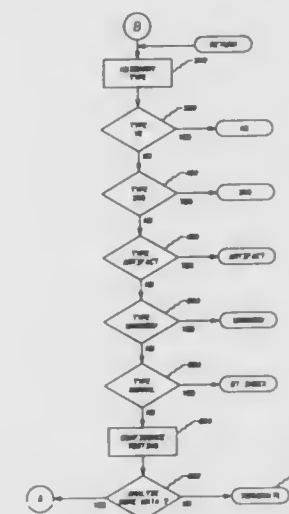
Wilber D. Squires, Fountain Valley; John A. Bachman, Dana Point, and Bryan L. Laney, Lakewood, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed Nov. 9, 1990, Ser. No. 610,979

Int. Cl.⁵ A61B 5/0452

U.S. Cl. 128—702

21 Claims



ECG data as being a member of one of a group of categories, said group of categories including a ventricular ectopic, a supraventricular ectopic, an ST index, an artifact, or an unknown;

accumulation means contained within said computational means to store a total number of occurrences of each of said categories;

means responsive to said accumulation means for automatically detecting significant abnormalities in said digital ECG signals, and responding thereto.

5,090,419

APPARATUS FOR ACQUIRING SOFT TISSUE BIOPSY SPECIMENS

Aubrey Palestrant, 6800 N. 47th St., Paradise Valley, Ariz. 85253

Filed Aug. 23, 1990, Ser. No. 572,055

Int. Cl.³ A61B 10/00

U.S. Cl. 128—754

7 Claims



1. An apparatus for acquiring biopsy specimens, the apparatus comprising in combination:

- a) an outer cannula having a predetermined inner diameter and having a distal end for insertion into a patient and having an opposing proximal end, said proximal end having a first connector means secured thereto;
- b) a stylet having a predetermined outer diameter commensurate with the predetermined inner diameter of said outer cannula and adapted to slide into said outer cannula through the proximal end of said outer cannula, said stylet having a closed distal end for closing the distal end of said outer cannula during insertion of said outer cannula into a patient, said stylet being detachable from said outer cannula;
- c) a biopsy actuator including a biopsy needle, said biopsy needle having a predetermined outer diameter commensurate with the predetermined inner diameter of said outer cannula and adapted to slide into said outer cannula through the proximal end of said outer cannula after said stylet is removed therefrom, said biopsy needle having a distal end including a specimen retaining notch for retaining a biopsy specimen therein, and having an opposing proximal end;
- d) said biopsy actuator further including a second connector means for releasably coupling with the first connector means of said outer cannula when said biopsy needle is extended into said outer cannula; and
- e) said biopsy actuator including trigger means for first exposing the specimen retaining notch of said biopsy needle relative to the distal end of said outer cannula to allow tissue to be biopsied to prolapse within the specimen retaining notch, and for subsequently rapidly advancing the distal end of said outer cannula over the specimen retaining notch to cut the specimen tissue which prolapsed within the specimen retaining notch.

5,090,420

BLOOD SAMPLING EQUIPMENT WITH NEEDLE HOLDER AND VACUUM VIAL

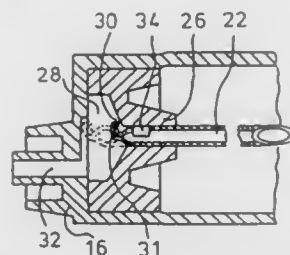
Björn Nielsen, Hvilstedsvej 16, Dk-8355 Solbjerg, Denmark
PCT No. PCT/DK89/00097, § 371 Date Oct. 30, 1990, § 102(e)
Date Oct. 30, 1990, PCT Pub. No. WO89/10723, PCT Pub. Date Nov. 16, 1989

PCT Filed Apr. 26, 1989, Ser. No. 601,709

Claims priority, application Denmark, May 2, 1988, 2370/88
Int. Cl.³ A61B 5/00

U.S. Cl. 128—764

3 Claims



1. Equipment for sampling blood with a needle, a holder and a vacuum vial for collecting blood, comprising a combined needle and vial holder in the form of a cylinder having an open end and a closed end, the closed end accommodating a holding socket for receiving an outwardly projecting sampling needle, an internal needle projecting freely internally in the cylinder from the closed end, the internal needle being adapted to perforate an end closure of an associated evacuated vial when the vial is inserted into the cylinder, the closed cylinder end including a passage capable of connecting the internal needle with the sampling needle through valve means actuated by the insertion of the vial, wherein the valve means comprise the combination of the internal needle being mounted for limited displacement in the holder so as to be displaceable forwardly and rearwardly, respectively, in response to insertion and retraction of the vial, and the internal needle is formed so as to be closed at its foremost end while having adjacent that end a side orifice, which cooperates with a surface of a closing bushing of the holder which surrounds a portion of said needle for opening and closing the side orifice thereof by the relative displacements of the needle with respect to the bushing and holder; the closing bushing is a fixed, central part of the foremost end portion of the holder, and adjacent is closed front end the internal needle is formed with a radial widening portion that blocks the needle against retraction, while a corresponding stop for the forward displacement is formed by a central inner side portion of a foremost end wall of the holder, said foremost end wall being provided with the said holding socket for the sampling needle in an eccentric position relative the end wall.

5,090,421

APPARATUS FOR TESTING MUSCLE STRENGTH

Earl V. Wagoner, III, West Jordan, Utah, assignor to Hoggan Health Industries, Inc., Draper, Utah
Filed Dec. 9, 1986, Ser. No. 939,809

The portion of the term of this patent subsequent to Mar. 10, 2006, has been disclaimed.

Int. Cl.³ A61B 5/22

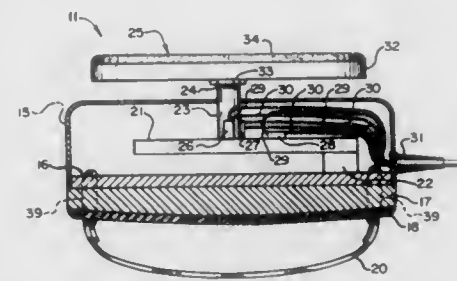
U.S. Cl. 128—774

3 Claims

1. Transducer apparatus for use in testing muscle strength, comprising:
a) a housing having a rigid base plate;
a substantially rigid support arm assembly mounted in the housing on said base plate and including a first leg affixed to said base plate and a substantially rigid second leg cantilevered from the first leg and having a longitudinal axis extending from said first leg a spaced distance from the base plate;
a substantially rigid support post affixed to said second leg,

said support post having an end portion projecting out of the housing and further having a longitudinal axis normal to the longitudinal axis through said second leg;
a pressure plate affixed to the end of the support post projecting from said housing;

first and second strain gauges, each having a longitudinal axis, and each mounted on the support post with its longitudinal axis parallel to the longitudinal axis of the post, said strain gauges mounted at ninety degrees with respect to each other around the longitudinal axis of the support post;



a third strain gauge mounted on the second leg and having a longitudinal axis parallel to the axis of the second leg and in a plane in common with a plane that includes both the longitudinal axis of the second leg and the longitudinal axis of the support post;
electrical means for converting signals output by all of said strain gauges into a signal indicative of muscle strength that contributes to the force exerted against said pressure plate when placed against a localized area of a person's body which is being activated by the person for diagnostic purposes; and
means for displaying said signal indicative of muscle strength.

5,090,422

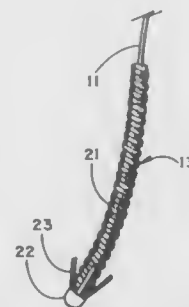
IMPLANTABLE ELECTRODE POUCH

Roger W. Dahl, Andover; Graydon E. Beatty, New Brighton; David K. Swanson, Roseville, and John E. Heil, St. Paul, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.
Filed Apr. 19, 1990, Ser. No. 511,068

Int. Cl.³ A61N 1/05

U.S. Cl. 128—784

34 Claims



1. In an automatic implantable cardioverter/defibrillator (AICD) system for delivering electrical shocks to the heart of a patient to restore normal cardiac rhythm, the system including an electrical input pulse generating means for generating an electrical pulse in cooperation with at least two implantable electrodes including an endocardial electrode electrically connected to said pulse generating means adapted to be positioned in the right ventricle of the heart of the patient, and a patch electrode electrically connected to said pulse generating means, said patch electrode being adapted to be positioned juxtaposed to the outside of the left ventricle of the heart, the improvement comprising:
porous bio-compatible enclosure means for isolating said

patch electrode in a manner which allows electrical conduction but spaces the patch electrode from the heart tissue so as to achieve a dissection plane, said enclosure means having a thickness which defines a tissue-electrode spacing that reduces proximate tissue damage from high localized current densities, said closure means being further adapted to be fixed in position relative to proximate tissue to thereby positively position said patch electrode in the desired position with respect to the heart; and
fixation means for attaching said enclosure means proximate to the heart.

5,090,423

LOCAL HEATING APPARATUS AND CAVITY RESONATOR FOR LOCAL HEATING

Jinichi Matsuda, and Kazuo Kato, both of Niigata, Japan, assignors to Omron Corporation; Jinichi Matsuda; Kazuo Kato and Yoshiaki Saito, all of Kyoto, Japan

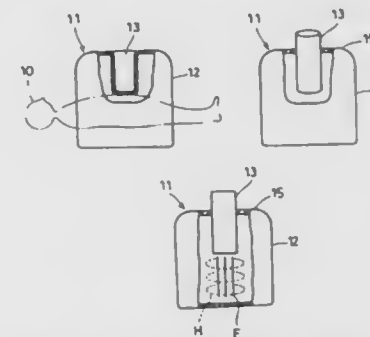
PCT No. PCT/JP89/00163, § 371 Date Oct. 6, 1989, § 102(e)
Date Oct. 6, 1989, PCT Pub. No. WO89/07469, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 17, 1989, Ser. No. 425,203

Claims priority, application Japan, Feb. 18, 1988, 63-34049
Int. Cl.³ A61N 5/02

U.S. Cl. 128—804

13 Claims



1. A cavity resonator responsive to high-frequency energy for locally heating a body inserted therein, said cavity resonator comprising:
electrically conductive walls means forming an enclosed cavity, said conductive wall means capable of conducting a current and thereby creating a magnetic field when said cavity resonator is supplied with high-frequency energy; at least one electrically conductive protrusion protruding from, and electrically continuous with, said wall means for protruding partly into said cavity to thereby define an empty space between said protrusion and said wall means opposite to said protrusion, said space being adapted to receive at least that part of a body to be inserted therein which is to be locally heated;
said wall means and said at least one protrusion forming an electrically resonant structure capable of generating, in response to appropriate high-frequency energy supplied to said cavity resonator, a standing wave electric field in all of said space along the axis of said at least one protrusion, said electric field being confined by said magnetic field.

5,090,424

CONFORMABLE URETHRAL PLUG

John G. Simon, Boston, and James E. Nicholson, Lincoln, both of Mass., assignors to UroMed Corporation, Boston, Mass.
Filed Dec. 31, 1990, Ser. No. 636,285

Int. Cl.³ A61F 5/48, 2/00

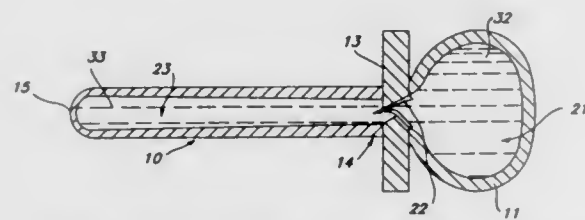
U.S. Cl. 128—885

8 Claims

1. A removable device for blocking unwanted flow of urine comprising:
(a) an expandable housing forming a plug portion of the

device which conforms to the shape of the urethra and defines an inner core which can accept a fluid;

(b) means for the wearer to insert the device to achieve continence including means for introducing fluid into the inner core to cause the configuration of the outer housing to distend sufficiently to reduce the flow of urine from a



bladder when the device is inserted into a urethra by the wearer; and

(c) means for the wearer to remove the device to void including means for removing fluid in the core of the plug portion of the device so that the plug can be removed from the urethra by the wearer.

5,090,425

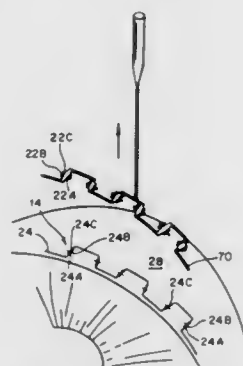
METHOD OF CONTROLLING ASTIGMATISM DURING EYE SURGERY

Norman O. Stahl, 3199 Monterey Dr., Merrick, N.Y. 11566
Filed Mar. 2, 1990, Ser. No. 487,621

Int. Cl.⁵ A61B 17/32

U.S. Cl. 128—898

11 Claims



1. A method of controlling astigmatism during eye surgery comprising:

forming an incision within eye tissue and within or adjacent to the cornea as a substantially continuous wave extending partially about the cornea, the incision defining a plurality of flaps of tissue between respective, opposing incision portions;

performing an operation within the eye tissue; and

suturing the flaps to the surrounding eye tissue following the operation.

5,090,426

SMOKING ARTICLE

Jiunn-Yann Tang, and Li-Chung Chao, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 16, 1989, Ser. No. 324,137

Int. Cl.⁵ A24D 1/00, 1/02, 1/18

U.S. Cl. 131—194

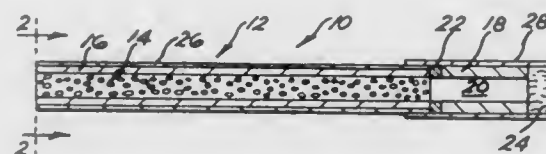
9 Claims

1. A smoking article comprising:

a sleeve of a heat generating material wherein the sleeve wall is air impermeable;

a cylinder of an aerosol-flavor generating compound concentrically located within the sleeve co-extensive therewith and substantially filling the cross-section of the interior of the sleeve, the cylinder being air permeable along

its cylindrical wall length, the aerosol-flavor generating compound comprising an inert metal oxide as a heat sink homogeneously mixed with the other components of the cylinder;



a tube coaxially located at one end of the sleeve and cylinder with the wall of the tube being about the same thickness as the sleeve; and,

a filter coaxially located at the distal end of the tube.

5,090,427

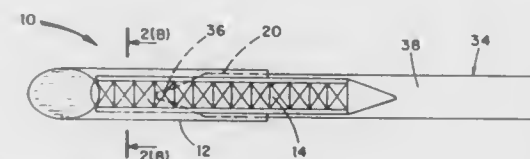
FINGER GROOMER ATTACHMENT FOR WRITING INSTRUMENTS

Charles Sherts, 70 Washington St., Norwalk, Conn. 06854
Filed Jan. 9, 1991, Ser. No. 639,122

Int. Cl.⁵ A45D 29/04

U.S. Cl. 132—75.6

13 Claims



1. A finger groomer attachment for a writing instrument, comprising, a pen cap having an outer surface, an open end for receiving a writing instrument and a closed end formed in a point and mimicking the appearance of a human finger and configured to push a cuticle during finger grooming, a clip disposed on said outer surface of said cap and secured to said cap at one end, a fingernail cleaner point forming the other end of said clip, an abrasive surface for fingernail shaping being secured to a surface of said clip facing away from said cap.

5,090,428

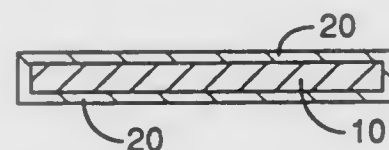
PROTEIN COATED HAIR PROTECTION APPARATUS AND METHOD

Edward W. Greene, deceased, late of Portland, Oreg., and Barbara G. Jackson, heir, Tacoma Park, Oreg., assignors to International Packagers, Inc., Lake Oswego, Oreg.
Filed Jul. 20, 1989, Ser. No. 383,858

Int. Cl.⁵ A45D 7/04

U.S. Cl. 132—204

17 Claims



1. A hair treatment apparatus for protecting hair from permanent wave solution chemicals comprising:

a flexible paper sheet made substantially entirely of paper to be water permeable and having first and second sides; and

a protein coating on at least one of said sides of said sheet, said coating containing a protein material as its major constituent and being free of permanent wave solution chemicals and releasing protein therefrom upon contact with said permanent wave solution.

5,090,429

VEHICLE WASH APPARATUS

Ivan J. Barber, Mississauga, Canada, assignor to Transcontinental Car Wash Systems Limited, Mississauga, Canada

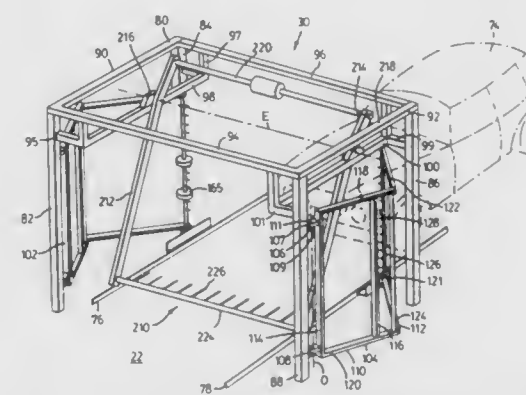
Filed Nov. 1, 1989, Ser. No. 430,211

Claims priority, application Canada, Sep. 8, 1989, 610763

Int. Cl.⁵ B08B 3/02

U.S. Cl. 134—57 R

50 Claims



1. Apparatus for washing side and end surfaces of a vehicle, in which there is relative movement between the apparatus and the vehicle comprising:

support means;

a side and end follower mounted on the support means to the side of a vehicle path and movable, between a first position to the side of the vehicle and a second position inwardly of the side of the vehicle path;

follower actuating means for moving the follower between the first and second positions;

washing fluid supply nozzles mounted on the follower for directing a spray of washing fluid towards a vehicle on the vehicle path; and

nozzle actuating means for moving the nozzles between first and second positions relative to the follower, the nozzles being positioned in the first position when the follower is in the first position, and in the second position when the follower is moving between the first and second positions, when the follower is in the first position, the washing fluid supply nozzles are in the first position to direct fluid inwardly of the vehicle path and thus towards a side surface of a vehicle thereon, and when the follower is moving between the first and second positions, the washing fluid supply nozzles are in the second position to direct fluid along the vehicle path and thus towards an end surface of a vehicle thereon.

5,090,430

ULTRASONIC CLEANING SYSTEM FOR FLUORESCENT LIGHT DIFFUSER LENS

Kent A. Nixon, Springfield, Pa., assignor to Agape Enterprises, Inc., Springfield, Pa.

Filed Feb. 2, 1990, Ser. No. 473,909

Int. Cl.⁵ B08B 3/12

U.S. Cl. 134—84

23 Claims

1. A generally box-like cleaning system with a planar cover means adapted for cleaning a formed planar elongate object, said cleaning system having plural top surface apertures, using a contained liquid medium adapted to ultrasonic transducer agitation without incurring appreciable volatilization, comprising:

(a) a generally box-like cabinet having a top and side walls;

(b) a generally rectangular wash trough having imperforate end walls, side walls and bottom wall adapted to receive and retain a substantial volume of a wash liquid, the wash trough communicating with a generally rectangular aperture in the top of the enclosure and having such dimensions that the planar elongate object to be cleaned may be

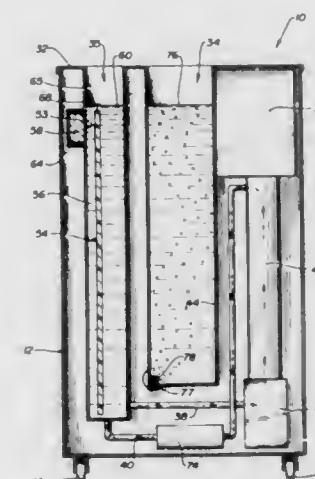
manually placed therein and fully immersed in said wash liquid;

(c) a generally rectangular rinse trough, substantially parallel to the wash trough, having imperforate side walls, end walls and a bottom wall adapted to receive and retain a substantial volume of a rinse liquid, the rinse trough communicating with a generally rectangular aperture in the top of the enclosure;

(d) a flow inlet means and companion flow outlet means connected to the lower portion of said wash trough adapted for circulating the wash liquid;

(e) an ultrasonic generator adapted to be connected to a source of electrical power and comprising means for conducting an ultrasonic signal to activate a transducer;

(f) a substantially horizontal, box-like niche disposed in one side wall of said wash trough, and vertically located so as



to be below the functional surface of the wash liquid while the cleaning system is in the operating mode, which niche is also in communication with the wash trough along one lateral surface;

(g) at least one submersible, ultrasonic transducer fixedly mounted within said niche and adapted to be immersed in said liquid medium for effecting its agitation upon activation by an ultrasonic signal from said ultrasonic generator;

(h) the transverse dimension of the rinse trough being such that the immersed planar elongate object being so cleaned may be efficiently subjected to ultrasonic agitation; and

(i) the dimensions and placement of the rinse trough being such that the planar article may be manually removed from said wash trough, moved a short distance transversely, and then be substantially fully immersed in the contained rinse liquid.

5,090,431

CLEANING APPARATUS WITH VAPOR CONTAINMENT SYSTEM

Robert L. Theroux, Holyoke, and Fatemeh Abnoosi, East Longmeadow, both of Mass., assignors to K & M Electronics, Inc., West Springfield, Mass.

Filed Jun. 1, 1990, Ser. No. 531,937

Int. Cl.⁵ B08B 3/10

U.S. Cl. 134—105

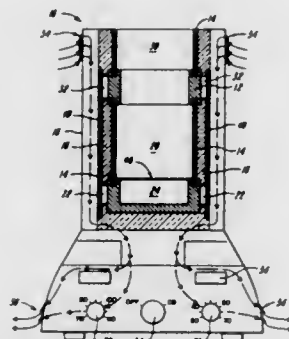
12 Claims

1. Apparatus for cleaning with vapor containment for vaporizing a liquid cleaning agent and condensing the resulting vapor, comprising:

a container for holding a quantity of cleaning agent, said container having a lower portion and sidewall portions vertically extending upward from and attached to said container, forming a continuous container wall, said container wall having an upper portion;

at least one cooling means for establishing and maintaining a

relatively low temperature at said upper portion of said container wall;
 at least one selectively operable temperature regulating means for maintaining a temperature differential between said upper portion and said lower portion,
 at least one conducting means circumferentially extending around said upper portion of said container wall, said



conducting means being positioned adjacent said cooling means for condensing said vapors and for providing a cold vapor blanket to prevent said cleaning agent loss by evaporation; and
 a shunting means for transferring heat from said cooling means to said lower portion of said container to provide heat to said lower portion.

5,090,432

SINGLE WAFER MEGASONIC SEMICONDUCTOR WAFER PROCESSING SYSTEM

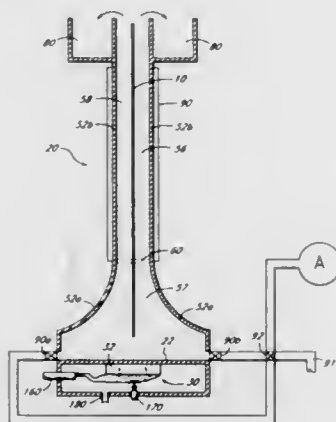
Mario E. Bran, Garden Grove, Calif., assignor to Verateq, Inc., Anaheim, Calif.

Filed Oct. 16, 1990, Ser. No. 598,426

Int. Cl.³ B08B 3/12

U.S. Cl. 134—139

10 Claims



1. Apparatus for cleaning a single semi-conductor wafer at one time comprising:

a container having a bottom wall and a plurality of upstanding walls, supports in said container for supporting a wafer such that two large flat, spaced surfaces of the wafer extend generally vertically, said upstanding walls including upper portions defining a thin, flat vertically oriented space for receiving a wafer, said space having a generally rectangular cross section defined by two side walls having flat, generally vertically oriented surfaces closely spaced from each other, said side walls being joined by two edge walls which are spaced from each other a distance slightly greater than a diameter of said wafer, said upstanding walls extending to an open upper end for receiving and permitting withdrawal of a wafer from said container; and a device in the lower portion of said container for propagating megasonic energy upwardly in said container to agi-

tate cleaning liquid in the container for purposes of dislodging particulates from the surfaces of a wafer.

5,090,433

COMPACT ENDOSCOPE CLEANING APPARATUS

Ryuichi Kamaga, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

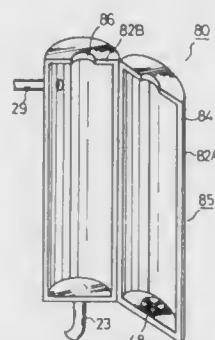
Filed Jan. 30, 1989, Ser. No. 302,959

Claims priority, application Japan, Jan. 28, 1988, 63-15909

Int. Cl.³ B08B 3/04

U.S. Cl. 134—169 C

4 Claims



1. A cleaning apparatus for cleaning a scope of an endoscope insertable into a biological body under medical examination, comprising:

an elongated cleaning vessel including
 a top end portion and a bottom end portion positioned opposite to each other along a longitudinal axis thereof,
 a scope insertion hole formed in said top end portion, through which said scope of the endoscope is insertable, whereby a substantially entire length of said scope is stored within said elongated cleaning vessel in a vertical direction parallel to said longitudinal axis,
 a cleaning-fluid conducting hole formed in a first portion adjacent to said top end portion, through which cleaning fluid is conducted into said elongated cleaning vessel, and, an exhaust hole formed in a second portion adjacent to said bottom end portion, through which effluent of the cleaning fluid is exhausted from the elongated cleaning vessel, said elongated cleaning vessel being constructed of a pair of semi-cylindrical vessel halves extending along the longitudinal axis thereof, and said semi-cylindrical vessel halves being hinged with each other so as to be opened for allowing said scope to be inserted into said cleaning vessel.

5,090,434

CHAIR ASSEMBLY FOR RELEASABLE ATTACHMENT TO CRUTCH

Elmer R. Hagen, 230 W. Genesee St., Apt. 3, Auburn, N.Y. 13201

Filed Nov. 28, 1990, Ser. No. 619,079

Int. Cl.³ A45B 3/00

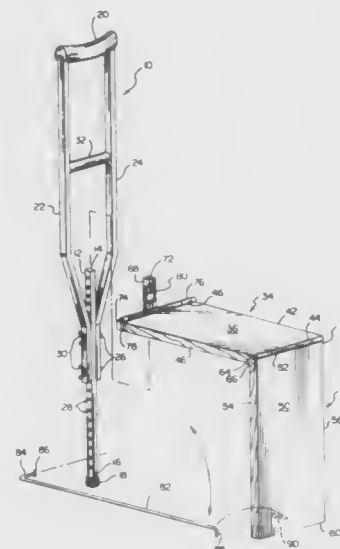
U.S. Cl. 135—66

12 Claims

1. A seat assembly for releasable attachment to the top, terminal end of a center post of a crutch, said assembly comprising:

a.) a sitting board having a substantially planar sitting surface with front, back and first and second, opposite side edges;
 b.) a support board having substantially planar front and back surfaces with top, bottom and first and second, opposite side edges;
 c.) a first elongated hinge having first and second, superposable hinge plates of like configuration, each of said hinge plates being independently axially rotatable about said first hinge, said first hinge plate fixedly attached to said sitting board front edge and said second hinge plate being fixedly attached to said support board top edge whereby

said support board may be pivoted from an open position wherein said support board is perpendicular to said sitting board, to a folded position wherein said support board front surface is in covering, contacted relation with said sitting board sitting surface; and



d.) means on said sitting board back edge for releasably attaching said sitting board to said crutch center post such that said sitting board extends substantially perpendicular to said crutch center post with said support board extending vertically from said sitting board in said open position.

5,090,435

FOLDING SHELTER, SUCH AS A SUNSHADE, SHELTER FOR HIKING OR CAMPING OR SIMILAR

Jean-Louis Leclercq, 1, rue Yves-Decugis, F-59650 Villeneuve-d'Ascq, France

PCT No. PCT/FR89/00333, § 371 Date Feb. 28, 1990, § 102(e) Date Feb. 28, 1990, PCT Pub. No. WO90/00215, PCT Pub. Date Jan. 11, 1990

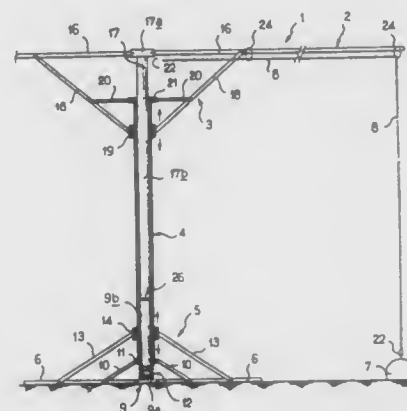
PCT Filed Jun. 27, 1989, Ser. No. 460,963

Claims priority, application France, Jun. 28, 1988, 88 09102

Int. Cl.³ E04H 15/28

U.S. Cl. 135—98

8 Claims



1. A foldable shelter such as a parasol, market shelter, camping shelter or similar apparatus, designed especially to protect a surface on the ground against bad weather, sun or rain, which comprises a roof supported by a foldable brace, a pole supporting said roof and said foldable brace, and a foldable foot comprising ground-engaging radial branches each pivoted at their inner end to a ground-engaging central member vertically movable with respect to said pole and each connected to said

pole by coupling links pivoted at their respective ends to said branches and to said pole, whereby, upon engagement of said ground-engaging central member with the ground, with said pole being substantially in a vertical position, the combined weight of said pole, roof and brace causes said pole to move downwardly with respect to said central member to unfold said foot and to thereby put said radial branches into a shelter-supporting unfolded position.

5,090,436

TEMPERATURE SENSITIVE WATER SUPPLY SHUT-OFF SYSTEM

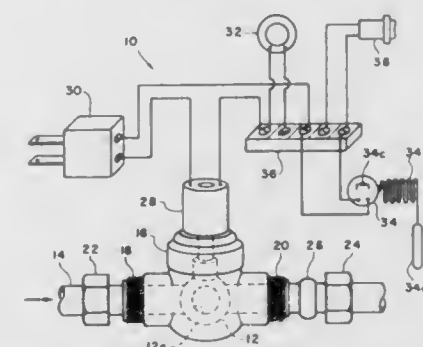
John R. Hoch, Jr., 13 Delacey Ave., East Quogue, N.Y. 11942, and Bruce A. Moore, 29 N Paquatuck Ave., East Moriches, N.Y. 11940

Continuation of Ser. No. 561,568, Aug. 2, 1990, abandoned. This application May 22, 1991, Ser. No. 707,958

Int. Cl.³ F16K 17/38

U.S. Cl. 137—80

7 Claims



1. An automatic water supply shut-off system for use in a building having an indoor plumbing network which includes a water supply pipe which supplies the network with water, comprising:

a shut-off valve movable between open and closed positions in the water supply pipe, and being normally in the closed position;
 a one-way solenoid operatively coupled to the shut-off valve to move the shut-off valve from the closed position to the open position when the solenoid is energized, the shut-off valve returning to the closed position when the solenoid is deenergized;
 electrical circuit means including an electrical power source for supplying electric energy to the solenoid;
 sensor means disposed within the building for sensing air temperature within the building;
 ambient condition responsive switch means, responsive to the sensor means and being connected to the circuit means between the power source and the solenoid, and being normally in a first, closed circuit position, for opening the electrical circuit in a second, open circuit position when the sensor means senses a predetermined freeze condition temperature; and
 a manual switch re-set button coupled to the switch means and being operable to place the switch means in the first, closed circuit position after an occurrence of the predetermined freeze condition temperature.

5,090,437

LOW FRICTION PROPORTIONAL UNLOADING VALVE

Philip L. Cowan, 901 Ashland, Houston, Tex. 77008

Filed May 7, 1990, Ser. No. 519,936

Int. Cl.³ F16K 31/365

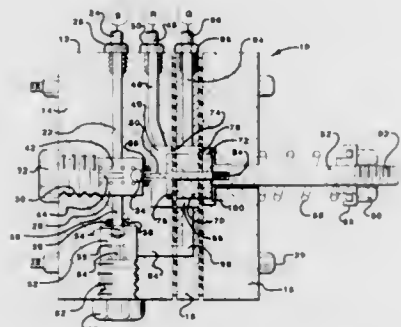
U.S. Cl. 137—116

13 Claims

1. A proportional unloading valve mechanism for pressurized fluid circuits, comprising:

(a) a source of pressurized fluid flow;

- (b) means forming a primary fluid circuit for receiving said pressurized fluid flow from said source under pressure;
- (c) means forming a bypass fluid circuit for receiving said fluid flow from said source at low pressure;
- (d) unloading valve means for selectively communicating said source with said primary fluid circuit and said bypass fluid circuit and normally being closed to maintain said source in communication with only said primary fluid circuit;
- (e) valve actuator means being disposed for opening of said unloading valve;
- (f) first and second pressure responsive members developing differing opposed pressure induced forces on said valve



actuator means responsive to fluid pressure in said primary fluid circuit, said differing opposed pressure induced forces developing a resultant valve opening force on said valve actuator means in direct proportion to the pressure of fluid within said primary fluid circuit which resultant valve opening force is sufficient for opening of said unloading valve when said pressure in said primary fluid circuit reaches a predetermined maximum; and

(g) means maintaining pressure in said primary fluid circuit on said pressure responsive members when said unloading valve is open to maintain said unloading valve means in the open position until the pressure in said primary fluid circuit drops to a level proportional to said predetermined maximum.

5,090,438

SELF-RELIEVING FLUID REGULATOR

Spencer M. Nimberger, 13711 Chelwood Pl., Houston, Tex. 77069

Filed Sep. 21, 1990, Ser. No. 586,221

Int. Cl.³ G05D 16/10

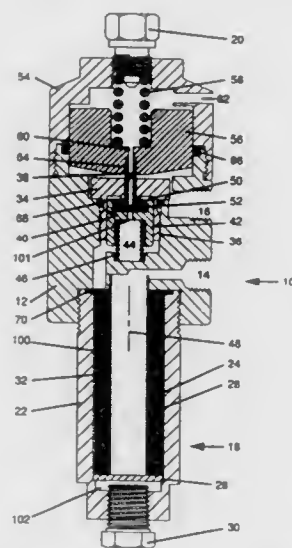
U.S. Cl. 137—116.5

20 Claims

1. A regulator for receiving high pressure fluid and controllably outputting low pressure fluid, the regulator including a regulator body having a high pressure fluid input port and a low pressure fluid output port, and an adjustment member for selectively controlling the level of output low pressure fluid, the regulator further comprising:

- a regulator valve mechanism for controlling the flow of fluid from the high pressure fluid input port to the low pressure fluid output port, the regulator valve mechanism including a regulator seat positioned within and carried by the regulator body, and a regulator valve disk movable within the regulator body for sealing engagement with the regulator seat;
- a fluid barrier axially movable with respect to the regulator body in response to the level of low pressure fluid, the fluid barrier having a port therethrough;
- a biasing device for biasing the fluid barrier toward the regulator valve mechanism; and
- a relieving valve mechanism for venting fluid from the regulator, the relieving valve mechanism including a seat having a conical configuration formed on the regulator valve disk, and a dart member carried by and in sealing engagement with the fluid barrier, the dart member hav-

ing a flow passageway therethrough in fluid communication with the port in the fluid barrier, and having a frusto-



conical sealing surface for sealing engagement with the seat of the relieving valve mechanism.

5,090,439

ATMOSPHERIC COMPENSATING AUTOMATIC AIR RELEASE VALVE

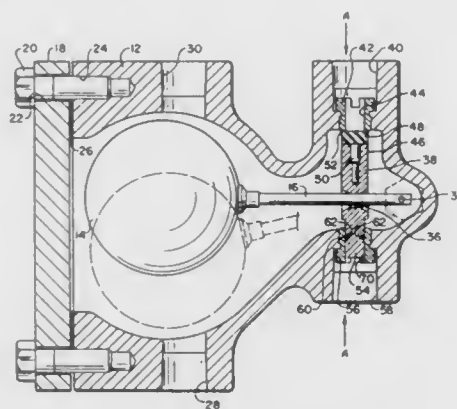
Vincent M. Sabalvaro, III, and Ralph DiLorenzo, Rolling Meadows, both of Ill., assignors to APCO Valve and Primer Corporation, Schaumburg, Ill.

Filed Jul. 24, 1989, Ser. No. 383,437

Int. Cl.³ F16K 31/26

U.S. Cl. 137—202

6 Claims



1. An automatic air release valve comprising:
- a valve housing;
 - a first aperture defined in said housing for fluidly coupling the interior of said housing to a fluid flow line;
 - an air release orifice defined through a wall of said housing;
 - valve means mounted within said housing for closing said air release orifice when fluid reaches a predetermined level within said housing;
 - atmospheric compensation means for operatively exposing said valve means to atmospheric pressure at a point remote from said air release orifice; said atmospheric compensation means comprising a second orifice defined through a wall of said housing at a location remote from said air release orifice and means for operatively exposing said valve means to atmospheric pressure at said second orifice, and said valve means comprising a float valve

mechanism operatively coupled to a needle valve stem, said needle valve stem having first and second longitudinal ends, said first longitudinal end selectively engaging said air release orifice so as to open and close said air release orifice in response to movement of said float valve mechanism, said second longitudinal end of said needle stem engaging and sealing said second orifice, said second end of said needle stem being exposed to atmospheric pressure through said second orifice, whereby the operation said valve means is independent of the size of said air release orifice.

5,090,440

LINE CLEANING APPARATUS

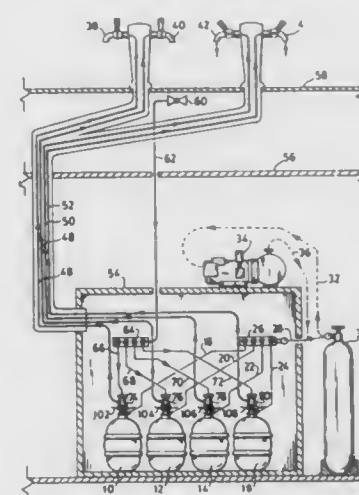
Jean Ladouceur, West Seneca, and Kenneth H. Podmore, Rush, both of N.Y., assignors to Legris Incorporated, Rochester, N.Y.

Filed Oct. 26, 1990, Ser. No. 604,822

Int. Cl.³ B67D 1/07

U.S. Cl. 137—209

19 Claims



1. A beverage delivery system for delivering beverage for a beverage source through conduits to a dispenser, wherein said beverage delivery system is comprised of a beverage container, a dispensing outlet, a source of compressed gas, means for connecting said compressed gas to said beverage container, a source of pressurized water, a fluid manifold comprised of an input port and an output port, a flapper valve, and means for connecting said input port of said fluid manifold to said source of pressurized water, wherein:

- (a) said fluid manifold is comprised of three orifices;
- (b) at least about 90 weight percent of the material in each of said fluid manifold, said flapper valve, and said line is comprised of nonmetallic material;
- (c) said flapper valve is comprised of a first input port, a second input port, an output port, a first resilient flapper comprised of a first movable flap, means for disposing said first movable flap over said first input port of said flapper valve, a second resilient flapper comprised of a second movable flap, means for disposing said second movable flap over said second input port of said flapper valve, means responsive to fluid pressure for moving said first flap away from said first input port of said flapper valve, and means responsive to fluid pressure for moving said second flap away from said second input port of said flapper valve;
- (d) said first input port of said flapper valve is connected to said output port of said fluid manifold;
- (e) said second input port of said flapper valve is connected to said beverage source; and

(f) said output port of said flapper valve is connected to said dispensing outlet.

5,090,441

ANTI-CLOG VALVE

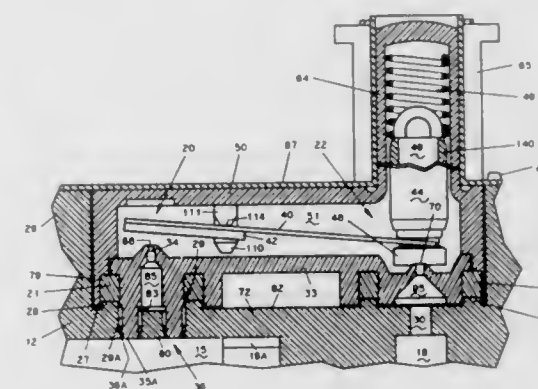
James W. Richmond, Indianapolis, Ind., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 16, 1991, Ser. No. 642,032

Int. Cl.³ F16K 31/06; F15B 13/044

U.S. Cl. 137—242

8 Claims



1. A pressure operated water valve comprising a housing having a water conduit including a valve inlet and a valve outlet, a sealing means between said valve inlet and said valve outlet for alternately permitting water to flow between said valve inlet and said valve outlet and stopping water from flowing between said valve inlet and said valve outlet, an operating pressure chamber, an inlet port connecting said operating pressure chamber and said valve inlet, an outlet port connecting said operating pressure chamber with said valve outlet, and port sealing means for alternately sealing said inlet port and said outlet port, said housing comprising a male portion and a female portion comprising a cylindrical bore said male portion comprising a cylindrical pin having a diameter slightly less than the diameter of said cylindrical bore, and which narrows at the end nearest said valve inlet and being inserted into said female portion to form said inlet port.

5,090,442

FIELD REPAIRABLE APPARATUS FOR USE IN FILLING CONTAINERS TO A PREDETERMINED LEVEL

Daniel N. Campau, Grand Rapids, Mich., assignor to Flow-Rite Controls, Ltd., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 554,293, Jul. 7, 1990, Pat. No. 5,048,557. This application Aug. 22, 1991, Ser. No. 748,680

Int. Cl.³ F16K 21/18, 43/00

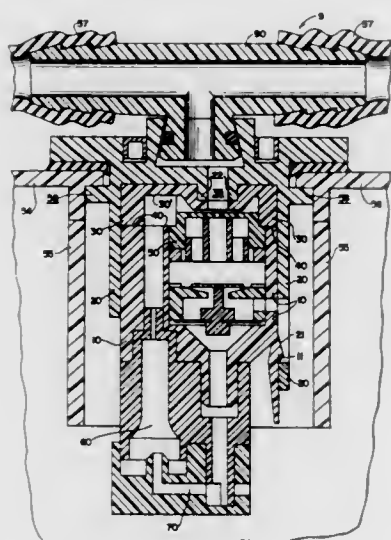
U.S. Cl. 137—315

18 Claims

1. An apparatus for filling a container to a predetermined level with a liquid provided from an external liquid supply means, the apparatus including a main valve and main valve seat for controlling the supply of liquid to the container, comprising:

- a lower valve housing supporting said main valve and said main valve seat;
- an upper cap housing providing fluid communication between the external liquid supply means and the main valve;
- said lower and upper housings being joined together by a manual releasable connection forming a unified valve assembly which is removably insertable into said container;
- said main valve seat being joined to said lower valve housing by a fixed connection such that the operating pressure of said main valve acting to separate the upper and lower housings is confined to act over a relatively small area of the interior surface of said upper cap housing, and said

fixed connection having sufficient strength to substantially withstand the force generated by said operating pressure



action on said main valve, thereby minimizing the force acting to separate the upper and lower housings at said manual releasable connection.

5,090,443

FLUID LEVEL CONTROL FLOAT VALVE

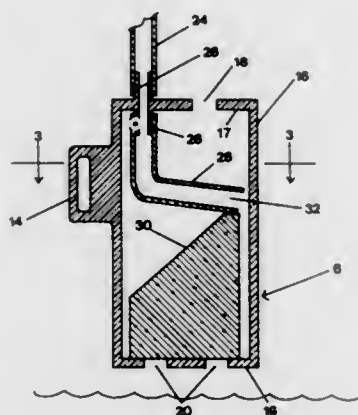
Paul S. Jacobsen, 1733 Hampshire Ave., St. Paul, Minn. 55116

Filed Jul. 24, 1991, Ser. No. 734,885

Int. Cl.⁵ F16K 31/18, 33/00

U.S. Cl. 137-429

20 Claims



1. A valve structure to control the level of fluid in a basin comprising:

- a housing having a valve chamber therein and further having a rigid tube passing therethrough to communicate fluid into said valve chamber, said housing further having an aperture for the egress of fluid from said valve chamber into said basin;
- a flexible tube of a specified length having an inlet portion connected to said rigid tube and an outlet portion extending into said valve chamber, said outlet portion terminating in an outlet open end; and
- a buoyant float member contained within said valve chamber, said float having a side wall and a slanted top portion with respect to said side wall, and said float having a top section connecting an upper end of said slanted top portion and an upper end of said side wall, whereby said flexible tubing is loosely received and guided thereon, said top section making direct contact with said flexible tube outlet portion to control fluid flow into said valve chamber.

ber by bending said outlet portion to shut off fluid flow through said flexible tube in response to movement of said float as a result of a change in the fluid level in said valve chamber.

5,090,444

VALVE PARTICULARLY USEFUL FOR FLUSHING FLUID LINES

Peretz Rosenberg, Moshav Beit Shearim, Israel

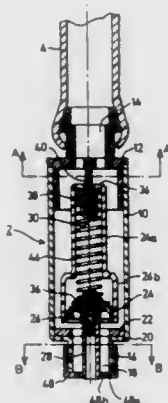
Filed Sep. 4, 1991, Ser. No. 754,780

Claims priority, application Israel, Sep. 14, 1990, 95689

Int. Cl.⁵ F16K 17/30

U.S. Cl. 137-495

19 Claims



1. A valve particularly useful for flushing a fluid line, comprising:

- a housing having an inlet connectable to the line, an outlet for discharging the flushing fluid, and a valve seat between said inlet and outlet and cooperable with a spring-biased cylinder movable with respect to a fixed piston to control the discharge of flushing fluid through the housing outlet;
- characterized in that said piston is fixed to the housing by a stem having a passageway extending therethrough and through the piston, which passageway is in alignment with said housing outlet to thereby vent the interior of the cylinder to the atmosphere, and also to permit an instrument to be manually inserted through the housing outlet, the piston stem, and the piston, to engage the cylinder and to move it to its open position with respect to the valve seat in order to manually flush the fluid line.

5,090,445

AIR ACTUATED DAMPER

Bert W. Jackson, 1219 Garfield Rd., Lansing, Mich. 48917

Filed Feb. 19, 1991, Ser. No. 656,449

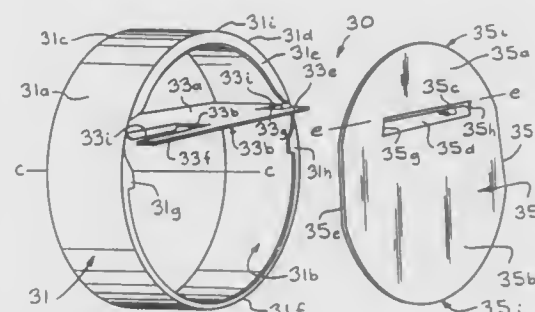
Int. Cl.⁵ F16K 15/03

U.S. Cl. 137-527.8

27 Claims

- An air actuated damper device which comprises:
 - a conduit means through which a gas is to be conveyed along a path in the conduit means around a longitudinal axis;
 - a support means mounted across the conduit means with an extension portion of the support means extending along the path of the gas wherein the gas flows along the extension portion of the support means; and
 - a damper means pivotally mounted across the path of the conveyed gas on the support means, the damper means comprised of a spaced apart inside surface and an outside surface with a side between the surfaces, and the damper means having a slot provided by an interior opening formed by at least one inside wall defining the opening between the surfaces, wherein the extension portion of the support means extends through the slot with the damper

means closed when gas is not conveyed in the conduit means and the damper means opens with the slot pivoting around the extension portion of the support means adjacent



cent to where the support means is mounted across the conduit means when a gas is conveyed in the conduit means.

5,090,446

ADJUSTABLE CHECK VALVE

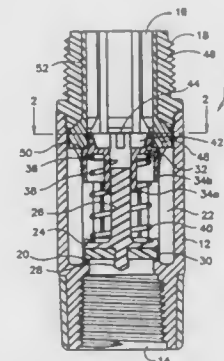
Edwin J. Hunter, Rancho Santa Fe, and Loren W. Scott, Carlsbad, both of Calif., assignors to Edwin J. Hunter, Rancho Santa Fe, Calif.

Filed Dec. 17, 1990, Ser. No. 629,724

Int. Cl.⁵ F16K 15/02

U.S. Cl. 137-540

17 Claims



- An adjustable pressure check valve comprising:
 - a generally cylindrical body having a throughbore communicating with an inlet and an outlet at opposite ends thereof, said throughbore having inwardly and longitudinally extending ribs;
 - an annular valve seat in said throughbore;
 - a valve member having a sealing surface for engagement with said seat disposed in said bore for movement into and out of engagement with said seat;
 - compression spring means disposed in said throughbore for biasing said valve member into engagement with said seat; and
 - adjusting means accessible exclusively via said outlet for adjusting the biasing force of said spring on said valve member, said adjusting means comprises a threaded member having external threads threadably engaging said ribs in said throughbore and having an annular shoulder engaging said spring;
- said thread member has a tool fitting for receiving a torque applying tool at said outlet, and a valve member including a stem positioned to displace a tool therefrom for limiting the adjustment thereof in one direction, and said body includes shoulder means for limiting adjustment thereof in the other direction for limiting the adjustment of the pressure of said valve.

5,090,447

TRANSPARENT BALL VALVE ASSEMBLY

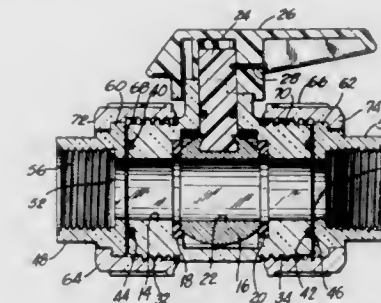
Leslie B. Lewis, Chestnut Hill, and Timothy Robinson, Tewksbury, both of Mass., assignors to Asahi/America, Inc., Malden, Mass.

Filed Apr. 3, 1991, Ser. No. 679,618

Int. Cl.⁵ F16K 3/22

U.S. Cl. 137-559

1 Claim



- A transparent thermoplastic ball valve assembly for regulating a flow of polycorrosive fluids through a pipeline and enabling visual detection of leakage of the polycorrosive fluids at locations where the transparent ball valve assembly is joined with the pipeline, the ball valve assembly comprising:
 - a rigid transparent thermoplastic valve body having planar end faces and externally threaded portions adjacent the respective planar end faces;
 - opposed transparent thermoplastic nipples each having an end for mating with the pipeline and an opposed mounting face disposed in face-to-face coupling relationship with one of the opposed planar end faces of the transparent valve body; and
 - opposed transparent thermoplastic union nuts threadably engaged with the external threaded portion adjacent a respective one of the planar end faces of the valve body and urging the planar mounting face of the respective transparent nipple into coupling relationship with the corresponding planar end face of the transparent valve body, whereby the transparency of the nipples, the valve body and the union nuts enables visual detection of polycorrosive fluid leakage at the coupling of the transparent valve body with the opposed transparent nipples.

5,090,448

CONNECTION FOR PIPES OF THE TYPE INCORPORATING ROTATING VALVES

Gaston Truchet, Faverges, France, assignor to S.A. Des Etablissements Staubi (France), Faverges, France

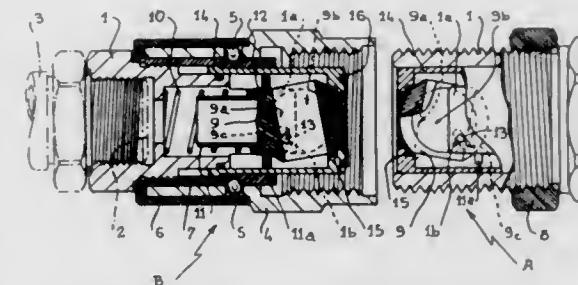
Filed Feb. 4, 1991, Ser. No. 650,428

Claims priority, application France, Feb. 8, 1990, 90 01709

Int. Cl.⁵ F16L 29/00

U.S. Cl. 137-614.03

4 Claims



- A valved connection for pipes comprising, first and second connector elements having tubular body portions from which a pair of bifurcated arms extend so as to be in spaced relationship to one another, said first and second connector

elements being aligned along a primary axis, a valve member mounted between said spaced arms of each of said first and second connector elements, each valve member having a bore therethrough and opposing generally planar sidewalls having recesses formed therein, said recesses being formed in offset relationship with a transverse axis taken with respect to said bores through said valve members, opposing pivot means mounted to said arms and extending into said recesses in said opposing side walls of said valve members and being slidable along said recesses as said valve members are rotated, a slidable pusher element for engageably retaining each of said valve members within each of said spaced arms, means for connecting said first and second connector elements in axial alignment so that said pusher elements are simultaneously engaged and moved against said valve members thereby rotating said valve members about said pivot means to align said bores of said valve members with said primary axis.

5,090,449

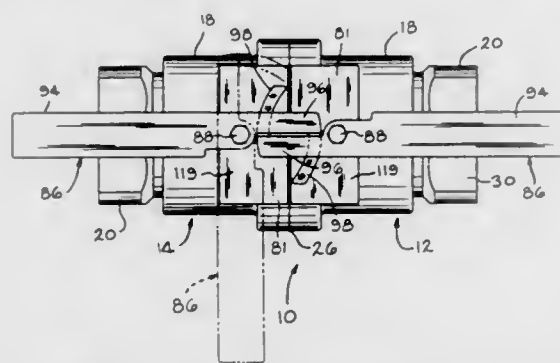
COUPLING SECURITY AND SAFETY LATCH SYSTEM
Paul J. E. Fournier, Jackson; Randolph L. Maiville, Onondaga, and David G. Zander, Jackson, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 27, 1990, Ser. No. 634,838

Int. Cl.⁵ F16K 31/60

U.S. Cl. 137—614.05

12 Claims



1. In a fluid coupling comprising first and second identical interconnected parts, each of the parts including a tubular housing having an axis, an exterior surface, an axial flow passage, a coupling connection end and a conduit connection end intersected by the flow passage, a valve rotatably mounted in each part flow passage controlling fluid flow therethrough and selectively positionable between open and closed positions, an exterior handle operatively connected to each valve for rotation in an operative plane for rotating the associated valve between its positions, and mutually interconnectable connectors mounted upon the coupling connection end of each of the parts' housings adapted to selectively coaxially interconnect the housings, the connectors adapted to engage and release from each other upon relative rotatable movement about the coaxial housing axes, the improvement comprising, identical handle interference portions defined on each of the housings' exterior surfaces, identical extensions defined on each of the exterior valve operating handles adapted to be disposed adjacent the interference portion of the connected housing in an interfering relationship thereto when the parts are fully interconnected and the handles are rotated to the valve open position upon attempted relative rotation of the housings about their axes to disconnect the connectors, rotation of the handles to the valve closed position removing said handles' extensions from an interfering relationship with the adjacent housing interference portion permitting relative rotation of the housings about their axes to disconnect the connectors and separate the coupling parts.

5,090,450

PLUG VALVE

Gregory D. Pelech, and Gary Williams, both of Alberta, Canada, assignors to Frontier Business Ltd. and Nutron Manufacturing Ltd., both of, Canada

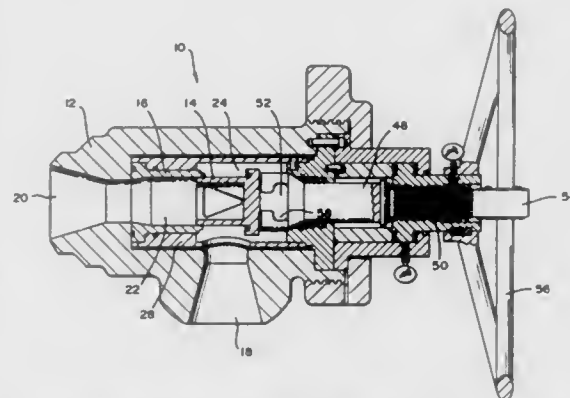
Filed May 28, 1991, Ser. No. 706,207

Claims priority, application Canada, Dec. 5, 1990, 2031609

Int. Cl.⁵ F16K 1/52, 1/48

U.S. Cl. 137—625.3

6 Claims



1. An improvement in a valve having a body with an outlet passage, an inlet passage intersecting the outlet passage at an angle, a plug disposed within the outlet passage at the intersection of the inlet passage and the outlet passage, the plug having sides with openings thereby permitting fluids to flow from the inlet passage into the outlet passage, the plug being telescopically movable in the outlet passage between a first position and a second position such that in the first position fluids flowing from the inlet passage pass through the openings into the outlet passage, the openings in the plug becoming increasingly restricted as the plug moves toward the second position until in the second position the openings in the plug are totally obstructed by the outlet passage, and means for moving the plug between the first and second position, the improvement comprising:

- an annular shoulder in the outlet passage downstream of the inlet passage; and
- an annular flange extending outwardly from the sides of the plug, the flange having a channel opening toward the downstream portion of the outlet passage, sealing means being disposed in the channel such that when the plug is in the first position the sealing means is sheltered from fluid flow within the channel and when the plug is in the second position the sealing means in the channel engages the annular shoulder.

5,090,451

COMBINATION STEAM AND FUEL OIL SUPPLY AND PURGE VALVE WITH RECIRCULATION FEATURE

Bascom F. Buchanan, Sarasota, Fla., and Joseph R. Buchanan, Portland, Conn., assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 493,198, Mar. 14, 1990, abandoned.

This application May 2, 1991, Ser. No. 700,067

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

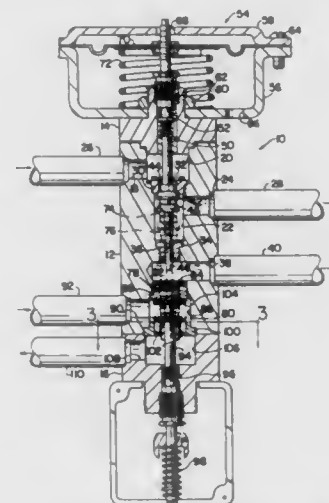
Int. Cl.⁵ F16K 11/16

U.S. Cl. 137—630.22

15 Claims

1. An improved combination steam and fuel oil supply and purge valve comprising a valve body defining steam and oil inlet ports, at least one discharge port, an oil recirculation port, a steam purge passageway interconnecting said steam inlet and discharge ports, an oil supply passageway interconnecting said oil inlet and discharge ports, an oil recirculation passageway interconnecting said oil inlet port and said oil recirculation

port, a steam valve and actuator member movable between first, second, and third positions in said valve body and operable to open and close said steam purge passageway, a double-acting oil supply and recirculation valve member movable between first and second positions respectively to open and close said oil supply passageway and directly and positively close and open said oil recirculation passageway, biasing means urging said oil supply and recirculation valve member toward its second position, said steam valve and actuator



member in its first and second positions respectively closing and opening said steam purge passageway, and said valve and actuator member in its third position closing said steam purge passageway and actuating said oil valve member whereby to urge said member to its first position in opposition to said biasing means and thereby open said oil supply passageway and close said oil recirculation passageway, said oil recirculation passageway having a normally open condition with said oil supply and recirculation valve member in its closed position.

5,090,452

PREVENTION OF WEFT STREAKS AFTER LOOM START UP

Dore Dondi Benelli, Marano Ticino, Italy, assignor to Ergotron S.a.s. di Dondi Benelli Dore & C., Novara, Italy

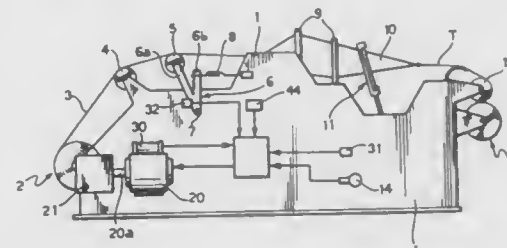
Filed Mar. 21, 1990, Ser. No. 496,709

Claims priority, application Italy, Mar. 21, 1989, 67196 A/89

Int. Cl.⁵ D03D 49/12

U.S. Cl. 139—100

7 Claims



1. A device for a loom for preventing the formation of weft streaks in cloth when the loom is restarted after a stoppage, comprising:

- control means adapted to reduce the tension of the warp by a predetermined amount by rotating a warp beam in a first direction as soon as the loom stops, and to restore the tension of the warp before the loom restarts by rotating the warp beam in a second direction reverse from said first direction;
- motor means for rotating the beam of the warp;

manually-operated means for setting the desired quantitative slackening of the tension in the warp;
sensor means for sensing the effective quantitative slackening of the tension in the warp; and
control means for causing the warp beam to be rotated by the motor means to slacken the warp until the effective slackening of the warp corresponds to the desired quantity set.

5,090,453

TORSION BAR TYPE WARP TENSIONING DEVICE FOR A LOOM

Angelo Stacher, Arbon, and Rudolf Vogel, Grut, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

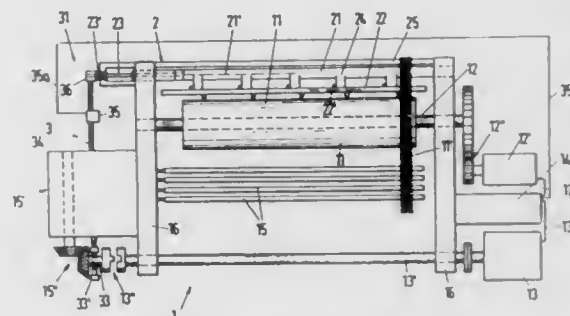
Filed Apr. 19, 1990, Ser. No. 510,937

Claims priority, application Switzerland, May 2, 1989, 01670/89

Int. Cl.⁵ D03D 49/12

U.S. Cl. 139—115

9 Claims



1. A tensioning device for a loom comprising
a drive shaft disposed for pivoting about a pivot axis;
a torsion bar disposed coaxially within said drive shaft on said pivot axis, said bar being connected to said shaft;
an adjusting mechanism connected to said torsion bar for adjusting the biasing of said bar at the cadence of a loom cycle;
a warp tensioning element disposed on a second axis parallel to said pivot axis of said drive shaft; and
a plurality of mounting means secured to said drive shaft in spaced apart relation for rotation therewith and having said tensioning element rotatably mounted thereon for rotation about said second axis.

5,090,454

DEWEAVING APPARATUS WITH PNEUMATIC DEFECTIVE PICK RELEASE FOR SHUTTLE-TYPE LOOM

Pierre Pierson, Bourgoin Jallieu, and Roger Fournieux, La Tour Du Pin, both of France, assignors to S. A. Saurer Diederichs (Societe Anonyme), Bourgoin Jallieu, France

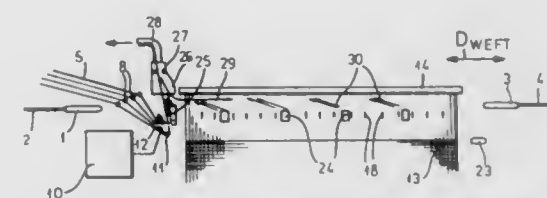
Filed Feb. 21, 1991, Ser. No. 659,106

Claims priority, application France, Mar. 6, 1990, 90 03358

Int. Cl.⁵ D03D 47/30, 47/34

U.S. Cl. 139—116.2

9 Claims



1. In a loom wherein a weft filament is inserted by a mechanical shuttle from a feed side as a pick in a weft direction into a shed formed between groups of warp filaments extending and

generally traveling in a warp direction, a deweaving system for removing a defective pick, the system comprising:

- means for directing a jet of air against the defective pick in the warp direction for loosening the defective pick from the warp;
- stripping means situated between the groups of warp filaments for blowing the separated-out defective pick out of the warp against the weft direction to the feed side;
- means on the feed side for monitoring the pressure of the defective pick outside the shed on the feed side; and
- control means connected to the stripping and loosening means for, on detection of a defective pick, sequentially operating the loosening and stripping means and then restarting the loom.

5,090,455

DUAL TORSION BAR PICKING MECHANISM FOR A LOOM

Frantisek Jankovsky, Winterthur; Danilo Vezzu, Ruti; Erwin Pfarrerwallner, and Hans Demuth, both of Winterthur, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

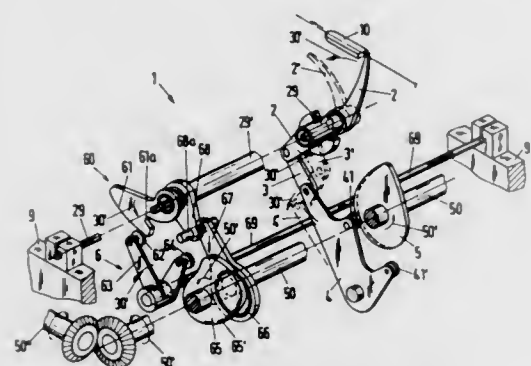
Filed Oct. 15, 1990, Ser. No. 600,843

Claims priority, application Switzerland, Oct. 25, 1989, 03853/89

Int. Cl.⁵ D03D 49/32

U.S. Cl. 139—145

14 Claims



1. A picking mechanism for a loom comprising an acceleration lever for picking of a gripper projectile;
- a first spring element connected to said lever for biasing said lever in a picking direction;
- a tensioning means for stressing said spring in a direction opposite said picking direction;
- a drive shaft for actuating said tensioning means;
- a second spring element for slowing movement of said lever in said picking direction while receiving kinetic energy therefrom; and
- mechanical transmission elements for coupling said second spring element to said drive shaft during movement of said lever in said picking direction to impart energy thereto.

5,090,456

WEFT GRIPPING AND CUTTING APPARATUS IN RAPIER LOOM

Junya Kasahara, Kanazawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Oct. 4, 1990, Ser. No. 593,014

Claims priority, application Japan, Oct. 4, 1989, 1-258999

Int. Cl.⁵ D03D 47/34

U.S. Cl. 139—302

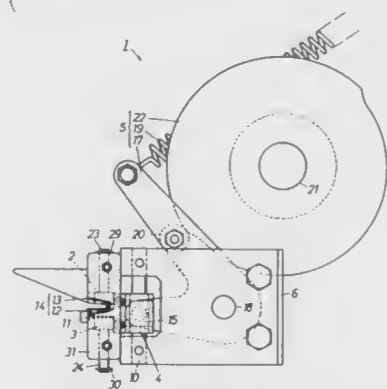
7 Claims

1. In a picking apparatus of a rapier loom having a weft selection device including first and second fingers operative to respectively select a weft yarn to be picked, a device for gripping and cutting weft yarns comprising: a yarn cutter;

first and second gripping bodies disposed in a vertically

opposed relation to one another between the weft selection device and said yarn cutter, guide means for supporting said first and said second gripping bodies in a manner which allows the gripping bodies to move up and down in the apparatus, and urging means for exerting forces on said gripping bodies which urge the gripping bodies toward one another;

a slider having a gripper interposed between said first and said second gripping bodies, said slider being movable between a lowest position at which the gripper engages said second gripping body and is



spaced from said first gripping body, a middle position at which the gripper engages both of said gripping bodies, and an uppermost position at which the gripper engages said first gripping body and is spaced from said second gripping body; and

driving means for moving said slider to one of said lowest and said uppermost positions thereof during a period in the operation of the loom in which a weft yarn is beaten, and for moving said gripper to said middle position thereof prior to a period in the operation of the loom in which a weft yarn is picked, in accordance with a desired color pattern of a fabric to be woven in the loom.

5,090,457

ELECTRO MAGNETIC WEFT SELECTION DEVICE

Luciano Corain; Gianni Maitan, both of Venice, and Luigi Corazzola, Tres, all of Italy, assignors to Nuovopignone-Industrie Meccaniche e Fonderia S.p.A., Florence, Italy

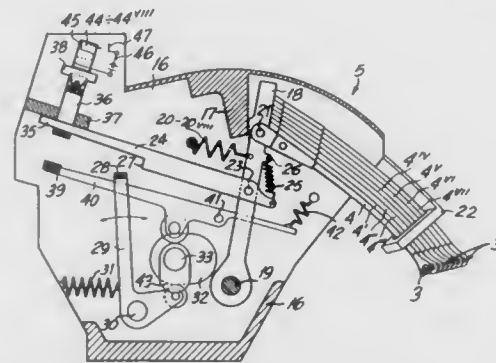
Filed Jun. 22, 1990, Ser. No. 542,812

Claims priority, application Italy, Jun. 30, 1989, 21036 A/89

Int. Cl.⁵ D03D 47/38

U.S. Cl. 139—453

2 Claims



1. A device for selection and presentation of weft yarns for high-speed looms, which device comprises a set of fingers having eyelets through whose eyelets the weft yarns run, which set of fingers are hinged to a corresponding set of actuation levers which are angularly moved by a corresponding set

of selectors, said selectors being elastically urged against a lever means operated by an oscillating element, and a transverse lifting beam being provided in order to simultaneously lift all of said selectors at a selection cycle, said device further including a set of collars for the selectors, said collars being equipped with an iron armature, which collars slidably support a free end of said selectors and cooperate with a corresponding set of magnetic means each equipped with a respective winding, with which magnetic means said collars are brought into contact by the transverse lifting beam and remain magnetically attached to said magnets in a lifted position, with the selection and hence the lowering of the selector being achieved by nullifying the magnetic field generated by the respective magnetic means by causing an electrical current to flow through said winding.

5,090,458

CLEANING APPARATUS AND METHOD

Richard F. Creeron, Valley Stream, N.Y., assignor to First Brands Corporation, Danbury, Conn.

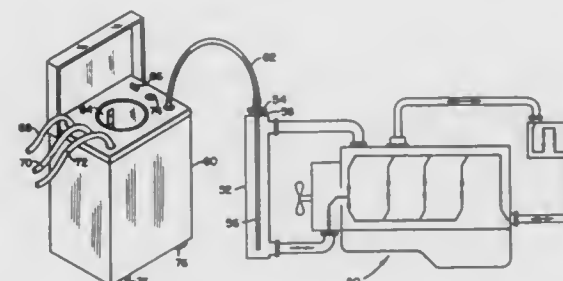
Continuation of Ser. No. 200,347, May 31, 1988, Pat. No. 4,949,765. This application May 24, 1990, Ser. No. 531,735

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.⁵ B65B 3/12

U.S. Cl. 141—7

19 Claims



1. A process for flushing/filling an automotive cooling system using a flushing apparatus having pumping means, liquid switching means and having an elongated hollow tubular member for flushing/filling an automotive cooling system having an automobile radiator having a neck opening, said automotive cooling system containing a first liquid to be replaced with a second liquid wherein the process comprises forming an elongated open fluid passageway extending into the automobile radiator through the neck opening for accessing said first liquid, one end of the elongated hollow tubular member adapted to engage in a fluid tight relationship said pumping means in communication with said switching means for removing first liquid from said automotive cooling system through said elongated hollow tubular member and for introducing said second liquid through said elongated hollow tubular member, said process comprising:

- a) removing said first liquid from said automobile radiator through said elongated hollow tubular member using said pumping means through said switching means;
- b) introducing said second liquid to said pumping means and to said elongated hollow tubular member through said liquid switching means to said pumping means; and
- c) introducing said second liquid to said automobile radiator through said elongated hollow tubular member using said pumping means and said liquid switching means.

5,090,459

FUEL TANK SYSTEM

Tomohide Aoki, Gifu; Hisao Hanabusa, Bisai; Tamiyosi Ohasi; Masakiyo Yoshida, both of Aichi; Masami Mizuno, Nagoya; Fujio Ninomiya, Aichi; Osamu Hokari, Kanagawa, and Tsugio Fujita, Yokohama, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Isuzu Motors Limited, Tokyo, both of Japan

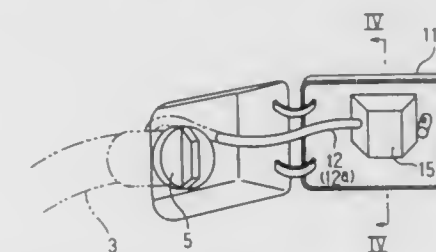
Filed Jan. 29, 1991, Ser. No. 647,666

Claims priority, application Japan, Jan. 29, 1990, 2-19936; Mar. 16, 1990, 2-67466

Int. Cl.⁵ B60K 15/02

U.S. Cl. 141—59

15 Claims



1. A fuel tank system, comprising:

- (a) a fuel tank disposed in a body;
- (b) a fuel charging port extending from said fuel tank and disposed in the vicinity of an outer panel of said body;
- (c) a fuel lid disposed in such a manner as to cover said fuel charging port and mounted in such a manner that said fuel lid is movable substantially horizontally relative to a portion of said outer panel of said body corresponding to said fuel charging port and that a distal end of said fuel lid is capable of moving away from said fuel charging port and said outer panel; and
- (d) a fuel passage having an outlet disposed on a rear surface side of said fuel lid in such a manner as to be oriented downwardly, said fuel passage extending from said fuel tank and adapted to allow a liquid fuel overflowing during overfueling to flow.

5,090,460

MOLDING MACHINES FOR WOODWORKING

Giuseppe Gemmani, Rimini, Italy, assignor to SCM S.p.A., Rimini, Italy

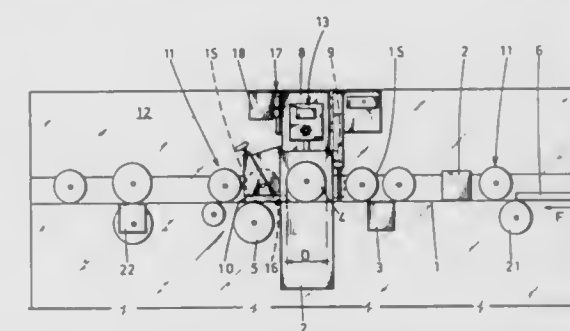
Filed Feb. 6, 1991, Ser. No. 652,114

Claims priority, application Italy, May 24, 1990, 3519 A/90

Int. Cl.⁵ B27C 9/00, 5/00

U.S. Cl. 144—134 R

4 Claims



1. A through feed molding machine for woodworking a work piece, comprising:

- a horizontal feed bed for supporting a work piece and for transporting said work piece along a feed path during machining;
- a plurality of tools positioned in close proximity to said feed

bed for machining four sides of said work piece, each said tool having a cutting edge;
 a plurality of tool slides, each said tool being supported by a respective slide, the position of each said slide and thereby a cutting edge of the associated tool being adjustable in a direction normal to the face being machined;
 a plurality of protective and dust collecting hoods, one said hood being mounted to each said slide, respectively;
 adjustment means operating between the hood and the tool side for moving said hood relative to said slide and adjusting the clearance between the hood and the work face of a work piece when a work piece is machined, said adjustment being commensurated with a reference diameter assigned to the tool;
 roller means spaced along the length of said horizontal bed, said roller means being mounted to a rail extending parallel to the bed, said roller means feeding said work piece from one tool to the next;
 hold down means associated at least with one of the tools, and including a first guide and a second guide rigidly attached to the sides of said hood in positions respectively preceding and following the associated tool along the feed path, and serving to direct and steady the work through the cutting stroke of the tool, said second guide comprising a housing, one of said plurality of roller means mounted to the rail being received at least in part in said housing.

5,090,461

ROUTER ATTACHMENT PERMITTING CUTTING OF DENTIL MOULDING

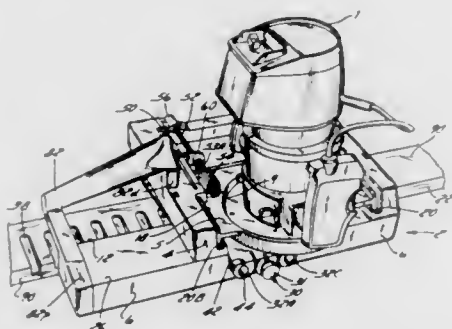
Ved P. Gakhar, Louisville, Ky.; Joseph H. Ballou, Elizabeth, Ind.; James M. Leubbers, Louisville, and D. M. Szymanski, Prospect, both of Ky., assignors to Vermont American Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 362,215, Jun. 6, 1989, Pat. No. 4,942,912. This application Jul. 23, 1990, Ser. No. 557,396

Int. Cl.⁵ B27C 5/10

U.S. Cl. 144—136 C

8 Claims



1. A router attachment for making dentil cuts into the surface of a workpiece, comprising:
 a top frame member having a substantially flat bottom surface adapted to rest upon the top surface of a workpiece and including a base member defining a substantially flat front surface for abutting the face of the workpiece into which the cut is to be made both before and during cutting;
 a substantially flat carriage member adapted to be received by said top frame member and having a top surface adapted to receive a router thereon and defining a central opening therein large enough to receive the bit of said router for aligning said router with the workpiece both before and during cutting;
 cooperating means on said carriage member and said top frame member for slidably mounting said carriage member to said top frame member to permit motion of said carriage member relative to said base member in a direction perpendicular to said flat front surface of said base member and permit said router bit to cut into the work-

piece, so that said carriage member can move in said perpendicular direction and permit said router bit to cut into the workpiece along said perpendicular direction while said base member remains in fixed contact with the face of the workpiece; and
 indexing means mounted on said base member to position said base plate and said router bit laterally along the workpiece for ensuring cuts in fixed selected relationship to the cut of said router bit just completed in the workpiece.

5,090,462

DOVETAIL CUTTING DEVICE AND METHOD

Erwin Dimter, Rudolf-Diesel-Strasse 12, 7918 Illertissen, Fed. Rep. of Germany

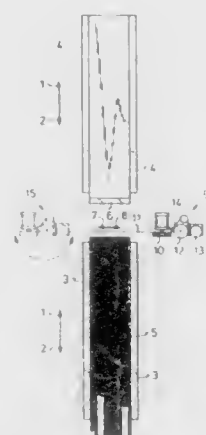
Filed Jan. 11, 1991, Ser. No. 640,245

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1990, 4000804; Nov. 7, 1990, 4035423

Int. Cl.⁵ B27F 1/00

U.S. Cl. 144—347

5 Claims



5. A method for cutting dovetailings on faces of boards that are to be jointed face to face, including the steps of:
 receiving said boards by a first table which is movable in a direction of transport of said boards;
 aligning a first end of said boards against an abutment disposed in a working plane of a dovetail cutting means;
 removing said abutment from said aligned boards;
 moving a dovetail cutting means from an initial position thereof in a direction transverse to said direction of transport of said boards, said dovetail cutting means comprising a cutter, a dovetail cutter, and a pasting device, and trimming said boards with said cutter, cutting dovetailings into said boards with said dovetail cutter, pasting said dovetailings with glue with said pasting device;
 pivoting said dovetail cutting means 180° after reaching an end position in said transverse direction;
 moving said machined boards to a second table, that is facing said first table and is slidable in said direction of transport of said boards, by sliding said first and second table and toward one another such that said second table receives said boards, and subsequently moving said tables back into an initial position thereof;
 aligning a second end of said boards with said abutment in said working plane of said dovetail cutting means;
 moving said dovetail cutting means back in said direction transverse to said direction of transport of said boards, and trimming said second ends of said boards with said cutter, cutting dovetailings into said second ends of said boards with said dovetail cutter, pasting said dovetailings with glue with said pasting device;
 pivoting said dovetail cutting means 180° after reaching said initial position in said transverse direction.

5,090,463

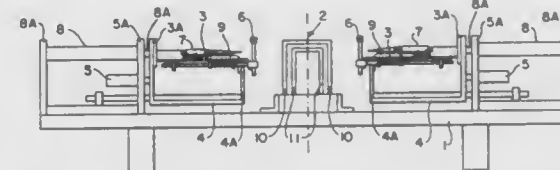
PROCESS FOR SPLITTING TIMBER QUARTERS TO OBTAIN THIN CUTS AND MACHINE ITS IMPLEMENTATION

Maurice Jeantelot, 5, Grande Rue, F-10110 Landreville, France
 Filed May 14, 1991, Ser. No. 699,759

Claims priority, application France, May 16, 1990, 90 06101
 Int. Cl.⁵ B27C 1/00; B27L 7/00

U.S. Cl. 144—363

12 Claims



12. A machine for splitting timber quarters into thin cuts of a determined thickness using splitting tools each actuated by thrust for the splitting operation and retraction at the end of it by a relevant cylinder (8) and comprising a rest (2) or cradle for the timber quarter to be split, located in the center of the support chassis (1) and designed to lift said timber quarter in a horizontal position centering it along the horizontal axis of this support chassis (1), two moving gripping devices (3) along this longitudinal axis, positioned transversely to said longitudinal axis to trap the timber quarter by its longitudinal ends, said gripping devices being mounted on a support (4) which moves longitudinally along the chassis (1) to a position in which the timber quarter is gripped by its ends, a thickness guide (6) for each of the thin cuts to be produced by splitting with an adjustable and moving mounting above each of the jaws (3) and overhanging in relation to the front edge or jaw respectively to the gripping device in order to constitute a stop (15) for the longitudinal upper side of the timber quarter and to calibrate the thickness chosen of the thin cut to be produced by forcing the gripping device (3) which carries this stop (15) to position itself by transverse oscillation in a plane parallel to that of the upper longitudinal surface of the timber quarter, before actuating the tightening movement of these gripping devices, a splitting tool (7) located above each of gripping devices, flat guided on the top of the corresponding jaw in order to position them for splitting and during release during retraction of the corresponding thickness guide (6), then left free to oscillate transversely on the shaft of its thrust cylinder (6) when its middle part has gone beyond the leading edge of the gripping device.

5,090,464

MAINTENANCE-FREE VEHICLE AND CART TIRE

James J. Kauzlarich, Charlottesville, Va., and Colin Metherell, Hertford, United Kingdom, assignors to The University of Virginia Patents Alumni Foundation, Charlottesville, Va. and The Malaysian Rubber Producers Research Association, Hertfordshire, United Kingdom

Filed Jun. 8, 1990, Ser. No. 535,157

Claims priority, application United Kingdom, Jun. 8, 1989, 8913202

Int. Cl.⁵ B60C 07/00, 07/24

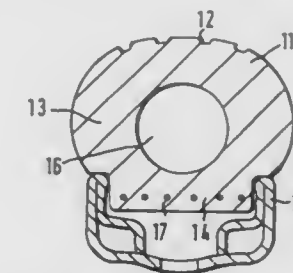
U.S. Cl. 152—310

10 Claims

1. A non-pneumatic tire comprising a base for attachment to a vehicle wheel rim, side walls and a tread merging with one another, wherein:

- the tire includes a single continuous encircling empty space between the said base and the said tread, said encircling empty space has a circular cross-sectional configuration;
- the size of the said encircling empty space is selected so as to result in a tire wall thickness providing a spring constant k in the range of 100 to 200 N/mm;
- the said tire contains reinforcing means to maintain the

position of the tire on the wheel under substantially all operating conditions; and wherein
 (d) the said tread is of generally constant thickness along any



radius of a tire cross-section taken from a center of said encircling empty space and the ratio of the moment of inertia of the said tread to that of the said side walls is within the range of 0.75 to 3.0.

5,090,465

DEVICE FOR REMOVING PROJECTING PARTS FROM TIRES AND THE LIKE

Erich Wolf, Pullach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

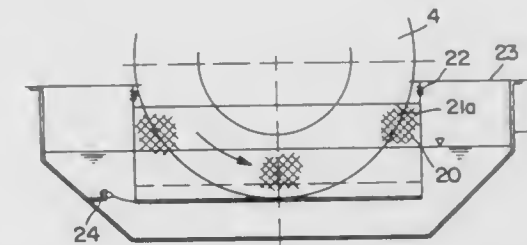
Filed Jan. 16, 1991, Ser. No. 641,957

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1990, 4001213

Int. Cl.⁵ B29H 21/00

U.S. Cl. 157—13

14 Claims



1. A device for removing projecting parts from tires and similar workpieces of different sizes, without any order, by embrittlement and breaking of the parts, which comprises:
 a housing that contains an embrittlement device, a breaking tool, means for isolating gripping and conveying tires within said housing and means for providing processing movement of the tires within said housing,
 wherein the breaking tool comprises a ribbed flexible strap comprising connected individual members or a wire mesh suspended in a mounting frame so that cold-embrittled tires can be positioned on the strap with the strap resting on the profile of the cold-embrittled tire so as to remove projecting parts with the processing movement of the supported tire.

5,090,466

PLEATED WINDOW SHADE

Amy Hong, No. 9, Jenn-Shing Lane, Fu-Nan Village, Fu-Shing Hsiang, Changhua Shiann, Taiwan

Filed Jun. 24, 1991, Ser. No. 719,437

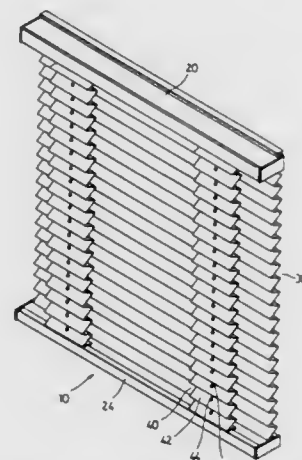
Int. Cl.⁵ E06B 3/94

U.S. Cl. 160—84.1

1 Claim

1. A pleated window shade comprising an upper rail, a bottom rail, a full blind having a length and a width and a plurality of folded parts with rows of string holes disposed therewith, and narrow blinds equal in number to rows of string holes of said full blind, said narrow blinds being further characterized in that they are of a width which is less than said width of said full blind, and that they are composed of folded parts,

with each of said folded parts having at least one string hole disposed therewith to accommodate therein a string, and further that they are arranged between said upper rail and said



bottom rail in such a manner that their positions are correspondent to those of rows of string holes of said full blind, with string holes of said narrow blind and of said full blind being positioned in a laterally alternate manner.

5,090,467

VERTICAL BLIND TRACK PROTECTOR

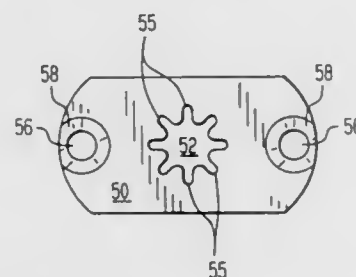
Lawrence I. Smuckler, 1301-A Comanche Ave., Point Pleasant, N.J. 08742

Filed May 24, 1991, Ser. No. 705,578

Int. Cl.⁵ E06B 9/26

U.S. Cl. 160—176.1

5 Claims



1. In a vertical-blind track, apparatus comprising:
 - a fluted pinion rod;
 - a plurality of carriers coupled to said pinion rod along its length;
 - a plurality of vanes held by said carriers;
 - an end control on one end of said rod;
 - track protector means, incorporating a pair of spaced apertures, positioned on said pinion rod between said end control and the one of said plurality of carriers nearest said end control;
 - a pull chain cooperating with said end control to rotate said rod;
 - a traverse cord passing through each of said spaced apertures on said track protector means and through said carriers to selectively position said plurality of vanes along the length of said pinion rod;
 - and with said track protector means having an internal configuration to accept the flutes of said pinion rod in fixed securement with said rod, and to correspondingly rotate along with said rod under control of pull-chain actuation, to allow any pulling of said chain to rotate said rod in closing said plurality of vanes to rotate said track protector means to twist said traverse cord passing there-through, and to allow any subsequent pulling of said traverse cord in positioning said plurality of vanes to

untwist said traverse cord to automatically rotate said rod to open said plurality of vanes before any positioning of said vanes occurs.

5,090,468

DEVICE FOR LOCKING A ROLL-UP CURTAIN, FOR PROTECTION OF WINDOW OPENINGS AND THE LIKE, IN THE SHUT POSITION

Giovanni Tedeschi, Funo di Argelato, Italy, assignor to Sun-project S.R.L., Bologna, Italy

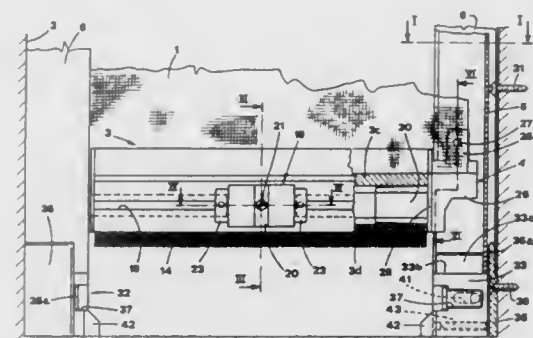
Filed May 7, 1990, Ser. No. 519,853

Claims priority, application Italy, May 12, 1989, 4810/89[U]

Int. Cl.⁵ E06B 9/54

U.S. Cl. 160—290.1

7 Claims



1. A device for locking a roll-up curtain in the fully drawn position, said curtain being intended for protecting an opening having a top, bottom and two opposed vertical sides, with vertical posts at said opening sides, said posts being a portion of an opening frame and having respective vertical guides formed therein comprising:
 - a flap section extending horizontally between said two opposed sides, said flap section having a seat for securing the lower edge of said curtain, and a pair of sliders at each horizontal end of said flap section, respectively;
 - a body located at the bottom of each said post, each said body having a basically polyhedron shape and a vertical median slit dimensioned to receive a respective slider of said flap section, each body having on opposed faces an oblong recess extending horizontally, said oblong recesses being lock seats for a pair of latch means connected to said flap section and extending horizontally, said latch means being biased horizontally to protrude from the ends of said flap section and to engage respectively in said lock seats when said curtain is in said fully drawn position;
 - each said body having on its top a narrow portion for insertion into the bottom of the associated post.

5,090,469

WINDOW SCREEN APPARATUS AND METHOD FOR MAKING

Henry J. Boulanger, 103 Red Bud Ct., Nicholasville, Ky. 40356

Continuation-in-part of Ser. No. 461,813, Jan. 8, 1990,

abandoned. This application Apr. 25, 1991, Ser. No. 691,216

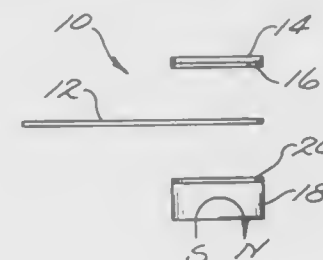
Int. Cl.⁵ E06B 9/00

U.S. Cl. 160—368.1

10 Claims

1. A process for placing ventilating screening material over an opening in a metal frame comprising the steps of taking an elongated strip of magnetic material having a layer of contact adhesive on a surface thereof, placing a sheet of screening material having interstices formed between individual strands of the screening material on the layer of adhesive, placing a tape of material having low tensile strength and having a layer of contact adhesive on a surface thereof on the sheet with the adhesive layer on the tape in engagement with the sheet and in

alignment with the adhesive layer on the magnetic material, and permanently deforming the tape of material into the inter-



stices so that the layers of adhesive coalesce on the side of the sheet of screening material facing the magnetic material.

5,090,470

APPARATUS FOR CASTING METAL ALLOYS WITH LOW MELTING TEMPERATURES

Thomas F. Kidd, Toledo, Ohio, assignor to Electrovert Ltd., Laprairie, Canada

Division of Ser. No. 562,710, Aug. 30, 1990, Pat. No. 5,031,686, which is a continuation-in-part of Ser. No. 268,492, Nov. 8, 1988,

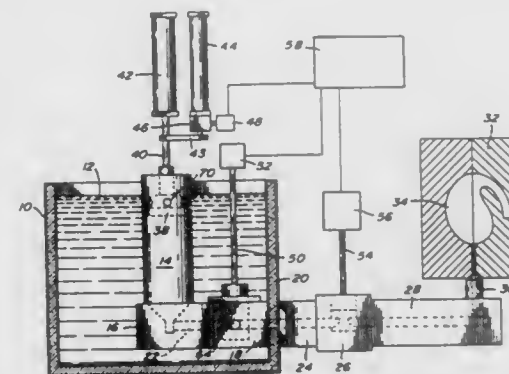
Pat. No. 4,958,675. This application Feb. 19, 1991, Ser. No. 657,165

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.⁵ B22D 17/00

U.S. Cl. 164—316

10 Claims



3. An apparatus for producing a casting from a molten metal alloy having a melting point below about 350° C., comprising:
 - a tank adapted to contain molten metal alloy;
 - a cylinder located in the tank having at its base a connection to an injection passageway adapted to contain molten metal alloy, leading through the tank to a die located outside the tank;
 - a valve in the passageway located in the tank having a first position where the passageway to the die is open and a second position where the passageway to the die is closed, the connection from the cylinder leading via a valve port opening located in the injection passageway at an elevation lower than the cylinder, to the tank;
 - valve operating means to transfer the valve from the first position to the second position;
 - a piston within the cylinder;
 - means to raise the piston in the cylinder with the valve in the second position to fill the cylinder with molten metal alloy and means to lower the piston in the cylinder with the valve in the first position to ensure no prepressurization of molten metal occurs in the cylinder or the passageway, and to inject molten metal alloy into the die;
 - control means for the means to raise and lower the piston in the cylinder to control the flow rate of molten metal alloy injected into the die so that the die fills within a time of about 3 to 30 seconds, and means to maintain pressure on

the piston after the molten metal alloy has been injected into the die during solidification of the casting;

the valve being a rotary valve with a rotary valve plug rotating in a valve body, when the valve is in the first position, a substantially straight channel extending through the valve plug providing an open passageway between the cylinder and the die and, when the valve is in the second position, a connection between the valve port opening in the valve body and the cylinder being opened.

5,090,471

CONTINUOUS CASTING

Robert Wilson, Hillside of Prieston, Tealing, Dundee, DD4 0RG, United Kingdom

PCT No. PCT/GB89/00360, § 371 Date Oct. 4, 1990, § 102(e)

Date Oct. 4, 1990, PCT Pub. No. WO89/09668, PCT Pub. Date Oct. 19, 1989

PCT Filed Apr. 7, 1989, Ser. No. 576,516

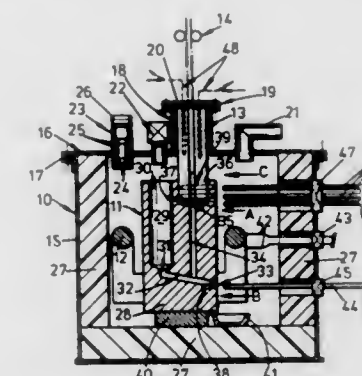
Claims priority, application United Kingdom, Apr. 8, 1988,

8808186

Int. Cl.⁵ B22D 11/10

U.S. Cl. 164—439

12 Claims



1. Continuous casting apparatus comprising a casing 10, a melt chamber (29) in a crucible (11), the crucible (11) placed within the casing (10), a charging opening (30) at an upper end of the melt chamber (29), means for sustaining a raised gas pressure within the casing (10) so that the pressure acts in and around the crucible (11), the feed duct means (32,34) for carrying melt from the melt chamber (29) to a casting die (13) leading from the casing (10); the crucible being made as a one-piece body (28) of a refractory material, and the feed duct means (32,34) extending through the body (28) of the crucible (11) from a relatively lower inlet (31) in the melt chamber (29) to a relatively upper outlet at a feed port (35) formed in the body (28) of the crucible (11).

5,090,472

METHOD FOR VERTICALLY AND CONTINUOUSLY CASTING BERYLLIUM COPPER ALLOYS

Munenori Uchida, Handa, Japan, and Donald A. Bates, Wyomissing, Pa., assignors to NGK Insulators, Ltd., Aichi, Japan and NGK Metals Corporation, Temple, Pa.

Filed Jun. 19, 1991, Ser. No. 717,472

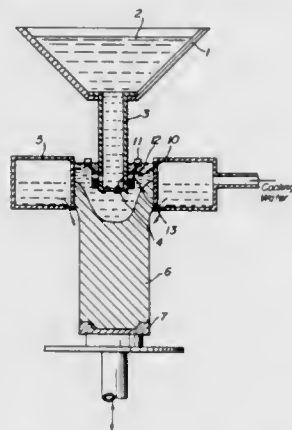
Int. Cl.⁵ B22D 11/04

U.S. Cl. 164—489

3 Claims

1. A method for vertically and continuously casting a beryllium copper alloy having a crystalline structure consisting essentially of isometric crystals, comprising the steps of arranging a casting nozzle in a melt of the beryllium copper alloy in a mold, said casting nozzle having a flow rate-regulating mechanism which is located in the melt in the mold for regulating the flow rate of the melt to be poured into the mold, said nozzle being opened in the melt inside the mold, pouring the melt into the mold through the nozzle, and continuously casting the beryllium copper alloy in a casting temperature range from the

liquidus temperature of the beryllium copper alloy to a temperature higher than the liquidus temperature by 50° C., whereby



the beryllium copper alloy having a crystalline structure consisting essentially of isometric crystals is obtained.

5,090,473

CERAMIC ROTARY HEAT EXCHANGER

Mikio Makino, Kariya, and Osamu Horikawa, Toyoake, both of Japan, assignors to NGK Insulators, Ltd., Japan

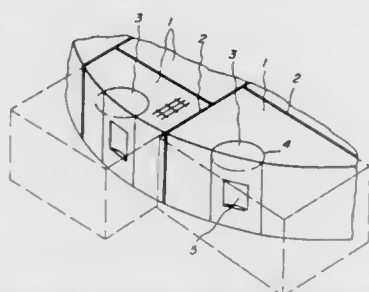
Filed Nov. 16, 1990, Ser. No. 614,395

Claims priority, application Japan, Nov. 28, 1989, 1-308158

Int. Cl. 5 F28D 19/04

U.S. Cl. 165—8

3 Claims



1. A ceramic rotary heat exchanger comprising a plurality of matrix segments, made of ceramics and having a honeycomb structure, being connected with each other, by using an adhesion member, in a disk shape, and a plurality of pins arranged at an outer peripheral portion of said matrix segments, wherein said matrix segments are connected with each other in such a manner that none of said pins is positioned at connecting portions between respective matrix segments.

5,090,474

HEAT STORAGE MEANS

Oskar Schatz, Waldpromenade 16, DW-8035 Gauting, Fed. Rep. of Germany

Filed Mar. 5, 1991, Ser. No. 665,286

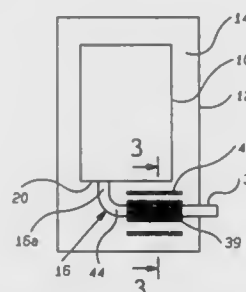
Int. Cl. 5 F28D 20/00

U.S. Cl. 165—10

19 Claims

1. A heat storage means, and more particularly to a latent heat storage means for motor vehicle heating systems supplied by engine waste heat, comprising an inner container with a storage core within it, an outer container (12) surrounding the inner container with a clearance with the formation of a preferably evacuated insulating space (14) and two ducts (16 and 18) extending through the insulating space (14), of which one duct serves as a supply duct and of which the other serves as a return duct for a heat vehicle fluid and both are arranged adjacent to the insulating space (14) in such a manner that they have a straight section (16b and 18b) which is as long as possible,

characterized in that the cross section of the straight duct sections have such a dense arrangement of permanently installed elements extending in the direction of flow that in



comparison with the flow cross section the periphery contacted by the fluid is so large that convection is substantially prevented.

5,090,475

LATENT HEAT STORAGE MEANS EMPLOYING BARIUM HYDROXIDE OCTAHYDRATE AS A STORAGE MEDIUM

Horst Marx, Geretsried, Fed. Rep. of Germany, assignor to Oskar Schatz, Gauting, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,064

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1989, 3931205

Int. Cl. 5 F28D 20/00

U.S. Cl. 165—10

2 Claims

1. A latent heat storage means comprising a composition including barium hydroxide octahydrate as a storage medium contained in a storage core adjacent to at least one flow path for a heat vehicle fluid, characterized in that at least parts of the latent heat storage means exposed to action of the storage medium include of a material selected from a first group essentially consisting of: oxygen-free copper alone, an alloy of oxygen-free copper with at least one element selected from the second group essentially consisting of nickel, chromium, and phosphorus.

5,090,476

AIR-WATER HEAT EXCHANGER FOR A CONTROL BOX

Manfred Immel, Mittenaar-Bicken, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

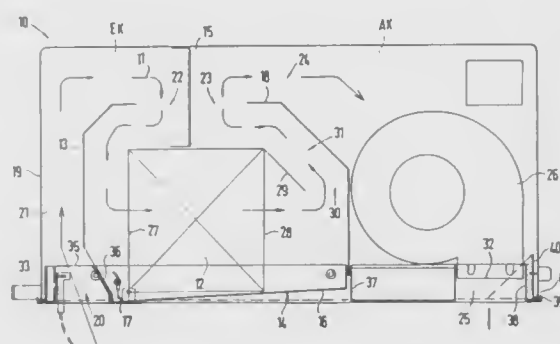
Filed Mar. 20, 1991, Ser. No. 672,536

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1990, 4008838

Int. Cl. 5 F25D 21/14; F28F 17/00

U.S. Cl. 165—122

22 Claims



1. In an air-water heat exchanger with an exchanger unit and a blower contained in a housing, placed on a cover of a control

box and provided on a side facing said cover with a plurality of exchanger openings which are aligned with corresponding cover openings of said cover of said control box, the improvement comprising:

said exchanger unit (12) positioned in a collecting tub (14) in which at least one of a fill level sensor and temperature sensor (17) is disposed;

in an area above said exchanger unit (12), a separating wall (15) in said housing (19) separating an inlet chamber (EK) from an outlet chamber (AK);

in said inlet chamber (EK), an inlet conduit (21), starting at an inlet opening (20), separated from an inlet side (27) of said exchanger unit (12) by a first deflection piece (13) and only connected with said inlet side (27) of said exchanger unit (12) through an inflow opening (22) located above said exchanger unit (12);

in said outlet chamber (AK), second and third deflection pieces (18, 29) forming an outlet conduit (31) coming from an outlet side (28) of the exchanger unit (12), which is connected above said exchanger unit (12) through an outflow opening (23) with a remaining space of said outlet chamber (AK); and

said blower (26) disposed in said remaining space of said outlet chamber (AK) and having an outlet connector (32) changing into an outlet opening (25).

5,090,477

EVAPORATOR HAVING INTEGRALLY BAFFLED TUBES

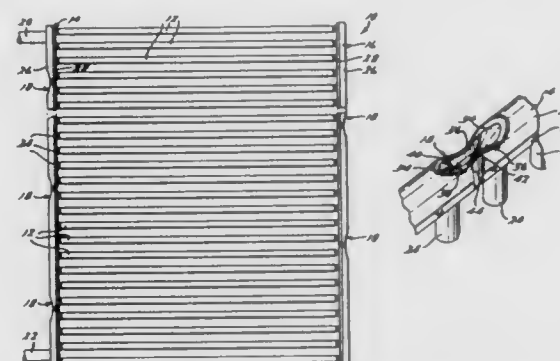
William Spruw, Clayton, and Donald Miller, Adrian, both of Mich., assignors to Brazeway, Inc., Adrian, Mich.

Continuation-in-part of Ser. No. 255,856, Oct. 11, 1988, abandoned. This application Aug. 28, 1990, Ser. No. 573,898

Int. Cl. 5 F28D 1/04; B21D 3/14

U.S. Cl. 165—150

19 Claims



1. A method of forming an internal baffle between the ends of a substantially rigid tube comprising the step of permanently collapsing the tube at the baffle location such that the tube wall top contacts the tube wall bottom and forms a substantially U-shaped internal seam of double wall thickness; said tube being provided with ports and the baffle being formed between said ports.

8. A method of forming an internal baffle between the ends of a substantially rigid metal tube comprising the step of permanently collapsing the tube at the baffle location by bringing the top tube wall into continuous contact with the bottom tube wall to form a continuous seam between the top and bottom tube wall but leaving erect substantial portions of the tube side walls in the baffle location; said erect substantial portions of the tube side walls being shaped and arranged so as to provide a self-locking feature which is effective to prevent said top tube wall that is in continuous contact with the bottom tube wall from being moved away from said bottom tube wall.

19. A heat exchanger having an inlet, outlet, a plurality of heat exchanging tubes and a manifold having an interior passage circumscribed by a wall and having a plurality of axially spaced side ports connected to said heat exchanging tubes for

allowing passage of coolant therethrough, the improvement comprising:

said manifold having at least one baffle axially interposed between two of said side ports, said baffle including a circumferential section of said wall being permanently deformed and depressed against an opposing circumferential wall section;

said circumferential sections having side portions opposed to each other with said wall portions being shaped and arranged so as to provide a self-locking feature which is effective to prevent said circumferential deformed section from moving away from said opposing circumferential section.

5,090,478

METHOD FOR REDUCING WATER PRODUCTION FROM A GRAVEL PACKED WELL

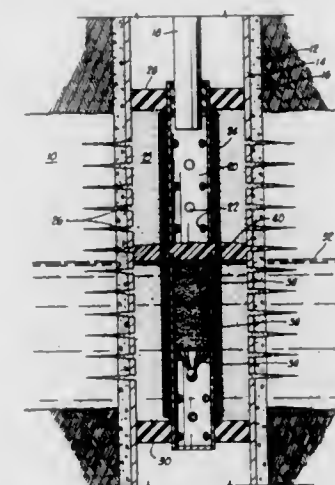
Laine E. Summers, Katy, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 30, 1990, Ser. No. 621,114

Int. Cl. 5 E21B 43/04

U.S. Cl. 166—278

2 Claims



1. A process for reducing water production from a well having a gravel containing gravel pack traversing a production zone, said gravel pack including a perforated tubing extending through said gravel pack, a screen over a perforated section of said tubing; isolating packers above and below said screen, and gravel packing between said screen and perforated casing adjacent- said production zone, said production zone including a lower water-producing interval and an upper hydrocarbon-producing interval, said process comprising:

- (a) placing a bridge plug within said perforated tubing at a position below said hydrocarbon-producing zone;
- (b) placing a layer of coarse sand on said bridge plug, said coarse sand having an average particle size greater than the average particle size of the gravel forming said gravel pack;
- (c) placing a layer of fine sand over said layer of coarse sand, said fine sand having an average particle size smaller than the average particle size of the gravel forming said gravel pack and filling said tubing to a level at or above the top of said water-producing interval;
- (d) placing a settable liquid resin through said tubing onto the top of said layer of fine sand, whereby said resin flows outwardly from said tubing to form a layer of resin extending from said tubing through said gravel; and
- (e) allowing said resin to set, thereby forming a barrier to flow of water from said water-producing zone into said tubing.

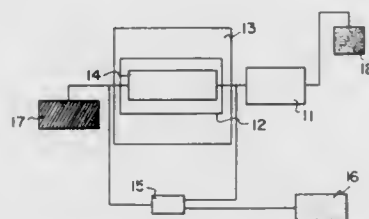
5,090,479
METHOD FOR SCALE INHIBITION IN OIL
PRODUCING WELLS

Peter A. Read, Sola, and Terje Schmidt, Sandnes, both of Norway, assignors to Den Norske Stats Oljeselskap A.S., Stavanger, Norway

Filed Jun. 29, 1990, Ser. No. 545,712
Int. Cl.⁵ E21B 43/12, 43/22

U.S. Cl. 166—279

15 Claims



1. A method of treating a fluid-bearing rock formation, comprising a material having ion-exchange sites at a surface thereof, to inhibit deposition of scale, said method comprising the steps of: treating said rock formation with a source of divalent alkali earth metal cations to displace a proportion of any cations present at said ion-exchange sites in said surface area of said material of said rock formation, and subsequently treating said rock formation with an inhibitor to inhibit deposition of scale.

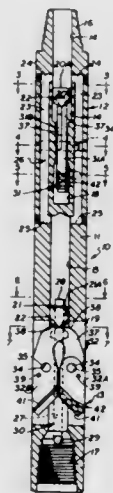
5,090,480
UNDERREAMER WITH SIMULTANEOUSLY
EXPANDABLE CUTTER BLADES AND METHOD

Fred J. Pittard, Richmond, and Jimmy D. Fultz, Houston, both of Tex., assignors to Slimdril International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 544,910, Jun. 28, 1990, Pat. No. 5,036,921. This application Dec. 26, 1990, Ser. No. 633,687
Int. Cl.⁵ E21B 10/32

U.S. Cl. 166—298

25 Claims



18. A downhole cutting tool comprising: upper and lower body portions having a longitudinal passageway extending therethrough, said body portions having cutter blade slots extending transversely therethrough, spaced apart and at a right angle to each other, said slots intersecting said longitudinal passageway, an upper pair of cutter blade members pivotally mounted in said upper slots,

a lower pair of cutter blade members pivotally mounted in said lower slots,

an upper piston member slidably received in said longitudinal passageway above said upper slots and engaging said upper cutter blade members for moving the same between a retracted position within said upper slots and an extended position outward therefrom,

a lower piston member slidably received in said longitudinal passageway above said lower slots and engaging said lower cutter blade members for moving the same between a retracted position within said lower slots and an extended position outward therefrom,

said longitudinal passageway including a first passageway portion spaced from said upper slots extending from a point above said upper slots adjacent said upper piston member to said longitudinal passageway at a point below said upper slots,

said longitudinal passageway including a second passageway portion spaced from said lower slots extending from a point above said lower slots adjacent said lower piston member to a point below said lower slots,

said upper and lower piston members being movable to move said upper and said lower pair of cutter blade members simultaneously to the extended position.

25. A method of cutting material located within a borehole having a tubing disposed therein, said method comprising the steps of:

lowering an underreamer tool into said tubing, which underreamer tool includes;

an upper piston member responsive to pressurized fluid operatively connected to an upper pair of cutter blade members movable below said tubing to an extended position in response to a pressurized fluid, and a lower piston member responsive to pressurized fluid operatively connected to a lower pair of cutter blade members movable below said tubing to an extended position in response to a pressurized fluid;

rotating and lowering said underreamer tool through said lower end of said tubing and into said borehole;

applying a pressurized fluid to said underreamer tool so that said upper and said lower pistons move said upper and said lower pair of cutter blade members to their extended position,

maintaining said upper and lower pairs of members in their respective extended positions, and concurrently continuing rotating and lowering said underreamer tool against said material in said borehole, stabilizing said rotating underreamer tool with said extended cutter blade members and cutting said material in said borehole with said extended upper and lower pair of cutter blade members.

5,090,481
FLUID FLOW CONTROL APPARATUS, SHIFTING TOOL
AND METHOD FOR OIL AND GAS WELLS

Charles W. Pleasants, Carrollton, and Stewart H. Fowler, Jr., Plano, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 11, 1991, Ser. No. 653,547

Int. Cl.⁵ E21B 4/14, 34/12, 34/14, 37/00

U.S. Cl. 166—373

20 Claims

10. A shifting tool assembly for shifting a valve sleeve in well tubing, said assembly comprising:

a. a tubular body member having a longitudinal bore extending therethrough;

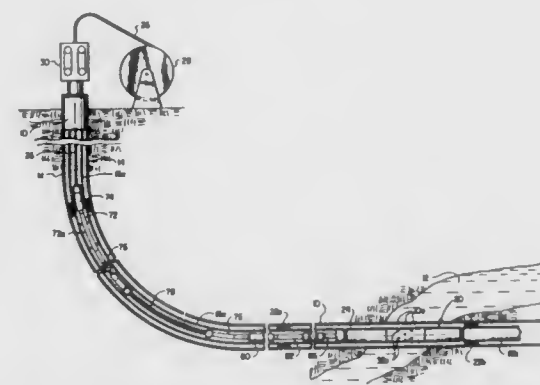
b. means for connecting said body member to reeled tubing for inserting said body member into said valve sleeve and for introducing fluid from said reeled tubing to said bore of said body member;

c. means supported on said body member for engaging said valve sleeve to slide said valve sleeve to and from an open position in said well tubing to control the flow of operating fluid through said well tubing; and

d. means associated with said body member for discharging said fluid into said well tubing.

15. A method of controlling fluid communication between an earth well and a string of well tubing with a sliding sleeve valve disposed therein, said method comprising the steps of:

a. connecting a shifting tool to a section of reeled tubing for inserting at least a portion of said shifting tool into said sleeve valve;



b. introducing fluid from said reeled tubing to said shifting tool;

c. discharging said fluid from said shifting tool into said well tubing; and

d. engaging said sleeve valve with said shifting tool to slide said sleeve valve to and from an open position permitting said fluid communication.

5,090,482
METHOD AND APPARATUS FOR EXTINGUISHING
FIRES

Reuven Baron, Haifa; Esther Jacobson, Tel Aviv, and Yechiel Spector, Zahala, all of Israel, assignors to Spectronix Ltd., Tel-Aviv, Israel

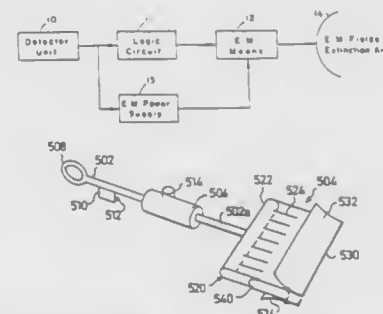
Filed Dec. 26, 1990, Ser. No. 633,824

Claims priority, application Israel, Jan. 3, 1990, 92951; May 11, 1990, 94367; Aug. 31, 1990, 95543

Int. Cl.⁵ A62C 3/00, 3/06

U.S. Cl. 169—46

30 Claims



1. A method of extinguishing a fire, characterized in: generating a gaseous plasma constituted of a body of electrically-charged particles; and directing said plasma to the base of the fire until the fire is extinguished.

5,090,483
BALLAST SEPARATING DEVICE FOR BALLAST
CLEANING MACHINE

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

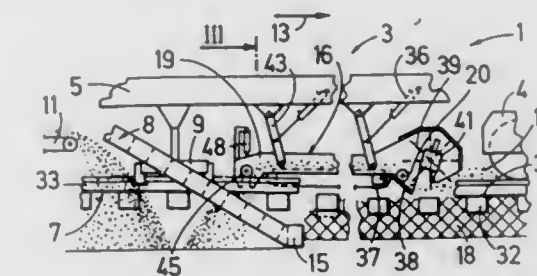
Filed Jun. 18, 1990, Ser. No. 539,782

Claims priority, application Austria, Jul. 18, 1989, 1736/89
The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.⁵ E01B 27/10

U.S. Cl. 171—16

18 Claims



1. In combination with a mobile ballast cleaning machine advancing continuously in an operating direction along a railroad track comprised of two rails fastened to upper surfaces of a succession of ties supported on a ballast bed and comprising a machine frame and a ballast excavating chain mounted on the machine frame, the chain including a transverse course extending under the track and driven to excavate a transversely extending portion of the ballast bed during the continuous advancement of the machine: a device connected to the machine for continuous advancement therewith and arranged to receive ballast deposited on the ballast bed and the ties ahead of the transverse ballast excavating chain course in the operating direction and to discharge the received ballast in the transversely extending excavated ballast bed portion, the device comprising

(a) a ballast receiving and discharging element extending substantially parallel to the track, and

(b) a vertical adjustment drive means linking the ballast receiving and discharging element to the machine frame and arranged to lower the element onto the upper surfaces of the ties between the rails whereby the ballast deposited on the ballast bed and the ties is separated from a portion of the ballast bed underlying the deposited ballast and is received on the element during the continuous advancement of the machine and the element connected thereto,

(c) the ballast receiving and discharging element having a discharge end above the transverse ballast excavating chain course for discharging the received ballast in the excavated ballast bed portion immediately therebehind in the operating direction.

5,090,484
MOBILE BALLAST CLEANING MACHINE
ARRANGEMENT

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 18, 1990, Ser. No. 539,918

Claims priority, application Austria, Jul. 18, 1989, 1735/89

Int. Cl.⁵ E01B 27/10

U.S. Cl. 171—16

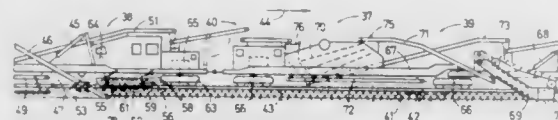
12 Claims

10. A mobile machine arrangement for excavating ballast from a ballast bed including a central portion supporting a railroad track and a respective shoulder portion at each side of the track, for cleaning the excavated ballast and for redistributing the cleaned ballast to the ballast bed, which comprises

(a) a first, elongated machine frame supported for mobility on the track in an operating direction on two widely

spaced undercarriages, and mounted on the first machine frame

- (1) a track lifting device,
- (2) a ballast excavating chain including a transverse course insertable in the central ballast bed portion under the track for excavating ballast from the central ballast bed portion and an ascending course for conveying the excavated ballast, and
- (3) a first ballast cleaning screen arranged to receive the conveyed ballast from the ascending course of the ballast excavating chain and to separate the ballast into a cleaned portion and a waste portion,
- (b) a second machine frame preceding the first machine frame in the operating direction and linked thereto, and mounted on the second machine frame
- (1) a ballast excavating device at each side of the track for excavating ballast from each ballast bed shoulder portion and for conveying the excavated shoulder ballast,
- (c) a second ballast cleaning screen preceding the first ballast cleaning screen in the operating direction and mounted on the second machine frame to receive the conveyed ballast from the ballast excavating devices and to separate the ballast into a cleaned portion and a waste portion,
- (d) a respective ballast redistributing conveyor means arranged for receiving the cleaned ballast portion from each ballast cleaning screen and for redistributing the cleaned ballast portion in a respective one of the ballast bed portions behind the transverse ballast excavating chain course



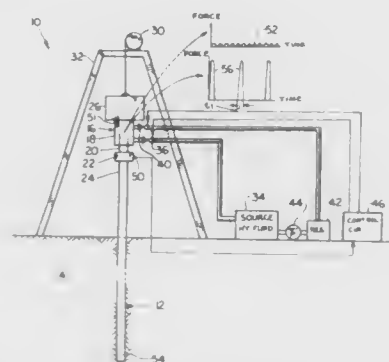
in the operating direction, the ballast redistributing conveyor means including

- (1) respective conveyor bands arranged under each ballast cleaning screen on the first and second machine frames, and
- (2) a vertically adjustable cleaned ballast portion separating device mounted on the first machine frame and extending between one of the undercarriages and the transverse ballast excavating chain course, pairs of flanged wheels supporting the cleaned ballast portion separating device for mobility on the track, the conveyor bands under the second ballast cleaning screen being arranged to redistribute the cleaned ballast portion received from the second ballast cleaning screen to the ballast bed center portion for intermediate storing while the track rests on the ballast bed, and the ballast separating device being arranged to receive the cleaned ballast portion from the conveyor bands under the second ballast cleaning screen and having a discharge end arranged to redistribute the received cleaned ballast portion behind the transverse ballast excavating chain course, and
- (c) a conveyor means arranged for selectively receiving the waste portions from the first and second ballast screens and for conveying the received waste portions forwardly in the operating direction along a conveying path, the conveyor means being mounted on the first and second machine frames and including
- (1) at least one laterally pivotal conveyor band.

5,090,485
PILE DRIVING USING A HYDRAULIC ACTUATOR
George M. Pomonik, 4144 Meadowlark Dr., Calabasas, Calif. 91302; Robert Geminder, 27935 Ambergate Dr., Rancho Palos Verdes, Calif. 90274, and Orlando J. Gonzalez, 571 35th St., Manhattan Beach, Calif. 90026
Filed Jul. 30, 1987, Ser. No. 79,715
Int. Cl. 5 E21B 7/00

U.S. Cl. 173—1

10 Claims

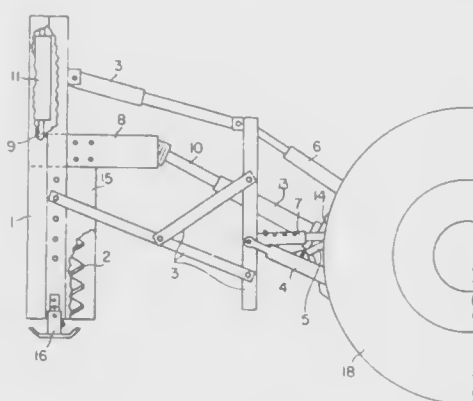


1. A method for driving a pile which has an upper end, comprising:
 - determining one of three lowest resonant frequencies of said pile;
 - applying time-spaced shocks to the upper end of said pile, wherein the duration of each shock is between 0.4 and 1.8 times the period of said one resonant frequency, and the time between shocks is at least as great as the duration of each shock.

5,090,486
MULTI-PURPOSE EARTH DRILL
Clyde S. Jones, 2109 N. Penelope, Belton, Tex. 76513
Filed May 31, 1990, Ser. No. 531,082
Int. Cl. 5 E21B 3/02

U.S. Cl. 173—26

8 Claims



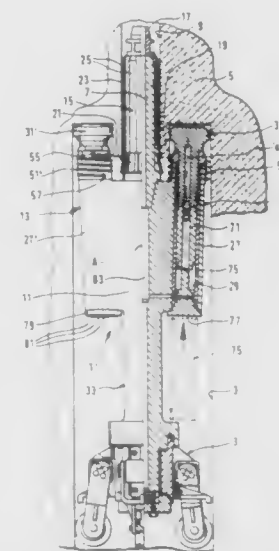
1. A tractor mounted earth drill comprising:
 - (a) a rigid channel shaped housing with mounting arms;
 - (b) an extensible auger mounted to a sliding yoke in said housing;
 - (c) a first one of dual double acting hydraulic cylinder means mounted in a top portion of a channel in said housing to drive said sliding yoke, connected to said auger, with a second one of said dual double acting hydraulic cylinder means acting to drive said sliding yoke further downward after said first one of said dual double acting hydraulic cylinder means is fully extended and retracting to further pull said sliding yoke upward when said first one of said dual double acting hydraulic cylinder means is fully retracted;

- (d) a locking bar means connected between a differential case of said tractor and a three point hitch means on said tractor to adjustably mount said mounting arms of said rigid channel shaped housing on said tractor and prevent movement of said three point hitch means;
- (e) an extensible shaft means connected from a power take off of said tractor to a drive gear means to drive said auger.

5,090,487
DRILL HEAD WITH INTEGRAL IMPACT HAMMERS
Roger F. Masse, 1132 Bérard Ave., Val d'Or, Québec, Canada J9P 3T9
Filed Apr. 3, 1991, Ser. No. 679,764
Claims priority, application Canada, Feb. 22, 1991, 2036883
Int. Cl. 5 E21B 4/16

U.S. Cl. 173—111

15 Claims



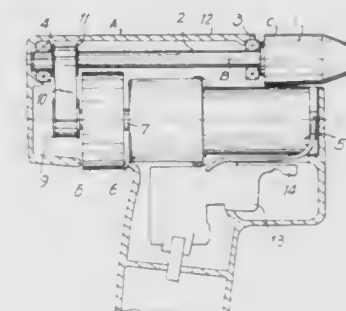
1. A drill head for use to drill a hole in a front of hard material such as rock, said drill head comprising:
 - a main body having a top end and a bottom end;
 - a spindle secured to the top end of the main body and upwardly projecting from said main body, said spindle having a vertical axis;
 - means for detachably connecting the spindle to a drill shaft extending in a pilot hole made into the front of hard material, said drill shaft being operable in use to rotate the drill head about said vertical axis and to pull it up toward said front of hard material; and
 - at least two impact hammers mounted onto the main body in such a manner as to fragment in use the hard material of said front along at least one circular path centered onto said vertical axis; each of said impact hammers comprising:
 - a hollow casing defining a central cavity having an upper open end and a lower end, said central cavity having a longitudinal axis substantially parallel to said vertical axis;
 - an impact-generating assembly enclosed within said central cavity of said casing; and
 - a drill bit slidably mounted into said upper open end of said casing, said drill bit projecting away from said upper open end toward said front of hard material and being actuated by said impact-generating assembly to fragment the hard material by impact along one of said at least one circular path;
- characterized in that said at least two hollow casings are integral with said main body and form therewith a single structural piece, the central cavities of said hollow casings consisting of longitudinal holes made in said single piece, said holes extend-

ing in directions substantially parallel to said vertical axis at short distances thereof.

5,090,488
POWER TOOL
Lawrence M. Cotton, New Bern, N.C., assignor to Robert Bosch Power Tool Corporation, New Bern, N.C.
Filed Aug. 7, 1990, Ser. No. 564,536
Int. Cl. 5 B23B 45/02

U.S. Cl. 173—163

7 Claims

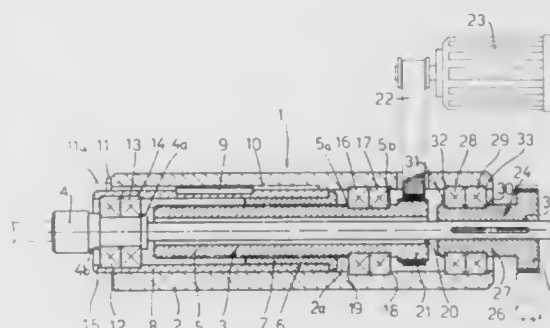


1. A power tool, comprising a chuck, a first shaft driving said chuck and having an axis, a driving motor; a second shaft extending from said driving motor substantially parallel to said first shaft; means for transmitting a rotation of said second shaft to said first shaft and including a single belt connecting said shafts with one another; and a housing surrounding said shafts, said housing having a top surface which is spaced from said axis of said first shaft by a distance which is at most equal to a distance between said axis of said first shaft and a top surface of said chuck.

5,090,489
MACHINING UNIT FOR MACHINE TOOLS, IN PARTICULAR FOR MACHINE TOOLS WITH SEVERAL MACHINING STATIONS
Ignazio Ettori, Carcina, Italy, assignor to Porta S.r.l., Italy
Filed Nov. 30, 1989, Ser. No. 443,431
Int. Cl. 5 B23Q 5/32

U.S. Cl. 173—165

2 Claims



1. A machining unit for machine tools with several machining stations, including a drivable tool spindle and a rotatably driven reversible threaded spindle/threaded nut unit, said nut unit being formed as a concentric unit including a threaded, axially hollow spindle rotatably drivably mounted on said machining unit and axially restrained thereon, and a threaded

nut arranged coaxially of said spindle, said nut including a nut part and a sleeve movable between two end positions inside said machining unit, said tool spindle penetrating said nut unit coaxially and being rotatably mounted on a side accommodating the tool, the threaded spindle being formed as a ball-circulating spindle and the threaded nut as a nut part, the nut part being fixed rigidly to a sleeve having a stop member which interacts with a counterstop member of said machining unit, in order to determine an end position for said tool spindle, said sleeve having a recess defined by two stops, to accommodate two ball bearings for said spindle, said ball bearings being arranged between two further stop members, one end of said tool spindle being formed as a profiled shaft mounted rotatably and axially displaceable in a hub-like gear wheel which is rotatably mounted between the stops of said machining unit and projects therefrom with a gear wheel part driven by drive means for the machine tool.

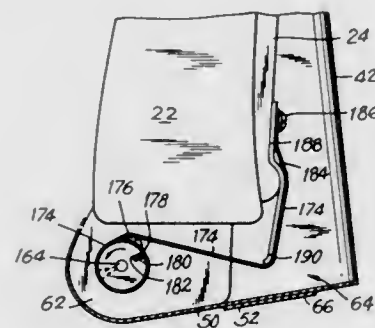
5,090,490 TAGGING SYSTEM

Charles Block, 1129 Albert Rd., North Bellmore, N.Y. 11710
Filed Sep. 7, 1990, Ser. No. 579,917

Int. Cl.⁵ B25C 1/00

U.S. Cl. 173-171

6 Claims



1. A powered actuator system for use with existing tagging handguns having hand-operated trigger actuating members, or the like, comprising, in combination:

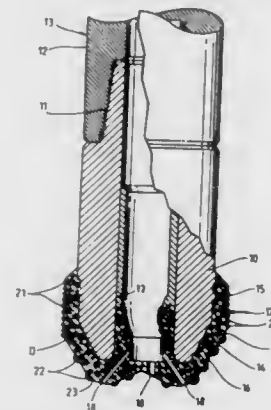
- a housing formed with means for attachment thereof to such a tagging handgun,
- an actuating assembly including a chamber formed therein and a valve member movably disposed within said chamber, said valve member being movably responsive to remote induced pneumatic forces,
- a pneumatic motor assembly integral with said housing, said pneumatic motor assembly including a drive shaft, said pneumatic motor including said drive shaft being operably responsive to movement of said valve member,
- conduit means operably communicating with said actuating assembly for conveying pneumatic fluid forces to same,
- means for transferring forces from said drive shaft to a tagging handgun trigger actuating member, and
- an actuator member capable of being repeatedly operably moved in response to movement of a single finger of a user without moving muscles which would otherwise induce carpal tunnel syndrome, said actuator member in response to said finger movement enabling operation of a valve, thus enabling induced pneumatic forces to move said valve member, thereby causing movement of the tagging handgun trigger actuating member in an actuating direction, resulting in ejection of a fastener from the handgun.

5,090,491 EARTH BORING DRILL BIT WITH MATRIX DISPLACING MATERIAL

Gordon A. Tibbitts, Salt Lake City; Ralph M. Horton, Murray, and Lorenzo G. Lovato, Salt Lake City, all of Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah
Continuation of Ser. No. 408,476, Sep. 15, 1989, abandoned, which is a continuation of Ser. No. 107,945, Oct. 13, 1987, abandoned. This application Mar. 4, 1991, Ser. No. 665,918
Int. Cl.⁵ E21B 10/00

U.S. Cl. 175-409

15 Claims



1. A rotary drill bit, comprising:
 - a bit body including a first plurality of particles substantially interspersed with a second plurality of particles and bonded together by a liquid binder infiltrated there-through and subsequently solidified therebetween to form a matrix;
 - said first plurality of particles comprising a hard metal matrix material;
 - said second plurality of particles comprising a displacement material having a greater degree of toughness than said hard metal matrix material;
 - a plurality of cutting elements disposed on the exterior of said bit body;
 - a bit blank secured to said matrix and extending at least partly thereinto.

5,090,492 DRILL BIT WITH VIBRATION STABILIZERS

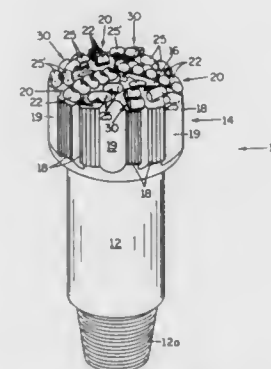
Carl W. Keith, Spring, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 12, 1991, Ser. No. 654,249

Int. Cl.⁵ E21B 10/46

U.S. Cl. 175-410

9 Claims



1. A rotary drill bit for use in drilling well bores in subterranean formations comprising:
 - a bit body having a shank for connection to a rotatable drill

string and an end face having a generally circular configuration;

a plurality of sets of primary cutting elements mounted on said end face in angularly spaced relationship relative to an axis of rotation;

each said set including a plurality of radially adjacent cutting elements extending radially outwardly from the central area of said end face to the perimeter of said end face;

at least one stabilizing projection on said bit body disposed angularly behind each set of cutting elements when the drill is operating;

each said stabilizing projection having a peripherally elongated, non-cutting, outer surface defining a lug positioned to snugly enter and engage the formation groove cut by a specific cutting element of the respective set of cutting elements located ahead of said stabilizing projection when said drill bit is rotated to drill through a subterranean formation.

5,090,493

LOAD CELLS AND SCALES THEREFROM

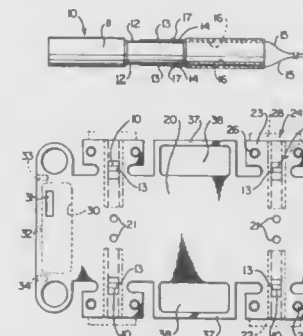
Terry Bergan, Brian Taylor, both of Saskatoon, Canada, assignors to International Road Dynamics Inc., Saskatchewan, Canada

Filed Oct. 29, 1990, Ser. No. 604,475

Int. Cl.⁵ G01G 3/14, 3/08; G01L 1/22

U.S. Cl. 177-211

24 Claims



1. A load cell comprising: a metal rod or bar having upper and lower faces; a strain transducer secured to a portion of each of the upper and lower faces of said metal bar; a signal wire having its terminal secured to one end face of each said strain transducer; and a strain relief means interposed between each said signal wire terminal and an associated said strain transducer.

5,090,494

BALANCE WITH PARALLEL GUIDE ROD GUIDANCE
Rudolf Müller, Bovenden; Peter Fleischer, and Veronika Martens, both of Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius AG, Göttingen, Fed. Rep. of Germany

Filed Jul. 13, 1990, Ser. No. 552,032

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1989, 3923808

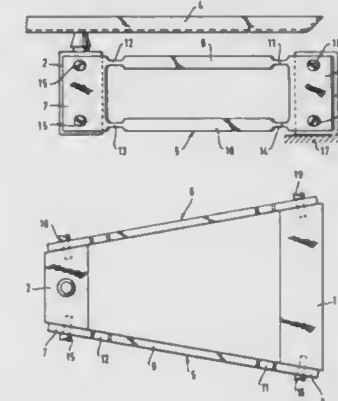
Int. Cl.⁵ G01G 3/08, 21/24

U.S. Cl. 177-229

5 Claims

1. In a balance with a system carrier fixed to a housing and with a balance scale support, said system carrier and said balance scale support being connected by a first and second connection means, each of said first and second connection means including an upper strut and a parallelly disposed lower strut, said upper and lower struts being connected at each end thereof to first and second guide rod plates, each of said first guide rod plates being affixed by screws to said system carrier and each of second guide rod plates being affixed by screws to said balance-scale support wherein the improvement comprises in that the system carrier and the balance-scale support each have a wedge shaped configuration and each are horizontally dimensioned whereby the said affixed first guide rod plates are further apart than said affixed second guide rod plates whereby

the system carrier, the struts and the balance-scale support describe a trapezoid when viewed from the top, the position of the screws of the first guide rod plates being different from the position of the screws of the second guide rod plates, and each of the struts proximate the first guide plates have first areas of



reduced dimensions and each of the struts proximate the second guide plates have second areas of reduced dimensions, the first areas differing in reduced dimensions from the second areas and said areas being asymmetric with respect to said struts.

5,090,495

TAG AXLE FOR REFUSE TRUCK

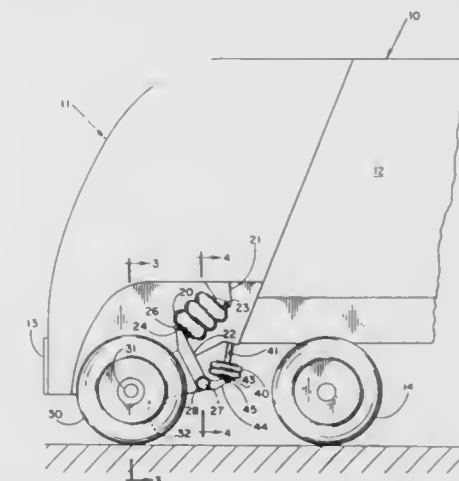
Ronald E. Christenson, Kasson, Minn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Filed Dec. 3, 1990, Ser. No. 620,662

Int. Cl.⁵ B62D 61/12; B60G 11/27

U.S. Cl. 180-24.92

12 Claims



1. A downwardly deployable auxiliary wheel system associated with the provision of positioned levered auxiliary support to affect axle loading and load distribution in a multi-axle load hauling vehicle, the system including a pair of aligned spaced tag axle systems each of which comprises:

- a tag axle suspension system including an axle mounting lever carrying a stub axle and a wheel on the stub axle;
- fluid operated tag axle deployment means for applying a variable force urging the tag axle suspension in a generally downward direction such that the wheel engages the ground in supportive relation to the work vehicle;
- fluid operated tag axle retraction means for applying a force urging the tag wheel suspension in a generally upward direction such that the wheel is returned to a stowed position;

lowering torque arm lever connected to the tag axle deployment means and rotatably mounted between a transverse pivot shaft and a tag pivot shaft and fixed to the axle mounting lever;

lifting torque arm lever mounted on the tag pivot shaft in fixed angular relation to the lowering torque arm lever and connected in pivotal relation to the tag axle retraction means; and

means for operating the fluid operated tag axle deployment means to apply a force to operate the lowering torque arm lever to deploy the tag wheel as desired and the fluid operated tag axle retraction means to apply a force to the lifting torque arm lever when it is desired to raise the tag axle system.

5,090,496

DOWN-HOLE BENT MOTOR HOUSINGS

Colin Walker, Belper, United Kingdom, assignor to Baroid Technology, Inc., Houston, Tex.

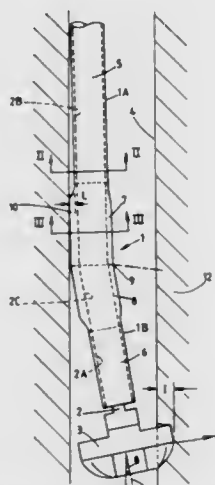
Continuation of Ser. No. 542,912, Jun. 25, 1990. This application Aug. 26, 1991, Ser. No. 758,265

Claims priority, application United Kingdom, Jun. 28, 1989, 8914799; Mar. 8, 1990, 9005235

Int. Cl.⁵ E21B 7/02

U.S. Cl. 175—61

20 Claims



1. A down-hole bent motor housing for use in drilling a borehole along a curve, the housing being elongate and having a top end by which it is to be connected to an end of a drill string within the borehole, a bottom end on which a drill is to be mounted for drilling the borehole, a bend intermediate the top and bottom end for angularly offsetting in a first radial direction the rotational axis of the drill bit relative to the longitudinal axis of the drill string to cause the drill bit to engage the wall of the borehole on the side of said first radial direction and to thereby drill the borehole toward the first radial direction, and a longitudinal bore extending from the top end to the bottom end of the housing and provided for passage of a motor shaft for rotatably driving the drill bit, wherein at least the portion of the housing in the vicinity of the bend has a thickened housing wall in a second radial direction opposing the first radial direction, said thickened housing wall constituting a stand off portion in the vicinity of the bend for bearing against the wall of the borehole on the opposite side to that engaged by the drill bit so as to cause the angle of tilt of the rotational axis of the drill bit relative to the axis of the borehole to exceed the angle of the bend in the housing.

5,090,497
FLEXIBLE COUPLING FOR PROGRESSIVE CAVITY DOWNHOLE DRILLING MOTOR

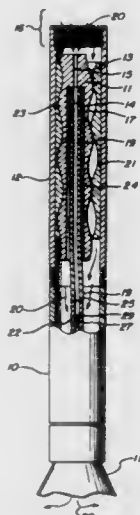
Herb Beimgraben, Houston; Benny Melton, Woodlands; Jay Eppink, Spring, and Paul Reinhardt, Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 560,379, Jul. 30, 1990, abandoned. This application Aug. 30, 1991, Ser. No. 758,406

Int. Cl.⁵ E21B 4/00

U.S. Cl. 175—107

20 Claims



4. In combination with a downhole drilling motor having a progressive cavity stator and a rotor rotating and gyrating within the stator in response to fluid flow through the stator wherein a housing connected to the stator contains a shaft mounted within the housing for rotation about the longitudinal axis of the shaft, the improvement therein comprising:

a flexible rod having an upper end and a lower end, said rod being a composite assembly of an upper section and a lower section, said lower section being attached to said upper section inside said rotor adjacent to a power-producing surface of said rotor, said rod being connected to said rotor at its upper end, and connected to said shaft at its lower end for translating the rotation and gyration of said rotor to the axial or true rotation of said shaft.

5,090,498

WATER WASH/OIL WASH CYCLONIC COLUMN TANK SEPARATION SYSTEM

James Hamill, Aberdeen, Scotland, assignor to M-I Drilling Fluids Company, Houston, Tex.

Continuation-in-part of Ser. No. 497,939, Mar. 23, 1990, abandoned. This application Jun. 20, 1990, Ser. No. 541,887

Claims priority, application United Kingdom, Nov. 10, 1989, 8925500; May 3, 1990, 9012087

Int. Cl.⁵ E21B 21/06

U.S. Cl. 175—206

26 Claims

1. A system for removing oil or oil base drilling mud from drill cuttings using a continuous phase liquid, either aqueous or non-aqueous, and for separating for recirculation and reuse the removed drilling mud and the continuous phase liquid, said system comprising:

platform shakers for receiving cuttings contaminated with oil or oil base drilling mud and for flushing the cuttings with the continuous phase liquid in a manner delivering the cuttings an continuous phase liquid to a wash drum; the wash drum agitating the cuttings and continuous phase liquid together so that the oil or oil base mud is removed from the cuttings and is dispersed in the continuous phase liquid;

a vibrating, drying screen for receiving the cuttings, contin-

uous phase liquid and dispersed oil or oil mud from the wash drum, for separating the larger cuttings from the continuous phase liquid an dispersed oil or oil mud, for drying the separated out larger cuttings, and for feeding the separated and dried larger cuttings to an inspection and discharge location;

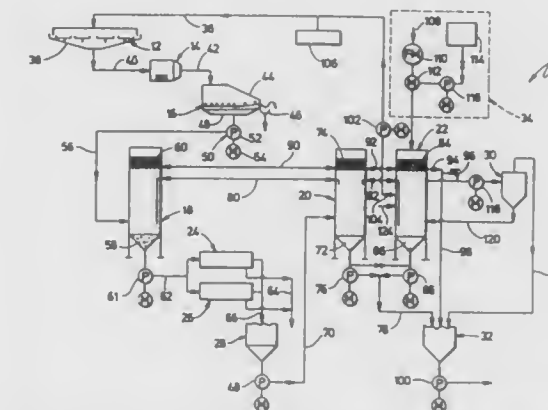
a catch pan and pump arrangement for collecting and delivering the continuous phase liquid, dispersed oil or oil mud, and small sized cuttings which pass through the drying screen to a first column tank;

the first column tank facilitating the settling of a dense suspension including oil, oil mud, emulsifiers and fine solids to the bottom of the tank;

a first column tank pump feeds the dense suspension from the bottom of the first column tank to at least one high "G" centrifuge;

the at least one centrifuge removing substantially all of the remaining cuttings from the liquid portion of the suspension, the separated out cuttings being transferred to a sampling an discharge location, the centrifugally separated out liquid portion containing continuous phase liquid, oil emulsifiers and very fine solid particles being delivered to a small catch tank and then transferred by a catch tank pump to a second column tank;

the second column tank allowing for further separation of a high density suspension to the bottom of the second column tank;



a third column tank receiving continuous phase liquid having fine solids, oil and oil mud suspended therein from the second column tank and allowing for the separation of higher density continuous phase liquid, tied up oil, emulsifiers, mud additives and fine solids to the bottom of the third column tank;

a continuous phase liquid line provides fluid communication between each of the first, second, and third column tanks at a high level on tank below the upper surface of the liquid in each tank;

a second column pump and a third column pump periodically draining the high density mixture from the bottom of each of the second and third column tanks into a recovered oil and emulsifier holding tank;

the liquid level in each of the first, second, and third column tanks being equalized by a high level equalizer line located at the liquid surface of each of the first, second, and third column tanks;

a holding tank pump feeding the recovered oil and emulsifiers from the recovered oil and emulsifier holding tank to an active system premix tank for reuse in an active mud system; and,

a high level suction pump recycling the continuous phase liquid from the third column tank to the platform shakers, the continuous phase liquid being used to flush the contaminated cuttings from the platform shakers.

5,090,499

DUST EXTRACTION FOR DRILL

Giuseppe L. Cuneo, Bergamo, Italy, assignor to Black & Decker Inc., Newark, Del.

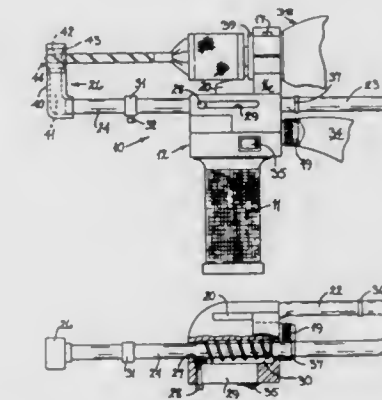
Filed Dec. 18, 1990, Ser. No. 629,368

Claims priority, application Italy, Dec. 22, 1989, 22828 A/89

Int. Cl.⁵ B25D 17/14; E21C 7/02

U.S. Cl. 175—209

26 Claims



1. A suction device, comprising:

a casing provided with means for securing the casing to a portable drill;

a suction head with means for movably supporting the suction head on the casing to enable this suction head to be kept close to the point of penetration into the surface of a body to be drilled by a drilling bit mounted on the drill, in order to such up material removed by the bit;

said casing having at least one portion constituting a hand-grip;

said casing containing a fan having an intake connected to said suction head through a connecting duct and with an outlet blowing into a container, for collecting aspirated material, supported by said casing;

an electric motor for driving the fan and connected to a source of electrical power;

said movably supporting means including said connecting duct, said connecting duct being rigid in a section leading off from the suction head, said section sliding in a housing in said casing in a direction parallel to the axial length of said drilling bit, in order to permit the suction head to move parallel to said direction, against the action of a spring, when pressure is exerted upon the suction head by the surface of the body to be drilled;

the suction head comprising a suction mouth substantially disposed to slidably surround the drilling bit over an axial section of the latter;

said mouth forming a chamber which is traversed by the drilling bit and closed at the end opposite the surface of the body to be drilled by an element which substantially prevents the passage of air through said closed end into the chamber; and

said element being made in the form of a flexible diaphragm having star-shaped slits defining flaps which bend to enable said diaphragm to be centrally penetrated by the drilling bit.

5,090,500

REPLACEABLE WEAR SLEEVE FOR PERCUSSION DRILL

Faisal J. Yousef, and Robert F. Kane, both of Houston, Tex., assignors to Sandvik Rock Tools, Inc., Bristol, Va.

Filed Nov. 30, 1990, Ser. No. 619,966

Int. Cl.⁵ E21B 10/36, 10/46, 17/10

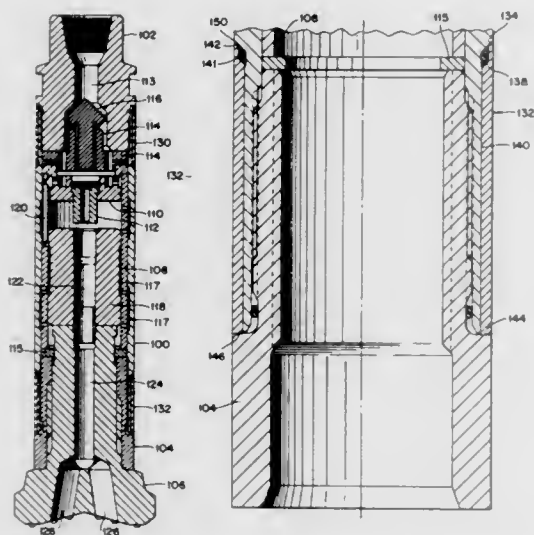
U.S. Cl. 175—320

16 Claims

1. A casing assembly for a tool adapted to be disposed in a subterranean hole containing an abrasive environment, said

casing assembly adapted to shield a component of the tool from such abrasive environment and comprising:

a cylindrical casing defining a longitudinal axis and having an axial first end, said casing including a first annular recess extending axially inwardly from said first end and terminating at a distance therefrom whereby an axial inner end of said first recess is defined by a first generally radial shoulder facing axially outwardly,



a replaceable hollow cylindrical wear sleeve disposed within said first recess so as to be coaxial with said casing, said wear sleeve including an axial inner end facing and spaced axially from said axial inner end of said first annular recess, said wear sleeve including a second annular recess situated adjacent said axial inner end of said wear sleeve and forming a second generally radial shoulder facing said first generally radial shoulder, and flexible seal means disposed between said first and second generally radial shoulders for excluding abrasives.

5,090,501

ROTARY PUMP OR MOTOR APPARATUS

Norbert E. McNulty, 604 Rudyard La., Virginia Beach, Va. 23464

Filed Sep. 11, 1990, Ser. No. 580,956

Int. Cl.⁵ B60K 8/00

U.S. Cl. 180—305

21 Claims

1. A rotary apparatus for use as one of a pump, motor, meter, and fluid brake, the apparatus comprising:

a stationary base member having a circular recessed channel portion defining a fluid chamber with a fluid inlet port and a fluid outlet port disposed in spaced apart relation within said channel,

a rotor having a hollow body portion rotatably received on and substantially surrounding said base member and enclosing said channel and having at least one piston portion extending adjacent to an inward from an inner periphery of the body portion,

said piston portions projecting into said channel to divide said channel into a plurality of enclosed fluid chambers configured to sequentially pass over said base member fluid inlet and outlet ports,

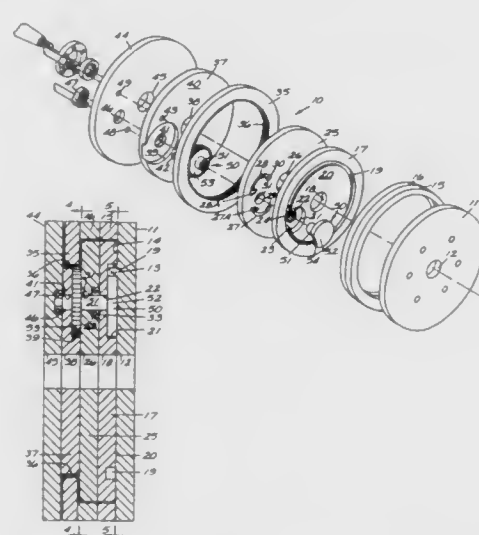
rotary divider means disposed partially within said base member channel and configured to receive and travel in coordinated movement with said piston portions to move over said base member fluid inlet and outlet ports after passage of a said piston portion,

timing means connected between said rotor and said rotary divider means for rotating said divider means in predetermined timed relation with said rotor, whereby

fluid entering said channel through said inlet port will fill a

chamber defined by said piston portions and travel around said channel to exit from said outlet port,

said piston portions are timed to travel with said rotary divider means in coordinated movement such that said rotary divider means when moving over said inlet and outlet ports will sequentially allow fluid passage there-through while cooperatively maintaining constant separation between incoming and outgoing fluid, and



fluid entering said channel through said inlet port after passage of a piston portion will fill a subsequent chamber defined by said piston portion just leaving said rotary divider means to travel around said channel and exit said outlet port,

said apparatus functioning as one of a pump, meter and brake when power is supplied to said rotor and fluid is circulated thereby, and functioning as a motor when fluid is circulated therethrough by external power and power is taken off at said rotor.

5,090,502

CONNECTING STRUCTURE FOR CONNECTING A POWER UNIT OF AN AUTOMOTIVE VEHICLE WITH THE BODY OF THE VEHICLE

Yasushi Inoue, Higashihiroshima, and Takashi Sakono, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

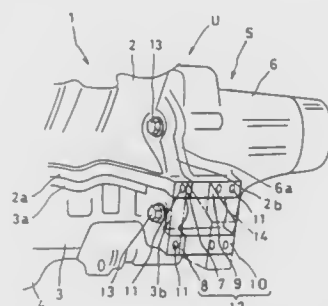
Filed Dec. 19, 1990, Ser. No. 629,947

Claims priority, application Japan, Dec. 29, 1989, 1-152182[U]

Int. Cl.⁵ B62D 21/00

U.S. Cl. 180—312

8 Claims



1. A connecting structure for connecting a power unit of an automotive vehicle comprising an engine and a transmission with a vehicle body, wherein the engine has a cylinder block divided into an upper block and a lower block, the transmission

has a transmission case, and said engine and said transmission together constitute the power unit of the automotive vehicle; said connecting structure comprising

means for mounting the power unit against the vehicle body so that the mounting means connects each of the upper block and the lower block with the transmission case while supporting the power unit.

5,090,503

VISUALLY INSPECTABLE SAFETY LANYARD

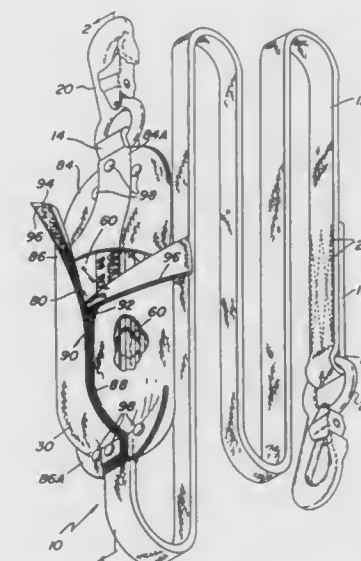
Michael Bell, 1705 Triumphe Way, Warrington, Pa. 19876

Filed Oct. 29, 1990, Ser. No. 605,284

Int. Cl.⁵ A62B 1/14, 35/00

U.S. Cl. 182—5

10 Claims



1. In a shock absorbing safety lanyard for protecting a person wearing a body engagement safety means from falling from an elevated position when connected by the lanyard to a fixed support, the lanyard having a first end to be connected to the person wearing the body engagement safety means for securing the person to a safety system, a second end arranged to be connected to the fixed support and shock absorber means for absorbing the shock of a fall, the shock absorber means being located between the first end and the second end, the improvement comprising the combination of an inner cover and outer cover enclosing the shock absorber means, said inner cover closely surrounding the shock absorber means for maintaining the shock absorber means in an actuatable state and for providing a visual indication of whether the shock absorber means is in the actuatable state or has been transformed therefrom, said outer cover being disposed about the inner cover to prevent inadvertent damage to said inner cover and said shock absorber means, said outer cover being readily openable to provide visual access to the inner cover so that the person can visually distinguish, from the appearance of the inner cover, whether the shock absorber means is in the actuatable state or is in an altered state.

5,090,504

UNIVERSAL TREE STAND

Joseph A. Amacker, 1212 Main St., Delhi, La. 71232

Filed Jul. 9, 1990, Ser. No. 550,018

Int. Cl.⁵ A47C 9/00

U.S. Cl. 182—134

49 Claims

1. A tree stand climbing apparatus comprising: a climbing section including a seating section; said setting section including a seat and a pair of lower side members extending lengthwise and providing lateral support for said seat;

means for gripping a tree connected at one end of said lower side members;

an upper pair of side members including additional means for gripping a tree connected at one end of said upper pair of side members, said upper and lower pairs of side members being pivotally connected to permit movement to a collapsed condition when not in use;

a pair of locking members for maintaining said pairs of upper and lower side members in angular and secured relation when in use;



a generally U-shaped cross member removably positioned on the end of said lower side members opposite the gripping means; and

said generally U-shaped cross member being telescopically connected to said lower side members such that the cross member extends said lower side members when in position either fully or partially, and may be completely and readily removed from contact with the side members thereby permitting said user to either stand or sit without interference from said cross member.

5,090,505

TREE CLIMBING STAND

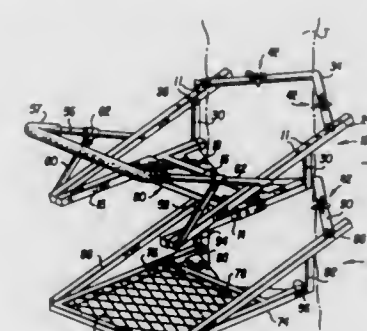
Joseph A. Amacker, 1212 Main St., Delhi, La. 71232

Continuation of Ser. No. 336,793, Apr. 12, 1989, Pat. No. 4,969,538. This application Jul. 18, 1990, Ser. No. 553,653

Int. Cl.⁵ A47C 9/00

U.S. Cl. 182—187

1 Claim



1. Apparatus for climbing a generally vertical member, comprising:

a climbing element for accommodating the body of a climber, said upper climbing element comprising a generally rectangular frame including at least a pair of upper and lower tubular side members;

means provided at one end of said upper and lower tubular side members for gripping said vertical member;

said upper and lower tubular side members being pivotally joined at their respective ends opposite the gripping means; said climbing element characterized by the absence of a cross member disposed between the lower pair of

tubular side members at the end of the frame opposite the gripping means;
a substantially rigid seat slidably secured to said lower pair of tubular side members which provides sufficient structural support to said climbing element and eliminates the need for any additional cross members between the seat and the end of said lower side members opposite the gripping means, said substantially rigid seat being moveable between said gripping means and the juncture of said upper and lower cross members, said moveable seat including means provided at opposite ends for enveloping each of said lower tubular side members respectively during movement from one portion to another while simultaneously providing the necessary structural support to said frame during use;

whereby the legs of the climber are free to move at said end of said frame opposite said gripping means when the climber is seated proximate to said gripping means and facing away from said vertical member.

5,090,506

ADJUSTABLE HUNTER'S TREE STAND

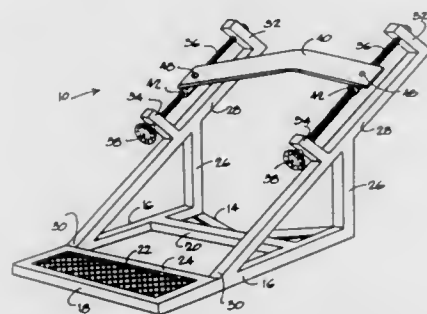
Cleve W. Womack, 200 Eighth St., and Renard R. McGuffee, 1021 Highway 8 West, both of Jonesville, La. 71343

Filed Mar. 22, 1991, Ser. No. 673,309

Int. Cl.⁵ A01M 31/02

U.S. Cl. 182—187

20 Claims



1. A hunter's tree stand which is adjustable to fit tree trunks of various diameters comprising:

- a platform means for supporting a hunter in the standing or sitting position, said platform means having a rear edge means for gripping a tree trunk,
- a pair of frame member means for straddling a tree trunk connected to said platform means,
- blade means for gripping a tree trunk, and
- rod means for moving said blade means away from and toward a tree trunk connected to said frame member means and said blade means.

5,090,507

LOAD LIMITING APPARATUS FOR A HOIST

Wayne L. Olson, Central Point, and Gary E. Choate, Lakewood, both of Oreg., assignors to Rose Manufacturing Company, Englewood, Colo.

Filed Oct. 29, 1990, Ser. No. 605,240

Int. Cl.⁵ A62B 1/10

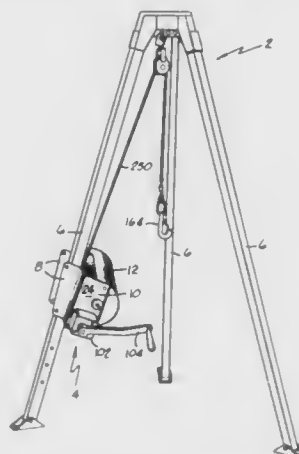
U.S. Cl. 182—234

20 Claims

1. Apparatus for limiting the amount of force placed on line means of a hoist comprising:

- a housing mounted at a fixed location;
- a fixed axle mounted at a fixed location on said housing;
- a drum having a center section and two end walls;
- line means attached at a first end to said drum for being wound onto or unwound from said drum, said line means being attached at a second end to a load supporting device;
- mounting means for mounting said drum for rotation on said fixed axle;

clutch means mounted on said mounting means for applying a force to rotate said drum;
rotatable means operatively connected to said clutch means for applying a limited force thereto to rotate said clutch means;
drive means for rotating said rotatable means; and



5,090,508

AUTOMOBILE SERVICING APPARATUS HAVING A TURNTABLE INCLUDING A RETRACTABLE LIFT

Koichi Nishikawa, 58, Komatsu-cho, Toyohashi-shi, Aichi-ken, Japan

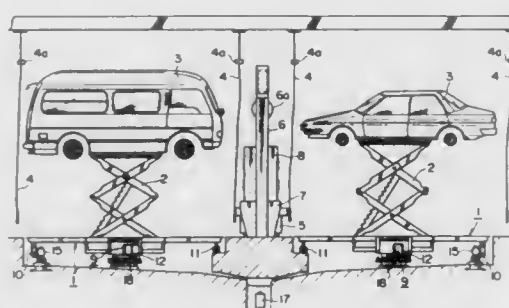
Filed Dec. 18, 1989, Ser. No. 452,224

Claims priority, application Japan, Dec. 19, 1988, 63-318550

Int. Cl.⁵ B60S 13/00

U.S. Cl. 187—8.43

10 Claims



1. An automobile servicing apparatus comprising:
 - a rotatably supported turntable including a storing space which is defined below a top surface of said turntable on which an automobile to be serviced may be supported;
 - a retractable lift means mounted on said turntable, said lift means lifting said automobile to be serviced to a desired height above the top surface of said turntable when advanced and being received completely in said storing space of said turntable when set in its retracted position, thereby providing a substantially flat top surface without any big holes at the top surface of said turntable;
 - first driving means for driving to rotate said turntable in a desired direction; and
 - second driving means for driving to operate said retractable lift means,

said second driving means including a power source provided outside of said turntable and a rotary connection unit which establishes an operative connection between said power source and said lift means.

5,090,509

INTERLOCK DEVICE, ESPECIALLY FOR A PRESSURE-MEDIUM ACTUATOR OF THE AXIAL-PISTON TYPE

Reinhold Lippert, Kirchheim, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

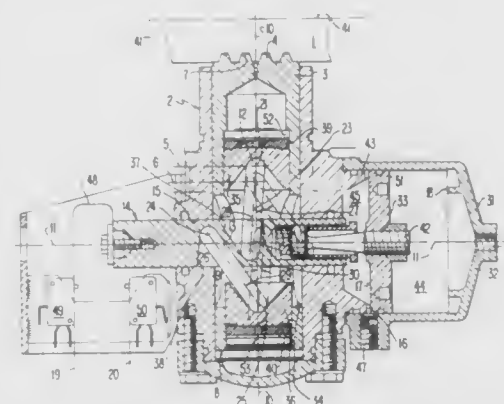
Filed Oct. 24, 1990, Ser. No. 602,764

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935443

Int. Cl.⁵ B62D 5/06

U.S. Cl. 180—140

1 Claim



1. Interlock device, comprising a locking slide which is displaceable in a receiving bore of a housing, a locking element having at least one positive engagement member, and being movable between an interlock position in which said engagement member is in mutual engagement with a mating engagement member to be interlocked, and a free position in which said engagement member and said mating engagement member are out of engagement, said locking slide being coupled to an adjusting member which is received movably in a housing bore of said housing and which interacts with said locking slide to cause said engagement member to move between said interlock position and said free position, said adjusting member being actuable by an axial piston of a pressure medium actuator having a cylinder bore which is fixedly mounted to said housing and which has a longitudinal axis perpendicular to and in a common plane with a longitudinal axis of said receiving bore for the locking slide, said locking slide and said adjusting member being coupled by a first tappet adapted to cooperate therewith to cause said locking element to move into the interlock position, said first tappet being articulated at a first end in a ball joint on the locking slide and at a second end in a ball joint on the adjusting member in such a manner that during operation a longitudinal axis of the first tappet passes through a dead center position parallel to the longitudinal axis of said receiving bore for the locking slide, a second tappet adapted to actuate said locking element and articulated at a first end in a ball joint on the adjusting member and at a second end in a ball joint on the locking slide in such a manner that during operation a longitudinal axis of the second tappet passes through a dead center position parallel to the longitudinal axis of said receiving bore for the locking slide, each of said tappets having two end positions, one corresponding to the interlock position and another corresponding to the free position of the locking slide respectively, in which positions the longitudinal axes of said tappets form an angle with the longitudinal axis of said receiving bore for the locking slide, said angle being relatively greater in one end position and relatively smaller in the other end position, stop means for limiting the movement of said adjusting member axially within said housing bore between a

first end position corresponding to said interlock position of the locking slide and a second end position corresponding to the free position thereof, wherein the locking slide has a passage therethrough, with said adjusting member being disposed and movable therein longitudinally along said housing bore, wherein said first tappet is operable to cause said locking slide to move said locking element into the interlock position and said second tappet is operable to cause said locking slide to move said locking element into the free position, said first and second tappets being so arranged that when said first tappet is in an end position which forms a relatively greater angle with the longitudinal axis of said receiving bore, said second tappet is in an end position which forms a relatively smaller such angle, and when said first tappet is in an end position which forms a relatively smaller such angle, said second tappet is in an end position which forms a relatively greater such angle, wherein the ball joint associated with at least one end of each said tappet is mounted against an elastically compressible member in such a manner as to be longitudinally displaceable by said tappet, and wherein a length of each said tappet relative to a longitudinal distance between said ball joints associated with said tappet is such that said longitudinally displaceable ball joint associated with said tappet is longitudinally displaced against said compressible member by said tappet when said tappet is in a dead center position.

5,090,510

DRIVE CONTROL SYSTEM OF FOUR-WHEEL DRIVE VEHICLE

Kenichi Watanabe, Eiji Nishimura, Mitsuru Nagaoka, and Kaoru Sotoyama, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

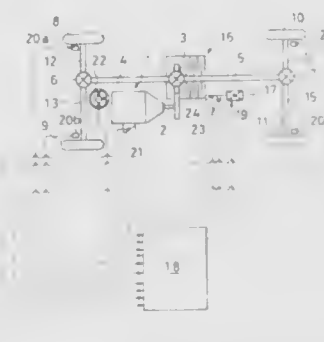
Filed Oct. 1, 1990, Ser. No. 591,987

Claims priority, application Japan, Sep. 30, 1989, 1-255963; Sep. 30, 1989, 1-255964; Sep. 30, 1989, 1-255965

Int. Cl.⁵ B60K 28/16

U.S. Cl. 180—197

8 Claims



1. A drive control system of a four-wheel drive vehicle having a differential device interposed between front and rear wheels and a differential restricting device mounted to said differential device for restricting a differential action of said differential device, comprising:

- a target slip ratio setting means for setting a target slip ratio of a wheel so that a slip ratio can be utilized as a control target value in controlling the four-wheel driving vehicle;
- a conversion means for converting the target slip ratio set by said target slip ratio setting means into a target rotational speed difference between the front and rear wheels in order to prevent a delay in performing and control;
- a detecting means for detecting a rotational speed difference between the front and rear wheels; and
- a feedback control means for controlling said differential restricting device so to cause said rotational speed difference between the front and rear wheels detected by said detection means to reach said target rotational speed difference between the front and rear wheels

5,090,511

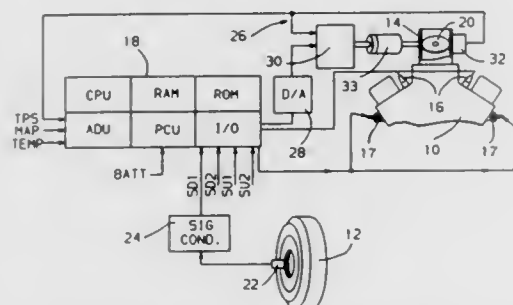
ADAPTIVE VEHICLE TRACTION CONTROL SYSTEM
Daniel F. Kabasin, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 393,181, Aug. 14, 1989, abandoned.
This application Jun. 18, 1990, Ser. No. 539,300

Int. Cl.⁵ B60K 31/00

U.S. Cl. 180—197

1 Claim



1. A method of adaptively controlling spin of a driven wheel of a vehicle having an engine for applying driving torque to the driven wheel, the method comprising the steps of:

- determining wheel spin;
- determining a time lapse from a time the determined wheel spin first exceeds a low spin threshold to a time the determined wheel spin first exceeds a high spin threshold;
- reducing the driving torque applied to the wheel while the determined wheel spin is between the low and high spin thresholds at a rate having a predetermined direct relationship to the determined wheel spin; and
- reducing the driving torque applied to the wheel while the determined wheel spin is greater than the second spin threshold at a rate having (a) a predetermined inverse relationship to the time lapse and (b) the predetermined direct relationship to the determined wheel spin.

5,090,512

**FOUR-WHEEL COORDINATED STEERING
MULTI-PURPOSE TRACTOR**

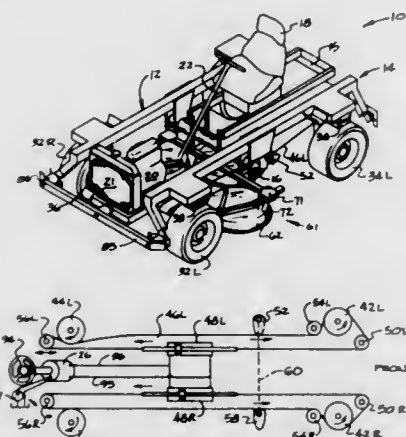
Paul W. Mullet, Hesston, and Elmer D. Voth, Newton, both of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Jun. 8, 1990, Ser. No. 535,109

Int. Cl.⁵ B60K 17/358

U.S. Cl. 180—236

10 Claims



1. Apparatus for controlling the longitudinal direction of movement of a motorized vehicle comprising:

- (a) a frame means lying in a horizontal plane;
- (b) first and second pairs of wheels each pair including a front and back wheel on each side of the vehicle;
- (c) journal means mounting each of said wheels to said frame

means for rotation about individual turning axes perpendicular to said plane;

- (d) first and second turning means coupled to said individual turning axis of the journal means for rotating said first pair of wheels in opposite directions from each other, and said second pair of wheels in opposite directions from each other, respectively;
- (e) a shaft transversely rotatably mounted on the frame;
- (f) first and second cam pulley means each having symmetric halves being rigidly mounted on said shaft for rotation therewith;
- (g) steering means including a steering wheel transmitting linear movement to the first and second turning means; and
- (h) means for coupling said first and second cam pulley means to said first and second turning means, respectively, each of said cam pulley means being configured in symmetric halves with the turning means wrapped therearound in a manner to cause said first and second pairs of wheels to follow a first and second circumference, both having a common center, when said steering wheel is turned, said common center lies upon a transverse line half way between the front and back wheel of each pair.

5,090,513

**POWERED WHEELED VEHICLE FOR THE
HANDICAPPED AND OTHERS DESIRING ASSISTANCE
INCORPORATING AUTOMATICALLY LOCKING
SWIVELABLE AND RAISEABLE POWERED SEAT**

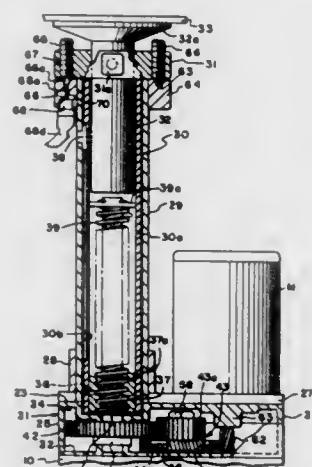
Allen L. Bussinger, Saginaw, Mich., assignor to Amigo Mobility International, Inc., Bridgeport, Mich.

Filed Dec. 24, 1990, Ser. No. 633,024

Int. Cl.⁵ A61G 5/04

U.S. Cl. 180—271

14 Claims



1. In combination with a powered wheeled vehicle for the handicapped and others desiring assistance and, having a longitudinal frame mounting motor means for driving one or more of the vehicle wheels, an upstanding, swivelable and raisable seat on said frame:

- a. a generally vertically disposed seat post mounting a seat thereon;
- b. a seat post support fixed to said vehicle to telescopically and revolvably receive said post;
- c. seat motor means on said vehicle having a drive connection to said seat post for raising and lowering it;
- d. control means on said vehicle for selectively operating said seat motor means to raise or lower said seat post;
- e. a lock part on said seat post support and a second mating lock part carried with said seat post to move vertically with said seat post; and
- f. means on said lock parts engageable when the seat post is in lowered position for locking said parts and thereby said

seat post and seat in any one of a plurality of relatively rotated positions relative to said seat post support, while disengaged to free said seat post parts and seat to freely rotate when the seat post is in a raised position.

5,090,514

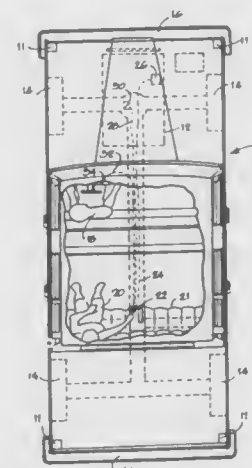
**SAFETY DEVICE OPERABLE BY A PASSENGER OF A
MOTOR VEHICLE**

Harry D. Wright, Rte. 2, Box 200, New Roads, La. 70760
Filed Sep. 10, 1990, Ser. No. 580,165

Int. Cl.⁵ B60K 28/00

U.S. Cl. 180—271

3 Claims



1. A safety device for an automobile having an engine, brakes, and emergency flashing lights, said safety device comprising:

- a. electrically operated engine control means for stopping the engine of said automobile;
- b. electrically operated brake control means for applying the brakes of an automobile to stop said automobile;
- c. electrically operated emergency flasher control means for applying the emergency flashing lights of an automobile; and
- d. electrically operated switch means located in said automobile operable by a passenger in said automobile to simultaneously stop said automobile engine, apply aid brakes, and operate said emergency flashing lights.

5,090,515

**PASSENGER TRANSPORT INSTALLATION, VEHICLE
FOR USE THEREIN, AND METHOD OF OPERATING
SAID INSTALLATION**

Tastubiko Takahashi; Jun Sugahara; Toshibiko Nara; Yuki Yamamoto; Yoshinari Atsumi; Hideaki Seki; Katutaro Masuda; Nobuyoshi Sato; Masanobu Ito; Masayuki Shigeta, all of Katsuta; Eiji Ikeda; Matsudo; Hiroshi Kinoshita, Hachi-oji, and Shinkei Kakami, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Elevator Engineering and Service Co., Ltd., both of Tokyo, Japan

Filed Mar. 19, 1990, Ser. No. 495,084

Claims priority, application Japan, Mar. 20, 1989, 1-066209

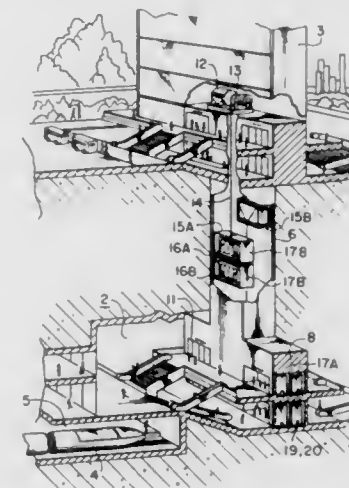
Int. Cl.⁵ B66B 9/16

U.S. Cl. 187—16

8 Claims

7. A method of controlling the operation of a passenger transport installation including an elevator passage or passages, stations communicating with the elevator passage or passages, elevator frames movable along the elevator passage or passages, and vehicles for carrying passengers and releasably engageable with the elevator frame for movement therewith along the elevator passage or passages, said vehicles being disengaged from said elevator frame so as to move to said stations, said method comprising the step of unloading the

vehicles from said elevator frame to said station simultaneously when another vehicle is loaded from said station to a different



portion of said elevator frame from the portion of said elevator frame where said unloaded vehicle has been placed.

5,090,516

ELEVATOR LINEAR MOTOR BUS BAR

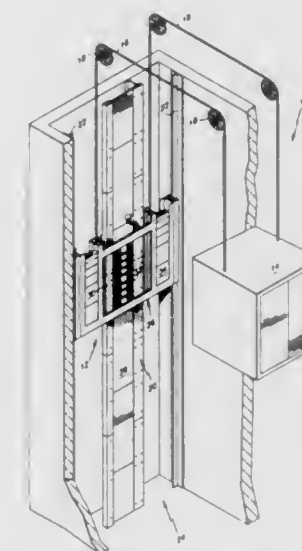
Timothy J. Grinaski, East Hartford; Jerome E. Jaminet, Glastonbury, and Eric G. Olsen, Woodbury, all of Conn., assignors to Otis Elevator Company, Farm Springs, N.J.

Filed Mar. 15, 1991, Ser. No. 670,746

Int. Cl.⁵ B66E 1/34

U.S. Cl. 187—112

10 Claims

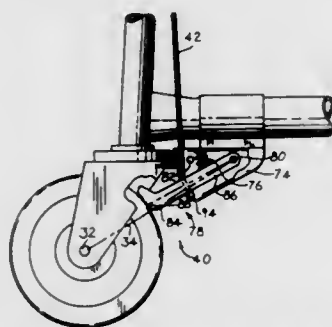


1. An elevator for use within a hoistway, said elevator comprising:

- a car;
- a linear motor comprising:
 - a secondary assembly having:
 - a support attaching to said hoistway and extending therefrom; and
 - a flat secondary element comprised of a plurality of segments, each segment supported by a first edge thereof from said support; and
 - a bus bar means attaching to a second edge of adjacent segments of said secondary elements for conducting current between adjacent segments of the secondary element; and

a primary assembly separated from said secondary element by an air gap, and
a rope attaching to said car and to said primary assembly, such that motion of said primary assembly induces concomitant motion of said car.

5,090,517
BRAKING SYSTEM FOR A GROCERY CART OR THE LIKE
Robert E. Doughty, 940 S. 134th, Bonner Springs, Kans. 66012
Filed Apr. 30, 1990, Ser. No. 516,720
Int. Cl.⁵ B62B 5/04
U.S. Cl. 188—19 13 Claims



1. A braking mechanism for a cart having a plurality of rotatable support wheels rotatable in a forward direction, said mechanism comprising:

a brake shoe presenting a braking surface for engaging the periphery of a cart wheel, the wheel presenting a rotational axis and having a radius presenting a radial dimension;

coupling means for pivotally coupling said brake shoe with the cart adjacent one of said wheels for pivotal shifting of said shoe about a pivot axis between a braked position in which said braking surface engages the wheel periphery at a point of contact therewith and a released position, and including structure for fixing the distance between said rotational and pivot axes such being along an extended radius of the wheel, said brake shoe having a longitudinal dimension between said pivot axis and said point of contact, the sum of said radial and longitudinal dimensions being greater than said distance between said axes; and biasing means for applying a biasing force to said brake shoe for biasing said shoe toward said braked position, said coupling means further including means for positioning said point of contact offset from said extended radius in a direction opposed to the forward rotational direction of the wheel.

said axes and point of contact defining a triangular relationship and cooperatively presenting means for substantially maintaining said triangular relationship, causing said brake shoe to engage said wheel periphery more tightly than said biasing force alone when in said braked position and when force is applied to propel the cart forwardly, and for applying braking action between said braking surface and wheel periphery in accordance with said biasing force when force is applied to propel the cart rearwardly.

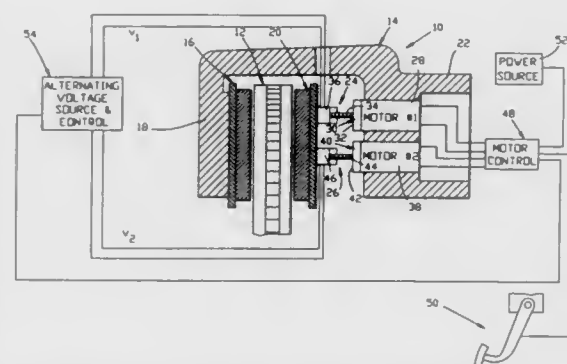
5,090,518
BRAKE CONTROL SYSTEM
Donald E. Schenk, Vandalia, Ohio, and Doonan D. McGraw, Naples, Fla., assignors to General Motors Corporation, Detroit, Mich.
Filed May 31, 1990, Ser. No. 531,796
Int. Cl.⁵ F16D 55/08
U.S. Cl. 188—72.1 15 Claims

1. A brake apparatus comprising an actuator mechanism for generating a desired braking force by moving friction braking

means into friction braking contact with a movable member to be braked, said actuator mechanism comprising:

first and second primary actuating units operable in forward movement for moving said friction braking means into friction braking contact with said movable member to be braked and generating a braking force which urges said friction braking means into friction braking relation with said movable member to be braked to achieve at least a part of the total actual braking effort of the brake apparatus when actuated, and operable in backing up movement to decrease and when desired to eliminate the generated braking force, said primary actuating units each having a non-backdriveable output preventing backing up movement thereof when it is loaded beyond its braking force output;

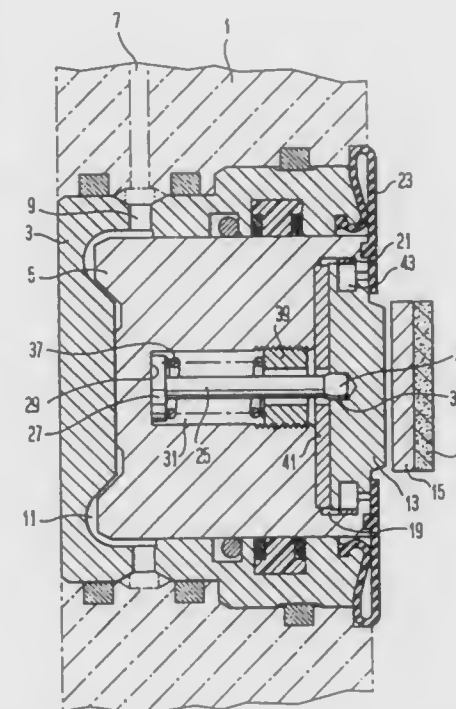
first and second secondary actuating units respectively in braking force transmitting series with said first and second primary actuating units for generating braking force which is additional to the braking force output of said first and second primary actuating units and further urging said friction braking means into greater friction braking relation with said movable member to be braked;



a first controller for operating said first and second primary actuating units in accordance with braking force demands and maintaining said first and second primary actuating units at their maximum braking force outputs while the braking force demands exceed their maximum braking force outputs;

and a second controller for alternately operating said first and second secondary actuating units to alternately urge said friction braking means into greater friction braking relation with said movable member to be braked and in so doing the operated one of said secondary actuating units acting to reduce the resistance to further actuating movements of an associated one of said primary actuating units associated with the other of said secondary actuating units below said associated one of said primary actuating units maximum braking force output so that said associated one of said primary actuating units, being continually operated to attain its maximum braking force output, follows up the action of the operated one of said secondary actuating units until said associated one of said primary actuating units maximum braking force output is again attained; said alternate operation and stepped follow-up actions being cyclicly continued until the braking force demand is attained.

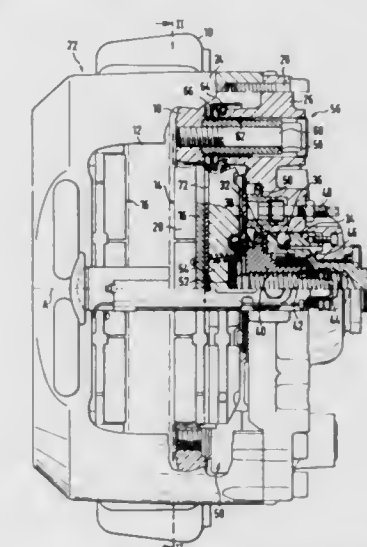
5,090,519
DISK BRAKE FOR VEHICLES
Filip Golea, Munich, and Xaver Wirth, Ismaning, both of Fed. Rep. of Germany, assignors to Knorr-Bremse AG, Munich, Fed. Rep. of Germany
Filed May 23, 1990, Ser. No. 527,562
Claims priority, application Fed. Rep. of Germany, May 23, 1989, 3916741
Int. Cl.⁵ F16D 55/225
U.S. Cl. 188—72.6 5 Claims



1. Vehicle disk brake comprising a piston (5) disposed in a housing and acting on a brake shoe (15) bearing a brake lining (17), said brake comprising

- (a) a laterally movable pressure plate (13) located on a side of said piston facing said brake shoe and comprising a recess (35) in a side of said pressure plate facing said piston;
- (b) spring means of predetermined spring force for returning said pressure plate upon brake release from a laterally deflected position, resulting from brake actuation, to a neutral starting position, said spring means comprising
 - (i) a bore (31) extending axially in the piston
 - (ii) a disk (27) braced against an end (29) of said bore remote from said pressure plate;
 - (iii) a tappet (25) having a first end connected to said disk (27) and extending at a distance from an inner wall of said bore (31), said tappet having a tappet head (33) located at a second end remote from said disk (27) and accommodated in said recess (35) in said pressure plate, said tappet head corresponding in shape to said recess to enable guidance of said tappet;
 - (iv) a threaded ring (39) screwed into said bore (31) at an end of said bore remote from said disk (27);
 - (v) a compression spring (37) surrounding said tappet (25) and having a first end braced against said disk (27) and a second end braced against said threaded ring (39);
 - (vi) said tappet (25) axially traversing said threaded ring (39) with clearance, such as to permit a predetermined amount of tilting of said tappet causing one-sided stressing of said compression spring (37) and subsequent return of said tappet to zero position aligned with said bore (31).

5,090,520
SPOT-TYPE DISC BRAKE, INCLUDING A FLOATING CALIPER HAVING PRESSURE AND HEAT INSULATING PLATE
Harald Gockel, Bendorf, and Bernd Röhling, Andernach, both of Fed. Rep. of Germany, assignors to Lucas Industries Public Limited Company, Birmingham, England
Filed Jun. 5, 1990, Ser. No. 533,517
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1989, 3919179
Int. Cl.⁵ F16D 65/097, 65/84; F16J 15/32
U.S. Cl. 188—73.45 4 Claims

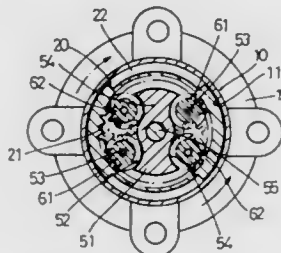


1. In a spot-type disc brake comprising a brake disc rotatable about an axis, a floating caliper and a brake carrier; a pair of caliper guides each including a sleeve having an inner end engaging said carrier and an outer end remote from said carrier, an elastic boot between said caliper and the inner end of each of said sleeves to protect said guides from contamination, a pair of brake pads disposed at either side of said brake disc, each pad including a back plate with a friction lining secured thereto, said floating caliper being guided on said sleeves parallel with the axis of rotation of said brake disc and straddling both said brake disc and said pair of brake pads, a brake actuating tappet guided for axial displacement in said floating caliper at one side of said brake disc, and a pressure plate parallel with said brake disc and disposed between said tappet and the back plate of that brake pad on said one side of said brake disc to distribute brake actuating forces to that brake pad, said pressure plate having a recess in each of its edges that are in the regions of said caliper guides and of a size to receive therein the respective elastic boots at the inner ends of the respective sleeves of said guides, the invention comprising a stiff, cup-shaped cap carried by each of the respective sleeves adjacent its inner end and covering an elastic boot, each of said caps extending with clearance into a respective recess in said pressure plate, and a heat insulation plate disposed between said pressure plate and the back plate of the brake pad on said one side of said brake disc, said heat insulation plate extending to either side of said pressure plate to at least partly cover said recesses in the respective edges of said pressure plate.

5,090,521
ONE-WAY DAMPER
Osamu Miura, Saitama, Japan, assignor to Tok Bearing Co., Ltd., Tokyo, Japan
Filed Dec. 27, 1990, Ser. No. 634,386
Claims priority, application Japan, May 18, 1990, 2-128912
Int. Cl.⁵ F16D 63/00
U.S. Cl. 188—82.1 3 Claims

1. A one-way damper comprising a fixed outer casing, an

inner casing rotatably mounted in the outer casing, a damping fluid between the inner casing and the outer casing, the inner casing having an interior space formed with a peripheral ring gear, a shaft member rotatably mounted in the interior space, the shaft member defining a profiled pocket, a fixed pinion rotatably mounted on the shaft member in the pocket and meshing with the ring gear, and a floating pinion in the pocket



adjacent the fixed pinion, the shaft member being freely rotatable within the interior space in one direction of rotation wherein the fixed pinion leads the floating pinion, and the floating pinion forming a drive connection between the shaft member and the inner casing in an opposite direction of rotation of the shaft member, whereby the inner casing is caused to rotate with the shaft member to provide damped rotation of the shaft member and the inner casing within the outer casing.

5,090,522

BRAKE ACTUATING APPARATUS

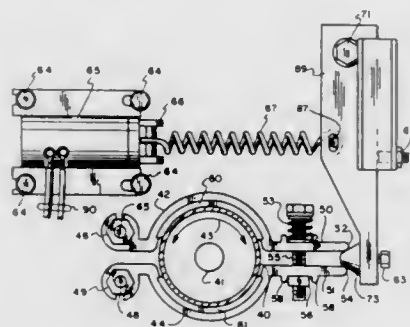
Roy D. Korff, Elk Grove Village, Ill., assignor to Duchossois Industries, Inc., Elmhurst, Ill.

Filed Aug. 24, 1990, Ser. No. 572,845

Int. Cl.⁵ F16D 51/16; B60T 13/04

U.S. Cl. 188—166

9 Claims



6. An arrangement for applying separating forces to a pair of spaced apart brake control arms, said arrangement comprising: a brake controlling stud having a substantially conical shape with a base larger than the space between said brake control arms and an apex smaller than the space between said brake control arms; means for moving said apex of said stud between said brake control arms to thereby apply separation forces to said brake control arms with the outside surface of said stud; and a sliding connection between the base of said stud and said moving means, said sliding connection permitting movement of said stud along said moving means such that unequal forces applied to said stud by said spaced-apart brake control arms result in sliding movement of said stud into a centralized relationship with said brake control arms for the application of substantially equal separation forces thereto.

5,090,523
HYDRODYNAMIC RETARDER

Klaus Vogelsang, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH & Co. KG, Crailsheim, Fed. Rep. of Germany

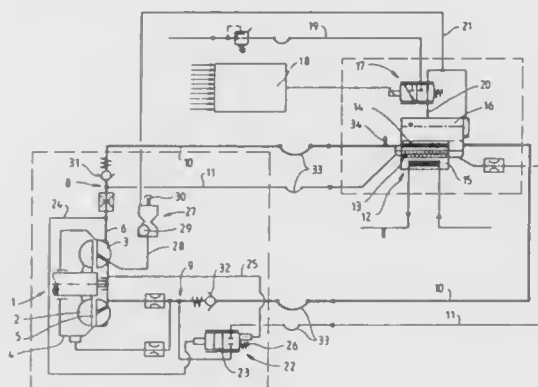
Filed Dec. 10, 1990, Ser. No. 624,620

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1989, 3940825

Int. Cl.⁵ F16D 57/02

U.S. Cl. 188—296

12 Claims



1. A hydrodynamic retarder apparatus comprising: a housing including an inlet and an outlet; a rotor impeller wheel disposed within said housing; a stator impeller wheel disposed within said housing; a torus-shaped working space defined by said rotor impeller wheel and said stator impeller wheel, adapted to be filled with and emptied of working fluid, said working space in fluid communication with said inlet and said outlet; a cooler means for removing heat from said working fluid; a cooling circuit line in fluid communication between said outlet and said inlet, and extending to and from said cooler means, said circuit line comprising a first flow line having a first flow cross sectional area and a second flow line having a second flow cross sectional area smaller than said first flow cross sectional area, wherein the working fluid in said first flow line and said second flow line are separately cooled within said cooler means; a splitter means for dividing said cooling circuit line into said first flow line and said second flow line, said splitter means disposed near the outlet of said housing; means for merging said first flow line and said second flow line, said means for merging disposed near the inlet of said housing; a first check valve disposed in said cooling circuit line between said splitter means and said cooler means; a second check valve disposed in said cooling circuit line between said means for merging and said cooler means; and a pneumatically pressurized receiver means for filling said working space with working fluid, said receiver means in fluid communication with said cooling circuit line.

5,090,524

SHOCK ABSORBER WITH AN ELECTRICAL CONNECTOR

Lonnie G. D. Miller, and Gary W. Groves, both of Monroe, Mich., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Continuation-in-part of Ser. No. 105,404, Oct. 5, 1987, Pat. No. 4,846,318. This application Jul. 7, 1989, Ser. No. 377,236

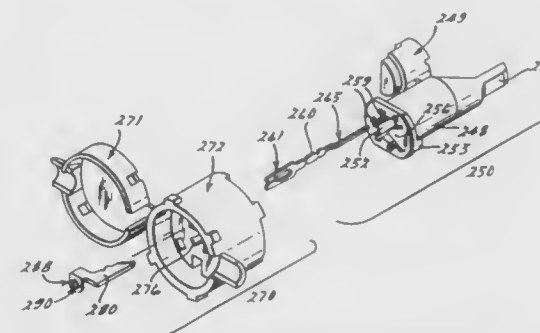
Int. Cl.⁵ F16F 9/46; H01R 33/00, 13/58

U.S. Cl. 188—299

28 Claims

1. A shock absorber electrically communicating with a source of electrical potential external to said shock absorber, said shock absorber comprising:

a pressure cylinder forming a working chamber to store damping fluid; a reciprocating piston disposed within said working chamber operable to divide said working chamber into first and second portions; an axially extending piston rod disposed in said working chamber and connected to said piston; valve means for electrically controlling the flow of damping fluid between said first and second portions of said working chamber; and connector means for allowing said valve means to be connected to said source of electrical potential, said connector means comprising: an adapter shaft mechanically communicating with said piston rod, a female connector assembly disposed partially within said adapter shaft, said female connector assembly including an anti-rotation key mechanically communicating with an anti-rotation slot formed in said adapter shaft for preventing rotation therebetween, said female connector assembly having an internal axially extending cavity defining a generally cylindrical cross-section which terminates in a wedge-shaped protrusion extending radially inwardly and axially through said cavity, said cavity defining hollowed leg portions extending radially beyond said cylindrical cross-section and which are located adjacent each side of said wedge-shaped protrusion, a plurality of female contact elements supported within said cavity and disposed radially about said cylindrical portion



thereof, said female contact elements having a first end defining a fork-like portion and a second end adapted to be electrically interfaced with said valve means, a male connector assembly electrically communicating with said female connector assembly and said source of electric potential, said male connector assembly having an annular portion adapted to receive said female connector assembly therein, said annular portion having a centrally located axially extending projection having a cross-sectional profile substantially identical to the cross-sectional profile of said cavity within said female connector assembly, said central projection adapted to be inserted into said cavity so as to coact with said wedge-shaped protrusion for inhibiting rotation movement between said male and female connector assemblies, said central protrusion having axially extending channels alignable with said fork-like portion of said female contact elements upon insertion of said central projection into said cavity, first locking means for securing said male connector assembly to said female connector assembly, said first locking means comprising a latching cap having a plurality of locking members disposed circumferentially about said latching cap, said locking members operable to engage an annular groove formed in the periphery of said adapter shaft, and second locking means for securing said female connector assembly to said adapter shaft; a plurality of male contact elements adapted to be inserted into said channels formed in said central projection of said male connector assembly following interconnection of said male and female connector assemblies, each of said

male contact elements having a first tapered end portion adapted to be seated and retained within said fork-like portion of its corresponding female contact element for maintaining constant engagement therewith, a second end of said male contact elements having surface means for permitting removable insertion of said male contact elements into said channels and which is adapted for electrical communication with said source of potential.

5,090,525

SHOCK ABSORBER ARRANGEMENT

Kent Öhlin, Sollentuna, Sweden, assignor to Ohlins Racing AB, Sweden

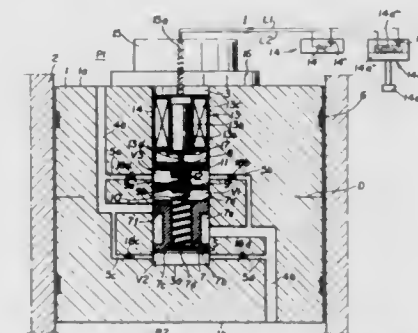
Continuation of Ser. No. 498,473, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 313,713, Feb. 22, 1989, abandoned. This application Aug. 17, 1990, Ser. No. 569,235

Claims priority, application Sweden, Feb. 22, 1988, 8800602-8

Int. Cl.⁵ F16F 9/18; B60G 11/26

U.S. Cl. 188—319

23 Claims



1. A control system for a shock absorber, said shock absorber having a piston/piston rod working in a cylinder filled with a flowable medium, said piston having upper and lower sides coupled by a pilot flow of said medium, said system comprising a first valve means for determining a size of a restriction to a principal flow of said medium between said upper and said lower sides of the piston, a second valve means responsive to said pilot flow for producing a first pressure space (P') for operating said first valve means, the first valve means having a position which is constantly in counterbalance between said first pressure space (P') and a second pressure space (P'') which is the differential (P1-P2; P2-P1) in the pressure between a space at an upper side (P1) and a space at lower side (P2) of said piston, and a proportional magnet associated with said second valve means for holding a constant pressure in the first pressure space (P') independently of any variations in parameters of said shock absorber.

5,090,526

SELF SUPPORTING, SELECTIVELY COLLAPSIBLE SOFT-WALLED CARRIER

Jeffrey M. Jacober, South Kingston, R.I., assignor to SGI Inc., Cranston, R.I.

Continuation of Ser. No. 457,341, Dec. 27, 1989, Pat. No. 4,984,662. This application Dec. 19, 1990, Ser. No. 629,839

The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

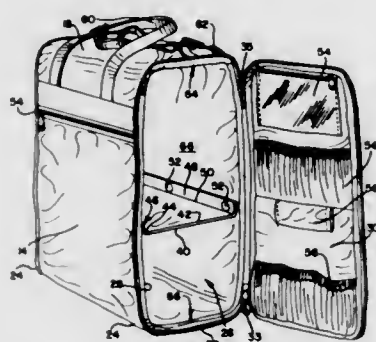
Int. Cl.⁵ A45C 7/00, 13/02, 13/08

U.S. Cl. 190—107

10 Claims

1. A self-supporting soft walled carrier comprising: a plurality of pliable panels including an upstanding end panel, a pair of upstanding side panels, a top panel and a bottom panel, said panels being joined together at their respective edges to form a shaped compartment body defining an inner body cavity having a generally rectangular mouth opening opposite the end panel, said carrier including a generally rectangular end cover panel for selectively opening and closing said mouth opening, said side panels, top panel and bottom panel each

having a resilient pliable construction, said carrier further including closure means for securing the end cover panel to said body, said closure means selectively joining or disjoining less than the full generally rectangular periphery of the end cover panel, the remainder of said full periphery including means for hingedly attaching the end cover panel to the body of the carrier, said carrier body having a height dimension



defined between said top and bottom panels and said carrier including a shelf member extending parallel to said top and bottom panels mounted in said body cavity intermediate the height of the carrier body and effective to subdivide the cavity into upper and lower sections, and said carrier further including means for rendering it self supporting in the absence of rigid framing.

5,090,527

PRESSURE CONTROL SYSTEM FOR LOCK-UP CLUTCH IN AUTOMOTIVE AUTOMATIC POWER TRANSMISSION WITH COMPENSATION OF FLUID PRESSURE IN LOW ENGINE SPEED RANGE

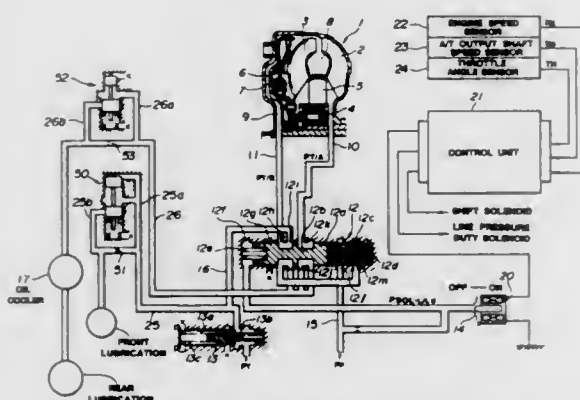
Hirofumi Imamura, and Mitsuaki Hashiba, both of Shizuoka, Japan, assignors to Jatco Corporation, Japan

Filed Sep. 21, 1990, Ser. No. 586,751

Int. Cl.³ F16D 33/16

U.S. Cl. 192—3.29

12 Claims



1. A pressure control system for a lock-up clutch of a lock-up type automotive automatic power transmission, comprising: a torque converter associated with an input element inputting driving torque from a prime mover and an output element for outputting driving torque, said torque converter including a lock-up clutch for establishing and releasing direct and mechanical connection between said input and output elements;
- a lock-up control fluid circuit connected to a pressurized fluid source which has a variable discharge rate depending upon an engine revolution speed, for adjusting fluid pressure to be applied to said lock-up clutch for engaging and disengaging said lock-up clutch depending upon vehicle driving condition;
- a lubricating circuit branched from said lock-up control

circuit for circulating part of working fluid flowing in said lock-up control fluid circuit for lubrication; and

- a flow restriction means associated with said lubricating circuit for continuously varying magnitude of flow restriction during operation of said pressurized fluid source depending upon discharge rate of said pressurized fluid source so as to reduce working fluid amount to be introduced into said lubricating circuit while the discharge rate of said pressurized fluid source is smaller than a given value.

5,090,528

TORQUE CONVERTER TO DRIVELINE COUPLER FOR DRAG-TYPE RACING

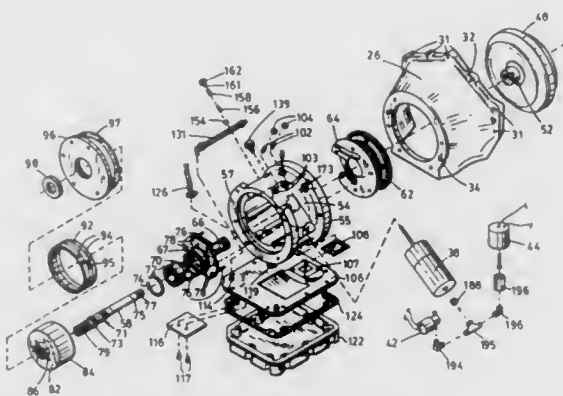
Bruno H. Massel, Bensenville, Ill., assignor to Bruno's Automotive Products, Inc., Bensenville, Ill.

Filed Feb. 25, 1991, Ser. No. 661,436

Int. Cl.³ F16D 33/00

U.S. Cl. 192—3.34

15 Claims



1. A coupler for a torque converter comprising: a main housing defining a pump chamber; a coupler shaft extending through the pump chamber having a torque converter engagement section extending away from the main housing adjacent to the pump chamber; a fluid pump within the pump chamber that engages and is driven by the torque converter when the torque converter engages the torque converter engagement section of the coupler shaft and that supplies fluid under pressure to the torque converter through a torque converter fluid supply passage; and a torque converter fluid pressure regulator that communicates with the fluid supply passage and allows fluid to flow from the fluid supply passage to a low pressure fluid reservoir in response to pressure in the fluid supply passage and that is adjusted from outside the main housing to increase or decrease the pressure of the fluid at which fluid is allowed to flow to the reservoir whereby the pressure of fluid supplied to the torque converter is adjusted from outside the main housing and the stall speed of the torque converter is thereby adjusted without disassembly of the main housing or any structure surrounding the torque converter.

5,090,529

BRAKE MECHANISM

Arthur J. Fahy, Double Bay; Neil Gillies, Earlwood, and Malcolm V. Wade, Meadowbank, all of Australia, assignors to IVG Australia Pty. Limited, Bankstown, Australia

Filed Sep. 28, 1990, Ser. No. 590,292

Claims priority, application Australia, May 16, 1990, PK0171

Int. Cl.³ B60K 41/26; F16D 55/48

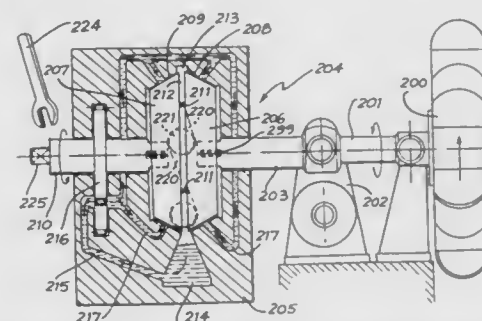
U.S. Cl. 192—8 R

19 Claims

1. A braking mechanism which becomes automatically effective

tive when there is a reversal in the direction of applied torque, comprising:

- two members having a common axis and between which relative rotation about the axis occurs when there is reversal in the direction of the applied torque;
- a housing surrounding the two members;
- a first braking surface provided on one of the members and a second complementary and opposed braking surface provided on the housing;
- first means accommodating change in the spacing between the two members to control the extent of the braking;
- second means responsive to a reversal in torque direction to permit change in the relative angular positions of the members;



- camming means incorporating thrust-resistant means and responsive to the change in the relative angular positions of the members, to alter the spacing between the members; resilient means for biasing the braking surfaces towards one another to induce the required braking action promptly when the direction of torque is reversed;
- a hydraulic pump operated by drive from one of the members and having an output side; and hydraulic ducts leading from the output side of the pump to the vicinity of the complementary braking surfaces to create a hydraulic cushion between them when the direction of torque through the mechanism is not reversed, the drive to the hydraulic pump diminishing, during braking, to collapse the cushion and permit prompt braking of the mechanism.

5,090,530

WRAP SPRING CLUTCH/BRAKE UNIT WITH SPRING DIFFERENTIAL ADJUSTMENT

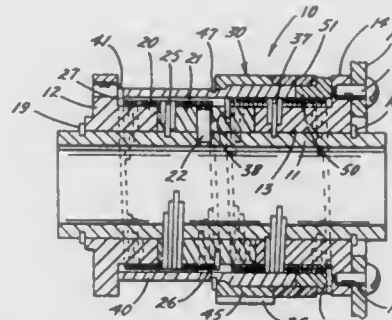
Michael F. Leone, Sewell, N.J., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 28, 1990, Ser. No. 635,307

Int. Cl.³ F16D 67/02

U.S. Cl. 192—128 A

5 Claims



1. A clutch/brake unit comprising rotatable input and output hubs, a rotationally fixed brake hub, a clutch spring telescoped over said input and output hubs and operable when contracted to couple said input hub and said output hub for rotation in unison, said clutch spring being operable when expanded to permit relative rotation of said input and output hubs, a brake

spring telescoped over said output and brake hubs and operable when contracted to couple said output hub to said brake hub and thereby prevent rotation of said output hub, said brake spring being operable when expanded to permit said output hub to rotate relative to said brake hub, and means for controlling said springs, said means comprising first sleeve means encircling said input hub and having inboard and outboard end portions, said clutch spring being anchored to said first sleeve means, the inboard end portion of said first sleeve means being splined, second sleeve means encircling said brake hub and having inboard and outboard end portions, said brake spring being anchored to said second sleeve means, the inboard end portion of said second sleeve means being splined complementary to and being telescoped with the inboard end portion of said first sleeve means.

5,090,531

ELECTROPHORETIC FLUID DIFFERENTIAL

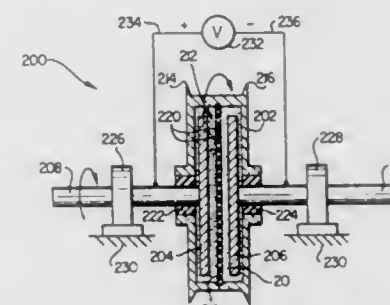
J. David Carlson, Cary, N.C., assignor to Lord Corporation, Erie, Pa.

Division of Ser. No. 463,245, Jan. 10, 1990. This application Jul. 18, 1991, Ser. No. 732,497

Int. Cl.³ F16D 27/00

U.S. Cl. 192—21.5

6 Claims



1. A differential apparatus for the transmission of torque between a primary element and secondary elements, said apparatus comprising means associated with said primary element defining an enclosed chamber for containing an electrophoretic fluid separable into particle-rich and particle deficient phases in the presence of an electric field, coaxially spaced, rotatable electrode plates within said chamber each connected respectively to one of said secondary elements, a grid fixed within said chamber between said plates, and means for applying a voltage potential between said plates for generating said electric field across said electrophoretic fluid, wherein upon application of said electric field said particle-rich phase of said fluid migrates to at least one of said plates and engages said grid thereby increasing the torque transmission between said primary element and at least one of said secondary elements.

5,090,532

DUAL TORQUE CLUTCH

Gary L. Bich, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Jan. 28, 1991, Ser. No. 646,406

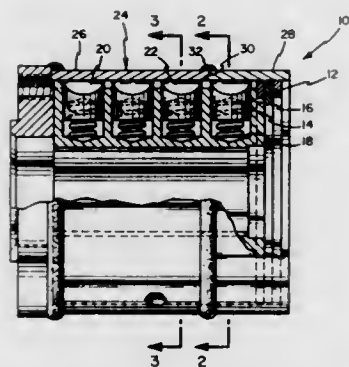
Int. Cl.³ F16D 43/202, 7/04

U.S. Cl. 192—56 R

6 Claims

1. A clutch assembly for preventing overloading in drive lines in machinery, said clutch assembly comprising: (a) a clutch housing assembly including a clutch hub and first and second sleeves connected together in operable engagement with said hub;
- (b) said first sleeve having a first set of recesses, said second sleeve having a second set of recesses;
- (c) said clutch hub having a plurality of biased drive members for releasably engaging said recesses of said first and second clutch sleeve;

- (d) said clutch hub being rotatable in forward and reverse direction;
 (e) said first set of recesses being shaped to transmit equal torque during rotation in both forward and reverse direction;



- (f) said second set of recesses being shaped to transmit more torque in the reverse direction than in the forward direction;
 (g) said first sleeve and said second sleeve having a combined length equal that of said clutch hub.

5,090,533
TEMPERATURE-SENSING TYPE FLUID FAN COUPLING DEVICE

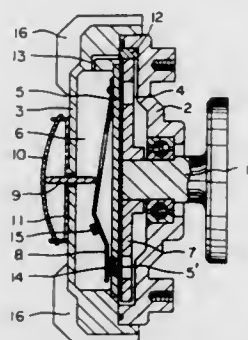
Hiroshi Inoue, Fuji, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Nov. 30, 1990, Ser. No. 620,139

Claims priority, application Japan, Dec. 1, 1989, 1-139827[U]
 Int. Cl.⁵ F16D 35/00, 43/25

U.S. Cl. 192—58 B

9 Claims



1. A temperature sensitive fluid fan coupling comprising:
 a closed housing formed with a cover having an outer periphery and a casing having an inner peripheral wall, said cover and said casing being supported on a rotating shaft through bearings, said rotating shaft being provided at an end thereof with a driving disc having an outer peripheral wall, said cover being provided on its outer periphery with a cooling fan, the inside of said closed housing being divided into an oil reservoir and a torque transmitting chamber by a partition plate having an oil outflow adjustment hole extending therethrough, said driving disc being disposed in said torque transmitting chamber;
 a dam formed on a portion of the inner peripheral wall of said casing facing the outer peripheral wall of said driving disc wherein oil is accumulated during the rotation of the fan;
 an oil circulating path being formed between said torque transmitting chamber and said oil reservoir through said dam;
 an elongated valve member disposed in said oil reservoir, an end of said valve member being fixed to said partition plate and another end of said valve member being mov-

able from a first position wherein said oil outflow adjustment hole is closed when an ambient temperature is below a predetermined value to a second position wherein oil may flow through said oil outflow hole when an ambient temperature exceeds a predetermined value, the movement of said valve member being made in response to a temperature sensing means which is deformed by the change of the ambient temperature so that the amount of oil flowing in a torque transmitting gap formed between said driving disc and said partition plate and between said driving disc and the outer portion of said casing is varied with temperature, thereby controlling the torque transmission from said rotating shaft to said closed housing;
 a tapered plug member disposed on the moveable end of said valve member fittable into said oil outflow adjustment hole, said plug member having a trapezoidal shaped cross-section; and
 a weight member disposed on said valve member adjacent the movable end thereof for biasing said valve member with centrifugal force.

5,090,534
SPACING RING FOR SPACING THE PLATES OF A VISCOUS COUPLING

Joachim Horst, Lohmar, Fed. Rep. of Germany, assignor to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

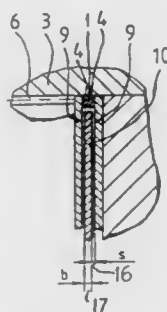
Filed Aug. 20, 1990, Ser. No. 570,292

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927587; Sep. 1, 1989, 3928975

Int. Cl.⁵ F16D 35/00

U.S. Cl. 192—58 B

7 Claims



1. A viscous coupling, comprising:
 a coupling housing (3) having axially extending inner teeth;
 a coupling hub (11) having axially extending outer teeth;
 a set of outer plates (9) provided with outer teeth which non-rotatingly engage the axially extending inner teeth of the coupling housing (3);
 a set of inner plates (10) provided with inner teeth which non-rotatingly engage the axially extending outer teeth (14) of the coupling hub (11), the plates of the inner and outer sets of plates being arranged in a given sequence; and
 spacing rings arranged between subsequent plates of one of said sets of inner and outer plates so as to provide gaps between the subsequent plates and thus fix the axial position of the subsequent plates, the plates of the other of said sets of plates being axially movable in the gaps between the spaced plates of the one set of plates, the spacing rings (1) having teeth (2) which fill tooth gaps of the teeth of one of the coupling housing (3) and the coupling hub (11), and the spacing rings (1) having a thickness which exceeds a thickness of the axially movable plates.

5,090,535
DRIVE UNIT PARTICULARLY FOR THE CALENDER OF A PAPER MACHINE

Christian Schiel, and Walter Reiter, both of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

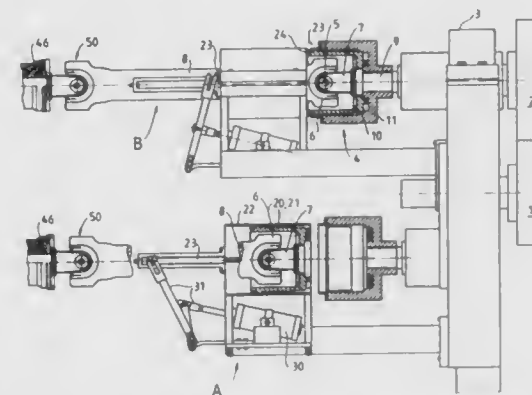
Filed Mar. 28, 1991, Ser. No. 676,875

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011143

Int. Cl.⁵ F16D 11/04

U.S. Cl. 192—67 R

11 Claims



1. A drive unit for a calender, said drive unit having a drive end and an output end, comprising:
 a first universal joint;
 a second universal joint, said second universal joint comprising a pair of joint halves;
 a pair of shafts, each of said shafts being coordinated with a separate one of said joint halves, wherein one of said shafts comprises a drive shaft and is arranged on the drive end of the drive unit, and the other of said shafts comprises an output shaft and is arranged on the output end of the drive unit, said drive shaft being connected at one end to a primary shaft through said first universal joint, said drive shaft being connected at the other end to said output shaft through said second universal joint;
 a clutch for engaging and disengaging said drive unit, said clutch comprising two generally cup-shaped clutch halves, a first one of said clutch halves being extendable along a shift path; said clutch halves being sized and arranged to be nested one within the other when said unit is in the engaged condition, whereby said bottom portions of said cup-shaped halves are situated in one of closely spaced and toughing relationship with each other; each of said clutch halves having a sidewall, and having teeth extending in the axial direction of said clutch halves generally across said sidewall;
 a shift mechanism operably associated with said second universal joint for actuating said clutch; and
 guide means coordinated with said second universal joint for guiding said joint along with said extendable clutch half on said shift path during operation of said clutch.

5,090,536
SELF ADJUSTER FOR PUSH TYPE CLUTCH
 Masaaki Asada, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Mar. 8, 1991, Ser. No. 666,772

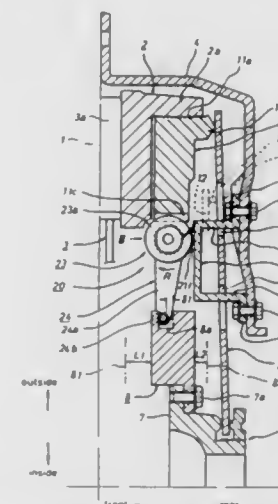
Claims priority, application Japan, Mar. 14, 1990, 2-26472[U]
 Int. Cl.⁵ F16D 13/75

U.S. Cl. 192—70.25

4 Claims

1. In a push-type clutch wherein a release bearing, to which an inner peripheral part of a diaphragm spring is coupled, is pushed toward a flywheel side and moves an outer peripheral part of said diaphragm spring in an opposite direction to release said clutch; a self adjuster for said push-type clutch having a clutch facing wear adjustment ring for contact with an

outer peripheral part of said diaphragm spring from a side of said diaphragm spring facing said flywheel threaded into an inside face of a pressure plate for movement in an axial direction relative to said clutch, a stay bracket having two support lugs extending adjacent an inner end of said adjustment ring with a width between said brackets in a clutch circumferential direction, secured to a clutch cover, a pin with each of its ends secured to a respective one of said support lugs, a worm wheel having a worm thread on its outer peripheral surface fitted onto one support lug side end of said pin and freely rotatable on said pin, said worm wheel having ratchet external teeth for one direction rotation of said worm wheel formed on said outer peripheral surface of said worm wheel on a support lug side end portion of said worm wheel and ratchet teeth on an end surface of said worm wheel, a stopper mating with said ratchet teeth on said outer peripheral surface of said worm wheel for preventing said worm wheel from rotating in a direction reverse to said one rotation direction and is secured to said stay bracket, a sensing lever having an arm extending in a direction radially inward of said clutch and installed on the



other support lug side of said pin for rotation on said pin and having a ratchet tooth surface thereon for engagement with said ratchet teeth on said end surface of said worm wheel, a tip end of said arm on said sensing lever being located in a concave portion at an outer peripheral surface of a bracket connected to said release bearing, said ratchet tooth surface on said sensing lever preventing said sensing lever from rotating in the rotatable direction of said ratchet external teeth and permitting said sensing lever to rotate in an opposite direction relative to said worm wheel, a spring member for pressing said sensing lever toward said worm wheel, said tip end of said sensing lever arm and said concave portion of said bracket and said ratchet teeth on said sensing lever and said worm wheel being relatively positioned for permitting said sensing lever to rotate relative to said pin upon movement of said bracket during clutch engagement and clutch release before said clutch facing wear without rotating said worm wheel and for rotating said worm wheel and racking said adjustment ring for moving said adjustment ring toward said diaphragm spring side after said clutch facing is worn.

5,090,537
TWIN CLUTCH
 Yoshinobu Fukuda, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 3, 1990, Ser. No. 621,207

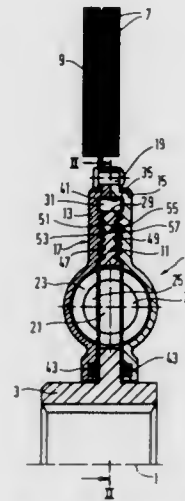
Claims priority, application Japan, Dec. 4, 1989, 1-315559
 Int. Cl.⁵ F16D 13/50

U.S. Cl. 192—70.27

3 Claims

1. A twin clutch, in which a pair of clutch discs are installed between a pressure plate and a flywheel of a flywheel assembly

housing part (17), wherein the disc part (11) and the housing part (17) limit, on a side located toward the axis of rotation (1) of at least one damper chamber, at least one shearing gap (47,



49) which is open toward the displacement compartments (37, 39) and into which at least a proportion of the damper fluid from the damper chambers can escape during the relative movement of disc part (11) and housing part (17).

5,090,543

DAMPER DISC

Hiroshi Takeuchi, Nayagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP90/00139, § 371 Date Oct. 2, 1990, § 102(e)

Date Oct. 2, 1990, PCT Pub. No. WO90/09532, PCT Pub.

Date Aug. 23, 1990

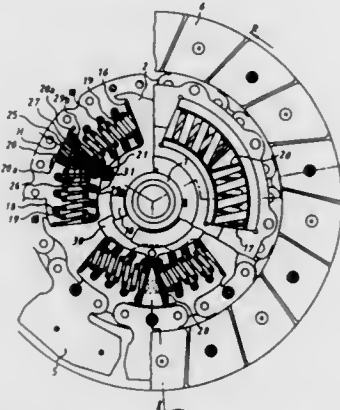
PCT Filed Feb. 5, 1990, Ser. No. 582,227

Claims priority, application Japan, Feb. 17, 1989, 1-18276[U]

Int. Cl.⁵ F16D 3/14

U.S. Cl. 192-106.2

3 Claims



1. A damper disc having an output side plate and input side plates at opposite sides of said output side plate, a plurality of circumferentially extending spring openings in said output side plate and said input side plates, at least two torsion springs in series in each of said spring openings for coupling said input side plates and said output side plate for transmitting torque through said disc, an intervening support plate between said two torsion springs in series and movable in opposite rotating directions of said disc, said support plate being formed with an approximately V-shape opening extending radially of said damper disc and having a pair of spring receiving surfaces vertical to a surface perpendicular to the axial center line of said output side plates, said spring receiving surfaces being formed on a folded metal plate having a boss part integrally

formed at the fold of said metal plate at the inner circumferential side of said support plate, said spring receiving surfaces abutting against the end surface of said torsion spring, said boss part being coupled to an annular coupling plate at the inner side of said support plate for movement in a radial direction by said torsion spring by a pin.

5,090,544

GRAIN DISTRIBUTOR

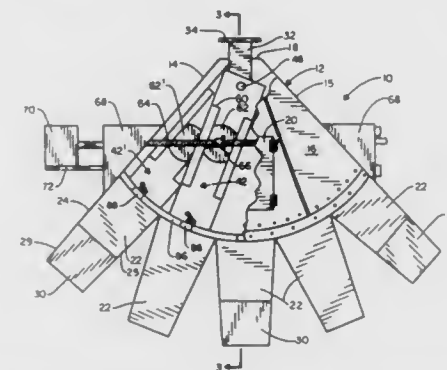
Marshall Carroll, 2060 22 Mile Rd., Sears, Mich. 49679

Filed Dec. 22, 1989, Ser. No. 455,547

Int. Cl.⁵ B65G 11/20

U.S. Cl. 193-31 A

21 Claims



1. In a grain distributor comprising a sector-shaped housing having a plurality of outlet openings in the arcuate periphery thereof, the improvement comprising:

at least two inlet openings in an upper portion of, said housing for receiving granular material;

at least two spouts, each of said spouts having an open upper end and an open lower end; and

means for independently mounting each of said spouts within said housing for swinging movement of the respective lower ends thereof for registry with each of said outlet openings while maintaining a respective open upper end thereof in registry with one of said inlet openings whereby granular material received in a respective inlet opening of a spout may be directed to a preselected one of said outlet openings.

5,090,545

SCREW GUN NOSE CONE ADAPTER

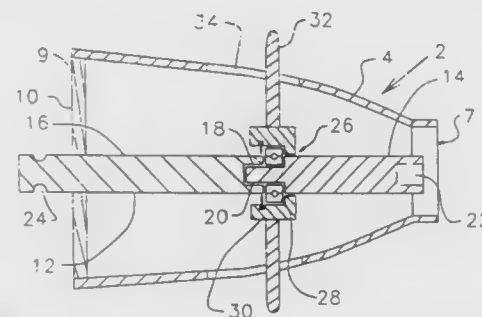
Alan E. Nassar, G-6 Foxtail La., Goffstown, N.H. 03045

Filed Oct. 25, 1990, Ser. No. 604,116

Int. Cl.⁵ F17D 23/00

U.S. Cl. 192-34

20 Claims



20. An adapter device, for attachment to a drive member having a clutch biased into disengagement for converting that drive member into a continuous positive rotational drive member, said adapter device comprising:

an outer casing having first and second opposed ends, the second end having means for engaging a drive end of the

drive member for attaching the adapter device to the drive member;

a drive shank, defining an axis, having a first end carrying means for engaging a member to be driven and a second end carrying means for engaging a drive output of the drive member;

bearing means, interacting with said outer casing via a handle member connect to said bearing means, for supporting said drive shank and allowing the drive shank to rotate relative to said outer casing;

said drive shank being axially movable relative to at least a portion of said outer casing, via the handle member, into first and second positions wherein, when said adapter device is attached to the drive member and the drive shank is in the first position, said drive shank causes continuous engagement of the clutch of the drive member and, when said drive shank is in the second position, said drive shank allows the clutch of the drive member to become disengaged but is movable in a direction of the clutch to cause engagement of the clutch, and means for releasably securing said drive shank in the first position.

5,090,546

DOOR/LEDGE ASSEMBLY FOR GRAVITY CHUTE

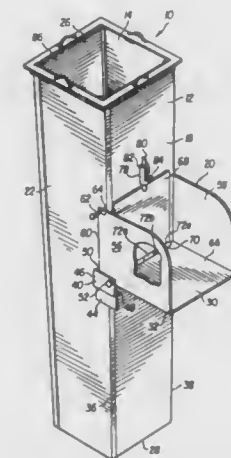
Daniel R. McDermott, Clinton, Md., assignor to Tribard, S.A., Luxembourg

Continuation of Ser. No. 280,914, Dec. 7, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 411,218

Int. Cl.⁵ B65G 11/16

U.S. Cl. 193-34

9 Claims



1. A gravity conveyor chute section of a type which can be engaged with other conveyor chute sections to form a gravity conveyor chute, the section comprising a sidewall having basically a tubular shape which guides items falling through a bore thereof, said section having an upstream end opening for receiving items dropped into said section from above and a downstream end opening for discharging said items passing through the bore of said section, at least one of said ends being selectively engagable with an adjacent section to form said conveyor chute to be longer than a single section whereby items serially fall through the bores of said thusly engaged sections, said section further defining a side opening through a panel of the sidewall thereof at a position intermediate said upstream and downstream ends through which items can be dropped into the bore of said section, said section including a door/ledge assembly mounted on said sidewall at said side opening, said door/ledge assembly comprising:

a ledge and a ledge-hinge means for hingedly attaching said ledge to said sidewall below said side opening for allowing said ledge to be selectively rotated to a laterally-extending position extending laterally away from said sidewall, thereby forming a ledge below said side opening, and to a covering position for covering said side opening, said

ledge being wider than the sidewall with first and second side edges of said width of said panel of ledge extending beyond first and second side edges of said panel;

first and second side supports respectively attached to said first and second side edges of said ledge for extending to, and engaging said sidewall for providing support to said ledge when it is in the laterally-extending position, said first and second side supports being respectively positioned beyond said first and second side edges of said panel so that when said ledge is moved to the covering position said first and second side supports move along the outer surface of said sidewall beyond the respective first and second side edges of said panel; and

a door and a door-hinge means for hingedly attaching said door to said chute section below said opening for allowing said door to be selectively rotated to said laterally-extending position with said ledge and to said closed position with or without said ledge;

whereby said ledge can be moved to said closed position without blocking said bore and can be moved to a laterally-extending position while allowing said door to be selectively opened and closed.

5,090,547

FASTENING AND/OR SUPPORT DEVICE FOR ROLLER BARS ON SUPPORT RAILS OR THE LIKE, PARTICULARLY OF CONTINUOUS SHELF SYSTEMS

Gerhard Schäfer, Neunkirchen, Fed. Rep. of Germany, assignor to Fritz Schäfer Gesellschaft mit beschränkter Haftung, Fed. Rep. of Germany

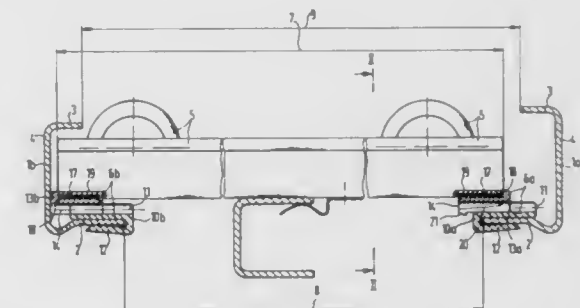
Filed Mar. 20, 1991, Ser. No. 678,539

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1990, 9003313

Int. Cl.⁵ B65G 13/00

U.S. Cl. 193-35 R

11 Claims



1. In a fastening and/or support device for roller bars on support rails which extend transversely of the roller bars, particularly in continuous shelf systems, the device including locking bars which extend in longitudinal direction of the support rails and can be fastened to the support rails, wherein the ends of the roller bars can be fixed in predetermined locking recesses provided on the locking bars, and wherein the locking recesses are arranged distributed over the longitudinal direction of the locking bars, the improvement comprising:

a head member each being provided between the locking bar and a corresponding end of each roller bar,

each head member having at an underside thereof several locking projections which are spaced from each other at a distance which corresponds to an integer multiple of the distance between two adjacent locking recesses in the locking bar,

each head member being in releasable support engagement through its locking projections with any of the locking recesses of the locking bar and each head member being guided in the locking recess so as to be displaceable over the width of the locking bars, and

each head member being provided above the locking projec-

tions with coupling engagement means for an end of the roller bar, wherein the coupling engagement means includes a transverse stop means for an end edge of the roller bar.

5,090,548

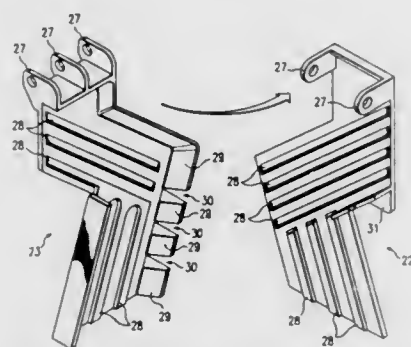
COIN HANDLING SYSTEM

John A. Hird, Dallas, and Mark E. Kerr, Wylie, both of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Oct. 9, 1990, Ser. No. 594,272

Int. Cl.⁵ G07F 1/04

U.S. Cl. 194—345



6. A coin handling system for use in a coin operated machine with a coin validator, comprising:

a chute for guiding coins into the coin validator comprising first and second chute pieces, wherein one of said first and second chute pieces comprises a bevel at an edge of said one piece such that when said one piece is joined with said other piece, said first and second chute pieces divide if said bevelled edge is forcibly impacted by a foreign object inside said chute; and

means for moving said chute from a rest position proximate to the coin validator to a second position away from the coin validator and dividing said first and second chute pieces after said chute reaches said second position.

5,090,549

CONVEYOR SYSTEM

Hans-Joachim Thiel, Rheurdt, Fed. Rep. of Germany, assignor to Krupp Industrietechnik Gesellschaft mit beschränkter Haftung, Duisburg, Fed. Rep. of Germany

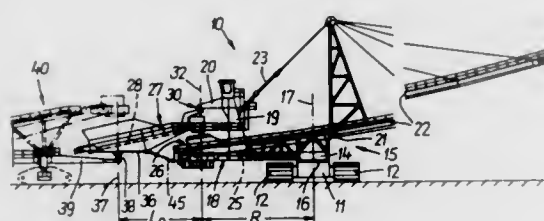
Filed Oct. 3, 1990, Ser. No. 592,347

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1989, 3934053

Int. Cl.⁵ B65G 21/10

U.S. Cl. 198—312

3 Claims



1. A conveyor system comprising:

a back arm pivotal about a first vertical axis;

a discharge arm pivotal about a horizontal axis and about the first vertical axis;

a discharge belt mounted on said discharge arm, the discharge belt extending rearward, beyond the first vertical axis, to the back arm; and

a connecting bridge pivotal about second and third vertical axes, and supported on a separate, movable device so as to be longitudinally displaceable, the connecting bridge being articulated to a component of the conveyor system

above the back arm, the second vertical axis being spaced from the first vertical axis at a predetermined distance and disposed diametrically opposite a discharge end of the discharge belt with respect to the first vertical axis; and a connecting belt mounted on said connecting bridge and feeding the discharge belt.

5,090,550

BELT CONVEYOR WITH TWO SECTIONS AT A VARIABLE ANGLE

Norbert Axmann, Sinsheim-Ho, Fed. Rep. of Germany, assignor to Firma Axmann-Fördertechnik GmbH, Sinsheim-Steinsfurt, Fed. Rep. of Germany

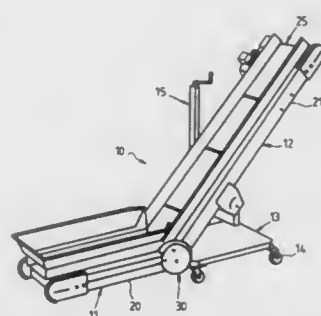
Filed Oct. 19, 1990, Ser. No. 600,409

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1989, 3935175

Int. Cl.⁵ B65G 15/26

U.S. Cl. 198—313

4 Claims



1. A belt conveyor comprising: two conveying sections pivotable at variable angles to each other; said conveyor having ends and at least one deflection roller with an axis of rotation at each end; a continuous belt traveling over said deflection roller; means for driving said deflection roller; means for shifting said deflection roller perpendicular to said axis of rotation, a section of said belt being associated with each conveyor section; said two conveying sections having two channels positionable at variable angles relative to each other through a pivoting axis parallel to said axis of rotation of said deflection roller, said belt having sides and an upper strand and a lower strand; said channels having walls at each side of said belt and extending above said upper strand; guide rollers adjacent said pivot axis and between said conveying sections for deflecting said belt; said pivot axis being located above both said lower strand and said upper strand of said belt; said walls of said channels overlapping throughout the range of said angles between said two conveying sections; means for supporting resiliently said axis of rotation of said deflection roller along said belt, said supporting means having substantially the same resilience over said range of angles between said conveying sections, said range of angles being less than 180 degrees, said walls of said conveying sections extending over said upper strand and over said sides of said belt.

5,090,551

MAN CONVEYOR

Yoshihito Yasuhara, and Toshio Saitou, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1991, Ser. No. 658,294

Claims priority, application Japan, Feb. 20, 1990, 2-37188; Mar. 8, 1990, 2-54855

Int. Cl.⁵ B66B 9/00

U.S. Cl. 198—323

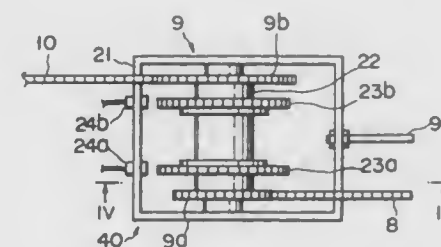
8 Claims

1. A conveyor for transporting people, comprising:

a body frame;

a large number of treadboards supported on the body frame for movement along a predetermined path;

a moving handrail supported on the body frame for movement along a predetermined path; first drive means for moving the treadboards; second drive means for moving the handrail in interlock with the first drive means, said second drive means including a handrail drive section engaging the handrail, and means for transmitting the driving force of the first drive means to the handrail drive section, said transmitting means including a transmission shaft rotatably supported on the body frame, first and second engaging sections provided on the transmission shaft so as to be rotatably integrally therewith and spaced in the axial direction of



the transmission shaft, a first power transmission member stretched between the first drive means and the first engaging section, for rotating the transmission shaft in interlock with the first drive means, and a second power transmission member stretched between the second engaging section and the handrail drive section, for driving the handrail drive section in interlock with the rotation of the transmission shaft; and means for detecting a change of the moving speed of the moving handrail by detecting a twist of the transmission shaft attributable to the difference between loads acting on the first and second engaging sections.

5,090,552

THREE DIMENSIONAL SORTING APPARATUS

Kiyoshi Fukuyama, Moriyama; Toru Wada, Shiga; Kozo Kitabata, Moriguchi; Masahiro Sudare, Higashi-Osaka; Shigemi Tsuchitani, Toyono, and Kazuya Ohminami, Himeji, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Feb. 12, 1991, Ser. No. 654,484

Claims priority, application Japan, Feb. 14, 1990, 2-31372

Int. Cl.⁵ B65G 47/46

U.S. Cl. 198—365

12 Claims



1. A three dimensional sorting apparatus wherein a plurality of frame members, supported for circulating movement by means of annular rails, are connected to each other by means of links; a tray supporting member is mounted for up and down movement on each of said frame members; and change-over rails, controlled to move up and down, are provided at a position between a first guide rail for guiding and holding said tray supporting members at a first level and a plurality of secondary guide rails for guiding and holding the tray supporting members at different levels.

5,090,553

PROCESS AND CONVEYING APPARATUS FOR THE CONVEYANCE OF OBJECTS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

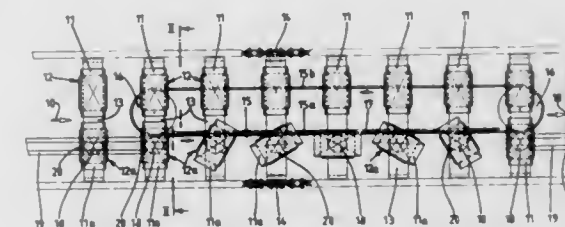
Filed Apr. 30, 1990, Ser. No. 516,578

Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915246

Int. Cl.⁵ B65G 17/32

U.S. Cl. 198—377

18 Claims



1. A process for conveying first and second packages side-by-side in first and second adjacent parallel rows, respectively, in a conveying direction along a conveying path, comprising the steps of:

placing the packages of both rows in a first angular orientation;

while simultaneously conveying the packages in both rows, turning the first packages in the first row to place them in a second angular orientation rotated by 180° relative to said first angular orientation, and retaining the second packages in the second row in said first angular orientation; wherein said turning step comprises turning each of the first packages around an axis perpendicular to a plane containing said conveying path and said first and second parallel rows;

providing an endless moving member having a movement in said conveying direction and extending in said conveying direction adjacent said first row; and

rotatably supporting the first packages in said first row on respective first carriers which engage said moving member to turn each first package from said first angular orientation to said second angular orientation.

5,090,554

ROTARY DEVICE TO CHANGE THE DIRECTION OF ADVANCEMENT OF A PLASTIC CARD OR METAL PLATE IN A PUNCHING MACHINE

Oliviero De Sanctis, Carnate, Italy, assignor to Fima S.p.A., Milan, Italy

Filed Mar. 15, 1991, Ser. No. 669,989

Claims priority, application Italy, Mar. 20, 1990, 19727 A/90

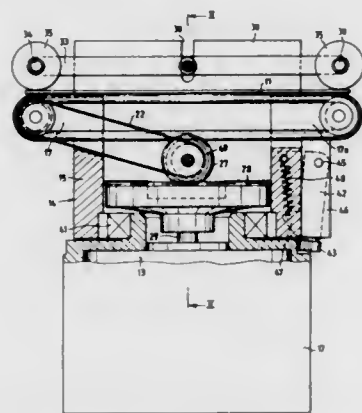
Int. Cl.⁵ B65G 29/00

U.S. Cl. 198—414

10 Claims

1. Rotary device which performs the task of changing the advancement direction of a plastics card or metal plate in a punching machine, which device is constituted by a bearing structure, a linear conveyor for said plastics card or metal plate and a drive motor means, characterized in that said bearing structure comprises a lower, fixed, hollow framework, inside which said drive motor means is housed, above which an upper, rotary framework is rotatably supported, on which upper framework said linear conveyor is positioned, with a first positive transmission being provided, which connects said drive motor means with said upper rotary framework of said bearing structure and causes said upper, rotary framework to rotate by a predetermined angular rotation, and a second positive transmission being provided as well, which connects said drive motor means with said linear conveyor which conveys

said plastics card or metal plate, with between said two positive transmissions and said drive motor means two free-wheel



mechanisms being interposed, which cause said two positive transmissions to be selectively actuated.

5,090,555

CONVEYOR OF CONNECTED CARRIAGES

Tetsuzo Kura, Sayama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

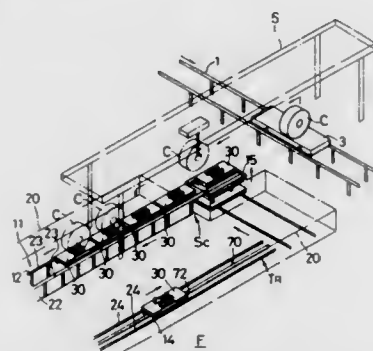
Filed Apr. 27, 1990, Ser. No. 514,379

Claims priority, application Japan, Apr. 28, 1989, 1-107447

Int. Cl.⁵ B65G 29/00

U.S. Cl. 198—465.1

13 Claims



1. A conveyor of connected article-supporting carriages comprising rail means disposed along a conveying path, a plurality of article-supporting carriages supported by, and arranged to travel on said rail means, connecting means provided at the front and rear ends of each article-supporting carriage for connecting said article-supporting carriages together, tow pin receiving means on each article-supporting carriage, and driving means, movable through a predetermined distance, for effecting movement of a connected group of said article-supporting carriages in a forward direction along said conveying path, said driving means including a tow pin carriage, means for effecting reciprocating movement of said tow pin carriage along a portion of said conveying path, and means for selectively moving said tow pin into and out of engagement with the tow pin receiving means on said conveying carriages, said tow pin receiving means, when engaged by said tow pin, preventing relative movement of the connected carriages and said tow pin carriage in both the forward and reverse directions along the conveying path, whereby the connected article-supporting carriages in the conveying path on said rail means are movable along said conveying path by the engagement of said tow pin with the tow pin receiving means of one of said connected article-supporting carriages followed by movement of said tow pin carriage, and the connected article-supporting carriages in the conveying path are stopped by stoppage of the

movement of said tow pin carriage, followed by disengagement of the tow pin from said tow pin receiving means.

5,090,556

PALLET TRANSFER CORNER SYSTEM

William D. Ach, Brookline; Edmund J. Anderson, Minneapolis; Lynn B. Behrends, Delano; Wayne P. Desrude, Brooklyn Park, and Gene J. Klos, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 204,103, Jun. 8, 1988, Pat. No. 4,989,721.

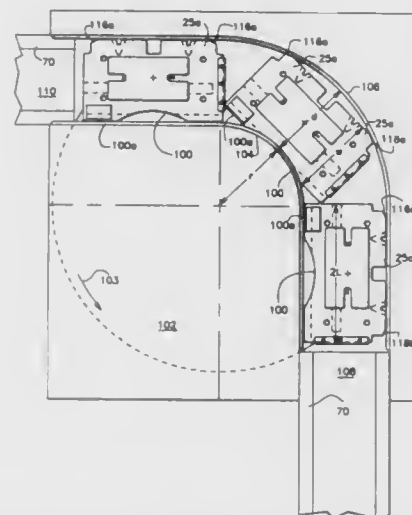
This application Sep. 10, 1990, Ser. No. 579,528

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.⁵ B65G 29/00

U.S. Cl. 198—465.1

13 Claims



1. A pallet transfer corner system, comprising:

a transfer mechanism having a corner portion centered about an axis and guide rail means defining the path of pallets of different lengths around said corner, including a curved inner guide rail having a radius of curvature of r and a curved outer guide rail having a radius of curvature of r plus d ; and

pallets having a nominal width of W , at least one small pallet having a nominal length L and at least one large pallet having a nominal length which is longer than L , said large pallet having at least one sidewall with an arcuate surface forming a substantial portion of said large pallet sidewall for cooperating with the adjacent guide rail such that the maximum distance from said axis to said outer sidewall does not exceed r plus d .

5,090,557

SIDE GRIP MEMBER FOR CONVEYOR SYSTEMS

Don Carmen, 21524 Hoover, Apt. 304, Warren, Mich. 48089

Filed Jun. 1, 1990, Ser. No. 531,959

Int. Cl.⁵ B65G 15/14

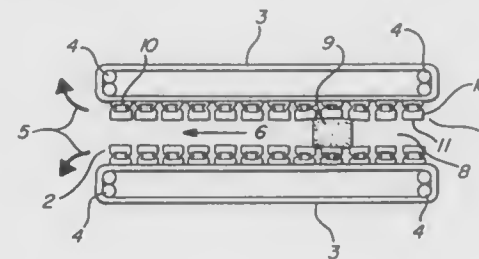
U.S. Cl. 198—626.1

17 Claims

1. A side grip member for use with a side grip conveyor of the type having a pair of closed loops of chains each consisting of separate links, the two loops being arrayed so as to include sections which extend parallel to and closely spaced from one another to form a conveyor channel between the two sections, the side grip member comprising:

a holder adapted to be connected to a link and a unitary gripping member adapted to be removably attached to said holder, said gripping member comprising a single piece structure which includes a relatively rigid object engaging section and relatively resilient section for supporting said object engaging section with respect to said

holder, said relatively resilient section being formed integrally with and substantially of the same material as said relatively rigid object engaging section, such that, when the gripping member is mounted on said holder, said



object engaging section projects into said conveyor channel to engage objects to be transported and forces imposed on said conveyor channel causes deformation of said resilient supporting section, without substantial deformation of said object engaging section.

5,090,558

SHELF APPARATUS UTILIZING ROLLERS

Gokichi Hatouchi, Komaki, Japan, assignor to Daifuku Co., Ltd., Japan

Continuation-in-part of Ser. No. 280,711, Dec. 6, 1988,

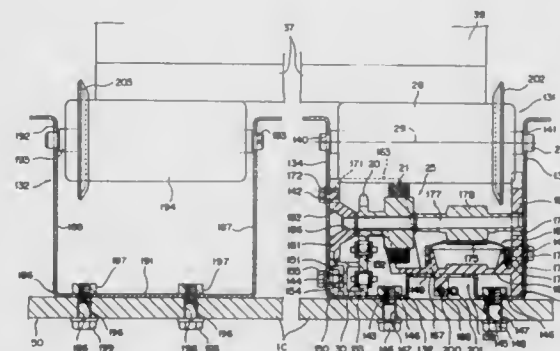
abandoned. This application Sep. 27, 1990, Ser. No. 589,393

Claims priority, application Japan, Dec. 15, 1987, 62-190585[U]; Feb. 2, 1988, 63-13430[U]; Feb. 9, 1988, 63-16119[U]; Feb. 9, 1988, 63-16120[U]; Mar. 17, 1988, 63-35625[U]; May 18, 1988, 63-65292[U]; May 18, 1988, 63-65293[U]; May 18, 1988, 63-65294[U]; Mar. 2, 1990, 2-21690[U]

Int. Cl.⁵ B65G 13/06

U.S. Cl. 198—781

8 Claims



1. A shelf apparatus using rollers, comprising

a shelf frame,

conveyor means disposed in a plurality of vertically spaced stages within said shelf frame, each of said conveyor means defining a horizontal plane and having two rows of roller conveyors defining a conveying path upon which loads are transported at least one of said two rows of roller conveyors being capable of exerting feed force to the loads along said conveyor means,

a plurality of free rollers arranged for idle rotation along a conveying path and included in each of said two rows of roller conveyors, and

driving means by which said at least one of said two rows of roller conveyors capable of exerting feed force to the loads along said conveyor means is adapted to come in frictional engagement and break frictional engagement with said free rollers and subject said free rollers to forced revolution as long as the frictional engagement is maintained.

5,090,559

REUSABLE GARMENT BAGS FOR DRYCLEANING

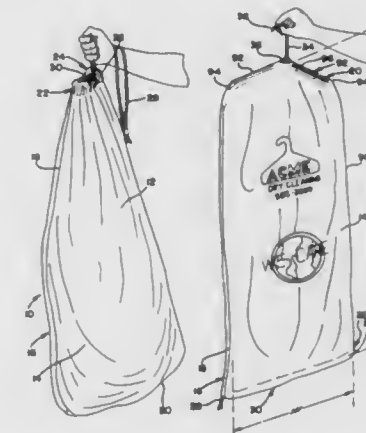
Alan Gendreau, Elgin, Ill., assignor to Safety Kleen Corp., Elgin, Ill.

Filed Nov. 19, 1990, Ser. No. 615,468

Int. Cl.⁵ B65D 85/18

U.S. Cl. 206—278

6 Claims



1. A reusable dry cleaning garment bag comprising:

an elongate bag body defined by a pair of web portions joined together along respective peripheral edges thereof, said bag body including an open end having releasable closure means including a cinchable drawstring slidably enclosed in a peripheral hem provided in said open end and having a permanently closed end having a small hanger hook opening, said garment bag further including hanger holder means on said bag body for receiving, storing and accumulating a plurality of hangers to be returned to the dry cleaner for reuse, said hanger holder means including a hanger receiving pocket defined on said bag body configured to receive a plurality of empty hangers to be returned, said hanger receiving pocket having a pocket opening with releasable closure means, said garment bag being useful in an open-end-up orientation to receive and carry clothing articles to be dry cleaned and being useful in a closed-end-up orientation to surroundingly protectively receive returning cleaned clothing articles arranged on hangers with a hook end of each hanger being received through said hanger hook opening.

5,090,560

DEVICE FOR ACCOMMODATING FLAT BLISTER PACKS, AND BLISTER PACK

Otto Schubert, Vienna, Austria, assignor to Lift Verkaufsgerate-Gesellschaft M.B.H., Austria

PCT No. PCT/AT88/00037, § 371 Date Jan. 29, 1990, § 102(e) Date Jan. 29, 1990, PCT Pub. No. WO88/09141, PCT Pub. Date Dec. 1, 1988

PCT Filed May 26, 1988, Ser. No. 455,435

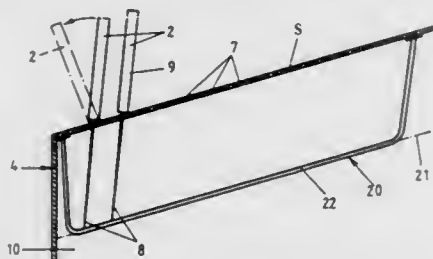
Claims priority, application Australia, May 27, 1987, 1360/87 Int. Cl.⁵ B65D 85/57; A47F 5/00

U.S. Cl. 206—309

12 Claims

1. A device accommodating and displaying generally flat blister packs, each of which has an upper accommodation portion accommodating and packing a generally flat article and a lower extension portion with a thickness being thinner than the upper accommodation portion, said device comprising at least one supporting base supporting the flat blister packs in a substantially erect position, said supporting base constituting an upper surface of and defining thereunder an accommodation space; a plurality of slot-shaped openings formed on said supporting base through which the lower extension portions of the flat blister packs are inserted into the accommodation space and supported by their upper accommodating portions at

edges of said slot openings respectively; and an abutment means provided at a distance below and being parallel to the



supporting base abutting lower edges of the extension portions of the flat blister packs thereby inclining the flat blister packs towards the supporting base.

5,090,561

COMPACT DISC PACKAGE

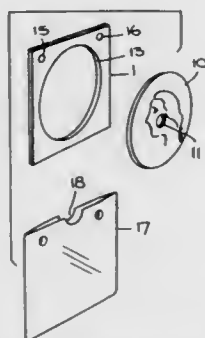
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed May 16, 1991, Ser. No. 701,078

Int. Cl.⁵ B65D 85/30

U.S. Cl. 206—313

9 Claims



1. A compact disc package in a card format comprising:
 - (a) a compact disc having a picture of a character printed on one face thereof and a spiral track recording on the other face whose subject matter is related to the pictured character;
 - (b) a rectangular card formed of relatively stiff, flexible material having a circular recess therein in which the disc is nested to provide a loaded card, the thickness of the card being such that neither face of the disc protrudes from the card; and
 - (d) a sleeve formed of transparent plastic material receiving the disc-loaded card and having substantially the same dimensions, whereby the picture is visible through the sleeve.

5,090,562

PROTECTIVE CASE FOR PORTABLE SOUND-PLAYING DEVICE

Winslow C. Grullemans, Road #1-216, Williamsburg, Mass. 01096

Filed Apr. 23, 1991, Ser. No. 690,076

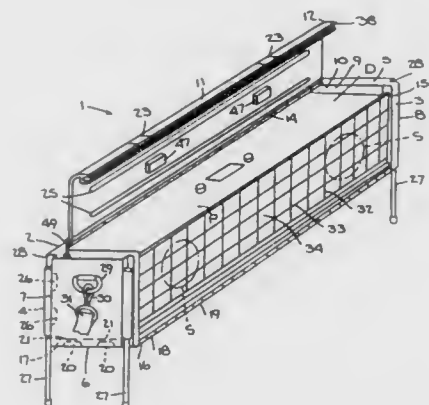
Int. Cl.⁵ B65D 85/00; A47B 81/06

U.S. Cl. 206—320

18 Claims

1. Protective case for shipping and for using in place therein a portable sound-playing device, comprising
 - a housing resembling a rectangular box, and having a front side, a rear side, a top side, a bottom side and opposed lateral sides forming a hollow interior adapted to receive protectively such a portable sound-playing device,
 - the top side having a top opening between the lateral sides that is closed by a top cover having a front edge and a rear edge, the front edge defining a free edge and the rear edge being hinged to the housing adjacent the rear side to pivot the top cover from a closed position upwardly and rear-

wardly to an open position to insert such a portable sound-playing device into the interior, the bottom side having an external recess, the front side having a front opening between the lateral sides that is closed by a front cover having an external protrusion releasably engageable in the recess, the front cover further having a top edge and a bottom edge, the top edge defining a free edge and the bottom edge being hinged to the housing adjacent the bottom side to pivot the front cover from a closed position forwardly and downwardly and then rearwardly and upwardly to a self-storing position generally parallel to the bottom side



and in which the protrusion engages the recess, for unhindered sound transmission from such a portable sound-playing device via the front opening after such a portable sound-playing device has been inserted into the interior of the housing,

the free edge of the top cover and the free edge of the front cover being arranged for interengagement to form a closure seam when the covers are in the closed position, and moisture-impeding edge-sealing formations disposed along the top opening, front opening and one of the free edges forming the seam to seal the covers to the housing and to each other when in the closed position.

5,090,563

ELECTRO-STATIC PROTECTIVE CONTAINER FOR ELECTRICAL COMPONENTS

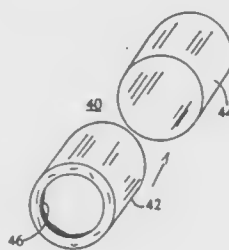
Raymond P. Becker, Gurnee, Ill., assignor to Conductive Containers, Inc., Northbrook, Ill.

Continuation-in-part of Ser. No. 475,334, Feb. 5, 1990, Pat. No. 5,014,849. This application Jan. 18, 1991, Ser. No. 644,032

Int. Cl.⁵ B65D 73/02, 85/20, 11/58

U.S. Cl. 206—328

5 Claims



1. A protective container for electrical components which are susceptible to damage from the discharge of electro-static charges, the container comprising:
 - a first part having a hollow body including a laminate of paperboard and first and second layers of electrically conductive material adjacent the inside and the outside surfaces of the

paperboard, and an end portion, integrally secured to the hollow body, including a laminate of paperboard and at least one layer of electrically conductive material making conductive contact with the conductive material of the hollow body; and

a second part having a hollow body including a laminate of paperboard and first and second layers of electrically conductive material adjacent the inside and the outside surfaces of the paperboard, and an end portion, integrally secured to the hollow body, including a laminate of paperboard and at least one layer of electrically conductive material making conductive contact with the conductive material of the hollow body;

wherein the outside diameter of the first part and the inside diameter of the second part are approximately the same dimension so that they slidably and removably interlock.

5,090,564

PROTECTIVE CONTAINER FOR A NEEDLE

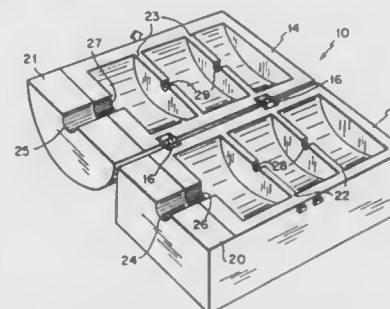
Vincent J. Chimienti, 2 Osborne La., Greenvale, N.Y. 11548

Filed Jan. 25, 1991, Ser. No. 646,660

Int. Cl.⁵ B65D 85/20

U.S. Cl. 206—365

7 Claims



1. A disposable needle sheath for receiving, containing, and disposing of a used hypodermic needle comprising:
 - a needle container which has two substantially similar halves which are flexibly connected so as to permit orientation of the halves in an open position and a non-releasably closed position, and
 - a set of ribs, disposed within said needle container, including centrally disposed channels for receiving the needle body in said open position and ridges lining said channels which are capable of gripping the surface of the needle body when said needle container is in said non-releasably closed position, whereby when said container halves are non-releasably closed around a needle on a syringe, said needle sheath receives and frictionally retains the needle, thereby allowing the needle to be safely twisted off a syringe and disposed of along with the needle sheath.

5,090,565

ADHESIVE TAPE HOLDER

Chung-Ching Wang, Taipei, Taiwan, assignor to Seal King Industrial Co., Ltd., Taipei, Taiwan

Filed Jan. 8, 1991, Ser. No. 638,815

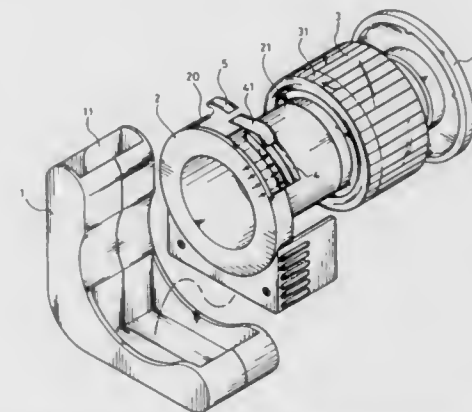
Int. Cl.⁵ B65D 85/671

U.S. Cl. 206—411

2 Claims

1. An adhesive tape holder for a tape roll comprising:
 - a base plate being substantially L-shaped having a rectangular cavity in a horizontal portion thereof,
 - a roller plate connected to a roller for receiving said adhesive tape roll, the outer edge of the roller plate being provided with a notch having an engaging slot at one end, the roller plate being mounted within the rectangular cavity of the base plate,
 - an urging member mounted at one end of the notch, the urging member having an upper end provided with a downward curved elastic urging plate;
 - a pressing plate mounted at an opposite end of the notch and

having one end thereof pressed against the urging plate; and



a lateral cap on the roller to prevent falling off of the tape roll.

5,090,566

PAPER ROLL HEADER AND PAPER ROLL WRAPPER ASSEMBLY

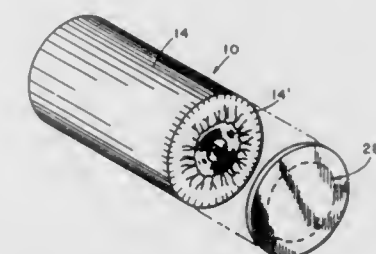
George S. Yount, San Marino, Calif., assignor to Fortifiber Corporation, Los Angeles, Calif.

Filed Jan. 7, 1991, Ser. No. 638,096

Int. Cl.⁵ B65D 85/66

U.S. Cl. 206—416

6 Claims



1. A paper roll header comprising:
 - a header plate having an inner face and an outer face;
 - a first waterproof polymeric coating over said inner face;
 - said coating having thermoplastic character to be heat-softenable for bonding at a predetermined elevated temperature;
 - said inner face having a central zone and an outer annular zone;
 - a second coating covering said first waterproof polymeric coating only in said central zone, thereby leaving said first coating exposed only in said annular zone; and
 - said second coating being nonsoftenable at said predetermined elevated temperature, whereby said header plate is sealably attachable to a paper roll wrapper only in said annular zone by a heated platen pressed against said header plate.
5. A paper roll, wrapper and header assembly comprising:
 - a cylindrical roll of wound paper having a periphery and a pair of ends;
 - a wrapper around said periphery having portions crimped over the outer annular portions of said ends while leaving the central portions uncovered by said wrapper;
 - a header on each end of said roll, externally of said wrapper, said header having an inner face in abutment with said crimped portions of said wrapper and having inner face central portions adjacent said central roll portions;
 - said header also having an outer face;
 - said inner face being coated with a waterproof polymer having a predetermined softening temperature;

the outer radial portion of said inner face being sealingly bonded by said polymer to said crimped portions of said wrapper; and
a second coating on said central portions of said inner face, said second coating being nonsoftenable at said predetermined softening temperature, and said central portions of said inner face being adjacent said central portions of said roll uncovered by said wrapper, but not bonded thereto.

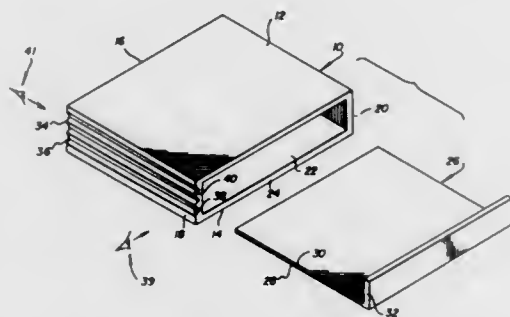
5,090,567

STORAGE PHOSPHOR PLATE CASSETTE HAVING VISUAL FEEDBACK FEATURE
John C. Boutet, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,401
Int. Cl.⁵ B65B 85/00

U.S. Cl. 206—455

3 Claims



1. A photo-stimulable storage phosphor cassette comprising:
a storage phosphor plate;
cassette means for housing said storage phosphor plate; and
said cassette means including visual feedback means for providing a visual indication of whether said cassette is positioned upside down or right side up, wherein said cassette means includes a side wall and said visual feedback means includes at least one groove in said side wall having first and second surfaces with different visual characteristics said surfaces being primarily viewable from different directions, such that, when viewed from the same direction, observation of said first surface visual characteristic indicates the cassette is positioned right side up and observation of said second surface visual characteristic, indicates the cassette is positioned upside down, wherein said different visual characteristics are different colors on said first and second surfaces.

5,090,568

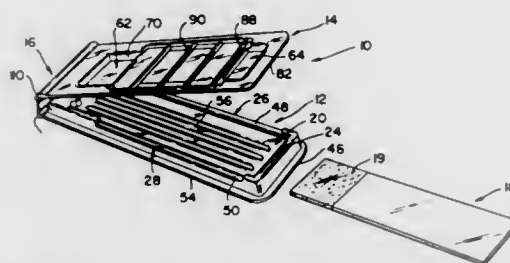
GLASS SLIDE MAILER

Tenny P. Tse, Cooper City, Fla., assignor to Mediscand (U.S.A.), Inc., Hollywood, Fla.

Filed Mar. 11, 1991, Ser. No. 667,212
Int. Cl.⁵ B65D 85/48

U.S. Cl. 206—456

22 Claims



1. A glass slide mailer, the combination comprising:
a base having a glass slide receiving cavity define by a first end wall, a second end wall, a pair of side walls, and a

bottom wall, said first and second end walls each having an inner surface facing said cavity;
a cover having a first protrusion extending therefrom and frictionally engageable with said inner surface on said first end wall of said base, and a second protrusion extending therefrom and frictionally engageable with said inner surface on said second end wall of said base, said first protrusion having a portion engageable with the glass slide; and
a hinge section having a first hinge pivotally interconnecting said hinge section and said base, and a second hinge pivotally interconnecting said hinge section and said cover.

5,090,569

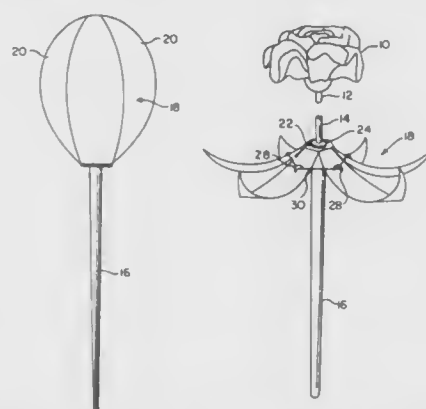
PACKAGE

Michael Nissen, and Marianne Zerlang, both of Paltholmter-rasserne 36 F, 3520 Farum, Denmark

Filed May 22, 1991, Ser. No. 704,081
Int. Cl.⁵ B65D 85/00

U.S. Cl. 206—457

11 Claims



1. A reusable packaging device in the nature of a joke or novelty item or advertising article, said device comprising an outer shell assembly in which an object to be packaged can be housed prior to use thereof or during interruptions in that use, said shell assembly including at least two shell parts which, in the closed position thereof, surround the object, an elongate support member on which said shell assembly is mounted and including means for supporting the object, hinge means for pivotally connecting said shell parts at one end thereof to said support member so that said shell parts can pivot between a first, closed position in which the shell parts surround and enclose the object and a second, open position, and resilient means secured to said shell parts for biasing said shell parts toward said support member so as to tend to maintain said shell parts in said first position when said shell parts are moved to said first position and to maintain said shell parts in said second position when said shell parts are moved to said second position.

5,090,570

PACKAGE FOR A SMALL FRAGILE ITEM

Alvin E. Todd, P.O. Box 924, Pigeon Forge, Tenn. 37868-0924

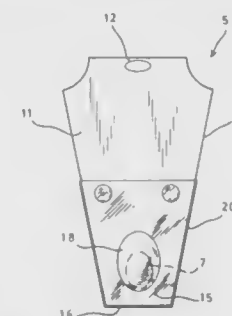
Filed Jul. 9, 1990, Ser. No. 549,606
Int. Cl.⁵ B65D 73/00, 81/02

U.S. Cl. 206—463

2 Claims

1. A package for protecting a small fragile item during shipment and subsequent display; said package comprising:
an encapsulating shell member constructed of a semi-rigid transparent material which allows said small fragile item to be carried in said package to be viewed substantially around its perimeter, said encapsulating shell member having two substantially planar members comprising first and second ends, said second ends being pivotally connected and defining a lower end of said package, said substantially planar members further comprise cooperat-

ing concave indentations whereby said concave indentations cooperate to define a cavity which encapsulates said small fragile item to be contained within said package;
a board member having means for suspending said package from a display rack and further having display indicia means to identify said small fragile item to be contained in said package;
a securing means having engaging male and female members on said planar member operable in cooperation with each other in a tight frictional engagement thus detachably securing said package in a releasably closed position; and



a shock absorbing means for partially absorbing mechanical shock and vibration having an extended portion of said encapsulating shell member that extends between said cavity and said lower end of said package, and further having said cavity having a volume that is greater than the volume of said item to be contained within said package; said shock absorbing means further having an opening in said board member that approximates the cross-sectional area of said small fragile item to be received therein, said board member having a lower portion that cooperates with said extended portion of said shock absorbing means.

5,090,571

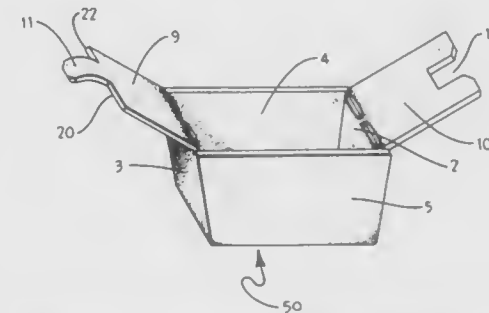
MEDICAL CONTAINER LINER

Michael R. Walker, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed Mar. 15, 1991, Ser. No. 670,138
Int. Cl.⁵ B65D 85/30, 81/02

U.S. Cl. 206—523

15 Claims



1. A liner to fit within a container and encapsulate a medical device, wherein the liner comprises a bottom with upwardly extending spaced apart end walls and side walls defining a cavity with an opening at the top to receive the medical device, the end wall width defining the latitudinal direction and the side wall length defining the longitudinal direction, at least one of said end walls extending beyond the opening to form a lid which can be folded downwardly to close the opening and complete the encapsulation of the medical device, wherein the lid extension is larger than the opening in the latitudinal direction such that the lid can be pressed into the opening to form an interference fit along the side walls thereby maintaining the lid in a closed position.

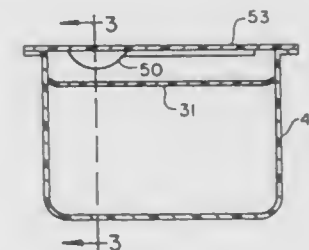
5,090,572

COMBINATION FOOD CONTAINER AND EATING UTENSIL

Robert F. DeRoseau, 4296 Lake Knolls, Oxford, Mich. 48051
Continuation of Ser. No. 493,982, Mar. 15, 1990, abandoned, which is a division of Ser. No. 232,802, Aug. 16, 1988, Pat. No. 4,930,637. This application Jul. 22, 1991, Ser. No. 733,370
Int. Cl.⁵ A45C 11/20

U.S. Cl. 206—542

3 Claims



1. In a food container for the storing and the partaking of food in a sanitary manner of the type having a one-piece cover attached to the body of the container, the improvement which comprises a partitioned body having a pocket in said container for storing at least one eating utensil, said body having a bottom wall, an upward-extending peripheral wall joined to said bottom wall; a flat outer cover attached to the upper end portion of said peripheral wall; a substantially flat liner spaced below said upper end portion of said body for partitioning the container into an upper pocket for storing a utensil and a lower pocket for storing food; and at least one eating utensil having an elongated portion stored in said pocket, said elongated portion of said utensil being welded directly to the lower surface of said cover.

5,090,573

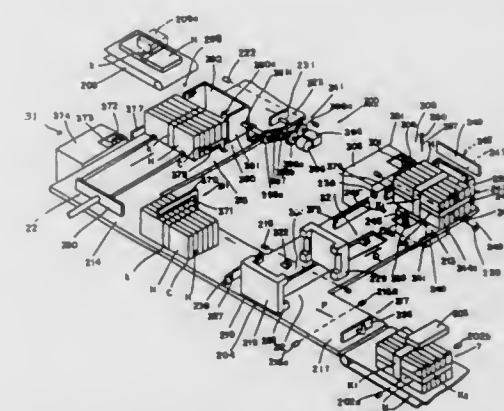
PAPER SHEET BUNDLE PROCESSING APPARATUS
Hitoshi Takahashi, and Toshinori Adachi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 23, 1990, Ser. No. 497,966

Claims priority, application Japan, Mar. 31, 1989, 1-81786
Int. Cl.⁵ B07C 5/02; B65B 61/04

U.S. Cl. 209—534

13 Claims



11. A paper sheet bundle processing apparatus for processing received bundles bound with large bands, each bundle having a predetermined number of sheaves bound individually with a small band, said apparatus comprising:
first transfer means for transferring said received bundles;
bundle positioning means for positioning a bundle transferred by said first transfer means at a prescribed position;
second transfer means for moving said bundle positioning

means together with said bundle positioned by said positioning means;

large band cutting means for cutting said large bands of said bundle transferred by said second transfer means;

large band removing means for removing a significant portion of said large bands cut by said large band cutting means from said bundle, said large band removing means comprising means for catching said large bands and means for pushing said large bands into said means for catching said large bands;

large band storing means for storing said significant portion of said large bands removed by said large band removing means;

third transfer means for transferring bundles whose said significant portion of said large bands have been removed by said large band removing means;

means for removing residual portions of said large bands remaining on said bundles transferred by said third transfer means;

fourth transfer means for transferring a bundle whose said residual portions of said large bands have been removed by said means for removing residual portions of said large bands;

sheaf separating means for separating a sheaf from sheaves included in said bundle transferred by said fourth transfer means;

fifth transfer means for transferring said sheaf separated by said sheaf separating means;

small band cutting means for cutting a small band of said sheaf transferred by said fifth transfer means;

small band removing means for removing said small band cut by said small band cutting means from said sheaf;

small band storing means for storing said small band removed by said small band removing means;

paper sheet inspecting means for inspecting paper sheets of said sheaf whose small band has been removed by said small band removing means; and

paper sheet sorting means for sorting said paper sheets in accordance with inspection results provided by said paper sheet inspecting means.

5,090,574

AUTO TRAMP REMOVAL SYSTEM

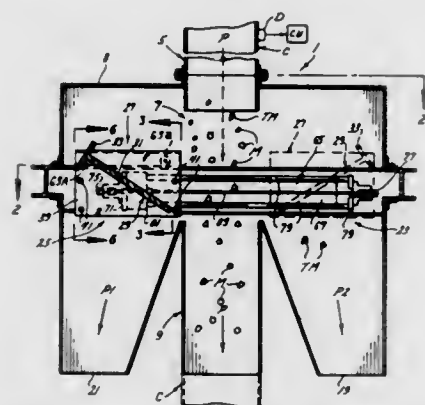
Michael G. Hamby, Belleville, Ill., assignor to T. J. Gundlach Machine Company, Belleville, Ill.

Continuation of Ser. No. 250,324, Sep. 27, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 569,512

Int. Cl.⁵ B07C 5/36

U.S. Cl. 209—552

17 Claims



1. Apparatus for removing tramp material entrained with other material flowing from one point to another, the presence of tramp material being detected during the flow, and the apparatus comprising:

- (a) means defining a primary path through which material including tramp material flows,
- (b) means defining at least one deflection path to which

material including entrained tramp material is moved from the primary path, said one deflection path being initially on one side of the primary path,

- (c) deflection means to deflect material including said entrained tramp material from the primary path to said one deflection path, and

- (d) means movable transverse to the primary path responsive to the detection of entrained tramp material for moving the deflection means from said one side completely through the primary path during flow of material between said points and deflecting material including entrained tramp material out of said primary path flow of material without the need for returning said deflection means back to said one side.

5,090,575

Patent Not Issued For This Number

5,090,576

METHOD AND APPARATUS FOR SORTING A FLOW OF OBJECTS AS A FUNCTION OF OPTICAL PROPERTIES OF THE OBJECTS

Emmanuel J. Menten, Leuven, Belgium, assignor to Elbicon N.V., Belgium

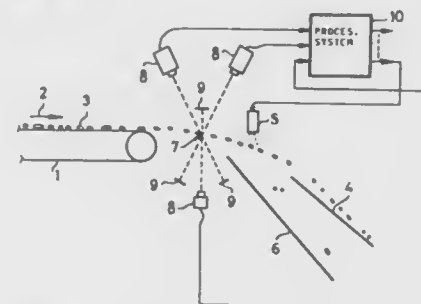
Filed Dec. 19, 1989, Ser. No. 452,875

Claims priority, application Netherlands, Dec. 19, 1988, 8803112

Int. Cl.⁵ B07C 5/342; G01N 21/88; H04N 5/335

U.S. Cl. 209—587

14 Claims



- 1. A method for sorting objects as a function of optical properties of the objects, comprising: conveying the objects over an object plane, all the objects passing a strip of the object plane; detecting light rays originating from the strip by one or more image pick-up units which each have a row of image pick-up elements in an image plane of the image pick-up unit;

and for each image pick-up unit: repeated scanning of the row of image pick-up elements to form a primary line signal which contains image information which is a function of the optical properties of the objects and which comprises, for each scan, a primary group of primary intervals corresponding to the image pick-up elements;

comparing the line signal with at least one reference signal; and energizing, as a function of the result of comparison, an ejection device, corresponding to the comparison time instant, of a number of ejection devices for the objects arranged downstream of the strip and corresponding to sections of the strip;

and comprising consecutively assigning, in accordance with a predetermined scheme, the image information, obtained during a scan, of each group of primary intervals to a corresponding secondary group of equal secondary intervals of a secondary line signal in a manner such that the distribution of the information assigned to a secondary group corresponds linearly to the distribution of the optical properties in the strip, each secondary interval corresponding to an associated sub-section of the strip, each having an equal length.

5,090,577

MERCHANDISING DISPLAY UNIT WITH IMPROVED DIVIDER

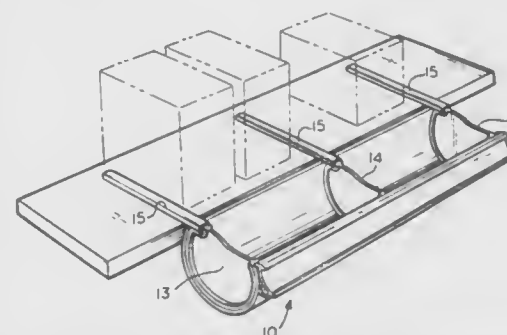
Paul F. Lehmann, 1855 N. Custer Rd., Monroe, Mich. 48161

Filed Apr. 22, 1991, Ser. No. 688,868

Int. Cl.⁵ A47F 5/00

U.S. Cl. 211—86

2 Claims



- 1. In a merchandising display unit having an elongate horizontal channel of uniform interior diameter formed by a rigid arcuate wall extending substantially 180 degrees about a horizontal axis to provide a partial enclosure with a bottom, opposed sides, and an open top, and having transverse barriers on each end and at least one transverse divider intermediate said end barriers, the improvement comprising said transverse divider having a generally arcuate lower periphery coextensive with said arcuate wall of said channel, and an upper surface extending generally linearly between opposed upper edges of said arcuate lower periphery whereby, when said transverse divider is positioned transversely of said elongate channel, its arcuate lower periphery is coextensive with the rigid arcuate channel wall and its linear upper surface extends directly between the opposed sides of said channel across said open top, said transverse divider comprising a planar wall extending between said arcuate lower periphery and said linear upper surface and further including an arcuate external rib coextensive with said arcuate lower periphery and said linear upper surface and further including an arcuate external rib coextensive with said arcuate lower periphery and extending normal to the planar wall, said transverse divider further including a support means located at one upper edge of said arcuate lower periphery of said divider, said support means comprising a finger-like projection extending outwardly beyond the upper edge of said arcuate lower periphery whereby a dividing rod is releasably supported thereby, wherein said support means further includes a stopping means consisting of two generally J-shaped ridges located on both faces of the transverse divider, said J-shaped ridges extending perpendicularly to the upper edges of said arcuate lower periphery, said J-shaped ridges further connecting to said finger-like projection such that a groove or slot is formed.

5,090,578

PORTABLE CLOTHES LINE DEVICE

Thomas N. Arnold, 286 Blue Hill Ave., Milton, Mass. 02186

Continuation of Ser. No. 587,116, Sep. 24, 1990, abandoned. This application Jun. 19, 1991, Ser. No. 717,856

Int. Cl.⁵ A47F 5/00

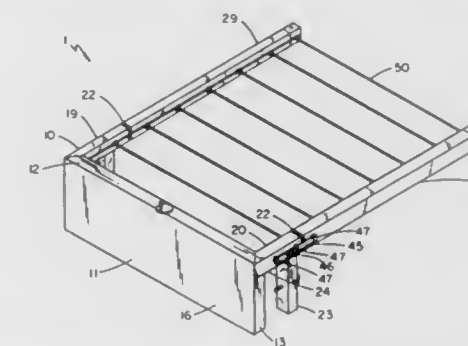
U.S. Cl. 211—119

8 Claims

- 1. An improved portable clothes line device, comprising: a "U"-shaped brace housing having a vertical housing member with top, two sides, bottom, a vertical inner face, and a vertical outer face, and having two support stubs extending horizontally outward from the vertical housing member sides near to the member top in planes perpendicular to the housing member's outer face, wherein each stub has a vertical brace member extending downwardly from the stub's unattached end;

two pivotal joints attached one each to the unattached end of each stub;

two lateral support rods each of which having two ends one of which is attached one each to a pivotal joint; and



a plurality of clothes line units each of which is connected between said support rods.

5,090,579

MODULAR SHELVING SYSTEM

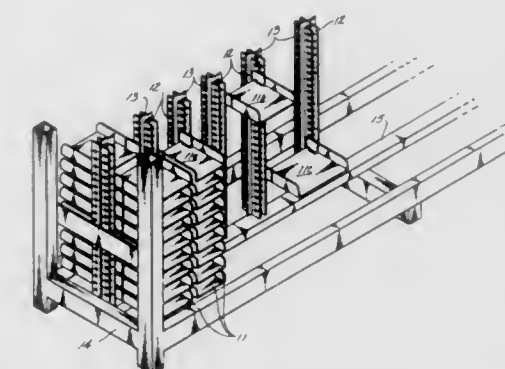
Ronald P. Major, 5606 Noel Dr., Temple City, Calif. 91780

Filed Sep. 20, 1990, Ser. No. 585,488

Int. Cl.⁵ A47B 63/00

U.S. Cl. 211—126

5 Claims



- 1. A modular shelving system comprising: at least two spaced apart vertical members with substantially parallel side surfaces and a series of aligned engagement means disposed in the side surfaces; and a plurality of tray members removably coupled to the vertical members, each tray member being of unitary construction and having means for interacting with the engagement means in each of the side surfaces for suspending the tray members from the vertical members in a substantially horizontal cantilever orientation, wherein the engagement means are holes and the means for interacting comprises a pair of detent pins connected to the tray members, the detent pins being spaced apart to align with any two holes defined in the side surfaces of the vertical members; each of the tray members comprise means for locking the detent pins in the holes defined in the side surface; the tray members comprise deflectable side elements, which can be deflected from a neutral position to align the detent pins with the holes in the side surfaces of the vertical members, and which return to the neutral position to engage the detent pins with the side surfaces; and the tray members comprise a deflectable bottom element, which can be deflected from a neutral position adjacent to the side elements of the tray members to a position substantially remote from the side elements.

5,090,580

TRUNK-MOUNTED PORTABLE CRANE

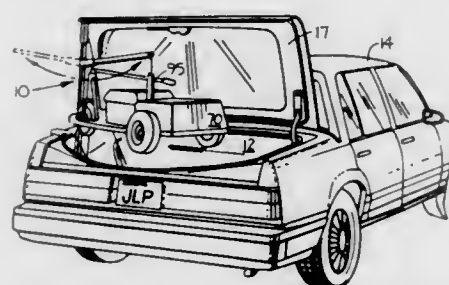
W. O. Nelson, Horton, Kans., assignor to Walbert O. Nelson and Eleanor C. Nelson, both of Horton, Kans.

Filed Sep. 10, 1990, Ser. No. 579,608

Int. Cl.⁵ B66C 23/44

U.S. Cl. 212—180

6 Claims



3. A crane for mounting in the trunk of a vehicle having a trunk lid and a trunk floor, comprising:

- (a) base means for supporting said crane as said base means is placed unsecured on the trunk floor;
- (b) a column assembly including:
 - (1) a column having:
 - (A) an upper end; and
 - (B) a lower end releasably and rotatably engaged with said base means; and
 - (2) trunk lid mounting means for mounting said column assembly on said trunk lid such that said upper end thereof is releasably and rotatably engaged with said trunk lid;
- (c) a boom assembly including:
 - (1) a boom arm having:
 - (A) a proximal end and a distal end;
 - (B) a passage extending longitudinally through said boom arm;
 - (C) a first pulley rotatably mounted in said passage near said proximal end of said boom arm; and
 - (D) a second pulley rotatably mounted in said passage at said distal end of said boom arm; and
 - (2) a boom arm sleeve having a proximal end rigidly secured to said column and a distal end adapted to releasably receive said proximal end of said boom arm;
- (d) a winch assembly mounted on said column; said winch assembly including:
 - (1) reel means;
 - (2) a reversible electric motor drivingly connected to said reel means; and
 - (3) a control subassembly such that electrical power can be selectively and reversibly supplied to said motor by a user conveniently positioned behind the vehicle; and
- (e) a tensile member having a first end connected to said reel and a second end reeved over said first pulley and said second pulley and having a hook connected to the distal end thereof.

5,090,581

BOTTLE CAPS

Howard Rose, Cheshire, and Ian G. C. McAffer, Kent, both of Great Britain, assignors to Waverley Pharmaceuticals, Ltd., Great Britain

Continuation-in-part of Ser. No. 322,901, Mar. 14, 1989, Pat. No. 5,007,546. This application Oct. 31, 1990, Ser. No. 593,858

Claims priority, application United Kingdom, Jul. 14, 1987, 8716514

Int. Cl.⁵ B65D 1/02

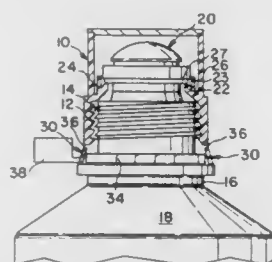
U.S. Cl. 215—32

26 Claims

1. A bottle cap for use with molded plastic bottles which have an integral flanged seal over the aperture of the threaded neck and a frangible membrane joining the seal to the neck, the cap having a complementary screw-thread to that of the neck and a plurality of inwardly projecting resilient members lo-

cated above the screw-thread such that, when the cap is screwed onto the bottle, the inwardly projecting members pass around the seal with resilient deformation and, on unscrewing the cap, engage the flanged seal in a lifting action, characterized in that at least one of said plurality of inwardly projecting members comprises:

- a. an upwardly directed blade portion, adapted to engage an undersurface of the flanged seal, such that upon unscrew-



ing of the cap, said upwardly directed blade portion will cut into the undersurface while lifting the flanged seal to provide an efficient severance of the seal from the bottle neck, and

- b. an upstanding wall portion adapted to engage a side of said flanged seal when upward pressure is applied and prevent buckling of said upwardly directed blade portion, said wall portion having a surface recurved from the side of said seal.

5,090,582

BOTTLE CAP

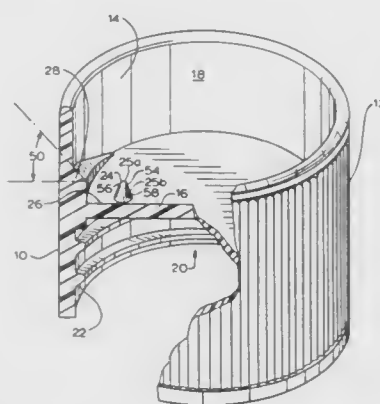
Gregory R. Art, Saugus; Frank M. Podsiadlik, Huntington Beach, and Albert Lackland, Canyon Country, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 16, 1990, Ser. No. 598,316

Int. Cl.⁵ B65D 53/04

U.S. Cl. 215—250

8 Claims



1. A bottle cap for opening a bottle having a mouth having an edge which is sealed with a liner, comprising:

- a cylinder having an inner surface;
- a partition dividing said cylinder into an upper and lower section said partition having an upper and lower surface;
- threaded means for securing said cap to said threaded bottle;
- said threaded means being located on said inner surface of said cylinder on said lower section;
- puncture means for circumferentially puncturing a "C"-shaped portion of the liner and causing the C-shaped portion of the liner to be pulled toward said edge of the mouth as said upper section of said cap is rotated over the mouth, said puncture means being located on said upper surface of said partition,
- ramp means for contacting the threads as said upper section of said cap is rotated over the mouth to cause said puncture means to refrain from puncturing a portion of the

circumference of the liner wherein said ramp means includes

- a first protrusion extending outwardly from said inner surface of said cylinder onto said upper surface of said partition wherein said first protrusion includes:
 - a first wall parallel to said inner surface of said cylinder; and second and third walls extending from said inner surface to said first wall, said second and third walls having an angle with respect to one another,
 - a fourth wall extending along an edge of said first wall that is parallel to said upper surface, said fourth wall extending from said first wall to said inner surface of said cylinder, and

wherein said puncture means further includes a second protrusion extending outwardly from said upper surface of said partition.

5,090,583

TAMPER-EVIDENT, TAMPER-RESISTANT CLOSURE

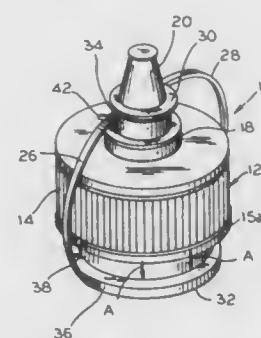
Richard W. Hoffman, Chicago; John Kinsley, Crystal Lake, and Michael Illenberger, Downers Grove, all of Ill., assignors to Magenta Corporation, Chicago, Ill.

Filed Mar. 27, 1991, Ser. No. 675,696

Int. Cl.⁵ B65D 41/32, 55/16

U.S. Cl. 215—253

10 Claims



1. A tamper-evident, tamper-resistant closure for an access opening to a container comprising:
 - said closure having an open end and a dispensing end, said open end being adapted to close said container opening;
 - a detachable closure cap being adapted to open and close said dispenser end;
 - a first holding element that circumferentially extends around the interior of a closure shell;
 - a second holding element that circumferentially extends around the exterior of the closure shell;
 - a first attachment means that is connected to the cap and the first holding element;
 - a second attachment means that is connected to the cap and the second holding element;
 - a notch means that is provided adjacent a bottom portion of the closure shell and which is intersected by the first attachment means; and
 - at least one breakable means for separating the first or second attachment means from the closure.

5,090,584

MULTI-FUNCTION CUP LID

Clifford J. Roberts, Mullica Hill, N.J.; Edward Batson, Tempe, and John H. Kurz, Scottsdale, both of Ariz., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 27, 1991, Ser. No. 661,217

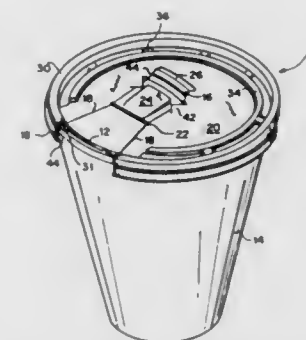
Int. Cl.⁵ B65D 43/06

U.S. Cl. 220—712

13 Claims

1. A container lid for releasable mounting to a disposable container comprising:
 - (a) a central portion;

- (b) an inverted annular trough surrounding said central portion;
- (c) a skirt extending about said inverted annular trough;
- (d) a hinge means located in said central portion;



- (e) a pair of tear impressions extending from said inverted annular trough to said hinge means;
- (f) a primary slit in said central portion;
- (g) a tab forming slit located at least at one end of said primary slit thereby creating at least one retaining flap.

5,090,585

GARBAGE CONTAINER APPARATUS

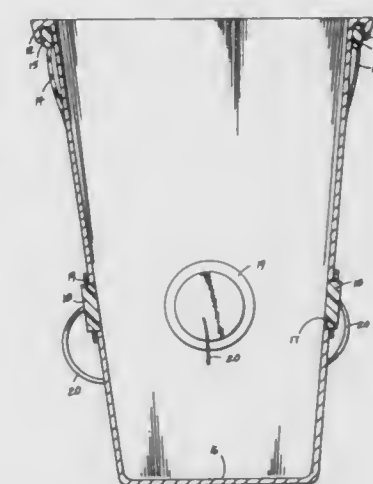
Elbert N. Power, 18920 Liggett St., Northridge, Calif. 91324

Filed Mar. 12, 1991, Ser. No. 668,092

Int. Cl.⁵ B65F 1/06

U.S. Cl. 220—404

2 Claims



1. A garbage container apparatus comprising, in combination,
 - a container member, including a longitudinal axis and an elongate side wall, circumferentially aligned with said axis, the side wall including an upper terminal edge, with the side wall including an "L" shaped skirt mounted orthogonally to the upper terminal edge defining an annular channel between the skirt and the side wall, the annular channel containing a width spaced from the side wall defined by a predetermined width, and
 - a plurality of plug heads equally spaced relative to one another and mounted within the annular channel, wherein each of the plug heads is defined by a thickness equal to the predetermined width, and
 - the container member including a container floor orthogonally aligned relative to said axis, and
 - the side wall further including a plurality of equally spaced wall apertures directed through the side wall circumferentially oriented relative to one another defining a common circle whose center is coincident with the axis, each of the apertures defined by a predetermined diameter, and a plug

member removably mounted within each of the apertures, each plug member defined by an external diameter substantially equal to the predetermined diameter, and each plug member including a coaxially aligned annular flange, and a tether line mounted fixedly to each plug member, and wherein each tether line is further mounted to the side wall.

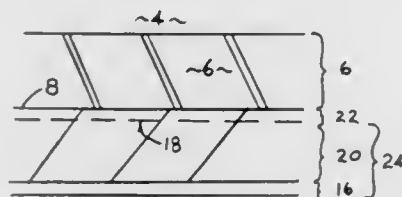
5,090,586

DUAL WALL TANK

A. Ross Mitchell, Mississauga, Canada, assignor to Madison Chemical Industries Inc., Milton, Canada
Division of Ser. No. 347,163, May 2, 1989, Pat. No. 4,993,581.
This application Dec. 11, 1990, Ser. No. 625,478
Int. Cl.⁵ B65D 90/04

U.S. Cl. 220—453

15 Claims



1. In a dual wall container for storing fluids comprising:
 - (a) inner wall means for storing said fluid;
 - (b) fabric means disposed exteriorly against said inner wall means, said fabric means permeable to leakage of said fluid through said inner wall means;
 - (c) outer wall means of cured resin means penetrating partially into said fabric means for containing leakage of said fluid from said inner wall means.

5,090,587

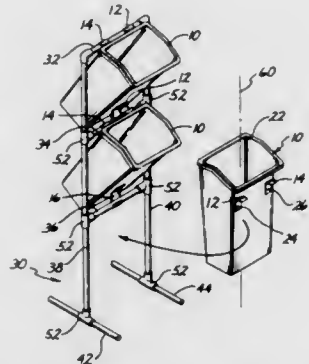
APPARATUS FOR STORING RECYCLABLE WASTE

Randolph K. Brown, 336 Riverside Dr., #4A, New York, N.Y. 10025

Filed Feb. 19, 1991, Ser. No. 656,754
Int. Cl.⁵ B65D 25/22

U.S. Cl. 220—475

14 Claims



1. Waste storage apparatus comprising:
 - a plurality of separate generally axially elongated waste containers each of which has a longitudinal axis, an opening at its normally upper end through which to receive presorted waste, and a mounting location, the center of gravity of said waste container being normally axially downward from said opening along said longitudinal axis;
 - a rack including a plurality of waste container support bars, said waste support bars, being positioned so as to support said plurality of separate waste containers in a normally vertical array within a small vertical space; each of said

support bars being non-pivotally interconnected and rigidly fixed with respect to said rack;
mounting means for removably mounting each of said waste containers on a respective one of said waste container support bars, said mounting means being adapted to mount each of said waste containers on said respective support bar at said mounting location, said mounting location being laterally offset from said longitudinal axis and spaced from said center of gravity toward said opening, whereby said longitudinal axis normally defines an acute angle with the perpendicular to the horizon when said waste container is mounted on said rack wherein said mounting means pivotally support said waste containers on said support bars;
at least one hook adapted to be hung on each of said respective one of said support bars; and
first fixing means for fixing said at least one hook to a respective one of said waste containers at said mounting location.

5,090,588

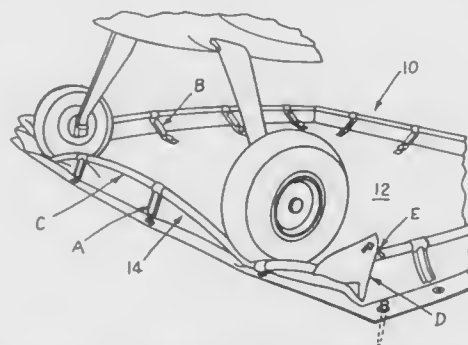
PORTABLE CONTAINMENT FOR CHEMICALS

Edward W. Van Romer, Anderson, S.C., and Brian R. Flood, De Kalb, Ill., assignors to Portable Containment, Inc., Antigo, Wis.

Filed Jul. 31, 1990, Ser. No. 560,435
Int. Cl.⁵ B65D 1/34

U.S. Cl. 220—573

30 Claims



1. A portable containment for containing spilled material and preventing environmental contact, comprising:
 - a floor composed of sheet material;
 - deformable upstanding wall means composed of sheet material integrally connected to said floor for containing the spilled material in cooperation with said floor; and
 - a plurality of vertically-extending resilient side braces attached to said wall means and spaced around a periphery of said wall means to brace said wall means in an upright position while allowing said wall means to recover resiliently and return to said upright position after collapse under force.

5,090,589

COIN-OPERATED VENDING MACHINE

John H. Brandes, Atlanta; Eddie W. King, Marietta, and Don S. Summerville, Snellville, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 623,123, Jun. 22, 1984, Pat. No. 4,682,709.
This application Feb. 20, 1987, Ser. No. 17,099

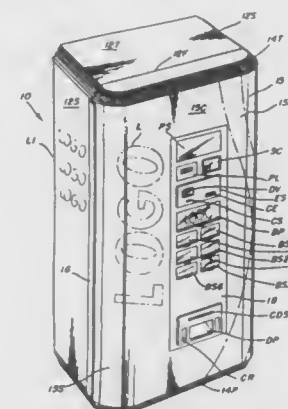
Int. Cl.⁵ G07F 9/02

U.S. Cl. 221—2

6 Claims

1. A vending machine for beverage containers comprising:
 - a frame having front, side and rear faces;
 - a bowed sign panel having a substantially continuous obverse surface substantially covering the front face and extending outwardly therefrom, said sign panel being fabricated from transparent material and having translucent display fields formed thereon;

c) illumination means disposed behind said bowed sign panel for backlighting the same, said illuminating means including a plurality of elongated cylindrical light sources having longitudinal axes extending vertically of said sign panel, the cylindrical curvature of said light sources about



said longitudinal axes approximating the curvature of portions of said bowed sign panel;
d) a control panel disposed adjacent the sign panel; and
e) a discharge port for presenting said beverage containers to customers through said front face.

5,090,590

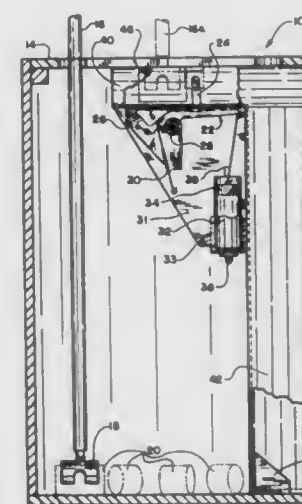
ACCESS DELAY MECHANISM

Arlan J. Hoffman, 5137 Coldbrook Dr., Mantua, Ohio 44255
Filed Dec. 17, 1990, Ser. No. 628,704

Int. Cl.⁵ B65B 59/00

U.S. Cl. 221—15

10 Claims



1. A limited access container that controls the rate of withdrawal of articles therefrom comprising:
 - a limited access container;
 - article transport means;
 - article blocking means;
 - spring means; and
 - unblocking delay means,
 wherein to withdraw articles from the container, the articles must be removed by said transport means along a passageway in said container to an opening communicating with the outside, said article blocking means being pivotal from a blocking position preventing movement of said articles through said passageway, to an unblocking position permitting said movement, the movement of said articles through the unblocked passageway pivoting said article blocking means into an article blocking position, said

spring means automatically pivoting said blocking means back to an article unblocking position after an interval of time determined by said unblocking delay means has elapsed, and wherein said unblocking delay means comprises a dash pot and said article transport means comprises a rod having an article-holding implement fixed to the lower end thereof, and said container has a top cover provided with a slot passing through the center thereof dimensioned to receive the rod which extends therethrough.

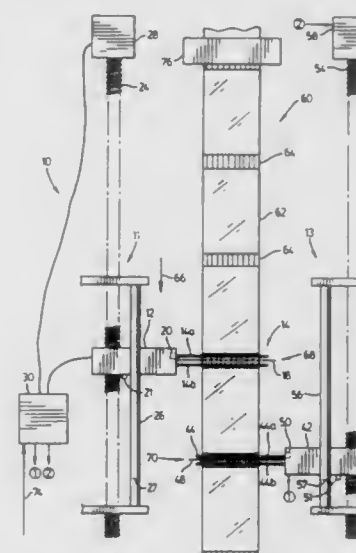
5,090,591

ARTICLE DISPENSER FOR USE WITH CONTINUOUS STRIP OF ARTICLES

John D. Long, Scarborough, Canada, assignor to Longford Equipment International Limited, Scarborough, Canada
Filed Mar. 18, 1991, Ser. No. 671,106
Int. Cl.⁵ G07F 11/66

U.S. Cl. 221—25

6 Claims



1. A dispenser for dispensing articles from the end of a continuous strip of articles feedable along its length in a downstream direction, comprising:
 - a first gripper having cantilevered gripping arms which may be opened or closed and a second gripper having cantilevered gripping arms which may be opened or closed, said first gripper for gripping a continuous strip of articles from one side of the strip and said second gripper for gripping the continuous strip of articles from the opposite side of the strip;
 - first motive means for reciprocating said first gripper along a portion of one side of said continuous strip of articles and second motive means for reciprocating said second gripper along a portion of the opposite side of said continuous strip of articles;
 - cutting means for severing articles from said strip of articles;
 - control means operatively associated with said first and second grippers, said first and second motive means and said cutting means for, repetitively, (i) moving said first gripper to a gripping position upstream of said second gripper when said second gripper is in an open position and for closing said cantilevered arms of said first gripper in order to grip the continuous strip of articles, (ii) moving said first gripper downstream through the open cantilevered arms of said second gripper in order to move an article of said continuous strip of articles to a dispensing position, (iii) activating said cutting means and opening said first gripper in order to dispense an article, (iv) moving said second gripper to a gripping position upstream of

said first gripper and closing said cantilevered arms of said second gripper in order to grip the continuous strip of articles, (v) moving said second gripper through the open arms of said first gripper in order to move an article of said continuous strip of articles to a dispensing position and activating said cutting means, and (vi) opening said second gripper in order to dispense an article.

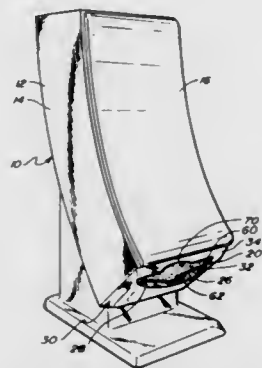
5,090,592
NOSE PIECE FOR FOLDED SHEET PRODUCT DISPENSER

Tor Petterson, Rancho Palos Verdes, and Jean T. McGregor, Covina, both of Calif., assignors to James River II, Inc., Oakland, Calif.

Filed Mar. 12, 1991, Ser. No. 667,962
Int. Cl.⁵ B65H 1/00

U.S. Cl. 221—55

9 Claims



1. In a dispenser for serially dispensing discrete folded sheet products from a stack of said folded sheet products, each of said folded sheet products being of generally rectangular configuration and having a pair of first side edges spaced from each other and substantially parallel, a pair of second side edges, said second side edges being spaced from one another, substantially parallel, and disposed at right angles to said first side edges, and a flap having a terminal end positioned between said first side edges and extending between said second side edges, the combination comprising:

- a housing having a plurality of side walls defining an interior and a discharge end, said interior accommodating a stack of folded sheet products and guiding said stack toward said discharge end with the flaps of the folded sheet products presented in the direction of said discharge end; and
- a nose piece connected to said housing discharge end and having an opening communicating with said housing interior through which folded sheet products are dispensed from said interior in serial fashion, said nose piece having a front and a back, said back facing toward and engageable by the stack in said housing interior, said nose piece including a pair of elongated first contact elements spaced from one another, substantially parallel to one another, and defining smooth, inclined first contact surfaces located at the back of said nose piece, said first contact surfaces leading from a first pair of opposed housing side walls and gradually converging toward one another and toward the nose piece front, and a pair of elongated second contact elements spaced from one another, substantially parallel to one another, and defining smooth, inclined second contact surfaces located at the back of said nose piece, said second contact surfaces leading from a second pair of opposed housing side walls and gradually converging toward one another and toward the nose piece front, said first and second contact elements at least partially defining said opening, and said first contact elements projecting toward the housing interior a greater distance than the second contact elements project toward the housing interior, said first contact elements being substantially straight and of sufficient length to engage the end-

most folded sheet product of the stack positioned at the discharge end of the housing closely adjacent to the first side edges along substantially the full length of said first side edges along a first plane and bend said end-most folded sheet product about a first axis generally parallel to said first contact elements to shorten the distance between said first side edges, said second contact elements being substantially straight and of sufficient length to engage the end-most folded sheet product of the stack positioned at the discharge end of the housing closely adjacent to the second side edges along substantially the full length of said second side edges along a second plane spaced from said first plane and so positioned relative to said first contact elements as to bend said end-most folded sheet product about a second axis generally parallel to said second contact elements after bending of the end-most folded sheet product about said first axis to shorten the distance between said second side edges and force an intermediate portion of flap terminal end thereof outwardly of the rest of the said end-most folded sheet product.

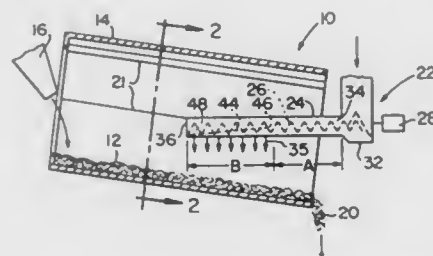
5,090,593
APPARATUS AND METHOD FOR DISTRIBUTING SEASONING

Ofomata E. Ejike, Lewisville, Tex., assignor to Recot, Inc., Plano, Tex.

Filed Apr. 18, 1990, Ser. No. 510,769
Int. Cl.⁵ B05C 19/00

U.S. Cl. 222—1

28 Claims



1. A dispenser apparatus for distributing a seasoning material and comprising a tube having a bottom as defined by a vertical and longitudinal axis through said tube, said tube having a proximal end in communication with a source of seasoning material and terminating at a distal end, and a transport means within the tube for moving the seasoning material in a downstream direction from the proximal end towards the distal end, the tube having a feed section adjacent the proximal end and a seasoning delivery section downstream of the feed section, the seasoning delivery section comprising seasoning distribution means for the seasoning material to exit the delivery section, wherein the seasoning distribution means are disposed on a side of the delivery section with a proximal end thereof disposed at least about 10° from the bottom of the tube, the distribution means extending longitudinally toward the distal end of the tube, with at least a portion of the distribution means so extending in a progressively downward manner with respect to the longitudinal axis of the tube.

5,090,594
VOLUMETRIC FLUID DISPENSING APPARATUS AND METHOD

John R. Randall, Jr., Freehold, N.J.; Denis E. Keyes, Staten Island, N.Y., and James V. Curcio, South Plainfield, N.J., assignors to FlowClean Equipment, Inc., Rocky Hill, N.J.

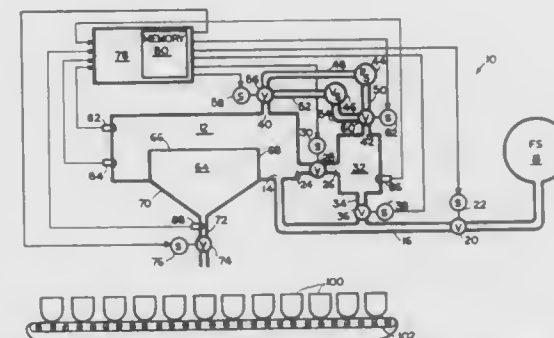
Filed Jan. 15, 1991, Ser. No. 641,278
Int. Cl.⁵ B67D 5/08

U.S. Cl. 222—1

13 Claims

11. A process for dispensing pre-measured volumes of a fluid comprising:

- a) providing a fluid chamber;
- b) placing a measuring cup having an open top and an outlet port inside the fluid chamber;
- c) filling the fluid chamber to a level above the open top of the measuring cup, wherein the fluid rising in the fluid chamber will overflow the sides of the measuring cup and cause the measuring cup to become filled,



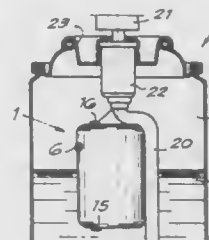
- d) draining the fluid from the fluid chamber after the measuring cup is filled so that a pre-determined volume of fluid is trapped inside the measuring cup when the fluid level drops below the top of the measuring cup; and
- e) dispensing the contents of the measuring cup after the fluid level in the fluid chamber drops below the top of the measuring cup.

5,090,595
PRESSURE CAPSULE FOR SPRAY CAN, AND SPRAY CAN WHICH UTILIZES SUCH A CAPSULE
Alfous Vandoninck, Antwerpen, Belgium, assignor to Jaico C.V., Cooperatieve venootschap, Antwerpen, Belgium
Division of Ser. No. 371,842, Jun. 27, 1989, Pat. No. 4,995,533.
This application Feb. 22, 1991, Ser. No. 659,574
Claims priority, application Belgium, Jun. 29, 1988, 8800747; Oct. 3, 1988, 8801131

The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.
Int. Cl.⁵ B67D 5/08

U.S. Cl. 222—54

32 Claims



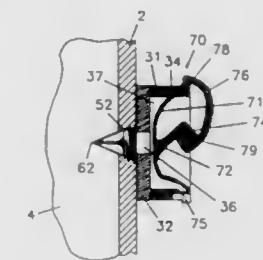
1. In a spray can (19) having a liquid (18) to be expelled, a pressure capsule fixedly mounted in the spray can, the capsule comprising first and second chambers (2, 3), the first chamber being filled with a first fluid under a first pressure and the second chamber being filled with a second fluid under pressure approximately equal to an overpressure present in the spray can for expelling the liquid (18), the first pressure being higher than the overpressure; a valve (4) in a wall of the first chamber (2); a membrane (5) forming a wall of the second chamber and controlling the valve (4); a removable element (6) for maintaining the valve (4) in a closed position when the removable element is in its non-removed condition, wherein the capsule can be prepressurized when the removable element is in its non-removed condition.

5,090,596
PLASTIC PERFORATIVE SPOUT DEVICE
Robert W. Knight, 39 N. San Mateo Dr., San Mateo, Calif. 94402

Filed Sep. 9, 1991, Ser. No. 756,986
Int. Cl.⁵ B67D 5/00, 3/00

U.S. Cl. 222—91

13 Claims



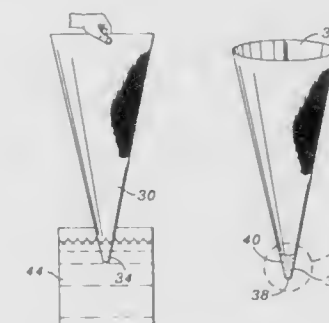
1. A plastic perforative spout device for dispensing a substance through the wall of a plastic container, the device comprising in combination:

- a unitary plastic perforation element comprising a body portion and a cutting portion, the body portion defining a tubular section and a flange at a first end thereof, the flange defining an aperture therethrough to an interior space of the tubular section; the cutting portion defining a shank and a cutting element, the shank surrounding the aperture and having an exterior thread means and an interior passageway communicating with the interior space of the tubular section, the interior passageway including at least one cross rib, the cutting element extending from a rim of the shank and tapering to a sharp point, the cutting element defining two edge blades, a vertical rib extending from said at least one cross rib to the sharp point;
- a plastic dispenser comprising: a wall removably attached over an exterior surface of the tubular section, a concave flexible valve means secured around the wall, a boss attached to the valve means for operating said valve means, lock means for locking the valve in an open position, said lock means including a first locking element on said boss and a mating lock means hinged to the wall, operation of the boss allowing the contents of the container to flow through the tubular section and out of an outlet in the wall, the lock means for enabling the user to lock the valve in an open position to dispense the contents unattended.

5,090,597
MASONRY GROUT BAG
Gregory J. Johnson, Mission Viejo, Calif., assignor to Westco Plastics, Inc., Laguna Hills, Calif.
Filed Jul. 26, 1990, Ser. No. 558,744
Int. Cl.⁵ B65D 35/00

U.S. Cl. 222—107

4 Claims



1. A masonry grout bag comprising:

- (a) a bag formed of a flexible material for holding grout, said bag having first and second openings, the first opening being larger than the second opening; and
- (b) a semi-rigid tip formed as an integral part of said bag, said tip having an interior surface and an exterior surface and including a coating of semi-rigid material formed on said interior and exterior surfaces so as to be in laminar contact with the flexible material of said bag.

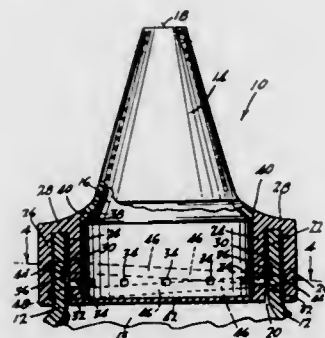
5,090,598 DISPENSER CONSTRUCTION

Gene Stull, 1 Winston Farm La., Far Hills, N.J. 07931
Filed May 23, 1990, Ser. No. 527,363

Int. Cl.⁵ B65D 47/06

U.S. Cl. 222—153

15 Claims



1. A dispenser construction comprising, in combination:

- an open-ended tubular fitment member provided with a discharge bore, said member being adapted to have a flowable substance pass through said bore, and
- a stopper member axially movable on and cooperable with said fitment member to permit or else halt the flow of substance through said fitment member depending on the axial positioning of the stopper member thereon, said stopper member having inner and outer annular walls forming an annular cavity in which the end of the fitment member fits and in which said end is turnable and axially movable,
- said fitment member having in its bore an annular internal groove and said stopper member having on its inner annular wall a pair of spaced-part annular beads which engage the walls of the bore of the fitment member and span the internal groove of the fitment member for one relative axial position of the stopper member and fitment member,
- said stopper member being axially movable on the fitment member from said one relative axial position to a second relative axial position to cause one of said beads to bypass the said annular groove,
- the inner annular wall of said stopper member forming a large interior discharge bore, and said stopper member having a connecting passage in said inner annular wall, communicating with said interior discharge bore and with the space between said beads whereby flowable substance can be discharged from the fitment member through said stopper member for the said second relative axial position of the stopper member and fitment member,
- said stopper member having a transverse closure bottom wall enclosing said large interior discharge bore and forming with said inner annular wall of the stopper member a cup-like structure which isolates the discharge bore from the interior of said fitment member.

5,090,599

SEAL FOR A BEVERAGE TAP

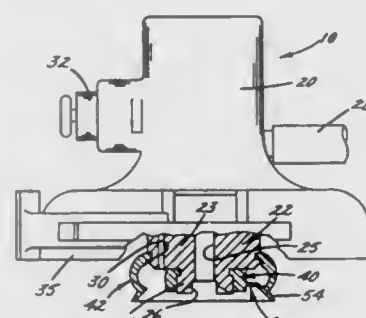
Tracy K. Stenger, Rockford, Ill., assignor to Johnson Enterprises, Inc., Rockford, Ill.

Filed Feb. 28, 1991, Ser. No. 662,017

Int. Cl.⁵ B67D 1/04

U.S. Cl. 222—400.7

11 Claims



1. A beverage tap seal made from a single piece of resiliently flexible material, said seal comprising an upright tubular body of circular cross-section, said body having upper and lower ends and inner and outer surfaces, an annular flange formed integrally with the upper end of said body and projecting radially inwardly therefrom, a substantially frustoconical fin formed integrally with and extending downwardly from the lower end of said body, said fin flaring outwardly away from said body upon progressing downwardly, a disc located within said body between the ends thereof and spaced radially inwardly from the inner surface of said body, said disc having upper and lower ends and inner and outer sides and having an upright hole formed therethrough, and a series of angularly spaced webs formed integrally with and extending between the outer side of said disc and the inner surface of said body to join said disc to said body.

5,090,600

LIQUID PRESSURE OPENED POURING SPOUT

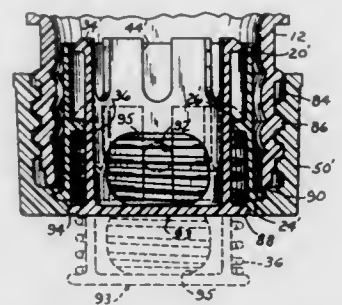
Robert D. Clark, 3911 Timberidge Dr., Norman, Okla. 73072
Continuation of Ser. No. 542,992, Jun. 25, 1990, abandoned.

This application Jul. 9, 1991, Ser. No. 728,827

Int. Cl.⁵ B65D 25/40

U.S. Cl. 222—492

8 Claims



1. In a flexible wall container having a tubular liquid discharge neck portion characterized by external threads at its terminal end, the improvement comprising:

- an elongated pouring spout having means at one end portion for securing it to the container neck portion;
- a piston sleeve valve secured to and normally closing the other end portion of said spout,
- said spout including
- an annular inwardly extending projection on the inner wall surface of said other end portion of said spout forming an annular stop;

an annular valve seat on the spout inner periphery adjacent its end opposite the container;

said piston sleeve valve having a sleeve wall portion slidably received by said other end portion of said spout and having a closed end,

said piston sleeve wall having a plurality of circumferentially spaced apertures adjacent its closed end;

a piston valve seat on the perimeter of said closed end of said piston sleeve valve for normally sealing with said spout annular valve seat; and,

outstanding flange means on the inner end of said piston sleeve wall for engaging said annular stop in response to axial outward movement of said piston sleeve valve relative to said other end portion of said spout,

said piston sleeve valve being biased to a spout open position by liquid pressure when the container is inverted and opposing walls of said container are forced inwardly toward each other.

5,090,601

CONTAINER CLOSURE WITH A RETRACTABLE TURNPOUT

Klaus J. Thanisch, Zell/Mosel, Fed. Rep. of Germany, assignor to Zeller Plastik GmbH, Zell/Mosel, Fed. Rep. of Germany
PCT No. PCT/EP88/00643, § 371 Date Mar. 12, 1990, § 102(e) Date Mar. 12, 1990, PCT Pub. No. WO89/00958, PCT Pub. Date Feb. 9, 1989

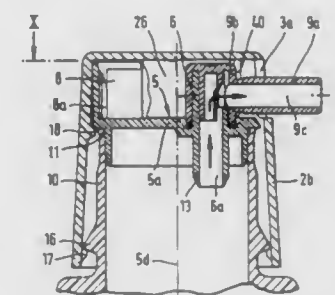
PCT Filed Jul. 16, 1988, Ser. No. 455,366

Claims priority, application European Pat. Off., Dec. 29, 1987, 87119298

Int. Cl.⁵ B67D 3/00

U.S. Cl. 222—507

9 Claims



- Container closure of plastics material for mounting on a container having a container mouth and a longitudinal axis, comprising:
 - a closure plug (5) rotationally fixedly inserted in the container mouth and having a plug base,
 - an upwardly extending bush (6) which is eccentrically arranged on the plug base and having an internal passage passing through through the plug base,
 - a turret (9b) which sealingly engages over the bush and is rotatable around an axis of rotation and which together with a tube (9a) projecting from said turret transverse to said axis of rotation forms a turnpout,
 - a continuous liquid passage in the turret and tube,
 - a sealing means between the bush (6) and turret (9b),
 - a cap (2) which lockingly engages over the closure plug and the container mouth along said longitudinal axis, is rotatable with respect to the closure plug and has a lateral opening (3) through which the tube (9a) passages in an operational position and one edge (35) of which cap serves to move the tube out of the operational position, said cap having a cap base, and a cap axis
 - a shield (8) upstanding from the plug base (5a) for closing the lateral opening when the turnpout (9) is pivoted toward a closed position,
 - a wall (26) which is on the cap base (2a), projects towards the plug base (5a) and extends concentrically to cap axis and having a first engaging edge (39) which peripherally

limits said wall with said first engaging edge pivoting the tube (9a) out into its operational position,

wherein:

- a longitudinal slot (7) is provided in the bush (6) which longitudinal slot together with an inward end of the liquid passage (9c) forms a tap,
- the shield (8) is partially cylindrical, has on its inner wall a projection (8a) for abutment by the free end of the tube and serves to limit the inward pivotal movement of the tube and the shield seals the free end of the tube (9a) when it has been pivoted to said closed position,
- the wall (26) projecting from the cap has towards the plug base the shape, with the exception of an interruption, of a closed cylindrical wall whose outer diameter is somewhat smaller than the inner diameter of the shield (8),
- a first engaging side (39) is provided on the wall (26), and
- a second engaging (40) is provided on the wall (26) for pivoting the tube in towards the end of the inward pivotal movement until it is behind the shield in a predefined storage position.

5,090,602

FLEXIBLE POUR SPOUT

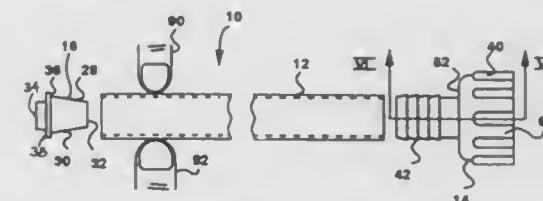
Paul A. Link, Wisconsin Rapids, Wis., assignor to Pal Products, Inc., Wisconsin Rapids, Wis.

Filed Aug. 8, 1989, Ser. No. 390,744

Int. Cl.⁵ B67D 5/38

U.S. Cl. 222—527

14 Claims



1. An apparatus for transferring fluid from a container of the type having a discharge orifice disposed at the distal end of a neck portion, the neck portion being in fluid communication with the interior of said container and having a substantially circular cross section and external threads disposed thereabout proximate said orifice, the apparatus comprising:

- a resiliently deformable conduit having respective first and second ends and including means for inhibiting fluidic communication between said first and second ends in response to transient manual deformation of said conduit;
- a spool sealingly and removably affixed within said first end of said conduit and communicating therewith, said spool having a first guide surface formed externally thereon; and
- a fastener snap fit around said spool and removably engageable with said external threads of said neck portion, said fastener being removable from said spool and having a second guide surface formed internally thereof, said first and second guide surfaces being in tracking relationship with each other to provide rotation between said spool and said fastener.

5,090,603

METAL POURING SYSTEM

Colin R. Bayliss, Rugby, England, assignor to T&N Technology Limited, Rugby, England

Filed May 23, 1990, Ser. No. 527,309

Claims priority, application United Kingdom, May 25, 1989, 8912081

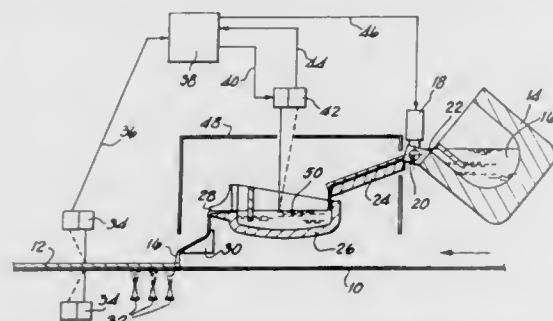
Int. Cl.⁵ B22D 41/00, 37/00

U.S. Cl. 222—590

7 Claims

1. A method for the control of the rate of flow of molten metal, the method comprising the steps of measuring by first sensor means the thickness of metal poured onto a moving strip, comparing the measured thickness with a desired thick-

ness stored in computer memory and control means, measuring the level of molten metal in intermediate holding dish means by second sensor means which are also linked to computer memory and control means, increasing or decreasing, as appropriate the rate of pour from holding furnace melting means to the



intermediate holding dish means by signals from the computer control means to furnace pour rate control means in order to minimise the difference between the actual measured metal thickness of the strip and the desired thickness by adjustment of the molten metal level in the intermediate holding dish relative to a pouring means in the holding dish.

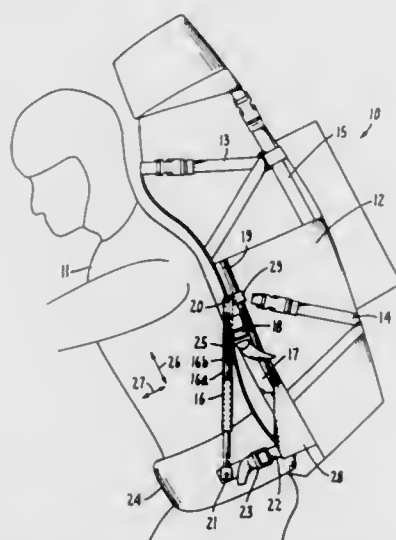
5,090,604 BACKPACK DEVICE

Robert Howe, Oakland, Calif., assignor to The North Face, Berkeley, Calif.

Filed Jul. 24, 1990, Ser. No. 557,515
Int. Cl.⁵ A45F 3/08

U.S. Cl. 224—211

3 Claims



1. A Backpack device comprising a flexible enclosure for containing a load to be supported and carried by a wearer of said device, a frame for supporting said flexible enclosure, said frame including a pair of vertically extending tubular struts located at two sides of said flexible enclosure, waist belt means for encircling the waist of the wearer being attached to said flexible enclosure, said frame further comprising sliding connector means adapted to slide along each of said vertically extending tubular struts, shock absorbing means, including telescoping tubes containing a spring means for absorbing shock between movement of said tubes, pivotally connected to each of said sliding connector means, and to said waist belt means to absorb shock between said flexible enclosure and the wearer as the wearer supports said backpack device.

5,090,605 SLAT ASSEMBLY FOR VEHICLE ARTICLE CARRIERS

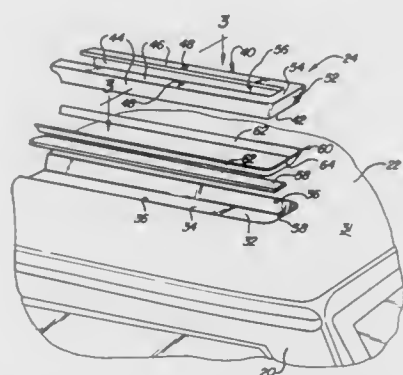
John S. Cucheran, Lake Orion, Mich., assignor to John A. Bott, Grosse Pointe Shores, Mich.

Filed Nov. 6, 1990, Ser. No. 609,822

Int. Cl.⁵ B60R 9/04

U.S. Cl. 224—321

25 Claims



1. A slat assembly operable to be mounted in a longitudinally extending recess in a surface portion of a vehicle, comprising: means forming a channel member disposed within the recess, said channel member having an upper surface; and means for setting a vertical height of said upper surface relative to the surface portion such that said upper surface is substantially flush with the surface portion of the vehicle.

5,090,606 COMBUSTION GAS POWERED FASTENER DRIVING TOOL

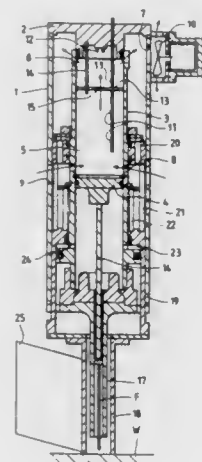
Takuji Torii, Ushiku; Hiromu Utsumi, Katsuta; Shinki Ohtsu, Ibaraki; Yo Kawakami, Mito; Teruo Suzuki, Hitachi; Yoshimitsu Kawasaki, Mito; Toshifumi Kubota, Katsuta; Yoshinori Ishizawa, Katsuta, and Tsunehisa Terayama, Katsuta, all of Japan, assignors to Hitachi Koki Company, Limited, Japan

Filed Oct. 26, 1990, Ser. No. 603,659
Claims priority, application Japan, Oct. 27, 1989, 1-280883; Aug. 10, 1990, 2-212757

Int. Cl.⁵ B25C 1/08

U.S. Cl. 227—10

17 Claims



1. A combustion gas powered fastener driving tool comprising:
a cylinder;
a cylinder head sealingly engageable with an upper end of said cylinder;

a piston slidably disposed within said cylinder and reciprocatingly movable between an uppermost driving position and a lowermost driven position, said cylinder, said cylinder head and said piston defining a combustion chamber;
a fastener driver attached to said piston;
at least one fuel injection nozzle disposed within said combustion chamber for injecting fuel into said combustion chamber where the fuel and air are mixed together;
a spark plug mounted on said cylinder head and disposed within the combustion chamber for igniting a fuel and air mixture to move said piston through a driving stroke from said driving position to said driven position, thereby forcing the fastener driver to drive a fastener into a workpiece;
said cylinder having inlet and outlet openings and being reciprocatingly movable toward and away from said cylinder head to close off said inlet and outlet openings to seal said combustion chamber during combustion and open said inlet and outlet openings to permit scavenging of said combustion chamber and return of said piston after the driving stroke of said piston, said inlet and outlet openings being disposed above said piston when the piston is disposed in its uppermost driving position; and
a fan disposed outside said cylinder for causing fresh air to flow from said inlet opening into the combustion chamber and simultaneously to discharge combustion gases from said combustion chamber to the atmosphere through said outlet opening.

5,090,607 FEED BELT FOR RIVETS

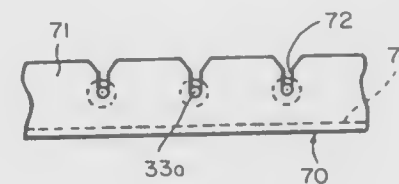
Masatoshi Ohuchi, Kooriyama, and Masaru Matsumoto, Machida, both of Japan, assignors to OPT Engineering Co., Ltd., Kooriyama, Japan

Filed Jul. 26, 1990, Ser. No. 557,769

Claims priority, application Japan, Jul. 28, 1989, 1-88994[U]
Int. Cl.⁵ B65D 85/24; B25C 5/02

U.S. Cl. 227—136

4 Claims



1. A feed belt for blind rivets characterized by comprising a series of supporting means formed on said feed belt at a determined distance for supporting a blind rivet rod, a series of driven means formed on said feed belt at a determined distance so as to engage with a driving pawl of a continuous riveter, and a plurality of blind rivets inserted into said supporting means wherein said series of supporting means for blind rivets comprises a series of elongated slits with linear sides formed on continuous edges of a channel made of plastic material at a determined distance.

5,090,608 RESILIENT LINEUP CLAMP

Richard L. Jones, Houston, Tex., assignor to CRC-Evans Automatic Welding, Houston, Tex.

Filed Feb. 20, 1990, Ser. No. 482,167

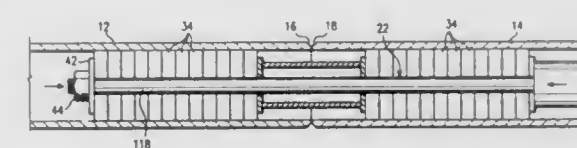
Int. Cl.⁵ B23K 37/053

U.S. Cl. 228—49.3

9 Claims

1. A pipe clamp for clamping first and second pipe sections with their ends in abutting engagement for welding, comprising:
a first element of elastically deformable material positioned within the first pipe section proximate its end;

a second element of elastically deformable material positioned within the second pipe section proximate its end;
a separator within the first and second pipes between the first and second elements and overlying the abutting ends of the pipe sections; means for purging a volume defined between the separator, first and second elements and the



interior surfaces of the pipe sections of air and replacing the air with an inert gas; and
a hydraulic cylinder acting to elastically deform the first and second elements against the separator and interior surfaces of the pipe sections along a sufficient length of the interior surfaces of the pipe sections to avoid line contact to clamp the pipe sections together for welding.

5,090,609 METHOD OF BONDING METALS, AND METHOD AND APPARATUS FOR PRODUCING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE USING SAID METHOD OF BONDING METALS

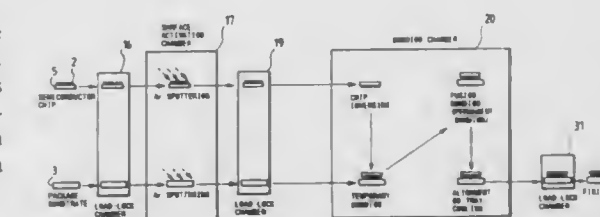
Takashi Nakao, Tokyo; Yoshiaki Emoto, Higashiyama; Koichi Sekiguchi, Tokyo; Masayuki Iketani, Kasugai; Kunizo Sahara, Hamura; Ikuo Yoshida, Musashimurayama; Akiomi Kohno, Tomobe; Masaya Horino, Chiyoda; Hideaki Kamohara, Katsuta; Shouichi Irie, Yokohama; Hiroshi Akasaki, Akishima, and Kanji Otsuka, Higashiyama, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,943
Claims priority, application Japan, Apr. 28, 1989, 1-107649; May 17, 1989, 1-123353; Nov. 29, 1989, 1-309922

Int. Cl.⁵ H01L 21/58

U.S. Cl. 228—123

24 Claims



1. A method of bonding a set of metal members which comprises the steps of:

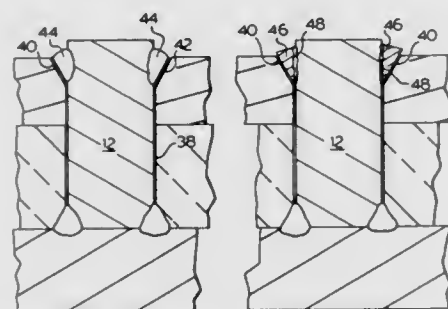
- irradiating respective bonding surfaces of a pair of metal members disposed in a vacuum vessel with an atomic beam;
- transferring said metal members into another vessel continuous with said vacuum vessel, said another vessel provided therein with a high-purity inert gas atmosphere; and
- pressing said bonding surfaces of said metal members against each other under normal pressure in said another vessel provided therein with the high-purity inert gas atmosphere.

5,090,610 KILN LINER

Jorgen O. Bernt, 241 Cardinal Dr., Oakville, Ontario, Canada L6J 4P1; Barry C. Forster, 1889 Pageburst Ave., Mississauga, Ontario, Canada L4X 1Y6, and Allan J. Blain, 1635 Snake Road R.R. #1, Waterdown, Ontario, Canada L0R 2H1
Division of Ser. No. 597,032, Oct. 15, 1990, Pat. No. 5,033,959.
This application Apr. 12, 1991, Ser. No. 684,266
Int. Cl.⁵ B23K 37/04; F27B 7/14

U.S. Cl. 228—138

6 Claims



1. Method of forming kiln liner on a cylindrical steel kiln wall having steel hangers extending generally radially inwardly therefrom, applying insulating material to a predetermined thickness less than the inward extension of said hangers, applying an apertured metal plate over each of a plurality of said hangers with said apertures receiving said hangers, so that said metal plates overlie said insulating material, affixing a means to said hanger inwardly of said metal plate to retain the metal plate in position without substantially altering the metallurgical qualities of said plate, wherein affixing is performed by welding retaining means to the portion of a hanger inwardly of said plate to retain said plate against outward movement relative to said hanger, portions of said plate being free to move under thermal effects relative to said kiln except where attached to said hanger.

5,090,611 METHOD OF MAKING A CROSS JOINT BETWEEN PIPES

Kazunori Takikawa, Numazu; Kazumi Fukaya, Mishima; Jun Ohbu, and Yasushi Yagi, both of Shizuoka, all of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

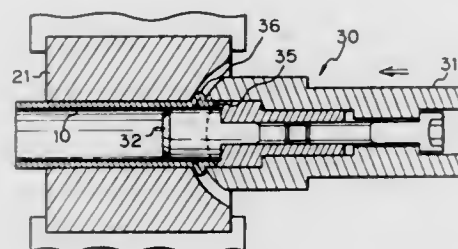
Filed Mar. 26, 1991, Ser. No. 675,522

Claims priority, application Japan, Mar. 27, 1990, 2-75742

Int. Cl.⁵ B23K 1/04

U.S. Cl. 228—173.4

2 Claims



1. A method of making a cross joint between different size pipes comprising the steps of: preparing a punch including a center rest, a curved slot and a curved surface, said curved slot having a bottom configuration corresponding to an inside curvature of a large pipe, setting a small pipe and the punch to a die and a pressing machine,

inserting the center rest of the punch into a distal end of the small pipe, moving the punch toward the small pipe, thereby transforming the distal end into an arcuate edge identical with the corresponding inside curvature of the large pipe, forming a curved bead on the small pipe, said curved bead being disposed circumferentially at an equal distance from the resultant edge of the small pipe, said distance being substantially the same as the wall thickness of the large pipe, detaching the small pipe from the pressing machine, inserting the arcuate edge of the small pipe into an aperture of the large pipe, and welding or brazing around the curved bead.

5,090,612 METHOD OF FABRICATING A PRESSURE VESSEL FOR A METAL OXIDE-HYDROGEN BATTERY

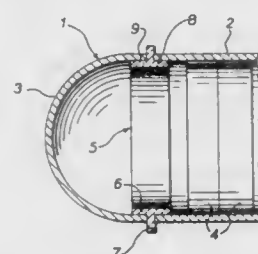
Kenneth R. Jones, Oconomowoc, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Feb. 13, 1991, Ser. No. 655,555

Int. Cl.⁵ B23K 31/02

U.S. Cl. 228—184

7 Claims



1. A method of attaching a head to a cylindrical shell of a pressure vessel for a metal oxide-hydrogen battery, comprising the steps of forming a straight length of metal with a T-shape cross section, forming the length into a circular configuration and disposing the ends of the length in abutting relation, welding the abutting ends together to form a ring having a pair of outer annular surfaces separated by an outwardly extending radial fin, forming a first of said annular surfaces of said ring with an outer diameter slightly less than the inner diameter of the open end of said shell, expanding the first annular surface radially outward to provide said first annular surface with an outer diameter approximating the inner diameter of the open end of the shell, positioning said first annular surface in the open end of said shell and positioning the end of the shell against one side of said fin, positioning a second of said annular surfaces in the open end of the head and positioning the end of the head against the opposite side of said fin, and welding said ends to said fin.

5,090,613 METHOD OF MANUFACTURING AN ANODE ASSEMBLY OF A MAGNETRON

Sang Sung Lee, Kyungsangbuk, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 21, 1991, Ser. No. 703,362

Claims priority, application Rep. of Korea, May 31, 1990, 7922/1990

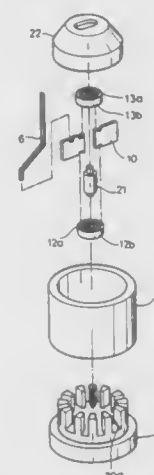
Int. Cl.⁵ B23K 1/00

U.S. Cl. 228—254

2 Claims

1. A method of manufacturing an anode assembly of a magnetron used in microwave oven to generate an electromagnetic wave, the method comprising the step of: forming vanes, each having ring-receiving grooves formed in its upper and lower sides, and then coating entire surfaces of the vanes with a brazing material; forming upper and lower strip rings having inner and outer

ring portions, an anode cylinder of a circular cross-sectional configuration, and an antenna lead, respectively; placing said lower strip rings having the inner and outer ring portions, and said anode cylinder on a base jig having a plurality of circumferentially spaced longitudinal grooves, and also inserting the respective vanes into the respective longitudinal grooves; fitting a lower end of said antenna lead into a lead-receiving groove formed in one of said vanes;



continually, assembling in sequence a center pin jig, said upper strip ring having the inner and outer ring portions, and an upper jig; and heat treating the obtained assembly in a heating furnace having a sufficient temperature to melt the brazing material coated on the surfaces of said vanes, thereby joining the components contiguous to said vanes by the molten brazing material on said vanes.

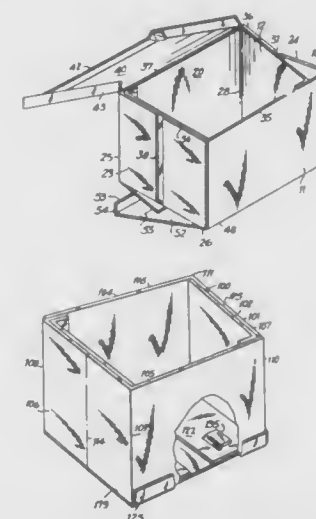
5,090,614 COLLAPSIBLE REINFORCED SHIPPING CARTON WITH FOLDABLE SLIP SHEET

Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10014
Filed Jun. 17, 1991, Ser. No. 716,260

Int. Cl.⁵ B65D 88/22, 88/52

U.S. Cl. 229—117.04

4 Claims



1. An improved collapsible reinforced shipping container comprising: a unitary blank of material forming first and second opposed rigid side walls, and third and fourth side walls interconnecting said first and second side walls to define continuous upper and lower peripheral edges, said third and fourth

side walls each having a vertical medially-positioned fold line; said lower peripheral edge defining four rectilinear segments; first and second flaps hingedly connected to two of said rectilinear segments at said third and fourth side walls, said flaps having medially-disposed fold lines forming extensions of the fold lines of said third and fourth walls; a third flap hingedly connected to a third of said segments of said lower peripheral edge; a slip-sheet member foldably connected to a fourth of said segments of said lower peripheral edge, and adapted to underlie said first, second and third flaps, said slip-sheet member extending outwardly of said first wall to facilitate engagement of said container by a fork lift.

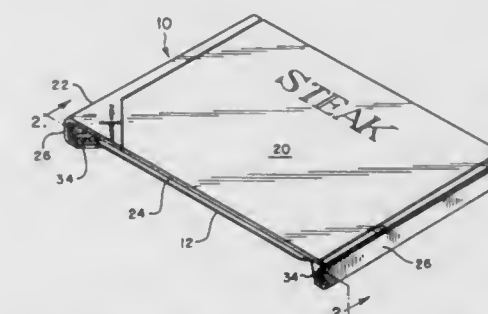
5,090,615 CONTAINER/LID ASSEMBLY

Brian D. Hopkins, and Matthew W. Lorence, both of Omaha, Nebr., assignors to Conagra, Inc., Omaha, Nebr.
Filed Jan. 14, 1991, Ser. No. 640,646

Int. Cl.⁵ B65D 43/08

U.S. Cl. 229—125.35

17 Claims



1. In a package of the type comprising a container comprising a bottom surface, a peripheral wall surrounding the bottom surface, and a peripheral lip surrounding the peripheral wall; and a lid secured to the peripheral lip; the improvement comprising:

at least one side flap having a first edge secured to the lid and a second edge, the side flap oriented to extend away from the lip toward the bottom surface; and at least one bottom flap having a first edge secured to the second edge of the side flap and a second edge secured to the bottom surface; the first and second edges of the side flap and the first edge of the bottom flap being equal in length and longer than the second edge of the bottom flap, each of the lid, side flap, and bottom flap defining at least one side edge; the side edges of the lid and side flap defining a plane oriented substantially perpendicular to the lid such that the package is stable when resting on the side edges of the lid and side flap, toward the bottom surface.

5,090,616 FOLDING CARTON BLANK AND METHOD OF FORMING SAME

Raymond O. Bertsch, Chebanse, Ill., assignor to Riverwood Natural Resources Corporation, Denver, Colo.

Division of Ser. No. 613,344, Nov. 14, 1990. This application

Aug. 8, 1991, Ser. No. 742,254

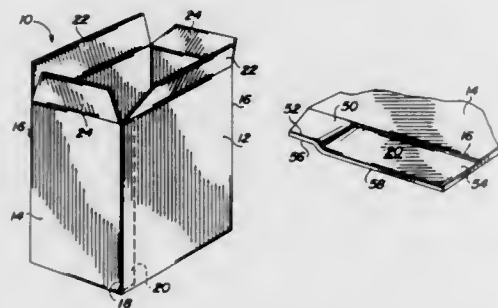
Int. Cl.⁵ B65D 5/02, 5/42

U.S. Cl. 229—132

4 Claims

1. A carton blank, comprising: a plurality of connected panel sections including at least one interior panel section and opposite end panel sections; each panel section being connected to an adjacent panel section by a fold line; a glue flap connected to one of the end panel sections by a fold line and being adapted to be glued to the other end panel section;

the glue flap comprising a first face adapted to receive glue from a glue wheel, an opposite face, a first edge adapted to be the leading edge of the flap as the blank moves through a carton blank folding machine and an opposite edge adapted to be the trailing edge of the flap; and



means on the glue flap for preventing application of excess glue thereto, said means comprising a protrusion on said opposite face of the glue flap and a corresponding recess in said first face thereof, the protrusion and recess being located near the trailing edge of the glue flap.

5,090,617

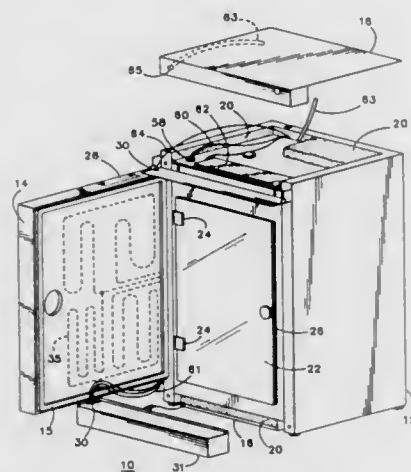
INCUBATOR HEATING SYSTEM

Alan J. Swan, Portland, and Tuan A. Trinh, Beaverton, both of Oreg., assignors to NAPCO Scientific Company, Tualatin, Oreg.

Filed Feb. 28, 1990, Ser. No. 486,066
Int. Cl.⁵ A01K 41/00

U.S. Cl. 236-3

15 Claims



1. An automatic incubator comprising: a chamber having an entry door; a heat storage means in surrounding relation to said chamber; a first heater means for controllably heating said heat storage means; a second heater means disposed within said chamber for controllably heating the gaseous interior of said chamber; sensing means disposed in said chamber; and control means for operably actuating said heater means in response to input from said sensing means for controlling the temperature within said chamber to provide rapid recovery after access to said incubator via said entry door.

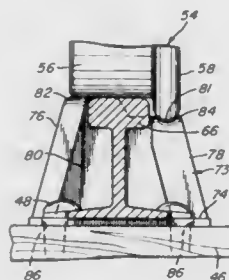
5,090,618
RAIL JOINT

Alan Newton, 67 Bluebird Ave., East Wareham, Mass. 02538
Filed Aug. 6, 1990, Ser. No. 563,042

Int. Cl.⁵ E01B 11/00

U.S. Cl. 238-218

16 Claims



9. A structure for supporting a wheel at a rail joint comprising:

a pair of rails joined at their ends with a gap therebetween, said rails each supporting a wheel at a predetermined elevation;

means for supporting said wheel in a region overlapping said gap and substantially at said predetermined elevation, said means for supporting including first support means bridging said gap and disposed laterally on one side of said rails for support of a first portion of said wheel, second support means also bridging said gap and disposed laterally on an opposite side of said rails for support of a guiding flange of said wheel, and web means passing transversely through said gap and interconnecting said first and said second support means.

5,090,619

SNOW GUN HAVING OPTIMIZED MIXING OF COMPRESSED AIR AND WATER FLOWS

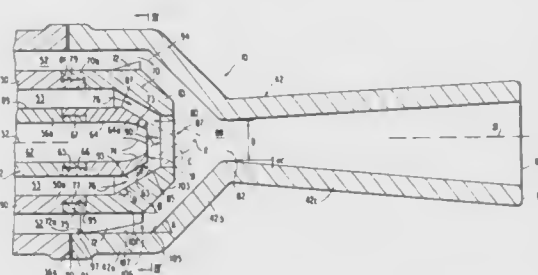
Scott Barthold, Lyme, N.H., and Bruce A. McLay, Seattle, Wash., assignors to Pinnacle Innovations, Lyme, N.H.

Filed Aug. 29, 1990, Ser. No. 574,031

Int. Cl.⁵ F25C 3/04; B05B 7/04

U.S. Cl. 239-14.2

16 Claims



1. A snow gun for atomizing a mixture of air and water to form artificial snow, said gun comprising: a hollow body including an outer cylindrical wall, a central tube coaxially positioned within said outer cylindrical wall and extending interiorly of said hollow body, a radially inner cylindrical wall concentrically positioned about said central tube, radially spaced from said outer cylindrical wall and said central tube and extending longitudinally within said hollow body, said outer cylindrical wall terminating at one end in a converging and diverging first expansion nozzle including a reduced diameter throat and defining at least one mixing chamber upstream of said throat, said central tube and said radially inner wall terminating short of said throat, said central tube forming an

internal compressed air channel, said central tube and said radially inner wall forming an annular water passage, and said radially inner wall and said radially outer wall defining an external compressed air channel, means for sealing said water passage from said internal compressed air channel and said external compressed air channel, means for supplying compressed air to said internal compressed air channel and said external compressed air channel for discharge into said converging and diverging expansion nozzle, and a second expansion nozzle defined by said central tube and said radially inner cylindrical wall at ends thereof proximate to said first converging and diverging expansion nozzle such that a hollow jet of water discharges at high velocity from said second expansion nozzle and is injected at high velocity into compressed air streams aligned with the gun direction and passing on both sides of the hollow jet of water from said internal compressed air channel and said external compressed air channel respectively in said at least one mixing chamber in proximity to said throat to effectively mix the air and water by maximizing the amount of shear forces between the compressed air and water to break up the water jet into droplets of uniform size and to employ the high velocity of the water stream passing through a narrow annulus in said second expansion nozzle to effectively distribute the water droplets within the flows of compressed air streams on opposite sides thereof while facilitating mixing of the air and water within said at least one mixing chamber downstream of the central tube and in proximity to said throat, thereby minimizing the amount of compressed air required for the unit volume of water converted to ice while making effective use of available water pressure to both atomize and distribute water particles.

5,090,620

HIGH PRESSURE FUEL INJECTION UNIT

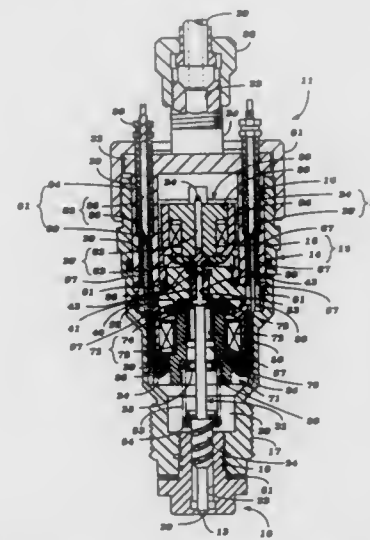
Takeo Yoshida, and Minoru Suzuki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Nov. 8, 1990, Ser. No. 610,540

Claims priority, application Japan, Nov. 9, 1989, 1-293366

Int. Cl.⁵ F02M 47/00

U.S. Cl. 239-96

7 Claims



1. An accumulator type of injection nozzle comprising an outer housing assembly defining a cavity partitioned into an accumulator chamber adapted to be supplied with high pressure fuel and a coil chamber, a nozzle port leading from said accumulator chamber, an injection valve moveable between a closed position and an open position for controlling the discharge of fuel from said accumulator chamber through said

nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injection valve for retaining said injection valve in its closed position when said control chamber is pressurized and for movement of said injection valve to its open position when pressure is relieved in said control chamber, valve means moveable between a closed position for maintaining pressure in said control chamber and an open position for relieving pressure in said control chamber for effecting fuel discharge through said nozzle port, a first electromagnet within said outer housing assembly for moving said valve means to one of said positions when said first electromagnet is energized, and a second electromagnet within said outer housing assembly for controlling the lift amount of said injection valve by selectively energizing or de-energizing said second electromagnet, wherein when said second electromagnet is energized, energization of said second electromagnet is started before energization of said first electromagnet for a given fuel injection cycle.

5,090,621

CONSTANT DRIVE NOZZLE FOR IMPULSE IRRIGATION SPRINKLERS

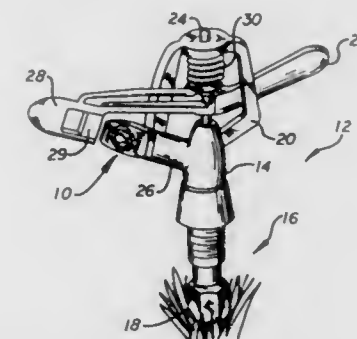
Charles A. McMillen, Alta Loma, and Hans D. Christen, La Verne, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Dec. 26, 1990, Ser. No. 634,022

Int. Cl.⁵ B05B 3/02

U.S. Cl. 239-230

15 Claims



1. A constant drive nozzle for use in combination with an impulse or impact drive sprinkler of the type including a sprinkler body adapted to be rotatably coupled with a supply conduit providing a source of pressurized water and having an outlet portion to which a nozzle can be coupled for ejecting water outwardly from the sprinkler body, a passage through the sprinkler body for directing water from the supply conduit through the outlet portion, and an oscillating drive arm rotatably carried by the sprinkler body for effecting rotation of the sprinkler body about a generally vertical axis, the drive arm having a drive spoon adapted to intercept a portion of the water ejected from the nozzle in intercepting position and to be laterally deflected thereby out of the intercepting position, and means biasing the drive spoon back toward the intercepting position such that repeated oscillations of the drive arm effect rotation of the sprinkler body about the supply conduit, said constant drive nozzle comprising:

a tubular nozzle body having an inlet end and an outlet end, said inlet end including an inlet opening adapted to mate with and form a continuation of the water passage through the outlet portion of the sprinkler body, said inlet opening defining a nozzle centerline; a circular drive orifice formed in said outlet end and defining a drive orifice axis, said circular drive orifice having a preselected size smaller than the size of said inlet opening, the axis of said drive orifice being laterally offset from said nozzle centerline; a range orifice formed in said outlet end and defining a range

orifice axis, said range orifice axis being disposed to be laterally spaced from said drive orifice axis in the direction of said nozzle centerline and lying in a plane extending through said centerline and said drive orifice axis such that said range orifice is tangent to said drive orifice, the size of said range orifice being at least approximately equal to or greater than the size of said drive orifice;

water passageway means communicating between said inlet end and each of said drive and range orifices, said passageway means being formed to cause water entering said inlet opening to be ejected from said nozzle body through both said drive orifice and said range orifice as substantially separate stream portions; and

means for coupling and orienting said nozzle body to the outlet portion of the sprinkler body with said drive orifice adjacent the drive spoon such that when the drive spoon is in the intercepting position, only that portion of the water entering said inlet end which is ejected through said drive orifice will engage the drive spoon.

5,090,622

ARRANGEMENT FOR SUPPLYING MEDIA TO A BLOWING LANCE

Johann Fohler, Puchengau; Hellmuth Smejkal, Linz, and Ernst Höllwarth, Neuzug, all of Austria, assignors to Voest-Alpine Industrieanlagenbau G.m.b.H., Linz, Austria

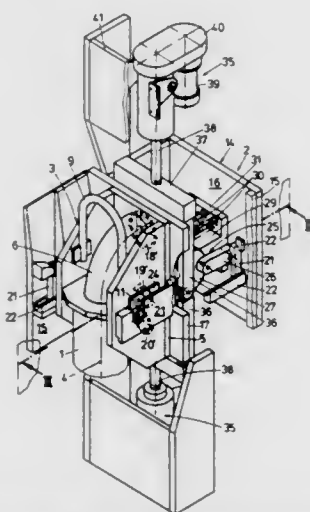
Filed Jan. 31, 1991, Ser. No. 648,556

Claims priority, application Austria, Feb. 1, 1990, 216/90; Jan. 10, 1991, 42/90

Int. Cl.⁵ B05B 15/06, 1/00

U.S. Cl. 239—273

10 Claims



1. In an arrangement for supplying media to a blowing lance for a metallurgical vessel, such as a steelworks converter, of the type including a lance carrier having a connection piece connected to at least one media supply duct, a blowing lance arranged on said lance carrier and having a counter connection piece including a corresponding media channel, said connection piece being pressable at said counter connection piece and said at least one media supply duct being sealably connectable to said corresponding media channel, the improvement comprising a displacement means provided on said lance carrier and including a seat for said blowing lance, said displacement means being adapted to move said counter connection piece from a released state into a coupled state and vice versa, and a driving means adapted to move said displacement means and to press said counter connection piece against said connection piece in the coupled state and to selflockingly and positively fix said displacement means in the coupled state.

5,090,623

PAINT SPRAY GUN

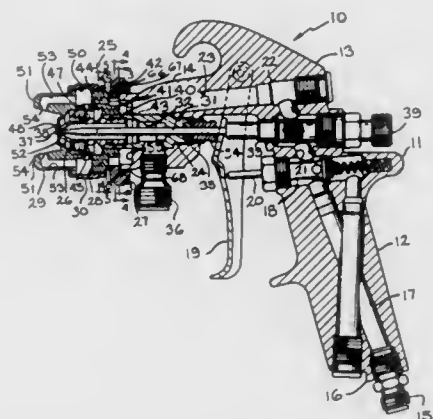
Marvin D. Burns, Millbury; Alan H. Fritz, Toledo, both of Ohio, and Thomas E. Grime, Temperance, Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Dec. 6, 1990, Ser. No. 622,853

Int. Cl.⁵ B05B 1/02, 1/30

U.S. Cl. 239—301

11 Claims



1. An improved paint spray gun including a gun body having a chamber to which high pressure air is supplied, said gun having a nozzle assembly including an orifice from which paint is discharged and atomized by a flow of atomization air and at least two fan orifices from which fan air may be discharged for shaping the pattern of the atomized paint, said spray gun being characterized by a first passage delivering low pressure air to atomize paint, a second passage delivering low pressure air to said fan orifices to control the pattern of the atomized paint, a first calibrated orifice connecting said high pressure air chamber to said first passage, a second calibrated orifice connecting said high pressure air chamber to said second passage, said first orifice having a size to drop said high pressure air to a predetermined maximum low pressure in said first passage, said second orifice having a size to drop said high pressure air to a predetermined maximum low pressure in said second passage, and valve means for controlling air flow through said second orifice to said second passage to control the flow of fan air.

5,090,624

HAND HELD SHOWER ADAPTED TO PROVIDE PULSATING OR STEADY FLOW

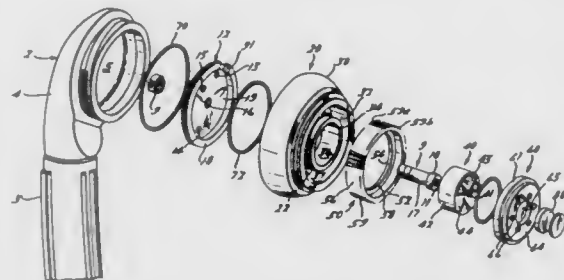
Daniel G. Rogers, Homer, Mich., assignor to Alsons Corporation, Hillsdale, Mich.

Filed Nov. 20, 1990, Ser. No. 616,119

Int. Cl.⁵ B05B 1/08, 3/06

U.S. Cl. 239—381

9 Claims



1. A shower comprising a shower head comprised of: a housing forming a chamber defined in part by a water inlet plate having at least one radially outer steady spray supply opening, and a radially inner pulsating spray supply opening;

a face plate having a wall sealably confronting the water inlet plate, the wall having at least one radially outer steady spray supply orifice, and a radially inner pulsating spray supply orifice, the face plate being manually movable arcuately to connect the steady spray supply opening with the steady spray supply orifice, or to connect the pulsating spray supply opening with the pulsating spray supply orifice.

said face plate including a radially outer annular chamber opening at its front or upstream end on the side of said wall opposite the side confronting said water inlet plate, and a radially inner cylindrical chamber open at its front or upstream end on the side of said wall opposite the side confronting said water inlet plate, said at least one radially outer steady spray supply orifice being in communication with said annular chamber and said radially inner pulsating spray supply orifice being in communication with said cylindrical chamber;

a circular cover having a plurality of pulsating spray discharge orifices closing the cylindrical chamber at its front, open end;

means disposed in said cylindrical chamber for producing a pulsating spray; and

means disposed in said annular chamber for producing a steady spray.

5,090,625

NOZZLES FOR IN-CYLINDER FUEL INJECTION SYSTEMS

Robert M. Davis, Maylands, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

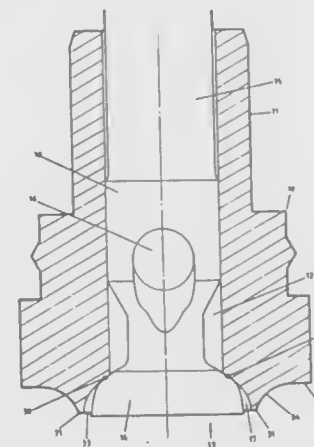
Filed Jun. 8, 1989, Ser. No. 362,986

Claims priority, application Australia, Jun. 10, 1988, PI8742

Int. Cl.⁵ B05B 1/32

U.S. Cl. 239—453

13 Claims



1. An internal combustion engine in-cylinder fuel injector nozzle comprising a body having a fuel passage extending to a terminal face at one end thereof, a port in the body end portion to, in use, communicate the fuel passage with the engine combustion chamber, said port having an annular seat therein, a valve element mounted for movement between an open position and a closed position, said valve element having an annular seat to co-operate with said annular seat in the port to control fuel flow therethrough when said valve element is moved to said open position and to contact said annular seat in the port when said valve element is moved to said closed position, and a respective annular flow directing surface extending downstream from each of the annular seats, said flow directing surfaces each diverging outwardly from the respective seats and respectively being contoured to blend smoothly with the respective seats.

5,090,626

APPARATUS FOR PRODUCING A VERY THIN MIST OF POWER AND CONTROLS FOR PRODUCING THIN MIST OF POWER

Hans G. Platsch, Stuttgart, Fed. Rep. of Germany, assignor to Industrielektronik Dr.-Ing Walter Klaschika GmbH & Co., Fed. Rep. of Germany

PCT No. PCT/EP89/00571, § 371 Date Nov. 27, 1990, § 102(e) Date Nov. 27, 1990, PCT Pub. No. WO89/11917, PCT Pub. Date Dec. 14, 1989

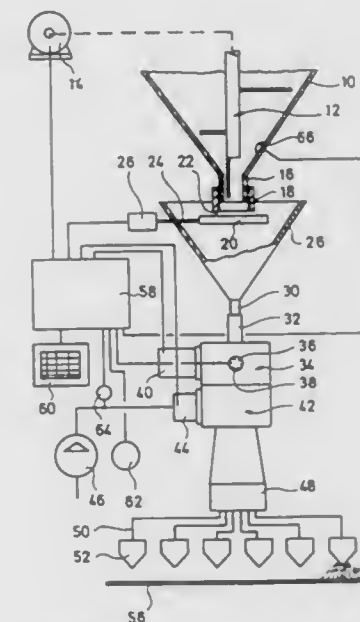
PCT Filed May 24, 1989, Ser. No. 623,962

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1988, 3819203

Int. Cl.⁵ B67D 5/08

U.S. Cl. 239—654

18 Claims



1. Dusting apparatus which includes in combination (a) a container (10) for storing atomizable ground powder that has a first outlet (16), (b) a controllable dosing device (18-28) positioned adjacent said outlet (16) to receive powder from said outlet (16) and which delivers a free falling powder stream (144) of predetermined volume to a second outlet (30), (c) a powder requirement sensor (36, 38) which is mounted to monitor the powder flow from said second outlet (30) and which regulates said dosing device (18-28), (d) an atomization device (42) connected to said second outlet (30) of the dosing chamber (18-28) which forms the fine particles of the powder stream into a mist which exits through a third outlet (48), (e) at least one nozzle connected to said third outlet (48) for discharging the mist-like powder stream formed by said atomization device (42) toward an object (56) to be dusted, (f) said sensor (34) including (1) a measuring means (36, 38) having a measuring axis through which the powder stream (144) is guided in free fall and which means measures the stream density, and (2) positioning means (32, 40; 122) for selectively establishing one of two relative positions between the free falling powder stream (144) and the measuring means (36, 38) the powder stream (144) intersecting the measuring means (36, 38) in the first of said two relative positions while passing clear of the measuring means (36, 38) in the second of said two relative positions.

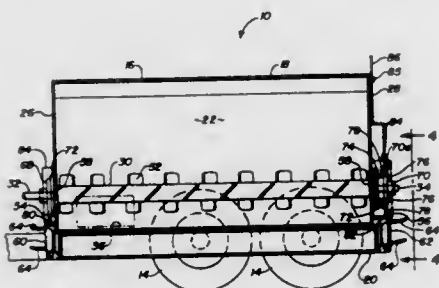
5,090,627

SEAL FOR MANURE SPREADER FLOATING AUGER
James T. Clevenger, Jr., Lancaster, and Gilbert W. Linde, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 340,447, Jan. 18, 1982, abandoned. This application Nov. 20, 1990, Ser. No. 616,156
Int. Cl.⁵ E01C 19/20

U.S. Cl. 239—675

7 Claims



1. A manure spreading apparatus comprising: a manure containing portion having a top and a bottom interconnected with sidewalls and a pair of endwalls; an auger rotatably mounted in the manure containing portion adjacent said bottom, said auger including first and second ends each extending through a respective slot formed in each endwall, said ends being movable within said slots; means operably connected for retaining movement of each end in said slots; bearings connected to each respective one of said ends to rotatively support said auger; a sealing mechanism associated with said bearings and being disposed between the bearings corresponding to each auger end and each respective said slot, said sealing mechanism including a seal member positioned adjacent each respective said slot and a plate disposed between one of said seals and the associated one of said bearings; resilient means compressed between said plate and said associated one of said bearings for imposing an axial load on both said seals through said auger to urge each said seal member toward engagement with the corresponding said endwalls; and means connected to said spreader adjacent each endwall operable for moving said auger within limits of said slots.

5,090,628

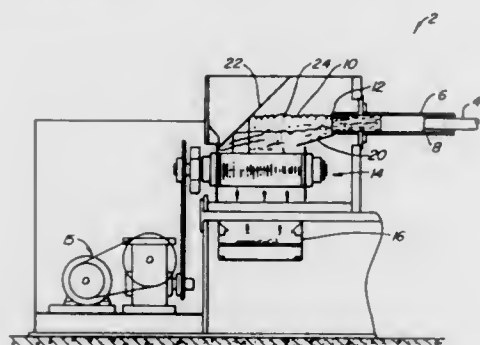
CHIP CRUSHER

Ronald J. Porter, Reno, Nev., assignor to Sierra Machinery, Inc., Sparks, Nev.

Filed Feb. 6, 1990, Ser. No. 475,654
Int. Cl.⁵ B02C 19/00, 4/08

U.S. Cl. 241—36

11 Claims



1. A device for performing skiving operations on a hollow

cylinder and crushing the chips formed by said skiving operation, said device comprising:

- a cutter for performing skiving operations on the interior of the hollow cylinder wherein strings of chips are discharged from an open end of the hollow cylinder;
- a crusher formed as an integral part of the device and disposed in juxtaposition to and beneath said open end of the hollow cylinder to receive said chips from the cutter;
- means located proximate said open end of the hollow cylinder to receive said chips from the cutter;
- means located proximate said open end of the hollow cylinder for guiding the chips from the open end of the hollow cylinder into the crusher;
- means formed in said crusher for grasping the chips from said cutter and pulling said chips through said crusher;
- and
- means for moving the crushed chips from said crusher to a receptacle.

5,090,629

OPENING DEVICE

Akiva Pinto, Duesseldorf Wittlaer; Guenter Lucaßen, Haltern, and Reinhard Schmidt, Gescher, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Dülmen, Fed. Rep. of Germany

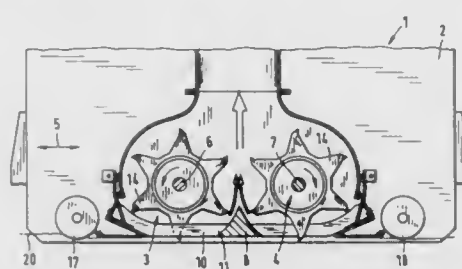
Continuation of Ser. No. 471,194, Jan. 26, 1990, abandoned. This application Oct. 22, 1990, Ser. No. 602,892

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 3903238

Int. Cl.⁵ D01G 7/04

U.S. Cl. 241—282.1

17 Claims



1. In a device for opening pressed fibre bales having a plurality of opener rolls on which a plurality of milling discs are arranged in side by side relation such that milling discs are offset with respect to milling discs of an adjacent opener roll, and including a grate having bars which extend between the milling discs, the improvement comprising:

- a baffle sheet, having a substantially gabled roof-shaped cross section with two upwardly extending walls joining to form a tip of said baffle sheet, disposed in parallel relation to the axes of the opener rolls between said opener rolls, the tip of the sheet protruding between the opener rolls for deflecting loosened fibers in a vertical direction.

5,090,630

BALE GRINDER WITH LIFT AND CARRIER FORKS

Ivyl D. Kopecky, Ypsilanti, and Ruben D. Morlock, Jamestown, both of N. Dak., assignors to Haybuster Manufacturing Inc., Jamestown, N. Dak.

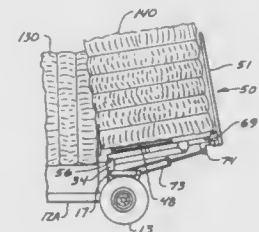
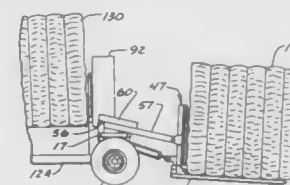
Filed Jul. 13, 1990, Ser. No. 552,436
Int. Cl.⁵ A01D 55/00

U.S. Cl. 241—279

8 Claims

1. A bale shredder supportable on a ground surface, having a shredding rotor and a bale chamber for holding large bales in which shredding occurs, the improvement comprising a lift fork assembly mounted on said shredder and including a main support member having one end pivotally mounted to a frame of said bale shredder, and a fork comprising a backstop and a pair of tines, the fork being pivotally mounted to a second end of said main support member, said tines being movable about

the pivotal mounting of the fork when the main support member is in a lowered position to a position wherein the tines are generally parallel to and adjacent the ground surface so that the tines pass under portions of a large cylindrical bale to be shredded, the bale having a length axis and opposite ends, with the tines parallel to a length of said bale, and the tines and backstop being pivotable relative to the main support member until the backstop and the main support member lie generally along parallel planes and the tines extend upwardly, without substantial movement of the main support member about its pivotal mounting to the frame, said main support member and fork thereafter being pivotable as a unit to an intermediate position wherein a bale supported on the backstop will slide while supported on an end thereof to a position adjacent the bale chamber in direction away from the tines and upon further



pivoting of the main support member and fork a bale will be caused to move into the bale chamber, said main support member and said fork being movable about their respective pivotal mountings to lift a second bale adjacent to the intermediate position and being of size to permit holding a second bale elevated from the ground with the first bale in the bale chamber, and extendable and retractable actuator means acting along a single plane of movement during extension and retraction and having one pivotal mounting of one end of the actuator means to the frame at an axis offset from the pivotal mounting of the main support member to the frame and a pivotal mounting of second end of the actuator means to the fork at an axis offset from the pivotal mounting of the fork to the main support member, said actuator means single plane of movement being positioned to cause the sequence of pivoting of the fork and subsequent pivoting of the main frame member.

5,090,631

AIR FLOW RATE CONTROL DEVICE FOR PULVERIZER VANE WHEEL

Rickey E. Wark, 2217 Lake Angelus Rd., Pontiac, Mich. 48055
Filed Oct. 15, 1990, Ser. No. 597,856

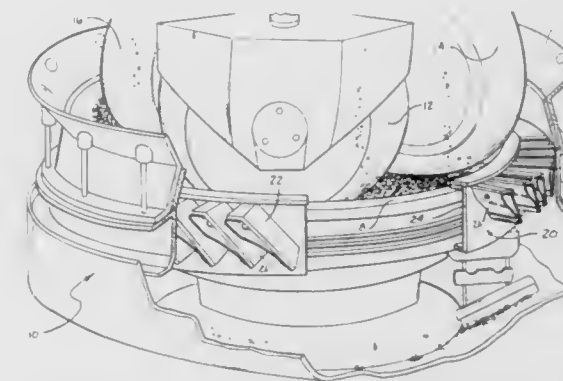
Int. Cl.⁵ B02C 15/00

U.S. Cl. 241—119

14 Claims

1. In a pulverizer of the type which includes an essentially circular arrangement of pitched vanes forming air flow pas-

sages there between and having upper and lower plane surfaces, an improvement comprising:



air flow velocity control means comprising means for deflecting air in said air flow passages mounted on the lower plane surfaces of at least some of said vanes.

5,090,632

APPARATUS FOR FORMING ELECTRICAL COIL ASSEMBLIES

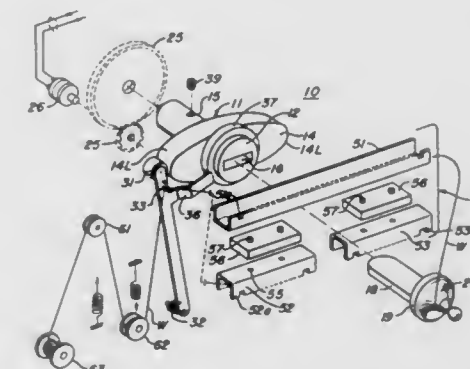
Donald A. Lace, 5041 Galway Circle, Huntington Beach, Calif. 92649

Filed Mar. 23, 1990, Ser. No. 497,682

Int. Cl.⁵ H01B 11/04

U.S. Cl. 242—7.13

5 Claims



1. Apparatus for winding coils onto an irregularly shaped spool assembly comprising: a rotary spindle mounted for rotation and including a face plate formed in one end thereof, said face plate being provided with a rectangular recess extending into said spindle; a clamping fixture characterized by a flange and a tongue extending from one face of said flange, said tongue being conformed for receipt in said rectangular recess; securing means formed on said spindle for securing said tongue within said rectangular recess; a cam formed on said spindle; a pivoted arm deployed adjacent said spindle and urged to contact said cam proximate a free end thereof; wire spool means mounted for rotation adjacent said arm for storing wire thereon, said arm including guide means conformed to receive said wire extending from said spool means; and a core assembly comprising a plurality of channel segments spaced from each other by insulative spacers received in clamped engagement between said flange and said face plate.

5,090,633

PACKAGE WINDING METHOD

Kenji Ohashi, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

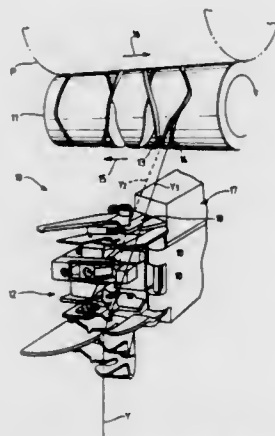
Filed Jul. 9, 1990, Ser. No. 550,159

Claims priority, application Japan, Jul. 14, 1989, 1-182120

Int. Cl.⁵ B65H 54/38, 54/48

U.S. Cl. 242—18.1

12 Claims



1. A method for winding a package using a traverse drum having a plurality of traverse grooves, the method comprising the steps of:

- detecting a diameter of the package,
- winding the package using a first predetermined combination of traverse grooves when the detected diameter of the package is within a first predetermined range of values, and
- winding the package using a second predetermined combination of traverse grooves when the detected diameter of the package is within a second predetermined range of values.

5,090,634

SPEED CHANGER FOR FISHING REELS

Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Division of Ser. No. 337,005, Apr. 12, 1989, Pat. No. 4,966,335.

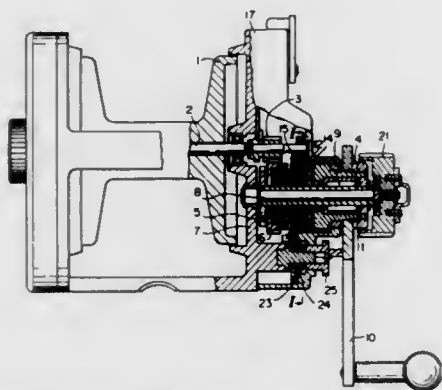
This application Jun. 7, 1990, Ser. No. 534,227

Claims priority, application Japan, May 13, 1988, 63-116654; Aug. 11, 1988, 63-200477; Aug. 26, 1988, 63-111700

Int. Cl.⁵ A01K 89/015

U.S. Cl. 242—255

5 Claims



1. A speed changer for fishing reels, comprising a driving gear-carrying driving shaft having a driving gear mounted thereon, a handle-carrying handle-turned tube mounted on an outer portion of said driving shaft via a one-way clutch so that said handle-turned tube can be turned unitarily with said driv-

ing shaft in a fishing line take-up direction, a spool-turning spool shaft and a pinion mounted on said spool-turning spool shaft, with which pinion said driving gear is meshed, planetary gears supported rotatably on shafts extending from an inner end portion of said handle-turned tube, an internal gear mounted on and rotatable with said driving shaft, with which internal gear outer portions of said planetary gears are meshed, a sun gear fitted rotatably around said driving shaft, with which sun gear inner portions of said planetary gears are meshed, a change-over member having locking teeth at its outer circumferential portion and formed unitarily with said sun gear, a stopper pawl pivotally mounted to contact said locking teeth in one position and contacted by an operating member so that said stopper pawl can be engaged with said locking teeth to stop rotation of said change-over member, and disengaged from said locking teeth, by said operating member, and a brake member engaged with said locking teeth of said change-over member, which provides a braking force resisting rotation of said change-over member, and means to regulate said braking force, said brake member being supported pivotally on a reel side plate via a support shaft spaced from said handle-turned tube.

5,090,635

MACHINE FOR PRODUCING CROSS-WOUND BOBBINS OR CHEESES

Hans Grecksch, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst AG & Co., Mönchengladbach, Fed. Rep. of Germany

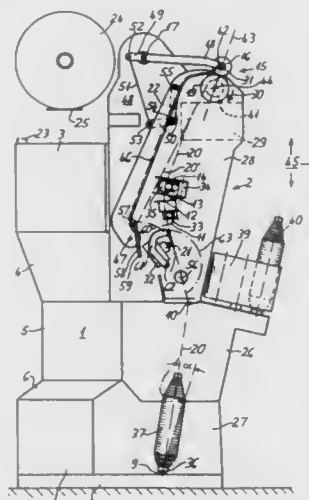
Filed Feb. 22, 1991, Ser. No. 660,436

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005547

Int. Cl.⁵ B65H 54/20, 54/22

U.S. Cl. 242—35.6 R

11 Claims



1. A machine for producing cross-wound bobbins or cheeses, comprising winding apparatuses each having a yarn delivery device, yarn guide devices disposed downstream of said yarn delivery device as seen in a yarn travel direction, a yarn take-up device disposed downstream of said yarn guide devices, said yarn take-up device having a bobbin frame for carrying a cheese with a center of gravity, said bobbin frame being pivotable about a pivot shaft, a winding roller for engaging the cheese and rotating about an axis of rotation for guiding the yarn around said winding roller from a given path of the yarn traveling toward the cheese, and at least one yarn breakage correcting device, and a suction nozzle with an inlet mouth for retrieving a broken yarn having run up onto the cheese, the center of gravity of the cheese and said axis of rotation of said winding roller defining an imaginary plane with one side on which said pivot shaft of said bobbin frame, said given path of the yarn at said winding roller, and said inlet mouth are all

disposed and another side facing a free space extending along the cheese winding machine.

5,090,636

AIRCRAFT

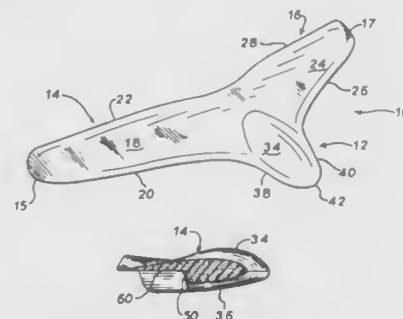
James M. Sadowski, 106 Linden La., Apt. 4, Thiensville, Wis. 53092

Filed Jan. 23, 1991, Ser. No. 644,832

Int. Cl.⁵ B64C 31/02

U.S. Cl. 244—16

9 Claims



1. An aircraft, comprising:
 - a central body portion defining an upper surface and a lower surface and terminating in a forwardly disposed nose, wherein the lower surface extends downwardly and rearwardly from the nose;
 - a pair of wings extending laterally outwardly one from each side of the body portion, each wing terminating in a wing tip, with each wing defining an upper wing surface and a lower wing surface, and wherein the wings and body portion cooperate to define a forward edge and a rearward edge of the aircraft, and wherein the rearward edge of the aircraft extends laterally between the wing tips and defines the rearwardmost extent of each wing, whereby the aircraft is tailless; and
 - wherein an upward step is formed in the underside of the aircraft extending between the body portion lower surface and the lower wing surfaces, to define a rearwardly facing riser surface disposed forwardly of the rearward edge of the aircraft defined by the wings and body portion.

5,090,637

HELIUM PURIFICATION SYSTEM FOR LIGHTER-THAN-AIR AIRCRAFT

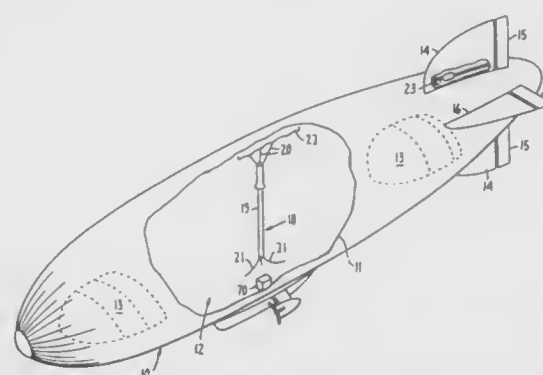
Willard M. Haunschild, 804 Cedar Ave., Tillamook, Oreg. 97141

Filed Apr. 14, 1989, Ser. No. 338,179

Int. Cl.⁵ B64B 1/58

U.S. Cl. 244—97

36 Claims



1. A method of at least periodically increasing the lift capacity of a lighter-than-air airship having at least one lift compartment containing helium to provide lift capacity for said airship which comprises,
 - inducing flow of a portion of the helium from said lift com-

partment through a confined path, said helium having a reactable mixture of hydrogen and oxygen components entrained therein, said path having disposed therein for contact by said hydrogen and oxygen components a catalytic reaction surface, the flow of said oxygen and hydrogen components in said mixture over said reaction surface being regulated to control the temperature of the effluent gas passing over said catalytic surface; and circulating the effluent gas into said lift compartment in a volume and at a rate sufficient to maintain or increase the lift capacity of said compartment.

5,090,638

LOCKING MECHANISM FOR TYING DOWN FREIGHT IN AN AIRCRAFT

Wilfried Eilenstein-Wiegmanns, Stühr, and Hartmut Sempert, Delmenhorst, both of Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany

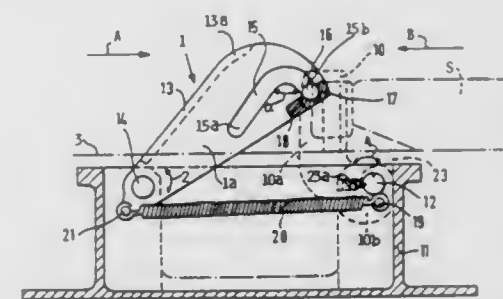
Filed Jun. 28, 1991, Ser. No. 722,896

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1990, 4021499

Int. Cl.⁵ B64C 1/20

U.S. Cl. 244—118.1

7 Claims



1. A locking mechanism for tying down a piece of freight on a loading floor in an aircraft, comprising housing means in said loading floor for housing said locking mechanism in a recessed position, a latch operating member (1), a first journal pin (14) for journalling said latch operating member (1) in said housing means, a latching member (10) for tying down said piece of freight, a second journal pin (12) for journalling said latching member (10) in said housing means, a tension spring (20) connected at one end to said latch operating member (1) and at its other end to said latching member (10) to bias said latch operating member (1) and said latching member (10) away from each other, said latch operating member (1) having two cam guide tracks (15), said latching member (10) having two follower cams each extending laterally into a respective cam guide track of said two cam guide tracks, each of said two cam guide tracks having two track sections merging into each other and enclosing an acute angle (α) with each other, said acute angle forming a vertex pointing substantially upwardly when said locking mechanism is in a freight tying down position.

5,090,639

CARGO-CARRYING SYSTEM FOR PASSENGER AIRCRAFT

James T. Miller, Louisville; Michael T. McAlpin, Crestwood, both of Ky.; Gordon Sanden, Huntington Beach, and Mark L. Snow, Woodland Hills, both of Calif., assignors to United Parcel Service General Services Co., Greenwich, Conn.

Continuation of Ser. No. 427,457, Oct. 26, 1989, abandoned.

This application May 8, 1991, Ser. No. 700,111

Int. Cl.⁵ B64C 1/20

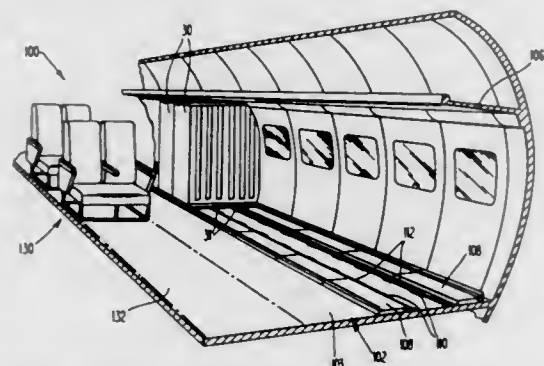
U.S. Cl. 244—118.1

19 Claims

1. A system for temporarily adapting all or a selected portion of a passenger cabin of a passenger aircraft to the carriage of cargo, comprising:
 - (a) a plurality of containers;

(b) fastening means for fastening each one of said containers in place in a passenger cabin of the passenger aircraft; and
(c) weight distributing means for distributing the weight of said containers over the floor of the passenger cabin of the passenger aircraft;

wherein said containers are (i) dimensioned to pass through a passenger door of the aircraft, fit under the overhead luggage racks, and, when one container is positioned on each side of the passenger cabin of the passenger aircraft, leaves sufficient space between them to permit an aisle of sufficient width to permit the passage of a person; and (ii) are sufficiently strong that, when loaded with cargo and fastened in place by said fastening means, will contain the cargo when subjected to accelerations of up to 9g's in the forward direction, 1.5g's in the aft direction, 3.0g's in the upward direction, 6.0g's in the downward direction, and 3.0g's in each lateral direction with an additional multiplication factor of 15 percent for safety; and



wherein said fastening means and said containers are both sufficiently strong that, when said containers are loaded with cargo and fastened in place by said fastening means, said containers will remain in place when subjected to accelerations of up to 9g's in the forward direction, 1.5g's in the aft direction, 3.0g's in the upward direction, 6.0g's in the downward direction, and 3.0 g's in each lateral direction with an additional multiplication factor of 15 percent for safety;

said fastening means comprising existing passenger seat tracks;

whereby said weight spreading means assures that limits on the weight of a floor of the cabin of the passenger aircraft are not exceeded even when said containers are fully loaded; and

whereby passenger seats may be provided and passengers may be carried in the passenger cabin of the aircraft in a portion thereof other than a selected portion temporarily adapted to the carriage of cargo wherein said system is located.

5,090,640

AIRCRAFT DOOR OPERATING MECHANISM

Donald J. Fessett, Chino Hills, Calif., assignor to Lucas Western, Inc., Brea, Calif.

Filed Apr. 5, 1990, Ser. No. 505,303

Int. Cl.⁵ B64D 25/14, 47/00

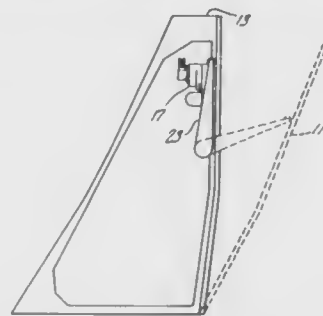
U.S. Cl. 244—129.5

27 Claims

1. For use with a frame defining an opening and a door mounted on said frame, said door having a closed position in which it covers said opening and an open position in which it exposes said opening, a mechanism for controlling the movement of said door comprising:

door latching means for retaining said door in said closed position, said door latching means being movable from a latched position in which said door is held in said closed position to an unlatched position in which said door can be moved toward said open position, said door latching means including force multiplying means for increasing a

force applied to said door latching means for immediately moving said door latching means from said latched position to said unlatched position,
door opening means for moving said door from said closed position toward said open position,
first resilient means for storing mechanical energy and being



selectively actuatable to cause said door latching means to move to its unlatched position, and
second resilient means for storing mechanical energy and being actuatable when said door latching means is in the unlatched position to cause said door opening means to move said door from said closed position toward said open position.

5,090,641

CASING FOR A PARACHUTE

Hubert Nöhren, Hamburg; Werner Moritzen, Elmshorn; Gerhard Siebrand, Quickborn, and Helmut Knoke, Norderstedt, all of Fed. Rep. of Germany, assignors to Autoflug GmbH & Co., Rellingen, Fed. Rep. of Germany

Filed Jan. 11, 1990, Ser. No. 463,615

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1989, 3900621

Int. Cl.⁵ B64D 17/50, 17/40

U.S. Cl. 244—148

18 Claims



1. A casing for a parachute that is intended for setting down a load, with said parachute having a parachute canopy, shroud lines, and a carrying harness attached thereto for the load, said casing comprising:

at least one substantially flat fabric sections that are deposited one above the other and are interconnected at outer edges thereof via an encircling seam, thereby forming between two adjacent ones of said fabric sections a respective chamber, with one outer one and respective interior ones of said fabric sections being provided with a respective central opening through which said parachute is a packed into said respective chambers and through which said parachute is released after actuation, with said central openings of said fabric sections remaining open in a packed state of said parachute.

5,090,642

PROJECTILE DELIVERY SYSTEM

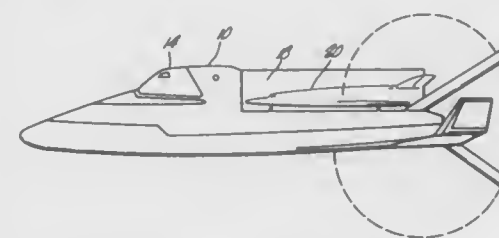
Robert J. Salkeld, 920 Louisiana S.E. #88, Albuquerque, N. Mex. 87108

Filed Feb. 20, 1990, Ser. No. 483,042

Int. Cl.⁵ B64G 1/14

U.S. Cl. 244—158 R

2 Claims



1. A process for delivering a projectile to a remote earth location, comprising the steps of
launching a first stage, a second stage and the projectile together to low earth orbit;
launching the second stage with the projectile from the first stage to a geosynchronous orbit;
returning the second stage with the projectile to atmospheric entry;
rebouncing the second stage with the projectile toward an outward trajectory;
releasing the projectile while in the outward trajectory in a lob trajectory from the second stage;
returning the second stage to an earth location remote from the earth impact of the projectile.

5,090,643

FORCE GENERATING SYSTEM

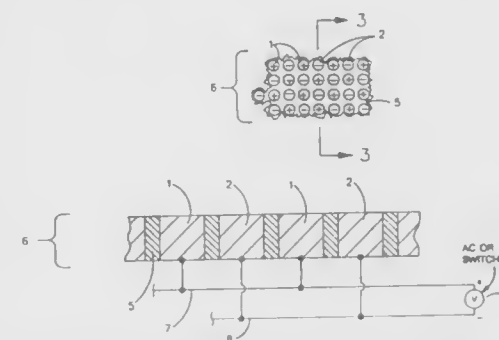
Morton F. Spears, P.O. Box 466, Cataumet, Mass. 02534

Filed Mar. 15, 1990, Ser. No. 494,156

Int. Cl.⁵ B64G 1/46; G09B 23/18

U.S. Cl. 244—163

12 Claims



1. Apparatus for creating an attractive force, comprising:
a first plurality of electrodes, each of said electrodes having an attracting end and a connection end, said attracting ends being disposed on a surface in a matrix,
a second plurality of electrodes, each of said electrodes having an attracting end and a connection end, said attracting ends of said second plurality being disposed on said surface in said matrix so as to form with said attracting ends of said first plurality of electrodes a checkerboard-pattern grid of alternating electrodes, such that each electrode of said first plurality is disposed immediately adjacent to electrodes of said second plurality,
a first insulator separating said first and second pluralities of electrodes, and
a power supply for applying an electrical voltage between said connection ends of said first plurality of electrodes

and said connection ends of said second plurality of electrodes.

5,090,644

CONDUIT SUPPORT APPARATUS

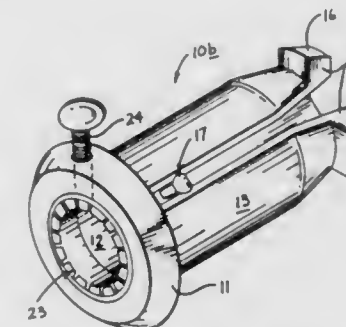
Scott J. Lenker, R.D. 1, Box 5024, Grantville, Pa. 17028

Filed Nov. 29, 1990, Ser. No. 619,594

Int. Cl.⁵ F16L 5/00

U.S. Cl. 248—56

1 Claim



1. A conduit support apparatus arranged for mounting within a planar support structure for securing a conduit there-through, the apparatus comprising,
a base flange, the base flange including a planar top surface, and
a plurality of mounting legs fixedly and orthogonally mounted to the planar top surface, each mounting leg including a locking lug fixedly mounted to each upper terminal end of each mounting leg projecting and mounted to an exterior surface of each mounting leg, and the base flange including a central, axially aligned bore, and the mounting legs mounted about the bore, and
lock ring means mounted within the mounting legs for securing the conduit therewithin, and
wherein the mounting legs are arranged in diametrically opposed pairs concentrically positioned about the axially aligned bore, and the axially aligned bore defining a central axis, with the mounting legs spaced an equal distance from the central axis, and
wherein each locking lug is defined by a trapezoidal cross-sectional configuration, including an exterior sloping guide surface and a planar bottom surface, with the planar bottom surface orthogonally aligned relative to the central axis, and the planar bottom surface and the exterior sloping guide surface defining an acute included angle therebetween, and

wherein each mounting leg includes a concentric groove segment directed through an interior surface of each mounting leg adjacent the base flange, and the groove segments of the mounting legs supporting the lock ring means therewithin, and the lock ring means including an annular array of plate elements angulated upwardly relative to the planar top surface of the base flange defining an acute included angle between the central axis and a projection of each plate element towards the central axis, and wherein the axially aligned bore of the base flange includes a further lock ring means mounted therewithin, wherein the further lock ring means includes a further series of lock plate elements angulated upwardly relative to the planar bottom surface and defining a further acute angle between the central axis and a projection of a further plate elements toward the central axis, and
wherein the base flange includes an internally threaded bore directed through the base flange and radially aligned therethrough intersecting the axially aligned bore, and an externally threaded locking stud threadably received within the threaded bore to enhance securement of the conduit within the axially aligned bore, and
wherein each mounting leg is formed of a memory retentent

material and is biased into an orthogonal orientation relative to the planar top surface.

5,090,645

CABLE STACKING MEMBER

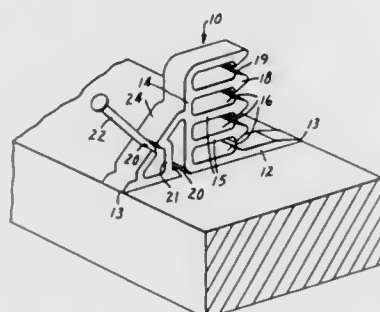
John L. Zuercher, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1990, Ser. No. 576,063

Int. Cl.⁵ F16L 3/04

U.S. Cl. 248—68.1

20 Claims



1. A cable stacking member for fastening and positioning wires and cables to a framing member comprising: a base plate having opposite surfaces and ends, a support member attached to said base plate and extending generally perpendicular from one surface thereof, said support member having at least one side, and a plurality of elongate extensions, said extensions having a first end and a second end, said first end of each extension being attached to said at least one side of said support member and said extensions projecting from said support member in spaced, substantially parallel relationship to each other, the spaces between adjacent extensions defining slots which are open on three sides for the retention of elongate articles and said extensions having means at their second ends for partially closing an open end of said slots to retain the elongate articles in said slots, said extensions and the resulting slots therebetween being generally centrally located on said base plate, and means for attaching said cable stacking member to a framing member.

5,090,646

SUPPORT AND POSITIONING ASSEMBLY FOR A SPRAY NOZZLE

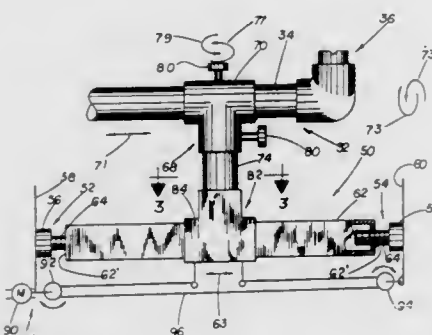
Robert L. Pucillo, P.O. Box 557442, Miami, Fla. 33155-7442
Division of Ser. No. 302,487, Jan. 27, 1989, Pat. No. 4,988,063.

This application May 31, 1990, Ser. No. 531,307

Int. Cl.⁵ A62C 13/76

U.S. Cl. 248—75

5 Claims



1. For use in cleaning fin type air conditioning unit coils, a cleaning spray nozzle support and positioning assembly

including a cleaning nozzle means to spray cleaning fluid under pressure on the coils, said cleaning nozzle means including a nozzle and an extending tubular portion, said assembly comprising: an elongate supporting base extending in spaced relation along the coils and means fixing said base to a support surface, a nozzle carrier means movably connected to the base for movement of translation along the base, said carrier means including orienting means to selectively orient the nozzle means to direct cleaning fluid spray in a predetermined path and means to maintain the nozzle means in a selected orientation, said orienting means comprising a finger included on said carrier means extending away from the base, a nozzle means holding member rotatable on the finger, said member including a lateral sleeve portion about the extending tubular portion of said nozzle means, said extending tubular portion being rotatable in said sleeve for swinging movement of said nozzle, said means to maintain comprising means to mutually engage the finger and the nozzle holding member to lock the finger and holding member in a selected position and means to mutually engage the nozzle holding member and the extending tubular portion of said nozzle means to lock the nozzle in an adjusted position, whereby, when oriented and locked in position, said carrier means and nozzle may be moved along said base to spray and clean said fin type coils.

5,090,647

HOSE TROLLEY

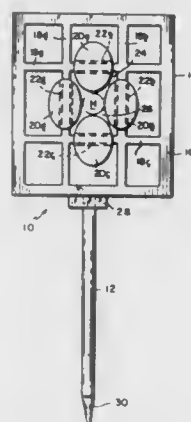
Samuel T. Clarke, 8-2 Louisburg Sq., Nashua, N.H. 03060

Filed Feb. 19, 1991, Ser. No. 657,428

Int. Cl.⁵ B05B 15/00

U.S. Cl. 248—87

12 Claims



1. A transportable supporting device to elevate and facilitate pulling a hose relative to a ground surface, which device comprises: support means; hose holding means for supporting a section of the hose which has been extended out along the ground surface so that the section of the hose is elevated and substantially parallel to the ground surface; said support means including a post having a top connected to said hose holding means, a bottom which can be removably positioned on the ground surface, and a height such that said hose holding means is supported at an elevated position above the ground surface; and

said hose holding means including a frame member and at least a pair of opposed rotary members defining a channel therebetween to receive the hose and having an axis of rotation oriented so that said rotary members rotate upon pulling of the hose through the channel and thereby facilitating the pulling.

5,090,648

STAND ASSEMBLY

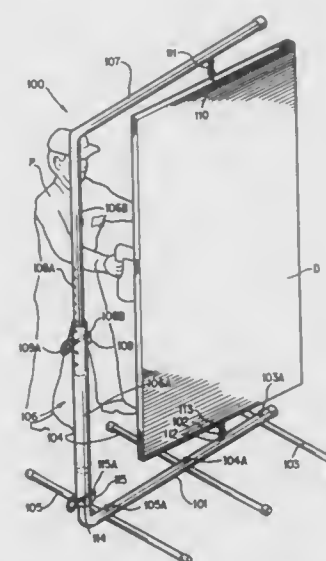
William R. Wood, IV, Dennison, Tex., assignor to TDS Manufacturing, Sherman, Tex.

Filed Mar. 1, 1991, Ser. No. 662,842

Int. Cl.⁵ A47G 29/00

U.S. Cl. 248—125

6 Claims



1. A stand assembly for rotationally holding an object to be painted, comprising: a base; a first pivot point projection means on said base for pivotal receipt of one end of said object; an upright support extending from said base and having a plurality of selectively telescopically expandable and contractable members; locking means for holding said members in a telescoped position; an elongate pivot support perpendicularly extending from said upright support and above and in alignment with said securing projection; and a second pivot point projection means on said pivot support and alignable with said first pivot point for pivotal receipt of the other end of said object, whereby upon receipt of said object within said stand and by said pivot points, all surfaces of said object are exposed for painting and said object may be pivotally rotated during painting.

5,090,649

PORTABLE SUPPORT FOR CURLING IRON

Charles S. Tipp, 6427 Quarry La., Dublin, Ohio 43017

Filed Mar. 27, 1990, Ser. No. 499,714

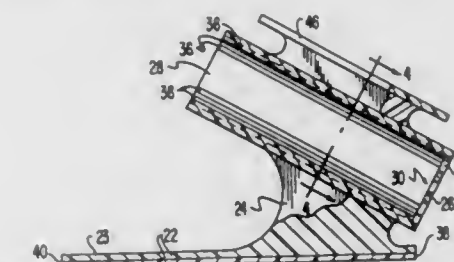
Int. Cl.⁵ F16M 11/00

U.S. Cl. 248—176

3 Claims

1. An apparatus for storing a handheld beauty device having a heatable electrical element, comprising: a portable base body; means coupled to said base body for removably mounting and storing at least a portion of the heating element of the handheld device; said storing means defines a generally tubular holding member having a cavity with at least one open end portion thereof for the insertion and removal of the heating element of the handheld device; a plurality of spaced apart internally disposed heat resistant means in said holding member which are arranged in at least heatable zones to be contacted by portions of the

heating element when received within said holding member; said holding member includes an end piece provided with openings allowing air passage relative to the heating element for cooling of the same wherein said holding member is made of a heat resistant material; one of said heatable zones of said heat resistant means is positioned adjacent said open end portion and another one of said heatable zones of said heat resistant means is positioned adjacent said end piece so that proximal and distal end portions of the heating element engage said heat resistant means; and,



said holding member is constructed and mounted to said base body in such a manner as to provide stability for the apparatus especially when holding the curling element, said base body includes a baseplate and a pedestal oriented at an angle on said baseplate such that a center of gravity of said apparatus is near a rearward end of said baseplate so as to provide stability for said apparatus wherein said heat resistant means includes a plurality of circumferentially spaced internal ribs which are made of a heat resistant material and which extend along the length of said holding member.

5,090,650

MOUNTING BRACKET ARRANGEMENT FOR ALIGNING OPTICAL SYSTEM COMPONENTS

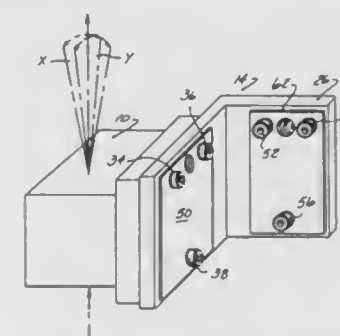
Robert D. Donaldson, and Freddie L. Raleigh, both of Centerville, Ohio, assignors to Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 30, 1990, Ser. No. 559,924

Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—183

5 Claims



1. A mounting bracket arrangement for adjustably mounting a component (10) on a base structure (12), the improvement comprising: a subplate (20) having said component (10) affixed thereto; a bracket assembly (14) comprising oppositely extending first and second bracket plates (24,26) with the respective planes thereof extending 90 degrees from each other; subplate attachment means (34, 36, 38) for securing said subplate (20) to said first bracket plate (24); base structure attachment means (52, 54, 56) securing said base structure (12) to said second bracket plate (26); said subplate attachment means including a pivot screw (38)

extending through a close fitted bore at one side of said first bracket plate (24) and into said subplate (20) to define a first fixed pivot axis and at least one locking screw (34, 36) spaced from said pivot screw (38) and passing through an opening (44) in said first bracket plate (24) and into said subplate (20) with sufficient clearance with said opening (44) in said first bracket plate (24) to enable adjusting pivoting of said subplate (20) with said pivot screw (38) and said at least one locking screw (34, 36) loosened; said base structure attachment means including pivot screw (56) extending through a close fitted bore at one side of said second bracket plate (26) and into said base structure (12) to define a second fixed pivot axis orthogonal to said first pivot axis, and at least one locking screw (52, 54) extending through an opening (66) in said second bracket plate (26) and into said base structure (12) with sufficient clearance between said at least one locking screw (52, 54) and said opening (66) in said second bracket plate (26) to enable adjusting pivoting of said second bracket plate (26) on said base structure (12) said subplate attachment means including a set of two locking screws (34, 36) and said base structure attachment means including a set of two locking screws (52, 54); and, a single torque plate (50, 62) located beneath each set of locking screws (34, 36, 52, 54) with each pair of said locking screws (34, 36, 52, 54) each passing therethrough a single torque plate (50, 62), whereby any tendency of tightening of said locking screws to cause shifting of said first or second bracket plates is avoided.

5,090,651

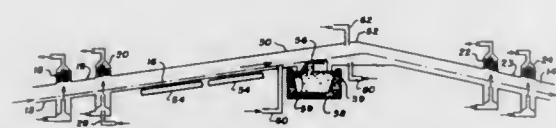
GAS CURTAIN ADDITIVES AND ZONED TUNNEL FOR SOLDERING

Michael T. Mittag, New Haven, Vt., assignor to Electrovert Ltd., Toronto, Canada

Continuation of Ser. No. 472,899, Jan. 31, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 733,061
Int. Cl.⁵ B23K 1/04, 35/38; F27D 7/00

U.S. Cl. 228—219

29 Claims



1. A process for soldering an element comprising the steps of:

conveying the element into an enclosed zone through an entry containing at least one fluid barrier curtain, with an additive added directly into fluid in the curtain so that the element is treated with the additive upon entry into the zone; then heating and soldering the element in the zone, and conveying the soldered element from the enclosed zone through an exit containing at least one fluid barrier curtain.

5,090,652

CONCEALED DEVICE FOR WALL-MOUNTING AN ITEM OF WALL FURNITURE

Carlo Cattaneo, Figino Serenza, Italy, assignor to Camar S.p.A., Como, Italy

Filed Mar. 19, 1990, Ser. No. 495,841

Claims priority, application Italy, Mar. 20, 1989, 19823 A/89; Nov. 24, 1989, 22501 A/89

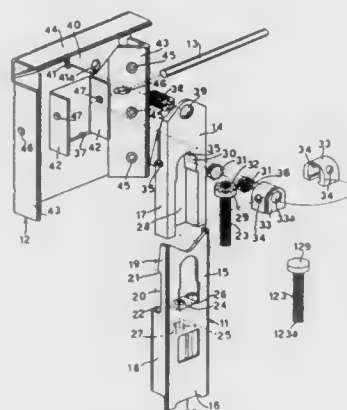
Int. Cl.⁵ A47B 96/06

U.S. Cl. 248—222.1

16 Claims

1. A concealed device for wall-mounting an item of wall furniture comprising, in combination: a plate to be fixed to the furniture item, a coupling element separate from said plate and

arranged to engage a support member fixed to the wall, and said coupling element having first and second adjustment linkages acting between said plate and said coupling element to



5,090,653

FENDER WASHER

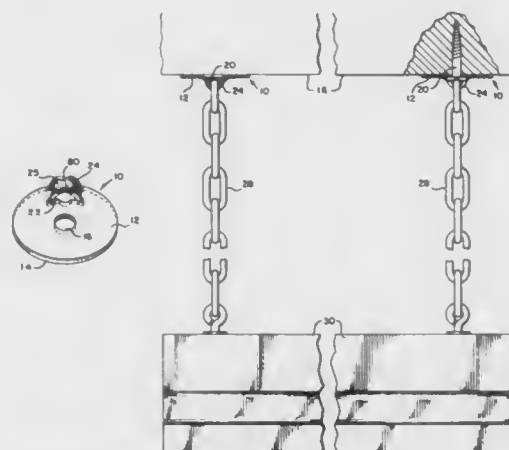
Panos Theodorides, 82 Lynnfield St., Hollbrook, Mass. 02343

Filed Dec. 3, 1990, Ser. No. 620,552

Int. Cl.⁵ A47H 1/10

U.S. Cl. 248—317

5 Claims



1. A fender washer comprising an annular flat metal disk having a central opening there-through to receive a screw for securing the washer to a support, and a hanger formed in the disk by separating a strip-shaped portion thereof from the remainder of the disk along the sides of the strip shaped portion while leaving the ends of said portion integral with the disk and displacing said portion from the plane of the disk.

5,090,654

CATHEDRAL CEILING ADAPTER

Ronald L. Ridings, Cleburne, and Robert M. Fitzpatrick, Arlington, both of Tex., assignors to Craftmade International, Inc., Grand Prairie, Tex.

Filed Mar. 8, 1991, Ser. No. 666,846

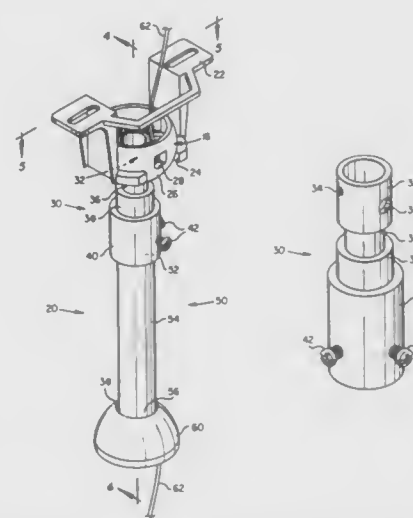
Int. Cl.⁵ B42F 13/00

U.S. Cl. 248—343

11 Claims

1. Apparatus for mounting a ceiling fan on a cathedral ceiling having a steep pitch angle comprising: a hanger;

a ball-joint pivotally supported by said hanger; an adapter attached to and extending downwardly from said ball-joint, said adapter including: a head portion attached to the ball-joint; a neck portion integral with and extending downwardly from said head portion;



a shoulder portion integral with and extending downwardly from said neck portion; and a body portion integral with and extending downwardly from said shoulder portion; and an extension means attached to and extending downwardly from the body portion for proper height positioning of a ceiling fan attached thereto.

5,090,655

SUPPORT FOR CHRISTMAS TREE

Marc-Antoine Bisson, 2397, rue Bellevue, St. Romuald Quebec, Canada

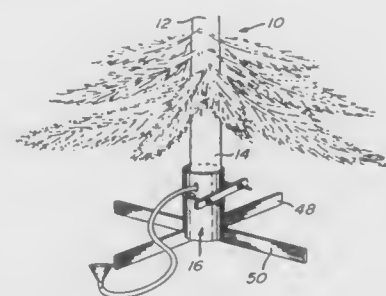
Filed Mar. 27, 1991, Ser. No. 675,948

Claims priority, application Canada, Apr. 4, 1990, 2013839

Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—523

8 Claims



1. A support for engaging a trunk at a butt end of a cut tree and for holding the tree upright, comprising:

a cylindrical body adapted to receive the butt end of the cut tree therein, said body having an inner wall and an outer wall and displaying a transverse horizontal slot extending for substantially half of said body;

trunk clamping means including a generally U-shaped yoke having an intermediate rectilinear straddle portion extending in said slot and two leg portions extending perpendicular to said straddle portion and along either side of said body in a direction away from said slot; said clamping means further including means forcing said straddle por-

tion against said trunk whereby the trunk is secured to the inner wall of said body; and means at the bottom of said body for maintaining said body, with said tree secured therein, in an upright position.

5,090,656

POST SUPPORT

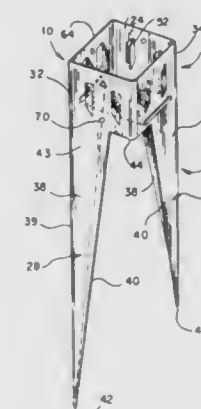
Roger A. Brown, 3423 Gold Candle, Spring, Tex. 77388

Continuation-in-part of Ser. No. 482,911, Feb. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 412,350, Sep. 26, 1989, abandoned. This application Nov. 29, 1990, Ser. No. 619,450

Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—545

11 Claims



1. A post supporting for engagement with the periphery of a post bottom comprising:

an upper section joined to a lower section, said upper section including a plurality of side walls defining an interior socket,

said lower section including a plurality of leg members depending from said upper section side walls and terminating in bottom points substantially laterally spaced from one another,

each said leg member comprising a pair of side plates having common outer edges cojoined to form a leg member corner edge, each said pair of side plates disposed normal to one another in horizontal cross-section, each said side plate disposed in a vertical plane coplanar with one said upper section side wall,

each said leg member side plate comprising a planar element defining a substantially triangular configuration bounded by an inclined inner edge with each said side plate tapering from a widened top portion to a bottom point,

said plurality of leg members consisting of a pair of leg member diametrically opposed to one another,

at least a pair of tangs projecting into said socket and affixed to each of a plurality of said side walls, said tangs each comprising a bladed element having a top edge inclined downwardly from one said side wall adapted to cut into a post bottom periphery as a post bottom is driven into said socket, and

a horizontal bottom plate spanning said socket intermediate said tangs and said lower section, whereby upon driving of a post into said socket said tangs cut into the post bottom periphery and continued driving of the post downwardly urges the post bottom to abut said bottom plate and said leg members to be driven into the ground to securely mount the post relative the ground.

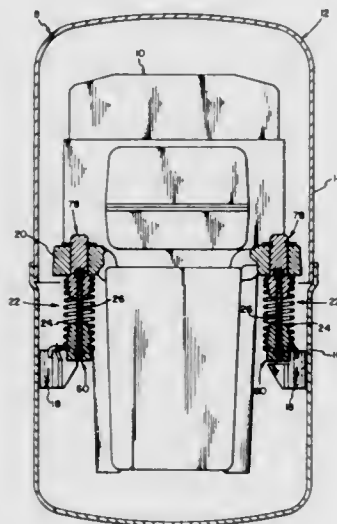
5,090,657

CABLE REINFORCED MOUNTING SYSTEM
Nelik I. Dreiman, Tipton, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 6, 1990, Ser. No. 563,279
Int. Cl.⁵ F16M 13/00

U.S. Cl. 248—624

21 Claims



1. A compressor comprising:

- a housing including a plurality of mounting brackets;
- a motor-compressor unit operably disposed within said housing, said motor-compressor unit including a plurality of mounts located at positions corresponding to said mounting brackets;
- a plurality of springs, each of said springs disposed between a respective said mounting bracket and mount;
- a plurality of cables for limiting the lateral and downward motion of said motor-compressor unit, said cables stretched between respective said mounting brackets and mounts to thereby reinforce said springs; and
- means for connecting first and second ends of said cables to respective said mounting brackets and mounts.

5,090,658

BELLOWS SEALED ROTARY VALVE AND SEAL ASSEMBLY

Dan P. Kusmer, Stafford, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Jan. 30, 1991, Ser. No. 648,542
Int. Cl.⁵ F16K 31/05, 31/14, 41/10

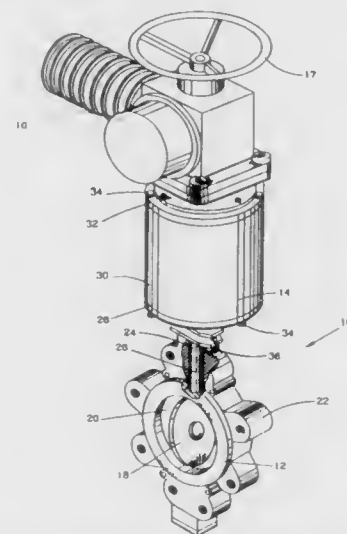
U.S. Cl. 251—14

20 Claims

1. A rotary valve, comprising:

- a valve body having a passageway extending therethrough for the flow of fluid through the valve;
- a valve member rotatably positioned within the passageway for movement between an open position and a closed position to open and close the valve;
- a valve stem rotatable about a stem axis and interconnected with the valve member for rotating the valve member;
- a seal assembly housing sealingly secured to the valve body and having an interior cavity therein;
- an epicyclic gearing assembly within the cavity and interconnected to the valve stem;
- an eccentric carrier within the cavity and interconnected with the epicyclic gearing assembly;
- a shaft within the cavity having a lower end with an axis offset from the stem axis, and an upper end with an axis offset from the shaft lower end axis;
- an end cap between the shaft and the eccentric carrier rotatable with respect to both the shaft and the carrier;
- a bellows surrounding the shaft and fixedly sealed at its upper end to the seal assembly housing and at its lower

end to the end cap to prevent fluid within the cavity from passing out the seal assembly housing and around the upper end of the shaft; and



an actuator interconnected with the upper end of the shaft for rotating the shaft and thereby the valve stem to open and close the valve.

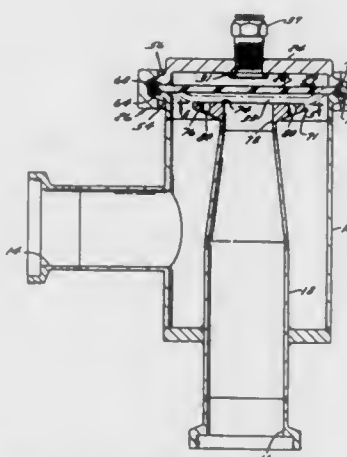
5,090,659

PRESSURE RESPONSIVE DIAPHRAGM CONTROL VALVE

Hervé X. Bronnert, 21495 Partridge Ct., Brookfield, Wis. 53005
Continuation-in-part of Ser. No. 300,263, Jan. 19, 1989, Pat. No. 4,913,397. This application Mar. 21, 1990, Ser. No. 498,096
Int. Cl.⁵ F16K 31/145

U.S. Cl. 251—61.1

13 Claims



1. A diaphragm valve comprising:

- a cylindrical casing having an inlet opening at one end and an outlet opening in the side of said casing;
- a cylindrical tube coaxially mounted in said inlet opening in said casing;
- a radial flange mounted on said tube in a spaced relation to the inside of said casing to form an outlet flow path therebetween;
- a cap mounted on one end of said casing;
- a resilient diaphragm mounted between said cap and said one end of said casing in a spaced relation to said tube and to said cap;
- and means connected to said cap for selectively pressurizing

said diaphragm into and out of engagement with said flange to control the flow of fluid across said flange, said flange including a number of pressure relief ports to prevent pressure surges between said flange and said diaphragm and thereby provide a steady flow of fluid to said outlet opening.

5,090,660

DIAPHRAGM VALVE COMPRISING A SLEEVE-SHAPED ELASTIC DIAPHRAGM

Johannes B. Ratelband, Eusebiusvinnensingel 5-3, NL-6811 BW, Arnhem, Netherlands

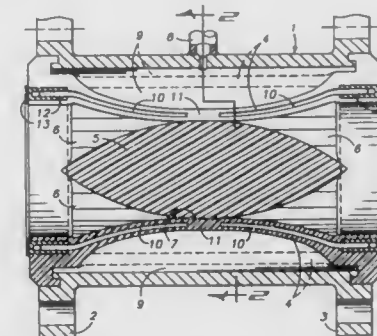
Filed Dec. 10, 1990, Ser. No. 626,576

Claims priority, application Netherlands, Dec. 11, 1989, 8903042

Int. Cl.⁵ F16K 07/07

U.S. Cl. 251—61.1

4 Claims



1. A diaphragm valve comprising:

- an elongated housing (1) extending along a central axis provided with axially spaced supply and discharge openings and adapted to be inserted in a conduit;
- an annular sleeve-shaped resilient diaphragm (4) having a wall in said housing, extending axially from opposed ends at said supply and discharge openings to a longitudinal middle section adapted to be transversely loaded from outside said wall by a pressure fluid to a transversely contracted loaded condition, from an unloaded condition;
- a core body (5) located centrally in the diaphragm (4) and defining together with said diaphragm wall an axial passage through the valve, extending in the unloaded condition axially through the valve but being transversely pressed by the longitudinal middle section (11) against the core body (5) to close said passage in the loaded condition; and
- the wall of said resilient diaphragm having a reinforcement means for increasing stiffness of the diaphragm, said means extending axially along the diaphragm to a place near the longitudinal middle section (11) of the diaphragm (4) leaving the middle section without reinforcement such that the longitudinal middle section (11) when fully loaded, is pressed against the core body (5) to close the valve.

5,090,661

GATE VALVE

Glenn C. Parks, Jr., Houston; C. Mack Ellison, Tomball; William L. Godare, and John Beson, both of Houston, all of Tex., assignors to Foster Oilfield Equipment Co., Houston, Tex.

Filed Sep. 28, 1990, Ser. No. 589,956

Int. Cl.⁵ F16K 31/16

U.S. Cl. 251—172

7 Claims

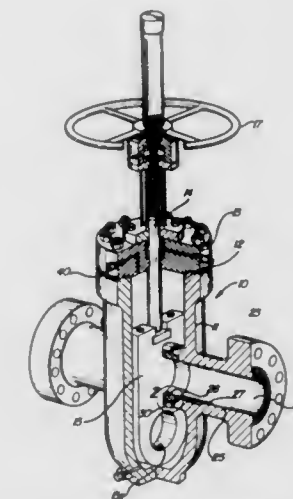
1. In a gate valve comprising:

- a valve body having a valve chamber therein and a pair of flow passages extending therethrough at opposite sides of said valve chamber; and,
- a gate member within said valve chamber and reciprocally movable along a line transverse to said valve body flow passages between a gate position in which said valve is

closed and a gate position in which said valve is open, said gate member having a flow passage therethrough which is aligned with the valve body flow passages when said gate member is in said open position and an imperforate portion which is aligned with said valve body flow passages when said gate member is in said closed position, said gate member being adapted to seal the downstream valve body flow passage by fluid pressure against the gate member on the upstream side thereof from the upstream valve body flow passage, the valve body and gate means being constructed such that fluid from the upstream valve body flow passage passes into the valve body during movement of the gate member between the open position and closed position;

the improvement comprising seal means for preventing flow of fluid from said upstream valve body flow passage along the surface of the gate member imperforate section, said seal means including a primary seal means and a secondary seal means;

said primary seal means comprising a recess around the inner end of at least said upstream flow passage adjacent the gate member, a primary seal seat member slidably mounted in said recess and surrounding the upstream flow passage adjacent to said gate member, said primary seal seat member having a first surface and a second surface, primary seal spring means normally biasing said primary



seal seat member toward the gate member such that when the gate member is in said closed position an initial primary seal is provided by said primary seal seat member against said gate member at said first surface; said first surface and said second surface each being exposed to the pressure of fluid in said upstream flow passage, said second surface having an area exposed to such fluid pressure greater than the area of said first surface exposed to such fluid pressure whereby the fluid pressure in said upstream flow passage forces the primary seal seat member against the gate member and establishes a primary seal preventing flow along the surface of said gate member when it is in said closed position;

said secondary seal means comprising a secondary seal seat member slidably mounted on and closely surrounding said primary seal seat member, said secondary seal seat member having a first surface and a second surface, and secondary seal spring means normally biasing said secondary seal seat member toward said gate member such that when the gate member is in said closed position an initial secondary seal is provided by said secondary seal seat member against said gate member at said first surface of the secondary seal seat member;

said first surface and said second surface of the secondary seal seat member being exposed to fluid pressure resulting

from pressure of fluid in the upstream flow passage when said primary seal means leaks fluid along the surface of the gate member, said second surface of the secondary seal seat member having an area exposed to such fluid pressure greater than the area of said first surface of the secondary seal seat member exposed to such fluid pressure whereby the fluid pressure from the upstream flow passage forces the secondary seal seat member against the gate member and establishes a secondary seal preventing flow along the surface of said gate member when said gate member is in the closed position and said primary seal means leaks; said primary seal seat member comprising an annular ring member having an enlarged ring-like body portion on the outside thereof, said secondary seal seat member comprising an annular ring member having a portion thereof extending over said enlarged body portion of the primary seal seat member to create therewith a chamber into which fluid can pass from the upstream flow passage upon leaking of the primary seal means, a surface of said chamber being said second surface of said secondary seal seat member.

5,090,662 STAPLE REMOVER

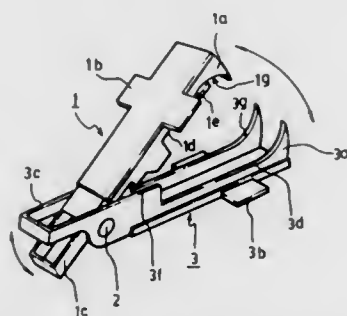
Ja M. Koo, 87-6 Dae Jo dong, Eun Pyoung-Ku, Seoul, Rep. of Korea 122-030

Filed Dec. 18, 1990, Ser. No. 629,624

Claims priority, application Rep. of Korea, Dec. 18, 1989, 89-19166[U]

Int. Cl.⁵ B25C 11/00

U.S. Cl. 254—28



1. A staple remover comprising elongate channel-shaped body members each having opposed longitudinal flanges and an interconnecting web, a pivot pin extending through the flanges of the respective body members, gripping portions on the webs of the respective body members to one side of the pivot pin, and staple removing forks extending from the flanges of each body member on said one side of the pivot pin, wherein the flanges of each body member are extended on the other side of the pivot pin and interconnected at their ends by respective cross-bars to form nippers for gripping a staple therebetween when the gripping portions are squeezed toward one another.

5,090,663 STAPLE REMOVER

H. Carl Crutchfield; Stephen M. Shomberger, both of Cordova; Mark T. Wedell, Memphis, all of Tenn., and Michael D. Breedlove, Michigan City, Miss., assignors to The Troxel Company, Moscow, Tenn.

Filed Dec. 13, 1990, Ser. No. 628,188

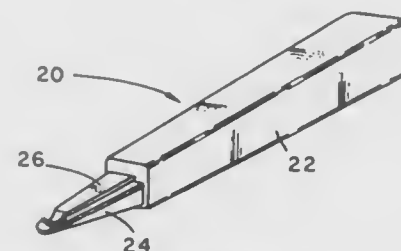
Int. Cl.⁵ B25C 11/00

U.S. Cl. 254—28

16 Claims

1. A staple remover which comprises an elongate handle for enabling the gripping of the staple remover by a user, a head projecting from one end of the handle, a clip supported atop said head including an insertable portion for being supportably inserted beneath a staple to enable its removal from the object by the application of a force on said clip through the support-

ing head, said clip including means defining a magazine for storage of removed staples and gate means for permitting restricted entry of staples to said magazine as staples are undergoing a process of removal and restricting displacement of



removed staples out of said magazine, said magazine-defining means and said gate means being integrally connected to said insertable portion as a one-piece unit to facilitate assembly of said staple remover.

5,090,664 COMBINATION JACK AND ROLLER FOR PRECISION MOVEMENT OF HEAVY LOADS

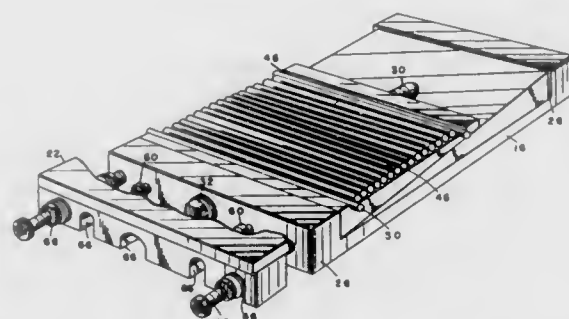
George S. McCullough, Glenville, and George S. Schmidt, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 10, 1991, Ser. No. 682,948

Int. Cl.⁵ B66F 1/02, 3/08

U.S. Cl. 254—104

19 Claims



1. Apparatus for controlled precision movement of heavy loads comprising:

- a base;
- an adjustment wedge carried by said base for generally horizontal movement relative thereto;
- a counter wedge carried by said base in engagement with said adjustment wedge for generally vertical movement in a direction generally normal to said horizontal movement and in response to horizontal movement of said adjustment wedge;
- a member adapted to carry the load and carried by said counter wedge for vertical movement therewith and horizontal movement relative thereto;
- first means for moving said adjustment wedge generally horizontally to move said counter wedge and said member generally vertically to lift the load; and
- second means for moving said member relative to said base for longitudinally moving the load.

5,090,665 DEPLOYING CABLES

David L. Walters, Stortford; Martin Healy, Harlow; Ernest C. Marlow, Sawbridgeworth, and David F. Harrison, Old Harlow, all of United Kingdom, assignors to STC PLC, London, England

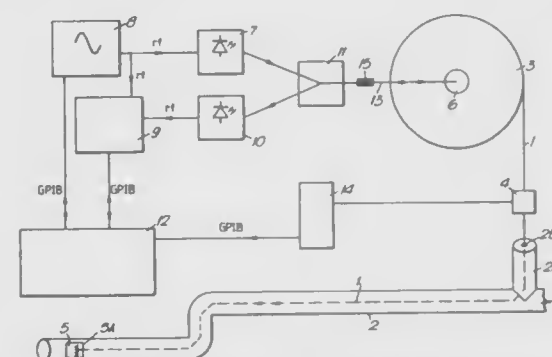
Filed Oct. 5, 1990, Ser. No. 594,389

Claims priority, application United Kingdom, Oct. 7, 1989, 8922643

Int. Cl.⁵ B65H 59/00

U.S. Cl. 254—134.4

6 Claims



1. A method of deploying an optical fibre cable by pulling the cable from a store of the cable comprising monitoring the strain in the cable by monitoring an optical signal in a fibre of the cable and controlling the deployment according to the strain monitored, and wherein the cable is pulled from the store by friction between the cable and the fluid.

5,090,666 HOIST APPARATUS

Marvin M. May, 529 S. Westgate Ave., Los Angeles, Calif. 90049

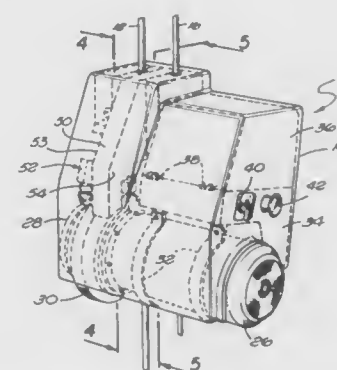
Continuation of Ser. No. 257,330, Oct. 13, 1988, abandoned.

This application Jul. 17, 1990, Ser. No. 554,080

Int. Cl.⁵ B66D 1/00

U.S. Cl. 254—333

29 Claims



1. A hoist apparatus for moving a load along a cable comprising:

- a frame;
- cable biasing means attached to said frame;
- a rotatably mounted traction sheave, said sheave also mounted for movement relative to said frame within a limited range toward and away from said cable biasing means, said sheave having a circumferential peripheral groove receiving the cable, said cable biasing means pressing the cable into said groove when said sheave is positioned adjacent said cable biasing means such that a frictional force between said cable and said sheave is produced which allows rotational movement of said sheave

to translate into corresponding movement of the hoist along the cable; and
a cable guide means mounted within said host for movement with said sheave relative to said frame, said guide means directing the cable around said sheave when the cable is reeved into the hoist and maintaining the cable within said groove when the cable is slack.

5,090,667

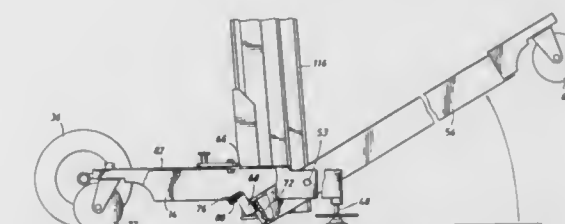
COLLAPSIBLE MOBILE BASE FOR CABLE HOISTS
Jerry J. Harrell, Conroe, Tex., assignor to Summer Mfg. Co., Inc., Houston, Tex.

Filed Dec. 3, 1990, Ser. No. 621,048

Int. Cl.⁵ B66D 3/00

U.S. Cl. 254—326

20 Claims



1. In a portable cable hoist mechanism having a plurality of telescopically related masts and being capable of elevating and supporting a load by means of a cable system, the improvement comprising:

- (a) a wheel mounted base structure having a base framework defining at least one aperture forming a latch receptacle;
- (b) a pair of base legs each being pivotally mounted by generally horizontally oriented pivot members to said base framework and capable of being pivotally moved from an extended position cooperating with said base framework to form a large stable base and capable of movement to a retracted position where said base legs are at a stowed position disposed in similar orientation relative to said base framework as that of said telescopically related masts;
- (c) a latch being fixed to each of said base legs and being received by a respective latch receptacle when said base legs are positioned at said extended position such that a portion of said latch projects through said aperture of said base framework; and
- (d) a pair of lock elements being pivotally supported by said base framework and being positionable in locking engagement with a respective latch when said base leg is located at said extended position thereof to prevent pivotal movement of said base leg relative to said base framework.

5,090,668

DYNAMIC DAMPER

Masaaki Hamada, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Jul. 20, 1990, Ser. No. 554,894

Claims priority, application Japan, Jul. 20, 1989, 1-85506[U]; Jul. 20, 1989, 1-85507[U]

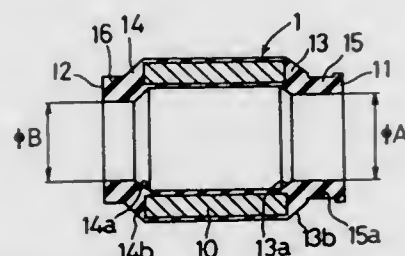
Int. Cl.⁵ F16F 15/00

U.S. Cl. 267—141

10 Claims

1. A dynamic damper comprising: a mass member formed in a cylinder shape, having an inner surface larger than the outer surface of a rotary shaft and inserted onto said rotary shaft; a first elastic member having a first fixing portion formed in a ring shape, inserted onto and supported on a portion of said rotary shaft spaced axially from a first end of said mass member and a first elastic portion integrally connecting said first fixing portion and said first end of said mass member; a second elastic member spaced axially away from said first

elastic member having a second fixing portion formed in a ring shape inserted onto and supported on a portion of said rotary shaft spaced axially from a second end of said mass member and a second elastic portion integrally connecting said second fixing portion and said second end of said mass member; and



said first fixing portion of said first elastic member having an engaging groove formed in a ring shape around an outer surface thereof, and the inner diameter of said first fixing portion thereof being larger than the inner diameter of said second fixing portion of said second elastic member.

5,090,669 PIN TABLE

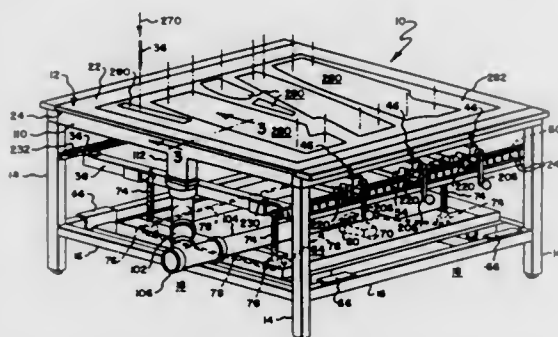
Robert J. Pieroni, Youngstown, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Dec. 11, 1990, Ser. No. 625,944

Int. Cl.⁵ B23Q 3/18

U.S. Cl. 269—54.5

7 Claims



1. Apparatus for supporting sheet material such as cloth during operations such as cutting performed thereon comprising:

- a supporting frame;
- means on said frame defining a planar supporting surface adapted to receive plies of sheet material placed thereon, said surface having a plurality of through apertures therein arranged in a pattern on said surface, said surface having an outer portion contacting said material and an oppositely disposed portion;
- a plurality of pins each disposed substantially perpendicular to the plane of said surface and each location in registry with one of said apertures, each of said pins having a sharp head at one end and an opposite end;
- a plurality of separate pin holding and supporting means carried by said frame and arranged in rows therealong and facing said oppositely disposed portion of said supporting surface, each of said pin holding and supporting means being of relatively narrow width and having a length extending transversely of said supporting surface and said plurality of holding and supporting means being in closely spaced relation in a direction longitudinally along said supporting surface, said holding and supporting means receiving said pins at said opposite ends thereof and maintaining the disposition of said pins substantially perpendicular to the plane of said surface and the location of said pins in registry with said apertures, each of said pin hold-

ing and supporting means including a pair of sidewalls in spaced relation extending along said length and having oppositely facing inner surfaces and defining a trough-like region open toward said portion of said supporting surface;

- each of said pin holding and supporting means including pin contacting means pivotally movable about an axis substantially parallel to said length between a first position wherein pins are releasably held in said pin holding and supporting means to a second position wherein said pins are firmly clamped in said pin holding and supporting means between said inner facing surfaces of said sidewalls and corresponding opposite surfaces of said pin contacting means, one of said surfaces of said pin contacting means being defined by surface defining means mounted in said pin contacting means for movement toward and away from said axis; and
- means carried by said frame for moving said holding and supporting means to move said pins through said apertures inwardly between a position where the heads of said pins are spaced inwardly from said outer surface portion and a position where said pins extend through said apertures and the heads of said pins are spaced outwardly from said outer surface portion so that said sheet material can be anchored on said pins.

5,090,670

FORCIBLE TYPE C-TYPE CLAMP WITH PRE-STRESS PACKING FACE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation of Ser. No. 344,065, Apr. 25, 1989, abandoned.

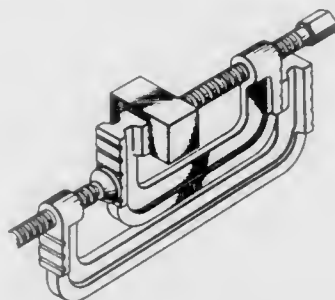
This application Sep. 11, 1990, Ser. No. 581,392

Claims priority, application United Kingdom, Apr. 27, 1988, 8809984

Int. Cl.⁵ B25B 1/10

U.S. Cl. 269—249

3 Claims



1. A combination of two C-clamps, a smaller C-clamp and a larger C-clamp, the combination comprising a larger C-shaped frame and a smaller C-shaped frame each including a first arm and a second opposite arm, the first and second arms of each respective clamp being substantially parallel to the opposite arm of the respective clamp;

an internal clamping face formed on the first arm of each clamp, so as to face the second opposite arm of the respective clamp;

a clamping rod carried by the second arm of each clamp for longitudinal movement in a first clamping direction toward the internal clamping face of the respective clamp for clamping a workpiece therebetween and in a second opposite direction away from the internal clamping face of the respective clamp for unclamping of a respective workpiece therebetween; and

an external clamping face on each of the first and second arms of each clamp, the external clamping faces of each clamp extending outwardly beyond the respective parallel arms of the respective clamp, the external clamping face on the respective first arm being substantially parallel to the external clamping face on the respective second arm of each clamp, the clamping faces of each clamp having

serrations formed thereon, the external faces of each clamp further being substantially parallel to the internal clamping face of the respective clamp, the smaller clamp being disposed with respect to the larger clamp such that one internal face of the larger clamp may engage one external face of the smaller clamp and the clamping rod of the larger clamp may engage the other external face of the smaller clamp such that the smaller C-clamp may be clamped and secured in a nested position with respect to the larger clamp.

5,090,671

METHOD AND DEVICE FOR FOLDING SHEETS

Jacobus F. Gombault, Drachten, and Gerhard Hidding, Heerenveen, both of Netherlands, assignors to Hadeve B.V., Drachten, Netherlands

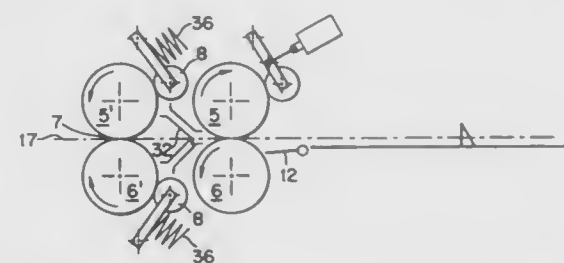
Filed Oct. 5, 1990, Ser. No. 593,876

Claims priority, application Netherlands, Oct. 5, 1989, 8902476

Int. Cl.⁵ B42C 1/00

U.S. Cl. 270—45

18 Claims



1. A method of folding a sheet, said method utilizing a first pair of diametrically opposite folding rollers, and a second pair of diametrically opposite folding rollers located downstream of said first roller pair, the rollers of said first roller pair forming a first nip therebetween and being located on opposite sides of a first feeding plane leading to said first roller pair, and the rollers of said second roller pair forming a second nip therebetween and being located on opposite sides of a second feeding plane extending from said first roller pair to said second roller pair, said first and second feeding planes being substantially coincident, said method comprising the steps of: arranging said sheet at said first roller pair such that a trailing portion of said sheet lies in said first feeding plane, and a leading portion of said sheet is bent out of said first feeding plane and is pressed against one roller of said first roller pair; pushing said sheet in a downstream direction to cause said bent upstream portion to enter said first nip; rotating said first roller pair as said sheet is advanced through said first nip such that a first fold is formed in said bent upstream portion to define a first-folded portion of said sheet; continuing to rotate said first roller pair to advance said first-folded portion in a downstream direction along said second feeding plane; guiding said sheet such that said first-folded portion is bent out of said second feeding plane and is pressed against a roller of said second roller pair; and rotating said second roller pair as said sheet is advanced through said second nip such that a second fold is formed in said sheet.

5,090,672

AUTOMATIC APPARATUS FOR FOLDING SHEET ELEMENTS

Aris Ballestrazzi, Via Castello, 14/1, and Lamberto Tassi, Via Castello, 14/2, both of Savignano Sul Panaro, Modena, Italy, assignors to Sitma S.p.A., Modena, Italy

Filed Jun. 12, 1990, Ser. No. 537,084

Claims priority, application Italy, Jun. 19, 1989, 20914 A/89

Int. Cl.⁵ B42C 1/00

U.S. Cl. 270—45

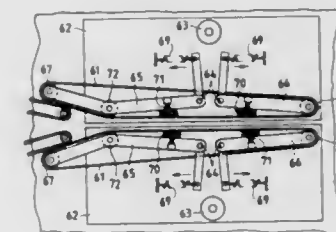
24 Claims

1. A device for folding sheets fed in a stream, wherein the device has a frame and the device comprises:

- a first shaping means for forming the sheets from a flat shape

into a U-shape, wherein said U-shape has two vertical side portions and a longitudinal central portion therebetween, and wherein said first shaping means includes:

a gripping means for gripping and accompanying said central portion, wherein said gripping means has lateral support and accompanying elements for rotating said two side portions of said sheets from said flat shape into said U-shape, a pusher element for shaping said central portion into a V-shape, and a first and second endless flat belt extending through and connected to said first shaping means and pulleys for guiding and driving said first and second flat belts, wherein said first and second flat belts



face one another and wherein said first flat belt is adapted to receive and support said central portion of said sheets, and said second flat belt is adapted to extend between said side portions of said sheets;

b) a second shaping means including first lateral elements for compacting said V-shaped central portion and folding said sheets, and retaining elements for guiding said folded sheets away from said second shaping means; and

c) a support frame for supporting said second flat belt and elastic elements adapted for vertically adjusting said support frame thereby changing the distance between said first and second flat belts.

5,090,673

SHEET POST TREATMENT APPARATUS

Yoshihiko Kitahara, Toride, and Kenji Kobayashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha & Canon Aptex, Inc., Tokyo, Japan

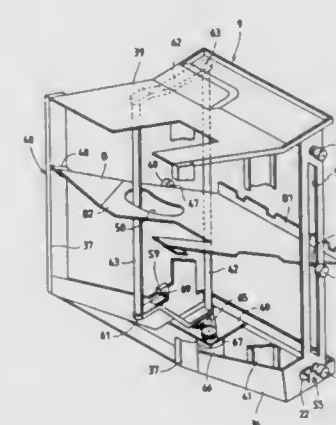
Filed Sep. 5, 1990, Ser. No. 577,639

Claims priority, application Japan, Sep. 5, 1989, 1-230717

Int. Cl.⁵ B42B 1/02

U.S. Cl. 270—53

5 Claims



1. A sheet post treatment apparatus comprising: receiving means for receiving sheets;

align means provided with a reference member providing a reference for aligning the sheets, and a moving member movable relative to said reference member to align the sheets; and

control means for controlling said align means to cause said moving member to wait at a different position in conformity with sheet size information before the discharge of the sheets in a case where the sheets discharged from an image forming apparatus are discharged so that the centers thereof may coincide with one another irrespective of the sizes of the sheets,

wherein assuming the width of the discharged sheets is W , the maximum width of the discharge sheets is W_{max} , the distance from that portion of said moving member which bears against the sheet to the end of the sheet is α , the distance from said reference member to the end of the sheet of the maximum width is β , and the distance from said reference member to that portion of said moving member which bears against the sheet is x , said control means causes said moving member to wait at a position which satisfies the following relation:

$$x = \beta + \frac{W_{max}}{2} + \frac{W}{2} + \alpha.$$

5,090,674

IMAGE FORMING APPARATUS

Takashi Ozawa, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 353,701, May 18, 1989, abandoned.

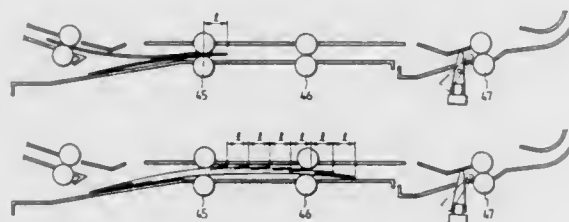
This application Apr. 18, 1990, Ser. No. 512,538

Claims priority, application Japan, May 20, 1988, 63-123682

Int. Cl.⁵ G03G 15/00

U.S. Cl. 271—3.1

23 Claims



22. A sheet conveying method, comprising steps of: taking out a first sheet from a stack of sheets, said sheets being stacked offset from one another by a predetermined distance in a sheet conveying direction; conveying the remainder of said stack in a direction reverse to the conveying direction and stopping said conveyance when said stack reaches a predetermined position; and offset stacking the sheet by the predetermined distance relative to the last sheet of said stack.

5,090,675

APPARATUS FOR AUTOMATICALLY TRANSPORTING SHEETS OF ORGINAL

Hiroyuki Nagai, Toyonaka, and Jun Miyoshi, Higashiosaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1990, Ser. No. 559,355

Claims priority, application Japan, Aug. 16, 1989, 1-211024

Int. Cl.⁵ B65H 3/06

U.S. Cl. 271—10

27 Claims

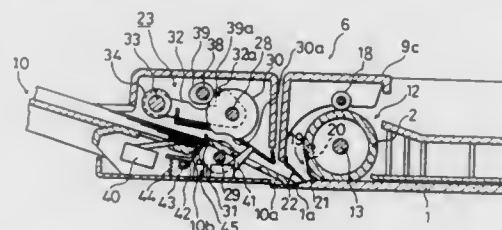
1. An apparatus for automatically transporting a sheet of original from an upstream position to a downstream reading position on a transparent plane member of an image forming apparatus, comprising:

sheet setting means for accommodating a sheet of original; a transporting rolling device positioned downstream from said sheet setting means, and said transporting rolling

device being dimensioned and arranged so as to press against the transparent plane member;

feeding means for feeding the sheet of original from said sheet setting means towards said transporting roller device such that a leading edge of the sheet of original is placed into a nipping position between said transporting rolling device and the transparent plane member;

rotating means for rotating said transporting rolling device, said rotating means including means for maintaining said transporting rolling device stationary during the position-



ing of the leading edge of the sheet in the nipping position, said rotating means further including timing means for initiating rotation of said transporting rolling device after a predetermined period has elapsed following the positioning of the leading edge of the sheet in said nipping position; and

guiding means for guiding the leading edge of the sheet of original, said guiding means being positioned upstream of the leading edge of the sheet when the sheet is in the reading position.

5,090,676

METHOD OF AND APPARATUS FOR SEPARATING AND FEEDING SHEETS

Junichi Matsuno, Toride; Tsuyoshi Ogasawara, Ibaraki, and Masataka Kawauchi, Ishioka, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Koki Co., Ltd., Chiyoda, both of, Japan

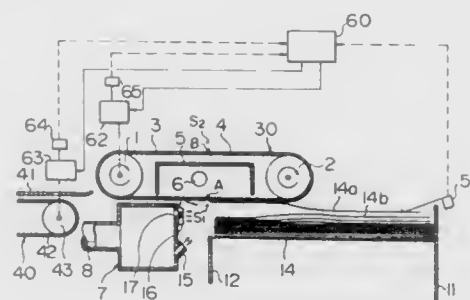
Filed Sep. 8, 1989, Ser. No. 404,873

Claims priority, application Japan, Sep. 19, 1988, 63-232472

Int. Cl.⁵ B65H 3/12

U.S. Cl. 271—12

14 Claims



11. A method of separating an uppermost sheet from piled sheets by using sheet separating means, and vacuum-attracting the uppermost sheet onto rotatable feeding means to feed the sheet to conveying means, said separating means causing compressed air to blow to an upper portion of the piled sheets, said vacuum feeding means having a plurality of holes provided in a part of said vacuum feeding means for intermittently communicating with a negative pressure source, comprising the steps of:

locating said vacuum feeding means at a position where leading ones of said holes are substantially aligned with front edges of the piled sheets with respect to a direction of feeding of the sheets;

operating said separating means and vacuum feeding means

to separate the uppermost sheet and allow said vacuum feeding means to attract the uppermost sheet; rotating said vacuum feeding means holding the uppermost sheet attracted thereto at a speed substantially equal to a conveying speed of said conveying means; rotating said vacuum feeding means at a speed faster than the conveying speed of said conveying means after the sheet attracted to the vacuum feeding means has reached said conveying means and communication between said holes and said negative pressure source has substantially lost; and rotating said vacuum feeding means again at a speed substantially equal to the conveying speed of said conveying means when said vacuum feeding means has again reached said position.

5,090,677

SHEET FEED ARRANGEMENT

Yukiyoichi Yamakoshi; Hajime Takei; Naoyuki Matsuda; Fuminori Moro, and Hiroshi Tomita, all of Osaka, Japan, assignors to Minolta Camera Kubushiki Kaisha, Osaka, Japan

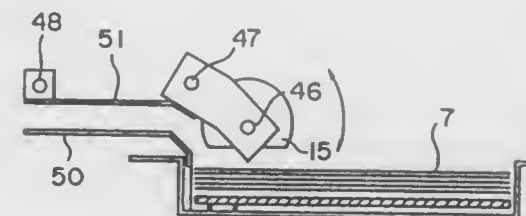
Filed Feb. 14, 1990, Ser. No. 480,030

Claims priority, application Japan, Feb. 17, 1989, 1-37960

Int. Cl.⁵ B65H 3/06

U.S. Cl. 271—117

17 Claims



1. A sheet feed arrangement comprising: container means for accommodating a plurality of sheet materials; means for feeding the sheet material accommodated in said container means one by one; a guide member disposed downstream from said feed means in a direction of feed of the sheet materials for guiding the sheet materials, and means for moving the guide member so that an end portion of said guide member is introduced in or removed from an inner end portion of said container means within the feed direction of the feeding means for guiding the sheet materials.

5,090,678

METHOD AND APPARATUS OF FORMING A SEPARATED STACK OF ZIGZAG FOLDED SHEETS FROM A MAIN STACK

Robert L. Green, Hillsboro, Ohio, assignor to G. Fordyce Co., Hillsboro, Ohio

Filed May 17, 1991, Ser. No. 705,028

Int. Cl.⁵ B61H 41/00

U.S. Cl. 270—52.5

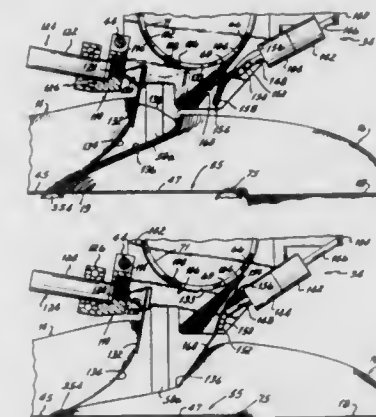
29 Claims

1. Apparatus for forming a separated stack of zigzag folded sheets, which are interconnected at adjacent, folded ends by perforations, from a main stack of sheets, comprising: conveyor means for transmitting the main stack of sheets on their folded ends downstream to a stack spreading and cutting station, the main stack having a top side and a bottom side which rests atop said conveyor means; first separator means, located at said stack spreading and cutting station in a position to enter the main stack between adjacent upstream and downstream sheets in a direction from said top side of the main stack toward said bottom side thereof, for contacting said upstream sheet to

restrain downstream movement of the main stack and to provide clearance between said upstream and downstream sheets;

second separator means located at said stack spreading and cutting station for contacting said downstream sheet to provide additional clearance between said upstream and downstream sheets;

cutter means movable within said clearance formed between said upstream and downstream sheets in a direction



toward said conveyor means for separating said sheets at the perforation along said folded end therebetween to form a separated stack of folded sheets downstream from the main stack;

take away means for removing said generated stack from said stack spreading and cutting station while at least one of said first separator means, cutter means and second separator means at least temporarily restrains the main stack from downstream movement relative to said stack spreading and cutting station.

5,090,679

SHEET FEEDING DEVICE

Takashi Maekawa, and Morimoto Kiyoshi, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

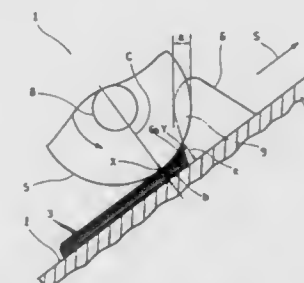
Filed May 16, 1990, Ser. No. 524,636

Claims priority, application Japan, May 19, 1989, 1-58482[U]

Int. Cl.⁵ B65H 3/52

U.S. Cl. 271—125

7 Claims



1. A sheet feeding device comprising: a guide member for guiding sheets of paper sent out from the paper pile section in the sheet feeding direction, a feeding roller installed at a fixed position facing the guide member, and which is installed above the guide member and by which a sheet of paper is transferred in the sheet feeding direction, and a separation member provided on said guide member and protruding therefrom which opposes and is engaged in non-contact with the feeding roller in the axial direction thereof and by which sheets of paper can be separated sheet by sheet between the separation member and the feeding roller;

characterized in that a point of intersection at the upstream side in the sheet feeding direction between the outer circumference of the feeding roller and a face of the separation member which opposes the feeding roller is located at the downstream side of the sheet feeding direction with a minimum fixed clearance portion formed between the guide member and the feeding roller and a distance between the point of intersection and the guide member is said to be larger than a clearance distance of the minimum clearance portion.

5,090,680

SHEET INVERTING APPARATUS

Masahiko Yashiro, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

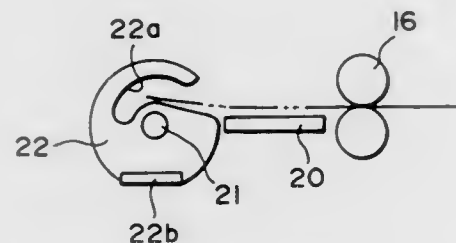
Filed May 11, 1990, Ser. No. 522,055

Claims priority, application Japan, May 12, 1989, 1-120037; May 12, 1989, 1-120038; May 12, 1989, 1-120039; May 12, 1989, 1-120040; May 12, 1989, 1-120041

Int. Cl.⁵ B65H 29/00

U.S. Cl. 271-186

11 Claims



1. A sheet inverting apparatus, comprising: a sheet discharge roller for discharging a sheet along a sheet discharge route; and sheet inverting means for inverting a sheet discharged from said roller, said sheet inverting means including an inverting rotary member, a shaft rotatably supporting said rotary member, and a balancer attached to said rotary member for maintaining said rotary member stationary at a waiting position, with said rotary member having a sheet clamping recess disposed opposite to said sheet discharge roller when said rotary member is at the waiting position, wherein said rotary member is initially rotated by the force of the sheet discharged from said sheet discharge roller and entering the sheet clamping recess and said rotary member is rotated to a position where said balancer further rotates said rotary member by the force of gravity, and after a trailing end of the sheet is discharged by said sheet discharge roller, the sheet is inverted and released from the sheet clamping recess when the sheet clamping recess is directed downwardly.

5,090,681

SHEET DELIVERY SYSTEM IN A SHEET-PROCESSING MACHINE

Manfred Henn, Heidelberg; Udo Ganter, Leutershausen, and Peter T. Blaser, Dielheim, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 29, 1990, Ser. No. 546,537

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1989, 3922587

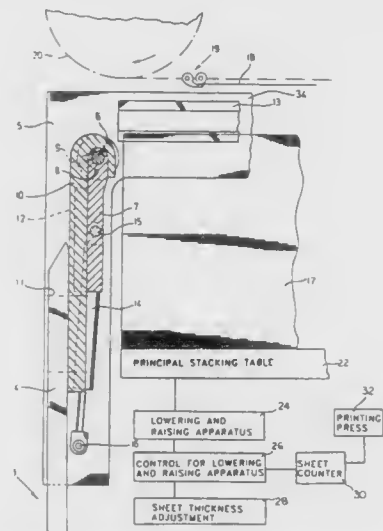
Int. Cl.⁵ B65H 31/12

U.S. Cl. 271-218

15 Claims

1. An auxiliary stacking table for a sheet stacker for stacking sheets in a stacking area in which the sheet stacker comprises: a principal stacking table for receiving the sheets; means for raising and lowering the principal stacking table; control means, connected to the raising and lowering means,

for successively lowering the stacking table as a height of the sheets in a stack on the stacking table increases; said auxiliary stacking table comprising: bar means for being inserted into the stacking area to support sheets coming from a sheet delivery apparatus; means for attaching said auxiliary table to a frame member of the sheet stacker; bar moving means for moving said bar means from a substantially vertical position to a substantially horizontal position, said bar moving means comprising: holding means for holding said bar means in the substantially vertical, non-working position;



said holding means comprising guiding means for guiding said bar means; swiveling means for swiveling said bar means together with said guiding means from the substantially vertical position to the substantially horizontal position such that said bar means swivels from the substantially vertical, non-working position to the substantially horizontal position adjacent the stacking area; and means for horizontally moving said bar means into the stacking area.

5,090,682

AUTOMATIC DOCUMENT FEEDER COMPRISING A GUIDE MEMBER

Kazushi Takimoto, Kodoma, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1990, Ser. No. 542,048

Claims priority, application Japan, Jun. 28, 1989, 1-167699; Jun. 30, 1989, 1-170976

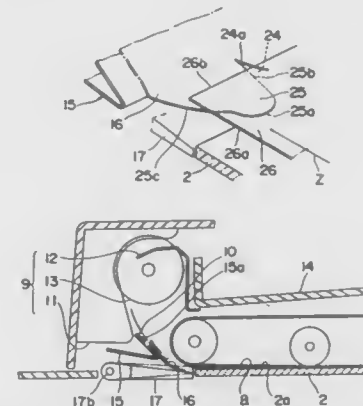
Int. Cl.⁵ B65H 5/00

U.S. Cl. 271-225

15 Claims

1. An automatic document feeder for an image forming apparatus which comprises a transparent plate on which an original document is placed, said document feeder comprising: (A) means for conveying the original document; and (B) a guide member for deflecting an original document conveyed by said conveying means,
 - i) said guide member comprising a flexible thin piece projecting inclinedly with a free end kept in contact with a surface,
 - ii) said flexible thin piece having a width and a center line central of its width and a plurality of recesses formed in said free end thereof, said recesses being formed in spaced-apart relationship in opposite directions away from said center line to provide a plurality of protrusions adjacent to said recesses, and

- iii) said protrusions each having an inside edge portion, an outside edge portion which generally is relatively further from said center line area than said inside edge portion, and a tip portion, said edge portions delimiting said recesses,
- iv) said outside edge portions of at least some of said protrusions having a length from its tip portion to an interior-most region of a recess adjacent thereto, which



length is longer than a length of its inside edge portion which length is defined from said tip portion to an interior-most region of another recess adjacent said inside edge portion,

- v) said recesses and protrusions being formed and disposed such that both side edges of original documents of various standard sizes pass said tip portions or said outside edge portions of said protrusions.

5,090,683

ELECTRONIC SHEET ROTATOR WITH DESKEW, USING SINGLE VARIABLE SPEED ROLLER

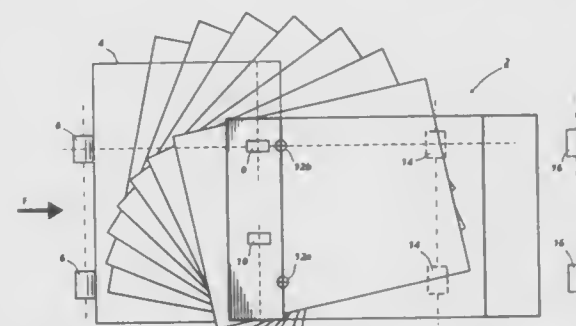
Venkatesh H. Kamath; Barry P. Mandel, both of Fairport; Ted A. Beer, Webster, and Russell J. Sokac, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1990, Ser. No. 560,872

Int. Cl.⁵ B65H 7/14

U.S. Cl. 271-227

44 Claims



1. A device for selectively turning documents which are fed thereto, comprising: input means for receiving documents which are moving in a process direction along a feed path; document drive means disposed along said feed path for turning a selected document through an angle in its own plane, said document drive means including first and second drive rollers aligned along an axis which is transverse to said process direction, and first and second follower rollers cooperatively peripherally aligned with said first and second drive rollers, respectively; a constant speed motor which operates at a single constant velocity attached to said first drive roller for operating

said first drive roller at a substantially constant peripheral velocity; and a single variable speed motor having feedback control attached to said second drive roller for selectively operating said second drive roller at a peripheral velocity which varies so that said document is turned.

5,090,684

GUIDE FOR A SHEET ALIGNING STATION OF A PACKAGE PRODUCING MACHINE

Claude A. Godi, Cheseaux, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

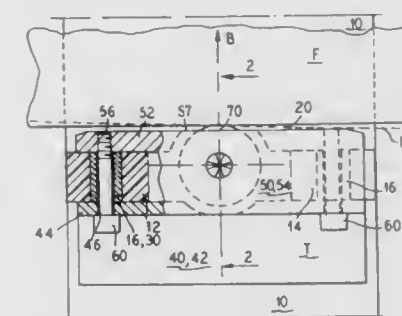
Filed Apr. 18, 1991, Ser. No. 687,240

Claims priority, application Switzerland, Apr. 19, 1990, 01326/90

Int. Cl.⁵ B65H 9/10

U.S. Cl. 271-233

8 Claims



8. A guide for an aligning station of a package producing machine, comprising: a surface arranged to abut a trailing edge of a sheet to push and position the sheet along a lengthwise axis of the package producing machine; a roller mounted so that a peripheral portion of said roller extend before said surface to act as a stop for a trailing edge of the sheet.

5,090,685

METHOD AND APPARATUS FOR SECURING A SHEET MATERIAL TO A ROTATING VACUUM DRUM USING A SEALING STRIP

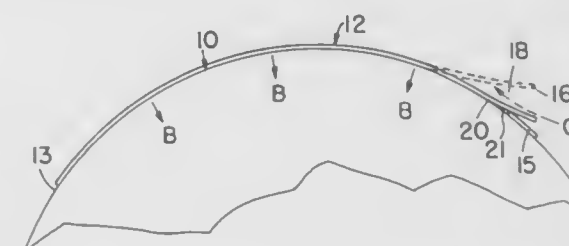
Haim Danon, Kiriat Ono, and Amir Gnessin, Tel-Aviv, both of Israel, assignors to Optrotech Ltd., Nes/Ziona, Israel

Filed Oct. 2, 1990, Ser. No. 591,620

Int. Cl.⁵ B65H 5/22

U.S. Cl. 271-276

21 Claims



8. In a drum having a flexible sheet material removably held on to and in direct contact with an outer surface thereof, the improvement whereby there is provided a thin sealing strip above the outer surface of the drum and between the outer surface of the drum and an inner surface of the sheet material at an end edge of said sheet material so as to reduce aerodynamic lift of said end edge.

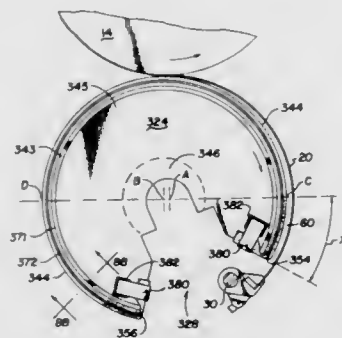
5,090,686

PAPER GUIDE WHEEL

Norman H. Kemp, 3216 Oakdale Dr., Hurst, Tex. 76054, and James R. Kemp, 1004 Billie Ruth, Hurst, Tex. 76053
Division of Ser. No. 281,521, Dec. 8, 1988, Pat. No. 4,973,040, which is a continuation of Ser. No. 152,896, Feb. 5, 1988, abandoned. This application Mar. 29, 1990, Ser. No. 501,019
Int. Cl.⁵ B65H 5/02

U.S. Cl. 271—277

20 Claims



1. A wheel for guiding paper in a printing press comprising a rim at the periphery of the wheel, the rim having an outer surface for supporting paper moving through the press and having at least one opening therein extending inwardly toward the center of the wheel with the opening defining a leading edge and a trailing edge at the outer surface, wherein the radial distance from the axis of rotation of the wheel to points on the outer surface increases gradually and uniformly in moving circumferentially around the outer surface from a first point at or near the leading edge to a second point closer to the trailing edge than the leading edge.

5,090,687

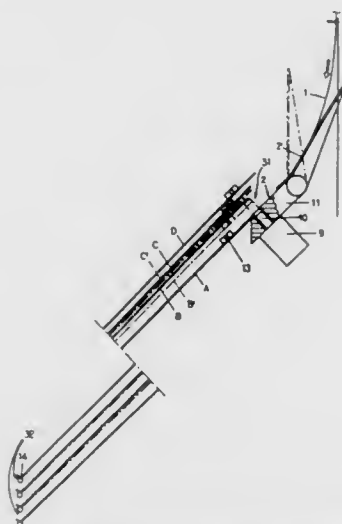
METHOD OF SORTING PRINTING PLATES

Willy Maier, Kloten, and Thomas Bachmann, Zurich, both of Switzerland, assignors to Daverio AG, Zurich, Switzerland
Division of Ser. No. 347,150, May 3, 1989, Pat. No. 5,011,131.
This application Dec. 20, 1990, Ser. No. 630,486
Claims priority, application Switzerland, Jul. 11, 1988, 2641/88

Int. Cl.⁵ B65H 39/06

U.S. Cl. 271—289

7 Claims



1. A method of sorting printing plates comprising: continuously moving the printing on a vertically oriented transport device and into a predetermined position adjacent to an insertion opening of a sorting device having a

plurality of vertically stacked, spaced, plate receiving shelves;
moving the printing plates on said transport device to a sorting carriage having a movable flap which, when in a first position, engages a printing plate and removes it from the transport device and which, when in a second position, bypasses the printing plates allowing the printing plates to continue along the transport device;
vertically moving said sorting carriage along said shelves to a position adjacent a predetermined shelf for storage of the plate;
positioning the movable flap in the first position when the sorting carriage arrives at the predetermined shelf transferring the plate to the sorting carriage; while substantially simultaneously,
causing upward movement of a second shelf directly above the predetermined shelf onto which the plate is to be transferred by means attached to said sorting carriage, to widen the insertion opening; and
transferring the plate to the predetermined shelf through the widened insertion opening and then causing the second shelf to resume normal spacing with respect to the predetermined shelf.

5,090,688

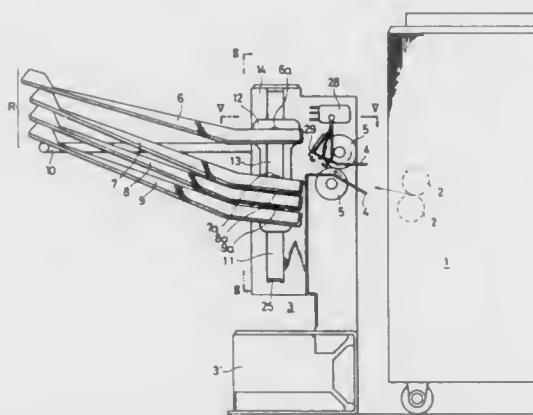
SHEET SORTER HAVING MOVABLE BIN TRAYS

Nobukazu Sasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 816,964, Jan. 8, 1986, abandoned, which is a continuation of Ser. No. 484,700, Apr. 13, 1983, abandoned. This application Sep. 27, 1990, Ser. No. 590,597
Claims priority, application Japan, Apr. 21, 1982, 57-66863; May 8, 1982, 57-76915

Int. Cl.⁵ B65H 39/10

U.S. Cl. 271—293

10 Claims



1. A sheet sorting apparatus comprising:
plural bin trays arranged in vertical alignment, said trays including a front end for receiving said sheets;
followers associated with the front ends of said bin trays;
front end support means for supporting the front ends of said plural bin trays for vertical movement; and
a cam member formed with a spiral groove for guiding said bin trays, said groove having an end portion of less inclination relative to a horizontal plane than the inclination of the remainder of said groove.

5,090,689

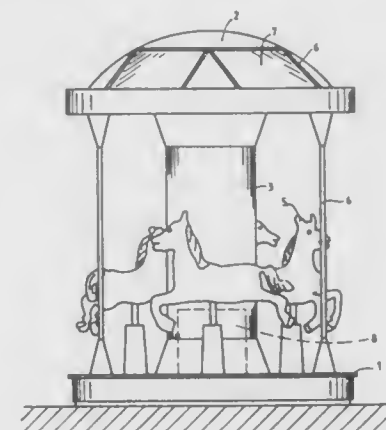
SOLAR CAROUSEL

Peter Petz, Siedlungsstrasse 44, 8891 Sulzbach-Aichach, Fed. Rep. of Germany
Filed Dec. 28, 1990, Ser. No. 635,935
Claims priority, application Fed. Rep. of Germany, May 31, 1990, 9006175[U]

Int. Cl.⁵ A63G 1/00

U.S. Cl. 272—29

12 Claims



1. A carousel driven by an electric drive motor and provided with a roof comprising a supporting structure to receive a plurality of solar cell arrangements connected electrically with the drive motor.

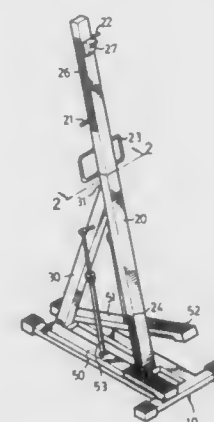
5,090,690

EXERCISE MECHANISM

Kelvin Huang, No. 210, Mingshan St., Homin Tsun, Hsiushui Hsiang, Changhua Hsien, Taiwan
Filed Sep. 10, 1991, Ser. No. 757,472
Int. Cl.⁵ A63B 23/04

U.S. Cl. 272—70

4 Claims



1. An exercise mechanism comprising a support frame including a base, a post extended upward from said base and including two side walls, a stay extended upward from said base to interconnect with said post at a point between its ends, said post including a slot formed in a lower portion of each of said side walls thereof and a groove formed in an upper portion of each of said side walls thereof; a pair of laterally adjacent foot pedals pivotally mounted at one end on said stay at a location above said base, each of said foot pedals including a shaft fixed thereto and extended through a respective slot of said post and extended into said post; a handle slidable along each of said grooves and having one end located in said post; resistance means interconnected between said foot pedals and a location on said support frame above said foot pedals; a first pulley rotatably disposed in top of said post, a second pulley

and a third pulley provided in said post, in which said second pulley being located above said third pulley; a rope coupled between said second pulley and said shaft fixed to a first foot pedal; a cord coupled between said third pulley and said shaft fixed to a second foot pedal; a cable having one end fixed to a first side wall and extended downward and over said second pulley, extended upward and fixed to a first handle, extended upward and over said first pulley, extended downward and fixed to a second handle, extended downward and over said third pulley, extended upward and having the other end fixed to a second side wall of said post; said first foot pedal being caused to move upward when said second handle is pulled downward and when said second foot pedal is pressed downward, and said second foot pedal being caused to move upward when said first handle is pulled downward and when said first foot pedal is pressed downward.

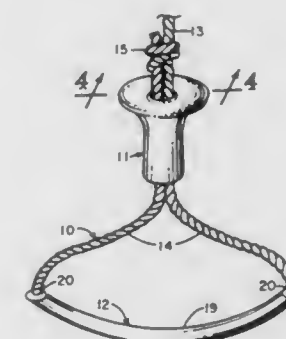
5,090,691

ACTIVE AND PASSIVE HANDLE FOR EXERCISE DEVICE

Todd E. Pollock, 3216 West 21st Ave., Spokane, Wash. 99204
Filed Aug. 6, 1990, Ser. No. 563,518
Int. Cl.⁵ A63B 21/00

U.S. Cl. 272—93

4 Claims



1. A handle structure for passive and active interconnection of the limbs of a human to a tensile type exercise device, comprising, in combination:
an elongate, flexible tensile element having a first end for interconnection with an exercise device, said flexible tensile element having a body and a loop formed at its second end by overlapping the second end upon itself and fastening the second end to the flexible element body to prevent the passage of a handle thereover;
an elongate handle defining an internal channel there-through and having a diametrically smaller and axially longer body portion and a diametrically larger and axially shorter head portion of oblately spheroidal configuration, said handle slidably carried on the loop defined by the flexible tensile element with the head portion of the handle proximal the elongate flexible tensile element body and the loop of said element extending outwardly therefrom; and
an elongate gripping member defining an internal channel, said gripping member carried about the medial portion of the elongate flexible tensile element forming the loop, outwardly of the handle member.

5,090,692

AQUATIC EXERCISE DEVICE

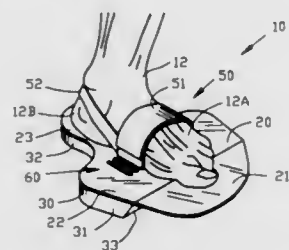
Robert Beasley, 1217 Terra Mar Dr., Tampa, Fla. 33613
Filed Nov. 8, 1989, Ser. No. 433,280
Int. Cl.⁵ A63B 21/00

U.S. Cl. 272—116

32 Claims

1. An improved aquatic exercise device for a user immersed in water, comprising in combination:
a restraining member having a top surface and a bottom surface;

said restraining member defining a front portion, an intermediate portion and a rear portion;
 flotation means for providing buoyancy for the user of the aquatic exercise device;
 means for removably securing said flotation means to said restraining member for enabling the user to adjust the buoyancy of the aquatic exercise device by adding or removing said flotation means;



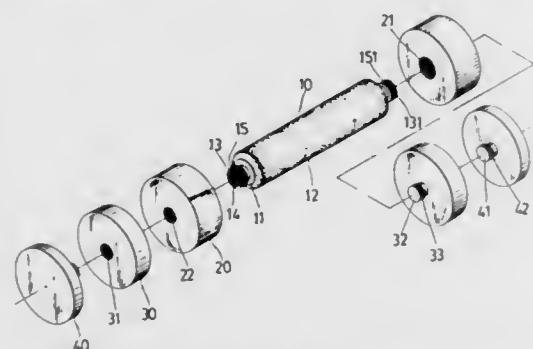
means for securing said restraining member to a foot of a user to enable said restraining member to restrain the foot movement of the user and to enable said buoyancy of said flotation means to partially support the user in the water; and
 said means for securing said flotation means to said restraining member secures said flotation means to said bottom surface of said restraining member.

5,090,693 DUMBBELL

Yung-Jen Liang, No. 76, An-Le Str. An-Tung Tsun, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan
 Filed May 30, 1991, Ser. No. 707,606
 Int. Cl.⁵ A63B 21/072

U.S. Cl. 272-122

2 Claims



1. A dumbbell for muscular exercise, the improvement comprising:

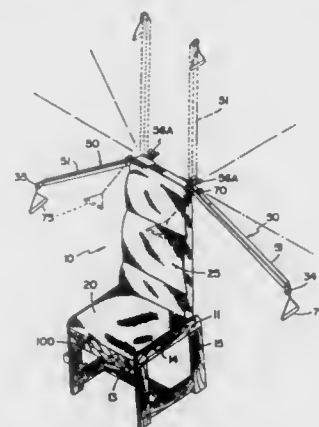
- a handlebar comprising a metal rod covered with a layer of soft covering for positive and comfortable grip, said metal rod having two joints formed at two opposite ends and respectively extended out of said soft covering, said two joints having each an inner thread and an outer thread;
- a pair of first weights having each a threaded stepped bolt hole through the central axis thereof, said threaded stepped bolt hole including a first bolt hole at one end and a second bolt hole longitudinally aligned at an opposite end, said first bolt hole having an inner diameter equal to the outer diameter on said joints, said second bolt hole having an inner diameter equal to the inner diameter on said joints;
- at least one pair of auxiliary weights having each a screw rod at one end longitudinally aligned with the central axis thereof and alternatively fastened in the second bolt hole on either of said first weights or the inner thread on either of said two joints, and a bolt hole disposed at an opposite end longitudinally aligned with the central axis thereof and made in size equal to said second bolt hole on either of

said first weights and the inner thread on either of said joints; and
 a pair of cover weights having each a screw rod at one end longitudinally aligned with the central axis thereof and alternatively fastened in the bolt hole on either of said auxiliary weights, the second bolt hole on either of said first weights or the inner thread on either of said joints.

5,090,694
COMBINATION CHAIR AND EXERCISE UNIT
 Edward A. Pauls, Excelsior; Timothy S. Engel, Bloomington; Michael E. Heutmaker, Long Lake; Robert A. Iverson, Eden Prairie, and Jeffrey E. Sandahl, Burnsville, all of Minn., assignors to NordicTrack, Inc., Chaska, Minn.
 Filed Mar. 28, 1990, Ser. No. 500,517
 Int. Cl.⁵ A63B 21/00

U.S. Cl. 272-134

22 Claims



1. A convertible exerciser, comprising:

- (a) a seat;
- (b) frame means to support said seat above a surface;
- (c) an upright back frame connected to said seat;
- (d) an operable exercise support including at least one arm portion having an inner end and positioned to the rear of said upright back frame, said at least one arm portion being moveable from a generally horizontal position extending laterally from said frame means to a position at the rear of said upright back frame and within a perimeter area defined by said upright back frame; and
- (e) load resistant line means mounted relative to said at least one arm portion and operable to apply a resistance load upon outward movement of said load resistant line means relative to said at least one arm portion.

5,090,695
EXERCISE FLOAT AND METHOD OF USE
 Peter A. Ciolino, 561 Cherry Tree La., Kinnelon, N.J. 07405
 Continuation of Ser. No. 359,215, May 31, 1989, abandoned.
 This application Sep. 17, 1990, Ser. No. 584,377
 Int. Cl.⁵ A63B 23/00

U.S. Cl. 272-144

11 Claims

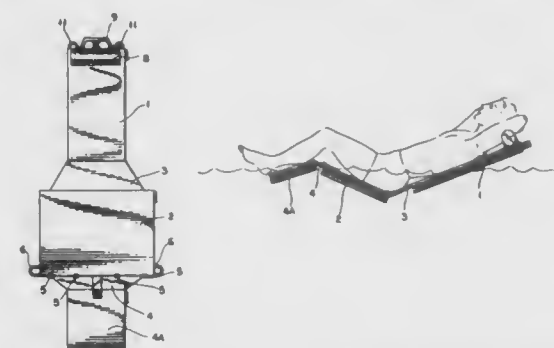
1. An apparatus to provide support and buoyancy to a user during an exercise routine performed in an aquatic environment comprising:

- a) a long narrow upper flotation section configured to correspond to the shape of the user's back as extending from the upper shoulders to the waist of said user, having a width that is sufficiently narrow thereby permitting the free movement of the arms and shoulders, and having sufficient buoyancy to support the user at submerged surface position in the aquatic environment to perform the exercise routine;
- b) a wide seat flotation section having a greater width than said upper flotation section and configured to correspond

to the shape of the user's seat as made up of the buttocks to the upper thigh region of said user and having sufficient buoyancy to support said seat at said submerged surface position in said aquatic environment,

- c) a first hinge means located between and operatively connecting said upper flotation section with said seat flotation section in a manner permitting pivoting of said upper and seat flotation sections through an angle of at least 90° between said upper and seat flotation sections, and
- d) a short narrow lower flotation section configured to correspond to the user's lower legs and feet, having sufficient buoyancy to support said user's lower legs and feet at a submerged surface position in an aquatic environment, and
- e) a second hinge means located between and operatively connecting said lower flotation section to said seat flotation section in a position so that said upper, seat and lower flotation sections form a substantially elongated float conforming to the total length of the user.

8. A method of aquatic exercise performed by a user concentrated on developing and conditioning the muscle groups



associated with a user's stomach, back and hip areas comprising the steps of:

- placing into an aquatic environment a flotation platform of the type characterized by a long narrow upper float section and a wide seat float section joined together by a hinge means, wherein said upper float section is shaped to correspond to the shape of said user's back without interfering with the free movement of said user's arms and shoulders, said seat float section is shaped to correspond to a user's seat, and said hinge means permits pivoting of said upper and seat float sections through an angle of at least 90°.

mounting onto said flotation platform whereby said user is supported at a submerged surface location in the aquatic environment facing upward and said user's back is located proximate to said hinge means permitting movement from both an inclined and upright user position in said aquatic environment during the performance of an aquatic sit up; and

exercising in said aquatic environment by user initiated multiple flexures of muscle groups substantially associated with said user's back, hips and stomach.

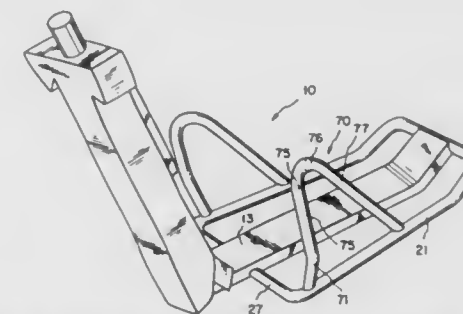
5,090,696
POP-UP TACKLING PRACTICE MACHINE
 Charles P. Forrest, Sr., Mobile, Ala., assignor to Charles P. Forrest, Jr., Mobile, Ala., a part interest
 Filed Feb. 8, 1991, Ser. No. 652,776
 Int. Cl.⁵ A63B 67/00

U.S. Cl. 273-55 R

7 Claims

1. In a tackling practice machine having a frame with at least one side member and an upright mounted on said frame, and carrying a pad, the improvement comprising righting means for righting said machine comprising an upstanding member mounted on said side member and extending upwardly with respect to said frame whereby when said machine is tackled by pivoting said machine so as to be in a position supported at least in part by said upstanding member, the size and configura-

tion of said upstanding member, and pad in conjunction with a location of a center of gravity of said machine will result in said

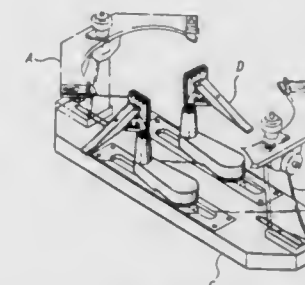


machine automatically righting itself to a position whereby said machine is supported solely by said frame.

5,090,697
RACKET FRAME STRINGING MACHINE
 Min-Wei Lee, Kaohsiung, Taiwan, assignor to Porex Industrial Co., Ltd., Taiwan
 Filed Mar. 22, 1991, Ser. No. 673,569
 Int. Cl.⁵ A63B 51/14

U.S. Cl. 273-73 A

1 Claim



1. A racket frame stringing machine including a frame support having front and rear holding arms for holding a racket frame for interlacing a network of strings on said racket frame, said stringing machine comprising:

- a guiding plate (C) having a guiding slot (C1);
- a guiding rail (3) having a slot (31) mountable in said guiding slot (C1) with a plurality of threaded holes;
- a disk member (1) slideable in said slot (31) of said guiding rail (3);
- a slide mechanism (2) having a main annular member and a secondary annular member engaged in a recess of said main annular member;
- said slide mechanism (2) slideable in said guiding slot (C1);
- a round fixing pole (4) having a flattened upper end and a flattened lower end;
- said flattened lower end being threaded;
- said upper end having a notch;
- a pivoting arm (6) pivotally secured at a first end in said notch of said round fixing pole (4);
- said disk member (1) and said slide mechanism (2) slideably engaged on opposite sides of said guiding rail (3) by extension of said round fixing pole (4) through a corresponding hole in said disk member, said slot (31) and a hole in said slide mechanism (2) and threadably engaging an adjusting nut (C3) to said lower end of said round fixing pole (4);
- said guiding plate (C) engaged to said plurality of threaded holes of said guiding rail (3) by threaded bolts through said guiding plate (C);
- an oval slide member (5) slideably engaged to said disk member (1) and housing said pivoting arm (6);
- said oval slide member (5) having a vertical extension (51) having a hole at a top end communicating with a second end of said pivoting arm (6);

a spring clip holder (7) having an inner through hole at a lower end and a flat mounting surface at an upper end;
 a push rod (9) having a notch at an upper end and an adjustable bolt at a lower end;
 a link (10) having a first end pivotally connected in said notch of said push rod (9);
 said spring clip holder (7) slideably engaged in said vertical extension of said oval slide member (5) and abutting said second end of said pivoting arm;
 said adjustable bolt of said push rod (9) adjustably abutting said second end of said pivoting arm through said through hole of said spring clip holder (7);
 a strip clip (8) having a pressing member and mounted on said flat mounting surface;
 said pressing member pivotally connected to a second end of said link (10);
 wherein said string clip (8) can be adjusted to move in a plurality of vertical and horizontal directions within said frame support to string said racket frame and said pressing member can be adjusted to create different pressures on said strings.

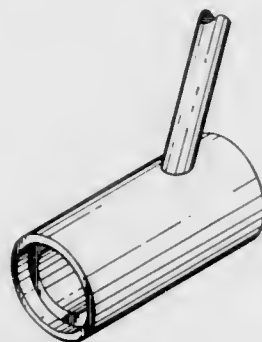
5,090,698
GOLF PUTTER

Thomas A. Kleinfelter, 891 Hlavka Rd., Maple City, Mich. 49664

Filed Mar. 27, 1990, Ser. No. 499,662
 Int. Cl.⁵ A63B 53/04, 53/02

U.S. Cl. 273—80.2

19 Claims



1. A golf putter comprising:
 A) a shaft having an outer dimension;
 B) a sleeve having
 (1) a first end,
 (2) a second end,
 (3) a wall connecting said first and second ends together,
 (4) a longitudinal axis extending between said first and second ends,
 (5) a bore extending along said longitudinal axis,
 (6) an inner surface adjacent to said bore and having an inner dimension, and
 (7) a shaft-receiving hole defined through said wall and intersecting said bore, said shaft-receiving hole having an inner dimension which is larger than said shaft outer dimension;
 C) an insert element located in said sleeve bore and which includes
 (1) a first end,
 (2) a second end,
 (3) a wall connecting said insert element first end to said insert element second end, said insert element wall having an outer dimension which is smaller than the sleeve element inner dimension,
 (4) a first flange element on said insert element first end,
 (5) a second flange element on said insert element second end,
 (6) said first and second flange elements having outer dimensions which are essentially equal to the inner dimension of said sleeve element adjacent to said sleeve

element bore and being attached to said sleeve element bore,
 (7) a club shaft-receiving hole defined in said insert element wall to be aligned with said sleeve element shaft-receiving hole when said insert element is in place in said sleeve element bore, said insert element shaft-receiving hole having a dimension which is essentially equal to the club shaft outer dimension to attach said insert element to said shaft.

5,090,699
GAME

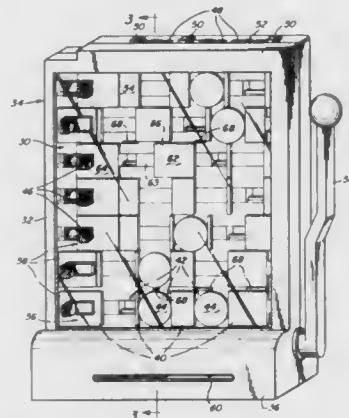
Ira Friedman, West Palm Beach, Fla., assignor to Tri-Tec Industries Ltd., West Palm Beach, Fla.

Filed Mar. 28, 1991, Ser. No. 676,431

Int. Cl.⁵ A63F 07/02

U.S. Cl. 273—126 R

27 Claims



1. A slot game comprising:
 an enclosed partially transparent case having, at an upper end thereof, means for inputting coins into one of a plurality of vertical columns and further having means, positioned at a lower end, for retrieving coins from the vertical columns;
 a plurality of horizontal rows of blocks and slots sized to receive coins therein oriented relative to the columns disposed from top to bottom, the blocks and slots being movable horizontally to allow movement of coins between columns for passage of coins in the slots from upper to lower rows; and
 means for individually activating each of the rows of blocks and slots to move them each horizontally.

5,090,700
GAME

Veli Toukomies, Rintamäkientie 15, SF-06100 Porvoo, Finland

PCT No. PCT/FI89/00019, § 371 Date Aug. 29, 1990, § 102(e) Date Aug. 29, 1990, PCT Pub. No. WO89/07478, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 1, 1989, Ser. No. 555,431

Claims priority, application Finland, Feb. 12, 1988, 873646; Aug. 8, 1988, 883691

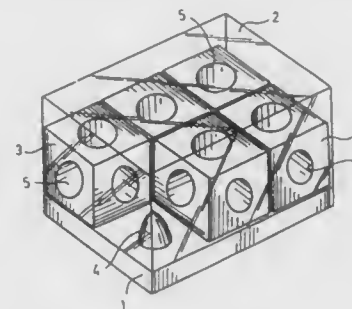
Int. Cl.⁵ A63F 9/06

U.S. Cl. 273—153 S

9 Claims

1. A game comprising a substantially planar playing board (1) divided into playing squares; a see-through dome (2) fastened to the playing board (1) so as to define a closed space together with the board (1); cubes (3) of the same size positioned in the closed space, the number of the cubes being smaller than that of the squares of the playing board; and interlocking means (4, 5) provided in each square and in sides of the cubes for detachably fastening the cubes to the square, wherein the interlocking means (4, 5) of the squares of the playing board (1) and the cubes (3) are shaped so as to prevent

the cubes (3) from sliding along the board (1) while allowing (3) of a metal material suitable for forging or swaging, said the cubes to be turned around their side edges when the play- striking plate having a ball-striking face (7) provided with



5,090,701
JIGSAW PUZZLE

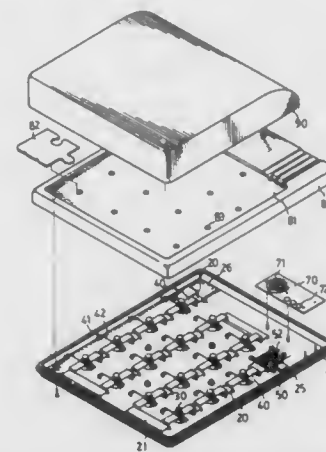
Morgan Chang, No. 291, Sec. 1, Chang Nan Rd., Chang Hua City, Taiwan

Filed Jul. 10, 1991, Ser. No. 728,163

Int. Cl.⁵ A63F 9/10

U.S. Cl. 273—157 R

6 Claims



1. A jigsaw puzzle comprising a base, a plurality of conductors disposed on said base and arranged in a line and including a first conductor and a last conductor, a first switching means disposed between every two adjacent conductors, a plurality of jigsaw pieces which can be disposed upon said first switching means, a sounding means connected between said first conductor and said last conductor, and said sounding means sending out a sound when all of said first switching means are depressed by all said jigsaw pieces and when all of said jigsaw pieces are correctly disposed in place.

5,090,702
GOLF CLUB HEAD

Claude Viste, Gruffy, France, assignor to Taylor Made Company, Inc., Carlsbad, Calif.

Filed Jan. 31, 1991, Ser. No. 648,842

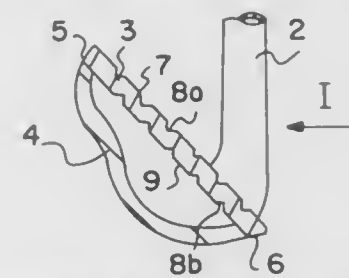
Claims priority, application France, Jan. 31, 1990, 90 01377

Int. Cl.⁵ A63B 53/04

U.S. Cl. 273—167 H

13 Claims

1. A golf club head comprising a shell (4) and a striking plate



external grooves (8a) and an internal face (9) provided with internal grooves (8b).

5,090,703

GOLF SAND WEDGE AND PUTTER

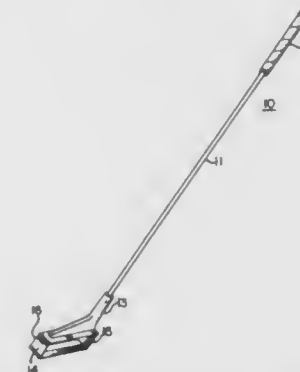
Angelo N. Koumariannos, 248 24th Ave., South Seaside Park, N.J. 08752

Filed Apr. 23, 1991, Ser. No. 689,995

Int. Cl.⁵ A63B 53/04

U.S. Cl. 273—175

8 Claims



1. A golf sand wedge and putter, comprising:
 a shaft having a handle portion at one end; and
 a club head at the opposite end of the shaft, said club head comprising a body portion having a front ball-engaging face and a rear face,
 said front ball-engaging face having upper and lower ball-engaging ramp parts and a central hole between said ramp parts, said hole extending entirely through said body portion between the faces thereof,
 said upper ramp part having an outer edge defining a forward upper edge of said front face, and an inner edge adjacent said central hole,
 said lower ramp part having an outer edge defining a forward lower edge of said front face, and an inner edge adjacent said central hole,
 said upper and lower ramp parts being spaced from each other a distance such that the outer edges thereof are spaced apart by a distance approximately equal to the diameter of a golf ball to be driven by said club head,
 said upper and lower ramp parts having ramp surfaces inclined with respect to said front ball-engaging face at angles such that, when driven by the club head, the golf ball may simultaneously contact a portion of each of said ramp parts intermediate the inner and outer edges thereof.

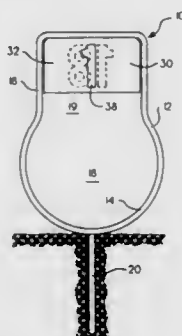
5,090,704

GOLF GAME TARGET

Joseph C. Dona, 3 Frick Dr., Irwin, Pa. 15642
 Filed Mar. 1, 1991, Ser. No. 663,495
 Int. Cl.⁵ A63B 69/36, 63/02

U.S. Cl. 273—177 R

12 Claims



1. A portable apparatus for use in playing a golf game comprising:
 - a target member defining an opening at least a major portion of which is in the shape of a circle adapted to permit a ball to pass therethrough;
 - a single support rod rigidly attached to said target member and extending perpendicularly from a central portion of said circle, said support rod adapted for insertion into the ground; and
 - a sign member rigidly attached to said target member opposite said support rod and extending perpendicularly therefrom, said sign member having a first side and a second side, said first side and said second side each having a different identifying number affixed thereto.

5,090,705

GOLF BALL

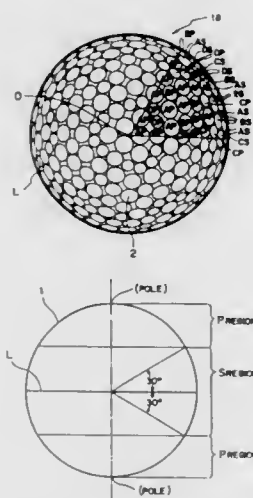
Kengo Oka; Susumu Yoshida; Yoshiyuki Mimoto, all of Kobe; Tadahiro Ebisuno, Nishinomiya, and Yoshikazu Yabuki, Akashi, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Aug. 13, 1990, Ser. No. 565,974

Claims priority, application Japan, Aug. 23, 1989, 1-217138
 Int. Cl.⁵ A63B 37/14

U.S. Cl. 273—232

8 Claims



1. A golf ball which comprises a spherical surface having a parting line at its equator and having a plurality of dimples formed thereon, wherein said dimples are formed so that the ratio, y , of the sum total of the flat surface area of the dimples to the

surface area of the same sphere having no dimples formed thereon is within the range

$$((0.046)(X))^{\frac{1}{3}} - 0.172 + 0.04 \leq y \leq ((0.046)(X))^{\frac{1}{3}} - 0.172 - 0.04$$

wherein X represents the total number of dimples; and wherein a dimple lying within a region S , which extends from 30° below the parting line to 30° above the parting line, has a volume V_S , and a dimple of the same diameter only lying within the region P , which comprises the surface of the sphere that is not within region S , has a volume V_P , such that the ratio of the volumes of dimples having the same diameters but in different regions is within the range of;

$$1.02 \leq V_S/V_P < 1.10, \text{ when } y < 0.70,$$

$$1.10 \leq V_S/V_P < 1.18, \text{ when } 0.70 \leq y < 0.80, \text{ and}$$

$$1.18 \leq V_S/V_P, \text{ when } 0.80 \leq y.$$

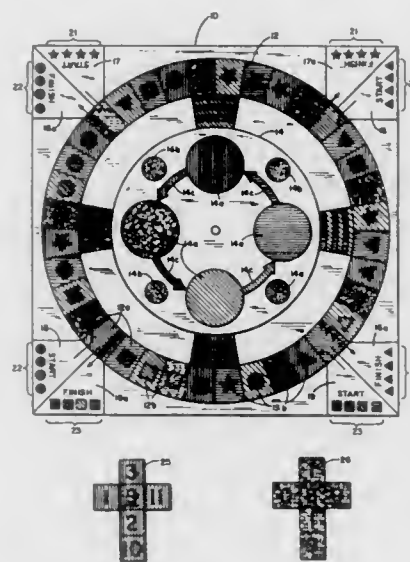
5,090,706

GAME APPARATUS

Harlan C. Hokanson, Box 25, Browerville, Minn. 56438
 Filed May 15, 1989, Ser. No. 352,185
 Int. Cl.⁵ A63F 3/00

U.S. Cl. 273—248

5 Claims



1. Game apparatus comprising:
 - a game board having a game path formed thereon with a plurality of segmented divisions formed therein, each division having a player starting location and a finish location with a segmented intermediate playing path therebetween,
 - a specified number of markers having player identifying shapes, each player having the same number of markers all of which have the same shape but the markers for each player having different colors,
 - a color selection disk having color-identifying indicators thereon,
 - a number of different colored dice corresponding to the number of players and the the respective colors of the markers as well as the respective color indicators of the rotatable color selection disk,
 - and each die having a different selection of numbers applied to the respective faces thereof so that one die will display a higher number than another specific die a substantially predictable percentage of the time.

5,090,707

CARD GAME SIMULATING THE SPORT OF HUNTING

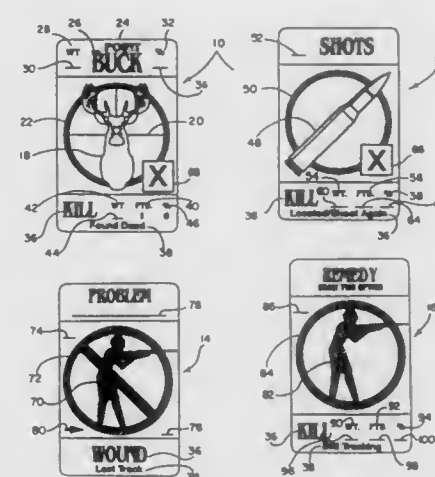
Darrell Patz, Coleman, Wis., assignor to Reflect Game Corp., Green Bay, Wis.

Filed Mar. 1, 1991, Ser. No. 663,252

Int. Cl.⁵ A63F 1/00

U.S. Cl. 273—298

15 Claims U.S. Cl. 273—422



1. A card game simulating the sport of hunting comprising:
 - a deck of cards having indicia printed on the face of each card, said deck including,
 - a plurality of wild game cards indicating the type of animal being hunted,
 - a plurality of shot cards indicating the number of shots a hunter may take,
 - a plurality of problem cards indicating difficult situations that may be encountered by a hunter, and
 - a plurality of remedy cards for elimination of said problem cards.

5,090,708

NON HAND-HELD TOY

Yonatan Gerlitz, 23 Malchei Israel Street, Herzliya; Dan Moran, 19 Aluf David Street, Ramat Gan, Ramat Gan, and Roni Raviv, 9a/8 Maccabi Street, Ness Ziona, all of Israel

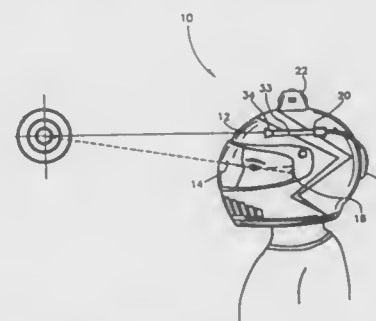
Filed Dec. 12, 1990, Ser. No. 626,537

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.⁵ F41J 5/08

U.S. Cl. 273—310

15 Claims



1. A firing toy comprising:
 - headgear having mounted thereon a simulated weapon system, a visor and means for producing a sighting reference; and
 - non hand held activation means for activating said simulated weapon system to produce simulated firing on a target.

5,090,709

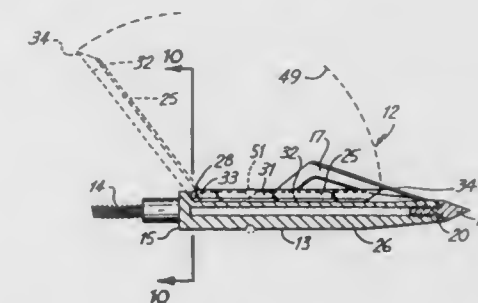
ARROWHEAD WITH EXTENDABLE BLADES

Gregory G. Johnson, 4824 Northrop Dr., Minneapolis, Minn. 55406

Filed Jun. 19, 1990, Ser. No. 540,143

Int. Cl.⁵ F42B 6/08

23 Claims



1. An arrowhead assembly attachable to an arrow comprising:
 - an elongated generally cylindrical body having a longitudinal axis and an inwardly tapered forward end, a plurality of fixed first blade means mounted on the body generally parallel to the longitudinal axis of the body, said first blade means having forward knife edges for cutting an object, and rear portions mounted on the body, a plurality of second blade means having forward heads and knife edges for cutting the object, said body having longitudinal slot means with forward ends open to the tapered forward end of the body and closed rear ends for accommodating the second blade means adjacent and parallel to one side of each first blade means and stops at the rear ends of the slot means, said second blade means being selectively movable from a folded position in the slot means to an extended position outwardly from the body, said second blade means engageable with the stops when located in their extended positions, said second blade means having the knife edges located in said slot means and the forward heads spaced outwardly from said tapered forward end of the body when the second blade means are in the folded position, pivot means pivotally mounting the second blade means on the body adjacent the stops whereby the second blade means pivot from the folded position with the knife edges in the slot means to the extended position into engagement with the stops with the knife edges extended outwardly from the body when the body and first and second blade means enter the object, and reacting means releasably holding the second blade means in the folded position, said retaining means including a continuous annular member surrounding the second blade means and body forwardly of the pivot means adjacent the rear portions of the first blade means for holding the second blade means in the folded position, said annular member being severed when the second blade means pivots from the folded position to the extended position.

5,090,710

BRUSH SEALS

Ralph F. J. Flower, Devizes, England, assignor to Cross Manufacturing Company (1938) Limited, Bath, England

Continuation of Ser. No. 200,009, May 27, 1988, abandoned.

This application Jul. 23, 1990, Ser. No. 556,865

Claims priority, application United Kingdom, May 29, 1987, 8712681

Int. Cl.⁵ F16J 15/447

U.S. Cl. 277—53

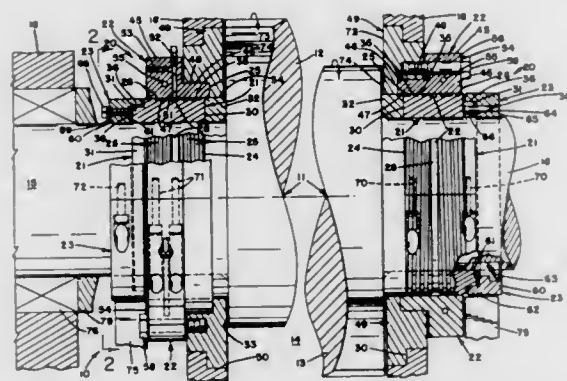
12 Claims

1. A brush seal assembly for effecting a seal between a fixed housing of a gas turbine engine and a shaft rotatable with respect to the housing, which brush seal assembly comprises an annular seal member assembled from a plurality of separate interfitting arcuate brush seal portions, each said brush seal portion having an arcuate carrier and a plurality of seal bristles carried by said carrier for effecting a seal against the shaft, and

mounting means provided on said housing and adapted to hold the carriers of all said plurality of arcuate seal portions such that the seal portions are disposed in a continuous end-to-end relationship defining said annular seal member with said bristles of each said seal portion arranged to form a substantially continuous brush seal, said carriers having end-plates formed to coact with the ends of adjacent arcuate base plates so that the bristles juxtapose to the ends of adjacent carriers to form a substantially continuous brush seal.



5,090,711
SEAL ASSEMBLIES FOR INTERNAL MIXERS
Anton Becker, Stow, Ohio, assignor to Americhem, Inc., Cuyahoga Falls, Ohio
Continuation-in-part of Ser. No. 233,593, Aug. 18, 1988, Pat. No. 5,056,800. This application Feb. 28, 1990, Ser. No. 486,148
Int. Cl.⁵ F16J 15/34
U.S. Cl. 277-68 7 Claims



1. A seal assembly for the rotor shafts of internal mixers comprising:

- seal rotor means carried by said rotor shaft outside of the mixing chamber of said mixer and having a continuous circumferential region for the bi-directional movement of a viscous melt of flowable material, said continuous circumferential region providing:
- first trough means extending axially away from said housing;
- second trough means extending axially toward said housing; and
- annular groove means between said first and second trough means;
- said seal rotor means providing
- a forward lip engageable with said rotor shaft; and
- a tail flange contiguous with said second trough means;
- said rotor shaft carrying blades providing a shoulder adjacent said housing and carrying a recess for receipt of said lip;
- sleeve means non-rotatably carried by the housing of said mixer concentrically disposed about said seal rotor means, said sleeve means providing a cylindrical element contiguous with said continuous circumferential region of said seal rotor means and having an annular recess about the outer periphery;
- retainer ring means rotatable with said rotor shaft and engageable with said rotor means while providing;
- a body portion;

an axially extending flange carrying an inclined surface engageable with said tail flange; and

a rearward face; and,

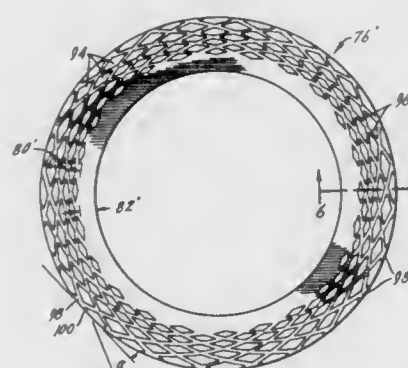
locking ring means rotatable with said rotor shaft and providing

an inwardly directed annular foot received within a groove provided in said shaft and

adjustable means engageable with said rearward face for maintaining said retainer ring means in communication with said seal rotor means;

wherein movement of said flowable material between said continuous circumferential region and said sleeve means forms a dynamic melt seal thereby controlling the discharge of materials from said mixing chamber between the housing and said rotor shaft.

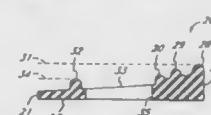
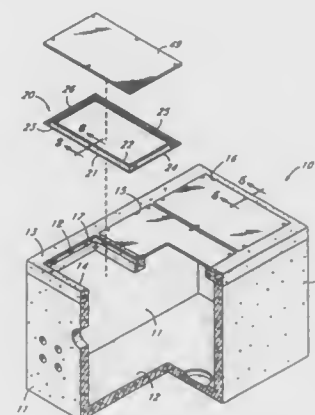
5,090,712
NON-CONTACTING, GAP-TYPE SEAL HAVING A RING WITH A PATTERNED MICRODAM SEAL FACE
Glenn G. Pecht, Wheeling, and Jon Hamaker, Schaumburg, Ill., assignors to John Crane Inc., Morton Grove, Ill.
Filed Jul. 17, 1990, Ser. No. 553,397
Int. Cl.⁵ F16J 15/34; F16C 17/04
U.S. Cl. 277-96.1 43 Claims



1. In a gap-type, grooved face seal having a stationary sealing ring and a relatively rotating sealing ring with opposed radially extending faces, one of said rings being sealingly affixed to a housing and the other sealingly affixed to a shaft, the improvement comprising, in at least one of said rings, a seal face including:

- a grooved portion having discontinuous grooved surfaces extending inwardly from one circumference of the face of at least one said ring, said grooved surfaces extending across the face of said ring in a discontinuous pattern and being defined by microdams extending between said grooved surfaces, said microdams being offset from the grooved surfaces and having a width at the outermost contacting surface which is significantly smaller than the width of the recesses formed by the grooved surfaces, said microdams being disposed along the boundary of each said grooved surface, whereby said discontinuous grooved surfaces essentially comprise a plurality of grooved polygonal surfaces disposed on the ring face adjacent each other with a microdam being disposed between each said grooved polygonal surface and any adjacent said grooved polygonal surface; and
- an ungrooved portion extending inwardly from the other circumference of the face of at least one said ring.

5,090,713
ELASTOMERIC GASKET FOR SEALING A GLASS FIBER REINFORCED COVER TO A VAULT
Roy E. Johnson, 12308 Aegean St., Norwalk, Calif. 90650
Filed Dec. 24, 1990, Ser. No. 633,074
Int. Cl.⁵ F16J 15/00; B65D 53/00; E04B 1/66
U.S. Cl. 277-166 3 Claims



1. An improved vault sealing assembly of the type including a gasket secured to a cover frame of an underground vault, said vault being of the type having a precast underground portion and an upper opening including a steel cover frame including a horizontal flat surface for supporting a gasket and said vault being of the type having a glass fiber reinforced polymeric cover including recessed bolt openings on all four sides and having a generally flat undersurface wherein the improvement comprises:

- a rectangular elastomeric member having four sides, each side having an inner peripheral edge and an outer peripheral edge, each side including a plurality of centrally located bolt holes, each side having a cross-sectional shape which includes an inner edge and an outer edge and a flat bottom affixed to the horizontal flat surface of said steel cover frame, said member having a plurality of adjacent ridges beginning at the inner edge thereof and including an innermost ridge which has the greatest height, a thin, flat area in the center of said cross-sectional shape in which said bolt holes are located and at least one outer ridge adjacent the thin, flat area and separated from the outer edge, and located between said bolt holes and said outer edge said outer ridge being of less height than the innermost ridge and said outer ridge extending past each of said plurality of bolt holes.

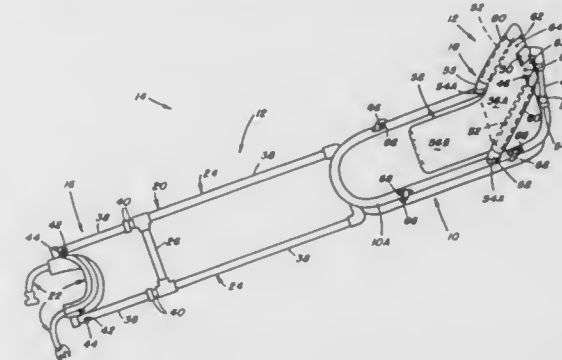
5,090,714
CROSS-COUNTRY SLED KIT AND ASSEMBLY
Barbara H. Seekins, and Tom W. Seekins, both of 401 Ben Hogan Dr., Missoula, Mont. 59803
Filed Feb. 11, 1991, Ser. No. 653,706
Int. Cl.⁵ A63C 17/06
U.S. Cl. 280-24 16 Claims

1. A kit for adapting a sled to a cross-country sled assembly for transporting a passenger and equipment over snow-covered terrain while nordic skiing, said kit comprising:

- (a) a towing harness system for interconnecting a sled and a skier's torso; and
- (b) a seat and frame structure for mounting on the sled to partially support a passenger thereon, said seat and frame structure including
- (i) a substantially U-shaped frame member having an upper bight portion and a pair of leg portions connected

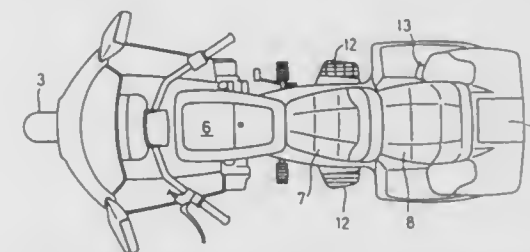
to and merging from said bight portion and being attachable at their lower ends to the opposite sides of the sled spaced forwardly from the rear end of the sled, and

(ii) an upright frame member extending between and



connected at its respective opposite ends to said bight portion of said U-shaped frame member and to the rear end of the sled for supporting said U-shaped frame member in an inverted and inclined relationship to a top portion of the sled.

5,090,715
MOVABLE STEP FOR MOTORCYCLE
Jun Nakajima, Tokyo; Yoshihiro Funayama, Asaka, and Kazuyoshi Otsuka, Higashimatsuyama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 27, 1990, Ser. No. 515,123
Int. Cl.⁵ B60R 3/00
U.S. Cl. 280-166 2 Claims



1. Means for adjusting the position of a foot rest of a motorcycle, said means comprising:

- (a) supporting means adapted to move said foot rest upwardly and downwardly, said supporting members comprising a pair of link members connected for pivoting movement relative to one another under ends of the said link members being operatively connected to a base support, and upper ends of said link members being operatively connected to a foot rest plate;
- (b) means for continuously biasing said foot rest in an upward direction;
- (c) means for selectively positioning said foot rest at a plurality of elevations;
- (d) lock means adapted to maintain said foot rest at a selected elevation;
- (e) manipulating means mounted on a body of said motorcycle; and
- (f) transmission means extending from said manipulating and connected to said lock means.

5,090,716

EXTENDED ELEVATED FOOT PLATFORM

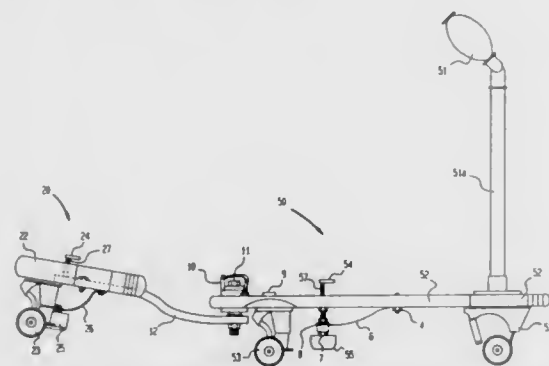
Kermit M. Borden, 2125 Whitney Ave., Apt. 3A, New Orleans, La. 70114

Filed Mar. 15, 1989, Ser. No. 323,807

Int. Cl.⁵ A63C 17/02

U.S. Cl. 280—87.042

14 Claims



1. A play and sports device for use with a skating mobile, comprising:

a foot platform on which to stand and coaxially disposed wheels rotatably mounted below and supported by said foot platform;

connecting means for connecting said foot platform to a rear portion of a skating mobile having a platform and front and back wheels, said connecting means including a pivot arm and pivot means for pivotally connecting said device to the skating mobile about a vertical axis so that said foot platform can pivot about said vertical axis and move in a side-to-side motion relative to a direction of travel of the foot platform; and

maintaining means for maintaining said wheels of said foot platform off the ground when the front and back wheels of the skating mobile are in contact with the ground, said maintaining means including said pivot arm.

5,090,717

LONGITUDINALLY ADJUSTABLE BICYCLE BAGGAGE CARRIER

Heinrich Belka, Bielefeld, Fed. Rep. of Germany, assignor to ESCE-Marby GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Continuation of Ser. No. 350,540, May 11, 1989, abandoned.

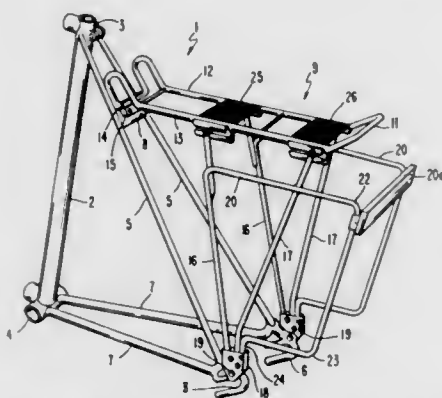
This application Sep. 12, 1990, Ser. No. 581,400

Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817396

Int. Cl.⁵ B62J 9/00

U.S. Cl. 280—304.5

20 Claims



1. Bicycle luggage or luggage carrier (9) adapted for attachment to a portion (8) of a frame of a bicycle

said carrier having

an elongated carrier frame (11, 25, 26) defining a baggage support surface, said carrier frame including longitudinal side portions (12, 13, 28) extending approximately parallel to a longitudinal axis of said bicycle;

attachment means (14, 15) for attaching one end portion of said carrier frame (9) to said bicycle frame;

at least two support legs (16, 17) extending downwardly from each of said side elements (12, 13) and converging to define a V-configuration, said support legs, each having upper ends and terminating in a free lower end,

said free lower ends being adapted to be secured to said bicycle frame adjacent an axle receiving portion (6) thereof; and

means for securely attaching said upper ends of the support legs (16, 17) to the carrier frame (9) with said support surface in essentially horizontally aligned position, independently of the geometrical configuration of the bicycle frame and spaced from said attachment means, comprising at least one groove (29, 29') formed in each of said side portions (12, 13, 28) extending longitudinally at least over a predetermined adjustment length of the respective side portion, and parallel to the longitudinal extent of said side portions,

wherein said at least one groove (29, 29') terminate in an open slit (34, 34', 34'') having a cross-sectional dimension less than the width of said groove to define groove edges projecting toward each other, whereby said at least one groove will be an undercut groove; and

releasable clamping means (37, 38, 41, 43; 52, 54; 68, 71, 72) including

slidable means (38, 39; 52, 68, 71) formed with an enlarged head located in said undercut groove and engaged by said projecting groove edges,

said enlarged head and said undercut groove forming inter-engaging projection and recess means; and

means (41, 43; 54; 66, 69) for coupling said slidable clamping means to said upper ends of the support legs and hence at any selected longitudinal position to said longitudinal side portions of said carrier frame, for selectively and securely connecting said upper ends of said support legs at any selected position within said adjustment lengths of said at least one undercut groove.

5,090,718

MULTI-FUNCTION TOWING TRAILER

Frank Kauffman, 1506 College Ave., Goshen, Ind. 46526

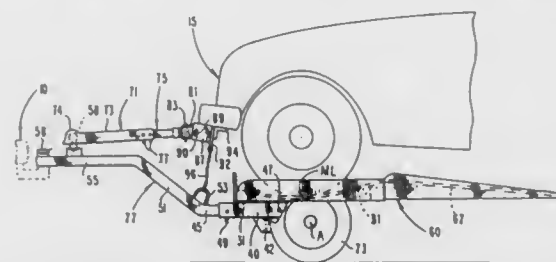
Continuation of Ser. No. 307,672, Feb. 6, 1989, Pat. No.

5,016,897. This application Jan. 22, 1991, Ser. No. 643,274

Int. Cl.⁵ B60P 3/06

U.S. Cl. 280—402

4 Claims



1. A vehicle towing apparatus for detachable connection to a towing vehicle, comprising:

a carriage having a longitudinal axis including;

an elongated beam member extending in parallel with said longitudinal axis;

a non-steerable wheel assembly fixed to said beam member, said wheel assembly including a pair of rotatable ground engaging wheels;

a pair of parallel tubular members affixed transversely to

said beam member and straddling each of said ground engaging wheels; and

a channel beam affixed to a forward one of said pair of tubular members, said channel beam including a downwardly opening channel having a pair of opposing channel walls;

wheel supporting means for supporting a pair of wheels of a vehicle to be towed, said wheel supporting means including;

a pair of elongated ramps, each of said pair of ramps having a wheel well at a forward portion of said ramp for receiving a wheel of the towed vehicle thereon and a rear ground engaging edge; and

mounting means for mounting each of said pair of ramps to opposite transverse sides of said pair of tubular members outboard of said pair of ground engaging wheels;

an elongated tow bar including means at a forward end of said tow bar for detachably engaging the towing vehicle;

connecting means for removably connecting said tow bar to said carriage with said tow bar at least partially extending between said pair of channel walls, said connecting means including;

a removable pivot pin extending through a rear end of said tow bar and said pair of channel walls, said pivot pin defining a pivot axis about which said carriage pivots relative to said tow bar, whereby said carriage is pivotable about said pivot axis when said tow bar is engaged with the towing vehicle between a loading position in which the rear edge of each of said pair of ramps engages the ground and a towing position in which each of said pair of ramps is generally parallel with the ground; and

means for releasably securing said tow bar to said channel beam to prevent pivoting of said carriage relative to said tow bar about said pivot axis.

5,090,719

FOUR WHEEL STEERING TRAILER

Hiroshi Hanaoka, deceased, late of Tokyo, Japan by Shigeru Hanaoka, legal representative, assignor to Hanaoka Sharyo Co., Ltd., Tokyo, Japan

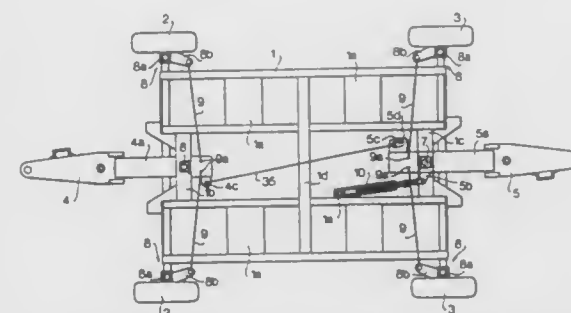
Continuation of Ser. No. 404,013, Sep. 7, 1989, abandoned. This application Mar. 11, 1991, Ser. No. 666,432

Claims priority, application Japan, Sep. 12, 1988, 63-119438[U]

Int. Cl.⁵ B62D 13/00

U.S. Cl. 280—408

4 Claims



1. A trailer having a body, a pair of front wheels and a pair of rear wheels each wheel of which is rotatably supported on a knuckle arm pivotally mounted for rotation about an axis on a body of said trailer, said knuckle arm being inwardly tilted from a vertical axis relative to said trailer body toward said body so as to support said pair of front wheels and said pair of rear wheels on said trailer body for rotation about horizontal axes when said pair of wheels are rotated in a straight ahead direction and for tipping said wheels when said pairs of said paired wheels are rotated in directions to the right or left of said straight ahead direction, a front tow bar pivotally mounted on a front steering member pivotally secured to the

body, a rear steering member pivotally mounted on a rear portion of said body, a pair of front tie rods connecting the knuckle arms of said pair of front wheels and said front steering member, and a pair of rear tie rods connecting said knuckle arms of said pair of rear wheels and said rear steering member, the trailer comprising:

a rear stabilizer between said rear steering member and said body,

the rear stabilizer comprising a cylinder, a piston rod slidably mounted in said cylinder at an end thereof, a first piston plate slidably mounted in said cylinder on said piston rod, a second piston plate slidably mounted in said cylinder on said piston rod, a compression spring in said cylinder around said piston rod and between said first and second piston plates, a stopper ring secured in said cylinder to an end of said piston rod at said second plate, a stopper sleeve mounted on said piston rod between a flange formed on an end of said piston rod and said first piston plate, and a cylinder stopper in said cylinder at said end of said piston rod for stopping said second piston plate, said cylinder being pivotally connected to said body, and the piston rod being pivotally connected to said steering member, whereby said piston rod, said first and second piston plates and said compression spring in said cylinder are protected from dust, water and mud and prevented from rusting and said stabilizer urges said rear steering member and said rear pair of wheels to said straight-ahead direction.

5,090,720

TRANSPORTING SYSTEM AND METHOD FOR USING SAME

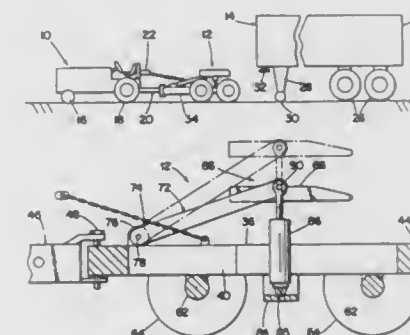
Merle J. Heider, 203-12th St. SW.; Dale J. Heider, 1108 8th Ave. SW., and Leon J. Heider, 1107 Third Ave. SW., all of Humboldt, Iowa 50548

Filed Nov. 23, 1990, Ser. No. 617,187

Int. Cl.⁵ B60D 1/00; B62D 53/08

U.S. Cl. 280—438.1

5 Claims



1. A transporting system comprising: an agricultural tractor having a forward end and a rear end and having a three point hitch extending rearwardly from said rear end of said tractor;

a dolly having a dolly frame, ground engaging wheels rotatably mounted to said frame, and a fifth wheel assembly mounted on said frame;

a trailer comprising a storage box having forward and rear ends, ground engaging wheels rotatably mounted to said storage box adjacent said rear end thereof, a pair of support legs mounted to said box adjacent said forward end thereof and having support pads engaging the ground to support said forward end of said box a predetermined distance above the ground, and a king pin mounted to said storage box adjacent said forward end thereof;

said fifth wheel assembly comprising a fifth wheel plate retentively engaging said king pin of said trailer;

connecting means connecting said three point hitch of said tractor to said dolly for pulling same;

said fifth wheel assembly further comprising link means pivotally interconnecting said dolly frame and said fifth wheel plate for permitting movement of said fifth wheel plate between a lowered position and a raised position; elongated extensible power means pivotally connected to said link means and to said dolly frame for causing said fifth wheel plate to move between said lowered position and said raised position; said dolly frame and said ground engaging wheels bearing the weight of said forward end of said storage box of said trailer, said tractor and said three point hitch being substantially free from bearing the weight of said forward end of said storage box.

5,090,721

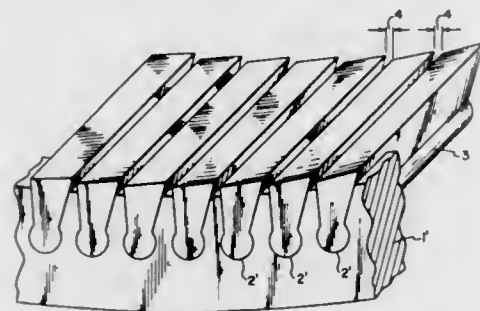
PROCESS FOR MANUFACTURING A SCREEN BASKET AND SCREEN BASKET MADE BY THIS PROCESS

Werner Lange, Nattheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany
Continuation of Ser. No. 570,392, Aug. 21, 1990, abandoned.
This application Oct. 31, 1990, Ser. No. 607,600
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1989, 3927748

Int. Cl.⁵ B23K 31/02

U.S. Cl. 220—485

15 Claims



1. A process for the manufacture of a rotationally symmetric screen basket, said screen basket having axially parallel bars with screen slots therebetween, said basket further having an axis and including rings for support of said bars, said rings being coaxial with said axis, said rings having an inner rim and being provided with recesses which open toward said rim, each of said bars having a respective foot portion whereby said foot portions are positioned and fastened in said recesses, said process comprising:

- providing respective bodies to be rounded into said rings, said bodies having said recesses formed therein;
- placing said bars in said recesses prior to rounding said bodies into rings; and
- rounding said bodies into rings so that the circular shape of said rings is closed and so that said bars are clamped in position in said recesses, said recesses being constricted by said rounding.

5,090,722

TEMPORARY FOOT-GRIPPING DEVICE FOR SNOWBOARDS

Julian C. Ritchie, 4457 S.W. Wynnwood, Hillsboro, Oreg. 97123, and Jaime L. Chriswiser, 12070 S.W. Fischer #A207, Tigard, Oreg. 97224

Filed Aug. 6, 1990, Ser. No. 562,837

Int. Cl.⁵ A63C 5/03

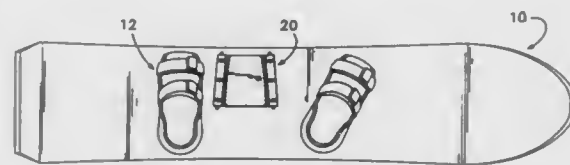
U.S. Cl. 280—607

4 Claims

1. A foot-gripping device for temporarily securing a person's shod foot to a snowboard, comprising:

- (a) a planar plate adapted to be fastened to said snowboard;
- (b) spaced-apart upright arm portions integral with the upper surface of said plate;

- (c) clamp members respectively overlying each said upright arm portion; and
- (d) resilient means, located between respective said arm portions and said clamp members, for frictionally gripping



and retaining the sides of a user's foot that is forcibly inserted onto said plate between said arm portions, said resilient means having a serrated, inwardly-extending edge.

5,090,723

LATERAL GUIDANCE DEVICE FOR A CROSS-COUNTRY SKI BOOT

Paul Arnulf, Alby Sur Cheran, France, assignor to Salomon, S.A., Annecy Cedex, France

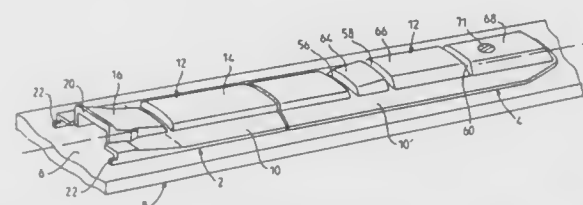
Filed Oct. 11, 1990, Ser. No. 596,008

Claims priority, application France, Oct. 11, 1989, 89 13291

Int. Cl.⁵ A63C 9/00

U.S. Cl. 280—615

14 Claims



1. A lateral guidance device for a ski boot, the ski boot being attachable at its front end to a ski having a longitudinal axis, so that a heel of the ski boot is free to move at least vertically, the ski boot having at least one longitudinal groove in a sole, said lateral guidance device comprising:

- at least one guidance rib cooperating with said at least one longitudinal groove to provide lateral guidance of the boot;
- said at least one guidance rib comprising a front element and a separate rear element, said front element and said rear element being generally aligned along the longitudinal axis of the ski;
- a rear end of said front element and a front end of said rear element including connecting means to vertically and transversely connect said front and rear elements while allowing relative longitudinal movement between said front and rear elements, said front element and said rear element each including means for substantially fixed attachment being located at the rear end of each of said front and rear elements.

5,090,724

STAND-UP STROLLER

Deborah A. Fiore, 2038 W. 11th St., Brooklyn, N.Y. 11223

Filed Feb. 6, 1991, Ser. No. 651,182

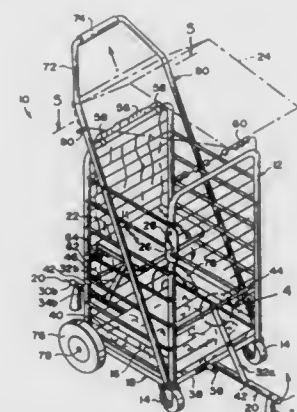
Int. Cl.⁵ B62B 7/08

U.S. Cl. 280—643

4 Claims

1. A stand-up stroller having a folded position and an extended use position, the stroller comprising a front frame section pivotally linked to a rear frame section, a bottom frame section, a handle, a pair of wheels mounted to the rear frame section, a pair of swivel wheels mounted to the front frame section, a supportive pad placed onto the bottom frame section, a collapsible seat located between the front and rear frame

sections and pivotally attached to the rear frame section, and means for preventing the stroller from tipping over while the seat is in an extended use position, said means including a pair of stabilizer arms, a pair of drop lock rails, and a pair of feet, each one of said pair of stabilizer arms being pivotally connected to a front edge and a rear edge respectively of said bottom frame section for movement between an extended horizontal position and a folded vertical position against a respective one of said front and rear frame sections, each one



of said pair of drop lock rails includes a pair of links pivotally interconnected at their inner ends, an outer end of one of said links being pivotally connected to the middle of a respective one of said pair of stabilizer arms and the outer end of the other link being pivotally connected to a horizontal rung located on a respective one of said front and rear frame sections, and each one of said pair of feet being mounted transversely to a free end of a respective one of said pair of stabilizer arms with said feet extending downwardly for engaging a ground surface when said stabilizer arms are in their extended position.

5,090,725

COLLAPSIBLE GARMENT CART

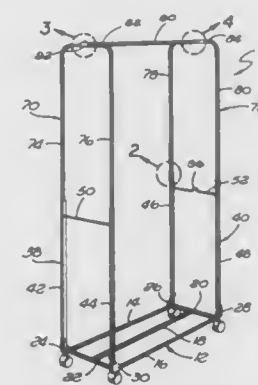
Robert H. Feldner, 3666 E. Olympic Blvd., Los Angeles, Calif. 90023

Filed Aug. 6, 1990, Ser. No. 564,726

Int. Cl.⁵ B62B 3/02

U.S. Cl. 280—651

9 Claims



1. A collapsible garment cart comprising:

- a base frame, said base frame having first and second ends;
- a first end frame pivotally mounted on said base frame at said first end thereof so that said first end frame can be folded down to lie against said base frame and can be moved to a raised position wherein said first end frame is at substantially a right angle with respect to said base frame;
- a second end frame pivotally mounted to said base frame at said second end thereof so that said second end frame has a lowered position wherein it lies against said first end

frame when said first end frame is lying against said base frame and a raised position wherein said second end frame is at substantially a right angle with respect to said base frame;

wheels mounted on said end frames and below said base frame so that, when said end frames are in a raised position, materials can be placed on said base frame between said end frames to be supported and transported on said vehicle;

first and second telescoping end frames respectively telescopically mounted in said first and second end frames so that said and second telescoping end frames may be telescoped to a raised position when said first and second end frames are in a raised position;

a hanging bar and means for attaching said hanging bar to said first and second telescoping end frames so that said hanging bar rests substantially parallel to said base frame and inhibits said first and second end frames from moving toward their folding position;

a plurality of stops, said stops interengaging between said base frame and said end frames to limit said end frames to being raised substantially to a position at a right angle with respect to said base frame, said stops being positioned so that at least one of said telescoping end frames can engage thereunder when said end frames are in their folded position so as to releasably retain said first and second end frames in their folded position.

5,090,726

SUSPENSION CONTROL SYSTEM

Kenichi Nakamura, Kanagawa, Japan, assignor to Tokico, Ltd., Kanagawa, Japan

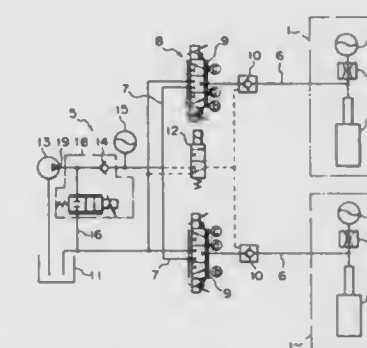
Filed Sep. 18, 1990, Ser. No. 584,576

Claims priority, application Japan, Sep. 21, 1989, 1-246159

Int. Cl.⁵ B60G 11/26

U.S. Cl. 280—707

12 Claims



7. A suspension control system for controlling the attitude of a vehicle, comprising:

- a hydraulic fluid supply comprising a reservoir tank and a pump connected thereto, said pump having a discharging port;
- a suspension unit for disposition between a vehicle body and a wheel of the vehicle, said suspension unit having a cylinder;
- a hydraulic fluid supply and discharge means connected to said discharging port of said pump, said reservoir tank and said cylinder being controlled selectively for supplying and discharging hydraulic fluid to and from said cylinder for controlling the attitude of the vehicle;
- wherein said hydraulic fluid supply further comprises an unload line connecting said discharging port of said pump to said reservoir and an unload valve means disposed in said unload line including an electromagnetic proportional valve controlled such that current supplied thereto gradually increases and decreases to gradually increase and decrease the opening of said proportional valve when said proportional valve is opened and closed, respectively.

5,090,727

SUSPENSION CONTROL SYSTEM WITH VEHICULAR DRIVING CONDITION DEPENDENT HEIGHT ADJUSTMENT

Katsuya Kii, Nara; Yuji Okuyama, and Kazuo Mori, both of Tochigi, all of Japan, assignors to Nissan Motor Company, Limited, Japan

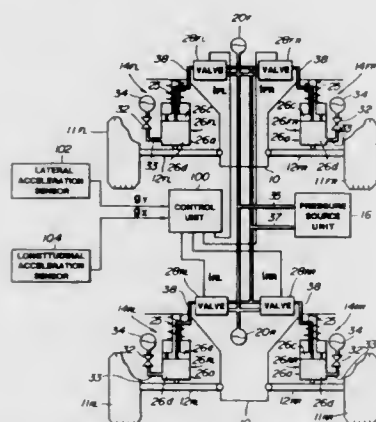
Filed Sep. 4, 1990, Ser. No. 576,585

Claims priority, application Japan, Sep. 4, 1989, 1-228809; Sep. 4, 1989, 1-228811

Int. Cl.⁵ B60G 11/26

U.S. Cl. 280—707

16 Claims



1. A suspension control system for an automotive vehicle, comprising:

a plurality of suspension systems, each disposed between a vehicular body and a road wheel for damping relative displacement therebetween;

damping characteristics adjusting means associated with each suspension system for controlling damping characteristics of the suspension system according to a suspension control command;

sensor means for monitoring an inertia force experienced by the vehicular body and affecting a vehicular attitude, said sensor means producing a sensor signal representative of the monitored inertia force; and

control means for performing a control operation on the basis of said sensor signal by deriving said suspension control command for regulating vehicular height within a predetermined standard height range and for regulating a vehicular attitude, said control means detecting a predetermined particular vehicle driving conditions on the basis of said sensor signal for switching control mode for adjusting the vehicular height at a lever lower than said standard height range with a controlled magnitude of vehicular attitude change.

5,090,728

APPARATUS FOR CONTROLLING DAMPING FORCE OF SHOCK ABSORBER

Yuji Yokoya, Toyota; Yasuhiro Tsutsumi, Susono; Yutaka Suzuki, Nishio; Makoto Shiozaki, Kariya; Nobuyoshi Onogi, Nagoya, and Kazuo Takasou, Oobu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 12, 1991, Ser. No. 654,102

Claims priority, application Japan, Feb. 14, 1990, 2-33366

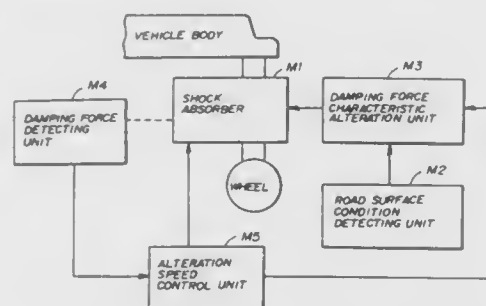
Int. Cl.⁵ B60G 11/26

U.S. Cl. 280—707

16 Claims

1. An apparatus for controlling a damping force of a shock absorber provided between a wheel of a vehicle and a body thereof, said shock absorber having at least two different characteristics of the damping force, said apparatus comprising: road surface condition detecting means for detecting roughness of a road surface on which the vehicle is traveling; damping force characteristic alteration means, coupled to said road surface condition detecting means, for altering

the setting of the damping force of the shock absorber on the basis of the roughness of the road surface detected by said road surface condition detecting means; damping force detecting means, coupled to said shock absorber, for detecting a magnitude of the damping force of the shock absorber; and



alteration speed control means, coupled to said damping force characteristic alteration means and said damping force detecting means, for controlling, on the basis of the magnitude of the damping force detected by said damping force detecting means, an alteration speed at which the setting of the damping force is altered so that the alteration speed decreases as the magnitude of the damping force increases.

5,090,729

AIR BAG FOR A PASSENGER

Kazuo Watanabe, Echi, Japan, assignor to Takata Corporation, Tokyo, Japan

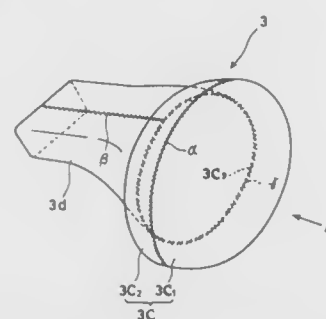
Filed Dec. 12, 1990, Ser. No. 626,139

Claims priority, application Japan, Dec. 15, 1989, 1-324924

Int. Cl.⁵ B60R 21/20

U.S. Cl. 280—743

11 Claims



1. An air bag for a passenger, comprising: a plurality of base cloths protect a passenger in a vehicle when inflated by reaction gas from an inflator operated in an emergency, including an air bag base formed in a shape of a sector, said air bag base fixed on one of said inflator and a fixed portion of a car body, and a passenger receiving unit for receiving the passenger, and said passenger receiving unit is connected to said air bag base.

5,090,730

VEHICLE STEERING COLUMN APPARATUS

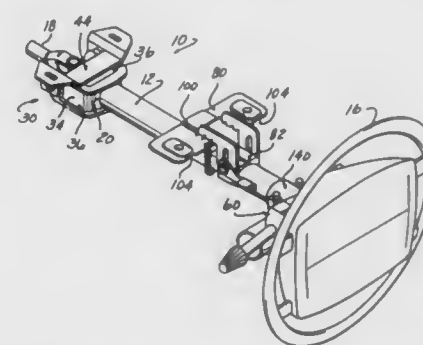
Dan DuRocher, Leanord, and Ellsworth S. Miller, Rochester Hills, both of Mich., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,719

Int. Cl.⁵ B62D 1/04

U.S. Cl. 280—775

23 Claims



1. A vehicle steering column apparatus comprising: a steering column shaft having first and second opposed ends; spaced first and second arms connected to the first end of the shaft having bored formed through the first and second arms with a common coaxial axis; means formed on the second end of the shaft for mounting a vehicle steering wheel; biasing means sheathing a first portion of the shaft disposed adjacent the first end of the shaft; first bracket means sheathing a second portion of the shaft and biased away from the first end of the shaft by the biasing means, the first bracket means pivotally connectible to the vehicle; a hollow tubular jacket sheathing a third portion of the shaft and having first and second ends; said first bracket means for supporting the first end of the jacket with respect to both the shaft and the vehicle; second bracket means sheathing a fourth portion of the shaft for supporting the second end of the jacket with respect to the shaft; and retaining means for preventing unintentional disassembling longitudinal movement of the second bracket means off from the second end of the shaft and for maintaining the biasing means, first bracket means, jacket and second bracket means in an assembled biased condition with the shaft rotatably supported by the first and second bracket means with respect to the jacket and the first and second ends of the shaft extending outward from the first and second ends of the jacket.

5,090,731

STEERING WHEEL

Yoshiyuki Fujita, and Katsunobu Sakane, both of Aichi, Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 28, 1990, Ser. No. 618,909

Claims priority, application Japan, Dec. 26, 1989, 1-338943

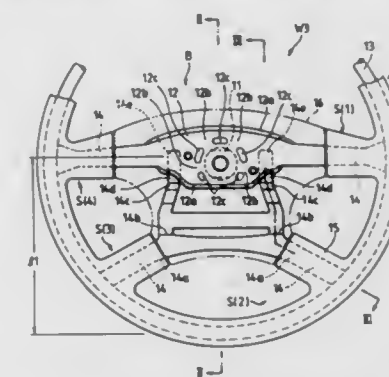
Int. Cl.⁵ B62D 1/11

U.S. Cl. 280—777

2 Claims

1. A steering wheel comprising: a boss portion disposed at a center of a ring portion of said steering wheel; a plurality of spokes radially extending outward of said boss portion and connecting to said ring portion, each of said spokes including a spoke core member therein; a ring core member disposed in said ring portion; and a boss plate disposed at said boss portion for connecting a boss of said boss portion and each of said spoke core members, said boss plate is capable of plastic deformation whereby a plane of said ring reorients to be at substantially right angles to an impact force line of action whenever

said impact force is exerted on said ring portion; wherein each spoke core member includes a first parallel portion which extends substantially parallel to said ring plane from said ring core member toward said boss to a kinked



portion, a tilting portion which extends toward said boss plate from said kinked portion to a second parallel portion, said second parallel portion being adapted to plastically deform and including a tip end connected to an underside of said boss plate.

5,090,732

INEXPENSIVE LAMINATED UNIVERSAL SALES PRESENTATION OR SECURITY FOLDER HAVING MANY USES

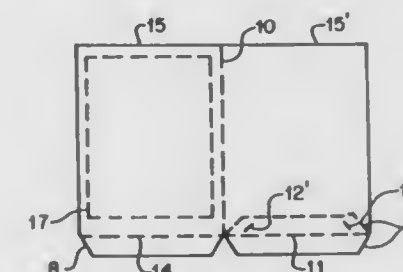
Roger J. Kuhns, Lincoln; Timothy S. McLaren, Westford; Robert L. Nathans, Billerica, and Robert F. Smith, Danvers, all of Mass., assignors to Avant Incorporated, Concord, Mass. Division of Ser. No. 529,138, May 14, 1990, Pat. No. 5,042,843.

This application May 28, 1991, Ser. No. 706,019

Int. Cl.⁵ B42D 3/00, 15/00; B41L 1/00

U.S. Cl. 281—29

41 Claims



1. A universal folder comprising:

- a rectangular folder sheet having a vertically oriented fold extending from a top portion of said folder sheet to a bottom portion of said folder sheet for dividing said folder sheet into a first major portion and a second major portion;
- at least one pouch forming flap attached to a bottom portion of said folder sheet via a first score line to facilitate upward folding of said flap to form a pouch or alternatively to enable manual separation of said flap from said folder sheet;
- a first light transmissive rectangular plastic cover sheet attached to a minor portion of a face of said folder sheet and having a heat activatable portion facing said folder sheet for enabling a customized insert sheet to be laminated between said plastic cover sheet and said folder sheet.

41. A method of utilizing a universal display folder comprising:

- providing said universal display folder which comprises: (a-1) a folder sheet having a vertically oriented first score

line extending from a top portion of said folder sheet to a bottom portion of said folder sheet for dividing said folder sheet into a first major portion and a second major portion;

- (a-2) at least one pouch forming flap attached to a bottom portion of said folder sheet via a second score line to facilitate upward folding of said flap to form a pouch or alternatively to enable separation of said flap from said folder sheet; and
- (a-3) a light transmissive plastic cover sheet attached to a face of said folder sheet and having an adhesive portion facing said folder sheet for enabling an indicia bearing insert sheet to be laminated between said light transmissive plastic cover sheet and said folder sheet; and
- (b) laminating an indicia bearing insert sheet between said light transmissive plastic cover sheet and said folder sheet.

5,090,733

MOTIVATIONAL PRINTED PRODUCT

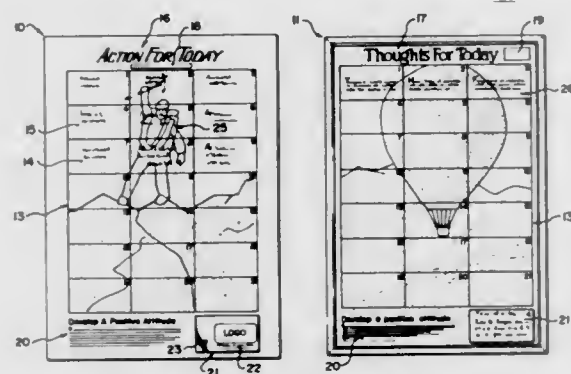
R. Bussiere, P.O. Box 307 Vonda, Saskatchewan, Canada S0K 4N0

Filed Jan. 22, 1991, Ser. No. 644,289

Int. Cl.⁵ B42D 15/00; G09D 3/00

U.S. Cl. 283—2

15 Claims



1. A printed product for motivation of a user comprising support substrate means, means on the support substrate means defining a plurality of calendar periods, said support substrate means carrying for each period first means providing a first printed statement constituting a proposed thought for study by the user and second means providing a second printed statement constituting a proposed action to be undertaken by the user.

5,090,734

METHOD FOR EFFECTING EVALUATION OF CONSUMER GOODS BY TEST PANEL MEMBERS

W. Richard Dyer, Roanoke, and D. Dennis Heard, Plano, both of Tex., assignors to Recot, Inc., Plano, Tex.

Filed Jul. 31, 1990, Ser. No. 560,925

Int. Cl.⁵ B42D 15/00

U.S. Cl. 283—67

20 Claims

1. A multi-wave method for effecting evaluation of consumer products by test panel members, comprising:

- A) selecting a plurality of test panel members to receive a first set of test materials from a test administrator;
- B) conducting a base wave by providing each test panel member with said first set of test materials, said first set of test materials comprising:
- 1) a base evaluation set of products;
 - 2) a first video tape containing a video presentation on products in said base evaluation set; and
 - 3) means for ordering at least one of the products in said base evaluation set;
- C) instructing each panel member to respond to the base wave by utilizing the ordering means to order at least one of said products in said base evaluation set;
- D) conducting a subsequent wave after conducting base

wave (B) by providing each test panel member with a subsequent set of test materials, said subsequent set of test materials comprising:

- 1) a subsequent evaluation set of products;
 - 2) a subsequent video tape containing a video presentation on each product in said subsequent evaluation set; and
 - 3) means for ordering at least one of said food products in said subsequent evaluation set;
- E) instructing each panel member to respond to the subsequent wave by utilizing the ordering means to order at least one of said food products in said subsequent evaluation set; and
- F) recording in a data file the identity of products ordered by each test panel member.

5,090,735

SEASONAL GAME

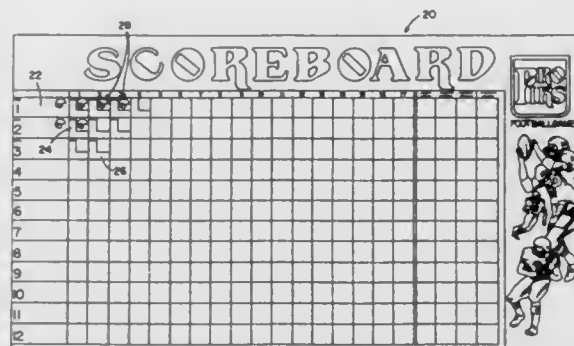
Stacey B. Meaney; Gregory J. Meaney, both of Bedminster, N.J.; David W. Schropfer, Stamford, and Harold L. Rogers, Bridgeport, both of Conn., assignors to Meaney Enterprises, Inc., Bedminster, N.J.

Filed Apr. 26, 1991, Ser. No. 692,235

Int. Cl.⁵ B42D 15/00; A63F 9/00

U.S. Cl. 283—67

12 Claims



1. A game which combines skill and chance for participation by one or more players who seek to correctly choose, beforehand, the outcomes of actual athletic contests played by a plurality of opposing teams belonging to a league in the course of a playing season which involves weekly contests, playoff contests, and a championship contest, said game of chance comprising:

- weekly notation means including a plurality of record means, each record means indicating the opposing teams for each of the weekly contests, the opposing teams for the playoff contests, and the opposing teams for the championship contest, and indicated locations for manually inserting, respectively, the name of the player and the date;
- a plurality of first marker means including first indicia thereon and being selectively attachable to said record means for overlying a designated portion of each of said record means for each of the contests scheduled for one week for which a player has successfully chosen the winning team;
- board means including a plurality of indicated locations, respectively, for manually inserting the names of each of the players, the total number of successful choices of each player for each successive week, the cumulative successful choices of each player for all of the preceding weeks of the contest season continuing through the playoffs and concluding with the championship contest and including a plurality of reception locations for receiving a plurality of second marker means thereon;
- said plurality of second marker means including second indicia thereon and being selectively attachable to said board means for overlying each of said reception locations

for which a player has successfully chosen the largest number of winning teams for the week;

whereby the player with the largest cumulative number of successful choices for the playing season is the winner of the game.

5,090,736

MULTI-SHEET LAMINATED IDENTIFICATION CARD WITH TAMPER RESISTANT, ULTRASONIC WELDMENTS

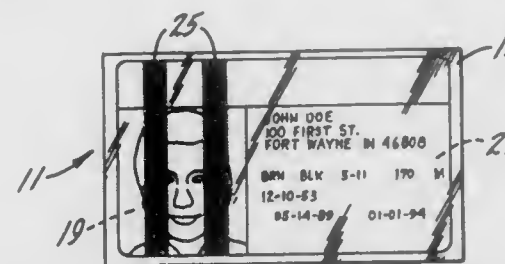
Morton Minkus, Winnetka, Ill., assignor to Transilwrap Company, Inc., Chicago, Ill.

Filed Jan. 28, 1991, Ser. No. 646,820

Int. Cl.⁵ B42D 15/00

U.S. Cl. 283—77

10 Claims



1. In an identification card of the kind comprising first and second sheets of predetermined dimensions, configuration and area, totally secured to each other is flat, surface-to-surface configuration, one of the sheets bearing identification data on its surface that engages the other sheet, and one of the sheets being transparent so that the identification data can be seen therethrough, the improvement comprising:

- a tamper resilient weldment, binding the two sheets together in a given weldment area substantially smaller than the total area, such that the tamper resistant weldment is clearly visible due to surface distortion caused by the presence of the tamper resistant weldment with said surface distortion not precluding effective inspection of the identification data in said weldment area.

5,090,737

DOWNHOLE ENERGIZABLE SEAL FOR TELESCOPING JOINTS

Norman Brammer, Fyvie Turiff, Scotland, and Philippe C. Nobilieu, Paris, France, assignors to ABB Vetco Gray Inc., Houston, Tex.

Filed Jan. 29, 1991, Ser. No. 647,603

Int. Cl.⁵ F16L 35/00

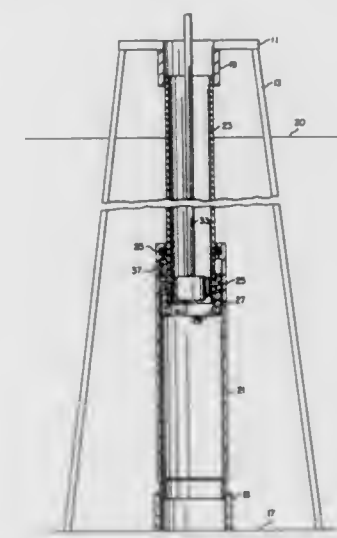
U.S. Cl. 285—39

14 Claims

1. An apparatus for connecting a subsea well housing to surface well housing supported by a drilling rig above sea level, comprising in combination:

- a lower conduit section extending upward from and above the subsea well housing and having an open upper end;
- an upper conduit section extending downward from the surface well housing, the upper conduit section having a lower end that extends telescopically into the upper end of the lower conduit section to a selected amount to land an upper end of the upper conduit section in the surface well housing;
- a seal located on the exterior of the upper conduit section at the lower end for sealing against the interior of the lower conduit section; and
- a torque nut secured by threads to the lower end of the upper conduit section, the torque nut having an upper end which engages the seal, the torque nut having a bore

containing at least one vertical shoulder for rotating the torque nut with a running tool lowered through the upper



conduit section, to selectively tighten the torque nut against the seal.

5,090,738

PLASTIC COATING FOR PIPE COUPLINGS

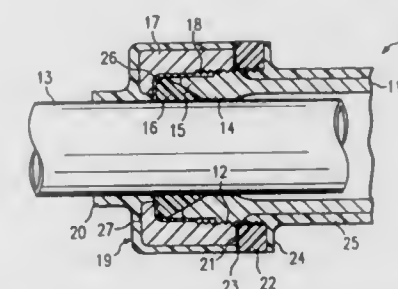
Kenneth E. Rakieski, Gifford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 301,831, Jan. 26, 1989, abandoned, which is a division of Ser. No. 88,426, Aug. 24, 1987, Pat. No. 4,827,596. This application May 1, 1990, Ser. No. 519,245

Int. Cl.⁵ F16L 11/12

U.S. Cl. 285—45

7 Claims



1. An improved plastic coated pipe coupling, the improvement comprising:

- a coupling nut having an end face and an exterior plastic coating, the coating forming an integral collar;
- a coupling body having a plastic coating, the body coating having an integral upstanding flange, the body threadedly engaging said nut; and
- a resilient annular moisture barrier adhered to said integral upstanding flange and engaging the plastic coating on the coupling nut at the end face of the coupling nut.

5,090,739

PLUMBING SLEEVE

Donald K. Pollard, 36 Carmichael Crescent, Collingwood, Ontario, Canada L9Y 4P5

Filed Jul. 11, 1990, Ser. No. 551,017

Int. Cl.⁵ F16L 11/12

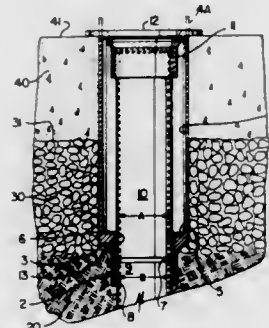
U.S. Cl. 285—56

1 Claim

1. A one-piece plastic coupling for two plastic pipes, each having an internal and an external diameter, adapted to be embedded through concrete consisting of a substantially cylindrical tube having substantially concentric inside and outside

walls, which comprises a first tube part, a second tube part of larger internal diameter than the first tube part, and an intermediate integral radial flange joining the first and second tube parts together, wherein:

- (a) the first tube part includes a first inside wall adjacent the intermediate flange, and a second inside wall separated from the first inside wall by an internal annular rib wherein each of the internal diameters of the first inside wall and of the second inside wall mate with the external diameters of the pipes to be coupled, and wherein the internal rib has a height such that the internal diameter of the internal rib is substantially the same as the internal



diameter of the smaller of the two plastic pipes to be coupled;

- (b) the second tube part has an internal diameter greater than the external diameter of the pipe entering the first inside wall of the first tube part;
- (c) the integral radial flange is adjacent the internal annular rib which separates the first and the second inside walls; and
- (d) the integral radial flange tapers outwardly from the outside diameter of the first tube part to the outside diameter of the second tube part;
- and wherein the taper serves to centralize the coupling.

5,090,740

INTEGRAL MANIFOLD

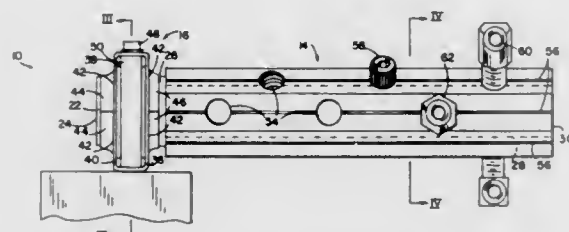
Richard F. Creager, 19723 Maple, Conklin, Mich. 49403; Mark Blanding, 5830 Bancroft Ave., SE., Alto, Mich. 49302; Jack VanRhee, 3484 Millshaft Ct., Caledonia, Mich. 49316, and Walter R. Hartuniewicz, 206 Leyden, SW., Grand Rapids, Mich. 49504

Filed Mar. 1, 1989, Ser. No. 317,825

Int. Cl.⁵ F16L 3/00

U.S. Cl. 285—61

9 Claims



1. A manifold for conducting a fluid between at least two conduits, the manifold comprising:

- a first section having engagement means adapted to engage a clamping assembly for preventing rotation of said manifold;
- a second section integrally connected to the first section, said first section and said second section together having a substantially centrally positioned chamber extending through the first section and the second section and at least two planar surfaces located radially of the chamber,

one of said at least two planar surfaces disposed at an angle of 45 degrees relative to another of said two planar surfaces, at least one of said at least two planar surfaces having at least one port in open communication with said chamber;

said second section being elongated in a longitudinal direction, and each of said planar surfaces having a groove along a longitudinal centerline thereof.

5,090,741

HOSE END FITTING

Takahiro Yokomatsu; Kenji Mine, and Shinichi Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

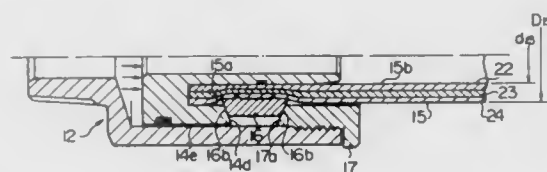
Filed Jun. 23, 1989, Ser. No. 372,660

Claims priority, application Japan, Sep. 14, 1988, 63-231579

Int. Cl.⁵ F16L 17/04

U.S. Cl. 285—101

23 Claims



1. A hose end fitting for sealed connection to a multilayer hose, comprising:

a first cylindrical member having a reduced diameter bore portion and an enlarged diameter bore portion connected to said reduced diameter bore portion, the reduced diameter bore portion being formed with an axial reduced bore extending therethrough and the enlarged diameter bore portion being formed with an axial enlarged bore extending therethrough;

a second cylindrical member axially slidable within said axial enlarged bore of said enlarged diameter bore portion of said first cylindrical member and having a radial flange portion and an axial tubular portion extending from said radial flange portion, the radial flange portion being provided with a first sealing member, and the axial tubular portion being formed with a through bore communicating with said axial reduced bore of said reduced diameter bore portion of said first cylindrical member and provided with a second sealing member, and said first sealing member serving so that said second cylindrical member is axially slid along and on said larger diameter bore portion of said first cylindrical member, as a piston, when internal pressure is applied to said hose fitting;

hose end gripping means provided within said axial enlarged bore of said enlarged diameter bore portion of said first cylindrical member and radially expandable and constrictible, a hose within said hose end gripping means and being gripped by said hose end gripping means which is radially constricted to grip said hose only by axial and outward movement of said second cylindrical member caused by internal fluid pressurization with the hose fitting; and

stopping means received in said enlarged diameter bore portion and adapted to limit axial movement of said second cylindrical member and said hose end gripping means.

5,090,742

PIPE HARNESS CLAMP

Jack L. Cohen, Floral Park, N.Y., and R. Peter Deubler, River Vale, N.J., assignors to Aegis Industries, Inc., Secaucus, N.J.

Filed Feb. 9, 1990, Ser. No. 477,731

Int. Cl.⁵ F16L 13/04

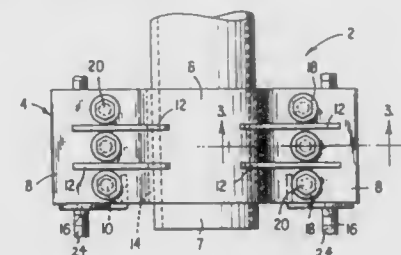
U.S. Cl. 285—114

7 Claims

1. A pipe harness clamp for stiffening a joint between two coaxially joined pipes by positioning said clamp on at least one

of the pipes, spaced away from the joint and spaced away from a coupling at the joint, said clamp comprising:

- arcuate means for contacting outer surfaces of a pipe spaced away from the joint between the two coaxial pipes;
- radial means extending from said arcuate means for clamping said arcuate means around said pipe;
- gusset means extending between said arcuate means and said radially extending means in a plane substantially perpendicular to the axis of said pipe for stiffening the clamp,
- liner means for fitting around said pipe between said arcuate means and said pipe,



clamping means for extending through said radial means and for securing said arcuate means together, and

preload washer means on said clamping means for achieving and substantially maintaining preload;

stiffening means attached to the pipe harness clamp secured to one of the pipes extending between said clamp and means on the other pipe for tightening therebetween;

whereby the joint between the pipes is stiffened when said clamp is in place on at least one of the pipes, spaced from the joint between the pipes and when said tightening means is adjusted for withstanding axial forces without slippage.

5,090,743

COMPRESSIBLE FITTING AND ASSOCIATED METHOD

Heinz U. Oebering, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

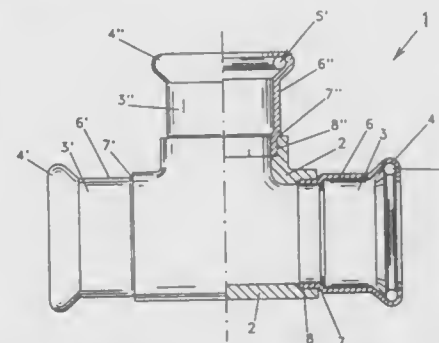
Filed Jun. 12, 1990, Ser. No. 537,443

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1989, 3919496

Int. Cl.⁵ F16L 41/02

U.S. Cl. 285—156

17 Claims



1. A connector for fluid conducting tubes comprising:
- channeling means having a fluid directing channel, said channeling means for channeling the fluid from a first fluid conducting tube to a second fluid conducting tube;
- fluid conducting connector means for being mechanically connected to said channeling means, said connector means for being connected to at least one of the first tube and the second tube;
- said connector means being configured to channel the fluid from at least one of the first tube and the second tube to said fluid directing channel of said channeling means;

said channeling means comprising a single piece formed from molded material,

said connector means comprising a rolled metal sheet material;

said connector means comprising means for supporting O-ring means;

said connector means being configured to receive at least one of the first tube and the second tube;

said connector means comprising tube positioning means for positioning at least one of the first tube and the second tube in connection with said fluid directing channel;

said connector means further comprising compressible fitting means, said compressible fitting means for mechanically connecting at least one of the first tube and the second tube to said fluid directing channel of said channeling means; and

fastening means for integrally and permanently connecting said connector means to said channeling means.

5,090,744

FLEXIBLE PIPE JOINT SYSTEM

Takanobu Hagiwara; Katsuhiko Hatta, and Isao Watanabe, all of Yokohama, Japan, assignors to Yokohama Aeroquip Co., Tokyo, Japan

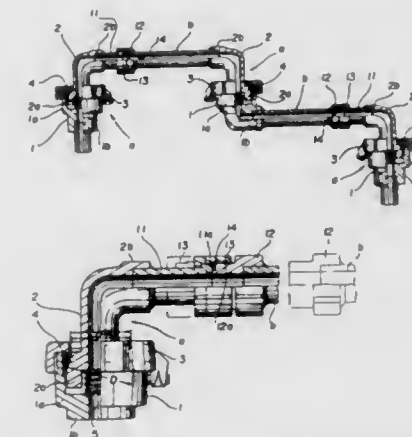
Filed Nov. 14, 1990, Ser. No. 612,375

Claims priority, application Japan, Nov. 16, 1989, 1-132567

Int. Cl.⁵ F16L 27/06

U.S. Cl. 285—166

4 Claims



1. A flexible pipe joint system having a first swivel joint on one side thereof, a second swivel joint on opposite side thereof and a third swivel joint substantially in a center thereof, and a first arm pipe connecting the first and third swivel joints and a second arm pipe connecting the second and third swivel joints, said first, second and third swivel joints each having a stepped cylinder body, an elbow and a cap nut, each stepped cylinder body having a larger diameter portion and a smaller diameter portion, each elbow having on one end thereof a ball portion with a spherical surface and a pipe connection portion on another end thereof, said larger diameter portion of the cylinder body receiving therein said ball portion of the elbow and having fitted therein a gasket which is pressed against the spherical surface of the ball portion, said cap nut being threadedly engaged with said large diameter portion of said cylinder body so as to retain said ball portion and said gasket in said large diameter portion, wherein said pipe connection portion of the elbow of said first swivel joint and said pipe connection portion of the elbow of said second swivel joint each having attached thereto a nipple, said nipple having a flange on its outer end and also having moveably fitted thereto a nut member on its outer periphery, one end of said first arm pipe being connected to said pipe connection portion of the elbow of said third swivel joint and one end of said second arm pipe being connected to said smaller diameter portion of said cylinder

body of said third swivel joint, the other ends of said first and second arm pipes each having attached thereto a short cylindrical adapter having threads on outer surface thereof, said nut member being detachably threadedly engaged with the adapter, said adapter and said nut member each having an outer diameter smaller than the inner diameter of said gasket and an inner diameter of an end portion of said cap nut such that said gasket can be easily exchanged.

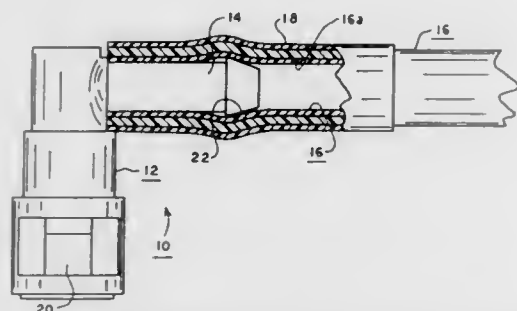
5,090,745

QUICK-CONNECT CONNECTOR FOR PLASTIC TUBES
Edward F. Kluger, Attica, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 23, 1990, Ser. No. 572,201
Int. Cl.⁵ F16L 55/00

U.S. Cl. 285—187

6 Claims



1. A connector assembly for terminating a plastic tube into a utilization connection, comprising, in combination:

a connector body having a central axis and a termination end for operatively coupling said body with a utilization device and having a connection stem extending from the other end of said body;

an elastic, readily expandable plastic tube having an inside diameter smaller than said connection stem, said plastic tube having an end portion received over said connection stem and elastically expanded thereby to be tightly fit to said connection stem; said plastic tube constructed of a material which relaxes at elevated temperatures on the order of 350° F.;

an elastic, readily expandable plastic compression sleeve fitted over said end portion of said plastic tube and axially extending a predetermined limited distance along said plastic tube, said plastic compression sleeve also elastically expanded by said connection stem being received in said end portion of said plastic tube to exert a compressive pressure on said plastic tube end portion;

said compression sleeve constructed of a material which does not relax at temperatures on the order of 350° F. so as to continue to exert said compressive pressure on said plastic tube at said elevated temperatures, whereby said plastic compression sleeve insures that said plastic tube remains in gripping relationship with said connection stem at said elevated temperatures.

5,090,746

HINGED JOINT FOR PIPES

Wieland Holzhausen, Auerbach, Fed. Rep. of Germany, assignor to IWK Regler und Kompensatoren GmbH, Stutensee, Fed. Rep. of Germany

Filed Mar. 30, 1990, Ser. No. 501,544

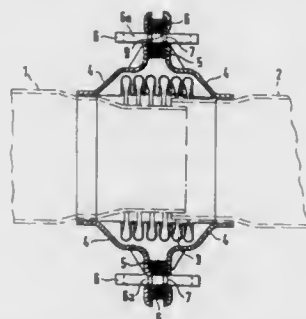
Claims priority, application France, Apr. 18, 1989, 89 05762
Int. Cl.⁵ F16L 27/107

U.S. Cl. 285—226

9 Claims

1. A hinged joint for pipes having a sealing element, the hinged joint comprising a connecting flange provided on each pipe at a predetermined distance from an end thereof, each of said connecting flanges including two diametrically positioned radially outwardly directed fastening attachments adapted to be connected to a corresponding attachment of the other con-

necting flange so as to permit a rotary movement about an axis orthogonal to a longitudinal center axis of the pipes, elastic clamps, and metal wire cushions positioned between the corresponding radially outwardly directed fastening attachments,



5,090,747

COUPLING SOCKET

Naoyuki Kotake, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

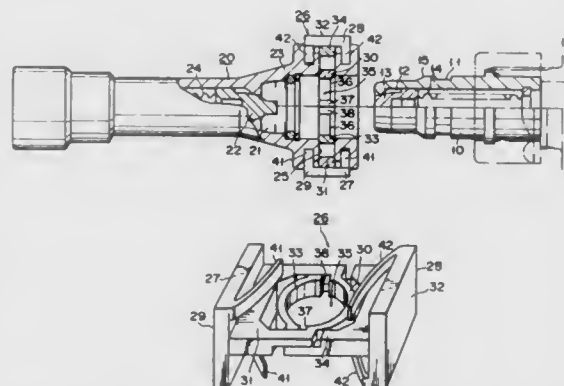
Filed Nov. 2, 1990, Ser. No. 608,535

Claims priority, application Japan, Nov. 11, 1989, 1-131575[U]

Int. Cl.⁵ F16L 37/26

U.S. Cl. 285—305

2 Claims



1. In a coupling socket having a plug including a locking groove and a first bore, a socket including a second bore having an axis, said bores lying in communication one with the other upon coupling the plug and socket to one another, and a locking means for engagement with the locking groove on said plug is connected to said socket, said coupling socket including a main cylindrical body about and defining said second bore, a plug-receiving portion opening through the end of said socket which receives said plug and a rectangular opening extending perpendicular to the second bore and formed in the plug-receiving portion, said locking means including a pair of locking parts each having an enclosed ring-shaped piece, said ring-shaped pieces being spaced from one another in a direction parallel to the axis of said second bore and engageable with the locking groove on said plug, said ring-shaped pieces lying in axially spaced overlapping relation one to the other and jointly defining a plug-receiving aperture, said locking parts being movable toward and away from one another and being configured such that said plug-receiving aperture is enlarged in response to movement of said locking parts toward one another and is narrowed in response to movement of said

locking parts away from one another, spring means interposed between said main cylindrical body and each locking part for urging the locking parts for movement away from one another, said locking means being fitted into the rectangular opening of the main cylindrical body such that the first and second bores lie in communication with one another when said ring-shaped pieces of said locking parts engage in said locking groove, the locking parts of the locking member having push pieces formed on end portions thereof operable externally of said body, said spring means including elastic elements formed integral with the push pieces and resiliently bearing directly against the main cylindrical body.

5,090,748

SMALL-SIZE PIPING COUPLING JOINT

Masayoshi Usui, Numazu; Katsushi Washizu, Sunto, and Kazunori Takikawa, Numazu, all of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Japan

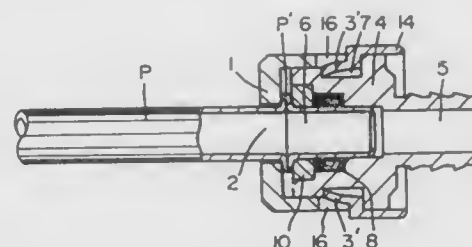
Division of Ser. No. 387,491, Jul. 31, 1989, Pat. No. 4,964,650.

This application Aug. 1, 1990, Ser. No. 561,731

Int. Cl.⁵ F16L 39/00

U.S. Cl. 285—319

3 Claims



1. A small-size pipe coupling joint comprising:

a cylindrical retainer member having an opened coupling end, an opposed bottom wall and a circumferential wall extending therebetween the bottom wall having a pipe insertion hole passing centrally therethrough, the opened coupling end defining a socket receiving recess extending to the bottom wall, the circumferential wall being circumferentially continuous adjacent the coupling end of the retainer member but comprising at least one engaging hole intermediate the ends;

a cap member having an annular portion engaged over the opened coupling end of the retainer member and having at least one locking claw wall projecting through said at least one engaging hole slantingly toward the bottom wall of the retainer member;

a socket member having a rear end, a forward end and a flow hole extending therebetween, portions of said flow hole adjacent the forward end defining a stepped expanded chamber, the forward end being disposed in the socket receiving recess of the retainer member and adjacent the bottom wall thereof, an outer circumferential portion of said socket member being characterized by an engaging groove disposed in the socket receiving recess and being lockingly engaged by the claw wall for securely retaining the socket member in the socket receiving recess of the retainer member;

a pipe having a coupling end and an annular swelling wall, the pipe passing through the pipe insertion hole of the retainer member such that the annular swelling wall and the coupling end thereof are engaged intermediate the bottom wall of the retainer member and the expanded chamber of the socket member; and

seal means provided in the expanded chamber of the socket member and adjacent the annular swelling wall of the pipe, whereby the continuous circumferential wall portion of the retainer member adjacent the coupling end thereof prevents accumulation of foreign matter at the engagement of the claw wall with the engaging groove of the socket member for ensuring secure retention of the pipe,

the retainer member and the socket member in locked engagement with one another.

5,090,749

EXPANDING CARAVAN

David C. Lee, Geraldton, Australia, assignor to Christopher M. Counsel, Geraldton, Australia

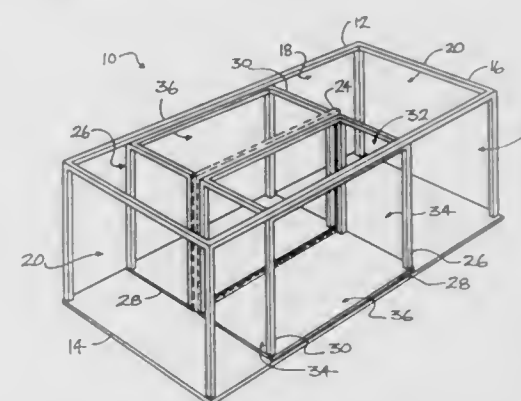
Filed Jan. 4, 1991, Ser. No. 638,367

Claims priority, application Australia, Jan. 8, 1990, PJ8119

Int. Cl.⁵ B60R 27/00

U.S. Cl. 296—171

11 Claims



1. An expanding caravan comprising a first module having a roof, a floor and opposite ends and at least one second module having a roof, a floor and opposite ends receivable by the first module, wherein the caravan has a contracted condition in which the or each second module is received by the first module such that the floor of the or each second module overlies the floor of the first module and an expanded condition in which the or each second module is displaced relative to the first module to increase the usable floor space, the floor of the first module having provided thereunder one or more sleeve members and a corresponding number of sliding members having first and second ends, the or each sleeve member being arranged to receive therein a second end of a respective one of the sliding members while the first end of the sliding member is supportively and pivotally connected to a corresponding one of the second modules.

5,090,750

LOCKING MECHANISM FOR SASH TYPE WINDOWS

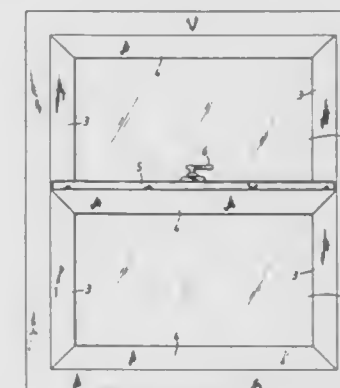
Per-Olof Lindqvist, Onsala, Sweden, assignor to Flxfabriken AB, Sweden

Filed Jan. 3, 1991, Ser. No. 637,177

Int. Cl.⁵ E05C 9/00

U.S. Cl. 292—7

20 Claims



1. A locking mechanism for a window having a window

frame including a guide groove extending in movement directions, and upper and lower sashes at least one of which is slidable with respect to said frame in said movement directions, each of said sashes having a meeting rail, said meeting rails adapted to lie adjacent one another when said sashes are in a closed position, said locking mechanism comprising

- at least one sash clamp connected to one of said meeting rails,
- at least one receiving element corresponding to said at least one sash clamp connected to the other of said meeting rails,
- a locking element disposed at an end of said one of said meeting rails and adapted in an extended position to lie within said guide groove,
- a handle moveable between a locked position, an unlocked position and a release position, and
- an operating mechanism including means for engaging said locking element with a wall of said guide groove and for engaging said at least one sash clamp with said at least one receiving element responsive to movement of said handle from said unlocked position to said locked position, said operating mechanism also including means for disengaging said locking element from said wall of said guide groove and for disengaging said at least one sash clamp from said at least one receiving element responsive to movement of said handle from said locked position to said unlocked position, said operating mechanism further including means for retracting said locking element from within said guide groove responsive to movement of said handle from said unlocked position to said release position.

5,090,751

LATCHING DEVICE FOR USE ON A VEHICLE

Yasutomo Kobayashi, Yokohama, Japan, assignor to Nifco Inc., Kanagawa, Japan

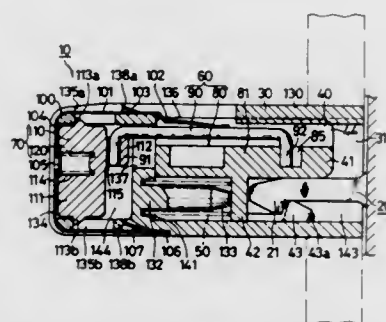
Filed Aug. 30, 1991, Ser. No. 753,380

Claims priority, application Japan, Sep. 4, 1990, 2-232560

Int. Cl.⁵ E05C 19/02

U.S. Cl. 292—71

17 Claims



1. a latching device for a vehicle, comprising:
 - a hollow casing having open front and rear ends;
 - a latching member supported for sliding motion within the casing so as to protrude through the open front end of the casing;
 - biasing means for biasing the latching member toward the open front end so that the latching member protrudes outside through the open front end of the casing;
 - a locking mechanism capable of locking the latching member at a locking position within the casing against the biasing force of the biasing means and of unlocking the latching member when the latching member is pushed from the locking position against the biasing force of the biasing means to an unlocking position within the casing; and
 - a safety mechanism capable of preventing the disengagement of the locking mechanism by inertia;
- the locking mechanism comprises a locking lever that en-

gages a heart-shaped cam groove formed in the latching member; and

the safety mechanism comprises a movable member pivotally supporting the locking lever and supported for sliding in the direction of sliding movement of the latching member within the casing and capable of moving by inertia in the direction of sliding movement of the latching member, and spring means biasing the movable member toward the latching member.

5,090,752

DOOR LATCH DEVICE WITH RECIPROCATABLY MOVEABLE PRIVACY LOCK CONTROL MEMBER

Franz W. Jans, Roedermark, Fed. Rep. of Germany, assignor to JADO Design Armatur und Beschlag Aktiengesellschaft, Roedermark, Fed. Rep. of Germany

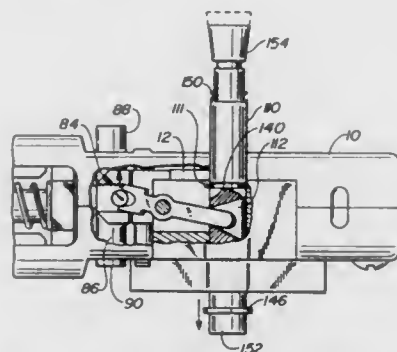
Continuation-in-part of Ser. No. 466,993, Jan. 18, 1990, Pat. No. 4,997,220, which is a continuation-in-part of Ser. No. 392,564,

Aug. 11, 1989, Pat. No. 4,974,883. This application Oct. 19, 1990, Ser. No. 600,305

Int. Cl.⁵ E05L 1/08

U.S. Cl. 292—169.16

6 Claims



1. In a latch device including a housing having opposed sides and defining an interior and an opening at one end of the housing communicating with said interior, a latch element disposed in said housing interior and including a latch body and a latch head, said latch element movable between an extended position and a retracted position, means operatively associated with the latch element for moving the latch element from said extended position to said retracted position, said latch element moving means including first and second actuator mechanisms selectively operatively associated with said latch element to move said latch element to said retracted position, and a reciprocatably control member movable along a first predetermined path of movement extending between said housing opposed sides for controlling which of said actuator mechanisms is operatively associated with said latch element, the improvement comprising:

- a mounting member attached to said housing and defining spaced apertures;
- a shaft projecting through said spaced apertures and manually accessible from outside said mounting member for moving said control member, said shaft mounted on said mounting member for axial reciprocatably movement in a direction generally opposed to the direction of movement of said control member; and
- lock means operatively associated with said mounting member and shaft for selectively preventing at least one of said actuator mechanisms from being operatively associated with said latch element.

5,090,753

AUTOMATIC LOCKING MECHANISM FOR DUMPSTER LID

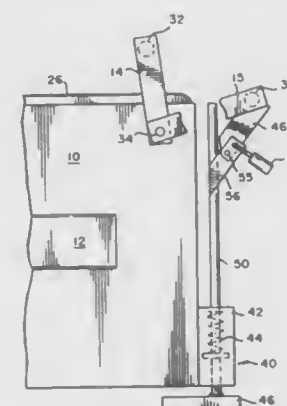
Lowell R. Goodman, Rt. 1, Box 79T, Chester, Md. 21619

Filed Jul. 30, 1990, Ser. No. 559,860

Int. Cl.⁵ B65D 45/04, 45/28; E05C 3/00

U.S. Cl. 292—230

8 Claims



7. An automatic pivoting locking mechanism for a dumpster container having a bottom supported by an underlying surface and a top with a hinging lid, said locking mechanism comprising:

- an L shaped locking bar pivotally attached to a sidewall of the container and having one leg of the L shape pivots over said hinging lid of said container, said L shaped locking bar being pivotal between a position which inhibits the opening of said lid, and a position which does not inhibit the opening of said lid;
- a foot piece which engages the underlying surface supporting said container when said container is resting on said surface, said foot piece being urged against said surface by gravity acting on said foot piece means;
- linkage means connecting between said locking bar and said foot piece means; wherein,
- when said container is lifted off of said surface, said foot piece is urged away from said container by gravity which in turn translates said linkage means and rotates said locking bar to said position which does not inhibit opening of said lid.

5,090,754

RESTRICTOR DEVICE WITH A RELEASABLE LATCH MEMBER

Peter J. Thompson, Greytown, New Zealand, assignor to Interlock Industries Limited, Miramar, New Zealand

Filed Apr. 10, 1991, Ser. No. 683,552

Claims priority, application New Zealand, Apr. 10, 1990, 233276

Int. Cl.⁵ E05C 17/34

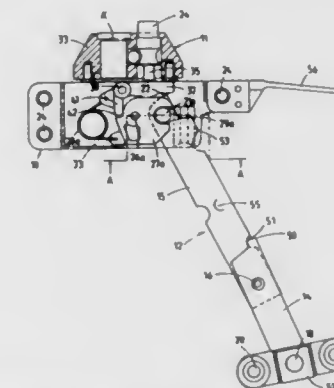
U.S. Cl. 292—262

14 Claims

1. A restrictor device for restricting the extent of movement of a closure movably mounted with a frame, the restrictor device comprising in combination:

- an arm adapted for coupling to one of the closure member or frame,
- latching means adapted for mounting with the other of the frame or closure member,
- a latch element included with said latching means, said latch element coupling said arm to the latching means, said latch element being mounted for movement to a release position to enable the arm to be released from its coupling with the latch element,
- a latch member which is operative such that the latch element can move to said release position,
- operating means associated with said latch member to enable said latch member to be operated, and

restriction means for preventing said latch element from moving to said release position except when said arm is in



a substantially predetermined position relative to said latching means.

5,090,755

IMPACT ABSORBER, ESPECIALLY AS A VEHICLE BUMPER SUPPORT

Peter Garnweidner, Lamprechtshausen, Austria, assignor to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

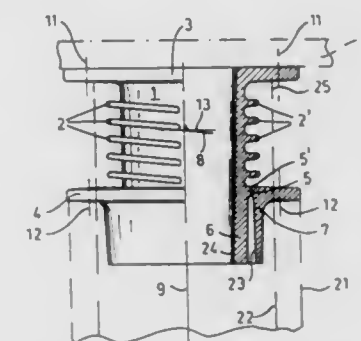
Filed Jun. 25, 1991, Ser. No. 721,720

Claims priority, application Austria, Jun. 25, 1990, 1349/90

Int. Cl.⁵ B60R 19/34

U.S. Cl. 293—133

11 Claims



1. An impact absorber especially for a motor vehicle, comprising:

- a generally cylindrical body formed along a region thereof with a plurality of substantially radially extending ribs each extending at least over a portion of the periphery of said body along the rib region thereof;
- means formed in one piece with said rib region on said cylindrical body at one end of said region for attachment to a part of a motor vehicle to move relative to another part of the motor vehicle upon impact; and
- a flange formed on said body at an opposite end of said region and surrounding said body while being connected thereto by a weakened zone for connection to said other part, said flange separating upon impact from said body whereby said body telescopes into said flange and said ribs are sheared against said flange during said impact.

5,090,756

MATERIAL COMPACTING DEVICE

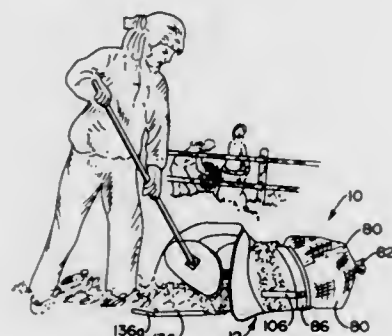
Dieter E. Pfisterer, Wyckoff, N.J., assignor to Pfister Enterprises, Inc., Hawthorne, N.J.

Filed May 18, 1990, Ser. No. 525,497

Int. Cl.⁵ B65B 67/12

U.S. Cl. 294—1.1

14 Claims



1. A device for compacting and containing compactible material, comprising:

- a directing element having an entrance funnel section which converges into an exit section of smaller dimensions than said entrance funnel section;
- clamp means for releasably clamping a netting material on said exit section with a resistance force which permits withdrawal of the netting material during use from between said clamp means and said exit section of said directing element, said clamp means including clamp strap means for clamping said netting material on said exit section and means for varying the pressure of said clamp strap means on said exit section to permit withdrawal of the netting material with a selected resistance force; and
- restraining means for securing said clamp means on said directing element, said restraining means being connected between said directing element and said clamp means, wherein said means for varying includes a cord, first securing means for securing said cord to one end of said clamp strap means a second securing means for securing said cord at any of a plurality of different positions at the opposite end of said clamp strap means.

5,090,757

ARRANGEMENT FOR THE HANDLING OF COMPONENTS WITH A GRIPPING DEVICE

Thomas Huber, Triberg, and Ralf Huber, Brigachtal, both of Fed. Rep. of Germany, assignors to Stiwa-Fertigungstechnik Sticht Gesellschaft m.b.H., Attnang-Puchheim, Austria, a part interest and GAS Gesellschaft für Antriebs- und Steuerungstechnik mbH & Co. KG, St. Georgen/Schwarzwald, Fed. Rep. of Germany, a part interest

Filed Apr. 4, 1990, Ser. No. 504,969

Claims priority, application Austria, Apr. 4, 1989, 790/89

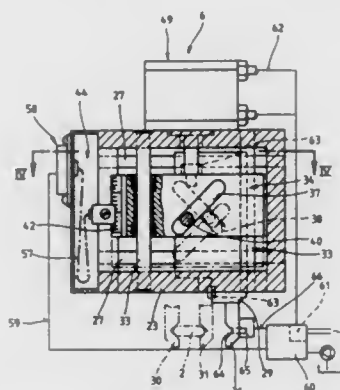
Int. Cl.⁵ B25J 15/08, 19/02

U.S. Cl. 294—88

11 Claims

1. An arrangement for handling structural parts, which comprises a gripping device displaceable along a guide path, a displacing drive connected to the gripping device for displacing the gripping device along the guide path, and the gripping device comprising two gripping fingers having facing and parallel gripping faces adjustable relative to each other in a direction perpendicular to the guide path, an adjusting element mounted between the facing gripping faces, a fixed housing slidably supporting the adjusting element, an adjusting drive mounted on the housing and connected to the adjusting element for slidably adjusting the adjusting element, a link guide arrangement linking the gripping fingers to the adjusting element for relative adjustment of the gripping faces relative to each other and while they remain in parallel relationship upon slidably adjusting the adjusting element, and a device for measuring the distance between the gripping faces, the measuring

device comprising a liner measuring scale element and a pickup element monitoring the linear measuring scale element,



one of the measuring device elements being mounted on the slidable adjusting element and the other measuring device element being mounted on the fixed housing.

5,090,758

RIGID SPINE INFLATABLE END EFFECTOR

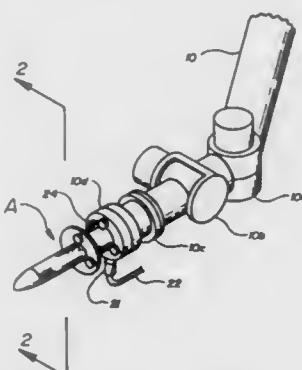
Carter K. Lord, 2433 N. Perry Park Rd., Sedalia, Colo. 80135

Filed Nov. 9, 1989, Ser. No. 433,856

Int. Cl.⁵ B25J 15/00; B66C 1/00

U.S. Cl. 294—98.1

5 Claims



1. In the combination of a manipulator arm and an end effector device for carrying out maneuvers by utilizing said end effector device to grasp an object to be handled, wherein said end effector device comprises:

- a rigid central spine, said rigid central spine having a forward end, an aft end, and an outer cylindrical surface;
- an inflatable bladder surrounding and substantially adjacent said outer cylindrical surface of said rigid central spine, said inflatable bladder having a forward end and an aft end;
- means for attaching said forward end of said inflatable bladder to said forward end of said rigid central spine to form a sealed bladder-to-spine junction therebetween;
- means for attaching the aft end of said inflatable bladder to the aft end of said rigid central spine to form a sealed bladder-to-spine junction therebetween;
- a base for holding said rigid central spine, said base including a forward surface, and being adapted for attachment to a manipulator arm to form a spine-to-base junction;
- means for sealing said spine-to-base junction to prevent the passage or leakage of gases or liquids;
- means for connecting a source of pressurized fluid to said base;
- at least one opening in said base to communicate said pressurized fluid to a surface on said rigid central spine opposite the surface surrounded by said bladder;

at least one opening between the surface of said rigid central spine opposite the surface surrounded by said bladder and the area between said rigid central spine and said inflatable bladder to permit said pressurized fluid to pass between said source of pressurized fluid and the area between said rigid central spine and said inflatable bladder; and an adapter attached to said base, said adapter having a forward surface which carries a plurality of resilient protective bumpers, said adapter being positioned and located to fit over said inflatable bladder, and said protective bumpers being positioned and located to fit around said inflatable bladder, whereby the inflation of said inflatable bladder is restricted over a portion of its length.

5,090,759

APPARATUS FOR GRIPPING AN OBJECT

Naomi Sato, Isao Watanabe, and Hiroshi Fukuyama, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

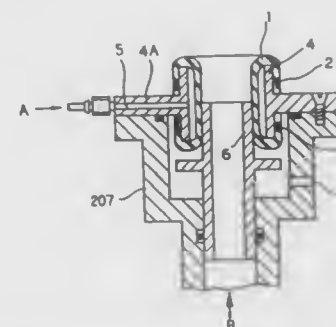
Continuation of Ser. No. 404,925, Sep. 7, 1989, abandoned. This application Feb. 13, 1991, Ser. No. 655,262

Claims priority, application Japan, Sep. 9, 1988, 63-225795; Oct. 18, 1988, 63-262134

Int. Cl.⁵ B25J 15/00; B66C 1/46

U.S. Cl. 294—119.3

1 Claim



1. An apparatus comprising an inflatable tube for gripping an object, and an inflation limiting member for limiting inflation of said tube, said apparatus comprising:

- a hollow cylindrical body having opposed open ends;
- said inflatable tube comprising a cylindrical tube within said body and being adapted to be inflatable inwardly with respect to said body when supplied with a fluid to form an inflated surface, said tube having ends, the ends of said tube being open, folded outwardly over respective opposite ends of said body, and affixed to at least one radially outer surface of said body, whereby a sealed space is defined between said body and said tube, said tube having inflated and uninflated states;
- said inflation limiting member having an outside diameter slightly larger than the inside diameter of the tube in its uninflated state and being inserted axially partially into the tube, the inflation limiting member being gripped and thereby supported by the tube regardless of whether the tube is inflated and being otherwise unsupported, whereby when said fluid is supplied into said sealed space, the inflated surface of said tube moves the inflation limiting member axially to decrease the extent of the axial insertion of the inflation limiting member into said tube and the object is gripped by the inflated surface of said tube.

5,090,760

BREAK-AWAY GAS FILL GUARD

Basil W. Wheeler, Rte. 9, Box 18-D, Athens, Ala. 35611

Filed Jan. 29, 1990, Ser. No. 471,625

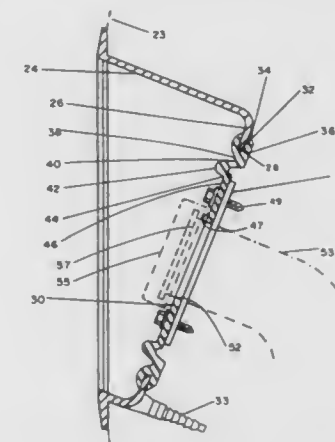
Int. Cl.⁵ B60R 27/00

U.S. Cl. 296—1.1

15 Claims

1. A fuel filler pipe support assembly adapted for attachment to a vehicle having a body portion, a fuel tank and fuel tank

filler pipe means, said assembly comprising: a housing having a frame, said frame comprising an outer portion, an intermediate portion extending inwardly from said outer portion and terminating in an inner portion, said housing further comprising a receptacle cup attached to the inner portion of said frame and having a portion extending laterally from said receptacle cup toward the fuel tank of said vehicle; a flexible support member having an enlarged outer peripheral ring, which ring includes radially inner and outer portions and a groove formed in the radially outer portion thereof, said groove receiving said laterally extending portion of said receptacle cup, said flexible



support member further including at least one flexible convolution, said convolution having radially inner and outer portions, the radially outer portion of said convolution being integrally connected to the radially inner portion of said peripheral ring, said flexible support member further including a connector disk located approximately in the same plane as said peripheral ring and having radially inner and outer portions, the radially outer portion of said connector disk being integrally connected to the radially inner portion of said convolution, and the radially inner portion of said connector disk forming an opening configured to stretchably receive said fuel tank filler pipe means.

5,090,761

TRAILER FOR ELONGATED, GENERALLY FLAT OBJECTS

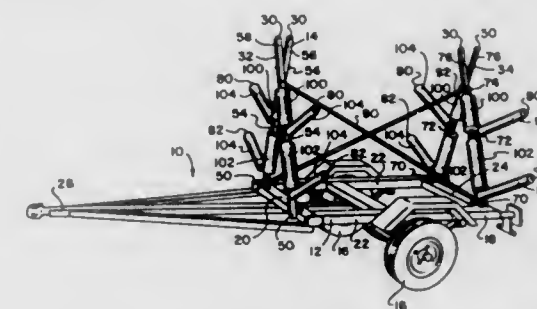
Bruce T. Renouard, and Gary R. Hochstatter, both of Dallas, Tex., assignors to Pack Rat Products, Inc., Dallas, Tex.

Filed Dec. 18, 1990, Ser. No. 629,459

Int. Cl.⁵ B60P 3/00

U.S. Cl. 296—3

9 Claims



1. A trailer for elongated, generally flat objects, such as sailboards, comprising:

- a trailer base having at least two wheels;
- a superstructure above said base, said superstructure having a plurality of members constructed and arranged to support horizontally at least one of said objects;

said superstructure including forward and aft pairs of upright members;

said forward pair of upright members forming an open, forward triangle with said front frame member when viewed from the front or rear of said trailer, and said aft pair of upright members forming an open, aft triangle with said rear frame member when viewed from the front or rear of said trailer;

with lower ends of said forward pair of upright members being connected to said front frame member at spaced locations thereon located substantially equal distances from a center line of said rectangular frame, lower portions of said forward pair of upright members extending inwardly and upwardly from said front frame member, with lower ends of said aft pair of upright members being connected to said rear frame member at spaced locations thereon located substantially equal distances from said center line of said rectangular frame, and lower portions of said aft pair of upright members extending inwardly and upwardly from said rear frame member;

said forward pair of upright members crossing and being interconnected at a forward cross point located substantially directly above said center line of said rectangular frame, and said aft pair of upright members crossing and being interconnected at a aft cross point located substantially directly above said center line;

with upper portions of said forward pair of upright members extending outwardly and upwardly from said forward cross point to form a "V", and upper portions of said aft pair of upright members extending outwardly and upwardly from said aft cross point to form a "V".

5,090,762

AUTOMOTIVE DOOR TRIM PANEL PROTECTOR AND METHOD OF USING THE SAME

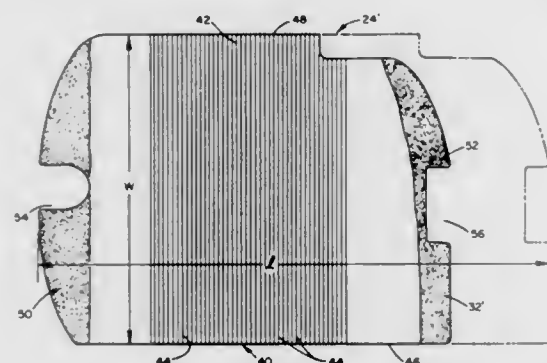
Paul A. Krieger, Olmsted Falls, Ohio, assignor to The Excello Specialty Company, Cleveland, Ohio

Filed Oct. 29, 1990, Ser. No. 604,949

Int. Cl.⁵ B32B 3/02, 3/28

U.S. Cl. 296—39.1

8 Claims



1. A protector sheet article intended for application to an inner door trim panel of a vehicle door to prevent soiling or damage to the trim panel during vehicle assembly and shipping, said door having peripheral edge closure portions, and said trim panel having a height and width, said protector sheet article comprising:

a continuous sheet of relatively thin and flexible plastic film having an outer periphery with a width w and a length l , said width w being at least substantially as great as the height of said trim panel and said length l being less than the width of said trim panel, small and closely spaced corrugations extending in a relatively wide band across the width of said sheet in an amount and number to allow said sheet to be extended in length to greater than the width of said trim panel, the outer periphery of said sheet when in said extended condition having a size and shape

generally corresponding to the size and shape of said trim panel;

tab portions extending from the periphery of said sheet at least along the end portions thereof, said tab members being of a length sufficient to extend over and beyond the side edges of said trim panel for engagement with the peripheral edge portion closure areas of said vehicle door; and,

pressure sensitive adhesive applied to at least said tab portions to allow them to be adhesively joined to the peripheral edge closure areas of said door.

5,090,763

TRUCK BED LINER

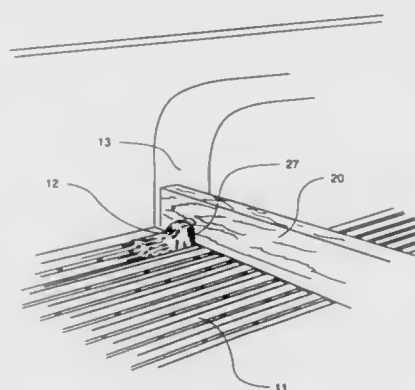
Richard Kremer, and Stephen R. Wood, both of Bloomington, Ind., assignors to Futorex Industries, Marshall, Ind.

Filed Jul. 3, 1991, Ser. No. 725,282

Int. Cl.⁵ B60R 13/01

U.S. Cl. 296—39.1

9 Claims



1. A truck bed liner for a vehicle cargo bed comprising a liner floor capable of substantially covering the bottom of the cargo bed, the floor liner having right and left bottom surfaces and right and left edges, and first and second right support members, and first and second left support members, each support member being formed from the liner floor and protruding upward from the liner floor, the support members and the liner floor being of one-piece construction, the first right and first left support members being entirely inwardly located from the right and left edges, respectively forming a space therebetween, such that a restraining member may be placed between the right support members and the left support members so that the restraining member is held in place by the support members.

5,090,764

VEHICLE BODY CONSTRUCTION FOR HARDTOP CONVERTIBLE

Hiroshi Kogawa, Atsugi; Hiroshi Imai, Tokyo; Masayuki Kikuchi, Tokyo; Minoru Shibata, Tokyo; Makoto Nagayama, Tokyo, and Hiroshi Hasegawa, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd. and Johnan Seisakusho Co., Ltd., both of Japan

Continuation of Ser. No. 228,839, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 884,172, Jul. 9, 1986, abandoned. This application Apr. 3, 1990, Ser. No. 504,056 Claims priority, application Japan, Jul. 13, 1985, 60-153396; Oct. 29, 1985, 60-242181

Int. Cl.⁵ B60J 7/16, 7/20

U.S. Cl. 296—107

16 Claims

13. A vehicle body construction for a hardtop convertible comprising:

a vehicle body;

a roof made of a rigid material and means for pivotally

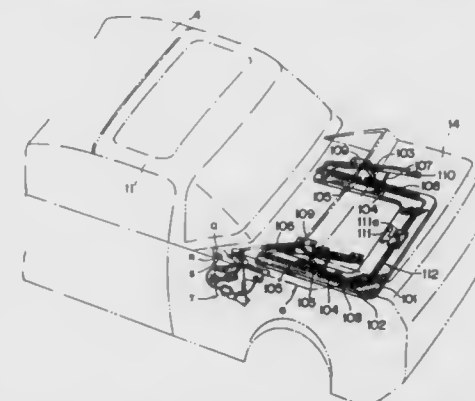
mounting the roof on said vehicle body so as to be swingable between a first position into which the roof is placed when the vehicle is used in a hardtop style and a second position into which the roof is placed when the vehicle is used in an open top style;

means for defining an opening in said vehicle body rearward of said roof in said first position;

means for defining a storage chamber in said vehicle body under said opening so that said roof passes through said opening into said storage chamber to be stored there-within when swung open into said second position;

a slide door installed on said vehicle body to be slidable forwardly and rearwardly thereon to cover and uncover said opening; and

slide door guiding and driving means for guiding and driving said slide door such that said slide door moves upwards while turning into an inclined position where it ascends rearwardly of said vehicle body during initial rearward movement of said slide door to uncover said opening, wherein said slide door guiding and driving means guides and drives said slide door such that said slide door moves downwards while turning from said inclined position into a horizontal position, and wherein said slide door guiding



and driving means comprises a tilt channel swingably installed at a front end thereof on said vehicle body and having a gradually arcuated guide groove extending longitudinally of said vehicle body, said guide groove having an upstanding forward end portion, a tilt bracket secured to said slide door and having an upstanding wall formed with a guide slot extending longitudinally of said vehicle body and inclined to descend rearwardly of said vehicle body, a first carriage roller rotatably installed on said upstanding wall of said tilt bracket and movably engaged in said guide groove, a slide pin movably installed in said guide slot, a second carriage roller attached to said slide pin and movably engaged in said guide groove, and a driving shoe mechanism drivingly connected to said slide pin such that during initial movement of said slide door to uncover said opening said slide pin first moves rearward in said guide slot for thereby driving said tilt bracket upwards while causing said first carriage roller to move upwards in said upstanding forward end portion of said guide groove and then moves together with said tilt bracket rearwardly of said vehicle body being held in a rear end of said guide slot and guided by said guide groove.

5,090,765

TRUCK CAB TO BED SEAL

Paul J. Gremillion, 210 Elmwood St., Slidell, La. 70460

Filed Jun. 1, 1989, Ser. No. 360,047

Int. Cl.⁵ B62D 35/00

U.S. Cl. 296—180.1

1 Claim

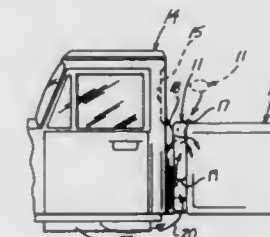
1. A method of forming a seal between a truck bed and a forwardly oriented truck cab wherein the truck cab is provided with a sliding rear window formed through a rear sur-

face of the truck cab, the rear surface positioned forwardly of the truck bed including an aligned portion of the rear surface underlying the rear window positioned forwardly of the truck bed, the rear surface formed of a predetermined length, and wherein the method comprising the steps of,

providing an inflation member of an elongate longitudinally aligned cylindrical configuration, and

inflating the inflation member, and

positioning the inflation member between a forward surface of the truck bed and a forwardly aligned portion of the rear surface of the truck cab underlying the rear window prior to traverse of the truck overlying a roadway, and



a steering angle sensor for monitoring steering angular position to produce a steering angle indicative signal;
a control unit for receiving said speed indicative signal and said steering angle indicative signal to derive a control signal for controlling a driving magnitude of said drive means to rotate said aerodynamic wing about said vertical axis at a desired angular position which is determined on the basis of said vehicle speed indicative signal and said steering angle indicative signal, said control unit deriving a rate of change in angular displacement of said aerodynamic wing relative to said steering angle, depending upon said vehicle speed indicative signal such that said rate of change in angular displacement is decreases according to the increase of the vehicle speed in a particular vehicle speed range from a medium speed to a high speed, so as to provide an optimum yawing rate of the vehicle.

5,090,767

SLIDING ROOF AND/OR SLIDING AND TILTING ROOF FOR MOTOR VEHICLES

Thomas Schreiter, Arpad Fuerst, both of Munich, and Werner Paetz, Freising, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

Filed Jan. 25, 1991, Ser. No. 645,794

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1990, 4002278

Int. Cl.⁵ B60J 7/05

U.S. Cl. 296—216

15 Claims



1. Roof for vehicles of the type having a rigid cover that is displaceable between positions closing and at least partially unblocking a roof opening in a fixed roof structure of a vehicle body, and a displacement mechanism coupled between the fixed roof structure and the cover for displacing the cover by at least a sliding device on a guide rail; wherein a safety device is provided as a means for preventing detachment of the cover from the motor vehicle, said safety device being separate and distinct from said displacement mechanism and having at least one flexible safety element in the form of an elongated structure selected from the group consisting of a band, belt, hose, sling, rope and cloth; wherein each of opposite ends of the elongated structure are connected to the fixed roof structure of the vehicle body and an intermediate portion of the elongated structure traverse a cover dimension beneath an outer surface thereof and is coupled to the cover in a relatively displaceable manner via a coupling member that is connected the cover; and wherein the safety device has a length between opposite ends thereof that is variable to an extent which is just sufficient to accommodate required operational movements of the cover in a vertical direction as the cover is displaced between said positions closing and at least partially unblocking the roof opening.

5,090,768

CHAISE LOUNGE RECLINER CHAIR

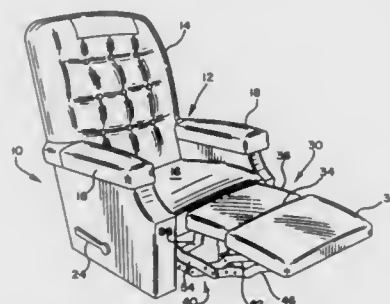
Frank M. Re, Holyoke, and James O. Williams, Munson, both of Mass., assignors to The Berkline Corporation, Morristown, Tenn.

Continuation of Ser. No. 563,495, Aug. 7, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 731,387

Int. Cl.⁵ A47C 1/02

U.S. Cl. 297—85

4 Claims



1. In a recliner chair having a seat frame and an upholstered seat, and actuation means for operating a footstool between a retracted position and an extended leg-supporting position, a footstool assembly comprising:

an upholstered base panel and a separate upholstered intermediate panel; and

a linkage mechanism interconnecting said base and intermediate panels and operationally connected to said actuation means, said linkage mechanism comprising first and second footstool links pivotally connected to said base panel; first and second connecting links pivotally connected respectively to said first and second footstool links and between said footstool links and the seat frame;

an L-shaped link having a leg and a foot, the foot being rigidly secured to said intermediate panel; and first and second intermediate links pivotally connected respectively to said leg and foot, said intermediate links being connected respectively to said first footstool link and said second connecting link, whereby said base and intermediate panels extend in substantially vertical planes adjacent the front of the chair with said intermediate panel concealed behind said base panel when the footstool is in the retracted position, and said intermediate panel is positioned directly in front of said seat and substantially flush with the seat and base panel to form a substantially uninterrupted leg-supporting surface when the footstool is in the extended position.

5,090,769

CUSHIONED ROCKING CHAIR

Guy A. Wade, Santa Clara, Calif., assignor to Carolyn L. L'hargoue, Santa Clara, Calif., a part interest

Filed Feb. 6, 1990, Ser. No. 475,499

Int. Cl.⁵ A47C 3/02

U.S. Cl. 297—258

9 Claims

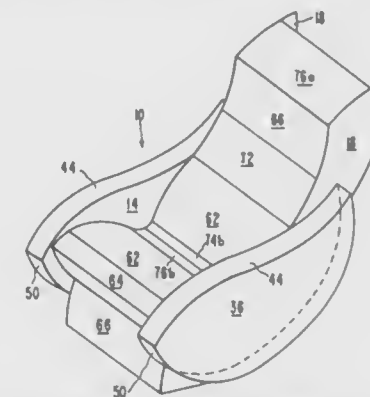
1. A cushioned rocking chair comprising:

a pair of spaced, inner side walls, each inner side wall having a convex lower marginal edge for engaging a floor in rocking relationship thereto, each inner said wall having an upper marginal edge;

a plurality of spaced, generally parallel rods coupled to and extending through the inner side walls for interconnecting the inner side walls, the rods passing through each inner side wall on a line extending along and adjacent to the lower marginal edge of the inner wall and upwardly toward the upper marginal edge of the inner side wall, the outer ends of the rods being spaced from the respective inner side walls;

means coupled with the rods for securing the rods in fixed positions on respective inner side walls;

an outer side wall adjacent to and spaced outwardly from each inner side wall, respectively, the outer side walls being secured to the adjacent outer ends of the rods, each outer side wall having a convex lower marginal edge for engaging a floor with the lower marginal edge of the adjacent inner side wall in rocking relationship to the



floor, each outer side wall having an upper marginal edge extending along and spaced from the upper marginal edge of the adjacent inner side wall;
a number of cushion parts between the inner side walls and supported by the rods; and
means covering the spaces between the upper marginal edges of adjacent inner and outer side walls.

5,090,770

ELECTRICAL SEAT ADJUSTMENT DEVICE

Heinz-Josef Heinrichs, Koblenz-Metternich; Stephan Enders, Koblenz; Udo Wagner, Dachsenhausen, and Alfred Dirksen, Wesseling, all of Fed. Rep. of Germany, assignors to Stabllus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

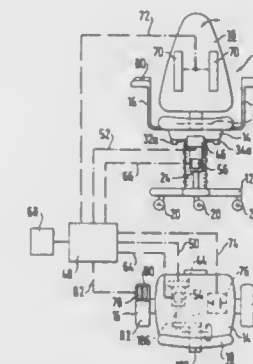
Filed Apr. 18, 1990, Ser. No. 510,555

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913849

Int. Cl.⁵ A47C 1/02

U.S. Cl. 297—347

26 Claims



1. An item of seating furniture comprising an electrically adjustable office chair, having at least one seat adjusting device (60, 62) for adjusting the seat height, with the seat adjusting device (60, 62) comprising:

a spring element engaging two parts of the seat which have to be adjusted in respect of each other;

a locking device (40, 42) for the releasably locking the two seat parts in whichever adjusted position is chosen;

an electrical actuating element (44, 46) for the locking device (40, 42);

a manually operable electrical control means (48) connected to the electrical element (44, 46) for control of said seat adjustment device (60, 62);

a position signal generator (54, 56) connected to the control

means (48) for generating a signal indicative of the relevant adjusted position (48); and
a position memory (68) connected to the control means (48) for storing the position signal generated by the position signal generator (54, 56).

5,090,771

RECLINING DEVICE FOR VEHICULAR SEAT

Tadashi Kawakita, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

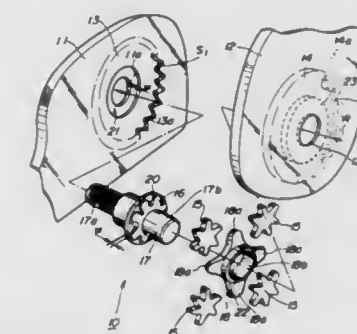
Filed Jul. 30, 1990, Ser. No. 559,099

Claims priority, application Japan, Jul. 31, 1989, 1-90077[U]

Int. Cl.⁵ A47C 1/025

U.S. Cl. 297—362

8 Claims



1. A reclining device for a vehicular seat comprising:
a rotation shaft;

a base frame having a first hollow, a first pit, and a first through-hole which are formed at a surface of said base frame and which are generally coaxial with said rotation shaft, said first hollow being defined by a cylindrical surface formed with a first internal gear, said rotation shaft passing through said first through-hole and being rotatably supported in said first through-hole, said first pit being located between said first hollow and said first through-hole in an axial direction of said rotation shaft;

an arm frame having a second hollow which is formed at a surface of said arm frame and which is generally coaxial with said rotation shaft, said arm frame being connected to said base frame so that said first and second hollows are opposite to form a space, and said second hollow being defined by a cylindrical surface formed with a second internal gear;

a plurality of planetary gears which are disposed in said space and which engage said first and second internal gears;

a supporting plate rotatably supported on said rotation shaft and being generally coaxial with said rotation shaft, said supporting plate supporting said planetary gears;

a control gear coaxially and fixedly connected to said rotation shaft and being disposed coaxial with said supporting plate, said control gear engaging with said planetary gears; and
a disc section which is fixedly connected to said control gear and which is located between said control gear and an outer axial end of said rotation shaft, said disc section being coaxial with said control gear, said disc section being rotatably fitted in said first pit so that said control gear is disposed in said first hollow and engages with said planetary gears.

5,090,772

MOBILE CHAIR AND SEAT FORM

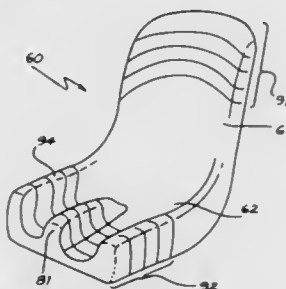
Christopher L. Ogle, Malak, and Ann L. Land, Nakara, both of Australia, assignors to The Northern Territory of Australia, Darwin, Australia

Continuation of Ser. No. 249,121, Sep. 22, 1988, abandoned, Division of Ser. No. 176,052, Apr. 1, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 485,789

Int. Cl.⁵ A47C 7/00

U.S. Cl. 297-440

52 Claims



1. A seat form comprising:
a generally vertically-oriented back portion having a width and a height,
a generally horizontally-oriented base portion secured to the back portion and having a width and a depth, and
one or more extension segments, each of such extension segments including securing means for rigidly securing it directly to, and abutting, the back portion or the base portion, or another extension segment previously secured to the back portion or the base portion, such that relative movement of the segment and the segment or portion to which it is secured is inhibited, the securing means of each extension segment functioning independently of the securing means of any succeeding extension segment, to vertically extend the height of the back portion, in a direction away from the base portion, or horizontally extend the depth of the base portion, in a direction away from the back portion.

5,090,773

DUMP TRUCK WITH INTERFITTING POLYGONAL DUMP BODY AND SUPPORTING CRADLE

Bernard Guillaume, 89 Vallon des Vaux, 06800 Cagnes Sur Mer, France

Continuation of Ser. No. 454,971, Dec. 22, 1989, abandoned.

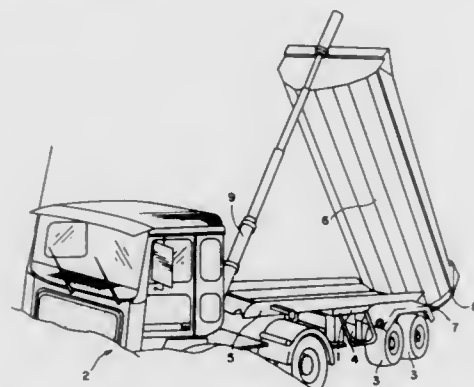
This application Apr. 15, 1991, Ser. No. 685,172

Claims priority, application European Pat. Off., Dec. 22, 1988, 88440107.6

Int. Cl.⁵ B60P 1/04

U.S. Cl. 298-17 R

1 Claim



1. A vehicle of the type having a dumping body, comprising a container (6) resting on a chassis (1) of the vehicle, means interconnecting the container (6) and the chassis (1) for verti-

cal swinging movement of the container relative to the chassis about a transverse horizontal axis, said container having a lower surface that is downwardly convex in a vertical plane parallel to said axis, said chassis (1) comprising a fixed cradle (5), said cradle (5) having an upper surface that is upwardly concave in said vertical plane, said convex lower surface and said concave upper surface being in nesting surface contact with each other when said container (6) is in a lowermost position, such that a lower portion of said container (6) is nested within said cradle (5), wherein said surfaces are polygonal and each is comprised by a plurality of flat sides interconnected at obtuse angles.

5,090,774

ACOUSTICALLY DECOUPLED UNDERBODY FOR A MOTOR VEHICLE

Franz Dolla, Isenbüttel, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

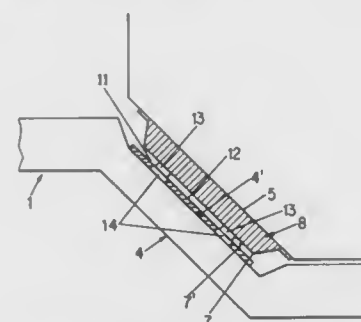
Filed Sep. 21, 1990, Ser. No. 586,449

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931493

Int. Cl.⁵ B62D 21/00

U.S. Cl. 296-188

2 Claims



1. An acoustically decoupled underbody for a motor vehicle having a longitudinal axis comprising a side rail that is spaced apart from and substantially parallel to the longitudinal axis of the vehicle and has an inclined portion, the inclined portion of the side rail having an upper surface; a sill located outwardly of the side rail relative to the longitudinal axis of the vehicle and oriented substantially parallel to the side rail; a floor panel having an inclined portion located above and in spaced-apart relation to the inclined portion of the side rail; and a transverse support arrangement that is connected to the sill and to the inclined portion of the floor panel and overlies the inclined portion of the side rail and is spaced apart from the inclined portion of the side rail, the transverse support arrangement having a projection extending toward the inclined portion of the side rail and the inclined portion of the side rail having a depression corresponding to the projection, and the projection normally being spaced apart from a bottom of the depression.

5,090,775

METHOD OF MONITORING AND CONTROLLING MINING OPERATIONS

Karl-Heinz Berger, Herten-Langenbochum, Fed. Rep. of Germany, assignor to Bochumer Eisenhütte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Dec. 4, 1990, Ser. No. 624,222

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 3941290

Int. Cl.⁵ E21F 17/18; G08B 3/10

U.S. Cl. 299-1

4 Claims

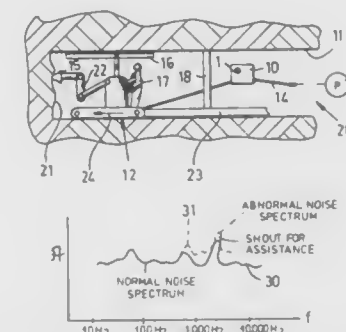
1. A method of monitoring a mining operation, comprising the steps of:

- (a) cutting away a subterranean structure in a mine chamber;
(b) picking up in said mine chamber a noise spectrum which is verbal control information in the form of oral commands or emergency calls with at least one microphone to

produce an electrical signal representing said noise spectrum;

- (c) converting said electrical signal representing said verbal control information of said noise spectrum into digital signals;

- (d) filtering said digital signals to distinguish operation-typical signals from operation-atypical signals;



- (e) electronically comparing said operation-atypical signals with previously stored reference information patterns of digital signals representing a plurality of atypical operating conditions and thereby determining the occurrence of an atypical operating condition represented by said operation-atypical signals; and
(f) automatically outputting a response signal which is a corresponding control-command or monitoring signal in response to the electronic comparison of step (e).

5,090,776

WHEEL HUB AND WHEEL FOR A BICYCLE

Eric H. G. Van Breemen, Brongouw 114, 1352 EK Almere, Netherlands

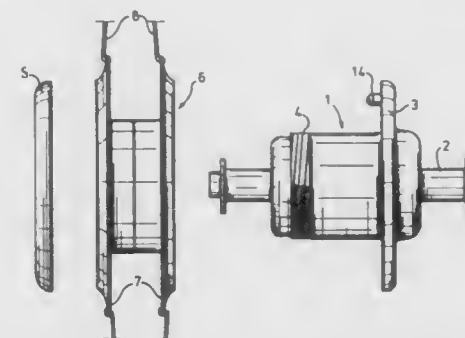
Filed Feb. 20, 1990, Ser. No. 486,877

Claims priority, application Netherlands, Feb. 20, 1989, 8900409

Int. Cl.⁵ B60B 21/00

U.S. Cl. 301-105 B

6 Claims



1. In a wheel hub for a bicycle, said hub comprising a cylindrical bearing housing which is rotatable about an axle, a detachable cylindrical sleeve which closely fits around the bearing housing for supporting the wheel, said sleeve being positioned on the bearing housing by means of a fixed housing flange on the bearing housing, the sleeve being detachable from the bearing housing; the improvement comprising a loose housing flange which uniformly clamps the sleeve onto the bearing housing parallel to the axle between both said flanges, cooperating surfaces of at least the loose housing flange and the adjacent sleeve end being of complementary shape such that upon tightening the loose housing flange a friction fit lock is established between at least said loose housing flange and said adjacent sleeve end thereby to clamp the sleeve onto the bearing housing between the flanges.

5,090,777

AUTOMOBILE WHEEL COVER

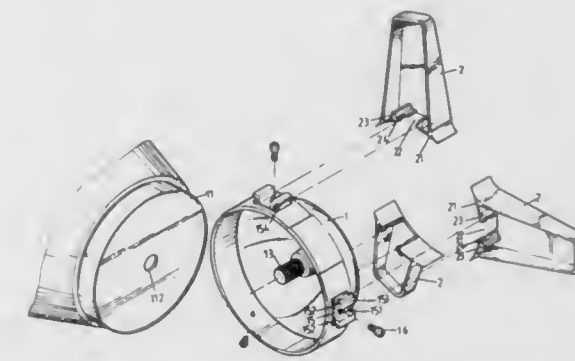
Kuo-Hsiung Li, 17-8, Chung Shan Rd., JenTe Hsiang, Tainan Hsien, Taiwan

Filed Aug. 22, 1990, Ser. No. 570,855

Int. Cl.⁵ B60B 7/04

U.S. Cl. 301-37 S

5 Claims



1. An improved automobile wheel cover comprising:
a) an axle cover;
b) an outer cover;
c) first attachment means to removably attach the outer cover to the axle cover;
d) at least one catch block;
e) second attachment means to removably attach the at least one catch block to the outer cover;
f) at least one wing member; and
g) third attachment means to attach the at least one wing member to the at least one catch block, the third attachment means comprising:
i) at least one wedge-shaped setting plate defined by the at least one catch block; and
ii) at least one lug defined by the at least one wing member and located so as to engage the at least one wedge-shaped setting plate.

5,090,778

WHEEL SUPPORT FOR TRAILER AXLES

Heinz Lauszun; Helmut Steiner, both of Wiehl, and Hans J. Leidig, Reichshof, all of Fed. Rep. of Germany, assignors to Bergische Achsenfabrik Fr. Kotz & Söhne, Wiehl, Fed. Rep. of Germany

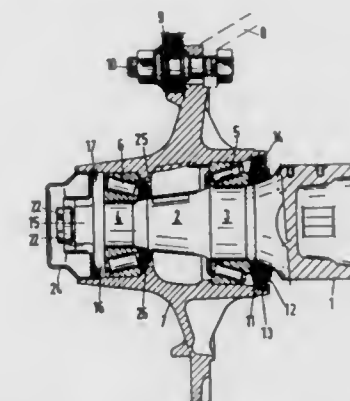
Filed Jul. 12, 1990, Ser. No. 551,928

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922858

Int. Cl.⁵ B60B 27/00

U.S. Cl. 301-105 R

6 Claims



1. In a wheel support for trailer axles having tapered-roller bearings disposed on an axle neck, and also having a hub that is rotatably mounted on said bearings, with said hub serving for

the mounting of a brake drum and a wheel, whereby a thrust washer is disposed between said axle neck and an inner one of said bearings, and whereby outwardly of an outer one of said bearings, an axle nut is screwed onto an outer thread of said axle neck, the improvement comprising:

- a first snap ring for securing said thrust washer in said hub; a collar that is provided on said axle nut and extends to an inner wall of said hub; and
- a second snap ring disposed at said collar for securing said axle nut in said hub to thereby form, after preassembly, a structural unit comprised of said hub, said bearing, said thrust washer, and said axle nut, with said structural unit being adapted as such to be disposed on and removed from said axle neck.

5,090,779

ACOUSTIC SIGNAL TRANSMISSION BETWEEN A TRACTOR AND TRAILER WITHIN THE AIR BRAKE SYSTEM

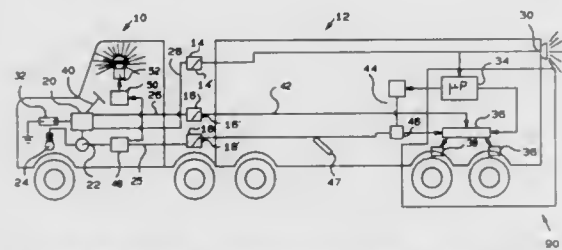
Dennis A. Kramer, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1990, Ser. No. 573,938

Int. Cl.⁵ B60T 8/88; H04R 17/00

U.S. Cl. 303—7

11 Claims



1. An apparatus for communicating trailer antilock system diagnostic status to a tractor operator through an existing air brake line comprising:

- means for generating and transmitting an acoustic signal in said air brake line in a trailer in response to a predefined diagnostic status of said antilock system;
- means for receiving said acoustic signal disposed on said air brake line on a tractor; and
- means for displaying receipt of said signal in direct view of said tractor operator.

5,090,780

BINARY WEIGHTED DIGITAL FLOW REGULATING SYSTEM

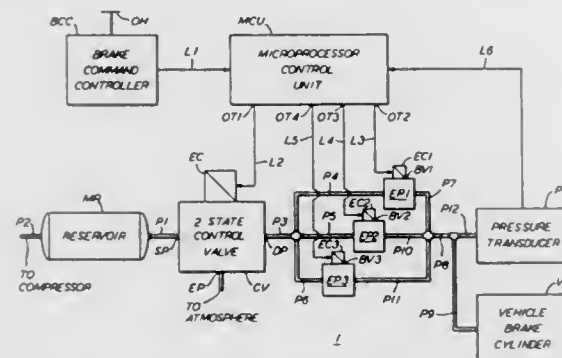
Terry D. Powell, Fort Wayne, Ind., assignor to Westinghouse Air Brake Company, Spartanburg, S.C.

Filed May 3, 1991, Ser. No. 695,079

Int. Cl.⁵ B60T 15/14

U.S. Cl. 303—15

20 Claims



1. A binary weighted digital fluid flow control system com-

prising, means for electrically initiating a desired brake command signal, means responsive to the desired brake command signal for pneumatically establishing a given flow rate from a supply source to an operating load by selectively energizing and deenergizing a plurality of electromagnetic valves which have orifice areas that are successively proportioned by a power of two.

5,090,781

METHOD FOR CONTROLLING HYDRAULIC BRAKING PRESSURE IN VEHICLE

Shohel Matsuda, and Tadatoshi Haga, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 365,062, Jun. 12, 1989, abandoned.

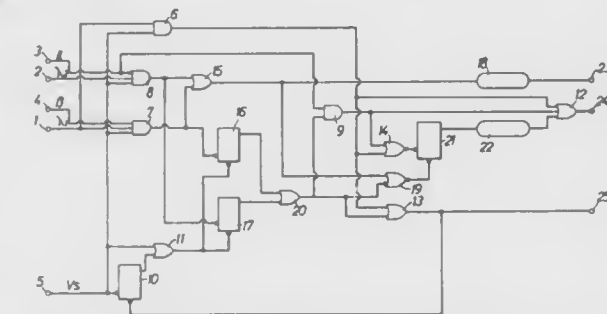
This application Mar. 7, 1991, Ser. No. 667,356

Claims priority, application Japan, Jun. 13, 1988, 63-145240

Int. Cl.⁵ B60T 8/60

U.S. Cl. 303—103

5 Claims



1. A method for controlling a hydraulic braking pressure in a vehicle comprising the steps of:

- progressively increasing the hydraulic braking pressure by intermittently maintenance thereof for a duration of operation time of one chopping operation after a reduction of the hydraulic braking pressure; and
- varying said duration of operation time of one chopping operation depending upon a degree of decrease in a wheel speed relative to a vehicle speed, so that said duration of operation time is increased when the degree of decrease in the wheel speed relative to the vehicle speed increases.

5,090,782

DEVICE FOR THE SEALED FIXING OF AN INTERCHANGEABLE MEMBER IN A CELL FLANGE

Charles Glachet, and Liliane Ponchet, both of Vendome, France, assignors to Euritech, Vendome, France

Filed Sep. 7, 1990, Ser. No. 578,631

Claims priority, application France, Sep. 15, 1989, 89 12102

Int. Cl.⁵ A61G 11/00

U.S. Cl. 312—1

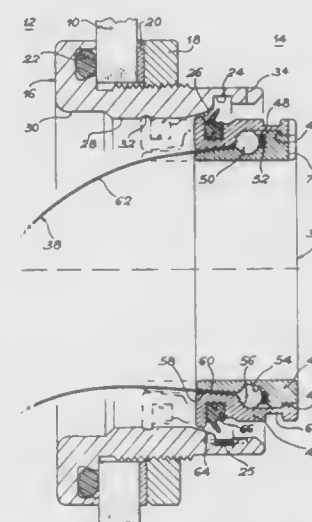
9 Claims

1. Device for the sealed fixing of an interchangeable member inside a flange having a bayonet link and mounted on a wall of a containment cell, said device comprising:

- a supporting ring fittable in the flange and having means for bearing the interchangeable member, said supporting ring including a bayonet link;
- a safety ring having bayonet links engageable with both the bayonet link of said supporting ring and the bayonet link of the flange for fixing the safety ring to the flange and to said supporting ring when the supporting ring is fitted in the flange; and

means for immobilizing said safety ring against rotation with respect to the flange and said supporting ring when said

removing floppy discs from each of said separate storage compartments.



safety ring is fixed to said flange and said supporting ring via said bayonet links.

5,090,783

FLOPPY DISK STORAGE ASSEMBLY

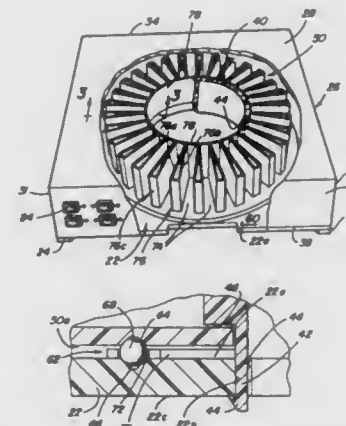
Scott W. Chimner, 2950 Robal Ct., Saline, Mich. 48176

Filed Dec. 24, 1990, Ser. No. 633,316

Int. Cl.⁵ A47F 1/04

U.S. Cl. 312—11

9 Claims



1. A media disk storage assembly comprising a housing having a base and a cover; said cover having a top, side walls and front and rear walls and a bottom edge connected to said base for securing said cover against removal therefrom;
- a pedestal mounted on said base extending upwardly thereof;
- a rotatable wheel surrounding said pedestal;
- coacting means on said pedestal and said rotatable wheel member for interlocking said rotatable wheel member against axially movement with respect to said pedestal;
- integrally formed partitions on said rotatable wheel which diverge outwardly from the inside perimeter of said rotatable wheel toward the outer perimeter thereof to form generally rectangularly sectioned separate storage compartments at circumferentially located positions around said rotatable wheel member;
- means for rotatably supporting said rotatable wheel member on said base; and
- means in the front wall of said cover for forming an access opening from exteriorly of said housing for loading and

5,090,784

CONCEALED JEWELRY CASE

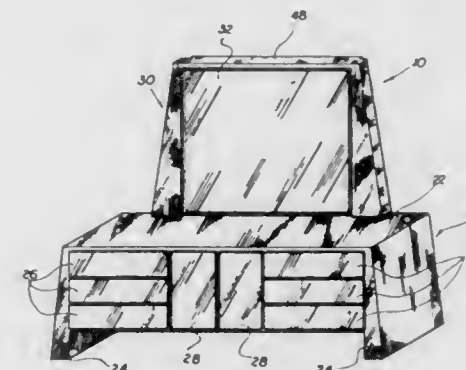
Anthony Battista, 6089 NW 74th Ter., Parkland, Fla. 33067

Filed Oct. 25, 1989, Ser. No. 426,792

Int. Cl.⁵ A47B 17/04

U.S. Cl. 312—204

2 Claims



1. A concealed jewelry case and dresser combination, comprising:

- (a) a conventional dresser having a flat horizontal top and a rear edge; and
- (b) a mirror/concealed jewelry case assembly, resting upon and abutting the rear edge of said to of said dresser, said mirror assembly being shallow in depth relative to the depth of said dresser whereby said mirror/concealed jewelry case assembly appears to be merely a sturdy mirror support and not a concealed jewelry case, said mirror/concealed jewelry case assembly defining an inner concealed jewelry storage compartment, said mirror assembly having a mirrored front-facing closure panel hingedly connected thereto, hinge means to allow swinging said closure panel between an open and closed position, said hinge means being concealed from visual inspection when said closure panel is in the closed position so as not to be visible from the front of said concealed jewelry case;
- a concealed locking means connected to said mirror/jewelry case assembly for releasably connecting said closure panel in closing relationship over said jewelry storage compartment;
- a necklace rack disposed within said inner concealed jewelry storage compartment comprising a forwardly directed horizontal protrusion from the back of said inner compartment and further comprising a plurality of hooks extending forwardly from said horizontal protrusion, said hooks disposed to receive necklaces for hanging;
- an aperture defined by said top panel member communicating the storage compartment with the exterior thereof;
- at least one annular storage compartment locking pin guide member located in said storage compartment and having a central axis, colinear with said aperture;
- a locking pin, removably disposable through said aperture and said storage compartment guide member, positionable between a first locking, position and a second, unlocked position;
- biasing means for retaining at least a portion of said pin in registry simultaneously with both said aperture in said top panel member and said guide member, thereby rendering said locking pin in said locked position;
- an annular closure panel locking pin guide member attached to the rear face of said closure panel having a central axis colinear with said storage compartment guide member and said aperture in said top panel of said jewelry case when said closure panel is in the closed position, whereby said closure panel may be locked in said closed position by said

locking pin extending through said annular closure panel guide member and said storage compartment guide member and whereby said closure panel may be opened by manually lifting said pin against said biasing means until said pin is no longer disposed through said annular closure panel guide member thereby allowing said closure panel to be moved into the open position.

5,090,785

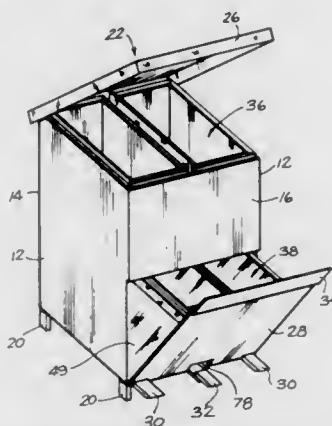
MULTI-COMPARTMENT CONTAINER

John R. Stamp, 24 Clovelly Drive, Saint John, New Brunswick, Canada E2K 4L7

Filed Jul. 31, 1990, Ser. No. 560,570
Int. Cl.⁵ A47B 41/04

U.S. Cl. 312—319

14 Claims



1. A multi-compartmented refuse container comprising:

- a housing defined by a bottom wall and upright rear, side and upper front walls;
- foot means spacing said bottom wall above a ground plane;
- a lower front wall hinged to said bottom wall along a forward edge thereof and sized to close a lower opening in said housing below said upper front wall;
- a top wall sized to close said housing at the top thereof, said top wall including a depending skirt having front, side and rear wall portions;
- hinge means connecting said skirt rear wall portion to said housing rear wall permitting pivoting motion of said top wall between a closed position and an open condition;
- a plurality of first clamping flange and clamping frame pairs at the top of said housing, each pair being adapted to releasably support a flexible bag so as to provide an upwardly opening independent first refuse compartment;
- a plurality of second clamping flange and clamping frame pairs attached to said lower front wall adjacent an upper edge thereof, each pair being adapted to releasably support a flexible bag so as to provide an independent generally upwardly opening second refuse compartment;
- a first foot pedal extending forwardly of said container at the bottom thereof, said first foot pedal being attached to a lever arm pivotally connected intermediate its ends to and below said bottom wall and extending to beyond said rear wall;
- a rod extending upwardly adjacent said rear wall and adapted to transmit pivoting movement of said lever arm to said top wall; and
- at least one second foot pedal extending forwardly from said lower front wall adjacent a bottom edge thereof, operation thereof serving to pivot said lower wall from a closed position to an open condition.

5,090,786

DRAWER

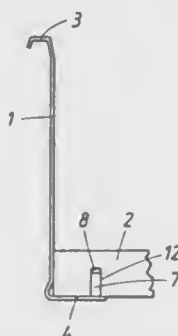
Karl-Heinz Albiez, Dornbirn, and Karl-Heinz Grabher, Lustenau, both of Austria, assignors to Alfit Aktiengesellschaft, Götzis, Austria

Filed Nov. 20, 1990, Ser. No. 616,781

Claims priority, application Austria, Nov. 20, 1989, 2642/89
Int. Cl.⁵ A47B 88/00

U.S. Cl. 312—330.1

7 Claims



1. A drawer comprising:

- a wooden bottom plate having opposite side edges and a bottom surface having a pair of grooves extending parallel to the opposite side edges, each groove having a first side face and a second side face, the distance between the first and second side faces defining the width of the groove, and
- two opposite metal side walls having top and bottom edges, the side walls extending adjacent, and parallel, to the side edges of the bottom plate, each metal side wall comprising
 - a guide rail at the top edge and
 - a bottom plate carrying flange at the bottom edge, the carrying flange extending in a longitudinal direction along the side wall and substantially perpendicularly thereto, the bottom plate carrying flange engaging the bottom surface of the bottom plate and covering the groove therein, and
- retaining lugs integral with the carrying flange and arranged in alignment with the groove, each retaining lug having a free end, a root portion merging into the carrying flange, the root portion providing a bend line extending transversely to the longitudinal direction and having a width not exceeding the width of the groove, the retaining lug being bent from an initial position wherein the retaining lug extends in the longitudinal direction and is flush with the carrying flange into a bottom plate retaining position wherein the retaining lug extends into the groove transversely to the longitudinal direction, and a portion wider than the width of the groove arranged between the free end and the root portion, the wider portion digging into at least one side face of the groove upon bending the retaining lug from the initial into the retaining position and forming at least one arcuate furrow into the side face.

5,090,787

DRAWER RUNNER

David N. Harley, Dorset, England, assignor to Titus Tool Company Limited, Iver, England

Continuation of Ser. No. 142,553, Jan. 11, 1988, abandoned. This application Mar. 19, 1991, Ser. No. 767,213

Claims priority, application United Kingdom, Jan. 12, 1987, 8700580

Int. Cl.⁵ A47B 88/16

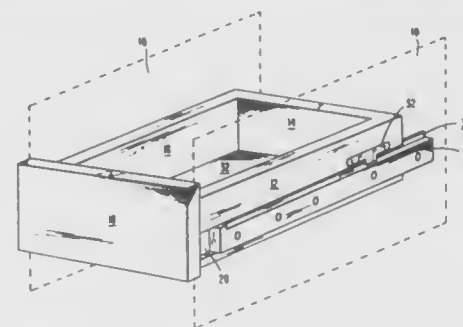
U.S. Cl. 312—348

6 Claims

5. A drawer runner assembly adapted for use with a cabinet and a drawer, said drawer having a horizontal groove along a

length of an outer side wall thereof for engaging said runner assembly, said runner assembly comprising:

an elongate runner having front and rear ends and adapted to be secured to a side wall of said cabinet in a substantially horizontal position, said elongate runner having a stepped top surface and a planar lower surface, said stepped top surface including a first elongate upper sliding portion extendable into, and engageable with an upper surface of, said drawer groove, and a second elongate sliding surface laterally adjacent said first sliding surface, said first sliding surface located above said second sliding surface toward front and rear portions of said runner and having a cut-away portion located between said front and rear portions



of said runner wherein said first sliding surface is inclined downwardly from said front portion to said rear portion to a location where said first sliding surface ramps down toward said second sliding surface, said second sliding surface terminating in a vertical wall at said front portion of said runner to thereby form an end stop, a rear portion of said lower surface engageable with a lower surface of said groove and a front portion of said lower surface ramping up toward said top stepped surface; and a retaining guide including means for mounting said retaining means on said side wall of said drawer, said retaining guide having a horizontal bearing surface engageable with said second sliding surface of said runner.

5,090,788

TAMPER INDICATING PACKAGE

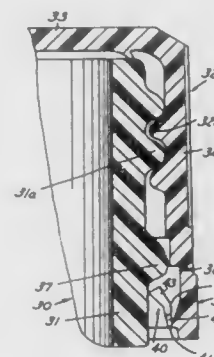
Keith W. Ingram, Centerville, Ohio, and Daniel J. Crowley, Jr., Portage, Mich., assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jul. 27, 1989, Ser. No. 386,391

Int. Cl.⁵ B65D 41/34

U.S. Cl. 215—252

29 Claims



1. A tamper indicating package comprising:

- a container having a neck with a threaded finish, an annular bead on said neck,
- a plastic closure which includes a base wall and a depending peripheral skirt having threads interengaging the threads of said container, and

a tamper indicating band attached to said skirt by one or more weakened portions defining a line of severing, and an annular flange extending axially upwardly and inwardly from said tamper indicating band toward said base wall of said closure,

said flange comprising a first continuous annular flange portion connected to an inner surface of said tamper indicating band by a hinge spaced radially inwardly from said inner surface of the band, and said flange being bent intermediate its ends to form a second portion such that a said portion extends inwardly at a greater predetermined angle to the axis of the closure than said first continuous flange portion, the free end of said second portion engaging beneath said bead on said container when said closure is threaded onto said container, said second portion comprising a plurality of circumferentially spaced segment portions separated by narrow slots extending axially upwardly and inwardly at said predetermined angles from the continuous annular flange portion said band having an inner surface adapted to be engaged by said first continuous flange portion when the closure is being removed to cause the flange to bend along the bend therein such that when the closure is applied to the container, the second portion initially engages the bead on the container and flexes at the bend to tend to straighten the bend and thereafter the first portion flexes relative to the band and the free end of the second portion engages beneath the bead.

5,090,789

LASER LIGHT SHOW DEVICE AND METHOD

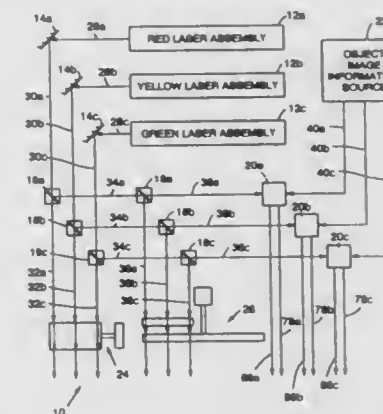
Allen E. Crabtree, 1001 Bridgeway, #139, Sausalito, Calif. 94965

Filed Aug. 3, 1990, Ser. No. 562,271

Int. Cl.⁵ G03H 1/22; G03B 21/56

U.S. Cl. 359—10

6 Claims



1. A method for generating a laser light show having holographic offsets, comprising the steps of

- receiving and X-Y scanning a first laser light beam to produce an X-Y scanned laser light beam which is selectively scanned along two substantially orthogonal dimensions in accordance with an image control signal;
- receiving and modulating a second laser light beam;
- receiving and diffracting said modulated laser light beam; and
- projecting said X-Y scanned and diffracted modulated laser light beams, wherein said projected beams are substantially superimposed.

5,090,790

POLARIZATION-INDEPENDENT SEMICONDUCTOR WAVEGUIDE

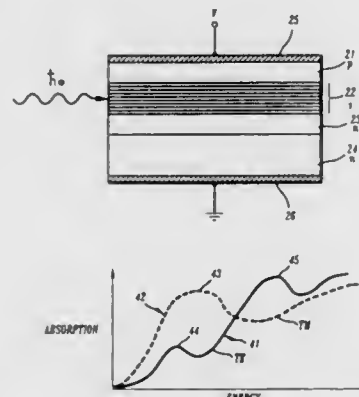
Jane E. Zucker, Aberdeen, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 29, 1990, Ser. No. 546,321

Int. Cl.⁵ H01L 29/205, 29/14; G02B 6/12, 5/30

U.S. Cl. 385—130

11 Claims



1. A semiconductor device comprising a guided wave structure for supporting propagation of a lightwave signal having an incident mean photon energy and a quantum well structure including at least first and second barrier layers and a quantum well layer therebetween, wherein said barrier layers have lattice constants which are substantially different from a lattice constant for the quantum well layer in order to produce a lattice mismatch condition, said quantum well structure having a predetermined optical property which exhibits a first characteristic for a first optical polarization of the lightwave signal and a second characteristic for a second polarization of the lightwave signal, and said guided wave structure including said quantum well structure, the quantum well layer being substantially parallel to a propagation axis through the guided wave structure for the lightwave signal, characterized in that, the quantum well structure has a lattice mismatch which yields a first sum of ratios which is substantially equal to a second sum of ratios, each sum of ratios being proportional to a combination of oscillator strength versus wavelength detuning substantially at each of a heavy hole exciton resonance peak and light hole exciton resonance peak for the predetermined optical property, said detuning being relative to the incident mean photon energy, said incident mean photon energy being less than an absorption band edge energy for said quantum well structure, said oscillator strength and detuning for the first sum of ratios being related to the first characteristic and said oscillator strength and detuning for the second sum of ratios being related to the second characteristic.

5,090,791

SELF-ILLUMINATED FIBRE OPTIC SWITCH

John S. Kidder, 2609 West 10th Ave., Vancouver, B.C., Canada V6K 2J8, and Derek Montgomery, Vancouver, Canada, assignors to John S. Kidder, Vancouver, Canada

Filed Sep. 6, 1989, Ser. No. 403,373

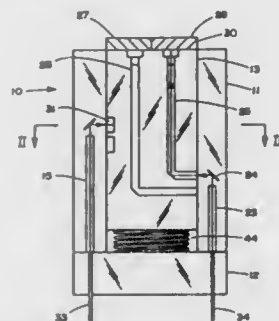
Int. Cl.⁵ G02B 6/26, 6/32; H01J 5/16

U.S. Cl. 385—18

23 Claims

1. A switch for switching a beam of light, comprising:
 - (a) a housing;
 - (b) an actuator reversibly moveable with respect to housing between a first and second position;
 - (c) an input optical path;
 - (d) a first output optical path; and
 - (e) a light redirecting means for directing light from said input path to said first output path said means including a prism positioned on said actuator and movable to and

from a first position in a direction such that reflecting faces of said prism are tangent to the direction of move-



ment of said prism, said prism directing light from said input path to said first output path when said actuator is in said first position.

5,090,792

OPTICAL FIBER TAP HANDLING TRAY

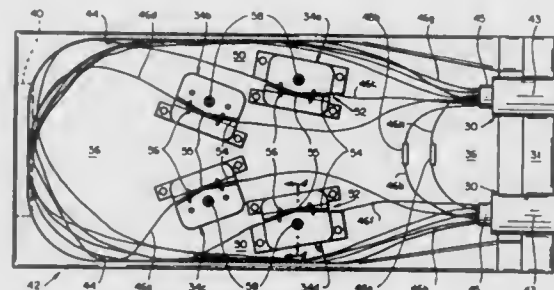
Lowell I. Koht, Foster City; Donald Del Fava, San Carlos; Brian H. Clark, Sunnyvale; Dana M. Takaki, San Jose, and George W. Haddock, Menlo Park, all of Calif., assignors to Raynet Corporation, Menlo Park, Calif.

Continuation of Ser. No. 344,778, Apr. 28, 1989, Pat. No. 5,002,356. This application May 11, 1990, Ser. No. 523,169

Int. Cl.⁵ G02B 6/36

U.S. Cl. 385—32

12 Claims



1. An optical fiber waveguide tap handling tray for use with a cable containing at least one optical fiber waveguide which is separated from the cable in a section thereof, the tap handling tray comprising:

a frame having a cable end and a backplane edge, optical tap means secured to the frame for engaging and bending a segment of the separated section of the optical fiber waveguide against an optical coupling medium for passing light energy through a side of the optical fiber waveguide segment and through the optical coupling medium,

the frame cable end enabling the cable to enter the tray at plural spaced apart locations so that the optical fiber waveguide section forms at least one loop within the frame, and the backplane edge enabling signal connections to be made with the optical coupling medium, the optical tap means defining an obtuse guiding angle arranged to lie in a path with which the fiber may freely be aligned within the frame after the cable has entered the tray,

wherein the frame further defines an inside peripheral channel and wherein portions of the loop section of the fiber waveguide other than the segment engaged in the optical tap means lie substantially within the inside peripheral channel, wherein the optical tap means being attached to the frame at a region lying inside of the inside peripheral channel.

5,090,793

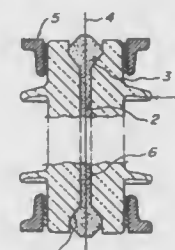
OPTICAL FIBER COMPOSITE INSULATOR

Shoji Seike, Toshiyuki Mima, both of Nagoya; Masayuki Nozaki, Ama; Naoki Tan, and Mitsuji Ikeda, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan Continuation of Ser. No. 421,410, Oct. 16, 1989, Pat. No. 5,029,969. This application Apr. 10, 1991, Ser. No. 683,076 Claims priority, application Japan, Oct. 14, 1988, 63-257365; Dec. 12, 1988, 63-311831; Dec. 12, 1988, 63-311832

Int. Cl.⁵ A02B 6/36

U.S. Cl. 385—100

1 Claim



1. An optical fiber composite insulator comprising a hollow insulator body having a central through-hole extending in an axial direction thereof, and at least one optical fiber extending through the through-hole, the central through-hole being filled with an organic material in a central portion of the axial direction thereof and both end portions of the through-hole being sealed with an inorganic material, wherein at the central portion of the through-hole filled with the organic material the inner surface of the through-hole is a glazed surface, and each inner surface of the end portions of the through-hole sealed with the inorganic material is a polished surface.

5,090,794

METHOD FOR DRIVING A MULTI-LAYERED-TYPE LIQUID CRYSTAL DISPLAY DEVICE

Akitsugu Hatano, and Yutaka Ishii, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

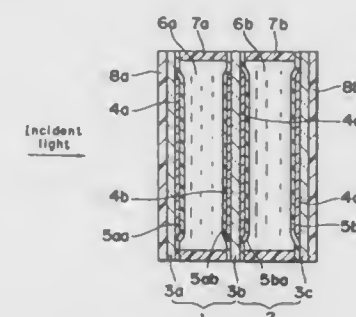
Filed Nov. 21, 1989, Ser. No. 439,876

Claims priority, application Japan, Nov. 21, 1988, 63-294373

Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—53

11 Claims



1. A method for driving a multi-layered-type liquid crystal display device which includes stacked plural cell layers, each plural cell layer containing liquid crystal molecules twisted between two transparent substrates so as to have a large birefringence Δn_x , a thickness d_x , a twist angle θ_x , wherein x , for birefringence, thickness and twist angle, is an integer corresponding to the cell layer, and having a varying light transmittance varying responsive to a voltage applied thereto, said method comprising the steps of:

determining voltages to be applied to each of the plural cell layers so as to vary the light transmittances of the individual cell layers to pass a predetermined color light, and driving each of the plural cell layers by applying said determined voltages to corresponding ones of each of the plural cell layers to display an image having the predetermined

color light on the liquid crystal display device due to the transmittance of each of the plural cell layers varying responsive to the determined voltages applied thereto.

5,090,795

INTEGRATED ADAPTIVE OPTICS APPARATUS

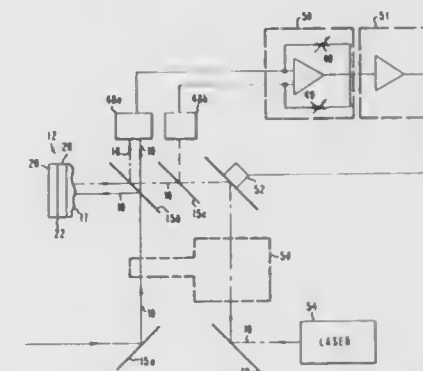
Thomas R. O'Meara, Malibu, and George C. Valley, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 118,707, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 865,231, May 20, 1986, abandoned. This application Nov. 10, 1989, Ser. No. 440,393

Int. Cl.⁵ H04N 9/31

U.S. Cl. 359—240

8 Claims



1. A method of processing a laser beam using a liquid crystal light valve, including the steps of:

sensing a first aberrated remote reference beam by:

(a) passing said aberrated reference beam through a changeably refractive medium; and

(b) reflecting said aberrated remote reference beam from a reflective layer which is substantially adjacent to said medium;

feeding back said remote reference beam to adapt the liquid crystal light valve with a map of the aberrations in said remote reference beam by:

(c) directing a first portion of the aberrated reflected beam toward a photosensitive region substantially adjacent to said reflective layer;

(d) applying a suitable voltage across said medium and said photosensitive region; and

(e) combining said first portion of the aberrated reflected beam with a local plane wave reference so as to form an interference pattern on said photosensitive region, thereby generating commensurate index changes in said changeably refractive medium responsive to the interference pattern, wherein said local plane wave reference tracks the remote reference beam in frequency and phase, and said interference pattern is in spatial registration with the remote reference beam, and

processing the laser beam with the adapted liquid crystal light valve so as to generate timereversed, phase conjugate aberrations in said laser beam responsive to the map of aberrations.

5,090,796

TEST FRAME FOR FITTING A PATIENT WITH TELESCOPIC CORRECTIVE LENSES AND ASSOCIATED METHOD

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonoma, N.Y.

Filed Nov. 26, 1990, Ser. No. 617,670

Int. Cl.⁵ G02C 1/00

U.S. Cl. 351—158

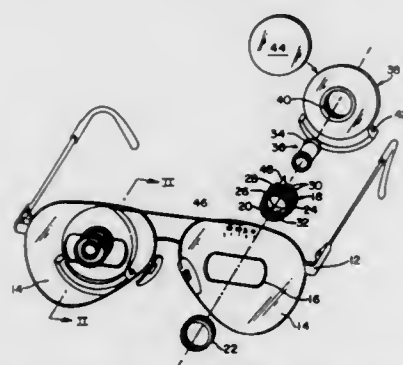
18 Claims

1. A testing apparatus for assisting a partially sighted person in selecting corrective lenses comprising:

A) a spectacle frame having at least one test mounting lens

emplaced in the eyepiece of said frame said test mounting lens including horizontally elongated slot for releasably and slideably receiving therein

B) telescope holding means for releasably retaining a telescope therein, said telescope holding means riding in said slot for positioning said telescope in a position that allows said person to see through said telescope, and



sample lens holding means coupled to said telescope holding means for releasably holding a sample carrier lens in a position that allows said person to see through said sample carrier lens and said telescope with said telescope an sample carrier lens positioned on the same optical axis.

5,090,797

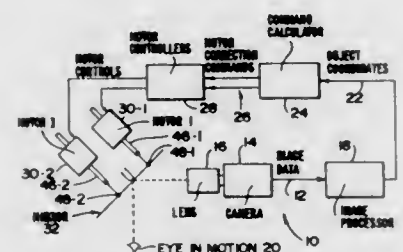
METHOD AND APPARATUS FOR MIRROR CONTROL
Dixon Cleveland, Vienna; James H. Cleveland, Clifton; Peter L. Norloff, Fairfax, all of Va.; Jeffrey A. Forsythe, West Chester, Pa., and Richard W. Collier, Burke, Va., assignors to LC Technologies Inc., Fairfax, Va.

Filed Jun. 9, 1989, Ser. No. 363,862

Int. Cl.⁵ A61B 3/14; G02B 5/08

U.S. Cl. 351—210

11 Claims



8. A method for tracking an eye comprising: positioning a mirror to reflect the eye to a means for forming an image of the eye, said means for forming an image having a sensor and a field of view wider than the image of the eye;

forming an image of the eye from the reflection of the eye in the mirror;

locating the position of the eye within the field of view; calculating the angular error in tracking the eye from the distance in the plane of the sensor between the position of the image of the eye and a desired position within the field of view of the means for forming the image; calculating an angular velocity command for the mirror corresponding to the angular tracking error of the eye being tracked to minimize the blur of the image; and controlling the angular velocity of the mirror according to the calculated angular velocity command.

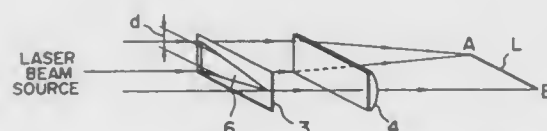
5,090,798
APPLIED INTENSITY DISTRIBUTION CONTROLLING APPARATUS

Yoshimi Kohayakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 453,209, Dec. 27, 1989, abandoned, which is a continuation of Ser. No. 184,194, Apr. 21, 1988, abandoned. This application Mar. 4, 1991, Ser. No. 664,431
Claims priority, application Japan, Apr. 27, 1987, 62-103624; May 22, 1987, 62-125390

Int. Cl.⁵ A61B 3/10

U.S. Cl. 351—221

17 Claims



1. A light intensity distribution controlling apparatus provided with:

an optical system including a cylindrical lens and passing an applied light beam therethrough and imaging the light beam onto a projection plane provided substantially on a focal plane of said cylindrical lens; and an opening member in which the passage width of the applied light flux has a predetermined non-uniform distribution along the direction of the axis of said cylindrical lens, wherein an intensity distribution of the imaged light beam on the projection plane in the direction of said axis is non-uniform and the same as the distribution of the passage width of the opening member.

5,090,799

OPHTHALMOLOGICAL MEASUREMENT METHOD AND APPARATUS

Misao Makino, Hachioji; Kiyoshi Hashimoto, and Toshiaki Sugita, both of Hino, all of Japan, assignors to Kowa Company Ltd., Japan

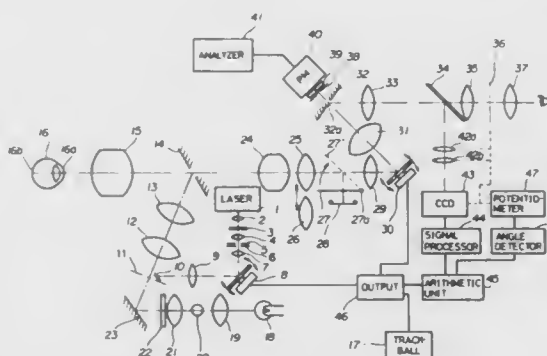
Filed Apr. 9, 1990, Ser. No. 507,390

Claims priority, application Japan, Apr. 10, 1989, 1-87857; Apr. 12, 1989, 1-90788

Int. Cl.⁵ A61B 3/10

U.S. Cl. 351—221

18 Claims



1. An ophthalmological measurement method comprising the steps:

projecting a laser beam having a predetermined diameter to an eye fundus; detecting motion of a laser speckle pattern formed by laser light scattered and reflected from the eye fundus at an observation point as fluctuations in the speckle light intensity; producing a speckle signal from the fluctuations in the speckle light intensity; evaluating the speckle signal in terms of a rate of change to

discriminate edges of a blood vessel to identify a blood vessel part of the eye fundus; detecting any movement of the identified blood vessel part of the eye fundus; and adjusting the position of the region illuminated by the laser beam and the position of the observation point by an amount corresponding to the amount of blood vessel movement to track the blood vessel part automatically.

5,090,800

PROJECTOR HAVING A LIQUID CRYSTAL DISPLAY PANEL

Seimei Ushiro, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

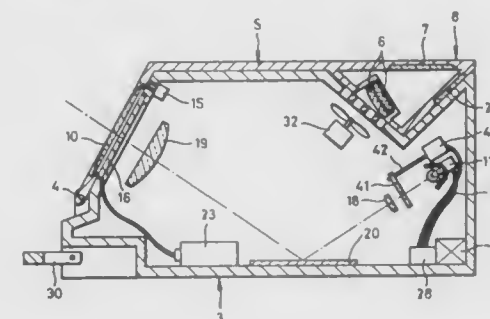
Filed May 2, 1991, Ser. No. 694,687

Claims priority, application Japan, May 24, 1990, 2-54369[U]

Int. Cl.⁵ G03B 21/10

U.S. Cl. 353—071

14 Claims



1. A projector comprising:

a projector body; electro-optical display means provided on the outside of said projector body for displaying an image; a light source in said projector body for illuminating from the rear said image displayed on said electro-optical display means; a movable member mounted on the outside of said projector body for movement between open and closed states, said movable member in said closed state allowing said electro-optical display means to be directly observed; and a projecting head on said movable member for projecting in said open state said image illuminated by said light source onto a screen outside said projector body.

5,090,801

LASER VELOCIMETER FOR NEAR-SURFACE MEASUREMENTS

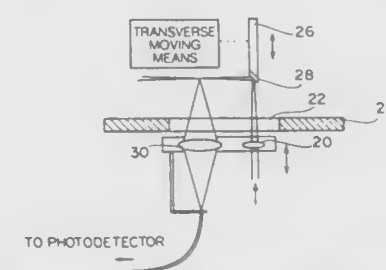
Dennis A. Johnson, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 11, 1990, Ser. No. 596,105

Int. Cl.⁵ B01P 3/36

U.S. Cl. 356—28.5

15 Claims



1. A laser Doppler velocimeter for measuring flow velocity near a surface in a wind tunnel comprising: means for generating plural laser beams; beam-turning means located within the flow of said wind

tunnel for receiving and turning said beams approximately 90 degrees and at a grazing incidence relative to said surface; means outside said wind tunnel for collecting particle-scattered laser light from the turned laser beams; and means coupled to said collecting means for determining at least one velocity component of said near-surface flow.

5,090,802

OPTICAL MEASUREMENT SYSTEM

Philip C. Longhurst, Tarporley, England, assignor to BICC, plc, London, United Kingdom

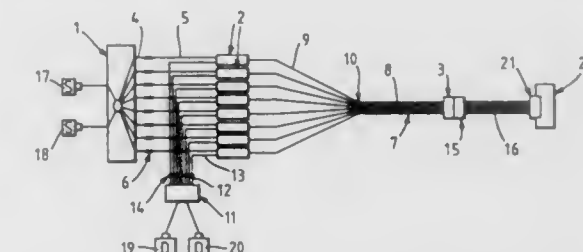
Filed Aug. 3, 1990, Ser. No. 562,277

Claims priority, application United Kingdom, Aug. 3, 1989, 8917737

Int. Cl.⁵ G01N 21/84, 21/59

U.S. Cl. 356—73.1

18 Claims



1. An optical measurement system by means of which can be obtained rapid and repeatable measurements of insertion and return loss of each fibre in sequence of a multi-fibre connector which is connected to an optical fibre ribbon and which is suitable for mating with a multi-fibre connector of complementary form, which optical measurement system comprises:

a multi-channel optical switch for connection to a source of light; a plurality of 1×2 bi-directional splitters each of which is directly optically coupled between one of the channels of the multi-channel optical switch and one fibre of a master multi-fibre connector for mating with a multi-fibre connector to be tested and, for connection to at least one detector for monitoring and recording the power reflected at the interface between a pair of optical fibres interconnected by the mating of the master multi-fibre connector and the multi-fibre connector under test; and a common splitter to which each of said bi-directional splitters is also optically coupled.

5,090,803

OPTICAL COORDINATE TRANSFER ASSEMBLY

Lawrence L. Ames, San Jose; Calvin W. Gillard, and Neal E. Buholz, both of Palo Alto, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Sep. 21, 1990, Ser. No. 586,161

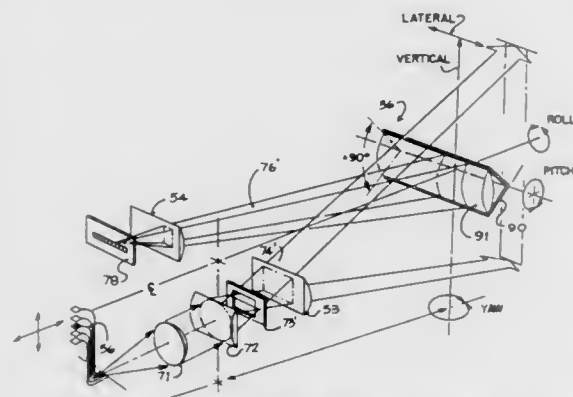
Int. Cl.⁵ G01B 11/28; G02B 5/122

U.S. Cl. 356—152

106 Claims

66. A reflector device for reflecting a portion of a fan-like beam of electromagnetic radiation exactly twice, said fan-like beam initially diverging in only a single dimension while otherwise converging, and for focussing said reflected portion of said fan-like beam in a specified direction in said single dimension in which said fan-like beam initially diverges, said fan-like beam otherwise continuing to converge, so as to form a spot on a focal line; said reflector device comprising a pair of reflective

surfaces disposed on corresponding interior faces of an angle of intersection, said interior faces intersecting each other in a line



of intersection that extend substantially parallel to said focal line.

5,090,804

APPARATUS AND METHOD FOR INSPECTION OF SURFACE QUALITY OF SMOOTH SURFACES

Andrew K. Wong, Mohamed S. Kamel, and John T. King, all of Waterloo, Canada, assignors to Virtek Vision Intelligence Robotics Technologies Corporation, Waterloo, Canada
PCT No. PCT/US88/02706, § 371 Date Jan. 29, 1990, § 102(e) Date Jan. 29, 1990, PCT Pub. No. WO89/01146, PCT Pub. Date Feb. 9, 1989

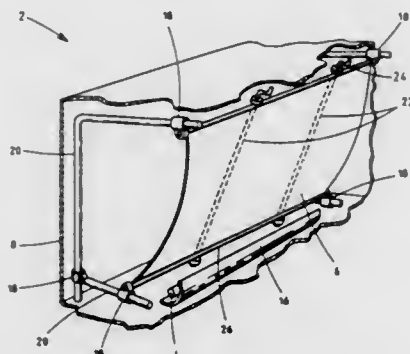
PCT Filed Jul. 27, 1988, Ser. No. 459,750

Claims priority, application United Kingdom, Jul. 30, 1987, 3718073

Int. Cl.⁵ G01N 21/00

U.S. Cl. 356—237

35 Claims



1. An apparatus for inspecting the surface quality of objects having smooth surfaces for defects, where the type of surfaces range from highly reflective to lowly reflective, said apparatus comprising a light source and diffusing surface, the light source and diffusing surface being contained in an opaque enclosure, said enclosure having an aperture through which some of the light can escape, the light source and diffusing surface being arranged to produce a gradient of light through the aperture, the diffusing surface being located some distance behind the aperture and the light emitted from the aperture being directed in the form of a beam, with means for supporting a particular object to be inspected at a low angle in said beam so that said object reflects said beam away from said enclosure, while controlling any extraneous light, with means to observe the reflected beam, the gradient in the reflected beam exposing any defects on the surface of said object that are located in said beam of light so that the location of said defects can be noted.

5,090,805 BOW SIGHT WITH PROJECTED RETICLE AIMING SPOT

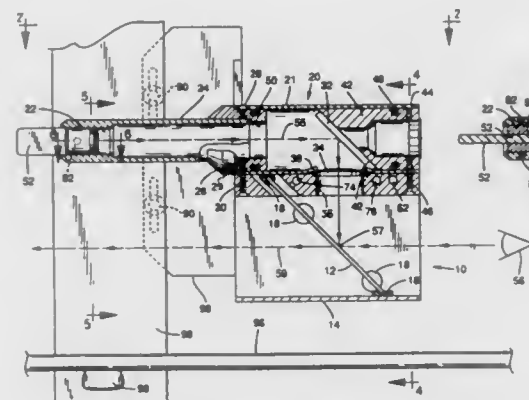
Dick A. Stawarz, Onalaska, Wis., assignor to Blount, Inc., Montgomery, Ala.

Filed Aug. 15, 1990, Ser. No. 567,923

Int. Cl.⁵ G02D 23/10

U.S. Cl. 356—251

18 Claims



1. A bow sight apparatus, comprising:
viewer means for providing a field of view in which a target can be sighted;
reticle means located outside said field of view for providing an aiming spot of colored light of a predetermined light wavelength range which is superimposed over an image of the target in said field of view, said reticle means including an apertured reticle member having a plurality of aiming apertures therethrough which provide a plurality of spaced, distinguishable aiming spots;
a light guide member for transmitting said colored light through said guide member and said aiming aperture to produce said aiming spot, said guide member having a light output end which covers all of said aiming apertures and is located outside but adjacent to said aiming aperture;
optical imaging means for superimposing said aiming spot over the target image in said field of view, said optical imaging means including a partial reflecting mirror which reflects light of said predetermined wavelength range and transmits light of another wavelength range; and
range selection means for selecting different target ranges for targets indicated by different ones of the aiming spots.

5,090,806

METHOD AND APPARATUS FOR MEASURING THE COMPOSITION OF A ZINC PHOSPHATE COMPOUND

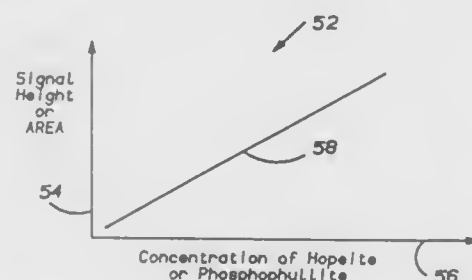
Brian M. Pierce, Moreno Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 23, 1989, Ser. No. 425,091

Int. Cl.⁵ G01J 3/44

U.S. Cl. 356—301

2 Claims



1. A method for measuring unknown concentrations of a first and second substance which make up a material, the con-

centration of said first and second substances being indicated by measuring the amplitude of RAMAN frequencies for said material, said method comprising:

determining a first unique RAMAN frequency for said first substance, said first frequency not present for said second substance;
determining a second unique RAMAN frequency of said second substance, said second frequency not present for said first substance;
measuring the amplitude of said first RAMAN frequency for a plurality of known concentrations of said first substance to generate a first calibration curve;
measuring the amplitude of said second RAMAN frequency for a plurality of known concentration of said second substance to generate a second calibration curve;
measuring the amplitude of the first and second RAMAN frequencies for the material to generate first and second comparison values;
comparing the first comparison value to the first calibration curve to indicate the concentration of the first substance present in said material; and
comparing the second comparison value to the second calibration curve to indicate the concentration of the second substance present in said material.

5,090,807

REAL TIME OPTICAL PRE-DETECTION PROCESSING OF MULTISPECTRAL IMAGE DATA

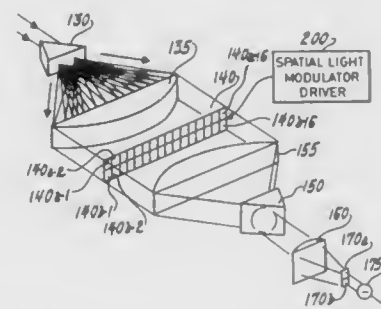
Anthony M. Tai, Northville, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Jan. 10, 1990, Ser. No. 463,277

Int. Cl.⁵ G01J 3/04

U.S. Cl. 356—310

11 Claims



1. An apparatus for forming a spectrally weighted value from multispectral radiation received from a pixel comprising: an optical system for gathering multispectral radiation from the pixel;
a wavelength dispersing element disposed in a plane to receive the multispectral radiation gathered by said optical system for spatially dispersing said gathered radiation by wavelength into a plurality of wavelength band areas;
a weighting filter disposed in a plane to receive radiation dispersed by said wavelength dispersing element having a first weighting filter element and a second weighting filter element for each of said wavelength band areas;
a wavelength converging element disposed to receive radiation filtered by said weighting filter for spatially converging all wavelengths of radiation filtered by said first weighting filter elements to a first detector location and all wavelengths of radiation filtered by said second weighting filter elements to a second detector location;
a first detector disposed at said first detector location for forming a first electrical signal corresponding to the intensity of radiation at said first detector location;
a second detector disposed at said second detector location for forming a second electrical signal corresponding to the intensity of radiation at said second detector location; and
a difference device connected to said first and second detectors for forming a difference signal between said first and

second electrical signals, said difference signal being the spectrally weighted value.

5,090,808

PARTICLE MEASUREMENT APPARATUS

Muneharu Ishikawa, Ryuugasaki, and Ayafumi Taniji, Tsukuba, both of Japan, assignors to Kowa Company Ltd., Japan

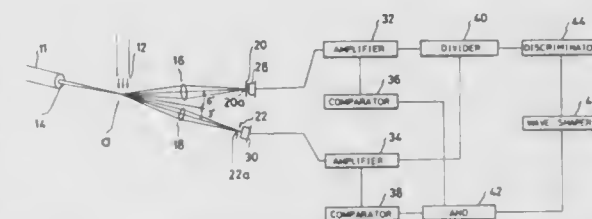
Filed Nov. 13, 1989, Ser. No. 435,717

Claims priority, application Japan, Nov. 16, 1988, 63-287809

Int. Cl.⁵ G01N 15/02; G06M 11/04

U.S. Cl. 356—336

14 Claims



1. A particle measurement apparatus in which a laser beam is projected at a sample containing particles to be measured in a measurement zone and light scattered by particles in the sample is evaluated to thereby determine properties of particles in the sample, comprising:
a first light receiving system for receiving scattered light and disposed at a predetermined angle relative to the axis of the laser beam;
a second light receiving system for receiving scattered light and disposed relative to the axis of the laser beam at an angle different from the angle of the first light receiving system;
means associated with each of the light receiving systems for converting the scattered light into an electrical scattered light signal;
means for processing the scattered light signals from the light receiving systems to determine particle size; and
means for comparing the amplitude of scattered light signals from the light receiving systems with predetermined values so that a single particle measurement takes place only when a scattered light signal from each light receiving system exceeds a predetermined value.

5,090,809

MODULATION FREQUENCY CONTROL IN A FIBER OPTIC ROTATION SENSOR

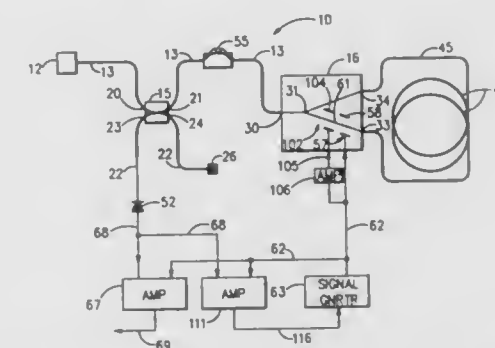
Carl M. Ferrar, 114 Wildflower Rd., East Hartford, Conn. 06118

Filed Jun. 4, 1990, Ser. No. 533,196

Int. Cl.⁵ G01C 19/72

U.S. Cl. 356—350

23 Claims



1. Apparatus for controlling the frequency of a modulation signal applied to a pair of counter-propagating light waves in an optical waveguide loop, comprising:

signal generator means, for generating the modulation signal having a certain frequency;
 phase modulator means, for phase modulating said light waves in response to said modulation signal;
 means for combining said light waves to form an optical output signal; and
 detection means, for detecting said optical output signal, and for providing a feedback signal proportional to the magnitude of a component of said optical output signal, said magnitude of said component being proportional to any deviation in the frequency of the modulation signal from said certain frequency, said signal generator means being responsive to said feedback signal in generating the modulation signal at a frequency equal to said certain frequency, said magnitude of said component being driven to zero when the frequency of the modulation signal equals said certain frequency.

5,090,810

RINGER RESONATOR GYROSCOPE CONTROLLING TWO SERVO CONTROL LOOPS BASED ON THE OUTPUT OF A SINGLE INTERFERENCE DETECTOR

Alan R. Malvern, Plymouth, United Kingdom, assignor to British Aerospace Public Limited Company, London, England
 Filed Apr. 18, 1990, Ser. No. 510,215

Claims priority, application United Kingdom, Apr. 19, 1989, 8508910; Aug. 14, 1989, 8918501

Int. Cl.⁵ G01C 19/72

U.S. Cl. 356—350

8 Claims



INTENSITY AS A FUNCTION OF TUNING (NO RATE)

1. A ring resonator gyro comprising:
 a resonator ring;
 means for introducing into said ring a clockwise and a counterclockwise beam;
 means for extracting from said resonator ring a clockwise and a counterclockwise beam component;
 a single detector, receiving said clockwise and counterclockwise beam components from said retracting means, within which said beam components interfere;
 first control means responsive to an output of said detector for compensating for variations in optical path length, said first control means including means for applying a reciprocal phase shift to said clockwise and counterclockwise beams, means for modulating said reciprocal phase shift at a first modulation frequency, and means for demodulating the output of said detector in accordance with said first modulation frequency to derive a control signal for controlling said reciprocal phase shift applying means; and
 second control means responsive to the output of said detector for compensating for rotation of the gyro, said second control means including means for applying a non-reciprocal phase shift to said clockwise and counterclockwise beams, means for modulating said nonreciprocal phase shift at a second modulation frequency, and means for demodulating the output of said detector in accordance with said second modulation frequency to derive a control signal for controlling said non-reciprocal phase shift applying means.

5,090,811

OPTICAL RADIUS GAUGE

Charles W. Donaldson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

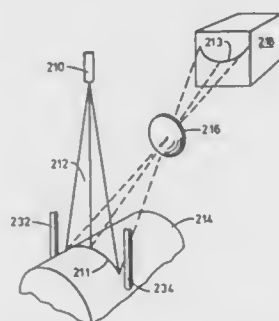
Continuation of Ser. No. 361,014, May 31, 1989, abandoned.

This application Oct. 15, 1990, Ser. No. 597,275

Int. Cl.⁵ G01B 11/24

U.S. Cl. 356—376

10 Claims



4. Apparatus for measuring the radius of a curved surface, comprising:
 means for illuminating said surface to form a line of light on said surface along an intersection of said surface with a first plane;
 a photodetector positioned such that a surface of said photodetector is in a second plane parallel with said first plane;
 a focusing lens for receiving light reflected from said surface and forming an image of said line of light on said photodetector surface;
 said lens positioned such that a principal axis of said lens is perpendicular to said first and second planes;
 said lens having a secondary axis forming an angle of between 20 and 60 degrees with said principal axis, said line of light and said photodetector being positioned along said secondary axis on opposite sides of said lens;
 means for determining, from said image, a coordinate location for at least three points along said line of light; and
 means for calculating the radius of said surface from said coordinate location of each of said at least three points.

5,090,812

RING LASER CAVITY BACKSCATTER MEASUREMENT

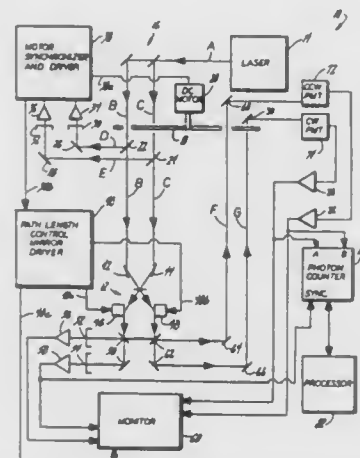
Douglas R. Jungwirth, Reseda, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jan. 31, 1991, Ser. No. 648,665

Int. Cl.⁵ G01N 21/47

U.S. Cl. 356—446

19 Claims



1. Apparatus for determining a magnitude of a backscatter radiation component of a ring laser comprising:

means for providing to a ring laser resonant cavity during a first interval of time a clockwise propagating radiation beam and during a second interval of time a counterclockwise propagating radiation beam, the cavity including a plurality of mirror means for reflecting the beams within the cavity; and
 means for measuring during the first interval of time a magnitude of a backscatter radiation component resulting from the clockwise propagating radiation beam and for measuring during the second interval of time a magnitude of a backscatter radiation component resulting from the counterclockwise propagating radiation beam.

5,090,813

DUAL DRUM RECYCLE ASPHALT DRYING AND MIXING METHOD AND APPARATUS

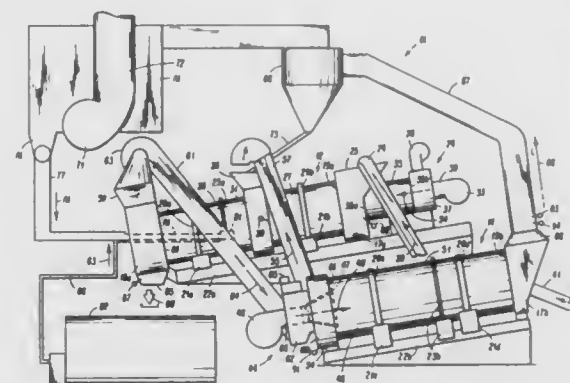
William D. McFarland, Cedar Rapids, and Joseph E. Musil, Ely, both of Iowa, assignors to Cedarapids, Inc., Cedar Rapids, Iowa

Filed Jul. 23, 1990, Ser. No. 556,744

Int. Cl.⁵ E01C 19/10; B01F 9/06; F27B 7/34

U.S. Cl. 366—23

8 Claims



1. An asphalt drum drying and mixing plant for drying, heating and mixing recycle and virgin aggregate materials to produce an asphaltic product, comprising:
 means for drying and heating the recycle material to a first temperature, and for mixing the dried and heated cycle material with virgin aggregate material, including a parallel flow drum having a feed and hot gas intake end, a drying region adjacent said feed and hot gas intake end for drying and heating the recycle material to the first temperature, and a mixing region adjacent and downstream of the drying region for receiving the recycle material at the first temperature directly from the drying region, a material discharge end at a downstream end opposite said feed and hot gas intake end, and having an intermediate material intake port intermediate the opposite ends of the parallel flow drum, the feed and hot gas intake end including an end closure and a first material feed hopper and chute at the end closure for directing the recycle material from the first feed hopper and chute into said parallel flow drum;
 means for introducing hot gases at the feed and hot gas intake end into the parallel flow drum, said hot gas introduction means including a combustion chamber communicating with said parallel flow drum and a burner assembly coupled to the combustion chamber, for delivering combustion gases into the combustion chamber for complete combustion of said gases within said combustion chamber prior to introduction of the gases from said combustion chamber into said parallel flow drum;
 means for drying and heating the virgin aggregate material to a second temperature, including a counterflow drum having a material drying region, material feed and discharge ends respectively at opposite ends of said counterflow drum and a burner assembly; and
 means for transferring the dried and heated virgin aggregate

material discharged from the discharge end of the counterflow drum to the intermediate material intake port of the parallel flow drum to be mixed within the mixing region of the parallel flow drum with the recycle material.

5,090,814

DISPENSER FOR REACTIVE CHEMICALS

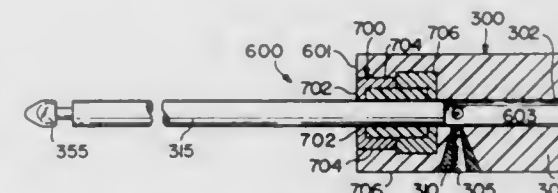
Donald H. Petcen, Colonial Heights, Va., assignor to E.R. Carpenter Company, Inc., Richmond, Va.

Filed Jun. 23, 1989, Ser. No. 370,310

Int. Cl.⁵ B01F 15/02; B67D 5/60

U.S. Cl. 366—177

32 Claims



1. An apparatus for mixing and purging first and second mutually reactive chemicals comprising:
 a purging member;
 a mixing assembly having a longitudinal passageway, a portion of which defines a mixing chamber, said mixing assembly also including a first chemical passageway for the passage of the first mutually reactive chemical and a second chemical passageway for the passage of the second mutually reactive chemical, said first and second chemical passageways each including an outlet which opens into said mixing chamber;
 scraping means for avoiding build up of said reactive chemicals on said purging member which is adapted to travel within said longitudinal passageway in reciprocating fashion, said scraping means including a first cup-shaped member and a second cup-shaped member, said first and second cup-shaped members each including a base portion, a side portion and a rim portion with said base, side and rim portions defining a recess, said first and second cup-shaped members being positioned within said mixing assembly and arranged such that the rim portions of said cup-shaped members are closer to one another than the base portions of said cup shaped members, and the base portions each including an aperture through which said purging member is adapted to pass, and said apertures being dimensioned so as to place said cup-shaped members in a scraping relationship with said purging member, and an insert positioned between the base portions of each of said cup-shaped members and said insert having a first and second end and a through-hole through which said purging member is adapted to pass, said first and second ends of said insert extending into said cup-shaped members such that the side portions of said cup-shaped members surround the ends of said insert.

5,090,815

APPARATUS FOR MIXING CHARGES OF FLOWABLE MATERIAL

Lorenz B. Bohle, Ennigerloh, Fed. Rep. of Germany, assignor to L. B. Bohle Pharmatechnik GmbH, Ennigerloh, Fed. Rep. of Germany

Filed Jan. 4, 1991, Ser. No. 637,877

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1990, 4000110; Jan. 30, 1990, 9001012[4]; Feb. 20, 1990, 4005219

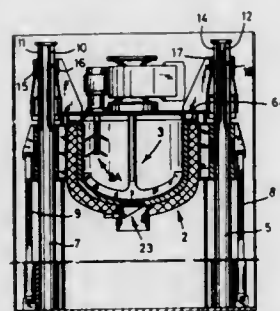
Int. Cl.⁵ G01F 7/16

U.S. Cl. 366—192

19 Claims

1. Apparatus for mixing charges of flowable material, comprising upright guides; a charge-receiving vessel having an open top and being movable up and down along said guides;

means for moving said vessel along said guides; a cover having means for sealing the open top of said vessel, said cover being movable along said guides to be lifted by said vessel and to descend by gravity on downward movement of said vessel; and means for agitating the charge in said vessel, comprising an upright rotary carrier disposed substantially centrally of and extending into said vessel, at least while said sealing means seals the open top of said vessel, said vessel including a bottom



wall and said carrier having a lower end disposed above and spaced apart from said bottom wall, said agitating means further comprising at least one mixing blade connected to said lower end and spaced apart from said bottom wall, said bottom wall having a concave upper side, a substantially centrally located charge-evacuating outlet, a closure for said outlet, and means for moving said closure to and from a position in which said outlet is sealed.

5,090,816

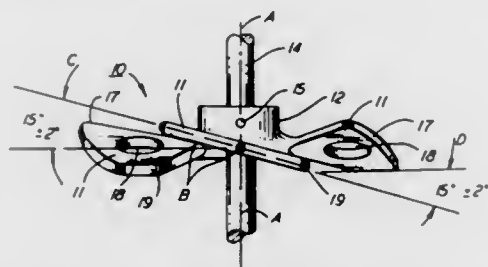
FLUID MIXING DEVICE

Thomas Socha, 24 E. Maine St., Johnson City, N.Y. 13790
Filed Feb. 9, 1989, Ser. No. 309,524

Int. Cl.⁵ B01F 7/22

U.S. Cl. 366—293

11 Claims



1. A mixing device for stirring and blending fluids, comprising a disc-like impeller having a multiplicity of blades integrally formed for mounting upon a rotatable shaft defined by a vertical shaft axis, each of said blades extending radially outwardly along a radial axis which is substantially perpendicular with respect to said shaft axis, means defining a hub portion of said impeller for affixing the impeller to said rotatable shaft, means defining a substantially elliptical hole in each of said blades for allowing fluid flow-through as each blade attacks the fluid, each of said blades having a $15^\circ \pm 2^\circ$ angle of attack with respect to said fluid and said radial axis, each blade further having a forward, circumferential edge which is rounded and a trailing circumferential edge which is terminated in a beveled cut with respect to said radial axis, and wherein said beveled cut allows said trailing circumferential edge to rest flush on a bottom wall of a container housing said fluid to be mixed.

5,090,817

POUR POINT DETECTION

Victoria S. Ker, and Charles Tsang, both of Calgary, Canada, assignors to Nova Corporation of Alberta, Calgary, Alberta, Canada

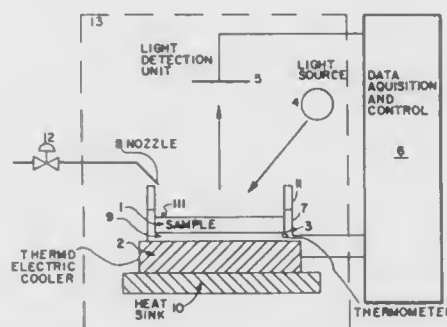
Filed Jan. 8, 1991, Ser. No. 638,738

Claims priority, application Canada, Sep. 20, 1990, 2025889-6

Int. Cl.⁵ G01N 25/02

U.S. Cl. 374—24

14 Claims



1. An apparatus for estimating the pour point of a hydrocarbon oil, said apparatus comprising:

- a receptacle adapted to receive a sample of said hydrocarbon oil, such that said sample of said hydrocarbon oil has a top surface;
- means for providing a flow of pressurized gas directed towards said top surface of said sample of said hydrocarbon oil, wherein said flow is of sufficient strength to cause a significant surface disturbance on said sample of said hydrocarbon oil when said sample of said hydrocarbon oil is at a temperature of about 20°C , but of insufficient strength to splash the majority of said sample of said hydrocarbon oil out of said receptacle;
- means for changing the temperature of said sample of said hydrocarbon oil;
- optical monitor means for monitoring movement of said top surface of said sample of said hydrocarbon oil; and
- temperature measuring means for measuring the temperature of said sample of said hydrocarbon oil, said optical monitor means comprising:
 - a light beam source located to direct a beam of light towards said top surface at an incident angle so that the light from the beam is largely reflected or absorbed by said top surface; and
 - scattered light detection means arranged so as to detect light scattered by said sample and changes in the intensity of the scattered light, wherein said detection means are connected into circuit means capable of registering change in light scattered from said sample.

5,090,818

FIBER OPTIC SYSTEMS FOR SENSING TEMPERATURE AND OTHER PHYSICAL VARIABLES

Marcos Y. Kleinerman, 24 Jerome St., Southbridge, Mass. 01550

Division of Ser. No. 711,062, Mar. 12, 1985, Pat. No. 5,004,913, which is a continuation-in-part of Ser. No. 608,932, May 14, 1984, Pat. No. 4,708,494, which is a continuation of Ser. No. 405,732, Aug. 6, 1982, abandoned. This application Apr. 30, 1990, Ser. No. 516,532

The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.

Int. Cl.⁵ G01K 11/20, 13/00; G01J 5/08

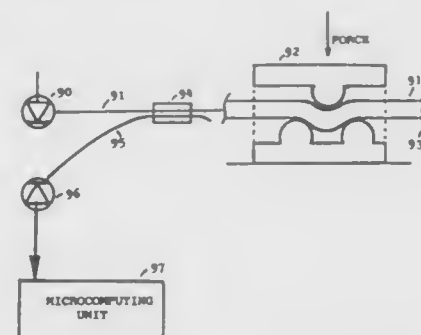
U.S. Cl. 374—131

11 Claims

1. A temperature measuring arrangement comprising:
 - probe means including a photoluminescent material containing luminescent centers so characterized that, when excited with transient interrogating light of a wavelength or wavelengths within a pre-determined spectral range,

they emit luminescence light from two excited electronic energy levels, one of them being higher than the other and having a higher rate of luminescence decay than that of said other level, the relative intensities of the luminescence light emitted from each of said two levels varying as a function of the probe means temperature, the intensity of the luminescence light emitted from said higher level increasing with increasing temperature within a pre-determined temperature range within which the quantum efficiency of the total luminescence emitted from said two levels is approximately invariant, the combined luminescence light emitted from said two levels continuing in time beyond the termination of the transient excitation light with a decay time of its intensity which decreases in a known manner with an increase in temperature within said temperature range;

- a source of said interrogating light;
 - fiber optic means for directing said interrogating light to said probe means;
 - fiber optic means for directing a fraction of the intensity of the luminescence light emitted from said probe means to photodetector means; and
 - photodetector means for measuring the decay time of the luminescence emitted from said probe means, said luminescence decay time being an indicator of the probe means temperature.
7. A method for measuring temperature, comprising the steps of:



- exposing a probe to the temperature to be measured, said probe including a photoluminescent material containing luminescent centers so characterized that, when excited with transient interrogating light of a wavelength or wavelengths within a pre-determined spectral range, they emit luminescence light from two excited electronic energy levels, one of them being higher than the other and having a higher rate of luminescence decay than that of said other level, the relative intensities of the luminescence light emitted from each of said two levels varying as a function of the probe temperature, the intensity of the luminescence light emitted from said higher level increasing with increasing temperature within a pre-determined temperature range within which the quantum efficiency of the total luminescence emitted from said two levels is approximately invariant, the combined luminescence light emitted from said two levels continuing in time beyond the termination of the transient excitation light with a decay time of its intensity which decreases in a known manner with an increase in temperature within said temperature range;
- illuminating said probe with said interrogating light, thereby generating luminescence light emitted by the probe;
- directing a fraction of the intensity of said luminescence light to photodetector means; and
- measuring the decay time of said luminescence light, said decay time being an indicator of the probe temperature.

5,090,819

SUPERCONDUCTING BOLOMETER

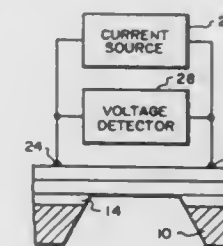
Abaron Kapitulnik, Palo Alto, Calif., assignor to Conductus, Inc., Sunnyvale, Calif.

Filed Aug. 20, 1990, Ser. No. 569,435

Int. Cl.⁵ G01N 25/20; H01L 39/00; G01K 7/16

U.S. Cl. 374—176

18 Claims



1. A superconducting transition edge bolometer adapted to change electrical resistance in the region corresponding to the onset of superconductivity in response to incident radiation comprising:

- a high T_c superconducting circuit element means comprising a thermally conductive substrate of material with a crystalline structure and lattice spacing substantially the same as that of copper oxide high T_c superconductors so as to support the epitaxial growth of said copper oxide superconductors thereon, and further comprising a layer of copper oxide superconductor epitaxially formed on said thermally conductive substrate, said circuit element means shaped so as to have a central detection portion and at least two thermally conductive attachment portions connected to said detection portion;
- a silicon base forming a reference cooling bath means;
- a thermally conductive bonding layer between said base and said attachment portions;
- an opening in said base positioned to thermally isolate said detection portion from said base and form a thermally conductive path only through said attachment portions to said base; and
- means to monitor the resistance of said circuit element means as an indicator of the incidence of radiation on said detection portion.

5,090,820

WHEEL FOR ROLLING DRAWER GUIDES

Horst Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

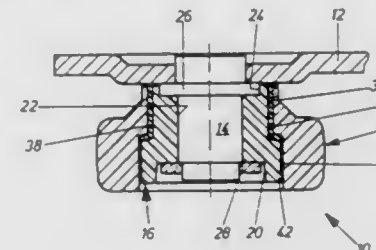
Filed Jul. 11, 1990, Ser. No. 551,620

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1989, 3922716

Int. Cl.⁵ F16C 29/04

U.S. Cl. 384—19

18 Claims



1. Wheel for drawer guides, which has a wheel body made from a material of stable shape and journaled on a wheel axle, in which body at least one recess is provided, in which a material is disposed that is softer in comparison to the wheel body and permits resilient deformation, an elastomeric plastic, charac-

terized in that the shape-staple wheel body has a hub (16) journaled on the wheel axle and a separate rim (18) surrounding the hub (16) concentrically and at a radial distance, that the recess is formed by the interstice (36) defined by the radially outer circumferential surface of the hub (16), and by the radially inner circumferential surface of the rim, and that the hub (16) and the rim (18) are held concentrically with one another by an interlayer (38) of the softer, resiliently deformable material disposed in the interstice (36) wherein the rim (18) is mounted nonrotatably on the interlayer (38) and the interlayer is mounted nonrotatably on the hub (16), and a number of groove-like recesses (34'; 44; 134'; 144) running parallel to the wheel's axis of rotation are provided in the confronting circumferential surface of the hub (16) and/or the rim (18).

5,090,821

ROLLER BEARING AND ROLLER TYPE LINEAR GUIDE APPARATUS

Toru Tsukada, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

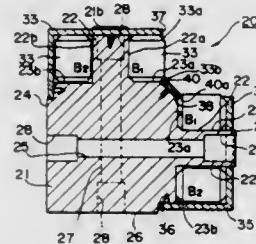
Filed Feb. 22, 1991, Ser. No. 660,342

Claims priority, application Japan, Feb. 28, 1990, 2-19958[U]; Feb. 28, 1990, 2-19959[U]

Int. Cl.⁵ F16C 29/06

U.S. Cl. 384—44

6 Claims



1. In a roller type linear guide apparatus having a guide rail extending in an axial direction, and a slider supported by the guide rail through at least a pair of roller bearings so that the slider moves in the axial direction through rolling of rollers of the roller bearing, the improvement comprising:

- the guide rail having a pair of V-shaped roller rolling grooves formed in both lateral side surfaces thereof so that the V-shaped grooves open laterally and outwardly;
- the slider having a pair of V-shaped bearing mounting grooves formed in inner surfaces of both side walls thereof so that the pair of V-shaped bearing mounting grooves respectively confront the pair of V-shaped roller rolling grooves of the guide rail; and
- the pair of roller bearings each having two rows of infinitely circulating roller rows respectively mounted in the pair of V-shaped bearing mounting grooves of said slider, wherein in each of the roller bearings, two circulation surfaces for the two rows of infinitely circulating roller rows are formed to intersect in a V shape, and the loaded rollers of one row of the two roller rows roll on one inclined surface of the V-shaped roller rolling groove of the guide rail and the loaded rollers of the other row of the two roller rows roll on the other inclined surface of the V-shaped roller rolling groove of the guide rail.

5,090,822

BEARING ARRANGEMENT FOR HIGH-SPEED SHAFTS

Rudolf Scheffel, Godesroth, Fed. Rep. of Germany, assignor to Gesellschaft für Kernverfahrntechnik m.b.H., Jülich, Fed. Rep. of Germany

Filed Jul. 31, 1968, Ser. No. 754,528

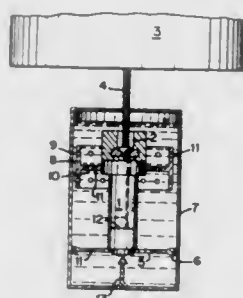
Int. Cl.⁵ F16C 25/00

U.S. Cl. 384—193

8 Claims

1. Bearing arrangement for high-speed shafts comprising: a bearing body taking up the axial and the radial bearing forces, respectively, and supporting a free end of the shaft in a bearing

area, said bearing body being clamped in a fixed support solely by means of at least one elastic, membrane-type element which extends in the radial direction so as to provide for the elastic



return of the bearing body and the shaft to an initial reference position in both axial and radial directions, and the top of the bearing body is provided with a damping pot immersed in a fluid bath.

5,090,823

PEDESTAL WITH TILTING BEARING RACE

G. Harold Lindsey, Tucker; D. Edward Sinyard, Mableton, and Dietrich Hoect H., Loganville, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

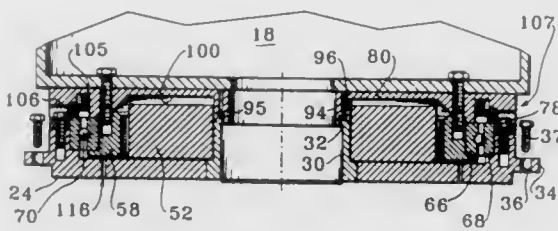
Continuation of Ser. No. 429,279, Oct. 27, 1989, abandoned.

This application Sep. 19, 1990, Ser. No. 587,454

Int. Cl.⁵ F16C 19/10

U.S. Cl. 384—605

8 Claims



- I. A bearing assembly, comprising:
- a bearing having a first race and a second race, each of said races having an inner surface and an outer surface;
 - a load movable with said first race;
 - a support on which said second race is mounted, said support contacting a lower portion of the outer surface of said second race; and
 - a retainer positioned to hold said second race on said support, said retainer contacting an upper portion of the outer surface of said second race;
- said support having a different coefficient of thermal expansion from that of said retainer and that of said bearing, whereby said second race tends to tilt in response to ambient temperature variation.

5,090,824

FAST OPTICAL SWITCH HAVING REDUCED LIGHT LOSS

Bruce N. Nelson, South Boston, and Ronald F. Cooper, Littleton, both of Mass., assignors to Geo-Centers, Inc., Newton Centre, Mass.

Filed Jul. 31, 1990, Ser. No. 560,128

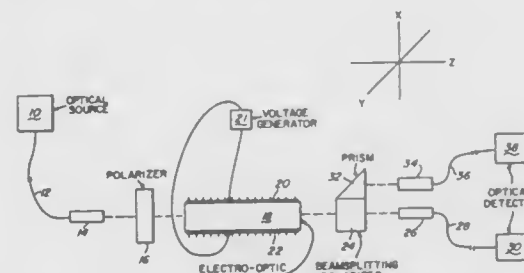
Int. Cl.⁵ G02B 6/10

U.S. Cl. 385—22

31 Claims

1. An electrically controlled optical switch comprising: an electro-optic crystal means for receiving a light beam having at least one light path through the crystal means and a set of fast and slow optical axes for each respective

light path and exhibiting electric field induced birefringence such that a light beam passing through the crystal means along a light path and having a plane of polarization oriented along a first direction may be switched to a plane of polarization oriented along a second direction; and



first light beam directing means disposed at the other end of the crystal means for transmitting a light beam passing through the crystal means along the light path and having a plane of polarization oriented along the first direction differently from a light beam passing through the crystal means along the light path and having a plane of polarization oriented along the second direction.

5,090,825

STABILIZER FOR A FLOATING PLATEN

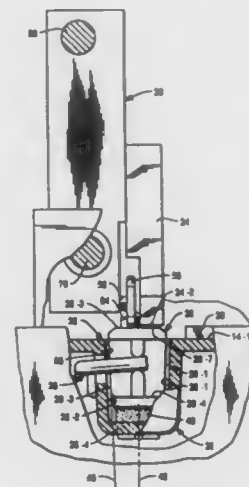
Richard A. Merriman, Jr., Dayton, and Howard B. Mayfield, Miamisburg, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 21, 1991, Ser. No. 672,793

Int. Cl.⁵ B41J 11/20

U.S. Cl. 400—58

8 Claims



1. An apparatus comprising: a print head having a printing face and an associated forms compensation member; and a floating platen comprising:
- a channel having first and second side walls and a bottom;
 - a platen having a printing surface, with said platen located in said channel;
 - resilient means biasing the platen away from the bottom of the channel towards said forms compensation member; and
 - a stabilizer means secured to said platen and cooperating with one of said first and second side walls to maintain said printing surface in parallel relationship with said printing face.

5,090,826

PRINTING WITH AUTOMATIC ON PAGE TEXT REPLACEMENT WITHOUT CHANGING MEMORY

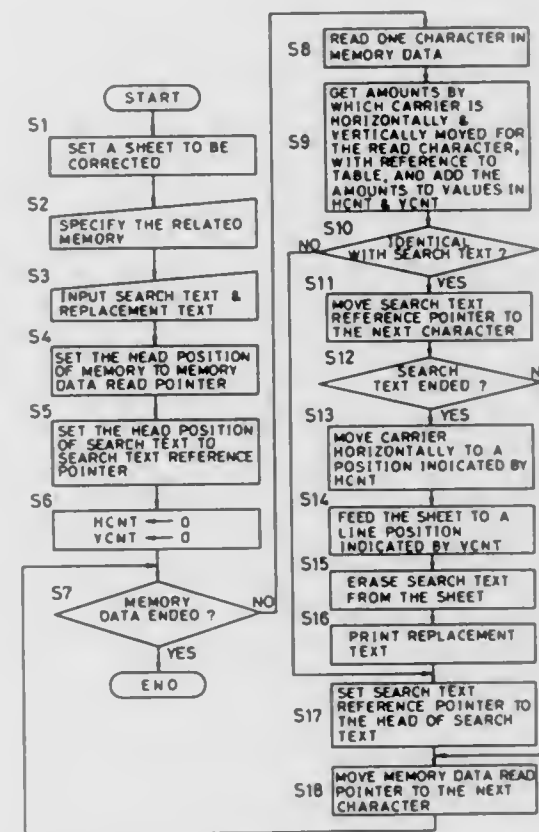
Hirohito Morioka, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1989, Ser. No. 394,019

Claims priority, application Japan, Aug. 26, 1988, 63-212756 Int. Cl.⁵ B41J 5/30, 29/26

U.S. Cl. 400—63

6 Claims



1. A method of printing with automatic text replacement, comprising the steps of:
- specifying a memory;
 - setting a sheet of paper, on which a stored character string stored in the memory specified has been printed, into a printer having a carrier;
 - inputting a search text character string into a search text storage buffer and a replacement text character string into a replacement text buffer and storing them;
 - retrieving the stored character string from memory from the beginning or end of the stored character string one character after another, and comparing the retrieved character with the search text so as to recognize whether the stored character string has an element identical with the search text;
 - calculating and storing a position on said printed sheet each time the retrieving is performed;
 - moving the carrier to the stored position calculated when the stored character string has an element identical with the search text;
 - erasing a portion of the printed sheet to create a blank space where the element identical with the search text is printed; and
 - printing the replacement text in the blank space from which the element has been erased, without changing the contents of the memory.

5,090,827
MECHANISM FOR MOVING THERMAL HEAD ON CARRIAGE

Hirofumi Hirano, Yokohama, and Akihiko Sukigara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 133,385, Dec. 15, 1987, abandoned.

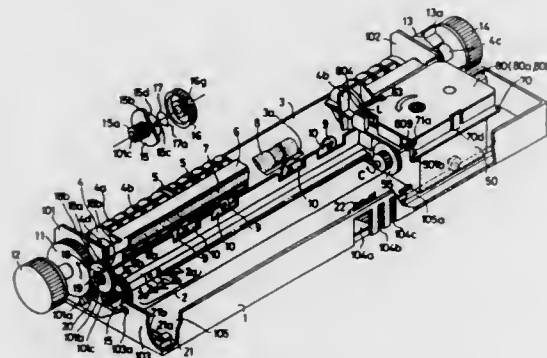
This application Sep. 11, 1990, Ser. No. 581,081

Claims priority, application Japan, Dec. 27, 1986, 61-312655; Dec. 27, 1986, 61-312661; Dec. 27, 1986, 61-312662; Dec. 27, 1986, 61-312663; Dec. 27, 1986, 61-312664; Dec. 27, 1986, 61-312665

Int. Cl.⁵ B41J 25/308

U.S. Cl. 400—185

24 Claims



1. A printer comprising:

a recording head for recording on a recording sheet;
support means capable of reciprocating motion along a transport path of said recording sheet for supporting said recording head in such a manner that said recording head is capable of up-down motion;

ink sheet winding means for winding an ink sheet having ink thereon;

recording sheet transport means for transporting said recording sheet;

a motor provided on said support means rotatable in forward and reverse directions;

control means for controlling the forward and reverse rotation of said motor;

first drive transmission means for moving said recording head from an up-position to a down-position and from a down-position to an up-position in response to the rotation of said motor once in a reverse direction and then in a forward direction;

second drive transmission means for driving said winding means in response to rotation of said motor; and

third drive transmission means for driving said recording sheet transport means in response to rotation of said motor, wherein said first drive transmission means is capable of moving said recording head between the up-position and the down-position at any point along the transport path and said support means is stationary when said motor moves once in a reverse direction.

5,090,828
APPARATUS FOR REPLENISHING A DEPLETED INK SHEET

Hidetsugu Shimura, and Hajime Kurihara, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Division of Ser. No. 312,000, Feb. 17, 1989. This application Feb. 23, 1990, Ser. No. 483,834

Claims priority, application Japan, Feb. 18, 1988, 63-36114; Feb. 18, 1988, 63-36116

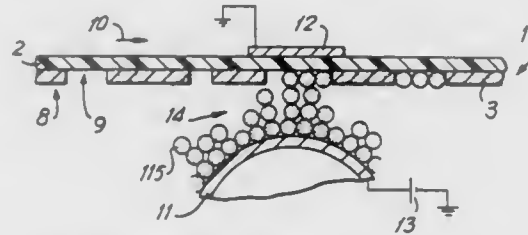
Int. Cl.⁵ B41J 31/16

U.S. Cl. 400—197

31 Claims

7. An apparatus for replenishing ink transferred from an ink layer of an ink transfer sheet including a conductive ink layer on a dielectric layer, comprising:

replacement ink supply means for supplying electrically conductive replacement ink to a depleted ink layer; and
charge supply means for inducing an electric charge in the replacement ink supplied to the depleted ink layer and



inducing an opposite charge at the side of the dielectric layer opposite the ink layer so that replacement ink from the supply means will be transferred electrostatically to depleted portions of the ink sheet.

5,090,829
METHOD AND APPARATUS FOR MONITORING PRINT HEAD CARRIAGE

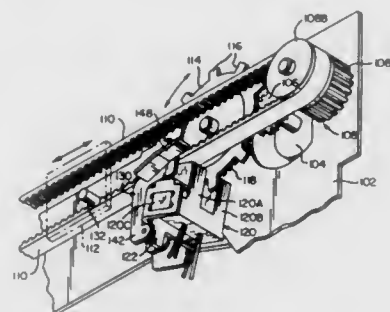
James W. Lee, Groton; Michael A. Ditonto, Cortland, and Dale W. Roddy, Candor, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 17, 1991, Ser. No. 642,499

Int. Cl.⁵ B41J 29/42, 29/38

U.S. Cl. 400—705.1

25 Claims



1. Print head carriage monitoring apparatus for use in a printer including a print head carriage, said apparatus comprising:

monitoring means separate from but moveable in coordination with the carriage and including single sensor means for generating an alternating signal indicating movement of the carriage; and

carriage position indicating means coupled to said monitoring means for activating said monitoring means to interrupt said alternating signal when the carriage is in at least one defined position, the carriage including control means for operating said carriage position indicating means when the carriage reaches said at least one defined position.

5,090,830
PRINTER HAVING SINGLE CONNECTOR FOR PARALLEL AND SERIAL INTERFACES

Wilbert L. Kroeger, Lexington, Ky.; John R. Ripley, and Bruce R. Wood, both of Austin, Tex., assignors to Lexmark International, Inc., Greenwich, Conn.

Continuation of Ser. No. 363,560, May 22, 1989, abandoned, which is a continuation of Ser. No. 164,925, Mar. 7, 1988, abandoned. This application Apr. 6, 1990, Ser. No. 506,515

Int. Cl.⁵ G06F 3/12

U.S. Cl. 400—719

3 Claims



1. A printer having integral with said printer for communication external of said printer one connector for a single cable, said printer communicating through said connector in a parallel mode and a serial mode of communication, said connector having no more than 36 effective contacts, said contacts being located in two adjacent columns and being assigned for purposes of reference as number 1 adjacent number 19 on one end of said columns, number 2 adjacent number 20 next in sequence in said columns, with numbers assigned to the other of said contacts likewise in sequence, and having individual contacts for the following signals used in said parallel mode of communication: strobe on contact 1, eight data signals on contacts 2 through 9, acknowledge on contact 10, busy on contact 11, printer out of paper on contact 12, printer selected on contact 13, logic ground on one or more of contact 16 and contacts 19 through 30, initialize the printer controller on contact 31, and printer error on contact 32; and also having individual contacts used in said serial mode of communication consisting only of the following signals for serial communications: transmit data on contact 15, request to send on contact 18, logic ground on one or more of contact 16 and contacts 19 through 30, receive data on contact 33, data terminal ready on contact 34, data set ready on contact 35, and clear to send on contact 36, all of said individual contacts except individual contacts used for ground being used only for one of said modes of communication, said printer in said parallel mode ignoring a parallel-mode signal on said contact for said clear to send signal.

5,090,831
WRITING INSTRUMENT

Hidehei Kageyama, Yoshitake Mitsuya, and Youichi Nakazato, all of Saitama, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Division of Ser. No. 377,271, Jul. 10, 1989, Pat. No. 5,018,891.

This application Dec. 11, 1990, Ser. No. 625,489

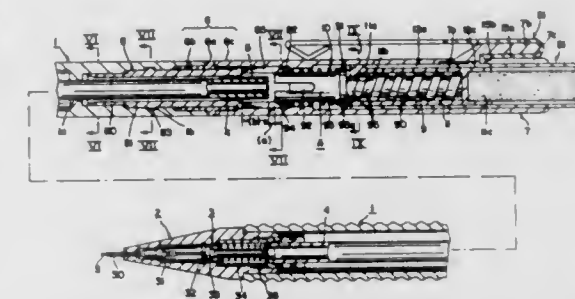
Int. Cl.⁵ B43K 29/02

U.S. Cl. 401—52

2 Claims

1. A writing instrument comprising:
an outer tube into which a lead pipe is axially slidably inserted, said outer tube having a rear end of which inner peripheral surface is formed into a polygonal shape;
a connector having a fore end of which outer peripheral surface is formed into a polygonal shape, and a rear end, fitting detachably between said fore end of the connector and said rear end of the outer tube being attained by inserting said fore end of the connector into said rear end of the outer tube;
a rear cap to which said rear end of the connector is rotatably connected for rotatably connecting between said outer tube and said rear cap;
an eraser guide member axially slidably receivable within

said rear cap, said eraser guide member having an axial guide groove formed therein;
an eraser receiving member axially slidably receivable within said eraser guide member for supporting an eraser, said eraser receiving member having a deformable portion deformable in a diametric direction, said deformable portion having an outward diametric projection formed



thereon, said outward diametric projection being axially slidably receivable within said axial guide groove of said eraser guide member;

a spiral member contained in said rear cap and threadingly engageable of a diametric projection of said eraser receiving member, said spiral member being detachably connected to said outer tube through said connector for rotation with said outer tube relative to said rear cap.

5,090,832
DISPOSABLE CLEANING PAD AND METHOD

Ligia A. Rivera, New Brunswick; Charles E. Buck, Caldwell, and Robert C. Roga, Spotswood, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

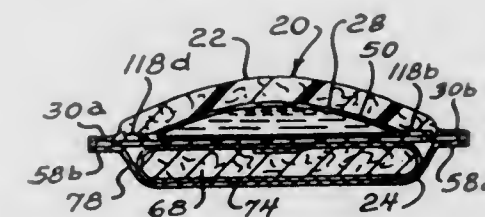
Continuation of Ser. No. 861,904, May 12, 1986, abandoned.

This application Mar. 30, 1988, Ser. No. 176,105

Int. Cl.⁵ A46B 11/02; A47L 13/17

U.S. Cl. 401—132

2 Claims



1. A disposable pad, comprising: a scrubber layer of coarse, resilient, porous, flexible material with wet strength to scrub a soiled surface, said scrubber layer having a front surface for contacting the soiled surface, and a rear surface;

a liquid impervious sheet substantially coextensive with the rear surface of the scrubber layer;

a blotter layer of absorptive material extending over and secured to the sheet on the side opposite the scrubber layer; and

rupturable packet means having a pair of imperforate opposed walls and containing liquid active material disposed intermediate the sheet and the scrubber layer, said packet means containing sufficient active material to saturate the scrubber layer when ruptured;

wherein the packet means has a seal extending around the periphery of the packet means, with a portion of the seal being strong and a remaining portion of the seal being weak such that it ruptures when pressure is applied to the packet means.

5,090,833

DEVICE FOR CONNECTING A MOTOR VEHICLE STEERING COLUMN TO A SHAFT JOURNAL OF A STEERING GEAR TRAIN

Max Oertle, Mauren, and Stefan Miescher, Schaan, both of Liechtenstein, assignors to Etablissement Supervis

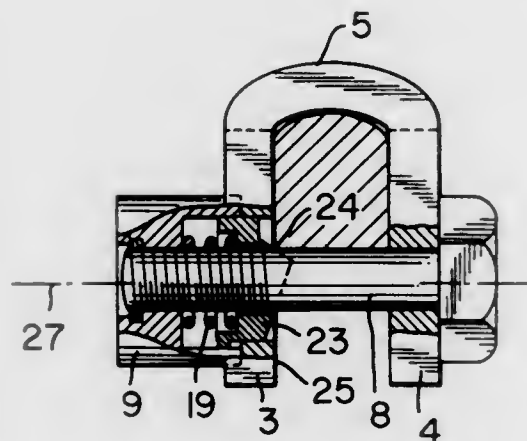
Filed Mar. 4, 1991, Ser. No. 664,040

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1990, 4006787

Int. Cl.⁵ B65D 39/00

U.S. Cl. 403—12

15 Claims



1. A device for connecting a motor vehicle steering column to a shaft journal (12) of a steering gear train, wherein the device comprises a coupling piece (1) having a first direction (A) with the coupling piece being U-shaped transversely of the first direction, said coupling piece (1) arranged to be articulated to the steering column for pivotal movement about an axis (2) extending transversely of the first direction, said U-shaped coupling piece (1) having a pair of laterally spaced sides (3, 4) and a bight section (5) extending between and interconnecting said sides, a bore (7) in at least one of said sides, a lock bolt (16) secured against turning in said bore, said sides (3, 4) each have a first side surface facing one another and a second side surface facing in the opposite direction, a stop formed in said lock bolt and arranged to contact the second side surface of the one of said sides (3), a spring (19) pressing said stop (22) of said lock bolt (16) against said second side surface, said lock bolt has a first end surface facing the other one of said sides and a second end surface facing in the opposite direction, and said first end surface (23, 24) of said lock bolt (16) has an axis extending in a second direction transversely of the first direction with said axis traversing said first end surface (23, 24) from a first point to a diagonally opposite second point on an outer circumferential periphery of said first end surface of said lock bolt with the first point being more remote from said bight section than said second point, said first end surface (23, 24) has a wedge-shaped configuration extending in the second direction and when said stop of said lock bolt is pressed against the one of said sides said wedge-shaped first end surface has a first bevel section inclined from the first point inwardly from the one of said sides in the second direction toward said bight section, wherein the improvement comprising that said wedge-shaped first end surface has a second bevel section inclined from the second point inwardly of the one of said sides in the second direction away from said bight section, and said first and second bevel sections (23, 24) each having an angle of inclination relative to the first side surface of said one of said sides and the angle of inclination of said second bevel section being greater than the angle of inclination of said first bevel section.

5,090,834

CONNECTION ARRANGEMENT AND METHOD OF FORMING THE SAME

Yoshimi Yamamoto, Shizuoka, Japan, assignor to Fuji Kiko Company, Limited, Tokyo, Japan

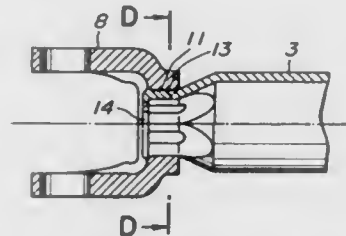
Filed Feb. 28, 1989, Ser. No. 316,974

Claims priority, application Japan, Feb. 29, 1988, 63-46543

Int. Cl.⁵ B25G 3/28

U.S. Cl. 403—277

6 Claims



1. An improved coupling structure comprising:
a member having a shaped aperture therein, with said shape being such as to have an essentially continuous peripheral wall which is free from sharp angles and corners wherein said shape has a curved, regularly undulating shape;
a hollow shaft; and
an end portion on said hollow shaft, said end portion being inserted into said aperture and worked in a manner wherein the periphery of said end portion is in intimate contact with the periphery of said aperture and the end of said end portion is combined with said member in a manner to be press fitted to the inner periphery of said shaped aperture so that a permanent connection is obtained between said end portion of said hollow shaft and the inner periphery of said shaped aperture and to provide an improved connection therebetween.

5,090,835

PICTURE FRAME CONNECTING SYSTEM

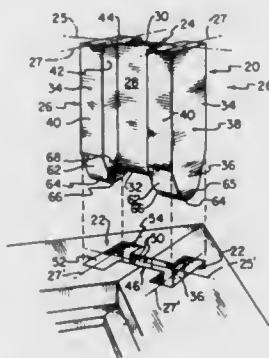
Eugene J. Cox, 9632 Farr La., Richmond, Va. 22325

Filed Dec. 11, 1989, Ser. No. 453,065

Int. Cl.⁵ F16B 7/00

U.S. Cl. 403—294

20 Claims

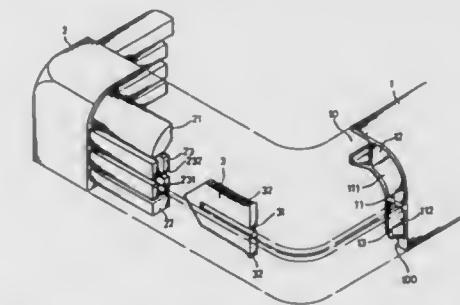


1. A picture frame connecting system, comprising:
a) a plurality of perimeter frame members adapted to be joined one to another in a picture frame configuration, each frame member having end portions with mitered end surfaces, with the frame members being adapted to be positioned with the end surfaces of adjacent end portions positioned against one another at a related inner location;
b) said end portions each being formed with a recess comprising:
i. a leg recess portion which has an inner end that opens to the end surface of the related end portion and an outer end, and also has side leg recess surface portions which extend along a leg axis and define said leg recess portion; ii. a cross recess portion which has a lengthwise cross axis which extends generally transversely to the leg axis, said cross recess portion connecting to the outer end of the leg recess portion and extending laterally therefrom, said cross recess portion having a first inwardly positioned recess surface portion which extends laterally from the leg recess portion, a second outwardly positioned recess surface portion facing said first recess surface portion, and third and fourth oppositely positioned side recess surface portions; c) said recess being configured as follows:
i. the side leg recess surface portions being spaced from one another by a first leg width recess dimension;
ii. the third and fourth side surface portion being spaced from one another by a second cross recess transverse dimension;
d) the recesses of adjacent end portions of two frame members being positioned in a manner that with the two frame members in the frame configuration, the leg recess portions of the adjacent end portions are made up of the leg recess portions of the adjacent end portions;
e) at least one connecting member adapted to fit into a pair of adjacent recesses, said connecting member comprising a leg member configured to fit in the connecting recess area and two cross members configured to fit into the cross recess portions of the adjacent recesses, each cross member having an inner surface which contacts said first inwardly positioned recess surface portion during insertion;
f) the distance between said first inwardly positioned recess surface portions when said frame members are joined being substantially equal to the distance between the inner surfaces of the two cross members;
g) said leg member having side surfaces and a leg width dimension which is equal to a distance between said side surfaces;
h) each cross member having two side surfaces spaced transversely from one another by a transverse cross member dimension;
i) said leg width dimension being less than the first leg width recess dimension by a predetermined leg dimension gap, and said second cross recess dimension being greater than said transverse cross member dimension by a predetermined cross dimension gap, said leg dimension gap and said cross dimension gap being sufficiently great so that the connector positioned in the adjacent recesses permits limited rotational movement of one frame member with respect to an adjacent frame member within a plane defined by the adjacent end surface portions of the two end members while said connector firmly holds said end surface portions together, said limited rotational movement relieving any twisting stress generated along the individual frame members during insertion of said connector.

extend along a leg axis and define said leg recess portion;

- ii. a cross recess portion which has a lengthwise cross axis which extends generally transversely to the leg axis, said cross recess portion connecting to the outer end of the leg recess portion and extending laterally therefrom, said cross recess portion having a first inwardly positioned recess surface portion which extends laterally from the leg recess portion, a second outwardly positioned recess surface portion facing said first recess surface portion, and third and fourth oppositely positioned side recess surface portions;
- c) said recess being configured as follows:
 - i. the side leg recess surface portions being spaced from one another by a first leg width recess dimension;
 - ii. the third and fourth side surface portion being spaced from one another by a second cross recess transverse dimension;
- d) the recesses of adjacent end portions of two frame members being positioned in a manner that with the two frame members in the frame configuration, the leg recess portions of the adjacent end portions are made up of the leg recess portions of the adjacent end portions;
- e) at least one connecting member adapted to fit into a pair of adjacent recesses, said connecting member comprising a leg member configured to fit in the connecting recess area and two cross members configured to fit into the cross recess portions of the adjacent recesses, each cross member having an inner surface which contacts said first inwardly positioned recess surface portion during insertion;
- f) the distance between said first inwardly positioned recess surface portions when said frame members are joined being substantially equal to the distance between the inner surfaces of the two cross members;
- g) said leg member having side surfaces and a leg width dimension which is equal to a distance between said side surfaces;
- h) each cross member having two side surfaces spaced transversely from one another by a transverse cross member dimension;
- i) said leg width dimension being less than the first leg width recess dimension by a predetermined leg dimension gap, and said second cross recess dimension being greater than said transverse cross member dimension by a predetermined cross dimension gap, said leg dimension gap and said cross dimension gap being sufficiently great so that the connector positioned in the adjacent recesses permits limited rotational movement of one frame member with respect to an adjacent frame member within a plane defined by the adjacent end surface portions of the two end members while said connector firmly holds said end surface portions together, said limited rotational movement relieving any twisting stress generated along the individual frame members during insertion of said connector.

gated block adapted to engage the lower compartment of the hollow plate, the plurality of elongated blocks forming a vertical slot and a horizontal slot; and an expansion block substantially rectangular-shaped having a slot therein, the block having upper and lower edges with wave-like gripping portions and end portions of the



edges provided with tapered hook portions, one end of the expansion block engaging the vertical slot formed by the plurality of elongated blocks, and one of the walls of the hollow plate engaging the slot in the expansion block at the opposite end of the expansion block in order to secure the hollow plate to the connecting element.

5,090,837

PERMANENT FASTENER-FREE POLE JOINT

Barry D. Mower, Riverdale, Utah, assignor to Lifetime Products, Inc., Clearfield, Utah

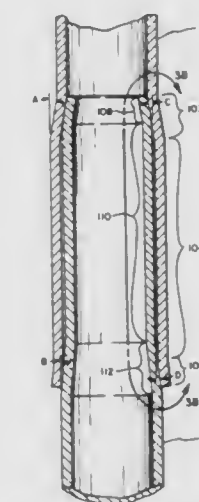
Continuation-in-part of Ser. No. 257,755, Oct. 14, 1988,

abandoned. This application Oct. 16, 1989, Ser. No. 421,584

Int. Cl.⁵ F16B 7/00

U.S. Cl. 403—334

51 Claims



1. A joint structure for joining a first pole member and second pole member in friction tight engagement each being tubular and having substantially the same outer dimension and substantially constant wall thickness along their length, the pole joint resisting rotational movement, inadvertent disassembly, and lateral deflection, the joint structure comprising:
a first diverging segment configured along a portion of the inner surface of the first pole member spaced from a first end of the first pole member, the first end forming a female component of the joint structure, the wall thickness of the first pole member being substantially constant at the first diverging segment;
a first converging segment configured along a portion of the outer surface of the second pole member adjacent to a second end of the second pole member, the second end

U.S. Cl. 403—295

1 Claim

1. An improved structure of a connecting joint for a case comprising:
a hollow plate having a curved surface and being partitioned into an upper engaging slot, a lower engaging slot, and an upper compartment and a lower compartment formed by walls therein;
a right-angled connecting element having a plurality of elongated insertion blocks including an upper elongated block substantially triangular-shaped adapted to engage the upper compartment of the hollow plate, a lower elongated block adapted to engage the lower compartment of the hollow plate, the plurality of elongated blocks forming a vertical slot and a horizontal slot; and
an expansion block substantially rectangular-shaped having a slot therein, the block having upper and lower edges with wave-like gripping portions and end portions of the edges provided with tapered hook portions, one end of the expansion block engaging the vertical slot formed by the plurality of elongated blocks, and one of the walls of the hollow plate engaging the slot in the expansion block at the opposite end of the expansion block in order to secure the hollow plate to the connecting element.

forming a male component of the joint structure, the wall thickness of the second pole member being substantially constant at the first converging segment, the angle of divergence of the first diverging segment and the angle of the first converging segment being such that at least a circular contact occurs between the inner surface of the first diverging segment and the outer surface of the first converging segment such that the mating of the first diverging and first converging segments forms a first contact friction tight for the pole joint structure;

a second diverging segment configured along a portion of the inner surface of the first pole member positioned adjacent the first end of the first pole member, said first and second diverging segments diverging a selected amount so that their combined lateral divergence is equal to not more than one wall thickness of the pole members; and
a second converging segment configured along a portion of the outer surface of the second pole member spaced a distance from the second end of the second pole member, the angle of divergence of the second diverging segment and the angle of convergence of the second converging segment being such that at least an annular contact occurs between the inner surface of the second diverging segment and the outer surface of the second converging segment such that when the second end of the second pole member is inserted into a female component provided on the first pole member, a friction tight pole joint is formed which is able to resist rotational movement, inadvertent disassembly, and lateral deflection.

5,090,838

MODULAR ROOF PANEL ASSEMBLY AND LOCKING APPARATUS FOR A MODULAR PANEL SYSTEM USED IN CONSTRUCTING RELOCATABLE BUILDINGS

Michael Baldino, Omaha, and Daniel L. Kelsay, Fremont, both of Nebr., assignors to Kelly Industries, Fremont, Nebr.

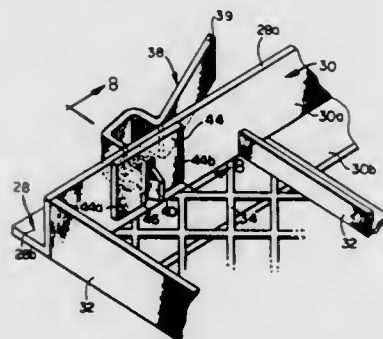
Division of Ser. No. 415,007, Sep. 29, 1989. This application Apr.

19, 1991, Ser. No. 688,028

Int. Cl.⁵ B25G 3/36

U.S. Cl. 403—388

3 Claims



1. An apparatus for lockably securing a first elongated member to a second elongated member, said members each including at least a first portion and a second portion, said first portion of each member including at least one aperture there-through, said first portion of said first member being in engagement with said first portion of said second member such that said apertures are in registry, said apparatus comprising:

a key member including a head portion for being positioned within said apertures for connecting said first and second members together, said key member being rotated between a first position wherein said first and second members are not secured together and a second position wherein said first and second members are secured together; and

locking means for locking said key member in said second position whereby said first and second members are lockably secured together, said locking means comprising a separate generally rigid member having notch means therein, said head portion being positioned within said

notch means when said key member is in said second position such that when said key member is rotated said rigid member engages one of said first or second members to prevent the rotation of said rigid member and said key member with respect to said first and second members to thereby securely lock said key member in said second position.

5,090,839

SUPPORTING DEVICE FOR A STEERING MECHANISM

Ulf W. Näslund, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

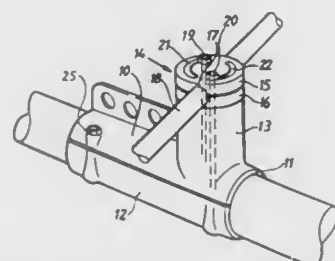
Filed May 2, 1990, Ser. No. 518,085

Claims priority, application Sweden, Mar. 13, 1989, 8900741

Int. Cl.⁵ F16B 7/04

U.S. Cl. 403—391

3 Claims



1. In a supporting device for a handle bar (18) of a clearing saw provided with a drive shaft tube connecting a driving engine at one end of the tube to a cutting tool at the other end, where on portion of the device, shaped as a body having semi-cylindrical portions (10,12) surrounding the drive shaft tube, and a second portion, shaped as a column (13), carries a tube clamp (14) surrounding said handle bar (18), the improvement comprising a plurality of screws (19,20,25) for fastening the tube clamp in an arbitrary angle position on the column and the tube, at least one of said screws (19,20) securing together said semi-cylindrical portions (10,12), said tube clamp (14) including a pair of washers (15,16) each having a pair of oblong, arched slots, at least a pair of said screws extending through said arched slots of said washers, each of said washers having a semi-cylindrical recess (17) adapted to receive said handle bar.

5,090,840

PRINTED CIRCUIT BOARD MOUNTING APPARATUS

Frank J. Cosenza, Santa Barbara, Calif., assignor to VSI Corporation, Chantilly, Va.

Filed Oct. 9, 1990, Ser. No. 594,756

Int. Cl.⁵ B25G 3/00

U.S. Cl. 403—409.1

11 Claims

1. An apparatus for locking a printed circuit board within an elongated slot in a rack comprising:

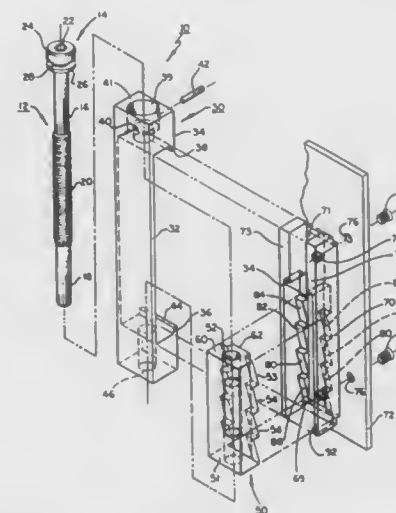
a first member comprising an elongated, flexible portion terminating in first and second end portions, a channel being formed by said member portions;

a driving member having a bottom wall portion and first and second wall portions extending vertically from said bottom wall, at least one inclined surface extending from said bottom wall portion;

a driven member having at least one inclined surface, said driven member being positioned in the channel formed in said driving member to form an assembly, the members being positioned such that the inclined surfaces therein are in engagement, said assembly being positioned in the channel formed in said first member; and

a screw interconnecting said driven member, rotation of the screw in a first direction drawing said driven member in a manner such that the inclined surface therein moves along

the corresponding inclined surface in said driving member whereby the flexible portion of said first member is de-



flected transversely from an initial position to lock a printed circuit board within an elongated slot in a rack.

5,090,841

BOAT LIFT

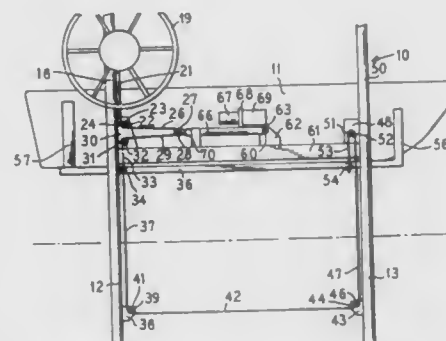
Clarence A. Penick, Jr., Hudson, and Darrel Walters, Angola, both of Ind., assignors to Brammell, Inc., Angola, Ind.

Filed Sep. 6, 1990, Ser. No. 578,141

Int. Cl.⁵ B63C 3/06

U.S. Cl. 405—3

2 Claims



1. A boat lift which can selectively be operated manually or by power comprising a frame with first and second end portions, a manual wheel and capstan rotatably mounted on said frame, a boat carriage with first and second end portions mounted between said frame, a cable with one end attached to the first end portion of said boat carriage, a first pulley rotatably attached to an upper portion of said first end portion of said frame and said cable passing thereover, a second pulley rotatably attached to a lower portion of said first end portion of said frame and said cable passing from said first pulley through said second pulley, a third pulley rotatably attached to a lower portion of said second end portion of said frame and said cable passing from said second pulley through said third pulley, a fourth pulley rotatably attached to an upper portion of said second end portion of said frame and said cable extending from said third pulley to said fourth pulley and attached to the second end portion of said boat carriage between said third and fourth pulleys, a fifth pulley rotatably attached to said upper portion of said second end portion of said frame above said fourth pulley and said cable extending between said fourth and fifth pulleys, said cable extending from said fifth pulley to said capstan and attached thereto, a hydraulic cylinder with a moveable piston and piston rod attached to said frame, a sixth

pulley attached to the free end of said piston rod and said cable between said fourth and fifth pulleys passing over said sixth pulley such that when said hydraulic cylinder is actuated to move said piston rod said boat carriage can be moved up and down relative to said frame.

5,090,842

BOAT LIFT APPARATUS AND SYSTEM

David M. Montgomery, 8912 Crestwood Dr., Fort Worth, Tex. 76179

Continuation-in-part of Ser. No. 490,484, Mar. 8, 1990, Pat. No.

4,983,067. This application Jan. 7, 1991, Ser. No. 638,202

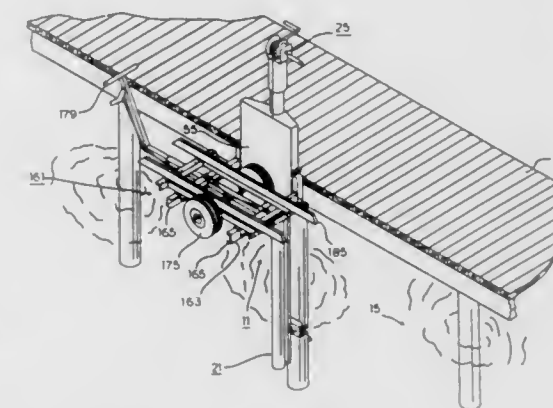
The portion of the term of this patent subsequent to Jan. 8, 2008,

has been disclaimed.

Int. Cl.⁵ B63C 3/06

U.S. Cl. 403—3

19 Claims



1. A lift system, comprising:

a) an elongated load member comprising a rail portion and mounting means, said load member also comprising coupling means for coupling said mounting means to said rail portion, said rail portion having a section that is free of said mounting means and said coupling means;

b) a lift cradle mounted onto said rail portion such that said lift cradle can slide along said rail portion, said lift cradle having bearing means for sliding along said rail portion, said bearing means having a gap for receiving said coupling means such that said bearing means can slide along said rail portion section with said mounting means and said coupling means;

c) said lift cradle being capable of rotating about said rail portion when said bearing means is located along said rail portion section that is free of said mounting means and said coupling means;

d) platform means for supporting a load, said platform means allowing said load to be transported away from said lift cradle;

e) securing means for securing and coupling said platform means to said lift cradle such that when said lift cradle lifts said load said platform means is also lifted, said securing means being releasable.

5,090,843

CHEMICAL SEAL FOR WASTE DISPOSAL COVER SYSTEMS

Charles O. Grigsby, 4269 Ridgeway Dr., Los Alamos, N. Mex. 87544

Filed Feb. 15, 1991, Ser. No. 656,762

Int. Cl.⁵ E02D 3/12

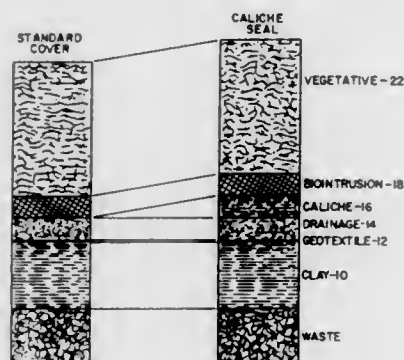
U.S. Cl. 405—129

11 Claims

1. A chemical seal for a landfill, mill or mine tailings site, and other solid waste disposal sites, comprising:

a low-permeability seal layer of a compacted mineral material, selected from the group consisting of calcium carbon-

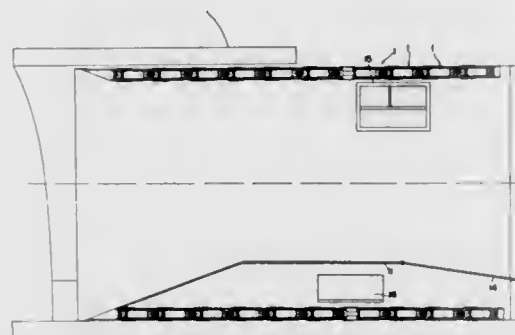
ate, magnesium carbonate, calcium sulfate, and silica, above the solid waste in said disposal sites; and a layer of soil materials above said layer of mineral material,



said soil layer having a thickness equivalent to the depth of formation of a natural analogue layer of said mineral material under the climatic conditions found at the locality of the cover being installed.

5,090,844
PLANT FOR DIGGING AND SHORING UP THE WALLS OF TUNNELS DURING EXCAVATION
Doriano Pacchiosi, No. 9, Via Serraglio Barbù-Frazzone Col-taro, 43033 Sissa, Italy
Filed Aug. 30, 1990, Ser. No. 575,447
Int. Cl.⁵ E21D 9/00

U.S. Cl. 405—145



1. A plant for digging and shoring up the walls of tunnels during their excavation, comprising a self-propelled extendible modular structure affording temporary support to the excavated tunnel walls, said plant structure being extendible while carrying all such equipment as may be used in excavating the tunnel and removing the spoil, said plant structure advancing and driving through the ground without the assistance of fixed thrust bearings, but exploiting exclusively its own mass and lateral friction generated between each modular element and the adjacent tunnel wall to provide the force of reaction, said structure including a succession of modular cylindrical elements, each of which comprises a first ring and a second ring that are rigidly interconnected by two annular sheet metal members, a plurality of hydraulic cylinders which are hinged to the first ring and which are inserted into the second ring, said cylinders being encompassed by at least one annular sheet member and including associated extendible rods that are hinged to the first ring of the modular cylindrical element next in succession.

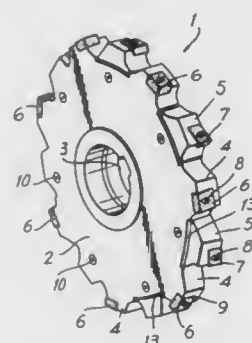
5,090,845
DISC MILL WITH REVERSIBLE CUTTING PLATES AND ADJUSTABLE CUTTING WIDTH
Bernd Bentjens, Schwarzenbek, Fed. Rep. of Germany, assignor to Firma Wulhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Aug. 23, 1990, Ser. No. 572,464
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929007

Int. Cl.⁵ B26D 1/12

U.S. Cl. 407—52

12 Claims



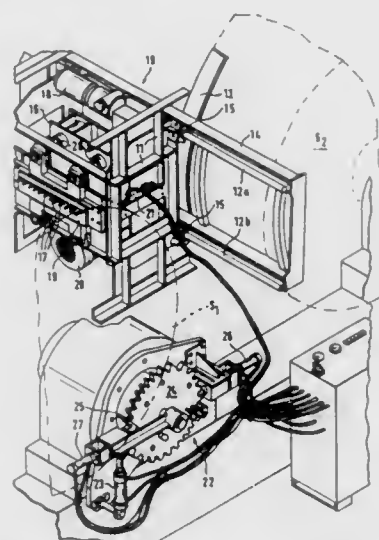
1. A disc mill comprising a base body composed of two discs; a plurality of claw-like posts provided on each of said discs and carrying reversible cutter plates, each of said posts of one of said discs protruding into a chamber between two nearest circumferentially adjacent neighboring posts of the other disc, said posts having outer sides provided with cutter plate chambers, said reversible cutter plates being arranged tangentially staggered and alternately in said cutter plate chambers.

5,090,846
METHOD AND APPARATUS FOR DRILLING OF HOLES INTO THE MANTLE OF A CYLINDER
Jaakko Hakala, Korpilahti, and Eero Savolainen, Jyväskylä, both of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Mar. 12, 1991, Ser. No. 667,825
Claims priority, application Finland, Mar. 19, 1990, 901367
Int. Cl.⁵ B23B 35/00, 41/00

U.S. Cl. 408—1 R

11 Claims



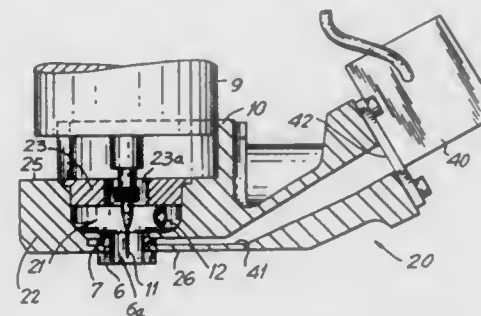
7. An apparatus for drilling holes into a mantle of a cylinder in a paper machine, comprising drilling equipment comprising a main frame and a drilling machine,

guide means for guiding said main frame along a longitudinal axis of the mantle face of a cylinder to be machined as said drilling equipment is moved into a drilling position while said cylinder is maintained in its place of operation in a paper machine, a drill guide for supporting and tensioning said drill equipment between said guide means and the mantle face of the cylinder to be machined, said drilling machine comprising a spindle box having a plurality of drill bits, said drill bits adapted to be rotated by a first drive means, said spindle box comprising a second drive means fitted to displace said spindle box relative to said mainframe when said drill bits are moved toward a mantle face of a cylinder to be machined, said drill bits producing drill holes in the mantle face of said cylinder without said cylinder being detached from its place of operation during the drilling process, said drilling equipment being substantially free from vibration during the drilling process, and further comprising a fastening belt upon which said guide means are supported, said fastening belt adapted to be fastened onto a cylinder adjacent to the cylinder to be machined such that said drilling equipment can be tensioned between the cylinder to be machined and the adjacent cylinder during the drilling process.

5,090,847
PRESSURE FOOT FOR MICROWAVE DRILL DETECTION SYSTEM
Norbert E. Gelston, II, Skaneateles, N.Y., assignor to U.S. Tech Corporation, East Syracuse, N.Y.
Filed May 4, 1989, Ser. No. 347,526
Int. Cl.⁵ B23B 49/00

U.S. Cl. 408—16

22 Claims

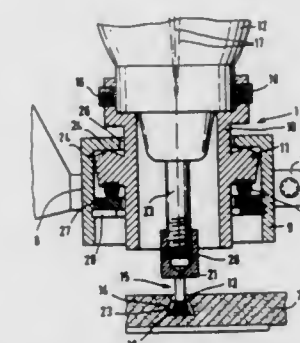


1. A pressure foot for a microwave drill detection system, comprising
a) a metallic base having opposed top and bottom surfaces, the bottom surface having an opening therethrough
b) a cavity in said base having an upper end and a lower end, said bottom surface opening extending to said cavity lower end
c) a metallic cover of pre-determined thickness disposed within said base at said cavity upper end, said cover having a bore therethrough aligned with said opening, whereby a drill bit may be extended through said bore, said cavity and said opening to a position beyond the bottom surface,
d) microwave waveguide means in said base and being adjacent said cavity and having an outlet in microwave energy communication with said cavity through said opening and an inlet remote from said cavity, whereby the microwave energy used for detection is substantially confined within the created cavity, and
e) means for generating a microwave signal through the waveguide means.

5,090,848
DEVICE FOR PRODUCING DRILLED HOLES WITH UNDERCUT
Willi Hang, Freudenstadt-Musbach, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Tümmingen/Waldachtal, Fed. Rep. of Germany
Filed Jan. 23, 1991, Ser. No. 644,834
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1990, 4004485

Int. Cl.⁵ B23B 51/08
U.S. Cl. 408—27

10 Claims



1. A device for producing a drilled hole with an undercut in a facing panel, said device including a drilling machine, a drilling tool having a drilling axis and a front end engagable with the facing panel, said drilling tool being formed with a drilling head at the front end; an adaptor connecting the drilling tool and the drilling machine so that, when said drilling machine is operated, said drilling machine applies a torque to said drilling tool; a sleeve fixedly connected to the drilling machine and having a circumferential collar, said adaptor extending through said sleeve with said drilling tool protruding from the sleeve; a bearing bush for pivotally receiving said sleeve so that said sleeve is pivotable in said bearing bush, said circumferential collar including a first axial end face arranged in linear contact with a wall of the bearing bush; and a resiliently deformable element arranged between an annular disc member connected to said bearing bush and a second axial end face of said circumferential collar opposite to said first axial end face for axially holding said circumferential collar in said bearing bush, said resiliently deformable element projecting beyond said second axial end face of said circumferential collar, said circumferential collar and said sleeve being provided with surfaces and being structured, so that said drilling machine and said sleeve are pivotable by hand so that the drilling tool can be swung out to make the undercut with a gyrating motion.

5,090,849
ROTARY CUTTING TOOL
Tatsuo Arai, Katsumi Haga, Takayoshi Saito, Hidehisa Shiraori, Ryoei Hasegawa, and Kazuo Iizuka, all of Tokyo, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Jun. 29, 1990, Ser. No. 545,626
Claims priority, application Japan, Jul. 4, 1989, 1-172508; Mar. 28, 1990, 2-80159; Jun. 15, 1990, 2-157346
Int. Cl.⁵ B23C 7/00

U.S. Cl. 409—137

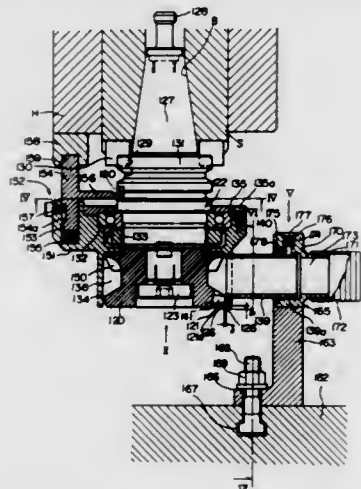
27 Claims

1. A rotary cutting tool for use with at least one cutting insert, a machine tool having a main spindle and a head, at least one table, said head being relatively movable to said table, for securing a workpiece thereon and means for collecting chips having a suction hose for collecting chips generated by said cutting insert, said rotary cutting tool comprising:
a) a cutter body rotatably mounted to said head about a rotational axis and having a forward end, said cutting insert being mounted to an outer periphery of said forward end of said cutter body; and

chip moving means disposed outwardly of an outer peripheral surface of said cutter body for moving chips generated by said cutting insert to a desirable location, said chip moving means including:

means for covering the outer peripheral surface of said cutter body including:

cover-restricting means disposed at said covering means, wherein said cover-restricting means is engageable with said head for said main spindle of said machine tool when said cutter body is mounted to said main spindle and said cover-restricting means restricts said cover means against rotation thereof relative to said head about said rotational axis, wherein said cover-restricting means is engageable with a connecting means, which is



disposed between said head and said cutter body, when said connecting means is demounted from said main spindle so as to restrict said cover means against rotation thereof relative to said cutter body about said rotational axis;

a chip accommodating chamber defined between an inner peripheral surface of said cover means and the outer peripheral surface of said cutter body;

at least one exhaust pipe connected to said chip accommodating chamber; and

hose holding means mounted on said table for detachably holding said suction hose of said chip collecting means and coupling means disposed in at least one end of said suction hose and exhaust pipe.

5,090,850

Patent Not Issued For This Number

5,090,851

CUTTING TOOL FOR MILLING MACHINES

Joseph P. White, 28655 Kimberly, St. Clair Shores, Mich. 48081
Filed Aug. 15, 1991, Ser. No. 746,229

Int. Cl.³ B23C 1/12

U.S. Cl. 409—199

16 Claims

1. A cutting tool for a milling machine, said cutting tool comprising:

a sleeve structured for being connected with the milling machine, said sleeve having a forward end and a rear end; a quill axially received in said sleeve, said quill having a forward end and a rear end, said quill having a cylindrical axis, said sleeve and said quill being structured so that said quill is slidable with respect to said sleeve;

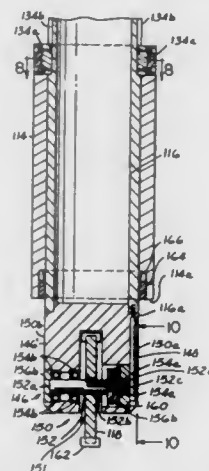
guidance means for preventing rotational movement of said quill with respect to said sleeve;

cutter drive means connected with said rear end of said quill for providing a source of rotational movement;

a drive shaft connected with said cutter drive means, said drive shaft being rotated by said cutter drive means, said drive shaft extending toward said forward end of said quill, said drive shaft being in parallel alignment with respect to the cylindrical axis of said quill;

a cutter head connected with said forward end of said quill, said cutter head comprising:

a cutter head body, said cutter head body having a rear end connected with said forward end of said quill, said cutter head body having a forward end, said forward end of said cutter head body having a slot, said slot having an orientation parallel with respect to the cylindrical axis of said quill, a first portion of said forward end of said cutter head body being located on one side of said slot, a second portion of said forward end of said cutter head body being located on the other side of said slot;



a cutter shaft rotatably mounted to each of said first and second portions of said forward end of said cutter head body, said cutter shaft being oriented transversely with respect to said slot and said drive shaft;

a side cutter connected with said cutter shaft, said side cutter rotating with said cutter shaft in said slot, said side cutter having a periphery extending beyond said forward end of said cutter head body, said side cutter being provided with a plurality of teeth on said periphery thereof; and

cutter shaft drive shaft gearing means for drivably connecting said cutter shaft to said drive shaft.

5,090,852

HIGH STRENGTH FASTENER AND METHOD

Richard D. Dixon, San Juan Capistrano, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Continuation of Ser. No. 185,327, Apr. 20, 1988, abandoned, which is a continuation of Ser. No. 45,186, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 664,209, Oct. 24, 1984, abandoned. This application Jul. 30, 1991, Ser. No.

739,726

Int. Cl.³ F16B 19/00

U.S. Cl. 411—361

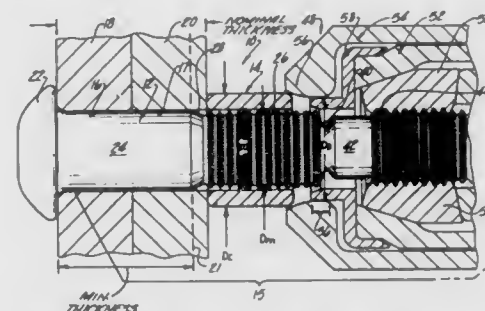
33 Claims

1. In a fastening system including a fastener, for securing a plurality of workpieces together with the fastening system providing a desired magnitude of retained preload on the workpieces relative to the yield strength of the fastener with the resultant fastened joint having a minimum ultimate design tensile load of a preselected magnitude, said fastener comprising:

a pin member having an elongated shank located in aligned openings in the workpieces and terminating at one end in an enlarged head and at its opposite end in a grooved portion comprising a plurality of circumferentially extending pin grooves and associated pin shoulders, said pin grooves being shallow and having a radial depth defined by the relationship of: $(h/D_u) \times 10^2$, where h is said radial

depth and D_u is the diameter as defined by said pin shoulders and with said depth h selected to be shallow relative to said shoulder diameter D_u to provide a result to said relationship of no greater than around 4, said pin grooves having a simulated streamlined root contour being generally defined by a portion of an ellipse, said ellipse portion being no greater than one half and no less than around 40% of the ellipse along the minor axis, a tubular collar swaged into said pin grooves whereby the workpieces are fastened together to define the fastened joint, said swaged collar having collar grooves and shoulders interlocking said pin grooves and shoulders, said pin member and said collar being of different materials having ultimate shear strengths of different magnitudes with the ratio of such shear strengths of said pin member to said collar being such that crushing of said pin member in swage is substantially avoided, said ratio of ultimate shear strengths of said pin member to said collar being in a range of around 1.8:1 to around 2.4:1, the axial widths of said pin grooves and shoulders and said collar grooves and shoulders being preselected in accordance with the relative shear strengths of said different materials whereby said pin shoulders and said collar shoulders are adapted to fail in shear generally at the same tensile load applied between said pin member and said collar,

said collar being swaged into said pin grooves via a swage anvil having an effective throat swage portion, said collar having a predetermined volume of material which is generally at least around 16% greater than the



available volume defined by said effective throat swage portion and the confronting portion of said pin grooves into which said collar is swaged, said collar being swaged to said pin member to provide a retained preload on said workpieces which results in a magnitude of stress no less than around 85% to around 95% of the yield strength of said pin member across said pin grooves, said yield strength of said pin member having a magnitude at least equal to the magnitude of stress on said pin member resulting from a tensile load on the fastened joint which is around 80% of the minimum ultimate design tensile load of the fastened joint, said pin member having sufficient strength to provide said magnitude of preload substantially without yielding in tension from the installation loads or necking from compressive swage loads, said collar having a final wall thickness provided to resist radial movement of said collar shoulders out from said pin grooves in response to the application of said minimum ultimate design tensile load on the fastened joint, said minimum ultimate design tensile load being the minimum magnitude of tensile load at which said fastener will fail, said collar being of sufficient length to provide a predetermined number of said collar shoulders engaged with a corresponding number of said pin shoulders to have a combined ultimate shear strength whereby said collar and/or said pin member will fail in shear across said pin or collar shoulders or said pin member will fail in tension diametrically across said pin grooves in response to tensile loads at or greater than said minimum ultimate design tensile load.

5,090,853

FASTENER WITH TAPER ATTACHED COMPONENT

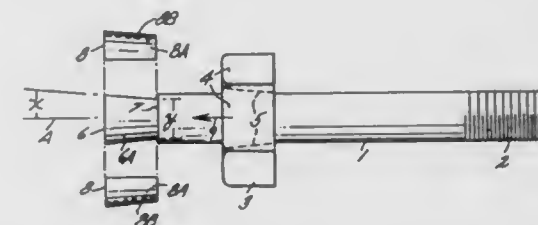
Morris F. Madsen, 1024 S. 2nd, Coos Bay, Oreg. 97420

Filed Mar. 18, 1991, Ser. No. 670,561

Int. Cl.³ F16B 19/00

U.S. Cl. 411—354

7 Claims



1. In combination, a fastener shaft having a segment with a frusto-conical wall with a selected taper of eleven degrees or less, inserts in place about said segment and each having curved inner and outer surfaces, said surfaces formed on said selected taper to provide each of said inserts with a uniform wall thickness, a fastener component with flats thereon for securement to said shaft and having an internal frusto-conical surface formed on said selected taper for surfacial locking engagement with the outer surfaces of said inserts.

5,090,854

SELF LOCKING NUT

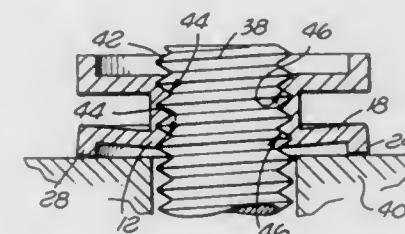
Paul B. Hafeli, El Toro, and Gregg S. Baker, Lake Forest, both of Calif., assignors to Artifex Ltd., Newport Beach, Calif.

Filed Mar. 6, 1991, Ser. No. 665,282

Int. Cl.³ F16B 37/00, 39/284

U.S. Cl. 411—186

10 Claims



1. A locking nut that fastens to a threaded member and a workpiece, comprising: a shank having a longitudinal axis and a threaded hole extending through said shank along said longitudinal axis; an annular flange extending from said shank essentially perpendicular to said threaded hole; and, a pair of annular rims each extending from said annular flange in opposite directions, each said annular rim having an outer surface that defines the outmost end portions of the locking nut; whereby said shank can be screwed onto the threaded member such that either one of said annular rims can engage the workpiece, deflecting said annular flange to further secure said shank to the threaded member.

5,090,855

LOCKING FASTENER ASSEMBLY

Sydney L. Terry, 47 Pine Ct., Grosse Pte. Farms, Mich. 48236
Continuation-in-part of Ser. No. 495,618, Mar. 19, 1990, Pat.

No. 5,011,351. This application Oct. 31, 1990, Ser. No. 606,586
Int. Cl.³ F16B 35/04, 37/04; B23P 11/02

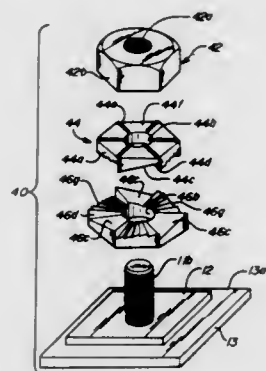
U.S. Cl. 411—144

31 Claims

1. An annular locking fastener assembly adapted for coax-

tion with an elongated threaded fastener, said assembly comprising:

- a first annular member defining a first annular face;
- a second annular member defining a second annular face; and
- coacting means on said faces operative in response to relative rotation of said members in one direction with said faces in confronting relation to lockingly engage said faces



in a sense to preclude retrograde relative rotation of said members in the opposite direction, said coacting means comprising a plurality of angled circumferentially spaced first cam surfaces on said first annular face and a plurality of angled circumferentially spaced second cam surfaces on said second annular face having a lead greater than the lead of said cam surfaces on said first annular face.

5,090,856

AUTOMOTIVE BARRIER NET

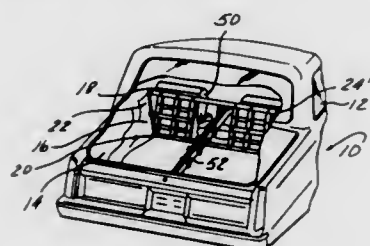
Donal Moore, Northville, Mich., assignor to Polytech Netting Industries, L.P., Orillia, Canada

Continuation-in-part of Ser. No. 469,966, Jan. 25, 1990, Pat. No. 5,026,231. This application Sep. 18, 1990, Ser. No. 584,467

Int. Cl.⁵ B61D 45/00

U.S. Cl. 410—118

18 Claims



1. In an automobile having a car body with a passenger compartment, a trunk compartment, and a selectively open space extending between the passenger compartment and the trunk compartment, the space adapted to receive oversized items extending from the trunk compartment into the passenger compartment, the trunk compartment having a forward end with a top wall, a bottom wall, and two side walls extending upwardly and outwardly from the bottom wall, the improvement comprising:

- a barrier net at the trunk forward end and suspended between the passenger compartment and the trunk compartment, the barrier net comprising:
- flexible, substantially inelastic webbing, the webbing comprising:
- a plurality of vertical, spaced straps;
- a plurality of horizontal, spaced straps traversing the vertical straps; and
- means for securing the vertical strap to the horizontal strap at each point where the two straps cross,

wherein a plurality of apertures are formed between the secured vertical and horizontal spaced straps; and an aperture formed in the webbing, the webbing aperture being enlarged relative to the plurality of apertures, and being situated such that it coincides with the space between the trunk and passenger compartments; and means for attaching the barrier net to the forward end side walls.

5,090,857

METALLIC THREADED COMPOSITE FASTENER

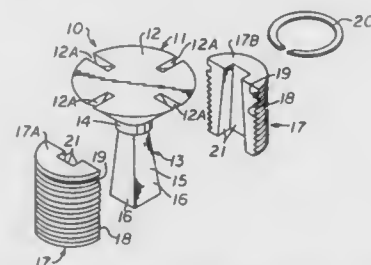
Thomas J. Dunn, Pasadena, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 31, 1991, Ser. No. 648,772

Int. Cl.⁵ F16B 19/00, 35/02

U.S. Cl. 411—385

24 Claims



1. A metallic threaded composite fastener comprising: a fastener body having a head portion configured to receive a tool for applying torque to the body and a non-circular and tapered shank portion therebelow, an externally threaded split collar member formed of metal alloy defining two halves and the interior of the collar having a non-circular and tapered portion corresponding to said shank non-circular and tapered portions to be received and engaged thereon, said collar exterior having a circumferential ring groove and releasable lock means on said collar formed of a lock ring removably received in said groove of the collar for releasably securing said collar halves onto said shank portion, whereby in the assembled condition torque may be transmitted from said body to said split collar by said engaged non-circular portions to install and remove said fastener assembly into or from a threaded aperture and shear loads in said collar threads are transferred to said shank tapered portion as a combination of radial compression and axial tension loads.

5,090,858

HOLDING DEVICE FOR FIXING OBJECTS TO MOTOR VEHICLES INTERIOR PARTS

Jean-C. Canadas, Remiremont, France, assignor to Rockwell-Cim Societe Anonyme

Continuation of Ser. No. 325,364, Mar. 17, 1989, abandoned.

This application Feb. 14, 1991, Ser. No. 656,124

Claims priority, application France, Mar. 17, 1988, 88 03472

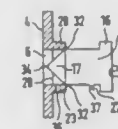
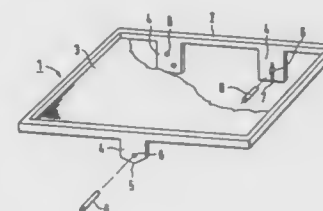
Int. Cl.⁵ F16B 15/00

U.S. Cl. 411—439

15 Claims

1. A holding device for fixing an object to or into a motor vehicle interior part made from foamed material, the holding device having a main body, and anchoring elements for engagement in the foamed material so as to fix the main body of the holding device in position, the anchoring elements comprising sinking pins with transverse passage openings formed therein, said sinking pins being insertable into the foamed material part, and cross-pins each having one end which can be fixed in the passage opening and a free end which can be driven

laterally to the sinking pins and through the passage opening into the foamed material in an undercutting manner with re-



spect to a removal direction of the holding device so that anchoring is effected solely by said cross-pins.

5,090,859

AUTOMATIC BINDING MACHINE USING INSERTION TOOLS

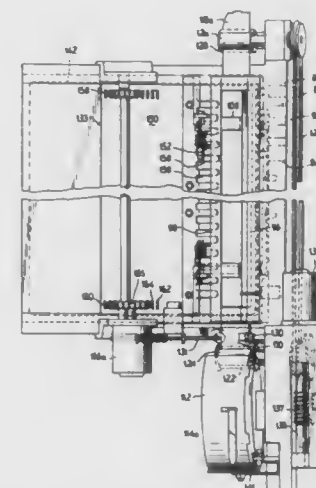
Nicholas M. Nanos, Morton Grove, and Roger M. Scharer, Des Plaines, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Feb. 20, 1990, Ser. No. 481,852

Int. Cl.⁵ B42L 13/04

U.S. Cl. 412—11

21 Claims



1. A binding apparatus for use with a cartridge having at least one curled-finger edge-type ring binder and binder data indicating means, which apparatus is adapted to bind prepunched sheets together and to form a booklet, said binding apparatus comprising:

- a base for supporting components of the binding apparatus;
- means associated with said base defining a binding position at which prepunched sheets are bound with an edge binder to form a booklet;
- cartridge support means for supporting a cartridge having at least one binder therein and inserting the same at said binding position;
- guide means for guiding sheets of material having prepunched apertures to the binding position;
- insertion means which includes a plurality of different sized elongated tool-like members for selection in response to cartridge binder data means and insertion into and retraction out of a binder;
- clamping means for movement toward and away from the

binding position receiving and holding said sheets of paper during binding; and control means responsive to binder data indicating cartridge for operating and controlling binding functions of said apparatus.

5,090,860

SHEET BINDER

Kazuhiro Matsuo, Tokyo; Koichi Murakami, Kanagawa; Yoichi Tagawa, and Kenichi Iizumi, both of Ibaraki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 634,826, Jan. 2, 1991, abandoned, which is a continuation of Ser. No. 500,730, Mar. 28, 1990, abandoned. This application Jun. 26, 1991, Ser. No. 725,238

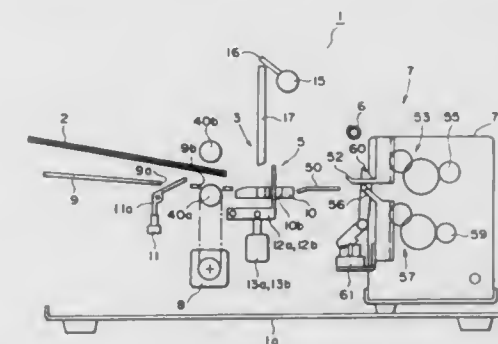
Claims priority, application Japan, Mar. 31, 1989, 1-81121;

Mar. 31, 1989, 1-81122; Apr. 7, 1989, 1-89455; Apr. 7, 1989, 1-89456; Apr. 13, 1989, 1-94207; May 8, 1989, 1-114532; May 8, 1989, 1-114533; May 30, 1989, 1-36844

Int. Cl.⁵ B42L 5/10

U.S. Cl. 412—11

11 Claims



1. A sheet binding apparatus, comprising: supporting means for supporting a set of sheets; punching means for punching the set of sheets on said supporting means; binding means for supporting a ring member and for binding the sheets by penetrating the ring member through punched holes or the sheets punched by said punching means; size signal generating means for generating a signal indicative of the size of the ring member supported on said binding means; means for changing a punching condition by said punching means in accordance with an output of said size signal generating means; and conveying means for conveying the set of sheets punched by said punching means to the ring member supported on said binding means.

5,090,861

BOOK OR OTHER GRAPHIC ARTS CONSTRUCTION USING ADHESIVE RESISTANT TO COLD FLOW

David B. Malcolm, Maplewood, and William L. Bunnelle, Hugo Township, Washington County, both of Mo., assignors to H. B. Fuller Licensing & Financing, Wilmington, Del.

Continuation of Ser. No. 553,448, Jul. 13, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,848

Int. Cl.⁵ B42C 9/00

U.S. Cl. 412—37

6 Claims

1. A process for the attachment of a book cover to a book block with an adhesive resistant to creep and shear, formed from a hot melt adhesive, which process comprises applying the adhesive to book block at an area immediately adjacent to the bound edges of the book block in a length substantially coterminous with the bound edges; applying the cover to the book block in proper alignment, and exerting pressure on the book cover in the area of the adhesive; wherein the hot melt adhesive is a composition comprising:

- (a) About 5 to 14 wt-% of a radial block copolymer having a molecular weight of at least about 145,000, having the formula:



- wherein Y is a multivalent coupling agent, A comprises a polyvinyl substituted aromatic block, B comprises a polybutadiene rubbery midblock, n1 is an integer of 3 to 10 and n2 is an integer of at least 0 to 10;
- (b) about 45 to 85 wt-% of a compatible tackifying resin selected from the group consisting of a C₅ resin, a styrenated terpene resin, a hydrogenated C₉ resin, a rosin derivative, a styrenated terpene resin and mixtures thereof; and
- (c) about 5 to 45 wt-% of a plasticizing oil.

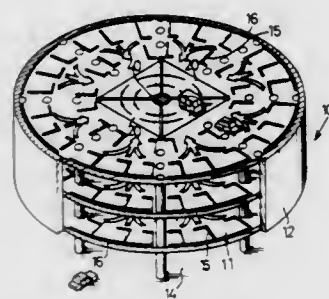
5,090,862

MULTI-LEVEL VEHICLE PARKING SYSTEM

Shui M. Lee, No. 160, Sec. 1, Tai Yuan Rd., Taichung, Taiwan
Filed Nov. 13, 1990, Ser. No. 611,536
Int. Cl.⁵ E04H 6/12

U.S. Cl. 414-261

2 Claims



1. A multi-level vehicle parking system comprising: a multi-level structure including a plurality of parking levels, said structure being substantially cylindrical having an outer wall provided on an outer peripheral surface thereof, each parking level defining a plurality of parking stations which are arranged circularly, a plurality of curbs which altogether form a circle being formed on an outer peripheral edge of each of said parking levels, said curbs being provided to alert drivers of said vehicles so that said drivers may feel that the vehicles have been moved to a rearmost position in order that said drivers can stop said vehicles and so that said vehicles are prevented from smashing into said outer wall;

four elevators being provided in a middle portion of said structure, each of said elevators being triangular and being vertically movable in order to transfer vehicles to any of said parking levels, said elevators altogether forming a rectangle which has four corners, a post being provided in a center of said structure, a beam being provided on each of said corners of said rectangle formed by said elevators, a plurality of rollers being provided between every elevator and said post and being provided between every elevator and said beams for facilitating a vertical movement of said elevators, two pairs of radially separated and curved grooves being formed in a floor of each of said elevators, each pair of said grooves having one groove closer to said post than the other groove, a distance between each pair of said grooves being substantially equal to a distance between a front wheel and a rear wheel of said vehicle, a stop being coupled to and being slidable along each of said grooves;

and when said vehicle moves into one of said elevators, said stops can be moved behind said front wheel and said rear wheel of said vehicle so as to prevent said vehicle from moving rearward, each elevator can transfer two vehicles at a time so that eight vehicles can be transferred by said

four elevators at a time and so that said multi-level vehicle parking system can transfer vehicles in a fast speed.

5,090,863

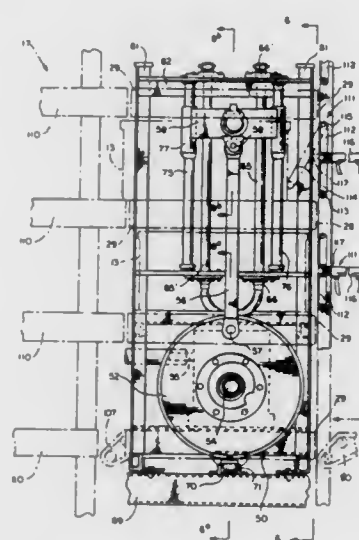
ORGANIZER SYSTEM AND METHOD FOR A ROTATABLE STORAGE STRUCTURE

Robert Lichti, Sr., Lake Almanor Peninsula; Clay Bernard, II, Pt. Richmond; Daniel C. Perry, San Jose, and Stanley H. Lukken, San Francisco, all of Calif., assignors to Computer Aided Systems, Inc., Hayward, Calif.

Division of Ser. No. 192,419, Apr. 29, 1988, Pat. No. 4,983,091, which is a continuation-in-part of Ser. No. 31,989, Mar. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 732,927, May 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 824,718, Jan. 31, 1986, abandoned. This application Feb. 16, 1990, Ser. No. 482,317
Int. Cl.⁵ B65G 1/04

U.S. Cl. 414-331

11 Claims



1. A lift assembly for carrying containers between a multiplicity of levels comprising:

a frame adapted to be mounted on a base;
a carrier in the form of a vertically traveling endless loop having an up travel reach and a down travel reach, and a plurality of uniformly spaced platforms disposed about the endless loop for supporting said containers;

power means for operating a reciprocating driving assembly for driving said loop to carry the containers in a vertical direction;

said reciprocating driving assembly including a drive block assembly mounted on the frame and a first crank arm pivotally connected to the drive block assembly, said drive block assembly including a reciprocable driver, the drive block assembly having an extended position wherein said driver is in operating engagement with said loop and a withdrawn position wherein said driver is not in operational engagement with said loop, said first crank arm having a first operable engagement with the drive block assembly and a second operable engagement with said power means for driving said reciprocable driver in a reciprocating fashion; and

a cam means of said reciprocating assembly for moving said reciprocable driver between said extended and withdrawn positions for driving said loop in a step-by-step manner.

5,090,864

METHOD OF OPENING FIBER BALES

Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

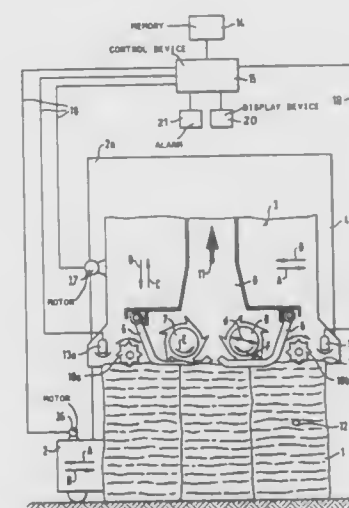
Filed Oct. 26, 1990, Ser. No. 604,002

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1989, 3936079

Int. Cl.⁵ B65G 21/02

U.S. Cl. 414-412

2 Claims



1. In a method of operating a fiber bale opener having a tower arranged for travel along a series of fiber bales and an opening device carried by the tower and movable vertically relative thereto; the opening device including opening roll means for penetrating into the fiber bales to remove fiber tufts therefrom; including the steps of moving the opening device back and forth along top surfaces of the fiber bales; removing fiber tufts by the opening device during travel thereof; coordinating travelling motions of the bale opener with vertical motions of the opening device by a control device and determining the presence of a foreign body occupying a location in the fiber bales; the improvement comprising the following consecutive steps:

- (a) lifting, during each pass of the bale opener, the opening device off the fiber bales just ahead of said location;
- (b) moving the opening device, in the course of the travel thereof, over the foreign body; and
- (c) lowering the opening device, in the course of the travel thereof, onto the fiber bales after passing over the foreign body.

5,090,865

WINDAGE SHIELD

Jairaj Ramachandran, Cincinnati; John R. Hess, West Chester, and Larry W. Plemmons, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 22, 1990, Ser. No. 600,792

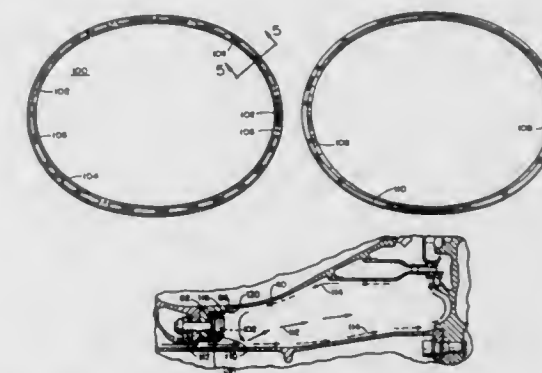
Int. Cl.⁵ F01D 11/00

U.S. Cl. 415-112

6 Claims

1. A windage shield for use in a fluid flow path within a gas turbine engine for reducing fluid drag generated by fluid flow over a plurality of circumferentially spaced fasteners each having a portion thereof extending into the fluid flow path, the windage shield comprising an annular member having a first plurality of circumferentially spaced arcuate openings in a first side thereof, said openings being arranged to receive at least some of the portions of the fasteners extending into the fluid flow path, said shield further including a second plurality of circumferentially spaced apertures, at least one of said apertures being located between each adjacent pair of said openings and each aperture including a countersunk portion on a

second side of said shield opposite said first side, each of said apertures being adapted to receive a headed fastener for attaching said shield over said at least some of the portions of the fasteners extending into the fluid flow path with a head of each



said headed fastener lying substantially flush with said second side of said shield in said countersunk portion, said second side of said shield providing a substantially continuous surface to said fluid flow path for minimizing windage heating.

5,090,866

HIGH TEMPERATURE LEADING EDGE VANE INSERT

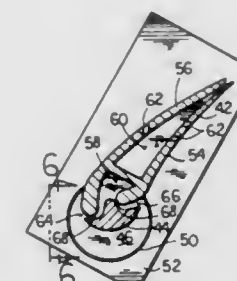
Michael F. Blair, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 27, 1990, Ser. No. 572,739

Int. Cl.⁵ F01D 5/18

U.S. Cl. 415-115

6 Claims



1. A temperature resistant vane for an axial flow gas turbine disposed between a radially inner platform and a radially outer platform, comprising:

a metallic downstream portion disposed between said inner and outer platform;

first and second retaining buttons disposed in a movable relationship in corresponding first and second recesses in the inner and outer platforms; and

a temperature resistant leading edge insert disposed between said first and second retaining buttons.

4. A temperature resistant vane for an axial flow gas turbine disposed between a radially inner platform and a radially outer platform comprising:

a metallic downstream portion disposed between said inner and outer platform;

a temperature resistant leading edge insert disposed in a movable relationship in an upstream direction relative to said downstream portion and said platforms;

a cavity in the vane bounded at least in part by said leading edge insert; and

means for conducting cooling air into said cavity at sufficient pressure to produce a pressure differential between said cavity and the axial flow such that separation is maintained between said leading edge insert and said downstream portion under at least one operative condition of

the turbine, thereby defining at least one cooling opening for exhausting a film of cooling air over said downstream portion.

5,090,867
ROTATING FLUID MACHINE FOR REVERSIBLE OPERATION FROM TURBINE TO PUMP AND VICE-VERSA

Carlo Ormenese, via S. G. Bosco No. 19, 15061 Arquata Scrivia (Alessandria), Italy

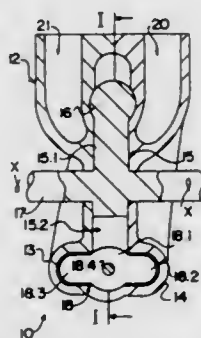
Filed Jul. 19, 1990, Ser. No. 554,569

Claims priority, application Italy, Jul. 21, 1989, 67618 A/89

Int. Cl.⁵ F01D 5/02

U.S. Cl. 415—141

6 Claims



1. A rotating fluid machine for reversible operation from turbine to pump and vice-versa, comprising:

- (a) a bladed rotor, containing:
 - (1) a rotor spindle;
 - (2) a rotor disk, tightly rotating integral with and coaxial to said rotor spindle;
 - (3) at least one radial groove, cutting through part of said rotor disk, emerging onto an external peripheral contour;
 - (4) a carrying pin integral to said rotor disk; and
 - (5) at least one rotor blade, possessing two identical tongues that extend symmetrically with respect to an axis of said carrying pin and protrude with respect to said rotor disk; said rotor blade being integral in rotation with said rotor disk and supported in said radial groove such that said rotor blade can freely rotate by means of said carrying pin;
- (b) external ducts for fluid suction and fluid discharge;
- (c) a casing containing said bladed rotor, possessing a continuous internal fluid duct, having a substantially helicoidal pattern, tightly connecting said external ducts to the beginning and end of said continuous internal duct, and following the direction of fluid passage, including a series of 3 passages of which:
 - a. the first passage proceeds from said external duct for fluid suction or intake, having a pattern which is substantially a conical semispiral, and extending as far as the external proximity of said casing;
 - b. the second passage proceeds in sequence from said first passage, having a pattern which is substantially a cylindrical spiral modified to accommodate a degree of radial extension of one tongue of said rotor blade with respect to said rotor disk, and forming a cavity in said casing;
 - c. the third passage proceeds in sequence from said second passage, having a pattern which is substantially a conical semispiral, being opposite to said pattern of said first passage, and emerging into an outlet for fluid delivery or discharge;

wherein at least one blade of said bladed rotor is tightly engaged and guided in rotation around said axis with one or another of its tongues in turn in said second passage of said fluid duct in such a way that, at the start of said second duct passage, said rotor blade has its longitudinal axis substantially

parallel to the axis of rotation of said rotor disk and in that position one of its tongues tightly fits and engages the initial portion of said second duct passage.

5,090,868
CENTRIFUGAL PUMP

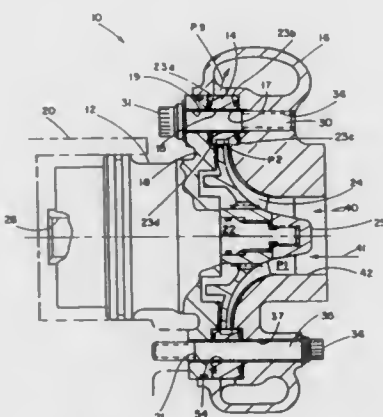
Duane C. Mosure, Poplar Grove, and Norman E. Houtz, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 16, 1990, Ser. No. 552,722

Int. Cl.⁵ F01D 1/00, 9/00

U.S. Cl. 415—207

7 Claims



1. A centrifugal pump bearing housing, diffuser ring, and volute housing fastening arrangement comprising:

- a pump bearing housing adapted for insertion in a gear box, said bearing housing having mounted for rotation therein an impeller shaft having secured thereto a pump impeller, said bearing housing having an annular flange means which flange means includes a plurality of openings radially disposed from an axis of rotation of said impeller shaft;
- a diffuser ring surrounding said pump impeller and provided with a number of openings which are positioned to correspond with a number of said openings of said annular flange;
- a volute housing surrounding said diffuser ring, and said pump impeller, said volute housing having a number of openings which are positioned to correspond with said openings of said diffuser ring and said annular flange means;
- selected corresponding openings in said annular flange means, said diffuser ring, and said volute housing define gear box mounting fastening openings, remaining corresponding openings in said annular flange means, said diffuser ring and said volute housing defining pump fastening openings;
- said gear box mounting openings adapted to receive fastening means in one direction therethrough to be secured to said gear box; and
- said remaining openings having therethrough pump fastening means in an opposite direction to secure said annular flange means, said diffuser ring, and said volute housing into a unitary assembly.

5,090,869
VARIABLE PITCH PROPELLER MODULE FOR AN AERO GAS TURBINE ENGINE POWERPLANT

William B. Wright, Leicester, England, assignor to Rolls-Royce plc, London, England

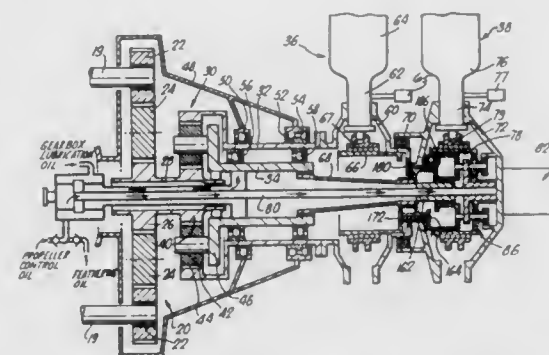
Filed Apr. 11, 1990, Ser. No. 507,578

Claims priority, application United Kingdom, May 17, 1989, 8911332

Int. Cl.⁵ B63H 3/00

U.S. Cl. 416—147

19 Claims



1. A propeller module for a gas turbine engine powerplant comprising a first multi-bladed propeller and a second multi-bladed propeller, the first and second multi-bladed propellers being arranged coaxially and being driven in contra-rotation by coaxial shaft means

the first multi-bladed propeller having a plurality of propeller blades and a hub, the propeller blades being rotatably mounted on the hub about their longitudinal axes,

a first pitch change means comprising a first drive means rotatably mounted on the hub of the first multi-bladed propeller arranged to rotate the blades of the first multi-bladed propeller,

the second multi-bladed propeller having a plurality of propeller blades and a hub, the propeller blades being rotatably mounted on the hub about their longitudinal axes,

a second pitch change means comprising a second drive means rotatably mounted on the hub of the second multi-bladed propeller arranged to rotate the blades of the second multi-bladed propeller,

a pitch change gear assembly being arranged to drive the first and second pitch change means to change the pitch of the blades of the first and second multi-bladed propellers, the pitch change gear assembly comprising at least one set of planet gears and a planet carrier, the planet carrier having a threaded inner surface portion,

a hydraulic motor being mounted coaxially on the second multi-bladed propeller, the hydraulic motor being arranged to drive the pitch change gear assembly,

a hollow hydraulic fluid feed member extending coaxially on the common axis of the first multi-bladed propeller and the second multi-bladed propeller to supply hydraulic fluid to the hydraulic motor, the hydraulic fluid feed member having passages formed therein for the flow of hydraulic fluid,

a sleeve being positioned on and enclosing the hydraulic fluid feed member, the sleeve having passages formed therein for the flow of hydraulic fluid, the sleeve having a threaded outer surface portion which engages the threaded inner surface portion of the planet carrier, the hydraulic fluid feed member and the sleeve being relatively movable axially to control the alignment of the passages of the hydraulic fluid feed member and the sleeve so as to control the flow of hydraulic fluid to the hydraulic motor, the hydraulic fluid feed member and the sleeve being inter-engaged so that relative rotation is not allowed.

5,090,870
METHOD FOR FLUENT MASS SURFACE TEXTURING A TURBINE VANE

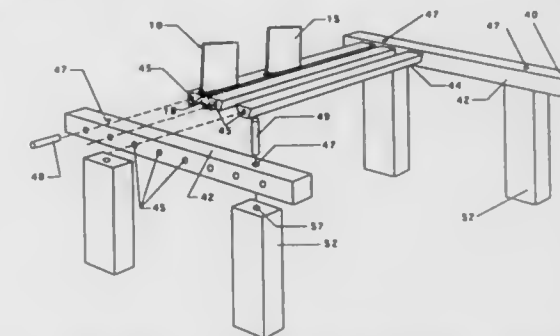
Glenn R. Gilliam, 310 Lake St., #104, Huntington Beach, Calif. 92648

Filed Oct. 20, 1989, Ser. No. 424,536

Int. Cl.⁵ F01D 5/00; B24B 1/00

U.S. Cl. 416—241 R

39 Claims



1. An apparatus for providing a surface texture on a plurality of vanes, comprising:

- (a) a barrel sized to retain a plurality of vanes;
- (b) a rack sized to be received with the barrel, such that the rack is configured to secure a plurality of vanes within the barrel so as to substantially fix the vanes relative to the barrel;
- (c) a fluent mass movably received within the barrel so that the fluent mass occupies at least 30% of the volume of the barrel;
- (d) a lubricating fluid for substantially wetting the surface of the fluent mass;
- (e) an abrasive material for abrading the vanes as the fluent mass impinges the vanes so as to produce a surface texture of less than 10×10^{-6} rms; and
- (f) centrifugal barrel finishing means for moving the barrel so that the fluent mass impinges the vanes.

19. A method for providing a surface texture on a vane, comprising:

- (a) securing the vane relative to a barrel;
- (b) introducing a fluent mass into the barrel so that the fluent mass occupies at least 30% of the volume of the barrel;
- (c) introducing an abrasive material to the fluent mass so that the abrasive material is substantially disposed on the fluent mass;
- (d) introducing a lubricating fluid into the barrel to substantially wet the surface of the fluent mass; and
- (e) moving the barrel in a centrifugal barrel finishing machine so that the fluent mass causes the abrasive material to impinge the blade so as to produce a surface texture of less than 10×10^{-6} inches in less than 30 minutes.

5,090,871
JUNCTION ASSEMBLY WITH LEAK DETECTION MEANS

Carl E. Story, Cupertino, and Kenneth M. O'Connor, Fremont, both of Calif., assignors to Systems Chemistry, Inc., Milpitas, Calif.

Filed Feb. 12, 1991, Ser. No. 656,304

Int. Cl.⁵ F04B 49/06

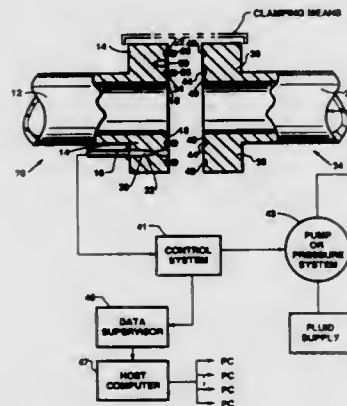
U.S. Cl. 417—9

10 Claims

1. An improved junction assembly for fluid handling systems, comprising:

first and second fluid handling means respectively including means forming first and second planar surfaces surrounding fluid passageways and adapted to face each other and be mated together to couple said first and second handling means together and to join said fluid passageways, at least one of said surfaces having an annular channel formed therein circumscribing the associated passageway and at

least one of said surfaces having a first annular groove formed interiorly of said channel and at least one of said surfaces having a second annular groove formed exteriorly of said channel;
means disposed between said first and second surfaces and forming a first seal around the joined passageways, said first seal being disposed in said first groove;
means disposed between said first and second surfaces and



forming a second seal around the joined passageways, said second seal being disposed in said second groove; and detector means for detecting the invention of fluid through one of said first and second seals and into said channel, and for generating a signal indicative of said invasion, said detector means including a sensing probe extending at least partially through at least one of said means forming planar surfaces and into sensing communication with said channel.

5,090,872

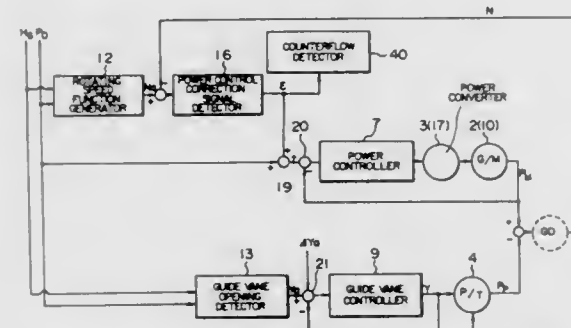
METHOD OF CONTROLLING THE OPERATION OF A PUMP IN A PUMPING INSTALLATION BY DETECTING COUNTERFLOW

Takao Kuwabara, Hitachi, Ezo Kita, Kyoto; Isao Yokoyama, Himeji; Hiroto Nakagawa, Osaka, and Yasuteru Oono, Kobe, all of Japan, assignors to Hitachi Ltd., Tokyo and The Kansai Electric Power Co., Inc., Osaka, both of Japan
Filed Nov. 27, 1989, Ser. No. 441,639

Claims priority, application Japan, Nov. 28, 1988, 63-298204
Int. Cl.³ F04B 49/00

U.S. Cl. 417-53

5 Claims



1. An operation of a pump in a pumping-up installation including a variable-speed driven pump, the method comprising the steps of:

- detecting that an operating condition of said pump has entered a counterflow operation region by a counterflow detecting means;
- compulsively changing the operating condition of the pump from an operation command value to a predetermined value by a biasing operation control means; and
- restoring the operating condition of the pump from the

counterflow operation region to a normal region upon a detection of a counterflow by actuating the biasing operation control means, wherein said variable speed operation of the pump is controlled by said biasing operation control means in such a manner that a guide vane opening of the pump determined by an operation command at that time is decreased by a predetermined value and is restored to the former value after a predetermined time interval.

5,090,873

CRANKCASE OIL SEPARATOR

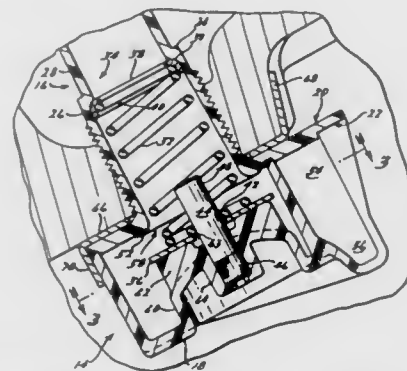
Gary K. Fain, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Dec. 18, 1989, Ser. No. 452,006

Int. Cl.³ F04B 39/04

U.S. Cl. 417-228

21 Claims



1. A venting apparatus for installation in a refrigerant motor compressor crankcase unit to prevent major crankcase oil loss to the system, said apparatus comprising: a first body portion; a second body portion depending from one end of said first body portion, said second body portion having an opening in relationship with an opening in said first body portion; and means for controlling flow through said openings positioned within said first and said second body portions, said means for controlling flow through said openings positioned between said openings.

5,090,874

FLUID COMPRESSOR

Eiichi Aikawa, Yokohama; Takayoshi Fujiwara, Kawasaki; Hisanori Honma, Yokohama; Yoshinori Sone, Yokohama, and Moriaki Shimoda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

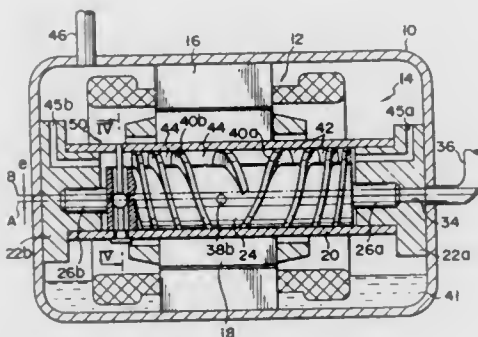
Filed Jun. 11, 1990, Ser. No. 535,563

Claims priority, application Japan, Jun. 30, 1989, 1-166887; Sep. 8, 1989, 1-233409

Int. Cl.³ F04C 18/00

U.S. Cl. 417-356

12 Claims



1. A fluid compressor comprising:

a cylinder having first and second discharge ends;
a columnar rotating body located in the cylinder to extend in an axial direction of the cylinder and be eccentric thereto, and rotatable while part of the rotating body is in contact with an inner circumference of the cylinder, said rotating body having first and second spiral grooves on an outer circumference thereof, said first groove having a first starting end located substantially in the middle of the rotating body, extending from the first starting end toward the first discharge end of the cylinder, and having pitches gradually narrowed with distance from the first starting end of the first discharge end of the cylinder, said second groove having a second starting end located substantially in the middle of the rotating body, extending from the second starting end toward the second discharge end of the cylinder, and having pitches gradually narrowed with distance from the second starting end to the second discharge end of the cylinder, said first and second grooves being turned in directions opposite to each other, and said first and second starting ends being set apart from each other by a certain angle in a circumferential direction of the rotating body, said first starting end at least partially overlapping said second starting end in the axial direction of the rotating body;

first and second spiral blades fitted into the first and second grooves to be slidable in a radial direction of the rotating body, respectively, having outer circumferential surfaces in contact with the inner circumference of the cylinder, and dividing a space between the inner circumference of the cylinder and an outer circumference of the rotating body into a plurality of operating chambers;
means for guiding operating fluid into that area of the space which is adjacent to the first and second starting ends of the first and second grooves; and
drive means for rotating the cylinder and rotating body synchronously with each other so as to feed the operating fluid, introduced into said area through the guide means, to the first and second discharge ends of the cylinder through the operating chambers and to discharge the operating fluid outside from the first and second discharge ends.

5,090,875

FLUID COMPRESSOR

Eiichi Aikawa, Yokohama; Takayoshi Fujiwara, Kawasaki; Hisanori Honma, and Yoshinori Sone, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

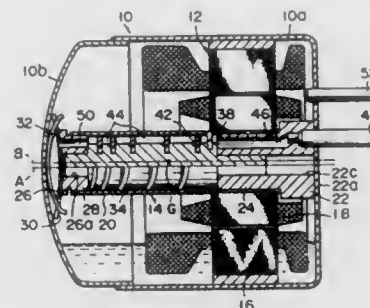
Filed Jul. 6, 1990, Ser. No. 549,129

Claims priority, application Japan, Sep. 8, 1989, 1-231413; Sep. 8, 1989, 1-233411

Int. Cl.³ F04C 18/16

U.S. Cl. 417-356

9 Claims



1. A fluid compressor comprising:

- a closed casing;
- a cylinder arranged within the casing and having a suction end and a discharge end;
- a columnar rotating body located in the cylinder to extend in an axial direction of the cylinder and be eccentric thereto, and rotatable synchronously with the cylinder while part

of the rotating body is in contact with an inner surface of the cylinder, said rotating body having a spiral groove on an outer circumferential surface thereof, said groove having pitches gradually narrowing with distance from the suction end of the cylinder;

a spiral blade fitted in said groove to be slidable, substantially in a radial direction of the cylinder, said blade having an outer circumferential surface closely in contact with the inner surface of the cylinder, and dividing a space defined between the inner surface of the cylinder and the outer circumferential surface of the rotating body into a plurality of operating chambers;

first and second bearings for rotatably supporting both ends of the cylinder and also rotatably supporting opposite ends of the rotating body, said first bearing being secured to said closed casing; and

drive means for synchronously rotating said cylinder and said rotating body so as to successively transport a fluid introduced from the suction end of the cylinder into the cylinder toward the discharge end of the cylinder through the operating chambers, and discharging the fluid to the outside from the discharge end of the cylinder, said drive means having a rotor secured to the cylinder and rotating integrally with the cylinder, said rotor being located so that at least a portion of the rotor which is in contact with the cylinder overlaps the first bearing in the axial direction of the cylinder.

5,090,876

SCROLL TYPE FLUID HANDLING MACHINE

Naoki Hashizume, Saitama, and Takeshi Seto, Nagano, both of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
PCT No. PCT/JP90/00225, § 371 Date Oct. 26, 1990, § 102(e)
Date Oct. 26, 1990, PCT Pub. No. WO90/10157, PCT Pub. Date Sep. 7, 1990

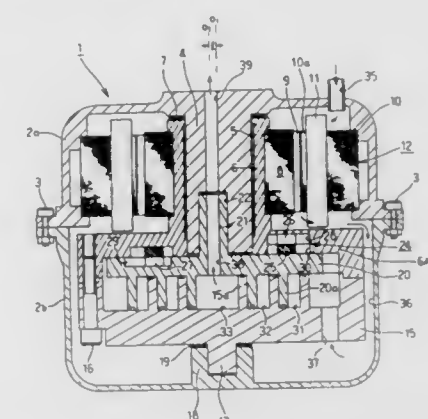
PCT Filed Feb. 23, 1990, Ser. No. 601,776

Claims priority, application Japan, Feb. 28, 1989, 1-45448

Int. Cl.³ F04B 17/00; F04C 2/00, 15/00

U.S. Cl. 417-410

1 Claim



1. A full system rotatable scroll type fluid handling machine including a sealed casing containing therein an electromotor, a driver scroll member rotatably driven by said electromotor and a follower scroll member adapted to be eccentrically rotated with respect to said driver scroll member so that both the driver scroll member and the follower scroll member are rotated but said follower scroll member presents an eccentric movement while it is rotated, said scroll type fluid handling machine comprising:

- a pillar-shaped boss formed on the inner side of said casing, extending in a direction in which a rotational axis of the scroll members extends, and formed with an axial cavity extending from a forward end into the interior thereof;
- a coupling having a cylindrical shaft rotatably mounted around said boss;

- an electromotor provided with a rotor carried on said shaft of said coupling and a stator located around said rotor;
- a follower scroll member having a follower shaft inserted into said cavity of said boss and rotatably supported by said boss;
- a rotation transmitting mechanism interposed between said follower scroll member and said coupling to transmit rotation of said coupling to the follower scroll member; and
- a driver scroll member fixed to said coupling to hold said follower scroll member between said driver scroll member and said coupling.

5,090,877

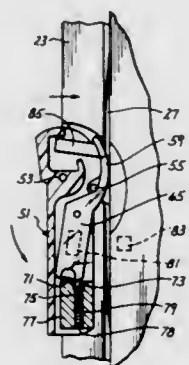
MISLOADED IV TUBE DETECTOR FOR AN IV PUMP
Edmund D. D'Silva, Highland Park, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Aug. 23, 1990, Ser. No. 572,054

Int. Cl.⁵ F04B 49/10

U.S. Cl. 417-474

15 Claims



1. A peristaltic pump comprising:
- a supporting structure including a base;
- a resilient tube;
- a peristaltic pumping member carried by the supporting structure, said tube being positionable on the base in a proper position in which the peristaltic, pumping member can properly progressively squeeze the tube to pump a fluid through the tube and in an improper position;
- a door;
- means for mounting the door on the supporting structure for movement between an open position in which the door allows access to the base and a closed position in which the door impedes access to the base; and
- means responsive to the tube being in said improper position for positively preventing movement of the door to said closed position.

5,090,878

NON-CIRCULAR ORBITING SCROLL FOR OPTIMIZING AXIAL COMPLIANCY

David K. Haller, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 14, 1991, Ser. No. 640,765

Int. Cl.⁵ F01C 1/04

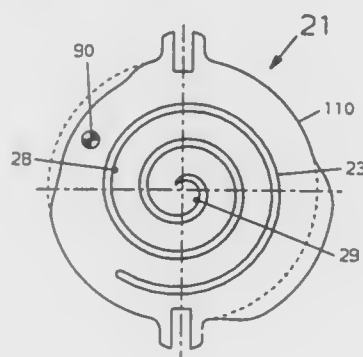
U.S. Cl. 418-1

6 Claims

1. An orbiting scroll of a scroll machine having an axis, a plate and a spiral wrap extending from said plate with said plate having a varying radius relative to said axis wherein said radius is uniform for two segments totalling at least 180° with said two segments being separated by two generally diametrically located segments one of which is of a greater radius than said uniform segments and the other of which is of a lesser radius than said uniform segments.

2. In a scroll machine having a first and second scroll member with said second scroll member being adapted to be driven in an orbiting motion with respect to said first scroll member whereby said first and second scroll members coact in a com-

pression process to compresses a gas with said gas producing gas forces responsive to said compression process with said gas forces including an axial gas force acting on said first and second scroll members and tending to cause their separation and a tangential gas force resisting driving of said second scroll member, said second scroll member having an axis, a plate having a first and second side, a spiral wrap extending from said first side, a hub extending from said second side and being supported by a bearing, means for applying an axial compliant force to said second side, said plate having a varying radius, r , which varies relative to said axis according to the relationship



$$r = (F_{gt}l) / (F_p - F_{ga})$$

where

 F_{gt} is the tangential gas force, l is the axial distance between the location of the tangential gas force and the opposed bearing reaction force, F_p is the axial compliant force, and F_{ga} is the axial gas force.

5,090,879

RECIRCULATING ROTARY GAS COMPRESSOR

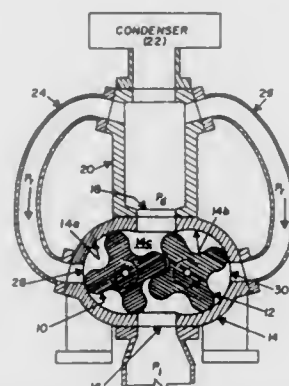
John F. Weinbrecht, 601 Oakwood Loop, NE., Albuquerque, N. Mex. 87123

Continuation-in-part of Ser. No. 368,873, Jun. 20, 1989, abandoned. This application May 29, 1990, Ser. No. 529,288

Int. Cl.⁵ F04C 18/18, 23/00

U.S. Cl. 418-9

18 Claims



1. A positive displacement recirculating rotary compressor comprising a housing having two mutually opposing cylindrical curved interior side walls; said housing including a gas inlet port at one end located between said mutually opposing cylindrical curved side walls; and a gas discharge port located at the opposite end of said housing from said inlet port and also located between said mutually opposing cylindrical curved interior side walls; said housing further including first and second gas recirculation ports formed respectively in said

cylindrically curved opposing side walls between said inlet port and said discharge port; first and second involutely lobed impellers journaled for rotation in opposite directions within said housing; each of said impellers having at least four lobes; said impellers being intermeshed so as to form a high-impedance seal when said impellers are rotated in opposite directions; said discharge port being connected in fluid communication with a discharge conduit; first and second recirculation conduit means connected in fluid communication with said discharge conduit and connecting said discharge conduit respectively to said first and second recirculation ports; said inlet port and said discharge port being approximately equal in size to one another; said discharge port being approximately twice the size of each of said recirculation ports; said inlet, discharge and recirculation ports being isolated from direct fluid communication with one another and further being as large as possible within the constraints of the foregoing size relationships; whereby gas discharged from said housing returns to said housing through said recirculation ports so as to reduce heating of said impellers; and with the sizing of said inlet, discharge and recirculation ports thereby resulting in minimal flow losses.

5,090,880

SCROLL COMPRESSOR WITH DISCHARGE VALVES
Denji Mashimo, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

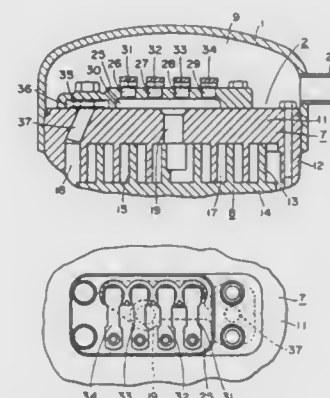
Filed Dec. 13, 1990, Ser. No. 626,892

Claims priority, application Japan, Dec. 28, 1989, 1-340808

Int. Cl.⁵ F04B 49/02; F04C 18/04; F16K 15/14

U.S. Cl. 417-310

2 Claims



1. A scroll compressor comprising:
- a fixed scroll member having an end plate and a wrap attached to surface of said end plate in the shape of an involute curve;
- an orbiting scroll member having an end plate and a wrap attached to a surface of said end plate of the orbiting scroll member in a juxtaposed relation with said fixed scroll member so that the wraps of the two scroll members are fitted closely together to form a compression space;
- said end plate of said fixed scroll member having:
- a discharge opening to permit a compressed gas to be discharged out of said compression space;
- a valve plate having a plurality of discharge ports connected to said discharge opening, and independent discharge valves in each of said discharge ports,
- wherein a center of each of said discharge ports is laterally offset from a center of said discharge opening of said fixed scroll member to thereby prevent a refrigerant from flowing directly from said discharge opening against said discharge valves, and
- the total cross-sectional area of said discharge ports is larger than the area of said discharge opening.

5,090,881

VARIABLE-DISPLACEMENT VANE-PUMP

Mikio Suzuki, Hekinan; Satoshi Suto; Ikuo Okuda, both of Okazaki; Yasunori Nakawaki, and Akiharu Abe, both of Susono, all of Japan, assignors to Toyota Koki Kabushiki Kaisha, Kariya, Japan

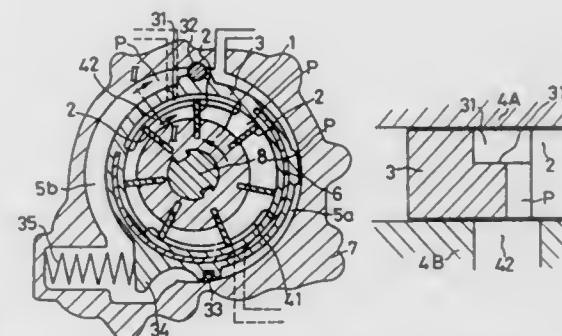
Filed Dec. 27, 1990, Ser. No. 634,504

Claims priority, application Japan, Dec. 27, 1989, 1-341916

Int. Cl.⁵ F04C 15/04

U.S. Cl. 418-26

5 Claims



1. A variable-displacement vane-pump, comprising:
- a pump housing;
- a drive shaft rotatably supported by said pump housing in coaxial relationship therewith;
- a rotor which is supported by said drive shaft to be rotated integrally with said drive shaft within said pump housing, said rotor being provided with a plurality of vanes at regular intervals in the circumferential direction on the outer peripheral surface thereof said plurality of vanes being radially slidable outward and inward with the rotation of said rotor;
- a cam ring interposed between said rotor and said pump housing in eccentric relationship with said pump housing, thereby defining two spaces between respective half portions of an outer periphery of said cam ring and an inner surface of said pump housing, one of said two spaces between said cam ring and said pump housing being communicated with a pressure source so that said cam ring is swung from its eccentric position to its coaxial position with respect to said pump housing to adjust discharge rate in accordance with the pressure of said pressure source;
- two side plates respectively provided on both sides of said vanes, a top end of said vane contacting the inner surface of said cam ring, thereby defining pump chambers between said rotor and said cam ring;
- an intake port for successively sucking working fluid into said pump chambers, and an exhaust port for successively discharging pressurized working fluid from said pump chambers, said intake port and said exhaust port being provided in one side plate, and opening upon one side face of said cam ring;
- a friction ring provided between said cam ring and one of said two side plates, said friction ring being urged by an elastic member into contact with said one of said two side plates; and
- a pressure compensating recess formed at the other side face to said cam ring, which is opposite to said one side face upon which said exhaust port opens, said pressure compensating recess having a configuration which conforms to that of said exhaust port, and being communicated with said pump chambers.

5,090,882

ROTARY FLUID MACHINE HAVING HOLLOW VANES AND REFRIGERATION APPARATUS INCORPORATING THE ROTARY FLUID MACHINE

Yukio Serizawa; Koichi Sekiguchi; Yasuhiro Oshima, all of Tochigi, and Tadashi Iizuka, Asakaga, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

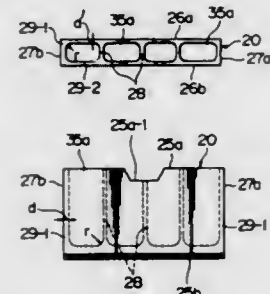
Filed Jul. 26, 1990, Ser. No. 557,787

Claims priority, application Japan, Aug. 4, 1989, 1-201237

Int. Cl.⁵ F04C 18/356, 29/00

U.S. Cl. 418—56

11 Claims



1. A rotary fluid machine comprising:
a cylinder block defining a cylinder bore therein;
a rotary piston rotatably disposed in said cylinder bore; and
a plate-like hollow vane dividing the space in said cylinder bore into a low-pressure chamber and a high-pressure chamber;
said vane having outer walls at least partially defining at least one cavity of a shape having corners, each corner comprising a curved concave surface of a radius of curvature greater than a thickness of the outer walls of said vane.

5,090,883

FUEL SUPPLY ASSEMBLY FOR A MOTOR VEHICLE

Lothar Krauter, Bietigheim-Bissingen; Hermann Nusser, Markgröningen; Peter Schelhas; Rainer Schillinger, both of Stuttgart; Dietrich Trachte, Leonberg, and Ulrich Kemmner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

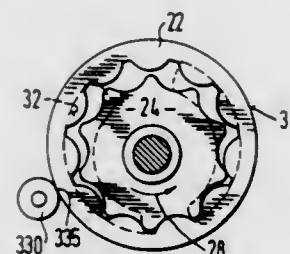
Division of Ser. No. 463,231, Jan. 10, 1990, abandoned. This application Jan. 22, 1991, Ser. No. 644,215

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1989, 3912965

Int. Cl.⁵ F04C 2/10

U.S. Cl. 418—171

1 Claim



1. A gear pump for a fuel supply assembly that feeds fuel from a fuel storage tank to an internal combustion engine of a motor vehicle, said gear pump comprising a ring gear having internal teeth; a pinion having external teeth meshing with said internal teeth of said ring gear, said pinion having less teeth than said ring gear, said internal teeth of said ring gear and said external teeth of said pinion defining expanding and contracting pumping chambers when said gear pump is driven; two cover plates for axially limiting said pumping chambers and having a suction opening in a region of expanding pumping chambers and a discharge opening in a region of contracting

pumping chambers; and stationary outer support means for movably supporting said ring gear, said outer support means comprising a support roller having an axis extending substantially parallel to an axis of said gear pump and a supporting surface engaging a portion of an outer surface of said ring gear and arranged outside of said discharge opening.

5,090,884

APPARATUS FOR MANUFACTURING HOLLOW CONCRETE STRUCTURES

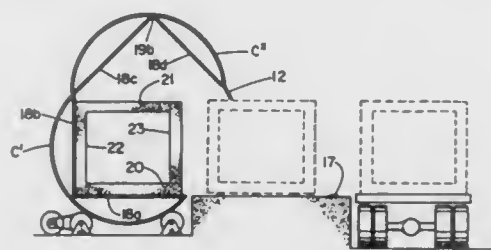
Samuel W. Beaman, 5233 Petty St., Houston, Tex. 77007

Filed Apr. 2, 1990, Ser. No. 502,770

Int. Cl.⁵ B28B 7/08; E04G 11/02

U.S. Cl. 425—63

13 Claims



1. An apparatus for forming multi-sided module concrete construction units comprising:
a) a forming structure having a plurality of substantially plane surfaces connected together to receive liquid cement to form an integral multi-side concrete structure;
b) positioning means adapted to sequentially position each plane surface in a substantially horizontal position for receiving liquid cement and supporting it in a substantially horizontal position for curing; and
c) means for forming a wall member in a substantially horizontal position with pivot means for pivoting said wall member into a substantially vertical position to provide a substantially vertical transverse member extending transversely relative to said sides in said modular concrete structure.

5,090,885

PLUNGER TO SUPPORT A WALL ON PLASTICS FOAMING AND METHOD TO MAKE SUCH A PLUNGER

Ann C. Stalin, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

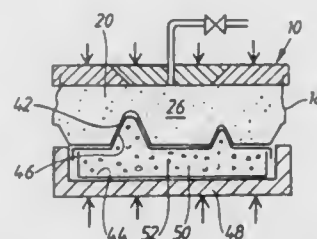
Filed Nov. 29, 1990, Ser. No. 619,734

Claims priority, application Sweden, Feb. 15, 1990, 9000547

Int. Cl.⁵ B29C 33/40, 39/10

U.S. Cl. 425—117

1 Claim



1. A mold form comprising a flexible bladder having an interior filled with a particulate material and conduit means to provide communication between the interior of the bladder and an evacuation means, said conduit means including a valve means to selectively control communication between said evacuation means and said bladder interior, said valve means being movable from a vacuum blocking position to a vacuum communicating position, wherein prior to evacuation of the bladder, and with said valve means in the vacuum blocking

position, the bladder and the particulate material freely conform to the contours of an original mold and thereafter, upon moving said valve means to said vacuum communicating position to evacuate the bladder, said bladder and particulate material accurately form a rigid inverted mold of the original mold, said inverted mold being maintained by returning said valve means to said vacuum blocking position, said inverted mold being reshaped into a different mold form after release of the vacuum.

5,090,886

APPARATUS FOR THE INJECTION MOLDING OF FLUID-FILLED PLASTIC BODIES

Christoph Jaroschek, Herbolzheim, Fed. Rep. of Germany, assignor to Klockner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

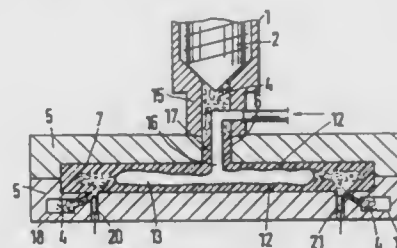
Division of Ser. No. 511,764, Apr. 20, 1990. This application Sep. 21, 1990, Ser. No. 586,528

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913109

Int. Cl.⁵ B29C 45/16

U.S. Cl. 425—130

4 Claims



1. An injection molding device having a mold cavity defined by movable walls, the device comprising:
means for injecting pressurized flowable plastic melt into the mold cavity to completely fill the mold cavity;
means for injecting pressurized gas into an interior of the plastic melt after a part of the plastic melt has cooled along the walls of the mold cavity;
at least one side cavity arranged outside of the mold cavity and in communication with the mold cavity to receive flowable plastic melt expelled by the injected pressurized gas; and
means for opening and closing the communication between said at least one side cavity and the mold cavity, wherein said opening and closing means comprises a stuffer having an end which aligns with a wall of the mold cavity which is in communication with said at least one side cavity when said stuffer is in a closed state.

5,090,887

SIEVE ARRANGEMENT FOR CLEANING SYNTHETIC PLASTIC MELTS

Detlef Gneuss, Bad Oeynhausen, Fed. Rep. of Germany, assignor to Gneuss Kunststofftechnik GmbH, Bad Oeynhausen, Fed. Rep. of Germany

Filed Jan. 25, 1990, Ser. No. 469,954

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902061

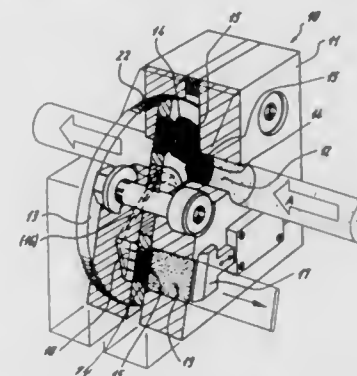
Int. Cl.⁵ B29C 47/68

U.S. Cl. 425—185

10 Claims

1. A sieve arrangement for cleaning synthetic plastic melts of a high pressure press, comprising a housing having a through-flow opening which is arranged to form a part of a flow passage of a high pressure press; a disc provided with a plurality of perforations and a sieve in each of said perforations and movable in said housing so that at least one of said perforations with said sieve is always in the region of said throughflow opening and at least one of said perforations with said sieve disc is always outside said housing; a blockable spraying passage provided at the side of the throughflow opening which is

located behind said disc as considered in a flow direction; a slot-shaped spraying nozzle associated with said perforation located always outside said throughflow opening and inside said housing so that said spraying passage opens into said spraying nozzle so as to provide an opposite flow through said sieve in said one perforation located outside said housing; an



- outlet passage provided in said housing at a side of said disc which is opposite to said spraying nozzle, one of said spraying passage and said outlet passage being provided with a blocking device which is synchronized with a drive of said disc, said spraying nozzle having a slot width which substantially corresponds to a value of a displacement cycle of said sieve discs.

5,090,888

DIE CASTING MOLD PART

Ernst Pfannkuchen, Höllentalstrasse 4, D-8104 Grainau, Fed. Rep. of Germany

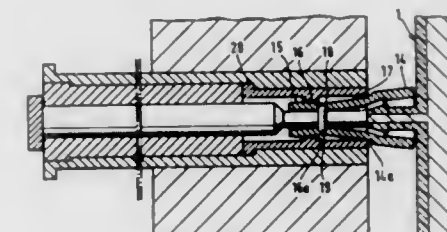
Filed Oct. 5, 1990, Ser. No. 593,857

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1989, 8911864; Apr. 12, 1990, 4011784716

Int. Cl.⁵ B29C 33/42, 33/48; B29D 1/00

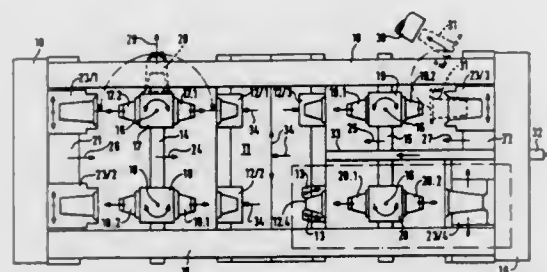
U.S. Cl. 425—438

8 Claims



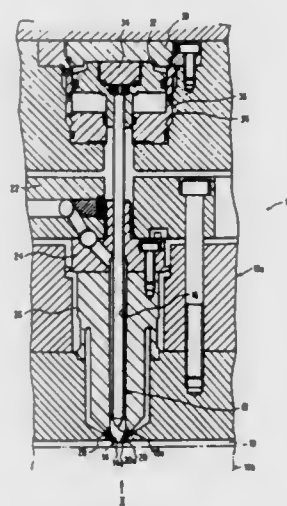
1. A die casting mold part for the manufacture of projections, including connection pieces, provided with flanges, beads, threads, undercuts or back tapers and like configurations provided for receiving other components, on a plastic or metal workpiece when the projections are located outside a mold separation plane, wherein said mold part comprises a plurality of segments which are received in a member defining a bore that guides and retains said segments together so that they function as a casting part that surrounds and forms the projections, said segments at one end forming a mold emplacement, and a central control shaft, said segments and said control shaft defining pivot means opposite said casting part for pivoting said segments whereby said segments are pivotally mounted on said central control shaft and are opened outwardly at said casting part by relative movement between said control shaft and said member defining said bore.

5,090,889
INJECTION BLOW TOOL FOR SYNTHETIC PLASTIC INJECTION CASTING MACHINES
 Walter Döber, and Heinz Oettinger, both of Badurach-Seeburg, Fed. Rep. of Germany, assignors to Systec Engineering Knauer GmbH & Co. KG, Bad Urach, Fed. Rep. of Germany
 Filed Jul. 11, 1990, Ser. No. 551,556
 Int. Cl.³ B29C 49/06
 U.S. Cl. 425—522 20 Claims



1. An injection blow tool for synthetic plastic injection casting machine, comprising a casting matrix with a plurality of casting molds; an associated matrix movable relative to said casting matrix and provided with mold cores corresponding to said casting molds, said matrix with said mold cores being formed as a turning body; a support supporting said turning body turnable about a turning angle of at least 90° relative to said casting matrix, said support being arranged between said casting matrix and a displaceable blow matrix with a plurality of blow molds so that mold cores arranged at a side of said turning body are inserted in said casting molds of the casting matrix and mold cores arranged at the opposite side of said turning body are simultaneously inserted in said blow molds of said blow matrix, and means for simultaneously performing injection casting and blow molding; a drive mechanism for relative displacement of the casting matrix, the turning body and the blow matrix and for rotation of the turning body, including a toothed rack and a control curve assembly operatively and mechanically connected between the displaceable blow matrix and the turning body, so that the turning body is rotated due to the displacement of the blow matrix.

for concealing a sinkmark produced on a surface of said molded article opposite said valve pin, said concealing means



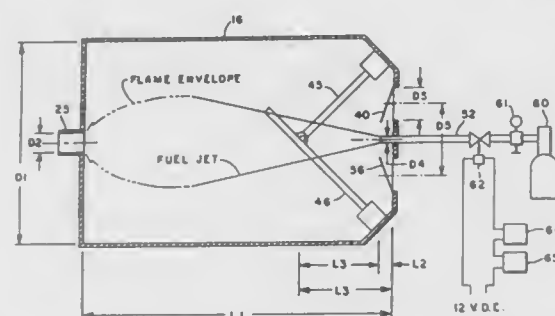
including a predetermined design irregularity provided on said end face of the valve pin.

5,090,891
HYBRID COMBUSTION DEVICE AND SYSTEM THEREFOR
 Klaus H. Hemsath, Toledo, Ohio, assignor to Indugas, Inc., Toledo, Ohio
 Continuation-in-part of Ser. No. 371,002, Jun. 26, 1981, Pat. No. 4,959,009. This application Sep. 19, 1990, Ser. No. 584,805
 Claims priority, application United Kingdom, Mar. 21, 1990, 9006359

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.
 Int. Cl.³ F23C 11/04

U.S. Cl. 431—1

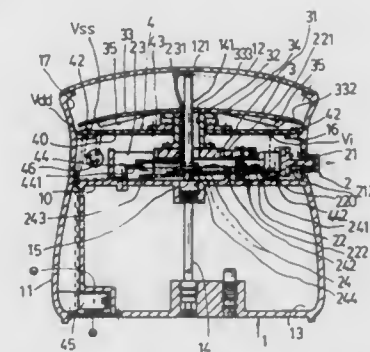
28 Claims



1. A pulse combustion type system comprising:
 a combustion chamber having a one-way air inlet opening, an exhaust outlet and a fuel inlet;
 ignition means in said chamber for igniting a combustible mixture of combustion air and fuel in said chamber;
 gas pressurizing means for pressurizing a source of gaseous fuel in fluid communication with said gas inlet;
 timing valve means cooperating with said gas pressurizing means for pulsing a metered amount of fuel as a free standing jet during a fixed time period through said fuel inlet whereby said fuel is essentially mixed with said combustion air through entrainment and a portion thereof ignited as it is metered into said combustion chamber past said ignition means and thereafter combusted to produce a pressurized pulse at low noise levels, said timing valve means actuated only after said combustion air has been admitted through said one-way air inlet to substantially fill said combustion chamber; and
 said gas inlet including a gas manifold having a plurality of

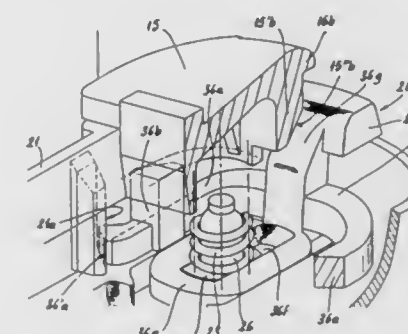
gas orifices for directing a plurality of gas jet streams into said chamber.

5,090,892
GAS LIGHTER WITH ROTATIONAL BINGO MEANS
 Jack Chuang, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan
 Filed Apr. 4, 1991, Ser. No. 680,324
 Int. Cl.³ F23Q 3/00
 U.S. Cl. 431—125 5 Claims



1. A gas lighter with rotational bingo means comprising:
 a lighter means including a lighter casing having a gas container formed on a lower portion of the casing and an upper chamber formed on an upper portion of the casing above a middle partition plate, a top transparent cover formed on a top portion of the casing, and a gas tube having a sparking terminal formed at an upper portion of the gas tube and a gas valve for on-off control of a gas from the gas container;
 an actuating means including a push button reciprocally held in said lighter casing, an actuating rod coupled with said push button for operatively actuating a sparking generator for producing sparking at the sparking terminal for igniting a flame of the lighter, and a trigger lever operatively biased by said actuating rod and said push button for opening said gas valve; a rotating disk means including a driving gear operatively driven by said actuating rod of said actuating means, a hollow shaft secured with said driving gear rotatably mounted in a base plate secured in said upper chamber of said casing and a rotating disk secured on an upper portion of said shaft having a plurality of decorative features annularly formed on a periphery of said disk; and
 an electronic driving means including a lotto flash driver having an integrated circuit formed as a printed circuit board embedded in said base plate, a plurality of indicator lamps selected from light emitting diodes annularly distributed on a periphery of said rotating disk each said lamp normally matched with and positioned under each said decorative feature formed on said disk, a sleeve secured on said base plate for rotatably mounting said hollow shaft of said rotating disk, a trigger switch operatively actuated by said actuating rod and said push button for actuating said lotto flash driver, a buzzer electrically connected to said lotto flash driver for sounding purpose, and a power source for powering said lotto flash driver, whereby upon a depression of said push button to ignite a flame of said lighter, said trigger switch is closed to actuate said lotto flash driver for flashing said indicator lamps and for sounding said buzzer, and said rotating disk being operatively rotated by said actuating rod and finally stopped at a random position corresponding to a finally stopped illuminating lamp after a circular flashing operation around the plurality of said lamps upon the actuation of said lotto flash driver for interesting bingo or lotto game.

5,090,893
CHILDPROOF GAS LIGHTER
 Marcel Floriot, Toussieu, France, assignor to Cricket, Rillieux-la-Pape, France
 PCT No. PCT/FR90/00244, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO90/12254, PCT Pub. Date Oct. 18, 1990
 PCT Filed Apr. 5, 1990, Ser. No. 651,332
 Claims priority, application France, Apr. 7, 1989, 89 04870
 Int. Cl.³ F23D 11/36 3 Claims



1. A gas lighter comprising:
 a housing adapted to hold a supply of combustible gas;
 a nozzle on the housing adapted to emit a jet of the gas;
 valve control means including
 a valve on the housing connected between the nozzle and the supply and actuatable to feed the gas along a nozzle axis from the supply to the nozzle;
 a rocking lever rocking on a fixed axis orthogonal to the nozzle axis and having one arm formed like a fork or elastic crown engaged under a collar of the valve and another arm intended to be operated by the user by being pushed in a direction toward the housing of the lighter against the force of a return spring;
 ignition means on the housing adjacent the valve actuatable for forming a spark and igniting the jet therewith, the ignition means being associated with the lever for opening the valve;
 a blocking slide on the housing displaceable between a neutralizing position preventing actuation of the ignition means and a freeing position permitting the ignition means to be actuated, whereby when the blocking slide is in the neutralizing position the lighter cannot be lit, the slide being positioned under the operating end of the rocking lever and movable parallel to this rocking lever between an actuated position in which it projects with respect a service end of the lever and a retracted position in which it is retracted toward an opposite end of the rocking lever, this slide being provided with guide means relative to the housing of the lighter having the shape of a horseshoe whose elastic legs carry a boss normally provided under a skirt bounding the service end of the rocking lever so as to impede rocking thereof in a direction to open the burner valve, converging complementary flanks being formed on the inside faces of the side walls of the housing of the lighter and on the external faces of the slide to reduce the spacing of their bosses when the slide is moved into the retracted position so as to completely free the path of the skirt of the service end of the rocking lever, a transverse leg of the slide and a rear outside face of the skirt of the service end of the rocking lever having complementary flanks of the same slope that can cooperate with each other when this end of the rocking lever is pushed in to move the slide in the opposite direction into its actuated neutralizing position.

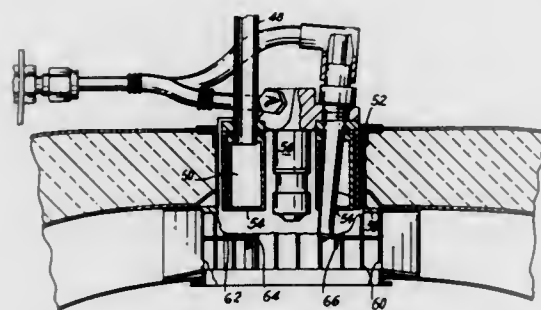
5,090,894
ENHANCED AIR/FUEL MIXING FOR AUTOMOTIVE
STIRLING ENGINE TURBULATOR-TYPE
COMBUSTORS

George T. Riecke, Ballston Spa, and Robert E. Stotts, Newark, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 29, 1991, Ser. No. 647,539
 Int. Cl. F23M 9/00

U.S. Cl. 431-183

7 Claims



1. A combustor for use in a Stirling engine and the like comprising:

- a combustor chamber;
- a fuel inlet couple to said chamber to inject fuel therein;
- a turbulator means disposed in said chambers downstream of said fuel inlet means for injecting combustion air into said chamber, said turbulator means being so positioned to cause a mixing of the combustion air and fuel injected into said chamber;
- diverter means for dividing said combustion air and creating a primary mixing zone of fuel and combustion air and a secondary mixing zone downstream of the primary mixing zone; and
- wherein said primary mixing zone comprises a fuel rich zone where combustion initiates and said secondary mixing zone has sufficient combustion air to complete combustion of the fuel.

5,090,895
DEVICE FOR PREVENTING OIL FROM DRIPPING OUT
OF THE BURNER NOZZLE OF AN OIL-FIRED
HEATING SYSTEM

Per F. Jensen, Nordborg; Ingvar M. Madsen, Sonderborg, and Leif B. Bonnerup, Nordborg, all of Denmark, assignors to Danfoxx A/S, Nordborg, Denmark

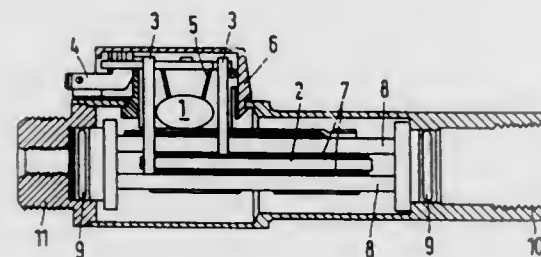
Filed Apr. 9, 1991, Ser. No. 682,368

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1990, 4020005

Int. Cl. F23D 11/44

U.S. Cl. 431-208

5 Claims



1. Apparatus for preventing oil dripping out of a burner nozzle of an oil-fired heating system, comprising a nozzle holder, an oil warmer unit having an encapsulating member, the encapsulating member having a nozzle connection portion and an oil connection portion, a first oil feed pipe within the

encapsulating member for fluidly connecting the connection portions to one another, a second oil feed pipe fluidly connecting the connection portions to one another, each feed pipe being made of metal, and a first heating element within the encapsulating member for heating oil within the first feed pipe and operable means for powering the heating element to continuously regulate the oil temperature during operation of the oil fired heating system to maintain the volume of oil in the warmer unit nearly constant, the operable means including a second heating element in the encapsulating member, the two heating elements being located between the two feed pipes in thermal contact therewith, and the oil warmer unit including means for electrically insulating the heating elements from the feed pipes.

5,090,896
CENTRAL HEATING FOR MOTOR VEHICLES AND
SUCH MOBILE UNITS

Erich Kenner, Esslingen, and Herbert Langen, Altbach, both of Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany

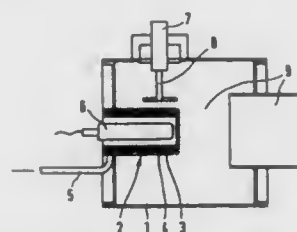
Filed Oct. 31, 1989, Ser. No. 429,758

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1988, 3837074

Int. Cl. F23Q 7/08

U.S. Cl. 431-262

7 Claims



1. A central heating unit, comprising:

- a vaporizer burner housing;
- a vaporizer burner including a cylindrical cup shaped vaporizer body surrounding an evaporation element;
- a rod heating plug positioned within the vaporizer burner surrounded by the evaporation element;
- a liquid fuel line connected to the evaporation element for supplying fuel to the evaporation element;
- high voltage electrode means positioned adjacent the vaporizer burner cylindrical cup shaped body for starting the vaporizer burner.

5,090,897
UNITIZED BURNER ASSEMBLY

Dan L. Christenson, Mulvane, Kans., assignor to Gordon-Piatt Energy Group, Inc., Winfield, Kans.

Filed May 3, 1990, Ser. No. 518,550

Int. Cl. F23Q 3/00

U.S. Cl. 431-265

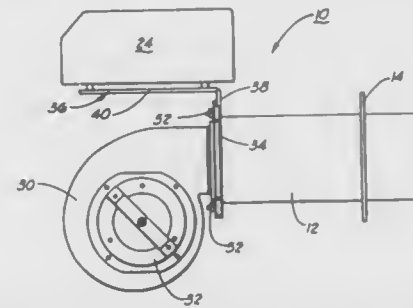
10 Claims

1. A unitized burner assembly for combustion of gaseous fuels comprising:

- an outer housing;
- means for supplying fuel through the burner assembly to a combustion chamber;
- a replaceable unitized combustion cartridge disposed within the outer housing, the unitized combustion cartridge comprising:
- an elongated cylindrical body;
- a flame holder connected to a downstream end of the cylindrical body;
- a fuel supply pipe stub extending at a right angle from the cylindrical body;
- means for distributing gaseous fuel over an upstream

surface of the flame holder for admixture with combustion air at the upstream surface of the flame holder; and mounting means for removably connecting the combustion cartridge to the outer housing;

a blower having means for forming an outlet, the blower pivotally connected to the outer housing by a hinge such



that the blower can be selectively moved between a first and a second position, in the first position the outlet of the blower being axially aligned with the elongated cylindrical body of the combustion cartridge, in the second position the blower being pivoted for permitting access to the combustion cartridge.

5,090,898
INFRA-RED HEATING

Thomas M. Smith, 1415 Golf Rd., Connaminson, N.J. 08077
 Continuation-in-part of Ser. No. 329,551, Mar. 28, 1989, Pat. No. 5,046,944, and a continuation-in-part of Ser. No. 125,001, Jan. 4, 1988, Pat. No. 4,830,651, and a continuation-in-part of Ser. No. 12,723, Feb. 9, 1987, abandoned, and a

continuation-in-part of Ser. No. 771,722, Sep. 3, 1985, Pat. No. 5,024,596, which is a continuation-in-part of Ser. No. 76,674, Jul. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 831,795, Feb. 19, 1986, Pat. No. 4,722,681, which is a

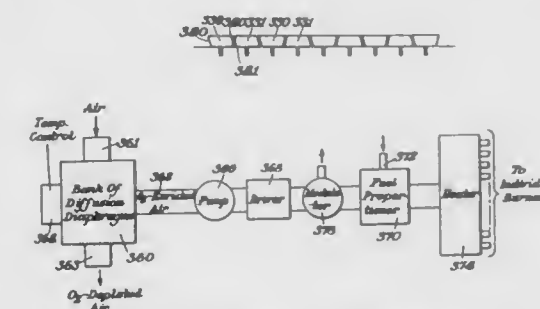
continuation-in-part of Ser. No. 752,908, Jul. 8, 1985, Pat. No. 4,604,054, which is a continuation-in-part of Ser. No. 628,989, Jul. 9, 1984, Pat. No. 4,589,843, which is a continuation-in-part of Ser. No. 592,793, Mar. 23, 1984, Pat. No. 4,654,000, which is a continuation-in-part of Ser. No. 567,270, Dec. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 509,161, Jun. 29, 1983, Pat. No. 4,500,823, which is a continuation-in-part of Ser. No. 435,412, Oct. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 312,730, Oct. 19, 1981, Pat. No. 4,443,185, which is a continuation-in-part of Ser. No. 292,167, Aug. 12, 1981, Pat. No. 4,474,552, which is a

continuation-in-part of Ser. No. 279,081, Jun. 30, 1981, Pat. No. 4,416,618, which is a continuation-in-part of Ser. No. 238,418, Feb. 26, 1981, Pat. No. 4,447,205, which is a continuation-in-part of Ser. No. 186,491, Sep. 12, 1980, Pat. No. 4,378,207, which is a continuation-in-part of Ser. No. 94,901, Nov. 16, 1979, Pat. No. 4,272,238. This application Oct. 20, 1989, Ser. No. 424,762

Int. Cl. F23D 3/40; F26B 3/32

U.S. Cl. 431-326

4 Claims



1. An aligned row of side-by-side gas-fired infra-red generators each with a generally rectangular radiant face and each in

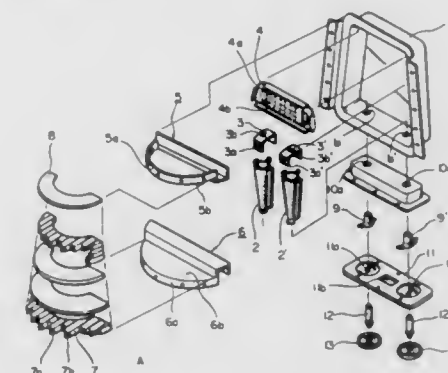
close engagement with the generators on each side of it, each generator having side walls about 1/4 inch thick with their radiant faces extending to those walls, a strip of engaging walls of adjacent generators to plug the spaces between generators against penetration of hot combustion gases generated by the generators, and the combustion mixture supply including a diffusion diaphragm and means for conducting a stream of air along one face of the diaphragm to cause some of the oxygen in that air to preferentially diffuse through the diaphragm, producing a stream of air enriched in oxygen.

5,090,899
ALL-PRIMARY TYPE GAS BURNER
 Heui-Tae Kee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea
 Filed Nov. 13, 1989, Ser. No. 434,786
 Claims priority, application Rep. of Korea, Nov. 11, 1988, 88-18435

Int. Cl. F23D 14/20

U.S. Cl. 431-326

1 Claim

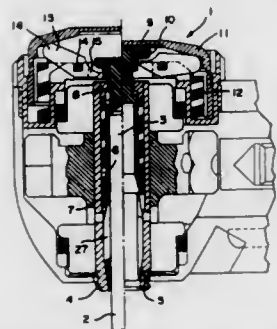


1. An all-primary type gas burner comprising:

- (a) a burner main body;
- (b) air suction means which suck air and gas into said burner main body, each said air suction means comprising:
 - (i) an air control plate mounted on said burner main body;
 - (ii) a nozzle mounted on said air control plate which receives gas from outside said burner main body;
 - (iii) an air control disk mounted on said air control plate so as to create an opening of variable size through which air can flow into said burner main body; and
 - (iv) a venturi which is coupled to said nozzle and said air control disk and which causes a reduction in pressure so as to suck gas from said nozzle and to suck air through said opening;
- (c) gas mixing tubes located inside said burner main body, each of which receives gas and air from one of said air suction means and mixes gas and air; and
- (d) a plurality of gas distribution means located inside said burner main body so as to uniformly distribute gas and air flowing from said gas mixing tubes throughout said burner main body;
- (e) a burner surface mounted on said burner main body comprising:
 - (i) a first semi-cylindrical element comprising a plurality of rectangular ceramic tubes through which gas and air flow out of said burner main body;
 - (ii) a second semi-cylindrical element comprising a plurality of rectangular ceramic tubes through which gas and air flow out of said burner main body, said second semi-cylindrical element having a greater diameter than said first semi-cylindrical element; and
 - (iii) insulation material placed between said first and second semi-cylindrical elements;
- (f) a first base plate which couples a first end of said burner main body to a first end of said burner surface; and

ing a cutting shank of a dentistry instrument in a head of a contra-angle or a handpiece, wherein displacement of the push-button is effected counter to a pressure spring, comprising:

at least one reversal element for receiving movements responsive to pressure on the push-button and for converting said movements into a traction movement exerted by



the reversal element on a pusher controlling a collet chuck for holding a neck formed in the shank of the instrument, wherein said reversal element includes a plurality of balls operated upon by a ramp of the push-button in contact with a counter-ramp of a ring controlling a shoulder formed in the pusher, for displacing the balls toward a corresponding seat.

5,090,907

DENTAL CURETTE WITH FINGER PAD

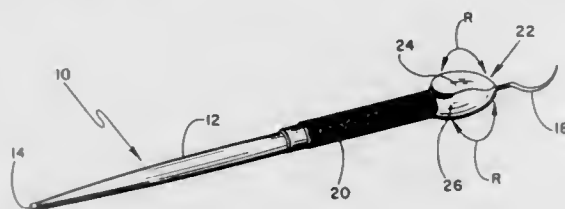
Fred G. Hewitt, 545 Chapel La., Eagan, Minn. 55121; John C. Conrad, 4729 Covington Ct., Eagan, Minn. 55122, and Kathy J. Conrad, 4729 Covington Ct., Eagan, Minn. 55122

Filed Aug. 19, 1991, Ser. No. 746,606

Int. Cl.⁵ A61C 3/02

U.S. Cl. 433—144

23 Claims



1. A dental curette, adapted to be held by a hand, comprising:

- a shaft member having a first end and a second end proximate a working head; and
- finger pad means axially constrained and selectively rotatable about said second end proximate said working head for receiving a first finger of said hand, said finger pads means having a first finger-surface complementary contoured to receive said first finger when said dental curette is held by said hand.

5,090,908

LASER APPARATUS FOR PERIODONTAL TREATMENT

Zvi Teumim-Stone, Ramot 01 36/26, Jerusalem, Israel

Filed Jul. 6, 1989, Ser. No. 376,102

Claims priority, application Israel, Jul. 6, 1988, 87015

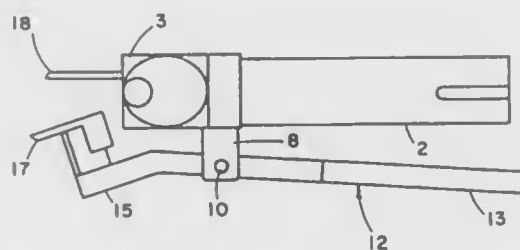
Int. Cl.⁵ A61C 5/00

U.S. Cl. 433—215

11 Claims

1. In a laser apparatus for periodontal treatment, comprising: a surgical laser for producing a beam of laser light, and a handpiece coupled to the laser and containing: directing means for directing the laser beam as a focused beam on to tissues within a periodontal pocket;

the improvement whereby there is further provided: a protective shield at an end of the handpiece shaped and dimensioned for insertion into a periodontal pocket and displaceable from a first position preventing passage of the



laser beam to a second position allowing the laser beam to pass therethrough, and displacing means coupled to the shield for displacing the shield relative to the handpiece from the first position to the second position.

5,090,909

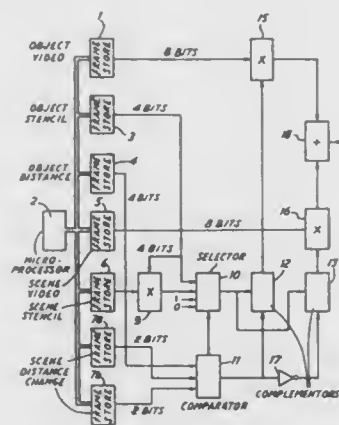
VIDEO GRAPHIC SIMULATOR SYSTEMS

Paul R. N. Kellar, Newbury; Robin A. Cawley, Ball Hill, and Alan L. Stapleton, Newbury, all of England, assignors to Quantel Limited, Surrey, England
Continuation of Ser. No. 289,425, Dec. 23, 1988, abandoned, which is a continuation of Ser. No. 633,321, Jul. 23, 1984, abandoned. This application Aug. 2, 1990, Ser. No. 562,442
Claims priority, application United Kingdom, Jul. 28, 1983, 8320357

Int. Cl.⁵ G09B 9/00; H04N 5/22

U.S. Cl. 434—43

10 Claims



1. A video graphic simulator system comprising:

- first source means for video signals representing a scene which includes features at different distances from an observer and which are separated by boundaries;
- second source means for video signals representing an object moving with respect to the scene;
- third source means for video signals representing a stencil for the scene and a stencil for the object, each of said stencils for the scene and the object having a value for each point of the scene which values are graduated at the boundaries between the features;
- fourth source means for signals representing the distances from the features in the scene to the observer and from the object to the observer;
- means for deriving contemporaneous sequences of video signals from said first, second and third source means with corresponding signals in said sequences relating to the same point on the scene;
- processor means responsive to successive video signals derived from said third source means for selectively inter-

polating one of the corresponding scene and object video signals on the other of said corresponding scene or object video signals in dependence upon the relationship of said object and scene distance signals;

g) means included in said processor means responsive to video signals from said third source means for gradually reducing the proportion of the object video signals and increasing the proportion of the scene video signals at the edges of the object where the object is interpolated on the scene, and also at discontinuities where a feature of the scene obscures part of the object; and

h) display means for displaying the combined video signals.

5,090,911

MODULAR CONNECTOR SYSTEM

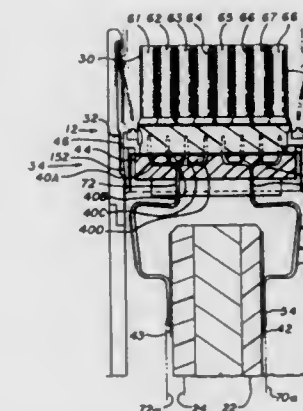
David E. Welsh, Tustin, Calif., assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 463,586, Jan. 11, 1990, abandoned. This application Feb. 7, 1991, Ser. No. 652,363

Int. Cl.⁵ H01R 23/70

U.S. Cl. 439—79

4 Claims



1. A connector system comprising:

- a circuit board assembly which includes a plate-like heat sink with opposite faces and a pair of circuit boards, said heat sink being sandwiched between said circuit boards, said boards each having an edge portion and a row of terminals spaced along its edge portion;
- a connector housing rigidly attached to said circuit board assembly at said board edge portion and having walls with an inside surface;
- at least one insert with opposite sides lying within said housing, said insert having an insulator assembly, a plurality of rows of contacts on said insulator assembly extending parallel to said opposite sides, and a plurality of leads, each lead having a front portion connected to a contact, a middle portion extending through said insulator assembly, and a rear portion projecting in a rearward direction from said insulator assembly, said lead rearward portions lying in two rows that engage said rows of terminals on said circuit boards;
- a heat dissipating apparatus;
- a clamp mechanism that clamps said heat sink against said heat dissipating apparatus to transfer out heat;
- said insert having a plurality of centering springs, each spring comprising an elongated resiliently bendable cantilevered member extending primarily in a rearward direction and having an inner end mounted on said insert insulator assembly and a free outer end biased against an inside surface of said housing walls, said springs lying at opposite sides of said insert, whereby to allow said insert to float within said housing to avoid stresses when said heat sink is sidewardly displaced during clamping.

5,090,912

ARRANGEMENT FOR THE MECHANICAL AND ELECTRICAL CONNECTION OF A SUPPLEMENTARY PRINTED CIRCUIT BOARD TO A BASE PRINTED CIRCUIT BOARD

Karl Zeli, Niederpoecking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 522,119, May 11, 1990, abandoned.

This application Aug. 28, 1991, Ser. No. 749,462

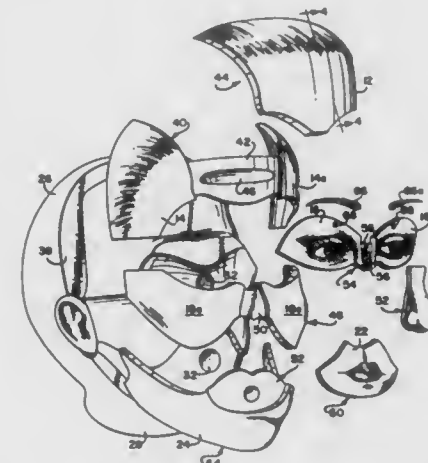
Claims priority, application Japan, May 12, 1989, 3915648

Int. Cl.⁵ H01R 9/09

U.S. Cl. 439—79

19 Claims

1. An arrangement for mechanically and electrically connecting a supplementary printed circuit board, including an



1. A three-dimensional facial display system for selectively creating any one of at least seven classic face shapes, each of which is characterized by a distinctive bone structure, and each of which is divided into regions including at least forehead, cheeks and jawbones regions, the system comprising:

- a self supporting skill base provided with a contoured support surface;
- a plurality of three dimensional facial display components corresponding to at least said forehead, cheeks and jawbones regions, each component having a front surface, rear surface and peripheral side edge, and wherein the rear surface of each of said forehead, cheeks and jawbones components is adapted to be supported directly on said contoured support surface, such that said support surface underlies each of said components, wherein said peripheral side edge of each of said components is complementary to the peripheral side edges of adjacent components when mounted on said skull base, and wherein a sufficient number of said components are alternatively shaped and interchangeable so as to enable the formation of any one of said at least seven classic face shapes.

edge and printed circuit interconnects and corresponding plated-through holes, to a base printed circuit board including printed circuit interconnects and corresponding plated-through holes thereon, comprising:

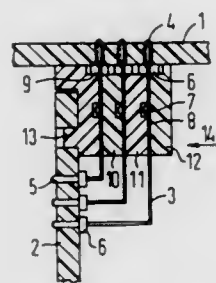
an insulating receptacle member;

a plurality of connector elements each including first and second plug-in end regions, said connector elements mounted in rows in said receptacle member with said first and second end regions extending out of said receptacle member;

second end regions of said connector elements plugged into and electrically connected to respective plated-through holes of said supplementary printed circuit board;

a pluggable unit comprising

first connection means on said receptacle member and second connection means on said supplementary printed circuit board for mating engagement with said first connection means to join said receptacle member and said supplementary printed circuit board;



said pluggable unit plugged into said base printed circuit board, said first and second end regions of said connector elements shaped to accommodate plugging and unplugging and said first regions plugged into and electrically contacting respective plated-through holes of said base printed circuit board; and

third connection means mounted on said base printed circuit board; fourth connection means mounted on said receptacle member for releasably securing said pluggable unit to said base printed circuit board;

said third and fourth connection means including means operable to apply plugging and unplugging forces to said receptacle member,

said third connection means comprising a thread bushing, said base printed circuit board comprising a bore mounting said threaded bushing,

said fourth connection means comprising a screw received in said threaded bushing, and said receptacle member including a bore rotatably mounting said screw.

5,090,913

PORTABLE APPARATUS HAVING CABLE ELECTRICALLY CONNECTING DISPLAY UNIT AND BASE UNIT

Takaichi Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1990, Ser. No. 542,061

Claims priority, application Japan, Jun. 23, 1989, 1-162224 Int. Cl.⁵ G06F 1/00

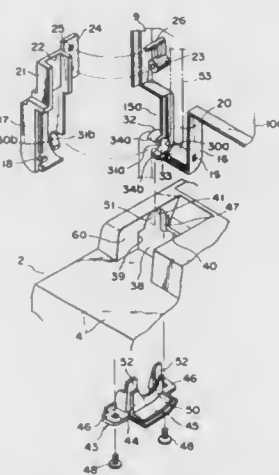
U.S. Cl. 439—165

21 Claims

1. A portable electronic apparatus comprising:
a display unit comprising a leg portion having a cable guide path therein;
a base unit comprising a leg mounting portion for receiving the leg portion, the leg mounting portion including a bottom mounting wall having a bottom opening and a side mounting wall having a side opening, the side opening being continuous with the bottom opening;
a cover comprising a bottom support wall for covering the bottom opening and a side support wall cooperating with

the side mounting wall of the leg mounting portion to form a cable guide hole; and

a cable comprising a first end having a first connector elec-



trically connected to the display unit and a second end having a second connector electrically connected to the base unit, the cable passing through the cable guide hole and the cable guide path.

5,090,914

ACTIVATED POLYMERS AND CONJUGATES THEREOF

Dayton T. Reardan, Hercules, and Dane A. Goff, Menlo Park, both of Calif., assignors to Xoma Corporation, Berkeley, Calif.

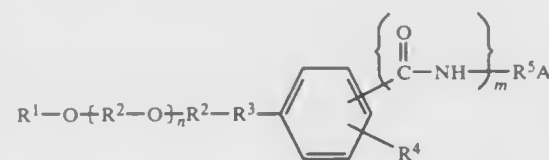
Division of Ser. No. 164,307, Mar. 4, 1988, abandoned. This application Aug. 24, 1990, Ser. No. 572,726

Int. Cl.⁵ A61K 37/02, 39/00

U.S. Cl. 435—188

19 Claims

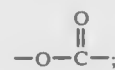
1. A compound having the formula



in which

R¹ is a member selected from the group consisting of H, C₁-C₂₀ alkyl, phenyl, (C₁-C₁₀ alkyl)-substituted phenyl, or phenyl-substituted C₁-C₁₀ alkyl;

R² is a member selected from the group consisting of C₂-C₅ alkylene and C₁-C₄ alkoxy-substituted C₂-C₅ alkylene; R³ is



R⁴ is a member selected from the group consisting of H and C₁-C₄ alkyl;

R⁵ is a member selected from the group consisting of —N— and —N—; n is at least 5;

m is zero or 1; and

A is a residue of a macromolecular species bearing a reactive carbonyl group, said molecular species being a member selected from the group consisting of enzymes, coenzymes, immunoglobulins, immunotoxins, proteins, drugs and polymeric solid supports.

5,090,915

SELF-TERMINATING COAXIAL TAP CONNECTOR WITH EXTERNAL TERMINATION ELEMENT

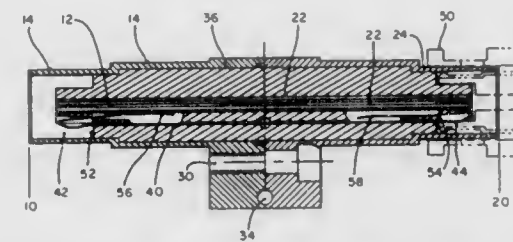
James I. Moulton, Sunnyvale, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Oct. 11, 1990, Ser. No. 596,128

Int. Cl.⁵ H01R 29/00

U.S. Cl. 439—188

11 Claims



1. A self-terminating coaxial tap connector with external termination circuit for mounting on a printed circuit board comprising:

first and second coaxial connector sockets with first and second connected center conductors and first and second connected surrounding shields;

a mounting tab on said connected shields for attachment to said printed circuit board;

a center conductor contact pin connected to said connected center conductors and extending through and insulated from said connected shields to end external to said connected shields for connection to said printed circuit board;

a secondary conductor within said connected shields parallel to and spaced from said connected center conductors and having first and second ends terminating near each of first and second ends of said center conductors, each of said first and second secondary conductor ends being formed as a movable switch element having a first switch position in contact with said center conductor when said socket is open, and having a second switch position detached from said center conductor when a mating plug connector is coupled to said socket, said switch element being moved to said second switch position by abutment with said mating plug connector; and

a secondary conductor contact pin connected to said secondary conductor and extending through and insulated from said connected shields to end external to said connected shields for connection to said printed circuit board.

5,090,916

MALE CONNECTOR FOR TELEPHONE AND/OR DATA PROCESSING COMMUNICATIONS NETWORK

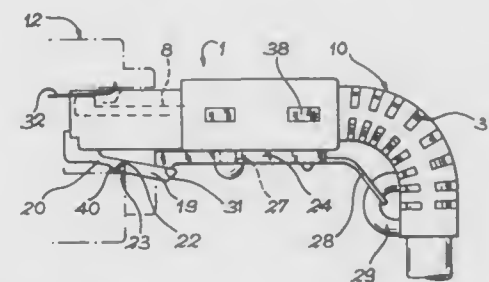
Bernard Magnier, Cadenet, France, assignor to Interconnection Informatique, Pertuis, France

Filed Jul. 10, 1991, Ser. No. 727,917

Claims priority, application France, Jul. 11, 1990, 90 08831 Int. Cl.⁵ H01R 13/627

U.S. Cl. 439—352

3 Claims



1. Male connector for a telephone and/or data processing communications network comprising a parallelepipedic insulating support (1) having two lateral faces (2,3), an upper face

(4), a lower face (5), a front face (6) and a rear face (7), connecting terminals (8) partly embedded in the support (1) and extending onto the upper face (4), said terminals being connected to lines (9) of a communications cable (10) surrounded by an insulating envelope and entering the support (1) by its rear face (7), the connecting terminals (8) of the male connector respectively coming into contact by sliding with corresponding terminals (32) of a female connector located in a case (12) and respectively connected to lines of a communications network during the insertion of the male connector into at least one insertion window (13) formed in a front face (14) of the case said window having edges (15, 16, 17, 18) respectively parallel to the upper, lower and lateral faces of said support, the support also comprising a rigid elastic tongue (19) rendered integral with the support in the vicinity of its lower (5) and front faces (6) by a planar base (20) which is wider than the tongue (19), said tongue and said base being inclined with respect to the lower face (5) and engaging in a corresponding recess (21) of the front face of the case adjacent to the window, the base (20) having a transverse locking shoulder (22) such that during the insertion of the male connector the tongue (19) and the base (20) are progressively turned down towards the lower face (5) of the support by the bearing and sliding of said base on the edges of said recess (21) and that at the end of insertion the tongue and the base move away from the lower face of the support in order to lock the male connector to the female connector by the bearing of said shoulder (22) on an inner wall (23) of said front face of the case (12), a portion of the tongue (19) being accessible outside the case following the insertion of the male connector, said male connector also comprising, on the lower face (5) of the support, a slide bolt (24) sliding along said lower face, between the front (6) and rear faces (7), and engaging beneath said tongue (19) portion, said slide bolt being provided with elastic means (25, 26) bearing on guide means (27) connected to the support (1) and causing a return movement of the slide bolt towards the front face of the support, the slide bolt being connected by articulated means (28, 29) to the envelope (10) of the cable, in the vicinity of the rear face (7) of the support, a portion of the insulating envelope (11) of the cable (10) adjacent to the support (1) having means (39) for curving the cable towards the lower face (5) of the support, the slide bolt being drawn towards the rear face of the support in order to release the turn-down movement of the tongue, either during insertion, or after insertion, when pulling on the cable (10) which acts on the articulated means (28, 29) in order to facilitate the disconnection of the male connector from the female connector.

5,090,917

INSULATION DISPLACING CONNECTOR FOR PROVIDING REPEATABLE SEALED TERMINATION OF ELECTRICAL CONDUCTORS

Peter Noorily, Bridgewater, and Sidney Levy, Belle Meade, both of N.J., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed May 10, 1991, Ser. No. 698,629

Int. Cl.⁵ H01R 4/24

U.S. Cl. 439—395

14 Claims

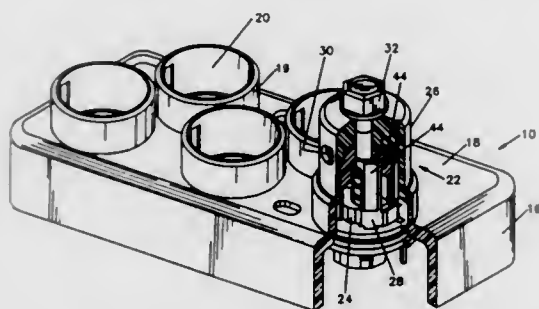
1. An electrical connector for providing repeatable sealed termination of an electrical wire having a center conductor and insulation therearound, said connector comprising:

an insulative base;

an insulation displacing electrical contact supported by said base, said contact being defined by a pair of spaced-apart beams having upper insulation piercing edges defining a wire receiving location thereat and defining a conductor receiving slot therebetween;

an insulative cover movably supported over said base including means for removably accommodating said wire, said cover being movable toward said base for urging said wire into insulation displacing electrical connection with

said contact and away from said base for removing said wire from said connection with said contact;
a flowable sealing material surrounding said contact and further positioned at said wire receiving location, said sealing material being displaceable from said location by said urging of said wire into said insulation displacing connection with said contact; and
a plunger positioned within said slot, said plunger having an upper surface adjacent said wire receiving location, said



plunger being compressible from an uncompressed condition to a compressed condition upon said urging of said wire into insulation displacing connection with said contact and returnable to said uncompressed condition upon said removing of said wire from said connection with said contact, said upper surface of said plunger returning said displaced sealing material to said wire receiving location upon said return of said plunger to said uncompressed condition.

5,090,918

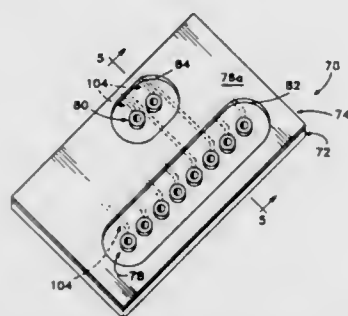
ISOTHERMAL TERMINATION BLOCK HAVING A MULTI-LAYER THERMAL CONDUCTOR

Raymond D. Zoellick, Bothell, and Peter F. Barbee, Woodinville, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed May 31, 1990, Ser. No. 530,996
Int. Cl.⁵ H05K 7/20

U.S. Cl. 439—487

10 Claims



1. An isothermal block for maintaining wire connections at substantially the same temperature in a temperature measurement system, comprising:

- (a) a multi-layer printed circuit board having a first substrate layer stacked on a second substrate layer and connecting means on said first substrate layer for connecting said multi-layer printed circuit board to electric wires; and
- (b) a first thermally conductive layer formed on one of said first and second substrate layers for thermally coupling said connecting means, wherein said first thermally conductive layer is embedded in said multi-layer printed circuit board between said first and second substrate layers and is electrically isolated from said connecting means, said first thermally conductive layer being substantially thinner than said first or second substrate layers.

5,090,919

TERMINAL PIECE SEALING STRUCTURE

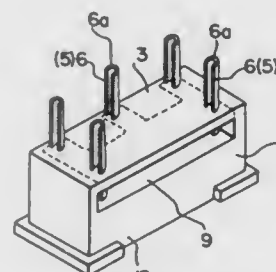
Hiideaki Tsuji, Yamaga, Japan, assignor to Omron Corporation, Kyoto, Japan

Continuation of Ser. No. 470,636, Jan. 26, 1990, abandoned. This application Jul. 26, 1990, Ser. No. 556,719

Claims priority, application Japan, Jan. 26, 1989, 1-8097[U]
Int. Cl.⁵ H01R 13/52

U.S. Cl. 439—519

10 Claims



1. A seal structure for an electric device, comprising:
an electrically insulating housing having a through hole in a bottom surface thereof and a lateral slot in a side surface thereof, said slot being in communication with said through hole;
an electrically conductive lead portion partially disposed in said through hole and passing completely through said slot;
a sealant disposed in said lateral slot, wherein said sealant is injected directly into said slot to prevent flux from traveling along said lead portion and said sealant from clinging and rising along said lead portion.

5,090,920

MODULE RETENTION/EJECTION SYSTEM

Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

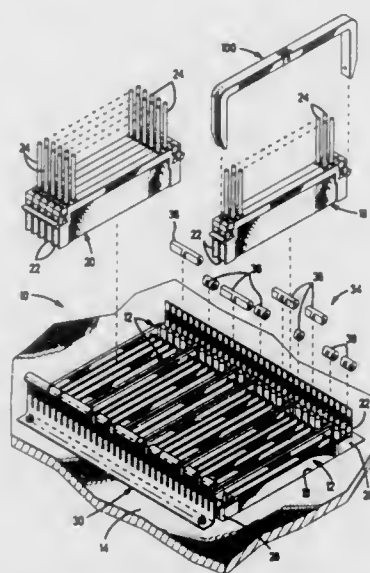
Continuation of Ser. No. 510,380, Apr. 17, 1990, abandoned.

This application Feb. 22, 1991, Ser. No. 660,230

Int. Cl.⁵ H01R 13/60

U.S. Cl. 439—540

17 Claims



1. A system for releasably retaining a plurality of modules in an array on a transverse panel, comprising:
a pair of parallel opposing bracket assemblies secured to said transverse panel spaced apart at an array site, each bracket assembly including at least an integral bracket member

having a body section having at least a portion thereof mounted against and along a surface of said panel, and each bracket member including a plurality of cantilever spring latch arms coextending from said body section at each site of a module and perpendicularly away from said panel surface to respective free ends at least deflectable in a direction away from the other said bracket assembly said latch arms of both said bracket members being associated in opposing parallel pairs at a said module site spaced apart for receipt of a respective said module therebetween, said latch arms defining opposing arrays of panel-remote free ends;

each said latch arm of each said pair including a means for retaining a said module in cooperation with retention means of said module when a said module is positioned in said array adjacent and between said pair of latch arms; each said latch arm free end being adapted to be engaged to be deflected away from the opposing said bracket assembly by a said module upon insertion of said module between a said pair of opposing latch arms in a direction from said free end toward said panel surface, said latch arms resiliently toward said module upon complete positioning thereof in said array at a said module site to engage said retaining means and said module retention means; at least one said latch arm free end including thereon a cap shaped to define a bearing surface engageable by a leading edge of a side portion of a said module without snagging, to initiate said latch arm deflection outwardly from said module side portion; and
each said latch arm free end being adapted to be deflectable away from the opposing said bracket assembly to become disengaged from a said module positioned in a module site, for removal of said module, whereby a said module is retainable in said array by a pair of opposing latch arms independently of other modules separate from said module in said array and is easily removable from said array while said opposing bracket assemblies retain said other separate modules in said array.

5,090,921

CONNECTING MEANS

Fritz J. van der Laar, Heemstede, Netherlands, assignor to Lumiance B.V., Haarlem, Netherlands

Filed Mar. 20, 1991, Ser. No. 671,420

Claims priority, application Netherlands, Mar. 22, 1990, 9000674

Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—668

5 Claims



1. A connecting means for a lamp holder comprising a halogen lamp, provided with an elongated insert portion with a metal contact pin and a contact sleeve disposed co-axially with respect to said contact pin, whereby insulating material is

provided between the contact pin and the contact sleeve, characterized in that the contact pin is fixedly mounted in and extends along part of its length into an insulation sleeve formed of an insulating material, which is surrounded along part of its length by the contact sleeve, in such a manner that the exposed part of the contact sleeve is confined between a part of the insulation sleeve surrounding the contact pin which projects from the contact sleeve, and a connecting means of an insulating material surrounding the contact sleeve, said connecting means near its end directed towards the contact pin being provided with a circular groove in its outer circumference, so as to receive locking means, whilst the connecting means is furthermore provided with at least one passage for lines attached to the contact pin and the contact sleeve, by means of which the contact pin and the contact sleeve can be connected to contact points located inside the lamp holder, whilst the connecting means is suitable for being connected to a lamp holder support, in such a manner that the support is separated from the contact sleeve by the connecting means.

5,090,922

TERMINAL BLOCK WITH MULTIPLE TRACK MOUNTING CAPABILITY

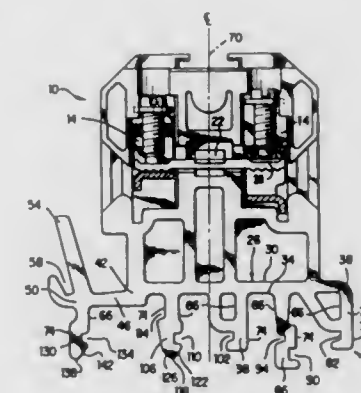
Phil R. Rymer, Asheville; Rex V. Cutshall, Fletcher, and Bo S. Ahn, Asheville, all of N.C., assignors to Square D Company, Palatine, Ill.

Filed Dec. 20, 1990, Ser. No. 632,235

Int. Cl.⁵ H01R 9/26

U.S. Cl. 439—716

7 Claims



1. A terminal block adapted for mounting on various mounting rails, said terminal block being generally rectangular in shape, having terminal connectors for connecting external electrical conductors, a bus bar for electrically connecting the terminal connectors together, means for retaining the bus bar in the terminal block, and comprising:

- a) a base forming one end of said terminal block, said base having an inside surface facing said bus bar, an outside surface facing away from said bus bar, a first end, and a second end;
- b) a plurality of retaining members, each integrally formed from said base, spaced apart one from another a predetermined distance along the longitudinal axis of said base, and extending downwardly perpendicularly to said outside surface of said base, a predetermined length, at least two said retaining members cooperating together for attaching said terminal block to the various sized mounting rails;
- c) a flexing arm, having a first end moveably attached to said second end of said base and an extended end, said flexing arm having a longitudinal axis parallel to the longitudinal axis of said base;
- d) a release arm, extending from said extended end of said flexing arm at an obtuse angle with respect to the longitudinal axis of said flexing arm, said release arm acting as a lever to cause a pivotal movement of said flexing arm

- which in turn selectively flexes one or more retaining members for quick release of the terminal block;
- a screwdriver slot immediately adjacent said release arm for inserting a screwdriver to increase the effective lever length of said release arm; and
 - wherein each said retaining member has an inside surface facing toward the center line of said terminal block, an outside surface facing away from the center line of said terminal block, and a slot running perpendicular to the longitudinal axis of said retaining member on one or both of said inside and outside surfaces, said plurality of retaining members comprising:
 - a first retaining member extending from said first end of said base and having a slot on said inside surface;
 - a second retaining member immediately adjacent and spaced apart a predetermined distance from said first retaining member and having a slot on said inside and said outside surfaces;
 - a third retaining member immediately adjacent and spaced apart a predetermined distance from said second retaining member and having a slot on said inside surface;
 - a fourth retaining member immediately adjacent and spaced apart a predetermined distance from said third retaining member, said fourth retaining member having a rounded end with a first beveled surface leading to said outside surface and having a slot on said inside surface and said outside surface; and
 - a fifth retaining member immediately adjacent and spaced apart a predetermined distance from said fourth retaining member, extending perpendicularly from said extended end of said flexing arm said fifth retaining member having a rounded end with a beveled surface leading to said inside surface and a slot on said inside surface.

5,090,923

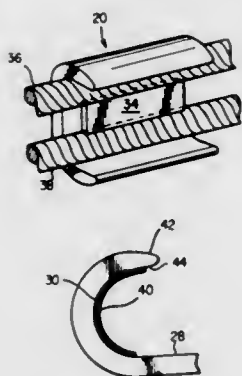
DEDICATED CONTACT AID FOR CONNECTORS UTILIZING HIGH SPEED INSTALLATIONS

Lee G. Kenyon, Mississauga, and Thomas C. Murray, Aurora, both of Canada, assignors to Burndy Corporation, Norwalk, Conn.

Filed Sep. 28, 1990, Ser. No. 589,618
Int. Cl.⁵ H01R 4/08

U.S. Cl. 439—783

3 Claims



- A C-configured connector used to prevent birdcaging when a wedge is explosively propelled therein, the C-shaped connector provided with an inner surface having first and second radius sections connected to an inner flat section, and a material comprising a mixture consisting of 30% by weight of silica sand and 70% by weight of a synthetic base vehicle in which zinc particles are suspended applied to the inner surface of the C-shaped member, said material used to reduce the contact resistance between the conductors and the C-shaped connector.

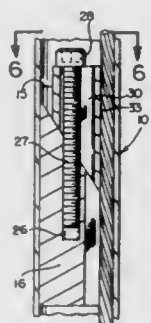
5,090,924 CATHODIC PROTECTION ANODE, CONNECTOR, AND METHOD OF MAKING

Mathew A. Pfaller; Kenneth N. Baker, both of Houston, Tex., and Richard E. Say, Spencer, Ohio, assignors to Materials Protection Company, Houston, Tex.

Filed Apr. 24, 1991, Ser. No. 690,657
Int. Cl.⁵ H01R 4/42

U.S. Cl. 439—807

14 Claims



- An electrical connector for a tubular anode comprising a diagonally split two-part generally cylindrical slug, jack means to drive said parts toward each other to offset one from the other along the diagonal split, and means to secure a lead wire to one of said parts comprising a continuous slot extending along a side of the parts, whereby an electrical lead may be connected to one of said parts in its slot and forced against the inside of the tubular anode when the parts are driven toward each other by said jack means.

5,090,925

ELECTRICAL CONNECTOR FOR DIVERSITY ANTENNAS

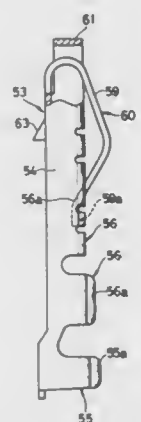
Kensaku Sato, and Akira Shirai, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1991, Ser. No. 718,252

Claims priority, application Japan, Sep. 18, 1990, 2-97254[U]
Int. Cl.⁵ H01R 13/00

U.S. Cl. 439—862

1 Claim



- An electrical connector comprising:
 - a male electrical connector having a plurality of male contact terminals and a plurality of male antenna connection terminals;
 - a female electrical connector having a plurality of female contact terminals for contact with said male contact terminals and a plurality of female antenna connection terminals for contact with said male antenna connection terminals;
 means provided on the front end of said terminal aperture

for supporting a front end of said female contact terminal; and said female contact terminals having a stopper portion in a middle portion thereof, a hook portion behind said stopper portion, a contact strip extending backwardly and upwardly from a front bottom end and then downwardly to form a V-shaped contact portion, with a free end of said contact strip engaged with said hook portion, and a front end supported by said means when said female contact terminal is fitted into said terminal aperture.

5,090,926

SOLDERABLE LEAD

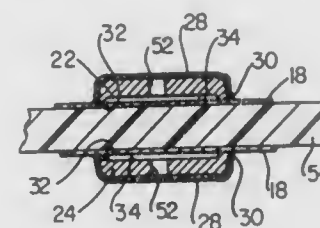
Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, Flushing, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,252

Int. Cl.⁵ H01R 4/02

U.S. Cl. 439—876

7 Claims



- A solderable lead for connection to a device having a conductive area, comprising:
 - a substantially flat elongated body, said body having a curved contact portion having an interior and an exterior, said interior being adapted to receive said device and to resiliently contact said conductive area of said device; and
 - a layer of solder overlying said curved portion exterior and having a portion extending around the edge thereof and immediately adjacent said curved portion interior, but without having solder in said interior of the curved portion, whereby upon heating, said layer of solder will liquefy and migrate to form a soldered joint between said interior and said conductive area.

5,090,927

CONNECTORS INCLUDING LEAD ALIGNMENT STRIPS

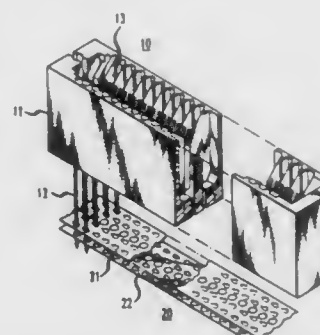
Robert E. McAnany, Kansas City, Mo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1991, Ser. No. 722,075

Int. Cl.⁵ H01R 13/46, 13/44

U.S. Cl. 439—892

11 Claims



- An electrical connector comprising:
 - a plurality of leads; and
 - an alignment strip comprising two sheets each with an array of openings therein, each opening including relatively wide and narrow portions, the two sheets being aligned so that the narrow portions of corresponding openings in the

arrays overlap to form narrow apertures through the two sheets with leads inserted and held therein.

5,090,928

MAN-POWERED PROPULSION DEVICE

Joseph A. Rybczyk, 365 Newtown Rd., D-16, Warminster, Pa. 18974

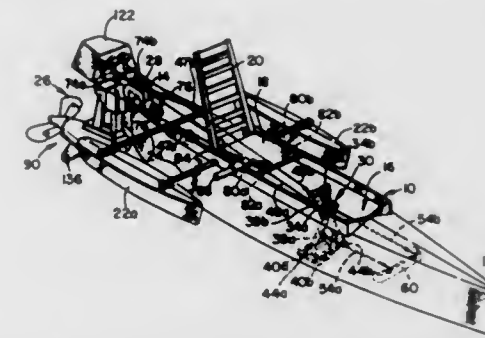
PCT No. PCT/US86/02004, § 371 Date Mar. 20, 1989, § 102(e) Date Mar. 20, 1989, PCT Pub. No. WO88/01966, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 22, 1986, Ser. No. 365,108

Int. Cl.⁵ B63H 16/08

U.S. Cl. 440—24

56 Claims



- A man powered propulsion device for propelling a light-weight craft comprising:
 - a frame for mounting the propulsion device on said craft;
 - shaft means rotatably supported on the frame including at least a propeller shaft;
 - propeller means on said propeller shaft, including at least one blade rotatably supported relative to the shaft for rotation about an axis having a major radial component;
 - stop means supported relative to the shaft limiting movement of each blade in each direction from a plane through the propeller shaft;
 - a pair of cables coupled to the shaft means to turn the propeller shaft and positioned to be wrapped around the shaft means so that as one wraps the other unwraps from around the shaft means so as to drive the propeller shaft alternately in opposite directions as the respective cables are unwrapped;
 - sheave means on the shaft means for each of the cables to contain and direct the cables as they are alternately wrapped and unwrapped around the shaft; and
 - means affording connection to limbs of a man to permit man powering and affixed to the cables to enable the cables to be pulled alternately to drive the shaft means by applying force to unwrap one cable wrapped around the shaft means, whereby, as the cable which is wrapped around the shaft means is unwrapped, the other cable is wrapped around the shaft means to thereby impart an oscillator motion to the propeller means.

5,090,929

PAIRED MOTOR SYSTEM FOR SMALL BOAT PROPULSION AND STEERAGE

Leo R. Rieben, S. 3205 University, No. 10, Spokane, Wash. 99206

Filed Apr. 12, 1991, Ser. No. 684,694

Int. Cl.⁵ B63H 11/107

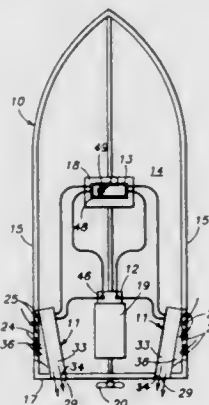
U.S. Cl. 440—40

9 Claims

- A steerable propulsion system for boats comprising, in combination:
 - two similar propulsion components carried in laterally spaced relationship by a boat, each propulsion component having
 - an elongate cylindrical body defining an internal channel having a first open end communicating with water

supporting the carrying boat and a second closed end, said channel carrying inwardly adjacent the second end an electrically powered motor having a propeller shaft extending toward the first end to carry a propeller for rotation within the internal channel to move water through the internal channel responsive to propeller motion, and

a peripherally defined transition element structurally carried by the cylindrical body spacedly inward of the second end to extend outwardly therefrom, said transition element defining an internal channel communicating from an external orifice, distal from the elongated cylindrical body and communicating with water sup-



porting the carrying boat, to the internal channel defined in the cylindrical body;

a powering component supplying electric energy to each electric motor, said powering component having power storage means including a rechargeable storage battery; and

a control component including control means movable in a first direction to regulate the total current passing to both propulsion motors and the direction of rotation of both motors and movable in a second direction to regulate the relative power passing to each motor to determine speed of propulsion of a serviced boat and allow steerage thereof.

5,090,930

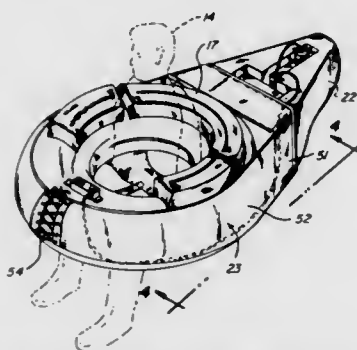
POWER-DRIVEN FLOAT ASSEMBLY

Robert R. Walden, 8995 W. 32nd Ave., Wheat Ridge, Colo. 80033

Continuation-in-part of Ser. No. 606,479, Oct. 31, 1990, abandoned. This application Jul. 19, 1991, Ser. No. 733,096
Int. Cl.⁵ B63B 3/00

U.S. Cl. 441-131

23 Claims



1. A power-driven float assembly comprising, in combination:

an inflatable float device having rounded external shape with an inner cavity traversed by a seat defining a hole for

legs for disposing a user in a selected orientation with the user floating thereon on a body of water,

a floatable support body having a top wall, bottom wall and opposed sidewalls, said sidewalls being tapered inwardly from a wider inner end wall portion to a narrower outer end wall portion in a direction away from said float device, said inner end wall portion being shaped to conform to a rounded external surface of said float device, said support body being made of an outer rigid skin filled with a floatable fill material, said body having a density suitable for floating in water and supporting a user in water independently of said float device,

fastening harness means secured at one end to said support body and having a side member that extends around the periphery of said float device and is pulled against said periphery by a fastener means for releasably attaching said support body to said float device,

a power assembly carried by said support body including a vertical shaft extending through a vertical hole in said support body between said inner end wall portion and said outer end wall portion and rotatable therein, control means for use by the user for steering and controlling motor speed, an electric motor driving an impeller, said impeller being mounted for rotation at the lower end of said shaft, an electric battery mounted in a recessed wall portion in said top wall of said support body and electrically connected to said electric motor, said recessed wall portion being between said inner end wall portion and said shaft,

whereby said power assembly is selectively actuated by the user to propel said float device in a body of water.

5,090,931

METHOD OF PRODUCING A LAMP HAVING A COATED LAYER AND THE LAMP PRODUCED THEREBY

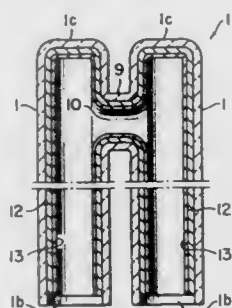
Isao Shiraishi, Yokosuka, Japan, assignor to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 620,405

Claims priority, application Japan, Nov. 29, 1989, 1-310250
Int. Cl.⁵ H01J 9/26, 9/38

U.S. Cl. 445-22

16 Claims



1. A method of producing a lamp having a coated layer and parallel linear tubes, comprising:

a step of forming a connected glass tube having a plural number of glass element tubes and connecting portions between side walls of said plural number of glass element tubes, each of said glass element tubes having openings at first and second ends and having linear main portions arranged parallel to each other;

a step of forming a coated layer on an inner wall surface of said connected glass tube including said connecting portions by introducing a coating substance from said openings at said first end of said connected glass tube and by exhausting said coating substance from said openings at said second end; and

a step of forming an airtight path as a discharge path in the connected glass tube including said main portions and said

connecting portions by sealing said openings of said connected glass tube after the formation of said coating layer.

5,090,932

METHOD FOR THE FABRICATION OF FIELD EMISSION TYPE SOURCES, AND APPLICATION THEREOF TO THE MAKING OF ARRAYS OF EMITTERS

Dominique Dieumegard, Marell-Marly; Guy Garry, Rueil Malmaison; Léonidas Karapiperis, Bourg la Reine; Didier Pribat, Paris, and Christian Collet, Limours, all of France, assignors to Thomson-CSF, Puteaux, France

PCT No. PCT/FR89/00142, § 371 Date Nov. 16, 1989, § 102(e)
Date Nov. 16, 1989, PCT Pub. No. WO89/09479, PCT Pub. Date Oct. 5, 1989

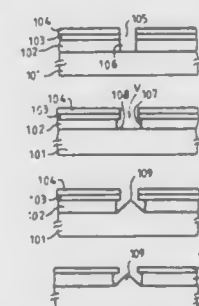
PCT Filed Mar. 24, 1989, Ser. No. 439,372

Claims priority, application France, Mar. 25, 1988, 88 03949; Mar. 10, 1989, 89 03153

Int. Cl.⁵ H01J 9/02

U.S. Cl. 445-24

34 Claims



1. A method for the fabrication of field emission type electron sources, comprising:

forming peaks by epitaxial and faceted growth of conductive or semi-conductive material on demarcated nucleation zones of a surface of a monocrystalline and, at least partially conductive, substrate.

5,090,933

PROVISION OF SUPPORT FOR TENSION SHADOW MASK BY WHICH A PREDETERMINED Q-HEIGHT IS ESTABLISHED WITHOUT POST-INSTALLATION MODIFICATION THEREOF

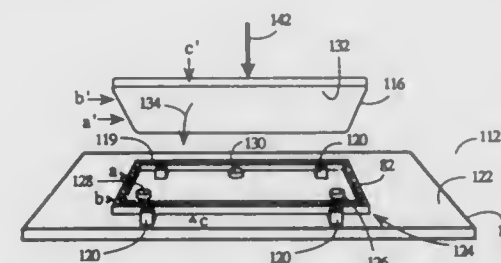
Raymond G. Capek, Elmhurst, and Slegfried M. Greiner, Crystal Lake, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed May 8, 1990, Ser. No. 520,477

Int. Cl.⁵ H01J 9/00, 29/07

U.S. Cl. 445-30

7 Claims



1. For use in the manufacture of a tension mask color cathode ray tube having a faceplate with an inner surface on which is deposited a centrally located screen, on opposed side of which is a mask support structure cemented to said faceplate by cement means, said mask support structure having a mask-receiving surface, an apparatus for installing said support structure on said faceplate such that said mask-receiving surface is

located at a predetermined Q-height relative to said inner surface, the apparatus comprising:

fixture means for supporting said mask-support structure against said faceplate with a layer of cement therebetween; and

Q-height spacer means on said fixture means for engaging said faceplate and said mask support structure to accurately space said faceplate inner surface from said mask-receiving surface,

wherein said Q-height spacer means comprise three spacers located substantially equidistantly apart whereby said faceplate sinks through cement to a predetermined Q-height relative to said support structure as determined by said Q-height spacer means, and is affixed permanently to said mask-support structure when said cement cures.

5,090,934

VEHICLE MODEL WITH TRANSPARENT, SEPARABLE COMPONENTS

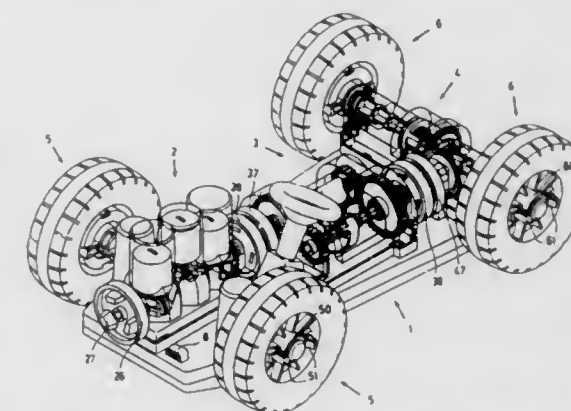
Alessandro Quercetti, Strada San Vito a Revigliasco 48, I-10133 Turin, Italy

Filed Feb. 15, 1991, Ser. No. 660,303

Claims priority, application Italy, Feb. 21, 1990, 67121-A/90
Int. Cl.⁵ A63H 17/00, 17/26; G09B 25/00

U.S. Cl. 446-93

12 Claims

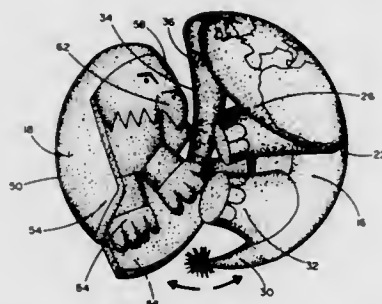


1. An instructive toy consisting in a disassemblable vehicle model, comprising: a frame unit which substantially simulates the frame of a real vehicle, said frame unit forming a supporting structure and having releasable connection means; and a plurality of operative units which substantially simulate main functional units of a real vehicle, each said operative unit having releasable connection means complementary to said releasable connection means of said frame unit, and each said operative unit also having operative connection means, said operative connection means of each said operative unit being complementary to the operative connection means of another operative unit, and each operative unit comprising a transparent casing and movable component parts intended to simulate operation of a simulated real functional unit of a real vehicle, said movable component parts of each operative unit being mounted within said transparent casing of the operative unit, each said operative unit comprising a base having said connection means complementary to said releasable connection means of said frame unit, said transparent casing being mounted on said base, and said component parts being mounted on said base within said transparent casing, each said operative unit comprising elastic snap members, which allow disassembling said operative unit into its component parts, and assembling it again.

5,090,935

COMPOSITE TOY HAVING INTERCONNECTABLE TOY COMPONENTS

Chris S. Monson, 5722-47 E. Stillwater, Orange, Calif. 92669
 Filed Dec. 17, 1990, Ser. No. 628,415
 Int. Cl.⁵ A63H 3/16, 3/02; G09B 27/08; A63F 9/10
 U.S. Cl. 446—101 20 Claims



1. A flexible three-dimensional composite toy having predetermined cooperating indicia formed on an external surface thereof, comprising:

- (a) at least a first identifiable flexible three-dimensionally configured simulated stuffed toy figure having a first external surface with first indicia further defining said first external surface, said first flexible three-dimensionally configured simulated toy figure having a first inner surface defining simulated animal features;
- (b) at least a second identifiable three-dimensionally configured simulated stuffed toy figure having a second external surface with second indicia further defining said second external surface, said second identifiable three-dimensionally configured simulated toy figure having a second inner surface defining simulated animal features of a second animal; and,
- (c) releasable securement means for releasably securing said first and second identifiable three-dimensionally configured simulated toy figure inner surfaces each to the other to form said composite, flexible three-dimensional composite toy having a substantially continuous surface with cooperating indicia.

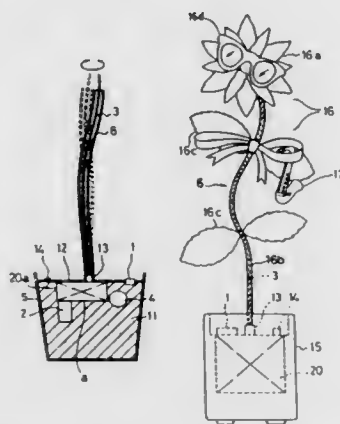
5,090,936

MOVABLE DECORATION

Yasuta Satoh, Nagareyama; Shigeru Nakane, Narashino; Shinya Saitoh, Tokyo, and Isamu Kataoka, Ichikawa, all of Japan, assignors to Takara Co., Ltd., Tokyo, Japan
 Division of Ser. No. 308,684, Feb. 9, 1989, Pat. No. 4,903,424.
 This application Feb. 26, 1990, Ser. No. 485,611
 Int. Cl.⁵ A63H 30/00

U.S. Cl. 446—175

13 Claims



1. A sound activated toy assembly comprising:
 a casing member having an upper horizontal lid member

including a central aperture and an integral sensor housing extending upward from the lid member;
 a mounting member operatively associated with the central aperture and extending upward from the lid member;
 an electric motor means provided in the casing member;
 a transmission assembly connected to the electric motor means for providing movement including an output member responsive to the activation of the motor means;
 an elongated core member extending through the central aperture and the mounting member and connected to the output member, the core member cantilevered vertically above the casing member, the core member has a nonlinear configuration and, when moved by the electric motor means, portions of the core member travel on paths about a longitudinal axis extending upward from the output member to create a wobbling visual effect;
 a flexible elongated hollow member extends over the core member and is dimensioned to permit relative rotational interior movement of the core member while transmitting the wobbling visual effect to an observer, the flexible elongated hollow member being fixed to the mounting member at one end so that it does not move in complete unison with the core member, and
 means, including a sound sensor mounted in the sensor housing, responsive to predetermined sound characteristics, for activating the motor means.

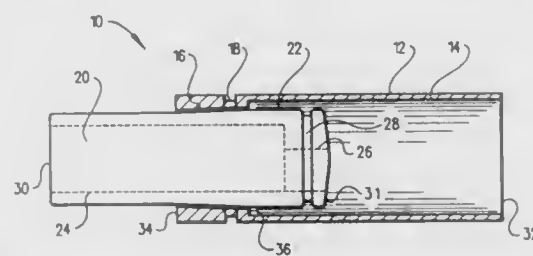
5,090,937

DIAPHRAGM GAME CALLER WITH CONICAL INNER MOUNT

Barney LaRue, P.O. Box 104, Rudy, Ark. 72952, and Zolan Jetton, 2806 Kendall Ave., Fort Smith, Ark. 72903
 Filed Feb. 4, 1991, Ser. No. 650,237
 Int. Cl.⁵ A63H 5/00

U.S. Cl. 446—207

1 Claim



- 1. A game caller, comprising:
 a substantially cylindrical tubular mouthpiece section possessing a substantially closed conical end face with an off-center air outlet aperture, said outlet aperture lying in a plane obliquely inclined to a longitudinal axis of said mouthpiece;
 a central longitudinal bore terminating short of said end face and intersecting said air outlet aperture, said air outlet aperture being substantially cylindrical and possessing a sidewall portion partially coextensive with a sidewall of said longitudinal bore, said air outlet aperture possessing a diameter greater than half the diameter of said longitudinal bore;
 a resilient diaphragm disposed at least partially over said end face and said air outlet aperture;
 an elastic ring disposed at least partially over said diaphragm and received in a groove formed around said mouthpiece, such that said diaphragm is pinched between said ring and said mouthpiece, whereby tension and position of said diaphragm may be readily adjusted to regulate sound produced by said game caller;
 a substantially cylindrical tubular amplifier, said mouthpiece disposed in inter-fitting telescopic relation within said amplifier;
 said mouthpiece and said amplifier including cooperating

tapered portions such that said mouthpiece and said amplifier are frictionally retained in said inter-fitting relation, said mouthpiece possessing an enlarged diameter cylindrical portion of a predetermined length disposed between said conical end face and said tapered portion of said mouthpiece such that said end face and outlet aperture of said mouthpiece are positioned within said amplifier a distance determined by said predetermined length; and said tapered portion of said amplifier being internally reduced in diameter with respect to a diameter of a longitudinal central passage through said amplifier and said tapered portion of said amplifier and said mouthpiece each having a maximum diameter less than said longitudinal passage of said amplifier such that a clearance space separates said mouthpiece from an interior sidewall of said longitudinal passage in said amplifier.

5,090,938

TOY OR OTHER OBJECT ALTERABLE BETWEEN TWO DIFFERENT SHAPES

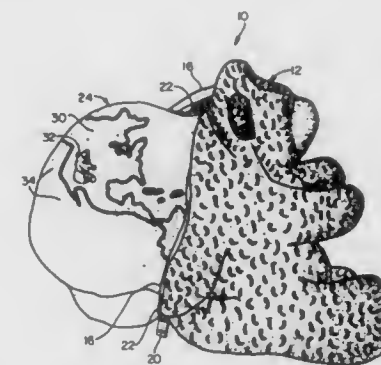
Christopher Reynolds, Apt. 1204, 520 Brickell Key Dr., Miami, Fla. 33131

Filed Mar. 27, 1991, Ser. No. 675,732

Int. Cl.⁵ A63H 3/02, 3/12; G09B 27/08

U.S. Cl. 446—369

9 Claims



- 1. An object that can be altered from an animal shape into a globe shape and vice versa, comprising:
 a first material that is pliable and is formed in said animal shape having an internal hollow;
 an aperture formed in said first material such that said aperture provides access to said internal hollow of said animal shape; and
 a second material that is pliable and is formed to assume a globe shape, said second material being positioned within said internal hollow and being connected to said first material within said internal hollow such that said first and second materials employ said aperture, and such that said second material is extractable from said internal hollow through said aperture, whereby upon extraction of said second material from said internal hollow said second material can assume said globe shape, and said first material can be inserted through said aperture into said internal hollow such that said animal shape collapses and is no longer detectable, said globe shape having an indicia formed thereon manifesting major land and water masses of earth and a likeness of said animal shape formed at a geographic position on said earth where the animal represented by said animal shape is found.

5,090,939

APPARATUS FOR TRIMMING BACK FAT OFF A PORK LOIN

Georges-Emile Leblanc, St-Anselme, Canada, assignor to G. E. Leblanc Inc., St. Anselme, Canada

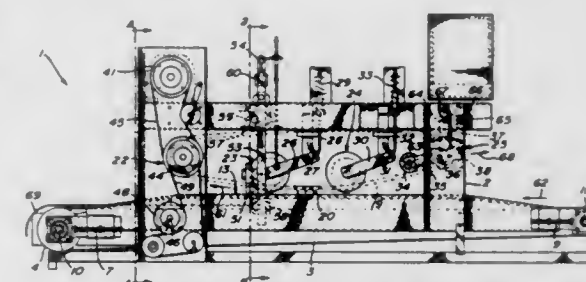
Filed Dec. 4, 1990, Ser. No. 624,318

Claims priority, application Canada, Mar. 16, 1990, 2012356
 The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.⁵ A23C 15/00

U.S. Cl. 452—127

16 Claims



1. An apparatus for trimming an outer layer of fat off a piece of meat, comprising:

- a frame;
 - conveyor means mounted on the frame and defining a top surface for conveying the piece of meat;
 - endless chain means also mounted on the frame above the conveyor means, the endless chain means extending generally parallel to the conveyor means;
 - a cutting blade attached to the frame and positioned between the conveyor means and the endless chain means;
 - means for driving the conveyor means and the chain means at different linear speeds for conveying the piece of meat toward the cutting blade and passing the piece of meat through the cutting blade to thereby trim off the fat; and
 - means for pressing the piece of meat between the chain means and the top surface of the conveyor means as the piece of meat is conveyed toward the cutting blade and passes through the cutting blade;
- whereby, in operation, the different linear speeds of the conveyor means and of the endless chain means produce in the pressed piece of meat a compression and tension distribution which facilitates passage of the meat through the cutting blade to thereby improve trimming of the layer of fat.

5,090,940

DRUMMETTE DEBONER

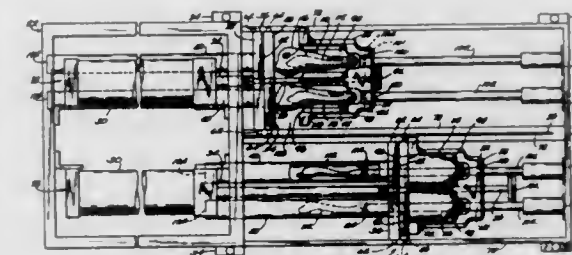
Frank L. Adkison, Winfield, Iowa, assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 16, 1991, Ser. No. 685,834

Int. Cl.⁵ A22C 17/04

U.S. Cl. 452—136

16 Claims



1. Apparatus for separating the meat from a poultry bone and wherein said bone is characterized by being elongated and having a longitudinal axis and first and second opposite ends, said apparatus comprising, in combination,

containing means including a generally elongated cup portion which is generally semicircular in cross section and open at the top for receiving said bone,

a generally elongated rod generally aligned with said cup portion for selectively engaging one end of a bone positioned in said cup portion,

plate means spaced from said rod means and said containing means positioned between said plate means and said rod, said plate means includes first and second plates each including means defining openings therein generally in relative alignment and cooperating to define a restricted opening, said restricted opening generally aligned with said rod relative to the longitudinal axis of said bone and having a predetermined size corresponding to thickness of said bone and being such that said bone passes through said opening and the meat carried by said bone is engaged by the walls defining said opening,

means for moving said plate means relative to said rod and into engagement with said containing means to move said containing means relative to said rod so that a bone in said cup portion is moved into said opening and the walls of said opening apply a force to said meat, said force reacting against the rod engaging said one end of said bone and being directed generally longitudinally along said bone to strip said meat from said bone,

means for moving said plates relative to each other to vary the amount of overlap of said separate plate openings to thereby vary the size of said restricted opening and including cam means connected with said separate plates and responsive to said means for moving said plates relative to said rod for moving one of said plates relative to the other as said plates move over a bone contained in said cup,

hollow tube means at said restricted opening and, relative to said containing means, positioned on the opposite side of plate means, and wherein the range of movement of said plate means is such that said plate means moves over said rod to the extent that said rod extends into said hollow tube means, and

said means for moving one of said plates relative to the other comprises cam means connected to plates and responsive to movement of said plates toward said rod, said cam means configured in accordance with said bone to generally size said restricted opening in accordance with the configuration of said bone.

5,090,941

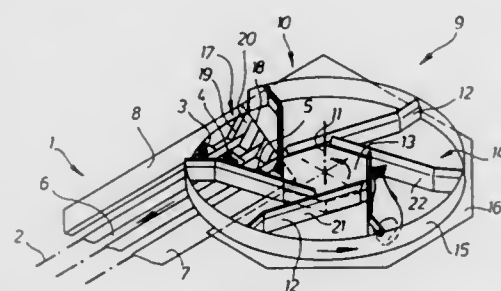
APPARATUS FOR FEEDING FISH PROCESSING MACHINES

Ulrich Dechow, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud.Baader GmbH + Co KG, Lübeck, Fed. Rep. of Germany
Filed Apr. 1, 1991, Ser. No. 678,435
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011177

Int. Cl.⁵ A22C 25/12; B65G 42/24

U.S. Cl. 452-183

20 Claims



1. A feeding apparatus for the timed feeding of fish into fish processing machines comprising at least one processing station such as a decapitating device and conveying means, which conveying means are equipped with at least one of receiving

troughs or entrainers and supply the fish to at least one processing station, wherein said feeding apparatus is adapted to be arranged above said conveying means and comprises a supporting surface for said fish, rotary entraining table means arranged above said supporting surface, driven to rotate about an axis perpendicular to said supporting surface and having entraining elements forming outwardly directed and sector-shaped chambers, said supporting surface having a cut-out in an area above said conveying means and limited by an edge extending essentially in a radial direction with regard to said axis.

5,090,942

LABEL WITH RECORD SHEET

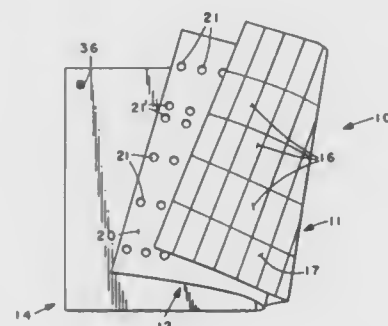
John E. Traise, Palm Bay, Fla., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Mar. 4, 1991, Ser. No. 663,616

Int. Cl.⁵ B41L 1/20, 1/22

U.S. Cl. 462-66

20 Claims



1. A business form, comprising:

- a label construction comprising a top face on which indicia may be readily applied, and a bottom face comprising pressure sensitive adhesive;
- a release sheet having means defining at least one opening therein, the means defining the opening in contact with the pressure sensitive adhesive of said bottom face of said label; and
- a self-imaging sheet held in contact with said release sheet on the opposite side thereof from said label construction by said label construction pressure sensitive adhesive, said self-imaging sheet for receipt of indicia applied to said label construction self-imaged thereon.

13. A method of constructing a record for a label, utilizing a label construction having a top face on which indicia may be applied, and a bottom face coated with pressure sensitive adhesive, a self-imaging sheet having an upper self-imaging face, and a release sheet having at least one opening therein allowing the adhesive from the label construction to engage and hold the self-imaging sheet upper face, comprising the steps of:

- (a) stacking the label construction, self-imaging sheet, and release sheet so that the release sheet is sandwiched between the self-imaging face of the self-imaging sheet, and the bottom face of the label construction, the self-imaging sheet engaged by adhesive from the label construction;
- (b) applying indicia on the top face of the label construction by impacting it, so that the impact transfers to the self-imaging face and is duplicated thereon; and
- (c) detaching the label construction indicia-containing portion from the release sheet and applying it to a desired surface, and removing the self-imaging sheet from contact with the release sheet so that the self-imaging sheet provides a record copy of the label construction.

5,090,943

DOCUMENT CARRIER

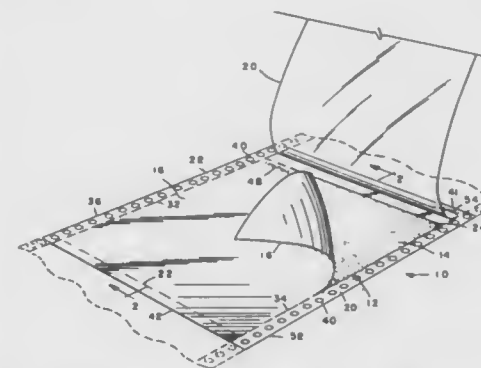
Walter G. Greig, Lewiston, N.Y., and Robert E. Ashby, Quakertown, Pa., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Sep. 18, 1990, Ser. No. 583,978

Int. Cl.⁵ B41L 3/00

U.S. Cl. 462-71

22 Claims



1. A document carrier assembly for processing a plurality of documents through a microfilming machine comprising;

a web of paper having an upper and lower surface, at least said upper surface having a low tack adhesive layer applied thereon;

a liner overlying said upper surface of the web and said low tack adhesive layer so as to releasably secure said liner to said web, said liner having a self-contained carbonless coating on an upper surface thereof;

a clear plastic film overlying said liner; and

means for adhering said clear plastic film to said liner.

5,090,944

MAGNETIC-DRIVE DEVICE FOR ROTARY MACHINERY

Osamu Kyo, and Yasuo Akitsu, both of Handa, Japan, assignors to NKG Insulators, Ltd., Japan
Continuation of Ser. No. 798,413, Nov. 15, 1985, abandoned.

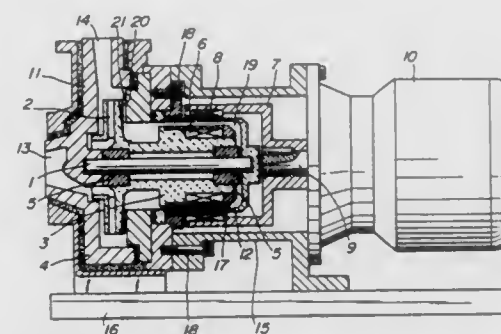
This application Nov. 25, 1987, Ser. No. 129,406

Claims priority, application Japan, Oct. 16, 1985, 60-230271

Int. Cl.⁵ F01D 25/24

U.S. Cl. 464-29

3 Claims



1. A magnetic-drive device for rotary machinery comprising:

- a driving motor and a rotatable motor driven by a magnetic coupling means including a driving magnet fixed on a magnetic holder connected with said driving motor and a driven impeller magnet fixed on a rotor of said rotatable motor, said driving magnet and the driven impeller magnet being combined with each other; and
- a chamber accommodating said rotatable motor and having a cylindrical partition defining the periphery of the chamber, said partition having a thickness of 1.5-8 mm and comprising a ceramic material having zirconia as a main

ingredient, containing 1-5%, based on the weight of the main ingredient, of alumina (Al₂O₃), silica (SiO₂) and an alkaline metal oxide, and having a specific resistance of at least 10⁷Ω-cm, through which partition the driving magnet and the driven impeller magnet are magnetically coupled.

5,090,945

TORSION DAMPING DEVICE, IN PARTICULAR A FRICTION CLUTCH FOR AUTOMOTIVE VEHICLES

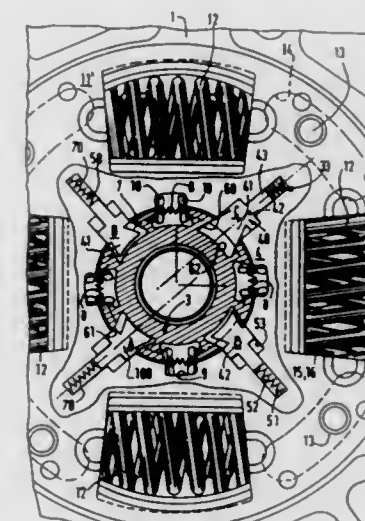
Michel Graton, Paris, and André Dalbiez, Argenteuil, both of France, assignors to Valeo, Paris, France
Filed Jun. 26, 1990, Ser. No. 543,370

Claims priority, application France, Jun. 27, 1989, 8908541

Int. Cl.⁵ F16D 3/12, 3/66

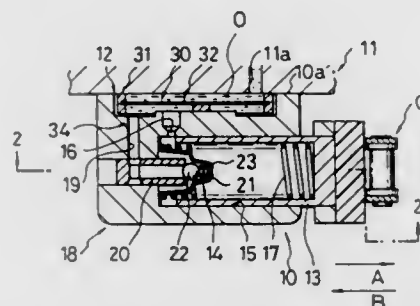
U.S. Cl. 464-64

6 Claims



1. A torsion damping device having: a first coaxial part comprising a hub; a second coaxial part comprising two guide rings and an annular damper plate between the guide rings, said first and second coaxial parts together defining loose meshing means coupling them coaxially together for relative rotation within the limits of a predetermined angular displacement; resilient means engaging both of said coaxial parts for acting circumferentially between them over at least a range of the said angular displacement; at least one generally radial guide housing carried fixedly by the damper plate and open at the inner periphery of the latter; an intervention member mounted in said guide housing for radial movement therein and comprising at least one weight formed with a trapezoidal tenon projecting from said inner periphery; return means engaging the damper plate and the intervention member for urging said intervention member radially inward; and at least one mortice carried by the hub and open radially outwardly for cooperating with a respective one of said tenon, said mortice being of trapezoidal shape complementary to said tenon, to define a base, whereby: in a first position corresponding to a first range of rotational velocities of the device said tenon lies in, and engages the base of, the associated mortice with circumferential clearance between said tenon and mortice; and said tenon being urged by centrifugal force against the return means radially outwardly to a second and a third position in succession, corresponding respectively to successively higher second and third ranges of said velocities; in said second position said tenon lies in the associated mortice with both circumferential and radial clearances between said tenon and mortice; and in said third position it engages the mortice in a wedging relationship, so that the intervention member cooperating with said mortice, modify the operating characteristics of the device, but in only said first and third positions.

5,090,946
TENSIONER WITH REPLACEABLE FILTER IN OIL PATH
 Yuichi Futami, Iruma, and Yuji Nagami, Hanno, both of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan
 Filed Nov. 6, 1990, Ser. No. 609,515
 Claims priority, application Japan, Nov. 6, 1989, 1-129088
 Int. Cl.⁵ F16H 7/22
 U.S. Cl. 474-104 20 Claims

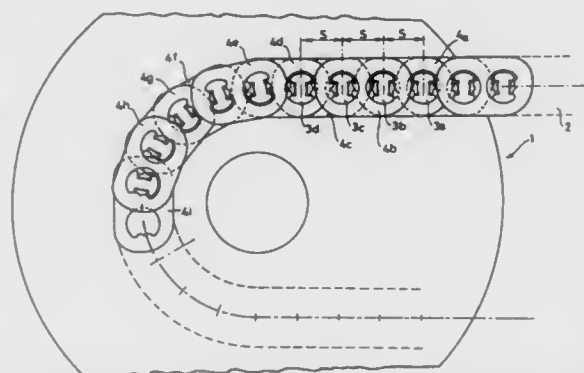


1. An oil tensioner in combination with a machine having a wall, an opening in said wall, and an oil passage capable of delivering oil to said opening, said oil tensioner comprising a housing having a cylindrical bore; a piston slidable in said bore, said piston and cylindrical bore providing an expansible chamber capable of containing oil; passage means in said housing providing for the flow of oil in a first direction into said expansible chamber and in a second direction out of said expansible chamber; and check valve means associated with said passage means, for controlling flow of oil in said passage means in at least one of said first and second directions, so that the flow of oil takes place in one of said directions at a slower rate than in the other of said directions; said passage means having an oil-receiving opening in communication with the exterior of the housing, and providing for the flow of oil from the exterior of said housing to said expansible chamber; and said passage means also including a filter chamber; oil filter means, located in said filter chamber, for preventing foreign particles from passing toward said expansible chamber through the portion of said passage means extending between said filter chamber and said expansible chamber; and a wall in said housing adapted to engage a portion of said wall of the machine, in which said filter chamber is provided in part by a recess formed in said wall of the housing and in part by said wall of the machine, said recess having a floor; in which the portion of said passage means extending between said filter chamber and said expansible chamber has an opening in the floor of said recess; in which said opening in said wall of the machine is in communication with said filter chamber; and in which said filter means comprises a screen located within said recess.

5,090,947
FRICTION TRANSMISSION PROVIDED WITH A PAIR OF SHEAVES
 Jacobus H. M. van Rooij, Nuenen, Netherlands, assignor to Volvo Car St. Truiden N.V., St. Truiden, Belgium
 Filed Dec. 5, 1990, Ser. No. 622,557
 Claims priority, application Netherlands, Dec. 6, 1989, 8903005
 Int. Cl.⁵ F16G 1/24 7 Claims

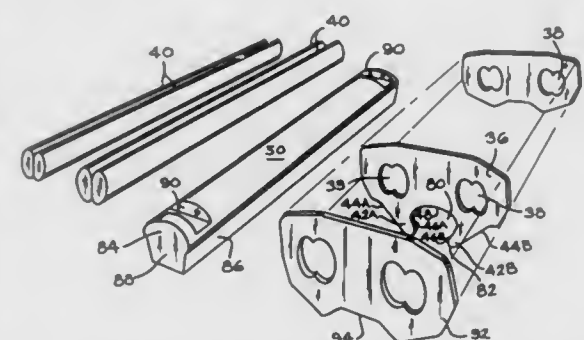
1. A friction transmission comprising: a pulley having angled surfaces with contact zones thereon; and transverse elements adapted to extend between said pulley surfaces, said transverse elements having contact zones mating with the contact zones on said pulley surfaces, in which the contact zones on said transverse elements lie at an angle to each other such that upon initial contact between a contact zone of a transverse element with a contact zone of a pulley surface, the bisector of the

angle formed by lines tangent to the respective contact zones of said transverse element does not coincide with the bisector



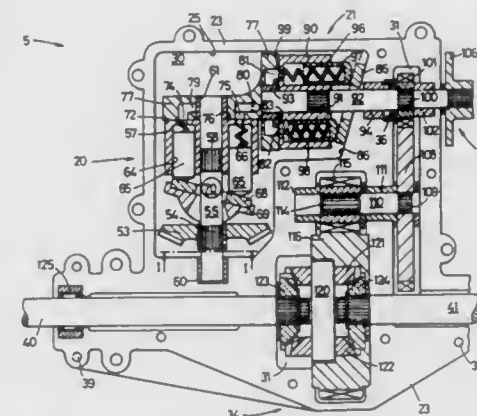
of the angle between lines tangent to the pulley contact zones mating with the contact zones on said transverse elements.

5,090,948
CHAIN BELT POWER TRANSMISSION
 Kevin W. Orth, Des Plaines, Ill., assignor to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.
 Filed Mar. 20, 1990, Ser. No. 496,390
 Int. Cl.⁵ F16G 1/22 12 Claims



1. A power transmission (10) chain-belt (32) especially adaptable for connecting the pulleys (12, 14) of a pulley transmission (10) comprising:
 a plurality of interleaved sets (34) of links (36), each set (34) having a plurality of transversely arranged links (36);
 pivot means (40) joining said adjacent sets (34) of links (36) to form an endless loop;
 a passageway (80) defined by said sets (34) of links (36);
 a plurality of load blocks (50) connected to said links (36), a portion of said load blocks (50) being positioned in said passageway (80), said passageway (80) partially enclosing said load block (50) wherein a section of said load block (50) extends radially from said passageway in a direction toward the center of said pulley, each load block (50) having edge surfaces (88) for contacting said pulleys (12, 14) of said transmission (10);
 at least one notch (90) positioned on each end of said load blocks (50), said notches (90) being positioned on the surface of said load blocks (50) that is adjacent said links (36);
 a retaining link (92) being positioned on each side of said sets (34) of links (36), said retaining links (92) engaging said notches (90) whereby said retaining links (92) restrain said load blocks (50) from transverse movement and said notches (90) position said retaining links (92) to assist in holding said set (34) of links (36) together.

5,090,949
VARIABLE SPEED TRANSAXLE
 Christian H. Thoma, St. Clement, and George D. M. Arnold, St. Helier, both of Channel Islands, assignors to Unipat AG, Glarus, Switzerland
 Filed Dec. 10, 1990, Ser. No. 625,129
 Claims priority, application United Kingdom, Dec. 11, 1989, 8927920; Jun. 18, 1990, 9013569
 Int. Cl.⁵ F16H 47/04 18 Claims

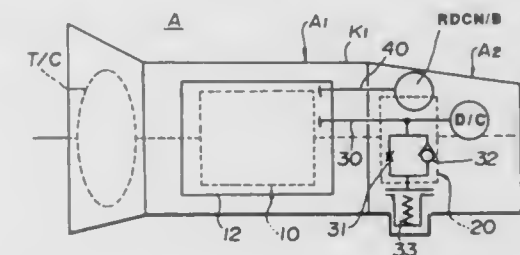


1. An axle assembly comprising:
 a housing including two main housing elements connected together along a parting plane and defining an internal chamber;
 a hydrostatic transmission encapsulated in said chamber and including a hydrostatic pump fluidly coupled to a hydrostatic motor by means of a coupling member non-rotatably supported in said housing;
 a primary shaft rotatably mounted in one said housing element and extending into said chamber for engagement with a first bevel gear;
 a secondary shaft drivingly connecting a second bevel gear to said hydrostatic pump, said first bevel gear drivingly engaged to said second bevel gear;
 axle shaft means rotatably supported in said housing, and having its axis substantially coincident with said parting plane; and
 differential gearing means within said chamber drivingly connected between said hydrostatic motor and said axle shaft means;
 wherein said hydrostatic pump and said hydrostatic motor are mounted in perpendicular relationship to one another via said coupling member such that the rotational axes of said hydrostatic pump and said hydrostatic motor are parallel to said parting plane and perpendicular to said primary shaft.

5,090,950
AUTOMATIC POWER TRANSMISSION WITH SUBSIDIARY TRANSMISSION UNIT
 Taku Sugano, Shizuoka; Kazuyoshi Iwanaga, and Noboru Hattori, both of Kanagawa, all of Japan, assignors to Nissan Motor Company, Ltd. and Jatco Corporation, both of Japan
 Filed Dec. 26, 1989, Ser. No. 456,179
 Claims priority, application Japan, Dec. 26, 1988, 63-330493
 Int. Cl.⁵ F16H 57/02 4 Claims

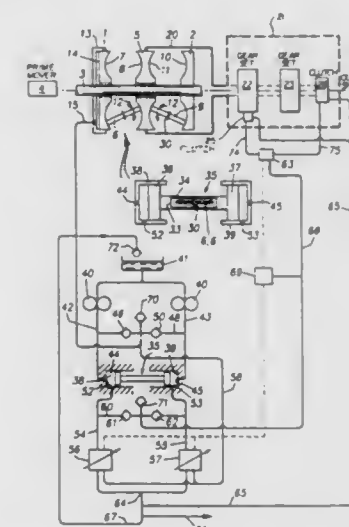
1. In an automatic power transmission:
 a primary transmission casing having mounted thereon a hydraulic control unit; and
 a subsidiary transmission casing connected to said primary transmission casing, said subsidiary transmission casing having housed therein a predetermined friction element and having a control line having one end communicating always with said predetermined friction element and an

opposite end connected to said hydraulic control unit for transmitting a control pressure from said primary hydraulic control unit to said predetermined friction element; said subsidiary transmission casing having an accumulator, a flow restriction orifice having one end communicating with said control line and an opposite end communicating



with said accumulator, and an one-way check valve having one end communicating with said control line and an opposite end communicating with said accumulator, said one-way check valve being so constructed and arranged as to allow an uninterrupted fluid flow from said control line to said accumulator.

5,090,951
HYDRAULIC CONTROL CIRCUITS FOR CONTINUOUSLY-VARIABLE-RATIO TRANSMISSIONS
 Christopher J. Greenwood, Preston, England, assignor to Torotrak (Development) Limited, England
 PCT No. PCT/GB89/00937, § 371 Date Feb. 13, 1991, § 102(e) Date Feb. 13, 1991, PCT Pub. No. WO90/02277, PCT Pub. Date Mar. 8, 1990
 PCT Filed Aug. 15, 1989, Ser. No. 655,392
 Claims priority, application United Kingdom, Aug. 16, 1988, 8819430
 Int. Cl.⁵ F16H 37/06 8 Claims



1. A hydraulic control circuit for a CVT including a first ratio-varying component (1,2,5,6,9) of variable orientation, and at least one second engagable component (25,26) having variable capacity to transmit torque when engaged and in which:
 a hydraulic ram means comprises a piston (35) movable over a predetermined stroke within a cylinder (38,39), and the piston is connectable in use to the first ratio-varying component (6) so that the location of the piston within its stroke reflects the orientation of the first component, and the cylinder includes inlet (44,45) and outlet (52,53) ports for hydraulic fluid;

the outlet is arranged within the cylinder so as to be restricted when the piston overshoots its predetermined stroke, so raising circuit pressure upstream of the ram means, and control means (56,57) are responsive to that raised upstream circuit pressure and operable, in use of the CVT, to reduce the torque-transmitting capacity of the said second component.

5,090,952

AUTOMATIC TRANSMISSION

Toshiyuki Asada, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

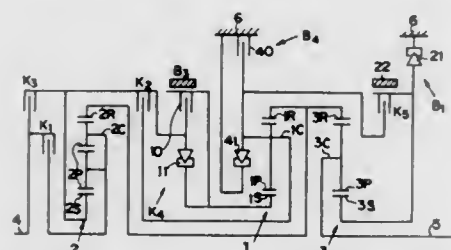
Filed Feb. 2, 1990, Ser. No. 474,464

Claims priority, application Japan, Feb. 3, 1989, 1-25322; Jul. 19, 1989, 1-186992

Int. Cl.⁵ F16H 57/10

U.S. Cl. 475—278

38 Claims



1. An automatic transmission for changing the rotational speed of an input shaft to transmit the resultant rotation to an output shaft through a gear train including a plurality of planetary gear sets, comprising:

- a single pinion type first planetary gear set provided with a first sun gear, a first ring gear, and a first carrier for holding a pinion gear meshing with said first sun gear and said first ring gear;
- a double pinion type second planetary gear set provided with a second sun gear normally or selectively connected to said first sun gear, a second ring gear normally or selectively connected to said first ring gear, and a second carrier for holding an inner pinion gear meshing with said second sun gear and an outer pinion gear meshing with said inner pinion and said second ring gear; and
- a single pinion type third planetary gear set provided with a third sun gear normally or selectively connected to said first carrier, a third ring gear normally or selectively connected to said first and second ring gears, and a third carrier for holding a pinion gear meshing with said third sun gear and said third ring gear.

5,090,953

METHOD OF AND APPARATUS FOR WITHDRAWING LIQUID FROM A CENTRIFUGE

Otto Büttner, Puchheim, and Bruno Hegnauer, Gauting, both of Fed. Rep. of Germany, assignors to Krauss-Maffel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 27, 1990, Ser. No. 619,194

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1989, 3940053

Int. Cl.⁵ B04B 11/00

U.S. Cl. 494—1

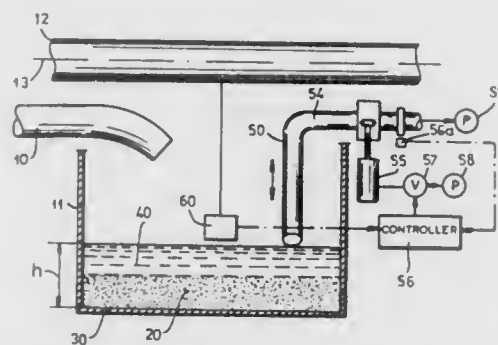
13 Claims

1. A method of withdrawing liquid from a centrifuge in which a layer of said liquid is formed on a layer of solids on a centrifuge drum upon rotation thereof in order to separate said solids from said liquid, constituting contents of said drum, in a suspension charged into said drum, said method comprising the steps of:

- (a) advancing a liquid-extraction scoop into said layer of liquid during rotation of said drum to progressively remove liquid from said layer of liquid said contents of said drum having as parameters of level of the contents of said

drum, and a characteristic of an exposed surface of the contents of said drum,

- (b) automatically monitoring with at least one sensor during rotation of said drum at least one of said parameters of the contents of said drum and including:
 - (b₁) a level of the contents of said drum, and
 - (b₂) a characteristic of an exposed surface of the contents of said drum; and



- (c) terminating said advancing of said liquid-extraction scoop into said layer of liquid in response to the automatic monitoring of step (b), thereby terminating removal of said liquid from said drum, selectively upon
 - (c₁) a rate of change of said level approaching zero, and
 - (c₂) said sensor detecting a transition of said characteristic from liquid to solid.

5,090,954

SUBCUTANEOUS ACCESS DEVICE FOR PERITONEAL DIALYSIS

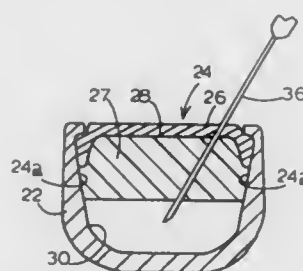
Gregory L. Geary, 12355 N.W. Maple Hill La., Portland, Oreg. 97229

Filed May 17, 1991, Ser. No. 702,775

Int. Cl.⁵ A61M 1/00

U.S. Cl. 604—29

8 Claims



1. A system for peritoneal dialysis comprising: an implantable intraperitoneal dialysis catheter, an elongate subcutaneous access device, said device including a rigid needle-impervious shell of elongate outline and having a bottom and upstanding sides, a top expanse providing an expansive flat presentation region forming the top of the access device, said expanse being formed of a layer of needle-permeable elastomer material and said layer being lodged within said shell with the outer perimeter of said layer confined within the sides of the shell and with the base of the layer spaced upwardly from the bottom of the shell, the layer having a thickness substantially exceeding the thickness of the sheet, the perimeter of the layer and the sides of the shell having an interacting construction serving to limit movement of the layer downwardly within the shell toward said bottom, a hollow central chamber being defined intermediate said layer and the bottom of said shell which chamber extends the length of the device, and means connecting said catheter and said device.

5,090,955

GEL INJECTION ADJUSTABLE KERATOPLASTY

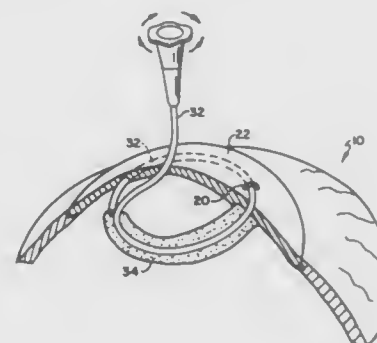
Gabriel Simon, Key Biscayne, Fla., assignor to University of Miami, Miami, Fla.

Filed Jul. 12, 1990, Ser. No. 551,807

Int. Cl.⁵ A61M 31/00

U.S. Cl. 604—51

21 Claims



1. A process for altering the radius of curvature of the central corneal region comprising: making a radial incision through a portion of the corneal thickness at a predetermined location radially spaced from the center of the cornea; inserting a device for delaminarizing a portion of the cornea in an arc-shaped path beginning at said predetermined radial location, so that said arc-shaped path is spaced from the center of the cornea, to define a completely covered intrastromal tunnel by delaminarizing to displace corneal tissue without removing that corneal tissue and without delaminarizing the enter of the cornea; and injecting a biocompatible, deformable, viscous gel into said tunnel.

5,090,956

CATHETER WITH MEMORY ELEMENT-CONTROLLED STEERING

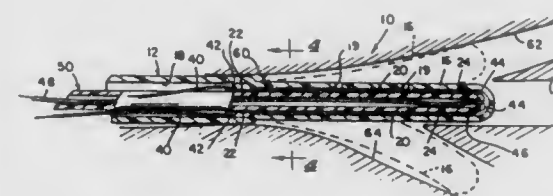
William C. McCoy, Zionsville, Ind., assignor to Catheter Research, Inc., Indianapolis, Ind.

Continuation of Ser. No. 103,926, Oct. 2, 1987, Pat. No. 4,944,727, which is a continuation-in-part of Ser. No. 870,926, Jun. 5, 1986, Pat. No. 4,758,222, which is a continuation-in-part of Ser. No. 728,634, May 3, 1985, Pat. No. 4,601,705, which is a continuation-in-part of Ser. No. 547,402, Oct. 31, 1983, Pat. No. 4,543,090. This application Dec. 4, 1989, Ser. No. 444,985 The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.

Int. Cl.⁵ A61M 25/00

U.S. Cl. 604—95

3 Claims



1. A catheter comprising an elongated tubular member having a proximal end and a distal end for insertion into a body, at least two nickel titanium elements in the distal end of the tubular member, a first of the nickel titanium elements having a predetermined shape, a second of the nickel titanium elements moving to assume a predetermined shape when heated to a predetermined temperature, the nickel titanium elements being disposed in the distal end of

the tubular member so that they move in different directions to assume their predetermined shapes, means for coupling the first nickel titanium element to the second nickel titanium element to lie in parallel in diametrically opposed relation to one another so that the movement of one of the first and second nickel titanium elements results in movement of the other of the first and second nickel titanium elements, and control means for heating at least the second nickel titanium element to the predetermined temperature so that the second nickel titanium element moves in a first direction to assume its predetermined shape and the first nickel titanium element is moved to deflect the distal end of the tubular member in the first direction.

5,090,957

INTRAAORTIC BALLOON INSERTION

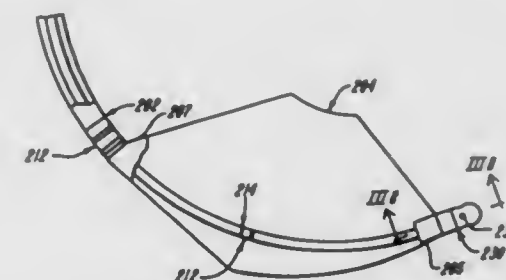
Timothy E. Moutafis, Gloucester, and Fredric L. Milder, Brookline, both of Mass., assignors to Abiomed, Inc., Danvers, Mass.

Continuation of Ser. No. 253,663, Oct. 5, 1988, abandoned. This application Oct. 9, 1990, Ser. No. 594,852

Int. Cl.⁵ A61M 25/10

U.S. Cl. 604—96

8 Claims



1. An insertable balloon pump apparatus comprising a balloon having proximal and distal ends, a handle, an inflation catheter interconnecting the balloon proximal end with the handle, an inner tube defining a pressure lumen extending from said handle to said balloon distal end, a hollow thrust receiving member rigidly coupled to said balloon distal end and defining a passage through which said pressure lumen communicates with an external region at said balloon distal end, a hollow torsion-free thrust imparting member removably insertable through said pressure lumen from said handle to engage said thrust receiving member, said thrust receiving member and said thrust imparting member each having a mating protruding end portion such that when engaged, the mating end portions transmit thrust and torsion while cooperating to form a passage between said handle and said external region.

5,090,958

BALLOON CATHETERS

Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740

Division of Ser. No. 276,375, Nov. 23, 1988, Pat. No. 4,983,167, and Ser. No. 510,470, Apr. 18, 1990, Pat. No. 5,019,042. This application Oct. 5, 1990, Ser. No. 593,759

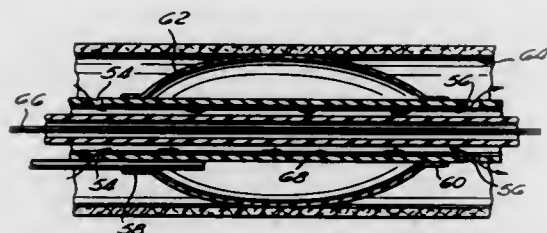
Int. Cl.⁵ A01M 26/00

U.S. Cl. 604—98

5 Claims

1. A dilatation catheter for relieving an obstructed artery while maintaining a steady flow of blood past the obstruction, comprising: an elongate tubular body; a dilatation balloon, secured to said tubular body, said balloon having an upstream end and a downstream end;

- a first conduit extending axially through at least a portion of said elongate tubular body for receiving a guide wire;
- a second conduit concentrically surrounding the first conduit and extending axially through the tubular body for allowing blood flow to bypass the dilatation balloon so that the exterior surface of the wall of said first conduit is radially inwardly spaced apart from the radially inwardly facing surface of the wall of said second conduit;
- a plurality of influent perfusion ports disposed about the periphery of and in fluid communication with said second



conduit, said influent perfusion ports disposed upstream from the upstream end of said dilatation balloon so as to enable blood from said artery to enter said second conduit; and

at least one effluent perfusion port distributed about the periphery of and in fluid communication with said second conduit, said at least one effluent perfusion port disposed downstream from the downstream end of said dilatation balloon so as to conduct blood from said second conduit back into said artery and maintain a steady flow of blood past said dilatation balloon during the dilatation process.

5,090,959

IMAGING BALLOON DILATATION CATHETER

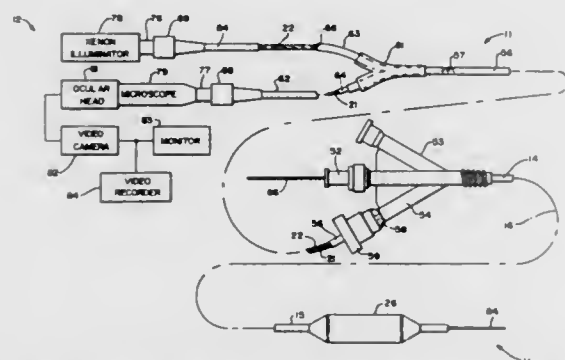
Gene L. Samson, Fremont, and Michael Aita, Mountain View, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 222,316, Jul. 19, 1988, abandoned, which is a continuation of Ser. No. 45,076, Apr. 30, 1987, abandoned. This application Sep. 13, 1990, Ser. No. 584,423

Int. Cl.⁵ A61M 25/10

U.S. Cl. 604—96

37 Claims



1. An imaging angioplasty catheter having proximal and distal ends, the catheter comprising:
- an elongated flexible tubular member having proximal and distal extremities and having first and second light lumens which are non-coaxial in relation to each other and having a guidewire lumen extending longitudinally therein;
- an inflatable dilation balloon carried by said tubular member such that it is located between the proximal and distal ends of the catheter and is disposed near the distal extremity of the tubular member and which is adapted to dilate an arterial stenosis and which has an interior in fluid communication with at least one of the light lumens;
- illuminating optical fiber means disposed in the first light

lumen and extending to the distal end of the catheter through the length of the tubular member;

an imaging optical fiber means disposed in the second light lumen and extending adjacent the distal end of the catheter through the length of the tubular member; and

a lens for supplying an image to said imaging optical fiber means;

wherein the guidewire lumen is adapted to receive a guidewire therein and to direct fluid therethrough.

5,090,960

REGIONAL PERFUSION DISSOLUTION CATHETER

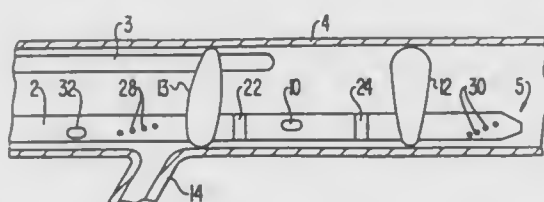
T. Anthony Don Michael, 309 Panorama Dr., Bakersfield, Calif. 93305

Continuation-in-part of Ser. No. 464,029, Jan. 12, 1990, abandoned. This application Mar. 13, 1990, Ser. No. 492,582

Int. Cl.⁵ A61M 29/00

U.S. Cl. 604—101

11 Claims



1. A device for performing regional perfusion obstruction dissolution, comprising:

an infusion catheter insertable into a blood vessel to extend across the site of an obstruction, said infusion catheter having a length and extending in the direction of said length between a distal end via which said infusion catheter is inserted into the blood vessel and a proximal end remote from the distal end, and said infusion catheter being configured to have:

first flow means defining a blood bypass flow path extending along a portion of the length of said infusion catheter and communicating with regions surrounding said infusion catheter at first and second locations along the length of said infusion catheter such that when said infusion catheter extends across an obstruction site in a blood vessel, said first and second locations are positioned upstream and downstream, respectively, of the obstruction with respect to the direction of blood flow in the vessel; and

second flow means defining a dissolution agent flow path extending along the length of said infusion catheter from said proximal end and communicating with a region surrounding said infusion catheter at a third location along the length of said infusion catheter between said first and second locations for delivering dissolution agent to the obstruction when said infusion catheter extends across the obstruction site in the blood vessel;

a suction catheter insertable into the blood vessel and positionable at the obstruction site independently of said infusion catheter and having proximal and distal ends and a suction lumen extending between said proximal and distal ends; and blocking means carried by one of said infusion catheters at a location which will be downstream of the obstruction site with respect to the direction of blood flow in the blood vessel when said infusion catheter is inserted into the blood vessel; wherein

said blocking means are controllable for blocking blood flow through the vessel along a path exterior to said infusion catheter.

5,090,961

SINGLE USE SYRINGE

Sergei M. Maruzik, Poltava, and Oleg V. Efremov, Karlovka, both of U.S.S.R., assignors to Poltavsky Meditsinsky Stomatologicheskii Institut, Poltava, U.S.S.R.

PCT No. PCT/SU89/00261, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/12612, PCT Pub. Date Nov. 1, 1990

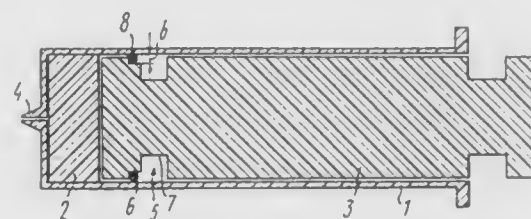
PCT Filed Oct. 4, 1989, Ser. No. 623,724

Claims priority, application U.S.S.R., Apr. 24, 1989, 4682845

Int. Cl.⁵ A61M 5/00, 5/315

U.S. Cl. 604—110

2 Claims



1. A disposable syringe comprising a cylindrical housing (1), which accommodates a piston (2) with a rod (3), and a needle fixing device, characterized in that the piston (2) and the rod (3) are mechanically disengaged from each other, the diameter (d) of the rod (3) is smaller than the diameter (D) of the piston (2), and the rod (3) has an annular two-stepped slot (5) with a lower-depth portion (6) and an increased-depth portion (7), wherein its lower-depth portion (6) is situated closer to one end of the rod (3) which faces the piston (2) than is the increased-depth portion, and an annular sealing cup (8) made of an elastic material situated on the lower-depth portion (6) of the slot (5), the inside diameter (d₁) of said cup (8) being smaller than the diameter (d₂) of the lower-depth portion (6) of the slot (5), while the radial width (a) of the cup exceeds a clearance (b) between the lower-depth portion (6) and the inner surface of the housing (1), the cup providing a hermetic seal between the rod and the piston for initial use of the rod in unison to draw fluid into the housing, the cup being movable from the lower-depth portion of the slot into the increased depth portion of the slot when the rod is used to discharge the fluid from the housing thereby breaking the hermetic seal and preventing further use of the syringe.

5,090,962

NON-REUSABLE SYRINGE

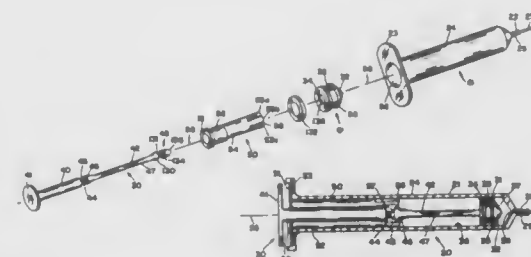
Maurice J. Landry, Jr., Nashua, N.H., and Frederick L. Plouff, Wakefield, Mass., assignors to FLP Enterprises, Inc., Andover, Mass.

Filed Apr. 28, 1989, Ser. No. 344,992

Int. Cl.⁵ A61M 5/00

U.S. Cl. 604—110

19 Claims



1. A syringe for a single administration of a fluid through a hypodermic needle comprising:
- A. cylindrical barrel means having a smooth internal surface and passage means at a first end for supporting the hypo-

dermic needle and transferring fluid between the hypodermic needle and a liquid cavity formed in said barrel means;

B. piston means in said barrel means including slidable sealing means for engaging said smooth internal barrel surface thereby to define said liquid cavity between said first barrel end and said piston means;

C. plunger means connected to said piston means for moving said piston means along a longitudinal axis to a first position contiguous said first end of said barrel means, to a second position intermediate said barrel means and to a third position intermediate said first and second positions closely adjacent said first position, said plunger means having detent means formed therewith, positioned at a location remote from said piston means, and

D. insert means internally of a barrel means and intermediate the length thereof for limiting the motion of said plunger means and said piston means, said insert means having a body portion for engaging the internal surface of said barrel means, a plurality of longitudinally extending circumferentially spaced arms pivoted from said body means, biased toward the longitudinal axis and extending toward the end opposite said first end of said cylindrical barrel means and follower means at the end of each of said arms for riding on said plunger means and engaging said detent means when said plunger moves to said first position.

5,090,963

ELECTROCHEMICALLY DRIVEN METERING MEDICAMENT DISPENSER

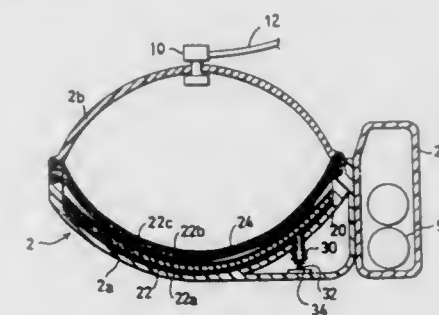
Joseph Gross, Moshav Mazor, and Shlomo Zucker, Yavne, both of Israel, assignors to Product Development (Z.G.S.) Ltd., Petach Tiqua, Israel

Filed Oct. 19, 1990, Ser. No. 599,917

Int. Cl.⁵ A61M 37/00

U.S. Cl. 604—132

17 Claims



1. A liquid material dispenser, comprising:
- a rigid housing having a flexible partition therein defining first and second compartments on opposite sides of said partition; and
- an electrolytic cell in said first compartment capable of generating a gas when energized by a source of electric current in order to expand said first compartment and thereby to contract said second compartment;
- said second compartment being capable of containing a liquid material and including a discharge opening for dispensing said liquid material upon contraction of said second compartment in accordance with the rate of generation of said gas;
- said rigid housing being made of two separable sections each for housing one of said compartments;
- each of said two housing sections containing a membrane, the membranes of the two housing sections contacting each other when the two sections are attached to each other in the operative condition of the dispenser and together constitute said flexible partition;
- at least one of said membranes being formed with protrusions facing the other membrane to define a space between the two membranes, which space is vented to the atmosphere to prevent any gas generated in said first compartment from entering said second compartment.

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UMI

CHEMICAL

5,090,964

RED DYE MIXTURES AND THEIR USE: DYEING
NATURAL OR SYNTHETIC POLYAMIDES

Dieter Mäusezahl, Biel-Benken, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,536

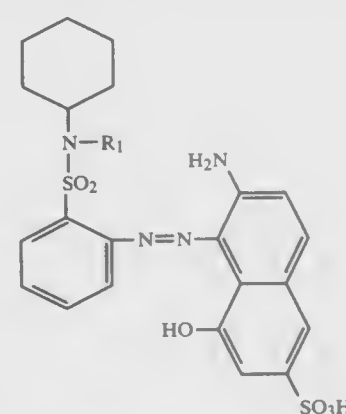
Claims priority, application Switzerland, Nov. 28, 1989, 4251/89

Int. Cl.⁵ C09B 49/00

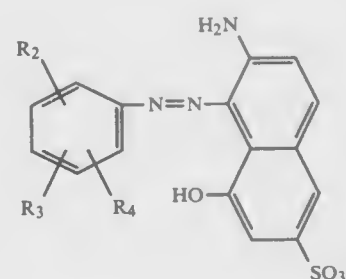
U.S. Cl. 8—641

17 Claims

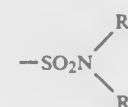
1. A dye mixture which contains a dye of the formula



(1)

in which R₁ is methyl or ethyl and at least one dye of the formula (2)

(2)

in which R₂ is substituted or unsubstituted C₁-C₈alkyl, halogen, benzoylamino which is unsubstituted or substituted in the phenyl ring by halogen, or 1-azacycloheptane-N-sulfonyl orin which R₅ is C₁-C₈alkyl or phenyl which is unsubstituted or substituted by C₁-C₄alkyl, and R₆ is hydrogen or C₁-C₈alkyl, R₃ is hydrogen, halogen or C₁-C₈alkyl, and R₄ is hydrogen or halogen.

5,090,965

PROCESS FOR THE SEPARATION OF SUBSTANCES BY
COOLING CRYSTALLIZATIONDetlef Kehm, Dinslaken; Bodo Weicht, and Joachim George, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jul. 28, 1989, Ser. No. 387,327

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827455

Int. Cl.⁵ B01D 9/02

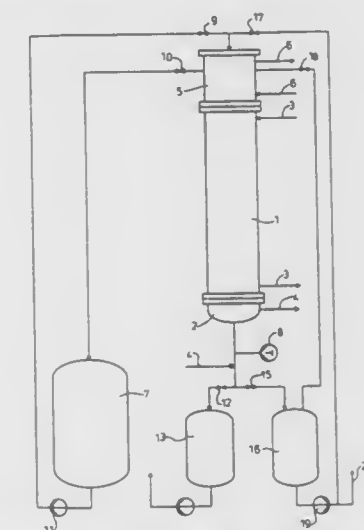
U.S. Cl. 23—295 R

5 Claims

1. A process for the separation of substances from a liquid

mixture at one or more stages of a multistage fractional cooling crystallization comprising the sequentially performed steps of

- feeding a quantity of the liquid mixture into a crystallization vessel such that the volume thereof is completely filled,
- cooling the enclosed volume of liquid mixture to effect crystallization, while simultaneously imparting an oscillating movement to the enclosed volume of liquid mixture until a degree of solidification of from 50% to 90% is



reached to form a solid crystal cake layer on the inner surface of the walls of the crystallization vessel and a remaining mother liquor phase in the crystallization vessel,

- withdrawing the remaining mother liquid phase from the crystallization vessel,
- melting the crystal cake layer by heating the crystallization vessel and discharging the resulting melt from the crystallization vessel.

5,090,966

FUEL COMPOSITION CONTAINING AN ADDITIVE FOR
REDUCING VALVE SEAT RECESSION

John Crawford, Caterham; Thakor Kikabhai, North Humber-side; David B. McLeary, Woking, and Andrew Pearce, North Humber-side, all of United Kingdom, assignors to BP Chemicals (Additives) Limited, London, England

Continuation of Ser. No. 184,385, Apr. 21, 1988, abandoned.

This application Sep. 13, 1990, Ser. No. 582,016

Claims priority, application United Kingdom, Apr. 23, 1987, 8709646; Oct. 6, 1987, 8723434

Int. Cl.⁵ C10L 1/12

U.S. Cl. 44—314

13 Claims

1. A fuel composition for use in internal combustion engines which comprises:

- a major amount of a fuel suitable for use in a spark ignition internal combustion engine comprising either a lead-free or low-lead fuel and
- a minor amount of a composition comprising a metal salt in the form of a particulate dispersion, said metal salt selected from the group consisting of water soluble potassium salts of a carbonic acid, and boric acid.

providing a liquid source and a separator having a rapidly axially rotating housing, said housing including means for

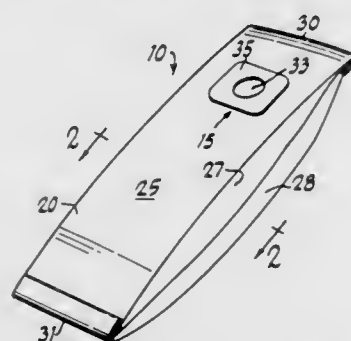
generating centrifugal force on liquid droplets and dust and dirt particulates entrained in the air ingested therein; ingesting air entrained with said dust and dirt particulates into said axially rotating housing of said separator; causing liquid droplets from said liquid source to become entrained in said dust and dirt entrained air as said dust and dirt entrained air is ingested into said axially rotating housing of said separator; allowing said liquid droplets and said dust and dirt particulates ingested into said axially rotating housing of said separator to coalesce within said housing; separating said coalescing liquid droplets and dust and dirt particulates from said first and dirt particulate entrained air by applying said centrifugal force to said coalescing liquid droplets and dust and dirt particulates; using said centrifugal force generated by said axially rotating housing of said separator to exhaust said coalescing liquid droplets and said dust and dirt particulates from said axially rotating housing of said separator, thereby leaving a relatively clean air mass within said axially rotating housing of said separator; and expelling said relatively clean air mass from said separator.

5,090,975

HIGH EFFICIENCY VACUUM CLEANER BAGS
Luz P. Requejo, and John P. Chua, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Sep. 21, 1990, Ser. No. 586,615
Int. Cl.⁵ B01D 46/02

U.S. Cl. 55—97

26 Claims



1. A vacuum cleaner bag suitable for use with a vacuum cleaner having a vacuum inlet tube attachable at one end to said vacuum cleaner bag, the vacuum cleaner bag comprising a closed receptacle having a vacuum inlet tube attachment orifice, said receptacle being formed from a sheet containing at least 65% ultra-short, micro-fine flashspun polyolefin fibers, and means affixed to said receptacle for attachment of the vacuum inlet tube within the orifice.

23. A method of vacuuming a surface to be cleaned comprising attaching the vacuum cleaner bag of claim 1 or 11 to a vacuum inlet tube in a vacuuming cleaning device, and vacuuming said surface.

5,090,976

DUAL CYCLONIC VACUUM CLEANER WITH DISPOSABLE LINER

James Dyson, Bathford, England, assignor to Notettry Limited, England

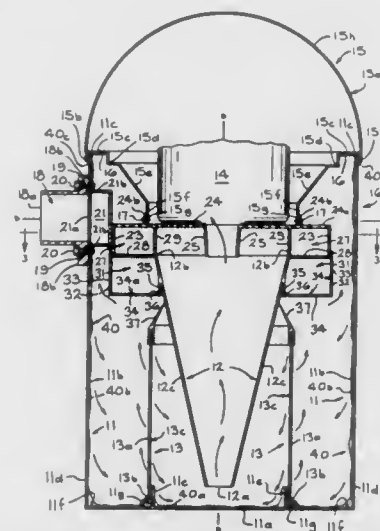
Filed Sep. 21, 1990, Ser. No. 585,975
Int. Cl.⁵ B01D 45/12

U.S. Cl. 55—337

36 Claims

1. In a cleaning apparatus including a container comprising a bottom and a sidewall extending to and meeting the bottom, the sidewall having an interior surface, a dirty air inlet at an upper portion of the container spaced from the bottom which is oriented for supplying dirt laden air into the container tangentially to the interior surface of the container which has a circular cross-section and an air outlet from the container at

the upper portion of the container; a circular cross-sectioned cyclone having a longitudinal axis and mounted inside the container, the cyclone comprising a cyclone air inlet at an upper end having a first diameter of the cyclone in air communication with the air outlet of the container, an interior dirt rotational surface of frusto-conical shape for receiving an airflow from the air inlet and for maintaining its velocity to a cone opening smaller in diameter than the diameter of the upper end of the cyclone, the air inlet being oriented for supplying air tangentially to the surface and a cyclone air outlet communicating with the interior of the cyclone adjacent the upper end of the cyclone; a dirt collecting receiver extending from the cone opening; and means for generating an airflow which passes through the dirty air inlet, the container, the cyclone air inlet, the cyclone, the receiver and the cyclone air outlet, the airflow rotating around the frusto-conical interior



surface of the cyclone and depositing the dirt in the receiver the improvement which comprises:

- (a) the receiver having opposed ends, one of which is open, adjacent to the bottom of the container; and
- (b) the container having a closure member projecting from the bottom of the container for removably mating with and closing the open end of the receiver;
- (c) wherein in use a bag shaped liner means is mounted in the container on the inside surface of the container including the closure member and the open end of the receiver between the closure member and the receiver so that the liner means has the shape of the interior surface of the container and wherein the liner means provides for collecting the dirt separated from the airflow, passing through the cleaning apparatus, by the container and by the cyclone in the receiver.

5,090,977

SEQUENCE FOR SEPARATING PROPYLENE FROM CRACKED GASES

Robert D. Strack; Rimas V. Vebeliunas; David A. Bamford, all of Houston, and Roy T. Halle, Clear Lake, all of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 13, 1990, Ser. No. 613,435
Int. Cl.⁵ F25J 3/06

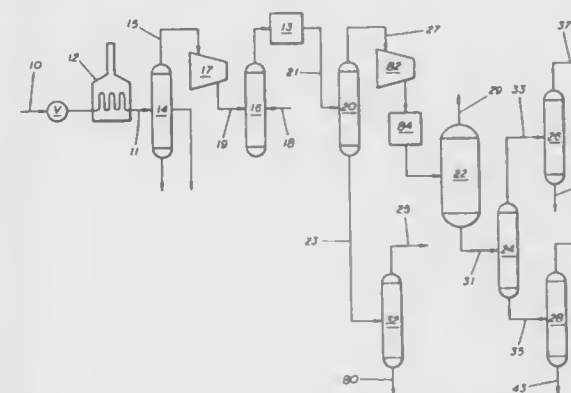
U.S. Cl. 62—23

21 Claims

1. A process for separating propylene from a mixture of cracked hydrocarbons produced by a cracking unit, comprising the steps of:

- (a) separating the mixture in a deethanizer into a deethanizer tops stream and deethanizer bottoms stream;
- (b) separating the deethanizer bottoms stream in a debutanizer into a debutanizer tops stream and a debutanizer bottoms stream;

nizer into a debutanizer tops stream and a debutanizer bottoms stream;



(c) separating the debutanizer tops stream in a depropylenizer into a depropylenizer tops stream comprising propylene and a depropylenizer bottoms stream.

5,090,978

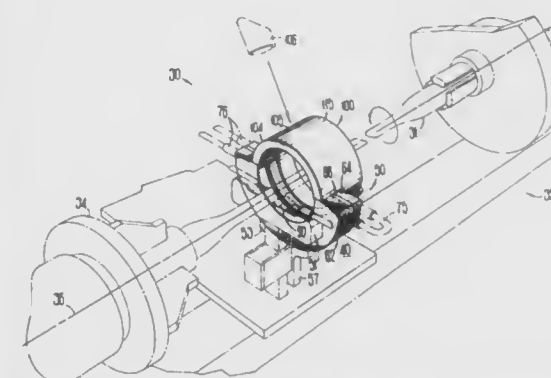
METHODS OF COLLAPSING GLASS TUBE

William D. O'Brien, Jr., Lilburn, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 238,373, Aug. 30, 1988, abandoned.
This application Jun. 12, 1990, Ser. No. 537,201
Int. Cl.⁵ C03B 37/00

U.S. Cl. 65—2

7 Claims



1. A method of heating a glassy tube to induce collapse of the tube into a rod from which optical fiber then is drawn, said method comprising the steps of:

- supporting a glassy tube having a longitudinal axis for rotation about its longitudinal axis with a portion of the tube extending transversely through a torch assembly having a first arcuate outer surface which partially circumscribes a portion of the circumference of a portion of the tube;
- causing the tube to be turned rotatably about its longitudinal axis;
- heating an outer surface of the tube by directing a flow of combustible gases through a plurality of passageways in the torch assembly which open toward the first arcuate outer surface of the torch assembly and toward said portion of the tube and causing the gases to provide a flame to provide a zone of heat;
- traversing the length of the tube with the zone of heat in a plurality of passes;
- cooling at least those portions of the torch assembly adjacent to the passageways to inhibit degradation of the material forming the torch assembly;
- providing a muffle tube having at least one overhang which muffle tube is mounted on the torch assembly and moved

therewith to enclose the circumference of both that portion of the tube which extends through the torch assembly and an additional portion of the tube which extends beyond the torch assembly to cause a substantial portion of the zone of heat to be enclosed to facilitate the collapse of the tube into a rod; while

within the muffle tube, providing the torch with a second arcuate outer surface through which said flow of combustible gases passes which second arcuate surface is recessed in the torch assembly away from the first arcuate outer surface and away from said tube such that a portion of the flow paths of the combustible gases are confined by the torch assembly for a portion of the distance between the second arcuate outer surface and the tube after the gases emerge from the passageways to cause the gases to be directed from the torch assembly toward the tube in a manner which restricts the width of the zone of heat as measured along the longitudinal axis and to maximize the heat energy applied to the tube to accelerate the collapse of the tube into a rod; wherein the torch assembly has a length as measured in a direction parallel to the longitudinal axis of rotation and between two opposing sides of the torch assembly wherein the zone of heat is confined by the muffle tube across the length of the torch assembly and for a predetermined distance beyond a single side of the torch assembly by said overhang;

collapsing the tube into a rod; and drawing optical fiber from the rod.

5,090,979

METHOD OF MANUFACTURING AN OPTICAL FIBER PREFORM HAVING DOPED CLADDING

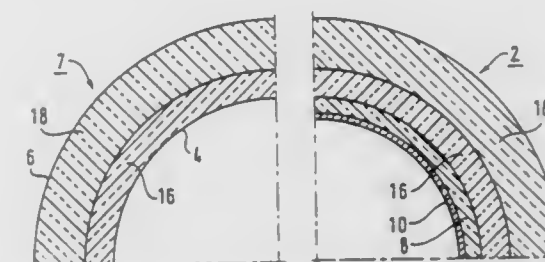
Christian Le Sergeant, Marconis, and Josiane Ramos, Bondoufle, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Aug. 2, 1990, Ser. No. 561,757

Claims priority, application France, Aug. 2, 1989, 89 10420
Int. Cl.⁵ C03C 25/02

U.S. Cl. 65—3.12

4 Claims



1. A method of manufacturing an optical fiber comprising the following steps:

- starting from a composite tube comprising a tubular substrate layer of silica doped with one material from the group consisting of fluorine and boron oxide, and a support layer surrounding the outer perimeter of said tubular substrate layer composed of silica that is either not doped or doped with boron oxide, said support layer having a higher softening temperature than that of said tubular substrate layer;
- depositing a tubular sheath layer on the interior surface of said composite tube composed of silica doped with fluorine at a temperature approaching the softening temperature of said sheath layer;
- depositing a tubular core layer on said tubular sheath layer to form a tubular preform, said tubular core layer being composed of a silica that is not doped or doped less than that of said sheath layer;

hot collapsing said tubular preform to form a fully collapsed preform, and
heat drawing said fully collapsed preform to form said fiber.

5,090,980

METHOD OF PRODUCING GLASS BODIES WITH SIMULTANEOUS DOPING AND SINTERING

Rolf Clasen, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

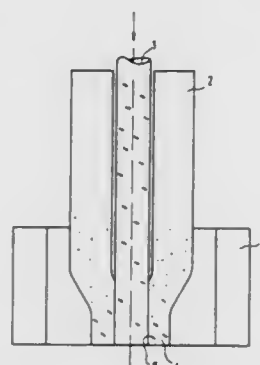
Filed Apr. 10, 1990, Ser. No. 507,949

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911745

Int. Cl.⁵ C03C 25/02

U.S. Cl. 65—3.12

32 Claims



1. A method of producing a glass body having regions with differing optical refractive indices having a basic body and a coating layer covering the basic body which has a different refractive index than that of the basic body, comprising the steps of:

- providing a basic body of glass;
- providing pulverized ceramic material to be formed into a coating layer;
- deforming said pulverized ceramic material into a self-supporting unsintered porous green body;
- drying and cleaning said green body by means of a heated gas thereafter;
- disposing the green body and the basic body in proximity and;
- melting the green body to form glass, by a combined doping and sintering procedure in a heated gas containing a refractive index altering dopant at a temperature of from 1150° to 1500° C., to sinter the green body and melting it onto the basic body as said coating layer.

5,090,981

METHOD FOR MAKING HIGH R SUPER INSULATION PANEL

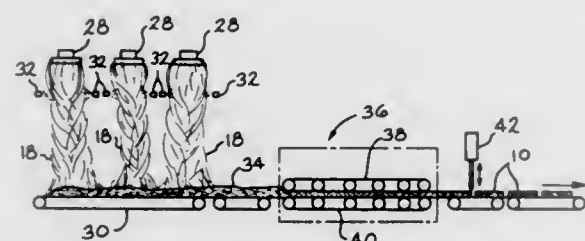
Stanley J. Rusek, Jr., Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Sep. 6, 1990, Ser. No. 579,915

Int. Cl.⁵ B32B 17/02

U.S. Cl. 65—4.4

15 Claims



1. A method for making an insulation panel comprising converting mineral material into mineral fibers, directing the

mineral fibers toward a collecting conveyor without applying an organic binder to the fibers, directing particulate material into the mineral fibers, the particulate material having a surface area of at least 50 square meters per gram, collecting the mineral fibers and the particulate material on the collecting conveyor, with the particulate material being packed in the interstices of the mineral fibers, and compressing the mineral fibers and particulate material into an insulation panel having a density of between 8 and 28 pounds per cubic foot.

5,090,982

METHOD OF PRODUCING A SURFACE MICROSTRUCTURE ON GLASS

John M. Bradshaw, Chorley, and Richard Gelder, Preston, both of United Kingdom, assignors to Pilkington plc, Merseyside, England

PCT No. PCT/GB88/01080, § 371 Date Jun. 1, 1990, § 102(e) Date Jun. 1, 1990, PCT Pub. No. WO89/05507, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 2, 1988, Ser. No. 476,399

Claims priority, application United Kingdom, Dec. 3, 1987, 8728272

Int. Cl.⁵ C03B 35/00

U.S. Cl. 65—24

29 Claims

11. A method of producing a surface microstructure on glass comprising providing glass to be stamped and characterised in that glass is coated and is heated to a surface temperature corresponding to a viscosity of from 10⁸ to 10¹³ poise, the glass is supported and then pressed with a stamper heated to within ±10° C. of the temperature of the glass, so that a microstructure on the heated stamper deforms the surface of the glass to give a corresponding microstructure which, when separated from the stamper and cooled in a controlled manner, gives the desired surface microstructure on the glass.

5,090,983

METAL ENRICHED SCRATCH RESISTANT CERAMIC PAINT

Premadaram T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 12, 1990, Ser. No. 551,362

Int. Cl.⁵ C03B 23/035

U.S. Cl. 65—25.4

11 Claims

1. A process for preparing a formed glass sheet having a fired ceramic paint field thereon, the fired ceramic paint field being free from surface defects, comprising the steps of:

- A. providing a glass sheet, having a surface;
- B. applying to at least a portion of the surface a ceramic paint composition including a quantity of a metal powder; and
- C. heating the glass sheet and metal powder-containing ceramic paint thereon, while simultaneously conveying the glass sheet over gas hearth forming blocks, the surface of the glass sheet having the ceramic paint thereon being disposed adjacent the gas hearth forming blocks, the heating and conveying being sufficient to form the glass sheet, and vitrify and simultaneously fuse the ceramic paint to the glass sheet,

the quantity of metal powder being effective to prevent surface defects on the fired ceramic paint field which otherwise would result from sliding engagement between the ceramic paint and the gas hearth forming blocks.

5,090,984

METHOD FOR PRODUCING GLASS OF HIGH TRANSMISSION IN THE VISIBLE SPECTRAL RANGE AND LOW SOLAR ENERGY TRANSMISSION

Joachim Szczyrbowski, Goldbach; Stefan Rögels, Erlensee; Anton Dietrich, Wiesenfelden, and Klaus Hartig, Ronneburg, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

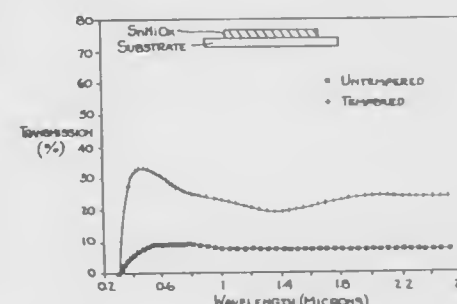
Continuation of Ser. No. 189,768, May 3, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 516,810

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806124

Int. Cl.⁵ C03C 17/00, 17/245, 17/34

U.S. Cl. 65—60.2

4 Claims



1. Method for the production of sheets of mineral glass with high transmission in the visible spectral range and with low solar energy transmission, comprising: cathode sputtering a coating onto a sheet of glass in a coating chamber by cathode sputtering from a target of an alloy of 65% tin and 35% nickel in an atmosphere with an oxygen content to thus form a Sn-Ni suboxide coating on the glass and then heating the glass and coating in air to a temperature of about 640° C. temper the coated glass, the tempering resulting in a stable and electrically conductive combination for said coating; the coating and tempering steps resulting in the providing of a sheet of mineral glass with high transmission in the visible spectral range and low solar energy transmission.

5,090,985

METHOD FOR PREPARING VAPORIZED REACTANTS FOR CHEMICAL VAPOR DEPOSITION

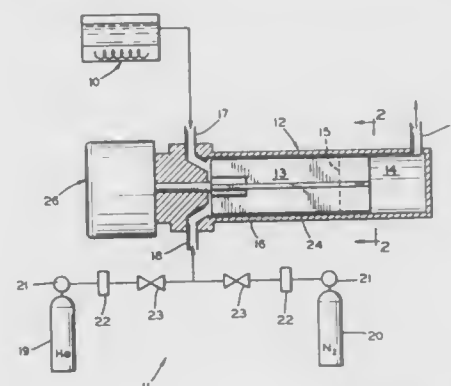
Michel J. Soubeyrand, Perrysburg, and Richard J. McCurdy, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Oct. 4, 1990, Ser. No. 591,121

Int. Cl.⁵ C03C 17/245

U.S. Cl. 65—60.52

31 Claims



1. A process for preparing vaporized reactants, comprising the steps of:

- A) providing a coating precursor selected from metal or silicon compounds at a temperature above its melting point but substantially below its standard vaporization

temperature, thereby causing the coating precursor to be in the form of a liquid;

- B) simultaneously and continually performing the steps of:
 - i) injecting the liquid coating precursor into a vaporization chamber, defined in part by at least one peripheral wall, wherein the liquid coating precursor produces a vapor;
 - ii) admitting to the vaporization chamber a blend gas in an amount sufficient to increase the mass transport of the coating precursor vapor and thus cause accelerated vaporization of the liquid coating precursor;
 - iii) mixing the liquid coating precursor, coating precursor vapor and blend gas, including dispensing the liquid precursor as a thin film along said chamber wall; whereby the liquid coating precursor is completely vaporized at a temperature below its standard vaporization temperature, to prepare a vaporized reactant gas stream having a high, uniform concentration of coating precursor; and
- C) conveying the reactant gas stream away from the vaporization chamber and into contact with a substrate.

5,090,986

METHOD FOR BENDING GLASS SHEETS

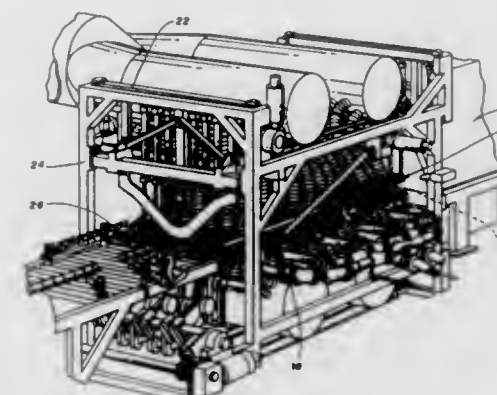
Thomas J. Zalesak, Rossford, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Mar. 26, 1991, Ser. No. 675,494

Int. Cl.⁵ C03B 23/03

U.S. Cl. 65—104

7 Claims



1. A method for bending glass sheets comprising: moving a heated glass sheet in one direction between spaced upper and lower bending platens of a glass bending and tempering apparatus; deforming the platens during the movement of the glass sheet to form the desired bent shape in the glass sheet; and cooling the bent glass sheet for at least 1/2 second during the movement of the glass sheet by applying cooling gas to initiate a freeze before the one direction of movement is interrupted thereby to prevent mechanical distortion referred to as roller wave from being formed in the bent glass sheet.

5,090,987

APPARATUS FOR DELIVERING NEWLY FORMED GLASS SHEET STRIP

Robert E. Maltby, Jr., Wayne, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Mar. 19, 1991, Ser. No. 671,502

Int. Cl.⁵ C03B 18/02

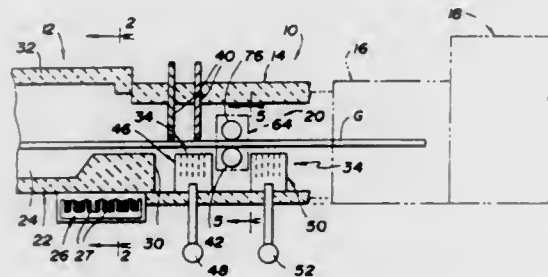
U.S. Cl. 65—182.2

12 Claims

1. In a glass sheet forming system including a bath container for containing a molten metal bath on which a newly formed glass sheet strip is floated, the bath container including a linear induction motor that permits the glass sheet to move horizontally from the molten metal bath without the bath overflowing

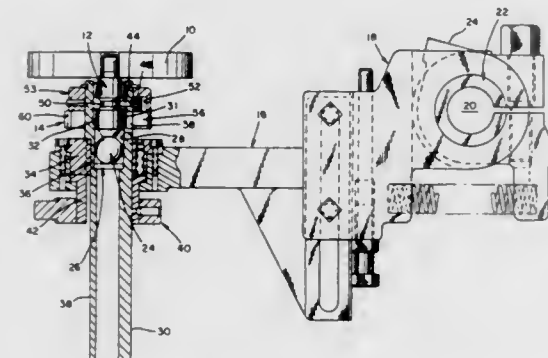
the bath container, apparatus for delivering the newly formed glass sheet strip from the bath container, comprising:

- a gas support for supporting the horizontally delivered glass sheet strip by upwardly directed pressurized gas delivered between lateral edge portions of the strip at a location immediately adjacent the bath container; and



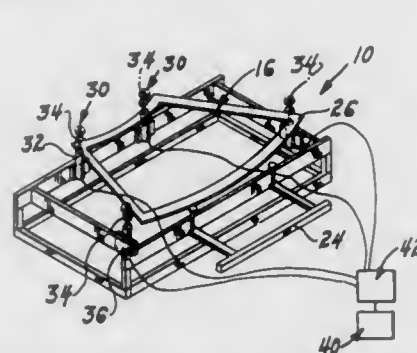
a drive roll located downstream from the molten metal bath and having spaced drive portion that rotatively drive the lateral edge portions of the glass sheet strip without the drive roll engaging the strip between the spaced drive portions.

5,090,988
BOTTOM PLATE FOR H-28 MACHINE
Richard A. Gorski, Hartford, Conn., assignor to Emhart Glass Machinery (U.S.) Inc., Windsor, Conn.
Filed May 10, 1991, Ser. No. 698,610
Int. Cl.⁵ C03B 9/195
U.S. Cl. 65—238
3 Claims



1. An H-28 machine having a bottom plate assembly comprising
 - a post to which a bottom plate is to be secured, said post including a reduced diameter portion having inclined side walls,
 - pivotal holder means including an arm,
 - post supporting means including
 - a hollow stud
 - a ball bearing
 - means for supporting said ball bearing within said stud for supporting said post with said reduced diameter portion within said stud, and
 - coupling means for releasably coupling said post and said stud including
 - a plurality of locking pins extending through a corresponding plurality of hole in said stud and
 - collar means for holding said plurality of locking pins against said reduced diameter post portion at a locking orientation and permitting retraction of said locking pins to permit removal of said post from said stud at an unlocking orientation.

5,090,989
AIR OPERATED LOCATING SYSTEM FOR ORIENTING GLASS SHEET ON GLASS SHEET SHAPING TOOL
Jack W. Adoline, Toledo, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio
Filed Oct. 17, 1990, Ser. No. 599,036
Int. Cl.⁵ C03B 23/023
U.S. Cl. 65—273
6 Claims



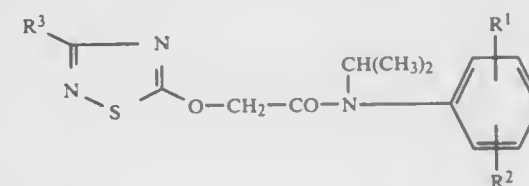
1. In a glass sheet forming system including a topside support device having a downwardly facing surface located adjacent to and extending away from a heating conveyor for conveying a heated glass sheet in a plane of conveyance and a glass positioning backgate, the support device being at an elevation just slightly above the plane of conveyance to receive the heated glass sheet from the heating conveyor, the topside support device being located above a moveable mold having a curved mold surface that is reciprocally positional below the topside support device to receive the heated glass sheet from the topside support device, the improvement comprising: a plurality of glass sheet locators mounted on the mold; each locator including an air actuated cylinder having a glass sheet nester mounted thereon; said nester being movable by the actuation of said air actuated cylinder between a raised position, above the mold for locating the glass sheet with the cooperable operation of the backgate as the glass sheet moves along the topside support device for aligning the glass sheet for subsequent accurate registration with the curved mold surface, and a lowered position, below the curved mold surface, whereby the glass sheet can be accurately deposited thereon by the topside support device in preparation for the forming operation.

5,090,990
INDUSTRIAL ANTIMICROBIAL USES FOR 2-(2-BROMO-2-NITROETHENYL)-FURAN
William F. McCoy, and Scott Thornburgh, both of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.
Continuation of Ser. No. 205,078, Jun. 10, 1988, abandoned.
This application Nov. 19, 1990, Ser. No. 615,354
Int. Cl.⁵ A01N 43/08
U.S. Cl. 71—67
18 Claims

1. A method for inhibiting microbial growth in an aqueous media which comprises adding an antimicrobially effective amount of 2-(2-bromo-2-nitroethenyl)-furan thereto.

5,090,991
HERBICIDAL N-ISOPROPYLHETEROARYLOXYACETANILIDES
Heinz Förster, Wuppertal; Roland Andree, Langenfeld; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 366,577, Jun. 15, 1989, Pat. No. 4,968,342.
This application Aug. 20, 1990, Ser. No. 569,880
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1988, 3821600
Int. Cl.⁵ C07D 280/08; A01N 43/82
U.S. Cl. 71—90
10 Claims

1. An N-isopropyl-(1,2,4-thiadiazol-2-yl)oxyacetanilide of the formula

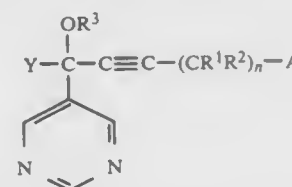


in which

- R¹ stands for hydrogen, fluorine, chlorine, bromine, cyano, nitro, for C₁-C₄-alkyl which is optionally substituted by fluorine and/or chlorine, for C₁-C₄-alkoxy which is optionally substituted by fluorine and/or chlorine, or for C₁-C₄-alkylthio which is optionally substituted by fluorine and/or chlorine,
- R² stands for hydrogen, fluorine, chlorine, bromine, methyl, trifluoromethyl or methoxy and
- R³ stands for fluorine, chlorine, bromine, cyano, for C₁-C₄-alkyl which is optionally substituted by fluorine and/or chlorine, for C₁-C₄-alkoxy which is optionally substituted by fluorine and/or chlorine, for C₁-C₄-alkylthio which is optionally substituted by fluorine and/or chlorine, for C₁-C₄-alkylsulphonyl or C₁-C₄-alkylsulphonyl.

5,090,992
PYRIMIDINE COMPOUNDS
Kevin R. Lawson, Piddington, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England
Filed Feb. 16, 1990, Ser. No. 480,832
Claims priority, application United Kingdom, Feb. 17, 1989, 8903650
Int. Cl.⁵ C07D 239/26; A01N 43/54
U.S. Cl. 71—92
10 Claims

1. A pyrimidine compound having the formula (I):



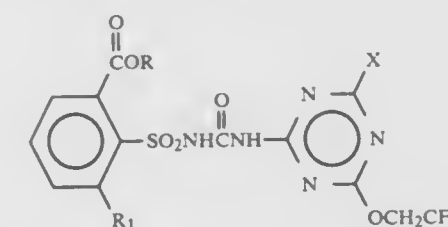
and stereoisomers thereof, wherein Y is an optionally halo-substituted secondary or tertiary alkyl group containing from 3 to 7 carbon atoms or an optionally halo-substituted cycloalkyl or alkylcycloalkyl group containing from 3 to 7 carbon atoms; R¹ and R², which may be the same or different, are hydrogen or a lower alkyl group;

A is a phenyl group optionally substituted by one or more substituents selected from halogen, lower alkyl, lower alkoxy, lower haloalkyl, lower alkoxy carbonyl, nitro, amino, formamido, acetamido, dialkylsulphamoyl and cyano;

n is an integer which may be 1 or 2; and
R³ is hydrogen, an alkyl group containing from 1 to 4 carbon atoms, an alkenyl group containing from 2 to 4 carbon atoms or an alkynyl group containing from 2 to 4 carbon atoms; and
agrochemically acceptable salts and metal complexes of the compounds of formula (I) and esters of compounds of formula (I) wherein R³ is hydrogen.

5,090,993
FLUOROALKOXY AMINO TRIAZINES FOR CONTROL OF WEEDS IN SUGAR BEETS
Marcus P. Moon, Wilmington, Del., assignor to E.I. Du Pont de Nemours & Company, Wilmington, Del.
PCT No. PCT/US89/00996, § 371 Date Sep. 14, 1990, § 102(e) Date Sep. 14, 1990
Continuation-in-part of Ser. No. 172,593, Mar. 24, 1988, abandoned. This PCT application Mar. 16, 1989, Ser. No. 576,445
Int. Cl.⁵ C07D 251/52; A01N 43/70
U.S. Cl. 71—93
23 Claims

1. A compound of the formula



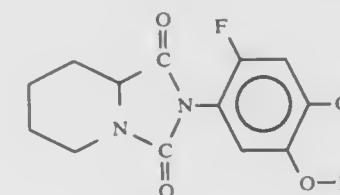
wherein

- R is C₁-C₄ alkyl, CH₂CH=CH₂, CH₂C(CH₃)₂cyclopropylmethyl or CH₂CH₂R₂;
- R₁ is C₁-C₂ alkyl, C₁-C₂ haloalkyl, CH₂CN, CH₂CH₃, C₁-C₃ alkoxy, C₁-C₃ alkylthio, phenylthio or NR₃R₄;
- R₂ is C₁-C₂ alkoxy, C₁-C₂ alkylthio, CN or halogen;
- R₃ and R₄ are independently H or CH₃; and
- X is NHCH₃, N(CH₃)₂ or N(CH₃)OCH₃; provided that when R₁ is OCH₂CH₃ or CH₂OCH₃, then R is other than CH₃;

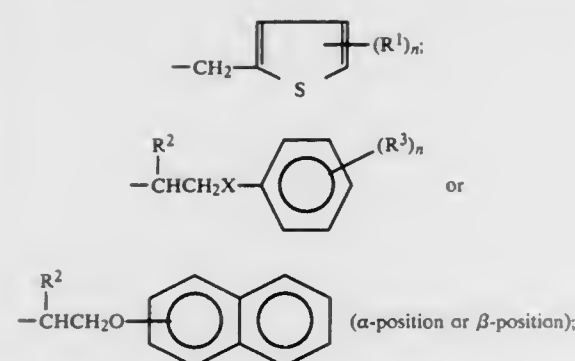
and their agriculturally suitable salts.

5,090,994
HETEROCYCLIC COMPOUNDS AND HERBICIDAL COMPOSITIONS CONTAINING THE COMPOUNDS AS EFFECTIVE COMPONENTS
(1) Nobuo Onodera, Hiratsuka; Shinzo Someya, Tokorozawa; Seigo Koura, Nerima, and Shigenori Segami, Tokorozawa, all of Japan, assignors to Agro-kanesho Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1989, Ser. No. 447,548
Claims priority, application Japan, Mar. 2, 1989, 1-50245
Int. Cl.⁵ A01N 43/40; C07D 451/00
U.S. Cl. 71—94
12 Claims

1. A heterocyclic compound represented formula (I):



wherein R is:



X is an oxygen atom or a sulfur atom; R¹ is a halogen atom or a lower alkyl group; R² is a hydrogen atom or a methyl group; R³ represents a halogen atom, a lower alkyl group, a lower haloalkyl group, a lower alkoxy group, a lower alkylthio group, a cyano group or —COOR⁴ (R⁴ is a lower alkyl group, a lower alkoxyalkyl group or a tetrahydrofurfuryl group); m is 0, 1 or 2 and n is 0, 1, 2 or 3.

5,090,995
AQUEOUS BIOCIDIC COMPOSITION STABILIZED BY PHTHALIC ACID ESTERS

Yutaka Kubota; Seiichi Shimono; Tetsuo Yanami, all of Yokohama; Tetsuji Iwasaki, and Kazuhiko Kurita, both of Wakayama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc. and Kao Corporation, both of Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,476

Claims priority, application Japan, Jun. 24, 1987, 62-157000
 Int. Cl.⁵ A01N 37/10, 31/14

U.S. Cl. 71—114 **12 Claims**
 1. An aqueous biocidal composition which comprises 10 to 60 wt. % of a water-insoluble, physiologically active substance, said substance being in the form of fine particles and having a melting point of 15° to 70° C., 0.001 to 10 wt. % of a water-soluble or water-dispersible polymer, said polymer comprising one or more monomer units selected from the group consisting of unsaturated carboxylic acids and derivatives thereof, 0.01 to 30 wt. % of a phthalate, and the balance being water.

5,090,996
MAGNESIUM PRODUCTION
 Andrew M. Cameron, Chester, United Kingdom, assignor to University of Manchester Institute of Science and Technology, Manchester, United Kingdom

PCT No. PCT/GB88/00560, § 371 Date Jan. 9, 1990, § 102(e) Date Jan. 9, 1990, PCT Pub. No. WO89/00613, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 11, 1988, Ser. No. 460,167

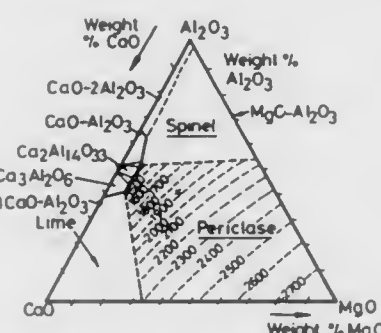
Claims priority, application United Kingdom, Jul. 10, 1987, 8716319

Int. Cl.⁵ C22B 4/00

U.S. Cl. 75—10.19 **15 Claims**
 1. A method of producing magnesium by the metallothermic reduction of MgO comprising the steps of:

effecting the reaction in a molten slag bath consisting essentially of MgO, Al₂O₃ and CaO together with oxide formed from the reducing metal, the slag defining a surface and a phase diagram having a periclase region, adding reducing metal and MgO or MgO containing feed material to the bath, directly heating the surface of the molten slag, controlling the composition of the molten slag so that the composition is wholly within the periclase region of the

phase diagram with a substantially constant liquidus temperature at least in the surface region, and



maintaining at least the surface region of the slag by the direct heating at a temperature substantially equal to the liquidus temperature.

5,090,997
PROCESS FOR PRODUCING POWDERED ALUMINUM ALLOYS

Udo Birkenstock, Ratingen; Jürgen Scharschmidt, Krefeld-Traar; Peter Kunert, Laufenburg; Helmut Meinhardt, Murg-Haenner; Paul Häusel, Rheinfelden/Baden, and Paul Meier, Willich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Hermann C. Starck Berlin GmbH & Co. KG, Berlin, both of, Fed. Rep. of Germany

Filed Jan. 11, 1991, Ser. No. 639,854

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1990, 4001484

Int. Cl.⁵ B22F 9/08

U.S. Cl. 75—338 **8 Claims**
 1. A process for producing powdered aluminum alloys which can be used as catalyst for alkylating aromatic compounds and/or can be treated with alkalis to form hydrogenation catalysts comprising

- atomizing a liquid aluminum alloy using an atomizer device in the presence of water or a mixture of water and a gas at a temperature of 50 to 500° C. above its melting point,
- cooling the atomized alloy, and
- removing the water present to a content of below 1% by weight.

5,090,998
PURIFICATION OF METAL MELTS WITH HALOGEN GAS GENERATED IN AN ELECTROLYSIS CELL

Kurt Buxmann, Sierre, Switzerland, assignor to Alusuisse-Lonza Services Ltd., Chippis, Switzerland

Filed Dec. 10, 1990, Ser. No. 625,203

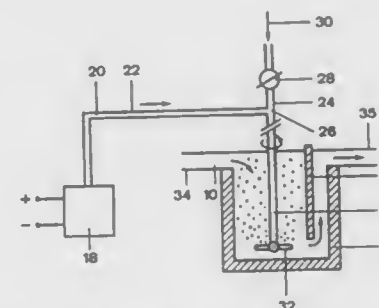
Claims priority, application Switzerland, Dec. 20, 1989, 4556/89

Int. Cl.⁵ C22B 21/06

U.S. Cl. 75—375 **12 Claims**

1. Process for purifying a metal melt by means of an active gas introduced into the lower region thereof, which comprises providing an inert carrier gas and an active, gaseous halogen, introducing said inert gas and halogen at a controlled rate into a vessel containing a metal melt wherein the active, gaseous halogen is generated in at least one gas evolution cell, including the step of controlling the gas generation with respect to rate per unit time and duration by controlling current intensity

of the electrolysis current, and introducing the resultant generated gaseous halogen into the carrier gas, and thereafter the



active gaseous halogen-carrier gas mixture is passed directly into the metal melt.

5,090,999
PROCESS FOR THE REMOVAL OF NON-FERROUS METALS FROM SOLID FERROUS SCRAP
 Masanori Iwase, Kyoto, Japan, assignor to Nippon Centronix, Ltd., Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 632,342

Claims priority, application Japan, Dec. 27, 1989, 1-344870
 Int. Cl.⁵ C22B 21/00

U.S. Cl. 75—433

5 Claims

1. A process for removing non-ferrous metal from solid ferrous scrap, comprising the steps of: contacting solid ferrous scrap containing said non-ferrous metal with at least one molten metal material selected from the group consisting of aluminum, magnesium, and alloys thereof, at a temperature of higher than the melting point of said metal material and lower than the melting point of iron; and separating said solid ferrous scrap from said molten metal material.

5,091,000
METHOD FOR CLEANING MOLTEN METAL AND APPARATUS THEREFOR

Toshio Ishii; Yutaka Okubo; Shuzo Fukuda; Yoshihiko Kawai; Shunichi Sugiyama; Yoshiteru Kikuchi, and Hidetoshi Matsuno, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 285,068, Dec. 15, 1988, abandoned, and a continuation-in-part of Ser. No. 481,776, Feb. 16, 1990, abandoned, which is a continuation of Ser. No. 295,808, Jan. 11, 1989, abandoned, and a continuation-in-part of Ser. No. 413,946, Sep. 28, 1989, abandoned. This application Apr. 30, 1990, Ser. No. 516,478

Claims priority, application Japan, Dec. 25, 1987, 62-326722; Dec. 25, 1987, 62-326723; Jan. 12, 1988, 63-3112; Jan. 12, 1988, 63-3113; Oct. 6, 1988, 63-9675; Oct. 6, 1988, 63-250806; Oct. 6, 1988, 63-250807; Feb. 13, 1989, 1-031105

Int. Cl.⁵ C21C 7/02

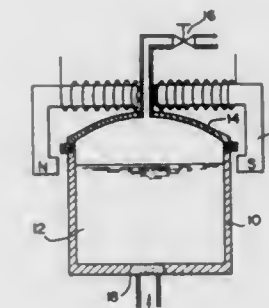
U.S. Cl. 75—508

59 Claims

1. A method for cleaning molten metal comprising the steps of:

- applying a pressure of 1 to 10 atmospheres to molten metal which contains inclusions suspended therein in a vessel;
- bubbling a gas which is soluble in the molten metal into the pressurized molten metal whereby (i) a portion of the inclusions suspended in the molten metal are trapped by gas bubbles produced by the bubbling gas and rise to a surface of the molten metal, and (ii) a portion of the bubbling gas is gas dissolved in the molten metal;
- reducing the pressure on the molten metal whereby fine gas bubbles form in the molten metal and remaining inclusions

suspending in the molten metal are trapped by the fine gas bubbles which rise to the surface of said molten metal; and



removing the inclusions from the surface of the molten metal.

5,091,001
DISPOSAL OF SPENT VANADIUM PENTOXIDE CATALYST BY VITRIFICATION
 Pierre L. J. Schumacher, Route De Gembloux 224, 5053, Aische En Refail, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 580,774

Claims priority, application United Kingdom, Sep. 12, 1989, 8920636

Int. Cl.⁵ C22B 13/00, 19/00

U.S. Cl. 75—586

19 Claims

1. A method of processing spent vanadium pentoxide-containing catalyst from a sulfuric acid manufacturing process into a vitrified form which is environmentally suitable for disposal; which comprises

- introducing the spent vanadium pentoxide catalyst into a furnace together with oxidic slag-forming materials comprising a mixture of calcium oxide, silica and iron oxide as employed in the smelting of zinc, lead or copper
- melting together the vanadium pentoxide catalyst and the oxidic slag-forming materials to form a slag
- removing the slag and solidifying it into a vitreous mass; the spent vanadium pentoxide catalyst and the slag-forming materials being used in amounts such as to result in a solid amorphous vitrified disposable slag.

5,091,002
PREPARATION FOR THE WATER-REPELLENT IMPREGNATION OF POROUS MINERAL BUILDING MATERIALS

Eckehard Schamberg; Götz Koerner, both of Essen; Herwig Fritsch, Gladbeck; Manfred Grasse, Unna, and Roland Sucker, Werne, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Mar. 12, 1990, Ser. No. 492,086

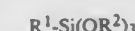
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911479

Int. Cl.⁵ C04B 41/64; C09D 3/82

U.S. Cl. 106—2

11 Claims

1. A composition for the impregnation of porous mineral building materials to protect such materials against penetration by water comprising an emulsion of 2.5 to 25% by weight of an alkoxysilane of the formula

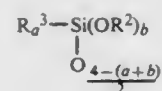


wherein

R¹ is an alkyl group with 3 to 12 carbon atoms and

R² is a methyl or ethyl group,

2 to 20% by weight of an alkoxysiloxane of the formula



wherein

R^3 is an alkyl group with 1 to 6 carbon atoms
a is 0.8 to 1.2 and
b is 0.2 to 1.2,
0.01 to 5% by weight of an emulsifier, 49.9 to 95.48% by weight of water.

5,091,003

INK COMPOSITIONS AND METHOD FOR PLACING INDICIA ON GLASS

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 15, 1990, Ser. No. 538,456

Int. Cl.⁵ C09D 11/00; B05D 3/00; C03C 21/00

U.S. Cl. 106—20 16 Claims

1. An ink composition for permanently affixing indicia to glass, comprising:

A. from about 0.01% to about 2.5% by weight silver nitrate; and

B. a vehicle capable of completely solubilizing silver nitrate selected from the group consisting of glycols, glycol ethers, diethylene glycol dibutyl ether, glycerol, and aqueous and non-aqueous mixtures thereof;

the ink having a viscosity less than about 4 centipoise at a temperature at which the ink is applied to the glass.

5,091,004

INK COMPOSITION

Isao Tabayashi, Saitama; Hiroshi Harada, Osaka; Sadahiro Inoue, Chiba, and Hiroshi Fukutomi, Saitama, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Filed Jun. 3, 1988, Ser. No. 201,708

Claims priority, application Japan, Sep. 22, 1987, 62-237714
Int. Cl.⁵ C09D 11/02

U.S. Cl. 106—22 6 Claims

1. An organic solvent-based ink composition for ink jet printer comprising a dye or dyes dissolved in a mixed solvent of a good solvent and a poor solvent, wherein

(1) a solvent having a dye solubility of at least 4% by weight is used as the good solvent,

(2) a solvent having a dye solubility of less than 0.5% by weight is used as the poor solvent, and

(3) when the dye solubility for the aforesaid mixed solvent is a % by weight and the concentration of the dye or dyes in the ink composition to the mixed solvent is b % by weight, the value of a/b is within the range of from 1.0 to 3.0.

5,091,005

INKS FOR BLEED-FREE INK-JET PRINTING ON PLAIN PAPER

Bruce E. Mueller, Escondido, and John L. Stoffel, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

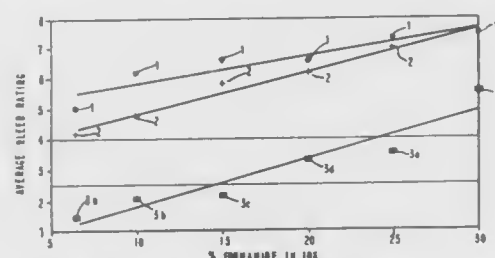
Filed Jul. 10, 1990, Ser. No. 551,214

The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.⁵ C09D 11/00

U.S. Cl. 106—22

10 Claims



1. An ink-jet ink suitable for ink-jet printing on plain paper, comprising, by weight:

- from about 4% to less than about 15% formamide,
- from about 1% to about 10% dye, and
- the balance water.

5,091,006

SOLUTION FLUORESCENT INKS

Thyagaraj Sarada, Norwalk, Conn., and Norman C. Hochwalt, West Carrollton, Ohio, assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 268,130, Nov. 7, 1988. This application Jul. 3, 1990, Ser. No. 547,717

Int. Cl.⁵ C09K 11/02; C09D 11/10

U.S. Cl. 106—22

6 Claims

1. A homogeneous fluorescent ink for use with porous foam applicators, comprising: 10 to 50% soluble fluorescent resin toner, 50 to 85% polar organic solvent, not more than 5% dye, wherein said polar organic solvent has a boiling point greater than 250° C. and a vapor pressure less than 0.05 mm Hg at 25° C.

5,091,007

NAPHTHENIC-AROMATIC HYDROCARBON COMPOSITIONS

Nils Hansen, Heilholkamp 11, 2000 Hamburg 60, Fed. Rep. of Germany

Filed Nov. 21, 1990, Ser. No. 617,079

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1989, 3938620

Int. Cl.⁵ C09D 11/08, 11/00

U.S. Cl. 106—30

9 Claims

1. A predominantly naphthenic-aromatic hydrocarbon composition comprising from about 5 to about 50 parts per weight of indene cumarone resins and from about 50 to about 95 parts per weight of a mineral oil cut having a boiling range between about 200° C. to about 600° C. wherein the composition contains an amount of polycyclic aromatic compounds (PCAs) that is less than about 0.01 percent by weight.

5,091,008

ELASTICALLY RESTORING POLYMER-MODIFIED BITUMEN (PMB)

Klaus-Dieter Lehmann, Heidenau, and Michael Müller, Bensheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany
Filed May 31, 1990, Ser. No. 531,332

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917816; Aug. 4, 1989, 3925827

Int. Cl.⁵ C08L 95/00; C09D 4/00, 101/00, 201/00

U.S. Cl. 106—273.1

13 Claims

1. A polymer-modified bitumen (PMB) having improved elastic restoration and having a content of 0.5–20 wt. % of polymer components in bitumea which polymer components are comprised to the extent of at least 20 wt. % of polyalkyl (meth)acrylates having molecular weights greater than 30,000, said polyalkyl (meth)acrylate being comprised of:

- 50–99.8 wt. % of alkyl (meth)acrylates having alkyl groups of 8–26 C atoms;
- 0.1–2.8 wt. % of polymerizable carboxylic acid monomers;
- 0.1–2.8 wt. % of polymerizable basic nitrogen compounds; and
- 0–49.8 wt. % of one or more other polymerizable compounds each having not more than one polymerizable double bond.

5,091,009

COATING COMPOSITION AND A PROCESS FOR MANUFACTURING THE SAME

Tatsuya Nogami; Kenichi Okubi, and Yoshitane Watanabe, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 449,817

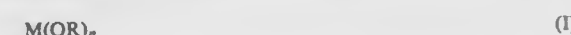
Claims priority, application Japan, Dec. 15, 1988, 63-317009; Oct. 16, 1989, 1-268390

Int. Cl.⁵ C09K 3/00

U.S. Cl. 106—287.1

12 Claims

1. A coating composition consisting essentially of a product obtained by hydrolyzing and condensing a metal alkoxide of the general formula:



wherein M represents a metal selected from the group consisting of silicon, titanium, tantalum, zirconium, boron, aluminum, magnesium and zinc; R represents an alkyl group having 1 to 5 carbon atoms, and n represents the valence number of M in an organic solvent in the presence of an aluminum salt which is soluble in water or an organic solvent; and adding a deposition inhibitor.

5,091,010

CHROMATIC-COLOR METAL FLAKE PIGMENT AND COLORED COMPOSITION COMPOUNDED THEREWITH

Thoru Souma; Masahiro Ishidoya, both of Yokohama; Toshihiko Nakamichi, Fujisawa, and Naoto Takai, Tokyo, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 300,613, Jan. 23, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 714,313

Claims priority, application Japan, Jan. 27, 1988, 63-16657; Dec. 27, 1988, 63-319246

Int. Cl.⁵ C09C 1/62

U.S. Cl. 106—403

14 Claims

1. A chromatic-color metal flake pigment which comprises: (a) flakes of a metal selected from the group consisting of aluminum, bronze, stainless steel, tin and iron; and (b) a coating layer of titanium oxide on the surface of the metal flakes formed by hydrolyzing a hydrolyzable organic titanate ester compound and depositing the titanium oxide on said surface, wherein the coating layer has a thickness of 40 nm to 155 nm

and the hydrolyzable organic titanate ester compound is of the formula



in which R is an alkyl group having 2 to 10 carbon atoms and the subscript n is a positive integer not exceeding 10 and wherein the hydrolyzable organic titanate ester compound is hydrolyzed in an organic medium having a pH from 4 to 8.

5,091,011

LIGHT AND MOISTURE RESISTANT METAL OXIDE-COATED MICA PIGMENTS

Carmine V. DeLuca, Jr., Peekskill, N.Y., assignor to The Mearl Corporation, Ossining, N.Y.

Filed Mar. 12, 1990, Ser. No. 491,728

Int. Cl.⁵ C04B 14/20

U.S. Cl. 106—417

4 Claims

1. A metal oxide-coated mica pigment with enhanced light and moisture stability comprising metal oxide-coated mica particles having on the particle surfaces a coating of hydrous aluminum oxide in which the hydrous aluminum oxide layer contains a light and moisture stability effective amount in the range of about 0.1 to 0.8% Al deposited at a rate of 0.001–0.070 mg Al per minute per gram of pigment.

5,091,012

COBALT TITANATE PARTICLES AND PROCESS FOR PRODUCING THE SAME

Tatsuya Nakamura, Hiroshima, Japan, assignor to Toda Kogyo Corp., Hiroshima, Japan

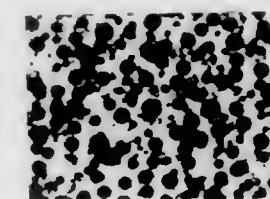
Filed Jun. 14, 1991, Ser. No. 714,174

Claims priority, application Japan, Jun. 25, 1990, 2-167658

Int. Cl.⁵ C04B 14/00; C09C 1/36

U.S. Cl. 106—440

4 Claims



(×2000)

1. Cobalt titanate particles comprising CoTiO₃ having an average particle diameter in the range of 0.5–2.0 μm, said particles being mono-dispersed and having uniform particle size distribution.

5,091,013

MOISTURE HOLDING PIGMENT AND A COSMETIC CONTAINING SUCH A PIGMENT

Ryota Miyoshi; Isao Imai, and Tadashi Sugaya, all of Saitama, Japan, assignors to Miyoshi Kasei Co., Ltd., Urawa, Japan
Continuation of Ser. No. 155,438, Feb. 12, 1988, abandoned. This application Aug. 3, 1989, Ser. No. 388,757

Claims priority, application Japan, Feb. 12, 1987, 62-30496

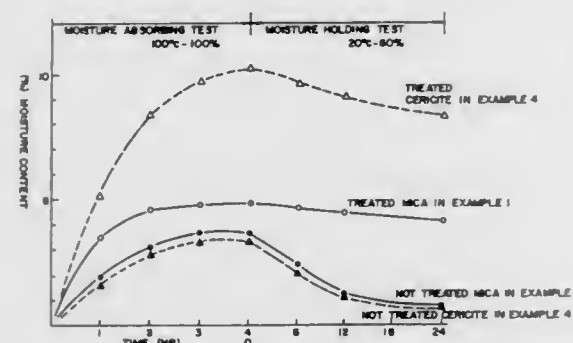
Int. Cl.⁵ C08K 5/09; A61K 7/00

U.S. Cl. 106—505

11 Claims

1. Pigment particles wherein the surfaces of the particles are covered with a water-insoluble, water-absorbent polymeric substance containing a group of the formula —COOR, wherein R is a metal atom selected from the group consisting of aluminum, magnesium, calcium, zinc, zirconium and tita-

nium, the amount of said polymeric substance being from 1.0 to 10.0% by weight of said particles, wherein said surfaces are

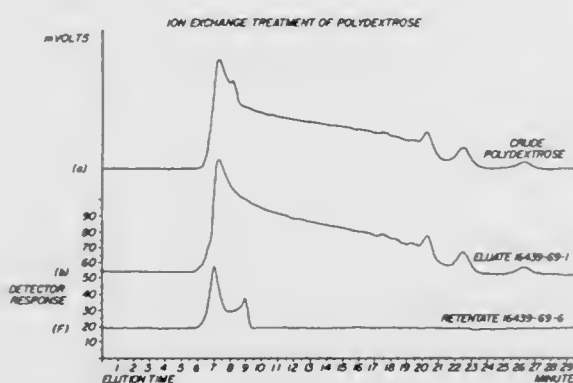


additionally covered with a substance which renders said surfaces hydrophobic.

5,091,014
STRENGTHENED CELLULAR CONCRETE COMPOSITIONS AND METHOD OF MAKING
Mikio Hihara, and Nobuhisa Suzuki, both of Fuji, Japan, assignors to Nissei Plan, Inc., Sizuoka, Japan
Filed Aug. 22, 1988, Ser. No. 234,947
Claims priority, application Japan, May 25, 1988, 58-127854; May 25, 1988, 58-127855
Int. Cl.⁵ C04B 24/02, 24/06, 24/42
U.S. Cl. 106—677 17 Claims

1. In a cellular concrete composition having improved mechanical strength consisting essentially of hydraulic cement and water; the improvement wherein polycarboxylic acids and organosilicon compounds are used in amounts sufficient to improve the strength of the cellular concrete, said polycarboxylic acids selected from the group consisting of (1) maleic acid or (2) a mixture of maleic acid and fumaric acid.

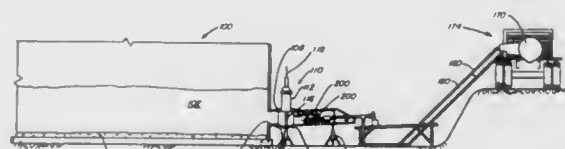
5,091,015
POLYDEXTROROSE COMPOSITIONS
Frank J. Bunick, Randolph, and Shih J. Luo, Livingston, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed May 22, 1990, Ser. No. 527,224
Int. Cl.⁵ C13J 01/06
U.S. Cl. 127—30 27 Claims



1. A polydextrose composition, substantially free of color and bitter-tasting residual compounds made by the process consisting essentially of:
a. dissolving polydextrose in a solvent;
b. adjusting the pH of the polydextrose solution thus formed to approximately 3.0 or higher;
c. passing said solution through an ion exchange column; and
d. collecting and concentrating the eluate produced thereby

until a commercially useful polydextrose composition is recovered.

5,091,016
METHOD FOR DISPERSING SEDIMENT CONTAINED IN A STORAGE TANK
Richard W. Krajicek, Houston, Tex., and Robert R. Cradeur, Sulphur, La., assignors to Serv-Tech, Inc., Houston, Tex.
Division of Ser. No. 180,334, Apr. 11, 1988, Pat. No. 4,945,933.
This application Jun. 22, 1990, Ser. No. 542,522
Int. Cl.⁵ B08B 9/00, 9/093
U.S. Cl. 134—22.1 8 Claims



1. A method for redispersing hydrocarbon sludge deposited in a crude oil storage tank containing crude oil and said hydrocarbon sludge, said crude oil storage tank having a manway in the side thereof covered by a normally closed gate valve, said method comprising the steps of:

mounting on said gate view an isolation barrel open only at the front thereof and having an axially aligned packing gland in the rear end thereof and a drain line, said isolation barrel containing a crude oil circulator comprising a laterally elongate housing open at the rear end thereof and having upstanding rotatable nozzled outlet jets and nozzle turning means mounted thereon and also having independently rotatable tubular connecting means mounted on said rear opening thereof, said tubular connecting means including nozzle drive means operatively connected with said nozzle turning means and also having tubular casing turning means mounted therein and operatively connected with said nozzle drive means.

inserting an initial joint of pipe through said packing gland, said joint of pipe having interconnective turning means mounted therein, coupling said joint of pipe to said tubular connecting means and connecting said interconnective turning means with said tubular casing turning means, opening said gate valve to establish communication between the interior of said storage tank and the interior of said isolation barrel, coupling to said initial joint of pipe additional joints of pipe, each of said joints of pipe containing interconnective turning means, and connecting each of said interconnective turning means with the next succeeding interconnective turning means thereby progressively moving said crude oil circulator through said open gate valve into said crude oil storage tank and to provide multi-joint support pipe means for supporting said crude oil circulator in said tank,

continuing said additional coupling of joints of pipe to said multi-joint support pipe means until said crude oil circulator is approximately centrally positioned in said crude oil storage tank,

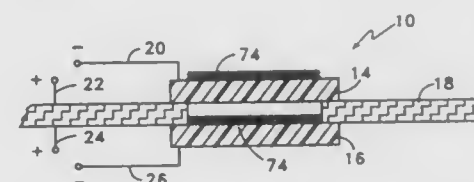
fluidly interconnecting said drain line sequentially with drain line conduit means, filter means, filter conduit means and the suction side of a high pressure crude oil pump, fluidly interconnecting the discharge side of said high pressure pump with a conduit means fluidly connected to the rearmost of said joints of pipe, connecting the interconnective turning means of said rearmost of said joints of pipe with indexing power means for rotating said interconnective turning means, said tubular casing turning means and said nozzled outlet jets, actuating said high pressure crude oil pump to circulate crude oil from said crude oil storage tank through said isolation barrel, drain line, said filter means, said multi-

joint support pipe means, said tubular connecting means, said hollow housing and said nozzled outlet jets back to said storage tank,
said crude oil being ejected from said nozzled outlet jets at an outlet velocity within the range of about 200 to 300 ft. per second, and
rotating said indexing power means to rotate said nozzled outlet jets at the rate of about 0.5 to 5 revolutions per hour and
continuing said recycle of said crude oil through said nozzled outlet jets and continuing said rotation of said nozzled outlet jets until said sludge originally in said storage tank is substantially redispersed in said crude oil.

5,091,017
AEROSOL FUEL INJECTOR CLEANER
Lloyd T. Flanner, Hudson, Ohio, assignor to Aerosol Systems, Inc., Macedonia, Ohio
Continuation of Ser. No. 182,350, Apr. 18, 1988, Pat. No. 4,920,996. This application Nov. 17, 1989, Ser. No. 438,710
Int. Cl.⁵ B08B 5/00
U.S. Cl. 134—22.11 9 Claims

1. A canister containing an aerosol formulation consisting essentially of a liquid cleaner composition, and oxygen bearing compressed air propellant, said air having an initial pressure from about 25 to about 110 pounds per square inch, gauge, measured at 70° F., and said liquid cleaner being present in an amount such that it occupies from about 25% to about 90%, on a volume basis, of the volume of said canister.

5,091,018
TANDEM PHOTOVOLTAIC SOLAR CELL WITH III-V DIFFUSED JUNCTION BOOSTER CELL
Lewis M. Fraas, Issaquah; James E. Avery, Fall City, both of Wash., and Gerald R. Girard, Oakland, Calif., assignors to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 339,311, Apr. 17, 1989, abandoned. This application May 14, 1990, Ser. No. 523,710
Int. Cl.⁵ H01L 31/052, 31/05, 31/0304, 31/18
U.S. Cl. 136—246 49 Claims



2. A GaAs/GaSb tandem solar cell having improved conversion efficiency, comprising:
(a) a GaAs upper cell having a predetermined bandgap selected for optimal performance of the tandem solar cell;
(b) a GaSb booster cell positioned beneath the GaAs upper cell to receive light transmitted through the GaAs upper cell and responsive to such light; and
(c) light conditioning means associated with the upper cell and the booster cell for achieving an energy conversion efficiency of at least 31% AMO.
3. The cell as defined in claim 2, wherein the light conditioning means includes a prismatic coverglass for optically eliminating grid line obscuration losses on at least said upper cell and a concentrating lens for focusing solar energy onto an upper surface of said upper cell.

5,091,019
RAPIDLY SOLIDIFIED ALUMINUM LITHIUM ALLOYS HAVING ZIRCONIUM
Jerry C. LaSalle, Upper Montclair, N.J., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.
Filed Feb. 12, 1990, Ser. No. 478,306
Int. Cl.⁵ C22F 1/04
U.S. Cl. 148—11.5 A 8 Claims



1. A rapidly solidified, low density aluminum base alloy consisting essentially of the formula $Al_{ba}Li_cCu_bMg_dZr_d$ wherein "a" ranges from about 2.1 to 3.4 wt %, "b" ranges from about 0.5 to 2.0 wt %, "c" ranges from about 0.2 to 2.0 wt % and "d" ranges from about 0.4 to 1.8 wt %, the balance being aluminum.

5,091,020
METHOD AND PARTICLE MIXTURE FOR MAKING RARE EARTH ELEMENT, IRON AND BORON PERMANENT SINTERED MAGNETS
Andrew S. Kim, Pittsburgh, Pa., assignor to Crucible Materials Corporation, Syracuse, N.Y.
Filed Nov. 20, 1990, Ser. No. 616,099
Int. Cl.⁵ H01F 1/02
U.S. Cl. 148—101 13 Claims

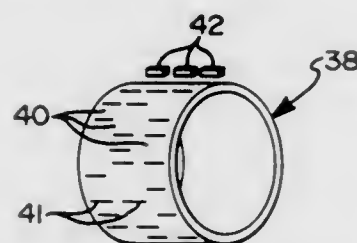
1. A method for producing sintered permanent magnets of a permanent magnet alloy comprising a rare earth element, iron and boron, said method comprising providing permanent magnet, rare earth element, iron and boron alloy material selected from one of:

a) dross alloy and up to 6% scrap alloy;
b) dross alloy and virgin alloy; and
c) dross alloy and virgin alloy and greater than 0 to 80% scrap alloy,
sequentially hydriding said material in a hydrogen atmosphere to hydride and decrepitate said material to form particles therefrom, reducing the size of said particles, compacting said particles and dehydriding and sintering the particles to produce a substantially fully dense article for use as a permanent magnet.

5,091,021
MAGNETICALLY CODED DEVICE AND METHOD OF MANUFACTURE
Thomas A. Perry, Washington; John R. Bradley, Centerline; Thaddens Schroeder, Rochester Hills, and Carlton D. Fuerst, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 28, 1990, Ser. No. 589,359
Int. Cl.⁵ H01F 1/02
U.S. Cl. 148—103 11 Claims

1. A method of imparting a magnetic pattern to an unmagnetized bulk permanent magnet material comprising the steps of: directing energy in a pattern onto unmagnetized base permanent magnet bulk material to heat a volume of the material to a threshold temperature to lower the coercivity thereof; selectively magnetizing the heated pattern by imposing on the pattern of a magnetic field stronger than the coercivity

of the heated volume and not strong enough to significantly magnetize the unheated material; and



allowing the material to cool in said magnetic field, whereby the treated pattern generates a magnetic flux density which is readily detected by a magnetic sensor.

5,091,022

MANUFACTURING PROCESS FOR SINTERED FE-P ALLOY PRODUCT HAVING SOFT MAGNETIC CHARACTERISTICS

Masakazu Achikita, Kashiwa, and Akihito Ohtsuka, Sakura, both of Japan, assignors to Sumitomo Metal Mining Company, Limited, Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 555,843

Claims priority, application Japan, Jul. 21, 1989, 1-187312
Int. Cl.⁵ H01F 1/02

U.S. Cl. 148—104

9 Claims

1. The method of manufacturing a sintered Fe-P powdered metal product having high magnetic permeability and excellent soft magnetic characteristics which comprises the steps of: preparing powders of Fe and P having particle sizes of less than 45 μm ; preparing a mixture of Fe and P powders having from 0.1 to 1.0% by weight of P and the balance of Fe; mixing said Fe-P mixture with a binder to form a pellet for injection molding; injection molding said powder and binder mixture to form a desired product; removing the binder material from said injection molded product; sintering said binder free injection molded product; and cooling said product at a rate of less than 50° C./min. to ambient temperature.

5,091,023

COMPOSITION AND PROCESS FOR CHROMATING GALVANIZED STEEL AND LIKE MATERIALS

Kenshi Saeki, Okayama, and Noriaki Yoshitake, Kanagawa, both of Japan, assignors to Henkel Corporation, Ambler, Pa.
Filed Sep. 27, 1990, Ser. No. 589,146

Claims priority, application Japan, Sep. 27, 1989, 1-251165
Int. Cl.⁵ C23C 22/48

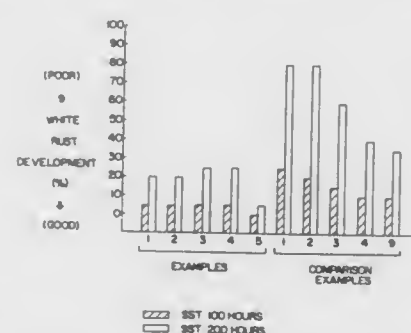
U.S. Cl. 148—247

4 Claims

1. An aqueous acidic liquid composition of matter, consisting essentially of water and:

- from about 9.6 to about 96 g/L, expressed as its stoichiometric equivalent as chromic acid, of total chromium;
- from about 2 to about 35 g/L of trivalent chromium ions;
- from about 1 to about 128 g/L of phosphate ions; and
- from about 0.3 to about 4 g/L of fluorozirconate ions; and, optionally,
- from about 0.1 to about 200 g/L of dispersed silica, the chromium ratio, which is the ratio by weight of trivalent chromium ions to total chromium atoms, in said aqueous acidic liquid composition being from 0.41/1 to about 0.70/1, the chromic acid/fluorozirconate ratio in said aqueous acidic liquid composition being about 10/1 to about 40/1, and the phosphate/Cr(III) ratio in said aqueous

ous acidic liquid composition being greater than about 0.03/1, greater than or equal to about {(9.2)(the chromium



ratio) — 4.0}/1, and less than or equal to about {(9.2)(the chromium ratio) — 1.2}/1.

5,091,024

CORROSION RESISTANT, MAGNETIC ALLOY ARTICLE

Terry A. DeBold, Wyomissing; Theodore Kosa, Reading, and Millard S. Masteller, Fleetwood, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 379,486, Jul. 13, 1989, Pat. No. 4,994,122. This application Jun. 27, 1990, Ser. No. 544,322

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.⁵ C22C 38/18

U.S. Cl. 148—306

9 Claims

1. A corrosion resistant, magnetic article formed of an alloy consisting essentially of, in weight percent, about

Carbon	0.03 max.
Manganese	0.5 max.
Silicon	0.5 max.
Phosphorus	0.03 max.
Sulfur	0-0.5
Chromium	10-13.0
Molybdenum	0-1.5
Nitrogen	0.05 max.
Titanium	0.01 max.
Aluminum	0.01 max.

and the balance essentially iron, wherein said article has been annealed at a temperature below the ferrite-to-austenite transition temperature of said alloy for at least about 2 hours.

5,091,025

PROCESS FOR MAKING A GRAPHITE FILM

Mutsuaki Murakami, Tokyo; Kazuhiro Watanabe, Kawasaki; Naomi Nishiki, Kyoto, and Katsuyuki Nakamura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 409,355, Sep. 19, 1989, Pat. No. 4,983,244. This application May 7, 1990, Ser. No. 519,692

Claims priority, application Japan, May 10, 1989, 1-116969; May 17, 1989, 1-123250

Int. Cl.⁵ B29C 65/02; C01B 31/04

U.S. Cl. 156—89

11 Claims

1. A process for making an artificial graphite film which comprises providing at least one film of a polymer selected from the group consisting of polyphenyleneoxadiazoles, polybenzothiazole, polybenzobisoxazole, poly(pyromellitimide), poly(p-phenyleneisophthalamide), poly(m-phenylenebenzimidazole), poly(phenylenebenzobisimidazole), polythiazole and poly-para-phenylenevinylene, said at least one film having a thickness of not larger than 400 μm , subjecting said at least one film to thermal treatment at a temperature of not lower than 2400° C. in an inert gas atmosphere to graphitize the film,

and rolling the graphitized film to obtain a graphite film having good flexibility and elasticity.

5,091,026

METHOD FOR CONTINUOUSLY VULCANIZING A SELF-MOLDING HOSE

Yokobori Shizuo; Miyamoto Kenzo, both of Kako; Fukushima Koji, Osaka; Tsujimoto Masami, Hyogo; Onda Kenji, Fukushima; Sato Kan, Tokyo, all of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

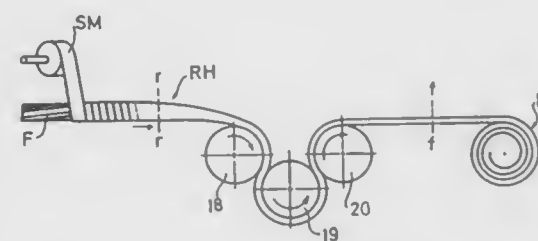
Division of Ser. No. 268,573, Nov. 8, 1988, Pat. No. 4,957,792. This application May 11, 1990, Ser. No. 522,245

Claims priority, application Japan, Nov. 9, 1987, 62-282700; Jul. 11, 1988, 63-173120; Aug. 3, 1988, 63-194132; Aug. 9, 1988, 63-199299

Int. Cl.⁵ B29C 35/06, 53/20

U.S. Cl. 156—149

1 Claim



1. A method for continuously vulcanizing a self-molding hose by external heating comprising the steps of:

- forming a continuous strip of self-molding material, said continuous strip of self-molding material being made by the steps of: providing a first unvulcanized elastomer topping layer on a top surface of a heat shrinkable woven fabric; providing a second unvulcanized elastomer topping layer on an under surface of said heat shrinkable woven fabric, said second unvulcanized elastomer topping layer being thinner than said first unvulcanized elastomer topping layer and vulcanizing said first and second unvulcanized elastomer topping layers to form first and second vulcanized elastomer topping layers; and providing an unvulcanized elastomer topping layer on the underside of said second vulcanized elastomer topping layer;
- wrapping said continuous strip of self-molding material on a former with a portion of said first vulcanized elastomer topping layer overlapping a top surface of said unvulcanized elastomer topping layer of a previous winding of said strip of self-molding material to form a circular hose; and continuously introducing said circular hose into a gap between rotary drums of a vulcanization apparatus comprising a combination of heating drums rotated at the same rate as the rate of said circular hose formation so that said hose is pressed flat, heated, vulcanized and converted into a flat hose.

5,091,027

PROCESS FOR PRODUCING HARD ROLL

Atsuo Watanabe, Osaka, Japan, assignor to Yamauchi Corporation, Osaka, Japan

Filed Aug. 15, 1990, Ser. No. 567,529

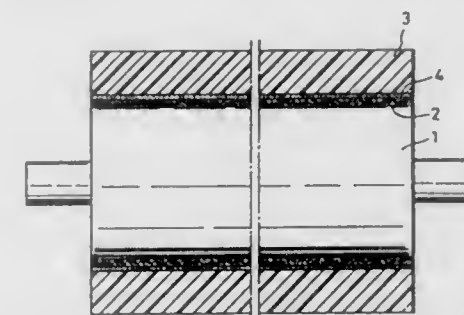
Int. Cl.⁵ B29C 39/12, 41/20, 41/30

U.S. Cl. 156—172

17 Claims

1. A process for producing a hard roll comprising: a first step of winding a fiber material impregnated with a thermosetting resin around the outer peripheral surface of a metal roll core to form a fiber-reinforced lower winding layer, a second step, independent from the first step, of injecting a thermosetting synthetic resin material into a mold of pre-

determined size and curing the material at an elevated temperature to form an outer layer hollow cylinder independent from the metal roll core having said fiber-reinforced lower winding layer, and a third step of fitting the outer layer hollow cylinder around the metal roll core covered with the lower winding layer,



forming an annular clearance therebetween, then injecting an adhesive into said annular clearance, said adhesive having an appropriate viscosity for flowing into said clearance, forming an adhesive layer therein, and curing the adhesive at an elevated temperature to bond the lower winding layer to the cylinder with the adhesive layer.

5,091,028

METHOD FOR MANUFACTURING A HEAT RESISTANT VOICE COIL

Yuzo Yamazaki, Komoro, and Toshiro Nishizawa, Ueda, both of Japan, assignors to Totoku Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 845,446, Mar. 28, 1986, abandoned.

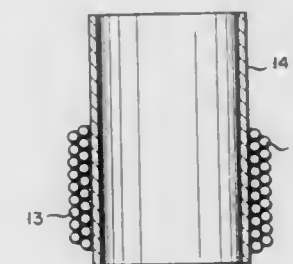
This application May 30, 1989, Ser. No. 358,452

Claims priority, application Japan, Mar. 30, 1985, 60-67347

Int. Cl.⁵ H01F 3/06; B65H 81/00

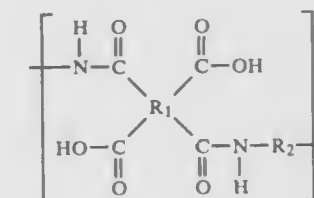
U.S. Cl. 156—172

3 Claims



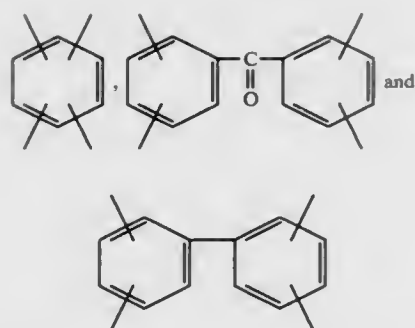
1. A method of manufacturing a voice coil which comprises the steps of:

- dissolving all aromatic polyamide resin and aromatic polyamic acid having a general structural formula given below in a polar non-water solvent to provide a thermosetting resinous adhesive paint:

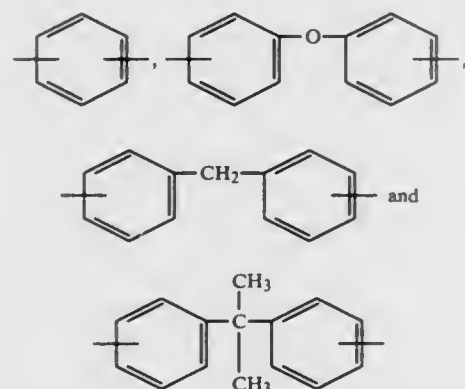


where:

R₁ is an aromatic cycle selected from the group consisting of:



R_2 is an aromatic cycle selected from the group consisting of:



and

n is an integer of 1 or more, producing a self-fusible electrically insulated paint-covered conductive wire by applying said paint on a surface of an insulation layer-coated conductive wire and drying said paint to a semihardened state; applying said paint on a surface of a bobbin and drying said paint to a semihardened state; tightly winding said paint-covered conductive wire about a peripheral surface of the bobbin covered with said thermosetting resinous adhesive paint, while applying a polar non-water solvent to swell said paint of a semihardened state; and thermally hardening said thermosetting resinous adhesive paint of semihardened state.

5,091,029

METHOD OF MANUFACTURING A UNITARY, MULTI-LEGGED HELICOPTER ROTOR FLEXBEAM MADE SOLELY OF COMPOSITE MATERIALS

Geoffrey C. R. Davis, Madison, and Allen J. McIntire, Ansonia, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 15, 1991, Ser. No. 641,220

Int. Cl.⁵ B65H 81/00; B64C 11/12

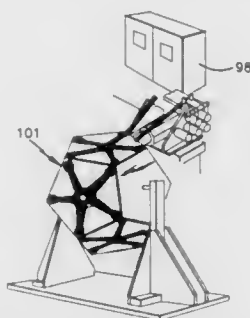
U.S. Cl. 156—174

17 Claims

1. The method of manufacturing a helicopter rotor flexbeam made solely of composite materials and including a flexbeam hub of generally circular shape and concentric about an axis, at least three flexbeam legs each having a centerline and extending radially outwardly from the hub and integrally attached thereto and spaced equidistant circumferentially about the hub, and each leg having a length and width comprising a plurality of full length plies of composite material which form a pattern extending for the full leg width and the full leg length and bifurcating in passing through the hub forming bifurcated portions such that the bifurcated portions extend into and for the length of two diametrically opposite legs, and taper plies of

composite material including short length taper plies of composite material forming the same pattern as the full length plies, and other taper plies being made of composite material, which taper plies are selectively shaped and positioned between the full length plies to cooperate therewith to define a shape of the hub and of each leg so that each leg has an inboard section tapering outwardly from the hub and an outboard section tapering inwardly to form thickened sections at each end of the leg and a narrow section therebetween, and filler plies shaped to fit between interstices generated by the full length plies including the steps of:

- producing the short length taper plies by a method comprising:
 - providing a rotatable mandrel having cylindrically shaped sections and conically shaped sections;
 - filament winding high tensile strength fiberglass fibers on to both the cylindrical and conical sections of the mandrel such that adjacent fibers abut to form cylindrical and conical filament wound layers of at least one ply thickness;
 - cutting the filament wound layers from the mandrel and producing a plurality of selectively shaped plies by laying them out flat, each with a substantially rectangular shaped ply with unidirectional fibers which was formed on the cylindrical section of the mandrel positioned at opposite ends of an arcuate ply which was formed on the conical section of the mandrel, to produce a plurality of plies which are arcuate in a central portion and have straight leg portions on opposite sides



thereof with unidirectional fibers extending for the full length of each ply, and which is at least one ply thick; p2 (4) cutting the plies so laid out to a shape desired for the short length taper plies so that one straight leg portion will be sized to occupy one half the width of a flexbeam leg and extend for a portion of the length thereof, and the other straight leg portion will occupy one half the width and extend for a portion of the length of a substantially diametrically opposite leg of the flexbeam, and so that the unidirectional fiberglass fibers extend for the full length of the short length taper plies;

- cutting other taper plies of composite material of selected shape to cooperate with the full length plies and the short length taper plies when laid up to form the thickened and tapered inboard section and the thickened and tapered outboard section of each flexbeam leg, the other taper plies having high tensile strength graphite fibers extending therethrough in parallel relationship to each other, but oriented to form a substantially angle with the unidirectional plies of the short length taper plies when laid up;
- selectively laying up a plurality of short length taper plies and graphite taper plies to form a first preply which will cooperate with the full length plies and other first preplies to form a thickened radial inboard end of each flexbeam leg and the tapering section projecting radially outwardly therefrom, and a second preply which will cooperate with the full length plies and other second preplies to form a thickened radial outboard end of each flexbeam leg and

the tapering section projecting radially inwardly therefrom;

- affecting final lay-up of the composite materials to form the flexbeam by a method comprising:

- providing a rotatably mounted lay-up tool of dodecahedron shape having twelve pentagon shaped facets, and with an axis of rotation of the tool passing through two of the facets;
- providing a filament winding machine computer programmed to coax with the rotatable tool to lay up an identical selected pattern of composite material including unidirectional fiberglass fibers on a selected number of the tool facets, and which pattern results in at least one ply of composite material on each facet including unidirectionally directed fiberglass fibers extending substantially parallel to the centerline of each flexbeam leg and to the unidirectional fibers in the leg portions of the short length taper plies and extending for the full length and the full width of each flexbeam leg, and with the full length plies in each leg bifurcating in passing through the flexbeam hub and then extending into two substantially diametrically opposite legs to form one half the width of the ply in each of the two opposite legs, thereby producing identical ply patterns in a cross-sectional shape of the flexbeam and its full length plies on each of the selected facets of the lay-up tool;
- selectively laying up on the full length ply on each lay-up tool facet said first and second preplies so that the unidirectional fibers in the leg portions of each short length taper ply of each first preply is extending in a substantially parallel relationship along a portion of the length of each leg and for the full width thereof and so that the second preplies are positioned at the outboard end of the full length plies to form third preplies each comprising a full length ply, at least one short length taper ply, and at least one of the graphite taper plies at each of a radial inner and outer end of the flexbeam leg on each lay-up tool facet, which each third preply being selectively shaped to cooperate to form the flexbeam when all third preplies are laid up together;
- debulking the third preplies in unison while still on the lay-up tool;
- cutting each third preply to size and removing each from the lay-up tool;
- selectively laying up the third preplies to form a flexbeam lay-up in a mold shaped to define the flexbeam;
- curing the flexbeam lay-up under appropriate heat and pressure;
- demolding the flexbeam so cured;
- overwrap winding over at least the outboard section of each leg of the flexbeam by:
 - hoop wrapping high tensile strength fiberglass roving over at least the outboard section of each leg of the flexbeam to increase its ballistic tolerance, and
 - helically winding at substantially $\pm 60^\circ$ and substantially -65° fiberglass over the hoop wrapping for at least an outer portion of each flexbeam leg to prevent delamination of the plies;
- drilling at least one hole in the inner and outer ends of each leg of the flexbeam and liquid shimming a bushing thereto to receive a flexbeam-to-rotor connecting bolt and a helicopter blade retaining bolt.

5,091,030 LIGHTLY BONDED POLYAMIDE YARNS AND PROCESS THEREFOR

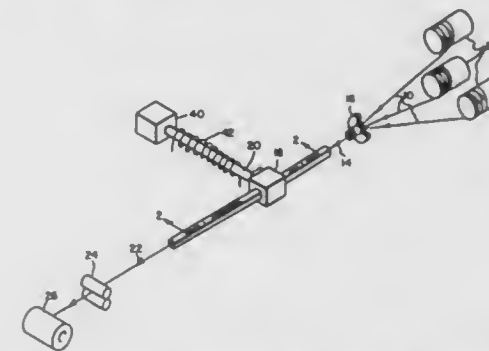
Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 78,155, Jul. 27, 1987, abandoned, which is a continuation of Ser. No. 754,703, Jul. 15, 1985, abandoned. This application Nov. 30, 1989, Ser. No. 443,371

Int. Cl.⁵ D02G 3/00

U.S. Cl. 156—180

6 Claims



1. A process for combining and treating a plurality of crimped multi-filament polyamide yarns, each filament having an outer surface and an interior core, to produce a substantially twist-free combined yarn suitable for use in cut pile carpets or other cut pile applications comprising the steps of:

- combining the crimped multi-filament yarns to form a yarn bundle;
- passing the yarn bundle under tension through a close-fitting inlet passage of known inside diameter to radially compress the filaments;
- steam-treating the compressed filaments by directly impinging the axis of the yarn bundle with saturated steam in a chamber having an inside diameter less than 1.5 times the inside diameter of the inlet passage for a time greater than about 15 milliseconds and less than about 150 milliseconds, the steam being at elevated pressure, substantially free of entrained water, and at a velocity high enough to separate and treat the filaments individually so that the outer surfaces of the filaments are deoriented and the interior cores are not; and
- passing the steam-treated filaments through a close-fitting outlet passage of known inside diameter under tension so that the treated filaments are again radially compressed and bond together lightly where the filaments touch.

5,091,031

METHOD FOR FORMING PLASTIC MOLDED PANELS WITH INSERTS

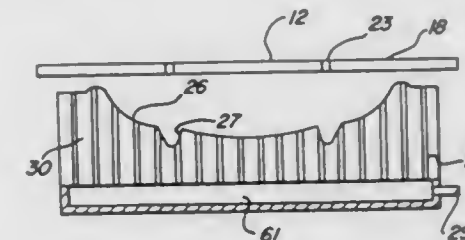
Vittorio Strapazzini, c/o Duotec Products Associates 5501 Enterprise Ct., Warren, Mich. 48092

Filed May 2, 1990, Ser. No. 517,928

Int. Cl.⁵ B29C 51/10, 51/12, 65/102

U.S. Cl. 156—211

13 Claims

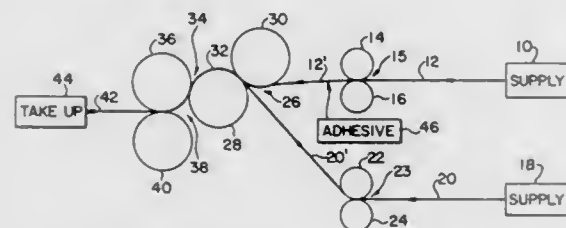


1. A method for forming molded plastic panels, having

inserts, for use as trim panels or interior door panels, comprising the steps of:

- (a) forming a thin, flexible, plastic sheet to a predetermined size and shape to provide a blank having an outer surface and an inner surface;
- (b) positioning at least one, initially separate, panel shaped insert upon one of the surfaces of the blank and integrally bonding at least a substantially continuous narrow edge band portion, which defines a peripheral edge of the insert, to a blank portion which said edge band portion overlaps to form a laminated narrow border strip which surrounds a portion of the blank that underlays the insert; removing the portion of the blank that underlays the insert within the narrow border strip such that a space is formed in said blank and such that said insert fills said space;
- (d) positioning the blank and insert within a mold with outer faces of the blank and insert positioned against a wall of the mold and with said border strip overlying a substantially continuous frame means formed on said mold wall for folding the border strip into a narrow, U-shaped in cross-section, continuous channel with the insert edge band portion arranged within and forming part of the interior of said channel;
- (e) applying and bonding a relatively thick plastic substrate against the inner surface of the blank and exposed inner surfaces of the insert for bonding together overlapping surfaces of the blank, insert and substrate; and
- (f) thereafter, removing the molded panel from the mold to provide a composite plastic panel having an exposed exterior surface formed of outer surfaces of the blank and the insert and with the peripheral edges of the insert visually concealed within the channel that opens outwardly of the channel and which channel surrounds the insert and forms a border for the insert.

5,091,032
MULTI-NIP HIGH-SPEED PAPER CONVERTING
 Galyn A. Schulz, Appleton, Wis., assignor to James River Corporation of Virginia, Richmond, Va.
 Filed Jul. 10, 1989, Ser. No. 377,586
 Int. Cl.⁵ B31F 1/00
 U.S. Cl. 156—219 7 Claims

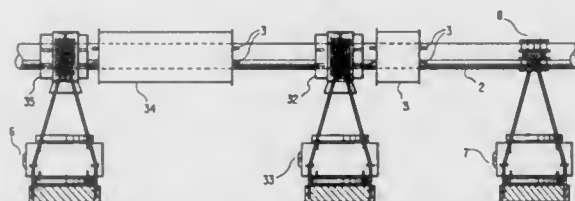


1. A method comprising: separately pre-embossing each of at least two webs to form respective pre-embossed webs; thereafter joining the pre-embossed webs to form a pre-embossed multi-ply web and calendering the pre-embossed multi-ply web to form a calendered multi-ply web; and thereafter embossing the calendered multi-ply web to form an embossed multi-ply web.

5,091,033
ADHESIVE FOR CERAMICS AND PROCESSES FOR THE BONDING OF CERAMICS USING SAME
 Nobuo Nakabayashi, Chiba; Narimichi Honda, Yamaguchi; Mitsuo Nakamura, Tokyo, and Takeshi Sakashita, Yamaguchi, all of Japan, assignors to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
 Division of Ser. No. 59,762, Jun. 8, 1987, abandoned. This application Dec. 7, 1990, Ser. No. 623,508
 Claims priority, application Japan, Jun. 6, 1986, 61-131193; Jun. 6, 1986, 61-131194
 Int. Cl.⁵ C23C 8/20
 U.S. Cl. 156—316 22 Claims

1. A process for bonding ceramics to an adherend using a liquid containing (a) a silane coupling agent and (b-1) at least one first acidic compound selected from the group consisting of organic carboxylic acids, organic carboxylic acid anhydrides, inorganic acids, organic sulfonic acids and organic phosphoric acids, and a mixture containing (c) a polymerizable monomer and (d) a polymerization catalyst, the amount of said silane coupling agent being at least 5% by weight based on the sum total weight of said components (a), (b-1), (c) and (d), which process involves the following steps of:
 - (1) applying said liquid containing said components (a) and (b-1) to the surface of the ceramics,
 - (2) drying the liquid thus applied to the surface of the ceramics to form a coat layer,
 - (3) applying said mixture containing said components (c) and (d) to said coat layer, and
 - (4) bonding said adherend to the surface of the thus treated ceramics.

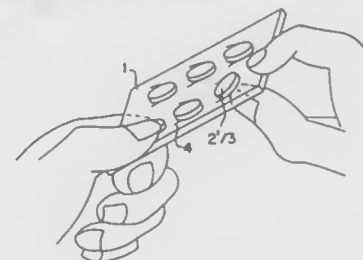
5,091,034
MULTI-STEP COMBINED MECHANICAL/THERMAL PROCESS FOR REMOVING COATINGS FROM STEEL SUBSTRATES WITH REDUCED OPERATING AND CAPITAL COSTS AND WITH INCREASED REFRIGERATION SPEED AND EFFICIENCY
 Jean-Luc Hubert, Willowbrook, Ill., assignor to Liquid Air Corporation, Walnut Creek, Calif.
 Filed Oct. 9, 1990, Ser. No. 594,087
 Int. Cl.⁵ B32B 31/18, 31/22
 U.S. Cl. 156—344 30 Claims



1. A process of removing low thermal conductivity coatings from an elongate support with high efficiency and speed, comprising the steps of:
 - a first cooling step of moving an enclosing tunnel means along the length of said support while applying a low temperature refrigeration medium onto said coating for a time sufficient to cool a first portion of the thickness of the coating to a temperature below an embrittlement temperature thereof, said first portion being less than the entire thickness of the coating;
 - after said first cooling step, performing a first removal step of removing the embrittled first portion of the coating while leaving a remaining coating;
 - at least one further cooling step of moving another enclosing tunnel means along the length of said support while applying a low temperature refrigeration medium onto said remaining coating for a time sufficient to cool a portion of the thickness of said remaining coating to a temperature below the embrittlement temperature thereof; and

after each said at least one further cooling step, performing a further removal step of removing the embrittled portion of the remaining coating, wherein said at least one further cooling step includes a final cooling step in which said portion of the thickness of the remaining coating is the entirety of the thickness of the remaining coating.

5,091,035
REMOVAL AID AND USE THEREOF
 Dieter Anhäuser, Melsbach, Fed. Rep. of Germany, assignor to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Fed. Rep. of Germany
 PCT No. PCT/DE88/00181, § 371 Date Nov. 11, 1988, § 102(e) Date Nov. 11, 1988, PCT Pub. No. WO88/07737, PCT Pub. Date Oct. 6, 1988
 Continuation of Ser. No. 276,047, Nov. 11, 1988, abandoned. This PCT application filed as PCT/DE88/00181, Mar. 22, 1988, Ser. No. 610,447
 Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711256
 Int. Cl.⁵ B65D 73/00 13 Claims
 U.S. Cl. 156—344

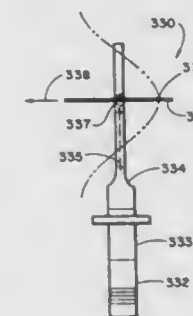


1. A therapeutic system for transfer of a medicament active substance by skin contact comprising at least one manually detachable therapeutic plaster substrate containing a medicament active substance, said substrate adhering to a sheet-like, flexible carrier material having a contact surface contacting the substrate in the form of predetermined lines of weakness in said carrier material, characterized in that a separate, non-linear, predetermined line of weakness (4) is provided for each said substrate at least in the contact surface of carrier material (1) substantially beneath each said substrate in such a way that when pressure is applied to the carrier material (1) with a force component in a direction at right angles to a corresponding substrate contact surface, it is possible to bend a carrier material portion bounded by the predetermined line of weakness (4) with the substrate portion adhering to it in the direction of the substrate or substrates (2), so that at least part of substrate (2) is detached in its border area adjacent to the predetermined line of weakness (4) from the carrier material (1) and consequently a gripping portion (5) is formed on the substrate for the complete removal of the latter.

5,091,036
APPARATUS FOR PULTRUDING THERMOPLASTIC STRUCTURES AT BELOW MELT TEMPERATURES
 Scott R. Taylor, 516 Kaw, Bartlesville, Okla. 74003
 Filed Oct. 5, 1989, Ser. No. 417,297
 Int. Cl.⁵ B32B 1/00, 1/08, 31/22
 U.S. Cl. 156—379.6 11 Claims

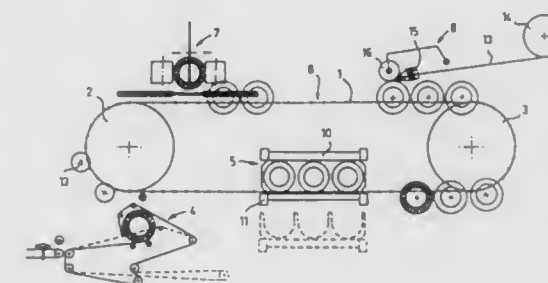
1. Apparatus for producing a fiber reinforced thermoplastic structure of predetermined cross-section from a plurality of resin impregnated, fiber substructures comprising:
 - means for heating said substructures to a temperature just below the melting temperature of said resin;
 - a platen in a downstream relationship relative to said heating means;
 - a wave guide spaced apart from said platen;
 - means mounted on said platen and cooperable with said

platen and said wave guide to define a passage having said predetermined cross-section; means in a downstream relationship relative to said passage for pulling said heated substructures from said heating means through said passage; means coupled to said waveguide for vibrating said wave



guide at an ultrasonic frequency and in a direction normal to the movement of said substructures through said passage to cause said resin of said substructures within said passage to flow; and means coupled to said waveguide for pressing said waveguide toward said platen to consolidate said substructures into an integral structure.

5,091,037
APPARATUS FOR THE MANUFACTURE OF INSULATING CHUTES
 Osmo Solkkeli, Lappeenranta, Finland, assignor to Oy Partek Ab, Finland
 PCT No. PCT/FI89/00013, § 371 Date Sep. 11, 1990, § 102(e) Date Sep. 11, 1990, PCT Pub. No. WO89/07733, PCT Pub. Date Aug. 24, 1989
 PCT Filed Jan. 23, 1989, Ser. No. 555,430
 Claims priority, application Finland, Feb. 12, 1988, 880666
 Int. Cl.⁵ B31C 13/00; B32B 31/00; B65H 81/00
 U.S. Cl. 156—443 10 Claims



1. Apparatus for manufacturing insulating chutes, comprising:
 - a transporter supported for movement in a forward direction around an endless path, and including means to hold a multitude of cores;
 - feeding means located adjacent the endless path for feeding a supply of cores onto the transporter;
 - drive means connected to the transporter to move the transporter and the cores along the endless path;
 - winding means located adjacent the endless path for receiving the cores from the transporter, winding an insulating material onto the cores, and returning the cores to the transporter;
 - curing means located adjacent the endless path for curing the insulating material wound onto the cores;
 - removing means located adjacent the endless path for removing the cured insulating material from the cores; wherein the cores are carried around the endless path by the

transporter in a plurality of spaced apart groups having equal numbers of the cores, each group extending along the transporter over a first given length; wherein adjacent groups of cores on the transporter are normally spaced apart on the transporter a distance equal to or greater than the first given length; and the curing means including means to detach one entire group of cores from the transporter at one time, to cure said one group of cores, and then to return the entire one group of cores to the transporter forward of the following group of cores.

5,091,038
PLASTIC WELDING MACHINE FOR PRODUCING WELD SEAMS

Peter Greller, Enkenbach, and Werner Schauss, Bruchmühlbach-Miesau, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany

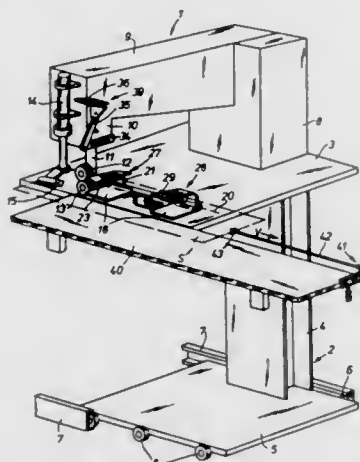
Filed Jun. 5, 1990, Ser. No. 533,594

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3921713

Int. Cl.⁵ B32B 31/20, 31/26

U.S. Cl. 156—443

6 Claims



1. A welding machine for forming thermoplastic welds and producing connecting seams on a material to be welded comprising: a welding machine body; heating means connected to the welding machine body for movement in a feed direction relative to the material and for continuously forming welds during relative movement of the welding machine body with respect to the material; a folding device including a support plate connected to the welding machine body and a folding plate, said folding plate being connected to said support plate for pivotal movement with respect to said support plate around an axis extending parallel to the direction of feed of the welding machine; a U-shaped guide stop positioned at an end of said folding plate facing away from said pivot axis, said folding plate being moveable back and forth between a preparation position, turned away from said support plate, and a working position, located at a spaced position above said support plate for continuously folding the material during said movement, said folding plate forming an essentially U-shaped guide slot together with said support plate and said guide stop in said working position.

5,091,039
METHOD AND APPARATUS FOR APPLYING ELASTIC BAND ONTO MOVING WEB

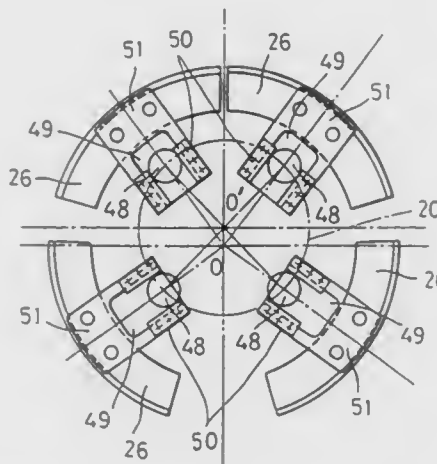
Hiroshi Ujimoto, Kawanoe; Hironori Nomura, Iyomishima; Taiji Shimakawa, Kawanoe; Junji Shinohara, Iyomishima; Shigetoyo Kobayashi, Kagawa, and Hiroki Yamamoto, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ebime, Japan

Division of Ser. No. 231,537, Aug. 12, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 499,007

Claims priority, application Japan, Aug. 18, 1987, 62-206157 Int. Cl.⁵ B32B 31/00

U.S. Cl. 156—519

4 Claims



1. Apparatus for intermittently severing two continuous bands of elastic into a series of pieces (5) of predetermined length and thereafter applying these pieces (5) to a moving continuous web (1) in spaced apart relationship to each other, said apparatus comprising in combination

- (a) a plurality of separate but circumferentially aligned rotor elements (26, 26a) that are sequentially spaced apart and rotatably supported by a first shaft (15) about an axis 0,
- (b) each rotor element (26, 26a) being provided with at least two suction members (12) having arc-shaped outer surfaces that are laterally spaced from each other, each suction member (12) being adapted to hold one piece (5) of said elastic band against its arc-shaped outer surface,
- (c) suction distributor means (13) associated with said suction members (12) to alternately apply suction and release suction from said suction members 12,
- (d) a drive wheel (20) mounted on a second shaft having an axis 0' that is offset from the 0 axis of said first shaft (15),
- (e) each rotor element (26, 26a) having a side wall that is provided with guide piece (49-51) and the drive wheel (20) being provided with a number of slidable engaging pins (48), each engaging pin (48) slidably engaging with a guide piece (49-51) whereby when the drive wheel (20) is rotated at constant speed the rotor elements (20, 26) are independently rotated at a variable speed following a common rotational path with the result that each pair of adjacent rotor elements (20, 26) are alternately moved close to each other and then farther apart from each other,
- (f) means to separately feed each of said two continuous elastic bands against the outer arcuate surfaces of said suction members (12),
- (g) severing means (41) intermittently cooperating with said suction members (12) to sever said continuous elastic band into pieces (5), and
- (h) web feeding means (10) located near the rotational path of said suction members (12) for transferring each severed piece (5) of elastic band to said continuous web (1).

5,091,040
TURRET TYPE LABELING MACHINE WITH CONTOURED VACUUM DRUM

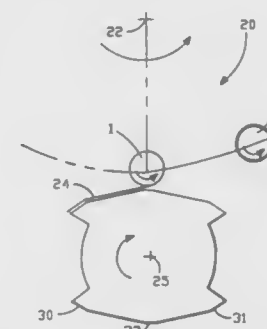
Svatoboj Otruba, Ceres, Calif., assignor to B & H Manufacturing Co., Inc., Ceres, Calif.

Filed May 3, 1990, Ser. No. 518,747

Int. Cl.⁵ B65C 3/00

U.S. Cl. 156—566

9 Claims



1. In a turret type machine for wrapping segments of sheet material, each having a leading end and a trailing end, about articles, said machine including a turret rotatable about a central turret axis and a plurality of pairs of chucks carried by the turret, the chucks of each pair being aligned coaxially and for orbital motion about the turret axis and for spinning about their own axes parallel to the turret axis,

said machine also comprising a vacuum feed member for said segments which is rotatable about an axis parallel to the turret axis and which has an arcuate surface generally parallel to the turret axis and which is capable of receiving a segment of sheet material at a segment pickup station, holding such segment on such arcuate surface by vacuum while transporting it to a segment applying station and releasing it at such station,

the improvement which comprises a configuration of said arcuate surface including a leading section which acts to apply pressure to the leading end of a segment to adhere it to an article held by a pair of said chucks, a trailing section which acts to apply pressure to the trailing end of such segment to adhere it to the article or to overlap and adhere to the leading end of the segment and a mid-section between said leading and trailing sections which is so shaped and contoured that it is in contact with the orbitally moving and spinning article or is close enough thereto that there is no substantial amount of freedom of movement allowed the segment other than its orbital and spinning motions, said arcuate surface being fixed in relation to said vacuum feed member axis and said turret axis.

5,091,041
BONDING APPARATUS FOR BONDING FRICTION MATERIAL

Thomas A. Genise, Dearborn, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 327,483, Mar. 22, 1989, abandoned.

This application Feb. 5, 1991, Ser. No. 651,114

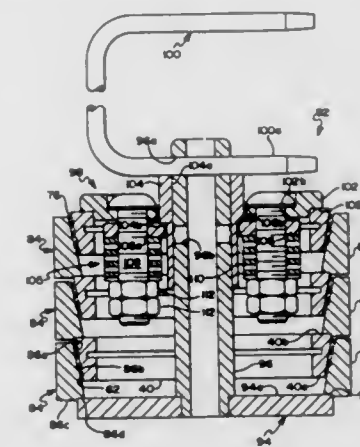
Int. Cl.⁵ B30B 1/02

U.S. Cl. 156—583.1

14 Claims

- 1. Bonding means comprising: an apparatus including fixture means, the fixture means for forming a bonding assembly including a ring member, an annular clutch member and a plurality of friction segments of predetermined thickness to be bonded to a frustoconical surface of the clutch member via an adhesive affixed to the segments; the fixture means comprising: the ring member including a frustoconical surface complementary to the clutch member frustoconical surface and ledge means extending radially and circumferentially from the ring member frustoconical surface to an edge thereof

spaced from the ring member frustoconical surface a distance less than the thickness of the segments; the fixture means including base and stop means for supporting the clutch and ring members with the axes of the clutch and ring members concentric and vertically oriented, with the stop means spacing apart the frustoconical



surfaces at a distance greater than the segment thickness for allowing insertion of the segments between the surfaces, and with the edge of the ledge means and clutch member frustoconical surface spaced apart a distance less than the segment thickness for effecting vertical support of the segments on the ledge means to thereby form the bonding assembly.

5,091,042
APPARATUS FOR SEPARATION OF FLOOR COVERINGS ON RAISED FLOOR PANELS OR THE LIKE

Gunther Bruckner, Abtswind, Fed. Rep. of Germany, assignor to MERO-Werke, Würzburg, Fed. Rep. of Germany

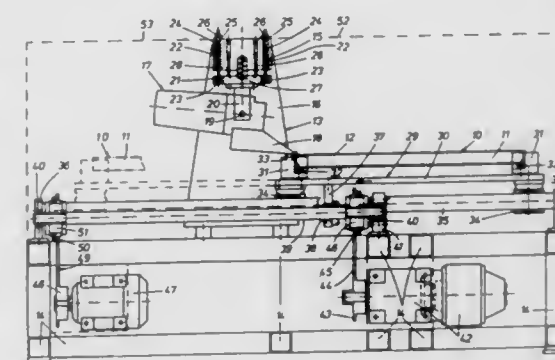
Filed Aug. 22, 1990, Ser. No. 570,788

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929192

Int. Cl.⁵ B32B 35/00

U.S. Cl. 156—584

12 Claims



1. Device for the separation of floor coverings on raised floor panels, with a motor-powered cutting blade, characterized in that

- (a) the separating apparatus (17) forms a part of the device for the automatic separation of floor coverings (12) and is fastened pivotally and adjustably around a horizontal axis (19) to a base plate (21) which, provided with springs and thus shock-absorbing, is fixed in a horizontal or approximately horizontal plane on a transverse frame part (15) of the device (13), the base plate (21) being movable to a limited extent in the direction of the longitudinal axis of the device (13), and

- (b) a carriage (29) with holders (31) for a raised floor panel (10) is arranged beneath the separating apparatus (17), which can be moved back and forth by motor transverse to the cutting blade (18) of the separating apparatus (17) and parallel to the longitudinal axis of the device (13).

5,091,043

METHOD FOR MONOCRYSTALLINE GROWTH OF DISSOCIATIVE COMPOUND SEMICONDUCTORS

Keiji Shirata, Koichi Sassa, and Kenji Tomizawa, all of Omiya, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,718

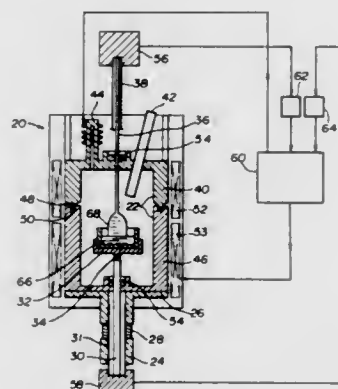
Claims priority, application Japan, Aug. 19, 1988, 63-205860; Aug. 19, 1988, 63-205862; May 16, 1989, 1-122630

The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.

Int. Cl.⁵ C30B 15/22

U.S. Cl. 156—601

17 Claims



1. A method for monocrystalline growth of dissociative compound semiconductor, the method including the steps of:
 - (a) preparing a first volatile component material and second material of the dissociative compound semiconductor, the first material being placed on the bottom of an air-tight vessel, the second material being contained in a crucible in the air-tight vessel, the crucible supported by a lower shaft extending from the inside to the outside of the air-tight vessel;
 - (b) heating the first material for evaporating the first material to make the first material react with the second material in the crucible, thereby synthesizing the dissociative compound semiconductor in the crucible; and
 - (c) pulling up a single crystal from said melt by an upper shaft, the upper shaft extending from inside to outside of the air-tight vessel, thereby growing the single crystal; said method characterized in that said pulling-up process comprises the steps of, after said heating step:
 - (d) measuring the weight of the melt in said crucible, the weight of the melt being influenced by a difference between the interior pressure of the air-tight vessel and a pressure outside of the air-tight vessel;
 - (e) correcting the measured weight of the melt for the error due to the pressure difference, thereby obtaining an accurate data of the weight of the melt; and
 - (f) controlling at least one of a composition and a diameter of the growing crystal on the basis of said weight data of the melt.

METHODS OF SUBSTRATE HEATING FOR VAPOR PHASE EPITAXIAL GROWTH

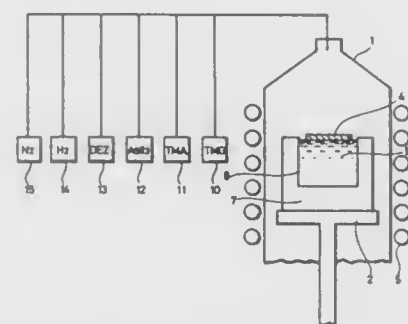
Toshio Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 379,389, Jul. 13, 1989. This application May 18, 1990, Ser. No. 525,009

Claims priority, application Japan, Jul. 21, 1988, 63-182110 Int. Cl.⁵ C30B 19/00

U.S. Cl. 156—607

7 Claims



1. A method of heating a substrate to a temperature required for causing epitaxial growth on the surface of said substrate by introducing a raw material gas or gas mixture for thin film formation onto the surface of said substrate in a reactor tube, which comprises the steps of:
 - disposing a liquid tank containing a melt in the reactor tube, the melt being composed of a lower liquid layer having a relatively high specific gravity and an upper liquid layer having a relatively low specific gravity,
 - bringing the reverse side of said substrate into contact with said melt,
 - heating said melt, and heating said substrate to said desired temperature by heat conduction from said upper liquid layer of said melt.

5,091,045

METHOD OF COUPLING ELECTRO-OPTICAL COMPONENTS TO INTEGRATED-OPTICAL WAVEGUIDES

Edilbert A. Froning, Bodanstrasse 23, 7772 Oberuhldingen, and Klaus A. Langner, Alte Dorfstrasse 61, 7770 Überlingen, both of Fed. Rep. of Germany

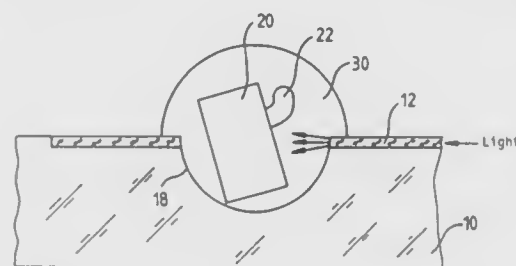
Filed Aug. 31, 1990, Ser. No. 575,977

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928894; Jan. 29, 1990, 4002490

Int. Cl.⁵ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—633

20 Claims



1. A method of coupling an electro-optical component to an integrated-optical waveguide provided in a substrate, comprising the steps of:
 - (a) making a cavity, which intersects the waveguide, in the surface of said substrate,
 - (b) positioning and holding said component in said cavity in a desired position relative to said waveguide, and
 - (c) encasing said component within said cavity into a cast rigidifying material.

- (c) encasing said component within said cavity into a cast rigidifying material.

5,091,046

CAUSTIC ETCHING OF ALUMINUM WITH MATTE FINISH AND LOW WASTE CAPABILITY

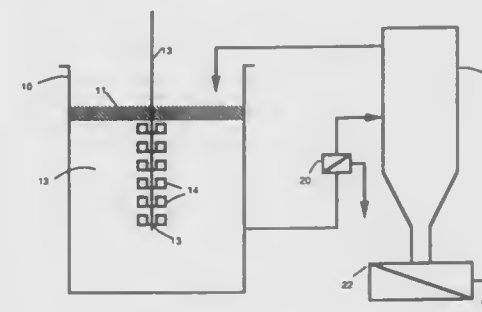
Robert F. Hunter, 2351 First Street, Burlington, Ontario, Canada L7R 1C2, and Phillip Hohn, 5 Rannock Street, Toronto, Ontario, Canada M1L 2N9

Filed Dec. 31, 1990, Ser. No. 636,458

Int. Cl.⁵ B44C 1/22; C23F 1/00

U.S. Cl. 156—642

47 Claims



1. A process for etching an aluminum or aluminum alloy work piece to obtain a desired finish from bright to matte, comprising the steps of:
 - (a) contacting the work piece with a caustic etch solution under the following conditions:
 - (i) the etch solution containing free sodium hydroxide and dissolved aluminum in a ratio of between about 0.6 and 2.1 and also containing an etch equalizing agent in an effective amount for producing a substantially uniform etch,
 - (ii) an etch temperature equal to or higher than about 70° C. and less than the boiling temperature of the etch solution, and
 - (iii) an etch time effective for producing the desired degree of etching on the work piece from a bright finish to a matte finish; and
 - (b) subsequently separating the work piece from the etch solution.

5,091,047

PLASMA ETCHING USING A BILAYER MASK

James M. Cleaves, Redwood City; James G. Heard, and Zoilo C. H. Tan, both of Cupertino, all of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

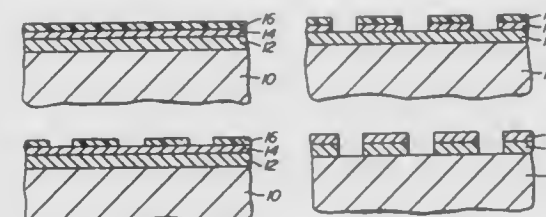
Division of Ser. No. 210,211, Jun. 17, 1988, Pat. No. 5,045,150.

This application Jul. 22, 1991, Ser. No. 733,473

Int. Cl.⁵ B44C 1/22; C03C 15/00, 25/06; C23F 1/00

U.S. Cl. 156—643

7 Claims



1. A method for etching a silicon dioxide dielectric layer on a semiconductor substrate, said method comprising:
 - forming a layer of aluminum having a thickness in the range from about 100 to 1000 Å over the dielectric layer;
 - forming a thin resist layer having a thickness in the range from about 0.2 to 2 μm over the aluminum layer;

- photolithographically patterning the resist layer to form a first mask; etching the aluminum layer through the first mask to form a second mask; plasma etching the dielectric layer through the second mask with a fluorinated hydrocarbon or oxygen plasma, wherein said plasma etching removes the resist layer from the aluminum layer.

5,091,048

ION MILLING TO OBTAIN PLANARIZATION

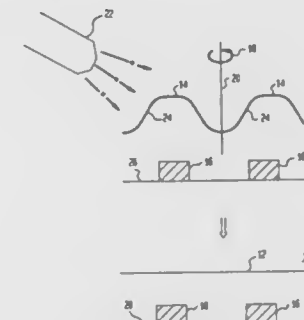
Michael E. Thomas, Milpitas, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Sep. 17, 1990, Ser. No. 583,832

Int. Cl.⁵ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

28 Claims



1. A method for planarizing a topographical semiconductor device formed of semiconductor device material disposed in a semiconductor device plane and having elevated topographical features extending beyond the surface of said semiconductor device, comprising the steps of:
 - providing particles from a particle source, and transporting said particles to said semiconductor device at an angle of incidence of said transported particles with respect to said semiconductor device plane less than approximately thirty degrees thereby removing said material from said elevated topographical features at a faster rate than from said surface to mill said semiconductor device by means of said transported particles.

5,091,049

HIGH DENSITY PLASMA DEPOSITION AND ETCHING APPARATUS

Gregor Campbell, Glendale; Robert W. Conn, Los Angeles, both of Calif., and Tatsuo Shoji, Nagoya, Japan, assignors to Plasma & Materials Technologies, Inc., Burbank, Calif.

Division of Ser. No. 365,533, Jun. 13, 1989, Pat. No. 4,990,229.

This application Jun. 29, 1990, Ser. No. 545,636

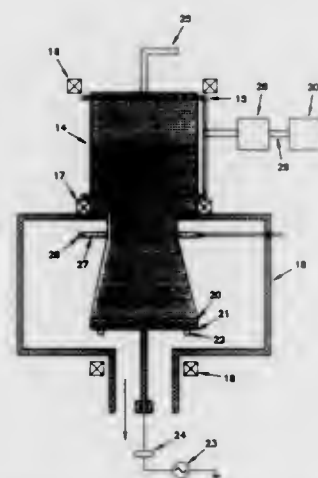
Int. Cl.⁵ B44C 1/22; B05D 3/06; C23C 14/00

U.S. Cl. 156—643

16 Claims

16. A method of plasma processing, comprising the steps of:
 - (a) radiating electromagnetic energy into a plasma generation chamber;
 - (b) injecting a first gas into the irradiated plasma generation chamber, thereby creating a plasma;
 - (c) generating a variable magnetic field proximate the plasma generation chamber, the variable magnetic field permitting manipulation of the plasma;

- (d) transporting the plasma to an adjacent process chamber;
(e) injecting a second gas into the process chamber; and



- (f) bombarding a substrate within the process chamber with the plasma, thereby permitting coating and etching of the substrate by the plasma.

5,091,050

DRY ETCHING METHOD

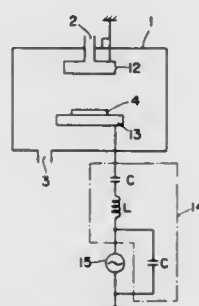
Makoto Fujino, Isahiro Hasegawa, and Masao Ito, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1988, Ser. No. 175,284

Claims priority, application Japan, Mar. 31, 1987, 62-79165
Int. Cl.³ C23F 1/00

U.S. Cl. 156—643

12 Claims



1. A method of dry etching a material containing aluminum and a transition metal which comprises etching said material in a reaction chamber with a gaseous etchant containing an oxide of carbon in an amount sufficient to produce a reaction product containing said transition metal and having a vapor pressure such as to enable said reaction product to be readily exhausted from said reaction chamber.

5,091,051

SAW DEVICE METHOD

James A. Greer, Andover, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 442,404, Nov. 28, 1989, Pat. No. 5,010,270, which is a continuation of Ser. No. 293,607, Jan. 5, 1989, abandoned, which is a continuation of Ser. No. 153,186, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 944,911, Dec. 22, 1986, abandoned. This application Jan. 25, 1991, Ser. No. 646,579

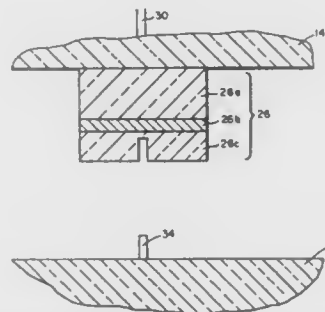
Int. Cl.³ B44C 1/22; C23F 1/02; B23K 26/00

U.S. Cl. 156—643

33 Claims

1. A method comprising the step of: directing energy towards a first material disposed over a surface wave propagat-

ing surface of a packaged SAW device through a first one of a cover portion and a base portion of the packaged SAW device,



to provide a second material on said surface wave propagating surface to change the acoustic properties of said surface.

5,091,052

METHOD FOR PRODUCING INDIVIDUALIZED LABELS

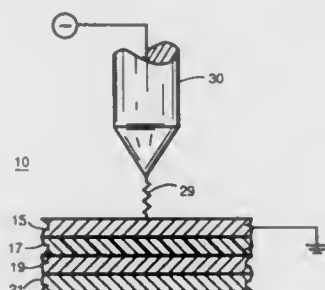
Michael T. Nowak, Gardner, Mass., and Thomas E. Lewis, E. Hampstead, N.H., assignors to Presstek, Inc., Hudson, N.H.

Filed Oct. 1, 1990, Ser. No. 607,512

Int. Cl.³ B44C 1/22; C23F 1/02; B29C 37/00

U.S. Cl. 156—643

11 Claims



1. A method of producing a label, the method comprising the steps of:
a. providing a construction comprising:
i. a conductive background layer;
ii. an underlying image layer contrasting from the background layer in at least one characteristic selected from the group consisting of tonality and color, the image layer being substantially impervious to erosion by the recording apparatus; and
iii. an adhesive layer;
b. causing relative movement between the construction and a non-contacting spark-discharge or plasma-discharge recording apparatus located proximately thereto; and
c. removing the conductive layer at selected points by spark or plasma discharge.

5,091,053

MATTE FINISHES ON OPTICAL FIBERS AND OTHER GLASS ARTICLES

Greg E. Blooder, Summit, and Bertrand H. Johnson, Murray Hill, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1990, Ser. No. 486,350

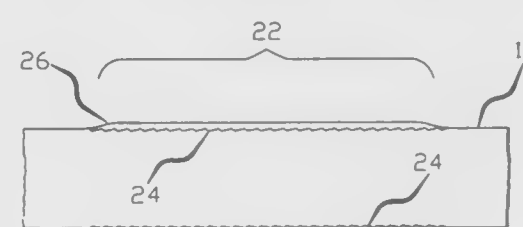
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—657

4 Claims

1. A method of forming a textured or matte finish on at least a portion of a silica cladding of an optical fiber by subjecting said cladding portion to a mixture comprising a fluorine-based

etchant and a treating agent, said agent comprising an acid which, by itself, does not significantly etch said portion and



which is selected from the group consisting of acetic acid, hydrochloric acid and sulfuric acid.

5,091,054

PROCESS FOR BLEACHING AND DELIGNIFICATION OF LIGNOCELLULOSIC

Juergen Meier, Elmwood Park, and Gerhard Arnold, Ringwood, both of N.J., assignors to Degussa Corporation, Ridgefield Park, N.J.

Filed Aug. 18, 1989, Ser. No. 395,520

Int. Cl.³ D21C 9/147, 9/16

U.S. Cl. 162—65

27 Claims

1. A process for bleaching and delignification consisting essentially of reacting lignocellulosic pulp for a period of time up to 2 hours with a source of peroxomonosulfuric acid, at a starting pH between 7 and 11 the reaction continuing until a final pH of 3 to 5, subsequently subjecting said pulp to an oxygen or peroxide or oxygen and peroxide delignifying and bleaching stage to obtain the desired degree of delignification or brightness or delignification and brightness without significant cellulose degradation or increase in viscosity loss, while strength properties of the pulp are improved.

5,091,055

SHEET PREPARED BY WET MEANS AND USABLE AS A BACKING FOR A COVERING MATERIAL

Pierre Fredenucci, and Jean-Bernard Berhaut, both of Charavines, France, assignors to Arjomari Europe, Paris, France

Continuation of Ser. No. 286,162, Dec. 19, 1988, abandoned.

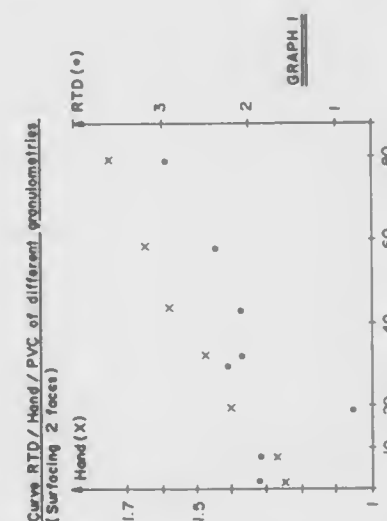
This application Aug. 22, 1990, Ser. No. 569,767

Claims priority, application France, Dec. 23, 1987, 87 18100

Int. Cl.³ D21H 5/18

U.S. Cl. 162—135

14 Claims



1. A sheet usable as a backing for a covering material and having a resistance to traction-delamination greater than 300 N/m, prepared by a papermaking process using an aqueous

composition whose mass comprises the following dry matter percentage by weight:

- 12% to 25% cellulose fibers refined to between 15°SR and 35°SR;
 - 6% to 12% mineral fibers;
 - 45% to 65% thermoplastic resin in the form of a powder whose average grain size is in the range 25 μ m to 60 μ m;
 - 4% to 10% of at least one binder;
 - 0.1% to 10% of at least one first flocculant; and
 - from 0 to 25% of at least one inorganic filler;
- with the total of the above components equaling 100%.

5,091,056

STRUCTURAL FRAME FOR SEPARATE NIPS IN A PRESS SECTION

Markku Autio, Jyväskylä, Finland, assignor to Valmet Paper Machinery Inc., Finland

Continuation of Ser. No. 470,159, Jan. 15, 1990, abandoned, which is a continuation of Ser. No. 181,738, Apr. 14, 1988, abandoned. This application Mar. 18, 1991, Ser. No. 671,003

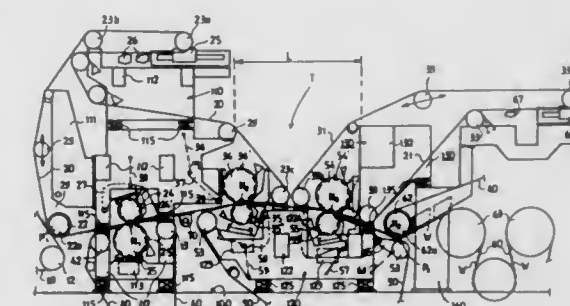
Claims priority, application Finland, Apr. 14, 1987, 871560

The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.

Int. Cl.³ D21F 3/02

U.S. Cl. 162—360.1

17 Claims



1. Frame structure in a press section of a paper machine having, in a running direction of a web from which water is removed, at least two separate press nips formed by respective separate pairs of press rolls substantially dewatering the web and being formed between opposite press elements through which the web runs supported by a fabric, comprising

- a front frame and a rear frame separate from and unlinked to one another and defining a permanently open space therebetween above said two separate press nips which is situated for use in replacement of fabric and press elements, said front frame having a rear part at which an upper press element comprising one of said press rolls of one of the nips is mounted, and
- said rear frame having a front part at which an upper press element comprising one of said press rolls of another nip is mounted,
- an intermediate frame situated between said front and rear frame and on which both a first lower roll of one of a first pair of press rolls forming a first press nip and a second lower roll of a second pair of press rolls forming a second press nip are supported; and
- a plurality of intermediate parts disposed between said intermediate frame and said first and second lower rolls, said plurality of intermediate parts being movable so as to open and to load one of said first press nip and said second press nip.

5,091,057

STRIPPING PROCESS FOR WATER REMOVAL FROM ALCOHOL

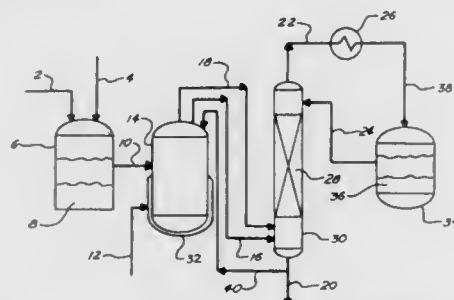
Wayne D. Jensen, Magnolia, Ark., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 20, 1990, Ser. No. 555,105

Int. Cl.⁵ B01D 3/00; C07C 29/80

U.S. Cl. 203—18

20 Claims



1. A process for recovery of a substantially dry alcohol product from a liquid mixture which mixture contains predominantly alcohol and water in a non-azeotropic amount, said process comprising:

- heating the liquid mixture so as to obtain a first vapor containing an alcohol portion and a water portion;
- condensing the first vapor to yield an alcohol phase and a water phase, the alcohol phase containing a minor amount of water to be removed;
- continuing to heat the liquid mixture so as to obtain a second vapor consisting essentially of alcohol; and
- contacting the alcohol phase from step (b) with the second vapor from step (c) so as to strip essentially all of the water from the alcohol phase thereby yielding the substantially dry alcohol product.

5,091,058

PURIFIED PARA-CUMYLPHENOL

William R. Davie, Hopewell, Pa., assignor to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 481,926, Feb. 20, 1990,

abandoned. This application Jan. 25, 1991, Ser. No. 645,775

Int. Cl.⁵ B01D 3/10, 3/34; C07C 37/74

U.S. Cl. 203—33

5 Claims

1. Method of preparing para-cumylphenol comprising reacting an excess of phenol with alpha-methylstyrene by the slow addition of alpha-methylstyrene to a 50% to 200% molar excess of phenol at a temperature from about 80° C. to about 90° C. in the presence of an acid catalyst and thereafter maintaining the temperature at about 95° to about 100° C. to obtain a crude cumylphenol reaction product containing acid derived from said catalyst, and stilling the reaction product in the presence of an amount of base sufficient to neutralize the acid therein.

5,091,059

SEPARATION OF P-XYLENE FROM M-XYLENE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Oct. 22, 1991, Ser. No. 780,209

Int. Cl.⁵ B01D 3/40; C07C 7/08

U.S. Cl. 203—51

1 Claim

1. A method for recovering p-xylene from a mixture of p-xylene and m-xylene which comprises distilling a mixture of p-xylene and m-xylene in the presence of about one part of an extractive agent per part of p-xylene-m-xylene mixture, recovering the m-xylene as overhead product and obtaining the p-xylene and the extractive agent from the stillpot, wherein said extractive agent comprises at least one material selected

from the group consisting of isobornyl acetate, butyl butyrate, isobutyl isobutyrate, methyl caproate and methyl heptanoate.

5,091,060

FRACTIONAL DISTILLATION COLUMN AND METHOD FOR ITS USE

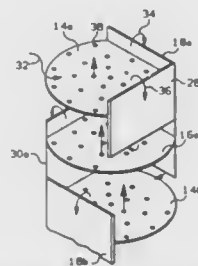
James D. Walker, and Stone P. Washer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 10, 1990, Ser. No. 580,899

Int. Cl.⁵ B01D 3/26

U.S. Cl. 203—99

8 Claims



1. A fractional distillation column comprising:

- a hollow shell;
- a plurality of vertically spaced, generally horizontally disposed trays within said shell, said plurality of trays comprising n sets of trays, where n is an integer and $n \geq 2$, which will pass vapor therethrough and which are arranged and structured to direct n separate liquid streams generally downwardly through the column, and wherein said plurality of trays includes an uppermost, top tray which is structured such that liquid thereon is split into said n liquid streams;
- a plurality of downcomers, wherein each tray has a downcomer, having an upper end and a lower end, associated therewith and wherein for any one tray of one set of trays said downcomer associated with said one tray of said one set generally vertically extends from its upper end positioned immediately above said one tray to its lower end positioned below said one tray and below at least one tray of at least one other set of trays but immediately above another tray of said one set, such that one liquid stream corresponding to said one set flows from said one tray of said one set, over the upper end of said downcomer so as to flow along said downcomer, and from the lower end of said downcomer to said another tray of said one set so as to bypass said at least one tray of said at least one other set; whereby each liquid stream flows onto and between individual trays of its corresponding set of trays so as to bypass the other trays of said plurality of trays.

6. A fractional distillation method comprising:

- providing a column having a plurality of vertically spaced, generally horizontally disposed trays which comprise n sets of trays, where n is an integer and $n \geq 2$, said column further having a plurality of downcomers, wherein each tray has a downcomer, having an upper end and a lower end, associated therewith and wherein for any one tray of one set of trays said downcomer associated with said one tray of said one set generally vertically extends from its upper end positioned immediately above said one tray to its lower end positioned below said one tray and below at least one tray of at least one other set of trays but immediately above another tray of said one set;
- passing n separate liquid streams generally downwardly through the column so that one liquid stream corresponding to said one set flows from said one tray of said one set, over the upper end of said downcomer so as to flow along said downcomer, and from the lower end of said downcomer to said another tray of said one set so as to bypass said at least one tray of said at least one other set, whereby each liquid stream flows onto and between individual

trays of its corresponding set of trays so as to bypass the other trays of said plurality of trays, and wherein said plurality of trays includes an uppermost, top tray from which liquid splits into said n separate streams; and

(c) passing vapor generally upwardly through said plurality of trays.

5,091,061

SILICON SUBSTRATE HAVING POROUS OXIDIZED SILICON LAYERS AND ITS PRODUCTION METHOD

Masakazu Katoh, and Takatoshi Ishikawa, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 556,777, Jul. 24, 1990. This application Dec.

18, 1990, Ser. No. 629,857

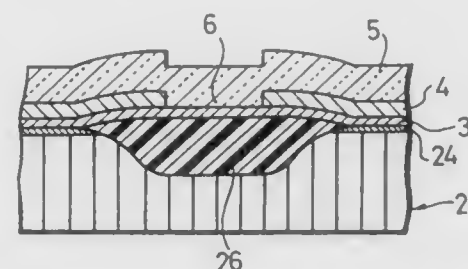
Claims priority, application Japan, Aug. 3, 1989, 1-201829;

May 28, 1990, 2-137641; Jun. 8, 1990, 2-150318

Int. Cl.⁵ C25D 11/32

U.S. Cl. 205—135

3 Claims



1. A method for producing a silicon substrate having porous oxidized silicon layers comprising the steps of:

- covering the surface of a silicon substrate with a mask having a pattern to expose areas of the surface to be treated;
- subjecting the silicon substrate to anodic formation in an aqueous hydrofluoric acid solution to form a porous silicon layer in each of the exposed areas;
- in step a., utilizing a mask material which, when the silicon substrate is subjected to the aqueous hydrofluoric acid solution, causes said porous silicon layer to extend into peripheral covered areas, wherein said porous silicon layer has a nonuniform thickness that decreases from said exposed areas to said peripheral areas; and
- oxidizing the formed porous silicon areas.

5,091,062

WEB BARRIER PACKAGING MATERIAL

Kenneth M. Revell, Thetford, England, assignor to Bowater Packaging Limited, London, England

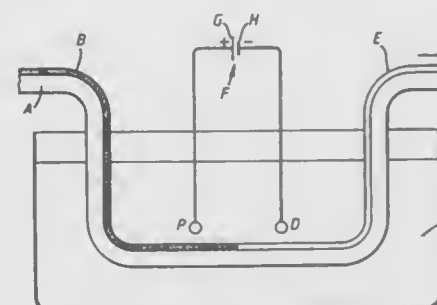
Filed Jun. 28, 1990, Ser. No. 544,543

Claims priority, application United Kingdom, Jun. 29, 1989, 8914881

Int. Cl.⁵ C25D 11/02

U.S. Cl. 205—138

5 Claims



1. A process for treating a metallised web of barrier packaging material having an oxygen permeability of less than 5 cc/meter²/24 hours and a moisture vapour transmission rate of

less than 5 gram/meter²/24 hours, in order to make it microwave transparent without significant loss of said oxygen permeability and its water vapour transmission rate properties, which comprises passing the metallised film through an electrolytic bath to anodise the metal and convert it to a state selected from its oxide and hydroxide and mixtures thereof, the electrolytic bath containing electrolyte in a concentration of less than about 10% by weight.

5,091,063

ORGANOALUMINUM ELECTROLYTES AND PROCESS FOR THE ELECTROLYTIC DEPOSITION OF ALUMINUM

Herbert Lehmkuhl, and Klaus-Dieter Mehler, both of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim/Ruhr, Fed. Rep. of Germany

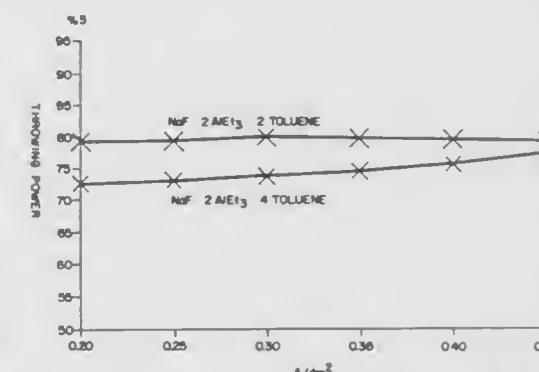
Filed Jun. 5, 1990, Ser. No. 533,322

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919069

Int. Cl.⁵ C25D 3/44

U.S. Cl. 205—237

7 Claims



1. In the electrolytic deposition of aluminum on an electrolytically conductive material employing an organoaluminum electrolyte and an aluminum anode, the improvement which comprises effecting the deposition in a toluene solution of an electrolyte at a temperature of from 80° to 105° C. or in a electrolyte solution of an electro at a temperature from 80° to 135° C. and employing as the electrolyte a mixture consisting of KF . 2 AlEt₃ (A), KF . 2 AlMe₃ (B) and MF . 2 Al(iBu)₃ (C), wherein M=sodium or potassium or a mixture of both, in a molar ratio of A:B:C of from 2:1:1 to 7:1:1.

5,091,064

METHOD FOR PREPARING PERFLUORINATED HETEROCYCLIC COMPOUNDS, AND COMPOUNDS PREPARED BY THIS METHOD

Hasso Melnert, Ulm; Rudolf Fackler, Senden; Juergen Mader, Ulm, and Peter Reuter, Ulm-Lehr, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 572,550

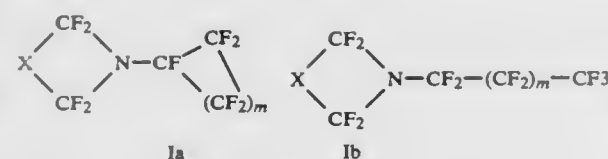
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928692; Dec. 15, 1989, 3941515

Int. Cl.⁵ C25B 3/08

U.S. Cl. 204—59 F

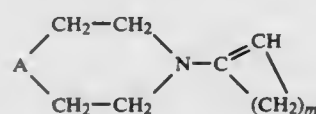
16 Claims

1. A method for preparing compounds corresponding to the formulas Ia and Ib:



wherein m is 3 or 4 and X is a $-\text{CF}_2-\text{O}-\text{CF}_2-$ group, a $-\text{CF}_2-\text{CF}_2-\text{CF}_2-$ group or a $-\text{CF}(\text{CF}_3)-\text{CF}_2-$ group, or mixtures thereof, said method comprising the steps of:

a) electrolyzing a solution of a compound corresponding to the formula II:



wherein m has the above meaning and A represents oxygen or a $-\text{CH}_2-$ group, in liquid hydrogen fluoride, and separating a raw reaction product containing perfluorinated compounds of formulas Ia and Ib plus partially fluorinated by-products;

b) treating said raw reaction product with an alkali metal or alkaline earth metal base in the presence of water at an elevated temperature sufficient to decompose the partially fluorinated by-products; and

c) isolating a mixture of the compounds of formulas Ia and Ib from the treated reaction product from step b).

5,091,065

PROCESS FOR PREPARATION OF NEODYMIUM OR NEODYMIUM-IRON ALLOY

Hideo Tamamura, Chichibu, Japan, assignor to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 255,201, Aug. 23, 1988, Pat. No. 4,966,661.

This application May 30, 1990, Ser. No. 530,772

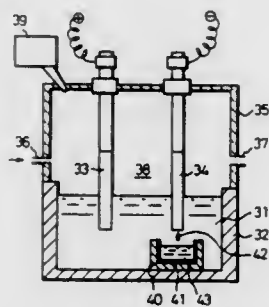
Claims priority, application Japan, Dec. 23, 1986, 61-307308;

Aug. 18, 1987, 62-204879; Sep. 3, 1987, 62-220893

Int. Cl.⁵ C25C 3/34, 3/36

U.S. Cl. 204—64 R

1 Claim



1. A process for the preparation of neodymium or neodymium-iron alloy, which comprises arranging a plate shape carbon electrode as an anode and a plate shaped metal or carbon electrode as a cathode in a fused salt electrolysis bath so that the electrodes confront each other in the electrolysis bath, and performing the electrolysis at an anode current density of at least $0.7\text{A}/\text{cm}^2$ to deposit neodymium or a neodymium-iron alloy on the cathode and drop the neodymium or neodymium-iron alloy below the cathode to collect the neodymium or neodymium-iron alloy at the bottom of the electrolysis bath.

5,091,066 ELECTROCHEMICAL SYNTHESIS OF 2-METHYL-5-PYRAZINOIC ACID

Marco Foà, Novara; Fabrizio Forlini, Pavia; Norberto Gatti, Novara, and Giampiero Borsotti, Novara, all of Italy, assignors to Presidenza del Consiglio dei Ministri, Rome, Italy

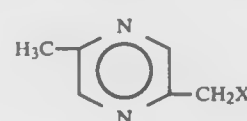
Continuation of Ser. No. 271,675, Nov. 16, 1988. This application May 29, 1991, Ser. No. 707,310

Claims priority, application Italy, Nov. 19, 1987, 22693 A/87

Int. Cl.⁵ C25B 3/02

6 Claims

1. A process for the preparation of 2-methyl-5-pyrazinoic acid consisting in subjecting to electrochemical oxidation a compound having formula:



wherein X is Cl, Br, $-\text{O}-\text{CO}-\text{R}$, $-\text{O}-\text{SO}_2-\text{R}$, in which R is a C_1-C_5 alkyl radical, optionally substituted with one or more atoms of F or Cl, or it is a C_6-C_{12} aryl radical, in an electrochemical cell, by using anodes coated with $\text{Ni}(\text{OH})_2$ nickel oxide-hydroxide, in an aqueous medium containing at least 6 equivalent moles of a base per mole of compound (I), at a temperature ranging from 20° to 90°C .

5,091,067

METHOD AND AN APPARATUS FOR MACHINING OPTICAL COMPONENTS

Kazuo Ushiyama, Akishima; Masaki Watanabe, Hachioji; Keiji Uchiyama, Tokorozawa; Hisayuki Takel, Hachioji; Noriaki Takahashi; Akimi Matsuzawa, both of Ina; Kiyoshi Ooshiro, Nagano, and Hajime Tamura, Fujinomachi, all of Japan, assignors to Olympus Optical Company Limited, Japan

Filed Jul. 26, 1990, Ser. No. 558,814

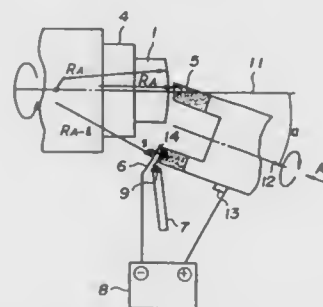
Claims priority, application Japan, Jul. 26, 1989, 1-192842;

Aug. 31, 1989, 1-225767; Aug. 31, 1989, 1-225769

Int. Cl.⁵ B23H 5/08, 5/14

U.S. Cl. 204—129.46

16 Claims



1. A method of machining optical components comprising the steps of:

providing an optical raw stock;

holding the optical raw stock by a rotatable holding shaft; and

machining the optical raw stock with the use of a machining tool having a machining surface thereof held by rotatable machining shaft and arranged opposite to a surface to be machined of the optical raw stock;

the improvement comprising the steps of:

providing an electrically conductive tool as the machining tool;

arranging an electrode opposite to the machining surface of the conductive tool at a certain distance therefrom and at a position at which the electrode does not interfere with the optical raw stock;

applying a positive voltage from an electrolytic power supply source to the conductive tool and a negative voltage therefrom to the electrode; and

applying weakly conductive coolant between the conductive tool and the electrode, while machining the raw stock by touching a surface to be machined with the machining surface of the conductive tool thereby performing the machining of the raw stock and dressing of the conductive tool during rotation of the conductive tool.

5,091,068

PREPARATION OF 3-TRICHLOROMETHYL-PYRIDINE

Klaus Jelic, Wuppertal, and Hans Lindel, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 590,387

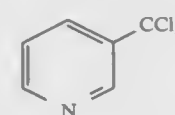
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934957

Int. Cl.⁵ C07C 401/00, 211/72

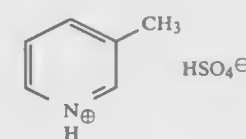
U.S. Cl. 204—157.64

8 Claims

1. A process for the preparation of 3-trichloromethyl-pyridine of the formula



which comprises reacting 3-methyl-pyridine hydrogen sulphate of the formula



with elemental chlorine with exposure to at least one of visible and ultraviolet light at a temperature between about 70°C and 150°C in the presence of an aromatic carboxamide as catalyst.

5,091,069

OZONE GENERATION METHODS

Richard J. Hendrickson, Richmond, Va., and Kenneth G. Kafer, New Berlin, Wis., assignors to Ozonia International, S.A., Paris, France

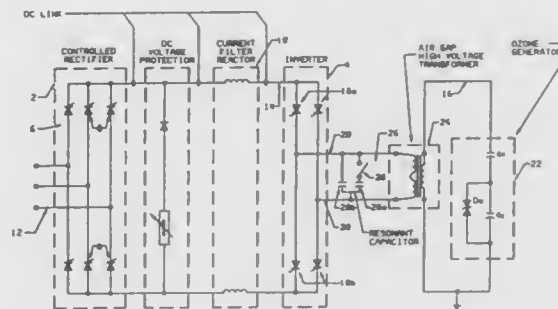
Division of Ser. No. 393,659, Aug. 14, 1989. This application

Apr. 25, 1991, Ser. No. 691,146

Int. Cl.⁵ C01B 13/10

U.S. Cl. 204—176

1 Claim



1. In a method of generating ozone by outputting electric power from a DC/AC inverter to opposed conductive electrodes between which a gas to be ozonized is passed through a high impedance that is parallel to said electrodes, the improve-

ment for increasing reliability and economy of operation which comprises:

energizing said inverter with a high impedance, substantially smooth dc current sufficient to hold the waveform of the electric current in said electric power from said inverter substantially constant and

maintaining a substantially square waveform in said electric current while permitting the voltage in said output electric power to assume the waveshape appropriate for the load imposed by said electrodes and said parallel high impedance.

5,091,070

METHOD OF CONTINUOUSLY REMOVING AND OBTAINING ETHYLENE DIAMINE TETRACETIC ACID (EDTA) FROM THE PROCESS WATER OF ELECTROLESS COPPER PLATING

Bernd Bauer, Stuttgart, and Wolfgang Erlmann, Herrenberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

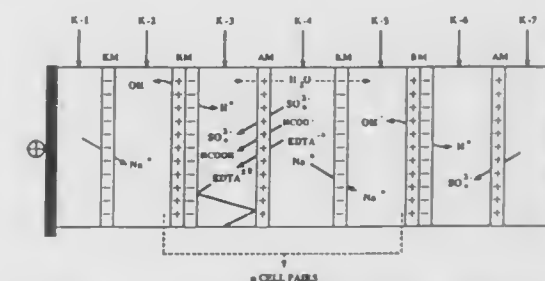
Filed Aug. 30, 1990, Ser. No. 575,264

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929137

Int. Cl.⁵ B01D 13/02

U.S. Cl. 204—182.4

11 Claims



1. Method of continuously removing and obtaining ethylene diamine tetracetic acid (EDTA) from the process water of electroless copper plating by means of EDTA protonation, characterized in that the process water containing the EDTA is directed into a first electrodialysis cell which is alternatively equipped with bipolar membranes and ion exchange membranes, and to which a potential difference is applied, that the EDTA is converted into its charge-neutral form, that the protons required for that process are generated via bipolar membranes by means of electrodialysis, and that the required pH-value is adjusted through a pH-controlled electric field regulation via the bipolar membranes.

5,091,071

REMOVAL OF ACID FROM CATHODIC ELECTROCOATING BATHS BY ELECTRODIALYSIS

Hartwig Voss, Frankenthal, and Thomas Bruecken, Dortmund, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 378,034, Jul. 11, 1989, which is a division of

Ser. No. 130,570, Dec. 9, 1987. This application May 21, 1990,

Ser. No. 525,672

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642164

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

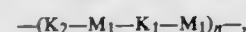
Int. Cl.⁵ B01D 13/02

U.S. Cl. 204—182.4

7 Claims

7. A process for removing acid from a cathodic electrocoating bath in which an electroconductive substrate is coated with a cationic resin present in the form of an aqueous dispersion, by separation of the dispersion by ultrafiltration into a resin dispersion and an ultrafiltrate and further treatment of the ultrafiltrate comprising the steps of

passing the ultrafiltrate through the chambers K_1 of an electrodialysis cell Z_A comprising the characteristic sequence



where M_1 is an anion exchange membrane and n is from 1 to about 500, and passing an aqueous base containing s salt through the chambers K_2 , and performing the electrodialysis using current densities of up to 100 mA/cm², the electric field required for this purpose being applied by means of two electrodes at the ends of the electrodialysis cell Z_A , wherein the flow velocity of the liquids in the electrodialysis cells ranges from 0.001 to 2 m/s; wherein the electrodialysis is carried out at from 0° to 100° C.; and wherein the aqueous base is sodium hydroxide, potassium hydroxide, sodium carbonate, potassium carbonate, calcium hydroxide, barium hydroxide, ammonia, ammonium carbonate, an amine or a quaternary ammonium hydroxide.

5,091,072

PROCESS FOR PREPARING PITCHES

Masatoshi Tsuchitani; Makoto Tamura; Kiyotaka Suzuki; Sjuji Okada; Ryoichi Nakajima, all of Ichihara, and Sakae Naito, Chiba, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

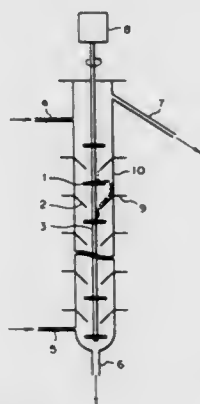
Continuation of Ser. No. 202,126, Jun. 2, 1988, abandoned. This application Apr. 3, 1990, Ser. No. 504,723

Claims priority, application Japan, Jun. 18, 1987, 62-152064; Nov. 13, 1987, 62-287173

Int. Cl.³ C10C 1/00, 3/00

U.S. Cl. 208—39

16 Claims



1. A continuous process for preparing a high softening point pitch for manufacturing carbon fibers consisting essentially of charging a preheated heavy oil or pitch with quinoline-insoluble content of 0-1 wt % at a viscosity not greater than 100 poises as a raw material into a heat-treating apparatus, wherein said raw material is heat-treated by dispersing fine droplets of said raw material by centrifugal force generated by a rotating structure selected from the group consisting of a disk, a cone and a bowl, rotating at a rate of V^2/R of not less than 10 m/sec², and in said formula R is the radius of the rotating structure (m), and V is the linear velocity of said rotating structure at its periphery (m/sec), into a gas stream of an inert gas or superheated vapor flowing substantially perpendicular to the direction of the movement of said fine droplets dispersed by said rotating structure at a rate of 0.1-10 m/sec at the plane at which said gas stream comes into contact with said fine droplets and the feed rate of said gas stream is 0.1-10 m³/kg of said raw material to be treated, calculated at the temperature and pressure at which said raw material is treated, thereby bringing said dispersed fine droplets into contact with said gas stream, at 350°-500° C. under a reduced or normal pressure,

collecting said dispersed fine droplets and repeating said dispersing and collecting operations at least once more under the same condition as above, to eliminate light fractions and thermally polymerize said raw material to form said pitch for manufacturing carbon fibers.

5,091,073

CRYSTALLINE MOLECULAR SIEVE COMPOSITIONS MCM-37

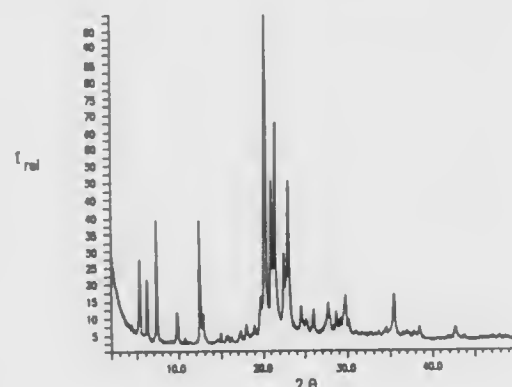
Clarence D. Chang; Cynthia T. W. Chu, both of Princeton; Ralph M. Dessau, Edison; John B. Higgins, Titusville; John D. Lutner, Hamilton Square, and John D. Schlenker, Pennington, all of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Jul. 13, 1990, Ser. No. 552,269

Int. Cl.³ C10G 47/04; C01B 25/36

U.S. Cl. 208—46

14 Claims



1. A composition of matter comprising crystals having a framework topology giving an x-ray diffraction pattern with interplanar d-spacings at 16.41 ± 0.59 Angstroms, 14.12 ± 0.45 Angstroms and 5.68 ± 0.08 Angstroms and without a significant interplanar d-spacing at 13.6-13.3 Angstroms, said crystals having pore windows framed by 14 tetrahedral members.

5,091,074

PROCESS FOR PRODUCING GASOLINE COMPONENTS

Ian E. Maxwell, and Gerrit J. Den Otter, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

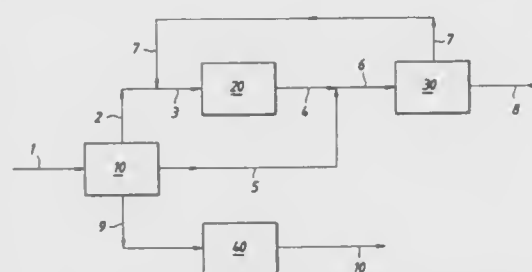
Filed Apr. 9, 1991, Ser. No. 682,174

Claims priority, application United Kingdom, Jun. 18, 1990, 9013565

Int. Cl.³ C10G 59/00

U.S. Cl. 208—79

10 Claims



1. A process for producing gasoline components from a hydrocarbonaceous feed containing hydrocarbons comprising at least 4 carbon atoms, which comprises:

- passing said feed to a first separation zone to separate said feed by fractional distillation into (i) a heavy fraction containing hydrocarbons having at least 7 carbon atoms,

5,091,077

TROMMEL MATERIAL AIR CLASSIFIER

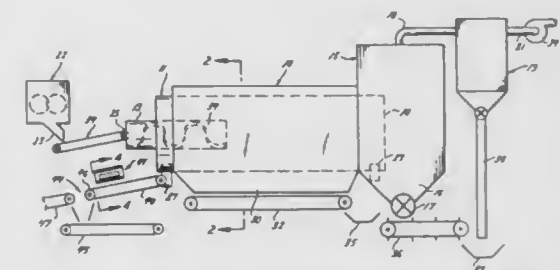
Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Filed Oct. 9, 1990, Ser. No. 594,053

Int. Cl.³ B07B 9/00

U.S. Cl. 209—12

6 Claims



1. A trommel material air classifier system for processing waste material containing different characteristics of waste according to fineness, sensitivity to an air stream, and inert to an air stream, said classifier system comprising:

- an elongated trommel having a perforated wall with opposite inlet and outlet ends and means for rotating said trommel about a substantially horizontal axis, said perforated wall extending substantially the length from said inlet to said outlet;
- delivery means adjacent said trommel inlet end for forceably inserting the different classes of waste material into said trommel beyond said inlet;
- air moving means adjacent to said trommel outlet end for developing an air flow through said trommel for collecting a class of waste material sensitive to air movement which passes material inert to said air flow;
- mixing means in said trommel for moving the class of waste material inert to air flow counter to said delivery means toward said trommel inlet end, and distributing a fineness class of material over said perforated wall for release by gravity from said trommel; and
- receiving means adjacent said trommel inlet end for said inert class of material.

5,091,078

OIL FILTRATION CIRCUIT FOR A BELT-TYPE TRANSMISSION

Masahiro Ogawa, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

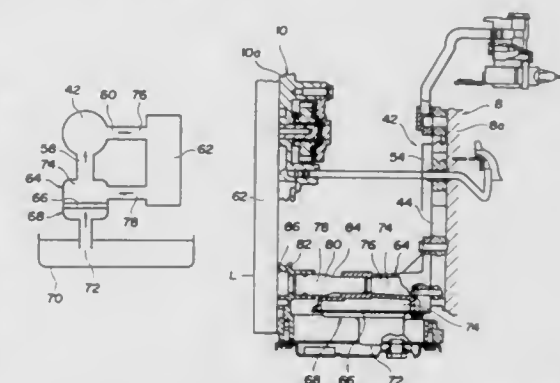
Filed Sep. 26, 1990, Ser. No. 588,602

Claims priority, application Japan, Sep. 30, 1989, 1-256407

Int. Cl.³ F01M 1/00

U.S. Cl. 210—168

2 Claims



1. A transmission having a case provided with first and second generally parallel and vertically extending case walls, an oil pump discharged by said oil pump to a predetermined

(ii) an intermediate fraction containing hydrocarbons having 6 or 7 carbon atoms, and (iii) a light fraction containing hydrocarbon having at most 6 carbon atoms.

- passing said light fraction to a first isomerization zone to isomerize said light fraction to produce a first isomerization zone effluent stream, wherein said first isomerization zone is operated at a temperature between 100° and 320° C. and a pressure between 10 and 60 bar;
- combining said first isomerization zone effluent stream with said intermediate fraction to form a first combined stream and passing said first combined stream to a second separation zone;
- separating said first combined stream in said second separation zone to form a stream containing normal hydrocarbons and a stream containing branched hydrocarbons; and
- passing at least a portion of said normal hydrocarbons to said first isomerization zone.

5,091,075

REFORMING PROCESS WITH IMPROVED VERTICAL HEAT EXCHANGERS

Patrick S. O'Neill; Elias G. Ragi, both of Williamsville, and Thomas J. Godry, Tonawanda, all of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Jul. 6, 1990, Ser. No. 549,324

Int. Cl.³ C10G 35/06

U.S. Cl. 208—134

13 Claims

1. In a process for reforming hydrocarbons comprising contacting a reforming feedstream with a reforming catalyst in a reforming reaction zone to form a reforming effluent stream wherein heat from the reforming effluent stream is transferred to the reforming feedstream by indirect heat exchange in a vertical heat exchange zone, the reforming feedstream is passed to a lower end of the vertical heat exchange zone and at least partially vaporized in said heat exchange zone, the reforming effluent stream is passed to an upper end of the vertical heat exchange zone and at least partially condensed in said heat exchange zone and boiling of said feedstream and condensing of said effluent stream occurs in a lower portion of said heat exchange zone, the improvement comprising contacting said reforming feedstream with an enhanced nucleate boiling surface in a lower portion of said heat exchange zone and maintaining said contact of the feedstream with said nucleate boiling surface above the point in said vertical heat exchange zone where boiling of said feedstream occurs to increase the effectiveness of the condensing heat transfer in said heat exchanger.

5,091,076

ACID TREATMENT OF KERAGEN-AGGLOMERATED OIL SHALE

Bernard Y. C. So, Wheaton; Terry L. Marker, Lisle, and Gene E. Tampa, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 9, 1989, Ser. No. 434,916

Int. Cl.³ C10G 1/00

U.S. Cl. 208—426

42 Claims

1. A method of upgrading kerogen-agglomerated oil shale, comprising the steps of:

- contacting oil shale with a two-phase mixture comprising an added organic liquid and water to form kerogen-rich agglomerates and mineral-rich particles;
- separating the kerogen-rich agglomerates from the mineral-rich particles and water utilizing at least one screen, said screen having a size that prevents passage of the kerogen-rich agglomerates and allows for passage of the mineral-rich particles and water, thereby producing solid, kerogen-rich agglomerates; and
- contacting the solid, kerogen-rich agglomerates with an acid-containing solution having a pH of less than about 3 to form acid-treated, kerogen-rich agglomerates.

pressure level and including a valve body mounted on said second case wall, said oil pump being provided with a pump manifold and a filter for filtering oil removed by said oil pump from an oil pan located beneath the transmission, said manifold including an oil intake passage which connects said oil pump to said oil pan and which permits oil to be drawn therethrough from said oil pan into said oil pump, said oil intake passage having a starting end which communicates with the interior of the oil pan and a terminating end which communicates with the oil pump, said filter being disposed in said oil intake passage downstream of said starting end and said oil pan, the manifold also including an oil feed passage for feeding oil discharged by said oil pump to said valve body and an oil return passage for returning surplus return oil from said valve body into said oil intake passage downstream of said filter, said oil feed passage and said oil return passage being respectively defined interiorly of first and second pipes which extend generally in parallel and horizontal relationship and which respectively have opposite ends thereof fixedly joined to said pump and said valve body.

5,091,079

SLUDGE TREATMENT APPARATUS

Danny Gayman, 24104 11th Ave. South, Des Moines, Wash. 98198

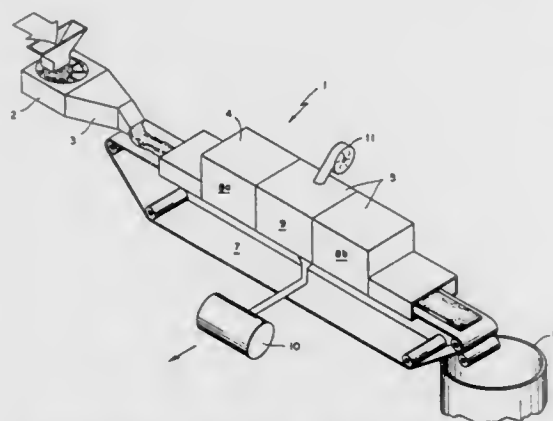
Division of Ser. No. 491,070, Mar. 9, 1990, Pat. No. 5,037,560.

This application Apr. 26, 1991, Ser. No. 691,692

Int. Cl.⁵ B01D 33/00

U.S. Cl. 210—175

6 Claims



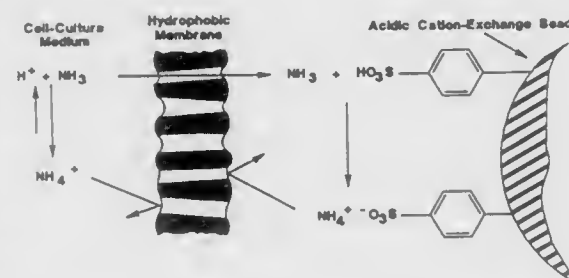
1. Modular-based apparatus for automatically and continuously treating a solvent containing waste sludge with a metallic soap comprising:

- means for mixing said metallic soap with said waste sludge resulting in a mixture;
- means for extruding said mixture in a continuous ribbon;
- means for initially induction-heating said mixture;
- a plurality of alternating chamber pairs wherein one chamber in each pair provides a means for separating said solvents from said mixture while second chamber in each of said pairs provides a means of induction-heating said mixture;
- a means for venting and draining said solvents;
- a means of storing a mixed sludge waste from which solvents have been separated;
- conveyor means for continuously transporting said mixture from said extruding means through said initial means of induction heating said alternating chamber pairs to said storing means.

5,091,080
ADSORBENTS FOR THE REMOVAL OF VOLATILE SUBSTANCES FROM AQUEOUS SYSTEMS
Paul van Elkeren; Daniel J. Brose, and Scott M. Herbig, all of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.
Filed Nov. 30, 1990, Ser. No. 621,022
Int. Cl.⁵ B01D 19/00

U.S. Cl. 210—188

18 Claims



1. An adsorbent device for the selective removal of a volatile and trappable chemical species from an aqueous environment comprising at least one core selected from a dense solid, a porous solid and a gel, said core containing at least one trapping agent capable of trapping said chemical species by irreversible reaction with the same, and being continuously enclosed by a semipermeable supported-gas membrane selected from a coating around said core, a capsule enclosing said core, and a hollow fiber enclosing said core and sealed at both ends.

5,091,081

ANTI-FREEZE RECYCLING APPARATUS AND METHOD

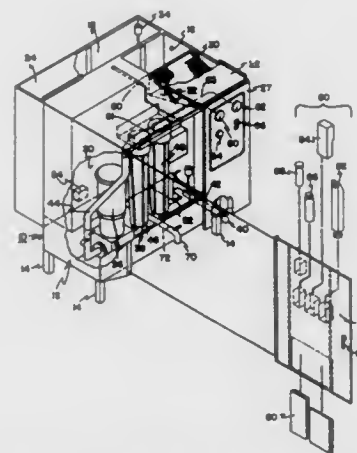
Wallace L. Hilgren, Edina, Minn., assignor to Kleer-Flo Company, Minneapolis, Minn.

Filed Apr. 18, 1990, Ser. No. 510,531

Int. Cl.⁵ B01D 37/02

U.S. Cl. 210—195.2

4 Claims



1. An apparatus for cleansing a used automobile anti-freeze solution, said apparatus comprising the following:

- a holding tank for holding used automobile anti-freeze solution;
- a pre-filter for receiving solution from said holding tank and pre-filtering said solution of contaminants sized greater than a predetermined minimum size;
- a membrane filter connected to said pre-filter and having a semi-permeable membrane with a concentrate portion disposed on one side of said membrane and a permeate portion disposed on an opposite side of said membrane, said concentrate portion connected to receive pre-filtered solution from said pre-filter; and

a test kit for testing desired parameters of said solution.

5,091,083

FLOTATION SEPARATION SYSTEM

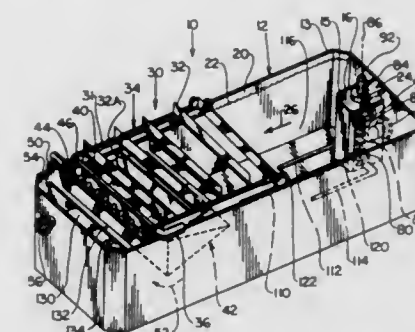
Donald M. Meylor, 22316 Harkwood, El Toro, Calif. 92630, and Patrick J. Finn, 845 Panlarino Ave., Apt. E320, Costa Mesa, 92626, both of Calif.

Filed Sep. 4, 1990, Ser. No. 577,158

Int. Cl.⁵ B03D 1/16

U.S. Cl. 210—219

2 Claims



1. A wastewater flotation separation apparatus, comprising: a container holding wastewater having a chamber therein and said chamber having upper and lower portions; a wastewater inlet located at said lower portion of said container; an aerator means located in said container adjacent to said inlet, for generating air bubbles to cling to waste particles and keep them at the surface of wastewater in said container; a sludge discharge apparatus; means in said container which directs said waste particles at the surface of wastewater into said sludge discharge apparatus; a cleaned water outlet coupled to said container; said aerator means includes a rotor lying in the lower half of said chamber and rotatable about a vertical axis, a motor coupled to said rotor to rotate it in a given direction, and an air-carrying tube means coupled to said rotor for supplying air thereto; said rotor having a plurality of hollow blades coupled to said air tube, said blades having tips with holes opening in a substantially circumferential direction relative to the blade tip movement and in the opposite direction relative to the blade tip movement, to eject air bubbles in said circumferential direction.

5,091,084

RETAINING SEAL AND SUPPORTING SCREEN SYSTEM FOR DRUM CENTRIFUGE

Guntram Krettek, Viersen, Fed. Rep. of Germany, assignor to Krupp Industrietechnik Gesellschaft Mit Beschränkter Haftung, Dulsburg, Fed. Rep. of Germany

Filed May 14, 1990, Ser. No. 522,559

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916383

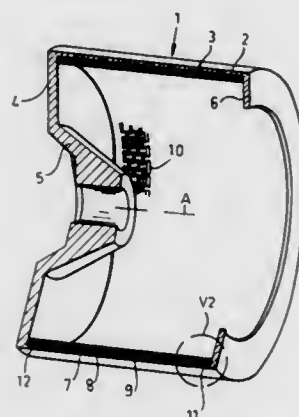
Int. Cl.⁵ B01D 33/067

U.S. Cl. 210—232

6 Claims

5. In a centrifuge filter having: a generally cylindrical drum rotatable about and centered on an axis and having a foraminous outer wall with an inner surface; a tubularly cylindrical support screen lying directly on the inner surface; a tubularly cylindrical filter mesh lying directly on the support screen; and a tubularly cylindrical protective screen lying on the filter mesh and holding same against the support screen; the improvement comprising a pair of axially spaced and confronting retaining seals each having at least two lips defining at least one recess, the

support screen and filter mesh both having end edges received in the recesses a respective recess with one of the respective lips being between the support screen and the drum inner surface, the protective screen lying on another



respectively of the seals and pressing the seals against the surface of the drum while clamping the edges in the respective recesses, another lip of each seal being axially longer than the one lip of the respective seal.

5,091,085

ULTRAFILTRATION DEVICE AND PROCESS

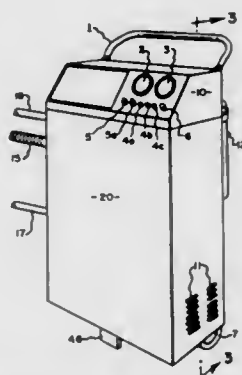
William H. Thalmann, Amherst, and Thomas W. Siegler, Kenmore, both of N.Y., assignors to Infinitex Corporation, Clarence, N.Y.

Division of Ser. No. 553,030, Jun. 4, 1990, Pat. No. 4,994,184. This application Dec. 17, 1990, Ser. No. 628,225

Int. Cl.⁵ B01D 61/22

U.S. Cl. 210—321.65

25 Claims



1. A portable ultrafiltration assembly comprising a prefilter sufficient to filter particles, having a size greater than about 100 microns, from an influent liquid feed stream comprising greater than about 50 percent by weight water; pump means, sufficient to draw said influent liquid feed from a reservoir source into said assembly through said prefilter; temperature and pressure sensor, sufficient to detect temperature and pressure variations of said liquid feed being processed in said assembly; means cooperating with a temperature sensor to interdict the operation of said pump means; means to transport liquid feed from said pump means to a membrane filter assembly; membrane filter assembly comprising an influent feed treatment zone containing a liquid feed input, a liquid feed output, and a water receiving zone containing a water outlet, said zones being separated by a hydrophilic ultrafiltration membrane through which water can pass from said liquid feed treatment zone to said water receiving zone; means cooperating with a pressure sensor to interdict the operation of the pump means; and, orifice means cooperating with said pump means sufficient to

maintain a liquid feed pressure of from about 45 to about 100 lbs/in² at said membrane and a p, along said membrane, of less than about 4 lbs/in².

5,091,086

PERMEABLE, POROUS POLYMERIC MEMBRANE WITH HYDROPHILIC CHARACTER, METHODS FOR PREPARING SAID MEMBRANES AND THEIR USE

Flemming F. Stengaard, Nakskov, Denmark, assignor to Danisco A/S, Denmark

Continuation of Ser. No. 89,550, Aug. 26, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 373,696

Claims priority, application Denmark, Aug. 27, 1986, 4079/86 Int. Cl.⁵ B01D 69/12

U.S. Cl. 210—490

12 Claims

1. A permeable, porous polymeric ultrafiltration or microfiltration membrane with hydrophilic character comprising: a permeable porous polymeric membrane; and a hydrophilic surface layer having hydrophilic character deposited on the porous polymeric membrane; obtained by the treatment of the porous polymeric membrane surface with a solution comprising one or more hydrophilic mono- or polymeric compounds selected from the group consisting of soluble cellulose derivatives, polyvinyl alcohols, and low molecular weight polyfunctional, NH or OH—containing compounds, followed by rendering the layer deposited during the treatment insoluble on the porous polymeric membrane surface by means of a base catalysed reaction at elevated temperatures in order to chemically bind the hydrophilic surface layer to the porous polymeric membrane; wherein the hydrophilic surface layer predominantly determines the filtration properties.

5,091,087

FABRICATION OF MICROPOROUS PBI MEMBRANES WITH NARROW PORE SIZE DISTRIBUTION

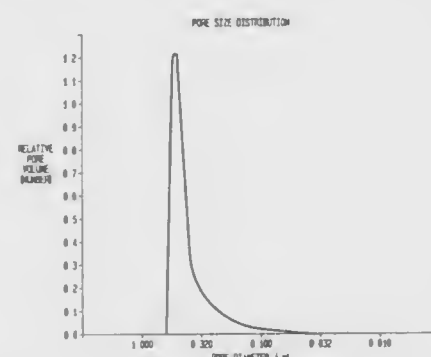
Gordon W. Calundann, North Plainfield, and Tai-Shung Chung, Randolph, both of N.J., assignors to Hoechst Celanese Corp., Somerville

Filed Jun. 25, 1990, Ser. No. 543,920

Int. Cl.⁵ B01D 69/06

U.S. Cl. 210—500.28

9 Claims



8. A process for fabricating a microporous polybenzimidazole membrane having uniform porosity and a narrow pore size distribution comprising:

dissolving a polymer in a solvent that does not dissolve polybenzimidazole to form a polymeric solution, said polymer being stable at temperatures up to at least about 450° C.;

immersing a polyimidazole powder in said polymeric solution to form a polybenzimidazole dispersion, said powder comprising particles that are about five microns or less in diameter;

evaporating said solvent from said dispersion to provide dry polybenzimidazole particles coated with said polymer;

compression molding said particles at about 435°–450° C.

and about 1,000–7,000 psi for about 5–10 minutes into the form of a membrane; and, extracting said polymer from said membrane.

9. A membrane made according to the process set forth in claim 8.

5,091,088

LIQUID SEPARATING APPARATUS

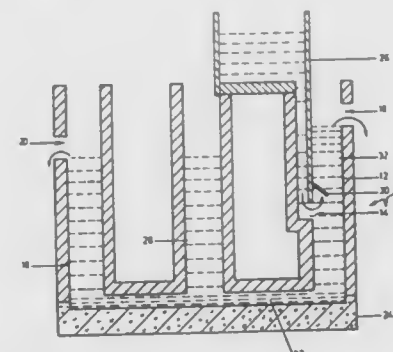
Saleam Essop, 97 Sir Kurma Reddi Rd., Natal, South Africa Filed Mar. 21, 1990, Ser. No. 497,542

Claims priority, application South Africa, Mar. 22, 1989, 89/2718

Int. Cl.⁵ B01D 17/02, 17/025, 17/04

U.S. Cl. 210—536

3 Claims



1. A method of separating a mixture of at least two immiscible liquids of different densities and insoluble in each other into its constituents comprising introducing the said mixture into a separating tank having a mixture inlet and a first outlet, said separating tank being in communication by a communication passage with an emulsion tank between the separating tank and a discharge tank whereby emulsion constituent build-up in emulsion tank at the lowest level of both tanks; the discharge tank having a second outlet; the relative level of the second outlet being higher than the level of the mixture inlet but lower than the level of the first outlet, the relative level of the communication passage being below the levels of the two outlets and the inlet, delivering the mixture to be separated to the said separating tank through the said mixture inlet; allowing the mixture constituent of lower density to build-up by flotation on the mixture constituents of higher density in the said separating tank, until the mixture constituent of lower density rises up to the first outlet and is discharged there through; and allowing the mixture constituents of higher density to build-up in the said discharge tank and to be discharged through the second outlet of the said discharge tank.

5,091,089

MICROBIAL DECOLORIZATION OF WASTEWATER

Hwei-Ping Shen, Duen-Gang Mou, Kim-Kee Lim, Paul Feng, and Chun-Hwei Chen, all of Taipei, Taiwan, assignors to Development Center for Biotechnology, Taipei, Taiwan

Filed Sep. 6, 1990, Ser. No. 578,226

Int. Cl.⁵ C02F 3/34

U.S. Cl. 210—611

20 Claims

1. A process for decolorizing dye-containing wastewater, comprising adding white-rot fungi to said wastewater so as to absorb, degrade, or remove the color or optical density of said wastewater.

5,091,090

Patent Not Issued For This Number

5,091,091

PROTEIN A PERFUSION AND POST PERFUSION DRUG INFUSION

David S. Terman, 1200 Moursund Ave., Texas Medical Center, Houston, Tex. 77030

Continuation of Ser. No. 331,095, Mar. 27, 1989, abandoned, which is a continuation of Ser. No. 173,227, Mar. 24, 1988,

abandoned, which is a continuation of Ser. No. 914,682, Oct. 2, 1986, abandoned, which is a continuation of Ser. No. 540,990,

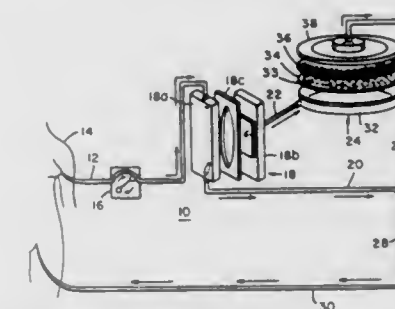
Oct. 2, 1983, abandoned, which is a continuation of Ser. No. 323,326, Nov. 6, 1981, abandoned, which is a continuation of Ser.

No. 183,665, Sep. 2, 1980, abandoned. This application Aug. 6, 1990, Ser. No. 563,940

Int. Cl.⁵ B01D 69/02

U.S. Cl. 210—632

52 Claims



23. A perfusion system comprising, a separator operable to separate plasma from whole blood, a therapeutic non-covalently immobilized protein A immunoadsorbent, a chamber, an inflow line connected to the separator and adapted to be connected to a host for inflow of blood into the system, a plasma flow line connected to the separator and to the therapeutic immobilized protein A immunoadsorbent operable to flow plasma from the separator to the immunoadsorbent, a formed element flow line connected to the separator and to the chamber operable to flow formed elements from the separator into the chamber, a perfused plasma flow line connected to the therapeutic protein A immunoadsorbent and into the chamber operable to flow perfused plasma from the immunoadsorbent to the chamber to form recombined whole blood with the formed elements, an outflow line connected to the chamber adapted to be connected to the host operable to flow the recombined whole blood back into the host, and non-pulsating pump means effective to flow the whole blood, plasma, formed elements and recombined whole blood through the system above thrombogenicity levels.

5,091,092

SINGLE-LOOP CHROMATOGRAPHY SYSTEM AND METHOD

Daniel L. Newhouse, Harrisburg; Leemer Cernohlavek, Fulton, and Phillip D. Lochhaas, Ashland, all of Mo., assignors to Analytical Bio-Chemistry Laboratories, Inc., Columbia, Mo.

Filed May 3, 1989, Ser. No. 347,519

Int. Cl.⁵ B01D 35/08; G01N 25/06

U.S. Cl. 210—635

21 Claims

1. A chromatography system comprising:

a chromatography column;

multiple storage containers each storing in excess of a predetermined volume of a respective sample fluid to be chromatographically treated in said column to obtain qualitative components for analysis;

a common sample sizing container having a capacity of said predetermined volume;

loading means for automatically loading and filling said sizing container with individual samples of sample fluid

energization of said pump applies a suction pressure through said pipe to the collector box for suctioning water and oil from said slick through the collector box and suction pipe;

means for sensing the rise and fall of the liquid surface above a plurality of incremental portions of said lip wherein said incremental portions extend substantially the entire length of said lip;

control means responsive to said sensing means for automatically maintaining the submergence of each said incremental portion of said lip to an associated predetermined level of submergence independent of the level of submergence of any other incremental portion and control means therefor whereby said lip is moveable in increments substantially throughout its length to track the rise and fall of the liquid surface as induced by wave action which is incident thereto from any direction with respect to said box; and

oil and water separators connected in fluid communication with said pump to receive the mixture of oil and water which is suctioned through said pipe and to separate the oil from the water in said mixture whereby the oil which is separated by said separators may be conveyed to storage devices for collection.

5,091,097

FIRE EXTINGUISHING AND INHIBITING MATERIAL
Edmund R. Pennartz, Kirkland, Wash., assignor to Old Firehand Corporation, Bothell, Wash.

Filed Jun. 5, 1991, Ser. No. 710,782
Int. Cl. 5 A62D 1/00

U.S. Cl. 252-7

9 Claims

1. A fire extinguishing and inhibiting material, comprising by weight one percent (1%) to five percent (5%) potassium hydroxide, two percent (2%) to seven percent (7%) citric acid, four percent (4%) to fourteen percent (14%) diammonium phosphate, and four percent (4%) to eight percent (8%) urea.

5,091,098

SLIDING MATERIAL AND METHOD OF MANUFACTURING THE SAME

Tadashi Tanaka, Konan; Hidehiko Tamura, Aichi; Kiyohide Uenaka, Nagoya, and Shigemasa Hakakoshi, Aichi, all of Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

Filed Feb. 26, 1991, Ser. No. 660,823

Claims priority, application Japan, Feb. 27, 1990, 2-046870
Int. Cl. 5 C10M 147/02, 147/04

U.S. Cl. 252-12.2

4 Claims

1. A sliding material comprising: a backing metal; a porous metal layer formed on a surface of said backing metal, and a composition for impregnation coating pores and the surface of said porous metal layer, wherein said composition for impregnation coating comprises:

0.5-30 vol % of at least one meltable fluorocarbon resin material selected from a group consisting of tetrafluoroethylene-perfluoroalkylvinylether copolymer, fluoroethylene propylene ether and tetrafluoroethylene-hexafluoropropylene copolymer, 5-30 vol % of lead metal having a relative surface area of 1,000-8,500 cm²/g in an average particle size, and a remaining portion composed of polytetrafluoroethylene, and wherein a total of components other than the polytetrafluoroethylene is 5.5-50 vol %.

5,091,099

LUBRICATING OIL COMPOSITION

Samuel Evans, and Rolf Schumacher, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 1, 1989, Ser. No. 360,646

Claims priority, application Switzerland, Jun. 9, 1988, 2196/88

Int. Cl. 5 C10M 141/08

U.S. Cl. 252-48.6

14 Claims

1. A phosphite-free lubricating oil composition which comprises

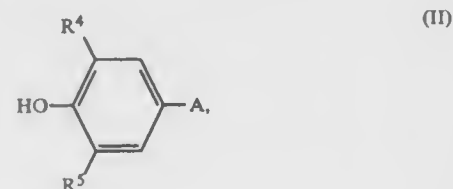
a) a mineral oil or a synthetic oil or a mixture thereof, and
b) a mixture of

(1) aromatic amines as follows:

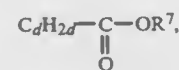
- (a) diphenylamine,
- (b) 4-tert-butylidiphenylamine
- (c)(i) 4-tert-octyldiphenylamine
- (c)(ii) 4,4'-di-tert-butylidiphenylamine
- (c)(iii) 2,4,4'-tris-tert-butylidiphenylamine
- (d)(i) 4-tert-butyl-4'-tert-octyldiphenylamine
- (d)(ii) o,o', m,m'- or p,p'-di-tert-octyldiphenylamine
- (d)(iii) 2,4-di-tert-butyl-4'-tert-octyldiphenylamine
- (e)(i) 4,4'-di-tert-octyldiphenylamine
- (e)(ii) 2,4-di-tert-octyl-4'-tert-butylidiphenylamine

wherein the amounts of the aromatic amines in the mixture being not more than 5% by weight of diphenylamine (a), 8-15% by weight of 4-tert-butylidiphenylamine (b), 24 to 32% by weight of compounds selected from group (c), 23 to 34% by weight of compounds selected from group (d) and 21 to 34% by weight of compounds selected from group (e), based in each case on the total amount of amines, and

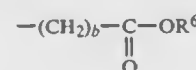
(2) at least one phenol of the formula



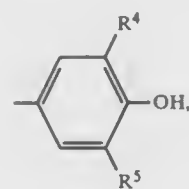
in which R⁴ is H, alkyl having 1 to 24 carbon atoms, cycloalkyl having 5 to 12 carbon atoms substituted by C₁-C₄alkyl, phenyl or -CH₂-S-R¹⁰, R⁵ is alkyl having 1 to 24 carbon atoms, cycloalkyl having 5 to 12 carbon atoms substituted by C₁-C₄alkyl, phenyl or -CH₂-S-R¹⁰, and A is C₆H₄-S_x-Y or



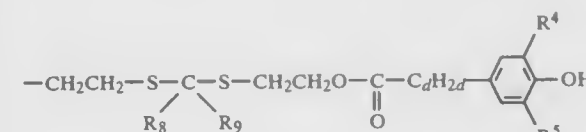
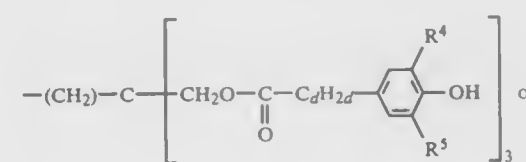
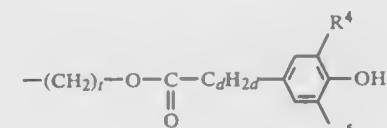
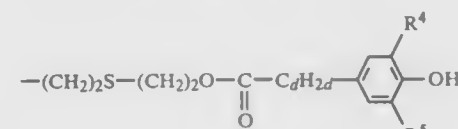
and Y is -H, alkyl having 1 to 18 carbon atoms, phenyl, phenyl substituted by C₁-C₂₄alkyl, benzyl,



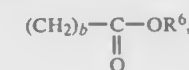
or, if q is 0,



in which R⁴ and R⁵ are in each case as defined above, and b is 1 or 2, d is 0, 1, 2 or 3, q is 0, 1, 2 or 3, x is 1, 2, 3 or 4, R⁶ is C₁-C₂₄alkyl, R⁷ is



in which d is in each case 0, 1, 2 or 3 and t is 2, 3, 4, 5 or 6 and in which R⁴ and R⁵ are in each case as defined above, and R⁸ and R⁹ independently of one another are H, alkyl having 1 to 12 carbon atoms, phenyl or phenyl which is substituted by one or two C₁ to C₄alkyl groups and/or -OH, or R⁸ and R⁹ form jointly with the connecting carbon atom a C₅-C₁₂cycloalkyl group, and R¹⁰ is C₁-C₁₈alkyl, phenyl or



b and R⁶ being as defined above, wherein the weight ratio of the amine to the phenol is 4 to 5:1.

5,091,100

FATTY TRIGLYCERIDE-IN-WATER SOLID FILM HIGH TEMPERATURE PRELUDE EMULSION FOR HOT ROLLED STEEL

Robert L. Trivett, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 20, 1990, Ser. No. 569,802

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl. 5 C10M 173/02

U.S. Cl. 252-49.5

8 Claims

1. A solid film prelude emulsion comprising a fatty acid triglyceride-in-water emulsion having the following formula:

Ingredients	% by weight
A. C ₁₄ -C ₂₂ fatty acid triglyceride	5.0-10.0
B. Water-in-oil emulsifier having an HLB number of at least 8.	3.0-8.0
C. Deionized Water	65.0-85.0

5,091,101

DETERGENT COMPOSITION CONTAINING C5-C14 FREE FATTY ACIDS AND ONE OR MORE SURFACTANT
Esle D. Hildreth, 13108 Amity Rd., Fredericktown, Ohio 43019

Filed Feb. 28, 1990, Ser. No. 486,168

Int. Cl. 5 C11D 9/22, 15/04

U.S. Cl. 252-89.1

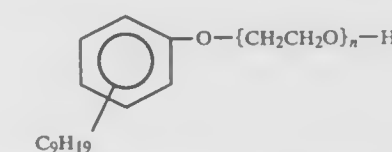
3 Claims

1. A composition of matter suitable for use as a laundry detergent, the composition comprising:

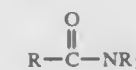
from about 95 to about 5 percent by weight of a first component and from about 5 to about 95 percent by weight of a second component;

said first component containing about 1.5 parts by weight of a fatty acid having 6 carbon atoms, about 78 parts by weight of a fatty acid having 8 carbon atoms, about 20 parts by weight of a fatty acid having 10 carbon atoms, and about 0.5 parts by weight of a fatty acid having 12 carbon atoms; and

said second component containing one or more surface active agents selected from the group consisting of surface active agents having the general formula



wherein the subscript n is an integer of from about 4 to about 40; condensation products of aliphatic alcohols with from about 1 to about 25 moles of ethylene oxide, condensation products of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol, condensation products of ethylene oxide with the reaction product of propylene oxide and ethylenediamine, water-soluble amine oxides, water soluble phosphine oxides, water soluble sulfoxides, alkyl-polysaccharides and fatty acid amides having the general formula



where R is an alkyl group containing from about 7 to about 21 (preferably from about 9 to about 17) carbon atoms, and R₁ is selected from the group consisting of hydrogen, C₁-C₄ alkyl, C₁-C₄ hydroalkyl and (C₂H₄)_xH where "x" is an integer from 1 to about 3.

5,091,102

METHOD OF MAKING A DRY ANTIMICROBIAL FABRIC

Christopher H. Sheridan, Cresskill, N.J., assignor to Nordico, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 271,320, Nov. 15, 1988, Pat. No. 4,946,617. This application Aug. 3, 1990, Ser. No. 563,561

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl. 5 C11D 11/00, 1/62, 1/835, 17/06

U.S. Cl. 252-91

58 Claims

1. A method of making a substantially flexible dry matrix processing antimicrobial properties to which no water has been added other than that naturally present therein, which comprises: passing a continuous line of a matrix material comprising (a) natural or synthetic, woven, non-woven or knitted fibers, or (b) flexible foam material or combinations thereof between an engraved roll and smooth roll, said engraved roll containing a non-aqueous treatment solution on the surface thereof, coating said matrix material with an antimicrobial effective amount of, or a disinfecting effective amount of said

non-aqueous treatment solution from said engraved roll, the amounts of the respective said coatings also being sufficient to allow said matrix to retain its substantially flexible dry characteristics, said non-aqueous treatment solution comprising between about 25% and 75% by weight of a cationic surfactant having antimicrobial or disinfecting properties; and thereafter converting said matrix by forming same into a shaped article of commerce.

53. The substantially flexible dry matrix made in accordance with the method defined in claim 1 to which no water has been added other than that naturally present therein, said matrix possessing antimicrobial properties, said matrix comprising (a) natural or synthetic woven, non-woven or knitted fibers, or (b) flexible foam material or combinations thereof containing an amount of a non-aqueous treatment solution sufficient to allow said matrix to retain its substantially flexible dry characteristics and its antimicrobial characteristics said non-aqueous treatment solution comprising by weight between about 25% and 75% of at least one glycol compound and between about 0.2% and 60% of a cationic surfactant, and antimicrobial effective amounts of an antimicrobial or disinfectant compound.

5,091,103

PHOTORESIST STRIPPER

Alicia Dean, 11 Robin Hill; John A. Fitzsimmons, 51 Skyview Dr., both of Poughkeepsie, N.Y. 12603; Janos Havas, Larchmont Dr., Hopewell Junction, N.Y. 12533; Barry C. McCormick, 12 Patricia Rd., Poughkeepsie, N.Y. 12603, and Prabodh R. Shah, 5 Sherrywood Rd., Wappingers Falls, N.Y. 12590
Filed May 1, 1990, Ser. No. 517,105
Int. Cl.⁵ C09D 9/00; C11D 7/50, 7/32

U.S. Cl. 252-162

24 Claims

1. A composition of matter useful for removing hard baked photoresist compositions from a substrate comprising essentially of

60 to 90% by weight of an N-alkyl-2-pyrrolidone, 10 to 40% by weight of 1,2-propanediol, and a sufficient amount of a tetraalkylammonium hydroxide to provide a solution being from 0.1 to 0.22 N.

5,091,104

AZEOTROPE-LIKE COMPOSITIONS OF TERTIARY BUTYL 2,2,2-TRIFLUOROETHYL ETHER AND PERFLUOROMETHYLCYCLOHEXANE

Michael Van Der Puy, Cheektowaga, N.Y., assignor to Allied-Signal Inc., Morris Township, N.J.

Filed Jun. 26, 1991, Ser. No. 721,022

Int. Cl.⁵ C11D 7/30, 7/50; C23G 5/028; B08B 3/00

U.S. Cl. 252-171

13 Claims

1. Azeotrope-like compositions consisting essentially of from about 20 to about 35 weight percent tertiary butyl 2,2,2-trifluoroethyl ether and from about to about 80 weight percent perfluoromethylcyclohexane which boil at about 70.5° C. at 754 m Hg.

5,091,105

LIQUID DETERGENT FABRIC SOFTENING LAUNDERING COMPOSITION

Linda M. Madore, Midland, Mich., and Annemieke C. M. Donkers, Le Cap Vert-Les Vigies, France, assignors to Dow Corning Corporation, Midland, Mich.

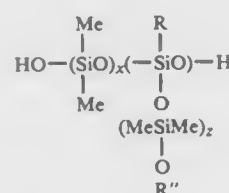
Continuation-in-part of Ser. No. 419,181, Oct. 10, 1989. This application Jan. 7, 1991, Ser. No. 637,843

Int. Cl.⁵ C11D 17/00, 7/32; D06M 10/08

U.S. Cl. 252-174

7 Claims

1. In a liquid laundry detergent free from silicones containing amino substituents having fabric softening properties the improvement comprising a silicone fabric softening agent which is a hydrophobic cationic emulsion of a silicone polymer having a general formula:



wherein:

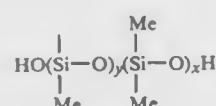
Me is methyl

x and z have values of 3 to 100,000;

y has a value of 1 to 10,000;

R is (CH₂)_nZ; Z is hydrogen;

R'' is a hydrogen or



n has a value of 1 to 10.

5,091,106

GRANULAR BLEACH AGENT: SOLID ALIPHATIC PEROXY-CARBOXYLIC ACID, INORGANIC SALT HYDRATE AND ORGANIC POLYMER

Jochen Jacobs, Wuppertal; Edgar Koepfmann, Hilden; Martin Wlthaus, Duesseldorf, and Manfred Dankowski, Karlstein, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,422

Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515712

Int. Cl.⁵ C11D 3/39, 7/60, 17/06; D06L 3/02

U.S. Cl. 252-186.26

24 Claims

1. A bleaching agent in the form of a granulate of uniform composition comprising:

(a) from about 3 to about 50% by weight of at least one solid aliphatic peroxycarboxylic acid,

(b) from about 40 to about 95% by weight of at least one hydratable inorganic salt, and

(c) from about 0.2 to about 10% by weight of an organic polymer granulation aid soluble in an alkaline aqueous medium, wherein the organic polymer is selected from the group consisting of polyacrylic acid, maleic acid-acrylic acid copolymer wherein the molar ratio is 1:5 to 5:1, and crotonic acid-vinyl acetate copolymer wherein the molar ratio is 1:10 to 1:80, and

wherein all of said components (a), (b) and (c) are uniformly distributed in the individual granules of said granulate and in that in water alone said granulate has a pH in the mildly acidic range.

5,091,107

CHLORINE DIOXIDE GENERATING DEVICE

Richard S. Hotchings, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Oct. 20, 1989, Ser. No. 424,844

Int. Cl.⁵ C01B 11/24

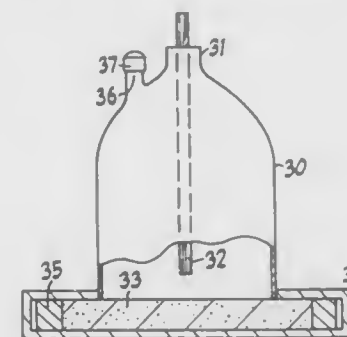
U.S. Cl. 252-187.21

5 Claims

1. A method for the generation of controlled quantities of chlorine dioxide, including the step of:

selectively transporting an aqueous solution by the capillary action of a wick from a container reservoir containing from about 0.1% to 10% sodium chlorite by weight to

contact at a controlled sequence of drops rate with an absorbent pad positioned adjacent the container, the pad



having therein a non-volatile reactive material that reacts with the solution to generate chlorine dioxide gas.

5,091,108

METHOD OF RETARDING CORROSION OF METAL SURFACES IN CONTACT WITH BOILER WATER SYSTEMS WHICH CORROSION IS CAUSED BY DISSOLVED OXYGEN

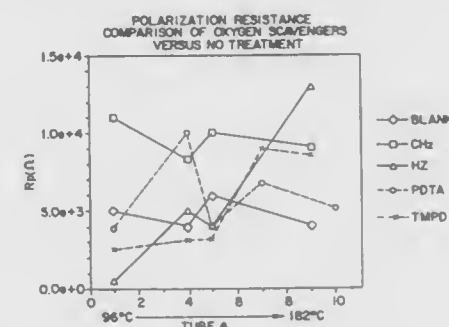
Scott R. Harder, Naperville; Cynthia A. Soderquist, Bolingbrook, and Claudia C. Pierce, Lisle, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Feb. 21, 1991, Ser. No. 658,732

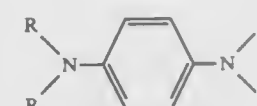
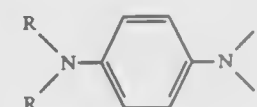
Int. Cl.⁵ C23F 11/12, 11/14

U.S. Cl. 252-188.28

9 Claims



1. method of scavenging oxygen from boiler waters comprising treating said boiler waters with an effective amount of an oxygen scavenging compound, or mixtures of compounds, having the structure:



wherein R, at each occurrence, is independently chosen from the group consisting of:

- lower linear and branched alkyl groups having from 1-4 carbon atoms;
- carboxylated groups having the structure:



wherein n is from 1-3, and M is H, alkali metal cations, ammonium or amino cations or mixtures thereof; and (c) or mixtures of the above alkyl groups and carboxylated groups.

5,091,109

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING SAME AND LIQUID CRYSTAL DEVICE USING SAME

Takao Takiguchi, Tokyo; Takashi Iwaki, Isehara; Takeshi Togano, Yokohama; Yoko Yamada, Atsugi; Shosei Mori, Atsugi, and Shinichi Nakamura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

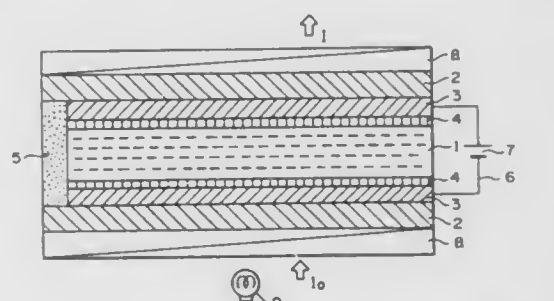
Filed Aug. 8, 1990, Ser. No. 564,077

Claims priority, application Japan, Aug. 25, 1989, 1-219768

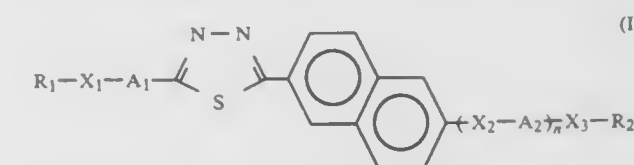
Int. Cl.⁵ C09K 19/34; C07D 85/14; G02F 1/13

U.S. Cl. 252-299.61

189 Claims

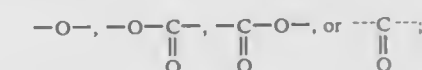


1. A mesomorphic compound represented by the following formula (I):

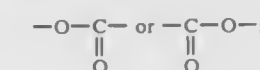


wherein R₁ and R₂ respectively denote an alkyl group having 1-16 carbon atoms capable of having a substituent;

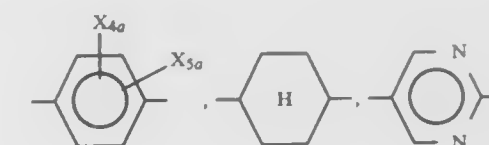
X₁ and X₃ respectively denote a single bond, —O—,

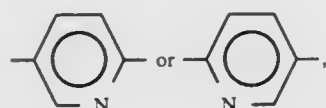
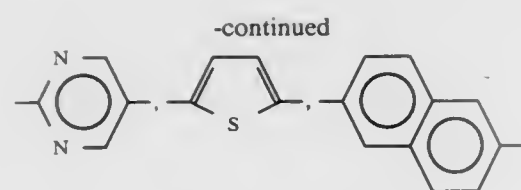


X₂ denotes a single bond,



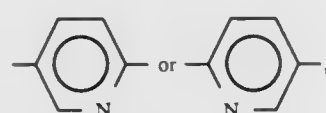
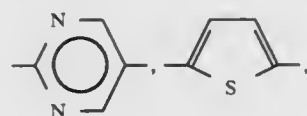
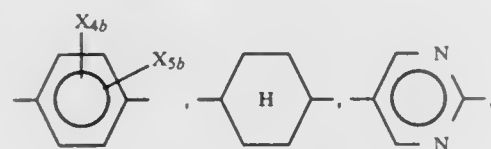
A₁ denotes a single bond,





wherein X_{4a} and X_{5a} respectively denote hydrogen, fluorine, bromine, $-\text{CH}_3$ or $-\text{CF}_3$ with the proviso that X_1 always denotes a single bond when A_1 denotes a single bond;

A_2 denotes a single bond,



wherein X_{4b} and X_{5b} respectively denote hydrogen, fluorine or $-\text{CN}$; and n is 0 or 1.

5,091,110

METHOD OF MAKING LANTHANUM CERIUM TERBIUM PHOSPHATE PHOSPHOR

Albert K. Fan; Anthony F. Kasenga, and Douglas R. Ginter, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 14, 1990, Ser. No. 522,617

Int. Cl.⁵ C09K 11/81

U.S. Cl. 252—301.4 P

6 Claims

1. A method of making lanthanum cerium terbium phosphate phosphor, comprising the steps of:

- forming an first aqueous solution of lanthanum nitrate, terbium nitrate and cerium nitrate;
- forming a second aqueous solution of diammonium hydrogen phosphate;
- adding said first and second solutions simultaneously and at the same rate to deionized water that has been heated and maintained at a temperature of between 80° to 90° C. to coprecipitate a lanthanum cerium terbium phosphate having the composition $\text{La}_x\text{Ce}_y\text{Tb}_z\text{PO}_4$ wherein $x=0.39$ to 0.73, $y=0.17$ to 0.45 and $z=0.10$ to 0.17 and digesting the coprecipitated phosphate for one hour at this temperature;
- combining said coprecipitated lanthanum cerium terbium phosphate with about 0.5 to about 5.0 weight percent Na_2HPO_4 to form a uniform mixture; and
- firing said mixture at about 1150° C. to about 1300° C. for about 1.5 to about 4 hours in a reducing atmosphere of 95% nitrogen/5% hydrogen to form said phosphor.

5,091,111 AQUEOUS EMULSION AND AEROSOL DELIVERY SYSTEM USING SAME

Phillip J. Neumiller, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 19, 1990, Ser. No. 584,963

Int. Cl.⁵ C09K 3/00

U.S. Cl. 252—305

15 Claims



1. An improved two-phase system for delivering an aerosol from a pressurized container characterized by a propellant reservoiring effect and comprising from 75% to 98% by weight of an aqueous component and from 25% to 2% by weight of a propellant component, the aqueous component comprising a mixture of a non-ionic surfactant, a C_9 – C_{18} primary alcohol, a compound selected from the group consisting of polyhydroxy alcohols, polyhydroxy alcohol esters and mixtures thereof, and an active ingredient, the balance of the aqueous component being water, the propellant component comprising a C_3 – C_5 linear hydrocarbon.

5,091,112

REDUCING COPPER CORROSIVENESS OF ORGANIC SULFIDES

Edmund F. Perozzi, Crestwood, Mo., and John F. Sieberth, Baton Rouge, La., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed Mar. 19, 1990, Ser. No. 495,090

Int. Cl.⁵ C09K 3/00; C23O 11/18

U.S. Cl. 252—387

22 Claims

1. A process of reducing the copper corrosiveness of an organic sulfur-containing substance that is corrosive toward copper which comprises treating such sulfur-containing substance with an alkali metal-containing or alkaline earth metal-containing substance capable of dissolving elemental sulfur, such treatment being effected in a liquid reaction medium composed of water and at least one ketone which has a solubility in water of at least about 1% by weight measured at 20° C., whereby the treated organic sulfur-containing substance is less corrosive toward copper.

5,091,113

CORROSION INHIBITING COMPOSITION

Brian G. Clubley, Wilmslow, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 191,090, May 6, 1988, Pat. No. 4,959,161.

This application Jul. 27, 1990, Ser. No. 558,926

Claims priority, application United Kingdom, May 15, 1987, 8711534

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

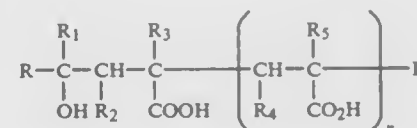
Int. Cl.⁵ C23F 11/10; C07D 307/02

U.S. Cl. 252—396

11 Claims

1. A composition, in contact with a corrodible metal surface, which composition comprises:

- an aqueous-based or oil-based system; and
- as inhibitor for protecting the metal surface against corrosion, an effective amount of at least one compound having the formula II:



as well as salts or partial esters thereof wherein:

n is 0 or an integer ranging from 1 to 20,

R is a straight or branched chain C_4 – C_{30} alkyl group, a straight or branched chain C_4 – C_{30} alkyl group interrupted by one, two or three oxygen atoms or substituted by one, two or three hydroxy groups, a C_5 – C_{12} cycloalkyl group, a C_6 – C_{10} aryl group, C_6 – C_{10} aryl group substituted by one, two or three C_1 – C_{12} alkyl groups, a C_7 – C_{13} aralkyl group or a C_7 – C_{13} aralkyl group which is substituted by a hydroxyl group;

R_1 is H or a straight- or branched chain C_1 – C_4 alkyl group;

R_2 is H, a straight or branched chain C_1 – C_4 alkyl group or CO_2H ;

R_3 is H, a straight or branched chain C_1 – C_4 alkyl group, $-\text{CH}_2\text{CO}_2\text{H}$ or $-\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$;

R_4 is H, a straight or branched chain C_1 – C_4 alkyl or CO_2H ;

R_5 is H, a straight or branched chain C_1 – C_4 alkyl group, $\text{CH}_2\text{CO}_2\text{H}$ or $\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$; with the following proviso

when n is an integer from 1 to 20 at least one group R_4 is CO_2H .

5,091,114

CONDUCTIVE METAL POWDERS, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Hitoshi Nakajima, and Akinori Yokoyama, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 18, 1989, Ser. No. 395,531

Claims priority, application Japan, Aug. 23, 1988, 63-207438; Jan. 27, 1989, 1-016425

Int. Cl.⁵ H01B 1/06

U.S. Cl. 252—514

13 Claims



1. Conductive metal powder having an average composition represented by $\text{Ag}_x\text{M}_{1-x}$ (wherein M is at least one metal selected from the group consisting of Ni, Co, Cu and Fe; $0.01 \leq x \leq 0.4$) and component particles wherein silver concentration progressively increases from an inner part toward the surface of such particles.

5,091,115

SEMICONDUCTOR-CONTAINING GLASS AND METHOD FOR PRODUCING SAME

Masayuki Nogami, 92-10, Yakato-cho, Seto-shi, Aichi-ken, Japan, assignor to Hoya Corporation, Tokyo and Masayuki Nogami, Aichi, both of, Japan

Filed Apr. 10, 1990, Ser. No. 506,784

Claims priority, application Japan, Apr. 17, 1989, 1-96889

Int. Cl.⁵ C03C 3/04

U.S. Cl. 252—518

2 Claims

2. A semiconductor-containing glass which comprises a glass matrix containing SiO_2 and other metal oxides selected from the group consisting of Al_2O_3 , TiO_2 , B_2O_3 and ZrO_2 , the

SiO_2 content being at least 60 mol % wherein said glass matrix contains from 1 to 15 mol % of a semiconductor microcrystal having a particle size of less than 100 Å, said semiconductor being selected from the group consisting of CdS, CuCl and PbS.

5,091,116

METHODS FOR TREATMENT OF EDIBLE OILS

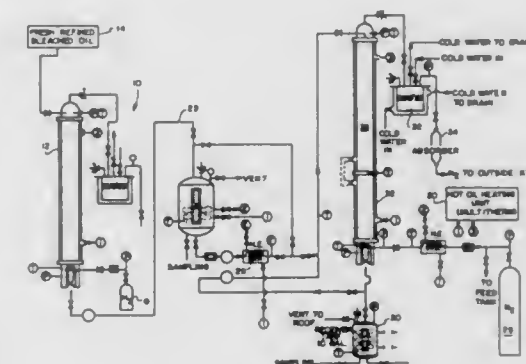
R. G. Krishnamurthy, Glenview; Neil R. Widlak, and Joel J. Wang, both of Northbrook, Ill., assignors to Kraft General Foods, Inc., Glenview, Ill.

Continuation of Ser. No. 935,642, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 579,385, Feb. 13, 1984, abandoned. This application Mar. 27, 1991, Ser. No. 677,380

Int. Cl.⁵ C11B 3/14, 3/00

U.S. Cl. 260—409

9 Claims



1. A method for deodorizing an edible oil selected from the group consisting of edible vegetable oils and edible animal fats and mixtures thereof comprising the steps of deoxygenating the oil to provide a deoxygenated oil, heating the deoxygenated oil to a temperature in the range of from about 325° F. to about 550° F., continuously conducting the heated deoxygenated oil through a nitrogen, contacting zone having a solid surface to volume ratio of at least about 30 square feet of surface area per cubic foot of nitrogen contacting zone volume and continuously introducing substantially oxygen-free nitrogen having less than one part by weight per million of oxygen in a countercurrent manner through the heated oil in the nitrogen contacting zone at about atmospheric pressure conditions for a time period of at least about 5 minutes at an oil to gas weight to weight ratio in the range of from about 1.2 to about 4.5, and cooling the oil which has been conducted through the nitrogen contacting zone under oxygen excluding conditions to provide a deodorized vegetable oil.

5,091,117

PROCESS FOR THE REMOVAL OF STEROL COMPOUNDS AND SATURATED FATTY ACIDS

Albert K. Athanasios, Madison, and Gareth J. Templeman, Sparta, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Apr. 16, 1990, Ser. No. 509,230

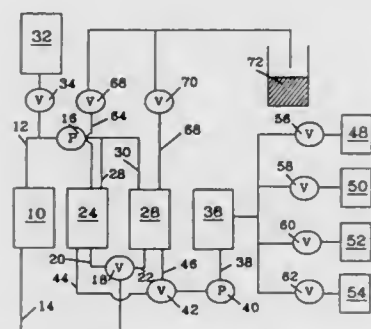
Int. Cl.⁵ C11B 3/10

U.S. Cl. 260—428

43 Claims

1. A process for the removal of at least one sterol compound and at least one saturated fatty acid from a fluid, which process

comprises contacting the fluid with an activated charcoal, the activated charcoal having been produced by heating charcoal



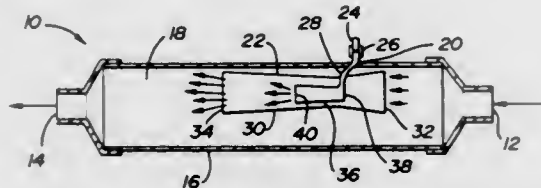
to a temperature of about 110° C. to about 150° C. for a period of at least about 12 hours.

5,091,118

DEVICE FOR DISSOLVING GASES INTO LIQUIDS
Peter H. Burgher, 15158 Wiles Dr., Captiva, Fla. 33924
Filed Oct. 9, 1990, Ser. No. 594,651
Int. Cl.⁵ B01F 3/04

U.S. Cl. 261-76

12 Claims



1. A system for dissolving a gas delivered from a gas supply in a liquid which moves through the system, the liquid having the characteristic of being low in concentration of the gas upon entry into the system, the system comprising:

a substantially closed chamber having an inlet through which the liquid flows, an outlet from which the liquid leaves the system, and a central region therebetween, said central region having walls defining an interior adapted for dissolving the gas in the liquid and having one or more orifices for introducing the gas into said chamber; and

a venturi including a pipe section and a horn, said venturi having a venturi inlet into which the liquid flows and a venturi outlet from which the liquid flows, said horn having a horn inlet into which the liquid flows and a horn outlet from which the liquid flows, said venturi defining between said venturi inlet and said venturi outlet a passage which initially converges to a minimum spacing in the direction of liquid flow and thereafter widens more slowly, thereby creating a low pressure region in the path of liquid flow and permitting the liquid to siphon the gas from said pipe section and displace the gas into the liquid at high velocity from the incoming gas flow in the form of minute bubbles, the horn being in fluid communication with said pipe section and being positioned within the venturi such that said horn inlet is proximate to said low pressure region, said venturi maximizing a gas-liquid interface and promoting contact between the gas and the liquid, the horn optimizing the displacement of the gas into the liquid.

5,091,119

LIQUID-GAS CONTACT DEVICE

Michael W. Biddulph, University Park; Satish C. Kler, Woking, and John T. Lavin, Guildford, all of England, assignors to The BOC Group plc, Windlesham, England
Filed Sep. 20, 1989, Ser. No. 410,381
Claims priority, application United Kingdom, Sep. 23, 1988, 8822479

Int. Cl.⁵ B01F 3/04

U.S. Cl. 261-114.3

15 Claims



1. A liquid-gas contact device comprising: a liquid-gas contact tray having, a liquid-bearing surface along which in use liquid is able to flow from a liquid receiving edge of the liquid-bearing surface to an opposed liquid outlet edge thereof, a multiplicity of elongate apertures in the tray for the passage of gas from below to above the tray, each aperture having a gas deflector associated therewith and being so disposed as to impart to the gas a component of velocity in a direction toward the liquid outlet edge; and at least several liquid flow impedance members overlying the liquid-bearing surface between said liquid receiving edge and said outlet edge; the deflectors and flow impedance members having a height such that in operation of the device they are fully submerged in the liquid flowing thereacross.

5,091,120

PROCESS FOR OBTAINING UO₂ FUEL PELLETS FROM METALLIC U WITHOUT PRODUCING ANY EFFLUENT
André Feugier, Chatuzange-le-Goubet, France, and Michel Pirsoul, Turnhout, Belgium, assignors to Uranium Pechiney, Courbevoie, France

Filed Nov. 26, 1990, Ser. No. 617,650

Claims priority, application France, Dec. 5, 1989, 89 16737

Int. Cl.⁵ G21C 21/00

U.S. Cl. 264-0.5

32 Claims

1. Process for obtaining nuclear fuel pellets based on UO₂ from metallic uranium, which does not lead to liquid effluents and gives intermediate, dense, pourable uranium oxide powders without any particular conditioning operation, such as granulation, comprising the steps of: oxidizing metallic uranium in an oxidizing gas at high temperature to obtain an oxide U₃O₈; crushing or milling the U₃O₈ to obtain a powder with an average grain size of approximately 10 to 30 μm; chemically reducing the U₃O₈ to UO₂; activating the UO₂ with the aid of at least one fine milling operation; and shaping by pressing and fritting.

5,091,121

PRODUCTION OF A BALLOON FOR AN INTRAOCULAR LENS

Kazuhiko Nakada, Akihiro Yasuda, and Makoto Ichikawa, all of Nagoya, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Division of Ser. No. 308,533, Feb. 10, 1989, Pat. No. 5,035,710.
This application Oct. 1, 1990, Ser. No. 591,279

Claims priority, application Japan, Feb. 12, 1988, 63-31582; Mar. 4, 1988, 63-52449

Int. Cl.⁵ B29D 11/00

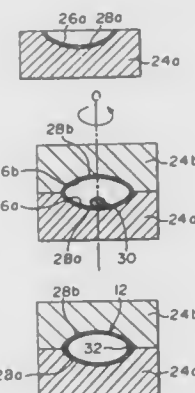
U.S. Cl. 264-1.4

11 Claims

1. A process for producing a balloon for an intraocular lens, which comprises:

a step of preparing mold halves having mold cavities corresponding respectively to halves of a hollow balloon made of an elastomer and having a convex lenticular shape, said mold cavities having substantially the same diameter, and having such balloon halves accommodated in the respective mold cavities;

a step of placing a predetermined amount of an adhesive monomer in one or each of the balloon halves, then closing the mold halves having the balloon halves accommo-



dated therein so that the convex side of each balloon half is located outside and the peripheral edges of the balloon halves abut against each other; and

a step of polymerizing the adhesive monomer while rotating the closed mold about an axis through the centers of the balloon halves, centrifugal action spreading the adhesive monomer so that the abutting peripheral edges of the balloon halves are bonded by the polymer of the adhesive monomer.

5,091,122

METHOD FOR MICROENCAPSULATION OF BASIC SOLUTIONS

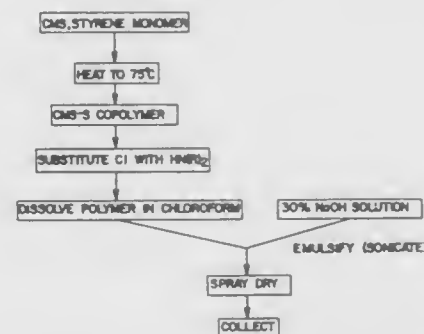
David R. Friend, Menlo Park, Calif., assignor to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 173,071

Int. Cl.⁵ B01J 13/04

U.S. Cl. 264-4.33

10 Claims



1. A method of microencapsulation of basic solutions comprising the steps of:

preparing a polymer which is hydrophobic at high pH levels, said polymer comprising a di-alkylaminomethyl or di-alkylphosphinomethyl substituted polymer or copolymer selected from the group consisting of styrene, ethylene, propylene, butene and butadiene; preparing a basic solution; dissolving the polymer in a solvent; adding a surfactant to the polymer solution; adding the basic solution to the dissolved polymer solution to form a mixture;

emulsifying the mixture of basic solution and dissolved polymer solution by sonification; maintaining the emulsion by mixing; and spray drying the emulsion.

5,091,123

METHOD OF ADJUSTING AN ADJUSTABLE PISTON-DRIVER CONNECTION

William S. Fealey, Jamestown, R.I., assignor to Stanley-Bositch, Inc., East Greenwich, R.I.

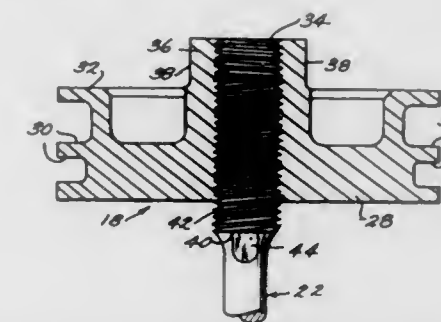
Division of Ser. No. 321,756, Mar. 10, 1989, Pat. No. 5,000,365.

This application Oct. 15, 1990, Ser. No. 597,325

Int. Cl.⁵ A29C 73/00, 67/00

U.S. Cl. 264-36

2 Claims



1. A method of adjusting the operating position of a fastener driving element of an assembled fastener driving device with respect to a piston of said device in the axial direction of the piston wherein connection between the fastener driving element and piston constitutes interengaged threads and a thermoplastic locking compound coating interengaging thread surfaces and filling spaces therebetween, said adjusting being effected without the necessity of disconnecting the interengaged threads and of applying new locking compound when a threaded reconnection is reestablished, said method comprising the steps of

heating the threaded connection sufficient to soften the thermoplastic locking compound, effecting a relative turning movement between said fastener driving element and said piston while said thermoplastic locking compound is softened to an extent sufficient to bring said fastener driving element and said piston into the desired position of adjustment such that the interengagement of the threads is devoid of significant opposing axial forces acting between the threads, and allowing the softened thermoplastic locking compound to harden.

5,091,124

HIGH TONNAGE RIM PRESS

Paul Zakich, Akron, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 502,087, Mar. 30, 1990,

Continuation-in-part of Ser. No. 318,574, Mar. 3, 1989, Pat. No. 4,944,669. This application Jan. 22, 1991, Ser. No. 643,874

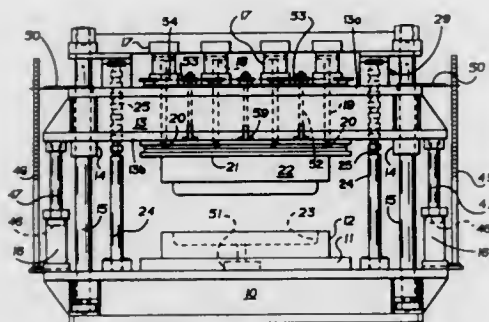
Int. Cl.⁵ B29C 45/66, 45/80

U.S. Cl. 264-40.1

24 Claims

1. A high pressure press comprising a pair of platens movable with respect to each other between open and closed positions, each platen supporting at least one of multiple mold parts capable of interfitting when said platens are forced toward each other at said closed position to define a mold having a mold cavity sealed at the junctures of the interfitting mold parts, a carrier associated with one of said platens for moving therewith to said closed position, locking means for locking said carrier at a plurality of locking positions spaced incrementally from said closed position, said carrier also being movable to the next successive locking position independently of said one platen at said closed position, force exerting means

mounted on said carrier for forcing said one platen toward the other platen when said platens are at said closed position and said carrier is locked at said next successive locking position comprising a plurality of connectors extensible independently of each other in the direction from said carrier toward said one



platen for pressing thereagainst at a plurality of separate locations within the area of said mold when the latter is clamped between said platens, thereby to seal said cavity at said junctures, and means for injecting molding chemicals into said sealed cavity.

5,091,125

METHOD OF FORMING ANTI-SLIP SHOE SOLE
Masasuke Harada, Saitama; Hideki Hayafuchi, Kurume, and Kouji Tsukamoto, Yanagawa, all of Japan, assignors to Asahi Corporation, Tokyo, Japan

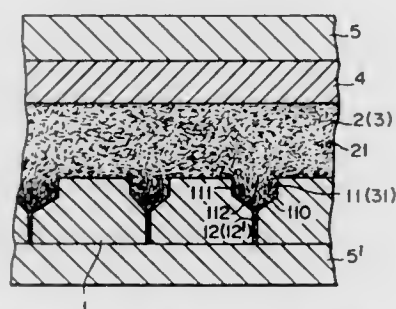
Filed Apr. 10, 1990, Ser. No. 506,804

Claims priority, application Japan, Apr. 2, 1988, 63-82092

Int. Cl.³ B29C 67/22

U.S. Cl. 264-45.3

8 Claims



1. A method of producing an anti-slip shoe sole comprising the steps of:

- providing a shoe sole forming die having a top portion, a bottom portion and a multiplicity of independent projection-forming cavities in said bottom portion, said bottom portion having a forward side and a reverse side, said cavities opening to the reverse side of said bottom portion through respective escape holes connected to said cavities;
- preparing unvulcanized green rubber containing hard fibers dispersed therein;
- placing said unvulcanized green rubber in said shoe sole forming die;
- applying heat and pressure to said unvulcanized green rubber;
- forcing by heating and pressurizing, said unvulcanized green rubber to flow, so as to fill said cavities and further to flow into escape holes, thereby forming a shoe sole blank having projections integral therewith and fibers dispersed in the green rubber oriented in parallel with the direction of flow;
- compressing air present in the cavities by said rubber, when

said rubber is forced to flow into the cavities and holes causing said air to flow into said escape holes; and finishing the blank to form an anti-slip shoe sole.

5,091,126

PREPARATION OF EXPANDABLE GRANULES, AND THE PRODUCTION OF FOAMS THEREFROM
Heinz Weber, Gruenstadt; Gerd Ehrmann, Deidesheim; Franz-Josef Dietzen, Schiffweiler; Eckhard Nintz, Ludwigshafen, and Hans D. Zettler, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 3, 1990, Ser. No. 562,659

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925740

Int. Cl.³ C08J 9/12

U.S. Cl. 264-53

3 Claims

1. A process for the preparation of expandable granules based on a polyaryl ether sulfone or a polyether imide or a mixture thereof, containing from 5 to 20% by weight, based on the total weight of the granules, of a physical blowing agent, the blowing agent and the polymers being mixed in an extruder and subsequently extruded directly into a medium at less than 40° C.

5,091,127

BUBBLE PACK PLASTIC FILMS AS PATTERNS FOR PRODUCING DIMPLED EFFECTS IN CAST CERAMIC PIECES

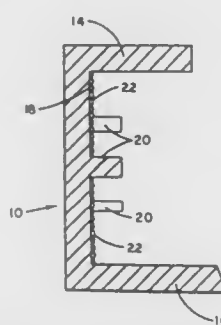
Madjid Soofi, St. Charles, Ill., assignor to Magneco/Metrel, Inc., Addison, Ill.

Filed Jul. 16, 1990, Ser. No. 552,865

Int. Cl.³ C04B 33/32; B28B 7/30, 7/36

U.S. Cl. 264-56

1 Claim



1. A process for producing a dimpled surfaced on an alumina tundish baffle which comprises the steps of:

- a) casting an alumina slurry having a mortar like consistency in a tundish shaped mold which contains patterns for producing openings in the baffle which mold also contains bubble pack as a dimple producing disposable pattern;
- b) allowing the cast alumina slurry to set;
- c) removing the set alumina slurry, and then;
- d) firing the set alumina slurry to produce a dimpled surface alumina tundish baffle.

5,091,128

METHOD FOR PRODUCING MATERIAL FOR LOW MELTING POINT METAL CASTING EQUIPMENT

Tsutomu Yamamoto; Michio Nishiyama; Mitsuo Yamamoto, and Masakazu Ozaki, all of Yokohama, Japan, assignors to Nihon Corporation, Tokyo, Japan

Division of Ser. No. 62,220, Jun. 12, 1987, Pat. No. 4,975,231, which is a division of Ser. No. 846,222, Mar. 3, 1986, Pat. No. 4,690,867. This application Nov. 27, 1990, Ser. No. 618,720

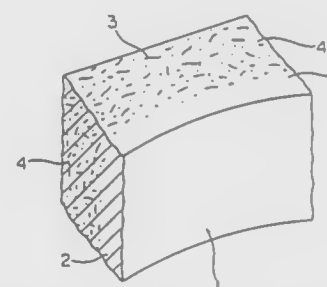
Claims priority, application Japan, Apr. 5, 1985, 60-71039; Feb. 12, 1986, 61-26854

The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.

Int. Cl.³ C04B 33/30, 33/32

U.S. Cl. 264-60

4 Claims



1. A method for the preparation of material for low melting point metal casting equipment comprising a calcium silicate molded body comprising xonotlite as matrix and about 0.7 to 5.9 wt.% based on the total solid content of carbon fiber as reinforcing fiber, and having characteristics such that when the material has been used for casting metal at least one time, the carbon fibers near the surface for contacting the molten metal are burnt down whereby a surface to said molded body coming in contact with any molten metal to be cast and a zone near the surface changes to contain substantially no reinforcing fibers or less reinforcing fibers than that of other zones, thereby providing that the fracture toughness of said surface or zone is lower than that of other zones, characterized in that a slurry comprising a uniform mixture (A)-(E) indicated below is molded, and the resultant molded body is subjected to steam curing under a vapor pressure until a matrix substantially comprising xonotlite is formed and then dried:

- (A) a mixture of lime material and a siliceous material in a mold ratio CaO/SiO₂ of 0.9-1.3.
- (B) a xonotlite slurry previously prepared by hydrothermal synthesis
- (C) a fibrous wollastonite
- (D) a reinforcing carbon fiber
- (E) water.

5,091,129

METHOD FOR MANUFACTURING A FILTER CARTRIDGE

Claude Gabelle, Ruell Malmalson, France, assignor to Institut Francais Du Petrole, Ruell Malmalson, France

Filed Dec. 29, 1989, Ser. No. 459,279

Claims priority, application France, Dec. 30, 1988, 88 17600

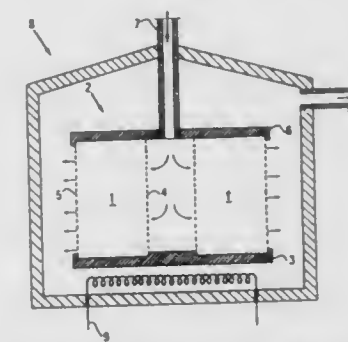
Int. Cl.³ B01D 27/02; B29L 31/14

U.S. Cl. 264-85

9 Claims

1. A method of manufacturing a filter cartridge by polymerization of a polymerizable polyethylene hydrocarbon admixed with granular elements, said method comprising preparation of a mixture comprising said hydrocarbon, a catalyst, and said granular elements, then introduction of the mixture into a mold which is formed by a first porous wall and a second porous wall, said walls being connected to a jacket, introduction of said mold in an oven thereby raising the temperature of the mixture and effecting a thermal polymerization reaction to transform the hydrocarbon into a material binding the granular elements of the mixture, the assembly of the material and

granular elements then forming a cartridge, and injection of a chemically inert gaseous composition into said mold through one of said porous walls to impart fluid permeability to said cartridge thereby forming said filter cartridge; said granular elements comprising at least one of sand, glass particles, silica



particles, alumina particles and carbide particles and said catalyst contains at least one element selected from the group consisting of barium, zirconium, lanthanum, a lanthanide, vanadium, manganese, iron, cobalt, zinc, nickel, lead and copper.

5,091,130

PROCESS FOR THE PRODUCTION OF HIGHLY FILLED YARNS

Hardev S. Bahia, Coventry, United Kingdom, assignor to Courtaulds PLC, United Kingdom

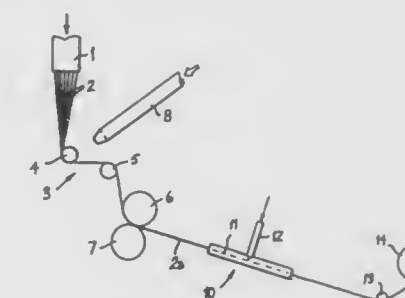
Division of Ser. No. 216,316, Jul. 7, 1988, abandoned. This application May 29, 1990, Ser. No. 530,452

Claims priority, application United Kingdom, Jul. 10, 1987, 8716243

Int. Cl.³ D01D 5/16, 11/04

U.S. Cl. 264-103

11 Claims



1. A process for the production of a continuous filament yarn comprising melt spinning a thermoplastic fiber-forming polymer containing at least 25% by weight of a particulate filler, based on the weight of polymer plus filler, through a spinneret to form a filament, drawing the filament away from the spinneret by draw means at a rate sufficient to at least partially orientate the yarn and taking up the filament as a continuous yarn, in which the filament passes around a guide between the spinneret and the draw means so that the direction of travel of the filament is diverted by means of the guide through an angle of at least 30° between the spinneret and the draw means, the guide being positioned so that the yarn, as it is diverted by the guide, is still at elevated temperature between T_m and (T_m-40)° C., where T_m is the melting point of the thermoplastic polymer, such that the guide controls the tension applied to the freshly extruded filaments so that a major part of the drawing of the yarn takes place between the guide and the draw means.

5,091,131

METHOD OF ATTACHING SMALL PLASTIC PARTS SECURELY ON COMPRESSION MOLDED PARTS
Rolf Schumacher, Sindelfingen, and Ewald Eissler, Hildrizhausen, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

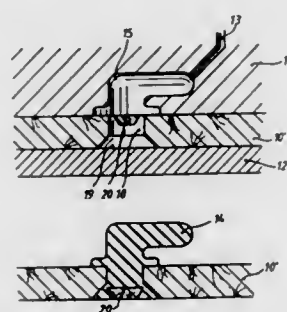
Filed Sep. 18, 1990, Ser. No. 584,922

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933416

Int. Cl.⁵ B29C 43/02, 45/14

U.S. Cl. 264—112

3 Claims



1. A method of attaching at least one small plastic part securely in a defined position in relation to a compression molded part consisting substantially of at least one of resin bound natural fibers and chips and also of binder, comprising the steps of

- introducing a loose layer of a mixture of at least one natural fibers and chips and binder into a compression mold, compression molding the mixture into a desired shape by undergoing a setting reaction of the binder and a volume reduction of the layer while forming at least one thin portion, smaller than the plastic part, in a wall of the compression molded part at a fastening point of the plastic part on the compression molded part;
- placing the finished compression molded part in a defined position with the fastening point in a split injection mold for molding the small plastic part in relation to the compression molded part, each half of the injection mold being brought snugly into contact on a near side and a far side of the wall of the compression molded part; and
- a direct, form-fitting injection molding of the small plastic part, in relation to the wall of the compression molded part at the fastening point by injecting plastic for forming the small plastic part from one side of a mold half into the injection mold and, within the injection mold the thin portion breaking open under the pressure of the injected plastic and leaving a clearance at the fastening point, so as to completely fill the clearance of the compression molded part, the plastic reaching the mold half opposite the one side through the clearance.

5,091,132

METHOD AND APPARATUS FOR PRODUCTION OF RUBBER DISPERSIBLE PELLETS

Thomas M. Haller, Havre de Grace, Md., assignor to J. M. Huber Corporation, Rumson, N.J.

Filed Aug. 7, 1989, Ser. No. 390,013

Int. Cl.⁵ B01J 2/72

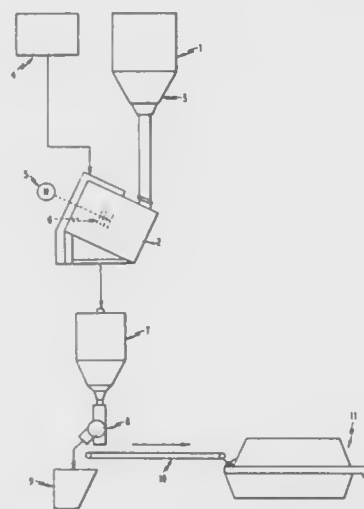
U.S. Cl. 264—117

11 Claims

1. A process for producing substantially dust-free pelletized materials which are highly dispersible in rubber formulations which comprises pelletizing rubber additives in an inclined mixer and drying the pelletized product in a fluidized bed dryer.

6. A process for producing pelletized silica having a density between about 0.20 and 0.50 g/cc and an average particle size between about 30 and about 150 mesh which comprises pelletizing a mixture of amorphous silica and solvent, having be-

tween about 40% and about 75% by weight of solvent, in an inclined mixer at a mixing speed of between about 400 and



about 3500 RPM and drying the pelletized silica in a fluidized bed dryer to a moisture content below about 10% by weight.

5,091,133

CONTINUOUS PRODUCTION PROCESS OF HIGH-STRENGTH AND HIGH-MODULUS POLYOLEFIN MATERIAL

Selzo Kobayashi; Takashi Mizoe, and Yoshimu Iwanami, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

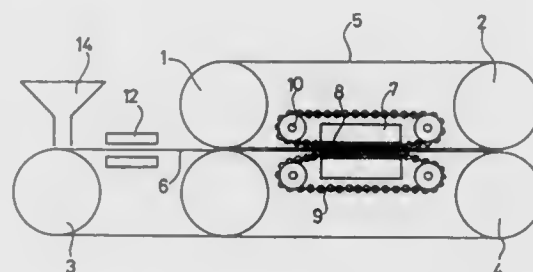
Filed Dec. 18, 1989, Ser. No. 451,788

Claims priority, application Japan, Dec. 21, 1988, 63-320401; Jan. 14, 1989, 1-149492

Int. Cl.⁵ B29C 43/26

U.S. Cl. 264—119

36 Claims



1. A process for the continuous production of a high-strength and high-modulus polyolefin material, which comprises:

- feeding a polyolefin in a powder form between a combination of endless belts disposed in an up-and-down opposing relation;
- compression-molding the polyolefin powder at a temperature lower than the melting point of the polyolefin powder by means of a pressing means while holding the polyolefin powder between the endless belts and conveying the same, said pressing means comprising pressing platens and corresponding sets of rollers, all accommodated within the respective endless belts, the rollers in each set being connected together, and said sets of rollers being arranged movably in an endless fashion between the respective platens and the endless belts associated therewith; and
- rolling the resultant compression-molded polyolefin, followed by stretching.

5,091,134

PROCESS AND APPARATUS FOR COOLING EXTRUDED THERMOPLASTIC FILM

Yoshitomo Oshima, and Kazumi Tou, both of Shizuoka, Japan, assignors to Fujii Photo Film Co., Ltd., Kanagawa, Japan

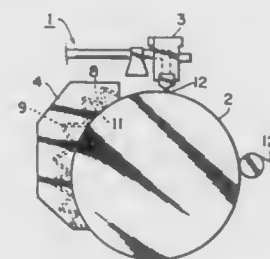
Filed Feb. 13, 1991, Ser. No. 654,468

Claims priority, application Japan, Feb. 16, 1990, 2-33822

Int. Cl.⁵ B29C 47/88

U.S. Cl. 264—176.1

6 Claims



1. A cooling process for cooling a thermoplastic resin film extruded onto a cooling drum, comprising blowing air through an air nozzle onto the surface of the film opposite the drum to decelerate and continuously vary the velocity of the blown air along the circumferential direction of the drum, said air nozzle comprising an air supply part having at least two air supply openings disposed at different points along the circumferential direction of the drum and a reduction filter having a porous or mesh construction covering the air supply openings.

2. The process of claim 1, wherein the reduction filter is in the form of a multi-folding plate.

5,091,135

IMPROVEMENTS IN THE ENCAPSULATION OF ELECTRONIC COMPONENTS EMPLOYING LOW STRESS ENCAPSULANT COMPOSITION

Tsuneyoshi Okada, Kawasaki; Toshikatsu Nitoh, Fuji; Toshio Kanoe, Osaka, and Masato Togami, Fuji, all of Japan, assignors to Polyplastic Co., Ltd., Osaka, Japan

Division of Ser. No. 235,248, Aug. 23, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 420,948

Claims priority, application Japan, Sep. 11, 1987, 62-227776; Feb. 2, 1988, 63-22614

Int. Cl.⁵ B29C 45/14

U.S. Cl. 264—272.13

18 Claims

1. An improved method for encapsulating an electronic component so as to seal the surface of the electronic component under low stress conditions with a highly stable protective layer comprising injection molding about the surface of said electronic component an encapsulant composition comprising a molten melt-processable aromatic polyester which is capable of forming an anisotropic melt phase which contains uniformly blended therein an organopolysiloxane selected from the group consisting of a silicone oil in a concentration of 0.1 to 5 percent by weight based upon the total weight of the encapsulant composition, and a silicone rubber in a concentration of 1 to 20 percent by weight based upon the total weight of the encapsulant composition possessing an average particle size of 0.1 to 100 μm , and cooling said anisotropic melt containing said uniformly blended organopolysiloxane selected from the group consisting of said silicone oil, and said silicone rubber to accomplish solidification of the encapsulant composition about the surface of said electronic component.

5,091,136

METHOD OF RELIEF STAMPING MOTHER-OF-PEARL PLATES

Jürgen Bock, Pforzheim; Karola Metzger-Pegau, Straubenhart, and Wolfgang Zeller, Pfinztal, all of Fed. Rep. of Germany, assignors to Bock & Schupp GmbH & Co. KG, Pforzheim, Fed. Rep. of Germany

Filed Jun. 19, 1991, Ser. No. 717,470

Claims priority, application European Pat. Off., Mar. 14, 1991, 91103922.0

Int. Cl.⁵ B29C 43/10

U.S. Cl. 264—320

2 Claims

1. A method of producing relief structures on mother-of-pearl layers removed from the shells of mollusks, wherein a portion of the layer is disposed on a negative mold having the desired relief shape formed therein, a modelling material with a thickness of at least the height of the relief shape is disposed on the exposed side of the mother-of-pearl layer which is then embossed by a planar stamp pressing onto the modelling material to force the mother-of-pearl foil portion into form-engagement with said negative mold.

5,091,137

PIPE LINING PROCESS

Patrick R. Ledoux, New Orleans, La., assignor to Pipe Liners, Inc., Metairie, La.

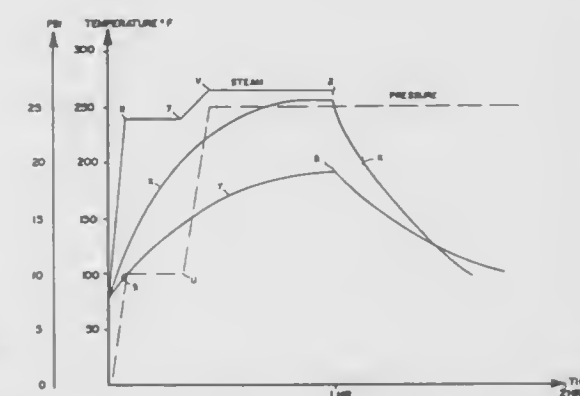
Division of Ser. No. 298,754, Jan. 19, 1989, Pat. No. 4,998,871.

This application Nov. 21, 1990, Ser. No. 616,926

Int. Cl.⁵ B29C 63/38, 53/08

U.S. Cl. 264—516

7 Claims



1. A method of installing a thermoplastic liner in a generally cylindrical pipe, comprising the steps of:

- (a) providing a liner formed of thermoplastic material having a non-cylindrical cross-sectional shape with its largest cross-sectional dimension of a value smaller than the inside diameter of said pipe and having a shape memory of a generally cylindrical shape, said liner being responsive to a shape memory activation temperature above the crystallization melting temperature of the thermoplastic liner whereby the liner may be formed into a generally cylindrical configuration;
- (b) pulling said non-cylindrical liner into said pipe such that it extends to the opposite ends of said pipe;
- (c) heating said non-cylindrical liner to a first temperature below said activation temperature;
- (d) pressurizing said non-cylindrical liner to a first pressure to cause said liner to assume a generally cylindrical cross-sectional configuration generally conformal to the interior contours of said pipe when said liner is heated and is at a temperature below said activation temperature;
- (e) holding said liner at said first temperature and said first pressure for a predetermined time period;
- (f) thereafter (1) increasing said temperature in said liner to a second temperature above said activation temperature to

raise the temperature of the liner sufficiently to inactivate any memory of the non-cylindrical shape and reactivate the memory of the cylindrical shape and (2) increasing the pressure in said liner to a second pressure above said first pressure, whereby said liner will generally adhere to the generally cylindrical interior contour of said pipe; and (g) cooling the liner to a temperature below said activation temperature and removing said second pressure from the liner whereby the liner maintains its generally, cylindrical shape.

5,091,138

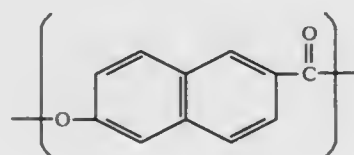
PRODUCTION OF WHOLLY AROMATIC POLYESTER FILM

Toshinori Ishii, Okayama, and Masanori Sato, Osaka, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Division of Ser. No. 365,729, Jun. 14, 1989, Pat. No. 5,053,481.
This application Jan. 31, 1991, Ser. No. 648,642
Claims priority, application Japan, Jun. 17, 1988, 63-150437
Int. Cl.⁵ B29C 47/20

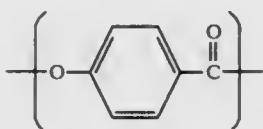
U.S. Cl. 264—564

7 Claims

1. A process for producing a wholly aromatic polyester film, which comprises melt-extruding a wholly aromatic polyester to form into a film under conditions that a shear rate applied in the machine direction to the wholly aromatic polyester in a molten state at the exit of the molding die is not less than 500 sec⁻¹, said wholly aromatic polyester consisting essentially of the following recurring units I and II



and



wherein the aromatic ring may be optionally substituted with at least one substituent selected from the group consisting of an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a halogen atom and a phenyl group, said wholly aromatic polyester comprising 10 to 90 mol % of the recurring unit I and 90 to 10 mol % of the recurring unit II, being capable of forming an optically anisotropic melt phase, and having a melt strength at a temperature 20 ° C. higher than its transition temperature to liquid crystal of at least 2.0 g/mm².

5,091,139

AUTOMATED THERMAL LIMIT MONITOR

Fred C. Chao, Saratoga, and William S. Rowe, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jun. 26, 1989, Ser. No. 371,365

Int. Cl.⁵ G21C 17/00

U.S. Cl. 376—216

18 Claims

1. A method of blocking in real time power increases on a reactor core as a function of minimum critical power ratio having discrete monitored rod bundle groups comprising the steps of:

providing initial local power range monitor readings to obtain reactor local power data in all core discrete monitored rod bundle groups via a plurality of vertical strings of local power range monitors, each string including a

plurality of power monitors disposed at differing elevations;

providing control rod position data from a group of control rods having positions of penetration with respect to said rod bundle group for the control of nuclear reaction in said rod bundle group;

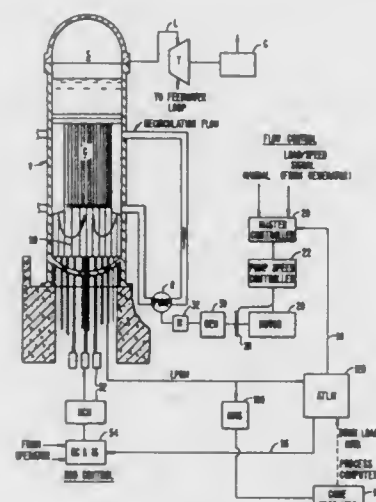
providing initial flow rate through said reactor core;

providing core average power data in the said reactor core;

utilizing said core average power data and said initial flow rate to determine operating limit minimum critical power ratio;

utilizing a reactor thermal limit output model to determine the worst initial regional minimum critical power ratio for said rod bundle group,

downloading the worst initial regional critical power ratio from the computing model to memory;



looking up at least one constant which is predetermined as a function of positions of withdrawal of said control rod, said constant constituting a bounding, substantially worst case scenario for all control rod withdrawals from said rod bundle groups;

computing a setpoint for said local power range monitor output based on said constant, said operating limit minimum critical power ratio, said initial local power range monitor reading, and said worst case initial regional minimum critical power ratio;

comparing said instantaneous local power range monitor to said setpoint; and

blocking said power increase responsive to violations of said setpoint.

5,091,140

METHOD OF REPLACING A HEATER NOZZLE IN A NUCLEAR REACTOR PRESSURIZER

Larry D. Dixon; Fred L. Snow, and Kenneth B. Stuckey, all of Forest, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 468,448, Jan. 22, 1990. This application Aug. 16, 1991, Ser. No. 745,790

Int. Cl.⁵ G21C 13/00

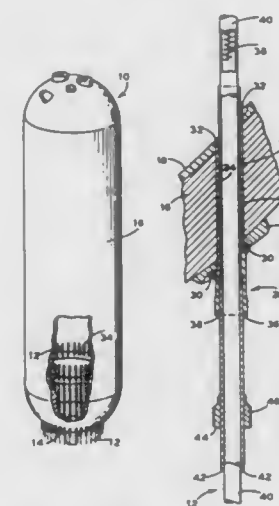
U.S. Cl. 376—260

2 Claims

1. A method of replacing a damaged heater nozzle in a nuclear reactor coolant system pressurizer wherein an electric heater extends into the pressurizer through the heater nozzle and bore in the wall of the pressurizer, comprising:

- removing the electric heater;
- removing the damaged heater nozzle;
- enlarging the bore in the wall of the pressurizer;
- installing an outer sleeve in the enlarged bore by welding it to the inner and outer surfaces of the pressurizer;
- installing an inner sleeve inside the outer sleeve so as to

extend into the pressurizer beyond the upper end of said outer sleeve and welding said inner sleeve to the lower end of said outer sleeve; and



f. installing an electric heater so as to extend through said inner sleeve into said pressurizer and welding said electric heater to the lower end of said inner sleeve.

5,091,141

DEVICE FOR INSERTING AND POSITIONING A TOOL INSIDE A HEAT EXCHANGER AND USE OF THIS DEVICE

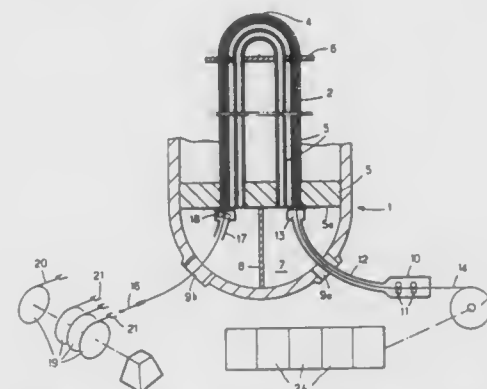
Patrice Feuillet, Marcy L'Etoile, France, assignor to Framatome, Courbevoie, France

Filed May 23, 1990, Ser. No. 527,554

Claims priority, application France, May 23, 1989, 89 06726
Int. Cl.⁵ G21C 19/00

U.S. Cl. 376—260

10 Claims



1. In a heat exchanger comprising a bundle of tubes (2) bent into a U shape, each of said tubes having two straight legs whose ends are fixed in holes passing through a tube plate (5) and a curved part (4) joining said two straight legs and, on one side of said tube plate (5), a water box (7) bounded by a face (5a) of said tube plate onto which ends of said tubes (3) open out, a device for inserting and positioning a tool inside a tube (3) comprising, outside said water box (7), a means (10) for pulling and pushing a guide conduit (12) connected to an exit end of said means for pulling and pushing (10), said guide conduit entering said water box (7) and being connected to a device (13) for positioning said guide conduit (12) in concordance with an end of any tube (3) opening out of said tube plate (5) and a transmission member (14) of elongate shape engaged in said means (10) for pulling and pushing to move it inside said guide conduit (12) and a tube (3) of said bundle comprising a component (16) for coupling to said tool (20) at an end of said

tool, and wherein said elongate transmission member (14, 20) comprises a central metal cable (31), a flexible peripheral sheath (32) having an external diameter smaller than an internal diameter of a tube of said bundle and a plurality of annular members (33) having an internal diameter larger than an external diameter of said sheath (32) and an external diameter smaller than said internal diameter of a tube of said bundle (3), said annular members being unjoined and being threaded in sequence onto said flexible sheath (32) of said transmission member in a number such that a total length of said annular members (33) when placed end to end is smaller than a length of said flexible sheath (32) by a length which is substantially equal to a length of a single said annular member (33).

5,091,142

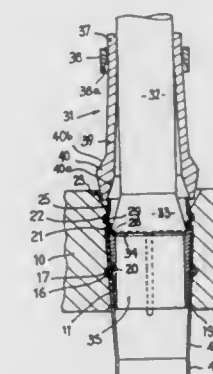
METHOD FOR EXTRACTING A LOCKING SLEEVE FROM A DEMOUNTABLE GUIDE TUBE OF A NUCLEAR REACTOR FUEL ASSEMBLY

Bernard Petit, L'Ermitage, France, assignor to Framatome, Courbevoie, France and Cogema, Velizy Villacoublay, France
Filed Sep. 19, 1989, Ser. No. 409,171

Claims priority, application France, Sep. 19, 1988, 88 12208
Int. Cl.⁵ G21C 19/32

U.S. Cl. 376—261

4 Claims



4. A method for extracting the locking sleeves (20) from all the guide tubes (4) of a demountable end block (5) of at least one fuel assembly of a nuclear reactor cooled by light water, said fuel assembly comprising a bundle of parallel fuel rods held inside a framework (9) formed by guide tubes (4), struts (3) and end blocks (5, 6) fixed onto ends of the guide tubes (4), at least one of the end blocks (5) being fixed onto one of the ends of each of the guide tubes (4) in a demountable manner, by means of an end part (4a) of the guide tube deformable radially and having a securing part (17) projecting gradually outwards, engaged inside and over a part of the length of an opening (11) passing through the end block (5) and comprising, in its part receiving the guide tube (4), an annular enlargement (16) receiving the securing part (17) of the guide tube (4), radial expansion of the end of the guide tube and holding of its securing part (17) inside the annular enlargement (16) of the opening (11) of the end block being ensured by a locking sleeve (20) comprising a part (24) for expanding the guide tube (4) and a ferrule (25) for fixing in the end block projecting at the end of the guide tube, in the locked position of the sleeve, inside a part of the opening (11) of the end block comprising at least one radial cavity (22) inside which at least one deformed part (29) of the fixing ferrule (25) is introduced by means of radial deformation of at least one zone of the ferrule (25) coinciding with the cavity (22), so as to ensure fixing of the locking sleeve (20) inside the end block (5), wherein, for all the locking sleeves of all the guide tubes, the following steps are performed simultaneously:

- deformation inwards of the at least one zone (25a, . . . 25f) of the fixing ferrules (25) comprising a radially projecting

deformed part (29), so as to extract the deformed parts (29) from the corresponding cavities (22); and
(b) extraction of the locking sleeves (20) by means of a pulling force axially of the guide tubes (4).

5,091,143

NATURAL CIRCULATION REACTOR

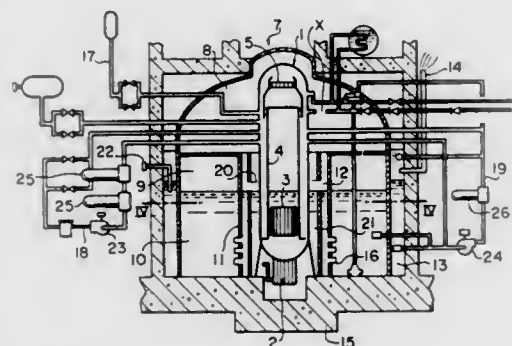
Hitoshi Tate; Fumio Totsuka; Tetuo Horiuchi, and Kumiaki Moriya, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,877

Claims priority, application Japan, Jun. 16, 1988, 63-148513
Int. Cl.⁵ G21C 15/18

U.S. Cl. 376—282

7 Claims



1. A natural circulation reactor providing natural circulation of coolant through a core without an external circulation force during normal operation of the reactor, comprising a reactor pressure vessel having the core housed therein and a reactor container having a wetwell and a drywell, said pressure vessel being located in a portion of the drywell centered in the wetwell, wherein the core is disposed at a position below a predetermined level of coolant in said pressure vessel so that a top portion of the core is maintained to be submerged below the coolant even in the event that any pipe connected to said pressure vessel is broken and a coolant level in said reactor pressure vessel is then lowered to the predetermined level by flushing as a result of pipe breakage.

5,091,144

BWR ZERO PRESSURE CONTAINMENT

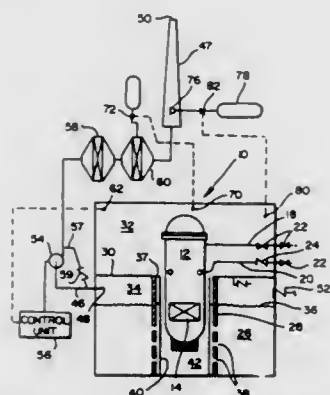
Charles W. Dillmann, Morgan Hill; Harold E. Townsend, Campbell, and Loyd B. Nesbitt, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 553,673, Jul. 10, 1990. This application Jul. 30, 1990, Ser. No. 560,410

Int. Cl.⁵ G21C 13/00

U.S. Cl. 376—283

34 Claims



1. In the operation of a nuclear reactor system, said system including a containment defining a drywell space wherein a nuclear reactor is disposed, there being a suppression pool in

the containment with the suppression pool having a wetwell space above a level of said pool to which any non-condensable gases entering the suppression pool can vent, the method of continuously ventilating the containment comprising continuously exhausting the wetwell space to remove gas mixture therefrom while admitting inflow of air from an atmospheric source thereof to said wetwell during normal operation but blocking off said inflow during a loss-of-coolant-accident whenever a pressure in the wetwell space is above a predetermined value, and subjecting the gas subsequent to its removal from the wetwell to a treatment operation to separate any particulate material entrained therein from the gas mixture.

5,091,145

GRID WITH HOLDING SPRINGS FOR A NUCLEAR FUEL ASSEMBLY

Bernard Petit, Saint Genis Laval, France, assignor to Framatome, Courbevoie and Compagnie Generale des Matieres Nucléaires, Velizy Villacoublay, both of, France

Filed Apr. 27, 1990, Ser. No. 515,124

Claims priority, application France, Apr. 28, 1989, 89 05724
Int. Cl.⁵ G21C 3/34

U.S. Cl. 376—441

7 Claims



1. A grid for holding and bracing fuel elements in a nuclear fuel assembly, comprising:

at least two sets of plates, the plates of a same one of said sets being mutually parallel and intersecting the plates of the other set for defining fuel element receiving cells, and a plurality of springs carried by said plates, each of said springs being formed as a U bent strip having two active legs formed with respective resilient parts, situated each on one side of a same plate, for bearing on fuel elements occupying two mutually adjacent cells separated by the plate and connected together by a loop located over the plate,

wherein the legs of each of said springs are joined together by a single weld located at the base of the loop and by means mechanically locking the legs with respect to each other and with respect to the respective plate, said means being located opposite the weld with respect to the resilient part of the legs and being arranged to hold an end portion of each of the two legs flat against the plate.

5,091,146

STEAM VENT TUBE FOR BWR FUEL ASSEMBLY

Gary E. Dix, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Mar. 20, 1991, Ser. No. 672,297

Int. Cl.⁵ G21C 3/30

U.S. Cl. 376—443

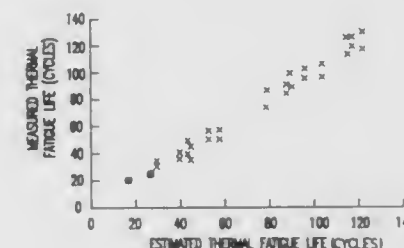
21 Claims

1. In a fuel bundle for a boiling water reactor having: a plurality of vertically aligned spaced apart fuel rods for form-

ing a fuel rod group within said fuel bundle for generation of a fission reaction in the presence of water moderator, a lower tie plate for admitting water moderator through said lower tie plate to the interstitial volume between said fuel rods and supporting said vertically aligned and spaced apart fuel rods, an upper tie plate for permitting water and steam to be discharged from the top of the fuel bundle and maintaining said vertically aligned and spaced apart fuel rods in upstanding spaced apart side-by-side relation, a surrounding fuel channel for confining moderator flow along a path over the fuel rods and from said lower tie plate to said upper tie plate; at least one of said fuel rods being a part length rod extending from the lower tie plate vertically less than the full length to the upper tie plate ending interior of the fuel bundle at a disposition wherein the upper end of the part length rods defines with

0.3–1.0% Mn, not more than 0.04% P, not more than 0.04% S, 15–22% Cr, 1.0–2.0% Nb, with the balance being Fe and incidental impurities,

wherein said cast steel has Nb bonded with at least one of C and N to form at least one of niobium carbide and niobium



nitride, respectively, and wherein the bonding of Cr and N to form chromium nitride and the bonding of Cr and C to form chromium carbide have been substantially avoided.

5,091,148

TITANIUM ALLOY DENTAL RESTORATIONS

Arun Prasad, Chesire, Conn., assignor to Jeneric/Pentron, Inc., Wallingford, Conn.

Filed Jan. 2, 1991, Ser. No. 636,912

Int. Cl.⁵ C22C 14/00

U.S. Cl. 420—417

11 Claims

1. A titanium dental restoration having improved resistance to corrosion and/or oxidation under conditions of use in the mouth, comprising a molded alloy of a biocompatible base titanium alloy, having alloyed therewith from about 0.01% to 5.0% by weight of at least one metal selected from the group consisting of noble metals, rhenium, yttrium, hafnium and cerium.

5,091,149

MANUFACTURING METHOD OF ALUMINUM-LITHIUM ALLOY BY ATMOSPHERIC MELTING

Myung C. Shin; Keun Y. Sohn; Young H. Chung, all of Seoul; Young Y. Lee, and Tai W. Park, both of Daejeon, all of Rep. of Korea, assignors to Korea Institute of Science & Technology, Seoul, Rep. of Korea

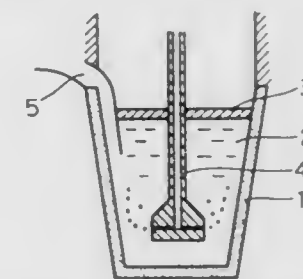
Filed Mar. 21, 1991, Ser. No. 673,146

Claims priority, application Rep. of Korea, Jun. 16, 1990, 8873/1990

Int. Cl.⁵ C22C 1/00, 21/00

U.S. Cl. 420—528

3 Claims



1. A method for manufacturing aluminum-lithium alloy by atmospheric melting, wherein:

5,091,147

HEAT-RESISTANT CAST STEELS

Kouki Ohtsuka; Kimio Kubo, both of Tochigi; Koichi Akiyama, Tokyo; Masahide Ike, and Kunio Kawai, both of Kanagawa, all of Japan, assignors to Hitachi Metals, Ltd. and Nissan Motor Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 402,034, Sep. 5, 1989, abandoned. This application Nov. 30, 1990, Ser. No. 619,953

Claims priority, application Japan, Sep. 5, 1988, 63-220414; Sep. 5, 1988, 63-220415; Oct. 14, 1988, 63-257280

Int. Cl.⁵ C22C 38/26, 38/22

U.S. Cl. 420—68

24 Claims

1. A heat-resistant cast steel consisting essentially of, on a weight basis 0.12–0.20% C, 0.01–0.10% N, 0.4–2.0% Si,

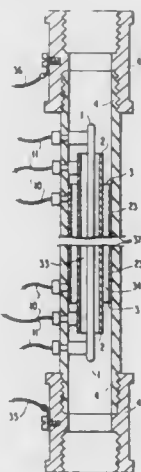
aluminum and other alloy materials except metal lithium are melted within atmospheric and in a state that surface of said molten metal is covered with a flux, a primary degassing process is executed by utilizing generally used degassing agent and then;

molten metal of aluminum-lithium alloy is manufactured by adding metal lithium covered with aluminum and successively;

secondary degassing process of molten metal is executed by burying gas bubbler into the molten metal and blowing inert gas therein; and then

in a process for pouring the molten metal into casting mold maintained with inert ambient environment, tertiary degassing process is executed by flowing inert gas to hermetically sealed pouring liquid path of hermetically sealed molten metal so that ingot of good aluminum-lithium alloy is manufactured.

- A. C. current generating means for generating an A.C. current having a predetermined magnitude, frequency and waveform being selected to destroy a predetermined living organism;
- a chamber for containing a fluid having the predetermined living organism therein, said chamber comprising a first



cylindrical electrode disposed in said chamber, a second rod-shaped electrode disposed in said chamber and along a central axis of said first cylindrical electrode, and a cylindrical third electrode, disposed between said first and second electrodes, which is connected to said A.C. current generating means, said first cylindrical and second rod-shaped electrodes each being connected to receive said current generated from said A.C. current generating means.

5,091,150 ZINC-ALUMINIUM BASED ALLOY FOR COATING STEEL PRODUCTS

Massimo Memmi, and Gelasio Giardetti, both of Rome, Italy, assignors to Nuova Italsider SpA, Genoa, Italy
Continuation of Ser. No. 324,542, Mar. 16, 1989, abandoned, which is a continuation of Ser. No. 66,935, Jun. 26, 1987, abandoned. This application Sep. 6, 1990, Ser. No. 579,261
Claims priority, application Italy, Jul. 14, 1986, 48263 A/86
Int. Cl.⁵ C22C 21/10; B32B 15/01

U.S. Cl. 420—541 3 Claims
1. A corrosion-resistant alloy suitable for hot-dip coating steels, consisting essentially of
aluminum: about 70% by weight
silicon: 0.05 to 0.5% by weight
magnesium: 0.01 to 0.5% by weight,
balance essentially zinc.

5,091,151
Patent Not Issued For This Number

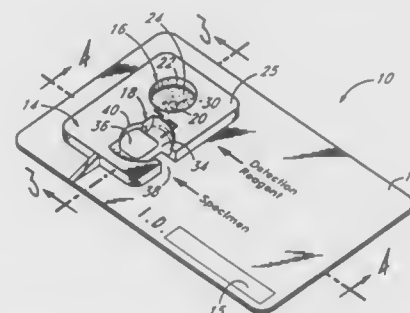
5,091,152
APPARATUS FOR ELECTRICALLY DESTROYING
TARGETED ORGANISMS IN FLUIDS
Tim L. Thomas, Sr., 2350 Great Southwest Pkwy., Fort Worth, Tex. 76106

Filed May 19, 1988, Ser. No. 195,752
Int. Cl.⁵ A61L 2/02 18 Claims
1. Apparatus for destroying a predetermined living organism in a fluid comprising:

5,091,153
CHEMICAL ANALYSIS TEST DEVICE
Steve S. Bachand, Laguna Niguel, Calif., assignor to Toxi-Lab Incorporated, Irvine, Calif.
Filed Oct. 11, 1990, Ser. No. 595,976
Int. Cl.⁵ G01N 31/22

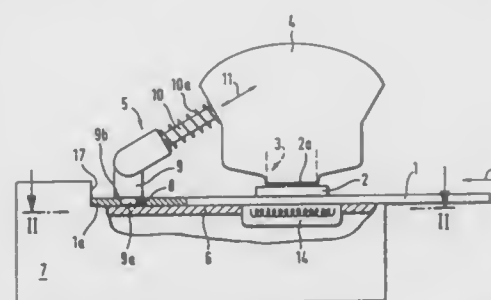
U.S. Cl. 422—58 13 Claims
1. A chemical analysis testing system for detecting the presence of a given chemical in a specimen of biological fluid, comprising:
a swab having an absorbent head portion and a handle portion; and
a test device, comprising:
a base;
a reagent retaining material secured to said base for storing a reagent which will give a visual indication if it is exposed to said given chemical;
a concentration chamber below said reagent retaining material at least partially formed by the surfaces of said

- base, said chamber shaped so that any gases or vapors rising from the bottom of said chamber are concentrated by said surfaces as they rise;
- a passage between said concentration chamber and said reagent retaining material;
- a first well at least partially formed by the surfaces of said base for receiving said head of said swab after it has been saturated with biological fluid, said first well having a bottom surface which defines an opening, said first well being sized and shaped so as to wring said biological fluid from said head upon the insertion of said head into said first well and direct said wrungout biological fluid toward said opening;



a strip of wicking material secured to said base interconnecting said opening and said concentration chamber, a portion of said strip forming the bottom of said concentration chamber, wherein said strip transports biological fluid from said opening to said bottom of said concentration chamber, said strip being chemically pre-treated with an agent which volatilizes said given chemical, so that if an amount of said given chemical is present in said biological fluid, said agent volatilizes said amount of said given chemical, causing at least a portion of said amount of said given chemical to rise from the bottom of said concentration chamber, whereupon said portion is concentrated by said surfaces of said base and is directed towards said passage and said reagent retaining material.

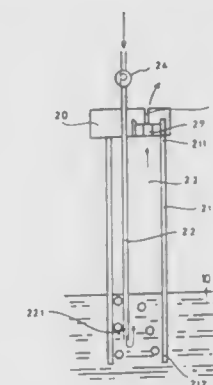
5,091,154
TEST CARRIER ANALYSIS SYSTEM
Manfred Pauli, and Rudolf Schüssler, both of Mannheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed Dec. 27, 1989, Ser. No. 456,147
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1988, 3844103
Int. Cl.⁵ G01N 21/01 14 Claims
U.S. Cl. 422—63



1. Evaluation apparatus for detecting a detectable change of a test carrier caused by contacting the test carrier with a fluid sample
said apparatus comprising: detecting means for detecting a detectable change,
and positioning means for accurately positioning a test layer

of a test carrier having a front end, a rear end and at least one recess located intermediate the front end and the rear end in a relationship to the detecting means in a measurement position,
said positioning means including rest means for supporting the test carrier in the measurement position at least in the vicinity of a recess in a level plane, stop means for positioning the front end of the test carrier when the front end is inserted into the apparatus to abut against the stop means, and fixing means connected to an actuating element for positive penetrating engagement with the test carrier recess when the test carrier is in the measurement position, said fixing means including a bit stop which limits the depth of penetration of the fixing means into the recess, said fixing means also including means for simultaneously transmitting force from the actuating element to the test carrier to force-load the test carrier both parallel to the surface thereof in the direction toward said stop means and normal to the surface thereof in a direction toward said rest means.

5,091,155
ALCOHOL CONCENTRATION SENSOR
Hideto Takayama; Yoshihiro Tsuruoka; Takashi Matsuzawa, and Hirono Nagae, all of Tokyo, Japan, assignors to Nemoto & Co., Ltd. and Toppan Printing Co., both of Tokyo, Japan
Filed Oct. 23, 1989, Ser. No. 425,631
Claims priority, application Japan, Oct. 24, 1988, 63-267825; Jul. 31, 1989, 1-198780; Jul. 31, 1989, 1-198781; Jul. 31, 1989, 1-198782; Aug. 8, 1989, 1-203959; Aug. 8, 1989, 1-203960
Int. Cl.⁵ G01N 25/20, 31/12 14 Claims
U.S. Cl. 422—88



9. An alcohol concentration sensor comprising:
a tubular member having a top end closing means for closing a top end portion of the tubular member, and wherein the bottom end of the tubular member remains open;
a gas supply tube means which penetrates said top end closing means to extend down into said tubular member, wherein said gas supply tube means is provided with an air blower means, and having the lower end thereof terminate slightly higher than the bottom end of said tubular member, wherein said lower end of said gas supply tube means is soaked into a liquid containing water and alcohol, of which the alcohol concentration is required to be determined, deeply sufficient to allow the air bubbles flown out of the gas supply tube means into said liquid to absorb sufficient quantity of alcohol contained in said liquid, whenever said tubular member is soaked in said liquid;
a gas drawing out means for drawing out gas from said liquid, wherein said gas drawing out means penetrates said top end closing means and which has a filter for filtering water particles;
a gas temperature sensing means connected to said gas drawing out means, said gas temperature sensing means having a gas oxidization means, wherein said temperature sensing

means determines the temperature of the gas in the neighborhood of the gas oxidization means for oxidizing the alcohol evaporated from said liquid;
 a temperature/alcohol concentration calibration means for calibrating said temperature of the gas toward the corresponding alcohol concentration; and
 an alcohol concentration output means for outputting the alcohol concentration determined by said temperature/alcohol concentration calibration means.

5,091,156

WATERWALLS IN A FLUIDIZED BED REACTOR

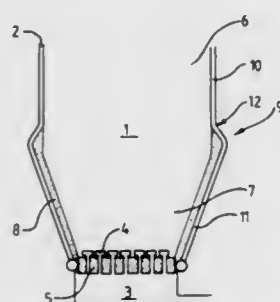
Lasse K. Ijas; Aimo I. Asikainen, both of Varkaus, Finland; Arto V. I. Hotta; Nell Raskin; James Stone; Gregory Beavers, and David Watson, all of San Diego, Calif., assignors to A. Ahlstrom Corporation, Karhula, Finland

Filed Feb. 13, 1989, Ser. No. 309,563

Int. Cl.⁵ F27B 15/06, 15/16; B01J 8/18

U.S. Cl. 422-146

23 Claims



1. A reactor chamber in a fluidized bed reactor having a bottom, inside, and outside, and comprising:
 a grid at the bottom of the reactor chamber;
 walls defining the interior of the reactor chamber and including upper, lower, and intermediate sections;
 said upper section comprising a waterwall including a plurality of tubes attached by fins or plates therebetween to define an upper waterwall, said upper waterwall disposed above said intermediate wall section, and extending substantially vertically;
 said lower wall section having an inner surface of refractory material;
 said intermediate section extending from said upper waterwall and terminating adjacent the inner surface of refractory material of said lower wall section, and
 said waterwall at said intermediate section bends outwardly from said upper section, and then bends back inwardly behind said refractory inner wall of said lower section;
 means for minimizing erosion of said intermediate waterwall section, comprising the waterwall in said intermediate section bent outwardly from said inside of said upper waterwall of said reactor chamber at an angle to vertical.

5,091,157

RECYCLE CONDUIT INSULATION ASSEMBLY

Harold L. Byerly, Houston, and Bruno R. Kuhn, Nassau Bay, both of Tex., assignors to Rollins Environmental Services (TX) Inc., Deer Park, Tex.

Filed Apr. 30, 1990, Ser. No. 516,484

Int. Cl.⁵ B01J 8/10

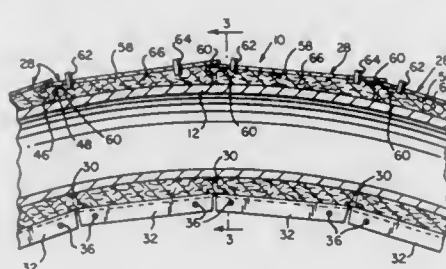
U.S. Cl. 422-209

16 Claims

1. For use with a rotary having rotation, horizontally-oriented cylindrical chamber for burning materials therein, a quantity of particulate, inorganic material within said chamber for conveying heat energy to material to be burned, and a helical, substantially cylindrical conduit extending about said chamber and communicating with opposite ends thereof for conveying said particulate material from one end of said cham-

ber to an opposite and thereof as said chamber rotates, an insulation assembly comprising:

means forming a plurality of shell elements for substantially enclosing said conduit in a spaced relation therefrom, thereby forming an insulating space between said shell means and said conduit, said shell elements being arranged in overlapping relation along said conduit;



means for mounting said shell elements on said conduit, whereby said shell elements slide relative to each other in response to longitudinal movement of said mounting means in response to thermal stresses imposed on said conduit; and
 means, contained within said insulating space, for providing an insulating layer to said conduit.

5,091,158

AUTOCLAVE FOR STERILIZING WASTE USING AN AIR-LOCK

Stefan Drauschke, and Michaela Birkholz, both of Berlin, Fed. Rep. of Germany, assignors to K-E-G Krankenhaus-Entsorgungsgesellschaft m.b.H., Berlin, Fed. Rep. of Germany

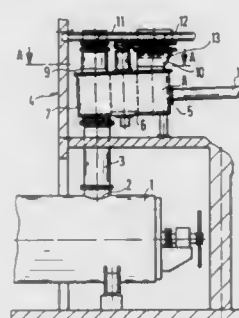
Filed Dec. 4, 1989, Ser. No. 445,785

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1988, 3841076

Int. Cl.⁵ A61L 2/08, 11/00, 2/04, 2/06

U.S. Cl. 422-295

15 Claims



1. In an autoclave for sterilizing waste having a stirrer and a vertically extending loading opening, the improvement comprising:

a horizontally disposed pressure lock connected to the vertically extending loading opening, the pressure lock having a casing enclosing a horizontally moveable member, the casing having at least one vertically extending filling opening defined therein, and closure means disposed at the top of each of said filling openings for sealing said filling opening in a pressure-tight manner, the casing and the moveable member defining at least one chamber moveable between a filling position and a loading position, and means for selectively moving the chamber between the filling position, wherein the chamber is in communication with the filling opening and isolated from the loading opening, and the loading position wherein the chamber is in communication with the loading opening and isolated from the filling opening.

5,091,159

USE OF DEXTRAN AS A FILTRATION AID FOR THICKENER OVERFLOW FILTRATION IN KELLY FILTERS IN THE BAYER PROCESS

Lawrence J. Connelly, Oak Lawn, Ill.; Steven J. Abbatello, San Antonio, Tex.; David C. Davis, Chesterfield, Mo., and David A. Undlin, Victoria, Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 10, 1991, Ser. No. 714,941

Int. Cl.⁵ C01F 7/00

U.S. Cl. 423-122

2 Claims

1. In the Bayer process for producing alumina from bauxite of the type wherein the bauxite is added to a caustic solution to produce a slurry of sodium aluminate solution and an insoluble red mud fraction which is then subjected to a thickener and separation steps to produce a thickener overflow, wherein said thickener overflow results from solid liquid separation, whereby said thickener overflow is then subjected to a filter press which contains a filter aid to polish the thickener overflow the improvement which comprises adding to the thickener overflow and the filter aid as the only treating agent from 0.05 to 15 mg/l of dextran.

5,091,161

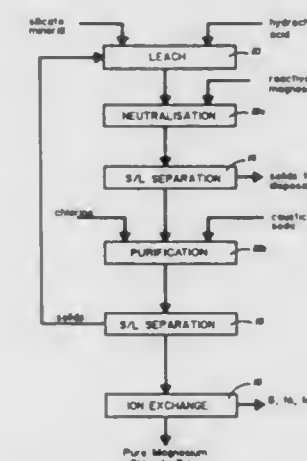
PRODUCTION OF PURE MAGNESIUM CHLORIDE SOLUTION FROM SILICEOUS MAGNESIUM MINERALS

G. Bryn Harris, Beaconsfield, and John G. Peacey, Lancaster, both of Canada, assignors to Noranda, Inc., Toronto, Canada
 Continuation-in-part of Ser. No. 279,812, Dec. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 102,377, Sep. 29, 1987, Pat. No. 4,800,003. This application Aug. 20, 1990, Ser. No. 570,301

Claims priority, application Canada, Nov. 21, 1986, 523608
 Int. Cl.⁵ C01F 5/30

U.S. Cl. 423-163

9 Claims



1. A process for the production of a magnesium chloride liquor from siliceous magnesium minerals comprising the steps of:

- continuously adding the siliceous magnesium mineral and a hydrochloric acid solution to a first stage reaction vessel and reacting the siliceous magnesium mineral and the hydrochloric acid solution to form a slurry at a temperature higher than 50° C. but below the boiling point of said slurry and in such a manner as to maintain the pH of the slurry below 1.5 thereby extracting magnesium from the siliceous magnesium mineral and preventing the formation of silica gel;
- continuously transferring the slurry from step (a) into a second stage reaction vessel and continuously adding a reactive magnesia to said second stage reaction vessel to react with said slurry and to maintain the pH of the slurry in the range of 4.0-7.0 in the second reaction vessel thereby precipitating substantially all the impurities from said slurry while preventing silica gel formation; and
- continuously transferring the slurry from step (b) to filtration equipment and performing a solid/liquid separation of the slurry from step (b) on said filtration equipment to obtain a magnesium chloride liquor.

5,091,162

PERHYDROSILOXANE COPOLYMERS AND THEIR USE AS COATING MATERIALS

Cecil L. Frye; Loren A. Haluska, both of Midland, Mich.; Keith D. Weiss, Cary, N.C., and Ronald H. Baney, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 1, 1990, Ser. No. 590,751

Int. Cl.⁵ C01B 31/113

U.S. Cl. 423-325

12 Claims

6. A method of forming a ceramic coating on a substrate comprising:
 coating the substrate with a solution comprising a solvent and a perhydrosiloxane copolymer of the chemical formula:



5,091,160

USE OF MICROWAVE RADIATION TO ELIMINATE FOAM IN ORE LEACHING

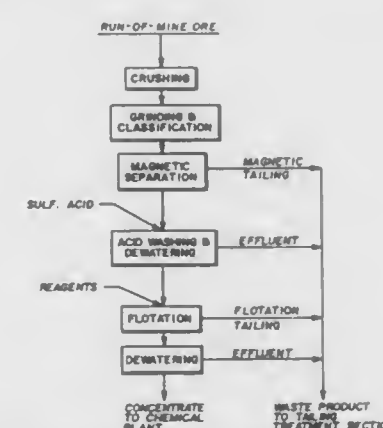
Peter D. Kondos; Kazi E. Haque, both of Ottawa; John C. MacDonald, Nepean; Wesley F. Griffith, Gloucester; Daniel Laforest, Nepean, and Joe Iuliano, Brampton, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Canada

Filed Nov. 5, 1990, Ser. No. 608,684

Int. Cl.⁵ C01F 1/00

U.S. Cl. 423-131

2 Claims



1. A method for leaching beryllium hydroxide from a crude ore containing said beryllium hydroxide comprising:

- forming an ore concentrate from said crude ore;
- mixing said concentrate with a sulphuric acid to form a slurry, whereby reaction of said acid with said concentrate produces gaseous reaction products which form an undesirable corrosive foam layer on the surface of said slurry; and
- eliminating said undesirable foam layer and heating said slurry by irradiation with microwaves.

wherein the mole fractions x and y total 1;
evaporating the solvent to deposit a preceramic coating on the substrate; and
subjecting the preceramic coating to a temperature sufficient to facilitate conversion of the preceramic coating to a ceramic coating.

5,091,163
PARTIALLY PROTONATED SODIUM-ZSM-5 METHOD OF MAKING

Anne M. Gaffney, and John A. Sofranko, both of West Chester, Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jul. 3, 1989, Ser. No. 375,214
Int. Cl.⁵ C01B 33/39

U.S. Cl. 423—328 **1 Claim**
1. The method of preparing a crystalline ZSM-5 zeolite having protonated sites external to the pores and having exchangeable cation sites within the pores which comprises contacting a crystalline ZSM-5 zeolite having exchangeable Na^+ cation sites both within the pores and external to the pores with an aqueous solution of $(n\text{-butyl})_3\text{N}\cdot\text{HCl}$ at 50–150° C. for 10 minutes to 5 hours, and protonating essentially only exchangeable sites external to the pores while protonating substantially none of the exchangeable sites internal to the pores.

5,091,164
POROUS CARBON-CARBON COMPOSITE AND PROCESS FOR PRODUCING THE SAME

Minoru Takabatake, Kamisumachi, Japan, assignor to Petoca Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 247,238, Sep. 21, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 453,105
Claims priority, application Japan, Sep. 22, 1987, 62-238221
Int. Cl.⁵ C01B 31/02

U.S. Cl. 423—445 **2 Claims**
1. A process for producing a porous carbon-carbon composite consisting essentially of pressure-molding a carbonaceous raw material consisting of from 60 to 90% by weight of a carbon fiber in short fiber form having a fiber diameter of 2.5 to 32 microns and a fiber length of not longer than 2 mm and not shorter than 30 microns and from 40 to 10% by weight of a pitch ground to 60 to 200 mesh and having a softening point of not lower than 220° C. at a temperature in the range of 5° to 100° C. lower than the softening point of said pitch at a pressure in the range of from 80 to 400 kg/cm², carbonizing the resulting product under an inert atmosphere substantially at atmospheric pressure to give a carbonized product having a porosity of 25 to 65%, wherein said pressure-molding is performed substantially in the absence of water.

5,091,165
CALCIUM HYPOCHLORITE PRODUCT

John H. Shaffer, James K. Melton, and Garland E. Hilliard, all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation of Ser. No. 353,572, May 18, 1989, abandoned.
This application Jul. 23, 1990, Ser. No. 560,490
Int. Cl.⁵ C01B 11/06

U.S. Cl. 423—474 **4 Claims**
1. A process for producing a neutral calcium hypochlorite cake which comprises reacting lime with a chlorinating agent consisting of a hypochlorous acid solution containing at least 35 percent by weight of HOCl at a temperature in the range of from about 15° to about 40° C. to produce a slurry of calcium hypochlorite dihydrate having a solids concentration of from about 5 to about 20 percent, and separating a mother liquor to produce a neutral calcium hypochlorite cake consisting essentially of calcium hypochlorite and water, the cake having less than about 5 percent by weight of all inert materials of which

less than about 1.5 percent by weight is an alkali metal chloride.

5,091,166
PROCESS FOR THE PRODUCTION OF CHLORINE DIOXIDE

Jörgen Engström, Bergforsen, and Maria Norell, Sundsvall, both of Sweden, assignors to Eka Nobel AB, Surte, Sweden
Filed Sep. 4, 1990, Ser. No. 576,949

Claims priority, application Sweden, Aug. 31, 1990, 9002801
Int. Cl.⁵ C01B 11/02; D21C 9/12

U.S. Cl. 423—478 **11 Claims**
1. In a process of producing chlorine dioxide by reducing alkali metal chlorate with hydrogen peroxide as the reducing agent in an aqueous reaction medium containing sulfuric acid, said reaction medium maintained in a single reaction vessel under subatmospheric pressure, the process including the steps of maintaining said reaction medium at its boiling point at a temperature of from about 50° C. to about 100° C. to evaporate water from said reaction medium and provide a gaseous mixture containing steam, oxygen and chlorine dioxide;
removing said gaseous mixture from said single reaction vessel, recovering an aqueous solution of chlorine dioxide from said removed mixture;
maintaining substantially steady state conditions in said reaction medium by continuously feeding said alkali metal chlorate, hydrogen peroxide and sulfuric acid into said reaction medium to make up chemicals consumed in said reducing step and to maintain a total acid normality in said reaction medium within the range of from about 2 to about 5N;
maintaining the liquid level in said single reaction vessel substantially constant by balancing water fed to the single reaction vessel with water removed therefrom;
continuously depositing alkali metal sulfate salt from said reaction medium after the reaction medium becomes saturated thereby after the initial start up of the process, and removing said deposited alkali metal salt from said single reaction vessel;
wherein said process is carried out in the absence of a catalyst.

5,091,167
PROCESS FOR THE PRODUCTION OF CHLORINE DIOXIDE

Jörgen Engström, Bergforsen, and Helena Falgén, Sundsvall, both of Sweden, assignors to Eka Nobel AB, Surte, Sweden
Filed Sep. 4, 1990, Ser. No. 576,948

Claims priority, application Sweden, Aug. 31, 1990, 9002802
Int. Cl.⁵ C01B 11/02

U.S. Cl. 423—478 **9 Claims**
1. In a process of producing chlorine dioxide by reducing alkali metal chlorate with hydrogen peroxide as the reducing agent in an aqueous reaction medium containing sulfuric acid, said reaction medium maintained in a single reaction vessel under subatmospheric pressure, the process including the steps of maintaining said reaction medium at its boiling point at a temperature of from about 50° C. to about 100° C. to evaporate water from said reaction medium and provide a gaseous mixture containing steam, oxygen and chlorine dioxide;
removing said gaseous mixture from said single reaction vessel, recovering an aqueous solution of chlorine dioxide from said removed mixture;
maintaining substantially steady state conditions in said reaction medium by continuously feeding said alkali metal chlorate, hydrogen peroxide and sulfuric acid into said reaction medium to make up chemicals consumed in said reducing step and to maintain a total acid normality in said reaction medium within the range of from about 5N to about 11N;
maintaining the liquid level in said single reaction vessel

substantially constant by balancing water fed to the single reaction vessel with water removed therefrom;
continuously depositing alkali metal sulfate salt from said reaction medium after the reaction medium becomes saturated thereby after the initial start up of the process, and removing said deposited alkali metal salt from said single reaction vessel;
wherein said process is carried out in the substantial absence of added chloride ions.

5,091,168
PREPARATION OF ANHYDROUS NIOBIUM AND TANTALUM PENTAFLUORIDES

Mario J. Nappa, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1990, Ser. No. 567,815
Int. Cl.⁵ C01G 35/02

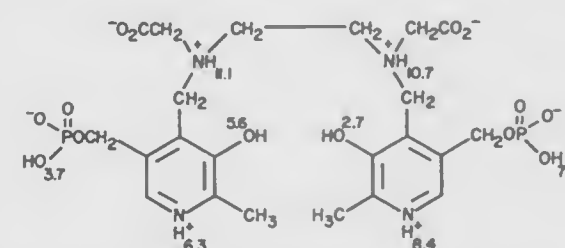
U.S. Cl. 423—489 **12 Claims**
1. A process for the preparation of an anhydrous niobium or tantalum pentafluoride comprising the steps of:
(a) contacting niobium or tantalum pentoxide or oxyhalide in the presence of an excess of hydrogen fluoride at about 50° C. to about 200° C. for sufficient time to convert at least some of said niobium or tantalum pentoxide or oxyhalide to niobium or tantalum pentafluoride wherein said contacting is performed without pentafluoride addition and in the presence of an effective amount of a dehydrating agent to react with any water formed; and
(b) recovering anhydrous niobium or tantalum pentafluoride.

5,091,169
DIPYRIDOXYL PHOSPHATE NMRI CONTRAST AGENT COMPOSITIONS

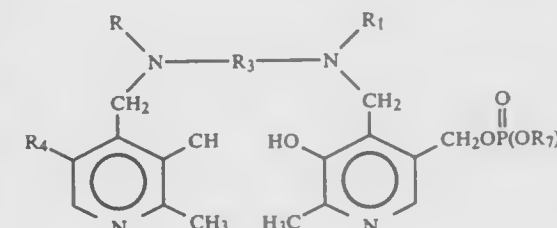
Scott M. Rocklage, Saratoga, and Steven C. Quay, Los Altos Hills, both of Calif., assignors to Salutar, Inc., Sunnyvale, Calif.

Division of Ser. No. 47,614, May 8, 1987, Pat. No. 4,993,456.
This application Jun. 23, 1989, Ser. No. 370,429

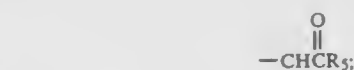
Int. Cl.⁵ A61K 49/00; C07F 1/02, 3/04, 13/00
U.S. Cl. 424—9 **20 Claims**



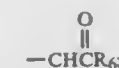
1. An NMRI contrast medium composition consisting essentially of a chelate of a compound of the formula I with a metal ion having an atomic number within the range of 21 to 29, 42, 44 or 58–70 and a pharmaceutically acceptable, compatible excipient:



wherein:
R is hydrogen or



R_1 is hydrogen or



with the proviso that at least one of R and R_1 is other than hydrogen;
 R_5 and R_6 are each, independently, hydroxy, alkoxy having from 1 to 18 carbons, hydroxy-substituted alkoxy having from 1 to 18 carbons, amino, or alkylamido having from 1 to 10 carbons;
 R_3 is alkylene having from 1 to 8 carbons, 1,2-cycloalkylene having from 5 to 8 carbons, or 1,2-arylene having from 6 to 10 carbons;
 R_4 is hydrogen, hydroxymethyl, alkyl having from 1 to 6 carbons, or



each R_7 is, independently, hydrogen, hydroxy-substituted alkyl having from 1 to 18 carbons, or aminoalkyl having from 1 to 18 carbons; or a physiologically biocompatible inorganic or organic cation salt of said chelating compound.

5,091,170
FERTILITY PREDICTION BY USE OF CLOMIPHENE CHALLENGE TEST

Daniel Navot, Virginia Beach, Va. 23464

Continuation of Ser. No. 26,879, Mar. 17, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,780

Int. Cl.⁵ A61K 49/00 **21 Claims**

1. A method for predicting the fertility or infertility of a human female patient which comprises administering clomiphene to said patient during the period of days 2–9 of said patient's menstrual cycle, measuring the follicle stimulating hormone response level of said patient during the period of days 9–11 of said patient's menstrual cycle, and comparing said response level to normal response levels, wherein a response level significantly greater than normal response levels is predictive of infertility and a response level within normal response levels is predictive of fertility.

5,091,171
AMPHOTERIC COMPOSITIONS AND POLYMERIC FORMS OF ALPHA HYDROXYACIDS, AND THEIR THERAPEUTIC USE

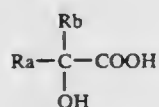
Ruey J. Yu, 4 Lindenwood Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 3 Hidden La., Abington, Pa. 19001

Filed Aug. 15, 1989, Ser. No. 393,749
Int. Cl.⁵ A61K 23/30, 31/70, 31/66

(1) U.S. Cl. 424—642 **20 Claims**
1. A composition comprising in combination an amphoteric or pseudoamphoteric agent and an alpha hydroxyacid, an alpha ketoacid or a related compound present in a therapeutically effective amount in a pharmaceutically acceptable vehicle for topical treatment of cosmetic conditions or dermatologic disorders, said amphoteric or pseudoamphoteric agent being at least one member selected from the group consisting of amino acids, dipeptides, polypeptides, proteins, creatine, aminoalldonic acid, aminouronic acids, lauryl aminopropylglycine, aminoalldaric acids, neuraminic acid, desulfated heparin, deacetylated hyaluronic acid, hyalobiuronic acid, chondrosine,

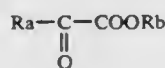
deacetylated chondroitin, creatinine, stearamidoethyl diethylamine, stearamidoethyl diethanolamine, stearaminopropyl dimethylamine, cocoamphoglycino cocoamphopropionate, cocoampho, propylsulfonate, phosphatidyl, ethanol-amine, phosphatidylserine and sphingomyelin, and zinc oxide and aluminum oxide, said amphoteric or pseudoamphoteric agent being present in a concentration effective to form an amphoteric or pseudoamphoteric system with said alpha hydroxyacid, alpha ketoacid or related compound;

said alpha hydroxyacid being at least one member selected from the group consisting of alkyl alpha hydroxyacid, aralkyl and aryl alpha hydroxyacid, polyhydroxy alpha hydroxyacid and polycarboxylic alpha hydroxyacid having the following chemical structure:



wherein Ra and Rb are H, F, Cl, Br, alkyl, aralkyl or aryl group of saturated or unsaturated, isomeric or non-isomeric, straight or branched chain, having 1 to 25 carbon atoms, or cyclic form having 5 or 6 ring members, and in addition Ra and Rb may carry OH, CHO, COOH and alkoxy group having 1 to 9 carbon atoms, said alpha hydroxyacid existing as a free acid or lactone form, or in salt form with an organic base or an inorganic alkali, and as stereoisomers, and D, L, and DL forms when Ra and Rb are not identical;

said alpha ketoacid being at least one member selected from a group of compounds represented by the following chemical structure:



wherein Ra and Rb are H, alkyl, aralkyl or aryl group of saturated or unsaturated, isomeric or non-isomeric, straight or branched chain, having 1 to 25 carbon atoms, or cyclic form having 5 or 6 ring members, and in addition Ra may carry F, Cl, Br, I, OH, CHO, COOH and alkoxy group having 1 to 9 carbon atoms, said alpha ketoacid existing as a free acid or an ester form, or in a salt form with an organic base or an inorganic alkali; and said related compound being at least one member selected from the group consisting of ascorbic acid, quinic acid, isocitric acid, tropic acid, trethocanic acid, 3-chlorolactic acid, cerebronic acid, citramalic acid, agaricic acid, 2-hydroxynervonic acid, aleuritic acid and pantoic acid.

5,091,172

COSMETIC USE OF 3-INDOLEPYRUVIC ACID

Vincenzo Politi; Giovanna De Luca; Giovanni Di Stazio, and Mario Materazzi, all of Rome, Italy, assignors to Polifarma S.p.A., Rome, Italy

Filed Aug. 6, 1990, Ser. No. 562,842

Claims priority, application Italy, Aug. 8, 1989, 48285 A/89
Int. Cl.⁵ A61K 7/40, 7/42, 7/48

U.S. Cl. 424—59

3 Claims

1. A method for the protection of the skin from damage caused by oxygen, by exposure to the sun and by aging, comprising applying to the skin an amount sufficient to protect the skin, of 3-indolepyruvic acid.

5,091,173

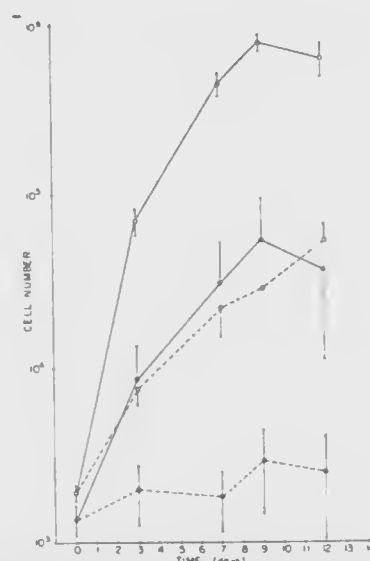
HAIR GROWTH COMPOSITION

Travis E. J. Buultjens; Stephen W. Hellens, both of Dundee; Colin A. B. Jahoda; Roy F. Oliver, both of Fife, and Anne P. Withers, Dundee, all of Scotland, assignors to The University of Dundee, Dundee, Scotland

Continuation-in-part of Ser. No. 373,727, Jun. 29, 1989, abandoned. This application May 22, 1990, Ser. No. 525,171
Int. Cl.⁵ A61K 7/06

U.S. Cl. 424—70

12 Claims



1. A composition suitable for topical application to mammalian skin or hair, comprising an amount of a cell-free supernatant from a culture of dermal papilla cells which is sufficient to increase hair growth in mammals, the dermal papilla cells having the characteristics of cell line 90032810, cell line 90032810 being a transformed cell line which can be serially transferred indefinitely, the supernatant comprising a proteinaceous hair growth factor possessing the ability to initiate DNA synthesis in a culture of serum starved 3T3 cells.

5,091,174

PRESERVATIVE FOR BIOLOGICAL SPECIMENS

William A. Lemberger, P.O. Box 2482, Oshkosh, Wis. 54903
Continuation-in-part of Ser. No. 232,057, Aug. 15, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 501,382

Int. Cl.⁵ A01N 1/00, 59/06

U.S. Cl. 424—75

6 Claims

1. A composition for preserving tissue of biological specimens, said composition comprising:

an effective amount of at least one anti-fungal and anti-bacteriological paraben preservative selected from the group consisting of methyl paraben, ethyl paraben, propyl paraben, or butyl paraben;

a sufficient amount of at least one alcohol, approved for topical use and capable of use as a preservative, and a sufficient amount of tissue penetrating means for penetrating the tissue of the biological specimens in which said anti-fungal and anti-bacteriological paraben preservative may be put into solution;

an effective amount of hydantoin to act as a softening and lubricating agent for softening and lubricating the tissue of the biological specimens;

an effective amount of 1-(3-chlorolallyl)-3,5,7-triaza-1-azoniaadamantane chloride to act as an anti-fungal and an anti-biological preservative;

an effective amount of vitamin C to act as an anti-oxidant; an effective amount of at least one alum to act as an astringent;

a sufficient amount of water for mixing above ingredients

whereby a solution results that may be used to preserve biological specimens.

5,091,175

PHARMACEUTICAL COMPOSITION CONTAINING BILE ACID SEQUESTANT ENCLOSED IN A SIZE-EXCLUSION MEMBRANE

Anthony R. Imondi, Westerville, and Larry M. Hagerman, Columbus, both of Ohio, assignors to Erbamont Inc., Minn.
Filed May 14, 1990, Ser. No. 523,163

Int. Cl.⁵ A61K 9/18, 9/24, 9/16, 31/785

U.S. Cl. 424—486

25 Claims

1. A pharmaceutical composition useful for treating hypercholesterolemia comprising a solid granular bile acid sequestant resin enclosed in a semipermeable or microporous membrane wherein said membrane enables bile acids from the digestive tract to contact and bind to said resin while preventing substances having a molecular weight greater than 2000 daltons from contacting and binding to said resin.

5,091,176

POLYMER-MODIFIED PEPTIDE DRUGS HAVING ENHANCED BIOLOGICAL AND PHARMACOLOGICAL ACTIVITIES

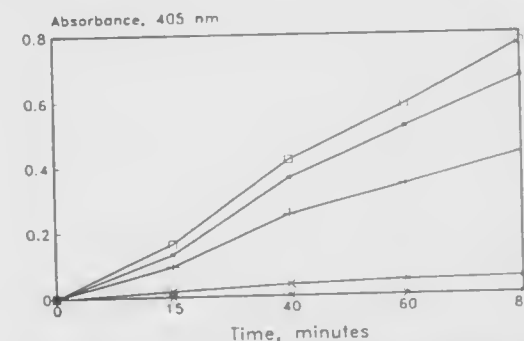
James A. Braatz, Beltsville, and Aaron H. Heifetz, Columbia, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 266,445, Nov. 2, 1988, Pat. No. 4,940,737. This application Apr. 24, 1990, Ser. No. 510,260

Int. Cl.⁵ A61K 31/74; C07K 3/00; C07G 7/02

U.S. Cl. 424—78.17

28 Claims



1. A method for enhancing biological or pharmacological activity of a biologically active peptide comprising preparing an aqueous solution of a liquid polymer-modified version of said peptide by covalently binding said peptide to a biocompatible prepolymer under aqueous conditions, wherein said prepolymer is a triol or higher polyol made up of at least 75% oxyethylene monomers, said polyol having a molecular weight of about 7,000 to about 30,000, said polyol having essentially all of the hydroxyl groups capped with aliphatic or cycloaliphatic polyisocyanates, wherein said covalent bond is between an isocyanate group of said prepolymer and an amino, sulfhydryl, carboxyl or hydroxyl group of said peptide, wherein the amount of chain extended insoluble material is reduced.

5,091,177

MONOCLONAL ANTIBODIES FOR TREATMENT OF HUMAN NON-SMALL CELL LUNG CARCINOMAS

Ingegerd Hellström; Joseph P. Brown; Karl E. Hellström; Diane Horn, and Peter Linsley, all of Seattle, Wash., assignors to Oncogen, Seattle, Wash.

Continuation of Ser. No. 684,759, Dec. 21, 1984, Pat. No. 4,935,495. This application May 11, 1990, Ser. No. 523,309

Int. Cl.⁵ A61K 39/395; C07K 15/28

U.S. Cl. 424—85.8

33 Claims

1. A method for reducing a population of tumor cells that express the L6 antigen in a host, comprising administering an

effective amount of a monoclonal antibody having an isotype that mediates a cytotoxic effector function, and an antigen combining site that competitively inhibits the immunospecific binding of monoclonal antibody L6 produced by hybridoma HB8677 as deposited with the ATCC to its target antigen.

5,091,178

TUMOR THERAPY WITH BIOLOGICALLY ACTIVE ANTI-TUMOR ANTIBODIES

Karl E. Hellstrom, and Ingegerd Hellstrom, both of Seattle, Wash., assignors to Oncogen, Seattle, Wash.

Continuation of Ser. No. 831,684, Feb. 21, 1986, abandoned.

This application Jan. 30, 1990, Ser. No. 473,137

Int. Cl.⁵ A61K 39/395; C07K 15/28

U.S. Cl. 424—85.8

3 Claims

1. A method for treating a human melanoma comprising administering in vivo an effective dose of a monoclonal antibody having the epitope binding specificity and biological effector function demonstrated by monoclonal antibody MG-21 produced by the hybridoma deposited with the ATCC and assigned accession number HB-9011, in which the monoclonal antibody is directed against a GD3 glycolipid antigen expressed by the melanoma and which upon complexing with the GD3 antigen activates serum complement or mediates antibody dependent cellular cytotoxicity so that the melanoma cells are killed.

5,091,179

INSECTICIDE BASED ON A VIRUS FROM THE BACULOVIRUS GROUP, AND USE THEREOF FOR THE DESTRUCTION OF PHTHORIMAEA OPERCULELLA

Gerard A. Biache, Guyancourt, and Michel R. Guillon, Beziers, both of France, assignors to Calliope S.A., Beziers, France

Filed Dec. 9, 1988, Ser. No. 281,737

Claims priority, application France, Dec. 18, 1987, 87 17748

Int. Cl.⁵ A01N 63/00

U.S. Cl. 424—93 T

10 Claims

1. A method for destroying *Phthorimaea operculella* comprising the step of causing the *Phthorimaea operculella* to ingest the baculovirus of the nuclear polyhedrose of the noctuid *Mamestra brassicae*.

4. A method for the destruction of *Phthorimaea operculella* infesting the foliage, the tubercles, the fruits or the flower buds of cultivated solanaceous plants, which comprises applying the baculovirus of the nuclear polyhedrose of the noctuid *Mamestra brassicae* on said foliage, tubercles, fruits or flower buds.

5,091,180

PROTECTION AGAINST

RHABDOMYOLYSIS-INDUCED NEPHROTOXICITY

Patrick D. Walker, New Orleans, and Sudhir V. Shah, Metairie, both of La., assignors to Administrators of the Tulane Educational Fund, La.

Continuation of Ser. No. 123,614, Nov. 20, 1987, abandoned.

This application Nov. 30, 1990, Ser. No. 621,395

Int. Cl.⁵ A61K 37/50

U.S. Cl. 424—944

14 Claims

1. A method for protecting against or reducing the renal toxicity of rhabdomyolysis comprising administering in vivo to a patient in need thereof an effective dose of at least one compound which substantially prevents the generation of, effectively scavenges, or detoxifies a reactive oxygen metabolite which mediates a nephrotoxic effect of rhabdomyolysis.

5,091,181

ASPHODELUS COMPOSITION FOR INCREASING WHITE BLOOD CELL COUNT

Stavros Papadakis, W. Berwyn, Chicago, Ill. 60659, and Konstantinos Papadakis, 9432 Bay Colony, Des Plaines, Ill. 60016
 Filed Jul. 19, 1990, Ser. No. 555,583
 Int. Cl.⁵ A61K 35/78, 39/00

U.S. Cl. 424—195.1

22 Claims

1. A composition for treating white blood cell deficiency in human beings or animals comprising, as an active pharmaceutical agent, an effective amount of an herb extract, wherein said herb is from the genus *Asphodelus*, and said active agent is admixed with a pharmaceutically acceptable carrier.

5,091,182

DISPENSING UNITS FOR KETOROLAC TOPICAL GEL FORMULATIONS

John T. H. Ong, Palo Alto; Jean S. Fujiki, Sunnyvale, and Wei-Cheng Liaw, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
 Filed Jul. 23, 1990, Ser. No. 556,938
 Int. Cl.⁵ A61K 09/00

U.S. Cl. 424—400

12 Claims

1. A dispensing unit for a ketorolac topical gel formulation, wherein said dispensing unit comprises:

(a) a ketorolac topical gel formulation comprising:

- (i) ketorolac, or a pharmaceutically acceptable salt thereof, in an amount between 0.1% and 5.0% w/w;
 - (ii) a lower alkanol in an amount between 30% and 45% w/w;
 - (iii) a thickening agent in an amount sufficient to gel said formulation; and
 - (iv) water q.s. to 100%; and
- (b) a gas-impermeable multi-layered container containing said formulation, which container consists of consecutive layers which are firmly adhered to each other to make a unitary structure, wherein:
- (i) the inner layer comprises a polyolefin and is in direct contact with said formulation; and
 - (ii) an outer layer comprises a metal foil.

5,091,183

INSECTICIDAL AND/OR ACARICIDAL COMPOSITION
 Toshihiko Yano, Ashiya; Noritada Matsuo, Itami; Yoko Torisu, Ashiya, and Kazunobu Dohara, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 4, 1990, Ser. No. 577,103

Claims priority, application Japan, Sep. 14, 1989, 1-239384

Int. Cl.⁵ A01N 25/00

U.S. Cl. 424—405

8 Claims

1. An insecticidal and/or acaricidal consisting of essentially of, as active ingredient, 2-methyl-4-oxo-3-(2-propynyl) cyclopent-2-enyl chrysanthemate and phenoxybenzyl ester selected from the group consisting of 3-phenoxybenzyl-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate, α -cyano-3-phenoxybenzyl-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate, α -cyano-3-phenoxybenzyl-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropane carboxylate; and an inert carrier; wherein the mixing ratio of 2-methyl-4-oxo-3-(2-propynyl) cyclopent-2-enyl chrysanthemate to the phenoxybenzyl ester compound is from 90:10 to 30:70.

5,091,184

COATED ADHESIVE TABLETS

Satish C. Khanna, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
 Continuation of Ser. No. 450,645, Dec. 14, 1989, abandoned.
 This application Apr. 26, 1991, Ser. No. 693,769
 Claims priority, application Switzerland, Dec. 30, 1988, 4855/88

Int. Cl.⁵ A61K 9/20, 9/28

U.S. Cl. 424—435

8 Claims

1. A pharmaceutical composition for the application of baclofen, in the form of an adhesive tablet, to the mucosa in the oral cavity, which pharmaceutical consists essentially of a hydrophobic tablet core, the top surface of which adheres to the receptor surface of the oral mucosa and which consists essentially of the drug baclofen or a pharmaceutically acceptable salt thereof and, as excipients, a swellable vinyl polymer, a galactomannan and at least one pharmaceutically acceptable excipient selected from the group consisting of a wax, a glyceride, a completely hydrogenated glyceride and a partially hydrogenated glyceride.

5,091,185

COATED VETERINARY IMPLANTS

Ernesto J. Castillo, St. Peters; Kenneth E. Eigenberg, St. Louis; Kanaiyalal R. Patel, Creve, and Milton J. Sabacky, Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.
 Filed Jun. 20, 1990, Ser. No. 541,114
 Int. Cl.⁵ A23K 1/18

U.S. Cl. 424—438

10 Claims

1. A coated veterinary implant of a growth hormone having extended release delivery characteristics upon parenteral administration to an animal, said implant comprising a solid core of said growth hormone in an amount sufficient to provide an effective dose for the desired biological response over an extended period of delivery, and a release inhibiting coating of polyvinyl alcohol continuously enveloping said core, said polyvinyl alcohol having a molecular weight of at least about 10,000, a degree of hydrolysis of at least about 95%, and being present in an amount of from about 0.5 to 5 percent by weight of said implant.

5,091,186

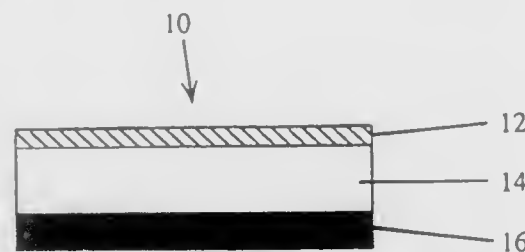
BIPHASIC TRANSDERMAL DRUG DELIVERY DEVICE
 Jesus Miranda, Miami, Fla., and Gary W. Cleary, San Mateo, Calif., assignors to Cygnus Therapeutic Systems, Redwood City, Calif.

Filed Aug. 15, 1989, Ser. No. 394,096

Int. Cl.⁵ A61F 13/02

U.S. Cl. 424—448

19 Claims



1. A biphasic transdermal drug delivery device for delivering a drug contained therein at therapeutically effective rates during an initial, delivery phase, but which during a subsequent, secondary phase, delivers substantially no drug, the device comprising:

- (a) a backing layer that is substantially impermeable to the drug and defines the face surface of the device; and
- (b) an adhesive drug reservoir layer that defines the basal

surface of the device during use and contains an initial quantity of the drug, wherein the diffusion coefficient of the drug in the reservoir layer is at least about 10^{-8} cm²/sec, and the solubility of the drug in the reservoir layer is less than about 10 wt. %, and further wherein the delivery phase includes a period of time from the application of the device to a patient to a time about 10 to 14 hours thereafter during which time more than 90 wt. % of the initial quantity of the drug is delivered.

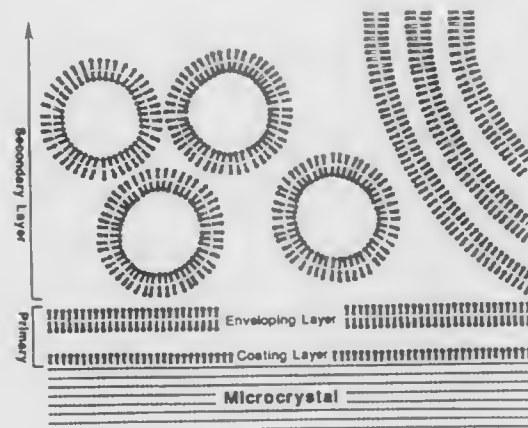
5,091,187

PHOSPHOLIPID-COATED MICROCRYSTALS: INJECTABLE FORMULATIONS OF WATER-INSOLUBLE DRUGS

Duncan H. Haynes, 4051 Barbarossa Ave., Miami, Fla. 33133
 Division of Ser. No. 514,012, Apr. 26, 1990, This application May 21, 1991, Ser. No. 703,786
 Int. Cl.⁵ A61K 37/22; A61F 13/00

U.S. Cl. 424—450

4 Claims



1. A method of treating localized inflammatory conditions comprising injecting into a tissue at or near the affected area a syringable, injectable pharmaceutical composition consisting essentially of an aqueous suspension of solid particles of a non-steroidal anti-inflammatory drug in solid form, the solid particles having diameters of about 0.05 μ m to about 10 μ m, coated with a 0.3 nm to 3.0 μ m thick layer of a membrane-forming amphipathic lipid which stabilizes the drug from coalescence and renders the drug in solid form acceptable to tissues of the host.

5,091,188

PHOSPHOLIPID-COATED MICROCRYSTALS: INJECTABLE FORMULATIONS OF WATER-INSOLUBLE DRUGS

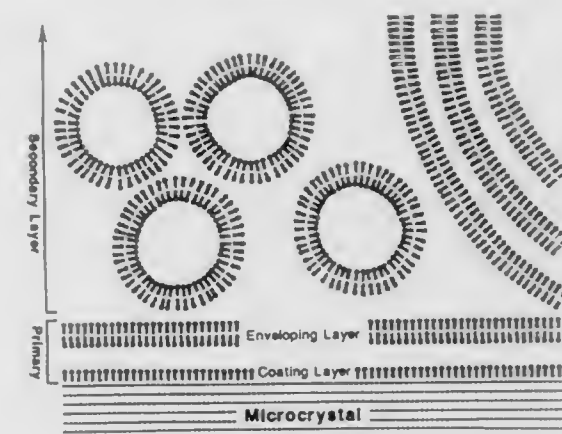
Duncan H. Haynes, 4051 Barbarossa Ave., Miami, Fla. 33133
 Filed Apr. 26, 1990, Ser. No. 514,012
 Int. Cl.⁵ A61K 37/22; A61F 13/00

U.S. Cl. 424—450

18 Claims

2. A syringable, injectable pharmaceutical composition consisting essentially of an aqueous suspension of crystals or solid particles of a pharmacologically active water-insoluble drug substance in solid form, the crystals or solid particles having diameters or maximal dimensions of about 0.05 μ m to about 10 μ m, coated with a 0.3 nm to 3.0 μ m thick encapsulating primary layer consisting of coating and enveloping layers of a membrane-forming amphipathic lipid, which stabilizes the drug substance from coalescence and renders the drug substance in solid form less irritating to living tissue, and 25 nm to 3.0 μ m thick secondary layer consisting of a membrane-form-

ing amphipathic lipid in vesicular form associated with and surrounding but not enveloping the lipid-encapsulated drug



particles, which composition is substantially devoid of uncoated crystals or particles.

5,091,189

CONTROLLED RELEASE DOSAGE FORMS HAVING A DEFINED WATER CONTENT

Joanne Heafield; Stewart I. Leslie; Sandra T. A. Malkowska, and Philip J. Neale, all of Cambridge, United Kingdom, assignors to Euroceltique S.A., Luxembourg, Luxembourg
 Continuation of Ser. No. 355,417, May 23, 1989, abandoned.
 This application May 17, 1991, Ser. No. 704,714
 Claims priority, application United Kingdom, Jun. 2, 1988, 8813064

Int. Cl.⁵ A61K 9/52

U.S. Cl. 424—457

23 Claims

1. A controlled release, solid, oral dosage form comprising a 3-C₁₋₃ alkylxanthine, at least one hydrophilic or hydrophobic polymer, from between 4% and 40% by weight of at least one wax having a melting point between 20° and 90° C., and between 3% and 10% by weight water, said dosage form excluding spheroids, film coated spheroids or unit dosage forms containing spheroids or film coated spheroids.

5,091,190

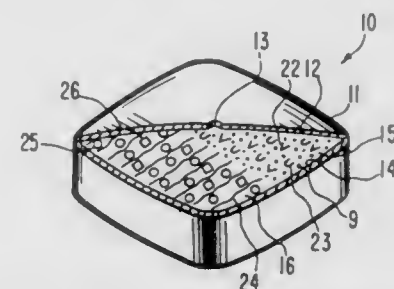
DELIVERY SYSTEM FOR ADMINISTRATION BLOOD-GLUCOSE LOWERING DRUG

Anthony L. Kuczyński; Atul D. Ayer, and Patrick S. Wong, all of Palo Alto, Calif., assignors to ALZA Corporation, Palo Alto, Calif.
 Continuation-in-part of Ser. No. 650,822, Jan. 22, 1991, and a continuation-in-part of Ser. No. 402,314, Sep. 5, 1989, Pat. No. 5,024,843. This application Feb. 8, 1991, Ser. No. 652,717
 The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.⁵ A61K 9/24

U.S. Cl. 424—473

2 Claims



1. A method for stimulating insulin secretion from the beta

cells or pancreatic-islet tissue in a patient in need of insulin secretion, wherein the method comprises:

- (a) admitting orally into the patient a dosage form comprising:
 - (1) a wall comprising a member selected from the group consisting of a cellulose ester, cellulose ether and cellulose ester-ether, which will defines:
 - (2) a lumen;
 - (3) a first composition in the compartment comprising 1 mg to 100 mg of the drug N-[2-[4-[[[(cyclohexylamino) carbonyl]amino]sulfonyl]phenyl]ethyl]-5-methylpyrazinecarboxamide for stimulating insulin secretion and a pharmaceutically acceptable carrier therefore;
 - (4) a second composition in the compartment comprising a therapeutically acceptable hydrogel;
 - (5) an exit passageway in the wall for delivering the first composition from the lumen;
- (b) imbibing fluid into the dosage form causing the first composition to provide a dispensable aqueous composition and the second composition to expand and push against the first composition, whereby the first composition is delivered from the dosage form; and,
- (c) stimulating insulin secretion by delivering the first composition comprising 1 mg to 100 mg of the drug to the patient.

5,091,191

PHARMACEUTICAL COMPOSITION WITH IMPROVED DISSOLUTION PROPERTY

Minoru Oda, Nakatsu; Shigemi Kino, Chikujo; Kenji Ogawa, Chikujo, and Takako Shiotsuki, Chikujo, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP89/00100, § 371 Date Sep. 25, 1989, § 102(e) Date Sep. 25, 1989, PCT Pub. No. WO89/06959, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 31, 1989, Ser. No. 415,356

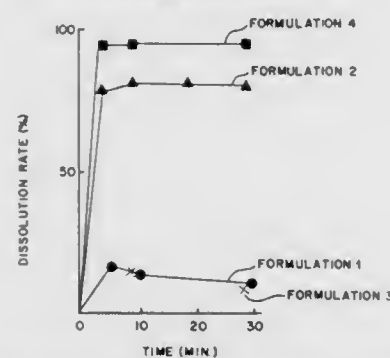
Claims priority, application Japan, Feb. 3, 1988, 63-23250

Int. Cl.⁵ A61K 31/41, 47/26, 47/38, 9/16

U.S. Cl. 514—399

2 Claims

DISSOLUTION OF FINE GRANULES OF EXAMPLE 1 INTO ACETATE BUFFER SOLUTION, pH 4.0



1. A pharmaceutical composition which comprises 1-50% by weight of sodium 4-[α-hydroxy-5-(1-imidazolyl)-2-methylbenzyl]-3,5-dimethylbenzoate, or its optical isomer, or its hydrate,

an additive selected from the group consisting of D-mannitol and a mixture of D-mannitol and sodium bicarbonate, and at least one water-soluble polymer compound selected from the group consisting of hydroxypropylcellulose, hydroxypropylmethylcellulose, methylcellulose and polyvinylpyrrolidone,

wherein the proportion of D-mannitol or a mixture of D-mannitol and sodium bicarbonate to the water-soluble polymer is in the range of 20:1 to 200:1.

5,091,192

BILE SALTS PERMANENTLY BOUND TO INSOLUBLE CELLULOSE AS A DIETARY SUPPLEMENT

Jackie R. See, Fullerton, Calif., assignor to Natur-All Systems, Inc., La Mirada, Calif.

Filed Jan. 16, 1990, Ser. No. 465,917

Int. Cl.⁵ A61K 35/413

U.S. Cl. 424—528

27 Claims

1. A method for producing a dietary supplement comprising bile salts permanently bound to insoluble cellulose, the method comprising the steps of:

- (a) in a first stage, forming an activated composition of bile salts and insoluble cellulose by:
 - (i) mixing together bile salt and insoluble cellulose in the dry state to form a bile salt/insoluble cellulose mixture;
 - (ii) blending the bile salt/insoluble cellulose mixture into distilled water adjusted to a pH of from about 2 to about 4 to form a bile salt/insoluble cellulose suspension;
 - (iii) drying the bile salt/insoluble cellulose suspension to no less than 1% moisture by weight of composition, while stirring, to provide a partially dry, activated bile salt/insoluble cellulose composition; and
 - (iv) granulating the partially dry, activated composition to provide an activated bile salt/insoluble cellulose composition; and
- (b) in a second stage, mixing the partially dry, activated, granulated bile salt/insoluble cellulose composition from the first stage with microcrystalline cellulose to provide a composition from the first stage with microcrystalline cellulose to provide a composition comprising bile salts permanently affixed to the insoluble cellulose composition.

5,091,193

DIAPER RASH TREATMENT AND COMPOSITIONS

Odile Enjolras, Meudon, and Hugues Noel, Ermont, both of France, assignors to Roussel Uclaf, France

Filed Aug. 21, 1990, Ser. No. 570,224

Claims priority, application France, Aug. 23, 1989, 89 11172

Int. Cl.⁵ A61K 33/32

U.S. Cl. 424—642

10 Claims

1. A composition for preventing or treating diaper rash comprising an effective amount of zinc oxide, phytic acid, an optional additional anti-enzyme sufficient to treat or prevent diaper rash and an inert pharmaceutical carrier.

5,091,194

COSMETIC COMPOSITIONS COMPRISING A NATIVE MINERAL SUBSTANCE FOR THE TREATMENT OF PHLEBECTASIAE AND PROCESS FOR PREPARING SAME

László Hankó, Lovag u. 10. III/2, 1066 Budapest, Hungary

Filed Dec. 14, 1988, Ser. No. 284,242

Int. Cl.⁵ A61K 33/06

U.S. Cl. 424—698

1 Claim

1. A method for treating phlebitis occurring in the lower limb of a human, which comprises topically applying to the affected area a composition consisting essentially of a pharmaceutically acceptable carrier and an amount of potassium aluminum sulfate or a hydrate thereof effective to alleviate the phlebitis.

5,091,195

SYSTEM FOR PRODUCING LOW CHOLESTEROL EGGS AND FEED ADDITIVE RESULTING IN SAME

Allee L. Havens, Route 39 North, RD 1, Box 87, Sherman, Conn. 06784

Filed Jul. 24, 1989, Ser. No. 384,265

Int. Cl.⁵ A23K 1/14

U.S. Cl. 426—2

20 Claims

17. The method of reducing the cholesterol content of eggs

which comprises the steps of adding dehydrated *Brassica oleracea* to the diet of hens and feeding said diet to laying hens, whereby, since said *Brassica oleracea* is dehydrated, said hens can eat a sufficient quantity of said *Brassica oleracea* each day to significantly reduce said cholesterol content of said eggs.

5,091,196

FORCEMEAT HAVING IMPROVED PROPERTIES, METHOD FOR THE PRODUCTION THEREOF AND HEAT SENSITIVE ENZYME CONTAINING MATERIAL FOR USE IN THE PRODUCTION THEREOF

Helge S. Paulin, Vejle, Denmark, assignor to Tulip Slagterierne A.M.B.A., Vejle, Denmark

Filed Sep. 28, 1989, Ser. No. 413,992

Claims priority, application Denmark, Sep. 29, 1988, 5417/88 Int. Cl.⁵ A23L 1/31

U.S. Cl. 426—56

3 Claims

1. A method for the production of forcemeat comprising: comminuting and mixing meat, water, at least one salt and at least one spice while admixing therewith a heat sensitive enzyme containing material, said enzyme containing material including proteinase and rennet; heat treating said mixture for 15 seconds at 68° C. and pH 6.0 or at 72° C. and pH 5.6; the sensitivity to heat causing said enzyme containing material to retain less than 1% of protein converting capacity after said heat treatment; said heat treatment producing a solid firm product exhibiting reduced jelly and fat secretion.

5,091,197

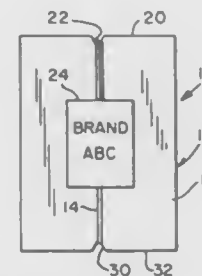
TEA BAG WITH SQUEEZING DEVICE

Rosemary Ferro, 85-12 115th St., Richmond Hills, N.Y. 11418, and Donald Williams, 124-13 97th Ave., Basement Apt., Richmond Hill, N.Y. 11419

Filed Jun. 8, 1990, Ser. No. 535,545

Int. Cl.⁵ B65B 29/04; B65D 85/00 U.S. Cl. 426—80

1 Claim



1. A tea bag with a squeezing device comprising:
 - a) an infusion bag made of thermoseal filter paper capable of allowing water to filter therethrough, with a quantity of ground tea leaves sealed within said bag;
 - b) a string attached at one end to said bag;
 - c) a squeezing device consisting of a cover fabricated out of light, resilient polystyrene foam plastic sheet that will not absorb the liquid and which will insulate the fingers from said infusion bag when said bag is steaming hot and comprising two panels joined together along a fold line formed with a hole centrally located along said fold line and with the string passing through the hole; each said panel being of a size to completely fit over said infusion bag and wherein said cover has a V-shaped notch centrally located in the free edge of each of said panels, opposite said fold line;
 - d) a tag attached to the other end of said string such that said cover can slide on said string towards said tag thus allowing said infusion bag to be exposed from said cover and be inserted into a cup with water and said cover can slide on said string toward and onto said infusion bag allowing said

panels to be used to squeeze said infusion bag therebetween to extract infusion from said bag; and

- e) reusable pressure sensitive adhesive material applied to a portion of one side of said tag; said tea bag with squeezing device being in its dry, stored, pre-use condition with said cover having been slid downwardly on said string and onto said infusion bag to completely cover said infusion bag in a protective arrangement; said string being wrapped around said cover and in said notches and said hole; said side of said tag having said pressure sensitive adhesive being positioned against said string, captivating said string and holding said tag to said cover; said pressure sensitive adhesive being sufficient to allow one to separate said tag and said adjoining string from said bag and to reposition said tag to again captivate said string and hold said tag to said cover to form a disposable structure after said infusion bag has been used.

5,091,198

COMPOSITE FOOD PRODUCTS AND THEIR PRODUCTION PROCESSES

Chikako Hoashi, Tokyo, Japan, assignor to Yugenkaisha Matsubei, Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,619

Claims priority, application Japan, Feb. 22, 1985, 60-34102 Int. Cl.⁵ A23L 1/325, 1/20; A22C 25/00

U.S. Cl. 426—92

15 Claims



1. A heat treated food product comprising a solidified, molded, first food material derived from a soybean protein-containing paste composition which comprises a soybean isolate in admixture with vegetable oil and water that expands on heating by frying in edible oil; a solidified, molded, second food material bonded to the first material in a texturally integral form, wherein the second food material is derived from a salt-minced fish meat-containing composition that expands on heating by frying in edible oil; and wherein the first food material has been expanded on heat treatment more than the second food material on heat treatment of the bonded food materials by frying in edible oil.
9. A process for the production of a food product comprising a first, soybean protein-based food material and a second, salt-minced fish meat-based food material bonded to the first food material, which process comprises the steps of: preparing a moldable soybean protein-containing paste composition which is prepared by mixing a soybean isolate with vegetable oil and water; preparing a moldable, salt-minced fish meat-containing composition; molding each of the soybean protein-containing composition and the salt-minced fish meat-containing composition; bonding the resulting molded compositions to form a first integral structure; and heating the first integral structure to fry in edible oil to form a hardened second integral structure; heating said hardened integral structure to fry in edible oil at a higher oil temperature to expand said hardened structure; wherein the first food material expands on heating more than the second food material so that the resulting hardened and expanded second integral structure has a shape that is different from the first integral structure.

5,091,199

UNITARY COMPARTMENTED PACKAGE AND METHOD OF MAKING SAME

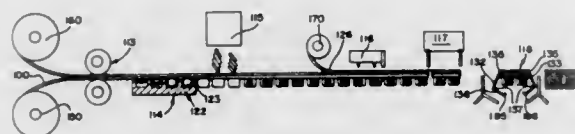
Timothy G. Mally, Oregon, and Bjorn J. Thompson, Madison, Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Jun. 15, 1990, Ser. No. 538,794

Int. Cl.⁵ B65D 85/00

U.S. Cl. 426—120

31 Claims



1. A method of making a package having a product tray with multiple product compartments which are partially enclosed by sidewalls of the package, comprising the steps of:

providing a package support blank having a package face panel portion and an extended package flap panel portion, the package face panel portion having at least one opening therein which receives a product tray therein having multiple product compartments the package support blank providing a support surface for a formable film;

applying the formable film to the face portion of the support blank such that the formable film covers at least the package face panel opening;

forming multiple product compartments in said formable film to define said product tray by drawing said formable film through said package face panel opening, a portion of said package face panel opening, providing the support surface for said formable film during said drawing step and providing a support surface for said product tray after forming, said multiple product compartments occupying substantially all of said package face panel at said opening thereof;

filling said package multiple product compartments with distinct, multiple product portions;

sealing the distinct multiple product portions in said multiple product compartments by covering said multiple product compartments with a flexible film; and

forming the extended package flap panel portion around said multiple product compartments to define opposing sidewalls of said package and enclosing a portion of said multiple product compartments between said package outer support blank and said extended package flap panel.

5,091,200

PROCESS FOR MICROWAVE BROWNING UNCOOKED BAKED GOODS FOODSTUFFS

Young C. Kang, Oakhurst; Chee-Teck Tan, Middletown; Brian Byrne, East Brunswick; Lawrence L. Buckholz, Jr., Middletown; Marion A. Sudol, Boonton, and Richard M. Boden, Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 596,498, Oct. 12, 1990, which is a division of Ser. No. 535,524, Jun. 8, 1990, Pat. No. 4,985,261, which is a continuation-in-part of Ser. No. 440,794, Nov. 24, 1989, Pat. No. 4,943,697, which is a division of Ser. No. 356,503, May 25, 1989, Pat. No. 4,904,490, and a continuation-in-part of Ser. No. 295,450, Jan. 10, 1989, Pat. No. 4,882,184. This application May 17, 1991, Ser. No. 701,850

The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.⁵ A23L 1/00

U.S. Cl. 426—243

24 Claims

1. A process for producing a cooked edibly browned baked goods foodstuff consisting essentially of the steps of:

(a) providing a particulate flowable flavoring powder consisting essentially of (A) separate individually, discretely

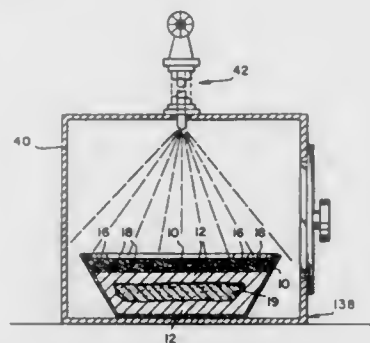
encapsulated Maillard reaction reagents, said encapsulated Maillard reaction reagent being:

(i) at least one encapsulated sugar optionally admixed with at least one Maillard reaction promoter;

(ii) at least one encapsulated amino acid; and optionally;

(iii) at least one encapsulated pH adjustment agent; and, optionally, (B), at least one Maillard reaction promoter;

(b) providing an uncooked baked goods foodstuff containing more than 50% of water having an outer uncooked foodstuff surface;



(c) placing in intimate contact with at least a major portion of said uncooked foodstuff surface a flavor augmenting, enhancing or imparting quantity of said particulate flowable flavoring powder thereby forming a flavoring powder-coated foodstuff surface; and

(d) exposing the flavoring powder-coated foodstuff surface to microwave radiation for a predetermined controlled period of time;

whereby the resulting product is caused to be edible as a foodstuff and the cooked, baked goods foodstuff surface is edibly browned.

5,091,201

PROCESS FOR MANUFACTURING MOLDED FOOD

Susumu Murata, Naomi Matsuo, and Masako Sano, all of Osaka, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Continuation of Ser. No. 353,269, May 17, 1989, abandoned.

This application Apr. 29, 1991, Ser. No. 692,966

Int. Cl.⁵ A23L 1/00

U.S. Cl. 426—285

5 Claims

1. A process for producing a molded food which comprises: wetting particles of a granular or chipped processed food with water;

sprinkling the surface of the wet particles with 5–20 parts, per 100 parts by weight of the processed food, of a pregelatinized cereal powder containing aqueous ethyl alcohol, whereby the cereal powder adheres to the surfaces of the wet particles; and

molding and drying the particles having powdered pregelatinized cereal powder on their surfaces.

5,091,202

METHOD FOR MANUFACTURING CONTINUOUS SHEETS OF BREAD DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Apr. 16, 1991, Ser. No. 686,091

Claims priority, application Japan, Apr. 17, 1990, 2-101078

Int. Cl.⁵ A21D 6/00

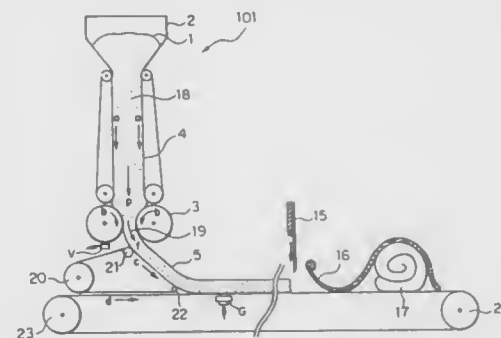
U.S. Cl. 426—496

2 Claims

1. A method for producing a continuous belt-like sheet of bread dough, comprising the steps of

conveying bread dough downward by vertical conveyors that are mounted on two sides of a dough hopper consisting of an inlet, a hopper body, and an outlet, and

controlling the cross section of the outlet such that the amount of the bread dough discharged from the outlet



corresponds to the amount of bread dough supplied that passes downward through the hopper body.

5,091,203

METHOD FOR REMOVING CHOLESTEROL FROM EGGS

Joseph A. Conte, Jr., Waterford; Bobby R. Johnson, Cherry Hill; Rudolf J. Hsieh, Mt. Laurel, and Sandy S. Ko, Collingswood, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Dec. 1, 1989, Ser. No. 444,198

Int. Cl.⁵ A23L 1/32

U.S. Cl. 426—614

20 Claims

1. A method for removing cholesterol from egg comprising: (a) heating an emulsion comprising edible oil containing at least about 5 wt percent monoglycerides, based on the weight of the oil, and a mixture of cholesterol-containing egg in aqueous solution to a temperature below about 70° C.;

(b) agitating the emulsion of step (a) with low-energy, low-shear stirring sufficient to ensure intimate admixture of the phases uniformly of temperature for a period sufficient to transfer cholesterol from the aqueous phase to the oil phase and form at least a cholesterol-reduced aqueous phase and a cholesterol-enriched oil phase; and

(c) recovering the cholesterol-reduced aqueous phase.

5,091,204

POLYMERIC INTRAOCULAR LENS MATERIAL HAVING IMPROVED SURFACE PROPERTIES

Buddy D. Ratner, and Nancy B. Mateo, both of Seattle, Wash., assignors to Weshington Research Foundation, Seattle, Wash.

Division of Ser. No. 768,895, Aug. 23, 1985, abandoned, and a continuation-in-part of Ser. No. 41,796, Apr. 23, 1987. This application Oct. 21, 1987, Ser. No. 111,132

Int. Cl.⁵ B05D 3/06, 5/08

U.S. Cl. 427—2

17 Claims

1. A method for making an intraocular lens that causes low corneal endothelial cell damage during implantation, comprising:

selecting a substrate for an intraocular lens; and applying a fluorocarbon polymer coating to said substrate prior to insertion of the intraocular lens into the eye, wherein said applying step includes binding said fluorocarbon polymer coating to said base material by plasma deposition of a gaseous fluorocarbon monomer.

5,091,205

HYDROPHILIC LUBRICIOUS COATINGS

You-Ling Fan, East Brunswick, N.J., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 297,331, Jan. 17, 1989, abandoned. This application Dec. 22, 1989, Ser. No. 449,777

Int. Cl.⁵ A01N 1/02; A61K 00/00; A61M 5/32

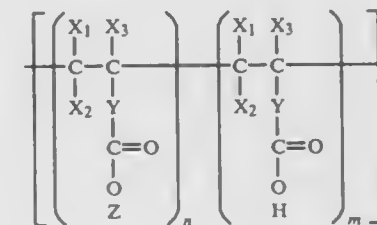
U.S. Cl. 427—2

52 Claims

1. A method of covering at least a portion of a substrate with a hydrophilic coating which coating exhibits good abrasion resistance and an increased lubricity when contacted with an aqueous-containing fluid, said method comprising the steps of:

(1) contacting said substrate with polyisocyanate contained in at least one first inert solvent to provide at least a partially coated substrate;

(2) contacting said coated substrate with a poly(acrylic acid) polymer of the formula:



where

n=0–0.95 mole fraction of neutralized acid moieties, m=0.05–1.0 mole fraction of acid moieties with the proviso that n+m=1,

X₁, X₂, X₃ are each a hydrogen atom or a monovalent organic radical,

Y is a single bond or a divalent organic radical,

Z is a metallic ion or a tertiary ammonium ion,

and

p is a number such that the polymer has a molecular weight between about 200,000 and about 5,000,000, said poly(acrylic acid) polymer contained in at least one second solvent to provide a multiple coated substrate; and

(3) thereafter drying said multiple coated substrate to provide a hydrophilic, lubricious coating which contains free carboxylic acid groups or partially neutralized carboxylic acid groups.

5,091,206

PROCESS FOR PRODUCING MAGNETICALLY RESPONSIVE POLYMER PARTICLES AND APPLICATION THEREOF

Chao-Huei Wang, Gurnee, and Dinesh O. Shah, Vernon Hills, Ill., assignors to Baxter Diagnostics Inc., Deerfield, Ill.

Division of Ser. No. 113,294, Oct. 26, 1987, abandoned. This application May 30, 1989, Ser. No. 337,511

Int. Cl.⁵ A01N 1/02; B05D 5/12, 7/00

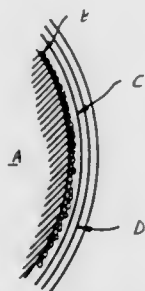
U.S. Cl. 427—2

5 Claims

1. The process to make a magnetically responsive polymer particle having a polymeric core particle evenly covered by a metal oxide/polymer coating comprising

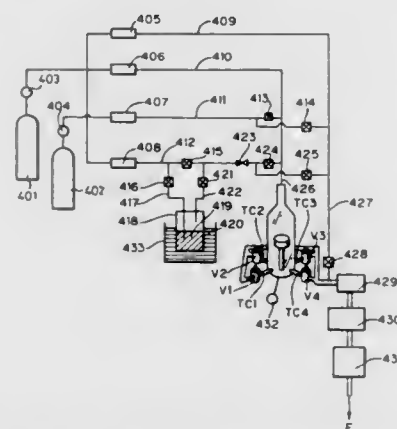
producing a magnetic oxide particle with an average size of about 1 micron or less by heating an aqueous solution containing a mixture of divalent and trivalent transition metal salts in a molar ratio of divalent to trivalent metal salt of 0.5 to 2.0 under alkaline conditions to precipitate a metal oxide, washing said precipitate, breaking down the aggregate of said metal oxide crystals contained in said precipitate, and collecting the smaller sized metal oxide crystals of average size less than 1.0 micron,

mixing said magnetic metal oxide particles with a monomer in a weight ratio of 0.1 to 12 to produce an admixture



coating a polymeric core with said admixture in the presence of a polymerization initiator capable of initiating polymerization of said monomer.

5,091,207
PROCESS AND APPARATUS FOR CHEMICAL VAPOR DEPOSITION
Hitoshi Tanaka, Sagami, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jul. 19, 1990, Ser. No. 554,369
Claims priority, application Japan, Jul. 20, 1989, 1-186008
Int. Cl.⁵ C23C 16/00
U.S. Cl. 427—8 12 Claims

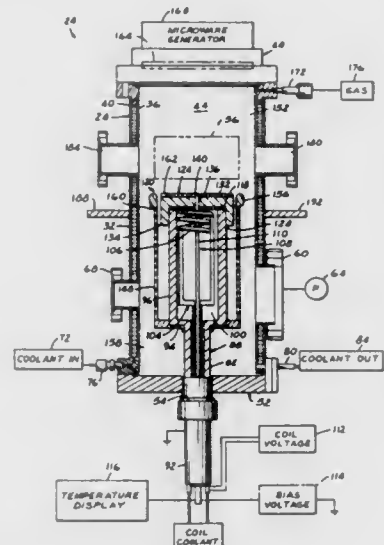


1. A process for chemical vapor deposition, in which a reactant gas is introduced into a reaction furnace containing a substrate on which a deposited layer is formed by a chemical reaction of the introduced reactant gas, and a used gas resulting from the chemical reaction is exhausted from the furnace through a plurality of exhaust ports disposed radially around an axis of flow of the reactant gas introduced into the furnace, which comprises the steps of:

- exhausting the used gas during a forming of the deposited layer on the substrate through an exhaust system comprising: exhaust ports disposed symmetrically with respect to a plane which contains said axis and at a substantially uniform distance from the axis; and exhaust pipes extending from the exhaust ports, each of the pipes being provided with a conductance valve inserted therein and a sensor for measuring a temperature of the pipe surface, the temperature sensor being fixed to the outer surface of the pipe at a position between the exhaust port and the conductance valve, and the exhaust pipes having substantially the same shape, size, and heat capacity over the portion thereof between the exhaust port and the position at which the temperature sensor is disposed; and
 - adjusting the conductance valves during said exhausting of the used gas to minimize the differentials among the temperature values measured by the temperature sensors.
6. An apparatus for carrying out a chemical vapor deposition process, in which a reactant gas is introduced into a reaction furnace containing a substrate on which a deposited layer is formed by a chemical reaction of the introduced reactant gas, and a used gas resulting from the chemical reaction is exhausted from the furnace through a plurality of exhaust ports disposed radially around an axis of flow of the reactant gas introduced into the furnace, which comprises:

an exhaust system comprising: exhaust ports disposed symmetrically with respect to a plane which contains said axis and at a substantially uniform distance from the axis; and exhaust pipes extending from the exhaust ports, each of the pipes being provided with a conductance valve inserted therein and a sensor for measuring a temperature of the pipe surface, the temperature sensor being fixed to the outer surface of the pipe at a position between the exhaust port and the conductance valve, and the exhaust pipes having substantially the same shape, size, and heat capacity over the portion thereof between the exhaust port and the position at which the temperature sensor is disposed.

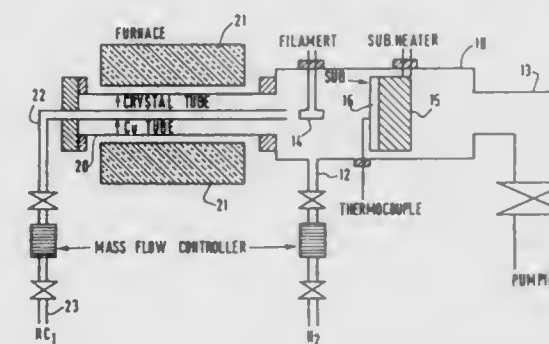
5,091,208
SUSCEPTOR FOR USE IN CHEMICAL VAPOR DEPOSITION APPARATUS AND ITS METHOD OF USE
Roger W. Pryor, Bloomfield Hills, Mich., assignor to Wayne State University, Detroit, Mich.
Filed Mar. 5, 1990, Ser. No. 488,585
Int. Cl.⁵ C23C 16/00
U.S. Cl. 427—38 28 Claims



1. A composite susceptor, comprising: a susceptor body for use in a deposition apparatus of the type in which a material is deposited on a substrate adjacent said susceptor body; said susceptor body having a first region of a first preselected material, said first region having a first predetermined electrical resistance; said susceptor body further having a second region of a second preselected material, said second region having a second predetermined electrical resistance; said first predetermined electrical resistance being less than said second predetermined electrical resistance, and wherein said second region defines a cavity for receiving means for heating said susceptor.
23. A method of forming a deposit of material on a substrate by chemical vapor deposition in the chamber of a chemical vapor deposition apparatus comprising the following steps: providing means for heating a substrate on which a material is to be deposited from a gaseous feedstock having a charged species;

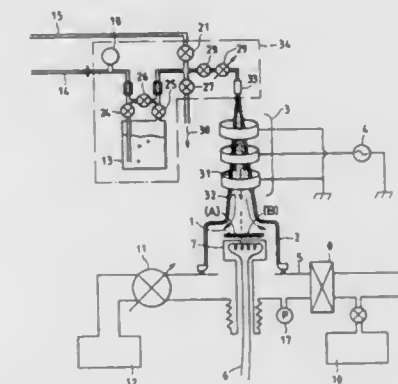
said heating means including a body of material having two distinct regions; one of said regions having a lower electrical resistance than said other of said regions; placing a substrate adjacent said body in a chemical vapor deposition apparatus having a chamber such that said body and said substrate reside in said chamber and such that said one of said regions of said body is closer to said substrate than said other of said regions; heating said substrate to a predetermined temperature with said heating means; introducing a gaseous feedstock into said chamber under conditions wherein said gaseous feedstock includes electrically charged species in said chamber; a portion of said gaseous feedstock flowing to an area adjacent said substrate; electrically biasing said one region of said body with electrical biasing means in a manner which interacts with said charged species of said gaseous feedstock; and contacting said substrate with said gaseous feedstock under conditions which promote the formation of a deposit of a material on said substrate originating from said gaseous feedstock.

5,091,209
METHOD OF FORMING A THIN COPPER FILM BY LOW TEMPERATURE CVD
Pierre Clavier, Boulogne Billancourt, France; Masao Kimura, Minatomachi, Juichi Arai, Shiraumemito, both of Japan, and Pierre Jalby, La Marne, France, assignors to L'Air Liquide, Societe Anonyme Pour L'etude et L'exploitation des Procédés Georges Claude, Paris, France
Filed Oct. 11, 1990, Ser. No. 596,001
Claims priority, application Japan, Oct. 12, 1989, 1-264101
Int. Cl.⁵ C23C 16/06, 16/08, 16/48
U.S. Cl. 427—38 13 Claims



1. A method of forming a thin copper film by CVD, said method consisting essentially of the steps of: (a) forming a gas stream containing a copper halide, followed by introducing said gas stream into a CVD reaction chamber having a heated catalytic metal filament arranged therein; (b) introducing hydrogen gas into said CVD reaction chamber for activation of said hydrogen gas by said heated catalytic metal filament; and (c) carrying out a reaction between said copper halide contained in said gas stream introduced in step (a) and said hydrogen activated in step (b) near a surface of a substrate arranged within said CVD reaction chamber so as to deposit a thin film of copper on said substrate surface; wherein said substrate is maintained at a temperature of about 250° C. to about 300° C.

5,091,210
PLASMA CVD OF ALUMINUM FILMS
Nobuo Mikoshiba, Kazuo Tsubouchi, and Kazuya Masu, all of Sendai, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 19, 1990, Ser. No. 584,637
Int. Cl.⁵ B05D 3/06, 5/12
U.S. Cl. 427—39 19 Claims



1. A deposited film formation method for forming an aluminum-containing film on a substrate in a deposition space comprising: (a) introducing a starting gas of trimethyl aluminum and hydrogen into a reaction zone having a portion which is increased in cross-sectional area from the gas-introducing side in a direction toward the substrate to prevent reverse gas flow; (b) generating a chemical vapor plasma of said starting gas in the reaction zone between the starting gas introduction side and the substrate; and (c) conducting the deposition of said film at an elevated substrate temperature and on a surface of the substrate having an electron donative portion (A) and a non-electron donative portion (B) to provide selective growth of said aluminum-containing film.

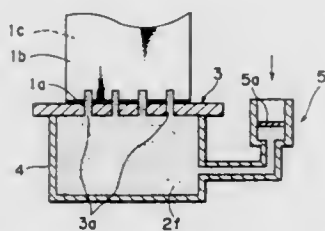
5,091,211
COATING METHOD UTILIZING PHOSPHORIC ACID ESTERS
Lawrence D. Richard, Erie, Pa., assignor to Lord Corporation, Erie, Pa.
Filed Aug. 17, 1989, Ser. No. 395,385
Int. Cl.⁵ B05D 3/06; B32B 27/40
U.S. Cl. 427—44 12 Claims

1. In a method of coating a vinyl resin layer with a coating composition comprising a radiation-curable acrylourethane, a photoinitiator and at least one unsaturated addition-polymerizable monomer polymerizable with said acrylourethane and radiation-curing the coated vinyl resin layer to form a bond with the coating composition, the improvement comprising including in said coating composition a monoester or diester of phosphoric acid in an amount sufficient to improve the strength of said bond.

5,091,212
METHOD AND APPARATUS FOR FORMING ELECTRODE ON ELECTRONIC COMPONENT
Norio Sakai, Kenji Minowa, and Shinji Morihiro, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Dec. 19, 1989, Ser. No. 452,755
Claims priority, application Japan, Dec. 19, 1988, 63-321629
Int. Cl.⁵ C23C 26/00 9 Claims

1. A method of forming an electrode on a selected portion of at least one surface of an electronic component, comprising the steps of:

preparing a slit plate provided with a through slit having width corresponding to the width of the electrode to be formed;
 preparing a bath of electrode paste for forming the electrode;
 locating said slit plate above said electrode paste bath;
 arranging said electronic component in close proximity above said slit plate so that said portion of said surface to



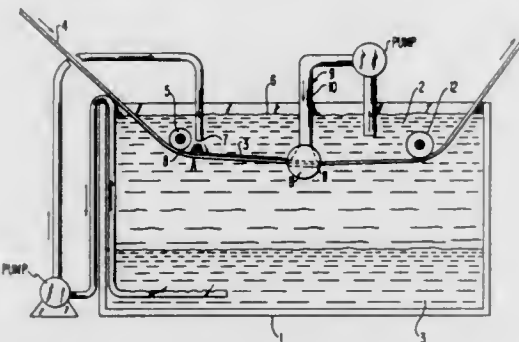
be provided with an electrode extends across said through slit; and
 bringing said electrode paste bath to such a level that said electrode paste passes through said through slit to reach substantially only said selected portion of said surface to be provided with an electrode;
 thereby applying said electrode paste passing through said through slit substantially only to said selected portion of said surface to be provided with an electrode.

5,091,213 PROCESS FOR SURFACE MODIFICATION OF POLYMER ARTICLES

Joseph Silbermann, Old Bridge, and Michael T. Burchill, Cranbury, both of N.J., assignors to Atochem North America, Inc., Philadelphia, Pa.
 Continuation of Ser. No. 232,963, Aug. 16, 1988, abandoned, which is a continuation of Ser. No. 945,595, Dec. 23, 1986, Pat. No. 4,770,905. This application Aug. 31, 1989, Ser. No. 401,544. The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
 Int. Cl.⁵ B05D 5/00

U.S. Cl. 427—160

16 Claims



1. A process for incorporating at least one ingredient into a polymer article which comprises the steps of:
 (a) immersing said article in an aqueous media; and
 (b) contacting a surface of the immersed article with a solution of said at least one ingredient in a solvent,
 wherein said aqueous media is non-aggressive towards said article and immiscible with said solvent; and
 wherein both steps are carried out in an environment which avoids escape of any significant amount of said solvent into the atmosphere.

5,091,214 PROCESS FOR THE PRODUCTION OF A LAYER OF SELF-CICATRIZING POLYURETHANE, AND PRODUCTS OBTAINED

René Muller, Yerres, and Gérard Daudé, Villenave D'Ornon, both of France, assignors to Saint-Gobain Vitrage International, Aubervilliers Cedex, France

Filed Jun. 5, 1990, Ser. No. 533,332

Claims priority, application France, Jun. 5, 1989, 89 07375
 Int. Cl.⁵ B05D 5/06

U.S. Cl. 437—164

16 Claims

1. A process for preparing a coating layer of a thermohardening polyurethane having self-cicatrization properties, comprising:

preparing a mixture of effective reactive amounts of an isocyanate component which is a diisocyanate or a mixture of diisocyanate monomers capable of forming an isocyanate trimer, a polyol monomer having a functionality of at least 2 and a trimerization catalyst;
 placing the reactive mixture onto a support for formation of said layer;
 heating the reactive mixture to a temperature sufficient to initiate trimerization; and then
 further heating the reactive mixture to initiate and conduct polymerization thereby forming said polyurethane layer.

5,091,215 COATING METHOD

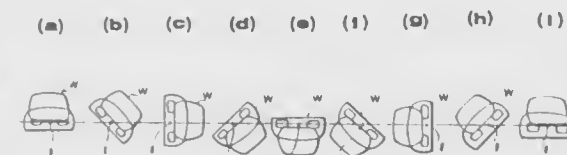
Yoshio Tanimoto; Tadimitsu Nakahama, and Takakazu Yamane, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 328,545, Mar. 24, 1989, abandoned.
 This application May 7, 1991, Ser. No. 700,045

Claims priority, application Japan, Mar. 25, 1988, 63-21334;
 Mar. 25, 1988, 63-71333; Mar. 25, 1988, 63-71338
 Int. Cl.⁵ B05D 3/12

U.S. Cl. 427—240

21 Claims



1. A coating method comprising:
 a coating step for coating a substrate by spraying with a paint, in which the substrate has a first side extending in a substantially upward-and-downward direction and a second side extending in a substantially horizontal direction; and
 a drying step for drying the paint sprayed on the substrate; wherein the coating step is carried out in a manner such that the paint is coated on the second side of the substrate in a given film thickness and is coated on the first side of the substrate in a film thickness which is thicker than a film thickness at which the paint sags on the first side of the substrate and such that the coating of the first side of the substrate is carried out at the same time as or subsequent to the coating of the second side;
 wherein the drying step is carried in a manner such that the substrate is rotated about its horizontal axis extending in a substantially horizontal and longitudinal direction of the substrate at least during a period of time from the time before the paint starts sagging to the time at which the paint is cured to such an extent as not to sag; and
 wherein the rotation of the substrate is carried out at a speed which is high enough to rotate the substrate before the paint coated thereon substantially sags due to gravity yet which is low enough to cause no sagging as a result of centrifugal force.

5,091,216 REACTIVE POST TREATMENT FOR GAS SEPARATION MEMBRANES

Okan M. Ekiner, Wilmington; Richard A. Hayes, Hockessin, and Philip Manos, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. and L'Air Liquide, S.A., Paris, France

Continuation of Ser. No. 175,499, Apr. 13, 1988, abandoned.

This application Dec. 5, 1990, Ser. No. 622,269

Int. Cl.⁵ B05D 5/00

U.S. Cl. 427—245

37 Claims

1. A process for improving the selectivity of a gas separation membrane selected from the classes of asymmetric and composite membranes that have a gas separating portion supported by a cellular structure, comprising applying to the surface of said gas separating portion of said gas separation membrane at least two monomers, each of which has a molecular weight of under 1,000 atomic units, causing said monomers to react with each other to form a polymer to improve the selectivity of the membrane for separating two or more gases.

5,091,217 METHOD FOR PROCESSING WAFERS IN A MULTI STATION COMMON CHAMBER REACTOR

H. Peter W. Hey, Phoenix; William A. Mazak; Ravinder K. Aggarwal, both of Mesa; John H. Curtin, Phoenix; Paul B. Brown, and Joe R. Smith, both of Tempe, all of Ariz., assignors to Advanced Semiconductor Materials, Inc., Phoenix, Ariz.

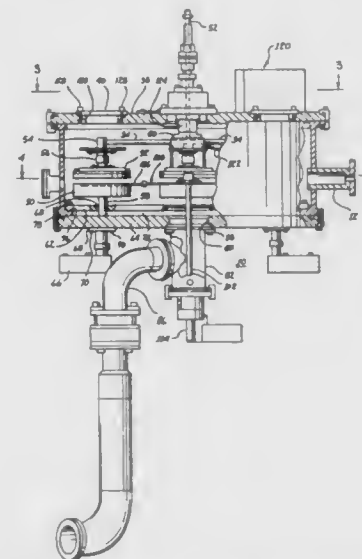
Division of Ser. No. 354,922, May 22, 1989, Pat. No. 4,987,856.

This application Sep. 25, 1990, Ser. No. 587,737

Int. Cl.⁵ C23C 16/44

U.S. Cl. 427—248.1

29 Claims



1. A method for processing multiple single wafers in a multi station CVD reactor having a number of susceptors equal in number to the number of stations, which stations are disposed in a common chamber of the reactor, said method comprising the steps of:

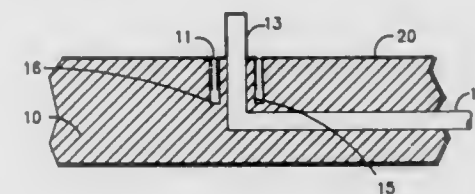
- supporting one wafer on a susceptor;
- dispensing a gas upon the supported wafer from a gas dispersion head associated with the wafer supporting susceptor; and
- urging outward radial flow of the gas across each supported wafer to the peripheral edge of the gas dispersion head; and
- drawing the gas from the peripheral edge of the wafer, along the side of the susceptor and into an exhaust chamber having an opening centrally aligned with the susceptor.

5,091,218 METHOD FOR PRODUCING A METALLIZED PATTERN ON A SUBSTRATE

Leonard F. Altman, and Dale W. Dorinski, both of Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
 Continuation of Ser. No. 319,035, Mar. 6, 1989, abandoned. This application Aug. 16, 1990, Ser. No. 569,254
 Int. Cl.⁵ B05D 5/12

U.S. Cl. 427—250

9 Claims



1. A method of manufacturing a substrate having a metallization pattern comprising the steps of:
 providing a substrate having a high aspect ratio non-connecting groove,
 said groove having a bottom surface framed by a plurality of sidewalls,
 said aspect ratio being sufficiently high to define an area electrically isolated from a desired metallization pattern; and
 applying metallization to the substrate by vacuum deposition whereby the high aspect ratio of the non-connecting groove prevents metallization of the bottom surface and complete metallization of said plurality of sidewalls of the groove thereby electrically isolating said groove from said metallization pattern.

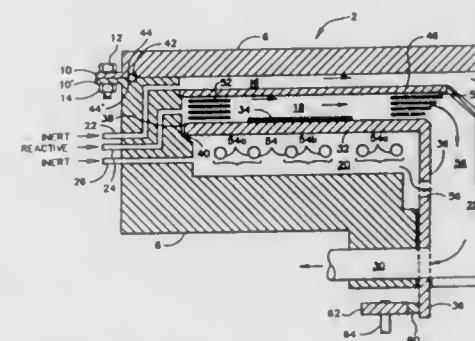
5,091,219 CHEMICAL VAPOR DEPOSITION METHOD

Joseph R. Monkowski, and Mark A. Logan, both of Carlsbad, Calif., assignors to LAM Research Corporation, Fremont, Calif.
 Continuation of Ser. No. 15,359, Feb. 17, 1987, Pat. No. 4,976,996. This application Jul. 20, 1990, Ser. No. 555,964. The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.⁵ C23C 16/00

U.S. Cl. 427—255.5

30 Claims



1. A method for depositing at least one layer of material onto substrates by chemical vapor deposition, comprising defining a generally circular reaction chamber about a central axis;
 defining a deposition zone in said reaction chamber between a horizontal top surface extending substantially across said chamber and a horizontal support plate;
 placing at least one substrate on said horizontal support plate;
 holding said horizontal top surface and said horizontal support plate at predetermined temperatures to heat said substrate placed on said support plate;

supplying said deposition zone with at least one reactive gas from which said layer of material is to be deposited on said substrate and exhausting said reactive gas and gaseous reaction products from said deposition zone at the periphery and center of said reaction chamber; and controlling the flow of said gas and gaseous reaction products so that said reactive gas passes radially through said deposition zone and over said substrates in a laminar flow and the recirculation of any reactive gas or gaseous reaction product over said substrate or through any part of said reaction chamber which affects said substrate is prevented; whereby said reactive gas passes over said substrate once for a predetermined residence time.

5,091,220

METHOD OF SURFACE TREATMENT WHEREBY A MASK IS ATTACHED TO THE WORK BY AN ADHESIVE, THE WORK IS SURFACE TREATED, AND THE MASK IS REMOVED BY SUCTION

Seinosuke Horiki, and Reiji Makino, both of Tokai, Japan, assignors to Nagoya Oilchemical Co., Ltd., Nagoya, Japan

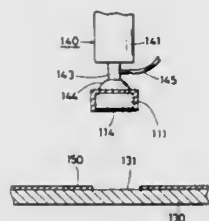
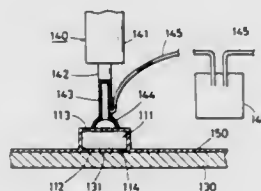
Filed Jun. 1, 1990, Ser. No. 532,017

Claims priority, application Japan, Feb. 6, 1989, 1-141360; Aug. 11, 1989, 1-291962; Aug. 22, 1989, 1-216861

Int. Cl.⁵ B05D 1/32; B05L 11/00

U.S. Cl. 427—272

4 Claims



1. A method of surface treatment employing a masking member to protect a part of an article from said surface treatment which comprises attaching said masking member by adhesive onto said part of said article to protect said part from said surface treatment, effecting said surface treatment of said article and removing by suction said masking member from said part of said article.

5,091,221

METHOD FOR PREPARING SUPERCONDUCTOR SPUTTERING TARGET

Jau-Jier Chu, Taipei; Ming-Chih Lai, Tai-Chung Hsien; Mei-Rung Tseng, and Huei-Hsing Yeh, both of Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Chutung, Taiwan

Filed Aug. 22, 1990, Ser. No. 571,138
Int. Cl.⁵ B05D 5/12

U.S. Cl. 427—282

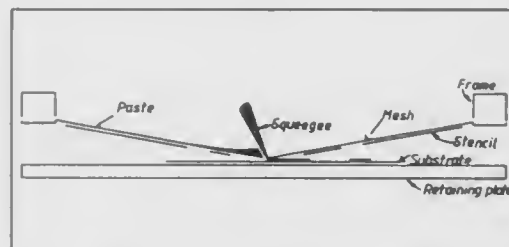
7 Claims

1. A method for preparing a superconductor sputtering target comprising the steps of:

- (1) mixing powdered oxides, carbonates or fluorides of (a) yttrium, barium, copper or (b) bismuth, strontium, calcium, copper; or (c) bismuth, lead strontium, calcium, copper and adding a vehicle prepared by blending ethyl cellulose used as an organic binder and butyl carbitol used as an organic solvent to the mixture thereof, the percent-

age by weight of said binder and solvent being from 5:95 to 15:85, such that the vehicle and the mixed powder has a solid content percentage of 60-80% and then stirring to form an oxide super-conductor paste;

- (2) pouring the oxide superconductor paste obtained in Step (1) on a stencil which is fitted thereon with a fine mesh and coating it over the surface of the mesh by using a squeegee, then lowering the stencil and scraping back with the squeegee such that the paste seeps through the mesh to have a layer of wet film printed on the substrate, said substrate composed of aluminum;



- (3) repeating Steps (2) several time, said substrate having a wet film of the mixture printed thereon to be bake-dried;
- (4) repeating Steps (2) and (3) several times and, finally, said substrate printed thereon with the wet film of the mixture being heated to a temperature of 400-500° C., at a rate of less than 5° C./min, holding said mixture at said temperature of 400-500° C. for about 30 minutes and then cooled down to room temperature also at the rate of less than 5° C./min.

5,091,222

METHOD FOR FORMING A CERAMIC FILM

Hiroaki Nishio; Michitaka Sato, and Keiji Watanabe, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

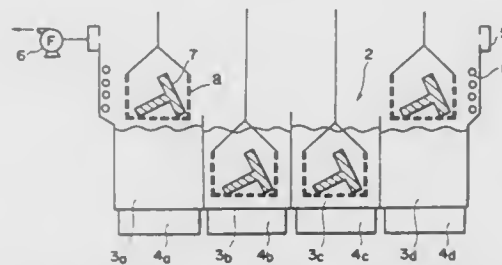
Filed Sep. 24, 1990, Ser. No. 586,801

Claims priority, application Japan, Sep. 28, 1989, 1-252644

Int. Cl.⁵ B05D 3/04

U.S. Cl. 427—335

24 Claims



1. A method for forming a ceramic film, comprising the steps of:

- heating a solution containing ceramics to produce a boiling solution;
- dipping a shaped base material into said boiling solution;
- taking said shaped base material out of said solution with the surface thereof carrying solution containing ceramics; and
- drying said shaped base material, which has been taken out of the boiling solution in the vapor of the solvent above said boiling solution to form a ceramic film on the surface of said shaped base material.

5,091,223

PROCESS FOR FORMING A BLACKENED LAYER ON A ZINCIFEROUS SURFACE BY CONTACTING THE SURFACE WITH AN AQUEOUS SOLUTION CONTAINING NICKEL AND COBALT IONS

Kazuhiko Mori; Toshi Miyawaki, and Hitoshi Ishii, all of Kanagawa, Japan, assignors to Henkel Corporation, Ambler, Pa.

Filed Jun. 27, 1990, Ser. No. 544,455

Claims priority, application Japan, Jun. 27, 1989, 1-164619
Int. Cl.⁵ B05D 3/02

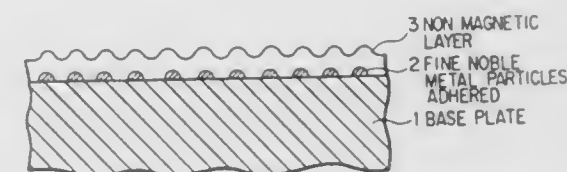
U.S. Cl. 427—383.7

20 Claims

1. A process for forming a blackened layer on a zinciferous surface by contact the zinciferous surface with an aqueous liquid solution composition that has a pH of at least 5 and consists essentially of water and the following components:

- (A) at least 0.5 g/L of the treatment solution of ions selected from the group consisting of Ni²⁺, Co²⁺, and mixtures thereof; and
- (B) an amount, stoichiometrically sufficient to complex all the ions of component (A), of a weak complexing component selected from the group consisting of ammonia, saturated aliphatic compounds having at least two amino groups of which at least one is a primary amino group, amino acids, and mixtures of any two or more of these; and
- (C) a component selected from the group consisting of nitrite ions, nitrate ions, perchlorate ions, and mixtures of any two or more of these in an amount effective to accelerate the rate of dissolution of zinc in contact with the composition; and, optionally,
- (D) a component selected from the group consisting of carbonate ions, thiocyanate ions, thiosulfate ions, thiourea, hypophosphite ions, phosphite ions, and mixtures of any two or more of these.

mixing particles of a noble metal contained in a noble metal salt solution, immersing said base plate in said noble metal salt solution in order to adhere said particles to said base plate, and



forming a non-magnetic layer on said base plate to which said particles of noble metal adhere, a surface of said non-magnetic layer having a roughness determined by a thickness of said non-magnetic layer.

5,091,226

DECORATIVE GARLAND

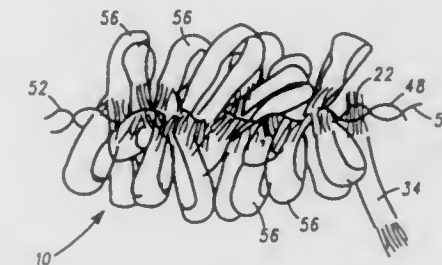
William F. Protz, Jr., Manitowoc, Wis., assignor to National Tinsel Manufacturing Company, Manitowoc, Wis.

Filed Feb. 6, 1991, Ser. No. 651,664

Int. Cl.⁵ A41G 1/04

U.S. Cl. 428—10

15 Claims



1. A decorative garland, comprising:

- a web of cut film having a center web portion and border web portions, said center web portion including widely spaced cut, and transversely cut, film sections and each of said border web portions including narrowly spaced cut, and transversely cut, film sections;
- said cut film web folded longitudinally along a line through said center web portion of said cut film web such that said border web portions are disposed near each other and said center web portion forming a loop; and
- a wire spine holding said folded, cut film web with said wire spine twisted about said folded, border cut web portion and thereby forming a rotated display arrangement of said cut film web about said wire spine of said folded, border cut web portions disposed radially nearest said wire spine and said folded, center cut web portions disposed farther from said wire spine than said border cut web portions.

5,091,225

MAGNETIC DISC MEMBER AND PROCESS FOR MANUFACTURING THE SAME

Fumio Goto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 23, 1989, Ser. No. 397,583

Claims priority, application Japan, Aug. 24, 1988, 63-211225

Int. Cl.⁵ B05D 1/18

U.S. Cl. 427—430.1

8 Claims

1. A process for manufacturing a substrate for a magnetic disc member, said process comprising the steps of:

- preparing a base plate;

5,091,227

DECORATIVE TREE STRUCTURE

Jeffery L. Wright, and Lisa K. Wright, both of 3171 Sturbridge Ct., Riverside, Calif. 92503

Filed Apr. 2, 1991, Ser. No. 679,237

Int. Cl.⁵ A41G 1/00

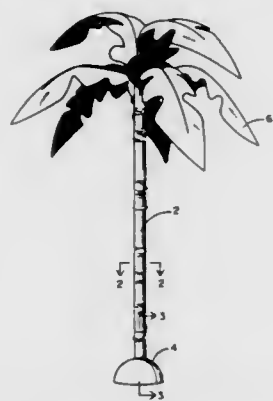
U.S. Cl. 428—18

6 Claims

1. A decorative tree structure comprising:

- a base to support the tree structure;

a tree trunk having an upper end and lower end, said lower end received into said base;
a fabric covering surrounding said trunk;



a cluster of leaves containing a plurality of leaves; and means, attached to said leaves, for connecting said cluster of leaves to the upper end of said tree trunk.

5,091,228

LINEAR POLYETHYLENE FILM AND PROCESS FOR PRODUCING THE SAME

Toshio Fujii; Kazuhiro Kato; Akihiko Sakai, and Yoshinao Shinohara, all of Kurashiki, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 217,930, Jul. 12, 1988, abandoned. This application Jun. 25, 1991, Ser. No. 720,650

Claims priority, application Japan, Jul. 13, 1987, 62-174527; Aug. 18, 1987, 62-204539; Aug. 19, 1987, 62-205786; Jan. 29, 1988, 63-19054; Jun. 20, 1988, 63-151980

Int. Cl.⁵ B32B 1/02, 27/10, 27/32; C08L 23/20, 23/26

U.S. Cl. 428—34.3

5 Claims

1. A packaging bag comprising an outer bag made of paper and an inner bag made of a monoaxially or biaxially stretched film having a heat shrinkage of 20% or more in one of the longitudinal and transverse directions and 60% or more in the other direction and comprising 100 to 50 parts by weight of a linear polyethylene having a density of 0.910 to 0.965 g/cm³, a melt index of 2 g/10 min or below and a fluidity ratio of 120 or below; 0 to 50 parts by weight of a branched low-density polyethylene having a melt index of 2 g/10 min or below, a fluidity ratio of 70 or below and a density of 0.930 g/cm³ or below; and 0.0001 to 0.1 part by weight of a radical initiator as an optional component.

5,091,229

ELECTRONICS PROTECTIVE PACKAGING FILM

Ralph C. Golike, Wilmington, Del.; Hua-Feng Huang, Mendenhall, Pa., and Herminio C. Llevat, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 421,547, Oct. 13, 1989, abandoned. This application Aug. 14, 1990, Ser. No. 565,771

Int. Cl.⁵ B65D 27/18; H01B 1/06

U.S. Cl. 428—35.2

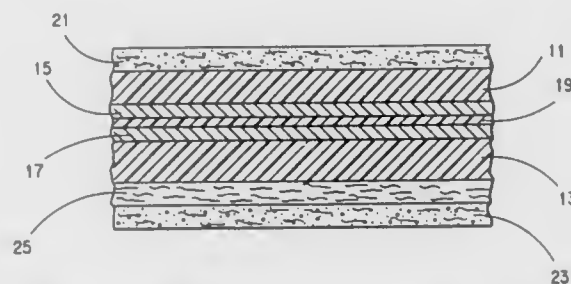
31 Claims

1. A flexible static charge-dissipating structure comprising: (a) a substrate film;

(a) a coating of at least one layer selected from a heat sealable thermoplastic matrix or latex on at least one surface of said substrate film; and

(a) an electroconductive pigment comprising shaped particles of a silica-containing material which is amorphous silica or a silica-containing material having an extensive co-valent network involving SiO₄ tetrahedra, and which particles are surface coated with a two-dimensional network of antimony-containing tin oxide crystallites in weight of the tin oxide, said particles being dispersed in at least one layer of said matrix or said latex and being pres-

ent in sufficient quantity whereby the particles interconnect and form an electroconductive network within the



matrix or latex and provide a surface resistivity of less than about 10¹² ohms per square.

5,091,230

TUBE OF COMPOSITE MATERIAL WITH A FIBROUS THERMOPLASTIC COATING AND PROCESS FOR MANUFACTURING SUCH A TUBE

Jean-François Fuchs, Sainte-Helene; Jean-Louis Tisne, Martignas, and Pierre Odru, Fontenay Sous Bois, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris and Institut Francais du Petrole, Malmaison, both of France

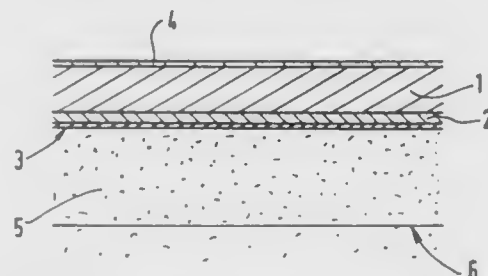
Filed Apr. 12, 1990, Ser. No. 508,197

Claims priority, application France, Apr. 13, 1989, 89 04898

Int. Cl.⁵ F16L 17/02

U.S. Cl. 428—36.4

2 Claims



1. A tube of composite material comprising a tubular structural portion containing fibers encapsulated with thermosetting matrixes functioning as a binder,

a first inner coating of fibrous composite material with a thermoplastic binder on the interior surface of the tubular structural portion, interface fibers of said first inner coating being closely bonded by polymerization to the thermosetting binder of said tubular structural portion, and a second supplementary inner coating on the first inner coating, the second supplementary inner coating of thermoplastic material consisting essentially of polyamide and bonded to the thermoplastic binder of the said first inner coating.

5,091,231

RETORTABLE CONTAINER

Keith Parkinson, Seaford, Va., assignor to QuesTech Ventures, Inc., Newport News, Va.

Division of Ser. No. 257,206, Oct. 13, 1988, Pat. No. 4,997,691, which is a continuation-in-part of Ser. No. 107,574, Oct. 13, 1987, Pat. No. 4,836,764. This application Dec. 13, 1990, Ser. No. 627,194

The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.

Int. Cl.⁵ B65D 25/00

U.S. Cl. 428—36.6

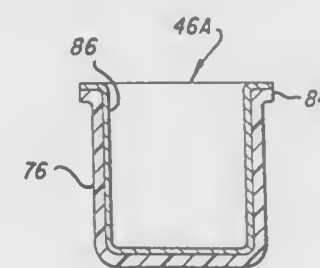
3 Claims

1. A retortable container comprising: a. a wall that is highly impermeable to fluids selected from a group consisting of oxygen and aromatic vapors and that

can withstand temperatures and pressures of a retort chamber without undergoing significant and permanent distortion; and

b. a rim in a solid phase, even when the wall of the container is heated to or above its melting point; said container being made by a method of thermal pressure forming of a plastic blank, said method including the steps of:

(1) bringing the plastic blank from a solid phase to a melt phase by heating said plastic blank to a melting temperature sufficient to relieve internal stresses in said plastic blank while conveying the plastic blank on a conveying means through a heating means;



said conveying means including at least a plurality of trays, each having a plurality of holes therethrough in which preventing means are placed;

(2) preventing the plastic blank in the solid phase from going into the melt phase while in the heating means only along outer peripheral edges thereof so that the plastic blank maintains its hoop strength and peripheral dimensions;

said preventing step including the substep of suspending the plastic blank across said preventing means; and

(3) forming the plastic blank into said container.

5,091,232

LAMINATED DECORATIVE FILM PROVIDING PEARLESCENT APPEARANCE OR EFFECT

Joseph W. Coburn, Jr., 953 Princewood Ave., Lakewood, N.J. 08701

Filed Jan. 2, 1990, Ser. No. 459,972

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.⁵ A61F 13/02

U.S. Cl. 428—40

13 Claims



1. Laminated decorative film providing a pearlescent appearance, comprising:

a layer of support material;

a layer of substantially clear plastic film; and

a layer of substantially transparent film having a predetermined reflection color intermediate said layer of support material and said layer of substantially clear plastic film, said layer of substantially transparent film having a predetermined reflection color having opposite surfaces one of which opposite surfaces is metallized to a predetermined thickness and adhered to said layer of support material and the other of which opposite surfaces is adhered to said layer of substantially clear plastic film.

5,091,233

GETTER STRUCTURE FOR VACUUM INSULATION PANELS

David B. Kirby, and Nihat O. Cur, both of St. Joseph Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

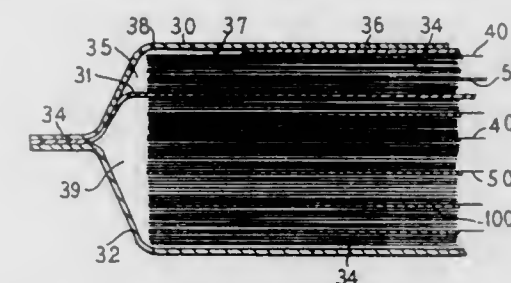
Filed Dec. 18, 1989, Ser. No. 452,068

The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.

Int. Cl.⁵ B32B 3/28, 1/06

U.S. Cl. 428—69

10 Claims



1. A vacuum thermal insulation panel comprising:

a first outer wall having low permeation with respect to atmospheric gasses and vapors;

a second outer wall having low permeation as to atmospheric gasses and vapors coextensive and parallel with said first outer wall and hermetically sealed together with said first outer wall about their perimeters;

at least one internal wall having low permeation with respect to atmospheric gasses and vapors parallel with said outer walls, interposed between said first outer wall and said second outer wall;

a first compartment being defined by said at least one internal wall and one other of said walls, said compartment being evacuated and filled with a porous insulating material, with a pressure differential across said at least one internal wall being small in comparison to atmospheric pressure;

a second compartment being defined by a second of said outer walls and one other of said walls, said second compartment being evacuated and filled with a porous insulating material, with a pressure differential across said outer wall being approximately equal to atmospheric pressure; and

a first gas or vapor absorbing material disposed in said first compartment and a second gas or vapor absorbing material having different absorbing characteristics disposed in said second compartment.

5,091,234

COMPOSITE WATER BARRIER SHEET

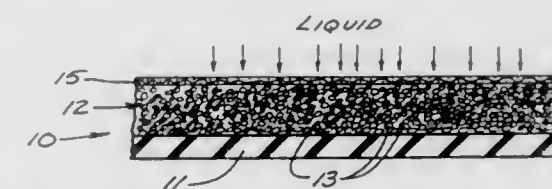
Bryan M. McGroarty, and Patrick J. McGroarty, both of 2600 Paramount Dr., Spearfish, S. Dak. 57783

Filed Jun. 30, 1989, Ser. No. 374,213

Int. Cl.⁵ D06N 7/04

U.S. Cl. 428—143

3 Claims



1. A composite leakproofing sheet comprising:

a support membrane of a substantial size;

a layer of particles of bentonite adhered to the support membrane and with the particles adhered to each other with a

suitable adhesive to cause the particles to be retained in a layer on the support membrane, said particles swelling in the presence of liquid to provide a leakproofing action, and a cover layer of a porous fabric sheet secured to the layer of bentonite particles solely by adhesive for retaining the cover sheet in place to protect the bentonite particle layer from abrasion, while permitting liquids to pass through the porous sheet to contact the bentonite particles to provide the waterproofing action.

5,091,235

LAMINATED SILL WRAP ASSEMBLY FOR PROVIDING AN AIR INFILTRATION BARRIER

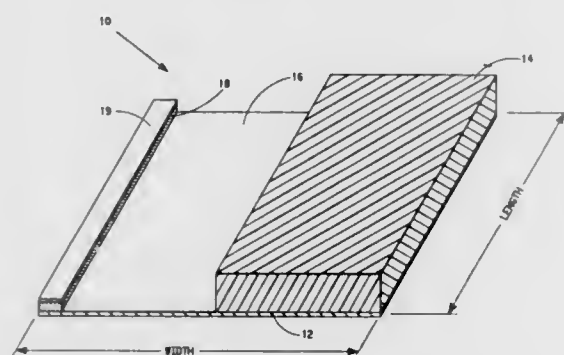
Mark P. Vergnano, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 4, 1990, Ser. No. 519,075

Int. Cl.⁵ B32B 23/02

U.S. Cl. 428—192

14 Claims



1. A laminated sill wrap assembly for providing an air infiltration barrier between and around the sill plate and foundation interface of a building under construction comprising:

- (a) a spunbonded polyolefin sheet;
- (b) a batt of infiltration material which is laminated onto a face portion of the sheet along the entire length of the sheet, but only along a portion of the width of the sheet starting from one edge of the sheet, such that a single sealing flap is formed where the infiltration material is not laminated onto the sheet.

5,091,236

MULTI-LAYER HIGH OPACITY FILM STRUCTURES

Lajos E. Keller, Luxembourg, Luxembourg; Jean-Pierre Frognet, Virton, Belgium, and Maurice Petitjean, Willers, France, assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 14, 1991, Ser. No. 699,864

Int. Cl.⁵ B32B 3/26, 7/02, 31/16

U.S. Cl. 428—213

20 Claims

1. An opaque, biaxially oriented polymeric film structure, comprising:

- (a) a thermoplastic polymer matrix core layer having a first surface and a second surface, within which is located a strata of voids; positioned at least substantially within a substantial number of said voids is at least one spherical void-initiating particle which is phase distinct and incompatible with said matrix material, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void; the population of said voids in said core being such as to cause a significant degree of opacity;
- (b) at least one thermoplastic polymer intermediate layer having a first surface and a second surface, said second surface of said intermediate layer adhering to at least said first surface of said core layer, said intermediate layer

including up to about 12% by weight of titanium dioxide contact pigment; and

- (c) a titanium dioxide-free, non-voided thermoplastic skin layer adhering to said first surface of said intermediate layer, said void-free skin layer and said intermediate layer together being of a thickness such that the outer surface of said skin core layer does not, at least substantially, manifest the surface irregularities of said matrix core layer.

5,091,237

TRANSPARENT SHRINK FILM BASED ON POLYPROPYLENE, PROCESS FOR ITS MANUFACTURE, AND ITS USE FOR SHRINK LABELS

Gunter Schloegl, Kelkheim; Lothar Bothe, Mainz-Gonsenheim; Guenther Crass, Taunusstein; Ursula Murschall, Nierstein, and Herbert Peiffer, Mainz-Finthen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,300

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 3821581

Int. Cl.⁵ B32B 7/02

U.S. Cl. 428—215

30 Claims

1. Transparent shrinkable film comprising:

- a base layer comprising a mixture of about 60 to 95% by weight of a propylene polymer and about 5 to 40% by weight of a hydrogenated hydrocarbon resin having a softening point in the range from 60° to 125° C., the percentages being related to the total weight of the mixture employed for the base layer, and
- a top layer on each of the two surfaces of said base layer comprising a propylene polymer and a hydrogenated hydrocarbon resin having a softening point in the range of 90° to 145° C., said top layers comprising about 60 to 100% by weight of the propylene polymer and up to 40% by weight of the hydrogenated hydrocarbon resin, the percentages being related to the total weight of the top layers,

said film being a shrinkable film which is stretched in the longitudinal and transverse directions and has a low degree of orientation in the longitudinal direction.

5,091,238

FLOPPY DISK COMPRISING A CELLULOSIC RESIN WITH A POLAR GROUP IN A SIDE CHAIN AND FERROMAGNETIC PARTICLES OF A SPECIFIC SURFACE AREA

Mikihiko Kato; Hiroshi Hashimoto; Yasushi Endo, and Yasuo Nagashima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1990, Ser. No. 534,912

Claims priority, application Japan, Jun. 9, 1989, 1-147655

Int. Cl.⁵ G11B 5/00

U.S. Cl. 428—64

1 Claim

1. A floppy disk comprising a nonmagnetic support having thereon a magnetic layer comprising mainly ferromagnetic metal particles and binder resins,

wherein said ferromagnetic metal particles have a specific surface area of 40 m²/g or more and an amount of said binder resins is from 5 to 350 parts by weight per 100 parts by weight of the ferromagnetic metal particles, and

wherein at least part of said binder resins is a cellulosic resin having in side chains of the molecules thereof a polar group which is a sulfonic acid group, a metal sulfonate group, a phosphoric acid group, or a metal phosphate group, and further

wherein a content of said cellulosic resin is from 25 to 70% by weight based on the binder resins and

a content of said polar group is from 1.10⁻⁶ to 1×10⁻³ equivalent per g of the cellulosic resin.

5,091,239

METHODS AND ADHESIVES FOR BONDING POLYOLEFIN FILM

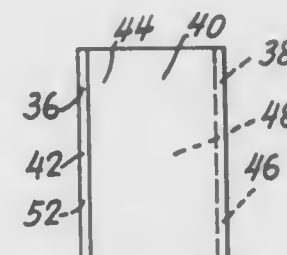
Richard A. Przeworski, Wayne, Pa., and Roy A. White, Somers, Conn., assignors to CMS Gilbreth Packaging Systems, Inc., Trevose, Pa.

Filed Mar. 7, 1990, Ser. No. 490,825

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—195

60 Claims



1. A method for high speed application of labels, having thermoplastic polyolefin film, to container walls, said labels each having a first side leading end and a second side trailing end comprising the steps of:

- a) activating at least one member of the group of a pattern of dry adhesive affixed to and defining said leading end of said first side of said film and a pattern of dry adhesive affixed to and defining said trailing end of said second side of said film, by applying a solvent thereto, said solvent being reactive with said dry adhesive but not being reactive with said film;
- b) overlapping, contacting and bonding said first side leading end with said second side trailing end with said solvent activated dry adhesive therebetween; and
- c) applying said label to the walls of a container.

5,091,240

LAMINATE INCORPORATING HOT MELT AND WATER BASED ADHESIVES

Richard E. Kajander, Ware, and David J. Fitzgerald, South Hadley, both of Mass., assignors to Tambrands, Inc., Palmer, Mass.

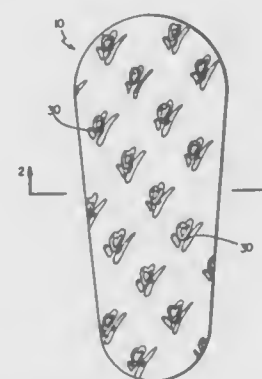
Continuation-in-part of Ser. No. 403,590, Sep. 5, 1989,

abandoned. This application Oct. 6, 1989, Ser. No. 417,831

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—198

21 Claims



1. A laminate comprising fibers held together in a moisture absorbent layer by water-based adhesive polymer that impregnates at least some regions of said layer and in those regions provides fiber-to-fiber bonding through said layer, a layer of hot melt adhesives; and a layer of hot melt adhered to said layer of fibers by said hot melt adhesive, said hot melt adhesive providing bonding

between said moisture absorbent layer and said adjoining layer.

5,091,241

FILM LAMINATE WITH EASY TO TEAR

Theodore J. Lang, 656 Sussex Blvd., Kingston, Ontario, Canada K7M 5A8, and Kevin Bergevin, 146 Falkirk Terr., Kingston, Ontario, Canada K7M 4C2

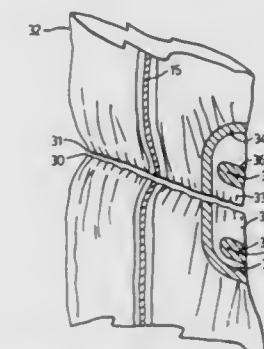
Filed Dec. 4, 1989, Ser. No. 445,774

Claims priority, application United Kingdom, Dec. 5, 1988, 8828349

Int. Cl.⁵ B32B 27/08

U.S. Cl. 428—213

9 Claims



1. A transversely tearable laminate comprising a linear low density polyethylene film, oriented in the machine direction below its melting temperature, a substantially unoriented sealant film laminated onto at least one side of said oriented film, the sealant film having an Elmendorf tear in the machine direction of at least about 2 g/μm, and the selection of said oriented film and said sealant film being made on the basis that:

$$[K.X>(1Y)]KX>(1-Y),$$

wherein

K is a factor defined as $(1-Y)/X$, and empirically determined so as to make the above expression true for laminates which will tear more easily and consistently in the transverse direction than in the machine direction and false for other lamination, said factor depending on the properties of the oriented film and the sealant film,

X is the thickness of all layers of sealant film in micrometers, Y is the thickness of all layers of oriented film in micrometers at which there is a change in the tearing property of the laminate from the machine direction to the transverse direction,

$$Y=(MD_c)/(TD_c),$$

MD_c is the Elmendorf tear strength, in the machine direction, of the oriented film, measured in grams, and TD_c is the Elmendorf tear strength, in the transverse direction, of the oriented film, measured in grams.

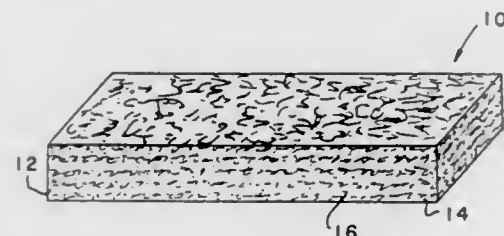
5,091,242

CARBON FIBER COMPOSITES HAVING IMPROVED FATIGUE RESISTANCE

Deborah D. L. Chung, Pittsburgh, Pa., assignor to The Research Foundation of State Univ. of N.Y., Albany, N.Y.
Filed Oct. 30, 1990, Ser. No. 605,645
Int. Cl.⁵ B32B 33/00

U.S. Cl. 428—237

16 Claims



1. A composite article comprising resin matrix containing carbon fibers and a tin alloy contained within the composite in the form of particles in discontinuous layers.

5,091,243

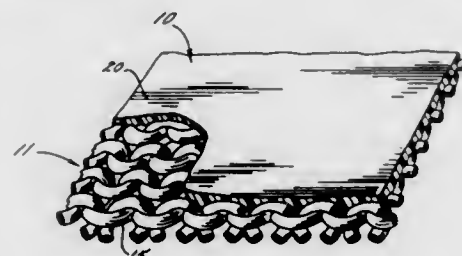
FIRE BARRIER FABRIC

Thomas W. Tolbert, Fort Mill; Pamela J. Jaco, Rock Hill, both of S.C.; Jeffrey S. Dugan, Charlotte, N.C., and James E. Hendrix, Spartanburg, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Apr. 4, 1989, Ser. No. 333,174
Int. Cl.⁵ B32B 7/00

U.S. Cl. 428—253

43 Claims



1. A fire-resistant fabric suitable for use as a flame barrier, and comprising: a flame durable textile fabric substrate formed of corespun yarns, said yarns comprising a core of a flame resistant filament and a sheath of staple fibers, and an intumescent coating carried by one surface of said textile fabric substrate.

5,091,244

ELECTRICALLY-CONDUCTIVE, LIGHT-ATTENUATING ANTIREFLECTION COATING

Erik J. Biernard, Northfield, Minn., assignor to Viratec Thin Films, Inc., Faribault, Minn.

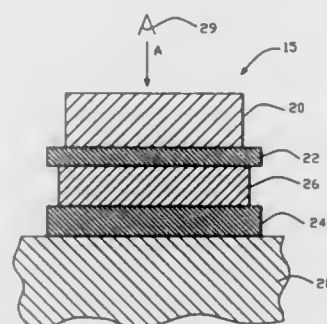
Filed Aug. 10, 1990, Ser. No. 566,052
Int. Cl.⁵ C03C 17/34

U.S. Cl. 428—216

34 Claims

1. A coating for an article, comprising:
a group of three layers wherein two of said layers substantially include a transition metal nitride, each of said two layers having a thickness between about 5 nm and 40 nm, and a third layer between said two layers, said third layer including a material substantially transparent to visible light, and having an optical thickness less than or equal to about one-quarter wavelength at a wavelength between about 480 nm and 560 nm and a refractive index between about 1.35 and about 2.65 at a wavelength of about 510 nm; and fourth layer adjoining said three layer group on the side thereof farthest from the article, said fourth layer

including a material substantially transparent to visible light and having a refractive index between about 1.35 and



1.9 at a wavelength of 510 nm and an optical thickness of about one-quarter wavelength between about 480 nm and about 560 nm.

5,091,245

DEGRADABLE ABSORBENT MATERIAL

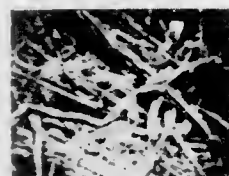
Christopher R. Phillips, P.O. Box 5667, Bellingham, Wash. 98225

Division of Ser. No. 236,678, Dec. 31, 1987, Pat. No. 4,931,139.
This application Sep. 5, 1989, Ser. No. 403,575

Int. Cl.⁵ D09H 1/58

U.S. Cl. 428—221

4 Claims



1. A degradable liquid absorbent material comprising waste cellulose fiber materials having minimal inorganic solids content and characterized by having: i) a bulk density of not more than 13 lbs./ft.³; ii) extensive open and unfilled interstitial spaces on the surface and throughout the interior of the degradable liquid absorbent material; and iii), surface fibers and fiber ends laid into the body of the degradable liquid absorbent material so as to form particles of absorbent material devoid of outwardly projecting fibers and fiber ends.

5,091,246

THREE DIMENSIONAL FABRIC AND METHOD FOR MAKING THE SAME

Yoshiharu Yasui; Meiji Anahara, and Hiroshi Omori, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Feb. 20, 1990, Ser. No. 482,345

Claims priority, application Japan, Feb. 20, 1989, 1-40479; Feb. 27, 1989, 1-47987; May 26, 1989, 1-133693

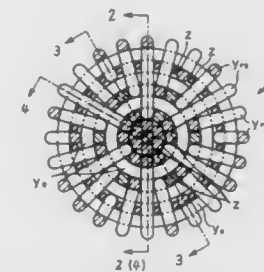
Int. Cl.⁵ D03D 3/00

U.S. Cl. 428—224

18 Claims

1. A three dimensional fabric having an axis, the fabric comprising:
a plurality of tubular axial yarn layers arranged concentrically about and outward from the axis, each of the axial yarn layers including a plurality of axial yarns extending longitudinally relative to the axis;
a circumferential yarn inserted to extend circumferentially around the axis and woven about a selected axial yarn layer; and
a plurality of radial yarns, each radial yarn being woven between portions of the circumferential yarn to extend

zigzag successively in longitudinal and radial directions relative to the axis, while being substantially perpendicular to the circumferential yarn, the radial yarns each being woven in a particular plane that extends through said axis.



lar to the circumferential yarn, the radial yarns each being woven in a particular plane that extends through said axis.

5,091,247

WOVEN GEOTEXTILE GRID

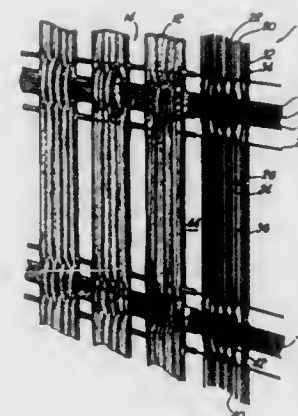
Gary L. Willibey, Dunwoody; John W. Hawkins, Stone Mountain; Russell P. Harp, Lithia Springs, and David M. Wilkinson, Stone Mountain, all of Ga., assignors to Nicolon Corporation, Norcross and Georgia Duck and Cordage Mill, Scottdale, both of Ga.

Continuation of Ser. No. 280,123, Dec. 5, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 402,971

Int. Cl.⁵ B32B 3/10, 5/08; E02D 17/20; D03D 19/00; E02B 3/12

U.S. Cl. 428—255

11 Claims



1. A woven grid for earth reinforcement, comprising:
a plurality of spaced-apart bundles of pick yarns positioned adjacent to one another and forming a first and a second side of the grid;
(b) a plurality of pairs of locking yarns oriented parallel to the pick yarns, each yarn in a locking yarn pair positioned adjacent to an edge of a pick yarn bundle;
(c) a plurality of spaced-apart bundles of warp yarns positioned adjacent to one another, alternately positioned on the first and second sides of the pick yarn bundles and extending between each pick yarn bundle and its corresponding locking yarns;
(d) a plurality of pairs of leno yarns oriented parallel to the warp yarns, the leno yarns in each pair positioned on opposite sides of the pick yarn bundles and interlocking with each other between each pick yarn bundle and its corresponding locking yarns; and
(e) a plastic coating covering the yarns.

5,091,248

COMPOSITION FOR PRECLUDING SEPARATION OF NONDIRECTIONAL FIBERS FROM SURFACE OF DRUMHEAD LAMINATE

Remo D. Belli, North Hollywood, Calif., assignor to Remo, Inc., N. Hollywood, Calif.

Continuation-in-part of Ser. No. 483,897, Feb. 23, 1990, abandoned. This application Dec. 20, 1990, Ser. No. 631,199
Int. Cl.⁵ B32B 27/04

U.S. Cl. 428—290

8 Claims



1. A head for a drum or similar musical instrument comprising, a synthetic plastic sheet material laminated to a polyester fabric material having a random fiber orientation, and a means applied to said fabric material to preclude delamination of said randomly orientated polyester fibers when said head is subjected to the constant beating or pounding of a drum stick or continuous circular motion of a drum brush upon its surface.

5,091,249

MAGNETIC RECORDING MEDIUM LUBRICANT COMPRISING TWO DIFFERENT FLUORINATED POLYETHERS EACH HAVING SPECIFIED TERMINAL GROUPS

Yasuo Nishikawa, and Kunihiko Sano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1990, Ser. No. 551,114

Claims priority, application Japan, Jul. 11, 1989, 1-178546
Int. Cl.⁵ G11B 05/00

U.S. Cl. 428—336

9 Claims

1. A magnetic recording medium comprising a nonmagnetic support having a magnetic layer thereon, wherein the surface of said magnetic layer contains (a) a first fluorinated polyether having an oxo acid group or an oxo acid salt group at one or both terminals thereof, and (b) a second fluorinated polyether having a group selected from the group consisting of an alkoxycarbonyl group, an acyloxy group and a hydroxyl group at one or both terminals thereof, and wherein said first fluorinated polyether and said second fluorinated polyether are contained in the surface of said magnetic layer after top coating in a combined amount of 1 to 50 mg/m² or said first fluorinated polyether and said second fluorinated polyether are incorporated into said magnetic layer in a combined amount of 0.5 to 10% by weight based on the amount of ferromagnetic powder, and wherein said first fluorinated polyether is mixed with said second fluorinated polyether in a mixing ratio of from 1:100 to 10:1 by weight.

5,091,250

LIGHT STABLE**POLYSTYRENE-POLYMETHYL METHACRYLATE LAMINATE AND METHOD OF PREPARATION**

Pak-Wing S. Chum, Lake Jackson, Tex., and Mark A. Barger, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 6, 1990, Ser. No. 475,523

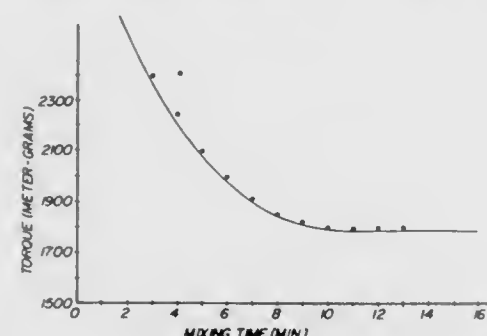
Int. Cl.⁵ B32B 27/08

U.S. Cl. 428—339

9 Claims

1. A light-stable laminate construction comprising, a first layer comprising a copolymer of a styrenic monomer and from about 1 to about 10% by weight of a reactive comonomer having a hydroxyl moiety or a precursor for a hydroxyl moiety, to form said first layer having pendant hydroxy-functional

groups, and a second layer of a polymer having pendant ester groups, wherein said pendant hydroxy-functional groups of



said first layer react with said pendant ester groups of said second layer to form covalent bonds between said first and second layers.

5,091,251

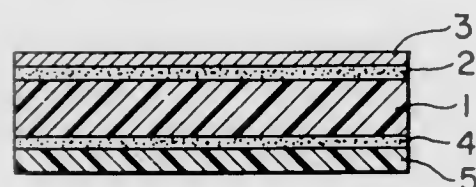
ADHESIVE TAPES AND SEMICONDUCTOR DEVICES
Yukinori Sakumoto; Shigeyuki Yokoyama; Akihiro Shibuya; Nobuyuki Nakayama, and Atsushi Koshimura, all of Shizuoka, Japan, assignors to Tomoe-gawa Paper Co., Ltd., Japan
Filed May 24, 1990, Ser. No. 528,203

Claims priority, application Japan, May 29, 1989, 1-132726; Apr. 14, 1990, 2-98285; Apr. 14, 1990, 2-98286; Apr. 14, 1990, 2-98287

Int. Cl.⁵ B32B 7/12, 15/04

U.S. Cl. 428—352

18 Claims



1. An adhesive tape which consists essentially of a heat-resistant substrate consisting of a heat-resistant adhesive layer and a heat-resistant film, a copper foil provided on the heat-resistant adhesive layer of the substrate, and a B-stage cured heat-resistant resin adhesive layer and a removable protective film provided successively on the other side of the heat-resistant film.

7. An adhesive tape which consists essentially of a heat-resistant substrate consisting of a heat-resistant resin layer, a copper foil provided on one side of the substrate, and a B-stage cured heat-resistant resin adhesive layer and a removable protective film provided successively on the other side of the substrate.

13. An adhesive tape which consists essentially of a heat-resistant substrate consisting of a heat-resistant resin layer, a heat-resistant adhesive layer and a heat-resistant film, a copper foil provided on the heat-resistant resin layer of the substrate, and a B-stage cured heat-resistant resin adhesive layer and a removable protective film provided successively on the other side of the heat-resistant film of the substrate.

5,091,252

NON-ORGANIC/POLYMER FIBER COMPOSITE AND METHOD OF MAKING SAME

Louis W. Hruska, Geneva; Carl W. Brown, Jr., and Christopher F. Graham, both of Painesville, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 93,469, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 768,941, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 651,248, Sep. 17, 1984, abandoned. This application Jan. 25, 1990, Ser. No. 469,994

Int. Cl.⁵ B32B 5/16, 9/00

U.S. Cl. 428—357

18 Claims

1. A fiber manufacture of individual, organic polymer fibers, at least some of the fibers being branched, with each individual fibers in said manufacture being non-isotropic, of non-uniform morphology and comprising an organic fluorine-containing polymer and having very finely-divided, non-organic, refractory particulates bound firmly with said polymer at least substantially within the surface thereof, so as to be resistant to physical separation from the fiber without fiber destruction, said non-organic particulates being bound during mechanically-induced fiber formation, with said fiber formation being performed at elevated temperature directly on precursor particles of organic polymer.

5,091,253

MAGNETIC CORES UTILIZING METALLIC GLASS RIBBONS AND MICA PAPER INTERLAMINAR INSULATION

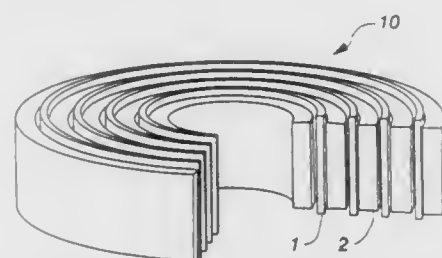
Carl H. Smith, Chatham, and Robert M. VonHoene, Basking Ridge, both of N.J., assignors to Allied-Signal Inc., Morristown, Morris County, N.J.

Filed May 18, 1990, Ser. No. 524,892

Int. Cl.⁵ B32B 19/04

U.S. Cl. 428—363

9 Claims



1. A magnetic core having high voltage hold off between laminations and superior magnetic properties at high magnetization rate comprising a ferromagnetic metallic glass alloy ribbon having at least 80% glassy structure and a mica paper insulation, said ribbon and insulation being co-wound to form a core wherein alternate layers are metal and insulation.

5,091,254

POLYVINYL ALCOHOL MONOFILAMENT YARNS AND PROCESS FOR PRODUCING THE SAME

Masatsugu Mochizuki; Kazutaka Koda; Siro Murakami; Naohiko Nagata, and Mitsuo Kawaguchi, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed May 24, 1990, Ser. No. 527,976

Claims priority, application Japan, May 24, 1989, 1-130799

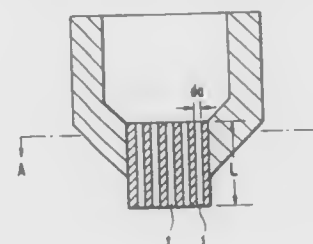
Int. Cl.⁵ D02G 3/00

U.S. Cl. 428—364

13 Claims

1. A polyvinyl alcohol monofilament yarn comprising poly-

vinyl alcohol having a polymerization degree of from 1500 to 7000, having a tensile strength of not less than 10 g/d and an



initial modulus of not less than 200 g/d, and having a fineness of 100 denier to about 400 denier.

5,091,255

MOLDING GRANULES, THEIR MANUFACTURE AND THEIR USE IN THE PRODUCTION OF MOLDED ARTICLES

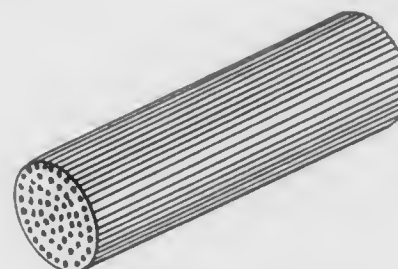
Nelson N. C. Hsu, Stamford; Franklyn A. Ballentine, Wallingford; Mark J. Hufziger, Guilford, and Roger J. Card, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 23, 1990, Ser. No. 468,525

Int. Cl.⁵ D06M 15/21; D02G 3/00; B32B 5/16; C08F 2/16

U.S. Cl. 428—378

3 Claims



1. Molding granules convertible to a molded article through use in conjunction with a molding resin, said granules comprising a bundle of elongated electrically non-conductive reinforcing fibers extending generally parallel to each other longitudinally within the granule and a film forming latex binder composition, the latex composition substantially surrounding each fiber within said bundle, wherein said latex is selected from the group consisting of:

- styrene/methylmethacrylate/butyl acrylate/methacrylic acid wherein the styrene content ranges from about 40 to about 60 wt. %, and methylmethacrylate content ranges from about 20 to about 45 wt. %, the butylacrylate content ranges from about 1 to about 35 wt. % and the methacrylic acid content ranges from about 0.1 to about 2.0 wt. %;
- styrene/methylmethacrylate/ethyl acrylate wherein the styrene content ranges from about 18 to about 30 wt. %, the methylmethacrylate content ranges from about 65 to about 77 wt. % and the ethylacrylate content ranges from about 2 to about 8 wt. %; and
- methylmethacrylate/butylacrylate/methacrylic acid wherein the methylmethacrylate content ranges from about 50 to about 70 wt. %, the butylacrylate content ranges from about 30 to about 40 wt. % and the methacrylic acid content ranges from about 1 to about 5 wt. %.

5,091,256

POLYPHENYLENE ETHER FOAMS FROM LOW I.V. POLYPHENYLENE ETHER EXPANDABLE MICROPARTICLES

Richard C. Bopp, West Coxsackie, N.Y., and Lynn M. Martynowicz, Pittsfield, Mass., assignors to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 456,674, Dec. 27, 1989, Pat. No. 5,064,869.

This application Sep. 5, 1991, Ser. No. 755,289

Int. Cl.⁵ C08J 9/16

U.S. Cl. 428—402

21 Claims

1. An expandable thermoplastic resin composition comprising microparticles having an average diameter of less than about 0.1 inch, said microparticles comprising

- a polyphenylene ether resin having an intrinsic viscosity of less than about 0.45 dl/g, optionally in combination with a polystyrene resin; and
- an effective amount of an imbibed blowing agent.

5,091,257

THERMOSENSITIVE STENCIL PAPER

Masayasu Nonogaki, Numazu; Fumiaki Arai, Mishima; Yuji Natori, Numazu, and Hideyuki Yamaguchi, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,682

Claims priority, application Japan, Sep. 13, 1989, 1-235817; Nov. 22, 1989, 1-301926

Int. Cl.⁵ B32B 9/00

U.S. Cl. 428—411.1

2 Claims

1. A thermosensitive stencil paper comprising a porous tissue paper comprising a plurality of different plant elements (a) and (b), serving as a porous substrate, and a thermoplastic resin layer formed thereon:

- plant elements (a) having a maximum width ranging from 100 μ m to 5 mm, a maximum length ranging from 100 μ m to 5 mm, and an area of 7800 μ m² or more, when measured in such a posture that provides a maximum area of said plant element (a), being 150 or less in number in a 100 cm² area of said porous tissue paper; and
- plant elements (b) having a maximum width ranging from 300 μ m to 5 mm, a maximum length ranging from 300 μ m to 5 mm, and an area of 70,000 μ m² or more, when measured in such a posture that provides a maximum area of said plant element, being 25 or less in number in a 100 cm² area of said porous tissue paper.

5,091,258

LAMINATE FOR A SAFETY GLAZING

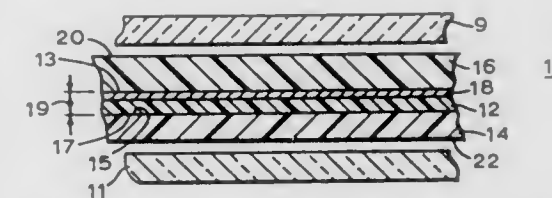
James R. Moran, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 20, 1990, Ser. No. 569,332

Int. Cl.⁵ B32B 17/10

U.S. Cl. 428—437

17 Claims



1. A laminate which is substantially free of reflected distortion when used in a safety glazing comprising:
a transparent, thermoplastic substrate layer, optionally surface treated or coated, bearing one or more functional performance layers; and
at least one layer of plasticized polyvinyl butyral bonded on one side to a functional performance layer or the substrate layer and having a roughened deairing surface on its other

side characterized by a roughness value, Rz, of at least 10 micrometers;
said at least one plasticized polyvinyl butyral layer, before bonding to the substrate layer or functional performance layer, possessing low surface waviness on each side characterized by a wave index value, W1, of less than 15,000 square micrometers.

5,091,259
ELECTRIC WIRE COATED WITH A
HALOGEN-CONTAINING POLYESTER RESIN
COMPOSITION

Toshio Nakane, Fuji; Kenji Hijikata, Mishima; Makoto Iiyama, Fuji; Yukihiko Kageyama, Fujinomiya, and Michirou Naka, Fuji, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Division of Ser. No. 151,802, Feb. 3, 1988, Pat. No. 4,987,167.

This application Oct. 31, 1990, Ser. No. 606,720

Claims priority, application Japan, Mar. 9, 1987, 62-53717

Int. Cl.⁵ B32B 15/08; B27N 9/00

U.S. Cl. 428—457 21 Claims

1. An electric wire having coated thereon a halogen-containing polyester resin composition, comprising:

(i) a flame retardant aromatic polyester copolymer having a halogen content of 0.5–30% by weight which is produced by a condensation polymerization reaction of the following groups:

(A) an aromatic dicarboxylic acid or an ester-forming derivative thereof,

(B) an aliphatic glycol or an ester-forming derivative thereof, and

(C) an ester-forming compound containing a halogen, and, in mixture with the polyester of group (i),

(ii) 0.1–10% by weight of a bisoxazoline compound relative to the total weight of the composition.

5,091,260
REDUCTION OF CORROSION OF METALS

Chun S. Wong, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Aug. 31, 1989, Ser. No. 401,301

Claims priority, application United Kingdom, Sep. 5, 1988, 8820807

Int. Cl.⁵ B32B 15/08

U.S. Cl. 428—461 15 Claims

12. A coated metallic substrate comprising a substrate formed from a metal selected from the group consisting of iron, steel and aluminum, said substrate having at least one surface thereof coated with a primer composition, said primer composition consisting essentially of (a) 1–70 percent, by weight of the primer composition, of a modified polyolefin, said modified polyolefin having been obtained by grafting a polyolefin with an ethylenically unsaturated aliphatic carboxylic acid, or derivative thereof, said polyolefin being selected from the group consisting of homopolymers of ethylene, homopolymers of propylene and copolymers of ethylene and at least one C₄–C₁₀ hydrocarbon alpha-olefin, such that the amount of carboxylic acid or derivative thereof in the modified polyolefin is 0.01–10 percent by weight of the composition, (b) hydrocarbon polymer and (c) 30–99 percent by weight of metallic zinc.

5,091,261
PAPERBOARD/POLYMER LAMINATE FOR BLISTER
PACK

Harry B. Casey, Covington; Todd H. Huffman, Richmond, both of Va., and Debora F. Massouda, Silver Spring, Md., assignors to Westvaco Corporation, New York, N.Y.

Filed Apr. 16, 1990, Ser. No. 509,586

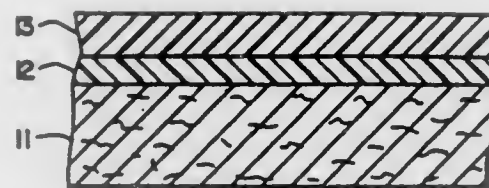
Int. Cl.⁵ B32B 23/08

U.S. Cl. 428—511 12 Claims

1. A process for forming a paperboard/polymer laminate for

use in the preparation of substrates for blister packs which comprises coextruding:

(a) a first molten layer comprising a polyolefin selected from the group consisting of low density polyethylene, linear low density polyethylene, high density polyethylene and copolymers of polyethylene; and,



(b) a second molten layer comprising a blister pack adhesive selected from the group consisting of ethylene-methyl acrylate, ethylene vinyl acetate, ionomers and acrylic copolymers onto a paperboard substrate in a single step to form a paperboard/polymer laminate, said polymer surface being the surface to which plastic blisters are adhered.

5,091,262
STARCH FILLED COEXTRUDED DEGRADABLE
POLYETHYLENE FILM

Jack E. Knott, Barrington, Ill., and Paul D. Gage, Eau Claire, Wis., assignors to Rexene Products Company, Dallas, Tex.

Filed Aug. 27, 1990, Ser. No. 572,402

Int. Cl.⁵ B32B 27/18, 27/32

U.S. Cl. 428—516 17 Claims

1. A multilayer film comprising:

a center layer coextruded with adjacent exterior layers, the center layer comprising a mixture of polyethylene and starch, the exterior layers comprising a mixture of polyethylene and at least one prodegradant.

5,091,263
COATED POLYNORBORNENE PRODUCTS
Shoji Suzuki, Yokohama, and Motoyuki Yamato, Kanagawa, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 402,286

Int. Cl.⁵ B32B 27/08

U.S. Cl. 428—518 9 Claims

1. A polynorbornene article having improved weatherability, luster, and reduced odor emittance comprising a ring-opened norbornene base polymer having on at least a portion of its surface an adherent film-forming, solvent born coating selected from the group consisting of vinylidene chloride polymers containing at least a major proportion of vinylidene chloride, unsaturated nitrile polymers containing at least a major proportion of a nitrile, and mixtures thereof, wherein said base polymer is polymerized from at least one norbornene monomer via ring-opening bulk polymerization in a mold.

5,091,264
WELDED BIMETALLIC SAWBLADE OR METAL SAW
BAND

Manfred Daxelmüller, Maidhofen; Dieter Doeberl, and Gerhard Kraxner, both of Boehlerwerk, all of Austria, assignors to Bohler Ges. M.B.H., Kapfenberg, Austria

Division of Ser. No. 280,114, Dec. 5, 1988, Pat. No. 5,015,539.

This application Oct. 30, 1990, Ser. No. 605,404

Claims priority, application Austria, Dec. 4, 1987, 3196/87

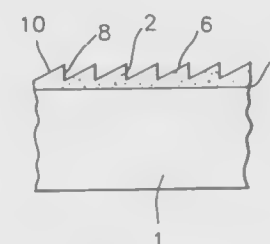
Int. Cl.⁵ B32B 15/00

U.S. Cl. 428—685 20 Claims

1. A welded bimetallic saw blade or metal saw band, comprising:

a support strip comprising a martensitically hardenable mar-

aging steel containing a maximum carbon content of Co and Ni in the proportion: 20% < Fe < 75%, 5% < Co < 45% 0.05% by weight and a content of alloying elements of at and 20% < Ni < 70% (atomic %) and having a face-centered least 10% by weight;

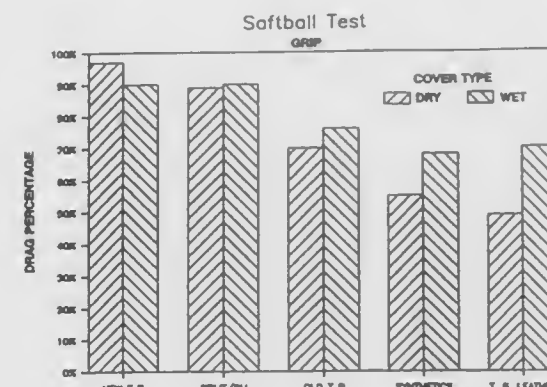


a top layer of high speed tool steel metallurgically welded along at least one surface thereof to at least one surface of said support strip; and
sawteeth in at least said top layer.

5,091,265
COATING COMPOSITIONS FOR GAME BALLS
Thomas J. Kennedy, Chicopee, Mass., and Alan D. Walker, Somers, Conn., assignors to Lisco, Inc., Tampa, Fla.
Filed Feb. 19, 1991, Ser. No. 657,476

Int. Cl.⁵ B32B 25/00; C09K 11/06; A63B 39/00

U.S. Cl. 428—690 35 Claims



1. A coating composition for a game ball, comprising:
a film forming binder, wherein said binder includes a linear saturated polyester polyol resin having an average equivalent weight of approximately 900 to 1500, and an aliphatic polyisocyanate cross-linking agent; and,
a fluorescent pigment, wherein said fluorescent pigment is present in a ratio of about 8514 90 parts by weight per 100 parts by weight of the film forming binder.

5,091,266
SOFT-MAGNETIC FILM HAVING SATURATION
MAGNETIC-FLUX DENSITY AND MAGNETIC HEAD
UTILIZING THE SAME

Yuuji Omata, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

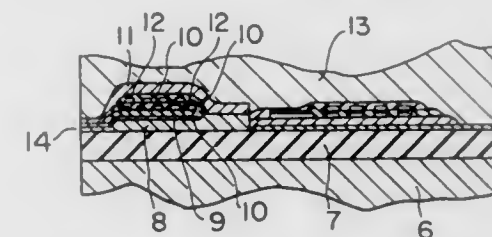
Filed Aug. 30, 1989, Ser. No. 400,921

Claims priority, application Japan, Sep. 2, 1988, 63-220935

Int. Cl.⁵ G11B 21/00

U.S. Cl. 428—692 7 Claims

1. A soft-magnetic film having high saturation magnetic-flux density made of an alloy containing as its main components Fe,



cubic structure which has (110) or (111) planes as a preferential crystallographic orientation.

5,091,267
MAGNETO-OPTICAL RECORDING MEDIUM AND
PROCESS FOR PRODUCTION OF THE SAME
Mutsumi Asano; Kiyoshi Kasai, and Hidehiko Misaki, all of Kanagawa, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Mar. 20, 1990, Ser. No. 495,952

Claims priority, application Japan, Mar. 20, 1989, 1-66382

Int. Cl.⁵ G11B 5/66

U.S. Cl. 428—694 4 Claims

1. A magneto-optical recording medium comprising a substrate having thereon a magneto-optical recording film and at least one coating film provided on a light incident side and/or an opposite side thereto of said magneto-optical recording film, wherein said coating film consists essentially of silicon, nitrogen, and hydrogen as constituent elements, wherein said coating film contains from 1.0×10^{21} to 1.0×10^{23} hydrogen atoms per cm³, wherein said coating film has a refractive index of 1.9–2.4, and wherein said coating film has a nitrogen content of at least 10 atomic % based on the sum of the constituent elements other than hydrogen.

5,091,268
MAGNETIC RECORDING MEDIUM LUBRICATED BY A
THREE COMPONENT FATTY ACID ESTER-FATTY ACID
AMIDE COMPOSITION

Yasuo Nishikawa; Akira Kasuga; Tsutomu Okita, and Masashi Aonuma, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

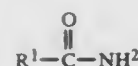
Filed Jun. 29, 1990, Ser. No. 546,183

Claims priority, application Japan, Jun. 30, 1989, 1-168896

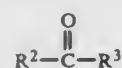
Int. Cl.⁵ G11B 5/00

U.S. Cl. 428—694 9 Claims

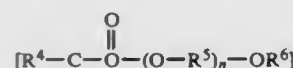
1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer comprising a ferromagnetic powder dispersed in a binder, wherein at least one fatty acid amide compound represented by formula (I), at least one fatty acid ester represented by formula (II) and at least one fatty acid ester represented by formula (III) are provided in or on the magnetic layer:



wherein R^1 represents a C_{13-21} straight-chain saturated hydrocarbon group;



wherein R^2 represents a C_{12-21} straight-chain or branched saturated or unsaturated hydrocarbon group; and R^3 represents a C_{1-10} straight-chain or branched saturated or unsaturated hydrocarbon group;



wherein R^4 represents a C_{12-21} straight-chain or branched saturated or unsaturated hydrocarbon group; R^5 represents a C_{2-3} divalent hydrocarbon group; R^6 represents a C_{1-10} straight-chain or branched saturated or unsaturated hydrocarbon group; and n represents an integer of from 1 to 10 where n may be the same or different when the magnetic layer contains two or more compounds represented by formula (III),

the addition amount of the at least one amide compound represented by formula (I) is selected within the range given by equation (1):

$$\log(A) + 3.45 \log(C) \leq 4.3 \quad (I)$$

wherein \log represents a base 10 logarithm; A represents the addition amount of the amide compound based on the ferromagnetic powder content in wt %, and C represents the number of carbon atoms per molecule of the amide compound.

5,091,269
MAGNETIC RECORDING MEDIUM LUBRICANT
CONSISTING OF AN AMINE SALT OF CARBOXYLIC
ACID, AN AMINE SALT OF PERFLUOROALKYL
CARBOXYLIC ACID OR AN FLUORO AMINE SALT OF
PERFLUORO CARBOXYLIC ACID

Hirofumi Kondo, Kanagawa; Shunichi Haga, and Takaaki Matsuda, both of Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

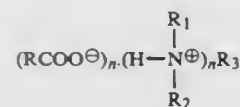
Filed Dec. 14, 1989, Ser. No. 450,665
Int. Cl.⁵ G11B 5/00

U.S. Cl. 428—695

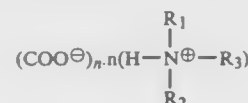
16 Claims



1. A magnetic recording medium comprising:
a non-magnetic base,
a ferromagnetic thin film on said non-magnetic base and
a lubricant layer on said ferromagnetic thin film,
wherein said lubricant layer comprises an amine salt of
carboxylic acid represented by the formula:



or by the formula:



wherein n stands for an integer of 1–3, R_1 , R_2 stand for a hydrocarbon group and R_3 stand for hydrogen or a hydrocarbon group.

5,091,270
MAGNETIC RECORDING MEDIUM LUBRICATED BY A
MIXTURE OF METHYL BRANCHED ISO ESTER
COMPOUNDS SYNTHESIZED BY THE OKO PROCESS
Takao Ohya; Yasuo Nishikawa, and Satoru Hayakawa, all of
Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd.,
Kanagawa, Japan

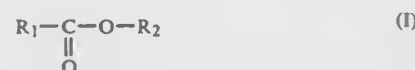
Filed Jul. 21, 1989, Ser. No. 382,880

Claims priority, application Japan, Jul. 21, 1988, 63-182676
Int. Cl.⁵ G11B 23/00, 5/72

U.S. Cl. 428—695

10 Claims

1. A magnetic recording medium having a magnetic layer on a non-magnetic support, wherein at least a mixture of ester compounds shown by formula (I) obtained by the reaction of a straight chain or branched fatty acid having from 12 to 30 carbon atoms and branched alcohols having from 10 to 32 carbon atoms synthesized by oxo synthesis is retained in or on the magnetic layer:



wherein R_1 represents a straight chain or branched alkyl group having from 11 to 29 carbon atoms or a straight chain or branched alkenyl group having from 11 to 29 carbon atoms, and R_2 represents a branched alkyl group having from 10 to 32 carbon atoms.

5,091,271
SHAPED SILICON CARBIDE-EASED CERAMIC ARTICLE
Toru Sawaki; Akio Nakaishi; Keizo Shimada, and Takashi Watanabe, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 254,370, Oct. 5, 1988, Pat. No. 4,897,229.
This application Oct. 12, 1989, Ser. No. 420,560

Int. Cl.⁵ C04C 35/56

U.S. Cl. 428—698

2 Claims

1. A shaped silicon carbide-based ceramic article consisting essentially of carbon, silicon and oxygen, having an atomic ratio of fixed carbon atoms to silicon atoms of 1.5:1 to 2.5:1 and containing silicon oxide compounds in an amount of from 0.5% to 7% by weight in terms of oxygen.

5,091,272
SEPARATOR FOR ELECTROCHEMICAL CELLS
Jack Treger, Milton, Mass., assignor to Duracell Inc., Bethel, Conn.

Filed May 29, 1990, Ser. No. 530,149
Int. Cl.⁵ H01M 2/16; B05D 5/00

U.S. Cl. 429—62

24 Claims

1. A porous, heat sensitive polymer film comprising a microporous layer comprising a polymer with a melting point of at least about 80° C.; a layer of heat-fusible, polymer particles coated on at least one side of the microporous layer, said particles having a melting point less than the melting point of the

microporous layer; and means for binding the particles to each other and to the surface of the microporous film; wherein the



heat sensitive polymer film becomes substantially impermeable above the melting point of the particles.

5,091,273
METHOD OF APPLYING A TAIL WRAP TO A WOUND
ELECTROCHEMICAL CELL AND CELL PRODUCED BY
THE METHOD

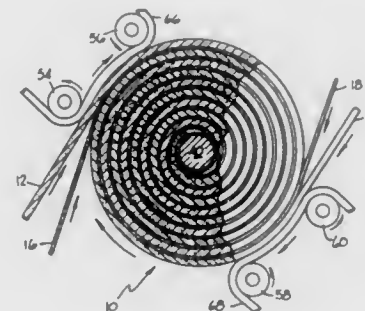
Leonard F. Hug, Arvada, and Martyn Sutton, Littleton, both of Colo., assignors to Optima Batteries, Inc., Denver, Colo.

Filed Jun. 11, 1990, Ser. No. 536,927

Int. Cl.⁵ H01M 2/02

U.S. Cl. 429—94

16 Claims



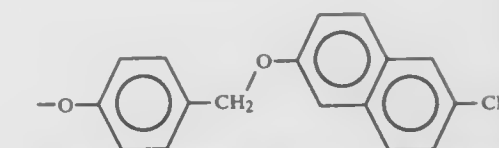
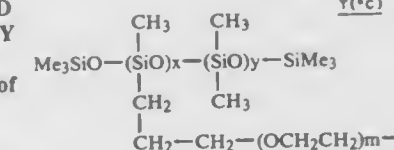
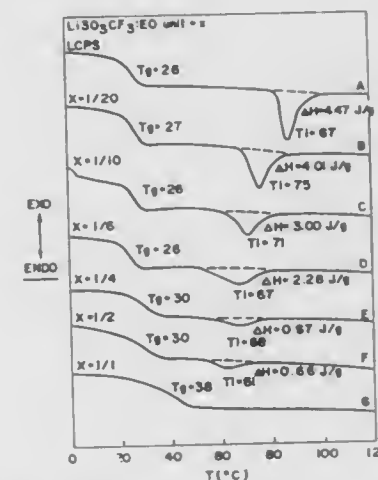
1. An electrochemical cell, said cell having a negative plate strip having at least one major surface, a positive plate strip having at least one major surface, at least one separator formed of a mat of inorganic material not easily bondable to itself or to organic materials interleaved between said surfaces of said plates, said plates and said separator forming a wound cell pack, the improvement comprising, a thin sheet of flexible material, capable of being heat softened, wrapped around said wound cell pack to secure said wound cell pack from unwinding, said sheet having a leading end and a trailing end, said sheet having at least one heat softened portion near said trailing end to attach said trailing end to a portion of said sheet between said leading and trailing ends.

5,091,274
IONIC CONDUCTING POLYMER ELECTROLYTES
BASED ON A SIDE-CHAIN CRYSTALLINE POLYMER
Ging-Ho Hsiue; Chain-Shu Hsu, both of Hsinchu; Chang-Jyh Hsieh, Taipei, and Deng-Shan Chen, Tungshan Hsiang, all of Taiwan, assignors to National Science Council, Taipei, Taiwan
Filed Jun. 19, 1990, Ser. No. 540,570
Int. Cl.⁵ H01M 10/40

U.S. Cl. 429—192

1 Claim

1. An ionic conducting polymer electrolyte comprising a complex which comprises an alkali metal salt and a side-chain liquid crystalline polysiloxane containing oligo(oxethylene) spacers and 6-cyano-2-naphthyl benzyl ether mesogens of the formula



where $\text{Me} = -\text{CH}_3$; m is an integer of 1 to 5; $x = 10-100\%$; and $y = 0-90\%$, wherein the ratio of the alkali metal salt to ethylene oxide unit is ranging from 1 to 1/30, and the weight average molecular weight of the polysiloxane backbone is 1000–15000.

5,091,275
GLASS FIBER SEPARATOR AND METHOD OF MAKING
William B. Brecht, Hatfield, Pa., and John D. Windisch, Corvallis, Oreg., assignors to Evanite Fiber Corporation, Corvallis, Oreg.

Filed Apr. 25, 1990, Ser. No. 514,301
Int. Cl.⁵ H01M 2/16

U.S. Cl. 429—247

12 Claims



1. A separator, comprising
a mat formed of glass fibers; and
binder means for binding the mat in a compressed state and

for releasing the mat from the compressed state upon contact with sulfuric acid, the binder means comprising an aqueous mixture of colloidal silica particles and a salt.

5,091,276
ELECTROPHOTOGRAPHIC REVERSE IMAGE FORMING PROCESS

Yutaka Akasaki; Hidekazu Aonuma; Kazuya Hongo; Katsuhiko Sato; Katsumi Nukada, and Teruumi Marumo, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 416,778, Oct. 4, 1989, Pat. No. 5,006,435.
This application Dec. 10, 1990, Ser. No. 625,196
Claims priority, application Japan, Oct. 5, 1988, 63-249736; Oct. 5, 1988, 63-249737; Oct. 5, 1988, 63-249740; Oct. 5, 1988, 63-249741

Int. Cl.⁵ G03G 13/01, 13/22

U.S. Cl. 430—45

6 Claims

1. An image-forming process, comprising the steps in order of (1) uniformly negatively charging a surface of an electrophotographic photosensitive material upon a support to produce an initial potential; (2) applying a first exposure of image areas to the surface of the photosensitive material by exposing first exposure image areas of the surface corresponding to the image areas to form a first electrostatic latent image; (3) attaching negatively charged toner to the first exposure image areas to form a first toner image; (4) applying a second exposure of non-image areas to the surface of the photosensitive material having the first toner image by exposing non-image areas of the surface for the second exposure to form a second electrostatic latent image; (5) attaching positively charged toner to second exposure image areas which are not exposed by the second exposure of non-image areas in step (4) to form a second toner image; (6) unifying the polarities of the first toner images and the second toner images to the polarity of a selected one of the first and second toner images; (7) superposing a transfer material having first and second surfaces on the surface of the electrophotographic photosensitive material, the first surface contacting the surface of the electrophotographic photosensitive material; and (8) applying a charge having a polarity opposite to the unified polarity of said first and second tone images to the second surface of said transfer material to transfer the first and second toner images onto the transfer material.

5,091,277
METHOD FOR RECORDING/REPRODUCING CHARGE IMAGE

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Tsutou Asakura, Yokohama; Masato Furuya, and Tetsuji Suzuki, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Yokohama, Japan

Filed Jul. 5, 1990, Ser. No. 548,077

Claims priority, application Japan, Jul. 5, 1989, 1-173673; Jul. 5, 1989, 1-173674

Int. Cl.⁵ G03G 13/18

U.S. Cl. 430—48

10 Claims

1. A method for recording/reproducing a charge image, comprising the steps of:
preparing a master recording medium including a charge holding member and an electrode;

focusing optical information onto the master recording medium, thus to form a charge image in accordance with the optical information, in the charge holding member;
preparing a reproduction member including an electrode and a photo-modulation member;
arranging the master recording medium and the reproduction member such that the surfaces of the charge holding member in which the charge image is formed and the photo-modulation member face each other;
transferring the charge image formed in the charge holding member onto the surface of the photo-modulation member; and
projecting a reading light onto the photo-modulation member to which the charge image is transferred, so as to apply photo-modulation corresponding to the charge image, to the reading light, thus to reproduce the charge image as the optical information.

5,091,278
BLOCKING LAYER FOR PHOTORECEPTORS

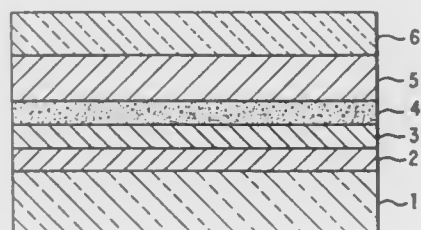
Leon A. Teuscher, and Ronald F. Ziolo, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 31, 1990, Ser. No. 575,610

Int. Cl.⁵ G03G 5/14, 5/047

U.S. Cl. 430—58

16 Claims



9. An electrophotographic imaging member, comprising:
a supporting substrate;
a conductive layer;
a charge blocking layer comprised of a complex or salt of a film forming polymer containing at least one nitrogen-containing group, the at least one nitrogen-containing group being chelated to a metal ion or atom;
an adhesive layer;
a charge generated layer; and
a charge transport layer.

5,091,279

Patent Not Issued For This Number

5,091,280
LIGHT- AND HEAT-SENSITIVE RECORDING MATERIAL

Jun Yamaguchi; Shintaro Washizu; Hirotaka Matsumoto; Ken Iwakura, and Yuuichi Fukushige, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

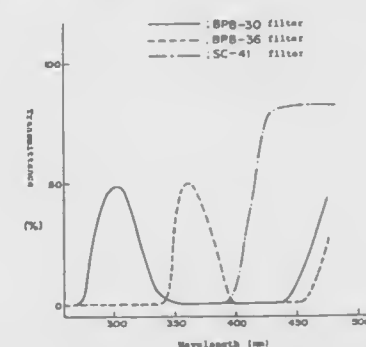
Filed Aug. 13, 1990, Ser. No. 567,040

Claims priority, application Japan, Aug. 11, 1989, 1-209318; Aug. 31, 1989, 1-224930; Nov. 16, 1989, 1-298144; Jan. 30, 1990, 2-19710

Int. Cl.⁵ G03C 1/72

U.S. Cl. 430—138

28 Claims



1. A light- and heat-sensitive recording material comprising a support having thereon at least one light- and heat-sensitive layer comprising,

- (1) microcapsules comprising a wall and a core containing an electron donative colorless dye, and
- (2) a light-hardenable composition arranged outside of said microcapsules containing (a) a polymerizable compound having at least one atom with an unpaired electron and at least one ethylenically unsaturated bond in the molecule, (b) a photopolymerization initiator, and (c) an electron acceptive developer, the wall of said microcapsules having increased permeability to the electron acceptive developer and polymerizable compound upon heating, wherein said light-hardenable composition is imagewise hardened by imagewise exposure of the recording material to light to form a hardened latent image, and subsequently under heating, the electron acceptive developer diffuses into the microcapsules in both the exposed portions and the unexposed portions whereas the polymerizable compound diffuses into the microcapsules in the unexposed portions only, to thereby obtain a color image in the exposed portions.

5,091,281
IMAGE RECORDING APPARATUS AND METHOD
Hiroshi Nakamura, and Nagao Ogiwara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 405,819, Sep. 8, 1989, Pat. No. 4,992,816.

This application Nov. 26, 1990, Ser. No. 605,300

Claims priority, application Japan, Sep. 9, 1988, 63-226201; Sep. 9, 1988, 63-226202; Sep. 9, 1988, 63-226203

Int. Cl.⁵ G03C 5/54

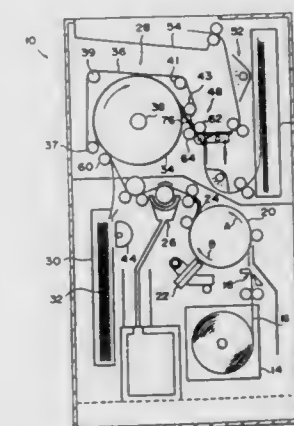
U.S. Cl. 430—203

8 Claims

1. An image recording method wherein an imagewise exposed heat-developable light-sensitive material and an image-receiving material are superposed on each other, said heat-developable light-sensitive material and image-receiving material in a superposed state are gradually wound around an outer periphery of a heating drum while said two materials are being conveyed, and said two materials are conveyed as said heating drum is rotated while said two materials are being pressed against said heating drum by pressure-contacting means so as to heat develop said heat-developable light-sensitive material and allow an image formed by heat development to be trans-

ferred onto said image-receiving material, comprising the steps of:

- (a) superposing said two materials in such a manner that a forward end of said heat-developable light-sensitive material is located forwardly, in a conveying direction, of a forward end of said image-receiving material by a predetermined amount;
- (b) heat developing said heat-developable light-sensitive material and transferring an image onto said image-receiving material while said superposed materials are conveyed and gradually wound around said heating drum over a



predetermined range in pressure contact with said heating drum by said pressure-contacting means in such a manner that said image-receiving material is located on the outer side; and

- (c) reducing the conveying speed of said two materials to a predetermined value when said forward end of said heat-developable light-sensitive material has come out of a nip between said pressure-contacting means and said heating drum so as to cause a curl to be produced in the direction of moving away from said heating drum by heating by said heating drum so as to cause said two materials to be released from said heating drum.

5,091,282
ALKALI SOLUBLE PHENOL POLYMER PHOTSENSITIVE COMPOSITION

Yasunobu Onishi; Hirokazu Niki, both of Yokohama; Yoshihito Kobayashi, Kawasaki; Rumiko Hayase, and Toru Ushirogouchi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 3, 1990, Ser. No. 504,300

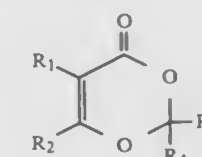
Claims priority, application Japan, Apr. 3, 1989, 1-81453; Jun. 8, 1989, 1-146503; Jun. 15, 1989, 1-150444; Jun. 15, 1989, 1-150445

Int. Cl.⁵ G03C 1/76

U.S. Cl. 430—270

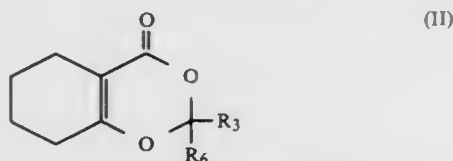
18 Claims

1. A photosensitive composition containing an alkali-soluble polymer having phenol skeletons and a compound represented by the following formula (I), (II) or (III):

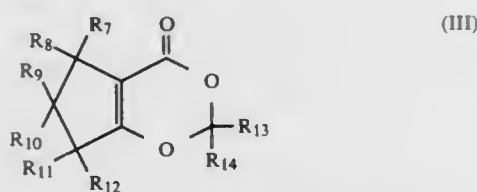


wherein R₁ and R₂ may be the same or different and independently represent a hydrogen atom or a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, and R₃ and R₄ may be the same or different and independently represent a hydrogen atom, a substituted or unsubstituted alkyl group

having 1 to 10 carbon atoms, a substituted or unsubstituted aryl group, a furyl group, a pyridyl group or a 2-styryl group, or R₃ and R₄ together form a cyclic structure represented by —CH₂—_n (wherein n represents a positive integer of 4 to 8):



wherein R₅ and R₆ may be the same or different and independently represent a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted aryl group, a furyl group, a pyridyl group or a 2-styryl group, or R₅ and R₆ together form a cyclic structure represented by —CH₂—_n (wherein n represents a positive integer of 4 to 8):



wherein R₇, R₈, R₉, R₁₀, R₁₁ and R₁₂ may be the same or different and independently represent a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, and R₁₃ and R₁₄ may be the same or different and independently represent a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted aryl group, a furyl group, a pyridyl group or a 2-styryl group, or R₁₃ and R₁₄ together form a cyclic structure represented by —CH₂—_n (wherein n represents a positive integer of 4 to 8).

5,091,283

PHOTOCURABLE DIALLYL PHTHALATE RESIN COMPOSITION AND PRINTED CIRCUIT BOARD USING THE SAME

Isamu Tanaka, Yokosuka; Hltoshi Oka, Yokohama; Makio Watanabe, Fujisawa; Hiroshi Kikuchi, Zushi; Shinichiro Imabayashi, Yokohama, and Yukihiko Taniguti, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 27, 1990, Ser. No. 499,706

Claims priority, application Japan, Mar. 29, 1989, 1-075118
Int. Cl.⁵ G03F 7/078

U.S. Cl. 430—280

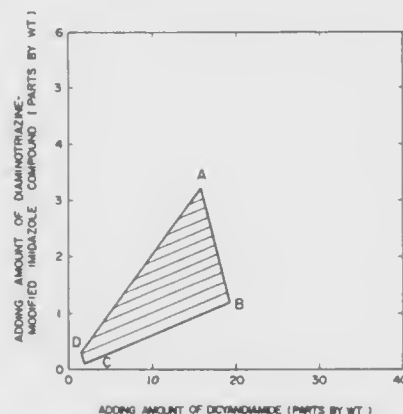
4 Claims

1. A photo curable diallyl phthalate resin composition for forming a solder resist

- 100 parts by weight of a prepolymer of diallyl phthalate,
- 4 to 30 parts by weight of a polyfunctional unsaturated compound obtained by esterification reaction of an unsaturated carboxylic acid with a polyhydroxy compound,
- 0.5 to 12 parts by weight of a photopolymerization initiator,
- 3 to 35 parts by weight of a solvent soluble epoxy resin,
- 2 to 20 parts by weight per 100 parts by weight of the epoxy resin of a catalyst mixture for the epoxy resin comprising dicyandiamide and a diamino-triazine-modified imazole compound in a weight ratio of the former to the latter of 16/1 to 5/1 which is in a range enclosed by the lines A-B-C-D shown in FIG. 3,

- 0.1 to 10 parts by weight of an agent, comprising at least one compound selected from the group consisting of 4-*t*-butyl-4'-methoxydibenzoylmethane, 2-ethylhexyl *p*-methoxycinnamate, 2-(2'-hydroxy-3',5'-di-*tert*-butylphenyl)benzotriazole, 2-(2'-hydroxy-3'-*tert*-butyl-5'-methylphenyl)-5-chlorobenzotriazole, 2-(2'-hydroxy-3',5'-

tert-butylphenyl)-5-chlorobenzotriazole, and 2-Δ²-hydroxy-3'-(3'',4'',5'', 6''-tetrahydrophthalimidomethyl)-5-methylphenylbenzotriazole or the at least one compound in combination with phthalocyanine green or phthalocyanine blue,



- 0.5 to 10 parts by weight of an anti-foaming agent,
- 20 to 100 parts by weight of a filler, and
- 55 to 100 parts by weight of a solvent for dissolving said prepolymer of diallyl phthalate and said epoxy resin.

5,091,284

MARKING FLUOROCARBON SURFACES

Malcolm G. Bradfield, Leigh, England, assignor to BICC Public Limited Company, London, England

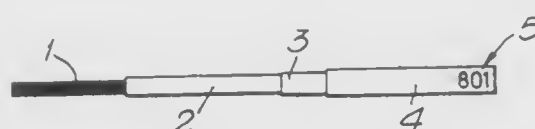
Filed Nov. 8, 1988, Ser. No. 268,732

Claims priority, application United Kingdom, Nov. 12, 1987, 8726482

Int. Cl.⁵ G03C 5/16; G03F 7/26

U.S. Cl. 430—292

14 Claims



1. A method of marking a fluorocarbon body having a surface of a reflective fluorocarbon polymer composition comprising applying a light-transmitting ethylene-tetrafluoro ethylene copolymer composition as a surface coating over said surface of said reflective composition, and marking said coated surface by laser printing.

5,091,285

METHOD OF FORMING PATTERN BY USING AN ELECTROCONDUCTIVE COMPOSITION

Keiji Watanabe, Atsugi; Yasuhiro Yoneda, Tokyo; Koichi Kobayashi, Yokohama; Keiko Yano, Kawasaki; Tomio Nakamura, Ichikawa, and Shigeru Shimizu, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki and Nitto Chemical Industry Co., Ltd., Tokyo, both of, Japan

Filed Apr. 27, 1990, Ser. No. 515,444

Claims priority, application Japan, Apr. 28, 1989, 1-107800

Int. Cl.⁵ G03F 7/004

U.S. Cl. 430—296

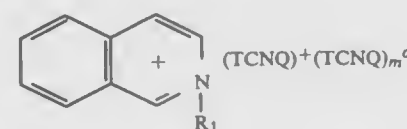
11 Claims

1. A pattern-forming method comprising the steps of: (1) forming a resist film on a substrate, (2) coating an electroconductive composition on the resist film to form an electroconductive film (3) irradiating the coated substrate with electron beams or ion beams for forming a pattern by exposure, and (4) developing the electroconductive film and resist film to form a

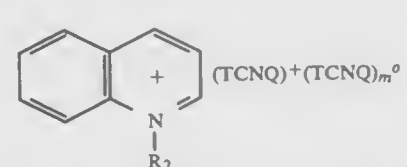
resist pattern using a liquid developer to simultaneously remove the electroconductive film and the resist film, wherein said electroconductive composition comprises



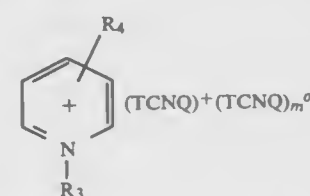
- 0.05 to 30 parts by weight of at least one tetraacyanoquinodimethane (TCNQ) complex salt selected from the group consisting of isoquinolinium TCNQ complex salts represented by the following formula (I):



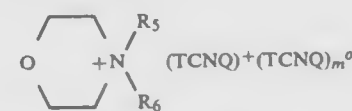
wherein R₁ represents an alkyl group having 3 to 24 carbon atoms, (TCNQ)⁺ represents a negatively charged TCNQ radical, (TCNQ)⁰ represents a neutral TCNQ radical, and m is a rational number of from 0 to 2, quinolinium TCNQ complex salts represented by the following formula (II):



wherein R₂ represents an alkyl group having 3 to 24 carbon atoms, (TCNQ)⁺ represents a negatively charged TCNQ radical, (TCNQ)⁰ represents a neutral TCNQ radical, and m is a rational number of from 0 to 2, alkyl pyridinium TCNQ complex salts represented by the following formula (III):

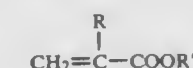


wherein R₃ represents an alkyl group having 3 to 24 carbon atoms, R₄ represents an alkyl group having 1 to 6 carbon atoms, (TCNQ)⁺ represents a negatively charged TCNQ radical, (TCNQ)⁰ represents a neutral TCNQ radical, and m is a rational number of from 0 to 2, and morpholinium TCNQ complex salts represented by the following formula (IV):



wherein R₅ represents an alkyl group having 3 to 24 carbon atoms, R₆ represents hydrogen or an alkyl group having 1 to 6 carbon atoms, (TCNQ)⁺ represents a negatively charged TCNQ radical, (TCNQ)⁰ represents a neu-

tral TCNQ radical, and m is a rational number of from 0 to 2,
(B) 0.05 to 100 parts by weight of a polymer comprising 50 to 100% by weight of units of a monomer represented by the following formula:



wherein R represents a hydrogen atom or a methyl group and R' represents an alkyl group having 1 to 6 carbon atoms, and 0 to 50% by weight of units of at least one monoethylenically unsaturated monomer, and
(c) 100 parts by weight of a solvent.

5,091,286

LASER-FORMED ELECTRICAL COMPONENT AND METHOD FOR MAKING SAME

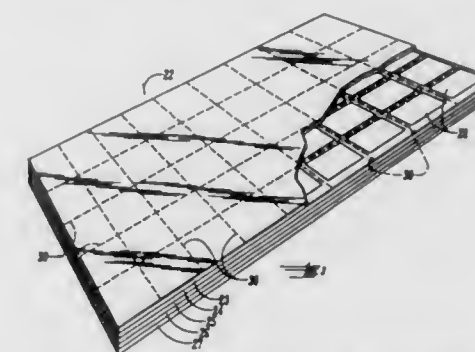
Herman R. Person, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Sep. 24, 1990, Ser. No. 587,761

Int. Cl.⁵ G03F 7/207

U.S. Cl. 430—297

4 Claims



1. A method for making an electrical component comprising: placing a film of electrically conductive material on the upper surface of a substrate of insulative material; passing a beam of laser light through a mask having a stencil opening therein shaped in the form of a negative pattern, whereby said laser beam after passing through stencil opening of said mask has a shape conforming to said negative pattern; using a lens positioned in the path of said laser beam between said mask and said film of electrically conductive material to focus said laser beam in a negative image on said film of electrically conductive material, whereby said laser beam will burn away a portion of said conductive material in the shape of said negative image, thereby leaving a desired pattern of said electrically conductive material on said substrate.

5,091,287

PHOTOREACTIVE OLIGOMER COMPOSITION AND PRINTING PLATE

Daniel S. Dustin, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1990, Ser. No. 506,905

Int. Cl.⁵ G03F 7/30, 7/038

U.S. Cl. 430—302

8 Claims

1. A process for developing a photoimage (i) comprising (i) exposing the presensitized lithoplate containing a lithographic support coated with a composition comprising:

- the reaction product of a heat reactive phenolic resin and an unsaturated monoisocyanate; and
- a haloalkyl-s-triazine photo sensitizer to ultraviolet light

under a negative or positive imaging pattern and (ii) thereafter developing the resulting image with an aqueous alkaline solution whereby the areas unexposed are removed.

5,091,288

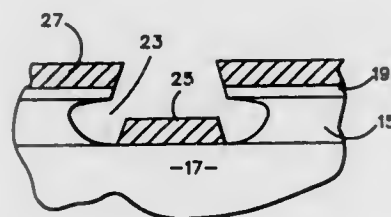
METHOD OF FORMING DETECTOR ARRAY CONTACT BUMPS FOR IMPROVED LIFT OFF OF EXCESS METAL
Pierino I. Zappella, Garden Grove; Angel A. Pepe, Irvine; William R. Fewer, Diamond Bar, and Eugene J. Babcock, Garden Grove, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 27, 1989, Ser. No. 428,371

Int. Cl.⁵ G03C 5/16

U.S. Cl. 430—311

17 Claims



1. A method of forming a plurality of contact bumps on a substrate, comprising:
depositing on a substrate a first layer of organic positive photoresist;
exposing said first layer of photoresist to a first pattern of light to form in said first layers of photoresist a first portion capable of being dissolved by an agent at a first rate;
depositing on said exposed first layer a second layer of organic positive photoresist;
exposing said second layer to a second pattern of light to form in said second layer of photoresist a second pattern portion capable of being dissolved by said agent at substantially said first rate, and a third portion that is either incapable of being dissolved by said agent, or is dissolved by said agent at a second rate, substantially slower than said first rate;
dissolving with said agent said second pattern portion of said second layer and at least some of said first portion of said first layer under said second pattern portion of said second layer and under a portion of said third pattern portion of said second layer to form openings through said second layer and said first layer to said substrate;
depositing contact material on the surface of said third pattern portion of said second layer and through said openings onto said substrate to form a layer of contact material on the surface of said second layer of material, and a pattern of contact bumps on the surface of said substrate;
dissolving said first and second layers of material under said contact material; and
removing said layer of contact material.

5,091,289

PROCESS FOR FORMING MULTI-LEVEL COPLANAR CONDUCTOR/INSULATOR FILMS EMPLOYING PHOTORESISTIVE POLYIMIDE POLYMER COMPOSITIONS

John E. Cronin, Milton; Carter W. Kaanta, Colchester; Rosemary A. Previti-Kelly, Richmond, and James G. Ryan, Essex Junction, all of Vt., assignors to Interational Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,394

Int. Cl.⁵ G03F 7/26

U.S. Cl. 430—312

13 Claims

1. A process for forming multi-level coplanar conductor/insulator films on a substrate having a conductor pattern, comprising the steps of:

applying a first layer comprising a photosensitive polyimide polymer composition to said substrate;
applying a develop stop layer to said first layer, said develop stop layer being comprised of a material which is capable of transmitting radiation to said first layer;
applying a second layer comprising a photosensitive polyimide polymer composition to said develop stop layer;
imagewise exposing said first and second layers and then developing said second layer so as to selectively expose portions of said develop stop layer;
removing said exposed portions of said develop stop layer; imagewise exposing and developing said first layer so as to selectively expose regions of said substrate, the openings formed in said first layer being in alignment with at least a portion of the openings formed in said second layer;
depositing a conductor material on said second layer and in said openings in said first and second layers; and
removing said conductor material which overlies said second layer to coplanarize the surfaces of conductor material and said second layer.

5,091,290

PROCESS FOR PROMOTING ADHESION OF A LAYER OF PHOTORESIST ON A SUBSTRATE HAVING A PREVIOUS LAYER OF PHOTORESIST

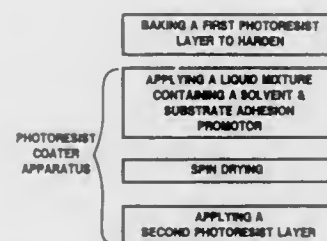
J. Brett Rolfson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 3, 1990, Ser. No. 620,752

Int. Cl.⁵ G03C 1/76

U.S. Cl. 430—327

15 Claims



1. A process for applying a second layer of photoresist to a semiconductor wafer having a substrate and a first layer of patterned photoresist comprising:
baking the wafer to harden the first layer of photoresist;
applying a liquid mixture onto the wafer, said liquid mixture containing a solvent for the photoresist to softening the first layer of photoresist and an adhesion promotor for the substrate;
spin drying the wafer; and
applying a second layer of photoresist, whereby the solvent provides adhesion promotion for the second layer of photoresist to the first layer of photoresist and the adhesion promotor provides adhesion promotion for the second layer of photoresist to the substrate of the wafer.

5,091,291

ALKYL SUBSTITUTED PHOTOGRAPHIC COUPLERS AND PHOTOGRAPHIC ELEMENTS AND PROCESSES EMPLOYING SAME

Philip T. S. Lau, Rochester, and Danny R. Thompson, Fairport, both of N.Y., assignors to Eastman Kodak Company

Filed Oct. 25, 1990, Ser. No. 603,590

Int. Cl.⁵ G03C 7/32, 7/34, 7/36, 7/38

U.S. Cl. 430—385

15 Claims

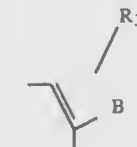
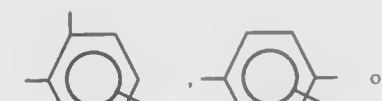
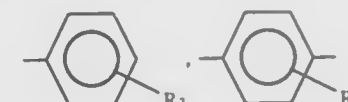
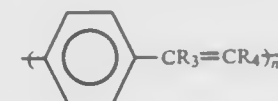
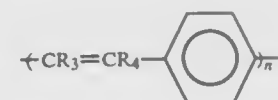
5. A process for developing an image in a photographic element comprising a support and a silver halide emulsion containing an imagewise distribution of developable silver halide grains, said process comprising the step of developing

said element with a silver halide color developing agent in the presence of a dye-forming coupler having the structure:



wherein

COUP is a dye-forming coupler moiety substituted in its coupling position with the remainder of the structure, R is hydrogen, (C₁₋₆)alkyl or unsubstituted or substituted (C₆₋₁₅)aryl, and S_e is represented by the formula —L—NHSO₂—R₁ in which L is a single bond, —(CH₂—CR₄)_n—,



n is 1 or 2,
B denotes atoms sufficient to complete a 5- or 6-member ring, wherein said atoms are selected from the group of C, N, O and S,
R₁ is (C₁₋₂₀)alkyl, unsubstituted or substituted (C₆₋₂₅)aryl, or —CO₂R₂,
R₂ is H, (C₁₋₂₀)alkyl or (C₆₋₂₅)aryl, and
R₃, R₄ are identical or different, and each is H, Cl, F, —CN, —NO₂, —CF₃, —SCH₃, —SO₂CH₃, (C₁₋₁₆)alkyl, (C₁₋₁₆)alkoxy, —NHCO(C₁₋₁₆)alkyl, —NHSO₂(C₁₋₁₆)alkyl or —CO₂(C₁₋₁₆)alkyl.

5,091,292

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroshi Fujimoto; Kiyoshi Morimoto, and Takatoshi Ishikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 1, 1990, Ser. No. 561,550

Claims priority, application Japan, Aug. 1, 1989, 1-199647

Int. Cl.⁵ G03C 7/30

U.S. Cl. 430—467

12 Claims

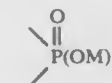
1. A method for processing a silver halide color photographic material, which comprises processing an image-wise exposed silver halide color photographic material which comprises at least one high silver chloride emulsion layer compris-

ing at least 90 mol % silver chloride, wherein the thickness of dried coating of the photographic material is 15 μm or less, with a color developer containing an aromatic primary amine color-developing agent, at least one of anionic surface-active agents in an amount of 0.05 to 3 g/l of the developer, represented by the following formula (W-1):

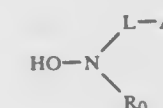


Formula (W-1)

wherein R represents a substituted or unsubstituted alkyl, cycloalkyl, alenyl, alkynyl, aryl, or heterocyclic group having 8 to 30 carbon atoms, and X represents —COOM, —SO₃M, —OSO₃M, —OP(OM)₂, or



in which M represents a hydrogen atom, lithium, potassium, sodium, or ammonium, and at least one of compounds represented by the following formula (I) in an amount of 0.1 to 50 g/l of the developer:



wherein L represents an alkylene group, A represents a carboxyl group, a sulfo group, a phosphono group, a phosphinic acid residue, a hydroxyl group, an amino group, or an ammonia group, and R₀ represents an alkyl group having from 1 to 10 carbon atoms, by using an automatic processor, wherein the opened surface ratio of color developing solution in the processing tank is 0.1 cm⁻¹ or below, and then delivering the photographic material.

5,091,293

COLOR NEGATIVE PHOTOGRAPHIC MATERIAL
Yasushi Nozawa; Hideto Ikoma; Keiji Mihayashi, and Yoshihiko Shibahara, all Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 91,159, Aug. 31, 1987, abandoned. This application Jun. 25, 1990, Ser. No. 542,690

Claims priority, application Japan, Aug. 29, 1986, 61-201756; Oct. 17, 1986, 61-246983; Oct. 17, 1986, 61-246984; Jun. 26, 1987, 62-159115

Int. Cl.⁵ G03C 1/46

U.S. Cl. 430—503

16 Claims

1. A color negative photographic material comprising, on a support, at least two red-sensitive silver halide emulsion layers each having different photographic sensitivities, at least two green-sensitive silver halide emulsion layers each having different photographic sensitivities and at least two blue-sensitive silver halide emulsion layers each having different photographic sensitivities and having a specific photographic sensitivity of 800 or above, and each of the red-, blue- and green-sensitive emulsion layers having the highest photographic sensitivity has a silver coverage of 0.3 to 1.8 g/m², wherein said material contains a combined total of silver coverages of 3.0 g/m² to 8.5 g/m² and wherein at least one emulsion layer of said red-, green- and blue-sensitive emulsion layers contains silver halide grains having a double structure comprising a core made up of silver iodobromide having an iodide content of at least 5 mol % and a shell which covers said core and is made up of silver iodobromide having an iodide content lower than that of said core or silver bromide.

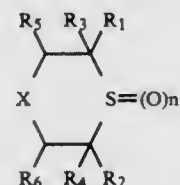
5,091,294
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL
 Toyoki Nishijima, and Masaki Tanji, both of Tokyo, Japan,
 assigns to Konica Corporation, Tokyo, Japan
 Filed Apr. 16, 1990, Ser. No. 509,879

Claims priority, application Japan, Apr. 21, 1989, 64-102902;
 Dec. 1, 1989, 64-313705

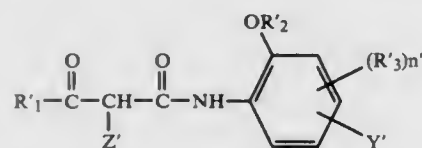
Int. Cl.³ G03C 1/34, 7/36, 1/38

U.S. Cl. 430—505 24 Claims

1. A silver halide color photographic material that has at least one silver halide emulsion layer on a support, which emulsion layer contains a compound represented by the following general formula (T) and a yellow coupler represented by the following general formula (Y-I):



where R₁, R₂ are each a hydrogen atom or an alkyl group; R₃ and R₄ are each a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group; R₅ and R₆ are each a hydrogen atom, an alkyl group, an aryl group, an acyl group or an alkoxycarbonyl group; X is a divalent group having a carbon atom as a constituent atom of the 6-membered ring; and n is 0, 1 or 2;



(where R'₁ is an alkyl group or a cycloalkyl group; R'₂ is an alkyl group, a cycloalkyl group, an acyl group or an H aryl group; R'₃ is a group capable of substitution on the benzene ring; n' is 0 or 1; Y' is a monovalent ballast group, and Z' is a hydrogen atom or an atom or group that is capable of being eliminated upon coupling).

5,091,295
COLOR PHOTOGRAPHIC MATERIAL AND METHOD OF FORMING COLOR IMAGE

Shigeru Kuwashima, and Mario Aoki, both of Kanagawa, Japan,
 assigns to Fuji Photo Film Co., Ltd., Kanagawa, Japan

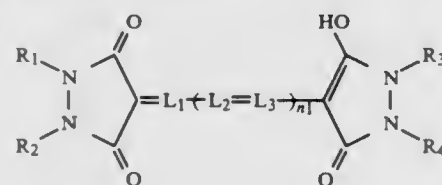
Filed Sep. 20, 1990, Ser. No. 585,840

Claims priority, application Japan, Sep. 20, 1989, 1-244652

Int. Cl.³ G03C 1/40

U.S. Cl. 430—507 4 Claims

1. A positive-positive silver halide color photographic material comprising at least one red-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer, at least one blue-sensitive silver halide emulsion layer, at least one hydrophilic colloid layer, and at least one colloidal silver layer on a support wherein said silver halide emulsion layer, hydrophilic colloid layer, or colloidal silver layer contains at least one dye of formula (I):



where R₁, R₂, R₃ and R₄ are the same or different and each

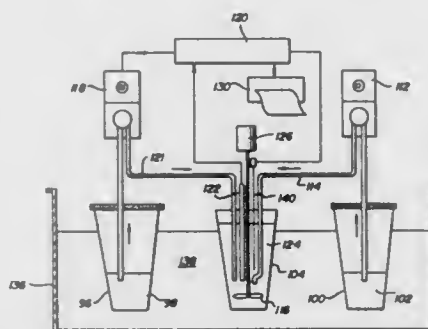
represents an alkyl group, an aryl group or a heterocyclic group; L₁, L₂ and L₃ each represents a methine group; n₁ represents 1 or 2; and any of R₁, R₂, R₃ and R₄ has a sulfo group and the total of the groups is at least two or more.

5,091,296
POLYMER CO-PRECIPITATED COUPLER DISPERSION
 Pranab Bagchi, Webster, Steven J. Sargeant, Honeoye Falls;
 James T. Beck, Rochester, and Brian Thomas, Fairport, all of
 N.Y., assigns to Eastman Kodak Company, Rochester, N.Y.
 Filed Jun. 26, 1990, Ser. No. 543,910

Int. Cl.³ G03C 7/26, 7/32

(T) U.S. Cl. 430—546

30 Claims



1. A method of preparing coprecipitated aqueous dispersions of a photographic material and a polymer comprising providing a first flow comprising water, surfactant, a base, and a polymer latex providing a second flow comprising a water miscible solvent, base, water, and photographic material mixing said first and said second flows, and immediately neutralizing the mixed flows to coprecipitate particles comprising said photographic material and said polymer latex forming a fine particle colloidal dispersion of said particles of said photographic material and said polymer latex.

5,091,297
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL
 Hiroo Fukunaga; Nobuo Furutachi, and Genichi Furusawa, all of
 Kanagawa, Japan, assigns to Fuji Photo Film Co., Ltd.,
 Kanagawa, Japan

Continuation-in-part of Ser. No. 353,372, May 17, 1989,
 abandoned. This application Jun. 5, 1990, Ser. No. 533,570

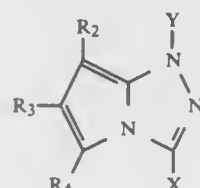
Claims priority, application Japan, May 17, 1988, 63-118075

Int. Cl.³ G03C 7/38

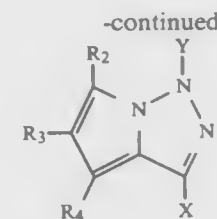
U.S. Cl. 430—558

13 Claims

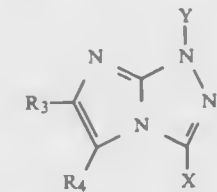
1. A silver halide color photographic material comprising a support having thereon at least one silver halide red-sensitive emulsion layer containing at least one cyan coupler represented by formula (IV), (V), (VI), (VII), (VIII), (IX), (X), (XI), (XII), (XIII), (XIV), (XV), (XVI) or (XVII):



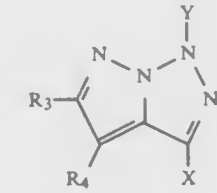
(IV)



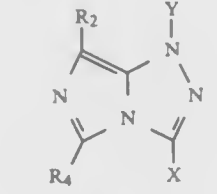
(V)



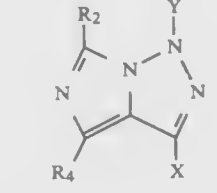
(VI)



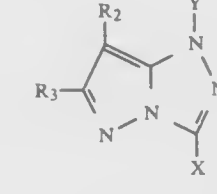
(VII)



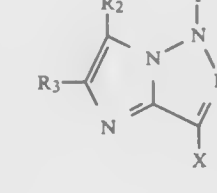
(VIII)



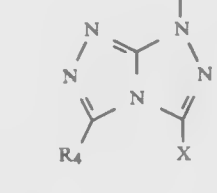
(IX)



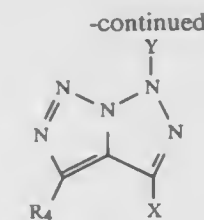
(X)



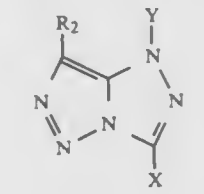
(XI)



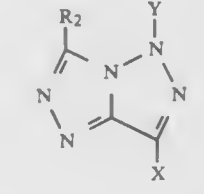
(XII)



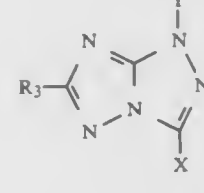
(XIII)



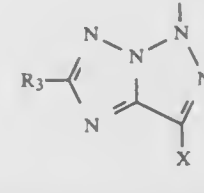
(XIV)



(XV)



(XVI)



(XVII)

wherein in formula (IV) to (XVII), Y represents a hydrogen atom or a blocking group; X represents a hydrogen atom or a group which releases upon a reaction with an oxidation product of an aromatic primary amine color developing agent; R₂ and R₄ each represents a group which is substantially not released upon reaction with an oxidation product of an aromatic primary amine color developing agent; R₃ represents a hydrogen atom or a substituent; or R₂, R₃, R₄, or X may form a dimer, oligomer or polymer, provided that in formula (X), in a case where R₂ represents an alkoxycarbonyl group or an aryloxy carbonyl group, X does not represent an alkylthio group, a heterocyclic group, an acylamino group or an alkoxy group, and in a case where a dimer is formed by R₂, a bis type coupler is not formed by an alkylidene group.

5,091,298
SENSITIZING DYES FOR PHOTOGRAPHIC MATERIALS

Richard L. Parton, Webster; Steven G. Link, Rochester; David
 A. Stegman, Churchville, and John D. Mee, Rochester, all of
 N.Y., assigns to Eastman Kodak Company, Rochester, N.Y.

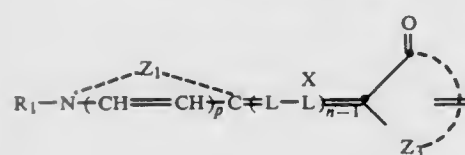
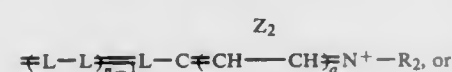
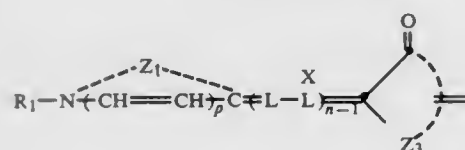
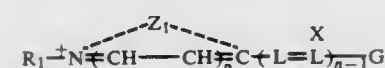
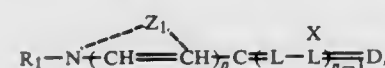
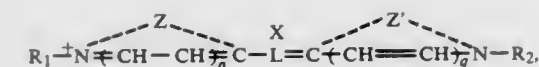
Filed Jul. 19, 1990, Ser. No. 554,649

Int. Cl.³ G03C 1/12

U.S. Cl. 430—570

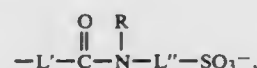
8 Claims

1. A photographic element comprising a support having thereon a silver halide emulsion layer sensitized with a dye according to any of the formulas:

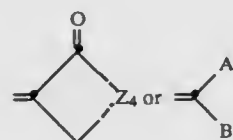


$\equiv L-\overset{\text{Z}_3}{\underset{\text{X}}{\text{C}}}-L$, wherein

Z and Z' each independently represent the atoms necessary to complete a substituted or unsubstituted thiazole nucleus, a substituted or unsubstituted selenazole nucleus, a substituted or unsubstituted imidazole nucleus, or a substituted or unsubstituted oxazole nucleus, Z₁, Z₂, and Z₃ each independently represents the atoms necessary to complete a substituted or unsubstituted heterocyclic nucleus, each L independently represents a substituted or unsubstituted methine group, n is a positive integer of from 1 to 4, p and q each independently represents 0 or 1, X represents a cation as needed to balance the charge of the molecule, R₁ and R₂ each independently represents substituted or unsubstituted alkyl or substituted or unsubstituted aryl, and at least one of R₁ and R₂ is represented by the formula:



L' represents a substituted or unsubstituted divalent linking group comprising about 1 to 6 carbon atoms, L'' represents a substituted or unsubstituted divalent linking group comprising about 1 to 6 carbon atoms, R represents H, substituted or unsubstituted alkyl, or forms a ring structure with L' or L'', =D represents



wherein

Z₄ represents the atoms necessary to complete a substituted or unsubstituted heterocyclic nucleus, A and B each independently represents a cyano radical, an

ester radical, an acyl radical, a carbamoyl radical, or an alkylsulfonyl radical, and G represents a substituted or unsubstituted aryl radical or a substituted or unsubstituted amino radical.

(II)

(III)

(IV)

(V)

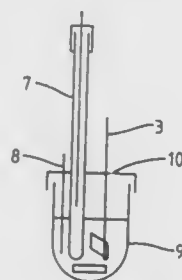
5,091,299 AN ENZYME ELECTRODE FOR USE IN ORGANIC SOLVENTS

Anthony P. F. Turner, Evergreens, Bourne Ead Road, Cranfield, Bedfordshire, MK43 0BD, England; David J. Best, Whin-garth, Gunnerton, Hexham, Northumberland, England, and Geoffrey F. Hall, 112 High Street, Cranfield, Bedfordshire, MK43 0DG, England

PCT No. PCT/GB88/00970, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO89/04364, PCT Pub. Date May 18, 1989

PCT Filed Nov. 10, 1988, Ser. No. 543,746
Claims priority, application United Kingdom, Nov. 13, 1987, 8726574; Apr. 21, 1988, 8809485

Int. Cl.⁵ G01N 27/26; C12M 1/40; C12Q 1/00
U.S. Cl. 435—4 16 Claims



8. A method for the determination of an analyte present in a solution having a solvent selected from the group consisting of nonaqueous and microaqueous solvents said method comprising: introducing a non-aqueous or microaqueous solution to be analysed for said analyte into an electrochemical cell, said cell having an electrode at which an enzyme is retained; and measuring an electrical response of said cell; said response arising from a reaction involving said enzyme and said analyte and being related to the concentration of said analyte; wherein said solution contacts said enzyme.

5,091,300 RADIO-IMMUNO ASSAY FOR HEPATITIS B VIRUS PRES2 ANTIBODIES

William M. Hurni, and William J. Miller, both of North Wales, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 3, 1989, Ser. No. 389,207
Int. Cl.⁵ C12Q 1/70 3 Claims

1. A method for the detection of anti-PreS2 antibodies in a biological fluid which comprises:

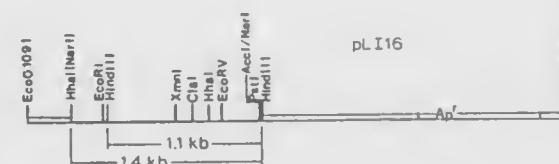
- coating the surface of polystyrene beads with anti-HBS antibodies;
- adsorbing PreS2+S protein to the beads via interaction with anti-HBS antibody;
- separately preparing test samples, positive control and negative control samples by mixing each with about 3×10^5 cpm of ¹²⁵I-labelled anti-PreS2 antibody;
- incubating the coated beads from (ii) with the samples prepared in (iii);
- measuring the amount labelled anti-PreS2 antibody bound to said beads and calculating the level of anti-PreS2 antibodies in the sample.

5,091,301 DIAGNOSTIC AND EPIDEMIOLOGICAL NUCLEIC ACID PROBE FOR BOVINE LEPTOSPIROSIS

Richard L. Zuerner, Ames, Iowa, assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 22, 1989, Ser. No. 327,064
Int. Cl.⁵ C12Q 1/68 16 Claims

U.S. Cl. 435—6



1. A single stranded RNA probe which will hybridize with a 1.4-kb NarI fragment having a restriction enzyme pattern as shown in FIG. 1 and contained within a repetitive genomic element of *Leptospira interrogans* serovar hardjo-type hardjovis, wherein said probe is the runoff transcription product of *Leptospira interrogans* template DNA obtained as an endonuclease digest of a plasmid selected from the group consisting of pLI16 (NRRL B-18461), pLI17 (NRRL B-18462), pLI18 (NRRL B-18463, and pLI20 (NRRL B-18464).

5,091,302 POLYMORPHISM OF HUMAN PLATELET MEMBRANE GLYCOPROTEIN IIIA AND DIAGNOSTIC AND THERAPEUTIC APPLICATIONS THEREOF

Peter J. Newman, Shorewood, and Richard H. Aster, Milwaukee, both of Wis., assignors to The Blood Center of Southeastern Wisconsin, Inc., Milwaukee, Wis.

Filed Apr. 27, 1989, Ser. No. 343,827
Int. Cl.⁵ C12Q 1/68; C07H 15/12; C12N 15/00 26 Claims

U.S. Cl. 435—6

1. A method of typing human platelet glycoproteins, comprising the steps of

- synthesizing cDNA from human platelet;
- amplifying said cDNA to produce amplified cDNA; and then
- analyzing said amplified cDNA to determine a platelet phenotype.

5,091,303 DIAGNOSIS OF WEGENER'S GRANULOMATOSIS

M. Amin Arnaut, Chestnut Hill; Robert T. McCluskey, Brookline, and John L. Niles, Cambridge, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Oct. 27, 1989, Ser. No. 428,286
Int. Cl.⁵ C07K 15/06; C12N 9/64; G01N 33/564, 33/577 4 Claims

1. A substantially pure protein having the following characteristics:

- it is found in neutrophils;
- it has a mass of approximately 29 kD as determined by SDS-PAGE;
- it is capable of binding diisopropylfluorophosphate;
- it has a pI of approximately 9.2-9.4;
- it is capable of binding to autoantibodies present in the sera of individuals afflicted with Wegener's granulomatosis; and
- it has the N terminal sequence Ile Val-Gly-Gly-His-Glu-Ala-Gln-Pro-His-Ser-X-Pro-Tyr-Met-Ala-Ser-Leu-Gln-Met, where X is unknown.

5,091,304 WHOLE BLOOD ACTIVATED PARTIAL THROMBOPLASTIN TIME TEST AND ASSOCIATED APPARATUS

Frank M. La Duca, East Brunswick, and Eduardo I. Marcelino, Edison, both of N.J., assignors to International Technidyne Corporation, Edison, N.J.

Filed Aug. 21, 1989, Ser. No. 396,043
Int. Cl.⁵ C12Q 1/56 25 Claims

U.S. Cl. 435—13

1. A method for performing an activated partial thromboplastin time test (APTT) comprising the steps of:

- applying non-anticoagulated blood to a test reservoir containing effective amounts of an anticoagulant, a blood coagulation activator and a platelet factor substitute to enable said applied blood to simultaneously anticoagulate and initiate contact activation, wherein said anticoagulant is a citrate compound, said coagulation activator is either diatomaceous earth, kaolin, celite, silica, micronized silica, ellagic acid or a combination thereof and said platelet factor substitute is a phospholipid.
- incubating the mixture at a given temperature for a given period of time and then adding a sufficient amount of calcium to said mixture to initiate the clotting cascade, measuring the length of time required to form a blood clot in said test reservoir after the addition of said calcium.

5,091,305 BILE ACID SULFATE SULFATASE, PROCESS FOR ITS PREPARATION AND METHOD FOR ASSAYING BILE ACID

Tsunetake Sugimori, Uji; Yoji Tsukada, Kyoto, and Yasuhiko Tatsuke, Ashiya, all of Japan, assignors to Marukin Shoyu Co., Ltd., Kagawa, Japan

PCT No. PCT/JP89/01186, § 371 Date Jul. 26, 1990, § 102(e) Date Jul. 26, 1990, PCT Pub. No. WO90/06360, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 21, 1989, Ser. No. 548,932
Claims priority, application Japan, Nov. 28, 1988, 63-301415
Int. Cl.⁵ C12N 9/16 15 Claims

U.S. Cl. 435—19

3. A method of determining 3α-sulfates of 5β-bile acids in a sample comprising the steps of causing a bile acid sulfate sulfatase having the following properties:

- action: acting on 3α-sulfates of 5β-bile acids to hydrolyze the sulfate ester moiety thereof and to change the bonding configuration of the resulting OH group from α-configuration to β-configuration, thereby producing 3β-hydroxy bile acids;
- substrate specificity: acting on 3α-sulfates of non-conjugated bile acids, and on 3α-sulfates each of glycine-conjugated and taurine-conjugated bile acids;
- optimum pH range: pH 8.5±0.5 and β-hydroxysteroid dehydrogenase to act on a sample containing 3α-sulfates of bile acids in the presence of β-NAD, and determining the amount of produced NADH.

5,091,306 METHOD AND KIT FOR TESTING FOR THE PRESENCE OF CATALASE IN MILK

Nathan Citri, Jerusalem, Israel, assignor to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Mar. 2, 1988, Ser. No. 163,390
Claims priority, application Israel, Mar. 8, 1987, 81822
Int. Cl.⁵ C12Q 1/30 8 Claims

U.S. Cl. 435—27

1. A method for testing for the presence of catalase in a milk sample as an indication of the presence of somatic cells therein which comprises: forming an aqueous solution of a substantially catalase-free alkaline protease-enriched detergent which is capable of

foaming and hydrogen peroxide and further containing at least 20 mM of a pH buffer wherein the concentration of said buffer is sufficient to provide a pH in the range of 7.0-8.0 upon the addition of said milk sample to said solution;

adding said milk sample to said aqueous solution to form an admixture for a time and under conditions sufficient to allow the release of catalase from said somatic cells; and thereafter determining the presence of catalase in said milk sample by visually observing the extent of foam generated in said admixture, said buffer serving to increase the amount of released oxygen available to generate said foam.

5,091,307

PROCEDURE FOR THE COUNTING, DETECTION AND IDENTIFICATION OF MYCOPLASMAS IN GENERAL AND URINOGENITAL MYCOPLASMAS IN PARTICULAR AND A BIOLOGICAL MEDIUM SPECIALLY ADAPTED TO THIS EFFECT

Claude Escarguel; Marie-Hélène Grosso, both of Sanary sur Mer, and Patrick Laconi, Hyeres, all of France, assignors to Diffusion Bacteriologie du Var-D.B.V., Sanary sur Mer, France

PCT No. PCT/FR88/00464, § 371 Date May 30, 1989, § 102(e) Date May 30, 1989, PCT Pub. No. WO89/02926, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 20, 1988, Ser. No. 363,901

Claims priority, application France, Sep. 29, 1987, 87 13703; Jan. 7, 1988, 88 00176

Int. Cl.⁵ C12Q 1/20, 1/02

U.S. Cl. 435—34

10 Claims

1. A method for the detection and quantitation of mycoplasmas comprising:

reacting a sample to be analyzed under anaerobic conditions in a liquid mycoplasma growth medium to obtain an enzymatic response, said mycoplasma growth medium also being used as dilution medium for the sample to be analyzed, said sample reacted with:

- a first substrate consisting essentially of dehydrated urea in the presence of a dehydrated colored pH indicator;
 - a second substrate consisting essentially of dehydrated arginine in the presence of a colored pH indicator; and
 - an optional third substrate comprising glucose in the presence of a dehydrated pH indicator; and
- measuring the enzymatic response by measuring the time required for the pH indicators to change color; the respective amounts of urea and arginine and the concentration and the composition of the growth medium having been chosen and standardized such that, for *U. urealyticum* and *M. hominis* or *M. fermentans* or pulmonary mycoplasmas present at supra- or sub-pathological levels, any color change of the pH indicators is obtained within a predetermined length of time; wherein supra-pathological levels of mycoplasmas are levels greater than 10⁴ CCU/ml, and sub-pathological levels of mycoplasmas are levels less than 10³ CCU/ml.

5,091,308

PROCESS FOR THE ENZYMATIC DISPERSAL OF MYCOBACTERIUM BOVIS - BCG

Melvin E. Klegerman, Chicago, and Michael J. Groves, Lake Forest, both of Ill., assignors to The Board of Trustees of the University of Illinois, Chicago, Ill.

Filed Jan. 29, 1990, Ser. No. 471,505

Int. Cl.⁵ C12P 9/50; C12N 1/20

U.S. Cl. 435—68.1

9 Claims

1. A process for the production of a suspension of *Mycobacterium bovis*-BCG having aggregates or single cells which comprises:

- adding a sterile pronase enzyme solution containing an effective amount of said enzyme which will degrade the

- covering material of a BCG cell to a BCG pellicle in a buffer solution or BCG in an aqueous suspension,
- agitating the resulting mixture until the enzyme solution is completely dispersed,
- concentrating the resultant suspension, and
- removing the enzyme from the suspension yielding said desired *Mycobacterium bovis*-BCG.

5,091,309

SINDBIS VIRUS VECTORS

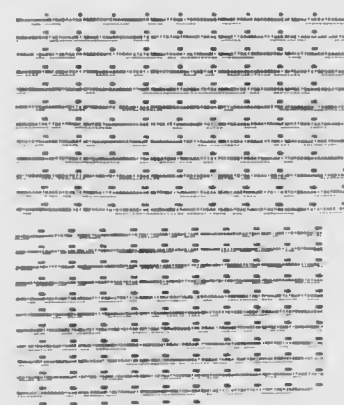
Sondra Schlesinger; Henry V. Huang, both of St. Louis, Mo.; Robin Levis, Takoma Park, Md.; Barbara Weiss, Clayton, and Manuel Tsiang, St. Louis, both of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 819,647, Jan. 16, 1986, abandoned. This application Aug. 17, 1989, Ser. No. 395,007

Int. Cl.⁵ C12P 21/00, 19/34; C12N 15/00, 7/00

U.S. Cl. 435—69.1

14 Claims



10. A method of producing a heterologous protein in a eucaryotic cell comprising the steps of:

- cloning a first DNA molecule comprising a cDNA of a Sindbis virus DI RNA downstream from a promoter able to cause transcription by a DNA dependent RNA polymerase;
- substituting into the Sindbis virus cDNA a second DNA molecule comprising DNA sequences encoding the heterologous protein between nucleotides 241 and 1928;
- transcribing the first DNA and the second DNA contained therein as a continuous transcript;
- transfecting a eucaryotic cell with the continuous transcript in the presence of helper virus; and
- growing the transfected eucaryotic cell under conditions which provide for the expression of Sindbis virus DI RNA.

5,091,310

STRUCTURE-INDEPENDENT DNA AMPLIFICATION BY THE POLYMERASE CHAIN REACTION

Michael A. Innis, Moraga, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Filed Sep. 23, 1988, Ser. No. 248,556

Int. Cl.⁵ C12P 19/34

U.S. Cl. 435—91

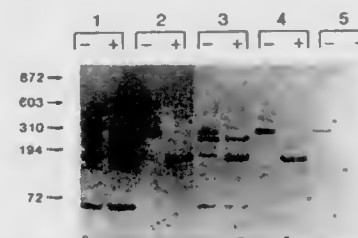
13 Claims

1. A method for structure-independent amplification of DNA by the polymerase chain reaction, said method comprising:

- treating the DNA under hybridizing conditions with a pair of oligonucleotide primers, a DNA polymerase, dATP, dCTP, TTP, and c¹⁴dGTP such that an extension product of each oligonucleotide primer is formed that is complementary to the DNA, wherein the extension product of a first primer of said primer pair, when separated from its template, can serve as a template for synthesis of the extension product of a second primer of said pair;

- separating the extension products from the templates on which the extension products were synthesized; and

ing or aerating and agitating, and collecting sarcosine oxidase from the culture medium obtained.



- repeating steps (a) and (b) on the extension products produced in step (b).

5,091,311

THE PRODUCTION OF KSB-1939 MACROLIDES USING STREPTOMYCES HYGROSCOPICUS

Hideki Katoh, Kakegawa; Reisuke Kobayashi, Shizuoka; Tomonori Shimazu, Hamamatsu; Akinori Suzuki; Akira Isogai, both of Chiba, and Osamu Tada, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 216,128, Jul. 7, 1988, Pat. No. 4,939,166.

This application Apr. 17, 1990, Ser. No. 512,126

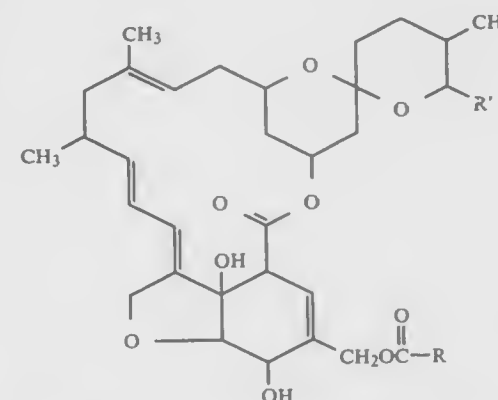
Claims priority, application Japan, Jul. 7, 1987, 62-169447; Jul. 23, 1987, 62-184621; Feb. 2, 1988, 63-22543

Int. Cl.⁵ C12R 1/465

U.S. Cl. 435—119

13 Claims

1. A process for producing a compound having the formula (I):



wherein R is $-(CH_2)_nCH(CH_3)_2$, $-(CH_2)_2CH_3$, or $-CH=C(CH_3)(CH_2)_mCH_3$, wherein n is an integer of 0-2 and m is an integer of 0 or 1, and R' is a methyl or ethyl group, comprising culturing *Streptomyces hygroscopicus* KSB-1939 deposited as FERM BP-1901, and mutants thereof capable of producing said compound of formula (I), and then collecting said compound from the resultant culture.

5,091,312

PROCESS FOR THE PREPARATION OF SARCOSE OXIDASE

Hiroya Iwasaki; Katsuyuki Fujimura, both of Hyogo; Yoshio Inoue, and Shoshiro Nakamura, both of Hiroshima, all of Japan, assignors to Kobayashi Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 158,408, Feb. 22, 1988, abandoned.

This application Oct. 16, 1990, Ser. No. 598,828

Claims priority, application Japan, Feb. 27, 1987, 62-46494

Int. Cl.⁵ C12N 9/06

U.S. Cl. 435—191

2 Claims

1. A process for producing sarcosine oxidase comprising cultivating *Streptomyces* sp. KB210-8SY, having the ability to produce sarcosine oxidase, in a liquid culture medium by shak-

ANTIGENIC EPITOPES OF IGE PRESENT ON B CELL BUT NOT BASOPHIL SURFACE

Tse-Wen Chang, Houston, Tex., assignor to Tanox Biosystems, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 229,178, Aug. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 226,421, Jul. 29, 1988, which is a continuation-in-part of Ser. No. 140,036, Dec. 31, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 272,243

Int. Cl.⁵ C12N 5/12; C07K 15/28

U.S. Cl. 435—240.27

11 Claims

1. An antibody which specifically binds to the extracellular segment of the membrane-bound domain of a membrane-bound immunoglobulin chain.

5,091,314

CLONING AND USE OF TRANSAMINASE GENE TYRB

Rüdiger Marquardt, Frankfurt am Main; Johann Then; Hans-Matthias Deger, both of Hofheim am Taunus; Gerhard Wöhner, Flörsheim am Main, all of Fed. Rep. of Germany; Martyn K. Robinson, Maidenhead, and Andrew Doherty, late of Bourne End, both of Great Britain by Evelyn Leah Kathryn Doherty, legal heir, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 98,193, Sep. 17, 1987, abandoned. This application Aug. 13, 1990, Ser. No. 566,322

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631829

Int. Cl.⁵ C12N 1/21, 15/52, 15/70

U.S. Cl. 435—252.33

2 Claims

1. A replicating extrachromosomal element containing the tyrB gene, isolated from *E. coli* ATCC 11303, and a multicopy plasmid.

5,091,315

BIOCONVERSION REACTOR

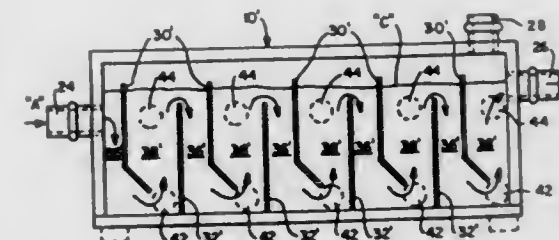
Perry L. McCarty, Stanford, and Andre Bachmann, Palo Alto, both of Calif., assignors to The Board of Trustees of Stanford University, Stanford, Calif.

Continuation of Ser. No. 771,972, Sep. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 414,958, Sep. 3, 1982, abandoned. This application Jun. 13, 1989, Ser. No. 366,250

Int. Cl.⁵ C12M 1/00

U.S. Cl. 435—287

50 Claims



1. A bioconversion reactor for the anaerobic fermentation of organic material, comprising:

- a shell having top, bottom and side walls enclosing a predetermined volume;
- an inlet port in said shell through which a liquid stream containing the organic material enters said shell;
- an outlet port in said shell through which said liquid stream exits said shell;
- a plurality of baffles positioned within said shell along a length thereof and spaced from one another with sides

thereof joined to said side walls of said shell, at least one of said baffles joined at a lower edge thereof to said bottom wall of said shell to extend substantially vertically upwardly therefrom, an upper portion of at least one of the other of said baffles substantially parallel to said baffle joined at the lower edge thereof to said bottom wall and a lower edge of the other of said baffles spaced from said bottom wall and slanted toward said outlet port to define a flow passageway; and

said baffles being positioned and arranged to define an up-flow chamber for the flow of said liquid stream there-through in fluid communication with one side of said flow passageway and a downflow chamber for the flow of said liquid stream therethrough in fluid communication with an opposite side of said flow passageway, the volume of said downflow chamber being less than that of said upflow chamber.

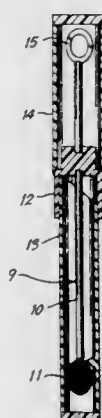
5,091,316

BIOLOGICAL SAMPLE COLLECTION AND TRANSPORT DEVICE

James F. Monthey, Baltimore; David T. Stitt, Parkton; C. Michael Gosnell, Fallston, all of Md., and Shannon D. Stewart, Stewartstown, Pa., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Continuation of Ser. No. 346,142, May 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 204,431, Jun. 9, 1988, abandoned. This application Apr. 11, 1990, Ser. No. 508,506
Int. Cl.⁵ C12M 1/30

U.S. Cl. 435—295

1 Claim



1. A viable microorganism collecting and transporting device without transport media, comprising:
 - a longitudinally extending sleeve container member comprising an open end, a closed end, and an inside and outside wall;
 - a cap comprising an exterior and interior face being removably attachable to said open end and outside wall of said container;
 - a shaft comprising a first and second end, wherein said first end is connected to said interior face of said cap;
 - a swabbing tip connected to said second end of said shaft wherein said swab is made with a polyurethane foam which is specifically non-toxic to live microorganisms;
 - said outside wall of said container member and said cap are longitudinally slidable relative to each other and form a slidable seal;
 - a seal inoculator connected to said exterior end of said cap; and
 - an inoculator cover removably attachable to said cap, to cover and protect the inoculator from contamination prior to use.

5,091,317

ANALYSIS OF ACIDIC METAL CARBONYL HYDRIDE CONTAINING STREAMS

James L. Cooper, and Jack M. Bogle, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 12, 1988, Ser. No. 231,566
Int. Cl.⁵ G01N 33/20

U.S. Cl. 436—73

8 Claims

1. A method for determining the change in concentration of an acidic transition metal carbonyl hydride in an organic liquid comprising the following steps:
 - a) providing an organic liquid suspected of containing an acidic transition metal carbonyl hydride;
 - b) measuring an initial electrical conductivity or pH level of the liquid;
 - c) measuring at a time later than the initial measurement the electrical conductivity or pH of the liquid; and
 - d) determining the change in electrical conductivity or pH wherein an increase in conductivity is an indication of increasing acidic metal carbonyl hydride concentration or wherein an increase in pH is an indication of decreasing acidic metal carbonyl hydride concentration.

5,091,318

BINDING OF ALLERGENS TO A SOLID PHASE

Mark A. Anawis, Grayslake, and Roger E. Lindberg, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 13, 1990, Ser. No. 509,255

Int. Cl.⁵ G01N 33/563

U.S. Cl. 436—513

51 Claims

1. A device, for detecting the presence or amount of IgE in a test sample, comprising:
 - a) a solid phase comprising a material selected from the group consisting of: nitrocellulose, nitrocellulose derivatives, nitrocellulose compounds, or combinations thereof, and
 - b) at least one allergen immobilized upon said solid phase, wherein said allergen was applied as an allergen composition and
 wherein said allergen composition is formed from the combination of said allergen with a pretreatment substance selected from the group consisting of: denaturants excluding organic solvents and concentrated salt solutions; organic solvents; crosslinking agents; concentrated salt solutions; and combinations thereof.

5,091,319

METHOD OF AFFIXING SILICON SPHERES TO A FOIL MATRIX

Gregory B. Hotchkiss, 2106 Apollo Rd., Richardson, Tex. 75081, and Millard J. Jensen, 11428 Oak Tree, Balch Springs, Tex. 75180

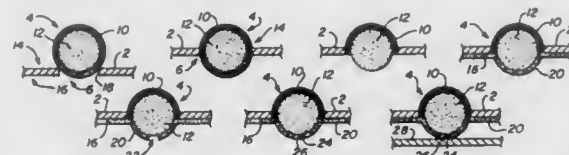
Filed Jul. 31, 1989, Ser. No. 388,105

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.⁵ H01L 31/18

U.S. Cl. 437—2

20 Claims



1. A method of affixing silicon spheres to a foil matrix comprising the steps of:
 - preparing a cell sandwich having silicon spheres mounted on said foil matrix inside upper and lower pressure pads;
 - heating said cell sandwich;
 - compressing said heated cell sandwich at a substantially

constant pressure for a dwell time to affix said silicon spheres to said foil matrix.

5,091,320

ELLIPSOMETRIC CONTROL OF MATERIAL GROWTH

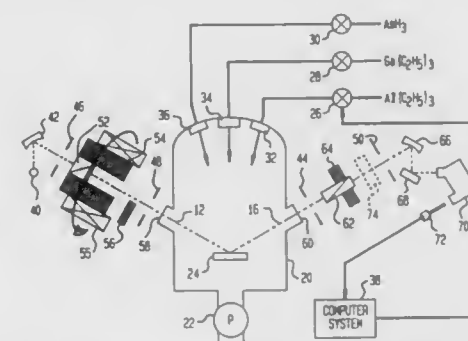
David E. Aspnes, Watchung, and William E. Quinn, Middlesex Boro, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jun. 15, 1990, Ser. No. 538,648

Int. Cl.⁵ H01Q 21/66

U.S. Cl. 437—8

17 Claims



1. A controlled growth apparatus, comprising:
 - a chamber capable of holding a substrate onto which a film is grown;
 - a plurality of sources within said chamber capable of simultaneously irradiating a surface of said substrate with a plurality of respective growth species to form said film;
 - at least one metering device capable of controlling an amount of a respective one of said species irradiated upon said surface;
 - an ellipsometer operable during an operation of said sources, illuminating said surface with a beam of light, and providing a time-ordered sequence of a plurality of ellipsometric data from light reflected by said surface from said beam of light; and
 - a controller generating a control signal from said time-ordered sequence of said plurality of said ellipsometric data, said control signal independently controlling each of said at least one metering device during said operation of said sources.

5,091,321

METHOD FOR MAKING AN NPN TRANSISTOR WITH CONTROLLED BASE WIDTH COMPATIBLE WITH MAKING A BI-MOS INTEGRATED CIRCUIT

Wing K. Huie, North Wales, Pa., and Alexander H. Owens, Santa Clara, Calif., assignors to Allegro Microsystems, Inc., Worcester, Mass.

Filed Jul. 22, 1991, Ser. No. 733,919

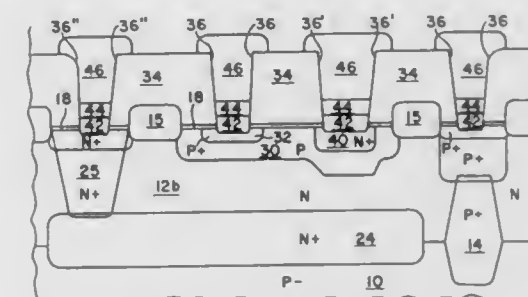
Int. Cl.⁵ H01L 21/265, 29/70

U.S. Cl. 437—27

7 Claims

1. A method for making a silicon integrated circuit comprising:
 - providing a P-type silicon substrate having an N-type epitaxial layer grown thereon and defining an NPN region of said epitaxial layer in which an NPN transistor is to be formed;
 - selectively doping with P-type atoms a portion of said epitaxial NPN region to provide a preliminary P-type base region at the epitaxial surface of said NPN region;
 - forming a blanket layer of a protective glass over said epitaxial layer;
 - selectively etching a first hole through said glass layer to expose said epitaxial surface at an emitter-designated portion of said P-type base region;
 - depositing N-type impurities through said first hole into the

surface of said epitaxial layer to form an N-type emitter in said P-type base region; implanting P-type impurities through said first hole to penetrate substantially all of said base region, to increase lo-



cally near said emitter the concentration of P-type impurities in said base region; and heating to drive said P-type and N-type impurities for obtaining a controlled base width in said NPN transistor.

5,091,322

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

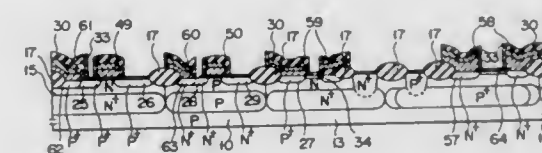
Takeo Maeda, and Hiroshi Momose, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 507,037, Apr. 10, 1990. This application Aug. 22, 1990, Ser. No. 572,136

Claims priority, application Japan, Apr. 14, 1989, 1-94884; Mar. 30, 1990, 2-83909

Int. Cl.⁵ H01L 21/265, 29/70

U.S. Cl. 437—31

15 Claims



15. A method of fabricating an electrode structure for a semiconductor device including a bipolar transistor and a MOS transistor having semiconductor regions formed in a semiconductor substrate, the method comprising the steps of:
 - forming a first polysilicon layer in contact with a base region of said bipolar transistor and spaced from a channel region of said MOS transistor by an insulating film;
 - patterning a base electrode of said bipolar transistor and a drain electrode of said MOS transistor from said first polysilicon layer;
 - forming a second polysilicon layer in contact with an emitter region of said bipolar transistor; and
 - patterning an emitter electrode of said bipolar transistor from said second polysilicon layer.

5,091,323

PROCESS FOR THE FABRICATION OF BIPOLAR DEVICE

Masahiko Shinozawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Minato, Japan

Filed May 23, 1991, Ser. No. 704,369

Claims priority, application Japan, May 30, 1990, 2-138320

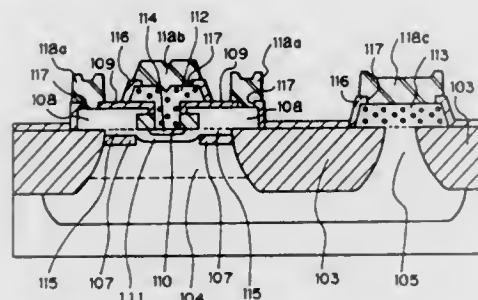
Int. Cl.⁵ H01L 21/265, 29/73

U.S. Cl. 437—31

4 Claims

1. A process for the fabrication of a bipolar semiconductor device having a substrate, said substrate defining a major surface, and a collector region of a first conductivity type formed within the substrate at a position adjacent to the working surface, which comprises the following steps:

- (a) forming a patterned, oxidation-resistant film on a predetermined portion of the collector region;
- (b) forming a silicon oxide film region within the collector region at a position spaced downwardly from an exposed surface of the collector region;
- (c) forming a selective epitaxial layer of a second conductivity type such that said selected epitaxial layer extends from the exposed surface of the collector region to a portion of a top part of the patterned, oxidation-resistant film;

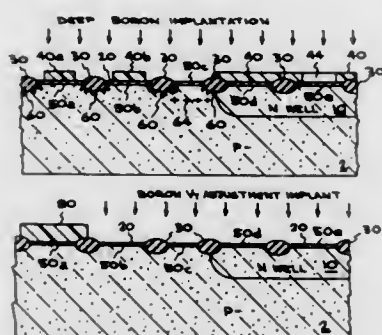


- (d) removing a portion of the patterned, oxidation-resistant film, said portion being free of said selective epitaxial layer, to expose said collector region;
- (e) forming a base region of the second conductivity type so that the base region extends from the thus-exposed surface of the collector region to the silicon oxide film region; and
- (f) forming an emitter region of the first conductivity type within the base region at a position adjacent to the exposed surface of the collector region.

5,091,324
PROCESS FOR PRODUCING OPTIMUM INTRINSIC, LONG CHANNEL, AND SHORT CHANNEL MOS DEVICES IN VLSI STRUCTURES
 James J. Hsu, Saratoga, and Yowjuang W. Liu, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 10, 1990, Ser. No. 565,384
 Int. Cl.⁵ H01L 21/265
 U.S. Cl. 437—34

20 Claims



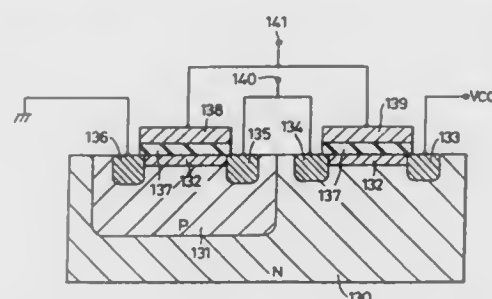
1. An improved process for forming MOS transistors in a VLSI structure on a semiconductor wafer containing at least one N well area wherein the improvement comprises:
- forming isolation oxide regions in the surface of said wafer;
 - masking:
 - said at least N well area of the wafer except where channel portions of long channel PMOS devices will be formed; and
 - areas of the wafer where channel portions of intrinsic NMOS devices and long channel NMOS devices will be formed; and
 - implanting boron into at least one unmasked region of said wafer at a concentration and depth sufficient to provide

punchthrough protection for a short channel NMOS device to be subsequently formed in said unmasked region; and at a sufficient energy to penetrate through unmasked portions of said isolation oxide to provide boron dopant beneath said isolation oxide regions which will inhibit field inversion adjacent NMOS devices subsequently constructed between said isolation oxide regions.

5,091,325
PROCESS FOR MAKING MOS DEVICES FOR LOW-TEMPERATURE OPERATION

Shoji Hanamura, Kodaira; Masaaki Aoki, Minato, and Toshiaki Masuhara, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
 Division of Ser. No. 363,866, Jun. 9, 1989, abandoned, which is a continuation of Ser. No. 103,037, Sep. 30, 1987, abandoned, which is a division of Ser. No. 731,014, May 6, 1985, Pat. No. 4,710,648. This application Jun. 26, 1990, Ser. No. 544,045
 Claims priority, application Japan, May 9, 1984, 59-90960; Jul. 25, 1984, 59-152834; Sep. 29, 1984, 59-205311
 Int. Cl.⁵ H01L 21/336, 21/203
 U.S. Cl. 437—40

11 Claims



11. In a method of forming a complementary MOS integrated device having a first and a second MOS transistor for operation in a range of temperature below 100° K., including
- (1) forming the first MOS transistor by steps including separately forming a first source and a first drain region of a second conductivity type in a first semiconductor region of a first type of conductivity, forming a first gate insulating layer overlying the first semiconductor region between the first source region and the first drain region and forming a first gate electrode on the first gate insulating layer; and
 - (2) forming the second MOS transistor by steps including separately forming a second source and a second drain region of the first type of conductivity in a second semiconductor region of second conductivity type, forming a second gate insulating film overlying the second semiconductor region between the second source region and the second drain region and forming a second gate electrode on the second gate insulating layer, wherein the improvement comprises:

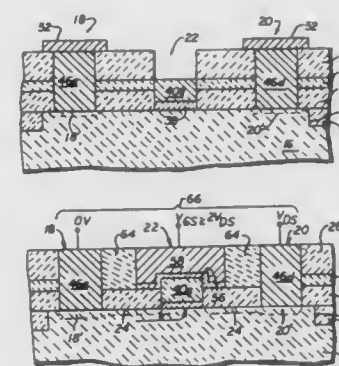
- forming a first low impurity concentration layer on a first surface region of the first semiconductor region between the first source region and the first drain region by evaporating amorphous silicon on the first surface region and passing it through a low-temperature annealing process, the first low impurity concentration layer having a lower total impurity concentration than that of the first semiconductor region and having a thickness not more than 100 nm, with the first gate insulating layer being provided on the first low impurity concentration layer; and
- forming a second low impurity concentration layer on a second surface region of the second semiconductor region between the second source region and the second drain region by evaporating amorphous silicon on the second surface region and passing it through a low-temperature annealing process, the second low impurity concentration layer having a lower total impurity concentration than that of the second semiconductor region and having a

thickness not more than 100 nm, with the second gate insulating layer being formed on the second impurity concentration layer.

5,091,326
EPROM ELEMENT EMPLOYING SELF-ALIGNING PROCESS

Jacob D. Haskell, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
 Division of Ser. No. 276,278, Nov. 23, 1988, Pat. No. 4,964,143, which is a continuation-in-part of Ser. No. 162,822, Mar. 2, 1988, abandoned. This application Sep. 12, 1990, Ser. No. 581,341
 Int. Cl.⁵ H01L 21/265, 21/70, 21/00
 U.S. Cl. 437—43

23 Claims



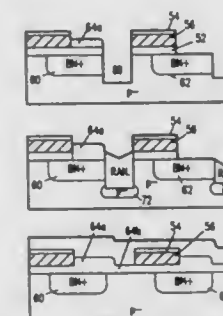
1. A process for fabricating an EPROM element on a semiconductor substrate and employing self-aligning of source, gate and drain regions of a MOS transistor, comprising:

- delineating an active area within which individual devices are made by forming an oxide region in said substrate therearound;
- forming a multi-layer structure on said surface, said structure including a buried etch-stop layer sandwiched between dielectric layers;
- using a mask in conjunction with a resist layer formed on said multi-layer structure and etching of undesired portions thereof to define a plurality of slots corresponding to said source, gate and drain components of said devices and to expose portions of said semiconductor surface, thereby self-aligning said components with each other;
- forming an oxide layer on said semiconductor surface overlying said source, gate, and drain regions and removing said oxide layer from said source and drain regions to leave a floating gate oxide overlying said gate region;
- filling said slots with a conducting material and forming N source and drain regions in said substrate by implanting ions in regions underlying said slots;
- removing upper portions of conducting material associated with said gate to form a floating gate comprising the remaining lower portion of said gate, the top surface of which is exposed;
- forming an insulating layer over at least said exposed portion of said floating gate;
- forming a control gate over said insulating layer over said floating gate, capacitively coupled together; and
- forming a metallic layer thereover to contact portions of said conducting material where contact is desired.

5,091,327
FABRICATION OF A HIGH DENSITY STACKED GATE EPROM SPLIT CELL WITH BIT LINE REACH-THROUGH AND INTERRUPTION IMMUNITY
 Albert M. Bergemont, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
 Filed Jun. 28, 1990, Ser. No. 545,396
 Int. Cl.⁵ H01L 21/76

U.S. Cl. 437—43

5 Claims



1. A method of fabricating a split-gate memory cell array in a semiconductor substrate of a first conductivity type utilizing stacked etch fabrication techniques, the method comprising the steps of:

- forming a layer of first dielectric material on the semiconductor substrate;
- forming a layer of first conductive material over the first dielectric material;
- forming a layer of second dielectric material over the first conductive material;
- etching the layer of second dielectric material and the layer of first conductive material to provide a plurality of spaced-apart and parallel-extending floating gate strips of the first conductive material that are separated from the semiconductor substrate by underlying first dielectric material and have second dielectric material formed thereon;
- forming a plurality of dopant regions of a second conductivity type in the semiconductor substrate, adjacent dopant regions being spaced-apart to define a channel region therebetween a first edge of each floating gate strip being used to define an edge of a corresponding dopant region, the floating gate strip extending only over a first section of the channel region defined between the corresponding dopant region and an adjacent dopant region such that a second portion of the channel region is defined between a second edge of the floating gate strip and the adjacent dopant region;
- forming a differential oxide layer on the semiconductor substrate between adjacent floating gate strips, the differential oxide layer comprising simultaneously formed first and second oxide regions, the first oxide region formed over exposed portions of the dopant region and having a first thickness and the second oxide region formed over the second section of the channel region and having a second thickness which is less than the first thickness;
- forming a layer of second conductive material over the differential oxide layer and over the plurality of floating gate strips such that the floating gate strips are separated from the second conductive material by the second dielectric material;
- etching the layer of second conductive material to define a plurality of parallel control gate lines that extend perpendicular to the floating gate strips;
- utilizing the control gate lines as a self-aligned mask in a stacked-etch step to etch the underlying second dielectric material and, subsequently, the underlying floating gate strips to define spaced-apart and parallel-extending floating gates of the split-gate memory cell array whereby, during the stacked-etch step, the first oxide region of the differential oxide layer protects the surface of the

dopant region and the second oxide region of the differential oxide layer is overetched into the underlying semiconductor substrate to form a trench in the channel region that extends below the junction depth of the dopant region.

5,091,328

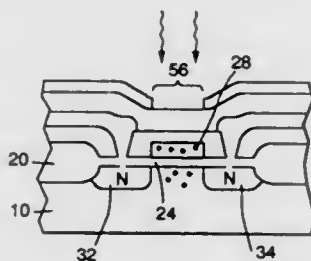
METHOD OF LATE PROGRAMMING MOS DEVICES
William E. Miller, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 21, 1989, Ser. No. 440,516

Int. Cl.⁵ H01L 21/70, 21/00

U.S. Cl. 437—52

30 Claims



3. A method for late programming integrated circuits, comprising the steps:

- forming on a silicon wafer, a field effect transistor, having a channel region defined by a source and drain, self-aligned to a gate formed from a first level conductive layer that is doped with dopant;
- depositing a first insulating layer, having an upper surface, over said field effect transistor;
- opening contact windows in said first insulating layer over said source and said drain;
- depositing a second level conductive layer on said upper surface of first insulating layer thereby filling said contact windows to make a low resistance electrical connection with said source and said drain;
- said second level conductive layer is etched to define source and drain electrodes;
- depositing a second insulating layer, having an upper surface;
- depositing an initial third level conductive layer on said upper surface of said second insulating layer;
- opening a late programming window in said initial third level conductive layer over said doped gate; and
- transporting said dopant from said doped gate into said channel region of said field effect transistor.

5,091,329

METHOD FOR PROGRAMMING MOS AND CMOS ROM MEMORIES

Roland Q. Bekkering, Varese, and Manlio S. Cereda, Lomagna, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

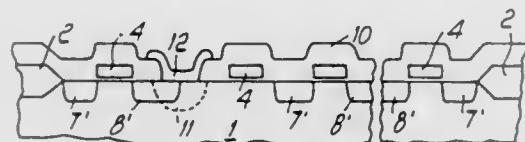
Filed Mar. 13, 1989, Ser. No. 322,132

Claims priority, application Italy, Mar. 28, 1988, 19989 A/88

Int. Cl.⁵ H01L 21/70

U.S. Cl. 437—52

7 Claims



1. A method for programming VLSI MOS and CMOS ROM memories comprising a plurality of memory cells each

having source and drain regions separated by a channel region and a gate region superimposed on said channel region, with the memory cells having a substantially common structure and being arranged in rows of cells each having its source region in common with the cell arranged on a side thereof and its drain region in common with the cell arranged on an opposite side thereof, the method comprising the steps of forming the gate regions on a substrate of semiconductor material having a first conductivity type, at least partially shielding substrate regions adjacent to the channel regions of the memory cells to be programmed to an always-off state and introducing doping ion species in said substrate for forming said source and drain regions having a second conductivity type, substantially opposite to said first conductivity type thereby obtaining non-doped substrate regions adjacent to the gate regions, wherein before introducing said doping ion species the memory cells to be programmed to the always-off state are covered with a mask which extends at least partially on the gate region and substantially on one side thereof after introduction of ion species the gate regions of programmed cells are spaced from adjacent common source regions.

5,091,330

METHOD OF FABRICATING A DIELECTRIC ISOLATED AREA

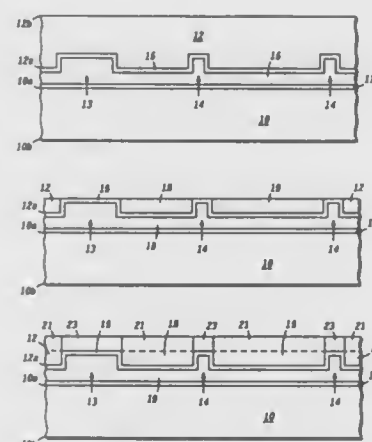
Bertrand F. Cambou; Juergen Foerstner, both of Mesa, and H. Ming Liaw, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1990, Ser. No. 635,071

Int. Cl.⁵ H01L 21/76

U.S. Cl. 437—62

24 Claims



1. A method of fabricating a dielectric isolated area, comprising the steps of:

- providing a first wafer having a first and a second surface;
- providing a second wafer having a first and a second surface;
- forming trenches in the first surface of the second wafer;
- forming a planarizable dielectric layer on the first surface of the second wafer and in the trenches of the second wafer;
- bonding the first and the second wafers so that the planarizable dielectric layer and the first surface of the first wafer and bonded to each other;
- removing a portion of the second surface of the second wafer down to at least the bottom of each trench;
- simultaneously growing an epitaxial layer over the second surface of the second wafer and a polysilicon layer over the bottom of each trench after the step of removing a portion of the second surface of the second wafer; and
- oxidizing the polysilicon layer to form a thermal oxide.

5,091,331

ULTRA-THIN CIRCUIT FABRICATION BY CONTROLLED WAFER DEBONDING

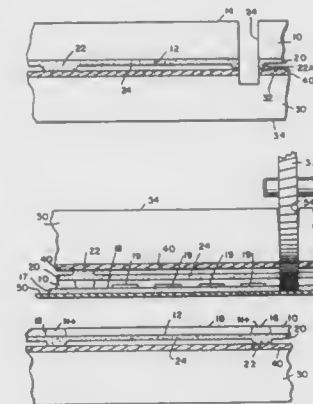
Jose A. Delgado, Palm Bay; Stephen J. Gaul, Melbourne; George V. Rouse, Indialantic, and Craig J. McLachlan, Melbourne Beach, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 16, 1990, Ser. No. 509,405

Int. Cl.⁵ H01L 21/304, 21/76

U.S. Cl. 437—62

16 Claims



1. A method of fabricating integrated circuits in wafers comprising:

- forming peaks and valleys in a bonding surface of a first wafer, with the peaks being at the scribe lines which define dice;
- oxygen bonding said peaks and not said valleys of said first wafer to a bonding surface of a second wafer;
- performing device formation steps on a surface of one of said first and second wafers;
- cutting through said one of said first and second wafers and said peaks to form dice; and
- separating said dice from said other of said wafers.

5,091,332

SEMICONDUCTOR FIELD OXIDATION PROCESS

Mark T. Bohr, Aloha; Lawrence N. Brigham, Jr., Beaverton, and Shahab Hossaini, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 19, 1990, Ser. No. 615,445

Int. Cl.⁵ H01L 21/76, 21/266

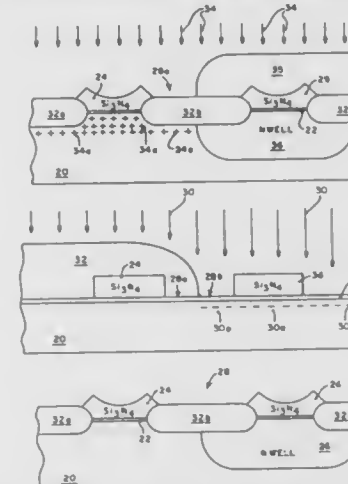
U.S. Cl. 437—69 G

12 Claims

1. A process for forming field oxide regions and channel stops on a silicon substrate, comprising the steps of:

- forming a first and a second spaced-apart silicon nitride members on said substrate thereby defining an isolation region between said spaced-apart silicon nitride members;
- forming a first photoresist layer over said first member, said first photoresist layer extending on to and covering a first portion of said isolation region adjacent to said first silicon nitride member, a second portion of said isolation region adjacent to said second silicon nitride member being free of said first photoresist layer;
- subjecting said substrate to a first ion implantation step with a first conductivity dopant so as to implant ions of said first conductivity type into said substrate in said second portion of said isolation region and into said substrate beneath said second silicon nitride member;
- heating said substrate in a first heating step so as to form a field oxide region at said isolation region;
- forming a second photoresist layer generally over said second silicon nitride member and said second portion of said isolation region, said first silicon nitride member and said first portion of said isolation region being substantially free of said first and second layer of photoresist;
- subjecting said substrate to a second ion implantation step

with a second conductivity type dopant to implant ions of said second conductivity type into said substrate beneath



said first silicon nitride member and said first portion of said isolation region, said second ion implantation step being carried out after said first heating step.

5,091,333

REDUCING DISLOCATIONS IN SEMICONDUCTORS UTILIZING REPEATED THERMAL CYCLING DURING MULTISTAGE EPITAXIAL GROWTH

John C. C. Fan, Chestnut Hill; Bor-Yeu Tsaur, Arlington; Ronald P. Gale, Bedford, and Frances M. Davis, Framingham, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 910,001, Sep. 22, 1986, abandoned, which is a continuation of Ser. No. 678,364, Dec. 4, 1984, Pat. No. 4,632,712, which is a continuation of Ser. No. 531,549, Sep. 12, 1983, abandoned.

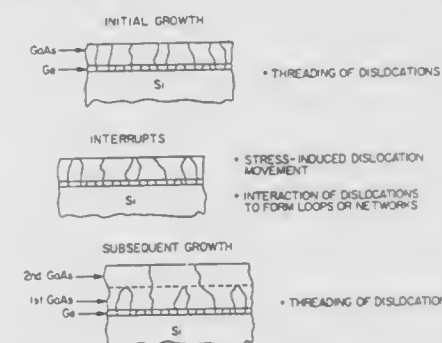
Filed Sep. 7, 1988, Ser. No. 241,506

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.⁵ H01L 21/20, 21/322

U.S. Cl. 437—82

13 Claims



1. A method of forming layers of material upon a substrate having a thermal coefficient of expansion different than that of the layers, the method comprising:

- depositing at least a portion of a layer of the material upon the substrate by deposition at a growth temperature substantially above ambient but below the melting point of the material;
- reducing the growth temperature to an intermediate temperature to induce a thermal stress therein and thereby trap dislocations in the layer portion formed by lattice mismatch between the layer portion and the substrate;
- depositing additional layer material on the deposited layer portion at a growth temperature above said intermediate temperature; and
- repeating the steps of reducing the growth temperature

and depositing additional layer material to further trap dislocations in the layer material.

5,091,334

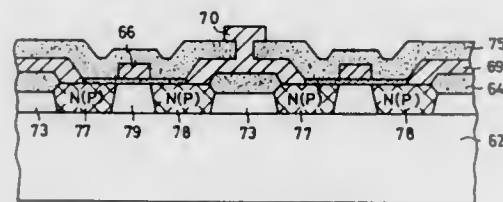
SEMICONDUCTOR DEVICE

Shunpei Yamazaki, Tokyo, and Yujiro Nagata, Ichikawa, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Division of Ser. No. 98,705, Sep. 18, 1987, abandoned, which is a continuation of Ser. No. 775,767, Sep. 13, 1985, abandoned, which is a division of Ser. No. 278,418, Jun. 29, 1981, Pat. No. 4,581,620, which is a continuation-in-part of Ser. No. 237,609, Feb. 24, 1981, Pat. No. 4,409,134. This application Mar. 5, 1990, Ser. No. 488,102

Claims priority, application Japan, Jun. 30, 1980, 55-88974
Int. Cl.⁵ H01L 21/263

U.S. Cl. 437—101

22 Claims



1. In a method of forming a MIS FET comprising source, drain and channel regions formed on an insulating substrate wherein the conductivity type of said channel region is substantially intrinsic or opposite to that of said source and drain regions, the improvement comprising the steps of:

- forming a non-crystalline semiconductor on said insulating substrate;
- converting at least a portion of said non-crystalline semiconductor to a semi-amorphous semiconductor which is in a stable state intermediate the amorphous state and the single crystal state of the semiconductor and which has a lattice strain, thereby forming at least said channel region; and
- doping at least said semi-amorphous semiconductor with a dangling bond neutralizer comprising hydrogen or halogen.

5,091,335

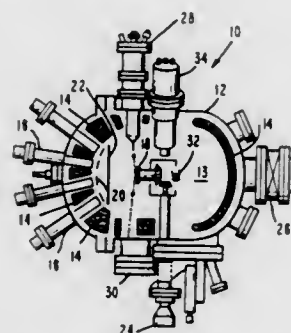
MBE GROWTH TECHNOLOGY FOR HIGH QUALITY STRAINED III-V LAYERS

Frank J. Grunthaner, Glendale; John K. Liu, Pasadena, and Bruce R. Hancock, Altadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 30, 1990, Ser. No. 506,137
Int. Cl.⁵ H01L 21/203, 29/38

U.S. Cl. 437—108

16 Claims



1. A method for growing a film comprising multiple high

quality strained layers comprising a first III-V compound on a substrate comprising a second III-V compound in molecular beam epitaxy apparatus, said substrate having a sufficiently different lattice parameter than said III-V layer to generate strain in said III-V layers, said method comprising:

- (a) forming a layer of said first III-V material having a slight excess of III-component to maintain a metal-stabilized surface reconstruction while forming about $\frac{1}{4}$ to 2 monolayers thick of said first III-V material on said substrate;
- (b) ceasing formation of said layer for a period of time;
- (c) repeating steps (a) and (b) until said film of the desired thickness is grown.

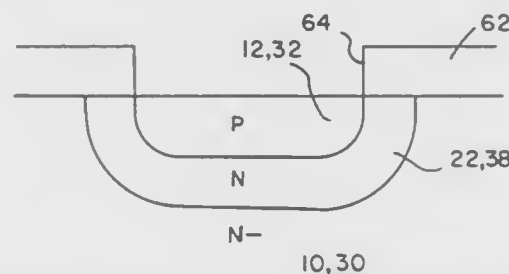
5,091,336

METHOD OF MAKING A HIGH BREAKDOWN ACTIVE DEVICE STRUCTURE WITH LOW SERIES RESISTANCE

James D. Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.
Division of Ser. No. 253,437, Oct. 19, 1988, Pat. No. 4,975,751, which is a continuation of Ser. No. 774,282, Sep. 9, 1985, abandoned. This application Oct. 3, 1990, Ser. No. 592,308
Int. Cl.⁵ H01L 21/22

U.S. Cl. 437—150

16 Claims



- 12. A method of forming a two layer device, comprising: introducing a first conductivity type impurities into a substrate of said first conductivity type to form a first region having an impurity concentration profile which will deplete under reverse biasing before critical field is reached in said first region; and introducing a second conductivity type impurities to form a second region totally separated from said substrate by said first region.

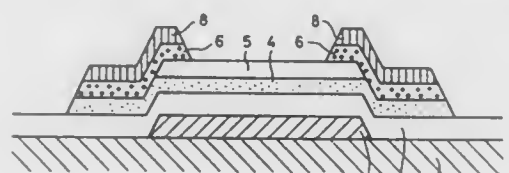
5,091,337

METHOD OF MANUFACTURING AMORPHOUS-SILICON THIN-FILM TRANSISTORS

Yoshiaki Watanabe, and Sakae Tanaka, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 496,049, Mar. 16, 1990, abandoned, which is a continuation of Ser. No. 283,405, Dec. 12, 1988, abandoned. This application Nov. 1, 1990, Ser. No. 609,127
Claims priority, application Japan, Dec. 26, 1987, 62-331068
Int. Cl.⁵ H01L 21/44, 21/265

U.S. Cl. 437—181

3 Claims



- 1. A method of manufacturing amorphous-silicon thin-film transistors, comprising the steps of: forming a gate insulating layer on an insulating substrate on

which a gate electrode having a predetermined configuration is formed;
forming an amorphous-silicon layer on said gate insulating layer;
forming a protective insulating layer on said amorphous-silicon layer;
imparting a pattern conforming to said gate electrode to said protective insulating layer while exposing said amorphous-silicon layer at regions outside of said pattern;
coating said protective insulating layer and said amorphous-silicon layer with a silicon layer containing impurities serving as the donor and acceptor;
forming a source electrode and a drain electrode in such a manner that they partly overlap said protective insulating layer; and then simultaneously removing said impurity containing silicon layer and said amorphous-silicon layer using said source electrode and drain electrode as a mask, to form an island structure.

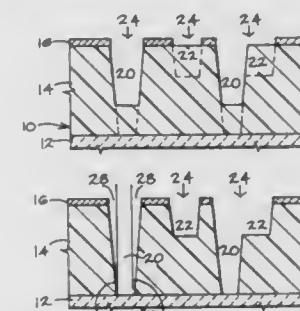
5,091,339

TRENCHING TECHNIQUES FOR FORMING VIAS AND CHANNELS IN MULTILAYER ELECTRICAL INTERCONNECTS

David H. Carey, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.
Filed Jul. 23, 1990, Ser. No. 557,427
Int. Cl.⁵ H01L 21/283, 21/306

U.S. Cl. 437—187

49 Claims



- 1. A method for fabricating a multilayer electrical interconnect, comprising the following steps in the sequence set forth: (a) providing an insulating layer on a base; (b) forming a channel in the top surface and partially through the thickness of the insulating layer; (c) forming a via in the top surface and completely through the thickness of the insulating layer adjacent the channel; wherein forming the channel and via in steps (b) and (c) comprises:

- covering the insulating layer with a hard mask having an opening to expose the channel and via, wherein the hard mask is non-erodible by an etch;
- covering the hard mask with a soft mask having an opening to expose the via but covering the channel, wherein the soft mask is erodible by an etch;
- applying an etch to remove material from the insulating layer where the via is exposed until the soft mask is completely eroded;
- applying the etch after the soft mask is completely eroded to remove material from the insulating layer where the channel is exposed and material from the insulating layer remaining where the via is exposed until the channel and via are etched; and then removing the hard mask from the insulating layer, thereby forming the channel and via in the same step;
- (d) depositing an electrical conductor into the channel and via; and
- (e) planarizing the interconnect top surface so that the electrically conductive layer remains only in the channel and via and is otherwise removed from the top surface of the insulating layer, and the interconnect top surface is substantially smooth, thereby forming an electrically conducting channel interconnect to an electrically conducting via.

5,091,340

METHOD FOR FORMING MULTILAYER WIRINGS ON A SEMICONDUCTOR DEVICE

Kazuyuki Mizushima, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 382,553, Jul. 19, 1989, abandoned. This application Jan. 2, 1991, Ser. No. 635,810

Claims priority, application Japan, Jul. 19, 1988, 63-181008
Int. Cl.⁵ H01L 21/44

U.S. Cl. 437—194

6 Claims

- 1. A method for forming multilayer wirings on a semiconductor device, comprising steps of forming a first seat formed of a first conductor in a portion where a lower wiring layer and an upper wiring layer on a semiconductor substrate are to be connected; forming a second conductor on said semiconductor

5,091,338

PROCESS FOR FORMING HEAT RESISTANT OHMIC ELECTRODE

Junichi Tsubimoto; Tooru Yamada, both of Yokohama, and Takaya Miyano, Kobe, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Division of Ser. No. 365,521, Jun. 13, 1989, Pat. No. 4,989,065.

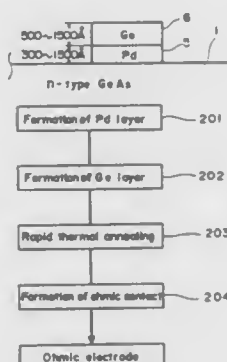
This application Apr. 23, 1990, Ser. No. 512,360

Claims priority, application Japan, Jun. 13, 1988, 63-144996; Dec. 23, 1988, 63-325485

Int. Cl.⁵ H01L 21/44

U.S. Cl. 437—184

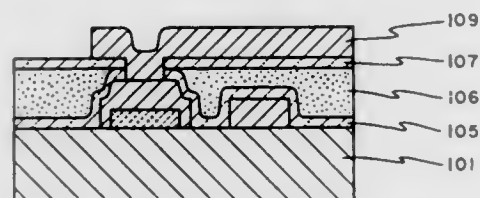
14 Claims



- 11. An ohmic electrode forming process for forming an ohmic electrode to provide an ohmic contact on an n-type GaAs semiconductor crystal, said process comprising the steps of:

- providing a Pd layer directly on an n-type GaAs semiconductor crystal;
- providing a Ge layer on the Pd layer; and
- annealing the Pd layer and the Ge layer by performing a rapid thermal annealing treatment wherein said layers are annealed between 500° C. and 600° C. whereby said electrode continues to exhibit ohmic characteristics when it is kept in high temperature conditions at 300° C. for at least 100 hours.

substrate and said first seat; forming said lower wiring layer formed of said second conductor by selectively removing said second conductor simultaneously with the formation of a second seat formed of said second conductor on said first seat; forming by a chemical vapor deposition method a first interlevel insulating film on said semiconductor substrate, on said



second seat and on said lower wiring layer; forming by a coating method a second interlevel insulating film on said first interlevel insulating film; forming a hole exposing said second seat in said first and second interlevel insulating films; and forming the upper wiring layer to be connected to said second seat via said hole on said second interlevel insulating film.

5,091,341

METHOD OF SEALING SEMICONDUCTOR DEVICE WITH RESIN BY PRESSING A LEAD FRAME TO A HEAT SINK USING AN UPPER MOLD PRESSURE MEMBER
Junichi Asada, Yokohama; Kenji Takahashi, Tokyo, and Toshiharu Sakurai, Kitakami, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

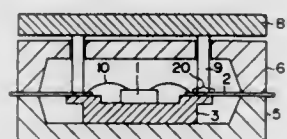
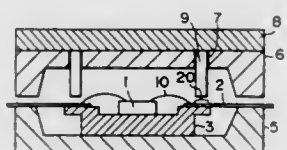
Filed May 17, 1990, Ser. No. 524,434

Claims priority, application Japan, May 22, 1989, 1-128399

Int. Cl.⁵ H01L 21/56, 21/58, 21/60, 21/603

U.S. Cl. 437-212

4 Claims



1. A method of sealing a semiconductor device with resin comprising the steps of:

- preparing a lead frame having a tie bar and leads;
- coupling said tie bar of the lead frame onto a tie bar support section of a heat sink;
- die bonding a semiconductor chip to the surface of said heat sink;
- wire bonding for electrically connecting said semiconductor chip to leads of said lead frame;
- placing said heat sink on the bottom surface of a cavity of a lower mold, putting an upper mold on said lower mold, and pressing down the tie bar coupled to said heat sink toward said bottom surface by using a pressure member mounted on said upper mold; and
- injecting melted resin within the cavity defined by said upper and lower molds, and hardening said resin.

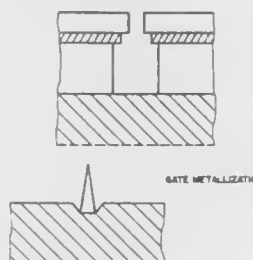
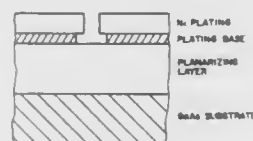
MULTILEVEL RESIST PLATED TRANSFER LAYER PROCESS FOR FINE LINE LITHOGRAPHY
Lawrence G. Studebaker, Fort Collins, Colo., and Edward H. Wong, Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 24, 1989, Ser. No. 315,351

Int. Cl.⁵ H01L 21/467

U.S. Cl. 437-228

17 Claims



1. A multilevel resist process involving the use of a plated transfer layer useful for fabricating semiconductor devices on a substrate of semiconductor material, comprising the steps of: applying a planarizing layer to the substrate of semiconductor material;
- depositing a plating base onto the planarizing layer;
- coating a negative e-beam resist onto the plating base to form an imaging layer;
- exposing the negative e-beam resist with an electron beam;
- developing the negative e-beam resist to produce a fine line of resist on top of the plating base;
- plating a transfer layer onto the plating base except where the fine line of resist remains;
- removing the fine line of resist to produce an opening in the plated transfer layer;
- etching the plating base out of the opening in the plated transfer layer to reveal the planarizing layer; and
- processing the planarizing layer using the opening in the plated transfer layer.

5,091,343

CONTAINER FOR HOLDING EQUIPMENT DURING STERILIZATION

Edward T. Schnelder; Norman L. Siegel, both of Mentor, and Raymond C. Kralovic, Austintown, all of Ohio, assignors to Steris Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 140,388, Jan. 4, 1988, Pat. No. 4,892,706, which is a continuation-in-part of Ser. No. 826,730, Feb. 6, 1986, Pat. No. 4,731,222. This application May 9, 1989, Ser. No. 349,304

Int. Cl.⁵ A61L 2/18; B08B 13/00

U.S. Cl. 422-297

23 Claims

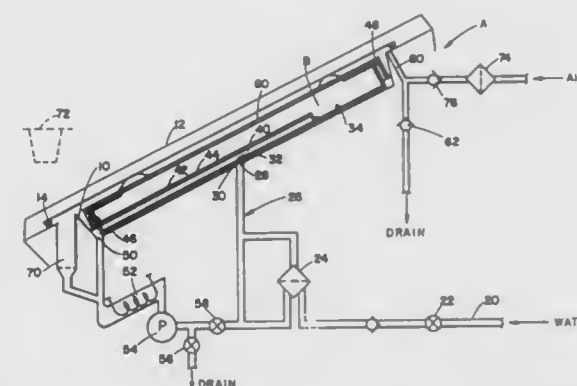
1. A liquid microbial decontamination system comprising: a basin which defines (i) a basin vent aperture adjacent an upper most portion thereof, (ii) a basin drain aperture adjacent a lower most portion thereof, and (iii) a basin liquid inlet;
- a lid for selectively sealing the basin when in a closed position and providing ready access to the basin in an open position;
- a container for receiving articles to be microbially decontaminated removably disposed in the basin, the container defining a container liquid inlet, a container liquid outlet, and a nozzle plate which defines a tortuous inlet path between the container liquid inlet and a plurality of noz-

zles defined in and distributed around the nozzle plate, the tortuous inlet path being sufficiently tortuous that a migration of contaminating microbes in ambient air after removal from the basin is inhibited;

a liquid antimicrobial solution supply means for supplying a liquid antimicrobial solution;

a rinse supply means for supplying a rinse liquid;

a drain operatively connected with the basin drain aperture for draining the antimicrobial solutions and rinse liquids from the basin;



- a means for selectively opening and closing the drain to drain liquid from the basin and to retain liquid in the basin; and
- a pumping means for selectively pumping volumes of liquid antimicrobial solution from the liquid antimicrobial solution supply means and rinse liquid from the rinse supply means to the basin liquid inlet for selectively filling the container and displacing ambient air therefrom.

5,091,344

FIBER REINFORCED CERAMICS OF CALCIUM PHOSPHATE SERIES COMPOUNDS AND METHOD OF PRODUCING THE SAME

Ryo Enomoto; Yoshimi Matsuno, and Masato Yokoi, all of Ogaki, Japan, assignors to Ilden Corporation, Gifu, Japan
PCT No. PCT/JP89/00092, § 371 Date Sep. 27, 1989, § 102(e) Date Sep. 27, 1989

PCT Filed Jan. 30, 1989, Ser. No. 415,310

Claims priority, application Japan, Jan. 30, 1988, 63-18567; Apr. 27, 1988, 63-102655

Int. Cl.⁵ C04B 35/00

U.S. Cl. 501-1

15 Claims

1. A method of producing fiber reinforced composite ceramics of calcium phosphate series compounds in which heat-resistant inorganic short fibers are three-dimensionally and uniformly dispersed in a matrix of calcium phosphate series compound, and said matrix is strongly adhered to said heat resistant inorganic short fibers, which comprises:
 - (1) a step of wet mixing fine powder of calcium phosphate series compound with heat-resistant inorganic short fibers and shaping this mixture to form a green shaped body;
 - (2) a step of impregnating the green shaped body with a solution of a precursor of calcium phosphate series compound and drying to form a preliminary shaped body; and
 - (3) a step of heat treating the preliminary shaped body obtained in the above step at a temperature of not less than 600° C. to obtain a fiber reinforced ceramic.

5,091,345

GLASS COMPOSITION

Gerd Becker, Urban/Koblenz, Fed. Rep. of Germany, assignor to Johnson Matthey Public Limited Company, United Kingdom

Filed May 31, 1990, Ser. No. 531,058

Claims priority, application United Kingdom, May 31, 1989, 8912506

Int. Cl.⁵ C03C 8/00

U.S. Cl. 501-14

11 Claims

5. A glaze composition for ceramics, which composition consists essentially of:

- (A) 70-96% by weight of glass flux composition comprising a component consisting essentially of, by weight, 30-70% SiO₂, 10-30% CaO, 0-20% ZnO, 3-8% MoO₃, 0-20% B₂O₃, 0-25% Al₂O₃, 0-10% K₂O, 0-10% Na₂O, 0-10% MgO, 0-15% BaO, 0-7% Li₂O, 0-10% PbO, 0-5% SrO, 0-10% CeO, 0-0.1% CoO and 0-5% P₂O₅;
- (B) 4-30% by weight of refractory material; and
- (C) 0-25% by weight of pigment.

5,091,346

COMPOSITION FOR PRODUCING CERAMICS

Hiroshi Inoue, Iwakuni; Chikara Igarashi, Ohtake, and Takeshi Muranaka, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00022, § 371 Date Sep. 15, 1988, § 102(e) Date Sep. 15, 1988, PCT Pub. No. WO88/05426, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 16, 1987, Ser. No. 251,380

Int. Cl.⁵ C04B 35/56, 35/58

U.S. Cl. 501-93

12 Claims

1. A ceramic-making composition comprising at least one starting powder selected from the group consisting of powders of metals, powders of metal oxides, powders of metal carbides, powders of metal nitrides and powders of metal borides, and a binder wherein the binder comprises polyalkylene carbonate and the binder is present in amounts up to 40 parts by weight, per 100 parts by weight of the starting powder, and which further comprises a plasticizer and/or a lubricant.

5,091,347

SELF-REINFORCED SILICON NITRIDE CERAMIC BODY AND A METHOD OF PREPARING THE SAME
Aleksander J. Pyzik, and Barbara M. Pyzik, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1990, Ser. No. 567,889

The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.

Int. Cl.⁵ C04B 35/02

U.S. Cl. 501-95

17 Claims

1. A process for preparing a silicon nitride ceramic body having a fracture toughness greater than about 6 MPa (m)^{1/2} and containing predominantly β -silicon nitride whiskers having a high average aspect ratio, the process comprising:

subjecting a powder mixture comprising

- (a) silicon nitride in an amount sufficient to provide a ceramic body;
- (b) silicon dioxide in an amount sufficient to promote densification of the powder;
- (c) a conversion aid in an amount sufficient to attain essentially complete conversion of the starting silicon nitride to β -silicon nitride, the conversion aid being a source of an element selected from the group consisting of yttrium, scandium, actinium, lanthanum, lithium, sodium, potassium, rubidium, cesium and francium; and
- (d) at least one whisker growth enhancing compound in an amount sufficient to promote formation of β -silicon nitride whiskers, said compound being a derivative of an element selected from the group consisting of calcium, sodium, potassium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, cop-

per, zinc, strontium, zirconium, niobium, barium, lanthanum, and mixtures thereof, or an oxide of an element selected from the group consisting of gallium, indium, hafnium, tantalum and boron, provided, however, that the element used as a whisker growth enhancing compound differs from that used as a conversion aid, to conditions of temperature and pressure sufficient to provide for densification of the powder mixture, in situ formation of β -silicon nitride whiskers having an average aspect ratio of at least about 2.5 occur and preparation of a silicon nitride ceramic body having a fracture toughness greater than about 6 MPa (m)^{1/2}, the conditions of temperature and pressure including a temperature of at least 1750 degrees Centigrade and a pressure of at least 20.7 megapascals.

5,091,348

SOL-GEL METHOD OF MAKING CERAMICS

James L. Woodhead, Banbury, and Paul Groves, Charlbury, both of England, assignors to Alcan International Limited, Montreal, Canada

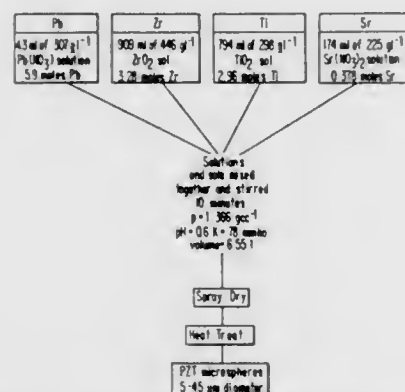
Filed Apr. 17, 1989, Ser. No. 339,306

Claims priority, application United Kingdom, Apr. 22, 1988, 8809608

Int. Cl.³ C04B 35/46.26

U.S. Cl. 501—136

21 Claims



1. A method of making a titanate ceramic material having a perovskite structure comprising mixing a first sol selected from the group consisting of hydrated titanium oxide sol and hydrated zirconium oxide sol with at least one second sol selected from the group consisting of hydrated oxide sols of zirconium (IV), indium (III), gallium (III), iron (III), aluminium (III), chromium (III), cerium (IV), silicon (IV) and titanium (IV), with the proviso that the first and second sols are not the same, wherein the first and second sols are mixed in proportions to form a mixed sol having a composition corresponding to that of the desired ceramic material, and then dehydrating the mixed sol to form a homogeneous gel, and heating the gel to form the desired ceramic material.

5,091,349

UTILIZATION OF SLAG FROM COIL GASIFICATION SYSTEMS

Seymour B. Alpert, Los Altos, Calif.; Donald Meisel, Spring, Tex., and Vas Choudhry, Fremont, Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Apr. 4, 1990, Ser. No. 503,985

Int. Cl.³ C04B 35/16, 35/18, 35/20, 35/22

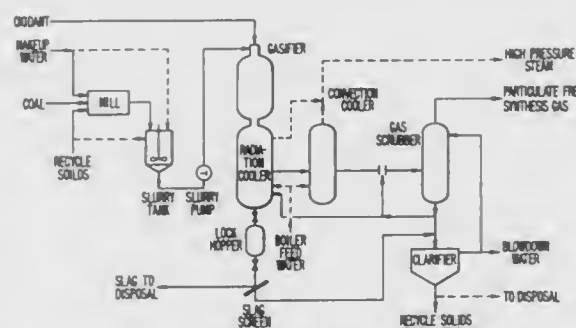
U.S. Cl. 501—155

5 Claims

1. A method for producing an aggregate useful as a structural material utilizing coal ash slag resulting from coal gasification wherein particles present in said coal ash slag are present in different sizes, said aggregate having a lesser density than said coal ash slag and having a commercially acceptable

particle size which may be different depending upon said aggregates final use, said method comprising the steps of:

- screening said coal ash slag to separate nonacceptable size particles from acceptable size particles;
- recovering any excess char content in said acceptable size particles of said coal ash slag which may be present above 7% of said coal ash slag;
- crushing said nonacceptable size particles of said coal ash slag to form crushed particles and combining said crushed



particles with the coal ash slag after the char recovery step to form a mixture;

- mixing said mixture with clay and water to form a pre-aggregate wherein said clay and water are present in the range of 2 to 10 percent of said pre-aggregate;
- drying said pre-aggregate with air;
- firing said pre-aggregate in a kiln for 4 to 10 minutes and at a predetermined temperature in the range of 1600° F. to 1900° F. to form said aggregate; and
- sealing said aggregate with an oxide sealer.

5,091,350

PROCESS FOR HYDROFORMYLATION WITH RHODIUM CATALYSTS AND THE SEPARATION OF RHODIUM THEREFROM

Boy Cornils, Dinslaken; Werner Konkol, Oberhausen; Helmut Bahrmann, Hamminkeln-Drunen; Hanswilhelm Bach; Ernest Wiebus, both of Oberhausen, and Wolfgang Lipps, Isny, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 920,901, Oct. 16, 1986, abandoned, which is a continuation of Ser. No. 714,960, Mar. 22, 1985, abandoned. This application Oct. 29, 1990, Ser. No. 605,939

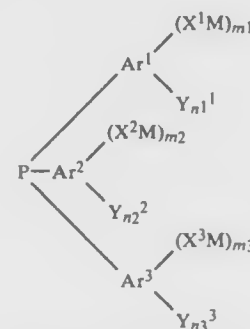
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3412335; Apr. 3, 1984, 3411034

Int. Cl.³ B01J 23/96, 38/68; C22B 11/04; C07C 45/50

U.S. Cl. 502—24

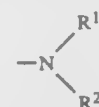
10 Claims

1. A process for the recovery of uncomplexed rhodium at a concentration of 3.9 to 17 ppm in an organic phase hydroformylation reaction product comprising extracting the organic phase reaction product with an aqueous solution of a sulfonate and/or carboxylate of organic phosphines of a formula



wherein Ar¹, Ar² and Ar³ are individually selected from the

group consisting of phenyl and naphthyl, Y¹, Y², and Y³ are individually selected from the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, halogen, hydroxy, cyano, nitro and



R¹ and R² are individually selected from the group consisting of carboxylate (COO—) and sulfonate (—SO₃—), m₁, m₂ and m₃ are individually an integer from 0 to 3 with the sum of m₁, m₂ and m₃ being at least one, n₁, n₂ and n₃ are individually integers from 0 to 5, M is selected from the group consisting of alkali-metal, alkaline earth metal, zinc, ammonium and quaternary ammonium ions of the formula N(R₃R₄R₅R₆)³, R₃, R₄, R₅ and R₆ are individually alkyl of 1 to 4 carbon atoms in an amount of 2 to 300 moles of said phosphine per mole of rhodium and a solubilizer in an amount of 0.1 to 2.5% by weight based on the aqueous solution to recover more than 95% of the rhodium contained in the organic reaction product.

5,091,351

CATALYST FOR PRODUCTION OF AROMATIC HYDROCARBONS

Takashi Murakawa, and Hisashi Katsumo, both of Sodegaura, Japan, assignors to Research Association for Utilization of Light Oil, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,386

Claims priority, application Japan, Oct. 4, 1986, 61-236689

Int. Cl.³ B01J 29/32

9 Claims

U.S. Cl. 502—66

1. A catalyst produced from an L-type zeolite by supporting platinum on an L-type zeolite and halogenating the L-type zeolite with platinum supported thereon with a halogen-containing compound.

2. A catalyst as claimed in claim 1, wherein the amount of platinum supported thereon ranges from 0.1% to 5.0% by weight on the basis of the total weight of the catalyst.

9. A catalyst as claimed in claim 1, wherein treatment with the halogen-containing compound is carried out at 80° C. to 600° C. for 1 minute to 20 hours.

5,091,352

OLEFIN POLYMERIZATION CATALYST COMPONENT, OLEFIN POLYMERIZATION CATALYST AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Mamoru Kioka, Toshiyuki Tsutsui, and Akinori Toyota, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,436

Claims priority, application Japan, Sep. 14, 1988, 63-231201; Sep. 14, 1988, 63-231202; Sep. 14, 1988, 63-231203; Sep. 14, 1988, 63-231204; Sep. 14, 1988, 63-231208; Sep. 14, 1988, 63-231209; Sep. 14, 1988, 63-231210; Sep. 14, 1988, 63-231211; Sep. 14, 1988, 63-231212; Mar. 28, 1989, 1-75605; Mar. 28, 1989, 1-75606; Mar. 28, 1989, 1-75607; Mar. 28, 1989, 1-75611; Mar. 28, 1989, 1-75612; Mar. 28, 1989, 1-75613; Mar. 28, 1989, 1-75614; Mar. 28, 1989, 1-75615

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.³ C08F 4/64, 4/68, 4/69

U.S. Cl. 502—103

15 Claims

1. An olefin polymerization catalyst component comprising an organoaluminum oxy-compound having less than 10% in terms of Al atom of Al component dissolving in benzene kept at 60° C., a ratio (D₁₂₂₀/D₁₂₆₀) of an absorbance (D₁₂₆₀) at 1260 cm⁻¹ to an absorbance (D₁₂₂₀) at 1220 cm⁻¹, both obtained by infrared spectrophotometry, of less than 0.09, and the organoaluminum oxy-compound being prepared by bringing a

solution of aluminosilane into contact with water or an active hydrogen containing compound.

2. An olefin polymerization catalyst component comprising an organoaluminum oxy-compound having less than 10% in terms of Al atom of Al component dissolving in benzene kept at 60° C., a ratio (D₁₂₆₀/D₁₂₂₀) of an absorbance (D₁₂₆₀) at 1260 cm⁻¹ to an absorbance (D₁₂₂₀) at 1220 cm⁻¹, both obtained by infrared spectrophotometry, of less than 0.09, and the organoaluminum oxy-compound being prepared by bringing a solution of organoaluminum compound into contact with water, wherein the water is used in such an amount that the organoaluminum atoms dissolved in the reaction system become less than 20% based on the total organoaluminum atoms.

4. An olefin polymerization catalyst comprising an organoaluminum oxy-compound having less than 10% in terms of Al atom of Al component dissolving in benzene kept at 60° C., as claimed in claim 1 or claim 2 and a transition metal compound containing a ligand having a cycloalkadienyl skeleton.

5,091,353

PROCESS FOR PRODUCING ETHYLENE COPOLYMER Mamoru Kioka, Ohtake, and Norio Kashiwa, Twakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 198,641, May 26, 1988, abandoned, which is a continuation of Ser. No. 82,913, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 801,697, filed as

PCT/JP85/00131, Mar. 15, 1985, abandoned. This application Oct. 17, 1989, Ser. No. 423,586

Claims priority, application Japan, Mar. 16, 1984, 59-49205

Int. Cl.³ C08F 4/654, 4/655, 210/02

U.S. Cl. 502—111

13 Claims

1. A process for preparing a catalyst for copolymerizing ethylene with at least one alphaolefin having 3 to 10 carbon atoms, which comprises

- reacting a solid complex (A-1) and a tetravalent titanium compound (A-2) under such conditions that the Ti/Mg atomic ratio of (A-1) and (A-2) is from 0.01 to 0.6 to form a titanium catalyst component (A), said solid complex (A-1) being (i) a hydrocarbon solvent-insoluble magnesium/aluminum solid complex derived from a liquid magnesium compound and selected from the group consisting of magnesium dihalides, alkoxy magnesium halides, aryloxy magnesium halides, dialkoxy magnesiums, diaryloxy magnesiums and magnesium salts of carboxylic acids, and an organoaluminum compound, and (ii) containing 0.01 to 0.5 g-equivalent, per Mg g-atom, of a hydrocarbon group R² having reducibility and 0.5 to 15 parts by weight, per part by weight of Mg, of an organic group OR¹ (where R¹ represents a hydrocarbon group) having no reducibility, and said solid complex (A) containing 10 to 100%, based on the entire Ti in the component, of Ti of a lower valency state than a valence of 4, and having a halogen/Mg atomic ratio of from 1.5 to below 3, and
- combining the titanium catalyst component (A) with an organoaluminum compound catalyst component (B) to form a catalyst.

5,091,354

ALKANE OXIDATION CATALYSTS

Paul E. Ellis, Jr., Downingtown, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 254,750, Oct. 7, 1988, Pat. No. 4,898,989. This application Jul. 11, 1990, Ser. No. 550,935

Int. Cl.³ B01J 27/24, 27/18, 27/188, 21/06

U.S. Cl. 502—200

5 Claims

1. In an alkane oxidation catalyst comprising a heteropolyacid having the formula (I) H_x(X_kM_nO_y)^{-c} where x is silicon or phosphorus, M is molybdenum, tungsten, vanadium, or combinations thereof, k is 1-5, n is 5-20, and y is 18-62, or polyoxoanions thereof, the improvement which comprises replacing

three atoms of M with three different metal atoms, M', to yield a catalyst having the formula (II) $H_k(X_kM_nM'_3O_y)^{-e}$ where k and M are as above, n is 5-17, y is 18-59, where two atoms of M' are selected from the group consisting of iron, chromium, manganese and ruthenium, and the third atom is different from said other two atoms and is selected from the group consisting of transition metals, where not more than two of the three M' atoms are the same, and wherein M' is free of double-bonded oxygen atoms and each M' atom is bonded through oxygen to another M' atom; or polyoxoanions thereof.

5,091,355

RELIABLE RANEY CATALYST COMPOSITION AND VESSEL FOR CONTAINING SAME

Imre Godla; Jozsef Földesi; István Polgár; Endre Gulyás; István Gebhardt; János Kiss; Károly Molnár; András Sugár; Pál Angyal; Ferenc Konok, and Zoltán Marina, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sep. 21, 1990, Ser. No. 586,864

Claims priority, application Hungary, Sep. 25, 1989, 5021/89
Int. Cl.⁵ B01J 25/00

U.S. Cl. 502-301

4 Claims

1. A Raney catalyst composition, which comprises a Raney catalyst embedded in ice as a solid carrier.

3. A catalyst package comprising a vessel for the storage and handling of a Raney catalyst composition, which comprises a conical casing or side walls joining a bottom through a bend radius of greater than 0.5 mm and a tightly closing cap for the vessel; and

a Raney catalyst composition received in said vessel and consisting essentially of a Raney catalyst embedded in ice as a solid carrier.

5,091,356

THERMOSENSITIVE RECORDING MEMBER

Norihiko Nakashima, Tochigi, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 451,170

Claims priority, application Japan, Dec. 28, 1988, 63-331630
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.⁵ B41M 5/30, 5/40

U.S. Cl. 503-200

4 Claims

1. A thermosensitive recording member which comprises (1) a substrate; (2) a foamed resin layer, provided on said substrate, said foamed resin layer being produced by foaming an aqueous emulsion of a self-emulsifiable resin having a I/O value of 0.6 to 1.1 which is a copolymer obtained from 2 to 25 wt. % of a double bond-containing monomer and having a salt-forming substituent thereon, and 98 to 75 wt. % of a comonomer; and (3) a thermosensitive coloring layer, provided on said foamed resin layer, containing an electron-donating dye and an electron-accepting compound to form a color by reacting with said electron-donating dye.

5,091,357

HEAT SENSITIVE RECORDING MATERIAL

Takao Kosaka, Himeji, Japan, assignor to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 655,773

Claims priority, application Japan, Feb. 26, 1990, 2-046678
Int. Cl.⁵ B41M 5/40

U.S. Cl. 503-207

2 Claims

1. A heat-sensitive recording material comprising a substrate, an intermediate layer formed on the substrate, and a heat-sensitive recording layer formed on the intermediate layer, said intermediate layer formed from an inorganic powder having an oil absorption of 50 ml/100 g or more as measured in accordance with JIS K5101, an aqueous adhesive and a carboxymethyl cellulose in an amount of 3 to 20% by weight based on the weight of the aqueous adhesive, and said heat-sensitive sensitive recording layer comprising an electron-donat-

ing, colorless dye precursor, an electron-accepting developer and a sensitizer.

5,091,358

REGENERABLE CO₂/H₂O SOLID SORBENT

Philip J. Birbara, Windsor Locks, and Timothy A. Nalette, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 27, 1990, Ser. No. 544,716

Int. Cl.⁵ B01J 20/14, 20/04, 20/16; B01D 53/34

U.S. Cl. 502-412

17 Claims

1. A method for preparing a regenerable CO₂/H₂O sorbent, which comprises:

- preparing an aqueous solution of a silver compound dissolved in a solvent;
- impregnating a support with the aqueous solution of silver compound to form an impregnated support;
- reacting the silver compound in the impregnated support with an alkali metal compound thereby converting said silver compound to an insoluble silver compound;
- washing the impregnated support;
- preparing an aqueous solution of a CO₂ sorption promoter dissolved in a solvent, wherein said CO₂ sorption promoter is an alkali metal salt having a pH of at least 11;
- further impregnating the impregnated support with the aqueous solution of the CO₂ sorption promoter; and
- drying said further impregnated support.

5,091,359

HEAT-SENSITIVE RECORD MATERIAL

Koichi Ishida, Amagasaki, and Yukio Takayama, Toyonaka, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1990, Ser. No. 475,172

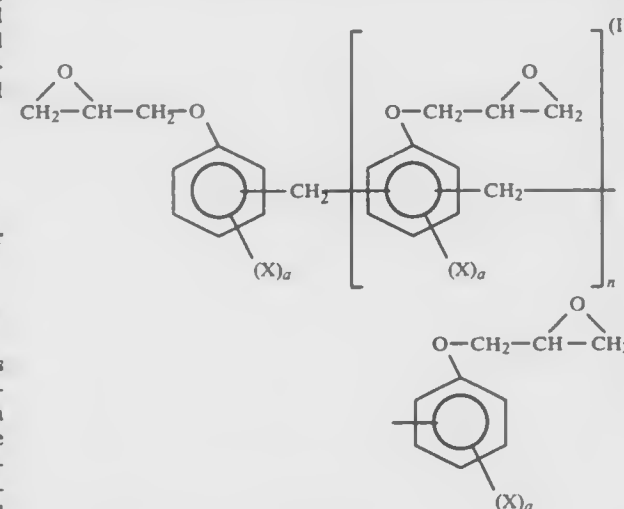
Claims priority, application Japan, Feb. 8, 1989, 1-29312; Feb. 16, 1989, 1-38898

Int. Cl.⁵ B41M 5/30

U.S. Cl. 503-209

6 Claims

1. A heat-sensitive record material having on a base sheet a heat-sensitive recording layer comprising a colorless or pale colored basic chromogenic material and a color developer which develops a color by contacting with said chromogenic material, characterized in that said recording layer comprises at least one epoxy resin represented by the following formula:



wherein X is a halogen atom or an alkyl having C₁ to C₅; a is an integer of 0 to 4; and n is an integer of 0 to 20.

5,091,360

THERMAL TRANSFER PRINTING

Peter A. Gemmell, Bentley, and Carol Leliaert, Great Dunmow, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed May 11, 1990, Ser. No. 522,038

Claims priority, application United Kingdom, May 26, 1989, 8912164

Int. Cl.⁵ B41M 5/035, 5/26

U.S. Cl. 503-227

25 Claims

1. A thermal transfer printing sheet comprising a substrate having a coating comprising a binder and a black dye mixture comprising from 5 to 60% of a dye of Formula 1, from 5 to 60% of Formula 2, and at least one member of the group consisting of from 5 to 60% of a dye of formula 3 and from 1 to 60% of a dye of Formula 4 in which

Dyes of Formula 1 are represented as:

wherein:

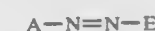
X is —H; nitro or —COOR¹ in which R¹ is an optionally substituted hydrocarbyl radical;

Y is an optionally substituted C₁₋₁₀-alkyl; optionally substituted C₁₋₁₀-alkoxy or halogen;

Z is an alkyl radical, and

R is an alkyl radical which may be interrupted by one or two —O— or —COO— links;

Dyes of Formula 2 are represented as:



Formula 2

wherein:

A is the residue of adizotisable heteroaromatic amine, A—NH₂, in which A is selected from imidazolyl, pyrazolyl, thiazolyl, benzothiazolyl, isothiazolyl, benzisothiazolyl, pyridoisothiazolyl; thienyl and triazolyl; and

E is the residue of an aromatic coupling component, E-B, wherein B is a group displaceable by a diazotised aromatic amine and E is optionally substituted amino-phenyl, tetrahydroquinolinyl, julolidyl or aminoquinolinyl;

Dyes of Formula 3 are represented as:



Formula 3

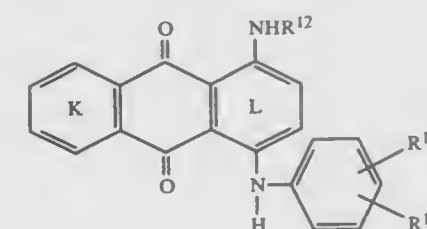
wherein:

C is the residue of a diazotisable phenylamine or naphthylamine, C—NH₂, carrying not more than one unsaturated electron-withdrawing group;

D is an optionally substituted thiophen-2,5-ylene or thiazol-2,5-ylene group; and

G is the residue of an aromatic coupling component G-J wherein J is a group displaceable by a diazotised aromatic amine; and

Dyes of Formula 4 are represented as:



Formula 4

wherein:

R¹² is C₁₋₆-alkyl, C₄₋₈-cycloalkyl or C₂₋₆-alkenyl;

R¹³ is C₁₋₆-alkyl or C₂₋₆-alkenyl; and

R¹⁴ is H or C₁₋₆-alkyl or C₂₋₆-alkenyl.

14. A transfer printing process which comprises contacting a transfer sheet according to claim 1 to with a receiver sheet, so that the dye is in contact with the receiver sheet and selectively heating areas of the transfer sheet whereby dye in the heated

areas of the transfer sheet may be transferred to the receiver sheet.

5,091,361

MAGNETIC HEAT PUMPS USING THE INVERSE MAGNETOCALORIC EFFECT

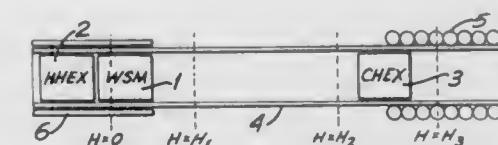
Aharon Z. Hed, 12 Wagon Trail, Nashua, N.H. 03062

Filed Jul. 3, 1990, Ser. No. 547,796

Int. Cl.⁵ H01L 39/14; F25B 21/00

U.S. Cl. 505-1

52 Claims



1. A heat pump system operative by the inverse magnetocaloric effect and including:

(a) a working medium comprising a superconductive body of high temperature type II superconductive material having a critical temperature above 23° K. and having paired charge carriers;

(b) magnet means to produce a magnetic field sufficient to decrease the concentration of paired charge carriers of the superconductive body and to thereby induce cooling and/or absorb heat of said body when the superconductor body is below said critical temperature but insufficient to quench the superconductive body to a normal non-conductive state;

(c) a hot heat exchange means to remove heat from said superconductive body;

(d) a cold heat exchange means from which heat is removed by said superconductive body; and

(e) magnetic field change means to repeatedly bring said superconductive body into and out of said magnetic field to reversibly change the concentration of said paired charge carriers of the superconductive body without elimination of all paired charge carriers; and

(f) motor means to bring said body in sequential thermal conductive contact with said hot heat exchange means and said cold heat exchange means.

5,091,362

METHOD FOR PRODUCING SILVER COATED SUPERCONDUCTING CERAMIC POWDER

William A. Ferrando, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 389,220, Aug. 2, 1989, Pat. No. 4,988,673. This application Oct. 10, 1990, Ser. No. 597,474
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.⁵ H01L 39/12; B05D 5/12

U.S. Cl. 505-1

9 Claims

1. A process for coating superconducting ceramic powders with silver metal comprising:

(1) mixing AgNO₃ with superconducting ceramic powder;

(2) heating the AgNO₃ superconducting ceramic powder mixture at a temperature above the melting point of AgNO₃ but below the decomposition temperature of AgNO₃ until the AgNO₃ melts and forms a uniform coating over the surfaces of the superconducting ceramic particles; and

(3) heating the molten AgNO₃-coated superconducting ceramic powder at a temperature from the decomposition temperature of AgNO₃ to 50° C. below the melting point of the superconducting ceramic powder until the AgNO₃ decomposes to form a thin, uniform coating of silver metal

over the surfaces of the superconducting ceramic powder particles;
wherein an amount of AgNO₃ is used in step (1) which will produce upon decomposition a silver metal coated superconducting ceramic powder composite comprising from 10 to 25 weight percent silver metal with the remainder being the superconducting ceramic.

5,091,363

AGENT FOR THE THERAPY OF FACTOR VIII-RESISTANT HEMOPHILIA A, AND A PROCESS FOR THE PREPARATION THEREOF

Norbert Heimbürger, Marburg; Karlheinz Wenz, Weimar, and Wilfried Wormsbücher, Kirchhain, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 76,600, Jul. 22, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,717

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625090

Int. Cl.⁵ A61K 37/02

U.S. Cl. 514—2

6 Claims

1. An agent for the therapy of Factor VIII inhibitor type hemophilia, said agent being stable in citrated human plasma and having no amidolytic or proteolytic activity, said agent comprising a composition obtained by maintaining a mixture of Factor VIII, antithrombin III, a phospholipid and calcium ions in an aqueous solution at a temperature of from 1° to 45° C. for at least one minute, adding Factor IX, and maintaining the solution at a temperature of from 1° to 45° C. until addition of a sample of this solution to an inhibitor plasma results in a partial thromboplastin time (PTT) of 15 to 30 seconds.

5,091,364

PREPARATION OF IMMUNOLOGICALLY ACTIVE CELL WALL COMPONENTS FROM ARCHAEABACTERIA

Jörg Baumgarten; Helmut Brunner, both of Wuppertal; Inge Flesch, Neu-Ulm, all of Fed. Rep. of Germany; Heinz Hildebrand, West Haven, Conn.; Norbert Piel, Erkrath, and Michael Sperzel, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 168,704, Mar. 16, 1988, abandoned. This application Jul. 25, 1990, Ser. No. 559,432

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710606; May 19, 1987, 3716669

Int. Cl.⁵ A61K 37/16, 39/02; C07K 3/00; C12N 1/00

U.S. Cl. 514—8

7 Claims

1. A pharmaceutical composition for unspecific defense against infection comprising a pharmaceutically acceptable carrier and an amount effective to unspecifically defend against infection of native cell wall glycoproteins of Halobacteria, or the enzymatic cleavage products thereof.

5,091,365

CYCLOC PEPTIDES AS PROMOTERS OF ABSORPTION ON ADMINISTRATION ONTO THE MUCOSA

Jürgen K. Sandow, Königstein/Taunus; Rainer Schmiedel, Kelkheim; Klaus Wirth, Frankfurt am Main; Hans P. Merkle, Frankfurt am Main, and Suzanne Raehs, Bonn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 228,651

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726324

Int. Cl.⁵ C07K 5/12; A61K 37/02

U.S. Cl. 514—9

9 Claims

1. A method for promoting the absorption of peptides and proteins on administration onto the mucosa which comprises administering in an effective amount a cyclic peptide or a physiologically tolerated salt thereof.

5,091,366

PEPTIDES HAVING ANF ACTIVITY

Ruth F. Nutt, East Greenville; Terrence M. Ciccarone, Harleysville; Stephen F. Brady, Philadelphia, and Daniel F. Veber, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

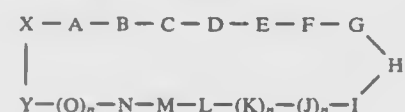
Continuation of Ser. No. 403,999, Sep. 5, 1989, abandoned, which is a continuation of Ser. No. 51,981, May 19, 1987, abandoned. This application Jun. 4, 1990, Ser. No. 534,001

Int. Cl.⁵ C07K 7/64; A61K 37/02

U.S. Cl. 514—11

6 Claims

1. A peptide having the amino acid sequence:



wherein

X is Pro;

Y is Phe, Pro, Val, Ile, NMP, Lys, Arg, or hAr

A is Phe, OMT or ChA;

B is Gly, D-Ala or D-Phe;

C is Gly or Ala;

D is D-Arg, Arg, Pro, D-Lys or Lys;

E is Ile, Met, MeO, MO₂, Leu, Nle or Val;

F is Asp, Glu, Aib, α-MA or α-MG;

G is Arg or Lys;

H is Ile or Val;

I is Gly, Aib, D-Ala or Ala;

is Ala, NMA, Phe, NMP or Pro;

K is D-Gln, D-Ala or Ala;

L is Ser, His, Arg or Lys;

M is Gly, D-Ala, Ala or Pro;

N is Leu, Phe or ChA;

O is Gly, D-Ala, Ala, D-Arg, Arg, hAr, hDA, D-Lys, or Lys;

n is 0 or 1;

and the amides, lower alkyl esters and the physiologically acceptable metal salts and acid addition salts thereof.

5,091,367

ANALOGS OF GONADOLIBERIN WITH IMPROVED SOLUBILITY, METHODS FOR THEIR PREPARATION, AGENTS CONTAINING THEM AND THEIR USE

Wolfgang König, Hofheim am Taunus; Jürgen K. Sandow, Königstein/Taunus, and Cenek Kolar, Marburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 390,477, Aug. 7, 1989, abandoned, which is a continuation of Ser. No. 105,240, Oct. 7, 1987, abandoned. This application Jun. 28, 1991, Ser. No. 724,477

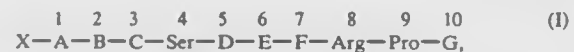
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634435

Int. Cl.⁵ A61K 37/02, 37/43; C07K 7/06, 7/20

U.S. Cl. 514—15

11 Claims

1. A peptide of the formula I



in which

X is hydrogen or (C₁-C₇)-acyl or, if A represents pyrrolutamy, is absent;

A is Pgl, dehydro-Pro, Pro, D-Thi, D-Pgl or D-Nal(2) optionally substituted in the aromatic ring by one or two identical or different radicals from the series bromo, chloro, fluoro, nitro, amino, methyl and methoxy, D-Phe substituted in this way or D-Trp substituted in this way;

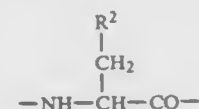
B in His or D-Phe optionally substituted in the phenyl ring by one or two identical or different radicals from the

series bromo, chloro, fluoro, nitro, amino, methyl and methoxy;

C is Trp, D-Thi-D-Pal(3) or D-Trp optionally substituted in position 5 and/or 6 by one or two identical or different radicals from the series bromo, chloro, fluoro, nitro, amino, methyl or methoxy;

D is Tyr, Arg or His;

E is D-Ser(R¹), β-Asn, β-Asp-Ome, D-Thi or the radical of A D-Amino acid of general formula II;

F is Ser(R¹), Leu, Trp or Phe;

G is Gly-NH₂, Aza-Gly-NH₂, D-Ala-NH₂ or NH-(C₁-C₄)-alkyl;

R¹ is optionally partly protected glycosyl radical with at least one free hydroxyl group and

R² is hydrogen, (C₁-C₄)-alkoxycarbonyl, (C₁-C₄)-alkoxy, (C₁-C₄)-alkyl which is optionally monosubstituted by (C₁-C₄)-alkoxycarbonyl or (C₁-C₄)-alkoxycarbonylamino, phenyl which is optionally substituted by up to three identical or different radicals from the series chloro, fluoro, methyl and (C₁-C₄)-alkoxy, naphthyl, 4, 5,6,7-tetrahydrobenzimidazol-2-yl or indolyl, or a physiologically acceptable salt thereof, with the proviso that

a) if E represents a residue of the formula II, β-Asn, β-Asp-OME or D-Thi, F is exclusively Ser(R¹) and

b) if F represents Leu, Phe or Trp, E is exclusively D-Ser(R¹).

5,091,368

BIOLOGICALLY ACTIVE COMPOUNDS FROM BLUE-GREEN ALGAE

Frank Koehn; Sue S. Cross, both of Fort Pierce, and Ross E. Longley, Vero Beach, all of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

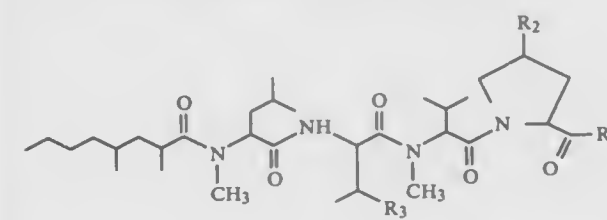
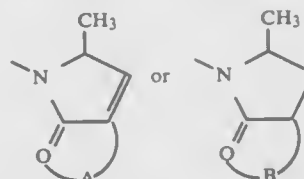
Filed Aug. 8, 1990, Ser. No. 564,817

Int. Cl.⁵ C07K 5/10; A61K 37/02

U.S. Cl. 514—18

9 Claims

1. A compound having the following structure:

wherein: R₁=OH, NH₂, O-alkyl, N-alkyl,

R₂=H, OH, =O, O-alkyl, O-acyl, =NOH, =NNHCONH₂, =NNHR, or =NO-alkyl; R₃=OH, =O, O-alkyl, =NOH, or =NO-alkyl; and R=aryl or alkyl.

5,091,369

METHOD OF PROMOTING ENDOGENOUS FAT OXIDATION

Michael Georgieff, Gleiwitzstr.22, 6944-Hemsbach, Fed. Rep. of Germany

Continuation of Ser. No. 15,573, Feb. 11, 1987, abandoned, which is a continuation of Ser. No. 707,457, Mar. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 686,719, Dec. 27, 1984, abandoned. This application Dec. 12, 1989, Ser. No. 453,138

Int. Cl.⁵ A61K 31/70

(II) U.S. Cl. 514—23

1 Claim

1. A method of promoting endogenous fat oxidation in a human in need thereof comprising administering through a vein of said human patient, a composition consisting essentially of 200 grams/liter of D-xylitol and 200 grams/liter of glucose.

5,091,370

ANGOLAMYCIN DERIVATIVES

Takeo Yoshioka, Ayase; Azuma Watanabe, Fujisawa; Koichiro Kominato, Yamato; Hiroshi Tone, Yokohama; Rokuro Okamoto, Fujisawa; Tsutomu Sawa, Ayase, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 539,743

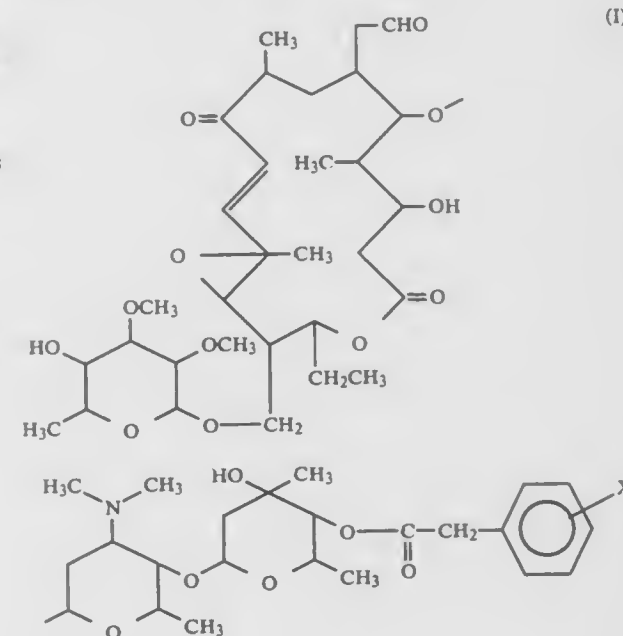
Claims priority, application Japan, Jun. 20, 1989, 1-155689; Aug. 23, 1989, 1-214894

Int. Cl.⁵ A61K 31/70; C07H 17/08

U.S. Cl. 514—30

5 Claims

1. An angolamycin derivative represented by the following formula



wherein X represents an acetyl, methylsulfonyl, methylthio, benzoyl or methoxy group.

5. A method of treating a patient suffering from a bacterial infection, which comprises administering to said patient an antibacterially effective amount of the angolamycin derivative of formula (I) in claim 1.

5,091,371

**ANTIFUNGAL AND ANTIVIRAL ANTIBIOTIC,
BENANOMICIN A 4'''-O-SULFATE OR ITS SALT, AND
THE PRODUCTION AND USES THEREOF**

Tomio Takeuchi, Tokyo; Shinichi Kondo, Yokohama, and Dai-shiro Ikeda, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,696

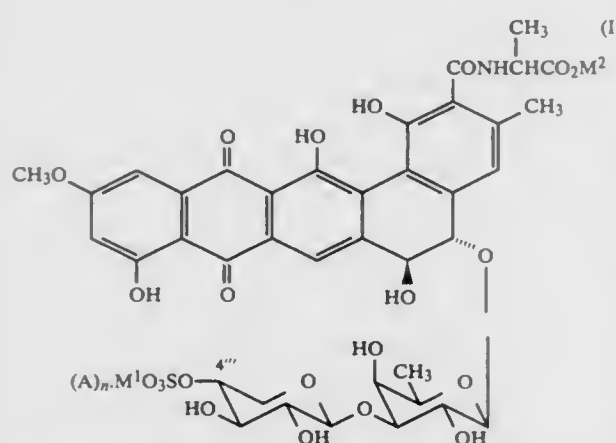
Claims priority, application Japan, Mar. 14, 1990, 2-61254

Int. Cl.⁵ A61K 31/70; C07H 15/24

U.S. Cl. 514—33

5 Claims

1. An antibiotic, benanomicin A 4'''-O-sulfate or a salt thereof having formula (I)



where M¹ denotes a mono-valent alkali metal atom or a di-valent alkaline earth metal atom or a hydrogen atom and A denotes a tri (lower) alkylamine or pyridine; n is zero when M¹ is an alkali metal atom or alkaline earth metal atom but n is 1 or zero when M¹ is a hydrogen atom, and M² denotes a hydrogen atom or an alkali metal atom or an alkaline earth metal atom.

5,091,372

**METHOD OF TREATING TUMORS WITH
PHARMACEUTICAL COMPOSITION CONTAINING
ANTHRACYCLINE GLYCOSIDES**

Gaetano Gatti, Sesto San Giovanni; Diego Oldani, Robecco sul Naviglio; Carlo Confalonieri, Cusano Milanino, and Luciano Gambini, Cornaredo, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Continuation of Ser. No. 453,268, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 326,432, Mar. 20, 1989, abandoned, which is a continuation of Ser. No. 158,107, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 894,048, Aug. 7, 1986, abandoned, which is a division of Ser. No. 788,158, Oct. 16, 1985, Pat. No. 4,675,311. This application Sep. 26, 1990, Ser. No. 588,526

Claims priority, application United Kingdom, Oct. 22, 1984, 8426672

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.⁵ A61K 31/70

U.S. Cl. 514—34

7 Claims

1. A method of treating a tumor susceptible to 4'-epi-doxorubicin, 4'-desoxy-doxorubicin, daunorubicin or 4'-deme-thoxy-daunorubicin therapy in a patient in need of such treatment, which comprises administering to the patient a tumor growth-inhibiting amount of a sterile injectable solution comprising water, an anti-tumor effective amount of 4'-epi-doxorubicin, 4'-desoxy-doxorubicin, daunorubicin or 4'-deme-thoxy-daunorubicin or a pharmaceutically acceptable salt thereof; and a cosolubilizing agent selected from the group consisting of a hydroxy-, mercapto-, or amino-substituted benzoic acid, an alkali metal salt thereof, a C₁-C₄ alkyl ester thereof, a ring-halogenated methyl-substituted phenol, an amino acid, and mixtures thereof; said solution being produced by reconstituting a lyophilized preparation comprising said

4'-epi-doxorubicin, 4'-desoxy-doxorubicin, daunorubicin or 4'-deme-thoxy-daunorubicin, or a pharmaceutically acceptable salt thereof, and said cosolubilizing agent.

5,091,373

**METHOD OF TREATING TUMORS WITH A
PHARMACEUTICAL COMPOSITION CONTAINING
ANTHRACYCLINE GLYCOSIDES**

Gaetano Gatti, Sesto San Giovanni; Diego Oldani, Robecco sul Naviglio; Carlo Confalonieri, Cusano Milanino, and Luciano Gambini, Cornaredo, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Continuation of Ser. No. 455,764, Dec. 28, 1989, abandoned, which is a continuation of Ser. No. 331,078, Mar. 28, 1989, abandoned, which is a continuation of Ser. No. 890,478, Jul. 30, 1986, abandoned, which is a continuation of Ser. No. 788,158, Oct. 16, 1985, Pat. No. 4,675,311. This application Sep. 28, 1990, Ser. No. 590,536

Claims priority, application United Kingdom, Oct. 22, 1984, 8426672

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.⁵ A61K 31/70

U.S. Cl. 514—34

8 Claims

1. A method of treating a tumor susceptible to doxorubicin therapy in a patient in need of such treatment, said method comprising administering to said patient a tumor growth-inhibiting amount of a sterile injectable solution comprising water, doxorubicin or pharmaceutically acceptable salt thereof and a cosolubilizing agent selected from the group consisting of a hydroxy-, mercapto-, or amino-substituted benzoic acid, an alkali metal salt thereof, a C₁-C₄ alkyl ester thereof, a ring-halogenated methyl-substituted phenol, an amino acid, and mixtures thereof, said solution being produced by reconstitution of a lyophilized preparation comprising doxorubicin or pharmaceutically acceptable salt thereof and said cosolubilizing agent.

5,091,374

**DOUBLE-STRANDED RNA CORRECTION OF
ABNORMALITIES IN CIRCULATING IMMUNE
COMPLEXES AND MONOCYTE FUNCTION**

William A. Carter, Birchrunville, Pa., assignor to HEM Research Inc., Rockville, Md.

Continuation of Ser. No. 490,503, Feb. 28, 1990, abandoned, which is a continuation of Ser. No. 252,003, Sep. 30, 1988, abandoned, which is a continuation of Ser. No. 124,577, Nov. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 74,616, Jul. 17, 1987, abandoned. This application May 6, 1991, Ser. No. 698,325

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.⁵ A61K 31/70

U.S. Cl. 514—44

10 Claims

1. A method of restoring the immunological capacity of macrophages and monocytes exposed to human immunodeficiency virus in a patient infected with human immunodeficiency virus, comprising administering to said patient an effective amount of a mismatched dsRNA that is (1) a complex of a polyinosinate and a polycytidylylate containing from 1 to 5 to 1 to 30 uracil or guanine unpaired bases or (2) a copolynucleotide having the formula poly(C_nU) or poly(C_nG) in which n is an integer having a value of from 4 to 29 and are formed by modifying poly(I_n)-poly(C_n) to incorporate the unpaired base uracil or guanine along the poly (C_n) strand.

5,091,375

NIKKOMYCIN DERIVATIVES

Richard F. Hector, Dublin, Calif.; Klaus Schaller, Wuppertal, Fed. Rep. of Germany; Heinrich F. Moeschler, Leverkusen, Fed. Rep. of Germany, and Manfred Blempel, Haan, Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 161,645, Feb. 29, 1988, Pat. No. 4,914,087.

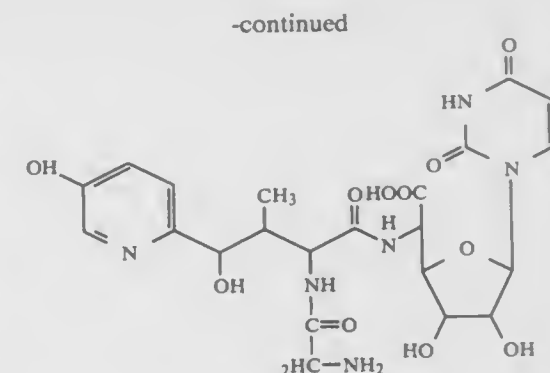
This application Jan. 12, 1990, Ser. No. 464,087

Int. Cl.⁵ A61K 31/71, 31/70

U.S. Cl. 514—50

2 Claims

2. A method of treating an animal infected with fungi, the method comprising administering to the animal an effective amount of a nikkomycin derivative selected from the group consisting of



5,091,376

**NON-CAPSULE EXOPOLYSACCHARIDE FROM
ZOOGLAEA RAMIGERA**

Donald D. Easson, Jr., Cambridge; Oliver P. Peoples, Arlington, and Anthony J. Sinskey, Boston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 329,594, Mar. 28, 1989, abandoned, which is a division of Ser. No. 35,604, Apr. 7, 1987, Pat. No. 4,948,733, Continuation-in-part of Ser. No. 891,136, Jul. 28, 1986, abandoned. This application May 17, 1990, Ser. No. 525,197

Int. Cl.⁵ A61K 31/715; C07B 37/00

U.S. Cl. 514—54

2 Claims

1. An exopolysaccharide produced by *Zoogloea ramigera* 115SL ATCC 53589 and *Zoogloea ramigera* 115SLR ATCC 53590 comprising glucose and galactose in an approximate 2:1 molar ratio and having pyruvate and acetate moieties.

5,091,377

**TRISUBSTITUTED SILYLALKYL 1,2,4-TRIAZOLE AND
IMIDAZOLE PHENYL BORANE DERIVATIVES**

Tsze H. Tsang, El Cerrito, Calif., and Vincent J. Spadafora, Morrisville, Pa., assignors to Chevron Research and Technology Company, San Francisco, Calif.

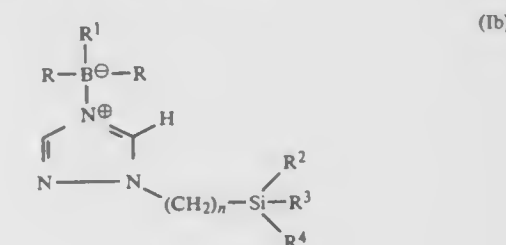
Filed Dec. 14, 1990, Ser. No. 628,806

Int. Cl.⁵ A01N 55/08; C07F 7/02

U.S. Cl. 514—63

26 Claims

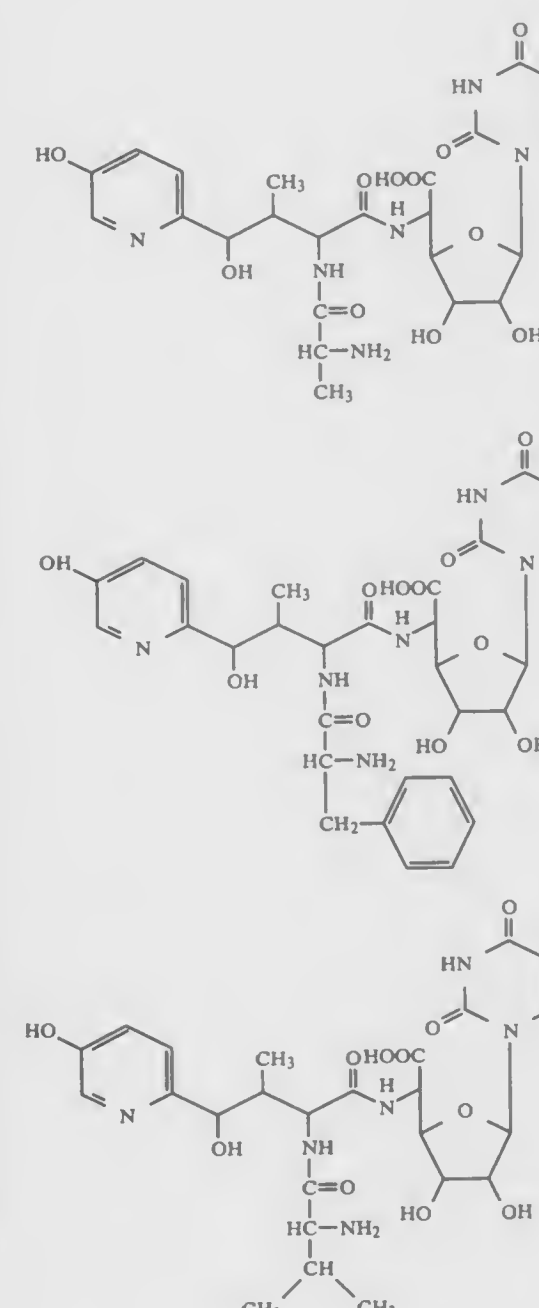
1. A compound having the formula:



wherein
n is 1 or 2;
R is styryl or the group

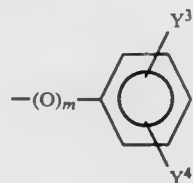


wherein
Y¹ is hydrogen; lower alkyl having 1 through 6 carbon



atoms; fluoro; chloro; lower alkoxy having 1 through 6 carbon atoms; lower alkylthio having 1 through 6 carbon atoms;

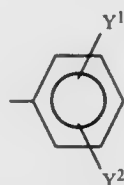
Y^2 is hydrogen; lower alkyl having 1 through 6 carbon atoms; lower alkylthio having 1 through 6 carbon atoms; or the group



wherein m is 0 or 1;

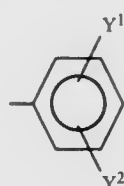
Y^3 and Y^4 are independently selected from the group of substituents defined for Y^1 ;

R^1 and R^4 are independently selected from the group of alkyl having 1 through 4 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; lower alkenyl having 2 through 6 carbon atoms; haloalkenyl having 3 through 6 carbon atoms and 1 through 4 halo atoms independently selected from the group of fluoro, chloro, and bromo; or the group



wherein Y^1 and Y^2 are as hereinabove defined with respect to R ;

R^2 and R^3 are independently selected from the group



wherein Y^1 and Y^2 are as defined hereinabove with respect to R .

23. A fungicidal composition comprising a fungicidally effective amount of the compound of claim 1 and a compatible carrier.

5,091,378

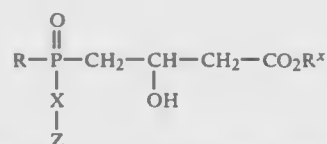
PHOSPHORUS-CONTAINING HMG-COA REDUCTASE INHIBITORS, NEW INTERMEDIATES AND METHOD
Donald S. Karanewsky, East Windsor; Michael C. Badia, Lawrenceville; Scott A. Biller, Ewing; Eric M. Gordon, Pennington, and Michael J. Sofia, Lawrenceville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 109,681, Oct. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 53,238, May 22, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,710

Int. Cl. 5 C07F 9/6503, 9/6506, 9/572, 9/6553
U.S. Cl. 514-80

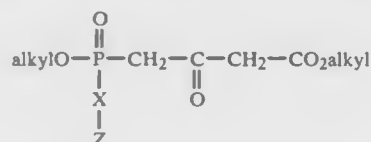
14 Claims

1. A compound having the structure



wherein R is OH or lower alkoxy and R^x is H or lower alkyl, including salts thereof, where in such salts R^x includes a salt moiety or each of R^x and R includes a salt moiety; X is $-CH_2-$, $-CH_2-CH_2-$, $-CH=CH-$, $-CH_2CH_2CH_2-$, $-C\equiv C-$ or $-CH_2O-$, where O is linked to Z , and Z is hydrophobic anchor which is a lipophilic group.

10. An intermediate having the structure



wherein X is $(CH_2)_n$, $-CH=CH-$, $-C\equiv C-$, or $-CH_2O-$, where O is linked to Z , and n is 1, 2 or 3 and Z is hydrophobic anchor which is a lipophilic group.

11. A hypocholesterolemic or hypolipemic composition comprising an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier thereof.

5,091,379

TOPICAL ANTINFLAMMATORY COMPOSITIONS WITH MINIMAL SYSTEMIC ABSORPTION

Bruce J. Aungst, Wilmington, Del., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Aug. 31, 1989, Ser. No. 400,404

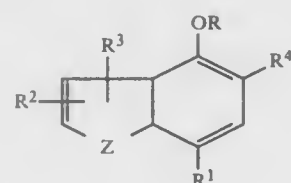
Int. Cl. 5 A61K 31/58

U.S. Cl. 514-159

41 Claims

1. A topical polyethylene glycol based, water-soluble ointment, which provides minimal systemic absorption of active compound while maintaining effective localized antiinflammatory activity, said composition comprising:

- a polyethylene glycol base comprising one or more polyethylene glycol with a molecular weight of greater than or equal to 400; and
- an antiinflammatory effective amount of a compound of the formula:



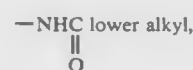
(I)

wherein

Z is NCH_3 or $C\equiv C$;

R is $COCH_3$ or H ;

R^1 is H , CH_3 , Br , Cl , OH , OCH_3 , OCH_2H_5 , COR^{17} , $COOR^{18}$, $CONR^{19}R^{20}$, phenyl, $-N(R^{12})(R^{13})$,



$S(O)_p$ lower alkyl where p is 0, 1 or 2, or $-NHSO_2$ lower alkyl or lower alkyl substituted with F ;

R^2 and R^3 independently are H , CH_3 , C_2H_5 , OCH_3 , or OC_2H_5 ;

R^4 is straight-chain or branched alkyl of 1-12 carbons, straight-chain or branched alkenyl of 2-12 carbons, straight-chain or branched alkynyl of 2-12 carbons,

cycloalkyl or cycloalkenyl of 5-7 carbons,

$CH_2-C\equiv C-(CH_2)_mR^5$ where m is 1-4,

$CH=CH-(CH_2)_nR^5$ where n is 0-3 and the olefinic bond has either the Z or E configuration

$A-R^6$, or

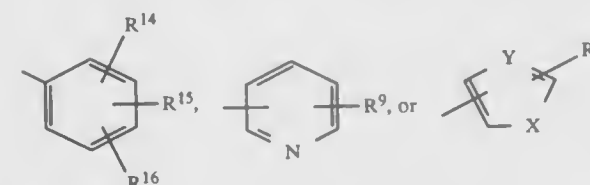
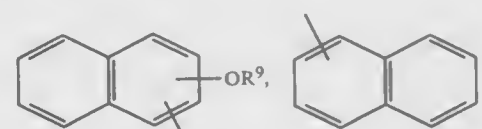


A is a chain of 2-6 unsubstituted methylene groups or 2-6 methylene group substituted at any one of the methylene carbons by a group R^8 ;

R^5 is C_5-C_7 cycloalkyl, phenyl, $COOR^9$, OR^9 , $OC(O)R^9$, or $C(R^{10})(R^{11})OR^9$, with the proviso that if $n=0$ then R^5 is not OR^9 or $OC(O)R^9$;

R^6 is C_5-C_7 cycloalkyl, phenyl, $COOR^9$, $CON(R^{12})(R^{13})$, CHO , CN , $CH(COOR^9)_2$, $C(R^{10})(R^{11})OR^9$, $P(O)(OR^9)_2$, $S(O)_wR^9$ where w is 0-2 with the proviso that if $w=1$ then R^9 is not H , $SC(NH)NH_2$, $N(R^{12})(R^{13})$, N_3 , OR^9 , $OC(O)R^9$, Cl , Br , or I ;

R^7 is C_3-C_8 cycloalkyl,



where X is S , O , or NR^{10} , and Y is CH or N ;

R^8 is C_1-C_4 alkyl, C_5-C_7 cycloalkyl, or phenyl;

R^9 , R^{10} , and R^{11} are independently H or C_1-C_4 alkyl;

R^{12} and R^{13} independently are H , C_1-C_4 alkyl, or together are $(CH_2)_4-5$;

R^{14} is H , C_1-C_4 alkyl, OR^9 , O -phenyl, OCH_2COOR^9 , O -benzyl, $COOR^9$, CF_3 , Cl , Br , I , $N(R^{12})(R^{13})$, or $S(O)_wR^9$ where w is 0-2 with the proviso that if $w=1$ then R^9 is not H ;

R^{15} and R^{16} are independently H , C_1-4 , alkyl, OR^9 , O -benzyl, F , or Cl ;

R^{17} is lower alkyl, phenyl, or phenyl monosubstituted with Cl , Br , F , CH_3O , CH_3 , pyridyl, thienyl or furyl;

R^{18} is H or lower alkyl;

R^{19} and R^{20} independently are H or lower alkyl, or taken together are $(CH_2)_4-5$; and

R^{21} is H , lower alkyl, phenyl or phenyl monosubstituted with Cl , Br , F , CH_3 , CH_3O , pyridyl, thienyl, or furyl; or a pharmaceutically suitable salt thereof.

5,091,380

N-MONOSUBSTITUTED ADAMANTYL/NORBORNANYL 17β-CARBAMIDES OF 3-CARBOXY-ANDROST-3,5-DIENES AS TESTOSTERONE 5α-REDUCTASE INHIBITORS

Gary H. Rasmussen, Watchung; Richard L. Tolman, Warren, and Gool F. Patel, Millington, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

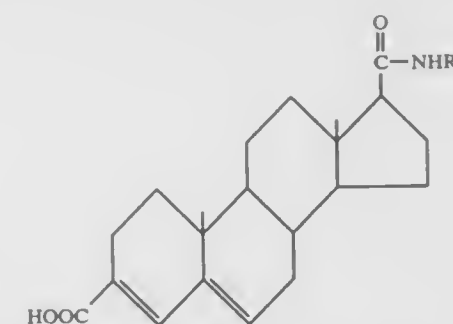
Filed Jun. 28, 1990, Ser. No. 545,264

Int. Cl. 5 A61K 31/56; C07J 53/00

U.S. Cl. 514-169

5 Claims

1. A compound of the formula:



wherein R is a hydrocarbon radical selected from 1- or 2-adamantyl, 1-, 2- or 7-norbornanyl, and pharmaceutically acceptable salts or esters thereof, said adamantyl and said norbornanyl being optionally substituted with a member selected from the group consisting of C_1-C_4 straight chain or branched alkyl, nitro, oxo, C_7-C_9 aralkyl, $(CH_2)_n COOR^1$ where n is 0-2 and R^1 is H ; straight chain or branched C_1-C_4 alkyl, CH_2OH , OH , OR^2 where R^2 is C_1-C_4 straight chain or branched alkyl, halo, $CONH_2$, CH_2NH_2 , CH_2NHCOR^3 where R^3 is C_1-C_4 straight chain or branched alkyl; phenyl; or, p -substituted phenyl wherein the substituents are members selected from the group consisting of nitro, amino, sulfo or cyano.

5,091,381

2H-1,3,4-BENZOTRIAZEPIN-2-ONES

Sun H. Kim, Chestnut Hill, and John E. Taylor, Upton, both of Mass., assignors to Biomeasure, Inc., Hopkinton, Mass.

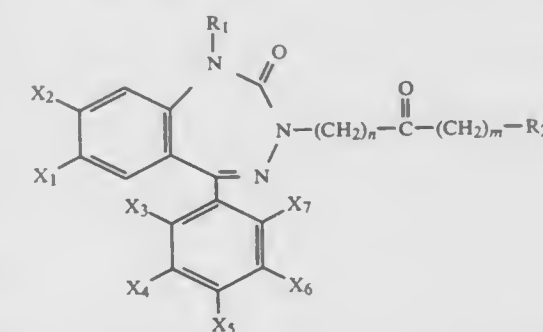
Filed Apr. 12, 1991, Ser. No. 684,715

Int. Cl. 5 C07D 255/04; A61K 31/55

U.S. Cl. 514-183

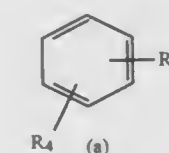
20 Claims

1. A compound of the formula 1:

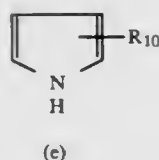
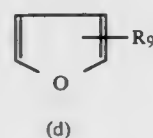
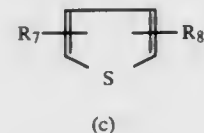
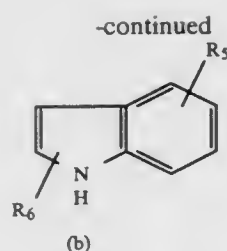


(I)

wherein each X , X_1 , X_2 , X_3 , X_4 , X_5 , X_6 , and X_7 , independently, is hydrogen, halogen (F , Cl , Br , I), C_1-C_4 straight or branched alkyl, C_1-C_4 alkoxy, C_1-C_4 alkylthio, hydroxy, nitro, cyano, amino, or trifluoromethyl; $R_1=H$, C_1-C_4 alkyl, cyclo C_3-C_5 alkyl, C_1-C_4 alkenyl, CH_2-CO_2H , or $CH_3-C=O$; R_2 is a member of the group of the formula (1a)



(1a)



wherein each R_3 , R_4 , R_7 , R_8 , R_9 , and R_{10} , independently, can be any of the groups listed as possibilities for X_1 - X_7 , and can be attached at any available ring carbon atom, said R_2 group being bonded to $(CH_2)_m$ in via any available ring carbon atom; $n=0$ or 1; and m =an integer between 0 and 4 provided that m is at least 1 when $n=0$.

5,091,382

CEPHALOSPORIN DERIVATIVES

Friedhelm Adam, Hofheim; Walter Dürckheimer, Hattersheim; Karl-Heinz Scheunemann, Frankfurt; Dieter Isert, Eschborn, Fed. Rep. of Germany, and Gerhard Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 13, 1990, Ser. No. 552,058

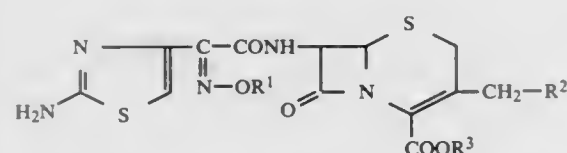
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923541

Int. Cl.⁵ C07D 501/36; A61K 31/545

U.S. Cl. 514-206

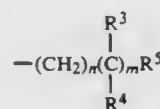
11 Claims

1. A cephalosporin derivative of the formula (I)



or a physiologically tolerable salt or acid addition salt thereof, in which

R^1 denotes hydrogen, unsubstituted or substituted C_1 - C_6 -alkyl, unsubstituted or substituted C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_3 - C_7 -cycloalkyl, C_4 - C_7 -cycloalkenyl, the group



in which m or n in each case denotes 0 or 1, R^3 and R^4 are

identical or different and denote hydrogen, aryl, a C_1 - C_4 -alkyl group or, together with the carbon atom to which they are bonded, form a methylene or a C_3 - C_7 -cycloalkylidene group; R^5 denotes a group $-CO_2R^6$ in which R^6 denotes hydrogen, C_1 - C_4 -alkyl or an equivalent of an alkali metal, alkaline earth metal or ammonium base or diisopropylamine, dicyclohexylamine or triethylamine; R^2 denotes a 5-thio-1,3-thiazole radical of the formula (II)



in which R^7 denotes hydrogen, carboxyl, C_1 - C_4 -alkoxycarbonyl or carbamoyl, in which the amino group is unsubstituted or is monosubstituted or disubstituted by C_1 - C_4 -alkyl or two of the alkyl groups on the nitrogen are closed to give a dimethylene to pentamethylene ring and R^3 denotes hydrogen, a physiologically tolerable cation or an easily cleavable ester group and in which the R^1O group is in the syn position.

5,091,383

SUBSTITUTED BRIDGED DIAZABICYCLOALKYL QUINOLONE CARBOXYLIC ACIDS

Martin R. Jefson, Oakdale, and Paul R. McGuirk, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 898,155, Aug. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 777,471, Sep. 18, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 157,182

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.⁵ A61K 31/47, 31/55; C07D 487/08, 519/00

U.S. Cl. 514-214

3 Claims

1. 1-(4-Fluorophenyl)-6-fluoro-7-(1,4-diazabicyclo[3.2.2]-non-4-yl)-1,4-dihydro-4-oxo-3-quinoline carboxylic acid.

5,091,384

ANTI-BACTERIAL QUINOLONE- AND NAPHTHYRIDONE-CARBOXYLIC ACID COMPOUNDS

Wan J. Kim; Myung H. Park; Jong H. Oh; Myung H. Jung, and Bong J. Kim, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea

Filed Oct. 19, 1990, Ser. No. 599,225

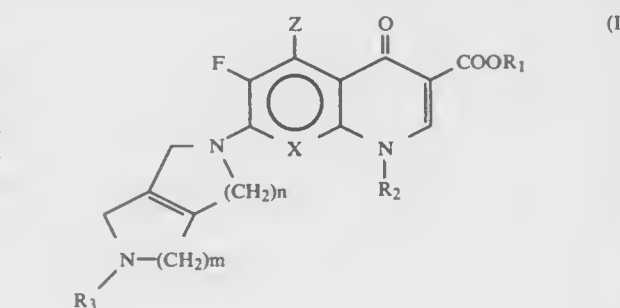
Claims priority, application Rep. of Korea, Oct. 23, 1989, 89-15202

Int. Cl.⁵ A61K 31/47, 31/435; C07D 215/56, 471/04

U.S. Cl. 514-215

3 Claims

1. A quinolone or naphthyridone compound of the formula



in which
X represents C—H, C—F or N,
Z represents hydrogen, halogen or amino,

R_1 represents hydrogen or a pharmaceutically acceptable cation,

R_2 represents alkyl, halogenated alkyl or hydroxyalkyl having 1 to 4 carbon atoms, vinyl, cycloalkyl having 3 to 6 carbon atoms or fluorophenyl,

R_3 represents hydrogen, lower alkyl or formyl,

m is an integer of 1 to 3, and

n is 1 or 2,

and, in case R_1 is hydrogen, pharmaceutically acceptable acid addition salts and the hydrates thereof.

5,091,385

PRE-ACTIVATED THERAPEUTIC AGENTS DERIVED FROM PHOTOACTIVE COMPOUNDS

Kirpal S. Gulliya; Shazib Pervaiz; J. Lester Matthews; Robert M. Dowben; Joseph T. Newman, and Edward Forest, all of Dallas, Tex., assignors to Baylor Research Institute, Dallas, Tex.

Filed Sep. 30, 1988, Ser. No. 252,256

Int. Cl.⁵ A61K 31/47, 31/535, 31/54

U.S. Cl. 514-224.8

35 Claims

1. A pre-activated therapeutic agent comprising:

(a) a pharmaceutically acceptable carrier;

(b) a photoactive compound dissolved in said pharmaceutically acceptable carrier producing a resultant solution, said photoactive compound being characterized in that it has at least one chromophore and that it is susceptible to activation by an activating agent; and

(c) said resultant solution being subjected to a sufficient amount of activating agent prior to being brought into contact with body tissue to be treated such that the photoactive compound is activated to produce a resultant therapeutic mixture, said therapeutic mixture being characterized in that, subsequent to activation, it has preferential affinity toward tumors or other pathogenic biological contaminants infecting said body tissue; that, subsequent to activation, it is capable of interacting with, and destroying, tumors or other pathogenic biological contaminants infecting said body tissue by contact therewith; that, subsequent to activation, it is, at effective dosages, relatively non-toxic to normal tissues or normal cells; and that its therapeutic properties are retained for at least a time sufficient to destroy said tumors or other pathogenic biological contaminants subsequent to activation.

5,091,386

7-SUBSTITUTED DERIVATIVES OF 3,5-DIHYDROXYHEPT-6-YNOIC ACIDS AND CORRESPONDING LACTONES AND THEIR USE AS HYPERCHOLESTEROLEMICS

Kurt Kesseler; Wilhelm Bartmann, both of Soden am Taunus; Günther Wess, Erlensee, and Erhold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 411,003

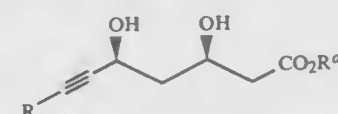
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832570

Int. Cl.⁵ C07D 213/55, 405/06; A61K 31/44

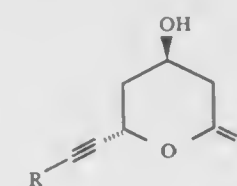
U.S. Cl. 514-277

8 Claims

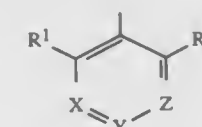
1. A compound of the formula I



or a corresponding lactone of the formula II



where, in formulae I and II, R is a radical of formula a



in which

R^1 and R^2 are, independently of one another, a straight-chain or branched alkyl or alkenyl radical having up to 6 carbon atoms, a saturated or up to doubly unsaturated cyclic hydrocarbon radical having 3-6 carbon atoms or a phenyl radical which is optionally substituted by 1-3 identical or different radicals selected from the group consisting of straight-chain or branched alkyl having up to 4 carbon atoms, halogen, alkoxy having up to 4 carbon atoms and hydroxyl, and

$X=Y-Z$ is a group of the formula $N=CR^4-CR^5$, in which

R^4 and R^5 are, independently of one another, hydrogen, a straight-chain or branched alkyl or alkenyl radical having up to 6 carbon atoms, a saturated or up to doubly unsaturated cyclic hydrocarbon radical having 3-6 carbon atoms or a phenyl radical which is optionally substituted by 1-3 identical or different radicals selected from the group consisting of straight-chain or branched alkyl having up to 4 carbon atoms, halogen, alkoxy having up to 4 carbon atoms and hydroxyl, and

R^0 is hydrogen, a straight-chain or branched alkyl radical having up to 6 carbon atoms, alkali metal or ammonium, or a physiologically tolerated salt thereof.

5,091,387

SPIROCYCLIC OXYTOCIN ANTAGONISTS

Ben E. Evans, Lansdale; Douglas J. Pettibone, Chalfont, and Roger M. Friedinger, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

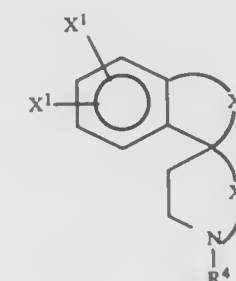
Continuation of Ser. No. 488,343, Mar. 2, 1990, abandoned. This application Aug. 5, 1991, Ser. No. 742,713

Int. Cl.⁵ A61K 31/445, 31/40; C07D 295/00

U.S. Cl. 514-278

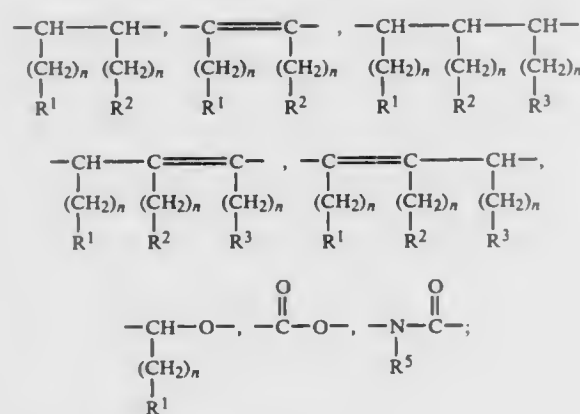
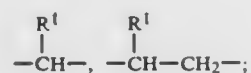
4 Claims

1. A compound having the formula:

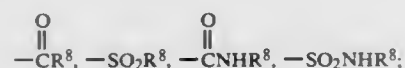


wherein:

X^1 is hydrogen, C_1 -6 linear or branched chain alkyl, lower alkenyl, lower alkynyl, $-X^4COOR^5$, $-X^5$ -cycloloweralkyl, $-X^4NR^6R^7$, $-X^4CONR^6R^7$, $-X^4CN$, $-X^4CF_3$, hydroxy, cyano, amino, nitro, loweracylamino, halogen or lower alkoxy;

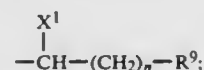
X² isX³ is $\text{---CH}_2\text{---}$, $\text{---CH}_2\text{---CH}_2\text{---}$,

R¹, R² and R³ are independently hydrogen, a C₁₋₆ linear or branch chained alkyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, or a substituted or unsubstituted phenyl wherein if the phenyl is substituted there may be 1 or 2 substituents, which may be at any position on the phenyl ring and the substituents are independently halogen, C₁₋₆ loweralkyl, C₁₋₆ loweralkoxy, carboxyl, cyano, loweralkylthio, carboxyloweralkyl, nitro, ---CF_3 or hydroxy;

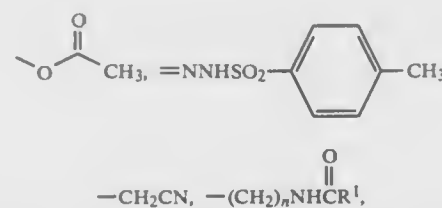
R⁴ is

R⁵ is H, loweralkyl, cycloloweralkyl, substituted or unsubstituted phenyl, wherein if the phenyl is substituted there may be 1 or 2 substituents which may be at any position on the phenyl ring and the substituents are independently halogen, C₁₋₆ loweralkyl, C₁₋₆ loweralkoxy, nitro, or CF_3 ;

R⁶ and R⁷ are independently R⁵ or in combination with the N of the NR⁶R⁷ group form an unsubstituted or mono or disubstituted, saturated or unsaturated, 4-7 membered heterocyclic ring containing a heteroatom selected from O and N or benzofused 4-7 membered heterocyclic ring containing a heteroatom selected from O and N or said heterocyclic ring and the substituent(s) is/are independently selected from C₁₋₄ alkyl;

R⁸ is $\text{---(CH}_2)_n\text{---}$, $\text{---(CH}_2)_n\text{---}$ 

R⁹ is substituted or unsubstituted phenyl wherein the substituents may be 1 or 2 of halo, loweralkyl, loweralkoxy, loweralkylthio, carboxyl, carboxyloweralkyl, nitro, ---CF_3 , hydroxy; 2-pyridyl, 3-pyridyl, 4-pyridyl; C₁₋₁₅ loweralkyl, cycloloweralkyl, C₅₋₁₄, C₅₋₁₄ bicycloloweralkyl, C₆₋₂₀ tricycloloweralkyl, any of which may contain O or N in place of one or two carbon atoms, and/or one or more double or triple bonds between adjacent carbon atoms, and any of which may be substituted or unsubstituted wherein the substituents may be independently 1 or 2 of ---OH , =O , =NOH , =NOCH_3 , ---NH---COCH_3 ,



---OR^1 , ---NR^1_2 , NHBoc, halogen, loweralkoxy, carboxy, carboalkoxy, carboxyloweralkyl, carboalkoxyloweralkyl, $(\text{CH}_2)_n\text{NR}^1_2$, substituted or unsubstituted phenyl wherein the substituents may be 1 or 2 of halo, loweralkyl, loweralkoxy, loweralkylthio, carboxyl, carboxyloweralkyl, nitro, ---CF_3 , hydroxy;

n is 0 to 4

X⁴ is absent or C₁₋₄ alkylene;X⁵ is absent or C₁₋₄ alkylene; O or NH;

or the pharmaceutically acceptable salts thereof.

5,091,388

PYRIDOBENZOINDOLE DERIVATIVES, THEIR PREPARATION AND COMPOSITIONS WHICH CONTAIN THEM

Emile Bisagni, Orsay, and Chi-Hung Nguyen, Massy, both of France, assignors to Rhone-Poulenc Sante, Antony Cedex, France

Filed Jun. 5, 1990, Ser. No. 533,416

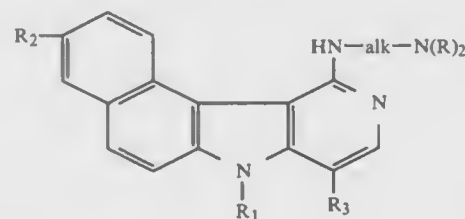
Claims priority, application France, Jun. 6, 1989, 89 07450; Apr. 25, 1990, 90 05059

Int. Cl.⁵ A61K 31/435; C07D 471/04, 221/00, 209/00

U.S. Cl. 514—285

6 Claims

1. A pyridobenzoindole derivative of formula:



in which

R denotes a hydrogen atom or an alkyl radical containing 1 or 2 carbon atoms, alk denotes a straight or branched alkylene radical containing 2 to 4 carbon atoms,

R₁ denotes a hydrogen atom or an alkyl radical containing 1 or 2 carbon atoms,

R₂ denotes a hydroxyl or methoxy radical, and

R₃ denotes an alkyl radical containing 1 or 2 carbon atoms, and its salts of addition with acids and including its hydrates and its isomeric forms and mixtures thereof.

5,091,389

LIPOPHILIC MACROLIDE USEFUL AS AN IMMUNOSUPPRESSANT

John Ondeyka, Fanwood; Otto Hensens, Red Bank, and Jerrold Liesch, Princeton Junction, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

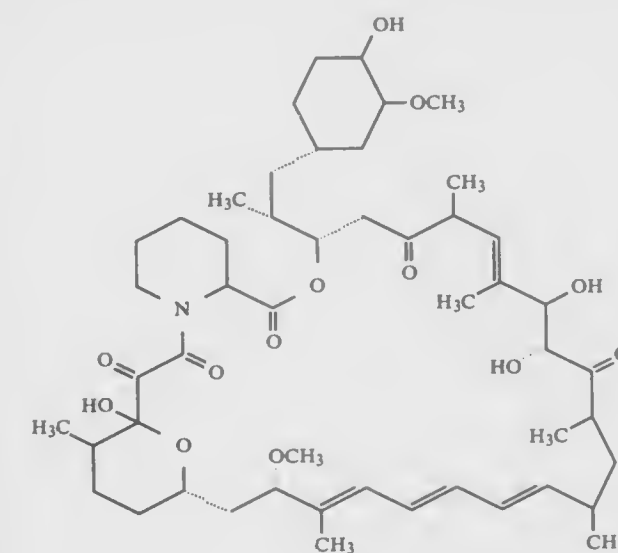
Filed Apr. 23, 1991, Ser. No. 690,407

Int. Cl.⁵ A61K 31/395; C07D 491/16

U.S. Cl. 514—291

3 Claims

1. A compound of Formula I,



or a pharmaceutically acceptable salt thereof.

5,091,390

TREATMENT OF CNS DISORDERS WITH 4,5,6,7-TETRAHYDRO-1H-IMIDAZO (4,5-)PYRIDINES AND ANALOGS

Robert J. Ardecky; Andrew T. Chiu, both of Landenberg, Pa.; John J. V. Duncia, Newark, Del.; Petrus B. M. W. M. Timmermans, Kennett Square, Pa., and Ruth R. Wexler, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

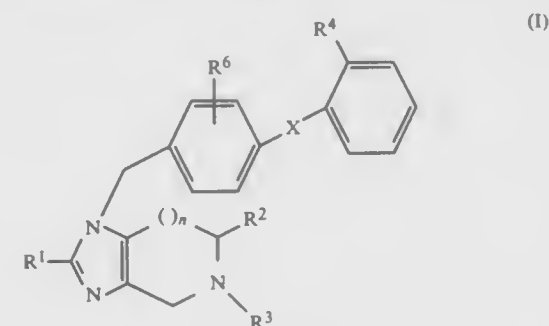
Filed Sep. 20, 1990, Ser. No. 585,422

Int. Cl.⁵ A61K 31/435; C07D 471/04

U.S. Cl. 514—303

24 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof; wherein

(1) R¹ is:

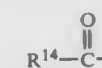
(a) H,

(b) halo,

(c) C₁₋₆ alkyl, or C₃₋₆ alkenyl or alkynyl,

(d) R¹⁴—(CH₂)_x—wherein x is one, two, three, four or five, and R¹⁴ is C₃₋₈ cycloalkyl, naphthyl, [heteroaryl], 2-, 3-, or 4-pyridyl; 1-, 2-, or 4-imidazolyl; 1-, 2-, 3-, 4-, 5-, 6- or 7-indolyl; 2-, or 3-pyraxolyl, phenyl unsubstituted or substituted with from one through five substituents comprising C₁₋₄ alkyl, halo, trifluoromethyl, hydroxy, C₁₋₄ alkoxy, lower acyloxy, amino, N-lower monoalkylamino, N,N-lower dialkylamino, lower thioalkyl, lower alkylsulfonyl, nitro or ---NH---COR^{10} wherein R¹⁰ is lower alkyl, phenyl unsubstituted or substituted with lower alkyl, or ---NHR^{11} wherein R¹¹ is H or C₁₋₄ alkyl,

(e)

wherein R¹⁴ is independently as defined above, or

(f) R¹⁴—CH(OH)—wherein R¹⁴ is independently as defined above;

(2) R² is

(a) $\text{---(CH}_2)_x\text{---OR}^7$ wherein R⁷ is H, C₁₋₄ alkyl, C₁₋₄ acyl, C₃₋₆ cycloalkyl, phenyl, or benzyl,

(b) $\text{---(CH}_2)_x\text{---NR}^8$ wherein R⁸ is independently as defined above and R⁸ is H, C₁₋₄ alkyl, phenyl, benzyl, or C₁₋₄ acyl,

(c) $\text{---(CH}_2)_x\text{---OC}_5\text{H}_{11}$,

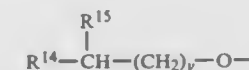
(d) ---CHO

(e) ---CN ,

(f) ---COOR^9 wherein R⁹ is hydrogen, C₁₋₄ alkyl or benzyl; unsubstituted or substituted with from one through five substituents, comprising alkyl, halo, trifluoromethyl, amino, N-lower monoalkylamino, N,N-lower dialkylamino, lower thioalkyl, lower alkylsulfonyl, OH, or C₁₋₄ alkoxy, or nitro.

(iii) $\text{---(CH=CR}^{12})\text{---R}^{16}$, is hydrogen or lower alkyl and R¹⁶ is

(a) alkyl of from four to twenty carbons, inclusive,

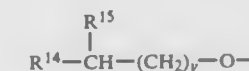


(b) wherein y, R¹⁴ and R¹⁵ are, independently, as defined above, and

(iv) R¹⁴(CH₂)_yR¹⁴ and R¹² are, independently, as defined above,

(v) R¹⁴—(CH₂)_y—O—wherein y and R¹⁴ are independently as defined above,

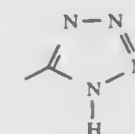
(vi)



wherein R¹⁴, R¹⁵, and y are independently as defined above,

(d) SO₂R⁵ wherein R⁵ is, independently, as defined above;

(4) R⁴ is $\text{---CO}_2\text{H}$, $\text{---NHSO}_2\text{CF}_3$, or



5,091,391

METHOD OF RESISTING NEURODEGENERATIVE DISORDERS

Elias Aizenman, Pittsburgh, Pa.; Paul A. Rosenberg, Newton, and Paul M. Gallop, Chestnut Hill, both of Mass., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Aug. 16, 1990, Ser. No. 568,301

Int. Cl.⁵ A61K 31/47

U.S. Cl. 514—311

15 Claims

1. A method of resisting neurological damage in a subject caused by overstimulation of the NMDA receptors of nerve cells by glutamate comprising,

administering to said subject an effective dose of the oxidizing agent pyrroloquinoline quinone to thereby diminish

the activity of NMDA receptors after activation by glutamate.

5,091,392

SUBSTITUTED

(QUINOLIN-2-YL-METHOXY)PHENYL-ACYL-SULPHONAMIDES AND -CYANAMIDES, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN MEDICAMENTS

Siegfried Raddatz, Cologne; Klaus-Helmut Mohrs, Wuppertal; Romanis Fruchtmann, Cologne; Christian Kohlsdorfer, Erfstadt; Pia Theisen-Popp, and Reiner Müller-Peddinghaus, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 1, 1990, Ser. No. 517,108

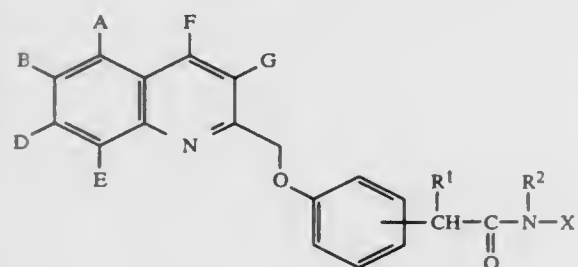
Claims priority, application Fed. Rep. of Germany, May 23, 1989, 3916663

Int. Cl.⁵ A61K 31/47; C07D 215/00, 215/12, 215/16

U.S. Cl. 514—311

17 Claims

1. A (quinolin-2-yl-methoxy)phenylacyl-sulphonamide or -cyanamide of the formula



in which

A, B, D, E, F and G are identical or different and represent hydrogen, hydroxyl, halogen, carboxyl, nitro, trifluoromethyl, trifluoromethoxy or a group of the formula —NR³R⁴, in which R³ and R⁴ are identical or different and denote hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or aryl having 6 to 10 carbon atoms,

represent straight-chain or branched alkyl, alkoxy or alkoxycarbonyl, in each case having up to 12 carbon atoms, and each of which is unsubstituted or substituted by hydroxyl, halogen, nitro, cyano or a group of the formula —NR³R⁴, in which R³ and R⁴ have the above-mentioned meanings,

represent aryl having 6 to 10 carbon atoms, which is unsubstituted or substituted by halogen, hydroxyl, nitro, cyano, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms or by a group of the formula —NR³R⁴, in which R³ and R⁴ have the above-mentioned meanings,

R¹ represents cycloalkyl having 3 to 8 carbon atoms, which is unsubstituted or substituted by straight-chain or branched alkyl having up to 8 carbon atoms,

R² represents hydrogen or straight-chain or branched alkyl having up to 10 carbon atoms, which is unsubstituted or substituted by hydroxyl, alkoxy having up to 8 carbon atoms, halogen or by cycloalkyl having 3 to 8 carbon atoms or aryl having 6 to 10 carbon atoms, which in turn is unsubstituted or substituted by straight-chain or branched alkyl having up to 8 carbon atoms, halogen, nitro, hydroxyl or cyano, or

represents cycloalkyl having 3 to 8 carbon atoms which is unsubstituted or substituted by straight-chain or branched alkyl having up to 8 carbon atoms, or represents an alkali metal,

X represents a group of the formula —SO₂—R⁵, in which R⁵ is trifluoromethyl or straight-chain or branched alkyl having up to 10 carbon atoms, which is unsubstituted or

substituted by hydroxyl, halogen, cyano, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms or by aryl having 6 to 10 carbon atoms, which is unsubstituted or substituted by halogen, nitro, cyano or straight-chain or branched alkyl or alkoxy in each case having up to 8 carbon atoms, or

is aryl having 6 to 10 carbon atoms, which is unsubstituted or substituted by halogen, nitro, cyano, hydroxyl, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, trifluoromethyl or trifluoromethoxy, or

X represents cyano

or a physiologically acceptable salt thereof.

5,091,393

TERTIARY 2,5-DIALKYL-3-PHENYLPYPERIDINE DERIVATIVES HAVING OPIATE-ANTAGONISTIC ACTIVITY

Jacobus A. Den Hartog; Ineke Van Wijngaarden, and Martinus T. Tulp, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation of Ser. No. 215,559, Jul. 6, 1988, abandoned. This application May 29, 1990, Ser. No. 528,895

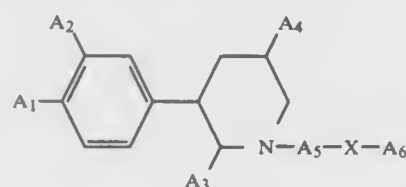
Claims priority, application Netherlands, Jul. 9, 1987, 8701617

Int. Cl.⁵ A61K 31/445; C07D 211/20

U.S. Cl. 514—317

4 Claims

1. Compounds of formula 4



and salts thereof, wherein

A₁ is an optionally esterified hydroxyl group wherein the esterifying group is acetate or benzoate;

A₂ is hydrogen;

A₃ and A₄ independently of each other are straight or branched alkyl or alkenyl having 1-6 C-atoms;

A₅ is alkylene having 3-5 C-atoms;

X is carbonyl or the group —CH(OH)—; and

A₆ is cyclohexyl or phenyl.

5,091,394

BENZOYLGUANIDINES, A PROCESS FOR THEIR PREPARATION, THEIR USE AS MEDICAMENTS AND MEDICAMENTS CONTAINING THEM

Heinrich C. Englert; Hans-Jochen Lang, both of Hofheim am Taunus; Wolfgang Linz, Mainz; Bernward Schölkens, Kelheim, and Wolfgang Scholz, Eschborn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 4, 1990, Ser. No. 576,937

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929582

Int. Cl.⁵ A61K 31/445; C07D 211/28; C07C 279/10

U.S. Cl. 514—331

3 Claims

1. A benzoylguanidine compound having the formula 3-methylsulfonyl-4-(1-piperidinyl)benzoylguanidine, or a pharmacologically tolerable salt thereof.

5,091,395

HETEROCYCLIC COMPOUNDS AND THEIR PHARMACEUTICAL FORMULATION

Claudio Semeraro, Bresso; Dino Micheli, Modena; Daniele Pieracciolli; Giovanni Gaviraghi, both of Verona, all of Italy, and Alan D. Borthwick, London, England, assignors to Glaxo S.p.A., Verona, Italy

Continuation of Ser. No. 897,351, Aug. 18, 1986, abandoned.

This application Nov. 4, 1988, Ser. No. 270,487

Claims priority, application Italy, Aug. 21, 1985, 21959 A/85; Feb. 20, 1986, 19479 A/86

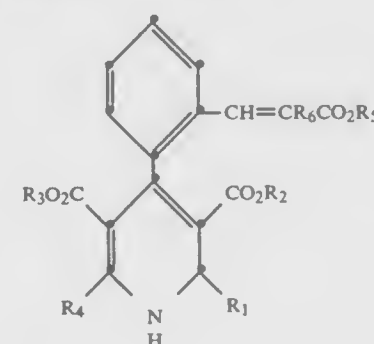
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.⁵ C07D 211/86; A61K 31/455

U.S. Cl. 514—356

18 Claims

1. A compound of the formula (I)



wherein

R₁ and R₄ independently represent a C₁₋₄ alkyl group; R₂ and R₃ independently represent a C₁₋₆ straight or branched chain alkyl or alkoxyalkyl group;

R₅ represents a C₁₋₁₃ straight or branched chain alkyl group or a C₅₋₈ cycloalkyl group which may be substituted by a C₁₋₃ alkyl group; and

R₆ represents a halogen atom or a straight or branched C₁₋₃ alkyl group.

5,091,396

PYRIDYL PEPTIDE MIMETIC COMPOUNDS WHICH ARE USEFUL PLATELET-AGGREGATION INHIBITORS

Foe S. Tjoeng, Manchester; Steven P. Adams, St. Charles, both of Mo.; Robert B. Garland, and Masateru Miyano, both of Northbrook, Ill., assignors to Monsanto Co., St. Louis, Mo. and G. D. Searle & Co., Skokie, Ill.

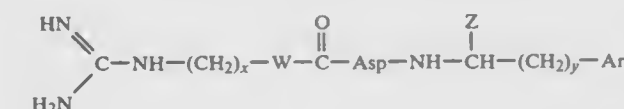
Division of Ser. No. 513,532, Apr. 23, 1990, Pat. No. 5,037,808, which is a continuation-in-part of Ser. No. 395,614, Aug. 8, 1989, abandoned, which is a division of Ser. No. 221,703, Jul. 20, 1988, Pat. No. 4,879,313. This application Jan. 7, 1991, Ser. No. 637,728

Int. Cl.⁵ A61K 31/44; C07D 213/02

U.S. Cl. 514—357

8 Claims

1. A peptide mimetic compound having the following chemical structure:



wherein

x=4 to 8,

y=0 to 4,

W=CH₂—CH₂ or CH=CH,

Z=H, COOH, CONH₂, CH₂OH, CO₂R, CH₂OR or C₁₋₆ alkyl,

R=C₁₋₆ alkyl,

Ar=a pyridyl group, and

Asp=aspartic acid residue.

5,091,397

1-AZA-BICYCLICO(2.2.1)HEPTANES

(I) Harry J. Wadsworth; Michael S. Hadley; Paul A. Wyman, and Sarah M. Jenkins, all of Harlow, England, assignors to Beecham Group p.l.c., Brentford, England

Filed Sep. 29, 1989, Ser. No. 415,123

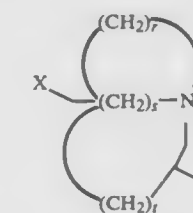
Claims priority, application United Kingdom, Oct. 3, 1988, 8823142; Sep. 7, 1989, 8920073

Int. Cl.⁵ C07D 487/08; A61K 31/41, 31/42, 31/425

U.S. Cl. 514—359

9 Claims

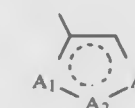
1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



in which one of X and Y represents hydrogen and the other represents —CH₂—Z where Z is a group



in which Q represents a 3-membered divalent residue completing a 5-membered aromatic ring and comprises one or two heteroatoms selected from oxygen, nitrogen and sulphur, or three nitrogen atoms, any amino nitrogen being optionally substituted by a C₁₋₂ alkyl, cyclopropyl or propargyl group, and any ring carbon atom being optionally substituted by a group R₁; or a group



in which A₁, A₂ and A₃ complete a 5-membered aromatic ring and A₁ is oxygen or sulphur, one of A₂ and A₃ is CR₂ and the other is nitrogen or CR₃, or A₂ is oxygen or sulphur, one of A₁ and A₃ is CR₂ and the other is CR₃; and R₁, R₂ and R₃ are independently selected from hydrogen, halogen, CN, OR₄, SR₄, N(R₄)₂, NHCOR₄, NHCOOCH₃, NHCOOC₂H₅, NHOR₄, NHHN₂, NO₂, COR₄, COR₅, C₂₋₄ alkenyl, C₂₋₄ alkynyl, cyclopropyl or C₁₋₂ alkyl optionally substituted with OR₄, N(R₄)₂, SR₄, CO₂R₄, CON(R₄)₂ or one, two or three halogen atoms, in which each R₄ is independently hydrogen or C₁₋₂ alkyl and R₅ is OR₄, NH₂ or NHR₄; r represents an integer of 2 s represents an integer of 1 and t represents 0.

5,091,398

SUBSTITUTED 1,2,3,4-OXATRIAZOLIUM-5-OLATES, A PROCESS FOR THEIR PREPARATION AND THEIR USE
Karl Schönaufinger, Alzenau; Helmut Bohn, Schöneck; Rudi Beyerle, Frankfurt, and Melitta Just, Nidderau, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 506,441

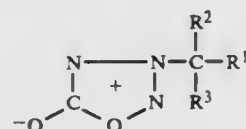
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1989, 3911668

Int. Cl.⁵ C07D 273/01; A61K 31/41

U.S. Cl. 514—361

9 Claims

1. 1,2,3,4-Oxatriazolium-5-substituted in the 3-position, of the general formula I



in which

R¹ denotes (C₂ to B₄) alkyl, R² denotes (C₂ to C₄) alkyl, and R³ denotes (C₁ to C₄) alkyl.

5,091,399

ANTIMICROBIAL COMPOUNDS AND METHODS OF USE

Peter Osei-Gyimah, Horsham, Pa., and Samuel E. Sherba, Wilmington, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

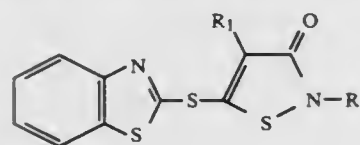
Filed Dec. 10, 1990, Ser. No. 625,284

Int. Cl.⁵ C07D 417/12; A61K 31/425

U.S. Cl. 514—367

13 Claims

1. Compound or salt thereof having the formula



wherein

R is (C₁—C₁₈)alkyl, (C₃—C₈)cycloalkyl, (C₆—C₁₈)aryl, (C₇—C₁₈)aralkyl, or (C₇—C₁₈)alkaryl, provided that aryl or the aryl portion of said aralkyl or alkaryl are optionally substituted with halo or methyl; and R₁ is H, Cl or methyl.

5,091,400

CLATHRATE COMPOUND

Minoru Yagi, Kanagawa, and Fumio Toda, Onsen, both of Japan, assignors to Kurita Water Industries Ltd., Tokyo, Japan
Continuation of Ser. No. 453,943, Dec. 20, 1989, abandoned.
This application Aug. 7, 1990, Ser. No. 563,945

Claims priority, application Japan, Dec. 28, 1988, 63-334259

Int. Cl.⁵ A01N 31/04, 43/80

U.S. Cl. 514—372

2 Claims

1. A clathrate compound comprising 2,2'-bis(alpha-hydroxydiphenylmethyl)biphenyl as a host compound and an antimicrobial effective amount of 5-chloro-2-methyl-4-isothiazolin-3-one as a guest compound.

5,091,401

1-HALOVINYLAZOLES AND FUNGICIDES CONTAINING THEM

Rainer Seele; Reiner Kober, both of Fussgoenheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 2, 1990, Ser. No. 546,879

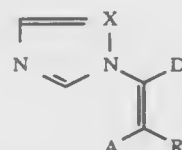
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923153

Int. Cl.⁵ A01N 43/653; C07D 249/08

U.S. Cl. 514—383

6 Claims

1. A compound selected from the group consisting of those of the formula I



wherein A is 4-fluorophenyl and R is selected from the group consisting of phenyl, substituted phenyl, biphenyl, substituted biphenyl, naphthyl, and substituted naphthyl, wherein the substituents are 1 to 3 substituents selected from the group consisting of halo, nitro, phenoxy, amino, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and haloalkyl of 1 to 4 carbon atoms;

D is selected from the group consisting of chloro and bromo;

and

X is N;

a plant tolerated acid addition salt thereof, and a metal complex thereof.

2. A fungicidal composition containing a carrier and a fungicidally effective amount of a compound of claim 1.

5,091,402

USE OF SUBSTITUTED IMIDAZOLES

Eija Kalso, Espoo, and Risto Lammintausta, Turku, both of Finland, assignors to Orion-Yhtymä OY, Espoo, Finland
Filed Oct. 17, 1990, Ser. No. 599,189

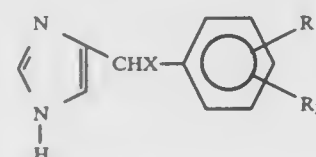
Claims priority, application Finland, Oct. 17, 1989, 894911

Int. Cl.⁵ A61K 31/415

U.S. Cl. 514—396

4 Claims

1. A method for obtaining analgesia in a mammal in whom analgesia without sedation is desired comprising local epidural or intraspinal administration to said mammal of a compound which is an imidazole of the formula (I):



where X is H or CH₃ and R₁ and R₂, which can be the same or different, are H or CH₃, a stereoisomer thereof or a non-toxic, pharmaceutically acceptable salt thereof, in an amount effective to achieve the desired level of analgesia.

5,091,403

SULFINYL IMIDAZOLE DERIVATIVES AND ANTIULCER AGENTS CONTAINING THE SAME
Susumu Okabe, Kyoto; Mitsuo Masaki; Tomio Yamakawa, both of Chiba; Hitoshi Matsukura, Saltama, and Yutaka Nomura, Chiba, all of Japan, assignors to Nippon Chemphar Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,975

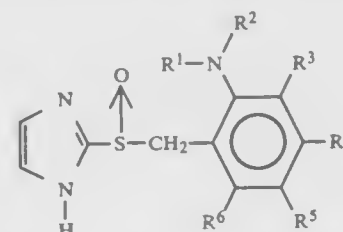
Claims priority, application Japan, Aug. 10, 1989, 1-209192

Int. Cl.⁵ A61K 31/415; C07D 233/84

U.S. Cl. 514—398

6 Claims

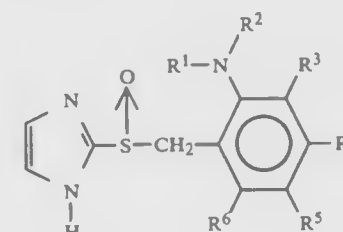
1. An imidazole derivative having the formula (I):



wherein:

R¹ is hydrogen or an alkyl group having 1-6 carbon atoms, R² is an alkyl group having 2-6 carbon atoms of which one hydrogen is substituted with an alkoxy group having 1-4 carbon atoms, each of R³, R⁴, R⁵ and R⁶ independently is hydrogen, a halogen, an alkyl group having 1-6 carbon atoms, an alkoxy group having 1-6 carbon atoms, a fluorine-substituted alkyl group having 1-6 carbon atoms, or a fluorine-substituted alkoxy group having 1-6 carbon atoms.

6. An anti-ulcer composition containing an effective amount of an imidazole derivative having the formula (I):



wherein R¹ is hydrogen or an alkyl group having 1-6 carbon atoms, R² is an alkyl group having 2-6 carbon atoms of which one hydrogen is substituted with an alkoxy group having 1-4 carbon atoms, each of R³, R⁴, R⁵ and R⁶ independently is hydrogen, a halogen, an alkyl group having 1-6 carbon atoms, an alkoxy group having 1-6 carbon atoms, a fluorine-substituted alkyl group having 1-6 carbon atoms, or a fluorine-substituted alkoxy group having 1-6 carbon atoms, as an active ingredient and an inert carrier.

5,091,404

METHOD FOR RESTORING FUNCTIONALITY IN MUSCLE TISSUE

Salwa A. Elgebaly, 22 Silo Way, Bloomfield, Conn. 06002

Filed Oct. 5, 1990, Ser. No. 593,073

Int. Cl.⁵ A61K 31/415

U.S. Cl. 514—401

14 Claims

1. A method of preserving and/or restoring the physiological functionality of in vivo animal muscle tissue subject to ischemia comprising the step of administering cyclocreatine in an amount effective for restoring post-ischemic physiological function to said tissue to a substantially pre-ischemic level.

5,091,405

INSECTICIDAL PYRAZOLINES

Thomas M. Stevenson, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US88/00001, § 371 Date May 12, 1989, § 102(e) Date May 12, 1989, PCT Pub. No. WO88/05046, PCT Pub. Date Jul. 14, 1988

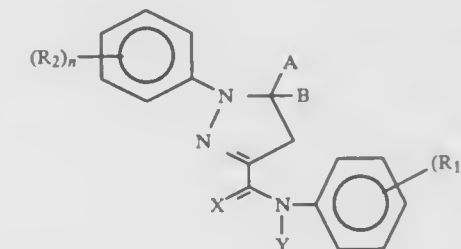
and a continuation-in-part of Ser. No. 113,530, Oct. 28, 1987, abandoned. This PCT application Jan. 4, 1988, Ser. No. 378,529

Int. Cl.⁵ C07D 231/06; A01N 43/56

U.S. Cl. 514—403

21 Claims

1. A compound having the following formula, and agriculturally suitable salts thereof:



wherein:

X is O or S;

Y is H, C₁ to C₄ alkyl, C₂ to C₄ alkoxyalkyl, C₁ to C₄ alkylthio, C₁ to C₄ haloalkylthio, phenylthio, or phenylthio substituted with 1 to 3 substituents independently selected from W, C₂ to C₄ alkoxyalkyl, C(O)H, C₂ to C₄ alkylcarbonyl or C₂ to C₄ haloalkylcarbonyl;

A is H, C₁ to C₆ alkyl, phenyl, phenyl substituted by (R₃)_n, CN, CO₂R₃, C(O)R₃, C(O)NR₃R₄, C(S)NR₃R₄, C(S)R₃ or C(S)SR₃;

B is H, C₁ to C₆ alkyl, C₁ to C₆ haloalkyl, C₂ to C₆ alkoxyalkyl, C₂ to C₆ cyanoalkyl, C₃ to C₈ alkoxyalkyl, C₂ to C₆ alkenyl, C₂ to C₆ alkynyl, C₂ to C₆ alkoxyalkyl, phenyl, phenyl substituted with 1 to 3 substituents independently selected from W, benzyl or benzyl substituted with 1 to 3 substituents independently selected from W;

W is halogen, CN, NO₂, C₁ to C₂ alkyl, C₁ to C₂ haloalkyl, C₁ to C₂ alkoxy, C₁ to C₂ haloalkoxy, C₁ to C₂ alkylthio, C₁ to C₂ haloalkylthio, C₁ to C₂ alkylsulfonyl or C₁ to C₂ haloalkylsulfonyl;

R₁, R₃ and R₅ are independently R₃, halogen, CN, N₃, SCN, NO₂, OR₃, SR₃, S(O)R₃, S(O)₂R₃, OC(O)R₃, OS(O)₂R₃, CO₂R₃, C(O)R₃, C(O)NR₃R₄, S(O)₂NR₃R₄, NR₃R₄, NR₄C(O)R₃, OC(O)NHR₃, NR₄C(O)NHR₃, NR₄S(O)₂R₃, or when m, n or p is 2, R₁, R₂ or R₅, individually can be taken together as —OCH₂O—, —OCF₂O—, —OCH₂CH₂O—, —CH₂C(CH₃)₂O—, —OCF₂CF₂O—, or —CF₂CF₂O— to form a cyclic bridge; provided R₁ is never H or C₁ to C₄ alkyl;

R₃ is H, C₁ to C₄ alkyl, C₁ to C₄ haloalkyl, C₂ to C₄ alkenyl, C₂ to C₄ haloalkenyl, C₂ to C₄ alkynyl, C₂ to C₄ haloalkynyl, C₂ to C₄ alkoxyalkyl, C₂ to C₄ alkylthioalkyl, C₁ to C₄ nitroalkyl, C₂ to C₄ cyanoalkyl, C₃ to C₆ alkoxyalkyl, C₃ to C₆ cycloalkyl, C₃ to C₆ halocycloalkyl, phenyl, benzyl, or phenyl or benzyl substituted with 1 to 3 substituents independently selected from W;

R₄ is H or C₁ to C₄ alkyl, or when R₃ and R₄ are attached to a single nitrogen atom, they can be taken together as (CH₂)₄, (CH₂)₅ or (CH₂CH₂OCH₂CH₂);

m is 1 to 3;

n is 0 to 3; and

p is 0 to 3.

5,091,406

PROLINAL DERIVATIVES

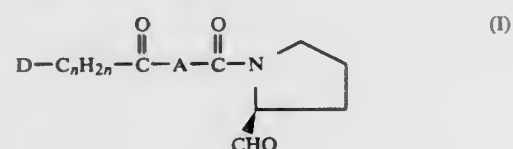
Masaaki Toda, Osaka; Shuichi Ohuchida, Kyoto, and Hiroyuki Ohno, Shiga, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 151,862, Feb. 3, 1988, Pat. No. 4,977,180. This application Feb. 7, 1990, Ser. No. 479,493

Claims priority, application Japan, Feb. 4, 1987, 62-22407

Int. Cl.⁵ A61K 31/40; C07D 405/06, 409/06, 405/08 U.S. Cl. 514-422 5 Claims

1. A prolinal derivative of the formula:



wherein A represents alkylene group of from 1 to 4 carbon atom(s) or saturated hydrocarbon ring of from 3 to 7 carbon atoms, n represents a number 2, 3 or 4, D represents heterocyclic ring selected from the group consisting of furan, thiophene, pyran, benzofuran, benzothiophene, chromene and xanthene ring, wherein said heterocyclic ring represented by D is unsubstituted or substituted by from one to three of halogen atom, alkyl group of from 1 to 4 carbon atoms, alkoxy group of from 1 to 4 carbon atom(s), nitro group or trifluoromethyl group.

5,091,407

HETEROCYCLIC COMPOUNDS AS FUNGICIDES

Paul deFraine, Workingham; Brian K. Snell, Reading; Kevin Beauteament, Wokingham, and Vivienne M. Anthony, Maidenhead, John M. Clough, Marlow, all of the United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation of Ser. No. 872,687, Jun. 10, 1986, abandoned.

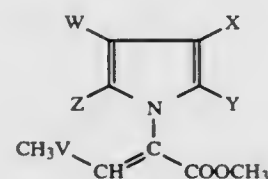
This application Nov. 24, 1989, Ser. No. 442,436

Claims priority, application United Kingdom, Jun. 18, 1985, 8515385; Apr. 17, 1986, 8609453

Int. Cl.⁵ A01M 43/36; C07D 207/327

U.S. Cl. 514-423 7 Claims

4. A compound of formula:



and stereoisomers thereof, wherein W, X and Y are independently hydrogen, halogen, nitro, nitrile, C₁₋₄ alkyl, C₃₋₆ alkenyl, C₃₋₆ alkynyl, phenyl, phenyl(C₁₋₄) alkyl, C₁₋₄ alkoxy, phenoxy, phenoxy(C₁₋₄)alkyl, amino, COOR³, CONR⁴R⁵, COR⁶, S(O)_nR⁷ where n is 0, 1 or 2, or CR⁸=NR⁹; Z is COOR³, CONR⁴R⁵ or COR⁶; R³, R⁴, R⁵, R⁶, R⁷ and R⁸ are C₁₋₄ alkyl, C₃₋₆ cycloalkyl, C₃₋₆ cycloalkenyl, C₃₋₄ alkynyl, phenyl or phenyl(C₁₋₄)alkyl, in which the phenyl rings are optionally substituted with C₁₋₄ alkyl, C₁₋₄ alkoxy, halogen, halo(C₁₋₄)alkyl, C₃₋₆ cycloalkyl, C₃₋₆ cycloalkenyl, phenyl, cyano or nitro; R⁹ is C₁₋₄ alkyl, C₃₋₆ cycloalkyl, phenyl, phenyl(C₁₋₄)alkyl, or 3-6 cycloalkyl(C₁₋₄)alkyl; and V is oxygen or sulphur.

5,091,408

FUNGICIDAL 3-CYANO-4-PHENYL-PYRROLES

Detlef Wollweber, Wuppertal; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänsler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

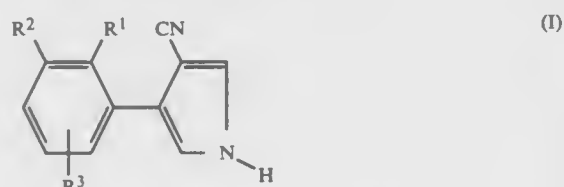
Filed Apr. 6, 1990, Ser. No. 506,414

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 3912156

Int. Cl.⁵ C07D 207/34; A01N 43/36

U.S. Cl. 514-427 6 Claims

1. A 3-cyano-4-pyrrole of the formula



in which

one of R¹ and R² is CF₃ and the other is alkyl having 1 to 4 carbon atoms or CF₃, and R³ is H or F.

5,091,409

4-ALKYLAMINO-6-(C₃₋₅-HYDROCARBYL)THIENO[2,3-B]THIOPYRAN-2-SULFONAMIDE-7,7-DIOXIDES

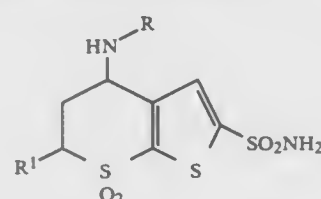
John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, Lansdale; Kenneth L. Shepard, North Wales, and Theresa M. Williams, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 17, 1990, Ser. No. 524,523

Int. Cl.⁵ A61K 31/38; C07D 335/04

U.S. Cl. 514-434 10 Claims

1. A compound of structural formula:



or diastereomers or enantiomers or mixtures thereof or an ophthalmologically acceptable salt thereof wherein:

R is ethyl, n-propyl or isopropyl; and

R¹ is

- C₃₋₅ alkyl,
- C₃₋₅ alkenyl, or
- C₃₋₅ alkynyl.

5,091,410

THIOXANTHENE ANTITUMOR AGENTS

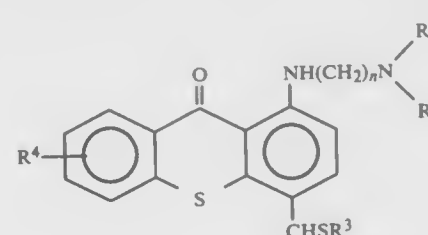
Theodore C. Miller, East Greenbush, N.Y., and Michael E. Ross, Haverford Township, Delaware County, Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed Jun. 10, 1991, Ser. No. 713,172

Int. Cl.⁵ A61K 31/38; C07D 335/16

U.S. Cl. 514-437 9 Claims

1. A compound of formula



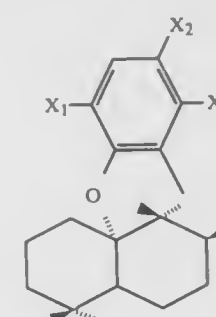
wherein

n is 2 or 3;

R¹ and R² are independently lower-alkyl;

R³ is lower-alkyl; and

R⁴ is hydrogen, lower-alkyl, lower-alkoxy or halogen.



wherein X₁=OR or H, wherein R may be H, Ac, p-bromobenzoyl, tosyl, mesyl, or lower alkyl (C₁ to C₅); X₂=H or OH; and X₃=H or OCH₃.

5,091,411

ANTIBIOTIC AGENT

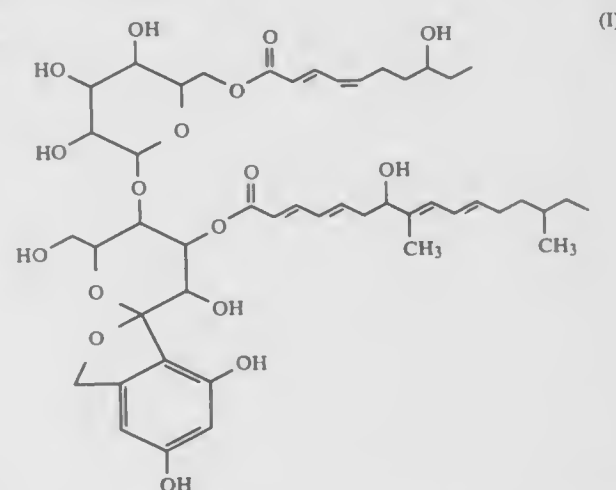
George M. Garrity, Westfield, N.J.; Sagrario M. Del Val, Madrid, Spain; Mary Nallin, Westfield, N.J.; Dennis M. Schmatz, Cranford, N.J.; Jack L. Smith, Colonia, N.J.; Frank L. VanMiddlesworth, Fanwood, N.J.; Kenneth E. Wilson, Westfield, N.J., and Marcia M. Zweerink, Shrewsbury, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1990, Ser. No. 479,482

Int. Cl.⁵ A61K 31/35; C07D 309/10

U.S. Cl. 514-460 9 Claims

1. A compound having the formula



wherein

R¹ is butyl, pentyl or hexyl;

R² is hydrogen, hydroxyl, or O-arabinose; and

X is a pharmaceutically acceptable inorganic acid ion or organic acid ion; or a mixture thereof.

5,091,412

ANTIVIRAL TERPENE HYDROQUINONES AND METHODS OF USE

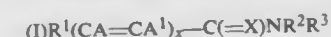
Amy S. Wright, Fort Pierce, Fla.; Sue S. Cross, both of Fort Pierce, Fla.; Neal S. Burres, Highland Park, Ill., and Frank Koehn, Fort Pierce, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

Continuation-in-part of Ser. No. 480,996, Feb. 16, 1990, Pat. No. 5,051,519. This application Jul. 6, 1990, Ser. No. 548,784

Int. Cl.⁵ A61K 31/35

U.S. Cl. 514-453 8 Claims

1. A process for inhibiting or killing viruses, said process comprising the administration to a person, animal or surface hosting a virus, of an effective antiviral amount of a compound having the following structure



5,091,414

PESTICIDAL COMPOUNDS

Malcolm H. Black; Robert J. Blade, and Robert J. Peek, all of Berkhamsted, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

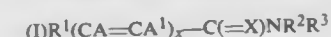
Division of Ser. No. 940,561, Dec. 11, 1986, Pat. No. 5,037,813.

This application Nov. 29, 1990, Ser. No. 619,872

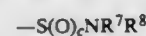
Int. Cl.⁵ A01N 47/24; C07C 271/08, 381/08

U.S. Cl. 514-478 9 Claims

1. A compound of formula (I):



wherein R^1 is C_{1-13} alkyl unsubstituted or substituted by a group selected from lower alkoxy, lower alkenyl, lower alkynyl, lower alkenyloxy, lower alkynyloxy, aryl, aryloxy, and aryl(lower)alkoxy, where the aryl group in the said aryl, aryloxy or arylalkoxy groups is phenyl, tetrahyde, indanyl or naphthyl, any of which may be substituted by one or more of halogen, lower alkyl, halo(lower)alkyl, halo(lower)alkoxy, halo, lower alkoxy and lower alkenyl; $x=1$ or 2 ; $X=O$ or S ; each A and A^1 is independently hydrogen, lower alkyl or halo(lower)alkyl; R^2 is C_{1-5} alkyl, C_{2-5} alkenyl or dioxalanyl-methyl and R^3 is:



where c is $0, 1$ or 2 , R^7 is $-CO_2R^9$ where R^9 is lower alkyl or lower alkyl substituted by lower acyl, carbo(lower)alkoxy or cyano, and R^8 is lower alkyl.

5,091,415

THIOFORMAMIDINES, THEIR PREPARATION AND USE AS MEDICAMENTS

Jean F. Patoiseau, Castres; Jean-Marie Autia, Labruguiere; Henri Cousse, Castres; Véronique Sales, Dijon; Jacky Tisne-Versailles, Castres, and Jean-Pierre Ball, Montpellier Cédex, all of France, assignors to Pierre Fabre Medicament, Paris, France

Division of Ser. No. 404,337, Sep. 7, 1989, Pat. No. 5,025,015. This application Oct. 15, 1990, Ser. No. 597,051

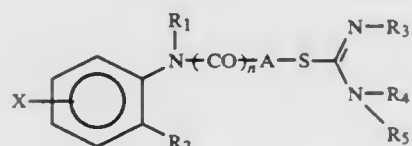
Claims priority, application France, Sep. 8, 1988, 88 11747

Int. Cl.⁵ A61K 31/21; C07C 335/00

U.S. Cl. 514—506

7 Claims

1. A thioformamidine selected from those having formula I:



in which:

R^1 represents hydrogen or lower-alkyl containing 1 to 4 carbon atoms, inclusive,

R^2 represents benzoyl, benzyl, or alpha-hydroxy-benzyl, the aromatic ring being optionally substituted by a halogen atom,

R^3 and R^4 , which are identical or different, represent hydrogen, lower C_{1-4} alkyl, or lower C_{1-4} alkenyl,

R^5 represents hydrogen or lower-alkyl containing 1 to 4 carbon atoms, inclusive,

n equal 0 to 1;

A represents a linear or branched alkylene group having 1 to 4 carbon atoms, inclusive,

X represents hydrogen, halogen, lower C_{1-4} alkyl, lower C_{1-4} alkoxy, or nitro, and pharmaceutically-acceptable organic and inorganic salts thereof.

7. A compound according to claim 1 which is N-methyl 2'-ortho-chlorobenzoyl-4'-chloro 2-isothioureidoacetanilide hydrochloride.

5,091,416

INSECTICIDAL COMPOUNDS

Michael J. Bushell, Woosahill, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 28, 1989, Ser. No. 413,561

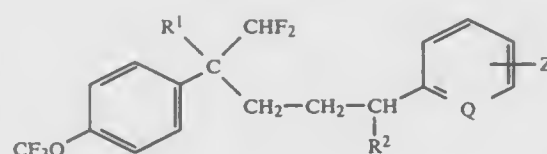
Claims priority, application United Kingdom, Sep. 28, 1988, 8822792

Int. Cl.⁵ A01N 47/40, 37/34; C07C 43/225, 43/29

U.S. Cl. 514—514

5 Claims

1. A compound of formula:



or a stereoisomer thereof, wherein R^1 represents alkyl containing up to four carbon atoms; R^2 is selected from hydrogen, cyano, methyl and trifluoromethyl; Q is carbon bearing a hydrogen atom, and Z represents one or more substituents selected from fluoro, benzyl, phenoxy, chlorophenoxy, fluoro-phenoxy and bromophenoxy.

5,091,417

PREVENTIVE AND THERAPEUTIC AGENT FOR HEPATITIS

Masahiro Watanabe, and Kazumasa Yokoyama, both of Hirakata, Japan, assignors to The Green Cross Corporation, Osaka and Taisho Pharmaceutical Co., Ltd., Tokyo, both of, Japan

Filed Sep. 10, 1990, Ser. No. 579,956

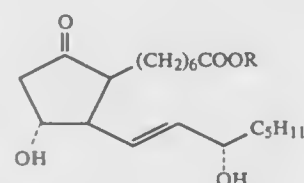
Claims priority, application Japan, Sep. 11, 1989, 1-235386

Int. Cl.⁵ A61K 31/19, 31/215

U.S. Cl. 514—530

9 Claims

1. A method for treating a hepatitis which comprises administering by intravenous injection and continuous drip infusion to a hepatitis patient a fat emulsion containing a compound having prostaglandin E_1 activities represented by the general formula



wherein R denotes hydrogen or an alkyl group having 1 to 30 carbon atoms in an amount of 0.2 to $100 \mu\text{g}$ per ml of the emulsion, 5 to 50% (W/V) of a vegetable oil, 1 to 50 parts by weight of phospholipid for 100 parts by weight of the vegetable oil, and a sufficient amount of water to make said emulsion.

5,091,418

ALPHA-GLUCOSIDASE INHIBITOR, PRADIMICIN Q

Yosuke Sawada, Tokyo; Tomokazu Ueki, Kanagawa; Takashi Tsuno, Tokyo, and Toshikazu Oki, Yokohama, all of Japan, assignors to Bristol-Myers Squibb Company, New York, N.Y.

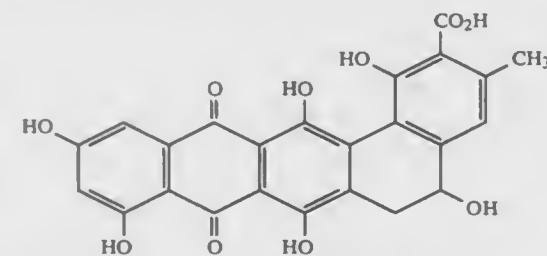
Filed Sep. 28, 1990, Ser. No. 589,729

Int. Cl.⁵ A61K 31/19

U.S. Cl. 514—569

2 Claims

1. A compound having the formula



and its pharmaceutically acceptable base salts.

5,091,419

DIUREA DERIVATIVES USEFUL AS MEDICAMENTS AND PROCESSES FOR THE PREPARATION THEREOF

Noriki Ito, Saitama; Tomoyuki Yasunaga, Tokyo; Yuichi Iizumi, Chiba, and Tomio Araki, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 296,443, Jan. 11, 1989, abandoned. This application Oct. 2, 1990, Ser. No. 593,516

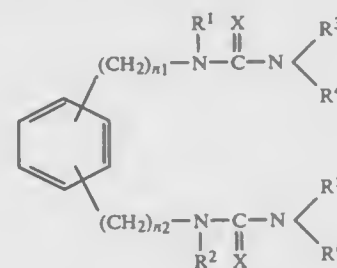
Claims priority, application Japan, Jan. 20, 1988, 63-10098; Jul. 19, 1988, 63-180119

Int. Cl.⁵ A01N 31/17

U.S. Cl. 514—596

16 Claims

1. A compound of the formula (I):



wherein

R^1 and R^2 , which are the same or different, each represents an alkyl group having 1-10 carbon atoms, a cycloalkyl group having 3-18 carbon atoms or a lower alkyl group substituted by a cycloalkyl group having 3 to 18 carbon atoms;

R^3 , R^4 , R^5 and R^6 , which are the same or different, each represents a hydrogen atom, a lower alkyl group, a cycloalkyl group having 3 to 18 carbon atoms, a hydrocarbyl aralkyl group, or a phenyl group which is unsubstituted or substituted by at least one group selected from lower alkyl, halogeno-lower-alkyl, halogen, nitro, amino, mono- or di-lower alkylamino, lower acylamino, hydroxyl, lower alkoxy;

X represents an oxygen atom; and

n_1 and n_2 , which are the same or different, each represents an integer of $1, 2, 3, 4, 5$ or 6 ;

or a salt of the formula (I) compound.

5,091,420

METHOD OF COMBATTING PESTS USING N-(CYCLO)ALKYL-5-SUBSTITUTED-2,4-THIOPEN-TADIENAMIDE COMPOUNDS

Robert J. Blade, and Robert J. Peek, both of Berkhamsted, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 320,870, Mar. 7, 1989, which is a continuation of Ser. No. 8,974, Jan. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,104, Jun. 23, 1986, abandoned. This application Jul. 26, 1990, Ser. No. 559,397

Int. Cl.⁵ A01N 39/00, 37/18; C07C 327/44

U.S. Cl. 514—599

4 Claims

1. A method of combatting insects of acarids comprising applying to the insect or acarid or to the locus of either a compound of the formula



wherein R^1 is a C_{1-14} alkyl group or a C_{1-14} alkyl group substituted with either a phenyl, phenoxy, phenyl alkenyl or phenylalkoxy group, and the phenyl moiety may be substituted by either a halogen or trifluoromethyl group; A and A' are hydrogen atoms; $n=2$; and one of R^2 and R^3 is hydrogen and the other is a C_{1-6} alkyl group or a C_{3-6} cycloalkyl group.

5,091,421

CHEMICAL PREVENTION OR REVERSAL OF CATARACT BY PHASE SEPARATION INHIBITORS

John I. Clark, Seattle, Wash.; George B. Benedek, Belmont, Mass.; Roelant J. Siezen, Ede, Netherlands; John A. Thomson, Laramie, Wyo., and Simon H. Friedman, Chicago, Ill., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 198,850, May 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 58,140, Jun. 4, 1987, abandoned. This application Dec. 15, 1989, Ser. No. 451,350

Int. Cl.⁵ A61K 31/16

U.S. Cl. 514—616

1 Claim

1. A method for inhibiting cataractogenesis in an animal, comprising administering to the animal a therapeutically or prophylactically effective amount of pantethine prior to the time that vision is impaired by formation of high molecular weight aggregates.

5,091,422

PHENETHANOLAMINE DERIVATIVES

Ian F. Skidmore, Welwyn; Lawrence H. C. Lants, Broxbourne; Harry Finch, Hitchin, and Alan Naylor, Royston, all of England, assignors to Glaxo Group Limited, London, England Division of Ser. No. 397,664, Aug. 23, 1989, Pat. No. 4,992,474, which is a continuation of Ser. No. 932,359, Nov. 19, 1986, abandoned, which is a continuation of Ser. No. 601,444, Apr. 18, 1984, abandoned. This application Jun. 21, 1990, Ser. No. 541,631

Claims priority, application United Kingdom, Apr. 18, 1983, 8310477; Jun. 23, 1983, 8317087; Nov. 4, 1983, 8329568; Jan. 25, 1984, 8401889

Int. Cl.⁵ A01N 33/02

U.S. Cl. 514—653

12 Claims

1. A method of treating a patient suffering from an inflammatory or allergic skin disease which method comprises administering to the patient an effective amount of the compound 4-hydroxy- α^1 -[[[6-(4-phenylbutoxy)hexyl]amino]methyl]-1,3-benzenedimethanol, 1-hydroxy-2-naphthalenecarboxylate.

5,091,423

USE OF KETONES, KETOESTERS AND ALCOHOL IN REPELLING INSECTS; USE OF ALIPHATIC ESTER IN ATTRACTING INSECTS AND PROCESS AND APPARATUS FOR DETERMINATION OF INSECT REPELLENCY AND ATTRACTANCY

Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel, both of N.J., and Jerry F. Butler, Gainesville, Fla., assignors to International Flavors and Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Division of Ser. No. 589,016, Sep. 27, 1990. This application Apr. 25, 1991, Ser. No. 691,638

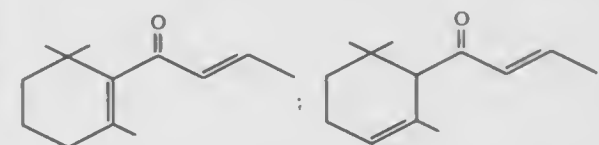
Int. Cl.⁵ A01N 35/02

U.S. Cl. 514—690

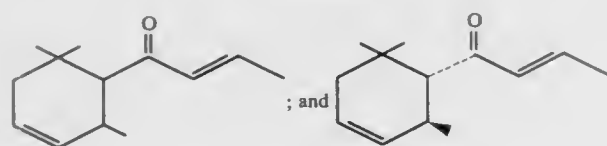
4 Claims

1. A method of repelling *Musca domestica* L. (Diptera Muscidae) or *Aedes aegyptae* for a finite period of time from a three-dimensional space inhabitable by said *Musca domestica* L. (Diptera Muscidae) or said *Aedes aegyptae* consisting essentially of the step of exposing said three-dimensional space to an effective *Musca domestica* L. (Diptera Muscidae) or *Aedes aegyptae*

repelling concentration and quantity of a compound selected from the group consisting of a compound defined according to the structure:



-continued



5,091,424

REDUCTION OF LEACHABLES FROM TYPE II ANION EXCHANGE RESINS

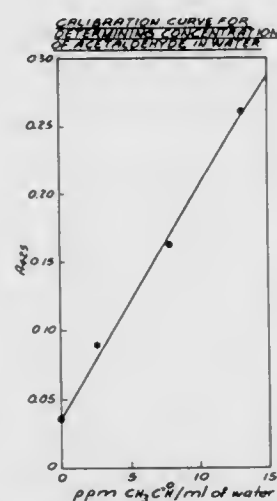
Lowell B. Lindy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 299,198, Jan. 23, 1989, abandoned. This application Jul. 5, 1990, Ser. No. 549,678

Int. Cl.⁵ C08F 5/20

U.S. Cl. 521-33

10 Claims



1. A process for reducing the concentration of acetaldehyde released during use or storage of a strong base anion exchange resin in the hydroxide form which has been prepared by reacting chloromethylated copolymer beads with an ethanolamine, wherein the acetaldehyde is associated with decomposition of the resin, the process comprising the step of contacting at reactive conditions in an aqueous medium either the chloride form or the sulfate form of the resin with at least about 0.02 gram bisulfite salt per gram resin for at least about 30 minutes and then converting the resin to the hydroxide form.

5,091,425

5-(HETEROCYCLYLALKANOYL)AMINO-4-HYDROXY-PENTANAMIDES

Robert H. Bradbury, Wilmslow; David Brown, Bridge; David A. Roberts, Congleton, and David Waterson, Bollington, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Nov. 14, 1989, Ser. No. 435,687

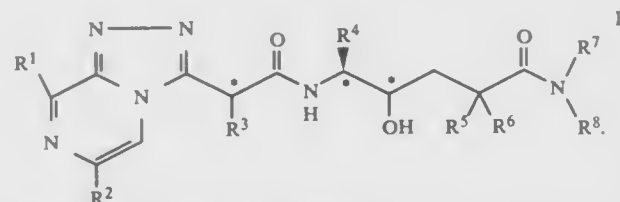
Claims priority, application United Kingdom, Nov. 17, 1988, 8826930; May 25, 1989, 8912080

Int. Cl.⁵ C07D 487/04, 263/06, 263/04; A61K 31/495

U.S. Cl. 514-228.5

12 Claims

1. A heterocyclic amide of the formula I

wherein R¹ is (1-8C)alkyl or phenyl;R² is phenyl or pyridyl, the latter optionally bearing a (1-4C)alkyl substituent;R³ is hydrogen or a group of the formula Q¹A¹-in which Q¹ is selected from pyridyl, imidazolyl, thiazolyl and pyrazolyl, and A¹ is methylene or ethylene;R⁴ is (1-8C)alkyl or (3-8C)cycloalkyl-(1-4C)alkyl;R⁵ is hydrogen or (1-4C)alkyl;R⁶ is hydrogen, (1-6C)alkyl, (1-4C)alkoxy, hydroxy, (1-4C)alkylthio, (1-4C)alkylsulphanyl, (1-4C)alkylsulphonyl, or a group of the formula Q²A²- in which Q² is selected from (1-4C)alkoxy, (2-4C)alkenyl, phenyl and hydroxy, and A² is (1-4C)alkylene;or R⁵ and R⁶ together form (2-4C)alkylene;and wherein R⁷ is hydrogen, (1-4C)alkyl or hydroxy-(2-4C)alkyl; andR⁸ is hydrogen, (1-4C)alkyl in which 2 or 3 carbon atoms may bear a hydroxy substituent, (1-8C)alkyl, a group of the formula Q³A³- in which Q³ is selected from (1-4C)alkoxy, morpholino, thiomorpholino, piperidino, pyrrolidino, N-(1-4C)piperazinyl, pyridyl (itself optionally bearing a (1-4C)alkyl substituent) and phenyl (itself optionally bearing 1 or 2 substituents independently selected from halogeno, trifluoromethyl, cyano, (1-4C)alkyl, (1-4C)alkoxy, amino(1-4C)alkyl), and A³ is (1-4C)alkylene; or R⁸ is a group of the formula Q⁴A⁴- in which Q⁴ is selected from amino, hydroxy and N,N-di-(1-4C)alkylamino, and A⁴ is (1-8C)alkylene;or R⁷ and R⁸ together with the adjacent nitrogen complete a morpholino, thiomorpholino, piperidino, pyrrolidino or N-(1-4C)piperazinyl moiety;and wherein a phenyl moiety of R¹, R² or Q², may optionally bear 1 or 2 substituents independently selected from halogeno, trifluoromethyl, cyano, (1-4C)alkyl and (1-4C)alkoxy;or a pharmaceutically acceptable salt thereof when R², R³, or R⁸, or R⁷ and R⁸ contain a basic group.

10. A method of inhibiting the catalytic action of renin in the formation of angiotensins in a warm blooded animal requiring such treatment which comprises administering to said animal a therapeutically effective amount of a compound of the formula I, II or IIa, or a pharmaceutically acceptable salt thereof, as defined in claim 1, 4, or 6.

5,091,426

5-PHENYL-2-FURAN KETONES AND USE AS ANTIEPILEPTIC AGENTS

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

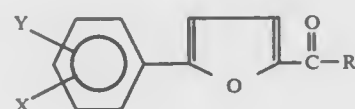
Filed Jun. 23, 1989, Ser. No. 371,354

Int. Cl.⁵ B61K 31/34; C07D 307/46

U.S. Cl. 514-231.5

21 Claims

1. A compound of the formula:



wherein

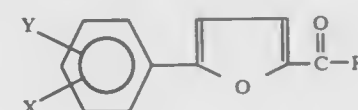
(a) X is halo or nil; and Y is a substituent selected from the group consisting of unsubstituted or halogen-substituted methyl, halo, nitro, amino, and methoxy; and

(b) R is R¹C(O)OH, R¹C(O)N(R²)₂, or R¹N(R²)₂; where R¹ is C₁-C₃ alkylene which is unsubstituted or substituted with C₁-C₂ alkyl; and

each R² is, independently, hydrogen or lower alkyl; or both R² groups are connected to form a saturated 5- or 6-membered heterocycle containing 1 or 2 heteroatoms, wherein one of which is nitrogen and the other is selected from oxygen and nitrogen and said heterocycle is unsubstituted or substituted with lower alkyl or hydroxy-substituted lower alkyl;

or a pharmaceutically-acceptable salt thereof.

12. A method of preventing epileptic seizures in a human or lower animal subject susceptible to said seizures, comprising systemically administering to said subject a safe and effective amount of a compound of the formula:



wherein

(a) X is halo or nil; and Y is a substituent selected from the group consisting of unsubstituted or halogen-substituted methyl, halo, nitro, amino, and methoxy; and

(b) R is R¹C(O)OH, R¹C(O)N(R²)₂, or R¹N(R²)₂; where R¹ is C₁-C₃ alkylene which is unsubstituted or substituted with C₁-C₂ alkyl; and

each R² is, independently, hydrogen or lower alkyl; or both R² groups are connected to form a saturated 5- or 6-membered heterocycle containing 1 or 2 heteroatoms, wherein one of which is nitrogen and the other is selected from oxygen and nitrogen and said heterocycle is unsubstituted or substituted with lower alkyl or hydroxy-substituted lower alkyl; or a pharmaceutically-acceptable salt thereof.

5,091,427

PIPERAZINEDIONES HAVING A PSYCHOTROPIC ACTION

Wolf-Ulrich Nickel, Bad Soden am Taunus; Rainer Henning, Hattersheim am Main; Wolfgang Rüger, Kelkheim; Ulrich Lerch, Hofheim am Taunus; Hansjörg Urbach, Kronberg-Taunus; Franz Hock, Dieburg, and Gabriele Wiemer, Kronberg-Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 1, 1989, Ser. No. 401,842

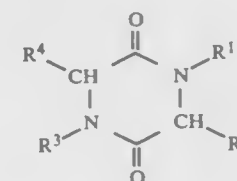
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830096

Int. Cl.⁵ A61K 31/495; C07D 241/36

U.S. Cl. 514-249

11 Claims

1. A compound of formula I

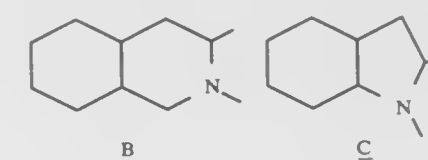


in which

R¹ denotes hydrogen or (C₁-C₈)-alkyl, wherein said (C₁-C₈)-alkyl can be substituted by (C₁-C₄)-alkylcarbonyl and/or phenyl;

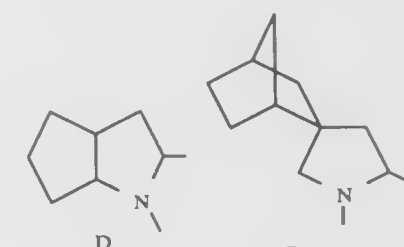
R² denotes (C₁-C₈)-alkyl or (C₃-C₈)-cycloalkyl-(C₁-C₄)-alkyl and

R³ and R⁴ form together with the atoms carrying them a ring system selected from the groups B, C, D, G and H



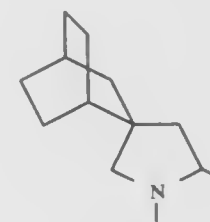
B

C



D

E



F

5,091,428

SUBSTITUTED IMIDAZOLYL-ALKYL-PIPERAZINE AND -DIAZEPINE DERIVATIVES

Jean C. Pascal, Cachan, France; Chi-Ho Lee, Palo Alto, Calif.; Brian J. Alps, Linlithgow, Scotland; Henri Pinhas, Paris, France, and Roger L. Whiting, Los Altos, Calif., assignors to Syntex Pharmaceuticals, Ltd., Hamilton, Bermuda

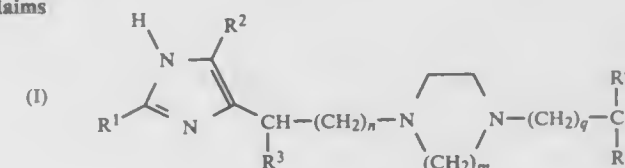
Division of Ser. No. 505,379, Apr. 6, 1990, Pat. No. 5,010,075, which is a division of Ser. No. 313,656, Feb. 21, 1989, Pat. No. 4,938,417, which is a division of Ser. No. 42,181, Apr. 24, 1987, Pat. No. 4,829,065. This application Feb. 7, 1991, Ser. No. 652,141

Int. Cl.⁵ A61K 31/495, 31/55; C07D 243/08, 403/06

U.S. Cl. 514-252

31 Claims

1. A compound having the structure represented by the formula:



wherein:

R¹ is aryl, lower alkyl, cycloalkyl or hydrogen;

R² is aryl, lower alkyl or hydrogen;

R³ is lower alkyl, hydroxy, or hydrogen;

R⁴ is aryl or hydrogen;

R⁵ is aryl or hydrogen;

m is two;

n is zero, one or two, provided that when R³ is hydroxy, n is one or two; and

q is zero, one, two, or three;

or a pharmaceutically acceptable salts thereof.

5,091,429
DERIVATIVES OF
4-AMINO-1-TRIFLUOROMETHYLTETRALINES THEIR
PREPARATION AND THEIR THERAPEUTIC
APPLICATION

Jean-Pierre Begue; Micheline Charpentiermorize; Danièle Bonnet Delpont, all of Paris, and Huguette Gilbert-Semon, Chartres Cedex, all of France, assignors to Laboratoires Lucien, Colombes, France

PCT No. PCT/FR88/00575, § 371 Date Jul. 24, 1989, § 102(e) Date Jul. 24, 1989, PCT Pub. No. WO89/04820, PCT Pub. Date Jun. 1, 1989

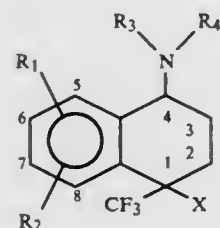
PCT Filed Nov. 24, 1988, Ser. No. 391,582

Claims priority, application France, Nov. 26, 1987, 87 16436 Int. Cl.⁵ A61K 31/495, 31/135; C07D 295/08; C07C 87/40

U.S. Cl. 514—255

17 Claims

1. Compounds of the formula:



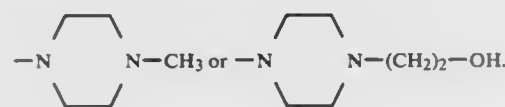
or an acid addition salt thereof, wherein:

X represents an aromatic nucleus which is phenyl, naphthyl, or α or β thienyl, unsubstituted or carrying one or two substituents selected from the group consisting of halogeno, hydroxy, C₁ to C₈ alkoxy or trifluoromethyl;

R₁ represents a hydrogen atom or a halogen, a hydroxy group, a C₁ to C₈ alkoxy group, in one of positions 5, 6 or 7, or a methylenedioxy group in positions 5 and 6 or 6 and 7;

R₂ represents a hydrogen atom or a halogen, a hydroxy group, a C₁ to C₈ alkoxy group in one of the other positions 5, 6 or 7, and

R₃ and R₄ together with the nitrogen atom to which they are linked form a group of the formula:



5,091,430
O⁶-SUBSTITUTED GUANINE COMPOUNDS AND
METHODS FOR DEPLETING O⁶-ALKYLGUANINE-DNA
ALKYLTRANSFERASE LEVELS

Robert C. Moschel, Frederick, Md.; M. Eileen Dolan, Chicago, Ill., and Anthony E. Pegg, Hershey, Pa., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

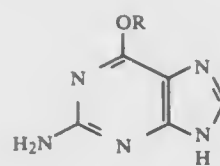
Filed Mar. 13, 1990, Ser. No. 492,468

Int. Cl.⁵ A61K 31/52; C07D 473/00

U.S. Cl. 514—262

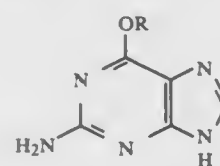
12 Claims

1. A method for depleting the levels of O⁶-alkylguanine-DNA alkyltransferase in tumor cells in a host which comprises administering to the host an effective amount of a composition containing compounds of the following formula:



wherein R is a benzyl group or a substituted benzyl group substituted at the ortho, meta or para position with a substituent selected from the group consisting of halogen, nitro, phenyl, alkyl of 1-4 carbon atoms, alkoxy of 1-4 carbon atoms, alkenyl of up to 4 carbon atoms, alkynyl of up to 4 carbon atoms, amino, monoalkylamino, dialkylamino, trifluoromethyl, hydroxy, hydroxymethyl, and SO_nR₁ wherein n is 0, 1, 2 or 3 and R₁ is hydrogen, alkyl of 1-4 carbon atoms, or phenyl.

2. A pharmaceutical composition which comprises compounds of the formula,



wherein R is a benzyl group or a substituted benzyl group substituted at the ortho, meta or para position with a substituent selected from the group consisting of halogen, nitro, phenyl, alkyl of 1-4 carbon atoms, alkoxy of 1-4 carbon atoms, alkenyl of up to 4 carbon atoms, alkynyl of up to 4 carbon atoms, amino, monoalkylamino, dialkylamino, trifluoromethyl, hydroxy, hydroxymethyl, and SO_nR₁ wherein n is 0, 1, 2 or 3 and R₁ is hydrogen, alkyl of 1-4 carbon atoms, or phenyl and a pharmaceutically acceptable excipient.

5,091,431
PHOSPHODIESTERASE INHIBITORS

Deen Tushian, Rockaway, and Ronald J. Doll, Maplewood, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

PCT No. PCT/US89/00409, § 371 Date Jul. 18, 1990, § 102(e) Date Jul. 18, 1990, PCT Pub. No. WO89/07102, PCT Pub. Date Aug. 10, 1989

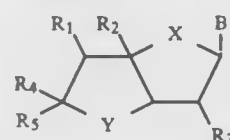
Continuation-in-part of Ser. No. 153,114, Feb. 8, 1988, abandoned. This PCT application Feb. 6, 1989, Ser. No. 543,778

Int. Cl.⁵ A61K 31/52; C07D 473/18, 473/34, 473/16

U.S. Cl. 514—262

6 Claims

1. Compounds represented by the formula



R₁ is hydrogen or R₁ and R₂ together form a double bond; R₂ is hydrogen or R₂ may form a double bond with either R₁ or X;

R₃ is hydrogen or OH;

R₄ is hydrogen or —(CH₂)_nCOOR₆;

R₅ is R₄ or —CH(COOR₆)(CH₂COOR₆), provided that R₄ and R₅ are not both hydrogen;

R₆ is hydrogen or lower alkyl;

n is 0-4;

X is —CH₂— or when R₁ is hydrogen, X may be —CH= and form a double bond with R₂;

Y is —CH₂— or —O—;

B is

5,091,434
POLYOL COMPOSITION AND METHOD FOR
PRODUCING A RIGID POLYURETHANE FOAM USING
THE SAME

Masahiro Suzuki; Ichiro Kamemura, both of Yokohama, and Hiromitsu Kodaka, Mitaka, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

PCT No. PCT/JP90/00465, § 371 Date Dec. 6, 1990, § 102(e) Date Dec. 6, 1990, PCT Pub. No. WO90/12047, PCT Pub. Date Oct. 18, 1990

PCT Filed Apr. 6, 1990, Ser. No. 613,745

Claims priority, application Japan, Apr. 7, 1989, 1-86904

Int. Cl.⁵ C08G 18/14

U.S. Cl. 521—78

12 Claims

1. A polyol composition for producing a rigid polyurethane foam by being mixed with a polyisocyanate compound by a spraying method, which comprises a polyol containing not less than 45% by weight of an ethylenediaminealkylene oxide addition polyol and having an average hydroxyl value of 250-550, a blowing agent comprising not more than 45% by weight of a low boiling halogenated hydrocarbon foaming agent and 1-6 parts by weight of water, per 100 parts by weight of said polyol.

5,091,435
CROSS-LINKABLE, FOAMABLE POLYOLEFIN RESIN
COMPOSITION

Toshiaki Suzuki; Sotoyuki Kitagawa; Takashi Nakayama, and Takao Kuno, all of Kawasaki, Japan, assignors to Tonen Chemical Corporation, Tokyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,075

Claims priority, application Japan, Jul. 4, 1990, 2-177161

Int. Cl.⁵ C08J 9/10

U.S. Cl. 521—134

4 Claims

1. A cross-linkable, foamable polyolefin resin composition comprising:

- 30-80 weight % of a propylene-ethylene random copolymer having an ethylene content of 1.5-6 weight %;
- 10-60 weight % of a propylene-ethylene random copolymer having an ethylene content of 0.2-1.0 weight %;
- 10-60 weight % of a linear low-density polyethylene; and
- 1-30 parts by weight, per 100 parts by weight of the total amount of said propylene-ethylene random copolymer (a) + said propylene-ethylene random copolymer (b) + said linear low-density polyethylene (c), of a foaming agent.

5,091,436
REINFORCED FOAM COMPOSITES COMPRISING
HYDROXY-CONTAINING VINYL ESTER RESIN

Kurt C. Frisch, 17986 Parke La., Grosse Ile, Mich. 48138, and Kaneyoshi Ashida, 28139 New Bedford, Farmington Hills, Mich. 48018

Filed Feb. 20, 1990, Ser. No. 482,298

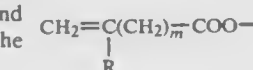
Int. Cl.⁵ C08G 18/04, 18/68; B32B 5/20, 27/28

U.S. Cl. 521—137

53 Claims

1. A high-density foam formed by foaming, with an amount of foaming agent such that the density is at least twenty pounds per cubic foot, a foam composition comprising:

- a foam-forming organic polyisocyanate component having a functionality greater than two;
- a polyol component having a functionality at least two and an equivalent weight between about 300 and about 1,000;
- a urethane catalyst;
- a surfactant suitable for use in urethane foams;
- water as blowing agent; (F) a hydroxyvinyl ester having the formula



5,091,432
9-SUBSTITUTED HYPOXANTHINE BI-FUNCTIONAL
COMPOUNDS AND THEIR NEUROIMMUNOLOGICAL
METHODS OF USE

Alvin J. Glasky, 9902 Brier La., Santa Ana, Calif. 92705

Filed Mar. 28, 1990, Ser. No. 500,789

Int. Cl.⁵ A61K 31/52; C07D 473/00

U.S. Cl. 514—262

10 Claims

1. A bi-functional pharmaceutical compound having neuroimmunologic properties consisting of 3-(1,6-dihydro-6-oxo-9H-purin-9-yl)-N-propanamide.

4. A bi-functional pharmaceutical composition having neuroimmunologic properties consisting of 4-[[3-(1,6-dihydro-6-oxo-9H-purin-9-yl)-1-oxopropyl]amino]benzoic acid compounded with 1-(dimethylamino)-2-propanol in an approximately 1 to 1 ratio.

5,091,433
COLUMN-PACKING MATERIAL FOR GEL-PERMEATION
CHROMATOGRAPHY, METHOD FOR ITS
PREPARATION, AND APPLICATIONS

Gunter Wulff, Erkrath; Milan Minarik, Piseckebo, and Ralf J. Oerschkes, Am Vogelsang, all of Fed. Rep. of Germany, assignors to Macherey, Nagel & Co., Fed. Rep. of Germany

Filed Oct. 12, 1990, Ser. No. 596,285

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1989, 3934068

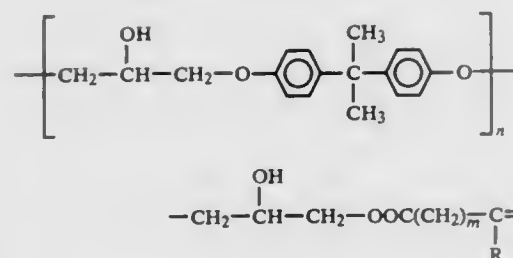
Int. Cl.⁵ C08J 9/40, 9/42

U.S. Cl. 521—54

12 Claims

1. Column-packing material for gel-permeation chromatography (GPS), consisting of support particles with a mean particle diameter of 1 to 50 μ m, the matrix of which is formed by an inorganic or organic, polymeric and porous hard material with a mean pore diameter of 6 to 500 nm and a pore volume of 0.1 to 3 ml/g, the matrix pores containing chemically bound polymer chains, characterized in that the polymer chains consist of linear, permeable polymers which are not crosslinked and which evince an upper exclusion limit between 200 and 200,000, these polymer chains wholly filling the pores of the matrix.

-continued



wherein n is 1 or 2, m is 0 or 1 through 4, $R = H$ or C_{1-4} -alkyl, dissolved in a liquid vinyl monomer in an amount up to about 50% by weight of the hydroxyvinyl ester, the vinyl ester solution being present in an amount between about 0.3 to 1 and about 0.8 to 1 by weight with reference to components (A) and (B) combined;

(G) a free-radical initiator catalyst, the isocyanate component (A), and the combined components (B), (C), and (E), being in proportions which provide an isocyanate index between about 50 and about 300, said composition having a consistency such that fillers and reinforcing fibers can be suspended therein in an amount of about 10 to about 50 percent based on the total weight of the composition.

5,091,437 POLYISOCYANATE COMPOSITIONS AND THEIR USE IN THE PREPARATION OF FLEXIBLE POLYURETHANE FOAMS

Gianflavio Lunardon, Padua, and Bruno Gallo, Mestre, both of Italy, assignors to Montedipe S.p.A., Italy

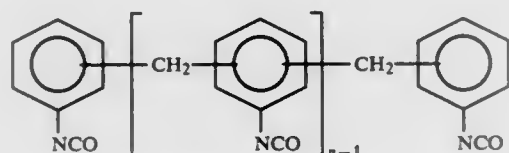
Filed May 17, 1990, Ser. No. 524,596

Claims priority, application Italy, May 17, 1989, 20541 A/89
Int. Cl.⁵ C08G 18/14

U.S. Cl. 521—159 9 Claims

1. Polyisocyanate compositions comprising:

- (a) from 90 to 50% by weight of a reaction product between an organic diisocyanate and a polyether-polyol of functionality of at least 2, and wherein said reaction product has a content of free NCO radicals within the range of from 26.5 to 33% by weight; and
- (b) from 10 to 50% by weight of mixtures of polymethylene-polyphenyl-polyisocyanates having the general formula:



wherein n is an integer greater than, or equal to, 1.

5,091,438 METHOD OF PRODUCING RIGID URETHANE FOAM

Yoshihiko Taira, Sakai, and Masayoshi Idemoto, Minoo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 10, 1990, Ser. No. 550,367

Claims priority, application Japan, Jun. 14, 1989, 1-182996
Int. Cl.⁵ C08G 18/14

U.S. Cl. 521—175 7 Claims

1. A method of producing a rigid urethane foam, which comprises reacting a blend polyol consisting of (1) a polyol having a hydroxyl value of 300 to 400 mg KOH/g obtained by subjecting an alkylene oxide and an acyclic sugar alcohol of 5 to 6 carbon atoms to addition reaction in the presence of a catalyst and (2) a polyol obtained by subjecting an alkylene oxide and tolylenediamine to addition reaction in the presence

of a catalyst and having a hydroxyl value of 330 to 460 mg KOH/g, said blend polyol having an acyclic sugar alcohol content of 3 to 14 weight %, a tolylenediamine content of not more than 8 weight % and an average hydroxyl value of 300 to 430 mg KOH/g, with a polyisocyanate using 4.0 to 7.0 weight parts of water based on 100 weight parts of said polyol as a blowing agent.

5,091,439 PROCESS FOR CURING POLYURETHANE COATINGS AND COMPOSITIONS

Godwin Berner, Binningen; Manfred Rembold, Aesch; Franciszek Sitek, Therwil, and Werner Rutsch, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 63,191, Jun. 16, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 249,608
Claims priority, application Switzerland, Jun. 17, 1986, 2436/86

Int. Cl.⁵ C08G 18/22, 18/82

U.S. Cl. 522—26 24 Claims

1. A process for curing polyurethane coatings containing at least one polyhydroxy compound and at least one polyisocyanate, or a masked polyisocyanate, which comprises adding a compound of the Formula



in which a is 1, 2, or 3, R^1 is an uncharged carbocyclic or heterocyclic aromatic ring, unsubstituted or substituted, R^2 is an unsubstituted or substituted cyclopentadienyl or indenyl anion, and $[X]^{a-}$ is an a -valent anion, to the coating as a latent curing catalyst before application, and heating the coating after application or irradiating it with actinic light and then heating it.

5,091,440 ACRYLATE- OR METHACRYLATE-FUNCTIONAL ORGANOPOLYSILOXANES

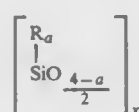
Roy M. Griswold, Tulsa, Okla., assignor to Wacker Silicones Corporation, Adrian, Mich.

Filed Dec. 8, 1989, Ser. No. 447,758

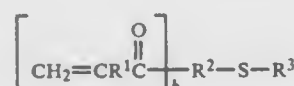
Int. Cl.⁵ C08F 2/46

U.S. Cl. 522—99 17 Claims

1. Acrylate- or methacrylate-functional organopolysiloxane compositions containing an organopolysiloxane of the formula



wherein R is a radical selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 20 carbon atoms, substituted monovalent hydrocarbon radicals having from 1 to 20 carbon atoms, monovalent hydrocarbonoxy radicals having from 1 to 20 carbon atoms and a radical of the formula



wherein at least one R is a radical of formula (I), R^1 is selected from the group consisting of hydrogen and a methyl radical, R^2 is selected from the group consisting of a multivalent hydrocarbonoxy radical and a multivalent hydrocarbonoxy radical containing non-terminal atoms selected from the group consisting of oxygen, and nitrogen atoms, R^3 is selected from

the group consisting of a divalent hydrocarbon radical and a divalent hydrocarbonoxy radical, a is a number having an average value of from 0.7 to 2.6, b is a number of from 1 to 5, and x is a number of from 2 to 200; said acrylate- or methacrylate-functional organopolysiloxane compositions are obtained by reacting a mercapto-functional compound selected from the group consisting of mercaptofunctional monohydric alcohols, mercapto-functional polyhydric alcohols, mercapto-functional monohydric alcohols containing non-terminal atoms selected from the group consisting of oxygen and nitrogen atoms and mercapto-functional polyhydric alcohols containing non-terminal atoms selected from the group consisting of oxygen and nitrogen atoms with organopolysiloxanes containing vinyl or allyl groups and thereafter the result product is reacted with an acid or ester thereof selected from the group consisting of an acrylic and methacrylic acid in the presence of a free radical initiator.

5,091,441 DENTAL COMPOSITION

Ikuo Omura, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jul. 13, 1989, Ser. No. 379,552

Claims priority, application Japan, Jul. 13, 1988, 63-175627
Int. Cl.⁵ C09J 4/00

U.S. Cl. 523—109 7 Claims

1. A dental primer or adhesive composition comprising a free radical-polymerizable monomer and an organic peroxide, which are dissolved in a volatile tertiary alcohol, the ratios being 0.1 to 300 weight parts of the monomer and 0.01 to 10 weight parts of the organic peroxide based on 100 weight parts of the tertiary alcohol, said composition being contained in an oxygen-permeable plaster container.

5,091,442 TUBULAR ARTICLES

Richard Milner, Bishops Cleeve, United Kingdom, assignor to Smith and Nephew plc, United Kingdom

PCT No. PCT/GB89/01048, § 371 Date Nov. 28, 1990, § 102(e)
Date Nov. 28, 1990, PCT Pub. No. WO90/02573, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 6, 1989, Ser. No. 613,581

Claims priority, application United Kingdom, Sep. 7, 1988, 8820945, Aug. 23, 1989 [GB] United Kingdom

PCT/GB89/0978

Int. Cl.⁵ A61M 25/00; C08L 7/02; C08K 5/06

U.S. Cl. 523—122 14 Claims

1. A method for the manufacture of an antimicrobially effective tubular article which comprises including an antimicrobially effective amount of a non-ionic sparingly water soluble antimicrobial agent in an aqueous dispersion of the article material prior to forming the article.

5,091,443 COMPOSITION FOR GELLING LIQUIDS

Mutlu Karakelle, Centerville; Carl D. Benson, Waynesville; Robert A. Taller, Centerville, and David E. Spielvogel, Springboro, all of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 7, 1990, Ser. No. 476,869

Int. Cl.⁵ C08L 251/00

U.S. Cl. 424—665 7 Claims

1. A gelling composition for an aqueous liquid comprising a mixture of a first particle of an ungelated, silylated graft copolymer wherein the graft copolymer is starch grafted with an acrylic acid derivative and a second particle of a gelling agent selected from the group consisting of a polyacrylic acid metal salt, a copolymer of polyacrylic acid and polyacrylamide and mixtures thereof.

5,091,444 MOISTURE-CURING POLYURETHANE-BASED HOT-MELT COMPOSITIONS

Herbert Bauer, Paudex, Switzerland; Heinz G. Gilch, Bad Homburg, Fed. Rep. of Germany; Walter Rath, Oberursel, Fed. Rep. of Germany, and Use Schumann, Oberursel, Fed. Rep. of Germany, assignors to Bostik, Inc., Middleton, Mass.

Filed Feb. 12, 1990, Ser. No. 478,664

Claims priority, application United Kingdom, Mar. 7, 1989, 8905133

Int. Cl.⁵ C08K 9/04

U.S. Cl. 523—209 10 Claims

1. A moisture-curing hot-melt composition comprising at least one isocyanate-terminated polyurethane prepolymer wherein the composition includes 1-17 wt% of hydrophobic, siloxane-coated, fumed silica.

5,091,445 SILICONE SEALANTS

Anthony Revis, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 4, 1990, Ser. No. 519,193

Int. Cl.⁵ C08K 9/06

U.S. Cl. 523—212 11 Claims

1. A curable composition comprising a mixture of an allyl ester; at least one methylhydrosiloxane; a Group VIII metal catalyst; a filler; and a material to strengthen, toughen, or reinforce the cured and crosslinked methylhydrosiloxane, the material being selected from the group consisting of silicone gums, silanol functional silicones, silane treated silicates, and curable silicone resin compositions.

5,091,446 CATIONIC ELECTRODEPOSITION COATING RESIN COMPOSITION BASED ON VINYL-CYCLOHEXENE OXIDE-ALKYLENE OXIDE COPOLYMERS

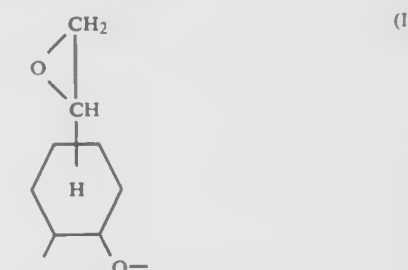
Reiziro Nishida, and Akira Tominaga, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Oct. 18, 1990, Ser. No. 599,358

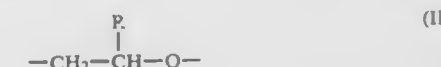
Claims priority, application Japan, Oct. 19, 1989, 1-0271957
Int. Cl.⁵ C08L 63/00

U.S. Cl. 523—404 18 Claims

1. A cationic electrodeposition coating resin composition composed mainly of
(A) a resin containing a primary hydroxyl group and a cationic group, and
(B) an epoxy resin which is a copolymer comprising recurring units represented by formula (I)



and recurring units represented by formula (II)



wherein R denotes a C_3 – C_{35} alkyl group, the proportion of the recurring units of formula (II) being 1 to 75% by weight.

5,091,447

IN-SITU POLYMERIC MEMBRANE FOR CAVITY SEALING AND MITIGATING TRANSPORT OF LIQUID HAZARDOUS MATERIALS BASED ON AQUEOUS EPOXY-RUBBER ALLOYS

Henry L. Lomasney, New Orleans, La., assignor to Isotron, New Orleans, La.

Filed May 8, 1989, Ser. No. 348,525

Int. Cl.⁵ B05D 3/02; C08L 63/00

U.S. Cl. 523-408

25 Claims

1. An aqueous polymer composition which is curable at ambient temperature to form a polymer alloy membrane, said composition comprising from about 40 to about 70 percent by weight of a latex rubber polymer component and from about 30 to about 60 percent by weight of an ambient temperature curable epoxy emulsion component; wherein said membrane maintains the following properties over an extended period of immersion in water or exposure to air;

- a percent elongation of at least about 250;
- a tensile strength to peel adhesion ratio of at least about 400/in.; and
- oxidation resistance sufficient to maintain the integrity (that is, (a) and (b)) of the membrane over a period of at least one week of immersion in water or exposure to air.

5,091,448

SUSPENDING MEDIUM FOR WATER SOLUBLE POLYMER

John E. Hostettler, and Marshall D. Bishop, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1990, Ser. No. 513,539

Int. Cl.⁵ C08J 9/42, 3/02; C08F 2/16; C09K 7/00

U.S. Cl. 524-45

26 Claims

1. A stable liquid suspension of water soluble polymer comprising:

- an oil selected from the group consisting of diesel, kerosene, heating oil, decane, tetradecane, hexadecane, dodecane, mixed C₁₃-C₁₄ isoparaffins, C₁₄ isoparaffins, C₁₆ isoparaffins, soybean oil and corn oil, wherein said oil is present in the range of from 40 weight percent to 95 weight percent;
- an oil soluble resin selected from the group consisting of styrene-isoprene copolymers, hydrogenated styrene-isoprene block copolymers, styrene ethylene/propylene block copolymers, styrene isobutylene copolymers, styrene butadiene copolymers, polybutylene and polystyrene, polyethylene-propylene copolymers, wherein said oil soluble resin is present in the range of from 0.2 weight percent to 10 weight percent;
- a water soluble polymer selected from the group consisting of cellulose ethers, gums, starches, vinyl polymers, acrylic polymers and biopolysaccharides, wherein said water soluble polymer is present in the range of from 3 weight percent to 60 weight percent, wherein the total of all weight percentages equals 100 weight percent.

5,091,449

ALPHA-(2,4-DIHYDROXY)PHENYL N-PHENYL NITRONE AND ITS USE IN THE MODIFICATION OF DIENE CONTAINING POLYMERS

Jose Cantillo, Miami, Fla.; Robert W. Strozier, Akron, and William P. Francik, Bath, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

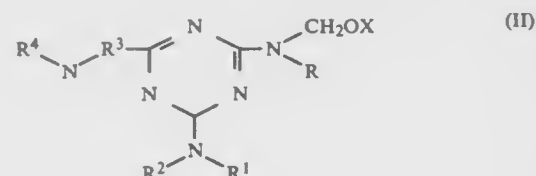
Filed Aug. 2, 1990, Ser. No. 563,028

Int. Cl.⁵ C08K 5/34

U.S. Cl. 524-100

12 Claims

1. A composition comprising a mononitron of the formula:



5,091,450

PIPERIDINE-TRIAZINE COMPOUNDS CONTAINING TETRAHYDROFURAN OR TETRAHYDROPYRAN GROUPS, FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

Valerio Borzatta, and Graziano Vignali, both of Bologna, Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,483

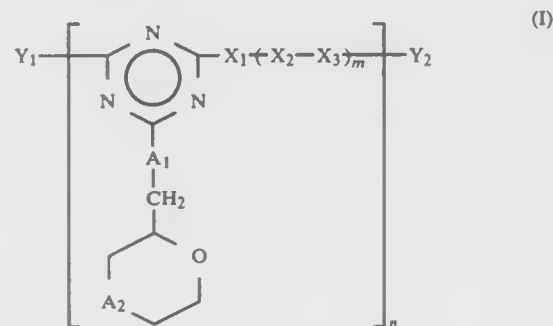
Claims priority, application Italy, Jul. 27, 1990, 21092 A/90

Int. Cl.⁵ C08K 5/3492; C07D 295/00, 251/68

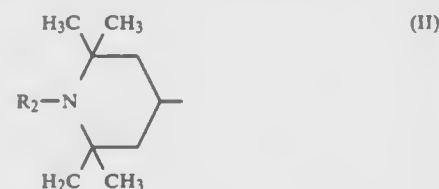
U.S. Cl. 524-100

12 Claims

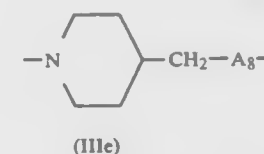
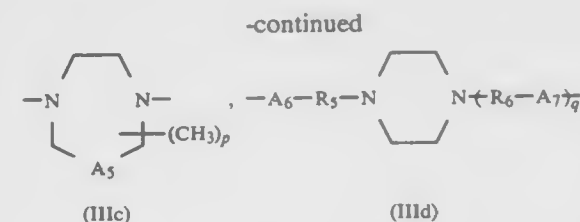
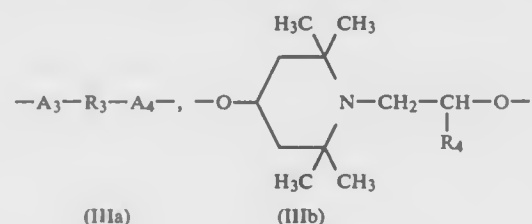
1. A compound of the formula (I)



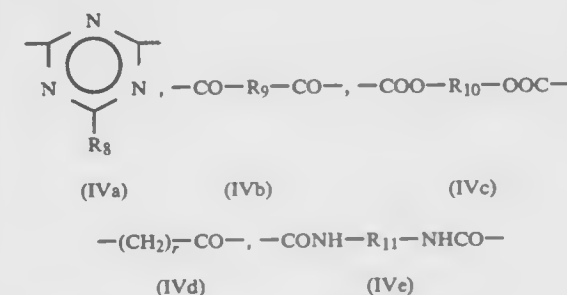
in which A₁ is —O— or >N—R₁, in which R₁ is hydrogen, C₁-C₈alkyl, C₅-C₁₂cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C₁-C₄alkyl; C₇-C₉phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C₁-C₄alkyl; tetrahydrofurfuryl or a group of the formula (II)



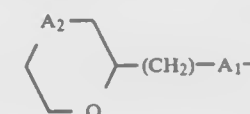
in which R₂ is hydrogen, C₁-C₈alkyl, O⁻, OH, NO, CH₂CN, C₁-C₈alkoxy, C₅-C₁₂cycloalkoxy, C₃-C₆alkenyl, C₇-C₉phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C₁-C₄alkyl; or R₂ is C₁-C₈acyl, A₂ is a direct bond or —CH₂—, X₁ and X₃ which can be identical or different are one of the groups of the formulae (IIIa)-(IIIe)



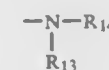
in which A₃, A₄, A₆, A₇ and A₈ which can be identical or different are as defined for A₁, R₃ is C₂-C₁₂alkylene, C₄-C₁₂alkylene interrupted by 1, 2 or 3 oxygen atoms or by 1 or 2 >N—R₇ groups, where R₇ is as defined for R₁ or is C₁-C₈acyl or (C₁-C₈alkoxy)-carbonyl; or C₅-C₇cycloalkylene, C₅-C₇cycloalkylene-di-(C₁-C₄alkylene), C₁-C₄alkylene-di-(C₅-C₇cycloalkylene), C₂-C₄alkylidene-di-(C₅-C₇cycloalkylene), phenylene, phenylene-di-(C₁-C₄alkylene), C₁-C₄alkylenediphenylene or C₂-C₄alkylenediphenylene, it being possible for each phenylene group to be unsubstituted or mono- or di-substituted by C₁-C₄alkyl, R₄ is hydrogen, C₁-C₈alkyl or phenyl, A₅ is a direct bond or —CH₂—, p is zero, 1, 2 or 3, R₅ and R₆ which can be identical or different are C₂-C₄alkylene and q is zero or 1, X₂ is C₂-C₁₂alkylene, C₄-C₁₂alkylene interrupted by 1, 2 or 3 oxygen atoms; 2-hydroxytrimethylene, xylene, carbonyl or one of the groups of the formulae (IVa)-(IVe)



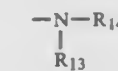
in which R₈ is a group of the formula (V)



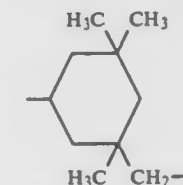
with A₁ and A₂ as defined above, or R₈ is a group —OR₁₂, —SR₁₂ or



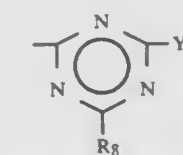
in which R₁₂, R₁₃ and R₁₄ which can be identical or different are hydrogen, C₁-C₈alkyl, C₅-C₁₂cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C₁-C₄alkyl; C₃-C₁₂alkenyl, phenyl which is unsubstituted or mono-, di- or tri-substituted by C₁-C₄alkyl or C₁-C₄alkoxy; C₇-C₉phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C₁-C₄alkyl; a group of the formula (II), C₂-C₄alkyl substituted in the 2-, 3- or 4-position by C₁-C₈alkoxy or by di-(C₁-C₄alkyl)-amino; or the group



is a 5-membered to 7-membered heterocyclic group, R₉ is a direct bond, C₁-C₁₂alkylene, cyclohexylene, methycyclohexylene or phenylene, R₁₀ is as defined for R₃, r is an integer from 1 to 10 and R₁₁ is as defined for R₃ or a group



m is zero, 1, 2, 3 or 4, n is a number from 1 to 50, Y₁ is Cl, OH, ONa, OK, a group R₈ or a group —X₁Z or —X₃Z where Z is hydrogen, methyl, benzyl, C₁-C₈acyl or (C₁-C₈alkoxy)-carbonyl and Y₂ is Z, a group



or a group —X₂OH; the provisos applying to the compounds of the formula (I) that (II) X₁ or X₂ or X₃ contains a group of the formula (II), that (2I) each of the groups A₁, A₂, X₁, X₂, X₃ and m has the same or a different definition in the individual recurring structural units of the formula (I) and that (3I), when m is zero and n is 1, the only definition of Y₁ is the group —X₁Z.

5,091,451

REACTION PRODUCTS OF ALPHA-AMINOMETHYLENE PHOSPHONIC ACIDS AND EPOXY COMPOUNDS AND THEIR USE IN COATING COMPOSITIONS

Charles F. Kahle, II, Allison Park; Kurt G. Olson, Gibsonia; James A. Claar, Export; Paul H. Pettit, Jr., Wexford, and Paul R. Kerr, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 333,355, Apr. 3, 1989, Pat. No. 5,034,556.

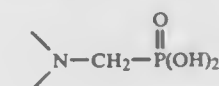
This application Mar. 4, 1991, Ser. No. 663,354

Int. Cl.⁵ C08K 5/17

U.S. Cl. 524-124

16 Claims

1. A waterborne coating composition comprising a film-forming polymer, a metallic pigment and an aqueous diluent medium, wherein the tendency of the pigment to react with the aqueous medium and release gaseous material is prevented or reduced by the incorporation in said coating composition of an effective amount of a compound which is a reaction product of at least one phosphonic acid group of an alpha-aminomethylene phosphonic acid containing at least one group corresponding to the formula,



with an epoxy group of a compound containing at least one epoxy group.

5,091,452

CHARGE DISSIPATIVE SURFACE COVERINGS

Kenneth K. Ko, West Grove; Jesse D. Miller, Jr., Lancaster, and Susan M. Von Stetten, Landisville, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jan. 30, 1989, Ser. No. 303,256

Int. Cl.⁵ C08K 5/41

U.S. Cl. 524—155

1 Claim

1. A surface covering comprising a layer including a vinyl resin and an antistatic agent capable of plasticizing said vinyl resin, wherein the antistatic agent is a quaternary ammonium salt having an organic chain ten to twenty-five atoms long selected from the group consisting of soyadimethylethyl ammonium ethosulfate, soya ethyldiammonium ethosulfate and soyadimethylammonium diethylphosphate.

5,091,453

FLAME RETARDANT POLYMER COMPOSITION

Neil S. Davidson, Stirling, and Kenneth Wilkinson, Dunblane, both of Scotland, assignors to BP Chemicals Limited, London, England

Filed Apr. 10, 1990, Ser. No. 506,787

Claims priority, application United Kingdom, Apr. 21, 1989, 8909070; Dec. 16, 1989, 8928444

Int. Cl.⁵ C08K 5/54

U.S. Cl. 524—269

10 Claims

1. A flame retardant polymer composition, which is substantially free of halogen compounds and of organometallic salts, said composition comprising:

- (A) an organic polymer, at least 40% by weight of which is a copolymer of ethylene with one or more comonomers selected from the group consisting of C₁ to C₆ alkyl acrylates, C₁ to C₆ alkyl methacrylates, acrylic acid, methacrylic acid and vinyl acetate;
- (B) from 0.5 to 100 parts by weight per 100 parts by weight of said organic polymer of a silicone fluid or gum; and
- (C) from 10 to 250 parts by weight per 100 parts by weight of said organic polymer of an inorganic filler which is a compound of a metal of Group IIA of the Periodic Table of Elements, but which is neither a hydroxide nor a substantially hydrated compound.

5,091,454

HOT MELT ADHESIVE COMPOSITION

William D. Arendt, Mundelein, Ill., assignor to Velsicol Chemical Corporation, Rosemont, Ill.

Division of Ser. No. 227,705, Aug. 3, 1988, Pat. No. 5,026,756.

This application Mar. 12, 1991, Ser. No. 668,089

Int. Cl.⁵ C08K 5/09

U.S. Cl. 524—293

1 Claim

1. A solid non-aqueous hot melt adhesive composition comprising a polymer, a tackifier, a wax, and a plasticizing amount in the range of about 5–40% by weight of 1,4-cyclohexane dimethanol dibenzoate.

5,091,455

POLYURETHANE-POLY(VINYLCHLORIDE) INTERPENETRATING NETWORK

Norman E. Blank, Heidelberg, Fed. Rep. of Germany; Richard C. Hartwig, Laurel, and Cung Vu, Gaithersburg, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 141,451, Jan. 7, 1988, abandoned. This application Jul. 10, 1990, Ser. No. 550,236

Int. Cl.⁵ C08K 3/26; C08L 75/04

U.S. Cl. 524—297

12 Claims

1. A two-step process, steps (A) and (B), for forming an interpenetrating polymeric network of distinct polyurethane and poly(vinyl chloride) networks wherein step (A) comprises mixing together

- (i) a polyol component,
- (ii) a polyisocyanate component,
- (iii) a polyurethane catalyst, and

(iv) a plastisol comprising plasticizer and poly(vinyl chloride);

wherein (i)–(iv) are present in a sufficient amount that the ratio of plastisol to polyurethane formed is in the range of about 0.1–2.0 and wherein at room temperature step (A) results in the formation of an initial partially cured polyurethane network holding the plastisol in uniform dispersion; and step (B) comprises heating the initial system to a poly(vinyl chloride) curing temperature to complete the cure of the polyurethane network and to cure the plastisol whereby the network resulting from the plastisol interpenetrates and is distinct from the polyurethane network.

5,091,456

ARAMID FIBER OF IMPROVED HYDROLYTIC STABILITY

David J. Rodini, Midlothian, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

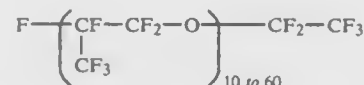
Filed Aug. 30, 1990, Ser. No. 575,544

Int. Cl.⁵ C08K 5/02, 5/05, 5/06

U.S. Cl. 524—366

7 Claims

1. An aramid fiber of improved hydrolysis resistance containing dispersed throughout the fiber, from 0.5 to 3% of bis(trifluoromethyl) benzyl alcohol or a polymer of the formula



based on the weight of the fiber.

5,091,457

POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITIONS

Howard F. Efner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 27, 1990, Ser. No. 515,294

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.⁵ C08K 7/14

U.S. Cl. 524—394

26 Claims

1. A composition comprising:

- (a) from about 20 to about 90 weight percent, based on total weight of the composition, of polyethylene terephthalate having an inherent viscosity of at least about 0.25;
- (b) from about 5 to about 65 weight percent, based on total weight of the composition, of filler, said filler comprising a mixture of flake glass and fiber glass having a ratio of said flake glass to said fiber glass from about 10:1 to about 1:10;
- (c) from about 0.5 to about 15 pph resin of a polyester having a number average molecular weight in the range from about 7,500 to about 20,000 and which is a condensation product of a dialkanoic acid containing from about 8 to 12 atoms per molecule and a dialkanol containing from 2 to about 5 carbon atoms per molecule;
- (d) from about 0.1 to about 3 pph resin of a metal salt of an ionic hydrocarbon copolymer of an alpha-olefin containing from 2 to about 5 carbon atoms per molecule and an alpha, beta-ethylenically unsaturated carboxylic acid containing from about 3 to about 5 carbon atoms per molecule in which copolymer the carboxyl groups have been at least partially neutralized with cations of said metal, said copolymer having a number average molecular weight in excess of about 3,000 prior to neutralization, said metal being selected from the group consisting of sodium and potassium; and
- (e) from about 0.01 to about 2 pph resin of an antioxidant.

5,091,458

WOOD GLUE

John Santoemma, Concord, Calif., assignor to Findley Adhesives, Inc., Wauwatosa, Wis.

Continuation-in-part of Ser. No. 192,452, May 11, 1988,

abandoned. This application Feb. 15, 1990, Ser. No. 482,126

Int. Cl.⁵ C08K 5/09; C08F 120/40

U.S. Cl. 524—436

4 Claims

1. A wood glue comprising a polyvinyl acetate emulsion and a crosslinking catalyst which consists essentially of about 12% to 20% aluminum chloride and about 12% to about 16% oxalic acid by weight.

5,091,459

THERMOPLASTIC BLOW MOLDABLE POLYETHYLENE TEREPHTHALATE COMPOSITIONS

King L. Howe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1990, Ser. No. 539,649

Int. Cl.⁵ C08L 67/02

U.S. Cl. 524—456

11 Claims

1. A semi-crystalline extrusion blow-moldable polyester composition comprising melt blends consisting essentially of:

- a) 62–88 weight percent at least one poly(ethylene terephthalate) PET selected from the group consisting of branched PET having an inherent viscosity of at least 0.60 dl/g and a mixture of the branched PET with linear PET having an inherent viscosity of at least about 0.65 dl/g, the mixture containing up to 90 weight percent of the linear PET;
- b) 10–30 weight percent of at least one ethylene terpolymer, E/X/Y, where E is ethylene at least 57 weight percent, X is glycidyl methacrylate from 4–8 weight percent and Y is from 10–35 weight percent of a moiety derived from C₁–C₆ alkyl (meth)acrylate;
- c) 2–8 weight percent of at least one ionomer obtained by neutralizing with Na⁺ or K⁺ at least 40 percent of the carboxyl groups in an ethylene copolymer which contains about 9–20 weight percent of units derived from (meth)acrylic acid and 0–35 weight percent of units derived from C₁–C₆ alkyl (meth)acrylate,
- the weight percentages given for each of components a), b) and c) being based on the total of these components only.

5,091,460

COATING COMPOSITION, COATED INORGANIC HARDENED PRODUCT, AND PROCESS FOR PRODUCING THE PRODUCT

Kazuo Seto, Minoru Inoue, Motoaki Haruna, all of Osaka; Hiroshi Kimura, Tokyo; Yasutoshi Nagano, Tokyo, and Yasuhiro Kushida, Tokyo, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo and Matsushita Electric & Works Ltd., Osaka, both of Japan

Filed Nov. 27, 1990, Ser. No. 618,551

Claims priority, application Japan, Nov. 27, 1989, 1-308781; Jul. 25, 1990, 2-200735; Sep. 29, 1990, 2-263509

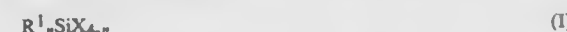
Int. Cl.⁵ C08K 3/34

U.S. Cl. 524—492

10 Claims

1. A coating composition comprising the following components (A) to (C);

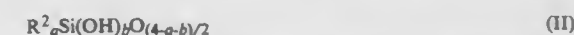
- (A) an organosilane oligomer solution containing silica particles dispersed therein, said solution being obtained by partially hydrolyzing a hydrolyzable organosilane represented by the formula



wherein R¹ which may be the same or different each represents a substituted or substituted monovalent hydrocarbon group having 1 to 8 carbon atoms, n is an integer of from 0 to 3, and X represents a hydrolyzable group, said partially hydrolyzing of said organosilane being in the

presence of colloidal silica dispersed in an organic solvent or water,

(B) a polyorganosiloxane having a silanol group in the molecule thereof, represented by the average composition formula



wherein R² which may be the same or different each represents a substituted or unsubstituted monovalent hydrocarbon group having 1 to 8 carbon atoms, and a and b are numbers satisfying the following equations:

$$0.2 \leq a \leq 2$$

$$0.0001 \leq b \leq 3$$

$$a + b < 4, \text{ and}$$

(C) a catalyst

5,091,461

FILLED POLYMERIC BLEND

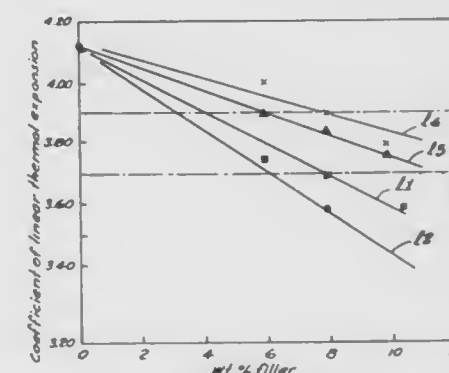
Richard E. Skochdopole, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 7, 1989, Ser. No. 334,411

Int. Cl.⁵ C08J 3/20; C08K 3/34; C08L 43/04

U.S. Cl. 524—493

9 Claims



1. A filled polymeric blend comprising:

- (A) from 50 to 80 percent by weight of an aromatic polycarbonate;
- (B) from 5 to 46 percent by weight of a rubber modified homopolymer or copolymer of a vinyl aromatic monomer;
- (C) from 4 to 18 weight percent of an inorganic filler selected such that at least 98 percent of the particles thereof in final blend have a diameter less than 44 μm and an average diameter to thickness ratio from 4 to 24, said blend having a coefficient of linear thermal expansion (CLTE) of $3.9 \times 10^{-5}/^\circ\text{F}$. ($7.0 \times 10^{-5}/^\circ\text{C}$) or less, a dart impact (-20°F) (-29°C) of at least 100 in lb (11.3 joules); and a heat distortion under load (DTUL) per ASTM D-648-82 at 66 psi (455 kPa) of at least 230° F. (110° C.).

5,091,462

THERMOPLASTIC RESIN COMPOSITION

Osamu Fukui, Kamakura; Kiyoshi Tsutsui, Sakai; Tomohiko Akagawa, Sakai; Ikunori Sakai, Sakai; Takao Nomura, Toyota; Takeyoshi Nishio, Okazaki; Toshio Yokoi, and Nobuya Kawamura, both of Toyota, all of Japan, assignors to Ube Industries Limited, Yamaguchi and Toyota Jidosha Kabushiki Kaisha, Aichi, both of Japan

Filed Mar. 14, 1990, Ser. No. 493,459

Claims priority, application Japan, Mar. 17, 1989, 1-65105

Int. Cl.⁵ C08L 51/00; C08K 3/34

U.S. Cl. 524—504

5 Claims

1. A polypropylene thermoplastic resin composition comprising:

100 parts by weight of a polypropylene thermoplastic resin composition comprising 95–5% by weight (a) a modified polypropylene obtained by grafting a crystalline polypropylene with 0.05 to 5% by weight of an unsaturated carboxylic acid and/or an acid anhydride, ester, salt or amide of an unsaturated carboxylic acid, or a crystalline polypropylene comprising at least 5% by weight of said modified polypropylene, and 5–95% by weight of (b) a modified polyamide obtained by partially or wholly modifying a polyamide with 0.05 to 10% by weight of a clay mineral, and

1–100 parts by weight of (c) an ethylene- α -olefin copolymer rubber or a modified ethylene- α -olefin copolymer rubber obtained by partially or wholly grafting an ethylene- α -olefin copolymer rubber with an unsaturated carboxylic acid and/or a derivative of an unsaturated carboxylic acid.

5,091,463

RESIN COMPOSITION FOR ADHERING
POLYARYLENE SULFIDE AND POLYVINYLIDENE
FLUORIDE, METHOD OF ADHERING THEM AND
THEIR LAMINATED STRUCTURE

Shunji Onishi, Tsukuba; Yoshinori Ichikawa, Fujisawa, and Junji Takeuchi, Kamakura, all of Japan, assignors to Tonen Sekiyukagaku Kabushiki Kaisha, Tokyo, Japan

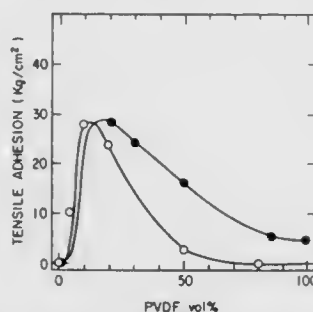
Filed Oct. 23, 1989, Ser. No. 425,630

Claims priority, application Japan, Oct. 28, 1988, 63-272430

Int. Cl.⁵ C08K 3/22, 13/02

U.S. Cl. 524—508

3 Claims



1. A resin composition comprising polyarylene sulfide, a polyvinylidene fluoride and ultrafine inorganic or metal particles having an average particle size of 0.01–1 μ m, said polyvinylidene fluoride consists essentially of the repeating unit of $-\text{CH}_2-\text{CF}_2-$, and has a melt index (230° C., 10 kg/cm², ASTM D 1238) to 1 to 100, a volume ratio of said polyarylene sulfide to said polyvinylidene fluoride is 35:65 to 93:7, and a filling ratio of said ultrafine particles is 30 volume % of less per 100 volume % of the total composition.

5,091,464

POLYMER COMPOSITIONS HAVING IMPROVED
MOLDING CHARACTERISTICS

Paul J. Huspeni, North Augusta, S.C.; Richard Layton, Augusta, and Paul D. Frayer, Martinez, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

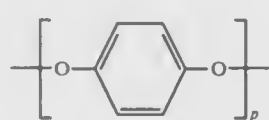
Continuation of Ser. No. 451,366, Dec. 15, 1989, abandoned, which is a continuation of Ser. No. 255,623, Oct. 11, 1988, abandoned. This application Dec. 19, 1990, Ser. No. 629,826

Int. Cl.⁵ C08L 67/03

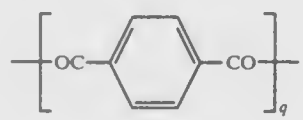
U.S. Cl. 524—539

4 Claims

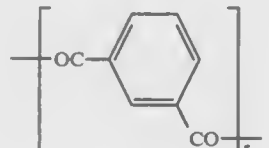
1. Fully aromatic polyester blends comprising 1–19 parts by weight of a polyester (a) comprising the following recurring units:



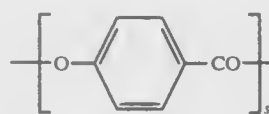
(I)



(II)

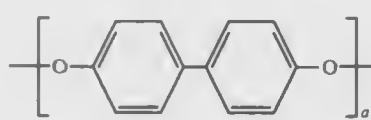


(III)

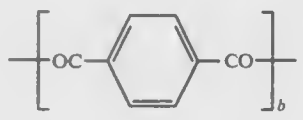


(IV)

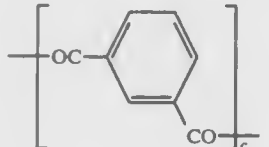
wherein the subscripts p, q, r and s are numbers representing the relative molar amounts of units (I), (II), (III) and (IV), respectively in the polyester; and wherein p is approximately equal to q+r; q is in the range of from about 0 to about 0.76, r is in the range of from about 1.00 to about 0.24, and s is in the range of from about 0.18 to about 9.0, and said polyester having a melting point in the range of from about 340° C. to 400° C., a crystallization temperature of from about 300° C. to 340° C. and a crystallization rate of at least about 1000 counts per minute; to 1 part by weight of a polyester (b) comprising the following recurring moieties:



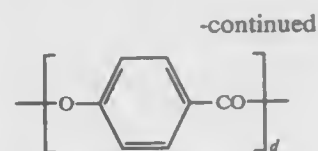
(V)



(VI)



(VII)



(VIII)

wherein a, b, c and d are numbers representing the relative molar amounts of units (V), (VI), (VII) and (VIII), respectively, in the polyester, and where a is approximately equal to b+c; b is in the range of from about 0.5 to about 0.8; c is in the range of from about 0.5 to about 0.2; and d is in the range of from about 1 to about 7.

5,091,465

GLASS FIBER SIZE

David E. Dana, Pittsburgh, Pa.; Tsao-Chin C. Huang, The Woodlands, Tex.; Enrico J. Pepe, Amawalk, N.Y.; Eric R. Pohl, Tarrytown, N.Y., and Shiu-Chin H. Su, Croton-on-Hudson, N.Y., assignors to Union Carbide Chemicals and Plastics Company, Inc. and PPG Industries, Inc., both of Danbury, Conn.

Filed Dec. 13, 1989, Ser. No. 450,065

Int. Cl.⁵ C08L 67/06; C08G 63/91

U.S. Cl. 524—588

14 Claims

1. A polyester resin having a molecular weight of greater than 1000 comprising a Michael addition adduct or its acid salt, formed by reaction between an aminoalkylalkoxysilane and a conjugated ethylenically unsaturated polyester resin having a polyalkylene glycol chain segment and wherein the conjugated ethylenically unsaturated polyester resin is prepared from (a) a conjugated ethylenically unsaturated dicarboxylic acid selected from the group consisting of maleic acid, fumaric acid, mesaconic acid, citraconic acid, halo- and alkyl-derivatives of said maleic, fumaric, mesaconic and citraconic acids, and mixtures thereof; (b) a saturated or aromatic dicarboxylic acid selected from the group consisting of succinic acid, adipic acid, suberic acid, azelaic acid, sebacic acid, phthalic acid, isophthalic acid, terephthalic acid, tetrachlorophthalic acid, and mixtures thereof; and (c) a dihydric alcohol selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol, 1,4-cyclohexane dimethanol, dipropylene glycol, neopentyl glycol, tetramethylene glycol, hexylene glycol, hexamethylene glycol, 1,3-propanediol, 2-methyl propanediol, 1,4-butanediol, 2,3-butanediol, 2-butenediol, 1,5-pentanediol, 2-ethyl-1,3-hexanediol, 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate, 1,3-butanediol, and mixtures thereof.

5,091,466

INSOLUBILIZATION OF SOLUBLE PRE-IMIDIZED
POLYIMIDES BY POLYHYDRAZINE COMPOUNDS
Siegfried Aftergut, Schenectady, and Theresa A. Sitnik, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

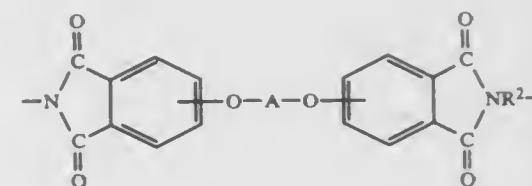
Filed Apr. 23, 1990, Ser. No. 513,393

Int. Cl.⁵ C08J 61/22; C08L 67/00, 73/00

U.S. Cl. 524—600

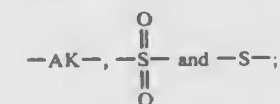
14 Claims

1. A composition comprising:
100 parts by weight of an organic solvent soluble fully imidized polyetherimide;
a sufficient amount of an organic solvent to dissolve the polyimide; and
a sufficient amount of a polyhydrazine to insolubilize the polyetherimide upon heating to an elevated temperature less than 250° C.;
said polyetherimide consisting essentially of structural units of the formula



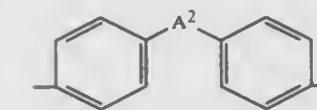
wherein:

A is a bisaryl radical in which the two aryl groups are joined by a covalent bond or by one or more divalent radicals selected from the class consisting of

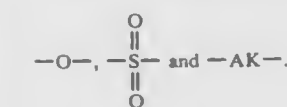


AK is an alkylene radical having from 1 to 5 carbon atoms; and

R² is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, (c) C₂–₈ alkylene-terminated polydiorganosiloxane and (d) divalent radicals includes by the formula



where A² is selected from the class consisting of



5,091,467

CONTROLLED MORPHOLOGY BARRIER
ELASTOMERS MADE FROM BLENDS OF
SYNDIOTACTIC 1,2-POLYBUTADIENE AND
ETHYLENE-VINYL ACETATE-VINYL ALCOHOL
TERPOLYMERS

Roger N. Beers, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 29, 1991, Ser. No. 678,879

Int. Cl.⁵ B60C 9/14; B32B 27/28; C08L 23/26, 9/00

U.S. Cl. 525—57

10 Claims

1. An innerliner of a tire containing a barrier composition, comprising:
a blend of syndiotactic 1,2-structure containing polybutadiene, a saponified copolymer of ethylene, vinyl acetate, and vinyl alcohol, and a compatibilizing agent, wherein said compatibilizing agent is one or more unsaturated acids, esters, anhydrides or derivatives thereof, or polymers containing unsaturated acids, esters, anhydrides or derivatives thereof, wherein the amount of said syndiotactic microstructure in said polybutadiene is at least 80 percent by weight based upon the total weight of syndiotactic, atactic, and isotactic structure of said polybutadiene, wherein the amount of said terpolymer is from about 10 to about 40 percent by weight, wherein the amount of said compatibilizing agent is from about 0.2 to about 3 percent by weight, and wherein the amount of said polybutadiene is the difference, all based upon the total weight of said

polybutadiene, said terpolymer, and said compatibilizing agent.

5,091,468

ORGANOSILANE COATING COMPOSITION

Eizi Takeuchi, Tokyo, Japan, assignor to T.S.B. Ltd., Tokyo, Japan

Filed Jan. 29, 1990, Ser. No. 471,349

Claims priority, application Japan, Jul. 3, 1989, 1-169793

Int. Cl.⁵ C08K 5/06

U.S. Cl. 524—761

11 Claims

1. An antistatic coating composition comprising:
 - (a) a first organosilane compound having at least one epoxy group and at least one hydrolyzable alkoxy group;
 - (b) a second organosilane compound having no epoxy group and two or more hydrolyzable alkoxy groups;
 - (c) 2 to 20 wt%, based on the total weight of said first and second organosilane compounds, of aluminum dihydrogenphosphate; and
 - (d) 50 to 500 parts by weight, based on the total weight of said first and second organosilane compounds, of an organic solvent for said first and second organosilane compounds, wherein said first organosilane compound and said second organosilane compound are present in an amount effective to provide an antistatic coating.

5,091,469

COMPATIBILIZED EPOXY/POLYAMIDE COMPOSITIONS CONTAINING POLYOLEFINS

Richard A. Miller, Kingsport, and David J. Olsen, Jonesborough, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1990, Ser. No. 545,166

Int. Cl.⁵ C08L 63/00, 77/00

U.S. Cl. 525—65

6 Claims

1. A compatibilized adhesive composition comprising:
 - (A) about 33 to about 49 weight % of a polyamide,
 - (B) about 0.5 to about 31 weight % of a polyolefin, and
 - (C) about 0.1 to about 33 weight % of a maleated polypropylene, and
 - (D) about 33 to about 49 weight % of an epoxy resin having an epoxy molar mass at from about 100 to 5,000.

5,091,470

MOLDING RESIN

Hendrick W. Wolsink, Terneuzen, Netherlands; John J. Plomer, and Thomas D. Traugott, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 343,301, Apr. 26, 1989, abandoned,

which is a division of Ser. No. 172,621, Mar. 24, 1988,

abandoned. This application Sep. 10, 1990, Ser. No. 581,436

Int. Cl.⁵ C08L 51/04, 55/02, 33/24

U.S. Cl. 525—71

16 Claims

1. A thermoplastic molding composition which is capable of providing injection molded objects having 60° Gardner gloss values of less than 70 and which comprises:

- A) a mass or solution polymerized graft copolymer composition comprising:
 - 1) a graft copolymer comprising in polymerized form an ethylenically unsaturated nitrile monomer, an N-aryl maleimide and at least one copolymerizable monomer selected from the group consisting of monovinylidene aromatic monomers, C₁₋₄ alkyl methacrylates, and mixtures thereof grafted to a rubbery substrate polymer; and
 - 2) a matrix polymer comprising in polymerized form an ethylenically unsaturated nitrile monomer, an N-aryl maleimide and at least one copolymerizable monomer selected from the group consisting of monovinylidene aromatic monomers, C₁₋₄ alkyl methacrylate, and mixtures thereof, the content of said N-aryl maleimide in the graft copolymer and the matrix polymer being from 7 to

30 weight percent based on the total weight of the mass or solution polymerized graft copolymer composition; and B) from 5 to 35% on a total molding composition weight basis of an emulsion polymerized grafted rubbery polymer having a polymer of a monovinylidene aromatic monomer, an ethylenically unsaturated nitrile and, optionally, an N-aryl maleimide grafted to a rubbery polymer substrate.

5,091,471

ELASTOMER BLENDS HAVING IMPROVED EXTRUSION RESISTANCE AND METHOD FOR THE PREPARATION THEREOF

Daniel F. Graves, Clinton, and William L. Hergenrother, Akron, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

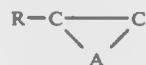
Filed Jan. 17, 1989, Ser. No. 297,166

Int. Cl.⁵ C08L 53/00

U.S. Cl. 525—90

15 Claims

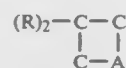
1. A curable elastomer composition having improved extrusion resistance comprising a homogeneous blend of:
 - from about 50 to about 90 parts by weight of a rubber having a weight average molecular weight of from about 50,000 to about 500,000 and selected from the group consisting of natural rubber, polyisoprene, styrene butadiene, polybutadiene, butyl rubber, Neoprene, ethylene/propylene rubber, ethylene/propylene/diene rubber, acrylonitrile/butadiene rubber, silicone rubber, fluoroelastomers, ethylene acrylic rubber, ethylene vinyl acetate copolymer, epichlorohydrin rubbers, chlorinated polyethylene rubbers, chlorosulfonated polyethylene rubbers, hydrogenated nitrile rubber and tetrafluoroethylene/propylene rubber and blends thereof and
 - from about 10 to about 50 parts by weight of a block copolymer containing elastomeric blocks comprising an anionically polymerizable rubber-forming monomer, and crystalline or semi-crystalline blocks comprising a thermosetting plastic to form 100 total parts of elastomer;
 wherein said elastomeric blocks of said block copolymers are prepared from monomers selected from the group consisting of olefin, conjugated diene, vinyl substituted aromatic, vinyl substituted pyridine, vinyl substituted quinoline;



where A is O or S and R is H or an aliphatic, cycloaliphatic or aromatic group containing from 1 to 15 carbon atoms inclusive;

RCH=A

where A is O or S and R is an aliphatic, cycloaliphatic or aromatic group containing from 1 to 15 carbon atoms inclusive;



where A is O or S and R is an aliphatic, cycloaliphatic or aromatic group containing from 1 to 15 carbon atoms inclusive; and

(R)₂C=S

where R is aliphatic, cycloaliphatic or aromatic group containing from 1 to 15 carbon atoms inclusive; said crystalline blocks are selected from the group consisting of monomers having an active hydrogen other than monomers employed to form said elastomeric block; and

said monomers having an active hydrogen are selected from the group consisting of lactams, ureas, urethanes, urethane-urea copolymers, imides, thioureas and thiourethanes.

5,091,472

SOLVENT-RESISTANT, COMPATIBLE BLENDS OF POLYPHENYLENE ETHERS AND THERMOPLASTIC POLYESTER MIXTURES

Sterling B. Brown, Schenectady, and Richard C. Lowry, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 314,267, Feb. 24, 1989, Pat. No. 4,935,472, which is a continuation of Ser. No. 173,789, Mar. 28, 1988, abandoned. This application Feb. 12, 1990, Ser. No. 478,864

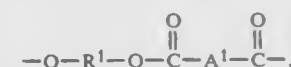
Int. Cl.⁵ C08L 51/00, 53/02, 71/12

U.S. Cl. 525—92

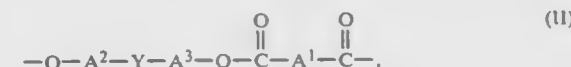
19 Claims

1. A resinous composition comprising the following resinous components and any reaction products thereof, all percentage proportions being by weight of total resinous components:

- (A) about 25-60% of at least one polyphenylene ether containing at most 800 ppm. of unneutralized amino nitrogen;
- (B) about 30-60% of a polyester mixture comprising (B-1) about 40-95%, based on total polyester, of a polymer consisting essentially of structural units of the formula



and (B-2) about 5-60% of a polymer consisting essentially of structural units of the formula



wherein:

- R¹ is a saturated C₂₋₁₀ divalent aliphatic or alicyclic hydrocarbon radical;
- each of A¹, A² and A³ is independently a monocyclic divalent aromatic radical; and
- Y is a bridging radical in which one or two atoms separate A² from A³;
- (C) about 5-20% of at least one aromatic polycarbonate having a weight average molecular weight of at least about 45,000 as determined by gel permeation chromatography relative to polystyrene; and
- (D) about 5-25% of at least one elastomeric polyphenylene ether-compatible impact modifier.

5,091,473

RESIN COMPOSITION

Yusuke Arashiro; Shinichi Yamauchi; Hironari Sano; Takayuki Inoue, and Koji Nishida, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 571,109

Claims priority, application Japan, Aug. 28, 1989, 1-218618

Int. Cl.⁵ C08L 53/00, 71/04

U.S. Cl. 525—92

7 Claims

1. A resin composition comprising:
 - (a) 28 to 78% by weight of a polyamide resin,
 - (b) 20 to 70% by weight of a polyphenylene ether resin,
 - (c) 2 to 40% by weight of a block copolymer composed of an alkenyl aromatic polymer and a conjugated diene polymer wherein a content of an alkenyl aromatic polymer structure unit is 10 to 45% by weight and at least 50% of a conjugated diene polymer structure unit is hydrogenated and
 - (d) at least one compound selected from the group consisting of α, β-unsaturated dicarboxylic acid, an acid anhydride and derivatives thereof with an amount of 0.01 to 10 parts

by weight based on 100 parts by weight of the sum of Components (a), (b) and (c),

Component (b) being present in Component (a) as a primary dispersed phase, Component (c) forming a secondary dispersed phase in Component (b), an average particle size of Component (c) being in the range of 0.01 to 3 microns and a melt viscosity ratio (η_c/η_b) of Component (c) and Component (b) being in the range of 0.09 to 5.

5,091,474

EPOXY RESIN CURING AGENT BASED ON BLENDS CONTAINING DISECONDARY AROMATIC DIAMINES Shinkichi Murakami; Osamu Watanabe, both of Iruma; Sadahisa Wada, Kamifukuoka; Makoto Miyazaki, Sakato, and Hiroshi Inoue, Iruma, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 310,657, Feb. 15, 1989, abandoned.

This application Jan. 18, 1991, Ser. No. 642,545

Claims priority, application Japan, Feb. 17, 1988, 63-34803;

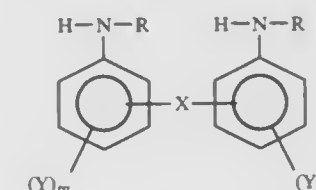
Apr. 29, 1988, 63-108860

Int. Cl.⁵ C08G 59/56, 59/50

U.S. Cl. 525—109

6 Claims

1. A curing agent composition consisting essentially of a first curing agent which is capable of cross-linking an epoxy resin and which is at least one member selected from the group consisting of aliphatic primary amines, polyamido primary amines, dicyanopolyamides, bisphenols, phenolic resins, vinyl-phenol polymers and acid anhydrides, and a second curing agent which is at least one compound represented by the following general formula:



wherein X is —CR₁R₂—, —CO—, —COO—, —SO₂—, —SO—, —S—, —O—, —NR₁—, —SiR₁R₂— or —POR₁— where R₁ and R₂ each stands for hydrogen, a lower alkyl or a phenyl; Y and Y' each stands for hydrogen, a lower alkyl or an electron attracting group; R is a lower alkyl; and m and n each is an integer of 1-4.

5,091,475

POWDER COATINGS WITH FLAT FINISHES

Terry A. Potter, New Martinsville, W. Va., and Hugh C. Grubbs, Cannonsburg, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jul. 17, 1989, Ser. No. 380,956

Int. Cl.⁵ C08G 18/67, 18/68; C09D 175/14, 175/16

U.S. Cl. 525—124

16 Claims

1. A coating composition comprising
 - a) a polyisocyanate having a content of isocyanate groups blocked by blocking agents of about 10 to 35% by weight and containing about 0.5 to 10.0% by weight of structural units corresponding to the formula



and

- b) a polyhydroxy polyacrylate in an amount sufficient to provide an equivalent ratio of blocked isocyanate groups to hydroxyl groups of about 0.5:1.0 to 2.0:1.0.

5,091,476
CYANATE ESTER RESIN BLENDS WITH BROMINATED
STYRENE-CONTAINING POLYMERS
Georgia A. Monnerat, Lake Jackson, Tex., assignor to The Dow
Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 295,873, Jan. 11, 1989. This
application Apr. 27, 1990, Ser. No. 515,989
Int. Cl.⁵ C08F 8/30

U.S. Cl. 525—149 **19 Claims**
1. A blend comprising (A) at least one compound containing a plurality of —OCN groups; and (B) a brominated homopolymer or brominated interpolymers of styrene or alkyl- or halo-substituted styrene or any combination thereof, which polymer has a weight average molecular weight of from about 2000 to about 700,000; wherein components (A) and (B) are present in an amount such that the blend contains a bromine content of from about 4 to about 25 percent by weight based on the combined weight of components (A) and (B).

5,091,477
THERMOPLASTIC MOLDING MATERIALS
Rainer Bueschl, Roedersheim-Gronau, and Peter Klaerner, Bat-
tenberg, both of Fed. Rep. of Germany, assignors to BASF
Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Mar. 16, 1990, Ser. No. 494,316
Claims priority, application Fed. Rep. of Germany, Apr. 5,
1989, 3910942

Int. Cl.⁵ C08F 8/299, 45/00, 67/02, 71/12
U.S. Cl. 525—152 8 Claims

1. A molding material consisting essentially of:

- (a) high impact polystyrene,
- (b) a polymer selected from the group consisting of an acrylonitrile-butadiene-styrene copolymer, polymethyl (meth)acrylate, a polyphenylene ether, polyvinyl chloride and a thermoplastic polyester, and
- (c) from about 1 to about 5% by weight of a homopolymer or copolymer of cyclohexyl (meth)acrylate, said copolymer containing not less than 45% by weight of units of cyclohexyl (meth)acrylate.

5,091,478
PARTIALLY GRAFTED THERMOPLASTIC
COMPOSITIONS

Robert P. Saltman, Townsend, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 117,941, Nov. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 930,843, Nov. 14, 1986, abandoned. This application May 21, 1990. Ser. No.

U.S. Cl. 525—179 8 Claims
1. A partially grafted, multi-phase flexible thermoplastic composition formed by melt blending:

composition formed by melt blending.

- 25-50 volume % of at least one polyamide resin having graft sites, the polyamide comprising at least one continuous phase of the composition, and the polyamide having a number average molecular weight of at least 5,000,
- 10-74 volume % of at least one ethylene copolymer, E/X/Y, where E is ethylene and is at least 50 weight % of E/X/Y, X is 1-35 weight % of an unsaturated monocarboxylic acid, and Y is 0-49 weight % of a moiety derived from at least one alkyl acrylate, alkyl methacrylate, alkyl vinyl ether, carbon monoxide, sulfur dioxide, or mixtures thereof where the alkyl groups contain 1-12 carbon atoms, and further wherein the acid groups in the acid-containing moiety are neutralized from 0-100% by a metal ion, and
- 1-50 volume % of at least one polymeric grafting agent which contains reactive groups selected from at least one of epoxides, isocyanates, axiridine, silanes, alkyl halides, alpha-halo ketones, alpha-halo aldehydes, or oxazoline, which grafting agents react with the acid-containing moieties in component b) and additionally react with the graft

sites of component a) and wherein the quantity of reactive groups x , provided to the composition by the grafting agent expressed as MMOLS of reactive groups per one hundred grams of component b) plus component c) is defined by the following formula:

$$d - (a) \cdot (m) < x < 16$$

where
a=volume % of component a),
d=0.9 MMOLS of reactive groups per 100 grams of
component b) plus component c)

$$m = 0.016 \left[\frac{\left(\begin{array}{c} \text{MMOLS of reactive groups per} \\ \text{100 g of component b) plus component c)} \end{array} \right)}{\text{volume \% of component a)} \right]$$

and further wherein the weight percent of monomers containing the reactive groups is 0.5–15 weight percent of the polymeric grafting agent, component c), the remainder of the polymeric grafting agent contains at least 50 weight % of ethylene and from 0–49 weight % of a moiety derived from at least one alkyl acrylate, alkyl methacrylate, alkyl vinyl ether, carbon monoxide, sulfur dioxide, or mixtures thereof where the alkyl groups contain 1–12 carbon atoms.

the above volume percentages for components a), b) and c) are based on the total of component a), component b), and component c) only and are calculated from the densities of the individual components prior to mixing.

5,091,479
USE OF OLIGOMERS OF ALKENYL
GROUPS-SUBSTITUTED AROMATICS AS CO-AGENTS
Wilhelmus M. Beijlvelde, ZM Olst, and Willem C. Endstra, AV
Epse, both of Netherlands, assignors to Akzo NV, Arnhem,
Netherlands

Filed Nov. 30, 1989, Ser. No. 443,978
Claims priority, application Netherlands, Dec. 6, 1988,
8802994

Int. Cl.⁵ C08F 4/32, 255/02, 255/04
U.S. Cl. 525—263 9 Claims

1. A process for the modification of (co)polymers by reacting said (co)polymers with 1 to 10 parts by weight organic peroxides per 100 parts (co)polymer in the presence of 0.1 to 10 parts by weight co-agent per 100 parts (co)polymer, wherein said co-agent comprises a (co)oligomer of an aromatic compound substituted with at least two C₃-6 alkenyl groups and having a degree of oligomerization of 1.5 to 50.

5,091,480
COMB-LIKE POLYMERS AND GRAFT COPOLYMERS
FROM POLYARYLENE POLYETHER
MACROMONOMERS

Virgil Percec, Pepper Pike, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Continuation-in-part of Ser. No. 932,4832, Nov. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 586,679, Mar. 6, 1984, abandoned. This application May 12, 1989, Ser. No. 351,363

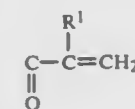
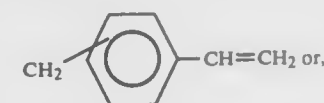
Int. Cl.⁵ C08F 283/08; C08G 75/23; C08L 71/12
U.S. Cl. 525—391 4 Claims

1. A mass of monofunctionalized polyarylene polyether macromonomer free from difunctionalized macromonomer, said monofunctionalized polyarylene polyether macromonomer being represented by the formula

$$\text{Hal}-(\text{Ar}_1-\text{X}-\text{Ar}_1-\text{O}-\text{Ar}_2-\text{X}-\text{Ar}_2-\text{O})-\text{R}^e$$

wherein

R^e represents



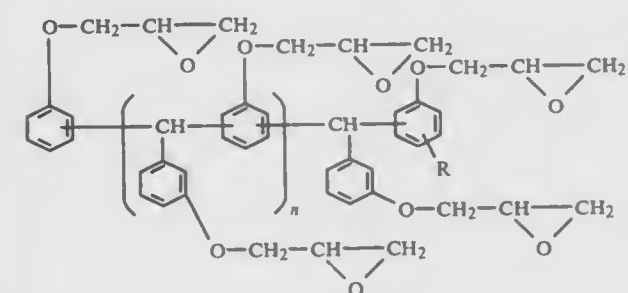
R^1 represents CH_3 or H ;
 Hal represents halogen, particularly F , Cl or Br ;
 X represents SO_2 , CO or O , and may be the same or different;
 n is an integer in the range from 1 to about 100;
 Ar_1 and Ar_2 are selected from the group consisting of 1,4-phenylene, 1,4-naphthylene, and 2,6-dimethylphenylene, and may be the same or different; except that when Ar_1 and Ar_2 are the same, and each represents 2,6-dimethyl-1,4-phenylene, then X can only be O .

5,091,481
COMPOSITION OF POLYEPOXY COMPOUNDS,
LINEAR POLYMER AND AROMATIC DIAMINE
Hiroyuki Nakajima; Takashi Takahama; Fumiaki Miyamoto;
Seiji Oka; Toshio Isooka, all of Amagasaki; Yoshihiro
Maruyama, Sagami, and Yasushi Yamamoto, Amagasaki,
all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha,
Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,333
Claims priority, application Japan, Jul. 20, 1988, 63-181209
Int. Cl.⁵ C08L 63/02, 63/07, 67/02, 79/08

U.S. Cl. 525-423 5 Claims

1. A resin composition for laminate, which comprises 100 parts by weight of a composition (B), from 0.5 to 10 parts by weight of dicyandiamide and from 1 to 100 parts by weight of a linear polymer, said composition (B) comprising (i) a composition comprising (a) from 20 to 80 parts by weight of a polyfunctional epoxy compound of the formula:



wherein R is H or CH₃ and n is an integer of from 0 to 5, and (b) from 80 to 20 parts by weight of an epoxy compound which is a diglycidyl ether obtained by reacting bisphenol A or halogenated bisphenol A with epichlorohydrin or is a polyglycidyl ether of a novolak phenol formaldehyde resin, and (ii) an aromatic diamino compound incorporated in the composition (i) in such an amount that its active hydrogen is from 0.3 to 0.8 equivalent per equivalent of terminal epoxy groups, and wherein the linear polymer is polyether sulfone, polysulfone, polyether imide, polyphenylene sulfide, polyester or a polyphenoxy resin.

5,091,482

**BLEND OF POLYCARBONATE CAPPED WITH
PHENOLIC CHAIN TERMINATOR MIXTURE**

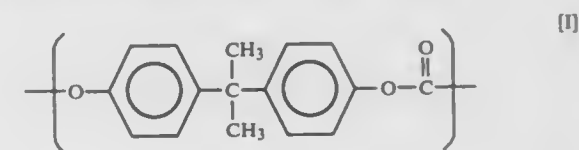
Masaya Okamoto, and Hiroshi Kurokawa, both of Ichihara,
Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo,
Japan

Division of Ser. No. 327,710, Mar. 23, 1989, Pat. No. 4,977,233.

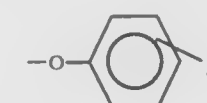
This application Sep. 7, 1990, Ser. No. 578,633

Claims priority, application Japan, Mar. 28, 1988, 63/71984;
Apr. 27, 1988, 63/102615

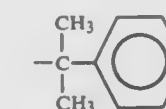
U.S. Cl. 525—462 **3 Claims**
1. A polycarbonate blend having a principal chain comprising a repeating unit represented by the formula:



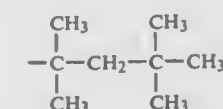
1- and (a) substituted phenoxy group represented by the formula:



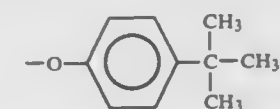
wherein A is α , α -dimethylbenzyl group represented by the formula:



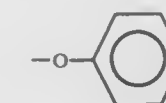
or 1,1,3,3-tetramethylbutyl group represented by the formula:



and (b) at least one group selected from the group consisting of
 p-tert-butylphenoxy group represented by the formula:



and phenoxy group represented by formula (IV)



bonded at the terminals of the molecules in the ratio of (a) 10 to 99 mole percent of the substituted phenoxy group and (b) 90 to 1 mole percent of the at least one group selected from the group consisting of p-tert-butylphenoxy group and phenoxy group, and wherein the polycarbonate blend is a mixture of a polycarbonate having (a) the substituted phenoxy group represented by the formula (II) bonded to the terminal of the mole-

cule and a polycarbonate having (b) at least one group selected from the group consisting of the p-tert-butyl phenoxy group and phenoxy group bonded to the terminal of the molecule.

5,091,483

RADIATION-CURABLE SILICONE ELASTOMERS AND PRESSURE SENSITIVE ADHESIVES

Mieczyslaw H. Mazurek; Steven S. Kantner; Charles M. Leir, all of St. Paul, Minn.; Yvan A. Bogaert, Gent, Belgium; Robert K. Galkiewicz, and Audrey A. Sherman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

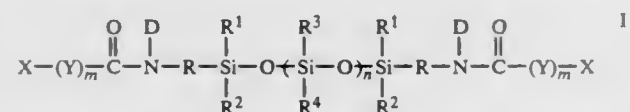
Continuation of Ser. No. 411,410, Sep. 22, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 671,172

Int. Cl.⁵ C08G 77/00

U.S. Cl. 525—477

30 Claims

1. A composition which is curable to an elastomer comprising: a polymer or mixture of polymers of the formula



wherein:

X are monovalent moieties having ethylenic unsaturation which can be the same or different;

Y are divalent linking groups which can be the same or different;

m is an integer of 0 to 1;

D are monovalent moieties which can be the same or different selected from the group consisting of hydrogen, an alkyl group of 1 to about 10 carbon atoms, aryl, and substituted aryl;

R are divalent hydrocarbon groups which can be the same or different;

R¹ are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, aryl, and substituted aryl;

R² are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, aryl, and substituted aryl;

R³ are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, vinyl, aryl, and substituted aryl; and

R⁴ are monovalent moieties which can be the same or different selected from the group consisting of alkyl, substituted alkyl, vinyl, aryl, and substituted aryl; and n is an integer of about 270 to about 1000.

5,091,484

ELASTOMER-FORMING COMPOSITIONS COMPRISING ALKOXYLATED MQ RESINS AND POLYDIORGANOSILOXANES

André R. L. Colas, Glashuett, and Klaus M. Geilich, Wiesbaden, both of Fed. Rep. of Germany, assignors to Dow Corning GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 10, 1990, Ser. No. 463,189

Claims priority, application United Kingdom, Feb. 1, 1989, 8902183

Int. Cl.⁵ C08F 283/00

U.S. Cl. 525—477

12 Claims

1. An organosilicon composition which upon curing forms an elastomer comprising (i) 100 parts by weight of a diorganopolysiloxane of which each terminal group has the general formula —Si(Z)₂Q, wherein each Z denotes an organic group consisting of C, H and optionally O atoms and Q is selected from the group consisting of —OH, —OSi(OR*)₃, —R*Si(OR*)₃ and —R*Si(Z)₂OSi(Z)₂R*Si(OR*)₃ wherein R* is a divalent alkylene group having up to 10 carbon atoms in the chain linking the two silicon atoms together, R* is an alkyl

group having up to 8 carbon atoms, said diorganopolysiloxane having a viscosity of from 10⁻⁴ m²/s to 10 m²/s, (ii) 1 to 150 parts by weight of an MQ resin consisting essentially of tetrafunctional units of the general formula SiO_{4/2} and monovalent units of the general formula R₂R'₂SiO_{1/2} wherein R is selected from the group consisting of alkyl and aryl groups having from 1 to 8 carbon atoms, R' is a group of the general formula —R''Si(OR*)₃ wherein R'' and R* are as defined above and a has the value of 2 or 3, there being at least one R' group per molecule and (iii) a titanium catalyst.

5,091,485

LOW VISCOSITY, CROSSLINKABLE LIQUID POLYSILANES

Patrick Noireaux, Le Mans; Jean Jamet, Carignan de Bordeaux; Michel Parlier, Voisins-le-Bretonneaux, and Marie-Pierre Bacos, Sceaux, all of France, assignors to National d'Etudes et de Recherches Aérospatiales (ONERA), Chatillon and Institut de Recherche/Appliquée sur les Polymères, Le Mans, both of, France

Filed Jan. 23, 1990, Ser. No. 469,024

Claims priority, application France, Jan. 23, 1989, 89 00764

Int. Cl.⁵ C08F 283/00

U.S. Cl. 525—478

26 Claims

1. A process for the preparation of a low viscosity, crosslinkable polysilane that is liquid at ambient temperatures and essentially free of volatiles, comprising (a) reacting at least one silane monomer of the formula (I):



(I)

in which R¹ is a hydrogen atom or a hydrocarbon radical and R² is a vinyl radical, with at least one organic or organosilicon monochlorinated comonomer, in the presence of molten sodium in an organic solvent and wherein the ratio r₁ of the number of moles of said silane monomer of formula (I) to the number of moles of said monochlorinated comonomer ranges from 0.5 to 2 and said solvent comprises toluene and dioxane, (b) cooling the reaction medium and separating same into (i) a liquid phase which comprises said solvent and the major fraction of low molecular weight polysilane in liquid and/or dissolved state and (ii) a solid phase which comprises sodium, sodium chloride and high molecular weight polysilane, and (c) recovering desired low viscosity polysilane from said liquid phase.

5,091,486

PREPARATION OF POLYACETALS/CYCLIC ACETALS FROM POLYKETONE

Andrew R. Lucy, Surrey, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jul. 10, 1990, Ser. No. 550,478

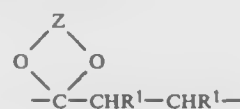
Claims priority, application United Kingdom, Jul. 18, 1989, 8916391

Int. Cl.⁵ C08G 67/02

U.S. Cl. 525—539

9 Claims

1. A process for preparing a polyacetal comprised of one or more acetal unit of formula:

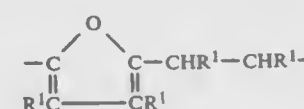


(I)

wherein Z is a divalent group having the formula —(C(R)₂)_n— where the R groups are independently H, OH, C₁ to C₁₀ alkyl or C₁ to C₁₀ hydroxyalkyl and n is 2 to 6 and containing less than 10% by weight of groups of formula:



wherein the R¹ groups as being independently hydrogen C₁ to C₁₀ alkyl, or phenyl with the proviso that the molar ratio of total acetal units of formula (I) to furan groups of formula:



(II)

is greater than or equal to 15:1, which process comprises the steps of:

- reacting a linear alternating polymer of carbon monoxide and one or more olefins with a diol at elevated temperature in the presence of an acid catalyst, and
- continuously removing from the reaction medium water generated by the reaction occurring in step (a).

5,091,487

VINYL CHLORIDE RESIN FOR SAFETY GLASS AND PROCESS FOR PREPARATION OF THE RESIN

Toshihiko Hori; Eitaro Nakamura, both of Kawasaki, and Toyochi Arai, Takaoka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed May 8, 1990, Ser. No. 520,426

Claims priority, application Japan, May 10, 1989, 1-116477; Apr. 25, 1990, 2-107507

Int. Cl.⁵ C08F 214/06; B32B 17/10

U.S. Cl. 526—87

5 Claims



1. A vinyl chloride resin for a safety glass interlayer, said resin consisting of particles or agglomerates thereof of a copolymer comprising a vinyl chloride monomer and an epoxy-containing monomer and having a degree of polymerization of 600 to 3000, said particles each having a particle diameter of at most 5 μm and having an outer portion and an inner portion, the outer portion having an epoxy content 0.1 to 5% by weight and an epoxy content higher than that of the inner portion.

5,091,488

POLYETHYLACETYLENE DERIVATIVE AND PROCESS FOR PREPARATION THEREOF

Masaru Ozaki; Yukihiko Ikeda, both of Fuji, and Tatsumi Arakawa, Yokohama, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 170,090, Mar. 9, 1988, abandoned, which is a continuation of Ser. No. 784,322, Oct. 4, 1985, abandoned. This application Dec. 1, 1989, Ser. No. 443,028

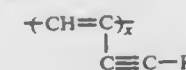
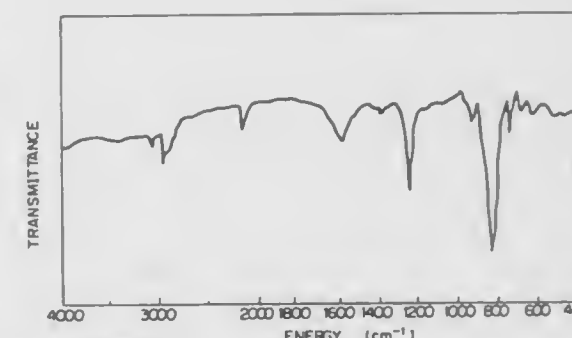
Claims priority, application Japan, Nov. 30, 1984, 59-251519; Jan. 18, 1985, 60-5836; Aug. 15, 1985, 60-178626

Int. Cl.⁵ C08F 30/08, 38/00, 4/06

U.S. Cl. 526—90

6 Claims

1. A polyethynylacetylene derivative represented by the following general formula:



wherein R is an alkyl group having 1 to 7 carbon atoms, a phenyl group, a benzyl group, a naphthyl group, a carbazole group, a vinyl-alkyl group having 2 to 7 carbon atoms or a group —CX₁X₂(OH) or —SiX₁X₂X₃ in which X₁, X₂ and X₃ independently represents a hydrogen atom, an alkyl group having 1 to 7 carbon atoms, a phenyl group or a benzyl group, with the proviso that the case where all of X₁, X₂ and X₃ are a hydrogen atom is excluded, and x is a number of from 20 to 500.

5,091,489

OLIGO (2-ALKENYL AZLACTONES)

Steven M. Hellmann; Dean M. Moren; Jerald K. Rasmussen; Larry R. Krepski, and Sadanand V. Pathre, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 602,100, Oct. 23, 1990. This application Jul. 24, 1991, Ser. No. 734,925

Int. Cl.⁵ C08F 4/20, 126/06

U.S. Cl. 526—90

7 Claims

1. A method comprising the steps: oligomerizing at least one 2-alkenyl 4,4-disubstituted azlactone in the presence of a catalytically effective amount of an acid to provide an oligomer having 2 to 15 units which are at least 30 mol % 2-alkenyl group polymerized units.

5,091,490

OLEFIN POLYMERIZATION CATALYSTS AND METHODS

Gil R. Hawley, Dewey, Okla.; Simon G. Kukes, Naperville, Ill., and Robert L. Banks, deceased, late of Bartlesville, Okla. by Mildred L. Banks, administratrix, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 19, 1991, Ser. No. 717,903

Int. Cl.⁵ C08F 4/44

U.S. Cl. 526—97

28 Claims

1. A method of producing an improved silica supported high activity olefin polymerization catalyst comprising:

- preparing a particulate silica support impregnated with tungsten oxide;
- contacting said support prepared in step (a) with the soluble complex produced by heating a mixture of a metal dihalide with at least one transition metal compound in the presence of a diluent to produce a solid, said support being present in an amount in the range of from about 0.1% to about 30% by weight based on the weight of said soluble complex; and
- contacting said solid produced in step (b) with an organoaluminum halide in an amount in the range of from about 0.1 mole to about 10 moles per mole of transition metal compound in said solid to produce said catalyst.

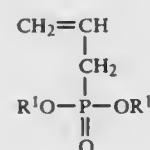
5,091,491
WATER-SOLUBLE ALLYLPHOSPHONATE
COPOLYMERS

Loc Quach, Columbia, Md., assignor to W. R. Grace & Co.,
Conn., New York, N.Y.

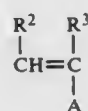
Filed Nov. 1, 1990, Ser. No. 607,980
Int. Cl.⁵ C08F 230/02, 228/02, 226/06

U.S. Cl. 526—278 17 Claims

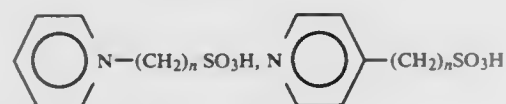
1. Water-soluble copolymers consisting essentially of the
reaction product of one or more allyl phosphonate monomers
having the formula:



and one or more water-soluble, α , β -ethylenically unsaturated
non-phosphorus containing monomers having the formula:



wherein each R^1 is independently selected from the group
consisting of hydrogen, lower alkyl groups having from 1 to
about 4 carbon atoms and salt forming cations, R^2 and R^3 are
independently selected from the group consisting of hydrogen,
halogen, COOH , CH_2COOH , lower alkyl groups having from
1 to about 4 carbon atoms, and phenyl, and A is selected from
the group consisting of SO_3H , $\text{CH}_2\text{SO}_3\text{H}$, $\text{CH}(\text{CH}_3)\text{SO}_3\text{H}$,
 $\text{CH}_2\text{OCH}_2\text{CH}(\text{OH})\text{CH}_2\text{SO}_3\text{H}$, $\phi\text{-SO}_3\text{H}$,



wherein $n=2$ to 4, CONH_2 , CONHCH_3 , $\text{CON}(\text{CH}_3)_2$,
 CONHCH_2OH , $\text{CONHCH}(\text{OH})\text{COOH}$, $\text{CONHC}(\text{CH}_3)_2\text{CH}_2\text{SO}_3\text{H}$,
 $\text{COO}(\text{CH}_2)_n\text{SO}_3\text{H}$ wherein $n=2$ to 4, and CO-
 $(\text{OCH}_2\text{CH}_2)_n\text{OH}$ wherein $n=1$ or more, and the correspond-
ing water soluble salts of the sulfonate and carboxylate groups.

5,091,492

RESIN COMPOSITION FOR USE AS PAINT

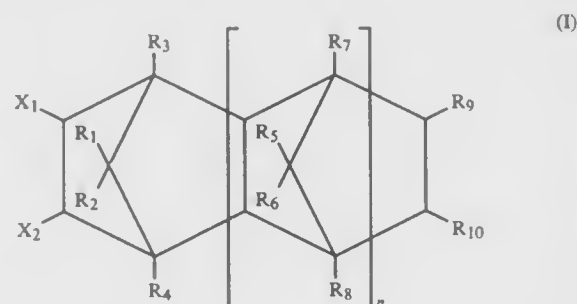
Masahiro Ishidoya, Kamakura; Kishio Shibato, Yokohama;
Osamu Ohe, Tokyo, and Masaaki Kawasaki, Hiroshima, all of
Japan, assignors to Nippon Oil and Fats Co., Ltd. and Mitsui
Petrochemical Industries, Ltd., both of Tokyo, Japan

Filed Aug. 7, 1990, Ser. No. 564,024

Claims priority, application Japan, Aug. 14, 1989, 1-207990
Int. Cl.⁵ C08F 236/00, 8/00, 8/30, 8/32, 8/14

U.S. Cl. 526—282 21 Claims

1. A resin composition for use as a paint comprising a co-
polymer prepared by copolymerizing a monomer (I) repre-
sented by the following formula (I):



wherein either one of X_1 and X_2 is an acryloyloxy or metha-
cryloyloxy group, the other being a hydrogen atom or an
alkyl group having 1 to 6 carbon atoms; R_1 to R_{10} each are
a hydrogen atom or an alkyl group having 1 to 6 carbon
atoms; and n is an integer of 1 to 4;

with an α , β -ethylenically unsaturated monomer having a
reactive functional group, and an α , β -ethylenically unsat-
urated monomer having no reactive functional group, a
monomer mixture for preparing said copolymer contain-
ing 5 to 95 percent by weight of said monomer (I), said
composition also containing a hardener which is reactable
with said copolymer and is selected from the group con-
sisting of amino compounds, isocyanate compounds,
blocked isocyanate compounds, polyamine compounds,
polyepoxy compounds, polyamine compounds, polycar-
boxylic acids, acid anhydrides, aziridine compounds, che-
late-forming compounds, and mixtures thereof.

5,091,493

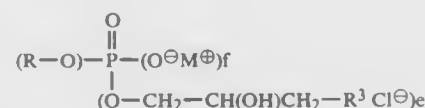
SILICONE PHOSPHOBETAINES

Anthony J. O'Lenick, Jr., Lilburn, and Jeff K. Parkinson, Law-
renceville, both of Ga., assignors to Siltech Inc., Norcross, Ga.
Continuation-in-part of Ser. No. 546,358, Jun. 27, 1990. This
application Jul. 22, 1991, Ser. No. 733,695

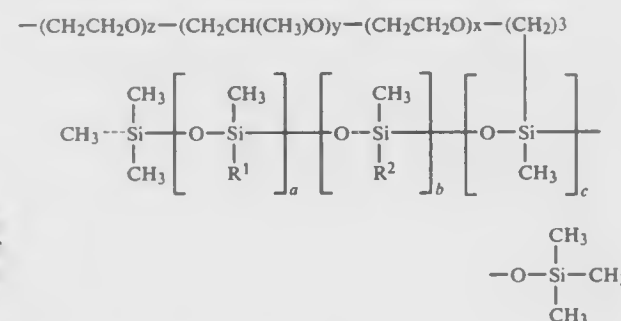
Int. Cl.⁵ C08G 77/22

U.S. Cl. 528—30 17 Claims

1. A silicone phosphobetaine which conforms to the follow-
ing structure;

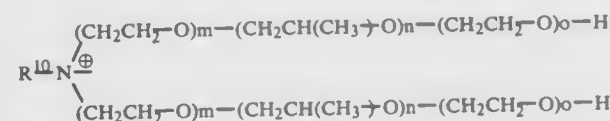
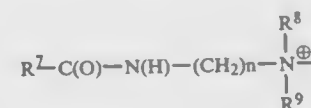
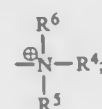


wherein
R is

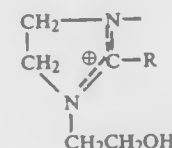


a is an integer from 0 to 200;
 b is an integer from 0 to 200;
 c is an integer from 1 to 200;
 R^1 is selected from $-(\text{CH}_2)_n\text{CH}_3$ or phenyl;
 n is an integer from 0 to 10;

R^2 is $-(\text{CH}_2)_3-(\text{OCH}_2\text{CH}_2)_x-(\text{OCH}_2\text{CH}(\text{CH}_3-
))y-(\text{OCH}_2\text{CH}_2)_z-\text{OH}$;
 x , y and z are independently integers ranging from 0 to 20;
 e is an integer ranging from 1 to 2;
 f is 0 or 1 with the proviso that $e+f=2$;
 M is selected from H, Na, K, Li or NH_4 ;
 R^3 is selected from



or



R^4 is alkyl having from 1 to 20 carbon atoms;
 R^5 is alkyl having from 1 to 20 carbon atoms;
 R^6 is alkyl having from 1 to 20 carbon atoms;
 R^7 is alkyl having from 1 to 20 carbon atoms;
 R^8 is alkyl having from 1 to 20 carbon atoms;
 R^9 is alkyl having from 1 to 20 carbon atoms;
 R^{10} is alkyl having from 1 to 20 carbon atoms;
 R^{11} is alkyl having from 1 to 20 carbon atoms;
 m , n , and o are independently integers each ranging from 0
to 20.

5,091,494

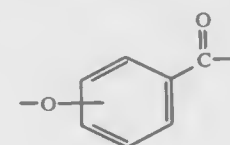
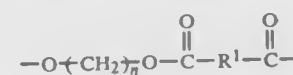
COPOLYESTER AMIDES, AND METHOD FOR MAKING
Dirk Leistner; Frank Böhme; Doris Pospiech; Manfred Rätzsch,
all of Dresden; Christian Vieth, Karl-Marx-Stad, and Michael
Stephan, Dresden, all of German Democratic Rep., assignors
to Akademie der Wissenschaften der DDR, Berlin, German
Democratic Rep.

Filed Jul. 30, 1990, Ser. No. 559,855

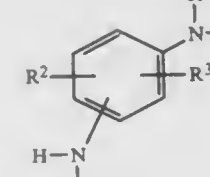
Int. Cl.⁵ C08G 18/80

U.S. Cl. 528—45 28 Claims

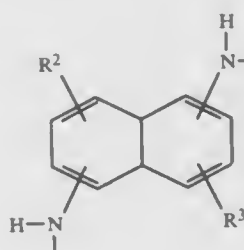
1. A copolyester amide containing divalent residues (A), (B),
(C) and/or (D) and/or (E) having the following structures



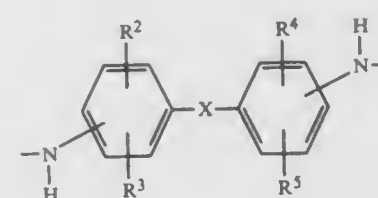
-continued
(C)



(D)



(E)



wherein

R^1 is a C_{4-20} divalent alicyclic residue or a divalent C_{6-16}
aromatic residue,
the carbonyl groups in (A) being separated from one another
by at least 3 carbon atoms,
at least 50 mole percent of the R^1 groups being divalent
aromatic groups,
 n in (A) is a cardinal number from about 2 to about 4, (B)
comprises at least 60 mole percent of the para isomer,
the R^2 to R^5 groups in (C), (D) and (E) being the same or
different are hydrogen, a C_{1-5} alkyl residue, a C_{1-5} alkoxy
residue, nitro, nitrile, or halogen,
the nitrogen atoms in (D) are disposed in the 1,3; 1,4; 1,6; 1,7;
or 2,6-positions,
the nitrogen atoms in (E) are disposed in the 4,4'; 3,3'; 4,3'; or
4,5'-positions,
 x in (E) is a single bond or a group of the formula $-\text{CH}_2-$,
 $-\text{CH}_2-\text{CH}_2-$, $-\text{CH}(\text{CH}_3)-$, $-\text{CH}(\text{C}_2\text{H}_5)-$,
 $-\text{C}(\text{CH}_3)_2-$, $-\text{CO}-$, $-\text{S}-$, $-\text{SO}_2-$, or $-\text{O}-$,
(B) being from about 30 to about 90 mole percent of the
aggregate of (A) and (B),
and the sum of (C), (D) and (E) being of from about 0.5 to
about 10 mole percent of (B).

5,091,495

THEREOF AS POLYOLS IN THE FORMATION OF
POLYURETHANES, POLYURETHANES ETC.

Gabriel Roux, Meylan; Janine Rivero, Fontaine, and Alessandro
Gandini, Saint-Martin-D'Uriage, all of France, assignors to
Centre Scientifique et Technique de Battiment, Paris, France
Division of Ser. No. 229,169, Aug. 22, 1988, Pat. No. 4,973,715.
This application Sep. 10, 1990, Ser. No. 580,152

Int. Cl.⁵ C08G 18/30

U.S. Cl. 528—49 49 Claims

1. A polyurethane including a polyisocyanurate which is the
reaction product of at least one isocyanate with at least one
polyol, said polyol comprising at least in part a furan polyol
which is the reaction product of:

(A)

(B)

a) an initiator compound selected from the group consisting
of a polyalcohol, a monoamine, a polyamine, and mixtures
thereof; and
b) an organic epoxide chain extension agent, said initiator

compound containing at least one furan moiety other than exclusively 2,5 bis-(hydroxymethyl)furan moieties when said chain extension agent is furan moiety free, and said chain extension agent being a furan-containing epoxide when said initiator compound is furan moiety free.

5,091,496

POLYISOCYANATOALKYLPHENYL-ISOCYANURATES, METHOD FOR THE PREPARATION THEREOF AND USE THEREOF

Ryuji Haseyama; Kazuyuki Kuroda; Kouzou Hayashi; Katsuyoshi Sasagawa; Taisaku Kano, all of Kanagawa, and Kiyoshi Shikai, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

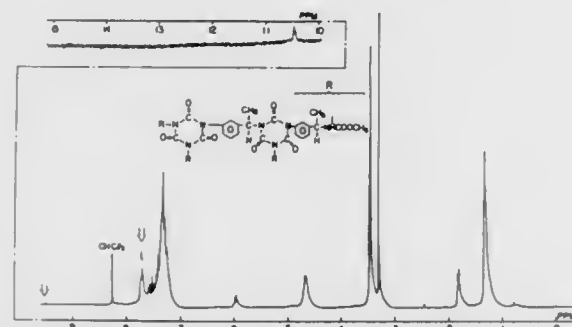
Filed May 15, 1990, Ser. No. 523,467

Claims priority, application Japan, May 19, 1989, 1-124263; Nov. 9, 1989, 1-290040; Dec. 28, 1989, 1-338218

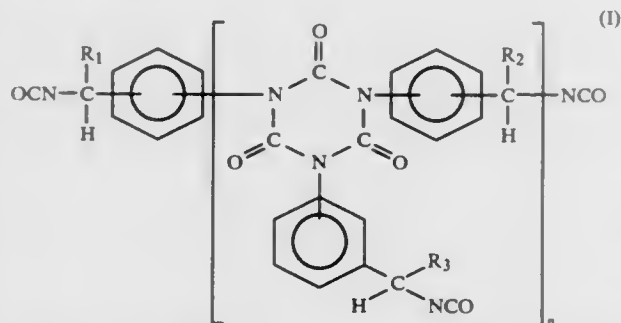
Int. Cl.⁵ C08G 18/74

U.S. Cl. 528—73

9 Claims



1. A polyisocyanato-isocyanurate represented by the following general formula (I):



wherein n is an integer ranging from 1 to 5 and R₁, R₂ and R₃ may be same or different and each represent hydrogen atom or a lower alkyl group.

5,091,497

HEAT-CURING

POLYETHER-POLYESTER-POLYURETHANE UREAS
Gerhard Grögler, Leverkusen; Richard Kopp; Heinrich Hess, both of Cologne; Eduard Hänsel, Wuppertal, and Thomas Scholl, Meerbusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1990, Ser. No. 621,179

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1989, 3940273

Int. Cl.⁵ C08G 18/32

U.S. Cl. 528—76

16 Claims

1. A heat-curable reaction system comprising a mixture of (a) a solid polyisocyanate having a melting point above 80° C.,
- (b) a linear or branched OH- and/or NH₂-terminated poly-

oxyalkylene polyether that has a molecular weight of 400 to 10,000 and is liquid at room temperature,

- (c) a solid linear or branched OH- and/or NH₂-terminated polyester that has a molecular weight of 400 to 20,000 and is solid at room temperature, wherein said polyester is thoroughly distributed throughout the mixture but is not homogeneously miscible with polyether (b), and
- (d) optionally, a low molecular weight chain-extending agent that contains OH and/or NH₂ groups and has a molecular weight of 62 to 399.

5,091,498

CURABLE COMPOSITIONS CONTAINING 1,3-DIALKYLIMIDAZOLE-2-THIONE CATALYSTS

Anthony J. Arduengo, III, Wilmington, Del.; Robert J. Barsotti, Franklinville, and Patrick H. Corcoran, Cherry Hill, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

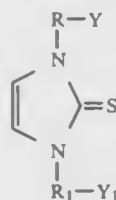
Continuation-in-part of Ser. No. 389,897, Aug. 4, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 657,737

Int. Cl.⁵ C08F 8/00; C08G 59/68, 65/10

U.S. Cl. 528—90

10 Claims

1. A composition comprising:
 - a) a compound having anhydride functionality;
 - b) a compound having epoxy functionality; and
 - c) a catalyst which catalyzes a crosslinking reaction between compound a) and compound b), said catalyst being a 1,3-dialkylimidazole-2-thione compound with the structure:



where R and R₁ are alkylene C₁ to C₁₄ (straight chain or branched) and Y and Y₁ are H, OH, CO₂H, aryl, ether, amine, perfluoroalkyl, amide, nitrile, or olefin.

5,091,499

PROCESS FOR PREPARING PHENOLIC FORMALDEHYDE RESOLE RESIN PRODUCTS DERIVED FROM FRACTIONATED FAST-PYROLYSIS OILS

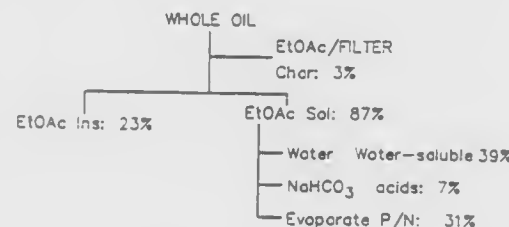
Helena L. Chum, Arvada, Colo., and Roland E. Kreibich, Auburn, Wash., assignors to Midwest Research Institute, Kansas City, Mo.

Continuation-in-part of Ser. No. 169,506, Mar. 17, 1988, Pat. No. 4,942,269. This application Dec. 29, 1989, Ser. No. 456,653

Int. Cl.⁵ C08G 8/04; C08J 89/06; B32B 21/08

U.S. Cl. 528—129

18 Claims



1. An improved process for preparing phenol-formaldehyde resole resins comprising, replacing a portion of the phenol

normally used in making resole resins with a phenol/neutral fractions extract obtained by a process of fractionating fast-pyrolysis oils, wherein the neutral fractions have molecular weights of between about 100 to about 800, and the phenol-containing compositions/neutral fractions extract is soluble in an organic solvent having a solubility parameter of approximately 8.4–9.1 [cal/cm³]^{1/2} with polar components in the 1–8–3.0 range and hydrogen bonding components in the 2–4.5 range.

5,091,500

POLYBENZAZOLE POLYMER CONTAINING PERFLUOROCYCLOBUTANE RINGS

Zenon Lysenko, and William J. Harris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

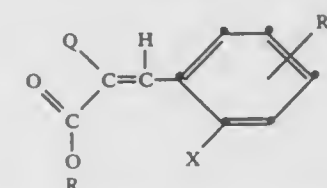
Filed Sep. 21, 1990, Ser. No. 588,127

Int. Cl.⁵ C08G 73/06

U.S. Cl. 528—183

20 Claims

1. A polybenzazole polymer containing perfluorocyclobutane rings in the polymer backbone.



to polyester forming reaction conditions, wherein R is hydrogen, C₁–C₁₀ alkyl, C₁–C₁₀ substituted alkyl, substituted aryl, C₃–C₁₀ alkenyl, or C₃–C₈ cycloalkyl; x is chloro, bromo, fluoro, or iodo; and Q and R₁ are as defined above.

5,091,502
TETRAKETONE PORPHYRIN MONOMERS AND THE PORPHYRIN-BASED POLYMERS THEREOF

Subhash C. Narang, Redwood City; Susanna Ventura, Mountain View, and Tilak R. Bhardwaj, Redwood City, all of Calif., assignors to General Petrochemical Industries Ltd, Tokyo, Japan

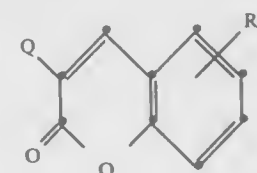
Continuation-in-part of Ser. No. 247,590, Sep. 23, 1988, Pat. No. 4,908,442. This application Mar. 12, 1990, Ser. No. 491,747

Claims priority, application Japan, Sep. 22, 1989, 1-247849

Int. Cl.⁵ C08G 12/00

U.S. Cl. 528—229

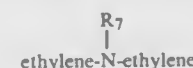
25 Claims



wherein

R₁ is hydrogen, halo, C₁–C₁₀ alkyl, C₁–C₁₀ alkoxy, hydroxy, C₁–C₁₀ acyloxy, a group of the formula —OR₂ or —N(R₂)(R₃),

wherein R₂ and R₃ are individually hydrogen; C₃–C₈ cycloalkyl optionally substituted with 1 or 2 groups selected from C₁–C₁₀ alkyl, hydroxy, C₁–C₁₀ acyloxy, C₁–C₁₀ alkoxy, halogen, or hydroxy C₁–C₁₀ alkyl; phenyl; substituted phenyl; C₃–C₈ alkenyl; C₁–C₈ alkyl; C₁–C₈ substituted alkyl; or R₂ and R₃ taken together with the nitrogen atom to which they are bonded form a pentamethylene, hexamethylene, ethylene oxyethylene, ethylene sulfoneethylene, ethylene thioethylene, or



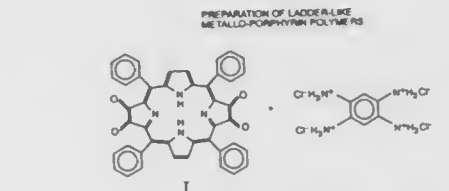
wherein R₇ is hydrogen, C₁–C₁₀ alkyl, aryl, or a group of the formula —XR₆, wherein X is —CO—, —COO—, or —SO₂—, and R₆ is C₁–C₁₀ alkyl, or C₁–C₁₀ alkyl substituted with one or more halogen, hydroxy, phenoxy, aryl, cyano, C₃–C₈ cycloalkyl, C₁–C₁₀ alkylsulfonyl, C₁–C₁₀ alkanoyloxy, or C₁–C₁₀ alkoxy;

and Q is hydrogen; C₁–C₁₀ alkyl; C₃–C₈ cycloalkyl; benzyl; phenyl; substituted phenyl; cyano; formyl; C₁–C₁₀ alkoxy-carbonyl; aryloxy-carbonyl; C₃–C₈ alkenyloxy-carbonyl; C₁–C₁₀ acyl; aroyl; carboxy; carbamoyl; N-C₁–C₁₀ alkyl-carbamoyl; N-aryl-carbamoyl; N-C₁–C₁₀ alkyl-N-aryl-carbamoyl; N-C₃–C₈ cycloalkyl-carbamoyl; C₁–C₁₀ alkylsulfonyl; arylsulfonyl; or a heterocyclic aryl ring optionally

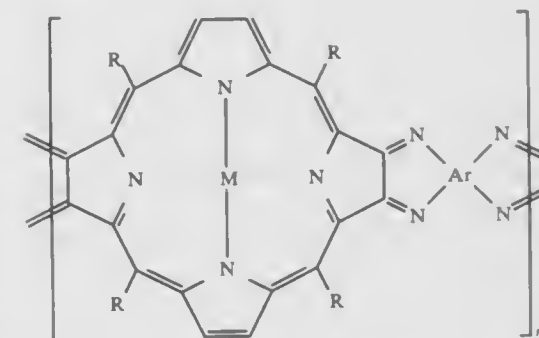
wherein

M is a metal atom;

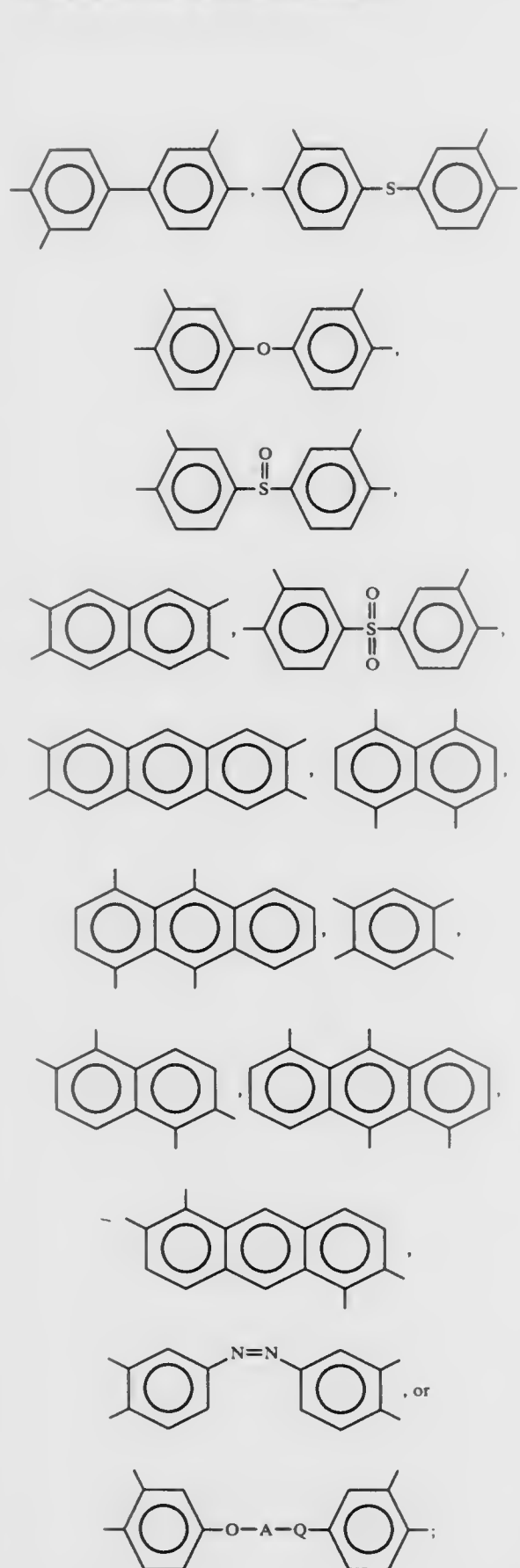
R is selected from phenyl, alkyl substituted phenyl, halogen substituted phenyl and alkoxy substituted phenyl; and



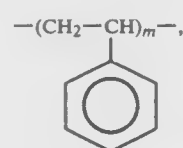
1. A polymer of the structure:



Ar is selected from the group consisting of:



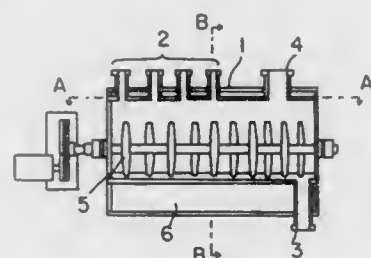
where when Q is oxygen, (O), A is $-(CH_2)_m-$,
 $-(CH_2CH(CH_3))_m-$,



—(OCF₂CF₂)_m—, or —(CF₂—CF(CF₃))_m—, where m is 1 to 10,000; or when Q is a direct carbon-carbon bond, A is —(CH₂C(H₂O))_m—, —(CH₂CH(CH₃)O)_m—, or —(SiR'₂O)_m—, wherein R' is methyl, ethyl, propyl, or butyl and m is 1 to 10,000; and n is between 2 and 3000.

5,091,503
CONTINUOUS POLYMERIZATION DEVICE AND
CONTINUOUS POLYMERIZATION METHOD
Hiroshi Inatome; Kazunari Inaguma; Hiroaki Yamaguchi, and
Yasuhisa Ohtani, all of Wakayama, Japan, assignors to Kao
Corporation, Tokyo, Japan

U.S. Cl. 528—272 4 Claims



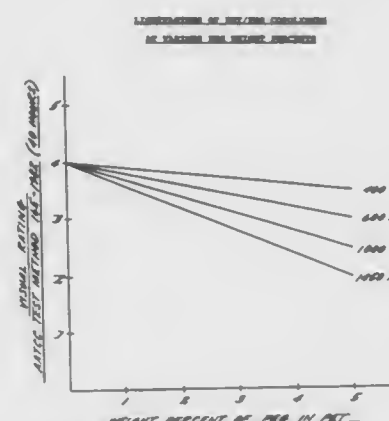
1. A continuous polymerization device which has the characteristic of being equipped with a stirring mechanism which possesses a drive shaft parallel to the direction of flow, a multiple number of polymerization precursor supply ports in the direction of flow, and at least one polymerization product output port at its latter portion, and possessing mixing capability with respect to the radial direction while possessing no actual mixing capability with respect to the direction of flow, in a continuous polymerization device which functions by piston flow.

5,091,504
ENHANCED POLYESTER COPOLYMER FIBER
 Eric J. Blaeser, and Carl S. Nichols, both of Charlotte, N.C.,
 assignors to Hoechst Celanese Corporation, Somerville, N.J.
 Division of Ser. No. 282,076, Dec. 9, 1988, Pat. No. 4,975,233.
 This application July 20, 1990. Ser. No. 555,883

U.S. Cl. 528—272 **Int. Cl.⁷ C08G 03/20** **22 Claims**

1. An enhanced polyester fiber which has a superior combination of tensile, dyeability and shrinkage properties, said fiber consisting essentially of a copolymer of polyester and polyethylene glycol, in which said polyethylene glycol has an average molecular weight of between about 200 and about 1500 grams per mol, and in which said polyethylene glycol is present in an

amount of between about 1.0 and 4% by weight based on the weight of the copolymer, and said fiber having a tensile



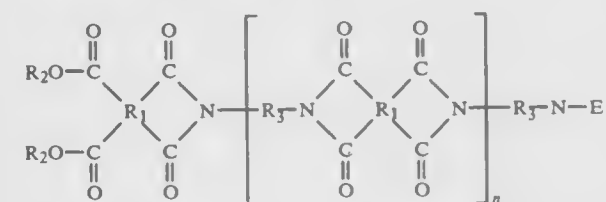
strength greater than 5.2 grams per denier, after being fully drawn and crimped.

5,091,505
POLYIMIDE RESINS PREPARED BY ADDITION
REACTIONS

Tito T. Serafini, Redondo Beach; Paul G. Cheng, Rancho Palos Verdes; Kenneth K. Ueda, Lomita, and Ward F. Wright, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 30, 1990, Ser. No. 472,036
Int. Cl.³ C08G 69/26, 63/08, 75/00; C08L 67/00
U.S. Cl. 528—353 20 Claims

1. A composition of matter consisting essentially of low molecular weight prepolymers having only one end cap radical and suitable for chain extension and crosslinking to form high molecular weight, thermally stable polyimides, the prepolymers having the formula:



where R_1 is a tetravalent aryl radical, each R_2 is independently selected from the group consisting of alkyl and hydrogen, at least one R_2 being alkyl, R_3 is a divalent aryl radical, E_1 is an end cap radical having at least one unsaturated moiety and being capable of undergoing addition polymerization, and n is at least 2 and is sufficiently small that the average molecular weight of the prepolymers is less than about 10,000.

5,091,506
POLYMERIZATION OF CARBON
MONOXIDE/NORBORNENE WITH P BIDENTATE
LIGAND

Eit Drent, and Anthonius J. M. Breed, both of Amsterdam,
Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed Sep. 17, 1990, Ser. No. 585,750
Claims priority, application Netherlands, Oct. 11, 1989;
8902518

U.S. Cl. 528—392 10 Claims
 1. In the process of producing a linear alternating copolymer of carbon monoxide and a hydrocarbon norbornene compound by contacting the carbon monoxide and the norbornene com-

pound under polymerization conditions of temperature and pressure in the presence of a reaction diluent and a catalyst composition formed from a palladium compound, the anion of a strong non-hydrohalogenic acid and a bidentate ligand, the improvement wherein the ligand is a bidentate ligand of phosphorus and the polymerization temperature is above 100° C.

5,091,507
POLYMERIZATION OF CARBON MONOXIDE/OLEFIN
WITH POLYALKOXYALKANE

Petrus W. N. M. Van Leeuwen; Cornelis F. Roobeek, both of Amsterdam, Netherlands, and Pui K. Wong, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 17, 1990, Ser. No. 509,845
Claims priority, application Netherlands, Apr. 19, 1989,
8900978

U.S. Cl. 528—392 Int. Cl.⁵ C08G 67/02 20 Claims

1. In the process for the production of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon of at least three carbon atoms by reacting the carbon monoxide and ethylenically unsaturated

contacting the carbon monoxide and ethylenically unsaturated hydrocarbon under polymerization conditions in the presence of a reaction diluent and a catalyst composition formed from a compound of palladium, the anion of a non-hydrohalogenic acid having a pKa below 2 and a bidentate phosphorus ligand, the improvement wherein the bidentate ligand is an aliphatic bidentate phosphorus ligand and wherein the catalyst composition contains a polyalkoxyalkane with from two to three alkoxy groups present as substituents of the same aliphatic carbon atom.

5,091,508
PROCESS FOR IMPROVING THE PROPERTIES OF
POLYMERS

Yash P. Khanna, 19 Manger Rd., Morris, N.J. 07927, and
Annemarie C. Reimschuessel, 20 Junard Dr., Morristown,
N.J. 07960
Continuation of Ser. No. 453,527, Dec. 20, 1989, abandoned.
This application May 8, 1991, Ser. No. 700,102
Int. Cl.⁷ C08J 3/12

U.S. Cl. 528—272 14 Claims

1. A process for increasing the crystallization temperature of a polymer which comprises the steps of

- a) cooling said polymer to a temperature sufficient to allow grinding of the polymer to an effective particle size, and
- b) grinding said cooled polymer to form a ground polymer having said effective particle size such that the crystallization temperature, T_{cc} , of said ground polymer is greater than the crystallization temperature of said polymer, said grinding effected while maintaining the polymer at the above temperature.

5,091,509

RECOVERY OF POLY(ARYLENE SULFIDE KETONE)
AND POLY(ARYLENE SULFIDE DIKETONE) RESINS

Aff M. Nesheiwat, Madison, N.J., and Jon F. Geibel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

U.S. Cl. 528—481 25 Claims

(a) preparing in an enclosed first vessel a first slurry comprised of a solid component and a liquid component, wherein the solid component of said first slurry comprises a first particulate resin selected from the group consisting of poly(arylene sulfide ketone) and poly(arylene sulfide diketone) resin, and wherein the liquid component of said

in which

A is a chromophoric or non-chromophoric aromatic-carboxylic or aromatic-heterocyclic radical,
M is an alkali metal,
R is H or C₁-C₄-alkyl,
R₁, R₂ independently of one another, are hydrogen, an aliphatic or cycloaliphatic radical or together with the N atom a 5- or 6-membered heterocyclic radical, and
M' is M or H, with 2,4,6-trifluorotriazine (III) in the absence of a strong base at a pH of about 2.5-6, then adding a strong base and completing the reaction at a pH of about 6-10.

5,091,516

PHENYL- OR NAPHTHYLAZOBENZENES WITH MULTIPLE REACTIVE GROUPS AND INTERMEDIATES THEREFOR

Bernd Siegel, Ludwigshafen, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Nov. 5, 1990, Ser. No. 608,842

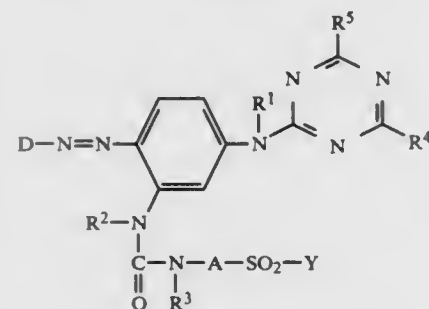
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1989, 3939286

Int. Cl.⁵ C09B 62/08, 62/507

U.S. Cl. 534-612

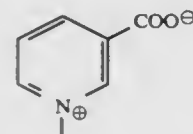
2 Claims

1. A reactive dye of the formula



where

R¹, R² and R³ are identical or different and each is independently of the others hydrogen, C₁-C₄-alkyl or phenyl,
R⁴ is C₁-C₄-alkoxy, phenoxy or a radical of the formula NL¹L², where L¹ and L² are identical or different and each is independently of the other C₁-C₄-alkyl, which may be substituted by hydroxyl, hydroxysulfonyl or sulfo, or substituted or unsubstituted phenyl, or L¹ and L² together combine with the nitrogen atom joining them to form a 5- or 6-membered saturated heterocyclic radical which may contain further hetero atoms, or L¹ may also be hydrogen,
R⁵ is fluorine, chlorine, bromine, C₁-C₄-alkylsulfonyl, phenylsulfonyl or a radical of the formula



A is C₂-C₈-alkylene, which may be interrupted by from 1 to 3 oxygen atoms, imino groups or C₁-C₄-alkylimino groups,

Y is vinyl or a radical of the formula -CH₂-CH₂-Q, where Q is a group which is detachable under alkaline reaction conditions, and

D is phenyl or naphthyl, which may each be monosubstituted or polysubstituted by hydroxysulfonyl, carboxyl, C₁-C₄-alkoxycarbonyl, cyano, C₁-C₄-alkyl, C₁-C₄-alkoxy, halogen, nitro or vinylsulfonyl.

5,091,517 AZO DYES CONTAINING A 4-AMINOPYRAZOLISOTHIAZOLE DIAZO COMPOUND

Rudolf Naef, Lupsingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 325,849, Mar. 20, 1989, abandoned.

This application Nov. 6, 1990, Ser. No. 610,717

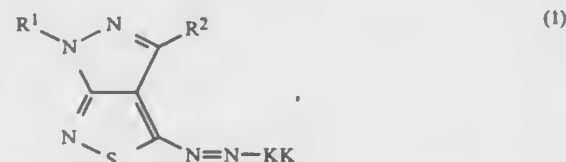
Claims priority, application Switzerland, Mar. 29, 1988, 1185/88

Int. Cl.⁵ C09B 29/039; D06P 1/18

U.S. Cl. 534-752

11 Claims

1. An azo dye of the formula



wherein

R¹ is an alkyl radical containing 1 to 12 carbon atoms, which is unsubstituted or substituted by hydroxy, alkoxy, cyano or phenyl, or is an aryl radical selected from the group consisting of phenyl, 1-naphthyl, 2-naphthyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidinyl and 2-thienyl, these radicals being unsubstituted or substituted by halogen, C₁-C₆alkyl, C₁-C₆alkoxy, nitro, cyano, -NHR³, -NH-C₂-C₆alkanoyl, -NH-benzoyl, phenoxy, COOR³, -CONHR³, phenyl, sulfo or C₁-C₄alkylsulfone,
R² is hydrogen or a radical as defined for R¹,
R³ is hydrogen, C₁-C₆alkyl, which is unsubstituted or substituted by hydroxy, alkoxy, cyano or phenyl, or phenyl which is unsubstituted or substituted by halogen, C₁-C₆alkyl, C₁-C₆alkoxy, nitro, cyano, -NH-C₂-C₆alkanoyl, -NH-benzoyl, phenoxy, phenyl, sulfo or C₁-C₄alkylsulfone, and

KK is the radical of a coupling component selected from the group consisting of N-arylacetylides, phenols, pyridones, quinolines, pyrazoles, indoles, diphenylamines, anilines, aminopyridines, pyrimidines, pyrimidones, naphthols, naphthylamines, aminothiazoles, thiophenes and hydroxypyrimidines.

5,091,518

BETA RETINOIC ACID RESPONSE ELEMENTS COMPOSITIONS AND ASSAYS

Henry M. Sucov, San Diego, and Ronald M. Evans, La Jolla, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Nov. 16, 1989, Ser. No. 438,757

Int. Cl.⁵ C07H 17/00

U.S. Cl. 536-27

14 Claims

7. A substantially pure DNA construct comprising a DNA segment selected from:

5'-GTTTAC-CGAAA-GTTTAC-3',

5'-AAGCTTAAGG-GTTTAC-CGAAA-GTTTAC-TCAGCTT-3',

5'-AAGCTTAAGG-GTTTAC-CGAAA-GTTTAC-TCGCAT-AGCTT-3',

or

5'-AAGCTTAAGG-GTTTAC-CGAAA-GTTTAC-TCGCAT-ATATT-AGCTT-3';

wherein said DNA segment is operatively linked to a promoter which is not normally subject to transcriptional activation by retinoic acid; wherein the DNA and the promoter are opera-

tively linked so as to confer transcriptional activation activity on said promoter in the presence of retinoic acid.

5,091,520

FINELY PARTICULATE CELLULOSE ESTERS OF AROMATIC OR AROMATIC-ALIPHATIC CARBOXYLIC ACIDS, PROCESS FOR THEIR PREPARATION, AND THE USE THEREOF

Eric Francotte, Kaiseraugst, Switzerland, and Gabriele Baisch, Weil-Friedlingen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 257,363, Oct. 13, 1988. This application Sep. 5, 1990, Ser. No. 578,060

Claims priority, application Switzerland, Oct. 26, 1987, 4202/87; Jun. 24, 1988, 2431/88

Int. Cl.⁵ C08B 3/04; B01D 39/18, 71/10; B01J 20/24

U.S. Cl. 536-56

1 Claim

1. In the method for resolving a racemic mixture by passing a solution of the racemic mixture through a column with a stationary phase and collecting the separated components of the mixture, the improvement comprising having a stationary phase which is a cellulose ester of an aromatic or aromatic aliphatic carboxylic acid in the form of substantially spherical particles having a heat of fusion as determined by calorimetry of 1 to 50 J/g, an average diameter of 1 to 200 μm and a specific surface area of 10 to 300 m²/g.

5,091,521

CIS-PLATINUM COMPLEXES, A PROCESS FOR THE PREPARATION THEREOF, AND PHARMACEUTICALS CONTAINING THESE COMPOUNDS

Cenek Kolar, Konrad Dehmel, and Hans Peter Kraemer, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany
Continuation of Ser. No. 467,276, Jan. 24, 1990, abandoned, which is a continuation of Ser. No. 93,207, Sep. 4, 1987, abandoned. This application Aug. 28, 1990, Ser. No. 576,185

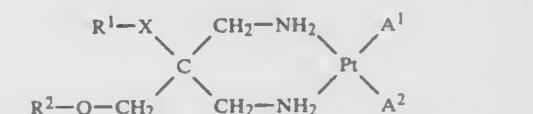
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1986, 3630497

Int. Cl.⁵ A61K 31/28; C07C 93/04, 103/44, 117/00; C07H 15/04

U.S. Cl. 536-17.1

13 Claims

1. A compound of the formula I



in which:

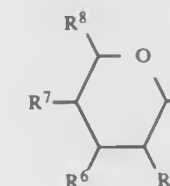
R¹ represents a hydrogen atom or an alkyl group of the formula CH₃(CH₂)_n—where n is 0, 1, 2, 3, 4 or 5;

R² represents a hydrogen atom when X is a carbamoyl group, an alkyl group having 1 to 6 carbon atoms, a group of the formula R³-O-CH₂-(CHR⁴)_m-CH₂—in which:

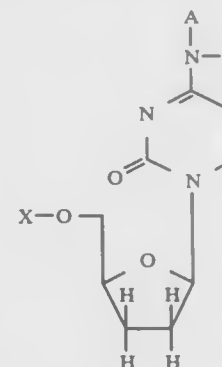
R³ is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms,

R⁴ is a hydroxyl group or an alkoxy group having 1 to 3 carbon atoms, and

m is 0, 1 or 2,
a group of the formula H-(CH₂)_a-(O-(CH₂)_b)_c—where a is 0, 1, 2, 3 or 4, b is 1, 2, 3 or 4 and c is 1, 2, 3, 4, 5, 6 or 7, or a radical of the formula



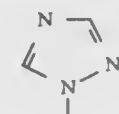
in which:



wherein X is hydrogen, mono, di, or triphosphate, or dimethoxytrityl; Z is hydrogen, hydroxyl, acetyl or a phosphoramidite, and A is represented by the formula:



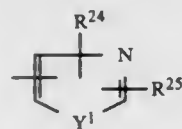
wherein K is selected from the group of halogens consistently of Cl, Br, F, I and At and w is an integer from 3 to 9; and B is the same as A or hydrogen or A and B, taken together with the exocyclic nitrogen, are



phenyl or C₁-C₄-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), di-(C₁-C₄-alkyl)-amino-sulphonyl or C₁-C₄-alkoxycarbonyl, and A¹ stands for oxygen, sulphur or the grouping N-Z¹, Z¹ standing for hydrogen, C₁-C₄-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C₃-C₆-cycloalkyl, benzyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine or nitro), C₁-C₄-alkylcarbonyl, C₁-C₄-alkoxy-carbonyl or di-(C₁-C₄-alkyl)-aminocarbonyl;

wherein furthermore

R¹ stands for the radical



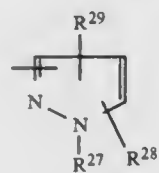
wherein

R²⁴ and R²⁵ are identical or different and stand for hydrogen, C₁-C₄-alkyl, halogen, C₁-C₄-alkoxycarbonyl, C₁-C₄-alkoxy or C₁-C₄-halogenoalkoxy, Y¹ stands for sulphur or the grouping N-R²⁶,

R²⁶ standing for hydrogen or C₁-C₄-alkyl;

wherein furthermore

R¹ stands for the radical



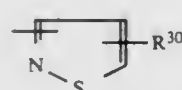
wherein

R²⁷ stands for hydrogen, C₁-C₄-alkyl, phenyl or (iso)-quinolinyl,

R²⁸ stands for hydrogen, halogen, cyano, nitro, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or chlorine), C₁-C₄-alkoxy (which is optionally substituted by fluorine and/or chlorine), dioxolanyl or C₁-C₄-alkoxy-carbonyl and R²⁹ stands for hydrogen, halogen or C₁-C₄-alkyl;

wherein furthermore

R¹ stands for the radical

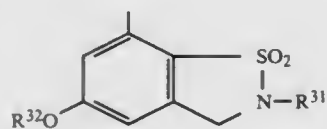


wherein

R³⁰ stands for hydrogen, halogen, C₁-C₄-alkyl or C₁-C₄-alkoxy-carbonyl;

wherein furthermore

R¹ stands for the radical

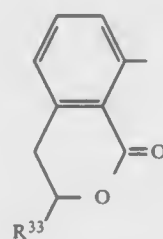


wherein

R³¹ stands for C₁-C₄-alkyl and R³² stands for C₁-C₄-alkyl,

wherein furthermore

R¹ stands for the radical



wherein

R³³ stands for hydrogen or methyl;

R⁴ stands for hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-halogenoalkyl, C₁-C₂-alkoxy-C₁-C₂-alkyl, C₁-C₄-alkoxy, C₁-C₄-halogenoalkoxy, C₁-C₄-alkylthio, C₁-C₄-halogenoalkylthio, amino, C₁-C₄-alkylamino, dimethylamino or diethylamino,

R⁶ stands for hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-halogenoalkyl, C₁-C₄-alkoxy, C₁-C₄-halogenoalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkyl-amino, dimethylamino or diethylamino.

5,091,530

BARON CHELATES OF QUINOLINE CARBOXYLIC ACIDS

István Hermecz; Géza Kereszturi; Lelle Vasvári; Ágnes Horváth, all of Budapest; Mária Balogh, Dunakeszi; Péter Rítili, Budapest; Judit Sipos, Budapest; Anikó Pajor, Budapest, and Katalin Mármárosi, Biatorbágy, all of Hungary, assignors to Chinoi Gyógyszer- és Vegyszeti Termékek Gyára Rt., Budapest, Hungary

PCT No. PCT/HU88/00019, § 371 Date Nov. 23, 1988, § 102(e) Date Nov. 23, 1988, PCT Pub. No. WO88/07993, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 8, 1988, Ser. No. 290,105

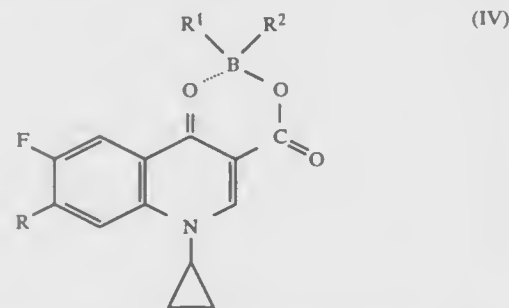
Claims priority, application Hungary, Apr. 8, 1987, 1505/87; Feb. 26, 1988, 1505/87

Int. Cl.⁵ C07D 403/04

U.S. Cl. 544—229

3 Claims

1. A compound of the Formula IV



wherein R stands for piperazinyl, 4-methyl-piperazinyl or 4-ethyl-piperazinyl group, R¹ and R² stand for halogen, for an aliphatic acyloxy group having 2 to 6 carbon atoms optionally substituted by halogen, or for an aromatic acyloxy group having 7 to 11 carbon atoms.

5,091,531

N-IMIDAXO[1,2-B]PYRIDAZINYL CARBAMATES

Simon T. Hodgson, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 12, 1988, Ser. No. 231,894

Claims priority, application United Kingdom, Aug. 15, 1987, 8719368

Int. Cl.⁵ C07D 487/04, 237/20, 401/12; A61K 31/50, 405/12

U.S. Cl. 544—236

3 Claims

1. A compound selected from the group consisting of

methyl N-[6-(3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(3,5-dimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(2,5-dimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(1-naphthylmethyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(3-methylbenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(2,3-dimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(2,5-dimethylbenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
ethyl N-[6-(2,5-dimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
ethyl N-[6-(3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
N-methyl-N-[6-(3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(2-bromo-3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
n-propyl N-[6-(3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate, and
n-butyl N-[6-(3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
2-methoxyethyl N-[6-(3,4,5-trimethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
methyl N-[6-(3,5-dimethoxy-4-ethoxybenzyloxy)imidazo[1,2-b]pyridazin-2-yl]carbamate,
and pharmaceutically acceptable salts thereof.

5,091,532

PROCESS FOR THE PREPARATION OF PIGMENTS BASED ON ISOINDOLE

Bernd Kaletta, Leverkusen, Fed. Rep. of Germany, and Meinhard Rolf, Charleston, S.C., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 16, 1990, Ser. No. 600,036

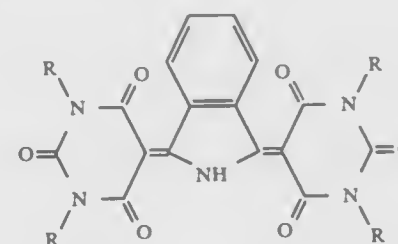
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3935858

Int. Cl.⁵ C07D 239/36

8 Claims

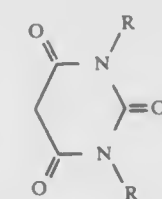
U.S. Cl. 544—296

1. A process for the preparation of pigments of the formula



in which

each R, independently of one another, represents hydrogen or a substituent selected from the group comprising C₁-C₆ alkyl and phenyl, characterized in that phthalodinitrile (II) is reacted in a water-miscible organic solvent with an alcohol (III) selected from the group comprising C₁-C₆ alkanols, C₂-C₆ alkanediols and their mono-C₁-C₄-alkyl ethers, in the presence of a base selected from the group comprising alkali metal alcoholates and alkaline earth metal alcoholates of the alcohols (III), alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal carbonates and alkaline earth metal carbonates, and the reaction product is then reacted, in the presence of water with compounds of the formula



(IV)

in a molar ratio of 2:1, relative to (II), if appropriate in the present of surface-active compounds, in the pH range from 1 to 6.

5,091,533

5-HYDROXY-2,3-DIHYDROBENZOFURAN ANALOGS AS LEUKOTRIENE BIOSYNTHESIS INHIBITORS

Patrice C. Belanger; Claude Dufresne, both of Dollard des Ormeaux; Brian Fitzsimmons, deceased, late of Pierrefond; Maryann Fitzsimmons, Helir, Pierrefond; Yvan Guindon, Montreal; Cheuk K. Lau, Bizzard, all of Canada; Joshua Rokach, Satellite Beach, Fla.; John Schiegetz, Dollard des Ormeaux, Canada; Michel Therien, Laval, Canada, and Robert N. Young, Senneville, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

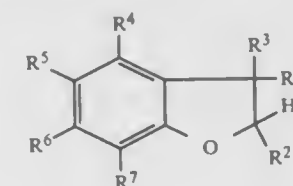
Filed Mar. 12, 1990, Ser. No. 491,799

Int. Cl.⁵ A61K 31/34; C07D 307/79

U.S. Cl. 544—318

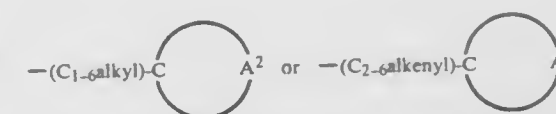
24 Claims

1. The leukotriene biosynthesis inhibitor of the formula:



(I)

wherein:
R² is



with A² completing a ring selected from the group consisting of (Y⁶)₅ substituted phenyl or (Y⁶)₇ substituted naphthyl;

R³ is independently, hydrogen or C₁-alkyl;

R⁵ is hydroxy or metabolizeable to hydroxy;

R⁶ is hydrogen, halogen, —C₁-alkyl, C₂-alkenyl, —(C₁-alkyl)—R^{6a}, —(C₂-alkenyl)—R^{6a}, —(C₁-alkyl)—OR^{6b}, —(C₂-alkenyl)—OR^{6b}, —(C₁-alkyl)—SR^{6b}, —(C₂-alkenyl)—SR^{6b}, —(C₁-alkyl)—S(O)R^{6b}, —(C₂-alkenyl)—S(O)R^{6b}, —(C₁-alkyl)—S(O)₂R^{6b}, —(C₂-alkenyl)—S(O)₂R^{6b}, —(C₁-alkyl)—N(R^{6c})R^{6b} or —(C₂-alkenyl)—N(R^{6c})R^{6b};

R⁶ is, hydrogen, halogen, C₂-alkenyl, —(C₁-alkyl)—R^{6a}, —(C₂-alkenyl)—R^{6a}, —(C₁-alkyl)—OR^{6b}, —(C₂-alkenyl)—OR^{6b}, —(C₁-alkyl)—SR^{6b}, —(C₂-alkenyl)—SR^{6b}, —(C₁-alkyl)—S(O)R^{6b}, —(C₂-alkenyl)—S(O)R^{6b}, —(C₁-alkyl)—S(O)₂R^{6b}, —(C₂-alkenyl)—S(O)₂R^{6b}, —(C₁-alkyl)—N(R^{6c})R^{6b} or —(C₂-alkenyl)—N(R^{6c})R^{6b}, provided that when one of R⁴ or R⁶ is hydrogen or halogen then the other is not hydrogen or halogen and provided that R⁶ is not —O—C₁-alkyl when R⁴ is —C₁-alkyl;

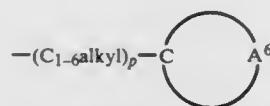
R⁷ is hydrogen, halogen or C₂-alkenyl;

R^{6a} is (Y⁶)₅ substituted phenyl, (Y⁶)₇ substituted naphthyl, —C(O)NR^{6c}, or



where A^6 completes a substituted or unsubstituted 6-membered heterocycle, substituted or unsubstituted 5-membered heterocycle having fused thereto a $(Y^2)_3$ or 4 substituted benzene ring, or a substituted or unsubstituted 6-membered heterocycle having fused thereto a $(Y^2)_3$ or 4 substituted benzene ring (wherein said 6-membered heterocycles are selected from the group consisting of alpha-pyronyl, gamma-pyronyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl and thiopyranyl, wherein said 5-membered heterocycles fused with a benzene ring are selected from the group consisting of benzofuran-2-yl, benzofuran-6-yl, benzothiophen-2-yl, benzothiophen-5-yl, indol-2-yl, indol-5-yl, benzopyrazol-3-yl, benzopyrazol-5-yl, benzimidazol-2-yl, benzimidazol-5-yl, benzoxazol-2-yl and benzoxazol-5-yl, wherein said 6-membered heterocycles fused with a benzene ring are selected from the group consisting of quinolin-2-yl, quinolin-4-yl, quinolin-7-yl, isoquinolin-1-yl, isoquinolin-3-yl, isoquinolin-7-yl, cinnolin-3-yl and quinazolin-2-yl, and where the heterocycle substituents are selected from the group consisting of hydrogen, C_1 -alkyl, phenyl, halogen, $-C(O)OH$, $-C(O)OC_1$ -alkyl and $-OC_1$ -alkyl);

R^{6b} is C_1 -alkyl, C_2 -alkenyl, $-(C_1\text{-alkyl})_p$ (Y^6) substituted naphthyl, $-(C_1\text{-alkyl})_p$ (Y^6) substituted phenyl, $-(C_1\text{-alkyl})_p$ $C(O)N(R^{6c})_2$, $-(C_1\text{-alkyl})_p$ $C(O)OR^{6c}$ or

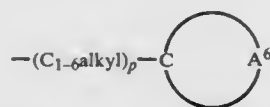


(where A^6 is defined immediately above);

R^{6c} is hydrogen or C_1 -alkyl;

Y^2 is $-H$, halogen, $-OH$, C_1 -alkyl, $-CN$, $-CF_3$, $-(C_1\text{-alkyl})_p$ $O-C_1$ -alkyl, $-(C_1\text{-alkyl})_p$ $S-C_1$ -alkyl, $-(C_1\text{-alkyl})_p$ $S(O)-C_1$ -alkyl, $-(C_1\text{-alkyl})_p$ $S(O)-2-C_1$ -alkyl, $-(C_1\text{-alkyl})_p$ $C(O)-C_1$ -alkyl, $-(C_1\text{-alkyl})_p$ $C(O)OR^{6c}$, $-(C_1\text{-alkyl})_p$ $C(O)NHR^{6c}$, $-(C_1\text{-alkyl})_p$ $NHC(O)O(C_1\text{-alkyl})$, $-(C_1\text{-alkyl})_p$ NHR^{6c} , $-(C_1\text{-alkyl})_p$ $NHS(O)_2-C_1$ -alkyl, $-(C_1\text{-alkyl})_p$ $NHS(O)_2-(R^7)_5$ substituted phenyl, or $-(C_1\text{-alkyl})_p$ NO_2 ;

Y^6 is Y^2 or



(where A^6 is defined immediately above); and p is 0 or 1.

5,091,534
TRIALKYL-SILYL TRIFLUOROMETHANESULFONATE
MEDIATED α -METHYLENIC CARBON
FUNCTIONALIZATION OF
4-AZA-5 α -ANDROSTAN-3-ONE STEROIDS

Anthony O. P. King, Hillsboro; Sandor Karady, Mountainside; Kevin Anderson, Plainsboro; Alan W. Douglas, Monmouth Junction; Newton L. Abramson, Edison, and Richard F. Shuman, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 27, 1990, Ser. No. 572,811
Int. Cl. 5 C07J 75/00, 73/00

U.S. Cl. 546-14

8 Claims

1. A process for derivatizing a lactam at the α -methylenic carbon which comprises the steps of (a) silylating the lactam with $R_3Si-OTf$, wherein R is lower alkyl, and (b) adding an electrophilic reagent, E , capable of appending a bromo-, iodo-, chloro-, R^2-S- , R^2-SO- , or $R^2-NH-S-$ functionality onto the α -methylenic carbon of the lactam, wherein:

R^2 is:

- lower alkyl,
- perhalogenated lower alkyl,
- aryl, or
- aryl substituted lower alkyl;

Aryl is:

- phenyl,
- lower alkyl substituted phenyl, or
- halogenated phenyl; and

the halogen in a perhalogenated alkyl or halogenated phenyl is fluorine or chlorine.

5,091,535
ORGANIC PHOTOCHROMIC COMPOUND, A DIMER
OF PYRIDO QUINOLINE

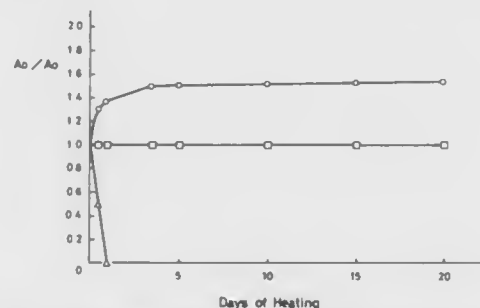
Shigeru Nomura, and Takahiro Hidaka, both of Tsukuba, Japan, assignors to Seikisui Kagaku Kogyo Kabushiki Kaisha, Japan
Filed Apr. 24, 1990, Ser. No. 513,637

Claims priority, application Japan, Apr. 27, 1989, 1-110421; Feb. 22, 1990, 2-42023

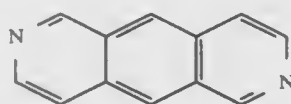
Int. Cl. 5 C07D 471/22, 471/04; G03C 1/73

U.S. Cl. 546-35

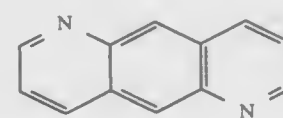
1 Claim



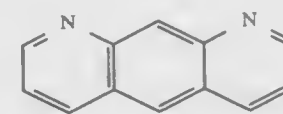
1. An organic photochromic compound selected from the group consisting of a dimer of pyrido[3,4-g]isoquinoline of chemical formula



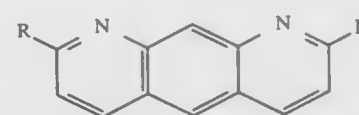
a dimer of pyrido[2,3-g]quinoline of chemical formula



a dimer of pyrido[3,2-g]quinoline of chemical formula and



a dimer of pyrido[3,2-g]quinoline derivatives of chemical formula



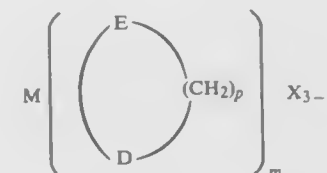
wherein R is methyl, ethyl, propyl, butyl, carboxy, carboxymethyl, or {carboxyethyl} carboxyethyl, wherein the dimer of each compound [I], [II], [III], and [IV] is formed by exposure of the compound [I], [II], [III], and [IV], respectively, to light of wavelength 320 to 400 nm, and wherein the dimers of [I], [II], [III], and [IV] can be reconverted to the compounds [I], [II], [III], and [IV], respectively, by exposure to light of wavelength 230 to 300 nm.

-continued



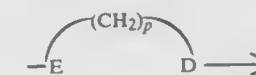
MQ_mX_{3-m}

and



in which

Q is an alkyl, alkenyl, alkoxy, dialkylamino, aralkyl, aryl or diarylamino group each with up to 18 carbons,
 R is an alkenyl, aralkyl or aryl group, each with up to 18 carbon atoms,
 X is chlorine, bromine, or iodine,



E is $-CH_2-$, $-N(R)-$ or $-O-$,
 D is a dialkylamino, diarylamino or alkoxy group, each with up to 18 carbon atoms,
 M is aluminum or boron,
 m is 1, 2, or 3,
 p is a whole number from 1-6, and
 $1 \leq n \leq 50$,
or organic solvent dissolving the product as produced.

5,091,536
SOLUBLE MAGNESIUM HYDRIDES, METHOD OF
PREPARING THEM, AND USE THEREOF

Borislav Bogdanovic, and Manfred Schwickardi, both of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbh, Mülheim/Ruhr, Fed. Rep. of Germany
Filed Feb. 9, 1988, Ser. No. 153,857

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3722993

Int. Cl. 5 C07D 221/02; C07F 3/02, 5/06, 5/02

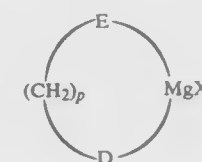
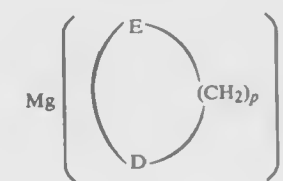
U.S. Cl. 546-112

6 Claims

1. A process for preparing a soluble magnesium hydride, comprising catalytically hydrogenating finely powdered magnesium in an organic solvent in the presence of a compound selected from the group consisting of

MgQ_2

$RMgX$



5,091,537
INTERMEDIATES FOR PREPARING
3-ARYL-PYRROLIDINE-2,4-DIONES

Reiner Fischer, Monheim; Hermann Hagemann, Leverkusen; Andreas Krebs, Odenthal-Holz; Albrecht Marhold, Leverkusen; Klaus Lürssen; Robert R. Schmidt, both of Bergisch-Gladbach; Hans-Joachim Santel, Leverkusen; Benedikt Becker, Mettmann; Klaus Schaller, and Wilhelm Stendel, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 391,227, Aug. 8, 1989, Pat. No. 4,985,063.

This application Aug. 8, 1990, Ser. No. 564,267

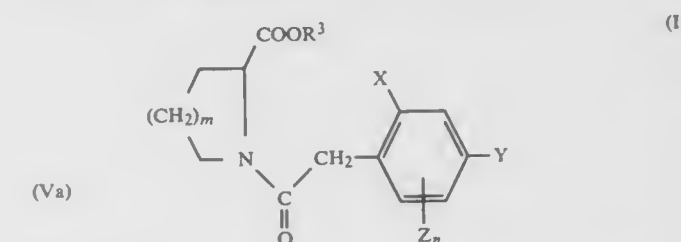
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1989, 3913682

Int. Cl. 5 C07D 221/06

U.S. Cl. 546-226

2 Claims

1. An acylamino acid ester of the formula (II)



in which

X represents alkyl, and halogen,
 Y represents hydrogen, alkyl, halogen, and halogenalkyl,

Z represents alkyl, and halogen,
m represents 2,
n represents a number from 0 to 3 and
R³ represents alkyl, wherein the alkyl, at each occurrence,
has up to 6 carbon atoms.

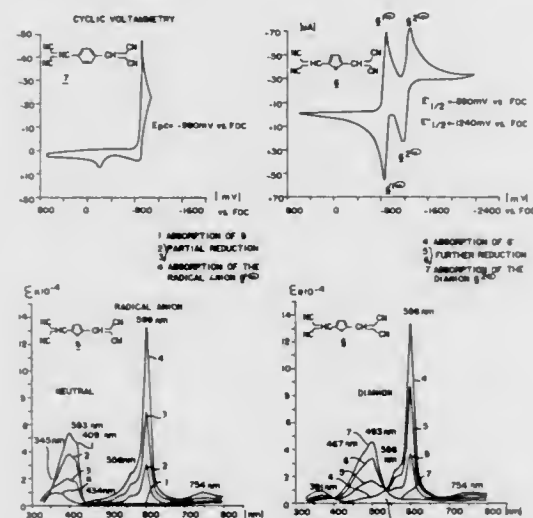
5,091,538

DICYANOVINYLSUBSTITUTED FURAN DERIVATIVES
Jörg Daub, Regensburg; Knut M. Rapp, Offstein; Petra Seltz, Straubing; Rainer Wild, Obrigheim, and Josef Salbeck, Regensburg, all of Fed. Rep. of Germany, assignors to Suddentische Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

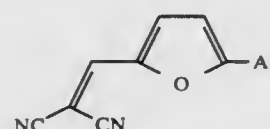
Continuation-in-part of Ser. No. 195,754, May 19, 1988, abandoned. This application Dec. 5, 1989, Ser. No. 445,092
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718917

Int. Cl.⁵ C07D 405/12, 307/42, 307/45, 307/54
U.S. Cl. 546—283

1 Claim



1. A dicyanovinylsubstituted furan compound of the formula



wherein A₁ is CH₂OR¹, and wherein R¹ is H or a C₁-C₈ alkyl, phenyl, p-hydroxyphenyl, p-nitrophenyl, p-dimethylamino phenyl, naphthyl, 2-pyridyl, trimethylsilyl, triphenylsilyl, acetyl, palmitoyl, benzoyl, p-nitrobenzoyl, methanesulfonyl, p-toluenesulfonyl, phosphonyl, 2-methoxyethyl or 4-methoxybutyl group.

5,091,539 **AZOLYL CYCLOALKANOL DERIVATIVES AND AGRICULTURAL FUNGICIDES**

Yasuo Makisumi, Hyogo; Akira Murabayashi, Osaka; Takayuki Hatta, and Takeo Ishiguro, both of Shiga, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

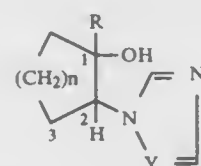
Division of Ser. No. 229,790, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 22,067, Mar. 5, 1987, abandoned, which is a continuation of Ser. No. 696,432, Jan. 30, 1985, abandoned. This application May 31, 1990, Ser. No. 531,347
Claims priority, application Japan, Feb. 3, 1984, 59-18564; Feb. 15, 1984, 59-27905

Int. Cl.⁵ C07D 249/08, 233/60

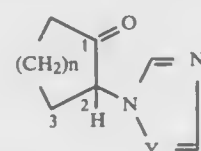
U.S. Cl. 548—267.8

1 Claim

1. A process for preparing a compound of the formula I:



wherein R is alkyl, phenyl, benzyl, thienyl or naphthyl, which groups are unsubstituted or are substituted by one or more halogens, Y is methine or nitrilo and n is 2 or 3 with the proviso that azolyl and hydroxy are in cis configuration when R is phenyl or halogenophenyl, or an acid addition salt thereof which comprises reacting a cycloalkane of the formula II



wherein Y and n are each as defined above with a compound of the formula III;

RZ

III

wherein Z is a halomagnesium or an alkali metal and R is the same as defined above to obtain the cis-isomer of the compound of formula I as the main product.

5,091,540

PROCESS FOR PREPARING CLOTRIMAZOLE
Egidio Molinari, Longone Al Segrino, Italy, assignor to Erregierre Industria Chimica S.P.A., Milan, Italy

Filed Mar. 28, 1990, Ser. No. 500,134

Claims priority, application Italy, Dec. 29, 1989, 22875 A/89

Int. Cl.⁵ C07D 233/54

U.S. Cl. 548—341

3 Claims

1. A process for preparing clotrimazole, i.e. 1-(o-chloro-α, α-diphenylbenzyl)imidazole, from chlorobenzotrichloride and imidazole, consisting essentially of the following steps:

- reacting o-chlorobenzotrichloride with benzene in the presence of aluminium trichloride;
- reacting the 2-chlorotriphenylmethylchloride obtained in a) with imidazole in a hydrocarbon solution in the presence of an amine;
- nitration of the product obtained in b) in solution with concentrated nitric acid;
- converting the nitration product into the free base by reaction with a caustic alkali;
- purifying the solution obtained in d) and recovering the desired product by distilling the solvent and crystallizing.

5,091,541

HEXAHYDROPYRROLO(2,3-B)INDOLE CARBAMATES, UREAS, AMIDES AND RELATED COMPOUNDS

Gerard J. O'Malley, Newtown, Pa.; Richard C. Allen, Flemington, N.J., and John I. White, Harleysville, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 480,706, Feb. 1, 1990, Pat. No. 4,983,616.

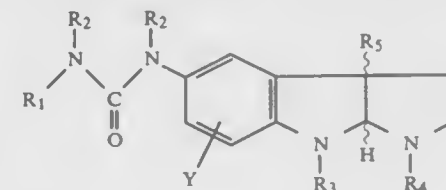
This application Oct. 24, 1990, Ser. No. 602,559

Int. Cl.⁵ C07D 487/00

U.S. Cl. 548—429

4 Claims

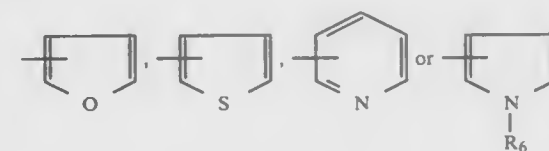
1. A method of preparing a compound of the formula,



where

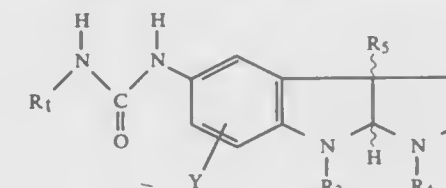
Y is hydrogen, fluorine, chlorine, bromine, nitro, loweralkyl, loweralkoxy or triloweralkylsilyl;
R₁ is loweralkyl, halogen-substituted loweralkyl, aryl, aryl-loweralkyl, cycloalkyl having from 3 to 7 carbon atoms in the ring, heteroaryl or heteroaryl-loweralkyl;
R₂ is loweralkyl or aryl-loweralkyl;
R₃ is loweralkyl or aryl-loweralkyl;
R₄ is hydrogen, loweralkyl, loweralkenyl, loweralkynyl, aryl-loweralkyl, formyl, loweralkylcarbonyl, aryl-loweralkylcarbonyl or loweralkoxycarbonyl;
R₅ is hydrogen or loweralkyl;

wherein the term heteroaryl signifies a group depicted by the formula



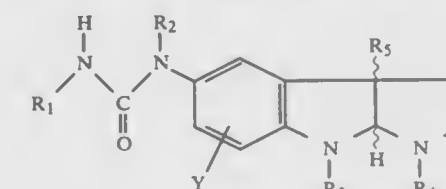
where R₆ is hydrogen or loweralkyl;

which comprises reacting a compound of the formula,



with a strong base and allowing the resultant anion to react with a compound of the formula R₂-Cl or R₂-Br to afford said compound.

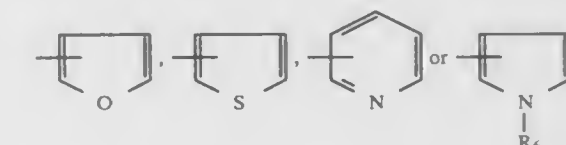
3. A method of preparing a compound of the formula,



where

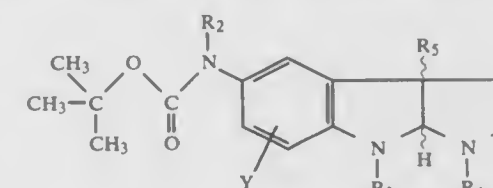
R₁ is loweralkyl, halogen-substituted loweralkyl, aryl, aryl-

loweralkyl, cycloalkyl having from 3 to 7 carbon atoms in the ring, heteroaryl or heteroaryl-loweralkyl;
R₂ is loweralkyl or aryl-loweralkyl;
R₃ is loweralkyl or aryl-loweralkyl;
R₄ is hydrogen, loweralkyl, loweralkenyl, loweralkynyl, aryl-loweralkyl, formyl, loweralkylcarbonyl, aryl-loweralkylcarbonyl or loweralkoxycarbonyl;
R₅ is hydrogen or loweralkyl; and
Y is hydrogen, fluorine, chlorine, bromine, nitro, loweralkyl, loweralkoxy or triloweralkylsilyl;
wherein the term heteroaryl signifies a group depicted by the formula

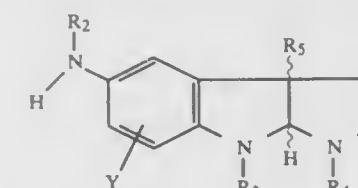


where R₆ is hydrogen or loweralkyl;

which comprises converting a compound of the formula,



to an amine compound of the formula,



by heating at a temperature of about 150°-250° C. in the absence of base and thereafter allowing the latter compound to react with an isocyanate of the formula R₁NCO to afford said compound.

5,091,542

TRIS-MALEIMIDO COMPOUNDS AS INTERMEDIATES IN TRIFUNCTIONAL ANTIBODY SYNTHESIS

Clarence Ahlem, San Diego, and Ann E. Huang, Carlsbad, both of Calif., assignors to Hybritech Incorporated, San Diego, Calif.

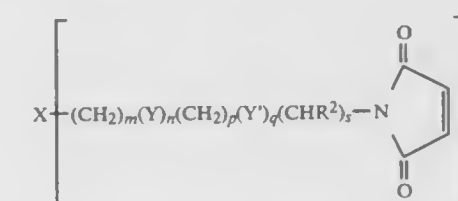
Filed Mar. 9, 1990, Ser. No. 491,386

Int. Cl.⁵ C07D 207/452; C12Q 1/00

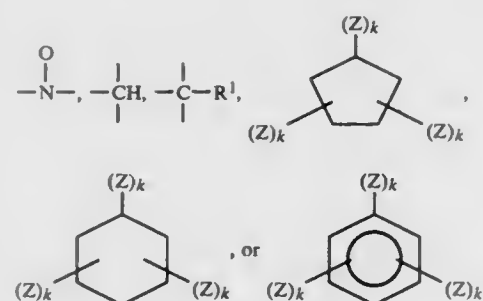
U.S. Cl. 548—521

11 Claims

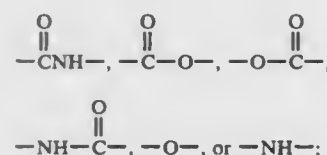
1. A compound of the formula:



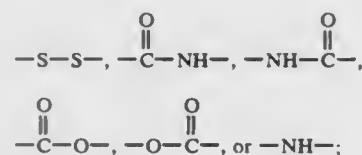
wherein X is



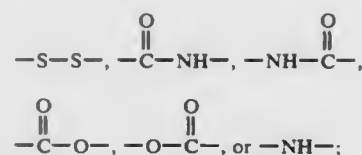
wherein k=1 or 0;
wherein Z is



wherein s=1 or 0;
wherein n=1;
wherein q=1 or 0;
wherein Y is



wherein Y' is



wherein p or m may be the same or different and are integers ranging from 0 to 20 with the provisos that when n=1, p and m are each an integer that is at least 1 and the sum of p and m is an integer ranging from 2 to 20;
wherein R¹ is straight or branched chain lower alkyl having from 1 to 6 carbon atoms or lower alkoxy having from 1-6 carbon atoms; and
wherein R² is hydrogen phenyl, -COOH, or straight or branched chain lower alkyl having from 1-6 carbon atoms optionally monosubstituted by -NH₂, -OH, or -COOH.

5,091,543

PREPARATION OF CYCLIC CARBONATES USING ALKYLAMMONIUM AND TERTIARY AMINE CATALYSTS

Roger A. Grey, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Oct. 15, 1990, Ser. No. 597,978
Int. Cl.⁵ C07D 317/12

U.S. Cl. 549-228

31 Claims

1. A process for preparing a 5- or 6-membered cyclic carbonate comprising: reacting a 1,2- or 1,3-diol with a diester of carbonic acid in the presence of an alkylammonium or a pyridinium salt at a temperature and for a time sufficient to form the cyclic carbonate.

5,091,544

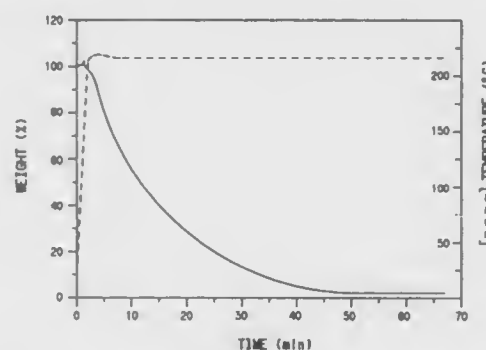
PROCESS FOR RAPID CONVERSION OF OLIGOMERS TO CYCLIC ESTERS

Kamlesh K. Bhatia, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

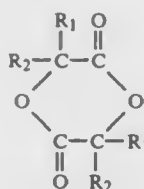
Continuation-in-part of Ser. No. 520,348, May 8, 1990, Pat. No. 5,023,349. This application Sep. 21, 1990, Ser. No. 586,157
Int. Cl.⁵ C07D 319/10

U.S. Cl. 549-274

20 Claims



1. An improved process for preparing a cyclic ester having the formula:



where R₁ and R₂ are independently a hydrogen or a C₁-C₆ aliphatic hydrocarbyl radical, which process comprises:

- feeding an oligomer of an alpha-hydroxy carboxylic acid, HO-C(R₁)-R₂-COOH, or an ester or a nitrogen based salt thereof, into a reaction zone maintained at a temperature effective to depolymerize the oligomer into cyclic ester;
- continuously feeding into the reaction zone a substance that is gaseous and non-reactive at said temperature, said substance forming a gaseous stream contacting the oligomer so as to form a large interfacial area with the oligomer; said gaseous substance being fed in an amount sufficient to strip cyclic ester from the oligomer substantially as fast as the cyclic ester is formed, wherein the feed rate of said gaseous substance is at least about 90 standard cubic feet per cubic foot of oligomer in the reaction zone;
- removing the gas stream comprising cyclic ester from the reaction zone; and
- recovering the cyclic ester from the gas stream.

5,091,545

CATALYTIC OXIDATION OF HYDROXY CONTAINING AROMATIC COMPOUNDS

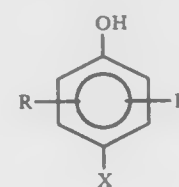
Dane K. Parker, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 2, 1990, Ser. No. 487,361
Int. Cl.⁵ C07C 249/02, 251/22

U.S. Cl. 552-302

7 Claims

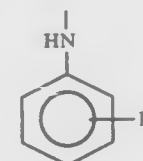
1. A process for the catalytic oxidation of hydroxy containing aromatic compounds comprising contacting a hydroxy containing aromatic compound of the formula:



with a molecular oxygen containing gas in the presence of:

- a catalytic amount of a cobalt (II) compound,
- a primary aliphatic amine having the nitrogen atom attached to a tertiary carbon, and
- an alcohol selected from the group consisting of methyl alcohol, ethyl alcohol, isopropyl alcohol, butyl alcohol, 2,2,2-trifluoroethanol and benzyl alcohol,

wherein X is of the formula:



wherein R is individually selected from the group consisting of hydrogen, an alkyl having from about 1 to about 18 carbon atoms, an alkoxy having from about 1 to about 8 carbon atoms, a phenyl and an aralkyl having 7 to 12 carbon atoms.

5,091,546

NOVEL RHODIUM RECOVERY

Peter Lappe, Dinslaken, and Helmut Springer, Oberhausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 26, 1990, Ser. No. 588,665

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1989, 3934824

Int. Cl.⁵ C07F 15/00

U.S. Cl. 556-23

14 Claims

1. A process for the recovery of rhodium from distillation residues of crude products from the oxo synthesis with rhodium complexed with an organic phosphorous III compound comprising treating the said distillation residues with oxygen or an oxygen containing gas in the presence of an alkali metal salt of a monocarboxylic acid of 2 to 5 carbon atoms at 60° to 120° C. at atmospheric or elevated pressure to form a water-soluble rhodium compound and extracting the mixture with water to obtain an aqueous phase containing the water soluble rhodium compound.

5,091,547

PHENYLACETIC ACID DERIVATIVE AND PROCESS FOR MAKING SAME

Antonio Buxade, Barcelona, Spain, assignor to Laboratorios Vinas, S.A., Barcelona, Spain

Filed May 17, 1990, Ser. No. 525,876

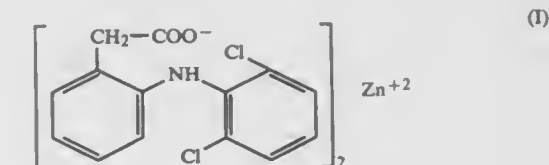
Claims priority, application Spain, May 29, 1989, 8901816

Int. Cl.⁵ C07F 3/06

U.S. Cl. 556-131

2 Claims

1. A zinc derivative of 2-(2,6-dichloroaniline)-phenylacetic acid having the following formula (I):



5,091,548 SOLVENTLESS PROCESS FOR PREPARING SULFOPHENETHYLSILOXANE OR SULFONAPHYHYLETHYLSILOXANES

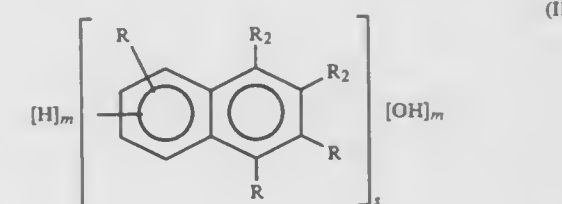
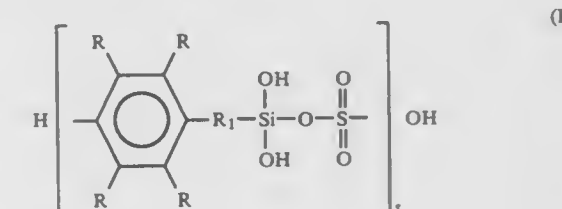
P. Davis, Gibraltar, Mich.; J. S. Ku, Baton Rouge, La., and T. M. Schmitt, Dearborn Hgts., Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed May 29, 1991, Ser. No. 706,913
Int. Cl.⁵ C07F 7/08

U.S. Cl. 556-428

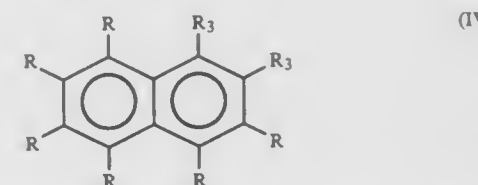
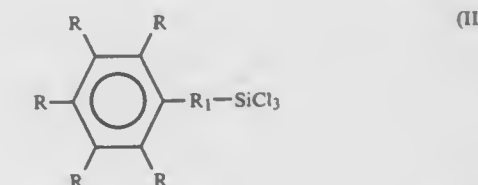
16 Claims

1. A process for preparing a sulfophenethylsiloxane having either of the following formulae:

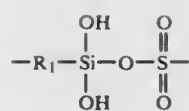


comprising:

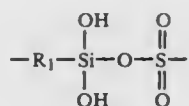
- adding in essentially equimolar ratio chlorosulfonic acid and a chlorosilane having either of the following formulae:



wherein R of formulae I, II, III, and IV is individually hydrogen, halogen, or an alkyl radical having 1 to 4 carbon atoms; R₁ is an alkylene radical having 2 to 5 carbon atoms; R₂ is R or



with the proviso that at least one R₂ be



R₃ is R or —R₁SiCl₃ with the proviso that at least one R₃ be —R₁SiCl₃ and m and n are each at least 1 continuously through a mixing nozzle in form of small droplets into a continuous stream of air with a temperature of from about 80° C. to about 150° C. in a reaction vessel to form a solid intermediate and (b) hydrolyzing said intermediate with water.

5,091,549

SYNTHESIS OF D-MYOINOSITOL-1-PHOSPHATE

Shoichiro Ozaki; Takahiko Akiyama; Naoto Takechi, all of Matsuyama; Kunio Kageyama, Yokohama, and Morihisa Machida, Kanagawa, all of Japan, assignors to The Yokohama Rubber Company, Ltd., Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 575,615

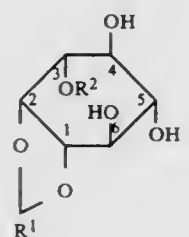
Claims priority, application Japan, Sep. 28, 1989, 1-253679

Int. Cl.⁵ C07F 9/117

U.S. Cl. 558—131

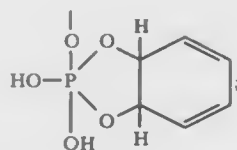
6 Claims

1. A method for the preparation of D-myoinositol-1-phosphate from a 1,2-(R¹)-3-R²-myoinositol compound as a starting material and having the formula



where R¹ is a protective group of a bridging type bonded to the two oxygen atoms at the 1- and 2-position, and R² is a protective group coupled to the oxygen atom at the 3-position, which method comprises the steps of:

- reacting the starting material with a benzyl or benzoyl halide to replace the hydroxyl groups at the 4-, 5- and 6-positions with a benzyl or benzoyl group, respectively;
- removing from compound (a) the protective group R¹, and the two oxygen atoms to which it is bonded at the 1- and 2-positions by reacting compound (a) with an acid to replace the substituent with two hydroxyl groups at the 1- and 2-positions;
- triethylsilylating compound (b) to replace the hydroxyl group at the 1-position with a triethylsilyl group;
- reacting compound (c) with a benzyl or benzoyl halide to replace the hydroxyl group at the 2-position with a benzyl or benzoyl group, respectively;
- reacting compound (d) with a Lewis acid to replace the triethylsilyl group at the 1-position with a hydroxyl group;
- reacting compound (e) with 1,5-dihydro-3-diethylamino-2,4,3-benzodioxaphosphin, followed by oxidation to replace the hydroxyl group at the 1-position with a group of the formula:



(g) reacting the compound of (f) with an alkali metal hydride to form D-myoinositol-1-phosphate.

5,091,550

5,5-BIS

(PERFLUOROALKYLHETEROMETHYL)-2-HYDROXY-2-OXO-1,3,2-DIOXAPHOSPHORINANES, DERIVED ACYCLIC PHOSPHORUS ACIDS AND SALTS OR ESTERS THEREOF

Robert A. Falk, New City, N.Y., and Kirtland P. Clark, Bethel, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

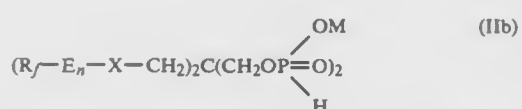
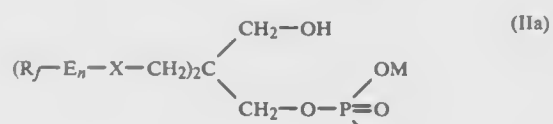
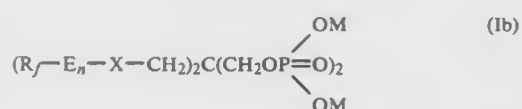
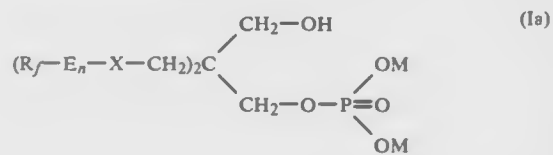
Filed Apr. 20, 1990, Ser. No. 513,356

Int. Cl.⁵ C07F 9/09, 9/141

U.S. Cl. 558—165

16 Claims

1. A compound of formula Ia, Ib, IIa or IIb:



wherein R_f is a straight or branched chain perfluoroalkyl of 2 to 12 carbon atoms or perfluoroalkyl of 2 to 6 carbon atoms substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

n=1 or 0, and when n=1,

E is a branched or straight chain alkylene of 2 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —NR—, —O—, —S—, —SO₂—, —CONR—, —NRCO—, —SO₂NR—, and —NRSO₂—, or terminated at the R_f end with —CONR— or —SO₂NR—, where R_f is attached to the carbon or sulfur atom, and X is —S—, —O—, or —SO₂— and when n=0,

X is —CONR— or —SO₂NR—, where R_f is attached to the carbon or sulfur atom, and where R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 2 to 6 carbon atoms,

and M is independently hydrogen, lower alkyl, an alkyl- or mixed polyalkyl-substituted aromatic group, or represents an ammonium, organoammonium, alkali metal or alkaline earth metal salt of the respective phosphite or phosphate group.

5,091,551

TRIALKYL-O-(W-AMINOALKYL)-PHOSPHATIDYLALKYLAMMONIUM SALTS USEFUL FOR THE MANUFACTURE OF BIOCOMPATIBLE SURFACES

Dennis Chapman, Buckinghamshire, and Aziz A. Durrani, London, both of England, assignors to Biocompatibles Ltd., London, England

Division of Ser. No. 328,709, Mar. 27, 1989, Pat. No. 4,937,369, which is a continuation of Ser. No. 114,762, Oct. 30, 1987, abandoned, which is a division of Ser. No. 778,185, filed as a PCT/GB85/00025, Jan. 18, 1985, Pat. No. 4,721,800. This application Apr. 18, 1990, Ser. No. 510,840

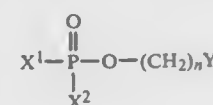
Claims priority, application United Kingdom, Jan. 20, 1984, 8401534

Int. Cl.⁵ C07F 9/10

U.S. Cl. 558—166

4 Claims

1. A compound of the formula:



in which X¹ is —O—(CH₂)_yNH₂ wherein y is an integer of from 1 to 10;

X² is a group —Oa;

Y is a group —N⁺R₃, wherein each R, which may be the same or different, is a C₁—C₄ alkyl group; and n is 2, 3 or 4.

5,091,552

NOVEL ANTITUMOR ALDOPHOSPHAMIDE ANALOGS

David Farquhar, Houston, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 879,910, Jun. 30, 1986, Pat. No. 4,841,085. This application Mar. 14, 1989, Ser. No. 323,423

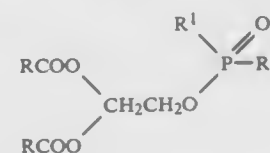
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.⁵ C07F 1/30, 9/36; C07H 15/252, 17/02

U.S. Cl. 558—180

1 Claim

1. A compound having the structure



wherein

R is CH₃ [or C₂H₅];

R¹ is NHC₃H₇, NHC₄H₉, [NCH₃(C₂H₅), NCH₃(C₃H₇), NHC₆H₅, [NHOH, NNNHCO₂CH₂C₆H₅, NNNHCO₂C(CH₃)₂], OC₃H₇, OC₄H₉, OC₆H₅, or OCH₂C₆H₅, [ONHCO₂C(CH₃)₃, OCH₂CH₂CH(OAC)₂, OP(O)(N)(CH₂CH₂Cl)₂, C₃H₇, C₄H₉, CH₂NO₂ or CH₂NH₂]; and

R² is [NHCH₂CH₂Cl or] N(CH₂CH₂Cl)₂.

5,091,553

PROCESS FOR THE PREPARATION OF SUBSTITUTED ISOCYANATES

Martin Müllner, Traun; Gerhard Stern, Soanberg; Erich Schulz, Ansfelden, and Markus Rössler, Linz, all of Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria

Filed Jul. 12, 1990, Ser. No. 552,696

Claims priority, application Austria, Jul. 28, 1989, 1831/89; Jul. 28, 1989, 1832/89; Jul. 28, 1989, 1833/89

Int. Cl.⁵ C07C 265/02

U.S. Cl. 558—302

8 Claims

1. Process for the preparation of substituted isocyanates, comprising reacting an adduct of isocyanic acid and a tertiary

amine with a compound having one or two non-cumulated olefinic double bonds in a diluent which is inert under the reaction conditions.

5,091,554

METHOD OF PREPARING

1,3,3-TRIMETHYL-5-OXO-CYCLOHEXANE CARBONITRILE

Klaus Huthmacher, Gelnhausen, and Hermann Schmitt, Rodenbach, both of Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany

Filed Dec. 5, 1990, Ser. No. 622,786

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942371

Int. Cl.⁵ C07C 253/10

U.S. Cl. 558—341

4 Claims

1. In a method of preparing 1,3,3-trimethyl-5-oxo-cyclohexane carbonitrile by means of the addition of hydrogen cyanide to isophorone in the presence of an alkaline-acting alkali compound as catalyst at 100° to 160° C.;

the improvement in which the catalyst is lithium hydroxide and the reaction is carried out in the presence of 0.005 to 5 mole % catalyst relative to isophorone, the isophorone and hydrogen cyanide being reacted in a molar ratio in the range of 1.1 to 1 to 5 to 1 and no further solvent being used.

5,091,555

PROCESS FOR THE VACUUM DISTILLATION OF CRUDE CYANOHYDRINS CONTAINING 3 TO 6 CARBON ATOMS USING LIQUID JET PUMP

Wolfgang Buder, New Delhi, India, and Udo Rudolph, Hanau, Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany

Filed Oct. 5, 1990, Ser. No. 592,485

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1989, 3933207

Int. Cl.⁵ C07C 253/30, 253/34, 253/00

U.S. Cl. 558—351

6 Claims

1. In a process for the purification of a crude cyanohydrin, said cyanohydrin being selected from the group consisting of lactonitrile, 2-hydroxy-n-butyronitrile, acetone cyanohydrin and methyl ethyl ketone cyanohydrin, said crude cyanohydrin containing unreacted hydrogen cyanide and the carbonyl compound from which the cyanohydrin has been made, said process comprising distilling off the unreacted reactants under vacuum at a temperature between 30° and 90° C. and a pressure of 35–100 mbar and recovering the cyanohydrin from the separated reactants;

the improvement in which the vacuum for the distillation is generated with a liquid jet pump, the exhaust vapors arising during the distillation, which contain unconsumed cyanohydrin reactants, are led without condensation or after partial condensation into the driving jet of the pump, whereby the driving jet in the liquid jet pump consists of crude cyanohydrin containing basic catalyst and the liquid jet pump is integrated into a cooled reaction circuit in which the cyanohydrin reactants, absorbed from the exhaust vapors, react to completion to the cyanohydrin.

5,091,556

PROCESS FOR PRODUCING CARBAMATES

Carlo Calderoni, Forlì; Franco Mizia; Franco Rivetti, both of Milan, and Ugo Romano, Vimercate, all of Italy, assignors to Enichem Synthesis, S.p.A., Palermo, Italy

Filed Mar. 28, 1990, Ser. No. 500,405

Claims priority, application Italy, Apr. 7, 1989, 20042 A/89

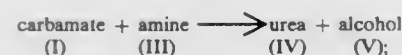
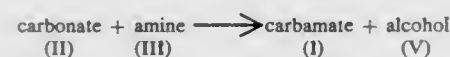
Int. Cl.⁵ C07C 269/00, 271/00

U.S. Cl. 560—24

20 Claims

1. A process for producing a carbamate (I), comprising: (a) contacting a carbonate (II), an amine (III), and a Lewis

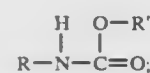
acid catalyst, in a molar ratio of carbonate (II) to amine (III) of from about 1/1 to about 15/1, under boiling conditions at a temperature of from about 90° to about 140° C., and removing at least some of a byproduct alcohol (V) until said amine (III) is substantially converted, thereby reacting said carbonate (II) and amine (III) to produce a mixture of carbamate (I) and urea (IV) according to the following equations:



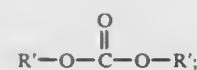
(b) contacting carbonate (II) and the urea (IV) of step (a) in a molar ratio of carbonate (II) to urea (IV) of from about 20/1 to about 80/1, under autogenous system pressure at a temperature of from 140° to 180° C., thereby converting the urea (IV) to carbamate (I) according to the following equation:



(c) recovering the carbamate (I) of step (b); said carbamate (I) being represented by the formula



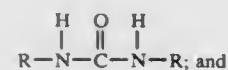
said carbonate (II) being represented by the formula



said amine (III) being represented by the formula



said urea (IV) being represented by the formula



said alcohol (V) being represented by the formula



wherein R is selected from the group consisting of a (C₁-C₁₈)-alkyl radical with a linear chain, a (C₁-C₁₈)-alkyl radical with a branched chain, a (C₅-C₇)-cycloalkyl radical, a monocyclic aryl radical, a condensed-ring polycyclic aryl radical, a non-condensed-ring polycyclic aryl radical, and a (C₁-C₄)-alkylaryl radical; and wherein R' is selected from the group consisting of a linear chain (C₁-C₁₂)-alkyl radical, a branched chain (C₁-C₁₂)-alkyl radical, and a (C₅-C₇)-cycloalkyl radical.

5,091,557

AMINO ACID DERIVATIVE HAVING LIQUID CRYSTAL PROPERTY AND PROCESS FOR PRODUCTION OF THE SAME

Kimie Nagai; Shuichi Naitoh; Ayako Kurotaki; Koro Shirane, and Chozo Inoue, all of Tokyo, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 501,220, Mar. 29, 1990. This application May 17, 1991, Ser. No. 701,906

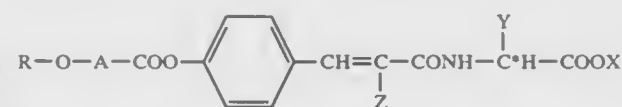
Claims priority, application Japan, Mar. 31, 1989, 1-82760; Sep. 22, 1989, 1-245199

Int. Cl.⁵ C07C 279/00

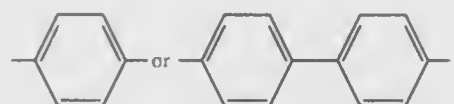
U.S. Cl. 560-39

2 Claims

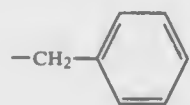
1. An optically active amino acid derivative represented by formula (I):



wherein R represents a straight chain alkyl group having 6 to 16 carbon atoms; A represents



X represents a straight chain alkyl group having 1 to 14 carbon atoms; Y represents —CH₃, —CH₂CH(CH₃)₂, —CH(CH₃)₂, —CH(CH₃)CH₂CH₃ or



and

Z represents —CH₃ or a hydrogen atom.

5,091,558

NAPHTHALENE ANTI-PSORIATIC AGENTS

Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco, and John M. Young, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

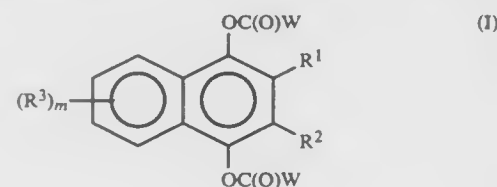
Continuation-in-part of Ser. No. 806,314, Dec. 9, 1985, abandoned, which is a division of Ser. No. 574,426, Jan. 27, 1984, abandoned. This application Mar. 6, 1987, Ser. No. 23,089

Int. Cl.⁵ C07C 69/00

U.S. Cl. 560-139

37 Claims

1. A composition in a form suitable for topical administration for treating the condition of psoriasis which composition comprises a pharmaceutically acceptable, non-toxic carrier and a psoriasis relieving amount of a compound of the formula:



wherein:

m is 0, 1 or 2;

R¹ is alkoxy of one to twelve carbon atoms, alkylthio of one to twelve carbon atoms, phenoxy or phenylthio optionally

substituted by one or two lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms or halo; R² is hydrogen, lower alkyl of one to six carbon atoms, phenyl or phenylalkyl wherein the phenyl ring of the phenylalkyl group is optionally substituted by one or two substituents selected from the group consisting of halo, lower alkyl of one to four carbon atoms or lower alkoxy of one to four carbon atoms;

R³ is halo, lower alkyl, lower alkoxy, optionally substituted phenyl, optionally substituted phenyl lower alkyl, optionally substituted phenyl lower alkoxy, amino, lower alkylamino, lower dialkylamino, cyano, or S(O)_nR wherein n is 0, 1 or 2, and R is lower alkyl of one to six carbon atoms, optionally substituted phenyl, optionally substituted phenyl lower alkyl, or heterocyclic aryl of three to nine ring atoms containing one or two heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur wherein the heterocyclic aryl is optionally substituted by one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, halo and cyano;

W is alkyl of one to seven carbon atoms, phenyl or benzyl optionally substituted with one or two lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms or halo;

with the proviso that

(a) is R¹ is methoxy or ethoxy, R² is hydrogen and W is methyl; or if R¹ is methoxy, R² is methyl and W is methyl, then m is not 0; or

(b) if R³ is phenyl, phenyl lower alkyl, phenyl lower alkoxy, amino, lower alkylamino, lower dialkylamino, cyano, or S(O)_nR, then m is not 2;

or a pharmaceutically acceptable acid addition salt thereof.

5,091,559

PROCESS FOR THE PREPARATION OF ALKYL 4-OXOBUTYRATE AND ITS ACETALS

Jawad H. Murib, Cincinnati, and William D. Baugh, Wilmington, both of Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 777,372, Sep. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 264,925, May 18, 1981, abandoned. This application Feb. 8, 1988, Ser. No. 153,621

Int. Cl.⁵ C07C 67/36, 67/37, 69/716

U.S. Cl. 560-175

6 Claims

1. A process for forming alkyl 4-oxobutyrate and acetals thereof which comprises reacting under anhydrous conditions β-halopropionaldehydes or the acetals thereof, carbon monoxide and an alcohol of the formula ROH wherein R is lower alkyl in the presence of a catalytically effective amount of a catalyst comprising palladium metal which is either unsupported or supported on an inert carrier.

5,091,560

METHOD FOR SYNTHESIZING ACYLOXYCARBOXYLIC ACIDS

Richard R. Rowland, Danville, Calif., assignor to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 409,279, Sep. 19, 1989, abandoned, which is a continuation of Ser. No. 167,544, Mar. 14, 1988, abandoned. This application Dec. 21, 1990, Ser. No. 635,409

Int. Cl.⁵ C07C 69/66

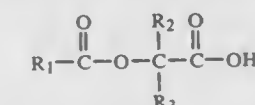
U.S. Cl. 560-185

13 Claims

1. A method for synthesizing an acyloxycarboxylic acid comprising:

providing a reaction chamber, the reaction chamber including a basic component in an amount effective to neutralize HCl by-product during formation of a reaction product; establishing sources of an α-hydroxy carboxylic acid and an acid chloride, both sources being separated from the reaction chamber and separated from one another; and repeatedly and simultaneously contacting substantially equimolar amounts of the α-hydroxy carboxylic acid and the

acid chloride within the reaction chamber from the sources thereof, wherein neither reactant is present in a significant excess over the other, to form an isolatable reaction product within the reaction chamber, the repeated and simultaneous contacting including introducing predetermined equimolar quantities at a predetermined rate of the α-hydroxy carboxylic acid and the acid chloride from the sources thereof into the reaction chamber, the predetermined quantities being small relative to total reactant quantities that accumulate in the reaction chamber, the reaction product having the structure



wherein R₁ is an alkyl group having two to about twelve carbon atoms, R₂ is hydrogen, a methyl, ethyl or propyl group, and R₃ is hydrogen, a methyl, ethyl or propyl group, or an alkyl substituted or unsubstituted benzyl or phenyl group.

5,091,561

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Dennis P. Riley, Chesterfield, and Willie J. Rivers, Jr., University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 311,786, Feb. 17, 1989, Pat. No. 4,965,402, which is a division of Ser. No. 112,594, Oct. 26, 1987, Pat. No. 4,853,159. This application Jun. 4, 1990, Ser. No. 532,413

Int. Cl.⁵ C07F 9/38

U.S. Cl. 562-17

16 Claims

1. A process for the production of N-phosphonomethylglycine comprising contacting N-phosphonomethyliminodiacetic acid with a molecular oxygen-containing gas in the presence of an aqueous soluble catalyst selected from the group consisting of the salts and salt complexes of iron, nickel, chromium, ruthenium, aluminum, molybdenum, vanadium and cerium.

5,091,562

PROCESS FOR ELIMINATING 1-CARBOXY-1-PHOSPHONOCYCLOPENTAN-3-ONE FROM, OR REDUCING ITS CONTENT IN, TECHNICAL 2-PHOSPHONOBUTANE-1,2,4-TRICARBOXYLIC ACID USING BLEACHING LIQUOR

Michael Immenkeppel, Bonn; Roland Kleinstück, Bergisch Gladbach; Hans-Dieter Block, Leverkusen; Hermann Siclus, Düsseldorf, and Peter Schmidt, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 27, 1991, Ser. No. 676,051

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1990, 4011379

Int. Cl.⁵ C07F 9/38

U.S. Cl. 562-24

5 Claims

1. A process for eliminating 1-phosphono-1-carboxycyclopentan-3-one (ketone) from, or reducing its content in, an aqueous solution of 2-phosphonobutane-1,2,4-tricarboxylic acid, wherein the solution is adjusted to a pH value of >6 using an aqueous inorganic base, and then a bleaching liquor is added in an amount sufficient to provide a molar ratio of NaOCl to ketone of >5 : 1.

5,091,563

PROCESS FOR PREPARING α -PHENYLPROPIONIC ACID DERIVATIVE

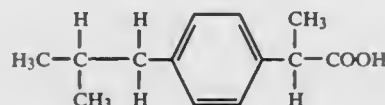
Yasutaka Tanaka; Hidetaka Kojima, and Yasuo Tsuji, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 315,525, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 103,309, Sep. 30, 1987, Pat. No. 4,843,172. This application Dec. 11, 1989, Ser. No. 453,154 Claims priority, application Japan, Dec. 24, 1986, 61-313868 Int. Cl.⁵ C07C 51/10

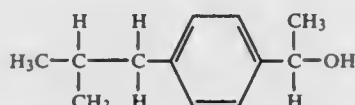
U.S. Cl. 562—406

7 Claims

1. A process for preparing a compound having the formula (I)



which comprises contacting at a temperature of from 60° to 100° C. (I) a compound having the formula (II)



with (2) carbon monoxide, in the presence of a catalytically effective amount of (3) a rhodium halide-containing catalyst system effective to carbonylate the formula (II) compound and convert it to the formula (I) compound, the contacting being carried out in the presence of hexane and an oxygen-containing organic solvent selected from the group consisting of dioxane, acetone and acetic acid, said hexane and oxygen-containing solvent being present in said mixture in a volume ratio of from 95/5 to 80/20 of hexane to oxygen-containing organic solvent.

5,091,564

PROCESS FOR PREPARING DIPHENYL SULFONETETRARCOXYLIC ACID

Hiroshi Manami, Jyoyo; Mikio Nakazawa, Uji; Shigeo Miki, Hirakata, and Akihiro Nishiuchi, Jyoyo, all of Japan, assignors to New Japan Chemical Co., Ltd., Kyoto, Japan Filed Sep. 20, 1990, Ser. No. 585,698

Claims priority, application Japan, Sep. 27, 1989, 1-251598

Int. Cl.⁵ C07C 51/265

U.S. Cl. 562—416

22 Claims

1. A process for preparing a diphenyl sulfonetetracarboxylic acid, the process comprising oxidizing a tetramethyldiphenyl sulfone with oxygen or an oxygen-containing gas in an aliphatic monocarboxylic acid having 2 to 10 carbon atoms in the presence of a catalyst consisting essentially of a cobalt component, a manganese component and a bromine compound wherein the weight ratio of manganese metal to cobalt metal is in the range of approximately 0.01 to 0.5.

5,091,565

POLY-DICARBOXYLIC ACID ANHYDRIDES, THEIR PRODUCTION AND USE

Gerd Ziegast, Liestal, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Continuation of Ser. No. 258,305, Oct. 14, 1988, which is a division of Ser. No. 912,281, Sep. 29, 1986, Pat. No. 4,792,598. This application Aug. 21, 1990, Ser. No. 570,939

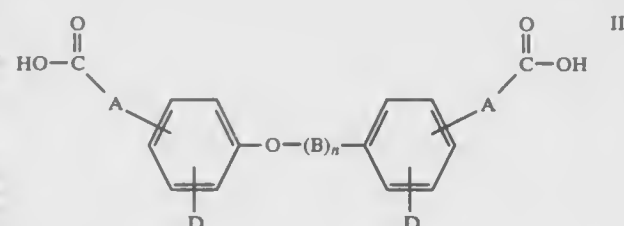
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535169

Int. Cl.⁵ C07C 65/00

U.S. Cl. 562—473

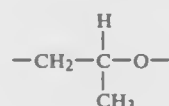
2 Claims

1. A compound of formula II,

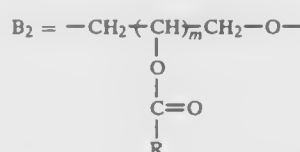


wherein

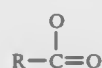
A represents a direct bond or (C₁₋₁₂) alkylene in the ortho-, meta- or para-position in the phenyl ring, and wherein B signifies B₁ = —CH₂—CH₂—O— with n > 2, —CH₂—CH₂—CH₂—O— or



with n > 2, or



with n = 1 and wherein m = 1, 2, 3 or 4 and wherein R is (C₁₋₂₀) alkyl or optionally substituted phenyl, or wherein



is a (co)(poly)ester group of one or more identical or different hydroxy carboxylic acid units, and D = H, CH₃ or OCH₃ in the ortho-, meta- or para-position in the phenyl ring.

5,091,566

PROCESS FOR THE MANUFACTURE OF AQUEOUS SOLUTIONS OF GLYOXYLIC ACID

Alain Schouteeten, Ezanville, and Yanni Christidis, Paris, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Jul. 3, 1989, Ser. No. 374,818

Claims priority, application France, Jul. 1, 1988, 88 08957

Int. Cl.⁵ C07C 59/153, 51/235, 51/27

U.S. Cl. 562—531

14 Claims

1. A process for the preparation of an aqueous solution of glyoxylic acid, comprising:

reacting alkyoxal in an aqueous solution with a reactant consisting essentially of molecular oxygen and in the presence of a catalyst consisting essentially of nitrogen monoxide, said catalyst being present in a catalytic amount, and said aqueous solution of glyoxal containing an amount sufficient of a strong mineral acid to provide a pH value less than 1.

5,091,567

PROCESS FOR THE PREPARATION OF 1-AMINOMETHYL-1-CYCLOHEXANECARBOXYLIC ACID

Wolfram Geibel, Hünfeld; Johannes Hartenstein, Stegen-Wittental; Wolfgang Herrmann, Merzhausen, and Joachim Witzke, Nimbura, all of Fed. Rep. of Germany, assignors to Gödecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany Filed Aug. 21, 1990, Ser. No. 570,487

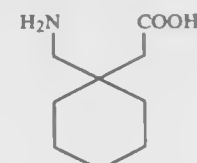
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928182

Int. Cl.⁵ C07C 61/08

U.S. Cl. 562—507

14 Claims

1. A process for the preparation of



which comprises:

- reacting cyclohexanone with a phosphonoacetic acid ester and a base to produce the corresponding cyclohexylideneacetic acid ester,
- reacting the cyclohexylideneacetic acid ester from Step (a) with nitromethane in the presence of a basic catalyst to produce the corresponding 1-nitromethyl-1-cyclohexanecarboxylic acid ester,
- reducing the 1-nitromethyl-1-cyclohexanecarboxylic acid ester from Step (b) with hydrogen in the presence of a noble metal catalyst to the corresponding 1-aminomethyl-1-cyclohexanecarboxylic acid ester and 2-aza-spiro[4,5]-decan-3-one,
- converting the products of Step (c), 1-aminomethyl-1-cyclohexanecarboxylic acid ester and 2-aza-spiro[4,5]-decan-3-one, into 1-aminomethyl-1-cyclohexanecarboxylic acid salt using a dilute acid, and
- converting the salt from Step (d) to the 1-aminomethyl-1-cyclohexanecarboxylic acid.

5,091,568

OXYGEN-RUTHENIUM OXIDE OXIDATION OF 2-HYDROXY-3,3-DIMETHYL-BUTANOIC ACID

Dennis E. Jackman, Prairie Village, Kans., assignor to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 832,504, Feb. 21, 1986, abandoned. This application May 23, 1986, Ser. No. 867,345

Int. Cl.⁵ C07C 51/373, 59/185

U.S. Cl. 562—577

5 Claims

1. In the oxidation of 2-hydroxy-3,3-dimethyl-butanoic acid in solution in the presence of a ruthenium oxide catalyst to produce 2-oxo-3,3-dimethyl-butanoic acid, the improvement wherein oxidation is effected with oxygen under alkaline conditions.

5,091,569

DI-TERT-BUTYL(HYDROXY)PHENYLTHIO SUBSTITUTED HYDROXAMIC ACID DERIVATIVES

Saichi Matsumoto, Osaka, Japan; Takuji Mizui, San Francisco, Calif., and Masami Doteuchi, Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan Filed Jun. 19, 1990, Ser. No. 540,625

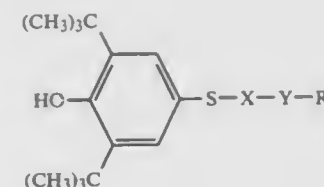
Claims priority, application Japan, Jun. 29, 1989, 1-167497

Int. Cl.⁵ C07C 259/06; A61K 31/165, 31/185

U.S. Cl. 562—621

6 Claims

1. A compound of the formula



wherein X is straight C₄ or C₅ alkylene; Y is CO—N(OH); and R is hydrogen, methyl, heptyl or cyclohexyl; or a pharmaceutically acceptable salt thereof.

5,091,570

METHOD FOR PREPARATION OF DIALKYL TELLURIUM AND DIALKYL SELENIUM

John B. Mullin, West Malvern, England; David J. Cole-Hamilton, Boarhills, Scotland; Deodatta V. Shenai-Khatkhate, St. Andrews, Scotland, and Paul Webb, Crail, Scotland, assignors to Secretary of State for Defence in her Britannic Majesty's Gov. of the U.K., London, United Kingdom

PCT No. PCT/GB88/01065, § 371 Date Jul. 31, 1990, § 102(e) Date Jul. 31, 1990, PCT Pub. No. WO89/05292, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 2, 1988, Ser. No. 488,076

Claims priority, application United Kingdom, Dec. 4, 1987, 8728392

Int. Cl.⁵ C07C 395/00

U.S. Cl. 562—899

34 Claims

1. A method for the preparation of dialkyl tellurium or dialkyl selenium comprising reacting either elemental tellurium or elemental selenium, or a tellurium (IV) halide or selenium (IV) halide with a group (I) metal alkyl in a solvent which is or contains at least one C₄—C₁₀ aliphatic ether.

5,091,571

PROCESS FOR PREPARING N,N'-DISUBSTITUTED UREA

Chul Woo Lee, Choongnam; Jae Sung Lee, Kyungbuk, and Sang Moo Lee, Choongnam, all of Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea Filed Oct. 31, 1990, Ser. No. 606,721

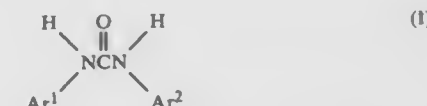
Claims priority, application Rep. of Korea, Nov. 2, 1989, 89-15880; Dec. 28, 1989, 89-19935

Int. Cl.⁵ C07C 275/28, 275/30

U.S. Cl. 564—52

8 Claims

1. A process for preparing N,N'-disubstituted urea of the formula (I)



wherein each of Ar¹ and Ar² represents an unsubstituted aromatic radical or an aromatic radical substituted with a halogen atom, a lower alkyl group or a lower alkoxy group, and Ar¹ and Ar² may be similar or different, which comprises reacting an aromatic mono-nitro compound, an aromatic primary amine and carbon monoxide in the presence of a catalyst consisting essentially of a divalent palladium compound as a main catalyst component and ammonium or a phosphonium salt containing halogen atom as a co-catalyst component, and a non-polar solvent, the molar ratio of said aromatic primary amines to said aromatic mono-nitro compound being greater than 2, and the molar ratio of said co-catalyst to said palladium compound being 1 to 20.

5,091,572

AMINE TERMINATED POLYAMIDES

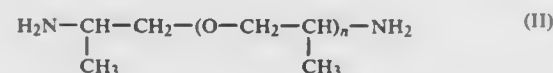
George P. Speranza, and Wei-Yang Su, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Dec. 11, 1989, Ser. No. 448,417
Int. Cl.³ C07C 231/02

U.S. Cl. 564—139

8 Claims

1. A method of preparing a liquid amine terminated polyamide addition product having an average molecular weight of about 3,000 to about 10,000 by the noncatalytic reaction of a dicarboxylic acid having a molecular weight within the range of about 130 to about 700 with a first higher molecular weight polyoxypropylene diamine having an average molecular weight within the range of about 1,500 to about 6,000 and with a second lower molecular weight polyoxypropylene diamine having an average molecular weight within the range of about 200 to about 700, which comprises:

- reacting said dicarboxylic acid with said first higher molecular weight polyoxypropylene diamine to form an intermediate reaction product and reacting said intermediate reaction product with said second lower molecular weight polyoxypropylene diamine, said reactions being conducted under reaction conditions including a temperature within the range of about 150° to about 280° C., a pressure of about 0.1 to 20 atmospheres and a reaction time of about 2 to about 5 hours to provide a reaction mixture, and
- recovering said liquid amine terminated polyamide from said reaction mixture,
- said first and said second polyoxypropylene diamines being reacted with said dicarboxylic acid in the molar ratio of about 1.05 to about 1.5 moles of total polyoxypropylene diamine per mole of said dicarboxylic acid, said first and said second polyoxypropylene diamines being used in the ratio of about 0.25 to about 3 moles of said first higher molecular weight polyoxypropylene diamine per mole of said second lower molecular weight polyoxypropylene diamine,
- said dicarboxylic acid being selected from the group consisting of aliphatic dicarboxylic acids containing 6 to 36 carbon atoms, aromatic dicarboxylic acids containing 8 to 16 carbon atoms, anhydrides and C₁ to C₄ alkyl esters thereof,
- said dicarboxylic acid and said first and said second polyoxypropylene diamines being reacted within the proportions and in amounts to provide an addition product having an average molecular weight of about 3,000 to about 10,000.
- said first and said second polyoxypropylene diamines having the formula:



wherein n for said first higher molecular weight polyoxypropylene diamine represents a positive number having an average value of about 25 to about 100, and wherein n for said second lower molecular weight polyoxypropylene diamine represents a positive number having an average value of about 3 to about 11.

5,091,573

THIOL-TERMINATED HYDROXYAMIDES

Andrew W. Gross, Hatboro, and William D. Emmons, Huntingdon Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 392,491, Aug. 11, 1990, abandoned.

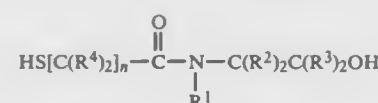
This application Aug. 27, 1990, Ser. No. 581,158

Int. Cl.³ C07C 323/60, 233/20; C08F 2/38; C08G 63/685

U.S. Cl. 564—192

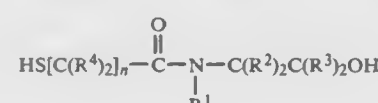
2 Claims

1. A method of using a thiol-terminated hydroxyamide of the structural formula:



where R¹ is hydrogen, a lower alkyl having from 1 to 5 carbon atoms, or HO(R³)₂C(R²)₂C—; R⁴ are the same or different radicals selected from hydrogen, or straight or branched chain lower alkyl having from 1 to 5 carbon atoms, or where one of the R² and one of the R³ radicals located on adjacent carbon atoms may be joined together with said adjacent carbon atoms; and where n is an integer greater than or equal to 1, as a chain transfer agent in a free radical initiated polymerization reaction.

2. A method of forming a reactive oligomer comprising reacting a carboxylic acid-containing monomer or oligomer with a thiol-terminated hydroxyamide of structural formula:



where R¹ is hydrogen, a lower alkyl having from 1 to 5 carbon atoms, or HO(R³)₂C(R²)₂C—; where R², R³ and R⁴ are the same or different radicals selected from hydrogen, or straight or branched chain lower alkyl having from 1 to 5 carbon atoms, or where one of the R² and one of the R³ radicals located on adjacent carbon atoms may be joined together with said adjacent carbon atoms; and where n is an integer greater than or equal to 1, under free radical initiated polymerization conditions.

5,091,574

POLYOXYETHYLENE DIAMINE DERIVATIVES OF DIGLYCIDYL ETHERS

Jiang-Jen Lin, Houston, and George P. Speranza, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Division of Ser. No. 475,516, Feb. 2, 1990, Pat. No. 5,025,100.

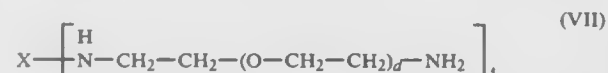
This application Feb. 25, 1991, Ser. No. 660,305

Int. Cl.³ C07C 217/42, 215/16

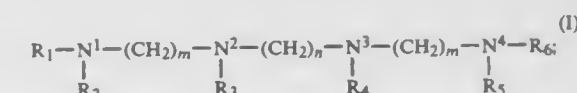
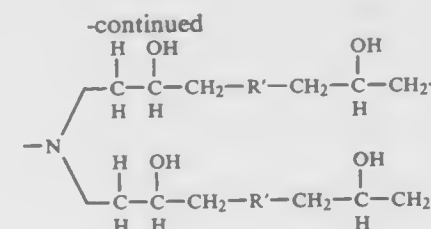
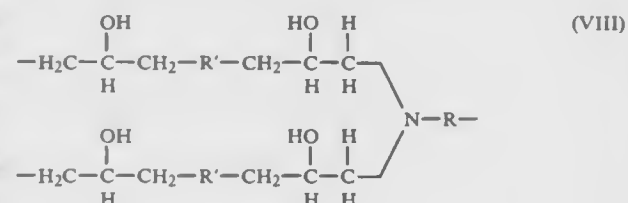
U.S. Cl. 564—325

5 Claims

1. An amine terminated derivative of diglycidyl ether having the formula:



wherein d is a positive number having an average value of 1 to about 4, and wherein X represents a group having the formula:

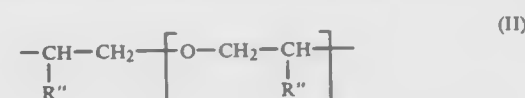


Wherein:

R₁-R₆ may be the same or different and are methyl, propyl, butyl, pentyl, benzyl or β,β,β-trifluoroethyl;
m is an integer from 3 to 6, inclusive;
n is an integer from 3 to 6, inclusive, or a salt thereof with an acid.

wherein:

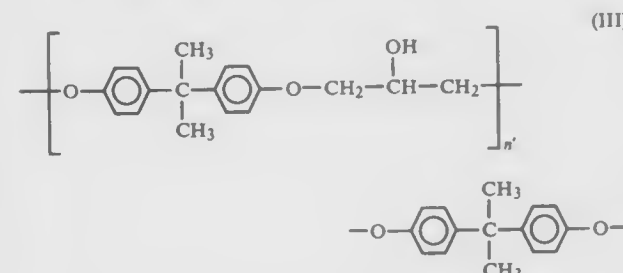
R represents a polyoxyalkylene group having the formula:



wherein n is a positive number having a value of 2 to 35,

R'' represents hydrogen, methyl or ethyl,

R' represents a glycidyl ether having the formula:



wherein n' represents 0 or a positive number having a value of 1 or 2.

5,091,575

PEPTIDYLAMINODIOLS

Jay R. Luly; Jacob J. Plattner, both of Libertyville, and Dale J. Kempf, Lake Villa, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 327,467, Mar. 22, 1989, abandoned, which is a division of Ser. No. 217,106, Jul. 11, 1988, Pat. No. 4,845,079, which is a continuation of Ser. No. 943,567, Dec. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 895,009, Aug. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 818,734, Jan. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 693,951, Jan. 23, 1985, abandoned. This application Jun. 10, 1991, Ser. No. 713,644

Int. Cl.³ C07C 211/03, 271/12

U.S. Cl. 560—115

7 Claims

1. The compound 2(S)-1-butyloxycarbonylamino-1-cyclohexyl-3(R),4(S)-dihydroxy-6-methylheptane.

5,091,576

ANTI-NEOPLASTIC, ANTI-VIRAL OR ANTI-RETROVIRAL SPERMINE DERIVATIVES

Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

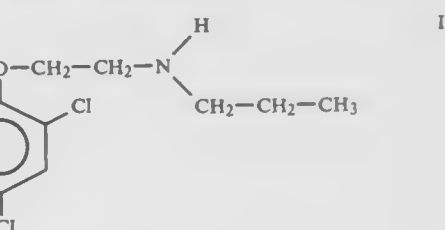
Continuation-in-part of Ser. No. 66,227, Jun. 25, 1987, abandoned, Continuation-in-part of Ser. No. 936,835, Dec. 2, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 210,520

Int. Cl.³ C07C 211/14

U.S. Cl. 564—367

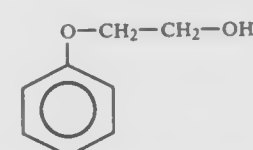
14 Claims

1. A compound having the formula:

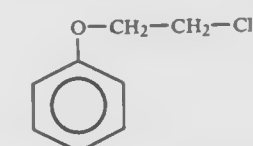


characterized in that:

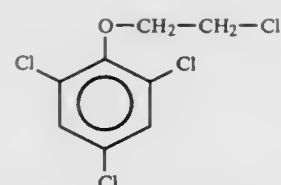
a. 2-phenoxy ethanol of the formula



is reacted with thionyl chloride in the presence of a catalytic amount of a tetra-alkyl ammonium halide having from 1-16 carbon atoms or benzyl trimethyl ammonium halide at a temperature of from 0° C. to 50° C. optionally in the presence of a solvent, to form 2-phenoxy-ethyl chloride of the formula:

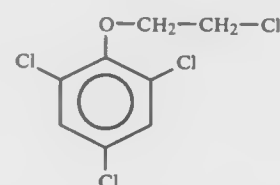


b. the 2-phenoxy-ethyl chloride is selectively chlorinated by reacting it with chlorine at a temperature of from 0° C. to 60° C. in the presence of a catalytic amount of urea to form 2-(2,4,6-trichlorophenoxy)-ethyl chloride of the formula:



III

solvent, to form 2-(2,4,6-trichlorophenoxy)-ethyl chloride of the formula:



III

c. the 2-(2,4,6-trichlorophenoxy)-ethyl chloride is reacted with n-propyl amine at a temperature of from 20° C. to 150° C., optionally in the presence of water, to form N-n-propyl-N-2-(2,4,6-trichlorophenoxy)-ethyl amine; and
d. the N-n-propyl-N-2-(2,4,6-trichlorophenoxy)-ethyl amine formed is recovered.

5,091,578

METHOD OF PREPARING PHENOXY ETHERS FOR USE AS AGROCHEMICAL INTERMEDIATES

Joseph Sharvit, Lehavim; Abraham A. Pereferkovich, Kfar Sava, and Daniel Shohat, Beer Sheva, all of Israel, assignors to Makhteshim Chemical Works Ltd., Beer Sheva, Israel
Filed Jun. 14, 1990, Ser. No. 537,968

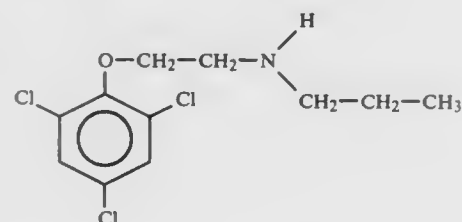
Claims priority, application Israel, Jun. 21, 1989, 90702; May 10, 1990, 94355

Int. Cl.⁵ C07C 213/02, 217/30

U.S. Cl. 564—399

22 Claims

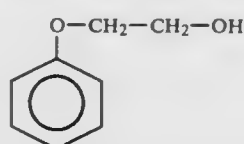
1. A process for preparing N-n-propyl-N-2-(2,4,6-trichlorophenoxy)-ethyl amine of the formula:



IV

characterized in that:

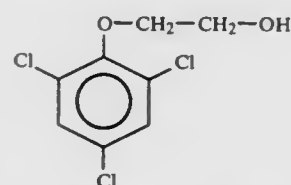
a. 2-phenoxy ethanol of the formula



II

is selectively chlorinated by reaction with chlorine
(1) in the presence of hydrogen chloride at a temperature of from -10° C. to 50° C.; or

(2) in the presence of urea at temperature of from 20° C. to 55° C. in a water/carbon tetrachloride solvent to form 2-(2,4,6-trichlorophenoxy)ethanol of the formula;



II

b. the 2-(2,4,6-trichlorophenoxy)-ethanol is reacted with thionyl chloride in the presence of a catalytic amount of tetra-alkyl ammonium halide having from 1 to 16 carbon atoms or benzyl trimethyl ammonium halide at a temperature of 30° C. to 100° C., optionally in the presence of a

c. the 2-(2,4,6-trichlorophenoxy)-ethyl chloride is reacted with n-propyl amine at a temperature of from 20° C. to 150° C., optionally in the presence of water, to form N-n-propyl-N-2-(2,4,6-trichlorophenoxy)-ethyl amine; and
d. the N-n-propyl-N-2-(2,4,6-trichlorophenoxy)-ethyl amine formed is recovered.

5,091,579

ANILINE CATALYST

Leonard A. Cullo, Hempfield Township, Westmoreland County, Pa., assignor to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 14, 1989, Ser. No. 379,854

Int. Cl.⁵ C07C 209/18; B01J 27/125

U.S. Cl. 564—402

3 Claims

3. Method of making aniline comprising reacting phenol and ammonia at a temperature from about 320° to about 400° C. in the presence of a catalyst derived by calcination from pseudo-boehmite containing less than about 1% alkali metal, said catalyst containing about 0.5% to about 4% fluoride by weight.

5,091,580

PROCESS FOR THE PREPARATION OF 2,6-DIFLUOROANILINE

R. Garth Pews, Midland, and James A. Gall, Sanford, both of Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Mar. 27, 1991, Ser. No. 676,017

Int. Cl.⁵ C07C 209/26

U.S. Cl. 564—407

3 Claims

1. A process for preparing 2,6-difluoroaniline from 1,2,3-trichlorobenzene which comprises the following sequential steps:

- (a) exchanging two chlorines from 1,2,3-trichlorobenzene with fluorines under conditions which give a mixture of 2,6-difluorochlorobenzene and 2,3-difluorochlorobenzene;
- (b) selectively reducing the chlorine from the 2,3-difluorochlorobenzene in admixture with 2,6-difluorochlorobenzene by contacting the mixture with a hydrogen source in the presence of a palladium catalyst in an inert organic solvent from ambient temperature to about 150° C. to give a mixture of 2,6-difluorochlorobenzene and ortho-difluorobenzene;
- (c) separating the ortho-difluorobenzene from the 2,6-difluorochlorobenzene; and
- (d) aminating the 2,6-difluorochlorobenzene under conditions which give 2,6-difluoroaniline.

5,091,581

PROCESS FOR THE SELECTIVE PREPARATION OF N-SUBSTITUTED 1,4-DIAMINO-2-NITROBENZENES

Winfried Seldel, Fuchsrute, Fed. Rep. of Germany, assignor to Hans Schwarzkopf GmbH, Hamburg, Fed. Rep. of Germany

Filed May 7, 1990, Ser. No. 518,710

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917113

Int. Cl.⁵ C07C 209/14, 269/04

U.S. Cl. 564—412

6 Claims

1. Process for the selective preparation of N⁴-substituted 1,4-diamino-2-nitrobenzenes of the general formula I

5,091,582

PROCESS FOR THE PREPARATION OF AROMATIC POLYAMINES

Josef Sanders, Koeln; Gerhard Grögler, and Dieter Dieterich, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 183,556, Apr. 19, 1988, abandoned.

This application Jul. 27, 1990, Ser. No. 558,947

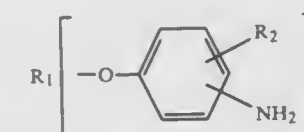
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713858

Int. Cl.⁵ C07C 209/36

U.S. Cl. 564—418

10 Claims

I. A process for the preparation of a compound containing aminophenoxy end groups and corresponding to the formula



wherein

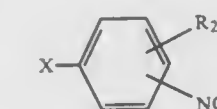
R₁ denotes an n-valent group obtained by the removal of the hydroxy groups from an n-valent polyhydroxyl compound having a molecular weight of 400 to about 12,000, R₂ denotes hydrogen or a methyl group and n represents an integer with a value from 2 to 8,

a) which comprises reacting in the absence of a solvent
(i) an n-valent, relatively high molecular weight polyhydroxyl compound corresponding to the formula

R₁(OH)_n

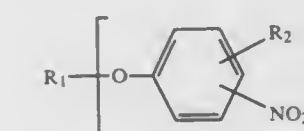
with

(ii) a compound corresponding to the formula



wherein

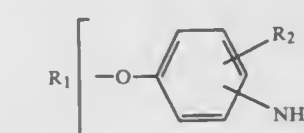
X is chlorine or fluorine in the presence of compounds which are alkaline in reaction and
b) hydrogenating the resulting nitrophenoxy adducts corresponding to the formula



(II)

to form the corresponding amine.

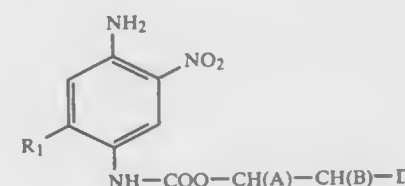
5. A process for the preparation of a compound containing aminophenoxy end groups and corresponding to the formula



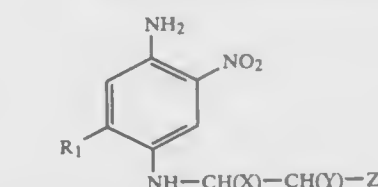
wherein

R₁ denotes an n-valent group obtained by the removal of the hydroxy groups from an n-valent polyhydroxyl compound having aliphatically-bound hydroxy groups and a molecular weight of 400 to about 12,000,

in which R₁ denotes hydrogen, halogen, (C₁-C₄) alkyl or (C₁-C₄) alkoxy, it being possible for the carbon atoms to be arranged in straight-chain or branched form, and R₂ represents a radical —COO—CH(A)—CH(B)—D with the meanings A=H, B=H, D=Cl, A=H, B=CH₃, D=Cl, A=H, B=H, D=CH₂Cl or A=CH₃, B=H and D=Cl (compounds of the general formula Ia) or a radical —CH(X)—CH(Y)—Z with the meanings X=H, Y=H, Z=OH, X=CH₃, Y=H, Z=OH, X=H, Y=H, Z=CH₂OH or X=H, Y=CH₃ and Z=OH (compounds of the general formula Ib)

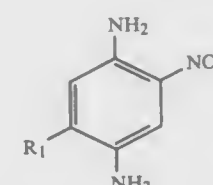


(Ia)



(Ib)

characterized in that 1,4-diamino-2-nitrobenzenes of the general formula II

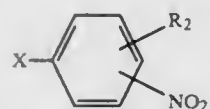


wherein R₁ has the abovementioned meaning, are reacted in a first stage with an approximately equimolar amount of a chloroalkyl chloroformate of the general formula Cl—COO—CH(A)—CH(B)—D, wherein A, B and D have the abovementioned meanings, in a predominantly aqueous medium which contains—based on the water present—not more than 20 per cent by weight of an organic solvent, to give carbamates of the general formula Ia and if appropriate these carbamates are converted into compounds of the general formula Ib in a second stage by means of treatment with a base.

R₂ denotes hydrogen or a methyl group and n represents an integer with a value from 2 to 8, a) which comprises reacting in the presence of a highly polar aprotic solvent
(i) an n-valent, relatively high molecular weight polyhydroxyl compound corresponding to the formula

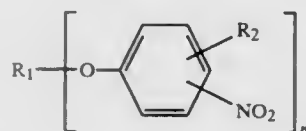


with
(ii) a compound corresponding to the formula



wherein

X is chlorine or fluorine in the presence of compounds which are alkaline in reaction and
b) hydrogenating the resulting nitrophenoxy adducts corresponding to the formula



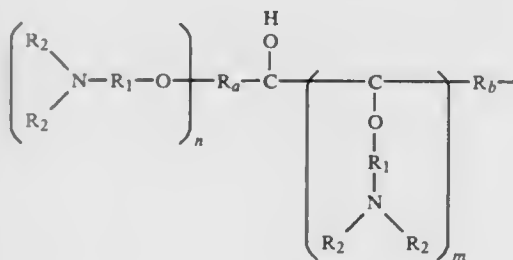
to form the corresponding amine.

5,091,583

TERTIARY AMINE CATALYSTS FOR POLYURETHANES
Jeremiah P. Casey, Emmaus; Richard V. C. Carr, Allentown; George J. Wasilczyk, Allentown, and Robert G. Petrella, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 519,711, May 7, 1990. This application May 9, 1991, Ser. No. 697,859
Int. Cl.⁵ C07D 401/08, 295/12; C07C 119/08, 125/067
U.S. Cl. 564-461 14 Claims

1. A tertiary amine catalyst represented by the formula:



R_a is C₁₋₃ alkylene when n is 1 or R_a may be C₁₋₃ alkyl or C₁₋₃ hydroxyalkyl when n is 0 and p is 1;
R_b is C₁₋₃ alkylene when p is 1 or R_b may be C₁₋₃ alkyl or C₁₋₃ hydroxyalkyl when n is 1 and p is 0;
R₁ is C₃₋₅ alkylene;
R₂ is C₁₋₄ lower alkyl, C₅₋₁₀ cycloaliphatic or the two R₂ groups may be combined to form a 5 to 6 membered ring;
n is 0 or 1;
m is 0 or 1;

p is 0 or 1; and, provided that at least n, m, or p is 1.

5,091,584

PROCESS OF PREPARING FORMALDEHYDE/AMINE ADDUCTS

Loren D. Brake, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 316,809, Feb. 28, 1989, Pat. No. 5,030,762.
This application Dec. 20, 1990, Ser. No. 631,267
Int. Cl.⁵ C07C 209/24

U.S. Cl. 564-471 11 Claims

1. A process for making a stable formaldehyde/secondary amine adduct comprising intimately contacting, in the presence of up to about 2 moles of a C₁₋₃ alkyl alcohol per mole of formaldehyde, 1 to 1.2 moles of a straight chain alkyl secondary amine, the alkyl groups having from 1 to 3 carbon atoms, with a mole of formaldehyde at a high enough temperature to cause the amine and formaldehyde to react in a short time to produce the adduct, the amine and the formaldehyde both being present in a sufficiently low concentration of water to produce the adduct containing no more than 30 wt.% water.

5,091,585

CONTINUOUS PREPARATION OF TERTIARY ALIPHATIC METHYL AMINES

Wei-Yang Su, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Dec. 21, 1990, Ser. No. 631,844

Int. Cl.⁵ C07C 209/26, 209/24

U.S. Cl. 564-473 14 Claims

1. A continuous process for the preparation of a tertiary aliphatic methyl amine comprising continuously passing an alkyl secondary amine, hydrogen and a formaldehyde source over a nickel catalyst promoted with copper and chromium.

5,091,586

NOVEL DIALKYL PEROXIDES, PRODUCTION METHOD AND USE THEREOF

Yoshiki Higuchi, and Shuji Suyama, both of Chita, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

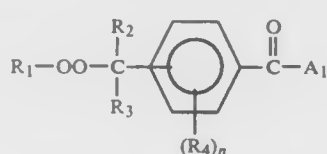
Filed Jul. 11, 1990, Ser. No. 550,901

Claims priority, application Japan, Jul. 19, 1989, 1-184498; Aug. 25, 1989, 1-217197; Sep. 5, 1989, 1-228189

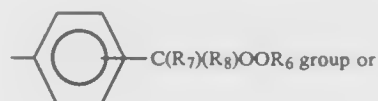
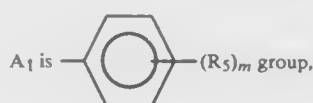
Int. Cl.⁵ C07C 49/213

U.S. Cl. 568-332 3 Claims

1. A dialkyl peroxide represented by the following general formula (I):



wherein



-continued
-C(R₉)(R₁₀)(Z₁) group,

each of R₁ and R₆ is a tertiary alkyl group having a carbon number of 4-8 or an α-cumyl group, each of R₂, R₃, R₇ and R₈ is an alkyl group having a carbon number of 1-2, R₄ is an alkyl group having a carbon number of 1-3 or a hydrogen atom, R₅ is an alkyl group having a carbon number of 1-12, an alkoxy group having a carbon number of 1-4, a halogen atom or a hydrogen atom, each of R₉ and R₁₀ is an alkyl group having a carbon number of 1-4 or R₉ and R₁₀ form a cycloalkyl group having a total carbon number of 5-8 together, Z₁ is a hydroxyl group, a chlorine atom, a bromine atom or an alkoxy group having a carbon number of 1-4, n is 1 or 2, m is an integer of 1-3, and each of R₁OOC(R₂)(R₃) group and R₆OOC(R₇)(R₈) group is a meta or para position).

5,091,587

PROCESS FOR THE PREPARATION OF KETONES

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

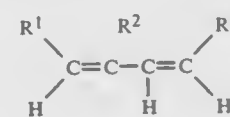
Filed Nov. 19, 1990, Ser. No. 615,755

Claims priority, application United Kingdom, May 14, 1990, 9010785

Int. Cl.⁵ C07C 45/42

U.S. Cl. 568-408 18 Claims

1. A process for the preparation of ketones which comprises reacting at a temperature in the range of from about 60° C. to about 220° C. a conjugated diolefin of general formula



wherein R¹, R² and R³ each independently represent hydrogen, an alkyl group or mono- or polyolefinically unsaturated hydrocarbyl group, and wherein R¹ and R² may together form an organic bridge group containing at least 3 carbon atoms in the bridge, and water in the liquid phase in the presence of a catalyst system comprising:

- a) a Group VIII metal compound selected from the group consisting of Group VIII metal oxides, Group VIII metal salts and Group VIII metal complexes, and
- b) a source of protons comprising an acid having a pK_a < 4 (measured at 25° C. in aqueous solution).

5,091,588

FLUORINATED STYRENE DERIVATIVES AND METHOD FOR MAKING

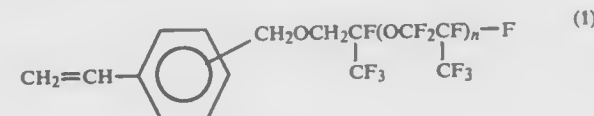
Yasushi Yamamoto, Takasaki, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,752

Claims priority, application Japan, Sep. 26, 1989, 1-249743
Int. Cl.⁵ C07C 43/166

U.S. Cl. 568-607 7 Claims

1. A fluorinated styrene derivative having the formula:



wherein n is an integer of 1 to 3.

5,091,589

PROCESS FOR THE PREPARATION OF PERFLUORINATED ETHERS

Matthias Meyer, Frankfurt am Main; Ralf Stapel, Kelkheim/-Taunus; Harloff Kottmann, Hofheim am Taunus, and Thomas Gries, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

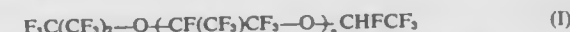
Filed Feb. 28, 1991, Ser. No. 662,763

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1990, 4006491

Int. Cl.⁵ C07C 43/11, 41/18

U.S. Cl. 568-615 5 Claims

1. A process for the preparation of fluorinated ethers of the formula (I)



where n is an integer from 10 to 60, from compounds of the formula (II)



where n has the above meaning, which comprises reacting one or more compounds of the formula (II) with alkali metal hydroxide at temperatures of 90° to 160° C. and in the absence of solvents.

5,091,590

ETHER PRODUCTION WITH STAGED REACTION OF OLEFINS

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 22, 1990, Ser. No. 570,744

Int. Cl.⁵ C07C 41/05

U.S. Cl. 568-697 11 Claims

1. A multistage process for etherifying a C₄ olefinic hydrocarbon feedstock containing isobutene and n-butene and the production of a C₅+ ether-rich and isoalkene-rich hydrocarbon stream, comprising:

- contacting the olefinic feedstock and methanol in a first reaction zone under isobutene etherification conditions with solid acid etherification catalyst whereby an etherification effluent stream is produced comprising methyl tertiary butyl ether, unconverted isobutene, n-butene and unreacted methanol;
- distilling said etherification effluent stream in a first product recovery section debutanizer in contact with a C₅+ isoalkene-rich recycle stream and recovering a debutanizer bottom stream comprising said C₅+ ether-rich and isoalkene-rich hydrocarbon stream and an overhead stream containing said unconverted isobutene, n-butene and unreacted methanol;
- reacting said debutanizer overhead stream under low severity isoalkene dimerization conditions at moderate temperature between 70° and 280° C. under olefin dimerization and methanol alkylation conditions in a secondary stage catalytic reaction zone containing acidic medium pore metallosilicate oligomerization catalyst particles to convert said unconverted iso-butene to a C₅+ isoalkene-rich hydrocarbon stream while reacting less than about 20% of said n-butene;
- passing the effluent from said secondary stage reaction zone to a rectifying distillation tower for contact with a portion of the rectifying distillation tower overhead comprising condensed n-butene-rich liquid reflux, thereby condensing normally liquid hydrocarbons to recover a liquid hydrocarbon rectifier bottom stream comprising said C₅+ isoalkene-rich recycle stream;
- passing said bottom stream from the rectifying distillation tower to said debutanizer in the first product recovery

section along with said etherification effluent for recovery with the liquid product stream; and recovering n-butene from said rectifying distillation tower.

5,091,591

PROCESS AND COMPOSITION

Michael J. Cipullo, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 13, 1990, Ser. No. 611,813

Int. Cl.³ C07C 27/26, 39/12

U.S. Cl. 568—703

14 Claims

1. A process comprising the addition of a degradation inhibiting effective amount of an ammonium, alkali metal, alkaline earth metal zinc of oxidation number +2 salt of an aliphatic mono or dicarboxylic acid having no other functional groups and from two to about eighteen carbon atoms, inclusive, to a composition comprising phenol and bisphenol-A, the addition occurring prior to a procedure which subjects the bisphenol to substantial heat, said bisphenol produced from an acidic ion exchange resin catalyzed reaction of phenol and acetone ketone or aldehyde.

5,091,592

PROCESS FOR PREPARING 4,4'-DIHYDROXYBIPHENYL

Hiroshi Iwane; Takahiro Sugawara, and Kimiko Kaneko, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1991, Ser. No. 641,899

Claims priority, application Japan, Jan. 22, 1990, 2-10674

Int. Cl.³ C07C 39/14, 37/08

U.S. Cl. 568—730

12 Claims

1. A process for preparing 4,4'-dihydroxybiphenyl comprising oxidizing 4,4'-diisopropylbiphenyl with molecular oxygen in a basic aqueous solvent and decomposing the resulting oxidation product in the presence of an acid catalyst, selected from inorganic acid, organic acid, heteropoly-acid and solid acid catalyst, in which said oxidizing is carried out in the presence of ammonia or an ammonium salt.

5,091,593

PROCESS FOR REMOVING SULFUR FROM ORGANIC SULFIDES

Michael J. Lindstrom, Downingtown; Glenn T. Carroll, Jeffersonville, both of Pa.; Jeffrey Hsing-Gan Yen, Woolwich, N.J., and Roger T. Clark, Pottstown, Pa., assignors to ATOCHEM North America, Inc.

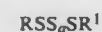
Filed May 26, 1989, Ser. No. 357,399

Int. Cl.³ C07C 319/22

U.S. Cl. 568—21

5 Claims

1. A process for decreasing the sulfur content of an organic sulfide which is one or more compounds having the formula:



where R and R¹ are independently alkyl, aryl, alkaryl, hydroxyalkyl or alkoxyalkyl groups wherein the alkyl moieties have from 1 to 24 carbon atoms and a is an average number greater than 0 but no greater than 13, comprising contacting said organic sulfide at an elevated temperature with a catalyst which is silica, alumina, silica-alumina, zeolite, vanadia, chromia, thoria, magnesia, titania, complex compounds thereof or mixtures thereof, in an amount sufficient to increase the rate of disproportionation of said organic sulfide to thereby produce elemental sulfur and a sulfide of reduced sulfur rank, and continuously removing said sulfide of reduced sulfur rank from the reaction zone.

5,091,594

PROCESS FOR THE PRODUCTION OF 2,6-DI-TERT-BUTYLPHENOL

Friedrich-Wilhelm Küpper; Wolfgang H. E. Müller, and Alfred Oberholz, all of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 11, 1990, Ser. No. 625,400

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941472

Int. Cl.³ C07C 37/11, 37/14

U.S. Cl. 568—789

19 Claims

1. A process for the production of 2,6-di-tert-butylphenol by reaction of 2-tert-butylphenol with isobutene in the liquid phase in the presence of aluminum tris-(2-tert-butylphenolate) as a catalyst, wherein the reaction is conducted in a diluent being:

- a member selected from the group consisting of saturated aliphatic hydrocarbons; saturate cycloaliphatic hydrocarbons; C₅-C₁₆ alkenes of the formulae R₁-CH=CH₂ or R₂-CH=CH-R₃, in which R₁, R₂, and R₃ represent alkyl or R₂ and R₃ form a C₅-C₁₂-cycloalkene; and mixtures thereof; said member being present in a quantity of 20-1000 parts by weight, based on 100 parts by weight of 2-tert-butylphenol;
- a mixture of (i) a member selected from the group consisting of saturated aliphatic hydrocarbons; saturated cycloaliphatic hydrocarbons; C₅-C₁₆-alkenes of the formulae R₁-CH=CH₂ or R₂-CH=CH-R₃, in which R₁, R₂ and R₃ represent alkyl or R₂ and R₃ form a C₅-C₁₂-cycloalkene; and mixtures thereof; said member being present in a quantity of 20-1000 parts by weight, based on 100 parts by weight of 2-tert-butylphenol, and (ii) dissolved isobutene in a molar excess of 0.2-10 mols based on 1 mole of 2-tert-butylphenol; or
- an excess of liquid isobutene, said molar excess being from 2-10 moles, based on 1 mole of tert-butylphenol, said reaction being conducted at 0°-80° C., a pressure of 0.1-11 bars, and with a catalyst concentration of 0.005-5 mol%, based on the 2-tert-butylphenol.

5,091,595

REDUCTION OF DIETHYL PHENYLMALONATE TO 2-PHENYL-1,3-PROPANEDIOL

Young M. Choi, 8-05 Quail Ridge Dr., Plainsboro, N.J. 08536

Filed Jun. 7, 1989, Ser. No. 362,891

Int. Cl.³ C07C 29/136

U.S. Cl. 568—814

4 Claims

1. A method for the preparation of 2-phenyl-1,3-propanediol in high yields which comprises adding diethyl phenylmalonate to a solution of a Lewis acid type metal hydride selected from the group consisting of diisobutylaluminum hydride and borane dimethylsulfide in tetrahydrofuran at reduced temperatures of about 0° C. allowing the mixture to warm to ambient temperature to complete the reaction, cooling the reaction mixture and recovering 2-phenyl-1,3-propanediol.

5,091,596

METHOD FOR PRODUCING CHIRO-INOSITOL

Allison Kennington, Laurel, Md.; Joseph Larner, Charlottesville, Va.; Cynthia Hill, Richmond, Va.; Butler Stringfield, Charlottesville, Va.; Giorgio Carta, Charlottesville, Va., and Donald J. Kirwan, Charlottesville, Va., assignors to Univ. of Va. Alumni Patents Foundation, Charlottesville, Va.

Filed Dec. 20, 1990, Ser. No. 631,374

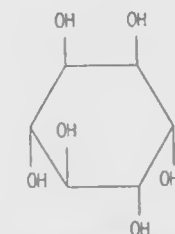
Int. Cl.³ C07C 35/16

U.S. Cl. 568—833

10 Claims

1. A method of producing D-chiro-inositol from kasugamycin, comprising the steps of: providing a quantity of kasugamycin; hydrolyzing said quantity of kasugamycin with a hydrolyzing agent under suitable time and temperature conditions

so as to obtain an aqueous mixture of D-chiro-inositol and reaction products from said quantity of kasugamycin; passing said aqueous mixture of D-chiro-inositol and reaction products through a cation exchange medium capable of binding anionic reaction products and impurities in said



D-CHIRO-INOSITOL

aqueous mixture and an anion exchange medium capable of binding cationic reaction products and impurities; removing other impurities from an eluate from said cation and anion exchange medium; and obtaining D-chiro-inositol from said eluate.

5,091,597

MANUFACTURE OF TERTIARY AND SECONDARY ALCOHOLS BY THE ACTION OF AN ORGANO-METALLIC COMPOUND ON A COMPOUND CARRYING A CARBONYL GROUP

Gérard Cahiez; Pierre-Yves Chavant, both of Paris, and Pierre Tozzolino, Serres-Morlaas, all of France, assignors to Societe Nationale Elf Aquitaine, France

Continuation of Ser. No. 291,045, Dec. 24, 1988, abandoned.

This application Aug. 28, 1990, Ser. No. 574,374

Claims priority, application France, Dec. 30, 1987, 87 18353

Int. Cl.³ C07C 29/14, 29/143, 29/136

U.S. Cl. 568—878

18 Claims

1. In the process of preparing a secondary or tertiary alcohol by reacting an aldehyde or ketone of the formula RCOR¹ where R is an alkyl, alkenyl, cycloalkyl, phenyl or naphthyl group optionally substituted by a group which forms therewith an ester, nitrile, ether, sulfide, halide or acetal and R¹ is hydrogen or selected from the same groups consisting R, with an organic halide XR²(Y)₀₋₁ where X is halogen, R² is a hydrocarbon group and Y represents a —COOC₂H₅ nitrile or amide group in an organic solvent and in the presence of powdered metallic manganese at a temperature of 20° to 100° C., hydrolyzing the product obtained as a result of the reaction and separating the secondary or tertiary alcohol thus produced, the improvement which comprises conducting the reaction in the presence of 0.01 to 2 equivalents per gram-atom of manganese of an activator which is a chloride, bromide or iodide of zinc, cadmium, mercury or tin in the reaction medium.

5,091,598

MANUFACTURE OF TERTIARY AND SECONDARY ALCOHOLS BY THE ACTION OF AN ORGANIC HALOGEN COMPOUND AND MANGANESE ON A COMPOUND CARRYING A CARBONYL GROUP

Gérard Cahiez; Pierre-Yves Chavant, both of Paris, and Pierre Tozzolino, Morlaas, all of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Dec. 28, 1988, Ser. No. 290,997

Claims priority, application France, Dec. 30, 1987, 87 18352

Int. Cl.³ C07C 29/14, 29/143, 29/136

U.S. Cl. 568—878

17 Claims

1. In a process of preparing a secondary or tertiary alcohol by reacting an aldehyde or ketone of the formula RCOR¹ where R is an aliphatic hydrocarbon group or a cycloaliphatic group or aryl group optionally substituted by alkyl, alkenyl, ester, amide, nitrile or halide groups and R¹ is hydrogen or selected from the same groups constituting R, with an organic halide XR²Y where X is halogen, R² is a hydrocarbon group

and Y represents an optional carboxylate, nitrile or amide group in an organic solvent and in the presence of powdered metallic manganese, hydrolyzing the product obtained as a result of the reaction and separating the secondary or tertiary alcohol thus produced, the improvement which comprises conducting the reaction of the aldehyde or ketone with the organic halide in the presence in the reaction medium of an activator which is an alkyl ester of a carboxylic acid having a total of 3 to 13 carbon atoms.

5,091,599

COBALT HYDROFORMYLATION CATALYST RECOVERY IN THE PRODUCTION OF ALCOHOLS

Nicolaas A. De Munck, Barendrecht, and Mattheus D. Olijve, Spykenisse, both of Netherlands, assignors to Exxon Chemical Patents Inc., Linden, N.J.

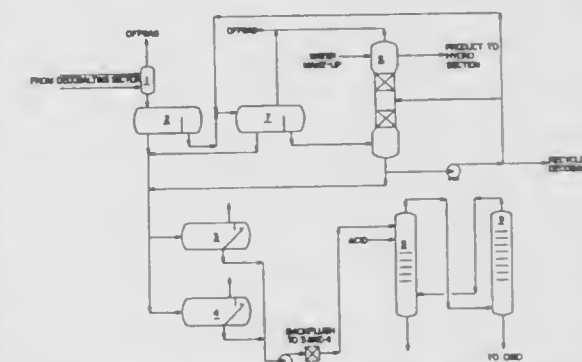
Filed Apr. 4, 1990, Ser. No. 504,234

Claims priority, application United Kingdom, Apr. 4, 1989, 8907577

Int. Cl.³ C07C 29/16, 45/50; B01J 31/40, 38/68

U.S. Cl. 568—882

2 Claims



1. In the method of hydroformylating C₃ to C₆ olefins to produce C₄ to C₇ alcohols, said hydroformylation being carried out at a pressure of 150-300 atm and a temperature of from 120°-190° C. in the presence of a cobalt hydroformylation catalyst comprising hydro cobalt carbonyl at a catalyst concentration of from 0.05-3 wt. %, based on the olefins, and in which hydroformylation process the crude product is treated with a dilute caustic solution to provide a water phase which is separated from the crude hydroformylation product, the water phase containing sodium cobalt carbonyl is acidified and gas stripped to provide hydro cobalt carbonyl, and said crude hydroformylation product is hydrogenated to provide a mixture comprising materials and separating therefrom the low boiling materials and alcohol to obtain a heavy fraction containing dimers and trimers and catalytically cracking said fraction at a temperature in the range of 300°-350° C. in the presence of steam and an alumina catalyst to provide a light fraction and a heavy fraction (U. HOF), the improvement which comprises recovering said U. HOF and recycling said U. HOF as an absorbent for the hydro cobalt carbonyl catalyst which is recycled back to the hydroformylation reactor.

5,091,600

TETRAFLUOROETHANE ISOMERIZATION

Geoffrey J. Moore, Weaverham, and Helen M. Massey, Leigh, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 424,108, Oct. 20, 1989, Pat. No. 4,950,815. This application May 29, 1990, Ser. No. 529,516
Claims priority, application United Kingdom, Oct. 20, 1988, 8824571

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.⁵ C07C 17/24, 19/02

U.S. Cl. 570—151

3 Claims

1. A method for the preparation of 1,1,1,2-tetrafluoroethane which comprises contacting 1,1,2,2-tetrafluoroethane with a fluorination catalyst comprising chromia at a temperature of 350 to 500° C. and in the presence of an inert gas diluent for a time between about 1 and about 50 seconds to effect isomerisation to give 1,1,1,2-tetrafluoroethane with a minimum of by-product formation.

5,091,601

PROCESS FOR PREPARING

1,1,1-TRIFLUORO-2,2-DICHLOROETHANE BY HYDROFLUORINATION IN THE PRESENCE OF CATALYSTS

Diego Carmello, Mestre, and Giorgio Guglielmo, Venezia, both of Italy, assignors to Austimont S.p.A., Milan, Italy

Continuation of Ser. No. 403,070, Sep. 5, 1989, Pat. No. 4,967,023, which is a continuation of Ser. No. 163,659, Mar. 3, 1988, abandoned. This application Sep. 19, 1990, Ser. No. 584,960

Claims priority, application Italy, Mar. 9, 1987, 19622 A/87

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.⁵ C07C 17/20, 19/02

U.S. Cl. 570—166

14 Claims

1. A continuous process for preparing 1,1,1-trifluoro-2,2-dichloroethane which comprises reacting perchloroethylene with HF in a gas phase in the presence of catalysts comprising Cr₂O₃ carried on AlF₃, without Al₂O₃, in the gamma and/or beta form and recycling unreacted perchloroethylene and partially fluorinated intermediates to the reaction of perchloroethylene with HF in a gas phase in the presence of said catalyst.

5,091,602

PROCESS FOR PREPARING

1,1,1-TRIFLUORO-2,2-DICHLOROETHANE

Kun Y. Park, and Hoon S. Kim, both of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jan. 28, 1991, Ser. No. 647,568

Claims priority, application Rep. of Korea, Oct. 18, 1990, 16639/1990

Int. Cl.⁵ C07C 17/08

U.S. Cl. 570—167

7 Claims

1. A process for preparing 1,1,1-trifluoro-2,2-dichloroethane of formula I (CH₃CHCl₂), comprising reacting pentachloroethane of formula II (CCl₃CHCl₂) with hydrofluoric acid in the presence of a catalyst system consisting of either pentahalogenantimony of formula III (SbX₅) and a compound of formula IV (MX₂L₂) or pentahalogenantimony of formula III (SbX₅) and a compound of formula V (MX₂(L—L)), wherein X is a chloro or bromo group; M is nickel, palladium, or platinum; L is PR₃ wherein R is a phenyl, methyl, ethyl, isopropyl, n-butyl, or tertbutyl group; and L—L is 1,2-bis(diphenyl phosphino)ethane, 1,2-diaminoethane, or S₂CH₂.

5,091,603

PROCESS FOR THE PREPARATION OF TRICHLOROETHYLENE

Willibald Dafinger, Emmerting; Wolf Dietrich Gabler, Burghausen; Eduard Pichl, Burghausen, and Roman Hierzegger, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 22, 1990, Ser. No. 602,417

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3941037

Int. Cl.⁵ C07C 17/34

U.S. Cl. 570—230

12 Claims

1. A process for the preparation of trichloroethylene comprising reacting perchloroethylene and hydrogen in the presence of a supported catalyst at a temperature of 150°–200° C. and a hydrogen pressure 1 to 10 bar absolute, said catalyst consisting of a support of active charcoal having a BET surface area of more than 500 m²/g, impregnated with 0.5 to 20% by weight of copper in elemental or chemically bonded form, 0.01 to 1.0% by weight of rhodium or palladium in elemental or chemically bonded form and 0.1 to 10.0% by weight of a water-soluble phosphonium halide, said weight based on the total weight of catalyst support and active components.

ELECTRICAL

5,091,604

ARRANGEMENT FOR PROTECTION OF ELECTRICAL INSTALLATIONS AGAINST ELECTROMAGNETIC DISTURBANCES

Safa Kirma, Wedel, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, Fed. Rep. of Germany

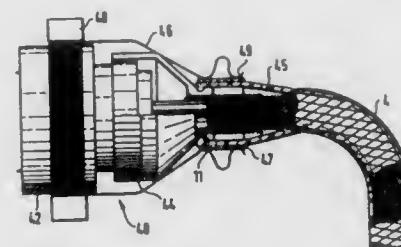
Filed Apr. 17, 1990, Ser. No. 510,205

Claims priority, application Fed. Rep. of Germany, May 6, 1989, 3914931

Int. Cl.⁵ H02G 13/00; H05K 9/00

U.S. Cl. 174—2

12 Claims



1. An electrical harness for interconnecting electrical apparatus for protecting same against electromagnetic disturbances due to overvoltages and lightning strikes, said harness comprising a plurality of electrical lines, an electrically conducting outer metallic braiding surrounding the electrical lines, a connector element connected to the electrical lines at the end of the harness, said connector element comprising a generally cylindrical transition member for receiving an end region of the metallic braiding, a clamping element for fastening the metallic braiding to the transition member, means for grounding the metallic braiding, and an inner plastic braiding surrounding the electrical lines inside of the metallic braiding for providing chafing protection between the electrical lines and the outer metallic braiding.

5,091,605

FIRE-PROOF SEALS

Paul Clifford, Leighton Buzzard, England, assignor to Rolls-Royce plc, London, England

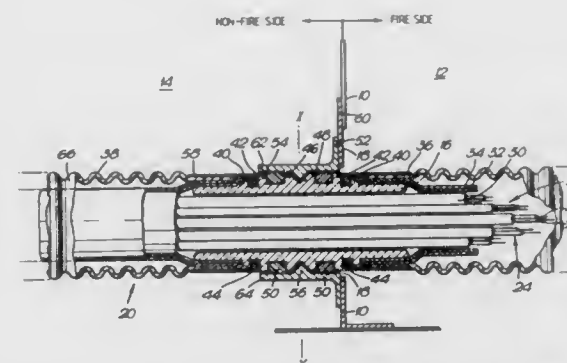
Filed Jan. 26, 1990, Ser. No. 470,727

Claims priority, application United Kingdom, Feb. 8, 1989, 8902796

Int. Cl.⁵ H02G 3/22

U.S. Cl. 174—65 R

5 Claims



1. A conduit in combination with an electrical cable for channelling the electrical cable through an aperture in a partition, the cable being of the type consisting of a conductive core enclosed in a fusible thermoplastic insulating sleeve, the insulating sleeve being closed in a wear-resistant sleeve, and the wear-resistant sleeve being enclosed in a braided metal sleeve, the conduit comprising:

a cylindrical metal tube having a wall with an upstanding circumferential portion distal from an end of the tube, a portion of the tube extending between the upstanding circumferential portion and said end of the tube defining a surface in facing contact with the wear-resistant sleeve, the upstanding circumferential portion defines a thermal contact surface with the braided metal sleeve to conduct heat from the braided metal sleeve through the wall of the conduit at the upstanding circumferential portion to the fusible thermoplastic insulating sleeve within the conduit so as to fuse the fusible sleeve and block the conduit.

5,091,606

GASKET FOR SEALING ELECTROMAGNETIC WAVES FILLED WITH A CONDUCTIVE MATERIAL

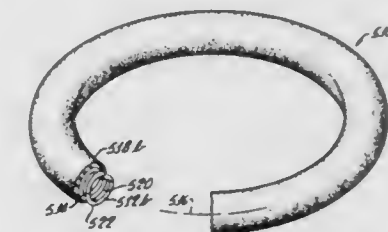
Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Continuation-in-part of Ser. No. 572,242, Aug. 27, 1990, which is a continuation-in-part of Ser. No. 496,329, Mar. 20, 1990, and a continuation-in-part of Ser. No. 568,909, Aug. 17, 1990, which is a continuation-in-part of Ser. No. 444,287, Dec. 1, 1989, and Ser. No. 463,480, Jan. 11, 1990. This application Feb. 11, 1991, Ser. No. 653,250

Int. Cl.⁵ H05K 9/00

U.S. Cl. 174—35 GC

33 Claims



1. Electromagnetic shielding gasket assembly comprising: coil spring means for blocking the propagation of electromagnetic waves therepast, said coil spring means comprising a plurality of individual coils canted along a center line thereof; means for supporting the plurality of coils in an orientation for controlling the electromagnetic shielding effectiveness of the coil spring means; and formable conductive means, disposed on said plurality of individual coils, for filling an aperture of the coil spring means to further block the propagation of electromagnetic waves upon loading of the plurality of individual coils.

5,091,607

ENERGY DISTRIBUTION RACEWAY

Henry R. Stob, Grand Rapids, Mich., assignor to Compatico, Inc., Grand Rapids, Mich.

Filed Jun. 11, 1990, Ser. No. 535,579

Int. Cl.⁵ H02G 3/28

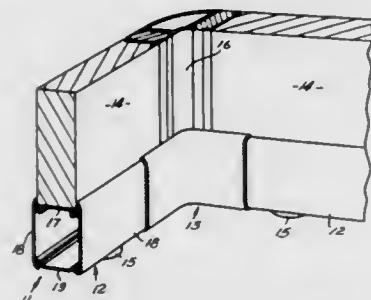
U.S. Cl. 174—48

7 Claims

1. An improved panel and raceway system of the knock-down extrusion type for energy distribution for routing communication lines and electrical lines through interconnected panels to terminals and receptacles for flexibility and convenience in locating comprising:

plural, adjacent, abutting wall panels; extruded elongate top plates of sufficient length to each receive one of said wall panels; extruded elongate bottom plates each connected to the bottom edges of side plate pairs and interlocking therewith in roll socket engagement to form a channel closeable at interlock of said side plates with said top plates to define generally enclosed rectangular raceway sections, said raceway sections each beneath one of said wall panels;

means having levelling feet through said top and bottom plates attaching each of said raceway sections to said wall panels; and



extruded cover plates selectively located and interlocked with said side plates and closing against said side plates.

5,091,608

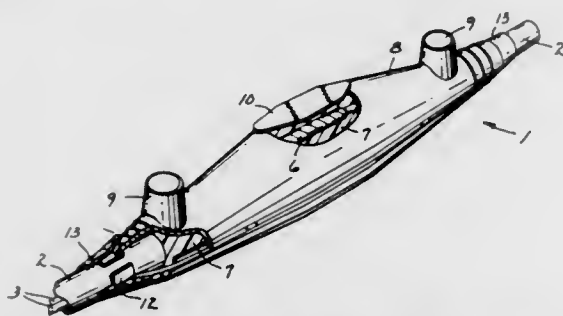
FLAME RETARDANT SPLICING SYSTEM

Günther John, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 225,574, Jul. 27, 1988, abandoned, which is a continuation of Ser. No. 111,106, Oct. 20, 1987, abandoned, which is a continuation of Ser. No. 843,874, Mar. 25, 1986, abandoned, which is a continuation of Ser. No. 592,792, Mar. 23, 1984, abandoned. This application Jan. 17, 1991, Ser. No. 642,710

Int. Cl.⁵ H02G 15/08

U.S. Cl. 174—84 R

11 Claims



1. A cast cable connection suitable for the enclosure of electrical conductors contained therein comprised of a plastic wrapping and a molded plastic cable splice, said cable splice comprising a known halogen-free synthetic resin and fire-retardant additives which do not generate toxic and/or corrosive products if exposed to fire and said wrapping comprising a halogen-free material capable of maintaining an essentially continuous coat-like structure when exposed to fire without generating any toxic or corrosive products, wherein said wrapping further comprises a synthetic resin material selected from the group consisting of thermoplastic resins and thermoelastic resins which contain at least one additive capable of forming a foamy coating structure on exposure to fire.

5,091,609

INSULATED WIRE

Kazuo Sawada, Shinji Inazawa, and Kouichi Yamada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

PCT No. PCT/JP90/00177, § 371 Date Oct. 12, 1990, § 102(e) Date Oct. 12, 1990, PCT Pub. No. WO90/09670, PCT Pub. Date Aug. 23, 1990

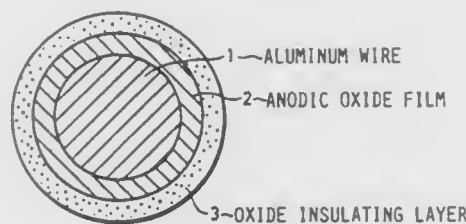
PCT Filed Feb. 13, 1990, Ser. No. 598,629

Claims priority, application Japan, Feb. 14, 1989, 1-34526; Jan. 31, 1990, 2-22854

Int. Cl.⁵ H01B 7/02, 3/10

U.S. Cl. 174—110 A

10 Claims



1. An insulated electrical wire having a conductor core surrounded by insulation comprising: a conductor core, a surface layer at least on the outer surface of said conductor core, said surface layer being made of a member selected from the group consisting of aluminum and aluminum alloys, an anodic oxide layer (2) on said surface layer, said anodic oxide layer having holes and pores therein, and an oxide insulating layer (3) bonded to said anodic oxide layer, said oxide insulating layer filling said holes and pores of said anodic oxide layer, said oxide insulating layer and said anodic oxide layer forming together a composite insulating coating on said outer surface of said conductor core, said composite insulating coating having an outer smooth surface.

5,091,610

HIGH IMPEDANCE ELECTRICAL CABLE

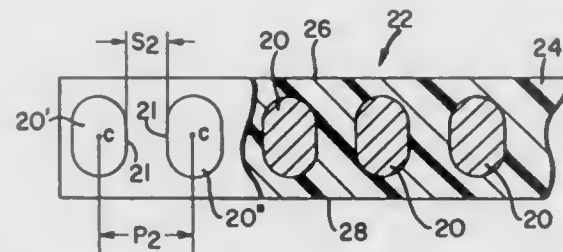
Richard F. Strauss, Morrisville, Pa., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Sep. 19, 1990, Ser. No. 585,860

Int. Cl.⁵ H01B 7/08

U.S. Cl. 174—117 F

10 Claims



1. An electrical cable assembly comprising: a plurality of elongate electrical conductors; and an elongate electrically insulative casing continuously surrounding each of said conductors and supporting said conductors in side-by-side, electrically insulated, transversely spaced arrangement, said casing including a first major planar surface; one of said conductors including a first flat surface portion facing an adjacent one of said conductors and a first curved surface portion facing said first major planar surface.

5,091,611

SWITCH FOR PORTABLE LIGHT SOURCE

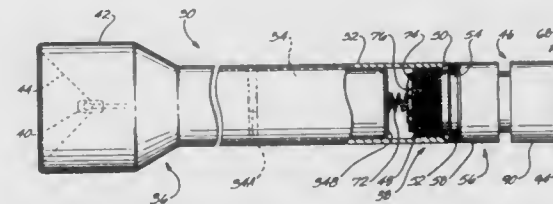
W. Clay Reeves, Dallas, Tex., and Donald L. Rohrs, Overland Park, Kans., assignors to The Brinkmann Corporation, Dallas, Tex.

Continuation of Ser. No. 434,535, Nov. 8, 1989, abandoned, which is a continuation of Ser. No. 261,786, Oct. 24, 1988, abandoned. This application Aug. 13, 1990, Ser. No. 566,888

Int. Cl.⁵ F21V 23/04; H01H 13/58

U.S. Cl. 200—60

38 Claims



1. In a portable light source such as a flashlight which includes a housing for carrying a power supply, the power supply having first and second power supply electrodes, a lamp bulb supported by the housing and having first and second lamp contacts wherein the first lamp contact electrically couples to the first power supply electrode, and conductor means electrically coupled to the second lamp contact wherein the power supply, the lamp bulb and the conductor means are connected in series to form an open circuit having first and second terminals, the improvement comprising:

a switch assembly including a switch body securable to the housing and actuator means axially movable relative to the switch body for electrically coupling and uncoupling the first and second terminals in the housing and thereby switching the lamp bulb on and off, and rotatably movable relative to the switch body for substantially preventing axial movement of the actuator means and locking the flashlight in either the on or off state.

5,091,612

MAGNETICALLY ACTUATED PROXIMITY FLOW SWITCH

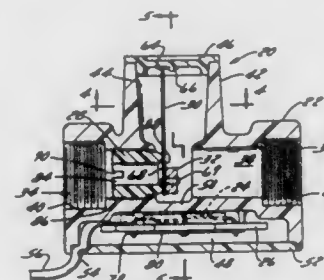
Robert A. Van Fossen, Auburn, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Oct. 31, 1990, Ser. No. 606,102

Int. Cl.⁵ H01H 35/40

U.S. Cl. 200—81.9 M

24 Claims



1. A flow switch, comprising: a housing having a flow passage extending therethrough; a resilient blade mounted on said housing, said blade being disposed substantially normal to a fluid flow path through said flow passage with a distal end of said blade extending into the fluid flow path to provide bending movement of said blade in the direction of the fluid flow; a magnet affixed to said distal end of said blade for movement in unison with said distal end; a magnetically actuated switch disposed proximate to said magnet and out of said fluid flow path; adjustable fastener means for selectively positioning said switch relative to said magnet in a plurality of positions corresponding to different minimum flow rates for actuat-

ing said switch, and securing said switch to said housing in one of said positions; and means for electrically connecting said switch to a device to be controlled when said magnet actuates said switch.

5,091,613

PEDAL BOARD FOR MUSICAL INSTRUMENTS

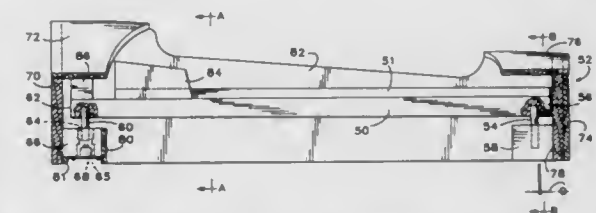
Mark W. Rohde, Scio; Roger T. Brown; George T. Kirkwood, both of Hillsboro; Dick G. Schalk, Portland, and Robert L. Smythe, Beaverton, all of Oreg., assignors to Rodgers Instrument Corporation, Hillsboro, Oreg.

Filed Mar. 14, 1990, Ser. No. 494,146

Int. Cl.⁵ H01H 3/14, 9/26; B26D 7/06

U.S. Cl. 200—86.5

26 Claims



10. A pedal board for a musical instrument, comprising: (a) a base for supporting one or more pedals, said base having a front and a back; (b) at least one pedal, said pedal being an elongate member having a front end adjacent said front of said base and a back end adjacent said back of said base; (c) an elastomeric electric switch and a guide pin attached to said pedal so that when said pedal moves downwardly, said guide pin actuates said elastomeric electric switch to close an electric circuit in response to movement of said pedal, said guide pin comprising a cylindrical element made of fiberglass and attached by an interference fit to said pedal; and (d) a mounting pin attached to said pedal adjacent said back end thereof and to said base adjacent said back thereof for supporting said pedal on said base such that downward movement of said pedal bends said mounting pin.

5,091,614

DISCONNECTING SWITCH

Hiroshi Yamamoto, and Juichi Hirata, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1989, Ser. No. 431,878

Claims priority, application Japan, Nov. 8, 1988, 63-146099[U]

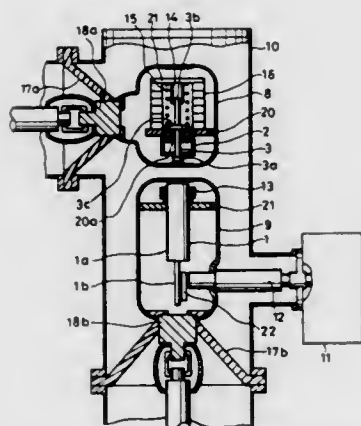
Int. Cl.⁵ H01H 33/02

U.S. Cl. 200—144 AP

3 Claims

1. A disconnecting switch comprising: a container, a fixed electrode shield mounted in said container being insulated therefrom, a moving electrode shield mounted in said container being insulated therefrom and from said fixed electrode shield, a movable contact having a rod-shaped sliding part, held slidably along the axis thereof in said moving electrode shield and electrically connected to said moving electrode shield, a main contact which is supported in said fixed electrode shield and electrically connected thereto, and is to contact said rod-shaped sliding part by sliding motion of said movable contact, a resistor supported in said fixed electrode shield with its one end electrically connected with said fixed electrode shield, and

an arc contact which is held movable in said fixed electrode shield and has a rear end electrically connected slidably to



the other end of said resistor and a front end for touching said rod-shaped sliding part.

5,091,615 VACUUM SWITCH

Bruno Lippi, Aarau; Ernst Suter, Koliken, and Thomas Meier, Niedergösgen, all of Switzerland, assignors to Sprecher Energie AG, Oberentfelden, Switzerland

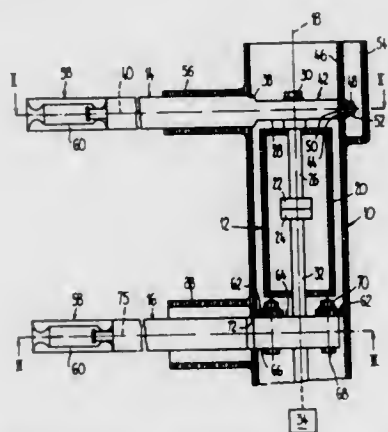
Filed Jan. 18, 1990, Ser. No. 465,749

Claims priority, application Switzerland, Jan. 30, 1989, 294/89; Dec. 6, 1989, 377/89

Int. Cl.⁵ H01H 33/66

U.S. Cl. 200—144 B

15 Claims



1. A vacuum switch for medium voltage, said vacuum switch comprising:

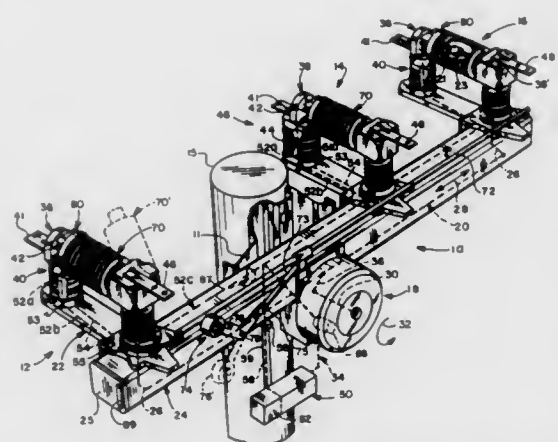
- a vacuum switch tube,
- a substantially tubular housing being open at opposite axial ends and made of insulating material, said vacuum switch tube being located in and surrounded by said tubular housing with a space defined between said vacuum switch tube and said tubular housing, and said tubular housing extending axially beyond said vacuum switch tube,
- said vacuum switch tube being secured to a connecting element, said connecting element penetrating said tubular housing in a transverse direction in relation to its longitudinal axis through a passage and being supported in a recess of the tubular housing located opposite the passage,
- said connecting element being constructed as one piece and extending through the passage from outside of said tubular housing and said vacuum switch tube being secured tight to said connecting element in an axial direction.

5,091,616 SELF-CONTAINED SWITCH FOR ELECTRICAL DISTRIBUTION CIRCUIT

Joel A. Ramos, Chicago; Leonard V. Chabala, Maywood; Edward J. Rogers, Chicago, and Thomas J. Tobin, Northbrook, all of Ill., assignors to S&C Electric Company, Chicago, Ill. Continuation-in-part of Ser. No. 331,216, Mar. 30, 1989, Pat. No. 4,983,792, and a continuation-in-part of Ser. No. 331,311, Mar. 30, 1989. This application Mar. 1, 1990, Ser. No. 487,356 Int. Cl.⁵ H01H 33/02

U.S. Cl. 200—146 R

51 Claims



1. A switch providing an interrupting function and a selective disconnect function between first and second circuit terminals comprising:

- a plurality of switch-pole units, each of said switch-pole units including support means, a housing, means for movably supporting said housing with respect to said support means, interrupting means including separable interrupting contacts and means for operating said interrupting contacts via a first drive input, and disconnect switch contacts, said interrupting means being disposed in and supported by said housing, said disconnect switch contacts and said separable interrupting contacts being connected in series between the first and second circuit terminals, a first of said disconnect contacts being disposed externally to and carried by said housing, said housing being movable via a second drive input and with respect to said first drive input as a movable switching member to perform said disconnect function via separation of said disconnect switch contacts;
- base support and drive means for operating said interrupting means and supporting said plurality of switch-pole units, said base support and drive means including a high-speed base drive linkage that is enclosed by said base support and drive means, said base drive linkage being connected to each of said respective first drive inputs to said switch-pole units; and
- disconnect-switch operating means being supported with respect to said base support and drive means and being connected to said second drive input of said switch-pole units for performing said disconnect function via movement of said housing, said disconnect-switch operating means including a disconnect linkage and an operating arm for actuation of said disconnect linkage.

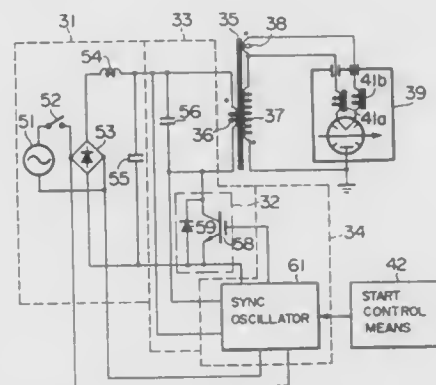
5,091,617 HIGH FREQUENCY HEATING APPARATUS USING INVERTER-TYPE POWER SUPPLY

Naoyoshi Maehara; Takahiro Matsumoto, both of Nara; Kazuo Sakamoto, Kyoto; Daisuke Bessyo, Yamatokoriyama; Takashi Niwa, Nara; Shigeru Kusunoki, and Takao Shitaya, both of Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan Continuation of Ser. No. 147,946, Jan. 25, 1988, abandoned. This application May 22, 1990, Ser. No. 526,521

Claims priority, application Japan, Jan. 26, 1987, 61-15509 Int. Cl.⁵ H05B 6/68

U.S. Cl. 219—10.55 B

8 Claims



1. A high-frequency heating apparatus comprising: power supply means;

- an inverter having an operating period and a controllable output with a predetermined rated output level including at least one semiconductor switch for controlling said output and having a selectable duty cycle, said duty cycle being defined as the ratio of the time during which said switch conducts to the sum of the times during which said switch is conducting and non-conducting; and
- a resonance capacitor;
- a boosting transformer forming a resonance circuit with the resonance capacitor, said boosting transformer supplying high-voltage and heater power to a magnetron having a cathode;
- inductance means connected in series with the cathode of the magnetron, said inductance means having a predetermined impedance of a value such that said inductance means functions as a noise damping filter and also operates to limit a current flowing through the cathode of the magnetron;
- inverter control means including synchronization means, for controlling the duty cycle of the semiconductor switch in synchronism with the resonance period of said resonance circuit; and
- start control means for supplying a modulation command to the inverter control means at the time of starting the inverter;
- said inverter control means being responsive to said modulation command during starting of said inverter for controlling the duty cycle of the semiconductor switch to be lower than that required for said inverter to produce said predetermined rated output level and to become substantially equal to that required for said cathode to be heated to a predetermined temperature, where said non-conduction time of the semiconductor switch is substantially equal to an integral multiple of said resonance period of the resonance circuit, thereby controlling the operating period of said inverter during starting thereof to be longer than when the inverter is operating to produce said predetermined rated output level.

5,091,618

IC CARD READER/WRITER

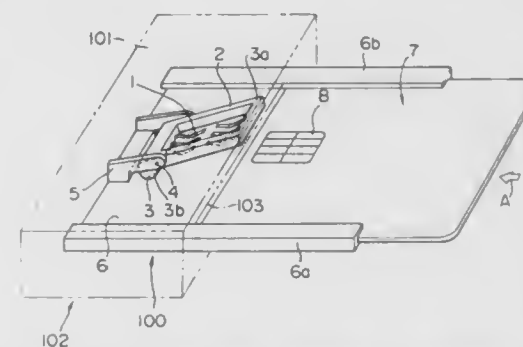
Takehiro Takahashi, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 22, 1990, Ser. No. 526,887

Claims priority, application Japan, May 23, 1989, 1-129292 Int. Cl.⁵ G06K 17/06

U.S. Cl. 235—441

12 Claims



1. An IC card reader/writer comprising a main body having an IC card insertion aperture therein, a base extending from said main body for guiding an IC card thereon to be inserted through said insertion aperture and a contact mechanism to bring electrical contact points of said IC card reader/writer into contact with terminals on the IC card inserted through the insertion aperture, said contact mechanism including:

- a pair of arms secured on said base near the ultimate position of the IC card when insertion thereof has been completed, the free ends of said pair of arms extending toward said insertion aperture;
- a first frame pivotally supported by said pair of arms at the free ends thereof, said first frame carrying a plurality of sets of the electrical contact points in a form of contact spring, each of the sets thereof arranged being spaced apart along the insertion direction of the IC card; and,
- a protrusion portion provided at one end of said first frame remote from said insertion aperture extending toward said base, said first frame being biased so that said protrusion portion contacts said base when no IC card is interposed therebetween, said protrusion portion being forced upward by an amount equal to the thickness of the IC card when the leading edge of the IC card pushes said protrusion portion to ride thereon in the course of insertion thereof toward the ultimate position thereof, thereby the other end of said first frame near said insertion aperture being forced downward and the plurality of the electrical contact points in a form of contact spring carried by said first frame being brought into contact with terminals of the IC card and completing the connection therewith when the leading edge of the IC card has been reached to the ultimate position thereof.

5,091,619

APPARATUS FOR RESISTANCE BONDING ELECTROMAGNETIC COILS

John H. Wall, and Edward L. Walter, both of Columbia City, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 26, 1990, Ser. No. 543,706

Int. Cl.⁵ B23K 11/10, 11/28; H05K 9/00

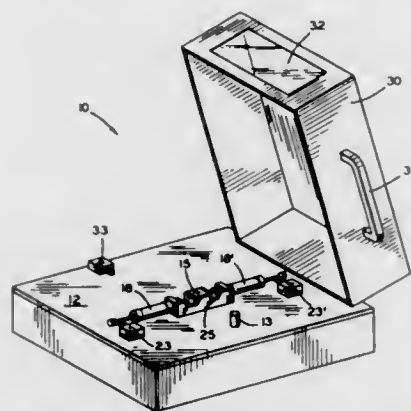
U.S. Cl. 219—56.1

21 Claims

1. An apparatus for performing a resistance bonding operation on an electromagnetic coil having a lead extending therefrom comprising:

- a terminal adapted to be connected to a source of electrical power;
- means for selectively connecting the lead of the coil to said terminal;

a cover movable between an opened position and a closed position; and



means responsive to the position of said cover for actuating said connecting means to connect the lead to said terminal when said cover is closed.

5,091,620

AUTOMATIC ELECTRIC DISCHARGE MACHINING METHOD AND APPARATUS WITH PERIODIC SENSING OF SURFACE ROUGHNESS OF THE WORKPIECE

Naotake Mohri, Aichi, and Nagao Saito, Tokyo, both of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Continuation of Ser. No. 845,151, Mar. 27, 1986, abandoned.

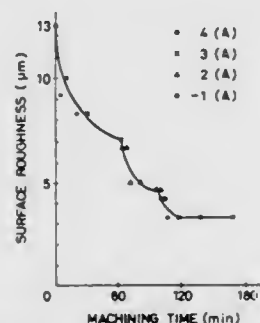
This application Apr. 23, 1990, Ser. No. 513,750

Claims priority, application Japan, Sep. 27, 1985, 60-214002

Int. Cl.⁵ B23H 7/20

U.S. Cl. 219—69.13

1 Claim



1. A fully automated electric discharge machine comprising: means for machining an electrically conductive workpiece by electric discharge;
- an automated workpiece machined surface roughness measuring device integrally connected to said machining means and movable with respect to said workpiece;
- means for automatically, periodically operating said machine for a predetermined period of time under first electric discharge machining conditions to machine said workpiece to a first relatively rough desired machine surface roughness under conditions where the surface roughness condition changes exponentially such that after machining conditions are changed, surface roughness quickly changes into a finer one suitable for new machining conditions but short of this point where, irrespective of continued machining time, the surface roughness stays the same;
- means for selecting, according to the result of measurement by said workpiece machined surface roughness measuring device, electric discharge machining conditions stored in a memory unit for said machine for machining said workpiece to a further desired machine surface roughness which has a surface roughness which is less than that

sensed by said electric discharge machine surface roughness measuring device during the initial machining of said workpiece, and wherein said means for automatically, periodically operating said electric discharge machine for a predetermined period of time comprises means for automatically suspending the electric discharge machining of said workpiece at termination of said first time period while holding said workpiece in said machine;

means for automatically operating said workpiece surface roughness measuring device for measuring the machine surface roughness of said workpiece at termination of said first time period;

means for comparing the surface roughness measured in the preceding step with a desired machine surface roughness reaching a suitable change in said exponential indicative of said roughness change to said finer one but short of the point where, irrespective of continued machining time, the surface roughness stays the same;

means for automatically continuing the electric discharge machining of said workpiece under said first electric discharge machining conditions for a second predetermined period of time until the surface roughness of the workpiece machined surface reaches said first desired machine surface roughness and when the surface roughness does not exceed said first desired machine surface roughness, automatically changing said first electric discharge machining conditions to said second, different electric discharge machining conditions correlated to a second predetermined desired surface roughness and machining said workpiece under said second electric discharging machining conditions for at least one further predetermined period of time and comparing the surface roughness and repeating that sequence at further predetermined periods of time if needed until said second desired machine surface roughness of the workpiece evidences a suitable change in the exponential indicative of said roughness change to at least a finer one for said second machining conditions but short of the point where, irrespective of continued machining time, the surface roughness stays the same.

5,091,621

METHOD AND APPARATUS FOR DESTROYING A SYRINGE NEEDLE

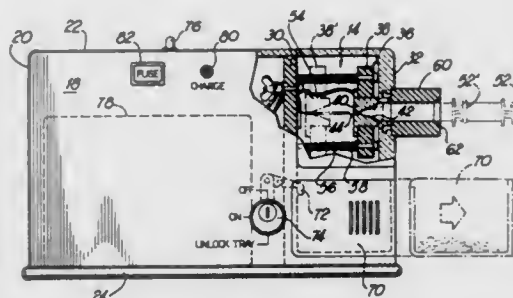
William F. Butler, 680 Atlanta Country Club Dr., Marietta, Ga. 30067

Filed Jun. 1, 1990, Ser. No. 532,021

Int. Cl.⁵ B23H 9/00; H05B 3/00

U.S. Cl. 219—68

6 Claims



1. An apparatus for destroying a syringe needle, comprising:
 - (a) a housing;
 - (b) first and second substantially vertically oriented surfaces in opposed relationship in the housing, and defining therebetween a needle burn chamber, the distance between the first and second surfaces being at least the length of the syringe needle, the first surface defining a first opening therethrough;

5,091,623

WELDING GUN PROVIDED WITH A BACKUP CYLINDER

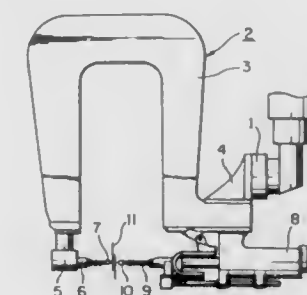
Hiroshi Obara, and Toshihiro Nishiwaki, both of Tokyo, Japan, assignors to Obara Corporation, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,734

Int. Cl.⁵ B23K 9/28

U.S. Cl. 219—89

3 Claims



- (c) a substantially horizontal needle receiving means with guide means comprising posts between the surfaces and a biasing means comprising springs on the posts in the chamber movable between the first and second surfaces and defining a second opening therethrough which is coaxial with the first opening;
- (d) a first electrical contact on the needle receiving means;
- (e) a second electrical contact on the second surface and being in registry with the second opening;
- (f) power means connected to the first and second contacts; and
- (g) means for normally biasing the needle receiving means toward the first opening so that when the needle is inserted in a substantially horizontal manner through the first and second openings to be in contacting relationship to the needle receiving means and the needle receiving means is moved toward the second surface, the tip of the needle engages the second contact closing the circuit between the contacts and melting the needle along at least most of its length.

5,091,622

COMPOUND MACHINING METHOD AND APPARATUS

Nobuaki Ohba, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

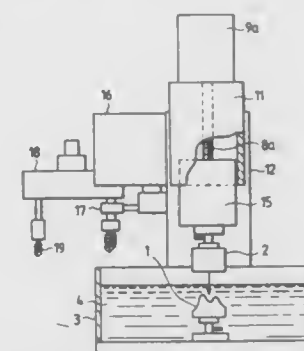
Filed Mar. 13, 1990, Ser. No. 493,048

Claims priority, application Japan, May 10, 1989, 1-116440; Jun. 1, 1989, 1-139740

Int. Cl.⁵ B23H 5/04

U.S. Cl. 219—69.15

8 Claims



1. A compound machining apparatus adapted to machine a workpiece comprising:
 - electrode forming means for mechanically machining an electrode material, fixedly secured in a machining solution, with a mechanical tool connected to a spindle into an electrode having a predetermined configuration;
 - storage means for storing said mechanical tool and said workpiece;
 - exchanging means for exchanging parts between said spindle and said storage means, wherein said exchanging means exchanges said mechanical tool connected to said spindle for said workpiece to be machined, said mechanical tool and said workpiece to be machined being moved relative to said electrode by said exchanging means; and
 - workpiece machining means for electrically machining said workpiece with said electrode fixedly secured in said machining solution.

5,091,624

METHOD OF FLASH BUTT WELDING HIGH-CARBON MATERIAL, IN PARTICULAR NODULAR CAST IRON

Anton Alt, Schaffhausen; Peter Toelke, Diessenhofen, both of Switzerland; Ludwig Wilhelm, Engen, and Urban Zimmermann, Klettgau, both of Fed. Rep. of Germany, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed Sep. 25, 1989, Ser. No. 411,723

Claims priority, application Switzerland, Sep. 23, 1988, 03553/88

Int. Cl.⁵ B23K 11/04

U.S. Cl. 219—100

3 Claims



1. A method for flash butt welding high-carbon materials wherein current is passed intermittently through the contact faces of the parts to be joined whereby the contact faces are heated by the formation of arcing contacts on the contact faces thereby producing arcing craters containing molten metal adjoining a zone of plasticized material, said method comprising forming said arcing craters on the contact faces of the parts to be joined such that the maximum depth of any crater is less than or equal to the minimum thickness of the plasticized zone

and thereafter applying an upsetting pressure to join the contact faces of said parts such that the molten metal areas are pressed out of the contact face areas into a weld bead thereby preventing the formation of ledeburitic and/or martensitic inclusions.

5,091,625

PLASMA ARC CUTTING DEVICE HAVING METAL DEPOSITION REMOVAL FUNCTION AND METHOD FOR REMOVING DEPOSITION FROM NOZZLE OF THE PLASMA ARC CUTTING DEVICE

Masahiro Kohda, Kakamigahara; Osamu Yamada, Niwa, and Hisaaki Yamane, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

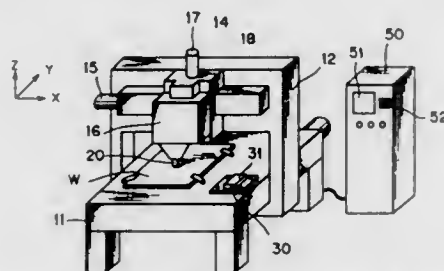
Filed Feb. 11, 1991, Ser. No. 653,300

Claims priority, application Japan, Feb. 16, 1990, 2-37057; Feb. 19, 1990, 2-15288[U]

Int. Cl.³ B23K 9/00

U.S. Cl. 219—121.44

19 Claims



1. A plasma arc cutting device for cutting an electrically conductive workpiece with a plasma arc comprising: a table for mounting the workpiece thereon; a plasma torch comprising a gas supply nozzle and an electrode for generating a plasma arc jet toward the workpiece, the plasma arc contacting the workpiece; moving means for relatively moving the plasma torch with respect to the table; a plasma arc power supply unit connected to the plasma torch for supplying electrical current thereto to thereby provide the plasma arc between the electrode and the workpiece; means for removing a material deposited on the nozzle therefrom, the deposited material removing means being stationary and fixed to the table, the plasma torch being movable toward and away from the removing means, and control means for controlling movement of the moving means for controlling relative position between the plasma torch and the workpiece, the control means having means for executing movement of the moving means at a predetermined interval so as to position the plasma torch in confrontation with the removing means to thereby remove the deposited material from the nozzle and timing means for determining the interval.

5,091,626

METHOD FOR THE ABLATIVE RESHAPING OF MATERIAL SURFACES

Aaron Lewis, Jerusalem; Amihay Fuxbruner, Ramat-Gan, and Itzhak Hemo, Kiryat Yovel, all of Israel, assignors to Hadasah Medical Organization and Israel Yissum Research Development Company of the Hebrew University of Jerusalem, both of Jerusalem, Israel

Filed Feb. 2, 1990, Ser. No. 473,814

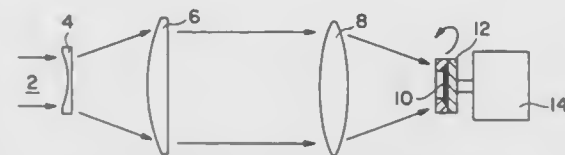
Int. Cl.³ B23K 26/00

U.S. Cl. 219—121.69

6 Claims

1. A method for the ablative reshaping of material surfaces, comprising the steps of: providing a source of an ablative beam having a given average fluence distribution over its cross-sectional extent;

determining the ablation curve of the material to be reshaped; selecting, from said ablation curve, an ascending region having an at least approximately constant slope; selecting a beam fluence from among the fluences comprised in said region;



irradiating the material surface to be reshaped, and controlling the geometry of the material surface thus being reshaped by controlling the total amount of energy per unit area of said surface delivered during said irradiation.

5,091,627

LASER BEAM CONTROLLER FOR SURVEYING EQUIPMENT

Akio Kimura, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Japan

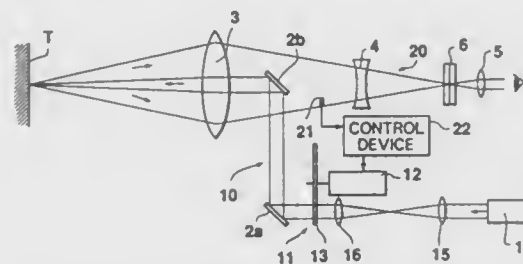
Filed Nov. 16, 1990, Ser. No. 614,445

Claims priority, application Japan, Nov. 17, 1989, 1-299171; Nov. 17, 1989, 1-299172

Int. Cl.³ B23K 26/00

U.S. Cl. 219—121.83

5 Claims



1. A laser beam controller for surveying equipment comprising laser beam irradiation means for irradiating a target with a laser beam, observation means for observing the laser beam reflected from said target and light quantity controlling means for controlling the quantity of the laser beam projected to said target.

5,091,628

LOW HYDROGEN BASIC METAL CORED ELECTRODE

Chang-Shung Chai, Highland Heights; David A. Fink, University Heights, and John Gonzalez, Willoughby, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio Division of Ser. No. 495,696, Mar. 19, 1990, Pat. No. 5,055,655, which is a continuation-in-part of Ser. No. 405,727, Sep. 11, 1989, Pat. No. 5,003,155. This application May 20, 1991, Ser. No. 703,196

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

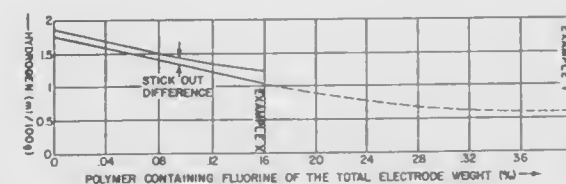
Int. Cl.³ B23K 35/22

U.S. Cl. 219—145.22

6 Claims

1. A flux for arc welding comprising a polymer containing

fluorine, which polymer constitutes a reducing agent for limiting diffusible hydrogen in the weld element to less than 5



ml/100 g, and a highly basic slag forming constituent consisting essentially of calcium fluoride.

5,091,629

HAIR CURLING IRON FOR CREATING AN INWARDLY BENDING CURL AND HEATING APPARATUS THEREFOR

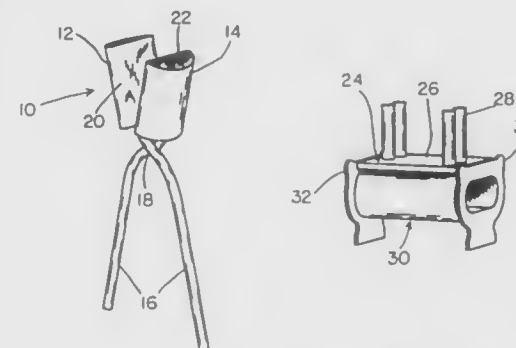
Robert J. McGee, 882 Elias, St. Louis, Mo. 63147

Filed Oct. 9, 1990, Ser. No. 594,402

Int. Cl.³ H05B 1/00; A45D 4/12

U.S. Cl. 219—222

4 Claims



1. A hair curling iron comprising a pair of elongated semi-cylindrical barrels of heat conductive material each having an inner flat longitudinal surface facing the inner flat longitudinal surface of the other barrel, said barrels each having a handle at an end thereof and being pivotally connected, whereby said barrels may be moved apart and together in relation to each other, said inner flat longitudinal surfaces of said barrels meeting when said barrels are pivotally moved together, said barrels further being hollow for a substantial distance along a longitudinal length of said barrels and having an open end opposite said end having said handle, said open end being of sufficient dimension to receive in removable relationship therein a heating element, whereby said curling iron may be heated prior to use.

5,091,630

HAIR CURLING APPARATUS MOUNTED TO A HAIR DRYER OUTLET CONDUIT WITH AN ADAPTER SLEEVE ARRANGEMENT ROTATABLY MOUNTED AND ROTATED BY HEATED AIR FLOW

Zoran Djuric, 55 Cosburn Ave. #208 (Ontario), Toronto, Canada M4K-2E9

Filed Nov. 5, 1990, Ser. No. 608,837

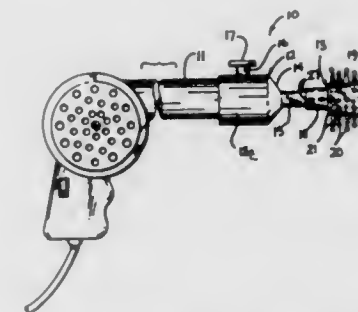
Int. Cl.³ A45D 2/36, 20/50; F24H 1/06

U.S. Cl. 219—222

5 Claims

1. A hair curling apparatus comprising, in combination, a hot air dryer having a longitudinally aligned hair dryer output conduit, and an adapter sleeve mounted to a forward terminal end of the output conduit and in air flow communication therewith, and the adapter sleeve including an open ended delivery tube extending therethrough directing heated air from the air output conduit through the adapter sleeve, and the deliv-

ery tube including a longitudinally aligned delivery tube extension extending beyond the end of the adapter sleeve, the delivery tube extension mounting a hair curling sleeve for rotation thereabout, extending through the hair curling sleeve and including rotation means for rotatably mounting the hair curling sleeve, the hair curling sleeve including a main body, with a matrix of resilient bristles projecting exteriorly thereof, the bristles radially aligned relative to the hair curling sleeve, and the delivery tube extension including a plurality of apertures oriented interiorly of the curling sleeve to direct the heated air into the curling sleeve, and a plurality of arcuate vanes mounted interiorly of the hair curling sleeve and projecting interiorly of the hair curling sleeve in communication with the



apertures of the delivery tube extension to enhance rotation of the hair curling sleeve about the delivery tube extension, wherein the adapter sleeve includes an input funnel overlying the hair dryer output conduit, the input funnel being in communication with the inlet end of the delivery tube, and a valve rod diametrically directed through the adapter sleeve and delivery tube, the valve rod including a head member arranged for manual grasping of the valve rod, the head member projecting exteriorly of the adapter sleeve, and the valve rod including a bore directed there-through, the bore arranged parallel to the delivery tube, and the valve rod positionable from a raised position with said bore spaced above the delivery tube to a lowered position, with the bore aligned with the delivery tube.

5,091,631

GLOW PLUG HAVING A SERIES CONNECTION OF RESISTANT FILAMENTS

Bertram Dupuis; Max Endler, both of Ludwigsburg, and Paul Bauer, Steinheim/Murr, all of Fed. Rep. of Germany, assignors to Beru Ruprecht GmbH & Co. KG, Ludwigsburg, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 383,094

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1988, 3825013

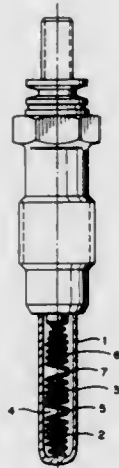
Int. Cl.³ F23Q 7/22

U.S. Cl. 219—270

16 Claims

15. A glow plug for disposition in the combustion chamber of an air-compressing internal combustion engine, with a plug housing, with a connection device for a glow current and with, fixed on the plug housing, a tube which is closed at its end remote from the plug housing, a wire filament-like resistance element being disposed in an insulating material within the tube, the resistance element consisting of two series-connected resistance filaments, of which the rear resistance filament, serving as a regulating filament, has a higher positive temperature resistance coefficient than the front resistance filament which is used as a heating filament, characterized in that the regulating filament which is made of material having a resistance at 1000° C. that is greater than its resistance at 20° C. by a resistance ratio over 7.5:1; and characterized in that the

regulating filament is directly connected to an additional filament, the regulating filament being adjacent to the heating



filament and the additional filament being adjacent to the tube of the glow plug housing and consisting of Ni.

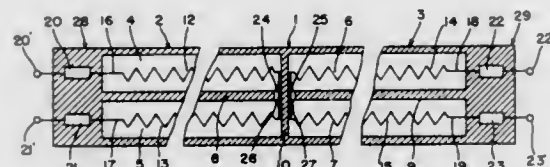
5,091,632 INFRARED RADIATOR

Udo Hennecke, Alzenau, Fed. Rep. of Germany, and Helmut Wölz, Alpharetta, Ga., assignors to Heraeus Quarzglas GmbH, Hanau, Fed. Rep. of Germany
Filed Nov. 8, 1990, Ser. No. 610,517
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1989, 8913683[U]

Int. Cl.⁵ H01C 1/024

U.S. Cl. 219—553

7 Claims



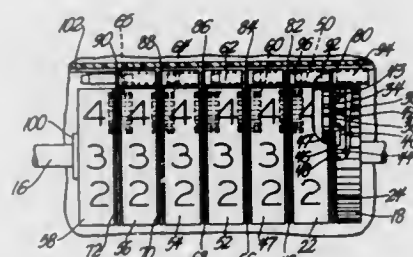
1. Short-wave infrared radiator comprising: a longitudinally extended twin tube having an internal spacer which separates two partial chambers running in longitudinal direction, each of these chambers accommodating a heater coil, and the tube including sealed power passageways led toward the exterior at the ends of the twin tube, these power passageways, at one end of the radiator, being directly connected to two free ends of the respectively associated heater coils, and, by means of an external terminal assignment, the radiator being optionally heated over its entire length or a partial length, over its length, the radiator 1 being divided in two radiator segments 2, 3 and at least one partition wall for separating the segments 2, 3, the segments 2, 3 each having a heater coil 12, 13, 14, 15 in the respective partial chambers 4, 5, 6, 7, and, in the vicinity of the partition wall, the heater coils 12, 14 of partial chambers 4, 6 being electrically connected with the heater coils 13, 15 of other partial chambers 5, 7 of the same segments, and the radiator including terminals of respective radiator ends 28, 29 to form a power supply 20, 22 and a power return 21, 23.

5,091,633 UNITIZED ODOMETER ROLL ASSEMBLY FOR VEHICLES AND ROLL INTERCONNECTING METHOD

Alfred H. Glover, Decatur; Joseph T. Betterton, Arab, and Richard L. Biegler, Huntsville, all of Ala.
Filed Feb. 19, 1991, Ser. No. 656,333
Int. Cl.⁵ G01C 22/00

U.S. Cl. 235—95 R

6 Claims



3. An odometer for an automotive vehicle to record distance traveled by the vehicle, comprising: a drive shaft having an axis of rotation, a plurality of circular rolls having indicia on an external surface thereof and operatively mounted on said drive shaft for rotation with respect to the axis, gear means for drivingly interconnecting said rolls so that a rotational drive of a first of said rolls through a predetermined number of turns will incrementally turn the other of said rolls relative to each other, partition plate means operatively supporting each of said gear means and operatively disposed in separate planes between said rolls so that said rolls are operatively geared to one another, and tang means projecting from each of said partition plate means in said associated plane to effect the alignment of the indicia on said rolls into a predetermined pattern, and pin and socket interlock means associated with said tang means extending transverse with respect to said planes and sequentially interfitting with one another to thereby operatively interlock said partition plate means to one another so that said rolls are maintained in operative position with respect to one another whereby said indicia on said rolls are maintained in substantial predetermined alignment, rotatable input means operatively connected to said drive shaft to effect the rotation of said drive shaft and a sequential operation of said rolls.

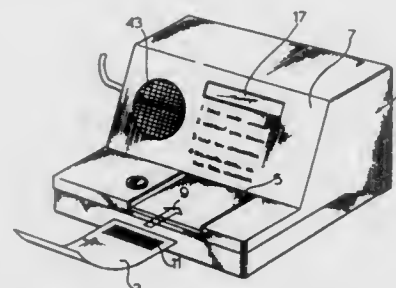
5,091,634 COUPON VALIDATION TERMINAL

John W. Finch, Thornhill, and Gary Wild, Downsview, both of Canada, assignors to Scantech Promotions Inc., Richmond Hill, Canada
Filed Oct. 4, 1989, Ser. No. 416,878
Claims priority, application United Kingdom, Oct. 4, 1988, 8823301

Int. Cl.⁵ G06F 15/20

U.S. Cl. 235—375

25 Claims



1. A coupon validation system for interpreting coupons presented thereto, each of said coupons incorporating a bar code having a range of validation dates and a message code, said system comprising:

- a real time clock for maintaining a current time and date record;
- means for storing one or more winning number codes;
- means for receiving a coupon presented to said system and in response reading said bar code; and
- means for comparing said range of validation dates with said current time and date record and in the event said current time and date record is not within said range of validation dates then rejecting said coupon, and in the event said current time and date record is within said range of validation dates then comparing said one or more winning number codes with said message code and in the event they are equal generating a message for indicating that said coupon is a winner, and in the event said one or more winning number codes and said message code are not equal then generating an alternative message for indicating that said coupon is not a winner.

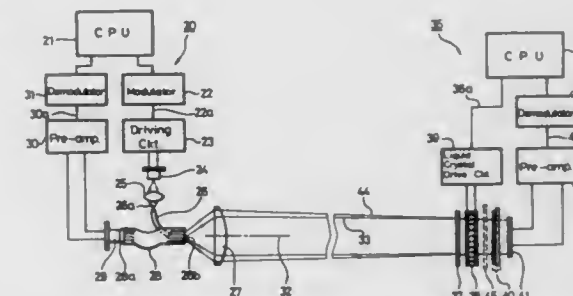
5,091,636 APPARATUS FOR DETECTING MODULATED INFORMATION FROM EMITTED LIGHT TURNED BY AN OBJECT

Hirohisa Takada, Tokyo, and Shosuke Tanaka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 295,552, Jan. 11, 1989, abandoned. This application Jul. 3, 1991, Ser. No. 726,650
Claims priority, application Japan, Feb. 23, 1988, 63-039985; Feb. 29, 1988, 63-046631

Int. Cl.⁵ G06K 70/1, 7/14

U.S. Cl. 235—454

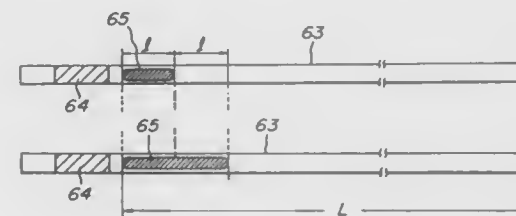
2 Claims



5,091,635 OPTICAL RECORD MEDIUM INCLUDING A DATA REGION, AN IDENTIFICATION REGION AND A CONTROL DATA REGION, AND A METHOD OF RECORDING SIGNALS ON THE OPTICAL RECORD MEDIUM

Yuichiro Akatsuka, Hachioji; Takayuki Abe, Sagami; Akira Matsueda, Hachioji; Takao Rokutan, Higashimurayama, and Nagahiro Gocho, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Continuation of Ser. No. 121,798, Nov. 17, 1987, abandoned.
This application Oct. 9, 1990, Ser. No. 595,652
Claims priority, application Japan, Nov. 21, 1986, 61-276817; Nov. 21, 1986, 61-278078; Jan. 30, 1987, 62-18714
Int. Cl.⁵ G06K 1/00; G11B 7/007
U.S. Cl. 235—494

2 Claims



1. A method of recording on an optical record medium a data signal and a control data signal for managing the optical record medium having a substrate, a first area defining a data region including a plurality of parallel tracks and a second area defining an identification region in which addresses of tracks are recorded, comprising the steps of: selecting at least one track among said tracks as a control data track; recording a data signal in a data track which is not selected as said control data track; and recording a control data signal representing a last data track in which the latest data signal has been recorded, for managing the optical record medium in said control data track; wherein marks having a constant length are recorded in said control data track each time data signals are recorded in the data tracks such that successive marks are brought into contact with each other in the longitudinal direction.

1. An apparatus for detecting modulated information from light emitted by a transmitting side and turned around or reflected by a receiving side, comprising: light signal emitting means arranged at the transmitting side for emitting a plurality of light signal pulses followed by an interval of emitting a substantially constant light signal, the receiving side including an optical recursive reflection member for reflecting back a portion of a light signal incident thereon in substantially the same direction as said incident light signal and for passing a portion of the light signal incident thereon, an electrically operable shutter disposed adjacent a reflection surface side of said optical recursive reflection member to selectively modulate light reflected by said reflection member passing therethrough, and processor means for receiving said portion of the light signal passed by said reflection member and producing a coded modulation signal fed to said shutter for causing said shutter to modulate light reflected by said reflection member during said interval of a substantially constant light signal, thereby acknowledging receiving the plurality of light signal pulses from the transmitting side.

5,091,637 NOISE REDUCING INFRARED RETICLE/DETECTOR ARRANGEMENT

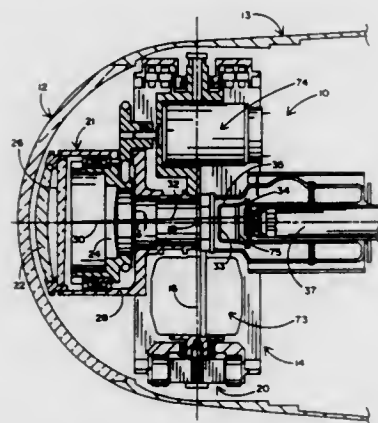
Byron Edwards, Orange, Calif., assignor to Loral Aerospace Corp., New York, N.Y.
Continuation-in-part of Ser. No. 392,676, Aug. 11, 1989, Pat. No. 4,967,065. This application Jun. 18, 1990, Ser. No. 539,778
Int. Cl.⁵ G01J 1/20; G06F 15/50

U.S. Cl. 250—203.6

6 Claims

1. An integrated reticle and detector assembly for tracking an infrared radiation-emitting target in an infrared target acquisition and tracking device operating substantially at wavelengths longer than 3.5 microns, comprising: a) a gimbaled platform having a platform axis; b) a telescope having an optical axis, said telescope being mounted on said platform for rotation about said platform axis, the optical axis of said telescope being spaced from said platform axis; c) cryogenically-cooled infrared detector means fixedly mounted on said platform to receive images from said telescope; and

d) cooled reticle means for obscuring portions of said detector means, said reticle means being fixedly positioned with



respect to said detector in the optical path of said telescope between said telescope and said detector means.

5,091,638

CONTACT IMAGE SENSOR HAVING LIGHT-RECEIVING WINDOWS

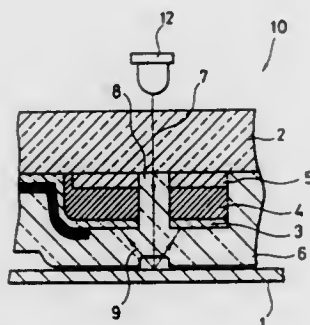
Shunpei Yamazaki, Tokyo; Takeshi Fukada, Ebina; Mitsunori Sakama, Hiratsuka; Hisato Shinohara, Sagami-hara; Nobumitsu Amachi, Atsugi; Naoya Sakamoto, Atsugi, and Takashi Inuzima, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Filed Jul. 19, 1990, Ser. No. 554,342

Claims priority, application Japan, Oct. 21, 1987, 62-255098; Oct. 21, 1987, 62-266099; Oct. 21, 1987, 62-266100

Int. Cl.⁵ H01J 40/14

U.S. Cl. 250—208.1

12 Claims



1. An image sensor comprising:

- a glass substrate;
 - a light blocking electrode formed on said substrate;
 - a photosensitive semiconductor layer formed on said light blocking electrode;
 - a transparent electrode formed on said semiconductor layer;
 - an opening formed throughout said light blocking electrode, semiconductor layer and transparent electrode to define a light window; and
 - a transparent resin layer covering said transparent electrode and opening,
- wherein said light blocking electrode at a periphery of said opening extends over said semiconductor layer.

5,091,639 MOUNT FOR AN ELECTRODE SYSTEM IN AN X-RAY IMAGE INTENSIFIER

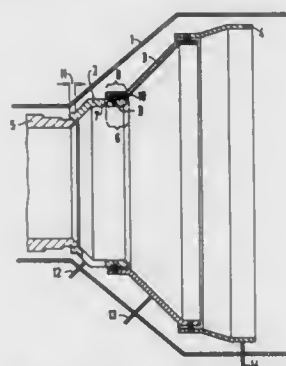
Reiner Heumann, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Feb. 4, 1991, Ser. No. 649,975

Claims priority, application European Pat. Off., Mar. 6, 1990, 90104289.5

Int. Cl.⁵ H01J 31/50

U.S. Cl. 250—213 VT

13 Claims



1. A mounting assembly for an electrode system in an x-ray image intensifier comprising:
an annular electrode in said electrode system; and
an annular mounting element for said electrode, said electrode and said mounting element having respective overlapping regions forming a clamped joint holding said electrode and mounting element together.

5,091,640

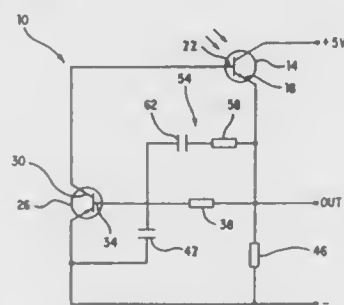
PHASE ADVANCE FOR AMBIENT LIGHT SUPPRESSION IN PHOTOTRANSISTORS

Colin V. Cornhill, Corsham, England, and Charles K. Carlin, Raleigh, N.C., assignors to Square D Company, Palatine, Ill.
Filed Jun. 24, 1991, Ser. No. 719,896

Int. Cl.⁵ H01J 40/14

U.S. Cl. 250—214 R

1 Claim



1. An oscillatory suppression circuit for preventing loop oscillation in a feedback circuit of a photosensor loop circuit including a phototransistor having an emitter, a collector connected to a supply voltage, and a base, a feedback transistor having a base connected through a feedback base resistor to the emitter of the phototransistor, and a feedback transistor bypass capacitor connected between the base and emitter of the feedback transistor; said oscillatory suppression circuit comprising:

- (a) a resistor having a first and a second end, said first end connected to the emitter of the phototransistor;
- (b) a capacitor, having a first and second end, said first end connected to said second end of said resistor and said second end connected to the base of the feedback transistor in the photosensor loop circuit, said resistor and said capacitor are connected in parallel across the base resistor

of the feedback transistor for inducing a phase advance into the feedback circuit to prevent oscillation in the photosensor loop circuit.

5,091,641

HIGH-FREQUENCY OPTOELECTRIC FRONT-END

Pieter W. G. Duijves, Brussel, Netherlands, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

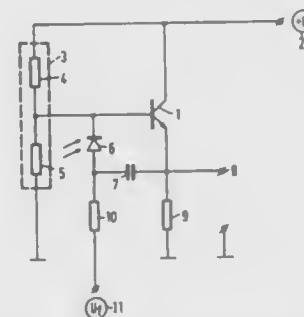
Filed Nov. 27, 1990, Ser. No. 619,634

Claims priority, application Netherlands, Dec. 5, 1989, 8902992

Int. Cl.⁵ H01J 40/14

U.S. Cl. 250—214 R

1 Claim



1. High-frequency optoelectric front-end for converting an optical signal into an electric signal by means of a photodiode arranged as a current source, which photodiode, via a capacitor, is connected in parallel with the base-emitter junction of a bipolar transistor arranged as a feedback amplifier, a main electrode of this transistor being connected to a side of a signal resistor which side forms the signal output of the front-end, characterised in that the main electrode connected to a side of the signal resistor is the emitter and in that the front-end comprises a voltage divider a first side of which is connected to the collector of the bipolar transistor and a second side of which is connected to the other side of the signal resistor, the output of the voltage divider being connected to the base of the bipolar transistor.

5,091,642

COLORIMETRIC DETECTION APPARATUS

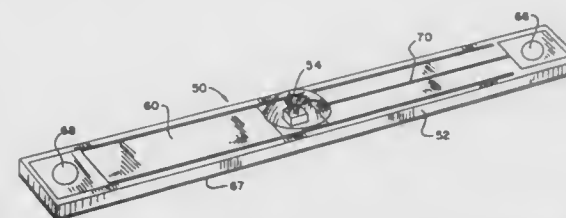
Vincent Chow, Hanover Park, and Byron Denenberg, Northfield, both of Ill., assignors to MDA Scientific, Inc., Lincolnshire, Ill.

Filed May 11, 1990, Ser. No. 522,164

Int. Cl.⁵ G01J 3/50, 1/48

U.S. Cl. 250—226

14 Claims



1. A monitor for detecting the presence of a target gas in an environment by sensing the color change of a colorimetric indicator material positioned in a holder thereon and exposed to the environment, the monitor comprising:

- a light detector positioned and having a surface oriented to receive light reflected from the colorimetric indicator material; and
- a light source positioned between the colorimetric indicator material and said light detector and oriented to provide illumination to the colorimetric indicator material but not to the light detector.

5,091,643

ABSOLUTE POSITION DETECTING METHOD AND APPARATUS THEREFOR

Norio Okutani, Neyagawa, and Yutaka Masuda, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 182,424, Apr. 10, 1988, abandoned.

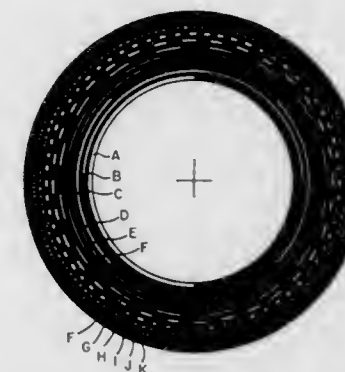
This application Jul. 31, 1990, Ser. No. 561,380

Claims priority, application Japan, Apr. 21, 1987, 62-97823

Int. Cl.⁵ G01D 5/34

U.S. Cl. 250—231.14

14 Claims



1. In an absolute encoder for detecting the absolute position of a movable object be detecting binary code patterns arranged on a code plate attached to the movable object, an absolute position detecting method comprising the steps of:

- (a) generating a pair of periodic detection signals having a 90-degree phase difference therebetween for each of a plurality of pure binary code patterns of varying orders, each order representing a different binary code pattern pitch, said binary code patterns being arranged in hierarchical order from higher to lower orders;
- (b) producing first two-bit binary position data for each position of the pure binary code patterns based on said pair of periodic detection signals;
- (c) performing a logical operation on said first two-bit binary position data of at least one of said pure binary code patterns to provide converted two-bit binary position data comprising one bit of said first two-bit binary position data of said at least one of said pure binary code patterns and an overlapping data bit which, if proper positional correspondence exists between said at least one of said pure binary code patterns and an adjacent next lower order one of said pure binary code patterns, is the same as one bit of said adjacent next lower order one of said pure binary code patterns;
- (d) making an equality/non-equality comparison between said overlapping data bit and said one bit of said adjacent next lower order one of said pure binary code patterns; and
- (e) responsive to a non-equality comparison result in step (d), correcting the content of said first two-bit binary position data of said at least one of said pure binary code patterns.

5,091,644

METHOD FOR ANALYZING FORMATION DATA FROM A FORMATION EVALUATION MWD LOGGING TOOL

Daniel C. Minette, Madison, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Jan. 15, 1991, Ser. No. 642,319

Int. Cl.⁵ G01V 5/12

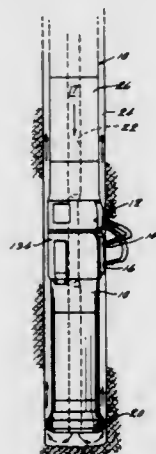
U.S. Cl. 250—254

12 Claims

1. A method of minimizing error in formation data from a borehole received by at least one detector assembly in a formation evaluation measurement-while-drilling (MWD) logging tool including the steps of:
dividing a cross section of a borehole into a plurality of selected sections;

receiving signals from said formation being logged while rotating the MWD logging tool and dividing the received signals with respect to the selected borehole section from which the signals are received;

determining a spectra for each of said selected sections;



analyzing each of said determined spectra to determine the relative error in each of said spectra; and minimizing said relative error by comparing the relative error in each spectra and by selecting a specific spectra or by combining at least two spectra.

5,091,645

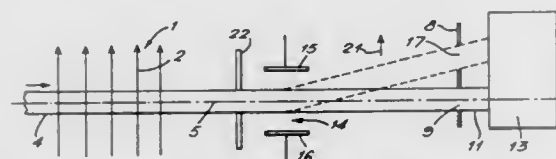
SELECTABLE-RESOLUTION CHARGED-PARTICLE BEAM ANALYZERS

Richard M. Elliott, Sale, United Kingdom, assignor to VG Instruments Group Limited, Crawley, England
Filed Dec. 18, 1990, Ser. No. 629,248
Claims priority, application United Kingdom, Dec. 22, 1989, 8929029

Int. Cl.⁵ H01J 49/26

U.S. Cl. 250—305

18 Claims



1. A method of analyzing a beam of charged particles according to a property chosen from the group comprising energy and momentum, said method comprising:

a) causing the charged particles to enter an analyzing field wherein they are dispersed according to the chosen property in an analyzing plane but are not substantially dispersed in a direction perpendicular to said analyzing plane, and

b) passing at least some of the charged particles leaving said analyzing field through an aperture whose width is chosen to determine the resolution of said analyzing field with respect to said chosen property,

the improvement wherein at least some of the charged particles leaving said analyzing field are directed through any selected one of a plurality of said apertures of different widths spaced at different distances from said analyzing plane, whereby the resolution of said analyzing field is varied according to which said aperture is selected.

5,091,646

INTEGRATED THERMAL IMAGING SYSTEM

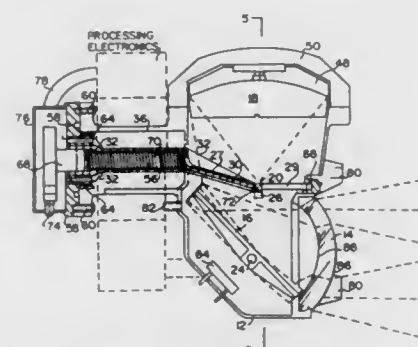
William H. Taylor, South Deerfield, Mass., assignor to Kolimor-gen Corporation, Simsbury, Conn.

Filed May 29, 1990, Ser. No. 529,933

Int. Cl.⁵ H01L 31/052

U.S. Cl. 250—332

99 Claims



1. A thermal imager system comprising:

- (i) a system housing having an evacuated enclosure and a corrector lens window having concentric surfaces for receiving radiation corresponding to a scene to be imaged;
- (ii) detector means disposed inside said enclosure for detecting incident radiation and producing a detector signal;
- (iii) focusing optical element means disposed inside said enclosure for focusing radiation corresponding to at least a portion of a scene onto said detector means.

5,091,647

METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF A LAYER ON A SUBSTRATE

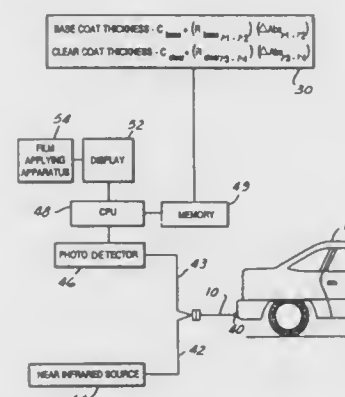
Keith R. Carduner, Roscoe O. Carter, III, both of Dearborn; Dennis Schuetzle, West Bloomfield, and Michael J. Decello, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1990, Ser. No. 632,557

Int. Cl.⁵ G01N 21/17, 21/35

U.S. Cl. 250—341

21 Claims



1. An apparatus for measuring the thickness of two or more film layers on a non-transparent substrate comprising:

- a near infrared radiation source emitting near infrared radiation onto said film layers;
- a near infrared radiation detector, said detector measuring the amount of near infrared radiation reflected from said film layers; and
- means to calculate the thickness of each of said film layers by comparing the measured reflectance to one or more predetermined values.

5,091,648

RADIATION DETECTION ARRANGEMENTS AND METHODS

Ian A. Owers, Fife, and John L. Galloway, Edinburgh, both of Scotland, assignors to Racal-Guardali (Scotland) Limited, Edinburgh, Scotland

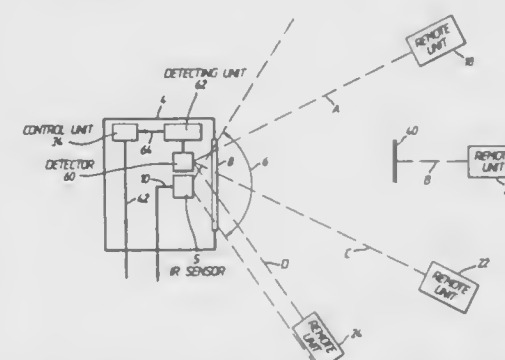
Filed Dec. 21, 1989, Ser. No. 454,695

Claims priority, application United Kingdom, Dec. 22, 1988, 8829892

Int. Cl.⁵ G01J 5/04; G08B 13/19

U.S. Cl. 250—342

6 Claims



1. An intruder detection system for detecting predetermined radiation within a predetermined area, comprising radiation sensing means sensitive to the predetermined radiation and having a field of view encompassing said area, and a plurality of test sources of test radiation positioned at different locations within said area, for directing the test radiation towards the radiation sensing means for detection by the sensing means, the test radiation produced by each test source being distinguishable from the test radiation produced by others of the test sources, wherein the radiation sensing means comprises first and second radiation sensing means positioned within the same housing and having substantially identical fields of view encompassing the area to be protected, the first sensing means being capable of detecting first predetermined radiation, but not second predetermined radiation, and the second sensing means being capable of detecting the second predetermined radiation, but not the first predetermined radiation, said test sources of the second predetermined radiation are positioned within the area and direct their radiation to the second sensing means, and there is provided means responsive to the output of the first sensing means for producing a warning output indicative of the presence of an intruder within the area and means responsive to the output of the second sensing means in order to detect the presence of material within the area which attenuates the second predetermined radiation and for determining whether or not that output corresponds to receipt by the second sensing means of the second predetermined radiation from all or less than all of the test sources whereby to detect the presence of material within the area which attenuates the second predetermined radiation.

5,091,649

REMOVAL OF GASES DISTURBING THE MEASUREMENTS OF A GAS DETECTOR

Börje T. Rantala, Helsinki, Finland, assignor to Instrumentarium Corporation, Finland

Filed Jul. 6, 1990, Ser. No. 549,562

Claims priority, application Finland, Jul. 7, 1989, 893329

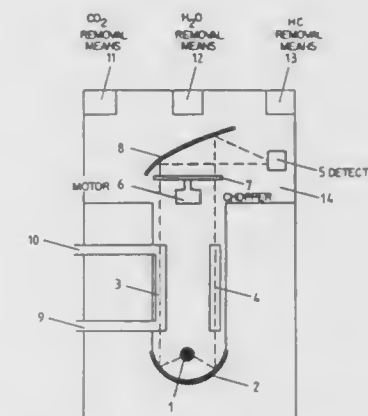
Int. Cl.⁵ G01N 21/35

U.S. Cl. 250—343

17 Claims

1. A gas detector for measuring both an anesthetic gas, the infrared absorption spectrum of which is partially or entirely overlapping with that of water, and at least one of carbon dioxide and an oxide of nitrogen, said detector comprising: a measuring chamber (2) through which the gas to be measured flows;

a reference gas chamber (4); an infrared radiation source, the infrared radiation of which passes through said measuring and reference chambers; a radiation detector (5) for receiving the radiation after passage through said measuring and reference chambers; and



housing means defining a space (14) containing said measuring chamber, reference chamber, radiation source and radiation detector and through which the radiation passes to said chambers and from said chambers to said radiation detector, said housing containing, in said space, means (11) for removing carbon dioxide from said space and means (12) for removing water from said space.

5,091,650

RADIATION DETECTOR USING SCINTILLATOR ARRAY

Hiroshi Uchida, and Tomohide Omura, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K. K., Shizuoka, Japan

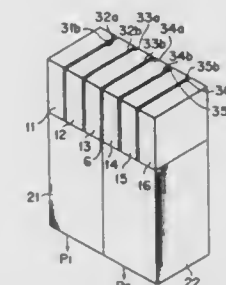
Filed Dec. 10, 1990, Ser. No. 624,956

Claims priority, application Japan, Dec. 15, 1989, 1-325293

Int. Cl.⁵ G01T 1/20

U.S. Cl. 250—366

11 Claims



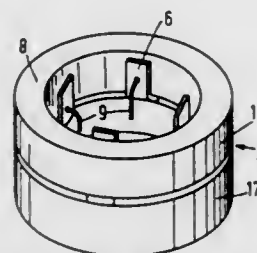
1. A radiation detector for detecting an incident position of radiation, comprising:

a scintillator array comprising plural scintillators for generating scintillation light upon incidence of radiation to a scintillator and distributing the scintillation light to the other scintillators at a predetermined distribution ratio, each of said scintillators having a radiation receiving surface for receiving the radiation therethrough, a light-emitting surface for emitting the scintillation light guided along an inside of the scintillator in a first direction and at least one light-distributing surface for transmitting a part of the scintillation light therethrough to the other scintillators in a second direction traverse to the first direction to distribute the scintillation light to the other scintillators at the predetermined distribution ratio, said light-distributing surface serving as a coupling surface through which each

of said scintillators is optically coupled to one of the other scintillators, and said light-distributing surface comprising at least one of a roughened surface, a mirror-polished surface and a combination thereof each of which is variable in transmissivity to light passing therethrough to thereby adjust the distribution ratio of the scintillation light transmitted from one of the scintillators to another in the second direction; and

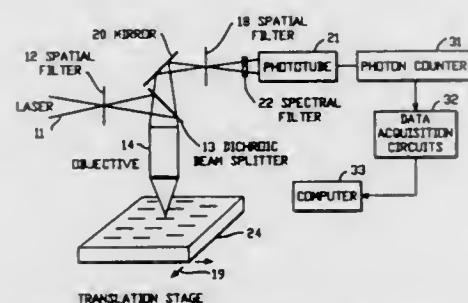
plural photomultiplier tubes optically coupled to said scintillator array for receiving the scintillation light distributed in said scintillator array and converting the scintillation light into an amplified electrical signal representing an incident position of the radiation to said scintillator array.

5,091,651
**OBJECT HOLDER FOR SUPPORTING AN OBJECT IN A
 CHARGED PARTICLE BEAM SYSTEM**
 Robin Hokke, Eindhoven, Netherlands, assignor to U.S. Phillips
 Corp., New York, N.Y.
 Filed Oct. 19, 1990, Ser. No. 600,460
 Claims priority, application Netherlands, Nov. 6, 1989,
 8902727
 Int. Cl.³ H01J 37/20
 U.S. Cl. 250—443.1 6 Claims



1. An object holder which serves to support an object in a charged particle beam system and which comprises a heating element, an object carrier which cooperates with the heating element and an electrically insulating member having a supporting face and an aperture which extends as far as the supporting face and which serves to transmit a charged particle beam, wherein the improvement comprises that at least two current-conductive contact portions are connected to said insulating member, and that the insulating member comprises two sub-members, each of which comprises a contact face, the contact portions being clamped between said contact faces.

5,091,652
LASER EXCITED CONFOCAL MICROSCOPE
FLUORESCENCE SCANNER AND METHOD
Richard A. Mathies, and Konan Peck, both of Contra Costa,
Calif., assignors to The Regents of the University of California,
Oakland, Calif.
Continuation-in-part of Ser. No. 463,757, Jan. 12, 1990. This
application Jun. 1, 1990, Ser. No. 531,900
Int. Cl.³ G01N 21/64
U.S. Cl. 250—458.1 9 Claims



7. An improved scanner for detecting fluorescence from a

fluorescence labeled sample material carried by a sample carrier comprising

- means for forming a light beam having a predetermined wavelength;
- a dichroic beam splitter for receiving said light beam and directing it towards an objective lens which receives said beam and focuses the beam at a spot on the sample carrier whereby to cause the sample material to fluoresce at a selected volume and for collecting the fluorescently emitted light from said selected volume and directing the emitted light to said dichroic beam splitter, said fluorescent light being at a second wavelength and said dichroic beam splitter serving to pass the second wavelength;
- a spatial filter for receiving light at said second wavelength and passing light emitted from said selected volume;
- a spectral filter for further filtering said light and passing light at said second wavelength;
- means for moving the light beam and sample carrier relative to one another to scan the sample carrier,
- means for detecting the passed, emitted light of said second wavelength and providing output signals representative of the intensity of said detected light, and
- means for receiving and processing said signals to provide an image of the fluorescence of said samples.

5,091,653

FIBER OPTIC DOSIMETER USING ELECTRON TRAPPING MATERIALS EMPLOYING TECHNIQUE FOR ELIMINATING BACKGROUND FLUORESCENCE

Ramon E. Creager, Gaithersburg, and Peter K. Soltani, Olney, both of Md., assignors to Quantex Corporation, Rockville, Md.

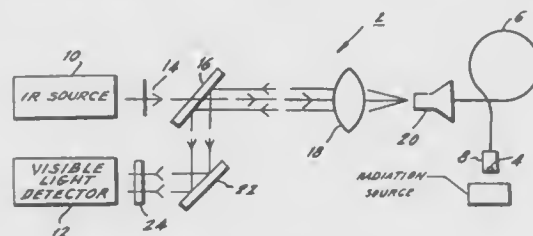
Continuation-in-part of Ser. No. 127,118, Dec. 1, 1987, Pat. No. 4,855,603. This application Dec. 30, 1988, Ser. No. 292,350

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.⁵ G01T 1/10, 1/105

U.S. Cl. 250—484.1

10 Claims



1. A fiber optic dosimeter system, comprising:
 - a radiation sensitive phosphor that stores energy from radiation when exposed thereto and releases said stored energy in the form of luminescence when triggered by exposure to optical stimulation, said phosphor comprising:
 - a base material of substantially strontium sulfide,
 - a first dopant of samarium, and
 - a second dopant of cerium oxide;
 - a stimulating source for supplying said optical stimulation;
 - an optical fiber for optically coupling said phosphor to said stimulating source and for optically coupling said phosphor to a sensor for detecting said luminescence released from said phosphor by converting said luminescence into an electrical signal; and
 - a modulator which cooperates with said stimulating source to periodically prevent said optical stimulation from reaching said phosphor, during which time the electrical signal from said sensor corresponds to background fluorescence.

5,091,654

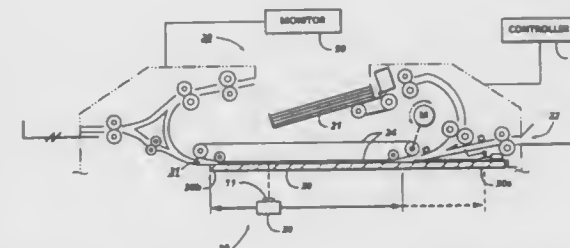
**METHOD OF AUTOMATICALLY SETTING DOCUMENT
REGISTRATION AND LOCATING CALIBRATION STRIP**

Gerald L. Coy, Rochester; Kenneth Buck, and William Blitz,
both of Webster, all of N.Y., assignors to Xerox Corporation,
Stamford, Conn.

Filed Aug. 28, 1990, Ser. No. 573,825
Int. Cl.⁷ G01N 21/86

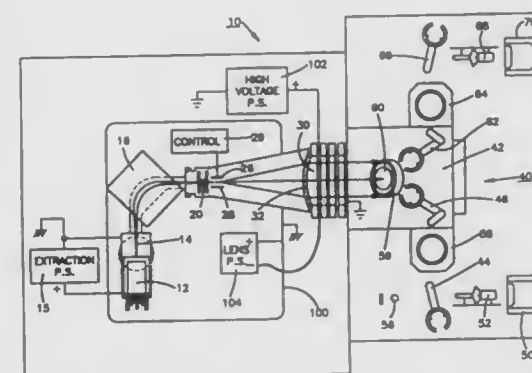
U.S. Cl. 250—561

34 Claims



1. A method of locating the position of an object on the platen of a raster input scanner having a movable scan carriage and an extended array of scanners, comprising:
 - a) obtaining a previously stored theoretical position of the object from a memory;
 - b) locating the scan carriage at a position spaced a predetermined distance from the previously stored position;
 - c) moving the scan carriage toward the previously stored position while operating at least some of the scanners until a target on the object is detected by the operating scanners; and
 - d) storing a target position of the scan carriage where the target is detected.

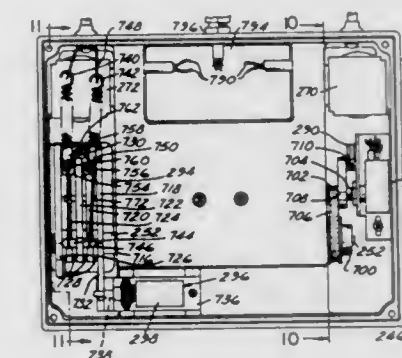
5,091,655
REDUCED PATH ION BEAM IMPLANTER
 Jerald P. Dykstra; Andrew M. Ray, and Monroe L. King, all of
 Austin, Tex., assignors to Eaton Corporation, Cleveland, Ohio
 Filed Feb. 25, 1991, Ser. No. 660,738
 Int. Cl.³ H01V 37/317
 U.S. Cl. 250—492.2 19 Claims



1. An ion beam implant system for controllably treating a workpiece comprising:
 - a) source means for providing ions to treat the workpiece;
 - b) support means for orienting the workpiece at a location relative the source means;
 - c) beam forming means for causing ions emitted by the source means to form an ion beam moving in a first trajectory;
 - d) electrode means for deflecting ions in said ion beam away from said first trajectory by a controlled amount;
 - e) acceleration means for accelerating ions deflected by said controlled amounts prior to said ions impacting the workpiece; and
 - f) control means having an output coupled to said electrode

g) said acceleration means comprising an entrance electrode and one or more additional electrodes for accelerating said ions to an impact energy, said entrance electrode and the first of said additional electrodes biased at voltages for creating a spatially non-uniform electric field that causes ions following diverse trajectories to be redeflected and impact the workpiece at a relatively uniform angle.

5,091,656
FOOTSWITCH ASSEMBLY WITH ELECTRICALLY
ENGAGED DETENTS
Gerald S. Gahn, Manchester, Mo., assignor to Storz Instrument
Company, St. Louis, Mo.
Filed Oct. 27, 1989, Ser. No. 428,355
Int. Cl.³ G05G 5/03
U.S. Cl. 307—119
15 Claims



8. A footswitch apparatus for surgical instruments comprising:

- a) a housing;
- b) a footpedal movably mounted on said housing;
- c) means for limiting the range of motion of said footpedal within first and second limits;
- d) first and second resilient means for resisting movement of said footpedal in one direction and for returning said footpedal to one of said limits in the other direction;
- e) said first resilient means providing a first resilient force substantially throughout the range of motion of said footpedal;
- f) said second resilient means providing a second resilient force in a zone of travel of said footpedal within said range of motion; and
- g) means for selectively disengaging said second resilient means so that only the force from said first resilient means is provided throughout said range of motion.

5,091,657
HIGH SPEED MULTIPLEX SWITCH CIRCUIT AND
METHOD
Rodney T. Burt, Tucson, Ariz., assignor to Burr-Brown Corpora-
tion, Tucson, Ariz.
Filed Mar. 19, 1991, Ser. No. 671,342
Int. Cl.⁵ H03K 17/00

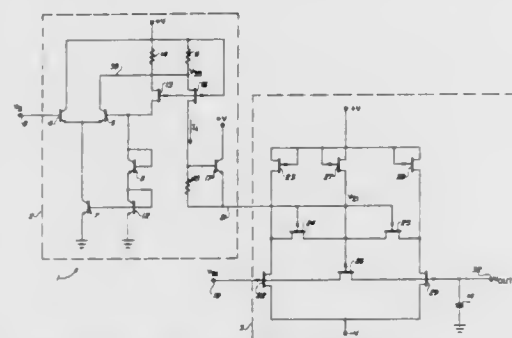
U.S. Cl. 307-246 15 Claims

1. A high speed, high current analog switching circuit, comprising in combination:

(a) a switch JFET having first and second current-carrying electrodes and a gate electrode, the first and second current-carrying electrodes being coupled to an analog input terminal and an analog output terminal, respectively;

(b) a first JFET having a source electrode, a drain electrode coupled to a first supply voltage conductor, and a gate electrode coupled to the first current-carrying electrode of the switch JFET;

- (c) a second JFET having a first current-carrying electrode coupled to the source electrode of the first JFET, a second current-carrying electrode coupled to the gate electrode of the switch JFET, and a gate electrode coupled to the gate electrode of the switch JFET;
- (d) a third JFET having a source electrode, a drain electrode coupled to the first supply voltage conductor, and a gate electrode coupled to the second current-carrying electrode of the switch JFET; and



- (e) a fourth JFET having a first current-carrying electrode coupled to the source electrode of the third JFET, a second current-carrying electrode coupled to the gate electrode of the switch JFET, and a gate electrode coupled to the gate electrode of the switch JFET, wherein both rapid turn-on of the switch JFET and rapid equalization of voltages on the analog input terminal and the analog output terminal to within a predetermined minute voltage difference are achieved.

5,091,658

CIRCUIT CONFIGURATION FOR NOISE SIGNAL COMPENSATION

Wolfgang Pribyl, Graz, Austria, and Johann Harter, Reichertshausen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

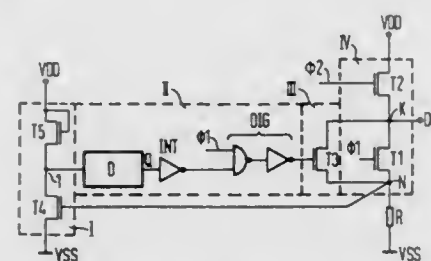
Filed Nov. 16, 1989, Ser. No. 438,333

Claims priority, application European Pat. Off., Nov. 17, 1988, 88119151.4

Int. Cl.⁵ H03K 17/16; H03B 1/00

U.S. Cl. 307—443

9 Claims



1. Circuit configuration for compensating for noise signals occurring in a component circuit of an integrated semiconductor circuit, comprising:
- a sensor circuit for detecting and converting noise signals that occur;
 - a converter circuit connected to said sensor circuit for preparing and converting the detected noise signals into logic levels;
 - a control element connected between said converter circuit and the component circuit for controlling the flow of current in the component circuit; and
 - the flow of current in the component circuit defining a first current path, and said control element defining a second current path connected in parallel to said first current path.

5,091,659

COMPOSITE LOGIC GATE CIRCUIT WITH MEANS TO REDUCE VOLTAGE REQUIRED BY LOGIC TRANSISTORS FROM EXTERNAL SOURCE

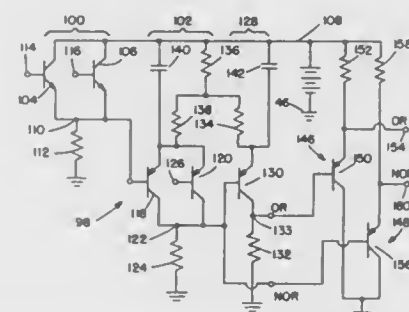
Michel S. Michail, Wappingers Falls, and James R. Struk, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1991, Ser. No. 685,859

Int. Cl.⁵ H03K 19/013, 19/0175

U.S. Cl. 307—454

10 Claims



1. A logic circuit comprising:

a first logic unit and a second logic unit which are operative upon energization by a power source, said power source having a first power-source terminal and a second power-source terminal providing a voltage where in the first terminal is positive relative to the second terminal, said first logic unit outputting a first output signal for driving said second logic unit; and

wherein said first logic unit comprises a plurality of PNP transistors and an emitter resistor shared by said PNP transistors, there being a junction of emitter terminals of said PNP transistors with said emitter resistor at a first node providing said first output signal, a terminal of said emitter resistor opposite said first node being connected to said first power-source terminal, and collector terminals of said PNP transistors being connected to said second power-source terminal;

said second logic unit comprises a plurality of NPN transistors and a collector resistor shared by said NPN transistors, there being a junction of collector terminals of said NPN transistors with said collector resistor at a second node providing a second output signal, a terminal of said collector resistor opposite said second node being connected to said first power-source terminal, and emitter terminals of said NPN transistors being connected to said second power-source terminal; and

said first node connects with a base terminal of one of said NPN transistors, a voltage drop between said first node and said second power-source terminal being greater than a voltage drop between a base terminal of said one NPN transistor and said second power-source terminal to provide continuous base current to said one NPN transistor and permitting reduction of the voltage of said power source.

5,091,660

SEMICONDUCTOR LOGIC CIRCUIT

Kimiyoichi Usami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 9, 1989, Ser. No. 391,164

Claims priority, application Japan, Aug. 9, 1988, 63-197171

Int. Cl.⁵ H03K 19/082; H01J 19/82

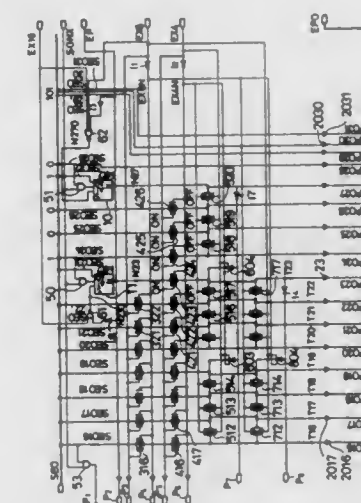
U.S. Cl. 307—463

14 Claims

1. A semiconductor logic circuit for receiving an input binary signal having a given bit length and for expanding said given bit length to an expansion bit length, said input binary signal having bits arranged in a given order of significance and having a most significant bit, said circuit comprising:

a plurality of output lines, arranged in an output line order

- corresponding to said order of significance and including a single output line arranged in a position in said output line order corresponding with said most significant bit and further including a group of said output lines arranged in positions in said output line order which are more significant than said position of said single output line;
- a plurality of semiconductor switching elements for interconnecting adjacent output lines of said group of said output lines for placing said adjacent output lines at an equal logic level;



- a common control line for receiving a control signal and providing said control signal to said switching elements for enabling said switching elements for interconnecting said adjacent output lines;
- a mode control line for receiving an expansion signal indicative of said expansion bit length; and
- a buffer circuit, connected to said mode control line for receiving said expansion signal, including an additional semiconductor switching element enabled by said control signal for connecting one output line of said group of said output lines with said single output line arranged in said position corresponding with said most significant bit.

5,091,661

METHODS AND APPARATUS FOR REDUCING COUPLING NOISE IN PROGRAMMABLE LOGIC DEVICES

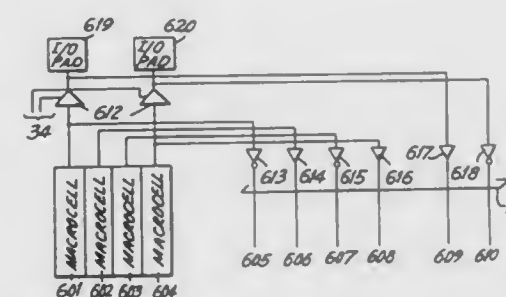
David Chiang, Saratoga, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Sep. 24, 1990, Ser. No. 587,075

Int. Cl.⁵ H03R 19/177

U.S. Cl. 307—465

13 Claims



1. A programmable logic device comprising:

a plurality of input conductors, each of which crosses a plurality of output conductors so that a signal applied to any one of said input conductors can be communicated

- unintentionally to any one of said output conductors by parasitic transmission media;
- a plurality of sources for generating a set of logical input signals, said set of logical input signals being classified into a group of logical input signals to be inverted and a group of remaining logical input signals;
- means for providing the logical states of said output conductors and the complement of the logical states of said output conductors for subsequent processing in said programmable logical device;
- means for inverting the logical state of said group of logical input signals to be inverted to produce a group of inverted logical input signals; and
- means for applying said group of inverted logical input signals and said group of remaining logical input signals to said input conductors so that, when some or all of said logical input signals change simultaneously to the same state, the effect of said logical input signals communicated unintentionally to said output conductors is reduced.

5,091,662

HIGH-SPEED LOW-POWER SUPPLY-INDEPENDENT TTL COMPATIBLE INPUT BUFFER

Henry T-H Yung, and William R. Krenik, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

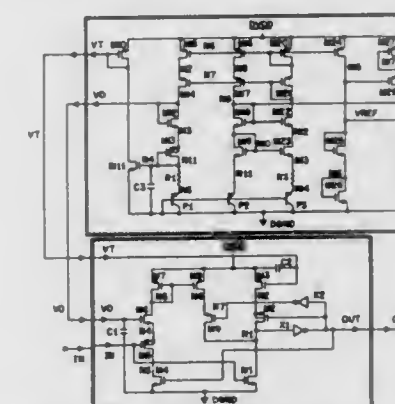
Continuation of Ser. No. 355,939, May 23, 1989, abandoned.

This application Feb. 21, 1991, Ser. No. 657,984

Int. Cl.⁵ H03K 19/0175

U.S. Cl. 307—475

24 Claims



1. A CMOS TTL compatible input buffer having an input node and an output node, comprising:

- a current source;
- a first switch device coupled between the current source and a reference node, the first switch device being responsive to the voltage level of the output node for changing from a first to a second state, said output node being responsive to the voltage at said reference node;
- a circuit connected to the current source for supplying a trip voltage level to the current source;
- a second switch device coupled between the reference node and ground, the second switch device being responsive to the voltage level of the input node, being in a first state when the voltage level is above the trip voltage level and a second state when the voltage level is below the trip voltage level;
- a current supply circuit coupled to the reference node for selectively injecting current into the reference node, the current supply circuit injecting current during a predetermined time period after the voltage level at the input node changes from a high level to a low level; and
- a control circuit coupled to the current supply circuit for limiting current flow from the current supply circuit into the reference node, the control circuit limiting the current flow when the voltage level at the input node is outside a

predetermined range and enabling current flow when the voltage level at the input node is inside the predetermined voltage range.

5,091,663

MESFET DIFFERENTIAL AMPLIFIER

Naoko Ishizaki, Urayasu, and Atsushi Kameyama, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

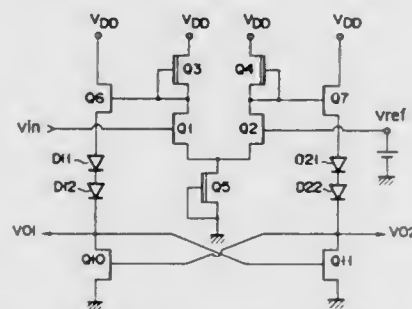
Filed Feb. 8, 1991, Ser. No. 653,071

Claims priority, application Japan, Feb. 9, 1990, 2-28151

Int. Cl.⁵ H03F 3/45, 3/16

U.S. Cl. 307—530

24 Claims



1. A differential amplifier comprising: first and second normally off type MOSFETs which constitute a differential switching stage, sources of which are commonly connected to a current source, and gates of which are applied with a signal input potential and a reference potential, respectively; third and fourth normally on type MESFETs connected as loads between said first MOSFET and a voltage source and between said second MOSFET and the voltage source, respectively; fifth and sixth normally off type MESFETs gates of which are connected to the drains of said first and second MESFETs, respectively, and drains of which are connected to the voltage source; and seventh and eighth MESFETs drains of which are connected to sources of the fifth and sixth MESFETs and output first and second output potentials and gates of which are applied with potentials having levels corresponding to said second and first output potentials, respectively.

5,091,664

INSULATED GATE BIPOLAR TRANSISTOR CIRCUIT WITH OVERCURRENT PROTECTION

Shoichi Furuhata, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

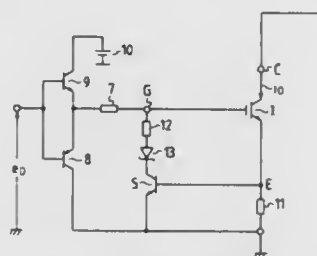
Filed Feb. 22, 1990, Ser. No. 482,896

Claims priority, application Japan, Apr. 7, 1989, 1-89035

Int. Cl.⁵ H03K 17/08, 17/28

U.S. Cl. 307—570

6 Claims



1. A semiconductor device comprising: an insulated gate main semiconductor element having a gate, a collector and an emitter; an auxiliary semiconductor element having a base con-

nected to the main semiconductor element emitter, a collector and an emitter; a voltage-dropping semiconductor element connected between the main semiconductor element gate and the auxiliary semiconductor element gate and the auxiliary semiconductor element collector; and resistive means, responsive to a predetermined main semiconductor element emitter current, for applying a control voltage across the base and the emitter of the auxiliary semiconductor element.

5,091,665

LINEAR MOTORS

Hugh-Peter G. Kelly, 66 Westleigh Avenue, Leigh-On-Sea, Essex, United Kingdom

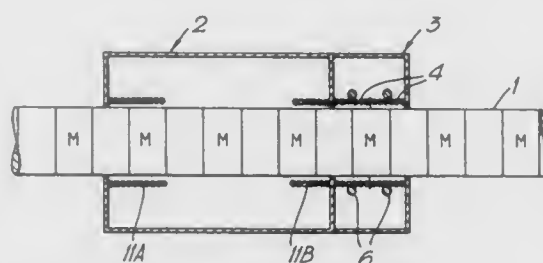
Filed Sep. 5, 1990, Ser. No. 577,570

Claims priority, application United Kingdom, Sep. 5, 1989, 8920013

Int. Cl.⁵ H02K 41/00

U.S. Cl. 310—12

9 Claims



7. A linear motor comprising: first and second members movable relative to one another, at an arbitrary relative speed, at least within a predetermined range, the first and second members having respective sets of magnetic flux generators for producing magnetic fields which interact to produce thrust causing a relative movement of the first and second members, the flux generators of the second member being coils; and a field-sensing coil arrangement movable with the second member for providing an emf substantially proportional to the relative speed of the first and second members to control circuitry for regulating the relative speed of the first and second members by control of energization of said coils, the field sensing coil arrangement comprising a plurality of coils, electrically separate from the coils of the flux generators of the second member, for sensing the magnetic fields produced by the flux generators of the first member to produce said thrust, the coils being distributed along a length of the second member such that in any arbitrary position of the two members within said range of relative movement at least one such field-sensing coil is capable of producing an emf substantially proportional to the relative speed of the first and second members, regardless of an output of the other field sensing coil or coils.

5,091,666

STATOR COOLING SYSTEM FOR ELECTRICAL MACHINERY

Emil Jarczyński, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 15, 1990, Ser. No. 539,829

Int. Cl.⁵ H02K 9/00

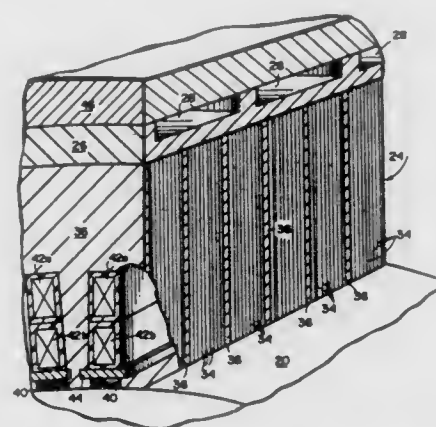
U.S. Cl. 310—54

34 Claims

16. An electrical power generator comprising: a rotor; a stator surrounding said rotor and having an electromagnetic core composed of a plurality of magnetic core laminations coaxially stacked adjacent to one another, and cooling means operatively associated with said stator for

dissipating heat therefrom, wherein said cooling means includes;

- (i) a number of solid thermal conducting laminations coaxially interspersed between predetermined pairs of said magnetic core laminations, said thermal conducting laminations having a thermal conductance that establishes preferential solid radial thermal conducting paths;



- (ii) a thermal collector sleeve surrounding said solid thermal conducting laminations in thermally conducting communication therewith, said thermal collector sleeve defining coolant ports through which a coolant fluid may circulate so as to remove heat therefrom.

5,091,667

D.C. MACHINE OF TYPE HAVING PERMANENT MAGNETS WITH AUXILIARY POLES

Toshio Tomite, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of Japan

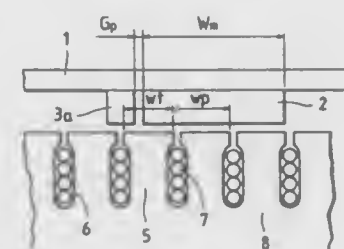
Filed Jun. 28, 1990, Ser. No. 544,943

Claims priority, application Japan, Jul. 1, 1989, 1-170375; Sep. 16, 1989, 1-240311

Int. Cl.⁵ H02K 23/04

U.S. Cl. 310—154

10 Claims



1. A D.C. machine comprising a cylindrical yoke; a plurality of field poles each mounted on an inner side of said cylindrical yoke, and including a permanent magnet and an auxiliary pole juxtaposed on an inner surface of said cylindrical yoke in a circumferential direction, said auxiliary pole being made of magnetic material exhibiting a reversible permeability higher than that of said permanent magnet and located on a side of said permanent magnet in which magnetic flux is increased by armature reaction; an armature having an armature core arranged in said cylindrical yoke so as to face inner peripheral surfaces at its outer peripheral surface with a predetermined gap therebetween, characterized by a structure which satisfies a condition that an inner peripheral width W_a of said auxiliary pole with a circumferential gap G_p defined between said permanent magnet and said auxiliary pole is equal to or greater than a distal end width W_t of each of teeth of

said armature core and equal to or less than double a distal end width W_s of a slot of said armature core, plus said distal end width W_t of each of said teeth ($W_t \leq W_a + G_p \leq 2 W_s + W_t$).

5,091,668

MOTOR HAVING FLUX-CONCENTRATING PERMANENT MAGNETS

Alain Cuenot, and Bouziane Bendahmane, both of Dijon, France, assignors to GEC ALSTHOM SA, Paris, France

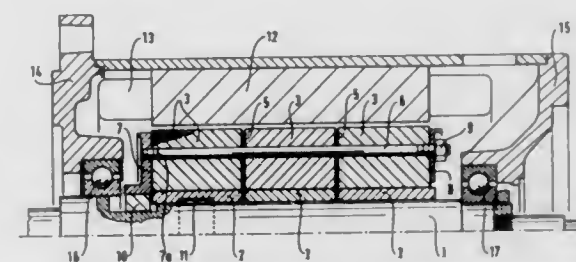
Filed Dec. 10, 1990, Ser. No. 625,192

Claims priority, application France, Dec. 8, 1989, 8916251

Int. Cl.⁵ H02K 21/12

U.S. Cl. 310—156

8 Claims



1. In a motor comprising flux-concentrating permanent magnets, a stator with windings and a rotor comprising a shaft, a sleeve surrounding the shaft, holding rotor laminations and said permanent magnets being supported by said rotor laminations, the improvement wherein said sleeve is constituted by a plurality of axially aligned unitary sleeves (2) abutting and separated by disks (5), and tie bars (6) connected to at least one end cheek plate (7) fixed to the shaft (1) clamping the sleeves and disks together.

5,091,669

SURFACE ACOUSTIC WAVE CONVOLVER

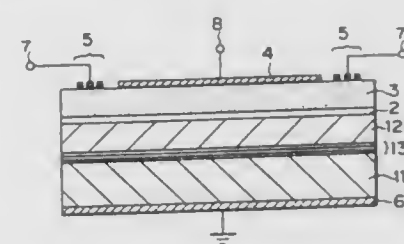
Syuichi Mitsutsuka, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 23, 1991, Ser. No. 704,328

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—313 A

20 Claims



1. A surface acoustic wave convolver comprising: a high impurity concentration Si substrate; a GaAs epitaxial layer formed on said substrate; a piezoelectric film formed on said GaAs epitaxial layer; and input transducers and an output gate formed in contact with said piezoelectric film.

5,091,670

ULTRASONIC MOTOR

Masayuki Kawata; Fujio Ozawa; Masao Kasuga; Minako Suzuki, and Takako Shibayama, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

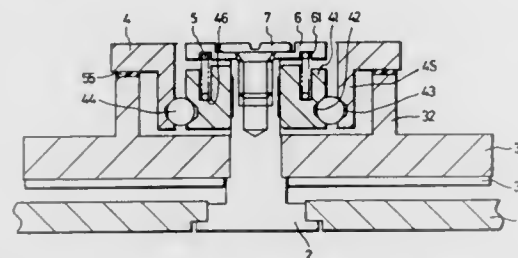
Filed Jun. 13, 1990, Ser. No. 537,358

Claims priority, application Japan, Jun. 19, 1989, 1-71908[U]; Jan. 22, 1990, 2-13031; Apr. 4, 1990, 2-36669[U]

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—323

21 Claims



1. An ultrasonic motor utilizing flexural travelling waves generated in a vibration member for rotating a rotor comprising:

- fixturing means for fixing said ultrasonic motor to a supporting means;
- a vibration member having amplifying projections for generating travelling waves;
- a piezoelectric element adhered to said vibration member;
- a rotor rotatably disposed in frictional contact with the amplifying projections of said vibration member;
- a pressure-regulator including a coil spring for generating suitable contact pressure between said rotor and said vibration member; and
- a ball bearing positioned inside of said amplifying projections, the ball bearing comprising an inner ring rotatably supported by said supporting means and having a groove for receiving said coil spring, an outer ring fixed to said rotor, and balls provided between said inner ring and said outer ring.

5,091,671

PIEZOELECTRIC OSCILLATOR

Ryuhei Yoshida, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

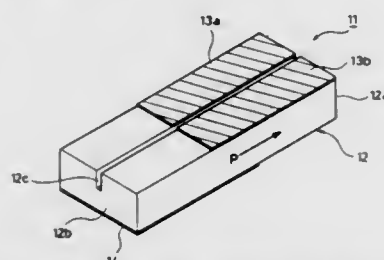
Filed Sep. 20, 1990, Ser. No. 585,481

Claims priority, application Japan, Sep. 20, 1989, 1-244133

Int. Cl.⁵ H01L 41/08

U.S. Cl. 310—358

7 Claims



1. A piezoelectric oscillator utilizing the thickness shear vibration mode of a piezoelectric plate, comprising:

- a piezoelectric plate subjected to polarization processing in substantially one direction parallel to its major surfaces;
- a pair of divided electrodes formed on one of the major surfaces of said piezoelectric plate so as to extend from one end surface of the piezoelectric plate to the central region thereof, said electrodes being separated by a groove formed in one and only one of the major surfaces of said piezoelectric plate, and not extending to the other major surface, and said groove extending over the full

length of said piezoelectric plate from said one end surface to the other end surface; and

a common electrode formed on the other major surface of said piezoelectric plate so as to extend from said other end surface of the piezoelectric plate to the central region thereof and so as to be opposed to said pair of divided electrodes through the piezoelectric plate in the central region of the piezoelectric plate.

5,091,672

SHIELD FOR ALIGNING A GROUND ELECTRODE OF A SPARK PLUG IN A CYLINDER HEAD

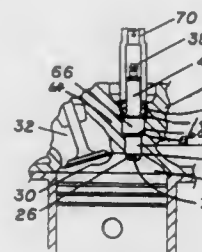
Matthew B. Below, Findlay, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 26, 1990, Ser. No. 543,917

Int. Cl.⁵ H01T 13/08, 13/00; F02P 13/00

U.S. Cl. 313—143

6 Claims



1. A spark plug located in an opening in a head in a combustion chamber of an internal combustion engine, comprising:

- a center electrode having a solid cylindrical body with a tip and a terminal;
- an insulator surrounding said center electrode having a substantially cylindrical body with at least first, second and third diameter sections separated by first and second shoulders;
- a shield surrounding said insulator having a sleeve member with a first annular section separated from a second annular section by a frustoconical section and a base section, said first annular section having a flange that engages said first shoulder on said insulator and said frustoconical section engaging said second shoulder to position said base section at a fixed dimension from said tip of the center electrode, said base section forming a ground electrode, said shield having a radial projection located in a slot in the head to fix the location and position of said base section within the combustion chamber; and
- an end nut surrounding said first diameter of said insulator having threads that are matched with threads in said opening of the head, said end nut engaging said flange to bring and hold said frustoconical section of said shield into engagement with said head to establish an electrical ground between said shield and head while at the same time sealing said combustion chamber from the surrounding environment.

5,091,673

COLOR CATHODE RAY TUBE APPARATUS

Taketoshi Shimoma, Isesaki; Eiji Kamohara, Fukaya; Shigeru Sugawara, Saltama, and Jiro Shimokobe, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1989, Ser. No. 413,547

Claims priority, application Japan, Sep. 28, 1988, 63-240809; Oct. 17, 1988, 63-259392

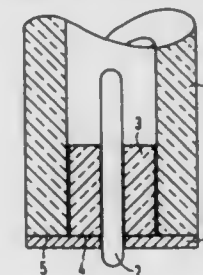
Int. Cl.⁵ H01J 29/51

U.S. Cl. 313—412

18 Claims

- 1. A color cathode ray tube apparatus comprising:
- a vacuum envelope including a panel section, a funnel section, and a neck section, the panel section having a rectangular face plate which has an inner surface, and having a skirt extending from a peripheral edge of the face plate,

- the neck section being formed in a cylindrical shape, the funnel section being continuous with the neck section;
- a phosphor screen formed on the inner surface of the face plate;
- a shadow mask arranged inside the panel section, facing the phosphor screen;
- an in-line electron gun assembly housed in the neck section, the assembly having an electron beam forming unit for generating, controlling, and accelerating three electron beams, including one central electron beam and two outside electron beams having central axes, and a main electron lens unit for converging and focusing the three electron beams; and
- a deflecting device for vertically and horizontally deflecting the electron beams emitted from the electron gun assembly, wherein:



only the end face of the glass tube being substantially covered by a layer of glass solder.

5,091,675

FLASHBULB HAVING HARD GLASS CONTAINING EMITTER SUBSTANCES

Ingo Duenisch, Taunusstein, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany

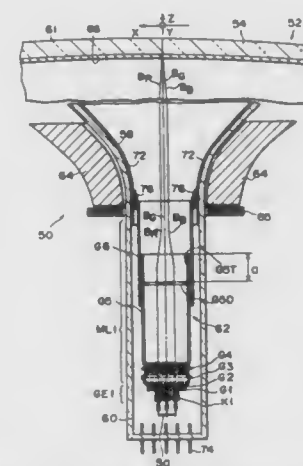
Filed Mar. 23, 1990, Ser. No. 497,926

Claims priority, application European Pat. Off., Apr. 14, 1989, 8910660.7

Int. Cl.⁵ H01J 17/16

U.S. Cl. 313—636

17 Claims



the main electron lens unit includes a large-aperture electron lens serving the three electron beams in common, and individual electron lenses comprising one central electron lens and two outside electron lenses, the central and outside lenses serving, respectively, the central and outside electron beams whereby the large-aperture lens causes a first aberration when the outside electron beams pass therethrough, and the outside lenses cause a second aberration which cancels the first aberration within a region of the large-aperture electron lens,

the respective central axes of the three electron beams incident on the large-aperture electron lens are parallel to one another, and

means is provided on the side of the electron beam forming unit closest to the large-aperture lens, for forming the three electron beams diffusing more strongly in the horizontal direction than in the vertical direction.

5,091,676

Patent Not Issued For This Number

5,091,677

LIGHTING CONTROL SYSTEM FOR PINBALL GAMES

Charles R. Bleich; Mark Coldebella, and Lawrence E. DeMar, all of Chicago, Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.

Filed Feb. 11, 1991, Ser. No. 653,305

Int. Cl.⁵ H05B 41/36

U.S. Cl. 315—360

7 Claims

1. An interactive lighting control system for pinball games of the type having an inclined playfield and a backbox, including:

- a) a lighting board having at least one lighting string including a plurality of lamps connected in parallel for illuminating said playfield or said backbox;
- b) an a.c. power supply for providing power to the lighting board for energizing each associated lighting string;
- c) means for detecting the zero-crossing point of said a.c. power supply and for generating a control signal when zero-crossing occurs;
- d) means for switching said a.c. power to said lighting strings at selected times relative to said zero-crossing point,

5,091,674

GAS DISCHARGE LAMP WITH GLASS TUBE AND SEAL MEMBERS

Josef Zimlich; Ingo Duenisch, both of Taunusstein, and Eugen Achter, Trebur, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 527,430, May 23, 1990, abandoned.

This application Jul. 15, 1991, Ser. No. 729,990

Claims priority, application European Pat. Off., Jun. 6, 1989, 89110243.6

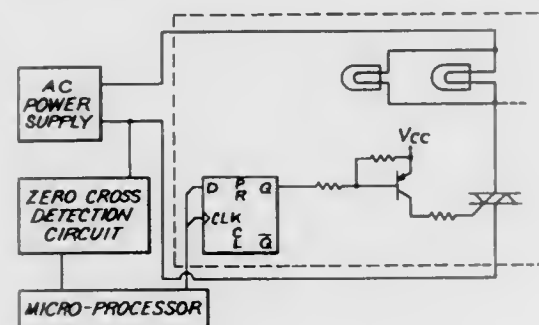
Int. Cl.⁵ H01J 61/30, 61/36

U.S. Cl. 313—625

2 Claims

1. A gas discharge lamp comprising a gas-filled glass tube into which two electrodes project from respective end faces thereof, each electrode being melted into a hollow-cylinder-type glass member which is matchingly inserted inside the glass tube such that each hollow-cylinder-type glass member provides an accurate centering of the respective electrode in the glass tube, an outside end face of each glass member being

e) a microprocessor for receiving said control signal and for controlling said switching means to vary the length of time power is applied to said light board, said micro-



processor including means for determining the duration of game inactivity and adjusting the intensity of the lighting string in response thereto.

5,091,678

TABLE LAMP CONTROLLING DEVICE

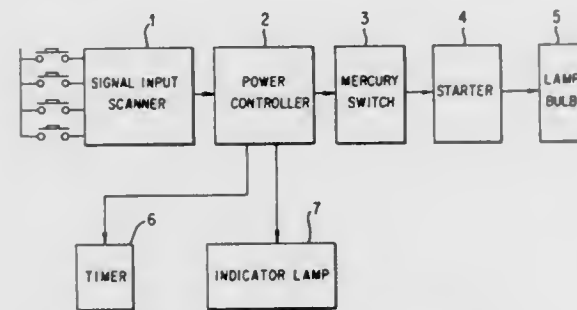
Chen Chin-Song, No. Lin 7, Alley 6, Lane 180, Pin Chiang St., Taipei, Taiwan

Filed Aug. 1, 1990, Ser. No. 561,435

Int. Cl.³ H05B 41/18

U.S. Cl. 315-362

11 Claims



1. A table lamp controlling device, comprising:
a scanner for detecting a control signal input through a signal input control panel;
a power controller controlled by said scanner to provide a lamp intensity signal output;
a lamp power supply connected to said power controller through a mercury switch attached to said table lamp to control the intensity of light of a table lamp connected thereto in response to said lamp intensity signal output from said power controller;
a timer connected to said power controller to automatically clear said lamp intensity signal output from said power controller upon expiration of a predetermined time period;
an indicator lamp connected to said power controller, said indicator lamp turned on in response to clearance of the lamp intensity signal output from said power controller;
wherein said mercury switch is normally connected to permit said lamp intensity signal output from said power controller to pass therethrough to drive said lamp power supply to turn on said table lamp; and
wherein said mercury switch is switched off when said table lamp falls from its standing position, to interrupt said lamp intensity signal from being received by said lamp power supply so as to turn off said lamp power supply.

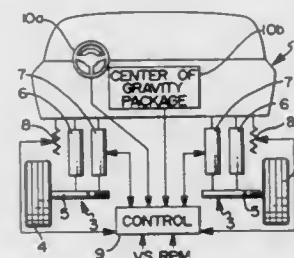
5,091,679
ACTIVE VEHICLE SUSPENSION WITH BRUSHLESS DYNAMOELECTRIC ACTUATOR

Balarama V. Murty, Sterling Heights, and Rassem R. Henry, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 540,989, Jun. 20, 1990, abandoned. This application Jun. 18, 1991, Ser. No. 717,425
Int. Cl.³ B60K 16/00

U.S. Cl. 318-153

7 Claims



1. A suspension for a vehicle having an electric power source and a sprung mass suspended on a plurality of unsprung masses, each unsprung mass being connected to the sprung mass through an actuator comprising a rotary brushless dynamoelectric machine having a rotor engaged with a rotary/linear motion converter for conversion between dynamoelectric machine torque and linear actuator force, the dynamoelectric machines being connected with each other for electrical power through a common supply bus, each actuator further comprising a dynamoelectric machine control effective to apply current from the electric power source to the dynamoelectric machine through the common supply bus in response to an input control signal to produce a desired actuator force providing motoring or generating action by the dynamoelectric machine, the common supply bus permitting one of the dynamoelectric machines in generating action to provide electric power directly through the common supply bus to another of the dynamoelectric machines in motoring action.

5,091,680

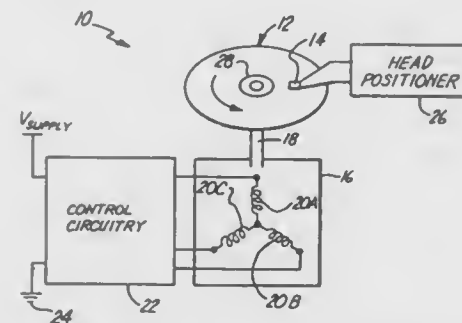
MOTOR BRAKE CIRCUIT FOR MAGNETIC DISK DRIVE SYSTEM

William A. Palm, Minnetonka, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 475,704, Feb. 6, 1990, abandoned. This application Apr. 23, 1991, Ser. No. 679,917
Int. Cl.³ H02P 3/00

U.S. Cl. 318-368

8 Claims



1. An apparatus for braking a storage disk of a storage system which includes spindle drive motor having a coil, wherein the storage system includes a head, and wherein the storage disk rotates at a rate of rotation, the apparatus comprising:
a spindle drive shaft coupled to the disk and the coil, wherein the coil induces the spindle drive shaft to rotate; coil drive means coupled to the coil for selectively providing

power to the coil by periodically electrically connecting the coil to a power source which thereby cause the spindle drive shaft to rotate;

controller means for selectively supplying a control signal to the coil drive means which energizes the coil drive means and selectively couples the coil drive means to the power source;

means for applying a brake signal to the coil drive means in response to a system power source falling below a predetermined threshold level, wherein the spindle drive shaft is dynamically braked when the brake signal is applied to the coil drive means and the threshold level is predetermined between a first and a second level the first level being representative of a maximum surge current that will not damage the coil and the second level being representative of a minimum rate of rotation of the storage disk at which the head will fly with respect to the storage disk; means for holding application of the brake signal to the coil drive means wherein the brake signal is maintained and dynamic braking of the spindle drive shaft is maintained upon loss of system power; and

means for resetting the holding means upon a return of system power, whereby application of the brake signal to the coil drive means by the means for holding is rapidly removed and the spindle drive shaft is free to rotate.

5,091,681

CRT DYNAMIC FOCUS SYSTEM HAVING INDEPENDENT CORNER ADJUSTMENT

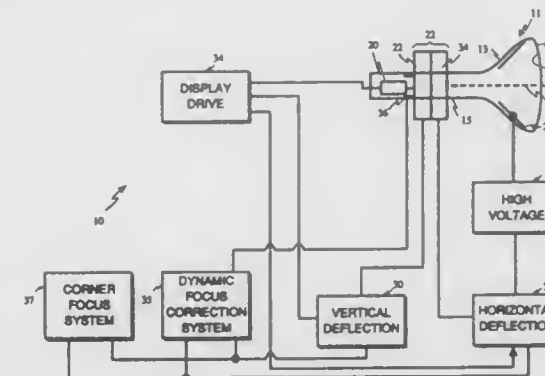
Leroy A. Sutton, Wheeling, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 30, 1990, Ser. No. 621,488

Int. Cl.³ G09G 1/04; H01J 29/58

U.S. Cl. 315-382

11 Claims



1. For use in a cathode ray tube display having a display screen, an electron beam source directed at the display screen, horizontal and vertical deflection systems for producing respective horizontal and vertical deflection signals, a horizontal and vertical deflection yoke for receiving the deflection signals and for scanning the electron beam across the screen and a focus electrode for receiving a focus signal used to focus the electron beam, a corner focus system comprising:

focus means coupled to the focus electrode for converting the horizontal and vertical deflection signals to dynamic focus correction signals;

supplemental focus means for producing supplemental horizontal deflection rate focus correcting signals having maximum effect at the beginning and end of horizontal scan;

gating means coupled to the vertical deflection system producing top and bottom gating signals corresponding to the top and bottom portions of the display screen;

top control means, responsive to said top gating signal, coupling said supplemental focus means to said focus means during the top portion of the display; and
bottom control means, responsive to said bottom gating

signal, coupling said supplemental focus means to said focus means during the bottom portion of the display.

5,091,682

SCREW ADJUSTING APPARATUS

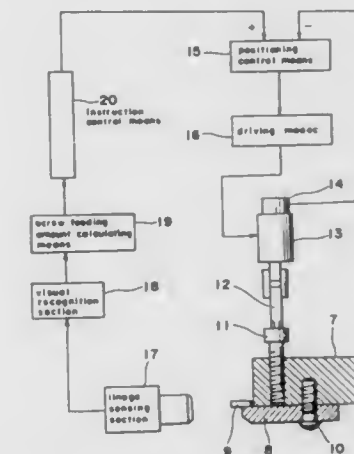
Soichi Naganuma, Neyagawa; Chihiro Nakamura, Moriguchi, and Yoshio Kanata, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 7, 1991, Ser. No. 651,620

Int. Cl.³ G05B 11/01

U.S. Cl. 318-560

1 Claim



1. A screw adjusting apparatus comprises:
a positioning control means for outputting rotation instructions to a designated position based on a rotation detection signal;
an image sensing section;
a visual recognition section for processing a video signal outputted from the image sensing section so as to measure position of an object;
screw feeding amount calculating means for calculating a feeding amount of a screw so as to place the object at a predetermined position according to position information outputted from the visual recognition section and the information of the object which has been moved by contact between the screw and a tool; and
instruction control means for issuing instructions to the positioning control means based on a calculated feeding amount of the screw.

5,091,683

SERVO CONTROL APPARATUS

Akira Shimada, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Sep. 10, 1990, Ser. No. 580,642

Claims priority, application Japan, Sep. 20, 1989, 1-244048

Int. Cl.³ G05B 13/00

U.S. Cl. 318-561

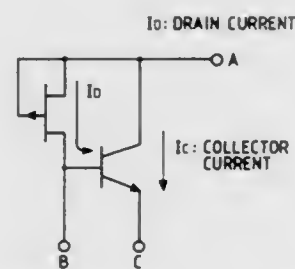
7 Claims

1. A servo control apparatus for controlling an object according to a target position signal and for driving the object by a drive torque signal, comprising:

an observer receptive of the drive torque signal and a detected position signal of the object for observing a disturbance torque applied to the object;

means for producing an error command signal dependent on the observed disturbance torque; and

a junction type field effect transistor comprising a channel forming region; and



a bipolar transistor comprising a base region, said channel forming region and said base region being common to each other.

5,091,690

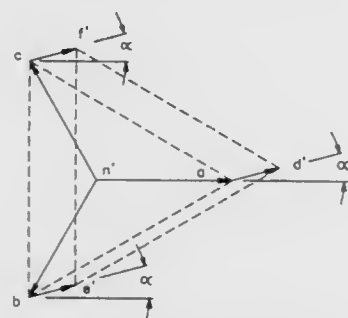
METHOD FOR MONITORING OPERATIONAL CONDITION OF CIRCUIT COMPONENTS

Michael J. D'Antonio, Salem; Irving A. Gibbs, Roanoke; Lawrence J. Lane, Salem, and Rodney A. Lawson, Fincastle, all of Va., assignors to General Electric Company, Salem, Va. Division of Ser. No. 411,977, Sep. 25, 1989, Pat. No. 4,996,519. This application Nov. 15, 1990, Ser. No. 614,177

Int. Cl.⁵ G01P 11/24

U.S. Cl. 324—107

2 Claims



1. A method of monitoring the operational status of circuit components in a polyphase electrical system operating on line-to-line voltages comprising the steps:

- generating a plurality of voltage signals respectively representing neutral-to-line voltages of said system;
- vectorially adding to each of said voltage signals an identical signal whereby there results a corresponding plurality of modified signals representing neutral-to-line voltages but no modification in line-to-line voltages and voltage representations thereof; and,
- examining said modified signal to determine the operational status the circuit components.

5,091,691

APPARATUS FOR MAKING SURFACE PHOTOVOLTAGE MEASUREMENTS OF A SEMICONDUCTOR

Emil Kamieniecki, Lexington; William C. Goldfarb, Melrose, and Michael Wollowitz, Cambridge, all of Mass., assignors to Semitest, Inc., Billerica, Mass.

Continuation-in-part of Ser. No. 171,677, Mar. 21, 1988, Pat. No. 4,891,584. This application Dec. 7, 1988, Ser. No. 280,973. The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.

Int. Cl.⁵ G01R 31/26; H01L 31/00

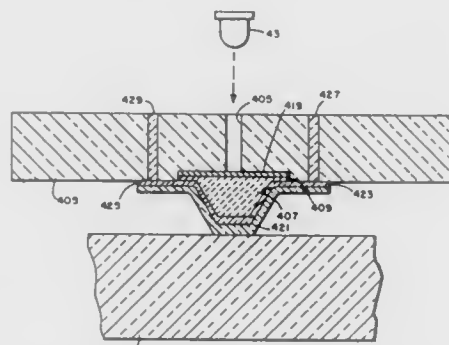
U.S. Cl. 324—158 R

19 Claims

17. A reference electrode assembly for use in an apparatus for making surface photovoltage measurements of a specimen

of semiconductor material, said reference electrode assembly comprising:

- a flat rigid plate, made of nonconductive material and having a hole through which light can pass,
- a button made of flexible deformable transparent insulating material fixedly mounted on said flat rigid plate,
- a flat rigid disc of transparent material disposed between said flat rigid plate and said button and extending over said hole in said flat rigid plate,



- a film of transparent insulating material mounted on said button,
- a first coating of conductive material on said film between said film and said button, said first coating of conductive material being transparent and constituting a reference electrode, and
- a second coating of conductive material on said film between said film and said button and electrically separated from said first coating, said second coating constituting a guard electrode.

5,091,692

PROBING TEST DEVICE

Akira Ohno, Yamanashi; Tetsuo Ohtsuka, Kawasaki, and Naotaka Matsumoto, Tama, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

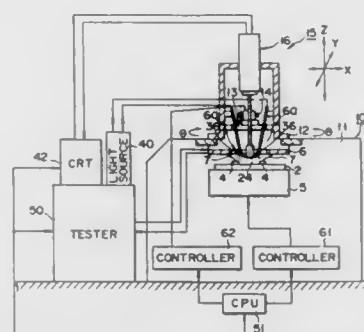
Filed Dec. 31, 1990, Ser. No. 636,094

Claims priority, application Japan, Jan. 11, 1990, 2-4879

Int. Cl.⁵ G01R 1/02

U.S. Cl. 324—158 F

13 Claims



3. The probing test device according to claim 1, wherein said lighting-up and reflected-light detecting means are introduced near to the tested object through the center of an opening of a probe card which are provided with the probes.

5,091,693

DUAL-SIDED TEST HEAD HAVING FLOATING CONTACT SURFACES

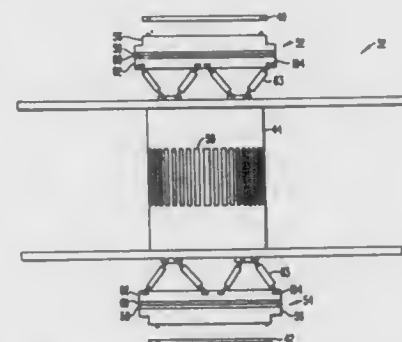
Tommie Berry, Morgan Hill; Larry Delaney, Fremont, and Rudy H. Staffebach, Santa Clara, all of Calif., assignors to Schlumberger Technologies, Inc., San Jose, Calif.

Filed Jul. 13, 1990, Ser. No. 553,202

Int. Cl.⁵ G01R 31/02, 1/73

U.S. Cl. 324—158 F

20 Claims



11. A dual-sided test head for an integrated circuit test system which tests an integrated circuit device coupled to a load board, the test head comprising:

- a first contactor at a first side of said test head for providing an electrical interface to a first load board and a second contactor at a second side of said test head providing an electrical interface to a second load board;
- means supporting one of the first or second contactors for enabling said one contactor freedom of motion to move with plural degrees of freedom so as to move within an initial plane defined by said one contactor relative to the test head, and to move out of said initial plane; and
- means for simultaneously holding said first and second contactors to said first and second load boards, respectively.

5,091,694

QUARTZ PROBE APPARATUS

Towl Ikeda, Kofu, and Hisashi Koike, Yamanashi, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

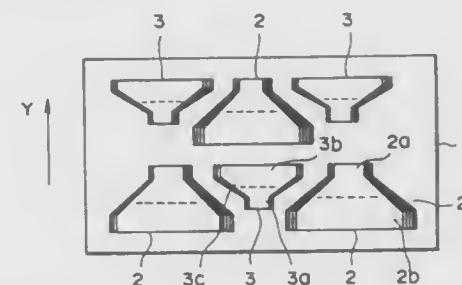
Filed Jan. 30, 1990, Ser. No. 472,228

Claims priority, application Japan, Jan. 31, 1989, 1-22085; May 15, 1989, 1-121076; Aug. 21, 1989, 1-214464; Oct. 5, 1989, 1-261007; Nov. 16, 1989, 1-297990

Int. Cl.⁵ G01R 1/02, 1/067

U.S. Cl. 324—158 P

11 Claims



1. A quartz probe apparatus comprising:

- a plurality of quartz probe bodies integrally formed from one quartz plate by etching a Z-plane of said quartz plate perpendicular to the crystal axis Z thereof, each quartz probe body incorporating a microprobe portion including:
- a number of microprobes corresponding to electrode arrays of an object of examination;
- a pattern wiring portion connected with the microprobe portion;

an electrode pad portion connected with the pattern wiring portion; and

a metal pattern layer formed on each side of each quartz probe body;

wherein said quartz plate serves as a substrate for said quartz probe bodies during testing of said object of examination.

5,091,695

ELECTRONIC METER FOR DETERMINING ENGINE SPEED IN DISTRIBUTORLESS IGNITION SYSTEM ENGINES AND CONVENTIONAL FOUR STROKE ENGINES

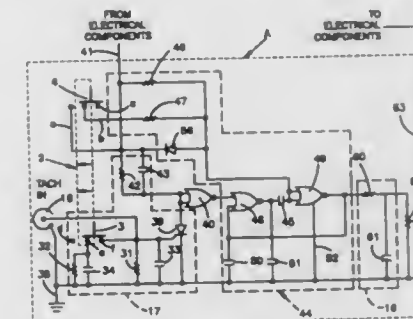
Alexander Shaland, Lyndhurst, Ohio, assignor to Actron Manufacturing Co., Cleveland, Ohio

Filed Oct. 1, 1990, Ser. No. 591,069

Int. Cl.⁵ G01P 3/54

U.S. Cl. 324—170

13 Claims



1. An electrical meter for measuring the speed of an engine, comprising:

- means to sense the current level in a spark plug lead from the engine,
- means to apply a voltage pulse of a selected duration to an integrating circuit when said current level increases above a selected threshold level, and
- means to scale the voltage in said integrating circuit and display the scaled voltage on said electronic meter as a value of engine speed,
- said electronic meter including a switch means for lowering said threshold level when said switch means is in a first position, and for increasing said threshold level when said switch means is in a second position.

5,091,696

METALLIC COATING MEASURING METHOD AND APPARATUS

Peter P. Roosen, 3560 Allsop Road, Nanaimo, British Columbia, Canada V9R 5K3

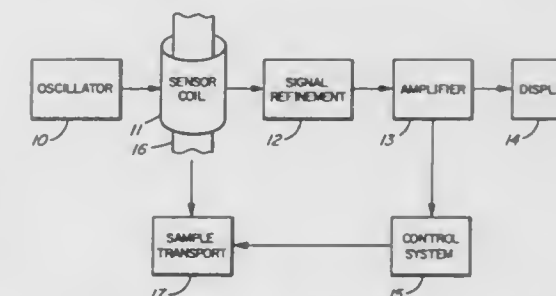
Filed Aug. 2, 1990, Ser. No. 561,617

Claims priority, application Canada, Aug. 9, 1989, 607963

Int. Cl.⁵ G01B 7/10; G01R 33/12

U.S. Cl. 324—229

10 Claims



1. A method of determining the thickness of a coating on a

coated metallic substrate comprising the steps of applying a high A.C. frequency of greater than 1 MHz to a coil, said high A.C. frequency being approximately the same as the resonant frequency of said coil and its associated tank circuit, inserting said coated substrate into said coil and measuring the impedance change of said coil upon insertion of said coated substrate.

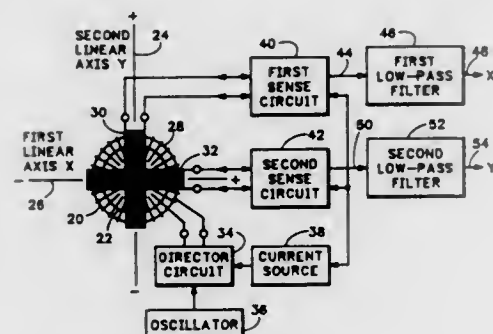
5,091,697

LOW POWER, HIGH ACCURACY MAGNETOMETER AND MAGNETIC FIELD STRENGTH MEASUREMENT METHOD

Stephen A. Roth, Aumsville, and Roar Berg-Johansen, Salem, both of Oreg., assignors to II Morrow, Inc., Portland, Oreg.
Filed Jul. 31, 1989, Ser. No. 388,579
Int. Cl.⁵ G01R 33/04; G01C 17/28

U.S. Cl. 324—253

26 Claims



1. A magnetometer, comprising:

- (a) a core of magnetic material;
- (b) drive means for periodically applying a control magnetic field to said core to saturate said core;
- (c) a first sense coil magnetically coupled to said core; and
- (d) first sense circuit means connected to said first sense coil for providing a sense signal representative of the current in said first sense coil, said first sense circuit means comprising an operational amplifier having an inverting input and an output which produces said sense signal and a feedback path from said output to said inverting input so as to render said inverting input a virtual ground, said first sense coil being connected to said inverting input.

5,091,698

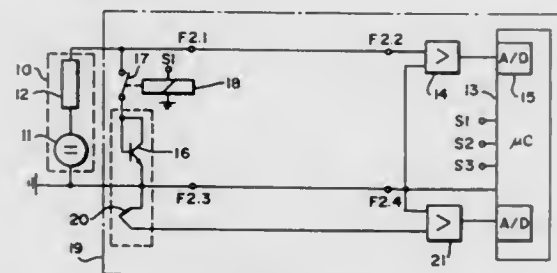
CIRCUIT FOR MEASURING THE INTERNAL RESISTANCE OF A LAMBDA PROBE

Manfred Grabs, Wiernsheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT filed Jan. 10, 1990, Ser. No. 582,866; PCT No. PCT/DE90/00068 371 Date Oct. 4, 1990, § 102(e) Date Oct. 4, 1990
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903314

Int. Cl.⁵ G01R 27/02

U.S. Cl. 324—693

8 Claims



1. A circuit for measuring the internal resistance of a lambda

probe having a probe voltage source for outputting a probe voltage, the circuit comprising:

- a junction device;
- a switch selectively movable between a first position wherein said junction device is disconnected from said probe and a second position for connecting the junction device in parallel with the probe thereby applying said junction device as a load to said probe; and,
- measuring means connected to the probe for making a first measurement of the probe voltage when said junction device is disconnected from said probe and a second measurement of the probe voltage when said junction device is connected across said probe.

5,091,699

FREQUENCY DIVISION NETWORK HAVING LOW PHASE NOISE

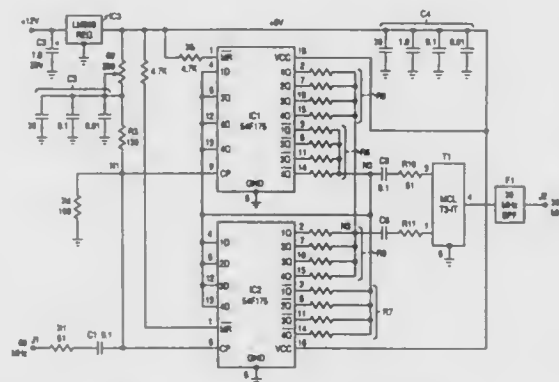
Bert K. Erickson, Fayetteville; Robert R. Greenwood, North Syracuse; Wilbert C. Kennedy, Brewerton; David W. Michel, Weedsport; David C. Allen, Camillus, and Victor J. Jacek, Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 14, 1990, Ser. No. 612,485

Int. Cl.⁵ H03K 17/16, 21/40

U.S. Cl. 328—25

14 Claims



1. A low phase noise frequency division network, for division by a factor of two, comprising:

- (A) an input terminal J1 for connection to a source of sine waves of constant frequency f and of low phase noise
- (B) an m -fold plurality of digital frequency dividers, where m is an integer greater than three, each divider comprising,
 - (1) a digital flip-flop having a digital D input, Q and \bar{Q} outputs, and a clock CLK input, said flip-flop having internal logic transferring data at said digital D input to said Q, \bar{Q} outputs in response to edges of one sense appearing at said CLK input, said transfer being subject to random timing jitter in the changes in internal logic states, independent of that in the other flip-flops, causing phase noise,
 - (2) means for coupling the \bar{Q} output of at least one flip-flop to each D input to cause the digital output states of each flip-flop to change at one-half the repetition rate of an applied periodic waveform,
 - (3) means for coupling said sine waves to said CLK inputs for all m flip-flops to cause each flip-flop to form a square wave having a repetition rate equal to one half said frequency f , each square wave being substantially in phase while subject to said independent random timing jitter,
- (C) a first common output node at which m like flip-flop outputs are connected to produce a combined square wave output in which the time of each of said output

transitions is an average of m transition times to reduce said random timing jitter and to minimize phase noise, and (D) a bandpass filter coupled to said first common output node, tuned to the frequency $f/2$ for deriving from said combined square wave output a sine wave having minimum phase noise at a frequency $f/2$.

5,091,700

AMPLIFIER WITH MAINS VOLTAGE REDUCTION

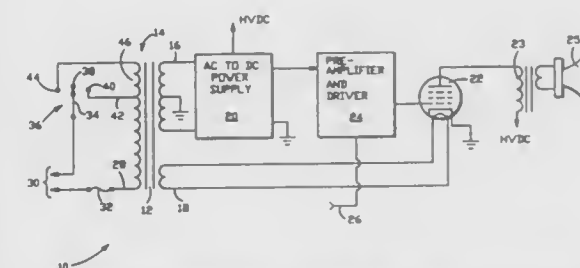
Randall C. Smith, 1317 Ross St., Petaluma, Calif. 94952

Filed Aug. 10, 1990, Ser. No. 566,148

Int. Cl.⁵ H03F 1/00

U.S. Cl. 330—128

3 Claims



1. A method for enabling a musician to reduce the power an audio power amplifier including at least one vacuum tube power output device and a reduced level, by controlling AC input voltage level of an AC to DC power supply via an input transformer having a primary winding connected to receive nominal AC voltage from the AC power mains, a high voltage secondary, and a low voltage secondary for directly supplying heater power to the vacuum tube power output device, the method comprising the steps of:

- overwinding the primary winding of the input transformer with respect to the AC voltage level of the supply mains, providing a tap in the overwound primary at a location which corresponds generally to the AC voltage level of the supply mains, and
- providing a switching means for switching between the tap corresponding to the AC voltage level of the supply mains to provide nominal full power supply to the audio power amplifier to achieve nominal sound reproduction characteristics during musical play, and the full winding of the overwound primary in order to provide a fraction of the AC voltage level of the supply mains to provide reduced power supply to the audio power amplifier to achieve altered sound reproduction characteristics during musical play.

5,091,701

HIGH EFFICIENCY CROSS-COUPLED FOLDED CASCODE CIRCUIT

James R. Butler, San Jose, Calif., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Oct. 15, 1990, Ser. No. 597,795

Int. Cl.⁵ H03F 3/45

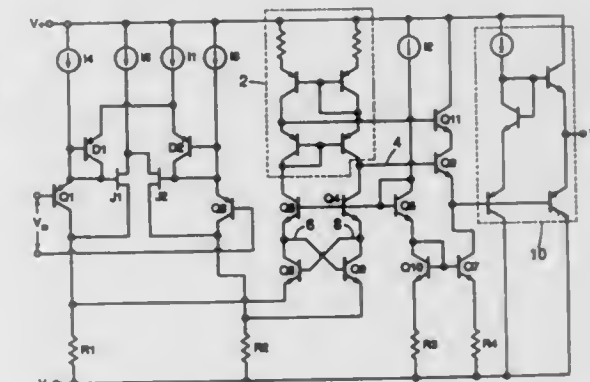
U.S. Cl. 330—252

5 Claims

- 1. A differential input circuit having:
 - a first stage comprising:
 - first and second current branches, respective load impedance in each branch, and
 - means for dividing a stage current between said first and second branches and their respective load impedances in accordance with a differential input voltage signal applied across the two branches, and
 - a second stage comprising:
 - first and second transistors connected to supply respective currents to said load impedances to compensate for changes in the branch currents, and
 - bias circuit means for said transistors,

wherein the improvement comprises:

- third and fourth transistors connected to couple the currents from said first and second transistors to the load impedances for said first and second branches, respectively, and circuit means cross-coupling said third and fourth transistors, said cross-coupled third and fourth transistors together with said cross-coupling circuit means compensating for current-induced changes in the



voltages across said first and second transistors to maintain the aggregate voltages across said first and third transistors and across said second and fourth transistors approximately constant, and thereby adjust the currents flowing from said second stage to said load impedances to maintain the total currents through said load impedances approximately constant, and approximately independent of said changes in the voltage across said first and second transistors.

5,091,702

AUTOMATIC SWEEP-TO-LOCK CIRCUIT FOR A PHASE-LOCKED LOOP

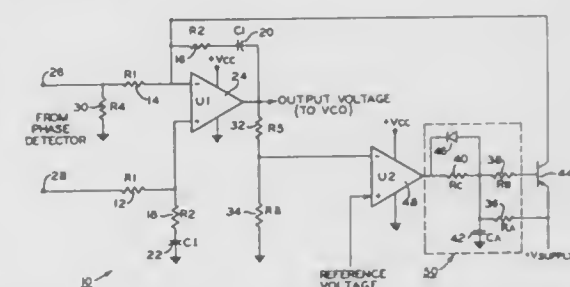
John D. Foell, Auburn, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Dec. 21, 1990, Ser. No. 631,522

Int. Cl.⁵ H03L 7/12, 7/095

U.S. Cl. 331—4

9 Claims



1. A sweep-to-lock circuit for a phase-locked loop having a voltage controlled oscillator and a phase detector, the sweep-to-lock circuit comprising:

- (a) first circuit means connected to receive an input voltage from the phase detector and to provide a sweeping output voltage to the voltage controlled oscillator;
- (b) second circuit means to cause a given condition of said input voltage;
- (c) third circuit means to determine when a desired value of said output voltage has been exceeded and to cause said output voltage to drop to a reset level in response thereto; and
- (d) fourth circuit means to prevent, for a selected interval of time, said first circuit means from providing a subsequent sweep, thereby to assure that said reset value is reached before said subsequent sweep is begun

(e) the value of said output voltage sweeping in a selected direction from the reset value to a maximum value in response to the given condition of said input voltage, thereby causing the frequency output of said voltage controlled oscillator to sweep.

5,091,703

ANALOG LINE CONNECTION

Heinrich Schenk, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

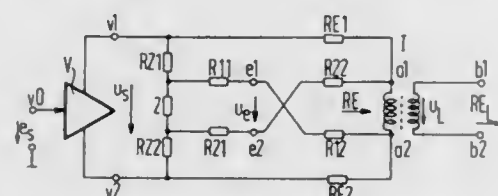
Filed Nov. 19, 1990, Ser. No. 615,162

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005644

Int. Cl.⁵ H03H 5/00; H03F 1/100

U.S. Cl. 333—24 R

8 Claims



1. In a line connection circuit of the type in which an amplifier has first and second symmetrical outputs respectively connected via first and second connecting resistors to first and second terminals of a first winding of a transformer which has a second winding connected to a transmission line, in which a first voltage divider comprises first and second divider resistors connected in series at a first connecting point for a receiver and is connected between said first output of said amplifier and said second terminal of said transformer, and in which a second voltage divider comprises third and fourth divider resistors connected in series at a second connecting point for the receiver and is connected between said second output of said amplifier and said first terminal of said transformer, the improvement therein comprising:

- a first auxiliary resistor connected between said first divider resistor and said first output of said amplifier;
- a second auxiliary resistor connected between said third divider resistor and said second output of said amplifier;
- said first divider resistor and said fourth divider resistor being of identical values; said third divider resistor and said second divider resistor being of identical values; and
- a complex impedance connected between said first and second auxiliary resistors, the impedance ratio of said complex impedance to said auxiliary resistors optimally corresponding to the ratio of the input impedance of the transmission line transformed onto the first winding of the transformer to that of the first and second connecting resistors.

5,091,704

OSCILLATOR HAVING RESONATOR COIL IMMERSED IN A LIQUID MIXTURE TO DETERMINE RELATIVE AMOUNTS OF TWO LIQUIDS

John J. C. Kopera, Rochester Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 12, 1991, Ser. No. 667,910

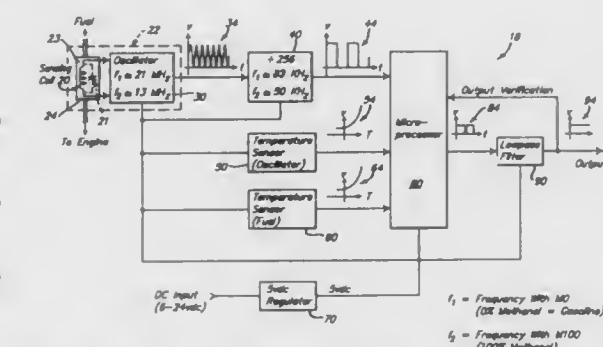
Int. Cl.⁵ H03B 5/08; G01N 27/00

U.S. Cl. 331—65

2 Claims

1. An oscillator for use in a fluid detection apparatus for determining the respective percentages of first and second liquids in a mixture disposed within a chamber, including an inductive element immersed in said mixture such that the mixture at least partially determines a value of distributed capacitance exhibited by said element when energized; where said inductive element is a coil acting as a resonant element in an oscillator, and where said oscillator is of the tuned input type such that said coil and its distributed capacitance define a parallel resonant tank circuit which generates an oscillating

signal at a resonant frequency of the tank circuit, said resonant frequency being inversely proportional related to said distributed



uted capacitance of said coil substantially in accordance with the following equation:

$$f = \frac{1}{2\pi\sqrt{LC}}$$

where "f" is the frequency of said signal, "L" is the inductance of said coil, and "C" at least includes the value of the distributed capacitance of said coil, the oscillator comprising:

- a source of electrical energy coupled to said inductive element for energizing said element so as to generate a signal having a frequency determined by said inductive element and its distributed capacitance; and
- a feedback capacitor to provide positive feedback to promote regeneration and oscillation at the resonant frequency.

5,091,705

FM MODULATOR

Yonejiro Hiramatsu, Mitaka, and Shun-ichi Satou, Kashiwa, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP90/00473, § 371 Date Dec. 5, 1990, § 102(e) Date Dec. 5, 1990, PCT Pub. No. WO90/12451, PCT Pub. Date Oct. 18, 1990

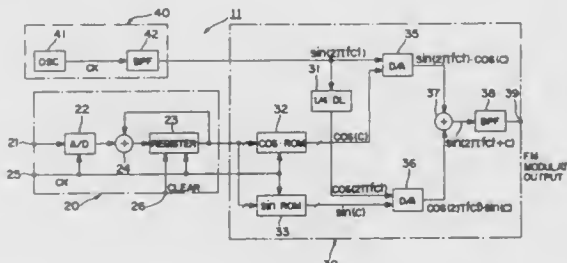
PCT Filed Apr. 6, 1990, Ser. No. 613,717

Claims priority, application Japan, Apr. 7, 1989, 1-88325; Jul. 29, 1989, 1-197775

Int. Cl.⁵ H03C 3/00

U.S. Cl. 332—103

10 Claims



1. An FM modulator for FM-modulating an integrated modulation signal by phase-modulation, comprising: integration means for converting an analog modulation signal to a digital integration output; carrier signal generating means for generating a carrier signal; and phase-modulating means for phase-modulating the output of said integration means based on said carrier signal; said phase-modulating means including, digital modulation signal outputting means for outputting

first and second digital modulation signals having phases orthogonal to each other based on the output of said integration means, carrier signal converting means for converting said carrier signal to first and second carrier signals having phases orthogonal to each other, first converting means for inputting said first digital modulation signal and said first carrier signal and for outputting an analog signal corresponding to a multiplication of the first digital modulation signal and first carrier signal, second converting means for inputting said second digital modulation signal and said second carrier signal and for outputting an analog signal corresponding to a multiplication of the second modulation signal and second carrier signal, and operation means for adding or subtracting the outputs of said first and second converting means.

5,091,706

PHASE LOCKED LOOP WITH D.C. MODULATION AND USE IN RECEIVER

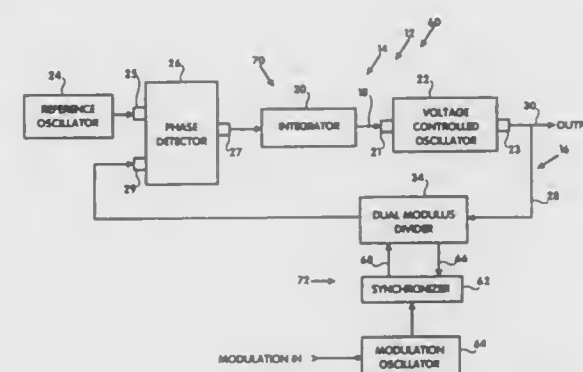
Lloyd L. Lautzenhiser, Nobel, Canada, assignor to Embiser Research Limited, Parry Sound, Canada

Filed May 24, 1990, Ser. No. 528,654

Int. Cl.⁵ H03C 3/09; H03L 7/197; H04B 1/26

U.S. Cl. 332—127

72 Claims



1. An electrical device (60, 80, 100, 140, 160, or 190) which comprises:

phase locking oscillator means (70, 90, 128, 154, 180, or 192), comprising a loop (12) with a forward path (14) that includes a comparator (26) and a variable frequency oscillator (22) that is operatively connected to said comparator, and with a feedback path (16) that feeds a feedback frequency from said variable frequency oscillator back to an input (29) of said comparator, for producing a phase locked output;

D.C. modulator means (72, 92, 130, 156, 182, or 194), being operatively connected to said feedback path, for D.C. modulating said feedback frequency; and said operative connection of said D.C. modulator means to said feedback path comprises synchronizer means (62) for synchronizing said D.C. modulating with said feedback frequency.

37. Signal processing apparatus (200) which comprises: input stage means (202) for receiving a frequency modulated input signal;

an I.F. stage (203) comprising a local mixer (214), and comprising both a local oscillator (216) and an output conductor (218) that are operatively connected to said local mixer;

phase locking oscillator means (70, 90, 128, 154, 180, or 192), comprising a loop (12) with a forward path (14) that includes a comparator (26) and a variable frequency oscillator (22), and with a feedback path (16) that feeds a feedback frequency from said variable frequency oscillator

back to an input of said comparator, for producing a phase locked output;

demodulator means (204), comprising both said I.F. stage and said phase locking oscillator means, and comprising both said I.F. stage and said phase locking oscillator means being operatively connected to said input stage means, for producing the D.C. component of said frequency modulated input signal in said output conductor; D.C. modulator means (72, 92, 130, 156, 182, or 194), comprising a modulation oscillator (64) that produces modulation frequencies, and being operatively connected to said output conductor and to said feedback path, for D.C. modulating said phase locked output in response to said D.C. component; and

said operative connection of said modulation oscillator to said feedback path comprises synchronizer means (62), being operatively connected to said modulation oscillator and to said feedback path, for synchronizing said D.C. modulating with said feedback frequency.

5,091,707

COAXIAL CABLE SHIELD FILTER

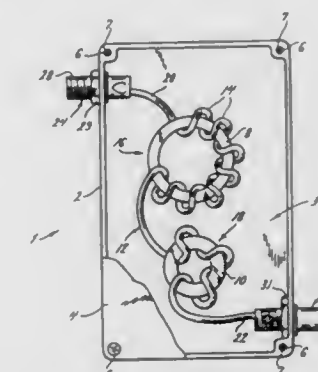
Steven M. Wollmerschauser, 10527 Wurdack, Overland, Mo. 63114, and David M. Mundy, 1912 Falcon Dr., Hanley Hills, Mo. 63133

Filed Aug. 13, 1990, Ser. No. 566,661

Int. Cl.⁵ H04B 3/28; H03H 7/00

U.S. Cl. 333—12

8 Claims



1. A coaxial cable shield filter for use in attenuating "off-air" RF signals that are picked up and conducted by coaxial cable shielding, the filter comprising:

- a housing;
 - an input connector mounted on the housing, and adapted to be connected with a coaxial cable;
 - an output connector mounted on the housing, and adapted to be connected with a coaxial cable;
 - an RF filter means in the housing interior; and
 - a conductor in the housing interior connecting the RF filter means to the input connector and the output connector, and arranged to connect the RF filter means in series with the shielding of a coaxial cable connected to the input connector and the shielding of a coaxial cable connected to the output connector;
- the RF filter means includes a first toroid secured in the housing interior, the first toroid being constructed from ferromagnetic material; and the RF filter means further includes a second toroid secured in the housing interior, the conductor being wrapped several times through the first and second toroids.

5,091,708

TRANSMISSION LINE TRANSFORMER

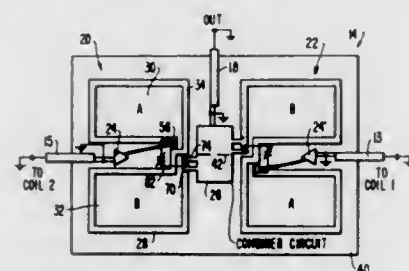
Greg W. Bezjak, Stratford, Conn., assignor to North American Phillips Corporation, New York, N.Y.

Filed Jul. 30, 1990, Ser. No. 559,811

Int. Cl.⁵ H03H 7/42

U.S. Cl. 333—26

23 Claims



1. A transmission line transformer construction comprising:
 a transmission line having at least one ground conductor, a dielectric member and a signal conducting conductor, said signal conducting conductor being spaced from the at least one ground conductor by said dielectric member, said line being formed into a first planar coil for receiving a radio frequency signal at an input thereto; and
 a second planar coil formed from said transmission line and coplanar with said first coil for outputting said signal at an output therefrom, said at least one ground and signal conducting conductors each having a first portion which forms a conductor of one coil and having a second portion which forms a conductor of the other coil, said coils being oriented, positioned and dimensioned relative to one another so that in the presence of a given magnetic field inducing a current in each coil ground conductor portion, the current induced in a first coil conductor opposes the current induced in that conductor of the second coil.

5,091,709

ELECTRICALLY SHORT AIR LINE FOR NETWORK ANALYZER CALIBRATION

Roger D. Pollard, Leeds, United Kingdom, assignor to Hewlett-Packard Company, Palo Alto, Calif.

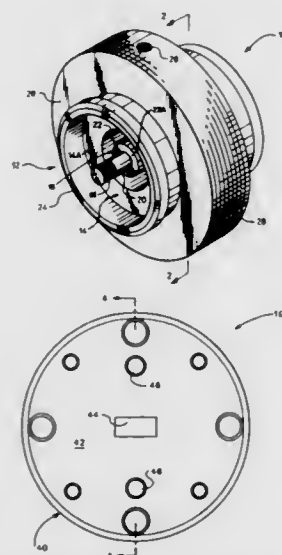
Division of Ser. No. 99,434, Sep. 21, 1987, Pat. No. 4,845,423.

This application Feb. 15, 1989, Ser. No. 312,322

Int. Cl.⁵ H01P 3/06, 3/12

U.S. Cl. 333—239

16 Claims



1. A precision transmission line in the form of a short air line

connectable between a network analyzer test port and a device under test, the short air line comprising:

a short coaxial air line, the short air line being approximately one-quarter wavelength at a middle frequency of a given measurement frequency range, the coaxial air line comprising:

an inner conductor connectable between an inner conductor of the network analyzer test port and a device under test, the inner conductor being threadably connectable at a first end to a mating inner conductor of one of the inner conductors of the network analyzer test port and the device under test; and

an outer conductor separate from the inner conductor of the short air line, the outer conductor being coaxially disposed to the inner conductor and connectable between the outer conductors of the network analyzer test port and the device under test, the interstitial region between the outer conductor and the inner conductor being devoid of any support for the inner conductor within the outer conductor;

wherein the lengths of the inner and outer conductors of the short coaxial air line are substantially identical.

5,091,710

STEP LINEAR ACTUATOR

Souji Ohba, Hirakata; Ryota Shimizu, Toyonaka, and Hideki Ohura, Matsuyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

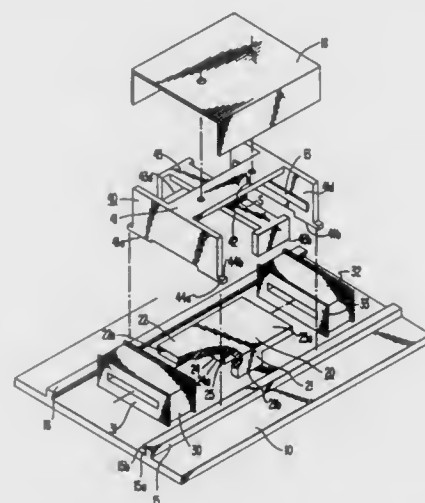
Filed Jul. 25, 1989, Ser. No. 384,764

Claims priority, application Japan, Jul. 28, 1988, 63-189011; Mar. 22, 1989, 1-69601; Mar. 22, 1989, 1-69602

Int. Cl.⁵ H01F 7/00

U.S. Cl. 335—229

23 Claims



1. A linear actuator comprising:
 a stationary member comprising a magnetic material;
 first and second moving units each being in contact with said stationary member and having a magnetic coupling means for generating a magnetic contact force to said stationary member and an opposing face, the opposing face of said first moving unit and the opposing face of said second moving unit being opposed to each other through a gap therebetween; and

magnetic drive means cooperative with said first and second moving units for generating magnetic forces to magnetically control the contact force of each of said first and second moving units generated by said magnetic coupling means and to cause a relative displacement of said first and second moving units to each other.

5,091,711

CURRENT TRANSFORMER MOUNTING MECHANISM FOR CIRCUIT BREAKER

Kojo Hirotsune, Hiroshima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

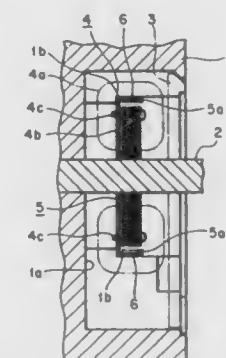
Filed May 28, 1991, Ser. No. 706,186

Claims priority, application Japan, Jun. 12, 1990, 2-62519[U]

Int. Cl.⁵ H01F 15/02

U.S. Cl. 336—65

2 Claims



1. A current transformer having a core and a current transformer mounting mechanism for mounting said current transformer on a circuit breaker comprising:

at least one substantially U-shaped fitting board having curved portions at both ends thereof;
 at least one setscrew for mounting said fitting board to the core of the current transformer;
 and
 a current transformer mounting portion having opposing walls, each wall being provided with a shoulder; the fitting board being fixed to each shoulder; said current transformer being mounted to the current transformer mounting portion by inserting the fitting board to the current transformer mounting portion.

5,091,712

THIN FILM FUSIBLE ELEMENT

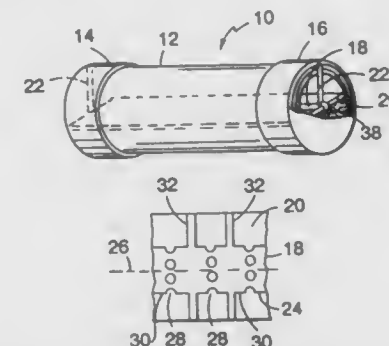
David E. Suuronen, Newburyport, Mass., assignor to Gould Inc., Eastlake, Ohio

Filed Mar. 21, 1991, Ser. No. 673,190

Int. Cl.⁵ H01H 85/04

U.S. Cl. 337—297

8 Claims



1. A fusible element component for use in an electrical fuse, said component comprising
 an elongated substrate made of insulative material and having an element supporting surface, said substrate having lateral edges and a longitudinal axis,
 a fusible element made of a thin film of conductive material on said element supporting surface,
 said element extending parallel to the longitudinal axis of said substrate spaced from the lateral edges thereof,
 said element having a body portion for conducting electricity therethrough from and to an external electrical circuit, said body portion being elongated, extending along said

longitudinal axis, and having back-up sections and a fusible portion that has smaller conductive area than said back-up sections and is designed to fuse during electrical overload conditions, and
 cooling arms that are made of said thin film of conductive material on said substrate and extend laterally from said back-up sections to conduct and dissipate heat but not conduct electricity.

5,091,713

INVENTORY, CASH, SECURITY, AND MAINTENANCE CONTROL APPARATUS AND METHOD FOR A PLURALITY OF REMOTE VENDING MACHINES

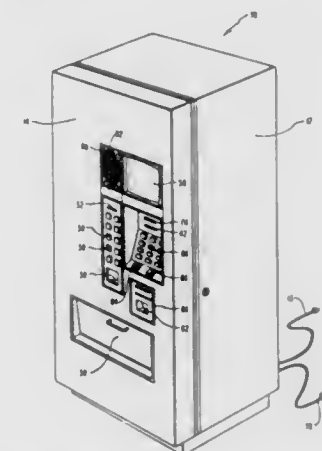
Arthur H. Horne; Ralph J. Henderson, both of Salt Lake City, and David C. Anderson, Deer Valley, all of Utah, assignors to Universal Automated Systems, Inc., Salt Lake City, Utah

Filed May 10, 1990, Ser. No. 521,605

Int. Cl.⁵ G08B 13/00; G06F 7/08

U.S. Cl. 340—541

15 Claims



1. A monitor system for a remote vending machine comprising:
 an electronic monitor means operable to receive signals from a remote vending machine;
 communication means for transmitting electronic signals between said electronic monitor means and said remote vending machine, said communication means including a speaker mounted on said vending machine to permit audible messages to be communicated from said electronic monitor means to a customer in the vicinity of said vending machine and a call switch and a microphone to enable said customer to communicate verbally and directly with a person at a location remote from said vending machine, said communication system comprising an alarm means for signaling said electronic monitor means when an alarm condition is experienced by said vending machine, said microphone being independently operable to enable security personnel to listen to ambient sounds adjacent said vending machine during said alarm; and
 inventory sensing means in said vending machine for sensing the inventory of said vending machine and transmitting electronic signals to said electronic monitor means as a function of said inventory.

5,091,714

SYSTEM FOR THE PREVENTION OF DROWNING ACCIDENTS

Francois de Solminihac, Brest, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 426,584, Oct. 25, 1989, abandoned.

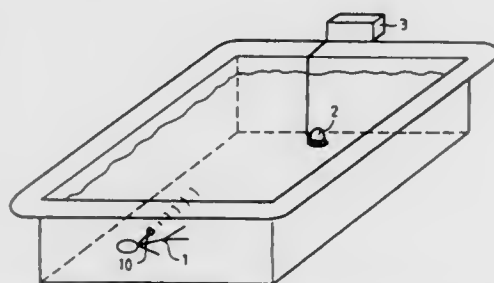
This application Mar. 25, 1991, Ser. No. 674,310

Claims priority, application France, Oct. 28, 1988, 8814140

Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—573

9 Claims



1. A system for the prevention of drowning accidents, comprising:

radio transmitter means for producing a radio signal; at least one water-tight casing adapted to be carried by a bather and comprising a submersion detector which comprises a radio receiver for receiving said radio signal and signalling submersion when said radio signal is not received, an electronic counter activated by said submersion detector, a comparator, and an acoustic transmitter which produces acoustic waves, said submersion detector for triggering said electronic counter which is connected to said comparator which controls said acoustic transmitter, said transmitter being turned-on after the counter reaches a predetermined threshold value, and said electronic counter being reset to an initial value each time submersion is interrupted,

at least one hydrophone placed in the water for picking-up any of said acoustic waves transmitted by said acoustic transmitter, means for signalling an accident when the hydrophone picks up said acoustic waves, said signalling means connected to the hydrophone by a water-tight cable.

5,091,715

LEAK DETECTION AND ALARM SYSTEM

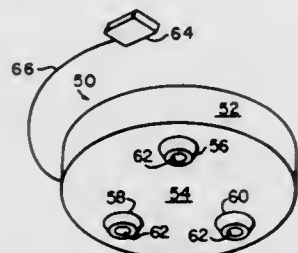
Anthony J. Murphy, 2104 Robinson St., Redondo Beach, Calif. 90278

Continuation of Ser. No. 461,660, Jan. 8, 1990, abandoned. This application Feb. 1, 1991, Ser. No. 649,141

Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—604

8 Claims



1. A liquid detection and alarm system for monitoring the wetness of a floor, the alarm system comprising:

a housing having a flat bottom surface; at least three spaced-apart support feet for supporting the bottom surface of the housing above the floor, such that the bottom of each support foot is in contact with the

floor, wherein the bottom of each support foot is constructed from an electrically conductive material, so as to have a single electrical polarity, such that at least one support foot is of opposite polarity from the others; an electrically activated alarm indicator; a battery connector for connecting a battery to the alarm system; and an alarm circuit located within the housing for interconnecting all of the support feet, the alarm indicator, and the battery such that the alarm circuit activates the alarm indicator in response to a reduced resistance condition between any two separate support feet of opposite polarity.

5,091,716

LIQUID LINE LEAK DETECTION METHOD AND APPARATUS

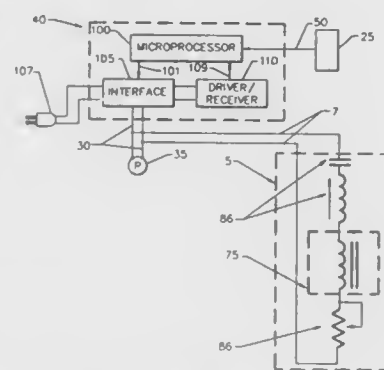
Thomas E. Nelson, Durham, and Walter S. Brock, Cary, both of N.C., assignors to EMCO Electronics, Cary, N.C.

Filed Jul. 10, 1990, Ser. No. 550,695

Int. Cl.⁵ G08B 21/00

U.S. Cl. 340—605

37 Claims



30. A liquid delivery system comprising:

a liquid storage tank; a liquid dispenser; a pump for pumping liquid from said storage tank to said liquid dispenser; a liquid line between said pump and said liquid dispenser; a pump controller for applying power to said pump to thereby activate said pump; an electrical power line, electrically connected between said pump controller and said pump, for delivering power applied by said pump controller to said pump; a line leak detector mechanically coupled to said liquid line for generating an electrical signal responsive to liquid in said liquid line, said line leak detector comprising: a liquid reservoir, mechanically coupled to said liquid line; a piston in said liquid line reservoir, and piston being moveable in response to liquid in said reservoir; and piston movement sensing means for continuously sensing the position of said piston and generating an electrical signal proportional thereto, said piston movement sensing means comprising: a core coupled to said piston, for movement along a predetermined path upon movement of said piston in response to liquid in said reservoir; an electrically conductive coil, mounted along said predetermined path, said core moving within said coil in response to liquid in said reservoir, to thereby change the electrical inductance of said coil; and means, electrically connected to said coil, for monitoring the inductance of said coil and comprising means for sampling said inductance of said coil, means for digitizing said sampled inductance of said coil, means for calculating the velocity of said piston from said digitized sampled inductance of said coil, and means

for detecting a leak in said liquid line from said calculated velocity; and means for electrically connecting said line leak detector to said electrical power line; said pump controller comprising means for receiving said electrical signal via said electrical power line.

5,091,717

APPARATUS FOR SELECTING MODE OF OUTPUT IN A COMPUTER SYSTEM

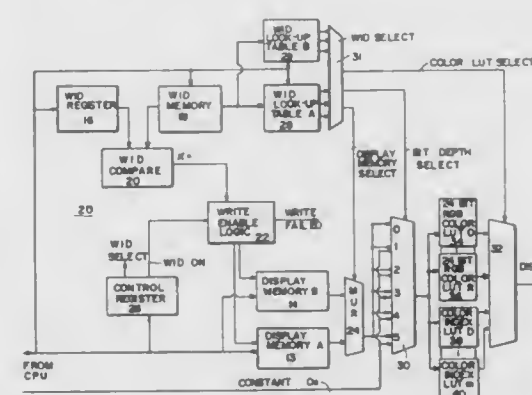
Susan Carrie, Sunnyvale; Sedar Ergene, San Jose, and James Gosling, Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed May 1, 1989, Ser. No. 345,955

Int. Cl.⁵ G09G 1/28

U.S. Cl. 340—703

20 Claims



1. A window display system comprising a display device and a display memory for displaying pixel data of an input image in a window on a display device, said pixel data being stored in the display memory and output from the display memory for generation of the image on the display device, each of said pixel data comprising color information and is identified by a window ID (WID) to indicate the window the image is to be displayed in, said system comprising:

a WID register for storing the WID for the pixel data of the input image to be displayed; a WID memory for storing the WID for each pixel stored in a display memory; a WID comparison circuit coupled to the WID register and WID memory to receive as input the WID for a pixel of the input image to be displayed at a particular pixel address on the display and the WID of the pixel at the same pixel address in display memory, said WID comparison circuit issuing a signal indicating whether the pixel of the input image is to be written to the display memory; write enable logic for controlling the pixel data to be written to the display memory whereby the pixel data is written to the display memory when the WID comparison circuit issues the signal indicating that the pixel data is to be written to the display memory; a WID lookup table coupled to receive the WID for a pixel data, said lookup table storing the number of bits of color information utilized for each window, said WID lookup table, upon receipt of a WID for a pixel, issuing a bit depth select signal identifying the number of bits of color information comprising the pixel data; a first selection means coupled to the WID lookup table for receiving the bit depth select signal and coupled to the display memory for receiving the color information of the pixel data, said first selection means receiving the color information in a plurality of formats according to the number of bits of color information, each of said formats being received at a predetermined input port to the first selection means, said first selection means selecting the

color information received at the input port identified by the bit depth select signal to be output for display; whereby an image is displayed in a window on a display device.

5,091,718

COLOR-MONOCROME VISUAL DISPLAY DEVICE

Paul H. J. Beatty, Craigievar, 3 Mossend, West Calder, West Lothian, Scotland

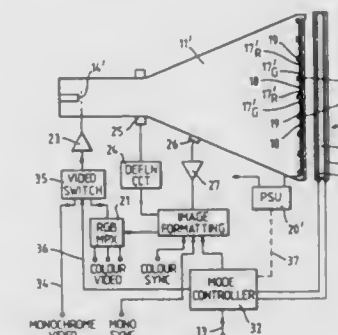
Filed Jan. 26, 1989, Ser. No. 301,894

Claims priority, application United Kingdom, Jan. 29, 1988, 8802002

Int. Cl.⁵ G09G 1/28

U.S. Cl. 340—703

19 Claims



1. A display device including a multiple colour visual display device for producing a multiple colour image as a two-dimensional array of image pixels, each pixel being defined by an addressable group of individually energizable three primary colour emitters, each emitter being associated with a physically discrete region of display area and energizable alone or with others to define emission of primary or secondary colours respectively from the group, said display device being adapted to provide a monochrome visual display by emission of radiation of a predetermined monochrome colour, said display device comprising groups of three primary colour emitters affording individual or combined emissions defining said multiple colours, at least some primary colour emitters of each group emitting light in other than said monochrome colour, means for addressing said groups in accordance with formation of a two-dimensional image by energizing the emitters of the groups and, associated at least with the primary colour emitters which emit other than said monochrome colour, an energizable monochrome colour emitter at a lower luminous intensity than the principal colours of the primary colour emitters with which they are associated, whereby each of the discrete regions of said display area may emit said monochrome color, mode control means operable to cause the display of multiple colour images by causing the energization of the emitters of said groups in accordance with the image colour to be generated to produce said principal coloured light at greater luminous intensity than any emission from the monochrome colour emitter associated therewith, and to cause the display of monochrome images by causing the image to be formed by energization of the individual emitters irrespective of their principally emitted colour and to limit light emission from any such emitter energized to that of said monochrome colour.

5,091,719

HELMET DISPLAY

William S. Beamon, III, Ormond Beach, Fla., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 26, 1989, Ser. No. 456,502

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.⁵ G09G 3/02

U.S. Cl. 340—705

21 Claims

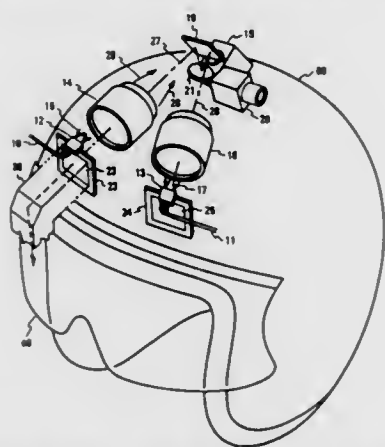
1. A helmet mountable display system for displaying a first

raster-scanned image to a wearer of the helmet in response to a plurality of first light source means, each of the plurality of first light source means for supplying a respective first light signal having a respective first predetermined size, the display system comprising:

first lens means having a central optical axis and a first optical input/output and a second optical input/output respectively disposed about the central optical axis of the first lens means and optically coupled to each other, each input/output of the first lens means having a respective focal point lying on the central axis, the first input/output of the first lens means optically coupled to the plurality of first light source means for receiving each first light signal, the first lens means for providing a first collimated light pattern at the second input/output of the first lens means in response to each first light signal supplied to the first input/output of the first lens means;

a first deflecting surface oscillatable about a first axis and optically coupled to the second input/output of the first lens means for receiving the first collimated light pattern, the first deflecting surface for deflecting the first collimated light pattern in a first direction along a first predetermined optical path;

a second deflecting surface oscillatable about a second axis and optically coupled to the first deflecting surface for receiving the first collimated light pattern from the first



deflecting surface, the second deflecting surface for deflecting the first collimated light pattern received from the first deflecting surface in a second direction along the first predetermined optical path;

second lens means having a central optical axis and a first optical input/output and a second optical input/output respectively disposed about the central axis of the second lens means and optically coupled to each other, each input/output of the second lens means having a respective focal point lying on the central axis, the second input/output of the second lens means optically coupled to the second deflecting surface for receiving the first collimated light pattern deflected from the second deflecting surface in the second direction along the first predetermined optical path, the second lens means focusing the first collimated light pattern received from the second deflecting surface; and

first optical system means optically coupled to the first input/output of the second lens means for receiving the focused first collimated light from the second lens means, the first optical system means for transporting the focused first collimated light from the second lens means to the wearer such that the wearer may observe the first raster scanned image when the first and second deflecting surfaces are oscillating at a respective predetermined rate and displacement about the first and second axis respectively.

5,091,720 DISPLAY SYSTEM COMPRISING A WINDOWING MECHANISM

Roger T. Wood, Romsey, England, assignor to International Business Machines Corporation, Armonk, N.Y.

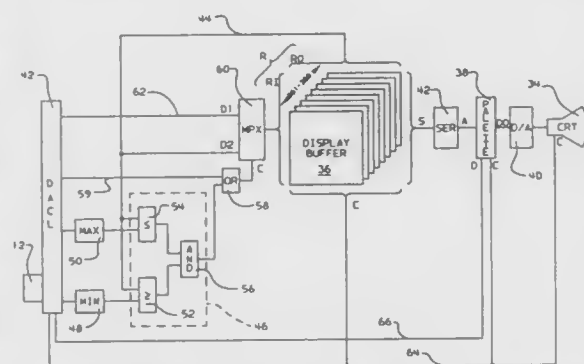
Filed Jan. 30, 1989, Ser. No. 304,382

Claims priority, application United Kingdom, Feb. 23, 1988, 8804166

Int. Cl.⁵ G09G 5/14

U.S. Cl. 340—721

19 Claims



1. A display system comprising a palette for picture chrominance and/or luminance information, a display buffer for pixel information defining the pixels of a display field, the pixel information including index values for indexing the palette to select the chrominance and/or luminance of the pixels, and a windowing mechanism for associating a different range of index values with each of a plurality of windows wherein each window may have a visible extent area in the display buffer, and wherein the windowing mechanism controls display buffer update by determining the visible extent of a given window in the display buffer in response to index values stored at individual pixel positions in the display buffer.

5,091,721 ACOUSTIC DISPLAY GENERATOR

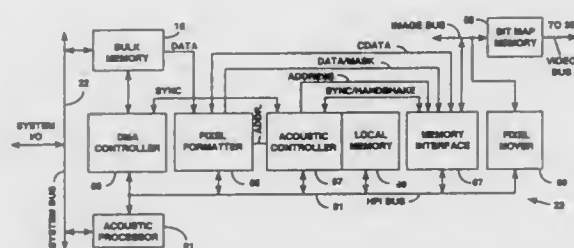
Alfred S. Hamori, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 22, 1988, Ser. No. 289,161

Int. Cl.⁵ G09G 5/00

U.S. Cl. 340—727

8 Claims



1. A display generator which constructs and updates images in a bit mapped memory from data signals stored in a bulk memory and applied signals that are indicative of the manner in which the data signals stored are to be formatted and displayed, said display generator comprising:

controller means for processing the applied signals and generating source and destination pixel addresses for the data signals stored in the bulk memory;

pixel formatting means coupled to the controller means and to the bulk memory, for utilizing the source addresses generated by the controller means to read the data signals from the bulk memory, for processing multipixel two

dimensional groups of the data signals to format them into predetermined display formats, and for transferring the formatted signals to the bit mapped memory in accordance with the destination addresses generated by the controller means; and

pixel manipulation means coupled to the bit mapped memory for independently processing two dimensional arrays of signals located in selected areas of the image stored in the bit mapped memory to reformat those selected areas without regenerating individual pixels from the bulk memory, said pixel manipulation means including

a sequencer for sequencing the operations of the pixel manipulation means;

rotation and corner turning means for manipulating matrices of pixels to update selected areas of the image stored in the bit mapped memory; and

register and arithmetic logic means coupled to the sequencer for responding to signals provided thereby and coupled to the rotation and corner turning means for processing bit mapped memory addresses, line buffer addresses, block lengths and boundary masks for use in manipulating the matrices of pixels.

5,091,722 GRAY SCALE DISPLAY

Masaaki Kitajima, Hitachi; Jun-ichi Ohwada, and Yoshitaru Nagae, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

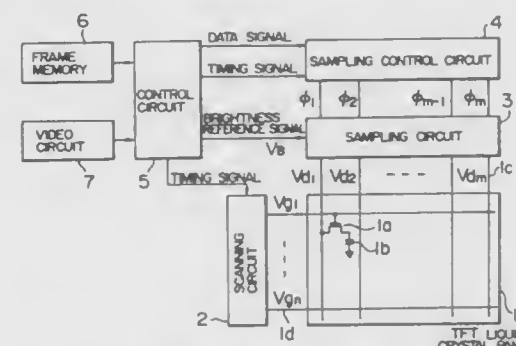
Filed Oct. 3, 1988, Ser. No. 252,605

Claims priority, application Japan, Oct. 5, 1987, 62-249832

Int. Cl.⁵ G09G 3/36

U.S. Cl. 340—784

40 Claims



1. A gray scale display device comprising:

a display panel including a plurality of scanning electrodes, a plurality of signal electrodes intersecting the plurality of scanning electrodes, a plurality of switching elements respectively formed at positions corresponding to the intersections of the plurality of scanning electrodes and the plurality of signal electrodes, each switching element connected to the scanning electrode and the signal electrode of the corresponding intersection, and a plurality of display bodies, one display body connected to each switching element, each switching element responsive to a signal on the scanning electrode of the corresponding intersection for applying a signal voltage from the signal electrode of the corresponding intersection to the corresponding display body, each display body responsive to the applied signal voltage for exhibiting a brightness controlled by the amplitude of the applied signal voltage; holding means for temporarily holding digital signals including gray scale information inputted in a unit of a predetermined number of bits and corresponding at least to the plurality of signal electrodes;

digital-time function transforming means for transforming the digital signals from the holding means into time function signals for each signal electrode;

means for providing a brightness reference signal; time function-gray scale transforming means for sampling the brightness reference signal, responding to the time

function signals, and generating gray scale signals based on the brightness reference signal at the times of the time function signals;

storage means for holding the generated gray scale signals; strobe means for simultaneously applying the held gray scale signals as signal voltages to each of the signal electrodes; and

scanning voltage generating means for generating a scanning voltage for successively scanning the plurality of scanning electrodes.

5,091,723

DISPLAY APPARATUS INCLUDING PARTIAL REWRITING MEANS FOR MOVING IMAGE DISPLAY
Hideo Kanno, Kawasaki; Hiroshi Inoue, Yokohama, and Atsushi Mizutome, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

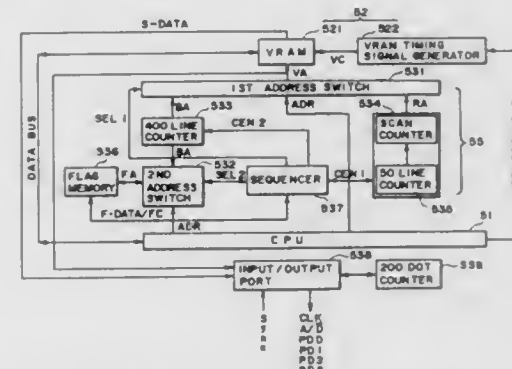
Filed Nov. 28, 1988, Ser. No. 276,548

Claims priority, application Japan, Nov. 26, 1987, 62-299047; Nov. 11, 1988, 63-285141

Int. Cl.⁵ G09G 3/36

U.S. Cl. 340—784

26 Claims



1. A display apparatus, comprising:

(a) a display panel having a display picture area formed by scanning electrodes and data electrodes arranged in a matrix;

(b) drive means including first means for driving the scanning electrodes and second means for driving the data electrodes; and

(c) control means for controlling said drive means so as to perform a partial rewriting scanning operation by applying a scanning signal to only a predetermined number of said scanning electrodes forming the display picture area and then repeating the partial rewriting scanning operation by applying the scanning selection signal to only the same or a different part and the same predetermined number of the scanning electrodes.

5,091,724

ANTI-THEFT DEVICE FOR A VEHICULAR ELECTRIC APPARATUS

Yasunao Go, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 513,732, Apr. 24, 1990, abandoned.

This application May 30, 1991, Ser. No. 707,318

Claims priority, application Japan, Sep. 29, 1989, 1-256698

Int. Cl.⁵ H04B 1/00

U.S. Cl. 340—825.56

2 Claims

1. An anti-theft device for a vehicular electric apparatus, comprising:

connection detecting means for detecting a disconnection of the electric apparatus from a power source used to supply power to the electric apparatus;

input means for allowing an input code to be input to the apparatus;

envelope demodulating means for envelope demodulating a received group of pulse signals;
 integrating means connected to receive the envelope demodulated signal for generating a summation signal having a magnitude that is a function of said envelope demodulated signal;
 binary demodulating means connected to receive said envelope demodulated signal for generating a binary pulse in response to each pulse in said group of pulses that exceeds a predetermined amplitude threshold; and
 means for generating a first validation signal and a second validation signal, said first validation signal being generated when said summation signal exceeds a predetermined first summation threshold and is less than a predetermined second summation threshold, said second validation signal being generated when said summation signal exceeds said predetermined second summation threshold and the number of binary pulses that exceeds said predetermined amplitude threshold also exceeds a first predetermined threshold number.

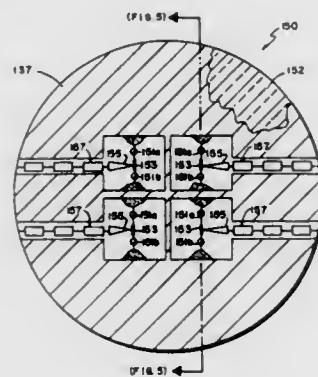
5,091,730

PULSE RADAR AND COMPONENTS THEREFOR

Apostle G. Cardiasmenos, Acton, and Martin R. Blustine, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 552,548, Oct. 31, 1983. This application Mar. 8, 1991, Ser. No. 666,829

Int. Cl.³ G01S 13/44, 7/285; F41G 7/22; H01L 27/14
 U.S. Cl. 342—153 19 Claims



1. An array comprising:

- (a) means for providing at least four apertures disposed about a region central to said four apertures; and
- (b) a plurality of pairs of diodes, each one of the plurality of pairs of diodes disposed in a corresponding one of the apertures, each diode having an anode and a cathode and disposed with the anode of one of the pair of diodes connected to the cathode of the other one of the pair of diodes.

5,091,731

ELECTROMAGNETIC RADIATION SENSORS

Huw D. Rees, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland of Whitehall, London, United Kingdom

Continuation of Ser. No. 357,080, Mar. 9, 1982. This application Jan. 5, 1988, Ser. No. 160,902

Claims priority, application United Kingdom, Mar. 11, 1981, 8107622; Jul. 7, 1981, 8121002

Int. Cl.³ H01Q 15/02

U.S. Cl. 343—700

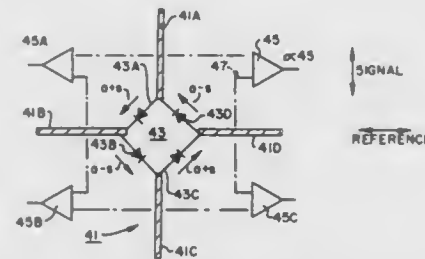
12 Claims

1. An electromagnetic radiation sensor comprising:

- (1) a substrate in the form of a sheet having front and rear

surfaces and comprising at least partly a semiconductor material;

- (2) a dipole antenna having two limbs mounted on the substrate front surface;
- (3) mixing means connected between the dipole limbs and comprising at least one mixer diode integrated onto the substrate semiconductor material and arranged to mix high frequency antenna signals to produce low frequency output signals;



- (4) a conductor configuration arranged on the substrate front surface and connected to the mixing means to relay low frequency signals therefrom to a sensor output; and
- (5) a dielectric lens having a flat surface arranged closely adjacent to the substrate rear surface to couple radiation to the antenna via the substrate, the dielectric constants of the lens and substrate, the lens dimensions and the lens-antenna spacing being in combination such as to cause the antenna to couple predominantly to radiation passing through the lens and the substrate thickness.

5,091,732

LIGHTWEIGHT DEPLOYABLE ANTENNA SYSTEM

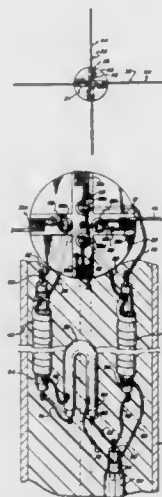
Paul Mileski, and Jeffrey Kornblith, both of Mystic, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1990, Ser. No. 579,455

Int. Cl.³ H01Q 21/260, 1/340, 9/160

U.S. Cl. 343—797

18 Claims



1. A deployable antenna assembly comprising: a canister providing an elongated chamber therewithin; an elongated hollow mast extending within said chamber and having its upper end spaced below the upper end of said canister; a mounting member on the upper end of said mast; a coaxial cable extending into said hollow mast to provide radio signals to said antenna assembly; four antenna members of resiliently deflectable wire spaced at 90 degree intervals about the periphery of said mounting member, and each comprising a generally helical coil

mounted on said mounting member and elongate arms extending downwardly along the periphery of said mounting member and along the inner wall of said canister, opposed pairs of said antenna members comprising dipoles;

first and second baluns comprising a pair connected to said coaxial cable and disposed adjacent said mounting member;

a phase shifter connected between said coaxial cable and one of said baluns;

a pair of first connectors, each first connector conductively connecting a core conductor of one of the baluns to the coil of one of the antenna members of a respective dipole;

a pair of second connectors, each second connector conductively connecting a conductive shield of one of the baluns to the coil of the other antenna member of the respective dipole; and

sealing means about said first and second baluns and phase shifter, the coils of said antenna members being flexed when said arms are in the downwardly extending position within said canister, said canister being slidable relative to said mast and antenna members to free said arms therefrom for extension into a horizontal position.

5,091,733

ANTENNA POINTING DEVICE

Gilles Labruyere, Oegstgeest, Denmark, assignor to Agence Spatiale Europeenne, France

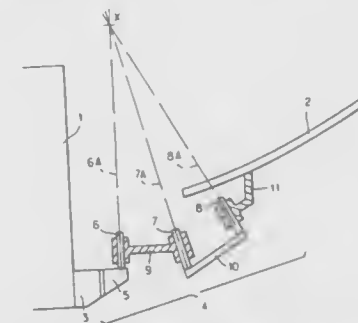
Filed Mar. 27, 1990, Ser. No. 499,774

Claims priority, application France, Apr. 18, 1989, 89 05105

Int. Cl.³ H01Q 3/20, 3/12, 3/2; B25J 11/00

U.S. Cl. 343—882

15 Claims



1. An articulated device for moving a first object with respect to a second object, said device comprising:

- first and second connecting arms, each of said connecting arms having ends spaced apart along a direction of extension of the respective arm;

- said first connecting arm having a first articulation means located at one end thereof, said first connecting arm being coupled to said second object by said first articulation means, said first articulation means having an axis of rotation about which said first connecting arm rotates, said first connecting arm having a second articulation means located at the other end of said first connecting arm; and

- said second connecting arm having one end coupled to said second articulation means, said second articulation means having an axis of rotation about which said second connecting arm rotates, said second connecting arm having a third articulation means at the other end thereof;

- said third articulation means being coupled to said first object, said third articulation means having an axis of rotation about which said first object rotates;

- the aforesaid connecting arms and articulation means being formed such when said second connecting arm extends beyond said first connecting arm and is aligned with said first connecting arm in the direction of extension of said first connecting arm, the axes of rotation of two of said first, second, and third articulation means are canted with respect to the axis of rotation of the remaining one of said

articulation means so that the axes of rotation intersect at a virtual common point remote from said first object.

5,091,734

COLOR IMAGE RECORDING UTILIZING COLOR CORRECTION IN ACCORDANCE WITH A PREDETERMINED ORDER OF RECORDING OF MULTIPLE COLOR AGENTS

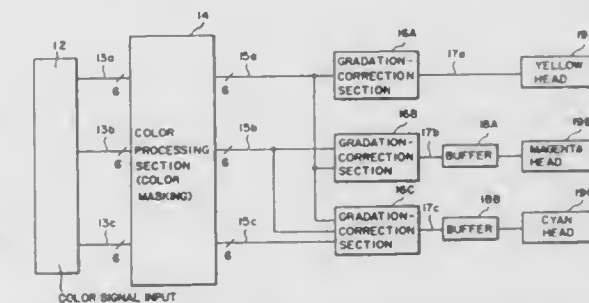
Akio Suzuki, Tokyo; Masaharu Ohkubo, and Yoshihiro Takada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 368,109, Jun. 20, 1989, abandoned, which is a continuation of Ser. No. 87,313, Aug. 20, 1987, abandoned. This application Mar. 27, 1991, Ser. No. 676,480

Claims priority, application Japan, Aug. 25, 1986, 61-197202
 Int. Cl.³ B41J 2/21; H04N 1/46

U.S. Cl. 346—1.1

18 Claims



1. A color image processing method comprising the steps of: inputting a plurality of first color component signals corresponding to a plurality of coloring agents;

- generating a plurality of second color component signals by color making said first color component signals, said second color component signals to be used for recording an image by depositing said plurality of coloring agents in a predetermined order of recording and in a superposed orientation;

- gradation correcting at least one of said second color component signals in accordance with said predetermined order of recording, said second color component signals being gradation corrected according to a quantity of said coloring agents used in a prior recording; and

- recording the image in response to said gradation corrected second color component signals by using said plurality of coloring agents and by depositing said coloring agents in said predetermined order and in said superposed orientation.

5,091,735

OVERHEAD PROJECTOR SHEET FOR PRINTING BY THERMAL TRANSFER PRINTING AND METHOD OF PRINTING THE SAME

Hidemasa Mohri; Michiaki Tobita, both of Yokohama, and Masahiko Ishida, Fujisawa, all of Japan, assignors to Taibo Industries Co., Ltd., Tokyo, Japan

Division of Ser. No. 237,271, Aug. 25, 1988, Pat. No. 5,021,272.

This application Apr. 15, 1991, Ser. No. 684,763

Claims priority, application Japan, Aug. 25, 1987, 62-209282

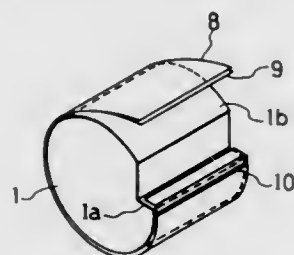
Int. Cl.³ G01D 9/00; B41J 2/325

U.S. Cl. 346—1.1

26 Claims

1. A method for thermal transfer printing on an OHP sheet comprising:

effecting thermal printing on an assembly comprising an OHP sheet having a printing surface thereon and a back-



ing sheet which contacts said OHP sheet on a surface opposite to said printing surface.

5,091,736

THERMAL PRINT HEAD

Toshio Narita, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 356,910, May 23, 1989, Pat. No. 4,973,986.

This application Oct. 26, 1990, Ser. No. 603,501

Claims priority, application Japan, May 27, 1988, 63-130532; Aug. 5, 1988, 63-196821

Int. Cl.⁵ G01D 15/10; B05D 1/36

U.S. Cl. 346—76 PH

13 Claims



a heat generating element over the partial glaze layer; a second common electrode disposed on a portion of the heat generating element and electrically coupled to the heat generating element and a portion of the first common electrode not covered with the partial glaze layer; an independent electrode disposed on and electrically coupled to a portion of the heat generating element and spaced apart from the second common electrode to expose a portion of the heat generating element; and a passivation layer disposed over the upper surface of the electrodes and heat generating element.

5,091,737

RECORDING DEVICE

Shigeo Toganoh; Yohji Matsufuji, and Hiroo Ichihashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

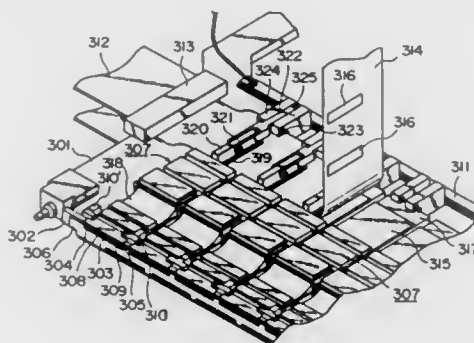
Continuation of Ser. No. 124,422, Nov. 23, 1987, abandoned, which is a continuation of Ser. No. 758,028, Jul. 23, 1985, abandoned, which is a continuation of Ser. No. 424,409, Sep. 27, 1982, Pat. No. 4,559,543. This application Jun. 13, 1989, Ser. No. 366,276

Claims priority, application Japan, Oct. 13, 1981, 56-163635; Oct. 13, 1981, 56-163636; Oct. 14, 1981, 56-163715

Int. Cl.⁵ G01D 15/18

U.S. Cl. 346—140 R

20 Claims



14. A recording device which comprises: a supporting member having a supporting surface, an ink jet device unit mounted on said supporting member, said unit having an ink jet head portion having a plural number of ink discharging outlets, and a holding member for detachably clamping said unit onto said supporting surface, said holding member including a pressure holding member for clamping said unit between said pressure holding member and said supporting member by contacting said ink jet head portion proximate to said discharging outlets.

5,091,738

PRINTING APPARATUS AND METHOD

Alfred L. Fulton; Kishor M. Lakhani; Scott D. Sampson, and Kent Lowman, all of Huntsville, Ala., assignors to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 51,046, May 15, 1987, Pat. No. 4,851,864. This application Mar. 22, 1989, Ser. No. 327,023

Int. Cl.⁵ G01D 15/00

U.S. Cl. 346—154

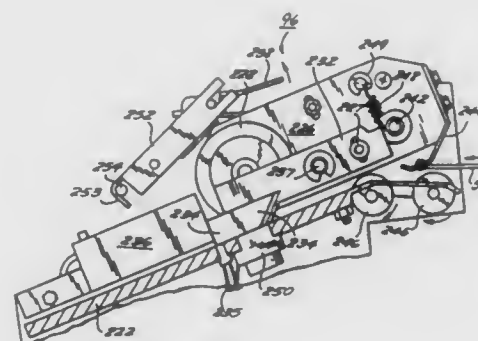
13 Claims

1. A thermal print head, comprising: a substantially planar heat resistant substrate; a first common electrode disposed on a planar surface of the substrate along an edge thereof, the first common electrode formed of a plurality of layers in a stepped structure in which a layer closer to the substrate is wider than a layer disposed thereon; a partial glaze layer formed substantially over the first common electrode;

1. A printer for printing vehicular transportation documents on bearer forms said printer comprising, in combination, a print engine, for electronically forming characters on said forms in response to the receipt of data signals, feeder means for feeding bearer forms to be printed into said print engine, and control means for controlling the printing of vehicular

transportation passenger information on said forms by said print engine, including detecting means for detecting the condition in which two forms are being fed simultaneously by said feeder means, said detecting means including means for sensing

a reflection member reflecting the light beam emerging from said prism toward said eyepiece lens, one of said another reflection surface of said prism and said reflection member is configured as a roof-shaped reflection surface.



5,091,740

FILM WINDING DEVICE

Masakatsu Hori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 417,016, Oct. 4, 1989, abandoned. This application Mar. 28, 1991, Ser. No. 680,622

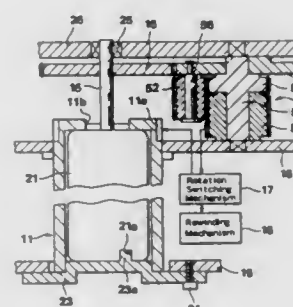
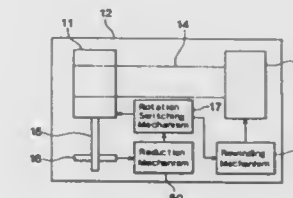
Claims priority, application Japan, Oct. 4, 1988, 63-130183

Int. Cl.⁵ G03B 1/18, 1/12

U.S. Cl. 354—173.1

12 Claims

the thickness of the forms being fed and producing a signal which is a function of the thickness detected, and for detecting the condition in which said signal exceeds a pre-determined level corresponding to the thickness of a single form.



5,091,739

REAL IMAGE MODE FINDER

Kazuteru Kawamura, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

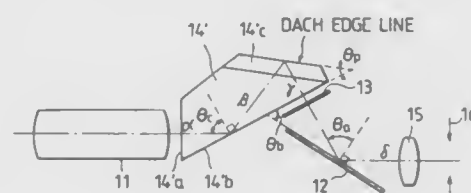
Filed Aug. 22, 1990, Ser. No. 570,852

Claims priority, application Japan, Aug. 25, 1989, 1-219991

Int. Cl.⁵ G03B 19/12

U.S. Cl. 354—152

11 Claims



11. A real image mode finder having an objective lens, image erection means, and an eyepiece lens arranged behind an image of an object formed by the objective lens, wherein said image erection means consists of:

a prism having an incidence surface, a common surface capable of serving as one of a reflection surface and a transmission surface in response to a direction of incidence of a beam of light, and another reflection surface, the light beam coming from said objective lens being incident on said incidence surface, reflected from said common surface toward said another reflection surface and further reflected from said another reflection surface, and then emerging from said common surface; and

1. A film winding device for a camera, said camera including a winding spool rotatably supported by a camera body and a drive motor housed in said winding spool in such a manner that an output shaft of said drive motor projects from said winding spool, said output shaft being connected to said winding spool through a reduction mechanism by which said winding spool is rotated to wind a film therearound, said film winding device comprising:

a parent gear rotating in association with said output shaft; a planet gear provided at a position offset from the center of said parent gear; a non-rotatable stationary gear coaxial with said parent gear and meshed with said planet gear; a rotational gear coaxial with said parent gear and meshed with said planet gear, said rotational gear being rotatable relative to said stationary gear, and a number of teeth of said rotational gear being different from a number of teeth of said stationary gear; and, a means for transmitting a rotation of said rotational gear to said winding spool to wind a film thereon.

5,091,741

Patent Not Issued For This Number

5,091,742

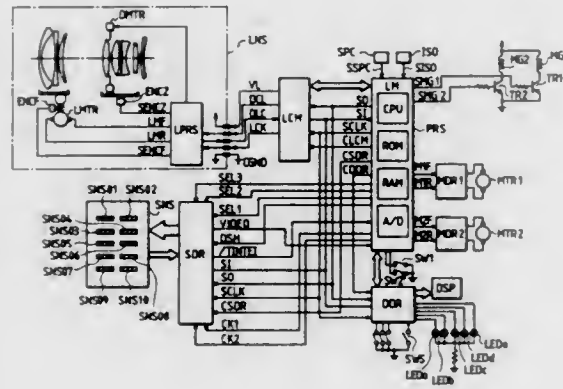
CAMERA HAVING AN AUTO FOCUSING DEVICE

Hidehiko Fukahori; Yasuo Suda; Kenji Itoh; Masaki Higashihara, and Keisuke Aoyama, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 27, 1990, Ser. No. 499,634

Claims priority, application Japan, Mar. 29, 1989, 1-076964
Int. Cl.⁵ G03B 7/00, 13/36

U.S. Cl. 354—402

26 Claims



1. A camera having an auto focusing device, including:
 - a) a focus detecting circuit for detecting the focus states of objects;
 - b) a first calculation circuit for calculating, on the basis of the focus states to the plurality of objects detected by said focus detecting circuit, an aperture value and the lens position;
 - c) a photometric circuit;
 - d) an exposure calculation circuit for calculating a shutter time on the basis of a photometric output obtained by said photometric circuit and said aperture value;
 - e) a judging circuit for judging whether the shutter time calculated by said exposure calculation circuit is outside a predetermined shutter time range; and
 - f) a driving circuit for driving a lens to the lens position calculated by said first calculation circuit, said driving circuit inhibiting the driving of the lens to the lens position calculated by said first calculation circuit when it is judged by said judging circuit that the shutter time is outside said predetermined shutter time range.

5,091,743

IMAGE RECORDING APPARATUS CONTROLLABLE TO ONE OF EXPOSURE CONDITION AND PRESSURE DEVELOPING CONDITION

Osamu Nagata, Aichi; Yoshinori Endo, Toyota, and Kelji Seo, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

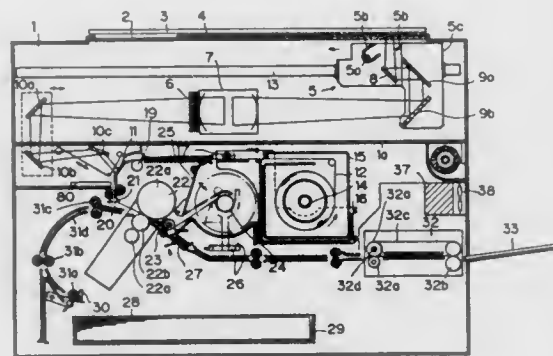
Filed Mar. 22, 1991, Ser. No. 673,345

Claims priority, application Japan, Mar. 30, 1990, 2-85233; Mar. 30, 1990, 2-85234; Mar. 30, 1990, 2-85235; Mar. 30, 1990, 2-85236; Apr. 4, 1990, 2-89573; Apr. 26, 1990, 2-110816

Int. Cl.⁵ G03B 27/52

U.S. Cl. 355—30

45 Claims



1. An image recording apparatus for forming a latent image corresponding to an image of an original on a photosensitive image recording medium and recording an output color image on a basis of the latent image on a developer medium; the photosensitive image recording medium being coated with different kinds of color forming materials, the apparatus comprising:
 - a frame;

- an exposure unit for an exposure operation comprising a light source, a filter unit having a plurality of filters of different colors, and an exposure stand for forming the latent image on the photosensitive image recording medium positioned on the exposure stand, an optical path being provided between the light source and the exposure stand through the filter unit, and each of the filters being movable into and out of the optical path;
 - a pressure developing unit for applying pressure to the photosensitive recording medium carrying the latent image and the developer medium superposed therewith in order to provide the output image on the developer medium;
 - a thermal fixing unit positioned downstream of the pressure developing unit for thermally fixing the output image on the developer medium; and
 - a sensor means for detecting one of humidity with the frame, temperature at or around the exposure unit, temperature at or around the pressure developing unit, temperature at the thermal fixing unit, a pressure developing speed of the pressure developing unit, and pressure level of the pressure developing unit;
- control means connected to the filters for controlling position of the filters of the filter unit relative to the optical path in response to a detection by the sensor means.

5,091,744

ILLUMINATION OPTICAL SYSTEM

Takashi Omata, Yokosuga, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

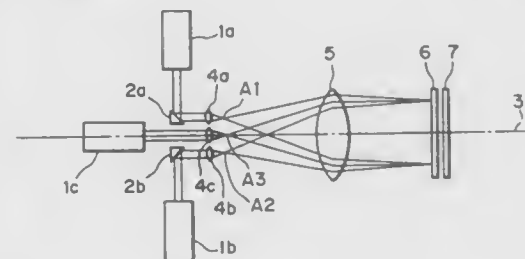
Continuation of Ser. No. 630,733, Dec. 20, 1990, abandoned, which is a continuation of Ser. No. 522,456, May 14, 1990, abandoned, which is a continuation of Ser. No. 423,580, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 355,854, May 17, 1989, abandoned, which is a continuation of Ser. No. 127,612, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 699,800, Feb. 8, 1985, abandoned. This application Jun. 18, 1991, Ser. No. 715,743

Claims priority, application Japan, Feb. 13, 1984, 59-2289; Jan. 8, 1985, 60-12941; Jan. 31, 1985, 60-17052

Int. Cl.⁵ G03B 27/42

U.S. Cl. 355—53

14 Claims



1. An optical illumination system for illuminating an object, such as the original in an exposure apparatus for exposing a workpiece to a pattern of the original, said optical illumination system comprising:
 - illumination means comprising a plurality of illumination sources which are each coherent respectively, but which are incoherent with each other, said illumination means for defining different optical paths for light beams emitted from said illumination sources; and

- a lens system comprising a plurality of lens elements, each of said lens elements distributed along a respective optical path of a corresponding light beam in a plane perpendicular to an optical axis of said illumination means, each of said lens elements for irradiating the object with a corresponding one of the light beams from said illumination means.

5,091,745

FULL RANGE PLATEMAKER OPTICAL SYSTEM

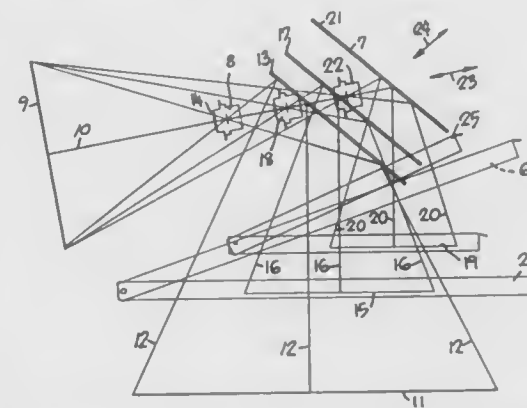
Robert H. Powers, Honeoye Falls, and Daniel H. Robbins, Rochester, both of N.Y., assignors to A.B. Dick Company, Chicago, Ill.

Filed Nov. 27, 1990, Ser. No. 618,717

Int. Cl.⁵ G03B 27/70

U.S. Cl. 355—66

20 Claims



1. A graphic camera/platemaker optical system with a range

of reduction and magnification for creating an image of an original on a photosensitive material comprising:

- an image plane for the photosensitive material;
- a lens movable along a track perpendicular to said image plane;
- a copyboard providing a plane for the original at an angle to said image plane and movable independently of said lens location; and
- a mirror optically located between said lens and said copyboard such that said mirror is operable to reflect light at a constant angle with respect to an optical center line through said lens and is movable along a different track from that for said lens.

5,091,746

IMAGE FORMING APPARATUS IN WHICH EDITING CONTENT FOR MASKING, TRIMMING, AND THE LIKE IS SET IN ADVANCE BY SEPARATE SETTING UNIT AND IMAGE FORMATION IS PERFORMED IN ACCORDANCE WITH EDITING CONTENT SET BY SETTING UNIT

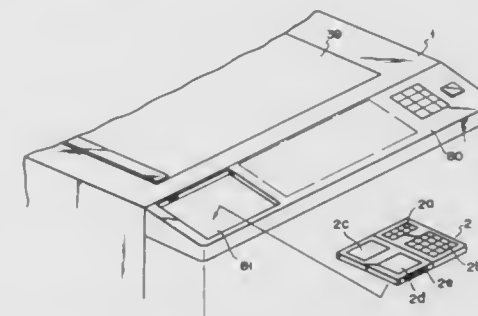
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 24, 1991, Ser. No. 720,190

Claims priority, application Japan, Jun. 26, 1990, 2-165602
Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—202

13 Claims



1. An image forming apparatus, comprising:
 - means for forming an image on an image carrier under predetermined conditions;
 - means for storing data representing the predetermined conditions under which said image forming means is to form an image;
 - means, detachably connected to said image forming means, for supporting said storing means;
 - means, attached to said supporting means, for changing the data stored in said storing means, when said supporting means is detached from said image forming means; and
 - means for setting conditions under which said image forming means is to form an image and which are represented by the data stored in said storing means, when said supporting means is attached to the said image forming means.

5,091,747

METHOD AND APPARATUS FOR CONVERTING A CONVENTIONAL COPIER INTO AN ELECTRONIC PRINTER

Irving Tsai, 435 E. 70th St., Apartment 16K, New York, N.Y.

Filed Nov. 16, 1989, Ser. No. 437,254

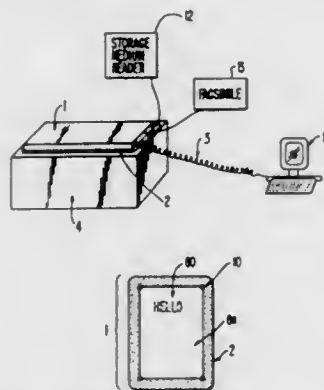
Int. Cl.⁵ G03G 15/04, 15/00

U.S. Cl. 355—202

13 Claims

1. An apparatus for presenting images to a copier through a copier window to enable reproduction of the images by the copier, the apparatus comprising:
 - display means for displaying images through the copier window;
 - detecting means including a plurality of sensors for detecting

the occurrence of a copying operation performed by the copier; and
control means, responsive to the detecting means, for con-



trolling the display means to display a first image prior to the detection of a copying operation and to display a second image following the detection of a copying operation by each of the plurality of sensors.

5,091,748

TONER SUPPLYING MECHANISM

Satoru Morisawa, Kita, and Tsutomu Sato, Tokyo, both of Japan, assignors to Asahi Kogyo Kogyo Kaisha, Tokyo, Japan

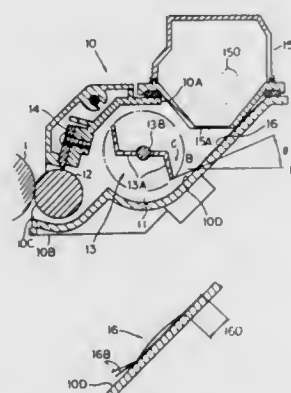
Filed Apr. 10, 1991, Ser. No. 683,344

Claims priority, application Japan, Apr. 10, 1990, 2-94423

Int. Cl.⁵ G03G 15/08

U.S. Cl. 355—245

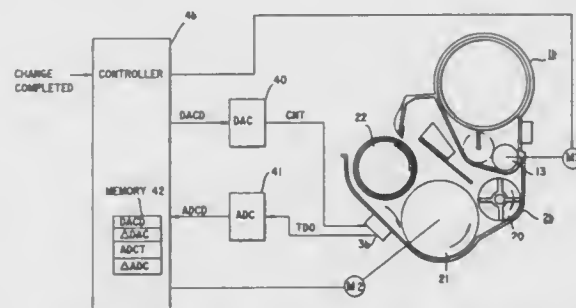
9 Claims



1. A development unit, adapted to be positioned in an imaging apparatus for forming a toner image, comprising a development roller for attracting toner particles thereto and subsequently transferring said particles onto a circumferential surface of a predetermined material, a toner cartridge member provided at an upper side of said development roller for housing a multiplicity of toner particles to be supplied toward said development roller through an inclined inner wall of said development unit, and a scraper member, having at least one rotating arm member on a predetermined shaft member, located between said development roller and said toner cartridge for scraping said toner particles on said inner wall and feeding them toward said development roller;

said development unit further comprising an elastic sheet member, located on said inclined inner wall and having upper and lower edge portions, said lower edge portion being arranged to be flipped by said rotating arm member, while said upper edge portion is fixed to said inclined inner wall.

5,091,749
TONER CONTENT CONTROL APPARATUS
Masaru Iida, Kawasaki, and Yoshihiro Tonomoto, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Jun. 22, 1990, Ser. No. 542,224
Claims priority, application Japan, Jul. 6, 1989, 1-175181
Int. Cl.⁵ G03G 21/00
U.S. Cl. 355—246
8 Claims



1. A toner content control apparatus which senses the toner content of developer in a developer station, compares the sensed toner content with a standard value, and replenishes toner in said developer station according to a result of comparison, said toner content control apparatus comprising:

sense means for sensing toner content of the developer and for outputting a signal indicating said toner content, said sense means having a sensitivity control circuit; and control means for determining an optimum sensor sensitivity control signal to be applied to said sensitivity control circuit, with said optimum sensor sensitivity control signal said sense means gives an optimum sensor sensitivity and, said control means for designating as said standard value, the signal output from said sense means when said optimum sensor sensitivity control signal is applied to said sensitivity control circuit, wherein toner content is controlled with said optimum sensor sensitivity control signal which is applied to said sense means.

5,091,750

CARTRIDGE UNIT

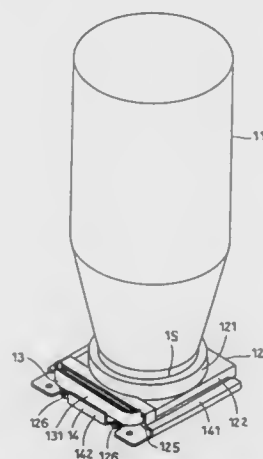
Seitaro Yoshida, Osaka, and Kenichi Ashida, Nishinomiya, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Dec. 5, 1990, Ser. No. 622,526

Claims priority, application Japan, Dec. 8, 1989, 1-320234

Int. Cl.⁵ G03G 15/06

U.S. Cl. 355—260

29 Claims



1. A cartridge unit for supplying powder to a powder receiver, the cartridge unit comprising:
a cartridge for containing powder and having a mouth through which the powder is supplied;

an adapter fixed to the mouth of the cartridge and having a hole through which the powder is supplied and a slit engraved from a side end of the adapter across the hole, the adapter being attachable to the powder receiver; an inner shutter that can be inserted in the slit of the adapter for shutting the hole; and an outer shutter that can be attached on the outside of the adapter for covering the hole of the adapter.

5,091,751

IMAGE FORMING APPARATUS UTILIZING INTERMEDIATE TRANSFER MEMBER

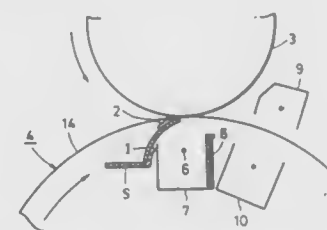
Masahiro Inoue, Kawasaki; Koji Amemiya, Tokyo; Akio Ohno, and Takeo Tsunemi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 30, 1990, Ser. No. 530,802

Claims priority, application Japan, May 31, 1989, 1-138778; May 31, 1989, 1-138780; May 31, 1989, 1-138964; May 28, 1990, 2-139035

Int. Cl.⁵ G03G 15/00, 15/01, 15/16

U.S. Cl. 355—274

110 Claims



1. An image forming apparatus comprising:
image carrying means;
toner image forming means for forming a toner image on said image carrying means;
transfer member conveying means for conveying a transfer member to an image transfer position and including transfer member carrying means for carrying said transfer member;
image transfer means for causing said toner image to be transferred to said transfer member carried by said transfer member carrying means at said image transfer position; and
pressing means disposed in the vicinity of said image transfer means and capable of pressing said transfer member carrying means towards said image carrying means, said pressing means including a pressing member and a conductive member provided on the side of said pressing member facing said transfer member carrying mean which is pressed by said pressing member.

5,091,752

IMAGE HEATING APPARATUS USING FILM DRIVEN BY ROTATABLE MEMBER

Tamotsu Okada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1991, Ser. No. 658,299

Claims priority, application Japan, Feb. 20, 1990, 2-39025; Feb. 20, 1990, 2-39026; Feb. 20, 1990, 2-39027; Feb. 20, 1990, 2-39028

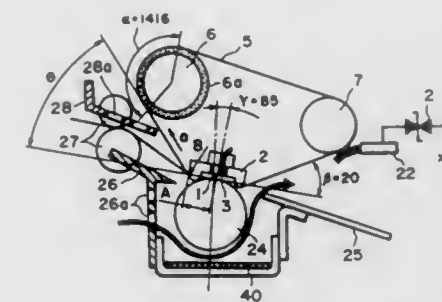
Int. Cl.⁵ G03G 15/20

U.S. Cl. 355—285

27 Claims

1. An image heating apparatus, comprising:
a heater;
a film movable in contact with a recording material carrying an image, wherein the image on the recording material is heated by heat from said heater through said film;
an unheated driving rotatable member for driving said film,

said driving rotatable member being positioned away from said heater;



wherein said driving rotatable member has a heat insulative surface layer.

5,091,753

CLEANING APPARATUS HAVING A SURFACE-CONFORMING BLADE

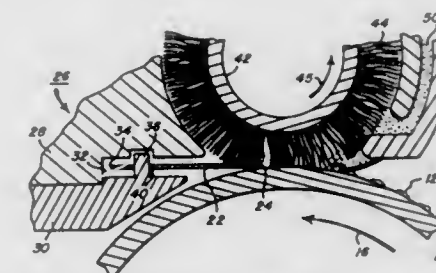
Vito Slapelis, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 13, 1991, Ser. No. 699,119

Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—297

16 Claims



1. A cleaning apparatus for removing particles from a moving surface in an electrostatic reproduction apparatus, the cleaning apparatus including:

- (a) a cleaning blade having a cleaning edge for making cleaning contact at a cleaning point P1 with the surface being cleaned;
- (b) float mounting means for mounting said cleaning blade such that said cleaning edge thereof can move floatingly in and out, up and down, and rotationally at said cleaning point P1 relative to, and in response to moving contact with the surface being cleaned; and
- (c) means for uniformly pressing and loading said cleaning edge of said blade into cleaning engagement with the surface being cleaned.

5,091,754

IMAGE FORMING APPARATUS COMPRISING LATERAL MOVEMENT MEANS

Makoto Abe, Kashiwa; Junichi Kimizuka, Yokohama; Akihisa Kusano, Kawasaki; Kaoru Sato, Yokohama; Toshiyuki Ito, Sagami-hara; Kazuhiko Okazawa, Kawasaki; Toshihiko Inuyama, Fujisawa; Takahiro Azeta, Kawasaki; Yoshiro Tsuchiya, Yokohama; Hiroshi Yukimachi, Kawasaki; Tadashi Yagi, Machida; Hiroo Kobayashi, Tokyo; Masahito Otsuka, Kawasaki; Tsuyoshi Waragai, Tokyo; Takamasa Sawada, Kawasaki; Hiroaki Miyake, Yokohama, and Toshifumi Moritani, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

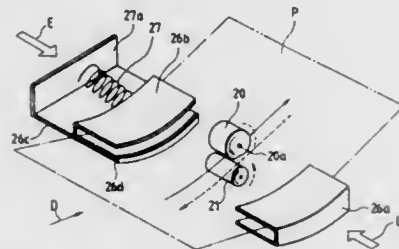
Filed Apr. 25, 1990, Ser. No. 514,310

Claims priority, application Japan, Apr. 26, 1989, 1-106611; Apr. 28, 1989, 1-111037; Jul. 31, 1989, 1-199018

Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—317

20 Claims



1. An image forming apparatus having a convey path comprising lateral movement means for controlling a widthwise position of a sheet member to be conveyed, wherein said convey path comprising said lateral movement means is curved in a convey direction, driving means for retracting said lateral movement means out of an entry path for the sheet member when the sheet member is entering into said convey path, and then shifting said lateral movement means to be pressed onto a side surface of the sheet member; and rotating means disposed in said convey path, for being abutted onto the sheet member for feeding when the sheet member is entering into said convey path, and then being separated from the sheet member when said driving means shifts said lateral movement means.

5,091,755

ORIGINAL DOCUMENT FEEDER FOR PRODUCING DOUBLE SIDED COPIES USING TWO EXPOSURE STATIONS

Osamu Tashiro, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1989, Ser. No. 390,766

Claims priority, application Japan, Aug. 10, 1988, 63-200787

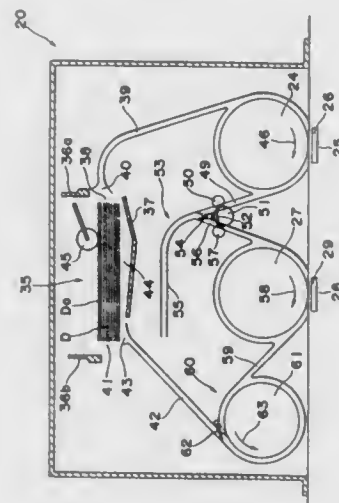
Int. Cl.⁵ G03G 21/00

U.S. Cl. 355—320

3 Claims

1. An original document feeder which comprises: an original document accommodating section arranged to feed in original document from a stack of sheet-formed original documents from a first end side at the uppermost portion of said stack and to return said original document to a second end side at the lowermost portion of said stack, a first original document presenting section for supporting said original document during reading of a first surface of said original document fed from said original document accommodating section, a second original document presenting section for supporting said original document during reading of a second surface of said original document, a first original document inverting means provided between said first original document presenting section and said

second original presenting section for inverting said first and said second surfaces of said original document, and a second original document reversing means for reversing



transporting direction of said original document without inverting said first and said second surfaces of said original document after being supported by said second original document presenting section.

5,091,756

SUPERLATTICE STRUCTURE

Kenichi Iga; Fumio Koyama, and Hiroyuki Uenohara, all of Tokyo, Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Continuation of Ser. No. 256,245, Sep. 30, 1988, abandoned,

which is a continuation of Ser. No. 12,422, Feb. 16, 1987,

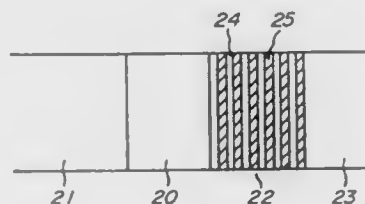
abandoned. This application Mar. 19, 1990, Ser. No. 501,291

Claims priority, application Japan, Aug. 14, 1989, 61-189623

Int. Cl.⁵ H01L 27/12, 29/161, 33/00

U.S. Cl. 357—4

3 Claims



1. A superlattice structure for receiving injected electrons or holes and having potential energy barriers which confine said injected electrons or holes, said superlattice structure comprising: a combination of first and second kinds of semiconductor crystal layers which alternate with respect to one another, have respective interfaces therebetween, have different band gap energies, and have different thicknesses d_1 and d_2 respectively, wherein said first kind of crystal layer defines a potential energy barrier having front and rear interfaces with respect to said second kind of crystal layer, and wherein said respective band gap energies and said respective thicknesses d_1 and d_2 are selected so that an incident injected electron or hole mass wave is reflected quantum-mechanically as first and second mass waves at respective front and rear interfaces of the potential energy barriers to enhance reflection of said injected electrons or holes with energy E and satisfy the following equations:

$$(2m_1^* \cdot E)^{1/4} \cdot d_1/h = \frac{2l-1}{4}$$

where $e = 1, 2, 3, \dots$, and

$$\{2m_2^*(E - \Delta E_c)\}^{1/4} \cdot d_2/h = \frac{2k-1}{4}$$

where $k = 1, 2, 3, \dots$, E is the energy of an injected electron or hole, m_1^* and m_2^* are effective masses of electrons in said at least two kinds of crystal layers, respectively, ΔE is the electron affinity difference of said at least two kinds of crystal layers, and h is Planck's constant, said superlattice structure including

- a first member for receiving said injected electrons or holes, said first member comprising at least one of said first and one of said second crystal layers; and
- a second member contiguous with said first member comprising a plurality of said first and second crystal layers, the thicknesses of the first and second crystal layers of said second member being less than the thicknesses of said first and second crystal layers respectively of said first member, the thicknesses decreasing in a direction away from the interface between said first and second members; wherein said first reflected mass wave and said second reflected mass wave have a phase difference therebetween which is created by propagation of said incident mass wave from said front interface to said rear interface and propagation of said second reflected mass wave from said rear interface to said front interface, said phase difference being substantially equal to π multiplied by an odd numbered integer, whereby the potential energy barriers of the superlattice structure are heightened.

5,091,757

SEMICONDUCTOR LIGHT EMITTING ARRAY WITH PARTICULAR SURFACES

Tomoaki Yoshida, Natori, Japan, assignor to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics Co., Ltd., Natori, both of Japan

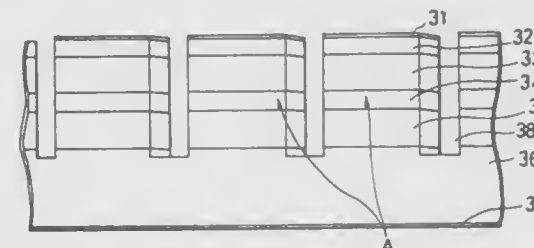
Filed Sep. 6, 1990, Ser. No. 578,348

Claims priority, application Japan, Sep. 7, 1989, 1-230519

Int. Cl.⁵ H01L 33/00

U.S. Cl. 357—17

32 Claims



1. A semiconductor light emitting array device comprising: a substrate having an upper surface and a lower surface; a plurality of light emitting elements formed on said substrate in a row and isolated from each other by a separation groove, each of said light emitting elements emitting light from a side end surface thereof in a direction parallel to said upper substrate surface and said groove having a portion formed in a direction other than in parallel to said direction of light, each of said light emitting elements being constituted from a stacked layer structure comprising: a first clad layer formed on said upper surface of said substrate; a light emitting active layer formed on said first clad layer;

a second clad layer formed on said active layer; a cap layer formed on said second clad layer; and an insulating film formed on said cap layer, said film having an opening spanning from said side end surface to an opposite side end surface and having a width narrower than that of said element, said opening defining a current route area through which current is supplied to said active layer.

5,091,758

SEMICONDUCTOR LIGHT-EMITTING DEVICES

Yoshio Morita, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

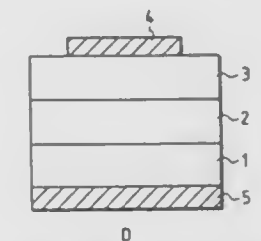
Filed Jun. 27, 1990, Ser. No. 544,579

Claims priority, application Japan, Jun. 27, 1989, 1-164680

Int. Cl.⁵ H01L 33/00, 29/161, 29/20

U.S. Cl. 357—17

30 Claims



1. A light-emitting semiconductor device which emits light with a wavelength of from 440 to 670 nm comprising a substrate and a p-n junction structure formed on the substrate, the p-n junction structure having a p-type semiconductor layer consisting essentially of $(\text{Cu}_x\text{Ag}_{1-x}) (\text{Al}_b\text{Ga}_{1-b})\text{Se}_2$, wherein $0 \leq x \leq 1$ and $0 \leq b \leq 1$ and an n-type semiconductor layer consisting essentially of $(\text{Zn}_c\text{Cd}_{1-c}) (\text{S}_d\text{Se}_{1-d})$, wherein $0 \leq c \leq 1$ and $0 \leq d \leq 1$.

5,091,759

HETEROSTRUCTURE FIELD EFFECT TRANSISTOR

Hung-Dah Shih, Plano, and Bamman Kim, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 428,423, Oct. 30, 1989, abandoned,

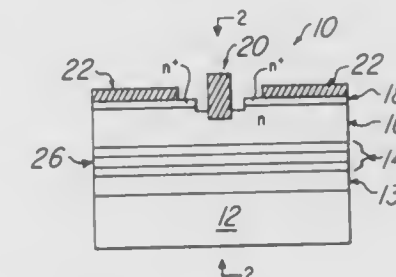
which is a continuation of Ser. No. 213,551, Jun. 30, 1988,

abandoned. This application Nov. 26, 1990, Ser. No. 618,005

Int. Cl.⁵ H01L 27/12, 29/161, 29/80

U.S. Cl. 357—22

12 Claims



1. A MESFET comprising: (a) a semi-insulating region having a first buffer layer of a first compound semiconductor material along a surface thereof; (b) a second region including a second compound semiconductor material different from said first compound semiconductor material, said second region including a central doped portion therein, said second region disposed over and contiguous with said buffer layer, said second region having a total thickness less than 250 Angstroms; (c) a third region of compound semiconductor material

disposed over said second region, the net dopant concentration in said second region exceeding the net dopant concentration in said third region; and
(d) a fourth gate region positioned over said third region to provide a quantum well in said doped second region and a conduction channel region in said central doped portion.

5,091,760

SEMICONDUCTOR DEVICE

Takeo Maeda, and Hiroshi Momose, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

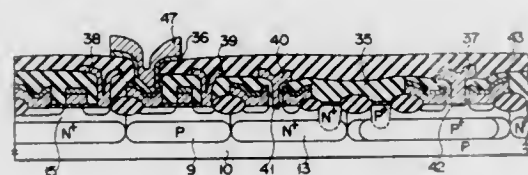
Filed Apr. 10, 1990, Ser. No. 507,037

Claims priority, application Japan, Apr. 14, 1989, 1-94884

Int. Cl.⁵ H01L 29/10

U.S. Cl. 357—23.4

31 Claims



1. A semiconductor device comprising:
 - a semiconductor substrate;
 - a bipolar transistor formed on said semiconductor substrate and having a base electrode, an emitter electrode, and a collector electrode; and
 - a MOS transistor formed on said semiconductor substrate and having electrodes, including a gate electrode, wherein said base electrode of said bipolar transistor and said gate electrode of said MOS transistor are comprised of a same first polysilicon layer containing impurities of a same impurity type and said emitter electrode of said bipolar transistor is comprised of a second layer different than said first layer.

5,091,761

SEMICONDUCTOR DEVICE HAVING AN ARRANGEMENT OF IGFETS AND CAPACITORS STACKED THEREOVER

Atsushi Hiraiwa, Kodaira; Shinichiro Kimura, Hachioji; Toshiyuki Mine, Hamuramachi; Takashi Kobayashi, Kokubunji; Tokuo Kure, Nishitama; Shinpei Iijima, Akishima, and Jiro Yugami, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

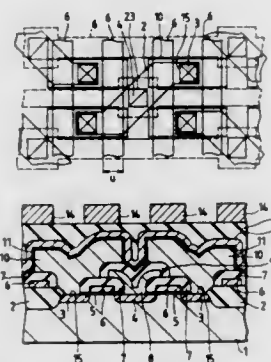
Filed Jul. 25, 1989, Ser. No. 384,821

Claims priority, application Japan, Aug. 22, 1988, 63-206470; Sep. 14, 1988, 63-228579

Int. Cl.⁵ H01L 29/68, 27/02, 27/10

U.S. Cl. 357—23.6

42 Claims



1. A semiconductor device comprising:
 - at least one insulated-gate field-effect transistor (IGFET) each one thereof comprising a pair of spaced-apart impurity doped regions from a plurality of impurity doped regions formed at a predetermined spacing within a sur-

face region of a semiconductor substrate having a first conductivity type, said doped regions having a second conductivity type, and a gate electrode including a first conductive film formed through a first insulator on the surface of said semiconductor substrate between a corresponding pair of impurity doped regions;
a second insulator formed on upper and side surfaces of said gate electrode;
a data line comprising a second conductive film electrically connected to a first of said pair of impurity doped regions and extending to the upper surface of said gate electrode along an outer surface of said second insulator; and
at least one storage capacitor each one thereof comprising a first electrode including a third conductive film electrically connected to the second of said pair of impurity doped regions through an opening provided in an insulator formed on said second impurity doped region, said third conductive film having a thickness greater than the radius of said opening and extending to an upper surface of said data line along the outer surface of said second insulator and an outer surface of a third insulator formed so as to insulate said data line, a dielectric film formed continuously over top and side surfaces of said first electrode, and a second electrode including a fourth conductive film stacked over said dielectric film,

wherein each IGFET of said at least one IGFET is electrically connected at the first one of a corresponding pair of impurity doped regions thereof to a respective one of a plurality of data lines disposed, at a regular interval, substantially in parallel and which are substantially straight-line directioned,

wherein the gate electrode of each said IGFET is correspondingly associated with one of a plurality of word lines disposed, at a regular interval, substantially in parallel and which are substantially straight-line directioned crossing said plurality of data lines substantially at a right angle, wherein each IGFET is defined by an active region, surrounded by an isolating insulating film, which includes a channel forming portion defining a channel length direction which is not in parallel to the direction of said data lines,

wherein the first region of said pair of impurity doped regions in each of said at least one IGFET is formed so as to orthogonally underlie, with respect to a plan view thereof, the data line electrically connected therewith, and
wherein, in the plan view arrangement thereof, the second impurity doped regions of IGFETs of said at least one IGFET corresponding to the same word line are disposed in an arrangement in which adjacent pairs of second impurity doped regions thereof have respectively interposed between them the second impurity doped regions of IGFETs adjacent thereto corresponding to ones of an adjacent word line, the second impurity doped regions of said IGFETs of adjacent word lines are disposed so as to effect a substantially straight-line arrangement thereof and which straight-line arrangement is substantially in parallel to the direction of said word lines.

5,091,762

SEMICONDUCTOR MEMORY DEVICE WITH A 3-DIMENSIONAL STRUCTURE

Toshiharu Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 358,278, May 30, 1989, abandoned.

This application Dec. 14, 1990, Ser. No. 626,404

Claims priority, application Japan, Jul. 5, 1988, 63-167601

Int. Cl.⁵ H01L 29/78

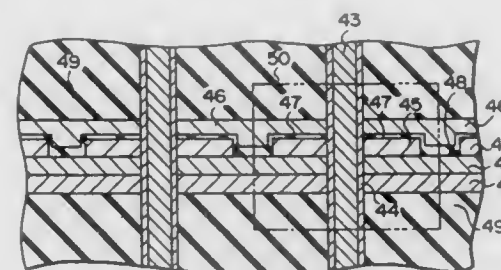
U.S. Cl. 357—23.6

4 Claims

1. A semiconductor memory apparatus having a semiconductor substrate comprising:
 - a first block of field-effect-transistor-memory structure on said substrate and a second block of field-effect-transistor memory structure which is directly on said first block; and

a plurality of gate layers serving as word lines, each of which penetrates each of said first and second blocks to intersect said field-effect-transistor memory structures of said first and second blocks,
wherein each of said first block and second block comprises:

- a first insulating layer;
- a first silicon layer of first conductivity type on said first insulating layer, serving as a source of at least one field-effect transistor and serving as a data line;



- a second silicon layer of second conductivity type on said first silicon layer serving a channel of said field-effect transistor;
- a third silicon layer of said first conductivity type on said second silicon layer serving a drain of said field-effect transistor;
- a second insulating layer on said third silicon layer; and
- a first conductive layer on said second insulating layer providing a capacitor between first conductive layer and said third silicon layer.

5,091,763

SELF-ALIGNED OVERLAP MOSFET AND METHOD OF FABRICATION

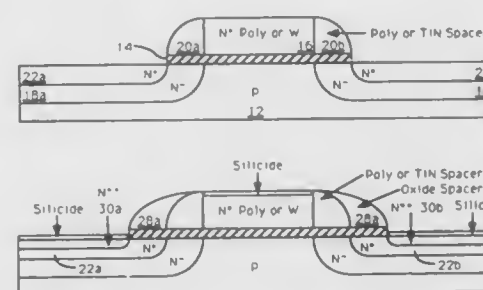
Julian J. B. Sanchez, Mesa, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1990, Ser. No. 630,285

Int. Cl.⁵ H01L 29/06, 21/265

U.S. Cl. 357—23.9

14 Claims



1. A high speed submicron channel hot electron resistant metal-oxide-semiconductor transistor ideal for VLSI circuits formed on a semiconductor substrate of a first conductivity type comprising:
 - a gate oxide layer formed on said substrate;
 - a polysilicon inner gate electrode of a predetermined length and width covering said gate oxide layer, said polysilicon inner gate electrode including laterally opposite sidewalls along said width of said inner gate electrode;
 - a pair of lightly doped drain surface oxide layers disposed on respective areas of said substrate adjacent respective sidewalls of said polysilicon inner gate electrode;
 - a first source region and a first drain region of a second conductivity type having a first concentration of second conductivity type dopant disposed in said substrate in alignment with said sidewalls of said polysilicon inner gate

electrode for forming a pair of lightly doped spread apart regions;

- a pair of TiN spacers formed adjacent to and in electrical contact with respective sidewalls of said polysilicon inner gate electrode on respective lightly doped drain surface oxide layers for forming along with said polysilicon inner gate electrode a MOSFET gate electrode which overlaps said lightly doped regions; and
- a second source region and a second drain region of a second concentration dopant of said second conductivity type wherein said second concentration dopant is greater than said first concentration dopant, disposed in said first source region and said first drain region, respectively, self-aligned with the outer edges of said TiN spacers which provide masking.

5,091,764

SEMICONDUCTOR DEVICE HAVING A TRANSPARENT ELECTRODE AND AMORPHOUS SEMICONDUCTOR LAYERS

Keizo Asaoka; Kazunori Tsuge, and Yoshihisa Tawada, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

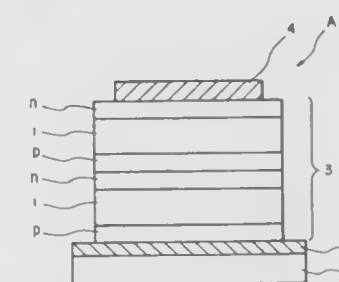
Filed Sep. 28, 1989, Ser. No. 143,797

Claims priority, application Japan, Sep. 30, 1988, 63-248452; Sep. 30, 1988, 63-248453; Sep. 30, 1988, 63-248454

Int. Cl.⁵ H01L 27/14

U.S. Cl. 357—30

7 Claims



1. A semiconductor device comprising a glass substrate having formed thereon, in order,
 - (a) a transparent electrode comprising a SnO₂;
 - (b) amorphous semiconductor layers having at least one pin-junction or nip-junction; and
 - (c) a back electrode,
 wherein the transparent electrode has a dopant density of not more than 0.5 weight %.

5,091,765

PHOTOCONDUCTIVE CELL WITH ZINC OXIDE TETRAPOD CRYSTALS

Minoru Yoshinaka, Higashiosaka; Eizou Asakura, Suita; Mitsumasa Oku, Osaka; Motoi Kitano, Kawanishi, and Hideyuki Yoshida, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 439,047, filed as PCT/JP89/00216, Mar. 2, 1989, abandoned. This application Apr. 3, 1991, Ser. No. 680,800

Claims priority, application Japan, Mar. 4, 1988, 53-51891

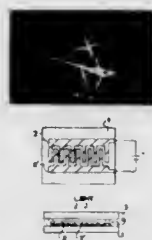
Int. Cl.⁵ H01L 29/22, 31/08

U.S. Cl. 357—30

2 Claims

1. A photoconductive cell comprising a photodetector section which comprises an aggregate containing tetrapod-like zinc oxide whiskers each consisting of a core and four needle-

shaped crystals extending in four different directions from the core and each having a diameter of from 0.7 to 14 μm at a root



portion of the crystal and a length from the root to a tip end of the crystal of from 3 to 200 μm .

5,091,766

THYRISTOR WITH FIRST AND SECOND INDEPENDENT CONTROL ELECTRODES

Tomohide Terashima, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

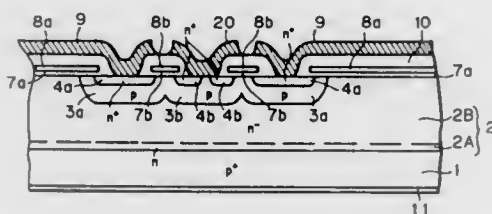
Filed Aug. 28, 1990, Ser. No. 573,776

Claims priority, application Japan, Oct. 23, 1989, 1-275412

Int. Cl.⁵ H01L 29/74

U.S. Cl. 357—38

5 Claims



1. A thyristor, comprising:

- a first semiconductor layer of a first conductivity type, having first and second major surfaces;
 - a second semiconductor layer of a second conductivity type, formed on said first major surface of said first semiconductor layer;
 - a first semiconductor region of the first conductivity type, selectively formed on a surface of said second semiconductor layer;
 - second and third semiconductor regions of the second conductivity type, selectively formed on a surface of said first semiconductor region separately from each other;
 - a first insulating film formed on the surface of said first semiconductor region between said second semiconductor layer and said second semiconductor region;
 - a second insulating film formed on the surface of said first semiconductor region between said second semiconductor region and said third semiconductor region;
 - first and second control electrodes formed on said first and second insulating films independent of each other, respectively;
 - a first main electrode formed on said second semiconductor region;
 - a conductive layer formed on said first semiconductor region and said third semiconductor region; and
 - a second main electrode formed on said second major surface of said first semiconductor layer;
- wherein said second semiconductor region is composed of a plurality of regions discretely formed; and said conductive layer is further formed on the surface of said first semiconductor region between said plurality of regions.

5,091,767

ARTICLE COMPRISING A LATTICE-MISMATCHED SEMICONDUCTOR HETEROSTRUCTURE

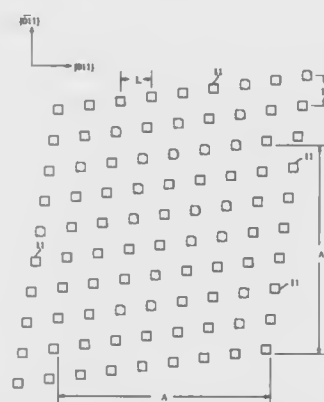
John C. Bean, New Providence; Gregg S. Higashi, Basking Ridge; Robert Hull, South Orange, all of N.J., and Justin L. Peticolas, Wescosville, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 18, 1991, Ser. No. 671,276

Int. Cl.⁵ H01L 29/04

U.S. Cl. 357—60

12 Claims



1. An article comprising a semiconductor body comprising
 - a) a first semiconductor single crystal substrate having a major surface and comprising a multiplicity of spaced-apart features (to be termed "dislocation sinks") on or in the substrate, associated with a given dislocation sink being a dimension (h) normal to the major surface;
 - b) a second semiconductor layer of nominal thickness t on the major surface and epitaxial with the first semiconductor substrate, with at least a portion of the second semiconductor layer contacting at least some of the dislocation sinks;
 - c) associated with the first and second semiconductor materials being lattice constants a_s and a_d , respectively, with a_s differing from a_d ; and
 - d) associated with the second semiconductor layer being one or more dislocation slip directions and a minimum distance of threading dislocation slip in a dislocation slip direction (said distance designated l_d);

CHARACTERIZED IN THAT

- e) the dislocation sinks are disposed such that in the at least a portion of the second semiconductor layer that contacts dislocation sinks substantially all points of the second semiconductor layer are within the distance l_d of a dislocation sink, the distance measured along a slip direction; and
- f) the layer thickness t and the sink dimension h are selected such that h is less than or approximately equal to t, and the layer surface is substantially planar.

5,091,768

SEMICONDUCTOR DEVICE HAVING A FUNNEL SHAPED INTER-LEVEL CONNECTION

Yasushi Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 18, 1990, Ser. No. 467,122

Claims priority, application Japan, Jan. 25, 1989, 1-16723

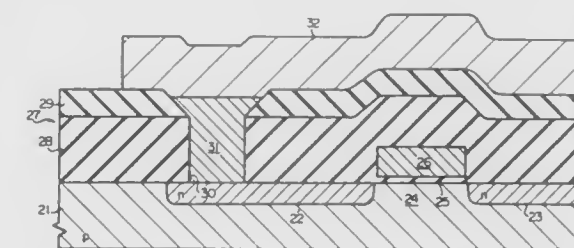
Int. Cl.⁵ H01L 21/94, 21/95

U.S. Cl. 357—71

7 Claims

1. A semiconductor device having at least one transistor, said device comprising:

- a) a lower conductive layer,
- b) an inter-level insulating film structure provided on said lower conductive layer, a contact window being formed in said inter-level insulating film structure,
- c) an inter-level connection provided in said contact window and making contact at the bottom surface thereof with said lower conductive layer, and
- d) an upper conductive layer formed on said inter-level insulating film structure and electrically connected to said inter-level connection, in which said inter-level insulating film structure comprises a lower insulating film having a



lower part of said contact window and an upper insulating film having an upper part of said contact window defined by tapered walls thereof, and in which the upper part of the contact window is increased in cross sectional area from said lower part of said upper contact window part to said upper part of said upper contact window part, said inter-level connection being accommodated in the lower and upper parts of said contact window without extending from said upper part, said inter-level connection having a generally flat upper surface substantially in parallel to an upper surface of said inter-level insulating film structure.

5,091,769

CONFIGURATION FOR TESTING AND BURN-IN OF INTEGRATED CIRCUIT CHIPS

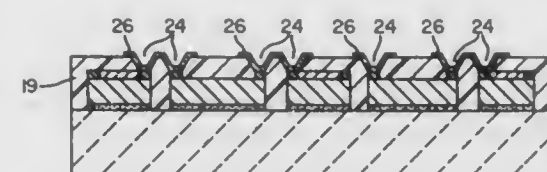
Charles W. Eichelberger, 1256 Waverly Pl., Schenectady, N.Y. 12308

Filed Mar. 27, 1991, Ser. No. 676,206

Int. Cl.⁵ H01L 23/28

U.S. Cl. 357—72

33 Claims



1. An integrated circuit chip package comprising:
 - a substrate;
 - a plurality of integrated circuit chips disposed on said substrate, said integrated circuit chips each having interconnection pads thereon;
 - a plurality of spacer blocks disposed on said substrate such that each block is located at a side of a chip of said plurality of integrated circuit chips, with at least some of said spacer blocks being disposed between said chips;
 - at least one of said plurality of blocks including a connection array for applying one of a biasing signal, power signal, ground signal and clock signal to selected chip interconnection pads, said connection array having a plurality of interconnection pads;
 - an encapsulant surrounding said integrated circuit chips and said spacer blocks, said encapsulant having an upper surface above the tops of the integrated circuit chips and the tops of the spacer blocks and having a plurality of via openings therein, said openings being aligned with at least

some of said chip interconnection pads and said connection array interconnection pads; and

a pattern of interconnection conductors disposed above the upper surface of said encapsulant so as to extend between at least some of said openings and so as to provide electrical connection to at least some of said chip interconnection pads and said connection array interconnection pads through said openings.

5,091,770

SEMICONDUCTOR DEVICE HAVING A CERAMIC PACKAGE

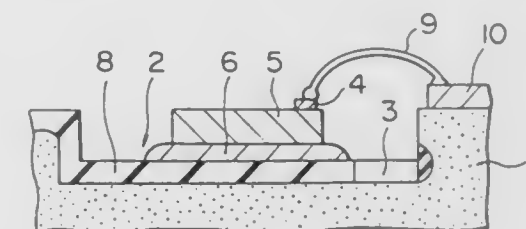
Ichiro Yamaguchi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 16, 1991, Ser. No. 700,777

Int. Cl.⁵ H01L 23/02, 21/44

U.S. Cl. 357—74

6 Claims



1. A semiconductor device, comprising:
 - a package body of a ceramic material formed with a stage region for supporting a semiconductor chip and an interconnection region used for external interconnection of the semiconductor device, said interconnection region being provided on a region that is separated from the stage region;
 - a semiconductor chip mounted on the stage region of the package body by a layer of a resin that fixes the semiconductor chip on the stage region, said semiconductor chip having a bonding pad region for external interconnection; an interconnection lead provided on the interconnection region of the package body for external connection of the semiconductor device;
 - an interconnection wire connecting the bonding pad region of the semiconductor chip and the interconnection lead electrically; and
 - a zone of modified surface texture formed on a surface of the package body at a part located between the semiconductor chip and the interconnection region, said zone having a texture with increased density as compared to the rest of the package body.

5,091,771

COMPACT PACKAGE FOR ELECTRONIC MODULE

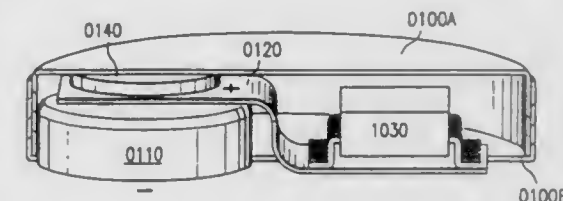
Michale L. Bolan, Dallas; Robert D. Lee, Denton, and James P. Manitt, Garland, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed May 15, 1989, Ser. No. 351,760

Int. Cl.⁵ H01L 23/02

U.S. Cl. 357—74

19 Claims



1. An electronic module, comprising:

5,091,778
IMAGING LIDAR SYSTEMS AND K-METERS
EMPLOYING TUNABLE AND FIXED FREQUENCY
LASER TRANSMITTERS

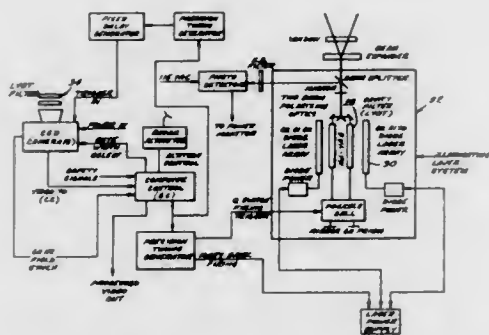
R. Norris Keeler, McLean, Va., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Dec. 21, 1990, Ser. No. 632,377

Int. Cl.⁵ H04N 7/18

U.S. Cl. 358—95

27 Claims



1. A method for detecting and imaging a volume in water, the volume being at a selected water depth and the selected water depth having a selected Jerlov Class associated therewith, including the steps of:

- tuning or setting the operating wavelength of a laser transmitter to a selected wavelength which optimizes performance of said laser transmitter with respect to said selected Jerlov Class;
- generating short pulses of light from said laser transmitter; projecting said generated short pulses of light toward the water and at said volume in said water;
- detecting said pulses of light reflected back from said volume using gated detector means; and
- converting said detected pulses of light to a video image of said volume.

5,091,779
AUTOMATIC LIGHT ADJUSTMENT MEANS FOR AN
ENDOSCOPE

Felix Ams, Kämpfelbach, and Roland Schäfer, Bretten-Dürrenbüchig, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 551,702

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928052

Int. Cl.⁵ A61B 1/04

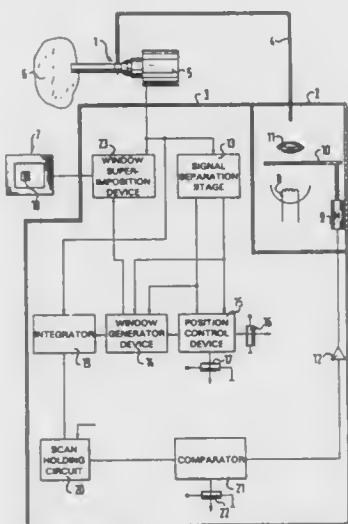
U.S. Cl. 358—98

3 Claims

1. Apparatus for adjusting a light source for illuminating an object under examination by means of an endoscope, the apparatus comprising:

- a light source having means for adjusting the quantity of light emitted thereby;
- a light guide connected to said light source for transmitting light therefrom to illuminate said object;
- a video camera for producing a video picture of said object; an image guide connected to said camera for transmitting an image of said object thereto;
- a monitor for displaying said video picture; and
- signal processing means connected to said camera for processing the video signal emitted thereby, and also to said monitor, and comprising a window generating device and a window superimposition device for visually displaying and optically defining a window and for generating a measuring window in the video picture displayed by said monitor, and an integrator device connected to said ad-

justing means and to said window generating device, for integrating a video signal therefrom to adjust the quantity



of light emitted by said light source, only within the area of said measuring window.

5,091,780
A TRAINABLE SECURITY SYSTEM METHOD FOR THE
SAME

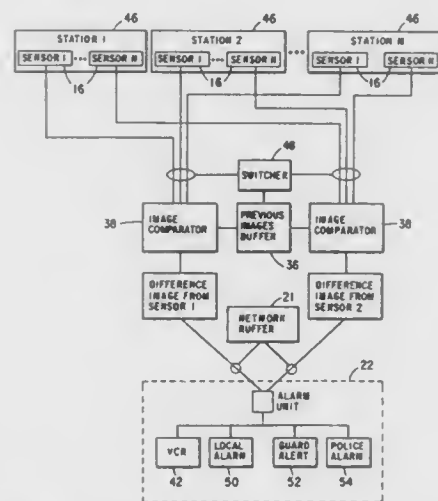
Dean A. Pomerleau, Pittsburgh, Pa., assignor to Carnegie-Mellon University, Pittsburgh, Pa.

Filed May 9, 1990, Ser. No. 521,237

Int. Cl.⁵ H04N 7/18

U.S. Cl. 358—108

15 Claims



1. A security system comprised of:
 means for monitoring an area under surveillance, said monitoring means producing difference images of the area;
 means for processing the difference images to determine whether the area is in a desired state or an undesired state, said processing means includes a trainable neural network to learn the difference between the desired state and the undesired state.

5,091,781
CAMERA MOVING APPARATUS
 Byeong-eui An, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

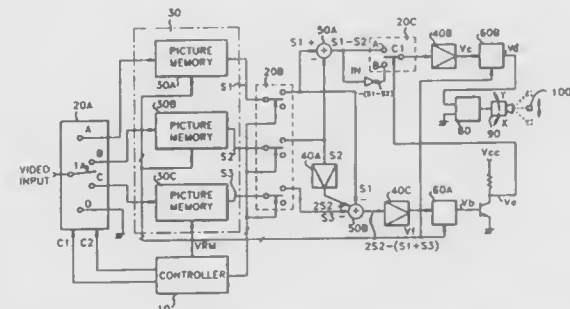
Filed Mar. 12, 1990, Ser. No. 491,977

Claims priority, application Rep. of Korea, Jul. 27, 1989, 89-10631

Int. Cl.⁵ H04N 5/225

U.S. Cl. 358—125

6 Claims



1. A camera moving apparatus, comprising:
 picture memory means sampling and storing picture signals representing images of a moving subject in order;
 switching means for multiplexing picture signals from said picture memory means in accordance with controlling signals from a controller;
 plural adding and subtracting means for adding and subtracting the picture signals from said switching means; and
 camera moving means for making a camera move in the direction of movement of a subject by detecting a peak value of an output signal from said respective adding and subtracting means.

5,091,782
APPARATUS AND METHOD FOR ADAPTIVELY
COMPRESSING SUCCESSIVE BLOCKS OF DIGITAL
VIDEO

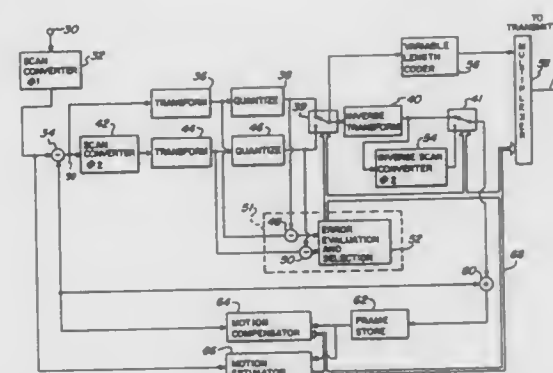
Edward A. Krause, San Diego, and Woo H. Paik, Encinitas, both of Calif., assignors to General Instrument Corporation, Hoboken, Pa.

Filed Apr. 9, 1990, Ser. No. 507,258

Int. Cl.⁵ H04N 7/12, 7/18

U.S. Cl. 358—135

33 Claims



1. Apparatus for processing digitized interlaced video signals for transmission in a compressed form comprising:
 first means for compressing a set of pixel data presented in a field format to provide a first compressed video signal;
 second means for compressing said set of pixel data presented in a frame format to provide a second compressed video signal;
 means coupled to said first means for evaluating errors in the first compressed video signal and coupled to said second

means for evaluating errors in the second compressed video signal; and
 means responsive to said error evaluating means for selecting the compressed video signal having the least error.

5,091,783
STILL MORE FEATURE FOR IMPROVED DEFINITION
TELEVISION DIGITAL PROCESSING UNITS, SYSTEMS,
AND METHODS

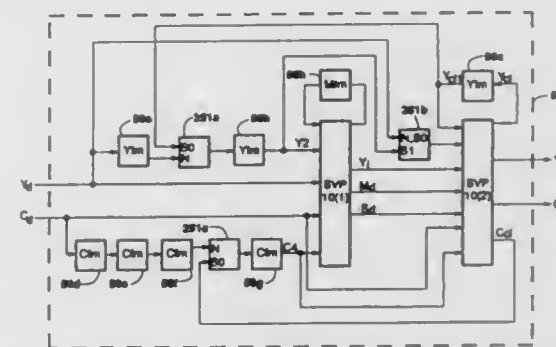
Hiroshi Miyaguchi, Tokyo, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 1, 1990, Ser. No. 486,663

Int. Cl.⁵ H04N 7/01

U.S. Cl. 358—140

19 Claims



1. A digital processing unit for use in an improved definition television receiver for providing a still picture display from data samples of a standard television signal representing a television picture, comprising:

- a single-instruction multiple-data processor for processing said data samples, wherein said processor has a number of processing elements corresponding to the number of said data samples, and wherein said processor receives a packet of said data samples representing a line of said television picture word-serially, and wherein said processor operates on said line of data samples in parallel;
- a plurality of field memories for providing data samples representing delayed fields of said television picture to said processor;
- a control unit for providing control and timing signals to said processor;
- an instruction generator for providing instructions to said processor;
- memory for storing instructions used by said processor; and
- a plurality of multiplexers for selecting whether data flow into said processor is unprocessed data or processed data fed back to said multiplexer, in response to a still mode selection signal.

5,091,784
MATRIX TYPE IMAGE DISPLAY APPARATUS USING
NON-INTERLACE SCANNING SYSTEM

Ryuichi Someya, Chigasaki; Nobuaki Kabuto; Yuichiro Kimura, both of Yokohama, and Kazuhiro Watanabe, Ishioka, all of Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering Company, both of Tokyo, Japan

Filed Sep. 4, 1990, Ser. No. 578,006

Claims priority, application Japan, Sep. 7, 1989, 1-230377; Sep. 8, 1989, 1-231488

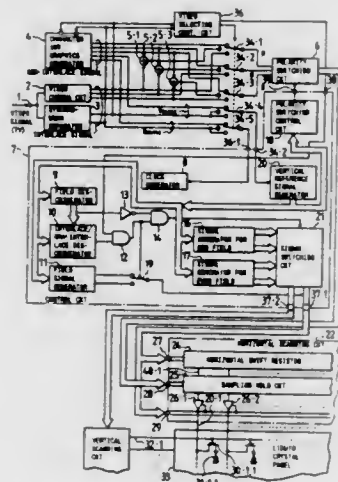
Int. Cl.⁵ H04N 3/14

U.S. Cl. 358—183

19 Claims

1. In an image display apparatus including a matrix display panel having image display elements as pixels arranged thereon in a matrix array at the intersecting points of a plurality of horizontally extended scanning electrodes and a plurality of vertically extended signal electrodes and adapted such that said display element is driven when both the electrodes are driven simultaneously, a vertical scanning circuit connected

with said horizontally extended scanning electrodes for driving said scanning electrodes in synchronism with the vertical synchronizing period of a signal to be displayed, a horizontal scanning circuit, when the signal to be displayed is a television signal on an interlace scanning system, sequentially using signals stored in a plurality of sample-and-hold circuits, which store the same horizontal scanning signal, for driving said vertically extended signal electrodes a plurality of times during one horizontal scanning period, thereby scanning a plurality of lines of said matrix-arrayed image display elements on the panel surface, and interlace scanning means, during said scanning process, providing a phase difference between the combination of a plurality of lines in the n th field of the television signal and the combination of a plurality of lines in the $n+1$ th field to make interlace scanning possible, whereby the scan-



ning line on said panel surface is converted to that of a multiple-line scanning system and an interlace display of said television signal is achieved, said image display apparatus comprising:

- a mixing circuit for outputting a mixed signal obtained by mixing a television signal on an interlace scanning system and a character and graphic signal of such data as characters and graphics on a non-interlace system as a signal to be displayed; and
- control means, when said signal to be displayed is said mixed signal, stopping the operation of said interlace scanning means and switching the scanning system to a non-interlace scanning system by force, whereby a superimposed display of a character and graphic signal on a television signal is made possible.

5,091,785

PICTURE-IN-PICTURE CIRCUITRY USING FIELD RATE SYNCHRONIZATION

Barth A. Canfield, and David J. Duffield, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

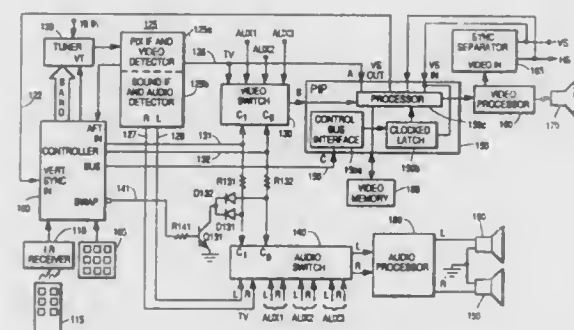
Filed Apr. 20, 1989, Ser. No. 340,944
Int. Cl.⁵ H04N 5/262

U.S. Cl. 358—183

20 Claims

1. A television receiver having picture-in-picture capability, comprising:
 - an RF signal input for receiving a plurality of television RF signals;
 - television tuner means for selecting a particular RF signal from said plurality of signals in response to a tuner control signal, and producing an IF signal from said selected RF signal;
 - IF processing and detector means coupled to said tuner means for receiving said IF signal and producing a detected baseband video signal therefrom;

control means coupled to said tuner means for generating said tuner control signal in response to data signals; data input means coupled to said control means for generating said data signals in response to activation by a user; a first auxiliary baseband video signal input terminal for receiving a first auxiliary baseband video signal; picture-in-picture processing means having a first signal input coupled to said video detector means for receiving said detected baseband video signal and a second signal input coupled to said first auxiliary baseband video input terminal means for receiving said baseband video signal, and combining said video signals to form a combined image signal which when displayed has a major portion, and has a minor portion displayed in a first position, said picture-in-picture processing means having a control input for receiving a second control signal from said control means, and having an output terminal for developing said



combined image signal in response to said second control signal; and synchronizing means coupled to said output terminal of said picture-in-picture processing means for receiving said combined image signal and for generating a television vertical synchronizing component signal therefrom; said control means having an input for receiving said television vertical synchronizing component signal, said control means generating said second control signal in response to said data signals and in response to said television vertical synchronizing component signal to cause said picture-in-picture processing means to form a combined image signal which when displayed has said minor portion displayed in a position offset from said first position by a predetermined step size in a desired direction, said predetermined step size being substantially smaller than the displayed height and width of said minor portion of said image.

5,091,786

MULTI-SCREEN FEATURE FOR IMPROVED DEFINITION TELEVISION DIGITAL PROCESSING UNITS, SYSTEMS, AND METHODS

Hiroshi Miyaguchi, Tokyo, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

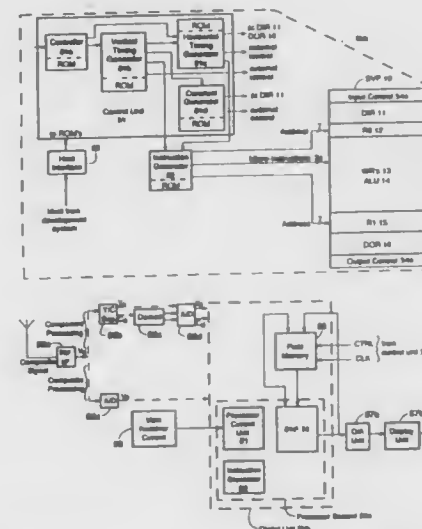
Filed Mar. 1, 1990, Ser. No. 486,666
Int. Cl.⁵ H04N 5/262

U.S. Cl. 358—183

20 Claims

1. A digital processing unit for use in an improved definition television receiver for providing a multi-screen display from data samples of a standard television signal representing a television picture, comprising:
 - a single-instruction multiple-data processor for processing said data samples, wherein said processor has a number of processing elements corresponding to the number of said data samples, and wherein said processor receives a packet of said data samples representing a line of said television picture word-serially, and wherein said processor operates on said line of data samples in parallel;
 - a plurality of field memories for providing data samples

representing delayed fields of said television picture to said processor; a first control unit for providing control and timing signals to said processor for controlling a full screen display; a second control unit for providing control and timing signals to said processor for controlling a sub-picture display; an instruction generator for providing instructions to said processor;



memory for storing instructions used by said processor; a plurality of still mode multiplexers for selecting whether data flow is into said processor is unprocessed data or processed data fed back to said processor, in response to a still mode selection signal; and a plurality of multi-screen mode multiplexers for providing sub-picture data to said processor, in response to a multi-screen mode selection signal.

5,091,787

MEMORY CARTRIDGE-CONNECTABLE ELECTRONIC DEVICE SUCH AS ELECTRONIC STILL VIDEO CAMERA

Mikio Watanabe, and Seiki Nishi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

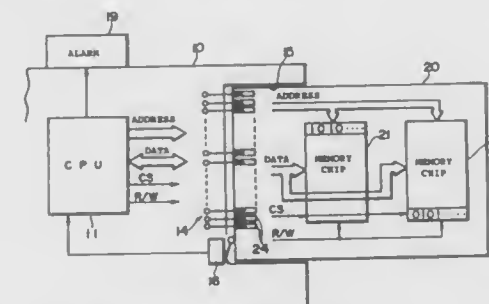
Division of Ser. No. 191,064, May 6, 1988. This application Dec. 7, 1989, Ser. No. 447,079

Claims priority, application Japan, May 6, 1987, 62-108956; May 19, 1987, 62-120075; Jun. 23, 1987, 62-154459

Int. Cl.⁵ H04N 5/30

U.S. Cl. 358—209

14 Claims



1. A digital electronic still video camera to which a memory cartridge is connected in a loadable/unloadable manner, the memory cartridge storing, in the form of digital data, a video signal representing a still picture, the camera comprising:
 - connecting means to which the memory cartridge is electrically connected in a loadable/unloadable manner;
 - image pick-up means, having a solid-state image pick-up

device, for imaging light of a subject received by said solid-state image pick-up device and for outputting a video signal representing the subject;

signal converting means for converting the video signal outputted by said image pick-up means into a corresponding digital signal and for outputting the digital signal to said connecting means; and

control means for controlling said image pick-up means to perform imaging and said signal converting means to convert the outputted video signal into the digital signal, and for supplying said connecting means with a control signal for controlling writing into the memory cartridge, said control means comprising

information generation means for generating information for verifying that the memory cartridge has been electrically connected to the camera through said connecting means, and information verifying means for verifying the information generated,

said control means transmitting the information generated by said information generating means to the memory cartridge for storage therein, reading the stored information from the memory cartridge, and enabling each functional part of the camera to perform a photographic operation after said information verifying means verifies that the generated information is identical to the stored information read from the memory cartridge.

5,091,788

CROSSTALK CANCELLING CIRCUIT FOR REMOVING CROSSTALK COMPONENT FROM REPRODUCED SIGNAL

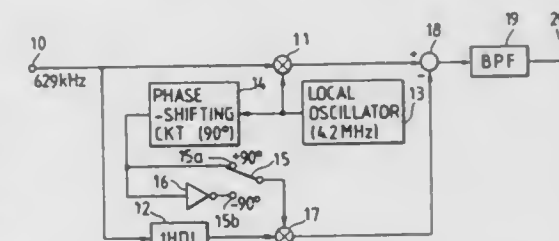
Yasutoshi Matsuo, Kawasaki, and Ryo Nakano, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Oct. 5, 1989, Ser. No. 417,402

Claims priority, application Japan, Oct. 6, 1988, 63-130431[U]
Int. Cl.⁵ H04N 9/79, 9/88

U.S. Cl. 358—328

2 Claims



1. A crosstalk cancelling circuit comprising:
 - first multiplying means for multiplying a frequency-lowered conversion chrominance signal reproduced from a magnetic tape by a local oscillating signal;
 - delay means for delaying said frequency-lowered conversion chrominance signal by one horizontal scanning period;
 - circuit means for alternately outputting a signal leading said local oscillating signal by a phase angle of 90° and a signal lagging said local oscillating signal by a phase difference of 90° in synchronism with a field frequency of frequency-lowered conversion chrominance signal;
 - second multiplying means multiplying the output of said delay means by the output of said circuit means; and
 - operation means for effecting addition or subtraction between the output of said first multiplying means and the output of said second multiplying means to thereby produce a cross-talk eliminated carrier chrominance signal.

5,091,789

MULTICOLOR IMAGE FORMING APPARATUS

Satoshi Haneda, Masakazu Fukuchi, and Hisashi Shoji, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 442,550, Nov. 28, 1989, abandoned.

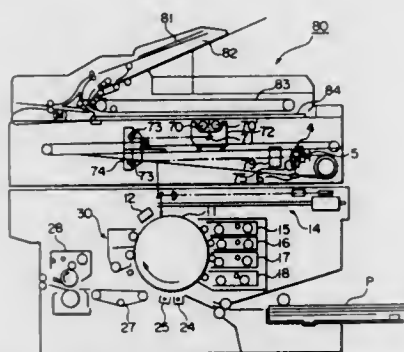
This application May 22, 1991, Ser. No. 707,963

Claims priority, application Japan, Nov. 30, 1988, 63-304737; May 12, 1989, 1-119594

Int. Cl.⁵ H04N 1/00, 1/04

U.S. Cl. 358—401

4 Claims



1. A method for reproducing a color image on a document on a recording sheet, comprising the steps of: providing an image reading means for generating a plurality of color component signals corresponding to the color image; moving the image reading means along the document in an outward direction from an initial position to photoelectrically read the color image while an image carrying means, having a rotatable endless imaging surface, rotates through a first rotation; writing a first color component image, corresponding to a first one of the plurality of color component signals, onto the imaging surface while the image carrying means rotates through the first rotation; storing a second one of the plurality of color component signals in a memory means while the image carrying means rotates through the first rotation; moving the image reading means in a backward direction to the initial position without reading the color image while the image carrying means rotates through a second rotation; and writing a second color component image, corresponding to the second one of the plurality of color component signals which is stored in the memory means, onto the imaging surface while the image carrying means rotates through the second rotation.

5,091,790

MULTIPURPOSE COMPUTER ACCESSORY FOR FACILITATING FACSIMILE COMMUNICATION

Morton Silverberg, 24 Edgewater Common, Westport, Conn. 06880

Filed Dec. 29, 1989, Ser. No. 459,057

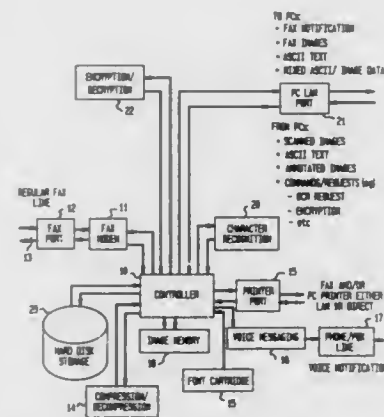
Int. Cl.⁵ H04N 1/32

U.S. Cl. 358—434

21 Claims

1. A computer accessory comprising a fax port for receiving fax messages, a second port adapted to be connected to at least one microcomputer for communication of messages to and from said microcomputer, controlling means for receiving fax messages from said fax port and applying corresponding messages to said second port and for receiving fax messages from said second port and applying corresponding messages to said

fax port, means responsive to the receipt of a fax message at said fax port for identifying an intended recipient of said fax



message, and means for providing a notification signal indicating the receipt of said fax message.

5,091,791

PORTABLE VIDEO-PHOTO MACHINE

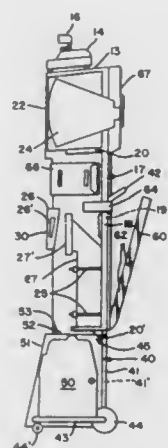
Charles E. Mitchell, 64 Union Ave., Upper Saddle River, N.J. 07458

Filed Sep. 12, 1990, Ser. No. 581,724

Int. Cl.⁵ H04N 1/40

U.S. Cl. 358—479

9 Claims



1. A portable, self contained video-photo machine for readily producing a photograph of a subject from a captured video image thereof, said video-photo machine comprising: an elongated upright, generally cylindrical housing; a video camera for creating real time video images of the subject mounted on the uppermost—horizontal exterior surface of said housing, said video camera having a video output terminal; a monitor having a screen for displaying said real time video images mounted within said housing, said screen being viewable through an opening in the frontal surface of said housing, and said monitor further having a video input terminal; a still-frame apparatus for "freezing" a selected one frame of said video images and controlling the display thereof on said monitor, said still-frame apparatus having video input and output terminals for connecting said still-frame apparatus intermediate said camera and monitor via the respective video output and input terminals of said camera and monitor; said still-frame apparatus comprising a computer having a memory for capturing and storing said selected one "frozen" video image;

5,091,793

OPTICAL HEAD

Shoji Goto; Akihiro Sakata; Hiroshi Yamamoto; Tetsuo Saimi, and Kazuo Momoo, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

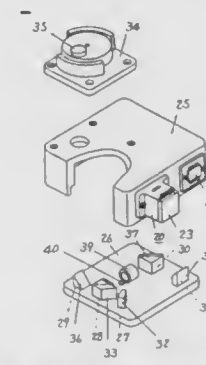
Filed Dec. 27, 1990, Ser. No. 634,849

Claims priority, application Japan, Dec. 28, 1989, 1-342680

Int. Cl.⁵ G02B 7/18

U.S. Cl. 359—831

6 Claims



- photo printing means integrally formed with said still-frame apparatus for readily producing a hard copy photograph of said selected one "frozen" video image;
- a frontal access door pivotally connected to said housing beneath said monitor and adjacent to said photo printing means to provide access to said photo printing means for loading the same with film for producing said photograph; said frontal access door further including an elongated opening therein for permitting the egress of said photograph from said printing means and the presentation thereof to an operator;
- a control panel electrically connected to said still-frame apparatus and mounted in a recess in said frontal access door; said control panel having actuation means for selectively providing said "freezing" of one of the video images;
- means for providing a source of power for said video camera, monitor, and still-frame printing apparatus; and
- means for facilitating the transport of the machine as a unit comprising: a hand truck having a platform surface, an upright frame member transversely connected to said platform surface at its lower end with handle means provided at its upper end, and wheel means connected to said platform and upright frame member;
- said hand truck being independently connected to said housing with all of the components comprising said video-photo machine either contained in or connected to said housing.

1. An optical head for recording and reproducing information on an optical disk, comprising:
 - (a) a semiconductor laser unit;
 - (b) a detector for detecting reflected light returning from the optical disk;
 - (c) a cover having a substantially U-shaped cross section and carrying thereon said semiconductor laser unit and said detector;
 - (d) a substantially planar base;
 - (e) at least one first optical component secured by bonding to said base and constituting a first optical system acting on a light beam emitted from said semiconductor laser unit, said first optical component including a beam shaping prism, a deflecting beam splitter or a composite prism comprised of a combination of the beam shaping prism and the deflecting beam splitter; and
 - (f) at least one second optical component secured by bonding to said base and constituting a second optical system acting on the reflected light returning from the optical disk, said second optical component including a prism or a mirror, wherein said cover is secured to said base and covers said first and second optical components.

5,091,792

LIQUID CRYSTAL DISPLAY HAVING REDUCED ITO SHADING MATERIAL AND METHOD OF MANUFACTURING SAME

Yoshimasa Kaida, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

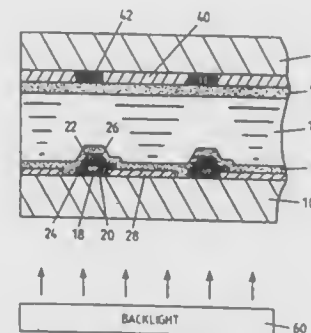
Filed Apr. 15, 1991, Ser. No. 685,574

Claims priority, application Japan, Apr. 13, 1990, 2-96650

Int. Cl.⁵ G02F 1/133

U.S. Cl. 359—67

18 Claims



1. A liquid crystal display comprising:
 - a first substrate;
 - an electrode disposed on said first substrate and having a composition containing indium tin oxide, said electrode having a selected region thereof reduced to lower the oxygen content in said selected region so that the transmissivity of said selected region is substantially reduced with respect to said portions of said electrode other than said selected region.

5,091,794

TWISTED NEMATIC LIQUID CRYSTAL DISPLAY DEVICE

Shunji Suzuki, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,747

Claims priority, application Japan, Nov. 11, 1988, 63-283760

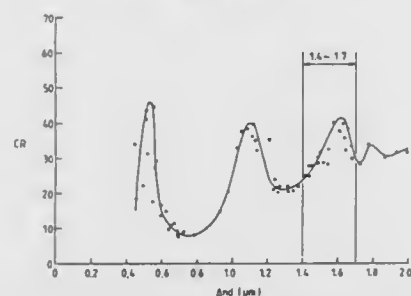
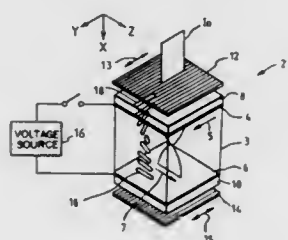
Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—93

6 Claims

1. A twisted nematic liquid crystal display device comprising:
 - a first transparent substrate;
 - a first transparent electrode which has been subjected to orientation treatment in a first direction disposed on said first substrate;
 - a second transparent substrate spaced apart and parallel to said first substrate;
 - a second transparent electrode which has been subjected to orientation treatment in a second direction disposed on said second substrate;
 - a liquid crystal layer wherein major axes of the molecules have been subjected to a twisted orientation of 90°, located between said first and second electrodes;
 - a first transparent polarizing plate having a direction of polarization coinciding with said first direction and located outside said first electrode, and

a second transparent polarizing plate having a direction of polarization coinciding with said second direction and located outside said second electrode, wherein when no voltage is applied between said two electrodes; light incident on said first polarizing plate is not able to pass through the liquid crystal layer due to the twisted orientation through 90° of the major axes of the molecules of said liquid crystal layer, when an excitation voltage is applied between said two



electrodes; the major axes of the molecules of said liquid crystal layer are re-orientated so as to lie parallel to the electric field and light incident on said first polarizing plate is able to pass through the liquid crystal layer and out through the second polarizing plate, and a difference in optical path length of said liquid crystal layer, which is equal to a product of thickness of the liquid crystal layer and double refraction index of the liquid crystal layer, has a value such that $1.4 \mu\text{m} \leq \Delta nd \leq 1.7 \mu\text{m}$, for light from a three wavelength source.

5,091,795

OPTICAL LOW-PASS FILTER WITHOUT USING POLARIZERS

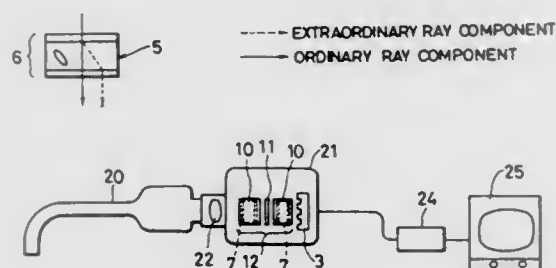
Kimihiro Nishioka, Hachioji; Toshio Kouchi, Tama, and Takao Okada, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 861,579, May 9, 1986, abandoned. This application Feb. 20, 1990, Ser. No. 481,675

Claims priority, application Japan, May 11, 1985, 60-100022 Int. Cl.⁵ G02F 1/13

U.S. Cl. 359—93

29 Claims



1. An image pick-up system comprising a television camera having built-in image pick-up means, an adapter lens contributing to image formation of an object to be photographed on said image pick-up means, and the optical low-pass filter being

arranged between said adapter lens and said image pick up means,

said optical low-pass filter comprises a first low-pass filter member comprising a first twisted nematic type liquid crystal device arranged to vary its optical rotatory power and a pair of first birefringent plates respectively arranged in front and rear of said liquid crystal device and having crystal axes inclined in the same direction with respect to the incident optical axis; a second low-pass filter member comprising a second twisted nematic type liquid crystal device aligned in a direction in which light travels with respect to said first low-pass filter member and arranged to vary its optical rotatory power and a pair of second birefringent plates respectively arranged in front and rear of said second liquid crystal device and formed so that the plane including the respective crystal axes directed in the same direction intersects the plane including the crystal axes of said first birefringent plates; and any one of a ¼-wave plate, polarization canceling plate, ±45-degree optical rotatory plate and birefringent plate interposed between said first low-pass filter member and said second low-pass filter member.

5,091,796

OPTICAL COMMUNICATION SYSTEM HAVING AN IMPROVED PROTECTION LINE SWITCHING MECHANISM

Koichi Nishimura; Ikuo Taniguchi; Fumihiro Ikawa, and Masumi Kurokawa, all of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

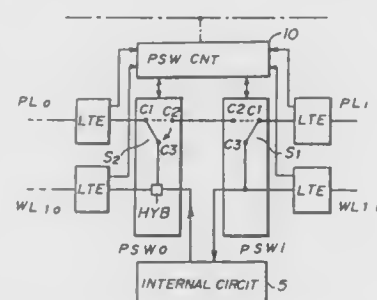
Filed Jan. 3, 1991, Ser. No. 637,220

Claims priority, application Japan, Jan. 10, 1990, 2-3153

Int. Cl.⁵ H04B 10/08; H04J 14/00

U.S. Cl. 359—110

24 Claims



1. A communication system comprising:

- a plurality of stations;
- a first working line coupling adjacent stations among said plurality of stations;
- a second working line passing predetermined stations among said plurality of stations without dropping therein; and
- a protection line provided in common for said first working line and said second working line, a supervisory signal continuously passing through said protection line;

each of said stations including:

internal circuit means connected in said first working line for receiving an input transmission signal from said first working line at a downstream side thereof and sending an output transmission signal to said first working line at an upstream side thereof; and

switching means connected to said internal circuit means and operated for passing said protection line without dropping in each of said stations in a normal mode and for connecting said protection line to said internal circuit means in an alarm mode so that the input transmission signal is received from said upstream side via said protection line and said supervisory signal which is generated from said output transmission signal is output toward said downstream side via said protection line.

5,091,797

METHOD AND APPARATUS FOR MODULATION CURRENT REGULATION FOR LASER DIODES

Walter Proebster, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 581,576

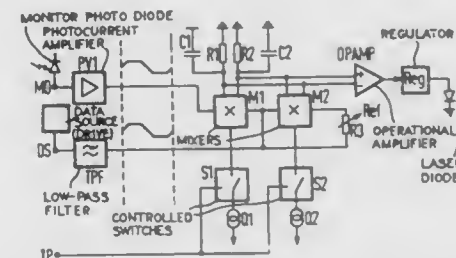
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1989, 3937747

Int. Cl.⁵ H04B 70/04

U.S. Cl. 359—187

7 Claims U.S. Cl. 359—209

1 Claim



6. An arrangement for regulating the modulation current of a laser diode used as an optical transmitter in a high bit rate digital communications transmission system, comprising:

- a monitor photodiode operable to receive and convert a portion of the light emitted by the laser diode into an electrical signal;
- drive means for operating the laser diode to produce a digital transmission signal for said laser diode that periodically comprises at least one pulse sequence that contains at least one part of predominantly one type of logical pulses selected from the group consisting of logical pulses and logical one pulses such that said electrical signal comprises a pulse signal comprising a constant amplitude and a fixed cycle return that yields a comparatively low-frequency signal part, said drive means including;
- a low-pass filter including an input and an output, said input connected to receive said digital transmission signal;
- first and second mixers, each of said mixers including a signal input, a common input and first and second outputs; said output of said low-pass filter connected to said signal input of said first mixer;
- regulating means for producing a setting signal for regulating the modulation current of said laser diode, said regulating means including first and second inputs, and an output for providing said setting signal;
- a first resistor connected to a reference potential;
- a second resistor connected to the reference potential;
- a first capacitor connected in parallel with said first resistor;
- a second capacitor connected in parallel with said second resistor;
- said first output of said first mixer connected to said second output of said second mixer, to said second input of said regulating means, and to said reference potential via said first resistor and said first capacitor;
- said second output of said first mixer connected to said first output of said second mixer, to said first input of said regulating means and to said reference potential via said second resistor and said second capacitor;
- a third, variable resistor;
- said first input of said second mixer connected to said output of said low-pass filter via said third, variable resistor;
- a first controlled switch including an input, a control input and an output;
- a second controlled switch including an input, a controlled input and an output;
- a first current source including an output connected to said input of said first control switch;
- a second current source including an output connected to said input of said second control switch; and
- said control input of said first and second controlled switches connected to receive gate pulses having a period approximately equal to the duration of the pulse sequence.

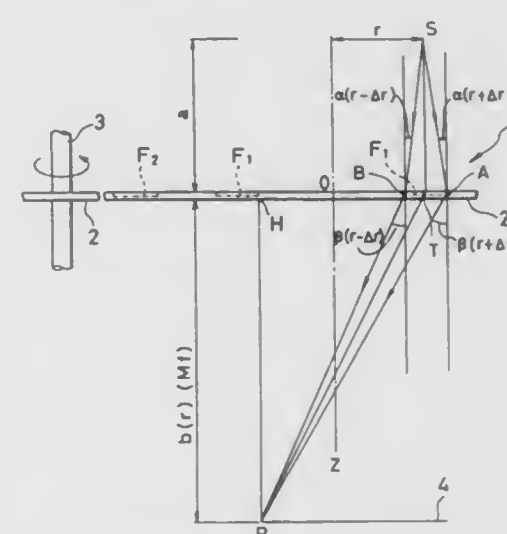
5,091,798

DIFFRACTION GRATING FOR OPTICAL SCANNING

Kenichi Hibino, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Continuation-in-part of Ser. No. 498,549, Mar. 26, 1990, abandoned. This application Jun. 12, 1991, Ser. No. 713,514

Claims priority, application Japan, Mar. 31, 1989, 1-82839 Int. Cl.⁵ G02B 5/18, 26/10, 27/44



1. A diffraction grating system for optical scanning, comprising:

- a plurality of diffraction gratings arranged on a peripheral edge portion of a disk scanner, each of said plurality of diffraction gratings further comprising:
- a plurality of grating rings disposed concentrically in a plane,
- said plurality of grating rings being provided at positions such that their radii r are selected so that a function $\phi(r)$ of r satisfies the following differential equation and initial conditions,

$$\lambda \left(\frac{d^2 \phi}{dr^2} \right) = \left(\frac{1}{M} \right) \times \left[1 - \left(\lambda \left(\frac{d\phi}{dr} \right) \right)^2 \right]^{3/2} + \left(1 - \left(\frac{1}{M} \right) \right)$$

$\phi(0)$ = specific real number, and

$$\frac{d\phi}{dr}(0) = 0$$

where λ is the wavelength of a scanning light beam, f is the focal length of each said diffraction grating, r is the radius from the center of each said diffraction grating, M is the distance from each said diffraction grating to a scanning surface expressed as a multiple of the focal length f , and moreover the relation

$$\phi(r) = n + \phi(0)$$

$$n = 0, 1, 2, 3, \dots$$

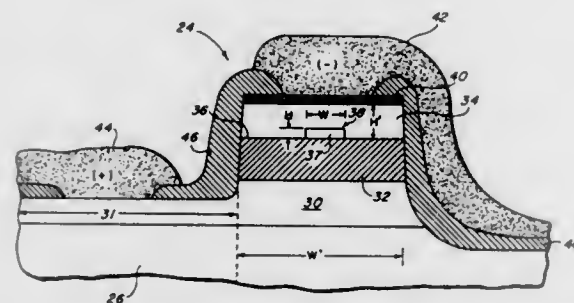
(n is a non-negative integer)

is satisfied.

5,091,799

BURIED HETEROSTRUCTURE LASER MODULATOR
John C. Sciortino, Jr., Springfield, Va., and Daniel L. Rode, St. Louis, Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 31, 1990, Ser. No. 607,390
Int. Cl.⁵ H01S 3/19; B44C 1/22; C03C 15/00
U.S. Cl. 359—254

7 Claims



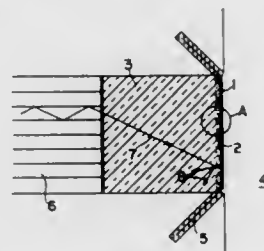
1. A buried-heterostructure laser modulator for modulating a laser beam comprising:
two adjacent epitaxial first layers of oppositely doped semiconductor material which form a P-N junction;
an epitaxial buried layer of undoped semiconductor material located at the junction of said first layers and surrounded thereby, said buried layer forming a single mode optical channel having a width larger than a height thereof with the width less than or equal to a width of a diffraction limited waveguide mode of the laser beam;
two epitaxial second layers of doped semiconductor material, said second layers being of opposite doping and being respectively adjacent said first layer of the same doping;
a semi-insulating substrate on one side of which one of said second layers is provided; and
two strip lines provided on the one side of said substrate, said strip lines being of opposite bias and connecting to a respective said second layer of the same bias.

5,091,800

COVER LAYER FOR OPTICAL ION SENSORS
Helmut Offenbacher, Graz, and Erna Schwarzenegger, Semriach, both of Austria, assignors to AVL AG, Schaffhausen, Austria

Filed Jul. 8, 1988, Ser. No. 216,546
Claims priority, application Austria, Jul. 20, 1987, 1833/87
Int. Cl.⁵ G01N 21/63
U.S. Cl. 359—350

8 Claims



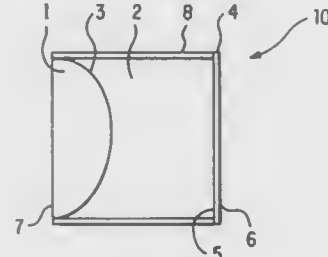
1. An optical ion sensor having a cover layer for suppressing stray light, said cover layer comprising a hydrophilic, ion-permeable, polymer membrane, having at least one of the following properties: high molecular weight, cross linkages and being in a partly crystalline state, said polymer membrane containing pigments of precious metals from the group consisting of Ag, Au and Pt which are embedded in colloidal distribution and precipitated by reduction techniques.

5,091,801

METHOD AND APPARATUS FOR ADJUSTING THE FOCAL LENGTH OF AN OPTICAL SYSTEM
Steven Ebstein, Brookline, Mass., assignor to North East Research Associates, Inc., Woburn, Mass.
Filed Oct. 19, 1989, Ser. No. 424,190
Int. Cl.⁵ G02B 1/06, 3/14

U.S. Cl. 359—665

21 Claims



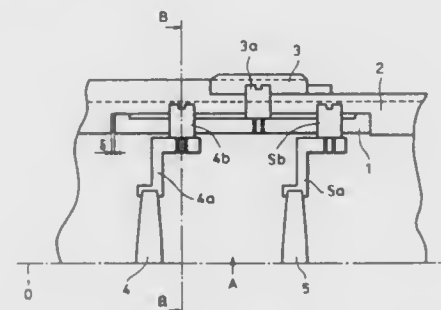
1. A nearly index matched (NIM) optic, comprising:
means for receiving light from a light source, the light having a given range of wavelengths;
means for transferring the light across at least a first surface into a first material having a first index of refraction;
means for refracting the light across at least a first boundary formed in the first material, each point on the first boundary having an optical curvature of a given sign; and
means for refracting the light at a second boundary formed in a second material that has a second index of refraction, each point on the second boundary corresponding to a point on the first boundary, each point on the second boundary having an optical curvature that is equal to the curvature of the corresponding point on the first boundary but opposite in sign, said first and second indices selected such that a difference between the second index of refraction and the first index of refraction is less than 0.1 and substantially the same over the range of wavelengths of the light, whereby the absolute value of the optical curvature at corresponding points on the first and second boundaries is reduced by the absolute value of the difference between the first and second indices of refraction thereby permitting control of focal length through selection of said indices.

5,091,802

ZOOM LENS BARREL
Yasunori Imaoka, and Shigeru Oshima, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 29, 1990, Ser. No. 619,503
Claims priority, application Japan, Dec. 5, 1989, 1-317262
Int. Cl.⁵ G02B 15/00

U.S. Cl. 359—694

3 Claims



1. A zoom lens barrel comprising:
first and second lens units simultaneously shiftable for zooming along an optical axis;
a fixed lens barrel for housing said first and second lens units;

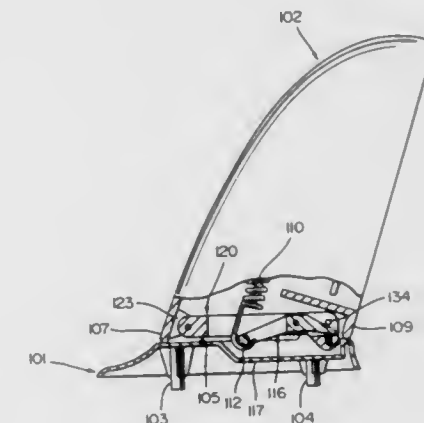
5,091,804

FOLDABLE OUTSIDE REAR-VIEW MIRROR FOR VEHICLES

Edwin Seitz, Neuenbuch, Fed. Rep. of Germany, assignor to Hohe KG, Collenberg, Fed. Rep. of Germany
Division of Ser. No. 286,143, Dec. 19, 1988, Pat. No. 4,957,265.
This application Jul. 3, 1990, Ser. No. 547,220
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 8716720[U]; Nov. 15, 1988, 8814288[U]
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.
Int. Cl.⁵ G02B 7/18

U.S. Cl. 359—841

7 Claims



1. An outside rear-view mirror for a vehicle, said mirror comprising:
a mirror base,
a mirror housing adapted to assume a normal position for use and to rock forwardly and rearwardly relative to said mirror base,
a rocker, said mirror housing being coupled to said mirror base by said rocker, said rocker having one end mounted rotatably to the mirror base and having an opposite end mounted rotatably to said mirror housing,
spreading means for urging said mirror housing to a fully rearward tilted position relative to said mirror base when said mirror housing is moved rearwardly from its normal position,
said spreading means including a tension spring, one end of said tension spring being anchored to said mirror housing and the other end forcing a locking pin against a way for travelling of said locking pin along said way when said mirror housing rocks rearwardly, said locking pin remaining caught in a trap of said way when said mirror housing rocks forwardly,
said way including a threshold joining said trap and a circular portion extending beyond said threshold and terminating in a recess which, when receiving said locking pin, causes the mirror housing to assume a rearward rocking end position relative to the mirror base.

5,091,803

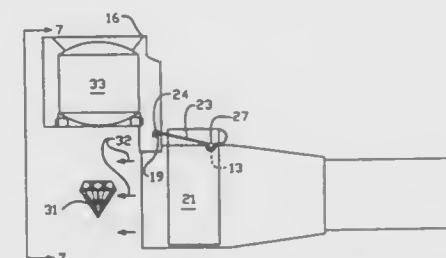
MAGNIFYING ATTACHMENT FOR FLASHLIGHT WITH DARK FIELD ILLUMINATION

Gerard E. Raney, 1278 Edgewood Rd., Redwood City, Calif. 94062

Filed Jan. 7, 1991, Ser. No. 638,786
Int. Cl.⁵ G02B 7/02

U.S. Cl. 359—818

7 Claims



1. A magnifying attachment having an eyepiece viewing portion for a flashlight body having a substantially cylindrical bulb bearing end, for dark field illumination of a gem specimen when the eye of a viewer observes the specimen through the eyepiece in an open-viewing position to detect inclusions in the specimen comprising:
a split resilient curved band slippable over said cylindrical bulb bearing end and having an axis substantially coincident with the axis of said flashlight body, said resilient band tightly gripping said flashlight body, and said resilient band including as a unitary part, a resilient folded back tab going from said band toward the bulb end of the said flashlight body in a plane substantially parallel to said axis of said flashlight body, and biased against the flashlight body because of said resilient curved band, said tab having a hooked end near said flashlight end forming a half bearing into which a rotational axis of said eyepiece viewing portion may be placed and retained by said bias for rotation between an open or viewing position and a closed or stowed position where said eyepiece portion is an extension of said flashlight body.

5,091,805

APPARATUS AND METHOD FOR RECORDING AND/OR REPRODUCING A DIGITAL SIGNAL

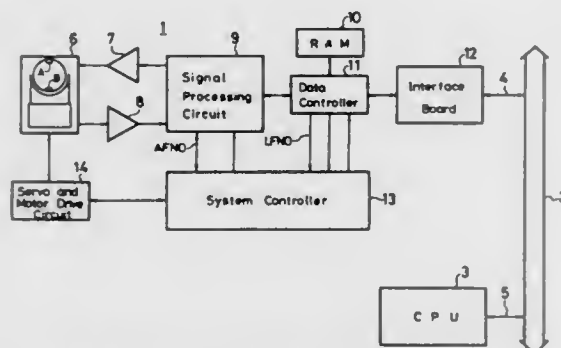
Kentaro Odaka, Tokyo; Shinya Ozaki, Kanagawa; Yoshizumi Inazawa, Kanagawa; Masaki Yamada, Kanagawa; Hiroshi Ishibashi, Kanagawa, and Tatsuya Iijima, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 25, 1988, Ser. No. 262,487

Claims priority, application Japan, Oct. 27, 1987, 62-270531; Dec. 14, 1987, 62-315789

Int. Cl.⁵ G11B 5/09

U.S. Cl. 360—53

10 Claims



1. An apparatus for recording a digital signal containing a plurality of blocks of digital data, each block including one grouping of main information data and sub-codes in a track formed on a recording medium, comprising:

- means for forming in each track a single main area for recording the main information data and at both ends of each track separate sub-areas for recording the sub-codes of a block of the digital data, such that the main area is located between the sub-areas, and
- means for generating check data for detecting an error in the data recorded in the main area and recording the check data in one of the sub-areas of each track.

5,091,806

ROTATING MAGNETIC RECORDING MEDIUM RECORDING/PLAYBACK APPARATUS

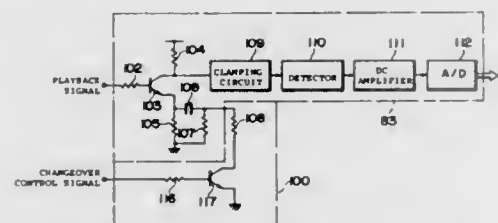
Yutaka Maeda, Kiyotaka Kaneko, Izumi Miyake, Yoshio Nakane, and Hiroshi Shimaya, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 22, 1989, Ser. No. 327,132

Claims priority, application Japan, Mar. 22, 1988, 63-65629

Int. Cl.⁵ G11B 5/02, 5/596

U.S. Cl. 360—67

9 Claims



1. A rotating magnetic recording medium recording/playback apparatus comprising:

- a head feed device for feeding a magnetic head diametrically of a rotating magnetic recording medium having a plurality of tracks;
- an envelope detector circuit having a predetermined gain for detecting an envelope of a read signal obtained from the magnetic head;
- a gain changeover circuit for changing over said predeter-

mined gain of said envelope detector circuit between at least a high stage and a low stage;

track search means for performing a track search on each of said plurality of tracks of the magnetic recording medium to determine whether each track is a recorded track or a blank track while the magnetic head is fed by said head feed device with said predetermined gain of said envelope detector circuit changed over to the high stage and developing a track map having data representative of the results from said track search stored in a memory; and

peak position detecting means for detecting a peak position of an envelope signal regarding a designated track by comparing detected envelope levels at neighboring detecting positions as the magnetic head is fed by said head feed device and developing an optimum position for playing back a signal on said designated track when playing back the magnetic recording medium, said peak position detecting means measuring the envelope level upon first changing over said predetermined gain of said envelope detector circuit to the high stage, and then changing over the high stage to the low stage when the envelope level saturates.

5,091,807

RECORDER SYSTEM WITH DEMAND ACTUATION

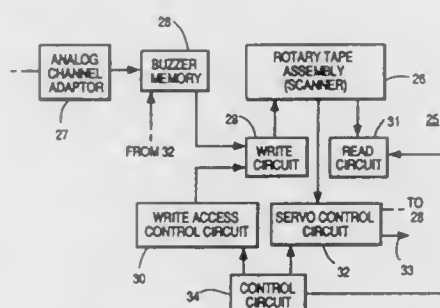
Rene Baus, Jr., Rancho Palos Verdes, and Kenneth C. Petty, Huntington Beach, both of Calif., assignors to American Magnetics Corporation, Carson, Calif.

Filed May 24, 1989, Ser. No. 356,775

Int. Cl.⁵ G11B 15/18; H04M 1/64

U.S. Cl. 360—71

7 Claims



1. Apparatus comprising a rotary scanner having read and write heads and a tape drive mechanism with the means for positioning a tape cassette so that the tape of said cassette engages said scanner and is maintained normally in a relaxed state of tension in a tape assembly loop, said apparatus comprising a buffer memory and an audio signal channel adaptor means, means responsive to data in said channel adaptor means for writing said data into said buffer, high and low data occupancy signal means for providing first and second signals when data occupies a first high amount of the capacity of said buffer and a second low amount of said capacity respectively, said apparatus also including a servo arrangement comprising a capstan, a supply reel, and a take-up reel having first, second and third motors respectively and a control means connected to said high and low data occupancy signal means for activating said motors responsive to said first and second signals for increasing the tension on said tape from said relaxed state to an operative state of tension and from operative state to said relaxed state respectively.

5,091,808

TWO-MOTOR SERVO MECHANISM SYSTEM FOR A MAGNETIC DISK DRIVE

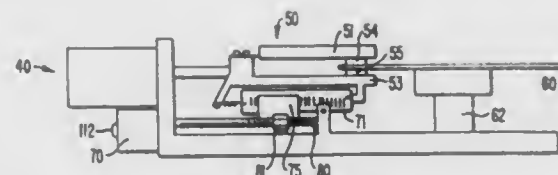
Anil K. Nigam, 1103 Elmsford Dr., Cupertino, Calif. 95014

Filed Aug. 7, 1989, Ser. No. 390,596

Int. Cl.⁵ G11B 5/596

U.S. Cl. 360—78.05

7 Claims



1. A servomechanism for controlling the position of a head in a disk drive having a base, a carriage assembly and a detector comprising:

- a head mounted on the carriage assembly for being positioned with respect to media on which information can be stored;
- a first motor mounted on the base and coupled to the carriage assembly for rapidly moving the carriage assembly along a first axis to position the carriage assembly at a desired location; and
- a second motor mounted on the base for moving the detector positioned to detect the position of the carriage assembly along the first axis and in response thereto generate a signal to control the first motor.

5,091,809

DISC DRIVE WITH SMALL AIR GAP BETWEEN BACK IRON AND SPINDLE HUB

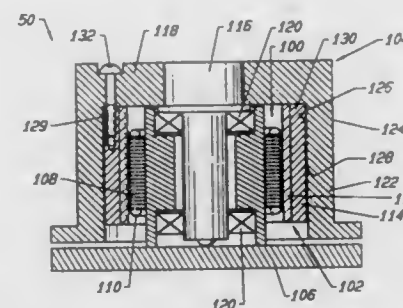
Eugene E. Connors, Edina, and Susan A. W. Holm, Minneapolis, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 31, 1990, Ser. No. 560,425

Int. Cl.⁵ G11B 17/02

U.S. Cl. 360—99.08

20 Claims



1. A disc drive comprising:

- a disc drive frame;
- a shaft extending along an axis;
- a bearing system located around said shaft;
- a spindle hub having an end wall portion and a disc receiving portion, said end wall portion being attached to a rotatable surface and extending radially outward from said rotatable surface, said disc receiving portion extending down from said radially extending end wall portion and having an inner and an outer circumferential surface, said inner and outer circumferential surfaces extending along said axis, whereby said spindle hub rotates about said axis and said shaft extends internal to said spindle hub along said axis;
- at least one storage disc mounted on said downwardly extending disc receiving portion of said spindle hub;
- a back iron having a top and a bottom surface and an inner and an outer circumferential surface, said inner and outer circumferential surfaces extending along said axis, said top

surface of said back iron being attached to said radially extending end wall portion of said spindle hub, whereby said outer circumferential surface of said back iron and said inner circumferential surface of said downwardly extending disc receiving portion having overlapping sections;

a small air gap extending along said axis between substantially all of said overlapping sections of said outer circumferential surface of said back iron and said inner circumferential surface of said downwardly extending disc receiving portion, whereby said small air gap is maintained so that thermal expansion and contraction of said back iron does not distort said downwardly extending disc receiving portion and cause misalignment or slippage of said at least one storage disc;

a rotor comprising a plurality of permanent magnets attached to said inner circumferential surface of said back iron;

a stator comprising a laminate core and a plurality of phase windings, said stator being fixed to said disc drive frame, whereby said rotor rotates around said fixed stator; and means for attaching said top surface of said back iron to said radially extending end wall portion of said spindle hub.

5,091,810

FLOATING TYPE MAGNETIC HEAD HAVING HEAD CORE AFFIXED TO OUTSIDE SURFACE OF SLIDER

Masao Kakizaki, Yoshihito Kobayashi, both of Yamanashi, and Hiroshi Yagi, Ichikawa, all of Japan, assignors to TDK Corporation, Tokyo, Japan

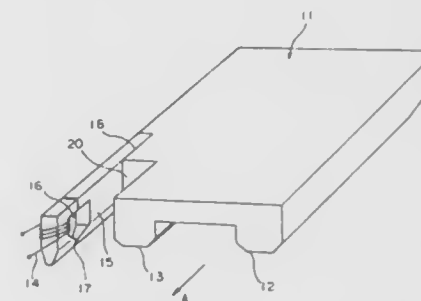
Filed May 25, 1990, Ser. No. 528,494

Claims priority, application Japan, Jun. 29, 1989, 1-168033

Int. Cl.⁵ G11B 5/48, 21/16

U.S. Cl. 360—103

12 Claims



1. A floating type magnetic head for recording onto a magnetic medium travelling in a running direction, said magnetic head comprising:

- a slider having rail like floating portions; and
- a head core having a magnetic gap and a wiring window, said head core being attached to one side of the slider in a manner such that said magnetic gap in combination with said window protrudes beyond said rail like floating portions in a direction perpendicular to the running direction of the magnetic recording medium.

5,091,811

READ HEAD MOUNTING STRUCTURE FOR MAGNETIC CARD READER

Yeng Ming Chang, Taipei, Taiwan, assignor to Uniform Industrial Corp., Taipei, Taiwan

Filed Aug. 21, 1990, Ser. No. 570,510

Int. Cl.⁵ G11B 5/56, 21/24

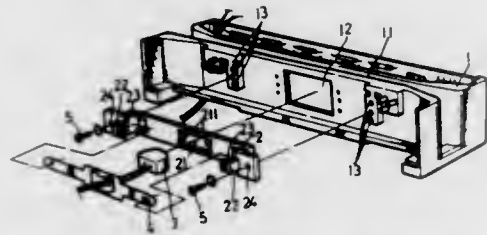
U.S. Cl. 360—104

1 Claim

1. A read head mounting structure for a magnetic card reader, comprising:

- a base having a magnetic card feed slot transversely disposed at the middle, a read head read window at the center in

communication with said magnetic card feed slot, and two rows of bolt holes at two opposite sides;
 a read head mounting frame comprising a flat strip portion at the middle and two raised edge portions at two opposite ends, said flat strip portion having an opening at the middle, said two raised edge portions having each an unitary support and a mounting hole respectively made thereon, said support having a pin rod extending downward therefrom;
 a read head for reading magnetic cards;
 a plate spring having two opposite ends respectively secured

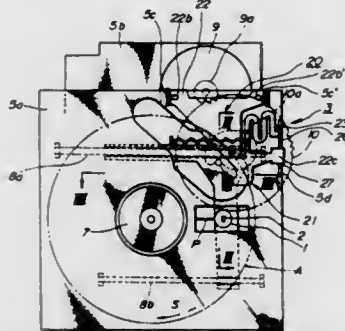


to said read head mounting frame by the two pin rods of the two supports of said read head mounting frame to firmly retain said read head in said opening on said read head mounting frame; and
 characterized in that said read head mounting frame is attached to said base by two fastening means, which are respectively inserted through the mounting holes on the two opposite ends of said read head mounting frame and respectively fastened in either one of the two rows of bolt holes on said base, permitting said read head to partly protrude through said read head read window in said magnetic card feed slot.

5,091,812
STABILIZING APPARATUS FOR RECORDING AND/OR REPRODUCING APPARATUS OF FLEXIBLE ROTARY RECORDING MEDIUM
 Tokio Kanada, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Aug. 3, 1989, Ser. No. 388,850
 Claims priority, application Japan, Aug. 15, 1988, 63-202821
 Int. Cl.⁵ G11B 25/04, 5/48
 U.S. Cl. 360—130.34

6 Claims



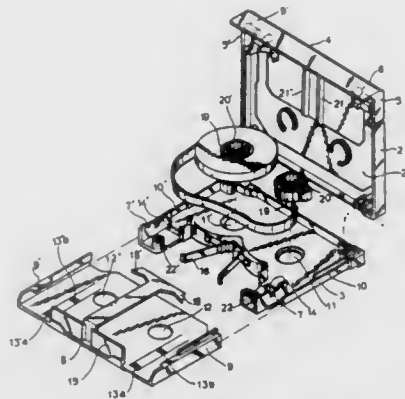
1. An arrangement for establishing stable contact between an information transfer head and a flexible recording medium disk in a disk drive apparatus, comprising:
 a stabilizer plate supporting said recording medium disk, said stabilizer plate incorporating means for generating a Beroulli drawing force for forcing said disk onto said information transfer head for establishing steady contact therebetween, and said stabilizer plate being inclined toward a downstream direction with respect to the disk rotating direction;
 a disk stabilizer block provided upstream of said information

transfer head with respect to said disk rotating direction for restricting a curving magnitude of said disk; and
 wherein said disk stabilizer block is formed of a metal material and incorporates a meandering spring formed integrally therewith; and
 a depression pad placed on said disk stabilizer block said depression pad being made of low friction fiber and contacting a side of said disk.

5,091,813
TAPE CARTRIDGE WITH T-SHAPED BRAKING LEVER
 Su S. Ryu, Chunwon-kun, Rep. of Korea, assignor to SKC Limited, Kiyongki-do, Rep. of Korea
 Filed Jul. 7, 1989, Ser. No. 376,615
 Claims priority, application Rep. of Korea, Oct. 7, 1988, 88-13106

Int. Cl.⁵ G11B 15/32, 23/04
 U.S. Cl. 360—132

2 Claims



1. A tape cartridge comprising a case (1) having as inside; a slider (8) having a frontal wall (15) having a central upper part having a rear, a T-shaped brake lever (17) extending into the inside of the case (1) attached in the rear of the central upper part of the frontal wall (15) of the slider (8), the T-shaped brake lever (17) having two ends, both ends of this T-shaped brake lever (17) are needle-shaped ends (18) (18'), tape hubs (19) (19') having sawteeth parts (20) (20') respectively, and these needle-shaped ends (18) (18') being made to face toward the sawteeth parts (20) (20') of tape hubs (19) (19') respectively but to stand in a required position to keep each tape hub from rotating clockwise and counterclockwise, said tape cartridge and said case (1) united by an upper half shell (2) and a lower half shell (3), an opening/closing lead installed in front of the case and said slider united with the bottom of lower half shell, and in which the tape hubs built in the inside of the case are provided with the sawteeth parts (20) (20') respectively, and guide projection parts (21) (21') of the said brake lever (17) being formed inside the upper half shell (2) and wherein when the slider (8) and in turn the T-shaped brake lever (17) are in a first position, the tape hubs (19) (19') are prevented from rotating and when moved to a second position, the tape hubs (19) (19') are allowed to rotate.

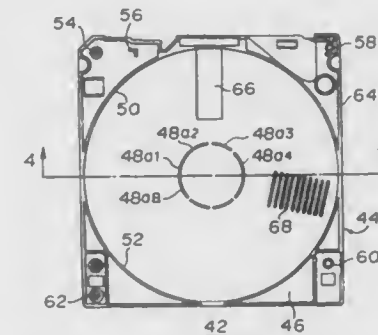
5,091,814
DISK CARTRIDGE HAVING DISCONTINUOUS HUB-POSITION DETERMINING RIB
 Masaru Ikebe; Haruo Shiba, and Morimasa Sasaki, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
 Filed Nov. 23, 1990, Ser. No. 617,090
 Claims priority, application Japan, Nov. 28, 1989, 1-308707
 Int. Cl.⁵ G11B 23/03

U.S. Cl. 360—133

6 Claims

1. A disk cartridge for rotatably receiving a disk-like magnetic medium mounted on a center hub, said disk cartridge comprising:
 an upper half casing and a lower half casing;

a hub-position determining annular rib formed at a central portion on an inner surface of said upper half casing and projecting outwardly from said inner surface so as to define a center hub rotating region;



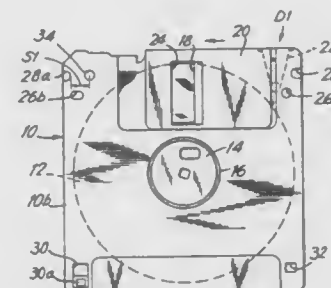
wherein said hub-position determining annular rib is discontinuous.

5,091,815
HIGH PACKING DENSITY DISK CARTRIDGE WITH WRITE PROTECT MECHANISM
 Yuji Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,906
 Claims priority, application Japan, Oct. 30, 1987, 62-275409
 Int. Cl.⁵ G11B 23/03

U.S. Cl. 360—133

10 Claims



1. A disk cartridge of a type compatible with a disk drive unit of a predetermined design but that can also be drawn into a disk drive unit of a different design with which it is incompatible, said disk cartridge comprising:

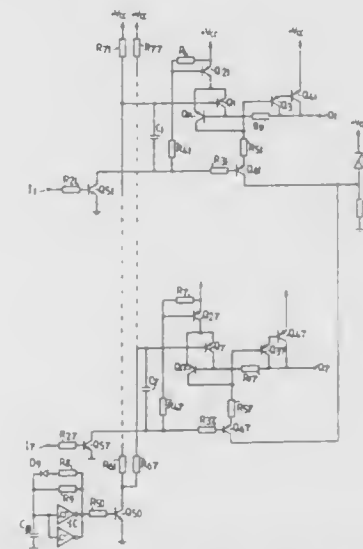
- a disk;
- a cassette casing having a front edge and opposed side edges and rotatably housing the disk therein;
- an opening formed in the cassette casing at a location neighboring the front edge thereof for exposing a part of the disk to the outside;
- a pair of first and second recesses formed on the opposed side edges of the cassette casing at a location neighboring the front edge for facilitating the drawing of the disk cartridge into the disk drive unit; and
- a third identification recess formed in the cassette casing at a point located on a straight line drawn between said first and second recesses for discriminating the type of disk cartridge.

5,091,816
PROCEDURE AND DEVICE FOR OVERLOAD AND SHORT-CIRCUIT PROTECTION OF OUTPUT DRIVERS
 Asko Juntunen, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland

Filed Oct. 10, 1989, Ser. No. 418,672
 Int. Cl.⁵ H02H 3/06

U.S. Cl. 361—18

2 Claims



1. A device for overload and short-circuit protection of at least one output driver provided with controllable solid state switches for a drain type connection of a load, comprising:

- a) a control reference value unit, which generates a reference value, set independently of an external control signal, controlling said at least one output driver during normal functioning conditions according to said external control signal, including a stabilized voltage divider;
- b) a control logic unit, capable of switching on or off said at least one output driver, which generates a sensing pulse to detect whether an overload or short-circuit condition is present, and controls the operation of said at least one output driver either with a control signal for normal functioning conditions, or with said sensing pulse during overload or short-circuit condition, said control logic unit including a first solid state switch which is turned on during normal functioning conditions when said external control signal goes high and turns off a second solid state switch; and a third and a fourth solid state switch which are turned on or off according to said external control signal, allowing said at least one output driver to be controlled by said control signal;
- c) an overload and short-circuit monitoring unit which controls the output current of said at least one output driver, accordingly switching off said output driver should an overload or short-circuit condition be detected, including said second solid state switch and a feedback resistor connected to the load circuit for detecting the overload or short-circuit condition whereby said second switch is turned on, thus diverting said reference value signal on an alternative path; and
- d) an oscillator, coupled to said at least one output driver which generates a sensing pulse capable of automatically restoring the normal functioning conditions when the overload or short-circuit condition ends, which during an overload or short-circuit condition attempts to switch on said at least one output driver and when the overload or short circuit condition ends, turns on said at least one output driver and restores the normal functioning conditions allowing said at least one output driver to be controlled by said external control signal.

5,091,817

AUTONOMOUS ACTIVE CLAMP CIRCUIT

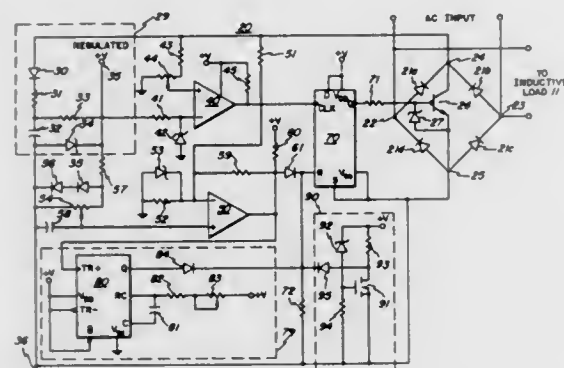
Robert P. Alley, Clifton Park, and Kevin C. Routh, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 677,413, Dec. 3, 1984, abandoned. This application Dec. 28, 1987, Ser. No. 136,501

Int. Cl.⁵ H02H 3/20

U.S. Cl. 361—56

7 Claims U.S. Cl. 361—56



1. An active clamp comprising:

a source of induced voltage of any polarity to be clamped; a controllable switch means connected to said source of induced voltage to be clamped and responsive to a control signal for clamping said induced voltage when said controllable switch means is conductive; and circuit means coupled to said controllable switch means for generating said control signal, said circuit means rendering conductive said controllable switch means when the magnitude of said induced voltage exceeds a predetermined value, thereafter said circuit means rendering nonconductive said controllable switch means when current flowing in said controllable switch means returns to zero, said circuit means comprising:

DC supply means for providing regulated power for said circuit means;

first comparator means coupled to said DC supply means and to said source of induced voltage for providing an over-voltage signal when the magnitude of said induced voltage exceeds said predetermined value;

second comparator means coupled to said DC supply means and to said source of induced voltage for providing a zero current signal when the magnitude of said induced voltage is below a second predetermined value;

flip-flop means for generating said control signal coupled to the outputs of said first and second comparator means, said flip-flop means being set upon receiving said over-voltage signal and being reset upon receiving a zero current signal; and

zero current pulse stretching means including a monostable multivibrator having its trigger coupled to the output of said second comparator means and having its output coupled to said flip-flop means, said multivibrator generating a stretched pulse signal for keeping said flip-flop means reset during the duration of said stretched pulse.

5,091,818

OVERVOLTAGE PROTECTING CIRCUIT

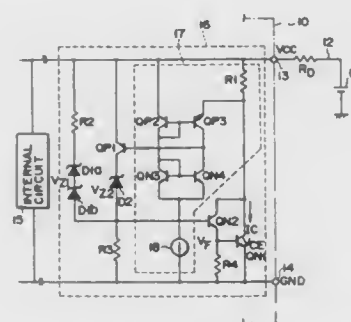
Yuji Morikawa, Kawasaki, and Hayako Tsurumaki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 21, 1990, Ser. No. 631,425

Claims priority, application Japan, Dec. 21, 1989, 1-329710

Int. Cl.⁵ H02H 9/04

2 Claims



1. An overvoltage protecting circuit incorporated in a semiconductor circuit, for clamping a voltage between a power supply terminal and a ground terminal to not more than a predetermined rated voltage upon supply of a current from an external power supply through a protective resistor, comprising:

a voltage clamping npn transistor which is arranged between said power supply terminal and said ground terminal, and an emitter of which is connected to said ground terminal; a first clamping circuit connected between said power supply terminal and a base of said voltage clamping npn transistor, for clamping a voltage to the rated voltage; a switch element and a second clamping circuit for clamping a voltage to a voltage less than the rated voltage, said switch element and said second clamping circuit being connected in series between said power supply terminal and the base of said voltage clamping npn transistor; and a switch control circuit having a resistor connected between said power supply terminal and a collector of said voltage clamping npn transistor, for ON/OFF-controlling said switch element in accordance with a current flowing through said resistor.

5,091,819

GAS-ELECTRONIC SWITCH (PSEUDOSPARK SWITCH)
Jens Christiansen, An den Hornwiesen 4, D-8521 Erlangen-Buckenhof; Klaus Frank, Eichenring 30, D-8551 Röttenbach; Werner Hartmann, Forchheimer Weg 14, D-8551 Röttenbach, and Claudius Kozlik, Jägerstrasse 47, D-8500 Nürnberg, all of Fed. Rep. of Germany

PCT No. PCT/EP88/00574, § 371 Date Feb. 23, 1989, § 102(e) Date Feb. 23, 1989, PCT Pub. No. WO89/00354, PCT Pub. Date Jan. 12, 1989

PCT Filed Jun. 30, 1988, Ser. No. 327,984

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721529

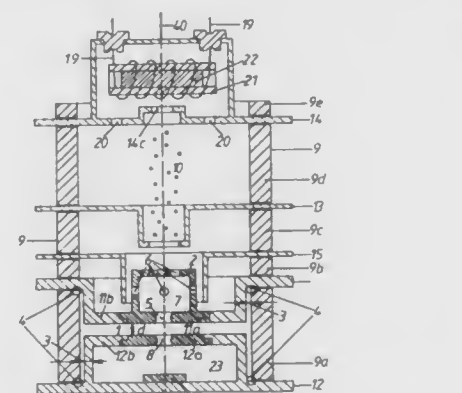
Int. Cl.⁵ H02H 9/04

U.S. Cl. 361—120

30 Claims

1. A gas-electric switch (pseudospark switch) having a gas discharge chamber, which contains two metal electrodes, namely, a cathode and an anode, said cathode and said anode being separated within said gas discharge chamber by a specific cathode-anode gap, an electrically insulating wall made of ceramic material or glass disposed between said cathode and said anode, said wall being disposed adjacent distal ends of said electrodes, the cathode has a hole and the electrodes are joined to the insulating wall by a tight metal-ceramic joint or fused joint, wherein the gas discharge chamber is filled with an ionizable low-pressure gas under such a pressure p that the

product $p \times d$ has such a value that a gas discharge between the electrodes will be fired in response to a voltage applied thereto which is disposed in that branch of the firing voltage-pressure characteristic in which the firing voltage decreases as the pressure rises, characterized in that for at least one of the two



electrodes, lines of contact at which said electrode, the gas and the insulating wall meet are spaced from the respective opposite electrode by a distance which is larger than said cathode-anode gap, said electrode being separated from said insulating wall by an electrode-insulating wall gap having a width less than said cathode-anode gap.

5,091,820

CERAMIC PIEZOELECTRIC ELEMENT WITH ELECTRODES FORMED BY REDUCTION

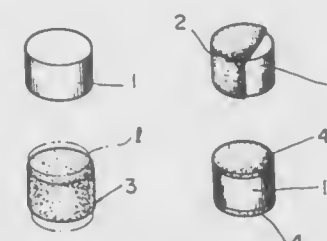
Shouichi Iwaya; Munemitsu Hamada, and Hitoshi Masumura, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 27,380, Mar. 18, 1987, abandoned. This application Nov. 3, 1989, Ser. No. 431,343 The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.⁵ H01G 1/015

U.S. Cl. 361—304

14 Claims



1. A ceramic piezoelectric element, comprising:

a core, said core comprising first and second faces and formed of a sintered reducible ceramic material at least one electrode formed on each of said first and second faces of said core, said electrodes comprising a reduced form of said reducible ceramic material of said core.

5,091,821

PROTECTIVE COVER FOR ELECTRICAL ASSEMBLY UNIT

Thomas B. Peyton, 216 Drake Ave., Oneida, N.Y. 13421

Filed Apr. 23, 1990, Ser. No. 512,966

Int. Cl.⁵ H02B 1/00; H01R 9/00; H02G 3/18

U.S. Cl. 361—380

9 Claims

1. A protective cover for attachment over an electrical assembly unit to protect internal components located on an upper surface thereof, said unit having substantially vertical

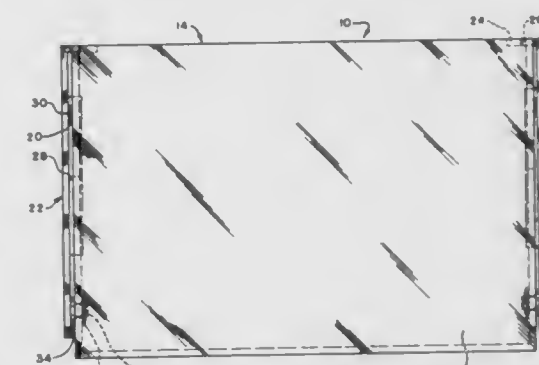
planar side, front, and rear panels in rectangular relationship to each other, comprising components which include:

a pair of elongated, parallel, planar mounting members having a front end, a rear end, and upper and lower edges, each of which is mounted on said unit substantially parallel with opposite ones of said side panels, and

a pivot member, said mounting members including:

a first inwardly extending flange at the rear end thereof, having a first aperture extending therethrough dimensioned to receive fastener means for securing said mounting members to said rear panel;

a second inwardly extending flange disposed along the lower edges of each of said mounting members, and



an inwardly extending pin adjacent to the front of each of said mounting members, said pins being co-axial with each other,

said pivot member having a generally planar top portion dimensioned to overlay the upper surface of said unit, and planar sidewalls extending downwardly therefrom parallel to said mounting members and to said side panels, and having a second aperture therein positioned and dimensioned to receive said pins, said pivot member being pivotable in a vertical plane about said pins between an open position facilitating access to said internal components of said unit, and a closed position providing protection for said components in which the lower edges of said sidewalls rest on said second flange of said mounting members.

5,091,822

RADIAL TYPE OF PARALLEL SYSTEM BUS STRUCTURE WITH PRINTED, TWISTED CONDUCTOR LINES

Tokuhei Takashima, Tokyo, Japan, assignor to Graphico Co., Ltd., Tokyo, Japan

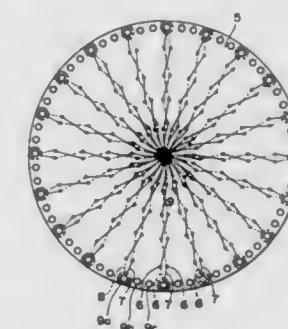
Filed Jun. 11, 1990, Ser. No. 535,487

Claims priority, application Japan, Jun. 15, 1989, 1-152985

Int. Cl.⁵ H05K 7/20, 7/10, 1/11; H01L 23/02

U.S. Cl. 361—384

20 Claims



1. Radial type of parallel system bus structure comprising: a plurality of bus wire-printed boards which are spaced and

arranged vertically along a center axis, each board having a plurality of printed signal conductors of generally equal length extending radially from a common contact center, each printed signal conductor comprising two twisted conductor lines each consisting of a plurality of successive segments disposed alternately at opposed positions of the board, adjacent printed signal conductors on each board having the conductor lines thereof imbricated with adjacent conductor lines such that the printed signal conductors can be closely spaced together;

means for electrically connecting the successive segments of each line, the means for connecting passing through through-holes in the board; and

a plurality of stationary connectors each being connected to selected signal conductors and being adapted to mate with an edge connector of a CPU board, and said stationary conductors being arranged around said bus wire printed boards;

whereby said structure permits connection between selected signal conductors on each bus wire-printed board and selected terminals on each of a plurality of CPU boards standing upright around the bus wire-printed boards.

5,091,823 INVERTER DEVICE

Takatsugu Kanbara, Funabashi; Hiroshi Asabuki, Sakura; Satoshi Ibori, Funabashi; Kengo Hasegawa, Sakura; Kenji Nandou, Matsudo; Takehiko Yanagida, Tsuchiura; Naoto Suzuki; Shigeyuki Baba, both of Funabashi; Hiroshi Fujii, Chiba, and Takuji Torii, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 401,012, Aug. 31, 1989, abandoned.

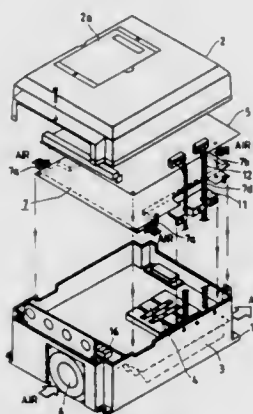
This application May 28, 1991, Ser. No. 711,492

Claims priority, application Japan, Aug. 31, 1988, 63-214967; Feb. 17, 1989, 1-36150

Int. Cl.⁵ H05K 7/20

U.S. Cl. 361—384

41 Claims



1. An inverter device, comprising:

- a housing;
- a main circuit section including a heat generating element;
- a logical circuit section disposed apart from said main circuit section;
- a first chamber formed in said housing for enclosing said logical circuit section and having a totally enclosed structure for preventing foreign substances from entering therein;
- a second chamber formed in said housing for enclosing said main circuit section and having a totally enclosed structure for preventing the foreign substances from entering therein; and
- a cooling passage disposed between said first and second chambers for cooling said main circuit section and said logical circuit section, said cooling passage being pro-

vided independent of said first and second chambers, respectively.

5,091,824

HOLD DOWN INTERCONNECTION STICK

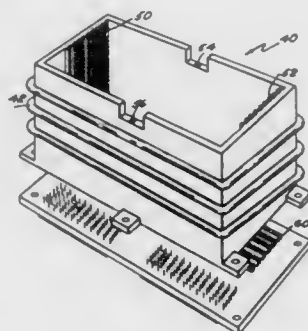
Luke Dzwonezyk, Marlborough, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1990, Ser. No. 502,969

Int. Cl.⁵ H05K 7/20

U.S. Cl. 361—385

4 Claims



1. In an electronic system a housing containing a plurality of modules of printed circuit boards each member thereof having electronic components and a power pin thereon and said boards placed longitudinally parallel to one another inside said housing in respective slots along the opposite sides of said housing and said housing provided with power means on a bottom surface thereof to power said printed circuit boards, an improved hold down interconnection stick making a vibration-free positive connection between said printed circuit boards and dissipating heat generated by the electronic components of each of said plurality of printed circuit boards, said hold-down interconnection stick comprises:

- a bar secured at the ends thereof to said container at the longitudinal walls thereof;
- a plurality of pins on said bar mating with corresponding pins of each of said plurality of printed circuit boards and power pins thereon; means securing each of said plurality of printed circuit boards with said bar; and
- heat conducting means on the hold-down stick carrying the heat generated by the powered electronic components of said plurality of printed circuit boards.

5,091,825

ORTHOGONAL BONDING METHOD AND EQUIPMENT

William H. Hill, and Dale W. Cawelti, both of Carlsbad, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

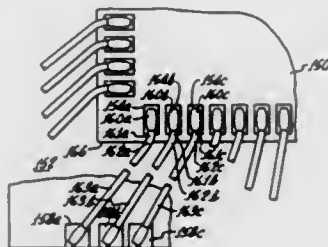
Division of Ser. No. 174,566, Mar. 29, 1988, Pat. No. 4,858,819.

This application Apr. 26, 1989, Ser. No. 343,756

Int. Cl.⁵ H01R 9/00

U.S. Cl. 361—404

3 Claims



1. An electrical component comprising:
a substrate having a plurality of mutually spaced relatively large substrate bond pads,

a semiconductor chip on the substrate having a plurality of relatively small mutually spaced chip bond pads, a plurality of conductors extending in a fan out pattern from said chip bond pads to said substrate bond pads, said chip bond pads each having a relatively longer dimension and a relatively shorter dimension, said chip bond pads having their longer dimensions parallel to one another, each conductor of a group of said conductors (a) being bent, (b) being connected at a first end thereof to an individual one of said chip bond pads over an elongated bond that is substantially aligned with the relatively longer dimension of the associated chip bond pad and (c) having a bend therein adjacent the associated chip bond pad, each said bent conductor extending from its bend toward an individual one of said substrate bond pads and having a second end thereof bonded to such substrate bond pad, whereby each conductor of said group has its first end extending in the direction of said longer dimension to the bend thereof, and extends from such bend to a substrate bond pad.

5,091,826

PRINTED WIRING BOARD CONNECTOR

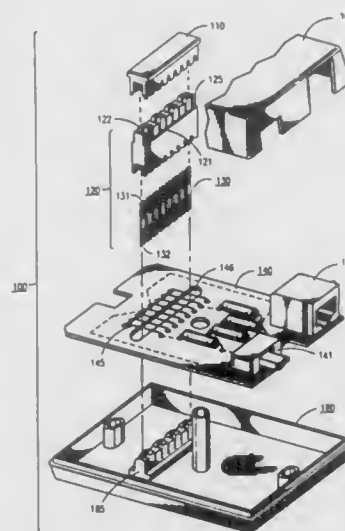
Jaime R. Arnett, Noblesville, and Robert J. O'Connor, Greenfield, both of Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 27, 1990, Ser. No. 500,324

Int. Cl.⁵ H01R 9/09; H05K 5/00

U.S. Cl. 361—408

14 Claims



1. A printed wiring board assembly comprising a printed wiring board and a base unit: the printed wiring board including at least one electrically conductive path thereon and a jumper wire that spans an opening in the printed wiring board, the jumper wire being mechanically attached to the printed wiring board on opposite sides of the opening and connected to the electrically conductive path; the base unit including wire-receiving means that extends through the opening in the printed wiring board, electrical connection with the jumper wire being made within the wire-receiving means.

5,091,827

ELECTROMAGNETICALLY COMPATIBLE VERTICAL ENCLOSURE FOR THE OPERATING SYSTEM OF TRANSMISSION EQUIPMENT, IN PARTICULAR FOR TRANSMISSION BY RADIO BEAM

Michel Suret, Eaubonne; Gérard Reltgen, Levallois-Perret, and Serge Morin, Paris, all of France, assignors to A.T.F.H., Cedex, France

Filed Nov. 26, 1990, Ser. No. 617,754

Claims priority, application France, Nov. 29, 1989, 89 15714 Int. Cl.⁵ H05K 7/20, 9/00

U.S. Cl. 361—424

11 Claims



1. An electromagnetically compatible vertical enclosure containing a set of electrical modules of an operating system of radio beam transmission equipment, said enclosure comprising: a top flap and a bottom flap closing off the front of said enclosure, said flaps including removable hinges at the top and at the bottom of said top and bottom flaps respectively and engaged about respective horizontal axes fixed to said enclosure, thereby making it possible to provide completely unhindered access to the modules, the bottom of the top flap overlapping the top of the bottom flap and said enclosure further comprising a handle fixed to one of said top flap and said bottom flap and locking on a catch fixed to the enclosure.

5,091,828 LIGHT BAR

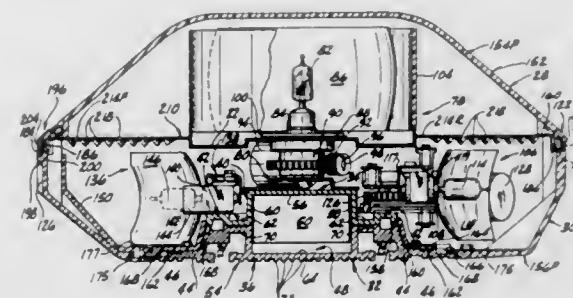
Danny C. Jincks, Annapolis; John S. Davis, Town and Country, and Michael D. Latta, St. Louis, all of Mo., assignors to Public Safety Equipment, Inc., St. Louis, Mo.

Filed Aug. 7, 1989, Ser. No. 390,684

Int. Cl.⁵ F21V 29/00

U.S. Cl. 362—35

44 Claims



1. A light bar for mounting on an emergency vehicle to provide warning light signals, the light bar comprising at least two vertically spaced lighting layers, each layer having at least one transient light source, the light sources on each layer cooperating to provide a transient high intensity warning light

signal 360° around the light bar wherein the light sources of one of the layers sweeps an arc of less than 360°.

5,091,829

HEADLAMP FOR A MOTOR VEHICLE

Wolfgang Hendrich, Soest, and Franz Kathmann, Lippstadt, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

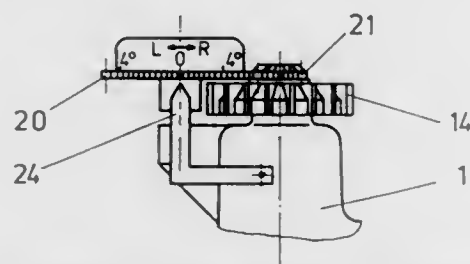
Filed Apr. 30, 1991, Ser. No. 693,585

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1990, 4013893

Int. Cl.⁵ B60Q 1/00

U.S. Cl. 362—61

10 Claims



1. In a headlamp for motor vehicles of a type including an adjusting device for pivoting a reflector at least about one axis, wherein the adjusting device comprises a threaded nut mounted on the reflector and a threaded shaft mounted on a stationary part of the headlamp to be rotatable thereon but not substantially moveable in an axial direction, and wherein the adjusting device includes a scale type indicating mechanism which shows the position of the pivotable reflector, with said indicating mechanism comprising a fixed part and a movable part;

the improvement wherein the moveable part of the indicating mechanism is a loose idling toothed wheel which meshes with a pinion mounted on the threaded shaft, said toothed wheel being moveable axially for disengagement thereof, from said pinion.

5,091,830

PROJECTION TYPE VEHICULAR HEADLAMP

Yoshinobu Suzuki, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

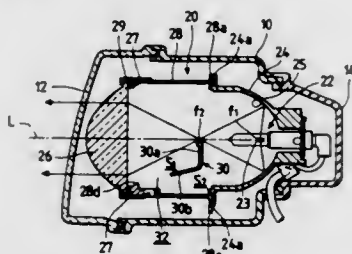
Filed Jun. 11, 1991, Ser. No. 713,201

Claims priority, application Japan, Jun. 19, 1990, 2-158621

Int. Cl.⁵ F21M 3/14

U.S. Cl. 362—61

9 Claims



1. A projection type vehicular headlamp comprising:
a light source;
an elliptic reflector having a front opening and a first and second focal points for reflecting light beam emitted from said light source into an optical path;
a tubular lens holder having a first opening fixedly secured with said front opening of said reflector and a second opening, said tubular lens holder being unbroken between said first and second openings;
a projection lens fitted on said second opening of said lens holder for collimating the light beam reflected by said

reflector, said tubular lens holder enclosing a space between said lens and said reflector; and
a shade for forming a required cut-off line of projected light beam, said shade being provided inside said lens holder in such a manner that said shade blocks substantially a lower half of the optical path in said projection type headlamp, said shade having an opening formed therein at a lower portion of said shade.

5,091,831

VEHICLE FOIL LAMINATED LAMP MOUNT

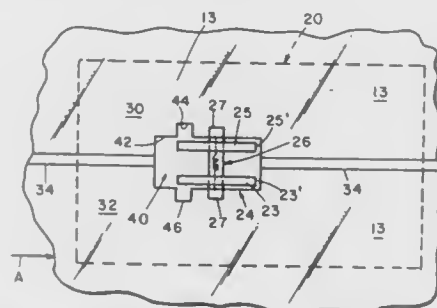
Klm L. Van Order, Hamilton; Jerry M. DeJong, West Olive, and Kenneth M. Lindberg, Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Jul. 5, 1990, Ser. No. 548,024

Int. Cl.⁵ B60Q 3/02

U.S. Cl. 362—74

30 Claims



1. A vehicle headliner comprising:

a substrate having an insulative layer and a conductive layer on at least one side of said insulative layer, said substrate having an aperture formed therein to define an electrical component receiving socket with said conductive layer extending adjacent said aperture to define a pair of spaced electrical contacts extending adjacent at least one edge of said aperture for supplying electrical energy to said socket; and

an electrical component including electrical contact means extending through said aperture and engaging said contacts for providing electrical contact between an electrical device of said component and said substrate, said component compressively engaging said substrate to hold said component in position within said aperture formed in said substrate to provide mechanical and electrical connection of said electrical component to said substrate.

5,091,832

LIGHT APPARATUS FOR USE WITH A COMPACT COMPUTER VIDEO SCREEN

Angelo Tortola, Lexington, and Robert Howitt, Leominster, both of Mass., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

PCT No. PCT/US90/03966, § 371 Date Apr. 19, 1991, § 102(e) Date Apr. 19, 1991

PCT Filed Jul. 11, 1990, Ser. No. 678,265

Int. Cl.⁵ F21V 33/00

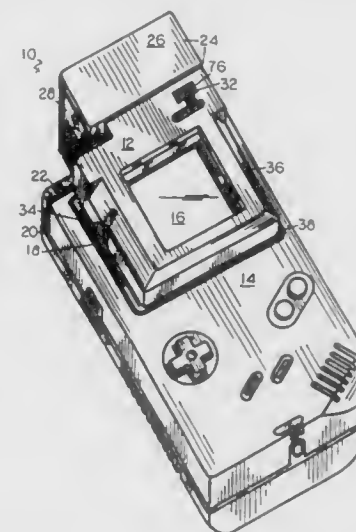
U.S. Cl. 362—109

15 Claims

1. A portable, battery-operated, compact light apparatus for use in enhancing the view of a compact computer video screen, which light apparatus comprises:

a) a body having a plurality of a light-colored, short, extended panels which define an open video viewing space within the body, the video viewing space adapted to conform generally to the size of the compact computer video screen to be enhanced for viewing by the user;
b) a battery compartment in the body adapted to receive one or more batteries as a power source for the light apparatus;
c) light means to light up indirectly one or more surfaces of

the side panels to have reflected light from said lighting means enhance the viewing of the compact computer video screen;
d) electrical switch means to control the power from the power source;
e) electrical connection means to connect the light means through the switch means to the battery compartment and to the batteries as a power source to be employed therein;



f) attachment means to secure releasably the body of the light apparatus directly on to the compact computer apparatus so that the open viewing space of the light apparatus may be positioned over the video screen of the compact computer apparatus and whereby the indirect reflected light enhances the view of the video screen in use by the user.

5,091,833

ILLUMINATED FACE ELEMENTS AND KIT FOR MAKING AN ILLUMINATED FACE ON PUMPKINS AND THE LIKE

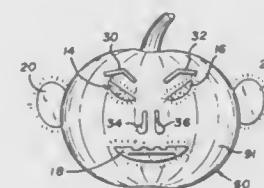
Joseph M. Paniaguas, and Maureen J. Paniaguas, both of 2839 Teresa St., Portage, Ind. 46368

Filed Jul. 29, 1991, Ser. No. 737,447

Int. Cl.⁵ F21L 11/00

U.S. Cl. 362—191

8 Claims



1. A kit of parts for creating a face on a head-like base such as a pumpkin or snowman's head, having illuminated face elements comprising:

a plurality of self-powered illuminating elongated insert units having a pointed end for inserting into the base and an opposite end, means for emitting light from said opposite end, and means for allowing face elements to be at-

tached to said opposite end, so as to be illuminated by said light emitting means; and

a plurality of face elements such as ears, eyes, mouths, or noses, each of which element is constructed of material such that it may be illuminated when attached to one said self-powered illuminating insert unit and each of which elements having means for securely attaching itself to one of said insert units to thereby form a illuminated face element assembly;

whereby selected ones of said plurality of said face elements may be securely attached to said self-powered illuminating inserts and said assembly then inserted into the base so as to create a face thereon with illuminated or glowing elements.

5,091,834

UNIVERSAL LIGHTING FIXTURE REPLACEABLE WITH DIVERSIFIED LAMPS

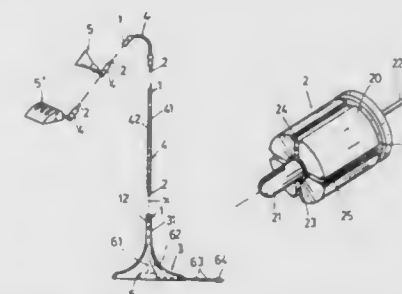
Yu-Tai Kao, and Yu-Hsin Kao, both of c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan

Filed Apr. 19, 1991, Ser. No. 687,620

Int. Cl.⁵ F21S 1/12

U.S. Cl. 362—226

4 Claims



1. A lighting fixture comprising:

a lamp secured with a connecting tube having a coupling plug integrally formed with the connecting tube; and
a supporting base having a coupling socket formed on an end portion of said base detachably engageable with said coupling plug formed on the connecting tube of said lamp, and having a transformer adapter mounted in said base for reducing voltage from an input power source; said coupling plug coaxially rotated in said coupling socket as limited by a limiting screw adjustably fixed in said socket; said adapter having a first pole electrically connected with a core conductor formed in each said socket, said plug and said connecting tube for connecting a first pole of said lamp, and having a second pole of said adapter electrically connected with an outer portion formed in each said base, said socket, said plug and said connecting tube for connecting a second pole of said lamp;

said coupling socket including: an outer cylindrical wall defining a socket portion within said cylindrical wall, a core female connector generally cylindrical shaped connected with a first core conductor clad with insulative material to be positioned in a core portion of said coupling socket, a first insulative packing packed between said female connector and said outer cylindrical wall, and said limiting screw adjustably fixed in said cylindrical wall; and

said coupling plug including: an outer plug portion engageable with said socket portion of said coupling socket, an inner plug portion protruded axially beyond said outer plug portion to be engageable with said female connector of said socket, a second core conductor connected with said inner plug portion positioned in a core portion in said coupling plug, a second insulative packing packed between said second core conductor and said outer plug portion, and an annular groove circumferentially recessed in said outer plug portion generally perpendicular to an

axis of said plug, said annular groove operatively engaged with said limiting screw then inwardly plugged into said groove from said outer cylindrical wall of said socket for rotatably limiting said plug and preventing a releasing of said plug from said socket, the improvement which comprises:

said outer plug portion of said coupling forked to form a plurality of forked slits longitudinally formed in said outer plug portion for resiliently engaging said outer plug portion of said coupling plug in said socket portion of said coupling socket; and

said outer plug portion of said coupling plug formed with a plurality of shallow grooves longitudinally recessed in said circumference surface of said outer plug portion for slidably guiding said limiting screw on said socket for coupling said plug into said socket.

5,091,835

HIGH INTENSITY LAMP WITH IMPROVED AIR FLOW VENTILATION

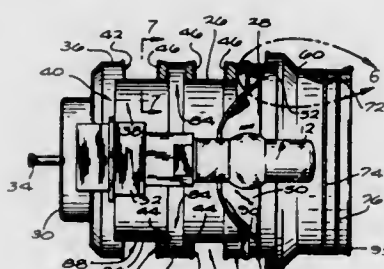
Jack H. Malek, Northridge; John L. Leonetti, and Gilbert Rosales, both of Los Angeles, all of Calif., assignors to Leonetti Company, Hollywood, Calif.

Filed Feb. 25, 1991, Ser. No. 660,398

Int. Cl.⁵ F24V 29/00

U.S. Cl. 362—294

21 Claims



1. A high intensity lamp, comprising:
 - a generally cylindrical lamp housing having an open forward end; and
 - a socket unit within said lamp housing for removably supporting a high intensity lamp globe;
- said lamp housing including a plurality of inner and outer rings, and means for connecting said inner and outer rings in an alternating, generally coaxial and axially overlapping relation to define a first radially outwardly open flow path formed by the combined open axial area between said inner rings, a second axially open flow path formed by the combined open radial area between said inner and outer rings, and a third radially outwardly open flow path formed by the combined open axial area between said outer rings;
- said second flow path having an open flow area significantly greater than said first flow path, and said third flow path having an open flow area significantly greater than said second flow path.

5,091,836

ELECTRIC LIGHT GLOBE HUB

Jerome Neustadt, 5 Holly Ave., Florida, N.Y. 10921

Filed Jun. 3, 1991, Ser. No. 709,358

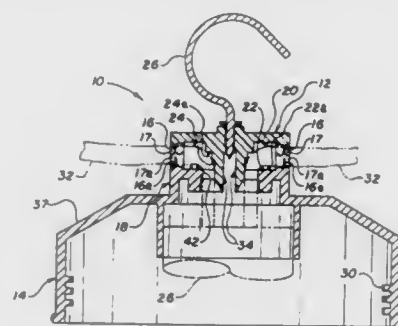
Int. Cl.⁵ F21S 1/8

U.S. Cl. 362—391

14 Claims

1. A globe hub for a casual electric light fixture comprising a cap connected to the top of a globe holder as a cover therefor, said cap and said holder being provided with openings adapted to receive electrical wiring therethrough for connection to an electric lamp held in said hub, said cap and said holder also being provided with a plurality of gripping structures extending from interior surfaces thereof adapted to force

electrical wiring to be connected to said fixture to bend within said fixture at right angles, thereby enabling said structures to



hold and immobilize said electrical wiring in contact therewith.

5,091,837

REGULATED POWER SUPPLY WITH ELECTRICALLY ISOLATED CONTROL AND VARIABLE IMPEDANCE MEANS IN SERIES WITH ON-OFF CONTROL MEANS

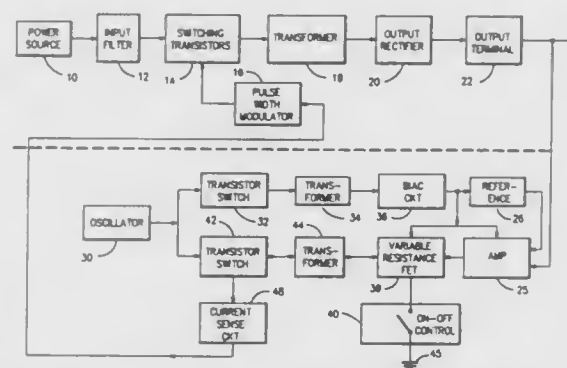
Walter S. Dusplva, Port Ewen, and John B. Gillett, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1991, Ser. No. 648,716

Int. Cl.⁵ H02M 3/28

U.S. Cl. 363—15

5 Claims



1. A regulated power supply comprising in combination:
 - an output terminal for providing a regulated output voltage;
 - a power transformer having a primary winding and a secondary winding;
 - means for coupling said secondary winding to said output terminal;
 - a controller responsive to said regulated output voltage coupling a power source to said primary winding;
 - on-off control means for generating a first output signal in its on state and a second output signal in its off state;
 - variable impedance means connected in series with said on-off control means and responsive to said regulated output voltage for providing a first impedance when said on-off control means is in its on state and a second impedance when said on-off control means is in its off state; and
 - means including an isolation transformer for coupling said variable impedance means to said controller to disconnect said power source from said primary in response to said second output signal.

5,091,838

Patent Not Issued For This Number

5,091,839

METHOD AND APPARATUS FOR SUPPLYING VOLTAGE TO A THREE-PHASE VOLTAGE SYSTEM HAVING A LOAD-CARRYING NEUTRAL CONDUCTOR WITH A PULSE WIDTH MODULATED THREE PHASE INVERTOR

Hartmut Gaul, Altenkirchen, and Albert Mueller, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

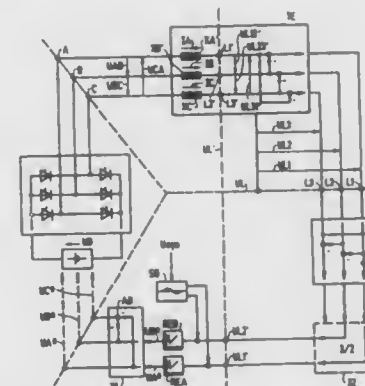
Filed Sep. 21, 1990, Ser. No. 586,519

Claims priority, application European Pat. Off., Sep. 25, 1989, 89117665.4

Int. Cl.⁵ H02J 3/26; H02M 1/084, 5/458

U.S. Cl. 363—41

26 Claims



1. A method for supplying voltage to a three-phase voltage system, whereby said system includes a load-carrying neutral conductor, said method comprising:
 - supplying a frequency setpoint value;
 - converting said frequency setpoint value into a controlled, instantaneous, phase-angle setpoint value;
 - forming an amplitude setpoint value;
 - forming a symmetrical setpoint three-phase voltage system from said phase-angle setpoint value and said amplitude setpoint value;
 - generating a synchronizing voltage system;
 - forming the phase difference between said synchronizing voltage system and said symmetrical setpoint three-phase voltage system;
 - controlling a frequency-controlled oscillator device with said phase difference;
 - tapping off from said frequency-controlled oscillator device said controlled, instantaneous, phase-angle setpoint value and said amplitude setpoint value;
 - forming an actual voltage value of an actual value voltage system from the measured voltage values of the three-phase voltage system being supplied;
 - supplying one setpoint voltage value of said symmetrical voltage system and one actual voltage value from said actual value voltage system to separate voltage control devices;
 - forming three individual voltage control signals from the output signals from said separate voltage control devices;
 - controlling the operation and output voltages of three bridge-arm pairs of a three-phase, pulse-width controlled inverter with said pulse-width modulated signals, whereby said three pulse-width modulated signals control said three bridge-arm pairs in a one-to-one correspondence;
 - coupling the output voltages of said bridge-arm pairs to three primary-coupled terminals of a transformer device, said transformer device comprising a neutral point coupled to the neutral conductor of said three-phase voltage system, and said transformer device comprising secondary

coupling terminals coupled to the phase conductors of said three-phase voltage system, and converting the secondary-side voltages into primary-side voltages in a closed-loop control circuit of said control devices, said conversion corresponding to the structure of the transformer device.

5,091,840

POWER CONVERSION SCHEME EMPLOYING SHORTING MEANS TO CONTROL CURRENT MAGNITUDE

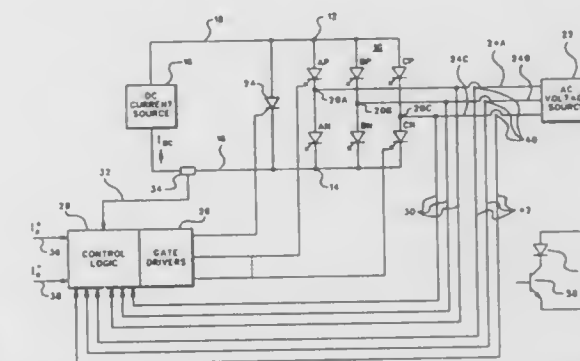
Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 14, 1990, Ser. No. 567,021

Int. Cl.⁵ H02M 7/521

U.S. Cl. 363—96

9 Claims



1. A power conversion scheme for selectively transferring electric power between a DC current source and an AC voltage source comprising:
 - a) plural switch devices arranged in a polyphase bridge circuit having DC terminals and AC terminals, each of said switch devices adapted to be selectively rendered conducting and non-conducting in response to applied gating signals;
 - b) a DC bus connecting said DC current source to said DC terminals;
 - c) an AC bus connecting said AC voltage source to said AC terminals;
 - d) thyristor means connected across said DC bus, said thyristor means acting, when conducting, to short circuit said DC current source, said thyristor means being rendered conducting by the application thereto of a gating signal and being rendered non-conducting by the reduction of current therethrough to substantially zero value;
 - e) control means for selectively furnishing gating signals:
 - 1) to said switch devices in a prescribed sequence thereby rendering said devices selectively conducting to establish an electrical current to thus transfer electrical power between said DC current source and said AC voltage source, said electrical current being at a fundamental frequency corresponding to the frequency of said AC voltage source;
 - 2) to said thyristor means to render said thyristor means conducting and hence short circuit said DC current source; and,
 - 3) to said switch devices to render said devices selectively conducting as a function of extant values of the several phase voltages of said AC voltage source to render said thyristor means non-conducting and thus establish a conduction period for said thyristor means;
 - 4) said control said gating signals being furnished to then conducting switch devices to render such devices non-conducting at substantially the same time as the gating signals are furnished to said thyristor means to render said thyristor conducting;
 - f) whereby the effective magnitude of the current between

said DC current source and said AC voltage is varied as a function of the conducting period of said thyristor means.

control means for respectively controlling the second- to N-th-phase output voltages of said inverter in such a

5,091,841
PROCEDURE FOR THE CONTROL OF FREQUENCY CONVERTER AND RECTIFIER/INVERTER BRIDGES, AND A MODULATOR UNIT DESIGNED FOR IMPLEMENTING THE PROCEDURE

Heikki J. Tuusa, Tampere, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland

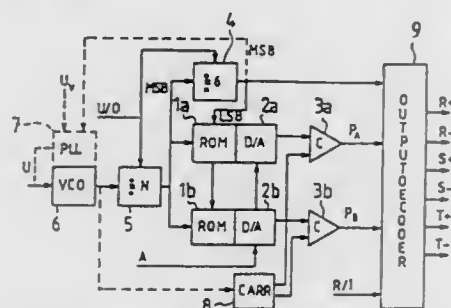
Filed Jan. 4, 1990, Ser. No. 460,785

Claims priority, application Finland, Mar. 6, 1989, 891057

Int. Cl.⁵ H02M 3/335

U.S. Cl. 363—98

11 Claims



1. A process for pulse-width modulation control of solid-state switches, used in three-phase frequency converter and rectifier/inverter bridges, each of said solid state switches having a reverse polarity component connected in inverse-parallel therewith, said process comprising the steps of:

- producing two derived reference signals each of which has a first half consisting of the 0°-60° interval, and a second half consisting of the 120°-180° interval, of a cycle of a sinusoidal modulation reference signal, said derived reference signals having a cycle length of 120° and being displaced by 60° relative to each other;
- obtaining modulation pulses for each phase by comparing said two derived reference signals, derived from modulation reference signals, to at least two out-of-phase triangular waveform type carrier signals; and
- switching the solid state switches to be controlled at 60° intervals.

5,091,842

DEVICE FOR REMOVING D.C. COMPONENTS FROM OUTPUT OF MULTI-PHASE INVERTER

Joji Kawai, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 26, 1990, Ser. No. 515,457

Claims priority, application Japan, Apr. 27, 1989, 1-109726

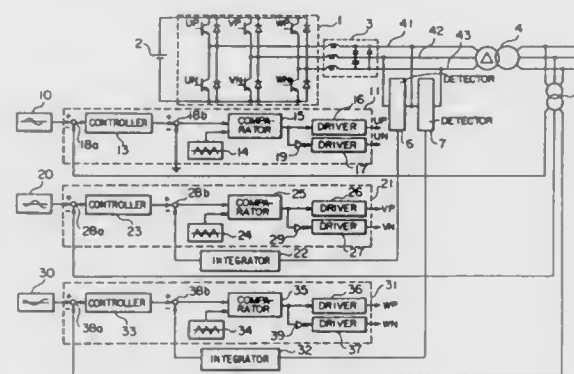
Int. Cl.⁵ H02M 7/5395

U.S. Cl. 363—98

5 Claims

1. A device for removing D.C. components from output voltages of a multi-phase inverter which converts a D.C. voltage into first to N-th phases of A.C. voltage, comprising:

- first to (N-1)th detectors connected between the first-phase output line of said multi-phase inverter and the second- to N-th-phase output lines of said multi-phase inverter, respectively; and



manner that the D.C. components detected by said first to (N-1)th detectors are nullified.

5,091,843

NONLINEAR MULTIVARIABLE CONTROL SYSTEM

Joseph L. Peczkowski, Granger, Ind., assignor to Allied-Signal, Inc., Morristown, N.J.

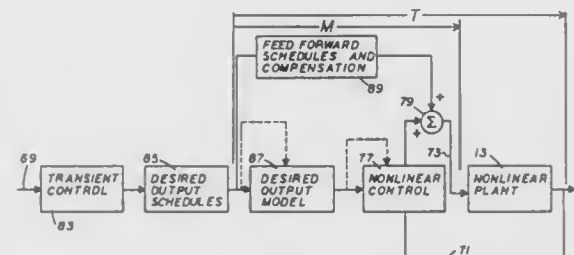
Division of Ser. No. 286,690, Dec. 20, 1988, Pat. No. 4,928,484.

This application Jan. 16, 1990, Ser. No. 465,293

Int. Cl.⁵ G05B 13/04

U.S. Cl. 364—150

3 Claims



1. The method of controlling a plant comprising the steps of: creating a nonlinear model of the plant which includes a plurality of linear plant models, said plurality of linear plant models each mimicking plant operation over a different limited portion of the total range of plant performance, there being a plant model for each of several different plant operating points about each of which, the actual plant operation is approximately linear.

identifying a particular set of linear plant models; computing a corresponding set of linear plant inverse models; applying plant performance request signals to both the plant and the model of the plant; forming a first feedback loop including a linear plant model and a linear plant inverse model; forming a second feedback loop including the plant; applying plant performance request signals to both the first and second feedback loops; utilizing the nonlinear plant model and the performance of the first feedback loop to modify the performance request signals supplied to the plant; comparing plant and linear plant models responses to a common request signal; and providing a warning indication upon an indication of an excessive discrepancy between the plant and plant model responses.

5,091,844

PREEMPTIVE CONSTRAINT CONTROL

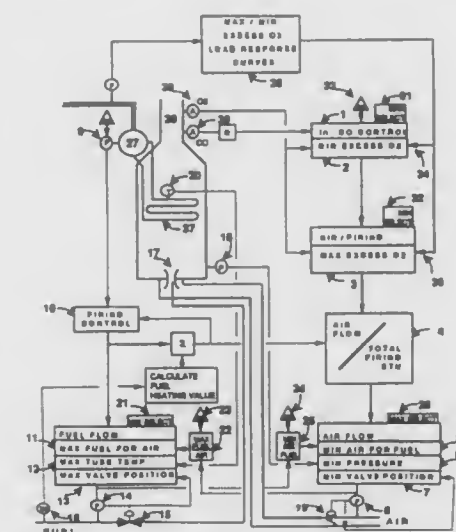
Albert J. Waltz, 2008 N. Memorial Ct., Pasadena, Tex. 77502

Filed Nov. 6, 1989, Ser. No. 431,835

Int. Cl.⁵ G06F 15/46

U.S. Cl. 364—153

36 Claims



1. A method for controlling a process operating under supervision of a plurality of feedback control loops, said method comprising:

- providing at least one constraint controller including a combination of operatively connected and interrelated override controllers, each of said override controllers including at least one individual controller, said override controllers combined in a preemptive constraint control system which system provides responsive regulation of interrelated process conditions attendant to said process being controlled;
- selecting a group of variables to be monitored;
- establishing operating parameters for said process being controlled based upon said group of variables, including:
 - establishing a setpoint for each variable within said group of variables, said setpoint and its corresponding variable being controlled by a selected one of said individual controllers;
 - establishing a limit value for each of said variables within said group of variables;
 - establishing limit violation direction for each operating parameter; and
 - choosing a common process parameter to receive output from said individual controllers;
- providing a plurality of monitoring means, said monitoring means being selectively connected with said override controllers and positioned to monitor said group of variables;
- monitoring by selected ones of said monitoring means, each of said variables within said group of variables, and measuring at an instant in time each of said variables within said group, thus establishing a measured value for each of said variables;
- storing each of said measured values;
- then computing a pseudo-value of each of said variables within said group of variables, each of said pseudo-values corresponding to a respective one of said measured values which said pseudo-value and said measured value form a corresponding pair of values;
- storing each of said pseudo-values;
- then selecting one of said measured values and comparing said selected measured value with its corresponding pseudo-value, and repeating such comparison for each of said corresponding pairs of values;
- establishing an array of adjustment values by utilizing sets of control values, each set consisting of one of said set-

points and said corresponding pair of values and computing for each of said control value sets a corresponding adjustment value, said adjustment value being used to bring said measured value of said control value set to a corresponding one of said setpoints;

- selecting one of a plurality of said individual controllers by choosing a final adjustment value for said plurality of feedback control loops by selecting a maximum value from said adjustment values computed in step (j) if a positive adjustment value moves said process away from one of said limit values, otherwise, by selecting a minimum value from said adjustment values computed in step (j) if a negative adjustment value moves said process away from a selected one of said limit values, thereby leaving a number of non-selected individual controllers;
- changing said common process parameter by said final adjustment value; and
- repeating steps (e) through (l) in a continuous manner.

5,091,845

SYSTEM FOR CONTROLLING THE STORAGE OF INFORMATION IN A CACHE MEMORY

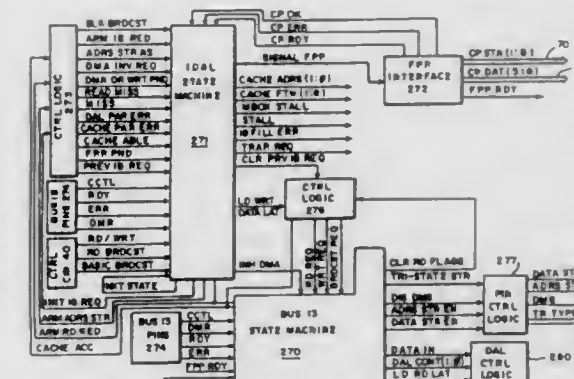
Paul I. Rubinfeld, Wayland, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 300,755, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 17,517, Feb. 24, 1987, abandoned. This application Aug. 11, 1989, Ser. No. 392,783

Int. Cl.⁵ G06F 13/00

U.S. Cl. 395—425

25 Claims



1. A processor for connection to a bus, said bus including information signal transfer lines for transferring data and address information signals from a source unit connected to said bus and a cache control signal transfer line for transferring a cache control signal having a plurality of conditions from said source unit, said processor including:

- a cache memory and
 - a bus interface circuit connected to said cache memory and for connection to said bus, said bus interface circuit including:
 - an information signal transfer circuit for performing a read operation in which it receives said data and address information signals from said information signal transfer lines, said information signal transfer circuit transferring said received information signals to said cache memory; and
 - a cache control circuit connected to said cache memory and said information signal transfer circuit and for connection to said cache control signal transfer line for controlling whether said received information signals are to be stored in said cache memory in response to the condition of said cache control signal,
- whereby said source unit issues said cache control signal for controlling encacheability of said data information signals that said source unit transfers over said bus.

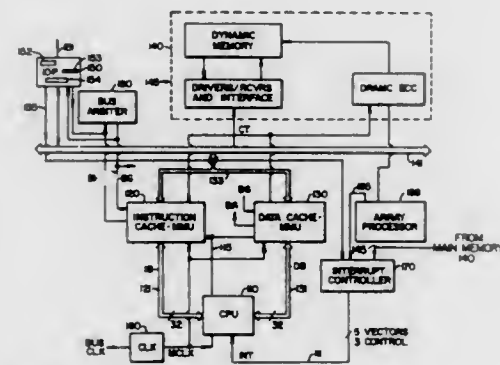
5,091,846

CACHE PROVIDING CACHING/NON-CACHING WRITE-THROUGH AND COPYBACK MODES FOR VIRTUAL ADDRESSES AND INCLUDING BUS SNOOPING TO MAINTAIN COHERENCY

Howard G. Sachs, Los Altos, and James Y. Cho, Los Gatos, both of Calif., assignors to Intergraph Corporation, Huntsville, Ala. Continuation of Ser. No. 915,132, Oct. 3, 1986, abandoned, which is a continuation of Ser. No. 794,248, Oct. 31, 1985, abandoned. This application Oct. 30, 1989, Ser. No. 428,480 Int. Cl.⁵ G06F 12/00

U.S. Cl. 395—250

20 Claims



1. A computer system comprising:
 - a primary memory for storing pages of data;
 - a system bus coupled to the primary memory;
 - a first data processing element coupled to the system bus for processing data from the primary memory;
 - a second data processing element for processing data from the primary memory;
 - cache memory management means, coupled to said second data processing element and to said system bus, including:
 - a cache memory for storing data from said primary memory wherein data from the primary memory stored in the cache memory is accessed by the first and second data processing elements;
 - a cache controller for providing real address translation for virtual addresses received from the second data processing element, for selectively storing and retrieving data to and from said cache memory, and for communicating data between the cache memory and the second data processing element; and
 - system tag means for storing a system tag which indicates one of a plurality of cache data storage modes; wherein said cache controller includes:
 - cache mode effecting means for effecting the cache data storage mode indicated by said system tag; and
 - data consistency means for ensuring shared data consistency between the first and second data processing elements, the data consistency means including system bus monitoring means, coupled to the system bus, for monitoring I/O requests over the system bus.

5,091,847

FAULT TOLERANT INTERFACE STATION

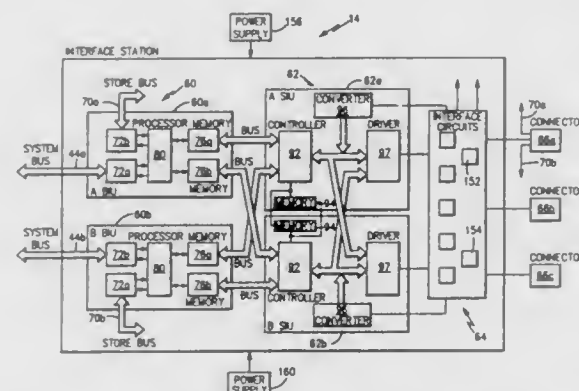
Carl R. Herbermann, Centerport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y. Filed Oct. 3, 1989, Ser. No. 416,643 Int. Cl.⁵ G06F 11/20

U.S. Cl. 395—575

11 Claims

1. A fault tolerant interface station for processing and transmitting data, comprising:
 - first and second interface units, each of the first and second interface units including
 - (i) a receiver to receive input data,
 - (ii) first and second memory sections,
 - (iii) means to transmit data between the receiver and the first and second memory sections, and

- (iv) a controller to control the transmission of data between the receiver and the first and second memory
- third and fourth interface units, each of the third and fourth interface units including
 - (i) an output section to generate a multitude of output signals,
 - (ii) a controller to control said output section,
 - (iii) means to transmit data between the controller and the output section;
- a first data bus to transmit data between the first memory section of the first unit and the controller of the third unit;



- a second data bus to transmit data between the second memory section of the first unit and the controller of the fourth unit;
- a third data bus to transmit data between the first memory section of the second unit and the controller of the third unit; and
- a fourth data bus to transmit data between the second memory section of the second unit and the controller of the fourth unit.

5,091,848

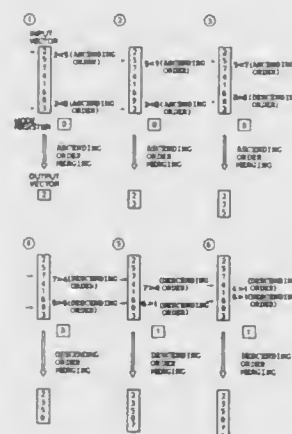
VECTOR PROCESSOR FOR MERGING VECTOR ELEMENTS IN ASCENDING ORDER MERGING OPERATION OR DESCENDING ORDER MERGING OPERATION

Keiji Kojima, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,987
Claims priority, application Japan, Apr. 10, 1987, 62-86846
Int. Cl.⁵ G06F 7/24, 7/36, 15/347

U.S. Cl. 395—800

38 Claims



1. A data merging apparatus comprising:
 - (a) data storage means for storing a first sequence of data elements and a second sequence of data elements;

- (b) operation means adapted for receipt of a data element from the first sequence of data elements and a data element from the second sequence of data elements, for merging the first and second sequences of data elements, said operation means including selecting means for comparing the received data element from the first sequence with the received data element from the second sequence and means for selecting one of the compared data elements;
- (c) supply means responsive to selection by said selecting means of the received data element from the first sequence for supplying the next sequential data element from the first sequence to said operation means and responsive to selection by said selecting means of the received data element from the second sequence for supplying the next sequential data element from the second sequence to said operation means;
- (d) detection means for detecting whether a pair of consecutive data elements of the first sequence, including the received data element of the first sequence, are arranged in ascending order of value or in descending order of value and whether a pair of consecutive data elements of the second sequence, including the received data element of the second sequence, are arranged in ascending order of value or in descending order of value; and
- (e) determining means, responsive to the results of the detection by said detection means, for causing said selecting means to select the smaller one of the received data elements or the larger one of the received data elements, in accordance with the detection results.

5,091,849

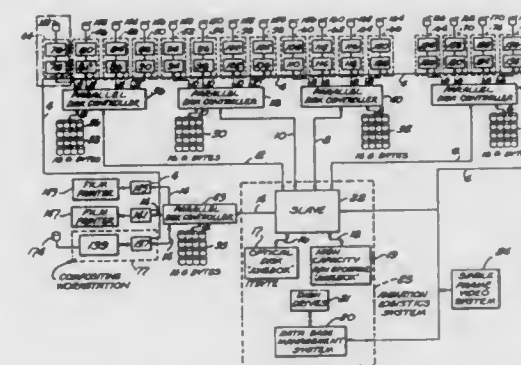
COMPUTER IMAGE PRODUCTION SYSTEM UTILIZING FIRST AND SECOND NETWORKS FOR SEPARATELY TRANSFERRING CONTROL INFORMATION AND DIGITAL IMAGE DATA

Lemuel L. Davis; Mark R. Kimball, both of La Canada; Vahe Sarkissian, Pasadena, and Dylan Kohler, Glendale, all of Calif., assignors to The Walt Disney Company, Burbank, Calif.

Continuation of Ser. No. 263,429, Oct. 24, 1988, abandoned.
This application Jan. 2, 1991, Ser. No. 636,544
Int. Cl.⁵ G26F 13/42, 15/62

U.S. Cl. 395—100

45 Claims



1. A method for use with a computer image production system for efficiently processing digital image data including pixel characteristic information, said computer image production system comprising a logistics system for storing said digital image data and control information relating to said digital image data, one or more information processing devices for enabling at least one user to develop, utilize, and enhance said digital image data, a first network for coupling each of said one or more information processing devices to said logistics system for communicating said control information to and from said logistics system to and from said one or more information processing devices, one or more first arbitration means for arbitrating access of said digital image data among said one or

more information processing devices, one or more of said one or more information processing devices coupled to one of said first arbitration means, one or more temporary memory means, each of said temporary memory means coupled to one of said one or more first arbitration means, each of said temporary memory means for storing said digital image data likely to be accessed by said coupled one or more information processing devices, and a second network having one or more high-speed data buses, each of said high-speed data buses for coupling said logistics system to said first arbitration means and for communicating said digital image data to and from said first arbitration means to and from said logistics system, said digital image data for image display on at least one of said information processing devices, said method comprising the steps of:

- sending a first request from one of said information processing devices to said first arbitration means coupled to said requesting information processing device for a segment of said digital image data for further processing;
- if said requested segment of digital image data is located at said temporary memory means coupled to said first arbitration means coupled to said requesting information processing device, transferring said requested segment of digital image data through said first arbitration means to said requesting information processing device;
- if not, sending a second request from said requesting information processing device over said first network to said logistics system, determining by said logistics system wherein said computer image production system said segment of digital image data is located, transferring over said second network said requested segment of digital image data through said first arbitration means coupled to said requesting information processing device to said temporary means coupled to said first arbitration means from said logistic system or from one of said temporary means which is coupled to one of said first arbitration means that is not coupled to said requesting information processing device; and
- transferring said requested segment of digital image data from said temporary memory means through said first arbitration means coupled to said temporary means to said requesting information processing device and processing said requested element of digital image data by said requesting information processing device.

5,091,850

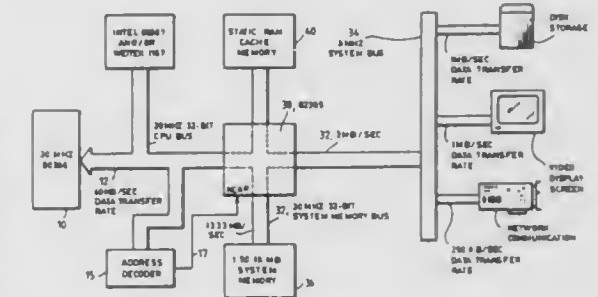
SYSTEM FOR FAST SELECTION OF NON-CACHEABLE ADDRESS RANGES USING PROGRAMMED ARRAY LOGIC

Paul R. Culley, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 102,507, Sep. 28, 1987, abandoned. This application Feb. 2, 1990, Ser. No. 474,652
Int. Cl.⁵ G06F 12/00, 13/00

U.S. Cl. 395—400

1 Claim



1. A computer system capable of designating selected portions of memory as containing non-cacheable data, comprising:
 - (a) a microprocessor which generates memory addresses and memory controls;

- (b) a main memory;
 (c) a cache controller receiving memory addresses and memory controls from said processor;
 (d) a cache memory coupled to said cache controller; and
 (e) an address decoder comprising programmed array logic programmed to satisfy the following logic equations:

$$(i) \quad NA = NAO \cdot /A19 \cdot /A18 \\ + NAO \cdot /A19 \cdot 512K \\ + NAO \cdot /A18 \cdot 640K \\ + NAO \cdot A20 \\ + NAO \cdot A21 \\ + NAO \cdot A22 \\ + NAO \cdot A23;$$

$$(ii) \quad NCA = /A31 \cdot /A23 \cdot /A22 \cdot /A21 \cdot /A20 \cdot /A19 \cdot \\ A18 \cdot /512K \\ + /A31 \cdot /A23 \cdot /A22 \cdot /A21 \cdot /A20 \cdot A19 \cdot \\ /A18 \cdot /A17 \cdot /640K \\ + /A31 \cdot /A23 \cdot /A22 \cdot /A21 \cdot /A20 \cdot A19 \cdot \\ /A18 \cdot A17 \\ + /A31 \cdot /A23 \cdot /A22 \cdot /A21 \cdot /A20 \cdot A19 \cdot \\ A18 \cdot /A17 \\ + /A31 \cdot A23 \cdot A22 \cdot A21 \cdot A20 \cdot A19 \cdot \\ A18 \cdot A17 \cdot CPROM \\ + A31$$

where:

A17-A31=input address lines from said microprocessor;
 CPROM=a second input software-selectable diagnostic bit from said microprocessor for designating whether a high-memory copy of said system ROM is being utilized;
 512K and 640K=input lines from said microprocessor for indicating the desired size of the base memory;
 NA=an output signal the inverse of which is sent to a designated port of said microprocessor requesting the next address; and
 NCA=an output signal the inverse of which is sent to a designated port of said cache controller indicating whether said address from said microprocessor contains non-cacheable data;
 * = a Boolean AND operation;
 + = a Boolean OR operation; and
 / = a NOT or inversion operation.

5,091,851

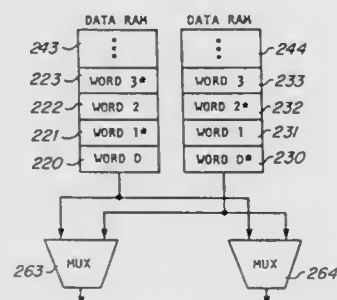
FAST MULTIPLE-WORD ACCESSES FROM A MULTI-WAY SET-ASSOCIATIVE CACHE MEMORY

John F. Shelton, Aptos, and Richard J. Carter, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1989, Ser. No. 382,158
 Int. Cl.⁵ G06F 13/00; G11C 7/00

U.S. Cl. 395-425

17 Claims



1. In a multi-way set-associative cache memory which stores a plurality of lines of data, each line of data containing a plurality of words of data, a method for storing and accessing data in a plurality of random access memories, the method providing

for simultaneous access of words grouped as a multiple-word, the method comprising the steps of:

- (a) placing corresponding words of each line of data in the plurality of lines of data into a different random access memory from the plurality of random access memories so that no two words from any multiple-word are placed into a single random access memory from the plurality of random access memories; and
 (b) when accessing an addressed multiple-word from the multi-way set-associative cache memory, simultaneously accessing from each random access memory a different word of the addressed multiple-word.

5,091,852

SYSTEM FOR OPTIMIZING QUERY PROCESSING IN A RELATIONAL DATABASE

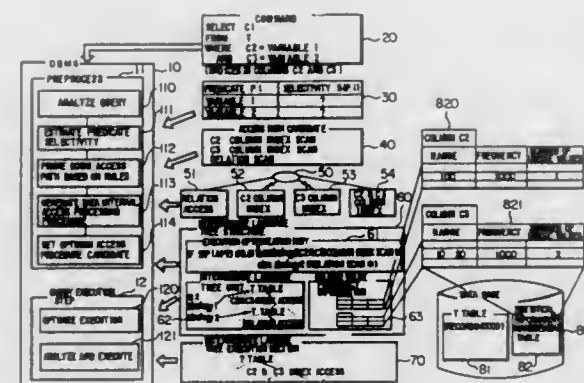
Masashi Tsuchida, Tokyo, and Kazuhiko Ohmachi, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 302,307

Claims priority, application Japan, Jan. 29, 1988, 63-17071
 Int. Cl.⁵ G06F 15/403, 15/401

U.S. Cl. 395-600

7 Claims



3. A method for processing a database comprising the steps of:

- preparing, in a central processing unit, at least one internal processing procedure which is validated, in execution of an input query, by a constant value substituted for a variable included in a retrieval condition expression of the input query, in addition to statistical information of a system including a database, the statistical information including
 (a) a characteristic of the database, and
 (b) a characteristic of the system including a central processing unit for issuing the query, and at least one of
 (i) frequency information of a column constituting a relation in the database, and
 (ii) information relating to a range value derived by dividing column value frequency relating to a column included in a retrieval condition expressed in the query, the column value frequency and the number of column values appearing in that range;
 maintaining, in a memory of the central processing unit, column value frequency information relating to a column appearing in the retrieval condition expression of the query;
 selecting, in the central processing unit, one internal processing procedure from the at least one internal processing procedure based on the column value frequency information in accordance with the constant value substituted for the variable in execution of the input query; and
 executing, in the central processing unit, the selected internal processing procedure developed into an execution module.

5,091,853

CHAINED ADDRESSING MODE PIPELINED PROCESSOR WHICH MERGES SEPARATELY DECODED PARTS OF A MULTIPLE OPERATION INSTRUCTION

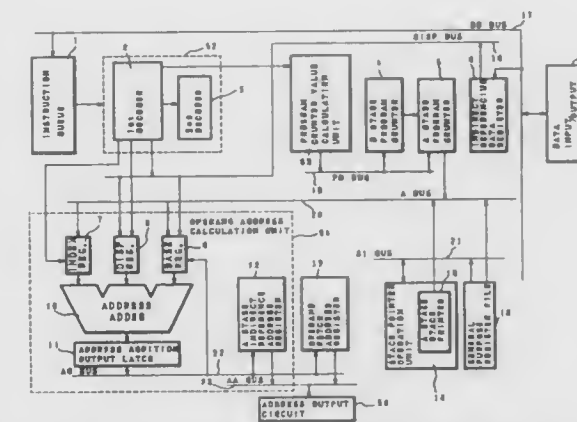
Tetsuya Watanabe, and Toyohiko Yoshida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,727

Claims priority, application Japan, Mar. 18, 1988, 63-66267
 Int. Cl.⁵ G06F 9/35

U.S. Cl. 395-375

3 Claims



1. A data processor for processing an instruction by a pipeline processing mechanism, the instruction including a first operation information designating part for designating a part of an operand operation content, a second operation information designating part for designating a part of the operand operation content, and an addressing mode designating part for specifying information relating to an operand address, comprising:

- a first pipeline stage for decoding a particular instruction by dividing said particular instruction into a plurality of unit decoding processes and for outputting a decoding result of each unit decoding processing, said first pipeline stage decoding said first operation information designating part as a first unit decoding processing to output the first unit decoding result, and decoding said second operation information designating part and said addressing mode designating part as a second unit decoding processing to output the second unit decoding result;
 a second pipeline stage for calculating the operand addresses according to each said decoding result to output said operand address and for successively merging a part of or all of a plurality of each said decoding results into a unit processing to output said operation information of an operand as a merged operation information, said second pipeline stage merging information relating to operand operation included in said first unit decoding result and said second unit decoding result into unit processing to output said operation information of an operand as a merged operation information, and for calculating an operand address according to said second unit decoding result to output said operand address; and
 a third pipeline stage which fetches an operand according to said operand address.

5,091,854

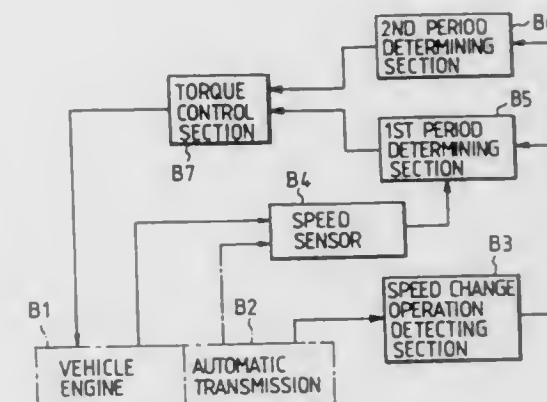
CONTROL SYSTEMS FOR VEHICLE ENGINES COUPLED WITH AUTOMATIC TRANSMISSIONS

Hiroshi Yoshimura, Keiji Bots, Kazuo Takemoto, all of Hiroshima, and Fumiaki Baba, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 23, 1989, Ser. No. 356,451

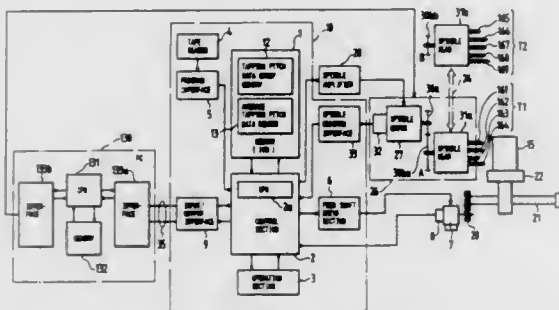
Claims priority, application Japan, May 26, 1988, 63-126969
 Int. Cl.⁵ B60K 41/04

15 Claims



1. A control system for a vehicle engine coupled with an automatic transmission, the control system comprising:
 speed change operation detection means for detecting a condition of speed change operation for varying a gear ratio in a power transmitting gear arrangement provided in the automatic transmission,
 speed sensing means for detecting a speed of a rotational element relating to the speed change operation of the automatic transmission,
 first period determining means for determining a first period of time, in which the speed change operation is to be carried out in the automatic transmission said first period of time beginning from a starting point of the speed change operation detected by said speed change operation detecting means, said first period determined by calculating an ending of the speed change operation based on the speed detected by said speed sensing means and gear ratios between which the speed change operation is performed,
 second period determining means for determining a second period of time, in which the speed change operation is to be carried out in the automatic transmission, in accordance with a predetermined lapse of time beginning from a starting point of the speed change operation detected by said speed change operation detecting means, and
 torque control means operative to vary torque produced by the vehicle engine so as to suppress torque shock resulting from the speed change operation during the first period of time as determined by said first period determining means when a condition of shifting-up operation is detected by said speed change operation detecting means and to vary the torque so as to suppress torque shock resulting from the speed change operation during the second period of time determined by said second period determining means when a condition of predetermined shifting-down operation is detected by said speed change operation detecting means.

pitch data group memory, obtaining an average value of said data group thus read, and feeding said spindle with



respect to rotation of said tapping tools in accordance with said average value.

5,091,861

SYSTEM FOR AUTOMATIC FINISHING OF MACHINE PARTS

Yair Geller, Ramat Gan; Michael Berman, Bnei Brak, and Orli Katsav, Ramat Gan, all of Israel, assignors to N.C.T. Ltd., Givataim, Israel

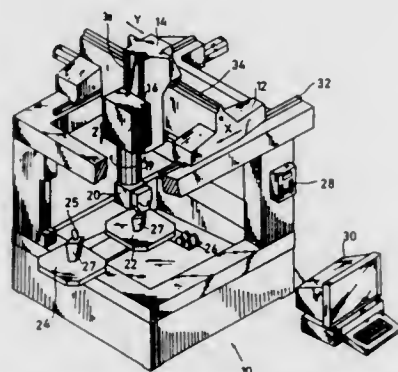
Filed Oct. 25, 1989, Ser. No. 427,687

Claims priority, application Israel, Mar. 3, 1989, 89484

Int. Cl.³ G06F 15/46

U.S. Cl. 364—474.34

25 Claims



1. A system for automatic finishing of machined parts comprising:

- means for defining a workpiece and finishing parameters thereof corresponding to a finishing task;
- means for calculating a three-dimensional tool path along which a finishing tool is drawn in order to perform said finishing task; and
- means for testing the placement of said workpiece and for correcting said three-dimensional path to account for workpiece misplacement; and
- finishing means operative to move along said three dimensional path to perform said finishing task.

5,091,862

METHOD AND SYSTEM FOR DIMENSIONAL AND WEIGHT MEASUREMENTS OF ARTICLES OF MANUFACTURE BY COMPUTERIZED TOMOGRAPHY

Carvel D. Hoffman, Bethlehem; R. Creighton Booth, Coopersburg; John C. Clymer, Bethlehem, all of Pa., and Richard J. Casler, Newtown, Conn., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

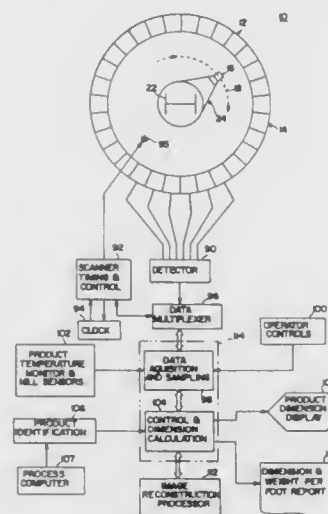
Division of Ser. No. 204,588, Jun. 9, 1988, Pat. No. 4,951,222.

This application Jun. 20, 1990, Ser. No. 541,284

Int. Cl.³ G01B 15/00

U.S. Cl. 364—507

4 Claims



1. A method for tomographic imaging of an inanimate object by fan rays detected by a set of detectors for determining the weight per unit length of the object having a predetermined density, comprising the steps of:

- generating a fan-shaped beam of radiation divided into a plurality of fan ray elements each having radiation of magnitude sufficient to penetrate the object;
- detecting the fan ray elements by the set of detectors and producing signals from the detectors representative of respective intensities of radiation of the detected ones of said fan ray elements;
- determining from the intensity signals the magnitude of the distance travelled by each fan ray element through the object;
- determining the cross-sectional area in accordance with the magnitudes of the distances; and
- determining the weight per unit length of the object in accordance with the determined cross-sectional area and the density of the object.

5,091,863

AUTOMATIC FLUID SAMPLING AND FLOW MEASURING APPARATUS AND METHOD

William G. Hungerford, Medina; Donald Miller; Carl Griffith, both of Middleport, and Donald Kaiser, Tonawanda, all of N.Y., assignors to American Sigma, Inc., Medina, N.Y.

Filed Dec. 22, 1989, Ser. No. 455,981

Int. Cl.³ G01F 11/00; B65B 3/00

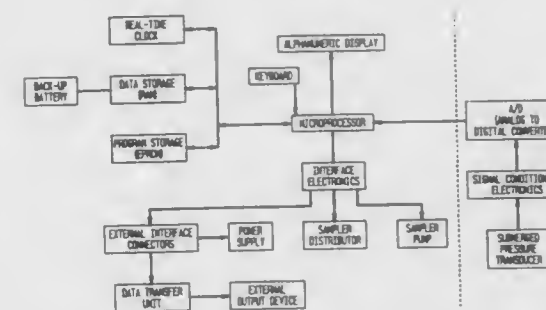
U.S. Cl. 364—510

36 Claims

1. An apparatus for automatically collecting samples from a fluid channel and for measuring a fluid flow-related variable, according to modes of operation selected by a user, said modes of operation including sampling on the basis of time and/or said fluid flow-related variable, comprising:

- means for controlling said apparatus;
- a fluid sampling assembly having an inlet for receiving fluid from said channel;

power means for supplying power to each element of said apparatus; said fluid sampling assembly, said control means and said power means comprising an integral operating unit disposed within a single case, said case being sufficiently compact so as to be receivable in a manhole; said integral operating unit further including at least one input connection for receiving a detected signal related to fluid flow in said channel, and means for conditioning said signal for input to said control means; and said control means comprising a microprocessor, program memory and data memory, wherein: said program memory stores a plurality of equations for computing values of said fluid flow-related variable;



said data memory stores user-selected input parameters including operating mode selection data, at least one fluid flow-related parameter and sampling times; said microprocessor receives said signal related to fluid flow from said conditioning means and calculates values of said fluid flow-related variable based on said signal, said at least one user-selected fluid flow-related parameter and a selected one of said stored equations; said microprocessor controls said fluid sampling assembly according to at least one of said modes of operation selected by the user, based on said user input sampling times and/or computed values of said fluid flow-related variable; and said data memory stores fluid sampling data and fluid flow-related data.

5,091,864

SYSTOLIC PROCESSOR ELEMENTS FOR A NEURAL NETWORK

Toru Baji, Burlingame, Calif., and Hidenori Inouchi, Donnybrook, Ireland, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 455,141

Claims priority, application Japan, Dec. 23, 1988, 63-323302

Int. Cl.³ G06F 15/18

U.S. Cl. 395—27

17 Claims

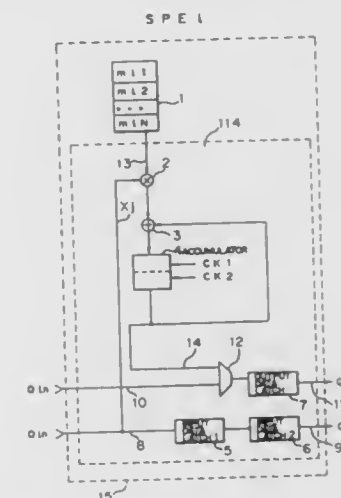
1. A neural net signal processor provided with a single layer neural net including N neuron circuits, wherein N is any positive integer, which sum results of multiplication of each of N input signals X_j ($j=1$ to N) by a coefficient m_{ij} to produce a multiply-accumulate value

$$S_i = \sum_{j=1}^N m_{ij} \cdot X_j$$

thereof, in which input signals X_j ($j=1$ to N) for input to the single layer neural net are input as serial input data, comprising:

- a plurality of systolic processor elements SPE ($i=1$ to M), wherein M is any positive integer, each systolic processor element including,
- storage means for storing coefficients,
- multiplying means for sequentially reading the coefficients from said storage means and sequentially multiplying

each of the serial input data by an associated coefficient read out from said storage means,



means for summing the results of the multiplications from said multiplying means to produce a multiply-accumulated value

$$S_i = \sum_{j=1}^N m_{ij} \cdot X_j$$

a multiplexor for selectively outputting one of the multiply-accumulated values produced from said summing means and a multiply-accumulated value applied from a preceding systolic processor element,

first latch for delaying the multiply-accumulated value applied from said multiplexor by a first time period corresponding to an operation period by at least one systolic processor element and for applying the delayed multiply-accumulated value to a succeeding systolic processor element,

second latch for delaying the serial input data by a second time period longer than the first time period by an operation period by at least one systolic processor element and for applying the delayed multiply-accumulated value to the succeeding systolic processor element,

whereby the single layer neural net produces a serial multiply-accumulated value.

5,091,865

PATTERN READING APPARATUS HAVING VARIABLE READING PERIOD

Yasuhiro Yamada, Yokohama; Yasuko Miyazaki, Tokyo; Takashi Kanemoto, Tokyo; Mikiharu Matsunaka, Tokyo, and Hirohiko Katayama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 569,583, Aug. 20, 1990, abandoned,

which is a continuation of Ser. No. 278,493, Dec. 1, 1988,

abandoned. This application Jun. 24, 1991, Ser. No. 718,911

Claims priority, application Japan, Dec. 14, 1987, 62-314233

Int. Cl.³ G06F 3/05; G09B 21/00

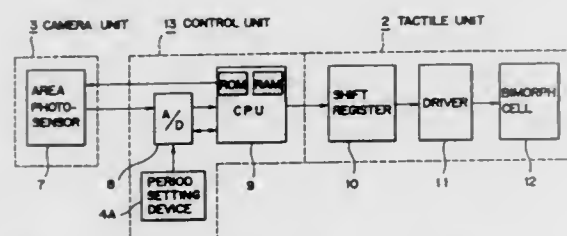
U.S. Cl. 395—153

17 Claims

1. A pattern reading apparatus comprising:

- first display means for outputting optical pattern information;
- conversion means for reading the optical pattern information outputted by said first display means and converting same into electrical signals;
- second display means for displaying pattern information by vibration of plural vibrating pins, the displayed pattern

information corresponding to the pattern information read by said conversion means; reading period determining means provided near said second display means for variably setting a reading period when the optical pattern information outputted by said first display means is read by said conversion means; and



control means for causing the electrical signals from said conversion means to be displayed by said second display means according to the reading period set by said reading period determining means.

5,091,866
INFORMATION PROCESSING APPARATUS
DISPLAYING MULTIPLE WINDOWS AND
DISTINGUISHING INDICIA

Shiro Takagi, Yokohama, Japan, assignor to Kabushiki Kaisha
Toshiba, Kawasaki, Japan

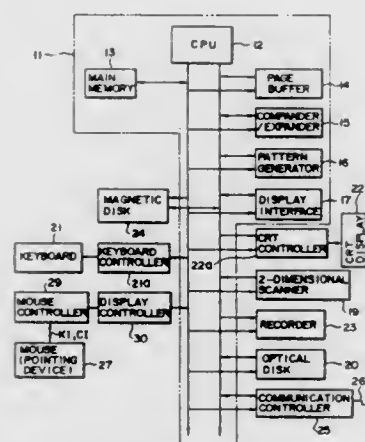
Continuation of Ser. No. 136,391, Dec. 22, 1987, abandoned.

This application Mar. 2, 1990, Ser. No. 489,724

Claims priority, application Japan, Dec. 26, 1986, 61-315332
Int. Cl.⁵ G06F 15/62

U.S. CL. 395-158

11 Claims



1. An information processing apparatus comprising:
means for displaying a plurality of window areas, each of which includes information to be processed and each of which has an associated one of a plurality of distinguishing indicia, wherein a window area at least partially overlapped and hidden by others of said plurality of windows defines a hidden window area;
means for determining a window area which is not a hidden window area; and
means for causing display, in the window area determined not to be hidden window area, of a distinguishing indicia associated with the window area determined not to be a hidden window area.

5,091,867
METHOD AND APPARATUS FOR GENERATING
DISPLAY FIGURES WITH THREE DEGREES OF
FREEDOM

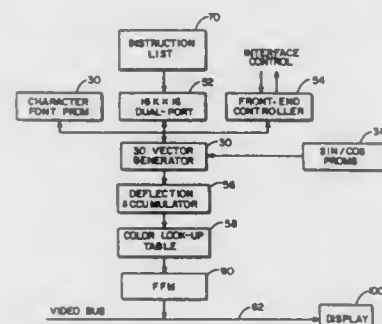
Joseph D. Clark, Rio Rancho, and Thomas A. Weingartner, Albuquerque, both of N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 20, 1989, Ser. No. 325,779

Int. Cl.⁵ G06F 15/72

U.S. Cl. 395-162

5 Claims



1. A three dimensional vector generator apparatus including a data bus, wherein the three dimensional vector generator apparatus comprises:

- a. a first programmable array logic block means having an input connected to the data bus and having an output;
- b. a first adder means having a first input connected to the output of the first programmable array logic block means, and further having a second input and an output;
- c. a second programmable array logic block means having a first input connected to the output of the first adder means, having a second input connected to the data bus and having an output connected to the second input of the first adder means;
- d. a first sine/cosine PROM means having an input which is also connected to the output of the second programmable array logic block means and further having an output;
- e. a first deflection accumulator means having first, second and third inputs and having an output, wherein the third input is connected to the output of the first sine/cosine PROM means;
- f. a first feedback circuit means having an input connected to the output of the first deflection accumulator means and having an output fed back to the third input of the first deflection accumulator means;
- g. a third programmable array logic block means having an input connected to the data bus and having an output;
- h. a second adder means having a first input connected to the output of the second programmable array logic block means, and further having a second input and an output;
- i. a fourth programmable array logic block means having a first input connected to the output of the second adder means, a second input connected to the data bus and having an output connected to the second input of the second adder means;
- j. a second sine/cosine PROM means having an input which is also connected to the output of the fourth programmable array logic block means and further has an output connected to the second input of the first deflection accumulator means;
- k. a second deflection accumulator means having first, second and third inputs and having an output, wherein the third input is connected to the output of the first sine/cosine PROM means;
- l. a third sine/cosine PROM means having an input which is also connected to the output of the fourth programmable array logic block means and further has an output connected to the second input of the second deflection accumulator means;

- m. a second feedback circuit means having an input connected to the output of the second deflection accumulator means and having an output fed back to the second input of the first deflection accumulator means;
- n. a register means having an input connected to the output of the second deflection accumulator means and an output connected to the second input of the second deflection accumulator means;
- o. a plurality of output register means including first second and third output registers each output register having an input and an output, wherein the input of the first output register is connected to the output of the first deflection accumulator means and the inputs of the second and third output registers are connected to the output of the second deflection accumulator means; and
- p. means for controlling elements a. through o. having a plurality of control lines including a first control line connected to the data bus so as to provide control signals to the elements a. through o. so as to produce cartesian coordinate offsets for unit vectors at the outputs of the first, second and third output registers.

5,091,868
METHOD AND APPARATUS FOR FORMS
GENERATION

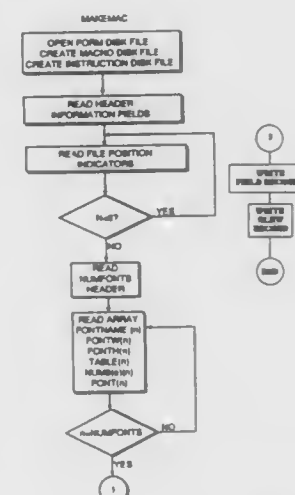
David S. Pickens, Dunwoody, and Susan G. Quinn, Lithia Springs, both of Ga., assignors to Westcorp Software Systems, Inc., Atlanta, Ga.

Filed May 9, 1988, Ser. No. 191,336

Int. Cl.⁵ G06F 15/18

U.S. Cl. 395-148

7 Claims



2. A forms generation system comprising:
 - a. at least one workstation having an input unit, a processing unit and a display unit;
 - b. software control means for controlling said workstation to create an object code output program corresponding to a particular form, wherein said software control means includes means for generating a macro disk file and an instruction disk file, means for creating a screen layout on said display unit and generating a screen layout disk file corresponding to said screen layout, source means for generating a source code program corresponding to said form, and compiling means for compiling said source code program into said object code form program which is capable of driving a printing unit to reproduce said form based on the information contained in said macro disk file and said instruction disk file; and
 - a printing unit coupled to said workstation and means for running said object code form program in said workstation to print said form with said printing unit.

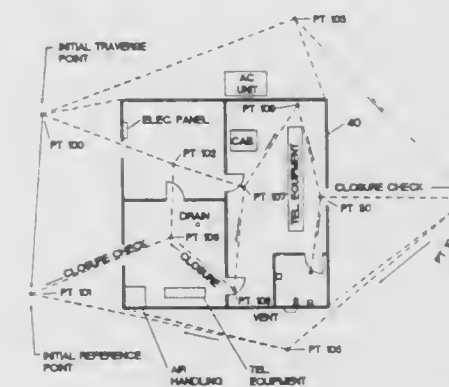
5,091,869
COMPUTER INTEGRATED FLOOR PLAN SYSTEM
Terry D. Ingram, Benton, and Randy Wolverton, Alexander,
both of Ark., assignors to Expert Technologies, Inc., Bryant,
Ark.

Filed Apr. 16, 1990, Ser. No. 509,862

Int. Cl.⁵ G01C 5/00; G06F 15/00

U.S. Cl. 364—560

10 Claims



1. A method for devising a floor plan for accurately portraying established physical features of and within an existing building which comprises selecting a traverse point within the building, setting up a surveying instrument on said traverse point, measuring through said instrument horizontal distances to and horizontal angles of prominent points in an interior portion of said building, setting up said instrument in a second traverse point and measuring through said instrument angles and distances to further prominent points in an adjacent interior portion of said building and recording said data from both of said traverse points and their respective angles and distances in a data collector, transferring said data to a computer, providing in said computer software means to convert said data into a format and using said format to provide an X-Y coordinate file compatible with a computer aided drafting system and printing out on paper through a plotter operated by computer aided drafting system said floor plan of the building.

5,091,870
APPARATUS FOR MEASURING THE SPEED OF
TRANSMISSION OF DIGITAL CHARACTERS

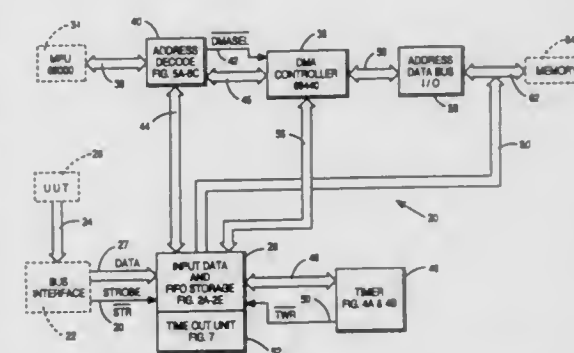
George Datsko, Rochester, N.Y., and William J. Ross, Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio
Continuation of Ser. No. 199,966, May 27, 1988, abandoned.

This application Jun. 12, 1990, Ser. No. 537,219

Int. Cl.⁵ G04F 10/00; G01P 3/50

U.S. Cl. 364-565

5 Claims



1. In a data processing system including a processor unit for outputting a plurality of consecutive first and second pairs of first and second data words, an apparatus or time-stamping said consecutive pairs of data words comprising:

interface means coupled to the processor unit for receiving and outputting said consecutive first and second pairs of first and second data words, said interface means outputting an associated first control signal upon receiving the first data word of each consecutive pair of first and second data words outputted by the processor unit and an associated second control signal upon receiving the second data word of each consecutive pair of first and second data words;

a first storage means coupled to said interface means for receiving said pairs of first and second data words and their associated first and second control signals, said first storage means including first and second storage units, said first storage unit for storing the pairs of first and second data words in response to receiving said first and second control signals, said first storage means further including first logic circuit means coupled to said interface means and to said second storage unit for outputting a third control signal in response to receiving said first and second control signals, said second storage unit receiving and storing the pairs of first and second data words from the first storage unit in response to receiving the third control signal, said first logic circuit means further outputting a fourth control signal in response to receiving the first and second control signals;

timing means coupled to said first storage means and to said first logic circuit means and responsive to receiving the fourth control signal for generating time-stamp data words representing time periods occurring between consecutive second data words of each pair of first and second data words outputted by said processor unit, said timing means including second logic circuit means coupled to said first logic circuit means for outputting a fifth control signal to said first storage means in response to receiving said fourth control signal for storing said time-stamp data words in said second storage unit with their associated pairs of first and second data words;

said second storage unit outputting a sixth control signal when said second storage unit has stored a predetermined amount of said pairs of first and second data words and said time-stamp data words;

second storage means; and

control means coupled to said second storage means and to said second storage unit for transferring the pairs of first and second data words and said time-stamp data words from said second storage unit to said second storage means in response to receiving said sixth control signal.

5,091,871

METHOD OF DETERMINING THE MEAN WIND SPEED WITH RESPECT TO THE GROUND DURING THE FLIGHT OF AN AIRCRAFT

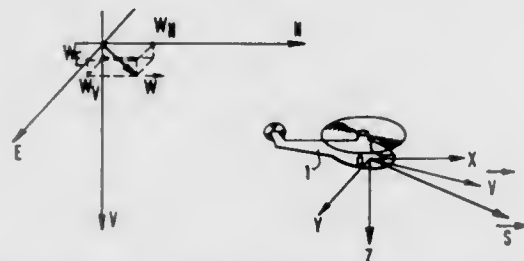
Jean P. Arethens, Drôme, France, assignor to Sextant Avionique, Valence, France

Filed Jan. 17, 1990, Ser. No. 464,876

Claims priority, application France, Jan. 18, 1989, 89 00533
Int. Cl.⁵ G06F 15/20, 15/54

U.S. Cl. 364—565

22 Claims



1. A device for providing the three components W_N , W_E and W_V in an Earth reference frame, of speed with respect to the ground of the wind during a flight period of an aircraft, for

use by equipment of said aircraft which is sensitive to the wind, comprising:

means for measuring including an anemobarometric sensor and an inertial unit which comprises accelerometers, at each time of rank i of a succession of times spread out over said flight period, a value V_i of the modulus of the speed of said aircraft with respect to the air mass in which it moves and values S_{Ni} , S_{Ei} , S_{Vi} of the three components, in said Earth reference frame, of the ground speed of said aircraft;

a digital memory for storing said measured values; and computer means including a microprocessor, for solving, using the method of least squares, a system of equations with three unknowns W_N , W_E , and W_V , in which system a current equation is:

$$2(S_{Ni} - S_{NR})W_N + 2(S_{Ei} - S_{ER})W_E + 2(S_{Vi} - S_{VR})W_V = S_{Ni}^2 - S_{NR}^2 + S_{Ei}^2 - S_{ER}^2 + S_{Vi}^2 - S_{VR}^2 + V_i^2 - V_R^2$$

V_R , S_{NR} , S_{ER} and S_{VR} being values, stored before the time of rank i in said digital memory, of said modulus and of said three components of the ground speed of said aircraft, respectively, wherein said three components are output to said equipment.

5,091,872

APPARATUS AND METHOD FOR PERFORMING SPIKE ANALYSIS IN A LOGIC SIMULATOR

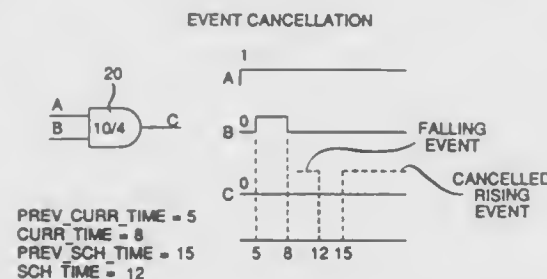
Prathima Agrawal, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 23, 1989, Ser. No. 370,934

Int. Cl.⁵ G06F 15/20

U.S. Cl. 364—578

10 Claims



1. A logic circuit simulator arranged for detecting spike conditions at the outputs of gates in a simulated logic network, which comprises

means for generating input messages specifying the scheduled times of output events and resulting new output values for said gates;

first and second time wheels each having a plurality of time slots corresponding to specific times,

scheduling means responsive to said input messages for linking the identities and last-received new output values for gates having output events scheduled at a specific time to the time slot in said first time wheel corresponding to such time and for transmitting output messages indicating new output values for the gates linked to each particular time slot in said first time wheel at the time associated with that particular time slot; and

analyzing means responsive to said input messages for determining the elapsed time between arrivals of successive input messages for each gate and, if said elapsed time exceeds a reference time for said gate, linking the identity of said gate and the presence of a spike condition with the time slot of said second time wheel corresponding to the start of the spike condition and for transmitting output messages indicating spike conditions for the gates linked to each particular time slot in said second time wheel at the time associated with that particular time slot.

5,091,873

WORD PROCESSOR WITH A LIQUID CRYSTAL DISPLAY PANEL AND A DETACHABLY ATTACHED LIGHTING UNIT THEREFOR

Shigeharu Araki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

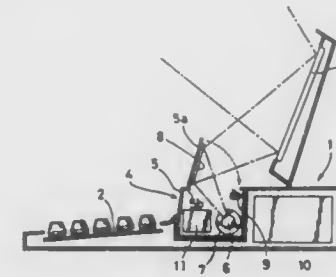
Filed Dec. 19, 1989, Ser. No. 453,404

Claims priority, application Japan, Dec. 20, 1988, 63-322408; Dec. 20, 1988, 63-322409

Int. Cl.⁵ G06F 1/00

U.S. Cl. 364—708

6 Claims



1. A word processor comprising:

- a main body having
 - a keyboard,
 - a liquid crystal display panel for making a display thereon according to a key operation on said keyboard,
 - a power source and power output terminals connected to said power source, and
 - a recessed space below said liquid crystal display for receiving a lighting unit for illuminating said liquid crystal display;
- said lighting unit being removably attached in said recessed space to said main body, and including an enclosure including a hinged lid having a closed and an opened position,
- a light source disposed inside said enclosure,
- a mirror attached to said lid as to reflect light from said light source to said liquid crystal display panel when said lid is in the opened position, and
- power input terminals connected to said light source contacting said power output terminals of said main body when said lighting unit is attached to said main body thereby providing power to said light source.

5,091,874

ENCODER APPARATUS

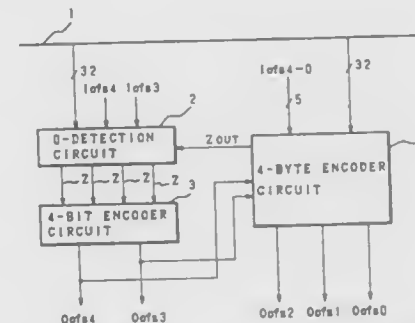
Yukari Watanabe, and Yuichi Saito, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 210,968

Claims priority, application Japan, Jun. 30, 1987, 62-164325
Int. Cl.⁵ G06F 7/38

U.S. Cl. 364—715.1

5 Claims



1. An encoding apparatus receiving an input offset value and an n -bit word, the n -bit word being segmented into a plurality of groups of predetermined bit-length, the apparatus generat-

ing an i -bit output offset value which defines a bit position within the n -bit word corresponding to either one of a lowest order bit or a highest order bit having a first logical value, the i -bit output offset value having x high-order bits and y low-order bits, the apparatus comprising:

means receiving said plurality of groups of said n -bit word for detecting for each one group of said plurality of groups whether all bits of said one group correspond to a second logical value, said detecting means generating an indicator signal for each said one group each respective indicator signal indicating whether all bits of the corresponding said one group correspond to said second logical value;

first encoding means receiving the indicator signal for each said one group for generating the x high-order bits of the output offset value in response to said indicator signals;

second encoding means receiving said plurality of groups for encoding each one of said plurality of groups into a respective encoded bit set, resulting in a plurality of encoded bit sets;

means for selecting one set of the plurality of encoded bit sets in response to said x high-order bits, said selected bit set defining the y low-order bits of said output offset value.

5,091,875

FAST FOURIER TRANSFORM (FFT) ADDRESSING APPARATUS AND METHOD

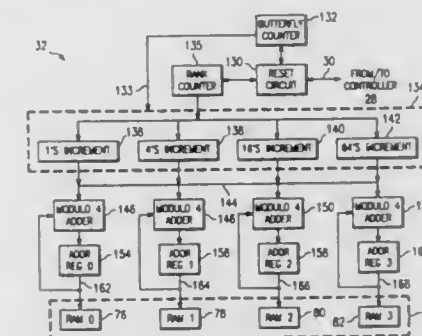
Yiwan Wong, Toshiaki Yoshino, and Louis G. Johnson, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 23, 1990, Ser. No. 500,437

Int. Cl.⁵ G06F 15/31

U.S. Cl. 364—726

31 Claims



1. Apparatus for generating memory addresses for accessing and storing data in an FFT computation, said FFT (Fast Fourier Transform) computation computing a plurality of ranks of a plurality of FFT butterflies, comprising:

a butterfly counter for determining the current FFT butterfly being computed and producing a plurality of butterfly carries;

a rank counter for determining the rank of said current FFT butterfly being computed and producing a rank number; incremental circuitry coupled to said rank counter and said butterfly counter for generating an incremental number in response to said rank number and said plurality of butterfly carries;

storage circuitry for storing a plurality of memory addresses; and

adder circuitry coupled to said incremental circuitry and said storage circuitry for adding said incremental number and each of said plurality of memory addresses.

5,091,876

MACHINE TRANSLATION SYSTEM

Akira Kumano; Hiroyasu Nogami; Seiji Miike, all of Yokohama; Hisahiro Adachi, Chigasaki, and Shin-ya Amano, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 898,020, Aug. 19, 1986, abandoned.

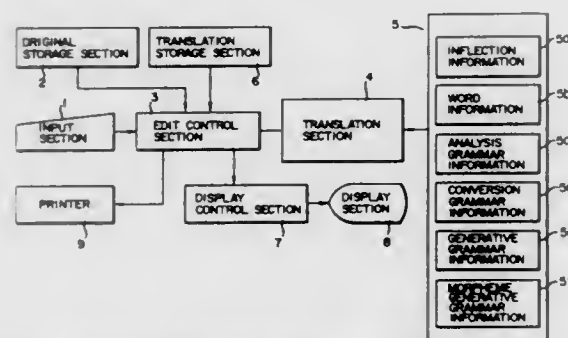
This application Dec. 18, 1989, Ser. No. 453,069

Claims priority, application Japan, Aug. 22, 1985, 60-184943

Int. Cl.³ G06F 15/38

U.S. Cl. 364—419

5 Claims



1. A machine translation system comprising: original storing means for storing a plurality of translation processing units of an original text; dictionary means for storing linguistic information necessary for translation processing for the original text; translation section means, operatively connected to said original storing means and to said dictionary means, for translating each translation processing unit of the original text stored in said original storing means with reference to the linguistic information; translation storing means, operatively connected to said translation section means, for storing a translated text including each translated translation processing unit obtained by said translation section means together with information indicating a correspondence between each translation processing units of the original and translated texts; edit processing means, operatively connected to said original and translation storing means and to said translation section means, for executing edit processing for the original and translated texts; display means having a display screen, for displaying at least one of the original and translated texts; display control means operatively connected to said edit processing means and to said display means, for controlling said display means; input means, operatively connected to said edit processing means for inputting instruction information for said translation section means and said edit processing means; said display control means including, display mode control means for controlling said display means in a first display mode for displaying the original and translated text respectively in original and translation display sections of the display screen, so that each of the translation processing units of the original text is displayed in horizontal lines as one paragraph in the original display section, and each of the translation processing units of the translated text is displayed in horizontal lines as one paragraph in the translation display section, and a display position of each translation processing unit of the original text and a corresponding translation processing unit of the translated text start at the same horizontal line in the display screen, in a second display mode for displaying the original text in horizontal lines on the entire display screen with the trans-

lation processing units of the original text displayed continuously, and in a third display mode for displaying the translated text in horizontal lines on the entire display screen with the translation processing units of the translated text displayed continuously, and mode discrimination means for discriminating a selected one of the three display modes and controlling the display mode control means; and said input means including means for inputting information for instructing one of the three display modes to be discriminated by said mode discrimination means.

5,091,877

DATA PROCESSING APPARATUS

Yoshikazu Itoh, Tokyo, and Shunji Wake, Kawasaki, both of Japan, assignors to Ikegami Tsushinki Co., Ltd. and Video Research Ltd., both of Tokyo, Japan

Continuation of Ser. No. 241,296, Sep. 7, 1988, abandoned. This

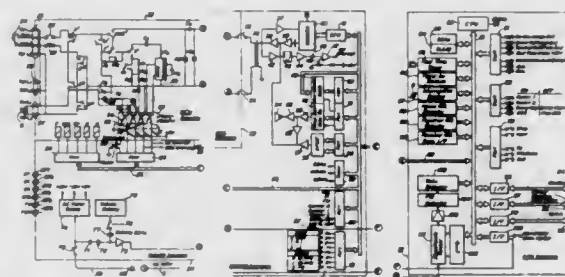
application Oct. 19, 1990, Ser. No. 600,139

Claims priority, application Japan, Sep. 9, 1987, 62-226069

Int. Cl.³ G06F 3/04

U.S. Cl. 395—200

9 Claims



1. A data processing apparatus for use in an electronic research system in which data collected at a panelist's home is formed into transmission data having a given format and the transmission data is transmitted to a data center via a telephone link, the data processing apparatus being disposed at the panelist's home to receive the data collected at the panelist's home and sharing the telephone link with a telephone set at the panelist's home, said data processing apparatus comprising: center call transmission means for effecting a center call mode in which the data processing apparatus responds to a call from the data center to the panelist's home by transmitting the transmission data from the panelist's home to the data center, the call from the data center occurring within a predetermined time gate; terminal call transmission means for effecting a terminal call mode in which the data processing apparatus originates a call to the data center, and then transmits the transmission data from the panelist's home to the data center; and control means, connected to said center call transmission means and said terminal call transmission means, for controlling the transmission of the transmission data from the panelist's home to the data center by either of said transmission means, the control means including a non-volatile RAM which stores operational data for controlling at least one of said transmission means, the operational data including data for setting the time gate, and data for denoting at least one telephone number for the data center, a real time timer for indicating the actual time, and means for rewriting the operational data in accordance with commands sent from the data center over the telephone link.

5,091,878

WORD PROCESSING APPARATUS

Hiroyuki Nagasawa, Nara; Jun Inoue, Shiga; Katsumori Takeda, Nara; Keizo Saito, Souraku, and Hiroko Mural, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 8, 1988, Ser. No. 268,566

Claims priority, application Japan, Nov. 9, 1987, 62-282730;

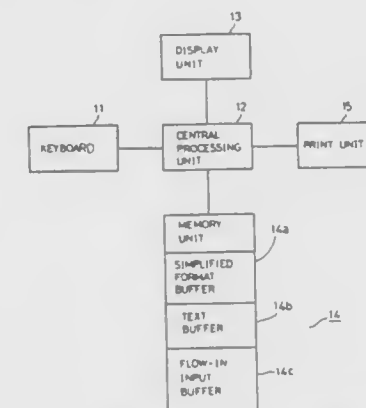
Nov. 30, 1987, 62-303790; Nov. 30, 1987, 62-303791; Nov. 30,

1987, 62-303792

Int. Cl.³ G06F 12/04, 12/12

U.S. Cl. 364—419

6 Claims



1. A word processing apparatus comprising: key input means for inputting characters; a central processing unit connected to said key input means; display means for displaying data, said display means connected to said central processing unit; first memory means for storing characters inputted from the key input means, said first memory means connected to said central processing unit; second memory means for storing a simplified format including at least one edit symbol and a series of particular symbols, said second memory means connected to said central processing unit; said central processing unit including, (a) read-out means for reading out and subsequently displaying the series of particular symbols of the simplified format stored in the second memory means on the display means, (b) retrieval means for retrieving at least one edit symbol of the simplified format stored in said second memory means, (c) replacing means for replacing at least one of the series of particular symbols with characters inputted by the key input means, and (d) edit means for editing, by using at least one edit symbol the characters provided by the replacing means and displaying an edited result on the display means; and storage means connected to the central processing unit, for storing the simplified format from the second memory means after operation of the replacing and editing means.

5,091,879

BICMOS STATIC MEMORY WITH IMPROVED PERFORMANCE STABILITY

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 310,796, Feb. 14, 1989. This application

May 9, 1990, Ser. No. 521,686

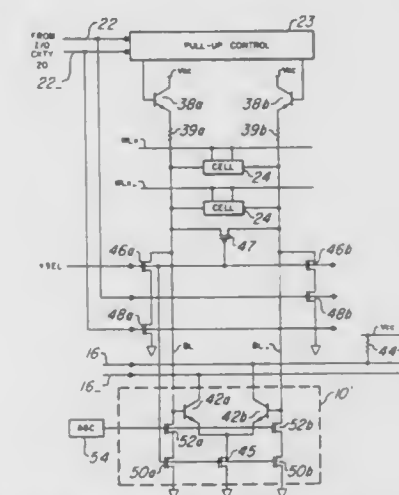
Int. Cl.³ G11C 7/00, 11/407

U.S. Cl. 365—177

9 Claims

1. A sense amplifier for connection to a bit line pair, comprising: first and second bipolar transistors having their bases con-

nected to first and second bit lines in said bit line pair, and having their emitters coupled together; a sense current source connected between said emitters of said bipolar transistors and a first reference voltage, said sense current source comprising a field effect transistor; and



first and second pull-down current sources connected between the bases said first and second bipolar transistors, respectively, and a second reference voltage, said first and second pull-down current sources each comprising a field effect transistor, said first and second field effect transistors including a common gate connection with said field effect transistor of said sense current source.

5,091,880

MEMORY DEVICE

Yasuo Isono, Fussa; Toshihito Kouchi, Tama; Akitoshi Toda, Kunitachi; Hiroshi Kajimura, Tokyo; Yoshiyuki Mimura; Hiroko Ohta, both of Hachioji, and Ryouhei Shimizu, Koshigaya, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

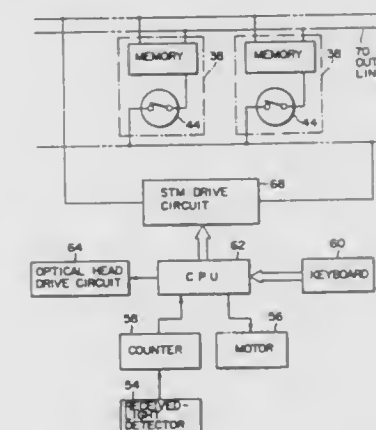
Filed Jan. 29, 1990, Ser. No. 471,841

Claims priority, application Japan, Feb. 2, 1989, 1-24554; Feb. 10, 1989, 1-32255

Int. Cl.³ G11C 7/00; G11B 11/00

U.S. Cl. 365—151

14 Claims



1. A memory device comprising: a supporting member having a plurality of memory blocks, each of the memory blocks including: a recording medium provided on the supporting member; a probe, supported in the vicinity of the recording me-

dium, for writing data on the recording medium or reading data therefrom;
 scanning means for scanning the probe across the recording medium; and
 a light-receiving element connected to the scanning means for activating the probe to perform a data write/read operation upon receiving light; and
 optical means for radiating light selectively on the light-receiving elements of said memory blocks.

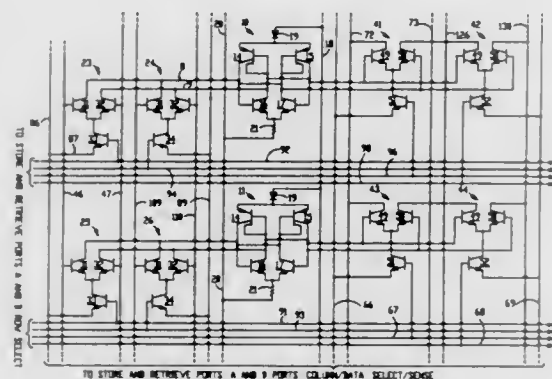
5,091,881

MULTIPLE PART MEMORY INCLUDING MERGED BIPOLAR TRANSISTORS
 James B. Hobbs, Minneapolis, Minn., assignor to Atmel Corporation, San Jose, Calif.

Filed Jun. 13, 1989, Ser. No. 365,664
 Int. Cl.⁵ G11C 11/411, 11/414

U.S. Cl. 365—155

29 Claims



1. A memory circuit having memory cells for storing information through corresponding storage ports, said memory circuit comprising:

- a first memory cell circuit having four transistors of both PNP and NPN type comprising:
- a pair of load bipolar transistors of one of said types, each having an emitter electrically connected to a first terminal means and
- a pair of control bipolar transistors of the other of said types, each having a collector electrically connected to a base of a corresponding one of said pair of load bipolar transistors and each having a base electrically connected to a collector of the corresponding one of said pair of load bipolar transistors, each control bipolar transistor having its base electrically connected to the collector of the other control bipolar transistor in said first memory cell circuit and its emitter electrically connected to a second terminal means and

a first memory cell initial storage port circuit having a row select input, a column select input, a pair of signal inputs, and a pair of signal outputs with each of said signal outputs being electrically connected to a collector of a corresponding one of said pair of control bipolar transistors in said first memory cell circuit, said first memory cell initial storage port circuit having a pair of bipolar transistors providing a pair of complementary output signals on said pair of signal outputs of the port circuit, representing a pair of complementary signals provided on said pair of signal inputs if a row select signal is present on said row select input simultaneously with a column select signal being present on said column select input.

5,091,882
NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF OPERATING THE SAME

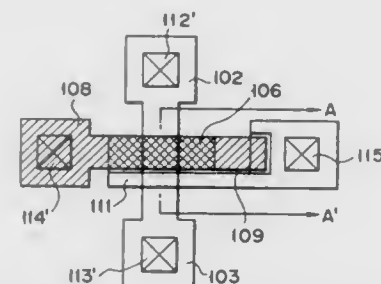
Kiyomi Naruke, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 30, 1990, Ser. No. 559,608

Claims priority, application Japan, Jul. 31, 1989, 1-196836
 Int. Cl.⁵ G11C 11/40

U.S. Cl. 365—185

11 Claims



1. A nonvolatile semiconductor memory device comprising: a semiconductor substrate of one conductivity type having source and drain regions of opposite conductivity type for defining a channel region therebetween;
- a stacked gate provided on said channel region, said stacked gate including a gate insulating film overlapping said drain region, a floating gate disposed on said gate insulating film and a control gate provided through an interlevel insulator above said floating gate,
- an erase gate provided above said channel region through an insulating film contiguous to said gate insulating film, said insulating film overlapping said source region, said erase gate being insulated from said stacked gate through a side wall insulating film, and
- an electrode provided on said source and drain regions, said control gate and said erase gate, respectively.

5,091,883

SEMICONDUCTOR MEMORY AND MICROPROCESSOR

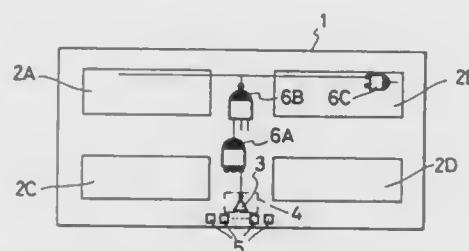
Nozomu Matsuzaki; Takashi Akioka; Masahiro Iwamura, all of Hitachi; Atushi Hiraishi, Oume; Tatsumi Yamauchi; Yuji Yokoyama, both of Hitachi; Yutaka Kobayashi, Katsuta, and Hideaki Uchida, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 13, 1990, Ser. No. 552,100

Claims priority, application Japan, Jul. 14, 1989, 1-181827
 Int. Cl.⁵ G11C 13/00

U.S. Cl. 365—189.05

9 Claims



1. A semiconductor memory including: a rectangular semiconductor chip;
- a plurality of memory cell blocks formed with a plurality of memory cells disposed in alignment within a plurality of rectangular areas on the upper surface of said semiconductor chip, which are arrayed to be disposed in alignment spaced apart from one another with passways being interposed between the adjacent areas;
- a plurality of input pads formed in the peripheral region on the upper surface of said semiconductor chip; and

at least one input buffer provided on the upper surface of said semiconductor chip, and processing an external signal which is input from one of said input pads, and the processed signal being transmitted to the memory cell in the memory cell block group including at least two said memory cell blocks directly or via a logic circuit: wherein said input buffer is provided in one of said passways, which is the closest to a line for equally dividing said memory cell block group longitudinally or laterally into two sections, said passway interposing between the adjacent memory cell blocks belonging to said memory cell block group to which the processed signal of said input buffer is transmitted.

5,091,884

SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED ADDRESS DISCRIMINATING CIRCUIT FOR DISCRIMINATING AN ADDRESS ASSIGNED DEFECTIVE MEMORY CELL REPLACED WITH REDUNDANT MEMORY CELL

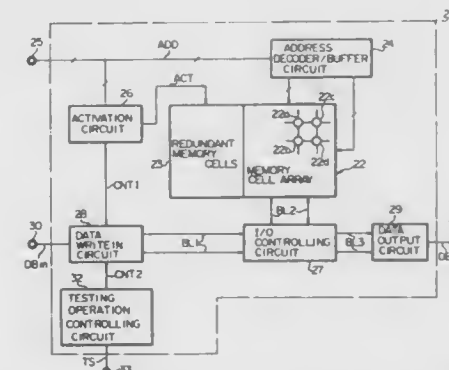
Akihiko Kagami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,509

Claims priority, application Japan, Jun. 26, 1989, 1-163520
 Int. Cl.⁵ G11C 7/00

U.S. Cl. 365—200

5 Claims



1. A semiconductor memory device having a write-in mode, a read-out mode and a testing mode of operation, comprising:
 - a) a memory cell array having a plurality of memory cells assigned to addresses, respectively;
 - b) a plurality of redundant memory cells, a defective memory cell of said memory cell array being replaced with one of said redundant memory cells, said defective memory cell having an address;
 - c) addressing means, responsive to an address signal representative of an address assigned to one of said memory cells for activating said one of said memory cells or one of said redundant memory cells for said write-in mode or said read-out mode of operation; and
 - d) data input-and-output means operative to write a write-in data bit, corresponding to an input data bit, into said one memory cell activated by said addressing means, when said one memory cell is not replaced with said one redundant memory cell, said data input-and-output means being further operative to write a predetermined data bit into said one redundant memory cell activated by said addressing means, independent of said input data bit.

5,091,885

DYNAMIC TYPE RANDOM-ACCESS MEMORY HAVING IMPROVED TIMING CHARACTERISTICS

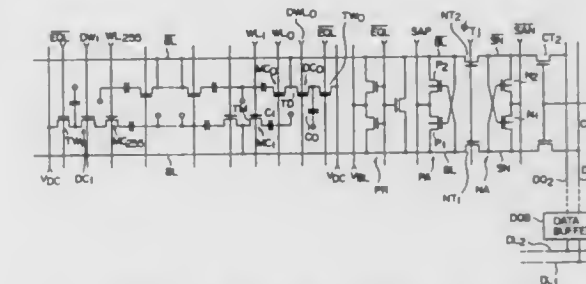
Takashi Ohsawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 15, 1990, Ser. No. 523,663

Claims priority, application Japan, May 15, 1989, 1-121204
 Int. Cl.⁵ G11C 7/00, 11/41, 11/417, 11/419

U.S. Cl. 365—203

6 Claims



1. A dynamic type random-access memory comprising: a bit line pair constituted by first and second bit lines;
- a memory cell array constituted by a plurality of memory cells connected to said bit line pair;
- a precharge circuit for precharging said bit line pair to a predetermined potential at a predetermined timing;
- a bit line sense amplifier to be enabled after data written in one of said plurality of memory cells is read out to said bit line pair; and
- a charge transfer circuit connected between said bit line pair and first and second sense nodes of said bit line sense amplifier, said dynamic type random-access memory including means for turning off said charge transfer circuit responsive to a reception of a charge transfer drive signal produced when a small potential difference is produced between bit lines of said bit line pair, and including means for decreasing an impedance responsive to a potential difference between said bit line pair and said first and second sense nodes of said bit line sense amplifier being increased when a potential difference between a control terminal and said first and second sense nodes or a potential difference between one of said bit line pair and one of said first and second sense nodes exceeds a threshold value.

5,091,886

DUAL CURRENT DATA BUS CLAMP CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE

Masahumi Miyawaki; Tamihito Ishimura, and Yoshio Ohtsuki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 28, 1991, Ser. No. 706,206

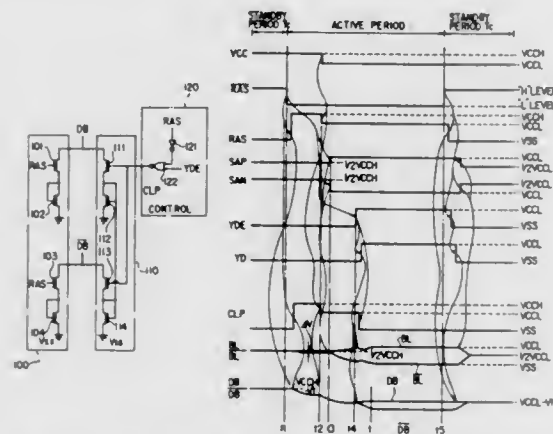
Claims priority, application Japan, May 31, 1990, 2-142664
 Int. Cl.⁵ G11C 7/00

U.S. Cl. 365—204

20 Claims

1. In a semiconductor memory device comprising a memory cell array for storing data, a row address decoder for decoding row address signals taken in by a row address strobe signal to select memory cells in a row direction of the memory cell array, a column address decoder for decoding column address signals based on a column address decoder enabling signal to select memory cells in a column direction of the memory cell array, complementary data buses for transmitting data read out from said memory cell array, a data bus pull-up circuit for pulling up said complementary data buses, a data bus clamping circuit for clamping said complementary data buses to a predetermined potential, and a differential amplification type of readout circuit for amplifying on a differential basis data on said complementary data buses to output readout data, said data bus clamping circuit comprising:

- a first discharge circuit for discharging electric charge on said complementary data buses during an active period of the row address strobe signal; and
a second discharge circuit for discharging electric charge on



said complementary data buses with a discharge ability larger than said first discharge circuit, during a period of time from the time the active period of the row address strobe signal starts until the column address decoder enabling signal becomes active.

5,091,887

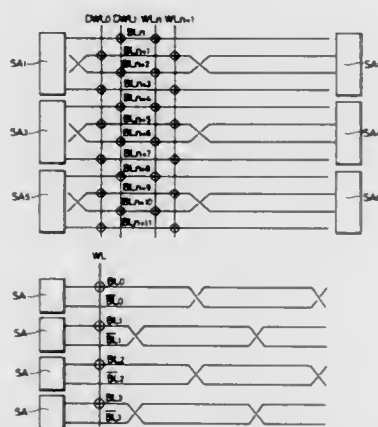
DYNAMIC SEMICONDUCTOR MEMORY DEVICE
Mikio Asakura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1990, Ser. No. 521,717

Claims priority, application Japan, May 16, 1989, 1-123129
Int. Cl.⁵ G11C 13/00

U.S. Cl. 365—206

12 Claims



1. A dynamic semiconductor memory device comprising:
a memory cell array including a plurality of word lines, a plurality of bit lines and a plurality of memory cells (MC) connected to the intersections between the word lines and the bit lines, said plurality of bit lines comprising bit line pairs each including a bit line for reading information of said memory cell and a bit line for providing a reference potential,
sense amplifiers for detecting and amplifying a potential difference between the bit lines in each bit line pair,
said plurality of bit line pairs comprising:
a first bit line pair having bit lines crossing with each other such that a capacitance is balanced between adjacent bit lines, and
a second bit line pair having bit lines arranged approximately parallel to each other, said bit lines of said second bit line pair having said first bit line pair therebetween,

said first bit line pair being arranged between the bit lines of said second bit line pair.

5,091,888

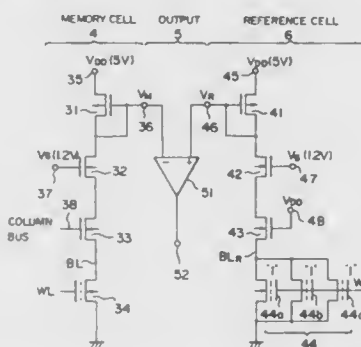
SEMICONDUCTOR MEMORY DEVICE
Takao Akaogi, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1990, Ser. No. 552,972

Claims priority, application Japan, Jul. 13, 1989, 1-183081
Int. Cl.⁵ G11C 7/00

U.S. Cl. 365—210

9 Claims



1. A semiconductor memory device, comprising:
a memory cell array including a plurality of memory cells for storing data, a plurality of word lines, and a plurality of bit lines, each of said memory cells comprising a memory cell transistor connected to a corresponding word line and a corresponding bit line;
addressing means supplied with address data for selecting one of the word lines and one of the bit lines, said addressing means including a word line driver that activates a selected word line by supplying a word line voltage to the selected word line;
said memory cell array producing an output signal indicative of the data stored in the memory cell in response to addressing by the addressing means;
a reference cell array including a plurality of reference cells for storing reference data, a reference word line, and a reference bit line, each of said reference cells comprising a reference cell transistor that is connected commonly to the reference word line and the reference bit line, said reference cell transistor being further connected in parallel to the reference cell transistors that are connected commonly to the same reference word line;
means for activating the reference word line by supplying a word line voltage thereto;
said reference cell array producing a reference output signal indicative of the reference data in response to the activation of the reference word line; and
output means supplied with the output signal from the memory cell array and the reference output signal from the reference cell array for producing a data output indicative of the data stored in the memory cell array based upon a comparison between the output signal of the memory cell array and the reference output signal of the reference cell array.

5,091,889

SEMICONDUCTOR MEMORY HAVING AN OPERATION MARGIN AGAINST A WRITE RECOVERY TIME

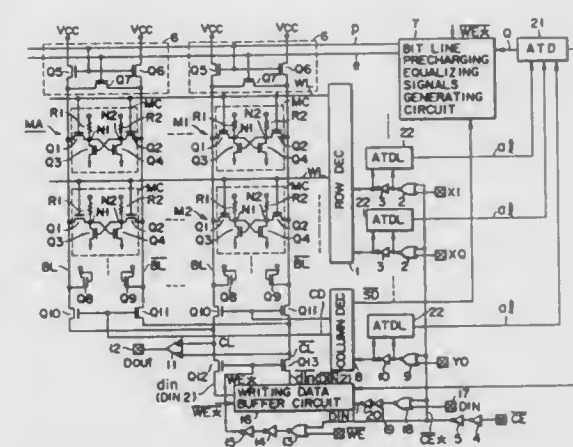
Takahiro Hamano, Yamato; Masataka Matsui, Tokyo, and Katsuhiko Sato, Yokohama, all of, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 26, 1989, Ser. No. 456,452

Claims priority, application Japan, Dec. 28, 1988, 63-333618
Int. Cl.⁵ G11C 11/34

U.S. Cl. 365—233.5

15 Claims



1. A static random access memory comprising:
an array of static memory cells arranged in rows and columns;
word lines coupled to the respective memory cells arranged relative to the rows of the memory cell array for selecting a row of the memory cell array;
paired bit lines coupled to the respective memory cells arranged relative to the columns of the memory cell array for allowing data transfer to and from the memory cell array;
paired write data lines for inputting write data to a memory cell of said array;
address input means for receiving address signals including row and column address signals;
row decoder means having input terminals coupled to the address input means and output terminals coupled to the word lines for decoding the row address signals from the address input means and for selectively driving a word line in accordance with the row address signals;
column decoder means having input terminals coupled to the address input means and output terminals coupled to the bit lines for decoding the column address signals from the address input means and for selectively driving paired bit lines in accordance with the column address signals;
address transition detecting means, coupled to said address input means, for detecting a transition of the address signals and for generating address transition data; and
bit line initializing means including a bit line precharge and equalize signals generating circuit having an input terminal connected to the address transition detecting means to receive address transition data generated from the address transition detecting means, said bit line precharge and equalize signals generating circuit respectively generating a bit line precharge signal enabled in synchronization with the address transition data and a bit line equalize signal separate from said precharge signal and enabled in synchronization with the address transition data during the read period of said static random access memory.

5,091,890

METHOD OF EXTRACTING TARGET RANGE AND DOPPLER INFORMATION FROM A DOPPLER-SPREAD SIGNAL

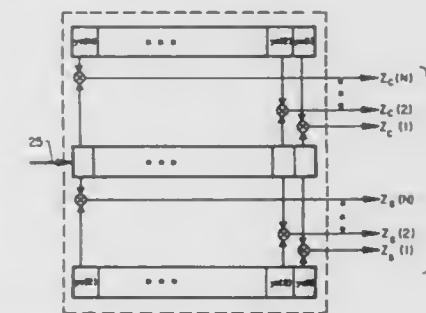
Roger F. Dwyer, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1991, Ser. No. 702,550

Int. Cl.⁵ G01S 15/00

U.S. Cl. 367—99

6 Claims



1. A method of extracting target range and Doppler information from an active sonar echo created by the target, said method being unaffected by Doppler-spreading and comprising the steps of:
transmitting a series of acoustic pulses into a medium;
receiving sonar echoes from the target associated with said transmitted series of pulses;
matching said transmitted series of pulses to said received sonar echoes to extract a transmitted frequency from said received sonar echoes to generate a complex vector function; and
filtering said complex vector function to generate a fourth-order cumulant spectrum wherein said spectrum is indicative of the target range and Doppler information, independent of Doppler-spreading.

5,091,891

SEISMIC PULSE GENERATION

Keith M. Thomas, Sutton; Michael R. Dongworth, Keston, and Alec Melvin, Maldenhead, all of England, assignors to British Gas plc, London, England

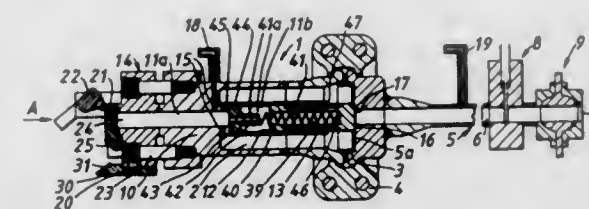
Filed Apr. 23, 1990, Ser. No. 511,277

Claims priority, application United Kingdom, Apr. 21, 1989, 8909068

Int. Cl.⁵ G01V 1/137

U.S. Cl. 367—144

35 Claims



1. A seismic pulse generator comprising: a generator body having an internal gas-pressurizable first chamber adjoining a second chamber for containing a fluid; a flap valve member pivotable about a hinge means connected to the generator body from a closed position wherein the valve member closes an opening associated with the first chamber to an open position wherein the openings are uncovered; latch means mounted on the generator body and pivotally movable about a pivot means to and from a position wherein the latch means releasably retains the flap valve member in said closed position; and a gas operated piston which is slidably movable within an associated cylinder and which, when the first chamber is pressurized and the flap valve member is released from its closed

position to uncover the opening, moves from a position wherein the piston blocks communication between the chambers to a position wherein the piston allows communication between the chambers and allows generation of a shock wave in the second chamber; said second chamber including means for permitting a pulse of energy to be transmitted from the second chamber in response to the shock wave generated in the second chamber.

5,091,892

EXPANDABLE SONAR ARRAY STRUCTURE

Stanley Secretan, Leona Valley, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

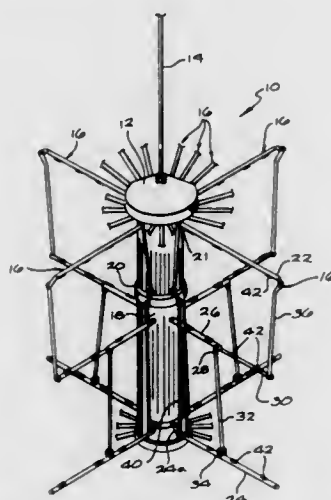
Continuation of Ser. No. 494,241, May 13, 1983, abandoned.

This application Apr. 19, 1991, Ser. No. 689,710

Int. Cl.⁵ H04R 17/00

U.S. Cl. 367—153

16 Claims



1. An expandable sonar array structure constructed to be successively lowered into and raised out of a body of water at the end of a suspension and signal-conducting cable, said structure comprising

- a body member attached to said cable,
- a drive member attached to said body member,
- powered drive means connected to drive said drive member parallel to the axis of said body member,
- a plurality of essentially identical hydrophone support members pivotally connected to said body and to said drive means, each said hydrophone support member being a combination parallelogram and modified parallelogram linkage arrangement whereby after said hydrophone support members are lowered into the water they are extendable radially from said body,
- said hydrophone support members being constructed and arranged such that when said array is extended each said support member includes a first arm pivotally attached to said body and pivot means attached at an outboard end of said first arm and displaced slightly out of the plane of said arm, and a second arm attached to said pivot means and extending parallel to said first arm,
- a stand-off support attached to said body and axially displaced a substantial distance from the pivotal attachment of said first arm and an outwardly extending elongated arm having a pivotal attachment to said stand-off support, a short length of said elongated arm extending inboard of said pivotal attachment at said stand-off support and bent away from the axis of said first elongated arm,
- a second stand-off support attached to said body and axially displaced a substantial distance from said first-named pivotal attachment in the opposite direction from said first-named stand-off support and a second outwardly extending elongated arm having a pivotal attachment to said second stand-off support at its inboard end and ori-

ented essentially parallel with said first arm and said first elongated arm, a short length of said second elongated arm adjacent said second stand-off support being bent away from the axis of said second elongated arm,

- a first pushrod attached to said drive member and pivotally attached to an inboard end of said first elongated arm,
- a second pushrod attached to said drive member and pivotally attached outwardly of an inboard end of the pivotal attachment of said second elongated arm to said second stand-off support,

a link pivotally attached to said first-named pivot means at one end and pivotally attached to said second elongated arm at a distance along said second elongated arm slightly greater than the outboard displacement of said pivot means,

- a second link connected between outboard ends of said second arm and said first elongated arm, and
- a plurality of hydrophones spaced along each of said first and second arms, said first elongated arm, and said second elongated arm with said hydrophones being positioned along substantially vertical lines,

whereby operation of said powered drive means while said array is open causes said drive member to move upwardly, resulting in translation of said first and second pushrods upwardly to cause said second elongated arm to rotate its outboard end upwardly around its inboard pivotal attachment to a vertical position while carrying said first link and said first arm to substantially parallel vertical positions against said body and causing said first elongated arm to rotate around its pivotal attachment with its outboard end moving downwardly, causing said second link to move downwardly and rotate around its pivotal attachment with said first elongated arm, carrying said second link and said second arm to substantially parallel vertical positions against said body, thereby folding said array into its closed position, and operation of said powered drive means while said array is closed resulting in reverse operation to extend said array.

5,091,893

ULTRASONIC ARRAY WITH A HIGH DENSITY OF ELECTRICAL CONNECTIONS

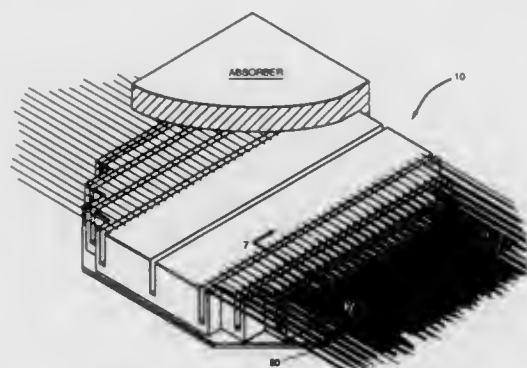
Lowell S. Smith; Charles W. Eichelberger, both of Schenectady; Robert J. Wojnarowski, Ballston Lake; William P. Kornrumpf, Albany, and Joseph E. Piel, Jr., Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1990, Ser. No. 504,750

Int. Cl.⁵ H04R 17/00

U.S. Cl. 367—153

26 Claims



1. An ultrasonic transducer comprising:

- a plurality of ultrasonic transducer elements arranged in an array of parallel rows and parallel columns, said columns being disposed at an angle to said rows;
- each of said elements including a signal electrode and a ground electrode;
- each of said elements having associated therewith a layer of

dielectric material and a signal conductor, said associated signal conductor being disposed on said associated layer of dielectric material and being ohmically connected to said signal electrode of its associated element; the portions of said signal conductors which are disposed over said array being disposed parallel to said columns; each of the signal conductors associated with an element of a column being disposed over said column; and at the edge of said array, two signal conductors which are disposed over a column being spaced apart by a ground conductor.

5,091,894

SUSPENSION DEVICE FOR ACOUSTIC BASE

François Warnan, Rambouillet, France, assignor to Thomson-CSF, Puteaux, France

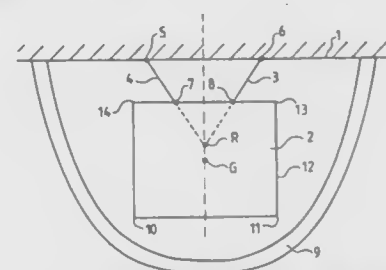
Filed Mar. 12, 1991, Ser. No. 668,173

Claims priority, application France, Mar. 23, 1990, 90 03747

Int. Cl.⁵ G01V 1/38

U.S. Cl. 367—173

1 Claim



1. A device for suspending an acoustic base enclosed in a protective dome beneath a ship hull, comprising:

- first and second connecting rods, each of said first and second connecting rods being rotatably connected on one side to different positions beneath said hull through first and second hinge means and being rotatably connected on the other side to different positions on said acoustic base through third and fourth hinge means, each of said first and second connecting rods being inclined from said hull to said acoustic base such that longitudinal axes of each of said connecting rods extend and intersect at a point R located above a center of gravity of the acoustic base;
- wherein said first and second connecting rods connected to said hull and said acoustic base form a triangular system which permits a lateral and rotational movement of said acoustic base about said point R such that during the movement of said acoustic base, a facing surface of said acoustic base closest to said protective dome is substantially parallel to a surface of said dome facing the facing surface of said acoustic base.

5,091,895

TIMING APPARATUS

Ian M. Chatwin, South Caulfield, and Allan R. Hines, Mulgrave, both of Australia, assignors to Dorian Industries Pty. Ltd., Australia

PCT No. PCT/AU89/00338, § 371 Date Feb. 8, 1991, § 102(e) Date Feb. 8, 1991, PCT Pub. No. WO90/01752, PCT Pub. Date Feb. 22, 1990

PCT Filed Aug. 8, 1989, Ser. No. 654,652

Claims priority, application Australia, Aug. 12, 1988, PI9807

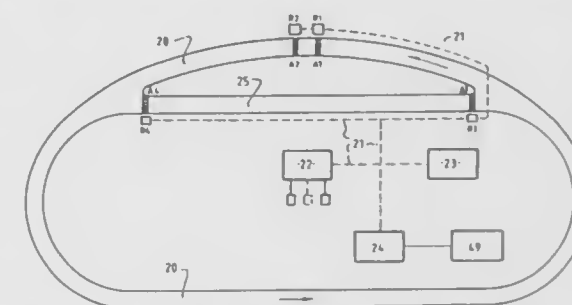
Int. Cl.⁵ G04F 8/00; G04B 47/00

U.S. Cl. 368—6

11 Claims

1. An electronic timing apparatus for determining the time at which specific vehicles (81, 82) pass over a timing line (A1-A4): said apparatus including an electronic transmitter (28) for attachment to each vehicle to be monitored, each transmitter being adapted, in use, to emit a unique identifying signal, characterized in that, a series of separate loop antennas (26) are arranged in closely adjacent relationship one to another across the width of a road or track (20) at said timing line

to receive a signal from a said transmitter passing thereover, each loop being disposed in a substantially horizontal plane, the width (x) of each loop in a direction across said road or track, relative to the width of the vehicles to be monitored,



being such that only one said transmitter can pass over a particular loop at the one time whereby the respective signals of a plurality of transmitters passing over said line simultaneously are received in different said loops.

5,091,896

METHOD AND APPARATUS FOR MAGNETO-OPTICAL RECORDING USING A DEMAGNETIZATION FIELD AND ERASING USING EXTERNAL MAGNETIC FIELD

Shinji Takayama, Mitaka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

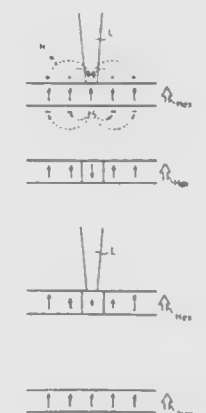
Filed Oct. 9, 1990, Ser. No. 594,514

Claims priority, application Japan, Oct. 13, 1989, 1-265308

Int. Cl.⁵ G11B 13/04, 11/12

U.S. Cl. 369—13

16 Claims



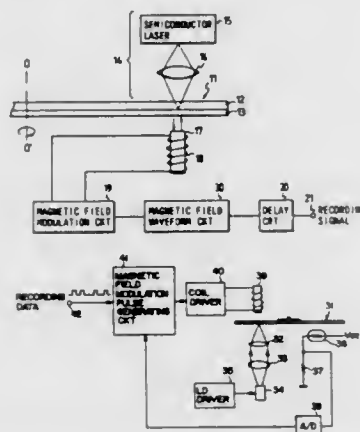
1. A method for overwriteable magneto-optical recording comprising the steps of:

- using a recording medium made of a rare-earth-transition-metal (RE-TM) amorphous recording medium having high magnetization saturation and coercive force reduced to a level at which the direction of magnetization of a heated region becomes parallel to the direction of a demagnetization field from the medium when the region is heated to a temperature less than a Curie temperature of the medium but greater than a compensation temperature of the medium;
- directing an external magnetic field having a first direction at the medium, the external magnetic field being weaker than the demagnetization field when the medium is heated to a temperature less than the Curie temperature and greater than the compensation temperature;
- using a laser emission means to radiate a first data modulated laser beam of power sufficient to heat a first region of the medium to said temperature less than the Curie temperature and greater than the compensation temperature, such that the first region has a magnetization aligned in the

direction of the demagnetization field and opposite to that of the external magnetic field; using said laser emission means to radiate a second data modulated laser beam of power sufficient to heat said first region of the medium to a temperature greater than the Curie temperature such that said first region has a magnetization aligned in the direction of the external magnetic field and opposite to that of the demagnetization field; and moving the medium relative to the first and second laser beams.

5,091,897
MAGNETO-OPTICAL RECORDING APPARATUS HAVING MEANS FOR DELAYING AN INPUT SIGNAL FOR PREVENTING BIT SHIFT
Mitsuhiko Otokawa; Shunpei Kimura, and Yasuyuki Miyaoka, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 490,430, Mar. 8, 1990, abandoned. This application Mar. 18, 1991, Ser. No. 670,530
Claims priority, application Japan, Mar. 9, 1989, 1-055206; Mar. 9, 1989, 1-055207; Mar. 10, 1989, 1-056246; Jul. 11, 1989, 1-177147

Int. Cl.⁵ G11B 13/04, 11/12
U.S. Cl. 369—13

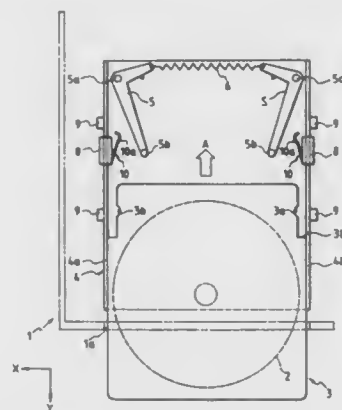


1. An apparatus for recording an input signal on a magneto-optical recording medium, comprising:
means for applying a light beam to said medium;
means for delaying said input signal by a time for preventing a bit recorded on said medium from shifting relative to said input signal;
means for applying a magnetic field modulated in conformity with said delayed signal to that portion of said medium to which the light beam is applied; and
means for moving said medium relative to the light beam.

5,091,898
PLAYBACK/RECORDING APPARATUS HAVING A DEVICE FOR POSITIVELY PREVENTING ENTIRE CARTRIDGE FROM SPRINGING OUT OF SLOT
Akira Bessho, and Youichi Konno, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 14, 1988, Ser. No. 206,463
Claims priority, application Japan, Aug. 6, 1987, 62-120647[U]

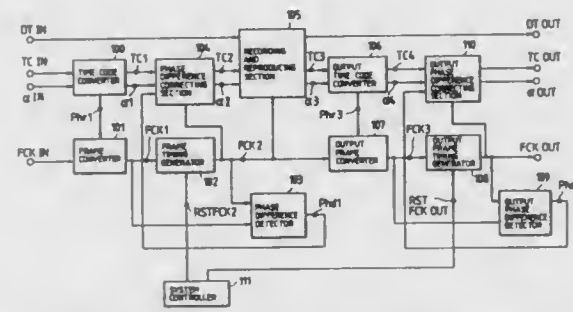
Int. Cl.⁵ G11B 25/04, 17/04, 5/012
U.S. Cl. 369—77.2
1. In a playback/recording apparatus for a disk supported within a cartridge, the apparatus comprising a playback/recording mechanism for playback/recording the disk, a casing for housing the playback/recording mechanism, the casing having a slot formed therein for inserting the cartridge in an insertion direction therethrough, means for supporting

the inserted cartridge, an urging means provided on the supporting means for urging the cartridge in a discharge direction toward the slot, resilient means slidably mounted for substantially linear movement on said supporting means, said resilient means including engagement portions for engaging the cartridge and thereby allowing said cartridge to reciprocate in the



insertion and discharge directions, and stoppers provided on said supporting means for limiting reciprocation of said resilient means in the discharge direction, whereby said resilient means and said stoppers prevent the urging means from discharging the cartridge completely out of said supporting means.

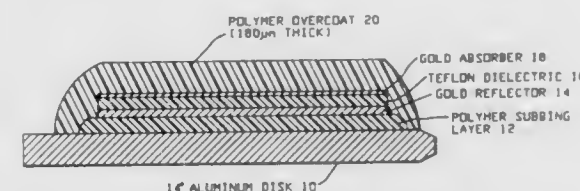
5,091,899
TIME CODE RECORDING OR REPRODUCING APPARATUS AND TIME CODE CONVERTER
Tatsuya Adachi; Kiyotaka Nagai; Yasushi Nakajima, all of Osaka; Takafumi Ueno, Nara; Naoki Ejima, and Masataka Nikaide, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
PCT No. PCT/JP89/00112, § 371 Date Sep. 11, 1989, § 102(e) Date Sep. 11, 1989, PCT Pub. No. WO89/07316, PCT Pub. Date Oct. 8, 1989
PCT Filed Feb. 3, 1989, Ser. No. 415,222
Claims priority, application Japan, Feb. 4, 1988, 63-24229; Mar. 14, 1988, 63-59695; Oct. 3, 1988, 63-249208
Int. Cl.⁵ G11B 27/00, 27/02; H04N 5/78
U.S. Cl. 369—83



1. A time code recording and reproducing apparatus comprising time code converting means for converting a first time code into a second time code, the first time code corresponding to a given timing within a frame of input information divided into frames, the second time code having a frame period different from a frame period of the input information; recording means for recording the input information; recording frame timing generating means for determining a frame phase of the recording means; phase difference detecting means for detecting a phase difference between a frame of the second time code and a recording frame; phase difference correcting means for outputting a third time code which is obtained by correcting

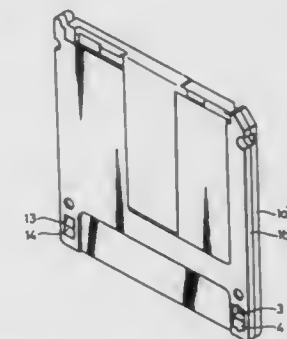
the second time code on the basis of the phase difference; the recording means recording the third time code; and reproducing means for reproducing the recorded input information and the third time code.

5,091,900
MULTI-LAYER OPTICAL MEDIA FOR AN OPTICAL RECORDING AND REPRODUCING SYSTEM IN WHICH NON-ABLATIVE DATA RECORDING IS PROVIDED IN A MANNER SUCH THAT HIGH SENSITIVITY IS ACHIEVED WITH AN IN-CONTACT OVERCOAT
Edward V. LaBude, Newbury Park, Calif., assignor to Unisys Corp., Detroit, Mich.
Continuation-in-part of Ser. No. 319,407, Nov. 9, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,426
Int. Cl.⁵ G11B 7/00, 7/24
U.S. Cl. 369—100



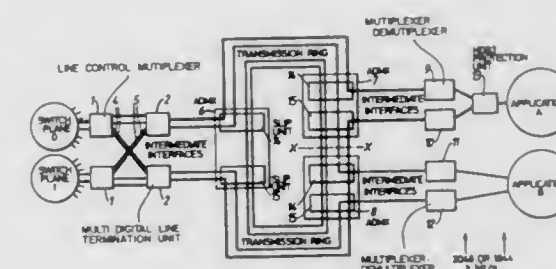
1. An optical medium for use in a high density digital data optical recording system employing a writing laser beam of predetermined wavelength for writing data on said medium, said medium comprising a plurality of layers including a reflective layer, a dielectric spacer layer overlying said reflective layer, an absorber layer overlying said spacer layer, and a hard in-contact overcoat layer overlying said absorber layer, the thicknesses and optical characteristics of said layers being chosen so that essentially a minimum reflectance condition is provided for said medium at said wavelength, said absorber layer being provided as a discontinuous gold island film comprised of microscopic irregular shaped polyhedra, and wherein optically detectable holes representative of high density digital data are provided in said medium, each hole being provided during relative movement between said laser beam and said medium as a result of a non-ablative hole forming mechanism which is initiatable in response to said writing beam being applied to said hole via said in-contact overcoat layer, the thickness of said film being such as to essentially eliminate radial conductivity as a thermal loss mechanism during formation of said hole, and said hole forming mechanism being such that a threshold temperature is reached in response to said beam which causes polyhedra in said hole to form spherical particles which migrate and agglomerate with each other so as to produce a microscopic debris configuration for said hole comprised of spaced agglomerated particles which are large enough to cause said hole to exhibit a relatively large optically detectable increase in reflection from said minimum reflectance condition yet small enough to prevent scattering and degradation of signal-to-noise ratio, said threshold temperature being well below the bulk melting temperature of gold and also being such that the distances over which said migration occurs is less than 500 Angstroms so that migration is not significantly impeded by said in-contact overcoat.

5,091,901
DISC CARTRIDGE WITH DUAL IDENTIFICATION ELEMENTS
Hiroshi Yamamoto, and Shizuo Arai, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 19, 1990, Ser. No. 495,635
Claims priority, application Japan, Apr. 6, 1989, 1-087726
Int. Cl.⁵ G11B 7/26, 15/04, 23/02
U.S. Cl. 369—291



1. A disc cartridge comprising:
(a) a cartridge body accommodating therein a disc-shaped record medium selected from different kinds of disc-shaped record media that can be recorded on and/or reproduced from in that accommodated condition;
(b) first identifying means provided in said cartridge body so that it can be switched between different identifying positions from outside said cartridge body; and
(c) second identifying means provided in said cartridge body and arranged therein so as not to be readily switched by a user between different identifying positions from outside said cartridge body, wherein information about the disc accommodated in said disc cartridge is indicated by said first and second identifying means.

5,091,902
TELECOMMUNICATIONS TRANSMISSION SECURITY ARRANGEMENT
Geoffrey Chopping, Dorset, and Jonathan W. Rowe, Nottingham, both of England, assignors to GEC Plessey Telecommunications Limited, Coventry, England
Continuation of Ser. No. 336,159, Apr. 11, 1989, abandoned.
This application May 24, 1990, Ser. No. 529,686
Claims priority, application United Kingdom, Aug. 16, 1988, 8819470
Int. Cl.⁵ H04J 3/14; H04Q 3/00
U.S. Cl. 370—16.1



1. A telecommunications transmission security arrangement connected to a dual path ring transmission system wherein transmission in one path occurs in a direction opposite to transmission in the other path comprising first and second transmission paths, each path having first and second serially connected circuit means, said first circuit means of said first path being arranged to be connectable to said second circuit means of said second path, and said first circuit means of said

second path being arranged to be connectable to said second circuit means of said first path, each second circuit means is arranged to constantly monitor alarm conditions of the transmission paths and based upon an alarm condition monitored by said second circuit means, the second circuit means are arranged to select a transmission path by way of the first circuit means of the first path and the second circuit means of the second path when the first path is determined not suitable for transmission by the second circuit means, and to set up a transmission path by way of the first circuit means of the second path and the second circuit means of the first path when the second path is determined not suitable for transmission, by the second circuit means, because of a monitored alarm condition, and wherein connection to the ring system is made by way of two add/drop multiplexers, a first of which is arranged to transfer traffic to and from an upper transmission rate synchronous stream and the second of which is arranged to transfer traffic to and from a lower transmission rate synchronous stream, each add/drop multiplexer including a switching arrangement which transfers a number of tributaries from the ring system in a defined order.

5,091,903

SWITCHING NETWORK AND SWITCHING-NETWORK MODULE FOR AN ATM SYSTEM

Karl Schrodi, Helmsheim, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

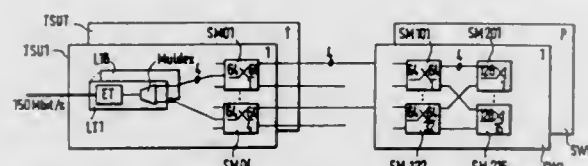
Filed Aug. 9, 1990, Ser. No. 566,158

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1989, 3926301; Jun. 29, 1990, 4020775

Int. Cl.⁵ H04Q 11/04

U.S. Cl. 370—58.1

6 Claims



1. Switching network for information transmitted synchronously as sequences of cells, said network comprising a plurality of interchangeable switching modules each further comprising a multi-stage switching arrangement including at least two first stage switching elements and at least two last stage switching elements, wherein each switching element further comprises

two or more element inputs for receiving individual ones of said cells,

two or more element outputs for transmitting said individual cells,

means for transferring a cell received at any said element input of said each switching element to any said element output of said each switching element, and

a common memory for buffering a cell so received at said any element input until it is so transferred to said any element output,

each said element input of each first stage switching-element is connected to a respective module input of the element's associated switching module,

each said element output of each last stage switching element is connected to a respective module output of the element's associated switching module,

during the passage of each cell through successive stages of the switching network,

the element outputs to which said each cell is initially successively transferred as the cell traverses a first portion of the switching network are selected independently of a predetermined destination of said each cell, and

the element outputs to which the cell is finally successively transferred as the cell traverses a last portion of the

switching network are selected in accordance with said predetermined destination,

at least one path is possible from any module input of said each switching module to any module output of said each switching-network module, and

if the number of said successive stages of said multi-stage switching arrangement were to be reduced for said each switching-network module, no path would be possible through said multi-stage switching arrangement from at least one module input of switching-network module to at least one module output of the same switching-network module.

5,091,904

GENERAL SIGNALING SERVICE UNIT OF ELECTRONIC SWITCHING SYSTEM

Je I. Back; Deok H. Kim; Hyun H. Hong; Mun G. Kyong; Ju Y. Park; Hyeon H. Lee; Young K. Lee, and Hang G. Park, all of Chungnam, Rep. of Korea, assignors to Korea Electronics and Telecommunications, Rep. of Korea

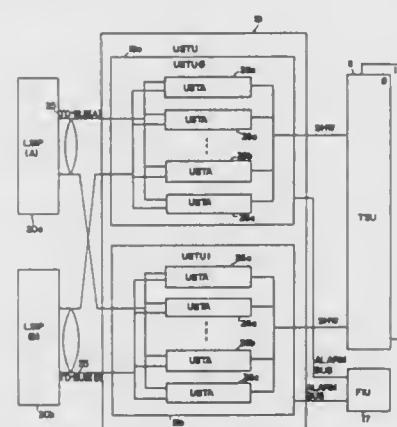
Continuation of Ser. No. 280,341, Dec. 6, 1988, abandoned. This application Jan. 24, 1990, Ser. No. 469,231

Claims priority, application Rep. of Korea, Dec. 11, 1987, 87-14187

Int. Cl.⁵ H04J 3/12

U.S. Cl. 370—58.1

9 Claims



1. In a time-division electronic switching system including a time switch unit TSU comprising a double switch network, a time switch processor TSP for controlling said TSU, an analog subscriber interface unit ASIU for connecting a subscriber, an analog subscriber interface processor ASIP for controlling said ASIU, a digital trunk interface unit DTIU for connecting a relay line between telephone exchanges, a digital trunk interface processor DTIP for controlling said DTIU, a fault interface unit FIU for collecting and processing errors for maintenance and repair within a telephone exchange, a fault interface processor FIP for controlling said FIU, a universal signaling transceiver unit USTU for executing various signal service functions required to process calling, a local service interface processor LSIP for controlling said USTU, and an accessing switching processor ASP for controlling and managing all of said processors through an inter-processor control bus IPCB to control various functions within the electronic switching system,

a universal signaling service unit characterized in that:

control of said LSIP is directly received through a telephony device-bus TD-bus composed of 1 byte units serially transmitted at a transmitting speed of 2.5 Mbps (mega bits per second), and pulse code modulation PCM signal data of a corresponding signal is transmitted and received by said TSU through a subhighway SHW interface;

a fault state generated in a case when a function fails at said USTU is forwarded to said FIU through an alarm bus;

a service function for requiring a real time process, such as a

function for generating a signal service function with respect to an R2 MFC multi-frequency compelled signal, a DTMF dual tone multi-frequency signal, a continuity checking tone, an audible signal tone and a sending to said TSU, in order to generalize circuit packs consisting of said USTU to one kind, and a function for detecting a signal received from said TSU, is made common whereby one universal signaling transceiver assembly USTA is designed;

a circuit is constituted such that an interface with said TD-bus and a pulse code modulation PCM signal SHW can be executed for receiving control from said LSIP and for executing, transmitting and receiving of a signal associated with said TSU within said USTA, and service of a transmitting and receiving function with respect to the R2 MFC signal, the DTMF signal, the continuity checking tone and the audible signal tone can be executed in a single universal signaling transceiver assembly;

a signal service function in said USTA is divided in response to a feature of a signal, providing a form of service and executing a process of service by a signal service type, into a signal tone transmitting and receiving mode service group for providing the R2 MFC signal, the DTMF signal and the continuity checking tone requiring transmitting and receiving of a signal, and an audible signal tone transmitting service group for providing an audible signal tone requiring only a transmitting function of a signal, whereby a standby mode service group performs a standby function when spare circuit packs have been packaged so that continuous provision of a signal service is provided;

said USTU is associated with a structure comprising respective signaling transceiver assemblies conforming to a function mode of three groups according to said USTA included with function mode service groups of three groups being used;

said USTU is divided into two units USTU 0 and USTU 1 for extension of signal service capacity and improvement in reliability whereby respective divided units connect a doubled TSU and a separate pulse code modulation PCM signal SHW, and executes a service function by receiving a control from an exclusive service interface processor among two service interface processors and by being connected with two service interface processors and said TD-bus;

said respective divided units are internally organized by signaling transceiver assemblies having functions respectively designated for the signal tone transmitting and receiving mode service group, the audible signal tone transmitting mode service group and the standby mode service group by receiving control from the exclusive service interface processor in normal operation time;

said USTA designated to the signal tone transmitting and receiving mode service group is organized by a structure so that an entire signal service capacity is divided to both sides of the respected divided units whereby a load is dispersed;

said USTA designated to the audible signal tone transmitting mode service group is singly organized to the respective divided units by doubling for directly transferring a response of a switching system to a subscriber by utilizing a signal tone; and

USTA designated to standby mode service group is organized by N+1 redundancy structure to respective USTU 0 and USTU 1 where N is the required number of USTAs in each said USTU which are performing signal service functions and 1 is the number of said USTAs for standby function.

HIGH-SPEED PACKET SWITCHING USING A SPACE DIVISION OPTICAL SWITCH

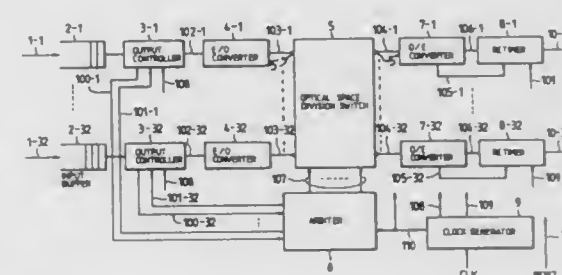
Eiichi Amada, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 323,970, Mar. 15, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 616,811

Claims priority, application Japan, Mar. 18, 1988, 63-63242 Int. Cl.³ H04Q 11/04; H04J 3/26

U.S. Cl. 370—60

55 Claims



32. A packet switching apparatus, comprising:

a plurality of input ports;

a plurality of output ports;

a plurality of input buffer means, respectively connected for receiving fixed length packets from said plurality of input ports and each storing a plurality of fixed length packets on a first-in/first-out basis;

a plurality of output controllers, respectively receiving packets from said input buffers, and having outputs;

cross point type optical space division switch means having a plurality of switch inputs respectively connected to the outputs of said output controllers and a plurality of switch outputs corresponding in number to said plurality of output ports, and for selectively providing optical connection between any one of said switch inputs and said switch outputs;

arbitrator means responsive to header information of all of the packets at a corresponding location in each of said input buffer means for determining priority of packets addressed to a common one of the output ports and for controlling said optical space division switch means for setting up a plurality of optical paths between a plurality of switch inputs and a corresponding plurality of switch outputs.

5,091,906

QUASI-DUPLEX RADIO SYSTEM USING BI-DIRECTIONAL HOLE EXTENSION

John D. Reed, Arlington; Walter J. Rozanski, Jr., Hurst, and Charles N. Lynk, Jr., Bedford, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1989, Ser. No. 452,929

Int. Cl.³ H04J 3/24; H04B 3/20; H04L 5/16

U.S. Cl. 370—94.1

24 Claims

1. In a radio-frequency communication system, a method for interrupting a radio transmission, comprising the steps of:

(a) receiving an information signal with a first communication unit;

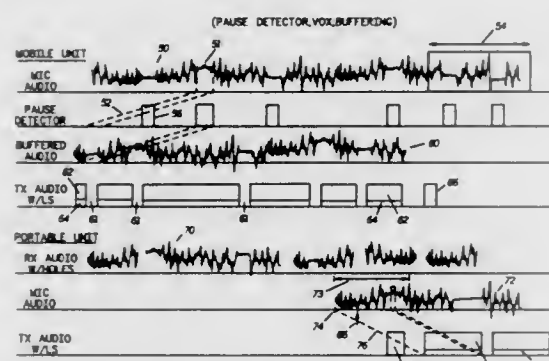
(b) transmitting a first signal, having a plurality of periodically-occurring holes of a predetermined duration, with the first communication unit, the first signal comprising an audio information portion, representing the information signal, and at least one information packet, specifying when at least one of the plurality of periodically-occurring holes will occur in the first signal;

(c) receiving the first signal with a second communication unit;

(d) transmitting an interruption request signal with the second communication unit at a time when at least one of the plurality of periodically-occurring holes is occurring in

the first signal, as specified by at least one information packet that is received with the second communication unit;

- (e) detecting at least a portion of the interruption request signal with the first communication unit to determine whether the detected portion complies with a first set of predetermined criteria; and



- (f) interrupting the transmission of the first communication unit, with the first communication unit, responsive to step (e), so that the second communication unit may begin transmitting information to be received by at least the first communication unit.

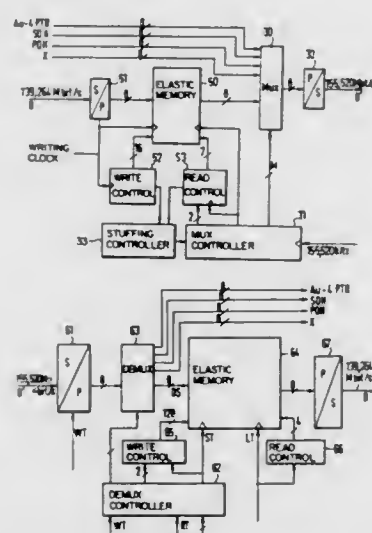
5,091,907 MULTIPLEXER AND DEMULTIPLEXER, PARTICULARLY FOR INFORMATION TRANSMISSION NETWORKS WITH A SYNCHRONOUS HIERARCHY OF THE DIGITAL SIGNALS

Heinz Wettengel, Ditzingen, Fed. Rep. of Germany, assignor to Alcatel N.V., Netherlands

Filed Oct. 12, 1990, Ser. No. 596,866
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934248

Int. Cl.⁵ H04J 3/06
U.S. Cl. 370—102

9 Claims



1. A multiplexer, for combining a digital signal and digital additional information into a time-division multiplex signal of the type having a pulse frame structured from successive n-bit words and containing in at least one word position a stuffing word which contains stuffing bits of undefined state in at least its last bit position and bits of the digital signal in the other bit positions, comprising:

means for forming the pulse frame by combining the successive n-bit words, word by word;
means for forming the stuffing word by replacing at least one bit of the digital signal at the end of a word with a stuffing bit; and
means for repeating the replaced bits of the digital signal at the beginning of a next adjacent word.

3. A demultiplexer, for separating a time-division multiplex signal composed of a digital signal, digital additional information, and stuffing bits, the pulse frame of the time-division multiplex signal structured from successive n-bit words and containing in at least one word position a stuffing word which contains a stuffing bit in at least its last bit position and bits of the digital signal in the other bit positions, said demultiplexer comprising:

a demultiplexing circuit which separates the time-division multiplex signal word by word, in accordance with the structure of the pulse frame, into n-bit words containing no bits of the digital signal and into n-bit words containing bits of the digital signal;

an elastic memory into which the n-bit words containing bits of the digital signal, including the stuffing words, are written word by word, such that memory cells occupied with stuffing bits during write-in of a stuffing word are overwritten during write-in of the next word; and
means for recovering the digital signal by reading out the bits stored in the elastic memory.

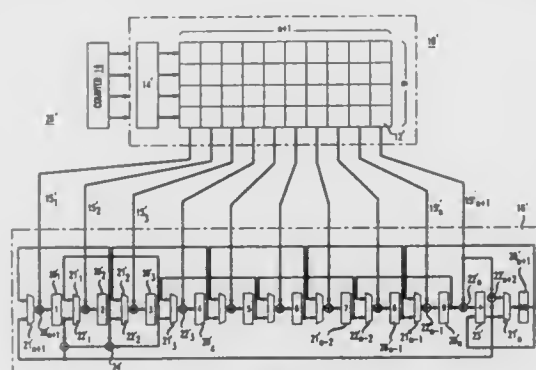
5,091,908 BUILT-IN SELF-TEST TECHNIQUE FOR READ-ONLY MEMORIES

Yervant Zorian, Princeton, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 6, 1990, Ser. No. 475,524
Int. Cl.⁵ G11C 29/00

U.S. Cl. 371—21.5

7 Claims



1. A method for self-testing a read-only memory (ROM) configured of an m row by n+1 column array of single-bit storage cells, where m and n are integers, the n+1th column containing a set of predetermined bits, comprising the steps of:
performing a first polynomial division on the m×n+1 bits stored in the ROM by inputting the n+1 bits in each successive row of the ROM to a bidirectional multiple input shift register (MISR) initialized with a predetermined seed and shifting said n+1 bits in each successive ROM row through the MISR in a first direction;
performing a second polynomial division on the first n bits in each of the m rows of the ROM by inputting n bits in each successive row of the ROM into the MISR and shifting said n bits through the MISR in a second opposite direc-

tion, such that at the completion of the second polynomial division, a residue remains in the MISR;
simultaneously generating a quotient bit in the MISR as each of the first n bits in each successive row of the ROM are shifted in the second direction through the MISR;
logically combining each successive one of the quotient bits generated by the MISR with a separate one of the predetermined bits stored in the n+1th column of the ROM;
detecting if a bit of a preselected state results when each separate bit in the n+1th column of the ROM is logically combined with each separate quotient bit generated by the MISR, and if so, then indicating an error in the ROM; and
examining the residue remaining in the MISR after the second polynomial division to detect the presence of an error in the ROM.

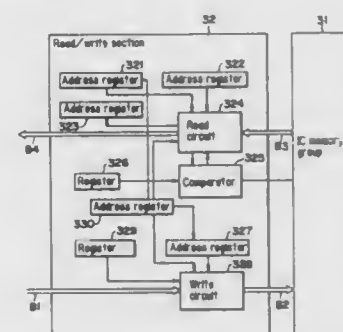
5,091,909 METHOD FOR WRITING/READING OF DATA IN MAGNETIC DISK SUBSYSTEM

Shigeru Kishiro; Tomohito Ogino; Yoshiaki Muto; Katsunori Nakamura, and Yoshiro Shiroyanagi, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of Japan

Filed Dec. 22, 1988, Ser. No. 288,150
Claims priority, application Japan, Dec. 26, 1987, 62-328339
Int. Cl.⁵ G06F 12/08

U.S. Cl. 371—40.1

18 Claims



1. A method for reading data contained in an IC memory group of a magnetic disk subsystem, the IC memory group storing a plurality of records including an object record, each said record being composed of a count area of fixed length, a key area of variable length, and a data area of variable length, wherein a data string of a special format containing an error detectable by ECC is provided before the count area of each record, comprising the steps of:

reading a data string from the IC memory group;
judging by ECC check whether the read data string contains an error;
if the read data string is judged to contain an error, judging whether the read data string is identical to the special-format data string; and
if the read data string is identical to the special-format data string, adding a previously-determined address to the address at which the read data string is stored to establish the beginning address of the count area of the object record.

5,091,910 INFORMATION PROCESSING DEVICE

Keiichi Ochi, Minoo, Japan, assignor to Ricoh Company, Ltd., Japan

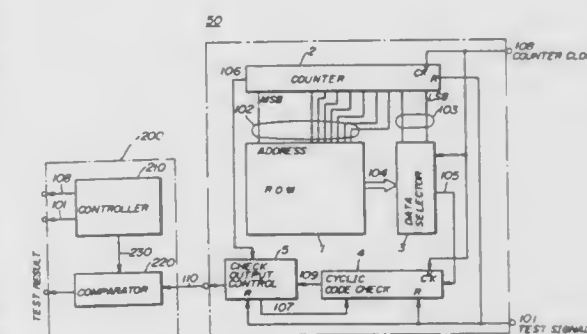
Filed Jan. 12, 1990, Ser. No. 464,387
Claims priority, application Japan, Jan. 24, 1989, 1-14551
Int. Cl.⁵ G06F 11/10

U.S. Cl. 371—40.1

12 Claims

1. An information processing device comprising:
a memory storing parallel program data;

address generating means for generating a first address supplied to said memory and a second address;
first conversion means for converting said parallel program data read out from said memory in accordance with said first address into serial program data when said second address generated by said address generating means is applied to said first conversion means; and



second conversion means for converting said serial program data into a cyclic code signal and outputting said cyclic code signal to an external device in which said cyclic code signal is compared with a reference cyclic signal formed on the basis of correct program data corresponding to said program data stored in said memory.

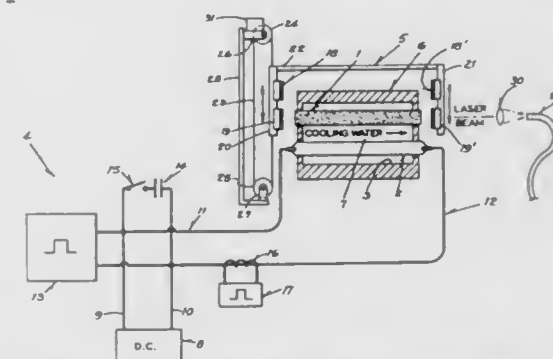
5,091,911 LONG WAVELENGTH NDYAG LASER

John Tulip, Edmonton, Canada, assignor to Carl Zeiss Stiftung, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 933,103, Nov. 20, 1986, Pat. No. 5,048,034. This application Apr. 26, 1991, Ser. No. 691,695

U.S. Cl. 372—4

2 Claims



1. A long wavelength neodymium laser, comprising:
a housing including a reflective hollow optical cavity;
a laser rod mounted in said optical cavity, said laser rod composed of a crystalline or glass host structure having neodymium doping;
a pump lamp mounted in said optical cavity adjacent to said laser rod, said pump lamp providing a source of light for transfer to said laser rod;
drive means including circuit means for driving said pump lamp to produce intermittent pulses of light from said pump lamp;
wavelength selective resonator means for providing maximum reflection at 1.4 to 1.5 μ m wavelength and minimum reflection at other wavelengths to allow laser oscillation in the range 1.4 to 1.5 μ m; and
the laser rod having a neodymium concentration level of between about 0.3 and 0.7N.

5,091,912

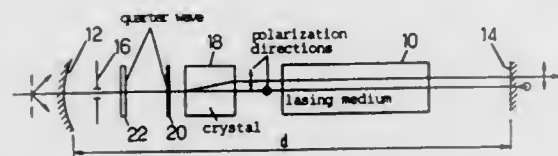
LASER HAVING TWO MODES AT DIFFERENT FREQUENCIES

Fabien Bretenaker, Paris, and Albert Le Floch, Rennes Cedex, both of France, assignors to Societe D'Applications Generales D'Electricite et De Mecanique Sagem, Paris Cedex, France
Filed Feb. 12, 1991, Ser. No. 653,636

Claims priority, application France, Feb. 13, 1990, 90 01687
Int. Cl.⁵ H01S 3/10

U.S. Cl. 372—23

9 Claims



1. Laser for delivery of two waves having different frequencies and mutually orthogonal linear polarization directions, comprising:

- a laser resonating cavity defined by two mirrors;
- a laser medium located in only a portion of said laser resonating cavity for being traversed by light reflected between said two mirrors;
- birefringent means located outside said portion and traversed by said light for separating said light into two waves having parallel paths when said light is in a first direction and recombining the light from said two paths into a common path when said light is in an opposite direction, said portion being so located with respect to said birefringent means that the light is separated in two parallel paths throughout said portion; and
- two quarter-wave plates located for being traversed by said light along said two paths, one of said quarter wave plates having neutral lines at approximately 45° from the polarization axes of the birefringent means, whereby the two waves are helically polarized between the two quarter-wave plates.

5,091,913

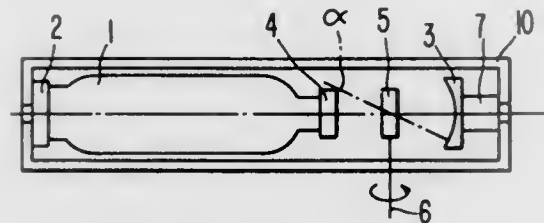
QUARTZ CRYSTAL TUNING HE-NE DOUBLE FREQUENCY LASER

Shulian Zhang, Sen Yang, Minxian Wu, and Kuofam Jin, all of Beijing, China, assignors to Tsinghua University, Beijing, China

Filed Apr. 10, 1990, Ser. No. 507,150
Int. Cl.⁵ H01S 3/106

U.S. Cl. 372—23

10 Claims



1. A He-Ne dual frequency laser for generating relatively large frequency differences in the dual frequencies having, in combination, a longitudinally extending laser housing containing a longitudinally extending He-Ne laser gas discharge tube; a plane reflecting mirror disposed at one end of the housing; a concave reflecting mirror disposed near the other end of the housing such that a laser oscillation cavity is defined along the longitudinal axis of the housing between the plane and concave reflecting mirrors; a birefringent quartz crystal plate interposed along said axis in advance of the concave reflecting mirror provided with means for adjusting the same to dispose

the crystalline axis thereof at an acute angle off the said longitudinal axis; and means for outputting from the housing the resulting dual frequency laser beam, and in which the said adjusting means is varied to vary the said frequency difference of the dual frequencies from the order of about tens of MHz to in excess of 1000 MHz.

5,091,914

HIGH-FREQUENCY DISCHARGE PUMPING LASER DEVICE

Michinori Maeda, and Akira Egawa, both of Yamanashi, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP90/00054, § 371 Date Sep. 4, 1990, § 102(e)
Date Sep. 4, 1990, PCT Pub. No. WO90/08415, PCT Pub. Date Jul. 26, 1990

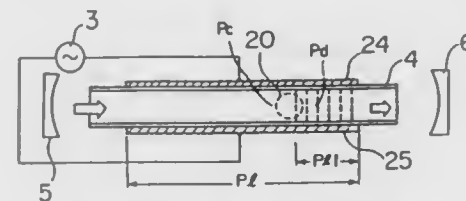
PCT Filed Jan. 17, 1990, Ser. No. 571,647

Claims priority, application Japan, Jan. 23, 1989, 1-13560

Int. Cl.⁵ H01S 3/03

U.S. Cl. 372—61

6 Claims



1. A high-frequency discharge pumping laser device in which a high-frequency voltage is applied to a discharge tube to cause laser oscillation and which comprises:

- light measuring means for measuring light discharged from said discharge tube, said discharge tube having a dischargeable area P1 and an actual discharging area P11, said light measuring means being disposed adjacent to said discharge tube at a position of the P1, said position defined by a ratio of P11 and P1, where the laser output is zero, wherein the measured discharge light is used as a feedback signal to control an output of a laser power supply, to thereby stably control the discharging operation when the laser output is zero.

5,091,915

SEMICONDUCTOR LASER EXCITED SOLID LASER DEVICE

Kenji Tatsumi, and Yoshihito Hirano, both of Kanagawa, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

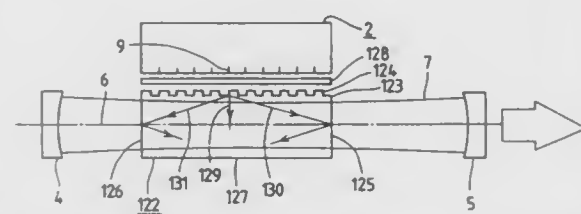
Filed Nov. 27, 1990, Ser. No. 618,427

Claims priority, application Japan, Dec. 25, 1989, 1-335585;
Apr. 2, 1990, 2-88052; Sep. 26, 1990, 2-256322

Int. Cl.⁵ H01S 3/094

U.S. Cl. 372—75

10 Claims



1. A semiconductor laser excited solid laser device comprising:

- a solid laser medium in which an excitation region is formed;
- semiconductor laser array means arranged longitudinally along a side face of said solid laser medium, for applying pumping light to said solid laser medium;
- lens means disposed between said solid laser medium and

said semiconductor laser array means, for converting a divergent laser beam from said semiconductor laser array means into a substantially non-divergent parallel light beam;

a resonator for forming a laser resonator mode in said solid laser medium; and

diffraction grating means for diffracting said parallel light beam of said semiconductor lasers in a direction of formation of said laser resonator mode.

5,091,916

DISTRIBUTED REFLECTOR LASER HAVING IMPROVED SIDE MODE SUPPRESSION

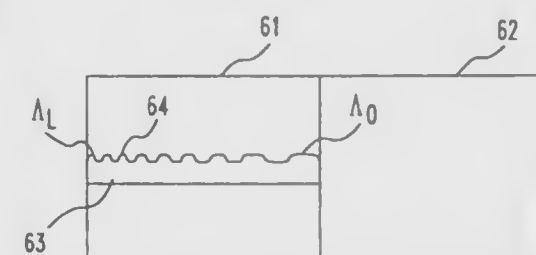
Leonard J. Cimini, Jr., Howell, and Isam M. I. Habbab, Old Bridge, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 28, 1990, Ser. No. 590,201

Int. Cl.⁵ H01S 3/098, 3/19

U.S. Cl. 372—96

12 Claims



1. A laser comprising an active part having a guided gain region having first and second ends, and an external region having an external waveguide and a diffraction grating optically coupled to the external waveguide, the external region optically coupled to the first end of the guided gain region, and a resonant optical cavity formed between the diffraction grating and the second end of the guided gain region, wherein the improvement comprises the diffraction grating having a plurality of corrugations with a period which varies nonlinearly from Λ_0 at one end of the grating to Λ_L at an opposite end of the grating so that the diffraction grating exhibits an asymmetric reflection characteristic with respect to wavelength, where Λ_0 is greater than Λ_L .

5,091,917

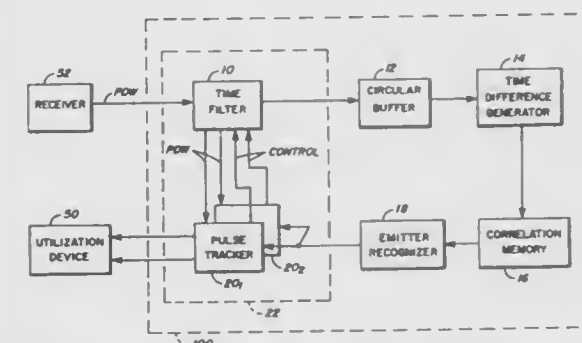
METHOD AND APPARATUS FOR PULSE SORTING
Richard L. Udd, and James C. Robertson, both of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 12, 1990, Ser. No. 507,820

Int. Cl.⁵ H04B 17/00

U.S. Cl. 375—10

12 Claims



8. A method for associating received pulses with one of a plurality of emitters producing pulses at periodic intervals, comprising the steps of:

- a) computing for each of a plurality of received pulses, the

difference in arrival times between the pulse and a predetermined number of previously received pulses;

(b) searching the computed differences for a first difference which is one half of a second computed difference; and

(c) associating pulses received at said first difference with said one of the plurality of emitters.

5,091,918

EQUALIZERS

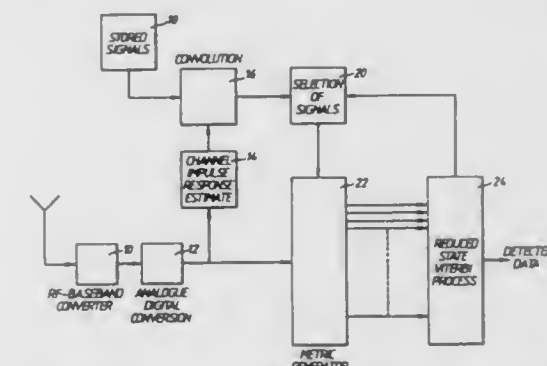
Stephen W. Wales, Southampton, England, assignor to Plessey Overseas Limited, Ilford, England
Continuation of Ser. No. 318,314, Mar. 3, 1989, abandoned. This application Sep. 18, 1990, Ser. No. 583,984

Claims priority, application United Kingdom, Mar. 5, 1988, 8805305

Int. Cl.⁵ H03H 2/40; H09B 15/02

U.S. Cl. 375—11

5 Claims



1. An equalizer for a radio signal receiver, said equalizer comprising:

- a converter for producing, from a received radio signal, digital samples at baseband, the received radio signal being in packet form and including a header having a predetermined bit sequence;
- means for providing an estimate of channel distortion by comparing the received predetermined bit sequence with a stored version of the predetermined bit sequence in the receiver;
- a signal set store in which signal sets are stored;
- means for applying the estimate of channel distortion to the stored signal sets to modulate the stored signal sets in accordance with the estimate;
- means for selecting modulated ones of the stored signal sets;
- metric generating means receiving said selected modulated stored signal sets and digital samples of said received radio signal for generating metrics of the selected stored modulated signal sets and the digital samples; and a processor for processing the generated metrics in accordance with a Viterbi algorithm to determined the most probable value of each digital sample of the received radio signal.

5,091,919

TRANSMITTER ARRANGEMENT FOR DIGITALLY MODULATED SIGNALS

Erkki Kuusma, Salo, Finland, assignor to Nokia-Mobira Oy, Salo, Finland

Filed Feb. 8, 1989, Ser. No. 308,245

Int. Cl.⁵ H04L 25/03

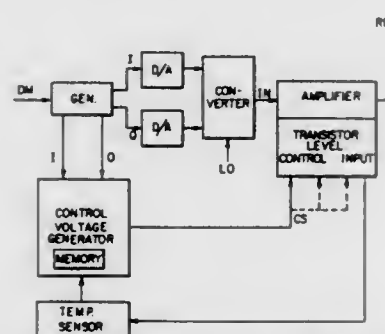
U.S. Cl. 375—60

9 Claims

1. A transmitter arrangement for non-constant envelope, digitally modulated signals, comprising:

- a non-linear output amplifier having inputs for receiving an input signal and a control signal, respectively, and an output for delivering an output signal responsive to said input and control signals;
- a control voltage generator having an input for receiving the

input signal and having stored predetermined information concerning non-linearity of the output amplifier, said control voltage generator providing the control signals to the non-linear output amplifier, the control signals being



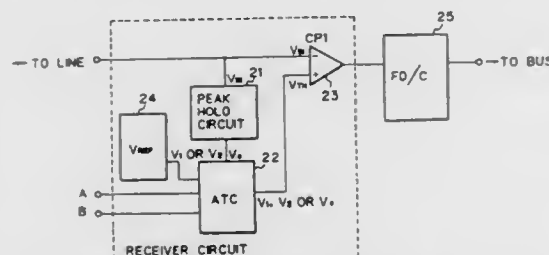
based upon the value of said input signal and the predetermined information, such that the control signal renders the output signal of said output amplifier substantially linear in relation to the input signal over a range of operation.

5,091,920

THRESHOLD VALVE CONTROL SYSTEM IN A RECEIVER CIRCUIT

Koji Ikeda, Kawasaki, and Hideki Shuto, Chikushi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 31, 1990, Ser. No. 607,033

Claims priority, application Japan, Nov. 10, 1989, 1-291066
Int. Cl.⁵ H04L 25/06; H03K 5/153
U.S. Cl. 375-76 18 Claims



1. A threshold value control system for discriminating an input signal received by a receiver circuit connected to terminals in a connection pattern, comprising:

- mode setting means for determining a mode setting signal based on the connection pattern by which the receiver circuit is connected to one of the terminals;
- variable threshold generating means for generating a variable threshold value dependent on the level of the input signal;
- constant threshold generating means for generating at least one constant threshold value by which the level of the input signal can be discriminated even when the level of the input signal cannot be distinguished by said variable threshold value;
- threshold comparing means, operatively connected to said variable threshold generating means and said constant threshold generating means, for comparing the variable threshold value and said at least one constant threshold value to output a comparison result;
- switching means, operatively connected to said variable threshold generating means, said constant threshold generating means, said mode setting means and said threshold comparing means, for passing only one of said variable threshold value and said at least one constant threshold value to output a discriminating threshold value based on the mode setting signal determined by said mode setting means and the comparison result output from said thresh-

old comparing means, the discriminating threshold value output of said switching means being sufficient to discriminate a digital level of the input signal; and
comparing means, operatively connected to receive input signal and the discriminating threshold, for comparing the input signal and the discriminating threshold value to output a discrimination result.

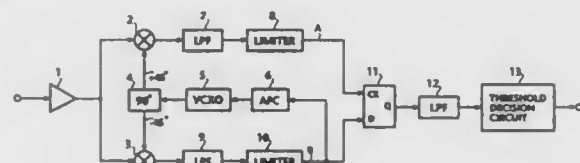
5,091,921

DIRECT CONVERSION RECEIVER WITH DITHERING LOCAL CARRIER FREQUENCY FOR DETECTING TRANSMITTED CARRIER FREQUENCY

Yoichiro Minami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,696

Claims priority, application Japan, Apr. 20, 1989, 1-100617; May 18, 1989, 1-57855[U]; Oct. 25, 1989, 1-277711
Int. Cl.⁵ H04L 27/14 26 Claims



1. A receiver for receiving a digitally modulated radio frequency signal at a transmitted carrier frequency, which has a frequency deviation, comprising:

- a first voltage-controlled oscillator for generating a first local carrier;
- a mixer circuit for mixing the received signal with said first local carrier for converting the frequency of the received radio signal to a baseband frequency;
- a low-pass filter for filtering a baseband signal from said mixer circuit;
- a limiting amplifier connected to an output of said low-pass filter;
- a frequency detector coupled to an output of said limiting amplifier for generating a signal representative of a variation frequency of the received radio signal, said variation frequency equaling the deviation frequency of the transmitted carrier frequency minus an offset between the transmitted and first local carrier frequencies;
- an average circuit for averaging the signal from the frequency detector to produce a signal representative of the deviation frequency of the received radio signal;
- a comparator circuit for detecting whether the signal from the frequency detector lies in or outside of the neighborhood of a frequency represented by the signal from the average circuit; and
- a ramp generator for periodically generating a ramp voltage of constant amplitude when the signal from the frequency detector is detected as lying outside of said neighborhood and holding said ramp voltage at an instantaneous value when said signal is detected as lying in said neighborhood, said first voltage-controlled oscillator being responsive to an output voltage of said ramp generator to control the frequency of said first local carrier.

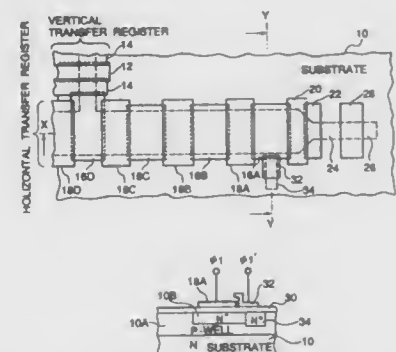
5,091,922

CHARGE TRANSFER DEVICE TYPE SOLID STATE IMAGE SENSOR HAVING CONSTANT SATURATION LEVEL

Kazuo Uehira, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 30, 1989, Ser. No. 373,397

Claims priority, application Japan, Jun. 30, 1988, 63-164313
Int. Cl.⁵ H01L 29/78; G11C 19/28; H04N 3/14
U.S. Cl. 377-58 4 Claims



1. A charge transfer device type solid state image sensor having a constant saturation level, the charge transfer device type solid state image sensor including an array of photo-electric converting elements formed on a semiconductor substrate, a shift register formed on said semiconductor substrate, and means for controlling transfer of photo-electric conversion electric charge signals from said photo-electric converting elements to said shift register, said shift register operating to serially transfer the received electric charge signals to a signal output circuit, said shift register comprising a plurality of transfer electrodes formed on the substrate, a control electrode formed on the substrate adjacent to a last transfer electrode of said plurality of transfer electrodes adjacent to the signal output circuit, and a drain diffusion region formed in the substrate adjacent to the control electrode, so that when a predetermined potential having a same phase with the predetermined potential applied to the last transfer electrode is applied to the control electrode, a portion of electric charge which should be accumulated under the last transfer electrode adjacent to the signal output circuit is discharged to the drain diffusion region, whereby the electric charge signal will not exceed a saturation level determined by the predetermined potential applied to the control electrode.

5,091,923

Patent Not Issued For This Number

5,091,924

APPARATUS FOR THE TRANSILLUMINATION OF ARTICLES WITH A FAN-SHAPED RADIATION BEAM

Rainer Bermbach, Mainz-Laubenheim; Gerhard Doenges, Heidenrod-Kemel; Georg Geus, and Cornelius Koch, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Heilmann GmbH, Fed. Rep. of Germany

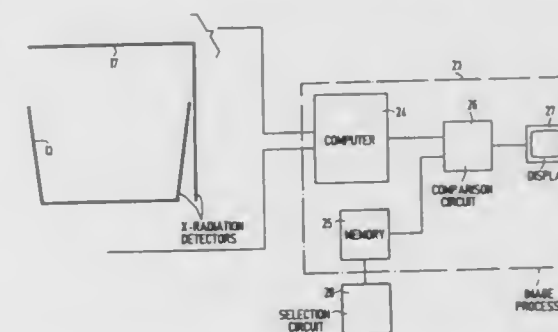
Filed Aug. 9, 1990, Ser. No. 564,602

Claims priority, application European Pat. Off., Aug. 9, 1989, 89114761.3
Int. Cl.⁵ G01N 23/04 4 Claims

1. An apparatus for inspecting item-containing articles for identifying the presence of items contained within the articles, said apparatus comprising:

means for generating a fan-shaped radiation beam directed at an item-containing article to be inspected;

means for detecting radiation from said fan-shaped radiation beam after penetrating said item-containing article and for converting the detected radiation into electrical signals; calculation means for calculating and generating an actual image of the item-containing article being inspected from the electrical signals of said means for detecting radiation; memory means for storing electrical signals comprising a



reference image of said item-containing article being inspected; means for comparing said electrical signals comprising said reference image of said item-containing article with the electrical signals forming said actual image, said comparison means forming a differential image including items which are not present in said reference image; and means for displaying said differential image.

5,091,925

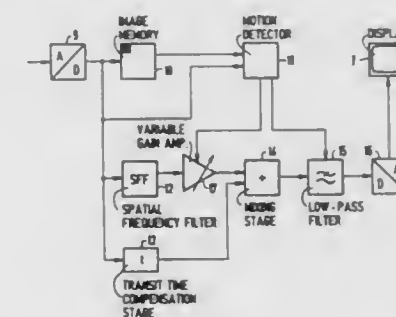
X-RAY DIAGNOSTICS INSTALLATION WITH SPATIAL FREQUENCY FILTERING

Joerg Haendle, and Paul Marhoff, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 605,111

Claims priority, application European Pat. Off., Jan. 18, 1990, 90101023.1
Int. Cl.⁵ H05G 1/64 6 Claims

U.S. Cl. 378-99



1. An x-ray diagnostics installation comprising: an x-ray tube which generates an x-ray beam for penetrating an examination subject disposed in the x-ray beam; means for detecting an image consisting of x-rays attenuated by the examination subject; and video image processing means for converting said x-ray image into video signals forming a video image, said video image processing means including means for spatial frequency high-pass filtering and means for detecting motion in said video image, said means for detecting motion generating a signal dependent on the degree of motion and being connected to said means for spatial frequency high-pass filtering for varying the high-pass filter effect so that said high-pass filter effect is greater for video images having little motion than for video images having greater motion.

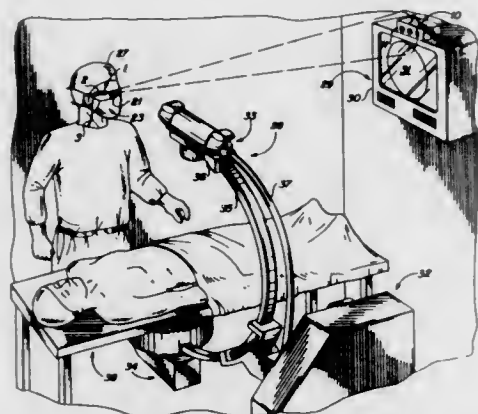
5,091,926

HEAD ACTIVATED FLUOROSCOPIC CONTROL

Jerry L. Horton, Rt. 2 Box 20460, Benton, La. 71006, and Claude H. Baines, 8308 Creekdale St., Shreveport, La. 71107
Continuation of Ser. No. 498,634, Mar. 26, 1990, Pat. No. 4,975,937. This application Nov. 21, 1990, Ser. No. 616,999
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.⁵ H05G 1/56

U.S. Cl. 378—114

22 Claims



1. A head activated fluoroscopic control for visually operating fluoroscopic x-ray equipment characterized by an x-ray tube and collimation element, an image intensification element and a monitor, said head operated fluoroscopic control comprising a transmitter adapted for removable attachment to a headpiece worn by an operator for emitting a continuous cone-shaped beam of infrared radiation substantially along the line of sight of the operator and a receiver spaced from said transmitter, said receiver electrically connected to the fluoroscopic x-ray equipment for receiving said continuous, cone-shaped beam of infrared radiation whereby said fluoroscopic x-ray equipment is operated when the monitor is in said line of sight of the operator and said continuous beam of electromagnetic radiation is received by said receiver.

5,091,927

X-RAY TUBE

Rolf Golitzer, Ammersbek, and Lothar Weil, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1990, Ser. No. 618,350

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1989, 8914064

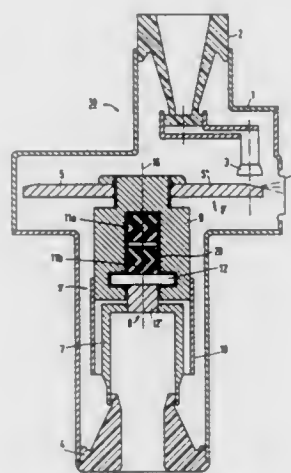
Int. Cl.⁵ H01J 35/10

U.S. Cl. 378—130

11 Claims

1. An X-ray tube construction comprising: an anode member having a cylindrical cavity; and cooling means in the cavity comprising: a first tube dimensioned to be located in the cavity and having an outer face spaced from the cavity wall; and cooling medium guide means secured to the tube outer face for causing cooling medium to flow around the tube in the space between said outer face and cavity wall; said cavity having a longitudinal axis, the cooling medium guide means comprising a plurality of discs which extend

transversely said longitudinal axis, each disc having an opening for the passage of the cooling medium, the open-



ings of neighboring discs being approximately 180° offset with respect to one another relative to said axis.

5,091,928

LEAD AND LEAD OXIDE SCREENS FOR USE WITH X-RAY FILMS

Theodore D. Robinette, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 24, 1989, Ser. No. 398,104

Int. Cl.⁵ G03B 42/04

U.S. Cl. 378—185

7 Claims



1. A flexible lead or lead oxide absorbing screen for an x-ray photographic element consisting essentially of in order:

- a flexible polymeric film support;
- an adhesive layer applied on said film support;
- a flexible layer of lead or lead oxide dispersed in a binder;
- an overcoat layer

wherein said flexible layer of (c) contacts said overcoat layer of (d).

5,091,929

INTEGRATED X-RAY TUBE AND POWER SUPPLY

John K. Grady, XRE Corporation, 300 Foster St., Littleton, Mass. 01460

Continuation of Ser. No. 390,272, Aug. 7, 1989, abandoned. This application Oct. 2, 1990, Ser. No. 591,959

Int. Cl.⁵ H05G 1/08

U.S. Cl. 378—197

21 Claims

1. X-ray apparatus comprising: a base, a hollow arm mounted on the base, an X-ray tube supported by the arm, and a high voltage supply for the X-ray tube; wherein the X-ray tube has a rotating anode generating substantial heat and is mounted within the hollow arm; the high voltage supply for the tube is also mounted within the hollow arm and includes a direct electrical connection to the tube within the arm; and the X-ray tube has a metal envelope including an external

5,091,931

FACSIMILE-TO-SPEECH SYSTEM

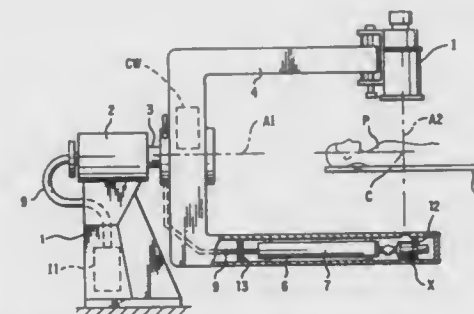
Allen E. Milewski, Red Bank, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 27, 1989, Ser. No. 427,410

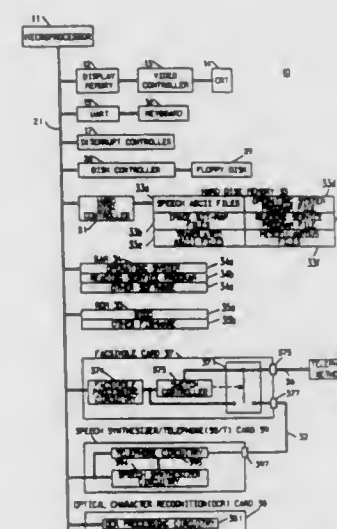
Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—100

23 Claims



heat from the rotating anode as well as connect it electrically to ground and position it within the hollow arm.



13. A computer-based system for providing a service for reading of written text, said system comprising first circuit means for receiving from a caller said written text via a facsimile machine over a telephone network, second circuit means responsive to the received written text facsimile for scanning said text utilizing an optical character recognition technique, and third circuit means for reading to said caller in a synthesized voice the content of the scanned written text over said telephone network.

5,091,932

CIRCUIT SWITCHING SYSTEM

Yukio Tsuda, Musashino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 137,573, Dec. 24, 1987, abandoned.

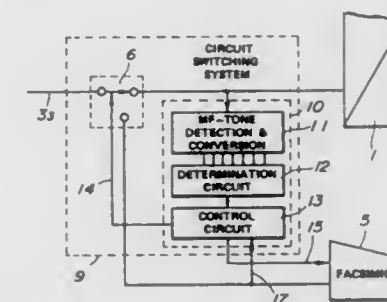
This application Jan. 19, 1990, Ser. No. 472,450

Claims priority, application Japan, Dec. 26, 1986, 61-314786

Int. Cl.⁵ H04M 11/00

U.S. Cl. 379—100

6 Claims



1. A circuit switching system comprising: an exchange for accommodating a plurality of extension telephone sets, the exchange being connected to a plurality of circuits; circuit switching means provided in one of the plurality of circuits; a facsimile connectable to the plurality of extension telephone sets via the circuit switching means, the facsimile

5,091,930

ENHANCEMENT OF A PERSONAL EMERGENCY RESPONSE SYSTEM

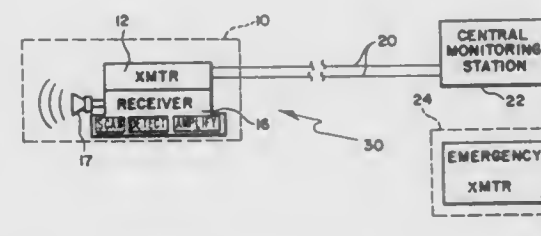
L. Dennis Shapiro, Chestnut Hill, Mass., assignor to Lifeline Systems, Inc., Watertown, Mass.

Continuation of Ser. No. 308,551, Feb. 8, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 622,361

Int. Cl.⁵ H04M 11/04

U.S. Cl. 379—39

14 Claims



1. A personal emergency response system which includes at least one subscriber station coupled via a telephonic communication link to a central monitoring station, comprising:

dedicated emergency communication means for radio frequency transmission of information signals over at least one predetermined frequency;

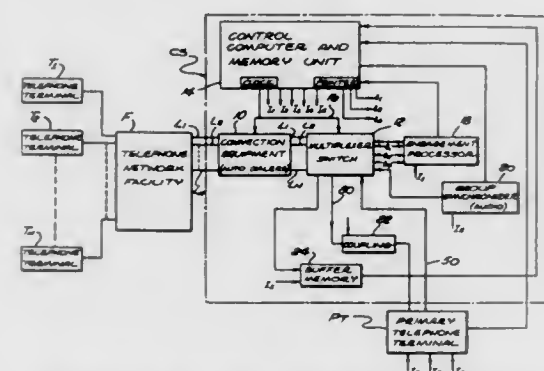
subscriber unit means disposed within the at least one subscriber station and normally operative in response to a predetermined condition for transmitting messages over the telephonic communication link to the central monitoring station;

emergency transceiver means having a receiver and a transmitter and normally operative as a radio receiver but not as a transmitter;

means coupled to the emergency transceiver means for monitoring the at least one predetermined frequency for information signals transmitted thereon and operative in response for reception of the information signals for broadcasting the information signals within the at least one subscriber station via the radio receiver and for transmitting a signal back to the dedicated emergency communications means via the transmitter.

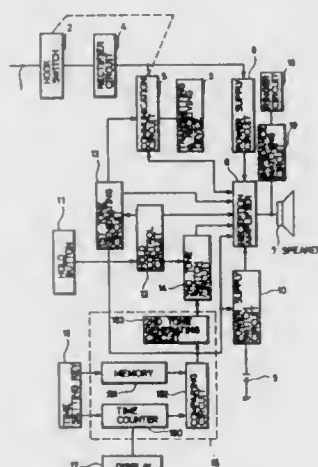
being commonly used by the plurality of extension telephone sets;
means for outputting a facsimile switching signal to the one of the plurality of circuits through a key operation of one of the plurality of extension telephone sets;
means for detecting the facsimile switching signal and outputting a detection output signal, the facsimile switching signal detecting means being connected to the one of the plurality of circuits; and
control means for driving the circuit switching means in response to the detection output signal of the facsimile switching signal detecting means to connect the one of the plurality of circuits to the facsimile.

5,091,933
MULTIPLE PARTY TELEPHONE CONTROL SYSTEM
Ronald A. Katz, Los Angeles, Calif., assignor to First Data Resources, Inc., Omaha, Nebr.
Continuation of Ser. No. 470,468, Jan. 26, 1990, Pat. No. 4,987,590, which is a continuation of Ser. No. 371,188, Jun. 26, 1989, Pat. No. 4,939,773. This application Jan. 17, 1991, Ser. No. 642,602
The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.
Int. Cl.⁵ H04M 3/56, 11/06
U.S. Cl. 379—204



1. A multiple-party control system for use with a telephone facility to interface a primary terminal with a multiplicity of remote terminals through said telephone facility, said system comprising:—
preliminary structure to provide vocal information to callers at connected terminals;
gang holding structure for collectively communicating with persons at said connected terminals collectively as a group;
a memory for down loading terminal numbers;
automatic dialing means for selectively connecting with said terminals; and
switch means for actuating said automatic dialing means to receive down loaded terminal numbers to establish terminal connections, initially coupling individual connected terminals to said preliminary structure during an engagement phase of operation, subsequently connecting said connected terminals to said gang holding structure during a pending phase of operation and thereafter connecting said gang holding structure to said primary terminal for collectively receiving unilateral voice communication.

5,091,934
TONE MODIFICATION SYSTEM FOR TELEPHONE SYSTEM WITH CLOCK
Yoshiyuki Shimizu, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 10, 1990, Ser. No. 507,678
Claims priority, application Japan, Apr. 10, 1989, 1-42388[U]; Jun. 2, 1989, 1-65027[U]
Int. Cl.⁵ H04M 1/00
U.S. Cl. 379—418

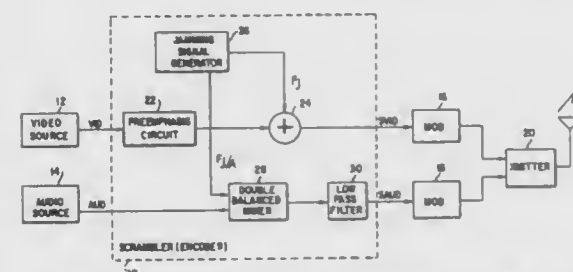


1. A telephone system connected to a transmission line, having transmission means for transmitting a communication signal to said transmission line and receiving means for receiving the transmission signal from said transmission line, comprising:
holding means for putting a connection with said transmission line on hold by setting a hold state,
means for generating a first tone,
means for generating a second tone,
holding tone means, responsive to the hold state, for enabling one of said first tone generating means or said second tone generating means for announcing the hold state,
clock means for measuring and displaying a present time,
means for setting a desired time,
comparing means for comparing said desired time and the present time of said clock means and providing an output of comparison indicating arrival of the set time,
time announcing tone means responsive to the output of comparison of said comparing means for enabling one of said first tone generating means or said second tone generating means,
means for determining that the arrival of the set time happens during the hold state set by said holding means or that the hold state is set by said holding means during the enablement of a tone by said time announcing means, and means responsive to the output of determination of said determining means for enabling the other one of said first and second tone generating means so that both generating means are enabled.

5,091,935
METHOD AND SYSTEM FOR SCRAMBLING INFORMATION SIGNALS
Frank T. Meriwether, Ramona, and Robert S. Block, Marina Del Rey, both of Calif., assignors to Maast, Inc., Los Angeles, Calif.
Continuation of Ser. No. 574,616, Jan. 27, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 850,090
Int. Cl.⁵ H04N 7/167
U.S. Cl. 380—15

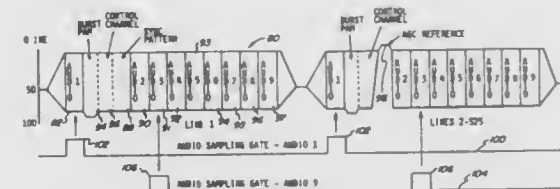
1. A method for scrambled transmission of a television video

signal having a regular, repeating video synchronizing rate from which a receiver of the television video signal derives synchronizing information for controlling the starting position of individual cycles of the television video signal, said television video signal including an associated audio signal,
summing the video signal with a scrambling signal having a frequency which is a function of the video synchronizing rate plus an error quantity within a predetermined bandwidth, said error quantity having a magnitude sufficient to



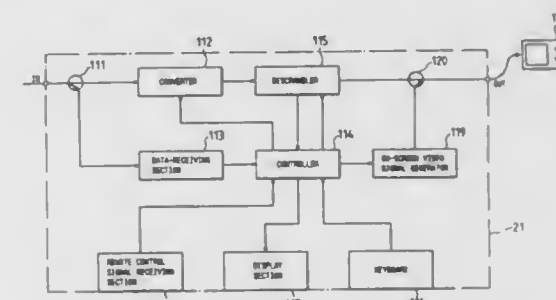
modify said synchronizing information so that the synchronizing information derived by said receiver produces a displacement of the starting position of said individual cycles from the normal starting position of said cycles; mixing the audio signal with a carrier signal related to the video synchronizing rate to produce a lower sideband; transmitting the sum of the television video signal and the scrambling signal; and
transmitting the lower sideband as the television audio signal.

5,091,936
SYSTEM FOR COMMUNICATING TELEVISION SIGNALS OR A PLURALITY OF DIGITAL AUDIO SIGNALS IN A STANDARD TELEVISION LINE ALLOCATION
Ron D. Katznelson, San Diego; Paul Moroney, Cardiff, and W. Allen Shumate, San Diego, all of Calif., assignors to General Instrument Corporation, Hatboro, Pa.
Filed Jan. 30, 1991, Ser. No. 647,827
Int. Cl.⁵ H04N 7/167
U.S. Cl. 380—19



1. Apparatus for selectively transmitting horizontal television lines including video and digital audio components or equivalent digital data lines containing a plurality of audio program signals, comprising:
first means for combining signals into a composite waveform;
means for coupling a first digital audio signal to said first means for inclusion in said composite waveform;
second means for providing a multiplexed plurality of digital audio signals;
switch means for selectively coupling either a video signal or said multiplexed plurality of digital audio signals to said first means for inclusion in said composite waveform; and means, operatively associated with said switch means, for coupling identification data to said first means for inclusion in said composite waveform, wherein said identification data indicates whether said composite waveform includes the video signal or the multiplexed plurality of digital audio signals.

5,091,937
CATV TERMINAL UNIT
Masahiko Kawasaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Continuation of Ser. No. 357,925, May 30, 1989, abandoned.
This application Mar. 20, 1991, Ser. No. 673,247
Claims priority, application Japan, Nov. 9, 1988, 63-281459
Int. Cl.⁵ H04N 7/16
U.S. Cl. 380—20



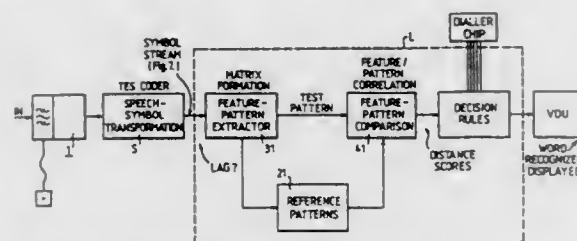
1. A CATV terminal unit for receiving program signals in which information as to whether a program is chargeable or not is included as in-band data, said terminal unit comprising:
in-band data reading means for reading the in-band data in a program of a selected channel;
judging means for judging whether or not the program of the selected channel is chargeable on the basis of the in-band data read by the in-band data reading means;
manually operable means for confirming the selection of a chargeable program;
on-screen video signal generating means for generating a video signal for announcing a chargeable program and superimposing the generated video signal on a descrambled video signal of the selected channel in such a way that the generated video signal effectively blocks out the descrambled video signal of the selected channel when it is judged by the judging means that the program on the selected channel is chargeable and said manually operable means has not been operated; and
on-screen video signal stopping means for stopping the generation of the video signal by said on-screen video signal generating means when it is judged by said judging means that the selected program is not chargeable, or when it is judged by said judging means that the selected program is chargeable and said manually operable means has been operated.

5,091,938
SYSTEM AND METHOD FOR TRANSMITTING ENTERTAINMENT INFORMATION TO AUTHORIZED ONES OF PLURAL RECEIVERS
John R. Thompson, La Quinta; C. J. Hunting, Altadena; William L. Phipps, Bermuda Dunes; Steven J. Raynesford, Cathedral City, all of Calif., and Philip H. Rittmueller, St. Charles, Ill., assignors to NEC Home Electronics, Ltd., Osaka, Japan
Filed Aug. 6, 1990, Ser. No. 563,165
Int. Cl.⁵ H04L 9/02; H04N 7/167
U.S. Cl. 380—21

1. A subscription system decoding unit comprising:
subscription show-key storing means for storing a plurality of subscription show-keys, selection of a proper one of said show-keys being required to decipher certain received enciphered commands;
show-key selecting means for selecting one of said subscription show-keys as an active show-key;
deciphering functions storage means for storing a plurality of deciphering functions;
function selecting means for selecting one of said deciphering functions as an active function;

1. A method of recognizing voice signals encoded as Time Encoded Speech (TES) in the form of a TES symbol stream, the method comprising the step of encoding the TES symbols corresponding to each word or group of words of said voice signals into a single matrix format of TES symbol event descriptors, each symbol event descriptor being dependent upon the symbols in said TES symbol stream, and comparing matrix

formats so formed with single reference matrix formats derived from TES symbols corresponding to each word or group of



words of reference voice signals to provide an output indicative of the content of the voice signals.

5,091,950

ARABIC LANGUAGE TRANSLATING DEVICE WITH PRONUNCIATION CAPABILITY USING LANGUAGE PRONUNCIATION RULES

Moustafa E. Ahmed, Dept. of Electrical Engineering, Worcester Polytechnic Institute, Worcester, Mass. 01609

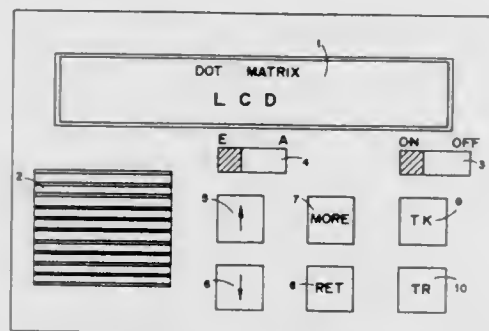
Continuation of Ser. No. 713,243, Mar. 18, 1985, abandoned.

This application Dec. 28, 1988, Ser. No. 291,309

Int. Cl.⁵ G10L 5/02; G06F 15/38

U.S. Cl. 381—51

4 Claims



1. An electronic dictionary and translating device for retrieving one or more words of a first language corresponding to a selected word group of a second language, wherein one of the said languages is an Arabic-related language such as, Arabic, Persian, and Urdu, the device comprising:

- a dot matrix display screen means comprising a plurality of electronics and logic for bit-mapping patterns stored in a display memory means, said display screen comprising additional display areas for Arabic diacritics over and under letters,
- a first memory means containing patterns of characters of said first and second languages, wherein said patterns of the characters are stored in variable width dot matrices, and wherein the patterns of the characters of said Arabic languages include a set of Arabic language diacritics that appear over or under other Arabic characters,
- a second memory means containing characters code/address tables, for the first and the second languages wherein the code of a character points to an entry in said table containing the memory address of the character dot matrix in said first memory means,
- a third memory means divided into variable-length data segments, wherein the said data segments are separated by one or more control characters, and wherein each data segment contains an explanatory message in the FIRST language,
- a fourth memory means divided into variable-length data segments, wherein the said data segments are separated by one or more control characters, and wherein each data

segment contains an explanatory message in the SECOND language,

- a fifth memory means comprising tables of speech parameters comprising linear predictive coding parameters of the allophones of said first and second languages, and comprising tables for allophone code/address lookup, wherein each allophone code points to an entry in a code-/allophone table containing the address of the memory location containing the table of the speech parameters of the allophone,
- a first firmware means containing language pronunciation rules for generating the allophonic components of the words of one or more languages, one of the said languages being the Arabic language,
- a voice synthesizer means which produces speech voice in accordance with speech parameters comprising the linear predictive coding parameters,
- a sixth memory means, comprising a first language word file, divided into variable-length data segments, wherein the said data segments are separated by one or more control characters, wherein each data segment is subdivided into fields, wherein one or more words of the FIRST LANGUAGE is stored in one of said fields, wherein codes of the allophones for pronunciation of said one or more words may be stored in a second of said field, wherein a third of said field contains the memory addresses of a data segment of an explanatory message in said THIRD memory means, and wherein a fourth of said field contains the memory addresses in a seventh memory means of data segments which contain words from the SECOND LANGUAGE which correspond in meaning to the said one or more words of the FIRST LANGUAGE,
- a seventh memory means, comprising a second language word file, divided into variable-length data segments, wherein said data segments are separated by one or more control characters, wherein each data segment is subdivided into fields, wherein one or more words of the SECOND LANGUAGE is stored in one of said fields, wherein codes of the allophones for pronunciation of the said one or more words may be stored in a second of said fields, wherein a third of said field contains the memory address of a data segment of an explanatory message in the said FOURTH memory means, wherein a fourth of the said fields contains the memory addresses in said sixth memory means of one or more data segments which contain words from the FIRST LANGUAGE which correspond in meaning to said one or more words of the SECOND LANGUAGE,
- a input means and word/sentence selection means comprising four basic search levels, four keys for word/sentence selection, a fifth key to initiate pronunciation, and a sixth key to initiate translation, wherein the first search level a single letter is displayed on the dot matrix screen, and the first key causes said letter to scroll up, the second key causes the displayed letter to scroll down, and the third key clears the display and restarts the search, and a fourth key causes the start of the second search level, and wherein in said second search level the first key causes a second displayed letter to scroll up, the second key causes a second displayed letter to scroll down, the third key causes said second displayed letter to disappear and the search level to go back to said first search level, and the fourth key causes the start of the third search level, wherein said third search level a complete word starting with the said first and second letters is displayed, and the first key causes displayed words to scroll up in the said first language word file, the second key causes displayed words to scroll down in the first language word file, the third key causes search level to go back to the second search level, the fourth key causes a fourth search level to start, wherein in said fourth search level an explanatory message (if available) is displayed, and wherein said fourth

search level the third key causes the search level to go back to the third search level, wherein in said third search level the fifth key causes the displayed word or words to be enunciated, and the sixth key causes a translation in the second language to be displayed, and wherein when said second language is displayed the fourth key causes other meanings or an explanatory message in the second language (if available) to be displayed, and the third key causes the display in the second language to terminate and the search level to go back to the third search level,

- a microprocessor means comprising an arithmetic logic means, plurality of accumulators and working registers, a random access memory, a timing and control unit, a program counter, stack registers, an internal ROM comprising a plurality of memory means and firmwares, wherein said micro-processor means comprises a plurality of input/output lines and control lines for interfacing and communication with the said dot matrix display means, said input means, said voice synthesis means, and with a second random access means comprising one or more of said first to sixth memory means, wherein said microprocessor means continuously scans said six keys of said input means and performs a word search as set forth in the k-th paragraph above and in accordance with execution steps stored in a second firmware means, wherein said microprocessor means scrolls down in said word files by allocating the control characters at the beginning of the next data segment then retrieving and displaying one or more words stored in the first field in said data segment, wherein said microprocessor means scrolls up in said word files by allocating the control characters at the beginning of the previous data segment then retrieving and displaying the one or more words stored in the first field in said data segment, wherein said microprocessor means displays a character by using said code/address tables stored in the first memory means (as set forth in paragraph c) to find the address of said character's dot matrix in said second memory means, and then copying said character's dot matrix to said display memory means (as set forth in paragraph a), wherein said microprocessor means performs an enunciation procedure for a displayed word or words in response to said fifth key by retrieving the allophone codes stored in said second field of said data segment (as set forth in paragraph l) containing the displayed word or words, wherein if said second field is empty said microprocessor means generates such allophone codes in accordance with pronunciation rules stored in said first firmware means, wherein said microprocessor means then obtains the memory address of stored parameters of allophones by using the allophones code/address tables stored in said fifth memory means (as set forth in paragraph f), wherein said microprocessor means then retrieves the parameters of the allophone and sends them sequentially to said voice synthesis means, wherein said microprocessor means performs a translation of the displayed word or words in response said sixth key by retrieving the address of the first word in the second language stored in said fourth field of the data segment of said displayed one or more words, wherein said microprocessor means uses said address to allocate the data segment in said word file of the second language, wherein said microprocessor means then retrieves and displays the said one or more words of the second language from the first field of said data segment in the word file of the second language, wherein said microprocessor means may then display the other words of the second language corresponding to said one or more words of the first language in response to said fifth key by retrieving sequentially the addresses stored in said fourth language, and then fetches and displays the corresponding words of the second language stored in said word file of the second language, and wherein said microprocessor means displays an explanatory message corresponding to a displayed word in response to said fourth key, by retrieving the memory address stored in said third field in the data segment of the displayed word, and wherein the said

microprocessor means then fetches and displays the message stored in said memory address in said third memory means.

5,091,951

AUDIO SIGNAL DATA PROCESSING SYSTEM

Kazunaga Ida; Makio Yamaki; Yukio Matsumoto; Hiroyuki Ishihara, all of Tokyo; Toshiyuki Naoe, and Hideo Teranishi, both of Yamanashi, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

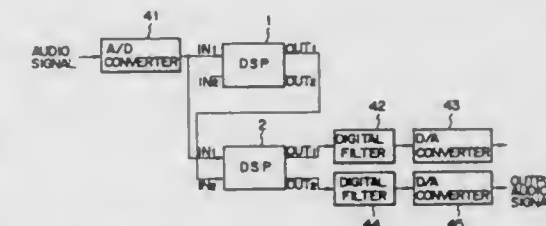
Filed Mar. 1, 1990, Ser. No. 486,866

Claims priority, application Japan, Jun. 26, 1989, 1-163322; Jun. 26, 1989, 1-163325; Jun. 26, 1989, 1-163328

Int. Cl.⁵ H03G 3/00

U.S. Cl. 381—63

5 Claims



1. An audio signal data processing system comprising: first processing means for processing audio signal data; second processing means for processing audio signal data, said first and second processing means having input and output ports of at least two channels; and control means for controlling the operation of said first and second processing means, wherein an input audio signal data is supplied to the input port of one channel of each of said first and second processing means, and output data from the output port of said one channel of said first processing means is supplied to the input port of the other channel of said second processing means, and output audio signal data are obtained at each output port of both channels of said second processing means.

5,091,952

FEEDBACK SUPPRESSION IN DIGITAL SIGNAL PROCESSING HEARING AIDS

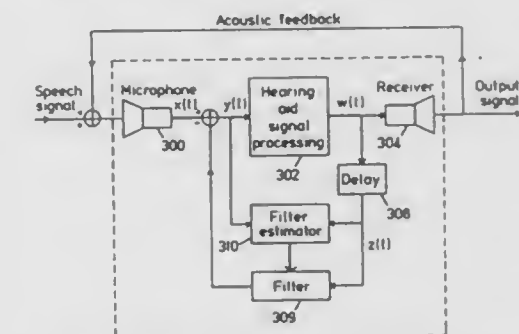
Malcolm J. Williamson, Madison, and Diane K. Bustamante, Marshall, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 10, 1988, Ser. No. 269,987

Int. Cl.⁵ H04R 25/00

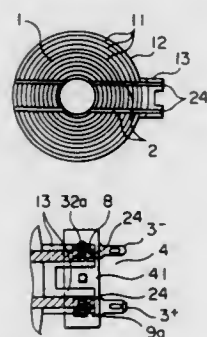
U.S. Cl. 381—68.2

10 Claims



1. A digital signal processing hearing aid system having feedback suppression comprising:
 - (a) input means for providing an electrical signal corresponding to a sound signal;
 - (b) analog to digital converter means for converting the

a projection mounted on said damper extending from the outer periphery of said damper to a substrate of said input terminal, the end of said conductor being extended on and along said projection, whereby the end portion of said conductor is connected to a lug on said substrate of said input terminal, wherein in coupling together the end of



said conductor and said lug, an extruded portion of said lug is bent or pressed down to fixedly connect said lug to said substrate while leaving a fraction of said extruded portion standing upright from said substrate, whereby said upright fraction of said extruded portion is coupled to said conductor.

5,091,959 SPEAKER SYSTEM

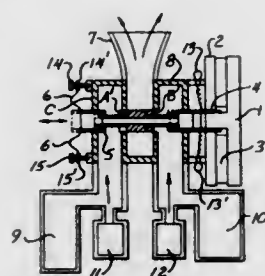
Tong-Hong Sohn, Kongjak Apt. House A-1011, Yoido-Dong, Yongsungpo-Ku, and Jeong-Hoon Yoon, both of Seoul, Rep. of Korea, assignors to Tong-Hoon Sohn, Seoul, Rep. of Korea
Filed Oct. 16, 1990, Ser. No. 598,539

Claims priority, application Rep. of Korea, Oct. 16, 1989, 89-14880

Int. Cl.⁵ H04R 25/00

U.S. Cl. 381-165

4 Claims



1. A speaker system comprising a longitudinal closed hollow cylinder having three chambers formed by two spaced walls, a longitudinal bore passing through said cylinder, a longitudinal cylindrical vibrator movably disposed in said bore, said vibrator having three spaced enlarged portions, the central portion defining a middle gate engageable with a central chamber formed by said spaced walls and coupled to a sound rendering horn, a high air pressure tank coupled to one outer chamber and a low air pressure tank coupled to another outer chamber of said three chambers, said middle gate on said vibrator adapted to move in either direction with respect to said central chamber to couple air pressure from either of said tanks to said central chamber and said horn, a yoked magnet, a plate and a voice coil adjacent one end of said vibrator for developing a magnetic circuit to move said vibrator with respect to said horn.

5,091,960 HIGH-SPEED IMAGE RENDERING METHOD USING LOOK-AHEAD IMAGES

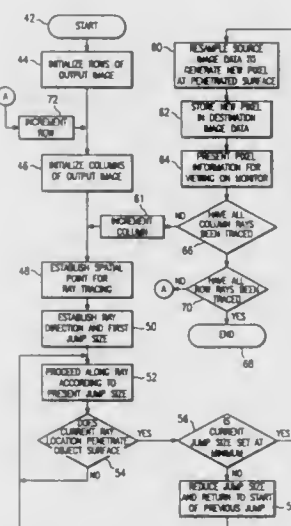
Timothy L. Butler, Plano, Tex., assignor to Visual Information Technologies, Inc., Plano, Tex.

Filed Sep. 26, 1988, Ser. No. 249,589

Int. Cl.⁵ G06K 9/00; G06F 15/00

U.S. Cl. 382-1

58 Claims



1. A method for providing a high-speed rendering of a new image from image data representative of an old image, comprising the steps of:

defining a spatial point of perspective so that the old image can be rendered and thereby produce a new image; preprocessing the image data by ray tracing to produce at least one look-ahead image having stored therein pixel data of interest utilized during rendering to increase the speed thereof; performing said rendering by image ray tracing and referring to said look-ahead image to eliminate processing where pixel image data of interest does not exist; and storing in said look-ahead image information concerning worst case values of any quality of a pixel within a fixed distance.

5,091,961 MAGNETIC INK CHARACTER DECODER

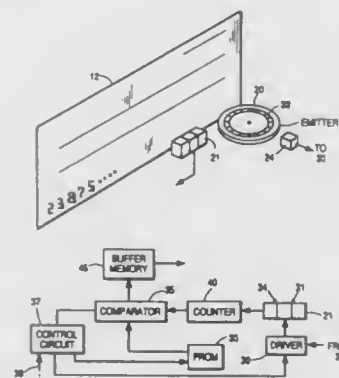
René Baus, Jr., Rancho Palos Verdes, Calif., assignor to American Magnetics Corp., Carson, Calif.

Filed Jul. 14, 1989, Ser. No. 380,194

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-7

10 Claims



1. A magnetic ink character decoder comprising a path of

movement of a medium having a set of magnetic ink characters printed thereon, said decoder including means for superimposing magnetic flux reversals on said magnetic ink characteristics, wherein each of said magnetic ink characters includes vertical and horizontal elements and said flux reversals are aligned with said vertical elements in a manner to provide a sequence of relatively long flux reversals in each of said vertical elements and a sequence of relatively short flux reversals in each of said horizontal elements defined by the relatively long vertical dimensions of said vertical element and the relatively short vertical dimensions of said horizontal elements respectively, said sequence of long and short flux reversals being equally-spaced, unique for each of said characters, said decoder also including means for counting the sequence of flux reversals for producing a unique pulse sequence count for each of said characters and means for comparing said unique pulse sequence count to stored pulse sequence counts for a set of magnetic ink characters for determining a match therebetween.

5,091,962 METHOD AND APPARATUS FOR DETECTING A SHEET STRIP MATERIAL MISFEED CONDITION

Joseph P. Malloy, Freeport, and William Baldwin, Verona, both of Pa., assignors to Oberg Industries, Inc., Freeport, Pa.

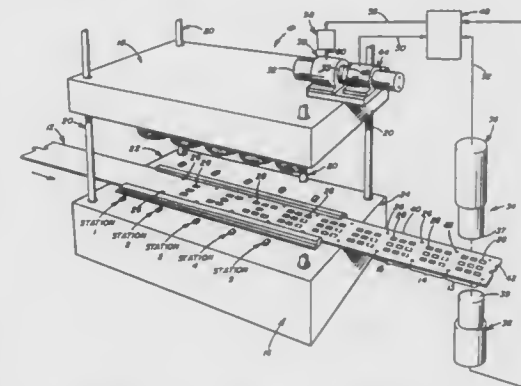
Continuation of Ser. No. 84,630, Aug. 11, 1987, Pat. No. 4,813,320. This application Dec. 9, 1988, Ser. No. 283,175

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.⁵ G06K 9/00; B26D 5/00; G01B 7/16; B65H 23/18

U.S. Cl. 382-8

7 Claims



1. An apparatus for continuously detecting the configuration of connected stamped items in a metallic strip comprising, sensing means, means for passing a metallic strip comprising a plurality of connected individual stamped items in proximity to said sensing means, said sensing means producing a sensing means signal as each said individual metallic stamped item in said strip is passed in proximity to said sensing means, and controller means having an input for receiving said sensing means signal produced as each said individual metallic stamped item in said strip is passed in proximity to said sensing means, said controller means including means for sampling said sensing means signal to produce an individual waveform for each said metallic stamped item in said strip, said controller means producing a plurality of individual waveforms as said plurality of individual metallic stamped items in said strip are passed in proximity to said sensing means, said controller means including means for selecting a desired individual waveform as a reference waveform and comparing each said individual waveform to said reference waveform to determine the deviation between any said

individual waveform and said reference waveform and the integrity of each of said stamped items in said strip.

5,091,963 METHOD AND APPARATUS FOR INSPECTING SURFACES FOR CONTRAST VARIATIONS

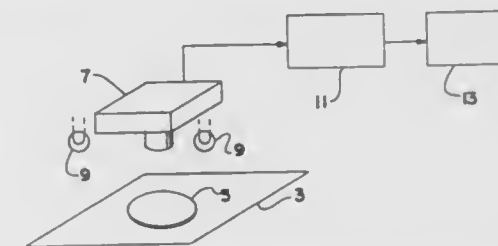
Maria Litt, Cleveland Heights; Wesley N. Cobb; David C. Bond, both of University Heights; Jack C. Chung, Cincinnati, all of Ohio, and Gary G. Leininger, Rolla, Mo., assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 2, 1988, Ser. No. 189,452

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-8

29 Claims



1. A method of inspecting a surface of an article for isolated contrast variations, comprising: illuminating a surface of an article; forming a surface image from the light reflected from said surface, said surface image being composed of a plurality of pixels, said pixels comprising digitized electrical signals each indicative of the relative intensity level of light reflected from a particular portion of said surface; comparing the intensity levels of at least some of the pixels to a predetermined intensity threshold to identify pixels corresponding to portions of said surface contrasting with other portions of said surface; determining the number of isolated regions of contrast variation on said surface and determining the magnitude of the space occupied by the area of each of said isolated regions of contrast variation from the number of pixels within each isolated region of contrast variation; and applying acceptability criteria based upon the number of isolated regions of contrast variation and the magnitudes of the respective areas of the isolated regions of contrast variation to decide whether the article is acceptable for a particular use.

5,091,964 APPARATUS FOR EXTRACTING A TEXT REGION IN A DOCUMENT IMAGE

Shoji Shimomura, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki and Fujifacom Corporation, Hino, both of Japan

Filed Apr. 1, 1991, Ser. No. 678,217

Claims priority, application Japan, Apr. 6, 1990, 2-91654

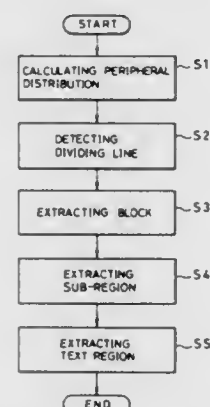
Int. Cl.⁵ G06K 9/34

U.S. Cl. 382-9

14 Claims

1. An apparatus for extracting a text region in a document image, comprising: projection calculation means for calculating a peripheral distribution of filled pixels in a document image, which contains a mixed form of text and other kind of visual information and which is represented in terms of binary data, by projecting the filled pixels in a predetermined direction, said predetermined direction being a direction extending along either one of an X-axis and a Y-axis; detection means for detecting a bottom part in the peripheral distribution calculated; dividing means for dividing said document image into a plurality of primary image regions in accordance with a

line intersecting the bottom part in said predetermined direction;
reduction means for reducing each of the plurality of primary image regions divided by said dividing means until the size of said primary image region reaches the size of a circumscribed rectangular frame of filled pixels to form a plurality of secondary image regions in which unfilled pixels are excluded from said primary image regions;



consolidating means for consolidating a plurality of secondary image regions adjacent to one another among said plurality of secondary image regions into a single tertiary image region; and
extraction means for calculating a line density of filled pixels in said tertiary image region consolidated and for extracting a text region from said document image by judging that said tertiary image region is a text region when said calculation result indicates a text image.

5,091,965

VIDEO IMAGE PROCESSING APPARATUS

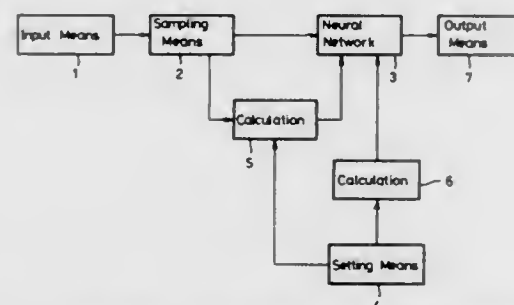
Seiji Kobayashi, Tokyo, Japan, and Demetri Psaltis, Pasadena, Calif., assignors to Sony Corporation, Tokyo, Japan and California Institute of Technology, Pasadena, Calif.

Filed Jul. 16, 1990, Ser. No. 553,995

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-15

3 Claims



1. A video image processing apparatus for converting an analog video image to a binary video image, said apparatus comprising:

- input means for receiving said analog video image in the form of a computer hologram;
- sampling means for sampling the received analog video image;
- a neural network circuit having a plurality of neurons which are connected together through respective synapses;
- setting means for setting a predetermined function which is a window function indicative of a range of a desired area of a reproduced video image which results from Fourier-transforming said computer hologram;
- first computing means for computing respective threshold values for each of said neurons in said neural network

circuit on the basis of the sampled value of the video image and said predetermined function; and
second computing means for computing respective coupling coefficients for each of said synapses of said neural network circuit on the basis of said predetermined function; said neural network circuit processing said threshold values and said coupling coefficients so as to form said binary video image.

5,091,966

ADAPTIVE SCALING FOR DECODING SPATIALLY PERIODIC SELF-CLOCKING GLYPH SHAPE CODES

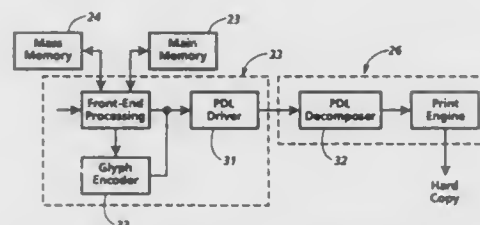
Dan S. Bloomberg, and Robert F. Tow, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1990, Ser. No. 560,658

Int. Cl.⁵ G06K 9/46

U.S. Cl. 382-21

5 Claims



1. A process for decoding a spatially periodic bitmap image space representation of a self-clocking glyph shape code of unknown spatial periodicity; said code being composed of glyphs having shapes that encode digital data values, such that each distinct data value that is encoded by said code is represented by the shape of a respective glyph; said glyphs being selected from a set of n permissible glyph shapes, with each said glyph shapes being preassigned to the encoding of a predetermined digital data value; said glyphs being spatially distributed in said bitmap image space in substantial accordance with a spatial formatting rule; said process comprising the steps of:
analyzing said bitmap image space representation of said code for determining its spatial periodicity along an X axis and an Y axis;
scaling said spatial formatting rule to match the determined spatial periodicity of said glyph code;
filtering said bitmap image space representation of said code with at least n discrimination filters, each of said discrimination filters being selected to match a respective one of said permissible glyph shapes, thereby providing at least n filtered versions of said bitmap image space representation;
evaluating said filtered version, glyph-by-glyph in accordance with said scaled spatial formatting rule for determining a filtered value for each glyph as filtered by each filter;
comparing the filtered values for each of said glyphs for classifying said glyphs by their shapes; and
assigning decoded data values to said shape classified glyphs in accordance with the data values preassigned to said glyph shapes.

5,091,967

METHOD OF EXTRACTING CONTOUR OF A SUBJECT IMAGE FROM AN ORIGINAL

Ikuo Ohsawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Apr. 10, 1989, Ser. No. 335,866

Claims priority, application Japan, Apr. 8, 1988, 63-87929; Jul. 29, 1988, 63-191428

Int. Cl.⁵ G06K 9/46

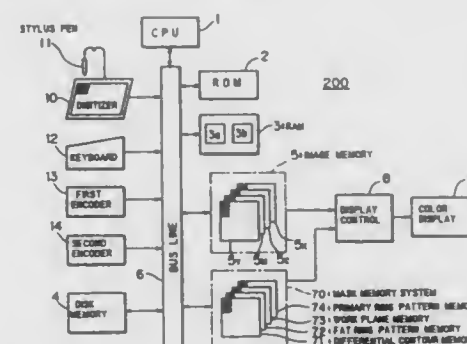
U.S. Cl. 382-22

24 Claims

1. A method of generating contour image data expressing a contour of a subject image that is included in an original image,

said original image being expressed by a plurality of pixels having respective gradation levels, the method comprising the steps of:

- (a) displaying said original image on a display means;
- (b) designating an area on said original image while observing said original image on said display means so that said contour belongs to said area;
- (c) calculating respective spatial differentials of gradation levels with respect to pixels being included in said area;
- (d) determining a threshold level for said respective spatial differentials, the step (d) including the substeps:
 - (d-1-1) generating a differential histogram which expresses a distribution of said respective spatial differentials over each of several partial areas of said area;
 - (d-1-2) designating criteria for dividing said differential histogram into two parts; and



- (d-1-3) finding a boundary level at which said differential histogram is divided into said two parts, said threshold level being determined by said boundary level;
- (e) comparing said respective spatial differentials with said threshold level, to thereby classify said pixels being included in said area into a first group of pixels having differentials larger than said threshold level and a second group of pixels having differentials smaller than said threshold level;
- (f) extracting pixels belonging to said first group from said pixels being included in said area, to thereby specify extracted pixels; and
- (g) generating contour image data expressing a contour image on which said extracted pixels represent said contour.

5,091,968

OPTICAL CHARACTER RECOGNITION SYSTEM AND METHOD

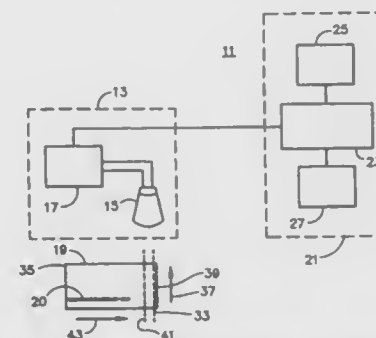
Raymond L. Higgins, Kitchener, and Dennis W. Golem, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 28, 1990, Ser. No. 635,899

Int. Cl.⁵ G06K 9/64

U.S. Cl. 382-30

37 Claims



1. Optical character recognition system comprising:
means for optically scanning a character recorded on a

document, the character and document having different opacities, and producing a plurality of gray-scale values corresponding to said opacities, said gray-scale values representing light and dark pixels;

memory means disposed for storing the gray-scale values, said memory means including a stored program, and predetermined data including a plurality of predetermined binary patterns, one of said predetermined binary patterns representing the character, each predetermined binary pattern including first, second, and third bit configuration, said first bit configuration representing an actual bit pattern of the character, said second bit configuration representing predetermined significance of respective bits of the actual bit pattern, and said third bit configuration representing weighted values of respective bits of the actual bit pattern; and

processing means coupled to the scanning means and to the memory means, and operating under control of the stored program, for locating the character on the document by selecting from said gray-scale values a matrix of values representative of the character, for converting the matrix values to binary data, and for selecting from the plurality of predetermined binary patterns a pattern that matches the converted binary data, said matching pattern serving to identify the character.

5,091,969

PRIORITY ORDER OF WINDOWS IN IMAGE PROCESSING

Shigesumi Kuwashima, Tokyo, Japan, assignor to Kabushiki Kaisha Ouyo Keisoku Kenkyusho, Tokyo, Japan

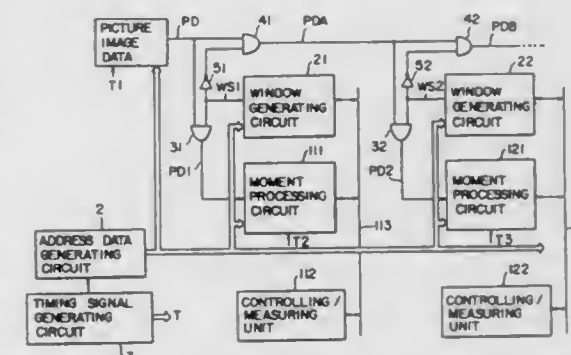
Continuation of Ser. No. 218,441, Jul. 12, 1988, abandoned, which is a continuation of Ser. No. 919,215, Oct. 15, 1986, abandoned. This application Feb. 6, 1991, Ser. No. 652,389

Claims priority, application Japan, Dec. 9, 1985, 60-275024

Int. Cl.⁵ G06K 9/20

U.S. Cl. 382-48

5 Claims



1. An image processing method comprising the steps of:
preparing a plurality of independent windows which respectively comprises a structure expressing a subset of a whole image, with the image being a group which has an array structure of n -dimensions where n is an integer and $n \geq 1$, and a size or shape of at least one of said independent windows could be set at will and mutual relationships among said independent windows could be freely located in the whole image to be measured;

allotting a priority order to said respective independent windows for simultaneous processing;
preparing a plurality of measuring processing means to respectively process image data which are expressed by said independent windows; and
respectively measuring, in each of the plurality of measuring processing means, a characteristic amount of an image within said respective independent windows, wherein at least one of said plurality of measuring processing means, corresponding to said independent window having a high-

est priority allotted to it in an overlapped area where said independent windows overlap, is selected to process the image of the overlapped area and another one of said plurality of measuring processing means is inhibited from processing the image of the overlapped area.

5,091,970

METHOD FOR JUDGING THE PRESENCE OR ABSENCE OF LIMITED IRRADIATION FIELD

Hideya Takeo, Kanagawa, Japan, assignor to Fujifilm Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 330,666, Mar. 30, 1989, abandoned.

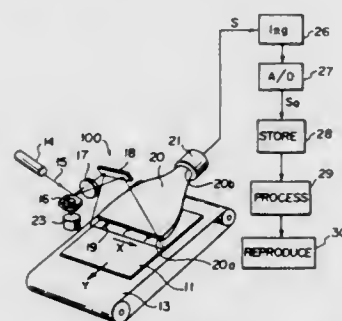
This application Jul. 25, 1990, Ser. No. 560,495

Claims priority, application Japan, Mar. 31, 1988, 63-80070; Jul. 26, 1988, 63-186086

Int. Cl.⁵ G06K 9/00

U.S. Cl. 382-48

3 Claims



1. A method for judging the presence or absence of a limited irradiation field, the method comprising the steps of:

- obtaining an image signal by reading out a radiation image of an object from a recording medium on which the radiation image has been recorded;
- based on said image signal, calculating a first representative value which is representative of the values of the image signal corresponding to the overall peripheral portion of said recording medium or corresponding to part of said peripheral portion, and a second representative value which is representative of the values of the image signal corresponding to the overall area of said recording medium or corresponding to approximately the center portion of said recording medium;
- comparing said first representative value and said second representative value with each other;
- judging the presence or absence of said limited irradiation field on the basis of the results of the comparison;
- discriminating said limited irradiation field if said limited irradiation field is determined to be present in said step (iv); and
- based on said image signal read out from within said limited irradiation field, determining at least one of image read-out and image processing conditions.

5,091,971

METHOD AND APPARATUS FOR HIGH-SPEED ELECTRONIC DATA SIGNAL MODIFICATION AND IMPROVEMENT

Joseph W. Ward, Pittsford, N.Y.; Kenneth Wang, La Palma, Calif.; Joel Lissade, Henrietta, N.Y.; Paula Sivi, Webster, N.Y.; David G. Wilcox, Macedon, N.Y., and Agatha Yang, Hawthorne, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1990, Ser. No. 590,126

Int. Cl.⁵ G06K 9/40

U.S. Cl. 382-54

39 Claims

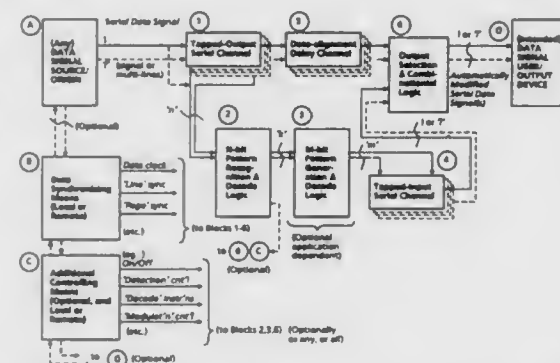
1. An apparatus for selectively modifying a data pattern of image data, comprising:

serial channel means communicating with the image data for

obtaining a desired number of sequential N-bit patterns from said image data;

recognition means communicating with the serial channel means for detecting unique bit patterns, recognized as light and dark bit patterns, from said sequential N-bit patterns;

pattern generator means communicating with the recognition means for generating a M-bit pattern specific to each unique bit pattern;



combinational means communicating with the serial channel means and the pattern generator means for selectively operating on the N-bit patterns and the M-bit patterns in a plurality of combinational modes to modify at least a portion of the data pattern in a response to a desired combinational mode to lighten the image data in response to recognized dark bit patterns; and

image writing means communicating with the combinational means for printing the image data as modified by the combinational means.

5,091,972

SYSTEM AND METHOD FOR REDUCING DIGITAL IMAGE NOISE

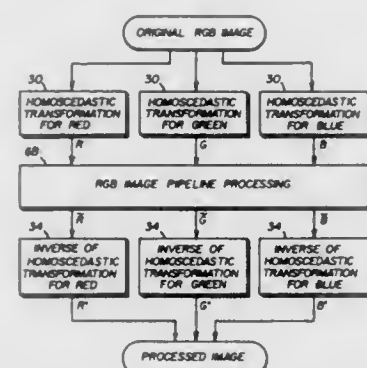
Heemin Kwon, Pittsford, and Martin C. Kaplan, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 17, 1990, Ser. No. 583,637

Int. Cl.⁵ G06K 9/40, 9/56, 9/54; H03F 1/26

U.S. Cl. 382-54

20 Claims



7. A method of processing a digital color image comprising the steps of:

- forming red, green, and blue pixel values representing the original digital color image;
- transform the red, green, and blue pixel values by a matrix to obtain luminance and chrominance band values;
- processing said luminance band by
 - selecting one or more square neighborhood sizes;
 - generating a lookup table for each neighborhood size

for inputting the value of the goodness of fit and for outputting a corresponding weight;

c. selecting a first row of said matrix of pixel elements which completely contains the largest neighborhood among said neighborhood sizes and initializing the pipeline calculations of said matrix for all neighborhood sizes;

d. selecting a target pixel at the first column of said selected row which completely contains the largest neighborhood among said neighborhood sizes and initializing the pipeline calculations of the selected row for all neighborhood sizes;

e. selecting one of said neighborhood sizes (of step a);

f. performing pipeline calculations to determine fit parameters of a plane to a neighborhood of pixels centered at said target pixel;

g. performing a pipeline calculation to obtain the goodness of fit;

h. determining the weight from said lookup table for said neighborhood;

i. iterating the steps e through h for every neighborhood size;

j. performing pipeline calculations of estimating the final pixel value by combining, with said weights, the values of all the fitted planes of the neighborhoods containing said target pixel with the original pixel value;

k. iterating steps e through j sequentially for all the subsequent pixels in the selected row; and

l. iterating steps d through k sequentially for all rows of said matrix; and

D. combining the processed luminance values with the chrominance band values by the inverse of the matrix to yield a noise suppressed color image.

5,091,973

IMAGE PROCESSING APPARATUS FOR REDUCING VISIBLE ROUGHNESS IN CONTOURS

Kiyoshi Watanabe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

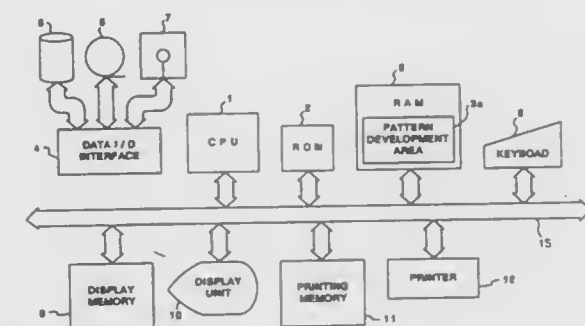
Filed Aug. 27, 1990, Ser. No. 572,387

Claims priority, application Japan, Aug. 30, 1989, 1-221670

Int. Cl.⁵ G06K 9/40

U.S. Cl. 382-54

21 Claims



1. An image processing apparatus comprising: input means for inputting an original image pattern composed of dots; detecting means for detecting contour dots from the original image pattern inputted by said input means; identifying means for identifying a pattern of dot rows formed by the contour dots detected by said detecting means; editing means for editing the original image pattern, which is inputted by said input means, based on the pattern identified by said identifying means; and output means for outputting results of editing performed by said editing means, wherein said detecting means further comprises subdividing

means for subdividing rows of the contour dots in accordance with a predetermined method.

5,091,974

METHOD OF PROCESSING LINWORK WITH ELECTRONIC IMAGE PROCESSOR

Masayuki Sasahara, and Katsuya Yamaguchi, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

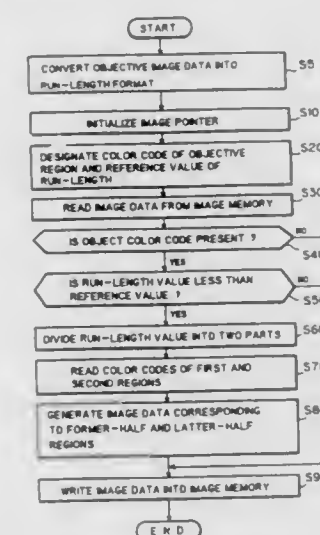
Filed Apr. 26, 1990, Ser. No. 515,011

Claims priority, application Japan, May 12, 1989, 1-119055

Int. Cl.⁵ G06K 9/44

U.S. Cl. 582-55

11 Claims

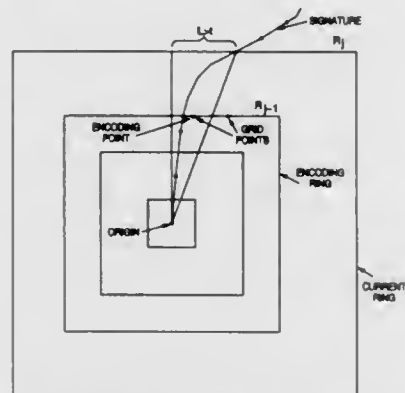


1. A method of changing a width of a linework which is included in an original image, said width of said linework having a non-zero value, said method comprising the steps of:

- defining a first parallel array of processing lines on said original image each of which extends in a first direction;
- obtaining first image data representing said original image in a run-length format which includes an arrangement of run-length data representing respective image regions on each processing line in said first parallel array, each of said run-length data having a run-length value and a color code;
- selecting one processing line from said first parallel array of processing lines;
- serially selecting an objective image region from said image regions on said one processing line;
- comparing a run-length value of said objective image region with a predetermined reference value;
- if said run-length value of said objective image region is smaller than said reference value, executing the steps of:
 - modifying run-length data of said objective image region; and
 - modifying at least one of first and second run-length data representing first and second image regions which are adjacent to said objective image region and between which said objective image region is located on said one processing line, said first and second run-length data being modified without changing a total run-length on said one processing line; and
- repeating the steps (c) through (f) while serially selecting said one processing line from said first parallel array of processing lines, to thereby obtain second image data representing a modified image in which said width of said linework is substantially changed.

5,091,975
METHOD AND AN APPARATUS FOR
ELECTRONICALLY COMPRESSING A TRANSACTION
WITH A HUMAN SIGNATURE
 Toby Berger, Ithaca, N.Y., and Daniel H. Miller, Kensington,
 Calif., assignors to Teknekron Communications Systems, Inc.,
 Berkeley, Calif.

Filed Jan. 4, 1990, Ser. No. 460,755
 Int. Cl.⁵ G06K 9/36, 9/46; G06F 15/30; G07G 1/14
 U.S. Cl. 382-56 4 Claims



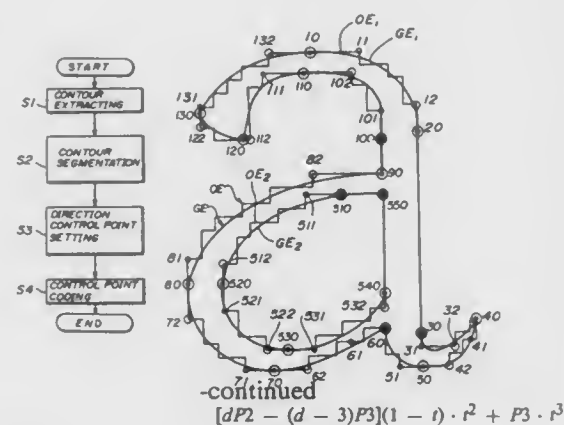
1. A method for electronically processing a transaction having a human signature for verification of said transaction, said method comprising the steps of:
 electronically capturing said transaction at said point of transaction to form a transaction signal;
 electronically capturing said human signature at said point of transaction to form a signature signal;
 compressing said signature signal to form a compressed signature signal;
 dividing said signature signal into a plurality of signature segment signals;
 encoding each signature segment signal by selecting N rings sized by the Fibonacci series of 1, 2, 3, 5, 8, 13 in a Modified Ring Encoding Method with each ring having a number of grid points, and where the total number of grid points is less than or equal to 256;
 combining said compressed signature signal with said transaction signal to form a record signal; and
 processing said record signal.

5,091,976
IMAGE CODING METHOD FOR EXTRACTING,
SEGMENTING, AND CODING IMAGE CONTOURS
 Noboru Murayama, Machida, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 14, 1990, Ser. No. 480,065
 Claims priority, application Japan, Feb. 22, 1989, 1-42842
 Int. Cl.⁵ G06K 9/36, 9/48, 9/46; H04N 1/415
 U.S. Cl. 382-56 8 Claims

1. An image coding method comprising the steps of:
 a) extracting an original vertical-horizontal contour of a bi-level image;
 b) segmenting the contour into a plurality of segments by fitting a predetermined generation curve on each of the segments, said predetermined generation curve being described by control points which include:
 1) end control points indicating ends of each segment; and
 2) direction control points indicating directions of the fitted curve of each segment at the two ends of each segment; wherein the predetermined generation curve is described by a polynomial MB, in which:

$$MB = P_0(1 - t)^3 + [cP_1 - (c - 3)P_0](1 - t)^2 \cdot t +$$



wherein:

- 1) MB denotes a generation point;
- 2) P0 denotes a starting end control point which indicates a start point of each segment;
- 3) P1 denotes a start direction control point which indicates a direction of each segment at the start point;
- 4) P2 denotes an end direction control point which indicates a direction of each segment at an end point of each segment;
- 5) P3 denotes an ending control point which indicates the end point of each segment;
- 6) t is a parameter, $0 \leq t \leq 1.0$; and
- 7) c and d are arbitrary real numbers;

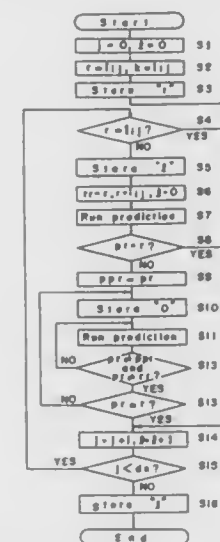
wherein an ending control point of a first one of first and second consecutive segments is identical to a starting control point of the second consecutive segment; and wherein the segmenting step includes assigning X and Y coordinates to an address of each of said control points; and
 c) coding the control points in a sequence of P0, P1, and P2 with respect to one contour, wherein the coding step includes adding a mode code, said mode code having:
 a first value for indicating an overlap of two control points,
 a second value for indicating an address change in only the X coordinate,
 a third value for indicating an address change in only the Y coordinate, and
 a fourth value for indicating an address change in both the X and Y coordinates.

5,091,977
IMAGE DATA COMPRESSION METHOD USING A RUN
PREDICTION TECHNIQUE
 Hiroyuki Katata, and Yoji Noguchi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1990, Ser. No. 630,200
 Claims priority, application Japan, Dec. 19, 1989, 1-329316
 Int. Cl.⁵ G06K 9/36; H04N 1/41
 U.S. Cl. 382-56 14 Claims

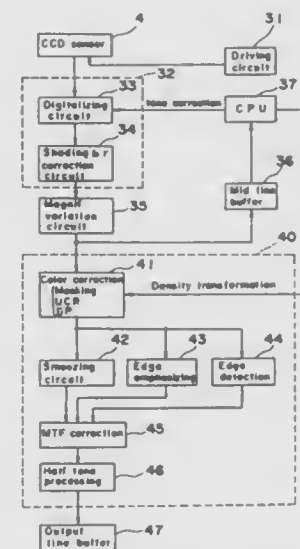
1. A machine implemented image data compression method comprising the steps of:
 (a) inputting digital image data whose pixels are represented by n bits (where $n < 1$) and which include 2^n different types of runs;
 (b) counting a run length of a current run of the digital image data;
 (c) predicting a value representing a run type of the current run wherein said prediction is repeated until a predicted value is equal to an actual value of the run type of said current run;
 (d) setting a run length for an imaginary run having the

predicted value to zero and entropy coding the run length of the imaginary run when the predicted value is not equal to the actual value of the run type of said current run;



- (e) entropy coding the actual run length of the current run when the predicted value is equal to with the actual value to produce compressed image data.
- (f) outputting the compressed image data.

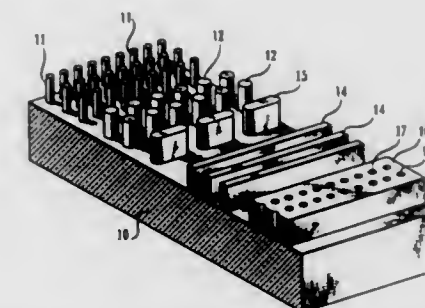
5,091,978
APPARATUS FOR LINE SCANNING A DOCUMENT
 Yoshihiko Hirota, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
 Filed Jul. 1, 1988, Ser. No. 214,442
 Claims priority, application Japan, Jul. 3, 1987, 62-167244
 Int. Cl.⁵ G06K 9/00
 U.S. Cl. 382-67 10 Claims



1. An image reading apparatus comprising:
 an image reading device for line scanning an image of a document and outputting an analogue image signal, said image reading device including a line image sensor having plural sensor chips arranged along a line in the lengthwise direction of said line sensor, each of said sensor chips having image sensing devices and an output terminal for

outputting an analogue signal from each image sensing device;
 plural analogue to digital conversion means for converting said analogue image signals outputted from said sensor chips, respectively, each of said conversion means being connected to the output terminal of each image sensor chip;
 plural memory means, associated with said plural analogue to digital conversion means, for storing image signals digitalized by said plural analogue to digital conversion means, each of said memory means being comprised of a first-in-first-out (FIFO) memory in which writing data thereto and reading data therefrom can be done asynchronously;
 driving means for driving said sensor chips in synchronization with one another;
 first pulse generating means for generating first clock pulses;
 second pulse generating means for generating second clock pulses having a frequency higher than a frequency of said first clock pulses;
 a control means for writing digitalized image signals from said plural sensor chips into said associated memory means in parallel and in synchronization with said first clock pulses and for outputting a serial image signal corresponding to a line scan ready by said image reading device by reading said digitalized image signals stored in respective memory means in synchronization with said second clock pulses and in the order of alignment of said plural sensor chips.

5,091,979
SUB-MICRON IMAGING
 Donald L. White, Lake Parsippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
 Filed Mar. 22, 1991, Ser. No. 673,615
 Int. Cl.⁵ G02B 6/10, 6/12
 U.S. Cl. 385-1 34 Claims



1. Apparatus comprising an article for serving a function entailing processing of electromagnetic radiation made incident on such article, said processing comprising modulating such radiation with desired image patterning information and with additional "compensating" information, and providing for transfer of modulated radiation to an image plane, said processing comprising phase shifting of such radiation as transmitted through such article, in which modulation with such additional information is within spatially selected regions of such radiation, to result in non-image patterning as well as image patterning radiation, such radiation as incident having a spectral distribution of reducing amplitude about a central wavelength and being of sufficient coherence to enable detection of such phase shifting, said apparatus providing for an image plane for imaging such processed electromagnetic radiation,
 Characterized in that such article includes a waveguide-containing layer, each such waveguide consisting essentially of a guide region comprising guide material, said waveguide being of such dimensions as to result in a phase shift for guided radiation of a magnitude of at least 5° relative to such radiation as transmitted for the same distance

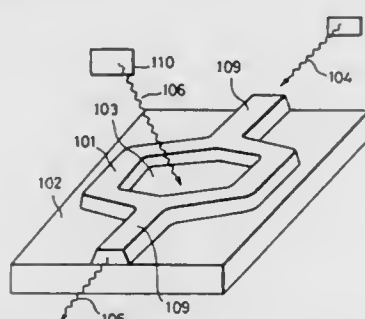
through bulk material of the same optical properties as those of which the guide region is comprised, thereby resulting in an image characterized by such phase shifted radiation whereby quality of such image on the said image plane is improved due to phase shifting.

5,091,980
OPTICAL QUANTUM INTERFERENCE
DEVICE/OPTICAL COMPUTER AND METHOD OF
MODULATING LIGHT USING SAME

Kensuke Ogawa, Hachioji; Toshio Katsuyama, Ome, and Tada-shi Fukuzawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 348,216, May 5, 1989, Pat. No. 4,957,337. This application Sep. 11, 1990, Ser. No. 580,599
Claims priority, application Japan, May 6, 1988, 63-108993;
May 25, 1988, 63-125711; Jul. 13, 1988, 63-172706

Int. Cl.⁵ G02B 6/10, 5/30; G01B 9/02; H01J 5/16
U.S. Cl. 385—3 14 Claims



1. An optical modulating system comprising:
a modulator modulating light by modulating a quantum mechanical first particle being generated by an interaction of light and a second particle having polarized charge.
13. A method for modulating light comprising the steps of:
receiving light to be modulated;
generating a quantum state in an interferometer by an interaction of the light and a source of polarization;
modulating said quantum state.

5,091,981

TRAVELING WAVE OPTICAL MODULATOR

David G. Cunningham, Wickwar, England, assignor to BT&D Technologies Limited, United Kingdom

PCT No. PCT/GB89/00456, § 371 Date Aug. 1, 1990, § 102(e)
Date Aug. 1, 1990, PCT Pub. No. WO89/10577, PCT Pub.
Date Nov. 2, 1989

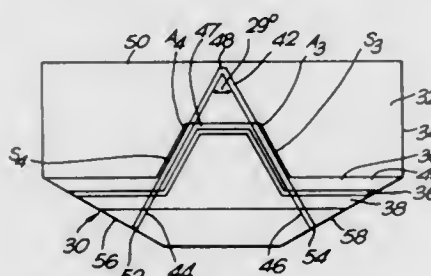
PCT Filed Apr. 28, 1989, Ser. No. 548,978

Claims priority, application United Kingdom, Apr. 29, 1988,
8810285

Int. Cl.⁵ G02B 6/10

U.S. Cl. 385—3

8 Claims



1. A travelling wave optical modulator comprising a substrate, an optical waveguide defined within the boundaries of a surface of the substrate; a travelling wave electrode by which a modulated electric field of a predetermined frequency is applicable to at least a portion of the optical waveguide; and

one or more delay portions between a respective splitting point and rejoining point where the optical waveguide is separated from the electrode and for which the transit time between the splitting point and rejoining point is greater for an optical signal in the optical waveguide than for the electric field in the electrode.

5,091,982

WAVEGUIDE TYPE OPTICAL DETECTION APPARATUS
Kiyoshi Yokomori; Shunsuke Fujita, both of Yokohama, and
Shigeyoshi Misawa, Tokyo, all of Japan, assignors to Ricoh
Company, Ltd., Tokyo, Japan

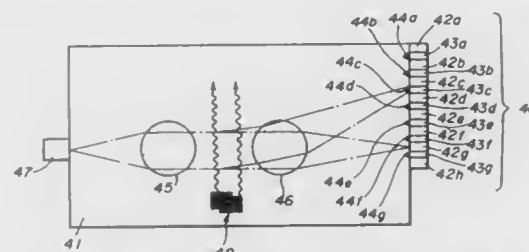
Filed Jul. 10, 1990, Ser. No. 550,569

Claims priority, application Japan, Jul. 11, 1989, 1-178294;
Aug. 3, 1989, 1-201763; Aug. 17, 1989, 1-211757

Int. Cl.⁵ G02B 6/10

U.S. Cl. 385—4

11 Claims



1. An optical detection apparatus provided on an optical integrated circuit which includes a waveguide, a light source for emitting light, a focusing means for converging the emitted light from the light source on a position of a target object so that the converged light is reflected from the target object, a coupler for coupling the light reflected back from the target object with the waveguide, one or more sets of two adjacent photodetectors provided on the waveguide for receiving the light coupled with the waveguide so that an optical detection signal is supplied, and one or more light-insensitive areas between the two adjacent photodetectors of each said set, said optical detection apparatus comprising:

waveguide focusing means provided on the waveguide for focusing the light beam traveling through said waveguide and splitting said light beam into two split light beam such that each of said two split light beams is led to each of said light-insensitive areas;

reflector means provided adjacent to each of said light-insensitive areas for leading each of said two separate, split light beams from said waveguide focusing means to each of said two adjacent photodetectors of each said set; and a transducer provided on the waveguide for generating an elastic surface wave traveling across a path of the light beam transmitting through the waveguide,

said waveguide focusing means being formed as a pair of focusing elements on the waveguide so that the light beam is diffracted by said elastic surface wave and the direction of the light beam transmitted through the waveguide is varied, depending on the frequency of a signal applied to the transducer.

5,091,983

OPTICAL MODULATION APPARATUS AND
MEASUREMENT METHOD

Walter Lukosz, Burstwiesenstr. 55, Grefensee 8606, Switzerland

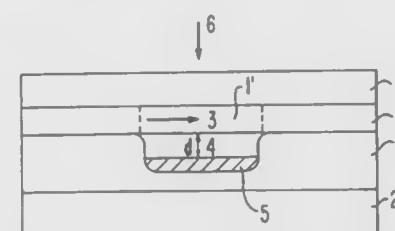
PCT No. PCT/EP87/00289, § 371 Date Nov. 29, 1989, § 102(e)
Date Nov. 29, 1989, PCT Pub. No. WO88/09917, PCT Pub.
Date Dec. 15, 1988

PCT Filed Jun. 4, 1987, Ser. No. 445,735

Int. Cl.⁵ G02B 6/10; G01D 5/34

U.S. Cl. 385—13

29 Claims



1. A method for changing the phase of guided waves and measuring very small mechanical displacements comprising the steps of

providing a waveguide (1) having a first waveguide section (1') with an effective refractive index N and a phase shifting element (5) spaced from the waveguide section (1') by a gap (4) having a width d ,
filling the gap (4) with a medium having small absorption and a refractive index $n < N$, and either

- (a) varying the width d of the gap as a function of time while passing an optical wave (3) through the waveguide, the width d of the gap being sufficiently small so that the refractive index of the waveguide and the phase of the wave are changed by interaction of the evanescent field of the wave with phase-shifting element 3 or surface layers (13) of phase shifting element (5) facing the waveguide section (1'), while absorbing or coupling out of the waveguide section (1') substantially no power of the guided wave (3) by the phase shifting element (5), or
- (b) measuring changes of the effective refractive index N and the phase of the optical wave (3) as a measure of changes of the width d .

5,091,984

OPTICAL SWITCH FOR USE WITH OPTICAL FIBERS
Yuji Kobayashi; Yasuo Matsuda; Toshifumi Hosoya, and Tsuyoshi Nonaka, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

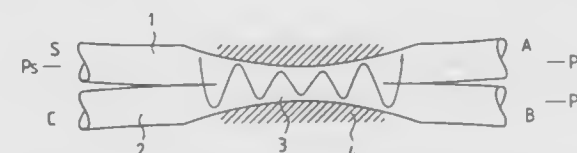
Filed Dec. 18, 1990, Ser. No. 629,692

Claims priority, application Japan, Dec. 20, 1989, 1-329842

Int. Cl.⁵ G02B 6/02

U.S. Cl. 385—16

20 Claims



1. An optical switch, comprising:
a directional coupler wherein a medium comprising a photochromic compound is contained in a vessel circumferentially surrounding said coupler; and
means for changing a refractive index of said medium wherein a light beam travels through an optical fiber connected to said coupler and leaks from said fiber into said vessel, irradiating said medium and causing optical path switching of said coupler.

5,091,985

OPTICAL SIGNAL CONNECTION DEVICE FOR UNITS
TO BE INSERTED IN A RACK

Rolf Heidemann, Tamm, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

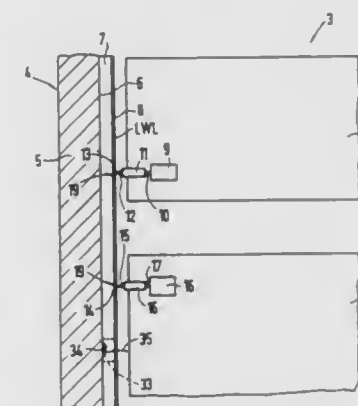
Filed Jan. 16, 1991, Ser. No. 640,799

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003056

Int. Cl.⁵ G02B 6/32

U.S. Cl. 385—33

13 Claims



1. A signal connecting device for establishing communication paths between insertable units of a rack having a rear panel by one or more signal connections, wherein each signal connection comprises:

at least one optical waveguide having inputs and outputs; and

imaging lenses associated with the insertable units, coupling between the at least one waveguide and the insertable units being effected by the imaging lenses of associated insertable units, an imaging lens, when its associated unit is inserted, being disposed opposite or against the at least one optical waveguide;

wherein the at least one optical waveguide is disposed on or in a carrier sheet arranged on a support of the rear panel, a coupling structure being formed in the carrier sheet and in the at least one optical waveguide at coupling-in and coupling-out locations, the coupling structure in the carrier sheet being formed by a grating.

5,091,986

OPTICAL DIVIDER FOR MULTIMODE OPTICAL FIBER SYSTEMS

Mitsuzo Arai; Norio Takeda; Shigeo Kataoka; Osamu Kondoh; Kuniaki Jinnai; Hisashi Ohwada, and Tomoko Kondoh, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

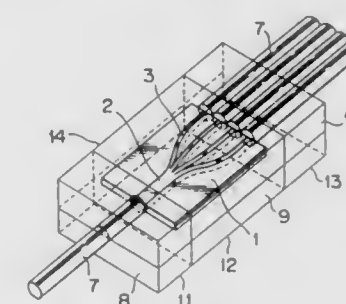
Filed Nov. 8, 1990, Ser. No. 610,680

Claims priority, application Japan, Nov. 15, 1989, 1-294908

Int. Cl.⁵ G02B 6/26

U.S. Cl. 385—48

6 Claims



1. An optical divider comprising:

an optical input section in which an input optical fiber is disposed;

a branching section including an optical divider, which consists of a main optical waveguide coupled to a plurality of branch optical waveguides, for dividing input light into a plurality of optical signals;

and an optical output section in which output optical fibers are disposed for distributing said plurality of optical signals;

whereby said optical waveguide and said optical fibers are formed to satisfy the following relations:

$$0.7 \leq T/K \leq 0.85 \quad (1)$$

$$0.35 \leq W/K \leq 0.80 \quad (2)$$

$$15 \leq M/D \leq 70 \quad (3)$$

$$D = N \times W \quad (4)$$

where, T is a core thickness of said optical waveguide, K is a core diameter of said input and output optical fibers, W is a width of said branch optical waveguide, M is a length of said main optical waveguide, D is a width of said main optical waveguide, and N is a number of branches of said branch optical waveguides.

5,091,987

FIBER OPTIC HERMETIC CONNECTOR

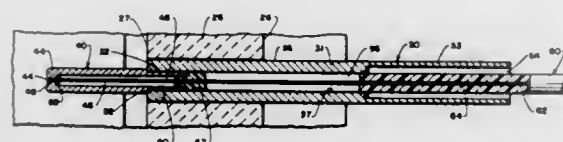
David B. MacCulloch, Saugus; Nick C. George, Sherman Oaks, both of Calif., and Benjamin P. Brickett, Eliot, Me., assignors to G & H Technology, Inc., Camarillo, Calif.

Filed Feb. 11, 1991, Ser. No. 653,410

Int. Cl.⁵ G02B 6/36, 7/26

U.S. Cl. 385—66

18 Claims



1. A receptacle for a fiber optic connector assembly comprising:

- a receptacle housing having an axial bore;
- a dielectric material of predetermined thickness overlying said bore and hermetically sealed thereto;
- an elongated hollow sleeve means extending through said thickness having a contact end opening;
- a fiber optic contact means hermetically sealed to said contact end opening, said contact means having a central aperture; and,
- a fiber optic cable having a light conductor that extends into said sleeve and is hermetically sealed thereto, said conductor extending through said aperture to provide a fiber optic connection with a corresponding means in said connector assembly.

5,091,988

ARTICLE FOR CONNECTING OPTICAL FIBERS

Yinon Degani, Highland Park; Robert M. Kimball, Lanoka Harbor, and George J. Shevchuk, Old Bridge, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 12, 1991, Ser. No. 684,129

Int. Cl.⁵ G02B 6/36

U.S. Cl. 385—70

6 Claims

1. Apparatus for making an optical connection between ends of respective first and second optical fibers, comprising:
- a first silicon member having a substantially planar first principal surface and a first groove formed in said first

surface such that the first fiber end can be supported in a portion of the first groove;

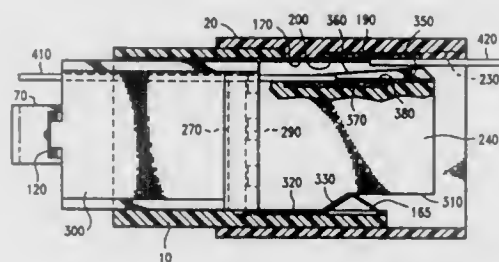
a second silicon member having a substantially planar second principal surface and a second groove formed in said second surface such that the second fiber end can be supported in a portion of the second groove;

a plug housing having a hollow interior portion and a longitudinal axis;

a receptacle which incorporates the second silicon member and which includes a cavity adapted to receive there-within at least a portion of the plug housing when the plug housing is inserted along a direction, to be referred to as the insertion direction, which is parallel to the longitudinal axis;

a floating head which incorporates the first silicon member and which is capable of sliding longitudinally within the plug housing and which is adapted to be at least partially inserted within the receptacle such that the first and second principal surfaces are substantially parallel and at least partially overlap and face each other;

a piston which is at least partially insertable within the plug housing and capable of sliding longitudinally within the plug housing, the piston and floating head being mechanically engaged such that motion of the piston along the insertion direction tends to insert the floating head into the receptacle, motion of the piston opposite to the insertion direction tends to withdraw the floating head from the receptacle, and during at least a portion of the insertion step, the floating head is capable of moving substantially



independently of the piston in one direction substantially perpendicular to the insertion direction;

guiding surfaces, integral with the receptacle, for directing the motion of the floating head during insertion, such that the perpendicular distance between the first and second principal surfaces initially decreases until a portion of the first fiber is captured within the second groove and a portion of the second fiber is captured within the first groove, and thereafter, the first and second fibers contactingly slide within, respectively, the second and first grooves such that the longitudinal axes of the first and second fiber end portions are substantially collinear and the first fiber end approaches the second fiber end along the longitudinal axis;

first resilient means for urging the first and second silicon blocks together after the first and second grooves have, respectively, captured the second and first fibers;

second resilient means for applying a force tending to advance the first fiber end toward the second fiber end just until the fiber ends make abutting contact, and tending to maintain such abutting contact; and

at least one compressible locking member affixed to an external surface of the plug housing, adapted to engage a corresponding slot in the receptacle such that when the locking member is compressed toward the plug housing, the plug housing is freely inserted or withdrawn relative to the receptacle, but when the locking member is released after insertion, the locking member prevents withdrawal of the plug housing.

5,091,989

METHOD FOR ENCAPSULATING AN OPTICAL COMPONENT AND THE ENCAPSULATED COMPONENT OBTAINED THEREBY

Thierry L. A. Dannoux, Avon, France, assignor to Corning Incorporated, Corning, N.Y.

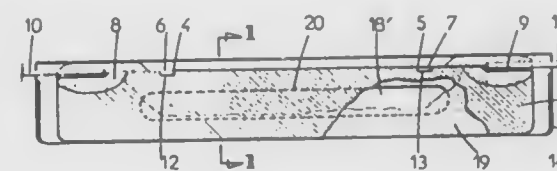
Filed Oct. 5, 1990, Ser. No. 593,903

Claims priority, application France, Oct. 9, 1989, 89 13136

Int. Cl.⁵ G02B 6/36

U.S. Cl. 385—70

9 Claims



1. An encapsulated component for the interconnection of optical fibers comprising:

- a bar having two parallel faces, and two edges which each have an area substantially smaller than the area of each of said faces, said optical fibers being disposed along one of said edges;
- a U-shaped casing substantially surrounding said bar and said one edge, the internal width of said casing being substantially the same as the thickness of said bar between said parallel faces, said U-shaped casing having side walls whose length and height are such that the side walls of said casing substantially overlap said bar; and
- a sealing composition in the open contour of said casing, adjacent the opposing surfaces of said bar, to secure said bar in said casing and seal said casing.

5,091,990

FIBER-OPTIC CONNECTOR

Alexander M. C. Leung, Seattle, Wash., and Guido Bertoglio fu Edoardo, Lugano, Switzerland, assignors to Augat Communications Group, Seattle, Wash.

Filed Feb. 15, 1991, Ser. No. 656,255

Int. Cl.⁵ G02B 6/26

U.S. Cl. 385—81

4 Claims

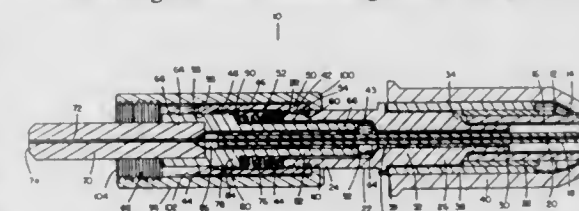
1. A fiber-optic connector for a cable with an optic fiber, comprising:

- a ferrule having a central passageway extending generally longitudinally fully through said ferrule to receive the optic fiber;

an elongated first backpost having an exteriorly threaded forward end portion, a rearward end portion attachable to the cable, and a central passageway extending generally longitudinally fully through said first backpost to receive the optic fiber, said first backpost exteriorly threaded portion having threads with a first pitch diameter and a first thread pitch and first backpost central passageway having a forward opening at said first backpost forward portion;

a body having a forward end portion, an interiorly threaded rearward end portion, and a central passageway extending generally longitudinally fully through said body, said body interiorly threaded portion having threads with said first pitch diameter, said first thread pitch and an interior thread diameter, said first backpost exteriorly threaded portion being threadably received by said body interiorly threaded portion, said body central passageway having a forward opening at said body forward portion defined by a shoulder which projects radially inward and a rearward opening at said body rearward portion;

an elongated second backpost positioned within said body central passageway and having forward and rearward end portions, said second backpost rearward portion extending rearwardly through said body rearward opening and into said first backpost forward opening, said second backpost forward portion terminating in a forwardly opening recess sized to receive and hold said ferrule in generally longitudinal alignment with said second backpost, said second backpost forward portion being disposed within said body central passageway for longitudinal movement of said second backpost relative to said body and having an outer dimension generally equal to or less



than said interior thread diameter to freely pass by said body interior threads when said second backpost is inserted within said body central passageway during assembly of the connector, and said second backpost rearward portion being disposed within said first backpost central passageway for longitudinal movement of said second backpost relative to said first backpost, said first backpost central passageway and said body central passageway having a combined longitudinal length to permit forward and rearward longitudinal movement of said second backpost therewithin, said second backpost further having an exteriorly threaded central portion positioned between said second backpost forward and rearward portions, and a central passageway extending generally longitudinally fully through said second backpost to receive the optic fiber, said second backpost exteriorly threaded portion having threads with said first pitch diameter and said first thread pitch to allow said second backpost exterior threads to threadably engage and upon rotation pass by said body interior threads when said second backpost is inserted within said body central passageway during assembly of the connector prior to said body interiorly threaded portion threadably receiving said first backpost radially inward sufficient to limit forward longitudinal movement of said second backpost within said first backpost and body central passageways;

a spring positioned within said body about said second backpost rearward portion and between said first backpost forward portion and said second backpost central portion to bias said second backpost forwardly relative to said first backpost; and

a coupling member mounted to said body.

5,091,991
OPTICAL FIBER CONNECTOR WITH ALIGNMENT
FEATURE

Robert C. Briggs, Newport; Bryan T. Edwards, Camp Hill;
David D. Sonner, Harrisburg, and Robert N. Weber, Hum-
melstown, all of Pa., assignors to Amp Incorporated, Harris-
burg, Pa.

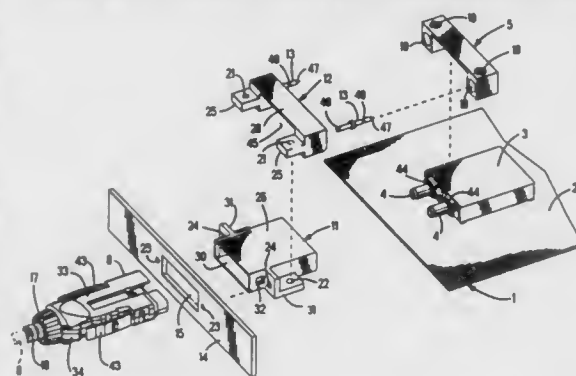
Filed Feb. 25, 1991, Ser. No. 660,507
Int. Cl.⁵ G02B 6/26

U.S. Cl. 385—82 12 Claims

1. A connector for joining light transmitting fiber cables to a
transmitter and/or receiver device comprising:

a plug half connector comprising; a plug having axial ex-
tending bore for receiving an optical fiber; a transceiver
adapter adapted to axially receive said plug and extending
axially for aligning said plug relative to said transmitter
and/or receiver device, and further having forward mat-
ing face; and pin, beveled at the end thereof and fixed to
the forward mating face of said transceiver adapter and
extending forward of said plug half connector; and

yoke half connector attached to and integral with said trans-
mitter and/or receiver device and having aperture therein



beveled to receive said pin to be guided into said aperture
by said beveling.

DESIGN PATENTS

GRANTED Feb. 25, 1992

ERRATA

For
CLASS

D24-133

See
PATENT NO.

324,205

VOL

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DESIGNS

FEBRUARY 25, 1992

324,123

FOOD PRODUCT

Robert L. Schuppan, Palatine, Ill.; Maeve C. Murphy, St. Paul,
and Stephen J. Fox, Minneapolis, both of Minn., assignors to
General Mills, Inc., Minneapolis, Minn.

Filed May 22, 1990, Ser. No. 526,809

Term of patent 14 years

U.S. Cl. D1—110



324,125

ABDOMEN SUPPORTING BODYSUIT FOR AN EXPECTANT MOTHER

Roselyne Gambier, 15 rue du Hamel, Beauchamps 80770, France
Filed Jan. 23, 1990, Ser. No. 468,976

Claims priority, application France, Jul. 24, 1989, 89 4736

Term of patent 14 years

U.S. Cl. D2—4



324,124

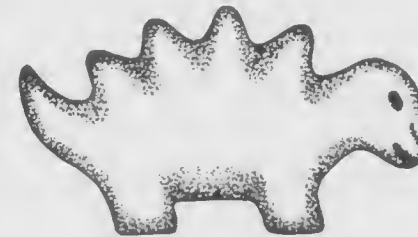
FOOD PRODUCT

Robert L. Schuppan, Palatine, Ill.; Maeve C. Murphy, St. Paul,
and Stephen J. Fox, Minneapolis, both of Minn., assignors to
General Mills, Inc., Minneapolis, Minn.

Filed May 22, 1990, Ser. No. 526,811

Term of patent 14 years

U.S. Cl. D1—110



324,126

BIKINI BRIEF

David L. Cornwall, Box 83751, Fairbanks, Ak. 99708
Filed May 4, 1990, Ser. No. 518,865

Term of patent 14 years

U.S. Cl. D2—11

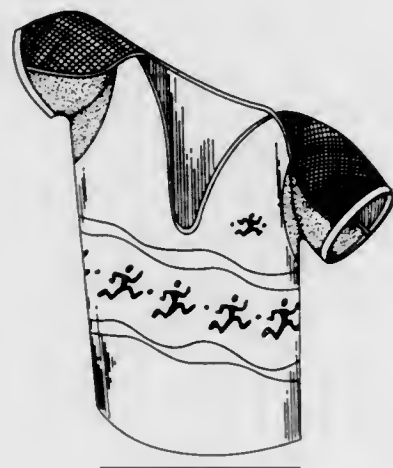


324,127
UNDERSHIRT

Steve Ashcraft, Rte. 2, Box 521, 3476 Pecks Creek Rd., Stanton, Ky. 40380

Filed May 4, 1990, Ser. No. 518,845
Term of patent 14 years

U.S. Cl. D2—215

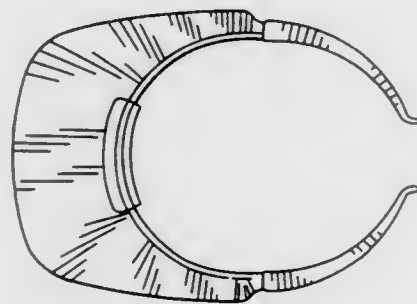


324,128
VISOR

Thomas E. Hoskins, 45 Balboa Coves, Newport Beach, Calif. 92959

Filed Apr. 11, 1988, Ser. No. 179,918
Term of patent 14 years

U.S. Cl. D2—247

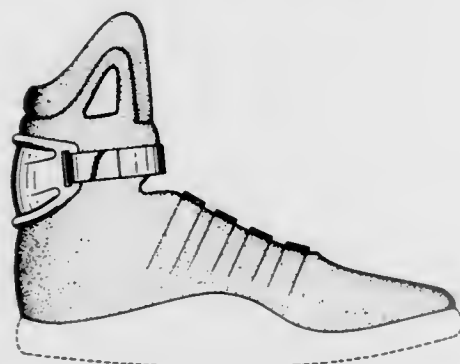


324,129
UPPER FOR A SHOE

Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.

Filed Apr. 6, 1990, Ser. No. 505,525
Term of patent 14 years

U.S. Cl. D2—314

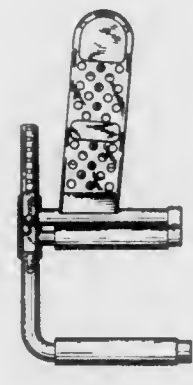


324,130
TREE CLIMBER

Shinsuke Matsumoto, Oita, and Hideo Shibata, Fukuoka, both of Japan, assignors to Matsumoto Industry Co., Ltd., Fukuoka, Japan

Filed Sep. 25, 1989, Ser. No. 413,021
Term of patent 14 years

U.S. Cl. D2—317

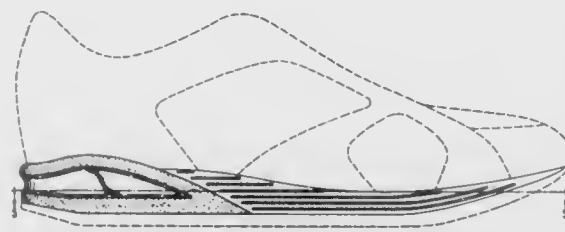


324,131
PERIPHERY OF A SHOE MIDSOLE

Robert Lucas, Lake Oswego, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.

Filed Jun. 15, 1990, Ser. No. 538,497
Term of patent 14 years

U.S. Cl. D2—314



324,132
SHOE UPPER

Bruce Rogers, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.

Continuation-in-part of Ser. No. 558,413, Jul. 27, 1990, Pat. No. Des. 321,085. This application Dec. 27, 1990, Ser. No. 629,492
Term of patent 14 years

U.S. Cl. D2—314



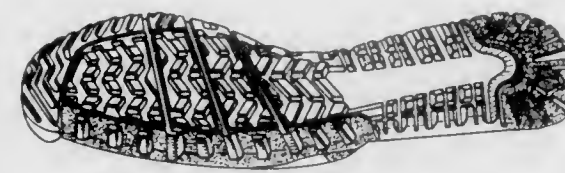
324,133
SHOE SOLE

Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan

Filed Jun. 22, 1990, Ser. No. 542,394

Claims priority, application Japan, Dec. 28, 1989, 1-48340
Term of patent 14 years

U.S. Cl. D2—320



324,134
LIGHT CANE

John W. Williams, 6300 Hellen Lee Dr., Clinton, Md. 20735

Filed May 4, 1990, Ser. No. 518,849

Term of patent 14 years

U.S. Cl. D3—6



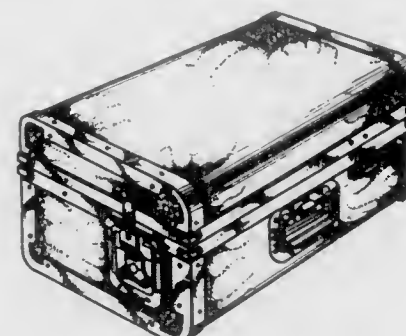
324,135
CARRYING CASE

Joseph E. March, Chicago, Ill., assignor to Platt Luggage, Inc., Chicago, Ill.

Filed Jan. 17, 1990, Ser. No. 466,687

Term of patent 14 years

U.S. Cl. D3—70



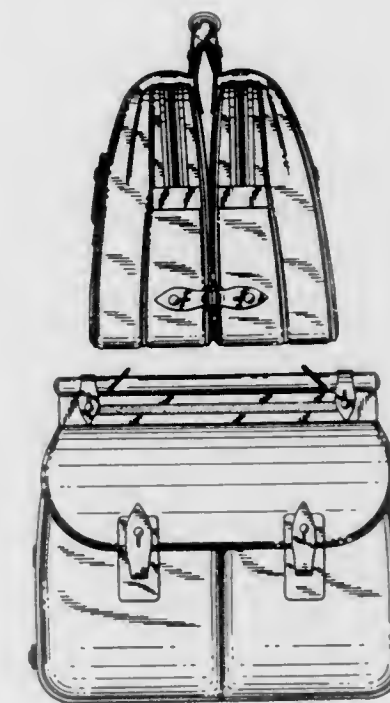
324,136
TWO-COMPONENT TRAVEL BAG

Robert M. Lee, Reno, Nev., assignor to Hunting World, Incorporated, Sparks, Nev.

Filed May 2, 1990, Ser. No. 518,098

Term of patent 14 years

U.S. Cl. D3—76



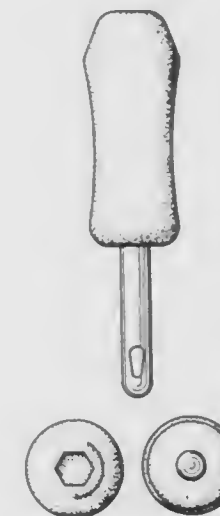
324,137
POLYFOAM BOLT PAINTING BRUSH

Danny Mendez, P.O. Box 1193, Romoland, Calif. 92380

Filed Aug. 21, 1989, Ser. No. 396,021

Term of patent 14 years

U.S. Cl. D4—137



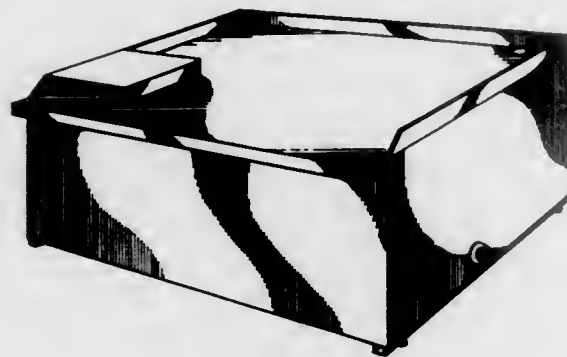
324,138

WORKBENCH FUEL TANK

William Labonte, P.O. Box 279, Rte. 26, West Paris, Me. 04289
Filed Apr. 3, 1989, Ser. No. 332,217

Term of patent 14 years

U.S. Cl. D6—400



324,141

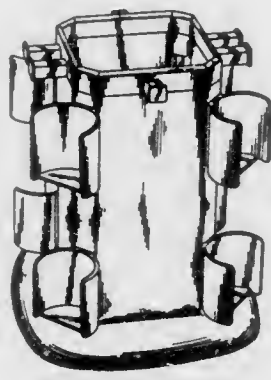
KITCHENWARE ORGANIZER

Chin-Lung Wu, 3th Fl., No. 10, Hoping E. Rd. Sec. 3, Taipei, Taiwan

Filed Apr. 13, 1989, Ser. No. 337,444

Term of patent 14 years

U.S. Cl. D6—457



324,142

DESIGN FOR A SHOE RACK

Timothy S. Cassel, Boxborough, Mass., assignor to Tucker Housewares, Leominster, Mass.

Filed Aug. 22, 1988, Ser. No. 235,035

Term of patent 14 years

U.S. Cl. D6—462



324,139

SHOE RACK

John W. Frazier, Walnut Creek, Calif., assignor to IFM Industries, Inc., Dixon, Calif.

Filed Oct. 5, 1989, Ser. No. 417,757

Term of patent 14 years

U.S. Cl. D6—411



324,143

COMPUTER STAND

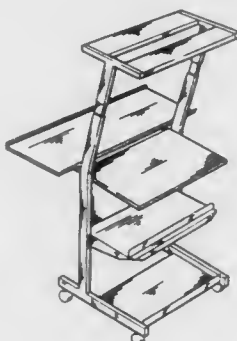
John E. Hammond, Randburg, South Africa, assignor to Pelham Plastics (Proprietary) Limited, Johannesburg, South Africa

Filed Aug. 30, 1989, Ser. No. 400,744

Claims priority, application South Africa, Mar. 13, 1989, 89/0195

Term of patent 14 years

U.S. Cl. D6—474



324,140

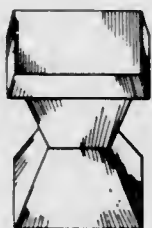
DISPLAY STAND

Michael Kuntz, 200 Spot Rd., Powells Point, N.C. 27966

Filed Sep. 11, 1989, Ser. No. 405,842

Term of patent 14 years

U.S. Cl. D6—455



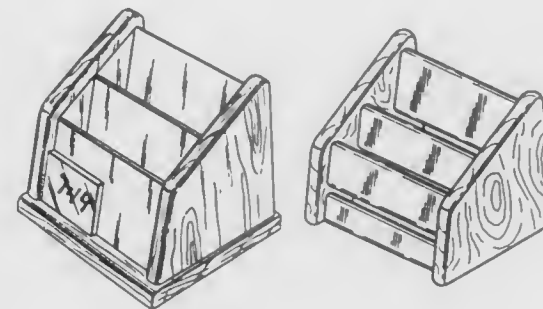
324,144

TV GUIDE AND TELEVISION REMOTE CONTROL STAND

Leslie P. Watrous, 19922 Fernglen, Yorba Linda, Calif. 92806
Continuation-in-part of Ser. No. 161,837, Feb. 29, 1988. This application May 26, 1988, Ser. No. 199,302

Term of patent 14 years

U.S. Cl. D6—476



324,147

END STANDARD FOR A VEHICLE SEAT OR SIMILAR ARTICLE

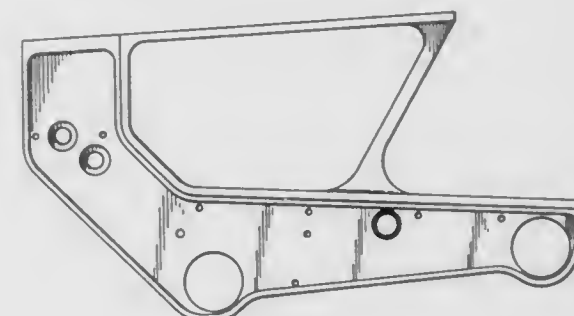
John Tchong, and John F. Branham, both of Buckinghamshire, England, assignors to John F. Branham, Aylesburg and Flight Equip. & Engineering Ltd., Chesham, both of, England

Filed Dec. 14, 1988, Ser. No. 284,448

Claims priority, application United Kingdom, Jun. 18, 1988, 1051702; Jun. 18, 1988, 1051703

Term of patent 14 years

U.S. Cl. D6—500



324,145

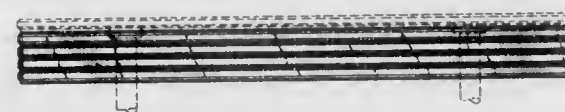
MODESTY PANEL

Niels Diffrient, Ridgefield, Conn., assignor to Howe Furniture Corporation, Trumbull, Conn.

Filed Sep. 30, 1988, Ser. No. 252,431

Term of patent 14 years

U.S. Cl. D6—491



324,148

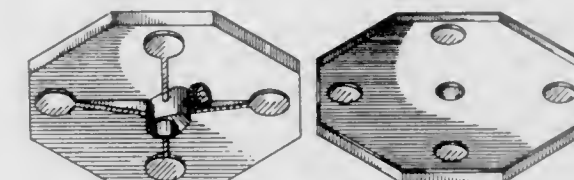
PORTABLE TRAY FOR ATTACHMENT TO A VERTICAL POST

Benjamin Dickman, 1336 Knorr St., Philadelphia, Pa. 19111

Filed Oct. 26, 1988, Ser. No. 263,123

Term of patent 14 years

U.S. Cl. D6—511



324,146

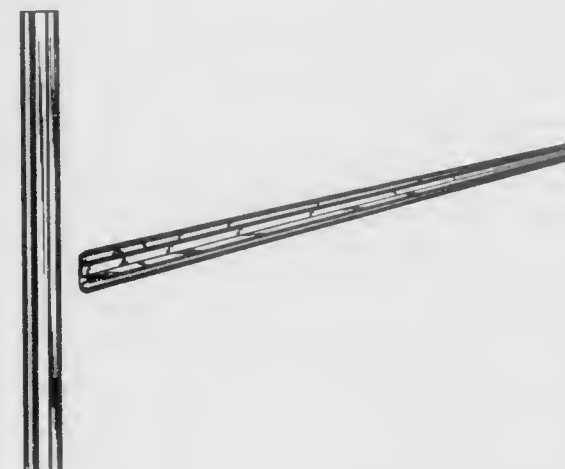
SEAT MOUNTING BRACKET FOR A BOAT

John Crowe, 443 Columbia St., Bogalusa, La. 70427

Filed Sep. 14, 1988, Ser. No. 245,016

Term of patent 14 years

U.S. Cl. D6—500



324,149

COFFEE MAKER

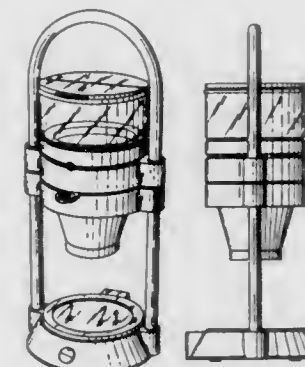
Aloysius J. Beeren, Haren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1989, Ser. No. 324,355

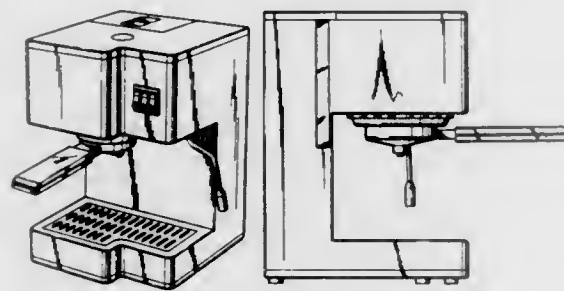
Claims priority, application World Int. Prop. O., Sep. 22, 1988, DM/011.776

Term of patent 14 years

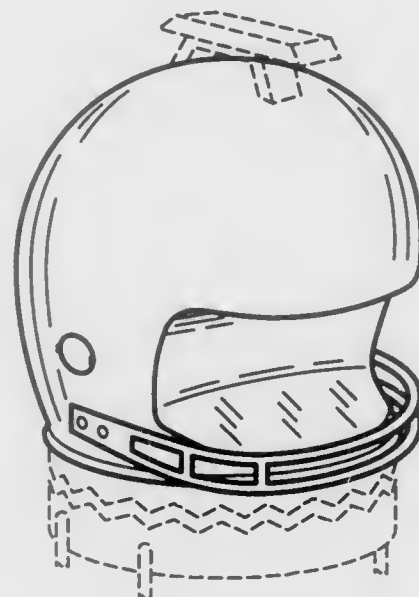
U.S. Cl. D7—309



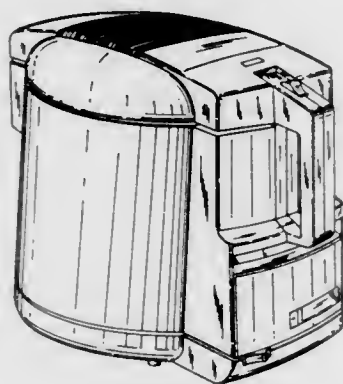
324,150
ESPRESSO COFFEE MACHINE
 Aldo De Felip, Milan, Italy, assignor to Brevetti Gaggia S.p.A., Milan, Italy
 Filed Jul. 17, 1989, Ser. No. 381,020
 Claims priority, application Italy, Mar. 9, 1989, 20707/89[U]
 Term of patent 14 years
 U.S. Cl. D7—309



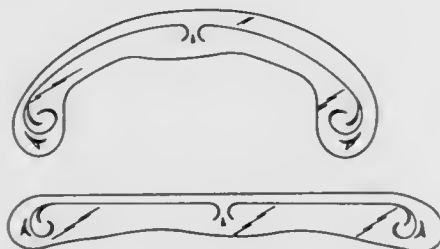
324,153
BARBECUE GRILL COVER IN THE SHAPE OF A FOOTBALL HELMET
 Robert E. Wood, 2829 Fulford St., Kalamazoo, Mich. 49001
 Filed Feb. 16, 1990, Ser. No. 481,118
 Term of patent 14 years
 U.S. Cl. D7—402



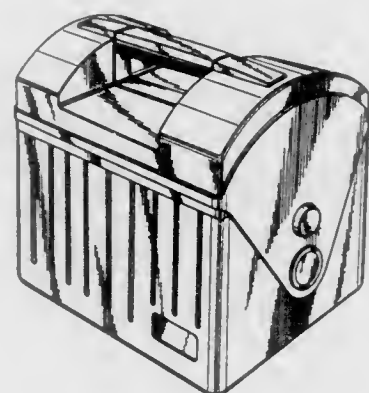
324,151
ELECTRIC DEEP FAT FRYER
 Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to Moulinex (Societe Anonyme)
 Filed Nov. 30, 1989, Ser. No. 443,382
 Claims priority, application France, Jun. 15, 1989, 89 3945
 Term of patent 14 years
 U.S. Cl. D7—354



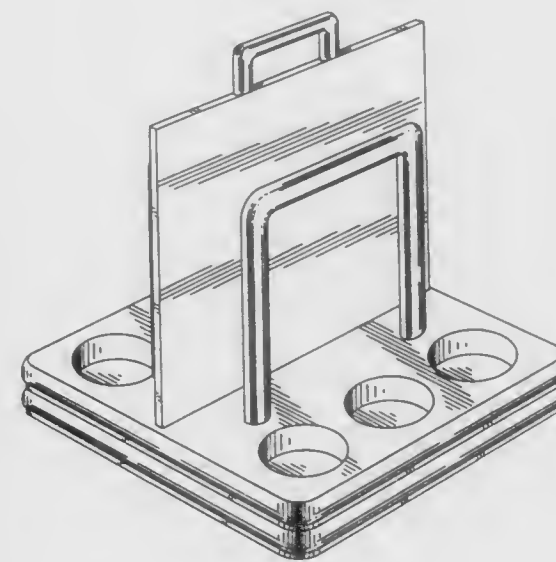
324,152
DECALCOMANIA FOR CHINA DINNERWARE OR SIMILAR ARTICLE
 Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
 Filed Apr. 4, 1988, Ser. No. 177,004
 Term of patent 14 years
 U.S. Cl. D7—396.4



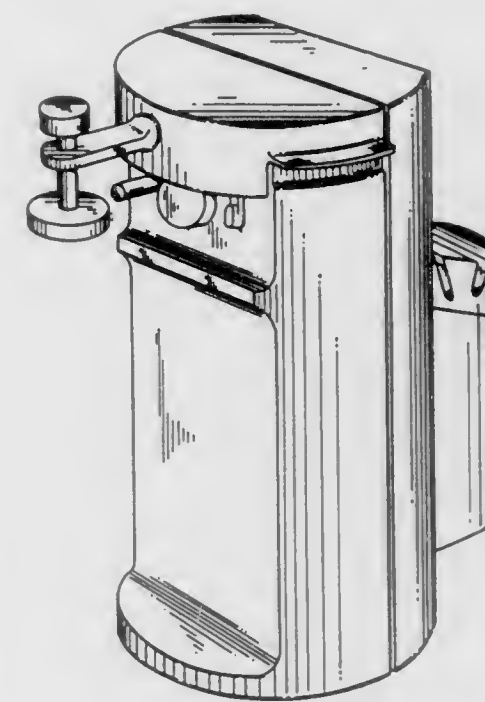
324,154
PIVOT TOP COOLER
 Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
 Filed Jul. 25, 1989, Ser. No. 385,166
 Term of patent 14 years
 U.S. Cl. D7—605



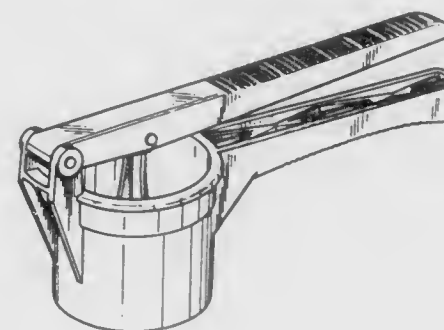
324,155
COMBINED NAPKIN HOLDER AND CONDIMENT CADDY
 Abrams Hyman, 17 Brown Cir., Paramus, N.J. 07652
 Filed Jan. 22, 1990, Ser. No. 468,789
 Term of patent 14 years
 U.S. Cl. D7—632



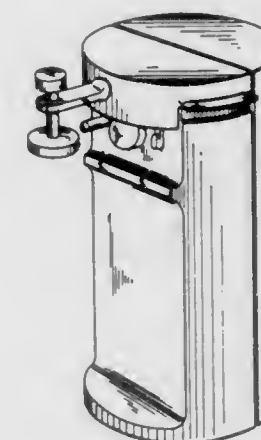
324,157
COMBINED CAN OPENER AND KNIFE SHARPENER
 Paul Gildersleve, Ridgefield, Conn., assignor to Black & Decker Inc., Newark, Del.
 Filed Mar. 28, 1990, Ser. No. 500,275
 Term of patent 14 years
 U.S. Cl. D8—35



324,156
POTATO MASHER
 So Shun, Kowloon, Hong Kong, assignor to Ki Mee Metal & Plastic Factory Ltd., Hong Kong, Hong Kong
 Filed Oct. 31, 1989, Ser. No. 429,862
 Claims priority, application United Kingdom, May 17, 1989, 1059546
 Term of patent 14 years
 U.S. Cl. D7—682



324,158
CAN OPENER
 Paul Gildersleve, Ridgefield, Conn., assignor to Black & Decker Inc., Newark, Del.
 Filed Mar. 28, 1990, Ser. No. 500,276
 Term of patent 14 years
 U.S. Cl. D8—36

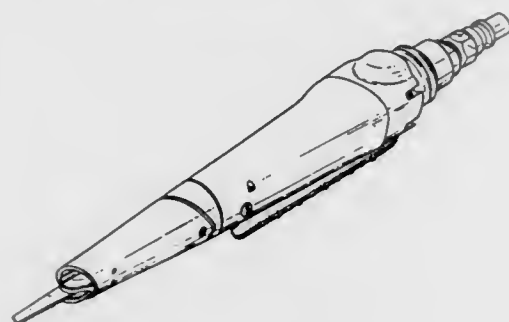


324,159
PORTABLE CUT SAW

Teruyuki Fujita, and Kenji Fukuda, both of Osaka, Japan, assignors to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan

Filed Aug. 1, 1989, Ser. No. 387,967
Term of patent 14 years

U.S. Cl. D8—64

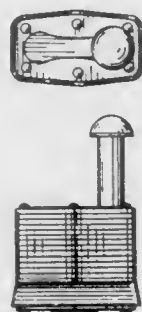


324,162
STRAIGHT-POST KEY LOCK

Horst Lebrecht, Reedsburg, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Aug. 8, 1989, Ser. No. 390,843
Term of patent 14 years

U.S. Cl. D8—331

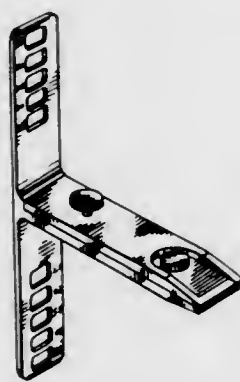


324,160
TOOL SHARPENING CLAMP

John R. Anthon, Getzville, N.Y., assignor to Great America Tool Company, Buffalo, N.Y.

Filed Sep. 8, 1989, Ser. No. 404,446
Term of patent 14 years

U.S. Cl. D8—71

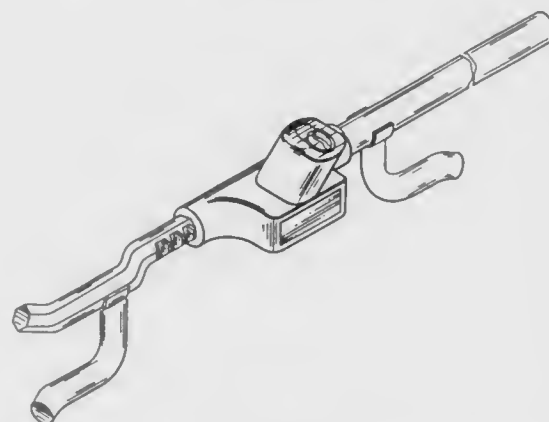


324,163
AUTOMOBILE STEERING WHEEL LOCK

Tsung I. Lo, 5th Fl., No. 76, Ai-Kuo E. Road, Taipei, Taiwan

Filed Apr. 6, 1990, Ser. No. 505,542
Term of patent 14 years

U.S. Cl. D8—331

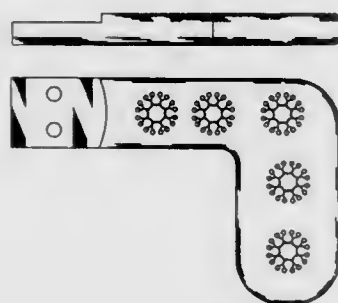


324,161
TOILET SEAT LIFT HANDLE

Mark E. MacRitchie, 180 SE. 188th St., #54, Portland, Ore. 97233

Filed Sep. 19, 1990, Ser. No. 586,583
Term of patent 14 years

U.S. Cl. D8—307

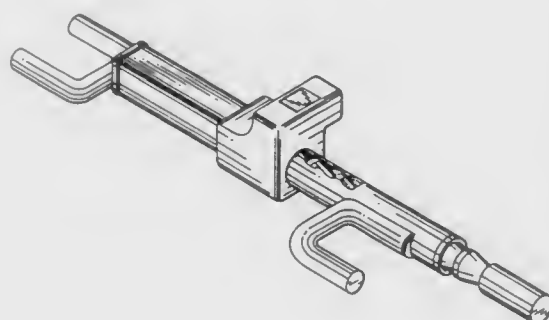


324,164
AUTOMOBILE STEERING WHEEL LOCK

Shwu-Meei Jan, No. 7-2, Alley 13, Lane 54, Sec. 2, Hsing-Nan Road, Jung-Heh, Taipei Hsien, and Hsiao-Pao Chen, No. 76, Lane 274, Jung-Jeng S. Road, Yung-Kang Shiang, Tainan Hsien, both of Taiwan

Filed Oct. 5, 1990, Ser. No. 593,632
Term of patent 14 years

U.S. Cl. D8—331



324,165
FLEXIBLE DRAW LATCH

Peter Bressler, Philadelphia, and Richard E. Schlack, Unionville, both of Pa., assignors to Southco, Inc., Concordville, Pa.

Filed Oct. 4, 1989, Ser. No. 417,005
Term of patent 14 years

U.S. Cl. D8—331

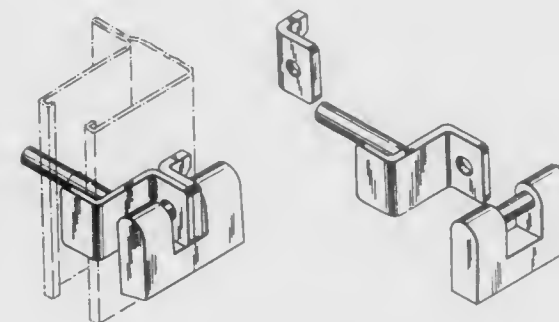


324,166
LATCH FOR ROLLING GATES

Vincent Greco, 65 Rockledge Dr., Pelham Manor, N.Y. 10803

Filed Mar. 20, 1990, Ser. No. 495,939
Term of patent 14 years

U.S. Cl. D8—331

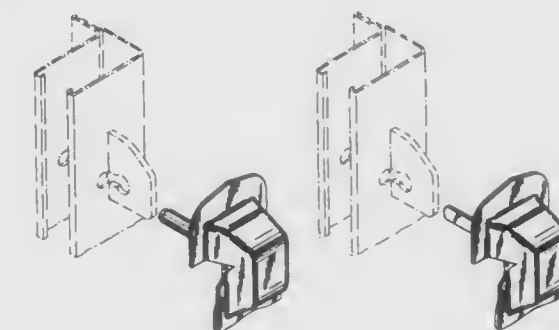


324,167
LATCH FOR ROLLING GATES

Vincent Greco, 65 Rockledge Dr., Pelham Manor, N.Y. 10803

Filed Apr. 19, 1990, Ser. No. 513,152
Term of patent 14 years

U.S. Cl. D8—331



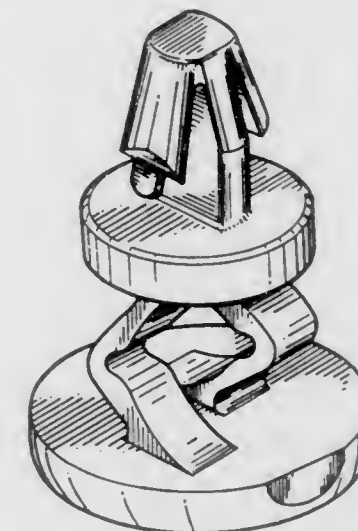
324,168
BOARD SPACER

Akio Fujioka, Ichikawa, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Division of Ser. No. 160,317, Feb. 25, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,132

Claims priority, application Japan, Jul. 3, 1987, 62-102901
Term of patent 14 years

U.S. Cl. D8—354



324,169
MALE DRIVE ROD COMPONENT

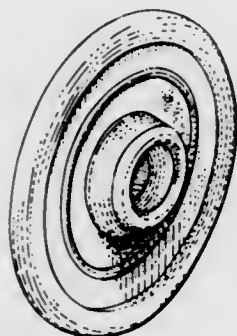
Edwin D. Hebert, Sr., Broussard, La., assignor to Mud Motors, Inc., Broussard, La.

Filed Aug. 29, 1989, Ser. No. 400,265
Term of patent 14 years

U.S. Cl. D8—382



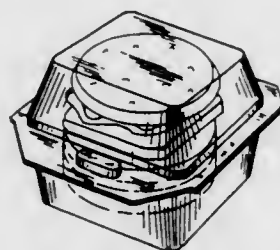
324,170
COMBINED DOOR STOP AND WALL PATCH
R. Larry Owens, 5121 E. Shore Dr., Conyers, Ga. 30208, and
Paul G. McClellan, 1795 Mackinaw Pl., Smyrna, Ga. 30080
Filed Nov. 30, 1988, Ser. No. 278,143
Term of patent 14 years
U.S. Cl. D8—402



324,171
COMBINED DIFFUSING DISPENSER AND CAP
P. Bruno Morane, Neuilly, France, assignor to L'Oreal S.A.,
France
Filed Jul. 18, 1988, Ser. No. 220,819
Claims priority, application Hague, Jan. 18, 1988,
DM/010084
Term of patent 14 years
U.S. Cl. D9—300



324,172
COMBINED PACKAGE WITH CANDY OR THE LIKE
Herbert Mederer, Furth, Fed. Rep. of Germany, assignor to
Mederer GmbH, Furth, Fed. Rep. of Germany
Filed Apr. 5, 1989, Ser. No. 334,122
Term of patent 14 years
U.S. Cl. D9—337



324,173
TWO COMPARTMENT BOTTLE
Larry G. Lynd, Canal Winchester, Ohio, assignor to Lynd Prop-
erties, Inc., Columbus, Ohio
Filed Nov. 6, 1989, Ser. No. 431,862
Term of patent 14 years
U.S. Cl. D9—347



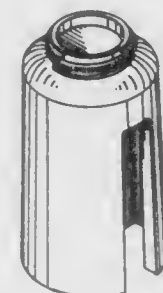
324,174
COMBINED BOTTLE AND CLOSURE
Garfield Litton, Glen Rock, N.J., assignor to Revlon, Inc., New
York, N.Y.
Filed May 25, 1990, Ser. No. 530,937
Term of patent 14 years
U.S. Cl. D9—371



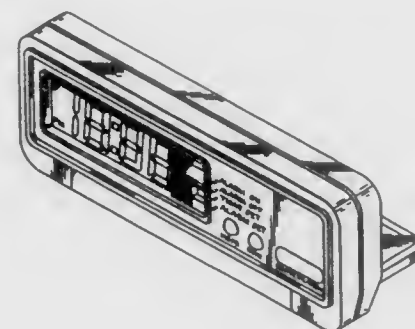
324,175
DISPENSING CLOSURE
James M. Beck, Carol Stream, Ill., assignor to Creative Packag-
ing Corp., Wheeling, Ill.
Division of Ser. No. 442,935, Nov. 29, 1989, Pat. No. Des.
319,588. This application May 24, 1991, Ser. No. 705,139
Term of patent 14 years
U.S. Cl. D9—447



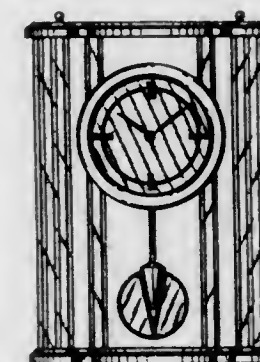
324,176
CONTAINER HOLDER
Keith D. Patterson, 224 Fifth St., Providence, R.I. 02906
Filed Feb. 13, 1989, Ser. No. 309,626
Term of patent 14 years
U.S. Cl. D9—455



324,177
CLOCK
Janice L. Tonyan, Des Plaines, and Alex Kowalenko, Barrington,
both of Ill., assignors to Spartus Corporation, Arlington
Heights, Ill.
Filed Jan. 22, 1990, Ser. No. 468,036
Term of patent 14 years
U.S. Cl. D10—18



324,178
CLOCK
Sojiro Anamizu, Tokyo, Japan, assignor to Seikosha Co., Ltd.,
Japan
Filed Jan. 31, 1990, Ser. No. 473,206
Term of patent 14 years
U.S. Cl. D10—26



324,179
CLOCK
Masumi Makoyama, and Kayoko Kato, both of Tokyo, Japan,
assignors to Seikosha Co., Ltd., Japan
Filed Dec. 29, 1989, Ser. No. 458,816
Term of patent 14 years
U.S. Cl. D10—28



324,180
CLOCK
Yoshimi Tamura, Tokyo, Japan, assignor to Seikosha Co., Ltd.,
Japan
Filed Dec. 29, 1989, Ser. No. 458,821
Term of patent 14 years
U.S. Cl. D10—28

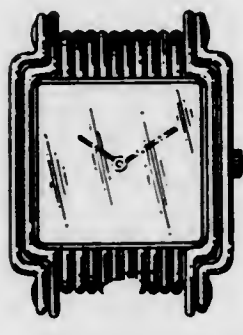


324,181
WATCH

Alain Boucheron, Paris, France, assignor to LMB - Les Montres Boucheron AG, Zug, Switzerland
Filed Feb. 27, 1989, Ser. No. 316,491
Claims priority, application France, Aug. 29, 1988, DM/011601

Term of patent 14 years

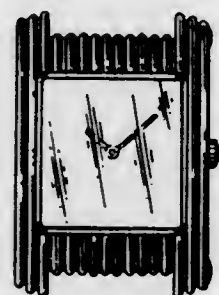
U.S. Cl. D10—39

324,182
WATCH

Alain Boucheron, Paris, France, assignor to LMB - Les Montres Boucheron AG, Zug, Switzerland
Filed Feb. 27, 1989, Ser. No. 316,492
Claims priority, application France, Aug. 29, 1988, DM/011601

Term of patent 14 years

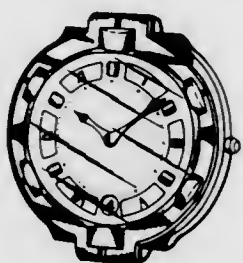
U.S. Cl. D10—39

324,183
WRISTWATCH

Shinjiro Hattori, and Sanae Ohashi, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan
Filed Aug. 18, 1989, Ser. No. 396,605

Term of patent 14 years

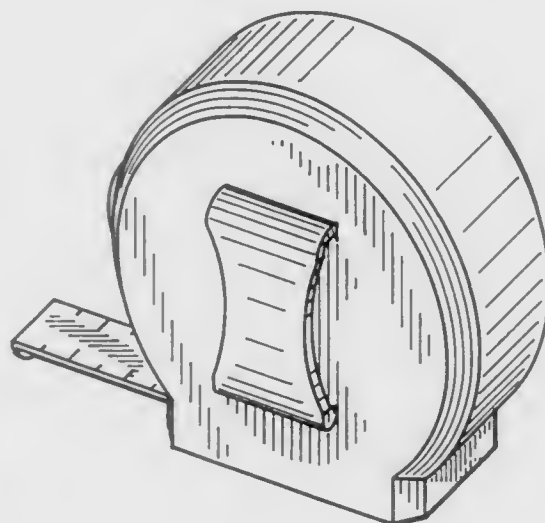
U.S. Cl. D10—39

324,184
COMBINED PENCIL SHARPENER AND MEASURING TAPE

David H. Benesh, 730 Rosemont Ave., Pacific Grove, Calif. 93950

Filed Sep. 5, 1989, Ser. No. 402,269
Term of patent 14 years

U.S. Cl. D10—72



324,185

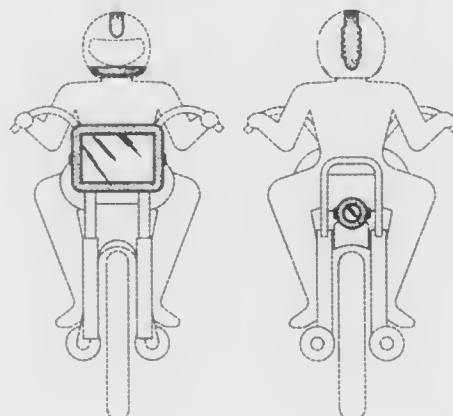
SET OF SUPPLEMENTAL REFLECTORS FOR MOTORCYCLE AND RIDER'S HELMET

Johnnie J. Cross, and LaVerne Lindsey, both of 19514 S. Sequoia Ave., Cerritos, Calif. 90701

Filed Mar. 8, 1989, Ser. No. 320,379

Term of patent 14 years

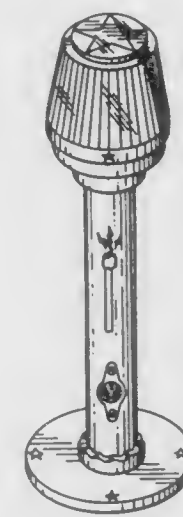
U.S. Cl. D10—111

324,186
FLASHING WARNING LIGHT

Francis J. DeFazio, 270 Cambridge Ave., Jersey City, N.J. 07307

Filed Sep. 26, 1989, Ser. No. 412,398
Term of patent 14 years

U.S. Cl. D10—114

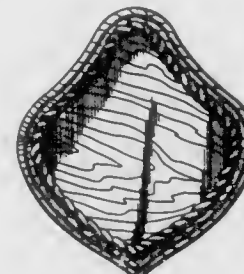
324,187
MOUNTING BASE FOR CLOCKS OR THE LIKE

John Yeh, 660 S. Aberdeen, Anaheim Hills, Calif. 92807

Filed Jul. 10, 1989, Ser. No. 377,211

Term of patent 14 years

U.S. Cl. D10—128

324,188
JEWELRY PIN

Christine Royer, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.

Filed Jun. 1, 1989, Ser. No. 361,006

The portion of the term of this patent subsequent to May 7, 2005, has been disclaimed.

Term of patent 14 years

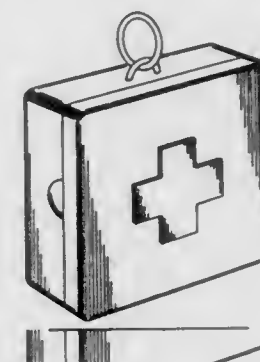
U.S. Cl. D11—75

324,189
LOCKET

Tairokuro Makoshi, 1301 S. Atlantic Blvd. #337C, Monterey Park, Calif. 91754

Filed Jul. 6, 1988, Ser. No. 215,905
Term of patent 14 years

U.S. Cl. D11—80



324,190

MODULAR NAVY SERVICE STRIPE

Andras Bende, 657 Glendale Rd., Franklin Lakes, N.J. 07417
Filed Mar. 28, 1988, Ser. No. 174,619

Term of patent 14 years

U.S. Cl. D11—95

324,191
GARDEN PLANTER

Christine Royer, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.

Filed Jun. 1, 1989, Ser. No. 361,006

The portion of the term of this patent subsequent to May 7, 2005, has been disclaimed.

Term of patent 14 years

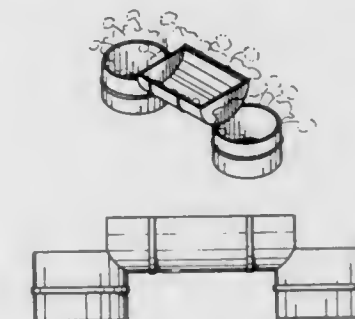
U.S. Cl. D11—75

Charles H. Abare, and Cheryl G. Abare, both of R.D. #2, Box 4008, Montpelier, Vt. 05602

Filed Apr. 5, 1990, Ser. No. 505,010

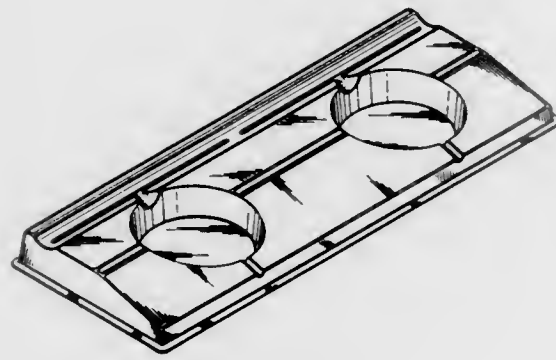
Term of patent 14 years

U.S. Cl. D11—143



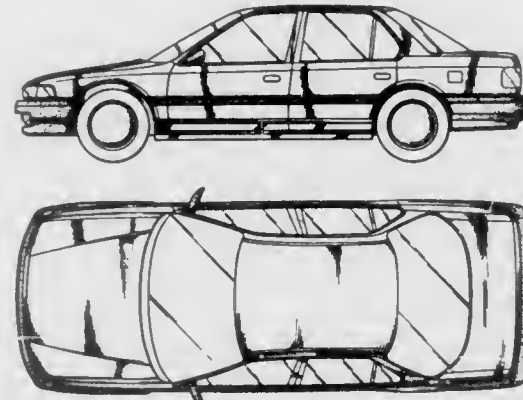
324,192
PLANT TRAY

Joe Waltel, Jr., 10 Ruland Rd., Melville, N.Y. 11747
Filed Mar. 16, 1990, Ser. No. 494,485
Term of patent 14 years
U.S. Cl. D11—164



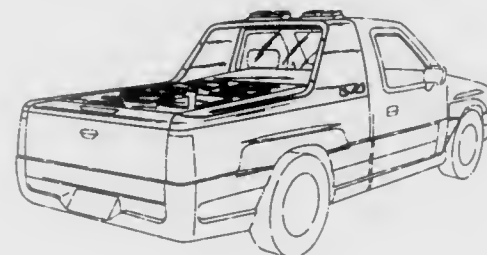
324,194
AUTOMOBILE

Toshihiko Shimizu, Saitama; Masanori Imaki; Shigeo Ueno, both of Tokyo; Yoshio Ui, Saitama; Yusuke Saitoh, Tokyo, and Iwao Honma, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 19, 1989, Ser. No. 367,119
Term of patent 14 years
U.S. Cl. D12—92



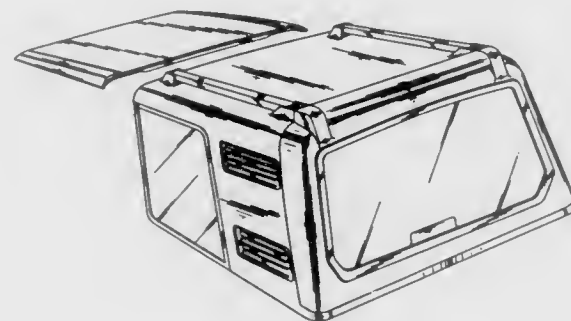
324,195

TONNEAU COVER FOR THE BED OF A PICKUP TRUCK
Toshiro Ueno, Fujisawa, Japan, assignor to Isuzu Motors Limited, Japan
Filed Jun. 6, 1989, Ser. No. 361,966
Claims priority, application Japan, Dec. 15, 1988, 63-48646
Term of patent 14 years
U.S. Cl. D12—156



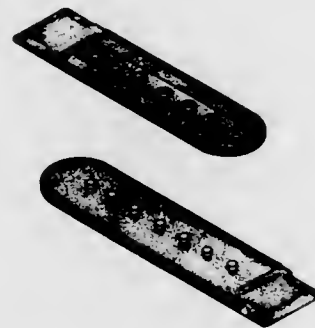
324,196

TWO PIECE REMOVABLE VEHICLE HARDTOP UNIT
Hans A. Muth, Landsberg-Pitzling, Fed. Rep. of Germany, assignor to American Suzuki Motor Corporation, Brea, Calif.
Filed Jul. 28, 1989, Ser. No. 387,099
Term of patent 14 years
U.S. Cl. D12—156



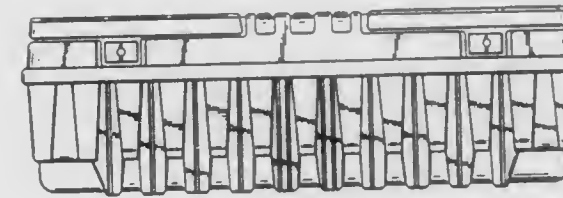
324,193

ADJUSTABLE STRAP FOR CAPS OR THE LIKE
Ho Wen-Long, No. 30-1, Ta-Chuan St., Taichung 40311, Taiwan
Filed Aug. 4, 1989, Ser. No. 389,827
Term of patent 14 years
U.S. Cl. D11—220



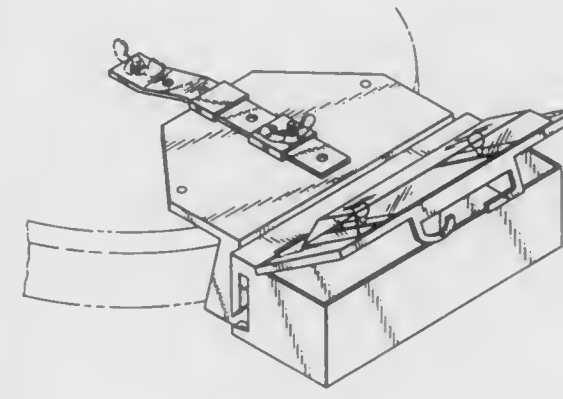
324,197
TRUCK TOOL BOX

Thomas Dickinson, St. Louis, Mo., assignor to Contico International, Inc., St. Louis, Mo.
Filed May 19, 1988, Ser. No. 196,084
Term of patent 14 years
U.S. Cl. D12—157



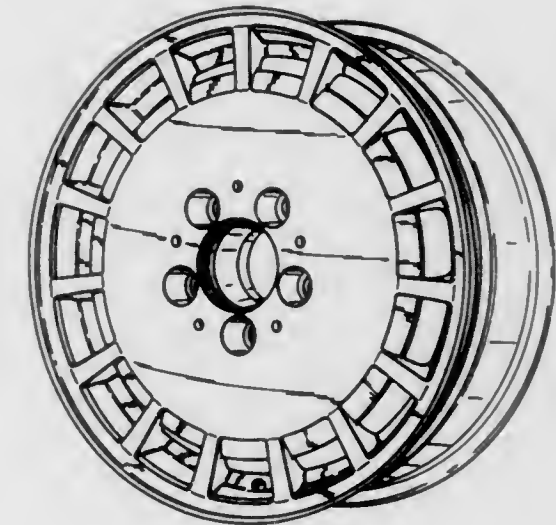
324,198

COMBINED TOOL CHEST AND RAG COMPARTMENT AND SUPPORT BRACKET FOR MOUNTING UNDER A VEHICLE HOOD
Lowell W. Sundstrom, Jr., P.O. Box 2427, Salt Lake City, Utah 84110
Filed Aug. 22, 1989, Ser. No. 397,096
Term of patent 14 years
U.S. Cl. D12—157



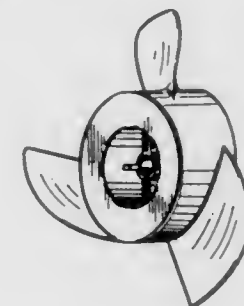
324,200
WHEEL

Manfred Lorinser, Waiblingen, Fed. Rep. of Germany, assignor to Sport-Service-Lorinser Sportliche Autoausrüstung GmbH, Waiblingen, Fed. Rep. of Germany
Filed Oct. 3, 1983, Ser. No. 538,414
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, 933; Apr. 6, 1983, 934
Term of patent 14 years
U.S. Cl. D12—211



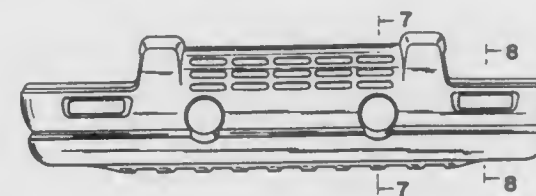
324,201

THREE-BLADE PROPELLER
R. Douglas Hannon, and George E. Lackman, both c/o Zebco Corporation, 6101 E. Apache St., Tulsa, Okla. 74115
Filed Mar. 1, 1990, Ser. No. 486,733
Term of patent 14 years
U.S. Cl. D12—214



324,199
BUMPER FOR AUTOMOBILE

Larry Abele, Cerritos, Calif., assignor to Isuzu Motors Limited, Japan
Filed Jul. 20, 1989, Ser. No. 382,326
Claims priority, application Japan, Feb. 8, 1989, 1-4108
Term of patent 14 years
U.S. Cl. D12—169



324,202

ELECTRICAL CONNECTOR HOUSING

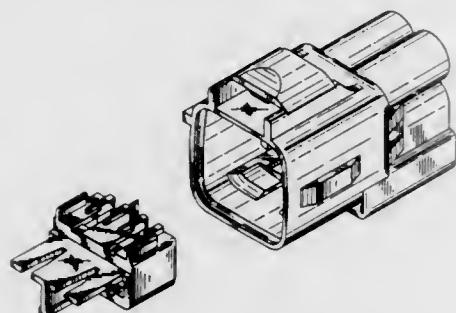
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 26, 1990, Ser. No. 470,566

Claims priority, application Japan, Jul. 31, 1989, 1-28086

Term of patent 14 years

U.S. Cl. D13—146



324,203

ELECTRICAL CONNECTOR HOUSING

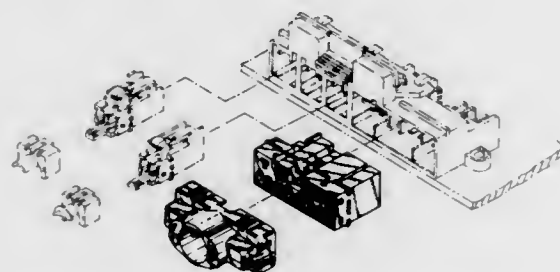
Shigemitsu Inaba, and Kazuto Ohtaka, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 453,462

Claims priority, application Japan, Jun. 22, 1989, 1-22869; Jun. 22, 1989, 1-22870

Term of patent 14 years

U.S. Cl. D13—147



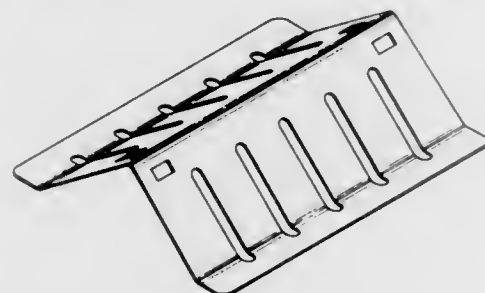
324,204

CABLE VIBRATION DAMPER OR SIMILAR ARTICLE
Curtis M. Wright, P.O. Box 83, Ellis Hill Rd., Dundee, N.Y. 14837

Filed Mar. 8, 1989, Ser. No. 323,608

Term of patent 14 years

U.S. Cl. D13—154



324,205

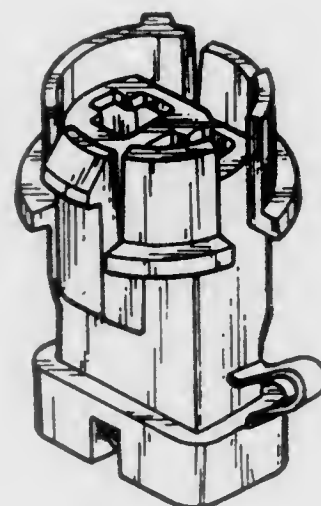
CONNECTOR HOUSING

Toshihiro Maki, Novi, and Mark S. Grant, Livonia, both of Mich., assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 16, 1989, Ser. No. 422,979

Term of patent 14 years

U.S. Cl. D24—133



324,206

ELECTRICAL CONNECTOR HOUSING

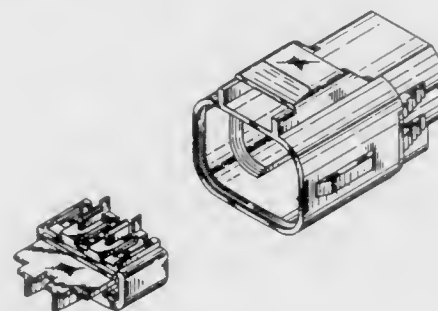
Tadahiro Sueyoshi; Masanori Tsuji; Yoshihiro Murakami; Takayuki Yamamoto; Masaru Fukuda, all of Shizuoka; Hidetaka Okabe, Toyota; Yasuhiro Nagasaka, Toyota, and Yasuo Hirayama, Toyota, all of Japan, assignors to Yazaki Corporation, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 26, 1990, Ser. No. 470,559

Claims priority, application Japan, Jul. 31, 1989, 1-28084

Term of patent 14 years

U.S. Cl. D13—147



324,207

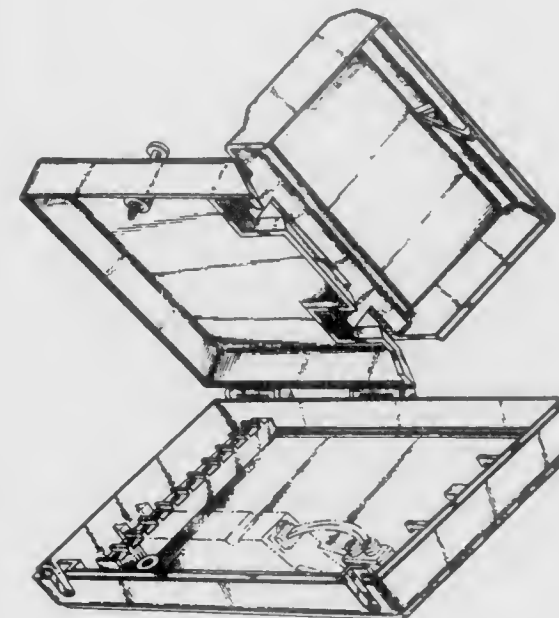
SUBSCRIBER NETWORK INTERFACE ENCLOSURE

Anthony L. Nieves, Bradley Beach, N.J., assignor to Keptel, Inc., Tinton Falls, N.J.

Filed May 15, 1989, Ser. No. 351,816

Term of patent 14 years

U.S. Cl. D13—184



324,209

READER/WRITER FOR DATA RECORDING CARDS

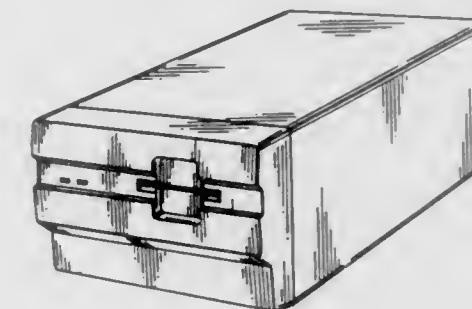
Zenya Tanabe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 29, 1988, Ser. No. 187,899

Claims priority, application Japan, Nov. 5, 1987, 62-44919

Term of patent 14 years

U.S. Cl. D14—107



324,210

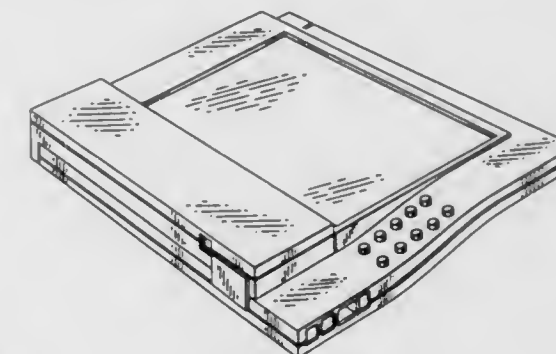
ELECTRONIC DATA DISPLAY PANEL FOR USE WITH AN OVERHEAD PROJECTOR

Sohrab Vossoughi; Christopher A. Alviar, both of Portland; Steven R. Hix, Lake Oswego, and Paul E. Gulick, Tualatin, all of Oreg., assignors to In Focus Systems, Inc., Tualatin, Oreg.

Filed Nov. 17, 1988, Ser. No. 272,686

Term of patent 14 years

U.S. Cl. D14—113



324,208

DATA INPUT AND OUTPUT TERMINAL

Hiroshi Sakaguchi, and Kenji Ohta, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

Filed Jun. 22, 1990, Ser. No. 543,562

Claims priority, application Japan, Dec. 22, 1989, 1-47017

Term of patent 14 years

U.S. Cl. D14—100



324,211

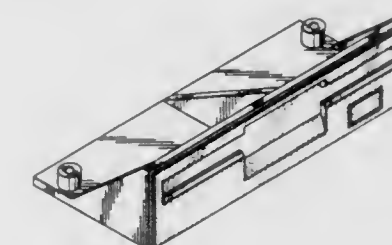
COMPUTER PANEL OR SIMILAR ARTICLE

Tai-Seng Lam, Taipei, Taiwan, assignor to Flytech Technology Co., Ltd., Taipei, Taiwan

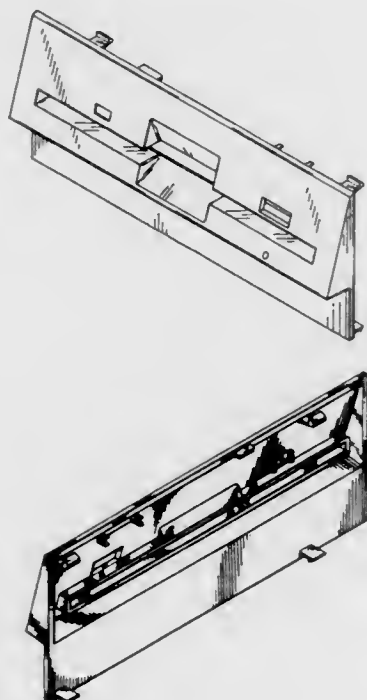
Filed Dec. 20, 1989, Ser. No. 453,475

Term of patent 14 years

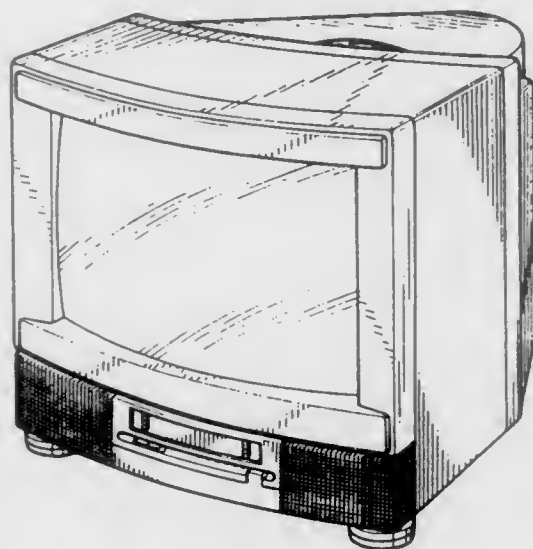
U.S. Cl. D14—115



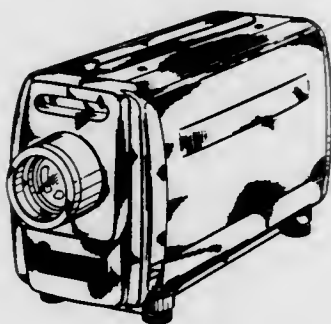
324,212
REDUCED HEIGHT FLOPPY DISC DRIVE BEZEL
 Vincent S. Garmon, Boynton Beach, and Graham M. White,
 Boca Raton, both of Fla., assignors to International Business
 Machines Corp., Armonk, N.Y.
 Filed May 18, 1990, Ser. No. 525,438
 Term of patent 14 years
 U.S. Cl. D14—115



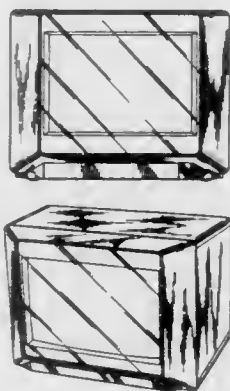
324,214
**COMBINED TELEVISION RECEIVER AND VIDEO
 CASSETTE RECORDER**
 Jae S. Jo, Seouli, Rep. of Korea, assignor to Gold Star Co., Ltd.,
 Seoul, Rep. of Korea
 Filed Jun. 25, 1990, Ser. No. 543,183
 Claims priority, application Rep. of Korea, Jan. 15, 1990,
 494/1990[U]
 Term of patent 14 years
 U.S. Cl. D14—129



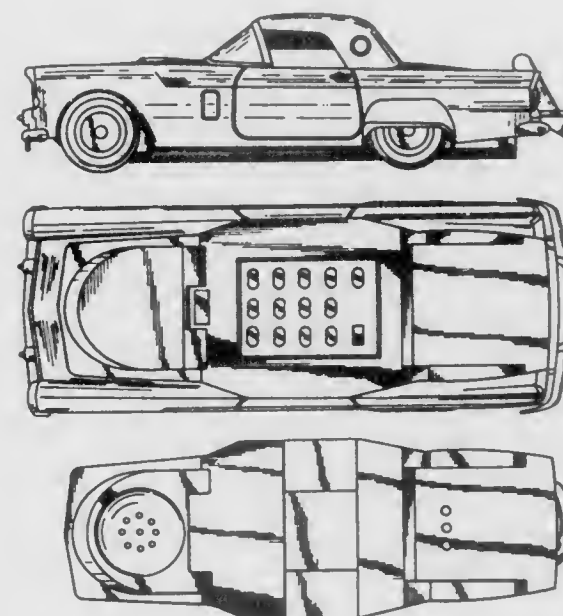
324,213
**COMBINED VIDEO PROJECTOR AND TELEVISION
 TUNER**
 Shinichi Otsuki, Nara, Japan, assignor to Sanyo Electric Co.,
 Ltd., Osaka, Japan
 Filed Aug. 23, 1990, Ser. No. 572,096
 Claims priority, application Japan, Feb. 28, 1990, 2-6509
 Term of patent 14 years
 U.S. Cl. D14—128



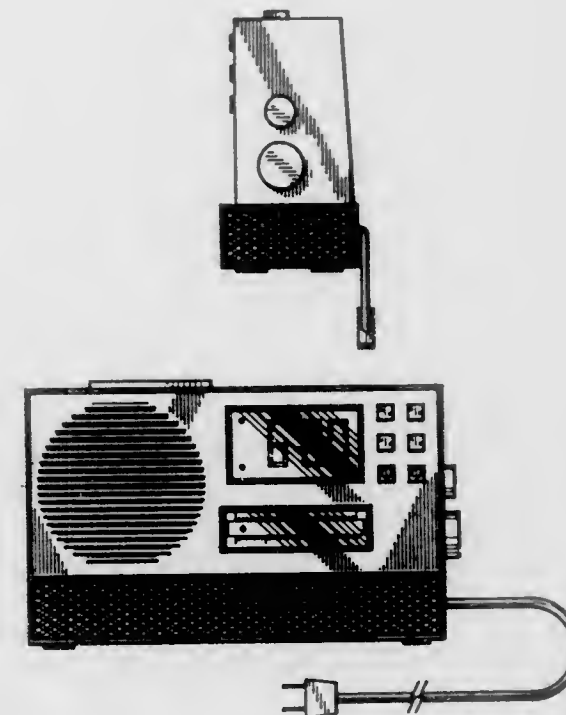
324,215
COMBINED TELEVISION RECEIVER AND MONITOR
 Hideki Kawai, Machida, Japan, assignor to Canon Kabushiki
 Kaisha, Tokyo, Japan
 Filed Aug. 24, 1990, Ser. No. 572,109
 Claims priority, application Japan, Mar. 6, 1990, 2-7398
 Term of patent 14 years
 U.S. Cl. D14—129



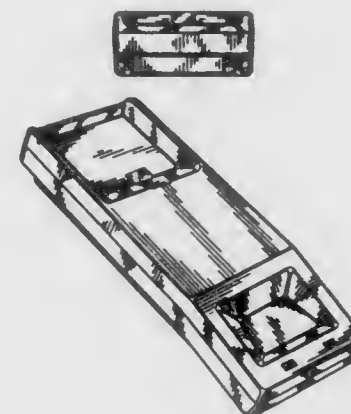
324,216
AUTOMOBILE TELEPHONE SET
 Kash Gobindram, Ronkonkoma, N.Y., assignor to Kash 'N Gold,
 Ltd., Ronkonkoma, N.Y.
 Filed Apr. 29, 1991, Ser. No. 692,478
 Term of patent 14 years
 U.S. Cl. D14—143



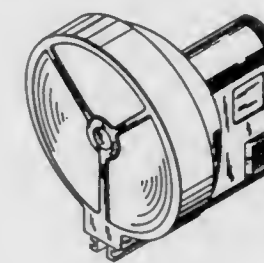
324,218
CLOCK RADIO
 Reyes V. Ruiz, P.O. Box 94, La Verne, Calif. 91750
 Filed Sep. 2, 1988, Ser. No. 239,961
 Term of patent 14 years
 U.S. Cl. D14—171



324,217
**PARKING UNIT FOR A PORTABLE TELEPHONE OR
 SIMILAR ARTICLE**
 Michael Suckley, Southampton, England, assignor to Orbitel
 Mobile Communications Limited, Bracknell, England
 Filed Apr. 18, 1990, Ser. No. 510,815
 Claims priority, application United Kingdom, Oct. 19, 1989,
 2001825
 Term of patent 14 years
 U.S. Cl. D14—148



324,219
**COMBINED MICROPHONE AND PARABOLIC
 REFLECTOR**
 Joseph C. Besasie, Shorewood, Wis., assignor to Silver Creek
 Nurseries, Inc., Manitowoc, Wis.
 Filed May 30, 1989, Ser. No. 359,051
 Term of patent 14 years
 U.S. Cl. D14—225



324,220

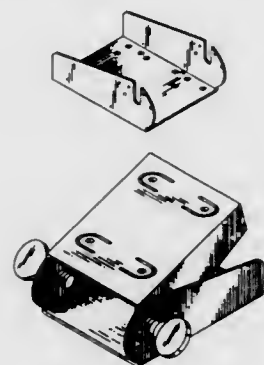
CLAM SHELL MOUNT

Jack Evans, and Allen DeMarre, both of Fountain Valley, Calif., assignors to Cellular I.C. Corp., Mokena, Ill.

Filed Oct. 30, 1989, Ser. No. 428,747

Term of patent 14 years

U.S. Cl. D14—253



324,221

INTERNAL COMBUSTION ENGINE

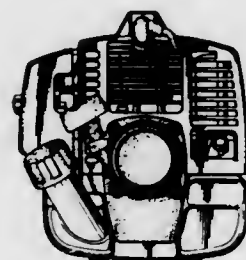
Katsumi Kiyooka, Togane, and Kaori Katoh, Chiba, both of Japan, assignors to Maruyama Mfg. Co., Inc., Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 390,917

Claims priority, application Japan, Feb. 14, 1989, 1-5116; Feb. 14, 1989, 1-5117

Term of patent 14 years

U.S. Cl. D15—1



324,222

SECONDARY CONTAINMENT FUEL PUMP BOX

Frank C. Marchica, East Meadow, N.Y., assignor to Environmental Protection Products, Inc., N.J.

Filed Sep. 22, 1989, Ser. No. 411,573

Term of patent 14 years

U.S. Cl. D15—9.1



324,223

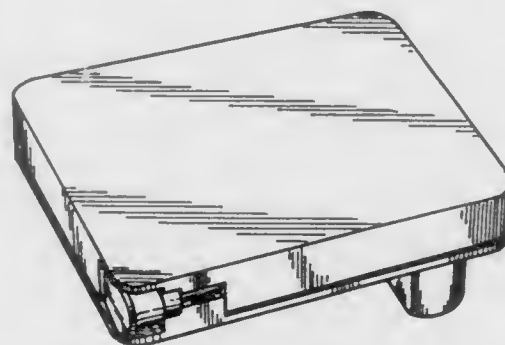
FOOT CONTROLLER FOR SEWING MACHINE

Nobufusa Kuroki, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed May 25, 1990, Ser. No. 529,178

Term of patent 14 years

U.S. Cl. D15—72



324,224

DRILL SHARPENER

Mu-Yen Chlen, 45 Szu-Wei Street, Taichung, Taiwan, Taiwan

Filed Aug. 17, 1989, Ser. No. 394,855

Term of patent 14 years

U.S. Cl. D15—122



324,225

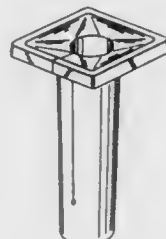
MOLD FORM OR SIMILAR ARTICLE

Howard D. Speer, Marriottsville, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 7, 1987, Ser. No. 82,711

Term of patent 14 years

U.S. Cl. D15—136



324,226

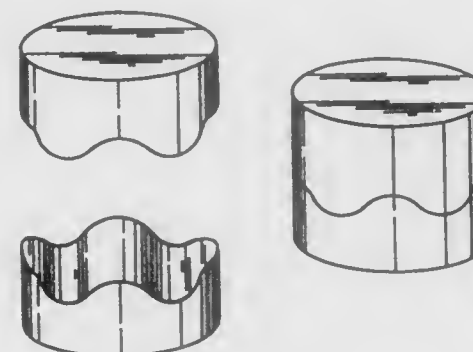
INTERLOCKING MOUNTED ABRASIVE COMPACTS

Ronald L. Frazee, Powell, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Apr. 3, 1989, Ser. No. 332,814

Term of patent 14 years

U.S. Cl. D15—139



324,229

CAMERA

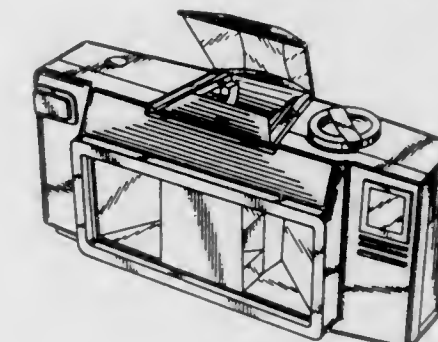
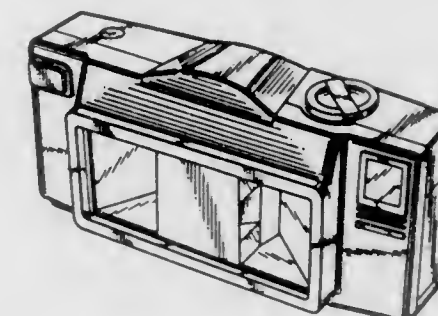
Anthony Lo, 12A Olympian Mansion, 9 Conduit Road, Hong Kong, Hong Kong

Filed May 4, 1989, Ser. No. 347,324

Claims priority, application United Kingdom, Nov. 5, 1988, 1054797

Term of patent 14 years

U.S. Cl. D16—209



324,227

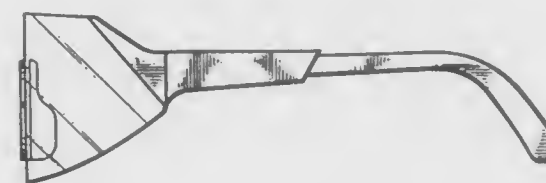
SUNGLASSES

Ronald W. Longsdorf, 1123 N. Flores, West Hollywood, Calif. 90069, and Jon Wong, 4137 E. Third St., #1, Long Beach, Calif. 90184

Filed Jan. 16, 1990, Ser. No. 465,877

Term of patent 14 years

U.S. Cl. D16—102



324,230

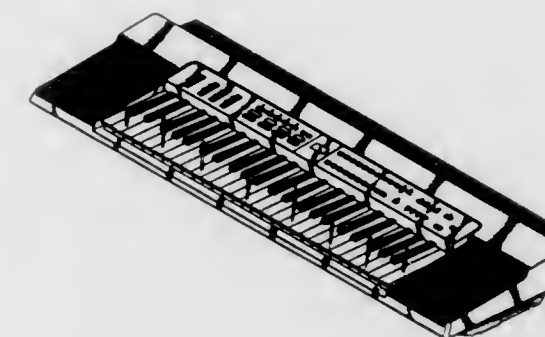
ELECTRONIC MUSIC KEYBOARD

Yoshitaka Naitoh, Ohme, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,329

Term of patent 14 years

U.S. Cl. D17—1



324,228

SPECTACLES

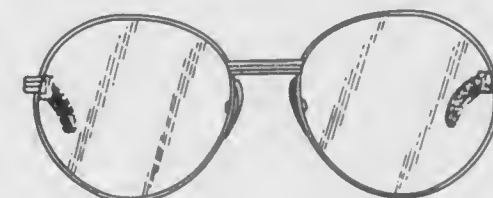
Alain-Dominique Perrin, Ruell-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Nov. 16, 1990, Ser. No. 614,759

Claims priority, application France, May 18, 1990, 90 3216

Term of patent 14 years

U.S. Cl. D16—102



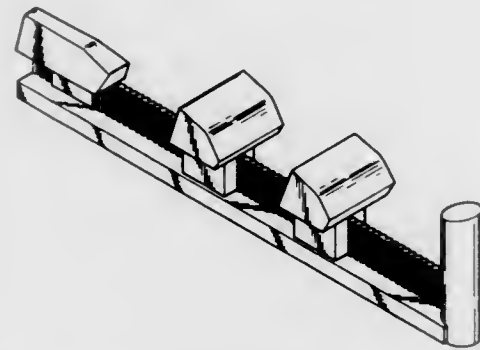
324,231

KEY UNIT FOR KEYBOARD MUSICAL INSTRUMENT
Noritaka Mutoh, 27-13-603, Sendagaya 4-chome, Shibuya-ku,
Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 538,402

Term of patent 14 years

U.S. Cl. D17—9



324,234

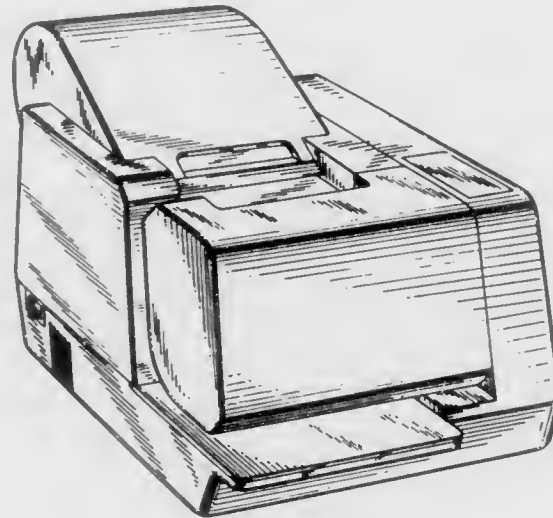
PRINTER FOR ELECTRONIC COMPUTER
Mitsuo Tanaka, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 12, 1989, Ser. No. 420,399

Claims priority, application Japan, Apr. 27, 1989, 1-15905

Term of patent 14 years

U.S. Cl. D18—54



324,232

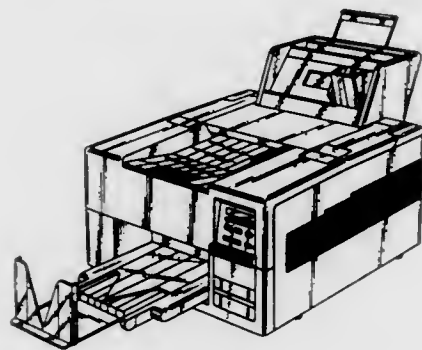
LASER BEAM PRINTER

Peter A. Ronzani, Los Gatos, Calif., assignor to Vistron, Inc.,
Cupertino, Calif. and Matsushita Kotobuki Electronics Industries Ltd., Takamatsu, Japan

Filed Oct. 31, 1990, Ser. No. 607,066

Term of patent 14 years

U.S. Cl. D18—55



324,235

COMBINED PEN AND FLASHLIGHT

Elaine A. Moore, 82 Pinta Cir., Springfield, Mass. 01104

Filed May 26, 1989, Ser. No. 357,308

Term of patent 14 years

U.S. Cl. D19—36



324,233

PRINTER

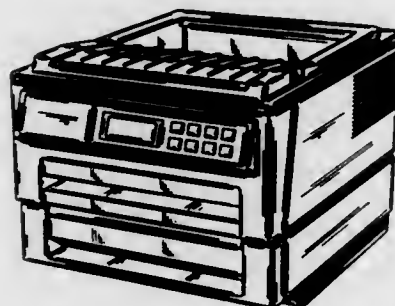
Shuzo Sawa, and Mikio Kosako, both of Osaka, Japan, assignors
to Sharp Corporation, Osaka, Japan

Filed Sep. 5, 1989, Ser. No. 403,150

Claims priority, application Japan, Jun. 3, 1989, 1-8302

Term of patent 14 years

U.S. Cl. D18—54



324,236

PEN

Francine Gomez, Rueil-Malmaison, France, assignor to Waterman S.A., Paris, France

Filed Jan. 6, 1989, Ser. No. 294,493

Claims priority, application France, Aug. 12, 1988, 885170

Term of patent 14 years

U.S. Cl. D19—48



324,238

WRITING INSTRUMENT

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation,
Yokohama, Japan

Filed Nov. 9, 1989, Ser. No. 434,055

Claims priority, application Japan, May 24, 1989, 1-18661

Term of patent 14 years

U.S. Cl. D19—49



324,239

VERTICAL HOLDER

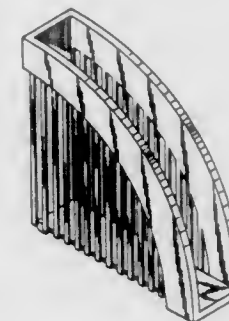
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Confon AG, Reineck, Switzerland

Filed Feb. 14, 1990, Ser. No. 479,710

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 8906005

Term of patent 14 years

U.S. Cl. D19—90



324,237

BALL-POINT PEN

Francine Gomez, Rueil-Malmaison, France, assignor to Waterman S.A., Paris, France

Filed Jan. 6, 1989, Ser. No. 294,494

Claims priority, application France, Aug. 12, 1988, 88 5170

Term of patent 14 years

U.S. Cl. D19—48



324,240

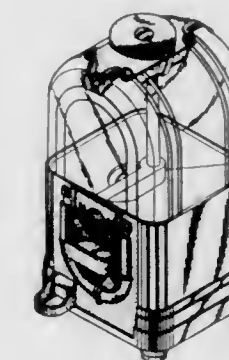
CANDY VENDING MACHINE OR SIMILAR ARTICLE

Ying-Chueh Huang, Tainan Hsien, Taiwan, assignor to New Chien Day Enterprise Co., Ltd., Tainan Hsien, Taiwan

Filed Jan. 4, 1990, Ser. No. 461,105

Term of patent 14 years

U.S. Cl. D20—3



324,241

ADVERTISEMENT PILLAR OR SIMILAR ARTICLE

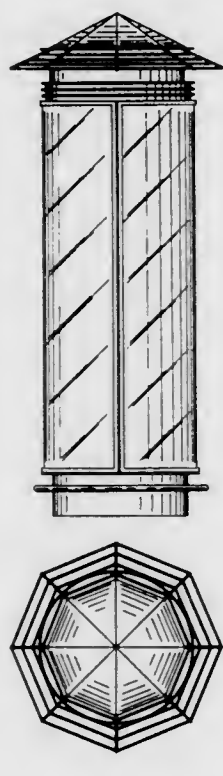
Alexander Von Canal, Koblenz, Fed. Rep. of Germany, assignor to DPW Deutsche Plakatwerbung GmbH & Co., Koblenz, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,835

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 8803065

Term of patent 14 years

U.S. Cl. D20—10



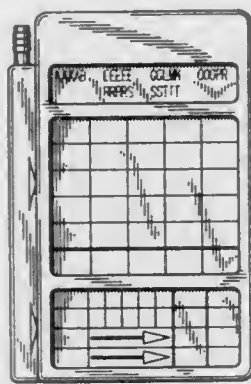
324,243

WORD GAME

Colin P. W. Meggison, San Francisco 326, Apdo. 402, Col., Del Valle, Mexico DF CP 03100

Filed Nov. 7, 1989, Ser. No. 432,972

Term of patent 14 years



324,244

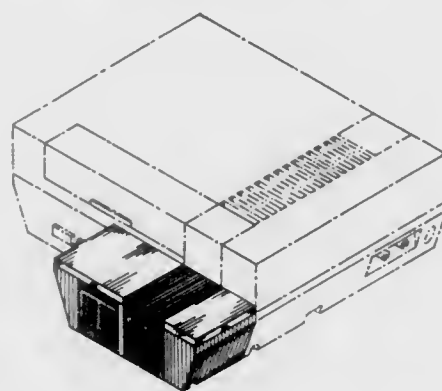
ADAPTER HOUSING FOR A VIDEO GAME CONTROL DECK

Christopher Stamper, Twycross, and Timothy Stamper, De La Zousch, both of United Kingdom, assignors to Nintendo of America Inc., Redmond, Wash.

Filed Feb. 22, 1989, Ser. No. 314,665

Term of patent 14 years

U.S. Cl. D21—48



324,242

RANDOM NUMBER SELECTOR

Richard C. Reheis, 328 Academy St., So. Orange, N.J. 07079

Filed Nov. 24, 1989, Ser. No. 441,088

Term of patent 14 years

U.S. Cl. D21—37



324,245

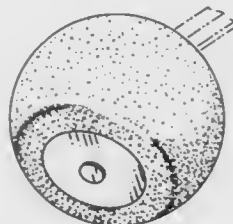
WHEEL FOR TOY VEHICLES

Christopher B. Wright, 2299 Pacific Ave., San Francisco, Calif. 94115

Filed Mar. 19, 1990, Ser. No. 495,216

Term of patent 14 years

U.S. Cl. D21—141



324,246

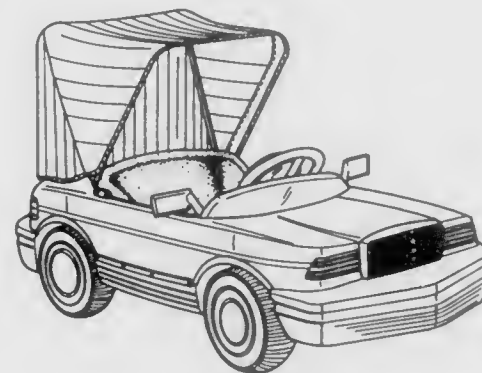
TOY CONVERTIBLE CAR

Yang Ching-Tien, 70, PeiHwei, HweiGuei Village, Shoei Shang Shiang, ChiaYi Hsien, Taiwan

Filed Feb. 26, 1990, Ser. No. 484,667

Term of patent 14 years

U.S. Cl. D21—78



324,247

INFLATABLE TOY

Harold Goldblatt, 3240 N. Lakeshore Dr., Chicago, Ill. 60657

Filed Aug. 2, 1988, Ser. No. 227,592

Term of patent 14 years

U.S. Cl. D21—84



324,249

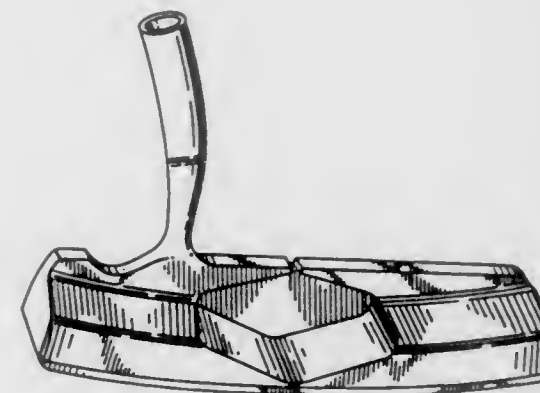
PUTTER HEAD

Douglas L. Dahle, Springdale, Ark., assignor to Aristocrat Manufacturing Company, Springdale, Ark.

Filed May 16, 1989, Ser. No. 352,485

Term of patent 14 years

U.S. Cl. D21—219



324,250

GOLF PUTTER

W. Bonham Magness, 902 Frostwood, Suite 300, Houston, Tex. 77024-2442

Filed Mar. 22, 1991, Ser. No. 673,503

Term of patent 14 years

U.S. Cl. D21—219



324,248

ANIMAL STYLIZED BASKET TOY

Kae S. Park, 3156-4 Sangdaewon 2-Dong, Sungnam-Si, Kyungki-Do, Rep. of Korea

Filed Jun. 23, 1989, Ser. No. 370,571

Claims priority, application Rep. of Korea, Dec. 26, 1988, DES88-17576

Term of patent 14 years

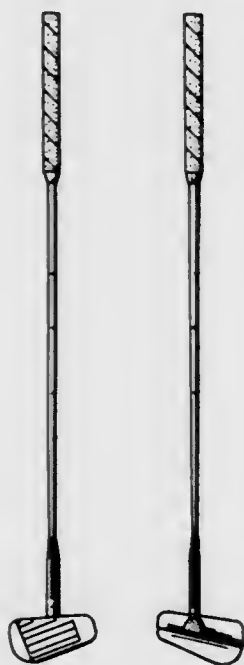
U.S. Cl. D21—187



324,251

GOLF CLUB

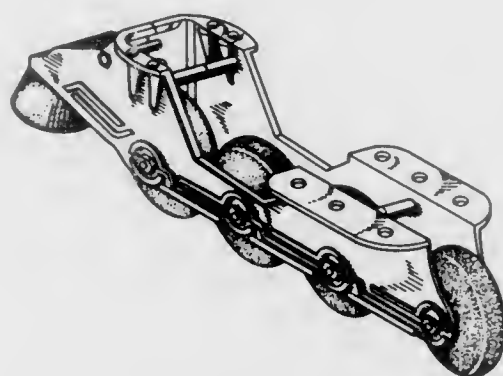
Dennis J. Morrisseau, 25 Bayview St., Burlington, Vt. 05401
 Filed Sep. 20, 1989, Ser. No. 409,866
 Term of patent 14 years
 U.S. Cl. D21—220



324,253

ROLLER SKATE

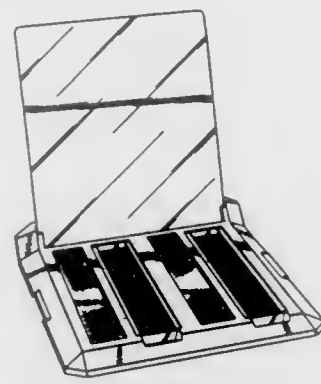
Mike Soo, No. 403 Chung Shan Rd., Jen Teh Hsiang, Tainan Hsien, Taiwan
 Filed Dec. 18, 1990, Ser. No. 631,074
 Term of patent 14 years
 U.S. Cl. D21—226



324,254

CANTING SIMULATOR

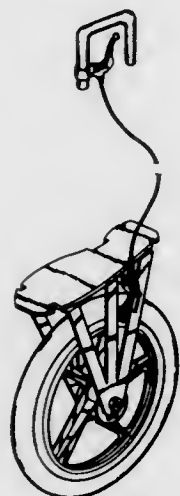
Louis Benoit, Frangy, France, assignor to Salomon S.A., Annecy Cedex, France
 Filed Mar. 29, 1989, Ser. No. 330,094
 Claims priority, application Beneiux, Oct. 3, 1988, DM/011 881
 Term of patent 14 years
 U.S. Cl. D21—229



324,252

UNICYCLE ROLLER SKATE

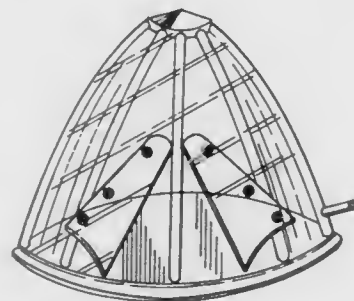
Lawrence J. Williamson, 15254 Promenade, Detroit, Mich. 48224
 Filed May 14, 1990, Ser. No. 522,967
 Term of patent 14 years
 U.S. Cl. D21—226



324,255

INFLATABLE SURVIVAL TENT

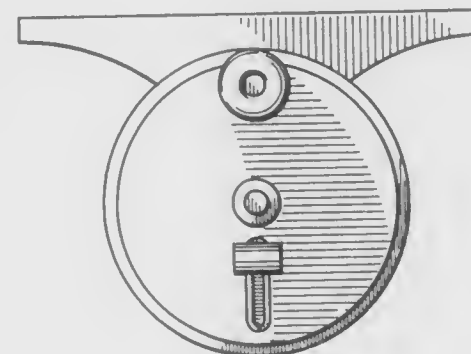
Deborah Branton, 8115 Medill Ave., El Cajon, Calif. 92021
 Filed Jul. 13, 1989, Ser. No. 379,537
 Term of patent 14 years
 U.S. Cl. D21—253



324,256

FISHING REEL

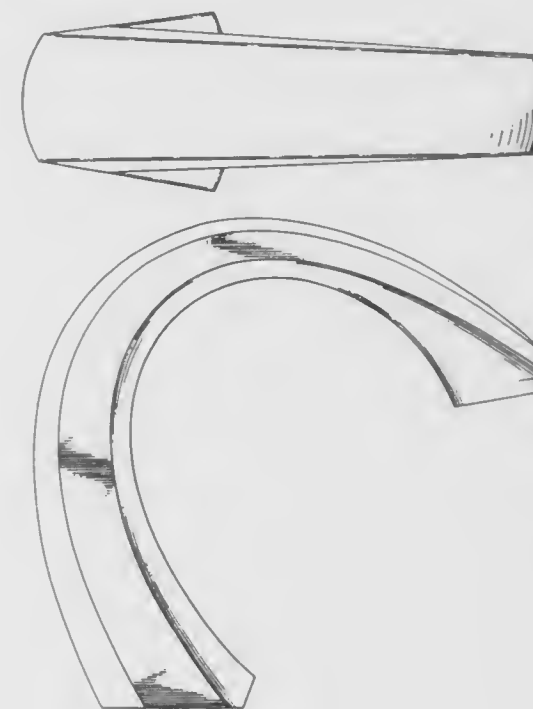
John R. B. Poe, 418 Marilyn Dr., Pearl, Miss. 39208, and Ricky Porter, Rte. 2, Box 19, Pickens, Miss. 39146
 Filed Oct. 26, 1989, Ser. No. 426,687
 Term of patent 14 years
 U.S. Cl. D22—140



324,259

SPOUT FOR PLUMBING FIXTURE

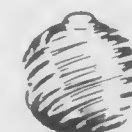
Holly K. Yost, Santa Monica, Calif., assignor to Emhart Inc., Newark, Del.
 Filed Jan. 14, 1988, Ser. No. 144,395
 Term of patent 14 years
 U.S. Cl. D23—255



324,257

KNOB

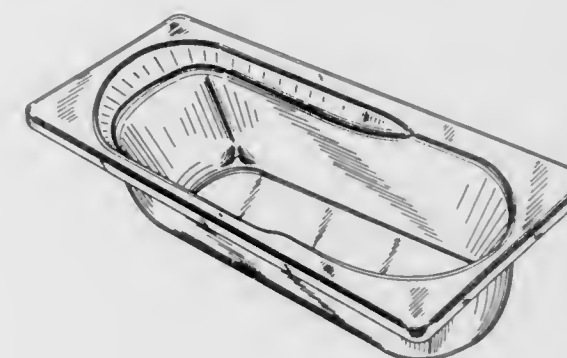
Manfred Rademacher, Peter Roos, Str. 6, 4000 Dusseldorf, Fed. Rep. of Germany
 Continuation of Ser. No. 351,676, May 12, 1989, abandoned.
 This application May 31, 1989, Ser. No. 359,832
 Claims priority, application Fed. Rep. of Germany, Nov. 14, 1988, 8803249
 Term of patent 14 years
 U.S. Cl. D23—250



324,260

BATHTUB

Henry M. Stairs, Jr., Ligonier, Pa., assignor to American Standard Inc., New York, N.Y.
 Filed Apr. 17, 1989, Ser. No. 339,431
 Term of patent 14 years
 U.S. Cl. D23—281



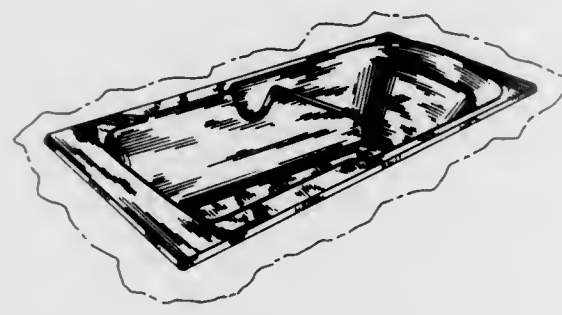
324,258

Patent Not Issued For This Number

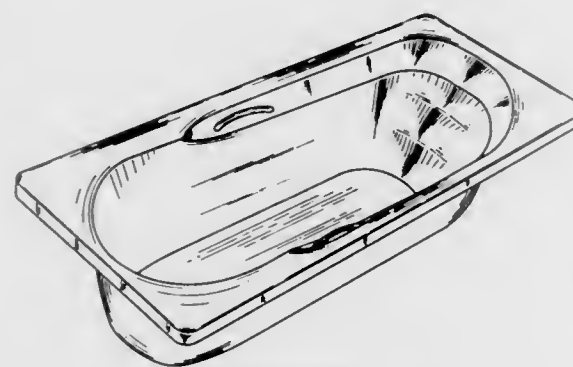
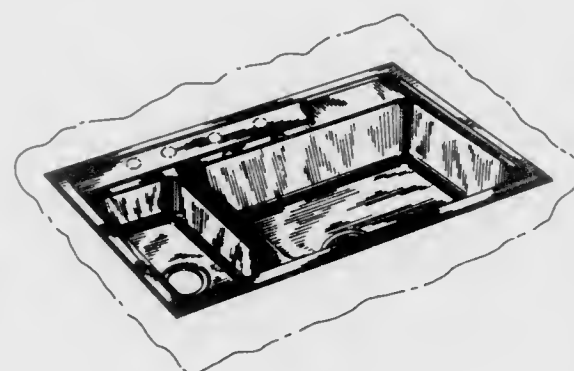
324,261

TUB SHELL OR THE LIKE

Roger J. Yvetot, Conflans Saint Honorine, France, assignor to Jacob Delafon, Paris, France
 Filed Aug. 24, 1989, Ser. No. 398,363
 Term of patent 14 years
 U.S. Cl. D23—281

324,262
BATHTUB

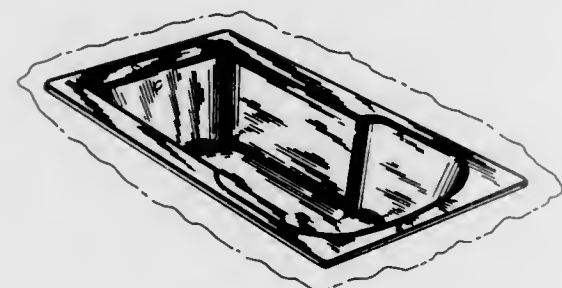
Henry M. Stairs, Jr., Ligonier, Pa., assignor to American Standard Inc., New York, N.Y.
 Filed Sep. 8, 1989, Ser. No. 404,973
 The portion of the term of this patent subsequent to Feb. 25, 2006, has been disclaimed.
 Term of patent 14 years
 U.S. Cl. D23—281



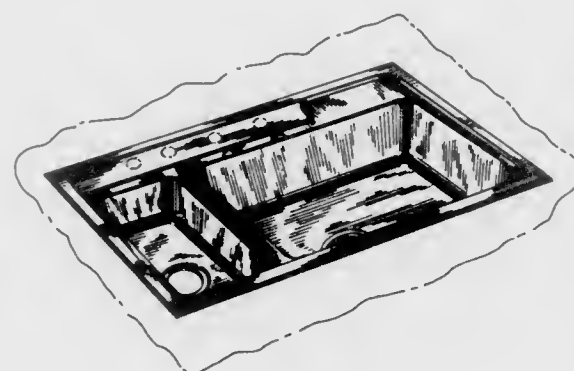
324,263

TUB OR THE LIKE

Herbert V. Kohler, Jr., Kohler, and Mary J. Reid, Sheboygan, both of Wis., Roger J. Yvetot, St. Honorine, France, assignors to Jacob Delafon, Paris, France
 Term of patent 14 years
 U.S. Cl. D23—281

324,264
SINK

Bruce M. Sauter, Schaumburg, Ill., and Raymond A. Dickson, Jr., Searcy, Ark., assignors to Kohler Co., Kohler, Wis.
 Filed Mar. 30, 1989, Ser. No. 331,575
 The portion of the term of this patent subsequent to Feb. 11, 2006, has been disclaimed.
 Term of patent 14 years
 U.S. Cl. D23—290



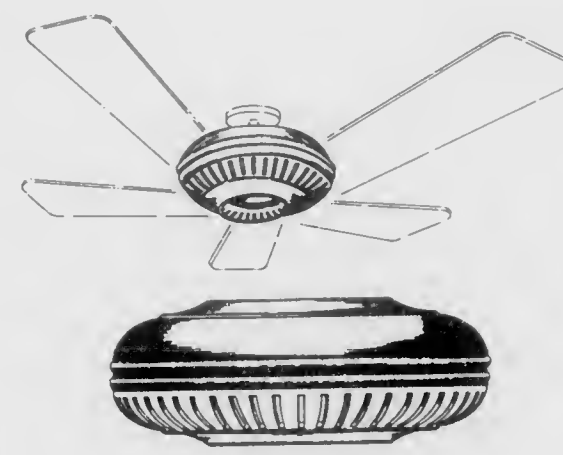
324,265
 LIQUID HEATER WHICH OPERATES ON SOLAR ENERGY OR ANY OTHER ENERGY SOURCE
 Mark G. Fleming, and David C. Collins, both of Victoria, Australia, assignors to Siddons Ramset Limited, Victoria, Australia
 Filed Feb. 8, 1989, Ser. No. 307,714
 Claims priority, application Australia, Aug. 9, 1988, 2668/88
 Term of patent 14 years
 U.S. Cl. D23—318



324,266

CEILING FAN MOTOR HOUSING

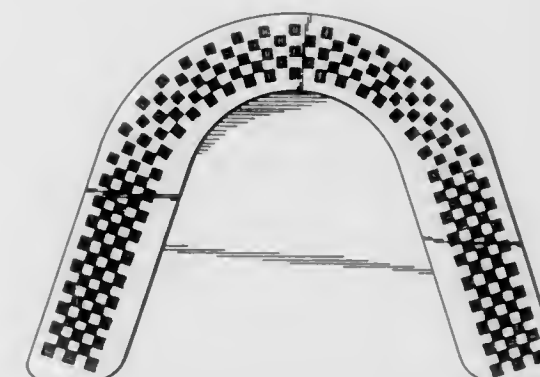
Richard M. Holbrook, Redondo Beach, Calif., assignor to Casa-blanca Fan Company, Inc., City of Industry, Calif.
 Filed Apr. 30, 1990, Ser. No. 516,835
 Term of patent 14 years
 U.S. Cl. D23—411



324,268

ANCHORING PLATE FOR DENTAL POSTS

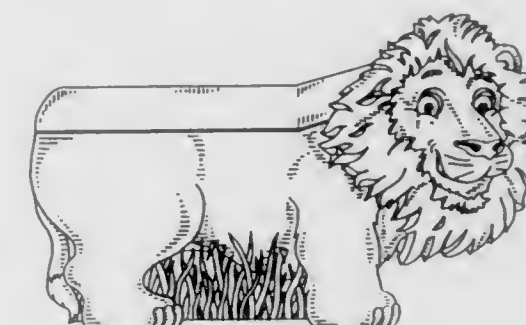
Martin Nordqvist, Södra vägen 4, S-871 40 Härnösand, Sweden
 Filed Oct. 17, 1989, Ser. No. 423,098
 Term of patent 14 years
 U.S. Cl. D24—176



324,269

EXAMINATION TABLE

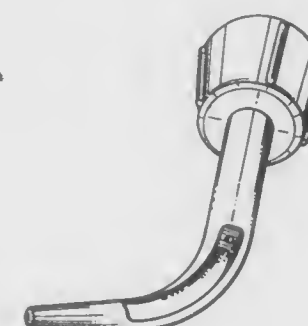
Ann M. Kochsiek, 1624 Brooks Ave., Maplewood, Minn. 55109
 Filed Mar. 26, 1990, Ser. No. 498,933
 Term of patent 14 years
 U.S. Cl. D24—123



324,267

DISPOSABLE DENTAL TIP FOR MEASURING GUM POCKETS

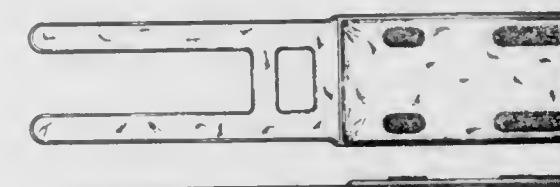
Rikard Smitt, Malmö, Sweden, assignor to Samhall Pile, Malmö, Sweden
 Filed Oct. 5, 1989, Ser. No. 417,677
 Claims priority, application Sweden, Apr. 10, 1989, 89-0915
 Term of patent 14 years
 U.S. Cl. D24—112



324,270

COLD PACK

Mark W. Raya; James M. Brodsky, and Lisa M. Raya, all of Villa Park, Calif., assignors to Medical Specialties of Calif., Inc., Villa Park, Calif.
 Filed May 1, 1989, Ser. No. 345,531
 Term of patent 14 years
 U.S. Cl. D24—207



324,271

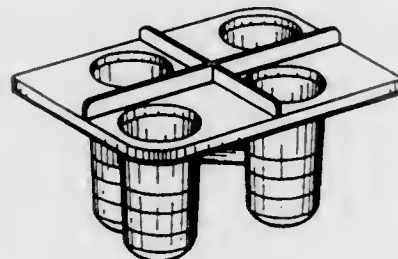
SAMPLE CUP OR SIMILAR ARTICLE

Dina Frenkel, Plano, Tex.; Fareed Kureshy, Westwood, Mass., and William J. Lawrence, Garland, Tex., assignors to PB Diagnostic Systems, Inc., Westwood, Mass.

Filed Jul. 24, 1989, Ser. No. 384,674

Term of patent 14 years

U.S. Cl. D24—226



324,272

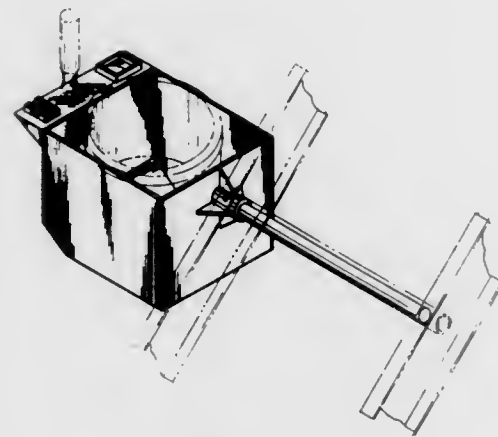
LADDER TRAY ATTACHMENT

Chris A. Thiel, 334 W. Walker St., Upper Sandusky, Ohio 43352

Filed Nov. 28, 1989, Ser. No. 442,161

Term of patent 14 years

U.S. Cl. D25—68



324,273

COMBINED LAMP AND MAGNIFYING GLASS

Elizabeth S. Jenkins, Marietta, Ga., assignor to Jay M. Jenkins, Jr., Atlanta, Ga.

Filed Jul. 31, 1989, Ser. No. 386,685

Term of patent 14 years

U.S. Cl. D26—51



324,274

ADJUSTABLE DESK LAMP

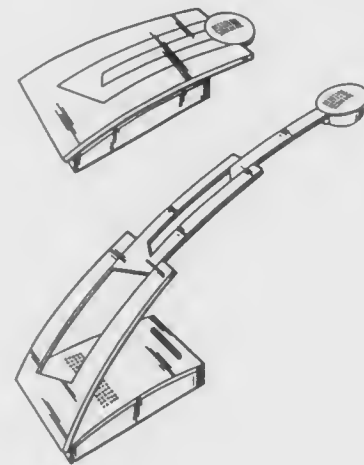
Christian Schwamkrug, Gries, and Ferdinand A. Porsche, Zell am See, both of Austria, assignors to Porsche Design Gesellschaft m.b.h., Austria

Filed Jan. 16, 1990, Ser. No. 465,871

Claims priority, application Italy, Sep. 19, 1989, 21759/89[U]

Term of patent 14 years

U.S. Cl. D26—66



324,275

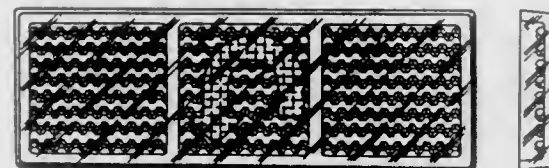
"U" TURN SIGNAL INDICATOR LENS

Gerald R. Barsotti, 7870 Hill Rd., Roseville, Calif. 95661

Filed Oct. 29, 1987, Ser. No. 114,153

Term of patent 14 years

U.S. Cl. D26—122



324,276

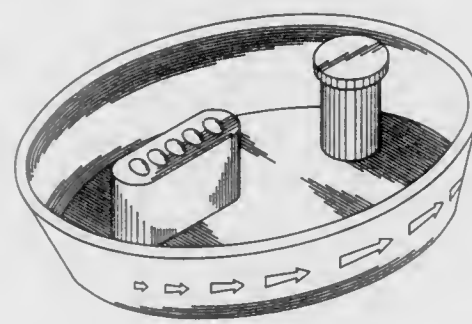
WATER ASHTRAY

Nellie C. Bradley, 517 Reid School Rd., Taylors, S.C. 29687

Filed Mar. 29, 1990, Ser. No. 501,188

Term of patent 14 years

U.S. Cl. D27—106



324,277

COMBINED CONTAINER FOR PERFUME BOTTLE AND TAG

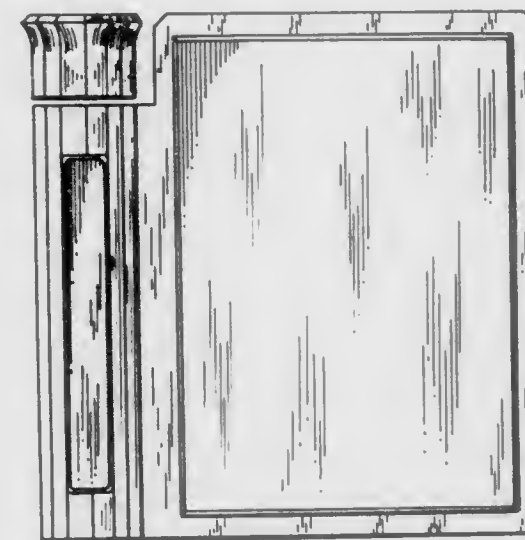
George Ortner, Lubecker Str., 13 d-5000, Kohn 1, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,666

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1988, M8800328.0

Term of patent 14 years

U.S. Cl. D28—5



324,279

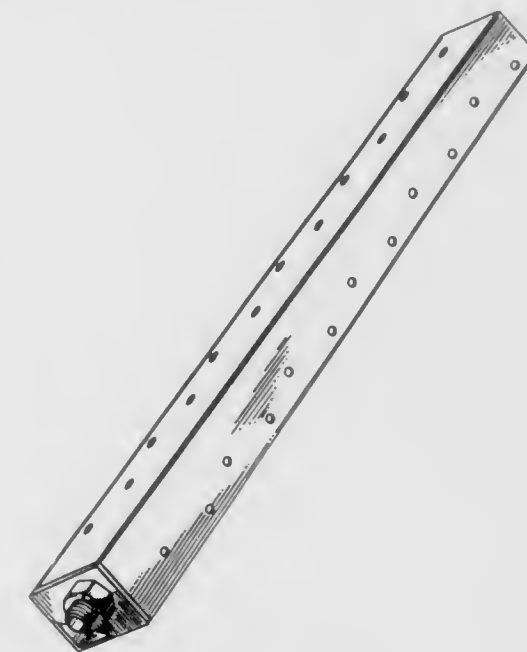
BUBBLE DIFFUSER

Peter S. Gross, Plymouth, Minn., assignor to Aeromix Systems, Incorporated, Minneapolis, Minn.

Filed Aug. 21, 1989, Ser. No. 397,171

Term of patent 14 years

U.S. Cl. D30—106



324,280

LIQUID EXTRACTION SURFACE CLEANER

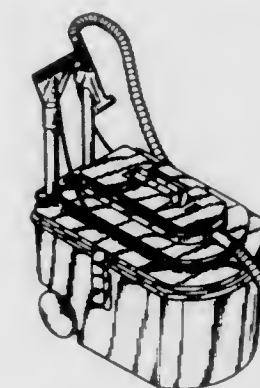
Gordon W. Goodrich, Grand Rapids, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 28,613, Mar. 20, 1987, Pat. No. 4,864,680. This application Mar. 20, 1987, Ser. No. 28,300

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D32—21



324,278

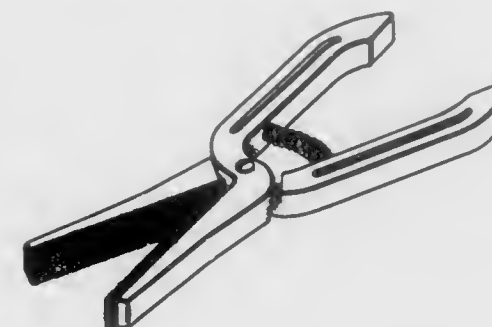
TONGS FOR REMOVING BLEACH FROM HAIR

George P. Agajan, Jr., 7141 Rob River Way, Sacramento, Calif. 95831

Filed Apr. 26, 1990, Ser. No. 515,158

Term of patent 14 years

U.S. Cl. D28—7



324,281

WASTE RECEPTACLE

Bernd Brüßing, Ulm/Donau, Fed. Rep. of Germany, assignor to
Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany

Filed Jan. 29, 1990, Ser. No. 471,802

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, M8905360.5

Term of patent 14 years

U.S. Cl. D34—1



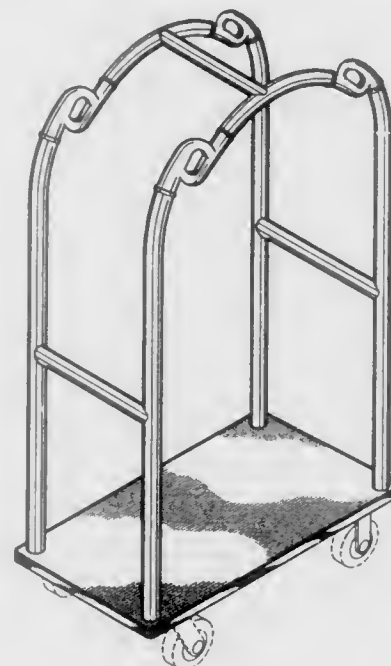
324,283

LUGGAGE CART

Chuck DeWitt, 1 S. Eudora, Denver, Colo. 80222

Filed Jan. 22, 1991, Ser. No. 645,699

Term of patent 14 years



324,284

LINEN CART

Robert J. Welch, Dallas, Pa., assignor to InterMetro Industries Corp., Wilkes-Barre, Pa.

Filed Feb. 3, 1989, Ser. No. 305,655

Term of patent 14 years

U.S. Cl. D34—21



324,282

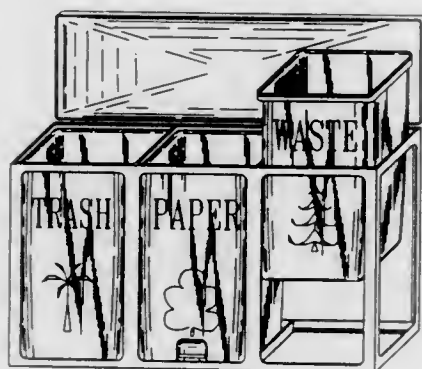
MULTIPLE COMPARTMENT REFUSE CONTAINER

Anne H. Schnitzer, and Eric B. Schnitzer, both of 1211 Sabattus St., Box 174, Lewiston, Me. 04240

Filed Nov. 2, 1990, Ser. No. 608,186

Term of patent 14 years

U.S. Cl. D34—5



324,285

MATERIAL HANDLING CART

Thomas M. Macy, 3214 Blue Goose Rd., Saukville, Wis. 53080

Filed Mar. 9, 1990, Ser. No. 491,124

Term of patent 14 years

U.S. Cl. D34—21



324,286

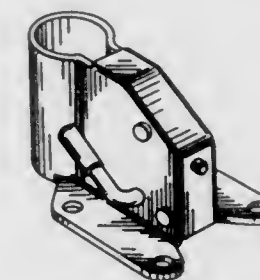
DESIGN FOR A MOUNTING BRACKET FOR A TRAILER JACK

Barry C. Nudd, Rockford, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.

Filed Jun. 18, 1990, Ser. No. 539,474

Term of patent 14 years

U.S. Cl. D34—31



324,287

PALLET

Pentti Moilanen, and Vesa Niemelä, both of Oulu, Finland, assignors to Rautaruuki Oy, Oulu and Oy Electrolux AB, Helsinki, both of, Finland

Filed Oct. 20, 1987, Ser. No. 111,523

Claims priority, application Finland, Aug. 31, 1987, 333/87

Term of patent 14 years

U.S. Cl. D34—38



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF FEBRUARY, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: *See—*
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- A.C.X., Inc.: *See—*
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- A/S Hastrup Plastic: *See—*
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- ABB Vetco Gray Inc.: *See—*
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- Abbatello, Steven J.: *See—*
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- Abbott Laboratories: *See—*
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- Luly, Jay R.; Plattner, Jacob J.; and Kempf, Dale J., 5,091,575, Cl.
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- Abe, Akiharu: *See—*
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Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada,
Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, to Canon
Kabushiki Kaisha. Image forming apparatus comprising lateral move-
ment means. 5,091,754, Cl. 355-317.000.
- Abe, Souhei: *See—*
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- Abe, Takayuki: *See—*
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- Abe, Yuichi: *See—*
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- Abimed, Inc.: *See—*
Moutafis, Timothy E.; and Milder, Fredric L., 5,090,957, Cl.
604-96.000.
- Abitibi-Price Corporation: *See—*
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- Abnoosi, Fatemeh: *See—*
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- Abouav, David M., to ICI Australia Ltd. Detonator actuator. 5,090,321,
Cl. 102-200.000.
- Abramson, Newton L.: *See—*
King, Anthony O. P.; Karady, Sandor; Anderson, Kevin; Douglas,
Alan W.; Abramson, Newton L.; and Shuman, Richard F.,
5,091,534, Cl. 546-14.000.
- Abrew, JeAnne M.: *See—*
Seveik, Thomas; and Abrew, JeAnne M., 5,090,098, Cl. 29-24.500.
- Ach, William D.; Anderson, Edmund J.; Behrends, Lynn B.; Desrude,
Wayne P.; and Klos, Gene J., to Honeywell Inc. Pallet transfer
corner system. 5,090,556, Cl. 198-465.100.
- Achikita, Masakazu; and Ohtsuka, Akihito, to Sumitomo Metal Mining
Company, Limited. Manufacturing process for sintered Fe-P alloy
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148-104.000.
- Achter, Eugen: *See—*
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- Actron Manufacturing Co.: *See—*
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- Adachi, Hideyuki: *See—*
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- Adachi, Hisahiro: *See—*
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and Amano, Shin-ya, 5,091,876, Cl. 364-419.000.
- Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno,
Takafumi; Ejima, Naoki; and Nikaido, Masataka, to Matsushita Elec-
tric Industrial Co., Ltd. Time code recording or reproducing appara-
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- Adachi, Toshinori: *See—*
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- Adam, Friedhelm; Durckheimer, Walter; Scheunemann, Karl-Heinz;
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- Adams, Steven P.: *See—*
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- Adkison, Frank L., to Oscar Mayer Foods Corporation. Drummette
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- Administrators of the Tulane Educational Fund: *See—*
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- Adoline, Jack W., to Glasstech, Inc. Air operated locating system for
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- Advanced Cardiovascular Systems, Inc.: *See—*
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- Advanced Micro Devices, Inc.: *See—*
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- Hsu, James J.; and Liu, Yowjuang W., 5,091,324, Cl. 437-34.000.
- Advanced Semiconductor Materials, Inc.: *See—*
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- Aegis Industries, Inc.: *See—*
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- Aeroquip Corporation: *See—*
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- Aerosol Systems, Inc.: *See—*
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- Aftergut, Siegfried; and Sitnik, Theresa A., to General Electric Com-
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- Agape Enterprises, Inc.: *See—*
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- Agrawal, Prathima, to AT&T Bell Laboratories. Apparatus and
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- Agro-kansho Co., Ltd.: *See—*
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- Ahlborn, Frank; Schafer, Volker; and Albrecht, Sieber, to Robert
Bosch GmbH. Electronic control device for modulating fuel quanti-
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- Ahlem, Clarence; and Huang, Ann E., to Hybritech Incorporated.
Tris-maleimido compounds as intermediates in trifunctional antibody
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- Ahmed, Moustafa E. Arabic language translating device with pronun-
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- Ahmed, Osman, to Landis & Gyr Powers, Inc. Laboratory fume hood
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- Ahn, Bo S.: *See—*
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- Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; Sone, Yo-
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- Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; and Sone,
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Akagui, Takao, to Fujitsu Limited. Semiconductor memory device. 5,091,888, Cl. 365-210.000.
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Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nakada, Katsumi; and Marumo, Teruumi, to Fuji Xerox Co., Ltd. Electrophotographic reverse image forming process. 5,091,276, Cl. 430-45.000.
Akatsuka, Yuichiro; Abe, Takayuki; Matsueda, Akira; Rokutan, Takao; and Gocho, Nagahiro, to Olympus Optical Co., Ltd. Optical record medium including a data region, an identification region and a control data region, and a method of recording signals on the optical record medium. 5,091,635, Cl. 235-494.000.
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Almen, Karl-Gosta: See—
Giesler, Rolf-Dieter; Muller, Volker; and Almen, Karl-Gosta, 5,090,215, Cl. 62-475.000.
Alpert, Seymour B.; Meisel, Donald; and Choudhry, Vas, to Electric Power Research Institute. Utilization of slag from coil gasification systems. 5,091,349, Cl. 501-155.000.
Alps, Brian J.: See—
Pascal, Jean C.; Lee, Chi-Ho; Alps, Brian J.; Pinhas, Henri; and Whiting, Roger L., 5,091,428, Cl. 514-252.000.
Alps Electric Co., Ltd.: See—
Katoh, Masakazu; and Ishikawa, Takatoshi, 5,091,061, Cl. 205-135.000.
Alsons Corporation: See—
Rogers, Daniel G., 5,090,624, Cl. 239-381.000.
Alt, Anton; Toelke, Peter; Wilhelm, Ludwig; and Zimmermann, Urban, to Georg Fischer AG. Method of alash butt welding high-carbon material, in particular nodular cast iron. 5,091,624, Cl. 219-100.000.
Altenau, Ernst-Wilhelm; Hahn, Ulf; Fischer, Siegmund; and Palten, Margret, to Rheinmetall GmbH. Lightweight training bomblet equipped with axially tensioned housing covers. 5,090,326, Cl. 102-395.000.
Altera Corporation: See—
Chiang, David, 5,091,661, Cl. 307-465.000.
Althaus, Wolfgang, to Wilkinson Sword Gesellschaft mit beschränkter Haftung. Razor blade unit. 5,090,124, Cl. 30-50.000.
Altman, Leonard F.; and Dorinski, Dale W., to Motorola, Inc. Method for producing a metallized pattern on a substrate. 5,091,218, Cl. 427-250.000.
Alusuisse-Lonza Services Ltd.: See—
Buxmann, Kurt, 5,090,998, Cl. 75-375.000.
ALZA Corporation: See—
Kuczynski, Anthony L.; Ayer, Atul D.; and Wong, Patrick S., 5,091,190, Cl. 424-473.000.
Amachi, Nobumitsu: See—
Yamazaki, Shunpei; Fukada, Takeshi; Sakama, Mitsunori; Shinohara, Hisato; Amachi, Nobumitsu; Sakamoto, Naoya; and Inuzima, Takashi, 5,091,638, Cl. 250-208.100.
Amacker, Joseph A. Universal tree stand. 5,090,504, Cl. 182-134.000.
Amacker, Joseph A. Tree climbing stand. 5,090,505, Cl. 182-187.000.
Amada, Eiichi, to Hitachi, Ltd. High-speed packet switching using a space division optical switch. 5,091,905, Cl. 370-60.000.
Amano, Fumio: See—
Iseda, Kohei; Satoh, Kazumi; Kurihara, Hideaki; Amano, Fumio; Unagami, Shigeyuki; and Okazaki, Koji, 5,091,955, Cl. 381-36.000.
Amano, Shin-ya: See—
Kumano, Akira; Nogami, Hiroyasu; Muke, Seiji; Adachi, Hisahiro; and Amano, Shin-ya, 5,091,876, Cl. 364-419.000.
Amemiya, Koji: See—
Inoue, Masahiro; Amemiya, Koji; Ohno, Akio; and Tsunemi, Takeo, 5,091,751, Cl. 355-274.000.
American Allsafe Company: See—
Wilson, David L., 5,090,349, Cl. 116-63.000.
American Biogenetic Sciences, Inc.: See—
Gargan, Paul E.; Ploplis, Victoria A.; and Pleasants, Julian R., 5,091,512, Cl. 530-387.000.
American Cyanamid Company: See—
Hsu, Nelson N. C.; Ballentine, Franklyn A.; Hufziger, Mark J.; and Card, Roger J., 5,091,255, Cl. 428-378.000.
American Magnetics Corporation: See—
Baus, Rene, Jr.; and Petty, Kenneth C., 5,091,807, Cl. 360-71.000.
Baus, Rene Jr., 5,091,961, Cl. 382-7.000.
American Sigma, Inc.: See—
Hungerford, William G.; Miller, Donald; Griffith, Carl; and Kaiser, Donald, 5,091,863, Cl. 364-510.000.
Americhem, Inc.: See—
Becker, Anton, 5,090,711, Cl. 277-68.000.

Ames, Lawrence L.; Gillard, Calvin W.; and Buholz, Neal E., to Lockheed Missiles & Space Company, Inc. Optical coordinate transfer assembly. 5,090,803, Cl. 356-152.000.
Amigo Mobility International, Inc.: See—
Bussinger, Allen L., 5,090,513, Cl. 180-271.000.
Ammermann, Eberhard: See—
Seele, Rainer; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 5,091,401, Cl. 514-383.000.
Amoco Corporation: See—
Huspeni, Paul J.; Layton, Richard; and Frayer, Paul D., 5,091,464, Cl. 524-539.000.
Morrison, Larry E.; Royer, Garfield P.; and Cruickshank, Kenneth, 5,091,519, Cl. 536-29.000.
So, Bernard Y. C.; Marker, Terry L.; and Tampa, Gene E., 5,091,076, Cl. 208-426.000.
Amp Incorporated: See—
Briggs, Robert C.; Edwards, Bryan T.; Sonner, David D.; and Weber, Robert N., 5,091,991, Cl. 385-82.000.
Casey, Daniel T., 5,090,920, Cl. 439-540.000.
Henschen, Homer E.; McKee, Michael J.; Pawlikowski, Joseph M.; Schaeffer, Richard L.; Shaffer, David T.; and Sharpe, Alexander M., 5,090,116, Cl. 29-827.000.
Ams, Felix; and Schafer, Roland, to Richard Wolf GmbH. Automatic light adjustment means for an endoscope. 5,091,779, Cl. 358-98.000.
An, Byeong-eui, to SamSung Electronics Co., Ltd. Camera moving apparatus. 5,091,781, Cl. 358-125.000.
Anahara, Meiji: See—
Yasui, Yoshiharu; Anahara, Meiji; and Omori, Hiroshi, 5,091,246, Cl. 428-224.000.
Analog Devices, Inc.: See—
Butler, James R., 5,091,701, Cl. 330-252.000.
Analytical Bio-Chemistry Laboratories, Inc.: See—
Newhouse, Daniel L.; Cernohlavek, Leemer; and Lochhaas, Philip D., 5,091,092, Cl. 210-635.000.
Anawis, Mark A.; and Lindberg, Roger E., to Abbott Laboratories. Binding of allergens to a solid phase. 5,091,318, Cl. 436-513.000.
Anderheggen, Manfred: See—
Wey, Edmund; Anderheggen, Manfred; and Grecksch, Hans, 5,090,189, Cl. 57-261.000.
Andersen, Bernt, to Spragelse Maskinfabrik A/S. Rotor cutter. 5,090,186, Cl. 56-255.000.
Anderson, David C.: See—
Horne, Arthur H.; Henderson, Ralph J.; and Anderson, David C., 5,091,713, Cl. 340-541.000.
Anderson, Edmund J.: See—
Ach, William D.; Anderson, Edmund J.; Behrends, Lynn B.; Desrude, Wayne P.; and Klos, Gene J., 5,090,556, Cl. 198-465.100.
Anderson, Forrest L. Three dimensional imaging device using filtered ellipsoidal backprojection. 5,090,245, Cl. 73-625.000.
Anderson, Kevin: See—
King, Anthony O. P.; Karady, Sandor; Anderson, Kevin; Douglas, Alan W.; Abramson, Newton L.; and Shuman, Richard F., 5,091,534, Cl. 546-14.000.
Anderson, Mark R.; and Parker, Robert P., to Thomson Consumer Electronics, Inc. Wideband expander for stereo and SAP signals. 5,091,957, Cl. 381-106.000.
Andree, Roland: See—
Forster, Heinz; Andree, Roland; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,090,991, Cl. 71-90.000.
Angyal, Pal: See—
Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.
Anhauser, Dieter, to LTS Lohmann Therapie-Systeme GmbH & Co. KG. Removal aid and use thereof. 5,091,035, Cl. 156-344.000.
Anthony, Vivienne M.: See—
deFraine, Paul; Snell, Brian K.; Beauteament, Kevin; and Anthony, Vivienne M., 5,091,407, Cl. 514-423.000.
Aoki, Chihiro: See—
Kamakura, Kunihito; Ohta, Seiichi; Aoki, Chihiro; Hamano, Seitaro; and Hiramatsu, Yasushi, 5,090,078, Cl. 15-97.100.
Aoki, Kongoh: See—
Hotta, Koji; Kano, Junichi; and Aoki, Kongoh, 5,090,365, Cl. 123-90.170.
Aoki, Mario: See—
Kuwashima, Shigeru; and Aoki, Mario, 5,091,295, Cl. 430-507.000.
Aoki, Masaaki: See—
Hanamura, Shoji; Aoki, Masaaki; and Masuhara, Toshiaki, 5,091,325, Cl. 437-40.000.
Aoki, Satoshi: See—
Oki, Takeo; Fukuta, Yoichi; Hisada, Eiichi; and Aoki, Satoshi, 5,090,969, Cl. 51-295.000.
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyosi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, to Toyoda Gosei Co., Ltd.; and Isuzu Motors Limited. Fuel tank system. 5,090,459, Cl. 141-59.000.
Aoki, Yoshisade: See—
Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyahara, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.
Aono, Masao; and Kanaoka, Hiroshi, to Kabushiki Kaisha Toshiba. Refrigerator with an automatic ice maker. 5,090,208, Cl. 62-347.000.

Aonuma, Hidekazu: See—
Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nakada, Katsumi; and Marumo, Teruumi, 5,091,276, Cl. 430-45.000.
Aonuma, Masashi: See—
Nishikawa, Yasuo; Kasuga, Akira; Okita, Tsutomu; and Aonuma, Masashi, 5,091,268, Cl. 428-694.000.
Aoyama, Keisuke: See—
Fukahori, Hidehiko; Suda, Yasuo; Itoh, Kenji; Higashihara, Masaki; and Aoyama, Keisuke, 5,091,742, Cl. 354-402.000.
APCO Valve and Primer Corporation: See—
Sabalvaro, Vincent M., III; and DiLorenzo, Ralph, 5,090,439, Cl. 137-202.000.
Apple Computer, Inc.: See—
Moulton, James I., 5,090,915, Cl. 439-188.000.
Arai, Fumiaki: See—
Nonogaki, Masayasu; Arai, Fumiaki; Natori, Yuji; and Yamaguchi, Hideyuki, 5,091,257, Cl. 428-411.100.
Arai, Juichi: See—
Claverie, Pierre; Kimura, Masao; Arai, Juichi; and Jalby, Pierre, 5,091,209, Cl. 427-38.000.
Arai, Minoru, to Isuzu Motors Limited. Regeneration system for particulate trap. 5,090,200, Cl. 60-286.000.
Arai, Shizuo: See—
Yamamoto, Hiroshi; and Arai, Shizuo, 5,091,901, Cl. 369-291.000.
Arai, Tatsuo; Haga, Katsumi; Saito, Takayoshi; Shiratori, Hidehisa; Hasegawa, Ryoei; and Iizuka, Kazuo, to Mitsubishi Materials Corporation. Rotary cutting tool. 5,090,849, Cl. 409-137.000.
Arai, Toyochi: See—
Hori, Toshihiko; Nakamura, Eitaro; and Arai, Toyochi, 5,091,487, Cl. 526-87.000.
Arakawa, Tatsumi: See—
Ozaki, Masaru; Ikeda, Yukihiko; and Arakawa, Tatsumi, 5,091,488, Cl. 526-90.000.
Araki, Shigeharu, to Sharp Kabushiki Kaisha. Word processor with a liquid crystal display panel and a detachably attached lighting unit therefor. 5,091,873, Cl. 364-708.000.
Araki, Tomio: See—
Ito, Noriki; Yasunaga, Tomoyuki; Iizumi, Yuichi; and Araki, Tomio, 5,091,419, Cl. 514-596.000.
Arashiro, Yusuke; Yamauchi, Shinichi; Sano, Hironari; Inoue, Takayuki; and Nishida, Koji, to Mitsubishi Petrochemical Co., Ltd. Resin composition. 5,091,473, Cl. 525-92.000.
Arco Chemical Technology, Inc.: See—
Gaffney, Anne M.; and Sofranko, John A., 5,091,163, Cl. 423-328.000.
Arco Chemical Technology, Inc.: See—
Grey, Roger A., 5,091,543, Cl. 549-228.000.
Ardecky, Robert J.; Chiu, Andrew T.; Duncia, John J. V.; Timmermans, Petrus B. M. W. M.; and Wexler, Ruth R., to Du Pont de Nemours & Co., Inc. Treatment of CNS disorders with 4,5,6,7-tetrahydro-1H-imidazo (4,5-c)pyridines and analogs. 5,091,390, Cl. 514-303.000.
Arduengo, Anthony J., III; Barsotti, Robert J.; and Corcoran, Patrick H., to Du Pont de Nemours & Co., Inc. Curable compositions containing 1,3-dialkylimidazole-2-thione catalysts. 5,091,498, Cl. 528-90.000.
Arendt, William D., to Velsicol Chemical Corporation. Hot melt adhesive composition. 5,091,454, Cl. 524-293.000.
Arethens, Jean P., to Sextant Avionique. Method of determining the mean wind speed with respect to the ground during the flight of an aircraft. 5,091,871, Cl. 364-565.000.
Arfert, Horst F.; Donaldson, Roger H.; Murdock, Thomas K.; and Whitlock, Barry M., to Eskimo Pie Corporation. Freezer apparatus. 5,090,175, Cl. 52-309.110.
Arii, Mitsuo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jin-nai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, to Mitsubishi Gas Chemical Co., Ltd. Optical divider for multimode optical fiber systems. 5,091,986, Cl. 385-48.000.
Aristech Chemical Corporation: See—
Cullo, Leonard A., 5,091,579, Cl. 564-402.000.
Davie, William R., 5,091,058, Cl. 203-33.000.
Ariyoshi, Takashi; Kawamoto, Toshiki; Yasuda, Seigou; Kuriki, Syoji; and Nakatani, Tomofumi, to Ricoh Company, Ltd. Speech recognition method and apparatus. 5,091,947, Cl. 381-42.000.
Arjomari Europe: See—
Fredenucci, Pierre; and Berhaut, Jean-Bernard, 5,091,055, Cl. 162-135.000.
Armstrong World Industries, Inc.: See—
Ko, Kenneth K.; Miller, Jesse D., Jr.; and Von Stetten, Susan M., 5,091,452, Cl. 524-155.000.
Amaout, M. Amin; McCluskey, Robert T.; and Niles, John L., to General Hospital Corporation. The Diagnosis of Wegener's granulomatosis. 5,091,303, Cl. 435-7.240.
Arnett, Jaime R.; and O'Connor, Robert J., to AT&T Bell Laboratories. Printed wiring board connector. 5,091,826, Cl. 361-408.000.
Arnold, George D. M.: See—
Thoma, Christian H.; and Arnold, George D. M., 5,090,949, Cl. 475-83.000.
Arnold, Gerhard: See—
Meier, Juergen; and Arnold, Gerhard, 5,091,054, Cl. 162-65.000.
Arnold, Thomas N. Portable clothes line device. 5,090,578, Cl. 211-119.000.
Arnulf, Paul, to Salomon, S.A. Lateral guidance device for a cross-country ski boot. 5,090,723, Cl. 280-615.000.

Art, Gregory R.; Podsiadlik, Frank M.; and Lackland, Albert, to Baxter International Inc. Bottle cap. 5,090,582, Cl. 215-250.000.

Artifex Ltd.: See—

Hafeli, Paul B.; and Baker, Gregg S., 5,090,854, Cl. 411-186.000.
Asabuki, Hiroshi: See—
Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.

Asada, Junichi; Takahashi, Kenji; and Sakurai, Toshiharu, to Kabushiki Kaisha Toshiba. Method of sealing semiconductor device with resin by pressing a lead frame to a heat sink using an upper mold pressure member. 5,091,341, Cl. 437-212.000.

Asada, Masaaki, to Kabushiki Kaisha Daikin Seisakusho. Self adjuster for push type clutch. 5,090,536, Cl. 192-70.250.

Asada, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission. 5,090,952, Cl. 475-278.000.

Asahi/America, Inc.: See—

Lewis, Leslie B.; and Robinson, Timothy, 5,090,447, Cl. 137-559.000.

Asahi Corporation: See—

Harada, Masasuke; Hayafuchi, Hideki; and Tsukamoto, Kouji, 5,091,125, Cl. 264-45.300.

Asahi Glass Company Ltd.: See—

Suzuki, Masahiro; Kamemura, Ichiro; and Kodaka, Hiromitsu, 5,091,434, Cl. 521-78.000.

Asahi Kasei Kogyo Kabushiki Kaisha: See—

Nakajima, Hitoshi; and Yokoyama, Akinori, 5,091,114, Cl. 252-514.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—

Hori, Masakatsu, 5,091,740, Cl. 354-173.100.

Asahi Kogyo Kogyo Kabushiki Kaisha: See—

Morisawa, Satoru; and Sato, Tsutomu, 5,091,748, Cl. 355-245.000.

Asakura, Eizou: See—

Yoshinaka, Minoru; Asakura, Eizou; Oku, Mitsumasa; Kitano, Motoi; and Yoshida, Hideyuki, 5,091,765, Cl. 357-30.000.

Asakura, Mikio, to Mitsubishi Denki Kabushiki Kaisha. Dynamic semiconductor memory device. 5,091,887, Cl. 365-206.000.

Asakura, Tsutou: See—

Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,091,277, Cl. 430-48.000.

Asano, Hiroyuki: See—

Katayama, Yoshinori; Murakami, Teruaki; Asano, Hiroyuki; Abe, Yuichi; Izuka, Haruhiko; Shimizu, Kazuaki; and Fukai, Yoshio, 5,091,857, Cl. 364-431.090.

Asano, Mutsumi; Kasai, Kiyoshi; and Misaki, Hidehiko, to Tosoh Corporation. Magneto-optical recording medium and process for production of the same. 5,091,267, Cl. 428-694.000.

Asaoka, Keizo; Tsuge, Kazunori; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Semiconductor device having a transparent electrode and amorphous semiconductor layers. 5,091,764, Cl. 357-30.000.

Ashby, Robert E.: See—

Greig, Walter G.; and Ashby, Robert E., 5,090,943, Cl. 462-71.000.

Ashida, Kaneyoshi: See—

Frisch, Kurt C.; and Ashida, Kaneyoshi, 5,091,436, Cl. 521-137.000.

Ashida, Kenichi: See—

Yoshida, Seitaro; and Ashida, Kenichi, 5,091,750, Cl. 355-260.000.

Ashley Worldwide, Inc.: See—

Gerber, Terry L., 5,090,058, Cl. 2-97.000.

Asikainen, Aimo I.: See—

Ijas, Lasse K.; Asikainen, Aimo I.; Hotta, Arto V. I.; Raskin, Neil; Stone, James; Beavers, Gregory; and Watson, David, 5,091,156, Cl. 422-146.000.

Asmo Co., Ltd.: See—

Nakatsukasa, Tetsuya, 5,090,261, Cl. 74-89.140.

Aspnes, David E.; and Quinn, William E., to Bell Communications Research, Inc. Ellipsometric control of material growth. 5,091,320, Cl. 437-8.000.

Aster, Richard H.: See—

Newman, Peter J.; and Aster, Richard H., 5,091,302, Cl. 435-6.000.

AT&T Bell Laboratories: See—

Agrawal, Prathima, 5,091,872, Cl. 364-578.000.

Arnett, Jaime R.; and O'Connor, Robert J., 5,091,826, Cl. 361-408.000.

Bean, John C.; Higashi, Gregg S.; Hull, Robert; and Peticolas, Justin L., 5,091,767, Cl. 357-60.000.

Blonder, Greg E.; and Johnson, Bertrand H., 5,091,053, Cl. 156-657.000.

Cimini, Leonard J., Jr.; and Habbab, Isam M. I., 5,091,916, Cl. 372-96.000.

Degani, Yinon; Kimball, Robert M.; and Shevchuk, George J., 5,091,988, Cl. 385-70.000.

Duijves, Pieter W. G., 5,091,641, Cl. 250-214.00R.

Kleijn, Willem B., 5,091,945, Cl. 381-36.000.

McAnany, Robert E., 5,090,927, Cl. 439-892.000.

Milewski, Allen E., 5,091,931, Cl. 379-100.000.

O'Brien, William D., Jr., 5,090,978, Cl. 65-2.000.

White, Donald L., 5,091,979, Cl. 385-1.000.

Zorian, Yervant, 5,091,908, Cl. 371-21.500.

Zucker, Jane E., 5,090,790, Cl. 385-130.000.

Athanasios, Albert K.; and Templeman, Gareth J., to Nabisco Brands, Inc. Process for the removal of sterol compounds and saturated fatty acids. 5,091,117, Cl. 260-428.000.

Atlantic Richfield Company: See—

Gard, Michael F., 5,091,725, Cl. 340-854.100.

Kolpak, Miroslav M., 5,090,253, Cl. 73-861.380.

Atmel Corporation: See—

Hobbs, James B., 5,091,881, Cl. 365-155.000.

ATOCHEM North America, Inc.: See—

Lindstrom, Michael J.; Carroll, Glenn T.; Hsing-Gan Yen, Jeffrey; and Clark, Roger T., 5,091,593, Cl. 568-21.000.

Silbermann, Joseph; and Burchill, Michael T., 5,091,213, Cl. 427-160.000.

Atsumi, Yoshinari: See—

Takahashi, Tatsuhiro; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaro; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.

Angat Communications Group: See—

Leung, Alexander M. C.; and Edoardo, Guido Bertoglio fu, 5,091,990, Cl. 385-81.000.

Aungst, Bruce J., to Du Pont Merck Pharmaceutical Company. Topical antiinflammatory compositions with minimal systemic absorption. 5,091,379, Cl. 514-159.000.

Austimont S.p.A.: See—

Carmello, Diego; and Guglielmo, Giorgio, 5,091,601, Cl. 570-166.000.

Austria Metall Aktiengesellschaft: See—

Garmweidner, Peter, 5,090,755, Cl. 293-133.000.

Autin, Jean-Marie: See—

Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,091,415, Cl. 514-506.000.

Autio, Markku, to Valmet Paper Machinery Inc. Structural frame for separate nips in a press section. 5,091,056, Cl. 162-360.100.

Autoflug GmbH & Co.: See—

Nehren, Hubert; Moritzen, Werner; Siebrand, Gerhard; and Knofe, Helmut, 5,090,641, Cl. 244-148.000.

Automotive Products plc: See—

Smith, Derek W., 5,090,201, Cl. 60-589.000.

Avant Incorporated: See—

Kuhns, Roger J.; McLaren, Timothy S.; Nathans, Robert L.; and Smith, Robert F., 5,090,732, Cl. 281-29.000.

Avery, James E.: See—

Fraas, Lewis M.; Avery, James E.; and Girard, Gerald R., 5,091,018, Cl. 136-246.000.

AVL AG: See—

Offenbacher, Helmut; and Schwarzenegger, Erna, 5,091,800, Cl. 359-350.000.

Axmann-Fordertechnik GmbH, Firma: See—

Axmann, Norbert, 5,090,550, Cl. 198-313.000.

Axmann, Norbert, to Axmann-Fordertechnik GmbH, Firma. Belt conveyor with two sections at a variable angle. 5,090,550, Cl. 198-313.000.

Ayer, Atul D.: See—

Kuczynski, Anthony L.; Ayer, Atul D.; and Wong, Patrick S., 5,091,190, Cl. 424-473.000.

Azeta, Takahiro: See—

Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.

Azuma, Yusaku: See—

Umetsu, Sachio; Tsuda, Toshio; Azuma, Yusaku; Miura, Toshihiko; Ishihara, Katsumi; and Ohsaka, Teiji, 5,090,113, Cl. 29-714.000.

B. F. Goodrich Company, The: See—

Percec, Virgil, 5,091,480, Cl. 525-391.000.

B & H Manufacturing Co., Inc.: See—

Otruba, Svatoboj, 5,091,040, Cl. 156-566.000.

Baba, Akira: See—

Okiura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, 5,090,339, Cl. 110-263.000.

Baba, Fumiaki: See—

Yoshimura, Hiroshi; Bota, Keiji; Takemoto, Kazuo; and Baba, Fumiaki, 5,091,854, Cl. 364-424.100.

Baba, Shigeyuki: See—

Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.

Babcock, Eugene J.: See—

Zappella, Pierino I.; Pepe, Angel A.; Fewer, William R.; and Babcock, Eugene J., 5,091,288, Cl. 430-311.000.

Babcock-Hitachi Kabushiki Kaisha: See—

Okiura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, 5,090,339, Cl. 110-263.000.

Babcock & Wilcox Company, The: See—

Dixon, Larry D.; Snow, Fred L.; and Stuckey, Kenneth B., 5,091,140, Cl. 376-260.000.

Hipple, James H.; Smith, Don W.; Carpenter, Steven P.; and Johnston, Jesse C., 5,090,087, Cl. 15-317.000.

Spada, Ralph E., 5,090,370, Cl. 122-510.000.

Babczinski, Peter: See—

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Bachand, Steve S., to Toxi-Lab Incorporated. Chemical analysis test device. 5,091,153, Cl. 422-58.000.

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Bachmann, Andre: See—

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Bacos, Marie-Pierre: See—

Noireaux, Patrick; Jamet, Jean; Parlier, Michel; and Bacos, Marie-Pierre, 5,091,485, Cl. 525-478.000.

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Bahia, Hardev S., to Courtauld PLC. Process for the production of highly filled yarns. 5,091,130, Cl. 264-103.000.

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Baik, Woo S., to Gold Star Co., Ltd. Operation control circuit for pump motor. 5,091,686, Cl. 318-798.000.

Bailey, Ronald L., to Young Dental Manufacturing Company. Auto-clavable air polisher handpiece. 5,090,904, Cl. 433-88.000.

Baines, Claude H.: See—

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Baisch, Gabriele: See—

Francotte, Eric; and Baisch, Gabriele, 5,091,520, Cl. 536-56.000.

Baji, Toru; and Inouchi, Hidenori, to Hitachi, Ltd. Systolic processor elements for a neural network. 5,091,864, Cl. 395-27.000.

Baker, Gregg S.: See—

Hafeli, Paul B.; and Baker, Gregg S., 5,090,854, Cl. 411-186.000.

Baker Hughes Incorporated: See—

Beimgraben, Herb; Melton, Benny; Eppink, Jay; and Reinhardt, Paul, 5,090,497, Cl. 175-107.000.

Baker, Kenneth N.: See—

Pfaller, Mathew A.; Baker, Kenneth N.; and Say, Richard E., 5,090,924, Cl. 439-807.000.

Baker, Roger C.; and Higham, Edward H., to National Research Development Corp. Flowmeters. 5,090,240, Cl. 73-197.000.

Balashchak, James J.; and Thrall, David E., to Teledyne Industries, Inc. Strain sensing valve. 5,090,239, Cl. 73-168.000.

Baldino, Michael; and Kelsay, Daniel L., to Kelly Industries. Modular roof panel assembly and locking apparatus for a modular panel system used in constructing relocatable buildings. 5,090,838, Cl. 403-388.000.

Baldwin, John J.; Ponticello, Gerald S.; Shepard, Kenneth L.; and Williams, Theresa M., to Merck & Co., Inc. 4-alkylamino-6-(C₃-5-hydrocarbyl)thieno[2,3-b]thiopyran-2-sulfonamide-7,7-dioxides. 5,091,409, Cl. 514-434.000.

Baldwin, William: See—

Malloy, Joseph P.; and Baldwin, William, 5,091,962, Cl. 382-8.000.

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Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,091,415, Cl. 514-506.000.

Ballentine, Franklyn A.: See—

Hsu, Nelson N. C.; Ballentine, Franklyn A.; Hufziger, Mark J.; and Card, Roger J., 5,091,255, Cl. 428-378.000.

Ballestrazzi, Aris; and Tassi, Lamberto, to Sitma S.p.A. Automatic apparatus for folding sheet elements. 5,090,672, Cl. 270-45.000.

Ballou, Joseph H.: See—

Gakhar, Ved P.; Ballou, Joseph H.; Leubbers, James M.; and Szymanski, D. M., 5,090,461, Cl. 144-136.00C.

Balogh, Marie: See—

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Balsells, Joan C.:

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Baus, Rene Jr., to American Magnetics Corp. Magnetic ink character decoder. 5,091,961, Cl. 382-7.000.

Baxter Diagnostics Inc.: See—
Wang, Chao-Huei; and Shah, Dinesh O., 5,091,206, Cl. 427-2.000.

Baxter International Inc.: See—
Art, Gregory R.; Podsiadlik, Frank M.; and Lackland, Albert, 5,090,582, Cl. 215-250.000.

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Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Blempel, Manfred, 5,091,375, Cl. 514-50.000.

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Forster, Heinz; Andree, Roland; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,090,991, Cl. 71-90.000.

Ilayer Aktiengesellschaft: See—
Baumgarten, Jorg; Brunner, Helmut; Flesch, Inge; Hildebrand, Heinz; Piel, Norbert; and Sperzel, Michael, 5,091,364, Cl. 514-8.000.

Birkenstock, Udo; Scharschmidt, Jurgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, 5,090,997, Cl. 75-38.000.

Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 5,091,537, Cl. 546-226.000.

Grogler, Gerhard; Kopp, Richard; Hess, Heinrich; Hansel, Eduard; and Scholl, Thomas, 5,091,497, Cl. 528-76.000.

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Immenkeppel, Michael; Kleinstuck, Roland; Block, Hans-Dieter; Sicius, Hermann; and Schmidt, Peter, 5,091,562, Cl. 562-24.000.

Jansen, Bernhard; Muller, Hanns P.; Richter, Roland; and Mayer, Wolfram, 5,090,405, Cl. 602-8.000.

Jelich, Klaus; and Lindel, Hans, 5,091,068, Cl. 204-157.640.

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Kehm, Detlef; Weicht, Bodo; and George, Joachim, 5,090,965, Cl. 23-295.000.

Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.

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Sanders, Josef; Grogler, Gerhard; and Dieterich, Dieter, 5,091,582, Cl. 564-418.000.

Wollweber, Detlef; Brandes, Wilhelm; Dutzmann, Stefan; and Hansler, Gerd, 5,091,408, Cl. 514-427.000.

Hayliss, Colin R., to T&N Technology Limited. Metal pouring system. 5,090,603, Cl. 222-590.000.

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Ilaiz, Roland; Soudant, Etienne; Obadia, Gerard; Laugier, Jean-Pierre; and Marcotte, Louis, to L'Oreal. Massaging appliance. 5,090,402, Cl. 128-57.000.

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Heaman, Samuel W. Apparatus for manufacturing hollow concrete structures. 5,090,884, Cl. 425-63.000.

Heamon, William S., III, to General Electric Company. Helmet display. 5,091,719, Cl. 340-705.000.

Hean, John C.; Higashi, Gregg S.; Hull, Robert; and Petecolas, Justin L., to AT&T Bell Laboratories. Article comprising a lattice-mismatched semiconductor heterostructure. 5,091,767, Cl. 357-60.000.

Heasley, Robert. Aquatic exercise device. 5,090,692, Cl. 272-116.000.

Heason, James D., to Harris Corporation. Method of making a high breakdown active device structure with low series resistance. 5,091,336, Cl. 437-150.000.

Beatty, Graydon E.: See—
Dahl, Roger W.; Beatty, Graydon E.; Swanson, David K.; and Heil, John E., 5,090,422, Cl. 128-784.000.

Beatty, Paul H. J. Color-monochrome visual display device. 5,091,718, Cl. 340-703.000.

Beautement, Kevin: See—
deFraine, Paul; Snell, Brian K.; Beautement, Kevin; and Anthony, Vivienne M., 5,091,407, Cl. 514-423.000.

Beavers, Gregory: See—
Ijas, Lasse K.; Asikainen, Aimo I.; Hotta, Arto V. I.; Raskin, Neil; Stone, James; Beavers, Gregory; and Watson, David, 5,091,156, Cl. 422-146.000.

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Heber, Richard A.: See—
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Heck, James T.: See—
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Hecker, Anton, to Americhem, Inc. Seal assemblies for internal mixers. 5,090,711, Cl. 277-68.000.

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Becker, Raymond P., to Conductive Containers, Inc. Electro-static protective container for electrical components. 5,090,563, Cl. 206-328.000.

Becton, Dickinson and Company: See—
Karakelle, Mutlu; Benson, Carl D.; Taller, Robert A.; and Spielvogel, David E., 5,091,443, Cl. 424-665.000.

Monthony, James F.; Stitt, David T.; Gosnell, C. Michael; and Stewart, Shannon D., 5,091,316, Cl. 435-295.000.

Bedi, Ram D., to K.J. Manufacturing Co. Main gallery - filter connection. 5,090,376, Cl. 123-196.000.

Beecham Group p.l.c.: See—
Wadsworth, Harry J.; Hadley, Michael S.; Wyman, Paul A.; and Jenkins, Sarah M., 5,091,397, Cl. 514-359.000.

Beer, Ted A.: See—
Kamath, Venkatesh H.; Mandel, Barry P.; Beer, Ted A.; and Sokac, Russell J., 5,090,683, Cl. 271-227.000.

Beers, Roger N., to Goodyear Tire & Rubber Company. The. Controlled morphology barrier elastomers made from blends of syndiotactic 1,2-polybutadiene and ethylene-vinyl acetate-vinyl alcohol terpolymers. 5,091,467, Cl. 525-57.000.

Begue, Jean-Pierre; Charpentiermorize, Micheline; Bonnet Delpon, Daniele; and Gilbert-Semon, Huguette, to Laboratoires Lucien. Derivatives of 4-amino-1-trifluoromethyltetralines their preparation and their therapeutic application. 5,091,429, Cl. 514-255.000.

Behrends, Lynn B.: See—
Ach, William D.; Anderson, Edmund J.; Behrends, Lynn B.; Desrude, Wayne P.; and Klos, Gene J., 5,090,556, Cl. 198-465.100.

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Kolar, Cenek; Dehmelt, Konrad; and Kraemer, Hans Peter, 5,091,521, Cl. 536-17.100.

Beijleveld, Wilhelmus M.; and Endstra, Willem C., to Akzo NV. Use of oligomers of alkenyl groups-substituted aromatics as co-agents. 5,091,479, Cl. 525-263.000.

Beimgraben, Herb; Melton, Benny; Eppink, Jay; and Reinhardt, Paul, to Baker Hughes Incorporated. Flexible coupling for progressive cavity downhole drilling motor. 5,090,497, Cl. 175-107.000.

Bekkering, Roland Q.; and Cereda, Manlio S., to SGS-Thomson Microelectronics S.r.l. Method for programming MOS and CMOS ROM memories. 5,091,329, Cl. 437-52.000.

Belanger, Patrice C.; Dufresne, Claude; Fitzsimmons, Brian, deceased; Fitzsimmons, Maryann, Heir; Guindon, Yvan; Lau, Cheuk K.; Rokach, Joshua; Schiegetz, John; Therien, Michel; and Young, Robert N., to Merck Frost Canada, Inc. 5-hydroxy-2,3-dihydrobenzofuran analogs as leukotriene biosynthesis inhibitors. 5,091,533, Cl. 544-318.000.

Belka, Heinrich, to ESCE-Marby GmbH & Co. KG. Longitudinally adjustable bicycle baggage carrier. 5,090,717, Cl. 280-304.500.

Bell Communications Research, Inc.: See—
Aspnes, David E.; and Quinn, William E., 5,091,320, Cl. 437-8.000.

Bell & Howell Phillipsburg Company: See—
Gleason, Michael E., 5,091,777, Cl. 358-93.000.

Bell, Michael. Visually inspectable safety lanyard. 5,090,503, Cl. 182-5.000.

Belli, Remo D., to Remo, Inc. Composition for precluding separation of nondirectional fibers from surface of drumhead laminate. 5,091,248, Cl. 428-290.000.

Below, Matthew B., to Allied-Signal Inc. Shield for aligning a ground electrode of a spark plug in a cylinder head. 5,091,672, Cl. 313-143.000.

Bend Research, Inc.: See—
van Eikeren, Paul; Brose, Daniel J.; and Herbig, Scott M., 5,091,080, Cl. 210-188.000.

Bendahmane, Bouziane: See—
Cuenot, Alain; and Bendahmane, Bouziane, 5,091,668, Cl. 310-156.000.

Bendix France: See—
Gautier, Jean-Pierre; and Perez, Miguel, 5,090,298, Cl. 92-98.00D.

Benedek, George B.: See—
Clark, John I.; Benedek, George B.; Siezen, Roelant J.; Thomson, John A.; and Friedman, Simon H., 5,091,421, Cl. 514-616.000.

Beneteau, Pierre: See—
Journée, Maurice; Duda, Jean; Beneteau, Pierre; and Bru, Jean-Raymond, 5,090,086, Cl. 15-250.420.

Bensch, Gunther; Schneider, Markus; Walch, Bert; and Schmidt, Martin, to Robert Bosch GmbH. Method and apparatus for manufacturing coils. 5,090,112, Cl. 29-605.000.

Benson, Carl D.: See—
Karakelle, Mutlu; Benson, Carl D.; Taller, Robert A.; and Spielvogel, David E., 5,091,443, Cl. 424-665.000.

Bentjens, Bernd, to Wulhelm Fette GmbH, Firma. Disc mill with reversible cutting plates and adjustable cutting width. 5,090,845, Cl. 407-52.000.

Berenstein, Eugenia. Pleasure mirror and fan unit. 5,090,300, Cl. 454-370.000.

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Roth, Stephen A.; and Berg-Johansen, Roar, 5,091,697, Cl. 324-253.000.

Berg, Lloyd, to Berg, Lloyd. Separation of p-xylene from m-xylene by extractive distillation. 5,091,059, Cl. 203-51.000.

Bergan, Terry, to International Road Dynamics Inc. Load cells and scales therefrom. 5,090,493, Cl. 177-211.000.

Bergemont, Albert M., to National Semiconductor Corporation. Fabrication of a high density stacked gate EPROM split cell with bit line reach-through and interruption immunity. 5,091,327, Cl. 437-43.000.

Berger, Joel G.; and Clader, John W., to Schering Corporation. Process for the enantiospecific synthesis of intermediates for hexahydro-benzof[d]-naphtho[2,1-b]azepines. 5,091,526, Cl. 540-576.000.

Berger, Karl-Heinz, to Bochumer Eisenhütte Heintzmann GmbH & Co. KG. Method of monitoring and controlling mining operations. 5,090,775, Cl. 299-1.000.

Berger, Stuart B.: See—
Hammond, John M.; Petropoulos, Mark; Berger, Stuart B.; and Nolley, Robert W., 5,090,350, Cl. 118-50.000.

Berger, Toby; and Miller, Daniel H., to Teknekron Communications Systems, Inc. Method and an apparatus for electronically compressing a transaction with a human signature. 5,091,975, Cl. 382-56.000.

Bergeron, Raymond J., to University of Florida. Anti-neoplastic, antiviral or anti-retroviral spermine derivatives. 5,091,576, Cl. 564-367.000.

Bergevin, Kevin: See—
Lang, Theodore J.; and Bergevin, Kevin, 5,091,241, Cl. 428-213.000.

Berghoefer, Leonard A. Animal carrier. 5,090,368, Cl. 119-96.000.

Bergische Achenfabrik Fr. Kotz & Sohne: See—
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Berhaut, Jean-Bernard: See—
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Berkline Corporation, The: See—
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Berman, Michael: See—
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Bermbach, Rainer; Doenges, Gerhard; Geus, Georg; and Koch, Cornelius, to Heilmann GmbH. Apparatus for the transillumination of articles with a fan-shaped radiation beam. 5,091,924, Cl. 378-57.000.

Bernard, Clay, II: See—
Lichti, Robert, Sr.; Bernard, Clay, II; Perry, Daniel C.; and Lukken, Stanley H., 5,090,863, Cl. 414-331.000.

Berner, Godwin; Rembold, Manfred; Sitek, Franciszek; and Rutsch, Werner, to Ciba-Geigy Corporation. Process for curing polyurethane coatings and compositions. 5,091,439, Cl. 522-26.000.

Bernt, Jorgen O.; Forster, Barry C.; and Blain, Allan J. Kiln liner. 5,090,610, Cl. 228-138.000.

Berry, Tommie; Delaney, Larry; and Staffebach, Rudy H., to Schlumberger Technologies, Inc. Dual-sided test head having floating contact surfaces. 5,091,693, Cl. 324-158.00F.

Bert, Stephen F., to Textron Inc. End connector with integral pivotal clam shell. 5,090,094, Cl. 24-265.0WS.

Bertolini, Carlo, to Rockwell International Corporation. Support for preassembled and preadjusted fittings for a motor vehicle door, and a door having this support. 5,090,158, Cl. 49-348.000.

Bertsch, Raymond O., to Riverwood Natural Resources Corporation. Folding carton blank and method of forming same. 5,090,616, Cl. 229-132.000.

Beru Ruprecht GmbH & Co. KG: See—
Dupuis, Bertram; Endler, Max; and Bauer, Paul, 5,091,631, Cl. 219-270.000.

Beson, John: See—
Parks, Glenn C., Jr.; Ellison, C. Mack; Godare, William L.; and Beson, John, 5,090,661, Cl. 251-172.000.

Bessho, Akira; and Konno, Youichi, to Pioneer Electronic Corporation. Playback/recording apparatus having a device for positively preventing entire cartridge from springing out of slot. 5,091,898, Cl. 369-77.200.

Bessho, Yoshihiro: See—
Tsuda, Toshio; Horio, Yasuhiko; Bessho, Yoshihiro; and Ishida, Toru, 5,090,119, Cl. 29-843.000.

Bessyo, Daisuke: See—
Maehara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuo; Bessyo, Daisuke; Niwa, Takashi; Kusunoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.

Best, David J.: See—
Turner, Anthony P. F.; Best, David J.; and Hall, Geoffrey F., 5,091,299, Cl. 435-4.000.

Bethea, Sylvia A.: See—
Schier, R. Clark; and Bethea, Sylvia A., 5,090,143, Cl. 40-152.100.

Bethge, Jorg, to Ohg, Claas. Round bale press for agricultural products. 5,090,182, Cl. 53-556.000.

Bethlehem Steel Corporation: See—
Hoffman, Carvel D.; Booth, R. C.; Clymer, John C.; and Casler, Richard J., 5,091,862, Cl. 364-507.000.

Betterton, Joseph T.: See—
Glover, Alfred H.; Betterton, Joseph T.; and Biegler, Richard L., 5,091,633, Cl. 235-95.00R.

Beyerle, Rudi: See—
Schonafinger, Karl; Bohn, Helmut; Beyerle, Rudi; and Just, Melitta, 5,091,398, Cl. 514-361.000.

Bezjak, Greg W., to North American Philips Corporation. Transmission line transformer. 5,091,708, Cl. 333-26.000.

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Narang, Subhash C.; Ventura, Susanna; and Bhardwaj, Tilak R., 5,091,502, Cl. 528-229.000.

Bhatia, Kamlesh K., to Du Pont de Nemours, E. I., and Company. Process for rapid conversion of oligomers to cyclic esters. 5,091,544, Cl. 549-274.000.

Biache, Gerard A.; and Guillon, Michel R., to Calliope S.A. Insecticide based on a virus from the baculovirus group, and use thereof for the destruction of phthoremae operculella. 5,091,179, Cl. 424-93.00T.

BICC, plc: See—
Longhurst, Philip C., 5,090,802, Cl. 356-73.100.

BICC Public Limited Company: See—
Bradfield, Malcolm G., 5,091,284, Cl. 430-292.000.

Bich, Gary L., to Ford New Holland, Inc. Dual torque clutch. 5,090,532, Cl. 192-56.00R.

Bickel, Wayne J.; and White, Richard L. Adjustable archery stabilizer. 5,090,396, Cl. 124-89.000.

Bickle, William W. Reusable coin counter and holding device. 5,090,179, Cl. 53-461.000.

Biddulph, Michael W.; Kler, Satish C.; and Lavin, John T., to BOC Group plc. The. Liquid-gas contact device. 5,091,119, Cl. 261-114.300.

Biegler, Richard L.: See—
Glover, Alfred H.; Betterton, Joseph T.; and Biegler, Richard L., 5,091,633, Cl. 235-95.00R.

Bieker, Guido; Kampmann, Gerhard; and Lohmann, Alfred, to Wagon Union GmbH. Bogie for high-speed railborne vehicle. 5,090,333, Cl. 105-218.100.

Bielewicz, Jerzy. Apparatus and method for testing the mechanical properties of a sample. 5,090,249, Cl. 73-822.000.

Bilgen, Elmar, to Steyr-Daimler-Puch AG. Cartridge with flash tube. 5,090,327, Cl. 102-430.000.

Biller, Scott A.: See—
Karanewsky, Donald S.; Badia, Michael C.; Biller, Scott A.; Gordon, Eric M.; and Sofia, Michael J., 5,091,378, Cl. 514-80.000.

Biocompatibles Ltd.: See—
Chapman, Dennis; and Durrani, Aziz A., 5,091,551, Cl. 558-166.000.

Biomeasure, Inc.: See—
Kim, Sun H.; and Taylor, John E., 5,091,381, Cl. 514-183.000.

Birbara, Philip J.; and Nalette, Timothy A., to United Technologies Corporation. Regenerable CO₂/H₂O solid sorbent. 5,091,358, Cl. 502-412.000.

Birkenstock, Udo; Scharschmidt, Jurgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, to Bayer Aktiengesellschaft; and Hermann C. Starck Berlin GmbH & Co. KG. Process for producing powdered aluminum alloys. 5,090,997, Cl. 75-338.000.

Birkholz, Michaela: See—
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Bisagni, Emile; and Nguyen, Chi-Hung, to Rhone-Poulenc Sante. Pyridobenzimidazole derivatives, their preparation and compositions which contain them. 5,091,388, Cl. 514-285.000.

Bishop, Marshall D.: See—
Hostettler, John E.; and Bishop, Marshall D., 5,091,448, Cl. 524-45.000.

Bisping, Bernhard: See—
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- Bran, Mario E., to Vertec, Inc. Single wafer megasonic semiconductor wafer processing system. 5,090,432, Cl. 134-139.000.
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Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr.; Sudol, Marion A.; and Boden, Richard M., 5,091,200, Cl. 426-243.000.

C. E. B. Enterprises, Inc.: See—
Bathrick, Leeland M.; and Brittain, Glenn, 5,090,071, Cl. 5-618.000.

Caden, John C.; Caden, Linda J.; Eads, Norman B.; and Hess, Jack H., to Health Products, Inc. Cellular patient support for therapeutic air beds. 5,090,077, Cl. 5-456.000.

Caden, Linda J.: See—
Caden, John C.; Caden, Linda J.; Eads, Norman B.; and Hess, Jack H., 5,090,077, Cl. 5-456.000.

Cahiez, Gerard; Chavant, Pierre-Yves; and Tozzolino, Pierre, to Societe Nationale Elf Aquitaine. Manufacture of tertiary and secondary alcohols by the action of an organo-metallic compound on a compound carrying a carbonyl group. 5,091,597, Cl. 568-878.000.

Cahiez, Gerard; Chavant, Pierre-Yves; and Tozzolino, Pierre, to Societe Nationale Elf Aquitaine. Manufacture of tertiary and secondary alcohols by the action of an organic halogen compound and manganese on a compound carrying a carbonyl group. 5,091,598, Cl. 568-878.000.

Calderoni, Carlo; Mizia, Franco; Rivetti, Franco; and Romano, Ugo, to Enichem Synthesis, S.p.A. Process for producing carbamates. 5,091,556, Cl. 560-24.000.

California Institute of Technology: See—
Kobayashi, Seiji; and Psaltis, Demetri, 5,091,965, Cl. 382-15.000.

Call, Jon: See—
Nath, Prem; Call, Jon; Didio, Gary M.; and Hoffman, Kevin, 5,090,356, Cl. 118-718.000.

Calliope S.A.: See—
Biache, Gerard A.; and Guillon, Michel R., 5,091,179, Cl. 424-93.00T.

Calundann, Gordon W.; and Chung, Tai-Shung, to Hoechst Celanese Corp. Fabrication of microporous PBI membranes with narrow pore size distribution. 5,091,087, Cl. 210-500.280.

Camar S.p.A.: See—
Cattaneo, Carlo, 5,090,652, Cl. 248-222.100.

Cambou, Bertrand F.; Foerstner, Juergen; and Liaw, H. Ming, to Motorola, Inc. Method of fabricating a dielectric isolated area. 5,091,330, Cl. 437-62.000.

Cameron, Andrew M., to University of Manchester Institute of Science and Technology. Magnesium production. 5,090,996, Cl. 75-10.190.

Campau, Daniel N., to Flow-Rite Controls, Ltd. Field repairable apparatus for use in filling containers to a predetermined level. 5,090,442, Cl. 137-315.000.

Campbell, Gregor; Conn, Robert W.; and Shoji, Tatsuo, to Plasma & Materials Technologies, Inc. High density plasma deposition and etching apparatus. 5,091,049, Cl. 156-643.000.

Campbell Soup Company: See—
Conte, Joseph A., Jr.; Johnson, Bobby R.; Hsieh, Rudolf J.; and Ko, Sandy S., 5,091,203, Cl. 426-614.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy: See—
Kondos, Peter D.; Haque, Kazi E.; MacDonald, John C.; Griffith, Wesley F.; Laforest, Daniel; and Iuliano, Joe, 5,091,160, Cl. 423-131.000.

Canadas, Jean-C., to Rockwell-Cim Societe Anonyme. Holding device for fixing objects to motor vehicles interior parts. 5,090,858, Cl. 411-439.000.

Canfield, Barth A.; and Duffield, David J., to Thomson Consumer Electronics, Inc. Picture-in-picture circuitry using field rate synchronization. 5,091,785, Cl. 358-183.000.

Canon Kabushiki Kaisha: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.

Fukahori, Hidehiko; Suda, Yasuo; Itoh, Kenji; Higashihara, Masaki; and Aoyama, Keisuke, 5,091,742, Cl. 354-402.000.

Hirano, Hirofumi; and Sukigara, Akihiko, 5,090,827, Cl. 400-185.000.

Imaoka, Yasunori; and Oshima, Shigeru, 5,091,802, Cl. 359-694.000.

Inoue, Masahiro; Amemiya, Koji; Ohno, Akio; and Tsunemi, Takeo, 5,091,751, Cl. 355-274.000.

Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,091,723, Cl. 340-784.000.

Katao, Shuichi, 5,091,689, Cl. 323-312.000.

Kohayakawa, Yoshimi, 5,090,798, Cl. 351-221.000.

Matsuo, Kazuhiro; Murakami, Koichi; Tagawa, Yoichi; and Izumi, Kenichi, 5,090,860, Cl. 412-11.000.

Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,091,210, Cl. 427-39.000.

Nakahara, Toshiaki; Tanikawa, Hirohide; Yoshida, Satoshi; Fujiwara, Masatsugu; and Sakashita, Kiichiro, 5,091,279, Cl. 430-106.600.

Okada, Tamotsu, 5,091,752, Cl. 355-285.000.

Omata, Takashi, 5,091,744, Cl. 355-53.000.

Otokawa, Mitsuhiro; Kimura, Shunpei; and Miyaoka, Yasuyuki, 5,091,897, Cl. 369-13.000.

Ozawa, Takashi, 5,090,674, Cl. 271-3.100.

Sasaki, Nobukazu, 5,090,688, Cl. 271-293.000.

Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 5,091,734, Cl. 346-1.100.

Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, 5,091,109, Cl. 252-299.610.

Togano, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, 5,091,737, Cl. 346-140.00R.

Umetsu, Sachio; Tsuda, Toshio; Azuma, Yusaku; Miura, Toshihiko; Ishihara, Katsumi; and Ohsaka, Teiji, 5,090,113, Cl. 29-714.000.

Watanabe, Kiyoshi, 5,091,973, Cl. 382-54.000.

Yamada, Yasuhiro; Miyazaki, Yasuko; Kanemoto, Takashi; Matsuo, Mikiharu; and Katayama, Hirohiko, 5,091,865, Cl. 395-153.000.

Yashiro, Masahiko, 5,090,680, Cl. 271-186.000.

Canon Kabushiki Kaisha & Canon Aptex, Inc.: See—
Kitahara, Yoshihiko; and Kobayashi, Kenji, 5,090,673, Cl. 270-53.000.

Cantillo, Jose; Strozier, Robert W.; and Francik, William P., to Good-year Tire & Rubber Company, The. Alpha-(2,4-dihydroxyphenyl) N-phenyl nitroene and its use in the modification of diene containing polymers. 5,091,449, Cl. 524-100.000.

Cantwell, Thomas C.; and Wilmot, Richard D., to Hughes Aircraft Company. Adaptive threshold detector. 5,091,729, Cl. 342-90.000.

Capek, Raymond G.; and Greiner, Siegfried M., to Zenith Electronics Corporation. Provision of support for tension shadow mask by which a predetermined Q-height is established without post-installation modification thereof. 5,090,933, Cl. 445-30.000.

Card, Roger J.: See—
Hsu, Nelson N. C.; Ballentine, Franklyn A.; Hufziger, Mark J.; and Card, Roger J., 5,091,255, Cl. 428-378.000.

Cardiac Pacemakers, Inc.: See—
Dahl, Roger W.; Beatty, Graydon E.; Swanson, David K.; and Heil, John E., 5,090,422, Cl. 128-784.000.

Cardiasmenos, Apostle G.; and Blustine, Martin R., to Raytheon Company. Pulse radar and components therefor. 5,091,730, Cl. 342-153.000.

Carduner, Keith R.; Carter, Roscoe O., III; Schuetzle, Dennis; and Decello, Michael J., to Ford Motor Company. Method and apparatus for measuring the thickness of a layer on a substrate. 5,091,647, Cl. 250-341.000.

Carey, David H., to Microelectronics and Computer Technology Corporation. Trenching techniques for forming vias and channels in multilayer electrical interconnects. 5,091,339, Cl. 437-187.000.

Carl Zeiss Stiftung: See—
Tulip, John, 5,091,911, Cl. 372-4.000.

Carlin, Charles K.: See—
Cornhill, Colin V.; and Carlin, Charles K., 5,091,640, Cl. 250-214.00R.

Carlson, J. David, to Lord Corporation. Electrophoretic fluid differential. 5,090,531, Cl. 192-21.500.

Carmello, Diego; and Guglielmo, Giorgio, to Austimont S.p.A. Process for preparing 1,1,1-trifluoro-2,2-dichloroethane by hydrofluorination in the presence of catalysts. 5,091,601, Cl. 570-166.000.

Carmen, Don. Side grip member for conveyor systems. 5,090,557, Cl. 198-626.100.

Carnegie-Mellon University: See—
Pomerleau, Dean A., 5,091,780, Cl. 358-108.000.

Carolyn L. Lahargoue: See—
Wade, Guy A., 5,090,769, Cl. 297-258.000.

Carpenter, Steven P.: See—
Hipple, James H.; Smith, Don W.; Carpenter, Steven P.; and Johnston, Jesse C., 5,090,087, Cl. 15-317.000.

Carpenter Technology Corporation: See—
DeBolt, Terry A.; Kosa, Theodore; and Masteller, Millard S., 5,091,024, Cl. 148-306.000.

Carr, Richard V. C.: See—
Casey, Jeremiah P.; Carr, Richard V. C.; Wasilczyk, George J.; and Petrella, Robert G., 5,091,583, Cl. 564-461.000.

Carrie, Susan; Ergene, Serdar; and Gosling, James, to Sun Microsystems, Inc. Apparatus for selecting mode of output in a computer system. 5,091,717, Cl. 340-703.000.

Carrier Corporation: See—
Fuller, Jack J.; Podesta, Joseph A.; and Yarnold, Daniel J., 5,090,115, Cl. 29-789.000.

Haller, David K., 5,090,878, Cl. 418-1.000.

Carroll, Glenn T.: See—
Lindstrom, Michael J.; Carroll, Glenn T.; Hsing-Gan Yen, Jeffrey; and Clark, Roger T., 5,091,593, Cl. 568-21.000.

Carroll, Marshall. Grain distributor. 5,090,544, Cl. 193-31.00A.

Carta, Giorgio: See—
Kennington, Allison; Lerner, Joseph; Hill, Cynthia; Stringfield, Butler; Carta, Giorgio; and Kirwan, Donald J., 5,091,596, Cl. 568-833.000.

Carter, Richard J.: See—
Shelton, John F.; and Carter, Richard J., 5,091,851, Cl. 395-425.000.

Carter, Roscoe O., III: See—
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Carter, William A., to HEM Research Inc. Double-stranded RNA correction of abnormalities in circulating immune complexes and monocyte function. 5,091,374, Cl. 514-44.000.

Casey, Daniel T., to AMP Incorporated. Module retention/ejection system. 5,090,920, Cl. 439-540.000.

Casey, Harry B.; Huffman, Todd H.; and Massouda, Debora F., to Westvac Corporation. Paperboard/polymer laminate for blister pack. 5,091,261, Cl. 428-511.000.

Casey, Jeremiah P.; Carr, Richard V. C.; Wasilczyk, George J.; and Petrella, Robert G., to Air Products and Chemicals, Inc. Tertiary amine catalysts for polyurethanes. 5,091,583, Cl. 564-461.000.

Casler, Richard J.: See—
Hoffman, Carvel D.; Booth, R. C.; Clymer, John C.; and Casler, Richard J., 5,091,862, Cl. 364-507.000.

Cassella Aktiengesellschaft: See—
Schonafinger, Karl; Bohn, Helmut; Beyerle, Rudi; and Just, Melitta, 5,091,398, Cl. 514-361.000.

Castellana, John: See—
Spath, Mark J.; Shost, Mark A.; Kunz, Timothy W.; Giannone, Guy E.; and Castellana, John, 5,090,364, Cl. 123-90.160.

Castex Industries, Inc.: See—
Wulff, Richard E., 5,090,083, Cl. 15-347.000.

Castillo, Ernesto J.; Eigenberg, Kenneth E.; Patel, Kanaiyalal R.; and Sabacky, Milton J., to Monsanto Company. Coated veterinary implants. 5,091,185, Cl. 424-438.000.

Catheter Research, Inc.: See—
McCoy, William C., 5,090,956, Cl. 604-95.000.

Cattaneo, Carlo, to Camar S.p.A. Concealed device for wall-mounting an item of wall furniture. 5,090,652, Cl. 248-222.100.

Cawelti, Dale W.: See—
Hill, William H.; and Cawelti, Dale W., 5,091,825, Cl. 361-404.000.

Cawley, Robin A.: See—
Keller, Paul R. N.; Cawley, Robin A.; and Stapleton, Alan L., 5,090,909, Cl. 434-43.000.

Cedarapids, Inc.: See—
McFarland, William D.; and Musil, Joseph E., 5,090,813, Cl. 366-23.000.

Centre Scientifique et Technique de Battment: See—
Roux, Gabriel; Rivero, Janine; and Gandini, Alessandro, 5,091,495, Cl. 528-49.000.

Cereda, Manlio S.: See—
Bekking, Roland Q.; and Cereda, Manlio S., 5,091,329, Cl. 437-52.000.

Cernohlavek, Leemer: See—
Newhouse, Daniel L.; Cernohlavek, Leemer; and Lochhaas, Philip D., 5,091,092, Cl. 210-635.000.

Cessna Aircraft Company, The: See—
Gonzalez, Cesar, 5,090,378, Cl. 123-275.000.

Cetus Corporation: See—
Innis, Michael A., 5,091,310, Cl. 435-91.000.

Chabala, Leonard V.: See—
Ramos, Joel A.; Chabala, Leonard V.; Rogers, Edward J.; and Tobin, Thomas J., 5,091,616, Cl. 200-146.00R.

Chai, Chang-Shung; Fink, David A.; and Gonzalez, John, to Lincoln Electric Company, The. Low hydrogen basic metal cored electrode. 5,091,628, Cl. 219-145.220.

Chana, Palvinder; and Clapson, John D., to Square Grip Limited. Shearhead reinforcement. 5,090,172, Cl. 52-252.000.

Chang, Chih C. D/A and A/D converters utilizing weighted impedances. 5,091,728, Cl. 341-153.000.

Chang, Clarence D.; Chu, Cynthia T. W.; Dessau, Ralph M.; Higgins, John B.; Lutner, John D.; and Schlenker, John D., to Mobil Oil Corp. Crystalline molecular sieve compositions MCM-37. 5,091,073, Cl. 208-46.000.

Chang, Morgan. Jigsaw puzzle. 5,090,701, Cl. 273-157.00R.

Chang, Tse-Wen, to Tanox Biosystems, Inc. Antigenic epitopes of IgE present on B cell but not basophil surface. 5,091,313, Cl. 435-240.270.

Chang, Yeng Ming, to Uniform Industrial Corp. Read head mounting structure for magnetic card reader. 5,091,811, Cl. 360-104.000.

Chao, Fred C.; and Rowe, William S., to General Electric Company. Automated thermal limit monitor. 5,091,139, Cl. 376-216.000.

Chao, Li-Chung: See—
Tang, Jiunn-Yann; and Chao, Li-Chung, 5,090,426, Cl. 131-194.000.

Chapman, Dennis; and Durrani, Aziz A., to Biocompatibles Ltd. Trialkyl-O-(W-aminoalkyl)-phosphatidylalkylammonium salts useful for the manufacture of biocompatible surfaces. 5,091,551, Cl. 558-166.000.

Chapman, Jeffrey S., to Textile Graphics Unlimited, Inc. Multi-color silk screen printer having separable two-piece platen for removal and replacement of printed material without loss of registry. 5,090,313, Cl. 101-129.000.

Charpentiermorize, Micheline: See—
Begue, Jean-Pierre; Charpentiermorize, Micheline; Bonnet Delpon, Daniele; and Gilbert-Semon, Huguette, 5,091,429, Cl. 514-255.000.

Chatwin, Ian M.; and Hines, Allan R., to Dorian Industries Pty. Ltd. Timing apparatus. 5,091,895, Cl. 368-6.000.

Chavant, Pierre-Yves: See—
Cahiez, Gerard; Chavant, Pierre-Yves; and Tozzolino, Pierre, 5,091,597, Cl. 568-878.000.

Cahiez, Gerard; Chavant, Pierre-Yves; and Tozzolino, Pierre, 5,091,598, Cl. 568-878.000.

Chemie Linz Gesellschaft m.b.H.: See—
Mullner, Martin; Stern, Gerhard; Schulz, Erich; and Rossler, Markus, 5,091,553, Cl. 558-302.000.

Chen, Chun-Hwei: See—
Shen, Hwei-Ping; Mou, Duen-Gang; Lim, Kim-Kee; Feng, Paul; and Chen, Chun-Hwei, 5,091,089, Cl. 210-611.000.

Chen, Deng-Shan: See—
Hsiue, Ging-Ho; Hsu, Chain-Shu; Hsieh, Chang-Jyh; and Chen, Deng-Shan, 5,091,274, Cl. 429-192.000.

Chen, Sam H.: See—
Lin, Tseng Y.; and Chen, Sam H., 5,090,188, Cl. 57-234.000.

Cheng, Paul G.: See—
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,091,505, Cl. 528-353.000.

Chevron Research and Technology Company: See—
Tsang, Tsze H.; and Spadafora, Vincent J., 5,091,377, Cl. 514-63.000.

Chezem, Jim A. Circular tool assembly. 5,090,287, Cl. 83-838.000.

Chiang, David, to Altera Corporation. Methods and apparatus for reducing coupling noise in programmable logic devices. 5,091,661, Cl. 307-465.000.

Chiang, Sai M.; and Newman, Don. Photo-hanging and display apparatus. 5,090,145, Cl. 40-605.000.

Chimienti, Vincent J. Protective container for a needle. 5,090,564, Cl. 206-365.000.

Chimner, Scott W. Floppy disk storage assembly. 5,090,783, Cl. 312-11.000.

Chin-Song, Chen. Table lamp controlling device. 5,091,678, Cl. 315-362.000.

Chinoi Gyogyszer es Vegyeszeti Termek Gyar R.T.: See—
De Kany, Gyula; Frank, Judit; Pelczar, Istvan; Kulcsar, Gabor; and Schreiner, Eniko, 5,091,411, Cl. 514-450.000.

Chinoi Gyogyszer-es Vegyeszeti Termek Gyar Rt.: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Marie; Ritli, Peter; Sipos, Judit; Pajor, Aniko; and Marmaros, Katalin, 5,091,530, Cl. 544-229.000.

Chiro Tool Mfg., Corp.: See—
McCann, Frank, 5,090,275, Cl. 81-177.850.

Chiu, Andrew T.: See—
Ardecky, Robert J.; Chiu, Andrew T.; Duncia, John J. V.; Timmermans, Petrus B. M. W. M.; and Wexler, Ruth R., 5,091,390, Cl. 514-303.000.

Cho, James Y.: See—
Sachs, Howard G.; and Cho, James Y., 5,091,846, Cl. 395-250.000.

Choate, Gary E.: See—
Olson, Wayne L.; and Choate, Gary E., 5,090,507, Cl. 182-234.000.

Choi, Young M. Reduction of diethyl phenylmalonate to 2-phenyl-1,3-propanediol. 5,091,595, Cl. 568-814.000.

Chonan, Mitsugi: See—
Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, 5,090,386, Cl. 123-478.000.

Suzuki, Kazuo; Tachibana, Fusao; and Chonan, Mitsugi, 5,090,380, Cl. 123-339.000.

Chopping, Geoffrey; and Rowe, Jonathan W., to GEC Plessey Telecommunications Limited. Telecommunications transmission security arrangement. 5,091,902, Cl. 370-16.100.

Choudhry, Vas: See—
Alpert, Seymour B.; Meisel, Donald; and Choudhry, Vas, 5,091,349, Cl. 501-155.000.

Chow, Vincent; and Denenberg, Byron, to MDA Scientific, Inc. Colorimetric detection apparatus. 5,091,642, Cl. 250-226.000.

Christen, Hans D.: See—
McMillen, Charles A.; and Christen, Hans D., 5,090,621, Cl. 239-230.000.

Christenson, Dan L., to Gordon-Piatt Energy Group, Inc. Unitized burner assembly. 5,090,897, Cl. 431-265.000.

Christenson, Ronald E., to McNeilus Truck and Manufacturing, Inc. Tag axle for refuse truck. 5,090,495, Cl. 180-24.020.

Christian, Robert E.: See—
Lemon, J. Robert; Evans, William T.; Christian, Robert E.; and Baer, Herbert J., 5,090,902, Cl. 433-72.000.

Christiansen, Jens; Frank, Klaus; Hartmann, Werner; and Kozlik, Claudius. Gas-electronic switch (pseudospark switch). 5,091,819, Cl. 361-120.000.

Christidis, Yanni: See—
Schouteeten, Alain; and Christidis, Yanni, 5,091,566, Cl. 562-531.000.

Christopher, Kent L.: See—
Spofford, Bryan T.; Christopher, Kent L.; and Hovan, Michael E., 5,090,408, Cl. 128-207.140.

Chriswiser, Jaime L.: See—
Ritchie, Julian C.; and Chriswiser, Jaime L., 5,090,722, Cl. 280-607.000.

Chrysler Corporation: See—
DeRees, Delbert D., 5,090,105, Cl. 29-469.000.

Kopera, John J. C., 5,091,704, Cl. 331-65.000.

Chu, Cynthia T. W.: See—
Chang, Clarence D.; Chu, Cynthia T. W.; Dessau, Ralph M.; Higgins, John B.; Lutner, John D.; and Schlenker, John D., 5,091,073, Cl. 208-46.000.

Chu, Jau-Jier; Lai, Ming-Chih; Tseng, Mei-Rung; and Yeh, Hui-Hsing, to Industrial Technology Research Institute. Method for preparing superconductor sputtering target. 5,091,221, Cl. 427-282.000.

Chua, John P.: See—
Requejo, Luz P.; and Chua, John P., 5,090,975, Cl. 55-97.000.

Chuang, Jack. Gas lighter with rotational bingo means. 5,090,892, Cl. 431-125.000.

Chum, Helena L.; and Kreibich, Roland E., to Midwest Research Institute. Process for preparing phenolic formaldehyde resin products derived from fractionated fast-pyrolysis oils. 5,091,499, Cl. 528-129.000.

Chum, Pak-Wing S.; and Barger, Mark A., to Dow Chemical Company. The Light stable polystyrene-polymethylmethacrylate laminate and method of preparation. 5,091,250, Cl. 428-339.000.

Chung, Deborah D. L., to Research Foundation of State Univ. of N.Y., The Carbon fiber composites having improved fatigue resistance. 5,091,242, Cl. 428-237.000.

Chung, Jack C.: See—
Litt, Maria; Cobb, Wesley N.; Bond, David C.; Chung, Jack C.; and Leininger, Gary G., 5,091,963, Cl. 382-8.000.

Chung, Tai-Shung: See—
Calundann, Gordon W.; and Chung, Tai-Shung, 5,091,087, Cl. 210-500.280.

Chung, Young H.: See—
Shin, Myung C.; Sohn, Keun Y.; Chung, Young H.; Lee, Young Y.; and Park, Tai W., 5,091,149, Cl. 420-528.000.

Ciba-Geigy Corporation: See—
Bernier, Godwin; Rembold, Manfred; Sitek, Franciszek; and Rutsch, Werner, 5,091,439, Cl. 522-26.000.

Borzatta, Valerio; and Vignali, Graziano, 5,091,450, Cl. 524-100.000.

Clubley, Brian G., 5,091,113, Cl. 252-396.000.

Evans, Samuel; and Schumacher, Rolf, 5,091,099, Cl. 252-48.600.

Falk, Robert A.; and Clark, Kirtland P., 5,091,550, Cl. 558-165.000.

Francotte, Eric; and Baisch, Gabriele, 5,091,520, Cl. 536-56.000.

Khan, Satish C., 5,091,184, Cl. 424-435.000.

Mausezahl, Dieter, 5,090,964, Cl. 8-641.000.

Naef, Rudolf, 5,091,517, Cl. 534-752.000.

Ciccarone, Terrence M.: See—
Nutt, Ruth F.; Ciccarone, Terrence M.; Brady, Stephen F.; and Veber, Daniel F., 5,091,366, Cl. 514-11.000.

Cimini, Leonard J., Jr.; and Habbab, Isam M. I., to AT&T Bell Laboratories. Distributed reflector laser having improved side mode suppression. 5,091,916, Cl. 372-96.000.

Ciminno, Alberto F.; Klein, Anthony G.; and Opat, Geoffrey I., to University of Melbourne. The Electronic transducer. 5,090,248, Cl. 73-780.000.

Ciolino, Peter A. Exercise float and method of use. 5,090,695, Cl. 272-144.000.

Cipullo, Michael J., to General Electric Company. Process and composition. 5,091,591, Cl. 568-703.000.

Citizen Watch Co., Ltd.: See—
Kushida, Hachiro; Hamano, Kazumi; Imazawa, Yoshitsugu; and Irie, Kenji, 5,091,224, Cl. 427-419.400.

Citri, Nathan, to Yissum Research Development Company of the Hebrew University of Jerusalem. Method and kit for testing for the presence of catalase in milk. 5,091,306, Cl. 435-27.000.

Citterio, Giorgio: See—
Slavik, Walter; Citterio, Giorgio; and Brunecker, Guido, 5,090,190, Cl. 57-264.000.

CJC Holdings, Inc.: See—
Wagh, John T., 5,090,216, Cl. 63-26.000.

Claar, James A.: See—
Kahle, Charles F., II; Olson, Kurt G.; Claar, James A.; Pettit, Paul H., Jr.; and Kerr, Paul R., 5,091,451, Cl. 524-124.000.

Clader, John W.: See—
Berger, Joel G.; and Clader, John W., 5,091,526, Cl. 540-576.000.

Clapson, John D.: See—
Chana, Palvinder; and Clapson, John D., 5,090,172, Cl. 52-252.000.

Clarion Co., Ltd.: See—
Mitsutsuka, Syuichi, 5,091,669, Cl. 310-313.00A.

Clarion Co., Ltd.: See—
Sakata, Haruo, 5,091,943, Cl. 381-7.000.

Clark, Brian H.: See—
Koht, Lowell I.; Del Fava, Donald; Clark, Brian H.; Takaki, Dana M.; and Haddock, George W., 5,090,792, Cl. 385-32.000.

Clark, John I.; Benedek, George B.; Siezen, Roelant J.; Thomson, John A.; and Friedman, Simon H., to Massachusetts Institute of Technology. Chemical prevention or reversal of cataract by phase separation inhibitors. 5,091,421, Cl. 514-616.000.

Clark, Joseph D.; and Weingartner, Thomas A., to Honeywell Inc. Method and apparatus for generating display figures with three degrees of freedom. 5,091,867, Cl. 395-162.000.

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Falk, Robert A.; and Clark, Kirtland P., 5,091,550, Cl. 558-165.000.

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Clarke, Robert R.: See—
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Clarke, Samuel T. Hose trolley. 5,090,647, Cl. 248-87.000.

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De Guzman, Joselito S., 5,090,084, Cl. 15-230.110.

Cleary, Gary W.: See—
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Clebowicz, Brian A., to Hughes Aircraft Company. Data router with burst shuffling and deshuffling output buffers. 5,091,940, Cl. 380-37.000.

Cleaves, James M.; Heard, James G.; and Tan, Zoilo C. H., to National Semiconductor Corp. Plasma etching using a bilayer mask. 5,091,047, Cl. 156-643.000.

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Sewter, Bruce R.; Clemons, Lester, Jr.; Battaglia, Joseph A.; and DeBarber, Thomas A., 5,090,221, Cl. 68-18.00R.

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Cleveland, James H.: See—
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Clevenger, James T., Jr.; and Linde, Gilbert W., to Ford New Holland, Inc. Seal for manure spreader floating auger. 5,090,627, Cl. 239-675.000.

Clifford, Paul, to Rolls-Royce plc. Fire-proof seals. 5,091,605, Cl. 174-65.00R.

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Rowland, Richard R., 5,091,560, Cl. 560-185.000.

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Clubley, Brian G., to Ciba-Geigy Corporation. Corrosion inhibiting composition. 5,091,113, Cl. 252-396.000.

Clymer, John C.: See—
Hoffman, Carvel D.; Booth, R. C.; Clymer, John C.; and Casler, Richard J., 5,091,862, Cl. 364-507.000.

CMS Gilbreth Packaging Systems, Inc.: See—
Przeworski, Richard A.; and White, Roy A., 5,091,239, Cl. 428-195.000.

Coates, Clarence A., Jr.: See—
Weaver, Max A.; Hilbert, Samuel D.; Pruett, Wayne P.; and Coates, Clarence A., Jr., 5,091,501, Cl. 528-220.000.

Cobb, Wesley N.: See—
Litt, Maria; Cobb, Wesley N.; Bond, David C.; Chung, Jack C.; and Leininger, Gary G., 5,091,963, Cl. 382-8.000.

Coburn, Joseph W., Jr. Laminated decorative film providing pearlescent appearance or effect. 5,091,232, Cl. 428-40.000.

Coca-Cola Company, The: See—
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 5,090,589, Cl. 221-2.000.

Cogdill, Cletus V. Bidet apparatus. 5,090,067, Cl. 4-420.200.

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Petit, Bernard, 5,091,142, Cl. 376-261.000.

Coggan, William G.; Guyette, John M.; and Pozzo, James A., to Abiti-Price Corporation. Lapped hardboard panels and method. 5,090,173, Cl. 52-309.800.

Cohen, Jack L.; and Deubler, R. Peter, to Aegis Industries, Inc. Pipe harness clamp. 5,090,742, Cl. 285-114.000.

Colas, Andre R. L.; and Geilich, Klaus M., to Dow Corning GmbH. Elastomer-forming compositions comprising alkoxylated MQ resins and polydiorganosiloxanes. 5,091,484, Cl. 525-477.000.

Coldebella, Mark: See—
Bleich, Charles R.; Coldebella, Mark; and DeMar, Lawrence E., 5,091,677, Cl. 315-360.000.

Cole-Hamilton, David J.: See—
Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhat, Deodatta V.; and Webb, Paul, 5,091,570, Cl. 562-899.000.

Cole, James F.; and Keeran, Jerald J., to Tandy Corporation. Method and apparatus for password protection of a computer. 5,091,939, Cl. 380-25.000.

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Rivera, Ligia A.; Buck, Charles E.; and Roga, Robert C., 5,090,832, Cl. 401-132.000.

Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barootian,

Arthur, to Johnson Service Corp. Elastomer type low pressure sensor. 5,090,246, Cl. 73-718.000.

Collet, Christian: See—
Dieumegard, Dominique; Garry, Guy; Karapiperis, Leonidas; Pribat, Didier; and Collet, Christian, 5,090,932, Cl. 445-24.000.

Collier, Richard W.: See—
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COMEC S.r.l.: See—
Brasa, Umberto, 5,090,311, Cl. 101-115.000.

Commissariat a l'Energie Atomique: See—
Lazzari, Jean-Pierre, 5,090,111, Cl. 29-603.000.

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Le Sergeant, Christian; and Ramos, Josiane, 5,090,979, Cl. 65-3.120.

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Culley, Paul R., 5,091,850, Cl. 395-400.000.

Compatico, Inc.: See—
Stob, Henry R., 5,091,607, Cl. 174-48.000.

Computer Aided Systems, Inc.: See—
Lichti, Robert, Sr.; Bernard, Clay, II; Perry, Daniel C.; and Lukken, Stanley H., 5,090,863, Cl. 414-331.000.

Conagra, Inc.: See—
Hopkins, Brian D.; and Lorence, Matthew W., 5,090,615, Cl. 229-125.350.

Conductive Containers, Inc.: See—
Becker, Raymond P., 5,090,563, Cl. 206-328.000.

Conductus, Inc.: See—
Kapitulnik, Aharon, 5,090,819, Cl. 374-176.000.

Confalonieri, Carlo: See—
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 5,091,372, Cl. 514-34.000.

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Conn, Robert W.: See—
Campbell, Gregor; Conn, Robert W.; and Shoji, Tatsuo, 5,091,049, Cl. 156-643.000.

Connelly, Lawrence J.; Abbateello, Steven J.; Davis, David C.; and Undlin, David A., to Nalco Chemical Company. Use of dextran as a filtration aid for thickener overflow filtration in Kelly filters in the Bayer process. 5,091,159, Cl. 423-122.000.

Connors, Eugene E.; and Holm, Susan A. W., to Seagate Technology, Inc. Disc drive with small air gap between back iron and spindle hub. 5,091,809, Cl. 360-99.080.

Conoco Inc.: See—
Summers, Laine E., 5,090,478, Cl. 166-278.000.

Conrad, John C.: See—
Hewitt, Fred G.; Conrad, John C.; and Conrad, Kathy J., 5,090,907, Cl. 433-144.000.

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Conte, Joseph A., Jr.; Johnson, Bobby R.; Hsieh, Rudolf J.; and Ko, Sandy S., to Campbell Soup Company. Method for removing cholesterol from eggs. 5,091,203, Cl. 426-614.000.

Conte, Robert F. I., to Dürkopp Adler Aktiengesellschaft. Sewing machine with a sewing head including a rotary housing. 5,090,342, Cl. 112-121.150.

Cooper, James L.; and Bogle, Jack M., to Eastman Kodak Company. Analysis of acidic metal carbonyl hydride containing streams. 5,091,317, Cl. 436-73.000.

Cooper, Ronald F.: See—
Nelson, Bruce N.; and Cooper, Ronald F., 5,090,824, Cl. 385-22.000.

Coors Brewing Company: See—
Hahn, Roger A.; Bowles, Ray L.; Schultz, Robert H.; Williams, Warren R.; and Bagrosky, Michael E., 5,090,229, Cl. 72-347.000.

Copeland Corporation: See—
Fain, Gary K., 5,090,873, Cl. 417-228.000.

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Corazzola, Luigi: See—
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Corcoran, Patrick H.: See—
Arduengo, Anthony J., III; Barsotti, Robert J.; and Corcoran, Patrick H., 5,091,498, Cl. 528-90.000.

Cornhill, Colin V.; and Carlin, Charles K., to Square D Company. Phase advance for ambient light suppression in phototransistors. 5,091,640, Cl. 250-214.00R.

Cornils, Boy; Konkol, Werner; Bahrmann, Helmut; Bach, Hanswilhelm; Wiebus, Ernest; and Lipps, Wolfgang, to Hoechst Aktiengesellschaft. Process for hydroformylation with rhodium catalysts and the separation of rhodium therefrom. 5,091,350, Cl. 502-24.000.

Corning Incorporated: See—
Dannoux, Thierry L. A., 5,091,989, Cl. 385-70.000.

Cosenza, Frank J., to VSI Corporation. Printed circuit board mounting apparatus. 5,090,840, Cl. 403-409.100.

Cotton, Lawrence M., to Robert Bosch Power Tool Corporation. Power tool. 5,090,488, Cl. 173-163.000.

Cousanon, Tristan D.: See—
Fouche, Yvon; Cousanon, Tristan D.; and Eouzan, Jean-Yves, 5,091,773, Cl. 358-10.000.

Counsel, Christopher M.: See—
Lee, David C., 5,090,749, Cl. 296-171.000.

Courtauld PLC: See—
Bahia, Hardev S., 5,091,130, Cl. 264-103.000.

Cousse, Henri: See—
Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,091,415, Cl. 514-506.000.

Cowan, Philip L. Low friction proportional unloading valve. 5,090,437, Cl. 137-116.000.

Cox, Eugene J. Picture frame connecting system. 5,090,835, Cl. 403-294.000.

Coy, Gerald L.; Buck, Kenneth; and Blitz, William, to Xerox Corporation. Method of automatically setting document registration and locating calibration strip. 5,091,654, Cl. 250-561.000.

Crabtree, Allen E. Laser light show device and method. 5,090,789, Cl. 359-10.000.

Cradeur, Robert R.: See—
Krajicek, Richard W.; and Cradeur, Robert R., 5,091,016, Cl. 134-22.100.

Craftmade International, Inc.: See—
Ridings, Ronald L.; and Fitzpatrick, Robert M., 5,090,654, Cl. 248-343.000.

Crass, Guenther: See—
Schloegl, Gunter; Bothe, Lothar; Crass, Guenther; Murschall, Ursula; and Peiffer, Herbert, 5,091,237, Cl. 428-215.000.

Crawford, John; Kikabhai, Thakor; McLeary, David B.; and Pearce, Andrew, to BP Chemicals (Additives) Limited. Fuel composition containing an additive for reducing valve seat recession. 5,090,966, Cl. 44-314.000.

Crawley, Clifton J., Jr.: See—
Schwarz, Fred M.; Crawley, Clifton J., Jr.; Raueo, Anthony F.; and Lagueux, Ken R., 5,090,193, Cl. 60-39.020.

CRC-Evans Automatic Welding: See—
Jones, Richard L., 5,090,608, Cl. 228-49.300.

Creager, Ramon E.; and Soltani, Peter K., to Quantex Corporation. Fiber optic dosimeter using electron trapping materials employing technique for eliminating background fluorescence. 5,091,653, Cl. 250-484.100.

Creager, Richard F.; Blanding, Mark; VanRhee, Jack; and Hartuniewicz, Walter R. Integral manifold. 5,090,740, Cl. 285-61.000.

Creative BioMolecules, Inc.: See—
Huston, James S.; and Oppermann, Hermann, 5,091,513, Cl. 530-387.000.

Creative Works, L.P.: See—
Shapiro, Bruce; and Narubin, Gunar, 5,090,127, Cl. 33-27.020.

Creeron, Richard F., to First Brands Corporation. Cleaning apparatus and method. 5,090,458, Cl. 141-7.000.

Crick: See—
Floriol, Marcel, 5,090,893, Cl. 431-153.000.

Cronin, John E.; Kaanta, Carter W.; Previti-Kelly, Rosemary A.; and Ryan, James G., to International Business Machines Corporation. Process for forming multi-level coplanar conductor/insulator films employing photosensitive polyimide polymer compositions. 5,091,289, Cl. 430-312.000.

Cross Manufacturing Company (1938) Limited: See—
Flower, Ralph F. J., 5,090,710, Cl. 277-53.000.

Cross, Sue S.: See—
Koehn, Frank; Cross, Sue S.; and Longley, Ross E., 5,091,368, Cl. 514-18.000.

Wright, Amy S.; Cross, Sue S.; Burres, Neal S.; and Koehn, Frank, 5,091,412, Cl. 514-453.000.

Crowley, Daniel J., Jr.: See—
Ingram, Keith W.; and Crowley, Daniel J., Jr., 5,090,788, Cl. 215-252.000.

Crucible Materials Corporation: See—
Kim, Andrew S., 5,091,020, Cl. 148-101.000.

Cruickshank, Kenneth: See—
Morrison, Larry E.; Royer, Garfield P.; and Cruickshank, Kenneth, 5,091,519, Cl. 536-29.000.

Crum, James N.: See—
Lee, Sung C.; and Crum, James N., 5,090,315, Cl. 101-148.000.

Crutchfield, H. Carl; Shomberger, Stephen M.; Wedell, Mark T.; and Breedlove, Michael D., to Troxel Company, The. Staple remover. 5,090,663, Cl. 254-28.000.

Cucheran, John S., to Bott, John A. Slat assembly for vehicle article carriers. 5,090,605, Cl. 224-321.000.

Cuenot, Alain; and Bendahmane, Bouziane, to GEC ALSTHOM SA. Motor having flux-concentrating permanent magnets. 5,091,668, Cl. 310-156.000.

Culley, Paul R., to Compaq Computer Corporation. System for fast selection of non-cacheable address ranges using programmed array logic. 5,091,850, Cl. 395-400.000.

Cullo, Leonard A., to Aristech Chemical Corporation. Aniline catalyst. 5,091,579, Cl. 564-402.000.

Cummins, Craig R.: See—
Kasper, Gary A.; Erickson, Roy O.; Rohn, Dean R.; Selewski, Steven R.; and Cummins, Craig R., 5,090,974, Cl. 55-95.000.

Cuneo, Giuseppe L., to Black & Decker Inc. Dust extraction for drill. 5,090,499, Cl. 175-209.000.

Cunningham, David G., to BT&D Technologies Limited. Traveling wave optical modulator. 5,091,981, Cl. 385-3.000.

Cunningham, Philip J. Carpenter square. 5,090,129, Cl. 33-481.000.

Cur, Nihat O.: See—
Kirby, David B.; and Cur, Nihat O., 5,091,233, Cl. 428-69.000.

- Curcio, James V.: See—
Randall, John R., Jr.; Keyes, Denis E.; and Curcio, James V., 5,090,594, Cl. 222-1.000.
- Curtin, John H.: See—
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- Curtis Manufacturing Company, Inc.: See—
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- Cutshall, Rex V.: See—
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- Cygnus Therapeutic Systems: See—
Miranda, Jesus; and Cleary, Gary W., 5,091,186, Cl. 424-448.000.
- Dafinger, Willibald; Gabler, Wolfriedrich; Pichl, Eduard; and Hierzegger, Roman, to Wacker-Chemie GmbH. Process for the preparation of trichloroethylene. 5,091,603, Cl. 570-230.000.
- Dahl, Roger W.; Beatty, Graydon E.; Swanson, David K.; and Heil, John E., to Cardiac Pacemakers, Inc. Implantable electrode pouch. 5,090,422, Cl. 128-784.000.
- Daiel Chemical Industries, Ltd.: See—
Kamakura, Kunihito; Ohta, Seiichi; Aoki, Chihito; Hamano, Seitaro; and Hiramatsu, Yasushi, 5,090,078, Cl. 15-97.100.
- Tanaka, Yasutaka; Kojima, Hidetaka; and Tsuji, Yasuo, 5,091,563, Cl. 562-406.000.
- Daido Metal Company Ltd.: See—
Tanaka, Tadashi; Tamura, Hidehiko; Uenaka, Kiyohide; and Hakakoshi, Shigemasa, 5,091,098, Cl. 252-12.200.
- Daifuku Co., Ltd.: See—
Hatouchi, Gokichi, 5,090,558, Cl. 198-781.000.
- Dainippon Ink and Chemicals, Inc.: See—
Tabayashi, Isao; Harada, Hiroshi; Inoue, Sadahiro; and Fukutomi, Hiroshi, 5,091,004, Cl. 106-22.000.
- Dainippon Screen Mfg. Co., Ltd.: See—
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- Sasahara, Masayuki; and Yamaguchi, Katsuya, 5,091,974, Cl. 582-55.000.
- Daiva Seiko Inc.: See—
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- Dalbicz, Andre: See—
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- Dale Electronics, Inc.: See—
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- Dallas Semiconductor Corporation: See—
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- Dalton Enterprises: See—
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- Dana Corporation: See—
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- Wall, John H.; and Walter, Edward L., 5,091,619, Cl. 219-56.100.
- Dana, David E.; Huang, Tsao-Chin C.; Pepe, Enrico J.; Pohl, Eric R.; and Su, Shiu-Chin H., to Union Carbide Chemicals and Plastics Company, Inc.; and PPG Industries, Inc. Glass fiber size. 5,091,465, Cl. 524-588.000.
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- Danisco A/S: See—
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- Dankowski, Manfred: See—
Jacobs, Jochen; Koepplmann, Edgar; Witthaus, Martin; and Dankowski, Manfred, 5,091,106, Cl. 252-186.260.
- Dannoux, Thierry L. A., to Corning Incorporated. Method for encapsulating an optical component and the encapsulated component obtained thereby. 5,091,989, Cl. 385-70.000.
- Danon, Haim; and Gnessin, Amir, to Optrotech Ltd. Method and apparatus for securing a sheet material to a rotating vacuum drum using a sealing strip. 5,090,685, Cl. 271-276.000.
- D'Antonio, Michael J.; Gibbs, Irving A.; Lane, Lawrence J.; and Lawson, Rodney A., to General Electric Company. Method for monitoring operational condition of circuit components. 5,091,690, Cl. 324-107.000.
- Dash, Thomas E., to Wallace Computer Services, Inc. Method of making a core lock shaft. 5,090,104, Cl. 29-434.000.
- Datascope Investment Corp.: See—
Saper, Lawrence; and Hanson, Bruce L., 5,090,410, Cl. 128-633.000.
- Datsko, George; and Ross, William J., to NCR Corporation. Apparatus for measuring the speed of transmission of digital characters. 5,091,870, Cl. 364-565.000.
- Daub, Dieter: See—
Schmiedberg, Winfried; and Daub, Dieter, 5,090,228, Cl. 72-238.000.
- Daub, Jorg; Rapp, Knut M.; Seitz, Petra; Wild, Rainer; and Salbeck, Josef, to Sueddeutsche Zucker-Aktiengesellschaft. Dicyanovinylsubstituted furan derivatives. 5,091,538, Cl. 546-283.000.
- Daude, Gerard: See—
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- Davenport, Martin F.: See—
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- Daverio AG: See—
Maier, Willy; and Bachmann, Thomas, 5,090,687, Cl. 271-289.000.
- Davidson, Neil S.; and Wilkinson, Kenneth, to BP Chemicals Limited. Flame retardant polymer composition. 5,091,453, Cl. 524-269.000.
- Davie, William R., to Aristech Chemical Corporation. Purified para-cumylphenol. 5,091,058, Cl. 203-33.000.
- Davis, David C.: See—
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- Davis, Frances M.: See—
Fan, John C. C.; Tsaor, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 5,091,333, Cl. 437-82.000.
- Davis, Geoffrey C. R.; and McIntire, Allen J., to United Technologies Corporation. Method of manufacturing a unitary, multi-legged helicopter rotor flexbeam made solely of composite materials. 5,091,029, Cl. 156-174.000.
- Davis, John S.: See—
Jincks, Danny C.; Davis, John S.; and Latta, Michael D., 5,091,828, Cl. 362-35.000.
- Davis, Lemuel L.; Kimball, Mark R.; Sarkissian, Vahe; and Kohler, Dylan, to Walt Disney Company. The Computer image production system utilizing first and second networks for separately transferring control information and digital image data. 5,091,849, Cl. 395-100.000.
- Davis, P.; Ku, J. S.; and Schmitt, T. M., to BASF Corporation. Solventless process for preparing sulfolphenethylsiloxane or sulfolphenethylsiloxanes. 5,091,548, Cl. 556-428.000.
- Davis, Robert M., to Orbital Engine Company Proprietary Limited. Nozzles for in-cylinder fuel injection systems. 5,090,625, Cl. 239-453.000.
- Daxelmuller, Manfred; Doeberl, Dieter; and Kraxner, Gerhard, to Bohler Ges. M.B.H. Welded bimetallic sawblade or metal saw band. 5,091,264, Cl. 428-685.000.
- Daylight Donut Flour & Equipment Co.: See—
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- Dean, Alicia; Fitzsimmons, John A.; Havas, Janos; McCormick, Barry C.; and Shah, Prabodh; R. Photoresist stripper. 5,091,103, Cl. 252-162.000.
- DeBarber, Thomas A.: See—
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- DeBold, Terry A.; Kosa, Theodore; and Masteller, Millard S., to Carpenter Technology Corporation. Corrosion resistant, magnetic alloy article. 5,091,024, Cl. 148-306.000.
- Decaux, Jean-Claude. Self-cleaning sanitation module incorporating a tilting back. 5,090,069, Cl. 4-662.000.
- Decello, Michael J.: See—
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- Dechow, Ulrich, to Nordischer Maschinenbau Rud. Baader GmbH + Co KG. Apparatus for feeding fish processing machines. 5,090,941, Cl. 452-183.000.
- Deer, Daniel J., to Renishaw plc. Position determining apparatus. 5,090,131, Cl. 33-556.000.
- deFraine, Paul; Snell, Brian K.; Beautelement, Kevin; and Anthony, Vivienne M., to Imperial Chemical Industries PLC. Heterocyclic compounds as fungicides. 5,091,407, Cl. 514-423.000.
- Degani, Yinon; Kimball, Robert M.; and Shevchuk, George J., to AT&T Bell Laboratories. Article for connecting optical fibers. 5,091,988, Cl. 385-70.000.
- Deger, Hans-Matthias: See—
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- Degussa AG: See—
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- Huthmacher, Klaus; and Schmitt, Hermann, 5,091,554, Cl. 558-341.000.
- Degussa Corporation: See—
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- De Guzman, Joselito S., to Cleanline Corporation. Cleaning roller for surfaces and apparatus for use therewith. 5,090,084, Cl. 15-230.110.
- Dehmel, Konrad: See—
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- Nappa, Mario J., 5,091,168, Cl. 423-489.000.
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- Edwards, Clarence K.; and Edwards, Lawrence D., to Kadee Metal Products Co. Self-centering model railroad car truck assembly, 5,090,332, Cl. 105-157.200.
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- Efremov, Oleg V.: See—
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- Egawa, Akira: See—
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- Egbers, David A.; and Jacob, Steven D., to Landis & Gyr Powers, Inc. Apparatus for determining the position of a moveable structure along a track, 5,090,304, Cl. 454-59.000.
- Ehara, Katuo: See—
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- Ehrmann, Gerd: See—
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- Eichelberger, Charles W. Configuration for testing and burn-in of integrated circuit chips, 5,091,769, Cl. 357-72.000.
- Eichelberger, Charles W.: See—
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- Eigenberg, Kenneth E.: See—
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- Eilenstein-Wiegmanns, Wilfried; and Sempert, Hartmut, to Deutsche Airbus GmbH. Locking mechanism for tying down freight in an aircraft, 5,090,638, Cl. 244-118.100.
- Eisenbeisz, John N. Apparatus and process for reducing heat gain and loss from windows, 5,090,302, Cl. 454-205.000.
- Eissler, Ewald: See—
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- Engstrom, Jorgen; and Falgen, Helena, 5,091,167, Cl. 423-478.000.
- Ekiner, Okan M.; Hayes, Richard A.; and Manos, Philip, to Du Pont de Nemours, E. I., and Company; and L'Air Liquide, S.A. Reactive post treatment for gas separation membranes, 5,091,216, Cl. 427-245.000.
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- Electric Power Research Institute: See—
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- Electrolux Siegen GmbH: See—
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- Electrovert Ltd.: See—
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- Mittag, Michael T., 5,090,651, Cl. 228-219.000.
- Elgebaly, Salwa A. Method for restoring functionality in muscle tissue, 5,091,404, Cl. 514-401.000.
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- Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., to Enviro-Air Control Corporation. Particulate abatement and environmental control system, 5,090,972, Cl. 55-20.000.
- Elliott, Richard M., to VG Instruments Group Limited. Selectable-resolution charged-particle beam analyzers, 5,091,645, Cl. 250-305.000.
- Ellis, Paul E., Jr.; and Lyons, James E., to Sun Refining and Marketing Company. Alkane oxidation catalysts, 5,091,354, Cl. 502-200.000.
- Ellis, Wilfred. Open cellular containership and method, 5,090,353, Cl. 114-72.000.
- Ellison, C. Mack: See—
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- ELTECH Systems Corporation: See—
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- EMCO Electronics: See—
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- EMCO MAIER GmbH: See—
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- Mair, Hans; and Reiner, Johan, 5,090,278, Cl. 82-117.000.
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- Emhart Glass Machinery (U.S.) Inc.: See—
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- Emhiser Research Limited: See—
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- Emmons, William D.: See—
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- Emoto, Yoshiaki: See—
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- Endo, Yasushi: See—
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- Endo, Yoshinori: See—
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- Endstra, Willem C.: See—
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- Engel, Timothy S.: See—
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Lippens, Christiaan A. C.; and Demaecker, Victor C. D., 5,090,307, Cl. 100-35.000.

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Guliyi, Kirpal S.; Pervaiz, Shazib; Matthews, J. Lester; Dowben, Robert M.; Newman, Joseph T.; and Forest, Edward, 5,091,385, Cl. 514-224.800.

Forlini, Fabrizio: See—
Foa, Marco; Forlini, Fabrizio; Gatti, Norberto; and Borsotti, Giam-piero, 5,091,066, Cl. 204-78.000.

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Forrest, Charles P., Sr., 5,090,696, Cl. 273-55.00R.

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Yount, George S., 5,090,566, Cl. 206-416.000.

Fossella, Gregory. Adjustable ratchet wrench. 5,090,273, Cl. 81-57.130.

Foster, Charles D. Methods and apparatus for periodic chemical cleanings of turbines. 5,090,205, Cl. 60-646.000.

Foster, Dean H.; and Mol, Hans C., to Pitney Bowes Inc. Apparatus for transporting and reorienting envelopes. 5,090,181, Cl. 53-569.000.

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Parks, Glenn C., Jr.; Ellison, C. Mack; Godare, William L.; and Beson, John, 5,090,661, Cl. 251-172.000.

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Pierson, Pierre; and Fourneaux, Roger, 5,090,454, Cl. 139-116.200.

Fournier, Paul J. E.; Maiville, Randolph L.; and Zander, David G., to Aeroquip Corporation. Coupling security and safety latch system. 5,090,449, Cl. 137-614.050.

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Pleasants, Charles W.; and Fowler, Stewart H., Jr., 5,090,481, Cl. 166-373.000.

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Petit, Bernard, 5,091,142, Cl. 376-261.000.

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Francik, William P.: See—
Cantillo, Jose; Strozier, Robert W.; and Francik, William P., 5,091,449, Cl. 524-100.000.

Francotte, Eric; and Baisch, Gabriele, to Ciba-Geigy Corporation. Finely particulate cellulose esters of aromatic or aromatic-aliphatic carboxylic acids, process for their preparation, and the use thereof. 5,091,520, Cl. 536-56.000.

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Frank, Klaus: See—
Christiansen, Jens; Frank, Klaus; Hartmann, Werner; and Kozlik, Claudius, 5,091,819, Cl. 361-120.000.

Frank, Rainer: See—
Mayer, Rudi; Denz, Helmut; Wild, Ernst; and Frank, Rainer, 5,090,387, Cl. 123-479.000.

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Theurer, Josef, 5,090,329, Cl. 104-7.100.

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 Frayer, Paul D.: See—
 Huspeni, Paul J.; Layton, Richard; and Frayer, Paul D., 5,091,464, Cl. 524-539.000.
 Fredenucci, Pierre; and Berhaut, Jean-Bernard, to Arjomari Europe. Sheet prepared by wet means and usable as a backing for a covering material. 5,091,055, Cl. 162-135.000.
 Fridman, Yoram J.: See—
 Fries, Carl F.; Hazar, Mitchell M.; and Fridman, Yoram J., 5,091,095, Cl. 210-742.000.
 Fried, David R., to Idemitsu Kosan Company, Ltd. Method for micro-encapsulation of basic solutions. 5,091,122, Cl. 264-4.330.
 Friedinger, Roger M.: See—
 Evans, Ben E.; Pettibone, Douglas J.; and Friedinger, Roger M., 5,091,387, Cl. 514-278.000.
 Friedman, Ira, to Tri-Tec Industries Ltd. Game. 5,090,699, Cl. 273-126.00R.
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 Clark, John I.; Benedek, George B.; Siezen, Roelant J.; Thomson, John A.; and Friedman, Simon H., 5,091,421, Cl. 514-616.000.
 Fries, Carl F.; Hazar, Mitchell M.; and Fridman, Yoram J., to Focus Enterprises, Inc. System for controlling drain system treatment using temperature and level sensing means. 5,091,095, Cl. 210-742.000.
 Friesen, Daniel E.: See—
 Fast, William A.; and Friesen, Daniel E., 5,090,168, Cl. 52-213.000.
 Frisch, Kurt C.; and Ashida, Kaneyoshi. Reinforced foam composites comprising hydroxy-containing vinyl ester resin. 5,091,436, Cl. 521-137.000.
 Fritsch, Herwig: See—
 Schamberg, Eckehard; Koerner, Gotz; Fritsch, Herwig; Grasse, Manfred; and Sucker, Roland, 5,091,002, Cl. 106-2.000.
 Fritz, Alan H.: See—
 Burns, Marvin D.; Fritz, Alan H.; and Grime, Thomas E., 5,090,623, Cl. 239-301.000.
 Fritz Schafer Gesellschaft mit beschränkter Haftung: See—
 Schafer, Gerhard, 5,090,547, Cl. 193-35.00R.
 Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; Vander-Heyden, Jean-Luc; and Srinivasan, Ananthachari, to NeoRx Corporation. Metal-radionuclide-labeled proteins and glycoproteins for diagnosis and therapy. 5,091,514, Cl. 534-14.000.
 Froehling, Paul H.: See—
 Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barcootian, Arthur, 5,090,246, Cl. 73-718.000.
 Frognet, Jean-Pierre: See—
 Keller, Lajos E.; Frognet, Jean-Pierre; and Petitjean, Maurice, 5,091,236, Cl. 428-213.000.
 Froning, Edilbert A.; and Langner, Klaus A. Method of coupling electro-optical components to integrated-optical waveguides. 5,091,045, Cl. 156-633.000.
 Frontier Business Ltd.: See—
 Pelech, Gregory D.; and Williams, Gary, 5,090,450, Cl. 137-625.300.
 Frosch, Hans-Georg: See—
 Herd, Karl J.; Frosch, Hans-Georg; Henk, Hermann; Mullers, Wolfgang; and Stohr, Frank-Michael, 5,091,515, Cl. 534-598.000.
 Fruchtman, Romanis: See—
 Raddatz, Siegfried; Mohrs, Klaus-Helmut; Fruchtman, Romanis; Kohlsdorfer, Christian; Theisen-Popp, Pia; and Muller-Peddighaus, Reiner, 5,091,392, Cl. 514-311.000.
 Frye, Cecil L.; Haluska, Loren A.; Weiss, Keith D.; and Baney, Ronald H., to Dow Corning Corporation. Perhydropolysiloxane copolymers and their use as coating materials. 5,091,162, Cl. 423-325.000.
 Fuchs, Jean-Francois; Tisne, Jean-Louis; and Odru, Pierre, to Aerospaiale Societe Nationale Industrielle, and Institut Francais du Petrole. Tube of composite material with a fibrous thermoplastic coating and process for manufacturing such a tube. 5,091,230, Cl. 428-36.400.
 Fuerst, Arpad: See—
 Schreiter, Thomas; Fuerst, Arpad; and Paetz, Werner, 5,090,767, Cl. 296-216.000.
 Fuerst, Carlton D.: See—
 Perry, Thomas A.; Bradley, John R.; Schroeder, Thaddeus; and Fuerst, Carlton D., 5,091,021, Cl. 148-103.000.
 Fuji Electric Co., Ltd.: See—
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 Fuji Jukogyo Kabushiki Kaisha: See—
 Kurosui, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, 5,090,386, Cl. 123-478.000.
 Suzuki, Kazuo; Tachibana, Fusao; and Chonan, Mitsugi, 5,090,380, Cl. 123-339.000.
 Fuji Kiko Company, Limited: See—
 Yamamoto, Yoshima, 5,090,834, Cl. 403-277.000.
 Fuji Photo Film Co., Ltd.: See—
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 Kato, Mikihiko; Hashimoto, Hiroshi; Endo, Yasushi; and Nagashima, Yasuo, 5,091,238, Cl. 428-64.000.
 Kuwashima, Shigeru; and Aoki, Mario, 5,091,295, Cl. 430-507.000.
 Maeda, Yutaka; Kaneko, Kiyotaka; Miyake, Izumi; Nakane, Yoshio; and Shimaya, Hiroshi, 5,091,806, Cl. 360-67.000.
 Morita, Kiyoo, 5,090,890, Cl. 425-564.000.
 Nakamura, Hiroshi; and Ogiwara, Nagao, 5,091,281, Cl. 430-203.000.

Nishikawa, Yasuo; and Sano, Kunihiko, 5,091,249, Cl. 428-336.000.
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 Ohya, Takao; Nishikawa, Yasuo; and Hayakawa, Satoru, 5,091,270, Cl. 428-695.000.
 Oshima, Yoshitomo; and Tou, Kazumi, 5,091,134, Cl. 264-176.100.
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 Watanabe, Mikio; and Nishi, Seiki, 5,091,787, Cl. 358-209.000.
 Yamaguchi, Jun; Washizu, Shintaro; Matsumoto, Hirotaka; Iwakura, Ken; and Fukushige, Yuuichi, 5,091,280, Cl. 430-138.000.
 Fuji Photo Film Co., Ltd.: See—
 Fujimoto, Hiroshi; Morimoto, Kiyoshi; and Ishikawa, Takatoshi, 5,091,292, Cl. 430-467.000.
 Fuji Xerox Co., Ltd.: See—
 Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsumi; Nukada, Katsumi; and Marumo, Teruomi, 5,091,276, Cl. 430-45.000.
 Fujifacom Corporation: See—
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 Fujii, Hiroshi: See—
 Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.
 Fujii, Toshio; Kato, Kazuhiro; Sakai, Akihiko; and Shinohara, Yoshinao, to Mitsubishi Kasei Corporation. Linear polyethylene film and process for producing the same. 5,091,228, Cl. 428-34.300.
 Fujiki, Jean S.: See—
 Ong, John T. H.; Fujiki, Jean S.; and Liaw, Wei-Cheng, 5,091,182, Cl. 424-400.000.
 Fujimoto, Akihiko, to Mitsubishi Denki K.K. Numerical control device including tapping pitch data group memory. 5,091,860, Cl. 364-474.110.
 Fujimoto, Hidefumi: See—
 Sasaki, Junsou; Hitomi, Mitsuo; Nishikawa, Toshio; and Fujimoto, Hidefumi, 5,090,391, Cl. 123-559.300.
 Fujimoto, Hiroshi; Morimoto, Kiyoshi; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic material. 5,091,292, Cl. 430-467.000.
 Fujimura, Katsuyuki: See—
 Iwasaki, Hiroya; Fujimura, Katsuyuki; Inoue, Yoshio; and Nakamura, Shoshiro, 5,091,312, Cl. 435-191.000.
 Fujino, Makoto; Hasegawa, Isahiro; and Ito, Masao, to Kabushiki Kaisha Toshiba. Dry etching method. 5,091,050, Cl. 156-643.000.
 Fujisawa, Masaaki: See—
 Hasegawa, Taiji; Fujisawa, Masaaki; Sakamoto, Masahide; Ishii, Toshio; and Takahashi, Hideharu, 5,091,856, Cl. 364-424.050.
 Fujita, Shunsuke: See—
 Yokomori, Kiyoshi; Fujita, Shunsuke; and Misawa, Shigeyoshi, 5,091,982, Cl. 385-4.000.
 Fujita, Tsugio: See—
 Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyoshi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.
 Fujita, Yoshiyuki; and Sakane, Katsunobu, to Toyoda Gosei Co., Ltd. Steering wheel. 5,090,731, Cl. 280-777.000.
 Fujitsu Limited: See—
 Akaogi, Takao, 5,091,888, Cl. 365-210.000.
 Iida, Masaru; and Tonomoto, Yoshihiro, 5,091,749, Cl. 355-246.000.
 Ikeda, Koichi; and Shutou, Hideki, 5,091,920, Cl. 375-76.000.
 Iseda, Koichi; Satoh, Kazumi; Kurihara, Hideaki; Amano, Fumio; Unagami, Shigeyuki; and Okazaki, Koji, 5,091,955, Cl. 381-36.000.
 Nishimura, Koichi; Taniguchi, Ikuo; Ikawa, Fumihiro; and Kurokawa, Masumi, 5,091,796, Cl. 359-110.000.
 Tanaka, Hitoshi, 5,091,207, Cl. 427-8.000.
 Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, 5,091,285, Cl. 430-296.000.
 Yamaguchi, Ichiro, 5,091,770, Cl. 357-74.000.
 Fujiwara, Masatsugu: See—
 Nakahara, Toshiaki; Tanikawa, Hirohide; Yoshida, Satoshi; Fujiwara, Masatsugu; and Sakashita, Kiichiro, 5,091,279, Cl. 430-106.600.
 Fujiwara, Takayoshi: See—
 Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; Sone, Yoshinori; and Shimoda, Moriaki, 5,090,874, Cl. 417-356.000.
 Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; and Sone, Yoshinori, 5,090,875, Cl. 417-356.000.
 Fukada, Takeshi: See—
 Yamazaki, Shunpei; Fukada, Takeshi; Sakama, Mitsunori; Shinohara, Hisato; Amachi, Nobumitsu; Sakamoto, Naoya; and Inuzima, Takashi, 5,091,638, Cl. 250-208.100.
 Fukahori, Hidehiko; Suda, Yasuo; Itoh, Kenji; Higashihara, Masaki; and Aoyama, Keisuke, to Canon Kabushiki Kaisha. Camera having an auto focusing device. 5,091,742, Cl. 354-402.000.
 Fukai, Yoshio: See—
 Katayama, Yoshinori; Murakami, Terukiyo; Asano, Hiroyuki; Abe, Yuichi; Iizuka, Haruhiko; Shimizu, Kazuaki; and Fukai, Yoshio, 5,091,857, Cl. 364-431.090.

Fukano, Izumi: See—
 Yamasaki, Akira; Takeda, Yoshinaka; Abe, Souhei; and Fukano, Izumi, 5,090,258, Cl. 73-863.030.
 Fukaya, Kazumi: See—
 Takikawa, Kazunori; Fukaya, Kazumi; Ohbu, Jun; and Yagi, Yasushi, 5,090,611, Cl. 228-173.400.
 Usui, Masayoshi; Fukaya, Kazumi; and Takikawa, Kazunori, 5,090,385, Cl. 123-468.000.
 Fukuchi, Masakazu: See—
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 Fukuda, Shuzo: See—
 Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.
 Fukuda, Yoshinobu, to Kabushiki Kaisha Daikin Seisakusho. Twin clutch. 5,090,537, Cl. 192-70.270.
 Fukuhara, Tohru: See—
 Kanai, Hachiro; Sosa, Toshio; and Fukuhara, Tohru, 5,091,741, Cl. 354-400.000.
 Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, to Ube Industries Limited; and Toyota Jidosha Kabushiki Kaisha. Thermoplastic resin composition. 5,091,462, Cl. 524-504.000.
 Fukumoto, Ryoichi: See—
 Yamamoto, Tokihiko; Fukumoto, Ryoichi; Ohhashi, Masao; Itagaki, Kazuhide; and Sumiya, Kazuhiro, 5,090,081, Cl. 15-250.130.
 Fukunaga, Hiroo; Furutachi, Nobuo; and Furusawa, Genichi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,091,297, Cl. 430-558.000.
 Fukunaga, Nobuyuki: See—
 Saito, Takeo; Ishida, Yoshiaki; Fukunaga, Nobuyuki; Kimura, Mutsuhiko; and Metoki, Yasuo, 5,090,325, Cl. 102-313.000.
 Fukushige, Yuuichi: See—
 Yamaguchi, Jun; Washizu, Shintaro; Matsumoto, Hirotaka; Iwakura, Ken; and Fukushige, Yuuichi, 5,091,280, Cl. 430-138.000.
 Fukushima, Koji: See—
 Yokohori, Shizuo; Miyamoto, Kenzo; Fukushima, Koji; Tsujimoto, Masami; Onda, Kenji; and Sato, Kan, 5,091,026, Cl. 156-149.000.
 Fukuta, Yoichi: See—
 Oki, Takeo; Fukuta, Yoichi; Hisada, Eiichi; and Aoki, Satoshi, 5,090,969, Cl. 51-295.000.
 Fukutomi, Hiroshi: See—
 Tabayashi, Isao; Harada, Hiroshi; Inoue, Sadahiro; and Fukutomi, Hiroshi, 5,091,004, Cl. 106-22.000.
 Fukuyama, Hiroshi: See—
 Sato, Naomi; Watanabe, Isao; and Fukuyama, Hiroshi, 5,090,759, Cl. 294-119.300.
 Fukuyama, Kiyoshi; Wada, Toru; Kitabata, Kozo; Sudare, Masahiro; Tsuchitani, Shigemasa; and Ohminami, Kazuya, to Tsubakimoto Chain Co. Three dimensional sorting apparatus. 5,090,552, Cl. 198-365.000.
 Fukuzawa, Soichi; Hayashi, Seiichi; Hirose, Etsuro; and Miyashita, Kazuo, to Hitachi, Inc. Automatic washing machine having tub posture tilting mechanism. 5,090,220, Cl. 68-3.00R.
 Fukuzawa, Tadashi: See—
 Ogawa, Kensuke; Katsuyama, Toshio; and Fukuzawa, Tadashi, 5,091,980, Cl. 385-3.000.
 Fuller, Jack J.; Podesta, Joseph A.; and Yarnold, Daniel J., to Carrier Corporation. Grommet insertion apparatus. 5,090,115, Cl. 29-789.000.
 Fulton, Alfred L.; Lakhani, Kishor M.; Sampson, Scott D.; and Lowman, Kent, to SCI Systems, Inc. Printing apparatus and method. 5,091,738, Cl. 346-154.000.
 Fultz, Jimmy D.: See—
 Pittard, Fred J.; and Fultz, Jimmy D., 5,090,480, Cl. 166-298.000.
 Funayama, Yoshihiro: See—
 Nakajima, Jun; Funayama, Yoshihiro; and Otsuka, Kazuyoshi, 5,090,715, Cl. 280-166.000.
 Furuhashi, Shoichi, to Fuji Electric Co., Ltd. Insulated gate bipolar transistor circuit with overcurrent protection. 5,091,664, Cl. 307-570.000.
 Furusawa, Genichi: See—
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 Furutachi, Hideaki: See—
 Katayanagi, Hideyuki; and Furutachi, Hideaki, 5,090,210, Cl. 62-135.000.
 Furutachi, Nobuo: See—
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 Furuya, Masato: See—
 Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,091,277, Cl. 430-48.000.
 Futami, Yuichi; and Nagami, Yuji, to Tsubakimoto Chain Co. Tensioner with replaceable filter in oil path. 5,090,946, Cl. 474-104.000.
 Futurex Industries: See—
 Kremer, Richard; and Wood, Stephen R., 5,090,763, Cl. 296-39.100.
 Fuxbruner, Amihay: See—
 Lewis, Aaron; Fuxbruner, Amihay; and Hemo, Itzhak, 5,091,626, Cl. 219-121.690.
 G. D. Searle & Co.: See—
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 G. E. Leblanc Inc.: See—
 Leblanc, Georges-Emile, 5,090,939, Cl. 452-127.000.

G. Fordyce Co.: See—
 Green, Robert L., 5,090,678, Cl. 270-52.500.
 G & H Technology, Inc.: See—
 MacCulloch, David B.; George, Nick C.; and Brickett, Benjamin P., 5,091,987, Cl. 385-66.000.
 Gabler, Wolfriedrich: See—
 Daffinger, Willibald; Gabler, Wolfriedrich; Pichl, Eduard; and Hierzegger, Roman, 5,091,603, Cl. 570-230.000.
 Gaddis, Ronald A., to Texas Instruments Incorporated. Apparatus and method for fabricating circuit pattern on conductive surface of circuit board. 5,090,121, Cl. 29-847.000.
 Gabelle, Claude, to Institut Francais du Petrole. Method for manufacturing a filter cartridge. 5,091,129, Cl. 264-85.000.
 Gaffney, Anne M.; and Sofranko, John A., to Arco Chemical Technology, Inc. Partially protonated sodium-ZSM-5 method of making. 5,091,163, Cl. 423-328.000.
 Gage, Paul D.: See—
 Knott, Jack E.; and Gage, Paul D., 5,091,262, Cl. 428-516.000.
 Gahn, Gerald S., to Storz Instrument Company. Footswitch assembly with electrically engaged detents. 5,091,656, Cl. 307-119.000.
 Gakhar, Ved P.; Ballou, Joseph H.; Leubbers, James M.; and Szymanski, D. M., to Vermont American Corporation. Router attachment permitting cutting of dentil moulding. 5,090,461, Cl. 144-136.000.
 Gale, Ronald P.: See—
 Fan, John C. C.; Tsuru, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 5,091,333, Cl. 437-82.000.
 Galkiewicz, Robert K.: See—
 Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogaert, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., 5,091,483, Cl. 525-477.000.
 Gall, James A.: See—
 Pews, R. Garth; and Gall, James A., 5,091,580, Cl. 564-407.000.
 Gallagher, Lawrence W. Electronic compass system. 5,090,231, Cl. 73-1.00E.
 Gallo, Bruno: See—
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 Gallop, Paul M.: See—
 Aizenman, Elias; Rosenberg, Paul A.; and Gallop, Paul M., 5,091,391, Cl. 514-311.000.
 Galloway, John L.: See—
 Owers, Ian A.; and Galloway, John L., 5,091,648, Cl. 250-342.000.
 Gambini, Luciano: See—
 Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 5,091,372, Cl. 514-34.000.
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 Ganter, Udo: See—
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 Gard, Michael F., to Atlantic Richfield Company. Well logging tool and system having a switched mode power amplifier. 5,091,725, Cl. 340-854.100.
 Gargan, Paul E.; Ploplis, Victoria A.; and Pleasants, Julian R., to American Biogenetic Sciences, Inc. Fibrinogen-specific monoclonal antibody. 5,091,512, Cl. 530-387.000.
 Garland, Robert B.: See—
 Tjoeng, Foe S.; Adams, Steven P.; Garland, Robert B.; and Miyano, Masateru, 5,091,396, Cl. 514-357.000.
 Garnweidner, Peter, to Austria Metall Aktiengesellschaft. Impact absorber, especially as a vehicle bumper support. 5,090,755, Cl. 293-133.000.
 Garrity, George M.; Del Val, Sagrario M.; Nallin, Mary; Schmatz, Dennis M.; Smith, Jack L.; VanMiddlesworth, Frank L.; Wilson, Kenneth E.; and Zweerink, Marcia M., to Merck & Co., Inc. Antibiotic agent. 5,091,413, Cl. 514-460.000.
 Garry, Guy: See—
 Dieumegard, Dominique; Garry, Guy; Karapiperis, Leonidas; Pribat, Didier; and Collet, Christian, 5,090,932, Cl. 445-24.000.
 Gartenmann, Niklaus: See—
 Meyer, Urs; Gartenmann, Niklaus; and Ulrich, Hanspeter, 5,091,687, Cl. 320-2.000.
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 GAS Gesellschaft für Antriebs- und Steuerungstechnik mbH & Co. KG: See—
 Huber, Thomas; and Huber, Ralf, 5,090,757, Cl. 294-88.000.
 Gates, Victor G. Sport shift sleeves having perspiration absorbing elements. 5,090,060, Cl. 2-115.000.
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- Gaul, Hartmut; and Mueller, Albert, to Siemens Aktiengesellschaft. Method and apparatus for supplying voltage to a three-phase voltage system having a load-carrying neutral conductor with a pulse width modulated three phase inverter. 5,091,839, Cl. 363-41.000.
- Gaul, Stephen J.: See—
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- Gautier, Jean-Pierre; and Perez, Miguel, to Bendix France. Brake booster with sealed passage for mounting. 5,090,298, Cl. 92-98.00D.
- Gaviraghi, Giovanni: See—
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- Gayman, Danny. Sludge treatment apparatus. 5,091,079, Cl. 210-175.000.
- Geary, Gregory L. Subcutaneous access device for peritoneal dialysis. 5,090,954, Cl. 604-29.000.
- Geberit AG: See—
Breitenberger, Konrad, 5,090,064, Cl. 4-252.00R.
- Gebhardt, Istvan: See—
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- GEC ALSTHOM SA: See—
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- GEC Plessey Telecommunications Limited: See—
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- Geibel, Jon F.: See—
Nesheiwat, Afif M.; and Geibel, Jon F., 5,091,509, Cl. 528-481.000.
- Geibel, Wolfram; Hartenstein, Johannes; Herrmann, Wolfgang; and Witzke, Joachim, to Godecke Aktiengesellschaft. Process for the preparation of 1-aminomethyl-1-cyclohexanecarboxylic acid. 5,091,567, Cl. 562-507.000.
- Geilich, Klaus M.: See—
Colas, Andre R. L.; and Geilich, Klaus M., 5,091,484, Cl. 525-477.000.
- Gelder, Richard: See—
Bradshaw, John M.; and Gelder, Richard, 5,090,982, Cl. 65-24.000.
- Geller, Yair; Berman, Michael; and Katsav, Orit, to N.C.T. Ltd. System for automatic finishing of machine parts. 5,091,861, Cl. 364-474.340.
- Gelston, Norbert E., II, to U.S. Tech Corporation. Pressure foot for microwave drill detection system. 5,090,847, Cl. 408-16.000.
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Pomonik, George M.; Geminder, Robert; and Gonzalez, Orlando J., 5,090,485, Cl. 173-1.000.
- Gemmani, Giuseppe, to SCM S.p.A. Molding machines for woodworking. 5,090,460, Cl. 144-134.00R.
- Gemmell, Peter A.; and Leliaert, Carol, to Imperial Chemical Industries PLC. Thermal transfer printing. 5,091,360, Cl. 503-227.000.
- Gendreau, Alan, to Safety Kleen Corp. Reusable garment bags for drycleaning. 5,090,559, Cl. 206-278.000.
- General Binding Corporation: See—
Nanos, Nicholas M.; and Scharer, Roger M., 5,090,859, Cl. 412-11.000.
- General Cryogenics Incorporated: See—
Marin, Patrick S., 5,090,209, Cl. 62-50.300.
- General Electric Company: See—
Aftergut, Siegfried; and Sitnik, Theresa A., 5,091,466, Cl. 524-600.000.
- Alley, Robert P.; and Routh, Kevin C., 5,091,817, Cl. 361-56.000.
- Beamon, William S., III, 5,091,719, Cl. 340-705.000.
- Bopp, Richard C.; and Martynowicz, Lynn M., 5,091,256, Cl. 428-402.000.
- Brown, Sterling B.; and Lowry, Richard C., 5,091,472, Cl. 525-92.000.
- Chao, Fred C.; and Rowe, William S., 5,091,139, Cl. 376-216.000.
- Cipullo, Michael J., 5,091,591, Cl. 568-703.000.
- D'Antonio, Michael J.; Gibbs, Irving A.; Lane, Lawrence J.; and Lawson, Rodney A., 5,091,690, Cl. 324-107.000.
- Dillmann, Charles W.; Townsend, Harold E.; and Nesbitt, Loyd B., 5,091,144, Cl. 376-283.000.
- Dix, Gary E., 5,091,146, Cl. 376-443.000.
- Donaldson, Charles W., 5,090,811, Cl. 356-376.000.
- Erickson, Bert K.; Greenwood, Robert R.; Kennedy, Wilbert C.; Michel, David W.; Allen, David C.; and Jacek, Victor J., 5,091,699, Cl. 328-25.000.
- Hurigen, Jerome P., 5,090,123, Cl. 29-882.000.
- Jarczynski, Emil, 5,091,666, Cl. 310-54.000.
- McCullough, George S.; and Schmidt, George S., 5,090,664, Cl. 254-104.000.
- Ramachandran, Jairaj; Hess, John R.; and Plemmons, Larry W., 5,090,865, Cl. 415-112.000.
- Richards, John C.; and Smith, Joseph P., Jr., 5,090,194, Cl. 60-39.290.
- Smith, Lowell S.; Eichelberger, Charles W.; Wojnarowski, Robert J.; Kornrumpf, William P.; and Piel, Joseph E., Jr., 5,091,893, Cl. 367-153.000.
- Walker, Duncan N.; Terry, Vincent G.; Ulery, Dennis R.; Kazmierczak, Edmund E.; Keck, Richard J.; Pedersen, James R.; and Gott, Brian E., 5,090,114, Cl. 29-734.000.
- Walker, Loren H., 5,091,840, Cl. 363-96.000.
- General Hospital Corporation: See—
Arnault, M. Amin; McCluskey, Robert T.; and Niles, John L., 5,091,303, Cl. 435-7.240.
- General Instrument Corporation: See—
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- Krause, Edward A.; and Paik, Woo H., 5,091,782, Cl. 358-135.000.
- General Motors Corporation: See—
Kabasin, Daniel F., 5,090,511, Cl. 180-197.000.
- Murty, Balarama V.; and Henry, Rassem R., 5,091,679, Cl. 318-153.000.
- Perry, Thomas A.; Bradley, John R.; Schroeder, Thaddeus; and Fuerst, Carlton D., 5,091,021, Cl. 148-103.000.
- Schenk, Donald E.; and McGraw, Doonan D., 5,090,518, Cl. 188-72.100.
- Spath, Mark J.; Shost, Mark A.; Kunz, Timothy W.; Giannone, Guy E.; and Castellana, John, 5,090,364, Cl. 123-90.160.
- General Petrochemical Industries Ltd.: See—
Narang, Subhash C.; Ventura, Susanna; and Bhardwaj, Tilak R., 5,091,502, Cl. 528-229.000.
- Genis, Daniel. Single bag therapeutic pack. 5,090,409, Cl. 128-402.000.
- Genise, Thomas A., to Eaton Corporation. Bonding apparatus for bonding friction material. 5,091,041, Cl. 156-583.100.
- Geo-Centers, Inc.: See—
Nelson, Bruce N.; and Cooper, Ronald F., 5,090,824, Cl. 385-22.000.
- Georg Fischer AG: See—
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- George, Joachim: See—
Kehm, Detlef; Weicht, Bodo; and George, Joachim, 5,090,965, Cl. 23-295.00R.
- George, Nick C.: See—
MacCulloch, David B.; George, Nick C.; and Brickett, Benjamin P., 5,091,987, Cl. 385-66.000.
- Georgetown University: See—
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- Georgia Duck and Cordage Mill: See—
Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., 5,091,247, Cl. 428-255.000.
- Georgieff, Michael. Method of promoting endogenous fat oxidation. 5,091,369, Cl. 514-23.000.
- Geoservices: See—
Issenmann, Olivier, 5,090,256, Cl. 73-863.230.
- Gerber, Terry L., to Ashley Worldwide, Inc. Jacket or similar garment. 5,090,558, Cl. 2-97.000.
- Gerlitz, Yonatan; Moran, Dan; and Raviv, Roni. Non hand-held toy. 5,090,708, Cl. 273-310.000.
- Germann, Andreas, to Raichle Sportschuh AG. Ski boot with a height-adjustable foot-bed. 5,090,139, Cl. 36-117.000.
- Gerstenberger, Markus: See—
Weber, Werner; and Gerstenberger, Markus, 5,090,319, Cl. 101-483.000.
- Gertsch, Peter: See—
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- Gesellschaft für Kernverfahrenstechnik m.b.H.: See—
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- Gesing, Ernst: See—
Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.
- Geus, Georg: See—
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- Ghiorgis, Alem: See—
Talebian, Abdolhossen; Green, Dianna; Hammer, Charles; Schein, Philip; Ghiorgis, Alem; and Clarke, Robert R., 5,091,523, Cl. 536-17.300.
- Giannone, Guy E.: See—
Spath, Mark J.; Shost, Mark A.; Kunz, Timothy W.; Giannone, Guy E.; and Castellana, John, 5,090,364, Cl. 123-90.160.
- Giardetti, Gelasio: See—
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- Gibbs, Irving A.: See—
D'Antonio, Michael J.; Gibbs, Irving A.; Lane, Lawrence J.; and Lawson, Rodney A., 5,091,690, Cl. 324-107.000.
- Giesler, Rolf-Dieter; Muller, Volker; and Almen, Karl-Gosta, to Electrolux Siegen GmbH. Apparatus for the disposal of cooling agent of absorption-type refrigerating systems. 5,090,215, Cl. 62-475.000.
- Gilbert-Semon, Huguette: See—
Begue, Jean-Pierre; Charpentiermorize, Micheline; Bonnet Delpon, Daniele; and Gilbert-Semon, Huguette, 5,091,429, Cl. 514-255.000.
- Gilbertson, Thomas A.; and Meyers, Michael R., to Reaction Thermal Systems, Inc. Ice building, chilled water system and method. 5,090,207, Cl. 62-59.000.
- Gilch, Heinz G.: See—
Bauer, Herbert; Gilch, Heinz G.; Rath, Walter; and Schumann, Use, 5,091,444, Cl. 523-209.000.
- Gillard, Calvin W.: See—
Ames, Lawrence L.; Gillard, Calvin W.; and Buholz, Neal E., 5,090,803, Cl. 356-152.000.
- Gillett, John B.: See—
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- Gilliam, Glenn R. Method for fluent mass surface texturing a turbine vane. 5,090,870, Cl. 416-241.00R.
- Gillies, Neil: See—
Fahy, Arthur J.; Gillies, Neil; and Wade, Malcolm V., 5,090,529, Cl. 192-8.00R.
- Gilman, Thomas H., to Isaacs, Alvin. Vented absorbent dressing. 5,090,406, Cl. 602-47.000.
- Ginter, Douglas R.: See—
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- Girard, Gerald R.: See—
Fraas, Lewis M.; Avery, James E.; and Girard, Gerald R., 5,091,018, Cl. 136-246.000.
- Glachet, Charles; and Ponchet, Liliane, to Euritech. Device for the sealed fixing of an interchangeable member in a cell flange. 5,090,782, Cl. 312-1.000.
- Gladish, Herbert E. Runner for air conveyor system. 5,090,330, Cl. 104-23.200.
- Glasky, Alvin J. 9-substituted hypoxanthine bi-functional compounds and their neuroimmunological methods of use. 5,091,432, Cl. 514-262.000.
- Glassman, Neil D. Container for liquid having a cooling capacity. 5,090,213, Cl. 62-457.300.
- Glasstech, Inc.: See—
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- Maltby, Robert E., Jr., 5,090,987, Cl. 65-182.200.
- Zalesak, Thomas J., 5,090,986, Cl. 65-104.000.
- Glaxo Group Limited: See—
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- Glaxo S.p.A.: See—
Semeraro, Claudio; Micheli, Dino; Pieraccioli, Daniele; Gaviraghi, Giovanni; and Borthwick, Alan D., 5,091,395, Cl. 514-356.000.
- Gleason, Michael E., to Bell & Howell Phillipsburg Company. Document monitor. 5,091,777, Cl. 358-93.000.
- Globe Products Inc.: See—
Banner, Alvin C.; Bradfute, John W.; Dolgas, Patrick A.; and Newman, Lawrence E., 5,090,108, Cl. 29-596.000.
- Globe-Union Inc.: See—
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- Glove Products Inc.: See—
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- Glover, Alfred H.; Betterton, Joseph T.; and Biegler, Richard L. Unitized odometer roll assembly for vehicles and roll interconnecting method. 5,091,633, Cl. 235-95.00R.
- Gluchowski, Charles, to Allergan, Inc. 6- or 7- (2-imino-2-imidazolidine)-1,4-benzoxazines as α adrenergic agents. 5,091,528, Cl. 544-105.000.
- Glynn, William D.: See—
Larsen, Robert H.; Whatley, B. Holt; and Glynn, William D., 5,090,397, Cl. 125-14.000.
- Gnessin, Amir: See—
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- Gneuss, Detlef, to Gneuss Kunststofftechnik GmbH. Sieve arrangement for cleaning synthetic plastic melts. 5,090,887, Cl. 425-185.000.
- Gneuss Kunststofftechnik GmbH: See—
Gneuss, Detlef, 5,090,887, Cl. 425-185.000.
- Go, Yasunao, to Pioneer Electronic Corporation. Anti-theft device for a vehicular electric apparatus. 5,091,724, Cl. 340-825.560.
- Gocho, Nagahiro: See—
Akatsuka, Yuichiro; Abe, Takayuki; Matsueda, Akira; Rokutan, Takao; and Gocho, Nagahiro, 5,091,635, Cl. 235-494.000.
- Gockel, Harald; and Rohling, Bernd, to Lucas Industries Public Limited Company. Spot-type disc brake, including a floating caliper having pressure and heat insulating plate. 5,090,520, Cl. 188-73.450.
- Godare, William L.: See—
Parks, Glenn C., Jr.; Ellison, C. Mack; Godare, William L.; and Beson, John, 5,090,661, Cl. 251-172.000.
- Godecke Aktiengesellschaft: See—
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- Godi, Claude A., to Bobst SA. Guide for a sheet aligning station of a package producing machine. 5,090,684, Cl. 271-233.000.
- Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, to Richter Gedeon Vegyeszeti Gyar Rt. Reliable Raney catalyst composition and vessel for containing same. 5,091,355, Cl. 502-301.000.
- Godry, Thomas J.: See—
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- Goff, Dane A.: See—
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- Gold Star Co., Ltd.: See—
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- Lee, Sang Sung, 5,090,613, Cl. 228-254.000.
- Goldbach, Richard A.; Salzer, Richard; and McConnell, Frank E., to Metro Machine Corporation; and Marinex International, Inc. Vessel hull construction and method. 5,090,351, Cl. 114-65.00R.
- Golden Technologies Company, Inc.: See—
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- Goldfarb, William C.: See—
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- Goldman, Jerome L. Multi-part ship construction system. 5,090,346, Cl. 114-77.00R.
- Golea, Filip; and Wirth, Xaver, to Knorr-Bremse AG. Disk brake for vehicles. 5,090,519, Cl. 188-72.600.
- Golem, Dennis W.: See—
Higgins, Raymond L.; and Golem, Dennis W., 5,091,968, Cl. 382-30.000.
- Golike, Ralph C.; Huang, Hua-Feng; and Llevat, Herminio C., to Du Pont de Nemours, E. I., and Company. Electronics protective packaging film. 5,091,229, Cl. 428-35.200.
- Golitzer, Rolf; and Weil, Lothar, to U.S. Philips Corporation. X-ray tube. 5,091,927, Cl. 378-130.000.
- Gombault, Jacobus F.; and Hidding, Gerhard, to Hadewe B.V. Method and device for folding sheets. 5,090,671, Cl. 270-45.000.
- Gombos, John M.; and Leashno, Moshe, to A.C.X., Inc. Method for unitization of cargo. 5,090,177, Cl. 53-399.000.
- Gondek, John T. Hydraulically operated engine valve system. 5,090,366, Cl. 123-90.170.
- Gonzalez, Cesar, to Cessna Aircraft Company, The. Dual nozzle single pump fuel injection system. 5,090,378, Cl. 123-275.000.
- Gonzalez, John: See—
Chai, Chang-Shung; Fink, David A.; and Gonzalez, John, 5,091,628, Cl. 219-145.220.
- Gonzalez, Orlando J.: See—
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- Goodman, Lowell R. Automatic locking mechanism for dumpster lid. 5,090,753, Cl. 292-230.000.
- Goodyear Tire & Rubber Company, The: See—
Beers, Roger N., 5,091,467, Cl. 525-57.000.
- Cantillo, Jose; Strozzer, Robert W.; and Francik, William P., 5,091,449, Cl. 524-100.000.
- Parker, Dane K., 5,091,545, Cl. 552-302.000.
- Gordon, Eric M.: See—
Karanevsky, Donald S.; Badia, Michael C.; Biller, Scott A.; Gordon, Eric M.; and Sofia, Michael J., 5,091,378, Cl. 514-80.000.
- Gordon-Piatt Energy Group, Inc.: See—
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- Gorski, Richard A., to Emhart Glass Machinery (U.S.) Inc. Bottom plate for H-28 machine. 5,090,988, Cl. 65-238.000.
- Gosling, James: See—
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- Gosnell, C. Michael: See—
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- Goto, Fumio, to NEC Corporation. Magnetic disc member and process for manufacturing the same. 5,091,225, Cl. 427-430.100.
- Goto, Shoji; Sakata, Akihiro; Yamamoto, Hiroshi; Saimi, Tetsuo; and Momoo, Kazuo, to Matsushita Electric Industrial Co., Ltd. Optical head. 5,091,793, Cl. 359-831.000.
- Goto, Tsuyoshi: See—
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- Gott, Brian E.: See—
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- Gould Inc.: See—
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- Grabber, Karl-Heinz: See—
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- Grabs, Manfred, to Robert Bosch GmbH. Circuit for measuring the internal resistance of a lambda probe. 5,091,698, Cl. 324-693.000.
- Grady, John K. Integrated x-ray tube and power supply. 5,091,929, Cl. 378-197.000.
- Graham, Christopher F.: See—
Hruska, Louis W.; Brown, Carl W., Jr.; and Graham, Christopher F., 5,091,252, Cl. 428-357.000.
- Gramling, James T. Indexing apparatus. 5,090,267, Cl. 74-427.000.
- Granzer, Erhold: See—
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- Graphico Co., Ltd.: See—
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- Grasse, Manfred: See—
Schamberg, Eckehard; Koerner, Gotz; Fritsch, Herwig; Grasse, Manfred; and Sucker, Roland, 5,091,002, Cl. 106-2.000.
- Graton, Michel; and Dalbiez, Andre, to Valeo. Torsion damping device, in particular a friction clutch for automotive vehicles. 5,090,945, Cl. 464-64.000.
- Graves, Daniel F.; and Hergenrother, William L., to Bridgestone/Firestone, Inc. Elastomer blends having improved extrusion resistance and method for the preparation thereof. 5,091,471, Cl. 525-90.000.
- Gray, Edward H.: See—
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- Gray, Irwin, to Gray, Edward H.; and Gray, James M. Patient lifting device. 5,090,072, Cl. 5-81.100.
- Gray, James M.: See—
Gray, Irwin, 5,090,072, Cl. 5-81.100.
- Great Lakes Chemical Corporation: See—
McCoy, William F.; and Thornburgh, Scott, 5,090,990, Cl. 71-67.000.
- Grecksch, Hans, to W. Schlafhorst AG & Co. Machine for producing cross-wound bobbins or cheeses. 5,090,635, Cl. 242-35.60R.

Grecksch, Hans: See—
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Green Cross Corporation, The: See—
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Green, Dianna: See—
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Green, Robert L., to G. Fordyce Co. Method and apparatus of forming a separated stack of zigzag folded sheets from a main stack, 5,090,678, Cl. 270-52.500.

Greene, Edward W., deceased; and Jackson, Barbara G., heir, to International Packagers, Inc. Protein coated hair protection apparatus and method, 5,090,428, Cl. 132-204.000.

Greenwood, Christopher J., to Torotrak (Development) Limited. Hydraulic control circuits for continuously-variable-ratio transmissions, 5,090,951, Cl. 475-216.000.

Greenwood, Robert R.: See—
Erickson, Bert K.; Greenwood, Robert R.; Kennedy, Wilbert C.; Michel, David W.; Allen, David C.; and Jacek, Victor J., 5,091,699, Cl. 328-25.000.

Greer, James A., to Raytheon Company. Saw device method, 5,091,051, Cl. 156-643.000.

Greig, Walter G.; and Ashby, Robert E., to Moore Business Forms, Inc. Document carrier, 5,090,943, Cl. 462-71.000.

Greiner, Siegfried M.: See—
Capek, Raymond G.; and Greiner, Siegfried M., 5,090,933, Cl. 445-30.000.

Greller, Peter; and Schauss, Werner, to Pfaff Industriemaschinen GmbH. Plastic welding machine for producing weld seams, 5,091,038, Cl. 156-443.000.

Gremillion, Paul J. Truck cab to bed seal, 5,090,765, Cl. 296-180.100.

Gresch, Walter, to Bucher-Guyer AG Maschinenfabrik. Unit for the preparation of fruits, berries and/or vegetables for the extraction of liquid raw products, 5,090,306, Cl. 99-510.000.

Grey, Roger A., to Arco Chemical Technology, Inc. Preparation of cyclic carbonates using alkylammonium and tertiary amine catalysts, 5,091,543, Cl. 549-228.000.

Gries, Thomas: See—
Meyer, Matthias; Stapel, Ralf; Kottmann, Hariolf; and Gries, Thomas, 5,091,589, Cl. 568-615.000.

Griffith, Carl: See—
Hungerford, William G.; Miller, Donald; Griffith, Carl; and Kaiser, Donald, 5,091,863, Cl. 364-510.000.

Griffith, Wesley F.: See—
Kondos, Peter D.; Haque, Kazi E.; MacDonald, John C.; Griffith, Wesley F.; Laforest, Daniel; and Juliano, Joe, 5,091,160, Cl. 423-131.000.

Grigsby, Charles O. Chemical seal for waste disposal cover systems, 5,090,843, Cl. 405-129.000.

Grilliot, Mary I.: See—
Grilliot, William L.; and Grilliot, Mary I., 5,090,054, Cl. 2-5.000.

Grilliot, William L.; and Grilliot, Mary I. Ventilated hood for firefighter, 5,090,054, Cl. 2-5.000.

Grime, Thomas E.: See—
Burns, Marvin D.; Fritz, Alan H.; and Grime, Thomas E., 5,090,623, Cl. 239-301.000.

Griswold, Roy M., to Wacker Silicones Corporation. Acrylate- or methacrylate-functional organopolysiloxanes, 5,091,440, Cl. 522-99.000.

Grogler, Gerhard; Kopp, Richard; Hess, Heinrich; Hansel, Eduard; and Scholl, Thomas, to Bayer Aktiengesellschaft. Heat-curing polyetherpolyester-polyurethane ureas, 5,091,497, Cl. 528-76.000.

Grogler, Gerhard: See—
Sanders, Josef; Grogler, Gerhard; and Dieterich, Dieter, 5,091,582, Cl. 564-418.000.

Groskey, Richard E. Wrench for installing strainer base in sink, 5,090,276, Cl. 81-436.000.

Gross, Andrew W.; and Emmons, William D., to Rohm and Haas Company. Thiol-terminated hydroxyamides, 5,091,573, Cl. 564-192.000.

Gross, Joseph; and Zucker, Shlomo, to Product Development (Z.G.S.) Ltd. Electrochemically driven metering medicament dispenser, 5,090,963, Cl. 604-132.000.

Grosso, Marie-Helene: See—
Escarguel, Claude; Grosso, Marie-Helene; and Laconi, Patrick, 5,091,307, Cl. 435-34.000.

Groves, Gary W.: See—
Miller, Lonnie G. D.; and Groves, Gary W., 5,090,524, Cl. 188-299.000.

Groves, Michael J.: See—
Klegerman, Melvin E.; and Groves, Michael J., 5,091,308, Cl. 435-68.100.

Groves, Paul: See—
Woodhead, James L.; and Groves, Paul, 5,091,348, Cl. 501-136.000.

Gruau, Jean: See—
Potier, Daniel; Gruau, Jean; and Lecrivain, Albert, 5,090,244, Cl. 73-572.000.

Grub, Joachim: See—
Herwig, Jens; Stuwe, Arnd; and Grub, Joachim, 5,091,093, Cl. 210-639.000.

Grubbs, Hugh C.: See—
Potter, Terry A.; and Grubbs, Hugh C., 5,091,475, Cl. 525-124.000.

Grullemans, Winslow C. Protective case for portable sound-playing device, 5,090,562, Cl. 206-320.000.

Grumman Aerospace Corporation: See—
Herbermann, Carl R., 5,091,847, Cl. 395-575.000.

Grunthaner, Frank J.; Liu, John K.; and Hancock, Bruce R., to United States of America, National Aeronautics and Space Administration. MBE growth technology for high quality strained III-V layers, 5,091,335, Cl. 437-108.000.

Gsrinaski, Timothy J.; Jaminet, Jerome E.; and Olsen, Eric G., to Otis Elevator Company. Elevator linear motor bus bar, 5,090,516, Cl. 187-112.000.

GTE Products Corporation: See—
Fan, Albert K.; Kasenga, Anthony F.; and Ginter, Douglas R., 5,091,110, Cl. 252-301.40P.

Guarise, Massimo: See—
Marchisio, Aldo; and Guarise, Massimo, 5,090,541, Cl. 192-98.000.

Guckel, Henry; and Sniegowski, Jeffry, to Wisconsin Alumni Research Foundation. Polysilicon resonating beam transducers, 5,090,254, Cl. 73-862.590.

Gudauskys, William V., Jr. Apparatus for testing the trueness of archery arrows, 5,090,130, Cl. 33-533.000.

Guglielmo, Giorgio: See—
Carmello, Diego; and Guglielmo, Giorgio, 5,091,601, Cl. 570-166.000.

Guillaume, Bernard. Dump truck with interfitting polygonal dump body and supporting cradle, 5,090,773, Cl. 298-17.00R.

Guillon, Michel R.: See—
Biache, Gerard A.; and Guillon, Michel R., 5,091,179, Cl. 424-93.00T.

Guindon, Yvan: See—
Belanger, Patrice C.; Dufresne, Claude; Fitzsimmons, Brian, deceased; Fitzsimmons, Maryann, Heir; Guindon, Yvan; Lau, Cheuk K.; Rokach, Joshua; Schiegetz, John; Therien, Michel; and Young, Robert N., 5,091,533, Cl. 544-318.000.

Guldager, Hans. Multiple cell inflation element, 5,090,076, Cl. 5-453.000.

Guliyay, Kirpal S.; Pervaiz, Shazib; Matthews, J. Lester; Dowben, Robert M.; Newman, Joseph T.; and Forest, Edward, to Baylor Research Institute. Pre-activated therapeutic agents derived from photoactive compounds, 5,091,385, Cl. 514-224.800.

Gulyas, Endre: See—
Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.

Gunther, John, to Minnesota Mining and Manufacturing Company. Flame retardant splicing system, 5,091,608, Cl. 174-84.00R.

Guyette, John M.: See—
Coggan, William G.; Guyette, John M.; and Pozzo, James A., 5,090,173, Cl. 52-309.800.

H. B. Fuller Licensing & Financing: See—
Malcolm, David B.; and Bunnelle, William L., 5,090,861, Cl. 412-37.000.

H & S Manufacturing Co., Inc.: See—
Peeters, Kenneth J., 5,090,268, Cl. 74-665.0GC.

Haas, Lothar: See—
Schrumpf, Hans; Haas, Lothar; and Hettich, Gerhard, 5,090,237, Cl. 73-146.500.

Haas, Milton; and Hsieh, Joe C. Y. Method to replace a solenoid unit in a starter motor assembly, 5,090,109, Cl. 29-596.000.

Habbab, Isam M. I.: See—
Cimini, Leonard J., Jr.; and Habbab, Isam M. I., 5,091,916, Cl. 372-96.000.

Hadassah Medical Organization: See—
Lewis, Aaron; Fuxbruner, Amihay; and Hemo, Itzhak, 5,091,626, Cl. 219-121.690.

Haddock, George W.: See—
Koht, Lowell I.; Del Fava, Donald; Clark, Brian H.; Takaki, Dana M.; and Haddock, George W., 5,090,792, Cl. 385-32.000.

Hadewe B.V.: See—
Gombault, Jacobus F.; and Hidding, Gerhard, 5,090,671, Cl. 270-45.000.

Hadley, Michael S.: See—
Wadsworth, Harry J.; Hadley, Michael S.; Wyman, Paul A.; and Jenkins, Sarah M., 5,091,397, Cl. 514-359.000.

Haendle, Joerg; and Marhoff, Paul, to Siemens Aktiengesellschaft. X-ray diagnostics installation with spatial frequency filtering, 5,091,925, Cl. 378-99.000.

Hafeli, Paul B.; and Baker, Gregg S., to Artifax Ltd. Self locking nut, 5,090,854, Cl. 411-186.000.

Haga, Katsumi: See—
Arai, Tatsuo; Haga, Katsumi; Saito, Takayoshi; Shiratori, Hidehisa; Hasegawa, Ryoei; and Iizuka, Kazuo, 5,090,849, Cl. 409-137.000.

Haga, Shuichi: See—
Kondo, Hirofumi; Haga, Shuichi; and Matsuda, Takaaki, 5,091,269, Cl. 428-695.000.

Haga, Tadatoshi: See—
Matsuda, Shohci; and Haga, Tadatoshi, 5,090,781, Cl. 303-103.000.

Hagemann, Hermann: See—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 5,091,537, Cl. 546-226.000.

Hagen, Elmer R. Chair assembly for releasable attachment to crutch, 5,090,434, Cl. 135-66.000.

Hagerman, Larry M.: See—
Imondi, Anthony R.; and Hagerman, Larry M., 5,091,175, Cl. 424-486.000.

Hagiwara, Takanobu; Hatta, Katsuhiko; and Watanabe, Isao, to Yokohama Aeroquip Co. Flexible pipe joint system, 5,090,744, Cl. 285-166.000.

Hahn & Kolb GmbH & Co.: See—
Klett, Manfred; Dreimann, Markus; and Baumer, Dieter, 5,090,100, Cl. 29-38.00C.

Hahn, Roger A.; Bowles, Ray L.; Schultz, Robert H.; Williams, Warren R.; and Bagrosky, Michael E., to Coors Brewing Company. Apparatus for supporting a workpiece, 5,090,229, Cl. 72-347.000.

Hahn, Ulf: See—
Altenau, Ernst-Wilhelm; Hahn, Ulf; Fischer, Siegmund; and Palten, Margret, 5,090,326, Cl. 102-395.000.

Hakakoshi, Shigemasa: See—
Tanaka, Tadashi; Tamura, Hidehiko; Uenaka, Kiyohide; and Hakakoshi, Shigemasa, 5,091,098, Cl. 252-12.200.

Hakala, Jaakko; and Savolainen, Eero, to Valmet Paper Machinery Inc. Method and apparatus for drilling of holes into the mantle of a cylinder, 5,090,846, Cl. 408-1.00R.

Hall, Geoffrey F.: See—
Turner, Anthony P. F.; Best, David J.; and Hall, Geoffrey F., 5,091,299, Cl. 435-4.000.

Hall, Ronald H. Adjustable blade holder, 5,090,141, Cl. 37-98.000.

Halle, Roy T.: See—
Strack, Robert D.; Vebelinas, Rimantas V.; Bamford, David A.; and Halle, Roy T., 5,090,977, Cl. 62-23.000.

Haller, David K., to Carrier Corporation. Non-circular orbiting scroll for optimizing axial compliance, 5,090,878, Cl. 418-1.000.

Haller, Thomas M., to J. M. Huber Corporation. Method and apparatus for production of rubber dispersible pellets, 5,091,132, Cl. 264-117.000.

Haluska, Loren A.: See—
Frye, Cecil L.; Haluska, Loren A.; Weiss, Keith D.; and Baney, Ronald H., 5,091,162, Cl. 423-325.000.

Hamada, Masaki, to Tokai Rubber Industries, Ltd. Dynamic damper, 5,090,668, Cl. 267-141.000.

Hamada, Munemitsu: See—
Iwaya, Shouichi; Hamada, Munemitsu; and Masumura, Hitoshi, 5,091,820, Cl. 361-304.000.

Hamaker, Jon: See—
Pecht, Glenn G.; and Hamaker, Jon, 5,090,712, Cl. 277-96.100.

Hamamatsu Photonics K. K.: See—
Uchida, Hiroshi; and Omura, Tomohide, 5,091,650, Cl. 250-366.000.

Hamamatsu Photonics Kabushiki Kaisha: See—
Yamashita, Takaji; and Yamashita, Yutaka, 5,090,415, Cl. 128-665.000.

Hamano, Kazumi: See—
Kushida, Hachiro; Hamano, Kazumi; Imazawa, Yoshitsugu; and Irie, Kenji, 5,091,224, Cl. 427-419.400.

Hamano, Seitaro: See—
Kamakura, Kunihito; Ohta, Seiichi; Aoki, Chihiro; Hamano, Seitaro; and Hiramatsu, Yasushi, 5,090,078, Cl. 15-97.100.

Hamano, Takahiro; Matsui, Masataka; and Sato, Katsuhiko, to Kabushiki Kaisha Toshiba. Semiconductor memory having an operation margin against a write recovery time, 5,091,889, Cl. 365-233.500.

Hamburg, Douglas R.; and Davenport, Martin F., to Ford Motor Company. Air/fuel ratio control with adaptive learning of purged fuel vapors, 5,090,388, Cl. 123-489.000.

Hamby, Michael G., to T. J. Gundlach Machine Company. Auto tramp removal system, 5,090,574, Cl. 209-552.000.

Hamill, James, to M-I Drilling Fluids Company. Water wash/oil wash cyclonic column tank separation system, 5,090,498, Cl. 175-206.000.

Hammer, Charles: See—
Talebian, Abdolhossen; Green, Dianna; Hammer, Charles; Schein, Philip; Ghorghis, Alem; and Clarke, Robert R., 5,091,523, Cl. 536-17.300.

Hammond, John M.; Petropoulos, Mark; Berger, Stuart B.; and Nolley, Robert W., to Xerox Corporation. Method and apparatus for cleaning, coating and curing receptor substrates in an enclosed planetary array, 5,090,350, Cl. 118-50.000.

Hamori, Alfred S., to Hughes Aircraft Company. Acoustic display generator, 5,091,721, Cl. 340-727.000.

Hanabusa, Hisao: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyosi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.

Hanai, Yoshimichi: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.

Hanamura, Shoji; Aoki, Masaaki; and Masuhara, Toshiaki, to Hitachi, Ltd. Process for making MOS devices for low-temperature operation, 5,091,325, Cl. 437-40.000.

Hanaoka, Hiroshi, deceased (by Hanaoka, Shigeru, legal representative), to Hanaoka Sharyo Co., Ltd. Four wheel steering trailer, 5,090,719, Cl. 280-408.000.

Hanaoka Sharyo Co., Ltd.: See—
Hanaoka, Hiroshi, deceased, 5,090,719, Cl. 280-408.000.

Hanaoka, Shigeru, legal representative: See—
Hanaoka, Hiroshi, deceased, 5,090,719, Cl. 280-408.000.

Hancock, Bruce R.: See—
Grunthaner, Frank J.; Liu, John K.; and Hancock, Bruce R., 5,091,335, Cl. 437-108.000.

Haneda, Satoshi; Fukuchi, Masakazu; and Shoji, Hisashi, to Konica Corporation. Multicolor image forming apparatus, 5,091,789, Cl. 358-401.000.

Hani, Beat: See—
Russemeyer, Hans; Kerl, Manfred; Schmidt, Hans-Joachim; Hani, Beat; and Kagi, Werner, 5,090,134, Cl. 34-57.00R.

Hanko, Laszlo. Cosmetic compositions comprising a native mineral substance for the treatment of phlebotasias and process for preparing same, 5,091,194, Cl. 424-698.000.

Hans Schwarzkopf GmbH: See—
Seidel, Winfried, 5,091,581, Cl. 564-412.000.

Hansel, Eduard: See—
Grogler, Gerhard; Kopp, Richard; Hess, Heinrich; Hansel, Eduard, and Scholl, Thomas, 5,091,497, Cl. 528-76.000.

Hansen, John A.: See—
Longaker, William A., Sr.; and Hansen, John A., 5,090,336, Cl. 108-51.100.

Hansen, Nils. Naphthenic-aromatic hydrocarbon compositions, 5,091,007, Cl. 106-30.000.

Hanson, Bruce L.: See—
Saper, Lawrence; and Hanson, Bruce L., 5,090,410, Cl. 128-633.000.

Hanssler, Gerd: See—
Wollweber, Detlef; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 5,091,408, Cl. 514-427.000.

Haque, Kazi E.: See—
Kondos, Peter D.; Haque, Kazi E.; MacDonald, John C.; Griffith, Wesley F.; Laforest, Daniel; and Juliano, Joe, 5,091,160, Cl. 423-131.000.

Hara, Masataka: See—
Wakabayashi, Yasuaki; Koizumi, Takeo; Ehara, Katuo; Hara, Masataka; and Ehara, Masahiro, 5,090,232, Cl. 73-23.340.

Harada, Hiroshi: See—
Tabayashi, Isao; Harada, Hiroshi; Inoue, Sadahiro; and Fukutomi, Hiroshi, 5,091,004, Cl. 106-22.000.

Harada, Masasuke; Hayafuchi, Hideki; and Tsukamoto, Kouji, to Asahi Corporation. Method of forming anti-slip shoe sole, 5,091,125, Cl. 264-45.300.

Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, to Mitsui Engineering & Shipbuilding Co., Ltd. Apparatus and process for treating waste incineration flyash, 5,090,338, Cl. 110-165.00A.

Haraguchi, Hiroshi: See—
Ikuta, Kenji; Kondo, Toshio; and Haraguchi, Hiroshi, 5,090,199, Cl. 60-276.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Ether production with staged reaction of olefins, 5,091,590, Cl. 568-697.000.

Harashima, Konomi: See—
Kobayashi, Masakazu; and Harashima, Konomi, 5,090,132, Cl. 34-5.000.

Harbor Branch Oceanographic Institution, Inc.: See—
Koehn, Frank; Cross, Sue S.; and Longley, Ross E., 5,091,368, Cl. 514-18.000.

Wright, Amy S.; Cross, Sue S.; Burres, Neal S.; and Koehn, Frank, 5,091,412, Cl. 514-453.000.

Harder, Scott R.; Soderquist, Cynthia A.; and Pierce, Claudia C., to Nalco Chemical Company. Method of retarding corrosion of metal surfaces in contact with boiler water systems which corrosion is caused by dissolved oxygen, 5,091,108, Cl. 252-188.280.

Hardin, Nathaniel A.: See—
Paynter, Henry M., 5,090,297, Cl. 92-48.000.

Harley, David N., to Titus Tool Company Limited. Drawer runner, 5,090,787, Cl. 312-348.000.

Harnischfeger Engineers, Inc.: See—
Sorensen, B. Chuck; and Devroy, Craig A., 5,091,685, Cl. 318-652.000.

Harp, Russell P.: See—
Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., 5,091,247, Cl. 428-255.000.

Harrell, Jerry J., to Summer Mfg. Co., Inc. Collapsible mobile base for cable hoists, 5,090,667, Cl. 254-326.000.

Harris Corporation: See—
Beasom, James D., 5,091,336, Cl. 437-150.000.

Delgado, Jose A.; Gaul, Stephen J.; Rouse, George V.; and McLachlan, Craig J., 5,091,331, Cl. 437-62.000.

Harris, G. Bryn; and Peacey, John G., to Noranda, Inc. Production of pure magnesium chloride solution from siliceous magnesium minerals, 5,091,161, Cl. 423-163.000.

Harris, Ronald W.: See—
Hunt, Thomas C.; and Harris, Ronald W., 5,090,136, Cl. 34-218.000.

Harris, William J.: See—
Lysenko, Zenon; and Harris, William J., 5,091,500, Cl. 528-183.000.

Harrison, David F.: See—
Walters, David L.; Healy, Martin; Marlow, Ernest C.; and Harrison, David F., 5,090,665, Cl. 254-134.400.

Hartenstein, Johannes: See—
Geibel, Wolfram; Hartenstein, Johannes; Herrmann, Wolfgang; and Witzke, Joachim, 5,091,567, Cl. 562-507.000.

Harter, Johann: See—
Pribyl, Wolfgang; and Harter, Johann, 5,091,658, Cl. 307-443.000.

Hartig, Klaus: See—
Szczyrbowski, Joachim; Rogels, Stefan; Dietrich, Anton; and Hartig, Klaus, 5,090,984, Cl. 65-60.200.

Hartmann, Werner: See—
Christiansen, Jens; Frank, Klaus; Hartmann, Werner; and Kozlik, Claudius, 5,091,819, Cl. 361-120.000.

Hartuniewicz, Walter R.: See—
Creager, Richard F.; Blanding, Mark; VanRhee, Jack; and Hartuniewicz, Walter R., 5,090,740, Cl. 285-61.000.

Hartwig, Richard C.: See—
Blank, Norman E.; Hartwig, Richard C.; and Vu, Cung, 5,091,455, Cl. 524-297.000.

Harumoto Iron Works Co., Ltd.: See—
Kishida, Hiroo; and Takenaka, Hirofumi, 5,090,176, Cl. 52-745.000.

Haruna, Motoaki: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,091,460, Cl. 524-492.000.

Hasegawa, Hiromi; and Ishiguro, Toshiaki, to Aisin Seiki Kabushiki Kaisha. Shift range device for automatic transmission. 5,090,540, Cl. 192-87.190.

Hasegawa, Hiroshi: See—
Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, 5,090,764, Cl. 296-107.000.

Hasegawa, Isahiro: See—
Fujino, Makoto; Hasegawa, Isahiro; and Ito, Masao, 5,091,050, Cl. 156-643.000.

Hasegawa, Kengo: See—
Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.

Hasegawa, Ryoei: See—
Arai, Tatsuo; Haga, Katsumi; Saito, Takayoshi; Shiratori, Hidehisa; Hasegawa, Ryoei; and Izuka, Kazuo, 5,090,849, Cl. 409-137.000.

Hasegawa, Taiji; Fujisawa, Masaaki; Sakamoto, Masahide; Ishii, Toshio; and Takahashi, Hideharu, to Hitachi, Ltd. Control apparatus for automobiles. 5,091,856, Cl. 364-424.050.

Haseyama, Ryuji; Kuroda, Kazuyuki; Hayashi, Kouzou; Sasagawa, Katsuyoshi; Kano, Taisaku; and Shikai, Kiyoshi, to Mitsui Toatsu Chemicals, Inc. Polyisocyanatoalkylphenyl-isocyanurates, method for the preparation thereof and use thereof. 5,091,496, Cl. 528-73.000.

Hashiba, Mitsuaki: See—
Imamura, Hiroyuki; and Hashiba, Mitsuaki, 5,090,527, Cl. 192-3.290.

Hashimoto, Hiroshi: See—
Kato, Mikihiro; Hashimoto, Hiroshi; Endo, Yasushi; and Nagashima, Yasuo, 5,091,238, Cl. 428-64.000.

Hashimoto, Kiyoshi: See—
Makino, Misao; Hashimoto, Kiyoshi; and Sugita, Toshiaki, 5,090,799, Cl. 351-221.000.

Hashimoto, Masashi: See—
Kwon, On-Kyong; Hashimoto, Masashi; and Malhi, Satwinder, 5,090,118, Cl. 29-843.000.

Hashizume, Naoki; and Seto, Takeshi, to Seiko Epson Corporation. Scroll type fluid handling machine. 5,090,876, Cl. 417-410.000.

Haskell, Jacob D., to Advanced Micro Devices, Inc. EPROM element employing self-aligning process. 5,091,326, Cl. 437-43.000.

Hatachi, Ltd.: See—
Tomite, Toshio, 5,091,667, Cl. 310-154.000.

Hatamura, Koichi: See—
Nakano, Toru; Hatamura, Koichi; and Goto, Tsuyoshi, 5,090,392, Cl. 123-564.000.

Hatano, Akitsugu; and Ishii, Yutaka, to Sharp Kabushiki Kaisha. Method for driving a multi-layered-type liquid crystal display device. 5,090,794, Cl. 359-53.000.

Hatouchi, Gokichi, to Daifuku Co., Ltd. Shelf apparatus utilizing rollers. 5,090,558, Cl. 198-781.000.

Hatta, Katsuhiko: See—
Hagiwara, Takanobu; Hatta, Katsuhiko; and Watanabe, Isao, 5,090,744, Cl. 285-166.000.

Hatta, Takayuki: See—
Makisumi, Yasuo; Murabayashi, Akira; Hatta, Takayuki; and Ishiguro, Takeo, 5,091,539, Cl. 548-267.800.

Hattori, Noboru: See—
Sugano, Taku; Iwanaga, Kazuyoshi; and Hattori, Noboru, 5,090,950, Cl. 475-129.000.

Haug, Willi, to Fischerwerke Artur Fischer GmbH & Co. KG. Device for producing drilled holes with undercut. 5,090,848, Cl. 408-27.000.

Hauk, Klaus: See—
Alber, Paul; Edele, Reinhard; Hauk, Klaus; Teich, Michael; and Schutze, Michael, 5,090,082, Cl. 15-250.170.

Haunschild, Willard M. Helium purification system for lighter-than-air aircraft. 5,090,637, Cl. 244-97.000.

Hausel, Paul: See—
Birkenstock, Udo; Scharschmidt, Jürgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, 5,090,997, Cl. 75-338.000.

Havas, Janos: See—
Dean, Alicia; Fitzsimmons, John A.; Havas, Janos; McCormick, Barry C.; and Shah, Prabodh; R., 5,091,103, Cl. 252-162.000.

Havens, Alice L. System for producing low cholesterol eggs and feed additive resulting in same. 5,091,195, Cl. 426-2.000.

Hawkins, John W.: See—
Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., 5,091,247, Cl. 428-255.000.

Hawley, Gil R.; Kukes, Simon G.; and Banks, Robert L., deceased (by Banks, Mildred L., administratrix), to Phillips Petroleum Company.

Olefin polymerization catalysts and methods. 5,091,490, Cl. 526-97.000.

Hayafuchi, Hideki: See—
Harada, Masasuke; Hayafuchi, Hideki; and Tsukamoto, Kouji, 5,091,125, Cl. 264-45.300.

Hayakawa, Satoru: See—
Ohya, Takao; Nishikawa, Yasuo; and Hayakawa, Satoru, 5,091,270, Cl. 428-695.000.

Hayasaki, Koichi, to Nissan Motor Co., Ltd. Shift control system for automatic transmission. 5,090,271, Cl. 74-869.000.

Hayase, Rumiko: See—
Onishi, Yasunobu; Niki, Hirokazu; Kobayashi, Yoshihito; Hayase, Rumiko; and Ushirogouchi, Toru, 5,091,282, Cl. 430-270.000.

Hayashi, Kouzou: See—
Haseyama, Ryuji; Kuroda, Kazuyuki; Hayashi, Kouzou; Sasagawa, Katsuyoshi; Kano, Taisaku; and Shikai, Kiyoshi, 5,091,496, Cl. 528-73.000.

Hayashi, Seiichi: See—
Fukuzawa, Soichi; Hayashi, Seiichi; Hirose, Etsuro; and Miyashita, Kazuo, 5,090,220, Cl. 68-3.00R.

Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Method for manufacturing continuous sheets of bread dough. 5,091,202, Cl. 426-496.000.

Haybuster Manufacturing Inc.: See—
Kopecky, Ivyl D.; and Morlock, Ruben D., 5,090,630, Cl. 241-279.000.

Hayes, Harry D., to Dalton Enterprises. Composite shock absorbing garment. 5,090,053, Cl. 2-2.000.

Hayes, Richard A.: See—
Ekiner, Okan M.; Hayes, Richard A.; and Manos, Philip, 5,091,216, Cl. 427-245.000.

Haynes, Duncan H. Phospholipid-coated microcrystals: injectable formulations of water-insoluble drugs. 5,091,187, Cl. 424-450.000.

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Fries, Carl F.; Hazar, Mitchell M.; and Fridman, Yoram J., 5,091,095, Cl. 210-742.000.

Heafield, Joanne; Leslie, Stewart I.; Malkowska, Sandra T. A.; and Neale, Philip J., to Euroceltique S.A. Controlled release dosage forms having a defined water content. 5,091,189, Cl. 424-457.000.

Health Products, Inc.: See—
Caden, John C.; Caden, Linda J.; Eads, Norman B.; and Hess, Jack H., 5,090,077, Cl. 5-456.000.

Healy, Martin: See—
Walters, David L.; Healy, Martin; Marlow, Ernest C.; and Harrison, David F., 5,090,665, Cl. 509-665.000.

Heard, D. Dennis: See—
Dyer, W. Richard; and Heard, D. Dennis, 5,090,734, Cl. 283-67.000.

Heard, James G.: See—
Cleaves, James M.; Heard, James G.; and Tan, Zoilo C. H., 5,091,047, Cl. 156-643.000.

Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Blempel, Manfred, to Bayer AG. Nikkomycin derivatives. 5,091,375, Cl. 514-50.000.

Hed, Aharon Z. Magnetic heat pumps using the inverse magnetocaloric effect. 5,091,361, Cl. 505-1.000.

Hegnauer, Bruno: See—
Buttner, Otto; and Hegnauer, Bruno, 5,090,953, Cl. 494-1.000.

Heidelberger Druckmaschinen AG: See—
Rodi, Anton; and Kraft, Hermann, 5,090,316, Cl. 101-148.000.

Weber, Werner; and Gerstenberger, Markus, 5,090,319, Cl. 101-483.000.

Heidelberger Druckmaschinen AG: See—
Henn, Manfred; Ganter, Udo; and Blaser, Peter T., 5,090,681, Cl. 271-218.000.

Heidemann, Rolf, to Alcatel N.V. Optical signal connection device for units to be inserted in a rack. 5,091,985, Cl. 385-33.000.

Heider, Dale J.: See—
Heider, Merle J.; Heider, Dale J.; and Heider, Leon J., 5,090,720, Cl. 280-438.100.

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Heifetz, Aaron H.: See—
Braatz, James A.; and Heifetz, Aaron H., 5,091,176, Cl. 424-78.170.

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Dahl, Roger W.; Beatty, Graydon E.; Swanson, David K.; and Heil, John E., 5,090,422, Cl. 128-784.000.

Heilmann, Steven M.; Moren, Dean M.; Rasmussen, Jerald K.; Krepski, Larry R.; and Pathre, Sadanand V., to Minnesota Mining and Manufacturing Company. Oligo (2-alkenyl azlactones). 5,091,489, Cl. 526-90.000.

Heimann GmbH: See—
Bermbach, Rainer; Doenges, Gerhard; Geus, Georg; and Koch, Cornelius, 5,091,924, Cl. 378-57.000.

Duenisch, Ingo, 5,091,675, Cl. 313-636.000.

Heimbürger, Norbert; Wenz, Karlheinz; and Wormsbacher, Wilfried, to Behringwerke Aktiengesellschaft. Agent for the therapy of factor VIII-resistant hemophilia A, and a process for the preparation thereof. 5,091,363, Cl. 514-2.000.

Heinrichs, Heinz-Josef; Enders, Stephan; Wagner, Udo; and Dirksen, Alfred, to Stabilus GmbH. Electrical seat adjustment device. 5,090,770, Cl. 297-347.000.

Heinz, David S., to University of Alberta Hospitals. Variable height bed. 5,090,070, Cl. 5-611.000.

Hella KG Hueck & Co.: See—
Hendrischk, Wolfgang; and Kathmann, Franz, 5,091,829, Cl. 362-61.000.

Hellens, Stephen W.: See—
Buultjens, Travis E. J.; Hellens, Stephen W.; Jahoda, Colin A. B.; Oliver, Roy F.; and Withers, Anne P., 5,091,173, Cl. 424-70.000.

Hellmeister, H.-P.: See—
Theis, Ulrich; Hellmeister, H.-P.; Bisping, Bernhard; Vagedes, Michael; Kessler, Siegfried; Kantner, Horst; and Sommer, Peter, 5,090,328, Cl. 102-522.000.

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Hellstrom, Ingegerd: See—
Hellstrom, Karl E.; and Hellstrom, Ingegerd, 5,091,178, Cl. 424-85.800.

Hellstrom, Karl E.; and Hellstrom, Ingegerd, to Oncogen. Tumor therapy with biologically active anti-tumor antibodies. 5,091,178, Cl. 424-85.800.

Hellstrom, Karl E.: See—
Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 5,091,177, Cl. 424-85.800.

HEM Research Inc.: See—
Carter, William A., 5,091,374, Cl. 514-44.000.

Hemo, Itzhak: See—
Lewis, Aaron; Fuxbruner, Amihay; and Hemo, Itzhak, 5,091,626, Cl. 219-121.690.

Hemsath, Klaus H., to Indugas, Inc. Hybrid combustion device and system therefor. 5,090,891, Cl. 431-1.000.

Henderson, Ralph J.: See—
Horne, Arthur H.; Henderson, Ralph J.; and Anderson, David C., 5,091,713, Cl. 340-541.000.

Hendrickson, Richard J.; and Kafer, Kenneth G., to Ozonia International, S.A. Ozone generation methods. 5,091,069, Cl. 204-176.000.

Hendrischk, Wolfgang; and Kathmann, Franz, to Hella KG Hueck & Co. Headlamp for a motor vehicle. 5,091,829, Cl. 362-61.000.

Hendrix, James E.: See—
Tolbert, Thomas W.; Jaco, Pamela J.; Dugan, Jeffrey S.; and Hendrix, James E., 5,091,243, Cl. 428-253.000.

Henk, Hermann: See—
Herd, Karl J.; Frosch, Hans-Georg; Henk, Hermann; Mullers, Wolfgang; and Stohr, Frank-Michael, 5,091,515, Cl. 534-598.000.

Henkel Corporation: See—
Mori, Kazuhiko; Miyawaki, Toshio; and Ishii, Hitoshi, 5,091,223, Cl. 427-383.700.

Saeki, Kenshi; and Yoshitake, Noriaki, 5,091,023, Cl. 148-247.000.

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Jacobs, Jochen; Koepfmann, Edgar; Witthaus, Martin; and Dankowski, Manfred, 5,091,106, Cl. 252-186.260.

Henn, Manfred; Ganter, Udo; and Blaser, Peter T., to Heidelberger Druckmaschinen AG. Sheet delivery system in a sheet-processing machine. 5,090,681, Cl. 271-218.000.

Hennecke, Udo; and Wolz, Helmut, to Heraeus Quarzglas GmbH. Infrared radiator. 5,091,632, Cl. 219-553.000.

Henning, Rainer: See—
Nickel, Wolf-Ulrich; Henning, Rainer; Ruger, Wolfgang; Lerch, Ulrich; Urbach, Hans-Jörg; Hock, Franz; and Wiemer, Gabriele, 5,091,427, Cl. 514-249.000.

Henry, Rasseem R.: See—
Murty, Balarama V.; and Henry, Rasseem R., 5,091,679, Cl. 318-153.000.

Henschen, Homer E.; McKee, Michael J.; Pawlikowski, Joseph M.; Schaeffer, Richard L.; Shaffer, David T.; and Sharpe, Alexander M., to AMP Incorporated. Method of assembling a connector to a circuit element and soldering lead frame for use therein. 5,090,116, Cl. 29-827.000.

Hensens, Otto: See—
Ondeyka, John; Hensens, Otto; and Liesch, Jerrold, 5,091,389, Cl. 514-291.000.

Heraeus Quarzglas GmbH: See—
Hennecke, Udo; and Wolz, Helmut, 5,091,632, Cl. 219-553.000.

Herbermann, Carl R., to Grumman Aerospace Corporation. Fault tolerant interface station. 5,091,847, Cl. 395-575.000.

Herbig, Scott M.: See—
van Eikeren, Paul; Brose, Daniel J.; and Herbig, Scott M., 5,091,080, Cl. 210-188.000.

Herd, Karl J.; Frosch, Hans-Georg; Henk, Hermann; Mullers, Wolfgang; and Stohr, Frank-Michael, to Bayer Aktiengesellschaft. Process for the preparation of substituted 2,4-diamino-6-fluoro-S-triazines. 5,091,515, Cl. 534-598.000.

Hergenrother, William L.: See—
Graves, Daniel F.; and Hergenrother, William L., 5,091,471, Cl. 525-90.000.

Hergeth Hollingsworth GmbH: See—
Pinto, Akiva; Lucaßen, Guenter; and Schmidt, Reinhard, 5,090,629, Cl. 241-282.100.

Hermann C. Starck Berlin GmbH & Co. KG: See—
Birkenstock, Udo; Scharschmidt, Jürgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, 5,090,997, Cl. 75-338.000.

Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Marie; Ritli, Peter; Sipos, Judit; Pajor, Aniko; and Marrosi, Katalin, to Chinoyn Gyogyszer-és Vegyszeti Termek

Gyara Rt. Baron chelates of quinoline carboxylic acids. 5,091,530, Cl. 544-229.000.

Herrmann, Wolfgang: See—
Geibel, Wolfram; Hartenstein, Johannes; Herrmann, Wolfgang; and Witzke, Joachim, 5,091,567, Cl. 562-507.000.

Herwig, Jens; Stuwe, Arnd; and Grub, Joachim, to EC Erdolchemie GmbH. Process for purifying acrylonitrile effluent. 5,091,093, Cl. 210-639.000.

Hesch, Harold E.; and Przybylinski, Phillip G., to Trinity Industries, Inc. All purpose car. 5,090,331, Cl. 105-3.000.

Hess, Heinrich: See—
Grogler, Gerhard; Kopp, Richard; Hess, Heinrich; Hansel, Eduard; and Scholl, Thomas, 5,091,497, Cl. 528-76.000.

Hess, Jack H.: See—
Caden, John C.; Caden, Linda J.; Eads, Norman B.; and Hess, Jack H., 5,090,077, Cl. 5-456.000.

Hess, John R.: See—
Ramachandran, Jairaj; Hess, John R.; and Plemmons, Larry W., 5,090,865, Cl. 415-112.000.

Hettich, Gerhard: See—
Schumpf, Hans; Haas, Lothar; and Hettich, Gerhard, 5,090,237, Cl. 73-146.500.

Heumann, Reiner, to Siemens Aktiengesellschaft. Mount for an electrode system in an x-ray image intensifier. 5,091,639, Cl. 250-213.0VT.

Heutmayer, Michael E.: See—
Pauls, Edward A.; Engel, Timothy S.; Heutmayer, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,090,694, Cl. 272-134.000.

Hewitt, Fred G.; Conrad, John C.; and Conrad, Kathy J. Dental curette with finger pad. 5,090,907, Cl. 433-144.000.

Hewlett-Packard Company: See—
Mueller, Bruce E.; and Stoffel, John L., 5,091,005, Cl. 106-22.000.

Pollard, Roger D., 5,091,709, Cl. 333-239.000.

Shelton, John F.; and Carter, Richard J., 5,091,851, Cl. 395-425.000.

Studebaker, Lawrence G.; and Wong, Edward H., 5,091,342, Cl. 437-228.000.

Hey, H. Peter W.; Mazak, William A.; Aggarwal, Ravinder K.; Curtin, John H.; Brown, Paul B.; and Smith, Joe R., to Advanced Semiconductor Materials, Inc. Method for processing wafers in a multi station common chamber reactor. 5,091,217, Cl. 427-248.100.

Hibino, Hiroki: See—
Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyahara, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.

Hibino, Kenichi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Diffraction grating for optical scanning. 5,091,798, Cl. 359-209.000.

Hidaka, Takahiro: See—
Nomura, Shigeru; and Hidaka, Takahiro, 5,091,535, Cl. 546-35.000.

Hidding, Gerhard: See—
Gombault, Jacobus F.; and Hidding, Gerhard, 5,090,671, Cl. 270-45.000.

Hierzegger, Roman: See—
Dafinger, Willibald; Gabler, Wolf Dietrich; Pichl, Eduard; and Hierzegger, Roman, 5,091,603, Cl. 570-230.000.

Higashi, Gregg S.: See—
Bean, John C.; Higashi, Gregg S.; Hull, Robert; and Petcolas, Justin L., 5,091,767, Cl. 357-60.000.

Higashihara, Masaki: See—
Fukahori, Hidehiko; Suda, Yasuo; Itoh, Kenji; Higashihara, Masaki; and Aoyama, Keisuke, 5,091,742, Cl. 354-402.000.

Higgins, John B.: See—
Chang, Clarence D.; Chu, Cynthia T. W.; Dessau, Ralph M.; Higgins, John B.; Lutner, John D.; and Schlenker, John D., 5,091,073, Cl. 208-46.000.

Higgins, Raymond L.; and Golem, Dennis W., to NCR Corporation. Optical character recognition system and method. 5,091,968, Cl. 382-30.000.

Higgins, Toney D. Rotary tool quick acting retention device. 5,090,126, Cl. 30-388.000.

Higham, Edward H.: See—
Baker, Roger C.; and Higham, Edward H., 5,090,240, Cl. 73-197.000.

Highland, Henry A.: See—
Mullen, Michael A.; Highland, Henry A.; Taggart, Robert E.; and Lingren, Bill W., 5,090,153, Cl. 43-114.000.

Higuchi, Jiro, to Kabushiki Kaisha Toshiba. Ultrasonic diagnosis apparatus. 5,090,411, Cl. 128-660.050.

Higuchi, Yoshiki; and Suyama, Shuji, to Nippon Oil and Fats Company, Limited. Novel dialkyl peroxides, production method and use thereof. 5,091,586, Cl. 568-332.000.

Hihara, Mikio; and Suzuki, Nobuhisa, to Nissei Plan, Inc. Strengthened cellular concrete compositions and method of making. 5,091,014, Cl. 106-677.000.

Hijkata, Kenji: See—
Nakane, Toshio; Hijkata, Kenji; Iiyama, Makoto; Kageyama, Yukihiko; and Naka, Michirou, 5,091,259, Cl. 428-457.000.

Hilbert, Samuel D.: See—
Weaver, Max A.; Hilbert, Samuel D.; Pruett, Wayne P.; and Coates, Clarence A., Jr., 5,091,501, Cl. 528-220.000.

Hildebrand, Heinz: See—
Baumgarten, Jorg; Brunner, Helmut; Flesch, Inge; Hildebrand, Heinz; Piel, Norbert; and Sperzel, Michael, 5,091,364, Cl. 514-8.000.

Hildreth, Esle D. Detergent composition containing C5-C14 free fatty acids and one or more surfactant. 5,091,101, Cl. 252-89.100.

Hilgren, Wallace L., to Kler-Flo Company. Anti-freeze recycling apparatus and method. 5,091,081, Cl. 210-195.200.

Hill, Cynthia: See—
Kennington, Allison; Lerner, Joseph; Hill, Cynthia; Stringfield, Butler; Carta, Giorgio; and Kirwan, Donald J., 5,091,596, Cl. 568-833.000.

Hill, William H., and Cawelti, Dale W., to Hughes Aircraft Company. Orthogonal bonding method and equipment. 5,091,825, Cl. 361-404.000.

Hilliard, Garland E.: See—
Shaffer, John H.; Melton, James K.; and Hilliard, Garland E., 5,091,165, Cl. 423-474.000.

Hilton Instruments, Inc.: See—
Hilton, Ralph M., 5,090,242, Cl. 73-302.000.

Hilton, Ralph M., to Hilton Instruments, Inc. Remote, pneumatic, continuous sensor of the liquid level in a vacuum tank. 5,090,242, Cl. 73-302.000.

Hinatase, Fumio: See—
Hitomi, Mitsuo; Hinatase, Fumio; Nishikawa, Toshio; and Takeuchi, Nobuo, 5,090,202, Cl. 60-602.000.

Hines, Allan R.: See—
Chatwin, Ian M.; and Hines, Allan R., 5,091,895, Cl. 368-6.000.

Hipple, James H.; Smith, Don W.; Carpenter, Steven P.; and Johnston, Jesse C., to Babcock & Wilcox Company, The. Hub assembly for sootblower. 5,090,087, Cl. 15-317.000.

Hiraishi, Atsushi: See—
Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hirai-shi, Atsushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, 5,091,883, Cl. 365-189.050.

Hiraiwa, Atsushi; Kimura, Shinichi; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, to Hitachi, Ltd. Semiconductor device having an arrangement of IGFETs and capacitors stacked thereover. 5,091,761, Cl. 357-23.600.

Hiramatsu, Yasushi: See—
Kamakura, Kunihito; Ohta, Seiichi; Aoki, Chihiro; Hamano, Seitaro; and Hiramatsu, Yasushi, 5,090,078, Cl. 15-97.100.

Hiramatsu, Yonejiro; and Satou, Shun-ichi, to Sharp Kabushiki Kaisha. FM modulator. 5,091,705, Cl. 332-103.000.

Hirano, Akira; and Kuzunuki, Masashi, to Honda Giken Kogyo Kabushiki Kaisha. High accuracy wheel examining method and apparatus. 5,090,235, Cl. 73-117.000.

Hirano, Hirofumi; and Sukigara, Akihiko, to Canon Kabushiki Kaisha. Mechanism for moving thermal head on carriage. 5,090,827, Cl. 400-185.000.

Hirano, Yoshihito: See—
Tatsumi, Kenji; and Hirano, Yoshihito, 5,091,915, Cl. 372-75.000.

Hirata, Juichi: See—
Yamamoto, Hiroshi; and Hirata, Juichi, 5,091,614, Cl. 200-144.0A.P.

Hird, John A.; and Kerr, Mark E., to Intellicall, Inc. Coin handling system. 5,090,548, Cl. 194-345.000.

Hirose Electric Co., Ltd.: See—
Sato, Kensaku; and Shirai, Akira, 5,090,925, Cl. 439-862.000.

Hirose, Etsuro: See—
Fukuzawa, Soochi; Hayashi, Seiichi; Hirose, Etsuro; and Miyashita, Kazuo, 5,090,220, Cl. 68-3.00R.

Hirota, Yoshihiko, to Minolta Camera Kabushiki Kaisha. Apparatus for line scanning a document. 5,091,978, Cl. 382-67.000.

Hirotsune, Kojo, to Mitsubishi Denki Kabushiki Kaisha. Current transformer mounting mechanism for circuit breaker. 5,091,711, Cl. 336-65.000.

Hisada, Eiichi: See—
Oki, Takeo; Fukuta, Yoichi; Hisada, Eiichi; and Aoki, Satoshi, 5,090,969, Cl. 51-295.000.

Hitachi Automotive Engineering Company: See—
Someya, Ryuichi; Kabuto, Nobuaki; Kimura, Yuichiro; and Watanabe, Kazuhiro, 5,091,784, Cl. 358-183.000.

Hitachi Automotive Engineering Co., Ltd.: See—
Tomite, Toshio, 5,091,667, Cl. 310-154.000.

Hitachi Computer Engineering Co., Ltd.: See—
Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsunori; and Shiroyanagi, Yoshiro, 5,091,909, Cl. 371-40.100.

Hitachi Elevator Engineering and Service Co., Ltd.: See—
Takahashi, Tashuho; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaru; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.

Hitachi, Inc.: See—
Fukuzawa, Soochi; Hayashi, Seiichi; Hirose, Etsuro; and Miyashita, Kazuo, 5,090,220, Cl. 68-3.00R.

Hitachi Koki Co., Ltd.: See—
Matsuno, Junichi; Ogasawara, Tsuyoshi; and Kawauchi, Masataka, 5,090,676, Cl. 271-12.000.

Hitachi, Ltd.: See—
Amada, Eiichi, 5,091,905, Cl. 370-60.000.

Baji, Toru; and Inouchi, Hidenori, 5,091,864, Cl. 395-27.000.

Hanamura, Shoji; Aoki, Masaaki; and Masuhara, Toshiaki, 5,091,325, Cl. 437-40.000.

Hasegawa, Taiji; Fujisawa, Masaaki; Sakamoto, Masahide; Ishii, Toshio; and Takahashi, Hideharu, 5,091,856, Cl. 364-424.050.

Hiraiwa, Atsushi; Kimura, Shinichi; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, 5,091,761, Cl. 357-23.600.

Kanbara, Takasugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto;

Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.

Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsunori; and Shiroyanagi, Yoshiro, 5,091,909, Cl. 371-40.100.

Kitajima, Masaaki; Ohwada, Jun-ichi; and Nagae, Yoshiharu, 5,091,722, Cl. 340-784.000.

Kojima, Keiji, 5,091,848, Cl. 395-800.000.

Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto; and Oono, Yasuteru, 5,090,872, Cl. 417-53.000.

Matsuno, Junichi; Ogasawara, Tsuyoshi; and Kawauchi, Masataka, 5,090,676, Cl. 271-12.000.

Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hirai-shi, Atsushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, 5,091,883, Cl. 365-189.050.

Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.

Ogawa, Kensuke; Katsuyama, Toshio; and Fukuzawa, Tadashi, 5,091,980, Cl. 385-3.000.

Serizawa, Yukio; Sekiguchi, Koichi; Oshima, Yasuhiro; and Izuka, Tadashi, 5,090,882, Cl. 418-56.000.

Shimada, Junichi; and Kobayashi, Kazutoshi, 5,090,367, Cl. 123-146.50A.

Someya, Ryuichi; Kabuto, Nobuaki; Kimura, Yuichiro; and Watanabe, Kazuhiro, 5,091,784, Cl. 358-183.000.

Takahashi, Tashuho; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaru; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.

Tanabe, Yoshiyuki, 5,090,381, Cl. 123-339.000.

Tanaka, Isamu; Oka, Hitoshi; Watanabe, Makio; Kikuchi, Hiroshi; Imabayashi, Shinichi; and Taniguti, Yukihiro, 5,091,283, Cl. 430-280.000.

Tate, Hitoshi; Totsuka, Fumio; Horiuchi, Tetuo; and Moriya, Kumiaki, 5,091,143, Cl. 376-282.000.

Tsuchida, Masashi; and Ohmachi, Kazuhiko, 5,091,852, Cl. 395-600.000.

Hitachi Maxell, Ltd.: See—
Takahashi, Takehiro, 5,091,618, Cl. 235-441.000.

Hitachi Metals, Ltd.: See—
Kondo, Takajiro, 5,090,285, Cl. 83-636.000.

Ohtsuka, Kouki; Kubo, Kimio; Akiyama, Koichi; Ike, Masahide; and Kawai, Kunio, 5,091,147, Cl. 420-68.000.

Hitachi Seiko, Ltd.: See—
Nakajima, Kiyoharu, 5,090,284, Cl. 83-577.000.

Hitachi VLSI Engineering Corp.: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.

Hitomi, Mitsuo; Hinatase, Fumio; Nishikawa, Toshio; and Takeuchi, Nobuo, to Mazda Motor Corporation. Intake system for an internal combustion engine with supercharger. 5,090,202, Cl. 60-602.000.

Hitomi, Mitsuo: See—
Sasaki, Junsou; Hitomi, Mitsuo; Nishikawa, Toshio; and Fujimoto, Hidefumi, 5,090,391, Cl. 123-559.300.

Hoashi, Chikako, to Yugenkaisha Matsubei. Composite food products and their production processes. 5,091,198, Cl. 426-92.000.

Hobbs, James B., to Atmel Corporation. Multiple port memory including merged bipolar transistors. 5,091,881, Cl. 365-155.000.

Hoch, John R., Jr.; and Moore, Bruce A. Temperature sensitive water supply shut-off system. 5,090,436, Cl. 137-80.000.

Hochstatter, Gary R.: See—
Renouard, Bruce T.; and Hochstatter, Gary R., 5,090,761, Cl. 296-3.000.

Hochstrasser, Ferdinand, to KWC AG. Sanitary fitting. 5,090,062, Cl. 4-192.000.

Hochwalt, Norman C.: See—
Sarada, Thyagaraj; and Hochwalt, Norman C., 5,091,006, Cl. 106-22.000.

Hock, Franz: See—
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Kesseler, Kurt; Bartmann, Wilhelm; Wess, Gunther; and Granzer, Erno, 5,091,386, Cl. 514-277.000.

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Lappe, Peter; and Springer, Helmut, 5,091,546, Cl. 556-23.000.

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Blaser, Eric J.; and Nichols, Carl S., 5,091,504, Cl. 528-272.000.

Calundann, Gordon W.; and Chung, Tai-Shung, 5,091,087, Cl. 210-500.280.

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O'Malley, Gerard J.; Allen, Richard C.; and White, John I., 5,091,541, Cl. 548-429.000.

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Hoffman, Kevin: See—
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Hoffman, Richard W.; Kinsley, John; and Illenberger, Michael, to Magenta Corporation. Tamper-evident, tamper-resistant closure. 5,090,583, Cl. 215-253.000.

Hoggan Health Industries, Inc.: See—
Wagoner, Earl V., III, 5,090,421, Cl. 128-774.000.

Hohe KG: See—
Seitz, Edwin, 5,091,804, Cl. 359-841.000.

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Hokke, Robin, to U.S. Philips Corp. Object holder for supporting an object in a charged particle beam system. 5,091,651, Cl. 250-443.100.

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Holcomb, Matthew L. Double-strike percussion instrument beater apparatus. 5,090,289, Cl. 84-422.100.

Holdren, Frederick V.; Novack, Mitchell J.; and Rupnick, Charles J., to Sundstrand Data Control, Inc. Preload system for accelerometer. 5,090,243, Cl. 73-514.000.

Hollwarth, Ernst: See—
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Holm, Susan A. W.: See—
Connors, Eugene E.; and Holm, Susan A. W., 5,091,809, Cl. 360-99.080.

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Honda, Narimichi: See—
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Back, Je I.; Kim, Deok H.; Hong, Hyun H.; Kyong, Mun G.; Park, Ju Y.; Lee, Hyeon H.; Lee, Young K.; and Park, Hang G., 5,091,904, Cl. 370-58.100.

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- Hsu, Nelson N. C.; Ballentine, Franklyn A.; Hufziger, Mark J.; and Card, Roger J., to American Cyanamid Company. Molding granules, their manufacture and their use in the production of molded articles. 5,091,255, Cl. 428-378.000.
- Huang, Ann E.: See—
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- Huang, Henry V.: See—
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- Huang, Hua-Feng: See—
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- Huang, Kelvin. Exercise mechanism. 5,090,690, Cl. 272-70.000.
- Huang, Tsao-Chin C.: See—
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- Huber, Thomas; and Huber, Ralf, to Stiwa-Fertigungstechnik Sticht Gesellschaft m.b.H., a part interest; and GAS Gesellschaft fur Antriebs- und Steuerungstechnik mbH & Co. KG, a part interest. Arrangement for the handling of components with a gripping device. 5,090,757, Cl. 294-88.000.
- Hubert, Jean-Luc, to Liquid Air Corporation. Multi-step combined mechanical/thermal process for removing coatings from steel substrates with reduced operating and capital costs and with increased refrigeration speed and efficiency. 5,091,034, Cl. 156-344.000.
- Huck Manufacturing Company: See—
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- Hudson, Eric B., to Tecumseh Products Company. Valve gear oiling system for overhead camshaft engine. 5,090,375, Cl. 123-196.00W.
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- Hufziger, Mark J.: See—
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- Clebowicz, Brian A., 5,091,940, Cl. 380-37.000.
- Hamori, Alfred S., 5,091,721, Cl. 340-727.000.
- Hill, William H.; and Cawelti, Dale W., 5,091,825, Cl. 361-404.000.
- O'Meara, Thomas R.; and Valley, George C., 5,090,795, Cl. 359-240.000.
- Pierce, Brian M., 5,090,806, Cl. 356-301.000.
- Hugron, Denis P. Traffic signalling post. 5,090,348, Cl. 116-63.00R.
- Huie, Wing K.; and Owens, Alexander H., to Allegro Microsystems, Inc. Method for making an NPN transistor with controlled base width compatible with making a Bi-MOS integrated circuit. 5,091,321, Cl. 437-27.000.
- Hull, Robert: See—
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- Hunt, Thomas C.; and Harris, Ronald W. Paint booth thermal reclamation system for space heating. 5,090,136, Cl. 34-218.000.
- Hunter Douglas Inc.: See—
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- Hunter, Edwin J.; and Scott, Loren W., to Edwin J. Hunter. Adjustable check valve. 5,090,446, Cl. 137-540.000.
- Hunter, Howard S.: See—
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- Hunter, Robert F.; and Hohn, Phillip. Caustic etching of aluminum with matte finish and low waste capability. 5,091,046, Cl. 156-642.000.
- Hunting, C. J.: See—
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- Hurtgen, Jerome P., to General Electric Company. Method of fabricating a lead termination device. 5,090,123, Cl. 29-882.000.
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- Hutchings, Richard, to Drackett Company, The. Chlorine dioxide generating device. 5,091,107, Cl. 252-187.210.
- Huthmacher, Klaus; and Schmitt, Hermann, to Degussa AG. Method of preparing 1,3,3-trimethyl-5-oxo-cyclohexane carbonitrile. 5,091,554, Cl. 558-341.000.
- Hwang, Blake; and Lee, Ming-Ted. Structure of a connecting joint of a case. 5,090,836, Cl. 403-295.000.
- Hybritech Incorporated: See—
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- I.S.T., Institut de Recherche en Sante et en Securite du Travail du Quebec: See—
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- Ida, Kazunaga; Yamaki, Makio; Matsumoto, Yukio; Ishihara, Hiroyuki; Naoe, Toshiyuki; and Terauchi, Hideyuki, to Pioneer Electronic Corporation. Audio signal data processing system. 5,091,951, Cl. 381-63.000.
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- Idemitsu Petrochemical Co., Ltd.: See—
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- II Morrow, Inc.: See—
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- Iizumi, Yuichi: See—
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- Ikeda, Towl; and Koike, Hisashi, to Tokyo Electron Limited. Quartz probe apparatus. 5,091,694, Cl. 324-158.00P.
- Ikeda, Yukihiro: See—
Ozaki, Masaru; Ikeda, Yukihiro; and Arakawa, Tatsumi, 5,091,488, Cl. 526-90.000.
- Ikegami Tsushinki Co., Ltd.: See—
Itoh, Yoshikazu; and Wake, Shunji, 5,091,877, Cl. 395-200.000.
- Ikenaka, Yoshiharu: See—
Takeoka, Katsushi; Ohashi, Tsuyoshi; and Ikenaka, Yoshiharu, 5,090,226, Cl. 72-117.000.
- Iketani, Masayuki: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.
- Ikoma, Hideto: See—
Nozawa, Yasushi; Ikoma, Hideto; Miyahashi, Keiji; and Shibahara, Yoshihiko, 5,091,293, Cl. 430-503.000.
- Ikuta, Kenji; Kondo, Toshio; and Haraguchi, Hiroshi, to Nippondenso Co., Ltd. Apparatus for controlling air-fuel ratio for engine. 5,090,199, Cl. 60-276.000.
- Illenberger, Michael: See—
Hoffman, Richard W.; Kinsley, John; and Illenberger, Michael, 5,090,583, Cl. 215-253.000.
- Imabayashi, Shinichiro: See—
Tanaka, Isamu; Oka, Hitoshi; Watanabe, Makio; Kikuchi, Hiroshi; Imabayashi, Shinichiro; and Taniguti, Yukihiro, 5,091,283, Cl. 430-280.000.
- Imai, Hiroshi: See—
Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, 5,090,764, Cl. 296-107.000.
- Imai, Isao: See—
Miyoshi, Ryota; Imai, Isao; and Sugaya, Tadashi, 5,091,013, Cl. 106-505.000.
- Imai, Mizuho: See—
Shiba, Nobuyasu; Imai, Mizuho; Sekiguchi, Mikio; and Iida, Hideyo, 5,090,360, Cl. 118-59.000.
- Imamura, Hiroyuki; and Hashiba, Mitsuki, to Jatco Corporation. Pressure control system for lock-up clutch in automotive automatic power transmission with compensation of fluid pressure in low engine speed range. 5,090,527, Cl. 192-3.290.
- Imaoka, Yasunori; and Oshima, Shigeru, to Canon Kabushiki Kaisha. Zoom lens barrel. 5,091,802, Cl. 359-694.000.
- Imazawa, Yoshitsugu: See—
Kushida, Hachiro; Hamano, Kazumi; Imazawa, Yoshitsugu; and Irie, Kenji, 5,091,224, Cl. 427-419.400.
- Imhof, Robert: See—
Miescher, Andreas; Gertsch, Peter; and Imhof, Robert, 5,090,314, Cl. 101-148.000.
- Immel, Manfred, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Air-water heat exchanger for a control box. 5,090,476, Cl. 165-122.000.
- Immenkeppel, Michael; Kleinstuck, Roland; Block, Hans-Dieter; Sicius, Hermann; and Schmidt, Peter, to Bayer Aktiengesellschaft. Process for eliminating 1-carboxy-1-phosphonocyclopentan-3-one from, or reducing its content in, technical 2-phosphonobutane-1,2,4-tricarboxylic acid using bleaching liquor. 5,091,562, Cl. 562-24.000.
- Imondi, Anthony R.; and Hagerman, Larry M., to Erbmont Inc. Pharmaceutical composition containing bile acid sequestrant enclosed in a size-exclusion membrane. 5,091,175, Cl. 424-486.000.
- Imperial Chemical Industries plc: See—
Bradbury, Robert H.; Brown, David; Roberts, David A.; and Waterson, David, 5,091,425, Cl. 514-228.500.
- Bushell, Michael J., 5,091,416, Cl. 514-514.000.
- deFraine, Paul; Snell, Brian K.; Beauteament, Kevin; and Anthony, Vivienne M., 5,091,407, Cl. 514-423.000.
- Gemmell, Peter A.; and Leliaert, Carol, 5,091,360, Cl. 503-227.000.
- Lawson, Kevin R., 5,090,992, Cl. 71-92.000.
- Moore, Geoffrey J.; and Massey, Helen M., 5,091,600, Cl. 570-151.000.
- Imran, Mir A., to Supra Products, Inc. Electronic lock box and retention mechanism for use therein. 5,090,222, Cl. 70-63.000.
- Inaguma, Kazunari: See—
Inatome, Hiroshi; Inaguma, Kazunari; Yamaguchi, Hiroaki; and Ohtani, Yasuhisa, 5,091,503, Cl. 528-272.000.
- Inaki, Shigeo: See—
Murakoshi, Toshiichi; Kawazoe, Hiroshi; Takahata, Toshihiro; Inaki, Shigeo; Yamashita, Tatsuo; and Doi, Yoshinori, 5,090,110, Cl. 29-596.000.
- Inatome, Hiroshi; Inaguma, Kazunari; Yamaguchi, Hiroaki; and Ohtani, Yasuhisa, to Kao Corporation. Continuous polymerization device and continuous polymerization method. 5,091,503, Cl. 528-272.000.
- Inazawa, Shinji: See—
Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,091,609, Cl. 174-110.00A.
- Inazawa, Yoshizumi: See—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,091,805, Cl. 360-53.000.
- Indugas, Inc.: See—
Hemsath, Klaus H., 5,090,891, Cl. 431-1.000.
- Industrial Technology Research Institute: See—
Shyu, Jia-Ming, 5,091,726, Cl. 340-904.000.
- Industrial Technology Research Institute: See—
Chu, Jau-Jier; Lai, Ming-Chih; Tseng, Mei-Rung; and Yeh, Huei-Hsing, 5,091,221, Cl. 427-282.000.
- Industrietechnik Dr.-Ing Walter Klaschka GmbH & Co.: See—
Platsch, Hans G., 5,090,626, Cl. 239-654.000.
- Infinitex Corporation: See—
Thalmann, William H.; and Siegler, Thomas W., 5,091,085, Cl. 210-321.650.
- Ingram, Keith W.; and Crowley, Daniel J., Jr., to Owens-Illinois Closure Inc. Tamper indicating package. 5,090,788, Cl. 215-252.000.
- Ingram, Terry D.; and Wolverton, Randy, to Expert Technologies, Inc. Computer integrated floor plan system. 5,091,869, Cl. 364-560.000.
- Innis, Michael A., to Cetus Corporation. Structure-independent DNA amplification by the polymerase chain reaction. 5,091,310, Cl. 435-91.000.
- Inoac Corporation: See—
Takeoka, Katsushi; Ohashi, Tsuyoshi; and Ikenaka, Yoshiharu, 5,090,226, Cl. 72-117.000.
- Inouchi, Hidenori: See—
Baji, Toru; and Inouchi, Hidenori, 5,091,864, Cl. 395-27.000.
- Inoue, Chozo: See—
Nagai, Kimie; Najoh, Schuichi; Kurotaki, Ayako; Shirane, Koro; and Inoue, Chozo, 5,091,557, Cl. 560-39.000.
- Inoue, Hiroshi, to Usui Kokusai Sangyo Kaisha Ltd. Temperature-sensing type fluid fan coupling device. 5,090,533, Cl. 192-58.00B.
- Inoue, Hiroshi; Igarashi, Chikara; and Muranaka, Takeshi, to Mitsui Petrochemical Industries, Ltd. Composition for producing ceramics. 5,091,346, Cl. 501-93.000.
- Inoue, Hiroshi: See—
Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,091,723, Cl. 340-784.000.
- Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; Miyazaki, Makoto; and Inoue, Hiroshi, 5,091,474, Cl. 525-109.000.
- Inoue, Hitoshi: See—
Demizu, Akira; and Inoue, Hitoshi, 5,090,383, Cl. 123-425.000.
- Inoue, Jun: See—
Nagasawa, Hiroyuki; Inoue, Jun; Takeda, Katsunori; Saito, Keizo; and Murai, Hiroko, 5,091,878, Cl. 364-419.000.
- Inoue, Masahiro; Amemiya, Koji; Ohno, Aki; and Tsunemi, Takeo, to Canon Kabushiki Kaisha. Image forming apparatus utilizing intermediate transfer member. 5,091,751, Cl. 355-274.000.
- Inoue, Minoru: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,091,460, Cl. 524-492.000.
- Inoue, Sadahiro: See—
Tabayashi, Isao; Harada, Hiroshi; Inoue, Sadahiro; and Fukutomi, Hiroshi, 5,091,004, Cl. 106-22.000.
- Inoue, Takayuki: See—
Arashiro, Yusuke; Yamauchi, Shinichi; Sano, Hironari; Inoue, Takayuki; and Nishida, Koji, 5,091,473, Cl. 525-92.000.
- Inoue, Teruhisa: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,090,318, Cl. 101-227.000.
- Inoue, Yasushi; and Sakono, Takashi, to Mazda Motor Corporation. Connecting structure for connecting a power unit of an automotive vehicle with the body of the vehicle. 5,090,502, Cl. 180-312.000.
- Inoue, Yoshio: See—
Iwasaki, Hiroya; Fujimura, Katsuyuki; Inoue, Yoshio; and Nakamura, Shoshiro, 5,091,312, Cl. 435-191.000.
- Installation Europeenne de Rayonnement Synchrotron (European Synchrotron Radiation Facility): See—
Roux, Daniel, 5,090,128, Cl. 33-367.000.
- Institut de Recherche/Appliquee sur les Polymeres: See—
Noireaux, Patrick; Jamet, Jean; Parlier, Michel; and Bacos, Marie-Pierre, 5,091,485, Cl. 525-478.000.
- Institut Francais du Petrole: See—
Fuchs, Jean-Francois; Tisne, Jean-Louis; and Odru, Pierre, 5,091,230, Cl. 428-36.400.
- Gadelle, Claude, 5,091,129, Cl. 264-85.000.
- Instrumentarium Corporation: See—
Rantala, Borje T., 5,091,649, Cl. 250-343.000.
- Intel Corporation: See—
Bohr, Mark T.; Brigham, Lawrence N., Jr.; and Hossaini, Shahab, 5,091,332, Cl. 437-69.00G.
- Sanchez, Julian J. B., 5,091,763, Cl. 357-23.900.

Intellicall, Inc.: See—
Hird, John A.; and Kerr, Mark E., 5,090,548, Cl. 194-345.000.
Interconnection Informatique: See—
Magnier, Bernard, 5,090,916, Cl. 439-352.000.
Intergraph Corporation: See—
Sachs, Howard G.; and Cho, James Y., 5,091,846, Cl. 395-250.000.
Interlock Industries Limited: See—
Thompson, Peter J., 5,090,754, Cl. 292-262.000.
International Business Machines Corporation: See—
Bauer, Bernd; and Erlmann, Wolfgang, 5,091,070, Cl. 204-182.400.
Cronin, John E.; Kaanta, Carter W.; Previti-Kelly, Rosemary A.; and Ryan, James G., 5,091,289, Cl. 430-312.000.
Duspiva, Walter S.; and Gillett, John B., 5,091,837, Cl. 363-15.000.
Kaida, Yoshimasa, 5,091,792, Cl. 359-67.000.
Michail, Michel S.; and Struk, James R., 5,091,659, Cl. 307-454.000.
Suzuki, Shunji, 5,091,794, Cl. 359-93.000.
Takayama, Shinji, 5,091,896, Cl. 369-13.000.
Wood, Roger T., 5,091,720, Cl. 340-721.000.
International Flavors & Fragrances Inc.: See—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr.; Sudol, Marion A.; and Boden, Richard M., 5,091,200, Cl. 426-243.000.
Wilson, Richard A.; Mookherjee, Braja D.; and Butler, Jerry F., 5,091,423, Cl. 514-690.000.
International Packagers, Inc.: See—
Greene, Edward W., deceased; and Jackson, Barbara G., heir, 5,090,428, Cl. 132-204.000.
International Road Dynamics Inc.: See—
Bergan, Terry, 5,090,493, Cl. 177-211.000.
International Technidyne Corporation: See—
La Duca, Frank M.; and Marcelino, Eduardo I., 5,091,304, Cl. 435-13.000.
Inuyama, Toshihiko: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
Inuzima, Takashi: See—
Yamazaki, Shunpei; Fukada, Takeshi; Sakama, Mitsunori; Shinohara, Hisato; Amachi, Nobumitsu; Sakamoto, Naoya; and Inuzima, Takashi, 5,091,638, Cl. 250-208.100.
Iowa Precision Industries, Inc.: See—
Welty, Robert E., 5,090,101, Cl. 29-243.500.
Irie, Kenji: See—
Kushida, Hachiro; Hamano, Kazumi; Imazawa, Yoshitsugu; and Irie, Kenji, 5,091,224, Cl. 427-419.400.
Irie, Shouchi: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouchi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.
Isaacs, Alvin: See—
Gilman, Thomas H., 5,090,406, Cl. 602-47.000.
Iseda, Kohei; Satoh, Kazumi; Kurihara, Hideaki; Amano, Fumio; Unagami, Shigeyuki; and Okazaki, Koji, to Fujitsu Limited. Voice coding/decoding system having selected coders and entropy coders. 5,091,955, Cl. 381-36.000.
Isert, Dieter: See—
Adam, Friedhelm; Durckheimer, Walter; Scheunemann, Karl-Heinz; Isert, Dieter; and Seibert, Gerhard, 5,091,382, Cl. 514-206.000.
Ishibashi, Hiroshi: See—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,091,805, Cl. 360-53.000.
Ishibashi, Ichirou; Ichinose, Kiyohiro; Yamamoto, Toru; and Kashida, Toshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Coating apparatus. 5,090,361, Cl. 118-313.000.
Ishibashi, Yutaka: See—
Takeda, Fumio; Kojima, Yoshio; Kaneko, Tsuneo; Ishibashi, Yutaka; Sasaki, Naoto; and Tsushima, Isako, 5,090,169, Cl. 52-220.000.
Ishida, Koichi; and Takayama, Yukio, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive record material. 5,091,359, Cl. 503-209.000.
Ishida, Masahiko: See—
Mohri, Hidemasa; Tobita, Michiaki; and Ishida, Masahiko, 5,091,735, Cl. 346-1.100.
Ishida, Toru: See—
Tsuda, Toshio; Horio, Yasuhiko; Bessho, Yoshihiro; and Ishida, Toru, 5,090,119, Cl. 29-843.000.
Ishida, Yoshiaki: See—
Saito, Takeo; Ishida, Yoshiaki; Fukunaga, Nobuyuki; Kimura, Mutsuhiko; and Metoki, Yasuo, 5,090,325, Cl. 102-313.000.
Ishidoya, Masahiro; Shibato, Kishio; Ohe, Osamu; and Kawasaki, Masaki, to Nippon Oil and Fats Co., Ltd.; and Mitsui Petrochemical Industries, Ltd. Resin composition for use as paint. 5,091,492, Cl. 526-282.000.
Ishidoya, Masahiro: See—
Souma, Thoru; Ishidoya, Masahiro; Nakamichi, Toshihiko; and Takai, Naoto, 5,091,010, Cl. 106-403.000.
Ishiguro, Takeo: See—
Makisumi, Yasuo; Murabayashi, Akira; Hatta, Takayuki; and Ishiguro, Takeo, 5,091,539, Cl. 548-267.800.

Ishiguro, Toshiaki: See—
Hasegawa, Hiromi; and Ishiguro, Toshiaki, 5,090,540, Cl. 192-87.190.
Ishihara, Hiroyuki: See—
Ida, Kazunaga; Yamaki, Makio; Matsumoto, Yukio; Ishihara, Hiroyuki; Naoe, Toshiyuki; and Terauchi, Hideyuki, 5,091,951, Cl. 381-63.000.
Ishihara, Katsumi: See—
Umetsu, Sachio; Tsuda, Toshio; Azuma, Yusaku; Miura, Toshihiko; Ishihara, Katsumi; and Ohsaka, Teiji, 5,090,113, Cl. 29-714.000.
Ishii, Hitoshi: See—
Mori, Kazuhiko; Miyawaki, Toshi; and Ishii, Hitoshi, 5,091,223, Cl. 427-383.700.
Ishii, Masami: See—
Takeda, Shin; Ishii, Masami; Ozawa, Mitsuhiro; and Terazawa, Toshihisa, 5,090,227, Cl. 72-178.000.
Ishii, Susumu: See—
Terada, Yasuhiro; and Ishii, Susumu, 5,090,096, Cl. 24-431.000.
Ishii, Toshinori; and Sato, Masanori, to Kuraray Co., Ltd. Production of wholly aromatic polyester film. 5,091,138, Cl. 264-564.000.
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, to NKK Corporation. Method for cleaning molten metal and apparatus therefor. 5,091,000, Cl. 75-508.000.
Ishii, Toshio: See—
Hasegawa, Taiji; Fujisawa, Masaaki; Sakamoto, Masahide; Ishii, Toshio; and Takahashi, Hideharu, 5,091,856, Cl. 364-424.050.
Ishii, Yumi: See—
Kawarabayashi, Waichirou; Ishii, Yumi; and Takahashi, Shigeru, 5,090,156, Cl. 47-58.000.
Ishii, Yutaka: See—
Hatano, Akitsugu; and Ishii, Yutaka, 5,090,794, Cl. 359-53.000.
Ishikawa, Hideyuki: See—
Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, 5,090,386, Cl. 123-478.000.
Ishikawa, Muneharu; and Taniji, Ayafumi, to Kowa Company Ltd. Particle measurement apparatus. 5,090,808, Cl. 356-336.000.
Ishikawa, Takatoshi: See—
Fujimoto, Hiroshi; Morimoto, Kiyoshi; and Ishikawa, Takatoshi, 5,091,292, Cl. 430-467.000.
Katoh, Masakazu; and Ishikawa, Takatoshi, 5,091,061, Cl. 205-135.000.
Ishimura, Tamihiko: See—
Miyawaki, Masahumi; Ishimura, Tamihiko; and Ohtsuki, Yoshio, 5,091,886, Cl. 365-204.000.
Ishizaki, Naoko; and Kameyama, Atsushi, to Kabushiki Kaisha Toshiba. MESFET differential amplifier. 5,091,663, Cl. 307-530.000.
Ishizawa, Yoshinori: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Tetsuo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.
Isogai, Akira: See—
Katoh, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, 5,091,311, Cl. 435-119.000.
Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, to Olympus Optical Co., Ltd. Memory device. 5,091,880, Cl. 365-151.000.
Isooka, Toshio: See—
Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyuki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.
Isotron: See—
Lomasney, Henry L., 5,091,447, Cl. 523-408.000.
Israel Yissum Research Development Company of the Hebrew University of Jerusalem: See—
Lewis, Aaron; Fuxbruner, Amihay; and Hemo, Itzhak, 5,091,626, Cl. 219-121.690.
Issenmann, Olivier, to Geoservices. Method and apparatus for sampling the gaseous content of a liquid. 5,090,256, Cl. 73-863.230.
Isuzu Motors Limited: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyosi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.
Arai, Minoru, 5,090,200, Cl. 60-286.000.
Itagaki, Kazuhide: See—
Yamamoto, Tokihiko; Fukumoto, Ryoichi; Ohhashi, Masao; Itagaki, Kazuhide; and Sumiya, Kazuhiro, 5,090,081, Cl. 15-250.130.
Itaya, Mazumi: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.
Ito, Hideo; Tonomura, Hiroshi; Nakata, Moritsune; and Kobiki, Yasuhiko, to Nissan Motor Company, Ltd. Aerodynamics control system for automotive vehicle. 5,090,766, Cl. 296-180.500.
Ito, Masao: See—
Fujino, Makoto; Hasegawa, Isahiro; and Ito, Masao, 5,091,050, Cl. 156-643.000.
Ito, Noriki; Yasunaga, Tomoyuki; Iizumi, Yuichi; and Araki, Tomio, to Yamanouchi Pharmaceutical Co., Ltd. Diurea derivatives useful as medicaments and processes for the preparation thereof. 5,091,419, Cl. 514-596.000.

Ito, Toshiyuki: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
Ito, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Fuel injection device of an engine for a vehicle. 5,090,379, Cl. 123-299.000.
Itoh, Kenji: See—
Fukuhori, Hidehiko; Suda, Yasuo; Itoh, Kenji; Higashihara, Masaki; and Aoyama, Keisuke, 5,091,742, Cl. 354-402.000.
Itoh, Masanobu: See—
Takahashi, Tashuhiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaro; Sato, Nobuyoshi; Itoh, Masanobu; Shigetani, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkai, 5,090,515, Cl. 187-16.000.
Itoh, Tsuneo; and Nishiwaki, Kozo, to NGK Spark Plug Co., Ltd. Auxiliary starter apparatus for multi-cylinder diesel engine by using 24-volt battery cell. 5,090,374, Cl. 123-179.600.
Itoh, Yoshikazu; and Wake, Shunji, to Ikegami Tsushinki Co., Ltd.; and Video Research Ltd. Data processing apparatus. 5,091,877, Cl. 395-200.000.
ITT Corporation: See—
Buchanan, Bascom F.; and Buchanan, Joseph R., 5,090,451, Cl. 137-630.220.
DuRocher, Dan; and Miller, Ellsworth S., 5,090,730, Cl. 280-775.000.
Kluger, Edward F., 5,090,745, Cl. 285-187.000.
Welsh, David E., 5,090,911, Cl. 439-79.000.
Iuliano, Joe: See—
Kondos, Peter D.; Haque, Kazi E.; MacDonald, John C.; Griffith, Wesley F.; Laforest, Daniel; and Iuliano, Joe, 5,091,160, Cl. 423-131.000.
Iverson, Robert A.: See—
Pauls, Edward A.; Engel, Timothy S.; Heutmacker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,090,694, Cl. 272-134.000.
IVG Australia Pty. Limited: See—
Fahy, Arthur J.; Gillies, Neil; and Wade, Malcolm V., 5,090,529, Cl. 192-8.00R.
Iwakai, Takashi: See—
Takiguchi, Takao; Iwakai, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, 5,091,109, Cl. 252-299.610.
Iwakura, Ken: See—
Yamaguchi, Jun; Washizu, Shintaro; Matsumoto, Hirotaka; Iwakura, Ken; and Fukushima, Yuichi, 5,091,280, Cl. 430-138.000.
Iwakura, Shiro: See—
Sakamoto, Yoshio; and Iwakura, Shiro, 5,091,958, Cl. 381-150.000.
Iwamura, Masahiro: See—
Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hirai-shi, Atushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, 5,091,883, Cl. 365-189.050.
Iwanaga, Kazuyoshi: See—
Sugano, Taku; Iwanaga, Kazuyoshi; and Hattori, Noboru, 5,090,950, Cl. 475-129.000.
Iwanami, Yoshimu: See—
Kobayashi, Seizo; Mizoe, Takashi; and Iwanami, Yoshimu, 5,091,133, Cl. 264-119.000.
Iwane, Hiroshi; Sugawara, Takahiro; and Kaneko, Kimiko, to Mitsubishi Petrochemical Co., Ltd. Process for preparing 4,4'-dihydroxybiphenyl. 5,091,592, Cl. 568-730.000.
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Iwasaki, Tetsuji: See—
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IWK Regler und Kompensatoren GmbH: See—
Holzhausen, Wieland, 5,090,746, Cl. 285-226.000.
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Garter, Lee F.; Orsborn, Jesse H.; Richman, Kevin S.; and Soto, Joel, 5,090,184, Cl. 56-10.200.
J. M. Huber Corporation: See—
Haller, Thomas M., 5,091,132, Cl. 264-117.000.
J. M. Voith GmbH: See—
Lange, Werner, 5,090,721, Cl. 220-485.000.
Schiel, Christian; and Reiter, Walter, 5,090,535, Cl. 192-67.00R.
Woir, Robert; and Steiner, Karl, 5,090,135, Cl. 34-124.000.
Jacek, Victor J.: See—
Erickson, Bert K.; Greenwood, Robert R.; Kennedy, Wilbert C.; Michel, David W.; Allen, David C.; and Jacek, Victor J., 5,091,699, Cl. 328-25.000.
Jackman, Dennis E., to Mobay Corporation. Oxygen-ruthenium oxide oxidation of 2-hydroxy-3,3-dimethyl-butanoic acid. 5,091,568, Cl. 562-577.000.

Jackson, Barbara G., heir: See—
Greene, Edward W., deceased; and Jackson, Barbara G., heir, 5,090,428, Cl. 132-204.000.
Jackson, Bert W. Air actuated damper. 5,090,445, Cl. 137-527.800.
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Tolbert, Thomas W.; Jaco, Pamela J.; Dugan, Jeffrey S.; and Hendrix, James E., 5,091,243, Cl. 428-253.000.
Jacob, Adir. Process and apparatus for dry sterilization of medical devices and materials. 5,091,151, Cl. 422-23.000.
Jacob, Christian, to Sotralentz S. A. Growth-preventing web for ground covering. 5,090,154, Cl. 47-9.000.
Jacob, Steven D.: See—
Egbers, David A.; and Jacob, Steven D., 5,090,304, Cl. 454-59.000.
Jacober, Jeffrey M., to SGI Inc. Self supporting, selectively collapsible soft-walled carrier. 5,090,526, Cl. 190-107.000.
Jacobs, Jochen; Koepfmann, Edgar; Witthaus, Martin; and Dankowski, Manfred, to Henkel Kommanditgesellschaft auf Aktien. Granular bleach agent: solid aliphatic peroxy-carboxylic acid, inorganic salt hydrate and organic polymer. 5,091,106, Cl. 252-186.260.
Jacobsen, Paul S. Fluid level control float valve. 5,090,443, Cl. 137-429.000.
Jacobson, Esther: See—
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Jans, Franz W., 5,090,752, Cl. 292-169.160.
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Buultjens, Travis E. J.; Hellens, Stephen W.; Jahoda, Colin A. B.; Oliver, Roy F.; and Withers, Anne P., 5,091,173, Cl. 424-70.000.
Jaico C.V., Cooperative venootschap: See—
Vandoninck, Alfons, 5,090,595, Cl. 222-54.000.
Jain, Ravi, to BOC Group, Inc., The. PSA employing high purity purging. 5,090,973, Cl. 55-26.000.
Jalby, Pierre: See—
Claverie, Pierre; Kimura, Masao; Arai, Juichi; and Jalby, Pierre, 5,091,209, Cl. 427-38.000.
James River Corporation of Virginia: See—
Schulz, Glyn A., 5,091,032, Cl. 156-219.000.
James River II, Inc.: See—
Pettersen, Tor; and McGregor, Jean T., 5,090,592, Cl. 221-55.000.
Jamet, Jean: See—
Noireaux, Patrick; Jamet, Jean; Parlier, Michel; and Bacos, Marie-Pierre, 5,091,485, Cl. 525-478.000.
Jaminet, Jerome E.: See—
Gsrinaski, Timothy J.; Jaminet, Jerome E.; and Olsen, Eric G., 5,090,516, Cl. 187-112.000.
Jankovsky, Frantisek; Vezzu, Danilo; Pfarrwaller, Erwin; and Demuth, Hans, to Sulzer Brothers Limited. Dual torsion bar picking mechanism for a loom. 5,090,455, Cl. 139-145.000.
Jans, Franz W., to JADO Design Armatur und Beschlag Aktiengesellschaft. Door latch device with reciprocally moveable privacy lock control member. 5,090,752, Cl. 292-169.160.
Jansen, Bernhard; Muller, Hanns P.; Richter, Roland; and Mayer, Wolfram, to Bayer Aktiengesellschaft. Water-hardening polymer preparations. 5,090,405, Cl. 602-8.000.
Japan as represented by Director General of Agency of Industrial Science and Technology: See—
Kogure, Nobuyuki; Shirahase, Masaaki; and Tamori, Ikuo, 5,090,233, Cl. 73-28.050.
Japan Electronic Control Systems Co.: See—
Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, 5,090,386, Cl. 123-478.000.
Jarczyński, Emil, to General Electric Company. Stator cooling system for electrical machinery. 5,091,666, Cl. 310-54.000.
Jarecki, James J.; Clouser, Leon C., Jr.; and Park, Insoon, to EZ Paint Corporation. Paint roller having adjustable spatter shield. 5,090,085, Cl. 15-248.00A.
Jaroschek, Christoph, to Klockner Ferromatik Desma GmbH. Apparatus for the injection molding of fluid-filled plastic bodies. 5,090,886, Cl. 425-130.000.
Jatco Corporation: See—
Imamura, Hiroyuki; and Hashiba, Mitsuaki, 5,090,527, Cl. 192-3.290.
Sugano, Taku; Iwanaga, Kazuyoshi; and Hattori, Noboru, 5,090,950, Cl. 475-129.000.
Jeantelot, Maurice. Process for splitting timber quarters to obtain thin cuts and machine its implementation. 5,090,463, Cl. 144-363.000.
Jefson, Martin R.; and McGuirk, Paul R., to Pfizer Inc. Substituted bridged diazabicycloalkyl quinolone carboxylic acids. 5,091,383, Cl. 514-214.000.
Jelich, Klaus; and Lindel, Hans, to Bayer Aktiengesellschaft. Preparation of 3-trichloromethyl-pyridine. 5,091,068, Cl. 204-157.640.
Jeneric/Pentron, Inc.: See—
Prasad, Arun, 5,091,148, Cl. 420-417.000.
Jenkins, Sarah M.: See—
Wadsworth, Harry J.; Hadley, Michael S.; Wyman, Paul A.; and Jenkins, Sarah M., 5,091,397, Cl. 514-359.000.
Jensen, Millard J.: See—
Hotchkiss, Gregory B.; and Jensen, Millard J., 5,091,319, Cl. 437-2.000.
Jensen, Per F.; Madsen, Ingvar M.; and Bonnerup, Leif B., to Danfoxx A/S. Device for preventing oil from dripping out of the burner nozzle of an oil-fired heating system. 5,090,895, Cl. 431-208.000.
Jensen, Wayne D., to Ethyl Corporation. Stripping process for water removal from alcohol. 5,091,057, Cl. 203-18.000.

- Jetton, Zolan: See—
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- Jin, Kuofam: See—
Zhang, Shulian; Yang, Sen; Wu, Minxian; and Jin, Kuofam, 5,091,913, Cl. 372-23.000.
- Jincks, Danny C.; Davis, John S.; and Latta, Michael D., to Public Safety Equipment, Inc. Light bar, 5,091,828, Cl. 362-35.000.
- Jinichi Matsuda: See—
Matsuda, Jinichi; and Kato, Knzuo, 5,090,423, Cl. 128-804.000.
- Jinnai, Kuniaki: See—
Arii, Mitsuzo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinnai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.
- John Crane Inc.: See—
Pecht, Glenn G.; and Hamaker, Jon, 5,090,712, Cl. 277-96.100.
- John D. Hollingsworth on Wheels, Inc.: See—
Dempsey, Gene A., 5,090,092, Cl. 19-113.000.
- John Fluke Mfg. Co., Inc.: See—
Zoellick, Raymond D.; and Barbee, Peter F., 5,090,918, Cl. 439-487.000.
- Johnson Seisakusho Co., Ltd.: See—
Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, 5,090,764, Cl. 296-107.000.
- Johnson, Bertrand H.: See—
Blonder, Greg E.; and Johnson, Bertrand H., 5,091,053, Cl. 156-657.000.
- Johnson, Bobby R.: See—
Conte, Joseph A., Jr.; Johnson, Bobby R.; Hsieh, Rudolf J.; and Ko, Sandy S., 5,091,203, Cl. 426-614.000.
- Johnson, Dennis A., to United States of America, National Aeronautics and Space Administration. Laser velocimeter for near-surface measurements, 5,090,801, Cl. 356-28.500.
- Johnson, Donald L.; LaBoube, Roger A.; and Satsangi, Suresh C., to Butler Manufacturing Company. Rectilinear building structure, 5,090,166, Cl. 52-167.0CB.
- Johnson Enterprises, Inc.: See—
Stenger, Tracy K., 5,090,599, Cl. 222-400.700.
- Johnson, Gregory G. Arrowhead with extendable blades, 5,090,709, Cl. 273-422.000.
- Johnson, Gregory J., to Westco Plastics, Inc. Masonry grout bag, 5,090,597, Cl. 222-107.000.
- Johnson, Louis G.: See—
Wong, Yiwan; Yoshino, Toshiaki; and Johnson, Louis G., 5,091,875, Cl. 364-726.000.
- Johnson Matthey Public Limited Company: See—
Becker, Gerd, 5,091,345, Cl. 501-14.000.
- Johnson, Roy E. Elastomeric gasket for sealing a glass fiber reinforced cover to a vault, 5,090,713, Cl. 277-166.000.
- Johnson Service Company: See—
Van Fossen, Robert A., 5,091,612, Cl. 200-81.90M.
- Johnson Service Corp.: See—
Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barootian, Arthur, 5,090,246, Cl. 73-718.000.
- Johnston, Jesse C.: See—
Hipple, James H.; Smith, Don W.; Carpenter, Steven P.; and Johnston, Jesse C., 5,090,087, Cl. 15-317.000.
- Jones, Clyde S. Multi-purpose earth drill, 5,090,486, Cl. 173-26.000.
- Jones, Gordon H.; Venuti, Michael C.; and Young, John M., to Syntex (U.S.A.) Inc. Naphthalene anti-psoriatic agents, 5,091,558, Cl. 560-139.000.
- Jones, Jeffrey A., to Santa Fe Energy Resources, Inc. Oil well production testing, 5,090,238, Cl. 73-155.000.
- Jones, Kenneth R., to Globe-Union Inc. Method of fabricating a pressure vessel for a metal oxide-hydrogen battery, 5,090,612, Cl. 228-184.000.
- Jones, Richard L., to CRC-Evans Automatic Welding. Resilient lineup clamp, 5,090,608, Cl. 228-49.300.
- Journee, Maurice; Duda, Jean; Beneteau, Pierre; and Bru, Jean-Raymond, to Paul Journee S.A. Pivoting device for connecting two oscillating elements of a windshield wiper blade, 5,090,086, Cl. 15-250.420.
- Jung, Myung H.: See—
Kim, Wan J.; Park, Myung H.; Oh, Jong H.; Jung, Myung H.; and Kim, Bong J., 5,091,384, Cl. 514-215.000.
- Jungwirth, Douglas R., to Northrop Corporation. Ring laser cavity backscatter measurement, 5,090,812, Cl. 356-446.000.
- Junius, Martina; Neumann, Ulrich; and von der Eltz, Herbert, to Boehringer Mannheim GmbH. Substrate for phospholipase, 5,091,527, Cl. 544-102.000.
- Juntunen, Asko, to Kone Elevator GmbH. Procedure and device for overload and short-circuit protection of output drivers, 5,091,816, Cl. 361-18.000.
- Just, Melitta: See—
Schonafinger, Karl; Bohn, Helmut; Beyerle, Rudi; and Just, Melitta, 5,091,398, Cl. 514-361.000.
- K-E-G Krankenhaus-Entsorgungsgesellschaft m.b.H.: See—
Drauschke, Stefan; and Birkholz, Michaela, 5,091,158, Cl. 422-295.000.
- K.J. Manufacturing Co.: See—
Bedi, Ram D., 5,090,376, Cl. 123-196.00R.
- K & M Electronics, Inc.: See—
Theroux, Robert L.; and Abnoosi, Fatemeh, 5,090,431, Cl. 134-105.000.
- Kaanta, Carter W.: See—
Cronin, John E.; Kaanta, Carter W.; Previti-Kelly, Rosemary A.; and Ryan, James G., 5,091,289, Cl. 430-312.000.
- Kabasin, Daniel F., to General Motors Corporation. Adaptive vehicle traction control system, 5,090,511, Cl. 180-197.000.
- Kabushiki Kaisha Daikin Seisakusho: See—
Asada, Masaaki, 5,090,536, Cl. 192-70.250.
- Fukuda, Yoshinobu, 5,090,537, Cl. 192-70.270.
- Takeuchi, Hiroshi, 5,090,543, Cl. 192-106.200.
- Kabushiki Kaisha Kenwood: See—
Sakamoto, Yoshio; and Iwakura, Shiro, 5,091,958, Cl. 381-150.000.
- Kabushiki Kaisha Ouyo Keisoku Kenkyusho: See—
Kuwashima, Shigesumi, 5,091,969, Cl. 382-48.000.
- Kabushiki Kaisha Topcon: See—
Kimura, Akio, 5,091,627, Cl. 219-121.830.
- Kabushiki Kaisha Toshiba: See—
Shimoda, Takatoshi; Kamohara, Eiji; Sugawara, Shigeru; and Shimokobe, Jiro, 5,091,673, Cl. 313-412.000.
- Kabushiki Kaisha Toshiba: See—
Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; Sone, Yoshinori; and Shimoda, Moriaki, 5,090,874, Cl. 417-356.000.
- Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; and Sone, Yoshinori, 5,090,875, Cl. 417-356.000.
- Aono, Masao; and Kanaoka, Hiroshi, 5,090,208, Cl. 62-347.000.
- Asada, Junichi; Takahashi, Kenji; and Sakurai, Toshiharu, 5,091,341, Cl. 437-212.000.
- Fujino, Makoto; Hasegawa, Isahiro; and Ito, Masao, 5,091,050, Cl. 156-643.000.
- Hamano, Takahiro; Matsui, Masataka; and Sato, Katsuhiko, 5,091,889, Cl. 365-233.500.
- Higuchi, Jiro, 5,090,411, Cl. 128-660.050.
- Ishizaki, Naoko; and Kameyama, Atsushi, 5,091,663, Cl. 307-530.000.
- Kamaga, Ryuichi, 5,090,433, Cl. 134-169.00C.
- Kobayashi, Takaichi, 5,090,913, Cl. 439-165.000.
- Kumano, Akira; Nogami, Hiroyasu; Miike, Seiji; Adachi, Hisahiro; and Amano, Shin-ya, 5,091,876, Cl. 364-419.000.
- Maeda, Takeo; and Momose, Hiroshi, 5,091,322, Cl. 437-31.000.
- Maeda, Takeo; and Momose, Hiroshi, 5,091,760, Cl. 357-23.400.
- Morikawa, Yuji; and Tsurumaki, Hayako, 5,091,818, Cl. 361-56.000.
- Naruke, Kiyomi, 5,091,882, Cl. 365-185.000.
- Ohsawa, Takashi, 5,091,885, Cl. 365-203.000.
- Onishi, Yasunobu; Niki, Hirokazu; Kobayashi, Yoshihito; Hayase, Rumiko; and Ushirogouchi, Toru, 5,091,282, Cl. 430-270.000.
- Saito, Satoshi, 5,090,400, Cl. 128-6.000.
- Takagi, Shiro, 5,091,866, Cl. 395-158.000.
- Takahashi, Hitoshi; and Adachi, Toshinori, 5,090,573, Cl. 209-534.000.
- Takano, Masayuki, 5,090,414, Cl. 128-662.050.
- Takeda, Fumio; Kojima, Yoshiro; Kaneko, Tsuneo; Ishibashi, Yutaka; Sasaki, Naoto; and Tsushima, Isako, 5,090,169, Cl. 52-220.000.
- Tsuda, Yukio, 5,091,932, Cl. 379-100.000.
- Usami, Kimiyoshi, 5,091,660, Cl. 307-463.000.
- Wada, Ichiro, 5,090,250, Cl. 73-861.120.
- Watanabe, Junji, 5,091,746, Cl. 355-202.000.
- Watanabe, Toshiharu, 5,091,762, Cl. 357-23.600.
- Yasuhara, Yoshihito; and Saitou, Toshio, 5,090,551, Cl. 198-323.000.
- Yoshioka, Yoshihisa, 5,090,413, Cl. 128-660.070.
- Kabushiki Kaisha Toyota Jidoshokki Seisakusho: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kasada, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
- Yasui, Yoshiharu; Anahara, Meiji; and Omori, Hiroshi, 5,091,246, Cl. 428-224.000.
- Kabuto, Nobuaki: See—
Someya, Ryuuichi; Kabuto, Nobuaki; Kimura, Yuichiro; and Watanabe, Kazuhiro, 5,091,784, Cl. 358-183.000.
- Kadee Metal Products Co.: See—
Edwards, Clarence K.; and Edwards, Lawrence D., 5,090,332, Cl. 105-157.200.
- Kafer, Kenneth G.: See—
Hendrickson, Richard J.; and Kafer, Kenneth G., 5,091,069, Cl. 204-176.000.
- Kagami, Akihiko, to NEC Corporation. Semiconductor memory device with improved address discriminating circuit for discriminating an address assigned defective memory cell replaced with redundant memory cell, 5,091,884, Cl. 365-200.000.
- Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Youichi, to Kotobuki & Co., Ltd. Writing instrument, 5,090,831, Cl. 401-52.000.
- Kageyama, Kunio: See—
Ozaki, Shoichiro; Akiyama, Takahiko; Takechi, Naoto; Kageyama, Kunio; and Machida, Morihisa, 5,091,549, Cl. 558-131.000.
- Kageyama, Yukihiko: See—
Nakane, Toshio; Hijikata, Kenji; Iiyama, Makoto; Kageyama, Yukihiko; and Naka, Michirou, 5,091,259, Cl. 428-457.000.
- Kagi, Werner: See—
Russemeyer, Hans; Kerl, Manfred; Schmidt, Hans-Joachim; Hani, Beat; and Kagi, Werner, 5,090,134, Cl. 34-57.00R.
- Kahl, Cindy L. Mother's Nursing cover, 5,090,059, Cl. 2-104.000.
- Kahle, Charles F., II; Olson, Kurt G.; Claar, James A.; Pettit, Paul H., Jr.; and Kerr, Paul R., to PPG Industries, Inc. Reaction products of alpha-aminomethylene phosphonic acids and epoxy compounds and their use in coating compositions, 5,091,451, Cl. 524-124.000.

- Kaida, Yoshimasa, to International Business Machines Corporation. Liquid crystal display having reduced ITO shading material and method of manufacturing same, 5,091,792, Cl. 359-67.000.
- Kaiser, Donald: See—
Hungerford, William G.; Miller, Donald; Griffith, Carl; and Kaiser, Donald, 5,091,863, Cl. 364-510.000.
- Kaiser, Gunther: See—
Bruckelt, Alfred; Kaiser, Gunther; Krauter, Immanuel; and Ott, Karl, 5,090,394, Cl. 123-643.000.
- Kajander, Richard E.; and Fitzgerald, David J., to Tambrands, Inc. Laminate incorporating hot melt and water based adhesives, 5,091,240, Cl. 428-198.000.
- Kajimura, Hiroshi: See—
Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151.000.
- Kakami, Shinkei: See—
Takahashi, Tashuho; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaru; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.
- Kakizaki, Masao; Kobayashi, Yoshihito; and Yagi, Hiroshi, to TDK Corporation. Floating type magnetic head having head core affixed to outside surface of slider, 5,091,810, Cl. 360-103.000.
- Kaku, Hiroyuki: See—
Okura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, 5,090,339, Cl. 110-263.000.
- Kaletta, Bernd; and Rolf, Meinhard, to Bayer Aktiengesellschaft. Process for the preparation of pigments based on isoindole, 5,091,532, Cl. 544-296.000.
- Kali-Chemie AG: See—
Meinert, Hasso; Fackler, Rudolf; Mader, Juergen; and Reuter, Peter, 5,091,064, Cl. 204-59.00F.
- Kallassy, Charles. Universal ankle support, 5,090,404, Cl. 602-65.000.
- Kallevig, John A.; and Kennedy, James L., to 501 Alliant Techsystems Inc. Two-piece ammunition propellant containment bag, 5,090,323, Cl. 102-282.000.
- Kalso, Eija; and Lammintausta, Risto, to Orion-Yhtymä OY. Use of substituted imidazoles, 5,091,402, Cl. 514-396.000.
- Kamaga, Ryuichi, to Kabushiki Kaisha Toshiba. Compact endoscope cleaning apparatus, 5,090,433, Cl. 134-169.00C.
- Kamakura, Kunihito; Ohta, Seiichi; Aoki, Chihiro; Hamano, Seitaro; and Hiramatsu, Yasushi, to Daicel Chemical Industries, Ltd. Optical disk storage container and cleaner, 5,090,078, Cl. 15-97.100.
- Kaman Aerospace Corporation: See—
Keeler, R. Norris, 5,091,778, Cl. 358-95.000.
- Kamata, Eitaro, to Shoei Kako Kabushiki Kaisha. Helmet with ear pads, 5,090,061, Cl. 2-423.000.
- Kamath, Venkatesh H.; Mandel, Barry P.; Beer, Ted A.; and Sokac, Russell J., to Xerox Corporation. Electronic sheet rotator with deskew, using single variable speed roller, 5,090,683, Cl. 271-227.000.
- Kamei, Hiroshi: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.
- Kamel, Mohamed S.: See—
Wong, Andrew K.; Kamel, Mohamed S.; and King, John T., 5,090,804, Cl. 356-237.000.
- Kamemura, Ichiro: See—
Suzuki, Masahiro; Kamemura, Ichiro; and Kodaka, Hiromitsu, 5,091,434, Cl. 521-78.000.
- Kametani, Jun, to NEC Corporation. Speaker recognition with glottal pulse-shapes, 5,091,948, Cl. 381-42.000.
- Kameyama, Atsushi: See—
Ishizaki, Naoko; and Kameyama, Atsushi, 5,091,663, Cl. 307-530.000.
- Kamieniecki, Emil; Goldfarb, William C.; and Wollowitz, Michael, to Semitec, Inc. Apparatus for making surface photovoltage measurements of a semiconductor, 5,091,691, Cl. 324-158.00R.
- Kamohara, Eiji: See—
Shimoda, Takatoshi; Kamohara, Eiji; Sugawara, Shigeru; and Shimokobe, Jiro, 5,091,673, Cl. 313-412.000.
- Kamohara, Hideaki: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuro; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.
- Kampmann, Gerhard: See—
Bieker, Guido; Kampmann, Gerhard; and Lohmann, Alfred, 5,090,333, Cl. 105-218.100.
- Kanada, Tokio, to Sony Corporation. Stabilizing apparatus for recording and/or reproducing apparatus of flexible rotary recording medium, 5,091,812, Cl. 360-130.340.
- Kanai, Hachiro; Sosa, Toshio; and Fukuhara, Tohru, to Nikon Corporation. Red eye prevent control device in an automatic focus adjustment camera and red eye prevent photographing method involving automatic focus adjustment, 5,091,741, Cl. 354-400.000.
- Kanaoka, Hiroshi: See—
Aono, Masao; and Kanaoka, Hiroshi, 5,090,208, Cl. 62-347.000.
- Kanata, Yoshio: See—
Naganuma, Soichi; Nakamura, Chihiro; and Kanata, Yoshio, 5,091,682, Cl. 318-560.000.
- Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba,

Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, to Hitachi, Ltd. Inverter device, 5,091,823, Cl. 361-384.000.

Kane, Robert F.: See—
Yousef, Faisal J.; and Kane, Robert F., 5,090,500, Cl. 175-320.000.

Kanebo, Ltd.: See—
Murata, Susumu; Matsuo, Naomi; and Sano, Masako, 5,091,201, Cl. 426-285.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Asaoka, Keizo; Tsuge, Kazunori; and Tawada, Yoshihisa, 5,091,764, Cl. 357-30.000.

Kaneko, Kimiko: See—
Iwane, Hiroshi; Sugawara, Takahiro; and Kaneko, Kimiko, 5,091,592, Cl. 568-730.000.

Kaneko, Kiyotaka: See—
Maeda, Yutaka; Kaneko, Kiyotaka; Miyake, Izumi; Nakane, Yoshio; and Shimaya, Hiroshi, 5,091,806, Cl. 360-67.000.

Kaneko, Kyoichi, to Daiwa Seiko Inc. Speed changer for fishing reels, 5,090,634, Cl. 242-255.000.

Kaneko, Tsuneo: See—
Takeda, Fumio; Kojima, Yoshio; Kaneko, Tsuneo; Ishibashi, Yutaka; Sasaki, Naoto; and Tsushima, Isako, 5,090,169, Cl. 52-220.000.

Kanemoto, Takashi: See—
Yamada, Yasuhiro; Miyazaki, Yasuko; Kanemoto, Takashi; Matsuo, Mikiharu; and Katayama, Hirohiko, 5,091,865, Cl. 395-153.000.

Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr.; Sudol, Marion A.; and Boden, Richard M., to International Flavors & Fragrances Inc. Process for microwave browning uncooked baked goods foodstuffs, 5,091,200, Cl. 426-243.000.

Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, to Canon Kabushiki Kaisha. Display apparatus including partial rewriting means for moving image display, 5,091,723, Cl. 340-784.000.

Kano, Junichi: See—
Hotta, Koji; Kano, Junichi; and Aoki, Kongoh, 5,090,365, Cl. 123-90.170.

Kano, Minoru; Negami, Kiyoshi; and Nakatani, Mikio, to Komatsu Wall Industry Co., Ltd. Movable partitioning panel, 5,090,171, Cl. 52-243.100.

Kano, Taisaku: See—
Haseyama, Ryuji; Kuroda, Kazuyuki; Hayashi, Kouzou; Sasagawa, Katsuyoshi; Kano, Taisaku; and Shikai, Kiyoshi, 5,091,496, Cl. 528-73.000.

Kanoe, Toshio: See—
Okada, Tsuneyoshi; Nitoh, Toshikatsu; Kanoe, Toshio; and Togami, Masato, 5,091,135, Cl. 264-272.130.

Kansai Electric Power Co., Inc.: See—
Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto, and Oono, Yasuteru, 5,090,872, Cl. 417-53.000.

Kansai Paint Co., Ltd.: See—
Nishida, Reiziro; and Tominaga, Akira, 5,091,446, Cl. 523-404.000.

Kantner, Horst: See—
Theis, Ulrich; Hellmeister, H. -P.; Bisping, Bernhard; Vagedes, Michael; Kessler, Siegfried; Kantner, Horst; and Sommer, Peter, 5,090,328, Cl. 102-522.000.

Kantner, Steven S.: See—
Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogaert, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., 5,091,483, Cl. 525-477.000.

Kanzaki Paper Manufacturing Co., Ltd.: See—
Ishida, Koichi; and Takayama, Yukio, 5,091,359, Cl. 503-209.000.

Kao Corporation: See—
Inatome, Hiroshi; Inaguma, Kazunari; Yamaguchi, Hiroaki; and Ohtani, Yasuhisa, 5,091,503, Cl. 528-272.000.

Kubota, Yutaka; Shimono, Seiichi; Yanami, Tetsuo; Iwasaki, Tetsuji; and Kurita, Kazuhiko, 5,090,995, Cl. 71-114.000.

Nakashima, Norihiko, 5,091,356, Cl. 503-200.000.

Kao, Yu-Hsin: See—
Kao, Yu-Tai; and Kao, Yu-Hsin, 5,091,834, Cl. 362-226.000.

Kao, Yu-Tai; and Kao, Yu-Hsin. Universal lighting fixture replaceable with diversified lamps, 5,091,834, Cl. 362-226.000.

Kapitulnik, Aharon, to Conductus, Inc. Superconducting bolometer, 5,090,819, Cl. 374-176.000.

Kaplan, Martin C.: See—
Kwon, Heemin; and Kaplan, Martin C., 5,091,972, Cl. 382-54.000.

Karady, Sandor: See—
King, Anthony O. P.; Karady, Sandor; Anderson, Kevin; Douglas, Alan W.; Abramson, Newton L.; and Shuman, Richard F., 5,091,534, Cl. 546-14.000.

Karakelle, Mutlu; Benson, Carl D.; Taller, Robert A.; and Spielvogel, David E., to Becton, Dickinson and Company. Composition for gelling liquids, 5,091,443, Cl. 424-665.000.

Karanewsky, Donald S.; Badia, Michael C.; Biller, Scott A.; Gordon, Eric M.; and Sofia, Michael J., to E. R. Squibb & Sons, Inc. Phosphorus-containing HMG-CoA reductase inhibitors, new intermediates and method, 5,091,378, Cl. 514-80.000.

Karapiperis, Leonidas: See—
Dieumegard, Dominique; Garry, Guy; Karapiperis, Leonidas; Pribat, Didier; and Collet, Christian, 5,090,932, Cl. 445-24.000.

Karl Lautenschlager GmbH & Co. KG: See—
Lautenschlager, Horst, 5,090,820, Cl. 384-19.000.

Kasahara, Junya, to Tsudakoma Corp. Weft gripping and cutting apparatus in rapier loom, 5,090,456, Cl. 139-302.000.

Kasai, Kiyoshi: See—
Asano, Mutsumi; Kasai, Kiyoshi; and Misaki, Hidehiko, 5,091,267, Cl. 428-694.000.

- Kasada, Satoshi: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kasada, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
- Kasenga, Anthony F.: See—
Fan, Albert K.; Kasenga, Anthony F.; and Ginter, Douglas R., 5,091,110, Cl. 252-301.40P.
- Kashida, Toshikazu: See—
Ishibashi, Ichirou; Ichinose, Kiyohiro; Yamamoto, Toru; and Kashida, Toshikazu, 5,090,361, Cl. 118-313.000.
- Kashiwa, Norio: See—
Kioka, Mamoru; and Kashiwa, Norio, 5,091,353, Cl. 502-111.000.
- Kashiwara, Hideaki: See—
Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki, 5,090,373, Cl. 123-169.0PA.
- Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki: See—
Auxiliary device attachable to a convention spark plug, 5,090,373, Cl. 123-169.0PA.
- Kashiwara, Takeaki: See—
Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki, 5,090,373, Cl. 123-169.0PA.
- Kasina, Sudhakar: See—
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; Vanderheyden, Jean-Luc; and Srinivasan, Ananthachari, 5,091,514, Cl. 534-14.000.
- Kasper, Gary A.; Erickson, Roy O.; Rohn, Dean R.; Selewski, Steven R.; and Cummins, Craig R., to Rexair, Inc. Separator for a vacuum cleaner system, 5,090,974, Cl. 55-95.000.
- Kasuga, Akira: See—
Nishikawa, Yasuo; Kasuga, Akira; Okita, Tsutomu; and Aonuma, Masashi, 5,091,268, Cl. 428-694.000.
- Kasuga, Masao: See—
Kawata, Masayuki; Ozawa, Fujio; Kasuga, Masao; Suzuki, Minako; and Shibayama, Takako, 5,091,670, Cl. 310-323.000.
- Katao, Shuichi, to Canon Kabushiki Kaisha. Constant current circuit and integrated circuit having said circuit, 5,091,689, Cl. 323-312.000.
- Kataoka, Isamu: See—
Satoh, Yasuta; Nakane, Shigeru; Saitoh, Shinya; and Kataoka, Isamu, 5,090,936, Cl. 446-175.000.
- Kataoka, Shigeo: See—
Arii, Mitsuo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.
- Katata, Hiroyuki; and Noguchi, Yoji, to Sharp Kabushiki Kaisha. Image data compression method using a run prediction technique, 5,091,977, Cl. 382-56.000.
- Katayama, Hirohiko: See—
Yamada, Yasuhiro; Miyazaki, Yasuko; Kanemoto, Takashi; Matsuo, Mikiharu; and Katayama, Hirohiko, 5,091,865, Cl. 395-153.000.
- Katayama, Yoshinori; Murakami, Terukiyo; Asano, Hiroyuki; Abe, Yuichi; Iizuka, Haruhiko; Shimizu, Kazuki; and Fukai, Yoshio, to Nissan Motor Company, Ltd. Driving force control system, 5,091,857, Cl. 364-431.090.
- Katayanagi, Hideyuki; and Furutachi, Hideaki, to Sanyo Electric Co., Ltd. Control system for ice making apparatuses, 5,090,210, Cl. 62-135.000.
- Kathmann, Franz: See—
Hendrich, Wolfgang; and Kathmann, Franz, 5,091,829, Cl. 362-61.000.
- Kato, Kazuhiro: See—
Fujii, Toshio; Kato, Kazuhiro; Sakai, Akihiko; and Shinohara, Yoshinao, 5,091,228, Cl. 428-34.300.
- Kato, Kazuo: See—
Matsuda, Jinichi; and Kato, Kazuo, 5,090,423, Cl. 128-804.000.
- Kato, Mikihiko; Hashimoto, Hiroshi; Endo, Yasushi; and Nagashima, Yasuo, to Fuji Photo Film Co., Ltd. Floppy disk comprising a cellulose resin with a polar group in a side chain and perromagnetic particles of a specific surface area, 5,091,238, Cl. 428-64.000.
- Kato, Shinichiro: See—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,090,741, Cl. 285-101.000.
- Kato, Tatu: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatu; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.
- Kato, Yoshito: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kasada, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
- Katoh, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, to Kumiai Chemical Industry Co., Ltd. The production of KSB-1939 macrolides using *epitomycetes hygroscopicus*, 5,091,311, Cl. 435-119.000.
- Katoh, Masakazu; and Ishikawa, Takatoshi, to Alps Electric Co., Ltd. Silicon substrate having porous oxidized silicon layers and its production method, 5,091,061, Cl. 205-135.000.
- Katsav, Orit: See—
Geller, Yair; Berman, Michael; and Katsav, Orit, 5,091,861, Cl. 364-474.340.
- Katsuno, Hisashi: See—
Murakawa, Takashi; and Katsuno, Hisashi, 5,091,351, Cl. 502-66.000.
- Katsuyama, Toshio: See—
Ogawa, Kensuke; Katsuyama, Toshio; and Fukuzawa, Tadashi, 5,091,980, Cl. 385-3.000.
- Katz, Ronald A., to First Data Resources, Inc. Multiple party telephone control system, 5,091,933, Cl. 379-204.000.
- Katznelson, Ron D.; Moroney, Paul; and Shumate, W. Allen, to General Instrument Corporation. System for communicating television signals or a plurality of digital audio signals in a standard television line allocation, 5,091,936, Cl. 380-19.000.
- Kauffman, Frank. Multi-function towing trailer, 5,090,718, Cl. 280-402.000.
- Kauno Koskinen Ky: See—
Koskinen, Kauno L. J., 5,090,230, Cl. 72-393.000.
- Kauzlarich, James J.; and Metherell, Colin, to University of Virginia Patents Alumni Foundation, The; and Malaysian Rubber Producers Research Association, The. Maintenance-free vehicle and cart tire, 5,090,464, Cl. 152-310.000.
- Kawaguchi, Mitsuo: See—
Mochizuki, Masatsugu; Kooda, Kazutaka; Murakami, Siro; Nagata, Naohiko; and Kawaguchi, Mitsuo, 5,091,254, Cl. 428-364.000.
- Kawai, Joji, to Mitsubishi Denki Kabushiki Kaisha. Device for removing D.C. components from output of multi-phase inverter, 5,091,842, Cl. 363-98.000.
- Kawai, Kunio: See—
Ohtsuka, Kouki; Kubo, Kimio; Akiyama, Koichi; Ike, Masahide; and Kawai, Kunio, 5,091,147, Cl. 420-68.000.
- Kawai, Yoshihiko: See—
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.
- Kawakami, Yo: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.
- Kawakita, Tadashi, to Ikeda Bussan Co., Ltd. Reclining device for vehicular seat, 5,090,771, Cl. 297-362.000.
- Kawamoto, Toshiki: See—
Ariyoshi, Takashi; Kawamoto, Toshiki; Yasuda, Seigou; Kuriki, Syoji; and Nakatani, Tomofumi, 5,091,947, Cl. 381-42.000.
- Kawamoto, Yuzo: See—
Nishiura, Yukio; and Kawamoto, Yuzo, 5,090,343, Cl. 112-130.000.
- Kawamura, Kazuteru, to Olympus Optical Co., Ltd. Real image mode finder, 5,091,739, Cl. 354-152.000.
- Kawamura, Nobuya: See—
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.
- Kawarabayashi, Waichirou; Ishii, Yumi; and Takahashi, Shigeru, to Mitsui Petrochemical Industries Ltd. Method for storing bulbs, 5,090,156, Cl. 47-58.000.
- Kawasaki, Masaaki: See—
Ishidoya, Masahiro; Shibata, Kishio; Ohe, Osamu; and Kawasaki, Masaaki, 5,091,492, Cl. 526-282.000.
- Kawasaki, Masahiko, to Pioneer Electronic Corporation. CATV terminal unit, 5,091,937, Cl. 380-20.000.
- Kawasaki, Yoshimitsu: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.
- Kawase, Masao: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kasada, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
- Kawata, Masayuki; Ozawa, Fujio; Kasuga, Masao; Suzuki, Minako; and Shibayama, Takako, to Seiko Instruments Inc. Ultrasonic motor, 5,091,670, Cl. 310-323.000.
- Kawauchi, Masataka: See—
Matsuno, Junichi; Ogasawara, Tsuyoshi; and Kawauchi, Masataka, 5,090,676, Cl. 271-12.000.
- Kawazoe, Hiroshi: See—
Murakoshi, Toshiichi; Kawazoe, Hiroshi; Takahata, Toshihiro; Inaki, Shigeo; Yamashita, Tatsuo; and Doi, Yoshinori, 5,090,110, Cl. 29-596.000.
- Kazmierczak, Edmund E.: See—
Walker, Duncan N.; Terry, Vincent G.; Ulery, Dennis R.; Kazmierczak, Edmund E.; Keck, Richard J.; Pedersen, James R.; and Gott, Brian E., 5,090,114, Cl. 29-734.000.
- Kazuo Kato: See—
Matsuda, Jinichi; and Kato, Kazuo, 5,090,423, Cl. 128-804.000.
- Keck, Richard J.: See—
Walker, Duncan N.; Terry, Vincent G.; Ulery, Dennis R.; Kazmierczak, Edmund E.; Keck, Richard J.; Pedersen, James R.; and Gott, Brian E., 5,090,114, Cl. 29-734.000.
- Kee, Heui-Tae, to Samsung Electronics Co., Ltd. All-primary type gas burner, 5,090,899, Cl. 431-326.000.
- Keeler, R. Norris, to Kaman Aerospace Corporation. Imaging lidar systems and K-meters employing tunable and fixed frequency laser transmitters, 5,091,778, Cl. 358-95.000.
- Keeran, Jerald J.: See—
Cole, James F.; and Keeran, Jerald J., 5,091,939, Cl. 380-25.000.
- Kehm, Detlef; Weicht, Bodo; and George, Joachim, to Bayer Aktiengesellschaft. Process for the separation of substances by cooling crystallization, 5,090,965, Cl. 23-295.00R.
- Keith, Carl W., to Dresser Industries, Inc. Drill bit with vibration stabilizers, 5,090,492, Cl. 175-410.000.

- Keller, Lajos E.; Frognet, Jean-Pierre; and Petitjean, Maurice, to Mobil Oil Corporation. Multi-layer high opacity film structures, 5,091,236, Cl. 428-213.000.
- Keller, Paul R. N.; Cawley, Robin A.; and Stapleton, Alan L., to Quantel Limited. Video graphic simulator systems, 5,090,909, Cl. 434-43.000.
- Kelly, Hugh-Peter G. Linear motors, 5,091,665, Cl. 310-12.000.
- Kelly Industries: See—
Baldino, Michael; and Kelsay, Daniel L., 5,090,838, Cl. 403-388.000.
- Kelly, Ralph B. Organic comminuting apparatus, 5,090,093, Cl. 24-38.000.
- Kelsay, Daniel L.: See—
Baldino, Michael; and Kelsay, Daniel L., 5,090,838, Cl. 403-388.000.
- Keltner, Robert L.; and Ferguson, Jim B., to Technical Chemical Company. Cutoff switch for refrigerant container, 5,090,212, Cl. 62-149.000.
- Kemmner, Ulrich: See—
Krauter, Lothar; Nusser, Hermann; Schelhas, Peter; Schillinger, Rainer; Trachte, Dietrich; and Kemmner, Ulrich, 5,090,883, Cl. 418-171.000.
- Kemp, James R.: See—
Kemp, Norman H.; and Kemp, James R., 5,090,686, Cl. 271-277.000.
- Kemp, Norman H.; and Kemp, James R. Paper guide wheel, 5,090,686, Cl. 271-277.000.
- Kempf, Dale J.: See—
Luly, Jay R.; Plattner, Jacob J.; and Kempf, Dale J., 5,091,575, Cl. 560-115.000.
- Kennametal Inc.: See—
Kosker, Leon G., 5,090,280, Cl. 82-158.000.
- Kennedy, James L.: See—
Kallevig, John A.; and Kennedy, James L., 5,090,323, Cl. 102-282.000.
- Kennedy, Thomas J.; and Walker, Alan D., to Lisco, Inc. Coating compositions for game balls, 5,091,265, Cl. 428-690.000.
- Kennedy, Wilbert C.: See—
Erickson, Bert K.; Greenwood, Robert R.; Kennedy, Wilbert C.; Michel, David W.; Allen, David C.; and Jacek, Victor J., 5,091,699, Cl. 328-25.000.
- Kenner, Erich; and Langen, Herbert, to Eberspacher, J. Central heating for motor vehicles and such mobile units, 5,090,896, Cl. 431-262.000.
- Kenney, James W., to Drummond Scientific Company. Programmable pipet apparatus, 5,090,255, Cl. 73-1.00R.
- Kennington, Allison; Larner, Joseph; Hill, Cynthia; Stringfield, Butler; Carta, Giorgio; and Kirwan, Donald J., to Univ. of Va. Alumni Patents Foundation. Method for producing chiro-inositol, 5,091,596, Cl. 568-833.000.
- Kenny, Loren D. Pole and post sleeve or boot, 5,090,165, Cl. 52-165.000.
- Kenyon, Lee G.; and Murray, Thomas C., to Burndy Corporation. Dedicated contact aid for connectors utilizing high speed installations, 5,090,923, Cl. 439-783.000.
- Ker, Victoria S.; and Tsang, Charles, to Nova Corporation of Alberta. Four point detection, 5,090,817, Cl. 374-24.000.
- Kereszturi, Geza: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Marie; Ritli, Peter; Sipos, Judit; Pajor, Aniko; and Marmarosi, Katalin, 5,091,530, Cl. 544-229.000.
- Kerl, Manfred: See—
Russemyer, Hans; Kerl, Manfred; Schmidt, Hans-Joachim; Hani, Beat; and Kagi, Werner, 5,090,134, Cl. 34-57.00R.
- Kerr, Mark E.: See—
Hird, John A.; and Kerr, Mark E., 5,090,548, Cl. 194-345.000.
- Kerr, Paul R.: See—
Kahle, Charles F., II; Olson, Kurt G.; Claar, James A.; Pettit, Paul H., Jr.; and Kerr, Paul R., 5,091,451, Cl. 524-124.000.
- Kessler, Kurt; Bartmann, Wilhelm; Wess, Gunther; and Granzer, Erhold, to Hoechst Aktiengesellschaft. 7-substituted derivatives of 3,5-dihydroxyhept-6-ynoic acids and corresponding lactones and their use as hypercholesterolemic, 5,091,386, Cl. 514-277.000.
- Kessler, Siegfried: See—
Theis, Ulrich; Hellmeister, H. -P.; Bisping, Bernhard; Vagedes, Michael; Kessler, Siegfried; Kantner, Horst; and Sommer, Peter, 5,090,328, Cl. 102-522.000.
- Keyes, Denis E.: See—
Randall, John R., Jr.; Keyes, Denis E.; and Curcio, James V., 5,090,594, Cl. 222-1.000.
- Keystone International, Inc.: See—
Kusmer, Dan P., 5,090,658, Cl. 251-14.000.
- Khanna, Satish C., to Ciba-Geigy Corporation. Coated adhesive tablets, 5,091,184, Cl. 424-435.000.
- Khanna, Yash P.; and Reinschuessel, Annemarie C. Process for improving the properties of polymers, 5,091,508, Cl. 528-272.000.
- Kidd, Thomas F., to Electrovert Ltd. Apparatus for casting metal alloys with low melting temperatures, 5,090,470, Cl. 164-316.000.
- Kidder, John S.; and Montgomery, Derek, to Kidder, John S. Self-illuminated fibre optic switch, 5,090,791, Cl. 385-18.000.
- Kii, Katsuya; Okuyama, Yuji; and Mori, Kazuo, to Nissan Motor Company, Limited. Suspension control system with vehicular driving condition dependent height adjustment, 5,090,727, Cl. 280-707.000.
- Kikabhai, Thakor: See—
Crawford, John; Kikabhai, Thakor; McLeary, David B.; and Pearce, Andrew, 5,090,966, Cl. 44-314.000.
- Kikuchi, Hiroshi: See—
Tanaka, Isamu; Oka, Hitoshi; Watanabe, Makio; Kikuchi, Hiroshi; Imabayashi, Shinichiro; and Taniguti, Yukihiro, 5,091,283, Cl. 430-280.000.
- Kikuchi, Masayuki: See—
Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, 5,090,764, Cl. 296-107.000.
- Kikuchi, Yoshiteru: See—
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.
- Kim, Andrew S., to Crucible Materials Corporation. Method and particle mixture for making rare earth element, iron and boron permanent sintered magnets, 5,091,020, Cl. 148-101.000.
- Kim, Bong J.: See—
Kim, Wan J.; Park, Myung H.; Oh, Jong H.; Jung, Myung H.; and Kim, Bong J., 5,091,384, Cl. 514-215.000.
- Kim, Bumman: See—
Shih, Hung-Dah; and Kim, Bumman, 5,091,759, Cl. 357-22.000.
- Kim, Deok H.: See—
Back, Je I.; Kim, Deok H.; Hong, Hyun H.; Kyong, Mun G.; Park, Ju Y.; Lee, Hyoeng H.; Lee, Young K.; and Park, Hang G., 5,091,904, Cl. 370-58.100.
- Kim, Hoon S.: See—
Park, Kun Y.; and Kim, Hoon S., 5,091,602, Cl. 570-167.000.
- Kim, Sun H.; and Taylor, John E., to Biomeasure, Inc. 2H-1,3,4-benzotriazepin-2-ones, 5,091,381, Cl. 514-183.000.
- Kim, Wan J.; Park, Myung H.; Oh, Jong H.; Jung, Myung H.; and Kim, Bong J., to Korea Research Institute of Chemical Technology. Antibacterial quinolone- and naphthyridone-carboxylic acid compounds, 5,091,384, Cl. 514-215.000.
- Kim, Yoon Ho; Ko, Jae Ung; and Shin, Hae Keun, to Korea Institute of Science & Technology. Method for manufacturing multilayer ceramic capacitor, 5,090,099, Cl. 29-25.420.
- Kimball, Mark R.: See—
Davis, Lemuel L.; Kimball, Mark R.; Sarkissian, Vahe; and Kohler, Dylan, 5,091,849, Cl. 395-100.000.
- Kimball, Robert M.: See—
Degani, Yimon; Kimball, Robert M.; and Shevchuk, George J., 5,091,988, Cl. 385-70.000.
- Kimizuka, Junichi: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Kimura, Akio, to Kabushiki Kaisha Topcon. Laser beam controller for surveying equipment, 5,091,627, Cl. 219-121.830.
- Kimura, Akira: See—
Sasaki, Tooru; Ohkubo, Masashi; and Kimura, Akira, 5,091,954, Cl. 381-72.000.
- Kimura, Hiroshi: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kishida, Yasuhiro, 5,091,460, Cl. 524-492.000.
- Kimura, Masao: See—
Claverie, Pierre; Kimura, Masao; Arai, Juichi; and Jalby, Pierre, 5,091,209, Cl. 427-38.000.
- Kimura, Mutsuhiko: See—
Saito, Takeo; Ishida, Yoshiaki; Fukunaga, Nobuyuki; Kimura, Mutsuhiko; and Metoki, Yasuo, 5,090,325, Cl. 102-313.000.
- Kimura, Shinichiro: See—
Hiraiwa, Atsushi; Kimura, Shinichiro; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, 5,091,761, Cl. 357-23.600.
- Kimura, Shunpei: See—
Otokawa, Mitsuhiro; Kimura, Shunpei; and Miyaoka, Yasuyuki, 5,091,897, Cl. 369-13.000.
- Kimura, Yuichiro: See—
Someya, Ryuuichi; Kabuto, Nobuaki; Kimura, Yuichiro; and Watanabe, Kazuhiro, 5,091,784, Cl. 358-183.000.
- King, Anthony O. P.; Karady, Sandor; Anderson, Kevin; Douglas, Alan W.; Abramson, Newton L.; and Shuman, Richard F., to Merck & Co., Inc. Trialkylsilyl trifluoromethanesulfonate mediated α -methylene carbon functionalization of 4-AZA-5 α -androstan-3-one steroids, 5,091,534, Cl. 546-14.000.
- King, Eddie W.: See—
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 5,090,589, Cl. 221-2.000.
- King, John T.: See—
Wong, Andrew K.; Kamel, Mohamed S.; and King, John T., 5,090,804, Cl. 356-237.000.
- King, Monroe L.: See—
Dykstra, Jerald P.; Ray, Andrew M.; and King, Monroe L., 5,091,655, Cl. 250-492.200.
- King, Reginald A. Method and apparatus for the recognition of voice signal encoded as time encoded speech, 5,091,949, Cl. 381-43.000.
- Kino, Shigem: See—
Oda, Minoru; Kino, Shigemi; Ogawa, Kenji; and Shiotsuki, Takako, 5,091,191, Cl. 514-399.000.
- Kinoshita, Hiroshi: See—
Takahashi, Tashihiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaro; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji;

- Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.
- Kinsley, John: See—
Hoffman, Richard W.; Kinsley, John; and Illenberger, Michael, 5,090,583, Cl. 215-253.000.
- Kioka, Mamoru; Tsutsui, Toshiyuki; and Toyota, Akinori, to Mitsui Petrochemical Industries, Ltd. Olefin polymerization catalyst component, olefin polymerization catalyst and process for the polymerization of olefins. 5,091,352, Cl. 502-103.000.
- Kioka, Mamoru; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for producing ethylene copolymer. 5,091,353, Cl. 502-111.000.
- Kirby, David B.; and Cur, Nihat O., to Whirlpool Corporation. Getter structure for vacuum insulation panels. 5,091,233, Cl. 428-69.000.
- Kirkwood, George T.: See—
Rohde, Mark W.; Brown, Roger T.; Kirkwood, George T.; Schalk, Dick G.; and Smythe, Robert L., 5,091,613, Cl. 200-86.500.
- Kirma, Sefa, to Messerschmitt-Bolkow-Blohm GmbH. Arrangement for protection of electrical installations against electromagnetic disturbances. 5,091,604, Cl. 174-2.000.
- Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal substituted sulphonylaminoazoles. 5,091,529, Cl. 544-197.000.
- Kirwan, Donald J.: See—
Kennington, Allison; Larner, Joseph; Hill, Cynthia; Stringfield, Butler; Carta, Giorgio; and Kirwan, Donald J., 5,091,596, Cl. 568-833.000.
- Kishida, Hiroo; and Takenaka, Hirofumi, to Harumoto Iron Works Co., Ltd. Method of positioning concrete slabs on girders. 5,090,176, Cl. 52-745.000.
- Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsumori; and Shiroyanagi, Yoshiro, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Method for writing/reading of data in magnetic disk subsystem. 5,091,909, Cl. 371-40.100.
- Kiss, Janos: See—
Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.
- Kita, Ezo: See—
Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto; and Oono, Yasuteru, 5,090,872, Cl. 417-53.000.
- Kitabata, Kozo: See—
Fukuyama, Kiyoshi; Wada, Toru; Kitabata, Kozo; Sudare, Masahiro; Tsuchitani, Shigemi; and Ohminami, Kazuya, 5,090,552, Cl. 198-365.000.
- Kitachi Koki Company, Limited: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 127-10.000.
- Kitagawa, Hiroji, to Kitagawa Industries Co., Ltd. Method for manufacturing a three-dimensional circuit substrate. 5,090,122, Cl. 29-852.000.
- Kitagawa Industries Co., Ltd.: See—
Kitagawa, Hiroji, 5,090,122, Cl. 29-852.000.
- Kitagawa, Sotoyuki: See—
Suzuki, Toshiaki; Kitagawa, Sotoyuki; Nakayama, Takashi; and Kuno, Takao, 5,091,435, Cl. 521-134.000.
- Kitahara, Yoshihiko; and Kobayashi, Kenji, to Canon Kabushiki Kaisha & Canon Aptex, Inc. Sheet post treatment apparatus. 5,090,673, Cl. 270-53.000.
- Kitajima, Masaaki; Ohwada, Jun-ichi; and Nagae, Yoshiharu, to Hitachi, Ltd. Gray scale display. 5,091,722, Cl. 340-784.000.
- Kitano, Motoi: See—
Yoshinaka, Minoru; Asakura, Eizou; Oku, Mitsumasa; Kitano, Motoi; and Yoshida, Hideyuki, 5,091,765, Cl. 357-30.000.
- Kiyoshi, Morimoto: See—
Maekawa, Takashi; and Kiyoshi, Morimoto, 5,090,679, Cl. 271-125.000.
- Klaerner, Peter: See—
Bueschl, Rainer; and Klaerner, Peter, 5,091,477, Cl. 525-152.000.
- Kleer-Flo Company: See—
Hilgren, Wallace L., 5,091,081, Cl. 210-195.200.
- Klegerman, Melvin E.; and Groves, Michael J., to University of Illinois, The Board of Trustees of the. Process for the enzymatic dispersal of *Mycobacterium bovis* - BCG. 5,091,308, Cl. 435-68.100.
- Kleijn, Willem B., to AT&T Bell Laboratories. Source dependent channel coding with error protection. 5,091,945, Cl. 381-36.000.
- Klein, Anthony G.: See—
Cimmino, Alberto F.; Klein, Anthony G.; and Opat, Geoffrey I., 5,090,248, Cl. 73-780.000.
- Klein, Carl F.: See—
Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barocian, Arthur, 5,090,246, Cl. 73-718.000.
- Klein, Hans-Christof, to Alfred Teves GmbH. Lever-type transmission gear. 5,090,262, Cl. 74-110.000.
- Kleiner, Marcos Y. Fiber optic systems for sensing temperature and other physical variables. 5,090,818, Cl. 374-131.000.
- Kleinfelter, Thomas A. Golf putter. 5,090,698, Cl. 273-80.200.
- Kleinstuck, Roland: See—
Immenkeppel, Michael; Kleinstuck, Roland; Block, Hans-Dieter; Sicius, Hermann; and Schmidt, Peter, 5,091,562, Cl. 562-24.000.
- Kler, Satish C.: See—
Biddulph, Michael W.; Kler, Satish C.; and Lavin, John T., 5,091,119, Cl. 261-114.300.
- Klett, Manfred; Dreimann, Markus; and Baumer, Dieter, to Hahn & Kolb GmbH & Co. Machine tool with a rotary table and rotatable holding devices. 5,090,100, Cl. 29-38.000.
- Klockner Ferromatik Desma GmbH: See—
Jaroschek, Christoph, 5,090,886, Cl. 425-130.000.
- Klos, Gene J.: See—
Ach, William D.; Anderson, Edmund J.; Behrends, Lynn B.; Desrude, Wayne P.; and Klos, Gene J., 5,090,556, Cl. 198-465.100.
- Kluger, Edward F., to ITT Corporation. Quick-connect connector for plastic tubes. 5,090,745, Cl. 285-187.000.
- Kluth, Joachim: See—
Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.
- Knapheide, Wolfgang: See—
Lubke, Herbert; Schroder, Volker; and Knapheide, Wolfgang, 5,090,317, Cl. 101-169.000.
- Knight, Robert W. Plastic perforative spout device. 5,090,596, Cl. 222-91.000.
- Knofe, Helmut: See—
Nohren, Hubert; Moritzen, Werner; Siebrand, Gerhard; and Knofe, Helmut, 5,090,641, Cl. 244-148.000.
- Knorr-Bremse AG: See—
Golea, Filip; and Wirth, Xaver, 5,090,519, Cl. 188-72.600.
- Knorr, Heinrich: See—
Kopp, Lorenz; Knorr, Heinrich; and Rossmann, Werner, 5,090,362, Cl. 118-423.000.
- Knott, Jack E.; and Gage, Paul D., to Rexene Products Company. Starch filled coextruded degradable polyethylene film. 5,091,262, Cl. 428-516.000.
- Ko, Jae Ung: See—
Kim, Yoon Ho; Ko, Jae Ung; and Shin, Hae Keun, 5,090,099, Cl. 29-25.420.
- Ko, Kenneth K.; Miller, Jesse D., Jr.; and Von Stetten, Susan M., to Armstrong World Industries, Inc. Charge dissipative surface coverings. 5,091,452, Cl. 524-155.000.
- Ko, Sandy S.: See—
Conte, Joseph A., Jr.; Johnson, Bobby R.; Hsieh, Rudolf J.; and Ko, Sandy S., 5,091,203, Cl. 426-614.000.
- Kobayashi, Hironobu: See—
Okiura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, 5,090,339, Cl. 110-263.000.
- Kobayashi, Hiroo: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasu; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Kobayashi, Hiroshi, to Nissan Motor Company, Limited. Flow rate sensor. 5,090,241, Cl. 73-204.260.
- Kobayashi, Kazutoshi: See—
Shimada, Junichi; and Kobayashi, Kazutoshi, 5,090,367, Cl. 123-146.50A.
- Kobayashi, Kenji: See—
Kitahara, Yoshihiko; and Kobayashi, Kenji, 5,090,673, Cl. 270-53.000.
- Kobayashi, Koichi: See—
Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, 5,091,285, Cl. 430-296.000.
- Kobayashi, Masakazu; and Harashima, Konomi, to Kyowa Vacuum Engineering, Ltd. Method and apparatus for freeze drying. 5,090,132, Cl. 34-5.000.
- Kobayashi Pharmaceutical Co., Ltd.: See—
Iwasaki, Hiroya; Fujimura, Katsuyuki; Inoue, Yoshio; and Nakamura, Shoshiro, 5,091,312, Cl. 435-191.000.
- Kobayashi, Reisuke: See—
Kato, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, 5,091,311, Cl. 435-119.000.
- Kobayashi, Seiji; and Psaltis, Demetri, to Sony Corporation; and California Institute of Technology. Video image processing apparatus. 5,091,965, Cl. 382-15.000.
- Kobayashi, Seizo; Mizoe, Takashi; and Iwanami, Yoshimu, to Nippon Oil Co., Ltd. Continuous production process of high-strength and high-modulus polyolefin material. 5,091,133, Cl. 264-119.000.
- Kobayashi, Shigetoyo: See—
Ujimoto, Hiroshi; Nomura, Hironori; Shimakawa, Taiji; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 5,091,039, Cl. 156-519.000.
- Kobayashi, Takaichi, to Kabushiki Kaisha Toshiba. Portable apparatus having cable electrically connecting display unit and base unit. 5,090,913, Cl. 439-165.000.
- Kobayashi, Takashi: See—
Hiraiwa, Atsushi; Kimura, Shinichiro; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, 5,091,761, Cl. 357-23.600.
- Kobayashi, Yasutomo, to Nifco Inc. Latching device for use on a vehicle. 5,090,751, Cl. 292-71.000.

- Kobayashi, Yoshihito: See—
Kakizaki, Masao; Kobayashi, Yoshihito; and Yagi, Hiroshi, 5,091,810, Cl. 360-103.000.
- Onishi, Yasunobu; Niki, Hirokazu; Kobayashi, Yoshihito; Hayase, Rumiko; and Ushirogouchi, Toru, 5,091,282, Cl. 430-270.000.
- Kobayashi, Yuji; Matsuda, Yasuo; Hosoya, Toshifumi; and Nonaka, Tsuyoshi, to Sumitomo Electric Industries, Ltd. Optical switch for use with optical fibers. 5,091,984, Cl. 385-16.000.
- Kobayashi, Yutaka: See—
Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hirai-shi, Atushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, 5,091,883, Cl. 365-189.050.
- Kober, Reiner: See—
Seele, Rainer; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 5,091,401, Cl. 514-383.000.
- Kobiki, Yasuhiko: See—
Ito, Hideo; Tonomura, Hiroshi; Nakata, Moritsune; and Kobiki, Yasuhiko, 5,090,766, Cl. 296-190.500.
- Koch, Cornelius: See—
Bermbach, Rainer; Doenges, Gerhard; Geus, Georg; and Koch, Cornelius, 5,091,924, Cl. 378-57.000.
- Kodaka, Hiromitsu: See—
Suzuki, Masahiro; Kamemura, Ichiro; and Kodaka, Hiromitsu, 5,091,434, Cl. 521-78.000.
- Koehn, Frank; Cross, Sue S.; and Longley, Ross E., to Harbor Branch Oceanographic Institution, Inc. Biologically active compounds from blue-green algae. 5,091,368, Cl. 514-18.000.
- Koehn, Frank: See—
Wright, Amy S.; Cross, Sue S.; Burres, Neal S.; and Koehn, Frank, 5,091,412, Cl. 514-453.000.
- Koepfmann, Edgar: See—
Jacobs, Jochen; Koepfmann, Edgar; Witthaus, Martin; and Dan-kowski, Manfred, 5,091,106, Cl. 252-186.260.
- Koerner, Gotz: See—
Schamberger, Eckehard; Koerner, Gotz; Fritsch, Herwig; Grasse, Manfred; and Sucker, Roland, 5,091,002, Cl. 106-2.000.
- Koester, Daniel R.: See—
Koester, Frank A., Jr.; and Koester, Daniel R., 5,090,097, Cl. 24-552.000.
- Koester, Frank A., Jr.; and Koester, Daniel R. Plastic clip. 5,090,097, Cl. 24-552.000.
- Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, to Nissan Motor Co., Ltd.; and Johan Seisakusho Co., Ltd. Vehicle body construction for hardtop convertible. 5,090,764, Cl. 296-107.000.
- Kogure, Nobuyuki; Shirahase, Masaaki; and Tamori, Ikuo, to Japan as represented by Director General of Agency of Industrial Science and Technology. In-line analyzer for particle size distribution in flue gas. 5,090,233, Cl. 73-28.050.
- Kohara, Ikumitsu: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kaseda, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
- Kohara, Masanobu; Kondo, Takashi; and Yama, Yomiyuki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and package. 5,091,772, Cl. 357-74.000.
- Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Applied intensity distribution controlling apparatus. 5,090,798, Cl. 351-221.000.
- Kohda, Masahiro; Yamada, Osamu; and Yamane, Hisaaki, to Brother Kogyo Kabushiki Kaisha. Plasma arc cutting device having metal deposition removal function and method for removing deposition from nozzle of the plasma arc cutting device. 5,091,625, Cl. 219-121.440.
- Kohler, Dylan: See—
Dylan, Lemuel L.; Kimball, Mark R.; Sarkissian, Vahe; and Kohler, Dylan, 5,091,849, Cl. 395-100.000.
- Kohlsdorfer, Christian: See—
Raddatz, Siegfried; Mohrs, Klaus-Helmut; Fruchtmann, Romanis; Kohlsdorfer, Christian; Theisen-Popp, Pia; and Muller-Peddinghaus, Reiner, 5,091,392, Cl. 514-311.000.
- Kohno, Akiomi: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.
- Koht, Lowell I.; Del Fava, Donald; Clark, Brian H.; Takaki, Dana M.; and Haddock, George W., to Raynet Corporation. Optical fiber tap handling tray. 5,090,792, Cl. 385-32.000.
- Koike, Hisashi: See—
Ikeda, Towli; and Koike, Hisashi, 5,091,694, Cl. 324-158.00P.
- Koito Manufacturing Co., Ltd.: See—
Suzuki, Yoshinobu, 5,091,830, Cl. 362-61.000.
- Koizumi, Takeo: See—
Wakabayashi, Yasusuke; Koizumi, Takeo; Ehara, Katuo; Hara, Masataka; and Ehara, Masahiro, 5,090,232, Cl. 73-23.340.
- Kojima, Hidetaka: See—
Tanaka, Yasutaka; Kojima, Hidetaka; and Tsuji, Yasuo, 5,091,563, Cl. 562-406.000.
- Kojima, Keiji, to Hitachi, Ltd. Vector processor for merging vector elements in ascending order merging operation or descending order merging operation. 5,091,848, Cl. 395-800.000.
- Kojima, Yoshio: See—
Takeda, Fumio; Kojima, Yoshio; Kaneko, Tsuneo; Ishibashi, Yutaka; Sasaki, Naoto; and Tsushima, Isako, 5,090,169, Cl. 52-220.000.
- Kolar, Cenek; Dehmelt, Konrad; and Kraemer, Hans Peter, to Behringwerke Aktiengesellschaft. Cis-platinum complexes, a process for the preparation thereof, and pharmaceuticals containing these compounds. 5,091,521, Cl. 536-17.100.
- Kolar, Cenek: See—
Konig, Wolfgang; Sandow, Jurgen K.; and Kolar, Cenek, 5,091,367, Cl. 514-15.000.
- Kollmorgen Corporation: See—
Taylor, William H., 5,091,646, Cl. 250-332.000.
- Kolpak, Miroslav M., to Atlantic Richfield Company. Coriolis type fluid flowmeter. 5,090,253, Cl. 73-861.380.
- Komatsu Wall Industry Co., Ltd.: See—
Kano, Minoru; Negami, Kiyoshi; and Nakatani, Mikio, 5,090,171, Cl. 52-243.100.
- Kominato, Koichiro: See—
Yoshioka, Takeo; Watanabe, Azuma; Kominato, Koichiro; Tone, Hiroshi; Okamoto, Rokuro; Sawa, Tsutomu; and Takeuchi, Tomio, 5,091,370, Cl. 514-30.000.
- Kondo, Hirofumi; Haga, Shuichi; and Matsuda, Takaaki, to Sony Corporation. Magnetic recording medium lubricant consisting of an amine salt of carboxylic acid, an amine salt of perfluoroalkyl carboxylic acid or a fluoro amine salt of perfluoro carboxylic acid. 5,091,269, Cl. 428-695.000.
- Kondo, Shinichi: See—
Takeuchi, Tomio; Kondo, Shinichi; and Ikeda, Daishiro, 5,091,371, Cl. 514-33.000.
- Kondo, Takajiro, to Hitachi Metals, Ltd.; and Yasugi Seimitsu Co., Ltd. Sheet cutter. 5,090,285, Cl. 83-636.000.
- Kondo, Takashi: See—
Kohara, Masanobu; Kondo, Takashi; and Yama, Yomiyuki, 5,091,772, Cl. 357-74.000.
- Kondo, Toshio: See—
Ikuta, Kenji; Kondo, Toshio; and Haraguchi, Hiroshi, 5,090,199, Cl. 60-276.000.
- Kondoh, Osamu: See—
Arii, Mitsuzo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinnai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.
- Kondoh, Tomoko: See—
Arii, Mitsuzo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinnai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.
- Kondos, Peter D.; Haque, Kazi E.; MacDonald, John C.; Griffith, Wesley F.; Laforest, Daniel; and Iuliano, Joe, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy. Use of microwave radiation to eliminate foam in ore leaching. 5,091,160, Cl. 423-131.000.
- Kone Elevator GmbH: See—
Juntunen, Asko, 5,091,816, Cl. 361-18.000.
- Tuusa, Heikki J., 5,091,841, Cl. 363-98.000.
- Konica Corporation: See—
Haneda, Satoshi; Fukuchi, Masakazu; and Shoji, Hisashi, 5,091,789, Cl. 358-401.000.
- Nishijima, Toyoki; and Tanji, Masaki, 5,091,294, Cl. 430-505.000.
- Konig, Wolfgang; Sandow, Jurgen K.; and Kolar, Cenek, to Hoechst Aktiengesellschaft. Analogs of gonadoliberin with improved solubility, methods for their preparation, agents containing them and their use. 5,091,367, Cl. 514-15.000.
- Konkol, Werner: See—
Cornils, Boy; Konkol, Werner; Bahrmann, Helmut; Bach, Hanswilhelm; Wiebus, Ernest; and Lipps, Wolfgang, 5,091,350, Cl. 502-24.000.
- Konno, Youichi: See—
Bessho, Akira; and Konno, Youichi, 5,091,898, Cl. 369-77.200.
- Kono, Hiromi: See—
Ohtsuka, Masuhiro; and Kono, Hiromi, 5,090,269, Cl. 74-861.000.
- Konok, Ferenc: See—
Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.
- Koo, Ja M. Staple remover. 5,090,662, Cl. 254-28.000.
- Kooda, Kazutaka: See—
Mochizuki, Masatsugu; Kooda, Kazutaka; Murakami, Siro; Nagata, Naohiko; and Kawaguchi, Mitsuo, 5,091,254, Cl. 428-364.000.
- Koosen, Peter P. Metallic coating measuring method and apparatus. 5,091,696, Cl. 324-229.000.
- Kopecky, Ivyl D.; and Morlock, Ruben D., to Haybuster Manufacturing Inc. Bale grinder with lift and carrier forks. 5,090,630, Cl. 241-279.000.
- Kopera, John J. C., to Chrysler Corporation. Oscillator having resonator coil immersed in a liquid mixture to determine relative amounts of two liquids. 5,091,704, Cl. 331-65.000.
- Kopp, Lorenz; Knorr, Heinrich; and Rossmann, Werner, to Schering Aktiengesellschaft. Arrangement for galvanization of treatment goods in a series of baths. 5,090,362, Cl. 118-423.000.
- Kopp, Richard: See—
Grogler, Gerhard; Kopp, Richard; Hess, Heinrich; Hansel, Eduard; and Scholl, Thomas, 5,091,497, Cl. 528-76.000.
- Korea Electronics and Telecommunications: See—
Back, Je I.; Kim, Deok H.; Hong, Hyun H.; Kyong, Mun G.; Park, Ju Y.; Lee, Hyeon H.; Lee, Young K.; and Park, Hang G., 5,091,904, Cl. 370-58.100.
- Korea Institute of Science & Technology: See—
Kim, Yoon Ho; Ko, Jae Ung; and Shin, Hae Keun, 5,090,099, Cl. 29-25.420.
- Park, Kun Y.; and Kim, Hoon S., 5,091,602, Cl. 570-167.000.

- Shin, Myung C.; Sohn, Keun Y.; Chung, Young H.; Lee, Young Y.; and Park, Tai W., 5,091,149, Cl. 420-528.000.
- Korea Research Institute of Chemical Technology: See—
Kim, Wan J.; Park, Myung H.; Oh, Jong H.; Jung, Myung H.; and Kim, Bong J., 5,091,384, Cl. 514-215.000.
- Korff, Roy D., to Duchossois Industries, Inc. Brake actuating apparatus. 5,090,522, Cl. 188-166.000.
- Korling, Werner: See—
Schulte, Ernst; Korling, Werner; and Kraft, Franz, 5,090,089, Cl. 16-49.000.
- Kornblith, Jeffrey: See—
Mileski, Paul; and Kornblith, Jeffrey, 5,091,732, Cl. 343-797.000.
- Kornrumpf, William P.: See—
Smith, Lowell S.; Eichelberger, Charles W.; Wojnarowski, Robert J.; Kornrumpf, William P.; and Piel, Joseph E., Jr., 5,091,893, Cl. 367-153.000.
- Kosa, Theodore: See—
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- Kosaka, Takao, to Mitsubishi Paper Mills Limited. Heat sensitive recording material. 5,091,357, Cl. 503-207.000.
- Koshimura, Atsushi: See—
Sakumoto, Yukinori; Yokoyama, Shigeyuki; Shibuya, Akihiro; Nakayama, Nobuyuki; and Koshimura, Atsushi, 5,091,251, Cl. 428-352.000.
- Kosker, Leon G., to Kennametal Inc. Tool holder assembly with angular adjustment mechanism. 5,090,280, Cl. 82-158.000.
- Koskinen, Kauno L. J., to Kauno Koskinen Ky. Pipe expanding pliers. 5,090,230, Cl. 72-393.000.
- Kotake, Naoyuki, to Nitto Kohki Co., Ltd. Coupling socket. 5,090,747, Cl. 285-305.000.
- Kotobuki & Co., Ltd.: See—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Youichi, 5,090,831, Cl. 401-52.000.
- Kottmann, Hariolf: See—
Meyer, Matthias; Stapel, Ralf; Kottmann, Hariolf; and Gries, Thomas, 5,091,589, Cl. 568-615.000.
- Kouchi, Toshihito: See—
Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151.000.
- Nishioka, Kimihiko; Kouchi, Toshihito; and Okada, Takao, 5,091,795, Cl. 359-93.000.
- Koumarianos, Angelo N. Golf sand wedge and putter. 5,090,703, Cl. 273-175.000.
- Koura, Seigo: See—
Onodera, Nobuo; Someya, Shinzo; Koura, Seigo; and Segami, Shigenori, 5,090,994, Cl. 71-94.000.
- Kowa Company Ltd.: See—
Ishikawa, Muneharu; and Taniji, Ayafumi, 5,090,808, Cl. 356-336.000.
- Makino, Misao; Hashimoto, Kiyoshi; and Sugita, Toshiaki, 5,090,799, Cl. 351-221.000.
- Ogino, Kouji; and Aizu, Yoshihisa, 5,090,416, Cl. 128-691.000.
- Koyama, Fumio: See—
Iga, Kenichi; Koyama, Fumio; and Uenohara, Hiroyuki, 5,091,756, Cl. 357-4.000.
- Kozlik, Claudius: See—
Christiansen, Jens; Frank, Klaus; Hartmann, Werner; and Kozlik, Claudius, 5,091,819, Cl. 361-120.000.
- Kraemer, Hans Peter: See—
Kolar, Cenek; Dehmel, Konrad; and Kraemer, Hans Peter, 5,091,521, Cl. 536-17.100.
- Kraft, Franz: See—
Schulte, Ernst; Korling, Werner; and Kraft, Franz, 5,090,089, Cl. 16-49.000.
- Kraft General Foods, Inc.: See—
Krishnamurthy, R. G.; Widlak, Neil R.; and Wang, Joel J., 5,091,116, Cl. 260-409.000.
- Kraft, Hermann: See—
Rodi, Anton; and Kraft, Hermann, 5,090,316, Cl. 101-148.000.
- Krajicek, Richard W.; and Cradeur, Robert R., to Serv-Tech, Inc. Method for dispersing sediment contained in a storage tank. 5,091,016, Cl. 134-22.100.
- Kralovic, Raymond C.: See—
Schneider, Edward T.; Siegel, Norman L.; and Kralovic, Raymond C., 5,091,343, Cl. 422-297.000.
- Kramer, Dennis A., to Rockwell International Corporation. Acoustic signal transmission between a tractor and trailer within the air brake system. 5,090,779, Cl. 303-7.000.
- Krause, Edward A.; and Paik, Woo H., to General Instrument Corporation. Apparatus and method for adaptively compressing successive blocks of digital video. 5,091,782, Cl. 358-135.000.
- Krauss-Maffei Aktiengesellschaft: See—
Buttner, Otto; and Hegnauer, Bruno, 5,090,953, Cl. 494-1.000.
- Krauter, Immanuel: See—
Bruckelt, Alfred; Kaiser, Gunther; Krauter, Immanuel; and Ott, Karl, 5,090,394, Cl. 123-643.000.
- Krauter, Lothar; Nusser, Hermann; Schelhas, Peter; Schilling, Rainer; Trachte, Dietrich; and Kemmer, Ulrich, to Robert Bosch GmbH. Fuel supply assembly for a motor vehicle. 5,090,883, Cl. 418-171.000.
- Kraxner, Gerhard: See—
Daxelmueller, Manfred; Doeberl, Dieter; and Kraxner, Gerhard, 5,091,264, Cl. 428-685.000.
- Krebs, Andreas: See—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 5,091,537, Cl. 546-226.000.
- Kreibich, Roland E.: See—
Chum, Helena L.; and Kreibich, Roland E., 5,091,499, Cl. 528-129.000.
- Kremer, Richard; and Wood, Stephen R., to Futrex Industries. Truck bed liner. 5,090,763, Cl. 296-39.100.
- Krenik, William R.: See—
Yung, Henry T-H; and Krenik, William R., 5,091,662, Cl. 307-475.000.
- Krepiski, Larry R.: See—
Hellmann, Steven M.; Moren, Dean M.; Rasmussen, Jerald K.; Krepiski, Larry R.; and Pathre, Sadanand V., 5,091,489, Cl. 526-90.000.
- Krettek, Guntram, to Krupp Industrietechnik Gesellschaft mit beschränkter Haftung. Retaining seal and supporting screen system for drum centrifuge. 5,091,084, Cl. 210-232.000.
- Krieger, Paul A., to Excello Specialty Company, The. Automotive door trim panel protector and method of using the same. 5,090,762, Cl. 296-39.100.
- Krishnamurthy, R. G.; Widlak, Neil R.; and Wang, Joel J., to Kraft General Foods, Inc. Methods for treatment of edible oils. 5,091,116, Cl. 260-409.000.
- Kroeger, Wilbert L.; Ripley, John R.; and Wood, Bruce R., to Lexmark International, Inc. Printer having single connector for parallel and serial interfaces. 5,090,830, Cl. 400-719.000.
- Krupp Industrietechnik Gesellschaft mit beschränkter Haftung: See—
Krettek, Guntram, 5,091,084, Cl. 210-232.000.
- Thiel, Hans-Joachim, 5,090,549, Cl. 198-312.000.
- Ku, J. S.: See—
Davis, P.; Ku, J. S.; and Schmitt, T. M., 5,091,548, Cl. 556-428.000.
- Kubo, Kimio: See—
Ohtsuka, Kouki; Kubo, Kimio; Akiyama, Koichi; Ike, Masahide; and Kawai, Kunio, 5,091,147, Cl. 420-68.000.
- Kubota, Toshifumi: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.
- Kubota, Yutaka; Shimono, Seiichi; Yanami, Tetsuo; Iwasaki, Tetsuji; and Kurita, Kazuhiko, to Mitsui Toatsu Chemicals, Inc.; and Kao Corporation. Aqueous biocide composition stabilized by phthalic acid esters. 5,090,995, Cl. 71-114.000.
- Kuczynski, Anthony L.; Ayer, Atul D.; and Wong, Patrick S., to ALZA Corporation. Delivery system for administration blood-glucose lowering drug. 5,091,190, Cl. 424-473.000.
- Kuhn, Bruno R.: See—
Byerly, Harold L.; and Kuhn, Bruno R., 5,091,157, Cl. 422-209.000.
- Kuhns, Roger J.; McLaren, Timothy S.; Nathans, Robert L.; and Smith, Robert F., to Avant Incorporated. Inexpensive laminated universal sales presentation of security folder having many uses. 5,090,732, Cl. 281-29.000.
- Kuisma, Erkki, to Nokia-Mobira Oy. Transmitter arrangement for digitally modulated signals. 5,091,919, Cl. 375-60.000.
- Kukes, Simon G.: See—
Hawley, Gil R.; Kukes, Simon G.; and Banks, Robert L., deceased, 5,091,490, Cl. 526-97.000.
- Kulcsar, Gabor: See—
De Kany, Gyula; Frank, Judit; Pelczar, Istvan; Kulcsar, Gabor; and Schreiner, Eniko, 5,091,411, Cl. 514-450.000.
- Kumano, Akira; Nogami, Hiroyasu; Milke, Seiji; Adachi, Hisahiro; and Amano, Shin-ya, to Kabushiki Kaisha Toshiba. Machine translation system. 5,091,876, Cl. 364-419.000.
- Kumano, Shinji; and Murasaki, Motoshi, to Yamaha Corporation. Keyboard device of electronic musical instrument. 5,090,290, Cl. 84-434.000.
- Kumiai Chemical Industry Co., Ltd.: See—
Kato, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, 5,091,311, Cl. 435-119.000.
- Kunert, Peter: See—
Birkenstock, Udo; Scharschmidt, Jürgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, 5,090,997, Cl. 75-338.000.
- Kuno, Takao: See—
Suzuki, Toshiaki; Kitagawa, Sotoyuki; Nakayama, Takashi; and Kuno, Takao, 5,091,435, Cl. 521-134.000.
- Kunz, Timothy W.: See—
Spath, Mark J.; Shost, Mark A.; Kunz, Timothy W.; Giannone, Guy E.; and Castellana, John, 5,090,364, Cl. 123-90.160.
- Kunzel, Walter: See—
Bonitz, Jörg; Rohde, Siegfried; Müller, Bernhard; and Kunzel, Walter, 5,090,204, Cl. 60-612.000.
- Kupersmit, Julius B. Collapsible reinforced shipping carton with foldable slip sheet. 5,090,614, Cl. 229-117.040.
- Kupper, Friedrich-Wilhelm; Müller, Wolfgang H. E.; and Oberholz, Alfred, to Huels Aktiengesellschaft. Process for the production of 2,6-di-tert-butylphenol. 5,091,594, Cl. 568-789.000.
- Kura, Tetsuzo, to Tsubakimoto Chain Co. Conveyor of connected carriages. 5,090,555, Cl. 198-465.100.
- Kuraray Co., Ltd.: See—
Ishii, Toshinori; and Sato, Masanori, 5,091,138, Cl. 264-564.000.
- Omura, Ikuo, 5,091,441, Cl. 523-109.000.

- Kure, Tokuo: See—
Hiraiwa, Atsushi; Kimura, Shinichiro; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, 5,091,761, Cl. 357-23.600.
- Kurihara, Hajime: See—
Shimura, Hidetsugu; and Kurihara, Hajime, 5,090,828, Cl. 400-197.000.
- Kurihara, Hideaki: See—
Iseda, Kohei; Satoh, Kazumi; Kurihara, Hideaki; Amano, Fumio; Unagami, Shigeyuki; and Okazaki, Koji, 5,091,955, Cl. 381-36.000.
- Kuriki, Syoji: See—
Ariyoshi, Takashi; Kawamoto, Toshiaki; Yasuda, Seigou; Kuriki, Syoji; and Nakatani, Tomofumi, 5,091,947, Cl. 381-42.000.
- Kurita, Kazuhiko: See—
Kubota, Yutaka; Shimono, Seiichi; Yanami, Tetsuo; Iwasaki, Tetsuji; and Kurita, Kazuhiko, 5,090,995, Cl. 71-114.000.
- Kurita Water Industries Ltd.: See—
Yagi, Minoru; and Toda, Fumio, 5,091,400, Cl. 514-372.000.
- Kuroda, Kazuyuki: See—
Haseyama, Ryuji; Kuroda, Kazuyuki; Hayashi, Kouzou; Sasagawa, Katsuyoshi; Kano, Taisaku; and Shikai, Kiyoshi, 5,091,496, Cl. 528-73.000.
- Kurokawa, Hiroshi: See—
Okamoto, Masaya; and Kurokawa, Hiroshi, 5,091,482, Cl. 525-462.000.
- Kurokawa, Masumi: See—
Nishimura, Koichi; Taniguchi, Ikuo; Ikawa, Fumihiro; and Kurokawa, Masumi, 5,091,796, Cl. 359-110.000.
- Kurosui, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, to Fuji Jukogyo Kabushiki Kaisha; Japan Electronic Control Systems Co.; and Polaris Industries L.P. Fuel injection control system for an internal combustion engine. 5,090,386, Cl. 123-478.000.
- Kurotaki, Ayako: See—
Nagai, Kimie; Najoh, Scheuichi; Kurotaki, Ayako; Shirane, Koro; and Inoue, Chozo, 5,091,557, Cl. 560-39.000.
- Kurz, John H.: See—
Roberts, Clifford J.; Batson, Edward; and Kurz, John H., 5,090,584, Cl. 220-712.000.
- Kusano, Akihisa: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiro; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Kushida, Hachiro; Hamano, Kazumi; Imazawa, Yoshitsugu; and Irie, Kenji, to Citizen Watch Co., Ltd. Method of preparation of a surface-coated metal-made ornamental article. 5,091,224, Cl. 427-419.400.
- Kushida, Yasuhiro: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,091,460, Cl. 524-492.000.
- Kusmer, Dan P., to Keystone International, Inc. Bellows sealed rotary valve and seal assembly. 5,090,658, Cl. 251-14.000.
- Kusunoki, Shigeru: See—
Machara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuo; Bessyo, Daisuke; Niwa, Takashi; Kusunoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.
- Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto; and Oono, Yasuteru, to Hitachi Ltd.; and Kansai Electric Power Co., Inc. The Method of controlling the operation of a pump in a pumping installation by detecting counterflow. 5,090,872, Cl. 417-53.000.
- Kuwashima, Shigeru; and Aoki, Mario, to Fuji Photo Film Co., Ltd. Color photographic material and method of forming color image. 5,091,295, Cl. 430-507.000.
- Kuwashima, Shigesumi, to Kabushiki Kaisha Ouyo Keisoku Kenkyusho. Priority order of windows in image processing. 5,091,969, Cl. 382-48.000.
- Kuzunuki, Masashi: See—
Hirano, Akira; and Kuzunuki, Masashi, 5,090,235, Cl. 73-117.000.
- KWC AG: See—
Hochstrasser, Ferdinand, 5,090,062, Cl. 4-192.000.
- Kwon, Heemin; and Kaplan, Martin C., to Eastman Kodak Company. System and method for reducing digital image noise. 5,091,972, Cl. 382-54.000.
- Kwon, On-Kyong; Hashimoto, Masashi; and Malhi, Satwinder, to Texas Instruments Incorporated. High performance test head and method of making. 5,090,118, Cl. 29-843.000.
- Kyo, Osamu; and Akitsu, Yasuo, to NKG Insulators, Ltd. Magnetic-drive device for rotary machinery. 5,090,944, Cl. 464-29.000.
- Kyong, Mun G.: See—
Back, Je I.; Kim, Deok H.; Hong, Hyun H.; Kyong, Mun G.; Park, Ju Y.; Lee, Hyeon H.; Lee, Young K.; and Park, Hang G., 5,091,904, Cl. 370-58.100.
- Kyowa Vacuum Engineering, Ltd.: See—
Kobayashi, Masakazu; and Harashima, Konomi, 5,090,132, Cl. 34-5.000.
- L. B. Bohle Pharmatechnik GmbH: See—
Bohle, Lorenz B., 5,090,815, Cl. 366-192.000.
- Laboratoires Lucien: See—
Begue, Jean-Pierre; Charpentiermorize, Micheline; Bonnet Delpont, Daniele; and Gilbert-Semon, Huguette, 5,091,429, Cl. 514-255.000.
- Laboratorios Vinas, S.A.: See—
Buxade, Antonio, 5,091,547, Cl. 556-131.000.
- LaBoube, Roger A.: See—
Johnson, Donald L.; LaBoube, Roger A.; and Satsangi, Suresh C., 5,090,166, Cl. 52-167.0CB.
- Labruyere, Gilles, to Agence Spatiale Europeenne. Antenna pointing device. 5,091,733, Cl. 343-882.000.
- LaBudde, Edward V., to Unisys Corp. Multi-layer optical media for an optical recording and reproducing system in which non-ablative data recording is provided in a manner such that high sensitivity is achieved with an in-contact overcoat. 5,091,900, Cl. 369-100.000.
- Lace, Donald A. Apparatus for forming electrical coil assemblies. 5,090,632, Cl. 242-7.130.
- Lackland, Albert: See—
Art, Gregory R.; Podsiadlik, Frank M.; and Lackland, Albert, 5,090,582, Cl. 215-250.000.
- Laconi, Patrick: See—
Escarguel, Claude; Grosso, Marie-Helene; and Laconi, Patrick, 5,091,307, Cl. 435-34.000.
- Ladouceur, Jean; and Podmore, Kenneth H., to Legris Incorporated. Line cleaning apparatus. 5,090,440, Cl. 137-209.000.
- La Duca, Frank M.; and Marcelino, Eduardo I., to International Technology Corporation. Whole blood activated partial thromboplastin time test and associated apparatus. 5,091,304, Cl. 435-13.000.
- Laforest, Daniel: See—
Kondos, Peter D.; Haque, Kazi E.; MacDonald, John C.; Griffith, Wesley F.; Laforest, Daniel; and Iuliano, Joe, 5,091,160, Cl. 423-131.000.
- Lagueux, Ken R.: See—
Schwarz, Fred M.; Crawley, Clifton J., Jr.; Rauseo, Anthony F.; and Lagueux, Ken R., 5,090,193, Cl. 60-39.020.
- Lai, Fu-Tung. Waste container. 5,090,309, Cl. 100-226.000.
- Lai, Ming-Chih: See—
Chu, Jau-Jier; Lai, Ming-Chih; Tseng, Mei-Rung; and Yeh, Huei-Hsing, 5,091,221, Cl. 427-282.000.
- L'Air Liquide, S.A.: See—
Ekiner, Okan M.; Hayes, Richard A.; and Manos, Philip, 5,091,216, Cl. 427-245.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—
Barbier, Francois-Xavier, 5,090,971, Cl. 55-16.000.
- Claverie, Pierre; Kimura, Masao; Arai, Juichi; and Jalby, Pierre, 5,091,209, Cl. 427-38.000.
- Lakhani, Kishor M.: See—
Fulton, Alfred L.; Lakhani, Kishor M.; Sampson, Scott D.; and Lowman, Kent, 5,091,738, Cl. 346-154.000.
- LAM Research Corporation: See—
Monkowski, Joseph R.; and Logan, Mark A., 5,091,219, Cl. 427-255.500.
- Lammintausta, Risto: See—
Kalso, Eija; and Lammintausta, Risto, 5,091,402, Cl. 514-396.000.
- Land, Ann L.: See—
Ogle, Christopher L.; and Land, Ann L., 5,090,772, Cl. 297-440.000.
- Landis & Gyr Powers, Inc.: See—
Ahmed, Osman, 5,090,303, Cl. 454-58.000.
- Egbers, David A.; and Jacob, Steven D., 5,090,304, Cl. 454-59.000.
- Landry, Maurice J., Jr.; and Plouff, Frederick L., to FLP Enterprises, Inc. Non-reusable syringe. 5,090,962, Cl. 604-110.000.
- Lane, Lawrence J.: See—
D'Antonio, Michael J.; Gibbs, Irving A.; Lane, Lawrence J.; and Lawson, Rodney A., 5,091,690, Cl. 324-107.000.
- Laney, Bryan L.: See—
Squires, Wilber D.; Bachman, John A.; and Laney, Bryan L., 5,090,418, Cl. 128-702.000.
- Lang, Hans-Jochen: See—
Englert, Heinrich C.; Lang, Hans-Jochen; Linz, Wolfgang; Scholken, Bernhard; and Scholz, Wolfgang, 5,091,394, Cl. 514-331.000.
- Lang, Theodore J.; and Bergevin, Kevin. Film laminate with easy to tear. 5,091,241, Cl. 428-213.000.
- Lange, Werner, to J. M. Voith GmbH. Process for manufacturing a screen basket and screen basket made by this process. 5,090,721, Cl. 220-485.000.
- Langen, Herbert: See—
Kenner, Erich; and Langen, Herbert, 5,090,896, Cl. 431-262.000.
- Langenstein, Otto: See—
Schuler, Bernhard; Wiedenhofer, Kurt; Langenstein, Otto; and Wissmann, Siegfried, 5,090,218, Cl. 66-121.000.
- Langner, Klaus A.: See—
Froning, Edilbert A.; and Langner, Klaus A., 5,091,045, Cl. 156-633.000.
- Lappe, Peter; and Springer, Helmut, to Hoechst Aktiengesellschaft. Novel rhodium recovery. 5,091,546, Cl. 556-23.000.
- Larner, Joseph: See—
Kennington, Allison; Larner, Joseph; Hill, Cynthia; Stringfield, Butler; Carta, Giorgio; and Kirwan, Donald J., 5,091,596, Cl. 568-833.000.
- Larsen, Robert H.; Whately, B. Holt; and Glynn, William D., to Sinco, Inc. Pile cutter support. 5,090,397, Cl. 125-14.000.
- Larson, Lynn D. Waterbed draining system including vacuum relief valve. 5,090,075, Cl. 5-451.000.
- LaRue, Barney; and Jetton, Zolan. Diaphragm game caller with conical inner mount. 5,090,937, Cl. 446-207.000.
- LaSalle, Jerry C., to Allied-Signal, Inc. Rapidly solidified aluminum lithium alloys having zirconium. 5,091,019, Cl. 148-11.50A.

- Laser Technology, Inc.: See—
Tyson, John, II, 5,091,776, Cl. 358-93.000.
- Latta, Michael D.: See—
Jincks, Danny C.; Davis, John S.; and Latta, Michael D., 5,091,828, Cl. 362-35.000.
- Lau, Cheuk K.: See—
Belanger, Patrice C.; Dufresne, Claude; Fitzsimmons, Brian, deceased; Fitzsimmons, Maryann; Heir, Guindon, Yvan; Lau, Cheuk K.; Rokach, Joshua; Schiegetz, John; Therien, Michel; and Young, Robert N., 5,091,533, Cl. 544-318.000.
- Lau, Philip T. S.; and Thompson, Danny R., to Eastman Kodak Company. Alkyl substituted photographic couplers and photographic elements and processes employing same. 5,091,291, Cl. 430-385.000.
- Laudszun, Heinz; Steiner, Helmut; and Leidig, Hans J., to Bergische Achsenfabrik Fr. Kotz & Sohne. Wheel support for trailer axles. 5,090,778, Cl. 301-105.00R.
- Laugier, Jean-Pierre: See—
Bazin, Roland; Soudant, Etienne; Obadia, Gerard; Laugier, Jean-Pierre; and Marcotte, Louis, 5,090,402, Cl. 128-57.000.
- Lautenschlager, Horst, to Karl Lautenschlager GmbH & Co. KG. Wheel for rolling drawer guides. 5,090,820, Cl. 384-19.000.
- Lautzenhiser, Lloyd L., to Emhiser Research Limited. Phase locked loop with D.C. modulation and use in receiver. 5,091,706, Cl. 332-127.000.
- Lavin, John T.: See—
Biddulph, Michael W.; Kler, Satish C.; and Lavin, John T., 5,091,119, Cl. 261-114.300.
- Lawson, Kevin R., to Imperial Chemical Industries PLC. Pyrimidine compounds. 5,090,992, Cl. 71-92.000.
- Lawson, Rodney A.: See—
D'Antonio, Michael J.; Gibbs, Irving A.; Lane, Lawrence J.; and Lawson, Rodney A., 5,091,690, Cl. 324-107.000.
- Layton, Richard: See—
Huspeni, Paul J.; Layton, Richard; and Frayer, Paul D., 5,091,464, Cl. 524-539.000.
- Lazzari, Jean-Pierre, to Commissariat a l'Energie Atomique. Process for producing a magnetic recording head. 5,090,111, Cl. 29-603.000.
- LC Technologies Inc.: See—
Cleveland, Dixon; Cleveland, James H.; Norloff, Peter L.; Forsythe, Jeffrey A.; and Collier, Richard W., 5,090,797, Cl. 351-210.000.
- Le Centre National d'Etudes Spatiales: See—
Potier, Daniel; Gruau, Jean; and Lecrivain, Albert, 5,090,244, Cl. 73-572.000.
- Leashno, Moshe: See—
Gombos, John M.; and Leashno, Moshe, 5,090,177, Cl. 53-399.000.
- Leavens, James E.: See—
Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., 5,090,972, Cl. 55-20.000.
- Leblanc, Georges-Emile, to G. E. Leblanc Inc. Apparatus for trimming back fat off a pork loin. 5,090,939, Cl. 452-127.000.
- Leclercq, Jean-Louis. Folding shelter, such as a sunshade, shelter for hiking or camping or similar. 5,090,435, Cl. 135-98.000.
- Lecrivain, Albert: See—
Potier, Daniel; Gruau, Jean; and Lecrivain, Albert, 5,090,244, Cl. 73-572.000.
- Ledoux, Patrick R., to Pipe Liners, Inc. Pipe lining process. 5,091,137, Cl. 264-516.000.
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 Kauzlarich, James J.; and Metherell, Colin, 5,090,464, Cl. 152-310.000.
 Malcolm, David B.; and Bunnelle, William L., to H. B. Fuller Licensing & Financing. Book or other graphic arts construction using adhesive resistant to cold flow. 5,090,861, Cl. 412-37.000.
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 Man Roland Druckmaschinen AG: See—
 Lee, Sung C.; and Crum, James N., 5,090,315, Cl. 101-148.000.
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 Bolan, Michale L.; Lee, Robert D.; and Manitt, James P., 5,091,771, Cl. 357-74.000.
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 Sinclair, Cunningham; and Wusthof, Peter, 5,090,295, Cl. 91-491.000.
 Mannesmann Aktiengesellschaft: See—
 Oberger, Heinz U., 5,090,743, Cl. 285-156.000.
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 Marhoff, Paul: See—
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 Marina, Zoltan: See—
 Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.
 Marinex International, Inc.: See—
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 Martens, Veronika: See—
 Muller, Rudolf; Fleischer, Peter; and Martens, Veronika, 5,090,494, Cl. 177-229.000.
 Martin, Patrick S., to General Cryogenics Incorporated. Enthalpy control for CO2 refrigeration system. 5,090,209, Cl. 62-50.300.
 Martynowicz, Lynn M.: See—
 Bopp, Richard C.; and Martynowicz, Lynn M., 5,091,256, Cl. 428-402.000.
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 Sugimori, Tsunetake; Tsukada, Yoji; and Tatsuke, Yasuhiko, 5,091,305, Cl. 435-19.000.
 Marumo, Terumi: See—
 Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Kat-suhiro; Nukada, Katsumi; and Marumo, Terumi, 5,091,276, Cl. 430-45.000.
 Maruyama, Yoshihiro: See—
 Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyuki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.
 Maruzen Petrochemical Co., Ltd.: See—
 Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Sjuji; Nakajima, Ryoichi; and Naito, Sakae, 5,091,072, Cl. 208-39.000.
 Maruzik, Sergei M.; and Efremov, Oleg V., to Poltavsky Meditsinsky Stomatologicheskyy Institut. Single use syringe. 5,090,961, Cl. 604-110.000.
 Marx, Horst, to Oskar Schatz. Latent heat storage means employing barium hydroxide octahydrate as a storage medium. 5,090,475, Cl. 165-10.000.
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 Meyer, Urs; Gartenmann, Niklaus; and Ulrich, Hanspeter, 5,091,687, Cl. 320-2.000.
 Slavik, Walter; Citterio, Giorgio; and Brunecker, Guido, 5,090,190, Cl. 57-264.000.
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 Clark, John I.; Benedek, George B.; Siezen, Roelant J.; Thomson, John A.; and Friedman, Simon H., 5,091,421, Cl. 514-616.000.
 Easson, Donald D., Jr.; Peoples, Oliver P.; and Sinskey, Anthony J., 5,091,376, Cl. 514-54.000.
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Masse, Roger F. Drill head with integral impact hammers. 5,090,487, Cl. 173-111.000.
 Massel, Bruno H., to Bruno's Automotive Products, Inc. Torque converter to driveline coupler for drag-type racing. 5,090,528, Cl. 192-3.340.
 Massey Ferguson Services N.V.: See—
 Weyman, Roger M.; and Barton, John R., 5,090,263, Cl. 74-339.000.
 Massey, Helen M.: See—
 Moore, Geoffrey J.; and Massey, Helen M., 5,091,600, Cl. 570-151.000.
 Massouda, Debora F.: See—
 Casey, Harry B.; Huffman, Todd H.; and Massouda, Debora F., 5,091,261, Cl. 428-511.000.
 Masteller, Millard S.: See—
 DeBord, Terry A.; Kosa, Theodore; and Masteller, Millard S., 5,091,024, Cl. 148-306.000.
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 Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,091,210, Cl. 427-39.000.
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 Takahashi, Tashihiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaro; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkai, 5,090,515, Cl. 187-16.000.
 Masuda, Yutaka: See—
 Okutani, Norio; and Masuda, Yutaka, 5,091,643, Cl. 250-231.140.
 Masuhara, Toshiaki: See—
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 Masumura, Hitoshi: See—
 Iwaya, Shouichi; Hamada, Munemitsu; and Masumura, Hitoshi, 5,091,820, Cl. 361-304.000.
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 Materazzi, Mario: See—
 Politi, Vincenzo; De Luca, Giovanna; Di Stazio, Giovanni; and Materazzi, Mario, 5,091,172, Cl. 424-59.000.
 Materials Protection Company: See—
 Pfaller, Mathew A.; Baker, Kenneth N.; and Say, Richard E., 5,090,924, Cl. 439-807.000.
 Mathies, Richard A.; and Peck, Konan, to University of California, The Regents of the. Laser excited confocal microscope fluorescence scanner and method. 5,091,652, Cl. 250-458.100.
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 Matsuda, Naoyuki: See—
 Yamakoshi, Yukiyo; Takei, Hajime; Matsuda, Naoyuki; Moro, Fuminori; and Tomita, Hiroshi, 5,090,677, Cl. 271-117.000.
 Matsuda, Shohhei; and Haga, Tadatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling hydraulic braking pressure in vehicle. 5,090,781, Cl. 303-103.000.
 Matsuda, Takaaki: See—
 Kondo, Hirofumi; Haga, Shuuichi; and Matsuda, Takaaki, 5,091,269, Cl. 428-695.000.
 Matsuda, Yasuo: See—
 Kobayashi, Yuji; Matsuda, Yasuo; Hosoya, Toshifumi; and Nonaka, Tsuyoshi, 5,091,984, Cl. 385-16.000.
 Matsueda, Akira: See—
 Akatsuka, Yuichiro; Abe, Takayuki; Matsueda, Akira; Rokutan, Takao; and Gocho, Nagahiro, 5,091,635, Cl. 235-494.000.
 Matsufuji, Yohji: See—
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 Matsumoto, Hirotaka: See—
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 Matsumoto, Masaru: See—
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 Matsumoto, Masuo, to Nippon CMK Corp. Process for forming solder lands in a printed wiring board manufacturing method. 5,090,120, Cl. 29-846.000.
 Matsumoto, Naotaka: See—
 Ohno, Akira; Ohtsuka, Tetsuo; and Matsumoto, Naotaka, 5,091,692, Cl. 324-158.00F.
 Matsumoto, Saichi; Mizui, Takuji; and Doteuchi, Masami, to Shionogi & Co., Ltd. Di-tert-butyl(hydroxy)phenylthio substituted hydroxamic acid derivatives. 5,091,569, Cl. 562-621.000.
 Matsumoto, Takahiro: See—
 Maehara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuo; Bessyo, Daisuke; Niwa, Takashi; Kusunoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.
 Matsumoto, Yukio: See—
 Ida, Kazunaga; Yamaki, Makio; Matsumoto, Yukio; Ishihara, Hiroyuki; Naoe, Toshiyuki; and Terauchi, Hideyuki, 5,091,951, Cl. 381-63.000.

- Matsuno, Hidetoshi: See—
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.
- Matsuno, Junichi; Ogasawara, Tsuyoshi; and Kawauchi, Masataka, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Method of and apparatus for separating and feeding sheets. 5,090,676, Cl. 271-12.000.
- Matsuno, Yoshimi: See—
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- Matsuo, Kazuhiro; Murakami, Koichi; Tagawa, Yoichi; and Iizumi, Kenichi, to Canon Kabushiki Kaisha. Sheet binder. 5,090,860, Cl. 412-11.000.
- Matsuo, Naomi: See—
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- Matsuo, Noritada: See—
Yano, Toshihiko; Matsuo, Noritada; Torisu, Yoko; and Dohara, Kazunobu, 5,091,183, Cl. 424-405.000.
- Matsuo, Yasutoshi; and Nakano, Ryo, to Victor Company of Japan, Ltd. Crosstalk cancelling circuit for removing crosstalk component from reproduced signal. 5,091,788, Cl. 358-328.000.
- Matsuoka, Mikiharu: See—
Yamada, Yasuhiro; Miyazaki, Yasuko; Kanemoto, Takashi; Matsuoka, Mikiharu; and Katayama, Hirohiko, 5,091,865, Cl. 395-153.000.
- Matsushita Electric Industrial Co., Ltd.: See—
Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,091,899, Cl. 369-83.000.
- Goto, Shoji; Sakata, Akihiro; Yamamoto, Hiroshi; Saimi, Tetsuo; and Momoo, Kazuo, 5,091,793, Cl. 359-831.000.
- Machara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuo; Bessyo, Daisuke; Niwa, Takashi; Kusunoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.
- Morita, Yoshio, 5,091,758, Cl. 357-17.000.
- Murakami, Mutsuaki; Watanabe, Kazuhiro; Nishiki, Naomi; and Nakamura, Katsuyuki, 5,091,025, Cl. 156-89.000.
- Murakoshi, Toshiichi; Kawazoe, Hiroshi; Takahata, Toshihiro; Inaki, Shigeo; Yamashita, Tatsuo; and Doi, Yoshinori, 5,090,110, Cl. 29-596.000.
- Naganuma, Soichi; Nakamura, Chihiro; and Kanata, Yoshio, 5,091,682, Cl. 318-560.000.
- Nakata, Aki; Yoshida, Masahiro; and Nakajima, Koshiro, 5,090,103, Cl. 29-418.000.
- Ohba, Souji; Shimizu, Ryota; and Ohura, Hideki, 5,091,710, Cl. 335-229.000.
- Okutani, Norio; and Masuda, Yutaka, 5,091,643, Cl. 250-231.140.
- Omata, Yuiji, 5,091,266, Cl. 428-692.000.
- Tsuda, Toshio; Horio, Yasuhiko; Bessho, Yoshihiro; and Ishida, Toru, 5,090,119, Cl. 29-843.000.
- Yoshinaka, Minoru; Asakura, Eizou; Oku, Mitsumasa; Kitano, Motor; and Yoshida, Hideyuki, 5,091,765, Cl. 357-30.000.
- Matsushita Electric & Works Ltd.: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,091,460, Cl. 524-492.000.
- Matsushita, Izumi: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,090,118, Cl. 101-227.000.
- Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hiraishi, Atushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, to Hitachi, Ltd. Semiconductor memory and microprocessor. 5,091,883, Cl. 365-189.050.
- Matsuzawa, Akimi: See—
Ushiyama, Kazuo; Watanabe, Masaki; Uchiyama, Keiji; Takei, Hisayuki; Takahashi, Noriaki; Matsuzawa, Akimi; Ooshiro, Kiyoshi; and Tamura, Hajime, 5,091,067, Cl. 204-129.460.
- Matsuzawa, Takashi: See—
Takayama, Hideto; Tsuruoka, Yoshihiro; Matsuzawa, Takashi; and Nagae, Hiroo, 5,091,155, Cl. 422-88.000.
- Matthews, J. Lester: See—
Gulliya, Kirpal S.; Pervaz, Shazib; Matthews, J. Lester; Dowben, Robert M.; Newman, Joseph T.; and Forest, Edward, 5,091,385, Cl. 514-224.800.
- Mausezahl, Dieter, to Ciba-Geigy Corporation. Red dye mixtures and their use: dyeing natural or synthetic polyamides. 5,090,964, Cl. 8-641.000.
- Maxwell, Ian E.; and Den Otter, Gerrit J., to Shell Oil Company. Process for producing gasoline components. 5,091,074, Cl. 208-79.000.
- May, Marvin M. Hoist apparatus. 5,090,666, Cl. 254-333.000.
- Mayer, Rudi; Denz, Helmut; Wild, Ernst; and Frank, Rainer, to Robert Bosch GmbH. Method and arrangement for checking the operational capability of an exhaust-gas probe heater and the supply system thereof. 5,090,387, Cl. 123-479.000.
- Mayer, Wolfram: See—
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- Mayfield, Howard B.: See—
Merriman, Richard A., Jr.; and Mayfield, Howard B., 5,090,825, Cl. 400-58.000.
- Mazak, William A.: See—
Hey, H. Peter W.; Mazak, William A.; Aggarwal, Ravinder K.; Curtin, John H.; Brown, Paul B.; and Smith, Joe R., 5,091,217, Cl. 427-248.100.
- Mazda Motor Corporation: See—
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- Inoue, Yasushi; and Sakono, Takashi, 5,090,502, Cl. 180-312.000.
- Nakano, Toru; Hatamura, Koichi; and Goto, Tsuyoshi, 5,090,392, Cl. 123-564.000.
- Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, 5,090,203, Cl. 60-612.000.
- Sasaki, Junsou; Hitomi, Mitsuo; Nishikawa, Toshio; and Fujimoto, Hidefumi, 5,090,391, Cl. 123-559.300.
- Tanimoto, Yoshio; Nakahama, Tadimitsu; and Yamane, Takakazu, 5,091,215, Cl. 427-240.000.
- Watanabe, Kenichi; Nishimura, Eiji; Nagaoka, Mitsuru; and Sotoyama, Kaoru, 5,090,510, Cl. 180-197.000.
- Yoshimura, Hiroshi; Bata, Keiji; Takemoto, Kazuo; and Baba, Fumiaki, 5,091,854, Cl. 364-424.100.
- Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogart, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., to Minnesota Mining and Manufacturing Company. Radiation-curable silicone elastomers and pressure sensitive adhesives. 5,091,483, Cl. 525-477.000.
- McAffer, Ian G. C.: See—
Rose, Howard; and McAffer, Ian G. C., 5,090,581, Cl. 215-32.000.
- McAlpin, Michael T.: See—
Miller, James T.; McAlpin, Michael T.; Sanden, Gordon; and Snow, Mark L., 5,090,639, Cl. 244-118.100.
- McAnany, Robert E., to AT&T Bell Laboratories. Connectors including lead alignment strips. 5,090,927, Cl. 439-892.000.
- McCann, Frank, to Chiro Tool Mfg., Corp. Retainer apparatus for a wrench unit. 5,090,275, Cl. 81-177.850.
- McCarty, Perry L.; and Bachmann, Andre, to Stanford University, The Board of Trustees of. Bioconversion reactor. 5,091,315, Cl. 435-287.000.
- McCluskey, Robert T.: See—
Arnaout, M. Amin; McCluskey, Robert T.; and Niles, John L., 5,091,303, Cl. 435-7.240.
- McConnell, Frank E.: See—
Goldbach, Richard A.; Salzer, Richard; and McConnell, Frank E., 5,090,351, Cl. 114-65.00R.
- McCormick, Barry C.: See—
Dean, Alicia; Fitzsimmons, John A.; Havas, Janos; McCormick, Barry C.; and Shah, Prabodh; R., 5,091,103, Cl. 252-162.000.
- McCoy, William C., to Catheter Research, Inc. Catheter with memory element-controlled steering. 5,090,956, Cl. 604-95.000.
- McCoy, William F.; and Thornburgh, Scott, to Great Lakes Chemical Corporation. Industrial antimicrobial uses for 2-(2-bromo-2-nitroethenyl)-furan. 5,090,990, Cl. 71-67.000.
- McCullough, George S.; and Schmidt, George S., to General Electric Company. Combination jack and roller for precision movement of heavy loads. 5,090,664, Cl. 254-104.000.
- McCurdy, Richard J.: See—
Soubeyrand, Michel J.; and McCurdy, Richard J., 5,090,985, Cl. 65-60.520.
- McDermott, Daniel R., to Trihard, S.A. Door/ledge assembly for gravity chute. 5,090,546, Cl. 193-34.000.
- McElroy, Philip J. R. Air cushion kneeling pad. 5,090,055, Cl. 2-24.000.
- McFarland, William D.; and Musil, Joseph E., to Cedarapids, Inc. Dual drum recycle asphalt drying and mixing method and apparatus. 5,090,813, Cl. 366-23.000.
- McGee, Robert J. Hair curling iron for creating an inwardly bending curl and heating apparatus therefor. 5,091,629, Cl. 219-222.000.
- McGraw, Doonan D.: See—
Schenk, Donald E.; and McGraw, Doonan D., 5,090,518, Cl. 188-72.100.
- McGregor, Jean T.: See—
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- McGroarty, Bryan M.; and McGroarty, Patrick J. Composite water barrier sheet. 5,091,234, Cl. 428-143.000.
- McGroarty, Patrick J.: See—
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- McGuffee, Renard R.: See—
Womack, Cleve W.; and McGuffee, Renard R., 5,090,506, Cl. 182-187.000.
- McGuirk, Paul R.: See—
Jefson, Martin R.; and McGuirk, Paul R., 5,091,383, Cl. 514-214.000.
- McIntire, Allen J.: See—
Davis, Geoffrey C. R.; and McIntire, Allen J., 5,091,029, Cl. 156-174.000.
- McKee, Michael J.: See—
Henschen, Homer E.; McKee, Michael J.; Pawlikowski, Joseph M.; Schaeffer, Richard L.; Shaffer, David T.; and Sharpe, Alexander M., 5,090,116, Cl. 29-827.000.
- McKenna, William F.: See—
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- McLachlan, Craig J.: See—
Delgado, Jose A.; Gaul, Stephen J.; Rouse, George V.; and McLachlan, Craig J., 5,091,331, Cl. 437-62.000.

- McLaren, Timothy S.: See—
Kuhns, Roger J.; McLaren, Timothy S.; Nathans, Robert L.; and Smith, Robert F., 5,090,732, Cl. 281-29.000.
- McLay, Bruce A.: See—
Barthold, Scott; and McLay, Bruce A., 5,090,619, Cl. 239-14.200.
- McLeary, David B.: See—
Crawford, John; Kikabhai, Thakor; McLeary, David B.; and Pearce, Andrew, 5,090,966, Cl. 44-314.000.
- McMillan, James S.: See—
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- McMillen, Charles A.; and Christen, Hans D., to Rain Bird Sprinkler Mfg. Corp. Constant drive nozzle for impulse irrigation sprinklers. 5,090,621, Cl. 239-230.000.
- McNeilus Truck and Manufacturing, Inc.: See—
Christenson, Ronald E., 5,090,495, Cl. 180-24.020.
- McNulty, Norbert E. Rotary pump or motor apparatus. 5,090,501, Cl. 180-305.000.
- MDA Scientific, Inc.: See—
Chow, Vincent; and Denenberg, Byron, 5,091,642, Cl. 250-226.000.
- Meany Enterprises, Inc.: See—
Meany, Stacey B.; Meany, Gregory J.; Schropfer, David W.; and Rogers, Harold L., 5,090,735, Cl. 283-67.000.
- Meany, Gregory J.: See—
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- Mechanical Technology Incorporated: See—
Riecke, George T.; and Stotts, Robert E., 5,090,894, Cl. 431-183.000.
- Mediscand (U.S.A.), Inc.: See—
Tse, Tenny P., 5,090,568, Cl. 206-456.000.
- Mee, John D.: See—
Parton, Richard L.; Link, Steven G.; Stegman, David A.; and Mee, John D., 5,091,298, Cl. 430-570.000.
- Meeks, Earl L. Mower. 5,090,185, Cl. 56-16.700.
- Mehler, Klaus-Dieter: See—
Lehmkuhl, Herbert; and Mehler, Klaus-Dieter, 5,091,063, Cl. 205-237.000.
- Meier, Juergen; and Arnold, Gerhard, to Degussa Corporation. Process for bleaching and delignification of lignocellulosic. 5,091,054, Cl. 162-65.000.
- Meier, Paul: See—
Birkenstock, Udo; Scharschmidt, Jurgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, 5,090,997, Cl. 75-338.000.
- Meier, Thomas: See—
Lippi, Bruno; Suter, Ernst; and Meier, Thomas, 5,091,615, Cl. 200-144.00B.
- Meinert, Hasso; Fackler, Rudolf; Mader, Juergen; and Reuter, Peter, to Kali-Chemie AG. Method for preparing perfluorinated heterocyclic compounds, and compounds prepared by this method. 5,091,064, Cl. 204-59.00F.
- Meinhardt, Helmut: See—
Birkenstock, Udo; Scharschmidt, Jurgen; Kunert, Peter; Meinhardt, Helmut; Hausel, Paul; and Meier, Paul, 5,090,997, Cl. 75-338.000.
- Meisel, Donald: See—
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- Melton, Benny: See—
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- Melton, James K.: See—
Shaffer, John H.; Melton, James K.; and Hilliard, Garland E., 5,091,165, Cl. 423-474.000.
- Melvin, Alec: See—
Thomas, Keith M.; Dongworth, Michael R.; and Melvin, Alec, 5,091,891, Cl. 367-144.000.
- Memmi, Massimo; and Giardetti, Gelasio, to Nuova Italsider SpA. Zinc-aluminum based alloy for coating steel products. 5,091,150, Cl. 420-541.000.
- Menicon Co., Ltd.: See—
Nakada, Kazuhiko; Yasuda, Akihiro; and Ichikawa, Makoto, 5,091,121, Cl. 264-1.400.
- Menten, Emmanuel J., to Elbicon N.V. Method and apparatus for sorting a flow of objects as a function of optical properties of the objects. 5,090,576, Cl. 209-587.000.
- Mercedes-Benz AG: See—
Lippert, Reinhold, 5,090,509, Cl. 180-140.000.
- Schumacher, Rolf; and Eissler, Ewald, 5,091,131, Cl. 264-112.000.
- Merck & Co., Inc.: See—
Baldwin, John J.; Ponticello, Gerald S.; Shepard, Kenneth L.; and Williams, Theresa M., 5,091,409, Cl. 514-434.000.
- Evans, Ben E.; Pettibone, Douglas J.; and Friedinger, Roger M., 5,091,387, Cl. 514-278.000.
- Garrity, George M.; Del Val, Sagrario M.; Nallin, Mary; Schmatz, Dennis M.; Smith, Jack L.; VanMiddlesworth, Frank L.; Wilson, Kenneth E.; and Zweerink, Marcia M., 5,091,413, Cl. 514-460.000.
- Hurni, William M.; and Miller, William J., 5,091,300, Cl. 435-5.000.
- King, Anthony O. P.; Karady, Sandor; Anderson, Kevin; Douglas, Alan W.; Abramson, Newton L.; and Shuman, Richard F., 5,091,534, Cl. 546-14.000.
- Nutt, Ruth F.; Ciccarone, Terrence M.; Brady, Stephen F.; and Veber, Daniel F., 5,091,366, Cl. 514-11.000.
- Ondeyka, John; Hensens, Otto; and Liesch, Jerrold, 5,091,389, Cl. 514-291.000.
- Rasmusson, Gary H.; Tolman, Richard L.; and Patel, Gool F., 5,091,380, Cl. 514-169.000.
- Merck Frosst Canada, Inc.: See—
Belanger, Patrice C.; Dufresne, Claude; Fitzsimmons, Brian, deceased; Fitzsimmons, Maryann, Heir; Guindon, Yvan; Lau, Cheuk K.; Rokach, Joshua; Schlegel, John; Thierien, Michel; and Young, Robert N., 5,091,533, Cl. 544-318.000.
- Meriwether, Frank T.; and Block, Robert S., to Maast, Inc. Method and system for scrambling information signals. 5,091,935, Cl. 380-15.000.
- Merkle, Hans P.: See—
Sandow, Jurgen K.; Schmiedel, Rainer; Wirth, Klaus; Merkle, Hans P.; and Raehs, Suzanne, 5,091,365, Cl. 514-9.000.
- MERO-Werke: See—
Bruckner, Gunther, 5,091,042, Cl. 156-584.000.
- Merriman, Richard A., Jr.; and Mayfield, Howard B., to NCR Corporation. Stabilizer for a floating platen. 5,090,825, Cl. 400-58.000.
- Messerschmitt-Bolkow-Blohm GmbH: See—
Kirma, Safa, 5,091,604, Cl. 174-2.000.
- Metherell, Colin: See—
Kauzlarich, James J.; and Metherell, Colin, 5,090,464, Cl. 152-310.000.
- Metoki, Yasuo: See—
Saito, Takeo; Ishida, Yoshiaki; Fukunaga, Nobuyuki; Kimura, Mutsuhiko; and Metoki, Yasuo, 5,090,325, Cl. 102-313.000.
- Metro Machine Corporation: See—
Goldbach, Richard A.; Salzer, Richard; and McConnell, Frank E., 5,090,351, Cl. 114-65.00R.
- Metronic Electronic GmbH: See—
Bucher, Heinz, 5,090,403, Cl. 128-66.000.
- Metzger-Pegau, Karola: See—
Bock, Jurgen; Metzger-Pegau, Karola; and Zeller, Wolfgang, 5,091,136, Cl. 264-320.000.
- Mews, Kenneth F. Pick-up assembly. 5,090,187, Cl. 56-364.000.
- Meyer, Matthias; Stapel, Ralf; Kottmann, Hariolf; and Gries, Thomas, to Hoechst Aktiengesellschaft. Process for the preparation of perfluorinated ethers. 5,091,589, Cl. 568-615.000.
- Meyer, Urs; Gartenmann, Niklaus; and Ulrich, Hanspeter, to Maschinenfabrik Rieter AG. Apparatus for exchanging and charging of energy storages of transport vehicles. 5,091,687, Cl. 320-2.000.
- Meyers, Michael R.: See—
Gilbertson, Thomas A.; and Meyers, Michael R., 5,090,207, Cl. 62-59.000.
- Meylor, Donald M.; and Finn, Patrick J. Flotation separation system. 5,091,083, Cl. 210-219.000.
- Michail, Michel S.; and Struk, James R., to International Business Machines Corporation. Composite logic gate circuit with means to reduce voltage required by logic transistors from external source. 5,091,659, Cl. 307-454.000.
- Michel, David W.: See—
Erickson, Bert K.; Greenwood, Robert R.; Kennedy, Wilbert C.; Michel, David W.; Allen, David C.; and Jacek, Victor J., 5,091,699, Cl. 328-25.000.
- Micheli, Dino: See—
Semeraro, Claudio; Micheli, Dino; Pieraccioli, Daniele; Gavraghi, Giovanni; and Borthwick, Alan D., 5,091,395, Cl. 514-356.000.
- Micro Mega SA: See—
Pernot, Jacques, 5,090,906, Cl. 433-127.000.
- Microelectronics and Computer Technology Corporation: See—
Carey, David H., 5,091,339, Cl. 437-187.000.
- Micron Technology, Inc.: See—
Rolfson, J. Brett, 5,091,290, Cl. 430-327.000.
- Midwest Research Institute: See—
Chum, Helena L.; and Kreibich, Roland E., 5,091,499, Cl. 528-129.000.
- Miescher, Andreas; Gertsch, Peter; and Imhof, Robert, to Maschinenfabrik Wifag. Inking and dampening mechanism for a reversible printing unit of a rotary offset printing press. 5,090,314, Cl. 101-148.000.
- Miescher, Stefan: See—
Oertle, Max; and Miescher, Stefan, 5,090,833, Cl. 403-12.000.
- Mihayashi, Keiji: See—
Nozawa, Yasushi; Ikoma, Hideto; Mihayashi, Keiji; and Shibahara, Yoshihiko, 5,091,293, Cl. 430-503.000.
- Miike, Seiji: See—
Kumano, Akira; Nogami, Hiroyasu; Miike, Seiji; Adachi, Hisahiro; and Amano, Shin-ya, 5,091,876, Cl. 364-419.000.
- Miki, Shigeo: See—
Manami, Hiroshi; Nakazawa, Mikio; Miki, Shigeo; and Nishiuchi, Akihiro, 5,091,564, Cl. 562-416.000.
- Miki, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Adaptive high pass filter having cut-off frequency controllable responsive to input signal and operating method therefor. 5,091,956, Cl. 381-98.000.
- Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, to Canon Kabushiki Kaisha. Plasma CVD of aluminum films. 5,091,210, Cl. 427-39.000.
- Milder, Fredric L.: See—
Moutafis, Timothy E.; and Milder, Fredric L., 5,090,957, Cl. 604-96.000.

- Mileski, Paul; and Kornblith, Jeffrey, to United States of America, Navy. Lightweight deployable antenna system. 5,091,732, Cl. 343-797.000.
- Milewski, Allen E., to AT&T Bell Laboratories. Facsimile-to-speech system. 5,091,931, Cl. 379-100.000.
- Miller, Bernhard: See—
Bonitz, Jorg; Rohde, Siegfried; Miller, Bernhard; and Kunzel, Walter, 5,090,204, Cl. 60-612.000.
- Miller, Daniel H.: See—
Berger, Toby; and Miller, Daniel H., 5,091,975, Cl. 382-56.000.
- Miller, Donald: See—
Hungerford, William G.; Miller, Donald; Griffith, Carl; and Kaiser, Donald, 5,091,863, Cl. 364-510.000.
- Sprow, William; and Miller, Donald, 5,090,477, Cl. 165-150.000.
- Miller, Ellsworth S.: See—
DuRocher, Dan; and Miller, Ellsworth S., 5,090,730, Cl. 280-775.000.
- Miller, James T.; McAlpin, Michael T.; Sanden, Gordon; and Snow, Mark L., to United Parcel Service General Services Co. Cargo-carrying system for passenger aircraft. 5,090,639, Cl. 244-118.100.
- Miller, Jesse D., Jr.: See—
Ko, Kenneth K.; Miller, Jesse D., Jr.; and Von Stetten, Susan M., 5,091,452, Cl. 524-155.000.
- Miller, Lonnie G. D.; and Groves, Gary W., to Monroe Auto Equipment Company. Shock absorber with an electrical connector. 5,090,524, Cl. 188-299.000.
- Miller, Richard A.; and Olsen, David J., to Eastman Kodak Company. Compatibilized epoxy/polyamide compositions containing polyolefins. 5,091,469, Cl. 525-65.000.
- Miller, Theodore C.; and Ross, Michael E., to Sterling Winthrop Inc. Thioxanthene antitumor agents. 5,091,410, Cl. 514-437.000.
- Miller, William E., to National Semiconductor Corporation. Method of late programming MOS devices. 5,091,328, Cl. 437-52.000.
- Miller, William J.: See—
Humi, William M.; and Miller, William J., 5,091,300, Cl. 435-5.000.
- Milner, Richard, to Smith and Nephew plc. Tubular articles. 5,091,442, Cl. 523-122.000.
- Mima, Toshiyuki: See—
Seike, Shoji; Mima, Toshiyuki; Nozaki, Masayuki; Tani, Naoki; and Ikeda, Mitsui, 5,090,793, Cl. 385-100.000.
- Mimoto, Yoshiyuki: See—
Oka, Kengo; Yoshida, Susumu; Mimoto, Yoshiyuki; Ebisuno, Tadashi; and Yabuki, Yoshikazu, 5,090,705, Cl. 273-232.000.
- Mimura, Yoshiyuki: See—
Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151.000.
- Minami, Yoichiro, to NEC Corporation. Direct conversion receiver with dithering local carrier frequency for detecting transmitted carrier frequency. 5,091,921, Cl. 375-88.000.
- Minarik, Milan: See—
Wulff, Gunter; Minarik, Milan; and Oerschkes, Ralf J., 5,091,433, Cl. 521-54.000.
- Mine, Kenji: See—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,090,741, Cl. 285-101.000.
- Mine, Toshiyuki: See—
Hiraiwa, Atsushi; Kimura, Shinichiro; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, 5,091,761, Cl. 357-23.000.
- Minette, Daniel C., to Teleco Oilfield Services Inc. Method for analyzing formation data from a formation evaluation MWD logging tool. 5,091,644, Cl. 250-254.000.
- Minkus, Morton, to Transilwrap Company, Inc. Multi-sheet laminated identification card with tamper resistant, ultrasonic weldments. 5,090,736, Cl. 283-77.000.
- Minnesota Mining and Manufacturing Company: See—
Dustin, Daniel S., 5,091,287, Cl. 430-302.000.
- Gunther, John, 5,091,608, Cl. 174-84.000.
- Heilmann, Steven M.; Moren, Dean M.; Rasmussen, Jerald K.; Krepski, Larry R.; and Pathre, Sadanand V., 5,091,489, Cl. 526-90.000.
- Mazurek, Mieczyslaw H.; Kantner, Steven S.; Leir, Charles M.; Bogaert, Yvan A.; Galkiewicz, Robert K.; and Sherman, Audrey A., 5,091,483, Cl. 525-477.000.
- Zuercher, John L., 5,090,645, Cl. 248-68.100.
- Minolta Camera Kabushiki Kaisha: See—
Hirota, Yoshihiko, 5,091,978, Cl. 382-67.000.
- Minolta Camera Kabushiki Kaisha: See—
Yamakoshi, Yukiyoshi; Takei, Hajime; Matsuda, Naoyuki; Moro, Fuminori; and Tomita, Hiroshi, 5,090,677, Cl. 271-117.000.
- Minowa, Kenji: See—
Sakai, Norio; Minowa, Kenji; and Morihiro, Shinji, 5,091,212, Cl. 427-96.000.
- Miranda, Jesus; and Cleary, Gary W., to Cygnus Therapeutic Systems. Biphasic transdermal drug delivery device. 5,091,186, Cl. 424-448.000.
- Misaki, Hidehiko: See—
Asano, Mutsumi; Kasai, Kiyoshi; and Misaki, Hidehiko, 5,091,267, Cl. 428-694.000.
- Misawa, Shigeyoshi: See—
Yokomori, Kiyoshi; Fujita, Shunsuke; and Misawa, Shigeyoshi, 5,091,982, Cl. 385-4.000.
- Mische, Gerhard. Construction set for a construction project. 5,090,164, Cl. 52-90.000.
- Mita Industrial Co., Ltd.: See—
Maekawa, Takashi; and Kiyoshi, Morimoto, 5,090,679, Cl. 271-125.000.
- Nagai, Hiroyuki; and Miyoshi, Jun, 5,090,675, Cl. 271-10.000.
- Takimoto, Kazushi, 5,090,682, Cl. 271-225.000.
- Yoshida, Seitaro; and Ashida, Kenichi, 5,091,750, Cl. 355-260.000.
- Mitchell, A. Ross, to Madison Chemical Industries Inc. Dual wall tank. 5,090,586, Cl. 220-453.000.
- Mitchell, Charles E. Portable video-photo machine. 5,091,791, Cl. 358-479.000.
- Mitsubishi Denki K.K.: See—
Fujimoto, Akihiko, 5,091,860, Cl. 364-474.110.
- Mohri, Naotake; and Saito, Nagao, 5,091,620, Cl. 219-69.130.
- Ohba, Nobuaki, 5,091,622, Cl. 219-69.150.
- Tatsumi, Kenji; and Hirano, Yoshihito, 5,091,915, Cl. 372-75.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
Asakura, Mikio, 5,091,887, Cl. 365-206.000.
- Demizu, Akira; and Inoue, Hitoshi, 5,090,383, Cl. 123-425.000.
- Hirotsune, Kojo, 5,091,711, Cl. 336-65.000.
- Kawai, Joji, 5,091,842, Cl. 363-98.000.
- Kohara, Masanobu; Kondo, Takashi; and Yama, Yomiyuki, 5,091,772, Cl. 357-74.000.
- Miki, Tsutomu, 5,091,956, Cl. 381-98.000.
- Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyouki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.
- Takahashi, Shinya, 5,091,944, Cl. 381-36.000.
- Tanaka, Toshio, 5,091,044, Cl. 156-607.000.
- Terashima, Tomohide, 5,091,766, Cl. 357-38.000.
- Watanabe, Tetsuya; and Yoshida, Toyohiko, 5,091,853, Cl. 395-375.000.
- Watanabe, Yukari; and Saito, Yuichi, 5,091,874, Cl. 364-715.100.
- Yamamoto, Hiroshi; and Hirata, Juichi, 5,091,614, Cl. 200-144.0A.P.
- Mitsubishi Gas Chemical Co., Ltd.: See—
Arii, Mitsuzo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinnai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.
- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—
Yamasaki, Akira; Takeda, Yoshinaka; Abe, Souhei; and Fukano, Izumi, 5,090,258, Cl. 73-863.030.
- Mitsubishi Kasei Corporation: See—
Fujii, Toshio; Kato, Kazuhiro; Sakai, Akihiko; and Shinohara, Yoshinao, 5,091,228, Cl. 428-34.300.
- Mitsubishi Materials Corporation: See—
Arai, Tatsuo; Haga, Katsumi; Saito, Takayoshi; Shiratori, Hidehisa; Hasegawa, Ryoei; and Iizuka, Kazuo, 5,090,849, Cl. 409-137.000.
- Shirata, Keiji; Sassa, Koichi; and Tomizawa, Kenji, 5,091,043, Cl. 156-601.000.
- Mitsubishi Paper Mills Limited: See—
Kosaka, Takao, 5,091,357, Cl. 503-207.000.
- Mitsubishi Petrochemical Co., Ltd.: See—
Arashiro, Yusuke; Yamauchi, Shinichi; Sano, Hironari; Inoue, Takayuki; and Nishida, Koji, 5,091,473, Cl. 525-92.000.
- Iwane, Hiroshi; Sugawara, Takahiro; and Kaneko, Kimiko, 5,091,592, Cl. 568-730.000.
- Mitsui Engineering & Shipbuilding Co., Ltd.: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.
- Mitsui Petrochemical Industries, Ltd.: See—
Inoue, Hiroshi; Igarashi, Chikara; and Muranaka, Takeshi, 5,091,346, Cl. 501-93.000.
- Ishidoya, Masahiro; Shibato, Kishio; Ohe, Osamu; and Kawasaki, Masaaki, 5,091,492, Cl. 526-282.000.
- Kawarabayashi, Waichiro; Ishii, Yumi; and Takahashi, Shigeru, 5,090,156, Cl. 47-58.000.
- Kioka, Mamoru; Tsutsui, Toshiyuki; and Toyota, Akinori, 5,091,352, Cl. 502-103.000.
- Kioka, Mamoru; and Kasniwa, Norio, 5,091,353, Cl. 502-111.000.
- Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha: See—
Nakabayashi, Nobuo; Honda, Narimichi; Nakamura, Mitsuo; and Sakashita, Takeshi, 5,091,033, Cl. 156-316.000.
- Mitsui Toatsu Chemicals, Inc.: See—
Haseyama, Ryuji; Kuroda, Kazuyuki; Hayashi, Kouzou; Sasagawa, Katsuyoshi; Kano, Taisaku; and Shikai, Kiyoshi, 5,091,496, Cl. 528-73.000.
- Kubota, Yutaka; Shimono, Seiichi; Yanami, Tetsuo; Iwasaki, Tetsuji; and Kurita, Kazuhiko, 5,090,995, Cl. 71-114.000.
- Mitsutsuka, Syuichi, to Clarion Co., Ltd. Surface acoustic wave convolver. 5,091,669, Cl. 310-313.00A.
- Mitsuya, Yoshihide: See—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Youichi, 5,090,831, Cl. 401-52.000.
- Mittag, Michael T., to Electrovert Ltd. Gas curtain additives and zoned tunnel for soldering. 5,090,651, Cl. 228-219.000.
- Miura, Osamu, to Tok Bearing Co., Ltd. One-way damper. 5,090,521, Cl. 188-82.100.
- Miura, Toshihiko: See—
Umetsu, Sachio; Tsuda, Toshio; Azuma, Yusaku; Miura, Toshihiko; Ishihara, Katsumi; and Ohsaka, Teiji, 5,090,113, Cl. 29-714.000.
- Miyaguchi, Hiroshi, to Texas Instruments Incorporated. Still more feature for improved definition television digital processing units, systems, and methods. 5,091,783, Cl. 358-140.000.
- Miyaguchi, Hiroshi, to Texas Instruments Incorporated. Multi-screen feature for improved definition television digital processing units, systems, and methods. 5,091,786, Cl. 358-183.000.

- Miyake, Hiroaki: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshio; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Miyake, Izumi: See—
Maeda, Yutaka; Kaneko, Kiyotaka; Miyake, Izumi; Nakane, Yoshio; and Shimaya, Hiroshi, 5,091,806, Cl. 360-67.000.
- Miyamoto, Fumiyouki: See—
Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyouki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.
- Miyamoto, Kenzo: See—
Yokohori, Shizuo; Miyamoto, Kenzo; Fukushima, Koji; Tsujimoto, Masami; Onda, Kenji; and Sato, Kan, 5,091,026, Cl. 156-149.000.
- Miyayama, Hirofumi: See—
Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyayama, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.
- Miyano, Masateru: See—
Tjoeng, Foe S.; Adams, Steven P.; Garland, Robert B.; and Miyano, Masateru, 5,091,396, Cl. 514-357.000.
- Miyano, Takaya: See—
Tsuchimoto, Junichi; Yamada, Tooru; and Miyano, Takaya, 5,091,338, Cl. 437-184.000.
- Miyaoka, Yasuyuki: See—
Otokawa, Mitsuhiro; Kimura, Shunpei; and Miyaoka, Yasuyuki, 5,091,897, Cl. 369-13.000.
- Miyashita, Kazuo: See—
Fukuzawa, Sooiichi; Hayashi, Seiichi; Hirose, Etsuro; and Miyashita, Kazuo, 5,090,220, Cl. 68-3.00R.
- Miyawaki, Masahumi; Ishimura, Tamihiko; and Ohtsuki, Yoshio, to Oki Electric Industry Co., Ltd. Dual current data bus clamp circuit of semiconductor memory device. 5,091,886, Cl. 365-204.000.
- Miyawaki, Toshi: See—
Mori, Kazuhiko; Miyawaki, Toshi; and Ishii, Hitoshi, 5,091,223, Cl. 427-383.700.
- Miyazaki, Makoto: See—
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; Miyazaki, Makoto; and Inoue, Hiroshi, 5,091,474, Cl. 525-109.000.
- Miyazaki, Yasuko: See—
Yamada, Yasuhiro; Miyazaki, Yasuko; Kanemoto, Takashi; Matsuo, Akiharu; and Katayama, Hirohiko, 5,091,865, Cl. 395-153.000.
- Miyoshi, Jun: See—
Nagai, Hiroyuki; and Miyoshi, Jun, 5,090,675, Cl. 271-10.000.
- Miyoshi Kasei Co., Ltd.: See—
Miyoshi, Ryota; Imai, Isao; and Sugaya, Tadashi, 5,091,013, Cl. 106-505.000.
- Miyoshi, Ryota; Imai, Isao; and Sugaya, Tadashi, to Miyoshi Kasei Co., Ltd. Moisture holding pigment and a cosmetic containing such a pigment. 5,091,013, Cl. 106-505.000.
- Mizia, Franco: See—
Calderoni, Carlo; Mizia, Franco; Rivetti, Franco; and Romano, Ugo, 5,091,556, Cl. 560-24.000.
- Mizoe, Takashi: See—
Kobayashi, Seizo; Mizoe, Takashi; and Iwanami, Yoshimu, 5,091,133, Cl. 264-119.000.
- Mizui, Takuji: See—
Matsumoto, Saichi; Mizui, Takuji; and Doteuchi, Masami, 5,091,569, Cl. 562-621.000.
- Mizuno, Masami: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyosi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.
- Mizushima, Kazuyuki, to NEC Corporation. Method for forming multilayer wirings on a semiconductor device. 5,091,340, Cl. 437-194.000.
- Mizutome, Atsushi: See—
Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,091,723, Cl. 340-784.000.
- Mobay Corporation: See—
Jackman, Dennis E., 5,091,568, Cl. 562-577.000.
- Potter, Terry A.; and Grubbs, Hugh C., 5,091,475, Cl. 525-124.000.
- Mobil Oil Corp.: See—
Chang, Clarence D.; Chu, Cynthia T. W.; Dessau, Ralph M.; Higgins, John B.; Lutner, John D.; and Schlenker, John D., 5,091,073, Cl. 208-46.000.
- Harandi, Mohsen N.; and Owen, Hartley, 5,091,590, Cl. 568-697.000.
- Keller, Lajos E.; Frognet, Jean-Pierre; and Petitjean, Maurice, 5,091,236, Cl. 428-213.000.
- Mochizuki, Masatsugu; Kooda, Kazutaka; Murakami, Siro; Nagata, Naohiko; and Kawaguchi, Mitsuo, to Unitika Ltd. Polyvinyl alcohol monofilament yarns and process for producing the same. 5,091,254, Cl. 428-364.000.
- Moeschler, Heinrich F.: See—
Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Blempl, Manfred, 5,091,375, Cl. 514-50.000.
- Mohri, Hidemasa; Tobita, Michiaki; and Ishida, Masahiko, to Taiho Industries Co., Ltd. Overhead projector sheet for printing by thermal transfer printing and method of printing the same. 5,091,735, Cl. 346-1.100.
- Mohri, Naotake; and Saito, Nagao, to Mitsubishi Denki K.K. Automatic electric discharge machining method and apparatus with periodic sensing of surface roughness of the workpiece. 5,091,620, Cl. 219-69.130.
- Mohrs, Klaus-Helmut: See—
Raddatz, Siegfried; Mohrs, Klaus-Helmut; Fruchtmann, Roman; Kohlsdorfer, Christian; Theisen-Popp, Pia; and Muller-Peddinghaus, Reiner, 5,091,392, Cl. 514-311.000.
- Mol, Hans C.: See—
Foster, Dean H.; and Mol, Hans C., 5,090,181, Cl. 53-569.000.
- Molinari, Egidio, to Erregierre Industria Chimica S.p.A. Process for preparing clotrimazole. 5,091,540, Cl. 548-341.000.
- Moll, Eberhard: See—
Rudolf, Wagner; Bader, Martin; Moll, Eberhard; Zanardo, Renzo; and Van Agtmaal, J. G., 5,090,900, Cl. 432-239.000.
- Mollan, Raymond A. B.; Boyd, Patricia E.; and Brown, John G. Medical diagnostic apparatus. 5,090,417, Cl. 128-691.000.
- Molnar, Karoly: See—
Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.
- Momoo, Kazuo: See—
Goto, Shoji; Sakata, Akihiro; Yamamoto, Hiroshi; Saimi, Tetsuo; and Momoo, Kazuo, 5,091,793, Cl. 359-831.000.
- Momose, Hiroshi: See—
Maeda, Takeo; and Momose, Hiroshi, 5,091,322, Cl. 437-31.000.
- Maeda, Takeo; and Momose, Hiroshi, 5,091,760, Cl. 357-23.400.
- Monkowski, Joseph R.; and Logan, Mark A., to LAM Research Corporation. Chemical vapor deposition method. 5,091,219, Cl. 427-255.500.
- Monnerat, Georgia A., to Dow Chemical Company, The. Cyanate ester resin blends with brominated styrene-containing polymers. 5,091,476, Cl. 525-149.000.
- Monroe Auto Equipment Company: See—
Miller, Lonnie G. D.; and Groves, Gary W., 5,090,524, Cl. 188-299.000.
- Monsanto Company: See—
Castillo, Ernesto J.; Eigenberg, Kenneth E.; Patel, Kanaiyalal R.; and Sabacky, Milton J., 5,091,185, Cl. 424-438.000.
- Moran, James R., 5,091,258, Cl. 428-437.000.
- Riley, Dennis P.; and Rivers, Willie J., Jr., 5,091,561, Cl. 562-17.000.
- Tjoeng, Foe S.; Adams, Steven P.; Garland, Robert B.; and Miyano, Masateru, 5,091,396, Cl. 514-357.000.
- Monson, Chris S. Composite toy having interconnectable toy components. 5,090,935, Cl. 446-101.000.
- Montedipe S.p.A.: See—
Lunardon, Gianflavio; and Gallo, Bruno, 5,091,437, Cl. 521-159.000.
- Montgomery, David M. Boat lift apparatus and system. 5,090,842, Cl. 403-3.000.
- Montgomery, Derek: See—
Kidder, John S.; and Montgomery, Derek, 5,090,791, Cl. 385-18.000.
- Monthony, James F.; Stitt, David T.; Gosnell, C. Michael; and Stewart, Shannon D., to Becton, Dickinson and Company. Biological sample collection and transport device. 5,091,316, Cl. 435-295.000.
- Mookherjee, Braja D.: See—
Wilson, Richard A.; Mookherjee, Braja D.; and Butler, Jerry F., 5,091,423, Cl. 514-690.000.
- Moon, Marcus P., to Du Pont de Nemours, E. I., and Company. Fluoroalkoxy amino triazines for control of weeds in sugar beets. 5,090,993, Cl. 71-93.000.
- Moore, Bruce A.: See—
Hoch, John R., Jr.; and Moore, Bruce A., 5,090,436, Cl. 137-80.000.
- Moore Business Forms, Inc.: See—
Greig, Walter G.; and Ashby, Robert E., 5,090,943, Cl. 462-71.000.
- Traise, John E., 5,090,942, Cl. 462-66.000.
- Moore, Donal, to Polytech Netting Industries, L.P. Automotive barrier net. 5,090,856, Cl. 410-118.000.
- Moore, Geoffrey J.; and Massey, Helen M., to Imperial Chemical Industries PLC. Tetrafluoroethane isomerization. 5,091,600, Cl. 570-151.000.
- Moran, Dan: See—
Gerlitz, Yonatan; Moran, Dan; and Raviv, Roni, 5,090,708, Cl. 273-310.000.
- Moran, James R., to Monsanto Company. Laminate for a safety glazing. 5,091,258, Cl. 428-437.000.
- Moren, Dean M.: See—
Heilmann, Steven M.; Moren, Dean M.; Rasmussen, Jerald K.; Krepski, Larry R.; and Pathre, Sadanand V., 5,091,489, Cl. 526-90.000.
- Mori, Kazuhiko; Miyawaki, Toshi; and Ishii, Hitoshi, to Henkel Corporation. Process for forming a blackened layer on a zinciferous surface by contacting the surface with an aqueous solution containing nickel and cobalt ions. 5,091,223, Cl. 427-383.700.
- Mori, Kazuo: See—
Kii, Katsuya; Okuyama, Yuji; and Mori, Kazuo, 5,090,727, Cl. 280-707.000.
- Mori, Shosei: See—
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, 5,091,109, Cl. 252-299.610.

- Morihiro, Shinji: See—
Sakai, Norio; Minowa, Kenji; and Morihiro, Shinji, 5,091,212, Cl. 427-96.000.
- Morikawa, Yuji; and Tsurumaki, Hayako, to Kabushiki Kaisha Toshiba. Overvoltage protecting circuit. 5,091,818, Cl. 361-56.000.
- Morimoto, Kiyoshi: See—
Fujimoto, Hiroshi; Morimoto, Kiyoshi; and Ishikawa, Takatoshi, 5,091,292, Cl. 430-467.000.
- Morin, Serge: See—
Suret, Michel; Reltgen, Gerard; and Morin, Serge, 5,091,827, Cl. 361-424.000.
- Morioka, Hirohito, to Sharp Kabushiki Kaisha. Printing with automatic on page text replacement without changing memory. 5,090,826, Cl. 400-63.000.
- Morisawa, Satoru; and Sato, Tsutomu, to Asahi Kogyo Kogyo Kabushiki Kaisha. Toner supplying mechanism. 5,091,748, Cl. 355-245.000.
- Morita, Kiyoo, to Fuji Photo Film Co., Ltd. Injection mold having a valve gate system. 5,090,890, Cl. 425-564.000.
- Morita, Shigeki: See—
Okura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, 5,090,339, Cl. 110-263.000.
- Morita, Yoshio, to Matsushita Electric Industrial Co., Ltd. Semiconductor light-emitting devices. 5,091,758, Cl. 357-17.000.
- Moritani, Toshifumi: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Moritzen, Werner: See—
Nohren, Hubert; Moritzen, Werner; Siebrand, Gerhard; and Knoke, Helmut, 5,090,641, Cl. 244-148.000.
- Moriya, Kumiaki: See—
Tate, Hitoshi; Totsuka, Fumio; Horiuchi, Tetuo; and Moriya, Kumiaki, 5,091,143, Cl. 376-282.000.
- Morlock, Ruben D.: See—
Kopecky, Ivyl D.; and Morlock, Ruben D., 5,090,630, Cl. 241-279.000.
- Moro, Fuminori: See—
Yamakoshi, Yukiyo; Takei, Hajime; Matsuda, Naoyuki; Moro, Fuminori; and Tomita, Hiroshi, 5,090,677, Cl. 271-117.000.
- Moroney, Paul: See—
Katznelson, Ron D.; Moroney, Paul; and Shumate, W. Allen, 5,091,936, Cl. 380-19.000.
- Morrison, Larry E.; Royer, Garfield P.; and Cruickshank, Kenneth, to Amoco Corporation. Nucleotide compositions with linking groups. 5,091,519, Cl. 536-29.000.
- Mosca, Joseph O.: See—
Murray, Jerome L.; and Mosca, Joseph O., 5,090,372, Cl. 123-44.00B.
- Moschel, Robert C.; Dolan, M. Eileen; and Pegg, Anthony E., to United States of America, Health and Human Services. O⁶-substituted guanine compounds and methods for depleting O⁶-alkylguanine-DNA alkyltransferase levels. 5,091,430, Cl. 514-262.000.
- Mosure, Duane C.; and Houtz, Norman E., to Sundstrand Corporation. Centrifugal pump. 5,090,868, Cl. 415-207.000.
- Motoe, Katsuro, to Riso Kagaku Corporation. Stencil discharge apparatus. 5,090,310, Cl. 101-114.000.
- Motorola, Inc.: See—
Altman, Leonard F.; and Dorinski, Dale W., 5,091,218, Cl. 427-250.000.
- Cambou, Bertrand F.; Foerstner, Juergen; and Liaw, H. Ming, 5,091,330, Cl. 437-62.000.
- Reed, John D.; Rozanski, Walter J., Jr.; and Lynk, Charles N., Jr., 5,091,906, Cl. 370-94.100.
- Mou, Duen-Gang: See—
Shen, Hwei-Ping; Mou, Duen-Gang; Lim, Kim-Kee; Feng, Paul; and Chen, Chun-Hwei, 5,091,089, Cl. 210-611.000.
- Moulton, James I., to Apple Computer, Inc. Self-terminating coaxial tap connector with external termination element. 5,090,915, Cl. 439-188.000.
- Moutafis, Timothy E.; and Milder, Fredric L., to Abiomed, Inc. Intra-aortic balloon insertion. 5,090,957, Cl. 604-96.000.
- Mowbray, Melton: See—
Reip, Paul; and Mowbray, Melton, 5,090,292, Cl. 89-8.000.
- Mower, Barry D., to Lifetime Products, Inc. Permanent fastener-free pole joint. 5,090,837, Cl. 403-334.000.
- Mueller, Albert: See—
Gaul, Hartmut; and Mueller, Albert, 5,091,839, Cl. 363-41.000.
- Mueller, Bruce E.; and Stoffel, John L., to Hewlett-Packard Company. Inks for bleed-free ink-jet printing on plain paper. 5,091,005, Cl. 106-22.000.
- Mueller, Heinz, to Zinser Textilmaschinen GmbH. Tube gripping apparatus for a textile machine. 5,090,191, Cl. 57-275.000.
- Muk Kim, Young. Decorated pipe for fishing rod and method for making same. 5,090,149, Cl. 43-18.100.
- Mullen, Michael A.; Highland, Henry A.; Taggart, Robert E.; and Lingren, Bill W., to Trece, Inc.; and United States of America, Agriculture. Insect monitoring system. 5,090,153, Cl. 43-114.000.
- Muller, Hanns P.: See—
Jansen, Bernhard; Muller, Hanns P.; Richter, Roland; and Mayer, Wolfram, 5,090,405, Cl. 602-8.000.
- Muller, Klaus-Helmut: See—
Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schall-

ner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.

Muller, Michael: See—
Lehmann, Klaus-Dieter; and Muller, Michael, 5,091,008, Cl. 106-273.100.

Muller-Peddinghaus, Reiner: See—
Raddatz, Siegfried; Mohrs, Klaus-Helmut; Fruchtmann, Roman; Kohlsdorfer, Christian; Theisen-Popp, Pia; and Muller-Peddinghaus, Reiner, 5,091,392, Cl. 514-311.000.

Muller, Rene.; and Daude, Gerard, to Saint-Gobain Vitrage International. Process for the production of a layer of self-cicatrizing polyurethane, and products obtained. 5,091,214, Cl. 437-164.000.

Muller, Rudolf; Fleischer, Peter; and Martens, Veronika, to Sartorius AG. Balance with parallel guide rod guidance. 5,090,494, Cl. 177-229.000.

Muller, Volker: See—
Giesler, Rolf-Dieter; Muller, Volker; and Almen, Karl-Gosta, 5,090,215, Cl. 62-475.000.

Muller, Wolfgang H. E.: See—
Kupper, Friedrich-Wilhelm; Muller, Wolfgang H. E.; and Oberholz, Alfred, 5,091,594, Cl. 568-789.000.

Mullers, Wolfgang: See—
Herd, Karl J.; Frosch, Hans-Georg; Henk, Hermann; Mullers, Wolfgang; and Stohr, Frank-Michael, 5,091,515, Cl. 534-598.000.

Mullet, Paul W.; and Voth, Elmer D., to Excel Industries, Inc. Four-wheel coordinated steering multi-purpose tractor. 5,090,512, Cl. 180-236.000.

Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhate, Deodatta V.; and Webb, Paul, to Secretary of State for Defence in her Britannic Majesty's Gov. of the U.K. Method for preparation of dialkyl tellurium and dialkyl selenium. 5,091,570, Cl. 562-899.000.

Mullner, Martin; Stern, Gerhard; Schulz, Erich; and Rossler, Markus, to Chemie Linz Gesellschaft m.b.H. Process for the preparation of substituted isocyanates. 5,091,553, Cl. 558-302.000.

Mundy, David M.: See—
Wollmerschauser, Steven M.; and Mundy, David M., 5,091,707, Cl. 333-12.000.

Munekata, Masanobu: See—
Sone, Saburo; Munekata, Masanobu; Nakamura, Akito; Uchida, Kiichi; and Seto, Kazumaro, 5,091,511, Cl. 530-351.000.

Murabayashi, Akira: See—
Makisumi, Yasuo; Murabayashi, Akira; Hatta, Takayuki; and Ishiguro, Takeo, 5,091,539, Cl. 548-267.800.

Murai, Hiroko: See—
Nagasawa, Hiroyuki; Inoue, Jun; Takeda, Katsunori; Saito, Keizo; and Murai, Hiroko, 5,091,878, Cl. 364-419.000.

Murakami, Alan E.: See—
Stoner, Aaron Z.; and Murakami, Alan E., 5,090,056, Cl. 2-69.000.

Murakami, Koichi: See—
Matsuo, Kazuhiro; Murakami, Koichi; Tagawa, Yoichi; and Izumi, Kenichi, 5,090,860, Cl. 412-11.000.

Murakami, Mutsuaki; Watanabe, Kazuhiro; Nishiki, Naomi; and Nakamura, Katsuyuki, to Matsushita Electric Industrial Co., Ltd. Process for making a graphite film. 5,091,025, Cl. 156-89.000.

Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; Miyazaki, Makoto; and Inoue, Hiroshi, to Toa Nenryo Kogyo Kabushiki Kaisha. Epoxy resin curing agent based on blends containing disocyanate aromatic diamines. 5,091,474, Cl. 525-109.000.

Murakami, Siro: See—
Mochizuki, Masatsugu; Kooda, Kazutaka; Murakami, Siro; Nagata, Naohiko; and Kawaguchi, Mitsuo, 5,091,254, Cl. 428-364.000.

Murakami, Terukiyo: See—
Katayama, Yoshinori; Murakami, Terukiyo; Asano, Hiroyuki; Abe, Yuichi; Iizuka, Haruhiko; Shimizu, Kazuaki; and Fukai, Yoshio, 5,091,857, Cl. 364-431.090.

Murakawa, Takashi; and Katsuno, Hisashi, to Research Association for Utilization of Light Oil. Catalyst for production of aromatic hydrocarbons. 5,091,351, Cl. 502-66.000.

Murakoshi, Toshiichi; Kawazoe, Hiroshi; Takahata, Toshihiro; Inaki, Shigeo; Yamashita, Tatsuo; and Doi, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing stator for rotating machine. 5,090,110, Cl. 29-596.000.

Muranaka, Takeshi: See—
Inoue, Hiroshi; Igarashi, Chikara; and Muranaka, Takeshi, 5,091,346, Cl. 501-93.000.

Murasaki, Motoshi: See—
Kumano, Shinji; and Murasaki, Motoshi, 5,090,290, Cl. 84-434.000.

Murata Kikai Kabushiki Kaisha: See—
Ohashi, Kenji, 5,090,633, Cl. 242-18.100.

Murata Manufacturing Co., Ltd.: See—
Sakai, Norio; Minowa, Kenji; and Morihiro, Shinji, 5,091,212, Cl. 427-96.000.

Yoshida, Ryuhei, 5,091,671, Cl. 310-358.000.

Murata, Susumu; Matsuo, Naomi; and Sano, Masako, to Kanebo, Ltd. Process for manufacturing molded food. 5,091,201, Cl. 426-285.000.

Murayama, Noboru, to Ricoh Company, Ltd. Image coding method for extracting, segmenting, and coding image contours. 5,091,976, Cl. 382-56.000.

Murdock, Thomas K.: See—
Arfert, Horst F.; Donaldson, Roger H.; Murdock, Thomas K.; and Whitlock, Barry M., 5,090,175, Cl. 52-309.110.

Murib, Jawad H.; and Baugh, William D., to Quantum Chemical Corporation. Process for the preparation of alkyl 4-oxobutyrates and its acetals. 5,091,559, Cl. 560-175.000.

Murphy, Anthony J. Leak detection and alarm system. 5,091,715, Cl. 340-604.000.

Murray, Jerome L.; and Mosca, Joseph O., to Murray, Jerome L. Rotary internal combustion engine. 5,090,372, Cl. 123-44.00B.

Murray, Thomas C.: See—
Kenyon, Lee G.; and Murray, Thomas C., 5,090,923, Cl. 439-783.000.

Murschall, Ursula: See—
Schloegl, Gunter; Bothe, Lothar; Crass, Guenther; Murschall, Ursula; and Peiffer, Herbert, 5,091,237, Cl. 428-215.000.

Murty, Balarama V.; and Henry, Rassem R., to General Motors Corporation. Active vehicle suspension with brushless dynamoelectric actuator. 5,091,679, Cl. 318-153.000.

Musil, Joseph E.: See—
McFarland, William D.; and Musil, Joseph E., 5,090,813, Cl. 366-23.000.

Muto, Yoshiaki: See—
Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsunori; and Shiroyanagi, Yoshiro, 5,091,909, Cl. 371-40.100.

N.C.T. Ltd.: See—
Geller, Yair; Berman, Michael; and Katsav, Orit, 5,091,861, Cl. 364-474.340.

Nabisco Brands, Inc.: See—
Athanasios, Albert K.; and Templeman, Gareth J., 5,091,117, Cl. 260-428.000.

Naef, Rudolf, to Ciba-Geigy Corporation. Azo dyes containing 4-aminopyrazolothiazole diazo compound. 5,091,517, Cl. 534-752.000.

Nagae, Hiroo: See—
Takayama, Hideto; Tsuruoka, Yoshihiro; Matsuzawa, Takashi; and Nagae, Hiroo, 5,091,155, Cl. 422-88.000.

Nagae, Yoshiharu: See—
Kitajima, Masaaki; Ohwada, Jun-ichi; and Nagae, Yoshiharu, 5,091,722, Cl. 340-784.000.

Nagai, Hiroyuki; and Miyoshi, Jun, to Mita Industrial Co., Ltd. Apparatus for automatically transporting sheets of original. 5,090,675, Cl. 271-10.000.

Nagai, Kimie; Najjoh, Schuichi; Kurotaki, Ayako; Shirane, Koro; and Inoue, Chozo, to Showa Denko K.K. Amino acid derivative having liquid crystal property and process for production of the same. 5,091,557, Cl. 560-39.000.

Nagai, Kiyotaka: See—
Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,091,899, Cl. 369-83.000.

Nagami, Yuji: See—
Futami, Yuichi; and Nagami, Yuji, 5,090,946, Cl. 474-104.000.

Nagano, Yasutoshi: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,091,460, Cl. 524-492.000.

Naganuma, Soichi; Nakamura, Chihiro; and Kanata, Yoshio, to Matsushita Electric Industrial Co., Ltd. Screw adjusting apparatus. 5,091,682, Cl. 318-560.000.

Nagaoka, Mitsuru: See—
Watanabe, Kenichi; Nishimura, Eiji; Nagaoka, Mitsuru; and Sotoyama, Kaoru, 5,090,510, Cl. 180-197.000.

Nagasawa, Hiroyuki; Inoue, Jun; Takeda, Katsunori; Saito, Keizo; and Murai, Hiroko, to Sharp Kabushiki Kaisha. Word processing apparatus. 5,091,878, Cl. 364-419.000.

Nagashima, Yasuo: See—
Kato, Mikihiro; Hashimoto, Hiroshi; Endo, Yasushi; and Nagashima, Yasuo, 5,091,238, Cl. 428-64.000.

Nagata, Naohiko: See—
Mochizuki, Masatsugu; Kooda, Kazutaka; Murakami, Siro; Nagata, Naohiko; and Kawaguchi, Mitsuo, 5,091,254, Cl. 428-364.000.

Nagata, Osamu; Endo, Yoshinori; and Seo, Keiji, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus controllable to one of exposure condition and pressure developing condition. 5,091,743, Cl. 355-30.000.

Nagata, Yujiro: See—
Yamazaki, Shunpei; and Nagata, Yujiro, 5,091,334, Cl. 437-101.000.

Nagayama, Makoto: See—
Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, 5,090,764, Cl. 296-107.000.

Nagoya Oilchemical Co., Ltd.: See—
Horiki, Seinosuke; and Makino, Reiji, 5,091,220, Cl. 427-272.000.

Naijoh, Schuichi: See—
Nagai, Kimie; Naijoh, Schuichi; Kurotaki, Ayako; Shirane, Koro; and Inoue, Chozo, 5,091,557, Cl. 560-39.000.

Naito, Sakae: See—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Sjuji; Nakajima, Ryoichi; and Naito, Sakae, 5,091,072, Cl. 208-39.000.

Naka, Michiru: See—
Nakane, Toshio; Hijikata, Kenji; Iiyama, Makoto; Kageyama, Yukihiro; and Naka, Michiru, 5,091,259, Cl. 428-457.000.

Nakabayashi, Nobuo; Honda, Narimichi; Nakamura, Mitsuo; and Sakashita, Takeshi, to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha. Adhesive for ceramics and processes for the bonding of ceramics using same. 5,091,033, Cl. 156-316.000.

Nakada, Kazuhiko; Yasuda, Akihiro; and Ichikawa, Makoto, to Menicon Co., Ltd. Production of a balloon for an intraocular lens. 5,091,121, Cl. 264-1.400.

Nakagaki, Shintaro: See—
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,091,277, Cl. 430-48.000.

Nakagawa, Hiroto: See—
Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto; and Oono, Yasuteru, 5,090,872, Cl. 417-53.000.

Nakahama, Tadamitsu: See—
Tanimoto, Yoshio; Nakahama, Tadamitsu; and Yamane, Takakazu, 5,091,215, Cl. 427-240.000.

Nakahara, Toshiaki; Tanikawa, Hirohide; Yoshida, Satoshi; Fujiwara, Masatsugu; and Sakashita, Kiichiro, to Canon Kabushiki Kaisha. Developer with silicic acid powder for developing electrostatic image. 5,091,279, Cl. 430-106.600.

Nakaishi, Akio: See—
Sawaki, Toru; Nakaishi, Akio; Shimada, Keizo; and Watanabe, Takashi, 5,091,271, Cl. 428-698.000.

Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyo; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Composition of polyepoxy compounds, linear polymer and aromatic diamine. 5,091,481, Cl. 525-423.000.

Nakajima, Hitoshi; and Yokoyama, Akinori, to Asahi Kasei Kogyo Kabushiki Kaisha. Conductive metal powders, process for preparation thereof and use thereof. 5,091,114, Cl. 252-514.000.

Nakajima, Jun; Funayama, Yoshihiro; and Otsuka, Kazuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Movable step for motorcycle. 5,090,715, Cl. 280-166.000.

Nakajima, Kiyoharu, to Hitachi Seiko, Ltd. Mechanisms for driving punch pins in punching apparatus. 5,090,284, Cl. 83-577.000.

Nakajima, Koshiro: See—
Nakata, Akio; Yoshida, Masahiro; and Nakajima, Koshiro, 5,090,103, Cl. 29-418.000.

Nakajima, Ryoichi: See—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Sjuji; Nakajima, Ryoichi; and Naito, Sakae, 5,091,072, Cl. 208-39.000.

Nakajima, Yasushi: See—
Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,091,899, Cl. 369-83.000.

Nakamichi, Toshihiko: See—
Souma, Thoru; Ishidoya, Masahiro; Nakamichi, Toshihiko; and Takai, Naoki, 5,091,010, Cl. 106-403.000.

Nakamura, Akito: See—
Sone, Saburo; Munekata, Masanobu; Nakamura, Akito; Uchida, Kiichi; and Seto, Kazumaro, 5,091,511, Cl. 530-351.000.

Nakamura, Chihiro: See—
Naganuma, Soichi; Nakamura, Chihiro; and Kanata, Yoshio, 5,091,682, Cl. 318-560.000.

Nakamura, Eitaro: See—
Hori, Toshihiko; Nakamura, Eitaro; and Arai, Toyochi, 5,091,487, Cl. 526-87.000.

Nakamura, Hiroshi; and Ogiwara, Nagao, to Fuji Photo Film Co., Ltd. Image recording apparatus and method. 5,091,281, Cl. 430-203.000.

Nakamura, Katsunori: See—
Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsunori; and Shiroyanagi, Yoshiro, 5,091,909, Cl. 371-40.100.

Nakamura, Katsuyuki: See—
Murakami, Mutsuaki; Watanabe, Kazuhiro; Nishiki, Naomi; and Nakamura, Katsuyuki, 5,091,025, Cl. 156-89.000.

Nakamura, Kenichi, to Tokico, Ltd. Suspension control system. 5,090,726, Cl. 280-707.000.

Nakamura, Mitsuo: See—
Nakabayashi, Nobuo; Honda, Narimichi; Nakamura, Mitsuo; and Sakashita, Takeshi, 5,091,033, Cl. 156-316.000.

Nakamura, Shinichi: See—
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, 5,091,109, Cl. 252-299.610.

Nakamura, Shoshiro: See—
Iwasaki, Hiroya; Fujimura, Katsuyuki; Inoue, Yoshio; and Nakamura, Shoshiro, 5,091,312, Cl. 435-191.000.

Nakamura, Tatsuya, to Toda Kogyo Corp. Cobalt titanate particles and process for producing the same. 5,091,012, Cl. 106-440.000.

Nakamura, Tomio: See—
Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, 5,091,285, Cl. 430-296.000.

Nakane, Shigeru: See—
Satoh, Yasuta; Nakane, Shigeru; Saitoh, Shinya; and Kataoka, Isamu, 5,090,936, Cl. 446-175.000.

Nakane, Toshio; Hijikata, Kenji; Iiyama, Makoto; Kageyama, Yukihiro; and Naka, Michiru, to Polyplastics Co., Ltd. Electric wire coated with a halogen-containing polyester resin composition. 5,091,259, Cl. 428-457.000.

Nakane, Yoshio: See—
Maeda, Yutaka; Kaneko, Kiyotaka; Miyake, Izumi; Nakane, Yoshio; and Shimaya, Hiroshi, 5,091,806, Cl. 360-67.000.

Nakano, Ryo: See—
Matsuo, Yasutoshi; and Nakano, Ryo, 5,091,788, Cl. 358-328.000.

Nakano, Toru; Hatamura, Koichi; and Goto, Tsuyoshi, to Mazda Motor Corporation. Control system for engine with supercharger. 5,090,392, Cl. 123-564.000.

Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichi; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Method of bonding metals, and method and apparatus for producing

semiconductor integrated circuit device using said method of bonding metals. 5,090,609, Cl. 228-123.000.

Nakashima, Norihiko, to Kao Corporation. Thermosensitive recording member. 5,091,356, Cl. 503-200.000.

Nakata, Akio; Yoshida, Masahiro; and Nakajima, Koshiro, to Matsushita Electric Industrial Co., Ltd. Method of fastening screw members which are supported by a fastener carrier. 5,090,103, Cl. 29-418.000.

Nakata, Moritsune: See—
Ito, Hideo; Tonomura, Hiroshi; Nakata, Moritsune; and Kobiki, Yasuhiko, 5,090,766, Cl. 296-180.500.

Nakatani, Mikio: See—
Kano, Minoru; Negami, Kiyoshi; and Nakatani, Mikio, 5,090,171, Cl. 52-243.100.

Nakatani, Tomofumi: See—
Ariyoshi, Takashi; Kawamoto, Toshiki; Yasuda, Seigou; Kuriki, Syoji; and Nakatani, Tomofumi, 5,091,947, Cl. 381-42.000.

Nakatsukasa, Tetsuya, to Asmo Co., Ltd. Geared motor. 5,090,261, Cl. 74-89.140.

Nakawaki, Yasunori: See—
Suzuki, Mikio; Suto, Satoshi; Okuda, Ikuo; Nakawaki, Yasunori; and Abe, Akihara, 5,090,881, Cl. 418-26.000.

Nakayama, Akira, to Nissan Motor Company, Ltd. Method of producing curved-toothed bevel gear. 5,090,161, Cl. 51-287.000.

Nakayama, Nobuyuki: See—
Sakumoto, Yukinori; Yokoyama, Shigeyuki; Shibuya, Akihiro; Nakayama, Nobuyuki; and Koshimura, Atsushi, 5,091,251, Cl. 428-352.000.

Nakayama, Takashi: See—
Suzuki, Toshiaki; Kitagawa, Sotoyuki; Nakayama, Takashi; and Kuno, Takao, 5,091,435, Cl. 521-134.000.

Nakazato, Youichi: See—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Youichi, 5,090,831, Cl. 401-52.000.

Nakazawa, Mikio: See—
Manami, Hiroshi; Nakazawa, Mikio; Miki, Shigeo; and Nishiuchi, Akihiro, 5,091,564, Cl. 562-416.000.

Nalco Chemical Company: See—
Connelly, Lawrence J.; Abbattello, Steven J.; Davis, David C.; and Undlin, David A., 5,091,159, Cl. 423-122.000.

Harder, Scott R.; Soderquist, Cynthia A.; and Pierce, Claudia C., 5,091,108, Cl. 252-188.280.

Trivetti, Robert L., 5,091,100, Cl. 252-49.500.

Nalette, Timothy A.: See—
Birbara, Philip J.; and Nalette, Timothy A., 5,091,358, Cl. 502-412.000.

Nallin, Mary: See—
Garritty, George M.; Del Val, Sagrario M.; Nallin, Mary; Schmatz, Dennis M.; Smith, Jack L.; VanMiddlesworth, Frank L.; Wilson, Kenneth E.; and Zweerink, Marcia M., 5,091,413, Cl. 514-460.000.

Nandou, Kenji: See—
Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.

Nanos, Nicholas M.; and Scharer, Roger M., to General Binding Corporation. Automatic binding machine using insertion tools. 5,090,859, Cl. 412-11.000.

Naoe, Toshiyuki: See—
Ida, Kazunaga; Yamaki, Makio; Matsumoto, Yukio; Ishihara, Hiroyuki; Naoe, Toshiyuki; and Terauchi, Hideyuki, 5,091,951, Cl. 381-63.000.

NAPCO Scientific Company: See—
Swan, Alan J.; and Trinh, Tuan A., 5,090,617, Cl. 236-3.000.

Nappa, Mario J., to Du Pont de Nemours, E. I., and Company. Preparation of anhydrous niobium and tantalum pentafluorides. 5,091,168, Cl. 423-489.000.

Nara, Toshihiko: See—
Takahashi, Tatsuhiro; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaru; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.

Narang, Subhash C.; Ventura, Susanna; and Bhardwaj, Tilak R., to General Petrochemical Industries Ltd. Tetraketone porphyrin monomers and the porphyrin-based polymers thereof. 5,091,502, Cl. 528-229.000.

Narita, Toshio, to Seiko Epson Corporation. Thermal print head. 5,091,736, Cl. 346-76.0PH.

Narlo, Jeanie R. Multiple three dimensional facial display system. 5,090,910, Cl. 434-82.000.

Narubin, Gunar: See—
Shapiro, Bruce; and Narubin, Gunar, 5,090,127, Cl. 33-27.020.

Naruke, Kiyomi, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device and method of operating the same. 5,091,882, Cl. 365-185.000.

Naslund, Ulf W., to Aktiebolaget Electrolux. Supporting device for a steering mechanism. 5,090,839, Cl. 403-391.000.

Nassar, Alan E. Screw gun nose cone adapter. 5,090,545, Cl. 192-34.000.

Nath, Prem; Call, Jon; Didio, Gary M.; and Hoffman, Kevin, to United Solar Systems Corporation. Chemically active isolation passageway for deposition chambers. 5,090,356, Cl. 118-718.000.

Nathans, Robert L.: See—
Kuhns, Roger J.; McLaren, Timothy S.; Nathans, Robert L.; and Smith, Robert F., 5,090,732, Cl. 281-29.000.

National d'Etudes et de Recherches Aerospatiales (ONERA): See—
Noireaux, Patrick; Jamet, Jean; Parlier, Michel; and Bacos, Marie-Pierre, 5,091,485, Cl. 525-478.000.

National Research Development Corp.: See—
Baker, Roger C.; and Higham, Edward H., 5,090,240, Cl. 73-197.000.

National Science Council: See—
Hsiue, Ging-Ho; Hsu, Chain-Shu; Hsieh, Chang-Jyh; and Chen, Deng-Shan, 5,091,274, Cl. 429-192.000.

National Semiconductor Corporation: See—
Bergemont, Albert M., 5,091,327, Cl. 437-43.000.

Cleaves, James M.; Heard, James G.; and Tan, Zoilo C. H., 5,091,047, Cl. 156-643.000.

Miller, William E., 5,091,328, Cl. 437-52.000.

Thomas, Michael E., 5,091,048, Cl. 156-643.000.

National Tinsel Manufacturing Company: See—
Protz, William F., Jr., 5,091,226, Cl. 428-10.000.

Natori, Yuji: See—
Nonogaki, Masayasu; Arai, Fumiaki; Natori, Yuji; and Yamaguchi, Hideyuki, 5,091,257, Cl. 428-411.100.

Natur-All Systems, Inc.: See—
See, Jackie R., 5,091,192, Cl. 424-528.000.

Nave, Bart I. Shoe printing process and apparatus. 5,090,320, Cl. 101-485.000.

Navot, Daniel. Fertility prediction by use of clomiphene challenge test. 5,091,170, Cl. 424-9.000.

Naylor, Alan: See—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; and Naylor, Alan, 5,091,422, Cl. 514-653.000.

NCR Corporation: See—
Datsko, George; and Ross, William J., 5,091,870, Cl. 364-565.000.

Higgins, Raymond L.; and Golem, Dennis W., 5,091,968, Cl. 382-30.000.

Lee, James W.; Ditonto, Michael A.; and Roddy, Dale W., 5,090,829, Cl. 400-705.100.

Merriman, Richard A., Jr.; and Mayfield, Howard B., 5,090,825, Cl. 400-58.000.

Neale, Philip J.: See—
Heafield, Joanne; Leslie, Stewart I.; Malkowska, Sandra T. A.; and Neale, Philip J., 5,091,189, Cl. 424-457.000.

NEC Corporation: See—
Goto, Fumio, 5,091,225, Cl. 427-430.100.

Kagami, Akihiko, 5,091,884, Cl. 365-200.000.

Kametani, Jun, 5,091,948, Cl. 381-42.000.

Minami, Yoichiro, 5,091,921, Cl. 375-88.000.

Mizushima, Kazuyuki, 5,091,340, Cl. 437-194.000.

Ozawa, Kazunori, 5,091,946, Cl. 381-36.000.

Uehira, Kazuo, 5,091,922, Cl. 377-58.000.

Yamazaki, Yasushi, 5,091,768, Cl. 357-71.000.

NEC Home Electronics, Ltd.: See—
Thompson, John R.; Hunting, C. J.; Phipps, William L.; Raynesford, Steven J.; and Rittmueller, Philip H., 5,091,938, Cl. 380-21.000.

Needle, David L.; and Stribling, Bradley C., to Rose Communications, Inc. Secure voice data transmission system. 5,091,941, Cl. 380-43.000.

Negami, Kiyoshi: See—
Kano, Minoru; Negami, Kiyoshi; and Nakatani, Mikio, 5,090,171, Cl. 52-243.100.

Nelson, Bruce N.; and Cooper, Ronald F., to Geo-Centers, Inc. Fast optical switch having reduced light loss. 5,090,824, Cl. 385-22.000.

Nelson, Eleanor C.: See—
Nelson, W. O., 5,090,580, Cl. 212-180.000.

Nelson, Robert T. Surface treating apparatus. 5,090,162, Cl. 51-425.000.

Nelson, Thomas E.; and Brock, Walter S., to EMCO Electronics. Liquid line leak detection method and apparatus. 5,091,716, Cl. 340-605.000.

Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. Lightly bonded polyamide yarns and process therefor. 5,091,030, Cl. 156-180.000.

Nelson, W. O., to Nelson, Walbert O.; and Nelson, Eleanor C. Trunk-mounted portable crane. 5,090,580, Cl. 212-180.000.

Nelson, Walbert O.: See—
Nelson, W. O., 5,090,580, Cl. 212-180.000.

Nemoto & Co., Ltd.: See—
Takayama, Hideto; Tsuruoka, Yoshihiro; Matsuzawa, Takashi; and Nagae, Hirao, 5,091,155, Cl. 422-88.000.

Nencioni, Luciano: See—
Mariotti, Sabina; Sisto, Alessandro; Nencioni, Luciano; Villa, Luigi; and Verdini, Antonio S., 5,091,510, Cl. 530-330.000.

NeoRx Corporation: See—
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; VanderHeyden, Jean-Luc; and Srinivasan, Ananthachari, 5,091,514, Cl. 534-14.000.

Nesbitt, Loyd B.: See—
Dillmann, Charles W.; Townsend, Herold E.; and Nesbitt, Loyd B., 5,091,144, Cl. 376-283.000.

Nesheiwat, Affi M.; and Geibel, Jon F., to Phillips Petroleum Company. Recovery of poly(arylene sulfide ketone) and poly(arylene sulfide diketone) resins. 5,091,509, Cl. 528-481.000.

Neumann, Ulrich: See—
Junius, Martina; Neumann, Ulrich; and von der Eltz, Herbert, 5,091,527, Cl. 544-102.000.

Neumiller, Phillip J., to S. C. Johnson & Son, Inc. Aqueous emulsion and aerosol delivery system using same. 5,091,111, Cl. 252-305.000.

Neustadt, Jerome. Electric light globe hub. 5,091,836, Cl. 362-391.000.

New Japan Chemical Co., Ltd.: See—
Manami, Hiroshi; Nakazawa, Mikio; Miki, Shigeo; and Nishiuchi, Akihiro, 5,091,564, Cl. 562-416.000.

New, Kevin. Easily accessible smoke curtain assembly. 5,090,163, Cl. 52-39.000.

Newhouse, Daniel L.; Cernohlavek, Leemer; and Lochhaas, Philip D., to Analytical Bio-Chemistry Laboratories, Inc. Single-loop chromatography system and method. 5,091,092, Cl. 210-635.000.

Newman, Don: See—
Chiang, Sai M.; and Newman, Don, 5,090,145, Cl. 40-605.000.

Newman, Joseph T.: See—
Gulliya, Kirpal S.; Pervaiz, Shazib; Matthews, J. Lester; Dowben, Robert M.; Newman, Joseph T.; and Forest, Edward, 5,091,385, Cl. 514-224.800.

Newman, Lawrence E.: See—
Banner, Alvin C.; Bradfute, John W.; Dolgas, Patrick A.; and Newman, Lawrence E., 5,090,108, Cl. 29-596.000.

Newman, Paul: See—
Nightingale, Douglas J.; Roberts, Martyn G.; and Newman, Paul, 5,090,198, Cl. 60-261.000.

Newman, Peter J.; and Aster, Richard H., to Blood Center of South-eastern Wisconsin, Inc., The. Polymorphism of human platelet membrane glycoprotein IIIa and diagnostic and therapeutic applications thereof. 5,091,302, Cl. 435-6.000.

Newton, Alan. Rail joint. 5,090,618, Cl. 238-218.000.

NGK Insulators, Ltd.: See—
Makino, Mikio; and Horikawa, Osamu, 5,090,473, Cl. 165-8.000.

Seike, Shoji; Mima, Toshiyuki; Nozaki, Masayuki; Tani, Naoki; and Ikeda, Mitsui, 5,090,793, Cl. 385-100.000.

Uchida, Munenori; and Bates, Donald A., 5,090,472, Cl. 164-489.000.

NGK Metals Corporation: See—
Uchida, Munenori; and Bates, Donald A., 5,090,472, Cl. 164-489.000.

NGK Spark Plug Co., Ltd.: See—
Itoh, Tsuneo; and Nishiuchi, Kozo, 5,090,374, Cl. 123-179.600.

Nguyen, Chi-Hung: See—
Bisagni, Emile; and Nguyen, Chi-Hung, 5,091,388, Cl. 514-285.000.

Nichias Corporation: See—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 5,091,128, Cl. 264-60.000.

Nichols, Carl S.: See—
Blaser, Eric J.; and Nichols, Carl S., 5,091,504, Cl. 528-272.000.

Nicholson, James E.: See—
Simon, John G.; and Nicholson, James E., 5,090,424, Cl. 128-885.000.

Nickel, Wolf-Ulrich; Henning, Rainer; Ruger, Wolfgang; Lerch, Ulrich; Urbach, Hansjorg; Hock, Franz; and Wiemer, Gabriele, to Hoechst Aktiengesellschaft. Piperazinediones having a psychotropic action. 5,091,427, Cl. 514-249.000.

Nicolson Corporation: See—
Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., 5,091,247, Cl. 428-255.000.

Nielsen, Bjorn. Blood sampling equipment with needle holder and vacuum vial. 5,090,420, Cl. 128-764.000.

Nifeo Inc.: See—
Kobayashi, Yasutomo, 5,090,751, Cl. 292-71.000.

Nigam, Anil K. Two-motor servo mechanism system for a magnetic disk drive. 5,091,808, Cl. 360-78.050.

Nightingale, Douglas J.; Roberts, Martyn G.; and Newman, Paul, to Rolls-Royce Inc. & Rolls-Royce plc. Mounting assembly. 5,090,198, Cl. 60-261.000.

Nihon Seiki Co., Ltd.: See—
Otsuka, Naotoshi, 5,090,266, Cl. 74-425.000.

Nikaido, Masataka: See—
Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,091,899, Cl. 369-83.000.

Niki, Hirokazu: See—
Onishi, Yasunobu; Niki, Hirokazu; Kobayashi, Yoshihito; Hayase, Rumiko; and Ushirogouchi, Toru, 5,091,282, Cl. 430-270.000.

Nikon Corporation: See—
Kanai, Hachiro; Sosa, Toshio; and Fukuhara, Tohru, 5,091,741, Cl. 354-400.000.

Niles, John L.: See—
Arnaut, M. Amin; McCluskey, Robert T.; and Niles, John L., 5,091,303, Cl. 435-7.240.

Nimberger, Spencer M. Self-relieving fluid regulator. 5,090,438, Cl. 137-116.500.

Ninomiya, Fujio: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyoshi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.

Nintz, Eckhard: See—
Weber, Heinz; Ehrmann, Gerd; Dietzen, Franz-Josef; Nintz, Eckhard; and Zettler, Hans D., 5,091,126, Cl. 264-53.000.

Nippon Centronix, Ltd.: See—
Iwase, Masanori, 5,090,999, Cl. 75-433.000.

Nippon Chemiphar Co., Ltd.: See—
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,091,403, Cl. 514-398.000.

Nippon CMK Corp.: See—
Matsumoto, Masuo, 5,090,120, Cl. 29-846.000.

Nippon Oil Co., Ltd.: See—
Kobayashi, Seizo; Mizoe, Takashi; and Iwanami, Yoshimu, 5,091,133, Cl. 264-119.000.

Nippon Oil and Fats Company, Limited: See—
Higuchi, Yoshiki; and Suyama, Shuji, 5,091,586, Cl. 568-332.000.

Ishidoya, Masahiro; Shibato, Kishio; Ohe, Osamu; and Kawasaki, Masaaki, 5,091,492, Cl. 526-282.000.

Souma, Thoru; Ishidoya, Masahiro; Nakamichi, Toshihiko; and Takai, Naoto, 5,091,010, Cl. 106-403.000.

Nippon Seiko Kabushiki Kaisha: See—
Tsukada, Toru, 5,090,821, Cl. 384-44.000.

Nippon Zeon Co., Ltd.: See—
Hori, Toshihiko; Nakamura, Eitaro; and Arai, Toyochi, 5,091,487, Cl. 526-87.000.

Suzuki, Shoji; and Yamato, Motoyuki, 5,091,263, Cl. 428-518.000.

Nippondenso Co., Ltd.: See—
Ikuta, Kenji; Kondo, Toshio; and Haraguchi, Hiroshi, 5,090,199, Cl. 60-276.000.

Nishi, Seiki: See—
Watanabe, Mikio; and Nishi, Seiki, 5,091,787, Cl. 358-209.000.

Nishida, Koji: See—
Arashiro, Yusuke; Yamauchi, Shinichi; Sano, Hironari; Inoue, Takayuki; and Nishida, Koji, 5,091,473, Cl. 525-92.000.

Nishida, Reiziro; and Tominaga, Akira, to Kansai Paint Co., Ltd. Cationic electrodeposition coating resin composition based on vinylcyclohexene oxide-alkylene oxide copolymers. 5,091,446, Cl. 523-404.000.

Nishijima, Tomio: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,090,318, Cl. 101-227.000.

Nishijima, Toyoki; and Tanji, Masaki, to Konica Corporation. Silver halide color photographic material. 5,091,294, Cl. 430-505.000.

Nishikawa, Koichi. Automobile servicing apparatus having a turntable including a retractable lift. 5,090,508, Cl. 187-8.430.

Nishikawa, Toshio: See—
Hitomi, Mitsuo; Hinatase, Fumio; Nishikawa, Toshio; and Takeuchi, Nobuo, 5,090,202, Cl. 60-602.000.

Sasaki, Junsoo; Hitomi, Mitsuo; Nishikawa, Toshio; and Fujimoto, Hidefumi, 5,090,391, Cl. 123-559.300.

Nishikawa, Yasuo; and Sano, Kunihiko, to Fuji Photo Film Co., Ltd. Magnetic recording medium lubricant comprising two different fluorinated polyethers each having specified terminal groups. 5,091,249, Cl. 428-336.000.

Nishikawa, Yasuo; Kasuga, Akira; Okita, Tsutomu; and Aonuma, Masashi, to Fuji Photo Film Co., Ltd. Magnetic recording medium lubricated by a three component fatty acid ester-fatty acid amide composition. 5,091,268, Cl. 428-694.000.

Nishikawa, Yasuo: See—
Ohya, Takao; Nishikawa, Yasuo; and Hayakawa, Satoru, 5,091,270, Cl. 428-695.000.

Nishiki, Naomi: See—
Murakami, Mutsuaki; Watanabe, Kazuhiro; Nishiki, Naomi; and Nakamura, Katsuyuki, 5,091,025, Cl. 156-89.000.

Nishimura, Eiji: See—
Watanabe, Kenichi; Nishimura, Eiji; Nagaoka, Mitsuru; and Sotoyama, Kaoru, 5,090,510, Cl. 180-197.000.

Nishimura, Koichi; Taniguchi, Ikuo; Ikawa, Fumihiro; and Kurokawa, Masumi, to Fujitsu Limited. Optical communication system having an improved protection line switching mechanism. 5,091,796, Cl. 359-110.000.

Nishio, Hiroaki; Sato, Michitaka; and Watanabe, Keiji, to NKK Corporation. Method for forming a ceramic film. 5,091,222, Cl. 427-335.000.

Nishio, Takeyoshi: See—
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikuonori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.

Nishioka, Kimihiko; Kouchi, Toshihito; and Okada, Takao, to Olympus Optical Co., Ltd. Optical low-pass filter without using polarizers. 5,091,795, Cl. 359-93.000.

Nishiuchi, Akihiro: See—
Manami, Hiroshi; Nakazawa, Mikio; Miki, Shigeo; and Nishiuchi, Akihiro, 5,091,564, Cl. 562-416.000.

Nishiura, Yukio; and Kawamoto, Yuzo, to Pegasus Sewing Machine Mfg. Co., Ltd. Chaining thread sew-in device. 5,090,343, Cl. 112-130.000.

Nishiwaki, Kozo: See—
Itoh, Tsuneo; and Nishiwaki, Kozo, 5,090,374, Cl. 123-179.600.

Nishiwaki, Toshihiro: See—
Obara, Hiroshi; and Nishiwaki, Toshihiro, 5,091,623, Cl. 219-89.000.

Nishiyama, Michio: See—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 5,091,128, Cl. 264-60.000.

Nishizawa, Toshiro: See—
Yamazaki, Yuzo; and Nishizawa, Toshiro, 5,091,028, Cl. 156-172.000.

Nissan Chemical Industries, Ltd.: See—
Nogami, Tatsuya; Okubi, Kenichi; and Watanabe, Yoshitane, 5,091,009, Cl. 106-287.100.

Nissan Motor Co., Ltd.: See—
Hayasaka, Koichi, 5,090,271, Cl. 74-869.000.

Ito, Hideo; Tonomura, Hiroshi; Nakata, Moritsune; and Kobiki, Yasuhiko, 5,090,766, Cl. 296-180.500.

Katayama, Yoshinori; Murakami, Teruaki; Asano, Hiroyuki; Abe, Yuichi; Iizuka, Haruhiko; Shimizu, Kazuaki; and Fukai, Yoshio, 5,091,857, Cl. 364-431.090.

Kii, Katsuya; Okuyama, Yuji; and Mori, Kazuo, 5,090,727, Cl. 280-707.000.

Kobayashi, Hiroshi, 5,090,241, Cl. 73-204.260.
Kogawa, Hiroshi; Imai, Hiroshi; Kikuchi, Masayuki; Shibata, Minoru; Nagayama, Makoto; and Hasegawa, Hiroshi, 5,090,764, Cl. 296-107.000.
Nakayama, Akira, 5,090,161, Cl. 51-287.000.
Ohtsuka, Kouki; Kubo, Kimio; Akiyama, Koichi; Ike, Masahide; and Kawai, Kunio, 5,091,147, Cl. 420-68.000.
Sugano, Taku; Iwanaga, Kazuyoshi; and Hattori, Noboru, 5,090,950, Cl. 475-129.000.
Suzuki, Yutaka, 5,090,270, Cl. 74-866.000.
Nissei Plan, Inc.: See—
Hihara, Mikio; and Suzuki, Nobuhisa, 5,091,014, Cl. 106-677.000.
Nissen, Michael; and Zerlang, Marianne. Package, 5,090,569, Cl. 206-457.000.
Nitoh, Toshikatsu: See—
Okada, Tsuneyoshi; Nitoh, Toshikatsu; Kanoe, Toshio; and Togami, Masato, 5,091,135, Cl. 264-272.130.
Nitro Chemical Industry Co., Ltd.: See—
Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, 5,091,285, Cl. 430-296.000.
Nitro Kohki Co., Ltd.: See—
Kotake, Naoyuki, 5,090,747, Cl. 285-305.000.
Nitz, Larry T.: See—
Bolander, William J.; and Nitz, Larry T., 5,090,382, Cl. 123-425.000.
Niwa, Takashi: See—
Maehara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuho; Bessyo, Daisuke; Niwa, Takashi; Kusonoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.
Nixon, Kent A., to Agape Enterprises, Inc. Ultrasonic cleaning system for fluorescent light diffuser lens, 5,090,430, Cl. 134-84.000.
NKG Insulators, Ltd.: See—
Kyo, Osamu; and Akiutsu, Yasuo, 5,090,944, Cl. 464-29.000.
NKK Corporation: See—
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.
Nishio, Hiroaki; Sato, Michitaka; and Watanabe, Keiji, 5,091,222, Cl. 427-335.000.
Nobileau, Philippe C.: See—
Brammer, Norman; and Nobileau, Philippe C., 5,090,737, Cl. 285-39.000.
Noble, Walter E. Saw table, 5,090,283, Cl. 83-467.100.
Noel, Hugues: See—
Enjolras, Odile; and Noel, Hugues, 5,091,193, Cl. 424-642.000.
Nogami, Hiroyasu: See—
Kumano, Akira; Nogami, Hiroyasu; Miike, Seiji; Adachi, Hisahiro; and Amano, Shin-ya, 5,091,876, Cl. 364-419.000.
Nogami, Masayuki, to Hoya Corporation; and Nogami, Masayuki. Semiconductor-containing glass and method for producing same, 5,091,115, Cl. 252-518.000.
Nogami, Tatsuya; Okubi, Kenichi; and Watanabe, Yoshitane, to Nissan Chemical Industries, Ltd. Coating composition and a process for manufacturing the same, 5,091,009, Cl. 106-287.100.
Noguchi, Hidehiko: See—
Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki, 5,090,373, Cl. 123-169.0PA.
Noguchi, Yoji: See—
Katata, Hiroyuki; and Noguchi, Yoji, 5,091,977, Cl. 382-56.000.
Nohren, Hubert; Moritzen, Werner; Siebrand, Gerhard; and Knoke, Helmut, to Autoflug GmbH & Co. Casing for a parachute, 5,090,641, Cl. 244-148.000.
Noireaux, Patrick; Jamet, Jean; Parlier, Michel; and Bacos, Marie-Pierre, to Institut d'Etudes et de Recherches Aeronautiques (ON-ERA); and Institut de Recherche Appliquée sur les Polymères. Low viscosity, crosslinkable liquid polysilanes, 5,091,485, Cl. 525-478.000.
Nokia-Mobira Oy: See—
Kuisma, Erkki, 5,091,919, Cl. 375-60.000.
Nolley, Robert W.: See—
Hammond, John M.; Petropoulos, Mark; Berger, Stuart B.; and Nolley, Robert W., 5,090,350, Cl. 118-50.000.
Nomura, Hironori: See—
Ujimoto, Hiroshi; Nomura, Hironori; Shimakawa, Taiji; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 5,091,039, Cl. 156-519.000.
Nomura, Shigeru; and Hidaka, Takahiro, to Seikisui Kagaku Kogyo Kabushiki Kaisha. Organic photochromic compound, a dimer of pyrido quinoline, 5,091,535, Cl. 546-35.000.
Nomura, Takao: See—
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.
Nomura, Yutaka: See—
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,091,403, Cl. 514-398.000.
Nonaka, Tsuyoshi: See—
Kobayashi, Yuji; Matsuda, Yasuo; Hosoya, Toshifumi; and Nonaka, Tsuyoshi, 5,091,984, Cl. 385-16.000.
Nonogaki, Masayasu; Arai, Fumiaki; Natori, Yuji; and Yamaguchi, Hideyuki, to Ricoh Company, Ltd. Thermosensitive stencil paper, 5,091,257, Cl. 428-411.100.
Noorily, Peter; and Levy, E.dney, to Thomas & Betts Corporation. Insulation displacing connector for providing repeatable sealed termination of electrical conductors, 5,090,917, Cl. 439-395.000.

Noranda, Inc.: See—
Harris, G. Bryn; and Peacey, John G., 5,091,161, Cl. 423-163.000.
Nordan, Lee T.; and Malcolm, Roger J. Surgical headrest, 5,090,073, Cl. 5-640.000.
Nordico, Inc.: See—
Sheridan, Christopher H., 5,091,102, Cl. 252-91.000.
NordicTrack, Inc.: See—
Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,090,694, Cl. 272-134.000.
Nordischer Maschinenbau Rud.Baader GmbH + Co KG: See—
Dechow, Ulrich, 5,090,941, Cl. 452-183.000.
Norell, Maria: See—
Engstrom, Jorgen; and Norell, Maria, 5,091,166, Cl. 423-478.000.
Noritake Co., Ltd.: See—
Oki, Takeo; Fukuta, Yoichi; Hisada, Eiichi; and Aoki, Satoshi, 5,090,969, Cl. 51-295.000.
Norloff, Peter L.: See—
Cleveland, Dixon; Cleveland, James H.; Norloff, Peter L.; Forsythe, Jeffrey A.; and Collier, Richard W., 5,090,797, Cl. 351-210.000.
North American Philips Corporation: See—
Bezjak, Greg W., 5,091,708, Cl. 333-26.000.
North American Specialties Corporation: See—
Seidler, Jack, 5,090,926, Cl. 439-876.000.
North East Research Associates, Inc.: See—
Einstein, Steven, 5,091,801, Cl. 359-665.000.
North Face, The: See—
Howe, Robert, 5,090,604, Cl. 224-211.000.
Northern Territory of Australia, The: See—
Ogle, Christopher L.; and Land, Ann L., 5,090,772, Cl. 297-440.000.
Northrop Corporation: See—
Jungwirth, Douglas R., 5,090,812, Cl. 356-446.000.
Norton Company: See—
Pellow, Scott W., 5,090,968, Cl. 51-293.000.
Rue, Charles V.; Pukaite, Leonard G.; and Subramanian, Krishnamoorthy, 5,090,970, Cl. 51-309.000.
Norwich Eaton Pharmaceuticals, Inc.: See—
Pelosi, Stanford S., Jr., 5,091,426, Cl. 514-231.500.
Notetory Limited: See—
Dyson, James, 5,090,976, Cl. 55-337.000.
Nova Corporation of Alberta: See—
Ker, Victoria S.; and Tsang, Charles, 5,090,817, Cl. 374-24.000.
Novack, Mitchell J.: See—
Holdren, Frederick V.; Novack, Mitchell J.; and Rupnick, Charles J., 5,090,243, Cl. 73-514.000.
Nowak, Michael T.; and Lewis, Thomas E., to Presstek, Inc. Method for producing individualized labels, 5,091,052, Cl. 156-643.000.
Nozaki, Masayuki: See—
Seike, Shoji; Mima, Toshiyuki; Nozaki, Masayuki; Tani, Naoki; and Ikeda, Mitsui, 5,090,793, Cl. 385-100.000.
Nozawa, Yasushi; Ikoma, Hideto; Mihayashi, Keiji; and Shibahara, Yoshihiko, to Fuji Photo Film Co., Ltd. Color negative photographic material, 5,091,293, Cl. 430-503.000.
Nukada, Katsumi: See—
Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsumi; Nukada, Katsumi; and Marumo, Teruomi, 5,091,276, Cl. 430-45.000.
Nuova Italsider SpA: See—
Memmi, Massimo; and Giardetti, Gelasio, 5,091,150, Cl. 420-541.000.
Nuovopignone-Industrie Meccaniche e Fonderia S.p.A.: See—
Corain, Luciano; Maitan, Gianni; and Corazzola, Luigi, 5,090,457, Cl. 139-453.000.
Nusser, Hermann: See—
Krauter, Lothar; Nusser, Hermann; Schelhas, Peter; Schillinger, Rainer; Trachte, Dietrich; and Kemmer, Ulrich, 5,090,883, Cl. 418-171.000.
Nutron Manufacturing Ltd.: See—
Pelech, Gregory D.; and Williams, Gary, 5,090,450, Cl. 137-625.300.
Nutt, Ruth F.; Ciccarone, Terrence M.; Brady, Stephen F.; and Veber, Daniel F., to Merck & Co., Inc. Peptides having ANF activity, 5,091,366, Cl. 514-11.000.
Nylok Fastener Corporation: See—
DiMaio, Anthony; Duffy, Richard J.; and Sessa, Eugene D., 5,090,355, Cl. 118-681.000.
Obadia, Gerard: See—
Bazin, Roland; Soudant, Etienne; Obadia, Gerard; Laugier, Jean-Pierre; and Marcotte, Louis, 5,090,402, Cl. 128-57.000.
Obara Corporation: See—
Obara, Hiroshi; and Nishiwaki, Toshihiro, 5,091,623, Cl. 219-89.000.
Obara, Hiroshi; and Nishiwaki, Toshihiro, to Obara Corporation. Welding gun provided with a backup cylinder, 5,091,623, Cl. 219-89.000.
Oberg Industries, Inc.: See—
Malloy, Joseph P.; and Baldwin, William, 5,091,962, Cl. 382-8.000.
Oberholz, Alfred: See—
Kupper, Friedrich-Wilhelm; Muller, Wolfgang H. E.; and Oberholz, Alfred, 5,091,594, Cl. 568-789.000.
Obering, Heinz U., to Mannesmann Aktiengesellschaft. Compressible fitting and associated method, 5,090,743, Cl. 285-156.000.
O'Brien, William D., Jr., to AT&T Bell Laboratories. Methods of collapsing glass tube, 5,090,978, Cl. 65-2.000.
Ochi, Keiichi, to Ricoh Company, Ltd. Information processing device, 5,091,910, Cl. 371-40.100.

O'Connor, Kenneth M.: See—
Story, Carl E.; and O'Connor, Kenneth M., 5,090,871, Cl. 417-9.000.
O'Connor, Robert J.: See—
Arnett, Jaime R.; and O'Connor, Robert J., 5,091,826, Cl. 361-408.000.
Oda, Minoru; Kino, Shigemi; Ogawa, Kenji; and Shiotsuki, Takako, to Yoshitomi Pharmaceutical Industries, Ltd. Pharmaceutical composition with improved dissolution property, 5,091,191, Cl. 514-399.000.
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, to Sony Corporation. Apparatus and method for recording and/or reproducing a digital signal, 5,091,805, Cl. 360-53.000.
Odru, Pierre: See—
Fuchs, Jean-Francois; Tisne, Jean-Louis; and Odru, Pierre, 5,091,230, Cl. 428-36.400.
Oellerer, Friedrich: See—
Theurer, Josef; and Oellerer, Friedrich, 5,090,483, Cl. 171-16.000.
Theurer, Josef; and Oellerer, Friedrich, 5,090,484, Cl. 171-16.000.
Oerschkes, Ralf J.: See—
Wulff, Gunter; Minarik, Milan; and Oerschkes, Ralf J., 5,091,433, Cl. 521-54.000.
Oertle, Max; and Miescher, Stefan, to Etablissement Supervis. Device for connecting a motor vehicle steering column to a shaft journal of a steering gear train, 5,090,833, Cl. 403-12.000.
Oettinger, Heinz: See—
Dober, Walter; and Oettinger, Heinz, 5,090,889, Cl. 425-522.000.
Offenbacher, Helmut; and Schwarzenegger, Erna, to AVL AG. Cover layer for optical ion sensors, 5,091,800, Cl. 359-350.000.
Ogasawara, Tsuyoshi: See—
Matsuno, Junichi; Ogasawara, Tsuyoshi; and Kawauchi, Masataka, 5,090,676, Cl. 271-12.000.
Ogawa, Kenji: See—
Oda, Minoru; Kino, Shigemi; Ogawa, Kenji; and Shiotsuki, Takako, 5,091,191, Cl. 514-399.000.
Ogawa, Kensuke; Katsuyama, Toshio; and Fukuzawa, Tadashi, to Hitachi, Ltd. Optical quantum interference device/optical computer and method of modulating light using same, 5,091,980, Cl. 385-3.000.
Ogawa, Masahiro, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Oil filtration circuit for a belt-type transmission, 5,091,078, Cl. 210-168.000.
Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Threading apparatus on a sewing machine, 5,090,345, Cl. 112-225.000.
Ogino, Kouji; and Aizu, Yoshihisa, to Kowa Company, Ltd. Ophthalmological diagnosis method and apparatus, 5,090,416, Cl. 128-691.000.
Ogino, Tomohito: See—
Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsunori; and Shiroyanagi, Yoshiro, 5,091,909, Cl. 371-40.100.
Ogiwara, Nagao: See—
Nakamura, Hiroshi; and Ogiwara, Nagao, 5,091,281, Cl. 430-203.000.
Ogle, Christopher L.; and Land, Ann L., to Northern Territory of Australia, The. Mobile chair and seat form, 5,090,772, Cl. 297-440.000.
Oh, Jong H.: See—
Kim, Wan J.; Park, Myung H.; Oh, Jong H.; Jung, Myung H.; and Kim, Bong J., 5,091,384, Cl. 514-215.000.
Ohashi, Kenji, to Murata Kikai Kabushiki Kaisha. Package winding method, 5,090,633, Cl. 242-18.100.
Ohashi, Tsuyoshi: See—
Takeoka, Katsushi; Ohashi, Tsuyoshi; and Ikenaka, Yoshiharu, 5,090,226, Cl. 72-117.000.
Ohasi, Tamiyosi: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyosi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.
Ohba, Nobuaki, to Mitsubishi Denki K.K. Compound machining method and apparatus, 5,091,622, Cl. 219-69.150.
Ohba, Souji; Shimizu, Ryota; and Ohura, Hideki, to Matsushita Electric Industrial Co., Ltd. Step linear actuator, 5,091,710, Cl. 335-229.000.
Ohbu, Jun: See—
Takikawa, Kazunori; Fukaya, Kazumi; Ohbu, Jun; and Yagi, Yasushi, 5,090,611, Cl. 228-173.400.
Ohe, Osamu: See—
Ishidoya, Masahiro; Shibato, Kishio; Ohe, Osamu; and Kawasaki, Masaaki, 5,091,492, Cl. 526-282.000.
Ohg, Claas: See—
Bethge, Jorg, 5,090,182, Cl. 53-556.000.
Ohhashi, Masao: See—
Yamamoto, Tokihiko; Fukumoto, Ryoichi; Ohhashi, Masao; Itagaki, Kazuhide; and Sumiya, Kazuhiro, 5,090,081, Cl. 15-250.130.
Ohinata, Yoshiharu, to Riso Kagaku Corporation. Mimeographic printing machine, 5,090,312, Cl. 101-120.000.
Ohkubo, Masaharu: See—
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 5,091,734, Cl. 346-1.100.
Ohkubo, Masashi: See—
Sasaki, Tooru; Ohkubo, Masashi; and Kimura, Akira, 5,091,954, Cl. 381-72.000.
Ohlin, Kenth, to Ohlins Racing AB. Shock absorber arrangement, 5,090,525, Cl. 188-319.000.
Ohlins Racing AB: See—
Ohlin, Kenth, 5,090,525, Cl. 188-319.000.

Ohmachi, Kazuhiko: See—
Tsuchida, Masashi; and Ohmachi, Kazuhiko, 5,091,852, Cl. 395-600.000.
Ohminami, Kazuya: See—
Fukuyama, Kiyoshi; Wada, Toru; Kitabata, Kozo; Sudare, Masahiro; Tsuchitani, Shigemi; and Ohminami, Kazuya, 5,090,552, Cl. 198-365.000.
Ohno, Akio: See—
Inoue, Masahiro; Amemiya, Koji; Ohno, Akio; and Tsunemi, Takeo, 5,091,751, Cl. 355-274.000.
Ohno, Akira; Ohtsuka, Tetsuo; and Matsumoto, Naotaka, to Tokyo Electron Limited. Probing test device, 5,091,692, Cl. 324-158.00F.
Ohno, Hiroyuki: See—
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 5,091,406, Cl. 514-422.000.
Ohsaka, Teiji: See—
Umetsu, Sachio; Tsuda, Toshio; Azuma, Yusaku; Miura, Toshihiko; Ishihara, Katsumi; and Ohsaka, Teiji, 5,090,113, Cl. 29-714.000.
Ohsawa, Ikuo, to Dainippon Screen Mfg. Co., Ltd. Method of extracting contour of a subject image from an original, 5,091,967, Cl. 382-22.000.
Ohsawa, Takashi, to Kabushiki Kaisha Toshiba. Dynamic type random-access memory having improved timing characteristics, 5,091,885, Cl. 365-203.000.
Ohta, Hiroko: See—
Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151.000.
Obta, Seiichi: See—
Kamakura, Kunihito; Ohta, Seiichi; Aoki, Chihiro; Hamano, Seitaro; and Hiramatsu, Yasushi, 5,090,078, Cl. 15-97.100.
Ohtani, Yasuhisa: See—
Inatome, Hiroshi; Inaguma, Kazunari; Yamaguchi, Hiroaki; and Ohtani, Yasuhisa, 5,091,503, Cl. 528-272.000.
Ohtsu, Shinki: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.
Ohtsuka, Akihito: See—
Achikita, Masakazu; and Ohtsuka, Akihito, 5,091,022, Cl. 148-104.000.
Ohtsuka, Kouki; Kubo, Kimio; Akiyama, Koichi; Ike, Masahide; and Kawai, Kunio, to Hitachi Metals, Ltd.; and Nissan Motor Co., Ltd. Heat-resistant cast steels, 5,091,147, Cl. 420-68.000.
Ohtsuka, Masahiro; and Kono, Hiromi, to Diesel Kiki Co., Ltd. System for automatically controlling transmission for vehicles, 5,090,269, Cl. 74-861.000.
Ohtsuka, Tetsuo: See—
Ohno, Akira; Ohtsuka, Tetsuo; and Matsumoto, Naotaka, 5,091,692, Cl. 324-158.00F.
Ohtsuki, Yoshio: See—
Miyawaki, Masahumi; Ishimura, Tamihiro; and Ohtsuki, Yoshio, 5,091,886, Cl. 365-204.000.
Ohuchi, Masatoshi; and Matsumoto, Masaru, to OPT Engineering Co., Ltd. Feed belt for rivets, 5,090,607, Cl. 227-136.000.
Ohuchida, Shuichi: See—
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 5,091,406, Cl. 514-422.000.
Ohura, Hideki: See—
Ohba, Souji; Shimizu, Ryota; and Ohura, Hideki, 5,091,710, Cl. 335-229.000.
Ohwada, Hisashi: See—
Arii, Mitsuo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinnai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.
Ohwada, Jun-ichi: See—
Kitajima, Masaaki; Ohwada, Jun-ichi; and Nagae, Yoshiharu, 5,091,722, Cl. 340-784.000.
Ohya, Takao; Nishikawa, Yasuo; and Hayakawa, Satoru, to Fuji Photo Film Co., Ltd. Magnetic recording medium lubricated by a mixture of methyl branched iso ester compounds synthesized by the oko process, 5,091,270, Cl. 428-695.000.
Oka, Hitoshi: See—
Tanaka, Isamu; Oka, Hitoshi; Watanabe, Makio; Kikuchi, Hiroshi; Imabayashi, Shinichiro; and Taniguti, Yukihiro, 5,091,283, Cl. 430-280.000.
Oka, Kengo; Yoshida, Susumu; Mimoto, Yoshiyuki; Ebisuno, Tadahiro; and Yabuki, Yoshikazu, to Sumitomo Rubber Industries, Ltd. Golf ball, 5,090,705, Cl. 273-232.000.
Oka, Seiji: See—
Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyuki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, to Nippon Chemphar Co., Ltd. Sulfanyl imidazole derivatives and antiulcer agents containing the same, 5,091,403, Cl. 514-398.000.
Okada, Sjuji: See—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Sjuji; Nakajima, Ryoichi; and Naito, Sakae, 5,091,072, Cl. 208-39.000.
Okada, Takao: See—
Nishioka, Kimihiko; Kouchi, Toshihito; and Okada, Takao, 5,091,795, Cl. 359-93.000.

Okada, Tamotsu, to Canon Kabushiki Kaisha. Image heating apparatus using film driven by rotatable member. 5,091,752, Cl. 355-285.000.

Okada, Tsuneyoshi; Nitoh, Toshikatsu; Kanoe, Toshio; and Togami, Masato, to Polyplastic Co., Ltd. Improvements in the encapsulation of electronic components employing low stress encapsulant composition. 5,091,135, Cl. 264-272.130.

Okamoto, Masaya; and Kurokawa, Hiroshi, to Idemitsu Petrochemical Co., Ltd. Blend of polycarbonate capped with phenolic chain terminator mixture. 5,091,482, Cl. 525-462.000.

Okamoto, Rokuro: See—
Yoshioka, Takeo; Watanabe, Azuma; Kominato, Koichiro; Tone, Hiroshi; Okamoto, Rokuro; Sawa, Tsutomu; and Takeuchi, Tomio, 5,091,370, Cl. 514-30.000.

Okazaki, Koji: See—
Iseda, Kohei; Satoh, Kazumi; Kurihara, Hideaki; Amano, Fumio; Unagami, Shigeyuki; and Okazaki, Koji, 5,091,955, Cl. 381-36.000.

Okazawa, Kazuhiko: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.

Oki Electric Industry Co., Ltd.: See—
Miyawaki, Masahumi; Ishimura, Tamihiko; and Ohtsuki, Yoshio, 5,091,886, Cl. 365-204.000.

Shinozawa, Masahiko, 5,091,323, Cl. 437-31.000.

Oki, Takeo; Fukuta, Yoichi; Hisada, Eiichi; and Aoki, Satoshi, to Oki, Takeo; and Noritake Co., Ltd. Coated abrasive grains and a manufacturing method therefor. 5,090,969, Cl. 51-295.000.

Oki, Toshikazu: See—
Sawada, Yosuke; Ueki, Tomokazu; Tsuno, Takashi; and Oki, Toshikazu, 5,091,418, Cl. 514-569.000.

Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, to Mazda Motor Corporation. Air and fuel supply control systems for internal combustion engines. 5,090,203, Cl. 60-612.000.

Okita, Tsutomu: See—
Nishikawa, Yasuo; Kasuga, Akira; Okita, Tsutomu; and Aonuma, Masashi, 5,091,268, Cl. 428-694.000.

Okiura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, to Babcock-Hitachi Kabushiki Kaisha. Burner apparatus for pulverized coal. 5,090,339, Cl. 110-263.000.

Oku, Mitsumasa: See—
Yoshinaka, Minoru; Asakura, Eizou; Oku, Mitsumasa; Kitano, Motoji; and Yoshida, Hideyuki, 5,091,765, Cl. 357-30.000.

Okubi, Kenichi: See—
Nogami, Tatsuya; Okubi, Kenichi; and Watanabe, Yoshitane, 5,091,009, Cl. 106-287.100.

Okubo, Yutaka: See—
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.

Okuda, Ikuo: See—
Suzuki, Mikio; Suto, Satoshi; Okuda, Ikuo; Nakawaki, Yasunori; and Abe, Akihara, 5,090,881, Cl. 418-26.000.

Okutani, Norio; and Masuda, Yutaka, to Matsushita Electric Industrial Co., Ltd. Absolute position detecting method and apparatus therefor. 5,091,643, Cl. 250-231.140.

Okuyama, Yuji: See—
Kii, Katsuya; Okuyama, Yuji; and Mori, Kazuo, 5,090,727, Cl. 280-707.000.

Old Firehand Corporation: See—
Pennartz, Edmund R., 5,091,097, Cl. 252-7.000.

Oldani, Diego: See—
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 5,091,372, Cl. 514-34.000.

Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 5,091,373, Cl. 514-34.000.

O'Lenick, Anthony J., Jr.; and Parkinson, Jeff K., to Siltech Inc. Silicone phosphobetaines. 5,091,493, Cl. 528-30.000.

Olijve, Matthues D.: See—
De Munck, Nicolaas A.; and Olijve, Matthues D., 5,091,599, Cl. 568-882.000.

Olin Corporation: See—
Shaffer, John H.; Melton, James K.; and Hilliard, Garland E., 5,091,165, Cl. 423-474.000.

Oliver, Roy F.: See—
Bultjens, Travis E. J.; Hellens, Stephen W.; Jahoda, Colin A. B.; Oliver, Roy F.; and Withers, Anne P., 5,091,173, Cl. 424-70.000.

Olsen, David J.: See—
Miller, Richard A.; and Olsen, David J., 5,091,469, Cl. 525-65.000.

Olsen, Eric G.: See—
Gsrinaski, Timothy J.; Jaminet, Jerome E.; and Olsen, Eric G., 5,090,516, Cl. 187-112.000.

Olson, Kurt G.: See—
Kahle, Charles F., II; Olson, Kurt G.; Claar, James A.; Pettit, Paul H., Jr.; and Kerr, Paul R., 5,091,451, Cl. 524-124.000.

Olson, Wayne L.; and Choate, Gary E., to Rose Manufacturing Company. Load limiting apparatus for a hoist. 5,090,507, Cl. 182-234.000.

Olympus Optical Co., Ltd.: See—
Akatsuka, Yuichiro; Abe, Takayuki; Matsueda, Akira; Rokutan, Takao; and Gocho, Nagahiro, 5,091,635, Cl. 235-494.000.

Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151.000.

Kawamura, Kazuteru, 5,091,739, Cl. 354-152.000.

Nishioka, Kimihiko; Kouchi, Toshihito; and Okada, Takao, 5,091,795, Cl. 359-93.000.

Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyana, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisada; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.

Ushiyama, Kazuo; Watanabe, Masaki; Uchiyama, Keiji; Takei, Hisayuki; Takahashi, Noriaki; Matsuzawa, Akimi; Ooshiro, Kiyoshi; and Tamura, Hajime, 5,091,067, Cl. 204-129.460.

O'Malley, Gerard J.; Allen, Richard C.; and White, John L., to Hoechst-Roussel Pharmaceuticals Inc. Hexahydropyrrolo(2,3-B)indole carbamates, ureas, amides and related compounds. 5,091,541, Cl. 548-429.000.

Oman, Gary F.: See—
Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barootian, Arthur, 5,090,246, Cl. 73-718.000.

Omata, Takashi, to Canon Kabushiki Kaisha. Illumination optical system. 5,091,744, Cl. 355-53.000.

Omata, Yuuji, to Matsushita Electric Industrial Co., Ltd. Soft-magnetic film having saturation magnetic-flux density and magnetic head utilizing the same. 5,091,266, Cl. 428-692.000.

O'Meara, Thomas R.; and Valley, George C., to Hughes Aircraft Company. Integrated adaptive optics apparatus. 5,090,795, Cl. 359-240.000.

Omori, Hiroshi: See—
Yasui, Yoshiharu; Anahara, Meiji; and Omori, Hiroshi, 5,091,246, Cl. 428-224.000.

Omron Corporation: See—
Matsuda, Jinichi; and Kato, Kazuo, 5,090,423, Cl. 128-804.000.

Tsuji, Hideaki, 5,090,919, Cl. 439-519.000.

Omura, Ikuo, to Kuraray Co., Ltd. Dental composition. 5,091,441, Cl. 523-109.000.

Omura, Tomohide: See—
Uchida, Hiroshi; and Omura, Tomohide, 5,091,650, Cl. 250-366.000.

Oncogen: See—
Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 5,091,177, Cl. 424-85.800.

Hellstrom, Karl E.; and Hellstrom, Ingegerd, 5,091,178, Cl. 424-85.800.

Onda, Kenji: See—
Yokohori, Shizuo; Miyamoto, Kenzo; Fukushima, Koji; Tsujimoto, Masami; Onda, Kenji; and Sato, Kan, 5,091,026, Cl. 156-149.000.

Ondeyka, John; Hensens, Otto; and Liesch, Jerrold, to Merck & Co., Inc. Lipophilic macrolide useful as an immunosuppressant. 5,091,389, Cl. 514-291.000.

O'Neill, Patrick S.; Ragi, Elias G.; and Godry, Thomas J., to UOP. Reforming process with improved vertical heat exchangers. 5,091,075, Cl. 208-134.000.

Ong, John T. H.; Fujiki, Jean S.; and Liaw, Wei-Cheng, to Syntex (U.S.A.) Inc. Dispensing units for ketorolac topical gel formulations. 5,091,182, Cl. 424-400.000.

Onishi, Shunji; Ichikawa, Yoshinori; and Takeuchi, Junji, to Tonen Sekiyukagaku Kabushiki Kaisha. Resin composition for adhering polyarylene sulfide and polyvinylidene fluoride, method of adhering them and their laminated structure. 5,091,463, Cl. 524-508.000.

Onishi, Yasunobu; Niki, Hirokazu; Kobayashi, Yoshihito; Hayase, Rumiko; and Ushirogouchi, Toru, to Kabushiki Kaisha Toshiba. Alkali soluble phenol polymer photosensitive composition. 5,091,282, Cl. 430-270.000.

Ono Pharmaceutical Co., Ltd.: See—
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 5,091,406, Cl. 514-422.000.

Onodera, Nobuo; Someya, Shinzo; Koura, Seigo; and Segami, Shigenori, to Agro-kansho Co., Ltd. Heterocyclic compounds and herbicidal compositions containing the compounds as effective components. 5,090,994, Cl. 71-94.000.

Onogi, Nobuyoshi: See—
Yokoya, Yuji; Tsutsumi, Yasuhiro; Suzuki, Yutaka; Shiozaki, Makoto; Onogi, Nobuyoshi; and Takasou, Kazuo, 5,090,728, Cl. 280-707.000.

Oono, Yasuteru: See—
Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto; and Oono, Yasuteru, 5,090,872, Cl. 417-53.000.

Ooshiro, Kiyoshi: See—
Ushiyama, Kazuo; Watanabe, Masaki; Uchiyama, Keiji; Takei, Hisayuki; Takahashi, Noriaki; Matsuzawa, Akimi; Ooshiro, Kiyoshi; and Tamura, Hajime, 5,091,067, Cl. 204-129.460.

Oota, Tadaki. Fuel delivery control apparatus for engine operable on gasoline/alcohol fuel blend. 5,090,389, Cl. 123-489.000.

Opat, Geoffrey I.: See—
Cimmino, Alberto F.; Klein, Anthony G.; and Opat, Geoffrey I., 5,090,248, Cl. 73-780.000.

Oppermann, Hermann: See—
Huston, James S.; and Oppermann, Hermann, 5,091,513, Cl. 530-387.000.

OPT Engineering Co., Ltd.: See—
Ohuchi, Masatoshi; and Matsumoto, Masaru, 5,090,607, Cl. 227-136.000.

Optima Batteries, Inc.: See—
Hug, Leonard F.; and Sutton, Martyn, 5,091,273, Cl. 429-94.000.

Optrotech Ltd.: See—
Danon, Haim; and Gnassin, Amir, 5,090,685, Cl. 271-276.000.

Orbital Engine Company Proprietary Limited: See—
Davis, Robert M., 5,090,625, Cl. 239-453.000.

Orion-Yhtymä OY: See—
Kalso, Eija; and Lammintausta, Risto, 5,091,402, Cl. 514-396.000.

Ormenese, Carlo. Rotating fluid machine for reversible operation from turbine to pump and vice-versa. 5,090,867, Cl. 415-141.000.

Ornerfors, Benny: See—
Pettersson, Torbjorn; and Ornerfors, Benny, 5,090,359, Cl. 119-14.080.

Orsborn, Jesse H.: See—
Garter, Lee F.; Orsborn, Jesse H.; Richman, Kevin S.; and Soto, Joel, 5,090,184, Cl. 56-10.200.

Orth, Hans: See—
Bocker, Jurgen; Scheideler, Wilfried; Lips, Hendrik R.; Orth, Hans; and Weishaupt, Herbert P., 5,090,324, Cl. 102-307.000.

Orth, Kevin W., to Borg-Warner Automotive Transmission & Engine Components Corporation. Chain belt power transmission. 5,090,948, Cl. 474-245.000.

Osawa, Masanori, to Tenryu Marusawa Kabushiki Kaisha. Electromagnetic spring clutch. 5,090,538, Cl. 424-00T.

Oscar Mayer Foods Corporation: See—
Adkison, Frank L., 5,090,940, Cl. 452-136.000.

Mally, Timothy G.; and Thompson, Bjorn J., 5,091,199, Cl. 426-120.000.

Osei-Gyimah, Peter; and Sherba, Samuel E., to Rohm and Haas Company. Antimicrobial compounds and methods of use. 5,091,399, Cl. 514-367.000.

Oshima, Shigeru: See—
Imaoka, Yasunori; and Oshima, Shigeru, 5,091,802, Cl. 359-694.000.

Oshima, Yasuhiro: See—
Serizawa, Yukio; Sekiguchi, Koichi; Oshima, Yasuhiro; and Iizuka, Tadashi, 5,090,882, Cl. 418-56.000.

Oshima, Yoshitomo; and Tou, Kazumi, to Fuji Photo Film Co., Ltd. Process and apparatus for cooling extruded thermoplastic film. 5,091,134, Cl. 264-176.100.

Oskar Schatz: See—
Marx, Horst, 5,090,475, Cl. 165-10.000.

Ostiguy, Claude: See—
Lesage, Jacques; and Ostiguy, Claude, 5,090,407, Cl. 128-205.270.

Otake, Hiroshi: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.

Otis Elevator Company: See—
Grinaski, Timothy J.; Jaminet, Jerome E.; and Olsen, Eric G., 5,090,516, Cl. 187-112.000.

Otis Engineering Corporation: See—
Pleasant, Charles W.; and Fowler, Stewart H., Jr., 5,090,481, Cl. 166-373.000.

Otokawa, Mitsuhiko; Kimura, Shunpei; and Miyaoka, Yasuyuki, to Canon Kabushiki Kaisha. Magneto-optical recording apparatus having means for delaying an input signal for preventing bit shift. 5,091,897, Cl. 369-13.000.

Otruba, Svatoboj, to B & H Manufacturing Co., Inc. Turret type labeling machine with contoured vacuum drum. 5,091,040, Cl. 156-566.000.

Otsuka, Kanji: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaka, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.

Otsuka, Kazuyoshi: See—
Nakajima, Jun; Funayama, Yoshihiro; and Otsuka, Kazuyoshi, 5,090,715, Cl. 280-166.000.

Otsuka, Masahito: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.

Otsuka, Naotoshi, to Horiya, Yoshio; Otsuka, Naotoshi; and Nihon Seiki Co., Ltd. Ball circulation path in rotation transmitter using balls. 5,090,266, Cl. 74-425.000.

Ott, Karl: See—
Bruckelt, Alfred; Kaiser, Gunther; Krauter, Immanuel; and Ott, Karl, 5,090,394, Cl. 123-643.000.

Owen, Hartley: See—
Harandi, Mohsen N.; and Owen, Hartley, 5,091,590, Cl. 568-697.000.

Owens, Alexander H.: See—
Huie, Wing K.; and Owens, Alexander H., 5,091,321, Cl. 437-27.000.

Owens-Corning Fiberglas Corporation: See—
Rusek, Stanley J., Jr., 5,090,981, Cl. 65-4.400.

Owens-Illinois Closure Inc.: See—
Ingram, Keith W.; and Crowley, Daniel J., Jr., 5,090,788, Cl. 215-252.000.

Owers, Ian A.; and Galloway, John L., to Rascal-Guardall (Scotland) Limited. Radiation detection arrangements and methods. 5,091,648, Cl. 250-342.000.

Oy Partek AB: See—
Soikkeli, Osmo, 5,091,037, Cl. 156-443.000.

Oyatsu, Noriyuki: See—
Okiura, Kunio; Baba, Akira; Oyatsu, Noriyuki; Kaku, Hiroyuki; Morita, Shigeki; and Kobayashi, Hironobu, 5,090,339, Cl. 110-263.000.

Ozaki, Masakazu: See—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 5,091,128, Cl. 264-60.000.

Ozaki, Masaru; Ikeda, Yukihiro; and Arakawa, Tatsumi, to Director-General of Agency of Industrial Science and Technology. Polyethylene derivative and process for preparation thereof. 5,091,488, Cl. 526-90.000.

Ozaki, Shinya: See—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,091,805, Cl. 360-53.000.

Ozaki, Shoichiro; Akiyama, Takahiko; Takechi, Naoto; Kageyama, Kunio; and Machida, Morihisa, to Yokohama Rubber Company, Ltd., The Synthesis of D-myoinositol-1-phosphate. 5,091,549, Cl. 558-131.000.

Ozawa, Fujio: See—
Kawata, Masayuki; Ozawa, Fujio; Kasuga, Masao; Suzuki, Minako; and Shibayama, Takako, 5,091,670, Cl. 310-323.000.

Ozawa, Kazunori, to NEC Corporation. Communication system capable of improving a speech quality by effectively calculating excitation multipulses. 5,091,946, Cl. 381-36.000.

Ozawa, Mitsuhiro: See—
Takeda, Shin; Ishii, Masami; Ozawa, Mitsuhiro; and Terazawa, Toshihisa, 5,090,227, Cl. 72-178.000.

Ozawa, Takashi, to Canon Kabushiki Kaisha. Image forming apparatus. 5,090,674, Cl. 27-13.100.

Ozonia International, S.A.: See—
Hendrickson, Richard J.; and Kafer, Kenneth G., 5,091,069, Cl. 204-176.000.

Pacchiosi, Dorian. Plant for digging and shoring up the walls of tunnels during excavation. 5,090,844, Cl. 405-145.000.

Pack Rat Products, Inc.: See—
Renouard, Bruce T.; and Hochstatter, Gary R., 5,090,761, Cl. 296-3.000.

Paetz, Werner: See—
Schreiter, Thomas; Fuerst, Arpad; and Paetz, Werner, 5,090,767, Cl. 296-216.000.

Paielli, Perry M., to Digital Fuel Injection. Electronic control of engine fuel delivery. 5,091,858, Cl. 364-431.120.

Paik, Woo H.: See—
Krause, Edward A.; and Paik, Woo H., 5,091,782, Cl. 358-135.000.

Pajor, Aniko: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Marie; Ritli, Peter; Sipos, Judit; Pajor, Aniko; and Marmaros, Katalin, 5,091,530, Cl. 544-229.000.

Pal Products, Inc.: See—
Link, Paul A., 5,090,602, Cl. 222-527.000.

Palestrant, Aubrey. Apparatus for acquiring soft tissue biopsy specimens. 5,090,419, Cl. 128-754.000.

Palm, William A., to Seagate Technology, Inc. Motor brake circuit for magnetic disk drive system. 5,091,680, Cl. 318-368.000.

Palten, Margret: See—
Altenau, Ernst-Wilhelm; Hahn, Ulf; Fischer, Siegmund; and Palten, Margret, 5,090,326, Cl. 102-395.000.

Paniaguas, Joseph M.; and Paniaguas, Maureen J. Illuminated face elements and kit for making an illuminated face on pumpkins and the like. 5,091,833, Cl. 362-191.000.

Paniaguas, Maureen J.: See—
Paniaguas, Joseph M.; and Paniaguas, Maureen J., 5,091,833, Cl. 362-191.000.

Papadakis, Konstantinos: See—
Papadakis, Stavros; and Papadakis, Konstantinos, 5,091,181, Cl. 424-195.100.

Papadakis, Stavros; and Papadakis, Konstantinos. Asphodelus composition for increasing white blood cell count. 5,091,181, Cl. 424-195.100.

Paquette, Alfred J. Planer blade sharpening apparatus. 5,090,160, Cl. 51-102.000.

Park, Hang G.: See—
Back, Je I.; Kim, Deok H.; Hong, Hyun H.; Kyong, Mun G.; Park, Ju Y.; Lee, Hyeon H.; Lee, Young K.; and Park, Hang G., 5,091,904, Cl. 370-58.100.

Park, Insoon: See—
Jarecki, James J.; Clouser, Leon C., Jr.; and Park, Insoon, 5,090,085, Cl. 15-248.00A.

Park, Ju Y.: See—
Back, Je I.; Kim, Deok H.; Hong, Hyun H.; Kyong, Mun G.; Park, Ju Y.; Lee, Hyeon H.; Lee, Young K.; and Park, Hang G., 5,091,904, Cl. 370-58.100.

Park, Kun Y.; and Kim, Hoon S., to Korea Institute of Science and Technology. Process for preparing 1,1,1-trifluoro-2,2-dichloroethane. 5,091,602, Cl. 570-167.000.

Park, Myung H.: See—
Kim, Wan J.; Park, Myung H.; Oh, Jong H.; Jung, Myung H.; and Kim, Bong J., 5,091,384, Cl. 514-215.000.

Park, Tai W.: See—
Shin, Myung C.; Sohn, Keun Y.; Chung, Young H.; Lee, Young Y.; and Park, Tai W., 5,091,149, Cl. 420-528.000.

Parker, Dane K., to Goodyear Tire & Rubber Company. The Catalytic oxidation of hydroxy containing aromatic compounds. 5,091,545, Cl. 552-302.000.

- Parker, Robert P.: See—
Anderson, Mark R.; and Parker, Robert P., 5,091,957, Cl. 381-106.000.
- Parkinson, Jeff K.: See—
O'Lenick, Anthony J., Jr.; and Parkinson, Jeff K., 5,091,493, Cl. 528-30.000.
- Parkinson, Keith, to QuesTech Ventures, Inc. Retortable container. 5,091,231, Cl. 428-36.600.
- Parks, Glenn C., Jr.; Ellison, C. Mack; Godare, William L.; and Beson, John, to Foster Oilfield Equipment Co. Gate valve. 5,090,661, Cl. 251-172.000.
- Parlier, Michel: See—
Noireaux, Patrick; Jamet, Jean; Parlier, Michel; and Bacos, Marie-Pierre, 5,091,485, Cl. 525-478.000.
- Parton, Richard L.; Link, Steven G.; Stegman, David A.; and Mee, John D., to Eastman Kodak Company. Sensitizing dyes for photographic materials. 5,091,298, Cl. 430-570.000.
- Pascal, Jean C.; Lee, Chi-Ho; Alps, Brian J.; Pinhas, Henri; and Whiting, Roger L., to Syntex Pharmaceuticals, Ltd. Substituted imidazo-lyl-alkyl-piperazine and -diazepine derivatives. 5,091,428, Cl. 514-252.000.
- Pastor, Walter. Self-engaging safety. 5,090,147, Cl. 42-70.050.
- Patel, Gool F.: See—
Rasmussen, Gary H.; Tolman, Richard L.; and Patel, Gool F., 5,091,380, Cl. 514-169.000.
- Patel, Kanaiyalal R.: See—
Castillo, Ernesto J.; Eigenberg, Kenneth E.; Patel, Kanaiyalal R.; and Sabacky, Milton J., 5,091,185, Cl. 424-438.000.
- Pathre, Sadanand V.: See—
Heilmann, Steven M.; Moren, Dean M.; Rasmussen, Jerald K.; Krepski, Larry R.; and Pathre, Sadanand V., 5,091,489, Cl. 526-90.000.
- Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, to Pierre Fabre Medicament. Thioformamides, their preparation and use as medicaments. 5,091,415, Cl. 514-506.000.
- Patsch, Manfred: See—
Siegel, Bernd; and Patsch, Manfred, 5,091,516, Cl. 534-612.000.
- Patterson, James. Multi-purpose grinder. 5,090,159, Cl. 51-34.00R.
- Patz, Darrell, to Reflect Game Corp. Card game simulating the sport of hunting. 5,090,707, Cl. 273-298.000.
- Paul, Journee S.A.: See—
Journée, Maurice; Duda, Jean; Beneteau, Pierre; and Bru, Jean-Raymond, 5,090,086, Cl. 15-250.420.
- Pauli, Manfred; and Schussler, Rudolf, to Boehringer Mannheim GmbH. Test carrier analysis system. 5,091,154, Cl. 422-63.000.
- Paulin, Helge S., to Tulip Slagterierne A.M.B.A. Forcecat having improved properties, method for the production thereof and heat sensitive enzyme containing material for use in the production thereof. 5,091,196, Cl. 426-56.000.
- Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., to NordicTrack, Inc. Combination chair and exercise unit. 5,090,694, Cl. 272-134.000.
- Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., to Marquip, Inc. Slitting apparatus for corrugated paperboard and the like. 5,090,281, Cl. 83-13.000.
- Pawlikowski, Joseph M.: See—
Henschen, Homer E.; McKee, Michael J.; Pawlikowski, Joseph M.; Schaeffer, Richard L.; Shaffer, David T.; and Sharpe, Alexander M., 5,090,116, Cl. 29-827.000.
- Paynter, Henry M., to Hardin, Nathaniel A., a part interest. All-elastomer fluid-pressure-actuatable twistors and twistor drive assemblies. 5,090,297, Cl. 92-48.000.
- Peacey, John G.: See—
Harris, G. Bryn; and Peacey, John G., 5,091,161, Cl. 423-163.000.
- Peacock, Dale: See—
Raymer, Doyle; and Peacock, Dale, 5,090,398, Cl. 126-41.00R.
- Pearce, Andrew: See—
Crawford, John; Kikabhai, Thakor; McLeary, David B.; and Pearce, Andrew, 5,090,966, Cl. 44-314.000.
- Pearson, Burton A., to Shrader Canada Limited. Rechargeable fuel injection kit. 5,090,377, Cl. 123-198.00A.
- Pecht, Glenn G.; and Hamaker, Jon, to John Crane Inc. Non-contacting, gap-type seal having a ring with a patterned microdam seal face. 5,090,712, Cl. 277-96.100.
- Peck, Konan: See—
Mathies, Richard A.; and Peck, Konan, 5,091,652, Cl. 250-458.100.
- Peczowski, Joseph L., to Allied-Signal, Inc. Nonlinear multivariable control system. 5,091,843, Cl. 364-150.000.
- Pedersen, James R.: See—
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- Peck, Robert J.: See—
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- Blade, Robert J.; and Peck, Robert J., 5,091,420, Cl. 514-599.000.
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- Pelosi, Stanford S., Jr., to Norwich Eaton Pharmaceuticals, Inc. 5-phe-nyl-2-furan ketones and use as antiepileptic agents. 5,091,426, Cl. 514-231.500.
- Pelzer, Helmut. Enclosure for liquid jet cutter. 5,090,288, Cl. 83-860.000.
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- Perry, Thomas A.; Bradley, John R.; Schroeder, Thaddeus; and Fuerst, Carlton D., to General Motors Corporation. Magnetically coded device and method of manufacture. 5,091,021, Cl. 148-103.000.
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- Peters, Kerry M. Snowblower and lawnmower apparatus. 5,090,142, Cl. 37-243.000.
- Peters, Raymond L., to ReKlame, Inc. Refrigerant recovery and recycling system. 5,090,211, Cl. 62-149.000.
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- Petit, Bernard, to Framatome; and Cogema. Method for extracting a locking sleeve from a demountable guide tube of a nuclear reactor fuel assembly. 5,091,142, Cl. 376-261.000.
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- Petoca Ltd.: See—
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- Pfannkuchen, Ernst. Die casting mold part. 5,090,888, Cl. 425-438.000.
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- Hostettler, John E.; and Bishop, Marshall D., 5,091,448, Cl. 524-45.000.
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- Walker, James D.; and Washer, Stone P., 5,091,060, Cl. 203-99.000.
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- Pierce, Brian M., to Hughes Aircraft Company. Method and apparatus for measuring the composition of a zinc phosphate compound. 5,090,806, Cl. 356-301.000.
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- Pieroni, Robert J., to Eastman Machine Company. Pin table. 5,090,669, Cl. 269-54.500.
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- Pinto, Akiva; Lucaßen, Guenter; and Schmidt, Reinhard, to Hergeth Hollingsworth GmbH. Opening device. 5,090,629, Cl. 241-282.100.
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- Go, Yasunao, 5,091,724, Cl. 340-825.560.
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- Kawasaki, Masahiko, 5,091,937, Cl. 380-20.000.
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- Pirsoul, Michel: See—
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- Pitney Bowes Inc.: See—
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- Sarada, Thyagaraj; and Hochwalt, Norman C., 5,091,006, Cl. 106-22.000.
- Pittard, Fred J.; and Fultz, Jimmy D., to Slindril International, Inc. Underreamer with simultaneously expandable cutter blades and method. 5,090,480, Cl. 166-298.000.
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- Platsch, Hans G., to Industrielektronik Dr.-Ing Walter Klaschika GmbH & Co. Apparatus for producing a very thin mist of power and controls for producing thin mist of power. 5,090,626, Cl. 239-654.000.
- Plattner, Jacob J.: See—
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- Pleasants, Charles W.; and Fowler, Stewart H., Jr., to Otis Engineering Corporation. Fluid flow control apparatus, shifting tool and method for oil and gas wells. 5,090,481, Cl. 166-373.000.
- Pleasants, Julian R.: See—
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- Plemmons, Larry W.: See—
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- Plessey Overseas Limited: See—
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- Plouff, Frederick L.: See—
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- Podmore, Kenneth H.: See—
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- Pollard, Roger D., to Hewlett-Packard Company. Electrically short air line for network analyzer calibration. 5,091,709, Cl. 333-239.000.
- Pollock, Todd E. Active and passive handle for exercise device. 5,090,691, Cl. 272-93.000.
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- Polyplastics Co., Ltd.: See—
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- Polytech Netting Industries, L.P.: See—
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- Pomonik, George M.; Geminder, Robert; and Gonzalez, Orlando J. Pile driving using a hydraulic actuator. 5,090,485, Cl. 173-1.000.
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- Portable Containment, Inc.: See—
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- Potter, Terry A.; and Grubbs, Hugh C., to Mobay Corporation. Powder coatings with flat finishes. 5,091,475, Cl. 525-124.000.
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- Power, Elbert N. Garbage container apparatus. 5,090,585, Cl. 220-404.000.
- Powers, Robert H.; and Robbins, Daniel H., to A.B. Dick Company. Full range platemaker optical system. 5,091,745, Cl. 355-66.000.
- Pozzo, James A.: See—
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- Previti-Kelly, Rosemary A.: See—
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- Protz, William F., Jr., to National Tinsel Manufacturing Company. Decorative garland. 5,091,226, Cl. 428-10.000.
- Pruett, Wayne P.: See—
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- Pryor, Roger W., to Wayne State University. Novel susceptor for use in chemical vapor deposition apparatus and its method of use. 5,091,208, Cl. 427-38.000.
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- Przybylinski, Phillip G.: See—
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- Pucillo, Robert L. Support and positioning assembly for a spray nozzle. 5,090,646, Cl. 248-75.000.
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- Quantex Corporation: See—
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- Ragi, Elias G.: See—
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- Rapp, Knut M.: See—
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- Raskin, Neil: See—
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- Raynet Corporation: See—
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- Raytheon Company: See—
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- Greer, James A., 5,091,051, Cl. 156-643.000.
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- Reflect Game Corp.: See—
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- Reglass S.p.A.: See—
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- Reip, Paul; and Mowbray, Melton, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Short-circuiting switch and electromagnetic projectile launcher incorporating the switch. 5,090,292, Cl. 89-8.000.
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- ReKlame, Inc.: See—
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- Reltgen, Gerard: See—
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- Revis, Anthony, to Dow Corning Corporation. Silicone sealants. 5,091,445, Cl. 523-212.000.
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- Rexair, Inc.: See—
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- Theis, Ulrich; Hellmeister, H. -P.; Bisping, Bernhard; Vagedes, Michael; Kessler, Siegfried; Kantner, Horst; and Sommer, Peter, 5,090,328, Cl. 102-522.000.
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- Rhone-Poulenc Sante: See—
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- Richard, Lawrence D., to Lord Corporation. Coating method utilizing phosphoric acid esters. 5,091,211, Cl. 427-44.000.
- Richard Wolf GmbH: See—
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- Richter Gedeon Vegyeszeti Gyar Rt.: See—
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- Richter, Roland: See—
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- Ochi, Keiichi, 5,091,910, Cl. 371-40.100.
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- Yoshida, Tomoaki, 5,091,757, Cl. 357-17.000.
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- Rittal-Werk Rudolf Loh GmbH & Co. KG: See—
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- Rivers, Willie J., Jr.: See—
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- Riverwood Natural Resources Corporation: See—
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- Robbins, Daniel H.: See—
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- Roberts, Clifford J.; Batson, Edward; and Kurz, John H., to Scott Paper Company, Multi-function cup lid, 5,090,584, Cl. 220-712.000.
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- Robinson, Martyn K.: See—
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- Rockwell International Corporation: See—
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- Rode, Daniel L.: See—
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- Rodgers Instrument Corporation: See—
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- Rodgers, Mark. Seedling protector, 5,090,155, Cl. 47-30.000.
- Rodi, Anton; and Kraft, Hermann, to Heidelberger Druckmaschinen AG. Method and device for determining dampening-medium feed in an offset printing machine, 5,090,316, Cl. 101-148.000.
- Rodini, David J., to Du Pont de Nemours, E. I., and Company. Aramid fiber of improved hydrolytic stability, 5,091,456, Cl. 524-366.000.
- Roga, Robert C.: See—
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- Rogers, Daniel G., to Alsons Corporation. Hand held shower adapted to provide pulsating or steady flow, 5,090,624, Cl. 239-381.000.
- Rogers, Edward J.: See—
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- Rogers, Harold L.: See—
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- Rohde, Mark W.; Brown, Roger T.; Kirkwood, George T.; Schalk, Dick G.; and Smythe, Robert L., to Rodgers Instrument Corporation. Pedal board for musical instruments, 5,091,613, Cl. 200-86.500.
- Rohde, Siegfried: See—
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- Rohling, Bernd: See—
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- Rohm and Haas Company: See—
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- Wright, William B., 5,090,869, Cl. 416-147.000.
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- Rosales, Gilbert: See—
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- Rose Communications, Inc.: See—
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- Rosenberg, Peretz. Valve particularly useful for flushing fluid lines, 5,090,444, Cl. 137-495.000.
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- Ross, Michael E.: See—
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- Ross, William J.: See—
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- Roux, Daniel, to Installation Europeenne de Rayonnement Synchrotron (European Synchrotron Radiation Facility). Device for measuring or controlling change of level between several points, 5,090,128, Cl. 33-367.000.
- Roux, Gabriel; Rivero, Janine; and Gandini, Alessandro, to Centre Scientifique et Technique de Battment. Thereof as polyols in the formation of polyurethanes, polyurethanes etc., 5,091,495, Cl. 528-49.000.
- Rowe, Jonathan W.: See—
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- Rowe, William S.: See—
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- Rowland, Richard R., to Clorox Company, The. Method for synthesizing acyloxy-carboxylic acids, 5,091,560, Cl. 560-185.000.

- Royer, Garfield P.: See—
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- Rozanski, Walter J., Jr.: See—
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- Rubinfeld, Paul I., to Digital Equipment Corporation. System for controlling the storage of information in a cache memory, 5,091,845, Cl. 395-425.000.
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- Rudolph, Udo: See—
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- Rue, Charles V.; Pukaite, Leonard G.; and Subramanian, Krishnamoorthy, to Norton Company. Bonded abrasive tools with combination of finely microcrystalline aluminous abrasive and a superabrasive, 5,090,970, Cl. 51-309.000.
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- Ruffler, John. Car theft deterrent to deflate tire, 5,090,223, Cl. 70-175.000.
- Ruger, Wolfgang: See—
Nickel, Wolf-Ulrich; Henning, Rainer; Ruger, Wolfgang; Lerch, Ulrich; Urbach, Hansjorg; Hock, Franz; and Wiemer, Gabriele, 5,091,427, Cl. 514-249.000.
- Rupnick, Charles J.: See—
Holdren, Frederick V.; Novack, Mitchell J.; and Rupnick, Charles J., 5,090,243, Cl. 73-514.000.
- Rusek, Stanley J., Jr., to Owens-Corning Fiberglass Corporation. Method for making high R super insulation panel, 5,090,981, Cl. 65-4.400.
- Russell, Kenneth R. Table for truck bed, 5,090,335, Cl. 108-44.000.
- Russemeyer, Hans; Kerl, Manfred; Schmidt, Hans-Joachim; Hani, Beat; and Kagi, Werner, to Buhler AG; and Buhler GmbH. Method and apparatus for continuously crystallizing polyester material, 5,090,134, Cl. 34-57.00R.
- Rutsch, Werner: See—
Bermer, Godwin; Rembold, Manfred; Sitek, Franciszek; and Rutsch, Werner, 5,091,439, Cl. 522-26.000.
- Ryan, James G.: See—
Cronin, John E.; Kaanta, Carter W.; Previti-Kelly, Rosemary A.; and Ryan, James G., 5,091,289, Cl. 430-312.000.
- Rybaczky, Joseph A. Man-powered propulsion device, 5,090,928, Cl. 440-24.000.
- Rymer, Phil R.; Cutshall, Rex V.; and Ahn, Bo S., to Square D Company. Terminal block with multiple track mounting capability, 5,090,922, Cl. 439-716.000.
- Ryu, Su S., to SKC Limited. Tape cartridge with T-shaped braking lever, 5,091,813, Cl. 360-132.000.
- S. A. Saurer Diederichs (Societe Anonyme): See—
Pierson, Pierre; and Fourniaux, Roger, 5,090,454, Cl. 139-116.200.
- S&C Electric Company: See—
Ramos, Joel A.; Chabala, Leonard V.; Rogers, Edward J.; and Tobin, Thomas J., 5,091,616, Cl. 200-146.00R.
- S. C. Johnson & Son, Inc.: See—
Neumiller, Phillip J., 5,091,111, Cl. 252-305.000.
Ricchio, Danny T., 5,090,178, Cl. 53-456.000.
- Sabacky, Milton J.: See—
Castillo, Ernesto J.; Eigenberg, Kenneth E.; Patel, Kanaiyalal R.; and Sabacky, Milton J., 5,091,185, Cl. 424-438.000.
- Sabalvaro, Vincent M., III; and DiLorenzo, Ralph, to APCO Valve and Primer Corporation. Atmospheric compensating automatic air release valve, 5,090,439, Cl. 137-202.000.
- Sabota, Harvinder. Balloon catheters, 5,090,958, Cl. 604-98.000.
- Sachs, Howard G.; and Cho, James Y., to Intergraph Corporation. Cache providing caching/non-caching write-through and copyback modes for virtual addresses and including bus snooping to maintain coherency, 5,091,846, Cl. 395-250.000.
- Sadowski, James M. Aircraft, 5,090,636, Cl. 244-16.000.
- Saeiki, Kenshi; and Yoshitake, Noriaki, to Henkel Corporation. Composition and process for chromating galvanized steel and like materials, 5,091,023, Cl. 148-247.000.
- Saf T. Lok. Corporation: See—
Brooks, Frank, 5,090,148, Cl. 42-70.110.
- Safety Kleen Corp.: See—
Gendreau, Alan, 5,090,559, Cl. 206-278.000.
- Sahara, Kunizo: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikko; Kohno, Akio; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.
- Saimi, Tetsuo: See—
Goto, Shoji; Sakata, Akihiro; Yamamoto, Hiroshi; Saimi, Tetsuo; and Momoi, Kazuo, 5,091,793, Cl. 359-831.000.
- Saint-Gobain Vitre International: See—
Muller, Rene; and Daude, Gerard, 5,091,214, Cl. 437-164.000.
- Saito, Keizo: See—
Nagasawa, Hiroyuki; Inoue, Jun; Takeda, Katsunori; Saito, Keizo; and Murai, Hiroko, 5,091,878, Cl. 364-419.000.
- Saito, Nagao: See—
Mohri, Naotake; and Saito, Nagao, 5,091,620, Cl. 219-69.130.
- Saito, Satoshi, to Kabushiki Kaisha Toshiba. Measuring endoscope, 5,090,400, Cl. 128-6.000.
- Saito, Takayoshi: See—
Arai, Tatsuo; Haga, Katsumi; Saito, Takayoshi; Shiratori, Hidehisa; Hasegawa, Ryoei; and Iizuka, Kazuo, 5,090,849, Cl. 409-137.000.
- Saito, Takeo; Ishida, Yoshiaki; Fukunaga, Nobuyuki; Kimura, Mutsumi; and Metoki, Yasuo, to Sato Kogyo Co., Ltd. Tunnel driving method, 5,090,325, Cl. 102-313.000.
- Saito, Yuichi: See—
Watanabe, Yukari; and Saito, Yuichi, 5,091,874, Cl. 364-715.100.
- Saitoh, Shinya: See—
Satoh, Yasuta; Nakane, Shigeru; Saitoh, Shinya; and Kataoka, Isamu, 5,090,936, Cl. 446-175.000.
- Saitou, Toshio: See—
Yasuhara, Yoshihito; and Saitou, Toshio, 5,090,551, Cl. 198-323.000.
- Sakai, Akihiko: See—
Fujii, Toshio; Kato, Kazuhiro; Sakai, Akihiko; and Shinohara, Yoshinao, 5,091,228, Cl. 428-34.300.
- Sakai, Ikunori: See—
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.
- Sakai, Norio; Minowa, Kenji; and Morihito, Shinji, to Murata Manufacturing Co., Ltd. Method and apparatus for forming electrode on electronic component, 5,091,212, Cl. 427-96.000.
- Sakama, Mitsunori: See—
Yamazaki, Shunpei; Fukada, Takeshi; Sakama, Mitsunori; Shinohara, Hisato; Amachi, Nobumitsu; Sakamoto, Naoya; and Inuzima, Takashi, 5,091,638, Cl. 250-208.100.
- Sakamoto, Kazuo: See—
Machara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuo; Bessyo, Daisuke; Niwa, Takashi; Kusunoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.
- Sakamoto, Masahide: See—
Hasegawa, Taiji; Fujisawa, Masaaki; Sakamoto, Masahide; Ishii, Toshio; and Takahashi, Hideharu, 5,091,856, Cl. 364-424.050.
- Sakamoto, Naoya: See—
Yamazaki, Shunpei; Fukada, Takeshi; Sakama, Mitsunori; Shinohara, Hisato; Amachi, Nobumitsu; Sakamoto, Naoya; and Inuzima, Takashi, 5,091,638, Cl. 250-208.100.
- Sakamoto, Yoshio; and Iwakura, Shiro, to Kabushiki Kaisha Kenwood. Wiring structure of loudspeaker, 5,091,958, Cl. 381-150.000.
- Sakane, Katsunobu: See—
Fujita, Yoshiyuki; and Sakane, Katsunobu, 5,090,731, Cl. 280-777.000.
- Sakashita, Kiichiro: See—
Nakahara, Toshiaki; Tanikawa, Hirohide; Yoshida, Satoshi; Fujiwara, Masatsugu; and Sakashita, Kiichiro, 5,091,279, Cl. 430-106.600.
- Sakashita, Takeshi: See—
Nakabayashi, Nobuo; Honda, Narimichi; Nakamura, Mitsuo; and Sakashita, Takeshi, 5,091,033, Cl. 156-316.000.
- Sakata, Akihiro: See—
Goto, Shoji; Sakata, Akihiro; Yamamoto, Hiroshi; Saimi, Tetsuo; and Momoi, Kazuo, 5,091,793, Cl. 359-831.000.
- Sakata, Haruo, to Clarion Co., Ltd. FM stereo receiving device, 5,091,943, Cl. 381-7.000.
- Sakono, Takashi: See—
Inoue, Yasushi; and Sakono, Takashi, 5,090,502, Cl. 180-312.000.
- Sakumoto, Yukinori; Yokoyama, Shigeyuki; Shibuya, Akihiro; Nakayama, Nobuyuki; and Koshimura, Atsushi, to Tomoe-gawa Paper Co., Ltd. Adhesive tapes and semiconductor devices, 5,091,251, Cl. 428-352.000.
- Sakurai, Toshiharu: See—
Asada, Junichi; Takahashi, Kenji; and Sakurai, Toshiharu, 5,091,341, Cl. 437-212.000.
- Salbeck, Josef: See—
Daub, Jorg; Rapp, Knut M.; Seitz, Petra; Wild, Rainer; and Salbeck, Josef, 5,091,538, Cl. 546-283.000.
- Sales, Veronique: See—
Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,091,415, Cl. 514-506.000.
- Salk Institute for Biological Studies, The: See—
Sucov, Henry M.; and Evans, Ronald M., 5,091,518, Cl. 536-27.000.
- Salkeld, Robert J. Projectile delivery system, 5,090,642, Cl. 244-158.00R.
- Salminen, Gary. Fishing lure with releasable hook, 5,090,151, Cl. 43-42.050.
- Salomon, S.A.: See—
Arnulf, Paul, 5,090,723, Cl. 280-615.000.
- Saltman, Robert P., to Du Pont de Nemours, E. I., and Company. Partially grafted thermoplastic compositions, 5,091,478, Cl. 525-179.000.
- Salutar, Inc.: See—
Rocklage, Scott M.; and Quay, Steven C., 5,091,169, Cl. 424-9.000.
- Salzer, Richard: See—
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- Sampson, Scott D.: See—
Fulton, Alfred L.; Lakhani, Kishor M.; Sampson, Scott D.; and Lowman, Kent, 5,091,738, Cl. 346-154.000.
- Samson, Gene L.; and Aita, Michael, to Advanced Cardiovascular Systems, Inc. Imaging balloon dilatation catheter, 5,090,959, Cl. 604-96.000.
- SamSung Electronics Co., Ltd.: See—
An, Byeong-eui, 5,091,781, Cl. 358-125.000.

Kee, Heui-Tae, 5,090,899, Cl. 431-326.000.
 Sanchez, Julian J. B., to Intel Corporation. Self-aligned overlap MOS-FET and method of fabrication. 5,091,763, Cl. 357-23.900.
 Sandahl, Jeffrey E.: See—
 Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,090,694, Cl. 272-134.000.
 Sandefur, Dennis L. Repositionable sign figures. 5,090,146, Cl. 40-618.000.
 Sanden, Gordon: See—
 Miller, James T.; McAlpin, Michael T.; Sanden, Gordon; and Snow, Mark L., 5,090,639, Cl. 244-118.100.
 Sanders, Josef; Grogler, Gerhard; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyamines. 5,091,582, Cl. 564-418.000.
 Sandow, Jurgen K.; Schmiedel, Rainer; Wirth, Klaus; Merkle, Hans P.; and Raehs, Suzanne, to Hoechst Aktiengesellschaft. Cyclic peptides as promoters of absorption on administration onto the mucosa. 5,091,365, Cl. 514-9.000.
 Sandow, Jurgen K.: See—
 Konig, Wolfgang; Sandow, Jurgen K.; and Kolar, Cenek, 5,091,367, Cl. 514-15.000.
 Sandoz Ltd.: See—
 Ziegast, Gerd, 5,091,565, Cl. 562-473.000.
 Sandvik Rock Tools, Inc.: See—
 Yousef, Faisal J.; and Kane, Robert F., 5,090,500, Cl. 175-320.000.
 Sano, Hironari: See—
 Arashiro, Yusuke; Yamauchi, Shinichi; Sano, Hironari; Inoue, Takayuki; and Nishida, Koji, 5,091,473, Cl. 525-92.000.
 Sano, Kunihiko: See—
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 Sanraku Incorporated: See—
 Yoshioka, Takeo; Watanabe, Azuma; Kominato, Koichiro; Tone, Hiroshi; Okamoto, Rokuro; Sawa, Tsutomu; and Takeuchi, Tomio, 5,091,370, Cl. 514-30.000.
 Santa Fe Energy Resources, Inc.: See—
 Jones, Jeffrey A., 5,090,238, Cl. 73-155.000.
 Santel, Hans-Joachim: See—
 Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 5,091,537, Cl. 546-226.000.
 Forster, Heinz; Andree, Roland; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,090,991, Cl. 71-90.000.
 Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.
 Santi, Franco; and Bordini, Giorgio, to Tetra Dev-Co. Piston unit with rolling membrane. 5,090,299, Cl. 92-98.00D.
 Santoemma, John, to Findley Adhesives, Inc. Wood glue. 5,091,458, Cl. 524-436.000.
 Sanyo Electric Co., Ltd.: See—
 Katayanagi, Hideyuki; and Furutachi, Hideaki, 5,090,210, Cl. 62-135.000.
 Mashimo, Denji, 5,090,880, Cl. 417-310.000.
 Saper, Lawrence; and Hanson, Bruce L., to Datascope Investment Corp. Fastener for attaching sensor to the body. 5,090,410, Cl. 128-633.000.
 Sapporo Breweries Limited: See—
 Sone, Saburo; Muneoka, Masanobu; Nakamura, Akito; Uchida, Kiichi; and Seto, Kazumaro, 5,091,511, Cl. 530-351.000.
 Sarada, Thyagaraj; and Hochwalt, Norman C., to Pitney Bowes Inc. Solution fluorescent inks. 5,091,006, Cl. 106-22.000.
 Sargeant, Steven J.: See—
 Bagchi, Pranab; Sargeant, Steven J.; Beck, James T.; and Thomas, Brian, 5,091,296, Cl. 430-546.000.
 Sarkisian, Vahe: See—
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 Sartorius AG: See—
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 Sasagawa, Katsuyoshi: See—
 Haseyama, Ryuji; Kuroda, Kazuyuki; Hayashi, Kouzou; Sasagawa, Katsuyoshi; Kano, Taisaku; and Shikai, Kiyoshi, 5,091,496, Cl. 528-73.000.
 Sasahara, Masayuki; and Yamaguchi, Katsuya, to Dainippon Screen Mfg. Co., Ltd. Method of processing linework with electronic image processor. 5,091,974, Cl. 582-55.000.
 Sasaki, Junsoo; Hitomi, Mitsuo; Nishikawa, Toshio; and Fujimoto, Hidefumi, to Mazda Motor Corporation. Control system for engine with mechanical supercharger. 5,090,391, Cl. 123-559.300.
 Sasaki, Morimasa: See—
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 Sasaki, Naoto: See—
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 Sasaki, Nobukazu, to Canon Kabushiki Kaisha. Sheet sorter having movable bin trays. 5,090,688, Cl. 271-293.000.

Sasaki, Tooru; Ohkubo, Masashi; and Kimura, Akira, to Sony Corporation. Noise reducing receiver device. 5,091,954, Cl. 381-72.000.
 Sassa, Koichi: See—
 Shirata, Keiji; Sassa, Koichi; and Tomizawa, Kenji, 5,091,043, Cl. 156-601.000.
 Sato, Kan: See—
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 Sato, Kaoru: See—
 Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
 Sato, Katsuhiko: See—
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 Sato, Katsuhiko: See—
 Akasaki, Yutaka; Aonuma, Hidekazu; Hongo, Kazuya; Sato, Katsuhiko; Nukada, Katsumi; and Marumo, Teruomi, 5,091,276, Cl. 430-45.000.
 Sato, Kensaku; and Shirai, Akira, to Hirose Electric Co., Ltd. Electrical connector for diversity antennas. 5,090,925, Cl. 439-862.000.
 Sato Kogyo Co., Ltd.: See—
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 Sato, Masanori: See—
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 Sato, Michitaka: See—
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 Sato, Nobuyoshi: See—
 Takahashi, Toshihiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaro; Sato, Nobuyoshi; Itoh, Masanobu; Shiget, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.
 Sato, Tsutomu: See—
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 Satoh, Kazumi: See—
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 Satoh, Yasuta; Nakane, Shigeru; Saitoh, Shinya; and Kataoka, Isamu, to Takara Co., Ltd. Movable decoration. 5,090,936, Cl. 446-175.000.
 Satou, Shun-ichi: See—
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 Satsangi, Suresh C.: See—
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 Sawada, Takamasa: See—
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 Sawada, Yosuke; Ueki, Tomokazu; Tsuno, Takashi; and Oki, Toshiyuki, to Bristol-Myers Squibb Company. Novel alpha-glucosidase inhibitor, pradimicin Q. 5,091,418, Cl. 514-569.000.
 Sawaki, Toru; Nakaishi, Akio; Shimada, Keizo; and Watanabe, Takashi, to Teijin Limited. Shaped silicon carbide-cased ceramic article. 5,091,271, Cl. 428-698.000.
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 Scales, John T.; and Barton, John. Support appliances. 5,090,074, Cl. 5-448.000.
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 Mariotti, Sabina; Sisto, Alessandro; Nencioni, Luciano; Villa, Luigi; and Verdini, Antonio S., 5,091,510, Cl. 530-330.000.
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 Henschen, Homer E.; McKee, Michael J.; Pawlikowski, Joseph M.; Schaeffer, Richard L.; Shaffer, David T.; and Sharpe, Alexander M., 5,090,116, Cl. 29-827.000.

Schafer, Gerhard, to Fritz Schafer Gesellschaft mit beschränkter Haftung. Fastening and/or support device for roller bars on support rails or the like, particularly of continuous shelf systems. 5,090,547, Cl. 193-35.00R.
 Schafer, Roland: See—
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 Schafer, Volker: See—
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 Schalk, Dick G.: See—
 Rohde, Mark W.; Brown, Roger T.; Kirkwood, George T.; Schalk, Dick G.; and Smythe, Robert L., 5,091,613, Cl. 200-86.500.
 Schaller, Klaus: See—
 Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 5,091,537, Cl. 546-226.000.
 Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Blempel, Manfred, 5,091,375, Cl. 514-50.000.
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 Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.
 Schamberg, Eckehard; Koerner, Gotz; Fritsch, Herwig; Grasse, Manfred; and Sucker, Roland, to Th. Goldschmidt AG. Preparation for the water-repellent impregnation of porous mineral building materials. 5,091,002, Cl. 106-2.000.
 Schapertons, Herbert; and Scheibner, Bodo, to Volkswagen AG. Evaporative cooling system. 5,090,371, Cl. 123-41.210.
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 Scharschmidt, Jurgen: See—
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 Schatz, Oskar. Heat storage means. 5,090,474, Cl. 165-10.000.
 Schaub, Erwin L., to Epicor Industries, Inc. Oil filter wrench. 5,090,274, Cl. 81-64.000.
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 Scheideler, Wilfried: See—
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 Schein, Philip: See—
 Talebian, Abdolhossen; Green, Dianna; Hammer, Charles; Schein, Philip; Ghiorghis, Alem; and Clarke, Robert R., 5,091,523, Cl. 536-17.300.
 Schelhas, Peter: See—
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 Schenk, Donald E.; and McGraw, Doonan D., to General Motors Corporation. Brake control system. 5,090,518, Cl. 188-72.100.
 Schenk, Heinrich, to Siemens Aktiengesellschaft. Analog line connection. 5,091,703, Cl. 333-24.00R.
 Schering Aktiengesellschaft: See—
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 Tulshian, Deen; and Doll, Ronald J., 5,091,431, Cl. 514-262.000.
 Scheunemann, Karl-Heinz: See—
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Sessa, Scott C., to Wolverine World Wide, Inc. Footwear with integrated counterpocket shoe horn. 5,090,140, Cl. 36-138,000.

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 Baldwin, John J.; Ponticello, Gerald S.; Shepard, Kenneth L.; and Williams, Theresa M., 5,091,409, Cl. 514-434,000.

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 Ujimoto, Hiroshi; Nomura, Hironori; Shimakawa, Taiji; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 5,091,039, Cl. 156-519,000.

Shimaya, Hiroshi: See—
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 Katoh, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, 5,091,311, Cl. 435-119,000.

Shimizu, Kazuaki: See—
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Shimizu, Ryota: See—
 Ohba, Souji; Shimizu, Ryota; and Ohura, Hideki, 5,091,710, Cl. 335-229,000.

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 Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151,000.

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Yamamoto, Yasushi, 5,091,588, Cl. 568-607.000.

Shin, Hae Keun: See—
Kim, Yoon Ho; Ko, Jae Ung; and Shin, Hae Keun, 5,090,099, Cl. 29-25.420.

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Makisumi, Yasuo; Murabayashi, Akira; Hatta, Takayuki; and Ishiguro, Takeo, 5,091,539, Cl. 548-267.800.
Matsumoto, Saichi; Mizui, Takuji; and Doteuchi, Masami, 5,091,569, Cl. 562-621.000.

Shiotsuki, Takako: See—
Oda, Minoru; Kino, Shigemitsu; Ogawa, Kenji; and Shiotsuki, Takako, 5,091,191, Cl. 514-399.000.

Shiozaki, Makoto: See—
Yokoyama, Yuji; Tsutsumi, Yasuhiro; Suzuki, Yutaka; Shiozaki, Makoto; Onogi, Nobuyoshi; and Takasou, Kazuo, 5,090,728, Cl. 280-707.000.

Shirahase, Masaaki: See—
Kogure, Nobuyuki; Shirahase, Masaaki; and Tamori, Ikuo, 5,090,233, Cl. 73-28.050.

Shirai, Akira: See—
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Shiraishi, Isao, to Toshiba Lighting & Technology Corporation. Method of producing a lamp having a coated layer and the lamp produced thereby. 5,090,931, Cl. 445-22.000.

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Kishiro, Shigeru; Ogino, Tomohito; Muto, Yoshiaki; Nakamura, Katsunori; and Shiroyanagi, Yoshiro, 5,091,909, Cl. 371-40.100.

Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyahara, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, to Olympus Optical Co., Ltd. Pipe-inspecting apparatus having a self propelled unit. 5,090,259, Cl. 73-866.500.

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Maehara, Naoyoshi; Matsumoto, Takahiro; Sakamoto, Kazuo; Bessyo, Daisuke; Niwa, Takashi; Kusunoki, Shigeru; and Shitaya, Takao, 5,091,617, Cl. 219-10.55B.

Shoei Kako Kabushiki Kaisha: See—
Kamata, Eitaro, 5,090,061, Cl. 2-423.000.

Shohat, Daniel: See—
Sharvit, Joseph; Pereferkovich, Abraham A.; and Shohat, Daniel, 5,091,578, Cl. 564-399.000.

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Haneda, Satoshi; Fukuchi, Masakazu; and Shoji, Hisashi, 5,091,789, Cl. 358-401.000.

Shoji, Tatsuo: See—
Campbell, Gregor; Conn, Robert W.; and Shoji, Tatsuo, 5,091,049, Cl. 156-643.000.

Shomberger, Stephen M.: See—
Crutchfield, H. Carl; Shomberger, Stephen M.; Wedell, Mark T.; and Breedlove, Michael D., 5,090,663, Cl. 254-28.000.

Shost, Mark A.: See—
Spath, Mark J.; Shost, Mark A.; Kunz, Timothy W.; Giannone, Guy E.; and Castellana, John, 5,090,364, Cl. 123-90.160.

Showa Denko K.K.: See—
Nagai, Kimie; Najoh, Schuichi; Kurotaki, Ayako; Shirane, Koro; and Inoue, Chozo, 5,091,557, Cl. 560-39.000.
Tamamura, Hideo, 5,091,065, Cl. 204-64.00R.

Shrader Canada Limited: See—
Pearson, Burton A., 5,090,377, Cl. 123-198.00A.

Shuman, Richard F.: See—
King, Anthony O. P.; Karady, Sandor; Anderson, Kevin; Douglas, Alan W.; Abramson, Newton L.; and Shuman, Richard F., 5,091,534, Cl. 546-14.000.

Shumate, W. Allen: See—
Katznelson, Ron D.; Moroney, Paul; and Shumate, W. Allen, 5,091,936, Cl. 380-19.000.

Shutou, Hideki: See—
Ikeda, Koji; and Shutou, Hideki, 5,091,920, Cl. 375-76.000.

Shyu, Jia-Ming, to Industrial Technology Research Institute. Vehicle anti-collision system. 5,091,726, Cl. 340-904.000.

Sicius, Hermann: See—
Immenkeppel, Michael; Kleinstuck, Roland; Block, Hans-Dieter; Sicius, Hermann; and Schmidt, Peter, 5,091,562, Cl. 562-24.000.

Siddiqui, Kabir: See—
Schoepe, Adolf; and Siddiqui, Kabir, 5,090,066, Cl. 4-378.000.

Sieberth, John F.: See—
Perozzi, Edmund F.; and Sieberth, John F., 5,091,112, Cl. 252-387.000.

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Nohren, Hubert; Moritzen, Werner; Siebrand, Gerhard; and Knoke, Helmut, 5,090,641, Cl. 244-148.000.

Siegel, Bernd; and Patsch, Manfred, to BASF Aktiengesellschaft. Phenyl- or naphthylazobenzenes with multiple reactive groups and intermediates therefor. 5,091,516, Cl. 534-612.000.

Siegel, Norman L.: See—
Schneider, Edward T.; Siegel, Norman L.; and Kralovic, Raymond C., 5,091,343, Cl. 422-297.000.

Siegler, Thomas W.: See—
Thalmann, William H.; and Siegler, Thomas W., 5,091,085, Cl. 210-321.650.

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Gaul, Hartmut; and Mueller, Albert, 5,091,839, Cl. 363-41.000.
Haendle, Joerg; and Marhoff, Paul, 5,091,925, Cl. 378-99.000.
Heumann, Reiner, 5,091,639, Cl. 250-213.0VT.
Pribyl, Wolfgang; and Harter, Johann, 5,091,658, Cl. 307-443.000.
Proebster, Walter, 5,091,797, Cl. 359-187.000.

Schenk, Heinrich, 5,091,703, Cl. 333-24.00R.
Soethout, Freddie, 5,090,301, Cl. 454-159.000.
Tschirner, Peter, 5,090,252, Cl. 73-861.280.

Zell, Karl, 5,090,912, Cl. 439-79.000.
Zimlich, Josef; Duenisch, Ingo; and Achter, Eugen, 5,091,674, Cl. 313-625.000.

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Porter, Ronald J., 5,090,628, Cl. 241-36.000.

Siezen, Roelant J.: See—
Clark, John I.; Benedek, George B.; Siezen, Roelant J.; Thomson, John A.; and Friedman, Simon H., 5,091,421, Cl. 514-616.000.

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Siltech Inc.: See—
O'Lenick, Anthony J., Jr.; and Parkinson, Jeff K., 5,091,493, Cl. 528-30.000.

Silverberg, Morton. Multipurpose computer accessory for facilitating facsimile communication. 5,091,790, Cl. 358-434.000.

Simon, Gabriel, to University of Miami. Gel injection adjustable keratoplasty. 5,090,955, Cl. 604-51.000.

Simon, John G.; and Nicholson, James E., to UroMed Corporation. Conformable urethral plug. 5,090,424, Cl. 128-885.000.

Sinclair, Cunningham; and Wusthof, Peter, to Mannesman Rexroth GmbH. Radial piston engine. 5,090,295, Cl. 91-491.000.

Sinco, Inc.: See—
Larsen, Robert H.; Whatley, B. Holt; and Glynn, William D., 5,090,397, Cl. 125-14.000.

Sinskey, Anthony J.: See—
Easson, Donald D., Jr.; Peoples, Oliver P.; and Sinskey, Anthony J., 5,091,376, Cl. 514-54.000.

Sinyard, D. Edward: See—
Lindsey, G. Harold; Sinyard, D. Edward; and Dietrich, Hoelt H., 5,090,823, Cl. 384-605.000.

Sipala, John R. Tree basket. 5,090,157, Cl. 47-76.000.

Sipos, Judit: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Balogh, Marie; Rittli, Peter; Sipos, Judit; Pajor, Aniko; and Marmarosi, Katalin, 5,091,530, Cl. 544-229.000.

SIPRA Patententwicklung und Beteiligungsgesellschaft mbH: See—
Schick, Wilfried, 5,090,219, Cl. 66-219.000.

Sisto, Alessandro: See—
Mariotti, Sabina; Sisto, Alessandro; Nencioni, Luciano; Villa, Luigi; and Verdini, Antonio S., 5,091,510, Cl. 530-330.000.

Sitek, Franciszek: See—
Bernier, Godwin; Rembold, Manfred; Sitek, Franciszek; and Rutsch, Werner, 5,091,439, Cl. 522-26.000.

Sitma S.p.A.: See—
Ballestrazzi, Aris; and Tassi, Lamberto, 5,090,672, Cl. 270-45.000.

Sitnik, Theresa A.: See—
Aftergut, Siegfried; and Sitnik, Theresa A., 5,091,466, Cl. 524-600.000.

Siviy, Paula: See—
Ward, Joseph W.; Wang, Kenneth; Lissade, Joel; Siviy, Paula; Wilcox, David G.; and Yang, Agatha, 5,091,971, Cl. 382-54.000.

SKC Limited: See—
Ryu, Su S., 5,091,813, Cl. 360-132.000.

Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; and Naylor, Alan, to Glaxo Group Limited. Phenethanolamine derivatives. 5,091,422, Cl. 514-653.000.

Skochdopole, Richard E., to Dow Chemical Company. The Filled polymeric blend. 5,091,461, Cl. 524-493.000.

Slapelis, Vito, to Eastman Kodak Company. Cleaning apparatus having a surface-conforming blade. 5,091,753, Cl. 355-297.000.

Slavik, Walter; Citterio, Giorgio; and Brunecker, Guido, to Maschinenfabrik Rieter AG. Double sensor docking system particularly for textile ring spinning machines. 5,090,190, Cl. 57-264.000.

Slimdri International, Inc.: See—

Pittard, Fred J.; and Fultz, Jimmy D., 5,090,480, Cl. 166-298.000.
Slocum, Alexander H. System to convert rotary motion to linear motion. 5,090,265, Cl. 74-424.80R.

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Fohler, Johann; Smejkal, Hellmuth; and Hollwarth, Ernst, 5,090,622, Cl. 239-273.000.

Smith, Carl H.; and VonHoene, Robert M., to Allied-Signal Inc. Magnetic cores utilizing metallic glass ribbons and mica paper interlaminar insulation. 5,091,253, Cl. 428-363.000.

Smith, Derek W., to Automotive Products plc. Fluid pressure actuator. 5,090,201, Cl. 60-589.000.

Smith, Don W.: See—
Hipple, James H.; Smith, Don W.; Carpenter, Steven P.; and Johnston, Jesse C., 5,090,087, Cl. 15-317.000.

Smith, Jack L.: See—
Garrity, George M.; Del Val, Sagrario M.; Nallin, Mary; Schmatz, Dennis M.; Smith, Jack L.; VanMiddlesworth, Frank L.; Wilson, Kenneth E.; and Zweerink, Marcia M., 5,091,413, Cl. 514-460.000.

Smith, Joe R.: See—
Hey, H. Peter W.; Mazak, William A.; Aggarwal, Ravinder K.; Curtin, John H.; Brown, Paul B.; and Smith, Joe R., 5,091,217, Cl. 427-248.100.

Smith, Joseph P., Jr.: See—
Richards, John C.; and Smith, Joseph P., Jr., 5,090,194, Cl. 60-39.290.

Smith, Lowell S.; Eichelberger, Charles W.; Wojnarowski, Robert J.; Kornrumpf, William P.; and Piel, Joseph E., Jr., to General Electric Company. Ultrasonic array with a high density of electrical connections. 5,091,893, Cl. 367-153.000.

Smith and Nephew plc: See—
Milner, Richard, 5,091,442, Cl. 523-122.000.

Smith Randall C. Amplifier with mains voltage reduction. 5,091,700, Cl. 330-128.000.

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Kuhns, Roger J.; McLaren, Timothy S.; Nathans, Robert L.; and Smith, Robert F., 5,090,732, Cl. 281-29.000.

Smith, Thomas M. Infra-red heating. 5,090,898, Cl. 431-326.000.

SMS Engineering, Inc.: See—
Schmiedberg, Winfried; and Daub, Dieter, 5,090,228, Cl. 72-238.000.

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Schimion, Werner, 5,090,225, Cl. 72-45.000.

Svagr, Alexander; Engel, Georg; and Feldmann, Hugo, 5,090,224, Cl. 72-20.000.

Smuckler, Lawrence I. Vertical blind track protector. 5,090,467, Cl. 160-176.100.

Smythe, Robert L.: See—
Rohde, Mark W.; Brown, Roger T.; Kirkwood, George T.; Schalk, Dick G.; and Smythe, Robert L., 5,091,613, Cl. 200-86.500.

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deFraine, Paul; Snell, Brian K.; Beauteament, Kevin; and Anthony, Vivienne M., 5,091,407, Cl. 514-423.000.

Sniegowski, Jeffery: See—
Guckel, Henry; and Sniegowski, Jeffery, 5,090,254, Cl. 73-862.590.

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Dixon, Larry D.; Snow, Fred L.; and Stuckey, Kenneth B., 5,091,140, Cl. 376-260.000.

Snow, Mark L.: See—
Miller, James T.; McAlpin, Michael T.; Sanden, Gordon; and Snow, Mark L., 5,090,639, Cl. 244-118.100.

So, Bernard Y. C.; Marker, Terry L.; and Tampa, Gene E., to Amoco Corporation. Acid treatment of kerogen-agglomerated oil shale. 5,091,076, Cl. 208-426.000.

Socha, Thomas. Fluid mixing device. 5,090,816, Cl. 366-293.000.

S.A. Des Etablissements Staubli (France): See—
Truchet, Gaston, 5,090,448, Cl. 137-614.030.

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Dubois, Claude A. G., 5,090,197, Cl. 60-226.200.

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Bretaneker, Fabien; and Le Floch, Albert, 5,091,912, Cl. 372-23.000.

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Schouteeten, Alain; and Christidis, Yani, 5,091,566, Cl. 562-531.000.

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Harder, Scott R.; Soderquist, Cynthia A.; and Pierce, Claudia C., 5,091,108, Cl. 252-188.280.

Soethout, Freddie, to Siemens Aktiengesellschaft. Arrangement for ventilating the passenger space of a motor vehicle. 5,090,301, Cl. 454-159.000.

Sofia, Michael J.: See—
Karanewsky, Donald S.; Badia, Michael C.; Biller, Scott A.; Gordon, Eric M.; and Sofia, Michael J., 5,091,378, Cl. 514-80.000.

Sofranko, John A.: See—
Gaffney, Anne M.; and Sofranko, John A., 5,091,163, Cl. 423-328.000.

Sogan, Donald J. Cutting tool. 5,090,125, Cl. 30-308.100.

Sohn, Keun Y.: See—

Shin, Myung C.; Sohn, Keun Y.; Chung, Young H.; Lee, Young Y.; and Park, Tai W., 5,091,149, Cl. 420-528.000.

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Soikkeli, Osmo, to Oy Partek AB. Apparatus for the manufacture of insulating chutes. 5,091,037, Cl. 156-443.000.

Sokac, Russell J.: See—
Kamath, Venkatesh H.; Mandel, Barry P.; Beer, Ted A.; and Sokac, Russell J., 5,090,683, Cl. 271-227.000.

Soltani, Peter K.: See—
Creager, Ramon E.; and Soltani, Peter K., 5,091,653, Cl. 250-484.100.

Someya, Ryuichi; Kabuto, Nobuaki; Kimura, Yuichiro; and Watanabe, Kazuhiro, to Hitachi, Ltd.; and Hitachi Automotive Engineering Company. Matrix type image display apparatus using non-interlace scanning system. 5,091,784, Cl. 358-183.000.

Someya, Shinzo: See—
Onodera, Nobuo; Someya, Shinzo; Koura, Seigo; and Segami, Shigenori, 5,090,994, Cl. 71-94.000.

Sommer, Peter: See—
Theis, Ulrich; Hellmeister, H. -P.; Bisping, Bernhard; Vagedes, Michael; Kessler, Siegfried; Kantner, Horst; and Sommer, Peter, 5,090,328, Cl. 102-522.000.

Sone, Saburo; Munkata, Masanobu; Nakamura, Akito; Uchida, Kiichi; and Seto, Kazumaro, to Sapporo Breweries Limited. Lymphokine activated killer suppressive factor (LAKSF), process for producing it and immunosuppressive agent comprising it. 5,091,511, Cl. 530-351.000.

Sone, Yoshinori: See—
Aikawa, Eiichi; Fujiwara, Takayoshi; Honma, Hisanori; Sone, Yoshinori; and Shimoda, Moriaki, 5,090,874, Cl. 417-356.000.

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Sonner, David D.: See—
Briggs, Robert C.; Edwards, Bryan T.; Sonner, David D.; and Weber, Robert N., 5,091,991, Cl. 385-82.000.

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Kanada, Tokio, 5,091,812, Cl. 360-130.340.

Kobayashi, Seiji; and Psaltis, Demetri, 5,091,965, Cl. 382-15.000.

Kondo, Hirofumi; Haga, Shuichi; and Matsuda, Takaaki, 5,091,269, Cl. 428-693.000.

Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,091,805, Cl. 360-53.000.

Sasaki, Tooru; Ohkubo, Masashi; and Kimura, Akira, 5,091,954, Cl. 381-72.000.

Suzuki, Yuji, 5,091,815, Cl. 360-133.000.

Takada, Hirohisa; and Tanaka, Shosuke, 5,091,636, Cl. 235-454.000.

Yamamoto, Hiroshi; and Arai, Shizuo, 5,091,901, Cl. 369-291.000.

Soofi, Madjid, to Magneco/Metrel, Inc. Bubble pack plastic films as patterns for producing dimpled effects in cast ceramic pieces. 5,091,127, Cl. 264-56.000.

Sorensen, B. Chuck; and Devroy, Craig A., to Harnischfeger Engineers, Inc. Method and apparatus for controlling the shuttle of a storage and retrieval machine. 5,091,685, Cl. 318-652.000.

Sorensen, Erling, to A/S Hastrup Plastic; and A/s PLM Hastrup Holding. Method and apparatus for producing sealed and filled containers. 5,090,180, Cl. 53-471.000.

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Soto, Joel: See—
Garter, Lee F.; Orsborn, Jesse

- Spectronix Ltd.: See—
Baron, Reuven; Jacobson, Esther; and Spector, Yechiel, 5,090,482, Cl. 169-46.000.
- Spence, Scott L.: See—
Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barootian, Arthur, 5,090,246, Cl. 73-718.000.
- Spencer Wright Industries, Inc.: See—
Satterfield, William H., 5,090,341, Cl. 112-80.040.
- Speranza, George P.; and Su, Wei-Yang, to Texaco Chemical Company. Amine terminated polyamides, 5,091,572, Cl. 564-139.000.
- Speranza, George P.: See—
Lin, Jiang-Jen; and Speranza, George P., 5,091,574, Cl. 564-325.000.
- Sperzel, Michael: See—
Baumgarten, Jorg; Brunner, Helmut; Flesch, Inge; Hildebrand, Heinz; Piel, Norbert; and Sperzel, Michael, 5,091,364, Cl. 514-8.000.
- Spielvogel, David E.: See—
Karakelle, Mutlu; Benson, Carl D.; Taller, Robert A.; and Spielvogel, David E., 5,091,443, Cl. 424-665.000.
- Spiller, Mildred E. Ski boot key, 5,090,277, Cl. 81-488.000.
- Spofford, Bryan T.; Christopher, Kent L.; and Hovanes, Michael E., to Spofford, Bryan T.; and Christopher, Kent L. Transtracheal catheter system and method, 5,090,408, Cl. 128-207.140.
- Spragelse Maskinfabrik A/S: See—
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- Sprecher Energie AG: See—
Lippi, Bruno; Suter, Ernst; and Meier, Thomas, 5,091,615, Cl. 200-144.00B.
- Springer, Helmut: See—
Lappe, Peter; and Springer, Helmut, 5,091,546, Cl. 556-23.000.
- Spring Industries, Inc.: See—
Tolbert, Thomas W.; Jaco, Pamela J.; Dugan, Jeffrey S.; and Hendrix, James E., 5,091,243, Cl. 428-253.000.
- Sprow, William; and Miller, Donald, to Brazeway, Inc. Evaporator having integrally baffled tubes, 5,090,477, Cl. 165-150.000.
- Square D Company: See—
Cornhill, Colin V.; and Carlin, Charles K., 5,091,640, Cl. 250-214.00R.
- Rymer, Phil R.; Cutshall, Rex V.; and Ahn, Bo S., 5,090,922, Cl. 439-716.000.
- Square Grip Limited: See—
Chana, Palvinder; and Clapson, John D., 5,090,172, Cl. 52-252.000.
- Squires, Wilber D.; Bachman, John A.; and Laney, Bryan L., to Del Mar Avionics. Method and apparatus for screening electrocardiographic (ECG) data, 5,090,418, Cl. 128-702.000.
- Srinivasan, Ananthachari: See—
Fritzberg, Alan R.; Kasina, Sudhakar; Rao, Tripuraneni N.; VandeHeyden, Jean-Luc; and Srinivasan, Ananthachari, 5,091,514, Cl. 534-14.000.
- Stabilus GmbH: See—
Heinrichs, Heinz-Josef; Enders, Stephan; Wagner, Udo; and Dirksen, Alfred, 5,090,770, Cl. 297-347.000.
- Stacher, Angelo; and Vogel, Rudolf, to Sulzer Brothers Limited. Torsion bar type warp tensioning device for a loom, 5,090,453, Cl. 139-115.000.
- Staffelbach, Rudy H.: See—
Berry, Tommie; Delaney, Larry; and Staffelbach, Rudy H., 5,091,693, Cl. 324-158.00F.
- Stahl, Norman O. Method of controlling astigmatism during eye surgery, 5,090,425, Cl. 128-898.000.
- Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Process and an arrangement for false-twist spinning, 5,090,192, Cl. 57-328.000.
- Stahlecker, Hans: See—
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- Stalin, Ann C., to Aktiebolaget Electrolux. Plunger to support a wall on plastics foaming and method to make such a plunger, 5,090,885, Cl. 425-117.000.
- Stamp, John R. Multi-compartment container, 5,090,785, Cl. 312-319.000.
- Standard Oil Company, The: See—
Litt, Maria; Cobb, Wesley N.; Bond, David C.; Chung, Jack C.; and Leininger, Gary G., 5,091,963, Cl. 382-8.000.
- Stanford, Ulf H., to Horton, Corvin R., a part interest. Bow foil, 5,090,352, Cl. 114-67.00A.
- Stanford University, The Board of Trustees of: See—
McCarty, Perry L.; and Bachmann, Andre, 5,091,315, Cl. 435-287.000.
- Stanley-Bostitch, Inc.: See—
Fealey, William S., 5,091,123, Cl. 264-36.000.
- Stapel, Ralf: See—
Meyer, Matthias; Stapel, Ralf; Kottmann, Hariolf; and Gries, Thomas, 5,091,589, Cl. 568-615.000.
- Stapleton, Alan L.: See—
Keller, Paul R. N.; Cawley, Robin A.; and Stapleton, Alan L., 5,090,909, Cl. 434-43.000.
- Starr, James W.: See—
Maresca, Joseph W., Jr.; Starr, James W.; and Wilson, Christopher P., 5,090,234, Cl. 73-49.100.
- Stawarz, Dick A., to Blount, Inc. Bow sight with projected reticle aiming spot, 5,090,805, Cl. 356-251.000.
- STC PLC: See—
Walters, David L.; Healy, Martin; Marlow, Ernest C.; and Harrison, David F., 5,090,665, Cl. 254-134.400.
- Stegman, David A.: See—
Parton, Richard L.; Link, Steven G.; Stegman, David A.; and Mee, John D., 5,091,298, Cl. 430-570.000.
- Steiner, Helmut: See—
Laudszun, Heinz; Steiner, Helmut; and Leidig, Hans J., 5,090,778, Cl. 301-105.00R.
- Steiner, Karl: See—
Wolf, Robert; and Steiner, Karl, 5,090,135, Cl. 34-124.000.
- Stendel, Wilhelm: See—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Lurssen, Klaus; Schmidt, Robert R.; Santel, Hans-Joachim; Becker, Benedikt; Schaller, Klaus; and Stendel, Wilhelm, 5,091,537, Cl. 546-226.000.
- Stengard, Flemming F., to Danisco A/S. Permeable, porous polymeric membrane with hydrophilic character, methods for preparing said membranes and their use, 5,091,086, Cl. 210-490.000.
- Stenger, Tracy K., to Johnson Enterprises, Inc. Seal for a beverage tap, 5,090,599, Cl. 222-400.700.
- Stephan, Michael: See—
Leistner, Dirk; Bohme, Frank; Pospiech, Doris; Ratzsch, Manfred; Vieth, Christian; and Stephan, Michael, 5,091,494, Cl. 528-45.000.
- Steris Corporation: See—
Schneider, Edward T.; Siegel, Norman L.; and Kralovic, Raymond C., 5,091,343, Cl. 422-297.000.
- Sterling Winthrop Inc.: See—
Miller, Theodore C.; and Ross, Michael E., 5,091,410, Cl. 514-437.000.
- Stern, Gerhard: See—
Mullner, Martin; Stern, Gerhard; Schulz, Erich; and Rossler, Markus, 5,091,553, Cl. 558-302.000.
- Stevenson, Thomas M., to Du Pont de Nemours, E. I., and Company. Insecticidal pyrazolines, 5,091,405, Cl. 514-403.000.
- Stewart, Shannon D.: See—
Monthony, James F.; Stitt, David T.; Gosnell, C. Michael; and Stewart, Shannon D., 5,091,316, Cl. 435-295.000.
- Steyr-Daimler-Puch AG: See—
Bilgeri, Elmar, 5,090,327, Cl. 102-430.000.
- Stitt, David T.: See—
Monthony, James F.; Stitt, David T.; Gosnell, C. Michael; and Stewart, Shannon D., 5,091,316, Cl. 435-295.000.
- Stiwa-Fertigungstechnik Sticht Gesellschaft m.b.H.: See—
Huber, Thomas; and Huber, Ralf, 5,090,757, Cl. 294-88.000.
- Stob, Henry R., to Compatico, Inc. Energy distribution raceway, 5,091,607, Cl. 174-48.000.
- Stoffel, John L.: See—
Mueller, Bruce E.; and Stoffel, John L., 5,091,005, Cl. 106-22.000.
- Stohr, Frank-Michael: See—
Herd, Karl J.; Frosch, Hans-Georg; Henk, Hermann; Mullers, Wolfgang; and Stohr, Frank-Michael, 5,091,515, Cl. 534-598.000.
- Stone, James: See—
Ijas, Lasse K.; Asikainen, Aimo I.; Hotta, Arto V. I.; Raskin, Neil; Stone, James; Beavers, Gregory; and Watson, David, 5,091,156, Cl. 422-146.000.
- Stoner, Aaron Z.; and Murakami, Alan E. Article of clothing and method of producing the same, 5,090,056, Cl. 2-69.000.
- Story, Carl E.; and O'Connor, Kenneth M., to Systems Chemistry, Inc. Junction assembly with leak detection means, 5,090,871, Cl. 417-9.000.
- Storz Instrument Company: See—
Gahn, Gerald S., 5,091,656, Cl. 307-119.000.
- Stotts, Robert E.: See—
Riecke, George T.; and Stotts, Robert E., 5,090,894, Cl. 431-183.000.
- Stout, Luke A.: See—
Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., 5,090,281, Cl. 83-13.000.
- Strack, Robert D.; Vebeliunas, Rimas V.; Bamford, David A.; and Halle, Roy T., to Exxon Chemical Patents Inc. Sequence for separating propylene from cracked gases, 5,090,977, Cl. 62-23.000.
- Strang, Harry: See—
Forster, Heinz; Andree, Roland; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,090,991, Cl. 71-90.000.
- Kirsten, Rolf; Kluth, Joachim; Fest, Christa; Gesing, Ernst; Muller, Klaus-Helmut; Riebel, Hans-Jochem; Babczinski, Peter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,091,529, Cl. 544-197.000.
- Strapazzini, Vittorio. Method for forming plastic molded panels with inserts, 5,091,031, Cl. 156-211.000.
- Strasser, Wilhelm, to Leybold AG. Vibration-dampening arrangement for a refrigerator operating according to the Gifford-McMahon principle, 5,090,206, Cl. 62-6.000.
- Strauss, Richard F., to Thomas & Betts Corporation. High impedance electrical cable, 5,091,610, Cl. 174-117.00F.
- Stribling, Bradley C.: See—
Needle, David L.; and Stribling, Bradley C., 5,091,941, Cl. 380-43.000.
- Stringfield, Butler: See—
Kennington, Allison; Lerner, Joseph; Hill, Cynthia; Stringfield, Butler; Carta, Giorgio; and Kirwan, Donald J., 5,091,596, Cl. 568-833.000.
- Strozier, Robert W.: See—
Cantillo, Jose; Strozier, Robert W.; and Francik, William P., 5,091,449, Cl. 524-100.000.
- Struk, James R.: See—
Michail, Michel S.; and Struk, James R., 5,091,659, Cl. 307-454.000.

- Stuckey, Kenneth B.: See—
Dixon, Larry D.; Snow, Fred L.; and Stuckey, Kenneth B., 5,091,140, Cl. 376-260.000.
- Studebaker, Lawrence G.; and Wong, Edward H., to Hewlett-Packard Company. Multilevel resist plated transfer layer process for fine line lithography, 5,091,342, Cl. 437-228.000.
- Studiengesellschaft Kohle mbH: See—
Bogdanovic, Borislav; and Schwickardi, Manfred, 5,091,536, Cl. 546-112.000.
- Lehmkuhl, Herbert; and Mehler, Klaus-Dieter, 5,091,063, Cl. 205-237.000.
- Stull, Gene. Dispenser construction, 5,090,598, Cl. 222-153.000.
- Stuwe, Arnd: See—
Herwig, Jens; Stuwe, Arnd; and Grub, Joachim, 5,091,093, Cl. 210-639.000.
- Su, Shiu-Chin H.: See—
Dana, David E.; Huang, Tsao-Chin C.; Pepe, Enrico J.; Pohl, Eric R.; and Su, Shiu-Chin H., 5,091,465, Cl. 524-588.000.
- Su, Wei-Yang: See—
Speranza, George P.; and Su, Wei-Yang, 5,091,572, Cl. 564-139.000.
- Su, Wei-Yang; and Zimmermann, Robert L., to Texaco Chemical Company. Continuous preparation of tertiary aliphatic methyl amines, 5,091,585, Cl. 564-473.000.
- Subramanian, Krishnamoorthy: See—
Rue, Charles V.; Pukaite, Leonard G.; and Subramanian, Krishnamoorthy, 5,090,970, Cl. 51-309.000.
- Sucker, Roland: See—
Schamberg, Eckehard; Koerner, Gotz; Fritsch, Herwig; Grasse, Manfred; and Sucker, Roland, 5,091,002, Cl. 106-2.000.
- Sucov, Henry M.; and Evans, Ronald M., to Salk Institute for Biological Studies. The Beta retinoic acid response elements compositions and assays, 5,091,518, Cl. 536-27.000.
- Suda, Yasuo: See—
Fukahori, Hidehiko; Suda, Yasuo; Itoh, Kenji; Higashihara, Masaki; and Aoyama, Keisuke, 5,091,742, Cl. 354-402.000.
- Sudare, Masahiro: See—
Fukuyama, Kiyoshi; Wada, Toru; Kitabata, Kozo; Sudare, Masahiro; Tsuchitani, Shigemi; and Ohminami, Kazuya, 5,090,552, Cl. 198-365.000.
- Suddeutsche Zucker-Aktiengesellschaft: See—
Daub, Jorg; Rapp, Knut M.; Seitz, Petra; Wild, Rainer; and Salbeck, Josef, 5,091,538, Cl. 546-283.000.
- Sudol, Marion A.: See—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr.; Sudol, Marion A.; and Boden, Richard M., 5,091,200, Cl. 426-243.000.
- Sugahara, Jun: See—
Takahashi, Toshihiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yukio; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katsuro; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.
- Sugano, Taku; Iwanaga, Kazuyoshi; and Hattori, Noboru, to Nissan Motor Company, Ltd.; and Jatco Corporation. Automatic power transmission with subsidiary transmission unit, 5,090,950, Cl. 475-129.000.
- Sugar, Andras: See—
Godla, Imre; Foldesi, Jozsef; Polgar, Istvan; Gulyas, Endre; Gebhardt, Istvan; Kiss, Janos; Molnar, Karoly; Sugar, Andras; Angyal, Pal; Konok, Ferenc; and Marina, Zoltan, 5,091,355, Cl. 502-301.000.
- Sugawara, Shigeru: See—
Shimoma, Taketoshi; Kamohara, Eiji; Sugawara, Shigeru; and Shimokobe, Jiro, 5,091,673, Cl. 313-412.000.
- Sugawara, Takahiro: See—
Iwane, Hiroshi; Sugawara, Takahiro; and Kaneko, Kimiko, 5,091,592, Cl. 568-730.000.
- Sugaya, Tadashi: See—
Miyoshi, Ryota; Imai, Isao; and Sugaya, Tadashi, 5,091,013, Cl. 106-505.000.
- Sugimori, Tsunetake; Tsukada, Yoji; and Tatsuke, Yasuhiko, to Marukin Shoyu Co., Ltd. Bile acid sulfate sulfatase, process for its preparation and method for assaying bile acid, 5,091,305, Cl. 435-19.000.
- Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, to Tokyo Electric Co., Ltd. Printer with sheet feeding apparatus, 5,090,318, Cl. 101-227.000.
- Sugimoto, Yoshihiko: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,090,318, Cl. 101-227.000.
- Sugita, Toshiaki: See—
Makino, Misao; Hashimoto, Kiyoshi; and Sugita, Toshiaki, 5,090,799, Cl. 351-221.000.
- Sugiyama, Shunichi: See—
Ishii, Toshio; Okubo, Yutaka; Fukuda, Shuzo; Kawai, Yoshihiko; Sugiyama, Shunichi; Kikuchi, Yoshiteru; and Matsuno, Hidetoshi, 5,091,000, Cl. 75-508.000.
- Sukigara, Akihiko: See—
Hirano, Hirofumi; and Sukigara, Akihiko, 5,090,827, Cl. 400-185.000.
- Sulzer Brothers Limited: See—
Jankovsky, Frantisek; Vezzu, Danilo; Pfarrwaller, Erwin; and Demuth, Hans, 5,090,455, Cl. 139-145.000.
- Stacher, Angelo; and Vogel, Rudolf, 5,090,453, Cl. 139-115.000.
- Sumitomo Chemical Company, Limited: See—
Yano, Toshihiko; Matsuo, Noritada; Tonsu, Yoko; and Dohara, Kazunobu, 5,091,183, Cl. 424-405.000.
- Sumitomo Electric Industries, Ltd.: See—
Kobayashi, Yuji; Matsuda, Yasuo; Hosoya, Toshifumi; and Nonaka, Tsuyoshi, 5,091,984, Cl. 385-16.000.
- Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,091,609, Cl. 174-110.00A.
- Tsuchimoto, Junichi; Yamada, Tooru; and Miyano, Takaya, 5,091,338, Cl. 437-184.000.
- Sumitomo Metal Mining Company, Limited: See—
Achikita, Masakazu; and Ohtsuka, Akihito, 5,091,022, Cl. 148-104.000.
- Sumitomo Rubber Industries, Ltd.: See—
Oka, Kengo; Yoshida, Susumu; Mimoto, Yoshiyuki; Ebisuno, Tadashi; and Yabuki, Yoshikazu, 5,090,705, Cl. 273-232.000.
- Sumiya, Kazuhiro: See—
Yamamoto, Tokihiko; Fukumoto, Ryoichi; Ohhashi, Masao; Itagaki, Kazuhide; and Sumiya, Kazuhiro, 5,090,081, Cl. 15-250.130.
- Summer Mfg. Co., Inc.: See—
Harrell, Jerry J., 5,090,667, Cl. 254-326.000.
- Summers, Laine E., to Conoco Inc. Method for reducing water production from a gravel packed well, 5,090,478, Cl. 166-278.000.
- Summerville, Don S.: See—
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 5,090,589, Cl. 221-2.000.
- Sun Microsystems, Inc.: See—
Carrie, Susan; Ergene, Serdar; and Gosling, James, 5,091,717, Cl. 340-703.000.
- Sun Refining and Marketing Company: See—
Ellis, Paul E., Jr.; and Lyons, James E., 5,091,354, Cl. 502-200.000.
- Sunahara, Shuichi: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kasada, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
- Sundstrand Corporation: See—
Mosure, Duane C.; and Houtz, Norman E., 5,090,868, Cl. 415-207.000.
- Sundstrand Data Control, Inc.: See—
Holdren, Frederick V.; Novack, Mitchell J.; and Rupnick, Charles J., 5,090,243, Cl. 73-514.000.
- Sunproject S.R.L.: See—
Tedeschi, Giovanni, 5,090,468, Cl. 160-290.100.
- Suppes, Stephan: See—
Zingher, Oded; Wuhrl, Arno; and Suppes, Stephan, 5,091,859, Cl. 364-471.000.
- Supra Products, Inc.: See—
Imran, Mir A., 5,090,222, Cl. 70-63.000.
- Suret, Michel; Reltgen, Gerard; and Morin, Serge, to A.T.F.H. Electromagnetically compatible vertical enclosure for the operating system of transmission equipment, in particular for transmission by radio beam, 5,091,827, Cl. 361-424.000.
- Suter, Ernst: See—
Lippi, Bruno; Suter, Ernst; and Meier, Thomas, 5,091,615, Cl. 200-144.00B.
- Suto, Satoshi: See—
Suzuki, Mikio; Suto, Satoshi; Okuda, Ikuo; Nakawaki, Yasunori; and Abe, Akiharu, 5,090,881, Cl. 418-26.000.
- Sutton, Leroy A., to Zenith Electronics Corporation. CRT dynamic focus system having independent corner adjustment, 5,091,681, Cl. 315-382.000.
- Sutton, Lloyd M. Method and apparatus for manufacturing lap desks, 5,090,334, Cl. 108-43.000.
- Sutton, Martyn: See—
Hug, Leonard F.; and Sutton, Martyn, 5,091,273, Cl. 429-94.000.
- Suuronen, David E., to Gould Inc. Thin film fusible element, 5,091,712, Cl. 337-297.000.
- Suyama, Shuji: See—
Higuchi, Yoshiki; and Suyama, Shuji, 5,091,586, Cl. 568-332.000.
- Suzuki, Akinori: See—
Katoh, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, 5,091,311, Cl. 435-119.000.
- Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, to Canon Kabushiki Kaisha. Color image recording utilizing color correction in accordance with a predetermined order of recording of multiple color agents, 5,091,734, Cl. 346-1.100.
- Suzuki Jidosha Kogyo Kabushiki Kaisha: See—
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- Suzuki, Kazuo; Tachibana, Fusao; and Chonan, Mitsugi, to Fuji Jukogyo Kabushiki Kaisha. Idling speed adjustment system for engine, 5,090,380, Cl. 123-339.000.
- Suzuki, Kiyotaka: See—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Sjiuji; Nakajima, Ryoichi; and Naito, Sakae, 5,091,072, Cl. 208-39.000.
- Suzuki, Masahiro; Kamemura, Ichiro; and Kodaka, Hiromitsu, to Asahi Glass Company Ltd. Polyol composition and method for producing a rigid polyurethane foam using the same, 5,091,434, Cl. 521-78.000.
- Suzuki, Masashi: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,090,318, Cl. 101-227.000.

Suzuki, Mikio; Suto, Satoshi; Okuda, Ikuo; Nakawaki, Yasunori; and Abe, Akiharu, to Toyoda Koki Kabushiki Kaisha. Variable-displacement vane-pump. 5,090,881, Cl. 418-26.000.

Suzuki, Minako: See—
Kawata, Masayuki; Ozawa, Fujio; Kasuga, Masao; Suzuki, Minako; and Shibayama, Takako, 5,091,670, Cl. 310-323.000.

Suzuki, Minoru: See—
Yoshida, Takeo; and Suzuki, Minoru, 5,090,620, Cl. 239-96.000.

Suzuki, Naoto: See—
Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.

Suzuki, Nobuhisa: See—
Hihara, Mikio; and Suzuki, Nobuhisa, 5,091,014, Cl. 106-677.000.

Suzuki, Shoji; and Yamato, Motoyuki, to Nippon Zeon Co., Ltd. Coated polyborborene products. 5,091,263, Cl. 428-518.000.

Suzuki, Shunji, to International Business Machines Corporation. Twisted nematic liquid crystal display device. 5,091,794, Cl. 359-93.000.

Suzuki, Teruo: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.

Suzuki, Tetsuji: See—
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,091,277, Cl. 430-48.000.

Suzuki, Toshiaki; Kitagawa, Sotoryuki; Nakayama, Takashi; and Kuno, Takao, to Tonen Chemical Corporation. Cross-linkable, foamable polyolefin resin composition. 5,091,435, Cl. 521-134.000.

Suzuki, Yoshinobu, to Koito Manufacturing Co., Ltd. Projection type vehicular headlamp. 5,091,830, Cl. 362-61.000.

Suzuki, Yuji, to Sony Corporation. High packing density disk cartridge with write protect mechanism. 5,091,815, Cl. 360-133.000.

Suzuki, Yutaka, to Nissan Motor Co., Ltd. Control system for automatic transmission. 5,090,270, Cl. 74-866.000.

Suzuki, Yutaka: See—
Yokoya, Yuji; Tsutsumi, Yasuhiro; Suzuki, Yutaka; Shiozaki, Makoto; Onogi, Nobuyoshi; and Takasou, Kazuo, 5,090,728, Cl. 280-707.000.

Svagr, Alexander; Engel, Georg; and Feldmann, Hugo, to SMS Schloemann-Siemag Aktiengesellschaft. Method of determining the spring characteristic of a roll stand. 5,090,224, Cl. 72-20.000.

Swan, Alan J.; and Trinh, Tuan A., to NAPCO Scientific Company. Incubator heating system. 5,090,617, Cl. 236-3.000.

Swanson, David K.: See—
Dahl, Roger W.; Beatty, Graydon E.; Swanson, David K.; and Heil, John E., 5,090,422, Cl. 128-784.000.

SWF Auto-Electric GmbH: See—
Alber, Paul; Edele, Reinhard; Hauk, Klaus; Teich, Michael; and Schutze, Michael, 5,090,082, Cl. 15-250.170.

Syntex Pharmaceuticals, Ltd.: See—
Pascal, Jean C.; Lee, Chi-Ho; Alps, Brian J.; Pinhas, Henri; and Whiting, Roger L., 5,091,428, Cl. 514-252.000.

Syntex (U.S.A.) Inc.: See—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 5,091,558, Cl. 560-139.000.

Ong, John T. H.; Fujiki, Jean S.; and Liaw, Wei-Cheng, 5,091,182, Cl. 424-400.000.

Systec Engineering Knauer GmbH & Co. KG: See—
Dober, Walter; and Oettinger, Heinz, 5,090,889, Cl. 425-522.000.

Systems Chemistry, Inc.: See—
Story, Carl E.; and O'Connor, Kenneth M., 5,090,871, Cl. 417-9.000.

Szczyrbowski, Joachim; Rogels, Stefan; Dietrich, Anton; and Hartig, Klaus, to Leybold Aktiengesellschaft. Method for producing glass of high transmission in the visible spectral range and low solar energy transmission. 5,090,984, Cl. 65-60.200.

Szymanski, D. M.: See—
Gakhar, Ved P.; Ballou, Joseph H.; Leubbers, James M.; and Szymanski, D. M., 5,090,461, Cl. 144-136.00C.

T. J. Gundlach Machine Company: See—
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T&N Technology Limited: See—
Bayliss, Colin R., 5,090,603, Cl. 222-590.000.

T.S.B. Ltd.: See—
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Tabayashi, Isao; Harada, Hiroshi; Inoue, Sadahiro; and Fukutomi, Hiroshi, to Dainippon Ink and Chemicals, Inc. Ink composition. 5,091,004, Cl. 106-22.000.

Tachibana, Fusao: See—
Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, 5,090,386, Cl. 123-478.000.

Suzuki, Kazuo; Tachibana, Fusao; and Chonan, Mitsugi, 5,090,380, Cl. 123-339.000.

Tada, Osamu: See—
Katoh, Hideki; Kobayashi, Reisuke; Shimazu, Tomonori; Suzuki, Akinori; Isogai, Akira; and Tada, Osamu, 5,091,311, Cl. 435-119.000.

Taga, Akira: See—
Umehara, Shigeru; Kohara, Ikumitsu; Kaseda, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.

Tagawa, Yoichi: See—
Matsuo, Kazuhiro; Murakami, Koichi; Tagawa, Yoichi; and Iizumi, Kenichi, 5,090,860, Cl. 412-11.000.

Taggart, Robert E.: See—
Mullen, Michael A.; Highland, Henry A.; Taggart, Robert E.; and Lingren, Bill W., 5,090,153, Cl. 43-114.000.

Tai, Anthony M., to Environmental Research Institute of Michigan. Real time optical pre-detection processing of multispectral image data. 5,090,807, Cl. 356-310.000.

Taiho Industries Co., Ltd.: See—
Mohri, Hidemasa; Tobita, Michiaki; and Ishida, Masahiko, 5,091,735, Cl. 346-1.100.

Tairaka, Yoshihiko; and Idomoto, Masayoshi, to Takeda Chemical Industries, Ltd. Method of producing rigid urethane foam. 5,091,438, Cl. 521-175.000.

Taisho Pharmaceutical Co., Ltd.: See—
Watanabe, Masahiro; and Yokoyama, Kazumasa, 5,091,417, Cl. 514-530.000.

Taiyo Yuden Co., Ltd.: See—
Shiba, Nobuyasu; Imai, Mizuho; Sekiguchi, Mikio; and Iida, Hideyo, 5,090,360, Cl. 118-59.000.

Takabatake, Minoru, to Petoca Ltd. Porous carbon-carbon composite and process for producing the same. 5,091,164, Cl. 423-445.000.

Takada, Hirohisa; and Tanaka, Shosuke, to Sony Corporation. Apparatus for detecting modulated informations from emitted light turned by an object. 5,091,636, Cl. 235-454.000.

Takada, Yoshihiro: See—
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 5,091,734, Cl. 346-1.100.

Takagi, Shiro, to Kabushiki Kaisha Toshiba. Information processing apparatus displaying multiple windows and distinguishing indicia. 5,091,866, Cl. 395-158.000.

Takahama, Takashi: See—
Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiyuki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.

Takahashi, Hideharu: See—
Hasegawa, Taiji; Fujisawa, Masaaki; Sakamoto, Masahide; Ishii, Toshio; and Takahashi, Hideharu, 5,091,856, Cl. 364-424.050.

Takahashi, Hitoshi; and Adachi, Toshinori, to Kabushiki Kaisha Toshiba. Paper sheet bundle processing apparatus. 5,090,573, Cl. 209-534.000.

Takahashi, Kenji: See—
Asada, Junichi; Takahashi, Kenji; and Sakurai, Toshiharu, 5,091,341, Cl. 437-212.000.

Takahashi, Noriaki: See—
Ushiyama, Kazuo; Watanabe, Masaki; Uchiyama, Keiji; Takei, Hisayuki; Takahashi, Noriaki; Matsuzawa, Akimi; Ooshiro, Kiyoshi; and Tamura, Hajime, 5,091,067, Cl. 204-129.460.

Takahashi, Shigeru: See—
Kawarabayashi, Waichiro; Ishii, Yumi; and Takahashi, Shigeru, 5,090,156, Cl. 47-58.000.

Takahashi, Shinya, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for linear predictive coding and decoding of speech using residual wave form time-access compression. 5,091,944, Cl. 381-36.000.

Takahashi, Takehiro, to Hitachi Maxell, Ltd. IC card reader/writer. 5,091,618, Cl. 235-441.000.

Takahashi, Tashuhiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaru; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, to Hitachi, Ltd.; and Hitachi Elevator Engineering and Service Co., Ltd. Passenger transport installation, vehicle for use therein, and method of operating said installation. 5,090,515, Cl. 187-16.000.

Takahata, Toshihiro: See—
Murakoshi, Toshiichi; Kawazoe, Hiroshi; Takahata, Toshihiro; Inaki, Shigeo; Yamashita, Tatsuo; and Doi, Yoshinori, 5,090,110, Cl. 29-596.000.

Takai, Naoto: See—
Souma, Thoru; Ishidoya, Masahiro; Nakamichi, Toshihiko; and Takai, Naoto, 5,091,010, Cl. 106-403.000.

Takaki, Dana M.: See—
Koht, Lowell I.; Del Fava, Donald; Clark, Brian H.; Takaki, Dana M.; and Haddock, George W., 5,090,792, Cl. 385-32.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, to Victor Company of Japan. Method for recording/reproducing charge image. 5,091,277, Cl. 430-48.000.

Takano, Masayuki, to Kabushiki Kaisha Toshiba. Intracavitary ultrasound probe. 5,090,414, Cl. 128-662.050.

Takara Co., Ltd.: See—
Satoh, Yasuta; Nakane, Shigeru; Saitoh, Shinya; and Kataoka, Isamu, 5,090,936, Cl. 446-175.000.

Takashima, Tokuei, to Graphico Co., Ltd. Radial type of parallel system bus structure with printed, twisted conductor lines. 5,091,822, Cl. 361-384.000.

Takasou, Kazuo: See—
Yokoya, Yuji; Tsutsumi, Yasuhiro; Suzuki, Yutaka; Shiozaki, Makoto; Onogi, Nobuyoshi; and Takasou, Kazuo, 5,090,728, Cl. 280-707.000.

Takasuka, Gentaro: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatuo; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.

Takata Corporation: See—
Watanabe, Kazuo, 5,090,729, Cl. 280-743.000.

Takayama, Hideto; Tsuruoka, Yoshihiro; Matsuzawa, Takashi; and Nagae, Hiroo, to Nemoto & Co., Ltd.; and Toppan Printing Co. Alcohol concentration sensor. 5,091,155, Cl. 422-88.000.

Takayama, Shinji, to International Business Machines Corporation. Method and apparatus for magneto-optical recording using a demagnetization field and erasing using external magnetic field. 5,091,896, Cl. 369-13.000.

Takayama, Syuichi: See—
Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyana, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.

Takayama, Yukio: See—
Ishida, Koichi; and Takayama, Yukio, 5,091,359, Cl. 503-209.000.

Takechi, Naoto: See—
Ozaki, Shoichiro; Akiyama, Takahiko; Takechi, Naoto; Kageyama, Kunio; and Machida, Morihisa, 5,091,549, Cl. 558-131.000.

Takeda Chemical Industries, Ltd.: See—
Tairaka, Yoshihiko; and Idomoto, Masayoshi, 5,091,438, Cl. 521-175.000.

Takeda, Fumio; Kojima, Yoshio; Kaneko, Tsuneo; Ishibashi, Yutaka; Sasaki, Naoto; and Tsushima, Isako, to Kabushiki Kaisha Toshiba. Interior panel unit for permitting arrangement of cables and devices on room floor. 5,090,169, Cl. 52-220.000.

Takeda, Katsunori: See—
Nagasawa, Hiroyuki; Inoue, Jun; Takeda, Katsunori; Saito, Keizo; and Murai, Hiroko, 5,091,878, Cl. 364-419.000.

Takeda, Norio: See—
Arii, Mitsuzo; Takeda, Norio; Kataoka, Shigeo; Kondoh, Osamu; Jinnai, Kuniaki; Ohwada, Hisashi; and Kondoh, Tomoko, 5,091,986, Cl. 385-48.000.

Takeda, Shin; Ishii, Masami; Ozawa, Mitsuhiro; and Terazawa, Toshio, to Aisin Seiki Kabushiki Kaisha. Roll forming apparatus. 5,090,227, Cl. 72-178.000.

Takeda, Yoshinaka: See—
Yamasaki, Akira; Takeda, Yoshinaka; Abe, Souhei; and Fukano, Izumi, 5,090,258, Cl. 73-863.030.

Takei, Hajime: See—
Yamakoshi, Yukiyo; Takei, Hajime; Matsuda, Naoyuki; Moro, Fuminori; and Tomita, Hiroshi, 5,090,677, Cl. 271-117.000.

Takei, Hisayuki: See—
Ushiyama, Kazuo; Watanabe, Masaki; Uchiyama, Keiji; Takei, Hisayuki; Takahashi, Noriaki; Matsuzawa, Akimi; Ooshiro, Kiyoshi; and Tamura, Hajime, 5,091,067, Cl. 204-129.460.

Takemoto, Kazuo: See—
Yoshimura, Hiroshi; Bota, Keiji; Takemoto, Kazuo; and Baba, Fumiaki, 5,091,854, Cl. 364-424.100.

Takenaka, Hirofumi: See—
Kishida, Hiroo; and Takenaka, Hirofumi, 5,090,176, Cl. 52-745.000.

Takeo, Hideya, to Fuji Photo Film Co., Ltd. Method for judging the presence or absence of limited irradiation field. 5,091,970, Cl. 382-48.000.

Takeoka, Katsushi; Ohashi, Tsuyoshi; and Ikenaka, Yoshiharu, to Rex Industries Co., Ltd.; and Inoac Corporation. Motor driven flaring device. 5,090,226, Cl. 72-117.000.

Takeuchi, Eizi, to T.S.B. Ltd. Organosilane coating composition. 5,091,468, Cl. 524-761.000.

Takeuchi, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Damper disc. 5,090,543, Cl. 192-106.200.

Takeuchi, Junji: See—
Onishi, Shunji; Ichikawa, Yoshinori; and Takeuchi, Junji, 5,091,463, Cl. 524-508.000.

Takeuchi, Nobuo: See—
Hitomi, Mitsuo; Hinatase, Fumio; Nishikawa, Toshio; and Takeuchi, Nobuo, 5,090,202, Cl. 60-602.000.

Takeuchi, Tomio; Kondo, Shinichi; and Ikeda, Daishiro, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Antifungal and antiviral antibiotic, benanomicin A 4"-O-sulfate or its salt, and the production and uses thereof. 5,091,371, Cl. 514-33.000.

Takeuchi, Tomio: See—
Yoshioka, Takeo; Watanabe, Azuma; Kominato, Koichiro; Tone, Hiroshi; Okamoto, Rokuro; Sawa, Tsutomu; and Takeuchi, Tomio, 5,091,370, Cl. 514-30.000.

Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, to Canon Kabushiki Kaisha. Mesomorphic compound, liquid crystal composition containing same and liquid crystal device using same. 5,091,109, Cl. 252-299.610.

Takikawa, Kazunori; Fukaya, Kazumi; Ohbu, Jun; and Yagi, Yasushi, to Usui Kokusai Sangyo Kaisha Ltd. Method of making a cross joint between pipes. 5,090,611, Cl. 228-173.400.

Takikawa, Kazunori: See—
Usui, Masayoshi; Fukaya, Kazumi; and Takikawa, Kazunori, 5,090,385, Cl. 123-468.000.

Usui, Masayoshi; Washizu, Katsushi; and Takikawa, Kazunori, 5,090,748, Cl. 285-319.000.

Takimoto, Kazushi, to Mita Industrial Co., Ltd. Automatic document feeder comprising a guide member. 5,090,682, Cl. 271-225.000.

Talebian, Abdolhossein; Green, Dianna; Hammer, Charles; Schein, Philip; Giorghis, Alem; and Clarke, Robert R., to Georgetown University. Mitomycin derivatives having reduced bone marrow toxicity, processes for their preparation, and the uses thereof. 5,091,523, Cl. 536-17.300.

Taller, Robert A.: See—
Karakelle, Mutlu; Benson, Carl D.; Taller, Robert A.; and Spielvogel, David E., 5,091,443, Cl. 424-665.000.

Tamamura, Hideo, to Showa Denko K.K. Process for preparation of neodymium or neodymium-iron alloy. 5,091,065, Cl. 204-64.00R.

Tambrands, Inc.: See—
Kajander, Richard E.; and Fitzgerald, David J., 5,091,240, Cl. 428-198.000.

Tamori, Ikuo: See—
Kogure, Nobuyuki; Shirahase, Masaaki; and Tamori, Ikuo, 5,090,233, Cl. 73-28.050.

Tampa, Gene E.: See—
So, Bernard Y. C.; Marker, Terry L.; and Tampa, Gene E., 5,091,076, Cl. 208-426.000.

Tamura, Hajime: See—
Ushiyama, Kazuo; Watanabe, Masaki; Uchiyama, Keiji; Takei, Hisayuki; Takahashi, Noriaki; Matsuzawa, Akimi; Ooshiro, Kiyoshi; and Tamura, Hajime, 5,091,067, Cl. 204-129.460.

Tamura, Hidehiko: See—
Tanaka, Tadashi; Tamura, Hidehiko; Uenaka, Kiyohide; and Hakakoshi, Shigemasa, 5,091,098, Cl. 252-12.200.

Tamura, Makoto: See—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Suiji; Nakajima, Ryoichi; and Naito, Sakae, 5,091,072, Cl. 208-39.000.

Tan, Chee-Teck: See—
Kang, Young C.; Tan, Chee-Teck; Byrne, Brian; Buckholz, Lawrence L., Jr.; Sudol, Marion A.; and Boden, Richard M., 5,091,200, Cl. 426-243.000.

Tan, Zoilo C. H.: See—
Cleaves, James M.; Heard, James G.; and Tan, Zoilo C. H., 5,091,047, Cl. 156-643.000.

Tanabe, Yoshiyuki, to Hitachi, Ltd. Method of and apparatus for controlling an idling control valve of an internal combustion engine. 5,090,381, Cl. 123-339.000.

Tanaka, Hitoshi, to Fujitsu Limited. Process and apparatus for chemical vapor deposition. 5,091,207, Cl. 427-8.000.

Tanaka, Isamu; Oka, Hitoshi; Watanabe, Makio; Kikuchi, Hiroshi; Imabayashi, Shinichiro; and Taniguti, Yukihiro, to Hitachi, Ltd. Photocurable diallyl phthalate resin composition and printed circuit board using the same. 5,091,283, Cl. 430-280.000.

Tanaka, Sakae: See—
Watanabe, Yoshiaki; and Tanaka, Sakae, 5,091,337, Cl. 437-181.000.

Tanaka, Shosuke: See—
Takada, Hirohisa; and Tanaka, Shosuke, 5,091,636, Cl. 235-454.000.

Tanaka, Tadashi; Tamura, Hidehiko; Uenaka, Kiyohide; and Hakakoshi, Shigemasa, to Daido Metal Company Ltd. Sliding material and method of manufacturing the same. 5,091,098, Cl. 252-12.200.

Tanaka, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Methods of substrate heating for vapor phase epitaxial growth. 5,091,044, Cl. 156-607.000.

Tanaka, Yasutaka; Kojima, Hidetaka; and Tsuji, Yasuo, to Daicel Chemical Industries, Ltd. Process for preparing α -phenylpropionic acid derivative. 5,091,563, Cl. 562-406.000.

Tandy Corporation: See—
Cole, James F.; and Keeran, Jerald J., 5,091,939, Cl. 380-25.000.

Tang, Jiunn-Yann; and Chao, Li-Chung, to Brown & Williamson Tobacco Corporation. Smoking article. 5,090,426, Cl. 131-194.000.

Tani, Naoki: See—
Seike, Shoji; Mima, Toshiyuki; Nozaki, Masayuki; Tani, Naoki; and Ikeda, Mitsuji, 5,090,793, Cl. 385-100.000.

Taniguchi, Ikuo: See—
Nishimura, Koichi; Taniguchi, Ikuo; Ikawa, Fumihiro; and Kurokawa, Masumi, 5,091,796, Cl. 359-110.000.

Taniguti, Yukihiro: See—
Tanaka, Isamu; Oka, Hitoshi; Watanabe, Makio; Kikuchi, Hiroshi; Imabayashi, Shinichiro; and Taniguti, Yukihiro, 5,091,283, Cl. 430-280.000.

Taniji, Ayafumi: See—
Ishikawa, Muncharu; and Taniji, Ayafumi, 5,090,808, Cl. 356-336.000.

Tanikawa, Hirohide: See—
Nakahara, Toshiaki; Tanikawa, Hirohide; Yoshida, Satoshi; Fujiwara, Masatsugu; and Sakashita, Kiichiro, 5,091,279, Cl. 430-106.600.

Tanimoto, Yoshio; Nakahama, Tadami; and Yamane, Takakazu, to Mazda Motor Corporation. Coating method. 5,091,215, Cl. 427-240.000.

Tanji, Masaki: See—
Nishijima, Toyoki; and Tanji, Masaki, 5,091,294, Cl. 430-505.000.

Tanox Biosystems, Inc.: See—
Chang, Tse-Wen, 5,091,313, Cl. 435-240.270.

Tarici, Adnan. Solar cooker with a parabolic reflector. 5,090,399, Cl. 126-451.000.

Tarsha, Simon: See—
Allison, Arlie; Tarsha, Simon; and McMillan, James S., 5,090,079, Cl. 15-104.310.

Tashima, Seiji: See—
Okimoto, Haruo; Akagi, Toshimichi; and Tashima, Seiji, 5,090,203, Cl. 60-612.000.

Tashiro, Osamu, to Sharp Kabushiki Kaisha. Original document feeder for producing double sided copies using two exposure stations. 5,091,755, Cl. 355-320.000.

Tassi, Lamberto: See—
Ballestrazzi, Aris; and Tassi, Lamberto, 5,090,672, Cl. 270-45.000.

Tate, Hitoshi; Totsuka, Fumio; Horiuchi, Tetuo; and Moriya, Kumiaki, to Hitachi, Ltd. Natural circulation reactor. 5,091,143, Cl. 376-282.000.

- Tatsuke, Yasuhiko: See—
Sugimori, Tsunetake; Tsukada, Yoji; and Tatsuke, Yasuhiko, 5,091,305, Cl. 435-19.000.
- Tatsumi, Kenji; and Hirano, Yoshihito, to Mitsubishi Denki K.K. Semiconductor laser excited solid laser device. 5,091,915, Cl. 372-75.000.
- Tawada, Yoshihisa: See—
Asaoka, Keizo; Tsuge, Kazunori; and Tawada, Yoshihisa, 5,091,764, Cl. 357-30.000.
- Taylor, Bruce F., to Thermo Electron Web Systems, Inc. Steam shower apparatus and method of using same. 5,090,133, Cl. 34-23.000.
- Taylor, John E.: See—
Kim, Sun H.; and Taylor, John E., 5,091,381, Cl. 514-183.000.
- Taylor Made Company, Inc.: See—
Viste, Claude, 5,090,702, Cl. 273-167.00H.
- Taylor, Roy M.; and Ross, Leonard. Dental prosthesis with controlled fluid dispensing means. 5,090,903, Cl. 433-80.000.
- Taylor, Scott R. Apparatus for pultruding thermoplastic structures at below melt temperatures. 5,091,036, Cl. 156-379.600.
- Taylor, William H., to Kollmorgen Corporation. Integrated thermal imaging system. 5,091,646, Cl. 250-332.000.
- TDK Corporation: See—
Ikebe, Masaru; Shiba, Haruo; and Sasaki, Morimasa, 5,091,814, Cl. 360-133.000.
- Iwaya, Shouichi; Hamada, Munemitsu; and Masumura, Hitoshi, 5,091,820, Cl. 361-304.000.
- Kakizaki, Masao; Kobayashi, Yoshihito; and Yagi, Hiroshi, 5,091,810, Cl. 360-103.000.
- TDS Manufacturing: See—
Wood, William R., IV, 5,090,648, Cl. 248-125.000.
- Technical Chemical Company: See—
Keltner, Robert L.; and Ferguson, Jim B., 5,090,212, Cl. 62-149.000.
- Tecumseh Products Company: See—
Dreiman, Nelik I., 5,090,657, Cl. 248-624.000.
- Hudson, Eric B., 5,090,375, Cl. 123-196.00W.
- Tedeschi, Giovanni, to Sunproject S.R.L. Device for locking a roll-up curtain, for protection of window openings and the like, in the shut position. 5,090,468, Cl. 160-290.100.
- Teich, Michael: See—
Alber, Paul; Edele, Reinhard; Hauk, Klaus; Teich, Michael; and Schutze, Michael, 5,090,082, Cl. 15-250.170.
- Teijin Limited: See—
Sawaki, Toru; Nakaishi, Akio; Shimada, Keizo; and Watanabe, Takashi, 5,091,271, Cl. 428-698.000.
- Teknekron Communications Systems, Inc.: See—
Berger, Toby; and Miller, Daniel H., 5,091,975, Cl. 382-56.000.
- Teleco Oilfield Services Inc.: See—
Minette, Daniel C., 5,091,644, Cl. 250-254.000.
- Teledyne Industries, Inc.: See—
Balaschak, James J.; and Thrall, David E., 5,090,239, Cl. 73-168.000.
- Temburg, Josef; Leifeld, Ferdinand; and Vollrath, Ulrich, to Trutzschler GmbH Co. KG. Opening apparatus for removing fiber from compressed fiber bales. 5,090,090, Cl. 19-80.00R.
- Temburg, Josef; and Vollrath, Ulrich, to Trutzschler GmbH & Co. KG. Bale opening method and device having rollers and grate bars adjustable in height relative to one another, for detaching fiber tufts from the top surface of a bale. 5,090,091, Cl. 19-80.00R.
- Templeman, Gareth J.: See—
Athanasios, Albert K.; and Templeman, Gareth J., 5,091,117, Cl. 260-428.000.
- Tenryu Marusawa Kabushiki Kaisha: See—
Osawa, Masanori, 5,090,538, Cl. 192-84.00T.
- Terada, Yasuharu; and Ishii, Susumu, to Yoshida Kogyo K.K. Pull tab for slide fastener sliders. 5,090,096, Cl. 24-431.000.
- Terashima, Tomohide, to Mitsubishi Denki Kabushiki Kaisha. Thyristor with first and second independent control electrodes. 5,091,766, Cl. 357-38.000.
- Terauchi, Hideyuki: See—
Iida, Kazunaga; Yamaki, Makio; Matsumoto, Yukio; Ishihara, Hiroyuki; Naoe, Toshiyuki; and Terauchi, Hideyuki, 5,091,951, Cl. 381-63.000.
- Terayama, Tsunehisa: See—
Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, 5,090,606, Cl. 227-10.000.
- Terazawa, Toshihisa: See—
Takeda, Shin; Ishii, Masami; Ozawa, Mitsuhiro; and Terazawa, Toshihisa, 5,090,227, Cl. 72-178.000.
- Terman, David S. Protein A perfusion and post perfusion drug infusion. 5,091,091, Cl. 210-632.000.
- Terry, Sydney L. Locking fastener assembly. 5,090,855, Cl. 411-144.000.
- Terry, Vincent G.: See—
Walker, Duncan N.; Terry, Vincent G.; Ulery, Dennis R.; Kazmierczak, Edmund E.; Keck, Richard J.; Pedersen, James R.; and Gott, Brian E., 5,090,114, Cl. 29-734.000.
- Tetra Dev-Co: See—
Santi, Franco; and Bordini, Giorgio, 5,090,299, Cl. 92-98.00D.
- Teumim-Stone, Zvi. Laser apparatus for periodontal treatment. 5,090,908, Cl. 433-215.000.
- Teuscher, Leon A.; and Ziolo, Ronald F., to Xerox Corporation. Blocking layer for photoreceptors. 5,091,278, Cl. 430-58.000.
- Texaco Chemical Company: See—
Lin, Jiang-Jen; and Speranza, George P., 5,091,574, Cl. 564-325.000.
- Speranza, George P.; and Su, Wei-Yang, 5,091,572, Cl. 564-139.000.
- Su, Wei-Yang; and Zimmerman, Robert L., 5,091,585, Cl. 564-473.000.
- Texas Instruments Deutschland GmbH: See—
Liebgen, Manfred H., 5,090,247, Cl. 73-727.000.
- Texas Instruments Incorporated: See—
Gaddis, Ronald A., 5,090,121, Cl. 29-847.000.
- Kwon, On-Kyong; Hashimoto, Masashi; and Malhi, Satwinder, 5,090,118, Cl. 29-843.000.
- Miyaguchi, Hiroshi, 5,091,783, Cl. 358-140.000.
- Miyaguchi, Hiroshi, 5,091,786, Cl. 358-183.000.
- Shih, Hung-Dah; and Kim, Bumman, 5,091,759, Cl. 357-22.000.
- Tran, Hiep V., 5,091,879, Cl. 365-177.000.
- Wong, Yiwan; Yoshino, Toshiaki; and Johnson, Louis G., 5,091,875, Cl. 364-726.000.
- Yung, Henry T-H; and Krenik, William R., 5,091,662, Cl. 307-475.000.
- Textile Graphics Unlimited, Inc.: See—
Chapman, Jeffrey S., 5,090,313, Cl. 101-129.000.
- Textron Inc.: See—
Bert, Stephen F., 5,090,094, Cl. 24-265.0WS.
- Th. Goldschmidt AG: See—
Schamberg, Eckehard; Koerner, Gotz; Fritsch, Herwig; Grasse, Manfred; and Sucker, Roland, 5,091,002, Cl. 106-2.000.
- Thalmann, William H.; and Siegler, Thomas W., to Infinitex Corporation. Ultrafiltration device and process. 5,091,085, Cl. 210-321.650.
- Thannisch, Klaus J., to Zeller Plastik GmbH. Container closure with a retractable turnspout. 5,090,601, Cl. 222-507.000.
- Theis, Ulrich; Hellmeister, H.-P.; Bisping, Bernhard; Vagedes, Michael; Kessler, Siegfried; Kantner, Horst; and Sommer, Peter, to Rheinmetall GmbH. Spin stabilized projectile unit. 5,090,328, Cl. 102-522.000.
- Theisen-Popp, Pia: See—
Raddatz, Siegfried; Mohrs, Klaus-Helmut; Fruchtmann, Romanis; Kohlsdorfer, Christian; Theisen-Popp, Pia; and Muller-Peddinghaus, Reiner, 5,091,392, Cl. 514-311.000.
- Then, Johann: See—
Marquardt, Rudiger; Then, Johann; Deger, Hans-Matthias; Wohner, Gerhard; Robinson, Martyn K.; and Doherty, Andrew, 5,091,314, Cl. 435-252.330.
- Theodor Groz & Sohne & Ernst Beckert: See—
Schuler, Bernhard; Wiedenhofer, Kurt; Langenstein, Otto; and Wissmann, Siegfried, 5,090,218, Cl. 66-121.000.
- Theodorides, Panos. Fender washer. 5,090,653, Cl. 248-317.000.
- Therien, Michel: See—
Belanger, Patrice C.; Dufresne, Claude; Fitzsimmons, Brian, deceased; Fitzsimmons, Maryann; Heir; Guindon, Yvan; Lau, Cheuk K.; Rokach, Joshua; Schiegetz, John; Therien, Michel; and Young, Robert N., 5,091,533, Cl. 544-318.000.
- Thermo Electron Web Systems, Inc.: See—
Taylor, Bruce F., 5,090,133, Cl. 34-23.000.
- Thermos Company, Inc.: See—
Raymer, Doyle; and Peacock, Dale, 5,090,398, Cl. 126-41.00R.
- Theroux, Robert L.; and Abnoosi, Fatemeh, to K & M Electronics, Inc. Cleaning apparatus with vapor containment system. 5,090,431, Cl. 134-105.000.
- Theurer, Josef, to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H. Reference system for track working machine. 5,090,329, Cl. 104-7.100.
- Theurer, Josef; and Dellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast separating device for ballast cleaning machine. 5,090,483, Cl. 171-16.000.
- Theurer, Josef; and Dellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast cleaning machine arrangement. 5,090,484, Cl. 171-16.000.
- Thiel, Hans-Joachim, to Krupp Industrietechnik Gesellschaft mit beschränkter Haftung. Conveyor system. 5,090,549, Cl. 198-312.000.
- Thoma, Christian H.; and Arnold, George D. M., to Unipat AG. Variable speed transaxle. 5,090,949, Cl. 475-83.000.
- Thoma, Paul E.: See—
Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barootian, Arthur, 5,090,246, Cl. 73-718.000.
- Thomas & Betts Corporation: See—
Noorily, Peter; and Levy, Sidney, 5,090,917, Cl. 439-395.000.
- Strauss, Richard F., 5,091,610, Cl. 174-117.00F.
- Thomas, Brian: See—
Bagchi, Pranab; Sargeant, Steven J.; Beck, James T.; and Thomas, Brian, 5,091,296, Cl. 430-546.000.
- Thomas, Keith M.; Dongworth, Michael R.; and Melvin, Alec, to British Gas plc. Seismic pulse generation. 5,091,891, Cl. 367-144.000.
- Thomas, Lynn E.; and Waisath, Wilfred J., Jr., to Alliance Industries, Inc. Marine oil spill recovery apparatus and method. 5,091,096, Cl. 210-744.000.
- Thomas, Michael E., to National Semiconductor Corp. Ion milling to obtain planarization. 5,091,048, Cl. 156-643.000.
- Thomas, Tim L., Sr. Apparatus for electrically destroying targeted organisms in fluids. 5,091,152, Cl. 422-23.000.
- Thompson, Bjorn J.: See—
Mally, Timothy G.; and Thompson, Bjorn J., 5,091,199, Cl. 426-120.000.
- Thompson, Danny R.: See—
Lau, Philip T. S.; and Thompson, Danny R., 5,091,291, Cl. 430-385.000.
- Thompson, John R.; Hunting, C. J.; Phipps, William L.; Raynesford, Steven J.; and Rittmueller, Philip H., to NEC Home Electronics, Ltd.

- System and method for transmitting entertainment information to authorized ones of plural receivers. 5,091,938, Cl. 380-21.000.
- Thompson, Peter J., to Interlock Industries Limited. Restrictor device with a releasable latch member. 5,090,754, Cl. 292-262.000.
- Thomson Consumer Electronics, Inc.: See—
Anderson, Mark R.; and Parker, Robert P., 5,091,957, Cl. 381-106.000.
- Canfield, Barth A.; and Duffield, David J., 5,091,785, Cl. 358-183.000.
- Thomson-CSF: See—
de Solminihac, Francois, 5,091,714, Cl. 340-573.000.
- Dieumegard, Dominique; Garry, Guy; Karapiperis, Leonidas; Pribat, Didier; and Collet, Christian, 5,090,932, Cl. 445-24.000.
- Fouche, Yvon; Couasnon, Tristan D.; and Eouzan, Jean-Yves, 5,091,773, Cl. 358-10.000.
- Potier, Daniel; Gruau, Jean; and Lecrivain, Albert, 5,090,244, Cl. 73-572.000.
- Warman, Francois, 5,091,894, Cl. 367-173.000.
- Thomson, John A.: See—
Clark, John I.; Benedek, George B.; Siezen, Roelant J.; Thomson, John A.; and Friedman, Simon H., 5,091,421, Cl. 514-616.000.
- Thornburgh, Scott: See—
McCoy, William F.; and Thornburgh, Scott, 5,090,990, Cl. 71-67.000.
- Thorud, Richard A.; and Tillotson, Henry B., to Toro Company, The. Discharge chute blocking device for a rotary lawn mower. 5,090,183, Cl. 56-2.000.
- Thrall, David E.: See—
Balaschak, James J.; and Thrall, David E., 5,090,239, Cl. 73-168.000.
- Thureson, Lars-Erik; and Thureson, Per-Gunnar. Brush handle. 5,090,080, Cl. 15-143.00R.
- Thureson, Per-Gunnar: See—
Thureson, Lars-Erik; and Thureson, Per-Gunnar, 5,090,080, Cl. 15-143.00R.
- Tibbitts, Gordon A.; Horton, Ralph M.; and Lovato, Lorenzo G., to Eastman Christensen Company. Earth boring drill bit with matrix displacing material. 5,090,491, Cl. 175-409.000.
- Tillotson, Henry B.: See—
Thorud, Richard A.; and Tillotson, Henry B., 5,090,183, Cl. 56-2.000.
- Timmermans, Petrus B. M. W. M.: See—
Ardecky, Robert J.; Chiu, Andrew T.; Duncia, John J. V.; Timmermans, Petrus B. M. W. M.; and Wexler, Ruth R., 5,091,390, Cl. 514-303.000.
- Tipp, Charles S. Portable support for curling iron. 5,090,649, Cl. 248-176.000.
- Tisne, Jean-Louis: See—
Fuchs, Jean-Francois; Tisne, Jean-Louis; and Odru, Pierre, 5,091,230, Cl. 428-36.400.
- Tisne-Versailles, Jacky: See—
Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,091,415, Cl. 514-506.000.
- Titus Tool Company Limited: See—
Harley, David N., 5,090,787, Cl. 312-348.000.
- Tjoeng, Foe S.; Adams, Steven P.; Garland, Robert B.; and Miyano, Masateru, to Monsanto Co.; and G. D. Searle & Co. Pyridyl peptide mimetic compounds which are useful platelet-aggregation inhibitors. 5,091,396, Cl. 514-357.000.
- Toa Nenryo Kogyo Kabushiki Kaisha: See—
Murakami, Shinkichi; Watanabe, Osamu; Wada, Sadahisa; Miyazaki, Makoto; and Inoue, Hiroshi, 5,091,474, Cl. 525-109.000.
- Tobin, Thomas J.: See—
Ramos, Joel A.; Chabala, Leonard V.; Rogers, Edward J.; and Tobin, Thomas J., 5,091,616, Cl. 200-146.00R.
- Tobita, Michiaki: See—
Mohri, Hidemasa; Tobita, Michiaki; and Ishida, Masahiko, 5,091,735, Cl. 346-1.100.
- Toda, Akitoshi: See—
Isono, Yasuo; Kouchi, Toshihito; Toda, Akitoshi; Kajimura, Hiroshi; Mimura, Yoshiyuki; Ohta, Hiroko; and Shimizu, Ryouhei, 5,091,880, Cl. 365-151.000.
- Toda, Fumio: See—
Yagi, Minoru; and Toda, Fumio, 5,091,400, Cl. 514-372.000.
- Toda Kogyo Corp.: See—
Nakamura, Tatsuya, 5,091,012, Cl. 106-440.000.
- Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, to Ono Pharmaceutical Co., Ltd. Prolinal derivatives. 5,091,406, Cl. 514-422.000.
- Todd, Alvin E. Package for a small fragile item. 5,090,570, Cl. 206-463.000.
- Todd Motion Controls Inc.: See—
Todd, William H., 5,090,296, Cl. 91-518.000.
- Todd, William H., to Todd Motion Controls Inc. Piston assembly and method. 5,090,296, Cl. 91-518.000.
- Toelke, Peter: See—
Alt, Anton; Toelke, Peter; Wilhelm, Ludwig; and Zimmermann, Urban, 5,091,624, Cl. 219-100.000.
- Togami, Masato: See—
Okada, Tsuneyoshi; Nitoh, Toshikatsu; Kanoe, Toshio; and Togami, Masato, 5,091,135, Cl. 264-272.130.
- Togano, Takeshi: See—
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, 5,091,109, Cl. 252-299.610.
- Togano, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Recording device. 5,091,737, Cl. 346-140.00R.
- Tok Bearing Co., Ltd.: See—
Miura, Osamu, 5,090,521, Cl. 188-82.100.
- Tokai Rubber Industries, Ltd.: See—
Hamada, Masaaki, 5,090,668, Cl. 267-141.000.
- Tokico Ltd.: See—
Endou, Mitsuhiro, 5,090,294, Cl. 91-376.00R.
- Nakamura, Kenichi, 5,090,726, Cl. 280-707.000.
- Tokyo Electric Co., Ltd.: See—
Sugimoto, Kazuaki; Nishijima, Tomio; Inoue, Teruhisa; Sugimoto, Yoshihiko; Suzuki, Masashi; and Matsushita, Izumi, 5,090,318, Cl. 101-227.000.
- Tokyo Electron Limited: See—
Ikeda, Towl; and Koike, Hisashi, 5,091,694, Cl. 324-158.00P.
- Ohno, Akira; Ohtsuka, Tetsuo; and Matsumoto, Naotaka, 5,091,692, Cl. 324-158.00F.
- Tokyo Institute of Technology: See—
Iga, Kenichi; Koyama, Fumio; and Uenohara, Hiroyuki, 5,091,756, Cl. 357-4.000.
- Tolbert, Thomas W.; Jaco, Pamela J.; Dugan, Jeffrey S.; and Hendrix, James E., to Springs Industries, Inc. Fire barrier fabric. 5,091,243, Cl. 428-253.000.
- Tolman, Richard L.: See—
Rasmussen, Gary H.; Tolman, Richard L.; and Patel, Gool F., 5,091,380, Cl. 514-169.000.
- Tominaga, Akira: See—
Nishida, Reiziro; and Tominaga, Akira, 5,091,446, Cl. 523-404.000.
- Tomita, Hiroshi: See—
Yamakoshi, Yukiyo; Takei, Hajime; Matsuda, Naoyuki; Moro, Fuminori; and Tomita, Hiroshi, 5,090,677, Cl. 271-117.000.
- Tomite, Toshio, to Hatachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. D.C. machine of type having permanent magnets with auxiliary poles. 5,091,667, Cl. 310-154.000.
- Tomizawa, Kenji: See—
Shirata, Keiji; Sassa, Koichi; and Tomizawa, Kenji, 5,091,043, Cl. 156-601.000.
- Tomogawa Paper Co., Ltd.: See—
Sakamoto, Yukinori; Yokoyama, Shigeyuki; Shibuya, Akihiro; Nakayama, Nobuyuki; and Koshimura, Atsushi, 5,091,251, Cl. 428-352.000.
- Tone, Hiroshi: See—
Yoshioka, Takeo; Watanabe, Azuma; Kominato, Koichiro; Tone, Hiroshi; Okamoto, Rokuro; Sawa, Tautomu; and Takeuchi, Tomio, 5,091,370, Cl. 514-30.000.
- Tonen Chemical Corporation: See—
Suzuki, Toshiaki; Kitagawa, Sotoyuki; Nakayama, Takashi; and Kuno, Takao, 5,091,435, Cl. 521-134.000.
- Tonen Sekiyukagaku Kabushiki Kaisha: See—
Onishi, Shunji; Ichikawa, Yoshinori; and Takeuchi, Junji, 5,091,463, Cl. 524-508.000.
- Tomomoto, Yoshihiro: See—
Iida, Masaru; and Tomomoto, Yoshihiro, 5,091,749, Cl. 355-246.000.
- Tomomura, Hiroshi: See—
Ito, Hideo; Tomomura, Hiroshi; Nakata, Moritsune; and Kobiki, Yasuhiko, 5,090,766, Cl. 296-180.500.
- Toppan Printing Co.: See—
Takayama, Hideto; Tsuruoka, Yoshihiro; Matsuzawa, Takashi; and Nagae, Hirono, 5,091,155, Cl. 422-88.000.
- Torii, Takuji; Utsumi, Hiromu; Ohtsu, Shinki; Kawakami, Yo; Suzuki, Teruo; Kawasaki, Yoshimitsu; Kubota, Toshifumi; Ishizawa, Yoshinori; and Terayama, Tsunehisa, to Kitachi Koki Company, Limited. Combustion gas powered fastener driving tool. 5,090,606, Cl. 227-10.000.
- Torii, Takuji: See—
Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.
- Toritsu, Yoko: See—
Yano, Toshihiko; Matsuo, Noritada; Toritsu, Yoko; and Dohara, Kazunobu, 5,091,183, Cl. 424-405.000.
- Toro Company, The: See—
Thorud, Richard A.; and Tillotson, Henry B., 5,090,183, Cl. 56-2.000.
- Torotrak (Development) Limited: See—
Greenwood, Christopher J., 5,090,951, Cl. 475-216.000.
- Tortola, Angelo; and Howitt, Robert, to Curtis Manufacturing Company, Inc. Light apparatus for use with a compact computer video screen. 5,091,832, Cl. 362-109.000.
- Toshiba Lighting & Technology Corporation: See—
Shiraishi, Isao, 5,090,931, Cl. 445-22.000.
- Toshiba Silicone Co., Ltd.: See—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,091,460, Cl. 524-492.000.
- Tosoh Corporation: See—
Asano, Mutsumi; Kasai, Kiyoshi; and Misaki, Hidehiko, 5,091,267, Cl. 428-694.000.
- Toth, John S. Deck-mounted leaf blower. 5,090,088, Cl. 15-405.000.
- Totoku Electric Co., Ltd.: See—
Yamazaki, Yuzo; and Nishizawa, Toshiro, 5,091,028, Cl. 156-172.000.
- Totsuka, Fumio: See—
Tate, Hitoshi; Totsuka, Fumio; Horiuchi, Tetuo; and Moriya, Kumiaki, 5,091,143, Cl. 376-282.000.

Tou, Kazumi: See—
Oshima, Yoshitomo; and Tou, Kazumi, 5,091,134, Cl. 264-176.100.
Toukomes, Veli. Game. 5,090,700, Cl. 273-153.00S.
Tow, Robert F.: See—
Bloomberg, Dan S.; and Tow, Robert F., 5,091,966, Cl. 382-21.000.
Townsend, Harold E.: See—
Dillmann, Charles W.; Townsend, Harold E.; and Nesbitt, Loyd B., 5,091,144, Cl. 376-283.000.
Toxi-Lab Incorporated: See—
Bachand, Steve S., 5,091,153, Cl. 422-58.000.
Toyo Tire & Rubber Co., Ltd.: See—
Yokohori, Shizuo; Miyamoto, Kenzo; Fukushima, Koji; Tsujimoto, Masami; Onda, Kenji; and Sato, Kan, 5,091,026, Cl. 156-149.000.
Toyoda Gosei Co., Ltd.: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohashi, Tamiyoshi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.
Fujita, Yoshiyuki; and Sakane, Katsunobu, 5,090,731, Cl. 280-777.000.
Toyoda Koki Kabushiki Kaisha: See—
Suzuki, Mikio; Suto, Satoshi; Okuda, Ikuo; Nakawaki, Yasunori; and Abe, Akiharu, 5,090,881, Cl. 418-26.000.
Toyota, Akinori: See—
Kioka, Mamoru; Tsutsui, Toshiyuki; and Toyota, Akinori, 5,091,352, Cl. 502-103.000.
Toyota Jidosha Kabushiki Kaisha: See—
Asada, Toshiyuki, 5,090,952, Cl. 475-278.000.
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.
Ito, Yasuji, 5,090,379, Cl. 123-299.000.
Umehara, Shigeru; Kohara, Ikumitsu; Kaseda, Satoshi; Kawase, Masao; Kato, Yoshito; Hori, Hideki; Taga, Akira; and Sunahara, Shuichi, 5,091,855, Cl. 364-424.020.
Yokoya, Yuji; Tsutsumi, Yasuhiro; Suzuki, Yutaka; Shiozaki, Makoto; Onogi, Nobuyoshi; and Takasou, Kazuo, 5,090,728, Cl. 280-707.000.
Tozzolino, Pierre: See—
Cahiez, Gerard; Chavant, Pierre-Yves; and Tozzolino, Pierre, 5,091,597, Cl. 568-878.000.
Cahiez, Gerard; Chavant, Pierre-Yves; and Tozzolino, Pierre, 5,091,598, Cl. 568-878.000.
Trachte, Dietrich: See—
Krauter, Lothar; Nusser, Hermann; Schelhas, Peter; Schillinger, Rainer; Trachte, Dietrich; and Kemmer, Ulrich, 5,090,883, Cl. 418-171.000.
Traise, John E., to Moore Business Forms, Inc. Label with record sheet. 5,090,942, Cl. 462-66.000.
Tran, Hiep V., to Texas Instruments Incorporated. BiCMOS static memory with improved performance stability. 5,091,879, Cl. 365-177.000.
Transcontinental Car Wash Systems Limited: See—
Barber, Ivan J., 5,090,429, Cl. 134-57.00R.
Transilwrap Company, Inc.: See—
Minkus, Morton, 5,090,736, Cl. 283-77.000.
Traugott, Thomas D.: See—
Wolsink, Hendrick W.; Plomer, John J.; and Traugott, Thomas D., 5,091,470, Cl. 525-71.000.
Trece, Inc.: See—
Mullen, Michael A.; Highland, Henry A.; Taggart, Robert E.; and Lingren, Bill W., 5,090,153, Cl. 43-114.000.
Treger, Jack, to Duracell Inc. Separator for electrochemical cells. 5,091,272, Cl. 429-62.000.
Tretter, Steven A., to University of Maryland at College Park. Repetitive phenomena cancellation arrangement with multiple sensors and actuators. 5,091,953, Cl. 351-71.000.
Tri-Tec Industries Ltd.: See—
Friedman, Ira, 5,090,699, Cl. 273-126.00R.
Trihard, S.A.: See—
McDermott, Daniel R., 5,090,546, Cl. 193-34.000.
Trinh, Tuan A.: See—
Swan, Alan J.; and Trinh, Tuan A., 5,090,617, Cl. 236-3.000.
Trinity Industries, Inc.: See—
Hesch, Harold E.; and Przybylinski, Phillip G., 5,090,331, Cl. 105-3.000.
Trivett, Robert L., to Nalco Chemical Company. Fatty triglyceride-in-water solid film high temperature prelude emulsion for hot rolled steel. 5,091,100, Cl. 252-49.500.
Troxel Company, The: See—
Crutchfield, H. Carl; Shomberger, Stephen M.; Wedell, Mark T.; and Breedlove, Michael D., 5,090,663, Cl. 254-28.000.
Truchet, Gaston, to S.A. Des Etablissements Staubli (France). Connection for pipes of the type incorporating rotating valves. 5,090,448, Cl. 137-614.030.
Trutzschler GmbH & Co. KG: See—
Leifeld, Ferdinand, 5,090,864, Cl. 414-412.000.
Temburg, Josef; Leifeld, Ferdinand; and Vollrath, Ulrich, 5,090,090, Cl. 19-80.00R.
Temburg, Josef; and Vollrath, Ulrich, 5,090,091, Cl. 19-80.00R.
TRW Inc.: See—
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,091,505, Cl. 528-353.000.
Tsai, Irving. Method and apparatus for converting a conventional copier into an electronic printer. 5,091,747, Cl. 355-202.000.
Tsang, Charles: See—
Ker, Victoria S.; and Tsang, Charles, 5,090,817, Cl. 374-24.000.

Tsang, Tsze H.; and Spadafora, Vincent J., to Chevron Research and Technology Company. Trisubstituted silylalkyl 1,2,4-triazole and imidazole phenyl borane derivatives. 5,091,377, Cl. 514-63.000.
Tsaui, Bor-Yeu: See—
Fan, John C. C.; Tsaui, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 5,091,333, Cl. 437-82.000.
Tschirner, Peter, to Siemens Aktiengesellschaft. Ultrasonic flow measurement installation. 5,090,252, Cl. 73-861.280.
Tse, Tenny P., to Medscand (U.S.A.), Inc. Glass slide mailer. 5,090,568, Cl. 206-456.000.
Tseng, Mei-Rung: See—
Chu, Jau-Jier; Lai, Ming-Chih; Tseng, Mei-Rung; and Yeh, Huei-Hsing, 5,091,221, Cl. 427-282.000.
Tsiang, Manuel: See—
Schlesinger, Sondra; Huang, Henry V.; Levis, Robin; Weiss, Barbara; and Tsiang, Manuel, 5,091,309, Cl. 435-69.100.
Tsinghua University: See—
Zhang, Shulian; Yang, Sen; Wu, Minxian; and Jin, Kuofang, 5,091,913, Cl. 372-23.000.
Tsubakimoto Chain Co.: See—
Fukuyama, Kiyoshi; Wada, Toru; Kitabata, Kozo; Sudare, Masahiro; Tsuchitani, Shigemi; and Ohminami, Kazuya, 5,090,552, Cl. 198-365.000.
Futami, Yuichi; and Nagami, Yuji, 5,090,946, Cl. 474-104.000.
Kura, Tetsuzo, 5,090,555, Cl. 198-465.100.
Tsubouchi, Kazuo: See—
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,091,210, Cl. 427-39.000.
Tsuchida, Masashi; and Ohmachi, Kazuhiko, to Hitachi, Ltd. System for optimizing query processing in a relational database. 5,091,852, Cl. 395-600.000.
Tsuchimoto, Junichi; Yamada, Tooru; and Miyano, Takaya, to Sumitomo Electric Industries, Ltd. Process for forming heat resistant ohmic electrode. 5,091,338, Cl. 437-184.000.
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Suji; Nakajima, Ryoichi; and Naito, Sakae, to Maruzen Petrochemical Co., Ltd. Process for preparing pitches. 5,091,072, Cl. 208-39.000.
Tsuchitani, Shigemi: See—
Fukuyama, Kiyoshi; Wada, Toru; Kitabata, Kozo; Sudare, Masahiro; Tsuchitani, Shigemi; and Ohminami, Kazuya, 5,090,552, Cl. 198-365.000.
Tsuchiya, Yoshio: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshio; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
Tsuda, Toshio; Horio, Yasuhiko; Bessho, Yoshihiro; and Ishida, Toru, to Matsushita Electric Industrial Co., Ltd. Method of forming an electrical contact bump. 5,090,119, Cl. 29-843.000.
Tsuda, Toshio: See—
Umetsu, Sachio; Tsuda, Toshio; Azuma, Yusaku; Miura, Toshihiko; Ishihara, Katsumi; and Ohsaka, Teiji, 5,090,113, Cl. 29-714.000.
Tsuda, Yukio, to Kabushiki Kaisha Toshiba. Circuit switching system. 5,091,932, Cl. 379-100.000.
Tsudakoma Corp.: See—
Kasahara, Junya, 5,090,456, Cl. 139-302.000.
Tsuge, Kazunori: See—
Asaoka, Keizo; Tsuge, Kazunori; and Tawada, Yoshihisa, 5,091,764, Cl. 357-30.000.
Tsuiji, Hideaki, to Omron Corporation. Terminal piece sealing structure. 5,090,919, Cl. 439-519.000.
Tsuiji, Yasuo: See—
Tanaka, Yasutaka; Kojima, Hidetaka; and Tsuiji, Yasuo, 5,091,563, Cl. 562-406.000.
Tsujimoto, Masami: See—
Yokohori, Shizuo; Miyamoto, Kenzo; Fukushima, Koji; Tsujimoto, Masami; Onda, Kenji; and Sato, Kan, 5,091,026, Cl. 156-149.000.
Tsukada, Toru, to Nippon Seiko Kabushiki Kaisha. Roller bearing and roller type linear guide apparatus. 5,090,821, Cl. 384-44.000.
Tsukada, Yoji: See—
Sugimori, Tsunetake; Tsukada, Yoji; and Tatsuke, Yasuhiko, 5,091,305, Cl. 435-19.000.
Tsukamoto, Kouji: See—
Harada, Masasuke; Hayafuchi, Hideki; and Tsukamoto, Kouji, 5,091,125, Cl. 264-45.300.
Tsunemi, Takeo: See—
Inoue, Masahiro; Amemiya, Koji; Ohno, Akio; and Tsunemi, Takeo, 5,091,751, Cl. 355-274.000.
Tsunoto, Takashi: See—
Sawada, Yosuke; Ueki, Tomokazu; Tsuno, Takashi; and Oki, Toshikazu, 5,091,418, Cl. 514-569.000.
Tsurumaki, Hayako: See—
Morikawa, Yuji; and Tsurumaki, Hayako, 5,091,818, Cl. 361-56.000.
Tsuruoka, Yoshihiro: See—
Takayama, Hideto; Tsuruoka, Yoshihiro; Matsuzawa, Takashi; and Nagae, Hirao, 5,091,155, Cl. 422-88.000.
Tsuchima, Isako: See—
Takeda, Fumio; Kojima, Yoshio; Kaneko, Tsuneo; Ishibashi, Yutaka; Sasaki, Naoto; and Tsuchima, Isako, 5,090,169, Cl. 52-220.000.
Tsutsui, Kiyoshi: See—
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.

Tsutsui, Toshiyuki: See—
Kioka, Mamoru; Tsutsui, Toshiyuki; and Toyota, Akinori, 5,091,352, Cl. 502-103.000.
Tsutsumi, Yasuhiro: See—
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- University of Melbourne, The: See—
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- University of Miami: See—
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- Uranium Pechiney: See—
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- Usami, Kimiyoshi, to Kabushiki Kaisha Toshiba. Semiconductor logic circuit. 5,091,660, Cl. 307-463.000.
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- Usui Kokusai Sangyo Kaisha Ltd.: See—
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- Takikawa, Kazunori; Fukaya, Kazumi; Ohbu, Jun; and Yagi, Yasu-shi, 5,090,611, Cl. 228-173.400.
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- Vagedes, Michael: See—
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- Marchisio, Aldo; and Guarise, Massimo, 5,090,541, Cl. 192-98.000.
- Valley, George C.: See—
O'Meara, Thomas R.; and Valley, George C., 5,090,795, Cl. 359-240.000.
- Valmet Paper Machinery Inc.: See—
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- Hakala, Jaakko; and Savolainen, Eero, 5,090,846, Cl. 408-1.00R.
- Van Agtmaal, J. G.: See—
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- Van Breemen, Eric H. G. Wheel hub and wheel for a bicycle. 5,090,776, Cl. 301-105.00B.
- VanderHeyden, Jean-Luc: See—
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- van der Laar, Fritz J., to Lumiance B.V. Connecting means. 5,090,921, Cl. 439-668.000.
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- Vandoninck, Alfons, to Jaico C.V., Cooperative venootschap. Pressure capsule for spray can, and spray can which utilizes such a capsule. 5,090,595, Cl. 222-54.000.
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- Van Fossen, Robert A., to Johnson Service Company. Magnetically actuated proximity flow switch. 5,091,612, Cl. 200-81.90M.
- Van Leeuwen, Petrus W. N. M.; Roobeek, Cornelis F.; and Wong, Pui K., to Shell Oil Company. Polymerization of carbon monoxide/olefin with polyalkoxyalkane. 5,091,507, Cl. 528-392.000.
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- Kenneth E.; and Zweerink, Marcia M., 5,091,413, Cl. 514-460.000.
- Van Order, Kim L.; DeJong, Jerry M.; and Lindberg, Kenneth M., to Prince Corporation. Vehicle foil laminated lamp mount. 5,091,831, Cl. 362-74.000.
- VanRhee, Jack: See—
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- Van Romer, Edward W.; and Flood, Brian R., to Portable Containment, Inc. Portable containment for chemicals. 5,090,588, Cl. 220-573.000.
- van Rooij, Jacobus H. M., to Volvo Car St. Truiden N.V. Friction transmission provided with a pair of sheaves. 5,090,947, Cl. 474-240.000.
- Van Scott, Eugene J.: See—
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- Van Wijngaarden, Ineke: See—
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- VDO Adolf Schindling AG: See—
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- Vebeilunas, Rimas V.: See—
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- Veech, Richard L. Hemodialysis processes & hemodialysis solutions. 5,091,094, Cl. 210-647.000.
- Velsicol Chemical Corporation: See—
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- Ventura, Susanna: See—
Narang, Subhash C.; Ventura, Susanna; and Bhardwaj, Tilak R., 5,091,502, Cl. 528-229.000.
- Venuti, Michael C.: See—
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- Verdini, Antonio S.: See—
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- Vernano, Mark P., to Du Pont de Nemours, E. I., and Company. Laminated sill wrap assembly for providing an air infiltration barrier. 5,091,235, Cl. 428-192.000.
- Vermont American Corporation: See—
Gakhar, Ved P.; Ballou, Joseph H.; Leubbers, James M.; and Szymanski, D. M., 5,090,461, Cl. 144-136.00C.
- Verteq, Inc.: See—
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- Vertes, Laszlo; Fehlhauer, Hans-Wolfram; and Schulz, Arno, to Hoechst Aktiengesellschaft. Glycosidase inhibitor salbostatin, process for its preparation, and its use. 5,091,524, Cl. 536-18.700.
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- VG Instruments Group Limited: See—
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- Victor Company of Japan: See—
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- Victor Company of Japan, Ltd.: See—
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- Video Research Ltd.: See—
Itoh, Yoshikazu; and Wake, Shunji, 5,091,877, Cl. 395-200.000.
- Vieth, Christian: See—
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- Vignali, Graziano: See—
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- Vignotto, Angelo, to Riv-SKF Officine di Villar Persosa S.p.A. Phonic element for speed sensing bearing assembly. 5,090,236, Cl. 73-118.100.
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- Viratec Thin Films, Inc.: See—
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- Virtek Vision Intelligence Robotics Technologies Corporation: See—
Wong, Andrew K.; Kamel, Mohamed S.; and King, John T., 5,090,804, Cl. 356-237.000.
- Viscodrive GmbH: See—
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- Vista Research, Inc.: See—
Maresca, Joseph W., Jr.; Starr, James W.; and Wilson, Christopher P., 5,090,234, Cl. 73-49.100.
- Viste, Claude, to Taylor Made Company, Inc. Golf club head. 5,090,702, Cl. 273-167.00H.
- Visual Information Technologies, Inc.: See—
Butler, Timothy L., 5,091,960, Cl. 382-1.000.
- Voest-Alpine Industrieanlagenbau G.m.b.H.: See—
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- Vogel, Rudolf: See—
Stacher, Angelo; and Vogel, Rudolf, 5,090,453, Cl. 139-115.000.
- Vogelsang, Klaus, to Voith Turbo GmbH & Co. KG. Hydrodynamic retarder. 5,090,523, Cl. 188-296.000.
- Voice Data Image Corporation Incorporated: See—
Dickie, Robert G., 5,090,117, Cl. 29-840.000.
- Voith Turbo GmbH & Co. KG: See—
Vogelsang, Klaus, 5,090,523, Cl. 188-296.000.
- Volkswagen AG: See—
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- Schapertons, Herbert; and Scheibner, Bodo, 5,090,371, Cl. 123-41.210.
- Vollrath, Ulrich: See—
Temburg, Josef; Leifeld, Ferdinand; and Vollrath, Ulrich, 5,090,090, Cl. 19-80.00R.
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- Volvo Car St. Truiden N.V.: See—
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- von der Eltz, Herbert: See—
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- VonHoene, Robert M.: See—
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- Von Stetten, Susan M.: See—
Ko, Kenneth K.; Miller, Jesse D., Jr.; and Von Stetten, Susan M., 5,091,452, Cl. 524-155.000.
- Voss, Hartwig; and Brueckner, Thomas, to BASF Aktiengesellschaft. Removal of acid from cathodic electrocoating baths by electro dialysis. 5,091,071, Cl. 204-182.400.
- Voth, Elmer D.: See—
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- VSI Corporation: See—
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- Vu, Cung: See—
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- W. R. Grace & Co.-Conn.: See—
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- Braatz, James A.; and Heifetz, Aaron H., 5,091,176, Cl. 424-78.170.
- Quach, Loc, 5,091,491, Cl. 526-278.000.
- Zagar, Steve J., 5,090,137, Cl. 34-242.000.
- W. Schlafhorst AG & Co.: See—
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- Wacker-Chemie GmbH: See—
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- Wacker Silicones Corporation: See—
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- Wada, Ichiro, to Kabushiki Kaisha Toshiba. Electromagnetic flowmeter utilizing magnetic fields of a plurality of frequencies. 5,090,250, Cl. 73-861.120.
- Wada, Sadahisa: See—
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- Wada, Toru: See—
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- Wade, Guy A., to Carolyn L. Lahargoue, a part interest. Cushioned rocking chair. 5,090,769, Cl. 297-258.000.
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- Wagner, Udo: See—
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- Wagon Union GmbH: See—
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- Wagoner, Earl V., III, to Hoggan Health Industries, Inc. Apparatus for testing muscle strength. 5,090,421, Cl. 128-774.000.
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- Wakabayashi & Co.: See—
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- Wake, Shunji: See—
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- Walch, Bert: See—
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- Walden, Robert R. Power-driven float assembly. 5,090,930, Cl. 441-131.000.
- Waldman, Martin. Aquarium or terrarium vessel. 5,090,358, Cl. 119-5.000.
- Wales, Stephen W., to Plessey Overseas Limited. Equalizers. 5,091,918, Cl. 375-11.000.
- Walker, Alan D.: See—
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- Walker, Colin, to Baroid Technology, Inc. Down-hole bent motor housings. 5,090,496, Cl. 175-61.000.
- Walker, Duncan N.; Terry, Vincent G.; Ulery, Dennis R.; Kazmierczak, Edmund E.; Keck, Richard J.; Pedersen, James R.; and Gott, Brian E., to General Electric Company. Tool for applying slot wedges. 5,090,114, Cl. 29-734.000.
- Walker, James D.; and Washer, Stone P., to Phillips Petroleum Company. Fractional distillation column and method for its use. 5,091,060, Cl. 203-99.000.
- Walker, Loren H., to General Electric Company. Power conversion scheme employing shorting means to control current magnitude. 5,091,840, Cl. 363-96.000.
- Walker, Michael R., to Zimmer, Inc. Medical container liner. 5,090,571, Cl. 206-523.000.
- Walker, Patrick D.; and Shah, Sudhir V., to Administrators of the Tulane Educational Fund. Protection against rhabdomyolysis-induced nephrotoxicity. 5,091,180, Cl. 424-944.000.
- Wall, John H.; and Walter, Edward L., to Dana Corporation. Apparatus for resistance bonding electromagnetic coils. 5,091,619, Cl. 219-56.100.
- Wallace Computer Services, Inc.: See—
Dash, Thomas E., 5,090,104, Cl. 29-434.000.
- Walt Disney Company, The: See—
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- Walter, Edward L.: See—
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- Walters, Darrel: See—
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- Walitz, Albert J. Preemptive constraint control. 5,091,844, Cl. 364-153.000.
- Wang, Chao-Huei; and Shah, Dinesh O., to Baxter Diagnostics Inc. Process for producing magnetically responsive polymer particles and application thereof. 5,091,206, Cl. 427-2.000.
- Wang, Chung-Ching, to Seal King Industrial Co., Ltd. Adhesive tape holder. 5,090,565, Cl. 206-411.000.
- Wang, Guang-Bin. Aluminum can compactor fed with bulk cans. 5,090,308, Cl. 100-215.000.
- Wang, Joel J.: See—
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- Wang, Kenneth: See—
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- Wang, Shui-Nu. Presser of a sewing machine. 5,090,344, Cl. 112-151.000.
- Waragai, Tsuyoshi: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Ward, Joseph W.; Wang, Kenneth; Lissade, Joel; Sivi, Paula; Wilcox, David G.; and Yang, Agatha, to Xerox Corporation. Method and apparatus for high-speed electronic data signal modification and improvement. 5,091,971, Cl. 382-54.000.
- Ward, William H. Food slicing guide. 5,090,286, Cl. 83-761.000.
- Wark, Rickey E. Air flow rate control device for pulverizer vane wheel. 5,090,631, Cl. 241-119.000.
- Warman, Francois, to Thomson-CSF. Suspension device for acoustic base. 5,091,894, Cl. 367-173.000.
- Warner-Lambert Company: See—
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- Warner & Swasey Company: See—
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- Washington University: See—
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- Washizu, Katsushi: See—
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- Washizu, Shintaro: See—
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- Wasilczyk, George J.: See—
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- Watanabe, Atsuo, to Yamauchi Corporation. Process for producing hard roll. 5,091,027, Cl. 156-172.000.
- Watanabe, Azuma: See—
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- Watanabe, Isao: See—
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- Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus in which editing content for masking, trimming, and the like is set in advance by separate setting unit and image formation is performed in accordance with editing content set by setting unit. 5,091,746, Cl. 355-202.000.
- Watanabe, Kazuhiro: See—
Murakami, Mutsuaki; Watanabe, Kazuhiro; Nishiki, Naomi; and Nakamura, Katsuyuki, 5,091,025, Cl. 156-89.000.
Someya, Ryuichi; Kabuto, Nobuaki; Kimura, Yuichiro; and Watanabe, Kazuhiro, 5,091,784, Cl. 358-183.000.
- Watanabe, Kazuo, to Takata Corporation. Air bag for a passenger. 5,090,729, Cl. 280-743.000.
- Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, to Fujitsu Limited; and Nitto Chemical Industry Co., Ltd. Method of forming pattern by using an electroconductive composition. 5,091,285, Cl. 430-296.000.
- Watanabe, Keiji: See—
Nishio, Hiroaki; Sato, Michitaka; and Watanabe, Keiji, 5,091,222, Cl. 427-335.000.
- Watanabe, Kenichi; Nishimura, Eiji; Nagaoka, Mitsuru; and Sotoyama, Kaoru, to Mazda Motor Corporation. Drive control system of four-wheel drive vehicle. 5,090,510, Cl. 180-197.000.
- Watanabe, Kiyoshi, to Canon Kabushiki Kaisha. Image processing apparatus for reducing visible roughness in contours. 5,091,973, Cl. 382-54.000.
- Watanabe, Makio: See—
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- Watanabe, Masahiro; and Yokoyama, Kazumasa, to Green Cross Corporation, The; and Taisho Pharmaceutical Co., Ltd. Preventive and therapeutic agent for hepatitis. 5,091,417, Cl. 514-530.000.
- Watanabe, Masaki: See—
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- Watanabe, Mikio; and Nishi, Seiki, to Fuji Photo Film Co., Ltd. Memory cartridge-connectable electronic device such as electronic still video camera. 5,091,787, Cl. 358-209.000.
- Watanabe, Osamu: See—
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- Watanabe, Takashi: See—
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- Watanabe, Tetsuya; and Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Chained addressing mode pipelined processor which merges separately decoded parts of a multiple operation instruction. 5,091,853, Cl. 395-375.000.
- Watanabe, Toshiharu, to Kabushiki Kaisha Toshiba. Semiconductor memory device with a 3-dimensional structure. 5,091,762, Cl. 357-23.600.
- Watanabe, Yoshiaki; and Tanaka, Sakae, to Seikosha Co., Ltd. Method of manufacturing amorphous-silicon thin-film transistors. 5,091,337, Cl. 437-181.000.
- Watanabe, Yoshitane: See—
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- Watanabe, Yukari; and Saito, Yuichi, to Mitsubishi Denki Kabushiki Kaisha. Encoder apparatus. 5,091,874, Cl. 364-715.100.
- Waterson, David: See—
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- Watson, David: See—
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- Waugh, John T., to CJC Holdings, Inc. Enhanced gemstone. 5,090,216, Cl. 63-26.000.
- Waverley Pharmaceuticals, Ltd.: See—
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- Wayne State University: See—
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- Weaver, Max A.; Hilbert, Samuel D.; Pruett, Wayne P.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Process for preparing 2H-1-benzopyran-2-ones and polyesters containing 2H-1-benzopyran-2-one residues. 5,091,501, Cl. 528-220.000.
- Webasto AG Fahrzeugtechnik: See—
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- Webb, Paul: See—
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- Weber, Heinz; Ehrmann, Gerd; Dietzen, Franz-Josef; Nintz, Eckhard; and Zettler, Hans D., to BASF Aktiengesellschaft. Preparation of expandable granules, and the production of foams therefrom. 5,091,126, Cl. 264-53.000.
- Weber, Robert N.: See—
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- Weber, Werner; and Gerstenberger, Markus, to Heidelberger Druckmaschinen AG. Printing unit cylinder for a rotary printing machine. 5,090,319, Cl. 101-483.000.
- Wedell, Mark T.: See—
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- Weicht, Bodo: See—
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- Weil, Lothar: See—
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- Weinbrecht, John F. Recirculating rotary gas compressor. 5,090,879, Cl. 418-9.000.
- Weingartner, Thomas A.: See—
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- Weiss, Barbara: See—
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- Weiss, Keith D.: See—
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- Weissaupt, Herbert P.: See—
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- Welsh, David E., to ITT Corporation. Modular connector system. 5,090,911, Cl. 439-79.000.
- Welty, Robert E., to Iowa Precision Industries, Inc. Duct corner installation tool. 5,090,101, Cl. 29-243.500.
- Weng, Yung J. Heat-absorbing/heating device with high efficiency and a supporting device therefor. 5,090,369, Cl. 122-44.200.
- Wenz, Karlheinz: See—
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- Washington Research Foundation: See—
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- Wess, Gunther: See—
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- Westcorp Software Systems, Inc.: See—
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- Westinghouse Air Brake Company: See—
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- Westinghouse Electric Corp.: See—
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- Westvaco Corporation: See—
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- Wettengel, Heinz, to Alcatel N.V. Multiplexer and demultiplexer, particularly for information transmission networks with a synchronous hierarchy of the digital signals. 5,091,907, Cl. 370-102.000.
- Wexler, Ruth R.: See—
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- Wey, Edmund; Anderheggen, Manfred; and Grecksch, Hans, to Zinser Textilmaschinen GmbH. Method and apparatus for preparing a yarn package for a subsequent yarn restarting operation. 5,090,189, Cl. 57-261.000.
- Weyman, Roger M.; and Barton, John R., to Massey Ferguson Services N.V. Gear coupler. 5,090,263, Cl. 74-339.000.
- Whately, B. Holt: See—
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- Wheeler, Basil W. Break-away gas fill guard. 5,090,760, Cl. 296-1.100.
- Whirlpool Corporation: See—
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- White, Donald L., to AT&T Bell Laboratories. Sub-micron imaging. 5,091,979, Cl. 385-1.000.
- White, John I.: See—
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- White, Joseph P. Cutting tool for milling machines. 5,090,851, Cl. 409-199.000.
- White, Richard L.: See—
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- White, Roy A.: See—
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- Whiting, Roger L.: See—
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- Whitlock, Barry M.: See—
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- Widlak, Neil R.: See—
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- Williams, Robert M. Trommel material air classifier. 5,091,077, Cl. 209-12.000.
- Williams, Theresa M.: See—
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- Williams, Warren R.: See—
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- Williamson, Malcolm J.; and Bustamante, Diane K., to Wisconsin Alumni Research Foundation. Feedback suppression in digital signal processing hearing aids. 5,091,952, Cl. 381-68.200.
- Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., to Nicolon Corporation; and Georgia Duck and Cordage Mill. Woven geotextile grid. 5,091,247, Cl. 428-255.000.
- Willmar Window Industries Ltd.: See—
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- Wilmot, Richard D.: See—
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- Wilson, Christopher P.: See—
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- Wilson, David L., to American Allsafe Company. Traffic safety cone. 5,090,349, Cl. 116-63.00C.
- Wilson, Kenneth E.: See—
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- Wilson, Richard A.; Mookherjee, Braja D.; and Butler, Jerry F., to International Flavors and Fragrances Inc.; and University of Florida. The use of ketones, ketoesters and alcohol in repelling insects; use of aliphatic ester in attracting insects and process and apparatus for determination of insect repellency and attractancy. 5,091,423, Cl. 514-690.000.
- Wilson, Robert. Continuous casting. 5,090,471, Cl. 164-439.000.
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- Wojnarowski, Robert J.: See—
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- Wolf, Andreas; and Breisch, Harald, to Zahnradfabrik Friedrichshafen AG. Pressure-medium actuated friction disk clutch or brake. 5,090,539, Cl. 192-85.0AA.
- Wolf, Erich, to Linde Aktiengesellschaft. Device for removing projecting parts from tires and the like. 5,090,465, Cl. 157-13.000.
- Wolf, Robert; and Steiner, Karl, to J. M. Voith GmbH. Device for removal of condensate from a steam-heated drying cylinder. 5,090,135, Cl. 34-124.000.
- Wollmershauser, Steven M.; and Mundy, David M. Coaxial cable shield filter. 5,091,707, Cl. 333-12.000.
- Wollowitz, Michael: See—
Kamieniecki, Emil; Goldfarb, William C.; and Wollowitz, Michael, 5,091,691, Cl. 324-158.00R.
- Wollweber, Detlef; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal 3-cyano-4-phenyl-pyroles. 5,091,408, Cl. 514-427.000.
- Wolsink, Hendrick W.; Plomer, John J.; and Traugott, Thomas D., to Dow Chemical Company, The. Molding resin. 5,091,470, Cl. 525-71.000.
- Wolverine World Wide, Inc.: See—
Sessa, Scott C., 5,090,140, Cl. 36-138.000.
- Wolverton, Randy: See—
Ingram, Terry D.; and Wolverton, Randy, 5,091,869, Cl. 364-560.000.
- Wolz, Helmut: See—
Hennecke, Udo; and Wolz, Helmut, 5,091,632, Cl. 219-553.000.
- Womack, Cleve W.; and McGuffee, Renard R. Adjustable hunter's tree stand. 5,090,506, Cl. 182-187.000.
- Wong, Andrew K.; Kamel, Mohamed S.; and King, John T., to Vitek Vision Intelligence Robotics Technologies Corporation. Apparatus and method for inspection of surface quality of smooth surfaces. 5,090,804, Cl. 356-237.000.
- Wong, Chun S., to Du Pont Canada Inc. Reduction of corrosion of metals. 5,091,260, Cl. 428-461.000.
- Wong, Edward H.: See—
Studebaker, Lawrence G.; and Wong, Edward H., 5,091,342, Cl. 437-228.000.
- Wong, Patrick S.: See—
Kuczyński, Anthony L.; Ayer, Atul D.; and Wong, Patrick S., 5,091,190, Cl. 424-473.000.
- Wong, Pui K.: See—
Van Leeuwen, Petrus W. N. M.; Roobeek, Cornelis F.; and Wong, Pui K., 5,091,507, Cl. 528-392.000.
- Wong, Yiwang; Yoshino, Toshiaki; and Johnson, Louis G., to Texas Instruments Incorporated. Fast fourier transform (FFT) addressing apparatus and method. 5,091,875, Cl. 364-726.000.
- Wood, Bruce R.: See—
Kroeger, Wilbert L.; Ripley, John R.; and Wood, Bruce R., 5,090,830, Cl. 400-719.000.
- Wood, Roger T., to International Business Machines Corporation. Display system comprising a windowing mechanism. 5,091,720, Cl. 340-721.000.
- Wood, Stephen R.: See—
Kremer, Richard; and Wood, Stephen R., 5,090,763, Cl. 296-39.100.
- Wood, William R., IV, to TDS Manufacturing. Stand assembly. 5,090,648, Cl. 248-125.000.
- Woodhead, James L.; and Groves, Paul, to Alcan International Limited. Sol-gel method of making ceramics. 5,091,348, Cl. 501-136.000.
- Wormsbacher, Wilfried: See—
Heimbürger, Norbert; Wenz, Karlheinz; and Wormsbacher, Wilfried, 5,091,363, Cl. 514-2.000.
- Wright, Amy S.; Cross, Sue S.; Burres, Neal S.; and Koehn, Frank, to Harbor Branch Oceanographic Institution, Inc. Novel antiviral terpene hydroquinones and methods of use. 5,091,412, Cl. 514-453.000.
- Wright, Harry D. Safety device operable by a passenger of a motor vehicle. 5,090,514, Cl. 180-271.000.
- Wright, Jeffery L.; and Wright, Lisa K. Decorative tree structure. 5,091,227, Cl. 428-18.000.
- Wright, Lisa K.: See—
Wright, Jeffery L.; and Wright, Lisa K., 5,091,227, Cl. 428-18.000.
- Wright, Ward F.: See—
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,091,505, Cl. 528-353.000.
- Wright, William B., to Rolls-Royce plc. Variable pitch propeller module for an aero gas turbine engine powerplant. 5,090,869, Cl. 416-147.000.
- Wu, Minxian: See—
Zhang, Shulian; Yang, Sen; Wu, Minxian; and Jin, Kuofan, 5,091,913, Cl. 372-23.000.

- Wuhrl, Arno: See—
Zingher, Oded; Wuhrl, Arno; and Suppes, Stephan, 5,091,859, Cl. 364-471.000.
- Wulff, Gunter; Minarik, Milan; and Oerschkes, Ralf J., to Macherey, Nagel & Co. Column-packing material for gel-permeation chromatography, method for its preparation, and applications. 5,091,433, Cl. 521-54.000.
- Wulff, Richard E., to Castex Industries, Inc. Wide area carpet vacuum cleaner. 5,090,083, Cl. 15-347.000.
- Wulhelm Fette GmbH, Firma: See—
Bentjens, Bernd, 5,090,845, Cl. 407-52.000.
- Wusthof, Peter: See—
Sinclair, Cunningham; and Wusthof, Peter, 5,090,295, Cl. 91-491.000.
- Wyatt, Charles H.: See—
Eller, Joe C.; Leavens, James E.; and Wyatt, Charles H., 5,090,972, Cl. 55-20.000.
- Wyman, Paul A.: See—
Wadsworth, Harry J.; Hadley, Michael S.; Wyman, Paul A.; and Jenkins, Sarah M., 5,091,397, Cl. 514-359.000.
- Xerox Corporation: See—
Bloomberg, Dan S.; and Tow, Robert F., 5,091,966, Cl. 382-21.000.
Coy, Gerald L.; Buck, Kenneth; and Blitz, William, 5,091,654, Cl. 250-561.000.
Hammond, John M.; Petropoulos, Mark; Berger, Stuart B.; and Nolley, Robert W., 5,090,350, Cl. 118-50.000.
Kamath, Venkatesh H.; Mandel, Barry P.; Beer, Ted A.; and Sokac, Russell J., 5,090,683, Cl. 271-227.000.
Teuscher, Leon A.; and Ziolo, Ronald F., 5,091,278, Cl. 430-58.000.
Ward, Joseph W.; Wang, Kenneth; Lissade, Joel; Sivi, Paula; Wilcox, David G.; and Yang, Agatha, 5,091,971, Cl. 382-54.000.
- Xoma Corporation: See—
Reardan, Dayton T.; and Goff, Dane A., 5,090,914, Cl. 435-188.000.
- Yabuki, Yoshikazu: See—
Oka, Kengo; Yoshida, Susumu; Mimoto, Yoshiyuki; Ebisuno, Tadashi; and Yabuki, Yoshikazu, 5,090,705, Cl. 273-232.000.
- Yagi, Hiroshi: See—
Kakizaki, Masao; Kobayashi, Yoshihito; and Yagi, Hiroshi, 5,091,810, Cl. 360-103.000.
- Yagi, Minoru; and Toda, Fumio, to Kurita Water Industries Ltd. Clathrate compound. 5,091,400, Cl. 514-372.000.
- Yagi, Tadashi: See—
Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiro; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
- Yagi, Yasushi: See—
Takikawa, Kazunori; Fukaya, Kazumi; Ohbu, Jun; and Yagi, Yasushi, 5,090,611, Cl. 228-173.400.
- Yama, Yomiyuki: See—
Kohara, Masanobu; Kondo, Takashi; and Yama, Yomiyuki, 5,091,772, Cl. 357-74.000.
- Yamada, Kazuya: See—
Harada, Yasuaki; Takasuka, Gentaro; Kato, Tatsu; Hanai, Yoshimichi; Kamei, Hiroshi; Yamada, Kazuya; Otake, Hiroshi; and Itaya, Mazumi, 5,090,338, Cl. 110-165.00A.
- Yamada, Kouichi: See—
Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,091,609, Cl. 174-110.00A.
- Yamada, Masaki: See—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,091,805, Cl. 360-53.000.
- Yamada, Osamu: See—
Kohda, Masahiro; Yamada, Osamu; and Yamane, Hisaaki, 5,091,625, Cl. 219-121.440.
- Yamada, Tooru: See—
Tsuchimoto, Junichi; Yamada, Tooru; and Miyano, Takaya, 5,091,338, Cl. 437-184.000.
- Yamada, Yasuhiro; Miyazaki, Yasuko; Kanemoto, Takashi; Matsuoka, Mikiharu; and Katayama, Hirohiko, to Canon Kabushiki Kaisha. Pattern reading apparatus having variable reading period. 5,091,865, Cl. 395-153.000.
- Yamada, Yoko: See—
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; Mori, Shosei; and Nakamura, Shinichi, 5,091,109, Cl. 252-299.610.
- Yamaguchi, Hideyuki: See—
Nonogaki, Masayasu; Arai, Fumiaki; Natori, Yuji; and Yamaguchi, Hideyuki, 5,091,257, Cl. 428-411.100.
- Yamaguchi, Hiroaki: See—
Inatome, Hiroshi; Inaguma, Kazunari; Yamaguchi, Hiroaki; and Ohtani, Yasuhisa, 5,091,503, Cl. 528-272.000.
- Yamaguchi, Ichiro, to Fujitsu Limited. Semiconductor device having a ceramic package. 5,091,770, Cl. 357-74.000.
- Yamaguchi, Jun; Washizu, Shintaro; Matsumoto, Hirotaka; Iwakura, Ken; and Fukushima, Yuichi, to Fuji Photo Film Co., Ltd. Light and heat-sensitive recording material. 5,091,280, Cl. 430-138.000.
- Yamaguchi, Katsuya: See—
Sasahara, Masayuki; and Yamaguchi, Katsuya, 5,091,974, Cl. 582-55.000.
- Yamaguchi, Seiji: See—
Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyanaga, Hirofumi; Takayama, Syuichi; Ueda,
- Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.
- Yamaha Corporation: See—
Kumano, Shinji; and Murasaki, Motoshi, 5,090,290, Cl. 84-434.000.
- Yamaha Hatsudoki Kabushiki Kaisha: See—
Yoshida, Takeo; and Suzuki, Minoru, 5,090,620, Cl. 239-96.000.
- Yamakawa, Tomio: See—
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,091,403, Cl. 514-398.000.
- Yamaki, Makio: See—
Ida, Kazunaga; Yamaki, Makio; Matsumoto, Yukio; Ishihara, Hiroyuki; Naoe, Toshiyuki; and Terauchi, Hideyuki, 5,091,951, Cl. 381-63.000.
- Yamakoshi, Yukiyoshi; Takei, Hajime; Matsuda, Naoyuki; Moro, Fuminori; and Tomita, Hiroshi, to Minolta Camera Kabushiki Kaisha. Sheet feed arrangement. 5,090,677, Cl. 271-117.000.
- Yamamoto, Hiroki: See—
Ujimoto, Hiroshi; Nomura, Hironori; Shimakawa, Taiji; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 5,091,039, Cl. 156-519.000.
- Yamamoto, Hiroshi; and Hirata, Juichi, to Mitsubishi Denki Kabushiki Kaisha. Disconnecting switch. 5,091,614, Cl. 200-144.0AP.
- Yamamoto, Hiroshi; and Arai, Shizuo, to Sony Corporation. Disc Cartridge with dual identification elements. 5,091,901, Cl. 369-291.000.
- Yamamoto, Hiroshi: See—
Goto, Shoji; Sakata, Akihiro; Yamamoto, Hiroshi; Saimi, Tetsuo; and Momoo, Kazuo, 5,091,793, Cl. 359-831.000.
- Yamamoto, Mitsuo: See—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 5,091,128, Cl. 264-60.000.
- Yamamoto, Tokihiko; Fukumoto, Ryoichi; Ohhashi, Masao; Itagaki, Kazuhide; and Sumiya, Kazuhiro, to Aisin Seiki Kabushiki Kaisha. Windshield wiper with variable arcuate pattern. 5,090,081, Cl. 15-250.130.
- Yamamoto, Toru: See—
Ishibashi, Ichiro; Ichinose, Kiyohiro; Yamamoto, Toru; and Kashida, Toshikazu, 5,090,361, Cl. 118-313.000.
- Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, to Nichias Corporation. Method for producing material for low melting point metal casting equipment. 5,091,128, Cl. 264-60.000.
- Yamamoto, Tsutomu: See—
Shishido, Yoshio; Adachi, Hideyuki; Hibino, Hiroki; Yamamoto, Tsutomu; Miyanaga, Hirofumi; Takayama, Syuichi; Ueda, Yasuhiro; Aoki, Yoshisade; and Yamaguchi, Seiji, 5,090,259, Cl. 73-866.500.
- Yamamoto, Yasushi, to Shin-Etsu Chemical Co., Ltd. Fluorinated styrene derivatives and method for making. 5,091,588, Cl. 568-607.000.
- Yamamoto, Yasushi: See—
Nakajima, Hiroyuki; Takahama, Takashi; Miyamoto, Fumiaki; Oka, Seiji; Isooka, Toshio; Maruyama, Yoshihiro; and Yamamoto, Yasushi, 5,091,481, Cl. 525-423.000.
- Yamamoto, Yoshima, to Fuji Kiko Company, Limited. Connection arrangement and method of forming the same. 5,090,834, Cl. 403-277.000.
- Yamamoto, Yuki: See—
Takahashi, Tashihiko; Sugahara, Jun; Nara, Toshihiko; Yamamoto, Yuki; Atsumi, Yoshinari; Seki, Hideaki; Masuda, Katutaro; Sato, Nobuyoshi; Itoh, Masanobu; Shigeta, Masayuki; Ikeda, Eiji; Kinoshita, Hiroshi; and Kakami, Shinkei, 5,090,515, Cl. 187-16.000.
- Yamane, Hisaaki: See—
Kohda, Masahiro; Yamada, Osamu; and Yamane, Hisaaki, 5,091,625, Cl. 219-121.440.
- Yamane, Takakazu: See—
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- Yamanouchi Pharmaceutical Co., Ltd.: See—
Ito, Noriki; Yasunaga, Tomoyuki; Iizumi, Yuichi; and Araki, Tomio, 5,091,419, Cl. 514-596.000.
- Yamasaki, Akira; Takeda, Yoshinaka; Abe, Souhei; and Fukano, Izumi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multiple flow-dividing dilution tunnel system. 5,090,258, Cl. 73-863.030.
- Yamashita, Takaji; and Yamashita, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Examination apparatus. 5,090,415, Cl. 128-665.000.
- Yamashita, Tatsuo: See—
Murakoshi, Toshiichi; Kawazoe, Hiroshi; Takahata, Toshihiro; Inaki, Shigeo; Yamashita, Tatsuo; and Doi, Yoshinori, 5,090,110, Cl. 29-596.000.
- Yamashita, Yutaka: See—
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- Yamato, Motoyuki: See—
Suzuki, Shoji; and Yamato, Motoyuki, 5,091,263, Cl. 428-518.000.
- Yamauchi Corporation: See—
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- Yamauchi, Shinichi: See—
Arashiro, Yusuke; Yamauchi, Shinichi; Sano, Hironari; Inoue, Takayuki; and Nishida, Koji, 5,091,473, Cl. 525-92.000.
- Yamauchi, Tatsumi: See—
Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hirai-shi, Atushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, 5,091,883, Cl. 365-189.050.

- Yamazaki, Shunpei; and Nagata, Yujiro, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device. 5,091,334, Cl. 437-101.000.
- Yamazaki, Shunpei; Fukada, Takeshi; Sakama, Mitsunori; Shinohara, Hisato; Amachi, Nobumitsu; Sakamoto, Naoya; and Inuzima, Takashi, to Semiconductor Energy Laboratory Co., Ltd. Contact image sensor having light-receiving windows. 5,091,638, Cl. 250-208.100.
- Yamazaki, Yasushi, to NEC Corporation. Semiconductor device having a funnel shaped inter-level connection. 5,091,768, Cl. 357-71.000.
- Yamazaki, Yuzo; and Nishizawa, Toshiro, to Totoku Electric Co., Ltd. Method for manufacturing a heat resistant voice coil. 5,091,028, Cl. 156-172.000.
- Yanagida, Takehiko: See—
Kanbara, Takatsugu; Asabuki, Hiroshi; Ibori, Satoshi; Hasegawa, Kengo; Nandou, Kenji; Yanagida, Takehiko; Suzuki, Naoto; Baba, Shigeyuki; Fujii, Hiroshi; and Torii, Takuji, 5,091,823, Cl. 361-384.000.
- Yanami, Tetsuo: See—
Kubota, Yutaka; Shimono, Seiichi; Yanami, Tetsuo; Iwasaki, Tetsuji; and Kurita, Kazuhiko, 5,090,995, Cl. 71-114.000.
- Yang, Agatha: See—
Ward, Joseph W.; Wang, Kenneth; Lissade, Joel; Sivi, Paula; Wilcox, David G.; and Yang, Agatha, 5,091,971, Cl. 382-54.000.
- Yang, Sen: See—
Zhang, Shulian; Yang, Sen; Wu, Minxian; and Jin, Kuofam, 5,091,913, Cl. 372-23.000.
- Yang, Tai-Her. Forcible type C-type clamp with pre-stress packing face. 5,090,670, Cl. 269-249.000.
- Yano, Keiko: See—
Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, 5,091,285, Cl. 430-296.000.
- Yano, Toshihiko; Matsuo, Noriaki; Torisu, Yoko; and Dohara, Kazunobu, to Sumitomo Chemical Company, Limited. Insecticidal and/or acaricidal composition. 5,091,183, Cl. 424-405.000.
- Yarnold, Daniel J.: See—
Fuller, Jack J.; Podesta, Joseph A.; and Yarnold, Daniel J., 5,090,115, Cl. 29-789.000.
- Yashiro, Masahiko, to Canon Kabushiki Kaisha. Sheet inverting apparatus. 5,090,680, Cl. 271-186.000.
- Yasuda, Akihiro: See—
Nakada, Kazuhiko; Yasuda, Akihiro; and Ichikawa, Makoto, 5,091,121, Cl. 264-1.400.
- Yasuda, Seigou: See—
Ariyoshi, Takashi; Kawamoto, Toshiaki; Yasuda, Seigou; Kuriki, Syoji; and Nakatani, Tomofumi, 5,091,947, Cl. 381-42.000.
- Yasugi Seimitsu Co., Ltd.: See—
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- Yasuhara, Yoshihiro; and Saitou, Toshio, to Kabushiki Kaisha Toshiba. Man conveyor. 5,090,551, Cl. 198-323.000.
- Yasui, Yoshiharu; Anahara, Meiji; and Omori, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Three dimensional fabric and method for making the same. 5,091,246, Cl. 428-224.000.
- Yasunaga, Tomoyuki: See—
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- Yefim, Ivshin: See—
Colla, Jeannine O.; Thoma, Paul E.; Oman, Gary F.; Klein, Carl F.; Froehling, Paul H.; Spence, Scott L.; Yefim, Ivshin; and Barcootian, Arthur, 5,090,246, Cl. 73-718.000.
- Yeh, Hui-Hsing: See—
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- Yissum Research Development Company of the Hebrew University of Jerusalem: See—
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- Yokogawa Medical Systems, Limited: See—
Shimazaki, Toru, 5,090,412, Cl. 128-660.070.
- Yokohama Aeroquip Co.: See—
Hagiwara, Takanobu; Hatta, Katsuhiko; and Watanabe, Isao, 5,090,744, Cl. 285-166.000.
- Yokohama Rubber Company, Ltd.: See—
Ozaki, Shoichiro; Akiyama, Takahiko; Takechi, Naoto; Kageyama, Kunio; and Machida, Morihisa, 5,091,549, Cl. 558-131.000.
- Yokohori, Shizuo; Miyamoto, Kenzo; Fukushima, Koji; Tsujimoto, Masami; Onda, Kenji; and Sato, Kan, to Toyo Tire & Rubber Co., Ltd. Method for continuously vulcanizing a self-molding hose. 5,091,026, Cl. 156-149.000.
- Yokoi, Masato: See—
Enomoto, Ryo; Matsuno, Yoshimi; and Yokoi, Masato, 5,091,344, Cl. 501-1.000.
- Yokoi, Toshio: See—
Fukui, Osamu; Tsutsui, Kiyoshi; Akagawa, Tomohiko; Sakai, Ikunori; Nomura, Takao; Nishio, Takeyoshi; Yokoi, Toshio; and Kawamura, Nobuya, 5,091,462, Cl. 524-504.000.
- Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichi, to Bridge-stone Flowtech Corporation. Hose end fitting. 5,090,741, Cl. 285-101.000.
- Yokomori, Kiyoshi; Fujita, Shunsuke; and Misawa, Shigeyoshi, to Ricoh Company, Ltd. Waveguide type optical detection apparatus. 5,091,982, Cl. 385-4.000.
- Yokoyama, Yuji; Tautsumi, Yasuhiro; Suzuki, Yutaka; Shiozaki, Makoto; Onogi, Nobuyoshi; and Takasuo, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling damping force of shock absorber. 5,090,728, Cl. 280-707.000.
- Yokoyama, Akinori: See—
Nakajima, Hitoshi; and Yokoyama, Akinori, 5,091,114, Cl. 252-514.000.
- Yokoyama, Isao: See—
Kuwabara, Takao; Kita, Ezo; Yokoyama, Isao; Nakagawa, Hiroto; and Oono, Yasuteru, 5,090,872, Cl. 417-53.000.
- Yokoyama, Kazumasa: See—
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- Yokoyama, Shigeyuki: See—
Sakumoto, Yukinori; Yokoyama, Shigeyuki; Shibuya, Akihiro; Nakayama, Nobuyuki; and Koshimura, Atsushi, 5,091,251, Cl. 428-352.000.
- Yokoyama, Yuji: See—
Matsuzaki, Nozomu; Akioka, Takashi; Iwamura, Masahiro; Hirai-shi, Atushi; Yamauchi, Tatsumi; Yokoyama, Yuji; Kobayashi, Yutaka; and Uchida, Hideaki, 5,091,883, Cl. 365-189.050.
- Yoneda, Yasuhiro: See—
Watanabe, Keiji; Yoneda, Yasuhiro; Kobayashi, Koichi; Yano, Keiko; Nakamura, Tomio; and Shimizu, Shigeru, 5,091,285, Cl. 430-296.000.
- Yoon, Jeong-Hoon: See—
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- Yoshiaki Saito: See—
Matsuda, Jinichi; and Kato, Kazuo, 5,090,423, Cl. 128-804.000.
- Yoshida, Hideyuki: See—
Yoshinaka, Minoru; Asakura, Eizou; Oku, Mitsumasa; Kitano, Motoi; and Yoshida, Hideyuki, 5,091,765, Cl. 357-30.000.
- Yoshida, Ikuo: See—
Nakao, Takashi; Emoto, Yoshiaki; Sekiguchi, Koichiro; Iketani, Masayuki; Sahara, Kunizo; Yoshida, Ikuo; Kohno, Akiomi; Horino, Masaya; Kamohara, Hideaki; Irie, Shouichi; Akasaki, Hiroshi; and Otsuka, Kanji, 5,090,609, Cl. 228-123.000.
- Yoshida Kogyo K.K.: See—
Terada, Yasuharu; and Ishii, Susumu, 5,090,096, Cl. 24-431.000.
- Yoshida, Masahiro: See—
Nakata, Aki; Yoshida, Masahiro; and Nakajima, Koshiro, 5,090,103, Cl. 29-418.000.
- Yoshida, Masakiyo: See—
Aoki, Tomohide; Hanabusa, Hisao; Ohasi, Tamiyoshi; Yoshida, Masakiyo; Mizuno, Masami; Ninomiya, Fujio; Hokari, Osamu; and Fujita, Tsugio, 5,090,459, Cl. 141-59.000.
- Yoshida, Ryuhei, to Murata Manufacturing Co., Ltd. Piezoelectric oscillator. 5,091,671, Cl. 310-358.000.
- Yoshida, Satoshi: See—
Nakahara, Toshiaki; Tanikawa, Hirohide; Yoshida, Satoshi; Fujiwara, Masatsugu; and Sakashita, Kiichiro, 5,091,279, Cl. 430-106.600.
- Yoshida, Seitaro; and Ashida, Kenichi, to Mita Industrial Co., Ltd. Cartridge unit. 5,091,750, Cl. 355-260.000.
- Yoshida, Susumu: See—
Oka, Kengo; Yoshida, Susumu; Mimoto, Yoshiyuki; Ebisuno, Tadashi; and Yabuki, Yoshikazu, 5,090,705, Cl. 273-232.000.
- Yoshida, Takeo; and Suzuki, Minoru, to Yamaha Hatsudoki Kabushiki Kaisha. High pressure fuel injection unit. 5,090,620, Cl. 239-96.000.
- Yoshida, Tomoaki, to Ricoh Company, Ltd.; and Ricoh Research Institute of General Electronics Co., Ltd. Semiconductor light emitting array with particular surfaces. 5,091,757, Cl. 357-17.000.
- Yoshida, Toyohiko: See—
Watanabe, Tetsuya; and Yoshida, Toyohiko, 5,091,853, Cl. 395-375.000.
- Yoshimura, Hiroshi; Bota, Keiji; Takemoto, Kazuo; and Baba, Fumiaki, to Mazda Motor Corporation. Control systems for vehicle engines coupled with automatic transmissions. 5,091,854, Cl. 364-424.100.
- Yoshinaka, Minoru; Asakura, Eizou; Oku, Mitsumasa; Kitano, Motoi; and Yoshida, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Photoconductive cell with zinc oxide tetrapod crystals. 5,091,765, Cl. 357-30.000.
- Yoshino, Toshiaki: See—
Wong, Yiwan; Yoshino, Toshiaki; and Johnson, Louis G., 5,091,875, Cl. 364-726.000.
- Yoshioka, Takeo; Watanabe, Azuma; Kominato, Koichiro; Tone, Hiroshi; Okamoto, Rokuro; Sawa, Tsutomu; and Takeuchi, Tomio, to Sanraku Incorporated. Angolamycin derivatives. 5,091,370, Cl. 514-30.000.
- Yoshioka, Yoshihisa, to Kabushiki Kaisha Toshiba. Ultrasonic diagnostic apparatus. 5,090,413, Cl. 128-660.070.
- Yoshitake, Noriaki: See—
Saeiki, Kenshi; and Yoshitake, Noriaki, 5,091,023, Cl. 148-247.000.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—
Oda, Minoru; Kino, Shigemi; Ogawa, Kenji; and Shiotsuki, Takako, 5,091,191, Cl. 514-399.000.
- Yost, Ken L. Apparatus for diverting fluid-entrained solids around a centrifugal pump. 5,091,082, Cl. 210-196.000.
- Young Dental Manufacturing Company: See—
Bailey, Ronald L., 5,090,904, Cl. 433-88.000.
- Young, John M.: See—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 5,091,558, Cl. 560-139.000.
- Young, Robert N.: See—
Belanger, Patrice C.; Dufresne, Claude; Fitzsimmons, Brian, deceased; Fitzsimmons, Maryann, Heir; Guindon, Yvan; Lau, Cheuk K.; Rokach, Joshua; Schiegetz, John; Thierien, Michel; and Young, Robert N., 5,091,533, Cl. 544-318.000.

Yount, George S., to Fortifiber Corporation. Paper roll header and paper roll wrapper assembly. 5,090,566, Cl. 206-416.000.
 Yusef, Faisal J.; and Kane, Robert F., to Sandvik Rock Tools, Inc. Replaceable wear sleeve for percussion drill. 5,090,500, Cl. 175-320.000.
 Yu, Ruey J.; and Van Scott, Eugene J. Amphoteric compositions and polymeric forms of alpha hydroxyacids, and their therapeutic use. 5,091,171, Cl. 424-642.000.
 Yugami, Jiro: See—
 Hiraiwa, Atsushi; Kimura, Shinichiro; Mine, Toshiyuki; Kobayashi, Takashi; Kure, Tokuo; Iijima, Shinpei; and Yugami, Jiro, 5,091,761, Cl. 357-23.600.
 Yugenkaisha Matsubei: See—
 Hoashi, Chikako, 5,091,198, Cl. 426-92.000.
 Yukimachi, Hiroshi: See—
 Abe, Makoto; Kimizuka, Junichi; Kusano, Akihisa; Sato, Kaoru; Ito, Toshiyuki; Okazawa, Kazuhiko; Inuyama, Toshihiko; Azeta, Takahiro; Tsuchiya, Yoshiro; Yukimachi, Hiroshi; Yagi, Tadashi; Kobayashi, Hiroo; Otsuka, Masahito; Waragai, Tsuyoshi; Sawada, Takamasa; Miyake, Hiroaki; and Moritani, Toshifumi, 5,091,754, Cl. 355-317.000.
 Yung, Henry T-H; and Krenik, William R., to Texas Instruments Incorporated. High-speed low-power supply-independent TTL compatible input buffer. 5,091,662, Cl. 307-475.000.
 Yuzuriha, Yoshiki: See—
 Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; and Yuzuriha, Yoshiki, 5,090,386, Cl. 123-478.000.
 Zagar, Steve J., to W. R. Grace & Co.-Conn. Perimeter seal for split enclosure drying hoods. 5,090,137, Cl. 34-242.000.
 Zahnradfabrik Friedrichshafen AG: See—
 Wolf, Andreas; and Breisch, Harald, 5,090,539, Cl. 192-85.0AA.
 Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—
 Takeuchi, Tomio; Kondo, Shinichi; and Ikeda, Daishiro, 5,091,371, Cl. 514-33.000.
 Zakich, Paul, to Dow Chemical Company, The. High tonnage rim press. 5,091,124, Cl. 264-40.100.
 Zalesak, Thomas J., to Glasstech, Inc. Method for bending glass sheets. 5,090,986, Cl. 65-104.000.
 Zinando, Renzo: See—
 Rudolf, Wagner; Bader, Martin; Moll, Eberhard; Zinando, Renzo; and Van Agtmaal, J. G., 5,090,900, Cl. 432-239.000.
 Zander, David G.: See—
 Fournier, Paul J. E.; Maiville, Randolph L.; and Zander, David G., 5,090,449, Cl. 137-614.050.
 Zappella, Pierino I.; Pepe, Angel A.; Fewer, William R.; and Babcock, Eugene J., to Rockwell International Corporation. Method of forming detector array contact bumps for improved lift off of excess metal. 5,091,288, Cl. 430-311.000.
 Zell, Karl, to Siemens Aktiengesellschaft. Arrangement for the mechanical and electrical connection of a supplementary printed circuit board to a base printed circuit board. 5,090,912, Cl. 439-79.000.
 Zeller Plastik GmbH: See—
 Thanisch, Klaus J., 5,090,601, Cl. 222-507.000.
 Zeller, Wolfgang: See—
 Bock, Jürgen; Metzger-Pegau, Karola; and Zeller, Wolfgang, 5,091,136, Cl. 264-320.000.
 Zellner, John R. Bath with interfitting seat. 5,090,068, Cl. 4-578.100.

Zenith Electronics Corporation: See—
 Capek, Raymond G.; and Greiner, Siegfried M., 5,090,933, Cl. 445-30.000.
 Sutton, Leroy A., 5,091,681, Cl. 315-382.000.
 Zerlang, Marianne: See—
 Nissen, Michael; and Zerlang, Marianne, 5,090,569, Cl. 206-457.000.
 Zettler, Hans D.: See—
 Weber, Heinz; Ehrmann, Gerd; Dietzen, Franz-Josef; Nintz, Eckhard; and Zettler, Hans D., 5,091,126, Cl. 264-53.000.
 Zhang, Shulian; Yang, Sen; Wu, Minxian; and Jin, Kuofan, to Tsinghua University. Quartz crystal tuning he-ne double frequency laser. 5,091,913, Cl. 372-23.000.
 Ziegast, Gerd, to Sandoz Ltd. Poly-dicarbonylic acid anhydrides, their production and use. 5,091,565, Cl. 562-473.000.
 Zimlich, Josef; Duenisch, Ingo; and Achter, Eugen, to Siemens Aktiengesellschaft. Gas discharge lamp with glass tube and seal members. 5,091,674, Cl. 313-625.000.
 Zimmer, Inc.: See—
 Walker, Michael R., 5,090,571, Cl. 206-523.000.
 Zimmerman, Robert L.: See—
 Su, Wei-Yang; and Zimmerman, Robert L., 5,091,585, Cl. 564-473.000.
 Zimmermann, Urban: See—
 Alt, Anton; Toelke, Peter; Wilhelm, Ludwig; and Zimmermann, Urban, 5,091,624, Cl. 219-100.000.
 Zingher, Oded; Wuhrl, Arno; and Suppes, Stephan, to MAN Roland Druckmaschinen AG. Control system for a printing plant. 5,091,859, Cl. 364-471.000.
 Zinser Textilmaschinen GmbH: See—
 Mueller, Heinz, 5,090,191, Cl. 57-275.000.
 Wey, Edmund; Anderheggen, Manfred; and Grecksch, Hans, 5,090,189, Cl. 57-261.000.
 Ziolo, Ronald F.: See—
 Teuscher, Leon A.; and Ziolo, Ronald F., 5,091,278, Cl. 430-58.000.
 Zoellick, Raymond D.; and Barbee, Peter F., to John Fluke Mfg. Co., Inc. Isothermal termination block having a multi-layer thermal conductor. 5,090,918, Cl. 439-487.000.
 Zorian, Yervant, to AT&T Bell Laboratories. Built-in self-test technique for read-only memories. 5,091,908, Cl. 371-21.500.
 Zucker, Jane E., to AT&T Bell Laboratories. Polarization-independent semiconductor waveguide. 5,090,790, Cl. 385-130.000.
 Zucker, Shlomo: See—
 Gross, Joseph; and Zucker, Shlomo, 5,090,963, Cl. 604-132.000.
 Zuercher, John L., to Minnesota Mining and Manufacturing Company. Cable stacking member. 5,090,645, Cl. 248-68.100.
 Zuerner, Richard L., to United States of America. Agriculture. Diagnostic and epidemiological nucleic acid probe for bovine leptospirosis. 5,091,301, Cl. 435-6.000.
 Zweerink, Marcia M.: See—
 Garrity, George M.; Del Val, Sagrario M.; Nallin, Mary; Schmatz, Dennis M.; Smith, Jack L.; VanMiddlesworth, Frank L.; Wilson, Kenneth E.; and Zweerink, Marcia M., 5,091,413, Cl. 514-460.000.
 501 Alliant Techsystems Inc.: See—
 Kallevig, John A.; and Kennedy, James L., 5,090,323, Cl. 102-282.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF FEBRUARY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asahi Kasei Kogyo Kabushiki Kaisha: See—
 Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, Re. 33,832, Cl. 525-98.000.
 Boland, Lawrence J., to International Business Machines Corporation. Non-shortning pin system. Re. 33,831, Cl. 439-260.000.
 Castleberry, Donald E., to General Electric Company. Redundant conductor structures for thin film FET driven liquid crystal displays. Re. 33,829, Cl. 340-784.000.
 General Electric Company: See—
 Castleberry, Donald E., Re. 33,829, Cl. 340-784.000.
 Hanma, Kentaro; and Murakami, Toshio. Auto-focus system for video camera. Re. 33,830, Cl. 358-227.000.
 Hashimoto, Masahide; Kurisu, Yoshitaka; Suenaga, Hiroshi; and Katou, Akio, to Mitsubishi Denki Kabushiki Kaisha. Freezing apparatus. Re. 33,828, Cl. 62-376.000.
 Hata, Hideo: See—
 Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, Re. 33,832, Cl. 525-98.000.
 Hens, Jozef F.: See—
 Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., Re. 33,833, Cl. 546-118.000.
 International Business Machines Corporation: See—
 Boland, Lawrence J., Re. 33,831, Cl. 439-260.000.
 Janssen Pharmaceutica N.V.: See—
 Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., Re. 33,833, Cl. 546-118.000.
 Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., to Janssen Pharmaceutica N.V.
 Novel N-(bicyclic heterocyclyl)-4-piperidinamines. Re. 33,833, Cl. 546-118.000.
 Kaneko, Takashi: See—
 Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, Re. 33,832, Cl. 525-98.000.
 Katou, Akio: See—
 Hashimoto, Masahide; Kurisu, Yoshitaka; Suenaga, Hiroshi; and Katou, Akio, Re. 33,828, Cl. 62-376.000.
 Kurisu, Yoshitaka: See—
 Hashimoto, Masahide; Kurisu, Yoshitaka; Suenaga, Hiroshi; and Katou, Akio, Re. 33,828, Cl. 62-376.000.
 Mitsubishi Denki Kabushiki Kaisha: See—
 Hashimoto, Masahide; Kurisu, Yoshitaka; Suenaga, Hiroshi; and Katou, Akio, Re. 33,828, Cl. 62-376.000.
 Murakami, Toshio: See—
 Hanma, Kentaro; and Murakami, Toshio, Re. 33,830, Cl. 358-227.000.
 Suenaga, Hiroshi: See—
 Hashimoto, Masahide; Kurisu, Yoshitaka; Suenaga, Hiroshi; and Katou, Akio, Re. 33,828, Cl. 62-376.000.
 Torremans, Joseph L. G.: See—
 Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., Re. 33,833, Cl. 546-118.000.
 Van Offenwert, Theophilus T. J. M.: See—
 Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., Re. 33,833, Cl. 546-118.000.
 Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Composition for drawn film, cold film made of said composition and process for manufacturing of said film. Re. 33,832, Cl. 525-98.000.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

AGA A.B.: See—
 MacNeal, James R.; Rack, Timothy P.; and Corns, Ronald R., B1 4,959,101, Cl. 75-685.000.
 Corns, Ronald R.: See—
 MacNeal, James R.; Rack, Timothy P.; and Corns, Ronald R., B1 4,959,101, Cl. 75-685.000.
 Dis Corporation, The: See—
 Fleming, Chet, B1 4,666,425, Cl. 604-4.000.
 Dynascan Corporation: See—
 Scordato, James, B1 4,881,259, Cl. 379-58.000.
 Fleming, Chet, to Dis Corporation, The. Device for perfusing an animal head. B1 4,666,425, 2-25-92, Cl. 604-4.000.
 Hood, Thomas G.: See—
 Meyer, Stephen F.; and Hood, Thomas G., B1 4,799,745, Cl. 359-360.000.
 Lemelson, Jerome H. Tape cartridge and reader. B1 1,028,461, 2-25-92, Cl. 250-570.000.
 MacNeal, James R.; Rack, Timothy P.; and Corns, Ronald R., to AGA A.B. Process for degassing aluminum melts with sulfur hexafluoride. B1 4,959,101, 2-25-92, Cl. 75-685.000.
 Meyer, Stephen F.; and Hood, Thomas G., to Southwall Technologies, Inc. Heat reflecting composite films and glazing products containing the same. B1 4,799,745, 2-25-92, Cl. 359-360.000.
 Rack, Timothy P.: See—
 MacNeal, James R.; Rack, Timothy P.; and Corns, Ronald R., B1 4,959,101, Cl. 75-685.000.
 Scordato, James, to Dynascan Corporation. Answering machine with cordless telephone. B1 4,881,259, 2-25-92, Cl. 379-58.000.
 Southwall Technologies, Inc.: See—
 Meyer, Stephen F.; and Hood, Thomas G., B1 4,799,745, Cl. 359-360.000.

LIST OF DESIGN PATENTEEES

Abare, Charles H.; and Abare, Cheryl G. Garden planter. 324,191, 2-25-92, Cl. D11-143.000.
 Abare, Cheryl G.: See—
 Abare, Charles H.; and Abare, Cheryl G., 324,191, Cl. D11-143.000.
 Abele, Larry, to Isuzu Motors Limited. Bumper for automobile. 324,199, 2-25-92, Cl. D12-169.000.
 Aeromix Systems, Incorporated: See—
 Gross, Peter S., 324,279, Cl. D30-106.000.
 Agajan, George P., Jr. Tong for removing bleach from hair. 324,278, 2-25-92, Cl. D28-7.000.
 Alviar, Christopher A.: See—
 Vossoughi, Sohrab; Alviar, Christopher A.; Hix, Steven R.; and Gulick, Paul E., 324,210, Cl. D14-113.000.
 American Standard Inc.: See—
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 Stairs, Henry M., Jr., 324,262, Cl. D23-281.000.
 American Suzuki Motor Corporation: See—
 Muth, Hans A., 324,196, Cl. D12-156.000.
 Anamizu, Sojiro, to Seikosha Co., Ltd. Clock. 324,178, 2-25-92, Cl. D10-26.000.

Anthon, John R., to Great America Tool Company. Tool sharpening clamp. 324,160, 2-25-92, Cl. D8-71.000.
 Aristocrat Manufacturing Company. See—
 Dahle, Douglas L., 324,249, Cl. D21-219.000.
 Ashcraft, Steve. Undershirt. 324,127, 2-25-92, Cl. D2-215.000.
 Asics Corporation. See—
 Mitsui, Shigeyuki, 324,133, Cl. D2-320.000.
 Atwood Industries, Inc. See—
 Nudd, Barry C., 324,286, Cl. D34-31.000.
 Barrault, Jean-Louis, to Moulinex (Societe Anonyme). Electric deep fat fryer. 324,151, 2-25-92, Cl. D7-354.000.
 Barsotti, Gerald R. "U" turn signal indicator lens. 324,275, 2-25-92, Cl. D26-122.000.
 Beck, James M., to Creative Packaging Corp. Dispensing closure. 324,175, 2-25-92, Cl. D9-447.000.
 Beeren, Aloysius J., to U.S. Philips Corporation. Coffee maker. 324,149, 2-25-92, Cl. D7-309.000.
 Bende, Andras. Modular navy service stripe. 324,190, 2-25-92, Cl. D11-95.000.
 Benesh, David H. Combined pencil sharpener and measuring tape. 324,184, 2-25-92, Cl. D10-72.000.
 Benoit, Louis, to Salomon S.A. Canting simulator. 324,254, 2-25-92, Cl. D21-229.000.
 Besasie, Joseph C., to Silver Creek Nurseries, Inc. Combined microphone and parabolic reflector. 324,219, 2-25-92, Cl. D14-225.000.
 Bissell, Inc. See—
 Goodrich, Gordon W., 324,280, Cl. D32-21.000.
 Black & Decker Inc. See—
 Gildersleve, Paul, 324,157, Cl. D8-35.000.
 Gildersleve, Paul, 324,158, Cl. D8-36.000.
 Speer, Howard D., 324,225, Cl. D15-136.000.
 Boucheron, Alain, to LMB - Les Montres Boucheron AG. Watch. 324,181, 2-25-92, Cl. D10-39.000.
 Boucheron, Alain, to LMB - Les Montres Boucheron AG. Watch. 324,182, 2-25-92, Cl. D10-39.000.
 Bradley, Nellie C. Water ashtray. 324,276, 2-25-92, Cl. D27-106.000.
 Branham, John F. See—
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 Branton, Deborah. Inflatable survival tent. 324,255, 2-25-92, Cl. D21-253.000.
 Bressler, Peter; and Schlack, Richard E., to Southco, Inc. Flexible draw latch. 324,165, 2-25-92, Cl. D8-331.000.
 Brevetti Gaggia S.p.A. See—
 De Felip, Aldo, 324,150, Cl. D7-309.000.
 Brodsky, James M. See—
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 Brusing, Bernd, to Hefendehl, Hans Friedrich. Waste receptacle. 324,281, 2-25-92, Cl. D34-1.000.
 Canon Kabushiki Kaisha. See—
 Kawai, Hideki, 324,215, Cl. D14-129.000.
 Cartier International B.V. See—
 Perrin, Alain-Dominique, 324,228, Cl. D16-102.000.
 Casablanca Fan Company, Inc. See—
 Holbrook, Richard M., 324,226, Cl. D23-411.000.
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 Naitoh, Yoshiaki, 324,230, Cl. D17-1.000.
 Cassel, Timothy S., to Tucker Housewares. Design for a shoe rack. 324,142, 2-25-92, Cl. D6-462.000.
 Cellular I.C. Corp. See—
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 Chen, Hsien-Pao. See—
 Jan, Shwu-Mee; and Chen, Hsien-Pao, 324,164, Cl. D8-331.000.
 Chien, Mu-Yen. Drill sharpener. 324,224, 2-25-92, Cl. D15-122.000.
 Ching-Tien, Yang. Toy convertible car. 324,246, 2-25-92, Cl. D21-78.000.
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 Confon AG. See—
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 Yvetot, Roger J., 324,261, Cl. D23-281.000.
 DeMarre, Allen. See—
 Evans, Jack; and DeMarre, Allen, 324,220, Cl. D14-253.000.
 DeWitt, Chuck. Luggage cart. 324,283, 2-25-92, Cl. D34-17.000.
 Dickinson, Thomas, to Contico International, Inc. Truck tool box. 324,197, 2-25-92, Cl. D12-157.000.
 Dickman, Benjamin. Portable tray for attachment to a vertical post. 324,148, 2-25-92, Cl. D6-511.000.

Dickson, Raymond A., Jr. See—
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 DPW Deutsche Plakatwerbung GmbH & Co. See—
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 Embree, Donald, to Rubbermaid Incorporated. Pivot top cooler. 324,154, 2-25-92, Cl. D7-605.000.
 Emhart Inc. See—
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 Fleming, Mark G.; and Collins, David C., to Siddons Ramset Limited. Liquid heater which operates on solar energy or any other energy source. 324,265, 2-25-92, Cl. D23-318.000.
 Flight Equip. & Engineering Ltd. See—
 Tchong, John; and Branham, John F., 324,147, Cl. D6-500.000.
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 Frazee, Ronald L., to General Electric Company. Interlocking mounted abrasive compacts. 324,226, 2-25-92, Cl. D15-139.000.
 Frazier, John W., to IFM Industries, Inc. Shoe rack. 324,139, 2-25-92, Cl. D6-411.000.
 Frenkel, Dina; Kureshy, Fareed; and Lawrence, William J., to PB Diagnostic Systems, Inc. Sample cup or similar article. 324,271, 2-25-92, Cl. D24-226.000.
 Fujioka, Akio, to Kitagawa Industries Co., Ltd. Board spacer. 324,168, 2-25-92, Cl. D8-354.000.
 Fujita, Teruyuki; and Fukuda, Kenji, to Nippon Pneumatic Manufacturing Co., Ltd. Portable cut saw. 324,159, 2-25-92, Cl. D8-64.000.
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 Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,206, Cl. D13-147.000.
 Gambier, Roselyne. Abdomen supporting bodysuit for an expectant mother. 324,125, 2-25-92, Cl. D2-4.000.
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 Greco, Vincent. Latch for rolling gates. 324,167, 2-25-92, Cl. D8-331.000.
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- Thiel, Chris A. Ladder tray attachment. 324,272, 2-25-92, Cl. D25-68.000.
- Tokai Corporation: See—
Nitta, Tomio, 324,238, Cl. D19-49.000.
- Tonyan, Janice L.; and Kowalenko, Alex, to Spartus Corporation. Clock. 324,177, 2-25-92, Cl. D10-18.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,202, Cl. D13-146.000.
Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,206, Cl. D13-147.000.
- Tsuji, Masanori: See—
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Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,206, Cl. D13-147.000.
- Tucker Housewares: See—
Cassel, Timothy S., 324,142, Cl. D6-462.000.
- Ueno, Shigeo: See—
Shimizu, Toshihiko; Imaki, Masanori; Ueno, Shigeo; Ui, Yoshio; Saitoh, Yusuke; and Honma, Iwao, 324,194, Cl. D12-92.000.
- Ueno, Toshiro, to Isuzu Motors Limited. Tonneau cover for the bed of a pickup truck. 324,195, 2-25-92, Cl. D12-156.000.
- Ui, Yoshio: See—
Shimizu, Toshihiko; Imaki, Masanori; Ueno, Shigeo; Ui, Yoshio; Saitoh, Yusuke; and Honma, Iwao, 324,194, Cl. D12-92.000.
- Unger, Steve A., to Syracuse China Corporation. Decalomania for china dinnerware or similar article. 324,152, 2-25-92, Cl. D7-396.400.
- U.S. Philips Corporation: See—
Beeren, Aloysius J., 324,149, Cl. D7-309.000.
- Vistron, Inc.: See—
Ronzani, Peter A., 324,232, Cl. D18-55.000.
- Von Canal, Alexander, to DPW Deutsche Plakatwerbung GmbH & Co. Advertisement pillar or similar article. 324,241, 2-25-92, Cl. D20-10.000.
- Vossoughi, Sohrab; Alviar, Christopher A.; Hix, Steven R.; and Gulick, Paul E., to In Focus Systems, Inc. Electronic data display panel for use with an overhead projector. 324,210, 2-25-92, Cl. D14-113.000.
- Waltel, Joe, Jr. Plant tray. 324,192, 2-25-92, Cl. D11-164.000.
- Waterman S.A.: See—
Gomez, Francine, 324,236, Cl. D19-48.000.
Gomez, Francine, 324,237, Cl. D19-48.000.
- Watrous, Leslie P. TV guide and television remote control stand. 324,144, 2-25-92, Cl. D6-476.000.
- Welch, Robert J., to InterMetro Industries Corp. Linen cart. 324,284, 2-25-92, Cl. D34-21.000.
- Wen-Long, Ho. Adjustable strap for caps or the like. 324,193, 2-25-92, Cl. D11-220.000.
- White, Graham M.: See—
Garmon, Vincent S.; and White, Graham M., 324,212, Cl. D14-115.000.
- Williams, John W. Light cane. 324,134, 2-25-92, Cl. D3-6.000.
- Williamson, Lawrence J. Unicycle roller skate. 324,252, 2-25-92, Cl. D21-226.000.
- Wong, Jon: See—
Longsdorf, Ronald W.; and Wong, Jon, 324,227, Cl. D16-102.000.
- Wood, Robert E. Barbecue grill cover in the shape of a football helmet. 324,153, 2-25-92, Cl. D7-402.000.
- Wright, Christopher B. Wheel for toy vehicles. 324,245, 2-25-92, Cl. D21-141.000.
- Wright, Curtis M. Cable vibration damper or similar article. 324,204, 2-25-92, Cl. D13-154.000.
- Wu, Chin-Lung. Kitchenware organizer. 324,141, 2-25-92, Cl. D6-457.000.
- Yamamoto, Takayuki: See—
Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,202, Cl. D13-146.000.
Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,206, Cl. D13-147.000.
- Yazaki Corporation: See—
Inaba, Shigemitsu; and Ohtaka, Kazuto, 324,203, Cl. D13-147.000.
Maki, Toshihiro; and Grant, Mark S., 324,205, Cl. D24-133.000.
- Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,202, Cl. D13-146.000.
- Sueyoshi, Tadahiho; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; Fukuda, Masaru; Okabe, Hidetaka; Nagasaka, Yasuhiro; and Hirayama, Yasuo, 324,206, Cl. D13-147.000.
- Yeh, John. Mounting base for clocks or the like. 324,187, 2-25-92, Cl. D10-128.000.
- Yost, Holly K., to Emhart Inc. Spout for plumbing fixture. 324,259, 2-25-92, Cl. D23-255.000.
- Yvetot, Roger J., to Delafon, Jacob. Tub shell or the like. 324,261, 2-25-92, Cl. D23-281.000.

LIST OF PLANT PATENTEES

- Carrier, Leonard E.; and Garton, Stephen, to Native Plants, Incorporated. Alstroemeria named Elena. 7,804, 2-25-92, Cl. 68.000.
- Drewlow, Lyndon W., to Mikkelsen, Inc. Kalanchoe plant named Heirloom. 7,810, 2-25-92, Cl. 68.000.
- Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Beacon. 7,805, 2-25-92, Cl. 68.000.
- Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Pink Glory. 7,806, 2-25-92, Cl. 68.000.
- Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Mandarin. 7,807, 2-25-92, Cl. 68.000.
- Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Sparkler. 7,808, 2-25-92, Cl. 68.000.
- Fleming, Margaret M., to Plant Company, The. Kalanchoe plant named Pioneer. 7,809, 2-25-92, Cl. 68.000.
- Garton, Stephen: See—
Carrier, Leonard E.; and Garton, Stephen, 7,804, Cl. 68.000.
- Mikkelsen, Inc.: See—
Drewlow, Lyndon W., 7,810, Cl. 68.000.
- Native Plants, Incorporated: See—
Carrier, Leonard E.; and Garton, Stephen, 7,804, Cl. 68.000.
- Pellett, Harold M., to University of Minn., Regents of the. Red maple tree named Autumn Spire. 7,803, 2-25-92, Cl. 51.000.
- Plant Company, The: See—
Fleming, Margaret M., 7,805, Cl. 68.000.
Fleming, Margaret M., 7,806, Cl. 68.000.
Fleming, Margaret M., 7,807, Cl. 68.000.
Fleming, Margaret M., 7,808, Cl. 68.000.
Fleming, Margaret M., 7,809, Cl. 68.000.
- University of Minn., Regents of the: See—
Pellett, Harold M., 7,803, Cl. 51.000.

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CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 25, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	308.1	5,090,125	97	5,090,975	1 R	5,090,255	CLASS 99	CLASS 119	
2	5,090,053	388	5,090,126	337	5,090,976	23.34	5,090,232	5	5,090,357
5	5,090,054	CLASS 33	CLASS 56	23.05	5,090,233	330	5,090,305	14.08	5,090,358
24	5,090,055	27.02	5,090,127	2	5,090,183	510	5,090,306	96	5,090,359
69	5,090,056	367	5,090,128	10.2	5,090,184	CLASS 100	CLASS 100	CLASS 122	5,090,368
82	5,090,057	481	5,090,129	16.7	5,090,185	35	5,090,307	44.2	5,090,369
97	5,090,058	533	5,090,130	255	5,090,186	215	5,090,308	510	5,090,370
104	5,090,059	556	5,090,131	364	5,090,187	226	5,090,309	CLASS 123	
115	5,090,060	CLASS 34	CLASS 57	197	5,090,240	CLASS 101	CLASS 101	CLASS 123	
423	5,090,061	5	5,090,188	204.26	5,090,241	114	5,090,310	41.21	5,090,371
CLASS 4	CLASS 4	23	5,090,189	302	5,090,242	115	5,090,311	44 B	5,090,372
192	5,090,062	57 R	5,090,190	514	5,090,243	120	5,090,312	73 PP	5,090,373
239	5,090,063	124	5,090,191	572	5,090,244	129	5,090,313	90.16	5,090,374
252 R	5,090,064	218	5,090,192	625	5,090,245	148	5,090,314	90.17	5,090,375
378	5,090,066	242	5,090,193	718	5,090,246	169	5,090,315	146.50 A	5,090,376
420.2	5,090,067	CLASS 36	CLASS 60	727	5,090,247	227	5,090,316	169 PA	5,090,377
578.1	5,090,068	102	5,090,194	822	5,090,248	483	5,090,317	196 R	5,090,378
662	5,090,069	117	5,090,195	861.12	5,090,249	485	5,090,318	196 W	5,090,379
CLASS 5	CLASS 5	138	5,090,196	861.28	5,090,250	CLASS 102	CLASS 102	198 A	5,090,380
81.1	5,090,072	CLASS 37	5,090,197	861.38	5,090,251	200	5,090,321	275	5,090,381
448	5,090,074	98	5,090,198	862.59	5,090,252	202.7	5,090,322	299	5,090,382
451	5,090,075	243	5,090,199	863.03	5,090,253	282	5,090,323	339	5,090,383
453	5,090,076	CLASS 40	5,090,200	863.23	5,090,254	307	5,090,324	425	5,090,384
456	5,090,077	152.1	5,090,201	866.5	5,090,255	313	5,090,325	436	5,090,385
611	5,090,070	410	5,090,202	CLASS 74	5,090,256	395	5,090,326	468	5,090,386
618	5,090,071	605	5,090,203	5.37	5,090,257	430	5,090,327	478	5,090,387
640	5,090,073	618	5,090,204	89.14	5,090,258	522	5,090,328	479	5,090,388
CLASS 8	CLASS 8	CLASS 42	5,090,205	110	5,090,259	CLASS 104	CLASS 104	489	5,090,389
641	5,090,964	70.05	5,090,206	110	5,090,260	23.2	5,090,330	494	5,090,390
CLASS 15	CLASS 15	70.11	5,090,207	135	5,090,261	CLASS 105	CLASS 105	559.3	5,090,391
97.1	5,090,078	CLASS 43	5,090,208	149	5,090,262	3	5,090,331	564	5,090,392
104.31	5,090,079	18.1	5,090,209	135	5,090,263	157.2	5,090,332	574	5,090,393
143 R	5,090,080	24	5,090,210	149	5,090,264	218.1	5,090,333	643	5,090,394
230.11	5,090,084	42.05	5,090,211	347	5,090,265	2	5,091,002	25.6	5,090,395
248 A	5,090,085	64	5,090,212	457.7	5,090,266	20	5,091,003	89	5,090,396
250.13	5,090,081	114	5,090,213	475	5,090,267	22	5,091,004	CLASS 125	
250.17	5,090,082	CLASS 44	5,090,214	CLASS 63	5,090,268	30	5,091,005	14	5,090,397
250.42	5,090,086	314	5,090,215	26	5,090,269	273.1	5,091,006	CLASS 126	
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347	5,090,088	CLASS 47	5,090,217	CLASS 65	5,090,271	403	5,091,008	451	5,090,399
405	5,090,088	9	5,090,154	2	5,090,272	417	5,091,009	CLASS 127	
CLASS 16	CLASS 16	30	5,090,155	3.12	5,090,273	440	5,091,010	30	5,091,015
49	5,090,089	58	5,090,156	4.4	5,090,274	505	5,091,011	CLASS 128	
CLASS 19	CLASS 19	76	5,090,157	24	5,090,275	677	5,091,012	6	5,090,400
80 R	5,090,090	CLASS 49	5,090,158	25.4	5,090,276	CLASS 106	CLASS 106	24 EL	5,090,401
113	5,090,092	348	5,090,159	60.2	5,090,277	2	5,091,002	57	5,090,402
CLASS 23	CLASS 23	CLASS 51	5,090,160	60.52	5,090,278	43	5,091,003	66	5,090,403
295 R	5,090,965	102	5,090,161	104	5,090,279	44	5,091,004	205.27	5,090,407
CLASS 24	CLASS 24	287	5,090,162	182.2	5,090,280	51.1	5,091,005	207.14	5,090,408
38	5,090,093	293	5,090,163	238	5,090,281	67	5,091,006	402	5,090,409
265 WS	5,090,094	295	5,090,164	273	5,090,282	CLASS 110	CLASS 110	660.05	5,090,410
306	5,090,095	309	5,090,165	CLASS 66	5,090,283	165 A	5,090,338	660.07	5,090,412
431	5,090,096	425	5,090,166	121	5,090,284	263	5,090,339	5,090,413	
552	5,090,097	CLASS 52	5,090,167	219	5,090,285	346	5,090,340	5,090,414	
CLASS 29	CLASS 29	39	5,090,168	CLASS 68	5,090,286	CLASS 112	CLASS 112	662.05	5,090,415
24.5	5,090,098	165	5,090,169	3 R	5,090,287	80.04	5,090,341	665	5,090,416
25.42	5,090,099	167 CB	5,090,170	18 R	5,090,288	121.15	5,090,342	691	5,090,417
38 C	5,090,100	173 R	5,090,171	CLASS 70	5,090,289	130	5,090,343	702	5,090,418
243.5	5,090,101	213	5,090,172	63	5,090,290	151	5,090,344	754	5,090,419
255	5,090,102	220	5,090,173	175	5,090,291	225	5,090,345	764	5,090,420
418	5,090,103	243.1	5,090,174	CLASS 71	5,090,292	CLASS 114	CLASS 114	774	5,090,421
434	5,090,104	252	5,090,175	67	5,090,293	65 R	5,090,351	784	5,090,422
469	5,090,105	252	5,090,176	90	5,090,294	67 A	5,090,352	804	5,090,423
525	5,090,106	309.11	5,090,177	92	5,090,295	72	5,090,353	885	5,090,424
566.3	5,090,107	309.8	5,090,178	93	5,090,296	77 R	5,090,354	898	5,090,425
596	5,090,108	745	5,090,179	94	5,090,297	145 R	5,090,355	CLASS 131	
CLASS 30	CLASS 30	CLASS 53	5,090,180	114	5,090,298	CLASS 116	CLASS 116	194	5,090,426
603	5,090,111	399	5,090,181	CLASS 72	5,090,299	63 C	5,090,349	CLASS 132	
605	5,090,112	456	5,090,182	20	5,090,300	63 R	5,090,348	75.6	5,090,427
714	5,090,113	461	5,090,183	45	5,090,301	CLASS 118	CLASS 118	204	5,090,428
734	5,090,114	471	5,090,184	117	5,090,302	50	5,090,350	CLASS 134	
789	5,090,115	556	5,090,185	178	5,090,303	59	5,090,351	22.1	5,091,016
827	5,090,116	569	5,090,186	238	5,090,304	313	5,090,352	22.11	5,091,017
840	5,090,117	CLASS 55	5,090,187	347	5,090,305	423	5,090,353	57 R	5,090,429
843	5,090,118	16	5,090,188	393	5,090,306	505	5,090,354	84	5,090,430
846	5,090,119	20	5,090,189	CLASS 73	5,090,307	681	5,090,355	105	5,090,431
847	5,090,120	26	5,090,190	1 E	5,090,308	718	5,090,356		
852	5,090,121	95	5,090,191						
882	5,090,122								
882	5,090,123								

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139	5,090,432	10	5,090,474	35 R	5,090,547	253	5,090,583	129.5	5,090,640	CLASS 267	
169 C	5,090,433		5,090,475				5,090,641	148	5,090,641		
	CLASS 135	122	5,090,476	CLASS 194		10.55 B	5,091,617	158 R	5,090,642	CLASS 269	
66	5,090,434	130	5,090,477	345	5,090,548	56.1	5,091,619	163	5,090,643	CLASS 270	
98	5,090,435			CLASS 198		68	5,091,621			CLASS 271	
	CLASS 136	278	5,090,478	312	5,090,549	69.13	5,091,620	56	5,090,644	54.5	5,090,669
246	5,091,018	279	5,090,479	313	5,090,550	68.15	5,091,622	249	5,090,670	249	5,090,670
	CLASS 137	298	5,090,480	323	5,090,551	89	5,091,623	45	5,090,671		
80	5,090,436	373	5,090,481	365	5,090,552	100	5,091,624	52.5	5,090,672		
116	5,090,437			377	5,090,553	121.44	5,091,625	53	5,090,673		
116.5	5,090,438	46	5,090,482	414	5,090,554	121.69	5,091,626				
202	5,090,439			465.1	5,090,555	121.83	5,091,627				
209	5,090,440	16	5,090,483	626.1	5,090,557	145.22	5,091,628				
242	5,090,441		5,090,484	781	5,090,558	222	5,091,629				
315	5,090,442			CLASS 200		270	5,091,631				
429	5,090,443			60	5,091,611	553	5,091,632				
495	5,090,444			81.9 M	5,091,612						
527.8	5,090,445	1	5,090,485	86.5	5,091,613						
540	5,090,446	26	5,090,486	144 AP	5,091,614						
559	5,090,447	111	5,090,487	144 B	5,091,615						
614.05	5,090,448	163	5,090,488	146 R	5,091,616						
614.05	5,090,449	165	5,090,489								
625.3	5,090,450	171	5,090,490								
630.22	5,090,451			CLASS 203							
	CLASS 139	2	5,091,604	18	5,091,057						
100	5,090,452	35 GC	5,091,606	33	5,091,058						
115	5,090,453	48	5,091,607	51	5,091,059						
116.2	5,090,454	65 R	5,091,608	99	5,091,060						
145	5,090,455	84 R	5,091,609								
302	5,090,456	110 A	5,091,610	59 F	5,091,064						
453	5,090,457	117 F	5,091,610	64 R	5,091,065						
	CLASS 141			78	5,091,066						
7	5,090,458	61	5,090,496	129.46	5,091,067						
59	5,090,459	107	5,090,497	157.64	5,091,068						
	CLASS 144	206	5,090,498	176	5,091,069						
134 R	5,090,460	209	5,090,499	182.4	5,091,070						
136 C	5,090,461	320	5,090,500								
347	5,090,462	409	5,090,501								
363	5,090,463	410	5,090,492								
	CLASS 148	211	5,090,493	135	5,091,061						
11.5 A	5,091,019	229	5,090,494	138	5,091,062						
101	5,091,020			237	5,091,063						
103	5,091,021			CLASS 206							
104	5,091,022	24.02	5,090,495	278	5,090,559						
247	5,091,023	140	5,090,509	309	5,090,560						
306	5,091,024	197	5,090,510	313	5,090,561						
	CLASS 152	236	5,090,512	320	5,090,562						
310	5,090,464	271	5,090,513	328	5,090,563						
	CLASS 156			365	5,090,564						
89	5,091,025	305	5,090,503	411	5,090,565						
149	5,091,026	312	5,090,504	455	5,090,566						
172	5,091,027			456	5,090,567						
174	5,091,028	5	5,090,503	457	5,090,568						
180	5,091,029	134	5,090,505	463	5,090,569						
211	5,091,030	187	5,090,506	523	5,090,570						
219	5,091,031	234	5,090,507	524	5,090,571						
316	5,091,032			542	5,090,572						
344	5,091,033			CLASS 208							
379.6	5,091,034	8.43	5,090,508	117.04	5,090,614						
443	5,091,035	16	5,090,515	125.35	5,090,615						
	5,091,036	112	5,090,516	132	5,090,616						
519	5,091,038			375 R	5,091,633						
566	5,091,039	12	5,091,077	395	5,091,634						
583.1	5,091,040	19	5,090,517	441	5,091,618						
584	5,091,041	72.1	5,090,518	454	5,091,636						
601	5,091,042	72.6	5,090,519	494	5,091,635						
607	5,091,043	73.45	5,090,520								
633	5,091,044	82.1	5,090,521								
642	5,091,045	166	5,090,522								
643	5,091,046	296	5,090,523								
	5,091,047	299	5,090,524								
	5,091,048	319	5,090,525								
	5,091,049										
	5,091,050										
	5,091,051										
	5,091,052										
	5,091,053										
657		3.29	5,090,527								
	CLASS 157	3.34	5,090,528								
13	5,090,465	8 R	5,090,529								
	CLASS 160	21.5	5,090,531								
84.1	5,090,466	34	5,090,545								
176.1	5,090,467	56 R	5,090,532								
368.1	5,090,468	58 B	5,090,533								
	5,090,469	67 R	5,090,534								
		70.25	5,090,535								
	CLASS 162	70.27	5,090,537								
65	5,091,054	84 T	5,090,538								
135	5,091,055	85 AA	5,090,539								
360.1	5,091,056	87.19	5,090,540								
		98	5,090,541								
	CLASS 164	106.1	5,090,542								
316	5,090,470	106.2	5,090,543								
439	5,090,471	128 A	5,090,530								
489	5,090,472										
	CLASS 165	31 A	5,090,544								
8	5,090,473	34	5,090,546								

262	5,090,754	170	5,091,695	301	5,090,806	96	5,091,840	CLASS 377	600	5,091,852
CLASS 293		229	5,091,696	310	5,090,807	98	5,091,841	58	800	5,091,848
133	5,090,755	253	5,091,697	336	5,090,808		5,091,842	CLASS 378	CLASS 400	
CLASS 294		693	5,091,698	350	5,090,809			57	58	5,090,825
1.1	5,090,756				5,090,810			59	63	5,090,826
88	5,090,757	25	5,091,699	376	5,090,811	150	5,091,843	99	185	5,090,827
98.1	5,090,758				5,090,812	153	5,091,844	114	197	5,090,828
119.3	5,090,759	128	5,091,700	4	5,091,756	419	5,091,876	130	705.1	5,090,829
CLASS 296		252	5,091,701	17	5,091,757		5,091,878	185	719	5,090,830
1.1	5,090,760				5,091,758		5,091,855	197		
3	5,090,761				5,091,759		5,091,856			
39.1	5,090,762	4	5,091,702	22	5,091,759		5,091,854	39	52	5,090,831
	5,090,763	65	5,091,704	23.4	5,091,760		5,091,857	58	132	5,090,832
107	5,090,764				5,091,761		5,091,858	100		
171	5,090,769	103	5,091,705	23.9	5,091,762		5,091,859	188		
180.1	5,090,765	127	5,091,706	38	5,091,763		5,091,860	204	3	5,090,842
188	5,090,766				5,091,764		5,091,861	418	12	5,090,833
216	5,090,774				5,091,765		5,091,862		277	5,090,834
CLASS 297		24 R			5,091,766		5,091,863		294	5,090,835
85	5,090,768	12	5,091,707	60	5,091,767		5,091,869	15	295	5,090,836
258	5,090,769	26	5,091,703	71	5,091,768		5,091,870	19	334	5,090,837
347	5,090,770	24	5,091,708	72	5,091,769		5,091,871	20	388	5,090,838
362	5,090,771	239	5,091,709	74	5,091,770		5,091,872	21	391	5,090,839
440	5,090,772				5,091,771		5,091,873	25	409.1	5,090,840
CLASS 298		229	5,091,710	CLASS 335	5,091,772		5,091,874	37		
17 R	5,090,773			CLASS 336	5,091,773		5,091,875	43		
CLASS 299		65	5,091,711	10	5,091,774			46	3	5,090,841
1	5,090,775			17	5,091,775				129	5,090,843
37 S	5,090,777			93	5,091,776				145	5,090,844
105 B	5,090,776			95	5,091,777					
105 R	5,090,778			98	5,091,778				52	5,090,845
CLASS 303				108	5,091,779					
7	5,090,779			125	5,091,780					
15	5,090,780			135	5,091,781				1 R	5,090,846
103	5,090,781			140	5,091,782				27	5,090,847
CLASS 307				183	5,091,783					
119	5,091,656			209	5,091,784					
246	5,091,657			227	5,091,785					
443	5,091,658			238	5,091,786					
454	5,091,659			301	5,091,787					
463	5,091,660			328	5,091,788					
465	5,091,661			474	5,091,789					
475	5,091,662			439	5,091,790					
530	5,091,663			10	5,091,791					
570	5,091,664			13						
CLASS 310				17	CLASS 359					
12	5,091,665			93	5,090,789					
34	5,091,666			63	5,090,790					
154	5,091,667			93	5,091,792					
156	5,091,668			100	5,091,793					
313 A	5,091,669			173	5,091,794					
323	5,091,670			187	5,091,795					
358	5,091,671			209	5,091,796					
CLASS 312				240	5,091,797					
1	5,090,782			254	5,091,798					
11	5,090,783			350	5,090,795					
204	5,090,784			360	5,091,799					
319	5,090,785			694	5,091,800					
330.1	5,090,786			818	5,091,801					
348	5,090,787			831	5,091,802					
CLASS 313				841	5,091,803					
143	5,091,672				5,091,804					
412	5,091,673				CLASS 360					
625	5,091,674				5,091,805					
636	5,091,675				5,091,806					
CLASS 315					5,091,807					
360	5,091,677				5,091,808					
362	5,091,678				5,091,809					
382	5,091,681				5,091,810					
153	5,091,679				5,091,811					
368	5,091,680				5,091,812					
560	5,091,682				5,091,813					
361	5,091,683				5,091,814					
616	5,091,684				5,091,815					
652	5,091,685				CLASS 361					
798	5,091,686				5,091,816					
CLASS 320					5,091,817					
2	5,091,687				5,091,818					
CLASS 322					5,091,819					
8	5,091,688				5,091,820					
CLASS 323					5,091,821					
312	5,091,689				5,091,822					
CLASS 324					5,091,823					
107	5,091,690				5,091,824					
158 F	5,091,692				5,091,825					
158 P	5,091,694				5,091,826					
158 R	5,091,691				5,091,827					
					5,091,828					
					5,091,829					
					5,091,830					
					5,091,831					
					5,091,832					
					5,091,833					
					5,091,834					
					5,091,835					
					5,091,836					
					CLASS 363					
					5,091,837					
					5,091,838					
					5,091,839					
					5,091,840					
					5,091,841					
					5,091,842					
					5,091,843					
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					5,091,901					
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					5,091,909					
					5,091,910					
					5,091,911					
					5,091,912					
					5,091,913					
					5,091,914					
					5,091,915					

CLASS 423	339	5,091,250	8	5,091,320	200	5,091,354	100	5,091,449	226	5,091,537
122	5,091,159	352	5,091,251	27	5,091,321	301	5,091,355	5,091,450	283	5,091,538
131	5,091,160	357	5,091,252	31	5,091,322	412	5,091,358	5,091,451		
163	5,091,161	363	5,091,253	34	5,091,323			5,091,452	CLASS 548	
325	5,091,162	364	5,091,254	40	5,091,324	200	5,091,356	5,091,453	267.8	5,091,539
328	5,091,163	378	5,091,255	43	5,091,325	207	5,091,357	5,091,454	341	5,091,540
445	5,091,164	402	5,091,256	43	5,091,326	209	5,091,359	5,091,455	429	5,091,541
474	5,091,165	411.1	5,091,257	52	5,091,327	227	5,091,360	5,091,456	521	5,091,542
478	5,091,166	437	5,091,258	52	5,091,328			5,091,457		
489	5,091,167	457	5,091,259	62	5,091,329			5,091,458	CLASS 549	
	5,091,168	461	5,091,260	62	5,091,330			5,091,459	228	5,091,543
		511	5,091,261	69 G	5,091,331	1	5,091,361	5,091,460	274	5,091,544
		516	5,091,262	82	5,091,332		5,091,362	5,091,461		
9	5,091,169	518	5,091,263	101	5,091,333			5,091,462	CLASS 552	
	5,091,170	585	5,091,264	108	5,091,334	2	5,091,363	5,091,463	302	5,091,545
	5,091,171	690	5,091,265	150	5,091,335	8	5,091,364	5,091,464		
	5,091,172	692	5,091,266	150	5,091,336	9	5,091,365	5,091,465	CLASS 556	
75	5,091,173	694	5,091,267	164	5,091,214	11	5,091,366	5,091,466	23	5,091,546
78.17	5,091,174		5,091,268	181	5,091,337	15	5,091,367	5,091,467	131	5,091,547
85.8	5,091,177	695	5,091,269	184	5,091,338	18	5,091,368	5,091,468	428	5,091,548
	5,091,178		5,091,270	187	5,091,339	23	5,091,369	5,091,469		
	5,091,179	698	5,091,271	194	5,091,340	30	5,091,370	5,091,470	CLASS 558	
93 T	5,091,181			212	5,091,341	33	5,091,371	5,091,471	131	5,091,549
195.1	5,091,182			228	5,091,342	34	5,091,372	5,091,472	165	5,091,550
400	5,091,183	62	5,091,272				5,091,373	5,091,473	166	5,091,551
405	5,091,184	94	5,091,273	79	5,090,911	44	5,091,374	5,091,474	180	5,091,552
435	5,091,185	192	5,091,274		5,090,912	50	5,091,375	5,091,475	302	5,091,553
438	5,091,186	247	5,091,275		5,090,913	54	5,091,376	5,091,476	341	5,091,554
448	5,091,187				5,090,915	57	5,091,377	5,091,477	351	5,091,555
450	5,091,188				5,090,916	80	5,091,378	5,091,478		
	5,091,189	45	5,091,276		5,090,917	80	5,091,379	5,091,479	CLASS 560	
457	5,091,190	48	5,091,277		5,090,918	109	5,091,380	5,091,480	24	5,091,556
473	5,091,191	58	5,091,278		5,090,919	124	5,091,381	5,091,481	39	5,091,557
486	5,091,192	106.6	5,091,279		5,090,920	149	5,091,382	5,091,482	115	5,091,558
528	5,091,193	138	5,091,280		5,090,921	159	5,091,383	5,091,483	139	5,091,559
642	5,091,194	203	5,091,281		5,090,922	169	5,091,384	5,091,484	175	5,091,560
	5,091,195	270	5,091,282		5,090,923	183	5,091,385	5,091,485		
665	5,091,196	280	5,091,283		5,090,924	215	5,091,386	5,091,486	17	5,091,561
698	5,091,197	292	5,091,284		5,090,925	224.8	5,091,387	5,091,487	24	5,091,562
944	5,091,198	296	5,091,285		5,090,926	228.5	5,091,388	5,091,488	406	5,091,563
		297	5,091,286		5,090,927	231.5	5,091,389	5,091,489	416	5,091,564
		302	5,091,287				5,091,390	5,091,490	473	5,091,565
63	5,090,884	311	5,091,288				5,091,391	5,091,491	507	5,091,566
117	5,090,885	312	5,091,289				5,091,392	5,091,492	531	5,091,567
130	5,090,886	327	5,091,290				5,091,393	5,091,493	577	5,091,568
185	5,090,887	385	5,091,291				5,091,394	5,091,494	621	5,091,569
438	5,090,888	467	5,091,292				5,091,395	5,091,495	899	5,091,570
522	5,090,889	503	5,091,293				5,091,396	5,091,496		
564	5,090,890	505	5,091,294				5,091,397	5,091,497	CLASS 564	
		507	5,091,295				5,091,398	5,091,498	52	5,091,571
		546	5,091,296				5,091,399	5,091,499	139	5,091,572
2	5,091,195	558	5,091,297				5,091,400	5,091,500	192	5,091,573
56	5,091,196	570	5,091,298				5,091,401	5,091,501	325	5,091,574
80	5,091,197						5,091,402	5,091,502	367	5,091,575
92	5,091,198						5,091,403	5,091,503	399	5,091,576
120	5,091,199						5,091,404	5,091,504		
243	5,091,200						5,091,405	5,091,505	402	5,091,577
285	5,091,201						5,091,406	5,091,506	418	5,091,578
496	5,091,202						5,091,407	5,091,507	461	5,091,579
614	5,091,203						5,091,408	5,091,508	471	5,091,580
							5,091,409	5,091,509	473	5,091,581
							5,091,410	5,091,510		
							5,091,411	5,091,511		
							5,091,412	5,091,512		
							5,091,413	5,091,513		
							5,091,414	5,091,514		
							5,091,415	5,091,515		
							5,091,416	5,091,516		
							5,091,417	5,091,517		
							5,091,418	5,091,518		
							5,091,419	5,091,519		
							5,091,420	5,091,520		
							5,091,421	5,091,521		
							5,091,422	5,091,522		
							5,091,423	5,091,523		
							5,091,424	5,091,524		
							5,091,425	5,091,525		
							5,091,426	5,091,526		
							5,091,427	5,091,527		
							5,091,428	5,091,528		
							5,091,429	5,091,529		
							5,091,430	5,091,530		
							5,091,431	5,091,531		
							5,091,432	5,091,532		
							5,091,433	5,091,533		
							5,091,434	5,091,534		
							5,091,435	5,091,535		
							5,091,436	5,091,536		
							5,091,437	5,091,537		
							5,091,438	5,091,538		
							5,091,439	5,091,539		
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							5,091,441	5,091,541		
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							5,091,446	5,091,546		
							5,091,447	5,091,547		
							5,091,448	5,091,548		
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							5,091,452	5,091,552		
							5,091,453	5,091,553		
							5,091,454	5,091,554		
							5,091,455	5,091,555		
							5,091,456	5,091,556		
							5,091,457	5,091,557		
							5,091,458	5,091,558		
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							5,091,461	5,091,561		
							5,091,462	5,091,562		
							5,091,463	5,091,563		
							5,091,464	5,091,564		
							5,091,465	5,091,565		
							5,091,466	5,091,566		
							5,091,467	5,091,567		
							5,091,468	5,091,568		
							5,091,469	5,091,569		
							5,091,470	5,091,570		
							5,091,471	5,091,571		
							5,091,472	5,091,572		
							5,091,473	5,091,573		
							5,091,474	5,091,574		
							5,091,475	5,091,575		
							5,091,476	5,091,576		
							5,091,477	5,091,577		
							5,091,478	5,091,578		
							5,091,479	5,091,579		
							5,091,480	5,091,580		
							5,091,481	5,091,581		
							5,091,482	5,091,582		
							5,091,483	5,091,583		
							5,091,484	5,091,584		
							5,091,485	5,091,585		
							5,091,486	5,091,586		

UMI

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,090,696	5,090,725	5,091,432	5,091,499	5,090,948	5,090,948
	5,090,760	5,090,769	5,091,458	5,090,125	5,090,942	5,090,971
	5,091,633	5,090,789	5,091,502	5,090,181	5,090,955	5,091,034
04 :	5,091,738	5,090,792	5,091,505	5,090,193	5,091,118	5,091,076
	5,090,151	5,090,795	5,091,518	5,090,291	5,091,186	5,091,100
	5,090,419	5,090,801	5,091,528	5,090,315	5,091,187	5,091,108
	5,091,095	5,090,803	5,091,542	5,090,397	5,091,188	5,091,116
	5,091,217	5,090,806	5,091,558	5,090,427	5,091,218	5,091,127
	5,091,330	5,090,812	5,091,560	5,090,516	5,091,331	5,091,151
	5,091,657	5,090,819	5,091,606	5,090,809	5,091,336	5,091,181
05 :	5,091,763	5,090,840	5,091,637	5,090,866	5,091,368	5,091,206
	5,090,902	5,090,852	5,091,652	5,090,988	5,091,412	5,091,262
	5,090,937	5,090,854	5,091,661	5,091,006	5,091,449	5,091,308
	5,091,057	5,090,863	5,091,693	5,091,029	5,091,576	5,091,318
06 :	5,091,869	5,090,870	5,091,700	5,091,148	5,091,719	5,091,454
	5,090,060	5,090,871	5,091,701	5,091,195	5,090,153	5,091,519
	5,090,066	5,090,911	5,091,715	5,091,255	5,090,185	5,091,575
	5,090,067	5,090,914	5,091,717	5,091,358	5,090,198	5,091,616
	5,090,073	5,090,915	5,091,721	5,091,383	5,090,341	5,091,642
	5,090,084	5,090,935	5,091,729	5,091,404	5,090,589	5,091,677
	5,090,109	5,090,958	5,091,782	5,091,644	5,090,823	5,091,681
	5,090,133	5,090,959	5,091,803	5,091,708	5,090,903	5,091,688
	5,090,145	5,090,960	5,091,807	5,091,732	5,090,978	5,091,945
	5,090,155	5,091,005	5,091,808	5,091,790	5,091,247	4,881,259
	5,090,163	5,091,040	5,091,825	5,091,890	5,091,493	5,090,058
	5,090,177	5,091,047	5,091,835	5,090,993	5,091,621	5,090,088
	5,090,207	5,091,048	5,091,846	5,091,030	5,091,868	5,090,123
	5,090,217	5,091,049	5,091,168	5,091,168	5,090,302	5,090,136
	5,090,222	5,091,082	5,091,851	5,091,216	5,091,290	5,090,146
	5,090,234	5,091,083	5,091,864	5,091,229	5,090,071	5,090,289
	5,090,238	5,091,122	5,091,892	5,091,235	5,090,104	5,090,331
	5,090,277	5,091,139	5,091,900	5,091,379	5,090,127	5,090,396
	5,090,352	5,091,144	5,091,917	5,091,405	5,090,130	5,090,441
	5,090,358	5,091,146	5,091,933	5,091,459	5,090,142	5,090,571
	5,090,409	5,091,153	5,091,935	5,091,478	5,090,184	5,090,718
	5,090,418	5,091,169	5,091,936	5,091,498	5,090,231	5,090,763
	5,090,432	5,091,182	5,091,938	5,091,544	5,090,304	5,090,780
	5,090,446	5,091,190	5,091,939	5,091,584	5,090,398	5,090,841
	5,090,485	5,091,192	5,091,940	5,090,077	5,090,439	5,090,956
	5,090,566	5,091,219	5,091,941	5,090,147	5,090,522	5,090,990
	5,090,579	5,091,227	5,091,961	5,090,148	5,090,528	5,091,512
	5,090,582	5,091,248	5,091,966	5,090,274	5,090,559	5,091,525
	5,090,585	5,091,288	5,091,987	5,090,276	5,090,563	5,091,591
	5,090,592	5,091,310	4,799,745	5,090,287	5,090,574	5,091,612
	5,090,596	5,091,315	5,090,098	5,090,335	5,090,583	5,091,619
	5,090,597	5,091,324	5,090,229	5,090,340	5,090,599	5,091,702
	5,090,604	5,091,326	5,090,251	5,090,354	5,090,616	5,091,785
	5,090,621	5,091,327	5,090,336	5,090,451	5,090,712	5,091,826
	5,090,632	5,091,328	5,090,408	5,090,568	5,090,736	5,091,833
	5,090,639	5,091,335	5,090,758	5,090,646	5,090,859	5,091,843
	5,090,640	5,091,349	5,090,930	5,090,692	5,090,868	5,091,957
	5,090,666	5,091,375	5,091,273	5,090,699	5,090,877	5,090,101
	5,090,713	5,091,377	5,091,342	5,090,784	5,090,933	5,090,368

20 :	5,090,720 5,090,813 5,090,940 5,091,301 5,090,267 5,090,378 5,090,512 5,090,517 5,090,580 5,090,897 5,091,568 5,090,426 5,090,461 5,090,469 5,090,830 5,090,102 5,090,346 5,090,504 5,090,505 5,090,506 5,090,514 5,090,716 5,090,765 5,091,137 5,091,180 5,091,447 5,091,926 5,090,143 5,090,546 5,090,753 5,091,094 5,091,132 5,091,176 5,091,316 5,091,430 5,091,491 5,091,596 5,091,653 5,091,953 5,090,138 5,090,160 5,090,239 5,090,273 5,090,406 5,090,424 5,090,431 5,090,447 5,090,562 5,090,578 5,090,618 5,090,643 5,090,653 5,090,732 5,090,768 5,090,818 5,090,824 5,090,957 5,090,970 5,091,051 5,091,052 5,091,151 5,091,240 5,091,258 5,091,265 5,091,272 5,091,303 5,091,333 5,091,376 5,091,381 5,091,513 5,091,646 5,091,691 5,091,712 5,091,727 5,091,730 5,091,801 5,091,824 5,091,832 5,091,845 5,091,929 5,091,930 5,091,950 5,090,105 5,090,106 5,090,140 5,090,173 5,090,355 5,090,356 5,090,376 5,090,377 5,090,382 5,090,388 5,090,442 5,090,445 5,090,449 5,090,477 5,090,513 5,090,524 5,090,544 5,090,557 5,090,572 5,090,577 5,090,605	5,090,624 5,090,631 5,090,657 5,090,698 5,090,730 5,090,740 5,090,745 5,090,779 5,090,783 5,090,807 5,090,851 5,090,855 5,090,856 5,090,974 5,090,983 5,091,003 5,091,021 5,091,031 5,091,041 5,091,105 5,091,162 5,091,208 5,091,233 5,091,347 5,091,424 5,091,436 5,091,445 5,091,461 5,091,500 5,091,548 5,091,580 5,091,607 5,091,647 5,091,679 5,091,704 5,091,831 5,091,858 5,090,083 5,090,183 5,090,323 5,090,366 5,090,422 5,090,443 5,090,495 5,090,556 5,090,694 5,090,706 5,090,709 5,090,861 5,090,907 5,091,081 5,091,244 5,091,287 5,091,483 5,091,489 5,091,608 5,091,680 5,091,809 5,091,881 5,090,097 5,090,166 5,090,211 5,090,286 5,090,305 5,090,904 5,090,927 5,091,077 5,091,092 5,091,112 5,091,185 5,091,309 5,091,396 5,091,561 5,091,629 5,091,656 5,091,707 5,091,828 4,666,425 5,090,165 5,091,059 5,090,075 5,090,615 5,090,838 5,091,286 5,090,628 5,090,545 5,090,619 5,090,647 5,090,962 5,091,361 5,090,221 5,090,372 5,090,467 5,090,530 5,090,561 5,090,584 5,090,594 5,090,598 5,090,599 5,090,557 5,090,572 5,090,577 5,090,605	5,090,790 5,090,832 5,090,898 5,090,917 5,090,973 5,091,015 5,091,019 5,091,053 5,091,054 5,091,073 5,091,087 5,091,102 5,091,117 5,091,170 5,091,200 5,091,203 5,091,205 5,091,213 5,091,232 5,091,253 5,091,304 5,091,320 5,091,378 5,091,380 5,091,389 5,091,413 5,091,423 5,091,431 5,091,508 5,091,509 5,091,526 5,091,534 5,091,590 5,091,595 5,091,767 5,091,791 5,091,872 5,091,908 5,091,916 5,091,931 5,091,979 5,091,988 1,028,461 5,090,245 5,090,257 5,090,642 5,090,843 5,090,879 5,091,867 Re.33,829 Re.33,831 5,090,056 5,090,072 5,090,114 5,090,157 5,090,223 5,090,300 5,090,349 5,090,350 5,090,364 5,090,395 5,090,410 5,090,425 5,090,434 5,090,436 5,090,440 5,090,458 5,090,490 5,090,511 5,090,564 5,090,567 5,090,587 5,090,614 5,090,664 5,090,669 5,090,683 5,090,724 5,090,742 5,090,796 5,090,816 5,090,829 5,090,847 5,090,878 5,090,894 5,090,926 5,090,943 5,091,011 5,091,075 5,091,085 5,091,103 5,091,104 5,091,197 5,091,256 5,091,278 5,091,291 5,091,296 5,091,298 5,091,410 5,090,695 5,090,703 5,090,714 5,090,735 5,091,654	5,091,659 5,091,666 5,091,699 5,091,745 5,091,747 5,091,753 5,091,769 5,091,774 5,091,817 5,091,821 5,091,836 5,091,837 5,091,847 5,091,863 5,091,870 5,091,893 5,091,971 5,091,972 5,091,975 5,090,063 5,090,280 5,090,296 5,090,488 5,090,531 5,090,922 5,091,504 5,091,716 5,091,928 5,090,347 5,090,630 5,090,054 5,090,057 5,090,068 5,090,087 5,090,107 5,090,108 5,090,194 5,091,579 5,091,583 5,091,593 5,091,610 5,091,728 5,091,776 5,091,777 5,090,678 5,090,711 5,090,762 5,090,788 5,090,811 5,090,825 5,090,865 5,090,873 5,090,891 5,090,975 5,090,981 5,090,985 5,090,986 5,090,987 5,090,989 5,091,017 5,091,101 5,091,107 5,091,124 5,091,175 5,091,252 5,091,343 5,091,443 5,091,467 5,091,471 5,091,480 5,091,545 5,091,559 5,091,628 5,091,672 5,091,695 5,091,963 4,959,101 5,090,162 5,090,600 5,091,036 5,091,060 5,091,440 5,091,448 5,091,457 5,091,490 5,090,313 5,090,332 5,090,428 5,090,507 5,090,617 5,090,637 5,090,722 5,090,853 5,090,954 5,091,080 5,091,332 5,091,613 5,091,697 5,090,116 5,090,213 5,090,228 5,091,550 5,090,357	5,090,977 5,091,016 5,091,091 5,091,096 5,091,152 5,091,157 5,091,250 5,091,313 5,091,317 5,091,319 5,091,339 5,091,385 5,091,476 5,091,552 5,091,572 5,091,574 5,091,585 5,091,611 5,091,655 5,091,662 5,091,759 5,091,771 5,091,844 5,091,850 5,091,875 5,091,879 5,091,906 5,091,960 5,090,242 5,090,421 5,090,491 5,090,837 5,091,685 5,091,713 5,090,297 5,090,651 5,091,289 5,090,167 5,090,175 5,090,214 5,090,265 5,090,351 5,090,464 5,090,501 5,090,797 5,090,814 5,090,835 5,091,069 5,091,140 5,091,231 5,091,261 5,091,362 5,091,456 5,091,523 5,091,690 5,091,778 5,091,799 5,091,840 5,090,170 5,090,196 5,090,243 5,090,272 5,090,691 5,090,918 5,090,929 5,091,018 5,091,079 5,091,097 5,091,177 5,091,178 5,091,204 5,091,245 5,091,421 5,091,514 5,091,990 5,090,174 5,090,205 5,091,475 5,090,053 5,090,085 5,090,137 5,090,178 5,090,246 5,090,254 5,090,593 5,090,608 5,090,645 5,090,648 5,090,654 5,090,656 5,090,658 5,090,661 5,090,667 5,090,686 5,090,734 5,090,761 5,090,842 5,090,857 5,090,884 5,090,910 5,090,924 5,091,952
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02 :	324,126	324,259	324,177	324,280	324,188	324,165
05 :	324,249	324,266	324,247	324,269	324,192	324,260
06 :	324,128	324,270	324,264	324,279	324,204	324,262
	324,137	324,275	324,286	324,256	324,216	324,284
	324,139	324,283	21 :	324,127	324,222	324,176
	324,144	324,288	22 :	324,146	324,197	324,276
08 :	324,185	324,145	29 :	324,136	324,136	324,250
09 :	324,184	324,157	32 :	324,155	37 :	324,154
	324,189	324,158	34 :	324,169	39 :	324,271
	324,199	324,174		324,174		324,198
12 :	324,201	324,186	23 :	324,138	324,173	324,271
	324,212	324,190	24 :	324,282	324,226	324,198
	324,218	324,207	25 :	324,225	324,272	324,191
13 :	324,170	324,207	26 :	324,134	324,226	324,251
	324,220	324,242		324,225	324,226	324,162
17 :	324,123	324,235	36 :	324,142	324,131	324,219
	324,232	324,152		324,235	324,132	324,258
	324,245	324,160		324,153	324,161	324,263
	324,255	324,166		324,205	324,210	324,285
		324,167		324,252	42 :	324,148

PLANT PATENTS

06 :	7,804	7,806	7,808	7,809	27 :	7,803	39 :	7,810
	7,805	7,807						

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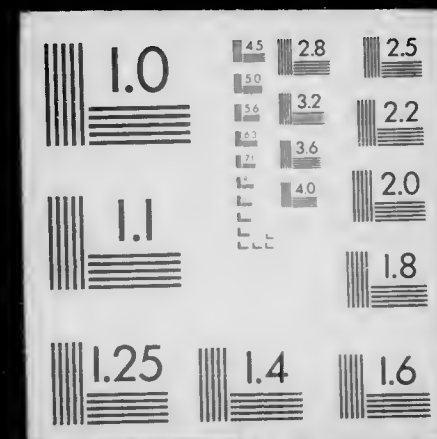
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